

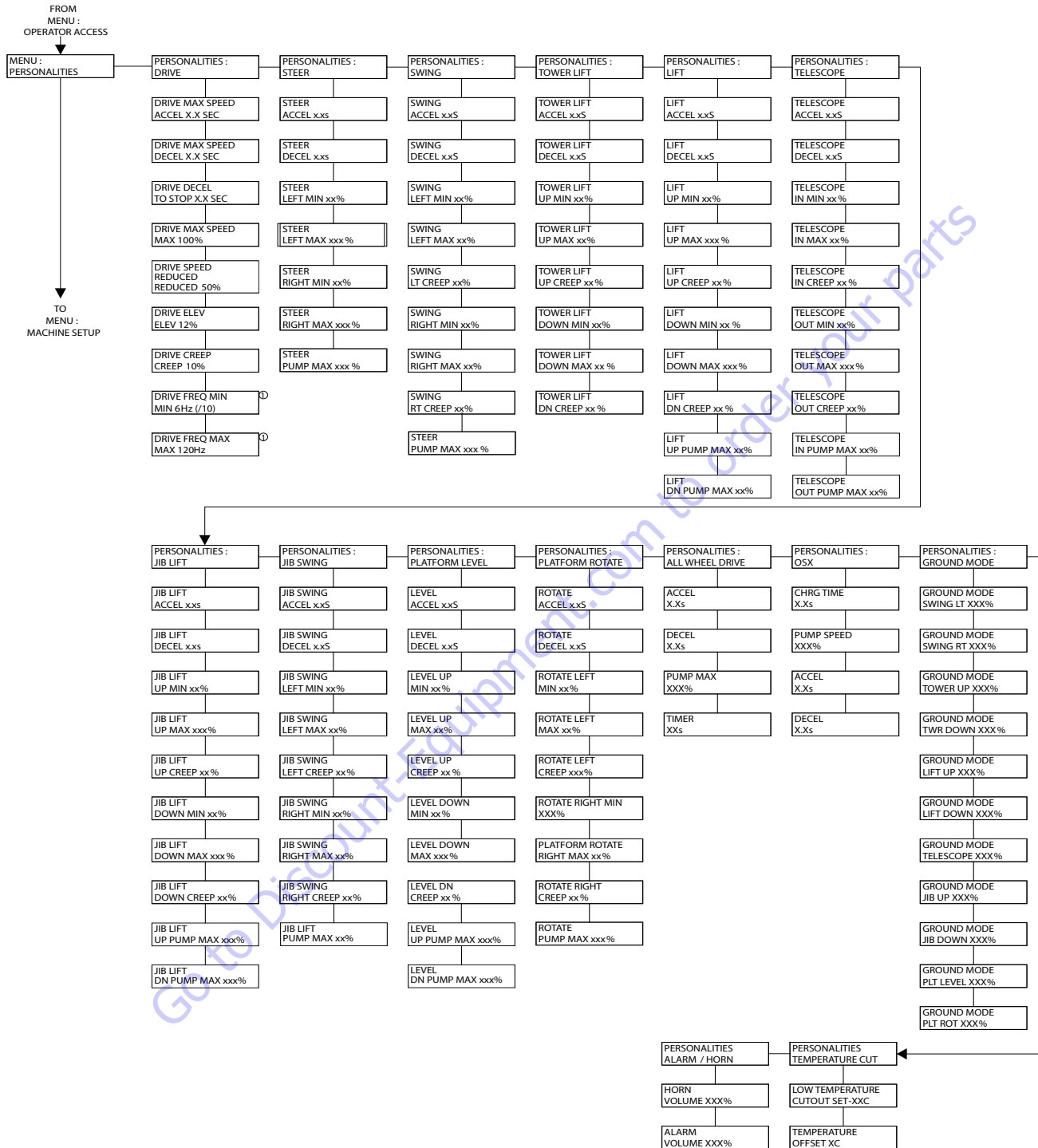


1001187146-M
MAE31790M

NOTE: The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration.

Figure 6-4. Analyzer Software P1.10 - Sheet 3 of 5

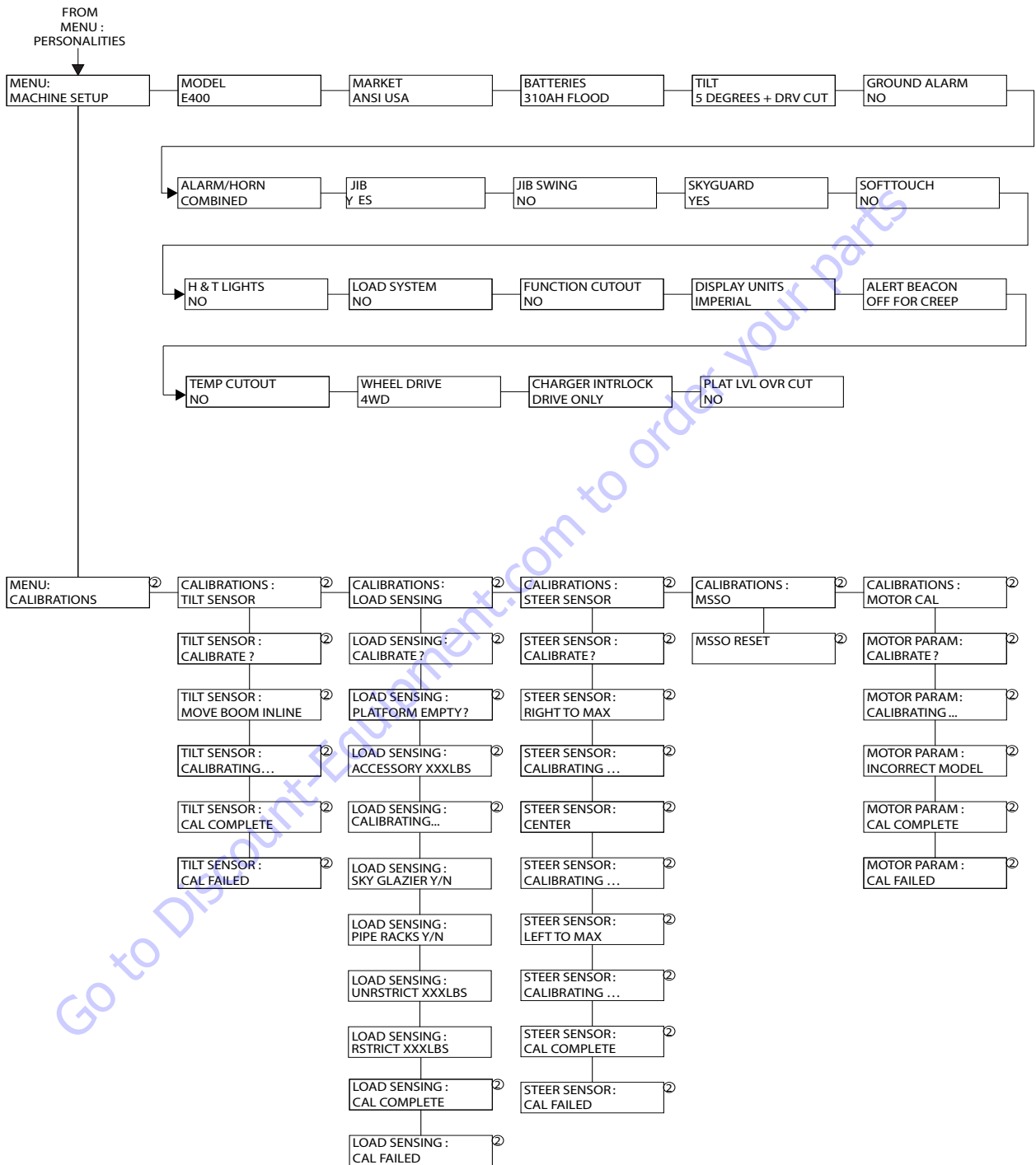
SECTION 6 - JLG CONTROL SYSTEM



1001187146-M
MAE31800M

NOTE: The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration.

Figure 6-5. Analyzer Software P1.10 - Sheet 4 of 5



1001187146-M
MAE31810M

NOTE: The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration.

Figure 6-6. Analyzer Software P1.10 - Sheet 5 of 5

6.3 MACHINE ORIENTATION WHEN PERFORMING TEST

Drive (Below elevation): Test should be done on a smooth, level surface. The Drive select switch should be in the "Max Speed" position. Start approximately 25 ft (7.6m) from starting point so the unit is at a maximum speed when starting the test. Result should be recorded for a 200 ft (61m) course. Drive Forward, "High speed", record time. Drive Reverse, "High speed", record time.

Drive Reduced (below elevation): Test should be done on a smooth, level surface. The Drive select switch should be in the "Reduced Speed" position. Start approximately 25 ft (7.6m) from starting point so the unit is at a maximum speed when starting the test. Result should be recorded for a 200 ft (61m) course. Drive Forward, "Reduced speed", record Time. Drive Reverse, "Reduced speed", record Time.

Drive (above elevation): Test should be done on a smooth, level surface. The drive select switch should be in the "Max Speed" position, the boom should be $>10^{\circ}$ above horizontal to ensure the drive is operating in elevated mode. Result should be recorded for a 50 ft (15.2m) course. Drive Forward, Record Time. Drive reverse, Record Time. Turn Platform Speed Control Knob fully counterclockwise to enter Creep mode; Creep light on Panel must be energized. Verify that machine will Drive Forward and Reverse. Return Knob to fully clockwise.

Swing: Boom at full elevation, Telescope retracted. Swing turntable right to end stop. Swing Left to end stop, record time. Swing Right to end stop, record time. Turn Platform Speed Control Knob fully counterclockwise to enter Creep mode; Creep light on Panel must be energized. Verify that machine will Swing left and right. Return Knob to fully counterclockwise.

Tower Lift: Tower Lift in stowed position, Telescope Retracted, Main lift horizontal. Tower Lift Up, record time. Tower Lift Down, record time. Turn Platform Speed Control Knob fully counterclockwise to enter Creep mode; Creep light on Panel must be energized. Verify that machine will Tower Up and Down. Return Knob to fully clockwise.

Main lift: Main Lift in stowed position Tower Lift in stowed position, Telescope Retracted. Main Lift Up, record time. Main Lift Down, record time. Turn Platform Speed Control Knob fully counterclockwise to enter Creep mode; Creep light on Panel must be energized. Verify that machine will Lift Up and Down. Return Knob to fully clockwise.

Telescope: Main Lift at full elevation, Telescope Retracted. Telescope Out, record time. Telescope In, record time. Turn Platform Speed Control Knob fully counterclockwise to enter creep mode; creep light on Panel must be energized. Verify that machine will Telescope Up and Down. Return Knob to fully clockwise.

Jib Lift: Platform level and centered with boom. Jib Lift Down until stop. Jib Lift Up, record time. Jib Lift Down, record time. Turn Platform Speed Control Knob fully counterclockwise to enter Creep mode; Creep light on Panel must be energized. Verify that machine will Jib Lift Up and Down. Return Knob to fully clockwise.

Jib Swing: Platform level and centered with boom. Jib Lift Horizontal and swing fully to left stop. Swing right to end stop, record time. Swing left to end stop, record time. Turn Platform Speed Control Knob fully counterclockwise to enter Creep mode; Creep light on Panel must be energized. Verify that machine will Jib swing left and right. Return Knob to fully clockwise.

Platform Rotate: Platform level, Rotate Platform Right until stop. Platform Left, record time. Platform Right, record time. Turn Platform Speed Control Knob fully counterclockwise to enter Creep mode; Creep light on Panel must be energized. Verify that machine will Platform Rotate Left and Right. Return Knob to fully counterclockwise.

Test Notes

1. Personality settings can be adjusted anywhere within the adjustment range for optimum machine performance.
2. Stop watch should be started with the function movement, not with actuation of joystick and switch.
3. Drive speeds should be set to the values below regardless of the tire size.
4. All speed tests are run from the platform. These speeds do not reflect the ground control operation.
5. The platform speed knob control must be at full speed (turned clockwise completely).
6. Some flow control functions may not work with the Platform Speed Control knob clicked into the creep position.
7. Functional speeds may vary due to cold, thick hydraulic oil. Test should be run with the oil temperature above 100° F (38° C).

6.4 FUNCTION SPEED

Function	Speed (In Seconds)
Main Lift Up	24-30
Main Lift Down	23-29
Turntable Swing Right & Left 360°	67-81
NOTE: Swing Left to Swing Right should be within 10% of each other.	
Telescope Out	9-12
Telescope In	15-19
Platform Rotate - Right & Left 180°	8-14
NOTE: Rotate Left to Swing Right should be within 15% of each other.	
Jib Lift Up	24-27
Jib Lift Down	19-25
Lower Lift Up	27-33
Lower Lift Down	22-26
Drive Fwd Below Elevation	30-35
Drive Reduced/Drive Reverse Below Elevation	50-59
Drive Above Elevation (ANSI)	107-112
Drive Above Elevation (CE)	107-112
NOTE: Drive Forward Max to 100% (Typical)	
NOTE: Drive Reverse Max = Drive Reduced Max (Below Elevation)	

1001250453-A

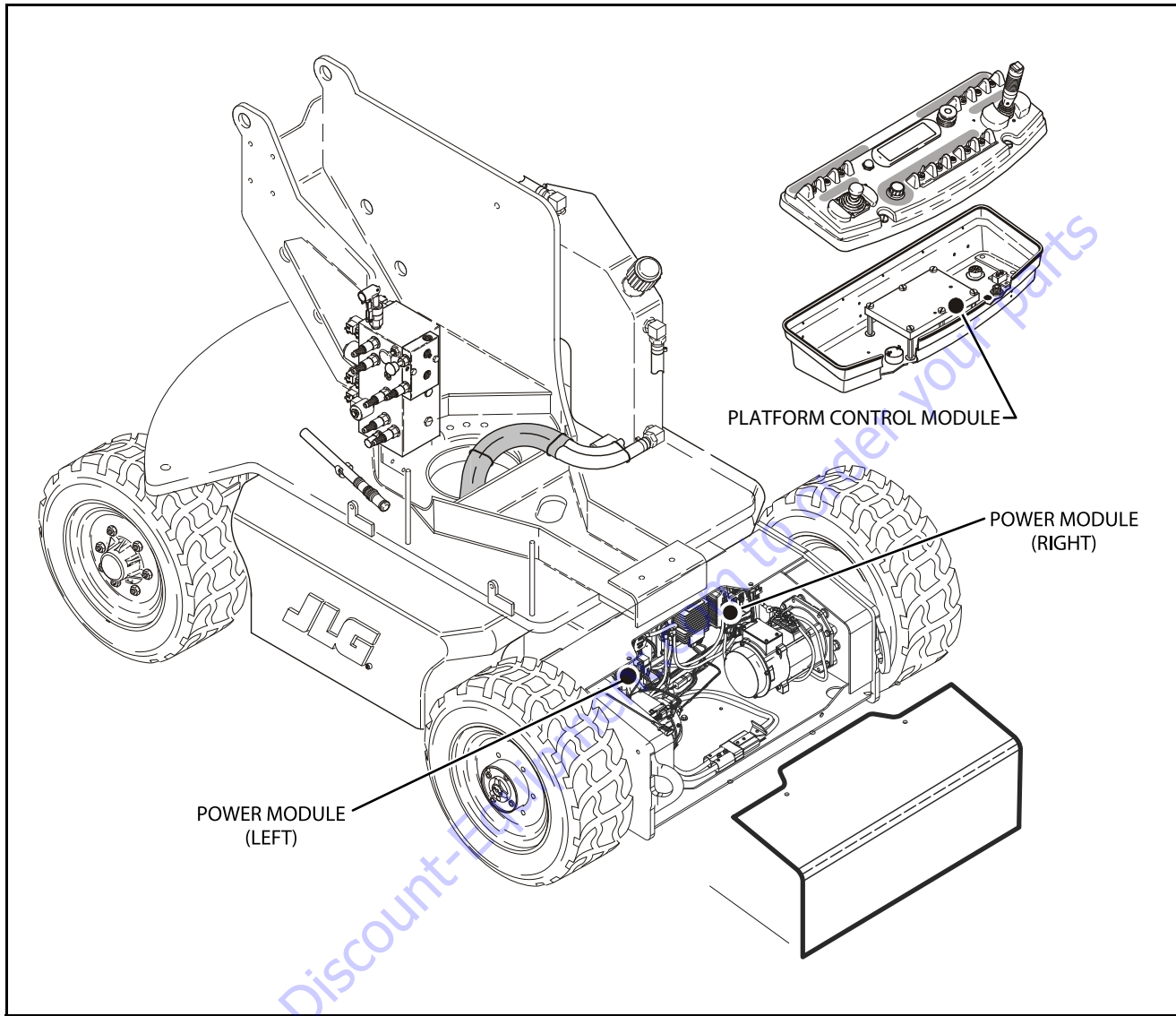


Figure 6-7. Control Module Location - Sheet 1 of 2

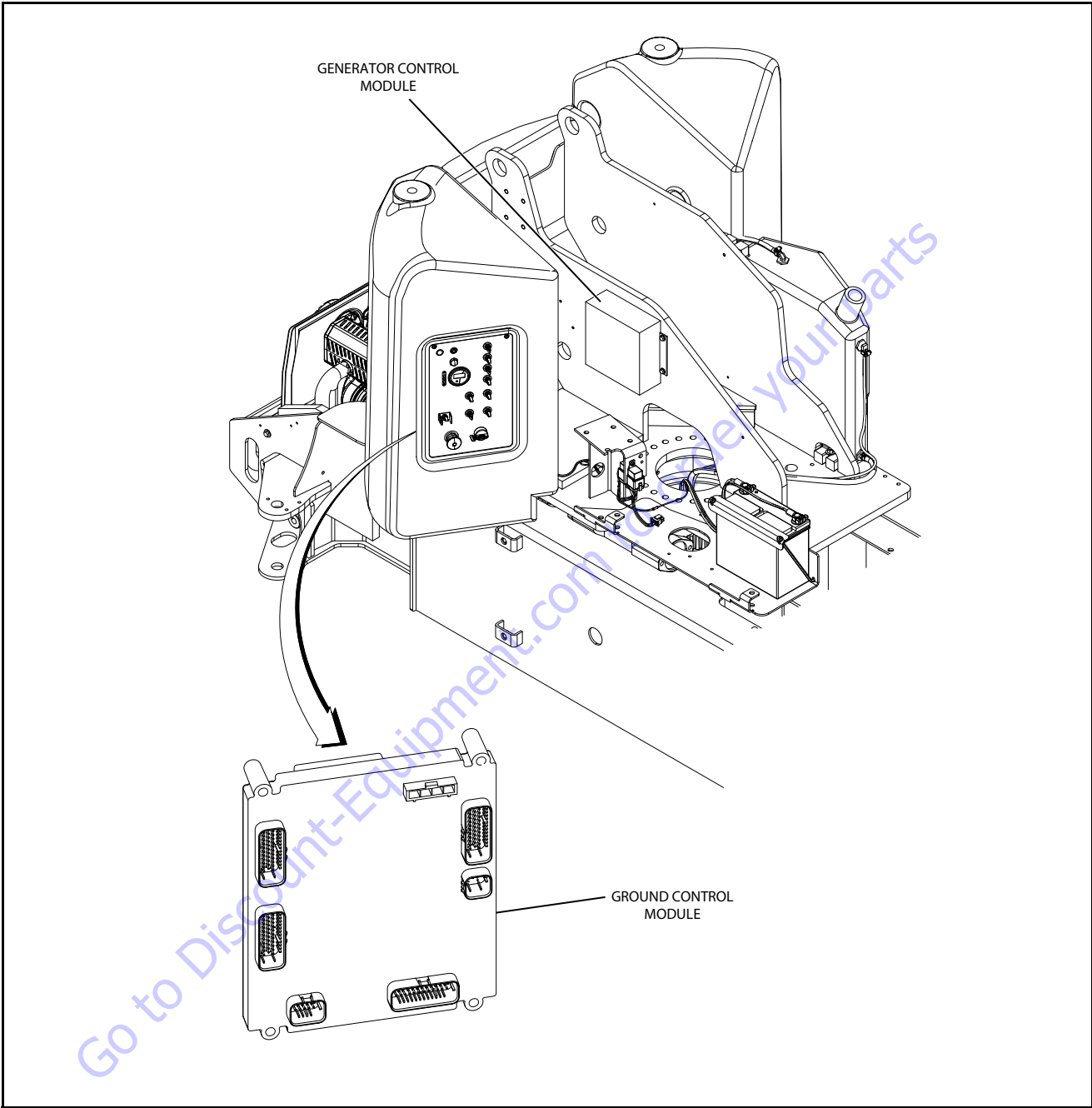


Figure 6-8. Control Module Location - Sheet 2 of 2



PLATFORM CONNECTION



GROUND CONTROL CONNECTION

Figure 6-9. Analyzer Connecting Points

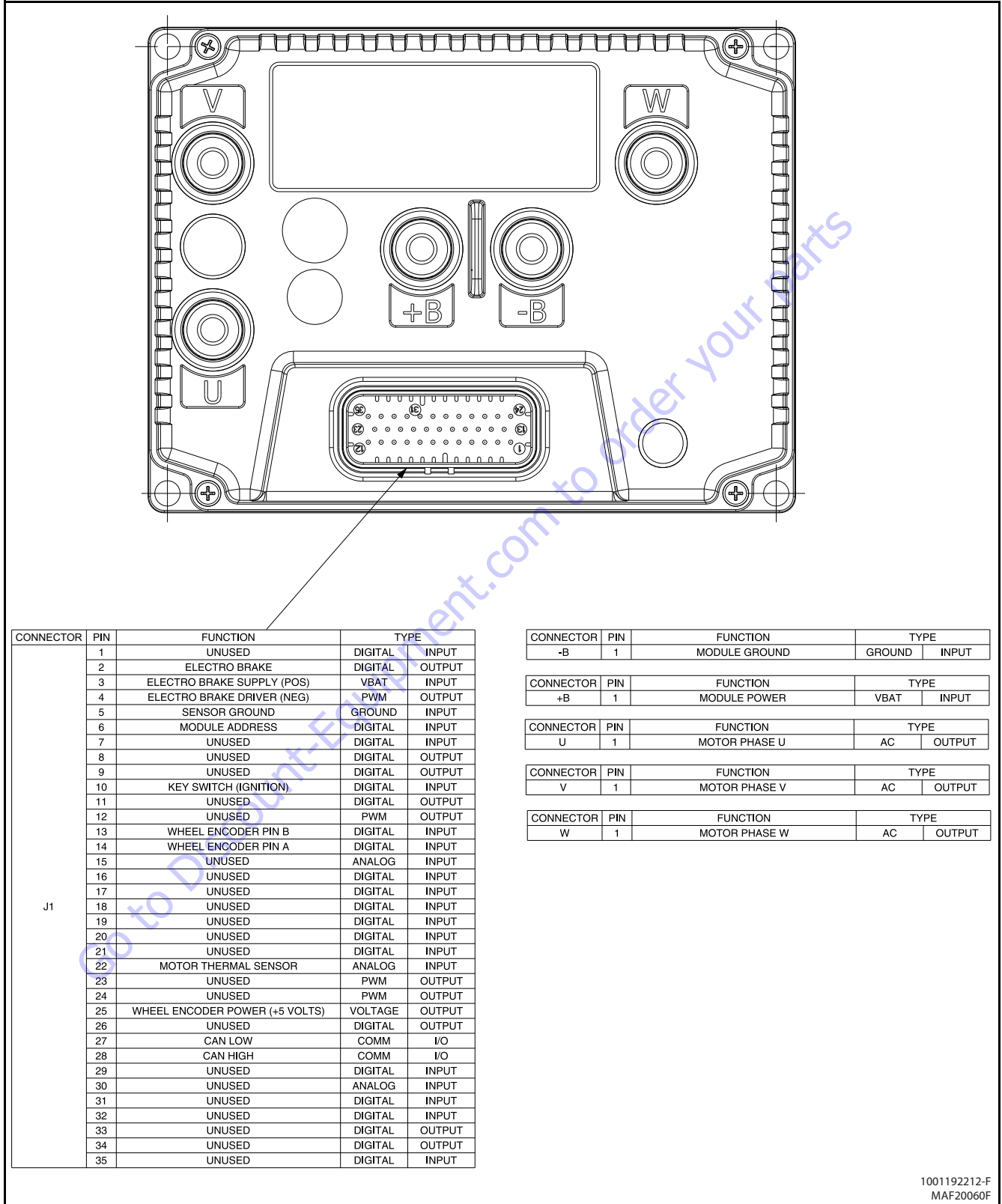


Figure 6-10. Power Module - LH

1001192212-F
MAF20060F

SECTION 6 - JLG CONTROL SYSTEM

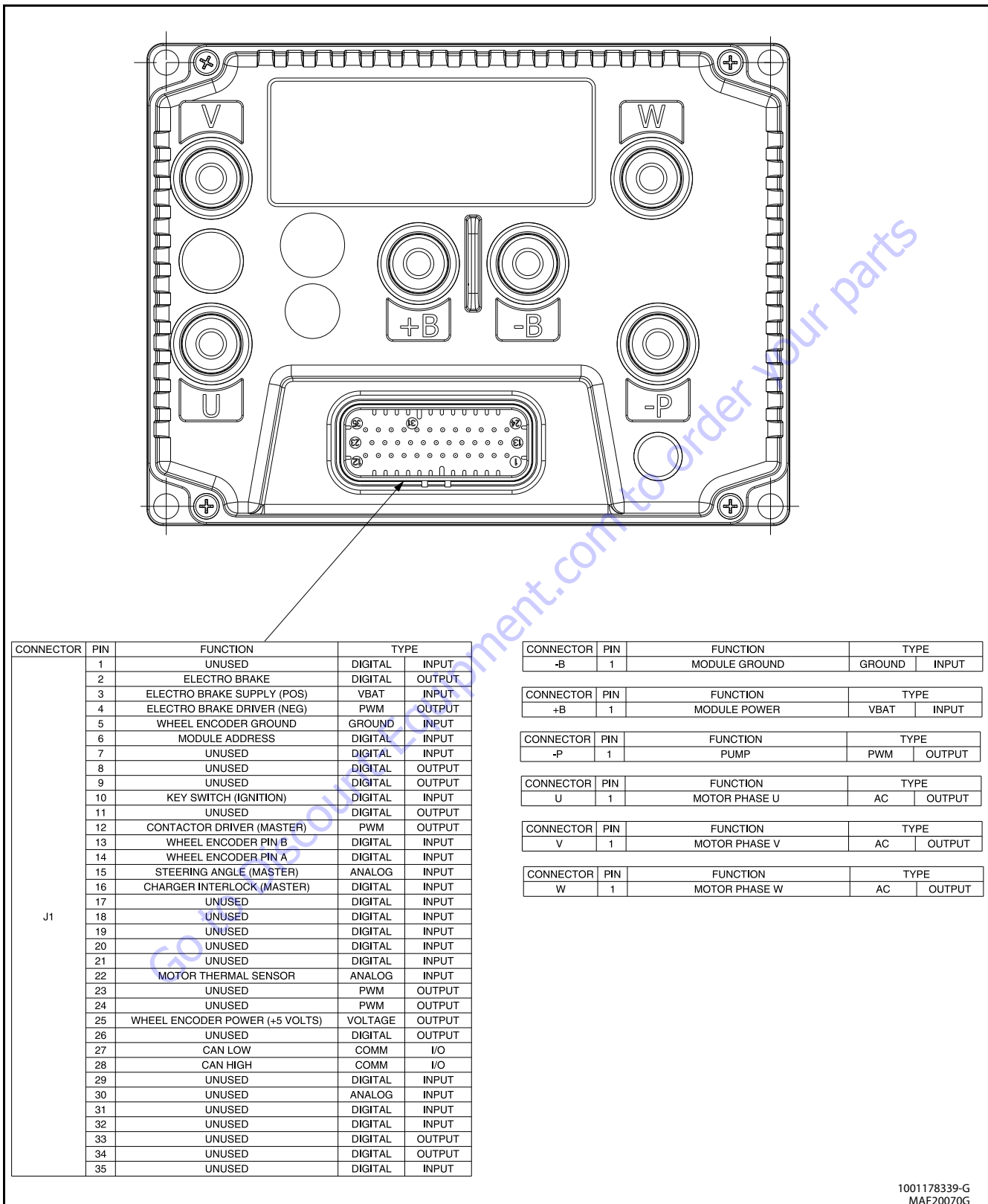
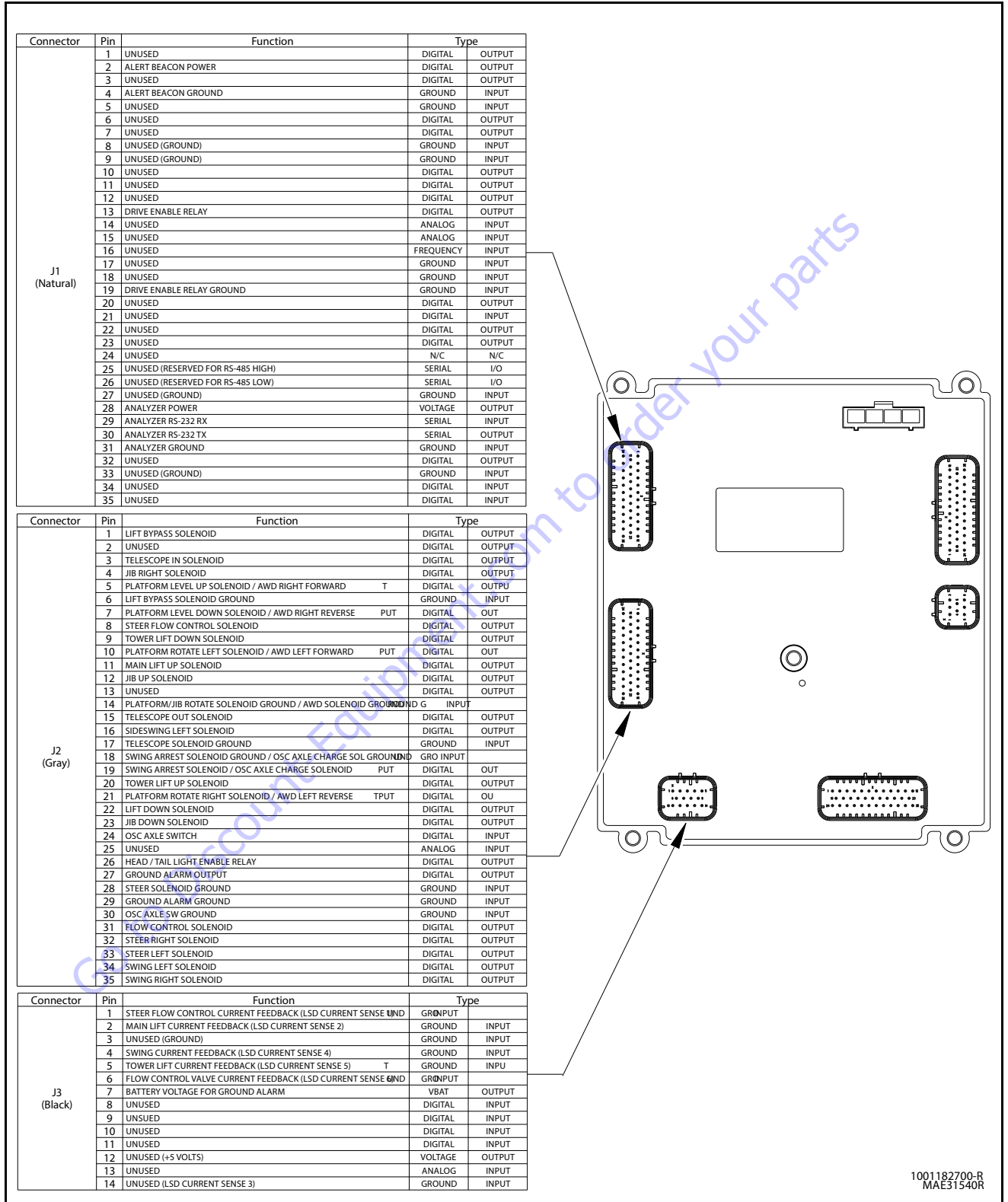


Figure 6-11. Power Module - RH

1001178339-G
MAF20070G



1001182700-R
MAE31540R

Figure 6-12. Ground Control Module - Sheet 1 of 3

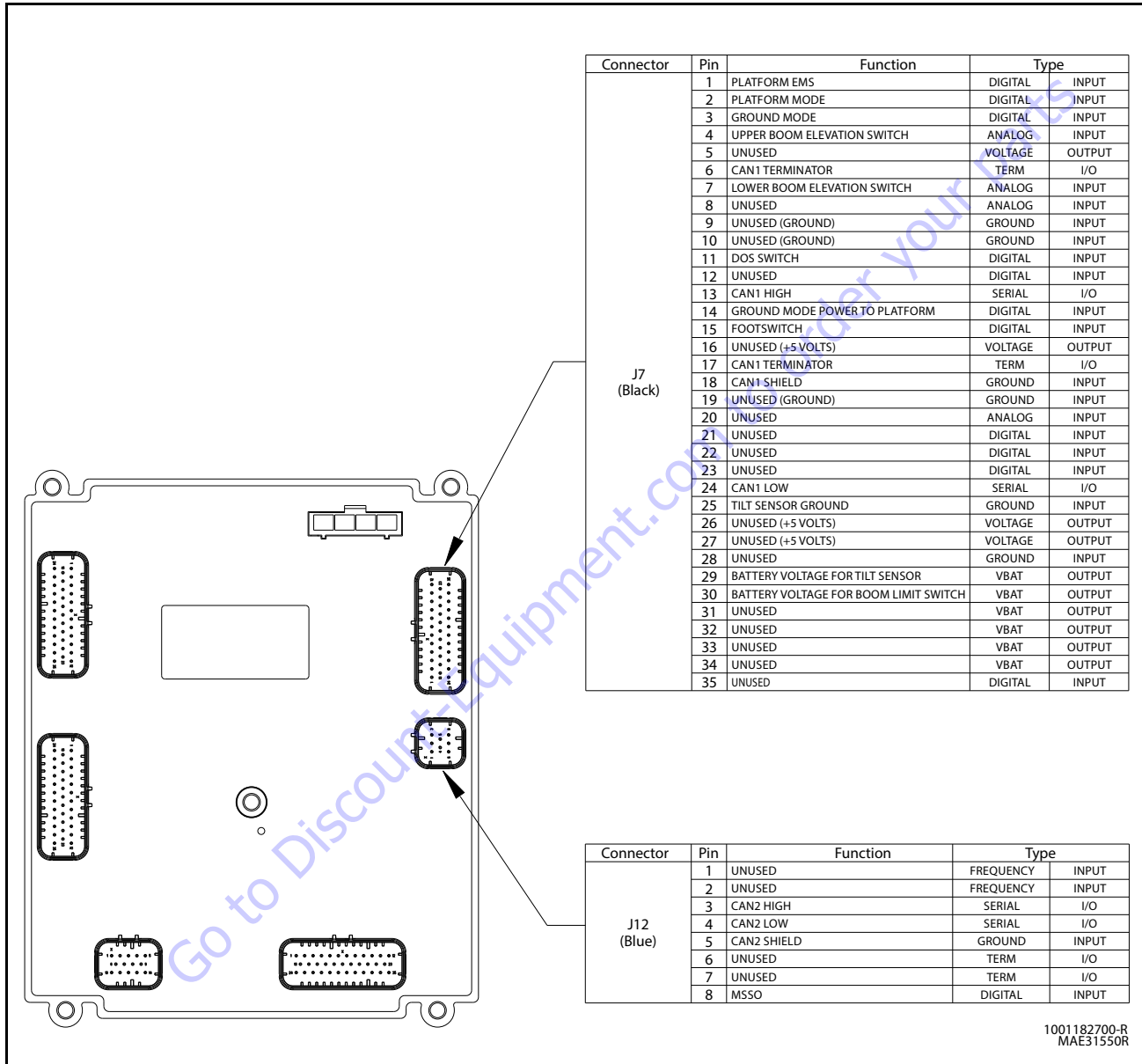
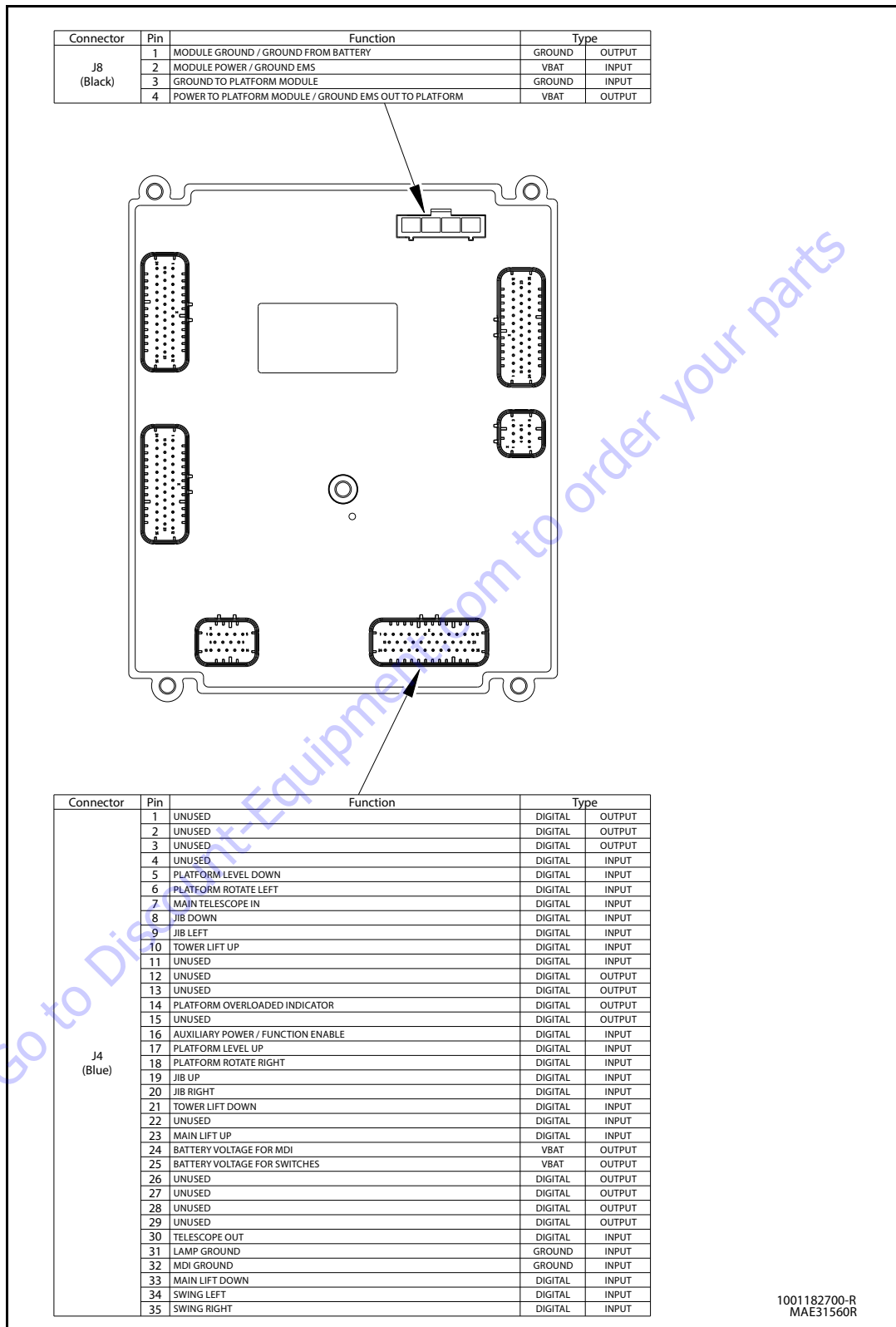


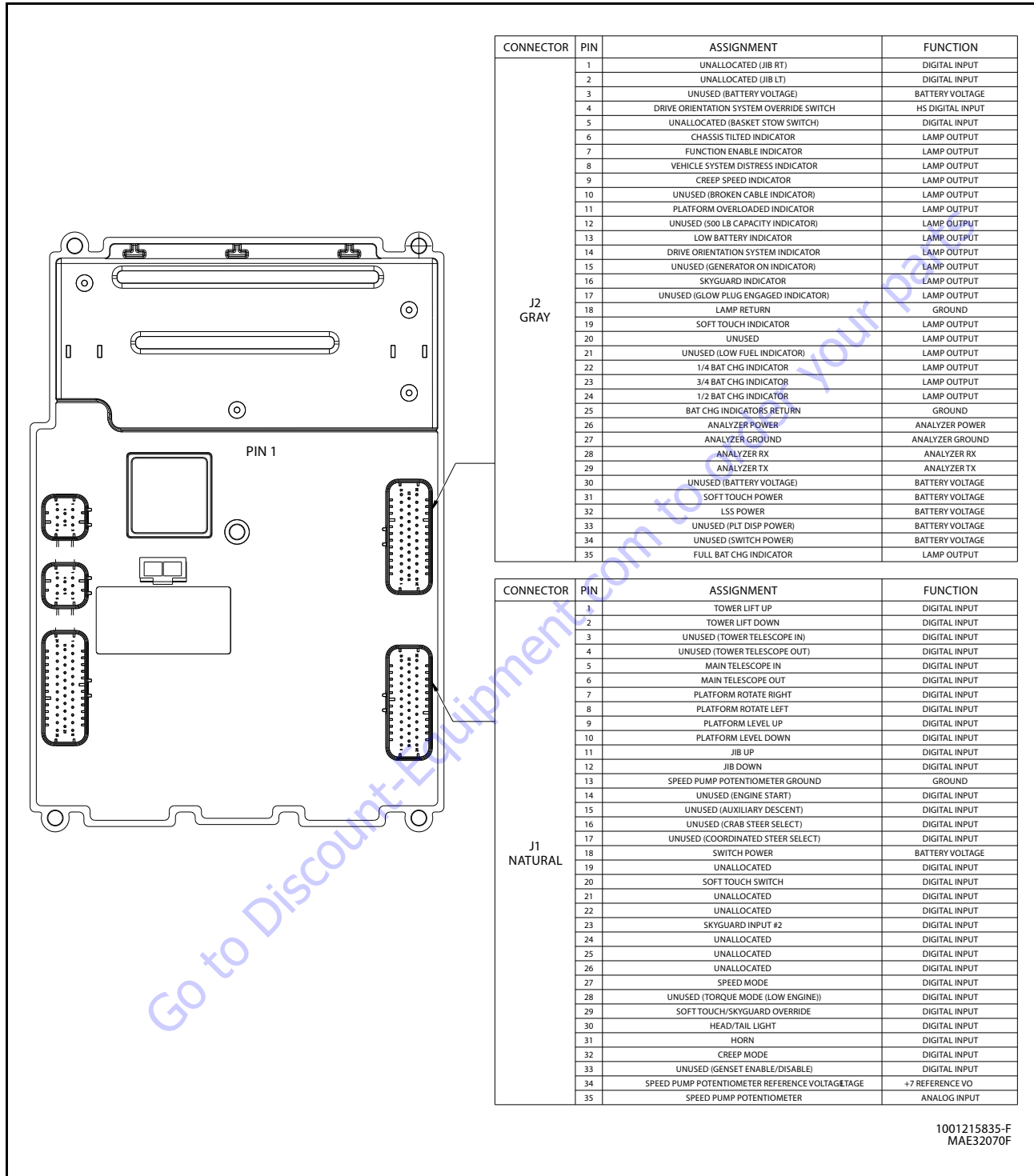
Figure 6-13. Ground Control Module - Sheet 2 of 3



1001182700-R
MAE31560R

Figure 6-14. Ground Control Module - Sheet 3 of 3

SECTION 6 - JLG CONTROL SYSTEM



1001215835-F
MAE32070F

Figure 6-15. Platform Module - Sheet 1 of 2

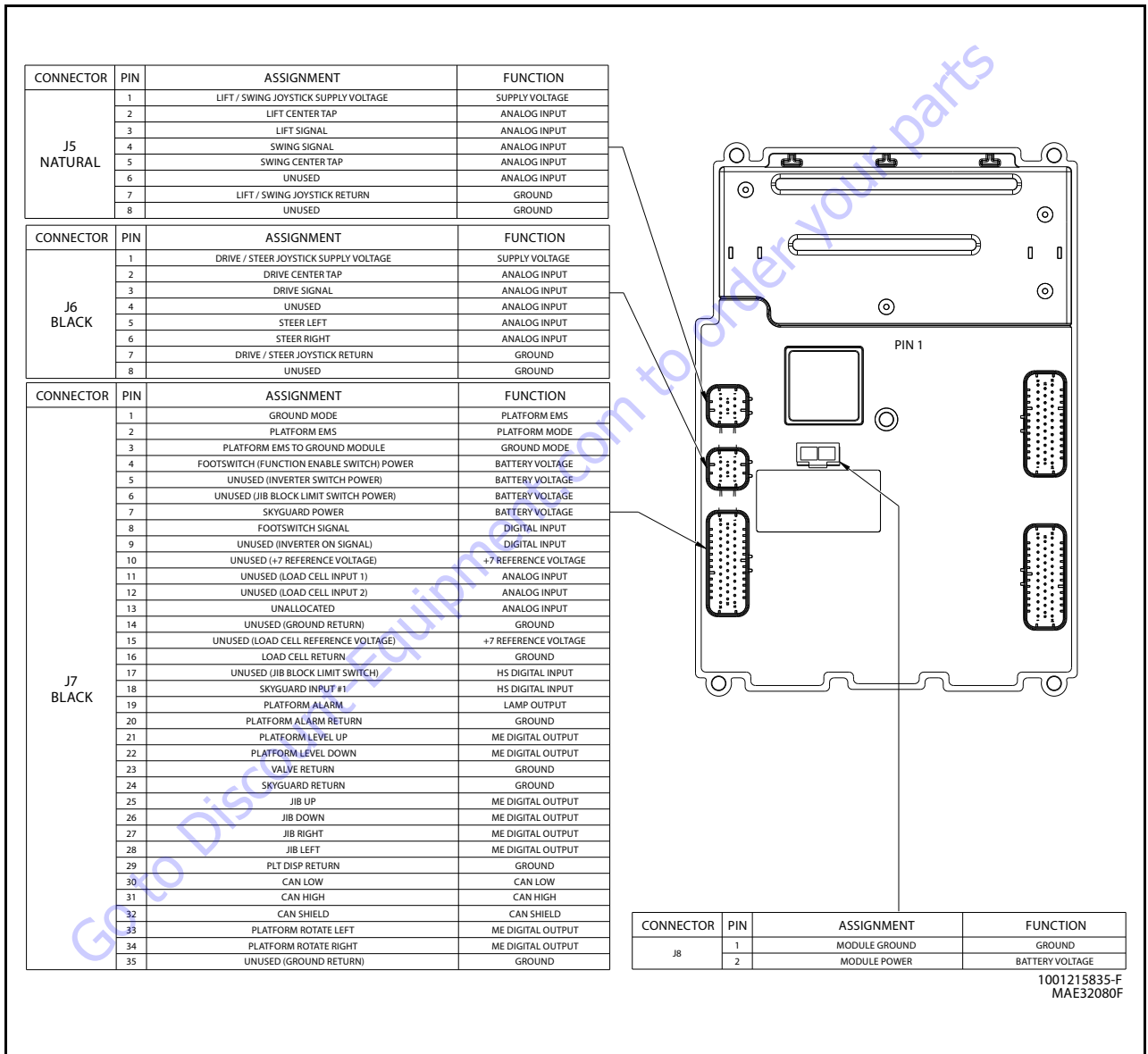


Figure 6-16. Platform Module - Sheet 2 of 2

Table 6-5. Machine Setup Descriptions

MODEL NUMBER	Displays/adjusts machine model NOTE: all personalities reset to default when model number is altered
TILT	Displays/adjusts tilt sensor function
DRIVE CUTOUT	Displays/adjusts drive cutout switch presence/function
FUNCTION CUTOUT	Displays/adjusts function cutout switch presence/function
JIB.	Displays/adjusts jib presence
GROUND ALARM	Displays/adjusts ground alarm presence/function

Help Descriptions and Fault Flash Codes

Table 6-6. JLG Control System Flash Codes

Code	Description
2-1	Faulty Footswitch/EMS
2-2	Drive/Steer inputs/Footswitch Interlocks
2-3	Boom function inputs/Lift-Swing Joystick
2-5	Function Cutout/Drive Cutout
3-1	Contactors miswired/Motors miswired
3-2	Line contactor welded
3-3	Contactor short circuit or valve short circuit
4-2	Controller Overtemperature
4-4	Battery voltage out of range
6-6	CANbus inputs
7-7	Traction /Pump motor wiring or motor faulty
9-9	Problem with Controller

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Table 6-7. Help Descriptions and Fault Flash Codes

Flash Code	Description
No flash code is indicated for the following help messages; they are intended to hint at a possible problem if the vehicle is not behaving as expected.	
	<p>EVERYTHING OK The "normal" help message in platform mode</p>
	<p>GROUND MODE OK The "normal" help message in ground mode</p>
	<p>BRAKES RELEASED Indicates manual brake release in ground mode</p>
	<p>DRIVING AT CREEP - TILTED Drive speed is limited to creep because the vehicle is tilted.</p>
	<p>FWS OPEN A drive or boom function has been selected but footswitch is open.</p>
	<p>PUMP MOTOR AT CURRENT LIMIT Pump current has reached controller current limit or safe operating area limit.</p>
	<p>RUNNING AT CREEP - CREEP SWITCH OPEN All function speeds are limited to creep because the creep switch is open.</p>
	<p>RUNNING AT CUTBACK - ABOVE ELEVATION All function speeds are limited to cutback speed because the vehicle is above elevation.</p>
	<p>RUNNING AT CREEP - TILTED AND ABOVE ELEVATION All function speeds are limited to creep because the vehicle is tilted and above elevation.</p>
	<p>TESTS ACTIVE - RECYCLE EMS TO END The system tests have been activated; normal vehicle operation is not allowed.</p>
	<p>TILT MODULE FAILURE: BAD TILT SENSOR There is a problem with the tilt sensor interface circuitry; the controller defaults to massively tilted and does not try to prevent vehicle roll on the grade.</p>
	<p>TRACTION MOTOR AT CURRENT LIMIT Traction current has reached controller current limit or safe operating area limit.</p>
	<p>WATER BATTERIES The batteries have been charged a number of times (set by machine digit) and need a top-up; when this is done the count will reset</p>
2/1	Flash code 2/1 indicates problems with the footswitch.
	<p>FWS FAULTY The two footswitch signals do not agree. EMS recycle required.</p>
	<p>START UP Neither EMS input is active - the system is just switching on or is discharging the capacitor bank. A welded line contactor might also cause this</p>

Table 6-7. Help Descriptions and Fault Flash Codes

2/2	Flash code 2/2 indicates problems with drive & steer selection.
	<p>DRIVE JOYSTICK FAULTY The drive joystick center tap is out of valid range, or the wiper is wire-off.</p> <p>DRIVE LOCKED - JOYSTICK MOVED BEFORE EMS/FWS Drive was selected before and during footswitch closure.</p> <p>FWS INTERLOCK TRIPPED Footswitch was closed for seven seconds with no function selected.</p> <p>STEER LOCKED - SELECTED BEFORE EMS/FWS Steer was selected before and during footswitch closure.</p> <p>STEER SWITCHES FAULTY Both steer switches are active together.</p> <p>WAITING FOR FWS TO BE OPEN Footswitch was closed when platform mode was selected.</p> <p>JOYSTICK FAULTS - CHECK PLATFORM BOX WIRING More than one of the drive, lift and swing joystick center tap or wiper voltages is out of range. This is probably due to a short-circuit across a joystick port.</p>
2/3	Flash code 2/3 indicates problems with boom function selection.
	<p>LIFT/SWING JOYSTICK FAULTY The lift or swing Joystick center tap is out of valid range, or the wiper is wire-off.</p> <p>LIFT/SWING LOCKED - JOYSTICK MOVED BEFORE EMS/FWS Upper Lift or swing was selected before and during footswitch closure.</p> <p>PUMP POT FAULTY The pump pot is open-circuit; all platform boom functions except upper lift & swing will run at creep.</p> <p>PUMP SWITCHES FAULTY - CHECK DIAGNOSTICS/BOOM A boom function (lower lift, telescope, basket level, basket rotate, jib) has both directions selected together.</p> <p>PUMP SWITCHES LOCKED - SELECTED BEFORE EMS/FWS A boom function (lower lift, telescope, basket level, basket rotate, jib) was selected before and during footswitch closure.</p> <p>PUMP SWITCHED LOCKED - SELECTED BEFORE EMS A ground boom function (lower lift, telescope, basket level, basket rotate, jib) was selected before keyswitch.</p> <p>SWING/LIFT JOYSTICK FAULTY The swing joystick center tap is out of valid range, or the wiper is wire-off.</p>
2/5	Flash code 2/5 indicates that a function is prevented due to a cutout.
	<p>BOOM PREVENTED - DRIVE SELECTED A boom function is selected while a drive function is selected and drive cutout is configured to prevent simultaneous drive & boom operation.</p> <p>BOOM PREVENTED - FUNCTION CUTOUT ACTIVE A boom function is selected while function cutout is active and configured to cutout boom functions.</p> <p>DRIVE & BOOM PREVENTED - FUNCTION CUTOUT ACTIVE Drive or a boom function is selected while function cutout is active and configured to cutout all functions.</p> <p>DRIVE PREVENTED - ABOVE ELEVATION Drive is selected while above elevation and drive cutout is configured to prevent drive.</p> <p>DRIVE PREVENTED - BOOM MOVEMENT SELECTED Drive is selected while a boom function is selected and drive cutout is configured to prevent simultaneous drive & boom operation.</p> <p>DRIVE PREVENTED - CHARGER CONNECTED Drive is selected while the charger is on (indicated by drive cutout being active) and drive cutout is configured to prevent drive.</p> <p>DRIVE PREVENTED - TILTED AND ABOVE ELEVATION Drive is selected while drive cutout is active and drive cutout is configured to prevent drive.</p>

Table 6-7. Help Descriptions and Fault Flash Codes

	<p>TILT MODULE FAILURE: NOT COMMUNICATING There is a problem with the positrac/tilt module; the controller defaults to massively tilted and does not try to prevent vehicle roll on the grade.</p>
3/1	Flash code 3/1 indicates that a contactor did not close when energized.
	<p>LINE & DIRECTION CONTACTORS MISWIRED When the line contactor was closed traction point A went high (and the capacitor bank charge did not increase to battery supply) - this occurs if the line contactor coil wiring is swapped with that for a direction contactor coil.</p> <p>OPEN-CIRCUIT FORWARD DIRECTION CONTACTOR OR TRACTION MOTOR Traction point A did not go high when forward contactor was energized (this could be due to traction motor open-circuit or a power wiring error).</p> <p>OPEN-CIRCUIT LINE CONTACTOR OR TRACTION MOTOR The capacitor bank charge did not increase to battery supply when line contactor was energized (this could be due to a power wiring error).</p> <p>OPEN-CIRCUIT REVERSE DIRECTION CONTACTOR Traction point A did not go high when reverse contactor was energized (this could be due to traction motor open-circuit or a power wiring error).</p>
3/2	Flash code 3/2 indicates that a contactor did not open when energized.
	<p>WELDED LINE CONTACTOR The capacitor bank charge did not decrease from battery supply when line contactor was deenergized (this could be due to a power wiring error). WARNING: If the line contactor is welded, the controller will not switch off when EMS or keyswitch is turned off.</p>
3/3	Flash code 3/3 indicates that a contactor coil is short-circuited.
	<p>OVERLOADED VALVE SUPPLY-CHECK WIRING. There is a high current draw from the valve supply when no valve is energized; this is probably due to a wiring error at the ground module.</p> <p>SHORT-CIRCUIT FORWARD CONTACTOR COIL The forward contactor was not energized when required, due to coil overcurrent protection.</p> <p>SHORT-CIRCUIT LINE CONTACTOR COIL The line contactor was not energized when required, due to coil overcurrent protection.</p> <p>SHORT-CIRCUIT REVERSE CONTACTOR COIL The reverse contactor was not energized when required, due to coil overcurrent protection.</p>
4/2	Flash code 4/2 indicates that the controller is over temperature.
	<p>CONTROLLER TOO HOT - PLEASE WAIT The controller heatsink temperature reached 75 degrees. The controller is shut down until it cools to below 70 degrees.</p>
4/4	Flash code 4/4 indicates problems with the battery supply.
	<p>BATTERY LOW Battery voltage is below 40V. This is a warning - the controller does not shut down.</p> <p>BATTERY TOO HIGH - SYSTEM SHUT DOWN Battery voltage is above 62V. EMS recycle required.</p> <p>BATTERY TOO LOW - SYSTEM SHUT DOWN Battery voltage is below 33V. EMS recycle required.</p>
6/6	Flash code 6/6 indicates problems with the CANbus.
	<p>48V PROTECTION TRIPPED - CHECK INTER-MODULE WIRING The power module is not receiving acknowledgments from the platform or ground modules to transmitted data, and the protection circuit which supplies the platform and ground modules has tripped. This is probably due to wiring problems at the platform or ground module.</p>

Table 6-7. Help Descriptions and Fault Flash Codes

	<p>CANbus FAILURE: GROUND MODULE The power module is receiving from the platform module but not the ground module. This should not be possible!</p> <p>CANbus FAILURE: PLATFORM MODULE The power module is receiving from the ground module but not the platform module. This is probably due to wiring problems between the platform and ground modules.</p> <p>CANbus FAILURE: POWER MODULE The power module is not receiving acknowledgments from the platform or ground modules to transmitted data. This is probably due to wiring problems between the ground and power modules.</p>
7/7	Flash code 7/7 indicates problems with a motor.
	<p>CAPACITOR BANK FAULT - CHECK POWER CIRCUITS The capacitor bank is not charging. This is probably due to a power wiring error causing illegal current drain; it could also be due to a very low battery supply.</p> <p>OPEN-CIRCUIT PUMP MOTOR Pump point A is collapsing when the pump MOSFETs are pulsed. This is probably due to an open circuit pump motor or a power wiring error.</p> <p>OPEN-CIRCUIT DIRECTIONAL CONTACTOR OR TRACTION MOTOR Traction point A is collapsing when the traction MOSFETs are pulsed. This is probably due to an open circuit traction motor or a power wiring error. NOTE: This fault is unlikely to be seen due to interaction with speed control.</p> <p>PUMP POINT A LOW - CHECK POWER CIRCUITS Pump point A is near 0V when the pump MOSFETs are off. This is probably due to a power</p> <p>STALLED TRACTION MOTOR The power module traction MOSFET protection circuit is active. This is due to massive current drain and could be a stalled traction motor or a power wiring error.</p> <p>STALLED PUMP MOTOR The power module pump MOSFET protection circuit is active. This is due to massive current drain and could be a stalled pump motor or a power wiring error.</p> <p>TRACTION MOTOR OVERLOADED The traction motor has been operating in current limit at a low percentage on for a period of time greater than 10 seconds.</p> <p>PUMP MOTOR OVERLOADED The pump motor has been operating in current limit at a low percentage on for a period of time greater than 10 seconds.</p> <p>TRACTION CURRENT AT ZERO - CHECK SHUNT WIRING Traction current measurement is at zero. This is probably due to an open-circuit between the current measurement shunt and the power module.</p> <p>TRACTION POINT A HIGH - CHECK POWER CIRCUITS Traction point A is near battery supply when neither direction contactor is energized and the traction MOSFETs are off. This could be due to a welded direction contactor or a power wiring error.</p> <p>TRACTION POINT A LOW - CHECK POWER CIRCUITS Traction point A is near 0V when neither direction contactor is energized and the traction MOSFETs are off. This could be due to a power wiring error.</p>


Table 6-7. Help Descriptions and Fault Flash Codes

9/9	Flash code 9/9 indicates problems with the controller.
	POWER MODULE FAILURE: CONTACTOR DRIVE CODE 1 A contactor remained energized when turned off.
	POWER MODULE FAILURE: HWFS CODE 2 The hardware failsafe tests did not complete because traction point A is not safe, or the hardware failsafe is permanently tripped.
	POWER MODULE FAILURE: HWFS CODE 3 The hardware failsafe tests did not complete because a contactor was energized when all should be turned off
	POWER MODULE FAILURE: HWFS CODE 4 The hardware failsafe tests did not complete because the hardware failsafe tripped immediately when the traction MOSFETs were turned on.
	POWER MODULE FAILURE: HWFS CODE 10 The hardware failsafe tests failed because the hardware failsafe did not trip within the allowed test time.
	POWER MODULE FAILURE: HWFS CODE 11 The hardware failsafe tests failed because the hardware failsafe tripped too slowly.
	POWER MODULE FAILURE: HWFS CODE 12 The hardware failsafe tests failed because the hardware failsafe tripped too quickly.
	POWER MODULE FAILURE: HWFS CODE 13 The hardware failsafe tests failed because the hardware failsafe remained tripped when the traction MOSFETs were turned off.
	POWER MODULE FAILURE: HWFS CODE 14 The hardware failsafe tests failed because the line contactor could still be energized when the hardware failsafe was tripped
	POWER MODULE FAILURE: HWFS CODE 15 The hardware failsafe tests failed because the contactor drive failsafe did not trip within the allowed test time.
	POWER MODULE FAILURE: HWFS CODE 16 The hardware failsafe tests failed because the contactor drive failsafe tripped too slowly.
	POWER MODULE FAILURE: HWFS CODE 17 The hardware failsafe tests failed because the contactor drive failsafe tripped too quickly.
	POWER MODULE FAILURE: HWFS TEST STALLED The hardware failsafe tests did not complete, but no reason can be determined.
	POWER MODULE FAILURE: BAD TEMPERATURE SENSOR The temperature sensor measurement is invalid, this is probably due to a disconnected wire within the power module. The possibility of other disconnected wires (which could cause dangerous system function) means that the controller is shut down.
	POWER MODULE FAILURE: S/C LINE CONTACTOR DRIVER The line contactor energized when the footswitch was closed, before it was turned on, this is probably due to a failed driver within the power module, although it could be due to bad power module wirings

Analyzer Diagnostics Menu Structure

In the following structure descriptions, an intended item is

selected by pressing ENTER ; pressing ESCAPE 

steps back to the next outer level. The LEFT  or RIGHT




 arrow keys move between items in the same level. The UP  or DOWN  arrow keys alter a value if allowed.

Table 6-8. DIAGNOSTICS - Menu Descriptions

Diagnosics Submenu (Displayed on Analyzer 1 st Line)	Parameter (Displayed on Analyzer 1 st Line)	Parameter Value (Displayed on Analyzer 2 nd Line)	Description
DRIVE/STEER [Platform Mode = True]	DRIVE DEMAND	FORWARD/REVERSE XXX%	Direction and calibrated Control System Command percentage
	DRIVE OUTPUT	FORWARD/REVERSE XXX%	UGM direction and output speed command
	DRIVE MODE	MAX SPEED/REDUCED SPEED	Drive Mode status
	STEER DEMAND	LEFT/RIGHT XXX%	Direction and percentage of input command from Drive/Steer Joystick
	STEER OUTPUT	LEFT/RIGHT XXX%	UGM directional valve output status
	STEER PRTY VLV	XXX%	Steer priority bypass valve [Machine SetUp -> E450 or E400N]
	STEER SENSOR	VOLTAGE XX.XXV	Steer sensor raw voltage reported by MTM
	STEER SENSOR	ANGLE XX.XDEG	Steer sensor angle reported by MTM
	DRV ORIENT MODE	INLINE/SWUNG	State of DOS switch (prox energized when in line to close normally open contacts)
	DRV ORIENT STATE	CONFIRMED/REQUIRED	InLine and DOS Active = Confirmed
	DRV ORNT OVR SW	CLOSED/OPEN	State of Drive Orientation Override Switch
BOOM FUNCTIONS	SWING DEMAND	LEFT/RIGHT XXX%	Direction and percentage of input command from Swing Joystick or Ground %
	SWING OUTPUT	LEFT/RIGHT XXX%	Direction and valve PWM output percentage
	SWING ASSIST	ON/OFF	Status of swing restriction bypass valve [Machine SetUp -> Model = E450 or E400N]
	LIFT OUTPUT	UP/DOWN XXX%	Direction and valve PWM output percentage
	LIFT BYPAS	ON/OFF	Status of Lift Bypass Valve [Machine SetUp -> Model = E450 or E400N]
	TELE DEMAND	IN/OUT XXX%/CREEP	Direction and percentage of input command (or CREEP if applicable) from Function Speed Pot or Ground%
	TELE OUTPUT	IN/OUT/OFF	Direction/state of Tele directional valve
	JIB LIFT DEMAND	UP/DOWN XXX%/CREEP	Direction and percentage of input command (or CREEP if applicable) from Function Speed Pot or Ground% [Machine SetUP -> JIB -> YES]
	JIB LIFT OUTPUT	UP/OFF/DOWN XXX%	Direction for Up, but % command for Down [Machine SetUP -> JIB -> YES]
	JIB SWING DEMAND	LEFT/RIGHT XXX%/CREEP	Direction and percentage of input command (or CREEP if applicable) from Function Speed Pot or Ground% [Machine SetUP -> JIB SWING -> YES]
	JIB SWING OUTPUT	LEFT/RIGHT XXX%	Direction for Left, but % command for Right [Machine SetUP -> JIB SWING -> YES]

Table 6-8. DIAGNOSTICS - Menu Descriptions

Diagnosics Submenu (Displayed on Analyzer 1 st Line)	Parameter (Displayed on Analyzer 1 st Line)	Parameter Value (Displayed on Analyzer 2 nd Line)	Description
	PLAT LVL DEMAND	UP/DOWN XXX%/CREEP	Direction and percentage of input command (or CREEP if applicable) from Function Speed Pot or Ground%
	PLAT LVL OUTPUT	UP/DOWN XXX%	Direction/state of Level directional valve
	PLAT ROT DEMAND	LEFT/RIGHT XXX%/CREEP	Direction and percentage of input command (or CREEP if applicable) from Function Speed Pot or Ground%
	PLAT ROT OUTPUT	LEFT/RIGHT XXX%	Direction/state of Rotate directional valve
	PUMP SPEED CMD	XXX%	UGM pump command value: 0-100%
	PUMP SPEED FDBK	XXX%	Pump PWM reported from MTM
	PUMP CURRENT	FDBK: XXXA	Pump current reported from MTM
	PUMP ENABL	ON/OFF	UGM pump enable bit status
	PUMP OP MODE	OFF/RUNNING	Pump status from MTM
	FUNCTION SPEED [Platform Mode = True]	SETTING: XXX%	Displays the percentage demand from the Function Speed Potentiometer.
	CREEP SW [Platform Mode = True]	OPEN/CLOSED	Status of Creep Switch Input
	CREEP MODE	ON/OFF	Displays status of Creep Mode
	FLOW CONTRL VLV	XXX%	Duty cycle of flow control proportional valve
SYSTEM	MAIN CONTACTOR	ENABLED/DISABLED	Status of Main Contactor reported by Zapi module
	MAIN CONT VOTE	ENABLED/DISABLED	Status of Main Contactor voting relay by UGM
	CHASSIS TILT	XX.XDEG	Combined X/Y Absolute Angle
	CHASSIS TILT	X-AXIS: XX.XDEG	X Angle with respect to sign
	CHASSIS TILT	Y-AXIS: XX.XDEG	Y Angle with respect to sign
	UGM AMBIENT TEMP	XXXC/XXXF	Ambient Temperature Sensor Reading from on-board UGM Sensor
	LOW AMBIENT TEMP	XXXC/XXXF	Low Temp Cutout Sensor Ambient Temperature sensor Reading [MACHINE SETUP ' TEMP CUTOUT = YES
	LOW TEMPERATURE	CUTOUT: ACTIVE/INACTIVE/FAULTY	Status of Low Temperature Cutout; Only displayed if MACHINE SETUP→TEMP CUTOUT = YES
	MSSO	ACTIVE/INACTIVE	Status of MSSO [MACHINE SETUP/MARKET=CE and Operating Mode=Ground]

SECTION 6 - JLG CONTROL SYSTEM

Table 6-8. DIAGNOSTICS - Menu Descriptions

Diagnosics Submenu (Displayed on Analyzer 1 st Line)	Parameter (Displayed on Analyzer 1 st Line)	Parameter Value (Displayed on Analyzer 2 nd Line)	Description	
SYSTEM INPUTS	BOOM ELEV SW	OPEN/CLOSED	State of Boom Elevation Switch #1	
	TOWER ELEV SW	OPEN/CLOSED	State of Boom Elevation Switch #2	
	ELEVATION MODE	ABOVE/NOT ABOVE	Elevation State	
	TRANSPORT MODE	IN TRANSPORT/OUT OF TRANSPORT	Transport Position	
	CREEP SW	OPEN/CLOSED	Status of Creep Switch Input	
	CREEP MODE	ON/OFF	Displays status of Creep Mode	
	GROUND SELECT	KEYSWITCH: OPEN	KEYSWITCH: CLOSED	Displays whether Ground Keyswitch position is being selected
		KEYSWITCH: CLOSED		
	PLATFORM SELECT	KEYSWITCH: OPEN	KEYSWITCH: CLOSED	Displays whether Platform Keyswitch position is being selected
		KEYSWITCH: CLOSED		
	STATION CONTROL	GROUND/PLATFORM	Displays Active control station per System Mode definition	
	FOOTSWITCH INPUT	GROUND: OPEN	GROUND: CLOSED	State of Footswitch input at UGM (Open with Footswitch is not activated).
		GROUND: CLOSED		
FOOTSWITCH INPUT	PLATFORM: CLOSED	PLATFORM: OPEN	State of Footswitch input at PM (Closed when footswitch not activated).	
	PLATFORM: OPEN			
TRACTION	RIGHT MOTOR	FREQ XXX.X Hz	Motor drive frequency reported by associated PM	
	LEFT MOTOR	FREQ XXX.X Hz	Motor drive frequency reported by associated PM	
	RIGHT MOTOR	SPEED XXX RPM	Motor encoder speed reported by associated PM	
	LEFT MOTOR	SPEED XXX RPM	Motor encoder speed reported by associated PM	
	RIGHT MOTOR	OFF/REGEN/DRIVE/MOTOR BRAKE/ PARKING BRAKE	Traction mode status as reported by associated PM	
	LEFT MOTOR	OFF/REGEN/DRIVE/MOTOR BRAKE/ PARKING BRAKE	Traction mode status as reported by associated PM	
	RIGHT MOTOR	CURRENT XXXA	ACrms Motor current reported by associated PM; display in Platform Mode only	
	LEFT MOTOR	CURRENT XXXA	ACrms Motor current reported by associated PM; display in Platform Mode only	
	RIGHT MOTOR	TEMP XXXC/F	Module temperature reported by PM; display in Platform Mode only	
	LEFT MOTOR	TEMP XXXC/F	Module temperature reported by PM; display in Platform Mode only	
	RIGHT BRAKE	APPLIED/RELEASED	Brake status reported by associated PM	
	LEFT BRAKE	APPLIED/RELEASED	Brake status reported by associated PM	
	RIGHT MODULE	TEMP XXXC/F	Module temperature reported by PM; display in Platform Mode only	
LEFT MODULE	TEMP XXXC/F	Module temperature reported by PM; display in Platform Mode only		

Table 6-8. DIAGNOSTICS - Menu Descriptions

Diagnosics Submenu (Displayed on Analyzer 1 st Line)	Parameter (Displayed on Analyzer 1 st Line)	Parameter Value (Displayed on Analyzer 2 nd Line)	Description
VOLTAGE/CUR	BATTERY SOC	XXX%/DISCHARGED/DEEP DISCHARGED	UGM calculated battery State-of-Charge; display percentage unless Discharged or Deeply Discharged
	BATTERY VOLTAGE	XX.XXV	UGM computed Vbat from MTM with compensation for voltage drop
	BATTERY CURRENT	XXXA	
	RIGHT SYSTEM	VOLTAGE XX.XXV	Real time system voltage reported by associated PM and compensated by UGM; not SOC
	LEFT SYSTEM	VOLTAGE XX.XXV	Real time system voltage reported by associated PM and compensated by UGM; not SOC
	UGM CONTROL	VOLTAGE XX.XV	UGM measured system control voltage
	PLATFORM MODULE	VOLTAGE XX.XV	Platform Module reported battery voltage measurement
	AC CHARGER	CONNECTED/NOT CONNECTED	Reflect status of charger connectivity reported by MTM
OPER CONTROLS	JOYSTICK DRIVE	FORWARD/REVERSE XXX%	Drive Joystick drive direction and command percentage as reported from PM [Platform Mode = TRUE]
	JOYSTICK STEER	LEFT/RIGHT XXX%	Drive Joystick steer direction and percentage command as reported from PM [Platform Mode = TRUE]
	JOYSTICK SWING	LEFT/RIGHT XXX%	Lift/Swing Joystick Swing direction and percentage command as reported from PM [Platform Mode = TRUE]
	JOYSTICK LIFT	UP/DOWN XXX%	Lift/Swing Joystick Lift direction and percentage command as reported from PM [Platform Mode = TRUE]
	DRV ORNT OVR SW	CLOSED/OPEN	State of Drive Orientation Override Switch [Platform Mode = TRUE]
	ENABLE	OPEN/CLOSED	Status of FUNCTION ENABLE Toggle Switch Input [Ground Mode = TRUE]
	SWING LEFT SW	OPEN/CLOSED	Status of Ground Toggle Switch Input [Ground Mode = TRUE]
	SWING RIGHT SW	OPEN/CLOSED	Status of Ground Toggle Switch Input [Ground Mode = TRUE]
	LIFT UP SW	OPEN/CLOSED	Status of Ground Toggle Switch Input [Ground Mode = TRUE]
	LIFT DN SW	OPEN/CLOSED	Status of Ground Toggle Switch Input [Ground Mode = TRUE]
	TELE IN SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input
	TELE OUT SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input

Table 6-8. DIAGNOSTICS - Menu Descriptions

Diagnosics Submenu (Displayed on Analyzer 1 st Line)	Parameter (Displayed on Analyzer 1 st Line)	Parameter Value (Displayed on Analyzer 2 nd Line)	Description
	JIB LIFT UP SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input [MACHINE SETUP ' Jib = YES]
	JIB LIFT DN SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input [MACHINE SETUP ' Jib = YES]
	JIB SWING LT SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input [MACHINE SETUP ' Jib Swing = YES]
	JIB SWING RT SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input [MACHINE SETUP ' Jib Swing = YES]
	PLAT LEVEL UP SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input
	PLAT LEVEL DN SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input
	PLAT ROT LEFT SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input
	PLAT ROT RIGHT SW	OPEN/CLOSED	Status of Ground/Platform Toggle Switch Input
	MAX SPEED SW	OPEN/CLOSED	Status of Platform Toggle Switch Input [Platform Mode = TRUE]
	CREEP SW	OPEN/CLOSED	Status of Creep Switch Input [Platform Mode = TRUE]
	HORN SW	OPEN/CLOSED	Status of Platform Switch Input [Platform Mode = TRUE]
	SG OVERRIDE SW	OPEN/CLOSED	Status of Platform SkyGuard Override Switch Input if MACHINE SETUP → SKYGUARD = YES
	MSSO SW	OPEN/CLOSED	Status of MSSO switch; [MACHINE SETUP MARKET=CE and Ground mode = TRUE]
OPTIONS	H&T LIGHTS SW	OPEN/CLOSED	Status of Platform Toggle Switch Input [Platform Mode = TRUE and MACHINE SETUP ' H&T LIGHTS = YES]
	H&T LIGHTS OUT	ON/OFF	UGM Nite Brite Relay Enable output [Platform Mode = TRUE and MACHINE SETUP ' H&T LIGHTS = YES]
	SKYGUARD INPUTS	OPEN/CLOSED/DISAGREE	SkyGuard Input #1 (PLT J7-18) AND SkyGuard Input #2 (PLT J1-23) state [Platform Mode = TRUE and MACHINE SETUP ' SKYGUARD ? NO]
	SKYGUARD INPUT 1	OPEN/CLOSED	State of SkyGuard Platform Input #1 (J7-18); relay NC contacts - closed when active [Platform Mode = true and MACHINE SETUP ' SKYGUARD ? NO]
	SKYGUARD INPUT 2	OPEN/CLOSED	State of SkyGuard Platform Input #2 (J1-23); relay NC contacts - closed when active [Platform Mode= TRUE and MACHINE SETUP ' SKYGUARD ? NO]
	SOFTTOUCH INPUT	OPEN/CLOSED	State of softtouch input (Platform input J1-20) [MACHINE SETUP ' SOFTTOUCH = YES]

Table 6-8. DIAGNOSTICS - Menu Descriptions

Diagnosics Submenu (Displayed on Analyzer 1 st Line)	Parameter (Displayed on Analyzer 1 st Line)	Parameter Value (Displayed on Analyzer 2 nd Line)	Description
PLATFORM LOAD (DISPLAY ONLY IF MACHINE SETUP → LOAD SYSTEM ≠ NO)	PLATFORM LOAD	STATE: OK/OVER LOAD	LSS Status
	PLATFORM LOAD	ACTUAL: XXX.XKG	Actual measured weight
	PLATFORM LOAD	GROSS: XXX.XKG	Combined weight of all cells; accounting for sign.
	PLATFORM LOAD	OFFSET: XXX.XKG	Tare weight of Platform Empty
	PLATFORM LOAD	ACC'Y XXX.XKG	Stored Accessory weight; visible only if Accessory recognized
	PLATFORM LOAD	CELL 1: XXX.XKG	Gross weight reading of Cell 1
	PLATFORM LOAD	CELL 2: XXX.XKG	Gross weight reading of Cell 2
	PLATFORM LOAD	CELL 3: XXX.XKG	Gross weight reading of Cell 3
	PLATFORM LOAD	CELL 4: XXX.XKG	Gross weight reading of Cell 4
CAN STATISTICS	CAN 1 STATISTICS	RX/SEC: XXX	
	CAN 1 STATISTICS	TX/SEC: XXX	
	CAN 1 STATISTICS	BUS OFF: XXX	
	CAN 1 STATISTICS	PASSIVE: XXX	
	CAN 1 STATISTICS	MSG ERROR: XXXX	
	CAN 2 STATISTICS	RX/SEC: XXX	
	CAN 2 STATISTICS	TX/SEC: XXX	
	CAN 2 STATISTICS	BUS OFF: XXX	
	CAN 2 STATISTICS	PASSIVE: XXX	
	CAN 2 STATISTICS	MSG ERROR: XXXX	

System Self Test

The system self test is utilized to locate typical problems. See Table 6-9, System Test Descriptions and Table 6-10, System Test Messages for information concerning the tests performed and available messages in this mode.

1. When the keyswitch is in the platform position and the self test enabled, the self test function will test all valves, contactors, platform inputs, indicator lamps, and system alarms for various fault conditions.

When the keyswitch is in the ground position, the self test function will test all valves, the line contactor, ground control inputs, and the ground alarm output for various fault conditions.

2. In order to test the inputs on the machine, the controller will ask the service technician to perform various tasks at the appropriate operator control station. An example of this is "Close LLU Switch". The controller expects the

operator to close the lower lift up switch. When the controller sees that the lower lift up switch has been closed, it will move on to the next input, lower lift down LLD. If the switch is faulty or the wiring is faulty, the controller will not move on to the next input. The controller will continue to wait for the closure of the input. If the operator knows the switch is faulty and wants to continue the tests he must simply press the enter key on the analyzer to continue.

3. After the controller has conducted the tests from the chosen operator station, it will display "TESTS COMPLETE". This indicates that the controller has checked all inputs and outputs for that station.

NOTICE

IN ORDER FOR THE MACHINE TO FUNCTION AFTER THE SELF TEST IS COMPLETE, POWER MUST BE RECYCLED USING THE EMS OR THE KEYSWITCH.

Table 6-9. System Test Descriptions

<p>ACTIVATE TESTS YES:ENTER, NO:ESC</p>	<p>Not available once tests are activated ENTER activates system tests NOTE: cannot be done while controller is in use (footswitch closed) and for a short time afterwards</p>
<p>RUN SYSTEM TEST</p>	<p>ENTER starts system test Not available until tests are activated Displays messages while system test runs Some messages are prompts, requiring user intervention. ENTER can be pressed if a fault is found, to confirm that the fault has been noted and to continue the system test. NOTE: a flashing message is critical, and prevents the system test running</p>

Table 6-10. System Test Messages

Message Displayed on Analyzer	Message Displayed on Analyzer	Description
RUNNING		Initial display when system test is run while running certain "critical" checks are made.
	CHECK GROUND/ PLATFORM SELECT	The analyzer must be connected to the active control station to run the system test
	CHECK CAN WIRING	The system test cannot run unless the CAN Bus is operating properly
	BATTERY VOLTAGE TOO LOW	The system test cannot run with MTM-reported battery voltage below 39.5V (not UGM-compensated value)
	BATTERY VOLTAGE TOO HIGH	The system test cannot run with the MTM-reported battery voltage above 65V
	CHECK SPEED	Reported vehicle speed must = 0 Hz (or mph)
	HIGHTILT ANGLE	The vehicle is tilted > 3° or the tilt sensor is faulty
	OPEN FOOTSWITCH	In platform mode, the footswitch must be open at the start of the test.
	CLOSE FOOTSWITCH	In platform mode, the operator must close the footswitch when this message is displayed
	BAD FOOTSWITCH	The two footswitch signals are not changing together, probably because one is open circuit. Check footswitch and wiring.
	OPEN FOOTSWITCH	In platform mode, the operator must open the footswitch when this message is displayed.
	PLATFORM OVERLOADED	Load Sensing is configured and the ground module considers the platform to be overloaded
TESTING VALVES	CLOSE FOOTSWITCH	*Check for Footswitch closed
	OPEN FOOTSWITCH	*Wait for Footswitch to open
	PRESS AND HOLD FOOTSWITCH	*The operator must engage and hold the footswitch for the next batch of tests to be successful. This is due to the hardware high side driver cutout in the ground module
	LIFT BYPASS VALVE (E400)	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	OPEN FOOTSWITCH	*Wait for Footswitch to open the advance
	FLOW CTRL VALVE	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	PRIORITY BYPASS (E400)	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	STEER RIGHT	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	STEER LEFT	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	SWING LEFT	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	SWING RIGHT	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	SWING ASSIST VALVE (E400)	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	LIFT UP	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	LIFT DOWN	SHORT TO BATTERY or OPEN-CIRCUIT; or SHORT TO GROUND (or advance test after short delay) do not energize for E300
	TELESCOPE OUT	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	TELESCOPE IN	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	TOWER UP (E300, E400)	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	TOWER DOWN (E300, E400)	SHORT TO BATTERY or OPEN-CIRCUIT; or SHORT TO GROUND (or advance test after short delay). do not energize for E300
	JIB UP	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	JIB DOWN	SHORT TO BATTERY or OPEN-CIRCUIT (or advance test after short delay)
JIB LT VALVE	SHORT TO BATTERY or OPEN-CIRCUIT (or advance test after short delay)	
JIB RT VALVE	SHORT TO BATTERY or OPEN-CIRCUIT (or advance test after short delay)	
PLATFORM LT VALVE	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)	

Table 6-10. System Test Messages

Message Displayed on Analyzer	Message Displayed on Analyzer	Description
	PLATFORM RT VALVE	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	PLATFORM LEVEL UP	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	PLATFORM LEVEL DOWN	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay)
	HEAD/TAIL LIGHTS	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay); displayed if the head/tail light option is configured.
	VOTE RELAY	SHORT TO BATTERY or OPEN-CIRCUIT or SHORT TO GROUND (or advance test after short delay); displayed if the head/tail light option is configured.
CHECKING PLATFORM INPUTS	DRIVE MAX SPEED	OPEN or CLOSED (advance after switch closed to open)
	DRIVE REDUCED SPEED	OPEN or CLOSED (advance after switch closed to open)
	CL PLATFORM UP	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM UP	OPEN or CLOSED (advanced test after switch toggles)
	CL PLATFORM DOWN	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM DOWN	OPEN or CLOSED (advanced test after switch toggles)
	LIFT JOYSTICK TO UP MAX	(wait for joystick to reach +100% then advance)
	LIFT JOYSTICK TO DOWN MAX	(wait for joystick to reach -100% then advance)
	SWING JOYSTICK TO LEFT MAX	(wait for joystick to reach -100% then advance)
	SWING JOYSTICK TO RIGHT MAX	(wait for joystick to reach +100% then advance)
	CREEP SWITCH CCW	OPEN or CLOSED (advanced test after switch toggles)
	CREEP SWITCH CW	OPEN or CLOSED (advanced test after switch toggles)
	FUNC SPD TO MAX	
	FUNC SPD TO MIN	
	CL HORN	OPEN or CLOSED (advanced test after switch toggles)
	OP HORN	OPEN or CLOSED (advanced test after switch toggles)
	CL PLATFORM LEFT	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM LEFT	OPEN or CLOSED (advanced test after switch toggles)
	CL PLATFORM RGHT	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM RGHT	OPEN or CLOSED (advanced test after switch toggles)
	CL TOWER UP	OPEN or CLOSED (advanced test after switch toggles) (E300, E400)
	OP TOWER UP	OPEN or CLOSED (advanced test after switch toggles) (E300, E400)
	CL TOWER DOWN	OPEN or CLOSED (advanced test after switch toggles) (E300, E400)
	OP TOWER DOWN	OPEN or CLOSED (advanced test after switch toggles) (E300, E400)
	CL JIB UP	OPEN or CLOSED (advanced test after switch toggles)
	OP JIB UP	OPEN or CLOSED (advanced test after switch toggles)
	CL JIB DOWN	OPEN or CLOSED (advanced test after switch toggles)
	OP JIB DOWN	OPEN or CLOSED (advanced test after switch toggles)
	CL JIB LEFT	OPEN or CLOSED (advanced test after switch toggles)
	OP JIB LEFT	OPEN or CLOSED (advanced test after switch toggles)
	CL JIB RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	OP JIB RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	CL TELE IN	OPEN or CLOSED (advanced test after switch toggles)

Table 6-10. System Test Messages

Message Displayed on Analyzer	Message Displayed on Analyzer	Description
	OP TELE IN	OPEN or CLOSED (advanced test after switch toggles)
	CL TELE OUT	OPEN or CLOSED (advanced test after switch toggles)
	OP TELE OUT	OPEN or CLOSED (advanced test after switch toggles)
	CL DRIVE ORIENT	OPEN or CLOSED (advanced test after switch toggles)
	OP DRIVE ORIENT	OPEN or CLOSED (advanced test after switch toggles)
	DRIVE JOYSTICK TO FORWARD MAX	(wait for joystick to reach +100% then advance)
	DRIVE JOYSTICK TO BACK MAX	(wait for joystick to reach -100% then advance)
	STEER TO LEFT MAX	OPEN or CLOSED (advanced test after switch toggles)
	STEER TO RIGHT MAX	OPEN or CLOSED (advanced test after switch toggles)
	CL HEADLIGHT SWITCH	OPEN or CLOSED (advanced test after switch toggles)
	OP HEADLIGHT SWITCH	OPEN or CLOSED (advanced test after switch toggles)
	CL SKYGUARD OVR	OPEN or CLOSED (advanced test after switch toggles); display on if MACHINE SETUP 'SKYGUARD = YES
	OP SKYGUARD OVR	OPEN or CLOSED (advanced test after switch toggles); display on if MACHINE SETUP 'SKYGUARD = YES
	ENGAGE SKYGUARD	SkyGuard bar pressed; SkyGuard inputs #1 and #2 must both change to low state for passing condition; display on if MACHINE SETUP 'SKYGUARD = YES
	RELEASE SKYGUARD	Both SkyGuard inputs must change to high; display on if MACHINE SETUP 'SKYGUARD = YES
	ENGAGE SOFTTOUCH	OPEN or CLOSED (advanced test after switch toggles); display on if MACHINE SETUP 'SOFTTOUCH = YES
	RELEASE SOFTTOUCH	OPEN or CLOSED (advanced test after switch toggles); display on if MACHINE SETUP 'SOFTTOUCH = YES
CHECKING GROUND INPUTS	CL SWING RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	OP SWING RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	CL SWING LEFT	OPEN or CLOSED (advanced test after switch toggles)
	OP SWING LEFT	OPEN or CLOSED (advanced test after switch toggles)
	CL TOWER UP	OPEN or CLOSED (advanced test after switch toggles) (E400)
	OP TOWER UP	OPEN or CLOSED (advanced test after switch toggles) (E400)
	CL TOWER DOWN	OPEN or CLOSED (advanced test after switch toggles) (E400)
	OP TOWER DOWN	OPEN or CLOSED (advanced test after switch toggles) (E400)
	CL LIFT UP	OPEN or CLOSED (advanced test after switch toggles)
	OP LIFT UP	OPEN or CLOSED (advanced test after switch toggles)
	CL LIFT DOWN	OPEN or CLOSED (advanced test after switch toggles)
	OP LIFT DOWN	OPEN or CLOSED (advanced test after switch toggles)
	CL TELE OUT	OPEN or CLOSED (advanced test after switch toggles)
	OP TELE OUT	OPEN or CLOSED (advanced test after switch toggles)
	CL TELE IN	OPEN or CLOSED (advanced test after switch toggles)
	OP TELE IN	OPEN or CLOSED (advanced test after switch toggles)
	CL JIB UP	OPEN or CLOSED (advanced test after switch toggles)
	OP JIB UP	OPEN or CLOSED (advanced test after switch toggles)
	CL JIB DOWN	OPEN or CLOSED (advanced test after switch toggles)

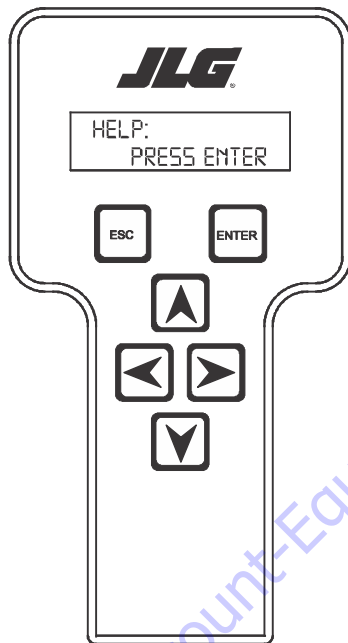
Table 6-10. System Test Messages

Message Displayed on Analyzer	Message Displayed on Analyzer	Description
	OP JIB DOWN	OPEN or CLOSED (advanced test after switch toggles)
	CL JIB SWING LEFT	OPEN or CLOSED (advanced test after switch toggles)
	OP JIB SWING LEFT	OPEN or CLOSED (advanced test after switch toggles)
	CL JIB SWING RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	OP JIB SWING RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	CL PLATFORM LEFT	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM LEFT	OPEN or CLOSED (advanced test after switch toggles)
	CL PLATFORM RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM RIGHT	OPEN or CLOSED (advanced test after switch toggles)
	CL PLATFORM UP	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM UP	OPEN or CLOSED (advanced test after switch toggles)
	CL PLATFORM DOWN	OPEN or CLOSED (advanced test after switch toggles)
	OP PLATFORM DOWN	OPEN or CLOSED (advanced test after switch toggles)
	CL FUNC ENABLE	OPEN or CLOSED (advanced test after switch toggles)
	OP FUNC ENABLE	OPEN or CLOSED (advanced test after switch toggles)
	CL MSSO SWITCH	OPEN or CLOSED (advanced test after switch toggles); display only if MACHINE SETUP ' MARKET = CE
	OP MSSO SWITCH	OPEN or CLOSED (advanced test after switch toggles); display only if MACHINE SETUP ' MARKET = CE
TESTING PLATFORM LAMPS	BAT FULL LAMP ON	
	BAT 3/4 LAMP ON	
	BAT 1/2 LAMP ON	
	BAT 1/4 LAMP ON	
	LOW BATTERY	
	ENABLE LAMP ON	
	CREEP LAMP ON	
	DISTRESS LAMP ON	
	TILT LAMP ON	
	OVERLOAD LAMP ON	Display only if LSS configured
	DRIVE ORIENTATION LAMP ON	
	SKYGUARD LAMP ON	Display on if SkyGuard configured
	SOFT TOUCH	Display if Soft Touch configured
	PLAT ALARM ON	
	HORN ON	
TESTING GROUND LAMPS	OVERLOAD LAMP ON	Display only if MACHINE SETUP ' MARKET = CE
	ALERT BEACON	Display only if MACHINE SETUP-> ALERT BEACON = 20FPM FOR CREEP
TESTS COMPLETE		Indicates that the system test is complete. Any problems reported should have been noted and should now be rectified. Press ESC/CANCEL to return to the RUN SYSTEM TEST Analyzer menu.

6.5 CALIBRATING STEER

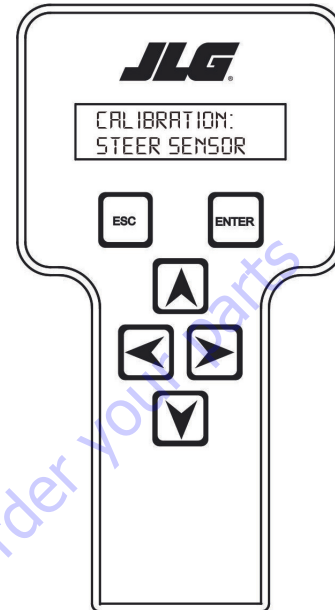
When calibrating steering, each individual wheel must be calibrated in order to make the tire and wheel parallel with the frame. Two methods to help ensure proper calibration are the use of a carpenter's square to square the spindle to the axle or aligning the two wheels on one side using a stretched string.

1. Position the Platform/Ground select switch to the Platform position.
2. Plug the analyzer into the connector at the base of the platform control box.
3. Pull out the Emergency Stop switch and Start the engine.
4. The analyzer screen should read:

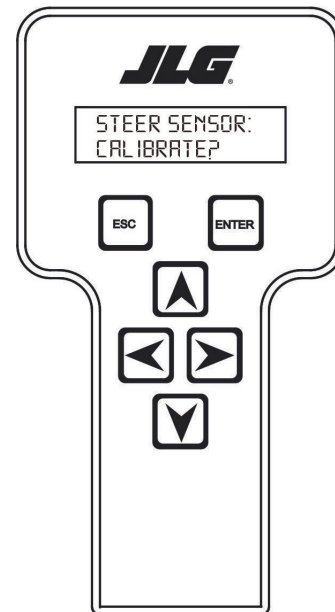


5. Use the arrow button to reach ACCESS LEVEL. Hit Enter.
6. Enter the Access Code, 33271.
7. Use the right Arrow key to reach CALIBRATIONS. Hit Enter.

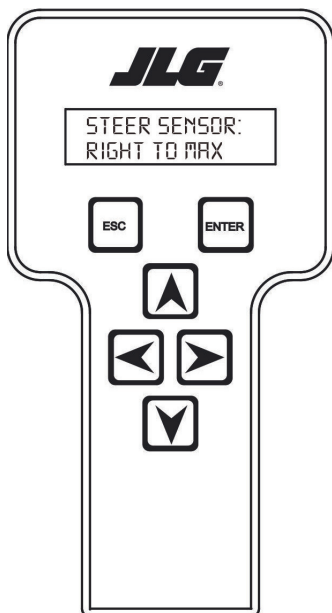
8. Use the arrow keys to reach STEER SENSOR. The screen will read:



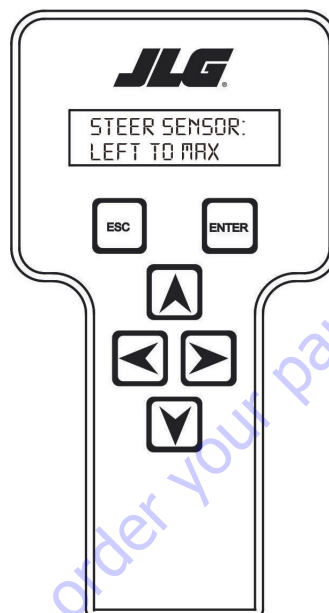
9. Hit Enter. The screen will read:



10. Hit Enter. The screen will read:

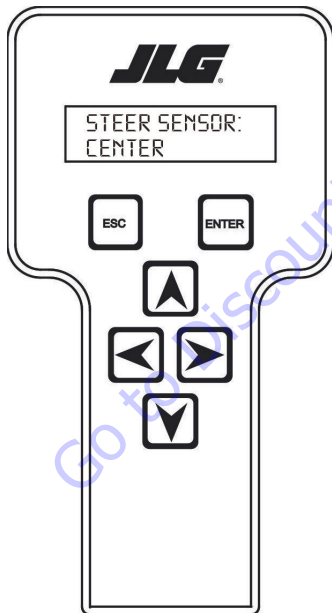


14. Hit Enter. The screen will read:



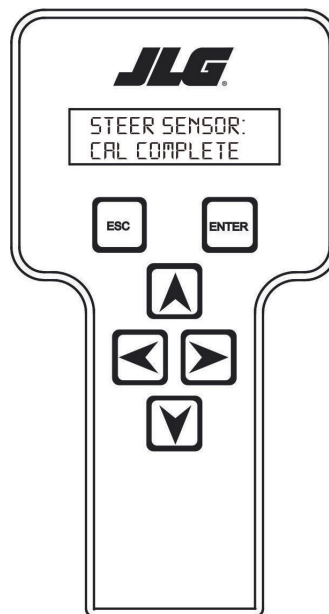
11. Activate the steer control until the tire and wheel are straight in relationship with the chassis, then leave off the control. The display will read Right Steer Maximum value.

12. Hit Enter. The screen will read:



15. The display will read Left Steer Maximum value.

16. Hit Enter. The screen will read:



13. The display will read steering Center position value.

17. After completing all the Steer Calibrations, hit ESC twice to go back to CALIBRATIONS.

6.6 CALIBRATING TILT SENSOR

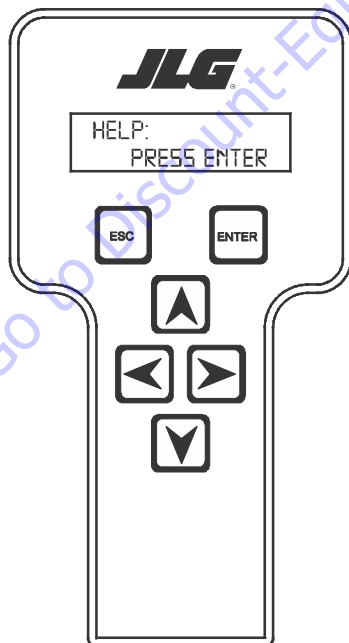
NOTICE

A NEW TILT MODULE WILL ACT AS IF IT IS TILTED ALL OF THE TIME UNTIL THE FOLLOWING PROCEDURE IS PERFORMED.

WARNING

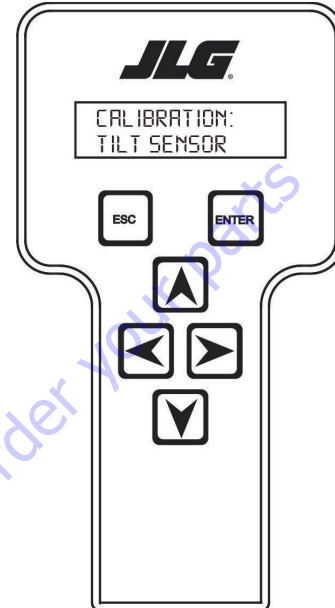
DO NOT CALIBRATE THE LEVEL SENSOR EXCEPT ON A LEVEL SURFACE.

1. Use the following procedure to calibrate the tilt sensor.
2. Before the tilt sensor can be calibrated, the following conditions must be met:
 - a. Steering previously calibrated.
 - b. Wheels straight.
 - c. Turntable centered.
 - d. Boom fully retracted.
 - e. Boom angle is less than 45°.
 - f. Machine on firm, level ground.
3. Position the Platform/Ground select switch to the Platform position.
4. Plug the analyzer into the connector inside the Ground control box.
5. Pull out the Emergency Stop switch and Start the engine.
6. The analyzer screen should read:

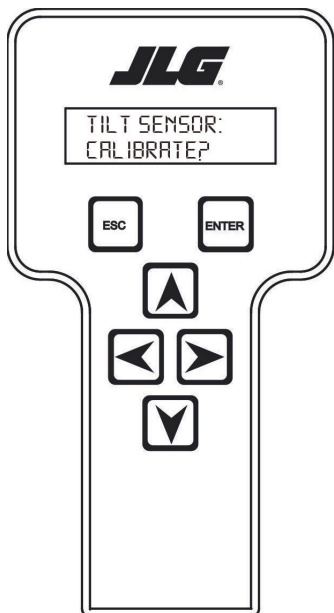


7. Use the arrow button to reach ACCESS LEVEL. Hit Enter.
8. Enter the Access Code, 33271.

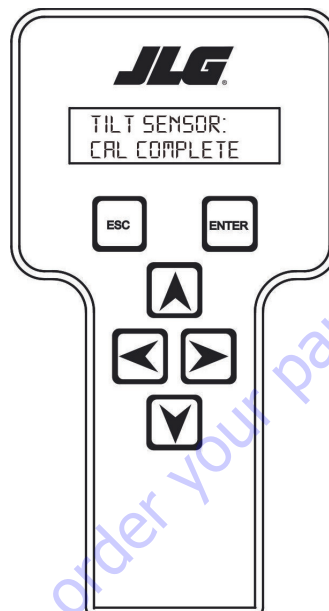
9. Use the right Arrow key to reach CALIBRATIONS. Hit Enter.
10. Use the arrow keys to reach TILT SENSOR. The screen will read:



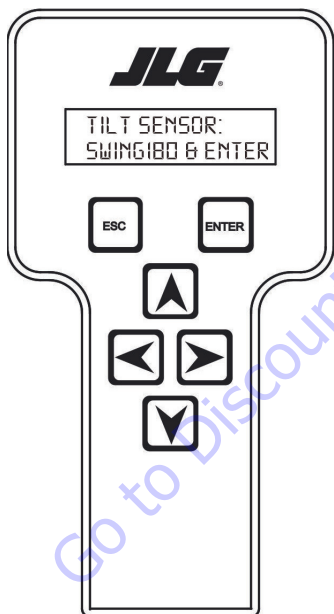
11. Hit Enter. The screen will read:



13. Hit Enter. The screen will read:



12. When prompted, swing turntable 180° to opposite end of chassis.

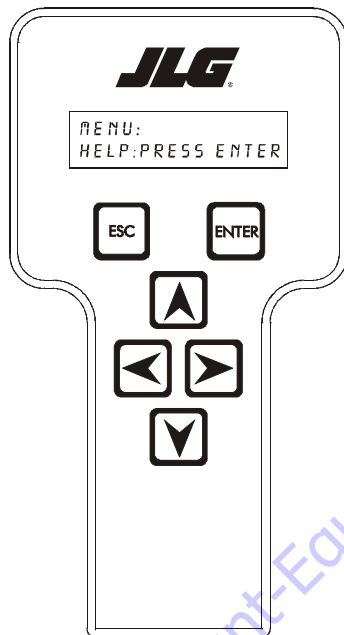


14. Upon completing swing calibration, swing turntable 180° back to the stowed position.
15. Hit ESC twice to go back to CALIBRATIONS.

6.7 CALIBRATING LOAD SENSING

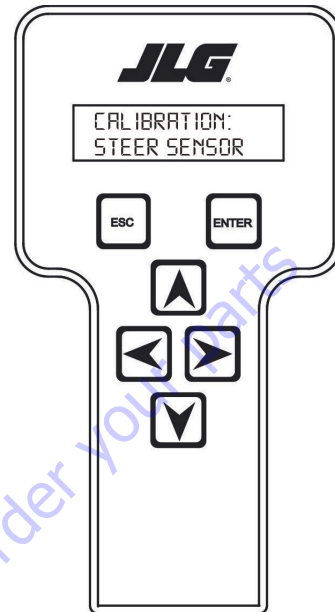
NOTE: Calibration sub-menu *LOAD SENSING* is visible only if *MACHINE SET-UP* sub-menu *LOAD SYSTEM* is selected to *NO*.

1. Position the Platform/Ground select switch to the Platform position.
2. Plug the analyzer into the connector at the base of the platform control box.
3. Pull out the Emergency Stop switch and Start the engine.
4. The analyzer screen should read:

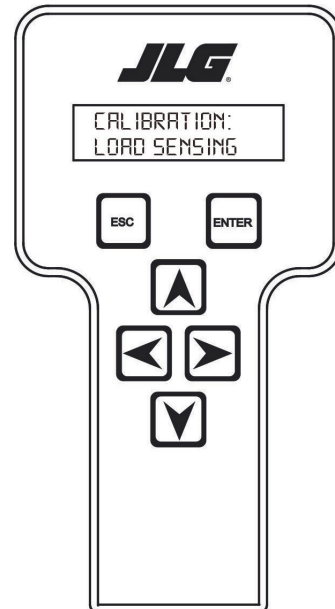


5. Use the arrow button to reach ACCESS LEVEL. Hit Enter.
6. Enter the Access Code, 33271.
7. Use the right Arrow key to reach CALIBRATIONS. Hit Enter.

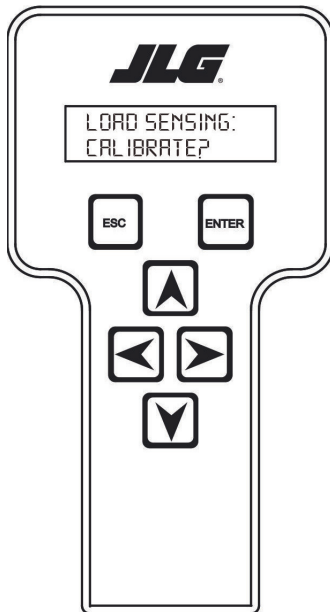
8. Use the arrow keys to reach *LOAD SENSING*. The screen will read:



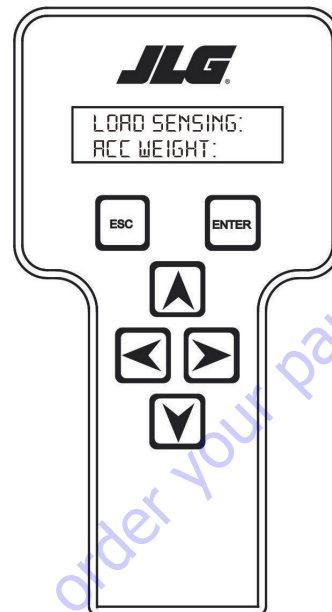
9. Hit Enter. The screen will read:



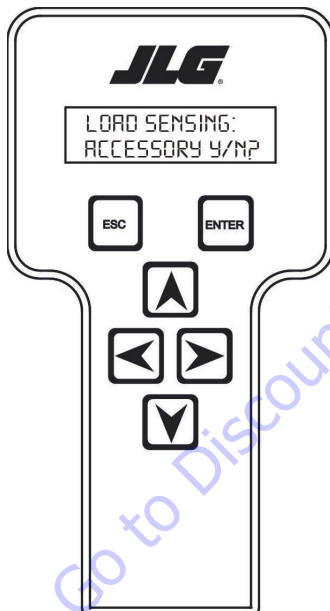
10. Hit Enter. The screen will read:



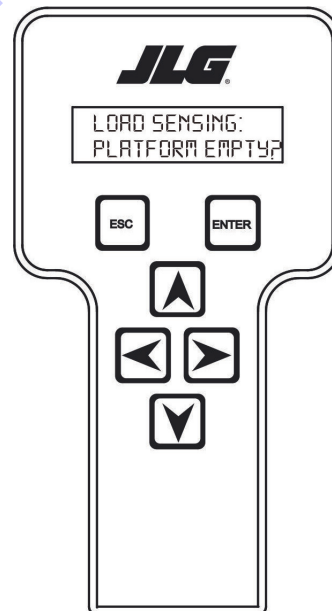
12. Hit Enter. The screen will read:



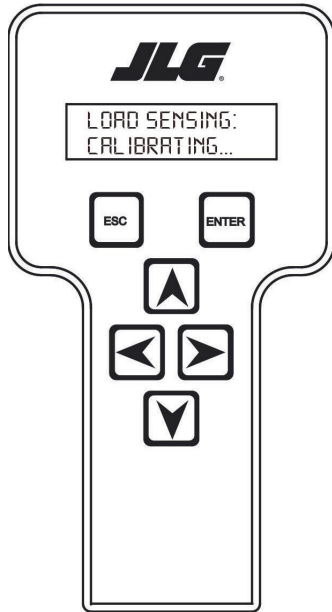
11. Hit Enter. The screen will read:



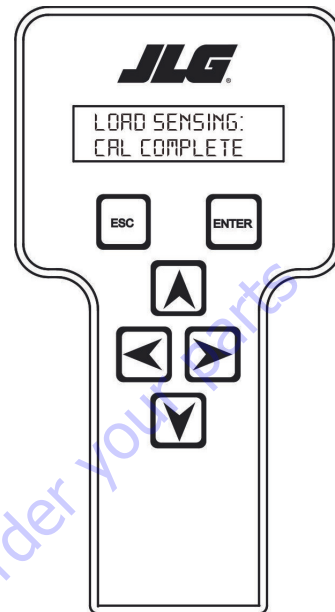
13. Hit Enter. The screen will read:



14. Hit Enter. The screen will read:




15. After few seconds, the screen will read:



16. Hit ESC twice to go back to CALIBRATIONS.

6.8 LSS SYSTEM

The JLG-designed Load Sensing System (LSS) measures platform load via a sensor mounted in the platform support structure. If the actual platform load exceeds the selected Rated Load, the following will occur:

1. The Overload Visual Warning Indicator will flash at the selected control position (platform or ground). 
2. The Platform and Ground Alarms will sound 5 seconds On, and 2 seconds Off.
3. All normal movement will be prevented from the platform control position (optional - ground control functions may be prevented).
4. Further movement is permitted by:
 - a. Removing the excess platform load until actual platform load is less than Rated Load.
 - b. Operation of the overriding emergency system (Auxiliary Power Unit).
 - c. By an authorized person at the ground control position (optional - ground control functions may be prevented).

NOTICE

THE LOAD SENSING SYSTEM MUST BE CALIBRATED WHEN ONE OR MORE OF THE FOLLOWING CONDITIONS OCCUR:

- a. LSS Sensor removal or replacement
- b. Addition or removal of certain platform mounted accessories. (Refer to Calibration)
- c. Platform is removed, replaced, repaired or shows evidence of impact.




NOTICE

THE LOAD SENSING SYSTEM REQUIRES PERIODIC FUNCTION VERIFICATION NOT TO EXCEED 6 MONTHS FROM PREVIOUS VERIFICATION. REFER TO TESTING & EVALUATION.

All calibration procedures are menu driven through the use of a JLG Analyzer.

Diagnostic Menu

The Diagnostic Menu is another troubleshooting tool for the Load Sensing System. Sensor and status information is presented in real-time for the technician. Several sub-menus exist to organize the data.

To access the Diagnostic Menu, use the LEFT  and RIGHT  Arrow keys to select DIAGNOSTICS from the Top Level Menu. Press the ENTER key  to view the menu.

Press the LEFT and RIGHT Arrow keys to view the displays and select the various sub-menus. To access a sub-menu, press the ENTER key. Once in a sub-menu, press the LEFT and RIGHT Arrow keys to view the various displays (just like a Top Level


menu). To exit a sub-menu, press the ESC key .

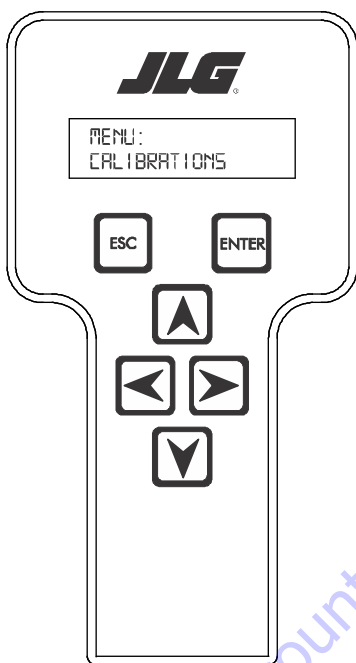
Table 6-11, Diagnostic Menu Descriptions details the structure of the Diagnostic Menu, and describes the meaning of each piece of information presented.

Table 6-11. Diagnostic Menu Descriptions


Diagnosics Menu (Displayed on Analyzer 1 st Line)	Parameter (Displayed on Analyzer 2 nd Line)	Parameter Value (Displayed on Analyzer 2 nd Line)	Description
PLATFORM LOAD	STATE:	OK / OVERLOAD	LSS Status.
PLATFORM LOAD	ACTUAL:	XXX.X KG	Calibrated weight of the platform. ??? if Platform Load is Unhealthy**.
PLATFORM LOAD (service*)	GROSS:	XXX.X KG	Gross weight of the platform. ??? if both Cells are Unhealthy**.
PLATFORM LOAD (service*)	OFFSET 1:	XXX.X KG	Stored offset weight of Cell 1. ??? if LSS is not calibrated.
PLATFORM LOAD (service*)	OFFSET 2:	XXX.X KG	Stored offset weight of Cell 1. ??? if LSS is not calibrated.
PLATFORM LOAD (service*)	ACCESSORY	XXX.X KG	Stored accessory weight. ??? if LSS is not calibrated.
PLATFORM LOAD (service*)	UNRESTRICT	XXX.X KG	UGM will set Unrestricted Rated Load as defined by Machine Configuration.
PLATFORM LOAD (service*)	RESTRICT	XXX.X KG	UGM will set Restricted Rated Load as defined by Machine Configuration.
PLATFORM LOAD (service*)	RAW 1:	XXX.X KG	Gross value from Cell 1. ??? if Unhealthy**.
PLATFORM LOAD (service*)	RAW 2:	XXX.X KG	Gross value from Cell 2. ??? if Unhealthy**.
* Indicates only visible in service view mode ** Typically indicates a DTC is active			

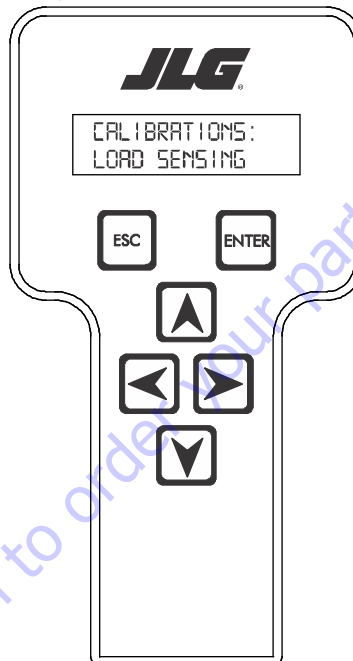
Calibration Procedure

1. Remove everything from the platform, except permanently fixed JLG Accessories, to allow the Load Sensing System to record its' weight during calibration. This includes all tools, debris, and customer-installed devices.
2. Plug the JLG Analyzer into the Machine at the Ground Station and enter Service Access Password 33271.
3. The platform should be approximately level for calibration. Level the platform from ground control (if necessary) to within +/- 5°.
4. To access the Calibration Menu, use the LEFT and RIGHT Arrow keys to select CALIBRATION from the Top Level Menu. The screen will read:

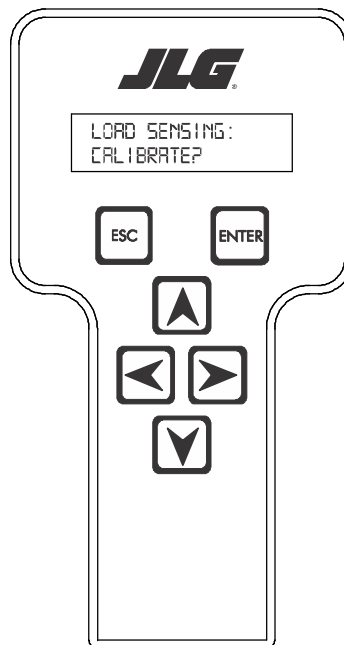


NOTE: The Calibration Menu is not available in OPERATOR ACCESS.


5. Press the ENTER key  to view the menu. Upon entry to the Calibration Menu, the JLG Control System will link to the Analyzer and the screen will read:




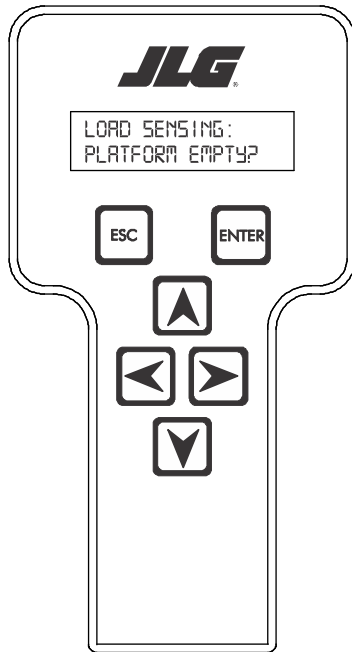
6. Press Enter . The Screen will read:




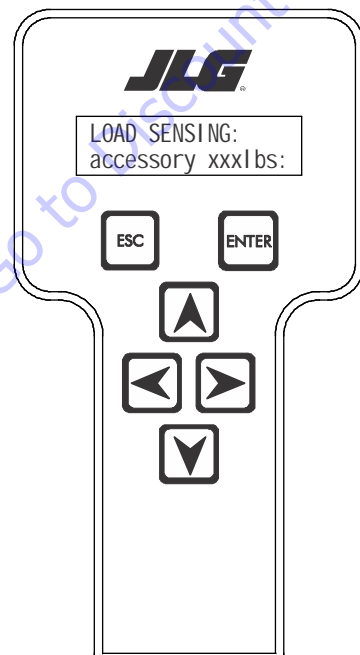
NOTE: Calibration will auto fail if LSS DTC's are active (443, 444, 4479, 4480, 663, 821, 822, 823, 824, 8218, 8222 -> 8238, 991, 992, 993, 994 or 99285).

NOTE: Pressing the ESC key  after starting calibration and before calibration is complete will display the CAL FAILED message. This will not disturb the prior calibration information.

7. Press ENTER . The analyzer screen will read:




8. If the platform is empty, press ENTER . The screen will read:



NOTE: Accessory weight will reset to 0 lb each time the machine is re-calibrated and will need to be re-entered.

NOTE: The Accessory weight will be temporarily stored in the Control System until calibration has been completed successfully.

Refer to Table 6-12, Accessory Weights. Use the up and down analyzer keys to enter the accessory weight(s) (in lb). When all the accessory weights are entered, press

ENTER . The screen will read:

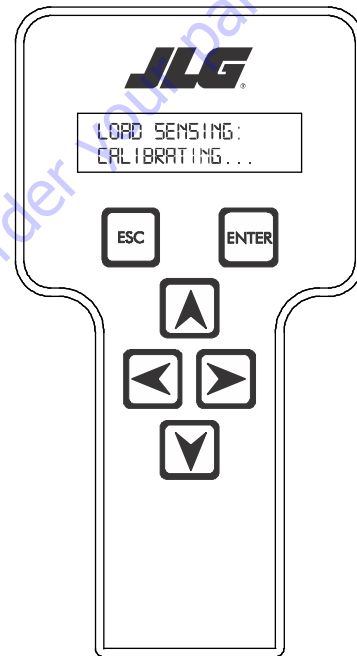


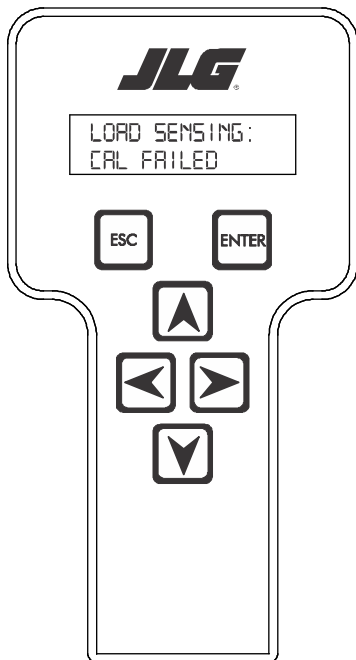
Table 6-12. Accessory Weights

Accessory	Weight
SkyWelder (stick welder)	70 lb (32 kg)
SkyWelder Prep	Prep only = 15 lb (7 kg) Full install = 70 lb (32 kg)
SkyCutter (plasma cutter)	70 lb (32 kg)
SkCutter / SkyWelder Combo	140 lb (64 kg)
Fire Extinguisher	45 lb (20 kg)
Overhead SoftTouch	80 lb (36 kg)
WorkSurface	20 lb (9 kg)


NOTE: Not all Accessories are available on every JLG model. Some Accessory combinations are prohibited due to excessive weight and/or load restriction. If any installed JLG Accessories are labeled with weight decals but are not listed in the table above, include their weight when entering the ACC WEIGHT value.

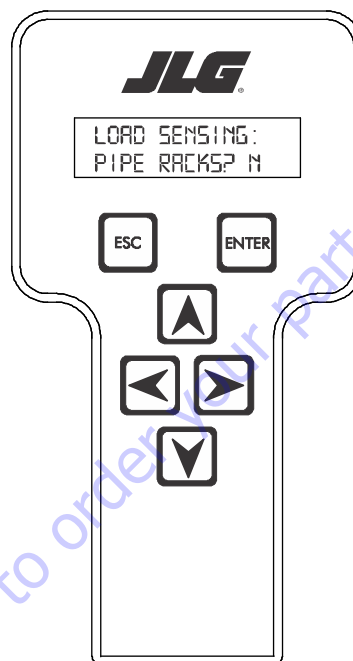
9. The control system will calculate the load cell readings and ensure it is greater than 130 lb (59 kg), but less than 575 lb (261 kg).


If the platform weight is not within the allowed range, the calibration attempt will be unsuccessful and the Analyzer will show the following:

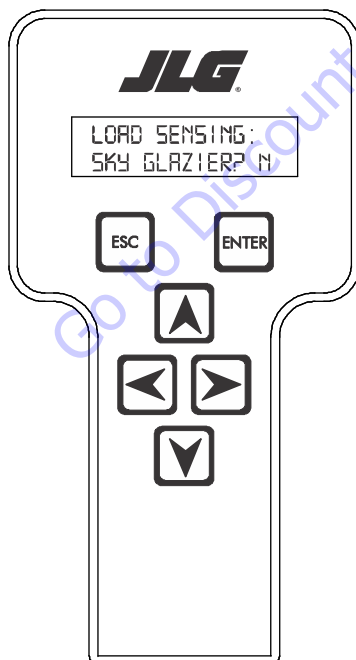


11. Use the analyzer keys to select N for no or Y for yes. Press


ENTER . The screen will read:



10. Press ENTER . The control system will ask for installed accessories. The screen will show the following:



12. Use the analyzer keys to select N for no or Y for yes. Press

ENTER . The control system will default to an estimate of unrestricted capacity, which can be adjusted if necessary. Refer to Table 6-13, SkyGlazier Capacity Reductions and Table 6-14, Pipe Rack Capacity Reductions.

The screen will read:

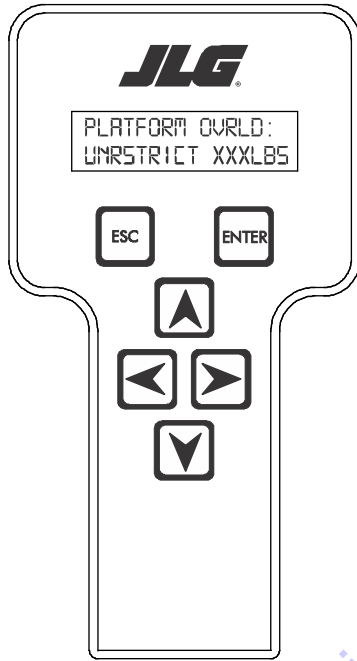


Table 6-13. SkyGlazier Capacity Reductions


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)

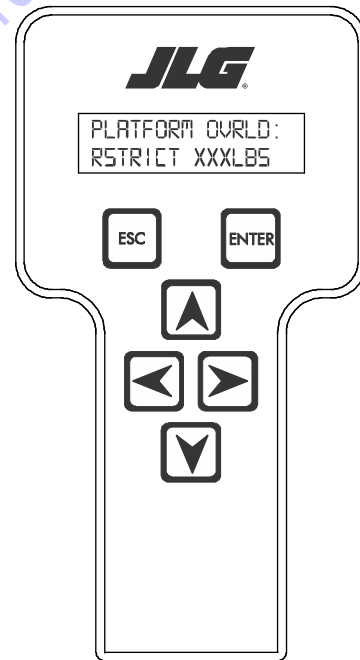
Note: If both SkyGlazier and Pipe Racks are configured, capacity will be the lower of the two values.


Table 6-14. Pipe Rack Capacity Reductions

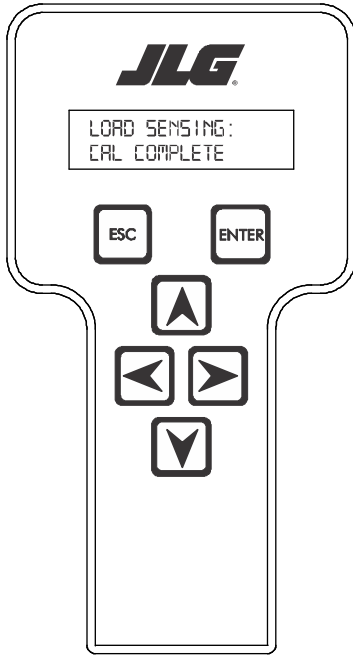
Capacity	PLATFORM OVRLD	PLATFORM OVRLD RESTRICT
500 lb (227 kg)	400 lb (181 kg)	n/a
550 lb (250 kg)	450 lb (204 kg)	n/a
600 lb (272 kg)	500 lb (227 kg)	n/a
750 lb (340 kg)	n/a	650 lb (295 kg)
1000 lb (454 kg)	n/a	900 lb (408 kg)

Note: If both SkyGlazier and Pipe Racks are configured, capacity will be the lower of the two values.

13. Press ENTER . The following screen will be displayed for restricted capacity, which can be adjusted if necessary. Refer to Table 6-13, SkyGlazier Capacity Reductions and Table 6-14, Pipe Rack Capacity Reductions.



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



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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 ± 15 lb (± 7 kg). Further, the reading should be stable and should not vary by more than ± 2 lb (± 1 kg) (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 500 lb (230kg) in the platform and ensure that PLTLOAD is with $\pm 5\%$ of the actual weight. For Dual Capacity vehicles, do the same for the alternate capacity (unrestricted or restricted).

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 6-15. LSS Troubleshooting Chart

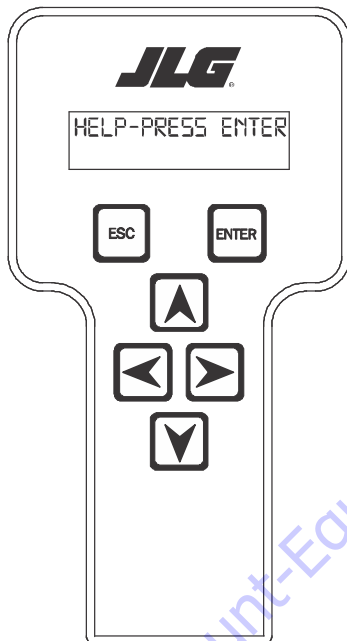
Difficulty	Possible Resolution
<p>Empty Platform Weight (DIAGNOSTICS, PLAT-FORM LOAD) is not within $\pm 15\text{lb}$ ($\pm 7\text{kg}$) of zero.</p> <p>or</p> <p>Platform Load readings (DIAGNOSTICS, PLTLOAD) are unstable by more than $\pm 2\text{lb}$ ($\pm 1\text{kg}$) (without the influence of vibration or wind).</p> <p>or</p> <p>There are large variations in Platform Load (DIAGNOSTICS, PLTLOAD) based on the location of the load. Tolerance to variations is 20lb for an evaluation using the technician's weight, and $\pm 5\%$ of Rated Load when using calibrated weights.</p>	<p>The LSS System is unable to properly measure the platform weight.</p> <ol style="list-style-type: none"> 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 $\pm 2\text{lb}$ ($\pm 1\text{kg}$) (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 ($> 6000\text{lb}$ [$> 2722\text{kg}$]).
<p>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.</p>	<p>The Control System is failing to regard the overload signal from the LSS System, or the signal is shorted.</p> <ol style="list-style-type: none"> 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).
<p>The Ground Audible Warning fails to sound, but the Platform Audible Warning sounds properly.</p>	<p>The Ground Alarm is missing or improperly installed. Verify that the device is mounted. Verify wiring from the Main Terminal Box and Ground Module.</p>
<p>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.</p>	<p>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.</p> <p>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.</p>



6.9 RESETTING THE MSSO SYSTEM

1. Use the following procedure to reset the MSSO system.
2. Position the Platform/Ground select switch to the desired position.
3. Plug the analyzer into the connector coming from the ground control module or from the platform console.

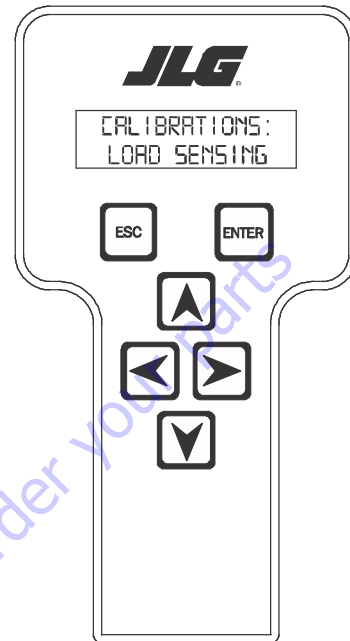
NOTE: If performing the procedure from the platform console, the Emergency Stop switch on the ground console must also be pulled out.



4. Pull out the Emergency Stop switch.
5. The analyzer screen should read:



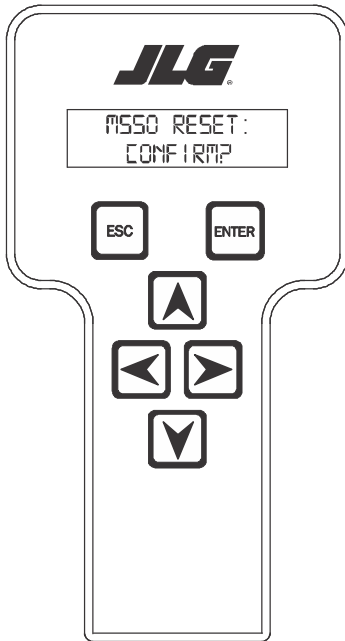
6. Use the arrow button to reach OPERATOR ACCESS. Press  Enter.
7. Enter the Access Code, 33271.
8. Use the right Arrow key to reach MENU: CALIBRATIONS. Press Enter .



9. Use the arrow keys to reach the LOAD SENSING menu. The screen should read:



10. Press ENTER .
11. Use the Down  arrow to reach MSSO RESET.

12. Press Enter . The screen will read:



13. Press Enter . The JLG Control System will reset an active 873 DTC and the MSSO System will be reset. Press Escape  to return to the CALIBRATIONS menu.

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Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
001	EVERYTHING OK	The UGM determines that platform station (EVERYTHING OK) OR ground station (GROUND MODE OK) is selected and no system faults exist, including Power Module check; 0 (No Fault)	Occurrence of active DTC
002	GROUND MODE OK	The normal help message in Ground Mode. Displays on the analyzer only.	Ground Mode selected; & occurrence of active DTC
008	FUNCTIONS LOCKED OUT - SYSTEM POWERED DOWN	Conditions exist and time for automatic power-down has expired.	Power cycled
0010	RUNNING AT CUTBACK - OUT OF TRANSPORT POSITION	Machine is in the Out Of Transport Position	Machine is not Out of Transport; If Swung, DOS transition requirements are required to return to In Line speed
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; Tower Lift; Telescope; Platform Level; Platform Rotate; Jib Lift (if MACHINE SETUP -> JIB = YES); Jib Swing (if MACHINE SETUP -> JIB PLUS = YES);	Controls initialized
0012	RUNNING AT CREEP - CREEP SWITCH OPEN	Machine is in Platform Mode; Platform creep switch input = HIGH; Fault RUNNING AT CREEP – TILTED AND ABOVE ELEVATION (DTC0013) is not active	Platform creep switch input = Low
0013	RUNNING AT CREEP - TILTED AND ABOVE ELEVATION	Machine is in Platform mode; Machine is Above Elevation and Tilted; MACHINE SETUP -> TILT (not + CUT)	Not all of the trigger conditions are met; Then non-Creep function speed permitted after controls initialized
0033	TRACTION MOTOR AT CURRENT LIMIT	Machine is in Platform Mode and UGM detects that Traction Current reported by any Power Module > 270A for 3000ms; MTM or SPM will keep the Traction motor current below limit (280A@48V) but will not report fault;	Currents return to levels below trigger level for same time period as trigger; UGM shall remove Creep speed restriction after controls initialized
0036	FUNCTION PREVENTED - FUNCTION SELECTED BEFORE GROUND ENABLE	Machine is in Ground Mode (DTC002); Machine is not enabled; Any valid ground control input becomes active;	Controls Initialized.
0039	SKYGUARD ACTIVE – FUNCTIONS CUTOUT	Machine is in Platform Mode and SkyGuard Enabled	Trigger conditions are no longer true
0047	DRIVING IN CREEP – STEEP DESCENT	UGM detects that the machine is descending a grade steeper than the MAX Grade setpoint (greater than or equal to): MAX Grade Setpoint = 19 degrees for a period of greater than 1 second. [MACHINE SETUP = E400 or 450].	The UGM detects that the grade in direction of travel is more than 3 degrees less than the machine's trip point.

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
0048	BATTERY CHARGE LOW	Battery SOC < 10%	Battery SOC > Discharged; speed restrictions removed after controls initialized
0046	TORQUE CUTBACK - EXCESSIVE TILT	UGM detects that the machine is ascending an inclination of greater than or equal to: 19 degrees for a period of greater than 1 second. [MACHINE SETUP = E400 or 450].	The UGM detects that the grade in direction of travel is more than 3 degrees less than the machine's trip point
211	POWER CYCLE	The normal help message is issued to designate the start of each power cycle in Analyzer Logged Help; new entry only recorded if new DTCs occurred since last power cycle	No special conditions required
212	KEYSWITCH FAULTY	UGM Ground Mode (input J7-3) and UGM Platform Mode (input J7-2) are both HIGH at the same time	UGM Ground Mode (input J7-3) or UGM Platform Mode (input J7-2) = 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	The horn switch was closed during power-up	Horn switch input = LOW
224	FUNCTION PROBLEM - STEER LEFT PERMANENTLY SELECTED	Machine in Platform Mode; Steer Left Switch input = HIGH at Startup	Steer Left Switch returns to neutral; steer functions enabled after remaining controls are initialized
225	FUNCTION PROBLEM - STEER RIGHT PERMANENTLY SELECTED	Machine in Platform Mode; Steer Right Switch input = HIGH at Startup	Steer Right Switch returns to neutral; Steer functions enabled after remaining controls are initialized
227	STEER SWITCHES FAULTY	Both steer switch inputs on the Drive/Steer joystick are High (detectable in Platform or Ground mode).	Steer Right and Steer Left are no longer simultaneous HIGH; steer and full Drive speed permitted after controls are initialized
2211	FSW INTERLOCK TRIPPED	Machine is in Platform Mode; A Machine Enabled state has been active for greater than or equal to 7 seconds without activation of any drive, steer, or boom functions	The footswitch is released
2212	DRIVE LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH	The machine is in Platform Mode and the drive joystick is not in the neutral position immediately following Start Up. The machine is in Platform Mode and a proper machine enable signal is received or DTC 2213, 2221 or 2223 is active while the drive joystick is not in the neutral position.	If triggered by the drive joystick not being in the neutral position immediately following Start Up THEN when Drive joystick is returned to its neutral position and the machine is not in the Enabled state. If triggered by proper machine enable signal being received while the drive joystick is not in the neutral position then when the Drive joystick is returned to neutral or the footswitch is released
2213	STEER LOCKED - SELECTED BEFORE FOOTSWITCH	The UGM detects that the machine is in Platform Mode and a proper machine enable signal is received or DTC 2212, 2221 or 2223 is active while the steer controls are not in the neutral position.	When the steer controls are returned to neutral or the footswitch is released
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/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

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
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/swing center tap voltage is between 3.31 and 3.75 volts and no longer reports the fault to the UGM
2220	L/S JOY. CENTERTAP 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	The machine is in Platform Mode and the Lift and/or Swing controls are not in the neutral position immediately following Start Up -OR- The machine is in Platform Mode and a proper machine enable signal is received or DTC 2212, 2213 or 2223 is active while the Lift/Swing joystick is not in the neutral position.	If triggered by the Lift/Swing controls not being in the neutral position immediately following Start Up, then when Lift/Swing controls are returned to neutral and the machine is not in the Enabled state. If triggered by proper machine enable signal being received while the Lift/Swing controls are not in the neutral position, then when the Lift/Swing controls are returned to neutral or the footswitch is released
2222	WAITING FOR FSW TO BE OPEN	Machine is in Platform Mode AND Footswitch has been engaged since Start Up	Footswitch is disengaged
2223	FUNCTION SWITCHES LOCKED - SELECTED BEFORE ENABLE	The machine is in Platform Mode and a proper machine enable signal is received or DTC 2212, 2213 or 2221 is active while any of the following boom control inputs are engaged: AWDA Enable, Tower Lift, Telescope, Platform Level, Platform Rotate, Jib Lift (if MACHINE SETUP -> JIB = YES) and Jib Rotate (if MACHINE SETUP -> JIB PLUS = YES)	None of the boom controls that trigger this fault are engaged or the Footswitch is disengaged.
2245	FUNCTION PROBLEM - JIB SWING LEFT PERMANENTLY SELECTED	The machine is in Platform mode and the Jib Swing Left input = High at Startup	Jib Swing Left input = LOW while the machine is not Enabled
2246	FUNCTION PROBLEM - JIB SWING RIGHT PERMANENTLY SELECTED	The machine is in Platform mode and the Jib Swing Right input = High at Startup	Jib Swing Right input = LOW while the machine is not Enabled
2247	FUNCTION PROBLEM - PLATFORM ROTATE LEFT PERMANENTLY SELECTED	The machine is in Platform mode and the Platform Rotate Left input = High at Startup	Platform Rotate Left input = LOW while the machine is not Enabled
2248	FUNCTION PROBLEM - PLATFORM ROTATE RIGHT PERMANENTLY SELECTED	The machine is in Platform mode and the Platform Rotate Right input = High at Startup	Platform Rotate Right input = LOW while the machine is not Enabled
2249	FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED	The machine is in Platform mode and the Jib Lift Up input = High at Startup	Jib Lift Up input = LOW while the machine is not Enabled
2250	FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED	The machine is in Platform mode and the Jib Lift Down input = High at Startup	Jib Lift Down input = LOW while the machine is not Enabled
2251	FUNCTION PROBLEM - TELESCOPE IN PERMANENTLY SELECTED	The machine is in Platform mode and the Telescope In input = High at Startup	Telescope In input = LOW while the machine is not Enabled
2252	FUNCTION PROBLEM - TELESCOPE OUT PERMANENTLY SELECTED	The machine is in Platform mode and the Telescope Out input = High at Startup	Telescope Out input = LOW while the machine is not Enabled
2257	FUNCTION PROBLEM - TOWER LIFT UP PERMANENTLY SELECTED	The machine is in Platform mode and the Tower Lift Up input = High at Startup	Telescope Out input = LOW while the machine is not Enabled
2258	FUNCTION PROBLEM - TOWER LIFT DOWN PERMANENTLY SELECTED	The machine is in Platform mode and the Tower Lift Down input = High at Startup	Tower Lift Down input = LOW while the machine is not Enabled
2262	FUNCTION PROBLEM - PLATFORM LEVEL UP PERMANENTLY SELECTED	The machine is in Platform mode and the Platform Level Up input = High at Startup	Platform Level Up input = LOW while the machine is not Enabled
2263	FUNCTION PROBLEM - PLATFORM LEVEL DOWN PERMANENTLY SELECTED	The machine is in Platform mode and the Platform Level Down input = High at Startup	Platform Level Down input = LOW while the machine is not Enabled

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
2264	FUNCTION PROBLEM - DOS OVERRIDE PERMANENTLY SELECTED	The machine is in Platform mode and the Drive Orientation switch input = High at Startup	Drive Orientation input = LOW while the machine is not Enabled
2286	FUNCTION PROBLEM - SOFT TOUCH / SKY-GUARD 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
234	FUNCTION SWITCHES FAULTY - CHECK DIAGNOSTICS/BOOM	Both inputs associated with mutually exclusive operations are simultaneously active.	Trigger conditions no longer true.
2310	FUNCTION PROBLEM - GROUND ENABLE PERMANENTLY SELECTED	The machine is in Ground mode and the Function Enable input = High at Startup	Enable switch = LOW; Enable permitted after controls initializ
2370	FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED	If MACHINE SETUP JIB = YES and the machine is in Ground mode and the subject switch input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
2371	FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED	If MACHINE SETUP JIB = YES and the machine is in Ground mode and the subject switch input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
2372	FUNCTION PROBLEM - SWING LEFT PERMANENTLY SELECTED	The machine is in Ground mode and the Swing Left = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
2373	FUNCTION PROBLEM - SWING RIGHT PERMANENTLY SELECTED	The machine is in Ground mode and the Swing Right input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23105	FUNCTION PROBLEM - TOWERLIFT UP PERMANENTLY SELECTED	The machine is in Ground mode and the Tower Lift Up input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23106	FUNCTION PROBLEM - TOWERLIFT DOWN PERMANENTLY SELECTED	The machine is in Ground mode and the Tower Lift Down input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23107	FUNCTION PROBLEM - LIFT UP PERMANENTLY SELECTED	The machine is in Ground mode and the Lift Up input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23108	FUNCTION PROBLEM - LIFT DOWN PERMANENTLY SELECTED	The machine is in Ground mode and the Lift Down input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23109	FUNCTION PROBLEM - TELESCOPE IN PERMANENTLY SELECTED	The machine is in Ground mode and the Telescope In input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23110	FUNCTION PROBLEM - TELESCOPE OUT PERMANENTLY SELECTED	The machine is in Ground mode and the Telescope Out input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23111	FUNCTION PROBLEM - PLATFORM LEVEL UP PERMANENTLY SELECTED	The machine is in Ground mode and the Platform Level Up input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23112	FUNCTION PROBLEM - PLATFORM LEVEL DOWN PERMANENTLY SELECTED	The machine is in Ground mode and the Platform Level Down input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23113	FUNCTION PROBLEM - PLATFORM ROTATE LEFT PERMANENTLY SELECTED	The machine is in Ground mode and the Platform Rotate Left input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23114	FUNCTION PROBLEM - PLATFORM ROTATE RIGHT PERMANENTLY SELECTED	The machine is in Ground mode and the Platform Rotate Right input = High at Start Up	Function switch returns to neutral and the machine is not in the Enabled state.
23163	FUNCTION PROBLEM - MSSO PERMANENTLY SELECTED	UGM determines that MSSO low-side switch is selected at Startup	Function switch returns to neutral and the machine is not in the Enabled state.
23171	FUNCTION PROBLEM - JIB SWING LEFT PERMANENTLY SELECTED	The machine is in Ground mode and the Jib Swing Left input = High at Start Up	Jib Swing Left input = LOW and the machine is not in the Enabled state.
23172	FUNCTION PROBLEM - JIB SWING RIGHT PERMANENTLY SELECTED	The machine is in Ground mode and the Jib Swing Right input = High at Start Up	Jib Swing Right input = LOW and the machine is not in the Enabled state.

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
241	AMBIENT TEMPERATURE SENSOR - OUT OF RANGE LOW	System is in platform mode; MACHINE SETUP -> TEMP CUTOFF = yes; Low Temperature Cutout Sensor reads less than or equal to -50 °C.	Ambient Temperature sensor reading > -50 °C THEN speed restrictions removed after controls are initialized
242	AMBIENT TEMPERATURE SENSOR - OUT OF RANGE HIGH	System is in platform mode; MACHINE SETUP -> TEMP CUTOFF = yes; Low Temperature Cutout Sensor reads greater than or equal to 85 °C.	Ambient Temperature sensor reading > -50 °C; Speed restrictions removed after controls are initialized
253	DRIVE PREVENTED - CHARGER CONNECTED	MACHINE SETUP => CHARGER INTERLOCK = DRIVE ONLY;	Trigger conditions not true; Restrictions remove after CntIni
259	MODEL CHANGED - HYDRAULICS SUSPENDED - CYCLE EMS	The MACHINE SETUP => MODEL has changed	Power cycle
2514	BOOM PREVENTED - DRIVE SELECTED	MACHINE SETUP => FUNCTION CUTOFF = BOOM CUTOFF; Drive or Steer is already engaged; The boom is Above Elevation; The operator is attempting to activate one of the boom functions DTC 2514 supersedes 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
2516	DRIVE PREVENTED - ABOVE ELEVATION	MACHINE SETUP => FUNCTION CUTOFF = DRIVE CUTOFF; The boom is Above Elevation; 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 CUTOFF = DRIVE CUTOFF; The boom is Above Elevation; The operator is attempting to activate Drive or Steer;	Not all of the trigger conditions are met
2538	FUNCTION PREVENTED - CHARGER CONNECTED	MACHINE SETUP => CHARGER INTERLOCK = CUTOFF ALL; MTM reports charger connected; UGM determines that machine is Enabled, and a function command was attempted.	Not all of the trigger conditions are met; Restricts removed after CntIni
2548	SYSTEM TEST MODE ACTIVE	UGM determines that System Test Mode is active	Power cycled
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 ≠ NO; 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)]
2564	DRIVE PREVENTED - LEFT BRAKE NOT RELEASING	Module detects brakes have not released because EB coil is damaged	Power cycle
2565	DRIVE PREVENTED - RIGHT BRAKE NOT RELEASING	Module detects brakes have not released because EB coil is damaged	Power cycle
2568	TEMPERATURE CUTOFF ACTIVE - AMBIENT TEMPERATURE TOO LOW	Low Temperature Cutout = Active	Low Temperature Cutout = Inactive; speed restrictions removed after controls are initialized

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
2576	PLATFORM LEVEL PREVENTED – ABOVE ELEVATION	UGM has determined that all of the following conditions exists: Platform Level Override Cutout = Enabled; Machine is Enabled; The Platform Level Up or Down switch input = High;	Not all of the trigger conditions are met
2578	FUNCTION PREVENTED – TILTED & ABOVE ELEVATION	Machine is in Platform mode Machine is Above Elevation and Tilted MACHINE SETUP → TILT → X DEGREES + CUT and the operator is attempting to activate Drive or Steer, Lift Up, Tower Up or Telescope Out. Where X = 3, 4, or 5 Degrees)	At least one of the trigger conditions is not met; then non-Creep function speed permitted after controls initialized.
2579	DRIVE PREVENTED – EXCESSIVE GRADE	DTC 0046 is active; Drive speed request, in direction of ascending grade, is greater than zero;	CntlIn (drive joystick returned to center position)
3111	MAIN CONTACTOR DRIVER – PERMANENTLY OFF	Master Traction Module detects that the line contactor driver is out of order and not able to close (Contactor Driver; 75)	Power cycle
3112	MAIN CONTACTOR – OPEN CIRCUIT	Master Traction Module detects current through Contactor Coil but no voltage on Contactor contacts during active traction or pump.	Power cycled
3212	MAIN CONTACTOR – WELDED OR MISWIRED	Master Traction Module determines at Startup that Line Contactor is closed/stuck before command	Power cycle
3213	MAIN CONTACTOR DRIVER – PERMANENTLY ON	Master Traction Module detects that the line contactor driver output failed short or contactor coil is disconnected/open circuit	Power cycle
334	LIFT UP VALVE – OPEN CIRCUIT	The UGM detects an open circuit at the Lift Up Solenoid	UGM no longer detects OC; Speed restriction removed after CntlIn;
336	LIFT DOWN VALVE – OPEN CIRCUIT	The UGM detects an open circuit at the Lift Down Solenoid	UGM no longer detects open circuit; Inhibits and restrictions removed after CntlIn;
337	STEER LEFT VALVE – SHORT TO BATTERY	UGM detects a short to battery at steer left output	Power cycle
338	STEER LEFT VALVE – OPEN CIRCUIT	The UGM detects an open circuit at steer left output	UGM no longer detects OC; Speed restriction removed after CntlIn.
339	STEER RIGHT VALVE – SHORT TO BATTERY	The UGM detects a short to battery at steer right output	Power cycle
3310	STEER RIGHT VALVE – OPEN CIRCUIT	The UGM detects an open circuit at steer right output	UGM no longer detects OC; Speed restriction removed after CntlIn.
3311	GROUND ALARM – SHORT TO BATTERY	The UGM detects a short to 12V battery at this output	Power cycle
3371	GROUND ALARM – SHORT TO GROUND	The UGM detects a short to ground at this output	Power cycle
3376	HEAD TAIL LIGHT - SHORT TO GROUND	MACHINE SETUP → H & T LIGHTS = YES; UGM detects a short to ground at head/tail light relay output	Power cycle
3377	HEAD TAIL LIGHT - OPEN CIRCUIT	MACHINE SETUP → H & T LIGHTS = YES; UGM detects a short to ground at head/tail light relay output	UGM no longer detects open circuit
3378	HEAD TAIL LIGHT - SHORT TO BATTERY	MACHINE SETUP → H & T LIGHTS = YES; UGM detects a short to battery at head/tail light relay output	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
3382	PLATFORM LEVEL UP VALVE - SHORT TO GROUND	The UGM detects a short to ground at the platform level up output	Power cycle
3383	PLATFORM LEVEL UP VALVE - OPEN CIRCUIT	The UGM detects an open circuit at the platform level up output	UGM no longer detects open circuit; speed restrictions removed after controls are initialized
3384	PLATFORM LEVEL UP VALVE - SHORT TO BATTERY	The UGM detects a short to 12V battery at the platform level up output	Power cycle
3388	PLATFORM LEVEL DOWN VALVE - SHORT TO GROUND	The UGM detects a short to ground at the platform level down output	Power cycle
3389	PLATFORM LEVEL DOWN VALVE - OPEN CIRCUIT	The UGM detects an open circuit at the platform level down output	UGM no longer detects open circuit; Prohibits and restrictions removed after CntlNi
3390	PLATFORM LEVEL DOWN VALVE - SHORT TO BATTERY	The UGM detects a short to 12V battery at the platform level down output	Power cycle
3394	PLATFORM ROTATE LEFT VALVE - SHORT TO GROUND	UGM detects a short to ground at platform rotate left output	Power cycle
3395	PLATFORM ROTATE LEFT VALVE - OPEN CIRCUIT	UGM detects an open circuit at platform rotate left output	UGM no longer detects OC; Speed restrictions removed after CntlNi;
3396	PLATFORM ROTATE LEFT VALVE - SHORT TO BATTERY	UGM detects a short to battery at platform rotate left output	Power cycle
3397	PLATFORM ROTATE RIGHT VALVE - SHORT TO GROUND	UGM detects a short to ground at platform rotate right output	Power cycle
3398	PLATFORM ROTATE RIGHT VALVE - OPEN CIRCUIT	UGM detects an open circuit at platform rotate right output	UGM no longer detects OC; Speed restrictions removed after CntlNi;
3399	PLATFORM ROTATE RIGHT VALVE - SHORT TO BATTERY	UGM detects a short to battery at platform rotate right output	Power cycle
33100	JIB LIFT UP VALVE - SHORT TO GROUND	MachineSetup -> Jib = YES; UGM detects a short to ground at the jib lift up output;	Power cycle
33101	JIB LIFT UP VALVE - OPEN CIRCUIT	MachineSetup -> Jib = YES; UGM detects an open circuit at the jib lift up output	UGM no longer detects OC; Speed restriction removed after CntlNi;
33102	JIB LIFT UP VALVE - SHORT TO BATTERY	MachineSetup -> Jib = YES; UGM detects a short to battery at the jib lift up output	Power cycle
33103	JIB LIFT DOWN VALVE - SHORT TO GROUND	MachineSetup -> Jib = YES; UGM detects a short to ground at the jib lift down output	Power cycle
33104	JIB LIFT DOWN VALVE - OPEN CIRCUIT	MachineSetup -> Jib = YES; UGM detects an open circuit at the jib lift down output	UGM no longer detects open circuit; Inhibits and restrictions removed after CntlNi;
33105	JIB LIFT DOWN VALVE - SHORT TO BATTERY	MachineSetup -> Jib = YES; UGM detects a short to battery at the jib lift down output	Power cycle
33106	TOWER LIFT UP VALVE - SHORT TO GROUND	The UGM detects a short to ground at the tower lift up output	Power cycle
33107	TOWER LIFT UP VALVE - OPEN CIRCUIT	The UGM detects an open circuit at the tower lift up output	UGM no longer detects OC; Speed restriction removed after CntlNi;
33108	TOWER LIFT UP VALVE - SHORT TO BATTERY	The UGM detects a short to ground at the tower lift up output	Power cycle
33109	TOWER LIFT DOWN VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
33110	TOWER LIFT DOWN VALVE - OPEN CIRCUIT	The UGM detects an open circuit supporting the Tower Down Solenoid	UGM no longer detects open circuit; Inhibits and restrictions removed after CntrlIn;
33111	TOWER LIFT DOWN VALVE - SHORT TO BATTERY	The UGM detects a short to ground at the tower lift down output	Power cycle
33118	SWING RIGHT VALVE - SHORT TO GROUND	The UGM detects a short to ground at the Swing Right output	Power cycle
33119	SWING RIGHT VALVE - OPEN CIRCUIT	The UGM detects an open circuit at the Swing Right output	UGM no longer detects OC; Speed restrictions removed after CntrlIn
33120	TELESCOPE IN VALVE - SHORT TO BATTERY	The UGM detects a short to 12V battery at this output	Power cycle
33122	SWING LEFT VALVE - SHORT TO GROUND	The UGM detects a short to ground at the Swing Left output	Power cycle
33123	TELESCOPE OUT VALVE - SHORT TO BATTERY	The UGM detects a short to 12V battery at this output	Power cycle
33175	JIB ROTATE LEFT VALVE - OPEN CIRCUIT	MACHINE SETUP -> JIB PLUS = YES; UGM detects an open circuit at the jib rotate left output	UGM no longer detects OC; Speed restrictions removed after CntrlIn
33176	JIB ROTATE LEFT VALVE - SHORT TO BATTERY	MACHINE SETUP -> JIB PLUS = YES; UGM detects a short to ground at the jib rotate left output	Power cycle
33177	JIB ROTATE LEFT VALVE - SHORT TO GROUND	MACHINE SETUP -> JIB PLUS = YES; UGM detects a short to battery at the jib rotate left output	Power cycle
33178	JIB ROTATE RIGHT VALVE - OPEN CIRCUIT	MACHINE SETUP -> JIB PLUS = YES; UGM detects an open circuit at the jib rotate right output	UGM no longer detects OC; Speed restrictions removed after CntrlIn
33179	JIB ROTATE RIGHT VALVE - SHORT TO BATTERY	MACHINE SETUP -> JIB PLUS = YES; UGM detects a short to battery at the jib rotate right output	Power cycle
33180	JIB ROTATE RIGHT VALVE - SHORT TO GROUND	MACHINE SETUP -> JIB PLUS = YES; UGM detects a short to ground at the jib rotate right output	Power cycle
33182	LIFT VALVES - SHORT TO BATTERY	UGM detects a short to 12V battery at either the Lift Up or Lift Down valve	Power cycle
33186	TELESCOPE OUT VALVE - OPEN CIRCUIT	UGM detects an open circuit at this output	UGM no longer detects OC. Speed restrictions removed after CntrlIn
33188	TELESCOPE OUT VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power cycle
33189	TELESCOPE IN VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	UGM no longer detects OC. Speed restrictions removed after CntrlIn
33190	TELESCOPE IN VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power cycle
33295	SWING LEFT VALVE - OPEN CIRCUIT	The UGM detects an open circuit at the Swing Left output	UGM no longer detects OC; Speed restrictions removed after CntrlIn
33298	STEER LEFT - SHORT TO GROUND	The UGM detects a short to ground at steer left output.	Power cycle
33305	STEER RIGHT - SHORT TO GROUND	The UGM detects a short to ground at steer right output.	Power cycle
33314	FLOW CONTROL VALVE - OPEN CIRCUIT	The UGM detects an OC at this output	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
33315	FLOW CONTROL VALVE - SHORT TO BATTERY	The UGM detects a short to 12V battery at this output	Power cycle
33316	FLOW CONTROL VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power cycle
33406	LIFT UP VALVE - SHORT TO GROUND	The UGM detects STG at the Lift Up Solenoid	Power cycle
33407	LIFT DOWN VALVE - SHORT TO GROUND	The UGM detects STG at the Lift Down Solenoid	Power cycle
33412	SWING VALVES - SHORT TO BATTERY	The UGM detects a short to 12V battery at the either Swing output	Power cycle
33425	TOWER LIFT VALVES - SHORT TO BATTERY	The UGM detects a short to battery at either the Tower Lift Up or Tower Lift Down valve.	Power cycle
33479	VOTING RELAY - SHORT TO BATTERY	UGM detects a short to battery at this output	Power cycle
33480	VOTING RELAY - SHORT TO GROUND	UGM detects a short to ground at the voting relay output	Power cycle
33549	VOTING RELAY - OPEN CIRCUIT	UGM detects an open circuit at the voting relay output	Power cycle
33578	STEER PRIORITY BYPASS VALVE - OPEN CIRCUIT	The UGM detects an OC at steer priority bypass output	UGM no longer detects OC; Speed restriction removed after Cntlni.
33579	STEER PRIORITY BYPASS VALVE - SHORT TO GROUND	The UGM detects a short to ground at steer priority bypass output	Power cycle
33580	STEER PRIORITY BYPASS VALVE - SHORT TO BATTERY	The UGM detects a short to battery at steer priority bypass output	Power cycle
33624	SWING BYPASS VALVE - SHORT TO GROUND	The UGM detects a short to ground at swing bypass output	Power cycle
33625	SWING BYPASS VALVE - SHORT TO BATTERY	The UGM detects a short to battery at swing bypass output	Power cycle
33626	SWING BYPASS VALVE - OPEN CIRCUIT	The UGM detects open circuit at swing bypass output	UGM no longer detects OC; Speed restriction removed after Cntlni.
33627	LIFT BYPASS VALVE - SHORT TO GROUND	The UGM detects STG at lift bypass output;	Power cycle
33628	LIFT BYPASS VALVE - SHORT TO BATTERY	The UGM detects STB at lift bypass output	Power cycle
33629	LIFT BYPASS VALVE - OPEN CIRCUIT	The UGM detects OC at lift bypass output	Power cycle
4219	REAR LEFT MODULE TEMPERATURE - OUT OF RANGE	The Power Module temperature sensor is out of the permitted operating range and reports a fault	Traction module no longer reporting fault; Creep restriction removed after controls initialized
4220	REAR RIGHT MODULE TEMPERATURE - OUT OF RANGE	The Front Right Power Module temperature sensor is out of the permitted operating range and reports a fault	Traction module no longer reporting fault; Creep restriction removed after controls initialized
4223	REAR LEFT MODULE TOO HOT - PLEASE WAIT	Associated Power Module has reached thermal cut-out limit	Traction module no longer reporting fault; Creep restriction removed after controls initialized
4224	REAR RIGHT MODULE TOO HOT - PLEASE WAIT	Front Right Power Module has reached thermal cutout limit	Traction module no longer reporting fault; Creep restriction removed after controls initialized
4228	REAR LEFT MOTOR TEMPERATURE - OUT OF RANGE	The Power Module reports that motor temperature sensor is out of range due to Open-Circuit (Temp Out of Range – High > 240°C), STG (Temp Out of Range – Low < -30°C) or damage	Traction module no longer reporting fault; Creep restriction removed after controls initialized
4229	REAR RIGHT MOTOR TEMPERATURE - OUT OF RANGE	The Power Module reports that motor temperature sensor is out of range due to Open-Circuit (Temp Out of Range – High > 240°C), STG (Temp Out of Range – Low < -30°C) or damage	Traction module no longer reporting fault; Creep restriction removed after controls initialized

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
4232	REAR LEFT MOTOR TOO HOT - PLEASE WAIT	The UGM determines that the drive motor temperature reported by the PM > 140°C but < 200°C or the PM determines that motor temperature sensor is reporting > 150°C UGM to suppress if DTC 4228 is active.	Power Module no longer report fault and UGM determines motor temp ≤ 140°C (149-10°C) and Controls initialized. Drive disable reset when motor temp ≤ 139°C (149-10°C) and Drive Joystick in Neutral.
4233	REAR RIGHT MOTOR TOO HOT - PLEASE WAIT	The UGM determines that the drive motor temperature reported by the PM > 140°C but < 200°C or the PM determines that motor temperature sensor is reporting > 150°C UGM to suppress if DTC 4229 is active.	Power Module no longer report fault and UGM determines motor temp ≤ 140°C (149-10°C) and Controls initialized. Drive disable reset when motor temp ≤ 139°C (149-10°C) and Drive Joystick in Neutral.
441	BATTERY VOLTAGE TOO LOW - SYSTEM SHUT-DOWN	The UGM detects that its 12V supply voltage is less than 9.0 volts for 5 seconds.	UGM voltage > 9.25V
442	BATTERY VOLTAGE TOO HIGH - SYSTEM SHUT-DOWN	The UGM detects that its 12V supply voltage > 16.0 volts	Power cycle
443	LSS BATTERY VOLTAGE TOO HIGH	MACHINE SETUP -> LOAD SYSTEM ≠ NO; The UGM determines that LSS error bit is set for supply voltage too high (> 34.0V)	Not all of the trigger conditions are met; motion restrictions removed after controls initialized
444	LSS BATTERY VOLTAGE TOO LOW	MACHINE SETUP -> LOAD SYSTEM ≠ NO; The UGM determines that LSS error bit is set for supply voltage too low (< 9.0V)	Not all of the trigger conditions are met; motion restrictions removed after controls initialized
4420	BATTERY DEEPLY DISCHARGED	UGM determines that the SOC% related to the Battery has reached the Deeply Discharged condition. Based on SOC% only, not Voltage threshold; No audible annunciation for this DTC.	Power cycle
4430	BATTERY VOLTAGE TOO LOW	UGM detects that its supply voltage < 11 volts for 5 seconds.	UGM voltage > 11.25V
4463	REAR LEFT MODULE - VOLTAGE OUT OF RANGE	Associated Power Module determines System Overvoltage/Undervoltage, Voltage measurement ≥ 65V or ≤ 12V	Traction modules no longer report fault then controls initialized.
4464	REAR RIGHT MODULE - VOLTAGE OUT OF RANGE	Associated Power Module determines System Overvoltage/Undervoltage, Voltage measurement ≥ 65V or ≤ 12V	Traction modules no longer report fault then controls initialized.
4692	REAR LEFT BRAKE - SHORT TO GROUND OR OPEN CIRCUIT	Associated Power Module detects A4 shorted to ground: at Standby as or at Running (PWM Supplemental info not applicable to this DTC for initiating separate DTC: Power Module detects A4 shorted to ground at Startup as or Power Module detects A2 shorted to ground only at Startup, not detected in Standby or Running.	Power cycle
4693	REAR RIGHT BRAKE - SHORT TO GROUND OR OPEN CIRCUIT	Associated Power Module detects A4 shorted to ground: at Standby as or at Running (PWM Supplemental info not applicable to this DTC for initiating separate DTC: Power Module detects A4 shorted to ground at Startup as or Power Module detects A2 shorted to ground only at Startup, as not detected in Standby or Running.	Power cycle
46100	REAR LEFT BRAKE RETURN - SHORT TO BATTERY	Traction Module detects an overcurrent condition on pin A4, indicating a short between B+ and the Electric Brake FET	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
46130	MAIN CONTACTOR/ REAR RIGHT BRAKE RETURN - SHORT TO BATTERY	At Startup, the Master Traction Module detects an overcurrent condition on pin A12, indicating a short between B+ and the Main Contactor. During active traction, the Master Traction Module detects an overcurrent condition on pin A4. Electric Brake FET	Power cycle
46104	REAR LEFT SPEED SENSOR - NOT RESPONDING PROPERLY	Associated Power Module has detected an encoder or directional sensing problem	Power cycle
46105	REAR RIGHT SPEED SENSOR - NOT RESPONDING PROPERLY	Associated Power Module has detected an encoder or directional sensing problem	Power cycle
46108	REAR LEFT SPEED SENSOR - RPM HIGH	Associated Power Module determines an over-speed condition (measured motor speed > DRIVE MAX + 15Hz) has occurred on a motor	Power cycle
46109	REAR RIGHT SPEED SENSOR - RPM HIGH	Associated Power Module determines an over-speed condition (measured motor speed > DRIVE MAX + 15Hz) has occurred on a motor	Power cycle
46136	REAR LEFT BRAKE SUPPLY VOLTAGE – OUT OF RANGE LOW	Associated Power Module determines that a low parking brake supply voltage condition exists.	Power cycle
46137	REAR RIGHT BRAKE SUPPLY VOLTAGE – OUT OF RANGE LOW	Associated Power Module determines that a low parking brake supply voltage condition exists.	Power cycle
662	CANBUS FAILURE - PLATFORM MODULE	UGM does not receive any CAN messages from Platform Module in 250ms	CAN1 messages are received from the PM and controls are initialized
663	CANBUS FAILURE - LOAD SENSING SYSTEM MODULE	MACHINE SETUP -> LOAD SYSTEM ≠ NO; UGM does not receive any CAN messages from the LSS module in 1000ms	Not all of the trigger conditions are met; motion restrictions removed after controls initialized
6613	CANBUS FAILURE - EXCESSIVE CANBUS ERRORS	UGM observes more than 22 error frames per second for 4 seconds or more than 500 Buss Off conditions since last power cycle.	Power cycle
6635	CANBUS FAILURE - CHASSIS TILT SENSOR	UGM does not receive any CAN1 messages from Chassis Tilt Sensor in 250ms	CAN1 messages are received from the sensor and controls are initialized;
6654	CANBUS FAILURE - REAR LEFT MODULE	After Startup complete, Power Module CAN2 messages are not received in 200ms	UGM receives all traction modules CAN2 messages and shall command main contactor closed; once fault reset, motion permitted after controls are initialized. If CAN messages are lost more than 5 times, the fault shall be latched until Power Cycle.G352
6655	CANBUS FAILURE - REAR RIGHT MODUL	After Startup complete, UGM or Power Modules not receive the designated CAN messages in 200ms (250ms for UGM)	UGM receives all traction modules CAN2 messages and shall command main contactor closed; once fault reset, motion permitted after controls are initialized. If CAN messages are lost more than 5 times, the fault shall be latched until Power Cycle.
6657	CANBUS FAILURE - TEMPERATURE SENSOR	UGM determines that: • MACHINE SETUP → TEMP CUTOFF = YES • UGM does not receive any CAN1 messages from the Low Temperature Cutout sensor in 250ms Suppress DTCs 241 and 242 if this DTC is active.	UGM receives CAN1 messages from the Ambient Temperature sensor; speed restrictions removed after controls initialized
7725	PUMP MOTOR - NOT RESPONDING	The Master Traction Module detects that the pump motor feedback is not responding when the pump is being commanded	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
7730	PUMP MOTOR OUTPUT - OUT OF RANGE HIGH	Master Traction Module detects that the pump motor voltage output is higher than expected (Pump Vmn High; 29/MC Drive Open). Too high with respect to PWM applied.	Power cycle
7731	PUMP MOTOR OUTPUT - OUT OF RANGE LOW	Master Traction Module detects that the pump motor voltage output lower than expected. Too low with respect to PWM applied.	Power cycle
7737	PUMP MOTOR OVERLOADED	UGM detects that Pump Current reported by MTM > 210A for 3000ms (both Constant Data Values); MTM detects pump current > 220A	Currents return to levels below trigger level for same time period as trigger and controls initialized. UGM shall remove Drive Creep speed restriction after controls initialized
7753	REAR LEFT MOTOR STALLED	The UGM or Power Module(s) detects that the motor is stalled during active traction. For the UGM commanded speed \geq Creep AND (RIGHT) +30 > Steer Angle < -45 (LEFT), the reported avg motor encoder feedback < 70 counts/s for 5 seconds (1.685 Hz). Avg motor encoder feedback evaluate on a 1s running average. For MTM, the encoder-measured motor speed < 0.6Hz for 5 seconds, when applied frequency > 1.5 Hz and Command > 10 Hz	UGM and Left Power Module shall clear the fault after drive joystick returns to neutral (and command returns to zero).
7754	REAR RIGHT MOTOR STALLED	The UGM or Power Module(s) detects that the motor is stalled during active traction. For the UGM commanded speed \geq Creep AND (RIGHT) +30 > Steer Angle < -45 (LEFT), the reported avg motor encoder feedback < 70 counts/s for 5 seconds (1.685 Hz). Avg motor encoder feedback evaluate on a 1s running average. For MTM, the encoder-measured motor speed < 0.6Hz for 5 seconds, when applied frequency > 1.5 Hz and Command > 10 Hz	UGM and Right Power Module shall clear the fault after drive joystick returns to neutral (and command returns to zero)
7757	REAR LEFT MOTOR OUTPUT - OUT OF RANGE HIGH	Associated Power Module detects at Startup or during active traction that the motor voltage output is higher than expected	Power cycle
7758	REAR RIGHT MOTOR OUTPUT - OUT OF RANGE HIGH	Associated Power Module detects at Startup or during active traction that the motor voltage output is higher than expected	Power cycle
7761	REAR LEFT MOTOR OUTPUT - OUT OF RANGE LOW	Associated Power Module detects at Startup or during active traction that the motor voltage output is lower than expected	Power cycle
7762	REAR RIGHT MOTOR OUTPUT - OUT OF RANGE LOW	Associated Power Module detects at Startup or during active traction that the motor voltage output is lower than expected	Power cycle
7765	REAR LEFT MOTOR - FEEDBACK FAILURE	After main contactor is closed, Power Module detects that the motor voltage feedback circuits are damaged	Power cycle
7766	REAR RIGHT MOTOR - FEEDBACK FAILURE	After main contactor is closed, Power Module detects that the motor voltage feedback circuits are damaged	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
7769	REAR LEFT MOTOR - ROTATION OPPOSITE CONTROL	Associated Power Module detects that the motor is rotating in the direction opposite of the commanded direction and deceleration is less than 15% of deceleration personality setting for a period of more than 0.5 seconds	Power cycle
7770	REAR RIGHT MOTOR - ROTATION OPPOSITE CONTROL	Associated Power Module detects that the motor is rotating in the direction opposite of the commanded direction and deceleration is less than 15% of deceleration personality setting for a period of more than 0.5 seconds	Power cycle
7773	REAR LEFT MOTOR - OPEN CIRCUIT	When motor output is active, the Power Module detects that a motor phase is disconnected/open during active traction	Power cycle
7774	REAR RIGHT MOTOR - OPEN CIRCUIT	When motor output is active, the Power Module detects that a motor phase is disconnected/open during active traction	Power cycle
813	CHASSIS TILT SENSOR NOT CALIBRATED	UGM determines that tilt sensor, <ul style="list-style-type: none"> • has not been calibrated • serial number does not match stored value initialized sensor has been installed (receives 10FF51C0)	Tilt sensor calibrated;
814	CHASSIS TILT SENSOR OUT OF RANGE	Fault CHASSIS TILT SENSOR NOT CALIBRATED (813) is not present and either of the external tilt sensor X or Y axis ? ABS [35°] for 4 seconds. Not to be reported during Tilt Sensor calibration.	Not all of the trigger conditions are met;
818	TILT SENSOR STAGNANT	UGM shall consider the Tilt Sensor stagnant if neither the X-axis or Y-axis unfiltered reading change by $\geq \pm 0.05^\circ$ in 5000ms while the reported Drive speed \geq Drive Creep Hz for all Traction modules	Power cycle;
821	LSS CELL #1 ERROR	MACHINE SETUP -> LOAD SYSTEM \neq NO; The UGM detects that LSS is reporting error with Cell #1	Not all of the trigger conditions are met; motion restrictions removed after controls initialized
822	LSS CELL #2 ERROR	MACHINE SETUP -> LOAD SYSTEM \neq NO; The UGM detects that LSS is reporting error with Cell #2	Not all of the trigger conditions are met; motion restrictions removed after controls initialized
823	LSS CELL #3 ERROR	MACHINE SETUP -> LOAD SYSTEM \neq NO; The UGM detects that LSS is reporting error with Cell #3	Not all of the trigger conditions are met; motion restrictions removed after controls initialized
824	LSS CELL #4 ERROR	MACHINE SETUP -> LOAD SYSTEM \neq NO; The UGM detects that LSS is reporting error with Cell #4	Not all of the trigger conditions are met; motion restrictions removed after controls initialized
825	LSS HAS NOT BEEN CALIBRATED	MACHINE SETUP -> LOAD SYSTEM \neq NO The load sensor has not been calibrated, or DTC 992 (LSS EEPROM ERROR) is active, or DTC 9977 (LSS CORRUPT EEPROM) is active	Not all of the trigger conditions are met
826	RUNNING AT CREEP - PLATFORM OVERLOADED	MACHINE SETUP -> LOAD SYSTEM = WARN ONLY; The platform is Overloaded;	UGM determines that the Platform is not Overloaded; motion restrictions removed after controls initialized
829	FUNCTIONS CUTOUT - PLATFORM OVERLOADED	The Platform is Overloaded and MACHINE SETUP -> LOAD SYSTEM = CUTOUT PLATFORM, Platform Mode is active, and conditions of LSS section apply. -or- The Platform is Overloaded and MACHINE SETUP -> LOAD SYSTEM = CUTOUT ALL and conditions of LSS section apply	UGM determines that the Platform is not Overloaded; motion restrictions removed after controls initialized

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
8211	LSS READING UNDER WEIGHT	MACHINE SETUP -> LOAD SYSTEM ≠ NO; The load sensor has been calibrated and Gross Platform Weight < (0.5 * Empty Platform Weight)	Not all of the trigger conditions are met; full functionality permitted after controls initialized
8664	STEER SENSOR - OUT OF RANGE HIGH	The UGM observes the Master Traction Module reported steer raw voltage signal ≥ 4.5V (Constant Data)	UGM observes steer voltage within calibrated range for 1000ms; Drive Creep restriction lifted after fault clears and controls initialized
8665	STEER SENSOR - OUT OF RANGE LOW	The UGM observes the Master Traction Module reported steer raw voltage signal ≤ 0.3V (Constant Data)	UGM observes steer angle voltage within calibrated range for 1000ms; Drive Creep restriction lifted after fault clears and controls initialized
8666	STEER SENSOR - DECOUPLED	The UGM observes the Master Traction Module reported steer raw voltage 0.3V < signal < 0.5V (Constant Data)	UGM determines steer angle within allowed range; Drive Creep restriction removed after fault clears and controls initialized;
8667	STEER SENSOR - NOT RESPONDING	The UGM determines that the Master Traction Module reported Machine Steer Angle does not change ≥ 1.0° in 4000ms while the steering output is being commanded while steer is calibrated and properly reported by MTM in range that is not within 3deg of calibrated MAX.	UGM determines steer angle changes more than trigger amount while in allowed evaluation range; Drive Creep restriction removed after fault clears and controls initialized
8668	STEER SENSOR - NOT CALIBRATED	UGM determines that the steering sensor has not been calibrated; UGM EEPROM values are default, do not match MTM, or UGM fails to successfully read from memory three times during Startup	UGM determines that sensor is calibrated
873	MACHINE SAFETY SYSTEM OVERRIDE OCCURRED	UGM determines that an MSSO has occurred	TBD
991	LSS WATCHDOG RESET	MACHINE SETUP -> LOAD SYSTEM ≠ NO; UGM detects LSS report of an anomaly exists that has caused a WatchDog Timer reset.	Power cycle
992	LSS EEPROM ERROR	MACHINE SETUP -> LOAD SYSTEM ≠ NO; UGM detects LSS report of an anomaly that exists in the LSS EEPROM	Power cycle
993	LSS INTERNAL ERROR - PIN EXCITATION	MACHINE SETUP -> LOAD SYSTEM ≠ NO; UGM detects LSS report of improper excitation voltage	Power cycle
994	LSS INTERNAL ERROR - DRDY MISSING FROM A/D	MACHINE SETUP -> LOAD SYSTEM ≠ NO; UGM detects LSS report of an anomaly that exists in the LSS A/D converter operations.	Power cycle
998	EEPROM FAILURE - CHECK ALL SETTINGS	The UGM has detected an anomaly in EEPROM that can not be auto-corrected from the backup EEPROM bank.	Power cycle
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	FUNCTIONS LOCKED OUT - LSS MODULE SOFTWARE VERSION IMPROPER	MACHINE SETUP -> LOAD SYSTEM ≠ NO; The UGM determines that the LSS software version is not compatible with existing code per the referenced Software Version Compatibility table.	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
9919	GROUND SENSOR REF VOLTAGE OUT OF RANGE	The UGM has detected reference voltage is out of range: $2.3V < \text{Reference Voltage} < 2.7V$ (debounced for 100ms)	Power cycle
9920	PLATFORM SENSOR REF VOLTAGE OUT OF RANGE	The UGM detects that its reference voltage being reported by PM out of range ($4.8V < \text{voltage} < 5.2V$); debounced for 100ms	Power cycle
9921	GROUND MODULE FAILURE - HIGH SIDE DRIVER CUTOUT FAULTY	The UGM footswitch input J7-15 is LOW	Power cycle
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 cycle
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 cycle
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 JDES manufacturing test process are detected as being out of range	Power cycle
9945	CURRENT FEEDBACK CALIBRATION CHECKSUM INCORRECT	The current feedback gains checksum that is calculated and written to flash memory during the JDES manufacturing test process is detected as being incorrect	Power cycle
9949	MACHINE CONFIGURATION OUT OF RANGE - CHECK ALL SETTINGS	UGM has detected an anomaly in EEPROM with regard to the Machine Setup configuration.	Power cycle
9977	LSS CORRUPT EEPROM	MACHINE SETUP -> LOAD SYSTEM \neq NO and one of the following conditions: UGM determines LSS-stored values for Unloaded weight in Indirect 0x100 \neq 0x108 or UGM determines LSS-stored values for Accessory weight in Indirect memory \neq 0x10A; UGM determines LSS-stored checksum1 in memory \neq checksum 2 in memory	Power cycle
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 cycle
9986	GROUND MODULE VLOW FET FAILURE	VLow FET determined to be failed on Startup; UGM unable to read high-sensing inputs.	Power cycle
99167	PUMP COMMAND ERROR	Master Traction Module determines that an inconsistency has occurred between the Pump Enable bits and the Pump commands; Pump enable bit = set, but Pump Command = 0	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
99234	REAR LEFT MODULE - EEPROM FAILURE	Applicable Power Module determines at Startup that an internal EEPROM error exists or UGM fails to successfully verify or write to/read back Indirect Table three times	Power cycle
99235	REAR LEFT MODULE - PROTECTION FAILURE	Applicable Power Module determines that an internal failure exists in the hardware protection circuit	Power cycle
99236	REAR LEFT MODULE - CHECK POWER CIRCUITS OR MOSFET SHORT CIRCUIT	Applicable Power Module determines at Startup that a short circuit exists on the power MOSFET outputs	Power cycle
99237	REAR LEFT MODULE - WATCHDOG RESET	Applicable Power Module determines that Watchdog failure/reset has occurred to one if two, or both	Power cycle
99238	REAR LEFT MODULE - WATCHDOG2 RESET	Applicable Power Module determines that Watchdog2 failure/reset has occurred	Power cycle
99239	REAR LEFT MODULE - RAM FAILURE	Applicable Power Module determines that a RAM checksum error has occurred	Power cycle
99240	REAR LEFT MODULE - INTERNAL ERROR	Applicable Power Module determines at Startup that the current gain is incorrect and may cause incorrect data acquisition values	Power cycle
99241	REAR LEFT MODULE - INTERNAL ERROR	Applicable Power Module determines that the data acquisition is in error	Power cycle
99242	REAR LEFT MODULE - INTERNAL ERROR	Applicable Power Module determines that the Pump current is being measured is not zero when expected to be zero at Startup or during standby	Power cycle
99243	REAR LEFT MODULE - INTERNAL ERROR	Applicable Power Module determines that the Slip Profile is in error	Power cycle
99244	REAR LEFT MODULE - INTERNAL ERROR	Applicable Power Module determines that the current feedbacks are out of range at Startup or when in standby	Power cycle
99245	REAR LEFT MODULE - INTERNAL ERROR	Applicable Power Module determines at Startup that there is a problem with overvoltage/under-voltage detection	Power cycle
99246	REAR LEFT MODULE - CAPACITOR BANK FAULT	The power capacitor bank of the Power Module is not charging properly (increasing voltage) at Startup	Power cycle
99247	REAR LEFT MODULE - A/D FAILURE	Applicable Power Module determines that an internal Analog Input error exists	Power cycle
99248	REAR RIGHT MODULE - EEPROM FAILURE	Applicable Power Module determines at Startup that an internal EEPROM error exists or UGM fails to successfully verify or write to/read back Indirect Table three times	Power cycle
99249	REAR RIGHT MODULE - PROTECTION FAILURE	Applicable Power Module determines that an internal failure exists in the hardware protection circuit	Power cycle
99250	REAR RIGHT MODULE - CHECK POWER CIRCUITS OR MOSFET SHORT CIRCUIT	Applicable Power Module determines at Startup that a short circuit exists on the power MOSFET outputs	Power cycle
99251	REAR RIGHT MODULE - WATCHDOG RESET	Applicable Power Module determines that Watchdog failure/reset has occurred to one if two, or both	Power cycle

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
99252	REAR RIGHT MODULE - WATCHDOG2 RESET	Applicable Power Module determines that Watchdog2 failure/reset has occurred	Power cycle
99253	REAR RIGHT MODULE - RAM FAILURE	Applicable Power Module determines that a RAM checksum error has occurred	Power cycle
99254	REAR RIGHT MODULE - INTERNAL ERROR	Applicable Power Module determines at Startup that the current gain is incorrect and may cause incorrect data acquisition values	Power cycle
99255	REAR RIGHT MODULE - INTERNAL ERROR	Applicable Power Module determines that the data acquisition is in error	Power cycle
99256	REAR RIGHT MODULE - INTERNAL ERROR	Applicable Power Module determines that the Pump current is being measured is not zero when expected to be zero at Startup or during standby	Power cycle
99257	REAR RIGHT MODULE - INTERNAL ERROR	Applicable Power Module determines that the Slip Profile is in error	Power cycle
99258	REAR RIGHT MODULE - INTERNAL ERROR	Applicable Power Module determines that the current feedbacks are out of range at Startup or when in standby	
99259	REAR RIGHT MODULE - INTERNAL ERROR	Applicable Power Module determines at Startup that there is a problem with overvoltage/under-voltage detection	Power cycle
99260	REAR RIGHT MODULE - CAPACITOR BANK FAULT	The power capacitor bank of the Power Module is not charging properly (increasing voltage) at Startup	Power cycle
99261	REAR RIGHT MODULE - A/D FAILURE	Applicable Power Module determines that an internal Analog Input error exists	Power cycle
99264	REAR LEFT MODULE - CURRENT MEASUREMENT ERROR	Power Module determines at when traction is active that the current feedback sensors are out of the permitted range and may cause incorrect data acquisition values	Power cycle
99265	REAR RIGHT MODULE - CURRENT MEASUREMENT ERROR	Power Module determines at when traction is active that the current feedback sensors are out of the permitted range and may cause incorrect data acquisition values	Power cycle
99270	REAR RIGHT MODULE - DRIVE COMMAND ERROR	Power Modules determine that an inconsistency has occurred between the Drive direction/enable bits and Drive magnitude/direction command	Power cycle
99269	REAR LEFT MODULE - DRIVE COMMAND ERROR	Power Modules determine that an inconsistency has occurred between the Drive direction/enable bits and Drive magnitude/direction command	Power cycle
99273	FUNCTIONS LOCKED OUT – REAR LEFT MODULE SOFTWARE VERSION IMPROPER	The UGM software version type is 'P' The UGM has received valid version information from all Power Modules. The Power Module major version number is not compliant with the version specified on the Software section of this document.	Not all of the trigger conditions are met

Table 6-16. Diagnostic Trouble Codes

DTC	DTC Text	Fault Description	Solution
99274	FUNCTIONS LOCKED OUT – REAR RIGHT MODULE SOFTWARE VERSION IMPROPER	The UGM software version type is 'P' The UGM has received valid version information from all Power Modules. The Power Module major version number is not compliant with the version specified on the Software section of this document.	Not all of the trigger conditions are met
99281	FUNCTIONS LOCKED OUT - IMPROPER MOTOR PARAMETERS	The UGM determines an incorrect protected Indirect Table value at start-up	Power cycle

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SECTION 7. BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

7.1 GENERAL

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

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

7.2 MULTIMETER BASICS

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

Grounding

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

Backprobing

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

Min/Max

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

Polarity

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

Scale

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

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

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

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

Example: 1.2 kW = 1200 W

Example: 50 mA = 0.05 A

Voltage Measurement

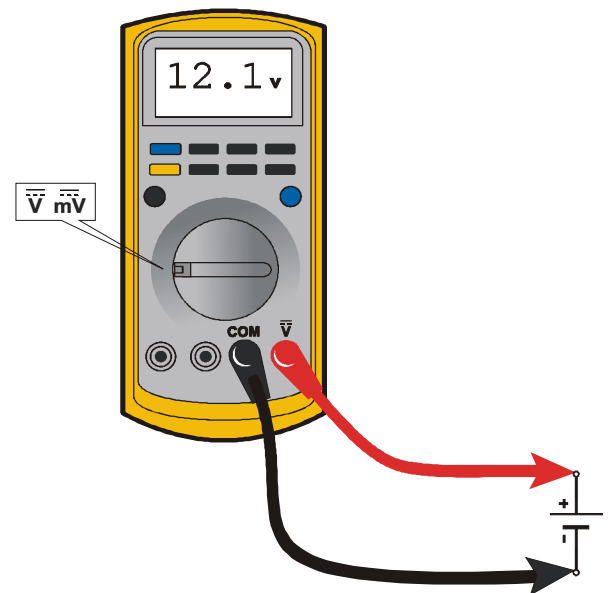


Figure 7-1. Voltage Measurement (DC)

- 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

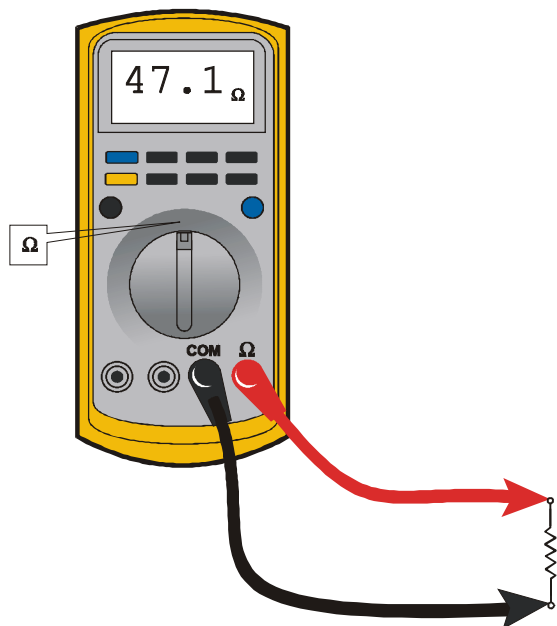


Figure 7-2. Resistance Measurement

- 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

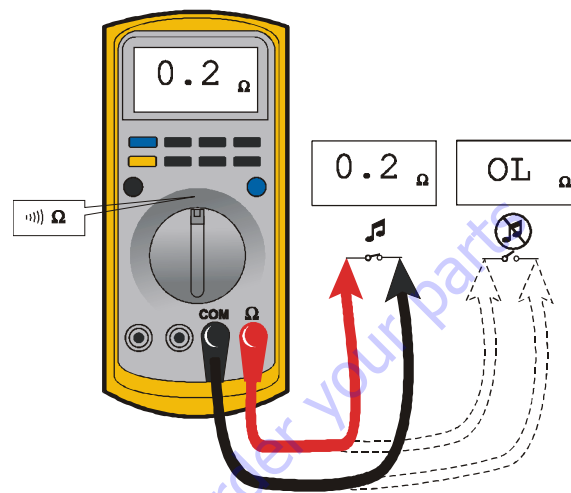


Figure 7-3. Continuity Measurement

- 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

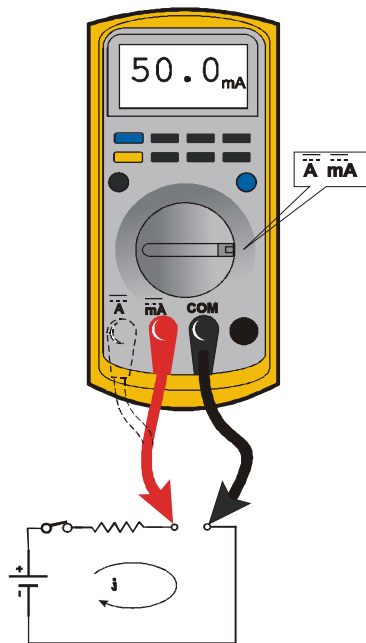


Figure 7-4. Current Measurement (DC)

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

7.3 CHECKING SWITCHES

Basic Check

The following check determines if the switch is functioning properly, not the circuit in which the switch is placed. A switch is functioning properly when there is continuity between the correct terminals or contacts only when selected.

1. De-energize the circuit.
2. Isolate the switch from the rest of the circuit if possible. If not possible, keep in mind it may affect readings.
3. Access the terminals to the switch.
4. If the switch has two terminals:
 - a. Measure resistance across the terminals.
 - b. Change the switch position.
 - c. Measure resistance again with the leads in the same positions. If the meter was reading short, it should read an open. If the meter was reading open it should read short.
5. If the switch has more than two terminals, consult the schematic or switch diagram to determine what terminals will be connected. The test is similar to testing a switch with two terminals.
 - a. Place one meter lead on the common contact and the other on a different contact in the same circuit.
 - b. Cycle through all positions of the switch. The meter should read short only when the switch connects the two terminals and open otherwise.
 - c. If the switch has more than one common contact repeat the process for that circuit.

Limit Switches

Limit switches are used to control movement or indicate position. Mechanical limit switches are just like manually operated switches except that the moving object operates the switch. These switches can be tested the same way as a standard switch by manually operating the sensing arm.

Another type of limit switch used by JLG is the inductive proximity switch, also referred to as a "prox switch". Inductive proximity switches are actuated only by ferrous metal (metal that contains Iron, such as steel) near the switch. They do not require contact, and must be energized to actuate. These types of switches can be used to detect boom or platform position, for example. These switches have a sensing face where the switch can detect ferrous metal close to it. To find the sensing face, take note how the switch is mounted and how the mechanisms meet the switch. Test this type of switch as follows:

1. Remove prox switch from its mount.
2. Reconnect harness if it was disconnected for step a, and turn on machine.
3. Hold switch away from metal and observe switch state in the control system diagnostics using the Analyzer. See vehicle or control system documentation on how to do this.
4. Place sensing face of switch on the object to be sensed by the switch. If that is not available, use a piece of ferrous metal physically similar to it. The switch state in the control system diagnostics should change.
5. When reinstalling or replacing switch be sure to follow mounting instructions and properly set the gap between the switch and object sensed.

Automatic Switches

If the switch is actuated automatically, by temperature or pressure for example, find a way to manually actuate the switch to test it. Do this either by applying heat or pressure, for example, to the switch. These switches may need to be energized to actuate.

1. Connect instrumentation to monitor and/or control the parameter the switch is measuring.
2. Observe switch state in control system with the Analyzer. See vehicle or control system documentation on how to do this.
3. Operate system such that the switch actuates. This could be going over a certain pressure or temperature, for example. The state indicated in the control system should change.

Switch Wiring - Low Side, High Side

When controlling a load, a switch can be wired between the positive side of the power source and the load. This switch is called a "high side" switch. The switch supplies the power to the load. When a switch is wired between the negative side of the power source and the load, it is a "low side" switch. The switch provides the ground to the load.

A low side switch will allow voltage to be present on the load. No power is applied because the switch is stopping current flow. This voltage can be seen if the measurement is taken with one test lead on the load and the other on the battery negative side or grounded to the vehicle. What is actually being measured is the voltage drop across the switch. This could mislead a technician into thinking the load is receiving power but not operating. To produce an accurate picture of power or voltage applied to the load, measure voltage across the load's power terminals. Also, the technician can measure the voltage at both power terminals with respect to battery ground. The difference between those two measurements is the voltage applied to the load.

7.4 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.

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

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

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

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

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

7.5 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.

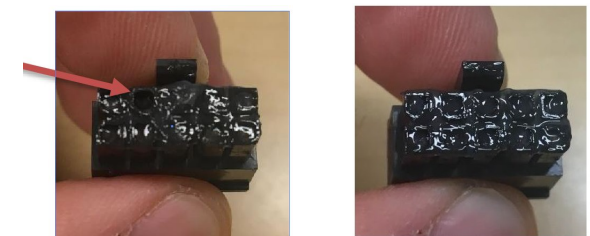


Improper

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.



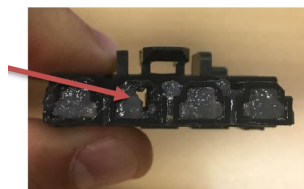
Improper



Proper

Mini Fit Sr

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



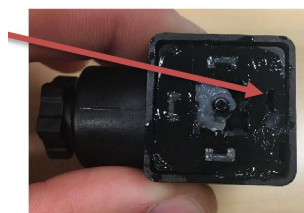
Improper



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.

7.6 AMP CONNECTOR

Applying Silicone Dielectric Compound to AMP Connectors

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

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

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

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

Assembly

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

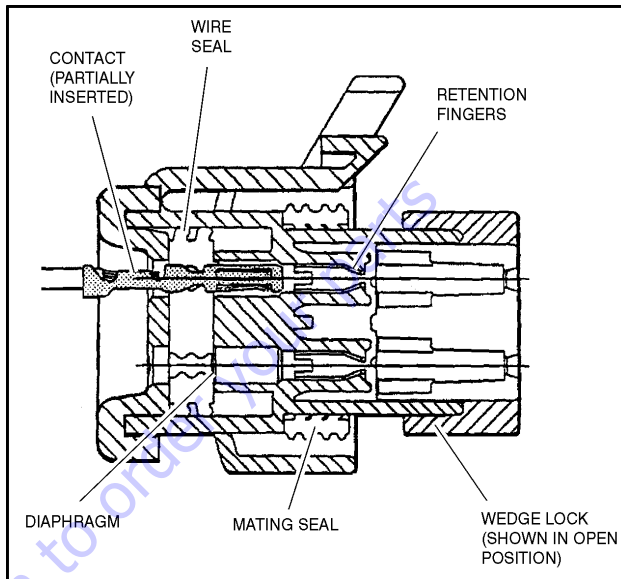


Figure 7-5. Connector Assembly Figure 1

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 lb to be sure the retention fingers are holding the contact (See Figure 7-7.).

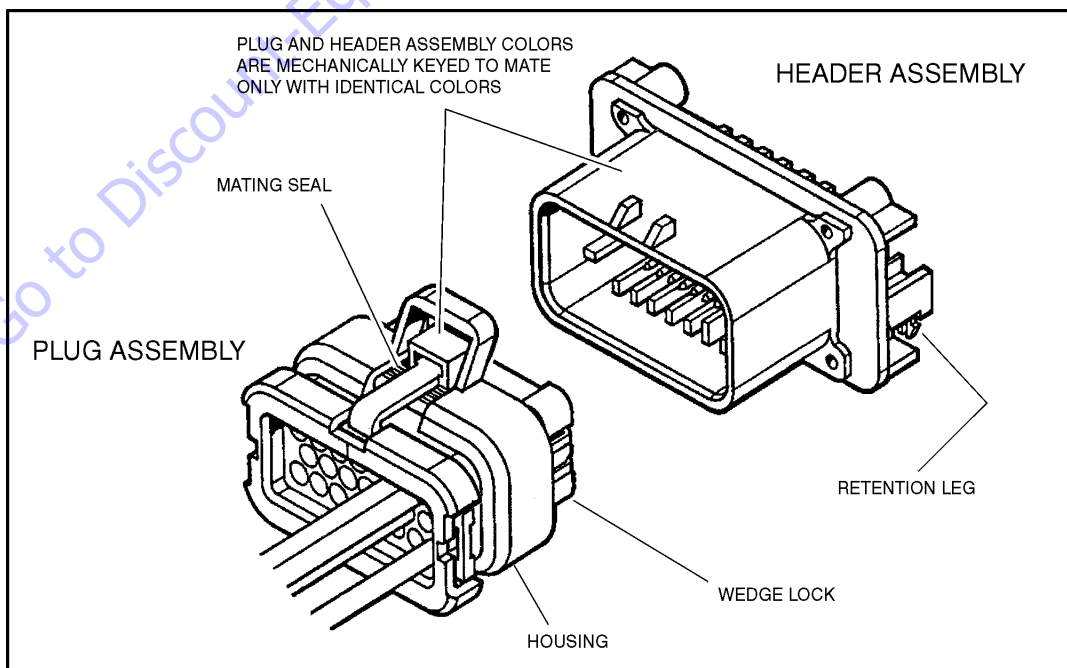


Figure 7-6. AMP Connector

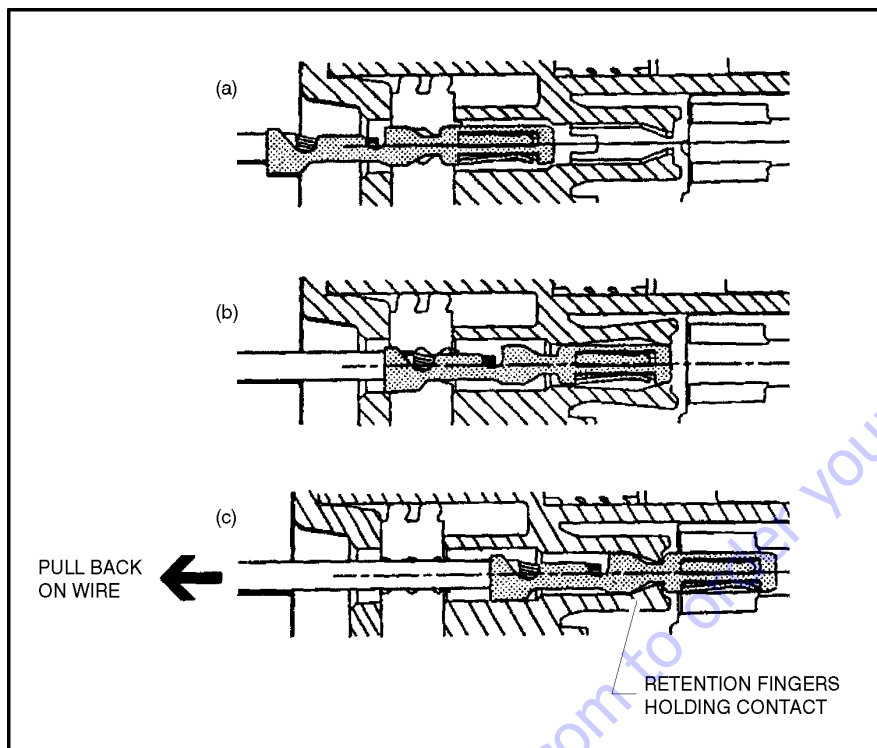


Figure 7-7. Connector Assembly Figure 2

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.).

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

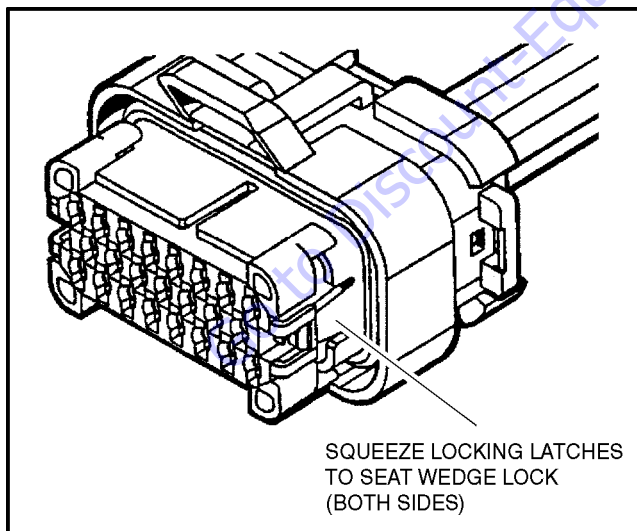


Figure 7-8. Connector Assembly Figure 3

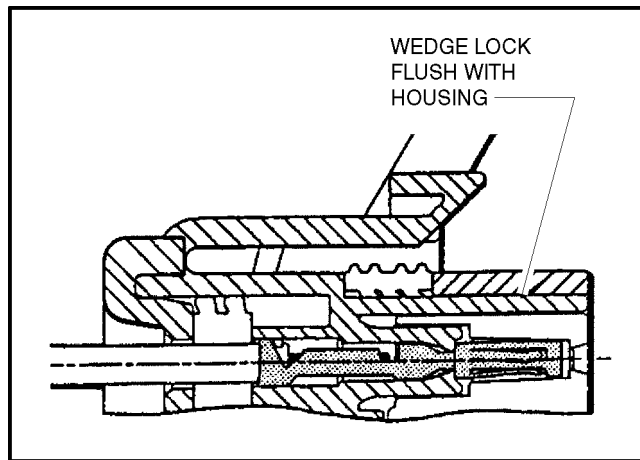


Figure 7-9. Connector Assembly Figure 4

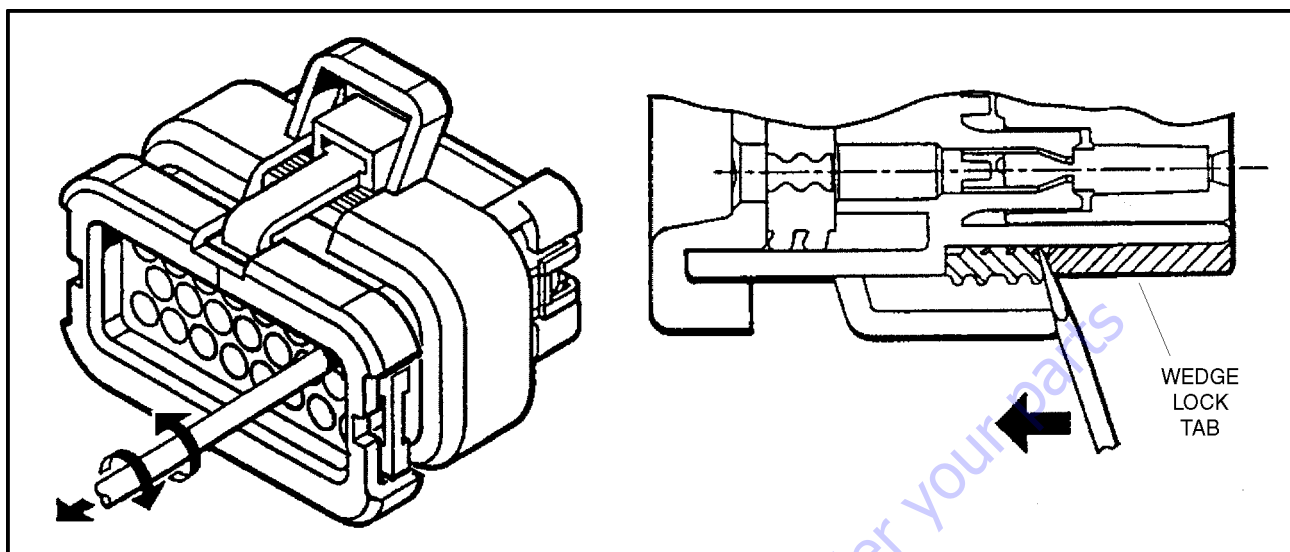


Figure 7-10. Connector Disassembly

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 AMPSEAL plug assembly, or any other sealed connector system. The resulting pinholes in the insulation will allow moisture to invade the system by traveling along the wire strands. This nullifies the effectiveness of the connector seals and could result in system failure.

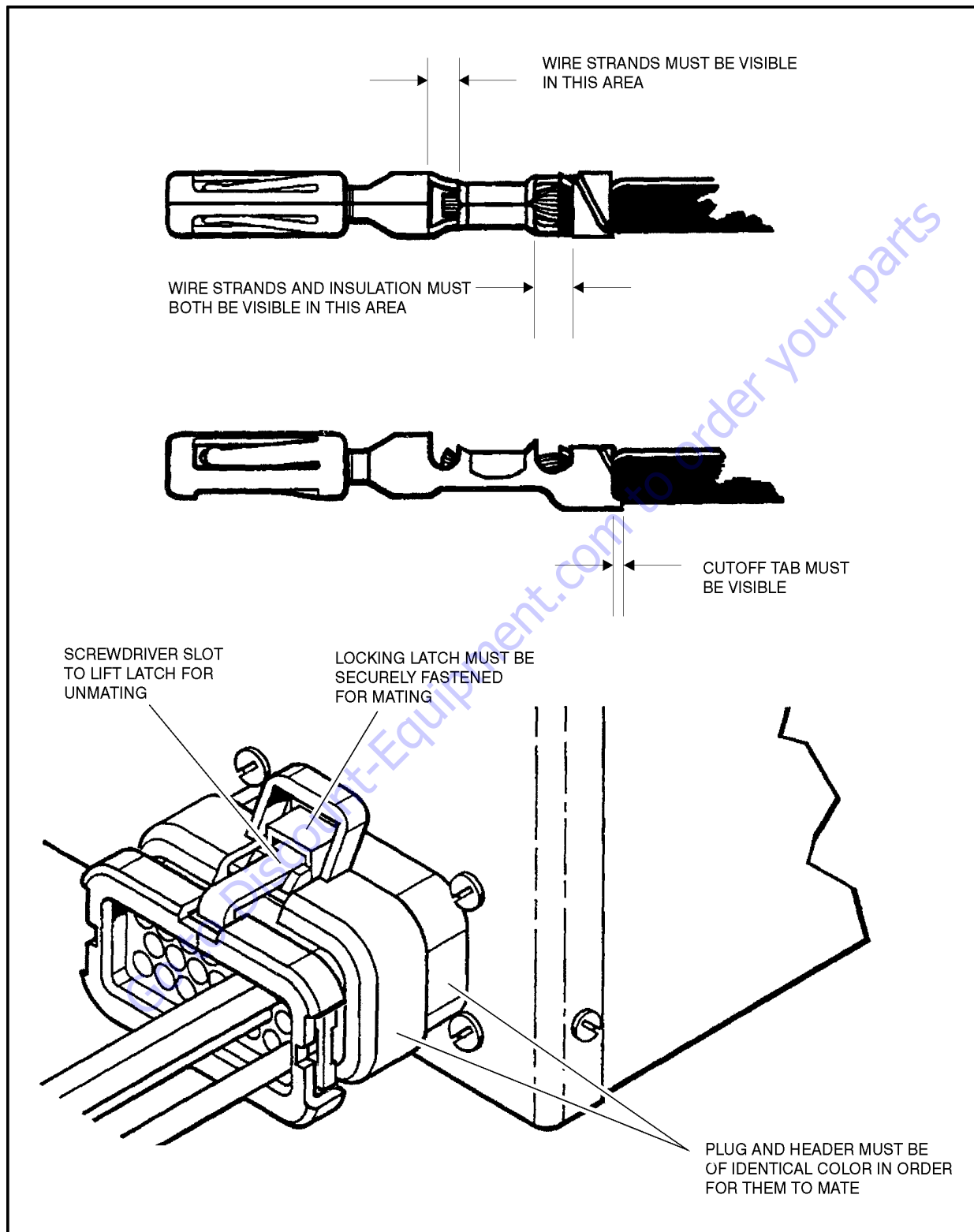


Figure 7-11. Connector Installation

7.7 DEUTSCH CONNECTORS

DT/DTP Series Assembly

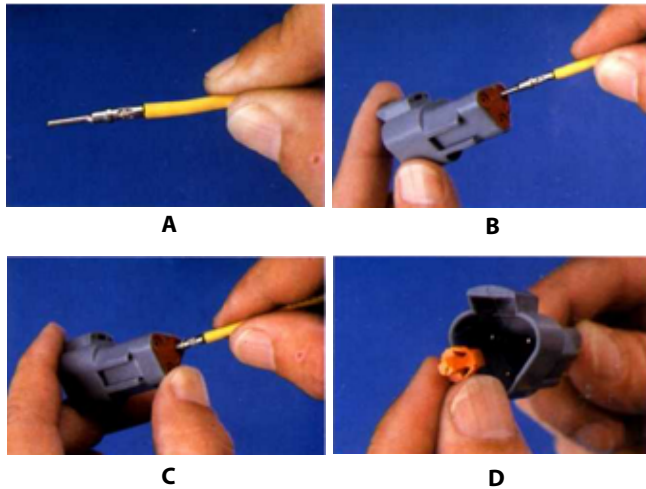


Figure 7-12. DT/DTP Contact Installation

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. They may go in either way.

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

DT/DTP Series Disassembly

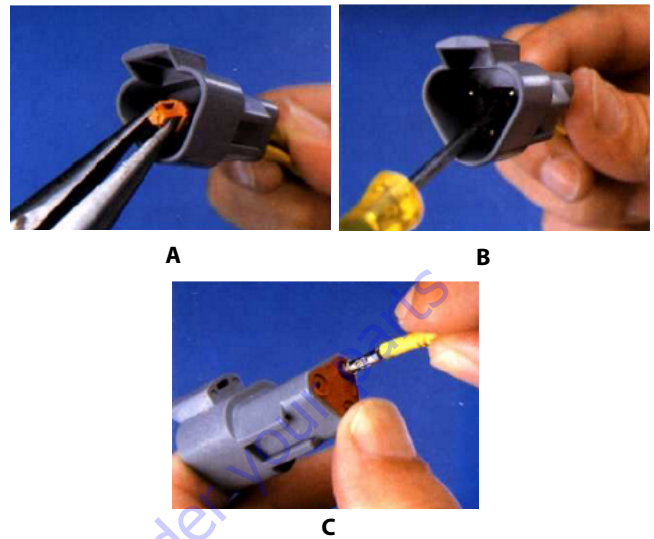


Figure 7-13. DT/DTP Contact Removal

5. Remove wedgelock using needle nose 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

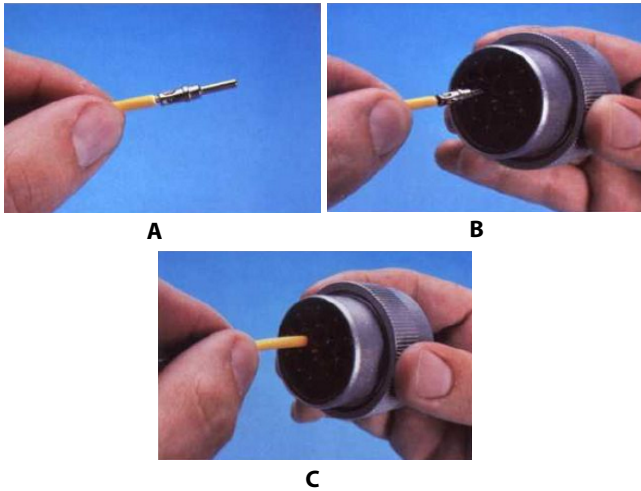


Figure 7-14. HD/HDP Contact Installation

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.

CONTACT

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

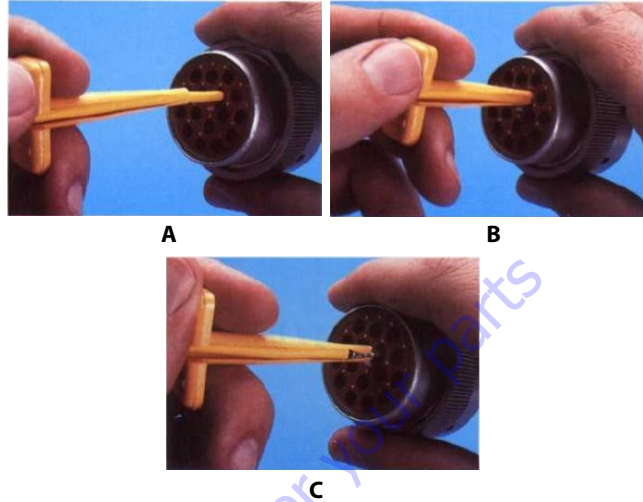


Figure 7-16. HD/HDP Contact Removal

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.

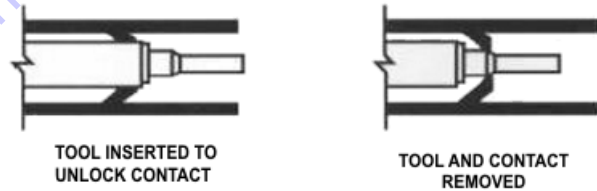


Figure 7-17. HD/HDP Unlocking Contacts

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

7.8 WIRING HARNESS CONNECTOR LABELS

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.

Example:

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 machine.

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

Components	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	

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

Table 7-1. Wiring Harness Connector Labels

Components	Category	Label
Other Switches	Disconnect	SW
	EMS	
	Foot	
	HVAC	WH
	Key	SW
	Park brake	
	Pump pot	
	Push	
	Shifter	
	Turn signal	
Relay	5 Pin	
	4 Pin	
	Contactors	
	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

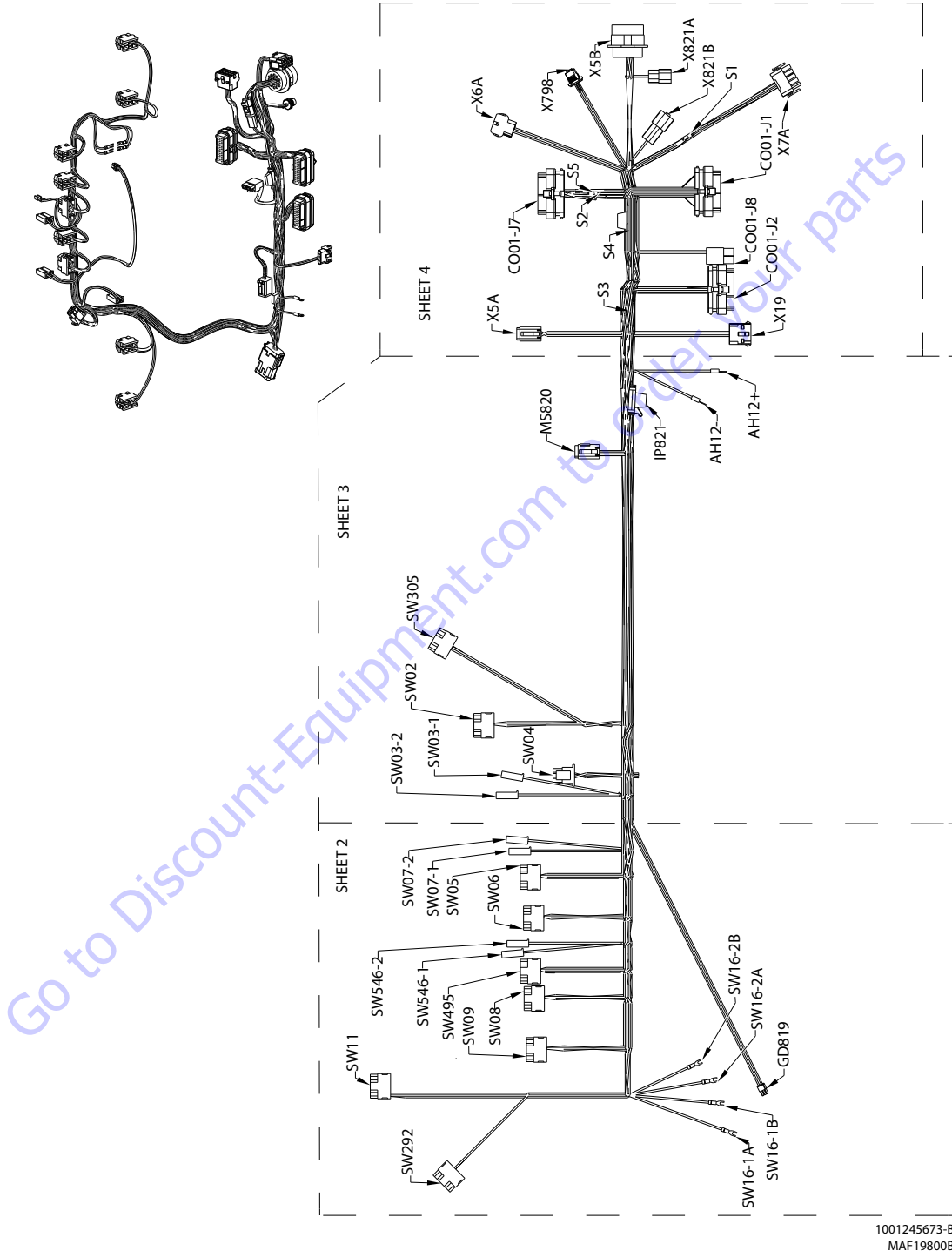
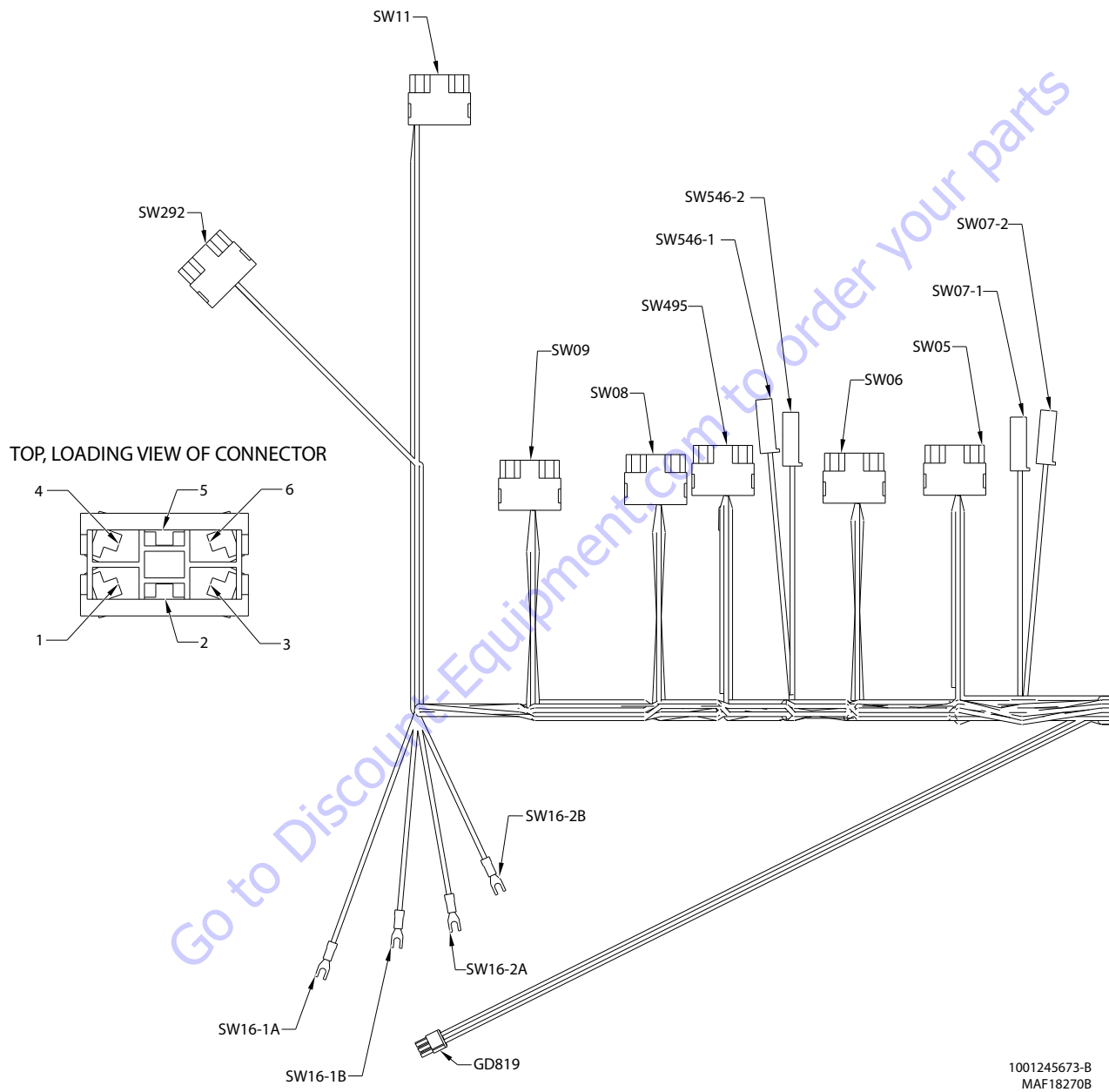


Figure 7-18. Platform Control Box Harness - Sheet 1 of 5



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Figure 7-19. Platform Control Box Harness - Sheet 2 of 5

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

SW11 - DRIVE ORIENT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	122-1 D05	18 AWG	GXL	CO01-J2 (4)
2	WHT	5-14-10 SW PWR	18 AWG	GXL	SW546-2 (1)
2	WHT	5-14-9 SW PWR	18 AWG	GXL	SW03-1 (1)
3					
4					
5					
6					

SW292 - GEN ENABLE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	WHT	2-12-2 GEN ENABLE IGN	18 AWG	GXL	X5B (7)
3	WHT	8-3 GEN ENABLE	18 AWG	GXL	X5B (5)
4					
5					
6					

SW09 - MAIN TELESCOPE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	14-0 MAIN TELE OUT	18 AWG	GXL	CO01-J1 (6)
2	WHT	5-14-2 SW PWR	18 AWG	GXL	SW06 (2)
2	WHT	5-14-3 SW PWR	18 AWG	GXL	SW05 (2)
3	WHT	13-0 MAIN TELE IN	18 AWG	GXL	CO01-J1 (5)
4					
5					
6					

SW08 - JIB					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	28-0 JIB DN	18 AWG	GXL	CO01-J1 (12)
2	WHT	5-14-5 SW PWR	18 AWG	GXL	SW02 (2)
2	WHT	5-14-6 SW PWR	18 AWG	GXL	SW495 (2)
3	WHT	27-0 JIB UP	18 AWG	GXL	CO01-J1 (11)
4					
5					
6					

SW16-1A - EMS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1A	WHT	5-11-2	18 AWG	GXL	X5B (9)

SW16-1B - EMS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1B	WHT	5-2-6	18 AWG	GXL	X5B (13)

SW16-2A - EMS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2A	WHT	5-11-3	18 AWG	GXL	CO01-J7 (2)

SW16-2B - EMS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2B	WHT	5-2-5	18 AWG	GXL	X5B (15)

SW495 - SIDE SWING					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	31-0 SIDE SWING LEFT	18 AWG	GXL	CO01-J1 (26)
2	WHT	5-14-6 SW PWR	18 AWG	GXL	SW08 (2)
2	WHT	5-14-7	18 AWG	GXL	SW04 (1)
3	WHT	32-0 SIDE SWING RIGHT	18 AWG	GXL	CO01-J1 (25)
4					
5					
6					

SW06 - TOWER LIFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	29-30 TWR LFT DN	18 AWG	GXL	CO01-J1 (2)
2	WHT	5-14-1 SW PWR	18 AWG	GXL	SW305 (2)
2	WHT	5-14-2 SW PWR	18 AWG	GXL	SW09 (2)
3	WHT	29-0 TWR LFT UP	18 AWG	GXL	CO01-J1 (1)
4					
5					
6					

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

SW546-1 - SKYGUARD/SOFTTOUCH OVERRIDE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	124-3 OVER RIDE	18 AWG	GXL	C001-J1 (29)

SW07-1 - HEAD/TAIL LIGHTS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	88-1 HEAD/TAIL LT	18 AWG	GXL	C001-J1 (30)

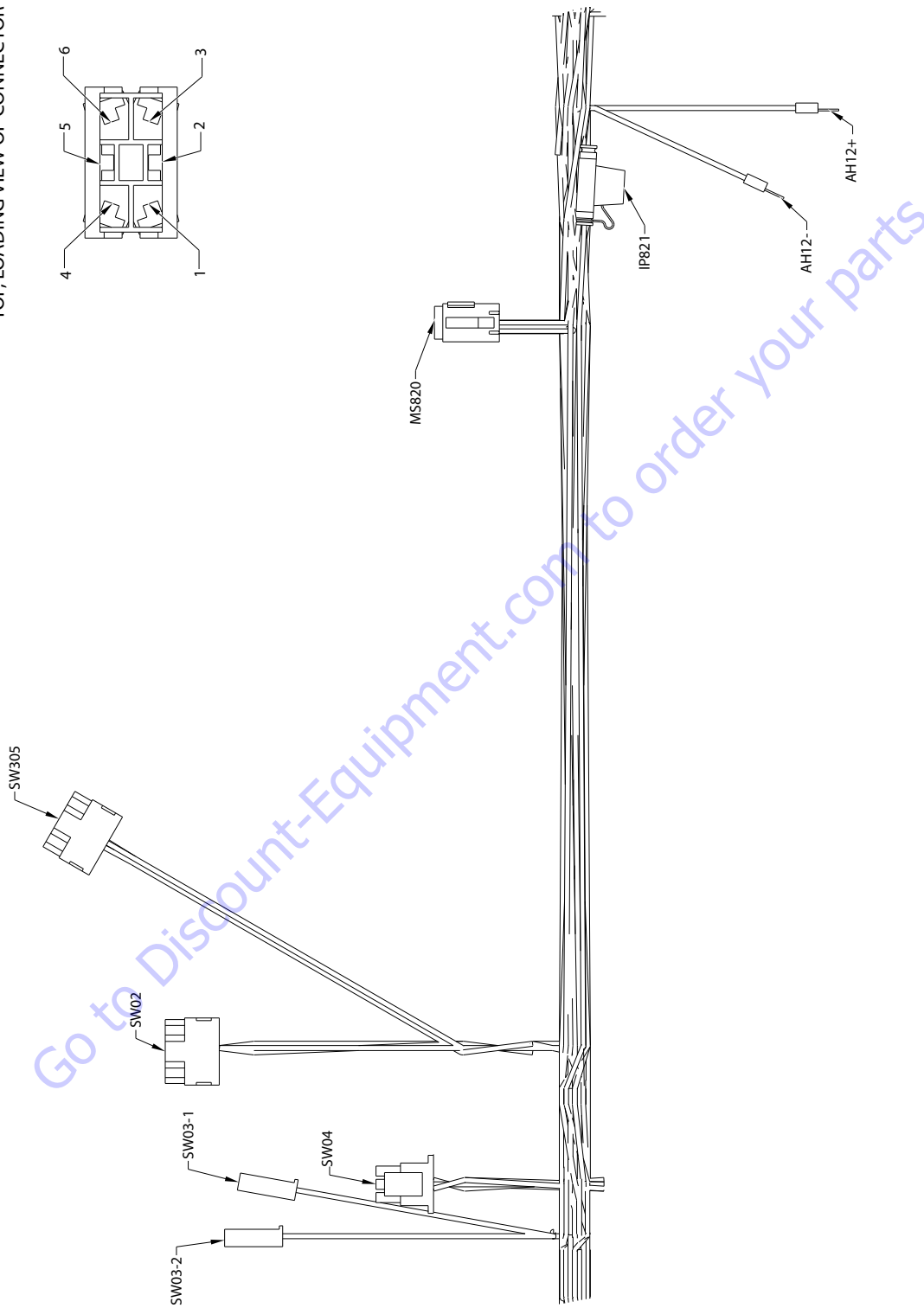
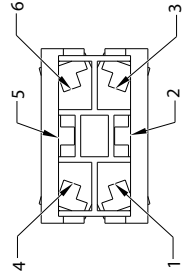
SW546-2 - SKYGUARD/SOFTTOUCH OVERRIDE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-14-10 SW PWR	18 AWG	GXL	SW11 (2)
1	WHT	5-14-11 SW PWR	18 AWG	GXL	SW07 - 2 (1)

SW07-2 - HEAD/TAIL LIGHTS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-14-11 SW PWR	18 AWG	GXL	SW546-2 (1)

SW05 - PLATFORM ROTATE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	23-0 PLAT ROT LFT	18 AWG	GXL	C001-J1 (8)
2	WHT	5-14-3 SW PWR	18 AWG	GXL	SW09 (2)
2	WHT	5-14-4 SW PWR	18 AWG	GXL	SW02 (2)
3	WHT	24-0 PLAT ROT RT	18 AWG	GXL	C001-J1 (7)
4					
5					
6					

GD819					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN1 HIGH	20 AWG	TXL	MS820 (2)
2					
3	WHT	1-90 DISPLAY PWR	20 AWG	TXL	IP821 (1)
4	GRN	CAN1 LOW	20 AWG	TXL	MS820 (8)
5					
6	WHT	1-26 DISPLAY GND	20 AWG	TXL	C001-J2 (18)

TOP, LOADING VIEW OF CONNECTOR



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Figure 7-20. Platform Control Box Harness - Sheet 3 of 5

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

SW03-2 - HORN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	49-0-1 HORN	18 AWG	GXL	C001-J1 (31)

SW03-1 - HORN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-14-8 SW PWR	18 AWG	GXL	SW04 (1)
1	WHT	5-14-9 SW PWR	18 AWG	GXL	SW11 (2)

SW02 - PLATFORM LEVEL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	26-0 PLAT LVL DN	18 AWG	GXL	C001-J1 (10)
2	WHT	5-14-4 SW PWR	18 AWG	GXL	SW05 (2)
2	WHT	5-14-5 SW PWR	18 AWG	GXL	SW08 (2)
3	WHT	25-0 PLAT LVL UP	18 AWG	GXL	C001-J1 (9)
4					
5					
6					

SW305 - TORQUE/SPEED MODE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	120-2 AWDA MAN	18 AWG	GXL	C001-J1 (28)
2	WHT	5-14-1 SW PWR	18 AWG	GXL	SW06 (2)
3	WHT	120-1 TORQUE/SPEED MODE	18 AWG	GXL	C001-J1 (27)
4					
5					
6					

SW04 - PUMP POT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-14-7	18 AWG	GXL	SW495 (2)
1	WHT	5-14-8 SW PWR	18 AWG	GXL	SW03-1 (1)
2	WHT	5-14 SW PWR	18 AWG	GXL	C001-J1 (18)
3	WHT	125-1 CREEP MODE	18 AWG	GXL	C001-J1 (32)
4	WHT	126-1 PUMP POT PWR	18 AWG	GXL	C001-J1 (34)
5	WHT	1-23 PUMP POT RETURN	18 AWG	GXL	C001-J1 (13)
6	WHT	126-2 PUMP POT CMD	18 AWG	GXL	C001-J1 (35)

MS820 - CAN BUSS BAR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	YEL	CAN1 HIGH	20 AWG	TXL	GD819 (1)
3	YEL	CAN1 HIGH	18 AWG	GXL	C001-J7 (31)
4	GRN	CAN1 LOW	18 AWG	GXL	C001-J7 (30)
5	GRY	CAN1 LOW	20 AWG	CABLE	X798 (5)
6	GRN	CAN1 LOW	18 AWG	GXL	X821B (2)
7	GRN	CAN1 LOW	18 AWG	GXL	X6A (9)
8	GRN	CAN1 LOW	20 AWG	TXL	GD819 (4)
9					
10	BLK	CAN1 HIGH	20 AWG	CABLE	X798 (4)
11	YEL	CAN1 HIGH	18 AWG	GXL	X821B (1)
12	YEL	CAN1 HIGH	18 AWG	GXL	X6A (8)

AH12 - - ALARM-					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	1-27 ALARM GND	18 AWG	GXL	C001-J7 (20)

AH12+ - ALARM+					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	132 PLAT ALARM	18 AWG	GXL	C001-J7 (19)

IP821					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	1-90 DISPLAY PWR	20 AWG	TXL	GD819 (3)
2	WHT	1-90 DISPLAY PWR	18 AWG	GXL	C001-J2 (30)

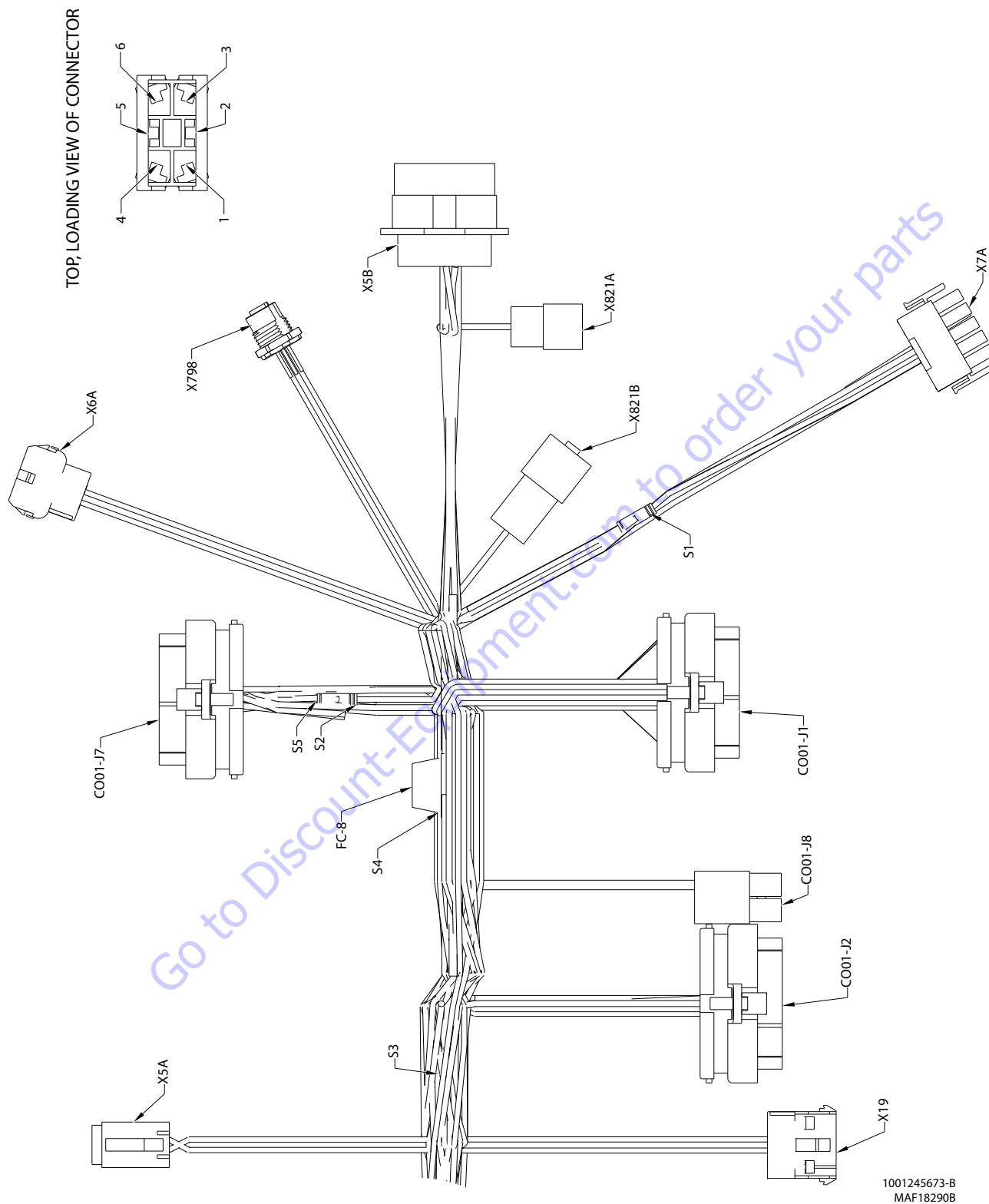


Figure 7-21. Platform Control Box Harness - Sheet 4 of 5

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

C001-J7 - BLACK					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	81-0 GND MODE RX	18 AWG	GXL	X5B (11)
2	WHT	5-11-3	18 AWG	GXL	SW16-2A (2A)
3	WHT	82-0 PLAT TX	18 AWG	GXL	X5B (4)
4	WHT	3-16 FOOTSWITCH	18 AWG	GXL	X7A (5)
5					
6					
7	WHT	3-18 SKYG PWR	18 AWG	GXL	S5 (1)
8	WHT	131-1 FOOTSWITCH	18 AWG	GXL	X7A (4)
9					
10					
11					
12					
13					
14					
15					
16	WHT	1-28 LSS GND	18 AWG	GXL	S2 (1)
17					
18	WHT	124-1 SKYG INPUT#1	20 AWG	SXL	X5A (4)
19	WHT	132 PLAT ALARM	18 AWG	GXL	AH12+ (1)
20	WHT	1-27 ALARM GND	18 AWG	GXL	AH12- (1)
21	WHT	25-0-3 PLAT LVL UP	18 AWG	GXL	X6A (13)
22	WHT	26-0-3 PLAT LVL DN	18 AWG	GXL	X6A (14)
23	WHT	1-30 VLV GND	18 AWG	GXL	X6A (5)
24	WHT	1-36 SKYG GND	18 AWG	GXL	X5A (2)
25	WHT	27-0-3 JIB UP	18 AWG	GXL	X6A (3)
26	WHT	28-0-3 JIB DN	18 AWG	GXL	X6A (4)
27	WHT	31-0-3 JIB RHT	18 AWG	GXL	X6A (11)
28	WHT	30-0-3 JIB LFT	18 AWG	GXL	X6A (12)
29	WHT	1-29 OPTION GND	18 AWG	GXL	X6A (6)
30	GRN	CAN1 LOW	18 AWG	GXL	MS820 (4)
31	YEL	CAN1 HIGH	18 AWG	GXL	MS820 (3)
32					
33	WHT	23-0-3 PLAT ROT LFT	18 AWG	GXL	X6A (1)
34	WHT	24-0-3 PLAT ROT RHT	18 AWG	GXL	X6A (2)
35					

X5A - INTERFACE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	3-18-1 SKYG PWR	20 AWG	GXL	S3 (2)
2	WHT	1-36 SKYG GND	18 AWG	GXL	C001-J7 (24)
3	WHT	3-18-2 SOFTT SENSE	20 AWG	GXL	S3 (2)
4	WHT	124-1 SKYG INPUT#1	20 AWG	GXL	C001-J7 (18)
5	WHT	124-2 SKYG INPUT#2	20 AWG	GXL	C001-J1 (23)
6	WHT	124-5-1 SOFTT OUT	20 AWG	GXL	S4 (2)

X6A - OPTIONS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	23-0-3 PLAT ROT LFT	18 AWG	GXL	C001-J7 (33)
2	WHT	24-0-3 PLAT ROT RHT	18 AWG	GXL	C001-J7 (34)
3	WHT	23-0-3 JIB UP	18 AWG	GXL	C001-J7 (25)
4	WHT	23-0-3 JIB DN	18 AWG	GXL	C001-J7 (26)
5	WHT	1-30 VLV GND	18 AWG	GXL	C001-J7 (23)
6	WHT	1-29 OPTION GND	18 AWG	GXL	C001-J7 (29)
7					
8	YEL	CAN1 HIGH	18 AWG	GXL	MS820 (12)
9	GRN	CAN1 LOW	18 AWG	GXL	MS820 (7)
10					
11	WHT	31-0-3 JIB RHT	18 AWG	GXL	C001-J7 (27)
12	WHT	30-0-3 JIB LFT	18 AWG	GXL	C001-J7 (28)
13	WHT	25-0-3 PLAT LVL UP	18 AWG	GXL	C001-J7 (21)
14	WHT	26-0-3 PLAT LVL DN	18 AWG	GXL	C001-J7 (22)
15					

X798 - 1 CELL LSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	WHT	3-20-2 LSS PWR	20 AWG	CABLE	S1 (1)
3	BLU	1-28-2 LSS GND	20 AWG	CABLE	S2 (2)
4	BLK	CAN1 HIGH	20 AWG	CABLE	MS820 (10)
5	GRY	CAN1 LOW	20 AWG	CABLE	MS820 (5)

C001-J8					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	1-5 PLAT GND	12 AWG	GXL	X5B (16)
2	WHT	3-8 PLAT IGN	12 AWG	GXL	X5B (12)

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X7A - FOOT SW/LSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3	WHT	1-551 JUMPER	18 AWG	GXL	X7A (13)
4	WHT	131-1 FOOT SWITCH	18 AWG	GXL	C001-J7 (8)
5	WHT	3-16 FOOT SWITCH	18 AWG	GXL	C001-J7 (4)
6	WHT	131-3 FOOT PEDAL	18 AWG	GXL	X5B (6)
7					
8					
9	WHT	3-25 SOFTT PWR	18 AWG	GXL	C001-J2 (31)
10					
11					
12	WHT	124-5-2 SOFTT OUT	20 AWG	GXL	S4 (1)
13	WHT	1-551 JUMPER	18 AWG	GXL	X7A (3)
14	WHT	1-28-1 LSS GND	18 AWG	GXL	S2 (2)
15	WHT	3-20-1 LSS PWR	18 AWG	GXL	S1 (2)

X821B					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN1 HIGH	18 AWG	GXL	MS820 (11)
2	GRN	CAN1 LOW	18 AWG	GXL	MS820 (6)
3					

X821A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN1 HIGH	18 AWG	GXL	X5B (3)
2	GRN	CAN1 LOW	18 AWG	GXL	X5B (2)
3					

S1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	3-20 LSS PWR	18 AWG	GXL	C001-J2 (32)
1	WHT	3-20-2 LSS PWR	20 AWG	CABLE	X798 (2)
2	WHT	3-20-1 LSS PWR	18 AWG	GXL	X7A (15)

X5B - TO BOOM CABLE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	GRN	CAN1 LOW	18 AWG	GXL	X821A (2)
3	YEL	CAN1 HIGH	18 AWG	GXL	X821A (1)
4	WHT	82-0 PLAT TX	18 AWG	GXL	C001-J7 (3)
5	WHT	8-3 GEN ENABLE	18 AWG	GXL	SW292 (3)
6	WHT	131-3 FOOT PEDAL	18 AWG	GXL	X7A (6)
7	WHT	2-12-2 GEN ENABLE IGN	18 AWG	GXL	SW292 (2)
8					
9	WHT	5-11-2	18 AWG	GXL	SW16-1A (1A)
10					
11	WHT	81-0 GND MODE RX	18 AWG	GXL	C001-J7 (1)
12	WHT	3-8 PLAT IGN	12 AWG	GXL	C001-J8 (2)
13	WHT	5-2-6	18 AWG	GXL	SW16-1B (1B)
14					
15	WHT	5-2-5	18 AWG	GXL	SW16-2B (2B)
16	WHT	1-5 PLAT GND	12 AWG	GXL	C001-J8 (1)
17					
18					
19					

S2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	1-28 LSS GND	18 AWG	GXL	C001-J7 (16)
2	WHT	1-28-1 LSS GND	18 AWG	GXL	X7A (14)
2	BLU	1-28-2 LSS GND	20 AWG	CABLE	X798 (3)

S3					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK		14 AWG	GXL	FC-8 (2)
2	WHT	3-18-1 SKYG PWR	20 AWG	GXL	X5A (1)
2	WHT	3-18-2 SOFTT SENSE	20 AWG	GXL	X5A (3)

S4					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	124-5 SOFTT	20 AWG	GXL	C001-J1 (20)
1	WHT	124-5-2 SOFTT OUT	20 AWG	GXL	X7A (12)
2	WHT	124-5-1 SOFTT OUT	20 AWG	GXL	X5A (6)

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

C001-J2 - GRAY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4	WHT	122-1 DOS	18 AWG	GXL	SW11 (1)
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18	WHT	1-26 DISPLAY GND	20 AWG	TXL	GD819 (6)
19					
20					
21					
22					
23					
24					
25					
26	RED	51-0 ANALYZER PWR	18 AWG	GXL	X19 (1)
27	BLK	54-0 ANALYZER GND	18 AWG	GXL	X19 (4)
28	GRN	52-0 ANALYZER RX	18 AWG	GXL	X19 (2)
29	WHT	53-0 ANALYZER TX	18 AWG	GXL	X19 (3)
30	WHT	1-90 DISPLAY PWR	18 AWG	GXL	IP821 (2)
31	WHT	3-25 SOFTT PWR	18 AWG	GXL	X7A (9)
32	WHT	3-20 LSS PWR	18 AWG	GXL	S1 (1)
33					
34					
35					

C001-J1 - NATURAL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	29-0 TWR LFT UP	18 AWG	GXL	SW06 (3)
2	WHT	29-30 TWR LFT DN	18 AWG	GXL	SW06 (1)
3					
4					
5	WHT	13-0 MAIN TELE IN	18 AWG	GXL	SW09 (3)
6	WHT	14-0 MAIN TELE OUT	18 AWG	GXL	SW09 (1)
7	WHT	24-0 PLAT ROT RT	18 AWG	GXL	SW05 (3)
8	WHT	23-0 PLAT ROT LFT	18 AWG	GXL	SW05 (1)
9	WHT	25-0 PLAT LVL UP	18 AWG	GXL	SW02 (3)
10	WHT	26-0 PLAT LVL DN	18 AWG	GXL	SW02 (1)
11	WHT	27-0 JIB UP	18 AWG	GXL	SW08 (3)
12	WHT	28-0 JIB DN	18 AWG	GXL	SW08 (1)
13	WHT	1-23 PUMP POT RETURN	18 AWG	GXL	SW04 (5)
14					
15					
16					
17					
18	WHT	5-14 SW PWR	18 AWG	GXL	SW04 (2)
19					
20	WHT	124-5 SOFTT	20 AWG	GXL	S4 (1)
21					
22					
23	WHT	124-2 SKYG INPUT#2	20 AWG	GXL	X5A (5)
24					
25	WHT	32-0 SIDE SWING RIGHT	18 AWG	GXL	SW495 (3)
26	WHT	31-0 SIDE SWING LEFT	18 AWG	GXL	SW495 (1)
27	WHT	120-1 TORQUE/SPEED MODE	18 AWG	GXL	SW305 (3)
28	WHT	120-2 AWDA MAN	18 AWG	GXL	SW305 (1)
29	WHT	124-3 OVERRIDE	18 AWG	GXL	SW546-1 (1)
30	WHT	88-1 HEAD/TAIL LT	18 AWG	GXL	SW07-1 (1)
31	WHT	49-0-1 HORN	18 AWG	GXL	SW03-2 (1)
32	WHT	125-1 CREEP MODE	18 AWG	GXL	SW04 (3)
33					
34	WHT	126-1 PUMP POT PWR	18 AWG	GXL	SW04 (4)
35	WHT	126-2 PUMP POT CMD	18 AWG	GXL	SW04 (6)

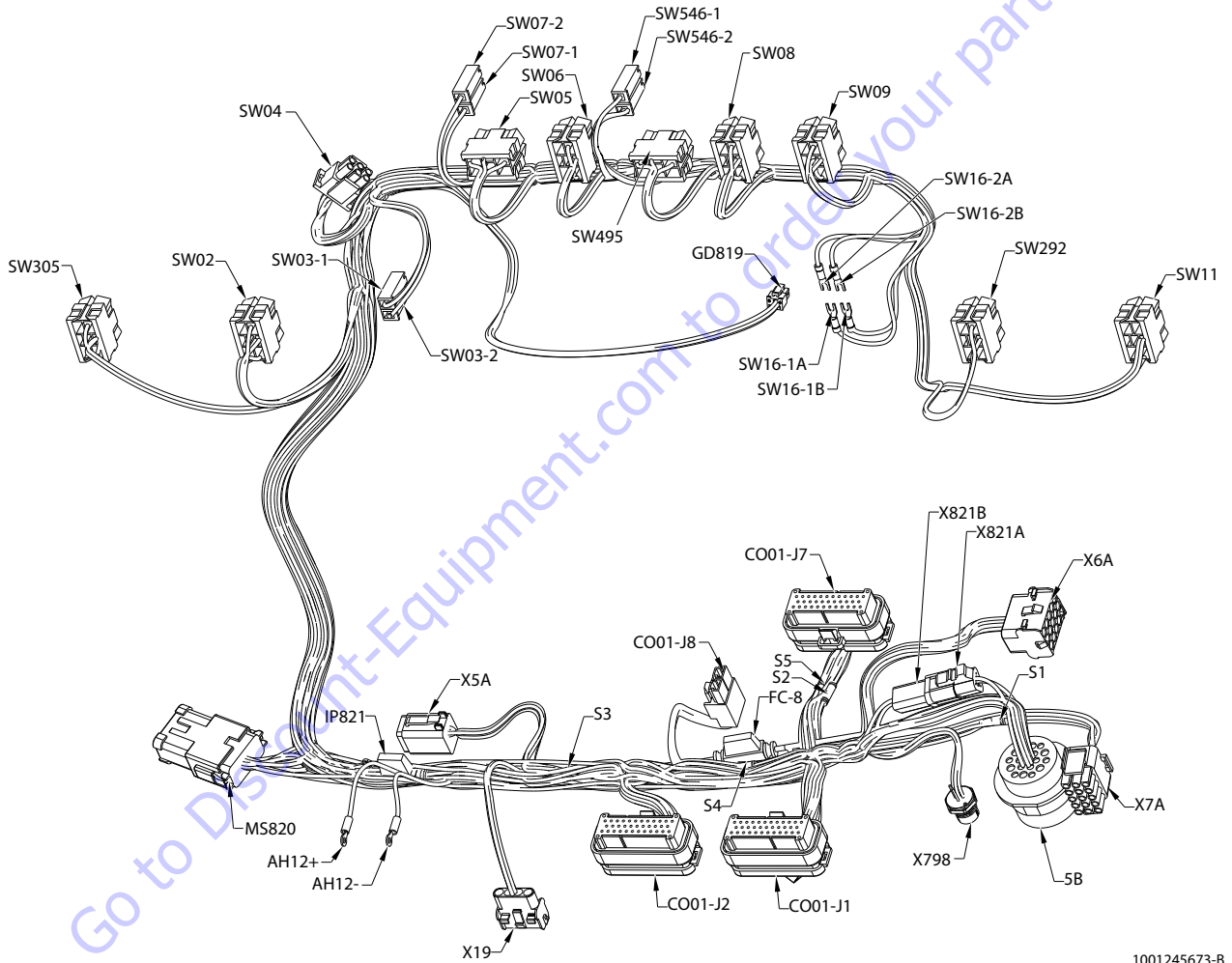
SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

S5					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	3-18 SKYG PWR	18 AWG	GXL	C001-J7 (7)
2	BLK		14 AWG	GXL	FC-8 (1)

FC-8- 5A SKYG FUSE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK		14 AWG	GXL	S5 (2)
2	BLK		14 AWG	GXL	S3 (1)

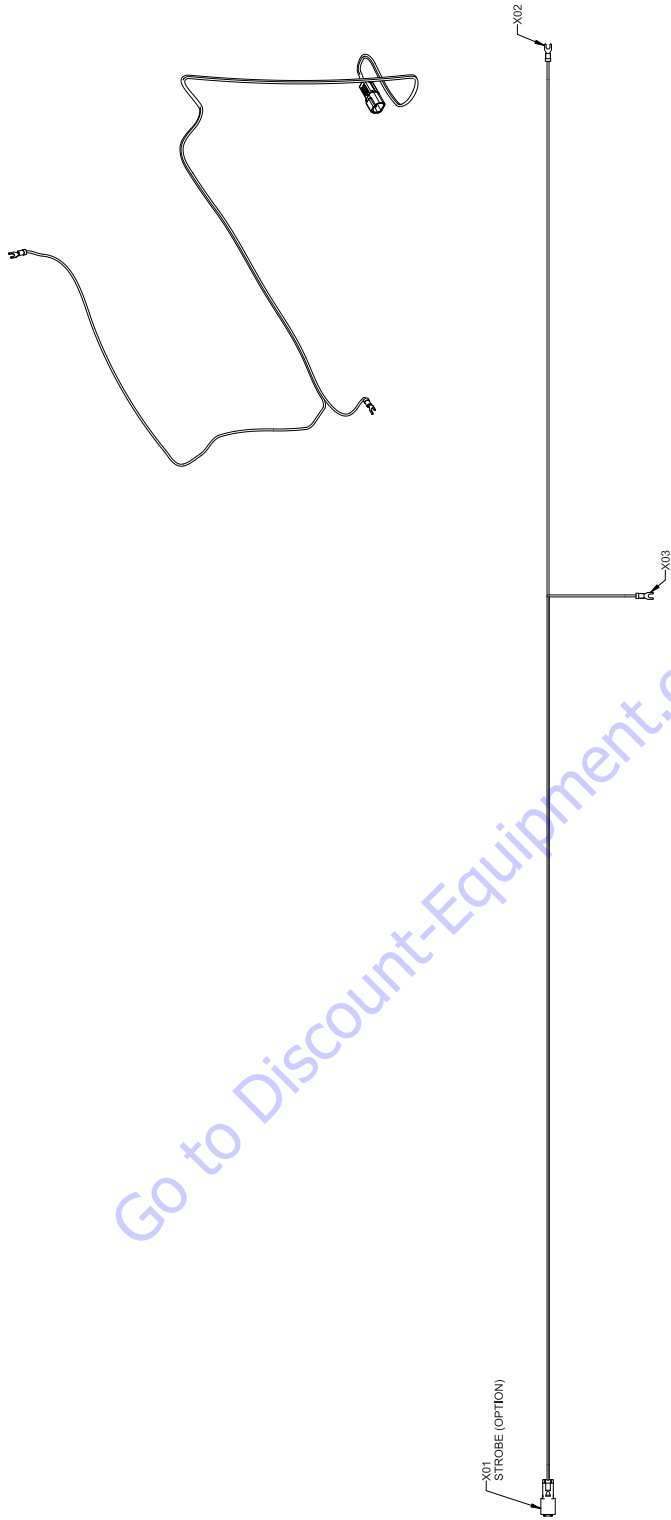
X19 - ANALYZER					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	51-0 ANALYZER PWR	18 AWG	GXL	C001-J2 (26)
2	GRN	52-0 ANALYZER RX	18 AWG	GXL	C001-J2 (28)
3	WHT	53-0 ANALYZER TX	18 AWG	GXL	C001-J2 (29)
4	BLK	54-0 ANALYZER GND	18 AWG	GXL	C001-J2 (27)

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Figure 7-22. Platform Control Box Harness - Sheet 5 of 5



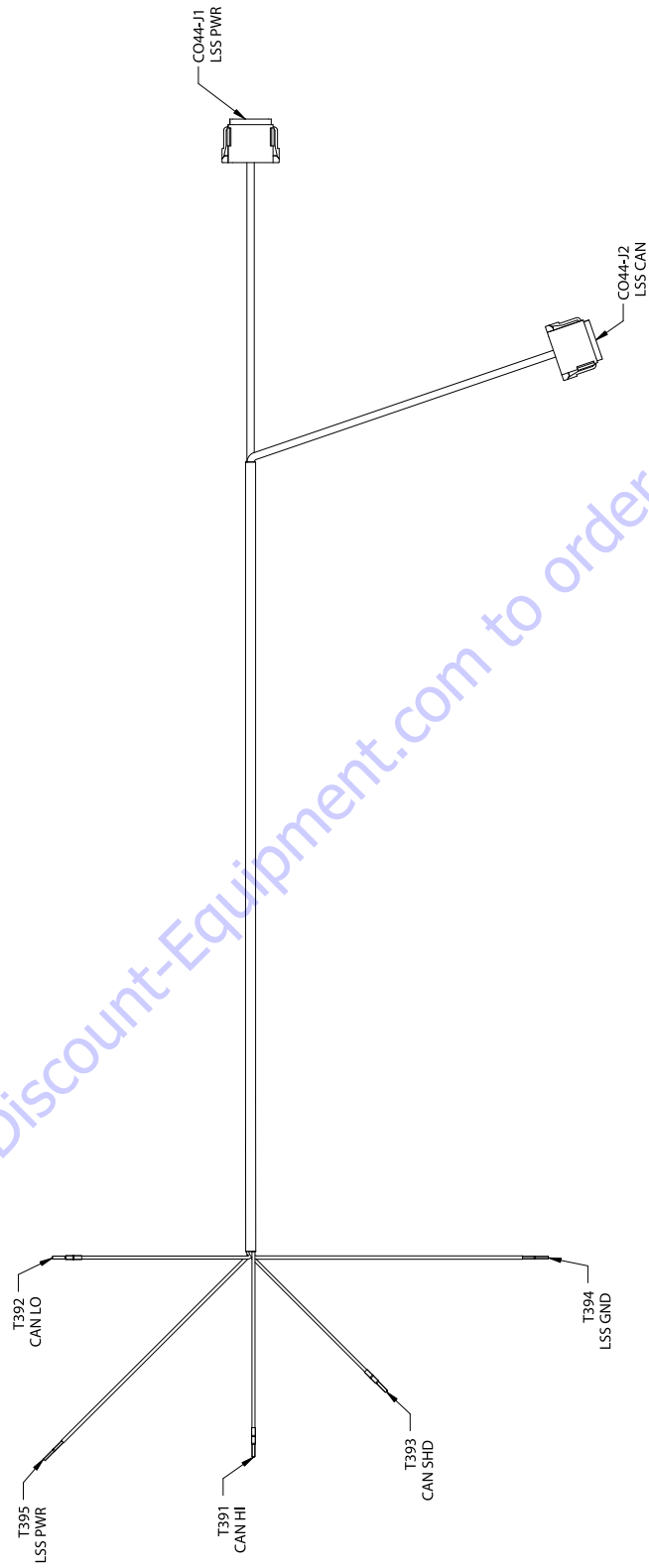
X01 STROBE (OPTION)						
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	TO
1	BLU/ORN	P1 PWR	18 AWG	TFFN	4460464	X02 (1)
2	BLK	P2 GND	18 AWG	TFFN	4460464	X03 (1)

X02						
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	TO
1	BLU/ORN	P1 PWR	18 AWG	TFFN	N/A	X01 (1)

X03						
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	TO
1	BLK	P2 GND	18 AWG	TFFN	N/A	X01 (2)

Figure 7-23. Platform Beacon Harness

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Figure 7-24. Load Sensing System Harness (LSS) - Sheet 1 of 2

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

T394 - LSS GND							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	1-28 LSS GND	18 AWG	GXL	N/A		CO44-J1 (2)

T395 - LSS PWR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	3-20 LSS PWR	18 AWG	GXL	N/A		CO44-J1 (1)

T393 - CAN SHD							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	SHLD	TP CAN CABLE	20 AWG	J1939 CABLE	N/A		CO44-J2 (NC)

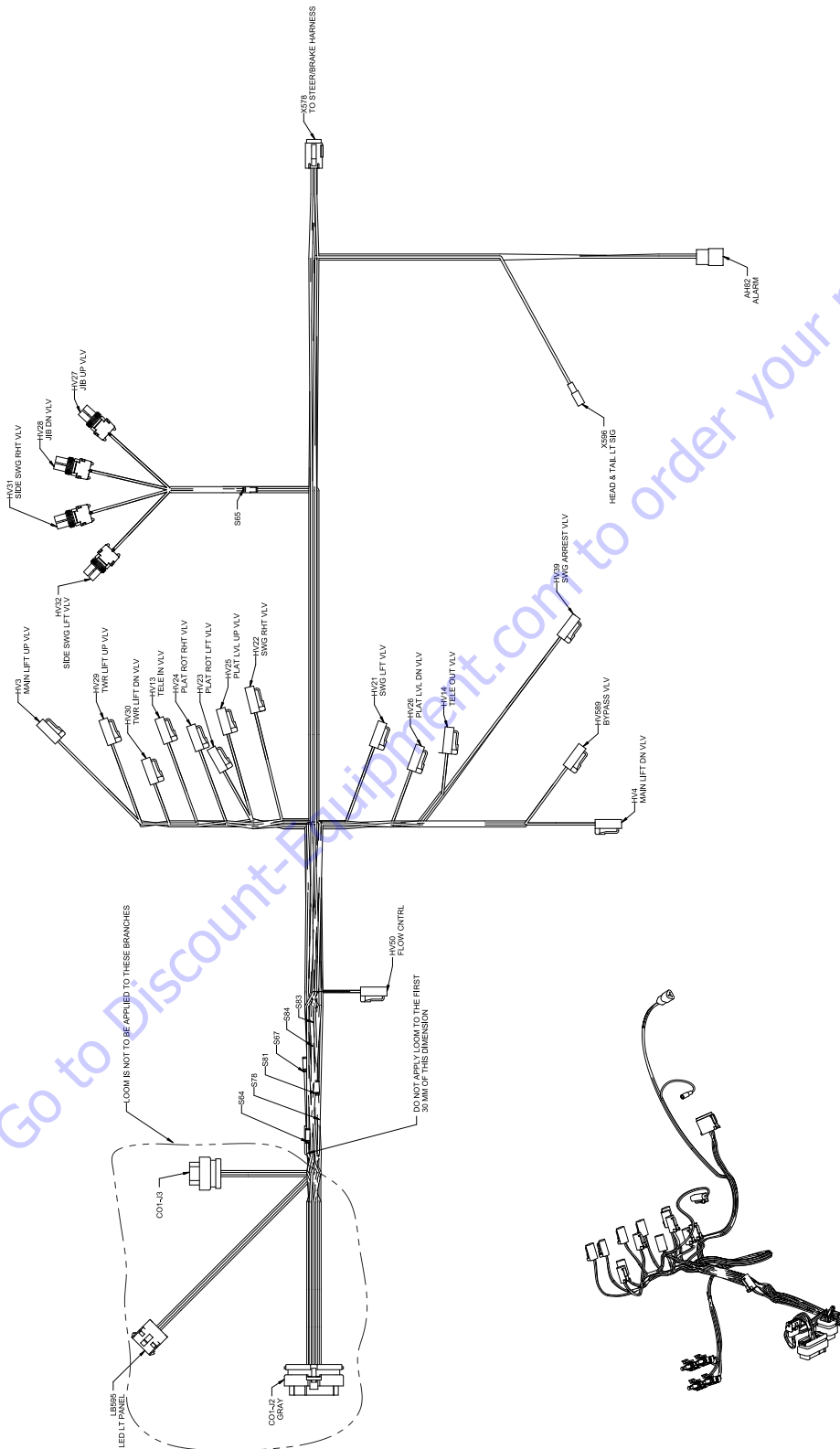
T392 - CAN LO							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	GRN	TP CAN CABLE	20 AWG	J1939 CABLE	N/A		CO44-J2 (9)

T391 - CAN HI							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	TP CAN CABLE	20 AWG	J1939 CABLE	N/A		CO44-J2 (4)

CO44-J2 - LSS CAN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1					4460466		
2					4460466		
3					4460466		
4	YEL	TP CAN CABLE	20 AWG	J1939 CABLE	4460944		T391 (1)
5					4460466		
6					4460466		
7					4460466		
8					4460466		
9	GRN	TP CAN CABLE	20 AWG	J1939 CABLE	4460944		T392 (1)
10					4460466		
11					4460466		
12					4460466		
NC	SHLD	TP CAN CABLE	20 AWG	J1939 CABLE	N/A		T393 (1)

CO44-J1 - LSS PWR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	3-20 LSS PWR	18 AWG	GXL	4460465		T395 (1)
2	WHT	1-28 LSS GND	18 AWG	GXL	4460465		T394 (1)
3					4460466		
4					4460466		
5					4460466		
6					4460466		
7					4460466		
8					4460466		
9					4460466		
10					4460466		
11					4460466		
12					4460466		

Figure 7-25. Load Sensing System Harness (LSS) - Sheet 2 of 2



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Figure 7-26. Main Valve Harness - Sheet 1 of 3

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

HV50 - FLOW CNTRL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	50-01 FLOW CNTRL	18 AWG	GXL	4460465		CO1-J2 (31)
2	WHT	38-0 CURNT FBCK	18 AWG	GXL	4460465		CO1-J3 (6)

HV13 - TELE IN VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	13-0 TELE IN	18 AWG	GXL	4460465		CO1-J2 (3)
2	BLK	413-2 RTN	18 AWG	GXL	4460465		S83 (1)

HV3 - MAIN LIFT UP VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	11-2 MAIN LIFT UP	18 AWG	GXL	4460465		CO1-J2 (11)
2	WHT	38-3 CURNT FBCK	18 AWG	GXL	4460465		S81 (1)

HV24 - PLAT ROT RHT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	24-4 PLAT ROT RHT	18 AWG	GXL	4460465		CO1-J2 (21)
2	BLK	427-1-4 RTN	18 AWG	GXL	4460465		S67 (1)

HV29 - TWR LIFT UP VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	29-0 TWR UP	18 AWG	GXL	4460465		CO1-J2 (20)
2	WHT	38-1-1 CURNT FBCK	18 AWG	GXL	4460465		S78 (1)

HV23 - PLAT ROT LFT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	23-0-4 PLAT ROT LFT	18 AWG	GXL	4460465		CO1-J2 (10)
2	BLK	427-1-3 RTN	18 AWG	GXL	4460465		S67 (1)

HV30 - TWR LIFT DN VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	30-0-3 TWR DN	18 AWG	GXL	4460465		CO1-J2 (9)
2	WHT	38-1-2 CURNT FBCK	18 AWG	GXL	4460465		S78 (1)

HV25 - PLAT LVL UP VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	25-0-4 PLAT LVL UP	18 AWG	GXL	4460465		CO1-J2 (5)
2	BLK	427-1-1 RTN	18 AWG	GXL	4460465		S67 (1)

CO1-J3							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	38-2 CURNT FBCK	18 AWG	GXL	4460871		X578 (8)
2	WHT	38-3 CURNT FBCK	18 AWG	GXL	4460871		S81 (2)
3					4460905		
4	WHT	38-5 CURNT FBCK	18 AWG	GXL	4460871		S84 (2)
5	WHT	38-1 CURNT FBCK	18 AWG	GXL	4460871		S78 (2)
6	WHT	38-0 CURNT FBCK	18 AWG	GXL	4460871		HV59 (2)
7	WHT	38-4 ALARM POWER	18 AWG	GXL	4460871		AH82 (A)
8					4460905		
9					4460905		
10					4460905		
11					4460905		
12					4460905		
13					4460905		
14					4460905		

S83							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	413-1 RTN	18 AWG	GXL	N/A		HV14 (2)
1	BLK	413-2 RTN	18 AWG	GXL	N/A		HV13 (2)
2	BLK	413 RTN	18 AWG	GXL	N/A		CO1-J2 (17)

S84							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	38-5-1 CURNT FBCK	18 AWG	GXL	N/A		HV21 (2)
1	WHT	38-5-2 CURNT FBCK	18 AWG	GXL	N/A		HV22 (2)
2	WHT	38-5 CURNT FBCK	18 AWG	GXL	N/A		CO1-J3 (4)

LB595 - LED LT PANEL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	448	18 AWG	GXL	4460226		X578 (4)
2	WHT	208 YEL LED	18 AWG	GXL	4460226		X578 (2)
3	WHT	207 GRN LED	18 AWG	GXL	4460226		X578 (3)
4	WHT	205 RED LED	18 AWG	GXL	4460226		X578 (1)

S67							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	427-1-4 RTN	18 AWG	GXL	N/A		HV25 (2)
1	BLK	427-1-2 RTN	18 AWG	GXL	N/A		HV26 (2)
1	BLK	427-1-3 RTN	18 AWG	GXL	N/A		HV23 (2)
1	BLK	427-1-4 RTN	18 AWG	GXL	N/A		HV24 (2)
2	BLK	427-1 RTN	18 AWG	GXL	N/A		S64 (1)

CO1-J2 - GRAY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	37-0 BYPASS VLV	18 AWG	GXL	4460871		HV589 (1)
2					4460905		
3	WHT	13-0 TELE IN	18 AWG	GXL	4460871		HV13 (1)
4	WHT	32-4 SIDE SWG RHT	18 AWG	GXL	4460871		HV31 (1)
5	WHT	25-4-4 PLAT LVL UP	18 AWG	GXL	4460871		HV25 (1)
6	BLK	44-2	18 AWG	GXL	4460871		HV589 (2)
7	WHT	26-4 PLAT LVL DN	18 AWG	GXL	4460871		HV26 (1)
8	WHT	41-2 STR FLOW CNTRL	18 AWG	GXL	4460871		X578 (9)
9	WHT	30-0-3 TWR DN	18 AWG	GXL	4460871		HV30 (1)
10	WHT	23-0-4 PLAT ROT LFT	18 AWG	GXL	4460871		HV23 (1)
11	WHT	11-0-2 MAIN LIFT UP	18 AWG	GXL	4460871		HV3 (1)
12	WHT	27-0-4 JIB UP	18 AWG	GXL	4460871		HV27 (1)
13					4460905		
14	BLK	4-27 RTN	18 AWG	GXL	4460871		S64 (2)
15	WHT	14-0-3 TELE OUT	18 AWG	GXL	4460871		HV14 (1)
16	WHT	31-0-4 SIDE SWG LFT	18 AWG	GXL	4460871		HV32 (1)
17	BLK	4-13 RTN	18 AWG	GXL	4460871		S83 (2)
18	BLK	4-17 RTN	18 AWG	GXL	4460871		HV39 (2)
19	WHT	36-1 SWG AREST	18 AWG	GXL	4460871		HV39 (1)
20	WHT	28-0-3 TWR UP	18 AWG	GXL	4460871		HV29 (1)
21	WHT	24-0-4 PLAT ROT RHT	18 AWG	GXL	4460871		HV24 (1)
22	WHT	12-0-2 MAIN LIFT DN	18 AWG	GXL	4460871		HV4 (1)
23	WHT	28-4-4 JIB DN	18 AWG	GXL	4460871		HV28 (1)
24					4460905		
25					4460905		
26	WHT	42-1 HST LT	18 AWG	GXL	4460871		X596 (1)
27	WHT	48-2 ALARM SIGNAL	18 AWG	GXL	4460871		AH82 (B)
28	BLK	4-40 RTN	18 AWG	GXL	4460871		X578 (6)
29	BLK	4-42 RTN	18 AWG	GXL	4460871		AH82 (C)
30					4460905		
31	WHT	50-0-1 FLOW CNTRL	18 AWG	GXL	4460871		HV50 (1)
32	WHT	9-2 STEER RT	18 AWG	GXL	4460871		X578 (7)
33	WHT	16-1 STEER LT	18 AWG	GXL	4460871		X578 (5)
34	WHT	21-0-1 SWG LFT	18 AWG	GXL	4460871		HV21 (1)
35	WHT	22-0-1 SWG RHT	18 AWG	GXL	4460871		HV22 (1)

S81							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	38-5-1 CURNT FBCK	18 AWG	GXL	N/A		HV3 (2)
1	WHT	38-5-2 CURNT FBCK	18 AWG	GXL	N/A		HV4 (2)
2	WHT	38-3 CURNT FBCK	18 AWG	GXL	N/A		CO1-J3 (2)

S78							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	38-1-1 CURNT FBCK	18 AWG	GXL	N/A		HV29 (2)
1	WHT	38-1-2 CURNT FBCK	18 AWG	GXL	N/A		HV30 (2)
2	WHT	38-1 CURNT FBCK	18 AWG	GXL	N/A		CO1-J3 (5)

S64							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	427-1 RTN	18 AWG	GXL	N/A		S67 (2)
1	BLK	427-2 RTN	18 AWG	GXL	N/A		S65 (1)
2	BLK	427 RTN	18 AWG	GXL	N/A		CO1-J2 (14)

HV22 - SWG RHT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	22-0-1 SWG RHT	18 AWG	GXL	4460465		CO1-J2 (35)
2	WHT	38-5-2 CURNT FBCK	18 AWG	GXL	4460465		S64 (1)

Figure 7-27. Main Valve Harness - Sheet 2 of 3

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X596 - HEAD & TAIL LT SIG							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	42-1 H&T LT	16 AWG	GXL			CO1-J2 (26)

AH82 - ALARM							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
A	WHT	38-4 ALARM POWER	18 AWG	GXL	4460465		CO1-J3 (7)
B	WHT	49-2 ALARM SIGNAL	18 AWG	GXL	4460465		CO1-J2 (27)
C	BLK	4-2 RTN	18 AWG	GXL	4460465		CO1-J2 (29)

HV32 - SIDE SWG LFT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	31-0-4 SIDE SWG LFT	18 AWG	GXL	4460743	4460458	CO1-J2 (16)
2	BLK	4-27-2-3 RTN	18 AWG	GXL	4460743	4460458	S65 (2)

HV31 - SIDE SWG RHT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	32-0-4 SIDE SWG RHT	18 AWG	GXL	4460743	4460458	CO1-J2 (4)
2	BLK	4-27-2-4 RTN	18 AWG	GXL	4460743	4460458	S65 (2)

HV28 - JIB DN VLV							
CONNECTOR PART NUMBER: 4460742							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	28-0-4 JIB DN	18 AWG	GXL	4460743	4460458	CO1-J2 (23)
2	BLK	4-27-2-2 RTN	18 AWG	GXL	4460743	4460458	S65 (2)

HV27 - JIB UP VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	27-0-4 JIB UP	18 AWG	GXL	4460743	4460458	CO1-J2 (12)
2	BLK	4-27-2-1 RTN	18 AWG	GXL	4460743	4460458	S65 (2)

X578 - TO STEER/BRAKE HARNESS							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	205 RED LED	18 AWG	GXL	1001116692		LB595 (4)
2	WHT	206 YEL LED	18 AWG	GXL	1001116692		LB595 (2)
3	WHT	207 GRN LED	18 AWG	GXL	1001116692		LB595 (3)
4	BLK	4-56	18 AWG	GXL	1001116692		LB595 (1)
5	WHT	10-1 STEER LT	18 AWG	GXL	1001116692		CO1-J2 (33)
6	BLK	4-40 RTN	18 AWG	GXL	1001116692		CO1-J2 (28)
7	WHT	9-2 STEER RT	18 AWG	GXL	1001116692		CO1-J2 (32)
8	WHT	38-2 CURNT FBCK	18 AWG	GXL	1001116692		CO1-J3 (1)
9	WHT	41-2 STR FLOW CNTRL	18 AWG	GXL	1001116692		CO1-J2 (8)
10					4460466		
11					4460466		
12					4460466		

S65							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	4-27-2 RTN	18 AWG	GXL	N/A		S64 (1)
2	BLK	4-27-2-1 RTN	18 AWG	GXL	N/A		HV27 (2)
2	BLK	4-27-2-2 RTN	18 AWG	GXL	N/A		HV28 (2)
2	BLK	4-27-2-3 RTN	18 AWG	GXL	N/A		HV32 (2)
2	BLK	4-27-2-4 RTN	18 AWG	GXL	N/A		HV31 (2)

HV21 - SWG LFT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	21-0-1 SWG LFT	18 AWG	GXL	4460465		CO1-J2 (34)
2	WHT	38-5-1 CURNT FBCK	18 AWG	GXL	4460465		S84 (1)

HV26 - PLAT LVL DN VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	26-0-4 PLAT LVL DN	18 AWG	GXL	4460465		CO1-J2 (7)
2	BLK	4-27-1-2 RTN	18 AWG	GXL	4460465		S67 (1)

HV14 - TELE OUT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	14-0-3 TELE OUT	18 AWG	GXL	4460465		CO1-J2 (15)
2	BLK	4-13-1 RTN	18 AWG	GXL	4460465		S83 (1)

HV39 - SWG ARREST VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	39-1 SWG ARREST	18 AWG	GXL	4460465		CO1-J2 (19)
2	BLK	4-17 RTN	18 AWG	GXL	4460465		CO1-J2 (18)

HV589 - BYPASS VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	37-0 BYPASS VLV	18 AWG	GXL	4460465		CO1-J2 (1)
2	BLK	4-61-0	18 AWG	GXL	4460465		CO1-J2 (6)

HV4 - MAIN LIFT DN VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	12-0-2 MAIN LIFT DN	18 AWG	GXL	4460465		CO1-J2 (22)
2	WHT	38-3-2 CURNT FBCK	18 AWG	GXL	4460465		S81 (1)

Figure 7-28. Main Valve Harness - Sheet 3 of 3

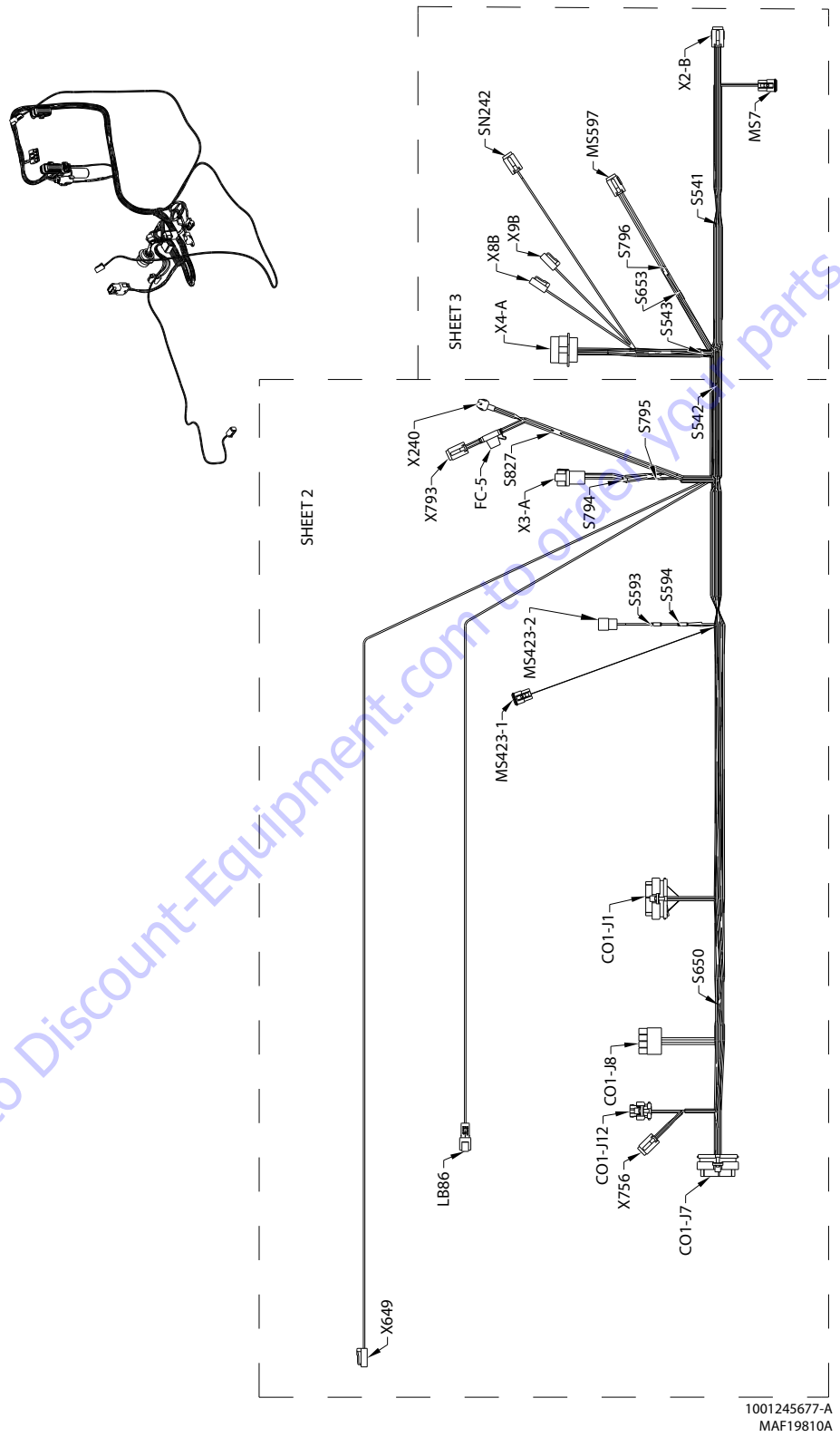
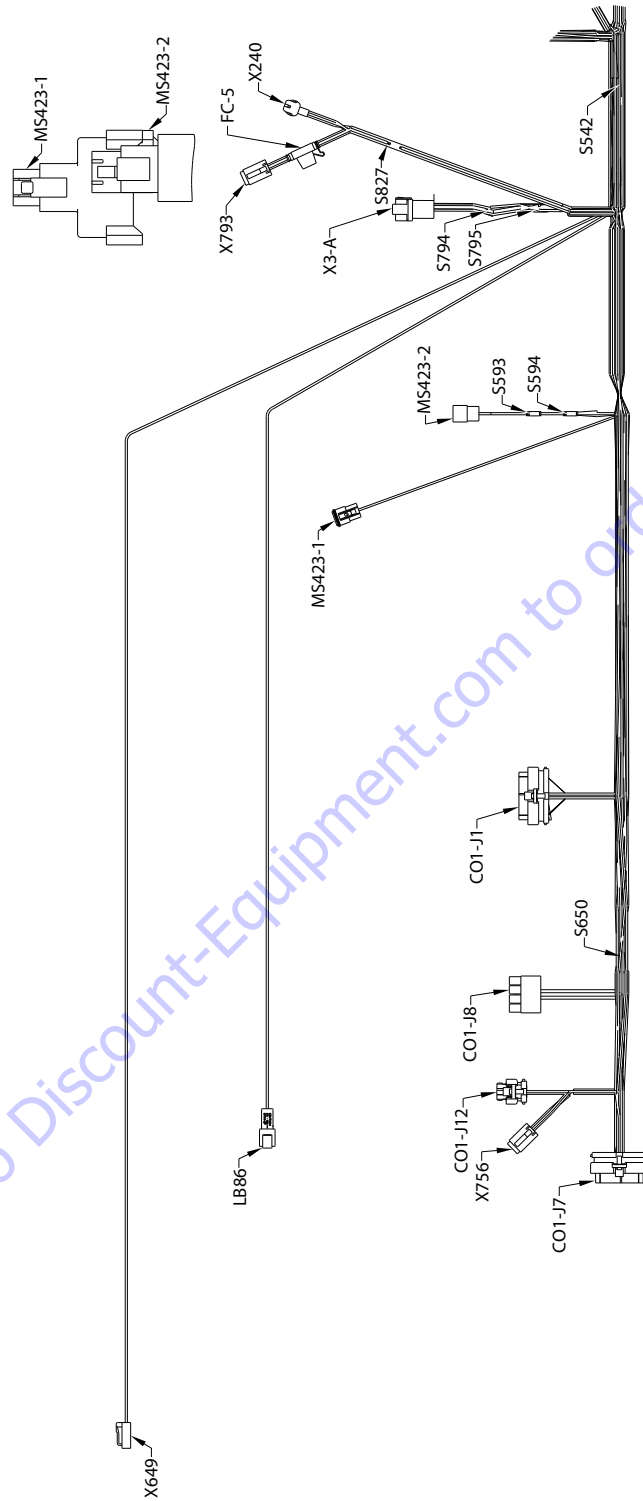


Figure 7-29. Turntable Harness - Sheet 1 of 4



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Figure 7-30. Turntable Harness - Sheet 2 of 4

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SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

C01-J7 - BLACK					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	82-2 PLATTX	18 AWG	GXL	S650 (1)
2	WHT	82-1 PLATTX	18 AWG	GXL	S650 (1)
3	YEL	5-10-6	18 AWG	GXL	X3-A (6)
4	WHT	57-0 UPPER BOOM	18 AWG	GXL	X8B (1)
5					
6	WHT	CAN TERM JUMPER	18 AWG	GXL	C01-J7 (17)
7	WHT	58-0 LOWER BOOM	18 AWG	GXL	X9B (2)
8					
9					
10					
11	YEL	5-5	18 AWG	GXL	SN242 (1)
12					
13	YEL	CAN1 HI	18 AWG	GXL	S593 (1)
14	WHT	81-0 GND MODE RX	18 AWG	GXL	X4-A (11)
15	WHT	131-3 FOOTSWITCH	18 AWG	GXL	X4-A (6)
16					
17	WHT	CAN TERM JUMPER	18 AWG	GXL	C01-J7 (6)
18					
19					
20					
21					
22					
23					
24	GRN	CAN1 LO	18 AWG	GXL	S594 (1)
25	BLK	4-55	18 AWG	GXL	X2-B (10)
26					
27					
28					
29	YEL	5-50	18 AWG	GXL	X2-B (9)
30	YEL	5-33 IGN LIM SW	18 AWG	GXL	S543 (2)
31					
32	WHT	59-0 DOS	18 AWG	GXL	SN242 (4)
33					
34					
35					

C01-J1 - NATURAL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	WHT	300-1 ALERT PWR	18 AWG	GXL	X649 (1)
3					
4	BLK	300-2 ALERT GND	18 AWG	GXL	X649 (2)
5					
6					
7					
8	WHT	4-90 CONFIG	18 AWG	GXL	C01-J7 (35)
9					
10					
11					
12					
13	WHT	49-10 VOTE RELAY	18 AWG	GXL	X2-B (5)
14					
15					
16					
17					
18					
19	WHT	4-52 INSTR GND	18 AWG	GXL	X2-B (6)
20					
21					
22					
23					
24					
25					
26					
27					
28	WHT	51-1 ANALYZER PWR	18 AWG	GXL	X240 (1)
29	WHT	52-1 ANALYZER RS-232 RX	18 AWG	GXL	X240 (2)
30	WHT	53-1 ANALYZER RS-232 TX	18 AWG	GXL	X240 (3)
31	WHT	54- 1 ANALYZER GND	18 AWG	GXL	X240 (4)
32					
33					
34					
35	WHT	4-90 CONFIG	18AWG	GXL	C01-J1 (8)

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

C01-J8					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	4-0-1 INSTR GND	12 AWG	GXL	X2-B (3)
2	YEL	5-10-1-1 SWITCHED PWR	12 AWG	GXL	SS41 (1)
3	BLK	PLAT GND	12 AWG	GXL	X4-A (16)
4	YEL	PLATFORM PWR	12 AWG	GXL	X4-A (12)

S594					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	CAN1 LO	18 AWG	GXL	C01-J7 (24)
1	GRN	CAN1 LO	18 AWG	GXL	X2-B (12)
2	GRN	CAN1 LO	18 AWG	GXL	MS423-2 (B)

MS423-1 - CAN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN1 HI	20 AWG	J1939 CABLE	X4-A (3)
B	GRN	CAN1 LO	20 AWG	J1939 CABLE	X4-A (2)
C					

S542					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	5-2-1 IGN MODE	18 AWG	GXL	X3-A (4)
1	YEL	5-2-5 IGN	18 AWG	GXL	X4-A (15)
2	YEL	5-2-2 IGN	18 AWG	GXL	X2-B (4)

C01-J12					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3	YEL	83-1-1 CAN2 HIGH	20 AWG	J1939 CABLE	X756 (2)
4	GRN	84-1-1 CAN2 LOW	20 AWG	J1939 CABLE	X756 (3)
5					
6					
7					
8	WHT	80-0 MSSO	18 AWG	GXL	X3-A (7)

X649 - BLUE BEACON					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	300-1 ALERT PWR	18 AWG	GXL	C01-J1 (2)
2	BLK	300-2 ALERT GND	18 AWG	GXL	C01-J1 (4)

LB86-AMB BEACON					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-12 STROBE	18 AWG	GXL	S653 (1)
2	BLK	1-7-1 GND	18 AWG	GXL	S796 (1)

S650					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	82-1 PLAT TX	18 AWG	GXL	C01-J7 (2)
1	WHT	82-2 PLAT TX	18 AWG	GXL	C01-J7 (1)
2	WHT	82-0 PLAT TX	18 AWG	GXL	X4-A (4)

S794					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	3-0-1 CONSTANT 12V	12 AWG	GXL	X3-A (1)
2	RED	3-0 CONSTANT 12V	12 AWG	GXL	X2-B (1)
2	RED	3-0-2 CONSTANT 12V	18 AWG	GXL	X793 (1)

S593					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN1 HI	18 AWG	GXL	C01-J7 (13)
1	YEL	CAN1 HI	18 AWG	GXL	X2-B (11)
2	YEL	CAN1 HI	18 AWG	GXL	MS423-2 (A)

S795					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	5-11-1 IGN PLAT	18 AWG	GXL	X3-A (5)
2	YEL	5-11-1-1 IGN PLAT	18 AWG	GXL	X4-A (9)
2	YEL	5-11-1-2 IGN PLAT	18 AWG	GXL	X793 (4)

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X3-A - GND CNTL PNL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	3-0-1 CONSTANT 12V	12 AWG	GXL	S794 (1)
2	YEL	5-10-1-2 IGN	12 AWG	GXL	S541 (1)
3	YEL	5-2-6	18 AWG	GXL	X4-A (13)
4	YEL	5-2-1 IGN MODE	18 AWG	GXL	S542 (1)
5	YEL	5-11-1 IGN PLAT	18 AWG	GXL	S795 (1)
6	YEL	5-10-6	18 AWG	GXL	C01-J7 (3)
7	WHT	80-0 MSSO	18 AWG	GXL	C01-J12 (8)
8					

FC-5 - 5A TM FUSE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK		14 AWG	GXL	S827 (2)
2	BLK		14 AWG	GXL	X793 (3)

S827					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	5-10-1-3 SWITCHED PWR	14 AWG	GXL	S541 (1)
2	BLK		14 AWG	GXL	FC-5 (1)

X240 - ANALYZER					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	51-1 ANALYZER PWR	18 AWG	GXL	C01-J1 (28)
2	WHT	52-1 ANALYZER RS-232 RX	18 AWG	GXL	C01-J1 (29)
3	WHT	53-1 ANALYZER RS-232 TX	18 AWG	GXL	C01-J1 (30)
4	WHT	54-1 ANALYZER GND	18 AWG	GXL	C01-J1 (31)

MS423-2 - CAN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN1 HI	18 AWG	GXL	S593 (2)
B	GRN	CAN1 LO	18 AWG	GXL	S594 (2)
C					

X756 - CAN TERM					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	83-1 CAN2 HIGH	20 AWG	J1939 CABLE	MS7 (A)
2	YEL	83-1-1 CAN2 HIGH	20 AWG	J1939 CABLE	C01-J12 (3)
3	GRN	84-1-1 CAN2 LOW	20 AWG	J1939 CABLE	C01-J12 (4)
4	GRN	84-1 CAN2 LOW	20 AWG	J1939 CABLE	MS7 (B)
NC	SHLD	85-1 SHIELD	20 AWG	J1939 CABLE	MS7 (C)

X793 - TELEMATICS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	3-0-2 CONSTANT 12V	18 AWG	GXL	S794 (2)
2	BLK	1-7-2 GND	18 AWG	GXL	S796 (1)
3	BLK		14 AWG	GXL	FC-5 (2)
4	YEL	5-11-1-2 IGN PLAT	18 AWG	GXL	S795 (2)

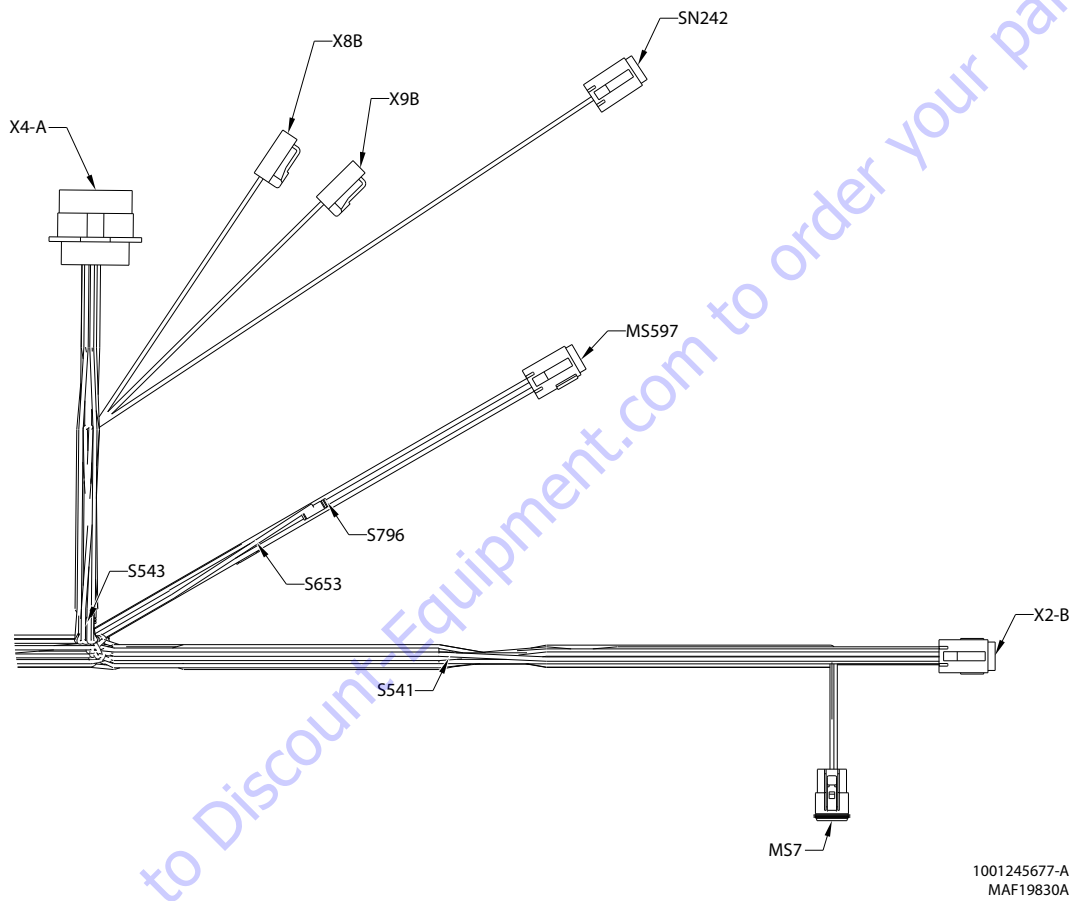


Figure 7-31. Turntable Harness - Sheet 3 of 4

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X4-A - BOOM CABLE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	TO	
1					
2	GRN	CAN1 LO	20 AWG	MS423-1 (B)	
3	YEL	CAN1 HI	20 AWG	MS423-1 (A)	
4	WHT	82-0 PLAT TX	18 AWG	S650 (2)	
5					
6	WHT	131-3 FOOTSWITCH	18 AWG	C01-J7 (15)	
7	WHT	2-12-2 IGN	18 AWG	S653 (1)	
8					
9	YEL	5-11-1-1 IGN PLAT	18 AWG	S795 (2)	
10	YEL	5-6	14 AWG	MS597 (5)	
11	WHT	81-0 GND MODE RX	18 AWG	C01-J7 (14)	
12	YEL	PLATFORM PWR	12 AWG	C01-J8 (4)	
13	YEL	5-2-6	18 AWG	X3-A (3)	
14					
15	YEL	5-2-5 IGN	18 AWG	S542 (1)	
16	BLK	PLAT GND	12 AWG	C01-J8 (3)	
17					
18	BLK	4-20	14 AWG	MS597 (2)	
19					

X9B - LO LIM SW					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-33-2 IGN LIM SW	18 AWG	GXL	S543 (1)
2	WHT	58-0 LOWER BOOM	18 AWG	GXL	C01-J7 (7)

X8B - UP LIM SW					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	57-0 UPPER BOOM	18 AWG	GXL	C01-J7 (4)
2	WHT	5-33-1 IGN LIM SW	18 AWG	GXL	S543 (1)

SN242 - DOS CONNECTOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	5-5	18 AWG	GXL	C01-J7 (11)
2					
3					
4	WHT	59-0 DOS	18 AWG	GXL	C01-J7 (32)

S543					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-33-1 IGN LIM SW	18 AWG	GXL	X8B (2)
1	WHT	5-33-2 IGN LIM SW	18 AWG	GXL	X9B (1)
2	YEL	5-33 IGN LIM SW	18 AWG	GXL	C01-J7 (30)

S541					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	5-10-1-1 SWITCHED PWR	12 AWG	GXL	C01-J8 (2)
1	YEL	5-10-1-2 IGN	12 AWG	GXL	X3-A (2)
1	YEL	5-10-1-3 SWITCHED PWR	14 AWG	GXL	S827 (1)
2	YEL	5-10-1 IGN	12 AWG	GXL	X2-B (2)

S796					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	1-7-1 GND	18 AWG	GXL	LB86 (2)
1	BLK	1-7-2 GND	18 AWG	GXL	X793 (2)
2	BLK	1-7 GND	18 AWG	GXL	MS597 (11)

S653					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-12 STROBE	18 AWG	GXL	LB86 (1)
1	WHT	2-12-2 IGN	18 AWG	GXL	X4-A (7)
2	WHT	2-12-1 IGN	18 AWG	GXL	MS597 (7)

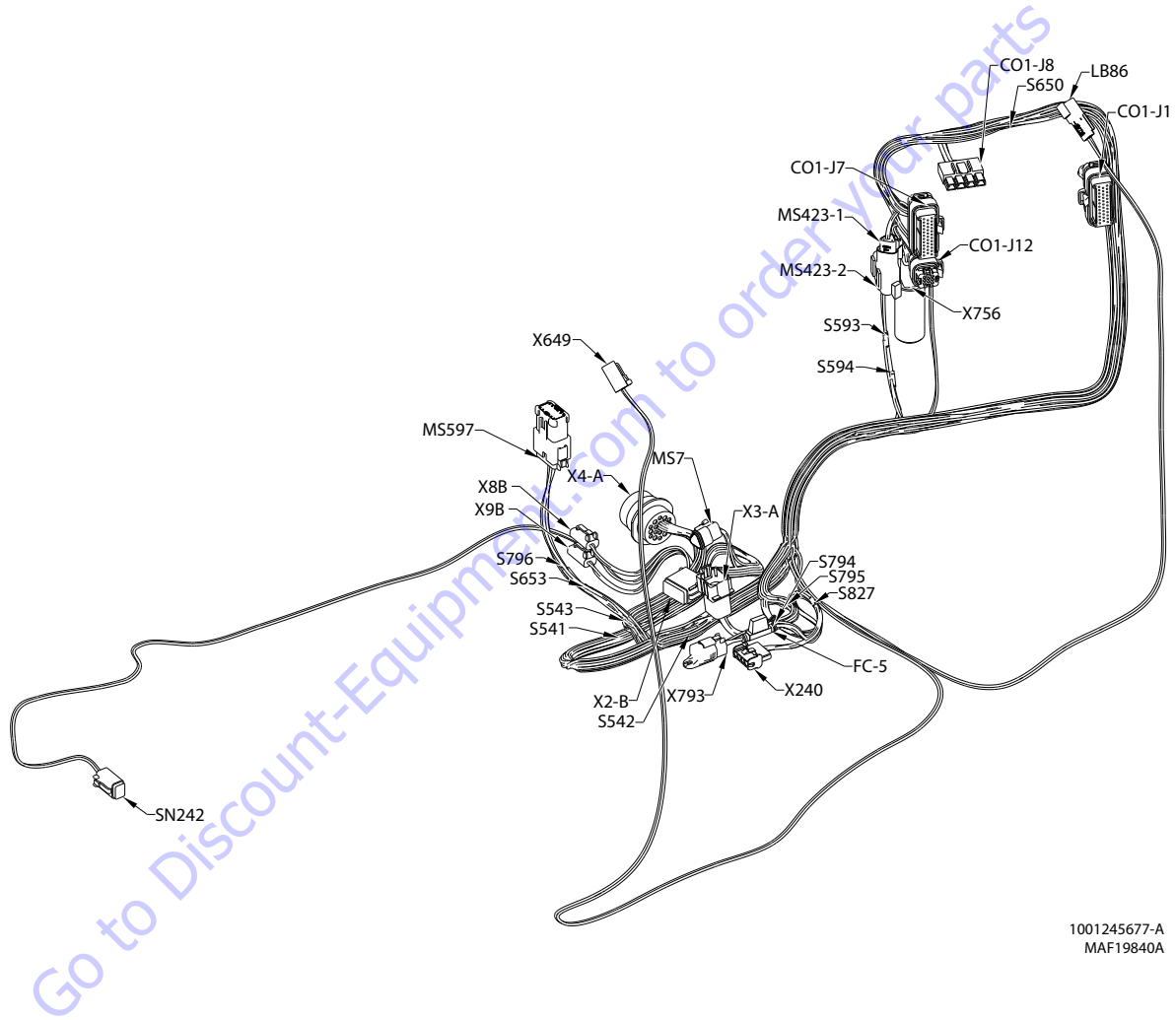
MS7 - CAN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	83-1 CAN2 HIGH	20 AWG	J1939 CABLE	X756 (1)
B	GRN	84-1CAN2 LOW	20 AWG	J1939 CABLE	X756 (4)
C	SHLD	85-1 SHIELD	20 AWG	J1939 CABLE	X756 (NC)

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X2-B - TO CHAS HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	3-0 CONSTANT 12V	12 AWG	GXL	S794 (2)
2	YEL	5-10-1 IGN	12 AWG	GXL	S541 (2)
3	BLK	4-0-1 INSTR GND	12 AWG	GXL	C01-J8 (1)
4	YEL	5-2-2 IGN	18 AWG	GXL	S542 (2)
5	WHT	49-10 VOTE RELAY	18 AWG	GXL	C01-J1 (13)
6	WHT	4-52 INSTR GND	18 AWG	GXL	C01-J1 (19)
7	YEL	5-10-2 IGN	14 AWG	GXL	MS597 (4)
8	BLK	4-0-3 INSTGND	14 AWG	GXL	MS597 (1)
9	YEL	5-50	18 AWG	GXL	C01-J7 (29)
10	BLK	4-55	18 AWG	GXL	C01-J7 (25)
11	YEL	CAN1 HI	18 AWG	GXL	S593 (1)
12	GRN	CAN1 LO	18 AWG	GXL	S594 (1)

MS597 - IGN/GND 12V BUSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	4-0-3 INST GND	14 AWG	GXL	X2-B (8)
2	BLK	4-20	14 AWG	GXL	X4-A(18)
3					
4	YEL	5-10-2 IGN	14 AWG	GXL	X2-B (7)
5	YEL	5-6	14 AWG	GXL	X4-A (10)
6					
7	WHT	2-12-1 IGN	18 AWG	GXL	S653 (2)
8					
9					
10					
11	BLK	1-7 GND	18 AWG	GXL	S796 (2)
12					

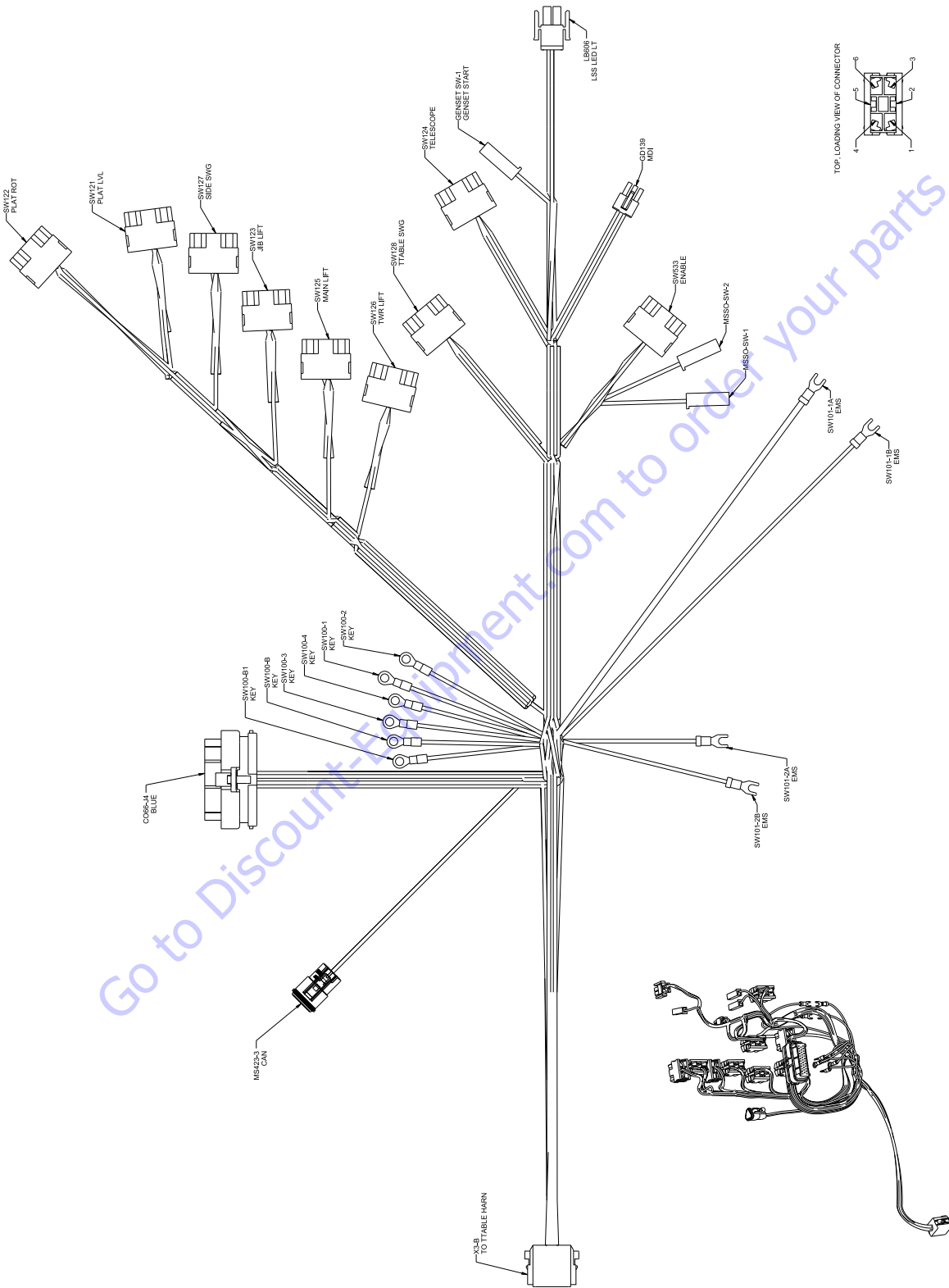
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Figure 7-32. Turntable Harness - Sheet 4 of 4

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS



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Figure 7-33. Ground Control Panel Harness - Sheet 1 of 3

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X3-B - TO TTABLE HARN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	3-0 CONSTANT 12V	12 AWG	GXL	1001157890		SW101-1A (1A)
2	YEL	5-10-3 IGN	18 AWG	GXL	1001157890		SW101-1B (1B)
3	YEL	5-2-6 IGN	18 AWG	GXL	1001156692		SW100-2 (1)
4	YEL	5-2-1 IGN GMODE	18 AWG	GXL	1001156692		SW100-4 (1)
5	WHT	5-1-1 IGN PLAT	18 AWG	GXL	1001156692		SW100-1 (1)
6	YEL	5-10-6 IGN GMODE	18 AWG	GXL	1001156692		SW100-3 (1)
7	WHT	80-0 MSSO	18 AWG	GXL	1001156692		MSSO-SW-2 (1)
8					4460466		

SW100-4 - KEY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-2-1 IGN GMODE	18 AWG	GXL	N/A		X3-B (4)

MS423-3 - CAN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
A		CAN1 HI	18 AWG	GXL	4460944		GD139 (4)
B		CAN1 LO	18 AWG	GXL	4460944		GD139 (3)
C					4460466		

SW100-1 - KEY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	5-1-1 IGN PLAT	18 AWG	GXL	N/A		X3-B (5)

SW100-2 - KEY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-2-6 IGN	18 AWG	GXL	N/A		X3-B (3)

CO66-J4 - BLUE							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1					4460905		
2					4460905		
3					4460905		
4					4460905		
5	WHT	26-0-1 PLAT LVL DN	18 AWG	GXL	4460871		SW121 (1)
6	WHT	23-0-1 PLAT ROT LFT	18 AWG	GXL	4460871		SW122 (3)
7	WHT	13-0-2 TELE IN	18 AWG	GXL	4460871		SW124 (3)
8	WHT	28-0-1 JIB DN	18 AWG	GXL	4460871		SW123 (1)
9	WHT	32-0-1 SIDE SWG LFT	18 AWG	GXL	4460871		SW127 (3)
10	WHT	29-0-2 TWR UP	18 AWG	GXL	4460871		SW126 (3)
11					4460905		
12					4460905		
13					4460905		
14	WHT	108-0 LSS LAMP	18 AWG	GXL	4460871		LB606 (1)
15					4460905		
16	WHT	99-0 ENABLE	18 AWG	GXL	4460871		SW533 (1)
17	WHT	25-0-1 PLAT LVL UP	18 AWG	GXL	4460871		SW121 (3)
18	WHT	24-0-1 PLAT ROT RHT	18 AWG	GXL	4460871		SW122 (1)
19	WHT	27-0-1 JIB UP	18 AWG	GXL	4460871		SW123 (3)
20	WHT	31-0-1 SIDE SWG RHT	18 AWG	GXL	4460871		SW127 (1)
21	WHT	30-0-2 TWR DN	18 AWG	GXL	4460871		SW126 (1)
22					4460905		
23	WHT	3-1 MAIN LIFT UP	18 AWG	GXL	4460871		SW125 (3)
24	WHT	METER PWR METER PWR	18 AWG	GXL	4460871		GD139 (1)
25	YEL	5-15	18 AWG	GXL	4460871		SW533 (2)
26					4460905		
27					4460905		
28					4460905		
29					4460905		
30	WHT	14-0-2 TELE OUT	18 AWG	GXL	4460871		SW124 (1)
31	BLK	4-22	18 AWG	GXL	4460871		LB606 (2)
32	BLK	METER GND METER GND	18 AWG	GXL	4460871		GD139 (2)
33	WHT	4-1 MAIN LIFT DN	18 AWG	GXL	4460871		SW125 (1)
34	WHT	21-1 SWG LFT	18 AWG	GXL	4460871		SW128 (3)
35	WHT	22-1 SWG RHT	18 AWG	GXL	4460871		SW128 (1)

SW101-2B - EMS							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
2B	YEL	2-26 IGN	18 AWG	GXL	N/A		SW100-B (1)

SW101-2A - EMS							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
2A	YEL	5-1 IGN	18 AWG	GXL	N/A		SW100-B1 (1)

SW122 - PLAT ROT							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	24-0-1 PLAT ROT RHT	18 AWG	GXL	1001159186		CO66-J4 (18)
2	YEL	5-15-7	18 AWG	GXL	4460419		SW121 (2)
3	YEL	5-15-6	18 AWG	GXL	4460419		GENSET SW-1 (1)
2	WHT	23-0-1 PLAT ROT LFT	18 AWG	GXL	1001159186		CO66-J4 (6)
4							
5							
6							

SW121 - PLAT LVL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	26-0-1 PLAT LVL DN	18 AWG	GXL	1001159186		CO66-J4 (5)
2	YEL	5-15-6	18 AWG	GXL	4460419		SW127 (2)
2	YEL	5-15-7	18 AWG	GXL	4460419		SW122 (2)
3	WHT	25-0-1 PLAT LVL UP	18 AWG	GXL	1001159186		CO66-J4 (17)
4							
5							
6							

SW100-B1 - KEY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-1 IGN	18 AWG	GXL	N/A		SW101-2A (2A)

SW127 - SIDE SWG							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	31-0-1 SIDE SWG RHT	18 AWG	GXL	1001159186		CO66-J4 (20)
2	YEL	5-15-6	18 AWG	GXL	4460419		SW121 (2)
2	YEL	5-15-6	18 AWG	GXL	4460419		SW123 (2)
3	WHT	32-0-1 SIDE SWG LFT	18 AWG	GXL	1001159186		CO66-J4 (9)
4							
5							
6							

SW100-B - KEY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	2-26 IGN	18 AWG	GXL	N/A		SW101-2B (2B)

SW123 - JIB LIFT							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	28-0-1 JIB DN	18 AWG	GXL	1001159186		CO66-J4 (8)
2	YEL	5-15-6	18 AWG	GXL	4460419		SW125 (2)
2	YEL	5-15-6	18 AWG	GXL	4460419		SW127 (2)
3	WHT	27-0-1 JIB UP	18 AWG	GXL	1001159186		CO66-J4 (19)
4							
5							
6							

SW100-3 - KEY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-10-6 IGN GMODE	18 AWG	GXL	N/A		X3-B (6)

Figure 7-34. Ground Control Panel Harness - Sheet 2 of 3

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

SW125 - MAIN LIFT							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	4-1 MAIN LIFT DN	18 AWG	GXL	1001159186		CO66-J4 (33)
2	YEL	5-15-4	18 AWG	GXL	4460419		SW126 (2)
2	YEL	5-15-5	18 AWG	GXL	4460419		SW123 (2)
3	WHT	3-1 MAIN LIFT UP	18 AWG	GXL	1001159186		CO66-J4 (23)
4							
5							
6							

SW533- ENABLE							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	99-0 ENABLE	18 AWG	GXL	1001159186		CO66-J4 (16)
2	YEL	5-15	18 AWG	GXL	4460419		CO66-J4 (25)
2	YEL	5-15-1	18 AWG	GXL	4460419		SW124 (2)
3							
4							
5							
6							

SW126 - TWR LIFT							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	30-2 TWR DN	18 AWG	GXL	1001159186		CO66-J4 (21)
2	YEL	5-15-3	18 AWG	GXL	4460419		SW128 (2)
2	YEL	5-15-4	18 AWG	GXL	4460419		SW125 (2)
3	WHT	29-2 TWR UP	18 AWG	GXL	1001159186		CO66-J4 (10)
4							
5							
6							

GD139- MDI							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	METER PWR	18 AWG	GXL	4460877		CO66-J4 (24)
2	BLK	METER GND	18 AWG	GXL	4460877		CO66-J4 (32)
3		CAN1 LO	18 AWG	GXL	4460877		MS423-3 (B)
4		CAN1 HI	18 AWG	GXL	4460877		MS423-3 (A)
5							
6							
NC							

SW101-1A - EMS							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1A	RED	3-0 CONSTANT 12V	12 AWG	GXL	N/A		X3-B (1)

LB606 - LSS LED LT							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	106-0 LSS LAMP	18 AWG	GXL	4460227		CO66-J4 (14)
2	BLK	4-22	18 AWG	GXL	4460227		CO66-J4 (31)
2	BLK	4-23	18 AWG	GXL	4460227		MSSO-SW-1 (1)

SW101-1B - EMS							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1B	YEL	5-16-3 IGN	18 AWG	GXL	N/A		X3-B (2)

MSSO-SW-2							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	80-0 MSSO	18 AWG	GXL	4460259		X3-B (7)

SW128 - TTABLE SWG							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	22-1 SWG RHT	18 AWG	GXL	1001159186		CO66-J4 (35)
2	YEL	5-15-2	18 AWG	GXL	4460419		SW124 (2)
2	YEL	5-15-3	18 AWG	GXL	4460419		SW126 (2)
3	WHT	21-1 SWG LFT	18 AWG	GXL	1001159186		CO66-J4 (34)
4							
5							
6							

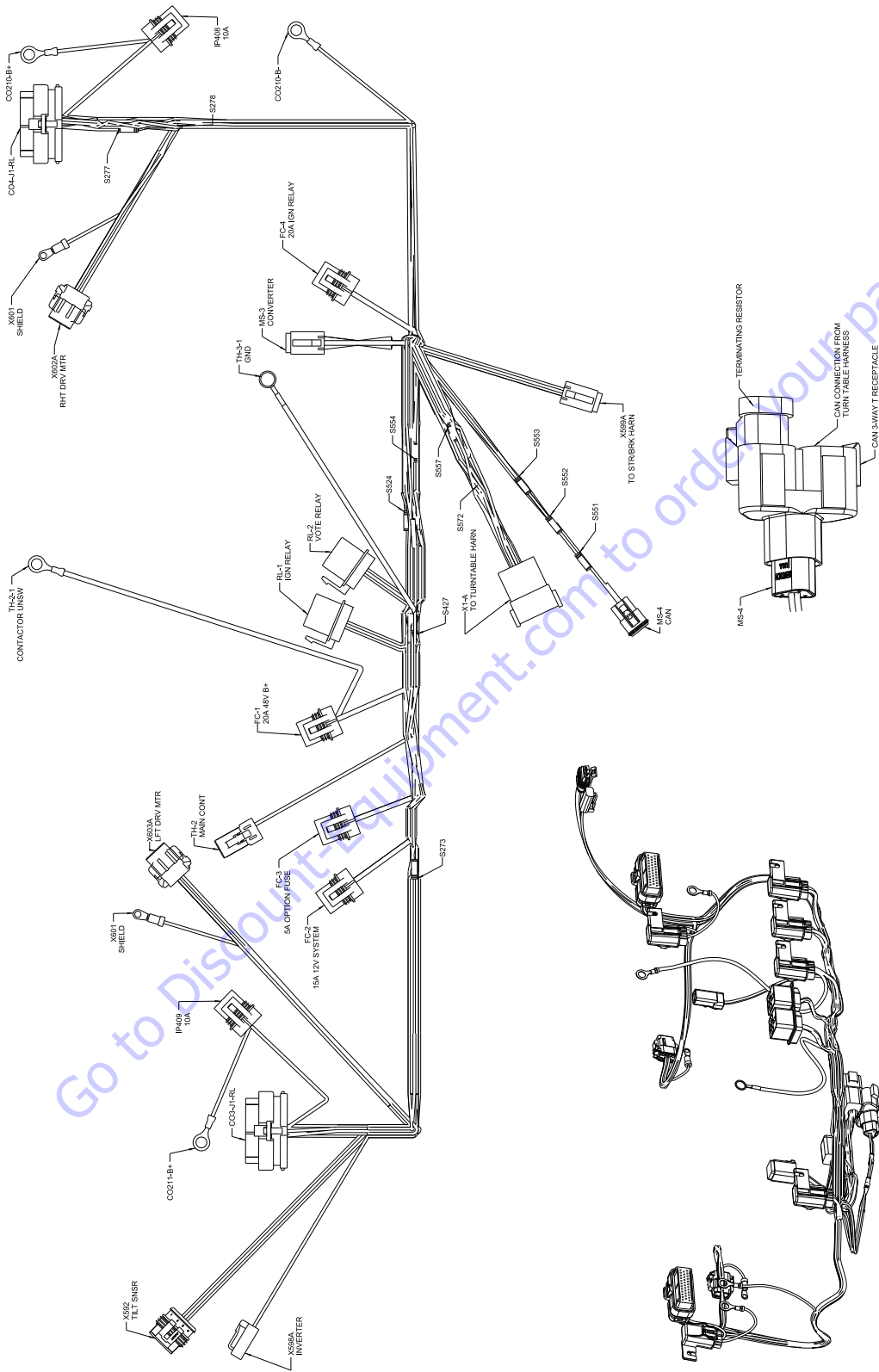
MSSO-SW-1							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	4-23	18 AWG	GXL	4460259		LB606 (2)

SW124 - TELESCOPE							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	14-0-2 TELE OUT	18 AWG	GXL	1001159186		CO66-J4 (30)
2	YEL	5-15-1	18 AWG	GXL	4460419		SW533 (2)
2	YEL	5-15-2	18 AWG	GXL	4460419		SW128 (2)
3	WHT	13-0-2 TELE IN	18 AWG	GXL	1001159186		CO66-J4 (7)
4							
5							
6							

GENSET SW-1 - GENSET START							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-15-8	18 AWG	GXL	4460259		SW122 (2)

Figure 7-35. Ground Control Panel Harness - Sheet 3 of 3

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS



SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X592 - TILT SNSR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-50	18 AWG	GXL	1001107854	1001104498	X1-A (9)
2	BLK	4-55	18 AWG	GXL	1001107854	1001104498	X1-A (10)
3	YEL	CAN1 HI	18 AWG	GXL	1001107854	1001104498	X1-A (11)
4	GRN	CAN1 LO	18 AWG	GXL	1001107854	1001104498	X1-A (12)

FC-1 - 20A 48V B+							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-0 B+	12 AWG	GXL	1001116734		TH-2-1 (1)
2	RED	1-0 B+	12 AWG	GXL	1001116734		S524 (1)

X598A-INVERTER							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	43-1 INVERTER	18 AWG	GXL	4460465		S554 (1)
2					4460466		

X603A - LFT DRV MTR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	101 LFT SNR PWR	18 AWG	GXL	1001126008		CO3-J1-RL (25)
2	WHT	102 ENCODER B	18 AWG	GXL	1001126008		CO3-J1-RL (13)
3	WHT	103 ENCODER A	18 AWG	GXL	1001126008		CO3-J1-RL (14)
4	BLK	2-1-1 ENCODER GND	18 AWG	GXL	1001126008		S273 (1)
5	WHT	104 LFT TMP	18 AWG	GXL	1001126008		CO3-J1-RL (22)
6	BLK	2-1-2 LFT TMP GND	18 AWG	GXL	1001126008		S273 (1)
7	WHT	100 LFT BRK	18 AWG	GXL	1001126008		CO3-J1-RL (2)
8	WHT	1-2 LFT BRK GND	18 AWG	GXL	1001126008		CO3-J1-RL (4)

CO3-J1-RL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1					4460905		
2	WHT	100 LFT BRK	18 AWG	GXL	4460871		X603A (7)
3	RED	BRAKE2-IN	16 AWG	GXL	4460871		IP409 (2)
4	WHT	1-2 LFT BRK GND	18 AWG	GXL	4460871		X603A (8)
5	BLK	2-1	18 AWG	GXL	4460871		S273 (2)
6	YEL	6-24 IGN 48 VOLT	18 AWG	GXL	4460871		S427 (2)
7					4460905		
8					4460905		
9					4460905		
10	YEL	6-26 IGN 48 VOLT	18 AWG	GXL	4460871		S427 (2)
11					4460905		
12					4460905		
13	WHT	102 ENCODER B	18 AWG	GXL	4460871		X603A (2)
14	WHT	103 ENCODER A	18 AWG	GXL	4460871		X603A (3)
15					4460905		
16					4460905		
17					4460905		
18					4460905		
19					4460905		
20					4460905		
21					4460905		
22	WHT	104 LFT TEMP	18 AWG	GXL	4460871		X603A (5)
23					4460905		
24					4460905		
25	WHT	101 LFT SNR PWR	18 AWG	GXL	4460871		X603A (1)
26					4460905		
27	GRN	CAN2 LO	20 AWG	J1939 CABLE	4460871		S552 (2)
28	YEL	CAN2 HI	20 AWG	J1939 CABLE	4460871		S551 (2)
29					4460905		
30					4460905		
31					4460905		
32					4460905		
33					4460905		
34					4460905		
35					4460905		
NC	SHLD	CAN2 SHLD	20 AWG	J1939 CABLE	N/A		S553 (2)
NC	SHIELD	METAL BRAID	18 AWG	SHLD	N/A		X601 (1)

CO211-B+							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
CONNECTOR PART NUMBER: 4460670							
1	RED	BRAKE2-IN-2	16 AWG	GXL	N/A		IP409 (1)

X601							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	SHIELD	METAL BRAID	18 AWG	SHLD			CO3-J1-RL (NC)

TH-2-1-CONTACTOR UNSW							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-0 B+	12 AWG	GXL			FC-1 (1)

TH-2 - MAIN CONT							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	VOTE-RLY-AIO	16 AWG	GXL	1001126008		RL-2 (4)
2	WHT	CONTACTOR-LS	18 AWG	GXL	1001126008		CO4-J1-RL (12)

IP409							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	BRAKE2-IN-2	16 AWG	GXL	1001116733		CO211-B+ (1)
2	RED	BRAKE2-IN	16 AWG	GXL	1001116733		CO3-J1-RL (3)

FC-2 - 15A 12V SYSTEM							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	3-0 CONSTANT 12V	12 AWG	GXL	1001116734		MS-3 (4)
2	RED	3-0 CONSTANT 12V	12 AWG	GXL	1001116734		X1-A (1)

S273							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	2-1-1 ENCODER GND	18 AWG	GXL	N/A		X603A (4)
1	BLK	2-1-2 LFT TMP GND	18 AWG	GXL	N/A		X603A (6)
2	BLK	2-1	18 AWG	GXL	N/A		CO3-J1-RL (5)

FC-3 - 5A OPTION FUSE							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-10-2 IGN	12 AWG	GXL	1001116734		S572 (2)
2	YEL	5-10-2 IGN	12 AWG	GXL	1001116734		X1-A (7)

Figure 7-37. Chassis Traction Harness - Sheet 2 of 4

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

RL-1 - IGN RELAY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-2 B+	18 AWG	GXL	100116732		S524 (2)
2	WHT	5-2-2 IGN	18 AWG	GXL	100116732		X1-A (4)
3							
4	YEL	6-2 IGN 48 VOLT	18 AWG	GXL	100116732		S554 (2)
5	WHT	4-2 INSTR GND	18 AWG	GXL	100116732		S557 (2)

RL-2 - VOTE RELAY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-3 B+	16 AWG	GXL	100116733		S524 (1)
2	WHT	49-10 VOTE RELAY	18 AWG	GXL	100116732		X1-A (5)
3							
4	YEL	VOTE-RLY-HO	16 AWG	GXL	100116733		TH-2 (1)
5	WHT	4-52 INSTR GND	18 AWG	GXL	100116732		X1-A (6)

TH3-1- GND							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	2-0 B-	12 AWG	GXL	N/A		MS-3 (3)

S427							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	6-2-2 IGN 48 VOLT	18 AWG	GXL	N/A		S554 (2)
1	WHT	6-2-5 IGN 48 VOLT	18 AWG	GXL	N/A		CO4-J1-RL (10)
2	YEL	6-2-4 IGN 48 VOLT	18 AWG	GXL	N/A		CO3-J1-RL (6)
2	YEL	6-2-6 IGN 48 VOLT	18 AWG	GXL	N/A		CO3-J1-RL (10)

S524							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-0 B+	12 AWG	GXL	N/A		FC-1 (2)
1	RED	1-3-3 B+	16 AWG	GXL	N/A		RL-2 (1)
2	RED	1-0-1 B+	12 AWG	GXL	N/A		MS-3 (1)
2	RED	1-0-2 B+	18 AWG	GXL	N/A		RL-1 (1)

S554							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	6-2-1 IGN 48 VOLT	18 AWG	GXL	N/A		X599A (6)
1	YEL	6-2-3 IGN 48 VOLT	18 AWG	GXL	N/A		MS-3 (2)
1	WHT	43-1 INVERTER	18 AWG	GXL	N/A		X598A (1)
2	YEL	6-2 IGN 48 VOLT	18 AWG	GXL	N/A		RL-1 (4)
2	YEL	6-2-2 IGN 48 VOLT	18 AWG	GXL	N/A		S427 (1)

S572							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-10-0 IGN	12 AWG	GXL	N/A		MS-3 (5)
2	YEL	5-10-1 IGN	12 AWG	GXL	N/A		FC-4 (1)
2	YEL	5-10-2 IGN	12 AWG	GXL	N/A		FC-3 (1)

S557							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	4-0-1 INSTR GND	12 AWG	GXL	N/A		X1-A (3)
1	BLK	4-0-3 INSTR GND	14 AWG	GXL	N/A		X1-A (8)
2	BLK	4-0 INSTR GRND	12 AWG	GXL	N/A		MS-3 (6)
2	WHT	4-0-2 INSTR GND	18 AWG	GXL	N/A		RL-1 (5)

X1-A- TO TURNTABLE HARN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	3-0 CONSTANT 12V	12 AWG	GXL	1001157891		FC-2 (2)
2	WHT	5-10-1 IGN	12 AWG	GXL	1001157891		FC-4 (2)
3	BLK	4-0-1 INSTR GND	12 AWG	GXL	1001157891		S557 (1)
4	WHT	5-2-2 IGN	18 AWG	GXL	1001116693		RL-1 (2)
5	WHT	49-10 VOTE RELAY	18 AWG	GXL	1001116693		RL-2 (2)
6	WHT	4-52 INSTR GND	18 AWG	GXL	1001116693		RL-2 (5)
7	YEL	5-10-2 IGN	12 AWG	GXL	1001157891		FC-3 (2)
8	BLK	4-0-3 INSTR GND	14 AWG	GXL	1001116693		S557 (1)
9	YEL	5-50	18 AWG	GXL	4460464		X592 (1)
10	BLK	4-55	18 AWG	GXL	4460464		X592 (2)
11	YEL	CAN1 HI	18 AWG	GXL	4460943		X592 (3)
12	GRN	CAN1 LO	18 AWG	GXL	4460943		X592 (4)

X601							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	SHIELD	METAL BRAID	18 AWG	SHLD			CO4-J1-RL (NC)

CO4-J1-RL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1					4460905		
2	WHT	200 RT BRK	18 AWG	GXL	4460871		X602A (7)
3	RED	BRAKE1-IN	16 AWG	GXL	4460871		IP408 (1)
4	WHT	2-6 RT BRK GND	18 AWG	GXL	4460871		X602A (8)
5	BLK	GND10	18 AWG	GXL	4460871		S278 (1)
6	BLK	GND-ADDR	18 AWG	GXL	4460871		CO210-B- (1)
7					4460905		
8					4460905		
9					4460905		
10	WHT	6-2-5 IGN 48 VOLT	16 AWG	GXL	4460871		S427 (1)
11					4460905		
12	WHT	CONTACTORLS	18 AWG	GXL	4460871		TH-2 (2)
13	WHT	202 RT ENCODER B	18 AWG	GXL	4460871		X602A (2)
14	WHT	203 ENCODER A	18 AWG	GXL	4460871		X602A (3)
15	BLU	STEER-SIG	18 AWG	GXL	4460871		X598A (2)
16	WHT	CHRG-STAT	18 AWG	GXL	4460871		X599A (5)
17					4460905		
18					4460905		
19					4460905		
20					4460905		
21					4460905		
22	WHT	204 RT TEMP	18 AWG	GXL	4460871		X602A (5)
23					4460905		
24					4460905		
25	WHT	201-2 RT SNR PWR	18 AWG	GXL	4460871		S277 (1)
26					4460905		
27	GRN	CAN2 LO	20 AWG	J1939 CABLE	4460871		S552 (2)
28	YEL	CAN2 HI	20 AWG	J1939 CABLE	4460871		S551 (2)
29					4460905		
30					4460905		
31					4460905		
32					4460905		
33					4460905		
34					4460905		
35					4460905		
NC	SHLD	CAN2 SHLD	20 AWG	J1939 CABLE	N/A		S553 (2)
NC	SHIELD	METAL BRAID	18 AWG	SHLD	N/A		X601 (1)

Figure 7-38. Chassis Traction Harness - Sheet 3 of 4

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

S553							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	SHLD	CAN2 SHLD	20 AWG	J1939 CABLE	N/A		MS-4 (C)
2	SHLD	CAN2 SHLD	20 AWG	J1939 CABLE	N/A		CO4-J1-RL (NC)
2	SHLD	CAN2 SHLD	20 AWG	J1939 CABLE	N/A		CO3-J1-RL (NC)

S552							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	GRN	CAN2 LO	20 AWG	J1939 CABLE	N/A		MS-4 (B)
2	GRN	CAN2 LO	20 AWG	J1939 CABLE	N/A		CO4-J1-RL (27)
2	GRN	CAN2 LO	20 AWG	J1939 CABLE	N/A		CO3-J1-RL (27)

S551							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	CAN2 HI	20 AWG	J1939 CABLE	N/A		MS-4 (A)
2	YEL	CAN2 HI	20 AWG	J1939 CABLE	N/A		CO4-J1-RL (28)
2	YEL	CAN2 HI	20 AWG	J1939 CABLE	N/A		CO3-J1-RL (28)

MS-3 - CONVERTER							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-0-1 B+	12 AWG	GXL	1001157890		S524 (2)
2	YEL	6-2-3 IGN 48 VOLT	18 AWG	GXL	1001166892		S554 (1)
3	BLK	2-0 B-	12 AWG	GXL	1001157890		TH-3-1 (1)
4	RED	3-0 CONSTANT 12V	12 AWG	GXL	1001157890		FC-2 (1)
5	YEL	5-10-0 IGN	12 AWG	GXL	1001157890		S572 (1)
6	BLK	4-0 INSTR GRND	12 AWG	GXL	1001157890		S557 (2)

FC-4 - 20A IGN RELAY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	YEL	5-10-1 IGN	12 AWG	GXL	100116734		S572 (2)
2	WHT	5-10-1 IGN	12 AWG	GXL	100116734		X1-A (2)

X599A - TO STR/BRK HARN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	201-1 STR SNR	18 AWG	GXL	4460465		S277 (1)
2	BLU	STEER-SIG	18 AWG	GXL	4460465		CO4-J1-RL (15)
3	BLK	GND1-3	18 AWG	GXL	4460465		S278 (1)
4					4460466		
5	WHT	CHRG-STAT	18 AWG	GXL	4460465		CO4-J1-RL (16)
6	YEL	6-2-1 IGN 48 VOLT	18 AWG	GXL	4460465		S554 (1)

MS-4 - CAN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
A	YEL	CAN2 HI	20 AWG	J1939 CABLE	4460944		S551 (1)
B	GRN	CAN2 LO	20 AWG	J1939 CABLE	4460944		S552 (1)
C	SHLD	CAN2 SHLD	20 AWG	J1939 CABLE	4460944		S553 (1)

X602A - RHT DRV MTR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	201 RT SNR PWR	18 AWG	GXL	1001126008		S277 (2)
2	WHT	202 RT ENCODER B	18 AWG	GXL	1001126008		CO4-J1-RL (13)
3	WHT	203 ENCODER A	18 AWG	GXL	1001126008		CO4-J1-RL (14)
4	BLK	GND1-1	18 AWG	GXL	1001126008		S278 (2)
5	WHT	204 RT TEMP	18 AWG	GXL	1001126008		CO4-J1-RL (22)
6	BLK	2-7 RT TEMP GND	18 AWG	GXL	1001126008		S278 (2)
7	WHT	200 RT BRK	18 AWG	GXL	1001126008		CO4-J1-RL (2)
8	WHT	2-6 RT BRK GND	18 AWG	GXL	1001126008		CO4-J1-RL (4)

IP408							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	BRAKE1-IN	16 AWG	GXL	1001116733		CO4-J1-RL (3)
2	RED	BRAKE1-IN-2	16 AWG	GXL	1001116733		CO210-B+ (1)

S277							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	201-1 STR SNR	18 AWG	GXL	N/A		X599A (1)
1	WHT	201-2 RT SNR PWR	18 AWG	GXL	N/A		CO4-J1-RL (25)
2	WHT	201 RT SNR PWR	18 AWG	GXL	N/A		X602A (1)

S278							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	GND1-0	18 AWG	GXL	N/A		CO4-J1-RL (5)
1	BLK	GND1-3	18 AWG	GXL	N/A		X599A (3)
2	BLK	2-7 RT TEMP GND	18 AWG	GXL	N/A		X602A (6)
2	BLK	GND1-1	18 AWG	GXL	N/A		X602A (4)

CO210-B+							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	BRAKE1-IN-2	16 AWG	GXL	N/A		IP408 (2)

CO210-B-							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	GND-ADDR	18 AWG	GXL	N/A		CO4-J1-RL (6)

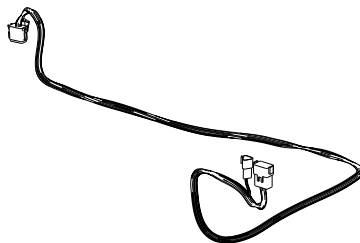
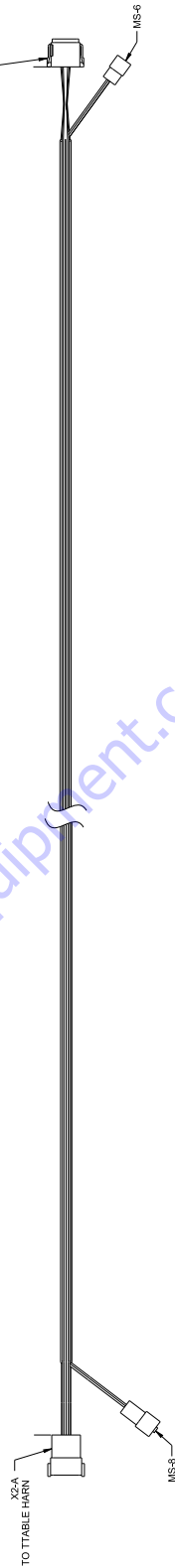
Figure 7-39. Chassis Traction Harness - Sheet 4 of 4

X2-A- TO TTABLE HARN

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL PIN	SEAL PIN	TO
1	RED	3-0 CONSTANT 12V	12 AWG	GXL	1001157891		X1-B (1)
2	WHT	5-0-1 IGN	12 AWG	GXL	1001157891		X1-B (2)
3	BLK	4-0-1 INSTR.GND	12 AWG	GXL	1001157891		X1-B (3)
4	WHT	5-2-2 IGN	18 AWG	GXL	4460944		X1-B (4)
5	WHT	4-0-0 VOTE RELAY	18 AWG	GXL	4460944		X1-B (5)
6	WHT	4-2-2 INSTR.GND	18 AWG	GXL	4460944		X1-B (6)
7	YEL	5-0-3 IGN	12 AWG	GXL	1001157891		X1-B (7)
8	BLK	4-0-3 INSTR.GND	14 AWG	GXL	4460944		X1-B (8)
9	YEL	5-00	18 AWG	GXL	4460944		X1-B (9)
10	BLK	4-50	18 AWG	GXL	4460944		X1-B (10)
11	YEL	CAN1 HI	18 AWG	GXL	4460943		X1-B (11)
12	GRN	CAN1 LO	18 AWG	GXL	4460943		X1-B (12)

MS-8

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL PIN	SEAL PIN	TO
A	YEL	8-1 CAN2 HIGH	20 AWG	J1939 CABLE	4460943		MS-8 (A)
B	GRN	8-1 CAN2 LOW	20 AWG	J1939 CABLE	4460943		MS-8 (B)
C	SHLD	8-1 SHIELD	20 AWG	J1939 CABLE	4460943		MS-8 (C)



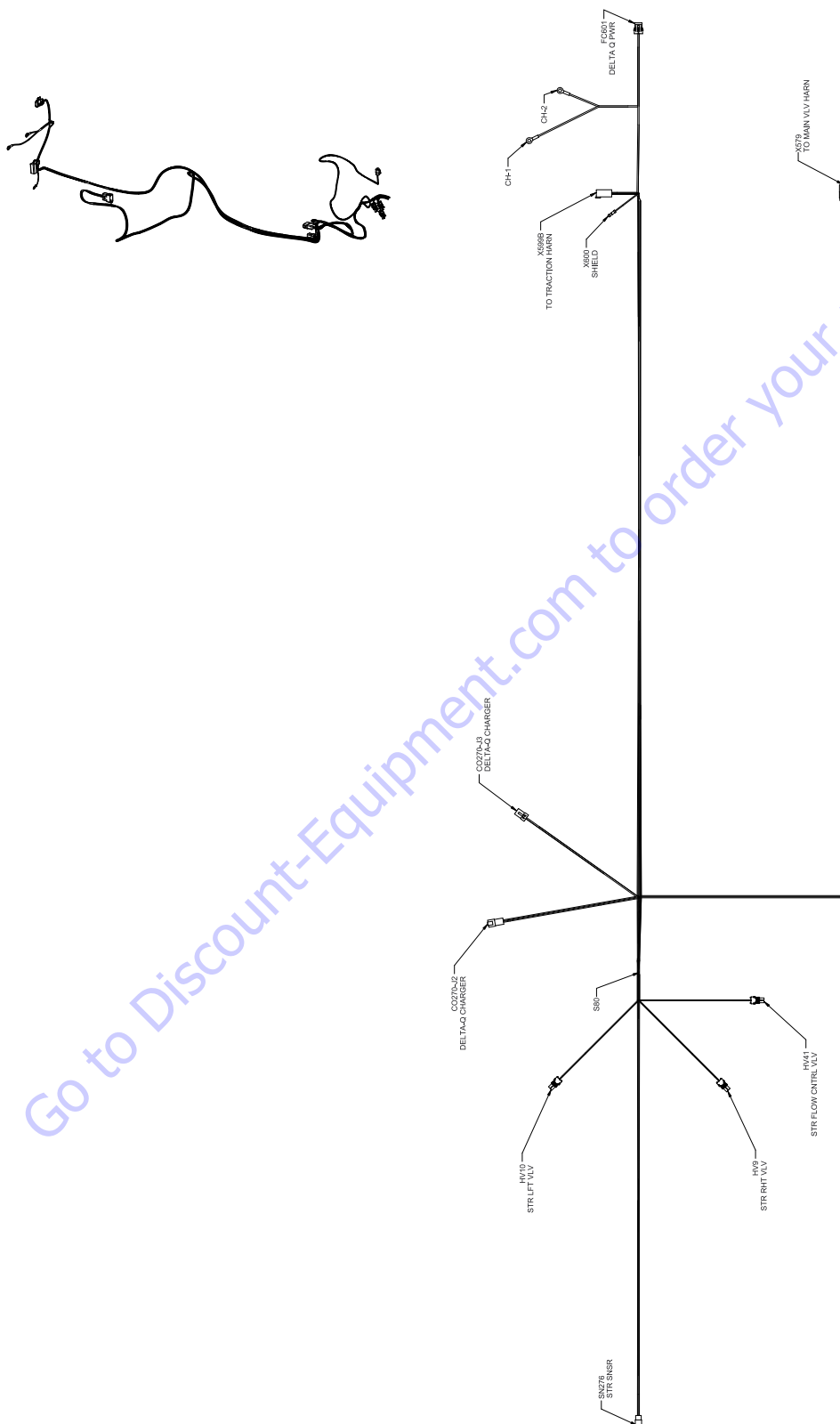
X1-B- TO TRACTION HARN

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL PIN	SEAL PIN	TO
1	RED	5-0 CONSTANT 12V	12 AWG	GXL	1001157890		X2-A (1)
2	WHT	5-0-1 IGN	12 AWG	GXL	1001157890		X2-A (2)
3	BLK	4-0-1 INSTR.GND	12 AWG	GXL	1001157890		X2-A (3)
4	WHT	5-2-2 IGN	18 AWG	GXL	4460945		X2-A (4)
5	WHT	4-0-0 VOTE RELAY	18 AWG	GXL	4460945		X2-A (5)
6	WHT	4-2-2 INSTR.GND	18 AWG	GXL	4460945		X2-A (6)
7	YEL	5-0-2 IGN	12 AWG	GXL	1001157890		X2-A (7)
8	BLK	4-0-3 INSTR.GND	14 AWG	GXL	4460942		X2-A (8)
9	YEL	5-00	18 AWG	GXL	4460945		X2-A (9)
10	BLK	4-50	18 AWG	GXL	4460945		X2-A (10)
11	YEL	CAN1 HI	18 AWG	GXL	4460944		X2-A (11)
12	GRN	CAN1 LO	18 AWG	GXL	4460944		X2-A (12)

MS-6

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL PIN	SEAL PIN	TO
A	YEL	8-1 CAN2 HIGH	20 AWG	J1939 CABLE	4460944		MS-6 (A)
B	GRN	8-1 CAN2 LOW	20 AWG	J1939 CABLE	4460944		MS-6 (B)
C	SHLD	8-1 SHIELD	20 AWG	J1939 CABLE	4460944		MS-6 (C)

Figure 7-40. Chassis to Turntable Harness



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Figure 7-41. Chassis Steer/Brake Harness - Sheet 1 of 2

1001188528 F

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

SN276-STR SNSR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	18/3 CABLE	18 AWG	CABLE	4460465		X599B (1)
2	BLU	18/3 CABLE	18 AWG	CABLE	4460465		X599B (2)
3	BLK	18/3 CABLE	18 AWG	CABLE	4460465		X599B (3)
NC	SHIELD	18/3 CABLE	18 AWG	SHLD	N/A		X600 (1)

S80							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	4-0-1 RTN	18 AWG	GXL	N/A		HV10 (B)
1	BLK	4-0-2 RTN	18 AWG	GXL	N/A		HV9 (B)
2	BLK	4-0 RTN	18 AWG	GXL	N/A		X579 (6)

X599B - TO TRACTION HARN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	18/3 CABLE	18 AWG	CABLE	4460464		SN276 (1)
2	BLU	18/3 CABLE	18 AWG	CABLE	4460464		SN276 (2)
3	BLK	18/3 CABLE	18 AWG	CABLE	4460464		SN276 (3)
4					4460466		
5	WHT	CHRG-STAT-1	18 AWG	GXL	4460464		CO270-J2 (1)
6	WHT	6-8 IGN PWR 48 VOLT	16 AWG	GXL	4460464		CO270-J2 (8)

HV41 - STR FLOW CNTRL VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
A	WHT	41-2 STR FLOW CNTRL	18 AWG	GXL	4460743	4460458	X579 (9)
B	WHT	38-2 CURNT FBACK	18 AWG	GXL	4460743	4460458	X579 (8)

HV9 - STR RHT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
A	WHT	9-2 STEER RT	18 AWG	GXL	4460743	4460458	X579 (7)
B	BLK	4-0-2 RTN	18 AWG	GXL	4460743	4460458	S80 (1)

HV10 - STR LFT VLV							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
A	WHT	10-1 STEER LT-1	18 AWG	GXL	4460743	4460458	X579 (5)
B	BLK	4-0-1 RTN	18 AWG	GXL	4460743	4460458	S80 (1)

FC601 - DELTA Q PWR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-6 B+	12 AWG	GXL			CH-1 (1)
2	RED	1-7 B+	12 AWG	GXL			CO270-J3 (1)

CO270-J2 - DELTA-Q CHARGER							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	CHRG-STAT-1	18 AWG	GXL	4460464		X599B (5)
2					4460466		
3	WHT	205 RED LED	18 AWG	GXL	4460464		X579 (1)
4	WHT	206 YEL LED	18 AWG	GXL	4460464		X579 (2)
5	BLK	4-56	18 AWG	GXL	4460464		X579 (4)
6	WHT	207 GRN LED	18 AWG	GXL	4460464		X579 (3)
7					4460466		
8	WHT	6-8 IGN PWR 48 VOLT	16 AWG	GXL	4460464		X599B (6)

CO270-J3 - DELTA-Q CHARGER							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-7 B+	12 AWG	GXL	4460509		FC601 (2)
2					4460466		
3	BLK	2-2	12 AWG	GXL	4460509		CH-2 (1)
4					4460466		

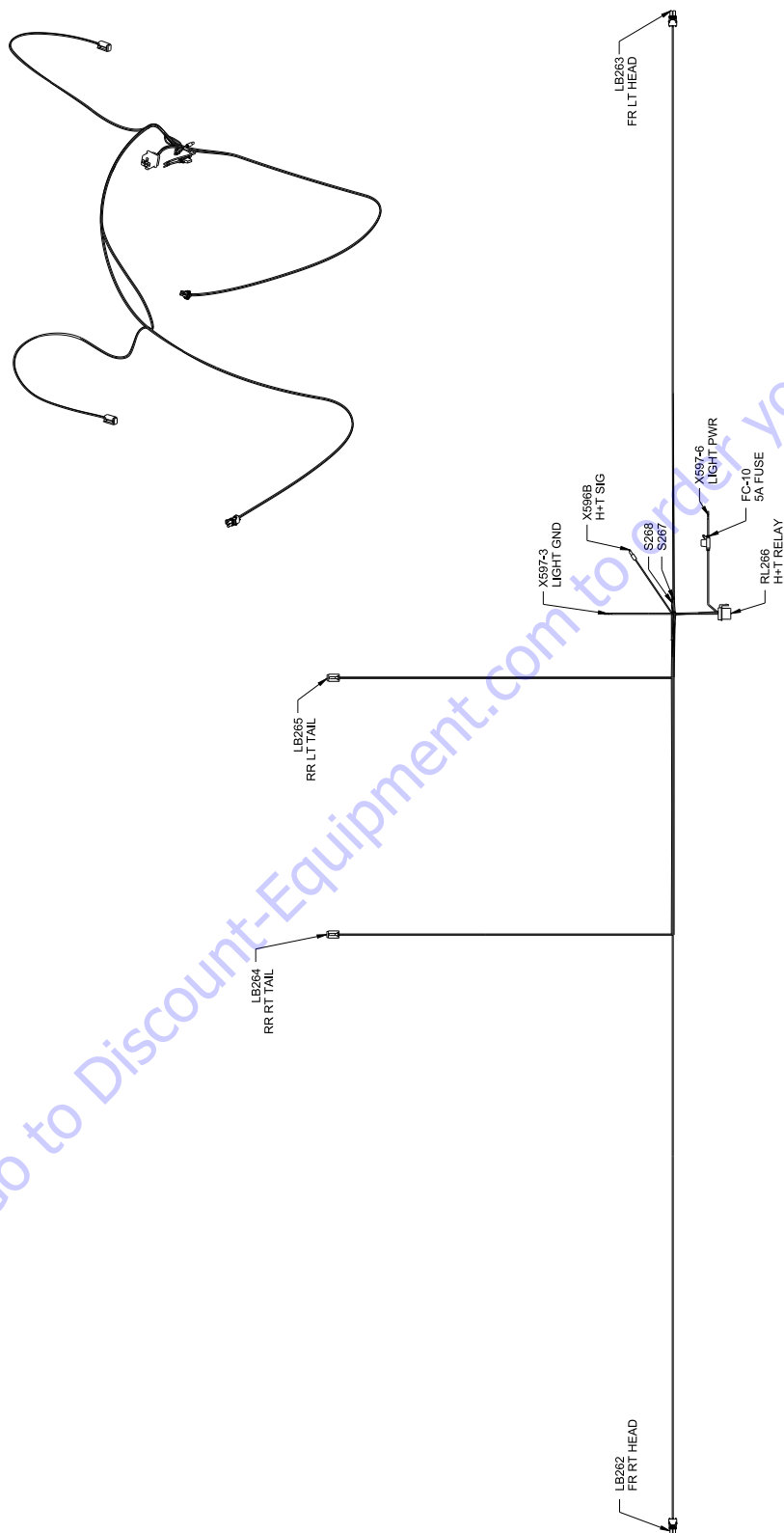
CH-1							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	RED	1-6 B+	12 AWG	GXL			FC601 (1)

CH-2							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	2-2	12 AWG	GXL			CO270-J3 (3)

X600-SHIELD							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	SHIELD	18/3 CABLE	18 AWG	SHLD			SN276 (NC)

X579 - TO MAIN VLV HARN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	205 RED LED	18 AWG	GXL	4460464		CO270-J2 (3)
2	WHT	206 YEL LED	18 AWG	GXL	4460464		CO270-J2 (4)
3	WHT	207 GRN LED	18 AWG	GXL	4460464		CO270-J2 (6)
4	BLK	4-56	18 AWG	GXL	4460464		CO270-J2 (5)
5	WHT	10-1 STEER LT-1	18 AWG	GXL	4460464		HV10 (A)
6	BLK	4-40 RTN	18 AWG	GXL	4460464		S80 (2)
7	WHT	9-2 STEER RT	18 AWG	GXL	4460464		HV9 (A)
8	WHT	38-2 CURNT FBACK	18 AWG	GXL	4460464		HV41 (B)
9	WHT	41-2 STR FLOW CNTRL	18 AWG	GXL	4460464		HV41 (A)
10					4460466		
11					4460466		
12					4460466		

Figure 7-42. Chassis Steer/Brake Harness - Sheet 2 of 2



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Figure 7-43. Chassis Head /Tail Light Harness - Sheet 1 of 2

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SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

LB262-FR RT HEAD							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	1-22 GND	16 AWG	GXL	4460457	4460458	S268 (2)
2	WHT	3-12-1 LIGHT	16 AWG	GXL	4460457	4460458	S267 (2)

LB263-FR LT HEAD							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	1-22 GND	16 AWG	GXL	4460457	4460458	S268 (2)
2	WHT	3-12-2 LIGHT	16 AWG	GXL	4460457	4460458	S267 (2)

LB265-RR LT TAIL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	1-22-4 GND	16 AWG	GXL	4460465		S268 (2)
2	WHT	3-12-4 LIGHT	16 AWG	GXL	4460465		S267 (2)
3					4460466		
4					4460466		

S267							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	3-12 LIGHT PWR	14 AWG	GXL	N/A		RL266 (4)
2	WHT	3-12-1 LIGHT	16 AWG	GXL	N/A		LB262 (2)
2	WHT	3-12-2 LIGHT	16 AWG	GXL	N/A		LB263 (2)
2	WHT	3-12-3 LIGHT	16 AWG	GXL	N/A		LB264 (2)
2	WHT	3-12-4 LIGHT	16 AWG	GXL	N/A		LB265 (2)

LB264-RR RT TAIL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	1-22-3 GND	16 AWG	GXL	4460465		S268 (2)
2	WHT	3-12-3 LIGHT	16 AWG	GXL	4460465		S267 (2)
3					4460466		
4					4460466		

X596B-H+T SIG							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	88-2 LIGHTING	18 AWG	GXL			RL266 (5)

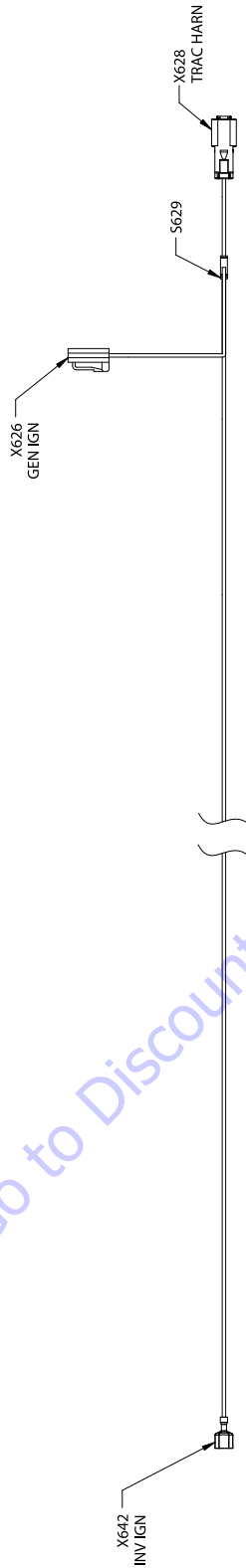
S268							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	1-22 LIGHT GND	14 AWG	GXL	N/A		X597-3 (1)
1	WHT	1-22-5 GND	18 AWG	GXL	N/A		RL266 (2)
2	BLK	1-22-1 GND	16 AWG	GXL	N/A		LB262 (1)
2	BLK	1-22-2 GND	16 AWG	GXL	N/A		LB263 (1)
2	BLK	1-22-3 GND	16 AWG	GXL	N/A		LB264 (1)
2	BLK	1-22-4 GND	16 AWG	GXL	N/A		LB265 (1)

RL266-H+T RELAY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK		14 AWG	GXL	1001116733		FC-10 (2)
2	WHT	1-22-5 GND	18 AWG	GXL	1001116732		S268 (1)
3							
4	WHT	3-12 LIGHT PWR	14 AWG	GXL	1001116733		S267 (1)
5	WHT	88-2 LIGHTING	18 AWG	GXL	1001116732		X596B (1)

X597-3- LIGHT GND							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	1-22 LIGHT GND	14 AWG	GXL	4460942		S268 (1)

Figure 7-44. Chassis Head /Tail Light Harness - Sheet 2 of 2

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS



X642 - INV IGN

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	IGN 48V	18 AWG	GXL	1001193545		S629 (2)

X628 - TRAC HARN

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-8-1	18 AWG	GXL	4460464		S629 (1)
2					4460466		

X626 - GEN IGN

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-8-3	18 AWG	GXL	4460465		S629 (2)
2					4460466		

S629

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-8-1	18 AWG	GXL	N/A		X628 (1)
2	WHT	IGN 48V	18 AWG	GXL	N/A		X642 (1)
2	WHT	8-8-3	18 AWG	GXL	N/A		X626 (1)

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Figure 7-45. Inverter IGN Harness

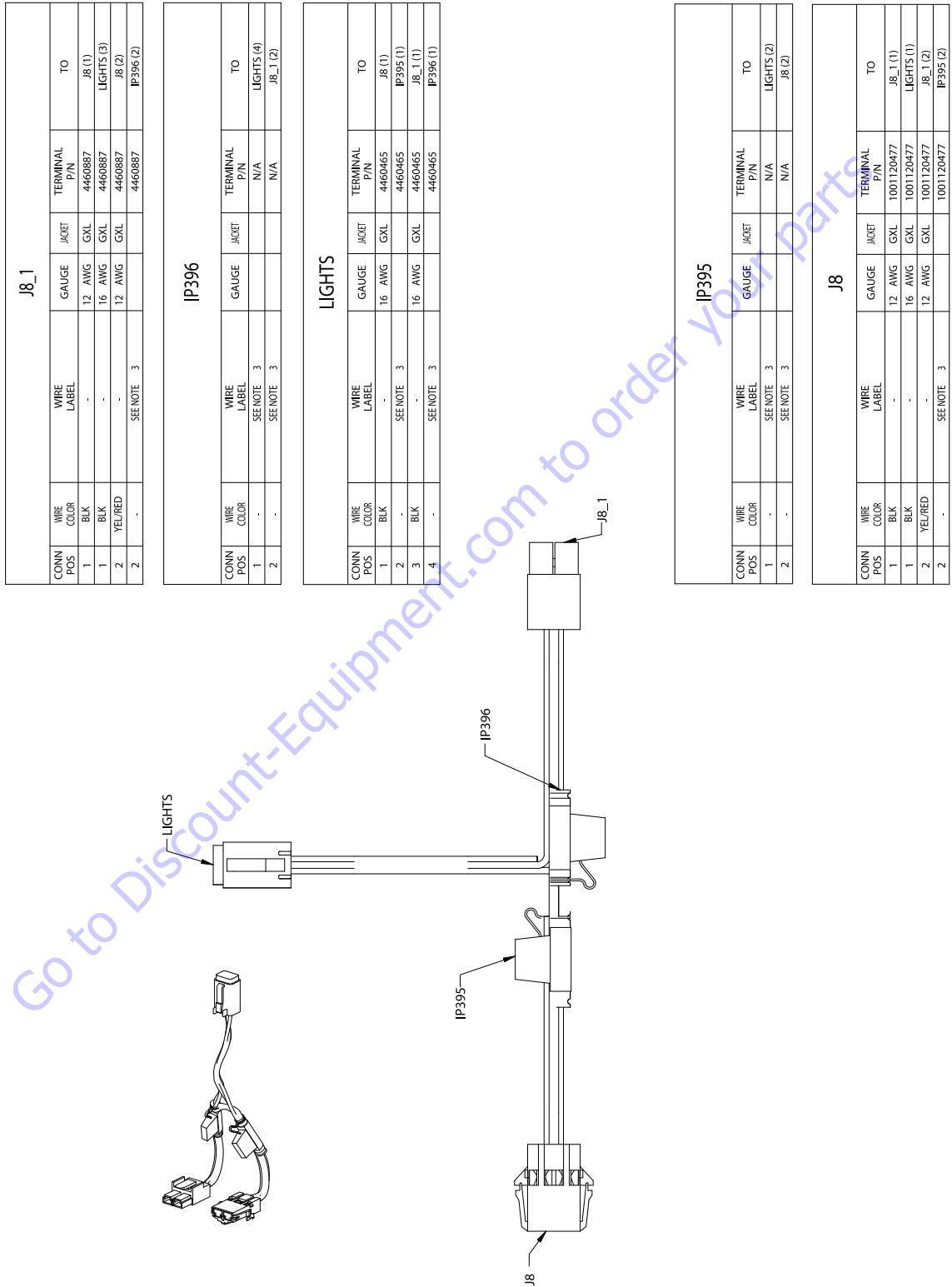


Figure 7-46. Platform Work Light Harness

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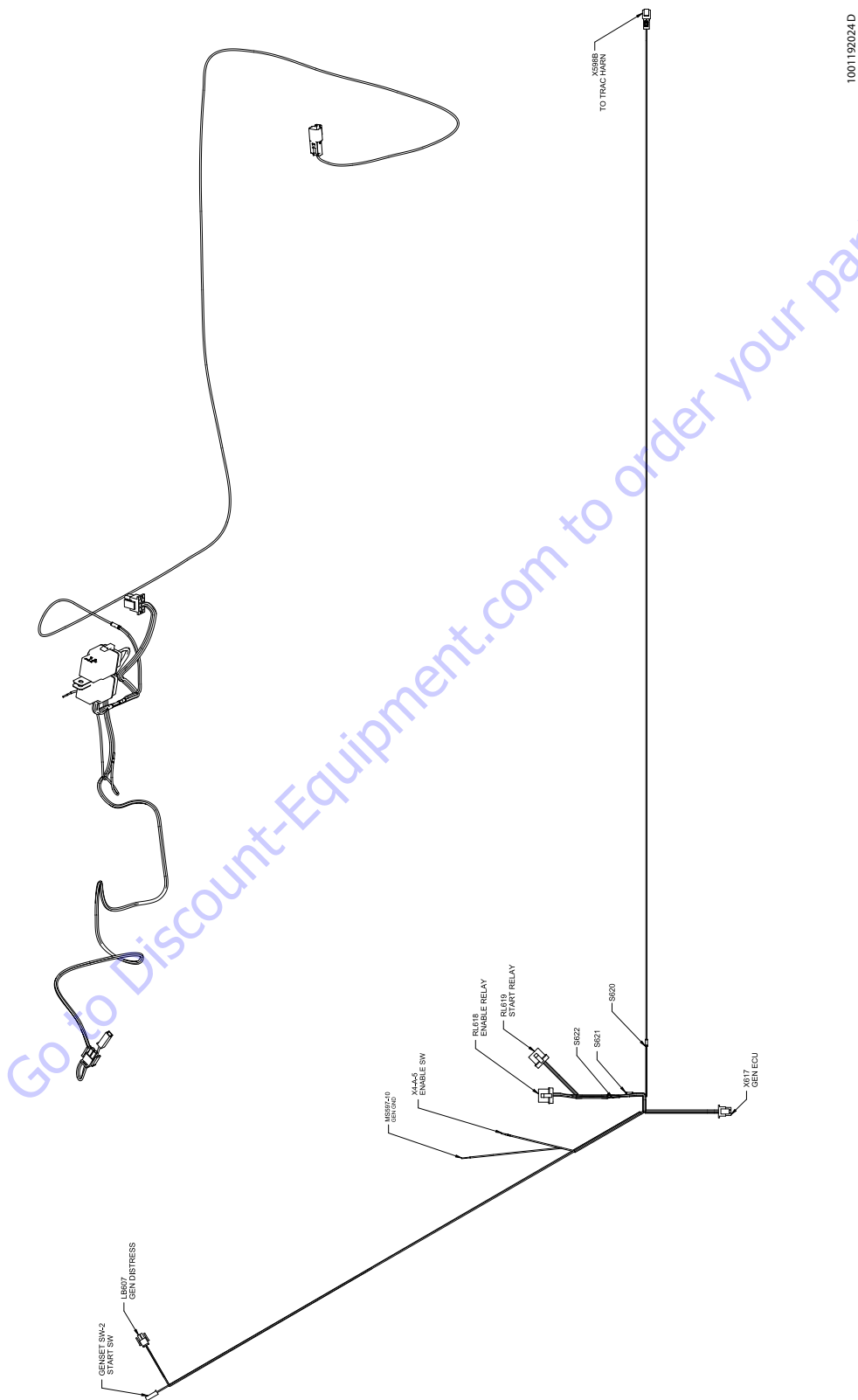


Figure 7-47. Generator IGM Harness - Sheet 1 of 2

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

GENSET SW-2 - START SW							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-2 GENSET START SW	18 AWG	GXL	4460259		RL619 (5)

LB607- GEN DISTRESS							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-5 GEN DISTRESS GND	18 AWG	GXL	4460227		X617 (4)
2	WHT	8-8 GEN DISTRESS PWR	18 AWG	GXL	4460227		X617 (3)

S620							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-4-1 IGN 48VOLT	18 AWG	GXL	N/A		X598B (1)
2	WHT	8-4-2 IGN 48VOLT	18 AWG	GXL	N/A		X617 (5)
2	WHT	8-4-3 IGN 48VOLT	18 AWG	GXL	N/A		S621 (1)

X617 - GEN ECU							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-6	14 AWG	GXL	4460267		RL618 (4)
2	WHT	8-7	14 AWG	GXL	4460267		RL619 (4)
3	WHT	8-8 GEN DISTRESS PWR	18 AWG	GXL	4460267		LB607 (2)
4	WHT	8-5 GEN DISTRESS GND	18 AWG	GXL	4460267		LB607 (1)
5	WHT	8-4-2 IGN 48VOLT	18 AWG	GXL	4460267		S620 (2)
6							

S621							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-4-3 IGN 48VOLT	18 AWG	GXL	N/A		S620 (2)
1	WHT	8-4-4 IGN 48VOLT	14 AWG	GXL	N/A		RL618 (1)
2	WHT	8-4-5 IGN 48VOLT	14 AWG	GXL	N/A		RL619 (1)

X598B -TO TRAC HARN							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-4-1 IGN 48VOLT	18 AWG	GXL	4460464		S620 (1)
2					4460466		

RL619 - START RELAY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-4-5 IGN 48VOLT	14 AWG	GXL	100116733		S621 (2)
2	BLK	8-1-3 GND	18 AWG	GXL	100116732		S622 (2)
3					1001128128		
4	WHT	8-7	14 AWG	GXL	100116733		X617 (2)
5	WHT	8-2 GENSET START SW	18 AWG	GXL	100116732		GENSET SW-2 (1)

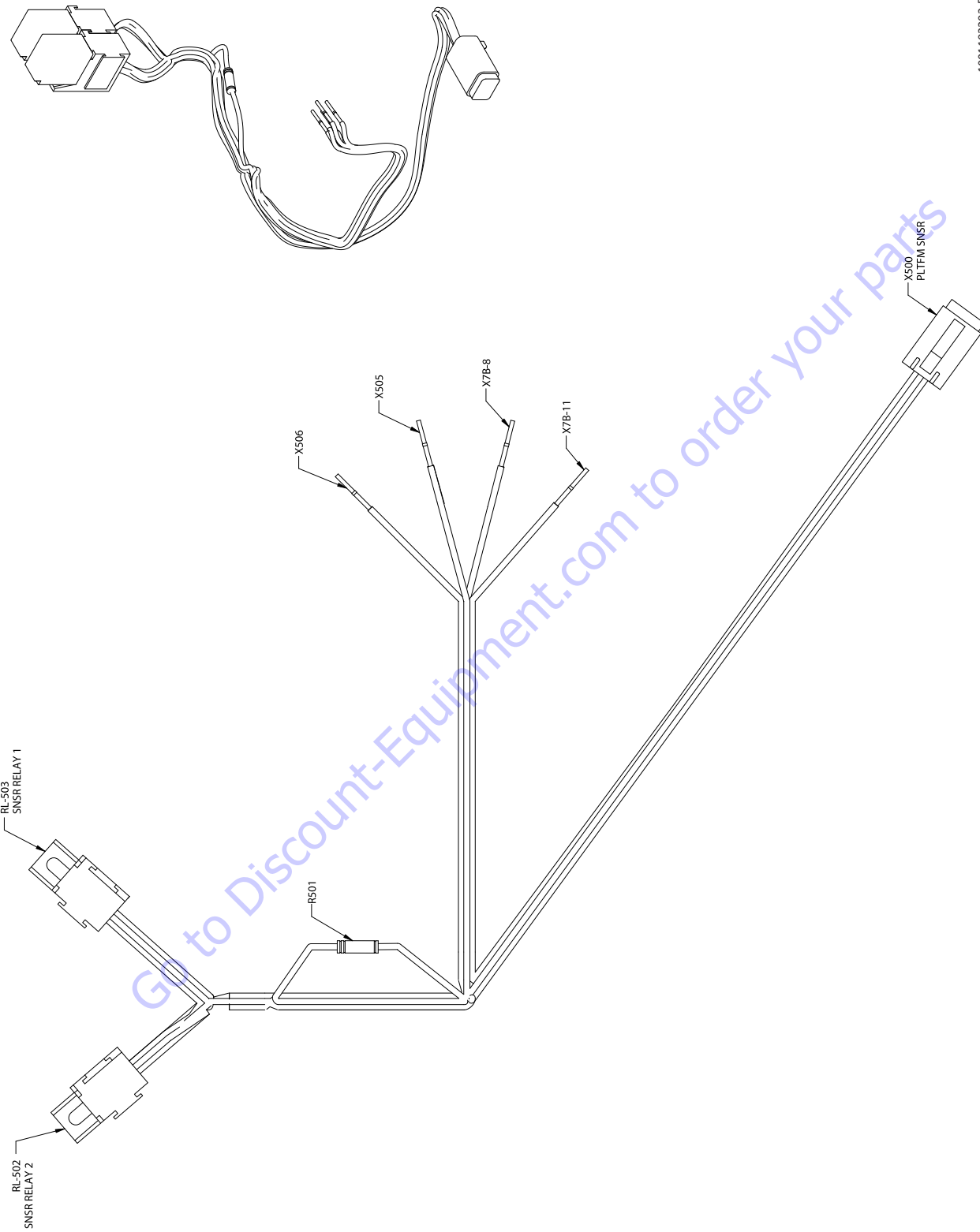
RL618 - ENABLE RELAY							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-4-4 IGN 48VOLT	14 AWG	GXL	100116733		S621 (1)
2	BLK	8-1-2 GND	18 AWG	GXL	100116732		S622 (2)
3					1001128128		
4	WHT	8-6	14 AWG	GXL	100116733		X617 (1)
5	WHT	8-3 GENSET ENABLE SW	18 AWG	GXL	100116732		X4-A-5 (1)

S622							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	8-1 GND	18 AWG	GXL	N/A		MS597-10 (1)
2	BLK	8-1-2 GND	18 AWG	GXL	N/A		RL618 (2)
2	BLK	8-1-3 GND	18 AWG	GXL	N/A		RL619 (2)

MS597-10 - GEN GND							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	BLK	8-1 GND	18 AWG	GXL	N/A		S622 (1)

X4-A-5 - ENABLE SW							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	8-3 GENSET ENABLE SW	18 AWG	GXL	N/A		RL618 (5)

Figure 7-48. Generator IGN Harness - Sheet 2 of 2



1001192292-B

Figure 7-49. SkyGuard Harness - Sheet 1 of 2

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X506							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	P1	18 AWG	GXL			RL-503 (87)

X505							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	P2	18 AWG	GXL			R501 (1)
1	WHT	P9	18 AWG	GXL			RL-503 (30)

X7B-8							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	P6	18 AWG	GXL			X500 (2)

X7B-11							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	P3	18 AWG	GXL			RL-502 (87)

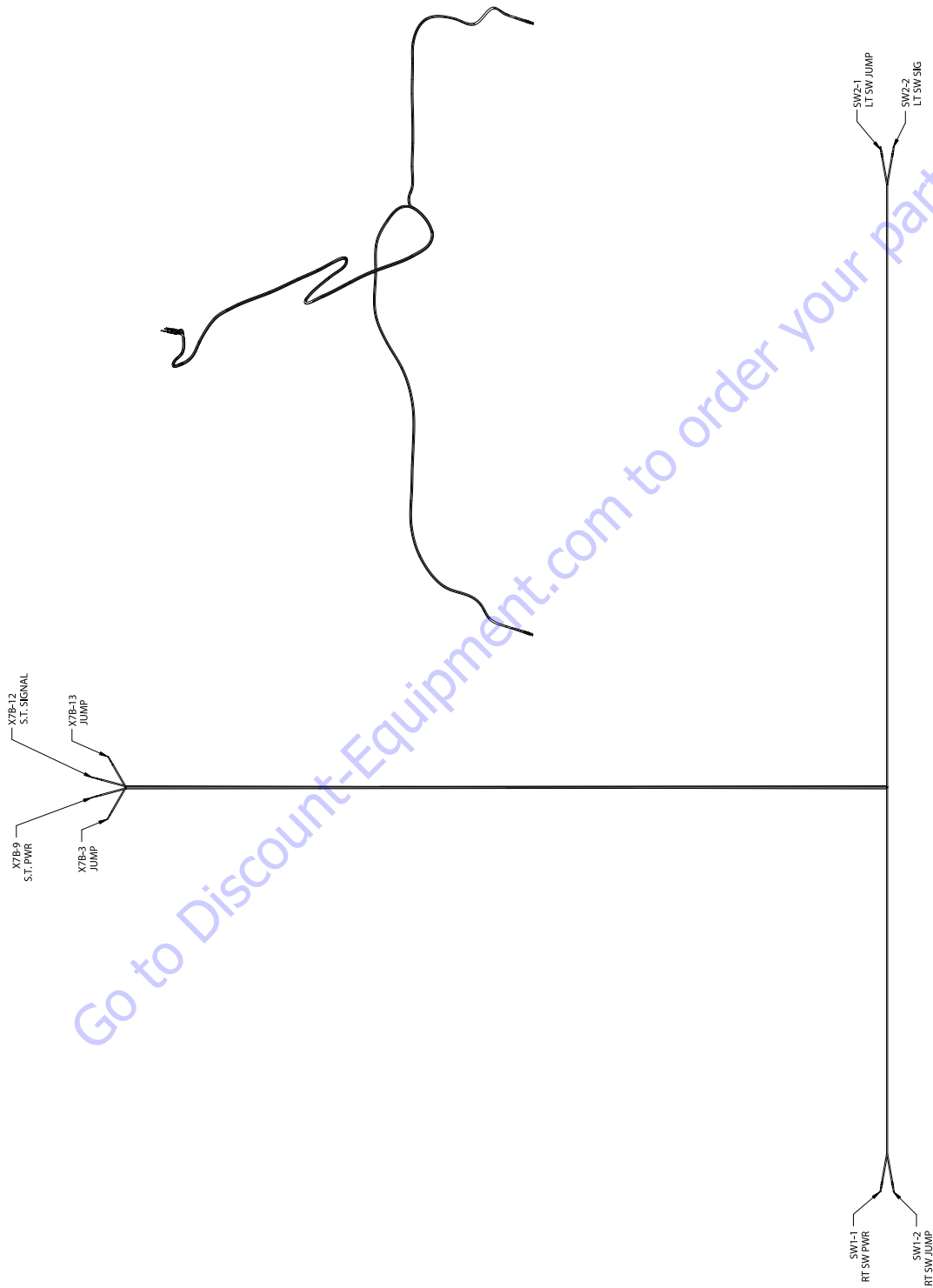
X500 - PLTFM SNRS							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	P10	18 AWG	GXL	4460465		R501 (2)
2	WHT	P6	18 AWG	GXL	4460465		X7B-8 (1)
3	WHT	P4	18 AWG	GXL	4460465		RL-502 (86)
4	WHT	P5	18 AWG	GXL	4460465		RL-502 (85)

RL-502 - SNRS RELAY 2							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
30	WHT	P9-1	18 AWG	GXL	1001116720		RL-503 (30)
85	WHT	P5	18 AWG	GXL	1001116720		X500 (4)
85	WHT	P5-1	18 AWG	GXL	1001116720		RL-503 (85)
86	WHT	P4	18 AWG	GXL	1001116720		X500 (3)
86	WHT	P4-1	18 AWG	GXL	1001116720		RL-503 (86)
87	WHT	P3	18 AWG	GXL	1001116720		X7B-11 (1)
87a							

RL-503 - SNRS RELAY 1							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
30	WHT	P9	18 AWG	GXL	1001116720		X505 (1)
30	WHT	P9-1	18 AWG	GXL	1001116720		RL-502 (30)
85	WHT	P5-1	18 AWG	GXL	1001116720		RL-502 (85)
86	WHT	P4-1	18 AWG	GXL	1001116720		RL-502 (86)
87	WHT	P1	18 AWG	GXL	1001116720		X506 (1)
87a							

R501							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	P2	18 AWG	GXL	N/A		X505 (1)
2	WHT	P10	18 AWG	GXL	N/A		X500 (1)

Figure 7-50. SkyGuard Harness - Sheet 2 of 2



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Figure 7-51. Soft Touch Harness - Sheet 1 of 2

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X7B-13-JUMP							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	1-551-3 JUMPER	18 AWG	GXL	N/A		SW2-1 (1)

X7B-12-S.T. SIGNAL							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	124-5-2 ST SWITCH	18 AWG	GXL	N/A		SW2-2 (1)

X7B-9-S.T. PWR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	3-25-2 ST PWR	18 AWG	GXL	N/A		SW1-1 (1)

X7B-3-JUMP							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	1-551-2 JUMPER	18 AWG	GXL	N/A		SW1-2 (1)

SW1-1-RT SW PWR							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	3-25-2 ST PWR	18 AWG	GXL	N/A		X7B-9 (1)

SW1-2-RT SW JUMP							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	1-551-2 JUMPER	18 AWG	GXL	N/A		X7B-3 (1)

SW2-1-LT SW JUMP							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	1-551-2 JUMPER	18 AWG	GXL	N/A		X7B-3 (1)

SW2-2-LT SW SIG							
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TERMINAL P/N	SEAL P/N	TO
1	WHT	124-5-2 ST SWITCH	18 AWG	GXL	N/A		X7B-12 (1)

Figure 7-52. Soft Touch Harness - Sheet 2 of 2

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

RL503 - SKYGAURD RELAY #1									
CONNECTOR PART NUMBER: 1001184932									
CONN	WIRE	WIRE	GAUGE	JOINT	TERMINAL	SEAL	TO		
1	WHT	P4	18 AWG	GOL	100118270	PIN	IP114 (1)		
30	WHT <td>P4 <td>18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td></td></td></td>	P4 <td>18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td></td></td>	18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td></td>	GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td>	100118270 <td></td> <td></td> <td></td> <td></td>				
85	WHT <td>P5</td> <td>18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td> </td></td></td>	P5	18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td> </td></td>	GOL <td>100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td> </td>	100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td>				S191 (1)
86	WHT <td>P4</td> <td>18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td> </td></td></td>	P4	18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td> </td></td>	GOL <td>100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td> </td>	100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td>				S192 (1)
87	WHT <td>P1</td> <td>18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td>X58 (4)</td> </td></td></td>	P1	18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td>X58 (4)</td> </td></td>	GOL <td>100118270 <td></td> <td></td> <td></td> <td>X58 (4)</td> </td>	100118270 <td></td> <td></td> <td></td> <td>X58 (4)</td>				X58 (4)
87A									

RL502 - SKYGAURD RELAY #2									
CONNECTOR PART NUMBER: 1001184932									
CONN	WIRE	WIRE	GAUGE	JOINT	TERMINAL	SEAL	TO		
1	WHT	P4	18 AWG	GOL	100118270	PIN	IP114 (1)		
30	WHT <td>P4 <td>18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td></td></td></td>	P4 <td>18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td></td></td>	18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td></td>	GOL <td>100118270 <td></td> <td></td> <td></td> <td></td> </td>	100118270 <td></td> <td></td> <td></td> <td></td>				
85	WHT <td>P5</td> <td>18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td> </td></td></td>	P5	18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td> </td></td>	GOL <td>100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td> </td>	100118388 <td></td> <td></td> <td></td> <td>S191 (1)</td>				S191 (1)
86	WHT <td>P4</td> <td>18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td> </td></td></td>	P4	18 AWG <td>GOL <td>100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td> </td></td>	GOL <td>100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td> </td>	100118388 <td></td> <td></td> <td></td> <td>S192 (1)</td>				S192 (1)
87	WHT <td>P1</td> <td>18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td>X58 (5)</td> </td></td></td>	P1	18 AWG <td>GOL <td>100118270 <td></td> <td></td> <td></td> <td>X58 (5)</td> </td></td>	GOL <td>100118270 <td></td> <td></td> <td></td> <td>X58 (5)</td> </td>	100118270 <td></td> <td></td> <td></td> <td>X58 (5)</td>				X58 (5)
87A									

S192									
CONNECTOR PART NUMBER: SPLICE									
CONN	WIRE	WIRE	GAUGE	JOINT	TERMINAL	SEAL	TO		
1	WHT	P4	18 AWG	GOL	N/A		RL503 (86)		
2	WHT <td>P4</td> <td>18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL502 (86)</th> <th></th> <th></th> </td></td>	P4	18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL502 (86)</th> <th></th> <th></th> </td>	GOL <th>N/A</th> <th></th> <th>RL502 (86)</th> <th></th> <th></th>	N/A		RL502 (86)		
									X500 (3)

S191									
CONNECTOR PART NUMBER: SPLICE									
CONN	WIRE	WIRE	GAUGE	JOINT	TERMINAL	SEAL	TO		
1	WHT	P5 <td>18 AWG</td>	18 AWG	GOL <th>N/A</th> <th></th> <th>RL503 (85)</th> <th></th> <th></th>	N/A		RL503 (85)		
2	WHT <td>P5</td> <td>18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL502 (85)</th> <th></th> <th>X500 (4)</th> </td></td>	P5	18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL502 (85)</th> <th></th> <th>X500 (4)</th> </td>	GOL <th>N/A</th> <th></th> <th>RL502 (85)</th> <th></th> <th>X500 (4)</th>	N/A		RL502 (85)		X500 (4)

X5B - INTERFACE									
CONNECTOR PART NUMBER: 4460939									
CONN	WIRE	WIRE	GAUGE	JOINT	TERMINAL	SEAL	TO		
1	WHT	P2	18 AWG	GOL	4460944	PIN	IP114 (1)		
2	WHT <td>P6 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>X500 (2)</td> </td></td></td></td>	P6 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>X500 (2)</td> </td></td></td>	18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>X500 (2)</td> </td></td>	GOL <td>4460944 <td></td> <td></td> <td></td> <td>X500 (2)</td> </td>	4460944 <td></td> <td></td> <td></td> <td>X500 (2)</td>				X500 (2)
3	WHT <td>P6 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td></td> </td></td></td></td>	P6 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td></td> </td></td></td>	18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td></td> </td></td>	GOL <td>4460944 <td></td> <td></td> <td></td> <td></td> </td>	4460944 <td></td> <td></td> <td></td> <td></td>				
4	WHT <td>P1 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL503 (87)</td> </td></td></td></td>	P1 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL503 (87)</td> </td></td></td>	18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL503 (87)</td> </td></td>	GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL503 (87)</td> </td>	4460944 <td></td> <td></td> <td></td> <td>RL503 (87)</td>				RL503 (87)
5	WHT <td>P3 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL502 (87)</td> </td></td></td></td>	P3 <td>18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL502 (87)</td> </td></td></td>	18 AWG <td>GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL502 (87)</td> </td></td>	GOL <td>4460944 <td></td> <td></td> <td></td> <td>RL502 (87)</td> </td>	4460944 <td></td> <td></td> <td></td> <td>RL502 (87)</td>				RL502 (87)
6									4460944

X500 - PLATSSENSOR									
CONNECTOR PART NUMBER: 4460984									
CONN	WIRE	WIRE	GAUGE	JOINT	TERMINAL	SEAL	TO		
1	WHT	P10	18 AWG	GOL	4460945	PIN	IP114 (2)		
2	WHT <td>P6 <td>18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>X58 (2)</td> </td></td></td></td>	P6 <td>18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>X58 (2)</td> </td></td></td>	18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>X58 (2)</td> </td></td>	GOL <td>4460945 <td></td> <td></td> <td></td> <td>X58 (2)</td> </td>	4460945 <td></td> <td></td> <td></td> <td>X58 (2)</td>				X58 (2)
3	WHT <td>P4 <td>18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>S192 (2)</td> </td></td></td></td>	P4 <td>18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>S192 (2)</td> </td></td></td>	18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>S192 (2)</td> </td></td>	GOL <td>4460945 <td></td> <td></td> <td></td> <td>S192 (2)</td> </td>	4460945 <td></td> <td></td> <td></td> <td>S192 (2)</td>				S192 (2)
4	WHT <td>P5 <td>18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>S191 (2)</td> </td></td></td></td>	P5 <td>18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>S191 (2)</td> </td></td></td>	18 AWG <td>GOL <td>4460945 <td></td> <td></td> <td></td> <td>S191 (2)</td> </td></td>	GOL <td>4460945 <td></td> <td></td> <td></td> <td>S191 (2)</td> </td>	4460945 <td></td> <td></td> <td></td> <td>S191 (2)</td>				S191 (2)

IP114									
CONNECTOR PART NUMBER: SEE NOTE 4									
CONN	WIRE	WIRE	GAUGE	JOINT	TERMINAL	SEAL	TO		
1	WHT	P2	18 AWG	GOL	N/A		X58 (1)		
2	WHT <td>P5</td> <td>18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL503 (80)</th> <th></th> <th></th> </td></td>	P5	18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL503 (80)</th> <th></th> <th></th> </td>	GOL <th>N/A</th> <th></th> <th>RL503 (80)</th> <th></th> <th></th>	N/A		RL503 (80)		
3	WHT <td>P2</td> <td>18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL502 (80)</th> <th></th> <th></th> </td></td>	P2	18 AWG <td>GOL <th>N/A</th> <th></th> <th>RL502 (80)</th> <th></th> <th></th> </td>	GOL <th>N/A</th> <th></th> <th>RL502 (80)</th> <th></th> <th></th>	N/A		RL502 (80)		
4	WHT <td>P10 <td>18 AWG <td>GOL <th>N/A</th> <th></th> <th>X500 (1)</th> <th></th> <th></th> </td></td></td>	P10 <td>18 AWG <td>GOL <th>N/A</th> <th></th> <th>X500 (1)</th> <th></th> <th></th> </td></td>	18 AWG <td>GOL <th>N/A</th> <th></th> <th>X500 (1)</th> <th></th> <th></th> </td>	GOL <th>N/A</th> <th></th> <th>X500 (1)</th> <th></th> <th></th>	N/A		X500 (1)		

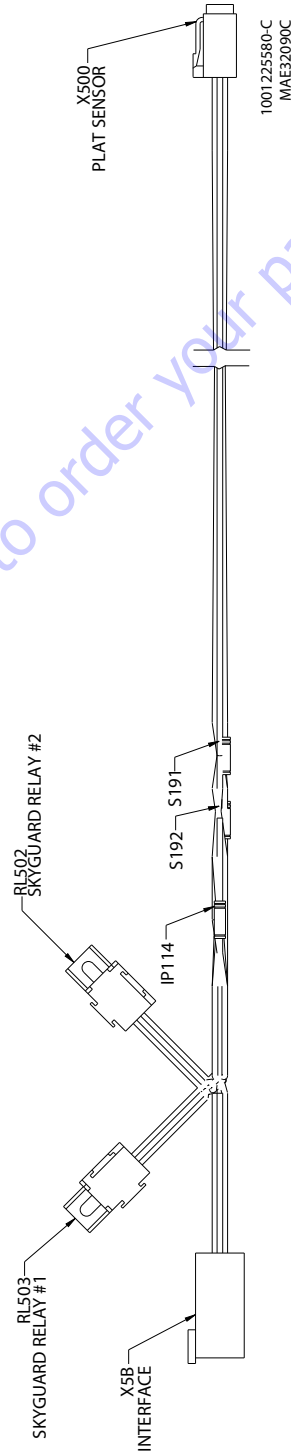


Figure 7-53. Gen 2 Plat Interface Harness

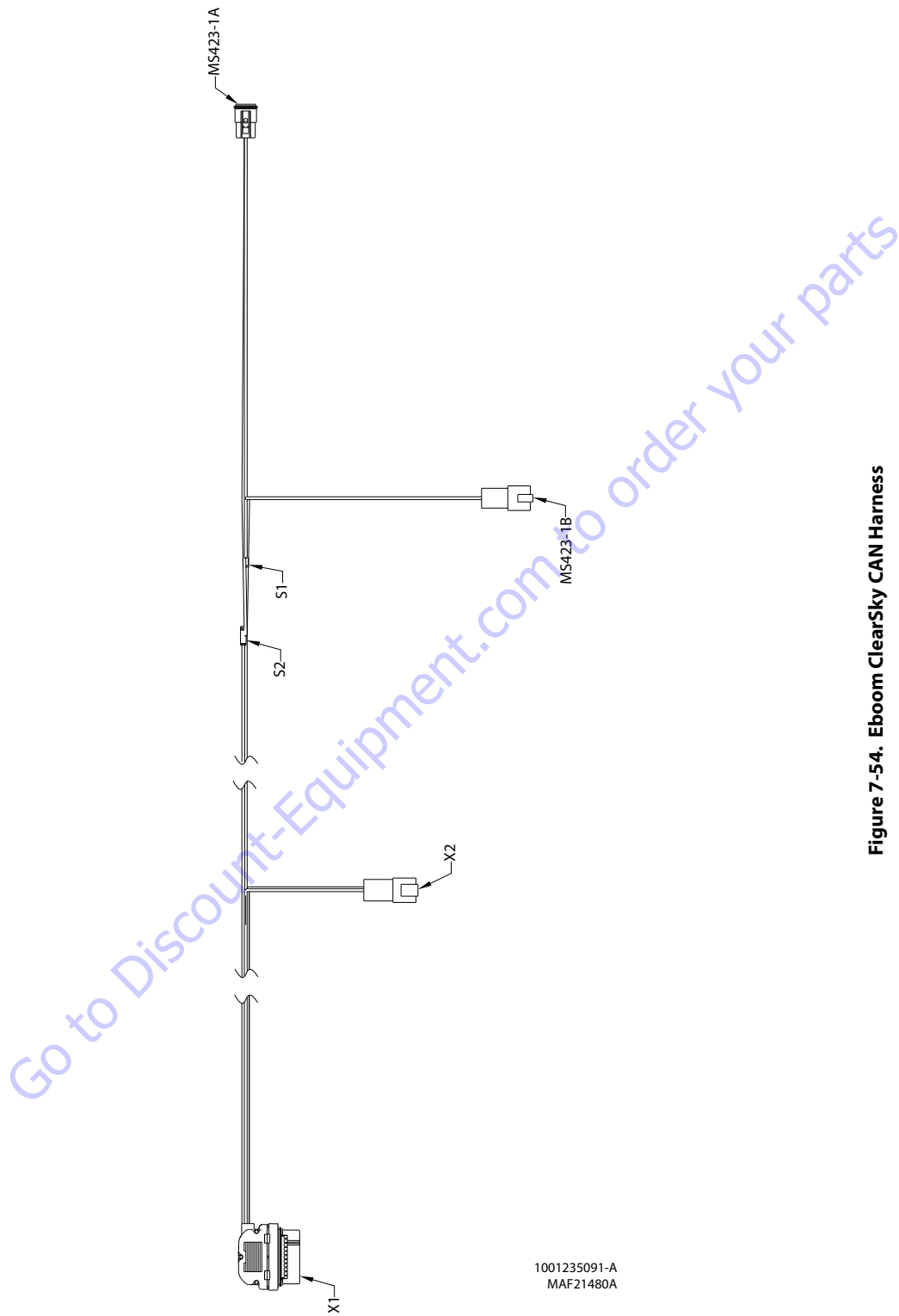


Figure 7-54. Eboom ClearSky CAN Harness

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

X1 - TCU					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4	ORG	2-0IGN	18 AWG	GXL	X2 (3)
5					
6					
7	GRN	CAN 1L-3	18 AWG	GXL	S2 (1)
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18	YEL	CAN 1H-3	18 AWG	GXL	S1 (1)
19					
20					
21					
22					
23	BLK	0-0 GND	18 AWG	GXL	X2 (2)
24	RED	1-0 BAT	18 AWG	GXL	X2 (1)

X1 - CONNECT TMR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-0 BAT	18 AWG	GXL	X1 (24)
2	BLK	0-0 GND	18 AWG	GXL	X1 (23)
3	ORG	2-0 IGN	18 AWG	GXL	X1 (4)
4					

S1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN 1H-3	18 AWG	GXL	X1 (18)
2	YEL	CAN 1H-2	18 AWG	GXL	MS423-1A (A)
3	YEL	CAN 1H-1	18 AWG	GXL	MS423-1B (A)

S2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	CAN 1L-3	18 AWG	GXL	X1 (7)
2	GRN	CAN 1L-2	18 AWG	GXL	MS423-1A (B)
3	GRN	CAN 1L-1	18 AWG	GXL	MS423-1B (A)

MS423-1A - TO CAN TEE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN 1H-2	18 AWG	GXL	S1 (2)
B	GRN	CAN 1L-2	18 AWG	GXL	S2 (2)
C					

MS423-1B - FROM CAN TEE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN 1H-1	18 AWG	GXL	S1 (2)
B	GRN	CAN 1L-1	18 AWG	GXL	S2 (2)
C					

7.9 ELECTRICAL SCHEMATICS

SHEET 2: PLATFORM CONSOLE

Console Harness

Platform Beacon

SHEET 3: PLATFORM AND BOOM COMPONENTS

LSS

SHEET 4: TURNTABLE AND UGM WIRING

Main Valve Harness

Turntable Harness

SHEET 5: GROUND CONTROL WIRING

Ground Panel Harness

SHEET 6: CHASSIS WIRING

Traction Harness

Chassis to Turntable

Steer/Brake Harness

SHEET 1

SHEET 7: OPTIONS

Generator

SHEET 8: OPTIONS

Chassis Head/Tail Light

Inverter IGN

Platform Work Light

Generator IGN

Sky Guard

Soft Touch

SHEET 9: PLATFORM INTERFACE

Gen 2 Plat Interface

Harness, E-Boom ClearSky CAN

1001245676-A

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

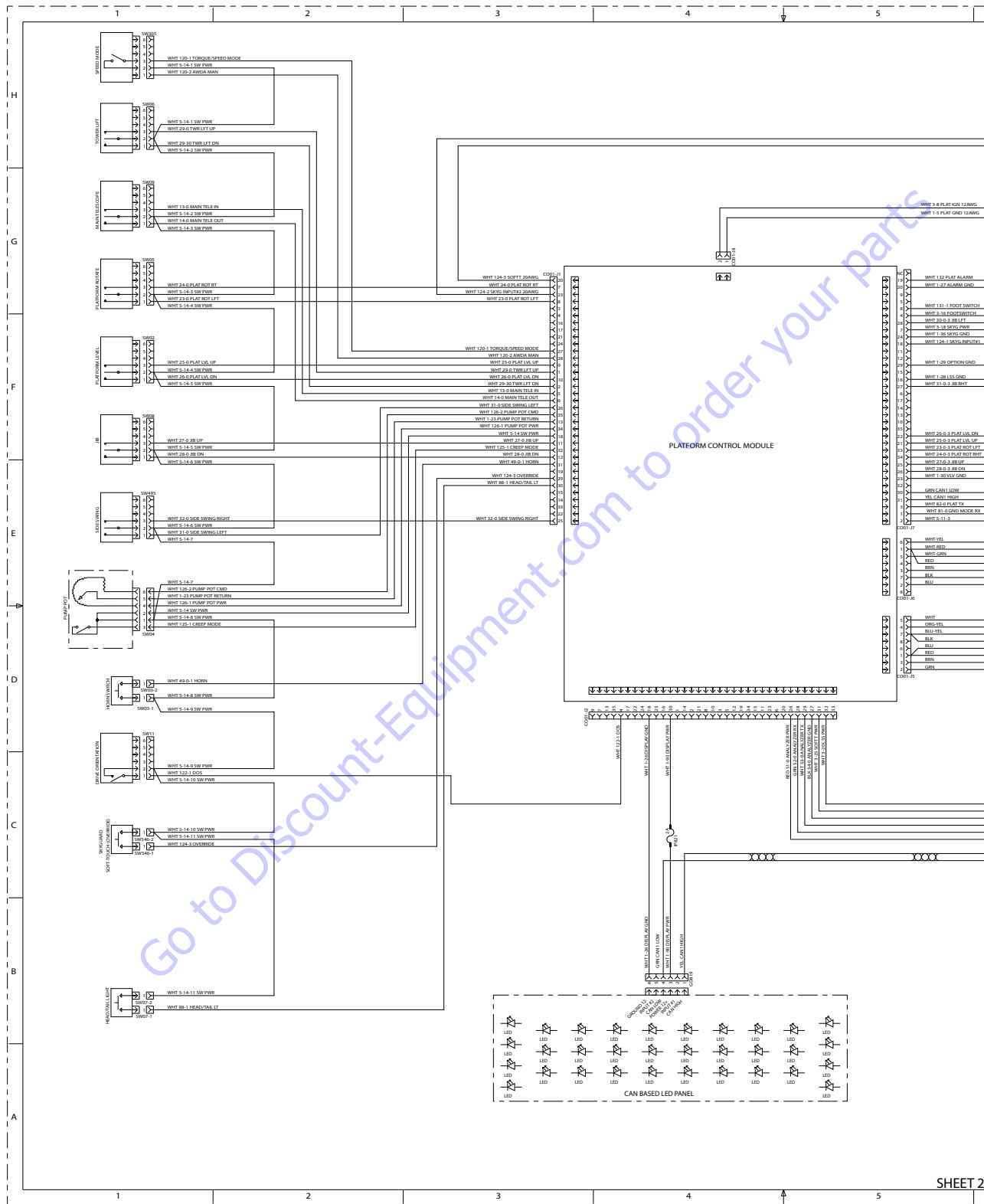


Figure 7-55. Electrical Schematic - Sheet 1 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

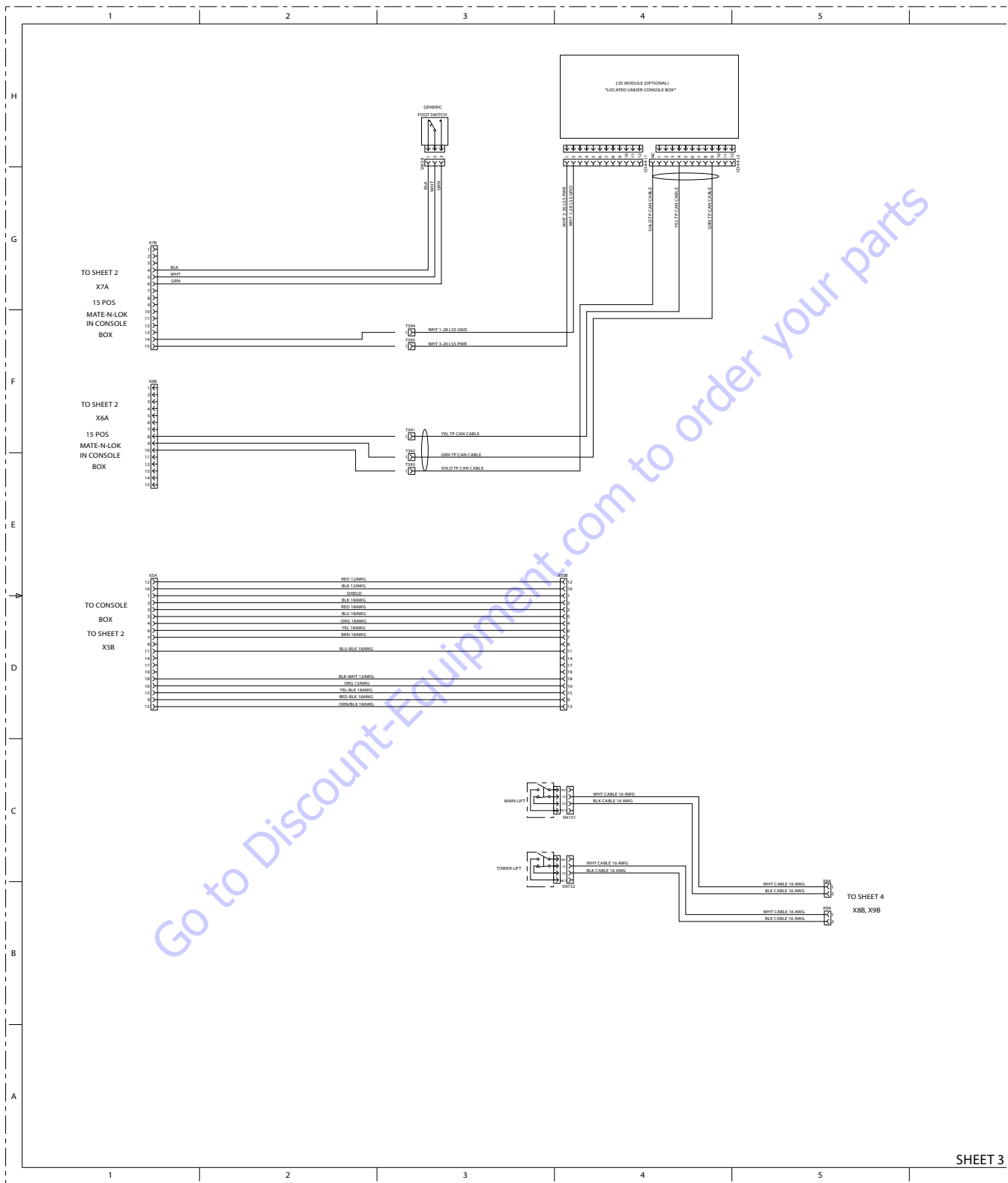


Figure 7-57. Electrical Schematic - Sheet 3 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

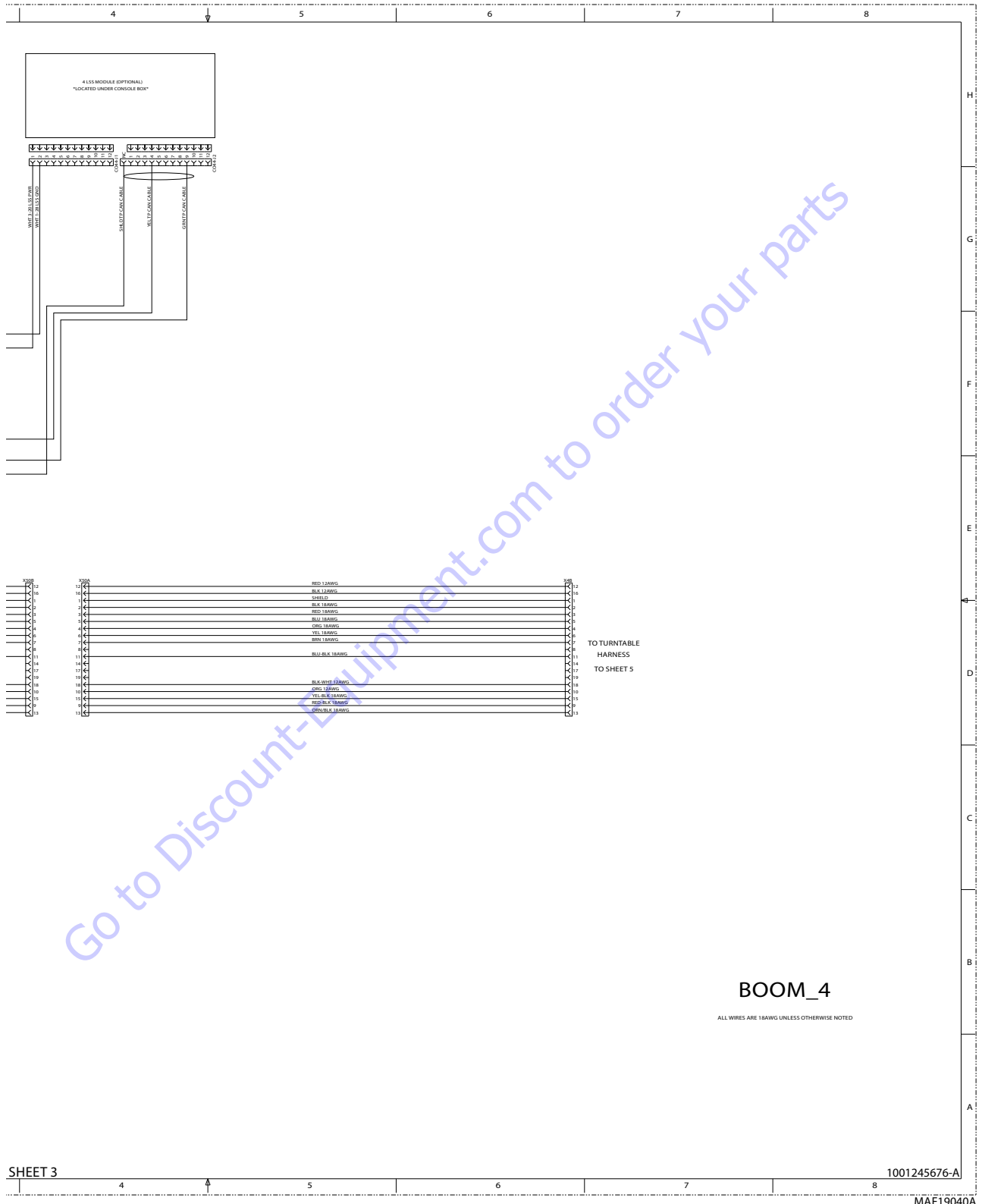


Figure 7-58. Electrical Schematic - Sheet 4 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

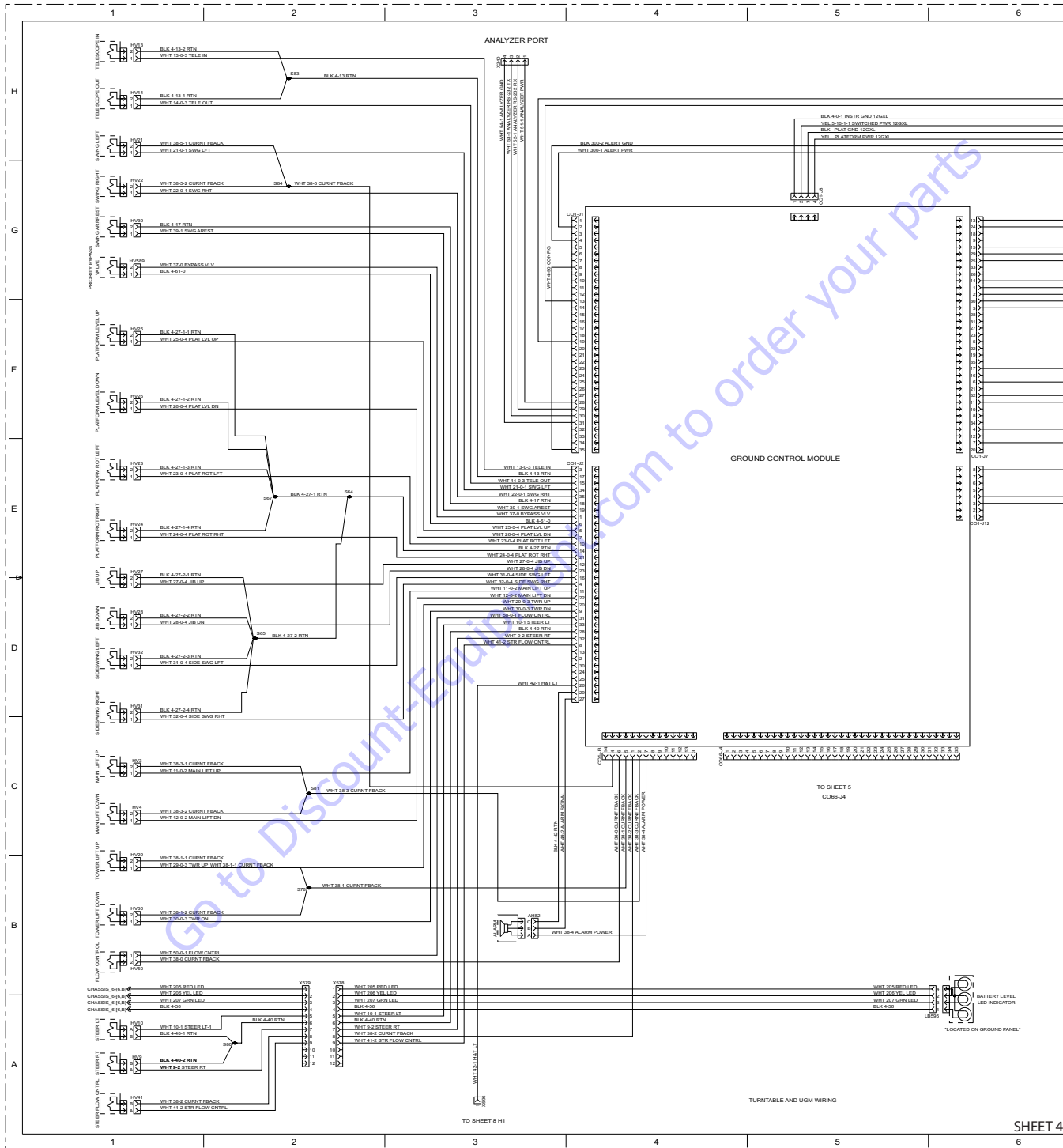


Figure 7-59. Electrical Schematic - Sheet 5 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

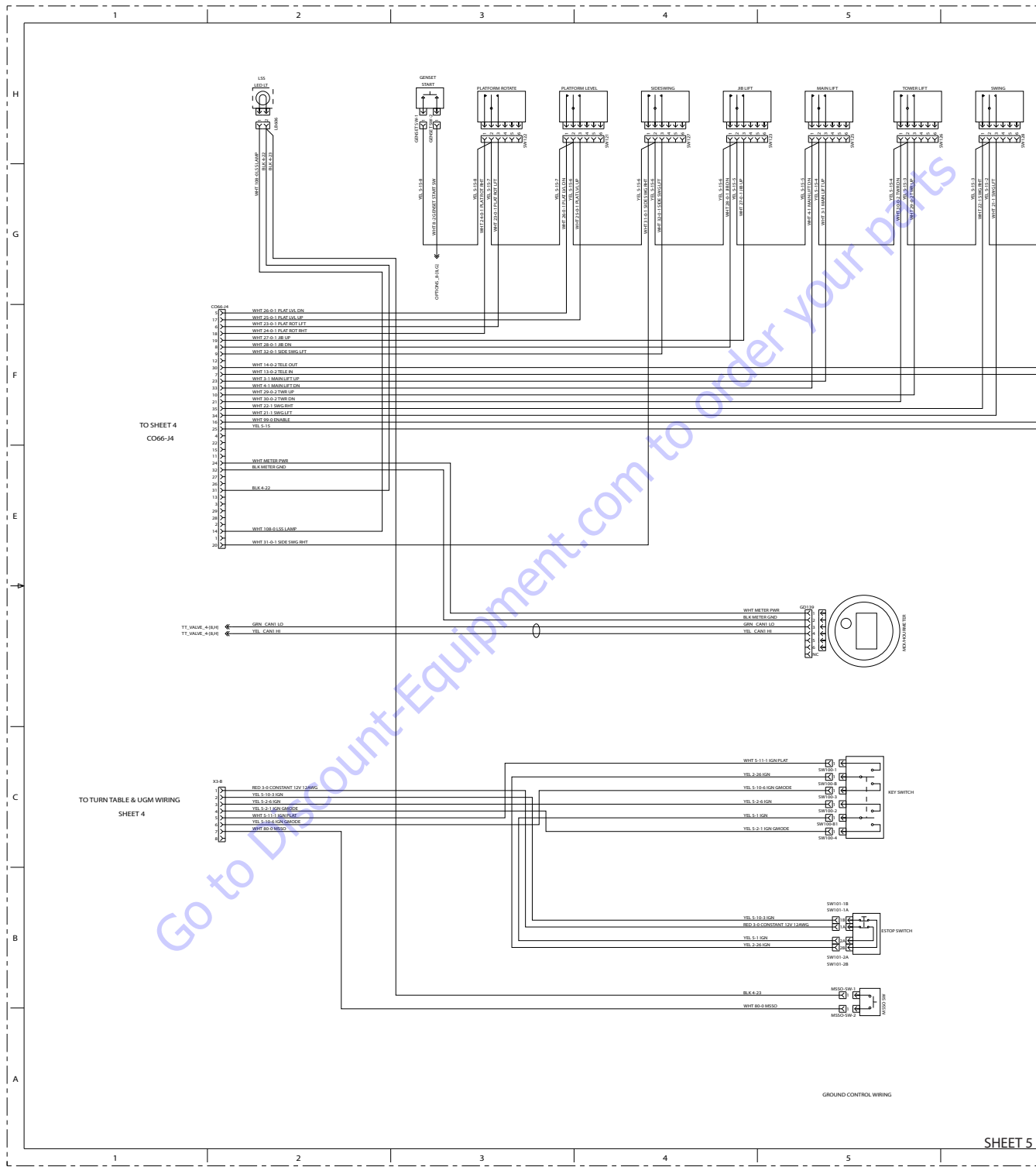
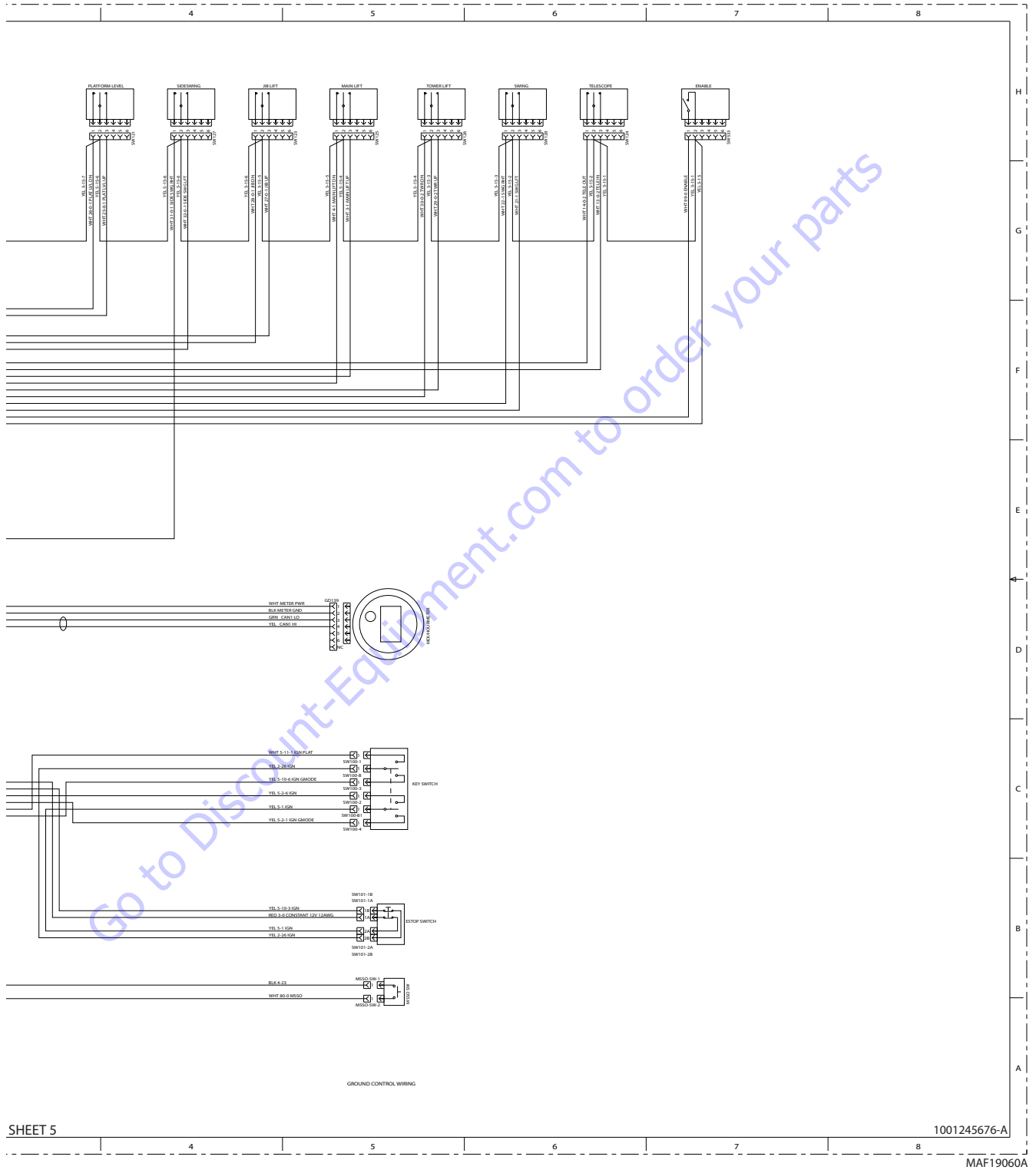


Figure 7-61. Electrical Schematic - Sheet 7 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS



SHEET 5

1001245676-A

MAF19060A

Figure 7-62. Electrical Schematic - Sheet 8 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

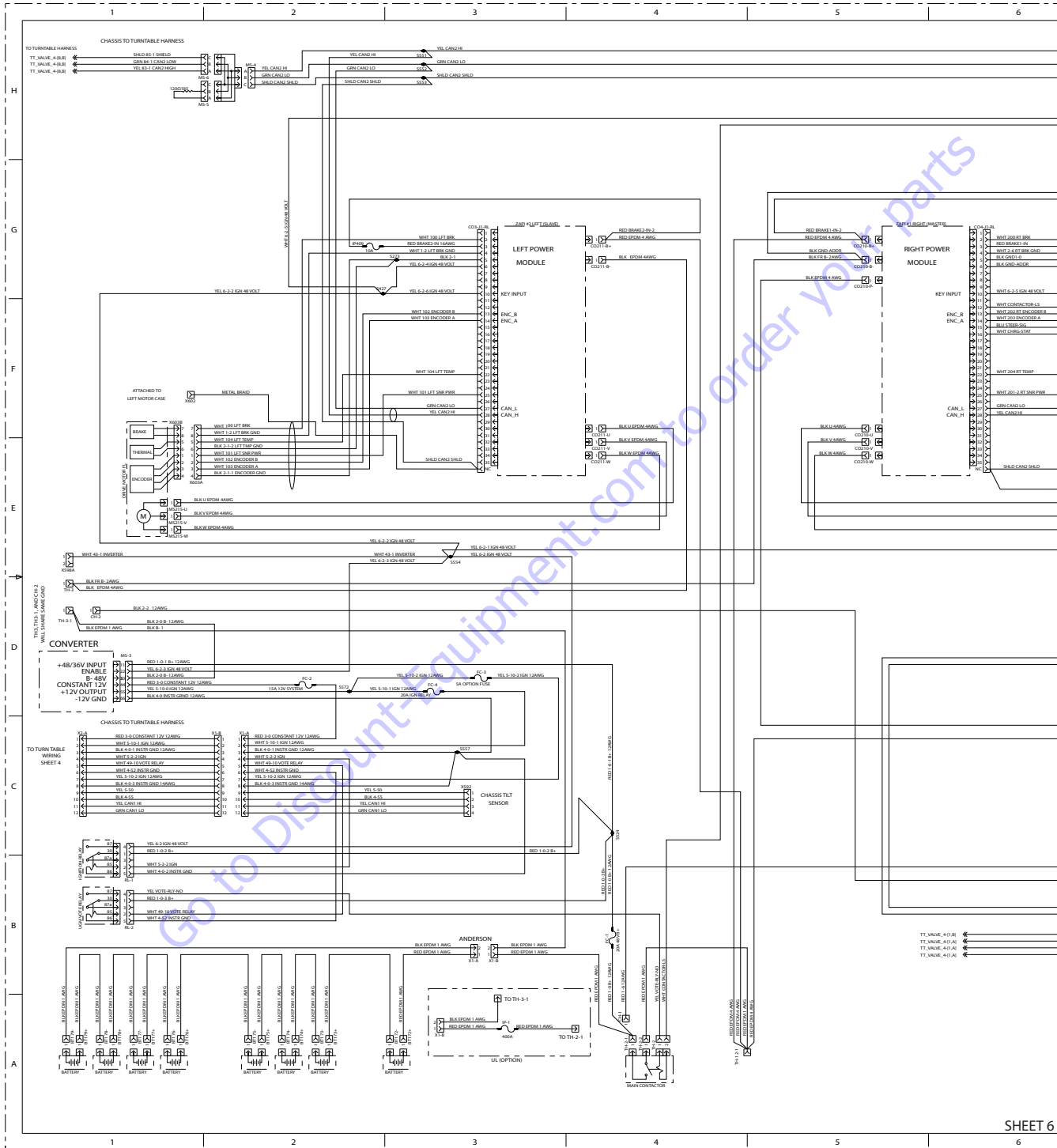


Figure 7-63. Electrical Schematic - Sheet 9 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

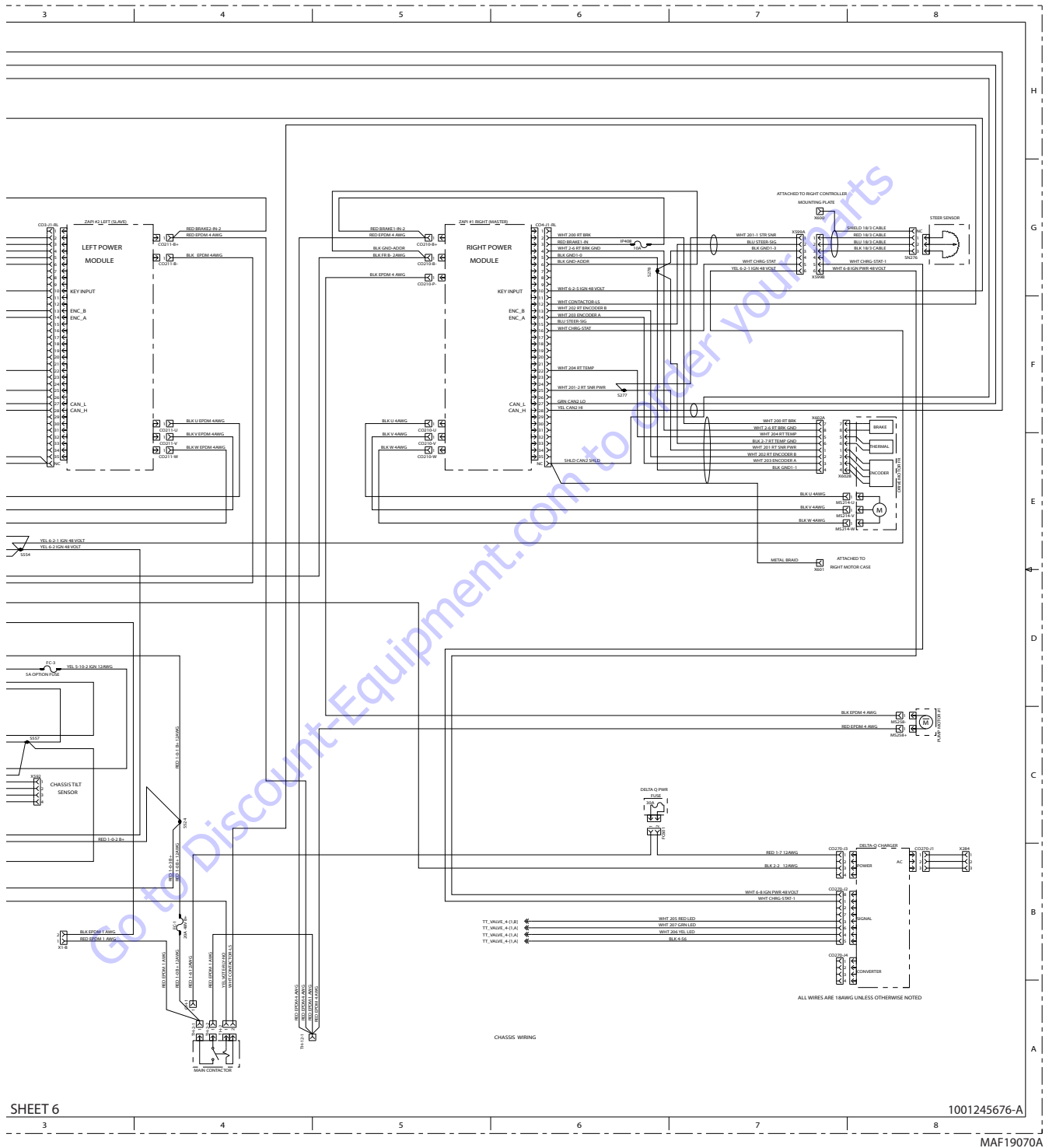


Figure 7-64. Electrical Schematic - Sheet 10 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

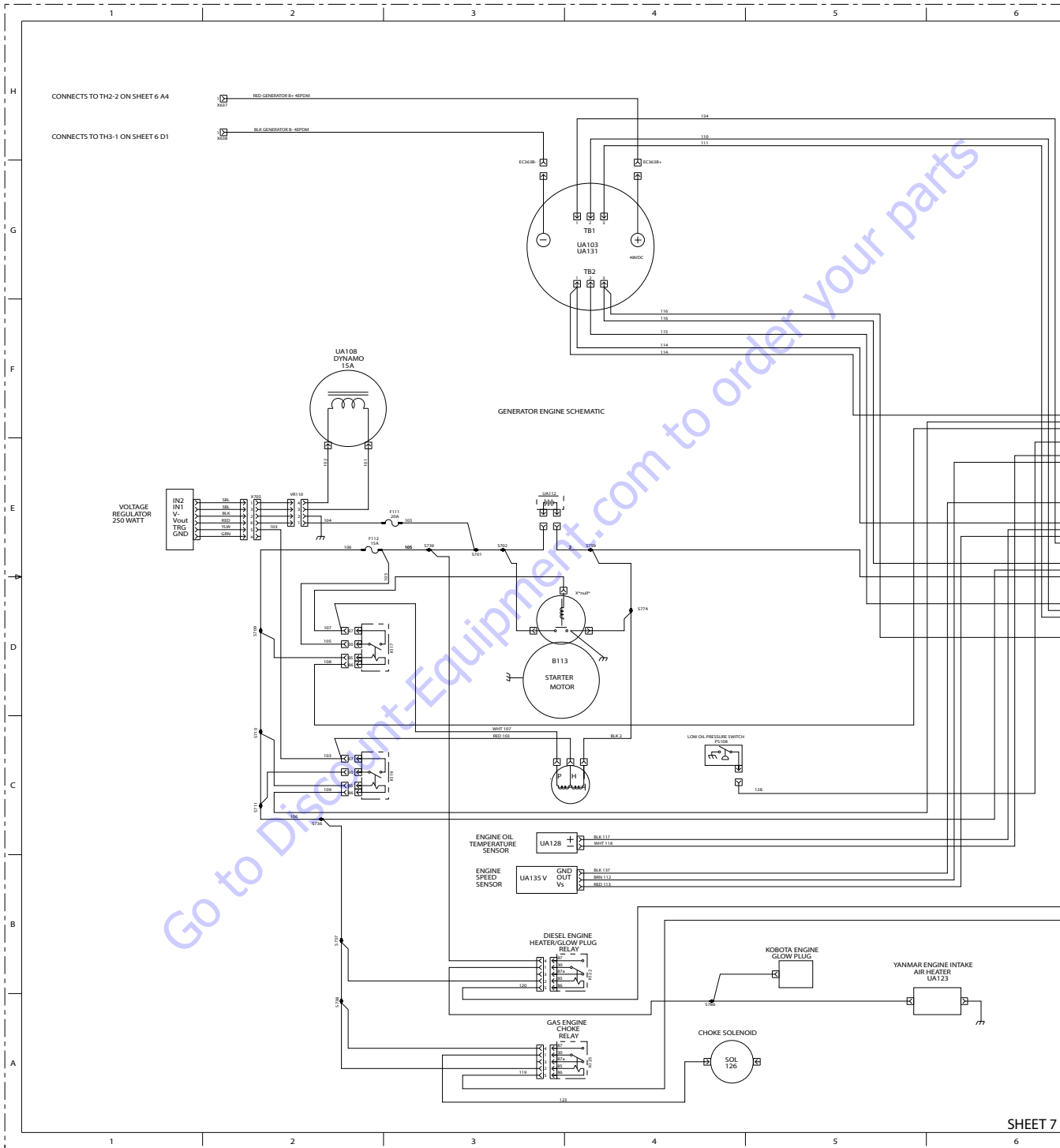


Figure 7-65. Electrical Schematic - Sheet 11 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

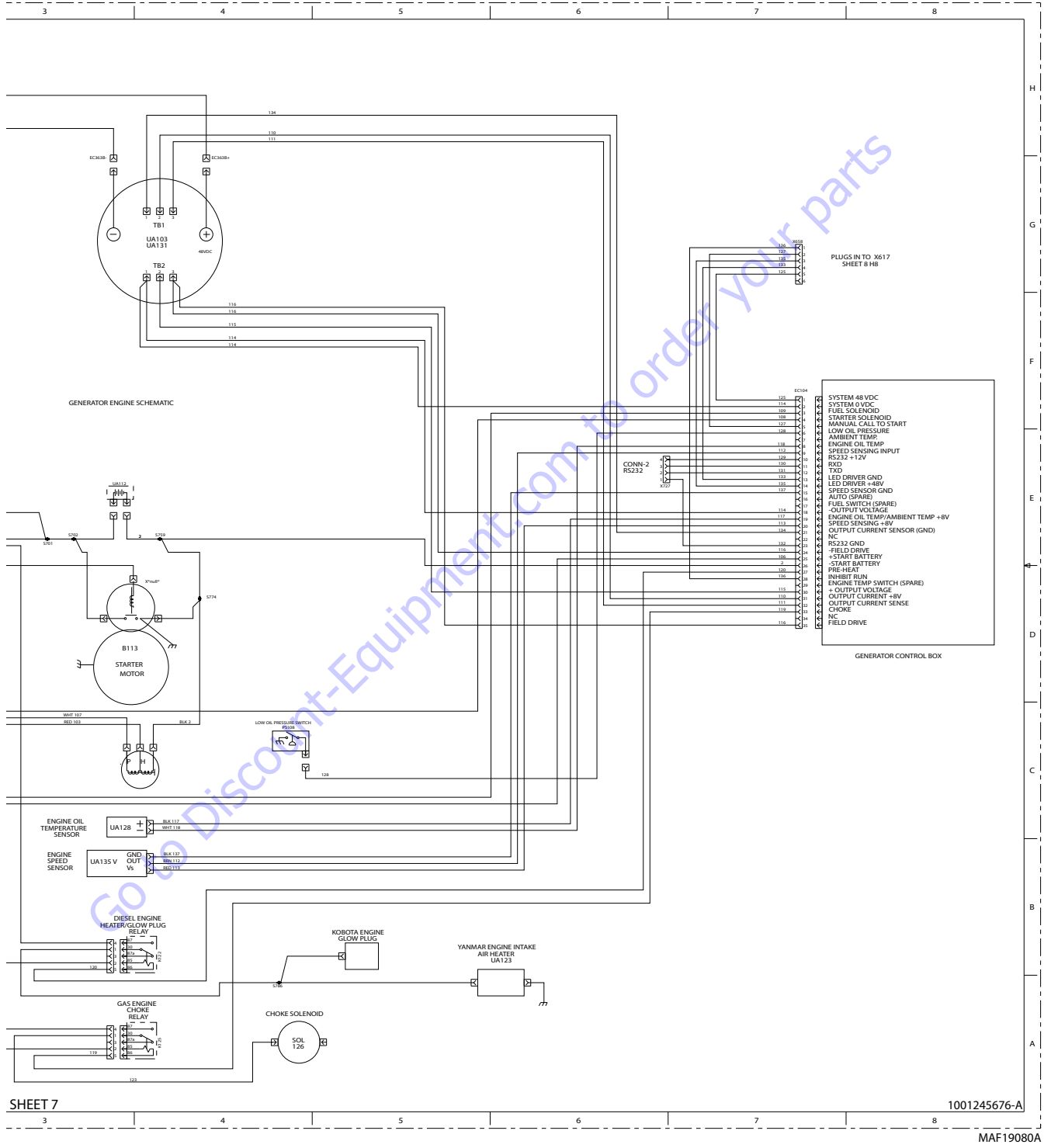


Figure 7-66. Electrical Schematic - Sheet 12 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

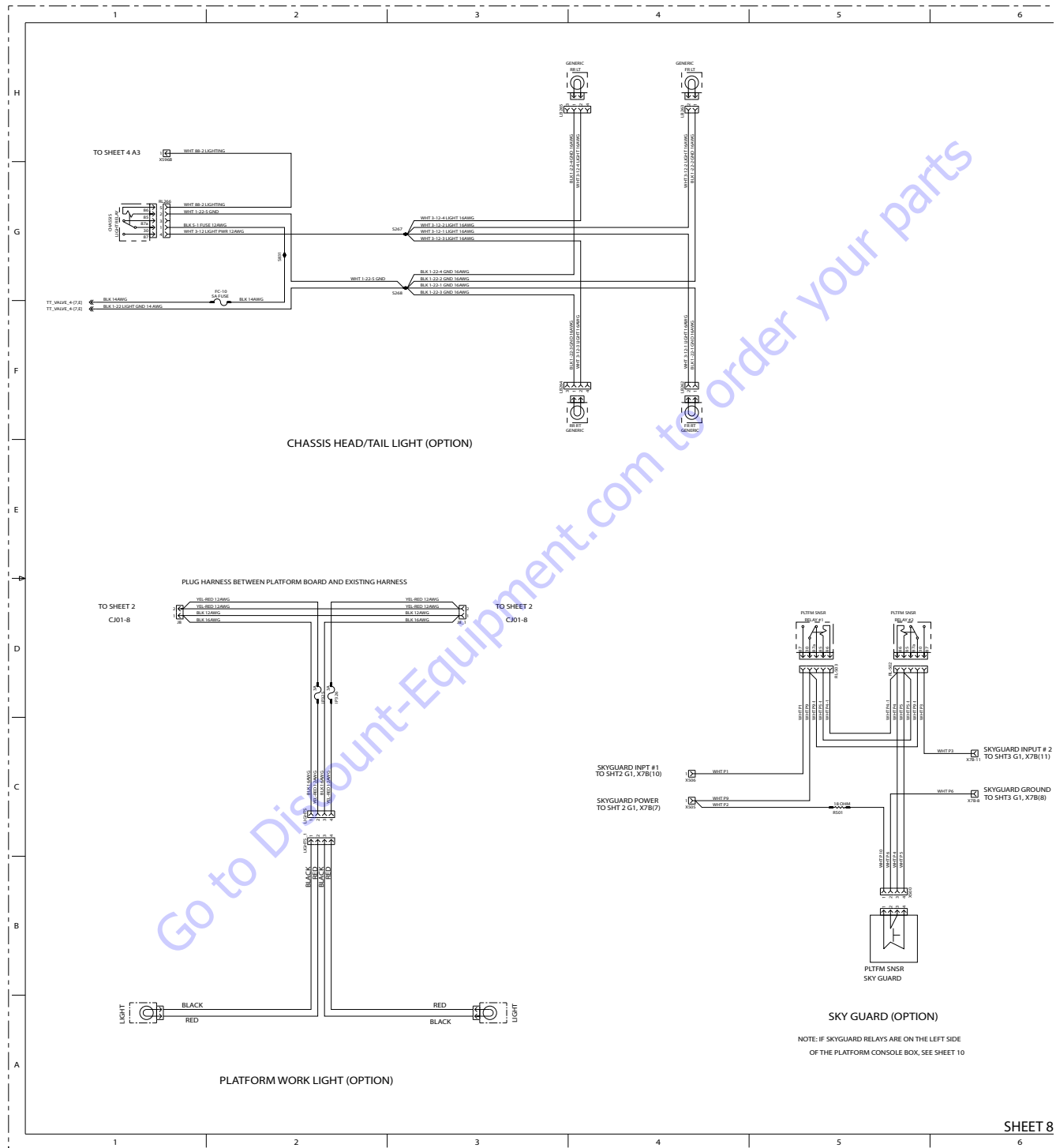
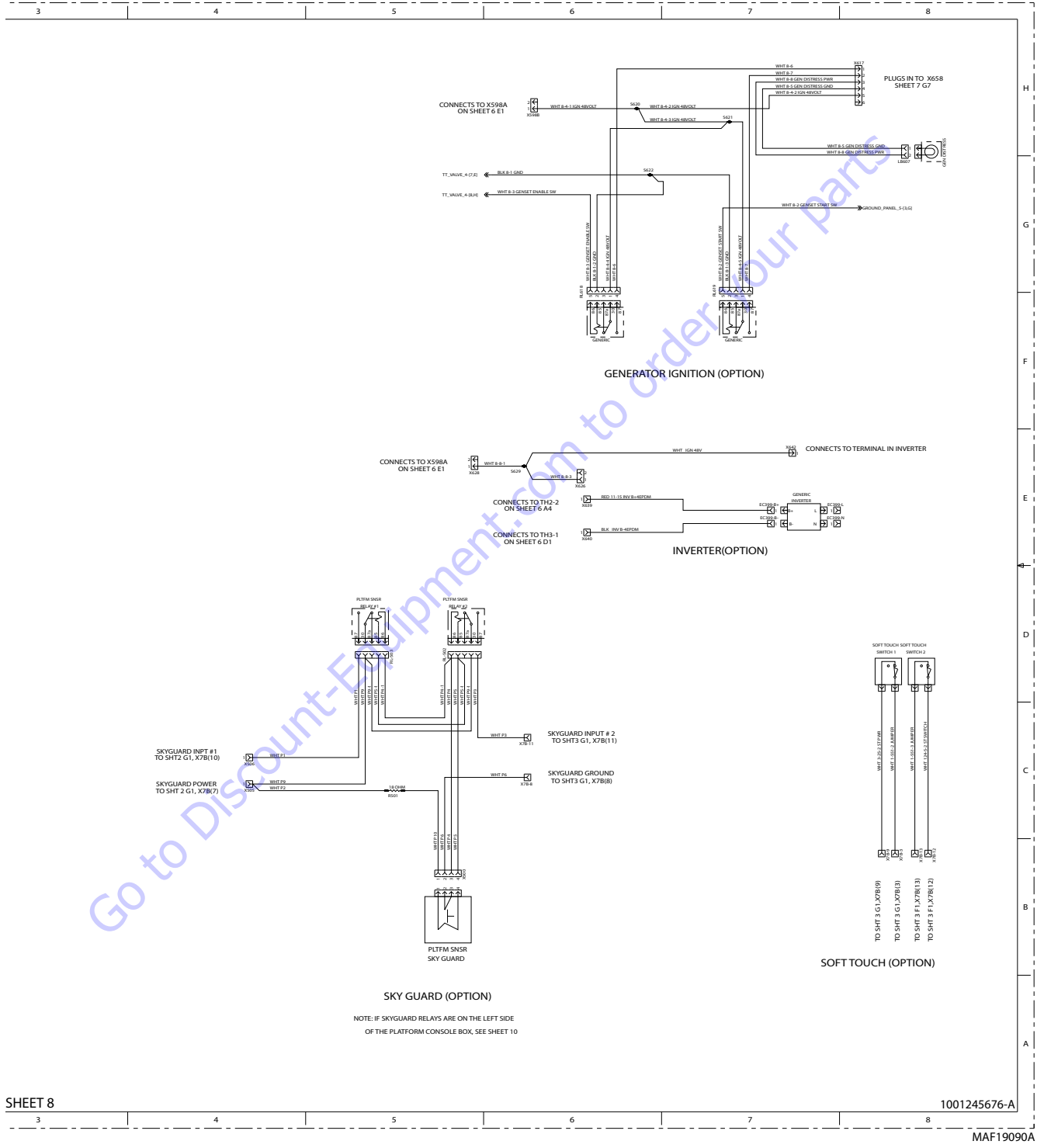


Figure 7-67. Electrical Schematic - Sheet 13 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS



SHEET 8

1001245676-A

MAF19090A

Figure 7-68. Electrical Schematic - Sheet 14 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

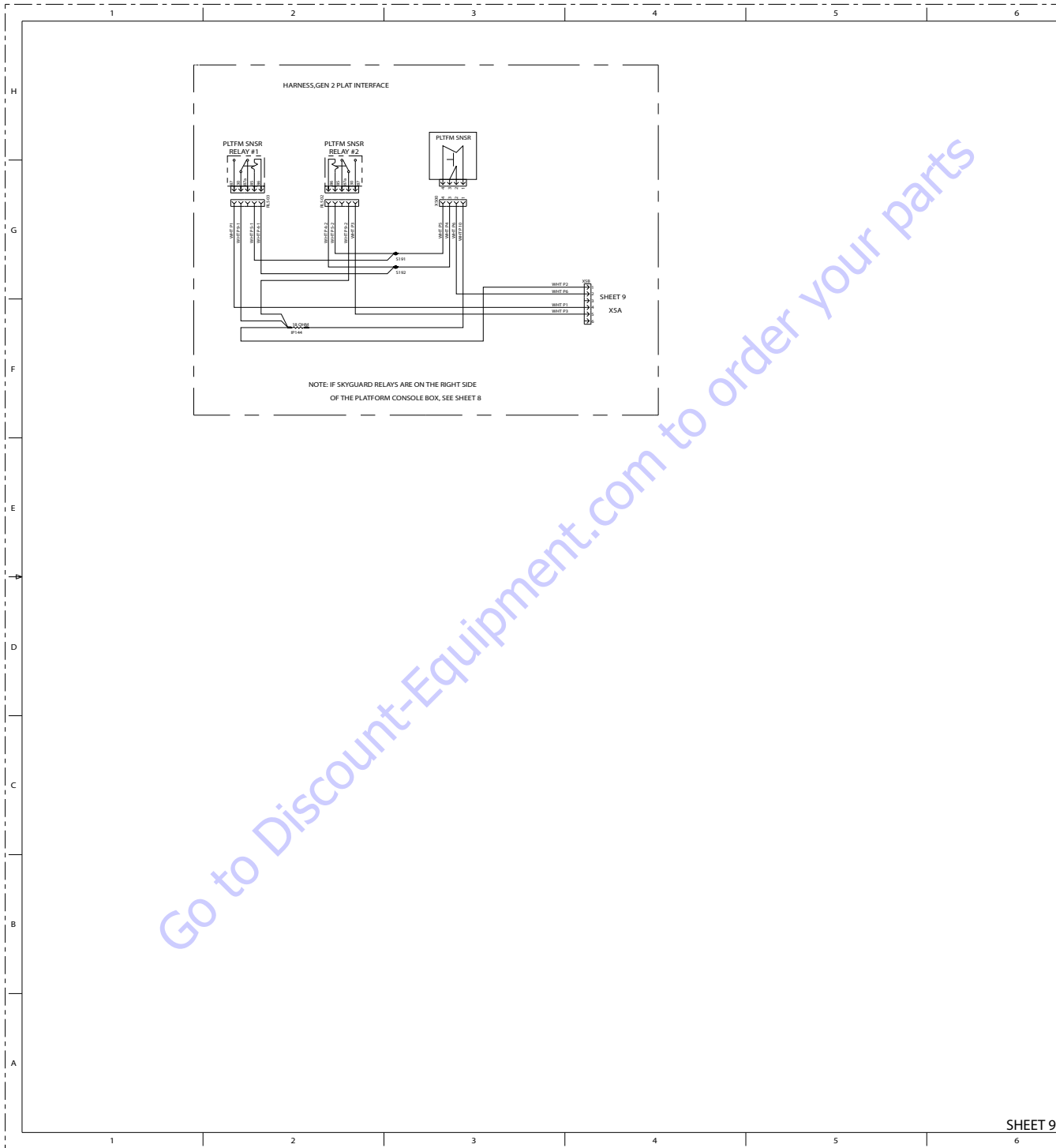


Figure 7-69. Electrical Schematic - Sheet 15 of 16

SECTION 7 - BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

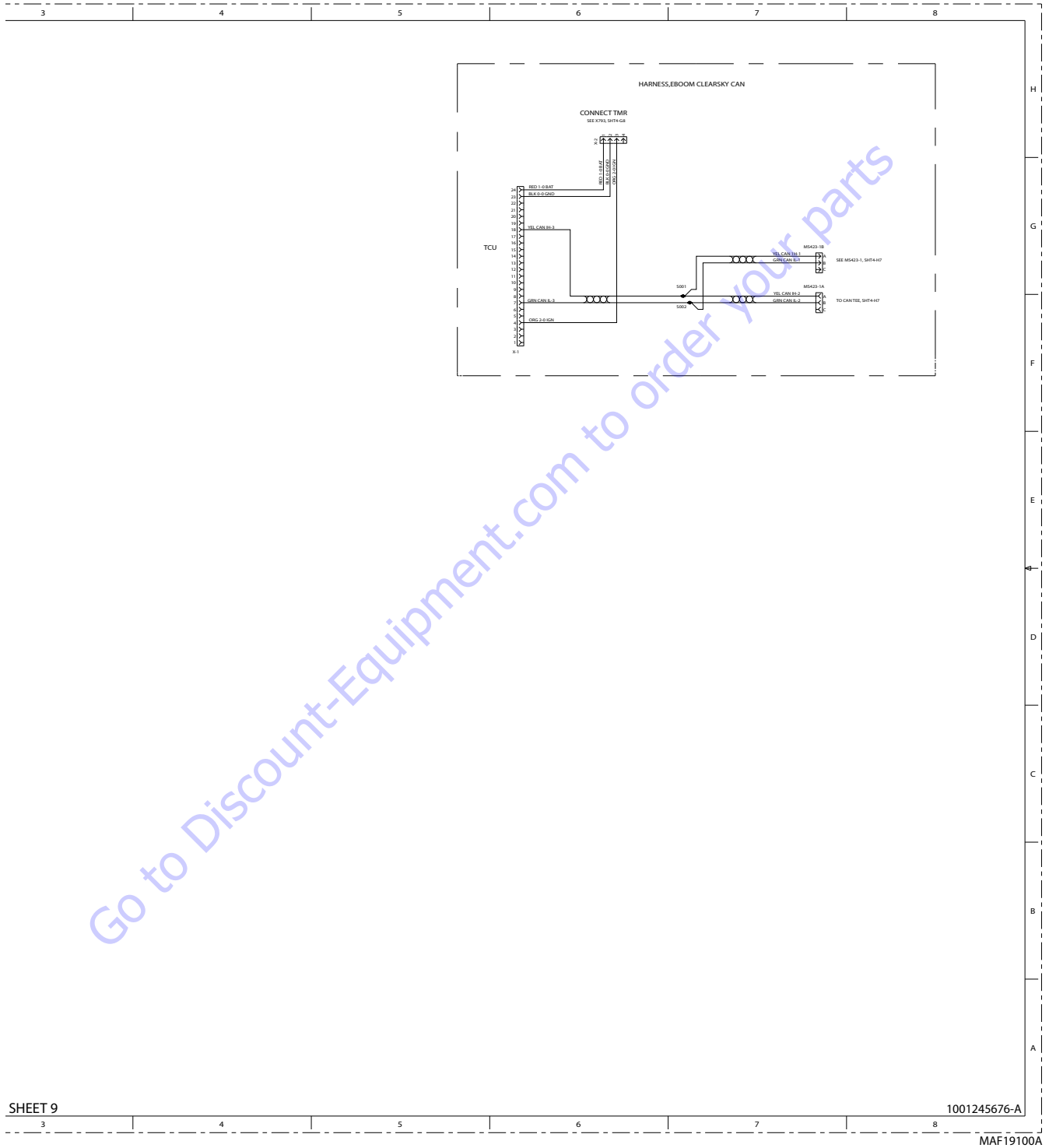


Figure 7-70. Electrical Schematic - Sheet 16 of 16

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