Connector	Pin	Function	Type	
J7 (Black)	1	PLATFORM EMS	DIGITAL	INPUT
	2	PLATFORM MODE	DIGITAL	INPUT
	3	GROUND MODE	DIGITAL	INPUT
	4	BOOM ANGLE #1 SWITCH	ANALOG	INPUT
	5	SPEED SENSOR POWER	VOLTAGE	OUTPUT
	6	CAN1 TERMINATOR	TERM	I/O
	7	BOOM ANGLE #2 SWITCH	ANALOG	INPUT
	8	UNUSED (INPUT)	ANALOG	INPUT
	9	UNUSED (GROUND)	GROUND	INPUT
	10	UNUSED (TILT SENSOR GROUND)	GROUND	INPUT
	11	TOWER ELEVATION SWITCH	DIGITAL	INPUT
	12	OSCILLATING AXLE SWING SWITCH #1	DIGITAL	INPUT
	13	CAN1 HIGH	SERIAL	I/O
	14	GROUND MODE POWER TO PLATFORM	DIGITAL	INPUT
	15	FOOTSWITCH	DIGITAL	INPUT
	16	UNUSED (+5 VOLTS)	VOLTAGE	OUTPUT
	17	CAN1 TERMINATOR	TERM	I/O
	18	CAN1 SHIELD	GROUND	INPUT
	19	IGNITION RELAY GROUND	GROUND	INPUT
	20	OSCILLATING AXLE SWING SWITCH #2	ANALOG	INPUT
	21	TELESCOPE RETRACTED SWITCH #1	DIGITAL	INPUT
	22	TELESCOPE CUTBACK SWITCH	DIGITAL	INPUT
	23	UNUSED (CAPACITY LENGTH SWTICH #1)	DIGITAL	INPUT
	24	CAN1 LOW	SERIAL	I/O
	25	HOURMETER GROUND	GROUND	INPUT
	26	UNUSED (+5 VOLTS)	VOLTAGE	OUTPUT
	27	UNUSED (+5 VOLTS)	VOLTAGE	OUTPUT
	28	TELESCOPE RETRACTED SWITCH GROUND	GROUND	INPUT
	29	GROUND DISPLAY POWER	VBAT	OUTPUT
	30	GROUND ALARM POWER	VBAT	OUTPUT
	31	BOOM ELEVATION SWITCH POWER	VBAT	OUTPUT
	32	DOS SWITCH POWER	VBAT	OUTPUT
	33	TELESCOPE RETRACTED SWITCH POWER	VBAT	OUTPUT
	34	TELESCOPE CUTBACK SWITCH POWER	VBAT	OUTPUT
	35	DOS SWITCH	DIGITAL	INPUT

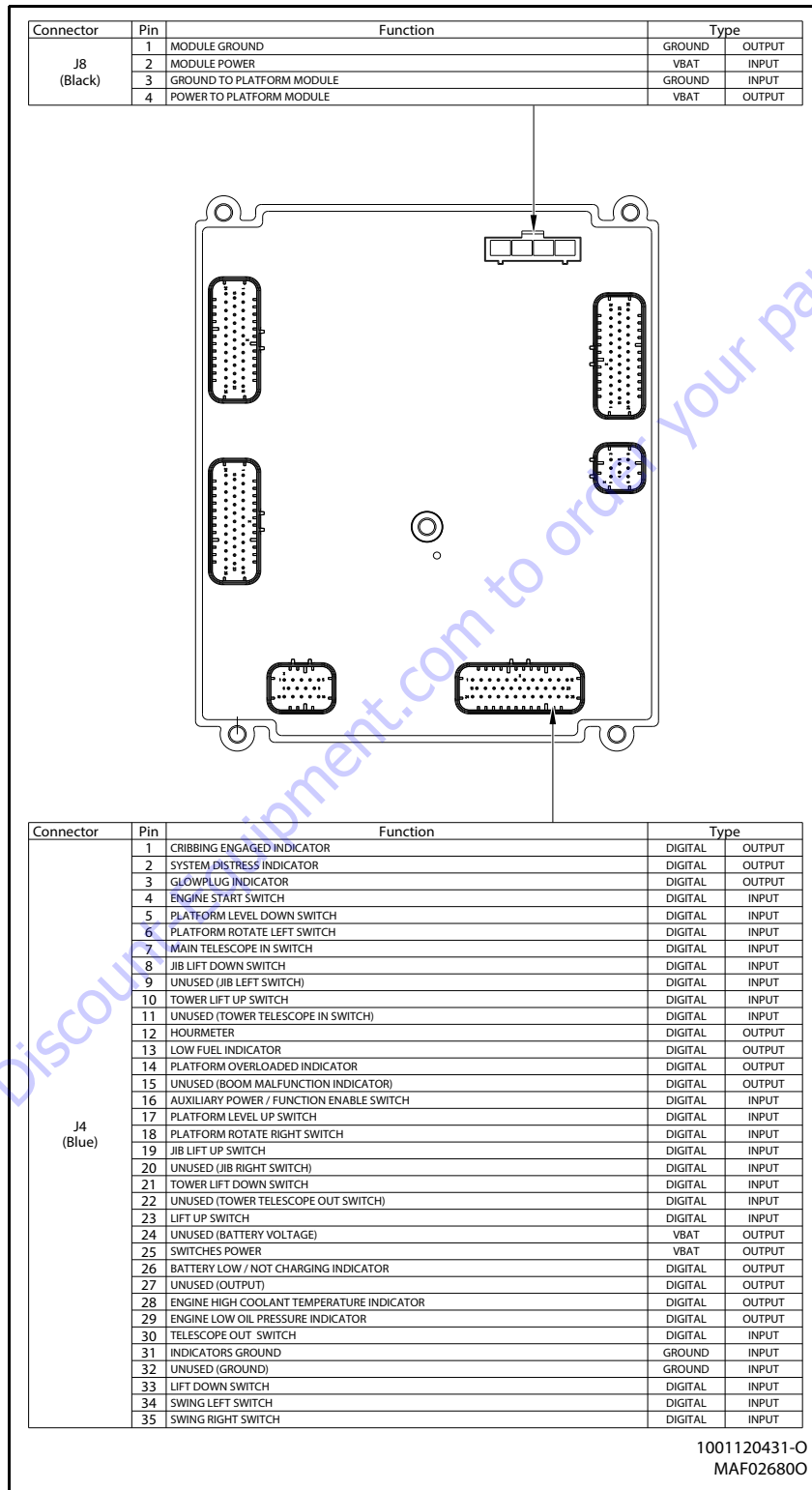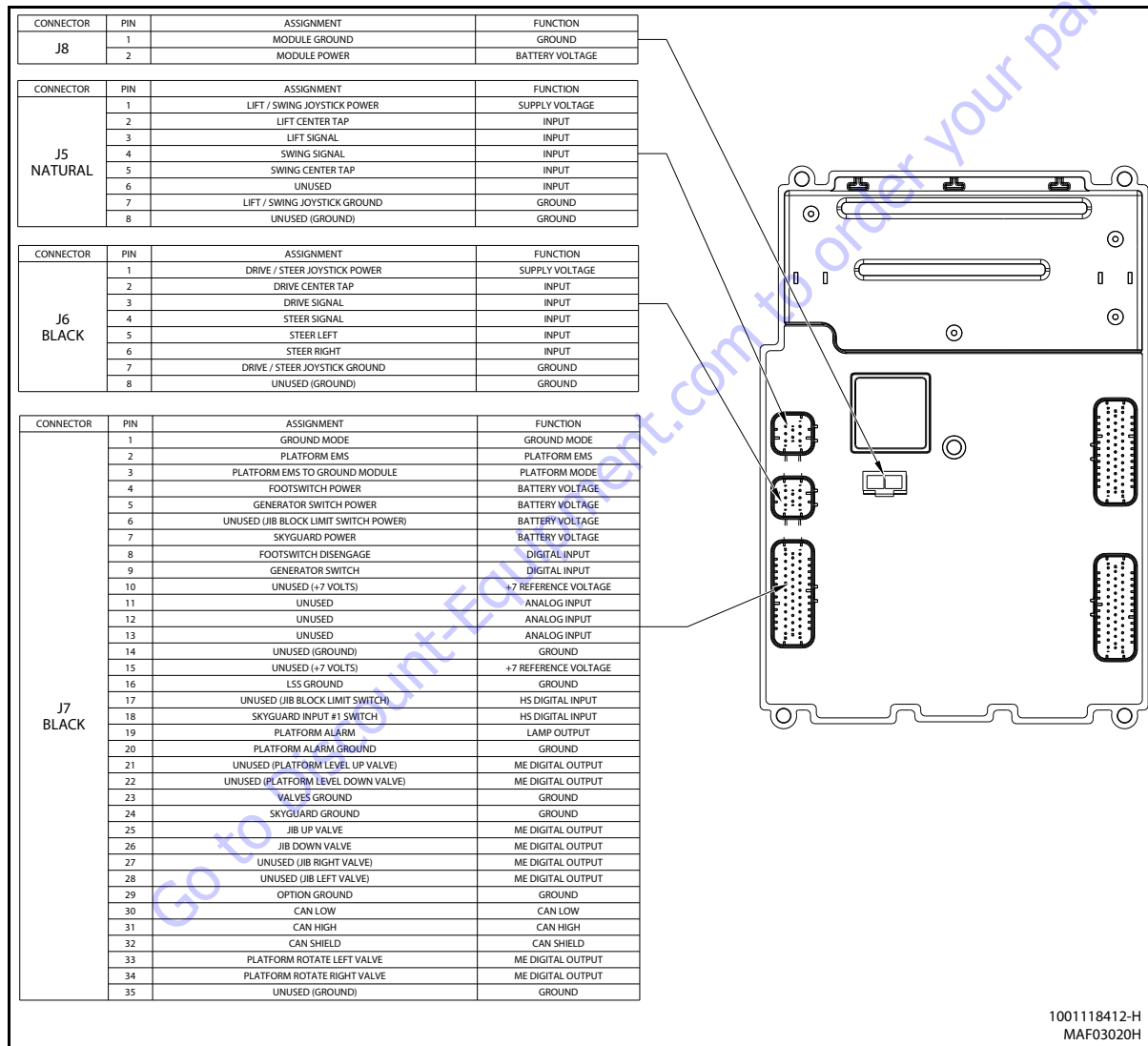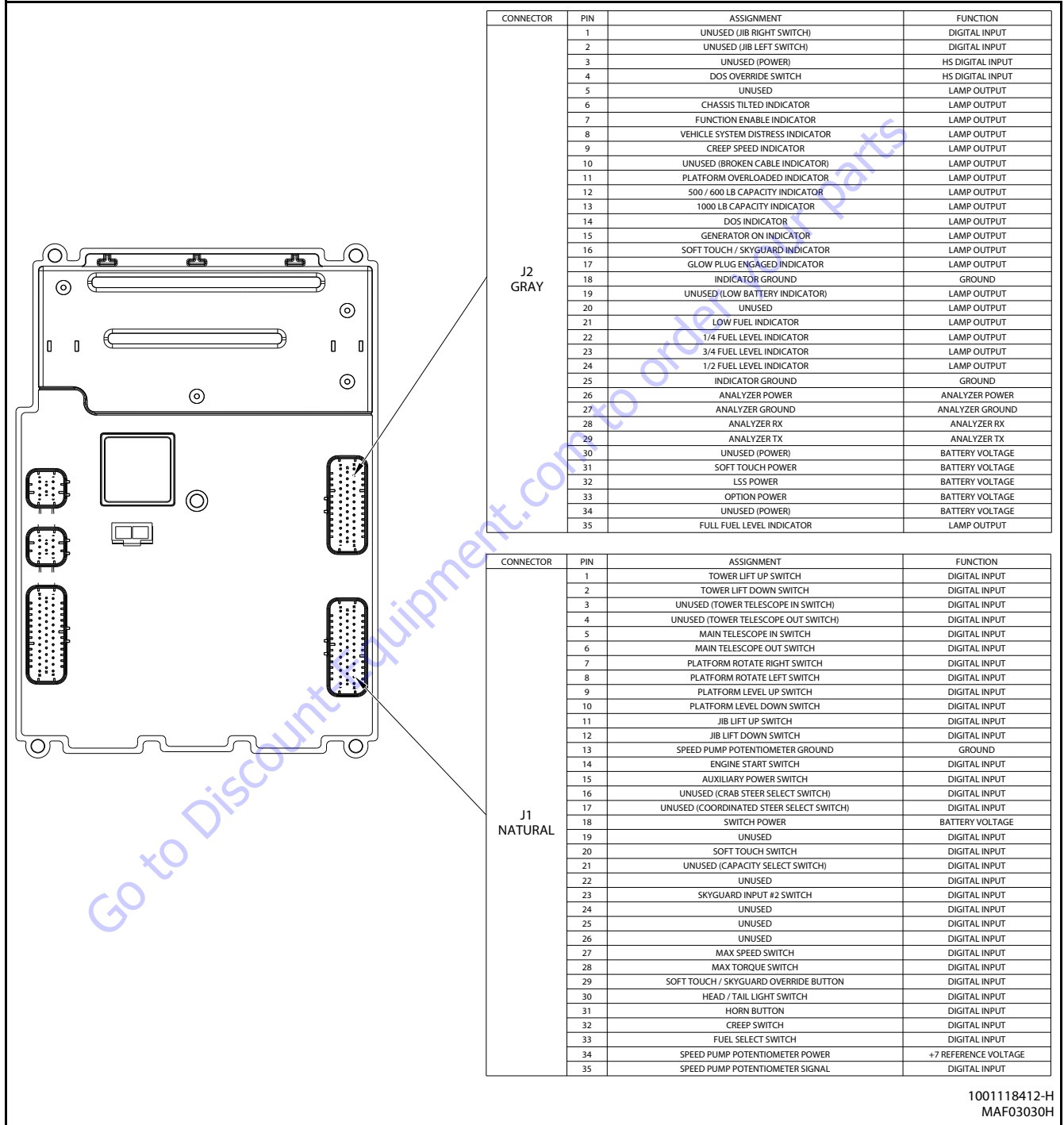| Connector	Pin	Function	Type	
J12 (Black)	1	UNUSED	FREQUENCY	INPUT
	2	UNUSED	FREQUENCY	INPUT
	3	CAN2 HIGH (TELEMATICS)	SERIAL	I/O
	4	CAN2 LOW (TELEMATICS)	SERIAL	I/O
	5	CAN2 SHIELD (TELEMATICS)	GROUND	INPUT
	6	CAN2 TERMINATOR	TERM	I/O
	7	CAN2 TERMINATOR	TERM	I/O
	8	UNUSED	DIGITAL	INPUT

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Figure 6-5. Ground Module - Sheet 3 of 4

Connector	Pin	Function	Type	
J8 (Black)	1	MODULE GROUND	GROUND	OUTPUT
	2	MODULE POWER	VBAT	INPUT
	3	GROUND TO PLATFORM MODULE	GROUND	INPUT
	4	POWER TO PLATFORM MODULE	VBAT	OUTPUT

Connector	Pin	Function	Type	
J4 (Blue)	1	CRIBBING ENGAGED INDICATOR	DIGITAL	OUTPUT
	2	SYSTEM DISTRESS INDICATOR	DIGITAL	OUTPUT
	3	GLOWPLUG INDICATOR	DIGITAL	OUTPUT
	4	ENGINE START SWITCH	DIGITAL	INPUT
	5	PLATFORM LEVEL DOWN SWITCH	DIGITAL	INPUT
	6	PLATFORM ROTATE LEFT SWITCH	DIGITAL	INPUT
	7	MAIN TELESCOPE IN SWITCH	DIGITAL	INPUT
	8	JIB LIFT DOWN SWITCH	DIGITAL	INPUT
	9	UNUSED (JIB LEFT SWITCH)	DIGITAL	INPUT
	10	TOWER LIFT UP SWITCH	DIGITAL	INPUT
	11	UNUSED (TOWER TELESCOPE IN SWITCH)	DIGITAL	INPUT
	12	HOURMETER	DIGITAL	OUTPUT
	13	LOW FUEL INDICATOR	DIGITAL	OUTPUT
	14	PLATFORM OVERLOADED INDICATOR	DIGITAL	OUTPUT
	15	UNUSED (BOOM MALFUNCTION INDICATOR)	DIGITAL	OUTPUT
	16	AUXILIARY POWER / FUNCTION ENABLE SWITCH	DIGITAL	INPUT
	17	PLATFORM LEVEL UP SWITCH	DIGITAL	INPUT
	18	PLATFORM ROTATE RIGHT SWITCH	DIGITAL	INPUT
	19	JIB LIFT UP SWITCH	DIGITAL	INPUT
	20	UNUSED (JIB RIGHT SWITCH)	DIGITAL	INPUT
	21	TOWER LIFT DOWN SWITCH	DIGITAL	INPUT
	22	UNUSED (TOWER TELESCOPE OUT SWITCH)	DIGITAL	INPUT
	23	LIFT UP SWITCH	DIGITAL	INPUT
	24	UNUSED (BATTERY VOLTAGE)	VBAT	OUTPUT
	25	SWITCHES POWER	VBAT	OUTPUT
	26	BATTERY LOW / NOT CHARGING INDICATOR	DIGITAL	OUTPUT
	27	UNUSED (OUTPUT)	DIGITAL	OUTPUT
	28	ENGINE HIGH COOLANT TEMPERATURE INDICATOR	DIGITAL	OUTPUT
	29	ENGINE LOW OIL PRESSURE INDICATOR	DIGITAL	OUTPUT
	30	TELESCOPE OUT SWITCH	DIGITAL	INPUT
	31	INDICATORS GROUND	GROUND	INPUT
	32	UNUSED (GROUND)	GROUND	INPUT
	33	LIFT DOWN SWITCH	DIGITAL	INPUT
	34	SWING LEFT SWITCH	DIGITAL	INPUT
	35	SWING RIGHT SWITCH	DIGITAL	INPUT

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Figure 6-6. Ground Module - Sheet 4 of 4

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J8	1	MODULE GROUND	GROUND
	2	MODULE POWER	BATTERY VOLTAGE

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J5 NATURAL	1	LIFT / SWING JOYSTICK POWER	SUPPLY VOLTAGE
	2	LIFT CENTER TAP	INPUT
	3	LIFT SIGNAL	INPUT
	4	SWING SIGNAL	INPUT
	5	SWING CENTER TAP	INPUT
	6	UNUSED	INPUT
	7	LIFT / SWING JOYSTICK GROUND	GROUND
	8	UNUSED (GROUND)	GROUND

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J6 BLACK	1	DRIVE / STEER JOYSTICK POWER	SUPPLY VOLTAGE
	2	DRIVE CENTER TAP	INPUT
	3	DRIVE SIGNAL	INPUT
	4	STEER SIGNAL	INPUT
	5	STEER LEFT	INPUT
	6	STEER RIGHT	INPUT
	7	DRIVE / STEER JOYSTICK GROUND	GROUND
	8	UNUSED (GROUND)	GROUND

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J7 BLACK	1	GROUND MODE	GROUND MODE
	2	PLATFORM EMS	PLATFORM EMS
	3	PLATFORM EMS TO GROUND MODULE	PLATFORM MODE
	4	FOOTSWITCH POWER	BATTERY VOLTAGE
	5	GENERATOR SWITCH POWER	BATTERY VOLTAGE
	6	UNUSED (JIB BLOCK LIMIT SWITCH POWER)	BATTERY VOLTAGE
	7	SKYGUARD POWER	BATTERY VOLTAGE
	8	FOOTSWITCH DISENGAGE	DIGITAL INPUT
	9	GENERATOR SWITCH	DIGITAL INPUT
	10	UNUSED (+7 VOLTS)	+7 REFERENCE VOLTAGE
	11	UNUSED	ANALOG INPUT
	12	UNUSED	ANALOG INPUT
	13	UNUSED	ANALOG INPUT
	14	UNUSED (GROUND)	GROUND
	15	UNUSED (+7 VOLTS)	+7 REFERENCE VOLTAGE
	16	LSS GROUND	GROUND
	17	UNUSED (JIB BLOCK LIMIT SWITCH)	HS DIGITAL INPUT
	18	SKYGUARD INPUT #1 SWITCH	HS DIGITAL INPUT
	19	PLATFORM ALARM	LAMP OUTPUT
	20	PLATFORM ALARM GROUND	GROUND
	21	UNUSED (PLATFORM LEVEL UP VALVE)	ME DIGITAL OUTPUT
	22	UNUSED (PLATFORM LEVEL DOWN VALVE)	ME DIGITAL OUTPUT
	23	VALVES GROUND	GROUND
	24	SKYGUARD GROUND	GROUND
	25	JIB UP VALVE	ME DIGITAL OUTPUT
	26	JIB DOWN VALVE	ME DIGITAL OUTPUT
	27	UNUSED (JIB RIGHT VALVE)	ME DIGITAL OUTPUT
	28	UNUSED (JIB LEFT VALVE)	ME DIGITAL OUTPUT
	29	OPTION GROUND	GROUND
	30	CAN LOW	CAN LOW
	31	CAN HIGH	CAN HIGH
	32	CAN SHIELD	CAN SHIELD
	33	PLATFORM ROTATE LEFT VALVE	ME DIGITAL OUTPUT
	34	PLATFORM ROTATE RIGHT VALVE	ME DIGITAL OUTPUT
	35	UNUSED (GROUND)	GROUND

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Figure 6-7. Platform Module - Sheet 1 of 2

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J2 GRAY	1	UNUSED (JIB RIGHT SWITCH)	DIGITAL INPUT
	2	UNUSED (JIB LEFT SWITCH)	DIGITAL INPUT
	3	UNUSED (POWER)	HS DIGITAL INPUT
	4	DOS OVERRIDE SWITCH	HS DIGITAL INPUT
	5	UNUSED	LAMP OUTPUT
	6	CHASSIS TILTED INDICATOR	LAMP OUTPUT
	7	FUNCTION ENABLE INDICATOR	LAMP OUTPUT
	8	VEHICLE SYSTEM DISTRESS INDICATOR	LAMP OUTPUT
	9	CREEP SPEED INDICATOR	LAMP OUTPUT
	10	UNUSED (BROKEN CABLE INDICATOR)	LAMP OUTPUT
	11	PLATFORM OVERLOADED INDICATOR	LAMP OUTPUT
	12	500 / 600 LB CAPACITY INDICATOR	LAMP OUTPUT
	13	1000 LB CAPACITY INDICATOR	LAMP OUTPUT
	14	DOS INDICATOR	LAMP OUTPUT
	15	GENERATOR ON INDICATOR	LAMP OUTPUT
	16	SOFT TOUCH / SKYGUARD INDICATOR	LAMP OUTPUT
	17	GLOW PLUG ENGAGED INDICATOR	LAMP OUTPUT
	18	INDICATOR GROUND	GROUND
	19	UNUSED (LOW BATTERY INDICATOR)	LAMP OUTPUT
	20	UNUSED	LAMP OUTPUT
	21	LOW FUEL INDICATOR	LAMP OUTPUT
	22	1/4 FUEL LEVEL INDICATOR	LAMP OUTPUT
	23	3/4 FUEL LEVEL INDICATOR	LAMP OUTPUT
	24	1/2 FUEL LEVEL INDICATOR	LAMP OUTPUT
	25	INDICATOR GROUND	GROUND
	26	ANALYZER POWER	ANALYZER POWER
	27	ANALYZER GROUND	ANALYZER GROUND
	28	ANALYZER RX	ANALYZER RX
	29	ANALYZER TX	ANALYZER TX
	30	UNUSED (POWER)	BATTERY VOLTAGE
	31	SOFT TOUCH POWER	BATTERY VOLTAGE
	32	LSS POWER	BATTERY VOLTAGE
	33	OPTION POWER	BATTERY VOLTAGE
	34	UNUSED (POWER)	BATTERY VOLTAGE
	35	FULL FUEL LEVEL INDICATOR	LAMP OUTPUT

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J1 NATURAL	1	TOWER LIFT UP SWITCH	DIGITAL INPUT
	2	TOWER LIFT DOWN SWITCH	DIGITAL INPUT
	3	UNUSED (TOWER TELESCOPE IN SWITCH)	DIGITAL INPUT
	4	UNUSED (TOWER TELESCOPE OUT SWITCH)	DIGITAL INPUT
	5	MAIN TELESCOPE IN SWITCH	DIGITAL INPUT
	6	MAIN TELESCOPE OUT SWITCH	DIGITAL INPUT
	7	PLATFORM ROTATE RIGHT SWITCH	DIGITAL INPUT
	8	PLATFORM ROTATE LEFT SWITCH	DIGITAL INPUT
	9	PLATFORM LEVEL UP SWITCH	DIGITAL INPUT
	10	PLATFORM LEVEL DOWN SWITCH	DIGITAL INPUT
	11	JIB LIFT UP SWITCH	DIGITAL INPUT
	12	JIB LIFT DOWN SWITCH	DIGITAL INPUT
	13	SPEED PUMP POTENTIOMETER GROUND	GROUND
	14	ENGINE START SWITCH	DIGITAL INPUT
	15	AUXILIARY POWER SWITCH	DIGITAL INPUT
	16	UNUSED (CRAB STEER SELECT SWITCH)	DIGITAL INPUT
	17	UNUSED (COORDINATED STEER SELECT SWITCH)	DIGITAL INPUT
	18	SWITCH POWER	BATTERY VOLTAGE
	19	UNUSED	DIGITAL INPUT
	20	SOFT TOUCH SWITCH	DIGITAL INPUT
	21	UNUSED (CAPACITY SELECT SWITCH)	DIGITAL INPUT
	22	UNUSED	DIGITAL INPUT
	23	SKYGUARD INPUT #2 SWITCH	DIGITAL INPUT
	24	UNUSED	DIGITAL INPUT
	25	UNUSED	DIGITAL INPUT
	26	UNUSED	DIGITAL INPUT
	27	MAX SPEED SWITCH	DIGITAL INPUT
	28	MAX TORQUE SWITCH	DIGITAL INPUT
	29	SOFT TOUCH / SKYGUARD OVERRIDE BUTTON	DIGITAL INPUT
	30	HEAD / TAIL LIGHT SWITCH	DIGITAL INPUT
	31	HORN BUTTON	DIGITAL INPUT
	32	CREEP SWITCH	DIGITAL INPUT
	33	FUEL SELECT SWITCH	DIGITAL INPUT
	34	SPEED PUMP POTENTIOMETER POWER	+7 REFERENCE VOLTAGE
	35	SPEED PUMP POTENTIOMETER SIGNAL	DIGITAL INPUT

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Figure 6-8. Platform Module - Sheet 2 of 2

6.4 OPERATOR CONTROLS AND SWITCHES

Ground Control Switches

The Ground Control Station has switches that allow the operator to start the engine and activate boom functions.

Table 6-2. Ground Control Switch Inputs

Switch	Function	Ground Module Input
Engine Start and Aux/Function Enable	Engine Start	J4-4
	Aux/Function Enable	J4-16
Swing	Left	J4-34
	Right	J4-35
Tower Lift	Up	J4-10
	Down	J4-21
Lift	Up	J4-23
	Down	J4-33
Telescope	In	J4-7
	Out	J4-30
Jib Lift	Up	J4-19
	Down	J4-8
Platform Level	Up	J4-17
	Down	J4-5
Platform Rotate	Left	J4-6
	Right	J4-18

Platform Control Switches

The Platform Control Station has switches which allow the operator to operate boom, engine, and drive functions.

PROPORTIONAL JOYSTICKS

Table 6-3. Platform Control Joystick Inputs

Control	Function	Platform Module Input
Lift/Swing Joystick	Lift	J5-3
	Swing	J5-4
Drive/Steer Joystick	Drive	J6-3
	Steer Left	J6-5
	Steer Right	J6-6

TOGGLE SWITCHES

Table 6-4. Platform Control Switch Inputs

Switch	Function	Platform Module Input
Tower Lift	Up	J1-1
	Down	J1-2
Telescope	In	J1-5
	Out	J1-6
Jib Lift	Up	J1-11
	Down	J1-12
Platform Level	Up	J1-9
	Down	J1-10
Platform Rotate	Left	J1-8
	Right	J1-7
Engine Start and Aux Descent Enable	Engine Start	J1-14
	Aux Descent Enable	J1-15
Drive Speed	Max Speed	J1-27
	Max Torque	J1-28
Drive Orientation Override	Drive Orientation Override	J2-4
Horn	Horn	J1-31

6.5 CONTROL SYSTEM STARTUP CHECKS

The following actions and checks are performed during system startup:

• Inhibit all hydraulic functions

• Energize all Ground and Platform Station indicators and energize the Platform Alarm.

• Perform assessments as shown in Table 6-5, System Startup Checks.

Table 6-5. System Startup Checks

Item Checked	Function	Condition/Action
NOTE: In this table, abbreviations STB=Short To Battery, STG=Short to Ground, and OC=Open Circuit.		
System Communications		
CAN Bus 1	Ground Module and Platform module to perform successful CAN Bus communication	Successful communication
	Verify healthy CAN Bus and presence of Platform Module	Successful communication
	If applicable, confirm presence of LSS system	Successful communication
CAN Bus 2	If applicable, confirm presence of ECU	Successful communication
Ground Station		
Digital and Functional Switch Inputs	Engine Start	Open; de-energized
	Function Enable	Open; de-energized
	Swing Left	Open; de-energized
	Swing Right	Open; de-energized
	Tower Lift Up	Open; de-energized
	Tower Lift Down	Open; de-energized
	Lift Up	Open; de-energized
	Lift Down	Open; de-energized
	Telescope In	Open; de-energized
	Telescope Out	Open; de-energized
	Jib Up	Open; de-energized
	Jib Down	Open; de-energized
	Level Up	Open; de-energized
	Level Down	Open; de-energized
	Rotate Left	Open; de-energized
	Rotate Right	Open; de-energized

Table 6-5. System Startup Checks

Item Checked	Function	Condition/Action
Valve and Actuator Outputs	Engine Proportional Throttle Actuator	No STB/OC No STG; energize and verify current path
	Engine High Speed Throttle Actuator	No STB/OC for relay No STG; energize to verify
	Drive Forward Valve	No STB/OC No STG; energize and verify current path
	Drive Reverse Valve	No STB/OC No STG; energize and verify current path
	Swing Left Valve	No STB/OC No STG; energize and verify current path
	Swing Right Valve	No STB/OC No STG; energize and verify current path
	Tower Lift Up Valve	No STB/OC No STG; energize and verify current path
	Tower Lift Down Valve	No STB/OC Do not check STG
	Lift Up Valve	No STB/OC No STG; energize and verify current path
	Lift Down Valve	No STB/OC Do not check STG
	Flow Control Valve	No STB/OC No STG; energize and verify current path
	Telescope In Valve	No STB/OC No STG; energize Tele In and Out simultaneously
	Telescope Out Valve	No STB/OC No STG; energize Tele In and Out simultaneously
	Level Up Valve	No STB/OC No STG; energize Level Up and Down simultaneously
	Level Down Valve	No STB/OC No STG; energize Level Up and Down simultaneously
Platform Station		
Digital and Functional Switch Inputs (Platform Module communicates and Ground Module verifies)	Engine Start	Open; de-energized
	Emergency Descent	Open; de-energized
	Drive Speed Select	Open or Closed, but not both Max Speed and Max Torque
	Horn	Open; de-energized
	Tower Lift Up	Open; de-energized
	Tower Lift Down	Open; de-energized
	Telescope In	Open; de-energized
	Telescope Out	Open; de-energized
	Jib Up	Open; de-energized
	Jib Down	Open; de-energized
	Level Up	Open; de-energized
	Level Down	Open; de-energized
	Rotate Left	Open; de-energized
	Rotate Right	Open; de-energized

Table 6-5. System Startup Checks

Item Checked	Function	Condition/Action
Valve and Actuator Inputs	Jib Up Valve	No STB/OC No STG; energize Jib Up
	Jib Down Valve	No STB/OC Do not check STG
	Rotate Left Valve	No STB/OC No STG; energize Rotate Left and Right simultaneously
	Rotate Right Valve	No STB/OC No STG; energize Rotate Left and Right simultaneously

ANALYZER MENU
STRUCTURE

MENU :
HELP :PRESS ENTER

HELP : (001)
SYSTEM OK

LOG : *(XXXXX)
X:XXXXXXXXXXXXX

MENU :
DIAGNOSTICS

DIAGNOSTICS :
DRIVE /STEER

DIAGNOSTICS :
BOOM FUNCTIONS

DIAGNOSTICS :
ENGINE

TO
DIAGNOSTICS:
SYSTEM

DRIVE DEMAND
FORWARD XXX %

DRIVE OUTPUT
FORWARD XXX %

DRIVE OUT mA
FORWARD XXXXmA

DRIVE FDBK Ma
XXXXmA

STEER DEMAND
LEFT XXX %

STEER OUTPUT
LEFT XXX %

LT TRACK DEMAND
FORWARD XXX %

LT TRACK OUTPUT
FORWARD XXX %

LT TRACK OUT mA
FORWARD XXXmA

LT TRACK FDBK mA
FORWARD XXXmA

RT TRACK DEMAND
FORWARD XXX %

RT TRACK OUTPUT
FORWARD XXX %

RT TRACK OUT mA
FORWARD XXXmA

RT TRACK FDBK mA
FORWARD XXXmA

DRV /ST JS ENABLE
CLOSED

STEER TYPE
NORMAL

BRAKES STATUS
LOCKED

TRACTION LOCK
OUTPUT OFF

2WD OUTPUT
OFF

2 SPEED OUTPUT
OFF

DRIVE MODE
MID ENGINE

DRV ORIENT TT SW
CLOSED

DRV ORIENT MODE
INLINE

DRV ORIENT STATE
REQUIRED

DRV ORNT OVR SW
CLOSED

TO
MENU:
SYSTEM TEST

SWING DEMAND
LEFT XXX %

SWING OUTPUT
LEFT XXX %

SWING OUTPUT mA
LEFT XXXXmA

SWING FDBK mA
XXXXmA

TWR LIFT DEMAND
UP XXX %

TWR LIFT OUTPUT
UP XXX %

TWR LIFT OUT mA
UP XXXXmA

TWR LIFT FDBK mA
XXXXmA

TWR LIFT DN AUX
OFF

LIFT DEMAND
UP XXX %

LIFT OUTPUT
UP XXX %

LIFT OUTPUT mA
UP XXXXmA

LIFT FDBK mA
XXXXmA

LIFT DN AUX
OFF

LIFT DN ENABLE
OFF

TELE DEMAND
OUT XXX %

TELE OUTPUT
OUT XXX %

TELE OUTPUT mA
OUT XXXXmA

TELE FDBK mA
XXXXmA

JIB LIFT DEMAND
UP XXX %

JIB LIFT OUTPUT
UP XXX %

PLAT LVL DEMAND
UP XXX %

PLAT LVL OUTPUT
UP XXX %

PLAT LVL OUT mA
UP XXXXmA

PLAT LVL UP FDBK
XXXXmA

PLAT LVL DN FDBK
XXXXmA

PLAT ROT DEMAND
LEFT XXX %

PLAT ROT OUTPUT
LEFT XXX %

FLW CNTRL OUT mA
XXXXmA

FLW CNTRL FBK mA
XXXXmA

LF PRS REL OUTPT
OFF

MAIN DUMP OUTPUT
OFF

STEER DUMP OUTPT
OFF

TELE IN DUMP
OFF

TELE OUT DUMP
OFF

HIGH PRES DMP
OFF

LOW PRES DMP
OFF

FUNCTION SPEED
SETTING : XXX %

CREEP SW
CLOSED

CREEP MODE
OFF

OPERATING STATE
STOPPED

GLOW PLUG
NOT ACTIVE

COOLANT TEMP
XXXC

ENGINE OIL PRESS
XXXKPA

FUEL SELECTION
STATUS : GAS

FUEL PRESS
XXXKPA

AMBIENT TEMP
XXXC

FUEL LEVEL
FULL

ALLOWED STARTER
CRANK TIME : XXXs

ENGINE SPEED
ACTUAL : XXXXRPM

ENGINE SPEED
TARGET : XXXXRPM

FUEL ACTUATOR
OUTPUT: XXXXmA

FUEL ACTUATOR
FDBK : XXXXmA

THROTTLE OUTPUT
OFF

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Figure 6-9. Analyzer Flow chart (Version P2.14) - Sheet 1 of 8

FROM
DIAGNOSTICS:
ENGINE

| DIAGNOSTICS :
SYSTEM | DIAGNOSTICS :
OPER CONTROLS | DIAGNOSTICS :
FEATURES | TO
DIAGNOSTICS:
CAN STATISTICS |

UGM BATTERY
XX.XV

PLATFORM MODULE
BATTERY : XX.XV

UGM TEMP
XXXC

PLATFORM SELECT
KEYSWITCH : OPEN

GROUND SELECT
KEYSWITCH : OPEN

STATION CONTROL
GROUND

FOOTSWITCH INPUT
GROUND : OPEN

FOOTSWITCH INPUT
PLATFORM : OPEN

BOOM ANGLE
XX.XDEG

BOOM ANGLE 1 RAW
XXXXCOUNTS

BOOM ANGLE 2 RAW
XXXXCOUNTS

BOOM ELEV SW 1
OPEN

BOOM ELEV SW 2
OPEN

BOOM ELEV SW
OPEN

TOWER ELEV SW
OPEN

PLATFORM ANGLE :
XXX .XDEG

PLAT ANGLE 1 RAW
XX.X %

PLAT ANGLE 2 RAW
XX.X%

ELEVATION MODE
NOT ABOVE

TELE CUTBACK SW
OPEN

TELE RETRAC SW 1
OPEN

TELE RETRAC SW 2
OPEN

TELE RETRACT SW
OPEN

RETRACTED MODE
NOT RETRACTED

SWING SW 1
OPEN

SWING SW 2
OPEN

OSC AXLE SW 1
OPEN

OSC AXLE SW 2
OPEN

OSC AXLE
LOCKED

TRANSPORT MODE
IN TRANSPORT

CREEP SW
CLOSED

CREEP MODE
OFF

CHASSIS TILT
XXX .XDEG

CHASSIS TILT
X-AXIS : XXX .XDEG

CHASSIS TILT
Y-AXIS : XXX . XDEG

MSSO
INACTIVE

SETUP CONFIG 1:

SETUP CONFIG 2:

JOYSTICK DRIVE
FORWARD XXX %

JOYSTICK STEER
LEFT XXX %

JOYSTICK SWING
LEFT XXX %

JOYSTICK LIFT
UP XXX %

DRV ORNT OVR SW
OPEN

FUEL SELECT SW
OPEN

START SWITCH
OPEN

APU DESCENT SW
OPEN

SWING LEFT SW
OPEN

SWING RIGHT SW
OPEN

TOWER LIFT UP SW
OPEN

TOWER LIFT DN SW
OPEN

LIFT UP SW
OPEN

LIFT DN SW
OPEN

TELE IN SW
OPEN

TELE OUT SW
OPEN

JIB LIFT UP SW
OPEN

JIB LIFT DN SW
OPEN

PLAT LEVEL UP SW
OPEN

PLAT LEVEL DN SW
OPEN

PLAT ROT LEFT SW
OPEN

PLAT ROT RGHT SW
OPEN

MAX SPEED SW
OPEN

MAX TORQUE SW
OPEN

CREEP SW
CLOSED

HORN SW
OPEN

MSSO SW
OPEN

STEER CRAB SW
OPEN

STEER COORD SW
OPEN

FEATURES :
CAPACITY

FEATURES :
CRIBBING

FEATURES :
GENSET /WELDING

FEATURES :
H&T LIGHTS

FEATURES :
PLATFORM LOAD

FEATURES :
SKYGUARD

FEATURES :
SOFT TOUCH

FEATURES :
TEMP CUTOUT

FEATURES :
WIRE ROPE

UNRESTRICT INPUT
1: OPEN

UNRESTRICT INPUT
2: OPEN

RESTRICTED INPUT
1: OPEN

RESTRICTED INPUT
2: OPEN

UNRESTRICT SW :
OPEN

RESTRICTED SW :
OPEN

CAPACITY MODE :
RESTRICTED

CRIBBING MODE
SW: CLOSED

CRIBBING MODE :
DISABLED

GENSET /WELDER
SW: OPEN

GENSET ENABLE
OUTPUT : OFF

H&T LIGHTS SW :
OPEN

H&T LIGHTS
OUTPUT: OFF

PLATFORM LOAD
STATE : OK

PLATFORM LOAD
ACTUAL : XXXXKG

PLATFORM LOAD
GROSS : XXXXKG ②

PLATFORM LOAD
OFFSET : XXXKG ②

PLATFORM LOAD
OFFSET 1:XXXKG ②

PLATFORM LOAD
OFFSET 2:XXXKG ②

PLATFORM LOAD
ACCESSORY XXXKG ②

PLATFORM LOAD
UNRESTR XXXXKG ②

PLATFORM LOAD
RESTR XXXXKG ②

PLATFORM LOAD
RESTR BL XXXXKG ②

PLATFORM LOAD
RESTR GN XXXXKG ②

PLATFORM LOAD
CELL 1: XXXKG ②

PLATFORM LOAD
CELL 2: XXXKG ②

PLATFORM LOAD
CELL 3 : XXXKG ②

PLATFORM LOAD
CELL 4: XXXKG ②

PLATFORM LOAD
RAW 1: XXXXKG ②

PLATFORM LOAD
RAW 2: XXXXKG ②

SKYGUARD INPUTS :
OPEN

SKYGUARD INPUT
1: OPEN

SKYGUARD INPUT
2: OPEN

SKYGUARD OVRD
SW: OPEN

SOFT TOUCH INPUT
OPEN

SOFT TOUCH OVRD
SW: OPEN

AMBIENT TEMP :
XXXX

LOW TEMPERATURE
CUTOUT: ACTIVE

WIRE ROPE
SWITCH : CLOSED

1001120432-M
MAF24670M

Figure 6-10. Analyzer Flow chart (Version P2.14) - Sheet 2 of 8

FROM DIAGNOSTICS: FEATURES

DIAGNOSTICS : ② CAN STATISTICS

CAN 1 STATISTICS ② RX /SEC : XXXXX

CAN 1 STATISTICS ② TX /SEC : XXXXX

CAN 1 STATISTICS ② BUS OFF : XXXXX

CAN 1 STATISTICS ② PASSIVE : XXXXX

CAN 1 STATISTICS ② MSG ERROR : XXXXX

CAN 2 STATISTICS ② RX /SEC : XXXXX

CAN 2 STATISTICS ② TX /SEC : XXXXX

CAN 2 STATISTICS ② BUS OFF : XXXXX

CAN2 STATISITICS ② PASSIVE : XXXXX

CAN 2 STATISTICS ② MSG ERROR : XXXXX

DIAGNOSTICS : ② CALIBRATION DATA

UGM TILT 1 X ② XXXX COUNTS

UGM TILT 1 Y ② XXXX COUNTS

UGM TILT 2 X ② XXXX COUNTS

UGM TILT 2 Y ② XXXX COUNTS

TILT X XX.X DEG

TILT Y XX.X DEG

BOOM ANGLE 1 MIN CAL : XXXX COUNTS

BOOM ANGLE 2 MIN CAL : XXXX COUNTS

BOOM ANGLE 1 MAX CAL : XXXX COUNTS

BOOM ANGLE 2 MAX CAL : XXXX COUNTS

PLAT ANGLE 1 MIN CAL : XX.X%

PLAT ANGLE 2 MIN CAL : XX.X%

PLAT ANGLE 1 MAX CAL : XX.X%

PLAT ANGLE 2 MAX CAL : XX. X%

PLAT LEVEL UP CRKPT : XXXXmA

PLAT LEVEL DOWN CRKPT : XXXXmA

DIAGNOSTICS : DATALOG

DATALOG TIME ON XXXH XXM

DATALOG TIME ENGINE XXXH XXM

DATALOG TIME ENABLD XXXH XXM

DATALOG TIME AUX XXXH XXM

DATALOG TIME DRIVE XXXH XXM

DATALOG TIME DRV MS XXXH XXM

DATALOG TIME DRV MT XXXH XXM

DATALOG TIME DRV ME XXXH XXM

DATALOG TIME STEER XXXH XXM

DATALOG TIME SWING XXXH XXM

DATALOG TIME TOWER XXXH XXM

DATALOG TIME LIFT XXXH XXM

DATALOG TIME TELE XXXH XXM

DATALOG TIME JIB XXXH XXM

DATALOG TIME LEVEL XXXH XXM

DATALOG TIME ROTATE XXXH XXM

DATALOG TIME GEN XXXH XXM

DATALOG CYCLES DRVE FWD XXXXX

DATALOG CYCLES DRVE REV XXXXX

DATALOG CYCLES STEER LT XXXXX

DATALOG CYCLES STEER RT XXXXX

DATALOG CYCLES SWING LT XXXXX

DATALOG CYCLES SWING RT XXXXX

DATALOG CYCLES TOWER UP XXXXX

DATALOG CYCLES TOWER DN XXXXX

DATALOG CYCLES LIFT UP XXXXX

DATALOG CYCLES LIFT DN XXXXX

DATALOG CYCLES TELE IN XXXXX

DATALOG CYCLES TELE OUT XXXXX

DATALOG CYCLES JIB UP XXXXX

DATALOG CYCLES JIB DOWN XXXXX

DATALOG CYCLES LEVEL UP XXXXX

DATALOG CYCLES LEVEL DN XXXXX

DATALOG CYCLES ROT LEFT XXXXX

DATALOG CYCLES ROT RIGHT XXXXX

DATALOG CYCLES UGM ON XXXXX

DATALOG CYCLES GND OPS XXXXX

DATALOG CYCLES PLAT OPS XXXXX

DATALOG CYCLES AUX OPS XXXXX

DATALOG CYCLES GEN ON XXXXX

DATALOG CYCLES BOOM TR XXXXX

DATALOG CYCLES BOOM UP XXXXX

DATALOG CYCLES TOWER UP XXXXX

DATALOG CYCLES TELE TR XXXXX

DATALOG CYCLES DUAL CAP XXXXX

DATALOG : MAX UGM TEMP XXXX

DATALOGI : MIN UGM TEMP XXXX

DATALOG : MAX UGM VOLT XXXV

DATALOG : MACHINE RENTAL XXXH XXM

DATALOG : ERASE ② MACHINE RENTAL ?

CLEAR RENTAL : ② YES : ENTER ,NO:ESC

DIAGNOSTICS : VERSIONS

UGM SOFTWARD XX .XX

UGM CNST DATA XX .XX

UGM HARDWARD REV XX

UGM S/N XXXXXX

UGM P/N XX -XXXXXX -XX

PLATFORM MODULE SOFTWARE XX . XX

PLATFORM MODULE HARDWARE REV XX

PLATFORM MODULE S/N XXXXX

LSS MODULE SOFTWARE XX .XX

LSS MODULE HARDWARE REV XX

TCU MODULE SOFTWARE XX .XX

TCU MODULE HARDWARE REV XX

TCU MODULE S/N XXXXXX

GROUND DISPLAY SOFTWARE XX . XX

ANALYZER ANALYZER XX . XX

1001120432-M
MAF24680M

Figure 6-11. Analyzer Flow chart (Version P2.14) - Sheet 3 of 8

FROM
MENU: DIAGNOSTICS

MENU : SYSTEM TEST	SYSTEM TEST : ACTIVATE ?
MENU : OPERATOR ACCESS	ACCESS LEVEL : CODE XXXXX
MENU : PERSONALITIES	

TO
MENU:
MACHINE SETUP

PERSONALITIES : DRIVE	PERSONALITIES : LEFT TRACK	PERSONALITIES : RIGHT TRACK	PERSONALITIES : SWING
DRIVE ACCEL XXXXmA /S	LEFT TRACK ACCEL X .XS	RIGHT TRACK ACCEL X .XS	SWING ACCEL X .Xs
DRIVE MAX SPEED ACCEL XXXXmA /S	LEFT TRACK DECEL X .XS	RIGHT TRACK DECEL X . XS	SWING DECEL X . Xs
DRIVE DECEL XXXXmA /S	LEFT TRACK FWD MIN XXXXmA	RIGHT TRACK FWD MIN XXXXmA	SWING LEFT MIN XXXXmA
DRIVE MAX SPEED DECEL XXXXmA / S	LEFT TRACK FWD MAX XXXXmA	RIGHT TRACK FWD MAX XXXXmA	SWING LEFT MAX XXXXmA
DRIVE MIN XXXXxmA	LEFT TRACK FWD ELV XXXXmA	RIGHT TRACK FWD ELV XXXXmA	SWING LT CREEP XXXXmA
DRIVE MAX SPEED MIN XXXXxmA	LEFT TRACK FWD CREEP XXXXmA	RIGHT TRACK FWD CREEP XXXXmA	SWING RIGHT MIN XXXXmA
DRIVE MAX XXXXxmA	LEFT TRACK REV MIN XXXXmA	RIGHT TRACK REV MIN XXXXmA	SWING RIGHT MAX XXXXmA
DRIVE MAX SPEED MAX XXXXmA	LEFT TRACK REV MAX XXXXmA	RIGHT TRACK REV MAX XXXXmA	SWING RT CREEP XXXXmA
DRIVE ME /MT ACCEL XXXXmA /S	LEFT TRACK REV ELV XXXXmA	RIGHT TRACK REV ELV XXXXmA	
DRIVE ME /MT DECEL XXXXmA /S	LEFT TRACK REV CREEP XXXXmA	RIGHT TRACK REV CREEP XXXXmA	

TO
PERSONALITIES:
TOWER LIFT

DRIVE TO STOP DECEL XXXXmA /S
DRIVE ME /MT MIN XXXXmA
DRIVE MAX TORQUE MAX XXXXmA
DRIVE MID ENGINE MAX XXXXmA
DRIVE MT ELEV MAX XXXXmA
DRIVE ME ELEV MAX XXXXmA
DRIVE MAX TORQUE CREEP XXXXmA
DRIVE MID ENGINE CREEP XXXXmA

1001120432-M
MAF24690M

Figure 6-12. Analyzer Flow chart (Version P2.14) - Sheet 4 of 8

FROM
PERSONALITIES:
SWING

TO
PERSONALITIES:
PLATFORM ROTATE

PERSONALITIES : TOWER LIFT	PERSONALITIES : LIFT	PERSONALITIES : TELESCOPE	PERSONALITIES : JIB LIFT	PERSONALITIES : PLATFORM LEVEL
TOWER LIFT ACCEL X .Xs	LIFT ACCEL X .Xs	TELESCOPE ACCEL X .Xs	JIB LIFT ACCEL X .Xs	PLATFORM LEVEL ACCEL X .Xs
TOWER LIFT DECEL X .Xs	LIFT DECEL X .Xs	TELESCOPE DECEL X .Xs	JIB LIFT DECEL X .Xs	PLATFORM LEVEL DECEL X .Xs
TOWER LIFT UP MIN XXXXma	LIFT UP MIN XXXXmA	TELESCOPE IN MIN XXXmA	JIB LIFT UP MIN XXXXmA	PLATFORM LEVEL UP MIN XXXXmA
TOWER LIFT UP MAX XXXXmA	LIFT UP MAX XXXXmA	TELESCOPE IN MAX XXXXmA	JIB LIFT UP MAX XXXXmA	PLATFORM LEVEL UP MAX XXXXmA
TOWER LIFT UP CREEP XXXXmA	LIFT UP CREEP XXXXmA	TELESCOPE IN CREEP XXXmA	JIB LIFT UP CREEP XXXXmA	PLATFORM LEVEL UP CREEP XXXXmA
TOWER LIFT DOWN MIN XXXXmA	LIFT DOWN MIN XXXXmA	TELESCOPE IN CUTBK XXXmA	JIB LIFT UP CUTBK XXXmA	PLATFORM LEVEL DOWN MIN XXXXmA
TOWER LIFT DOWN MAX XXXXmA	LIFT DOWN MAX XXXXmA	TELESCOPE OUT MIN XXXmA	JIB LIFT DOWN MIN XXX %	PLATFORM LEVEL DOWN MAX XXXXmA
TOWER LIFT DN CREEP XXXXmA	LIFT DN CREEP XXXXmA	TELESCOPE OUT MAX XXXXmA	JIB LIFT DOWN MAX XXX%	PLATFORM LEVEL DN CREEP XXXXmA
TOWER LIFT DN SOFT XXXXmA	LIFT DN SOFT XXXXmA	TELESCOPE OUT CREEP XXXmA	JIB LIFT DOWN CREEP XXX %	
	LIFT UP SOFT XXXXmA	TELESCOPE OUT CUTBK XXXmA	JIB LIFT DN CUTBK XXXmA	

1001120432-M
MAF24700M

Figure 6-13. Analyzer Flow chart (Version P2.14) - Sheet 5 of 8

FROM
PERSONALITIES:
PLATFORM LEVEL

| PERSONALITIES : PLATFORM ROTATE | PERSONALITIES : GROUND MODE | PERSONALITIES : ENGINE RPM ② | PERSONALITIES : ALARM /HORN | PERSONALITIES : TEMPERATURE CUT |

| PLATFORM ROTATE ACCEL X .Xs | GROUND MODE SWING LT XXXXmA | ENGINE RPM GEN SET XXXXRPM ② | HORN VOLUME XXX % | LOW TEPERATURE CUTOUT SET : XXXC |

| PLATFORM ROTATE DECEL X . Xs | GROUND MODE SWING RT XXXXmA | | ALARM VOLUME XXX % | PERSONALITIES : PLATFORM LOAD |

| PLATFORM ROTATE LEFT MIN XXXXmA | GROUND MODE TOWER UP XXXXmA | | | PLATFORM OVRLD XXXX |

| PLATFORM ROTATE LEFT MAX XXXXmA | GROUND MODE TWR DOWN XXXXmA | | | PLATFORM OVRLD RESTRICT XXXX |

PLATFORM ROTATE
LT CREEP XXXXmA

GROUND MODE
LIFT UP XXXXmA

PLATFORM ROTATE
RIGHT MIN XXXXmA

GROUND MODE
LIFT DOWN XXXXmA

PLATFORM ROTATE
RIGHT MAX XXXXmA

GROUND MODE
TELE IN XXXXmA

PLATFORM ROTATE
RT CREEP XXXXmA

GROUND MODE
TELE OUT XXXXmA

GROUND MODE
JIB UP XXXXmA

GROUND MODE
JIB DOWN XXX %

GROUND MODE
PLTLVL UP XXXXmA

GROUND MODE
PLTLVL DN XXXXmA

GROUND MODE
PLT ROT XXXXmA

1001120432-M
MAF24710M

Figure 6-14. Analyzer Flow chart (Version P2.14) - Sheet 6 of 8

FROM
MENU:
PERSONALITIES

MENU : MACHINE SETUP	→	MODEL 340 AJ	MARKET ANSI USA	ENGINE KUBOTA D 1105	STARTER LOCKOUT DISABLED

ENGINE SHUTDOWN ENABLED	FUEL CUTOUT ONE RESTART	TILT 5 DEGREES	JIB YES	4 WHEEL STEER NO

SOFT TOUCH NO	SKYGUARD BAR /SKYLINE	GEN SET /WELDER BELT DRIVE	GEN SET CUTOUT MOTION ENABLED	H & T LIGHTS NO

WIRE ROPE NO	LOAD SYSTEM NO	FUNCTION CUTOUT NO	GROUND ALARM NO	DRIVE TYPE 4WD

TO
MENU:
CALIBRATIONS

DISPLAY UNITS IMPERIAL	CLEARSKY NO	CRIBBING OPTION NO	ALERT BEACON OFF FOR CREEP	TEMP CUTOUT NO

PLAT LVL OVR CUT NO	CAPACITY SINGLE	ALARM/ HORN COMBINDED	TELE CUTBACK NO	FUEL LEVEL NONE

WATER IN FUEL SESNOR YES	LIFT CYL WITH AUX VALUE

1001120432-M
MAF24720M

Figure 6-15. Analyzer Flow chart (Version P2.14) - Sheet 7 of 8

Figure 6-16. Analyzer Flow chart (Version P2.14) - Sheet 8 of 8

Table 6-6. Machine Model Adjustment

	Adjustment	Adjustment Ranges	Default Setting	Model Time Ranges (In Seconds)
DRIVE	Max Speed Accel	25 - 2000mA/sec	275mA/sec	
	Max Speed Decel	25 - 2000mA/sec	175mA/sec	
	Max Speed Min	250 - 1800mA	635mA	
	Max Speed Max	250 - 1800mA	1500mA	42-47
	Max-Engine/Max Torque Accel	25 - 2000mA/sec	300mA/sec	
	Max-Engine/Max Torque Decel	25 - 2000mA/sec	100mA/sec	
	Drive to Stop Decel	25-2000mA/sec	1075mA/sec	
	Mid-Engine/Max Torque Min	250 - 1800mA	635mA	
	Max Torque Max	250 - 1800mA	1100mA	
	Mid-Engine Max	250 - 1800mA	1135mA	
	Max Torque Elevated	250 - 850mA	790mA	113 min
	Max-Engine Elevated	250 - 975mA	900mA	113 min
	Max Torque Creep	250 - 750mA	725mA	
	Mid-Engine Creep	250 - 900mA	850mA	
STEER	Accel	0.0 - 5.0sec	0.3sec	
	Decel	0.0 - 5.0sec	0.1sec	
	Min Right	10-100%	35%	
	Max Right	10-100%	80%	
	Creep Right	10-100%	50%	
	Min Left	10-100%	35%	
	Max Left	10-100%	80%	
	Creep Left	10-100%	50%	
SWING	Accel	0.0 - 3.0sec	2.2sec	
	Decel	0.0 - 3.0sec	1.2sec	
	Min Left	250 - 1400mA	400mA	
	Max Left	250 - 1400mA	880mA	58-72
	Creep Left	250 - 1400mA	600mA	
	Min Right	250 - 1400mA	400mA	
	Max Right	250 - 1400mA	880mA	58-72
	Creep Right	250 - 1400mA	600mA	
TOWER LIFT	Accel	0.0 - 3.0sec	3.0sec	
	Decel	0.0 - 3.0sec	1.0sec	
	Min Up	250 - 1400mA	400mA	
	Max Up	250 - 1400mA	1250mA	15-21
	Creep Up	250 - 1400mA	600mA	
	Min Down	250 - 1400mA	400mA	
	Max Down	250 - 1400mA	750mA	14-20
	Creep Down	250 - 1400mA	450mA	
	Soft Down	250 - 1400mA	450mA	

Table 6-6. Machine Model Adjustment

Adjustment		Adjustment Ranges	Default Setting	Model Time Ranges (In Seconds)
LIFT	Accel	0.0 - 3.0sec	2.0sec	
	Decel	0.0 - 3.0sec	1.0sec	
	Min up	250 - 1400mA	400mA	
	Max Up	250 - 1400mA	1250mA	19-25
	Creep Up	250 - 1400mA	525mA	
	Min Down	250 - 1400mA	400mA	
	Max Down	250 - 1400mA	850mA	13-19
	Creep Down	250 - 1400mA	500mA	
	Soft Down	250 - 1400mA	500mA	
TELESCOPE	Accel	0.0 - 3.0sec	1.0sec	
	Decel	0.0 - 3.0sec	1.0sec	
	Min In	250 - 1400mA	400mA	
	Max In	250 - 1400mA	1250mA	15-21
	Creep In	250 - 1400mA	675mA	
	In Cutback	250 – 1400mA	N/A	
	Min Out	250 - 1400mA	400mA	
	Max Out	250 - 1400mA	1250mA	12-18
	Creep Out	250 - 1400mA	675mA	
	Out Cutback	250 - 1400mA	N/A	
JIB LIFT	Accel	0.0 - 3.0sec	1.0sec	
	Decel	0.0 - 3.0sec	1.0sec	
	Min Up	250 - 1400mA	400mA	
	Max Up	250 - 1400mA	1075mA	25-32
	Creep Up	250 - 1400mA	575mA	
	Min Down	10 - 70%	32%	
	Max Down	10 - 70%	53%	17-23
	Creep Down	10 - 70%	48%	
PLATFORM LEVEL	Accel	0.0 - 3.0sec	0.0sec	
	Decel	0.0 - 3.0sec	0.0sec	
	Min Up	250 - 1400mA	400mA	
	Max Up	250 - 1400mA	1250mA	
	Creep Up	250 - 1400mA	550mA	
	Min Down	250 - 1400mA	400mA	
	Max Down	250 - 1400mA	1250mA	
	Creep Down	250 - 1400mA	550mA	

Table 6-6. Machine Model Adjustment

Adjustment		Adjustment Ranges	Default Setting	Model Time Ranges (In Seconds)
PLATFORM ROTATE	Accel	0.0 - 3.0sec	0.0sec	
	Decel	0.0 - 3.0sec	0.0sec	
	Min Left	250 - 1400mA	400mA	
	Max Left	250 - 1400mA	1250mA	23-34
	Creep Left	250 - 1400mA	1250mA	
	Min Right	250 - 1400mA	400mA	
	Max Right	250 - 1400mA	1250mA	23-34
	Creep Right	250 - 1400mA	1250mA	
GROUND MODE	Swing (Left / Right)	250 - 1400mA	875mA	
	Tower Up	250 - 1400mA	1245mA	
	Tower Down	250 - 1400mA	745mA	
	Lift Up	250 - 1400mA	1245mA	
	Lift Down	250 - 1400mA	845mA	
	Telescope (In / Out)	250 - 1400mA	1245mA	
	Jib Up	250 - 1400mA	1070mA	
	Jib Down	10 - 70%	52%	
	Platform Level (Up / Down)	250 - 1400mA	1245mA	
	Platform Rotate (Left / Right)	250 - 1400mA	1245mA	
NOTE: *Personality settings can be adjusted anywhere within the adjustment range in order to achieve optimum machine performance.*				

1001247842-A

6.6 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 7.6 m (25 ft) from starting point so the unit is at a maximum speed when starting the test. Results should be recorded for a 61m (200 ft) course. Drive forward, "High 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° above horizontal to ensure the drive is operating in Max Torque mode. Results should be recorded for a 15.2 m (50 ft) 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 Right until over rear axle or end stop (if equipped). Swing Left 360° or end stop (if equipped), record time. Swing Right 360° or end stop (if equipped), 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 clockwise.

TOWER LIFT:

Tower Lift in stowed position, Telescope Retracted. 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, 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 In and Out. Return Knob to fully clockwise.

JIB LIFT:

Platform level and centered with the 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.

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 clockwise.

NOTE: *When the platform speed control knob is turned fully counterclockwise. The platform rotate may not work, this is acceptable.*

Test Notes

1. Personality settings can be adjusted anywhere within the adjustment range in order to achieve optimum machine performance.

2. Stop watch should be started with the function movement, not with actuation of the joystick or switch.

3. Drive speeds would 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 Control knob must be at full speed (turned clockwise completely) unless noted.

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 38° C (100° F)

Table 6-7. Machine Configuration Programing Information (Software Version P2.14)

Configuration Label/Digit	Number	Description	Default Number
The machine configuration must be completed before any personality settings can be changed. Changing the personality settings first and then changing the model number of the machine configuration will cause the personality settings to return to default.			
MODEL NUMBER: 1	0	Visible only on a Non-Configured UGM	
	1	**340AJ**	**1**
MARKET: 2*	**1**	**ANSI USA**	**1**
	2	ANSI EXPORT	
	3	CSA	
	4	CE	
	5	AUSTRALIA	
	6	JAPAN	
	7	GB	
* Certain model selections will limit market options.			
ENGINE: 3*	**1**	**KUBOTA D1105**	**1**
	2	GM DUAL FUEL: GM/PSI 0.97L Dual Fuel (Tier 3)	
	3	KUBOTA DUAL FUEL	
	4	Deutz EMR2 (Tier 4i)	
	5	Deutz EMR4 (Tier 4f)	
* Certain model selections will limit engine options. * Certain market selections will limit engine options.			
STARTER LOCKOUT: 4*	**1**	**DISABLED: Automatic pre-glow time determined by ambient air temperature; engine start can be attempted at any time during pre-glow.**	**1**
	2	ENABLED: Automatic pre-glow time determined by ambient air temperature; engine start is NOT permitted until pre-glow is finished.	
* Only visible for diesel engine selections.			
ENGINE SHUTDOWN: 5	1	DISABLED: No engine shutdown.	
	2	**ENABLED: Shutdown engine for high coolant temperature fault or low oil pressure fault.**	**2**

Table 6-7. Machine Configuration Programing Information (Software Version P2.14)

Configuration Label/Digit	Number	Description	Default Number
FUEL CUTOUT: 6*	1	ONE RESTART: One restart with limited run time when near Empty.	
	2	ENGINE STOP: No starting permitted when near Empty.	
	3	NONE	
	4	**RESTART: Restarts allowed with limited run time when near Empty.**	**4**
* Only visible for diesel engine selections.			
TILT: 7*	1	5 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also reduces drive speed to creep.	
	2	4 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also reduces drive speed to creep.	
	3	3 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also reduces drive speed to creep.	
	4	5 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also disallows tower lift up, drive, telescope out and lift up.	
	5	4 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also disallows tower lift up, drive, telescope out and lift up.	
	6	3 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also disallows tower lift up, drive, telescope out and lift up.	
	7	5 DEG + DRV CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also reduces drive speed to creep when drive reversal is allowed, drive is disallowed otherwise.	
	8	4 DEG + DRV CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also reduces drive speed to creep when drive reversal is allowed, drive is disallowed otherwise.	
	9	**3 DEG + DRV CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also reduces drive speed to creep when drive reversal is allowed, drive is disallowed otherwise.**	**9**
* Certain market selections will limit tilt options and alter default setting.			
4 WHEEL STEER 8*	**1**	**NO: 4 Wheel Steer not installed.**	**1**
	2	YES: 4 Wheel Steer installed.	
* Certain model selections will limit visibility.			

Table 6-7. Machine Configuration Programing Information (Software Version P2.14)

Configuration Label/Digit	Number	Description	Default Number
JIB: 9*	**1**	**NO: No jib installed.**	**1**
	2	YES: Jib installed which has up and down movements only.	
* Certain model selections will limit visibility.			
SOFT TOUCH: 10	**1**	**NO: No Soft Touch System installed.**	**1**
	2	YES: Soft Touch System installed.	
* Certain model selections will limit visibility.			
SKYGUARD: 11	1	NO: No SkyGuard system installed.	
	2	**BAR/SKYLINE: SkyGuard system installed.**	**2**
	3	SKYEYE: SkyGuard system installed.	
GEN SET/WELDER: 12	**1**	**NO: No generator installed.**	**1**
	2	BELT DRIVE: Belt driven setup.	
GEN SET CUTOUT: 13*	**1**	**MOTION ENABLED: Motion enabled when generator is ON.**	**1**
	2	MOTION CUTOUT: Motion cutout in platform mode only.	
* Only visible if Gen Set / Welder Menu selection is not NO.			
H & T LIGHTS: 14	1	NO: No head and tail lights installed.	**1**
	2	YES: Head and tail lights installed.	
LOAD SYSTEM: 15*	1	NO: No load Sensor installed.	
	2	WARN ONLY: Functions in creep, overload lamp lit, platform alarm beeps (5 Sec ON, 2 Sec OFF).	
	3	**CUTOUT PLATFORM: All functions cutout, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF).**	**3**
	4	CUTOUT ALL: All functions cutout, flash overload light (500mS on, 500mS off), platform alarm beeps (5 Sec ON, 2 Sec OFF).	
* Certain market selections will limit load system options or alter default setting.			
FUNCTION CUTOUT: 16*	**1**	**NO: No drive cutout.**	**1**
	2	BOOM CUTOUT: Boom function cutout while driving above elevation.	
	3	DRIVE CUTOUT: Drive & steer cutout above elevation.	
	4	DRIVE CUT E/T: Drive & steer cutout above elevation or telescoped.	
* Certain market selections will limit function cutout options or alter default setting.			

Table 6-7. Machine Configuration Programing Information (Software Version P2.14)

Configuration Label/Digit	Number	Description	Default Number
GROUND ALARM: 17	1	NO: No ground alarm installed.	
	2	DRIVE: Travel alarm sounds when the drive function is active.	
	3	DESCENT: Descent alarm sounds when lift down is active.	
	4	**MOTION: Motion alarm sounds when any function is active.**	**4**
DRIVE TYPE: 18*	**1**	**4WD: 4 wheel drive.**	**1**
	2	2WD: 2 wheel drive.	
* Certain model selections will limit visibility.			
DISPLAY UNITS: 19*	1	METRIC: Celsius, Kilograms, Kilo Pascal.	
	2	**IMPERIAL: Fahrenheit, Pounds, Pounds/in2**	**2**
* Certain market selections will alter default setting.			
CLEARSKY: 20	**1**	**NO: ClearSky (telematics) options is disabled.**	**1**
	2	YES: ClearSky (telematics) option is enabled.	
* Only visible under certain model selections.			
CRIBBING OPTION: 21*	**1**	**NO: Cribbing Option is disabled.**	**1**
	2	YES: Cribbing Option is enabled.	
* Certain model selections will limit visibility.			
ALERT BEACON: 22	**1**	**OFF FOR CREEP**	**1**
	2	IN CREEP 20FPM	
TEMP CUTOUT: 23*	**1**	**NO: No Low Temp Cutout System installed**	**1**
	2	YES: Low Temp Cutout System installed	
* Only visible under certain market selections.			
PLAT LVL OVR CUTOUT: 24	**1**	**NO: Platform Level functions above elevation.**	**1**
	2	YES: Platform Level does not functions above elevation.	
CAPACITY: 25*	1	SINGLE: Single Capacity system installed.	
	2	**DUAL: Dual Capacity system installed.**	**2**
	3	TRIPLE: Triple Capacity system installed.	
* Certain model selections will limit visibility. * Certain model selections will limit capacity options. * Certain market selections will limit capacity options.			

Table 6-7. Machine Configuration Programing Information (Software Version P2.14)

Configuration Label/Digit	Number	Description	Default Number
ALARM/HORN: 26	1	SEPARATE: Ambient alarm installed.	
	2	**COMBINED: Single Horn/Alarm installed.**	**2**
WATER IN FUEL SENSOR: 27*	**1**	**NO: Water in Fuel Sensor is not installed.**	**1**
	2	YES: Water in Fuel Sensor is installed.	
* Only visible if engine selection is Deutz EMR4.			
LIFT CYL WITH: 28*	**1**	**AUX VALVE: Lift Down Aux Valve is installed.**	**1**
	2	ENABLE VALVE: Lift Down Enable Valve is installed.	
* Certain model selections will limit visibility.			

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Table 6-8. Machine Configuration Programming Settings (Software Version P2.14)

340AJ	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Model Number	1	1	1	1	1	1	1
Market	1	2	3	4	5	6	7
Engine	1	1	1	1	1	1	1
	2	2	2	X	X	2	X
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
Starter Lockout	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Engine Shutdown	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
Fuel Cutout	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	X	X	X	X	X	X	X
	4	4	4	4	4	4	4
Tilt	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	X	X	X	X	X	4	X
	X	X	X	X	X	5	X
	6	6	6	6	6	6	6
	X	X	X	X	X	7	X
	X	X	X	X	X	8	X
	9	9	9	9	9	9	9
4 Wheel Steer	1	1	1	1	1	1	1
	X	X	X	X	X	X	X
Jib	X	X	X	X	X	X	X
	2	2	2	2	2	2	2
Soft Touch	1	1	1	1	1	1	1
	X	X	X	X	X	X	X
SkyGuard	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
Gen Set / Welder	1	1	1	1	1	1	1
	2	2	2	2	2	2	2

Table 6-8. Machine Configuration Programming Settings (Software Version P2.14)

340AJ	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Gen Set Cutout	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Head & Taillights	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Load System	X	1	X	X	X	X	X
	X	X	X	X	X	X	X
	3	3	3	X	3	3	3
	4	4	4	4	X	4	4
Function Cutout	1	1	1	X	1	1	1
	X	2	2	2	2	2	2
	3	3	3	X	3	3	3
Ground Alarm	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
	4	4	4	4	4	4	4
Drive Type	1	1	1	1	1	1	1
	X	X	X	X	X	X	X
Display Units	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Clearsky	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Cribbing Option	1	1	1	1	1	1	1
	2	2	2	X	X	2	X
Alert Beacon	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Temp Cutout	1	1	1	1	1	1	1
	X	2	X	2	X	X	2
Plant LVL OVR Cut	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Capacity	1	1	1	1	1	1	1
	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
Alarm / Horn	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Water in Fuel Sensor	1	1	1	1	1	1	1
	X	X	X	X	X	X	X

BOLD TEXT indicates the default setting; plain text indicates another available selection. *RED ITALIC TEXT* indicates the required selection for a machine with a Jib. SHADED CELLS indicate hidden menus or selection.

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6.7 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.

6.8 MSSO (MACHINE SAFETY SYSTEM OVERRIDE)

The MSSO (Machine Safety System Override) is fitted to the ground console and is standard only for the CE market. The MSSO is only used to retrieve an operator who is pinned, trapped, or unable to operate the machine from the platform controls and function controls are locked out from platform due to a platform overload situation.

Platform overload fault is logged like any other fault, it remains active and is displayed until it is removed using the JLG Analyzer. No functional checks of the MSSO system are necessary. The JLG control system will set a Diagnostic Code if the MSSO enable switch is faulty.

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 [ENTER] 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 [ESC].

Table 6-9, Diagnostic Menu Descriptions details the structure of the Diagnostic Menu, and describes the meaning of each piece of information presented.

Table 6-9. Diagnostic Menu Descriptions

Diagnostics Menu (Displayed on Analyzer 1st Line)	Parameter (Displayed on Analyzer 2nd Line)	Parameter Value (Displayed on Analyzer 2nd 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:

```
MENU:
CALIBRATIONS
```
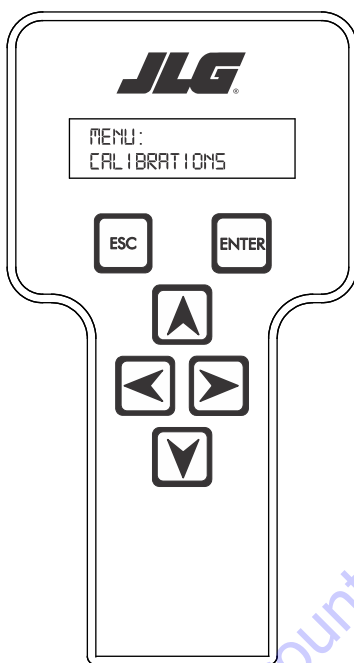
NOTE: *The Calibration Menu is not available in OPERATOR ACCESS.*

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:

```
CALIBRATIONS:
LOAD SENSING
```
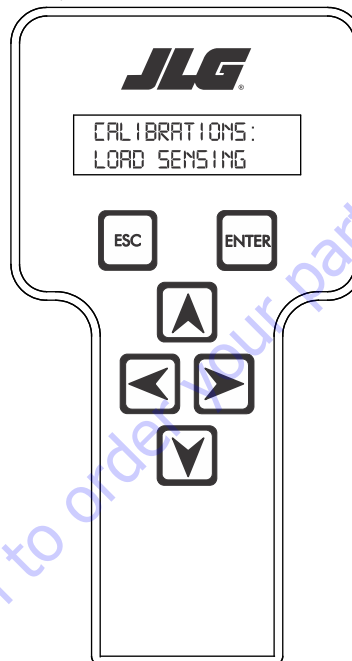
6. Press Enter . The Screen will read:

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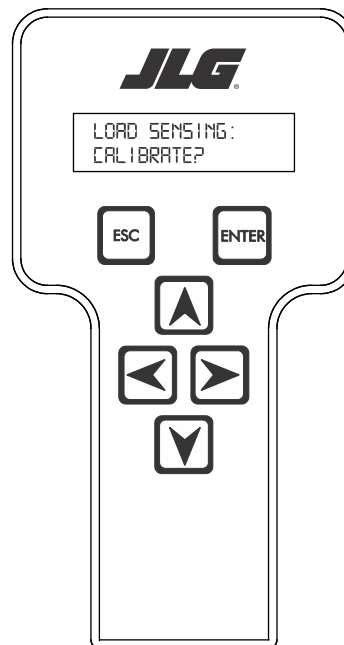
NOTE: *Calibration will auto fail if LSS DTC's are active (443, 444, 4479, 4480, 663, 821, 822, 823, 824, 8218, 8222 -> 8238, 991, 992, 993, 994 or 99285).*

Pressing the ESC key [ESC] *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 [ENTER]. The analyzer screen will read:

```
JLG
LOAD SENSING:
PLATFORM EMPTY?
```
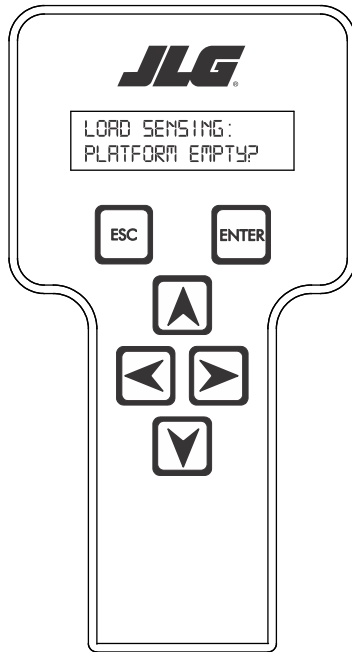
8. If the platform is empty, press ENTER [ENTER]. The screen will read:

```
JLG
LOAD SENSING:
accessory xxxlbs:
```
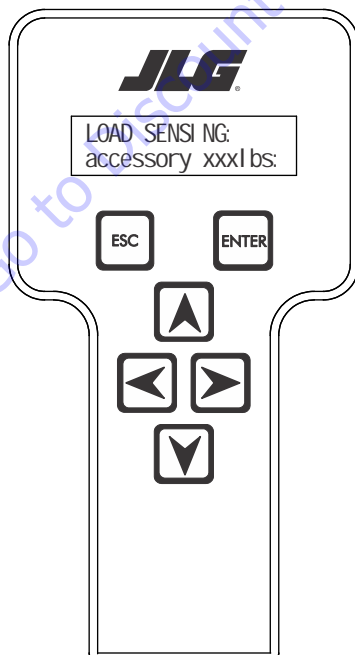
NOTE: *Accessory weight will reset to 0 lb each time the machine is re-calibrated and will need to be re-entered.*

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

Refer to Table 6-10, 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 [ENTER]. The screen will read:

```
JLG
LOAD SENSING:
CALIBRATING...
```
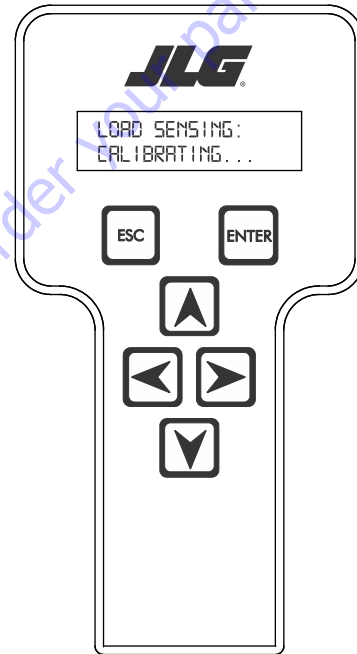
Table 6-10. Accessory Weights

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)
Operating Surface	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:

```
LOAD SENSING:
CAL FAILED
```

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

```
LOAD SENSING:
SKY GLAZIER? N
```
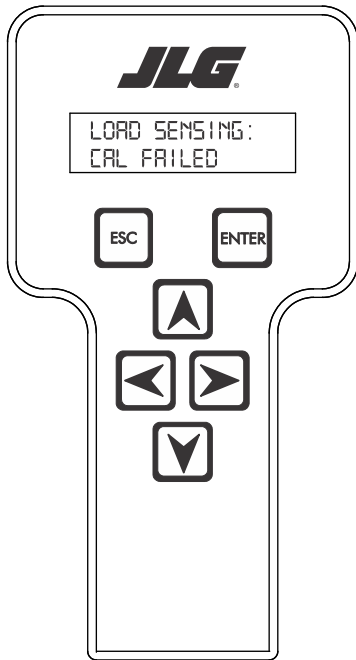
11. Use the analyzer keys to select N for no or Y for yes. Press ENTER. The screen will read:

```
LOAD SENSING:
PIPE RACKS? N
```
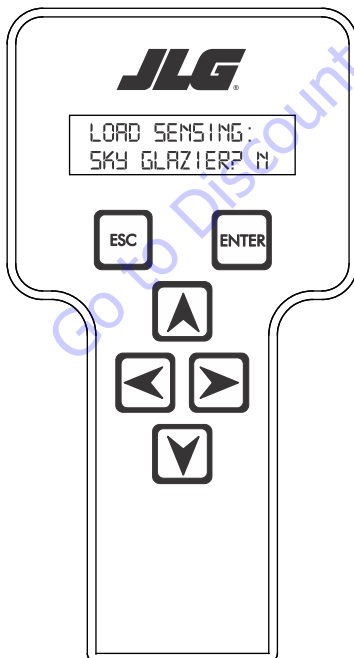
12. Use the analyzer keys to select N for no or Y for yes. Press ENTER [ENTER]. The control system will default to an estimate of unrestricted capacity, which can be adjusted if necessary. Refer to Table 6-11, SkyGlazier Capacity Reductions and Table 6-12, Pipe Rack Capacity Reductions.

The screen will read:
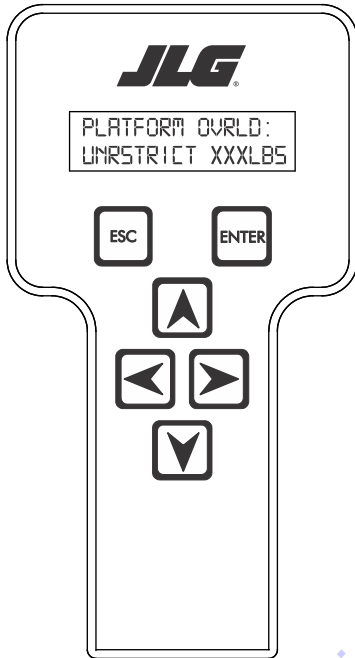
```
        JLG®

 PLATFORM OVRLD:
 UNRSTRICT XXXLBS

   ESC      ENTER

        [▲]
   [◄]  [►]
        [▼]
```

Table 6-11. 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 6-12. Pipe Rack Capacity Reductions

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

13. Press ENTER [ENTER]. The following screen will be displayed for restricted capacity, which can be adjusted if necessary. Refer to Table 6-11, SkyGlazier Capacity Reductions and Table 6-12, Pipe Rack Capacity Reductions.

```
        JLG®

 PLATFORM OVRLD:
 RSTRICT XXXLBS

   ESC      ENTER

        [▲]
   [◄]  [►]
        [▼]
```
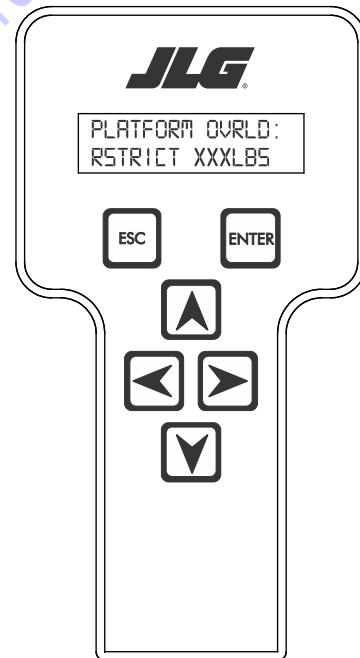
14. Press ENTER [ENTER]. If calibration is successful, the screen will read:

```
LOAD SENSING:
CAL COMPLETE
```
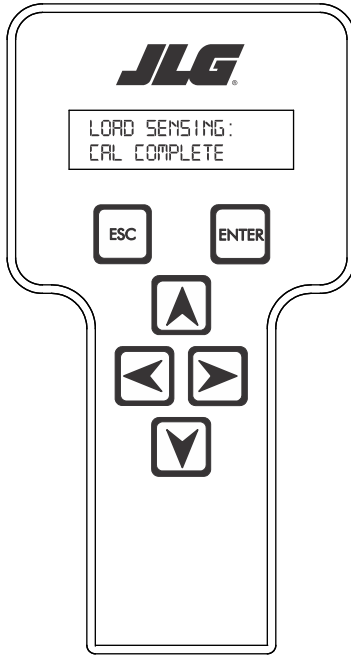
Testing & Evaluation

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

1. <u>Connect the JLG Analyzer.</u>

2. <u>Level the Platform.</u> 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. <u>Observe the Empty Platform Weight.</u> 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 ±15lb (± 7kg). Further, the reading should be stable and should not vary by more than ±2lb (±1kg) (unless there is heavy influence from wind or vibration).

4. <u>Use the Technician's Weight to Evaluate.</u> The technician should enter the platform and record the PLTLOAD reading while standing in the center of the platform.

5. <u>Confirm Control System Warnings and Interlocks.</u> 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. <u>Confirm Control System Capacity Indication (optional for vehicles with Dual Capacity Ratings).</u> 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. <u>Confirm Load Sensing System Performance with Calibrated Weights.</u> 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 500lb (230kg) in the platform and ensure that PLTLOAD is with ±5% of the actual weight. For Dual Capacity vehicles, do the same for the alternate capacity (unrestricted or restricted).

Troubleshooting

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

Table 6-13. LSS Troubleshooting Chart

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

6.9 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:

```
        JLG®

┌──────────────────────┐
│  HELP-PRESS ENTER    │
│                      │
└──────────────────────┘

   [ESC]      [ENTER]

        [▲]
    [◄]   [►]
        [▼]
```
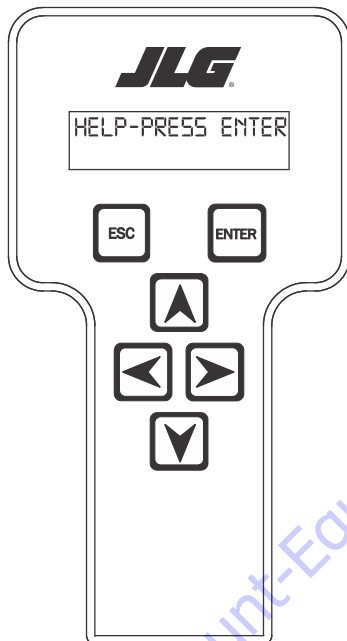
6. Use the arrow button to reach OPERATOR ACCESS. Press Enter [ENTER].

7. Enter the Access Code, 33271.

8. Use the right Arrow key to reach MENU: CALIBRATIONS. Press Enter [ENTER].

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

```
        JLG®

┌──────────────────────┐
│  CALIBRATIONS:       │
│  LOAD SENSING        │
└──────────────────────┘

   [ESC]      [ENTER]

        [▲]
    [◄]   [►]
        [▼]
```
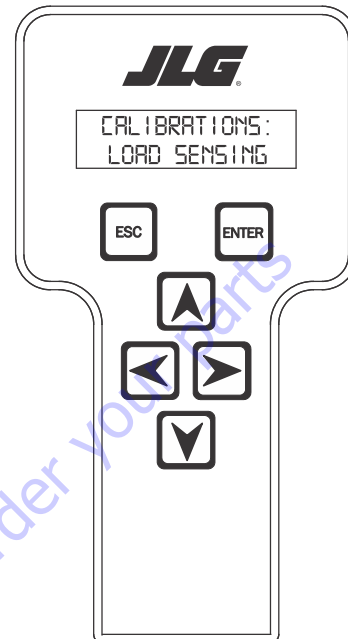
10. Press ENTER [ENTER].

11. Use the Down [►] arrow to reach MSSO RESET.

12. Press Enter [ENTER]. The screen will read:

```
       JLG®

   MSSO RESET:
    CONFIRM?

   ESC     ENTER

      [▲]
   [◄] [►]
      [▼]
```
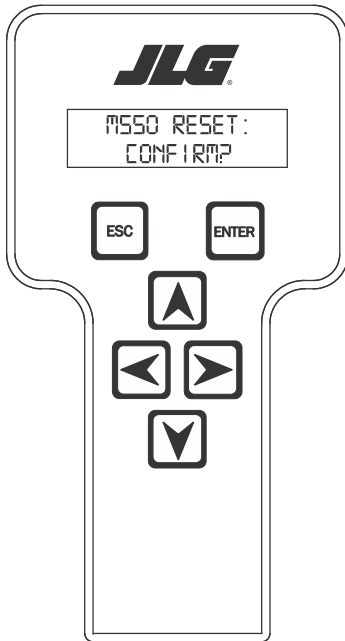
13. Press Enter [ENTER]. The JLG Control System will reset an active 873 DTC and the MSSO System will be reset. Press Escape [ESC] to return to the CALIBRATIONS menu.

6.10 SYSTEM FAULT MESSAGES

The Help Message display on the JLG Analyzer provides diagnostic feedback to explain vehicle operation and interlocks. After the Analyzer is connected to the Ground Module or Platform Module, the Control System shall receives an "Initialize Analyzer" command from the Analyzer and the Control System commands the Analyzer to display the top menu item:
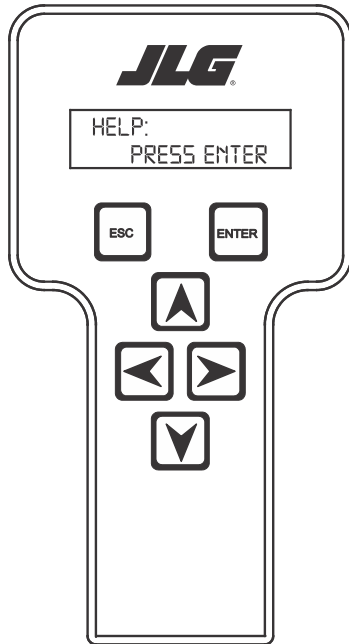
If the operator presses ENTER when in Platform Mode and no active faults are present, the Control System commands the Analyzer to display:

EVERYTHING OK

If the operator presses ENTER when in Ground Mode, display will read GROUND MODE OK.

Pressing ENTER again will cause the Analyzer to display the current Help description followed by its' Diagnostic Trouble Code (DTC). Help Messages larger than the Analyzer's display are scrolled across the screen and repeated. Using the up arrow will increase the scroll speed. If the Fault is active, an asterisk will appear beside the DTC. If the operator enters Logged Help, the Control System will show the previous 25 logged DTCs along with the Fault description on the analyzer screen.

Table 6-14, System Fault Code Listing lists the fault codes applicable for this machine and the analyzer message that accompanies the fault code. Table 6-15, Fault Code Troubleshooting Information contains evaluation, response, display, and operational requirements for each Fault condition.

Table 6-14. System Fault Code Listing

DTC	Analyzer Text
001	EVERYTHING OK
0010	RUNNING AT CUTBACK - OUT OF TRANSPORT POSITION
0011	FSW OPEN
0012	RUNNING AT CREEP - CREEP SWITCH OPEN
0013	RUNNING AT CREEP - TILTED AND ABOVE ELEVATION
0014	CHASSIS TILT SENSOR OUT OF RANGE
0030	RUNNING AT CREEP - PLATFORM STOWED
0031	FUEL LEVEL LOW - ENGINE SHUTDOWN
211	POWER CYCLE
212	KEYSWITCH FAULTY
213	FSW FAULTY
224	FUNCTION PROBLEM - STEER LEFT PERMANENTLY SELECTED
225	FUNCTION PROBLEM - STEER RIGHT PERMANENTLY SELECTED
227	STEER SWITCHES FAULTY
2211	FSW INTERLOCK TRIPPED
2212	DRIVE LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH
2213	STEER LOCKED - SELECTED BEFORE FOOTSWITCH
2216	D/S JOY. OUT OF RANGE HIGH
2217	D/S JOY. CENTER TAP BAD
2219	L/S JOY. OUT OF RANGE HIGH
2220	L/S JOY. CENTER TAP BAD
2221	LIFT/SWING LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH
2222	WAITING FOR FSW TO BE OPEN
2223	FUNCTION SWITCHES LOCKED - SELECTED BEFORE ENABLE
2224	FOOTSWITCH SELECTED BEFORE START
2247	FUNCTION PROBLEM - PLATFORM ROTATE LEFT PERMANENTLY SELECTED
2248	FUNCTION PROBLEM - PLATFORM ROTATE RIGHT PERMANENTLY SELECTED
2249	FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED
2250	FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED
2251	FUNCTION PROBLEM - TELESCOPE IN PERMANENTLY SELECTED
2252	FUNCTION PROBLEM - TELESCOPE OUT PERMANENTLY SELECTED
2257	FUNCTION PROBLEM - TOWER LIFT UP PERMANENTLY SELECTED
2258	FUNCTION PROBLEM - TOWER LIFT DOWN PERMANENTLY SELECTED
2262	FUNCTION PROBLEM - PLATFORM LEVEL UP PERMANENTLY SELECTED
2263	FUNCTION PROBLEM - PLATFORM LEVEL DOWN PERMANENTLY SELECTED
234	FUNCTION SWITCHES FAULTY - CHECK DIAGNOSTICS/BOOM
235	FUNCTION SWITCHES LOCKED - SELECTED BEFORE AUX POWER
236	FUNCTION SWITCHES LOCKED - SELECTED BEFORE START SWITCH
237	START SWITCH LOCKED - SELECTED BEFORE KEYSWITCH
2310	FUNCTION PROBLEM - GROUND ENABLE PERMANENTLY SELECTED
2370	FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED
2371	FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED
2372	FUNCTION PROBLEM - SWING LEFT PERMANENTLY SELECTED

Table 6-14. System Fault Code Listing

DTC	Analyzer Text
2373	FUNCTION PROBLEM - SWING RIGHT PERMANENTLY SELECTED
23104	BOOM TRANSPORT SWITCH DISAGREEMENT
23105	FUNCTION PROBLEM - TOWER LIFT UP PERMANENTLY SELECTED
23106	FUNCTION PROBLEM - TOWER LIFT DOWN PERMANENTLY SELECTED
23107	FUNCTION PROBLEM - LIFT UP PERMANENTLY SELECTED
23108	FUNCTION PROBLEM - LIFT DOWN PERMANENTLY SELECTED
23109	FUNCTION PROBLEM - TELESCOPE IN PERMANENTLY SELECTED
23110	FUNCTION PROBLEM - TELESCOPE OUT PERMANENTLY SELECTED
23111	FUNCTION PROBLEM - PLATFORM LEVEL UP PERMANENTLY SELECTED
23112	FUNCTION PROBLEM - PLATFORM LEVEL DOWN PERMANENTLY SELECTED
23113	FUNCTION PROBLEM - PLATFORM ROTATE LEFT PERMANENTLY SELECTED
23114	FUNCTION PROBLEM - PLATFORM ROTATE RIGHT PERMANENTLY SELECTED
259	MODEL CHANGED - HYDRAULICS SUSPENDED - CYCLE EMS
2513	GENERATOR MOTION CUTOUT ACTIVE
2514	BOOM PREVENTED - DRIVE SELECTED
2516	DRIVE PREVENTED - ABOVE ELEVATION
2517	DRIVE PREVENTED - TILTED & ABOVE ELEVATION
2518	DRIVE PREVENTED - BOOM SELECTED
2520	FUNCTIONS LOCKED OUT - CONSTANT DATA VERSION IMPROPER
331	BRAKE - SHORT TO BATTERY
332	BRAKE - OPEN CIRCUIT
334	LIFT UP VALVE - OPEN CIRCUIT
335	LIFT DOWN VALVE - SHORT TO BATTERY
336	LIFT DOWN VALVE - OPEN CIRCUIT
3311	GROUND ALARM - SHORT TO BATTERY
3352	LP LOCK - SHORT TO GROUND
3353	LP LOCK - OPEN CIRCUIT
3354	LP LOCK - SHORT TO BATTERY
3355	LP START ASSIST - SHORT TO GROUND
3356	LP START ASSIST - OPEN CIRCUIT
3357	LP START ASSIST - SHORT TO BATTERY
3358	MAIN DUMP VALVE - SHORT TO GROUND
3359	MAIN DUMP VALVE - OPEN CIRCUIT
3360	MAIN DUMP VALVE - SHORT TO BATTERY
3361	BRAKE - SHORT TO GROUND
3362	START SOLENOID - SHORT TO GROUND
3363	START SOLENOID - OPEN CIRCUIT
3364	START SOLENOID - SHORT TO BATTERY
3365	STEER DUMP VALVE - SHORT TO GROUND
3366	STEER DUMP VALVE - OPEN CIRCUIT
3367	STEER DUMP VALVE - SHORT TO BATTERY
3373	GEN SET/WELDER - SHORT TO GROUND
3374	GEN SET/WELDER - OPEN CIRCUIT

Table 6-14. System Fault Code Listing

DTC	Analyzer Text
3375	GEN SET/WELDER - SHORT TO BATTERY
3376	HEAD TAIL LIGHT - SHORT TO GROUND
3377	HEAD TAIL LIGHT - OPEN CIRCUIT
3378	HEAD TAIL LIGHT - SHORT TO BATTERY
3379	HOUR METER - SHORT TO GROUND
3382	PLATFORM LEVEL UP VALVE - SHORT TO GROUND
3383	PLATFORM LEVEL UP VALVE - OPEN CIRCUIT
3384	PLATFORM LEVEL UP VALVE - SHORT TO BATTERY
3388	PLATFORM LEVEL DOWN VALVE - SHORT TO GROUND
3389	PLATFORM LEVEL DOWN VALVE - OPEN CIRCUIT
3390	PLATFORM LEVEL DOWN VALVE - SHORT TO BATTERY
3394	PLATFORM ROTATE LEFT VALVE - SHORT TO GROUND
3395	PLATFORM ROTATE LEFT VALVE - OPEN CIRCUIT
3396	PLATFORM ROTATE LEFT VALVE - SHORT TO BATTERY
3397	PLATFORM ROTATE RIGHT VALVE - SHORT TO GROUND
3398	PLATFORM ROTATE RIGHT VALVE - OPEN CIRCUIT
3399	PLATFORM ROTATE RIGHT VALVE - SHORT TO BATTERY
33100	JIB LIFT UP VALVE - SHORT TO GROUND
33101	JIB LIFT UP VALVE - OPEN CIRCUIT
33102	JIB LIFT UP VALVE - SHORT TO BATTERY
33103	JIB LIFT DOWN VALVE - SHORT TO GROUND
33104	JIB LIFT DOWN VALVE - OPEN CIRCUIT
33105	JIB LIFT DOWN VALVE - SHORT TO BATTERY
33106	TOWER LIFT UP VALVE - SHORT TO GROUND
33107	TOWER LIFT UP VALVE - OPEN CIRCUIT
33109	TOWER LIFT DOWN VALVE - SHORT TO GROUND
33110	TOWER LIFT DOWN VALVE - OPEN CIRCUIT
33118	SWING RIGHT VALVE - SHORT TO GROUND
33119	SWING RIGHT VALVE - OPEN CIRCUIT
33120	TELESCOPE IN VALVE - SHORT TO BATTERY
33122	SWING LEFT VALVE - SHORT TO GROUND
33123	TELESCOPE OUT VALVE - SHORT TO BATTERY
33130	THROTTLE ACTUATOR - SHORT TO GROUND
33131	THROTTLE ACTUATOR - OPEN CIRCUIT
33132	THROTTLE ACTUATOR - SHORT TO BATTERY
33182	LIFT VALVES - SHORT TO BATTERY
33186	TELESCOPE OUT VALVE - OPEN CIRCUIT
33188	TELESCOPE OUT VALVE - SHORT TO GROUND
33189	TELESCOPE IN VALVE - OPEN CIRCUIT
33190	TELESCOPE IN VALVE - SHORT TO GROUND
33279	GLOWPLUG - OPEN CIRCUIT
33280	GLOWPLUG - SHORT TO BATTERY
33281	GLOWPLUG - SHORT TO GROUND

Table 6-14. System Fault Code Listing

DTC	Analyzer Text
33287	LIFT - CURRENT FEEDBACK READING TOO LOW
33295	SWING LEFT VALVE - OPEN CIRCUIT
33314	FLOW CONTROL VALVE - OPEN CIRCUIT
33315	FLOW CONTROL VALVE - SHORT TO BATTERY
33316	FLOW CONTROL VALVE - SHORT TO GROUND
33317	DRIVE FORWARD VALVE - OPEN CIRCUIT
33318	DRIVE FORWARD VALVE - SHORT TO BATTERY
33319	DRIVE FORWARD VALVE - SHORT TO GROUND
33320	DRIVE REVERSE VALVE - OPEN CIRCUIT
33322	DRIVE REVERSE VALVE - SHORT TO GROUND
33331	DRIVE - CURRENT FEEDBACK READING TOO LOW
33406	LIFT UP VALVE - SHORT TO GROUND
33410	DRIVE - CURRENT FEEDBACK READING LOST
33412	SWING VALVES - SHORT TO BATTERY
33413	TOWER LIFT - CURRENT FEEDBACK READING TOO LOW
33414	SWING - CURRENT FEEDBACK READING TOO LOW
33415	FLOW CONTROL VALVE - CURRENT FEEDBACK READING TOO LOW
33416	TOWER LIFT - CURRENT FEEDBACK READING LOST
33417	LIFT - CURRENT FEEDBACK READING LOST
33418	SWING - CURRENT FEEDBACK READING LOST
33419	FLOW CONTROL VALVE - CURRENT FEEDBACK READING LOST
33420	TRACTION LOCK VALVE - SHORT TO BATTERY
33421	TRACTION LOCK VALVE - OPEN CIRCUIT
33422	TRACTION LOCK VALVE - SHORT TO GROUND
33423	OSCILLATING AXLE VALVES - SHORT TO BATTERY
33424	OSCILLATING AXLE VALVES - SHORT TO GROUND
33425	TOWER LIFT VALVES - SHORT TO BATTERY
342	PLATFORM LEVEL UP VALVE - SHORT TO BATTERY
343	PLATFORM LEVEL UP VALVE - SHORT TO GROUND
345	PLATFORM LEVEL DOWN VALVE - OPEN CIRCUIT
346	PLATFORM LEVEL DOWN VALVE - SHORT TO BATTERY
347	PLATFORM LEVEL DOWN VALVE - SHORT TO GROUND
349	PLATFORM ROTATE LEFT VALVE - OPEN CIRCUIT
3410	PLATFORM ROTATE LEFT VALVE - SHORT TO BATTERY
3411	PLATFORM ROTATE LEFT VALVE - SHORT TO GROUND
3412	PLATFORM ROTATE RIGHT VALVE - OPEN CIRCUIT
3413	PLATFORM ROTATE RIGHT VALVE - SHORT TO BATTERY
3414	PLATFORM ROTATE RIGHT VALVE - SHORT TO GROUND
3415	JIB LIFT UP VALVE - OPEN CIRCUIT
3416	JIB LIFT UP VALVE - SHORT TO BATTERY
3417	JIB LIFT UP VALVE - SHORT TO GROUND
3418	JIB LIFT DOWN VALVE - OPEN CIRCUIT
3419	JIB LIFT DOWN VALVE - SHORT TO BATTERY

Table 6-14. System Fault Code Listing

DTC	Analyzer Text
3420	JIB LIFT DOWN VALVE - SHORT TO GROUND
431	FUEL SENSOR - SHORT TO BATTERY
432	FUEL SENSOR - SHORT TO GROUND
433	OIL PRESSURE - SHORT TO BATTERY
434	OIL PRESSURE - SHORT TO GROUND
435	COOLANT TEMPERATURE - SHORT TO GROUND
437	ENGINE TROUBLE CODE
438	HIGH ENGINE TEMP
4310	NO ALTERNATOR OUTPUT
4311	LOW OIL PRESSURE
4313	THROTTLE ACTUATOR FAILURE
4314	WRONG ENGINE SELECTED - ECM DETECTED
4322	LOSS OF ENGINE SPEED SENSOR
4323	SPEED SENSOR READING INVALID SPEED
4326	FUEL ACTUATOR - SHORT TO GROUND
4327	FUEL ACTUATOR - OPEN CIRCUIT
4328	FUEL ACTUATOR - SHORT TO BATTERY
4329	FUEL ACTUATOR - CURRENT FEEDBACK READING TOO LOW
4330	FUEL ACTUATOR - CURRENT FEEDBACK READING LOST
441	BATTERY VOLTAGE TOO LOW - SYSTEM SHUTDOWN
442	BATTERY VOLTAGE TOO HIGH - SYSTEM SHUTDOWN
443	LSS BATTERY VOLTAGE TOO HIGH
444	LSS BATTERY VOLTAGE TOO LOW
445	BATTERY VOLTAGE LOW
662	CANBUS FAILURE - PLATFORM MODULE
663	CANBUS FAILURE - LOAD SENSING SYSTEM MODULE
666	CANBUS FAILURE - ENGINE CONTROLLER
6613	CANBUS FAILURE - EXCESSIVE CANBUS ERRORS
6622	CANBUS FAILURE - TCU MODULE
6629	CANBUS FAILURE - TELEMATICS CANBUS LOADING TOO HIGH
681	REMOTE CONTRACT MANAGEMENT OVERRIDE - ALL FUNCTIONS IN CREEP
813	CHASSIS TILT SENSOR NOT CALIBRATED
814	CHASSIS TILT SENSOR OUT OF RANGE
815	CHASSIS TILT SENSOR DISAGREEMENT
821	LSS CELL #1 ERROR
822	LSS CELL #2 ERROR
823	LSS CELL #3 ERROR
824	LSS CELL #4 ERROR
825	LSS HAS NOT BEEN CALIBRATED
826	RUNNING AT CREEP - PLATFORM OVERLOADED
827	DRIVE & BOOM PREVENTED - PLATFORM OVERLOADED
828	LIFT UP & TELE OUT PREVENTED - PLATFORM OVERLOADED

Table 6-14. System Fault Code Listing

DTC	Analyzer Text
8211	LSS READING UNDER WEIGHT
8639	FRONT LEFT STEER VALVE - OPEN CIRCUIT
8640	FRONT LEFT STEER VALVE - SHORT TO BATTERY
8641	FRONT LEFT STEER VALVE - SHORT TO GROUND
8642	FRONT RIGHT STEER VALVE - OPEN CIRCUIT
8643	FRONT RIGHT STEER VALVE - SHORT TO BATTERY
8644	FRONT RIGHT STEER VALVE - SHORT TO GROUND
8669	OSCILLATING AXLE SWITCH DISAGREEMENT
991	LSS WATCHDOG RESET
992	LSS EEPROM ERROR
993	LSS INTERNAL ERROR - PIN EXCITATION
994	LSS INTERNAL ERROR - DRDY MISSING FROM A/D
998	EEPROM FAILURE - CHECK ALL SETTINGS
9910	FUNCTIONS LOCKED OUT - PLATFORM MODULE SOFTWARE VERSION IMPROPER
9911	FUNCTIONS LOCKED OUT - LSS MODULE SOFTWARE VERSION IMPROPER
9915	CHASSIS TILT SENSOR NOT GAIN CALIBRATED
9919	GROUND SENSOR REF VOLTAGE OUT OF RANGE
9920	PLATFORM SENSOR REF VOLTAGE OUT OF RANGE
9921	GROUND MODULE FAILURE - HIGH SIDE DRIVER CUTOUT FAULTY
9922	PLATFORM MODULE FAILURE - HWFS CODE 1
9923	GROUND MODULE FAILURE - HWFS CODE 1
9924	FUNCTIONS LOCKED OUT - MACHINE NOT CONFIGURED
9944	CURRENT FEEDBACK GAINS OUT OF RANGE
9945	CURRENT FEEDBACK CALIBRATION CHECKSUM INCORRECT
9949	MACHINE CONFIGURATION OUT OF RANGE - CHECK ALL SETTINGS
9977	LSS CORRUPT EEPROM
9979	FUNCTIONS LOCKED OUT - GROUND MODULE SOFTWARE VERSION IMPROPER
9986	GROUND MODULE VLOW FET FAILURE

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
EVERYTHING OK or GROUND MODE OK	001[1]	The platform station (EVERYTHING OK) or ground station (GROUND MODE OK) is selected and the system detects no problems exist.	No response required.	–
RUNNING AT CUTBACK – OUT OF TRANSPORT POSITION	0010[1]	Tower Elevation Switch shows tower is elevated out of transport position or Boom Elevation Switch #1 shows boom elevated out of transport position or Boom Elevation Switch #2 shows boom elevated out of transport position	Machine is considered Out Of Transport Position	Lower boom into transport position
FSW OPEN	0011[1]	Machine is in Platform Mode Drive/Steer or Boom function control is activated when Footswitch not engaged	Machine is not allowed to enter the Machine Enabled state	Release controls, Engage Foot-switch and reactivate Drive/ Steer and/or Boom function control
RUNNING AT CREEP - CREEP SWITCH OPEN	0012[1]	Machine is in Platform Mode Platform creep switch is turned on	Creep Mode is active	Turn Platform creep switch off
RUNNING AT CREEP - TILTED AND ABOVE ELEVATION	0013[1]	Fault RUNNING AT CREEP - CREEP SWITCH OPEN (DTC 0012) is **not** active Machine is Out Of Transport Position Machine chassis is considered Tilted	Creep Mode is active	Lower Machine and place on firm, level surface
RUNNING AT CREEP – PLAT-FORM STOWED	0030[1]	Platform is in Stowed Position	Lift Down and Level Down function speed maximums are limited to Ground Creep	Raise Platform from Stowed Position
LOAD SENSOR READING UNDER WEIGHT	0015	LSS has been calibrated and the UGM has determined that the load sensing system reading is less than -50lb for 2 seconds. If the load sensing system determines that the reading is greater than -50lb for 5 seconds this fault will no longer be annunciated. No control system interlocks present when DTC is active.		Ensure platform is not resting on the ground or is not leveled at an extreme negative angle. Re-calibrate the load sensing system if the above items are not a factor.
FUEL LEVEL LOW – ENGINE SHUTDOWN	0031	Engine Shutdown has occurred due to Fuel Level being EMPTY	Machine prohibits engine cranking and throttle functions	Add fuel to fuel tank
APU ACTIVE	0035	Emergency Descent Mode is active	Operation specified in Emer-gency Descent Mode section	Stop using Emergency Descent Mode
KEYSWITCH FAULTY	212	Both Ground and Platform Keyswitches are energized at the same time	The Control System assumes a station selection of Ground	On Analyzer under DIAGNOS-TICS-->SYSTEM-->PLAT-FORM SELECT (and GROUND SELECT), activate Platform and Ground keyswitches to deter-mine fault location; then trou-bleshoot wiring and/or keyswitch.
FSW FAULTY	213	The ground footswitch input and platform footswitch input have been both engaged or disengaged for a time period greater than or equal to 1 second	Machine does not allow any functions	Use the Emergency Stop Switch to cycle power

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUNCTION PROBLEM - STEER LEFT PERMANENTLY SELECTED	224	The machine is in Platform mode and the Steer Left switch is energized at startup	Machine enters Creep Mode and Steer Left and Right are prohibited	Enable machine and on Analyzer under DIAGNOSTICS-->DRIVE/STEER-->STEER DEMAND, observe Steer Left and Right commands; open Platform box and troubleshoot wiring or replace joystick.
FUNCTION PROBLEM - STEER RIGHT PERMANENTLY SELECTED	225	The machine is in Platform mode and the Steer Right switch is energized at startup	Machine enters Creep Mode and Steer Left and Right are prohibited	Enable machine and on Analyzer under DIAGNOSTICS-->DRIVE/STEER-->STEER DEMAND, observe Steer Left and Right commands; open Platform box and troubleshoot wiring or replace joystick.
STEER SWITCHES FAULTY	227	Both steer switch inputs on the Drive/Steer joystick are energized at startup (Platform or Ground mode).	Drive and Steer are prohibited.	Enable machine and on Analyzer under DIAGNOSTICS-->DRIVE/STEER-->STEER DEMAND, observe Steer Left and Right commands; open Platform box and troubleshoot wiring or replace joystick.
FSW INTERLOCK TRIPPED	2211	Machine is in Platform Mode. The footswitch is depressed for a time period greater than or equal to 7 seconds without activation of any functions	The Machine Enabled function is disabled	Release the footswitch
DRIVE LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH	2212	The Control System detects one of the following conditions: 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 the footswitch is depressed or DTC 2213, 2221, or 2223 are active while the drive joystick is not in the neutral position.	If caused by the drive joystick not being in the neutral position immediately following the startup period then disable drive and steer. If caused by engaging footswitch while the drive joystick is not in the neutral position, then do not allow the machine to enter the Machine Enabled state	If caused by the drive joystick not being in the neutral position immediately following Start Up, then return Drive joystick to its neutral position before depressing footswitch. If caused by footswitch being depressed while the drive joystick is not in the neutral position then release the footswitch, return the Drive joystick to neutral and depress the footswitch again
STEER LOCKED - SELECTED BEFORE FOOTSWITCH	2213	The Ground Module detects that the machine is in Platform Mode and the footswitch is depressed or DTC 2212, 2221 or 2223 is active while the steer controls are not in the neutral position.	Do not allow the machine to enter the Machine Enabled state	Steer controls are returned to neutral and the footswitch is released

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
D/S JOY. OUT OF RANGE HIGH	2216	The Platform Module detects that the drive/steer joystick voltage is out of range	The Control System disables Drive; Brake release and Steer still permitted	The Platform Module detects the voltage is in range and no longer reports the fault. Move joystick through range of motion and check voltage (should be approximately 0.7-6.3V).
D/S JOY. CENTER TAP BAD	2217	The Platform Module detects that the drive/steer center tap voltage is out of range	The Control System disables Drive; Brake release and Steer still permitted	The Platform Module detects the voltage is in range and no longer reports the fault
L/S JOY. OUT OF RANGE HIGH	2219	The Platform Module detects that the Lift/Swing joystick reference voltage is high	Disable Lift and Swing in Platform Mode	The Platform Module no longer reports the fault
L/S JOY. CENTER TAP BAD	2220	The Platform Module detects that the Lift/Swing center tap voltage is out of range	Disable Lift and Swing in Platform Mode.	The Platform Module detects that the lift/swing center tap voltage is in range and no longer reports the fault
LIFT/SWING LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH	2221	The Ground Module detects one of the following conditions:

The machine is in Platform Mode and the Lift and/or Swing controls are not in the neutral position immediately following Start Up.

The machine is in Platform Mode and the footswitch is depressed or DTC 2212, 2213 or 2223 are active while the Lift/Swing joystick is not in the neutral position. | If fault occurs at startup, disable Lift and Swing in Platform Mode

If fault occurs by engaging the footswitch after the control, then machine is not permitted to enter the Machine Enabled state. | Return Lift/Swing controls to neutral while not in the Enabled state.

Return Lift/Swing controls to neutral and release the footswitch |
| WAITING FOR FSW TO BE OPEN | 2222 | Machine is in Platform Mode
Footswitch has been engaged since Start Up | Machine is not allowed to enter the Machine Enabled state | Release the Footswitch |
| FUNCTION SWITCHES LOCKED - SELECTED BEFORE ENABLE | 2223 | The machine is in Platform Mode and the footswitch is depressed or DTC 2212, 2213, or 2221 is active while any of the following boom control inputs are engaged:
Tower Lift
Telescope
Platform Level
Platform Rotate
Jib Lift | Machine is not allowed to enter the Machine Enabled state | Release engaged control switch and then depress footswitch |
| FOOTSWITCH SELECTED BEFORE START | 2224 | Machine is in Platform mode
The footswitch is already engaged when an engine start is attempted from the platform controls | Disable engine start | Release the footswitch before attempting to start the engine |
| FUNCTION PROBLEM - PLATFORM ROTATE LEFT PERMANENTLY SELECTED | 2247 | The machine is in Platform mode and the platform rotate switch is sending a continual left rotate signal. | Machine enters Creep Mode and Platform Rotate Left and Right prohibited. | Release the footswitch and return the platform rotate switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty. |

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUNCTION PROBLEM - PLATFORM ROTATE RIGHT PERMANENTLY SELECTED	2248	The machine is in Platform mode and the platform rotate switch is sending a continual right rotate signal.	Machine enters Creep Mode and Platform Rotate Left and Right prohibited.	Release the footswitch and return the platform rotate switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.
FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED	2249	The machine is in Platform mode and the jib lift switch is sending a continual lift up signal.	Machine enters Creep Mode and Platform Jib Lift Up and Down prohibited.	Release the footswitch and return the platform jib lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.
FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED	2250	The machine is in Platform mode and the jib lift switch is sending a continual lift down signal.	Machine enters Creep Mode and Platform Jib Lift Up and Down prohibited.	Release the footswitch and return the platform jib lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.
FUNCTION PROBLEM - TELESCOPE IN PERMANENTLY SELECTED	2251	The machine is in Platform mode and the telescope switch is sending a continual telescope in signal.	Machine enters Creep Mode and Tele In and Out prohibited.	Release the footswitch and return the telescope switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.
FUNCTION PROBLEM - TELESCOPE OUT PERMANENTLY SELECTED	2252	The machine is in Platform mode and the telescope switch is sending a continual telescope out signal.	Machine enters Creep Mode and Tele In and Out prohibited.	Release the footswitch and return the telescope switch to neutral. Replace the switch if faulty.
FUNCTION PROBLEM - TOWER LIFT UP PERMANENTLY SELECTED	2257	The machine is in Platform mode and the tower lift switch is sending a continual tower lift up signal.	Machine enters Creep Mode and Tower Lift Up and Down prohibited.	Release the footswitch and return the telescope switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUNCTION PROBLEM - TOWER LIFT DOWN PERMANENTLY SELECTED	2258	The machine is in Platform mode and the tower lift switch is sending a continual tower lift down signal.	Machine enters Creep Mode and Tower Lift Up and Down prohibited.	Release the footswitch and return the telescope switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.
FUNCTION PROBLEM - PLATFORM LEVEL UP PERMANENTLY SELECTED	2262	The machine is in Platform mode and the platform level up switch is sending a continual level up signal.	Machine enters Creep Mode and Platform Level Up and Down prohibited.	Release the footswitch and return the platform level switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.
FUNCTION PROBLEM - PLATFORM LEVEL DOWN PERMANENTLY SELECTED	2263	The machine is in Platform mode and the platform level down switch is sending a continual level up signal.	Machine enters Creep Mode and Platform Level Up and Down prohibited.	Release the footswitch and return the platform level switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if faulty.
FUNCTION SWITCHES FAULTY - CHECK DIAGNOSTICS/BOOM	234	The Ground Module detects one of the following conditions: The machine is in Ground Mode and both direction inputs of the following boom controls are energized at the same time: Engine Start/Aux, Telescope, Platform Level, Platform Rotate, Jib Lift, Tower Lift, Lift, or Swing. The machine is in Platform Mode and both direction inputs of the following boom controls are energized at the same time: Engine Start/Aux, Telescope, Platform Level, Platform Rotate, Jib Lift, Tower Lift	The boom function that is triggering the fault is disabled. **NOTE: If Engine Start/Aux Power is at fault, Emergency Descent will still be permitted.**	Check the switch for the applicable function. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace if faulty.
FUNCTION SWITCHES LOCKED - SELECTED BEFORE AUX POWER	235	The Ground Module detects one of the following conditions: The machine is in Ground Mode, the engine is stopped, and the ground Auxiliary Descent switch is selected after a Ground control switch has been selected. The machine is in Platform Mode, the engine is stopped, and the platform Auxiliary Descent switch is selected after a Platform control switch has been selected.	Emergency Descent mode is disabled	Release all function switches. Activate the Auxiliary Descent switch *before* any other applicable control switches or start the engine

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUNCTION SWITCHES LOCKED - SELECTED BEFORE START SWITCH	236	The Ground Module detects one of the following conditions: The machine is in Ground Mode, the engine is stopped, and any boom control is selected before the ground engine start switch is selected. The machine is in Platform Mode, the engine is stopped, any drive/steer or boom control is already engaged and the foot-switch is not engaged before the platform engine start switch is selected	Engine start is disabled	Release all function switches. Start the engine *before* any other applicable function switches are selected.
START SWITCH LOCKED - SELECTED BEFORE KEY-SWITCH	237	The engine start switch for the selected station is engaged during the Ground Module startup sequence.	Engine start is disabled	Release the engine start switch. Position the Ground/Platform Select switch to the opposite operating station to verify the engine can be started. View switch state on Analyzer under DIAGNOSTICS-->OPER CONTROLS-->START SWITCH.
FUNCTION PROBLEM - GROUND ENABLE PERMANENTLY SELECTED	2310	The machine is in Ground mode and the Enable switch is in the selected position.	Disable Start and Boom functions, including Emergency Descent.	Return the switch to the off position. View switch state on Analyzer under DIAGNOSTICS-->OPER CONTROLS-->AUX DESCENT SW. Replace the switch if defective.
FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED	2370	The machine is in Ground mode and the Jib Lift switch is selected and trying to activate the Jib Lift Up function at startup.	Jib Lift Up and Down prohibited.	With the machine controls not enabled, return the Jib Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED	2371	The machine is in Ground mode and the Jib Lift switch is selected and trying to activate the Jib Lift Down function at startup.	Jib Lift Up and Down prohibited.	With the machine controls not enabled, return the Jib Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - SWING LEFT PERMANENTLY SELECTED	2372	The machine is in Ground mode and the Swing switch is selected and trying to activate the Swing Left function at startup.	Swing Left and Right prohibited.	With the machine controls not enabled, return the Swing switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUNCTION PROBLEM - SWING RIGHT PERMANENTLY SELECTED	2373	The machine is in Ground mode and the Swing switch is selected and trying to activate the Swing Right function at startup.	Swing Left and Right prohibited.	With the machine controls not enabled, return the Swing switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
BOOM TRANSPORT SWITCH DISAGREEMENT	23104	The Ground Module detects that Boom Elevation switch #1 and switch #2 are not in agreement for more than 4 seconds while lifting.	The Ground Module assumes an "Above Elevation" condition and does not allow Axle Oscillation.	Verify that the two boom angle switches are adjusted to actuate simultaneously. Cycle Power.
FUNCTION PROBLEM – TOWER LIFT UP PERMANENTLY SELECTED	23105	The machine is in Ground mode and the Tower Lift switch is selected and trying to activate the Tower Lift Up function at startup.	Tower Lift Up and Down prohibited.	With the machine controls not enabled, return the Tower Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM – TOWER LIFT DOWN PERMANENTLY SELECTED	23106	The machine is in Ground mode and the Tower Lift switch is selected and trying to activate the Tower Lift Down function at startup.	Tower Lift Up and Down prohibited.	With the machine controls not enabled, return the Tower Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - LIFT UP PERMANENTLY SELECTED	23107	The machine is in Ground mode and the Lift switch is selected and trying to activate the Lift Up function at startup.	Lift Up and Down prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - LIFT DOWN PERMANENTLY SELECTED	23108	The machine is in Ground mode and the Lift switch is selected and trying to activate the Lift Down function at startup.	Lift Up and Down prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUNCTION PROBLEM - TELE-SCOPE IN PERMANENTLY SELECTED	23109	The machine is in Ground mode and the Telescope switch is selected and trying to activate the Telescope In function at startup.	Tele In and Out prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - TELE-SCOPE OUT PERMANENTLY SELECTED	23110	The machine is in Ground mode and the Telescope switch is selected and trying to activate the Telescope Out function at startup.	Tele In and Out prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - PLAT-FORM LEVEL UP PERMA-NENTLY SELECTED	23111	The machine is in Ground mode and the Platform Level switch is selected and trying to activate the Platform Level Up function at startup.	Platform Level Up and Down prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - PLAT-FORM LEVEL DOWN PERMA-NENTLY SELECTED	23112	The machine is in Ground mode and the Platform Level switch is selected and trying to activate the Platform Level Down function at startup.	Platform Level Up and Down prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - PLAT-FORM ROTATE LEFT PERMA-NENTLY SELECTED	23113	The machine is in Ground mode and the Platform Rotate switch is selected and trying to activate the Platform Rotate Left function at startup.	Platform Rotate Right and Left prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.
FUNCTION PROBLEM - PLAT-FORM ROTATE RIGHT PERMA-NENTLY SELECTED	23114	The machine is in Ground mode and the Platform Rotate switch is selected and trying to activate the Platform Rotate Right function at startup.	Platform Rotate Right and Left prohibited.	With the machine controls not enabled, return the Lift switch to neutral. Actuate switch while monitoring state changes under appropriate menu in DIAGNOSTICS-->OPER CONTROLS on Analyzer. Replace the switch if defective.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
ROD SIDE PRESSURE SENSOR – FAULTY	23217*	After the operator demand is complete (enable valve de-energized after a tower lift down or boom lift down) and footswitch still active, the flow control are directional valves are appropriately held for 3 sec to check the tower lift enable valve. This diagnostic is run at the same time as DTC 33563 If Rod side pressure is greater than 1800 psi or less than 1000 psi, fault is detected Fault, once triggered, is maintained within a given key-cycle Machine will be trapped in transport		Check relief setting or pressure transducer
*This fault will not be active if Boom Sensors are not calibrated, a subsequent function is activated, any retrieval mode is active, any valves or sensors involved in the diagnostics are not healthy, ground mode is selected or dump valve is energized for less than 3 sec after a function is complete				
MODEL CHANGED – HYDRAU-LICS SUSPENDED – CYCLE EMS	259	The MACHINE SETUP → MODEL is changed using the analyzer	All of the boom, drive, and steer functions are disabled; the engine will be shut down.	Cycle Power.
GENERATOR MOTION CUTOUT ACTIVE	2513	MACHINE SETUP → GEN SET = BELT DRIVE and GEN SET CUTOUT = MOTION CUTOUT The machine is being operated in Platform mode and the footswitch and Generator Enable switch are engaged while any of the config-ured boom, drive, or steer functions are attempting to be activated.	All of the boom, drive, and steer functions are disabled.	Motion is no longer attempted or generator is turned off.
BOOM PREVENTED – DRIVE SELECTED	2514	The machine is set up to cut out boom functions when the drive or steer is being operated. The machine is in the Out of Transport posi-tion and the operator is operating a Drive or Steer function and attempts to activate a boom function. Note: DTC 2514 supercedes DTC 2518 if drive/steer and boom func-tions are both active when the machine changes from Below Eleva-tion to Above Elevation.	All boom functions are dis-abled.	Stop operating any Drive or Steer functions. Activate the Boom function.
DRIVE PREVENTED – ABOVE ELEVATION	2516	The machine is set up to cut out drive and steer when the boom is above elevation. The machine is in the Out of Transport position. The Control System senses the boom is above elevation and the operator is attempting to activate Drive or Steer	Disable Drive and Steer	Place the machine in the trans-port position before attempt-ing to drive or steer.
DRIVE PREVENTED – TILTED & ABOVE ELEVATION	2517	The machine is set up to cut out drive and steer when the chassis is tilted and boom is above elevation. The machine is in the Out Of Transport position. The Control System senses the chassis is tilted and the operator is attempting to activate Drive or Steer	Disable Drive and Steer	Place the machine in the trans-port position before attempt-ing to drive or steer.
DRIVE PREVENTED – BOOM SELECTED	2518	The machine is set up to cut out functions when the boom is being operated. The machine is in the Out Of Transport position. The opera-tor is operating a boom function and tries to activate the Drive or Steer controls.	Disable Drive and Steer	Stop operating any boom func-tions. Activate the Drive or Steer function.
FUNCTIONS LOCKED OUT – CONSTANT DATA VERSION IMPROPER	2520	The Ground Module detects a mismatch between programmed sec-tions of the processor memory.	Disable all machine and engine functions (i.e., command engine shutdown and do not permit start).	Reprogram the software so that the memory values match. Cycle Power.
RUNNING AT CREEP - PLAT-FORM LEVELED UNDER	2587	The control system has determined that the platform is leveled under and is being considered to be in a loading/unloading position. Boom, Tower, and Level Override functions will operate at creep speed.		

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
BRAKE – SHORT TO BATTERY	331	The Ground Module detects a short to battery at the brake output.	Disable Drive and Brake outputs.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
BRAKE – OPEN CIRCUIT	332	The Ground Module detects an open circuit at the brake output.	No response required.	Inspect wiring for physical damage. Check for a good connection at the solenoid and for wire continuity through this circuit. Cycle power to clear the fault.
LIFT UP VALVE – OPEN CIRCUIT	334	The Ground Module detects an open circuit at the lift up valve output.	The Ground Module suspends the Lift Up/Down command and reverts to Open Loop Current control for Lift; Lift speed is limited to Creep after both Lift Up/Down controls are returned to neutral and the machine controls are not Enabled.	Inspect wiring for physical damage. Check for a good connection at the solenoid and for continuity through the circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Cycle power to clear the fault.
LIFT DOWN VALVE – SHORT TO GROUND	335	The Ground Module detects a short to ground at the Lift Down valve output.	Ground Module Lift Up and Down outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
LIFT DOWN VALVE – OPEN CIRCUIT	336	The Ground Module detects an open circuit at the Lift Down valve output.	The Ground Module suspends Lift Up/Down commands and reverts to Open Loop Current control for Lift; Lift speed is limited to Creep after both Lift Up/Down controls have been returned to neutral and machine is not Enabled.	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
GROUND ALARM – SHORT TO BATTERY	3311	The Ground Module detects a short to battery at the Ground Alarm output.	No response required.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
MAIN DUMP VALVE – SHORT TO GROUND	3358	The Ground Module detects a short to ground at the Main Dump Valve output.	The Main Dump Valve output is disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
MAIN DUMP VALVE – OPEN CIRCUIT	3359	The Ground Module detects an open circuit at the Main Dump Valve output.	No response required.	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
MAIN DUMP VALVE – SHORT TO BATTERY	3360	The Ground Module detects a short to battery at the Main Dump Valve output.	Ground Module Main Dump, Swing Left/Right, Tower Lift Up, and Lift Up outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
BRAKE – SHORT TO GROUND	3361	The Ground Module detects a short to ground at the Brake output.	Ground Module Drive/Steer and Brake outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
START SOLENOID – SHORT TO GROUND	3362	The Ground Module detects a short to ground at the Engine Starter Solenoid.	Engine Start attempt is not permitted.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
START SOLENOID – OPEN CIRCUIT	3363	Ground Module detects an open circuit at this output; if machine is equipped with a Dual Fuel ECU, ground module will only evaluate for open circuit conditions until first Start is attempted for each power cycle due to possibility of ECU opening ground solenoid return path to disable Start and causing erroneous diagnostics.	No response required.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
START SOLENOID – SHORT TO BATTERY	3364	The Ground Module detects a short to battery at the Engine Starter Solenoid.	Ground Module Engine Start is disabled by de-energizing the Fuel Actuator (Kubota) or sending an Engine Shutdown command (Dual Fuel ECU)	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
STEER DUMP VALVE – SHORT TO GROUND	3365	The Ground Module detects a short to ground at the Steer Dump Valve output.	Ground Module Steer Dump output is disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
STEER DUMP VALVE – OPEN CIRCUIT	3366	The Ground Module detects an open circuit at the Steer Dump Valve output.	No response required.	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
STEER DUMP VALVE – SHORT TO BATTERY	3367	The Ground Module detects a short to battery at the Steer Dump Valve output.	Ground Module Steer Dump, Steer, and Flow Control outputs are disabled; Steer, Tele In/Out, Jib Up (permitted if operating in Emergency Descent mode), Level Up/Down, and Rotate Left/Right functions are disallowed.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
GEN SET/WELDER – SHORT TO GROUND	3373	The Ground Module detects a short to ground at the Gen Set/Welder output.	Ground Module Generator relay output is disabled thereby disabling generator functionality.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
GEN SET/WELDER – OPEN CIRCUIT	3374	The Ground Module detects an open circuit at the Gen Set/Welder output.	No response required.	Check for a good connection at the relay and for continuity through this circuit. With the relay disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
GEN SET/WELDER – SHORT TO BATTERY	3375	The Ground Module detects a short to battery at the Gen Set/Welder output.	The Ground Module Generator relay output is disabled, but the Ground Module considers the Generator always enabled and restricts engine speed to Generator RPM. If MACHINE SETUP → GENSET CUTOUT = MOTION CUTOUT, disregard cutout and permit motion.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
HEAD TAIL LIGHT – SHORT TO GROUND	3376	The Ground Module detects a short to ground at the Head-Tail Light output.	Ground Module H&T Light relay output is disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
HEAD TAIL LIGHT – OPEN CIRCUIT	3377	The Ground Module detects an open circuit at the Head-Tail Light output.	No response required.	Check for a good connection at the relay and for continuity through this circuit. With the relay disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Fault cleared with power cycle.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
HEAD TAIL LIGHT – SHORT TO BATTERY	3378	The Ground Module detects a short to battery at the Head-Tail Light output.	Disable Ground Module H&T Light relay output is disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
HOUR METER – SHORT TO GROUND	3379	The Ground Module detects a short to ground at the Hourmeter output.	Ground Module Hourmeter output is disabled.	Inspect wiring for physical damage and check for wire continuity. Confirm high resistance reading across hourmeter. Cycle power to clear the fault.
HOUR METER – SHORT TO BATTERY	3381	The Ground Module detects a short to battery at the Hourmeter output.	Ground Module Hourmeter output is disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
PLATFORM LEVEL UP VALVE – SHORT TO GROUND	3382	The Ground Module detects a short to ground at the Platform Level Up Valve output.	Ground Module Platform Level Up is disabled; Level Down speed is limited to Creep.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
PLATFORM LEVEL UP VALVE – OPEN CIRCUIT	3383	The Ground Module detects an open circuit at the Platform Level Up Valve output.	Platform Level speed is limited to Creep.	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.
PLATFORM LEVEL UP VALVE – SHORT TO BATTERY	3384	The Ground Module detects a short to battery at the Platform Level Up Valve output.	Ground Module Platform Level Up, Level Down, and Flow Control Valve outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
PLATFORM LEVEL DOWN VALVE – SHORT TO GROUND	3388	The Ground Module detects a short to ground at the Platform Level Down Valve output.	Ground Module Platform Level Up and Down valve outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
PLATFORM LEVEL DOWN VALVE – OPEN CIRCUIT	3389	The Ground Module detects an open circuit at the Platform Level Down Valve output.	Platform Level speed is limited to Creep.	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.
PLATFORM LEVEL DOWN VALVE – SHORT TO BATTERY	3390	The Ground Module detects a short to battery at the Platform Level Down Valve output.	Ground Module Platform Level Up, Level Down, and Flow Control Valve outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

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TOWER LIFT UP VALVE – SHORT TO GROUND	33106	The Ground Module detects a short to ground at the Tower Lift Up Valve output.	Ground Module Tower Lift Up output is disabled; Tower Lift Down speed is limited to Creep	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
TOWER LIFT UP VALVE – OPEN CIRCUIT	33107	The Ground Module detects an open circuit at the Tower Lift Up Valve output.	The Ground Module suspends Tower Lift Up/Down commands and reverts to Open Loop Current control for Tower Lift; Tower Lift speed is limited to Creep after both Tower Lift Up/Down controls have been returned to neutral and machine is not Enabled	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
TOWER LIFT DOWN VALVE – SHORT TO GROUND	33109	The Ground Module detects a short to ground at the Tower Lift Down Valve output.	Ground Module Tower Lift Up and Down outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
TOWER LIFT DOWN VALVE – OPEN CIRCUIT	33110	The Ground Module detects an open circuit at the Tower Lift Down Valve output.	The Ground Module suspends Tower Lift Up/Down commands and reverts to Open Loop Current control for Tower Lift; Tower Lift speed is limited to Creep after both Tower Lift Up/Down controls have been returned to neutral and machine is not Enabled	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
SWING RIGHT VALVE – SHORT TO GROUND	33118	The Ground Module detects a short to ground at the Swing Right Valve output.	Swing Left and Right outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
SWING RIGHT VALVE – OPEN CIRCUIT	33119	The Ground Module detects an open circuit at the Swing Right Valve output.	The Ground Module suspends Swing Left/Right commands and reverts to Open Loop Current control for Swing; Swing speed is limited to Creep after both Swing Left/Right controls are returned to neutral and machine is not Enabled	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
TELESCOPE IN VALVE – SHORT TO BATTERY	33120	The Ground Module detects a short to battery at the Telescope In Valve output.	Ground Module Telescope In, Telescope Out, and Flow Control Valve outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
SWING LEFT VALVE – SHORT TO GROUND	33122	The Ground Module detects a short to ground at the Swing Left Valve output.	Ground Module Swing Left and Right outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
TELESCOPE OUT VALVE – SHORT TO BATTERY	33123	The Ground Module detects a short to battery at the Telescope Out Valve output.	Ground Module Telescope In, Telescope Out, and Flow Control Valve outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
THROTTLE ACTUATOR – SHORT TO GROUND	33130	The Ground Module detects a short to ground at the Throttle Actuator output (Kubota).	The Ground Module Throttle Actuator output is disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
THROTTLE ACTUATOR – OPEN CIRCUIT	33131	The Ground Module detects an open circuit at the Throttle Actuator output (Kubota).	No response required	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
THROTTLE ACTUATOR – SHORT TO BATTERY	33132	The Ground Module detects a short to battery at the Throttle Actuator output (Kubota).	The Ground Module Throttle Actuator output is disabled; functions are set to Creep speed.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
LIFT VALVES – SHORT TO BATTERY	33182	The Ground Module detects a short to battery at either the Lift Up or Lift Down valve	The Ground Module Lift Up and Down outputs are disabled and ground current return path is open circuited.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

Table 6-15. Fault Code Troubleshooting Information

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

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

Table 6-16. Overload Variations

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

Clarifications:

1. The term Report Fault is defined as logging the DTC on the Analyzer fault stack and flashing the System Distress lamp.

2. When specified, Ground Alarm energization shall only occur if MACHINE SETUP → GROUND ALARM ≠ NO.

3. This selection is not Analyzer configurable in MACHINE SETUP → LOAD SYSTEM but is shown here for completeness of the response table.

PARTS FINDER

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SECTION 7. BASIC ELECTRICAL INFORMATION & SCHEMATICS

7.1   GENERAL

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

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

7.2   MULTIMETER BASICS

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

Grounding

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

Backprobing

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

Min/Max

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

Polarity

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

Scale

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

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

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

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

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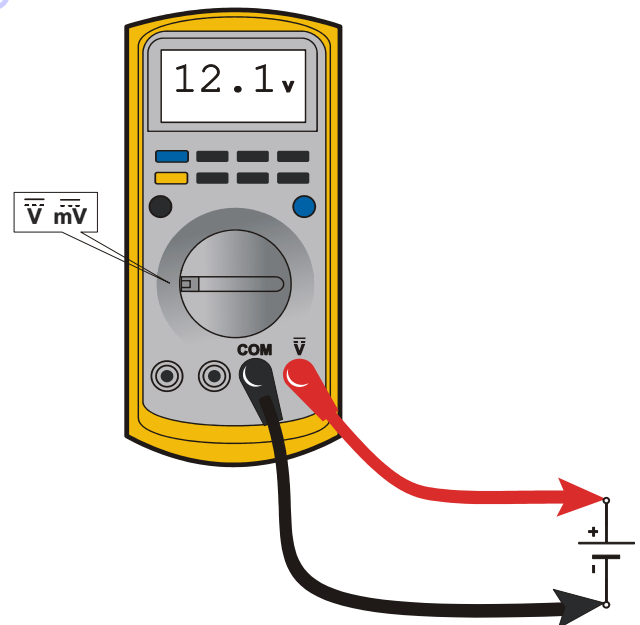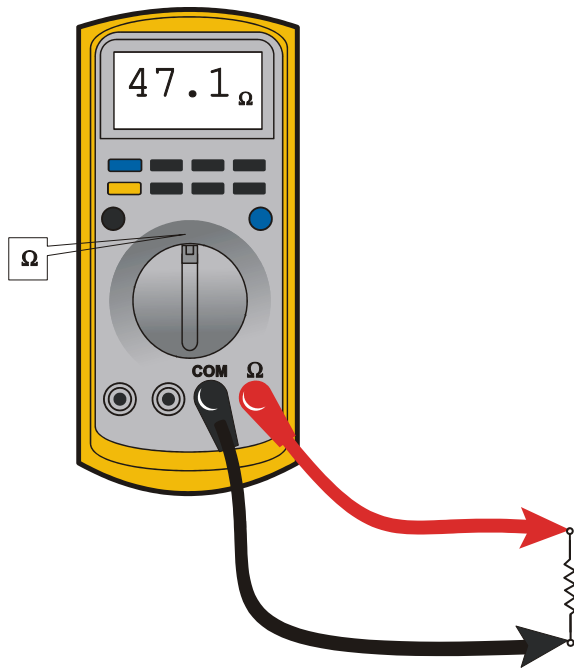Example: 50 mA = 0.05 A

Voltage Measurement

Figure 7-1. Voltage Measurement (DC)

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

- Use firm contact with meter leads

Resistance Measurement

Figure 7-2. Resistance Measurement

- First test meter and leads by touching leads together. Resistance should read a short circuit (very low resistance)

- Circuit power must be turned OFF before testing resistance

- Disconnect component from circuit before testing

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

- Use firm contact with meter leads

Continuity Measurement
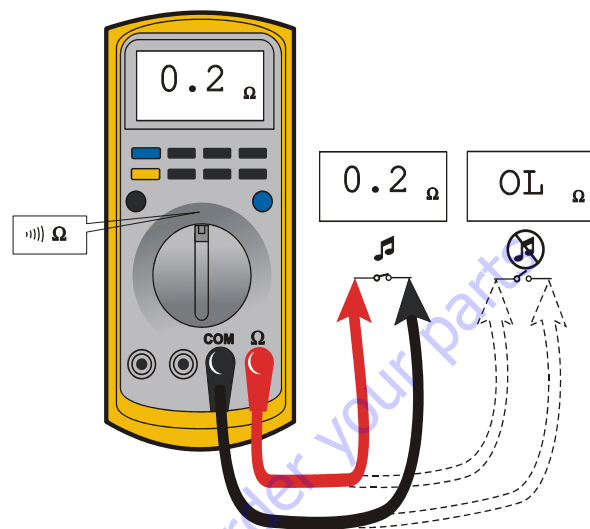
Figure 7-3. Continuity Measurement

- Some meters require a separate button press to enable audible continuity testing

- Circuit power must be turned OFF before testing continuity

- Disconnect component from circuit before testing

- Use firm contact with meter leads

- First test meter and leads by touching leads together. Meter should produce an audible alarm, indicating continuity

Current Measurement
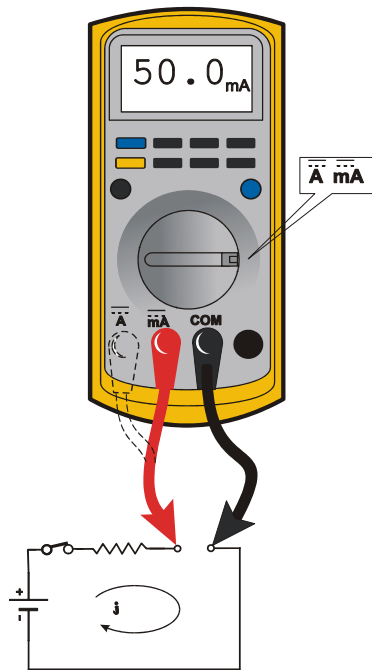
Figure 7-4. Current Measurement (DC)

• Set up the meter for the expected current range

• Be sure to connect the meter leads to the correct jacks for the current range you have selected

• If meter is not auto ranging, set it to the correct range (See multi meter's operation manual)

• Use firm contact with meter leads

7.3 APPLYING SILICONE DIELECTRIC COMPOUND TO ELECTRICAL CONNECTIONS

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

NOTICE

JLG PN 0100048 DIELECTRIC GREASE (NOVAGARD G661) IS THE ONLY MATE-RIAL 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)

7.4 DIELECTRIC GREASE APPLICATION

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

Installation

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

- Use dielectric grease in a tube for larger connection points or apply with a syringe for small connectors.

- Apply dielectric grease to plug/male connector housing which typically contains sockets contact/female terminals.

- Leave a layer of dielectric grease on the mating face of the connector, completely covering each connector terminal hole. Refer the pictures shown below.

Assemble the connector system immediately to prevent moisture ingress or dust contamination.

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

AMP Mate-N-Lok

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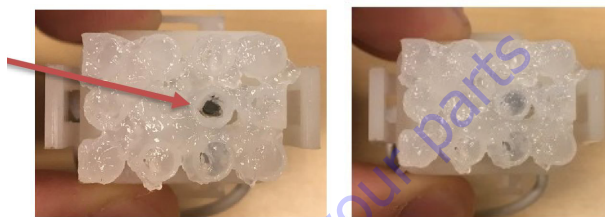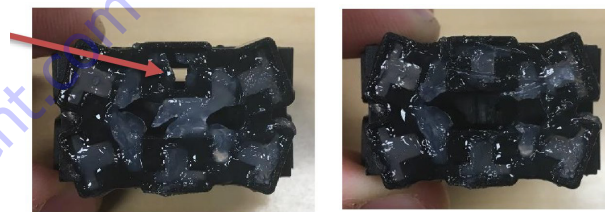

Improper   Proper

AMP Faston

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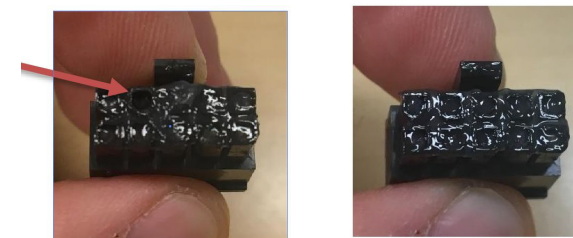

Improper   Proper

AMP Micro-Fit

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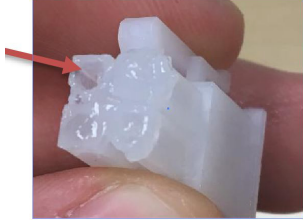

Improper   Proper

AMP Mini Fit Jr

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

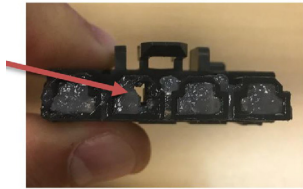Improper   Proper

Mini Fit Sr

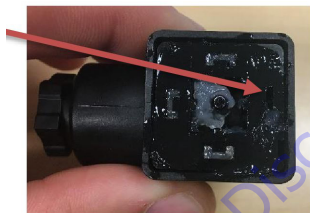This connector system is typically used on control modules at JLG. Follow the general guidance for installation.

Improper   Proper

DIN Connectors

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

Improper   Proper

Exceptions

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

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

ENCLOSURES

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

CARLING SWITCH CONNECTORS

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

7.5   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

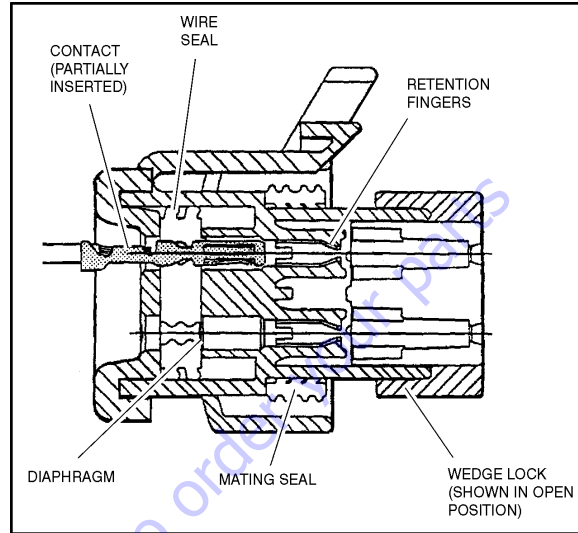Check to be sure the wedge lock is in the open, or as-shipped, position (See Figure 7-5.). Proceed as follows:

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.).
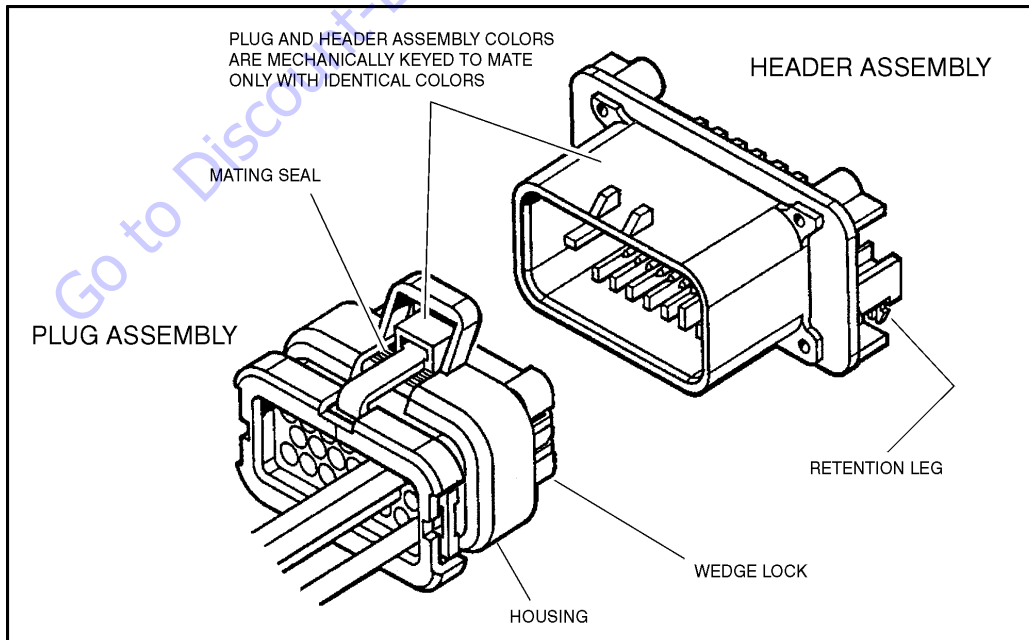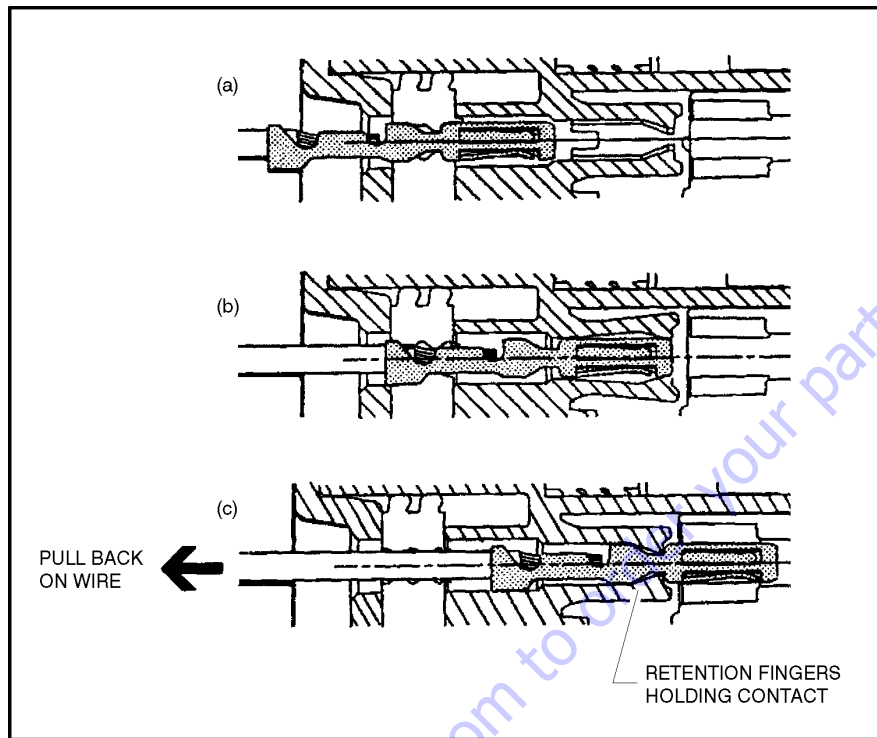

Figure 7-6. AMP Connector

(a)

(b)

(c)

PULL BACK
ON WIRE

RETENTION FINGERS
HOLDING CONTACT

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.).

SQUEEZE LOCKING LATCHES
TO SEAT WEDGE LOCK
(BOTH SIDES)

Figure 7-8. Connector Assembly Figure 3

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

WEDGE LOCK
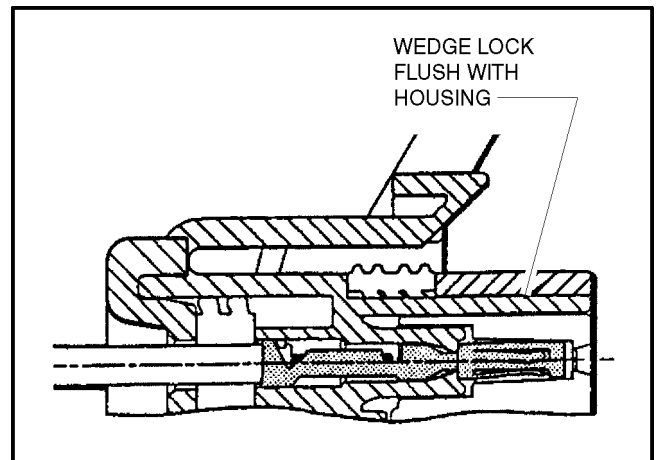FLUSH WITH
HOUSING

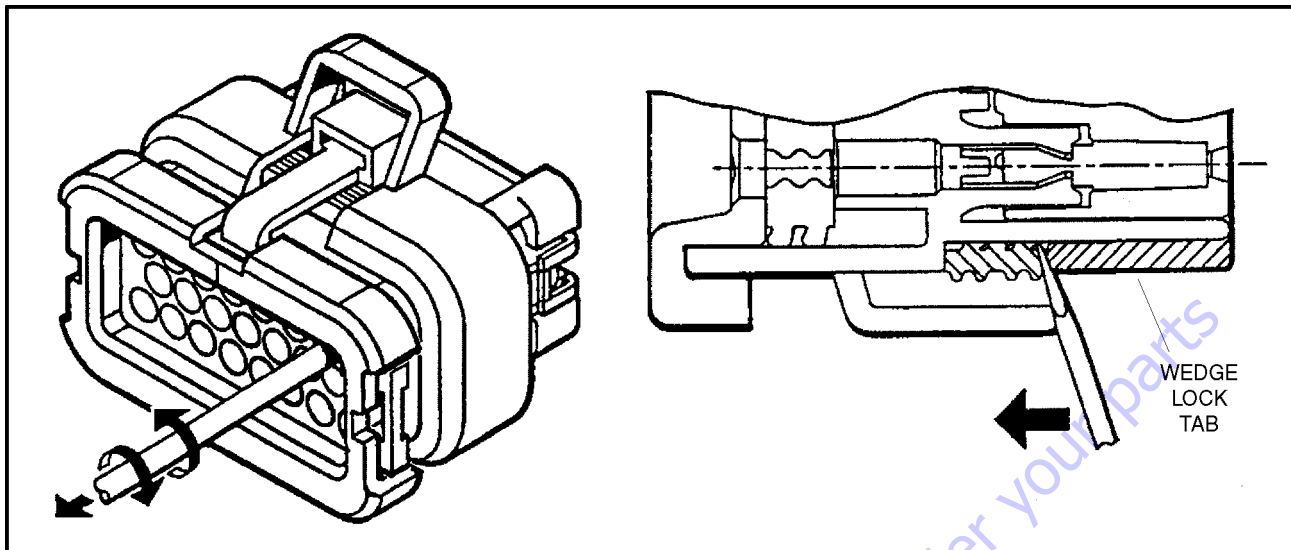**Figure 7-9. Connector Assembly Figure 4**

Figure 7-10. Connector Disassembly

Disassembly

5. Insert a 4.8 mm (3/16") wide screwdriver blade between the mating seal and one of the red wedge lock tabs.

6. Pry open the wedge lock to the open position.

7. While rotating the wire back and forth over a half turn (1/4 turn in each direction), gently pull the wire until the contact is removed.

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

Wedge Lock

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

Service - Voltage Reading

NOTICE

DO NOT PIERCE WIRE INSULATION TO TAKE VOLTAGE READINGS.

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

WIRE STRANDS MUST BE VISIBLE
IN THIS AREA

WIRE STRANDS AND INSULATION MUST
BOTH BE VISIBLE IN THIS AREA

CUTOFF TAB MUST
BE VISIBLE

SCREWDRIVER SLOT
TO LIFT LATCH FOR
UNMATING

LOCKING LATCH MUST BE
SECURELY FASTENED
FOR MATING

PLUG AND HEADER MUST BE
OF IDENTICAL COLOR IN ORDER
FOR THEM TO MATE
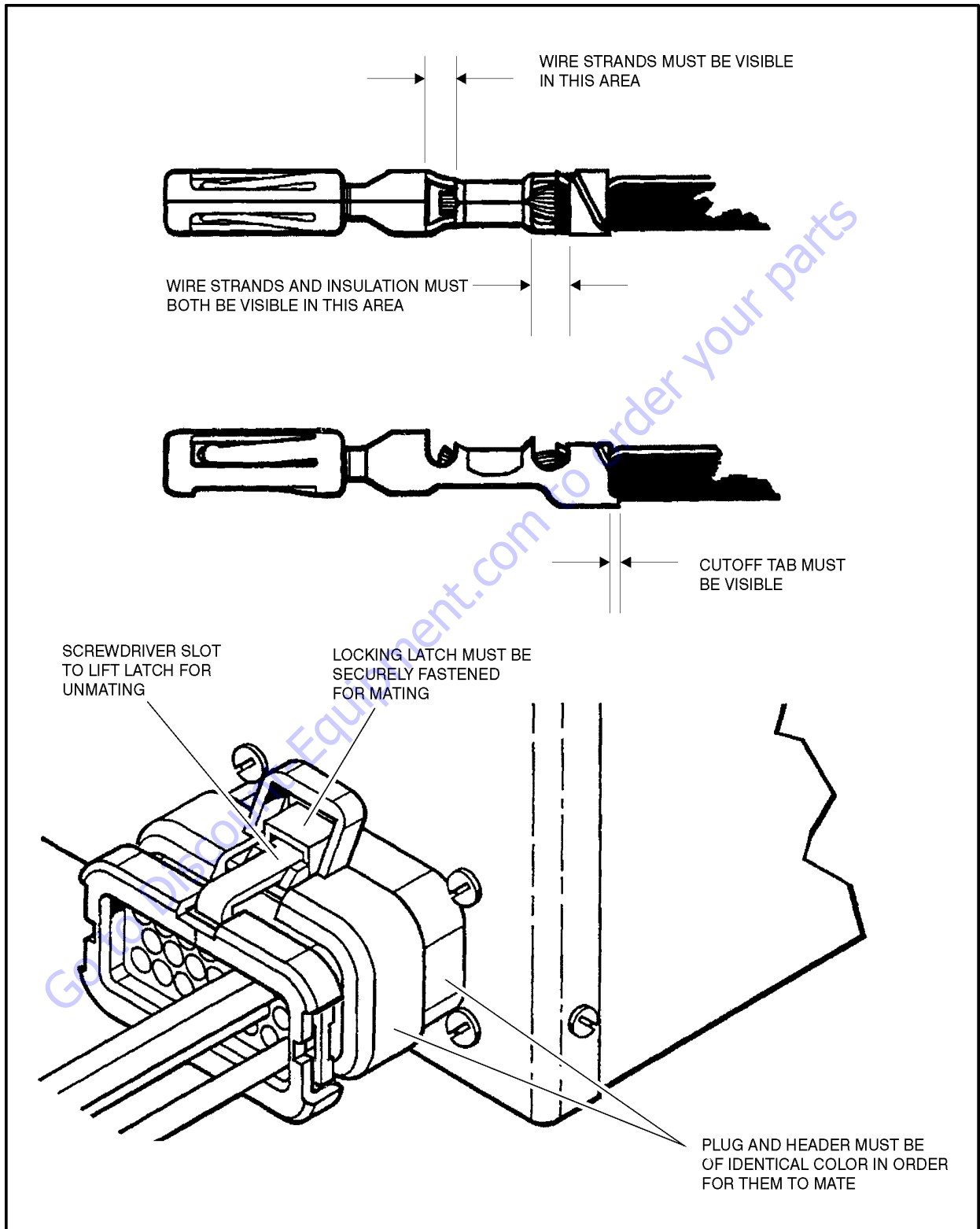
Figure 7-11. Connector Installation

7.6 DEUTSCH CONNECTORS

DT/DTP Series Assembly

Figure 7-12. DT/DTP Contact Installation

1. Grasp crimped contact about 25mm behind the contact barrel.

2. Hold connector with rear grommet facing you.

3. Push contact straight into connector grommet until a click is felt. A slight tug will confirm that it is properly locked in place.

4. Once all contacts are in place, insert wedgelock with arrow pointing toward exterior locking mechanism. The wedgelock will snap into place. Rectangular wedges are not oriented. Thy may go in either way.

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

DT/DTP Series Disassembly
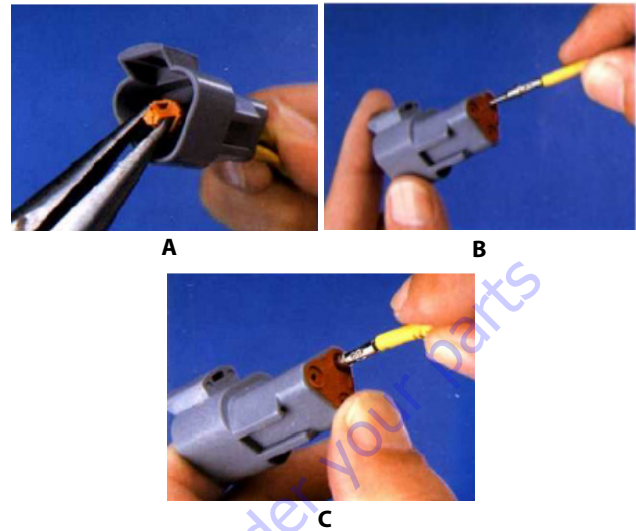
Figure 7-13. DT/DTP Contact Removal

5. Remove wedgelock using needlenose pliers or a hook shaped wire to pull wedge straight out.

6. To remove the contacts, gently pull wire backwards, while at the same time releasing the locking finger by moving it away from the contact with a screwdriver.

7. Hold the rear seal in place, as removing the contact may displace the seal.

HD30/HDP20 Series Assembly

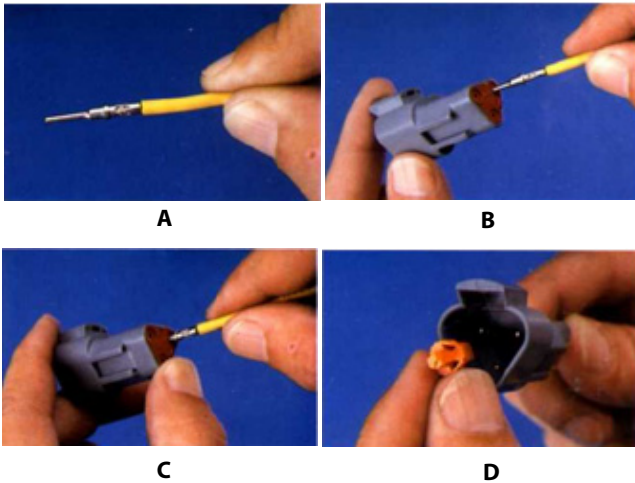A   B

C
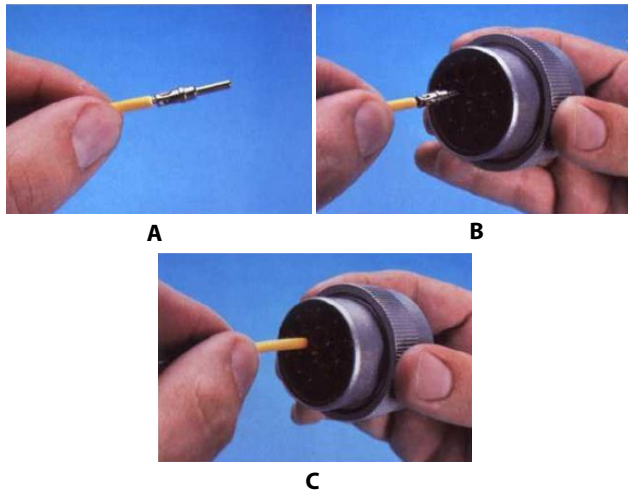
Figure 7-14. HD/HDP Contact Installation

8.   Grasp contact about 25mm behind the contact crimp barrel.

9.   Hold connector with rear grommet facing you.

10. Push contact straight into connector grommet until a positive stop is felt. A slight tug will confirm that it is properly locked in place.
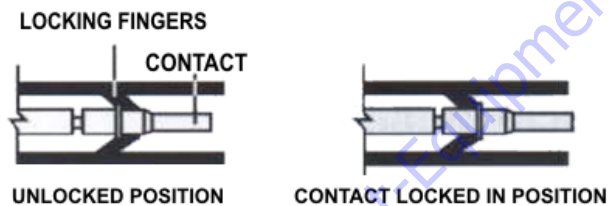
Figure 7-15. HD/HDP Locking Contacts Into Position

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

HD30/HDP20 Series Disassembly

A   B

C
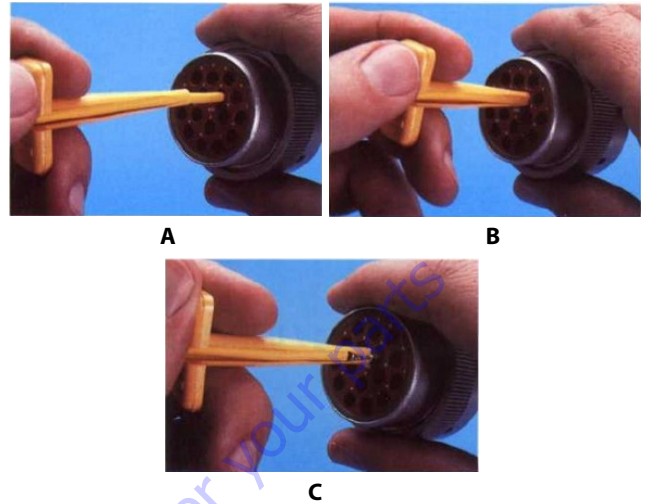
Figure 7-16. HD/HDP Contact Removal

11. With rear insert toward you, snap appropriate size extractor tool over the wire of contact to be removed.

12. Slide tool along into the insert cavity until it engages contact and resistance is felt.

13. Pull contact-wire assembly out of connector.
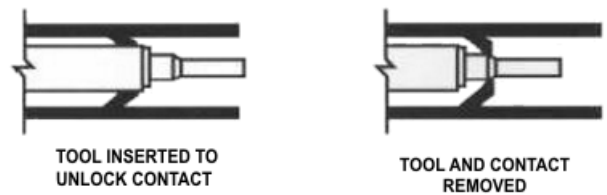
Figure 7-17. HD/HDP Unlocking Contacts

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

7.7   TELEMATICS GATEWAY

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

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

GATEWAY MODULE

DIAGNOSTICS PLUG

TELEMATICS-READY PLUG
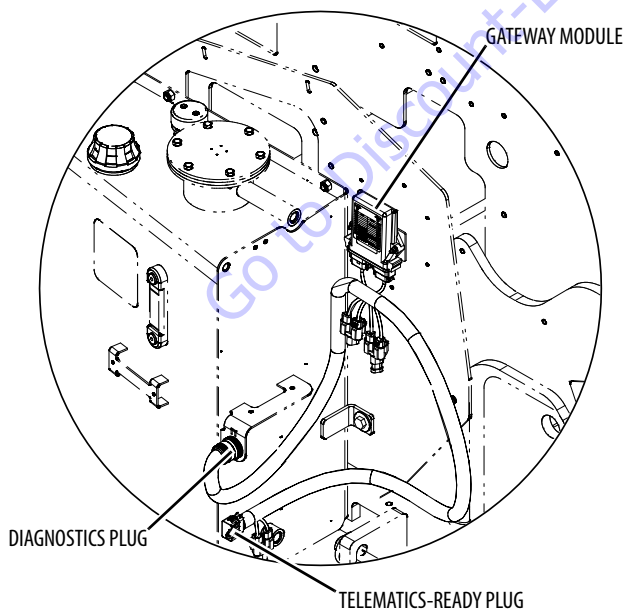
Telematics-Ready (TCU) Plug

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

12
11
CAN-HI 2 - 10
CAN-LO 2 - 9
8
7

1 - BATTERY
2 - GROUND
3
4 - IGNITION
5
6
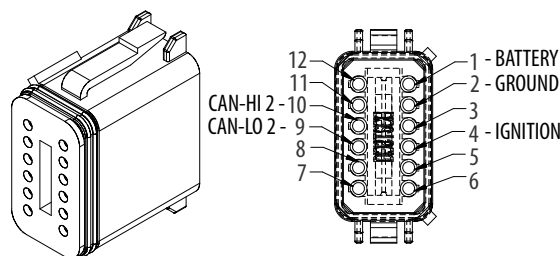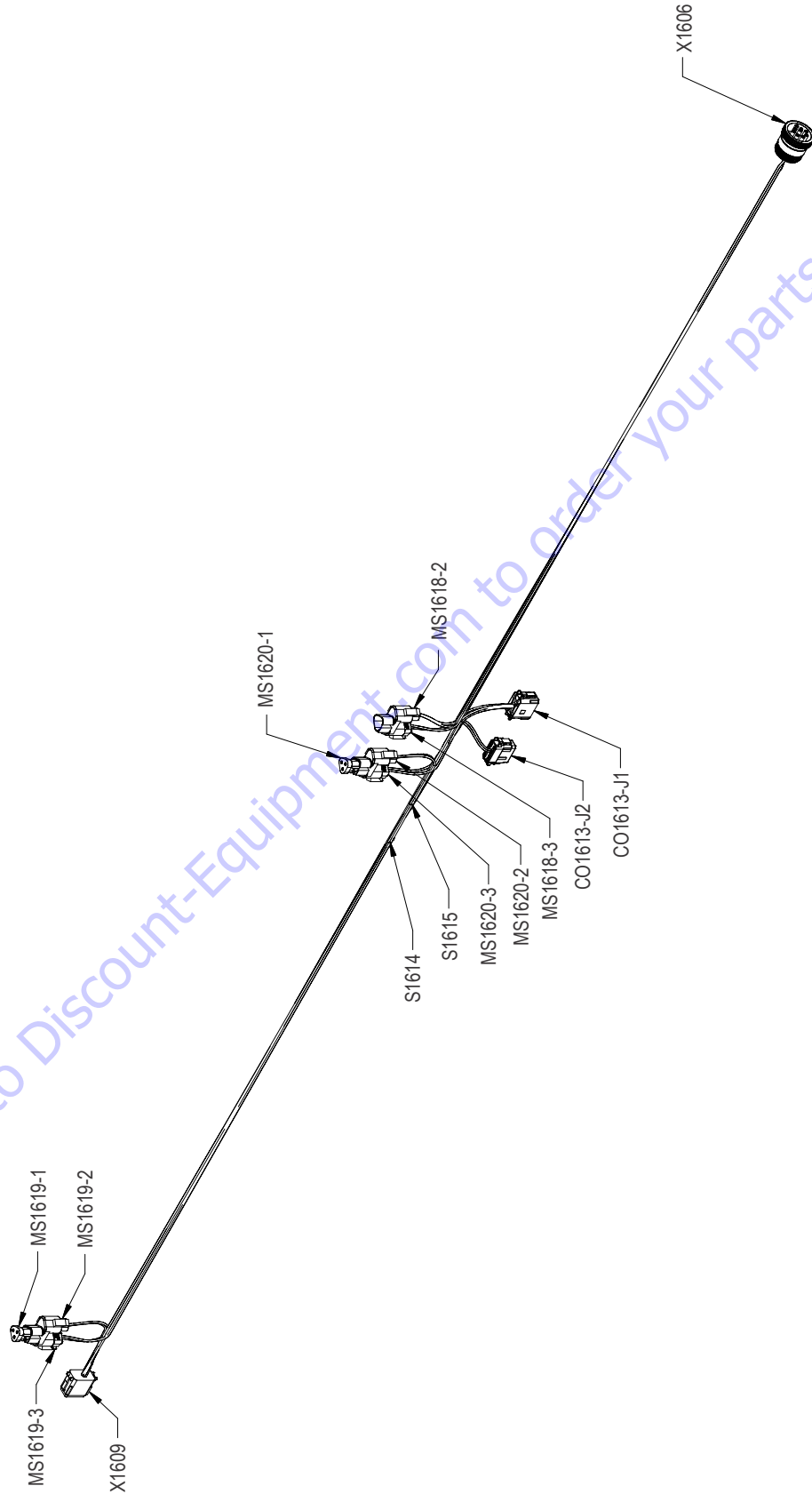
Figure 7-18. Telematics Gateway Harness - Sheet 1 of 3

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

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

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

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

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

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

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

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

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

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

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

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

Figure 7-19. Telematics Gateway Harness - Sheet 2 of 3

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

Figure 7-20. Telematics Gateway Harness - Sheet 3 of 3
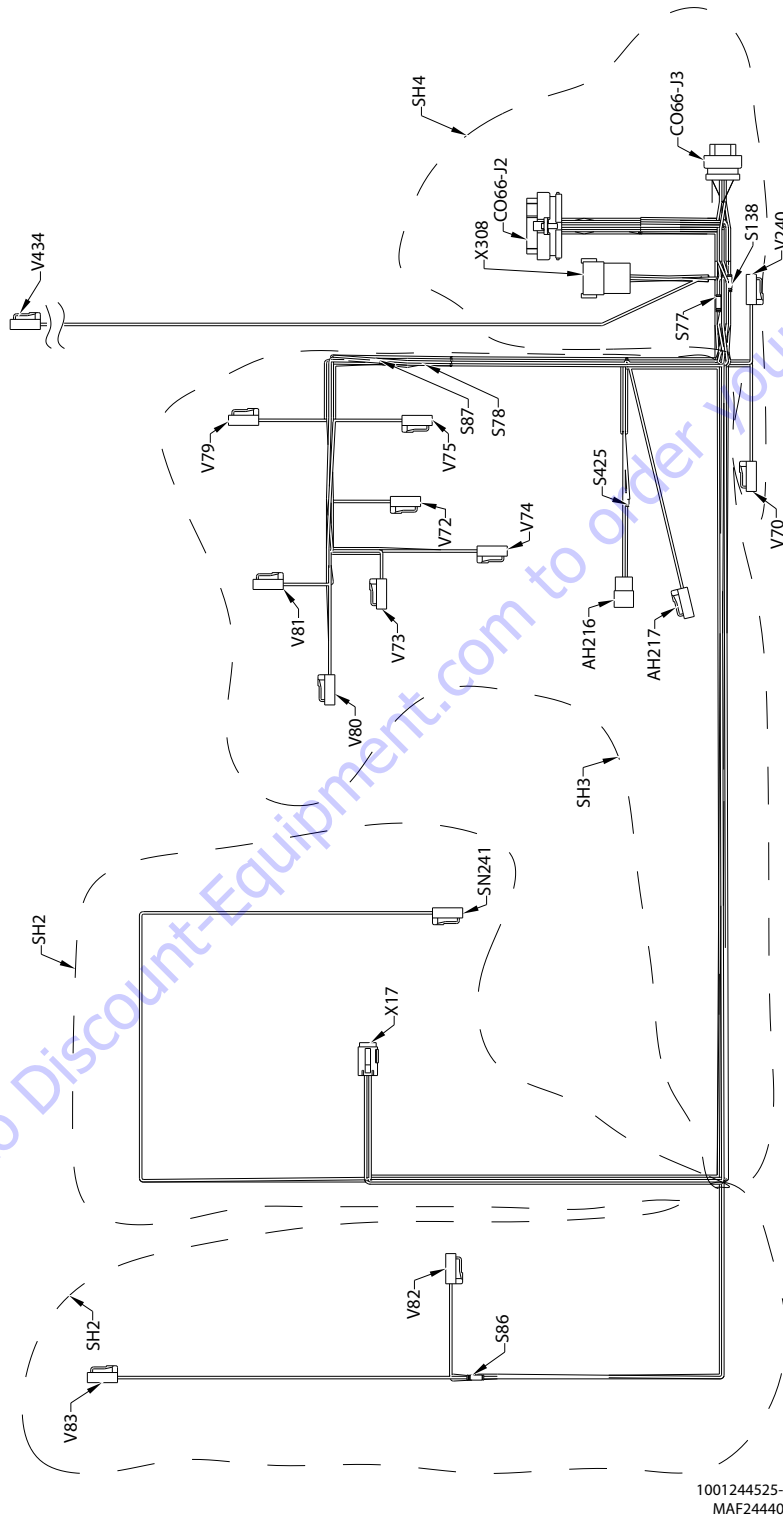
Figure 7-21. Valve Harness - Sheet 1 of 8

1001244525-A
MAF24440A

V434					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	1-99 LOW FLOW VLV	18 AWG	GXL	CO66-J2 (32)
2	WHT	0-13-13 LOW FLOW VLV RTN	18 AWG	GXL	CO66-J2 (17)

Figure 7-22. Valve Harness - Sheet 2 of 8

V83

V82

S86

X17

SN241
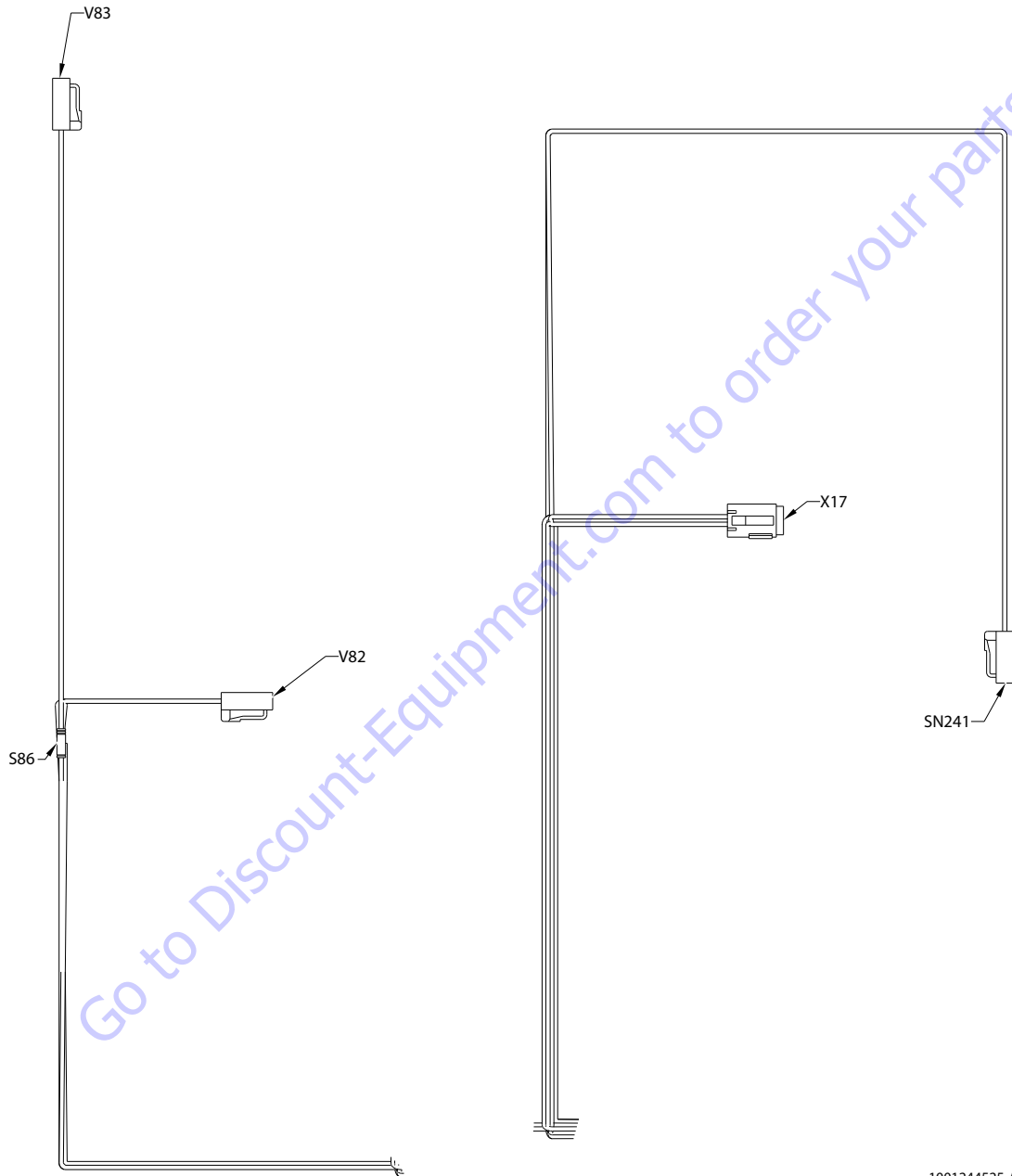
1001244525-A
MAF24450A

Figure 7-23.   Valve Harness - Sheet 3 of 8

V83

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	7-2 DRV FORWARD	18 AWG	GXL	X308 (7)
2	WHT	47-2 DRV VLV RTN	18 AWG	GXL	S86 (2)

V82

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	8-2 DRV REVERSE	18 AWG	GXL	X308 (8)
2	WHT	47-3 DRV VLV RTN	18 AWG	GXL	S86 (2)

S86

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	47-1 DRV VLV RTN	18 AWG	GXL	CO66-J3 (1)
2	WHT	47-2 DRV VLV RTN	18 AWG	GXL	V83 (2)
2	WHT	47-3 DRV VLV RTN	18 AWG	GXL	V82 (2)

SN241

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	39-1 FUEL LVL	18 AWG	GXL	CO66-J2 (25)
2	WHT	0-14 FUEL GND	18 AWG	GXL	CO66-J2 (6)

X17

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	25-3 PLAT LVL UP	18 AWG	GXL	CO66-J2 (5)
2	WHT	26-3 PLAT LVL DN	18 AWG	GXL	CO66-J2 (7)
3	WHT	13-3 TELE IN	18 AWG	GXL	CO66-J2 (4)
4	WHT	14-3 TELE OUT	18 AWG	GXL	CO66-J2 (16)
5	WHT	0-10 MID VLV GND	18 AWG	GXL	CO66-J2 (14)
6	WHT	4-3 LIFT DN	18 AWG	GXL	CO66-J2 (22)
7	WHT	0-13-11 LIFT VLV RTN	18 AWG	GXL	S77 (2)
8	WHT	6-3 TWR LIFT DN	18 AWG	GXL	CO66-J2 (9)
9	WHT	0-13-5 TWR VLV RTN	18 AWG	GXL	S138 (2)
10					
11					
12					

Figure 7-24. Valve Harness - Sheet 4 of 8
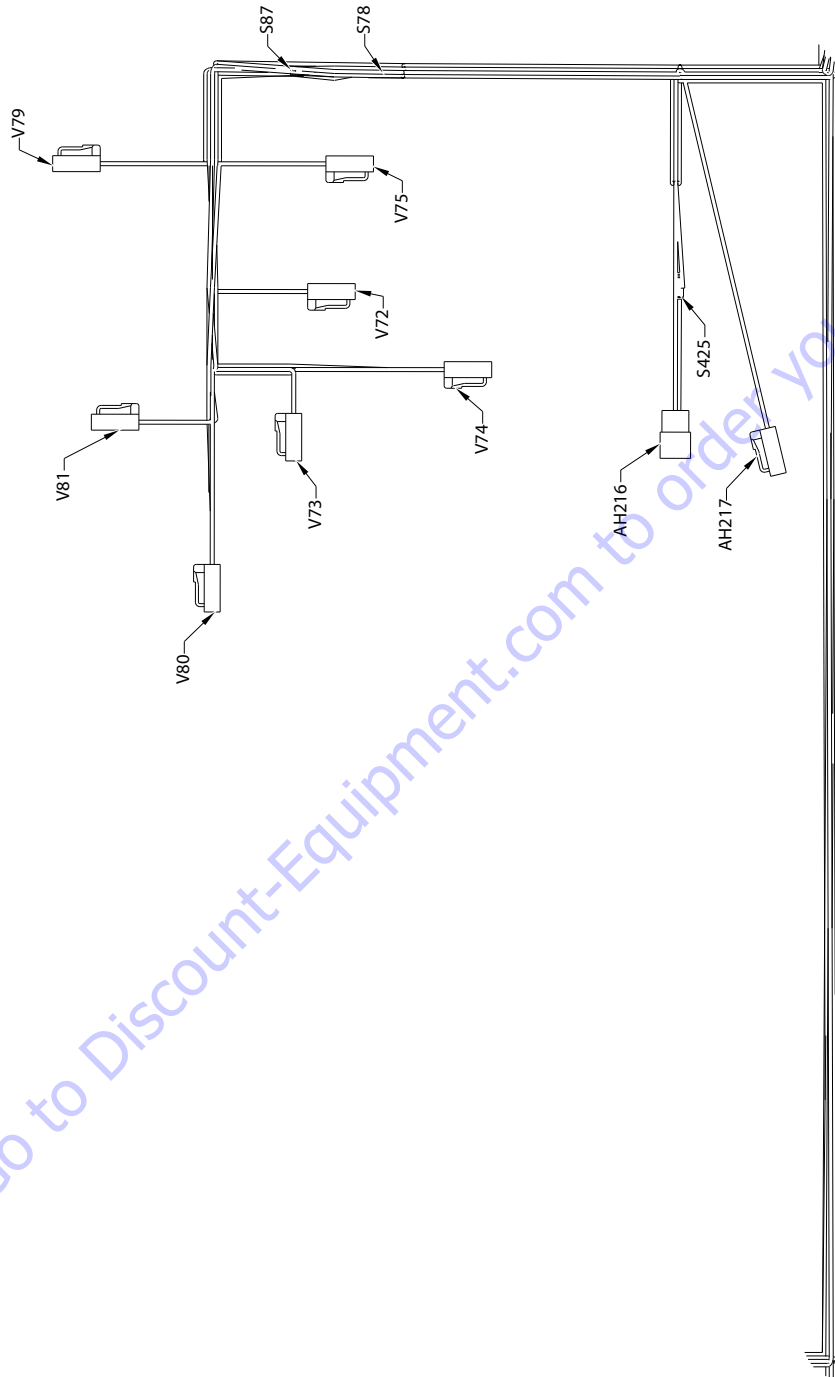
Figure 7-25. Valve Harness - Sheet 5 of 8

1001244525-A
MAF24460A

V79					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-3 TWR LIFT UP	18 AWG	GXL	CO66-J2 (20)
2	WHT	0-13-4 TWR VLV RTN	18 AWG	GXL	S138 (2)

V80					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	9-2 STEER LFT	18 AWG	GXL	CO66-J2 (19)
2	WHT	0-12-1 STR VLV GND	18 AWG	GXL	S87 (2)

V81					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	10-2 STEER RT	18 AWG	GXL	CO66-J2 (8)
2	WHT	0-12-2 STR VLV GND	18 AWG	GXL	S87 (2)

V73					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	22-3 SWG RT	18 AWG	GXL	CO66-J2 (35)
2	WHT	0-13-8 SWG VLV RTN	18 AWG	GXL	S78 (2)

V74					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	21-3 SWG LFT	18 AWG	GXL	CO66-J2 (34)
2	WHT	0-13-9 SWG VLV RTN	18 AWG	GXL	S78 (2)

V72					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-2 FLOW VLV	18 AWG	GXL	CO66-J2 (31)
2	WHT	0-13-7 FLOW VLV RTN	18 AWG	GXL	CO66-J3 (6)

V75					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	3-3 LIFT UP	18 AWG	GXL	CO66-J2 (11)
2	WHT	0-13-10 LIFT VLV RTN	18 AWG	GXL	S77 (2)

AH216					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	36-1 GND ALARM B+	18 AWG	GXL	CO66-J3 (7)
2	WHT	36-2 GND ALARM	18 AWG	GXL	CO66-J2 (27)
3	WHT	0-15-1 GND ALARM GND	18 AWG	GXL	S425 (1)

AH217					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-1 WHT NOISE	18 AWG	GXL	CO66-J2 (2)
2	WHT	0-15-2 GND NOISE	18 AWG	GXL	S425 (2)

S425					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-15-1 GND ALARM GND	18 AWG	GXL	AH216 (3)
2	WHT	0-15-2 GND NOISE	18 AWG	GXL	AH217 (2)
2	WHT	0-15-2 GND ALARM GND	18 AWG	GXL	S525 (2)

S87					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-12 STR VLV GND	18 AWG	GXL	CO66-J2 (28)
2	WHT	0-12-1 STR VLV GND	18 AWG	GXL	V80 (2)
2	WHT	0-12-2 STR VLV GND	18 AWG	GXL	V81 (2)

S78					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-13-2 SWG VLV RTN	18 AWG	GXL	CO66-J3 (4)
2	WHT	0-13-8 SWG VLV RTN	18 AWG	GXL	V73 (2)
2	WHT	0-13-9 SWG VLV RTN	18 AWG	GXL	V74 (2)

Figure 7-26. Valve Harness - Sheet 6 of 8
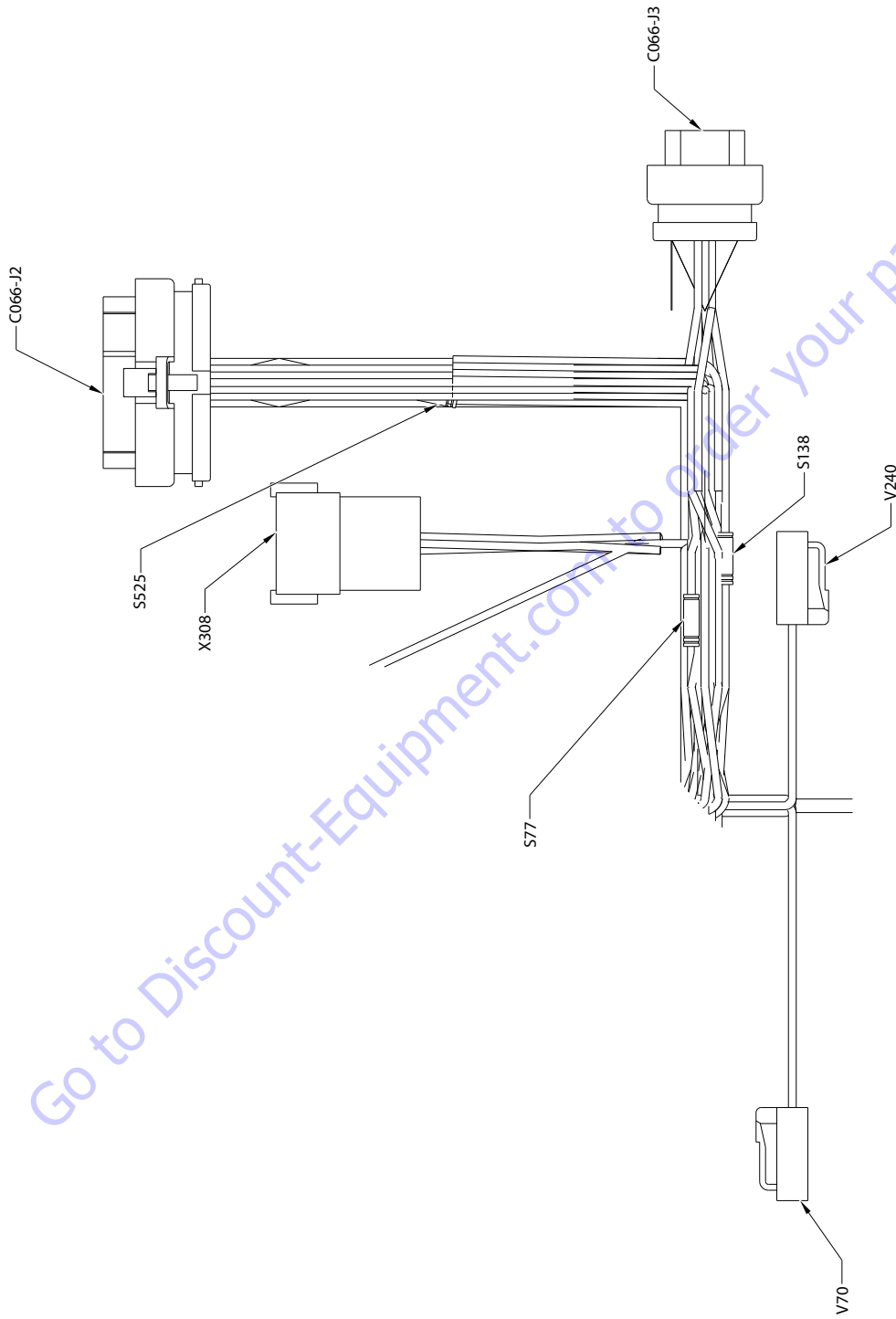
Figure 7-27. Valve Harness - Sheet 7 of 8

1001244525-A
MAF24470A

S525				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-15-1 GND ALARM GND	18 AWG	GXL	CO66-J2 (29)
1	WHT	0-15-3 CONFIG	18 AWG	GXL	CO66-J2 (24)
2	WHT	0-15-2 GND ALARM GND	18 AWG	GXL	S425 (2)

X308				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	49-1 CRIBBING	18 AWG	GXL	CO66-J3 (9)
2	WHT	51-1 NITE BRITE	18 AWG	GXL	CO66-J2 (26)
3					
4					
5					
6	WHT	0-43-1 THROTTLE RTN	18 AWG	GXL	CO66-J3 (2)
7	WHT	7-2 DRV FORWARD	18 AWG	GXL	V83 (1)
8	WHT	8-2 DRV REVERSE	18 AWG	GXL	V82 (1)

S77				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-13-3 LIFT VLV RTN	18 AWG	GXL	CO66-J3 (14)
2	WHT	0-13-10 LIFT VLV RTN	18 AWG	GXL	V75 (2)
2	WHT	0-13-11 LIFT VLV RTN	18 AWG	GXL	X17 (7)

S138				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-13-1 TWR VLV RTN	18 AWG	GXL	CO66-J3 (5)
2	WHT	0-13-4 TWR VLV RTN	18 AWG	GXL	V79 (2)
2	WHT	0-13-5 TWR VLV RTN	18 AWG	GXL	X17 (9)

V70				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-1 MAIN DUMP	18 AWG	GXL	CO66-J2 (13)
2	WHT	0-13-6 MAIN DUMP GND	18 AWG	GXL	CO66-J2 (30)

V240				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-3 STEER DUMP	18 AWG	GXL	CO66-J2 (1)
2	WHT	0-13-12 STEER DUMP GND	18 AWG	GXL	CO66-J2 (18)

CO66-J2				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-3 STEER DUMP	18 AWG	GXL	V240 (1)
2	WHT	77-1 WHT NOISE	18 AWG	GXL	AH217 (1)
3					
4	WHT	13-3 TELE IN	18 AWG	GXL	X17 (3)
5	WHT	25-3 PLAT LVL UP	18 AWG	GXL	X17 (1)
6	WHT	0-14 FUEL GND	18 AWG	GXL	SN241 (2)
7	WHT	26-3 PLAT LVL DN	18 AWG	GXL	X17 (2)
8	WHT	10-2 STEER RT	18 AWG	GXL	V81 (1)
9	WHT	6-3 TWR LIFT DN	18 AWG	GXL	X17 (8)
10					
11	WHT	3-3 LIFT UP	18 AWG	GXL	V75 (1)
12					
13	WHT	50-1 MAIN DUMP	18 AWG	GXL	V70 (1)
14	WHT	0-10 MID VLV GND	18 AWG	GXL	X17 (5)
15					
16	WHT	14-3 TELE OUT	18 AWG	GXL	X17 (4)
17	WHT	0-13-13 LOW FLOW VLV RTN	18 AWG	GXL	V434 (2)
18	WHT	0-13-12 STEER DUMP GND	18 AWG	GXL	V240 (2)
19	WHT	9-2 STEER LFT	18 AWG	GXL	V80 (1)
20	WHT	5-3 TWR LIFT UP	18 AWG	GXL	V79 (1)
21					
22	WHT	4-3 LIFT DN	18 AWG	GXL	X17 (6)
23					
24	WHT	0-15-3 CONFIG	18 AWG	GXL	S525 (1)
25	WHT	39-1 FUEL LVL	18 AWG	GXL	SN241 (1)
26	WHT	51-1 NITE BRITE	18 AWG	GXL	X308 (2)
27	WHT	36-2 GND ALARM	18 AWG	GXL	AH216 (2)
28	WHT	0-12 STR VLV GND	18 AWG	GXL	S87 (1)
29	WHT	0-15-1 GND ALARM GND	18 AWG	GXL	S525 (1)
30	WHT	0-13-6 MAIN DUMP GND	18 AWG	GXL	V70 (2)
31	WHT	50-2 FLOW VLV	18 AWG	GXL	V72 (1)
32	WHT	1-99 LOW FLOW VLV	18 AWG	GXL	V434 (1)
33					
34	WHT	21-3 SWG LFT	18 AWG	GXL	V74 (1)
35	WHT	22-3 SWG RT	18 AWG	GXL	V73 (1)

CO66-J3				
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	47-1 DRV VLV RTN	18 AWG	GXL	S86 (1)
2	WHT	0-43-1 THROTTLE RTN	18 AWG	GXL	X308 (6)
3					
4	WHT	0-13-2 SWG VLV RTN	18 AWG	GXL	S78 (1)
5	WHT	0-13-1 TWR VLV RTN	18 AWG	GXL	S138 (1)
6	WHT	0-13-7 FLOW VLV RTN	18 AWG	GXL	V72 (2)
7	WHT	36-1 GND ALARM B+	18 AWG	GXL	AH216 (1)
8					
9	WHT	49-1 CRIBBING	18 AWG	GXL	X308 (1)
10					
11					
12					
13					
14	WHT	0-13-3 LIFT VLV RTN	18 AWG	GXL	S77 (1)

Figure 7-28. Valve Harness - Sheet 8 of 8
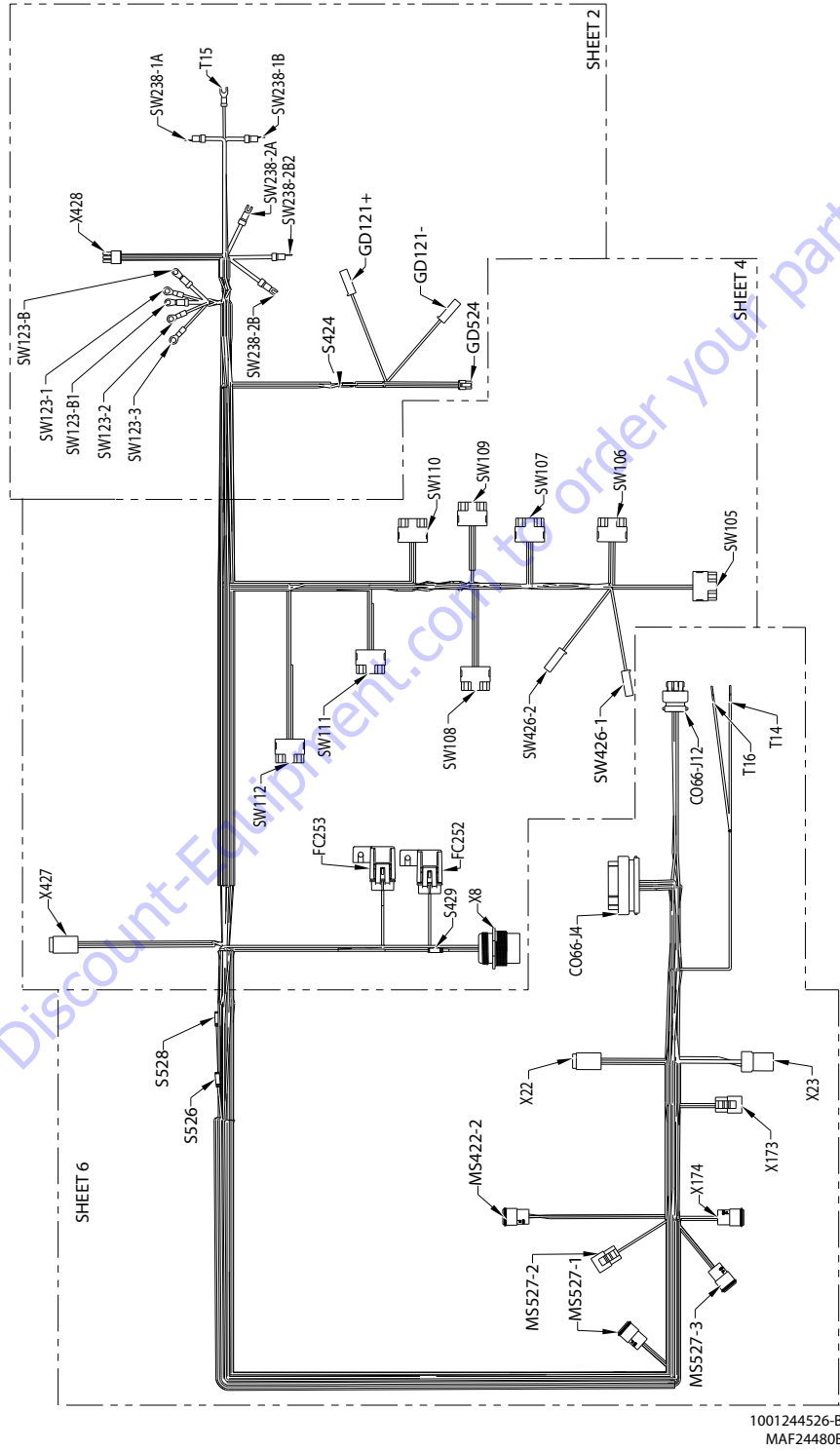
Figure 7-29. GND User Interface Harness - Sheet 1 of 7

1001244526-B
MAF24480B

SW123-B

SW123-1

SW123-B1

SW123-2

SW123-3

X428

SW238-1A

T15

SW238-1B

SW238-2A

SW238-2B2

SW238-2B

S424

GD121+

GD121-

GD524

1001244526-B
MAF24490B

Figure 7-30. GND User Interface Harness - Sheet 2 of 7

SW123-2 (KEYSWITCH)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-6 PLAT MODE	18 AWG	GXL	X22 (3)
1	WHT	2-6-1 PLAT MODE	18 AWG	GXL	X427 (4)

SW123-B (KEYSWITCH)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-1 GND EMS	12 AWG	GXL	SW238-2B (2B)

SW123-B1 (KEYSWITCH)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-3 GND EMS	12 AWG	GXL	SW238-2A (2A)

SW123-1 (KEYSWITCH)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-4 PLAT MODE	18 AWG	GXL	X22 (1)

SW123-3 (KEYSWITCH)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-5 GND MODE	18 AWG	GXL	X22 (2)

GD121+ (HOURMETER)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	32 HOUR METER	18 AWG	GXL	CO66-J4 (12)
1	WHT	32-1 HOURMETER	18 AWG	GXL	X427 (3)

GD121- (HOURMETER)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-17 LAMP GND	18 AWG	GXL	CO66-J4 (31)
1	WHT	0-17-9 LAMP GND	18 AWG	GXL	X427 (2)

GD524 (INDICATOR PANEL)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	CAN1 HI	20 AWG	TXL	MS527-2 (A)
2	WHT	100-3-3 DISPLAY PWR	20 AWG	TXL	S424 (2)
3	WHT	100-3-4 DISPLAY PWR	20 AWG	TXL	S424 (2)
4	BLK	CAN1 LO	20 AWG	TXL	MS527-2 (B)
5					
6	BLK	0-19-2 GROUND DISPLAY	20 AWG	TXL	S528 (1)

S424 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	100-3-2 GROUND DISPLAY	18 AWG	GXL	S526 (1)
2	WHT	100-3-3 DISPLAY PWR	20 AWG	TXL	GD524 (2)
2	WHT	100-3-4 DISPLAY PWR	20 AWG	TXL	GD524 (3)

SW238-1A (E-STOP)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1A	RED	1-4-1 B+	12 AWG	GXL	X23 (2)

SW238-1B (E-STOP)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1B	RED	1-4-2 B+	12 AWG	GXL	X23 (1)

T15 (E-STOP)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-9-1 B+	18 AWG	GXL	FC252 (1)

SW238-2B (E-STOP)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2B	WHT	2-1 GND EMS	12 AWG	GXL	SW123-B (1)

SW238-2A (E-STOP)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2A	WHT	2-3 GND EMS	12 AWG	GXL	SW123-B1 (1)

SW238-2B2 (E-STOP)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2B2	WHT	2-2 GND EMS	12 AWG	GXL	X23 (3)

X428 (MDI)

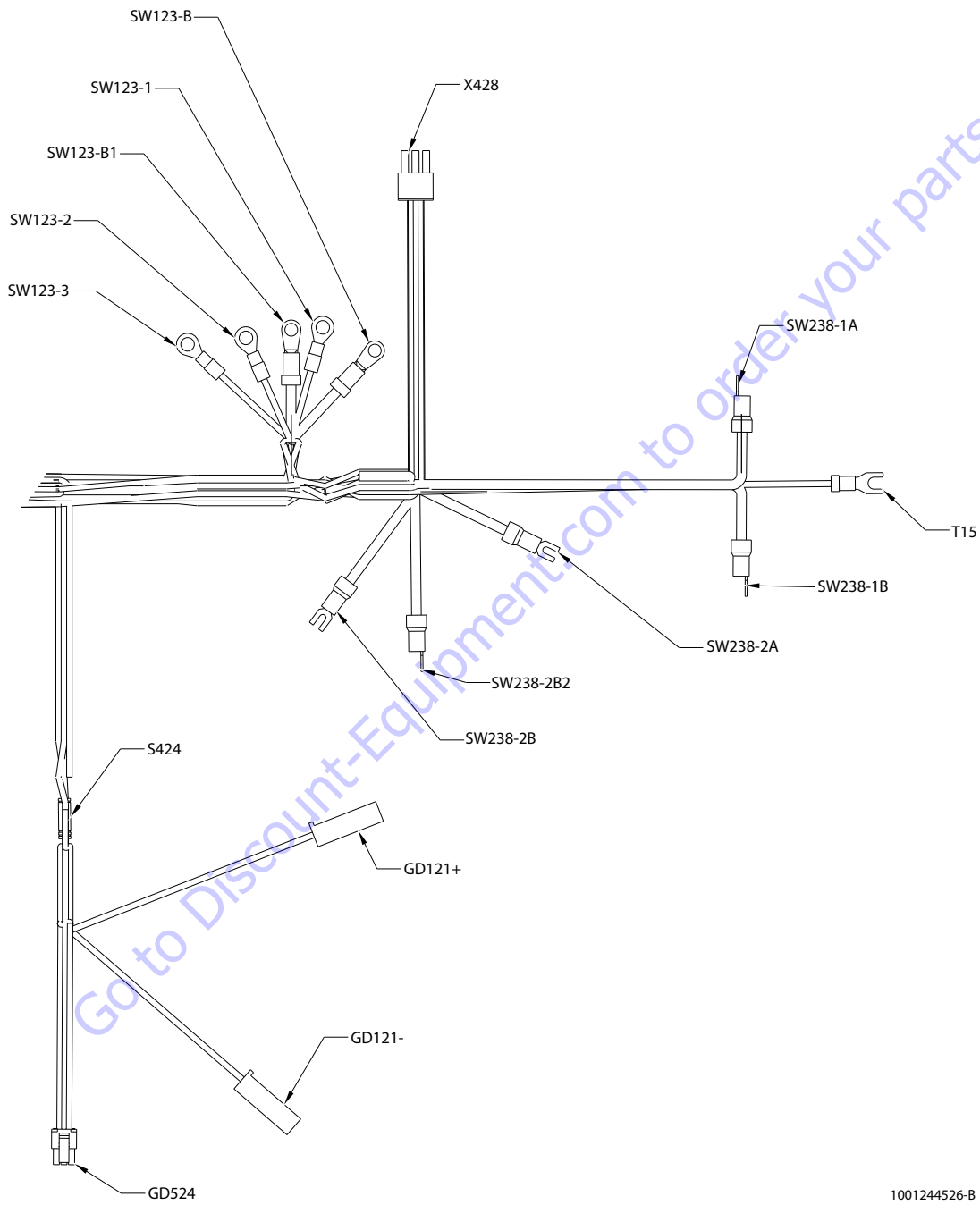| CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	100-3-1 MDI PWR	18 AWG	GXL	S526 (1)
2	BLK	0-19-1 MDI GND	18 AWG	GXL	S528 (1)
3	RED	CAN1 HI	18 AWG	CABLE	MS527-1 (A)
4	BLK	CAN1 LO	18 AWG	CABLE	MS527-1 (B)
5					
6					
NC	SHLD	CAN1 SHIELD	18 AWG	CABLE	MS527-1 (C)

Figure 7-31. GND User Interface Harness - Sheet 3 of 7
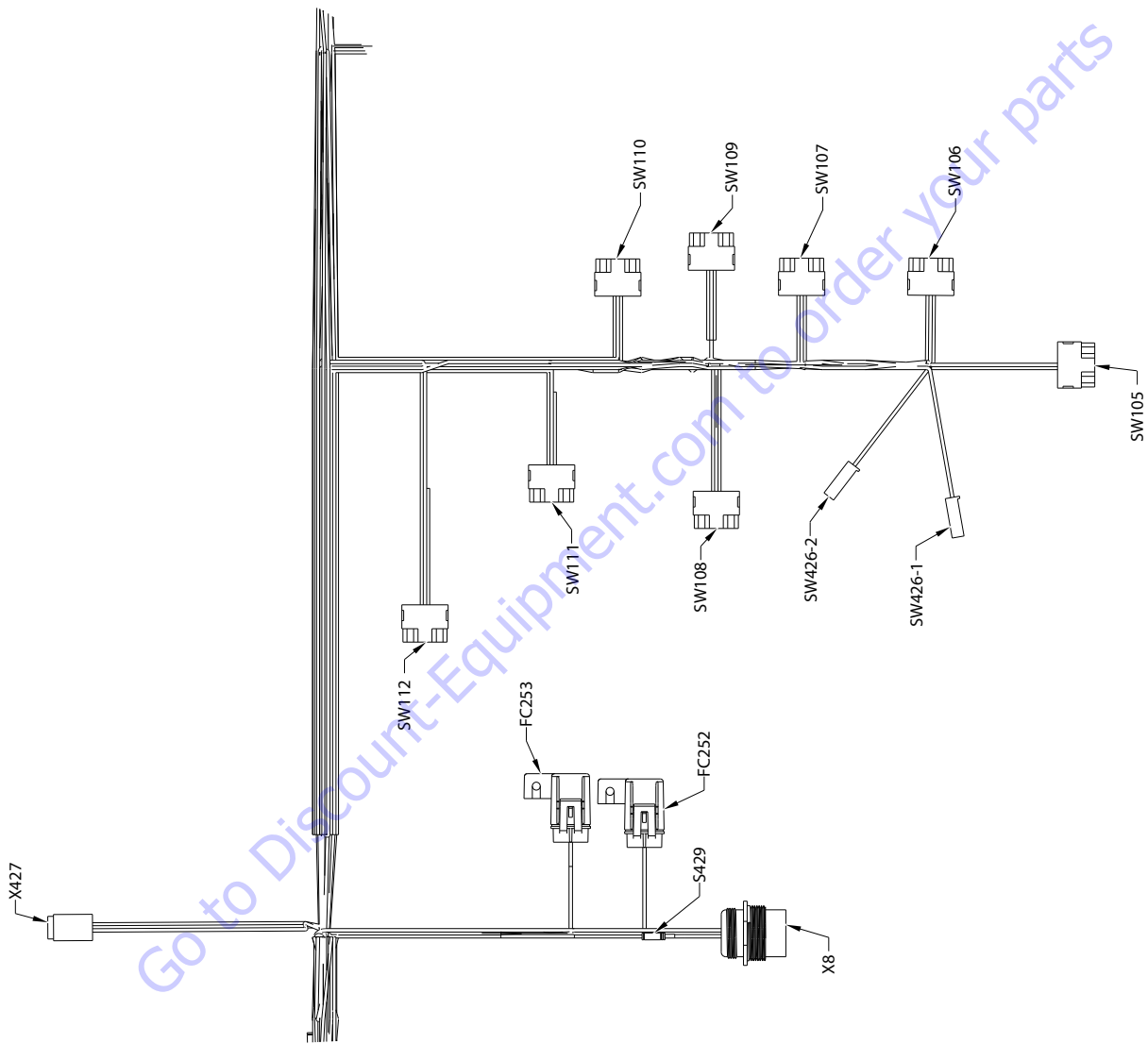
Figure 7-32. GND User Interface Harness - Sheet 4 of 7

1001244526-B
MAF24500B

X427 (TELEMATICS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-9-2 B+	18 AWG	GXL	S429 (2)
2	WHT	0-17-9 LAMP GND	18 AWG	GXL	GD121- (1)
3	WHT	32-1 HOURMETER	18 AWG	GXL	GD121+ (1)
4	WHT	2-6-1 PLAT MODE	18 AWG	GXL	SW123-2 (1)

FC253 (FUSE, 5A)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-16-1 IGN	18 AWG	GXL	X8 (H)
2	WHT	2-16 IGN	18 AWG	GXL	T16 (1)

FC252 (FUSE, 5A)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-9-1 B+	18 AWG	GXL	T15 (1)
2	RED	1-9-3 B+	18 AWG	GXL	S429 (1)

X8 (ADVANCED DIAGNOSTIC)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	WHT	0-8 GND	18 AWG	GXL	T14 (1)
B	RED	1-9 B+	18 AWG	GXL	S429 (2)
C	RED	RED2_CAN	18 AWG	CABLE	X174 (A)
D	BLK	BLK2_CAN	18 AWG	CABLE	X174 (B)
E	SHLD	SHLD_CAN	18 AWG	CABLE	X174 (C)
F					
G					
H	WHT	2-16-1 IGN	18 AWG	GXL	FC253 (1)
J					

SW112 (START / AUX POWER SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	53-2 AUX / ENABLE	18 AWG	GXL	CO66-J4 (16)
2	WHT	2-14 SWITCH IGN	18 AWG	GXL	CO66-J4 (25)
2	WHT	2-14-1 SWITCH IGN	18 AWG	GXL	SW111 (2)
3	WHT	45-2 START	18 AWG	GXL	CO66-J4 (4)
4					
5					
6					

SW111 (SWING SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	22-2 SWING RT	18 AWG	GXL	CO66-J4 (35)
2	WHT	2-14-1 SWITCH IGN	18 AWG	GXL	SW112 (2)
2	WHT	2-14-2 SWITCH IGN	18 AWG	GXL	SW110 (2)
3	WHT	21-2 SWING LFT	18 AWG	GXL	CO66-J4 (34)
4					
5					
6					

SW108 (TELESCOPE SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	14-2 TELE OUT	18 AWG	GXL	CO66-J4 (30)
2	WHT	2-14-4 SWITCH IGN	18 AWG	GXL	SW109 (2)
2	WHT	2-14-5 SWITCH IGN	18 AWG	GXL	SW107 (2)
3	WHT	13-2 TELE IN	18 AWG	GXL	CO66-J4 (7)
4					
5					
6					

S429 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-9-3 B+	18 AWG	GXL	FC252 (2)
2	RED	1-9 B+	18 AWG	GXL	X8 (B)
2	RED	1-9-2 B+	18 AWG	GXL	X427 (1)

SW426-1 (MSSO)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	102 MSSO GND	18 AWG	GXL	X22 (4)

SW426-2 (MSSO)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	104 MSSO SW	18 AWG	GXL	CO66-J12 (8)

SW110 (TOWER LIFT SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	5-2 TWR LIFT UP	18 AWG	GXL	CO66-J4 (10)
2	WHT	2-14-2 SWITCH IGN	18 AWG	GXL	SW111 (2)
2	WHT	2-14-3 SWITCH IGN	18 AWG	GXL	SW109 (2)
3	WHT	6-2 TWR LIFT DN	18 AWG	GXL	CO66-J4 (21)
4					
5					
6					

SW109 (LIFT SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	3-2 LIFT UP	18 AWG	GXL	CO66-J4 (23)
2	WHT	2-14-3 SWITCH IGN	18 AWG	GXL	SW110 (2)
2	WHT	2-14-4 SWITCH IGN	18 AWG	GXL	SW108 (2)
3	WHT	4-2 LIFT DN	18 AWG	GXL	CO66-J4 (33)
4					
5					
6					

SW107 (JIB LIFT SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	27-2 JIB UP	18 AWG	GXL	CO66-J4 (19)
2	WHT	2-14-5 SWITCH IGN	18 AWG	GXL	SW108 (2)
2	WHT	2-14-7 SWITCH IGN	18 AWG	GXL	SW106 (2)
3	WHT	28-2 JIB DOWN	18 AWG	GXL	CO66-J4 (8)
4					
5					
6					

SW106 (PLATFORM ROTATE SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	23-2 PLAT ROT LFT	18 AWG	GXL	CO66-J4 (6)
2	WHT	2-14-7 SWITCH IGN	18 AWG	GXL	SW107 (2)
2	WHT	2-14-8 SWITCH IGN	18 AWG	GXL	SW105 (2)
3	WHT	24-2 PLAT ROT RT	18 AWG	GXL	CO66-J4 (18)
4					
5					
6					

SW105 (PLATFORM LEVEL SW)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	26-2 PLAT LVL DN	18 AWG	GXL	CO66-J4 (5)
2	WHT	2-14-8 SWITCH IGN	18 AWG	GXL	SW106 (2)
3	WHT	25-2 PLAT LVL UP	18 AWG	GXL	CO66-J4 (17)
4					
5					
6					

Figure 7-33. GND User Interface Harness - Sheet 5 of 7
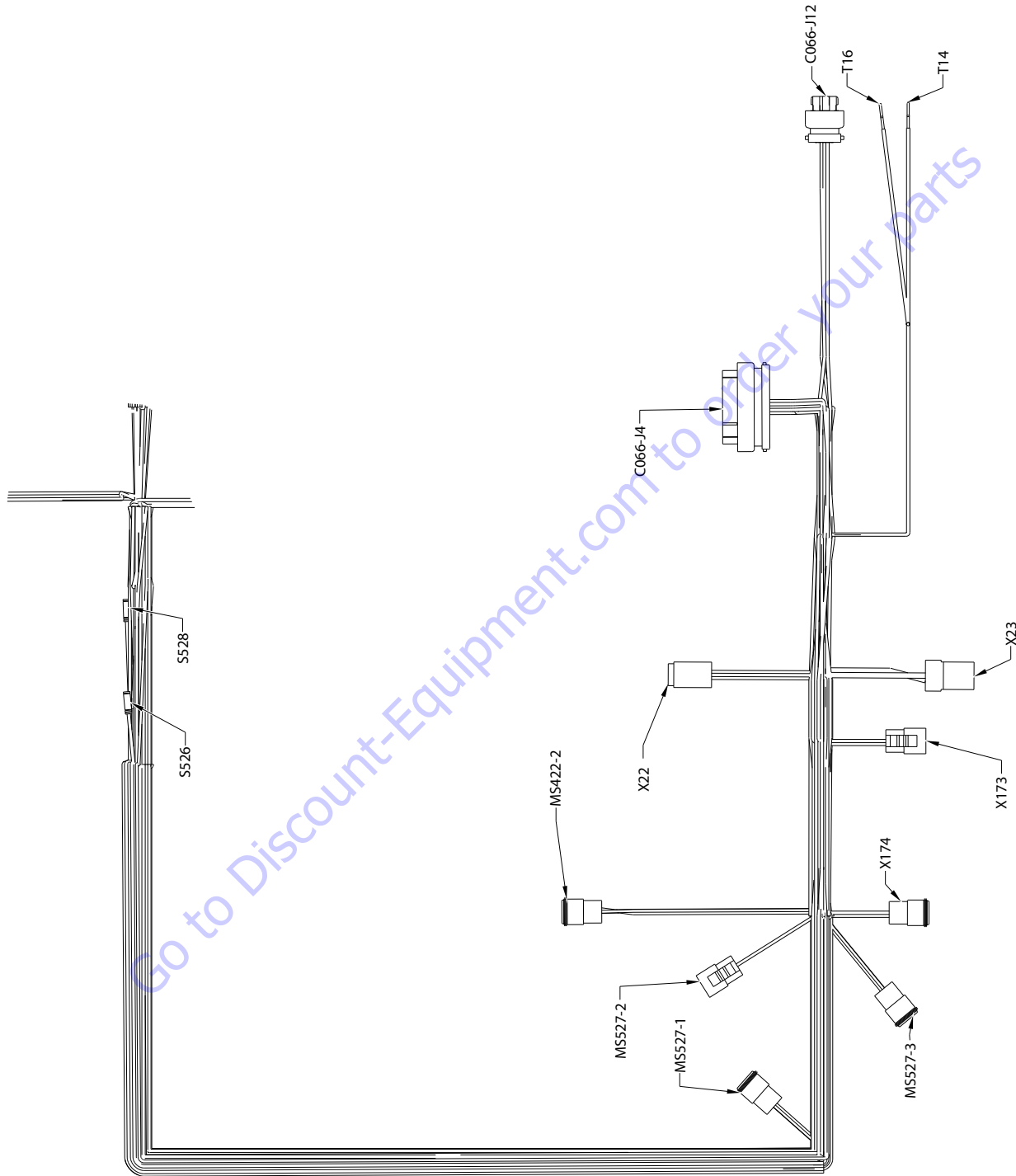
Figure 7-34. GND User Interface Harness - Sheet 6 of 7

C066-J12

T16

T14

C066-J4

X23

X22

X173

MS422-2

X174

MS527-2

MS527-1

MS527-3

S528

S526

1001244526-B
MAF24510B

X173 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	RED_CAN	18 AWG	CABLE	CO66-J12 (3)
B	BLK	BLK_CAN	18 AWG	CABLE	CO66-J12 (4)
C	SHLD	SHLD_CAN	18 AWG	CABLE	CO66-J12 (5)

X174 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	RED2_CAN	18 AWG	CABLE	X8 (C)
B	BLK	BLK2_CAN	18 AWG	CABLE	X8 (D)
C	SHLD	SHLD_CAN	18 AWG	CABLE	X8 (E)

X23 (TO CHASSIS HARNESS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-4-2 B+	12 AWG	GXL	SW238-1B (1B)
2	RED	1-4-1 B+	12 AWG	GXL	SW238-1A (1A)
3	WHT	2-2 GND EMS	12 AWG	GXL	SW238-2B2 (2B2)
4					

X22 (TO CHASSIS HARNESS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-4 PLAT MODE	18 AWG	GXL	SW123-1 (1)
2	WHT	2-5 GND MODE	18 AWG	GXL	SW123-3 (1)
3	WHT	2-6 PLAT MODE	18 AWG	GXL	SW123-2 (1)
4	BLK	102 MSSO GND	18 AWG	GXL	SW426-1 (1)

S526 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	100-3-1 MDI PWR	18 AWG	GXL	X428 (1)
1	WHT	100-3-2 GROUND DISPLAY	18 AWG	GXL	S424 (1)
2	WHT	100-3 DISPLAY PWR	18 AWG	GXL	CO66-J4 (24)

S528 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-19-1 MDI GND	18 AWG	GXL	X428 (2)
1	BLK	0-19-2 GROUND DISPLAY	20 AWG	TXL	GD524 (6)
2	BLK	0-19 DISPLAY GND	18 AWG	GXL	CO66-J4 (32)

MS527-3 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	CANH	18 AWG	CABLE	MS422-2 (B)
B	BLK	CANL	18 AWG	CABLE	MS422-2 (A)
C	SHLD	CANSHD	18 AWG	CABLE	MS422-2 (C)

MS422-2 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	CANL	18 AWG	CABLE	MS527-3 (B)
B	BLK	CANH	18 AWG	CABLE	MS527-3 (A)
C	SHLD	CANSHD	18 AWG	CABLE	MS527-3 (C)

MS527-2 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	CAN1 HI	20 AWG	TXL	GD524 (1)
B	BLK	CAN1 LO	20 AWG	TXL	GD524 (4)
C					

MS527-1 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	CAN1 HI	18 AWG	CABLE	X428 (3)
B	BLK	CAN1 LO	18 AWG	CABLE	X428 (4)
C	SHLD	CAN1 SHIELD	18 AWG	CABLE	X428 (NC)

T16 (TO IGN BUS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-16 IGN	18 AWG	GXL	FC253 (2)

CO66-J4 (GROUND MODULE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4	WHT	45-2 START	18 AWG	GXL	SW112 (3)
5	WHT	26-2 PLAT LVL DN	18 AWG	GXL	SW105 (1)
6	WHT	23-2 PLAT ROT LFT	18 AWG	GXL	SW106 (1)
7	WHT	13-2 TELE IN	18 AWG	GXL	SW108 (3)
8	WHT	28-2 JIB DOWN	18 AWG	GXL	SW107 (3)
9					
10	WHT	5-2 TWR LIFT UP	18 AWG	GXL	SW110 (1)
11					
12	WHT	32 HOUR METER	18 AWG	GXL	GD121+ (1)
13					
14					
15					
16	WHT	53-2 AUX / ENABLE	18 AWG	GXL	SW112 (1)
17	WHT	25-2 PLAT LVL UP	18 AWG	GXL	SW105 (3)
18	WHT	24-2 PLAT ROT RT	18 AWG	GXL	SW106 (3)
19	WHT	27-2 JIB UP	18 AWG	GXL	SW107 (1)
20					
21	WHT	6-2 TWR LIFT DN	18 AWG	GXL	SW110 (3)
22					
23	WHT	3-2 LIFT UP	18 AWG	GXL	SW109 (1)
24	WHT	100-3 DISPLAY PWR	18 AWG	GXL	S526 (2)
25	WHT	2-14 SWITCH IGN	18 AWG	GXL	SW112 (2)
26					
27					
28					
29					
30	WHT	14-2 TELE OUT	18 AWG	GXL	SW108 (1)
31	WHT	0-17 LAMP GND	18 AWG	GXL	GD121- (1)
32	BLK	0-19 DISPLAY GND	18 AWG	GXL	S528 (2)
33	WHT	4-2 LIFT DN	18 AWG	GXL	SW109 (3)
34	WHT	21-2 SWING LFT	18 AWG	GXL	SW111 (3)
35	WHT	22-2 SWING RT	18 AWG	GXL	SW111 (1)

CO66-J12 (GROUND MODULE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3	RED	RED_CAN	18 AWG	CABLE	X173 (A)
4	BLK	BLK_CAN	18 AWG	CABLE	X173 (B)
5	SHLD	SHLD_CAN	18 AWG	CABLE	X173 (C)
6	WHT	72-1 JUMPER	18 AWG	GXL	CO66-J12 (7)
7	WHT	72-1 JUMPER	18 AWG	GXL	CO66-J12 (6)
8	WHT	104 MSSO SW	18 AWG	GXL	SW426-2 (1)

T14 (TO GROUND BUS)

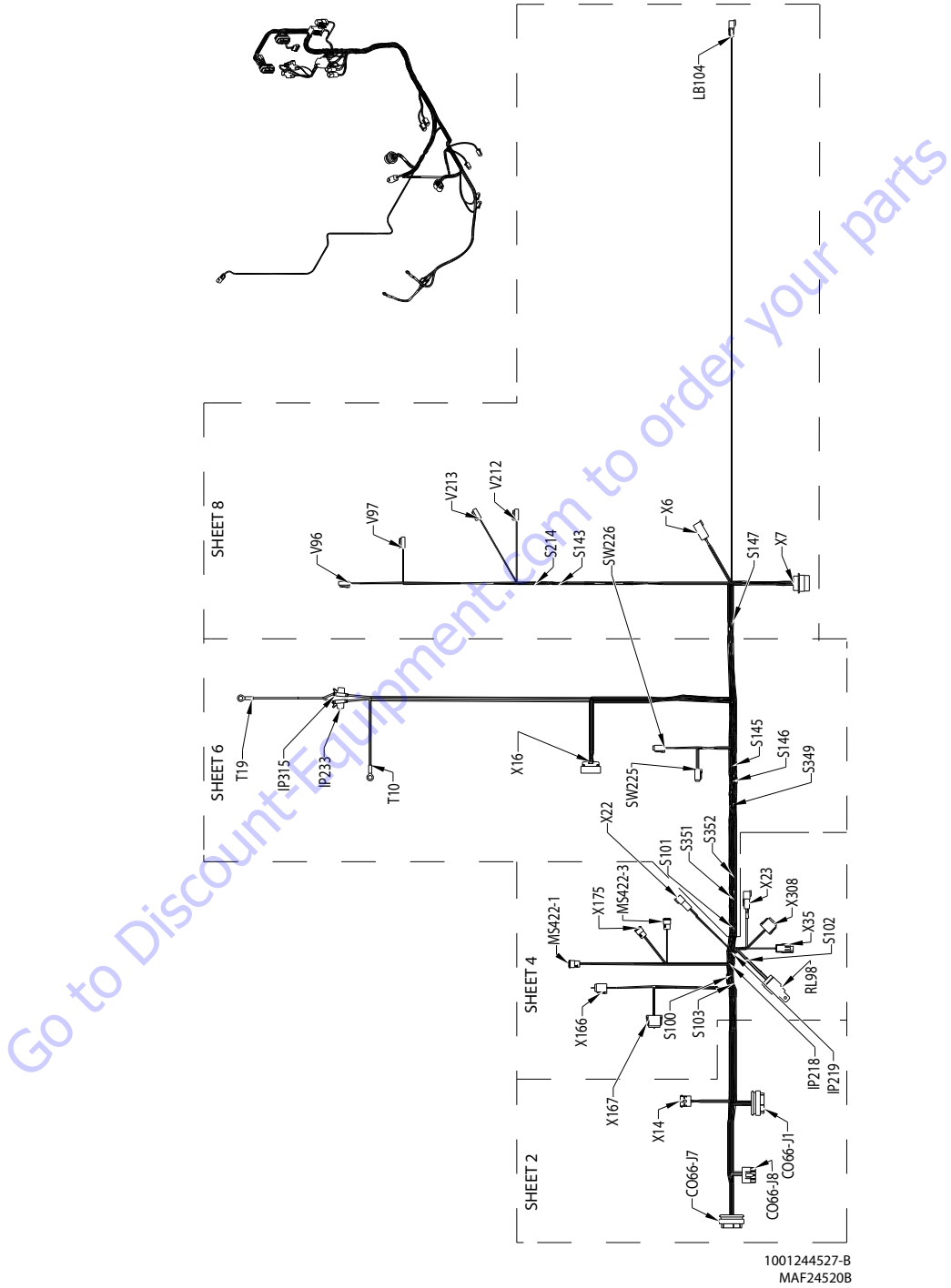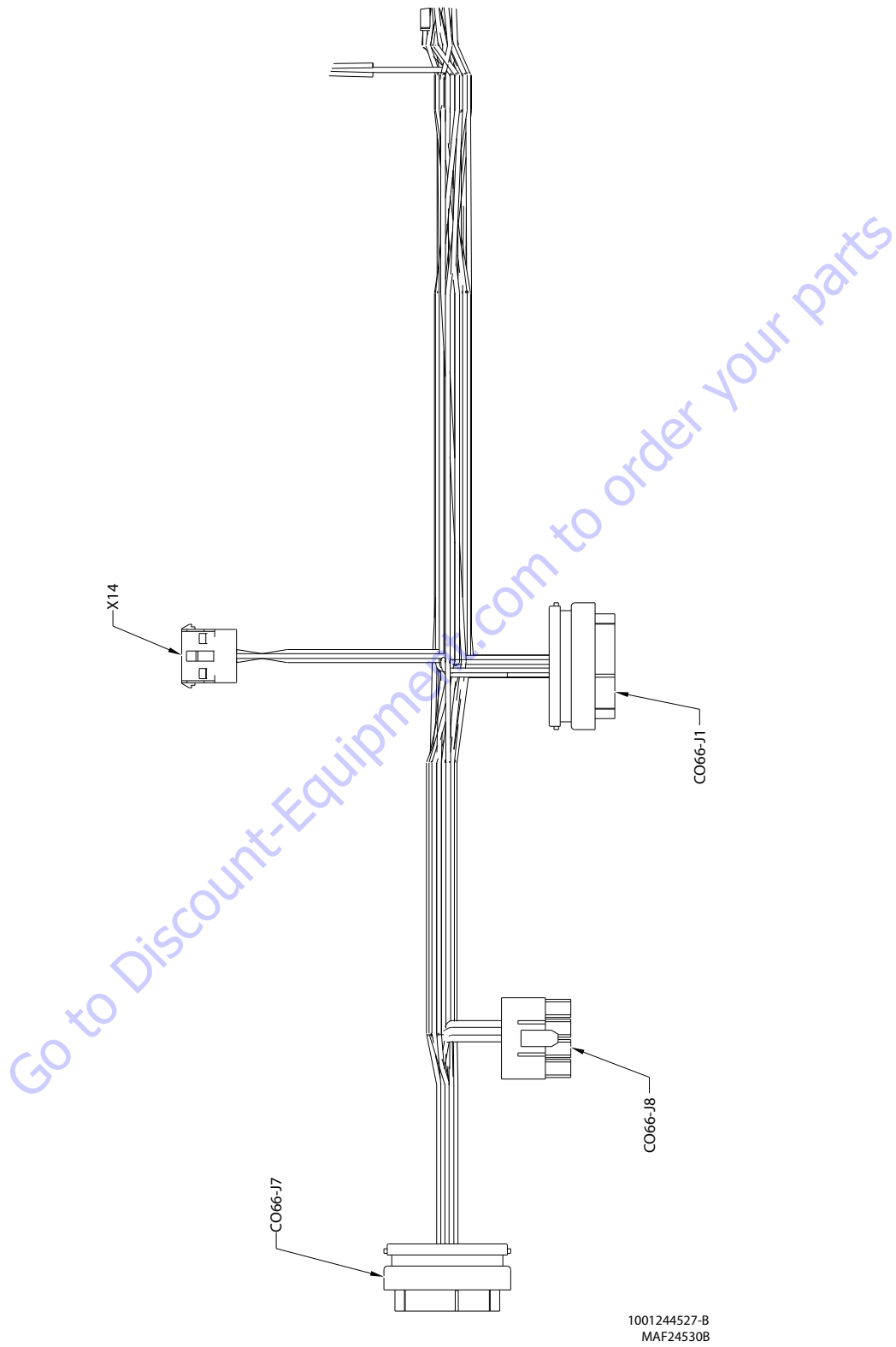| CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-8 GND	18 AWG	GXL	X8 (A)

Figure 7-35. GND User Interface Harness - Sheet 7 of 7

Figure 7-36. Mid Engine Harness - Sheet 1 of 10

1001244527-B
MAF24520B

Figure 7-37. Mid Engine Harness - Sheet 2 of 10

X14

CO66-J1

CO66-J8

CO66-J7

1001244527-B
MAF24530B

CO66-J7 (GROUND MODULE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-8-1 PLAT EMS	18 AWG	GXL	S101 (2)
2	WHT	2-8-3 PLAT EMS	18 AWG	GXL	S103 (1)
3	WHT	2-5-1 GND MODE	18 AWG	GXL	S100 (1)
4	WHT	63-4-2 BOOM ELEV SW	18 AWG	GXL	S351 (1)
5	WHT	82-2 SPEED VCC	18 AWG	GXL	X16 (D)
6	WHT	72-2 CAN TERM JUMPER	18 AWG	GXL	CO66-J7 (17)
7	WHT	63-5-1 BOOM ELEV SW	18 AWG	GXL	S352 (1)
8					
9					
10					
11	WHT	74-1 TRANSPORT SW	18 AWG	GXL	X6 (6)
12	WHT	73-1 OSC AXLE #1	18 AWG	GXL	S146 (1)
13	RED	CANH	18 AWG	CABLE	MS422-1 (A)
14	WHT	2-12 GND MODE	18 AWG	GXL	X7 (11)
15	WHT	31-2 FOOT PEDAL	18 AWG	GXL	X7 (6)
16					
17	WHT	72-2 CAN TERM JUMPER	18 AWG	GXL	CO66-J7 (6)
18	BLK	CANSHD	18 AWG	GXL	MS422-1 (C)
19	WHT	0-17 IGN GND	18 AWG	GXL	RL98 (2)
20	WHT	73-2 OSC AXLE #2	18 AWG	GXL	S145 (1)
21					
22					
23					
24	BLK	CANL	18 AWG	CABLE	MS422-1 (B)
25					
26					
27					
28					
29					
30					
31					
32	WHT	63-6 OSC AXLE #2	18 AWG	GXL	S349 (1)
33					
34					
35	WHT	63-7 OSC AXLE #2	18 AWG	GXL	SW225 (3)

CO66-J1 (GROUND MODULE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	80-1 THROTTLE ACT	18 AWG	GXL	X16 (E)
2	WHT	85-1 FULL THROTTLE	18 AWG	GXL	X16 (C)
3	WHT	7-2 DRV FORWARD	18 AWG	GXL	X308 (7)
4					
5					
6	WHT	8-2 DRV REVERSE	18 AWG	GXL	X308 (8)
7	WHT	63-3 BOOM ELEV SW	18 AWG	GXL	S147 (1)
8					
9	BLK	102-2 MSSO GND	18 AWG	GXL	X22 (4)
10					
11	WHT	45-3 START	18 AWG	GXL	X16 (F)
12	WHT	84-1 GLOW PLUGS	18 AWG	GXL	X16 (R)
13					
14	WHT	81-1 COOLANT TEMP	18 AWG	GXL	X16 (H)
15	WHT	83-1 OIL PRESSURE	18 AWG	GXL	X16 (L)
16	WHT	82-1 SPEED SN	18 AWG	GXL	X16 (G)
17	WHT	0-42 SN GND	18 AWG	GXL	X16 (M)
18	WHT	0-46 GND	18 AWG	GXL	X16 (K)
19					
20	WHT	43-1 BYPASS	18 AWG	GXL	V213 (1)
21					
22	WHT	54-2 GEN ON	18 AWG	GXL	X35 (A)
23	WHT	44-1 BRAKE	18 AWG	GXL	V212 (1)
24					
25					
26					
27	WHT	0-11 VLV GND	18 AWG	GXL	S214 (1)
28	WHT	70-1 PWR	18 AWG	GXL	X14 (1)
29	WHT	70-2 RX	18 AWG	GXL	X14 (2)
30	WHT	70-3 TX	18 AWG	GXL	X14 (3)
31	WHT	70-4 GND	18 AWG	GXL	X14 (4)
32	WHT	46-1 ALT EXCITE	16 AWG	GXL	X16 (B)
33					
34					
35					

CO66-J8 (GROUND MODULE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-5 SYS GND	10 AWG	GXL	T10 (1)
2	WHT	2-9 IGN	12 AWG	GXL	RL98 (4)
2	WHT	2-9-1 IGN	16 AWG	GXL	X166 (1)
3	WHT	0-35 GND	16 AWG	GXL	X167 (1)
3	BLK	0-6 PLAT GND	12 AWG	GXL	X7 (16)
4	WHT	2-10 PLAT IGN	12 AWG	GXL	X7 (12)

X14 (ANALYZER PORT)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	70-1 PWR	18 AWG	GXL	CO66-J1 (28)
2	WHT	70-2 RX	18 AWG	GXL	CO66-J1 (29)
3	WHT	70-3 TX	18 AWG	GXL	CO66-J1 (30)
4	WHT	70-4 GND	18 AWG	GXL	CO66-J1 (31)

Figure 7-38. Mid Engine Harness - Sheet 3 of 10
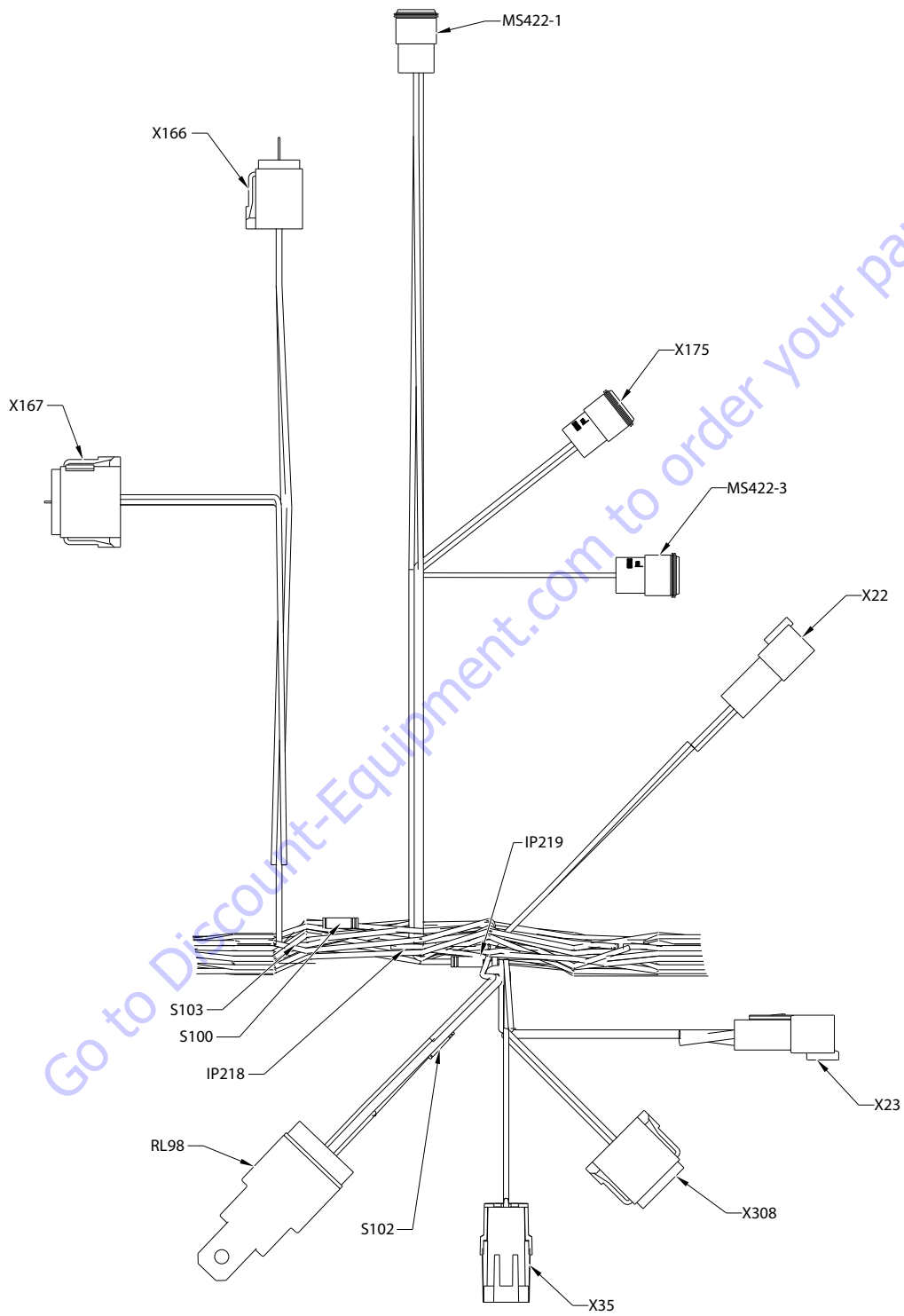
Figure 7-39. Mid Engine Harness - Sheet 4 of 10

X166 (IGN BUSS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-9-1 IGN	16 AWG	GXL	CO66-J8 (2)
2					
3	WHT	2-21 IGN	16 AWG	GXL	X16 (A)
4					
5					
6					

X167 (GROUND BUS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-35 GND	16 AWG	GXL	CO66-J8 (3)
2	WHT	0-9 GND	18 AWG	GXL	LB104 (2)
3	WHT	0-18 VLV GND	18 AWG	GXL	S143 (1)
4					
5					
6					
7					
8					
9					
10					
11					
12					

S103 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-8-3 PLAT EMS	18 AWG	GXL	CO66-J7 (2)
2	WHT	2-8-2 PLAT EMS	18 AWG	GXL	S101 (2)
2	WHT	2-8-4 PLAT EMS	18 AWG	GXL	IP218 (2)

S100 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-5-1 GND MODE	18 AWG	GXL	CO66-J7 (3)
2	WHT	2-5 GND MODE	18 AWG	GXL	X22 (2)
2	WHT	2-5-3 GND MODE	18 AWG	GXL	IP219 (2)

IP218 (DIODE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-8-4 PLAT EMS	18AWG	GXL	S102 (2)
2	WHT	2-8-4 PLAT EMS	18AWG	GXL	S103 (2)

IP219 (DIODE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-5-3 GND MODE	18 AWG	GXL	S102 (2)
2	WHT	2-5-3 GND MODE	18 AWG	GXL	S100 (2)

RL98 (IGN RELAY)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-2 GND EMS	12 AWG	GXL	X23 (3)
2	WHT	0-17 IGN GND	18 AWG	GXL	CO66-J7 (19)
3					
4	WHT	2-9 IGN	12 AWG	GXL	CO66-J8 (2)
5	WHT	2-5-4 SYS ON	18 AWG	GXL	S102 (1)

MS422-1 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	CANH	18 AWG	CABLE	CO66-J7 (13)
B	BLK	CANL	18 AWG	CABLE	CO66-J7 (24)
C	BLK	CANSHD	18 AWG	GXL	CO66-J7 (18)

X175 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	CAN2H	18 AWG	CABLE	X16 (N)
B	BLK	CAN2L	18 AWG	CABLE	X16 (P)
C	BLK	CAN2SHD	18 AWG	GXL	X16 (NC)

MS422-3 (CAN TEE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	RED	CANH	18 AWG	CABLE	X7 (3)
B	BLK	CANL	18 AWG	CABLE	X7 (2)
C	SHIELD	CANSHD	18 AWG	SHLD	X7 (1)

X22 (TO GND CTL HARN)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-4 PLAT MODE	18 AWG	GXL	X7 (9)
2	WHT	2-5 GND MODE	18 AWG	GXL	S100 (2)
3	WHT	2-6 PLAT MODE	18 AWG	GXL	X7 (13)
4	BLK	102-2 MSSO GND	18 AWG	GXL	CO66-J1 (9)

X23 (TO GND CTL HARN)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-4-2 B+	12 AWG	GXL	IP233 (1)
2	RED	1-4-1 B+	12 AWG	GXL	IP233 (1)
3	WHT	2-2 GND EMS	12 AWG	GXL	RL98 (1)
4					

X308 (TO VALVE HARNESS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4					
5					
6	WHT	0-43 THROTTLE RTN	18 AWG	GXL	X16 (J)
7	WHT	7-2 DRV FORWARD	18 AWG	GXL	CO66-J1 (3)
8	WHT	8-2 DRV REVERSE	18 AWG	GXL	CO66-J1 (6)

X35 (TO GENERATOR HARN)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	WHT	54-2 GEN ON	18 AWG	GXL	CO66-J1 (22)
B					

S102 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-5-4 SYS ON	18 AWG	GXL	RL98 (5)
2	WHT	2-5-3 GND MODE	18 AWG	GXL	IP219 (1)
2	WHT	2-8-4 PLAT EMS	18 AWG	GXL	IP218 (1)

Figure 7-40. Mid Engine Harness - Sheet 5 of 10

T19

IP315

IP233

T10

X16

SW226

SW225

S101   S351   S352   S349   S146   S145

1001244527-B
MAF24550B
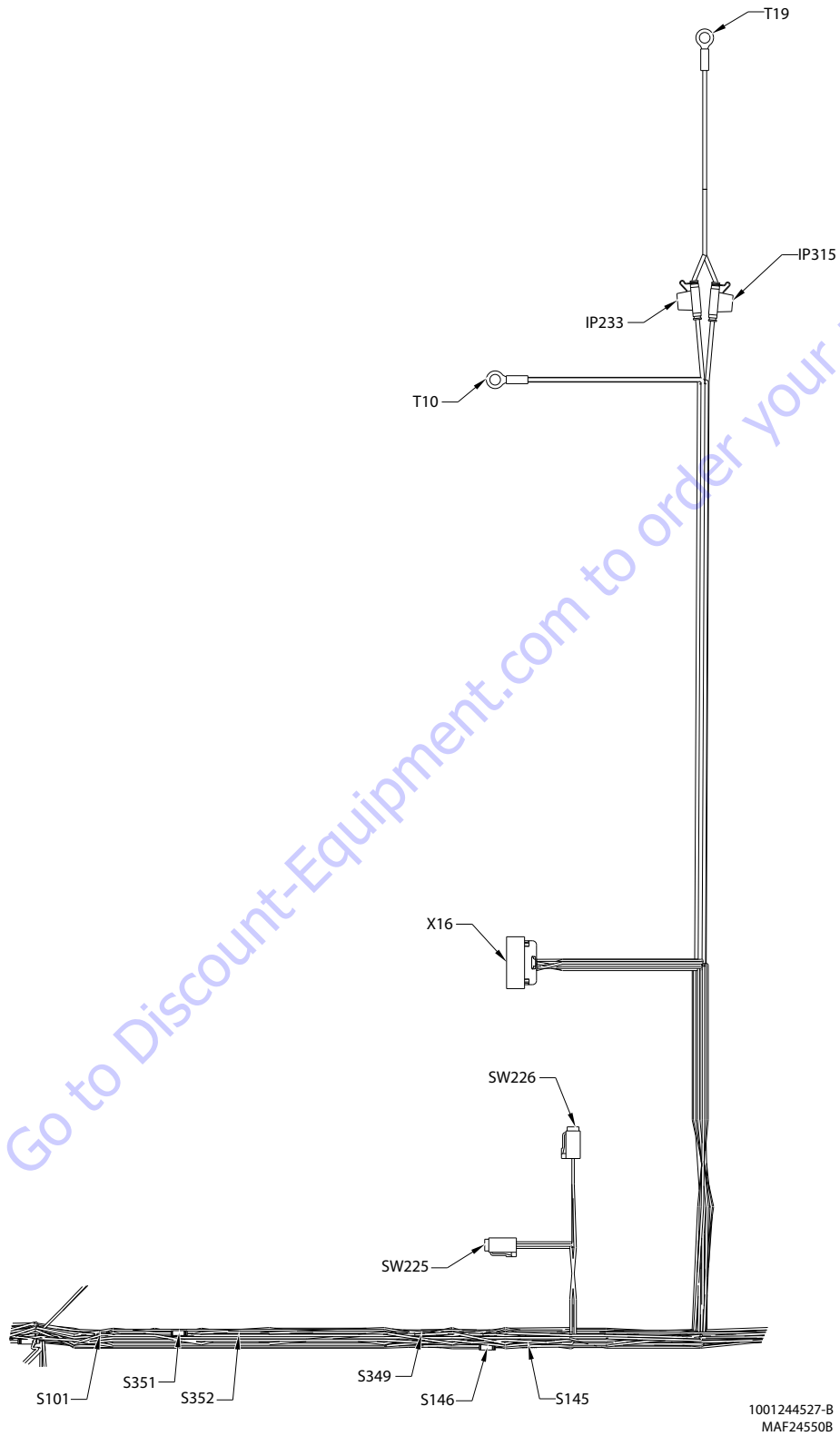
Figure 7-41. Mid Engine Harness - Sheet 6 of 10

T19   (B+ STARTER))

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	NA	SEE NOTE 5	12 AWG	NA	IP233 (2)

IP315   (FUSE, 15A)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-7 B+	12 AWG	GXL	X7 (10)
2	NA	SEE NOTE 5	12 AWG	NA	T19 (1)

IP233   (FUSE, 30A)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-4-1 B+	12 AWG	GXL	X23 (2)
1	RED	1-4-2 B+	12 AWG	GXL	X23 (1)
2	NA	SEE NOTE 5	12 AWG	NA	T19 (1)

T10   (TO STARTER GND)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-5 SYS GND	10 AWG	GXL	CO66-J8 (1)
1	BLK	0-7 GND	12 AWG	GXL	X7 (18)

X16   (TO ENGINE HARNESS)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	WHT	2-21 IGN	16 AWG	GXL	X166 (3)
B	WHT	46-1 ALT EXCITE	16 AWG	GXL	CO66-J1 (32)
C	WHT	85-1 FULL THROTTLE	18 AWG	GXL	CO66-J1 (2)
D	WHT	82-2 SPEED VCC	18 AWG	GXL	CO66-J7 (5)
E	WHT	80-1 THROTTLE ACT	18 AWG	GXL	CO66-J1 (1)
F	WHT	45-3 START	18 AWG	GXL	CO66-J1 (11)
G	WHT	82-1 SPEED SN	18 AWG	GXL	CO66-J1 (16)
H	WHT	81-1 COOLANT TEMP	18 AWG	GXL	CO66-J1 (14)
J	WHT	0-43 THROTTLE RTN	18 AWG	GXL	X308 (6)
K	WHT	0-46GND	18 AWG	GXL	CO66-J1 (18)
L	WHT	83-1 OIL PRESSURE	18 AWG	GXL	CO66-J1 (15)
M	WHT	0-42 SN GND	18 AWG	GXL	CO66-J1 (17)
N	RED	CAN2H	18 AWG	CABLE	X175 (A)
NC	BLK	CAN2SHD	18 AWG	GXL	X175 (C)
P	BLK	CAN2L	18 AWG	CABLE	X175 (B)
R	WHT	84-1 GLOW PLUGS	18 AWG	GXL	CO66-J1 (12)
S					

SW225   (LIMIT SW-OSC AXLE#2)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	63-5-2 BOOM ELEV SW	18 AWG	GXL	S352 (2)
2	WHT	63-6-1 OSC AXLE #2	18 AWG	GXL	S349 (2)
3	WHT	63-7 OSC AXLE #2	18 AWG	GXL	CO66-J7 (35)
4	WHT	73-2-1 OSC AXLE #2	18 AWG	GXL	S145 (2)

S145   (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	73-2 OSC AXLE #2	18 AWG	GXL	CO66-J7 (20)
2	WHT	73-2-1 OSC AXLE #2	18 AWG	GXL	SW225 (4)
2	WHT	73-2-2 OSC AXLE #1	18 AWG	GXL	V97 (1)

S146   (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	73-1 OSC AXLE #1	18 AWG	GXL	CO66-J7 (12)
2	WHT	73-1-1 OSC AXLE #1	18 AWG	GXL	SW226 (3)
2	WHT	73-1-2 OSC AXLE #2	18 AWG	GXL	V96 (1)

S349   (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	63-6 OSC AXLE #2	18 AWG	GXL	CO66-J7 (32)
2	WHT	63-6-1 OSC AXLE #2	18 AWG	GXL	SW225 (2)
2	WHT	74-2 TRANSPORT SW	18 AWG	GXL	X6 (5)

S352   (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	63-5-1 BOOM ELEV SW	18 AWG	GXL	CO66-J7 (7)
2	WHT	63-5 BOOM ELEV SW	18 AWG	GXL	X6 (4)
2	WHT	63-5-2 BOOM ELEV SW	18 AWG	GXL	SW225 (1)

S351   (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	63-4-2 BOOM ELEV SW	18 AWG	GXL	CO66-J7 (4)
2	WHT	63-4 BOOM ELEV SW	18 AWG	GXL	X6 (2)
2	WHT	63-4-1 BOOM ELEV SW	18 AWG	GXL	SW226 (2)

S101   (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-8 PLAT EMS	18 AWG	GXL	X7 (4)
2	WHT	2-8-1 PLAT EMS	18 AWG	GXL	CO66-J7 (1)
2	WHT	2-8-2 PLAT EMS	18 AWG	GXL	S103 (2)

SW226   (LIMIT SW-OSC AXLE#1)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	WHT	63-4-1 BOOM ELEV SW	18 AWG	GXL	S351 (2)
3	WHT	73-1-1 OSC AXLE #1	18 AWG	GXL	S146 (2)
4					

Figure 7-42. Mid Engine Harness - Sheet 7 of 10
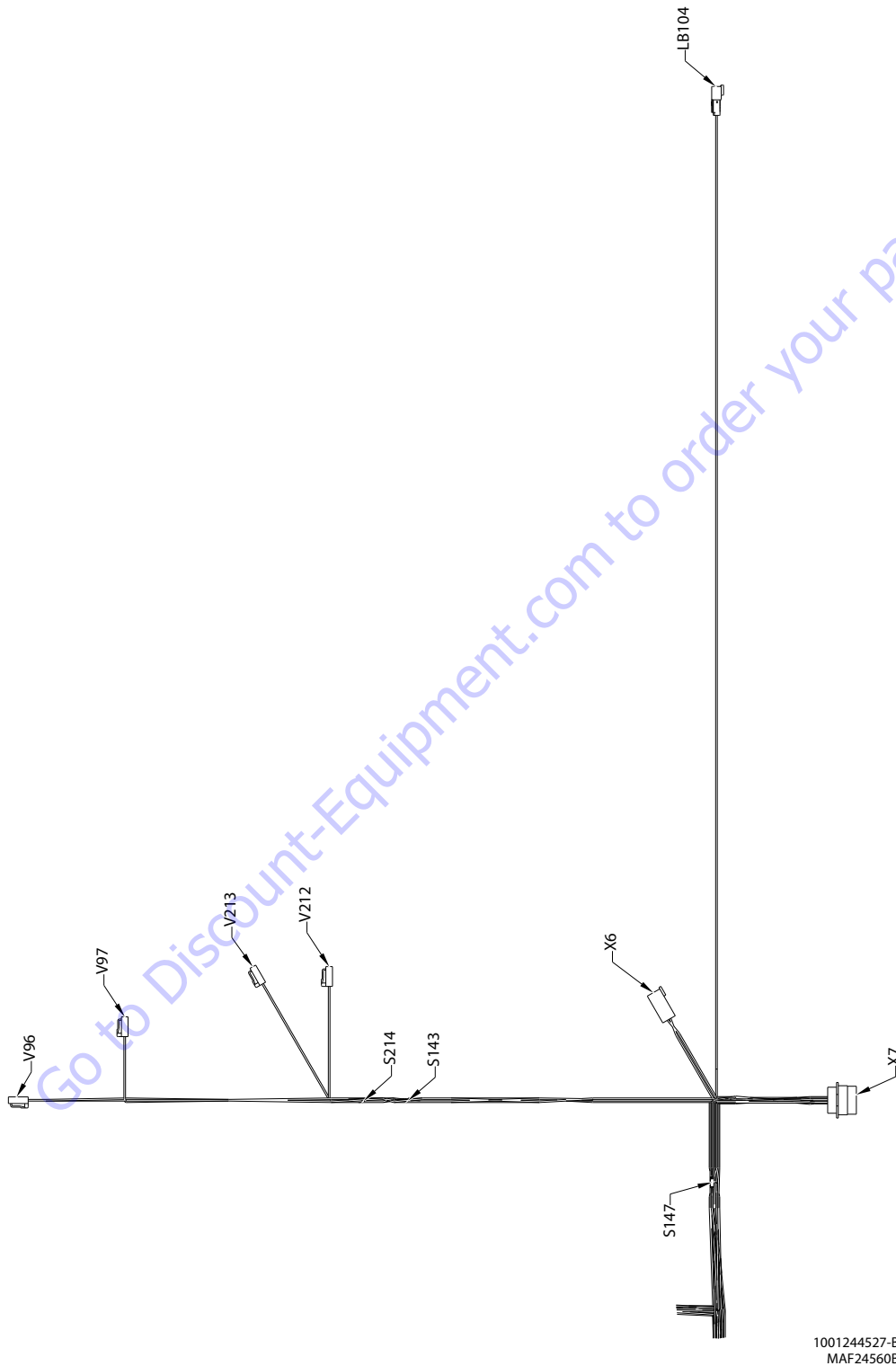
Figure 7-43. Mid Engine Harness - Sheet 8 of 10

LB104

V96

V97

V213

V212

S214

S143

X6

X7

S147

1001244527-B
MAF24560B

V96 (OSC AXLE # 2)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	73-1-2 OSC AXLE #2	18 AWG	GXL	S146 (2)
2	WHT	0-18-2 VLV GND	18 AWG	GXL	S143 (2)

V97 (OSC AXLE # 1)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	73-2-2 OSC AXLE #1	18 AWG	GXL	S145 (2)
2	WHT	0-18-1 VLV GND	18 AWG	GXL	S143 (2)

V213 (BYPASS VALVE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	43-1 BYPASS	18 AWG	GXL	CO66-J1 (20)
2	WHT	0-11-2 VLV GND	18 AWG	GXL	S214 (2)

V212 (BRAKE VALVE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	44-1 BRAKE	18 AWG	GXL	CO66-J1 (23)
2	WHT	0-11-1 VLV GND	18 AWG	GXL	S214 (2)

S214 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-11 VLV GND	18 AWG	GXL	CO66-J1 (27)
2	WHT	0-11-1 VLV GND	18 AWG	GXL	V212 (2)
2	WHT	0-11-2 VLV GND	18 AWG	GXL	V213 (2)

S143 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	0-18 VLV GND	18 AWG	GXL	X167 (3)
2	WHT	0-18-1 VLV GND	18 AWG	GXL	V97 (2)
2	WHT	0-18-2 VLV GND	18 AWG	GXL	V96 (2)

S147 (SPLICE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	63-3 BOOM ELEV SW	18 AWG	GXL	CO66-J1 (7)
2	WHT	63-3-1 BOOM ELEV SW	18 AWG	GXL	X6 (1)
2	WHT	63-3-2 BOOM ELEV SW	18 AWG	GXL	X6 (3)

X7 (TO BOOM CABLE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	SHIELD	CANSHD	18 AWG	SHLD	MS422-3 (C)
2	BLK	CANL	18 AWG	CABLE	MS422-3 (B)
3	RED	CANH	18 AWG	CABLE	MS422-3 (A)
4	WHT	2-8 PLAT EMS	18 AWG	GXL	S101 (1)
5					
6	WHT	31-2 FOOT PEDAL	18 AWG	GXL	CO66-J7 (15)
7					
8					
9	WHT	2-4 PLAT MODE	18 AWG	GXL	X22 (1)
10	RED	1-7 B+	12 AWG	GXL	IP315 (1)
11	WHT	2-12 GND MODE	18 AWG	GXL	CO66-J7 (14)
12	WHT	2-10 PLAT IGN	12 AWG	GXL	CO66-J8 (4)
13	WHT	2-6 PLAT MODE	18 AWG	GXL	X22 (3)
14					
15	WHT	2-11 STROBE	18 AWG	GXL	LB104 (1)
16	BLK	0-6 PLAT GND	12 AWG	GXL	CO66-J8 (3)
17					
18	BLK	0-7 GND	12 AWG	GXL	T10 (1)
19					

X6 (TO BOOM CABLE)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	63-3-1 BOOM ELEV SW	18 AWG	GXL	S147 (2)
2	WHT	63-4 BOOM ELEV SW	18 AWG	GXL	S351 (2)
3	WHT	63-3-2 BOOM ELEV SW	18 AWG	GXL	S147 (2)
4	WHT	63-5 BOOM ELEV SW	18 AWG	GXL	S352 (2)
5	WHT	74-2 TRANSPORT SW	18 AWG	GXL	S349 (2)
6	WHT	74-1 TRANSPORT SW	18 AWG	GXL	CO66-J7 (11)

LB104 (STROBE LIGHT)

CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	2-11 STROBE	18 AWG	GXL	X7 (15)
2	WHT	0-9 GND	18 AWG	GXL	X167 (2)

Figure 7-44. Mid Engine Harness - Sheet 9 of 10
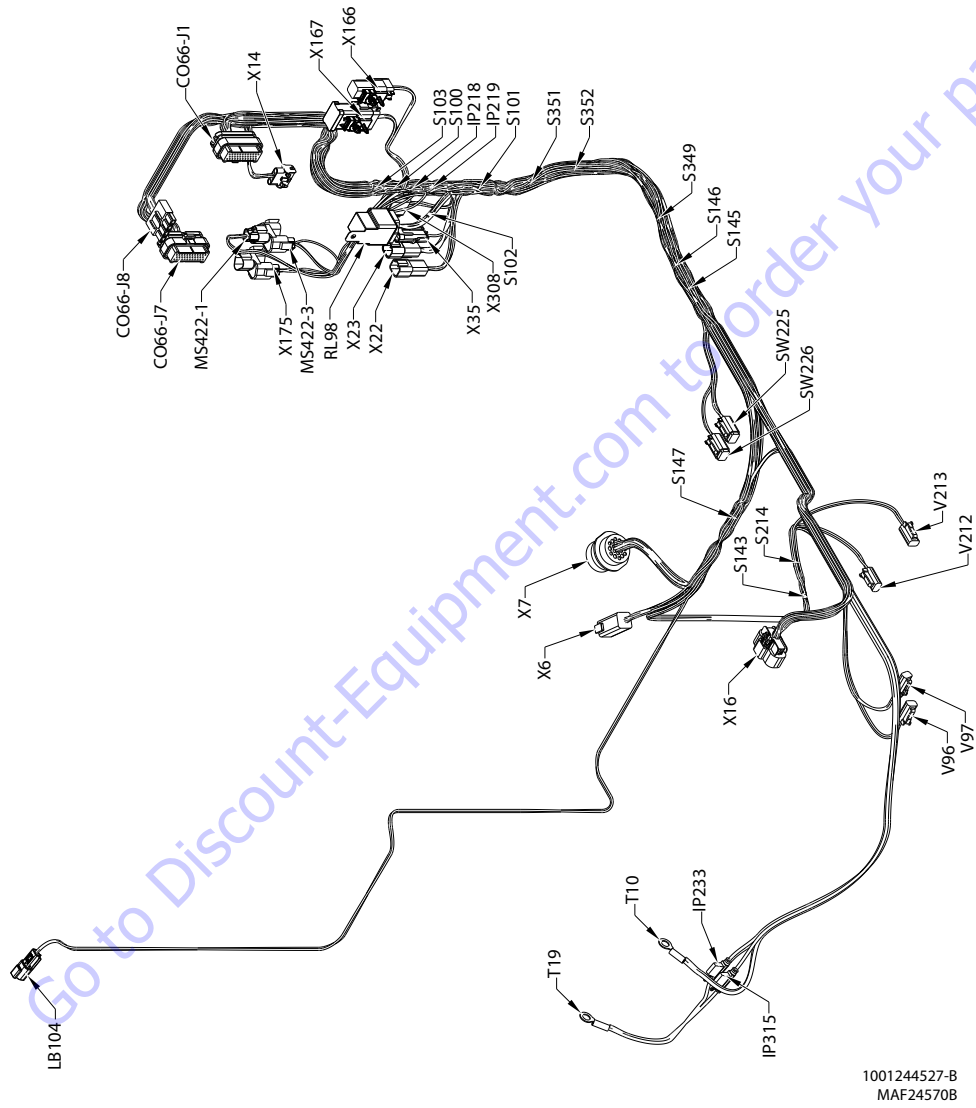
Figure 7-45. Mid Engine Harness - Sheet 10 of 10

1001244527-B
MAF24570B
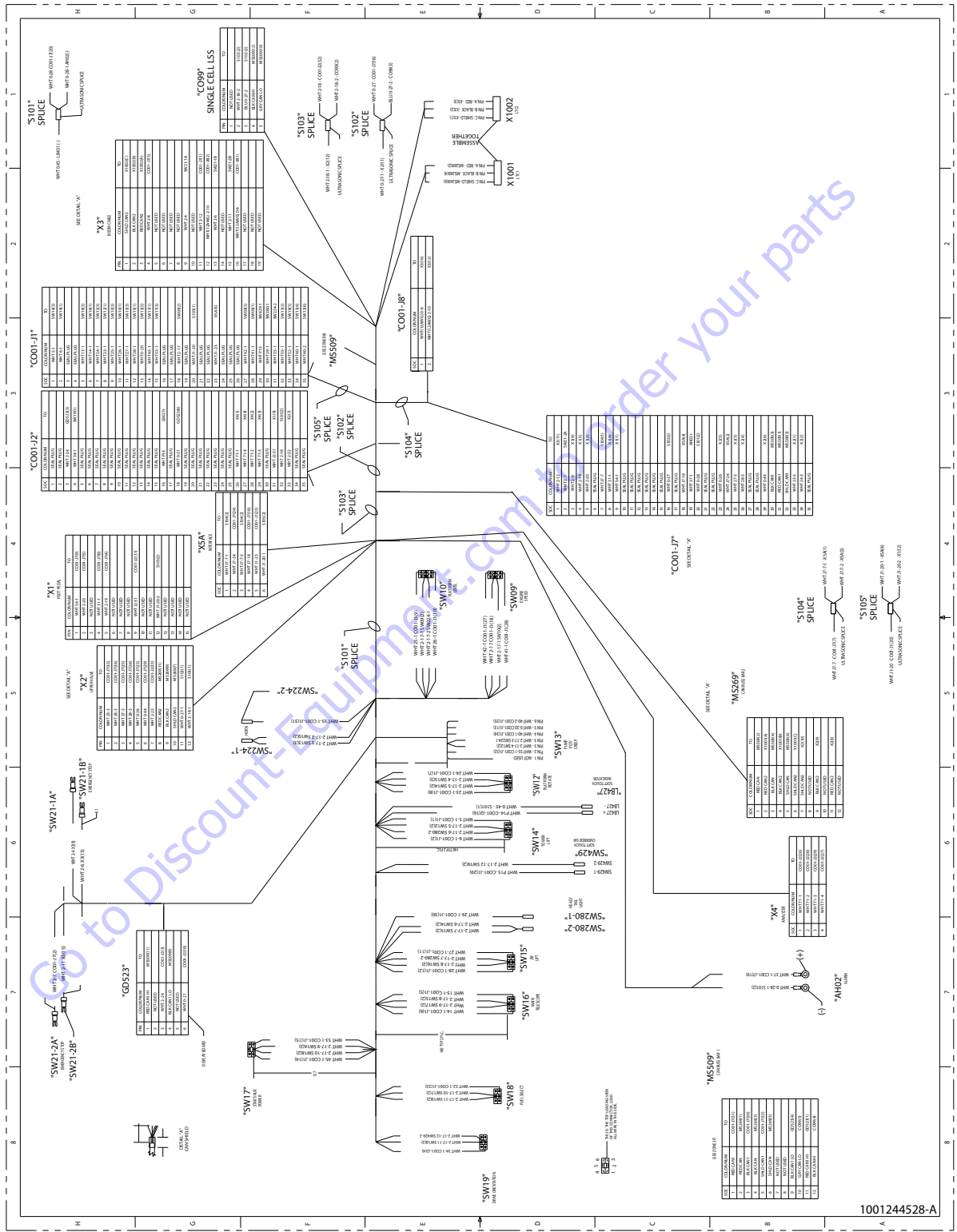
Figure 7-46. Console Harness

MAF24580A
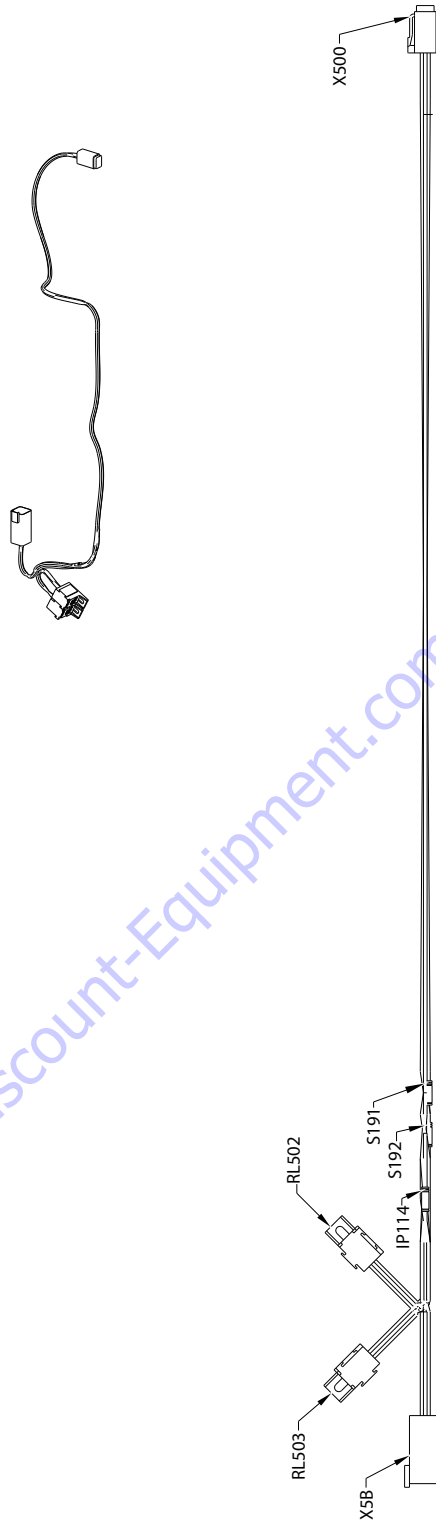
Figure 7-47. GEN 2 Platform Interface Harness - Sheet 1 of 2

X500

RL502

S191

S192

IP114

RL503

X5B

1001225580-D
MAF24430D

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

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

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

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

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

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

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

Figure 7-48. GEN 2 Platform Interface Harness - Sheet 2 of 2

7.8 ELECTRICAL SCHEMATICS

SHEET 2: PLATFORM
> CONSOLE BOX HARNESS WITH SKYGUARD CONN
> AND 1 CELL LSS

SHEET 3: PLATFORM AND BOOM COMPONENTS

SHEET 4: CHASSIS, TURN-TABLE, AND UGM
> VALVE

SHEET 5: GROUND USER INTERFACE AND TELEMATICS INTERFACE
> GND USER INTERFACE

SHEET 6: ENGINE (KUBOTA) AND GENERATOR

SHEET 7: ENGINE (GM) VENDOR SCHEMATIC

SHEET 8: MID ENGINE HARNESS SCHEMATIC
> MID ENGINE

SHEET 9: OPTIONS
> CHASSIS LIGHT SCHEMATIC HARNESS
>
> PLATFORM LIGHTS SCHEMATIC HARNESS
>
> GEN 2 PLAT INTERFACE
>
> ALERT BEACON OPTION

SHEET 1   1001244529-B
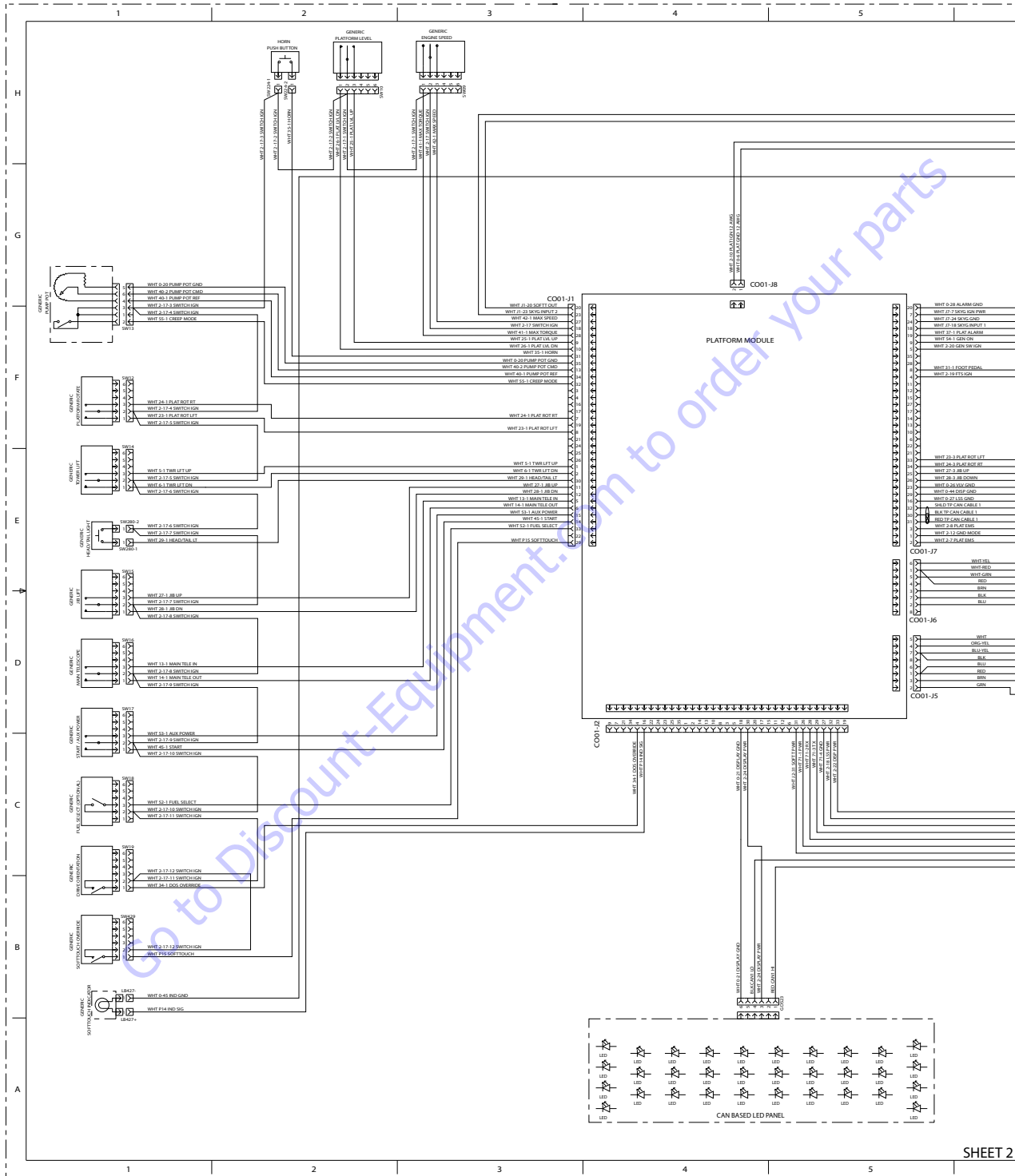
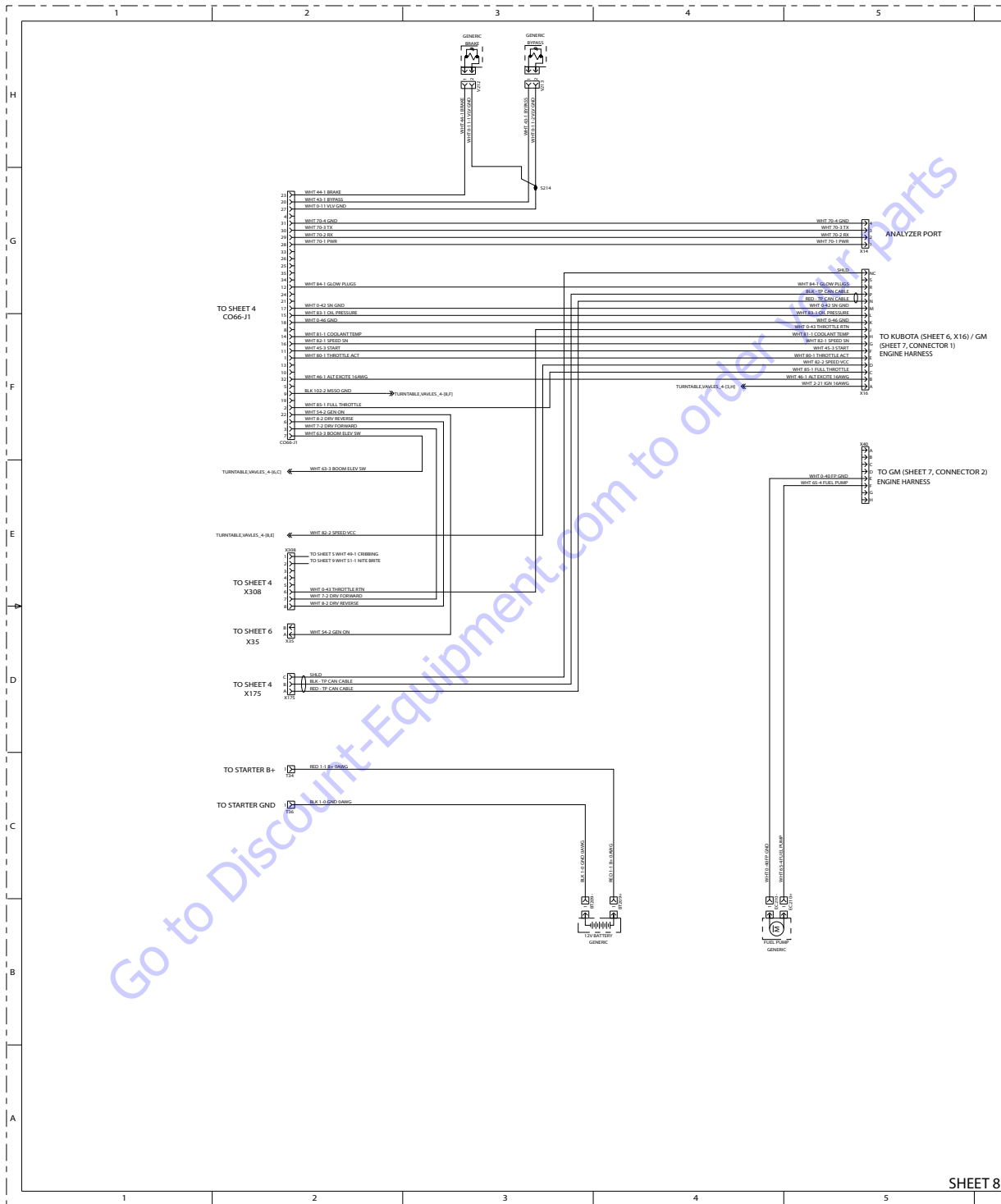**Figure 7-49. Electrical Schematic - Sheet 1 of 16**
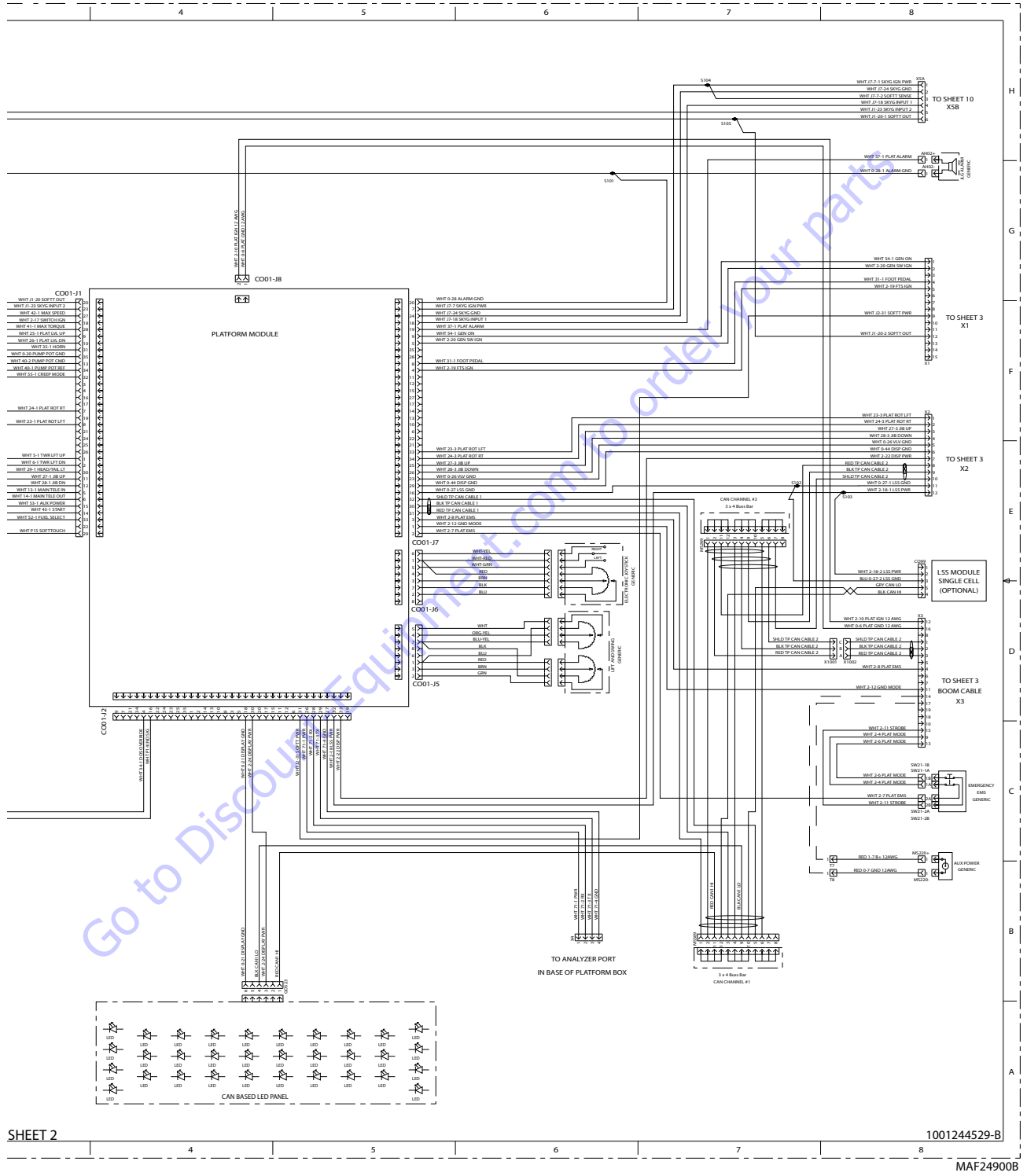
Figure 7-50. Electrical Schematic - Sheet 2 of 16
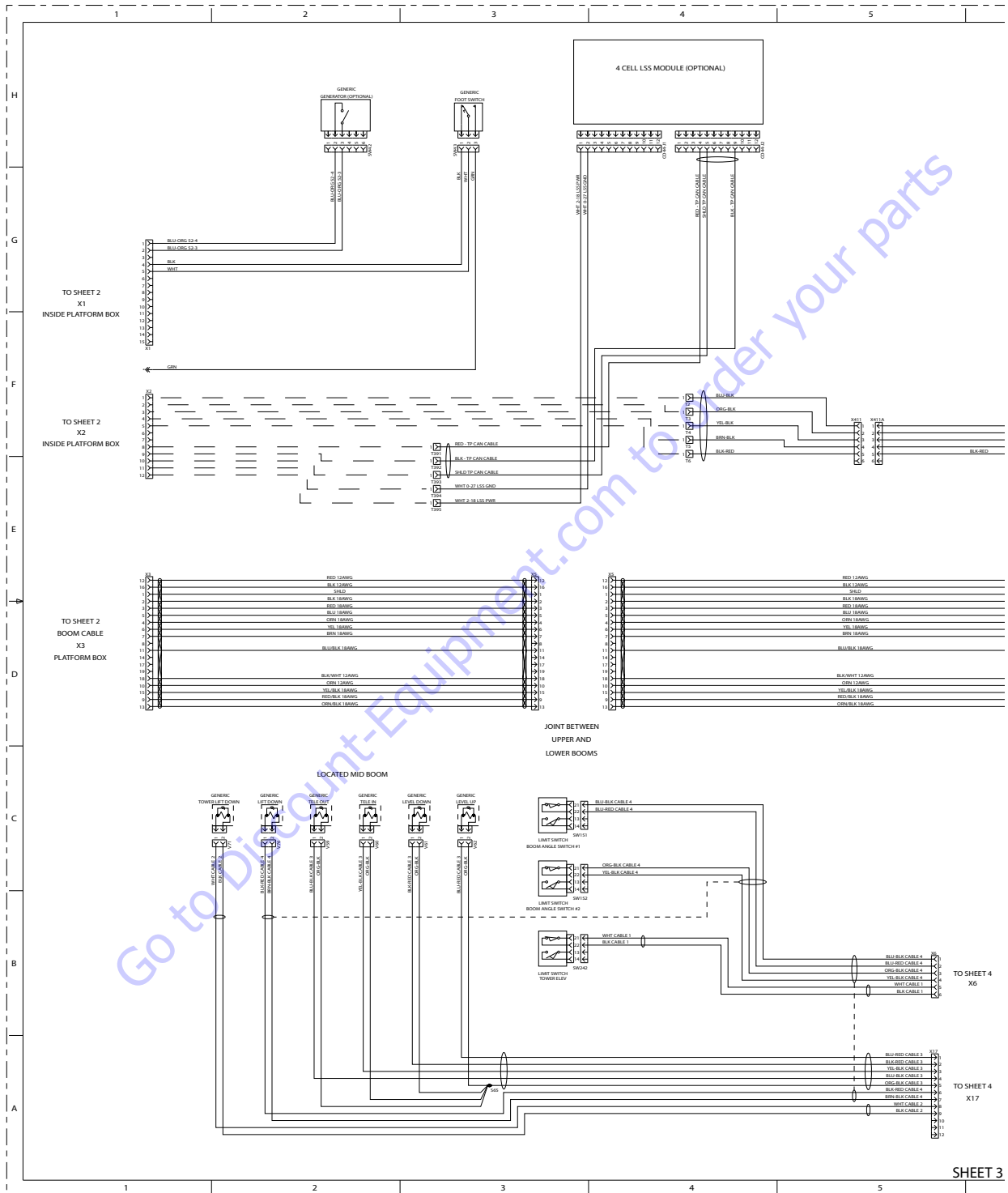
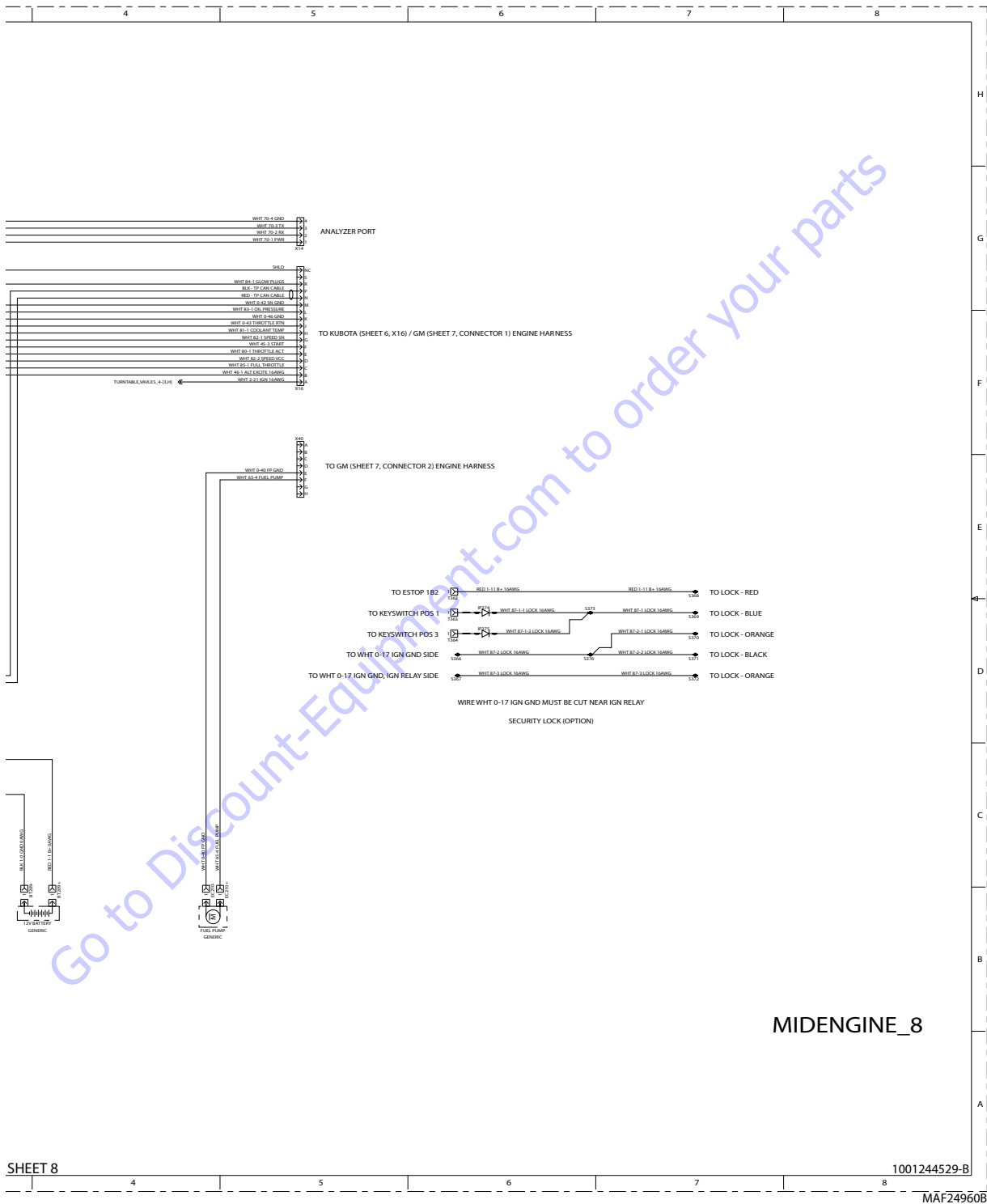**Figure 7-51. Electrical Schematic - Sheet 3 of 16**
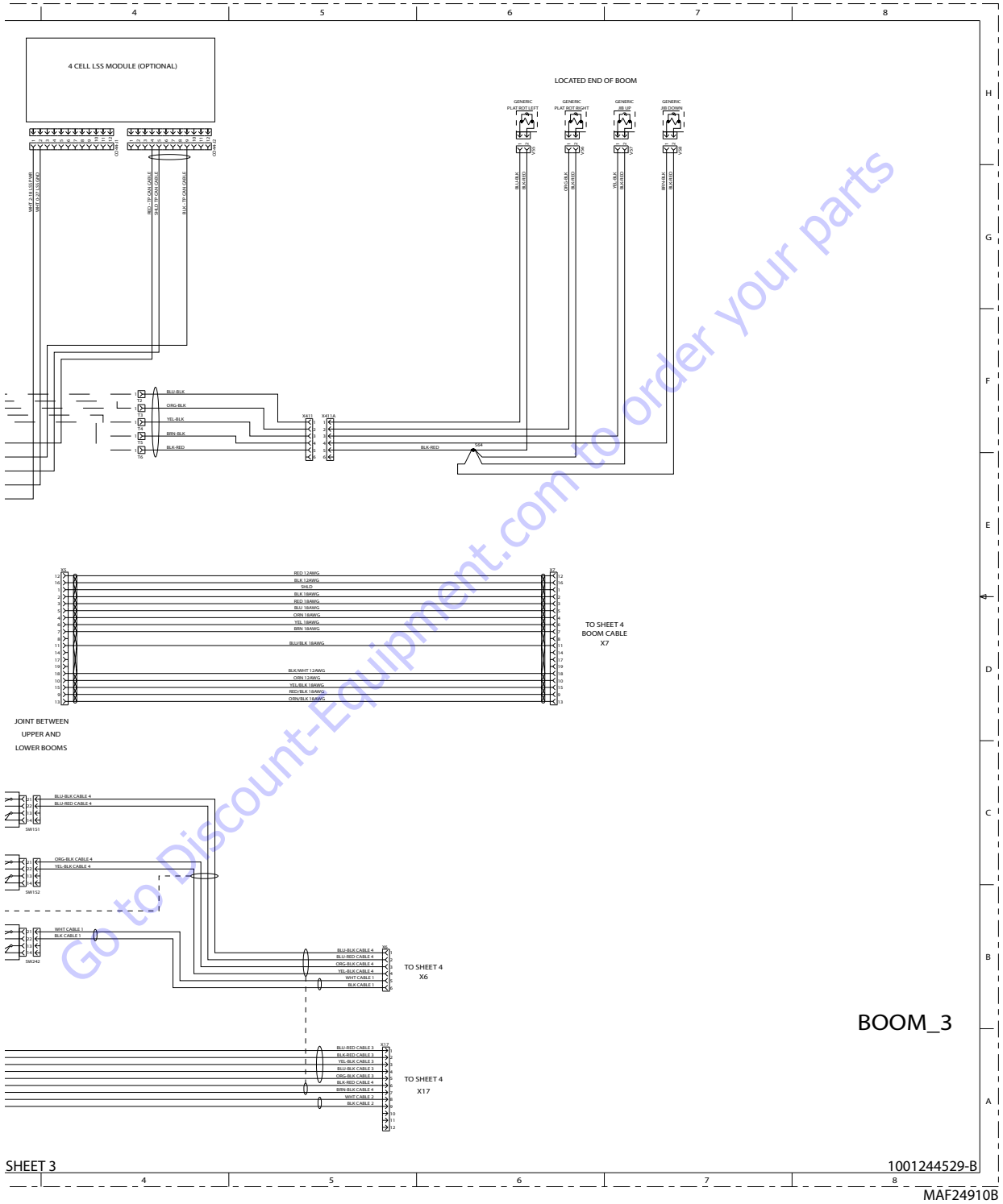
Figure 7-52. Electrical Schematic - Sheet 4 of 16
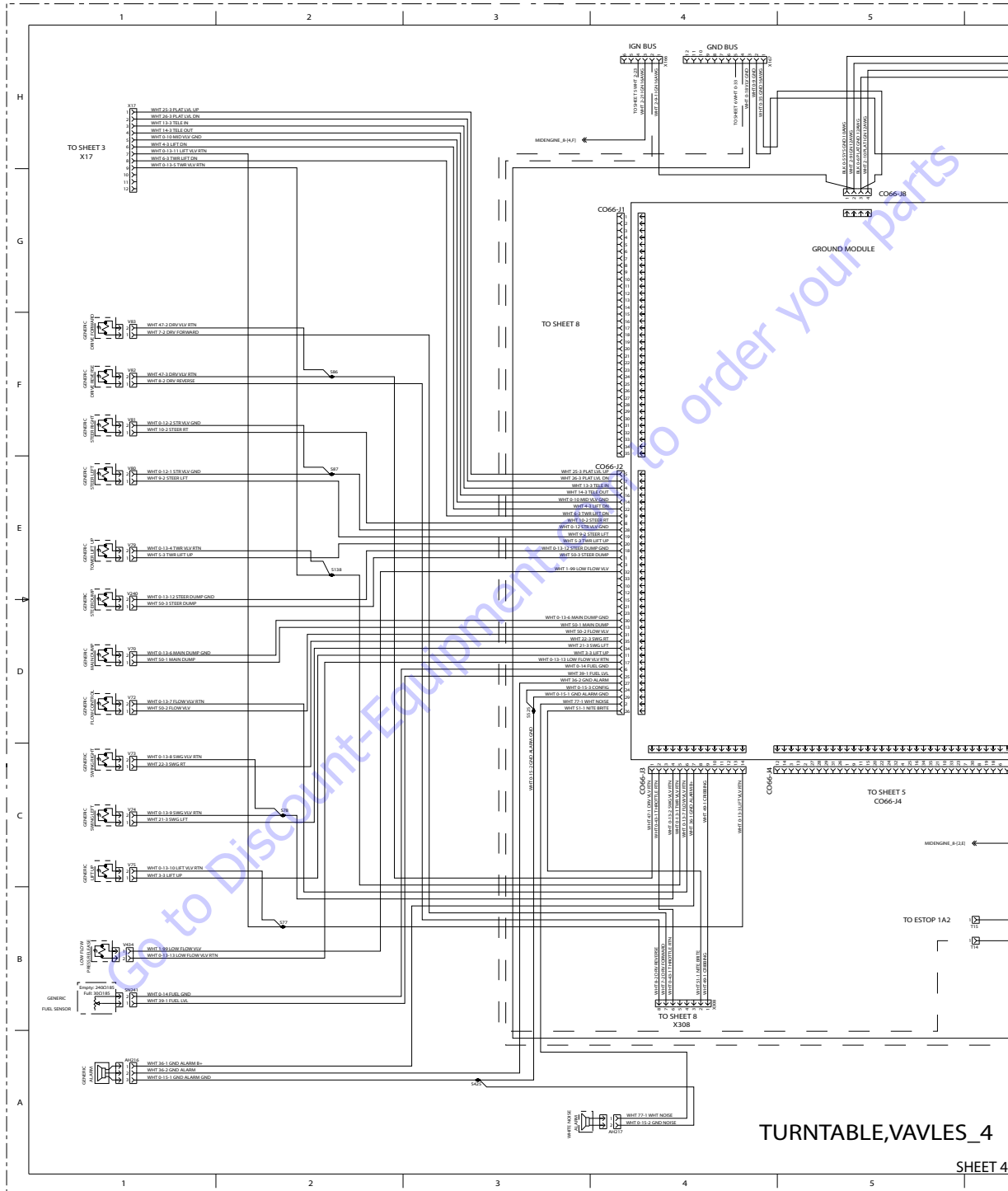
Figure 7-53. Electrical Schematic - Sheet 5 of 16

Figure 7-54. Electrical Schematic - Sheet 6 of 16
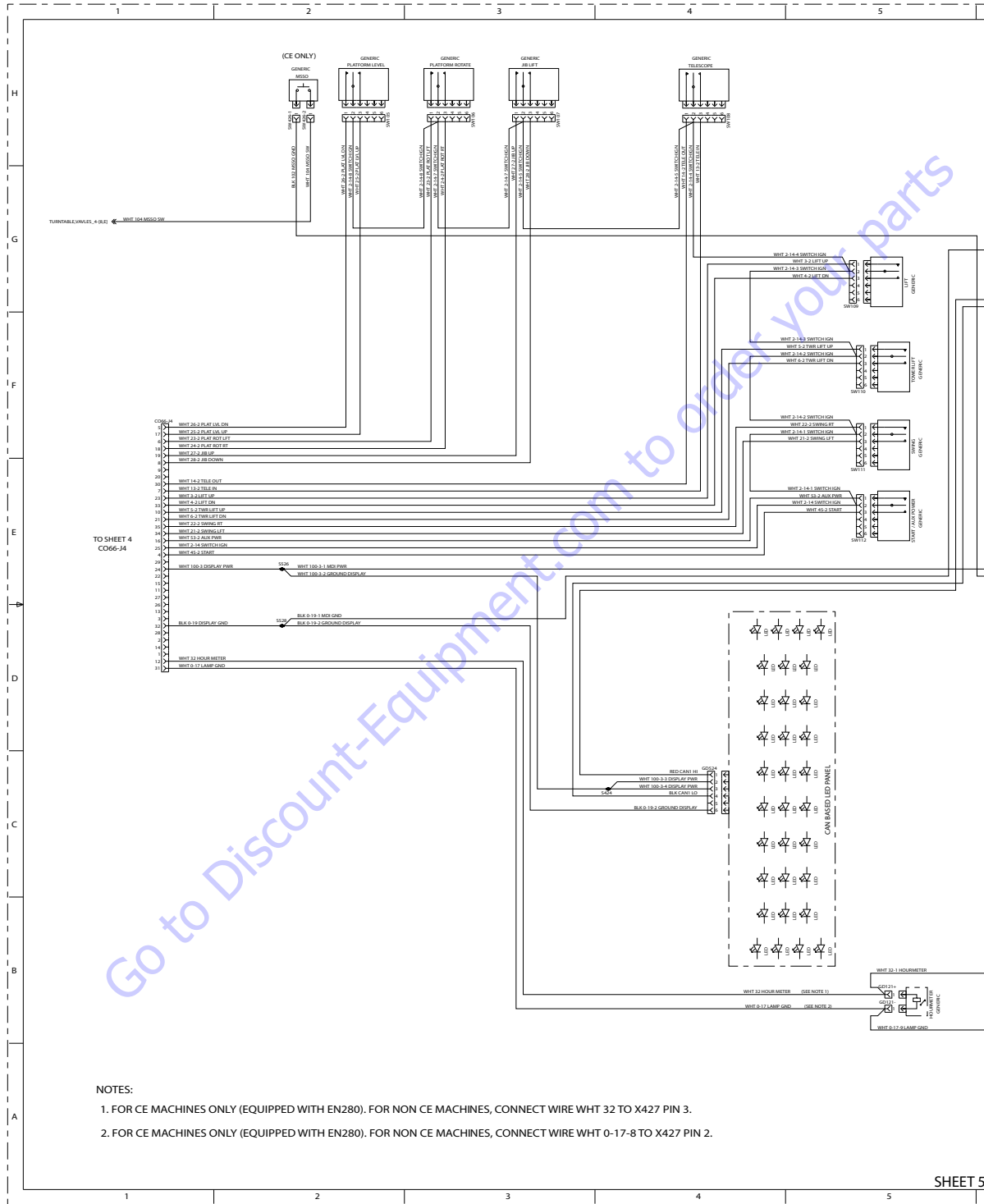
Figure 7-55. Electrical Schematic - Sheet 7 of 16

NOTES:

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

2. FOR CE MACHINES ONLY (EQUIPPED WITH EN280). FOR NON CE MACHINES, CONNECT WIRE WHT 0-17-8 TO X427 PIN 2.
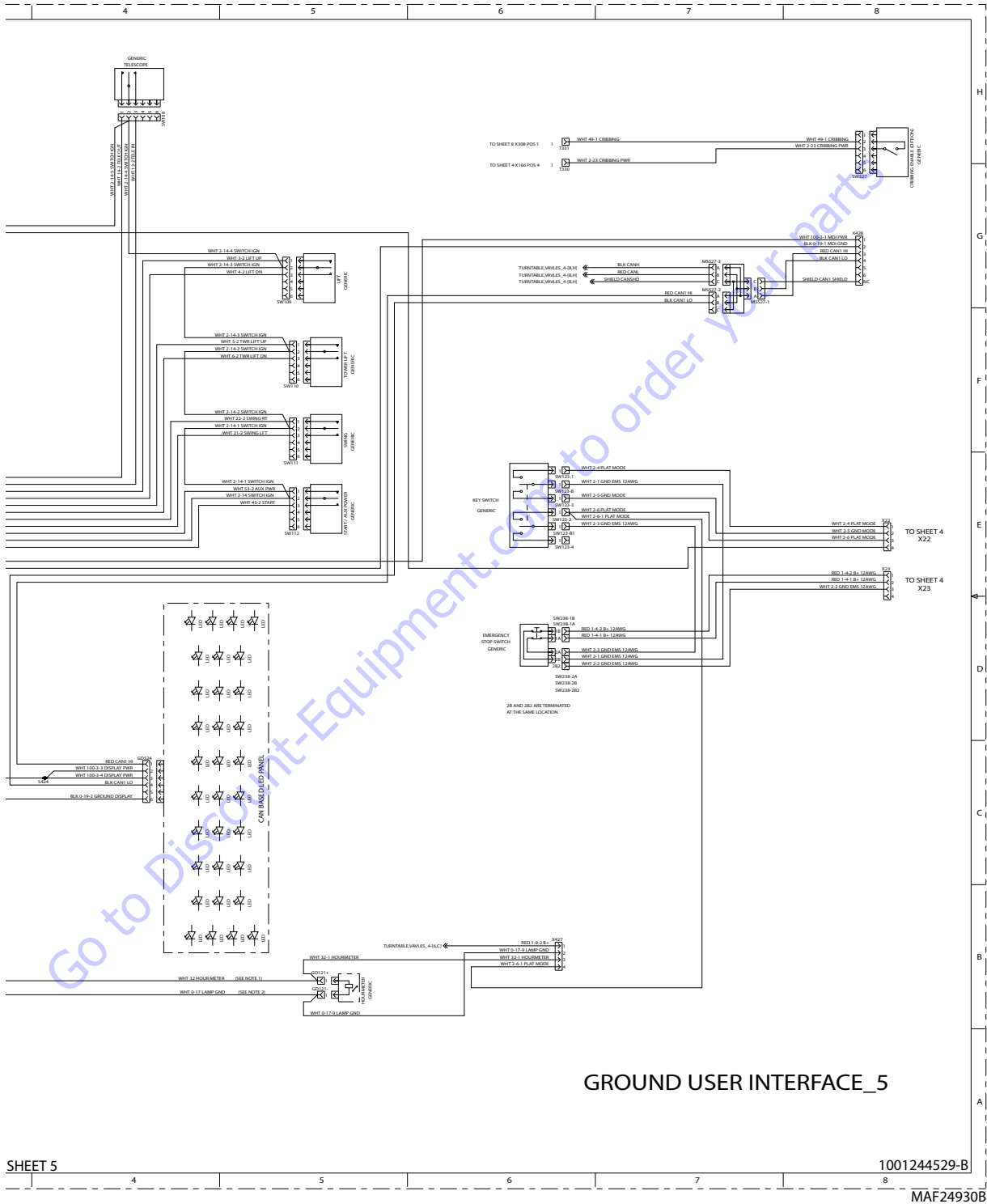
Figure 7-56. Electrical Schematic - Sheet 8 of 16

KUBOTA ENGINE HARNESS
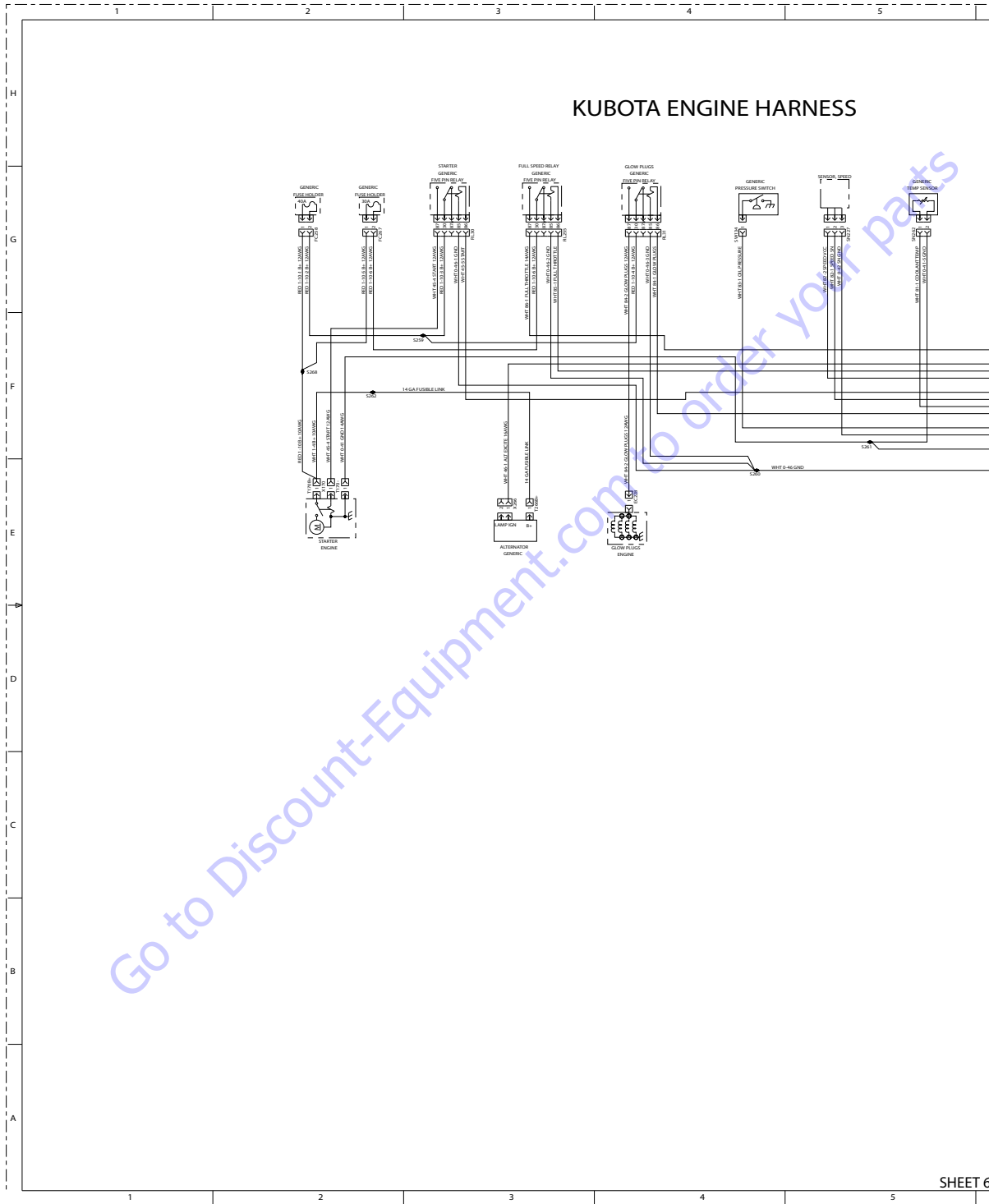
Figure 7-57. Electrical Schematic - Sheet 9 of 16

KUBOTA ENGINE HARNESS
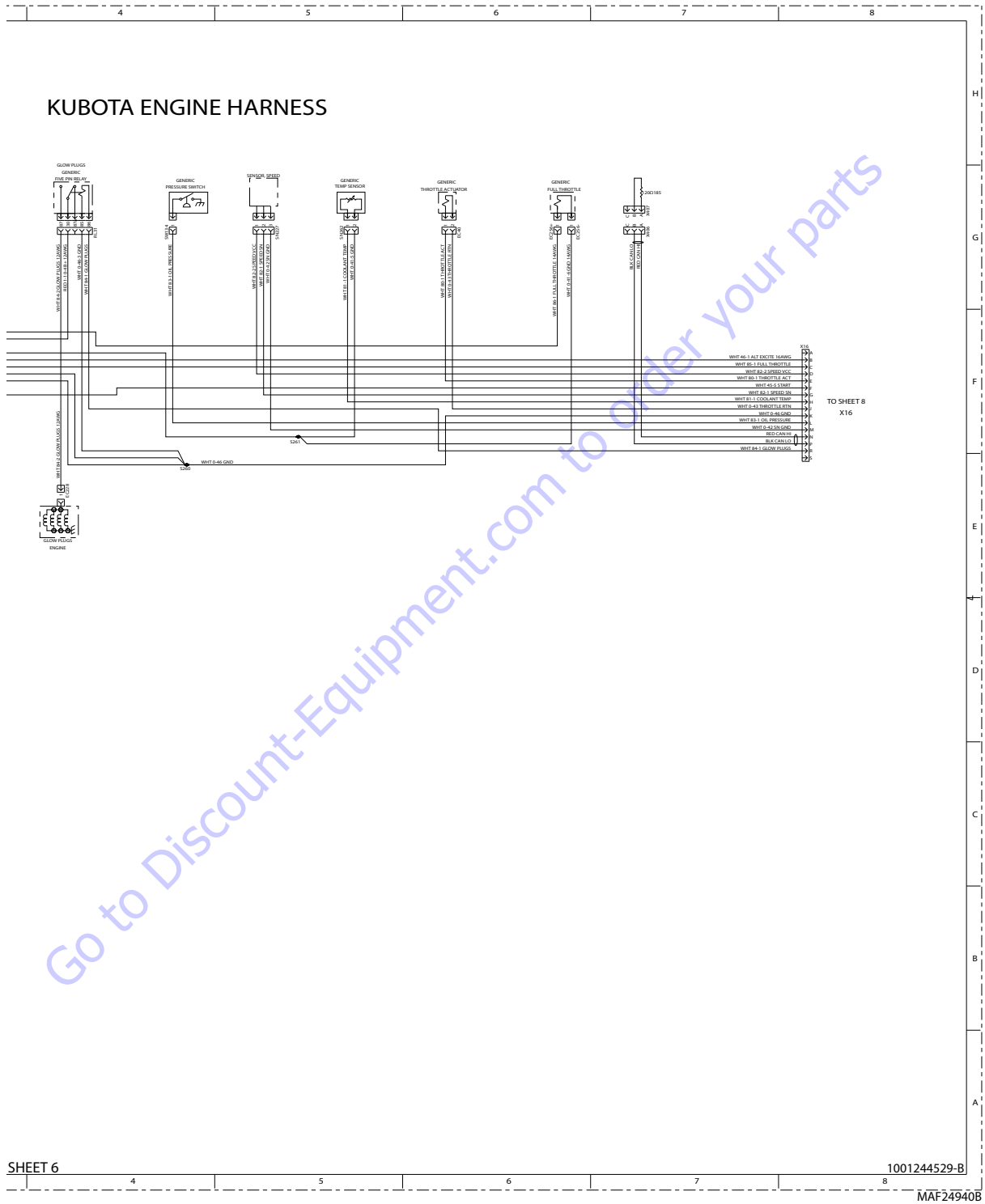
Figure 7-58. Electrical Schematic - Sheet 10 of 16

GM ENGINE HARNESS
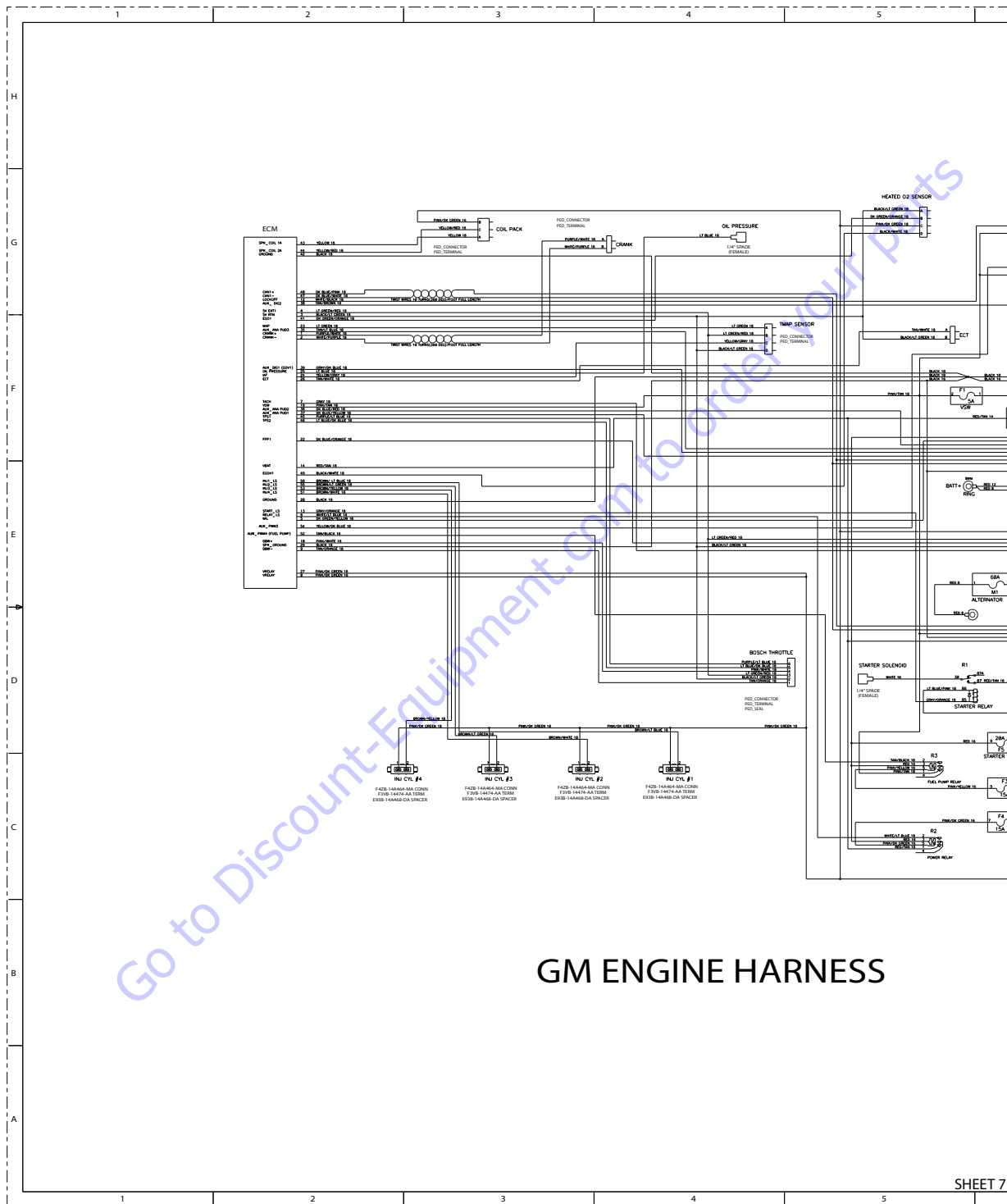
Figure 7-59. Electrical Schematic - Sheet 11 of 16

GM ENGINE HARNESS

ENGINE GM_7

SHEET 7

1001244529-B

MAF24950B
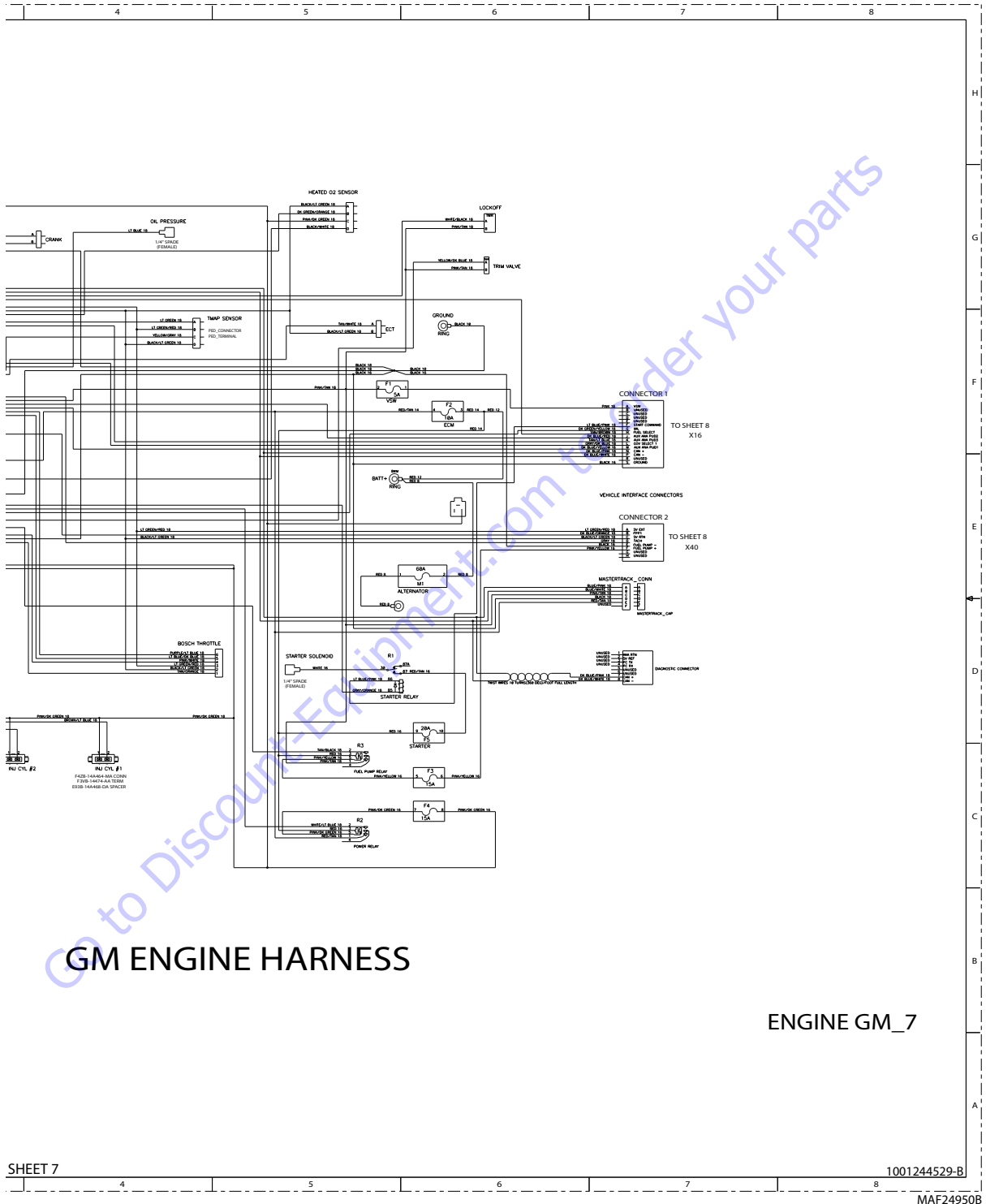
Figure 7-60. Electrical Schematic - Sheet 12 of 16

Figure 7-61. Electrical Schematic - Sheet 13 of 16

Figure 7-62. Electrical Schematic - Sheet 14 of 16

CHASSIS LIGHT (OPTION)

GENERATOR HARNESS

ALERT BEACON OPTION HARNESS

HARNESS,GEN 2 PLAT INTERFACE
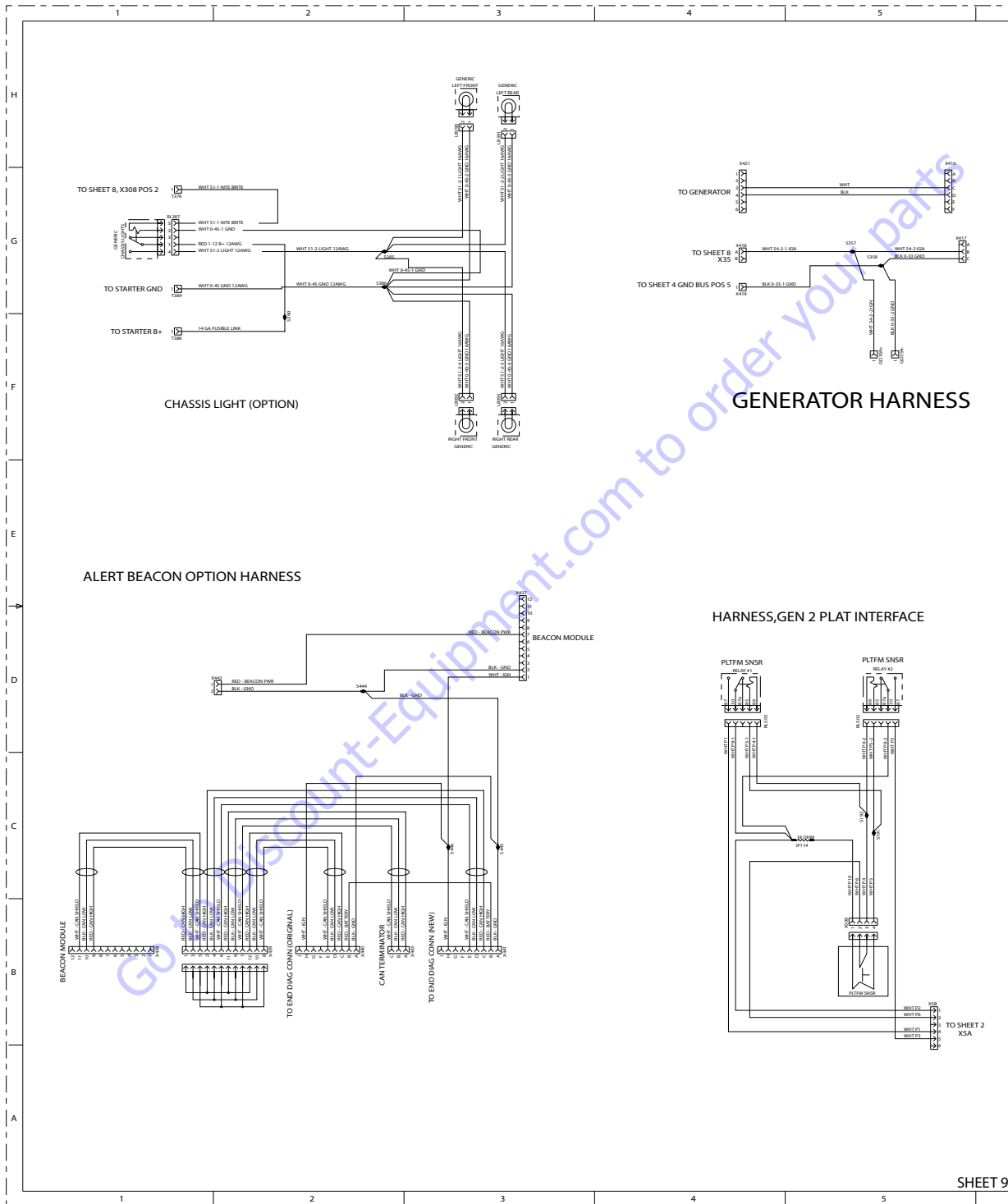
SHEET 9

Figure 7-63. Electrical Schematic - Sheet 15 of 16
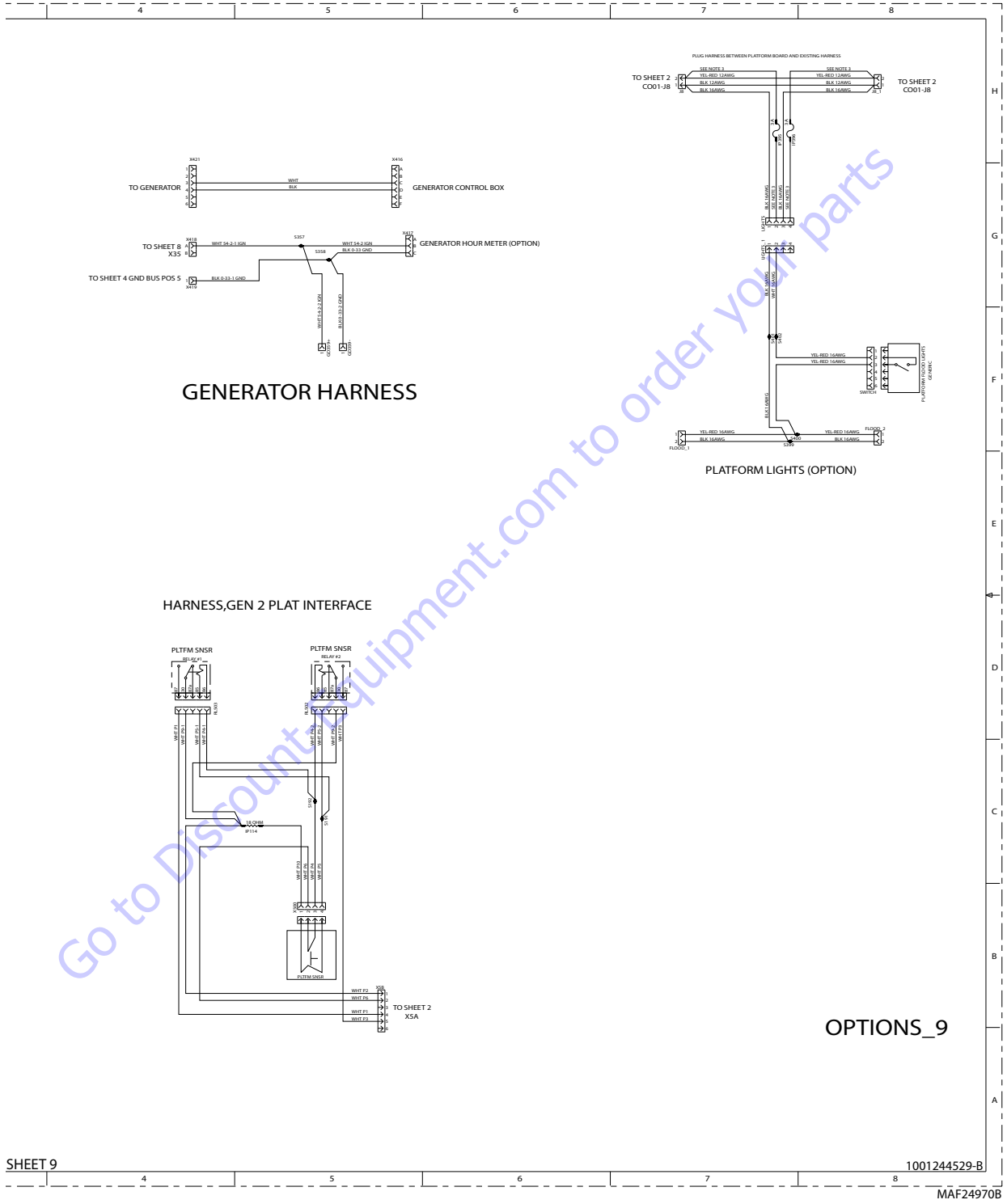
Figure 7-64. Electrical Schematic - Sheet 16 of 16

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