**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| MAIN DUMP VALVE – OPEN CIRCUIT | 3359 | The UGM detects an open circuit at this output | The UGM shall suspend Swing (340AJ, 400S, 450AJ), Tower Lift Up (340AJ, 450AJ), Lift Up, Telescope (400S, 450AJ, 18RS, 24RS), Jib Lift (400S, 450AJ); Platform Rotate (400S, 450AJ) and Platform Level (400S, 450AJ); The UGM shall limit Tower Lift Up (340AJ, 450AJ), Telescope (400S, 450AJ, 18RS, 24RS), Lift Up, Platform Rotate (400S, 450AJ), Platform Level (400S, 450AJ), and Jib Lift (400S, 450AJ) to Creep speed after controls initialized | The UGM no longer detects open circuit; Full speed Swing (340AJ, 400S, 450AJ), Tower Lift Up (340AJ, 450AJ), Lift Up, Telescope (400S, 450AJ, 18RS, 24RS) Jib Lift (400S, 450AJ), Platform Rotate (400S, 450AJ) and Platform Level (400S, 450AJ) permitted after controls are initialized |
| MAIN DUMP VALVE – SHORT TO BATTERY | 3360 | The UGM detects a short to battery at this output | The UGM shall prohibit Main Dump, Steer (400S, 450AJ), Swing (340AJ, 400S, 450AJ), Tower Lift Up (340AJ, 450AJ), Lift Up, Telescope (400S, 450AJ, 18RS, 24RS), Jib Lift (400S, 450AJ), Platform Level (400S, 450AJ) and Platform Rotate (400S, 450AJ) | Power Cycled |
| BRAKE – SHORT TO GROUND | 3361 | The UGM detects a short to ground at this output | Disable UGM Drive/Steer and Brake outputs | Power Cycled |
| START SOLENOID – SHORT TO GROUND | 3362 | UGM detects a short to ground at this output | Engine Start attempt shall not be permitted. | Power Cycled |
| START SOLENOID – OPEN CIRCUIT | 3363 | UGM detects an open circuit at this output; if MACHINE SETUP > ENGINE = DUAL FUEL ECU, only evaluate until first Start is attempted for each power cycle due to possibility of ECU opening ground solenoid return path to disable Start and causing erroneous diagnostics. | No response required for this DTC | Power Cycled |
| START SOLENOID – SHORT TO BATTERY | 3364 | UGM detects a short to battery at this output | Disable UGM Engine Start by deenergizing Fuel Actuator (Kubota) or sending Engine Shutdown command (CAN-based ECUs) | Power Cycled |
| GROUND ALARM -SHORT TO GROUND | 3371 | | | |
| GROUND ALARM -OPEN CIRCUIT | 3372 | | | |
| GEN SET/WELDER – SHORT TO GROUND | 3373 | MACHINE SETUP > GEN SET = BELT DRIVE and the UGM detects a short to ground at this output | Disable UGM Generator output. Do not Enable generator functionality or set Engine to Generator RPM. | Power Cycled |
| GEN SET/WELDER – OPEN CIRCUIT | 3374 | MACHINE SETUP > GEN SET = BELT DRIVE and the UGM detect an open circuit at this output | No response required for this DTC | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| GEN SET/WELDER – SHORT TO BATTERY | 3375 | MACHINE SETUP > GEN SET = BELT DRIVE and the UGM detects a short to battery at this output | Disable UGM Generator output, but UGM shall consider Generator always excited (enabled) and restrict engine to Generator RPM. If MACHINE SETUP > GEN SET CUTOUT = MOTION CUTOUT, disregard cutout and permit motion. | Power Cycled |
| HEAD TAIL LIGHT – SHORT TO GROUND | 3376 | MACHINE SETUP > H & T LIGHTS = YES and the UGM detects a short to ground at this output | Disable UGM H&T Light relay output | Power Cycled |
| HEAD TAIL LIGHT – OPEN CIRCUIT | 3377 | MACHINE SETUP > H & T LIGHTS = YES and the UGM detects an open circuit at this output | No response required for this DTC | Power Cycled |
| HEAD TAIL LIGHT – SHORT TO BATTERY | 3378 | MACHINE SETUP > H & T LIGHTS = YES and the UGM detects a short to battery at this output | Disable UGM H&T Light relay output | Power Cycled |
| PLATFORM LEVEL UP VALVE – SHORT TO GROUND | 3382 | The UGM detects a short to ground at this output | The UGM shall prohibit Platform Level Up; (340AJ, 400S, 450AJ) The UGM shall limit Platform Level Down to Creep speed | Power Cycled |
| PLATFORM LEVEL UP VALVE – OPEN CIRCUIT | 3383 | The UGM detects an open circuit at this output | The UGM shall suspend Platform Level Up and Down; (340AJ, 400S, 450AJ) The UGM shall limit Platform Level Up and Down to Creep speed after controls initialized; (18RS, 24RS) Platform Level Up and Down permitted after controls are initialized | The UGM no longer detects open circuit; (340AJ, 400S, 450AJ) Full speed Platform Level Up and Down permitted after controls are initialized |
| PLATFORM LEVEL UP VALVE – SHORT TO BATTERY | 3384 | The UGM detects a short to battery at this output | The UGM shall prohibit Platform Level Up, Level Down, and Flow Control | Power Cycled |
| PLATFORM LEVEL DOWN VALVE – SHORT TO GROUND | 3388 | The UGM detects a short to ground at this output | The UGM shall prohibit Platform Level Up and Down | Power Cycled |
| PLATFORM LEVEL DOWN VALVE – OPEN CIRCUIT | 3389 | The UGM detects an open circuit at this output | The UGM shall suspend Platform Level Up and Down; The UGM shall prohibit Platform Level Up; (340AJ, 400S, 450AJ) The UGM shall limit Platform Level Down to Creep speed after controls initialized; (18RS, 24RS) Platform Level Down permitted after controls are initialized | The UGM no longer detects open circuit; (340AJ, 400S, 450AJ) Full speed Platform Level Up and Platform Level Down permitted after controls are initialized |
| PLATFORM LEVEL DOWN VALVE – SHORT TO BATTERY | 3390 | The UGM detects a short to battery at this output | The UGM shall prohibit Platform Level Up, Level Down, and Flow Control | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| PLATFORM ROTATE LEFT VALVE – OPEN CIRCUIT | 3395 | The UGM detects an open circuit at this output | The UGM shall suspend Platform Rotate Left and Right; (340AJ, 400S, 450AJ) The UGM shall limit Platform Rotate Left and Right to Creep speed after controls initialized; (18RS, 24RS) Platform Rotate Left and Right permitted after controls are initialized | The UGM no longer detects open circuit; (340AJ, 400S, 450AJ) Full speed Platform Rotate Left and Right permitted after controls are initialized |
| TOWER LIFT UP VALVE – SHORT TO GROUND | 33106 | The UGM detects a short to ground at this output | The UGM shall prohibit Tower Lift Up; The UGM shall limit Tower Lift Down Creep speed | Power Cycled |
| TOWER LIFT UP VALVE – OPEN CIRCUIT | 33107 | The UGM detects an open circuit at this output | The UGM shall suspend Tower Lift Up and Down command and revert to Open Loop Current control for Tower Lift; The UGM shall limit Tower Lift Up and Down to Creep speed after controls initialized | The UGM no longer detects open circuit; Full speed Tower Lift Up and Down permitted after controls are initialized |
| TOWER LIFT DOWN VALVE – SHORT TO GROUND | 33109 | The UGM detects a short to ground at this output | The UGM shall prohibit Tower Lift Up and Down | Power Cycled |
| TOWER LIFT DOWN VALVE – OPEN CIRCUIT | 33110 | The UGM detects an open circuit at this output | The UGM shall suspend Tower Lift Up and Down command and revert to Open Loop Current control for Tower Lift; The UGM shall prohibit Tower Lift Up; The UGM shall limit Tower Lift Down to Creep speed after controls initialized | The UGM no longer detects open circuit; Tower Lift Up permitted after controls are initialized; Full speed Tower Lift Down permitted after controls are initialized |
| SWING RIGHT VALVE – SHORT TO GROUND | 33118 | The UGM detects a short to ground at this output | The UGM shall prohibit Swing Left and Right | Power Cycled |
| SWING RIGHT VALVE – OPEN CIRCUIT | 33119 | The UGM detects an open circuit at this output | The UGM shall suspend Swing Left and Right command and revert to Open Loop Current control for Swing; The UGM shall limit Swing Left and Right to Creep speed after controls initialized | The UGM no longer detects open circuit; Full speed Swing Left and Right permitted after controls are initialized |
| TELESCOPE IN VALVE – SHORT TO BATTERY | 33120 | The UGM detects a short to battery at this output | The UGM shall prohibit Telescope In, Out and Flow Control | Power Cycled |
| SWING LEFT VALVE – SHORT TO GROUND | 33122 | The UGM detects a short to ground at this output | The UGM shall prohibit Swing Left and Right | Power Cycled |
| TELESCOPE OUT VALVE – SHORT TO BATTERY | 33123 | The UGM detects a short to battery at this output | The UGM shall prohibit Telescope In, Out and Flow Control | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| LIFT VALVES – SHORT TO BATTERY | 33182 | The UGM detects a short to battery at either the Lift Up or Lift Down valve | The UGM shall prohibit Lift Up and Down;<br>The UGM shall open the Lift Current Feedback low side FET | Power Cycled |
| TELESCOPE OUT VALVE – OPEN CIRCUIT | 33186 | The UGM detects an open circuit at this output | (340AJ, 400S, 450AJ)<br>The UGM shall suspend Telescope In and Out<br><br>(18RS, 24RS) The UGM shall suspend Telescope In and Out command and revert to Open Loop Current control for Telescope<br><br>The UGM shall limit Telescope In and Out to Creep speed after controls initialized | The UGM no longer detects open circuit;<br>Full speed Telescope In and Out permitted after controls are initialized |
| TELESCOPE OUT VALVE – SHORT TO GROUND | 33188 | The UGM detects a short to ground at this output | The UGM shall prohibit Telescope Out;<br>Tele In speed limited to Creep | Power Cycled |
| TELESCOPE IN VALVE – OPEN CIRCUIT | 33189 | The UGM detects an open circuit at this output | (340AJ, 400S, 450AJ)<br>The UGM shall suspend Telescope In and Out<br><br>(18RS, 24RS) The UGM shall suspend Telescope In and Out command and revert to Open Loop Current control for Telescope<br><br>The UGM shall prohibit Telescope Out;<br>The UGM shall limit Telescope In to Creep speed after controls initialized | The UGM no longer detects open circuit;<br>Telescope Out permitted after controls are initialized;<br>Full speed Telescope In permitted after controls are initialized |
| TELESCOPE IN VALVE – SHORT TO GROUND | 33190 | The UGM detects a short to ground at this output | The UGM shall prohibit Telescope In and Out | Power Cycled |
| HORN - SHORT TO BATTERY | 33208 | | | |
| APU PUMP RELAY - OPEN CIRCUIT | 33276 | The UGM detects an open circuit at this output | No response required for this DTC | Power Cycled |
| APU PUMP RELAY - SHORT TO BATTERY | 33277 | The UGM detects a short to battery at this output | Disable UGM APU Pump relay output | Power Cycled |
| APU PUMP RELAY - SHORT TO GROUND | 33278 | The UGM detects a short to ground at this output | Disable UGM APU Pump relay output | Power Cycled |
| GLOW PLUG – OPEN CIRCUIT | 33279 | MACHINE SETUP > ENGINE ≠ DUAL FUEL ECM<br>MACHINE SETUP > ENGINE ≠ DEUTZ EMR4<br>MACHINE SETUP > GLOW PLUG ≠ NO<br>The UGM detects an open circuit at this output | No response required for this DTC | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| GLOW PLUG – SHORT TO BATTERY | 33280 | MACHINE SETUP > ENGINE ≠ DUAL FUEL ECM<br>MACHINE SETUP > ENGINE ≠ DEUTZ EMR4<br>MACHINE SETUP > GLOW PLUG ≠ NO<br>The UGM detects a short to battery at this output | Disable UGM Glow Plug relay output | Power Cycled |
| GLOW PLUG – SHORT TO GROUND | 33281 | MACHINE SETUP > ENGINE ≠ DUAL FUEL ECM<br>MACHINE SETUP > ENGINE ≠ DEUTZ EMR4<br>MACHINE SETUP > GLOW PLUG ≠ NO<br>The UGM detects a short to ground at this output | Disable UGM Glow Plug relay output | Power Cycled |
| LIFT – CURRENT FEEDBACK READING TOO LOW | 33287 | The Engine State = ENGINE RUNNING;<br>The UGM commanded current > 250mA;<br>The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second | The UGM shall suspend Lift Up and Down command and revert to Open Loop Current control for Lift;<br>The UGM shall limit Lift Up and Down to Creep speed after controls initialized | Power Cycled |
| SWING LEFT VALVE – OPEN CIRCUIT | 33295 | The UGM detects an open circuit at this output | The UGM shall suspend Swing Left and Right command and revert to Open Loop Current control for Swing;<br>The UGM shall limit Swing Left and Right to Creep speed after controls initialized | The UGM no longer detects open circuit;<br>Full speed Swing Left and Right permitted after controls are initialized |
| DRIVE FORWARD VALVE – OPEN CIRCUIT | 33317 | The UGM detects an open circuit at this output | The UGM shall suspend Drive Forward and Reverse command and revert to Open Current loop control for Drive;<br>The UGM shall limit Drive Forward and Reverse to Creep speed after controls initialized | The UGM no longer detects open circuit;<br>Full speed Drive Forward and Reverse permitted after controls are initialized |
| DRIVE VALVES – SHORT TO BATTERY | 33318 | The UGM detects a short to battery at either the Drive Forward or Drive Reverse valve. | The UGM shall prohibit Drive Forward and Reverse;<br>The UGM shall open the Drive Current Feedback low side FET | Power Cycled |
| DRIVE FORWARD VALVE – SHORT TO GROUND | 33319 | The UGM detects a short to ground at this output | The UGM shall prohibit Drive Forward and Reverse | Power Cycled |
| DRIVE REVERSE VALVE – OPEN CIRCUIT | 33320 | The UGM detects an open circuit at this output | The UGM shall suspend Drive Forward and Reverse command and revert to Open Current loop control for Drive;<br>The UGM shall limit Drive Forward and Reverse to Creep speed after controls initialized | The UGM no longer detects open circuit;<br>Full speed Drive Forward and Reverse permitted after controls are initialized |
| DRIVE REVERSE VALVE – SHORT TO GROUND | 33322 | The UGM detects a short to ground at this output | The UGM shall prohibit Drive Forward and Reverse | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| DRIVE – CURRENT FEEDBACK READING TOO LOW | 33331 | The Engine State = ENGINE RUNNING;<br>The UGM commanded current > 250mA;<br>The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second | The UGM shall suspend Drive Forward and Reverse command and revert to Open Current loop control for Drive;<br>The UGM shall limit Drive Forward and Reverse to Creep speed after controls initialized | Power Cycled |
| LIFT UP VALVE – SHORT TO GROUND | 33406 | The UGM detects a short to ground at this output | The UGM shall prohibit Lift Up;<br>The UGM shall limit Lift Down Creep speed | Power Cycled |
| LIFT DOWN VALVE – SHORT TO GROUND | 33407 | The UGM detects a short to ground at this output | The UGM shall prohibit Lift Up and Down | Power Cycled |
| DRIVE – LOSS OF CURRENT FEEDBACK | 33410 | Measured feedback current < 225mA while PWM output > 40% for a period of 100ms. | The UGM shall suspend Drive Forward and Reverse command and revert to Open Current loop control for Drive;<br>The UGM shall limit Drive Forward and Reverse to Creep speed after controls initialized | Power Cycled |
| SWING VALVES – SHORT TO BATTERY | 33412 | The UGM detects a short to battery at either the Swing Right or Swing Left valve | The UGM shall prohibit Swing Left and Right;<br>The UGM shall open the Swing Current Feedback low side FET | Power Cycled |
| TOWER LIFT – CURRENT FEEDBACK READING TOO LOW | 33413 | The Engine State = ENGINE RUNNING;<br>The UGM commanded current > 250mA;<br>The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second | The UGM shall suspend Tower Lift Up and Down command and revert to Open Loop Current control for Tower Lift;<br>The UGM shall limit Tower Lift Up and Down to Creep speed after controls initialized | Power Cycled |
| SWING – CURRENT FEEDBACK READING TOO LOW | 33414 | The Engine State = ENGINE RUNNING;<br>The UGM commanded current > 250mA;<br>The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second | The UGM shall suspend Swing Left and Right command and revert to Open Loop Current control for Swing;<br>The UGM shall limit Swing Left and Right to Creep speed after controls initialized | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| FLOW CONTROL VALVE – CURRENT FEEDBACK READING TOO LOW | 33415 | The Engine State = ENGINE RUNNING;<br>The UGM commanded current > 250mA;<br>The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second | The UGM shall suspend Flow Control and revert to Open Current loop control for Flow Control;<br>The UGM shall limit Telescope, Jib Lift Up; Jib Lift Down (400S, 450AJ), Platform Rotate and Platform Level to Creep speed after controls initialized | Power Cycled |
| TOWER LIFT – CURRENT FEEDBACK READING LOST | 33416 | Measured feedback current < 225mA while PWM output > 40% for a period of 100ms. | The UGM shall suspend Tower Lift Up and Down command and revert to Open Loop Current control for Tower Lift;<br>The UGM shall limit Tower Lift Up and Down to Creep speed after controls initialized | Power Cycled |
| LIFT – CURRENT FEEDBACK READING LOST | 33417 | Measured feedback current < 225mA while PWM output > 40% for a period of 100ms. | The UGM shall suspend Lift Up and Down command and revert to Open Loop Current control for Lift;<br>The UGM shall limit Lift Up and Down to Creep speed after controls initialized | Power Cycled |
| SWING – CURRENT FEEDBACK READING LOST | 33418 | Measured feedback current < 225mA while PWM output > 40% for a period of 100ms. | The UGM shall suspend Swing Left and Right command and revert to Open Loop Current control for Swing;<br>The UGM shall limit Swing Left and Right to Creep speed after controls initialized | Power Cycled |
| FLOW CONTROL VALVE – CURRENT FEEDBACK READING LOST | 33419 | Measured feedback current < 225mA while PWM output > 40% for a period of 100ms. | The UGM shall suspend Flow Control and revert to Open Current loop control for Flow Control;<br>The UGM shall limit Telescope In and Out, Jib Lift Up and Down (400S, 450AJ), Platform Rotate Right and Left and Platform Level Up and Down to Creep speed after controls initialized | Power Cycled |
| TOWER LIFT VALVES – SHORT TO BATTERY | 33425 | The UGM detects a short to battery at either the Tower Lift Up or Tower Lift Down valve. | The UGM shall prohibit Tower Lift Up and Down;<br>The UGM shall open the Tower Lift Current Feedback low side FET | Power Cycled |
| AUXILIARY LIFT DOWN VALVE - SHORT TO GROUND | 33537 | The UGM detects a short to ground at this output | The UGM shall prohibit Aux Lift Down | Power Cycled |

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| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| AUXILIARY LIFT DOWN VALVE - OPEN CIRCUIT | 33538 | The UGM detects an open circuit at this output | The UGM shall suspend Aux Lift Down;<br>Aux Lift Down permitted after controls are initialized | The UGM no longer detects open circuit |
| AUXILIARY TOWER LIFT DOWN VALVE - SHORT TO GROUND | 33540 | The UGM detects a short to ground at this output | The UGM shall prohibit Aux Tower Lift Down | Power Cycled |
| AUXILIARY TOWER LIFT DOWN VALVE - OPEN CIRCUIT | 33541 | The UGM detects an open circuit at this output | The UGM shall suspend Aux Tower Lift Down;<br>Aux Tower Lift Down permitted after controls are initialized | The UGM no longer detects open circuit |
| OSCILLATING AXLE #1 VALVE - SHORT TO GROUND | 33543 | The UGM detects a short to ground at this output | UGM shall disable Oscillating Axle #1 valve and Oscillating Axle #2 valve outputs;<br>The UGM shall Lock the Oscillating Axle | Power Cycled |
| OSCILLATING AXLE #1 VALVE - OPEN CIRCUIT | 33544 | The UGM detects an open circuit at this output | UGM shall disable Oscillating Axle #1 valve and Oscillating Axle #2 valve outputs;<br>The UGM shall Lock the Oscillating Axle | Power Cycled |
| OSCILLATING AXLE #1 VALVE - SHORT TO BATTERY | 33545 | The UGM detects a short to battery at this output | UGM shall disable Oscillating Axle #1 valve and Oscillating Axle #2 valve outputs;<br>The UGM shall Lock the Oscillating Axle | Power Cycled |
| OSCILLATING AXLE #2 VALVE - SHORT TO GROUND | 33546 | The UGM detects a short to ground at this output | UGM shall disable Oscillating Axle #1 valve and Oscillating Axle #2 valve outputs;<br>The UGM shall Lock the Oscillating Axle | Power Cycled |
| OSCILLATING AXLE #2 VALVE - OPEN CIRCUIT | 33547 | The UGM detects an open circuit at this output | UGM shall disable Oscillating Axle #1 valve and Oscillating Axle #2 valve outputs;<br>The UGM shall Lock the Oscillating Axle | Power Cycled |
| OSCILLATING AXLE #2 VALVE - SHORT TO BATTERY | 33548 | The UGM detects a short to battery at this output | UGM shall disable Oscillating Axle #1 valve and Oscillating Axle #2 valve outputs;<br>The UGM shall Lock the Oscillating Axle | Power Cycled |
| AUXILIARY VALVES - SHORT TO BATTERY | 33567 | The UGM detects a short to battery at either the Aux Lift Down or Aux Tower Lift Down valve | The UGM shall prohibit Aux Lift Down and Aux Tower Lift Down;<br>The UGM shall open the Auxiliary low side FET | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| AUXILIARY - CURRENT FEEDBACK READING LOST | 33568 | Measured feedback current < 225mA while output is active for a period of 100ms. | The UGM shall suspend Aux Lift Down and Aux Tower Down (450AJ);<br>Aux Lift Down and Aux Tower Down (450AJ) permitted after controls are initialized | Power Cycled |
| ECM PULL DOWN RESISTOR - OPEN CIRCUIT | 33575 | MACHINE SETUP > ENGINE = DEUTZ EMR4;<br>Pull down resister not detected | The UGM shall send the Engine Shutdown command | Power Cycled |
| PLATFORM ROTATE LEFT VALVE – OPEN CIRCUIT | 349 | The PM detects an open circuit at this output and reports it to the UGM | The UGM shall suspend commands to PM for Platform Rotate Right and Left;<br>The UGM shall limit Platform Rotate Right and Left to Creep speed after controls are initialized | The PM no longer detects open circuit;<br>Full speed Platform Rotate Right and Left permitted after controls are initialized |
| PLATFORM ROTATE LEFT VALVE – SHORT TO BATTERY | 3410 | The PM detects a short to battery at this output and reports it to the UGM | The UGM shall disable commands to PM for Platform Rotate Right and Left;<br>The UGM shall prohibit Flow Control | Power Cycled |
| PLATFORM ROTATE LEFT VALVE – SHORT TO GROUND | 3411 | The PM detects a short to ground at this output and reports it to the UGM | The UGM shall disable commands to PM for Platform Rotate Right and Left | Power Cycled |
| PLATFORM ROTATE RIGHT VALVE – OPEN CIRCUIT | 3412 | The PM detects an open circuit at this output and reports it to the UGM | The UGM shall suspend commands to PM for Platform Rotate Right and Left;<br>The UGM shall limit Platform Rotate Right and Left to Creep speed after controls are initialized | The PM no longer detects open circuit;<br>Full speed Platform Rotate Right and Left permitted after controls are initialized |
| PLATFORM ROTATE RIGHT VALVE – SHORT TO BATTERY | 3413 | The PM detects a short to battery at this output and reports it to the UGM | The UGM shall disable commands to PM for Platform Rotate Right and Left;<br>The UGM shall prohibit Flow Control | Power Cycled |
| PLATFORM ROTATE RIGHT VALVE – SHORT TO GROUND | 3414 | The PM detects a short to ground at this output and reports it to the UGM | The UGM shall disable commands to PM for Platform Rotate Right and Left | Power Cycled |
| JIB LIFT UP VALVE – OPEN CIRCUIT | 3415 | MACHINE SETUP > JIB = YES<br>The PM detects an open circuit at this output and reports it to the UGM | The UGM shall suspend commands to PM for Jib Lift Up and Down;<br>The UGM shall limit Jib Lift Up and Down to Creep speed | The PM no longer detects open circuit;<br>Full speed Jib Lift Up and Down permitted after controls are initialized |
| JIB LIFT UP VALVE – SHORT TO BATTERY | 3416 | MACHINE SETUP > JIB = YES<br>The PM detects a short to battery at this output and reports it to the UGM | The UGM shall disable commands to PM for Jib Lift Up and Down;<br>The UGM shall prohibit Flow Control | Power Cycled |

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|---|---|---|---|---|
| JIB LIFT UP VALVE – SHORT TO GROUND | 3417 | MACHINE SETUP > JIB = YES<br>The PM detects a short to ground at this output and reports it to the UGM | The UGM shall disable commands to PM for Jib Lift Up;<br>The UGM limits Jib Lift Down to Creep speed | Power Cycled |
| JIB LIFT DOWN VALVE – OPEN CIRCUIT | 3418 | MACHINE SETUP > JIB = YES<br>The PM detects an open circuit at this output and reports it to the UGM | The UGM shall suspend commands to PM for Jib Lift Up and Down;<br>The UGM shall prohibit Jib Lift Up;<br>The UGM shall limit Jib Lift Down to Creep speed | The PM no longer detects open circuit;<br>Jib Lift Up permitted after controls are initialized<br>Full speed Jib Lift Down permitted after controls are initialized |
| JIB LIFT DOWN VALVE – SHORT TO BATTERY | 3419 | MACHINE SETUP > JIB = YES<br>The PM detects a short to battery at this output and reports it to the UGM | The UGM shall disable commands to PM for Jib Lift Up and Down;<br>(450AJ) The UGM shall prohibit Flow Control | Power Cycled |
| JIB LIFT DOWN VALVE – SHORT TO GROUND | 3420 | MACHINE SETUP > JIB = YES<br>The PM detects a short to ground at this output and reports it to the UGM; detection occurs for PWM output approximately ≤ 15% or for STG condition. | The UGM shall disable commands to PM for Jib Lift Up and Down | Power Cycled |
| ENGINE TROUBLE CODE | 437 | An engine with a CAN engine controller is configured in MACHINE SETUP<br>The engine controller reports a J1939 fault | Report and log in Help<br>If [(MACHINE SETUP > DEUTZ EMR2) or (MACHINE SETUP > DEUTZ EMR4) and SPN:FMI = 535:7], prohibit engine cranking | Power Cycled |
| HIGH ENGINE TEMP | 438 | An engine with a CAN engine controller is <u>not</u> configured in MACHINE SETUP:<br>The Engine State = ENGINE RUNNING > 10 seconds<br>The coolant temperature is greater than or equal to the configured engines max allowed temperature. The maximum allowed temperature > 110°C.<br>An engine with a CAN engine controller is configured in MACHINE SETUP:<br>ECM transmits a J1939 DM1 message for an engine coolant high temperature critical fault (SPN:FMI 110:0) on CAN2 or uses the J1939 Transport Protocol every one second to send this information if multiple engine faults exist. | MACHINE SETUP > ENGINE SHUTDOWN = ENABLED then shutdown the engine<br>Activate High Engine Temperature indicator J4-28 | Power Cycled |
| NO ALTERNATOR OUTPUT | 4310 | The Engine State = ENGINE RUNNING > 10 seconds and UGM system voltage < 11.5 volts for 10 seconds | Activate the No Charge indicator J4-26 per System Indicators | UGM system voltage > 11.7 volts |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| LOW OIL PRESSURE | 4311 | An engine with a CAN engine controller is not configured in MACHINE SETUP<br>The Engine State = ENGINE RUNNING > 10 seconds<br>The engine oil pressure is LOW (debounce 3s).<br>An engine with a CAN engine controller is configured in MACHINE SETUP<br>ECM transmits a J1939 DM1 message for an engine oil low pressure critical fault (SPN:FMI 100:1) on CAN2 or uses the J1939 Transport Protocol every one second to send this information if multiple engine faults exist. | MACHINE SETUP > ENGINE SHUTDOWN = ENABLED then shutdown the engine<br>Activate the Low Oil Pressure indicator J4-29 | Power Cycled |
| ENGINE COOLANT – LOW LEVEL | 4334 | MACHINE SETUP > ENGINE = DEUTZ EMR4;<br>ECM transmits a J1939 DM1 message for an engine coolant low level fault (SPN:FMI 111:1) on CAN2 or uses the J1939 Transport Protocol every one second to send this information if multiple engine faults exist. | MACHINE SETUP > ENGINE SHUTDOWN = ENABLED then shutdown the engine;<br>Activate High Engine Temperature indicator J4-28 | Power Cycled |
| WATER IN FUEL | 4375 | | | |
| BATTERY VOLTAGE TOO LOW – SYSTEM SHUTDOWN | 441 | The UGM detects that its supply voltage is less than 9 volts<br>Engine State ≠ ENGINE CRANKING<br>Auxiliary Power/Emergency Descent Mode is not active | Disable all UGM valve outputs except those used during APU/Emergency Descent [Tower Lift Down, Lift Down, Swing (400S, 450AJ, 24RS), Jib Lift Up/Down (MACHINE SETUP > JIB = YES)]. If MACHINE SETUP > H&T LIGHTS = YES or > ENGINE ≠ DUAL FUEL ECM turn off lights | Voltage is greater than 9.25 volts |
| BATTERY VOLTAGE TOO HIGH – SYSTEM SHUTDOWN | 442 | The UGM detects that its supply voltage > 16.0 volts | Disable all UGM and Platform outputs until voltage < 15.75 volts and do not permit Machine Enable | Power Cycled |
| LSS BATTERY VOLTAGE TOO HIGH | 443 | MACHINE SETUP > LOAD SYSTEM ≠ NO<br>The UGM detects that the LSS reports supply voltage > 16.0V | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| LSS BATTERY VOLTAGE TOO LOW | 444 | MACHINE SETUP > LOAD SYSTEM ≠ NO<br>The UGM detects that the LSS reports supply voltage < 9.0V | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| BATTERY VOLTAGE LOW | 445 | The UGM detects that its supply voltage < 11 volts for 5 seconds.<br>Engine State ≠ ENGINE CRANKING<br>Auxiliary Power/Emergency Descent Mode is not active<br>Glow Plugs are not energized | No response required for this DTC | Voltage is greater than 11.25 volts |
| LSS BATTERY VOLTAGE - INITIALIZATION ERROR | 4479 | | | |
| LSS BATTERY VOLTAGE - NOT CALIBRATED | 4480 | | | |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| CANBUS FAILURE – PLATFORM MODULE | 662 | UGM does not receive any CAN messages from the PM in 250ms | The UGM shall suspend motion;<br><br>If MACHINE SETUP > GENERATOR, the UGM shall disableto turn off generator relay output and assume generator off state.<br><br>If MACHINE SETUP > ENGINE = DUAL FUEL and > H &T LIGHTS = YES, state of switch prior to loss of CAN Bus 1 shall be retained until CAN Bus 1 is restored or power cycled.<br><br>Reactivation of Footswitch is required after CAN Bus 1 is restored to obtain Machine Enable.<br><br>(340AJ, 450AJ) If the Machine is in Ground Mode, the UGM shall disable commands to PM for Jib Lift Up and Down, Platform Rotate Right and Left; | CAN messages are received from the PM |
| CANBUS FAILURE – LOAD SENSING SYSTEM MODULE | 663 | MACHINE SETUP > LOAD SYSTEM ≠ NO<br>UGM does not receive any CAN messages from the LSS module in 1000ms | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| CANBUS FAILURE – ENGINE CONTROLLER | 666 | An engine with a CAN engine controller is configured in MACHINE SETUP<br>No CAN messages are received from the engine controller for more than 250ms | UGM shall set Target engine RPM = Mid-Engine if Engine State ≠ ENGINE STOPPED, and assume Engine Controller reporting mid-Engine; otherwise, Engine State = ENGINE STOPPED. If engine state = ENGINE STOPPED at time of CAN loss, UGM shall permit one start attempt. If engine state ≠ ENGINE STOPPED at time of CAN loss, UGM shall decel all functions. If MACHINE SETUP > GENERATOR ≠ NO, Generator Relay output to be turned off until re-enabled by operator after CAN is re-established. | CAN messages are received from the engine controller;<br>UGM shall require re-activation of Footswitch (Platform Mode) or Ground Enable (Ground Mode) to enable functions and resume operation. |
| 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 response required for this DTC | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| CANBUS FAILURE – TCU MODULE | 6622 | MACHINE SETUP > CLEARSKY = YES<br>No CAN2 messages are received from the TCU module for more than 30 seconds | No response required for this DTC | Not all of the trigger conditions are met |
| CANBUS FAILURE – CHASSIS TILT SENSOR | 6635 | UGM does not receive any CAN messages from the Chassis Tile Sensor in 250ms | The UGM shall consider the machine Tilted;<br>UGM reports a combined chassis tilt angle of 90 degrees;<br>UGM shall report individual axis readings as ?? | CAN messages are received from the Chassis tilt Sensor and controls are initialized |
| CANBUS FAILURE - GROUND DISPLAY | 6651 | UGM does not receive any CAN messages from the Ground Display in 250ms | No response required for this DTC | CAN messages are received from the Ground Display |
| CANBUS FAILURE – TEMPERATURE SENSOR | 6657 | MACHINE SETUP > TEMP CUTOUT = YES;<br>UGM does not receive any CAN messages from the Ambient Temperature sensor in 250ms | The UGM shall set Low Temperature Cutout state = Faulty<br><br>If the Machine is in Platform Mode and if the Boom is Above Elevation;<br>The UGM shall suspend motion;<br>The UGM shall limit the machine to Creep speed after controls initialized<br><br>If the Machine is in Platform Mode and if the Boom is not Above Elevation;<br>The UGM shall limit Swing, Tower Lift (340AJ. 450AJ), Tele, Lift, Platform Rotate, Platform Level, and Jib Lift (if MACHINE SETUP > JIB = YES) to Creep speed<br><br>If the Machine is in Ground Mode;<br>No response required for this DTC | CAN messages are received from the Ambient Temperature sensor |
| REMOTE CONTRACT MANAGEMENT OVERRIDE – ALL FUNCTIONS IN CREEP | 681 | MACHINE SETUP > CLEARSKY = YES<br>Value set by ClearSky TCU | Response detailed in Remote Contract Management section. | Cleared by ClearSky TCU |
| CHASSIS TILT SENSOR NOT CALIBRATED | 813 | The UGM detects one of the follow conditions:<br>The tilt sensor has not been calibrated;<br>For 400S, 450AJ, the Tilt Sensor source Address is 0xC0;<br>For 400S, 450AJ, the Tilt Sensor Serial number does not match | The UGM shall consider the machine Tilted<br>UGM reports a combined chassis tilt angle of 90 degrees;<br>UGM shall report individual axis readings | Tilt sensor calibrated |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| CHASSIS TILT SENSOR OUT OF RANGE | 814 | Fault CHASSIS TILT SENSOR NOT CALIBRATED (813) is not present and Tilt sensor measurement > 19º for 4 seconds. Not to be reported during Tilt Sensor calibration. | No additional action required beyond Tilted requirements specified elsewhere;<br>UGM reports a combined chassis tilt angle of 90 degrees;<br>UGM shall report individual axis readings | Not all of the trigger conditions are met. |
| CHASSIS TILT SENSOR DISAGREEMENT | 815 | | | |
| TILT SENSOR STAGNANT | 818 | The UGM detects the following conditions:<br>The X axis or Y axis filtered readings change by < ±0.1º in 5 second;<br>Drive Forward or Drive Reverse output value is ≥ Creep output value;<br>Do not report if DTC 823 is active | The UGM shall consider the machine Tilted;<br>UGM reports a combined chassis tilt angle of 90 degrees;<br>The UGM reports individual axis readings | Power Cycled |
| CHASSIS TILT SENSOR - SINGLE POINT CALIBRATION PERFORMED | 8112 | | | |
| LSS CELL #1 ERROR | 821 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>The UGM detects that LSS is reporting error with Cell #1 | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| LSS CELL #2 ERROR | 822 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>The UGM detects that LSS is reporting error with Cell #2 | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| LSS CELL #3 ERROR | 823 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>The UGM detects that LSS is reporting error with Cell #3 | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| LSS CELL #4 ERROR | 824 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>The UGM detects that LSS is reporting error with Cell #4. | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| LSS HAS NOT BEEN CALIBRATED | 825 | MACHINE SETUP > LOAD SYSTEM ≠ NO<br><br>If Load System is the 4-Cell LSS;<br>The load sensor has not been calibrated, or<br>DTC 992 (LSS EEPROM ERROR) is active, or<br>DTC 9977 (LSS CORRUPT EEPROM) is active<br><br>If Load System is the 1-Cell LSS;<br>The LSS serial number does not match | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| RUNNING AT CREEP – PLATFORM OVERLOADED | 826 | Machine Setup > LOAD SYSTEM = WARN ONLY<br>The platform is Overloaded<br>Ground mode is active with Auxiliary Power/Emergency<br>Descent mode not active or Platform mode is active | Refer to Table 7-1 for machine response. | Not all of the trigger conditions are met |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| 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 7-1 apply.<br>-or-<br>The Platform is Overloaded and Machine Setup > LOAD SYSTEM = CUTOUT ALL and conditions of Table 7-1 apply. | Refer to Table 7-1 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<br>Platform Mode is active<br>The platform is Overloaded | Refer to Table 7-1 for machine response. | Not all of the trigger conditions are met |
| FUNCTIONS CUTOUT - PLATFORM OVERLOADED | 829 | | | |
| LSS READING UNDER WEIGHT | 8211 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>The load sensor has been calibrated and Gross Platform Weight < (0.5 * Empty Platform Weight);<br>Do not report if DTC 0030 is active | UGM to set Platform Load State = Overloaded | Not all of the trigger conditions are met |
| LSS SENSOR DISAGREEMENT | 8218 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 1-Cell LSS;<br>The UGM detects that Platform Gross 1 calculation and Platform Gross 2 calculation disagree by > 10% for longer than 5 seconds;<br>Do not report of DTC 825 is active | UGM to set Platform Load State = Overloaded | Power Cycled |
| LSS STRAIN GAUGE 1 - STAGNANT | 8222 | | | |
| LSS STRAIN GAUGE 1 - STAGNANT | 8223 | | | |
| LSS STRAIN GAUGE 1 - OUT OF RANGE LOW | 8224 | | | |
| LSS STRAIN GAUGE 2 - OUT OF RANGE LOW | 8225 | | | |
| LSS STRAIN GAUGE 1 - OUT OF RANGE HIGH | 8226 | | | |
| LSS STRAIN GAUGE 2 - OUT OF RANGE HIGH | 8227 | | | |
| LSS STRAIN GAUGE 1 - INITIALIZATION ERROR | 8228 | | | |
| LSS STRAIN GAUGE 2 - INITIALIZATION ERROR | 8229 | | | |
| LSS STRAIN GAUGE 1 - NOT CALIBRATED | 8230 | | | |
| LSS STRAIN GAUGE 2 - NOT CALIBRATED | 8231 | | | |
| LSS STRAIN GAUGE 1 - SENSOR DEFECT | 8232 | | | |
| LSS STRAIN GAUGE 2 - SENSOR DEFECT | 8233 | | | |
| LSS STRAIN GAUGE 1 - NOT INSTALLED | 8234 | | | |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| LSS STRAIN GAUGE 2 - NOT INSTALLED | 8235 | | | |
| LSS NOT DETECTING CHANGE | 8236 | | | |
| LSS STRAIN GAUGE 1 - A/D DEFECT | 8237 | | | |
| LSS STRAIN GAUGE 2 - A/D DEFECT | 8238 | | | |
| FRONT LEFT STEER VALVE – OPEN CIRCUIT | 8639 | The UGM detects an open circuit at this output | Steer Left and Right speed limited to Creep (340AJ, 400S, 450AJ);<br>No response required for this DTC (18RS, 24RS) | Power Cycled |
| FRONT LEFT STEER VALVE – SHORT TO BATTERY | 8640 | The UGM detects a short to battery at this output | Disable UGM Drive Forward/ Reverse and Steer Left/Right outputs | Power Cycled |
| FRONT LEFT STEER VALVE – SHORT TO GROUND | 8641 | The UGM detects a short to ground at this output | Disable UGM Steer Left and Right outputs | Power Cycled |
| FRONT RIGHT STEER VALVE – OPEN CIRCUIT | 8642 | The UGM detects an open circuit at this output | Steer Left and Right speed limited to Creep(340AJ, 400S, 450AJ);<br>No response required for this DTC (18RS, 24RS) | Power Cycled |
| FRONT RIGHT STEER VALVE – SHORT TO BATTERY | 8643 | The UGM detects a short to battery at this output | Disable UGM Drive Forward/ Reverse and Steer Left/Right outputs | Power Cycled |
| FRONT RIGHT STEER VALVE – SHORT TO GROUND | 8644 | The UGM detects a short to ground at this output | Disable UGM Steer Left and Right outputs | Power Cycled |
| MACHINE SAFETY SYSTEM OVERRIDE OCCURRED | 873 | MSSO = Active | Response described in MSSO Influence on Machine Operation section | Fault shall be retentive through Power Cycled;<br>Can be reset only with an Analyzer via the CALIBRATIONS > MSSO > MSSO RESET menu |
| LSS WATCHDOG RESET | 991 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>UGM detects LSS report of an anomaly exists that has caused a Watch Dog Timer reset. | UGM to set Platform Load State = Overloaded | Power Cycled |
| LSS EEPROM ERROR | 992 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>UGM detects LSS report of an anomaly that exists in the LSS EEPROM | UGM to set Platform Load State = Overloaded | Power Cycled |
| LSS INTERNAL ERROR – PIN EXCITATION | 993 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>UGM detects LSS report of improper excitation voltage | UGM to set Platform Load State = Overloaded | Power Cycled |
| LSS INTERNAL ERROR – DRDY MISSING FROM A/D | 994 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>UGM detects LSS report of an anomaly that exists in the LSS A/D converter operations. | UGM to set Platform Load State = Overloaded | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| EEPROM FAILURE - CHECK ALL SETTINGS | 998 | The UGM has detected an anomaly in EEPROM | Disable all machine and engine functions (i.e., command engine shutdown and do not permit start); reset the section of EEPROM where the failure occurred to defaults. | Power Cycled |
| FUNCTIONS LOCKED OUT - PLATFORM MODULE SOFTWARE VERSION IMPROPER | 9910 | The UGM software version type is 'P' or 'B'<br>The UGM has received valid version information from the PM<br>The PM software version type is 'P' or 'B'<br>The UGM software major version number does not match the major version number of the platform software | Activate the platform alarm continuously<br>Creep mode is active<br>If Platform Mode is active, disable all Drive, Steer, and Boom functions and do not permit Machine Enable | Not all of the trigger conditions are met |
| FUNCTION LOCKED OUT - LSS MODULE SOFTWARE VERSION IMPROPER | 9911 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>The UGM determines that the LSS software version is not compatible with existing code. | UGM to set Platform Load State = Overloaded | Power Cycled |
| CHASSIS TILT SENSOR NOT GAIN CALIBRATED | 9915 | The tilt sensor gain calibration values recorded to flash memory during Phoenix International's manufacturing test are not present | The UGM reports a faulted chassis tilt angle of 90 degrees | Valid values are present |
| PLATFORM SENSOR REF VOLTAGE OUT OF RANGE | 9920 | The PM detects that its reference voltage is out of range and reports the fault to the UGM | If in Platform mode, Lift/Swing and Drive shall be place in Creep. All other functions shall operate normally. | Power Cycled |
| GROUND MODULE FAILURE:HIGH SIDE DRIVER CUTOUT FAULTY | 9921 | The engine is not running<br>The engine is not cranking<br>The UGM footswitch input J7-15 is LOW<br>The machine is in Platform Mode<br>The Main Dump output J2-13 is detected as HIGH via the analog feedback 300ms after it is attempted to be activated during the one time startup test of the UGM hardware shutoff circuitry | Disable all Drive/Steer and Boom functions except Tower Lift Down (340AJ, 450AJ), Lift Down, and Jib Lift Down (340AJ). | Power Cycled |
| PLATFORM MODULE FAILURE: HWFS CODE 1 | 9922 | The PM detects that its V(low) FET has failed and reports this fault to the UGM | No response required for this DTC | Power Cycled |
| FUNCTIONS LOCKED OUT - MACHINE NOT CONFIGURED | 9924 | The machine is powered up and no model has been selected yet in the MACHINE SETUP menu | Display ??? or NO MODEL at Analyzer MACHINE SETUP menu MACHINE SETUP->MODEL NUMBER<br>Do not report any other faults<br>Disable all machine and engine functions (i.e., command engine shutdown and do not permit start) | Power Cycled |

**Table 6-11. Diagnostic Trouble Code Chart**

| Help Message | DTC | Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise) | Required Control Response or State Assignment | Conditions Required for Movement and/or to Clear Fault |
|---|---|---|---|---|
| GROUND MODULE CONSTANT DATA UPDATE REQUIRED | 9927 | The UGM detects one of the following conditions when software type is 'P' or 'B':<br>The Version Verification Word #1 or the Version Verification Word #2 values located in the constant data sector of flash memory (found on constant data spreadsheet tab pstConstantDataVersion) do not match the values located in the code area of flash memory<br>The Version Major value located in the constant data sector of flash memory (found on constant data spreadsheet tab pstConstantDataVersion) does not match the value located in the code area of flash memory | Disable all machine and engine functions (i.e., command engine shutdown and do not permit start) | A different application code or constant data version is programmed so that the values match<br>Power Cycled |
| CURRENT FEEDBACK GAINS OUT OF RANGE | 9944 | One or more of the current feedback gains that are calculated and written to flash memory during the PIC manufacturing test process are detected as being out of range | A gain of 1 is used for the factory gain(s) that was out of range; all functions shall be placed in Creep mode. | Power Cycled |
| CURRENT FEEDBACK CALIBRATION CHECKSUM INCORRECT | 9945 | The current feedback gains checksum that is calculated and written to flash memory during the PIC manufacturing test process is detected as being incorrect | Disable all machine and engine functions (i.e., command engine shutdown and do not permit start). | Power Cycled |
| MACHINE CONFIGURATION OUT OF RANGE – CHECK ALL SETTINGS | 9949 | UGM has detected an anomaly in EEPROM with regard to the Machine Setup configuration. | UGM to prompt operator to correct issue via Analyzer and disable all machine and engine functions (i.e., command engine shutdown and do not permit start).until EEPROM data in corrupted area is changed. | Power Cycled and EEPROM data in associated area is changed |
| LSS CORRUPT EEPROM | 9977 | MACHINE SETUP > LOAD SYSTEM ≠ NO;<br>Load System is the 4-Cell LSS;<br>and one of the following conditions:<br>UGM determines LSS-stored values for Unloaded weight in Indirect 0x100 ≠ 0x108 or<br>UGM determines LSS-stored values for Accessory weight in Indirect 0x102 ≠ 0x10A<br>UGM determines LSS-stored checksum1 (0x10F) ≠ checksum 2 (0x107) | UGM to set Platform Load State = Overloaded | Power Cycled |
| FUNCTIONS LOCKED OUT - GROUND MODULE SOFTWARE VERSION IMPROPER | 9979 | Ground software has been installed on a UGM with a ST10F274 processor (Hardware Rev < 6), which does not have guaranteed flash storage in the sector where Constant Data is written. | Disable all machine and engine functions (i.e., command engine shutdown and do not permit start) | Power Cycled |
| GROUND MODULE VLOW FET FAILURE | 9986 | VLow FET determined to be failed because all Digital Inputs are high; UGM unable to read high-sensing inputs. | Disable all machine and engine functions (i.e., command engine shutdown and do not permit start). | Power Cycled |
| LSS - FACTORY CALIBRATION ERROR | 99285 | | | |

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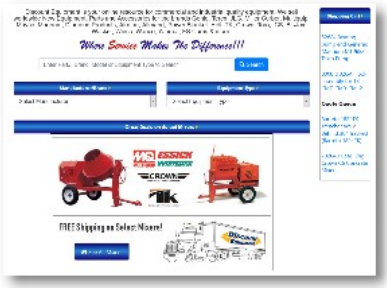

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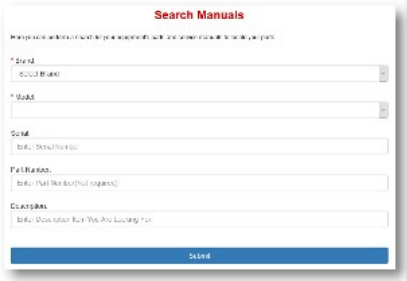


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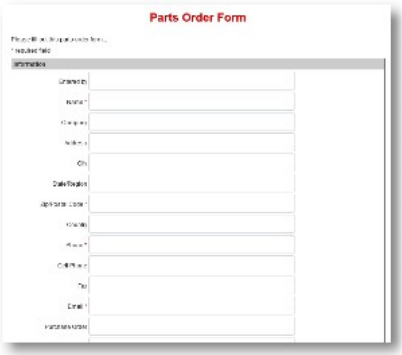


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# SECTION 7. BASIC ELECTRICAL INFORMATION & SCHEMATICS

## 7.1 GENERAL

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

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

## 7.2 MULTIMETER BASICS

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

### Grounding

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

### Backprobing

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

### Min/Max

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

### Polarity

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

### Scale

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

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

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

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

Example: 1.2 kW = 1200 W
Example: 50 mA = 0.05 A

### Voltage Measurement

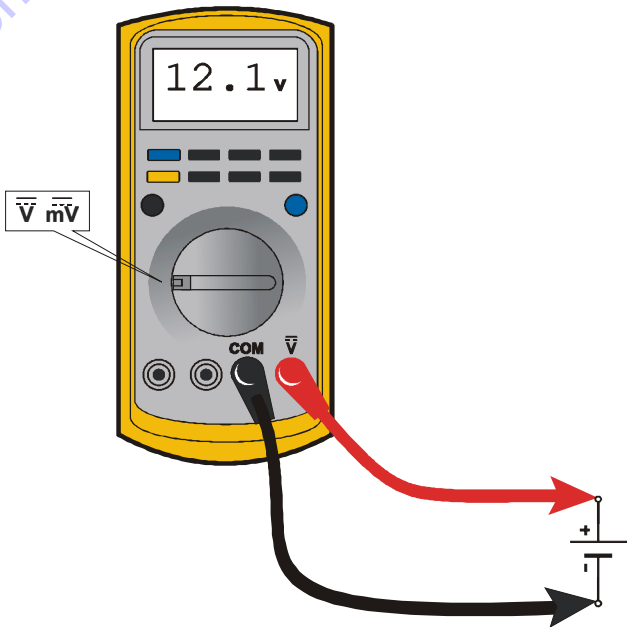



**Figure 7-1. Voltage Measurement (DC)**

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

## Resistance Measurement

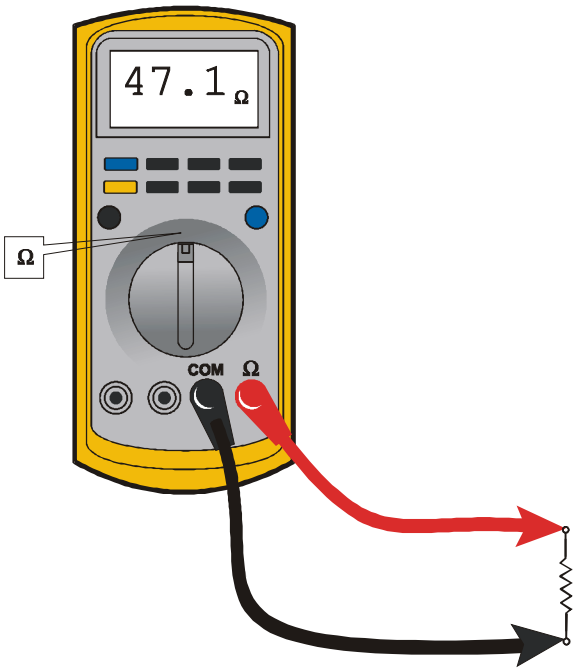



**Figure 7-2. Resistance Measurement**

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

## Continuity Measurement

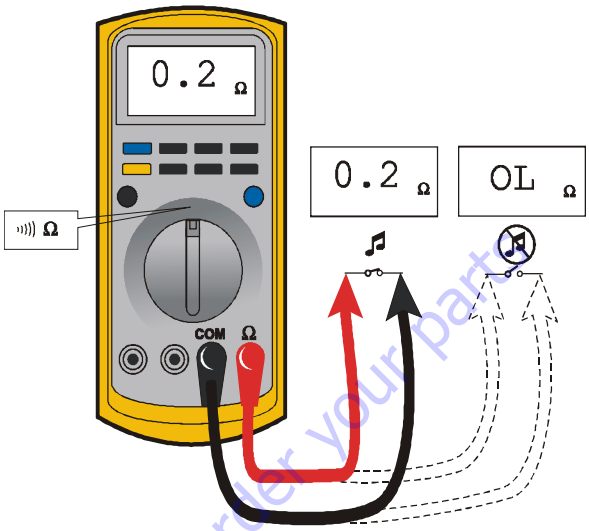



**Figure 7-3. Continuity Measurement**

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

## Current Measurement

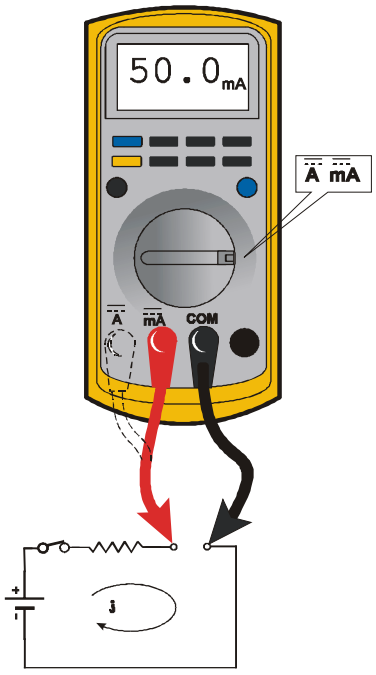



**Figure 7-4. Current Measurement (DC)**

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

## 7.3 APPLYING SILICONE DIELECTRIC COMPOUND TO ELECTRICAL CONNECTIONS

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

**NOTICE**

**JLG PN 0100048 DIELECTRIC GREASE (NOVAGARD G661) IS THE ONLY MATERIAL APPROVED FOR USE AS A DIELECTRIC GREASE.**

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

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

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

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

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

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

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

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

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

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

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

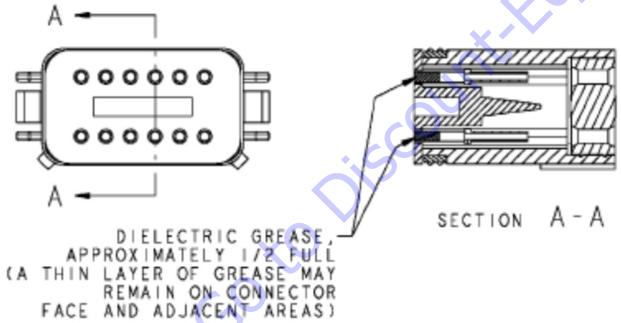
When applied to electrical connections, dielectric grease helps to prevent corrosion of electrical contacts and improper conductivity between contacts from moisture intrusion. Open and sealed connectors benefit from the application of dielectric grease.

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

## Installation of Dielectric Grease

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

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




## Deutsch HD, DT, DTM, DRC Series

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

## AMP Seal

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

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

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

**Figure 7-5. Application to Male Contacts**

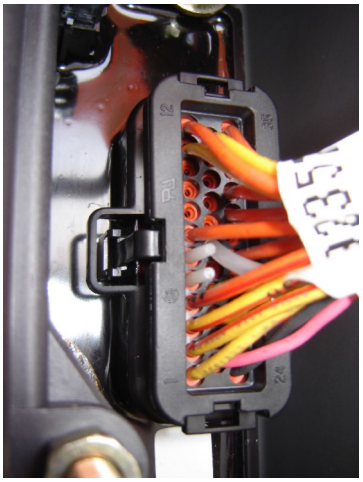
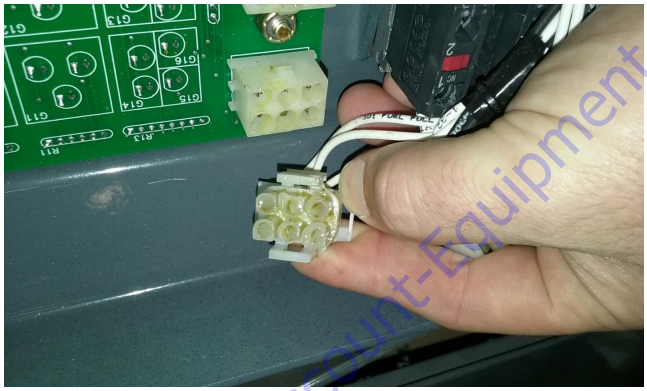


**Figure 7-6. Use of Seal Plugs**

## AMP Mate-N-Lok

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



## DIN Connectors

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

## Exclusions

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

### BRAD HARRISON / PHOENIX CONTACT M12

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

**Figure 7-7. Brad-Harrison M12**

**Figure 7-8. Phoenix Contact M12**

### ENGINE CONTROL UNIT CONNECTORS

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

### SEALED ENCLOSURES

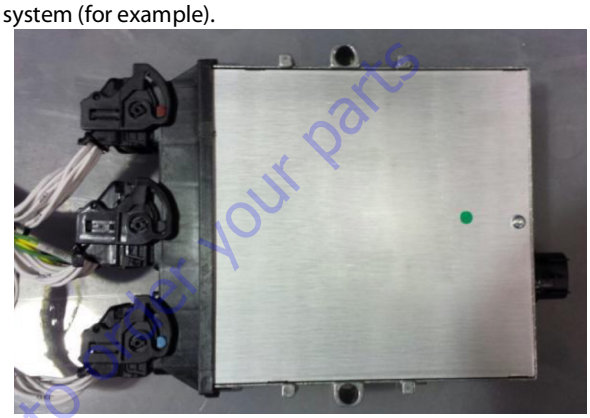
Application of dielectric grease is not required in properly sealed enclosures. To meet criteria, the enclosure must be rated to at least IP66 (dust tight; protected from powerful jets of water). The enclosure must be fitted with a high quality, continuous gasket and all wiring must pass through cable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

### MIL-C-5015 SPEC CONNECTOR'S

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

### MOLEX CMC SERIES CONNECTORS

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



## 7.4 AMP CONNECTOR

### Applying Silicone Dielectric Compound to AMP Connectors

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

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

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

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

### Assembly

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

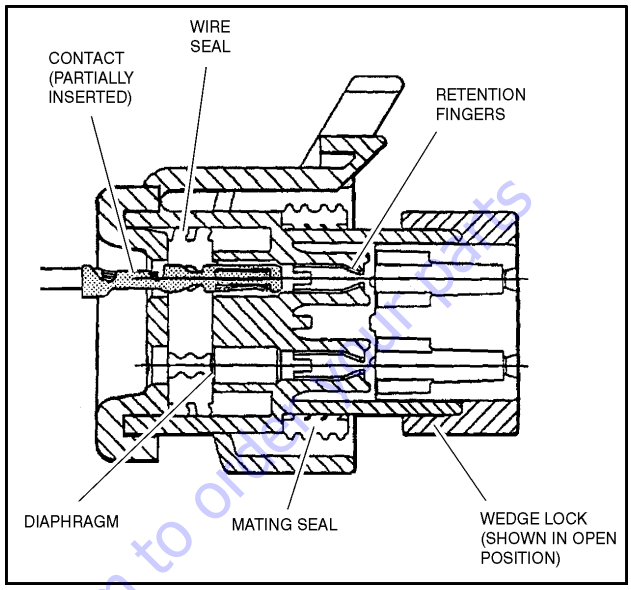



**Figure 7-9. Connector Assembly Figure 1**

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

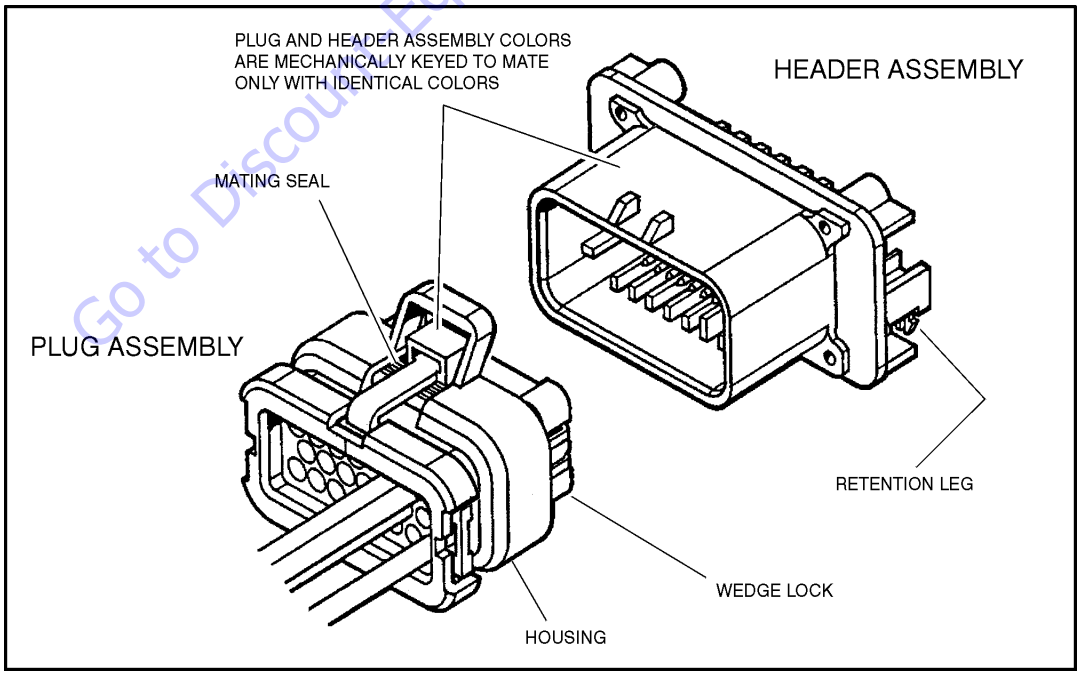



**Figure 7-10. AMP Connector**

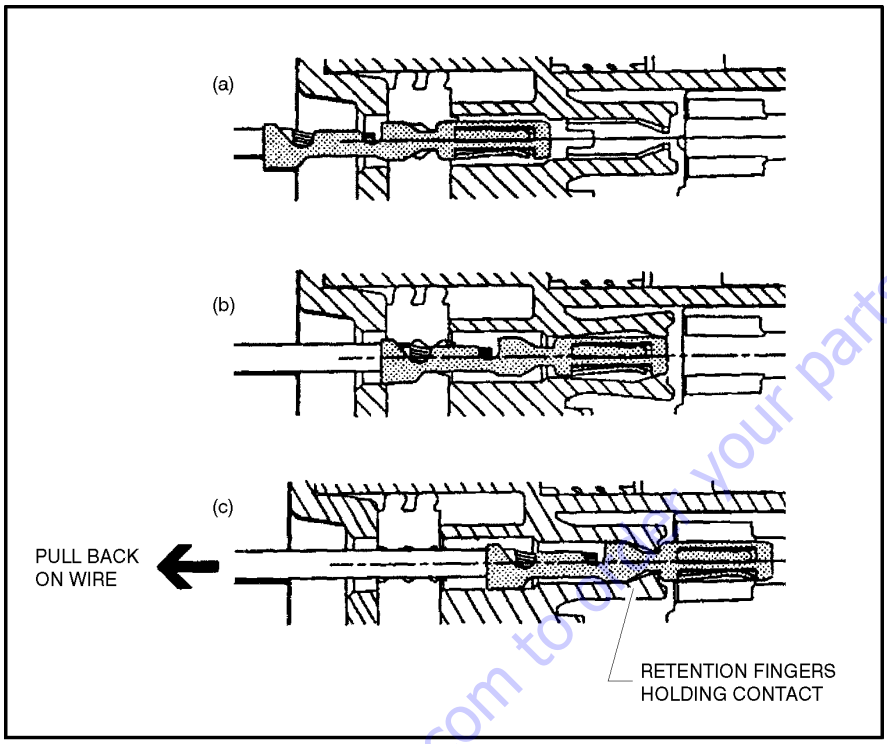



**Figure 7-11. Connector Assembly Figure 2**

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

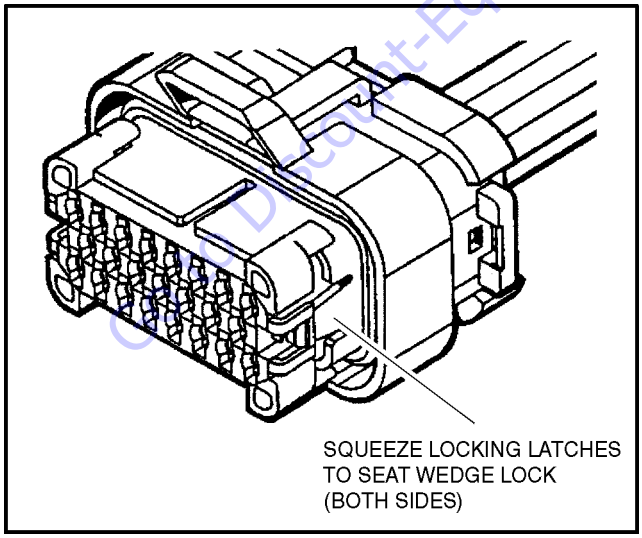



**Figure 7-12. Connector Assembly Figure 3**

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

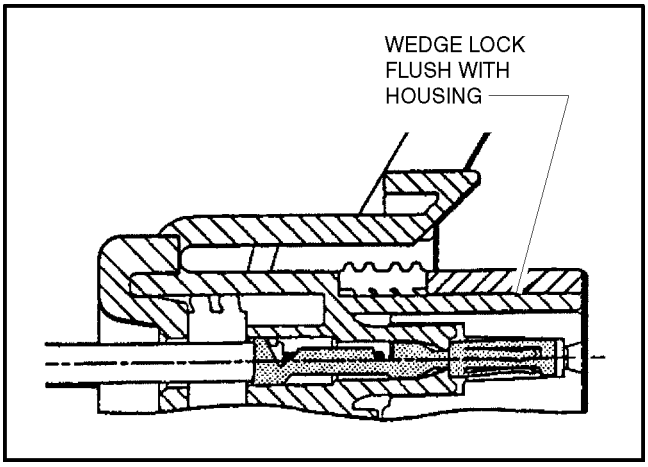



**Figure 7-13. Connector Assembly Figure 4**

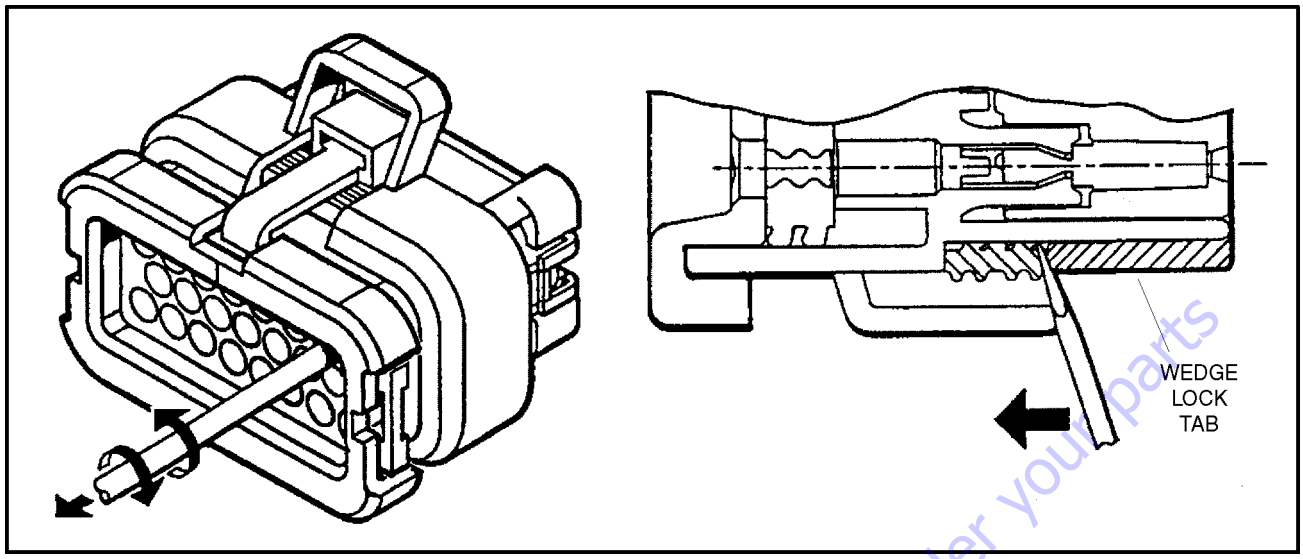



**Figure 7-14. Connector Disassembly**

## Disassembly

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

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

## Wedge Lock

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

## Service - Voltage Reading

***NOTICE***

**DO NOT PIERCE WIRE INSULATION TO TAKE VOLTAGE READINGS.**

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

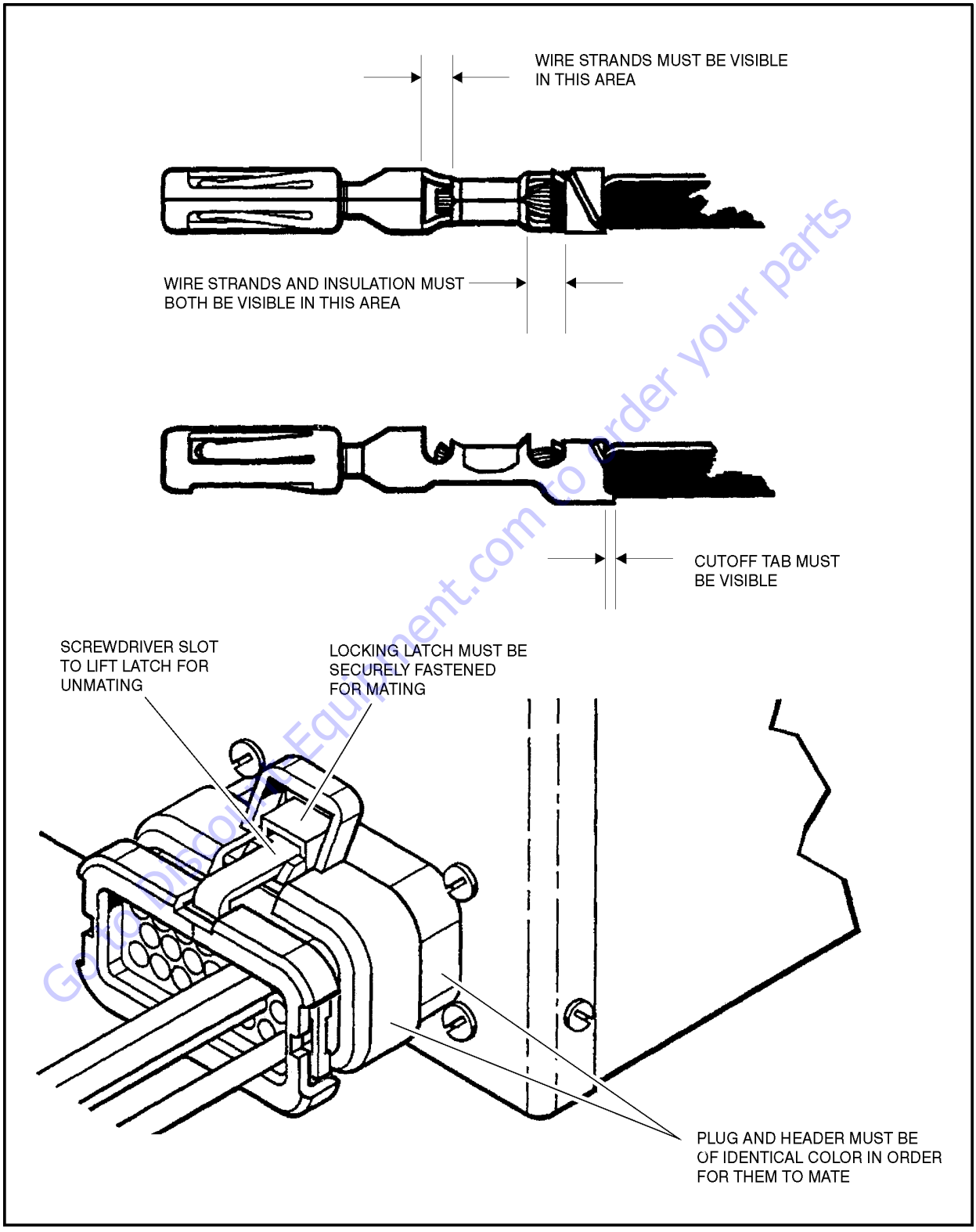





**Figure 7-15. Connector Installation**

## 7.5 DEUTSCH CONNECTORS

### DT/DTP Series Assembly

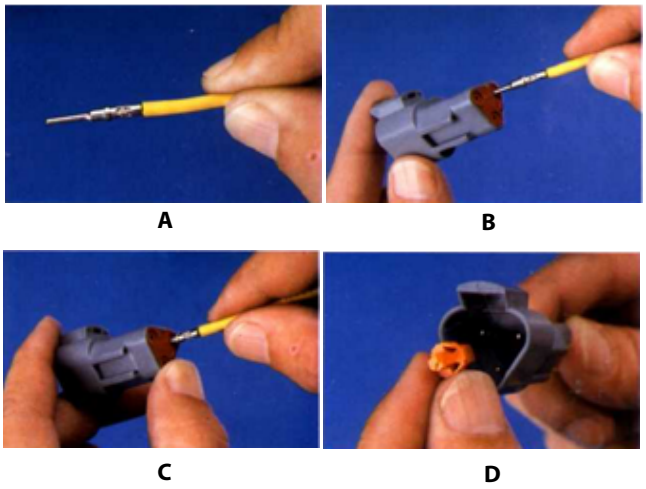



**Figure 7-16. DT/DTP Contact Installation**

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

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

### DT/DTP Series Disassembly

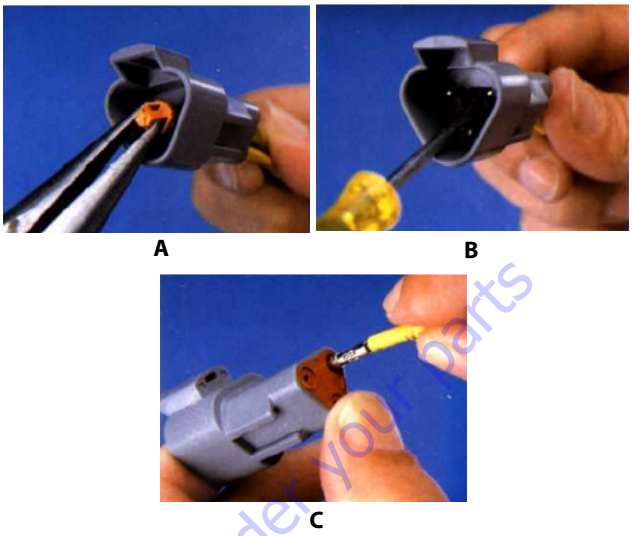



**Figure 7-17. DT/DTP Contact Removal**

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

## HD30/HDP20 Series Assembly

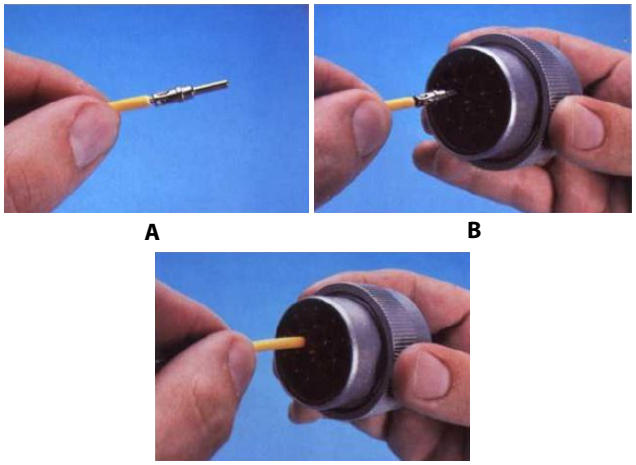



**Figure 7-18. HD/HDP Contact Installation**

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

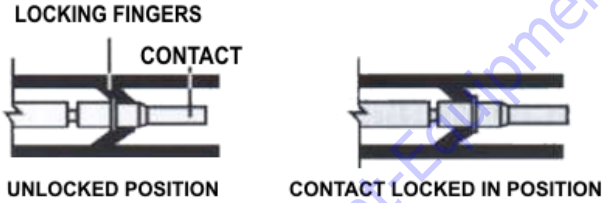



**Figure 7-19. HD/HDP Locking Contacts Into Position**

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

## HD30/HDP20 Series Disassembly

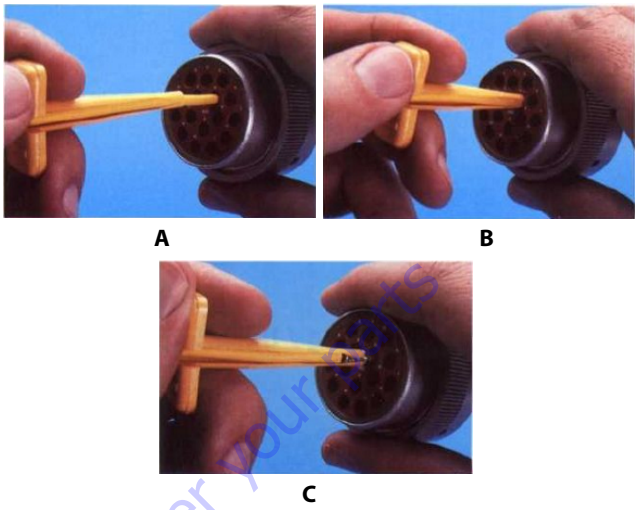



**Figure 7-20. HD/HDP Contact Removal**

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

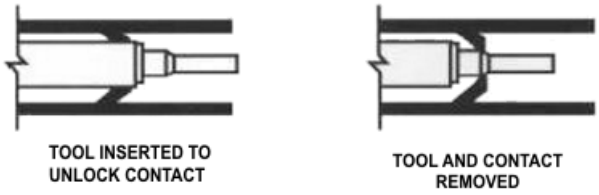


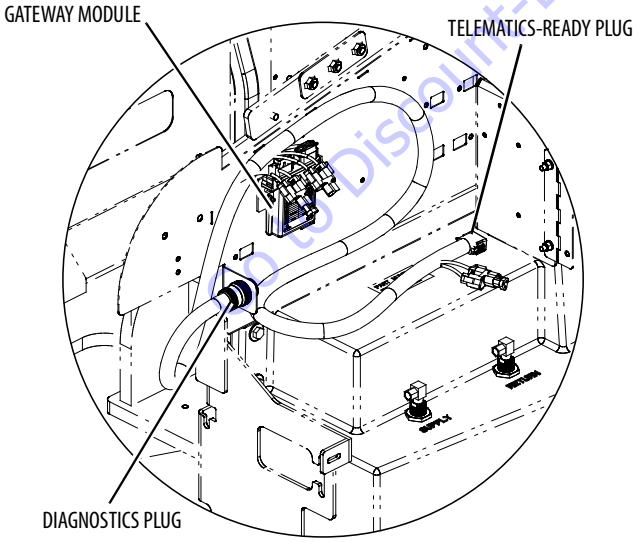

**Figure 7-21. HD/HDP Unlocking Contacts**

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

## 7.6 TELEMATICS GATEWAY

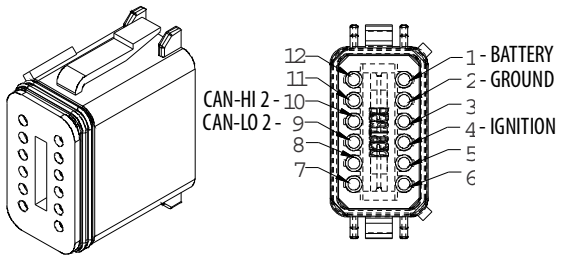
Personnel using machines equipped with an optional telematics gateway will be able to view the following data through their telematics device:

| JLG LABEL | DESCRIPTION | UNIT |
|---|---|---|
| Engine Speed | Actual engine speed. | RPM |
| DEF Tank Level (If Equipped) | Indicates the level of DEF (diesel exhaust fluid) within the DEF tank if the machine is equipped with DEF tank.<br>• 0% = Empty<br>• 100% = Full | Percentage (%) |
| JLG Machine Faults:<br>Active / Not-Active | • 00 - No Machine Faults<br>• 01 - Active Machine Fault<br>• 10 - Error<br>• 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.<br><br>When Fuel Level 2 (SPN 38) is not used, Fuel Level 1 represents the total fuel in all fuel storage containers. When Fuel Level 2 is used, Fuel Level 1 represents the fuel level in the primary or left side fuel storage container. | Percentage (%) |
| DM1 Engine Faults | Shows actual engine fault codes. | N/A |




### Telematics-Ready (TCU) Plug

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



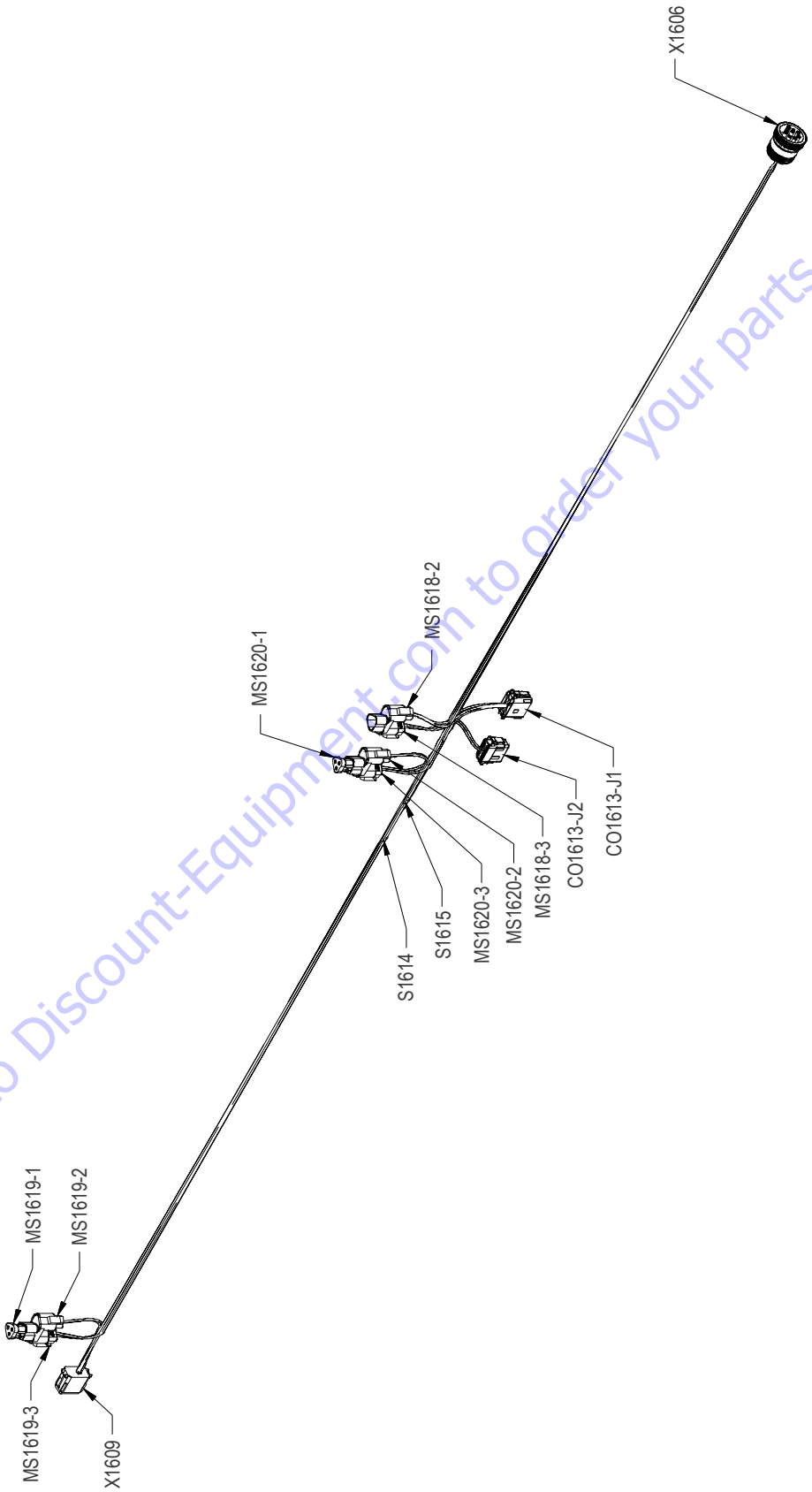



**Figure 7-22. Telematics Gateway Harness - Sheet 1 of 3**

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

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

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

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

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

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

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

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

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

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

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

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



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

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



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

## 7.7 WIRING HARNESS CONNECTOR LABELS

### Connector Labels

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

**Examples:**

*X25 connects to X25 in another harness.*

*X65A, X65B connect to different portions of one device*

*X163 connects to X163A in ANSI and X163B in CE machines*

### Component Labels

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

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

**Table 7-1. Wiring Harness Connector Labels**

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

**Table 7-1. Wiring Harness Connector Labels**

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

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

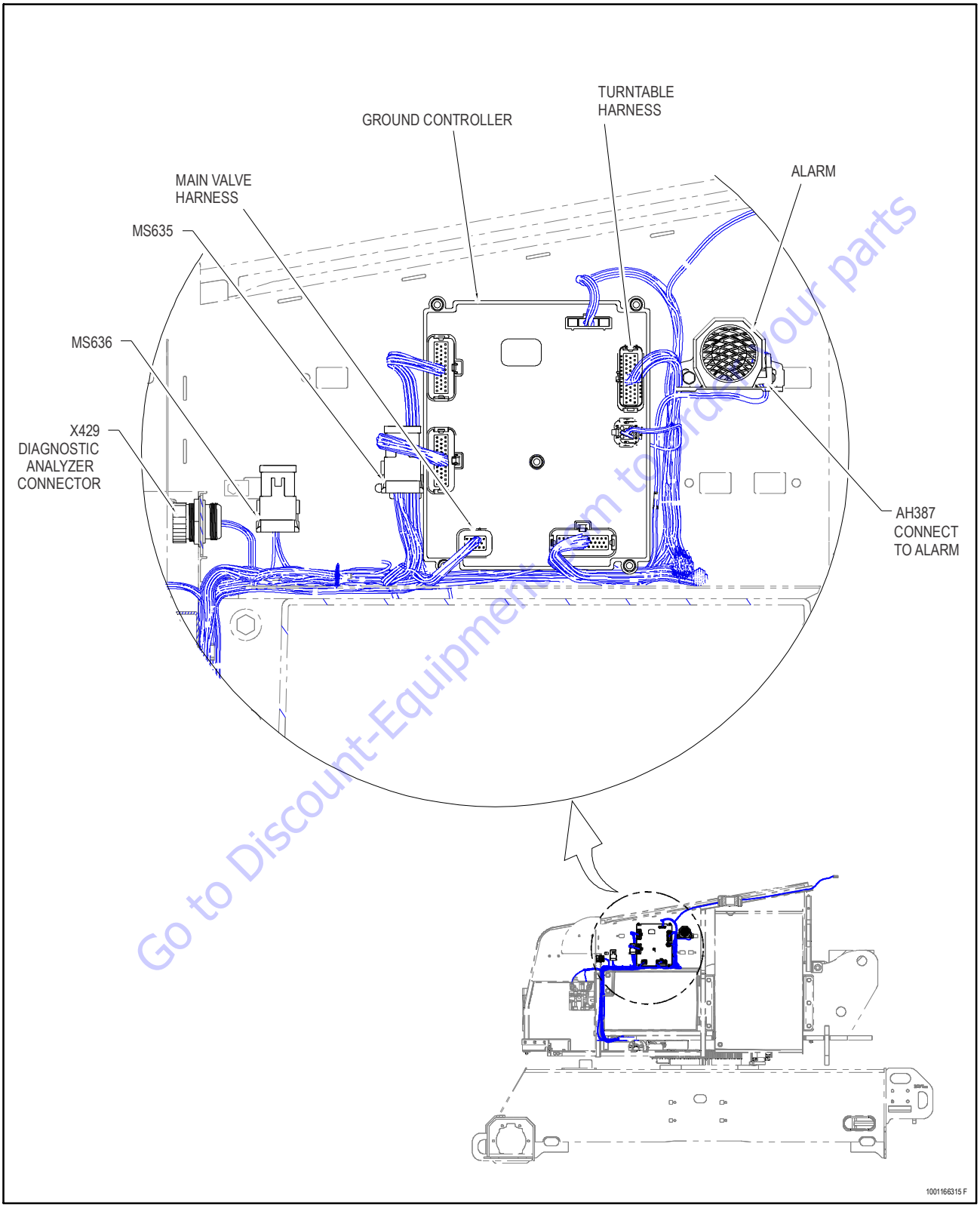





**Figure 7-25. Electrical Installation - Sheet 1 of 10**

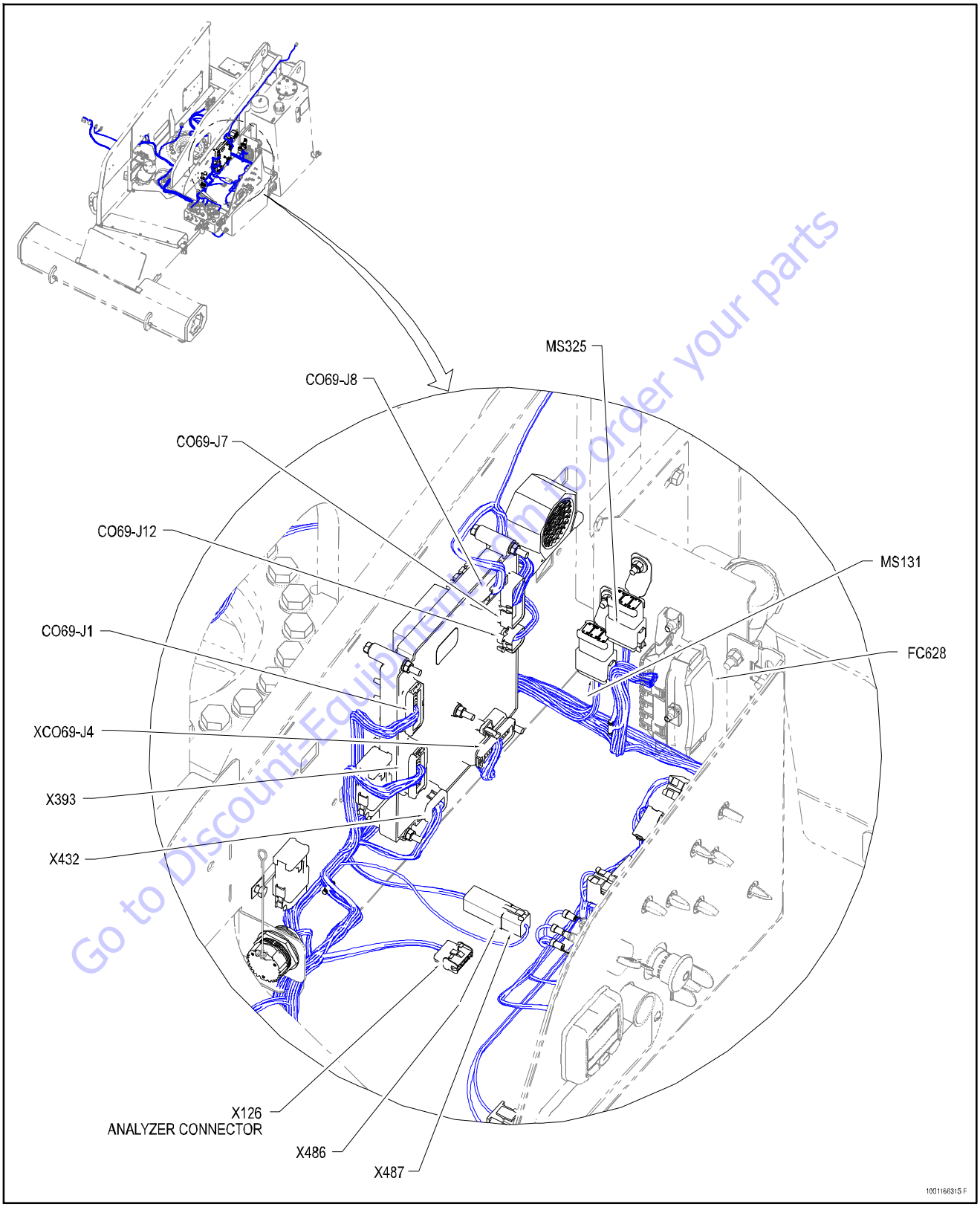





**Figure 7-26. Electrical Installation - Sheet 2 of 10**

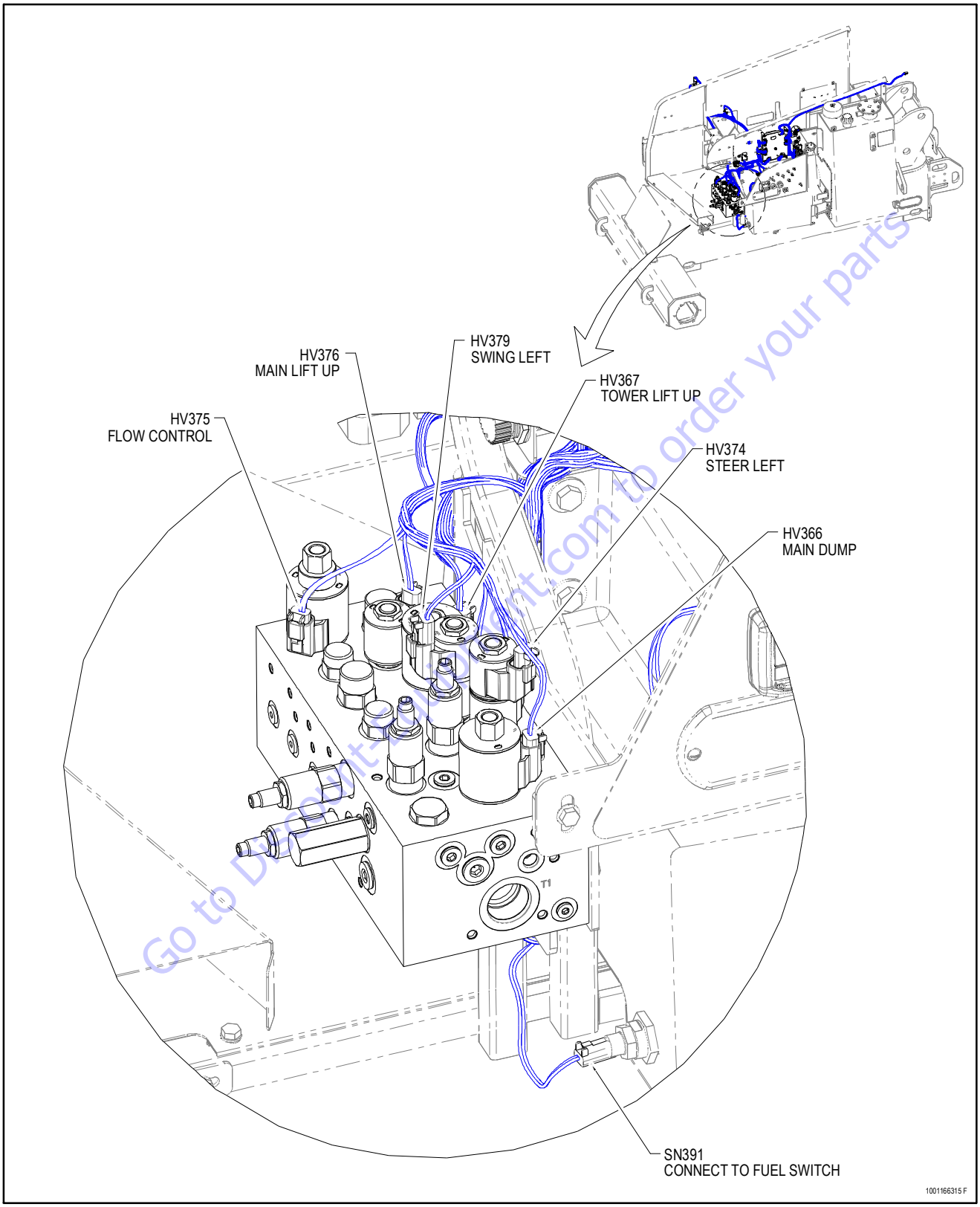





**Figure 7-27. Electrical Installation - Sheet 3 of 10**

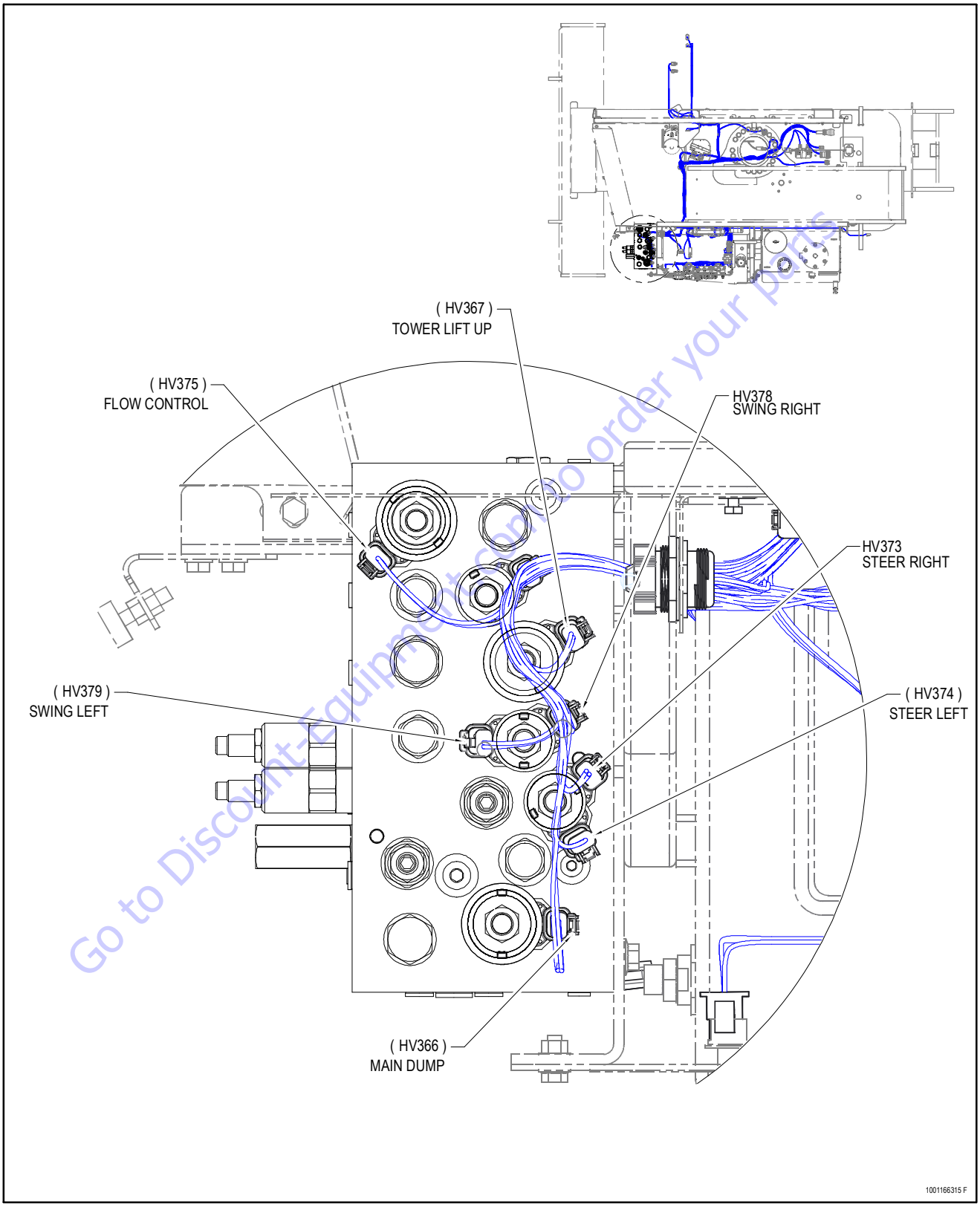





**Figure 7-28. Electrical Installation - Sheet 4 of 10**

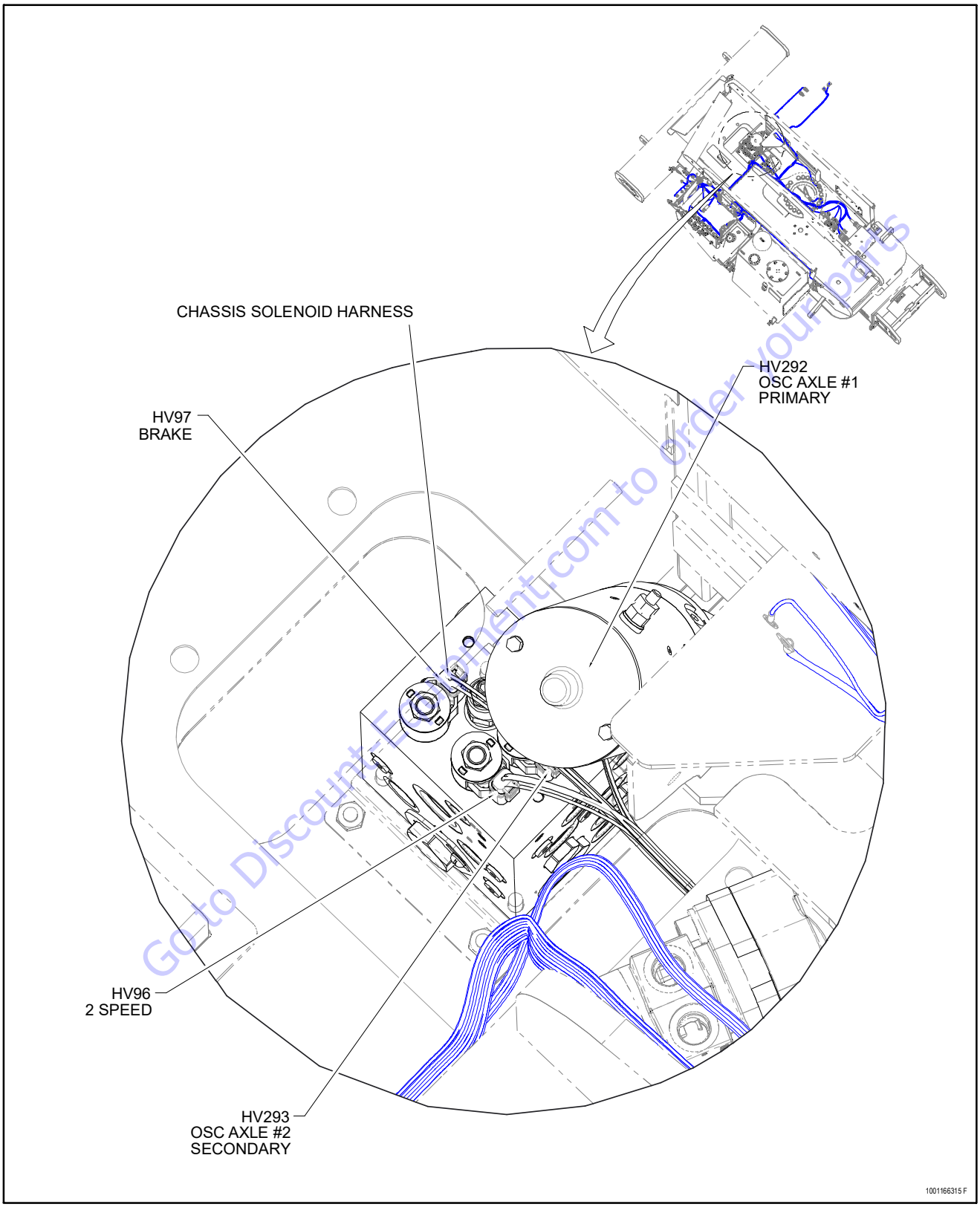





**Figure 7-29. Electrical Installation - Sheet 5 of 10**

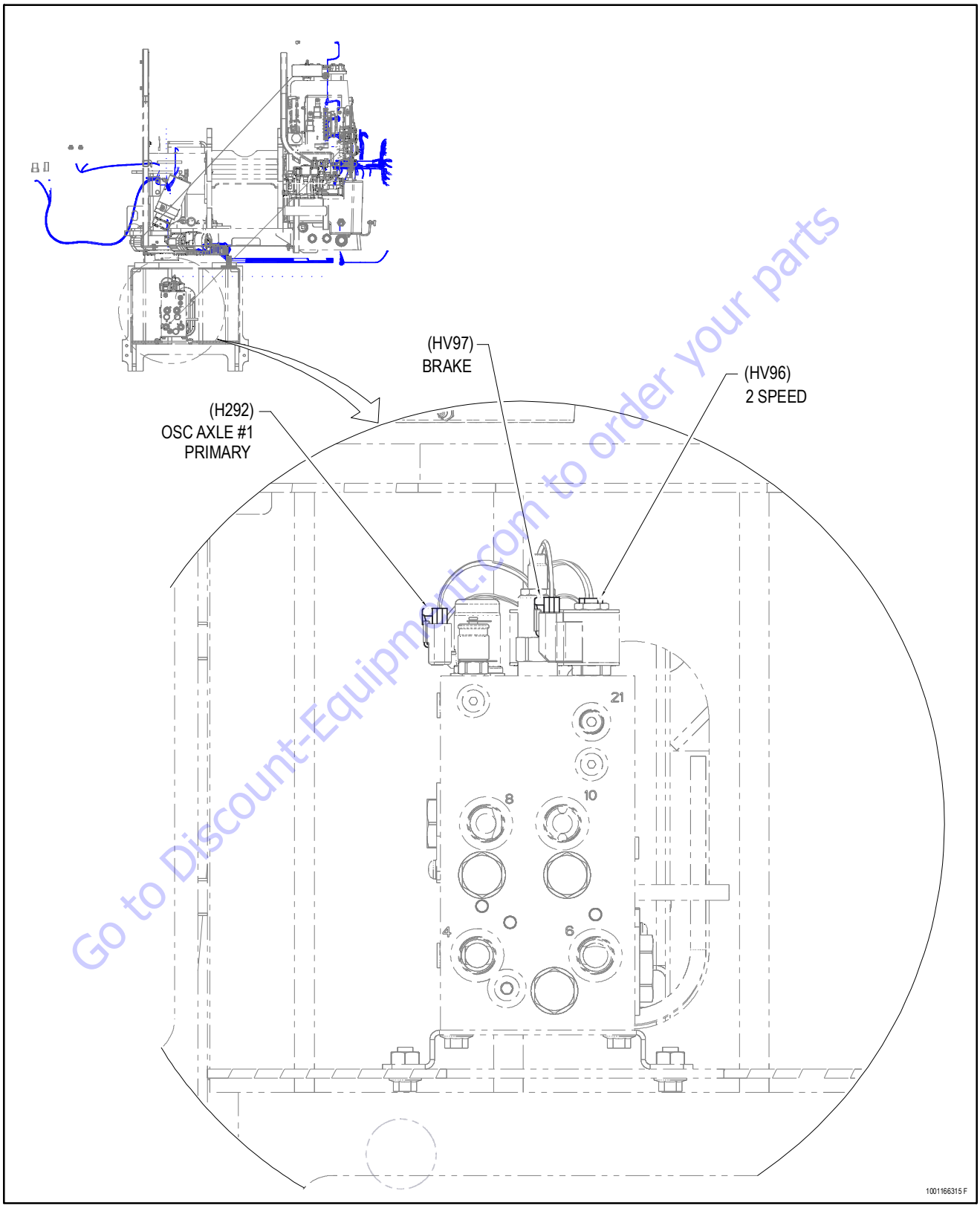





**Figure 7-30. Electrical Installation - Sheet 6 of 10**

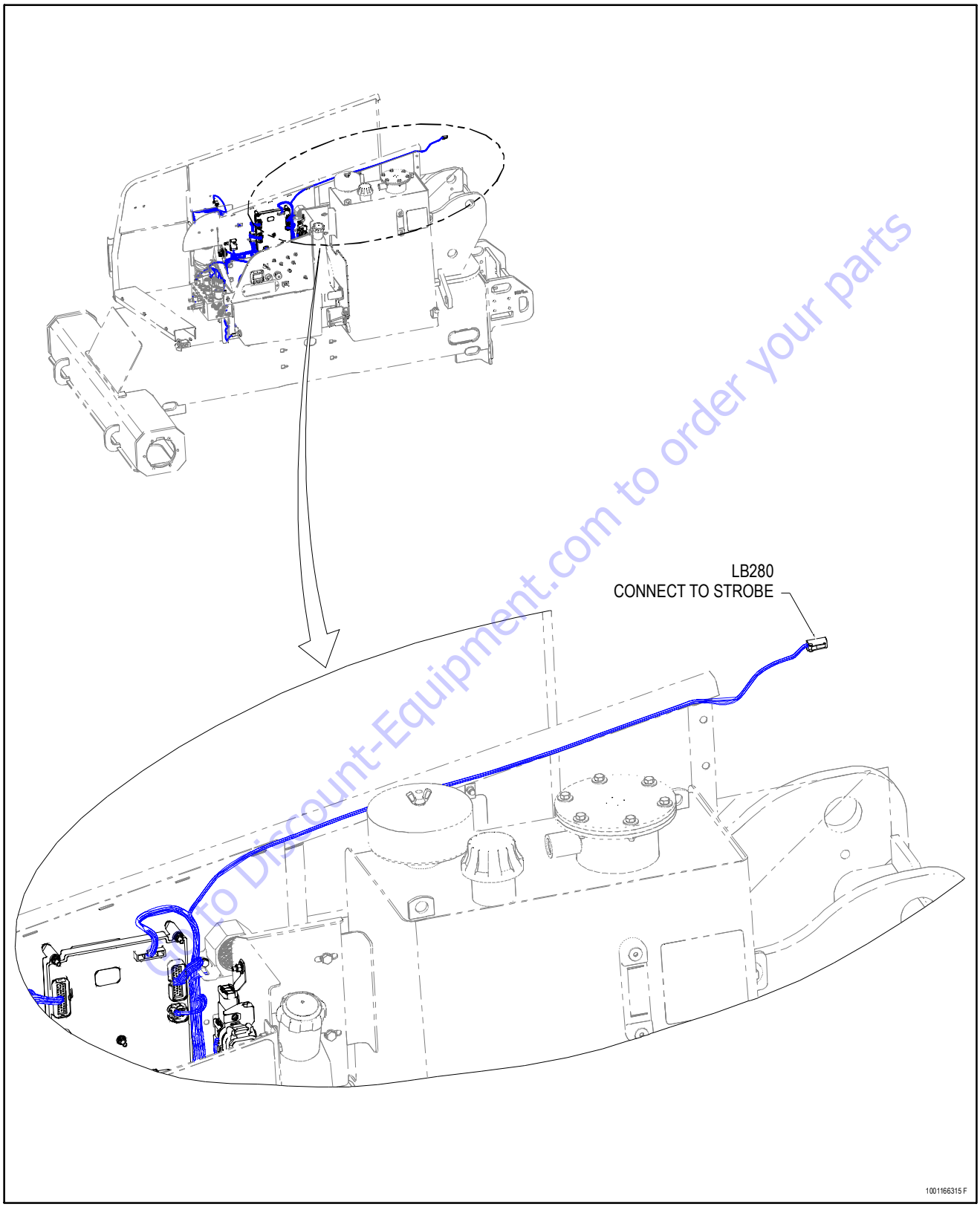





**Figure 7-31. Electrical Installation - Sheet 7 of 10**

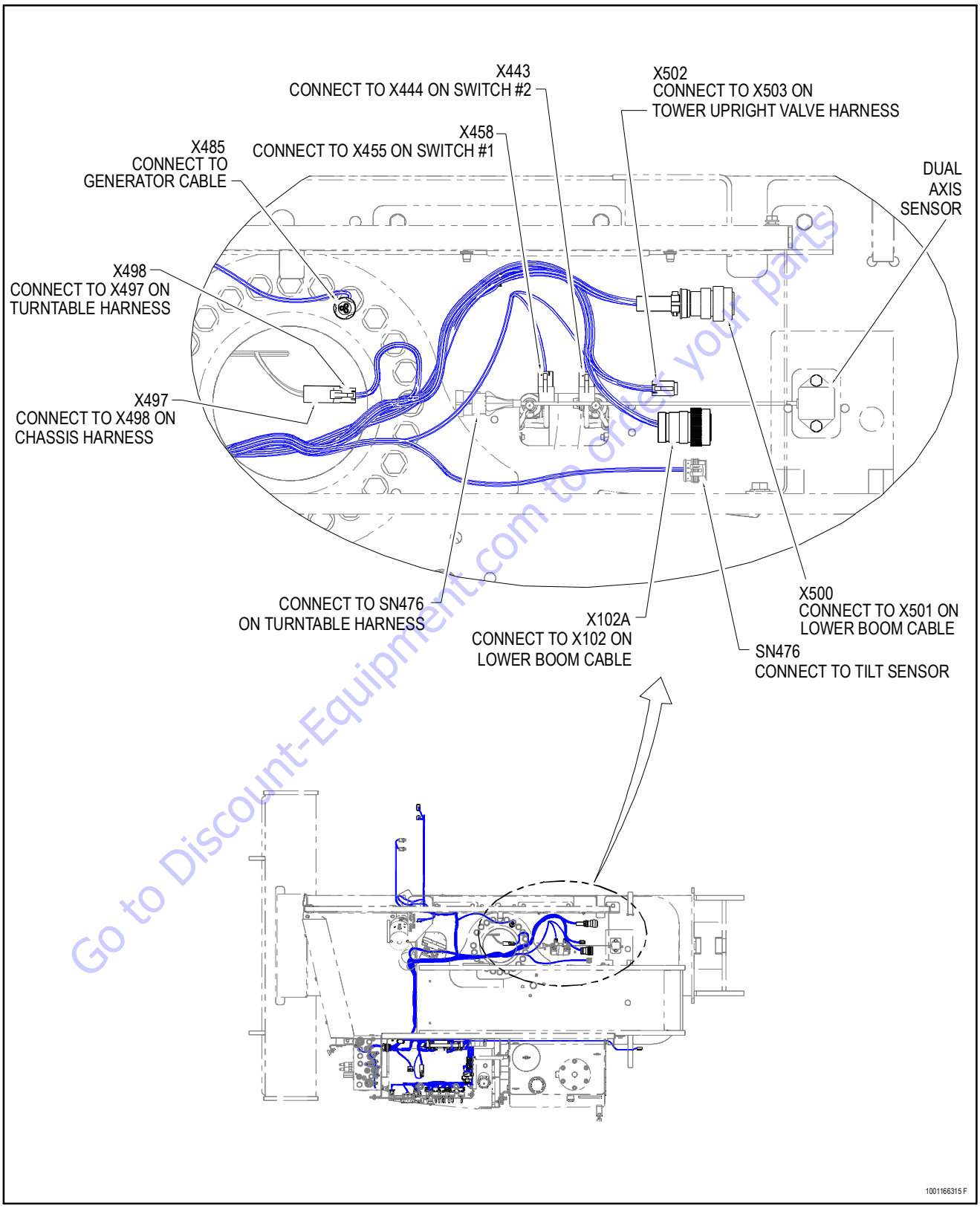





**Figure 7-32. Electrical Installation - Sheet 8 of 10**

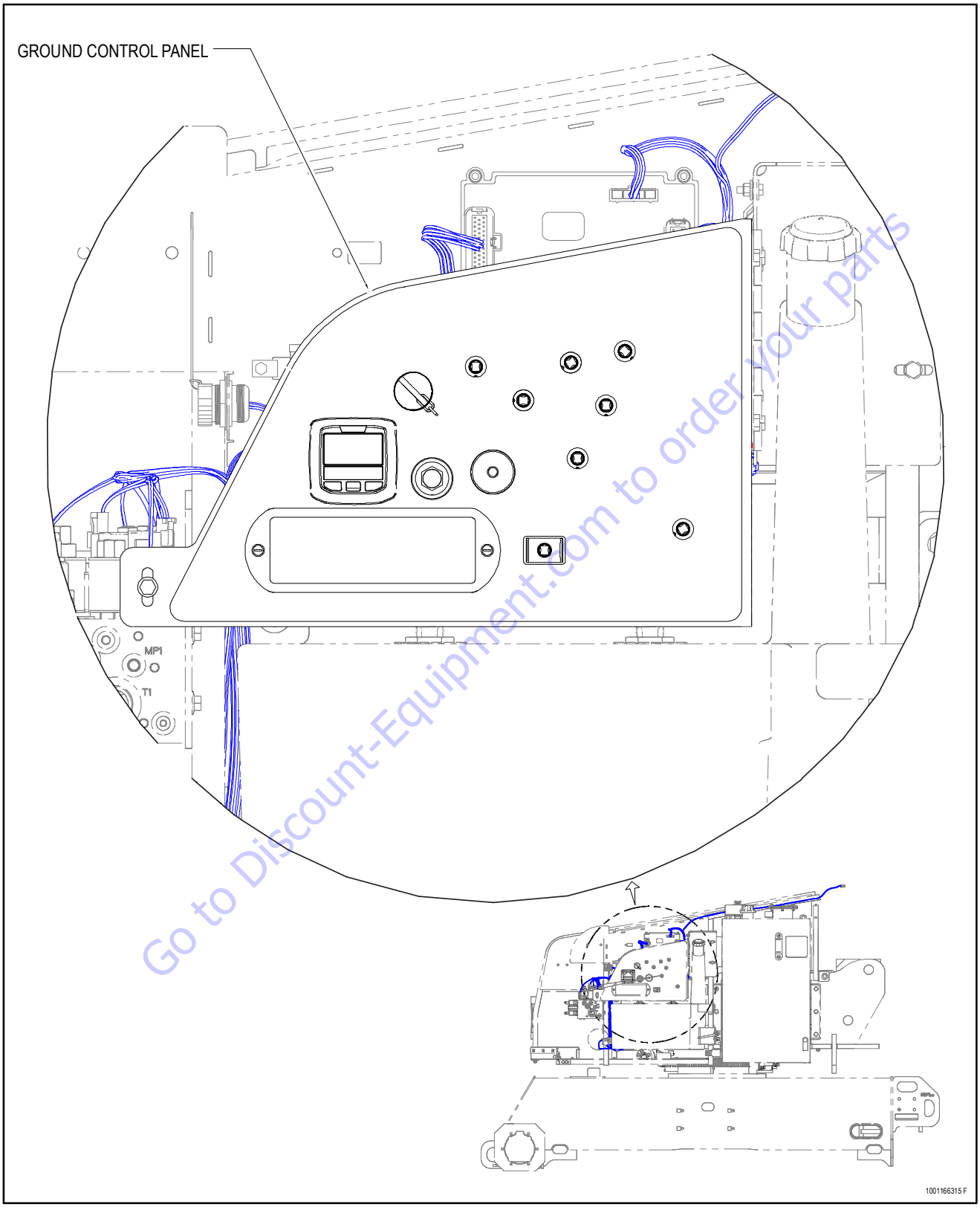





**Figure 7-33. Electrical Installation - Sheet 9 of 10**

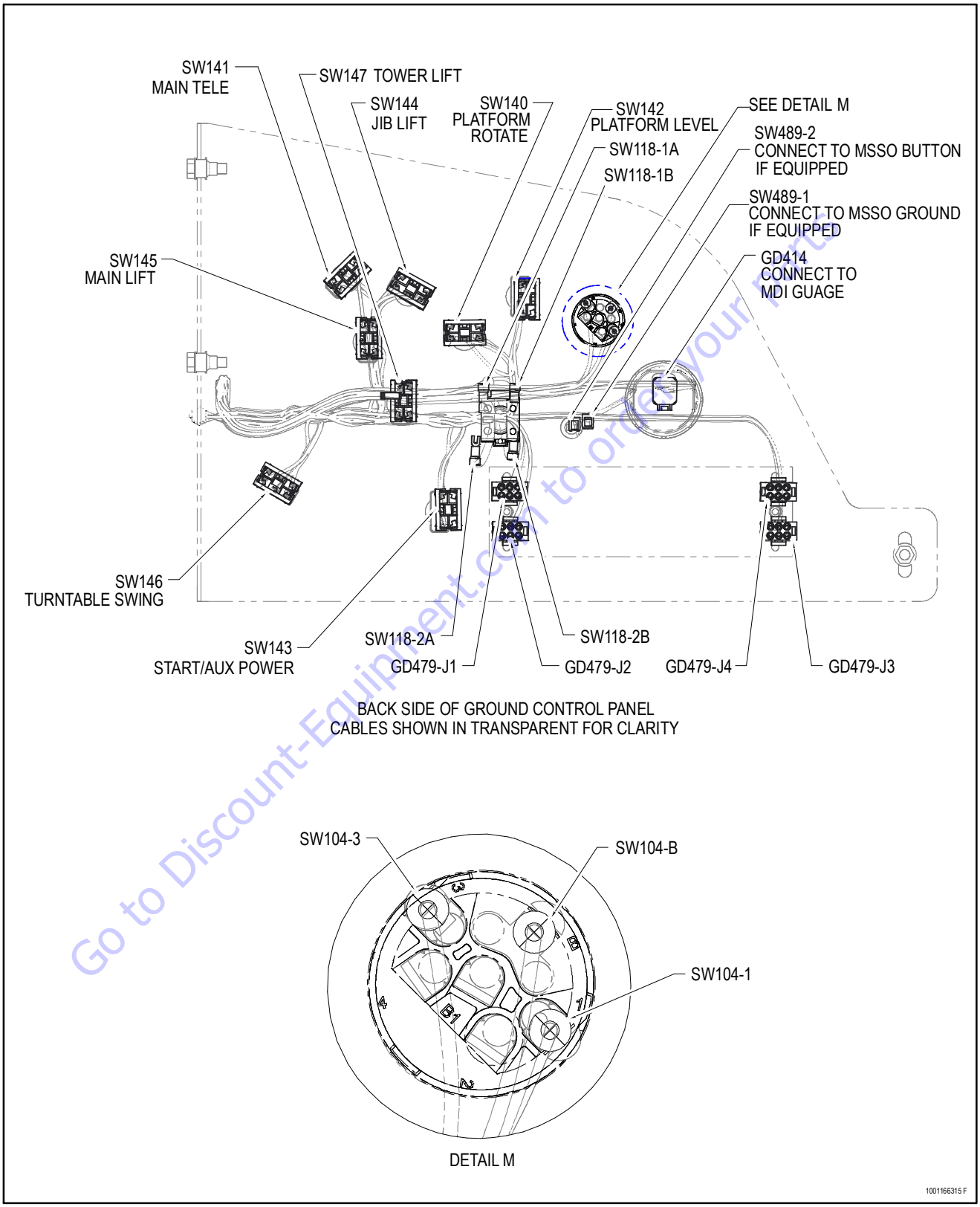





**Figure 7-34. Electrical Installation - Sheet 10 of 10**

## 7.8 WIRING HARNESS

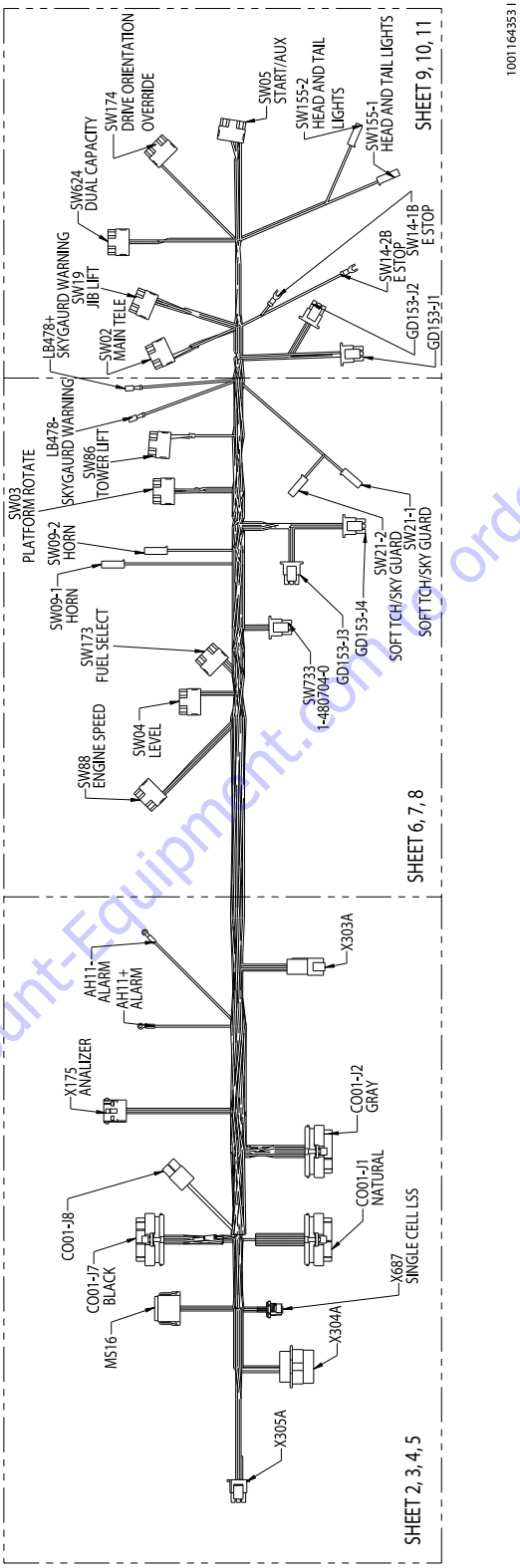



**Figure 7-35. Platform Console Harness (Without SkyGuard) - Sheet 1 of 12**

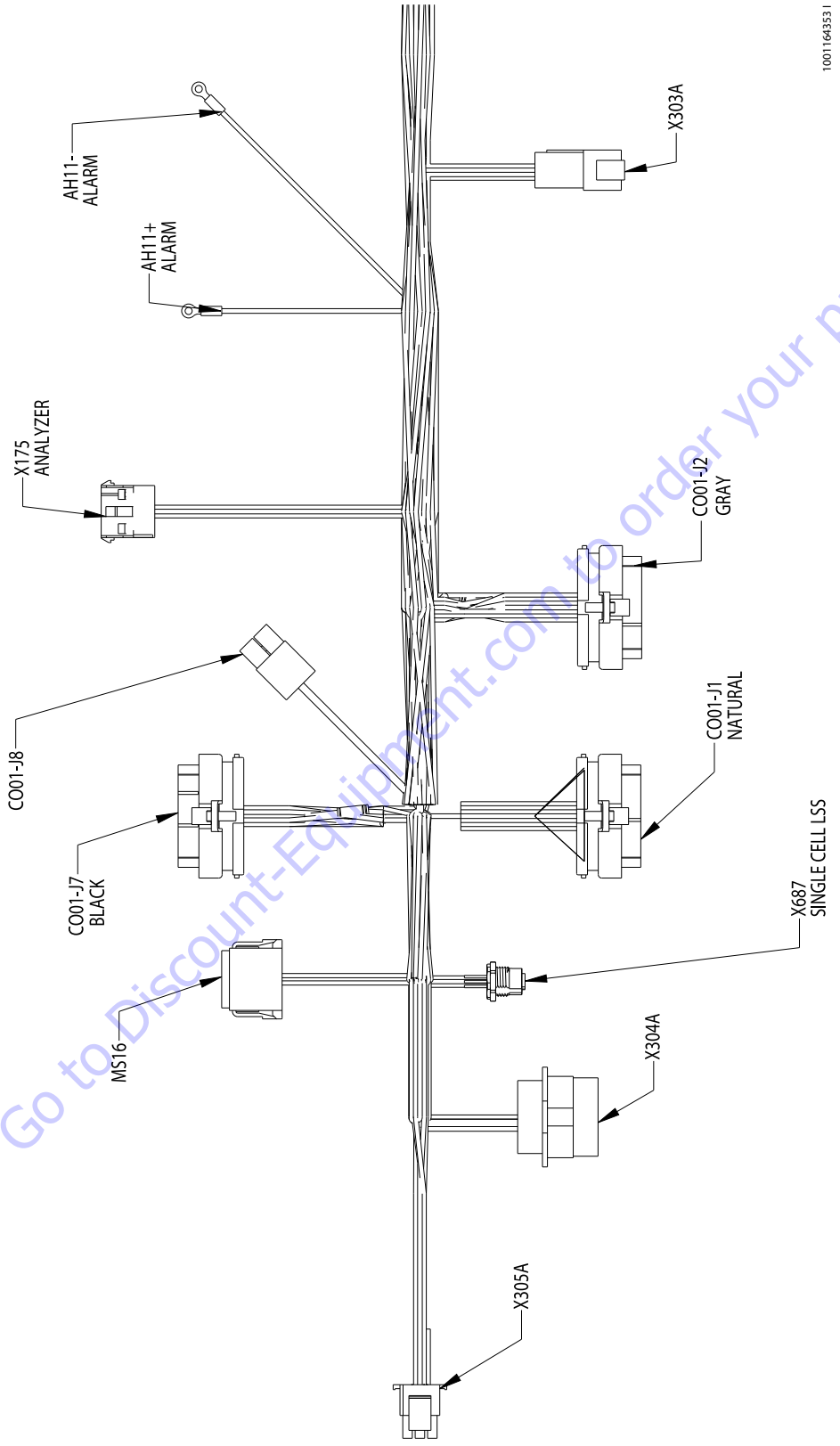



**Figure 7-36. Platform Console Harness (Without SkyGuard) - Sheet 2 of12**

| X305A | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-35GENERATORSWITCH | 18AWG | GXL | C001-J7(9) |
| 2 | WHT | 1-38GEN ON SWITCH | 18AWG | GXL | C001-J7(5) |
| 3 | | | | | |
| 4 | WHT | 1-39 FOOTSW DISENGAGED | 18AWG | GXL | C001-J7(8) |
| 5 | WHT | 1-40FOOTSW | 18AWG | GXL | C001-J7(4) |
| 6 | | | | | |
| 7 | WHT | 1-90SGPOWER | 18AWG | GXL | C001-J7(7) |
| 8 | BLK | 1-86SG GND | 18AWG | GXL | C001-J7(24) |
| 9 | WHT | 1-85STPOWER | 18AWG | GXL | C001-J2(31) |
| 10 | WHT | 1-87SG INPUT1 | 18AWG | GXL | C001-J7(18) |
| 11 | WHT | 1-88 SG INPUT 2 | 18AWG | GXL | C001-J1(23) |
| 12 | WHT | 1-91STSWITCH | 18AWG | GXL | C001-J1(20) |
| 13 | | | | | |
| 14 | WHT | 1-551 | 18AWG | GXL | X305A |
| 15 | WHT | 1-551 | 18AWG | GXL | X305A |

| X303A | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-41PLATFROTATE LEFT | 18AWG | GXL | C001-J7(33) |
| 2 | WHT | 1-42PLATFROTATE RIGHT | 18AWG | GXL | C001-J7(34) |
| 3 | WHT | 1-36JIB UP | 18AWG | GXL | C001-J7(25) |
| 4 | WHT | 1-43 JIBDOWN | 18AWG | GXL | C001-J7(26) |
| 5 | BLK | 000-10-11VALVESGND | 18AWG | GXL | C001-J7(23) |
| 6 | BLK | 000-10-34OPTIONGND | 18AWG | GXL | C001-J7(29) |
| 7 | WHT | 1-89 OPTION POWER | 18AWG | GXL | C001-J2(33) |
| 8 | YEL | CAN | 20AWG | J1939 CABL | MS16(3) |
| 9 | GRN | CAN | 20AWG | J1939 CABL | MS16(6) |
| 10 | | | | | |
| 11 | BLK | 000-10-30-2LSSGND | 18AWG | GXL | S688(2) |
| 12 | WHT | 1-33-2 LSS PWR | 18AWG | GXL | S689(2) |

| X304A | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | GRN | CAN | 20AWG | J1939 CABL | MS16(5) |
| 3 | YEL | CAN | 20AWG | J1939 CABL | MS16(2) |
| 4 | WHT | 1-44EMS | 18AWG | GXL | C001-J7(3) |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | WHT | 1-62EMS B+ | 18AWG | GXL | SW14-1B(1B) |
| 10 | | | | | |
| 11 | WHT | 1-37GROUNDMODE | 18AWG | GXL | C001-J7(1) |
| 12 | WHT | 1-1 | 18AWG | GXL | C001-J8(2) |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | BLK | 000-10-14 GND | 12AWG | GXL | C001-J8(1) |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |

| X175 ANALIZER | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-66 POWER | 18 AWG | GXL | C001-J2 (26) |
| 2 | WHT | 1-81 RECEIVE | 18 AWG | GXL | C001-J2 (28) |
| 3 | WHT | 1-82 TRANSMIT | 18 AWG | GXL | C001-J2 (29) |
| 4 | BLK | 000-10-12 GND | 18 AWG | GXL | C001-J2 (27) |



**Figure 7-37. Platform Console Harness (Without SkyGuard) - Sheet 3 of 12**

| MS16 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | CAN | 20AWG | J1939 CABLE | C001-J7(31) |
| 2 | YEL | CAN | 20AWG | J1939 CABLE | X304A (3) |
| 3 | YEL | CAN | 20AWG | J1939 CABLE | X303 A (8) |
| 4 | GRN | CAN | 20AWG | J1939 CABLE | C001-J7(30) |
| 5 | GRN | CAN | 20AWG | J1939 CABLE | X304 A (2) |
| 6 | GRN | CAN | 20AWG | J1939 CABLE | X303 A (9) |
| 7 | GRY | CAN LO | 20AWG | CABLE | X687 (5) |
| 8 | | | | | |
| 9 | | | | | |
| 10 | BLK | CAN HI | 20 AWG | CABLE | X687 (4) |
| 11 | | | | | |
| 12 | | | | | |

| AH11- ALARM | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 000-10-16 PLAT ALARM GND | 18 AWG | GXL | C001-J7 (20) |

| C001-J7 BLACK | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-37 GROUND MODE | 18AWG | GXL | X304A(11) |
| 2 | WHT | 1-45 PLATF EMS | 18AWG | GXL | SW14-2B (2B) |
| 3 | WHT | 1-44EMS | 18AWG | GXL | X304A(4) |
| 4 | WHT | 1-40 FOOT SW | 18AWG | GXL | X305A(5) |
| 5 | WHT | 1-38 GEN ON SWITCH | 18AWG | GXL | X305A(2) |
| 6 | | | | | |
| 7 | WHT | 1-90 SG POWER | 18AWG | GXL | X305A(7) |
| 8 | WHT | 1-39 FOOT SW DISENGAGED | 18AWG | GXL | X305A(4) |
| 9 | WHT | 1-35 GENERATOR SWITCH | 18AWG | GXL | X305A(1) |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | BLK | 000-10-30 LSS GND | 18AWG | GXL | S688 (1) |
| 17 | | | | | |
| 18 | WHT | 1-87 SG INPUT1 | 18AWG | GXL | X305A(10) |
| 19 | WHT | 1-34 PLAT ALRM | 18AWG | GXL | AH11+ (1) |
| 20 | WHT | 000-10-16 PLAT ALARM GND | 18AWG | GXL | AH11- (1) |
| 21 | | | | | |
| 22 | | | | | |
| 23 | BLK | 000-10-11 VALVES GND | 18AWG | GXL | X303A(5) |
| 24 | BLK | 1-86 SG GND | 18AWG | GXL | X305A(8) |
| 25 | WHT | 1-36 JIB UP | 18AWG | GXL | X303A(3) |
| 26 | WHT | 1-43 JIB DOWN | 18AWG | GXL | X303A(4) |
| 27 | | | | | |
| 28 | | | | | |
| 29 | BLK | 000-10-340PTION GND | 18AWG | GXL | X303A(6) |
| 30 | GRN | CAN | 20AWGJ | J1939 CABL | MS16 (4) |
| 31 | YEL | CAN | 20AWGJ | J1939 CABL | MS16 (1) |
| 32 | | | | | |
| 33 | WHT | 1-41 PLATF ROTATE LEFT | 18AWG | GXL | X303A(1) |
| 34 | WHT | 1-42 PLATF ROTATE RIGHT | 18AWG | GXL | X303A(2) |
| 35 | | | | | |



**Figure 7-38. Platform Console Harness (Without SkyGuard) - Sheet 4 of 12**

| C001-J2 GRAY | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | WHT | 1-67 PLTF ORIENT OVERRIDE | 18AWG | GXL | SW174 (1) |
| 5 | | | | | |
| 6 | WHT | 1-20 TILT | 18AWG | GXL | GD153-J4 (5) |
| 7 | WHT | 1-32 FT SWITCH ENABLE | 18AWG | GXL | GD153-J2 (2) |
| 8 | WHT | 1-25 SYSTEM DISTRESS | 18AWG | GXL | GD153-J3 (6) |
| 9 | WHT | 1-24CREEP | 18AWG | GXL | GD153-J2 (1) |
| 10 | | | | | |
| 11 | WHT | 1-22 PLATFORM OVERLOAD | 18AWG | GXL | GD153-J4 (3) |
| 12 | WHT | 1-21500#/600# MODE | 18AWG | GXL | GD153-J4 (4) |
| 13 | WHT | 1-271000# MODE | 18AWG | GXL | GD153-J3 (4) |
| 14 | WHT | 1-28DRIVE ORIENT SW | 18AWG | GXL | GD153-J3 (3) |
| 15 | WHT | 1-23 GENERATOR ON | 18AWG | GXL | GD153-J4 (2) |
| 16 | WHT | 1-31SOFT TCH/SKY GUARD | 18AWG | GXL | LB478+ (1) |
| 17 | WHT | 1-29 GLOW PLUG | 18AWG | GXL | GD153-J4 (6) |
| 18 | BLK | 000-10-27 GND | 18AWG | GXL | GD153-J2 (6) |
| 19 | | | | | |
| 20 | WHT | 1-92 DRIVE DISABLE | 18AWG | GXL | GD153-J3 (1) |
| 21 | WHT | 1-30 LOW FUEL | 18AWG | GXL | GD153-J2 (3) |
| 22 | WHT | 1_498 1/4 FUEL | 18AWG | GXL | GD153-J1 (1) |
| 23 | WHT | 1_499 3/4 FUEL | 18AWG | GXL | GD153-J1 (3) |
| 24 | WHT | 1_500 1/2 FUEL | 18AWG | GXL | GD153-J1 (2) |
| 25 | BLK | 1_497FUEL GND | 18AWG | GXL | GD153-J1 (4) |
| 26 | WHT | 1-66 POWER | 18AWG | GXL | X175 (1) |
| 27 | BLK | 000-10-12 GND | 18AWG | GXL | X175 (4) |
| 28 | WHT | 1-81 RECEIVE | 18AWG | GXL | X175 (2) |
| 29 | WHT | 1-82 TRANSMIT | 18AWG | GXL | X175 (3) |
| 30 | | | | | |
| 31 | WHT | 1-85 ST POWER | 18AWG | GXL | X305A (9) |
| 32 | WHT | 1-33 LSS PWR | 18AWG | GXL | S689 (1) |
| 33 | WHT | 1-89 OPTION POWER | 18AWG | GXL | X303A (7) |
| 34 | | | | | |
| 35 | WHT | 1_501 FUEL FULL | 18AWG | GXL | GD153-J1 (6) |

| AH11+ ALARM | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-34 PLAT ALRM | 18AWG | GXL | C001-J7 (19) |

| C001-J8 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-10-14 GND | 12AWG | GXL | X304A (16) |
| 2 | WHT | 1-1 | 18AWG | GXL | X304A (12) |



**Figure 7-39. Platform Console Harness (Without SkyGuard) - Sheet 5 of 12**

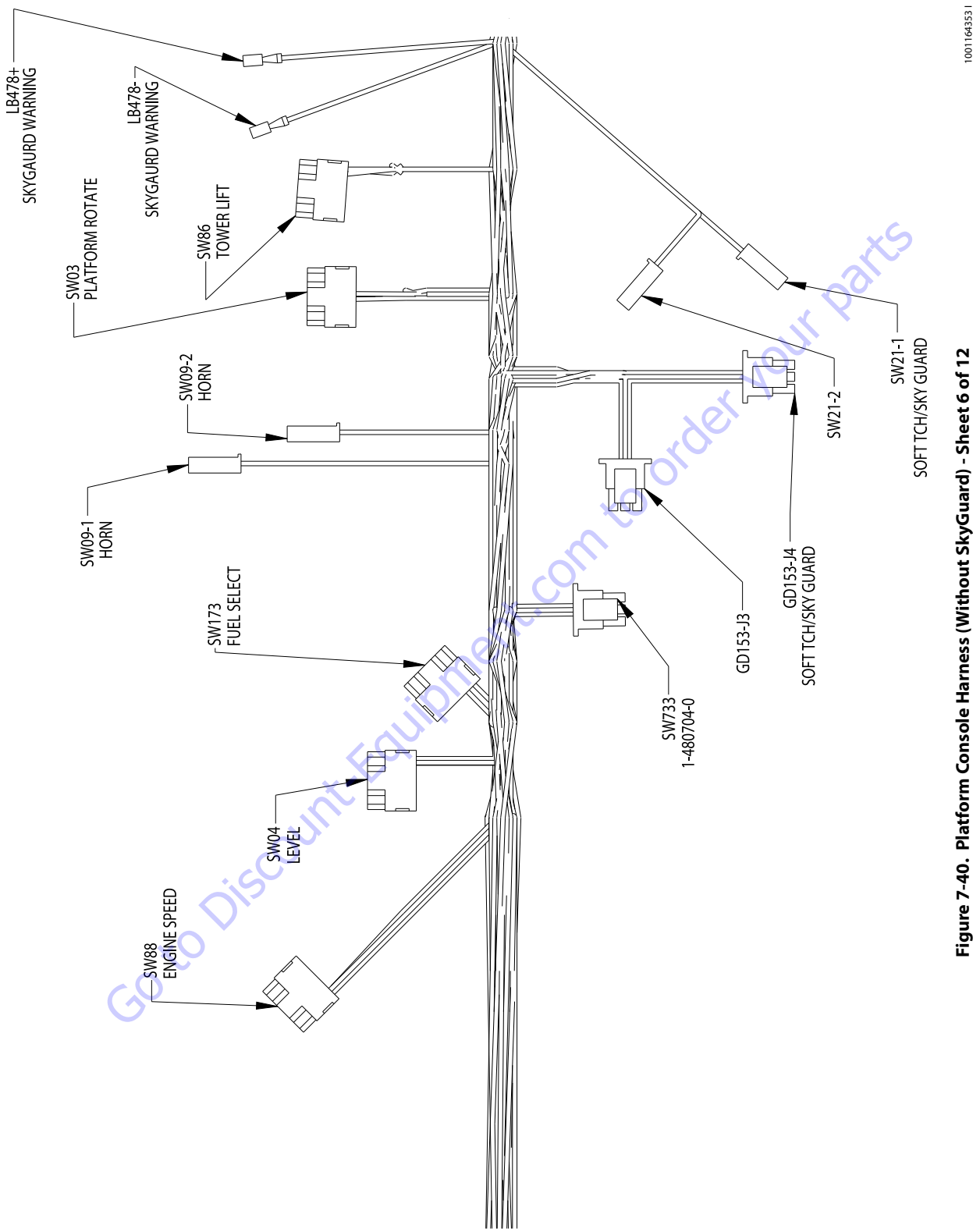



**Figure 7-40. Platform Console Harness (Without SkyGuard) - Sheet 6 of 12**

| SW88 ENGINE SPEED | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-11 MIN SPEED | 18AWG | GXL | C001-J1(28) |
| 2 | WHT | 1-70SWITCHESPWR | 18AWG | GXL | C001-J1(18) |
| 2 | WHT | 1-80SWITCHESPWR | 18AWG | GXL | SW04(2) |
| 3 | WHT | 1-12 MAX SPEED | 18AWG | GXL | C001-J1(27) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW733 PUMP POT | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | WHT | 1-101 RSII PORT 2 | 18AWG | GXL | C001-J1(32) |
| 3 | WHT | 1-102SWITCHESPWR | 18AWG | GXL | SW09-2(1) |
| 3 | WHT | 1-80SWITCHESPWR | 18AWG | GXL | SW174(2) |
| 4 | WHT | 1-105 POTCCW | 18AWG | GXL | C001-J1(34) |
| 5 | WHT | 1-103 POTCW | 18AWG | GXL | C001-J1(13) |
| 6 | WHT | 1-104 POTW | 18AWG | GXL | C001-J1(35) |

| SW04 LEVEL | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | LEVELDOWN | 18AWG | GXL | C001-J1(10) |
| 2 | WHT | 1-73SWITCHESPWR | 18AWG | GXL | SW173(2) |
| 2 | WHT | 1-80SWITCHESPWR | 18AWG | GXL | SW88(2) |
| 3 | WHT | 1-8 LEVELUP | 18AWG | GXL | C001-J1(9) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW09-2 HORN | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-102SWITCHESPWR | 18AWG | GXL | SW733(3) |
| 1 | WHT | 1-87SWITCHESPWR | 18AWG | GXL | SW21-2(1) |

| SW09-1 HORN | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-2 HORN | 18AWG | GXL | C001-J1(31) |

| GD153-J3 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-92 DRIVE DISABLE | 18AWG | GXL | C001-J2(20) |
| 2 | | | | | |
| 3 | WHT | 1-28 DRIVE ORIENT SW | 18AWG | GXL | C001-J2(14) |
| 4 | WHT | 1-27 1000# MODE | 18AWG | GXL | C001-J2(13) |
| 5 | | | | | |
| 6 | WHT | 1-25 SYSTEM DISTRESS | 18AWG | GXL | C001-J2(8) |

| SW173 FUEL SELECT | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | WHT | 1-73 SWITCHES PWR | 18 AWG | GXL | SW04 (2) |
| 2 | WHT | 1-74 SWITCHES PWR | 18 AWG | GXL | SW03 (2) |
| 3 | WHT | 1-68 FUEL SELECT | 18 AWG | GXL | C001-J1 (33) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |



**Figure 7-41. Platform Console Harness (Without SkyGuard) - Sheet 7 of 12**

| GD153-J4 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | WHT | 1-23 GENERATOR ON | 18 AWG | GXL | C001-J2 (15) |
| 3 | WHT | 1-22 PLATFORM OVERLOAD | 18 AWG | GXL | C001-J2 (11) |
| 4 | WHT | 1-21 500#/600# MODE | 18 AWG | GXL | C001-J2 (12) |
| 5 | WHT | 1-20 TILT | 18 AWG | GXL | C001-J2 (6) |
| 6 | WHT | 1-29 GLOW PLUG | 18 AWG | GXL | C001-J2 (17) |

| SW03 PLATFORM ROTATE | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-7 PLTF ROTATE LEFT | 18 AWG | GXL | C001-J1 (8) |
| 2 | WHT | 1-72 SWITCHES PWR | 18 AWG | GXL | SW86 (2) |
| 2 | WHT | 1-74 SWITCHES PWR | 18 AWG | GXL | SW173 (2) |
| 3 | WHT | 1-6 PLTF ROTATE RIGHT | 18 AWG | GXL | C001-J1 (7) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW21-2 SOFT TCH/SKY GUARD | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-87 SWITCHES PWR | 18 AWG | GXL | SW09-2 (1) |

| SW86 TOWER LIFT | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-17TOWER DOWN | 18 AWG | GXL | C001-J1 (2) |
| 2 | WHT | 1-72 SWITCHES PWR | 18 AWG | GXL | SW03 (2) |
| 2 | WHT | 1-78 SWITCHES PWR | 18 AWG | GXL | SW19 (2) |
| 3 | WHT | 1-16 TOWER UP | 18 AWG | GXL | C001-J1 (1) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW21-1 SOFT TCH/SKY GUARD | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-4 SOFT TOUCH | 18 AWG | GXL | C001-J1 (29) |

| LB478- SKYGAURD WARNING | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-10-501 GND | 18 AWG | GXL | GD153-J2 (6) |

| LB478+ SKYGAURD WARNING | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-31 SOFT TCH/SKY GUARD | 18 AWG | GXL | C001-J2 (16) |



**Figure 7-42. Platform Console Harness (Without SkyGuard) - Sheet 8 of 12**

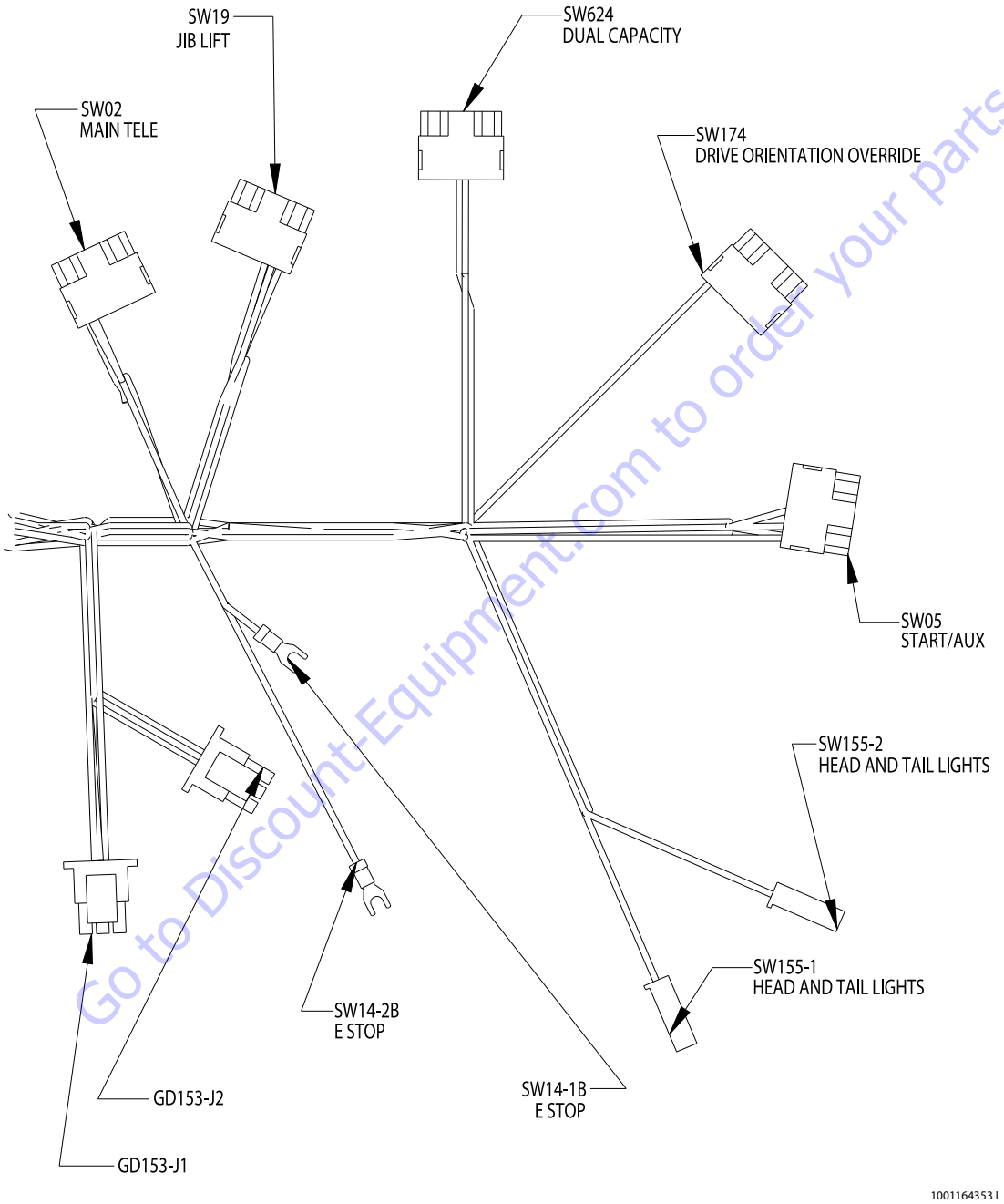





**Figure 7-43. Platform Console Harness (Without SkyGuard) - Sheet 9 of 12**

| GD153-J2 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-24 CREEP | 18 AWG | GXL | C001-J2 (9) |
| 2 | WHT | 1-32 FT SWITCH ENABLE | 18 AWG | GXL | C001-J2 (7) |
| 3 | WHT | 1-30 LOW FUEL | 18 AWG | GXL | C001-J2 (21) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | BLK | 000-10-27 GND | 18 AWG | GXL | C001-J2 (18) |
| 6 | BLK | 000-10-501 GND | 18 AWG | GXL | LB478- (1) |

| GD153-J1 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1_498 1/4 FUEL | 18 AWG | GXL | C001-J2 (22) |
| 2 | WHT | 1_500 1/2 FUEL | 18 AWG | GXL | C001-J2 (24) |
| 3 | WHT | 1_499 3/4 FUEL | 18 AWG | GXL | C001-J2 (23) |
| 4 | BLK | 1_497 FUEL GND | 18 AWG | GXL | C001-J2 (25) |
| 5 | | | | | |
| 6 | WHT | 1_501 FUEL FULL | 18 AWG | GXL | C001-J2 (35) |

| SW14-1B E STOP | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1B | WHT | 1-62 EMS B+ | 18 AWG | GXL | X304A (9) |

| SW02 MAIN TELE | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-5 TELE OUT | 18 AWG | GXL | C001-J1 (6) |
| 2 | WHT | 1-71 SWITCHES PWR | 18 AWG | GXL | SW155-2 (1) |
| 2 | WHT | 1-76 SWITCHES PWR | 18 AWG | GXL | SW19 (2) |
| 3 | WHT | 1-3 TELE IN | 18 AWG | GXL | C001-J1 (5) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW19 JIB LIFT | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-14 JIB DOWN | 18 AWG | GXL | C001-J1 (12) |
| 2 | WHT | 1-76 SWITCHES PWR | 18 AWG | GXL | SW02 (2) |
| 2 | WHT | 1-78 SWITCHES PWR | 18 AWG | GXL | SW86 (2) |
| 3 | WHT | 1-13 JIB UP | 18 AWG | GXL | C001-J1 (11) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |



**Figure 7-44. Platform Console Harness (Without SkyGuard) - Sheet 10 of 12**

| SW624 DUAL CAPACITY | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | WHT | 1-75 SWITCHES PWR | 18AWG | GXL | SW174 (2) |
| 2 | WHT | 1-79 SWITCHES PWR | 18AWG | GXL | SW05 (2) |
| 3 | WHT | 1-50 DUAL CAPACITY | 18AWG | GXL | C001-J1 (21) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW05 START/AUX | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-10 AUX POWER | 18AWG | GXL | C001-J1 (15) |
| 2 | WHT | 1-77 SWITCHES PWR | 18AWG | GXL | SW155-2 (1) |
| 2 | WHT | 1-79 SWITCHES PWR | 18AWG | GXL | SW624 (2) |
| 3 | WHT | 1-9 START SWITCH | 18AWG | GXL | C001-J1 (14) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW155-1 HEAD AND TAIL LIGHTS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-15 HEAD LIGHTS | 18AWG | GXL | C001-J1 (30) |

| SW155-2 HEAD AND TAIL LIGHTS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-71 SWITCHES PWR | 18AWG | GXL | SW02 (2) |
| 1 | WHT | 1-77 SWITCHES PWR | 18AWG | GXL | SW05 (2) |

| SW174 DRIVE ORIENTATION OVERRIDE | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 1-67 PLTF ORIENT OVERRIDE | 18AWG | GXL | C001-J2 (4) |
| 2 | WHT | 1-75 SWITCHES PWR | 18AWG | GXL | SW624 (2) |
| 2 | WHT | 1-80 SWITCHES PWR | 18AWG | GXL | SW733 (3) |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW14-2B E STOP | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 2B | WHT | 1-45 PLATF EMS | 18AWG | GXL | C001-J7 (2) |



**Figure 7-45. Platform Console Harness (Without SkyGuard) - Sheet 11 of 12**

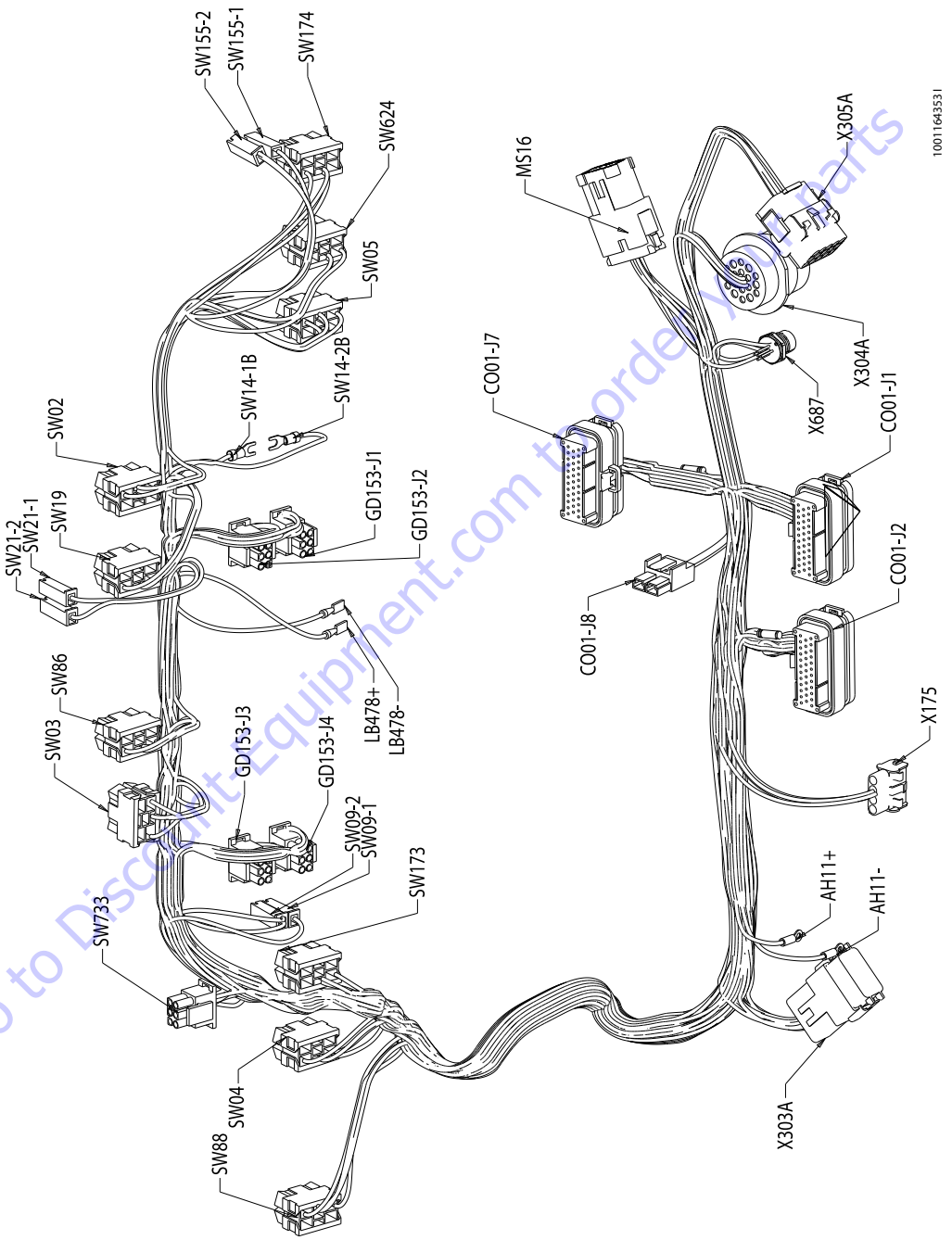



**Figure 7-46. Platform Console Harness (Without SkyGuard) - Sheet 12 of 12**

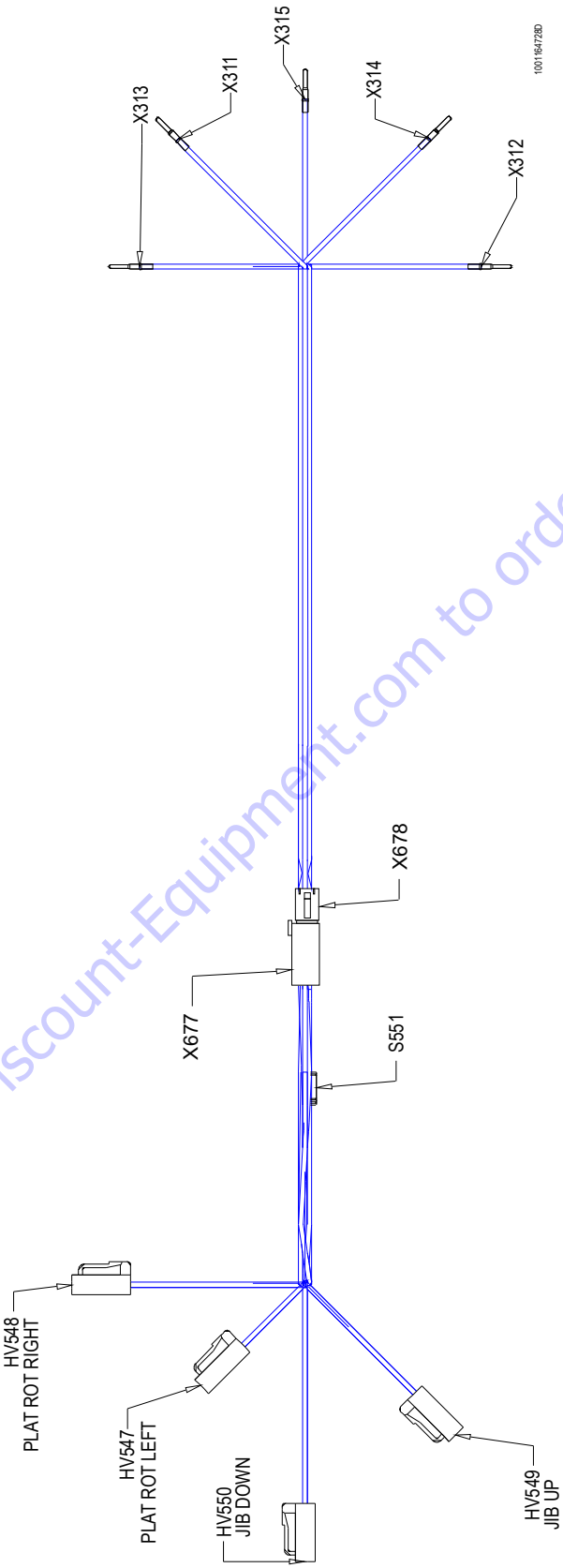



**Figure 7-47. Platform Valve Harness - Sheet 1 of 2**

| HV548<br>PLAT ROT RIGHT | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BRN/BLK | 2-8 CABLE | 18 AWG | TFFN | X677 (4) |
| 2 | BLK | 000-2-3 GND | 18 AWG | GXL | S551 (2) |

| HV547<br>PLAT ROT LEFT | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL/BLK | 2-7 CABLE | 18 AWG | TFFN | X677 (5) |
| 2 | BLK | 000-2-2 GND | 18 AWG | GXL | S551 (1) |

| HV550<br>JIB DOWN | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLU/BLK | 2-10 CABLE | 18 AWG | TFFN | X677 (1) |
| 2 | BLK | 000-2-5 GND | 18 AWG | GXL | S551 (2) |

| HV549<br>JIB UP | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | ORG/BLK | 2-9 CABLE | 18 AWG | TFFN | X677 (2) |
| 2 | BLK | 000-2-4 GND | 18 AWG | GXL | S551 (2) |

| S551 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-2-2 GND | 18 AWG | GXL | HV47 (2) |
| 1 | BLK/RED | 000-2-6 CABLE | 18 AWG | TFFN | X677 (3) |
| 2 | BLK | 000-2-3 GND | 18 AWG | GXL | HV548 (2) |
| 2 | BLK | 000-2-4 GND | 18 AWG | GXL | HV549 (2) |
| 2 | BLK | 000-2-5 GND | 18 AWG | GXL | HV550 (2) |

| X677 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLU/BLK | 000-2-2 GND | 18 AWG | GXL | HV550 (1) |
| 2 | ORN/BLK | 000-2-6 CABLE | 18 AWG | TFFN | HV549 (1) |
| 3 | BLK/RED | 000-2-3 GND | 18 AWG | GXL | S551 (1) |
| 4 | BRN/BLK | 000-2-4 GND | 18 AWG | GXL | HV548 (1) |
| 5 | YEL/BLK | 000-2-5 GND | 18 AWG | GXL | HV547 (1) |

| X313 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | ORG/BLK | 2-9 CABLE | 18 AWG | TFFN | X678 (2) |

| X315 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK/RED | 000-2-6 CABLE | 18 AWG | TFFN | X678 (5) |

| X311 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL/BLK | 2-7 CABLE | 18 AWG | TFFN | X678 (5) |

| X312 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BRN/BLK | 2-8 CABLE | 18 AWG | TFFN | X678 (4) |

| X314 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLU/BLK | 2-10 CABLE | 18 AWG | TFFN | X678 (1) |

| X678 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLU/BLK | 2-10 CABLE | 18 AWG | GXL | X314 (1) |
| 2 | ORN/BLK | 2-9 CABLE | 18 AWG | TFFN | X313 (1) |
| 3 | BLK/RED | 000-2-6 CABLE | 18 AWG | GXL | X315 (1) |
| 4 | BRN/BLK | 2-8 CABLE | 18 AWG | GXL | X312 (1) |
| 5 | YEL/BLK | 2-7 CABLE | 18 AWG | GXL | X311 (1) |



**Figure 7-48. Platform Valve Harness - Sheet 2 of 2**

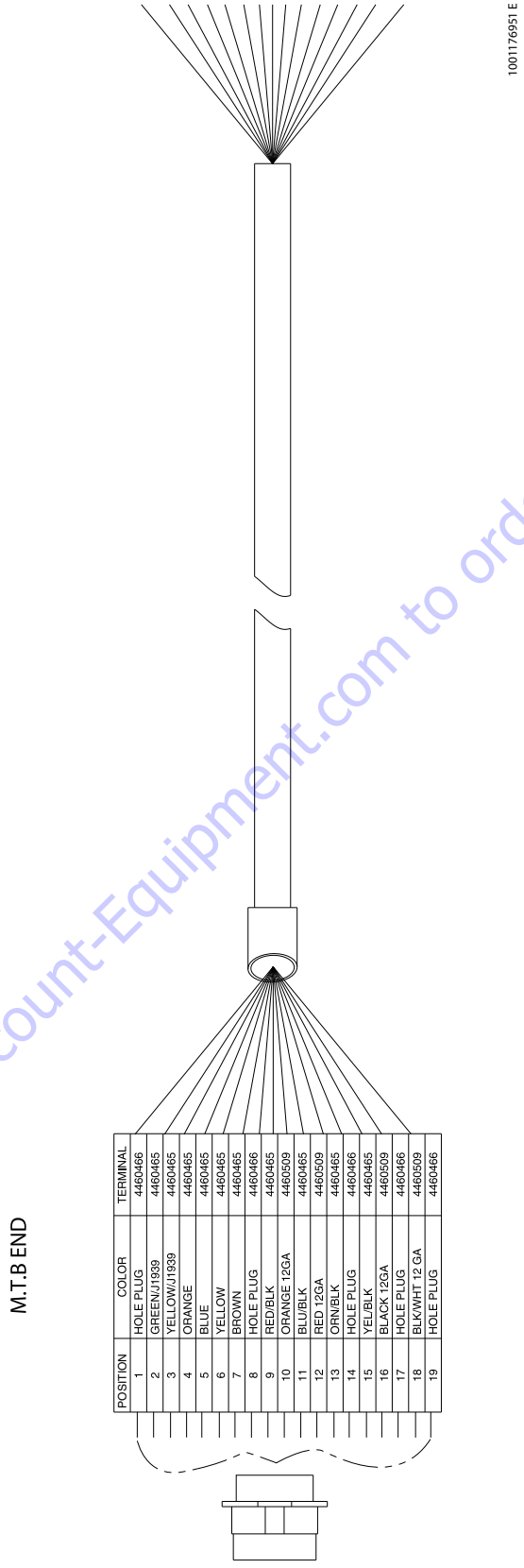



**Figure 7-49. Boom Lower Harness - Standard**

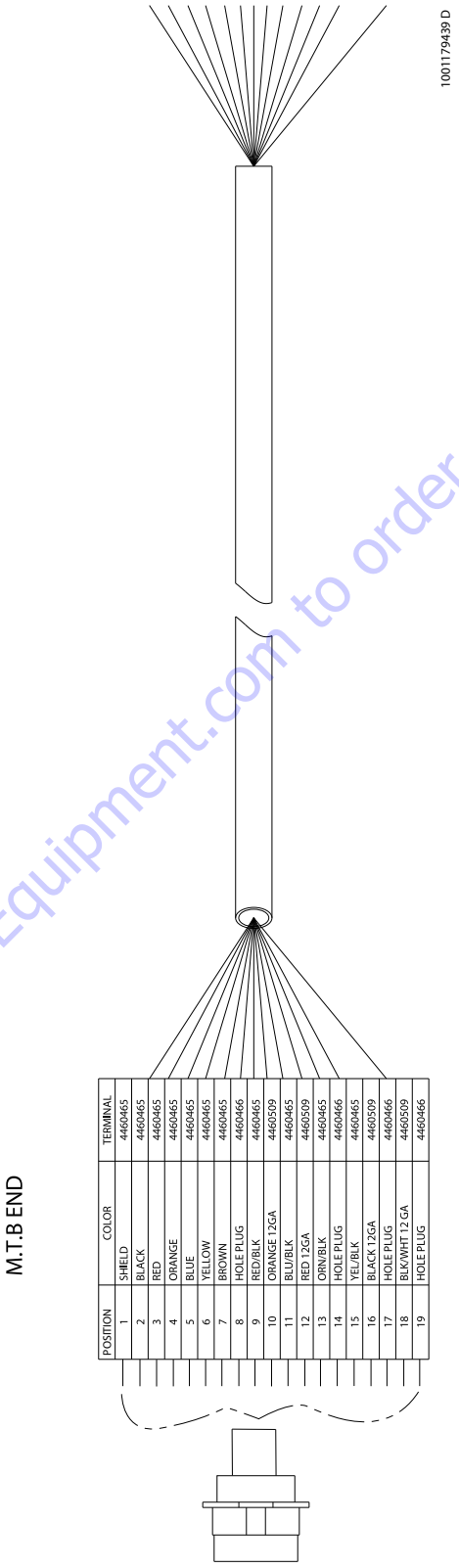



**Figure 7-50. Boom Lower Harness - Arctic**

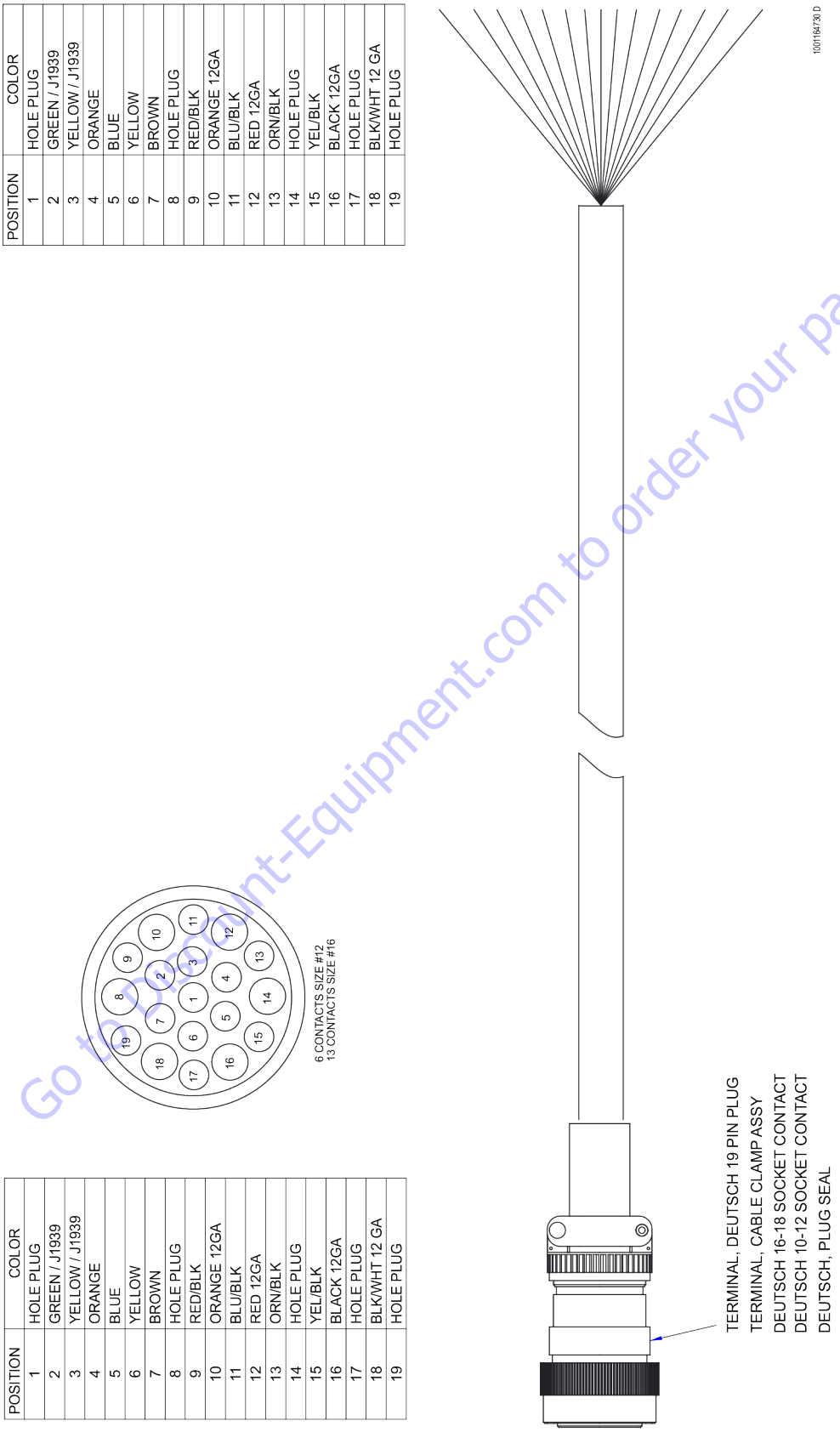
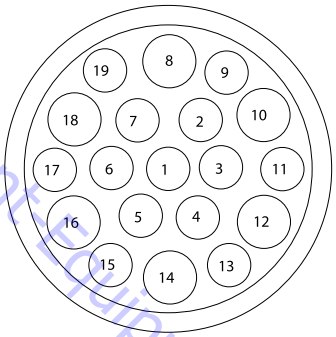


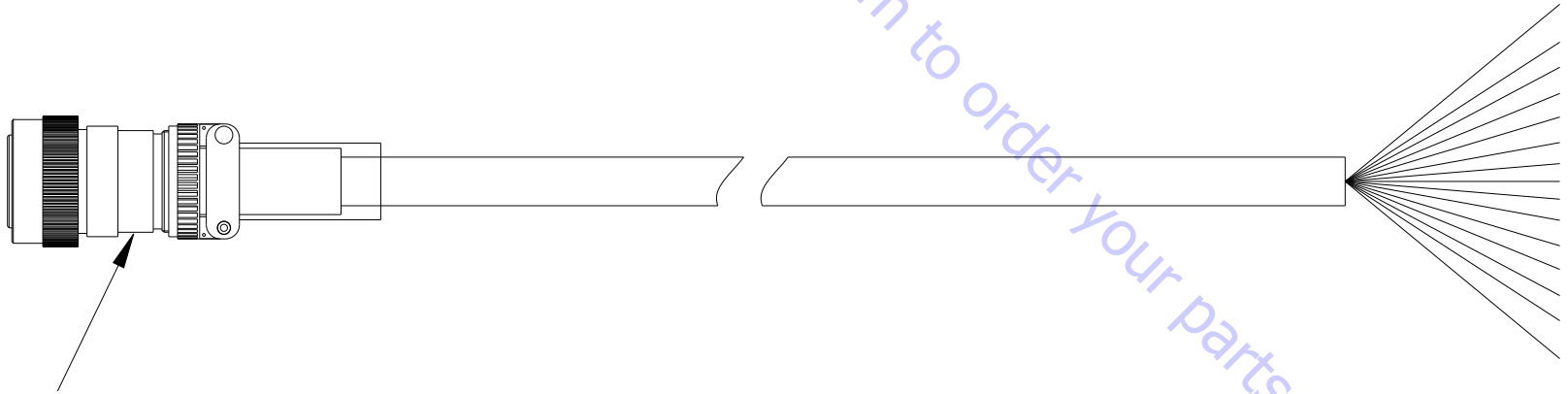

**Figure 7-51. Boom Upper Harness - Standard**

| POSITION | COLOR | TERMINAL |
|---|---|---|
| 1 | SHIELD | 4460465 |
| 2 | BLACK | 4460465 |
| 3 | RED | 4460465 |
| 4 | ORANGE | 4460465 |
| 5 | BLUE | 4460465 |
| 6 | YELLOW | 4460465 |
| 7 | BROWN | 4460465 |
| 8 | HOLE PLUG | 4460466 |
| 9 | RED/BLK | 4460465 |
| 10 | ORANGE 12GA | 4460509 |
| 11 | BLU/BLK | 4460465 |
| 12 | RED 12GA | 4460509 |
| 13 | ORN/BLK | 4460465 |
| 14 | HOLE PLUG | 4460466 |
| 15 | YEL/BLK | 4460465 |
| 16 | BLACK 12GA | 4460509 |
| 17 | HOLE PLUG | 4460466 |
| 18 | BLK/WHT 12 GA | 4460509 |
| 19 | HOLE PLUG | 4460466 |




6 CONTACTS SIZE #12
13 CONTACTS SIZE #16

| COLOR | TERMINAL |
|---|---|
| SHIELD | 4460465 |
| BLACK | 4460465 |
| RED | 4460465 |
| ORANGE | 4460465 |
| BLUE | 4460465 |
| YELLOW | 4460465 |
| BROWN | 4460465 |
| RED/BLK | 4460465 |
| ORANGE 12GA | 4460509 |
| BLU/BLK | 4460465 |
| RED 12GA | 4460509 |
| ORN/BLK | 4460465 |
| YEL/BLK | 4460465 |
| BLACK 12GA | 4460509 |
| BLK/WHT 12 GA | 4460509 |



TERMINAL, DEUTSCH 19 PIN PLUG
TERMINAL, CABLE CLAMP ASSY
DEUTSCH 16-18 SOCKET CONTACT
DEUTSCH 10-12 SOCKET CONTACT
DEUTSCH, PLUG SEAL

**Figure 7-52. Boom Upper Harness - Arctic**

1001174748 C

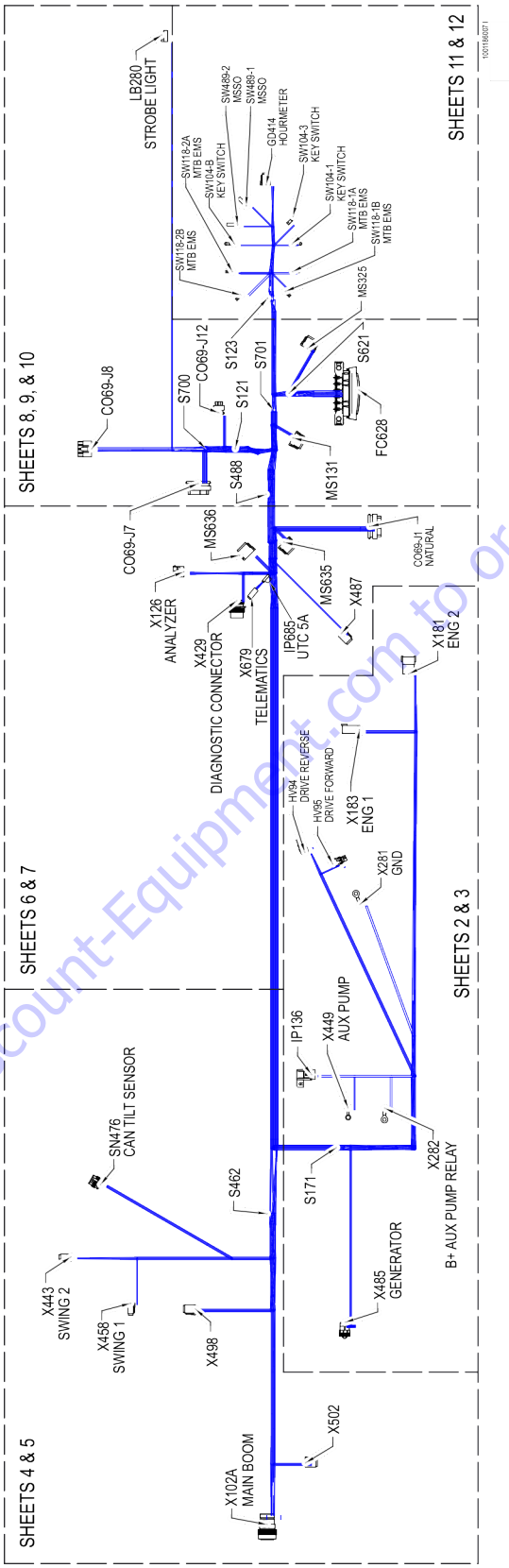



**Figure 7-53. Turntable Harness - Sheet 1 of 14**

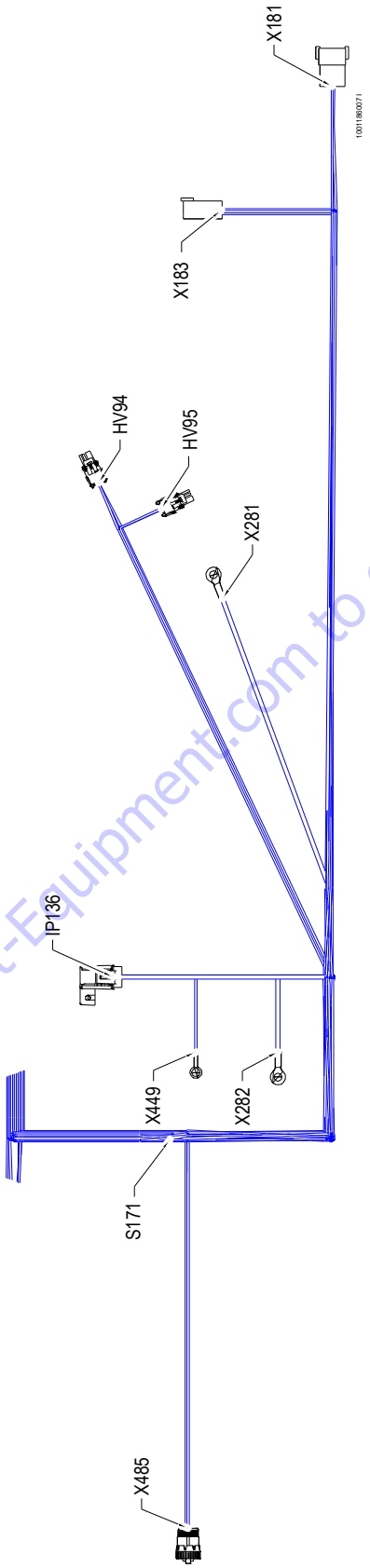





**Figure 7-54. Turntable Harness - Sheet 2 of 14**

| S171 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-40 CF | 18 AWG | GXL | HV95 (2) |
| 1 | BLK | 000-40-41 CF | 18 AWG | GXL | HV94 (2) |
| 2 | BLK | 00-40-43 - | 18 AWG | GXL | X487 (1) |

| IP136<br>30A | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-79 12AWG | 12 AWG | GXL | S123 (2) |
| 2 | RED | 4-49 12AWG | 12 AWG | GXL | X282 (1) |

| X485<br>GENERATOR | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 4-82 IGN | 18 AWG | GXL | FC628 (41) |
| 2 | WHT | 4-74 GEN ON | 18 AWG | GXL | CO69-J1 (22) |
| 3 | BLK | 000-40-109 | 18 AWG | GXL | MS635 (5) |

| X449<br>AUX PUMP | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-78 AUX PUMP | 16 AWG | GXL | CO69-J1 (13) |

| X282<br>B+ AUX PUMP RELAY | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-49 12AWG | 12 AWG | GXL | IP136 (2) |

| HV94<br>DRIVE REVERSE | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-4 DRIVE REVERSE | 18 AWG | GXL | CO69-J1 (6) |
| 2 | BLK | 000-40-41 CF | 18 AWG | GXL | S171 (1) |

| HV95<br>DRIVE FORWARD | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-3 DRIVE FORWARD | 18 AWG | GXL | CO69-J1 (3) |
| 2 | BLK | 000-40-40 CF | 18 AWG | GXL | S171 (1) |

| X281<br>GND | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-8 (10) | 10 AWG | GXL | CO69-J8 (1) |

| X183<br>ENG 1 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 4-84 IGN | 18 AWG | GXL | MS636 (4) |
| 2 | WHT | 4-67 START | 16 AWG | GXL | CO69-J1 (11) |
| 3 | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | MS325 (6) |
| 4 | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | MS325 (4) |
| 5 | RED | 4-76 ALT EXCITE | 16 AWG | GXL | CO69-J1 (32) |
| 6 | | 2 | | | |

| X181<br>ENG 2 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-94 EMR4 IGNITION | 18 AWG | GXL | CO69-J1 (10) |
| 2 | BLK | 000-40-557 GROUND | 18 AWG | GXL | MS635 (6) |
| 3 | | | | | |
| 4 | WHT | 4-80 GLOW PLUG | 16 AWG | GXL | CO69-J1 (12) |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |



**Figure 7-55. Turntable Harness - Sheet 3 of 14**

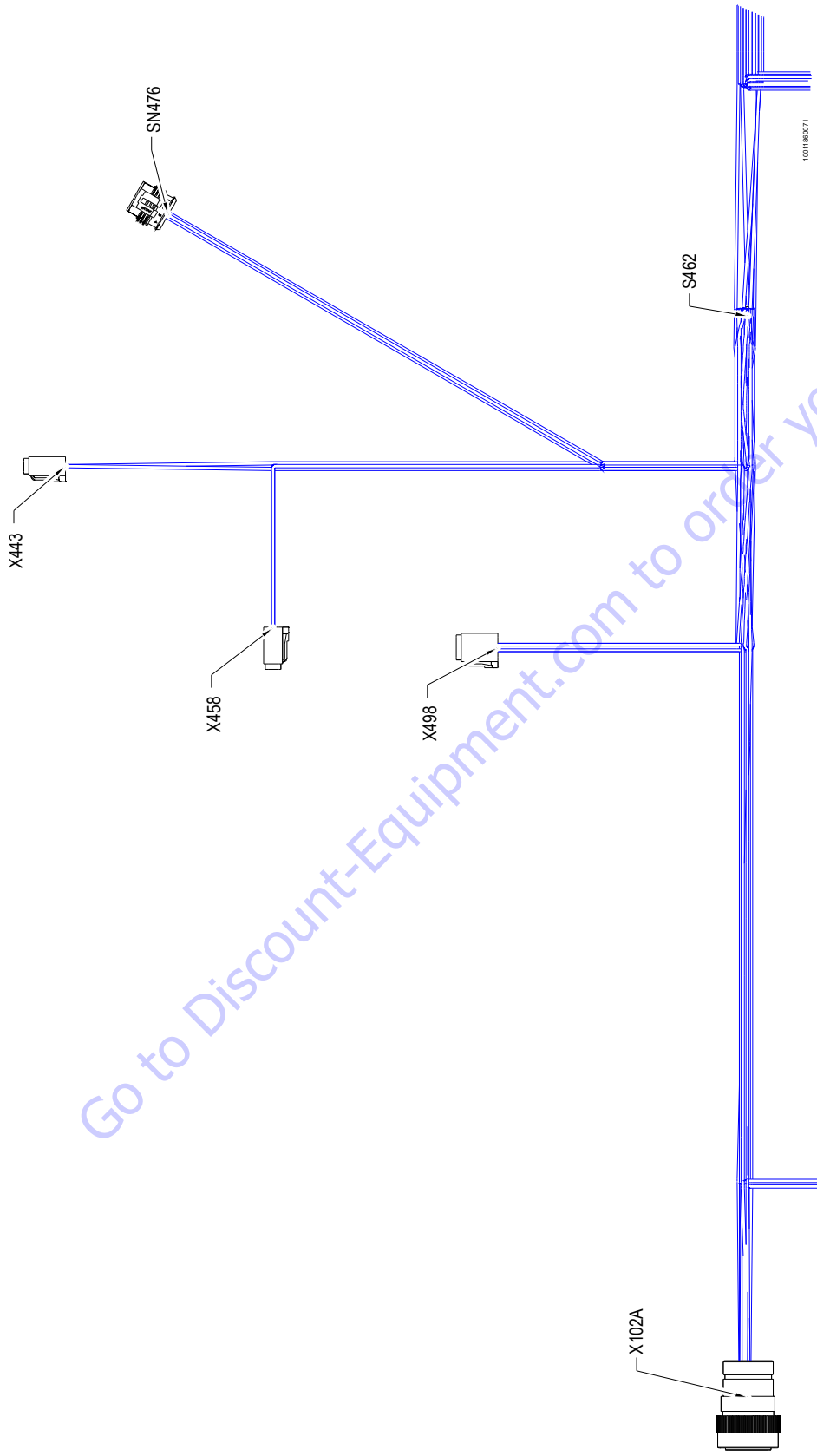



**Figure 7-56. Turntable Harness - Sheet 4 of 14**

## X102A
## MAIN BOOM

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | GRN | CAN 1 LO | 20 AWG | J1939 CABLE | MS131 (3) |
| 3 | YEL | CAN 1 HI | 20 AWG | J1939 CABLE | MS131 (1) |
| 4 | WHT | 4-43 PLTF EMS | 18 AWG | GXL | S121 (2) |
| 5 | | | | | |
| 6 | WHT | 4-52 FOOT SW | 18 AWG | GXL | CO69-J7 (15) |
| 7 | | | | | |
| 8 | | | | | |
| 9 | RED | 4-552 | 16 AWG | GXL | FC628 (34) |
| 10 | | | | | |
| 11 | WHT | 4-53 GROUND MODE | 18 AWG | GXL | CO69-J7 (14) |
| 12 | RED | 4-71 | 12 AWG | GXL | FC628 (33) |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | BLK | 000-40-12 PLATF GND | 12 AWG | GXL | CO69-J8 (3) |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |

## X502

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 4-114 BOOM ANG SEN PWR | 18 AWG | GXL | CO69-J7 (16) |
| 2 | WHT | 4-115 BOOM ANG SEN #2 | 18 AWG | GXL | CO69-J7 (7) |
| 3 | BLK | 000-40-80 GND | 18 AWG | GXL | CO69-J7 (9) |
| 4 | WHT | 4-117 BOOM ANG SEN #1 | 18 AWG | GXL | CO69-J7 (4) |
| 5 | WHT | 4-107 | 18 AWG | GXL | S462 (2) |
| 6 | WHT | 4-108 TOWER EL SW | 18 AWG | GXL | CO69-J7 (11) |

## X498

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | BLK | 000-40-498 OSC VLVs GND | 18 AWG | GXL | MS635 (2) |
| 2 | WHT | 4-400 OSC AXLE #2 SEC | 18 AWG | GXL | CO69-J1 (2) |
| 3 | WHT | 4-401 OSC AXLE #1 PRIMARY | 18 AWG | GXL | CO69-J1 (7) |
| 4 | BLK | 000-40-499 GND | 18 AWG | GXL | CO69-J1 (5) |
| 5 | WHT | 4-402 BRAKE | 18 AWG | GXL | CO69-J1 (23) |
| 6 | WHT | 4-403 TWO SPEED | 18 AWG | GXL | CO69-J1 (20) |

## X458
## SWING 1

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | WHT | 4-109 | 18 AWG | GXL | S462 (2) |
| 3 | WHT | 4-110 OSC AXL SWING SW#1 | 18 AWG | GXL | CO69-J7 (12) |
| 4 | | | | | |

## X443
## SWING 2

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 4-111 | 18 AWG | GXL | S462 (1) |
| 2 | | | | | |
| 3 | | | | | |
| 4 | WHT | 4-112 OSC AXL SWING SW#2 | 18 AWG | GXL | CO69-J7 (20) |

## SN476
## CAN TILT SENSOR

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 4-130 TILT VCC | 18 AWG | GXL | CO69-J7 (34) |
| 2 | WHT | 4-129 TILT GND | 18 AWG | GXL | CO69-J7 (10) |
| 3 | YEL | CAN 1 HI | 20 AWG | J1939 CABLE | MS131 (11) |
| 4 | GRN | CAN 1 LO | 20 AWG | J1939 CABLE | MS131 (10) |

## S462

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 4-106 TRANS EL SW | 18 AWG | GXL | CO69-J7 (32) |
| 1 | WHT | 4-111 | 18 AWG | GXL | X443 (1) |
| 2 | WHT | 4-107 | 18 AWG | GXL | X502 (5) |
| 2 | WHT | 4-109 | 18 AWG | GXL | X458 (2) |



**Figure 7-57. Turntable Harness - Sheet 5 of 14**

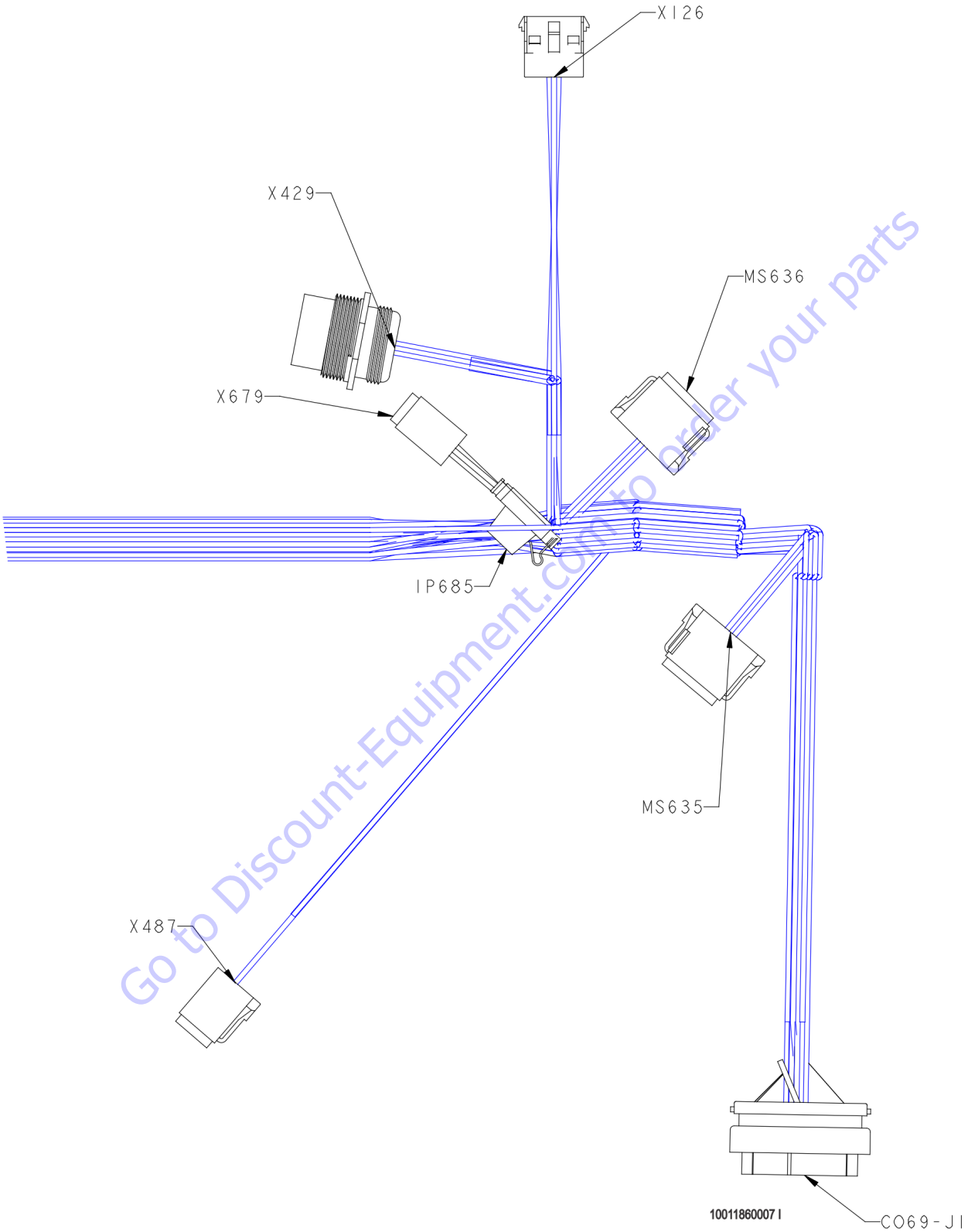





**Figure 7-58. Turntable Harness - Sheet 6 of 14**

## CO69-J1

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | WHT | 4-400 OSC AXLE #2 SEC | 18 AWG | GXL | X498 (2) |
| 3 | WHT | 4-3 DRIVE FORWARD | 18 AWG | GXL | HV95 (1) |
| 4 | | | | | |
| 5 | BLK | 000-40-499 GND | 18 AWG | GXL | X498 (4) |
| 6 | WHT | 4-4 DRIVE REVERSE | 18 AWG | GXL | HV94 (1) |
| 7 | WHT | 4-401 OSC AXLE #1 PRIMARY | 18 AWG | GXL | X498 (3) |
| 8 | | | | | |
| 9 | BLK | 4-164 GND | 18 AWG | GXL | SW489-2 (1) |
| 10 | WHT | 4-94 EMR4 IGNITION | 18 AWG | GXL | X181 (1) |
| 11 | WHT | 4-67 START | 16 AWG | GXL | X183 (2) |
| 12 | WHT | 4-80 GLOW PLUG | 16 AWG | GXL | X181 (4) |
| 13 | WHT | 4-78 AUX PUMP | 16 AWG | GXL | X449 (1) |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | WHT | 4-403 TWO SPEED | 18 AWG | GXL | X498 (6) |
| 21 | | | | | |
| 22 | WHT | 4-74 GEN ON | 18 AWG | GXL | X485 (2) |
| 23 | WHT | 4-402 BRAKE | 18 AWG | GXL | X498 (5) |
| 24 | | | | | |
| 25 | | | | | |
| 26 | | | | | |
| 27 | | | | | |
| 28 | WHT | 4-5 POWER | 18 AWG | GXL | X126 (1) |
| 29 | WHT | 4-6 RECEIVE | 18 AWG | GXL | X126 (2) |
| 30 | WHT | 4-7 TRANSMIT | 18 AWG | GXL | X126 (3) |
| 31 | BLK | 000-40-4 GND | 18 AWG | GXL | X126 (4) |
| 32 | RED | 4-76 ALT EXCITE | 16 AWG | GXL | X183 (5) |
| 33 | | | | | |
| 34 | | | | | |
| 35 | | | | | |

## MS635 NEG BUSS

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | BLK | 000-40-64 BATT GND | 18 AWG | GXL | CO69-J8 (1) |
| 2 | BLK | 000-40-498 OSC VLVs GND | 18 AWG | GXL | X498 (1) |
| 3 | BLK | 000-40-14 STROBE GND | 18 AWG | GXL | LB280 (2) |
| 4 | BLK | 000-40-11 NEG | 18 AWG | GXL | X429 (A) |
| 5 | BLK | 000-40-109 | 18 AWG | GXL | X485 (3) |
| 6 | BLK | 000-40-557 GROUND | 18 AWG | GXL | X181 (2) |
| 7 | BLK | 000-40-558 GROUND | 18 AWG | GXL | X679 (2) |

## X487

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | BLK | 00-40-43 - | 18 AWG | GXL | S171 (2) |

## MS636 IGN BUSS

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | YEL | 4-36 IGN | 12 AWG | GXL | CO69-J8 (4) |
| 2 | YEL | 4-72 IGN | 18 AWG | GXL | FC628 (40) |
| 3 | YEL | 4-54 IGN | 18 AWG | GXL | LB280 (1) |
| 4 | YEL | 4-84 IGN | 18 AWG | GXL | X183 (1) |
| 5 | YEL | 4-81 IGN | 18 AWG | GXL | FC628 (45) |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |

## X429 DIAGNOSTIC CONNECTOR

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| A | BLK | 000-40-11 NEG | 18 AWG | GXL | MS635 (4) |
| B | WHT | 4-65-1 | 18 AWG | GXL | S701 (2) |
| C | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | MS325 (7) |
| D | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | MS325 (9) |
| E | | | | | |
| F | | | | | |
| G | | | | | |
| H | WHT | 4-66 IGN | 18 AWG | GXL | FC628 (36) |
| J | | | | | |

## X126 ANALYZER

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 4-5 POWER | 18 AWG | GXL | CO69-J1 (28) |
| 2 | WHT | 4-6 RECEIVE | 18 AWG | GXL | CO69-J1 (29) |
| 3 | WHT | 4-7 TRANSMIT | 18 AWG | GXL | CO69-J1 (30) |
| 4 | BLK | 000-40-4 GND | 18 AWG | GXL | CO69-J1 (31) |

## X679 TELEMATICS

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 4-65-2 | 18 AWG | GXL | S701 (2) |
| 2 | BLK | 000-40-558 GROUND | 18 AWG | GXL | MS635 (7) |
| 3 | RED | 4-97-2 PWR | 18 AWG | GXL | S700 (2) |
| 4 | RED | 4-51-1 | 18 AWG | GXL | IP685 (2) |

## IP685 UTC 5A

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | RED | 4-51-1 | 18 AWG | GXL | SW104-3 (1) |
| 2 | RED | 4-51-1 | 18 AWG | GXL | X679 (4) |



**Figure 7-59. Turntable Harness - Sheet 7 of 14**

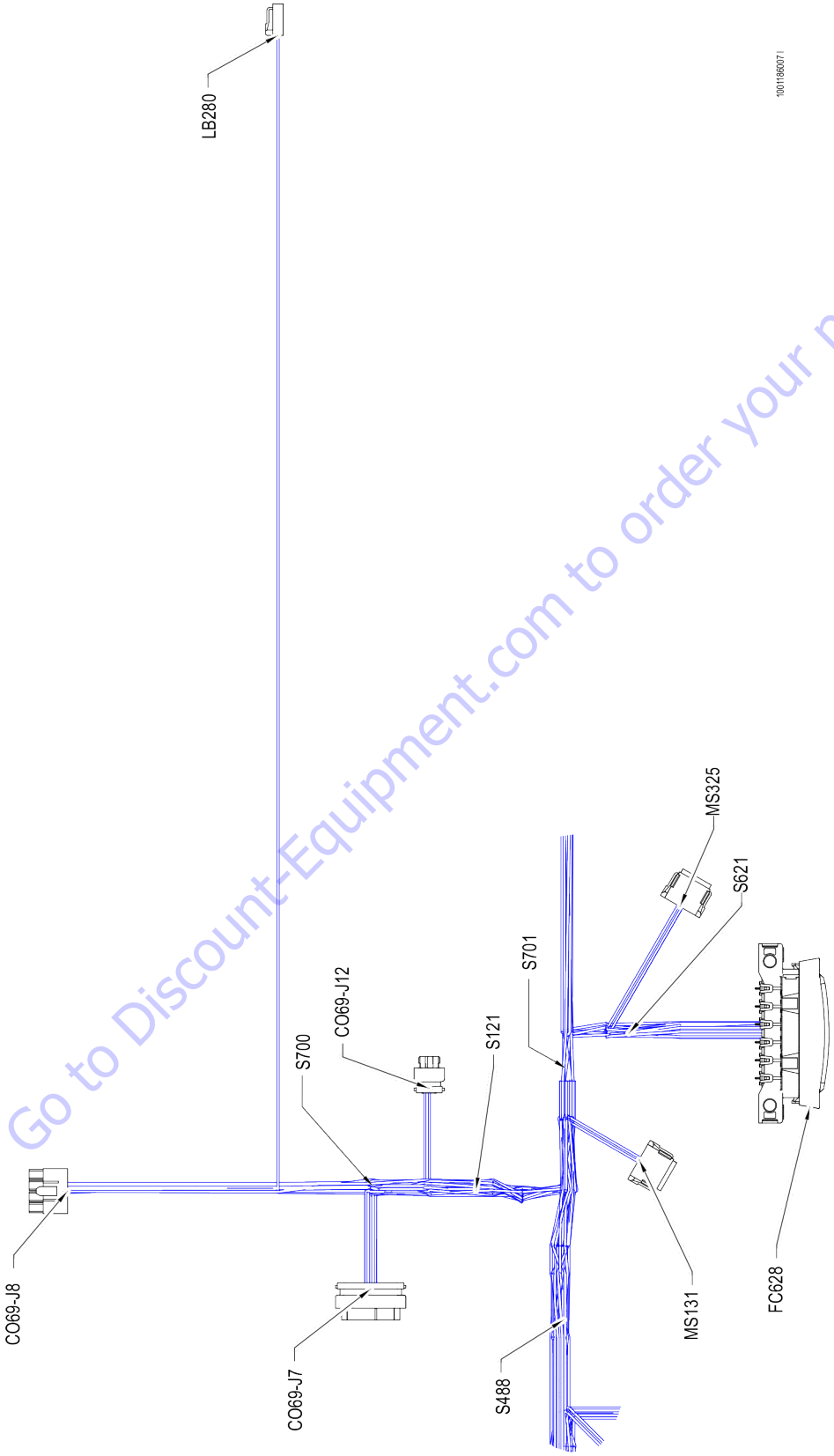



**Figure 7-60. Turntable Harness - Sheet 8 of 14**

| CO69-J8 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-64 BATT GND | 18 AWG | GXL | MS635 (1) |
| 1 | BLK | 000-40-8 (10) | 10 AWG | GXL | X281 (1) |
| 2 | RED | 4-35 IGN | 12 AWG | GXL | FC628 (28) |
| 3 | BLK | 000-40-12 PLATF GND | 12 AWG | GXL | X102A (16) |
| 4 | YEL | 4-36 IGN | 12 AWG | GXL | MS636 (1) |

| S121 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-41 | 18 AWG | GXL | FC628 (30) |
| 1 | WHT | 4-42 PLTF EMS | 18 AWG | GXL | CO69-J7 (1) |
| 2 | WHT | 4-132 PLT MODE | 18 AWG | GXL | CO69-J7 (2) |
| 2 | WHT | 4-43 PLTF EMS | 18 AWG | GXL | X102A (4) |

| CO69-J12 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | | | | | |
| 3 | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | MS325 (5) |
| 4 | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | MS325 (3) |
| 5 | | | | | |
| 6 | WHT | 4-96 JUMP | 18 AWG | GXL | CO69-J12 (7) |
| 7 | WHT | 4-96 JUMP | 18 AWG | GXL | CO69-J12 (6) |
| 8 | WHT | 4-165 MSS0 | 18 AWG | GXL | SW489-1 (1) |

| S488 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-38 | 18 AWG | GXL | FC628 (26) |
| 1 | RED | 4-39 | 18 AWG | GXL | FC628 (25) |
| 2 | WHT | 4-38 | 18 AWG | GXL | FC628 (1) |

| S621 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-550 - | 12 AWG | GXL | FC628 (37) |
| 1 | RED | 4-551 | 12 AWG | GXL | FC628 (32) |
| 2 | RED | 4-166 | 12 AWG | GXL | FC628 (2) |
| 2 | RED | 4-553 | 18 AWG | GXL | Fc628 (47) |

| LB280 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 4-54 IGN | 18 AWG | GXL | MS636 (3) |
| 2 | BLK | 000-40-14 STROBE GND | 18 AWG | GXL | MS635 (3) |

| MS131 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | CAN 1 HI | 20 AWG | J1939 CABLE | X102A (3) |
| 2 | | | | | |
| 3 | GRN | CAN 1 LO | 20 AWG | J1939 CABLE | X102A (2) |
| 4 | GRN | CAN 1 LO | 20 AWG | J1939 CABLE | CO69-J7 (24) |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | GRN | CAN 1 LO | 20 AWG | J1939 CABLE | SN476 (4) |
| 11 | YEL | CAN 1 HI | 20 AWG | J1939 CABLE | SN476 (3) |
| 12 | YEL | CAN 1 HI | 20 AWG | J1939 CABLE | CO69-J7 (13) |

| MS325 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | | | | | |
| 3 | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | CO69-J12 (4) |
| 4 | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | X183 (4) |
| 5 | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | CO69-J12 (3) |
| 6 | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | X183 (3) |
| 7 | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | X429 (C) |
| 8 | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | GD414 (3) |
| 9 | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | X429 (D) |
| 10 | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | GD414 (4) |
| 11 | | | | | |
| 12 | | | | | |

| S700 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-97-1 PWR | 18 AWG | GXL | GD414 (2) |
| 2 | RED | 4-97 PWR | 18 AWG | GXL | CO69-J7 (29) |
| 2 | RED | 4-97-2 PWR | 18 AWG | GXL | X679 (3) |

| S701 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-65 | 18 AWG | GXL | Fc628 (35) |
| 2 | WHT | 4-65-1 | 18 AWG | GXL | X429 (B) |
| 2 | WHT | 4-65-2 | 18 AWG | GXL | X679 (1) |



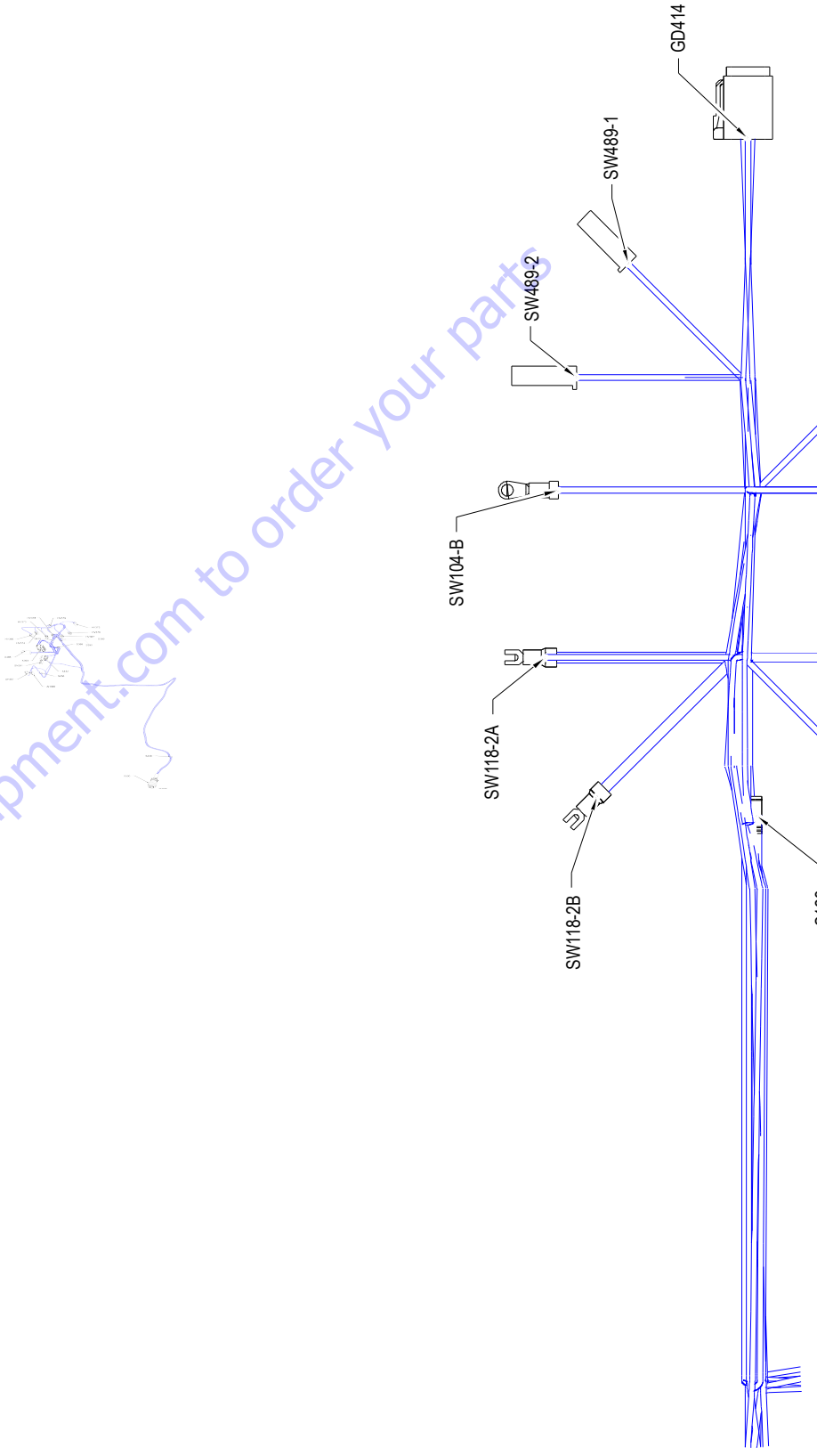
**Figure 7-61. Turntable Harness - Sheet 9 of 14**

| CO69-J7 BLACK | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-42 PLTF EMS | 18 AWG | GXL | S121 (1) |
| 2 | WHT | 4-132 PLT MODE | 18 AWG | GXL | S121 (2) |
| 3 | RED | 4-122 MOD SEL | 16 AWG | GXL | FC628 (46) |
| 4 | WHT | 4-117 BOOM ANG SEN #1 | 18 AWG | GXL | X502 (4) |
| 5 | | | | | |
| 6 | WHT | 4-131 JUMP | 18 AWG | GXL | CO69-J7 (17) |
| 7 | WHT | 4-115 BOOM ANG SEN #2 | 18 AWG | GXL | X502 (2) |
| 8 | | | | | |
| 9 | BLK | 000-40-80 GND | 18 AWG | GXL | X502 (3) |
| 10 | WHT | 4-129 TILT GND | 18 AWG | GXL | SN476 (2) |
| 11 | WHT | 4-108 TOWER EL SW | 18 AWG | GXL | X502 (6) |
| 12 | WHT | 4-110 OSC AXL SWING SW#1 | 18 AWG | GXL | X458 (3) |
| 13 | YEL | CAN 1 HI | 20 AWG | J1939 CABLE | MS131 (12) |
| 14 | WHT | 4-53 GROUND MODE | 18 AWG | GXL | X102A (11) |
| 15 | WHT | 4-52 FOOT SW | 18 AWG | GXL | X102A (6) |
| 16 | WHT | 4-114 BOOM ANG SEN PWR | 18 AWG | GXL | X502 (1) |
| 17 | WHT | 4-131 JUMP | 18 AWG | GXL | CO69-J7 (6) |
| 18 | | | | | |
| 19 | BLK | 000-40-13 GND | 18 AWG | GXL | FC628 (10) |
| 20 | WHT | 4-112 OSC AXL SWING SW#2 | 18 AWG | GXL | X443 (4) |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | GRN | CAN 1 LO | 20 AWG | J1939 CABLE | MS131 (4) |
| 25 | BLK | 000-40-51 GND | 18 AWG | GXL | GD414 (1) |
| 26 | | | | | |
| 27 | | | | | |
| 28 | | | | | |
| 29 | RED | 4-97 PWR | 18 AWG | GXL | S700 (2) |
| 30 | | | | | |
| 31 | | | | | |
| 32 | WHT | 4-106 TRANS EL SW | 18 AWG | GXL | S462 (1) |
| 33 | | | | | |
| 34 | WHT | 4-130 TILT VCC | 18 AWG | GXL | SN476 (1) |
| 35 | | | | | |

| FC628 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-38 | 18 AWG | GXL | S488 (2) |
| 2 | RED | 4-166 | 12 AWG | GXL | S621 (2) |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | RED | 4-37 EMS | 12 AWG | GXL | SW118-1A (1A) |
| 10 | BLK | 000-40-13 GND | 18 AWG | GXL | CO69-J7 (19) |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | RED | 4-39 | 18 AWG | GXL | S488 (1) |
| 26 | WHT | 4-38 | 18 AWG | GXL | S488 (1) |
| 27 | | | | | |
| 28 | RED | 4-35 IGN | 12 AWG | GXL | CO69-J8 (2) |
| 29 | RED | 4-40 | 12 AWG | GXL | SW104-1 (1) |
| 30 | WHT | 4-41 | 18 AWG | GXL | S121 (1) |
| 31 | | | | | |
| 32 | RED | 4-551 | 12 AWG | GXL | S621 (1) |
| 33 | RED | 4-71 | 12 AWG | GXL | X102A (12) |
| 34 | RED | 4-552 | 16 AWG | GXL | X102A (9) |
| 35 | WHT | 4-65 | 18 AWG | GXL | S701 (1) |
| 36 | WHT | 4-66 IGN | 18 AWG | GXL | X429 (H) |
| 37 | RED | 4-550 - | 12 AWG | GXL | S621 (1) |
| 38 | RED | 4-51 | 12 AWG | GXL | SW104-3 (1) |
| 39 | WHT | 4-50 | 18 AWG | GXL | SW118-2A (2A) |
| 40 | YEL | 4-72 IGN | 18 AWG | GXL | MS636 (2) |
| 41 | YEL | 4-82 IGN | 18 AWG | GXL | X485 (1) |
| 42 | RED | 4-122 MOD SEL | 12 AWG | GXL | SW104-1 (1) |
| 43 | | | | | |
| 44 | | | | | |
| 45 | YEL | 4-81 IGN | 18 AWG | GXL | MS636 (5) |
| 46 | RED | 4-122 MOD SEL | 18 AWG | GXL | CO69-J7 (3) |
| 47 | RED | 4-553 | 18 AWG | GXL | S621 (2) |
| 48 | | | | | |



**Figure 7-62. Turntable Harness - Sheet 10 of 14**



| S123 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-121 12AWG | 12 AWG | GXL | SW118-2A (2A) |
| 1 | RED | 4-47 12AWG | 12 AWG | GXL | SW118-2B (2B) |
| 2 | RED | 4-79 12AWG | 12 AWG | GXL | IP136 (1) |

| SW118-2B MTB EMS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 2B | RED | 4-47 12AWG | 12 AWG | GXL | S123 (1) |

| SW118-2A MTB EMS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 2A | RED | 4-121 12AWG | 12 AWG | GXL | S123 (1) |
| 2A | WHT | 4-50 | 18 AWG | GXL | FC628 (39) |

| SW118-1B MTB EMS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1B | RED | 4-45 | 12 AWG | GXL | SW104-B (1) |

| SW118-1A MTB EMS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1A | RED | 4-37 EMS | 12 AWG | GXL | FC628 (9) |

| SW489-2 MSSO | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 4-164 GND | 18 AWG | GXL | CO69-J1 (9) |

| SW104-B KEY SWITCH | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-45 | 12 AWG | GXL | SW118-1B (1B) |

| SW489-1 MSSO | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-165 MSS0 | 18 AWG | GXL | CO69-J12 (8) |

| GD414 HOURMETER | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-51 GND | 18 AWG | GXL | CO69-J7 (25) |
| 2 | RED | 4-97-1 PWR | 18 AWG | GXL | S700 (1) |
| 3 | YEL | CAN 2 HI | 20 AWG | J1939 CABLE | MS325 (8) |
| 4 | GRN | CAN 2 LO | 20 AWG | J1939 CABLE | MS325 (10) |
| 5 | | | | | |
| 6 | | | | | |

| SW104-3 KEY SWITCH | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-51 | 12 AWG | GXL | FC628 (38) |
| 1 | RED | 4-51-1 | 18 AWG | GXL | IP685 (1) |

| SW104-1 KEY SWITCH | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 4-122 MOD SEL | 12 AWG | GXL | FC628 (42) |
| 1 | RED | 4-40 | 12 AWG | GXL | FC628 (29) |



**Figure 7-64. Turntable Harness - Sheet 12 of 14**

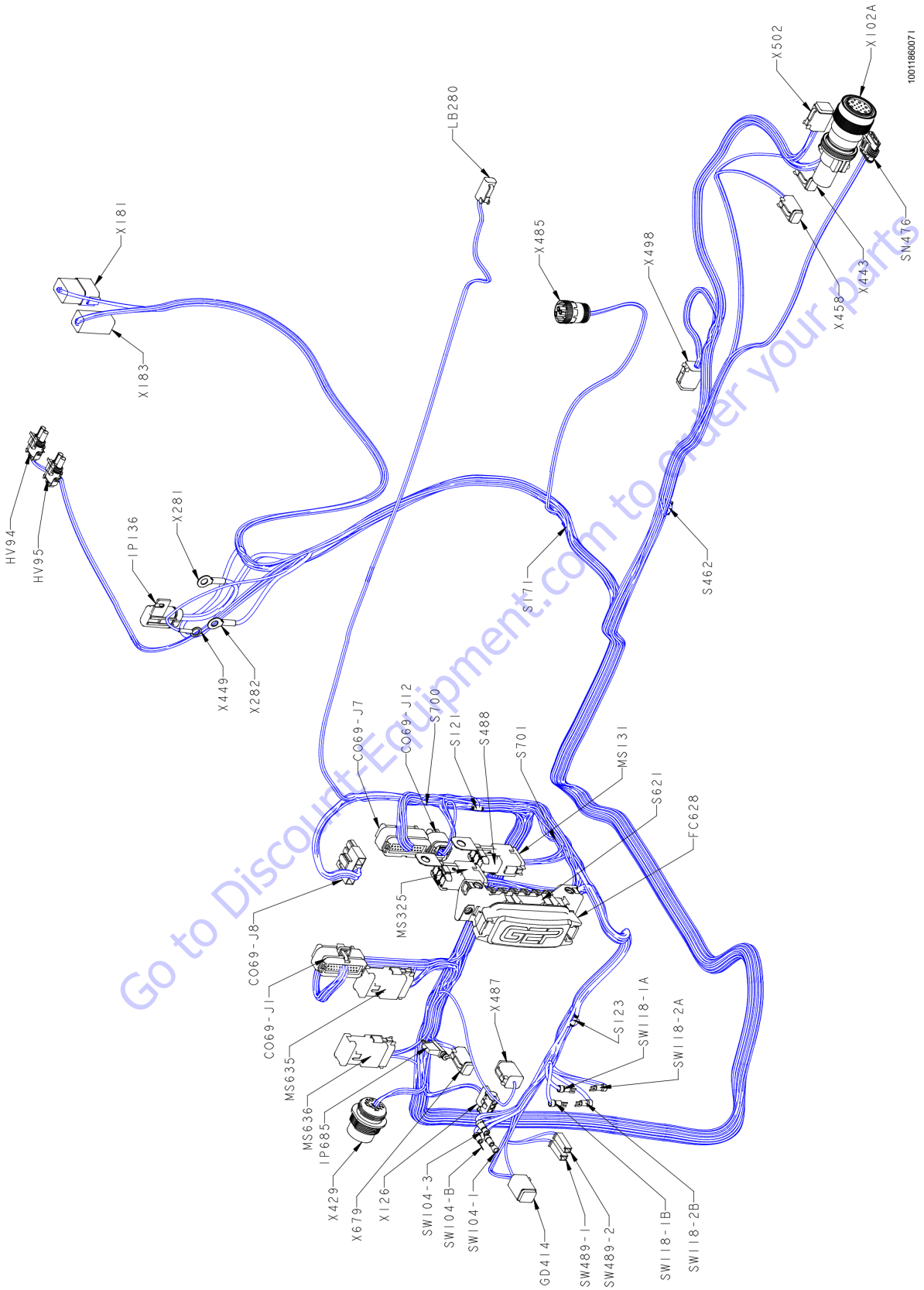





**Figure 7-65. Turntable Harness - Sheet 13 of 14**

# FUSE BOX LAYOUT

| | DESIGNATION | POSITION | RATING |
|---|---|---|---|
| FUSES | F1 | 28,32 | 15A |
| | F2 | 33,37 | 15A |
| | F3 | 34,38 | 5A |
| | F4 | 35,39 | 5A |
| | F5 | 36,40 | 5A |
| | F6 | 41,45 | 5A |
| | F7 | 42,46 | 3A |
| | F8 | 43,47 | |
| | F9 | 44,48 | |
| DIODES | D1 | 29 ANODE | |
| | | 25 CATHODE | |
| | D2 | 30 ANODE | |
| | | 26 CATHODE | |
| | D3 | 31 ANODE | |
| | | 27 CATHODE | |
| RELAYS | R1 | 10 (relay post 85) | 35A |
| | | 1 (relay post 86) | |
| | | 2 (relay post 87) | |
| | | 9 (relay post 30) | |
| | | 6 (relay post 87a) | |
| | R2 | 12 (relay post 85) | |
| | | 3 (relay post 86) | |
| | | 4 (relay post 87) | |
| | | 11 (relay post 30) | |
| | | 8 (relay post 87a) | |
| | R3 | 22 (relay post 85) | |
| | | 13 (relay post 86) | |
| | | 14 (relay post 87) | |
| | | 21 (relay post 30) | |
| | | 18 (relay post 87a) | |
| | R4 | 24 (relay post 85) | |
| | | 15 (relay post 86) | |
| | | 16 (relay post 87) | |
| | | 23 (relay post 30) | |
| | | 20 (relay post 87a) | |



**Figure 7-66. Turntable Harness - Sheet 14 of 14**

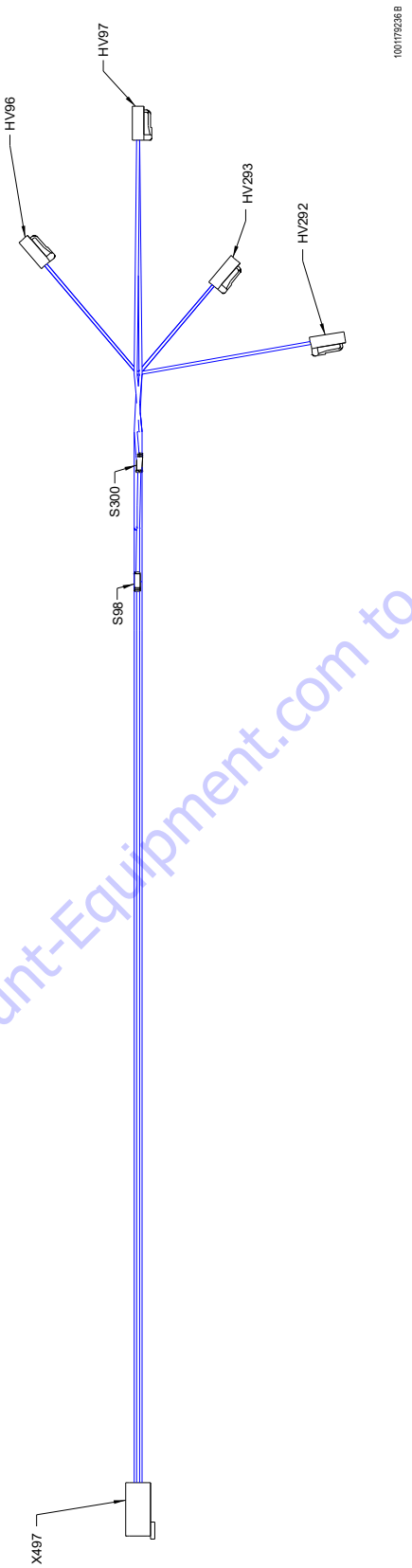





**Figure 7-67. Chassis Solenoid Harness - Sheet 1 of 3**

| X497 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-47 OSC VLVs GND | 18 AWG | GXL | S300 (1) |
| 2 | WHT | 4-101 OSC AXLE #2 SECONDARY | 18 AWG | GXL | HV293 (1) |
| 3 | WHT | 4-100 OSC AXLE #1 PRIMARY | 18 AWG | GXL | HV292 (1) |
| 4 | BLK | 000-40-3 GND | 18 AWG | GXL | S98 (2) |
| 5 | WHT | 4-1 BRAKE | 18 AWG | GXL | HV97 (1) |
| 6 | WHT | 4-2 TWO SPEED | 18 AWG | GXL | HV96 (1) |

| S98 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-1 GND | 18 AWG | GXL | HV97 (2) |
| 1 | BLK | 000-40-2 | 18 AWG | GXL | HV96 (2) |
| 2 | BLK | 000-40-3 GND | 18 AWG | GXL | X497 (4) |

| S300 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-47 OSC VLVs GND | 18 AWG | GXL | X497 (1) |
| 2 | BLK | 000-40-75 | 18 AWG | GXL | HV292 (2) |
| 2 | BLK | 000-40-76 | 18 AWG | GXL | HV293 (2) |

| HV97 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-1 BRAKE | 18 AWG | GXL | X497 (5) |
| 2 | BLK | 000-40-1 GND | 18 AWG | GXL | S98 (1) |

| HV293 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-101 OSC AXLE #2 SECONDARY | 18 AWG | GXL | X497 (2) |
| 2 | BLK | 000-40-76 | 18 AWG | GXL | S300 (2) |

| HV96 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-2 TWO SPEED | 18 AWG | GXL | X497 (6) |
| 2 | BLK | 000-40-2 | 18 AWG | GXL | S98 (1) |

| HV292 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-100 OSC AXLE #1 PRIMARY | 18 AWG | GXL | X497 (3) |
| 2 | BLK | 000-40-75 | 18 AWG | GXL | S300 (2) |



**Figure 7-68. Chassis Solenoid Harness - Sheet 2 of 3**

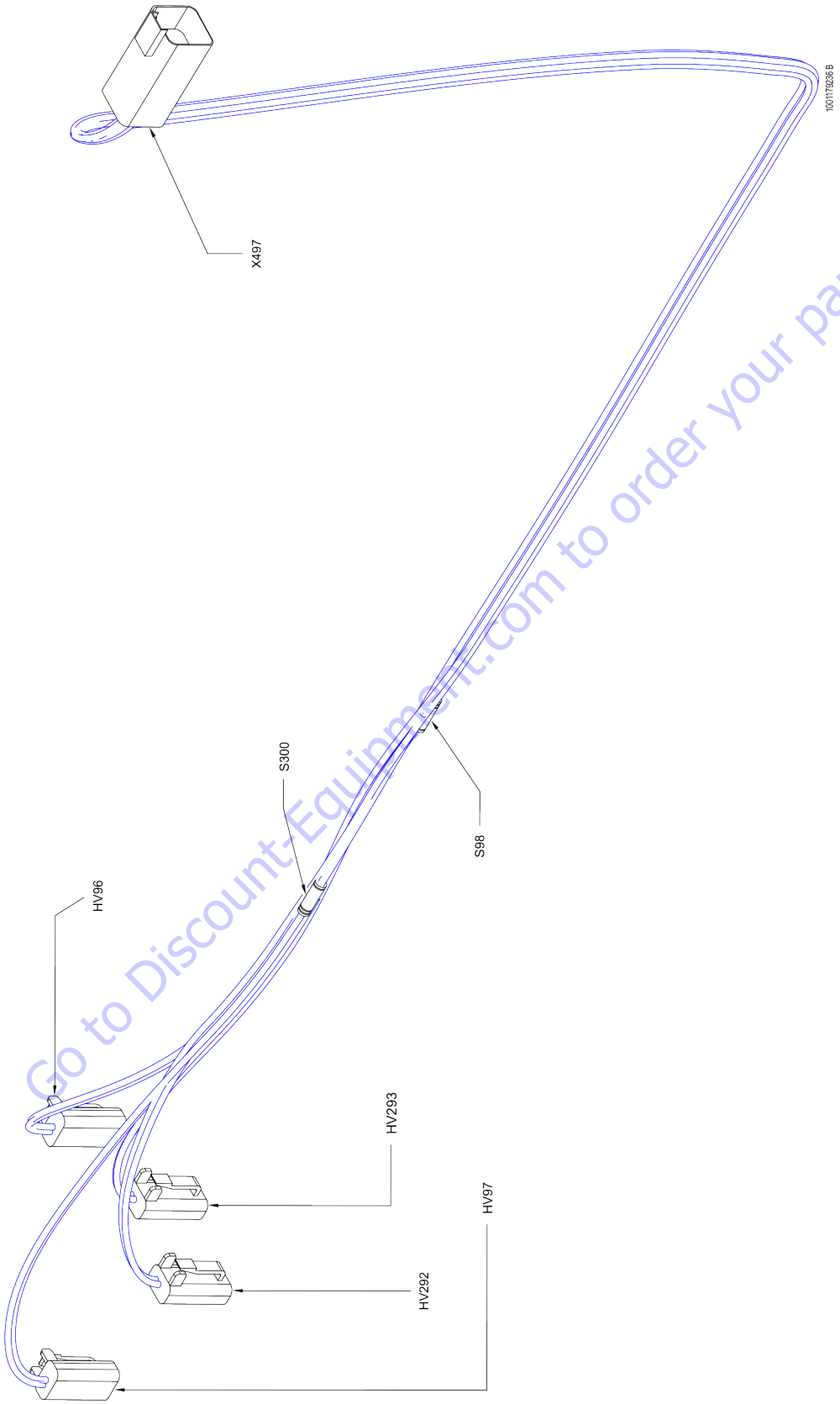



**Figure 7-69. Chassis Solenoid Harness - Sheet 3 of 3**

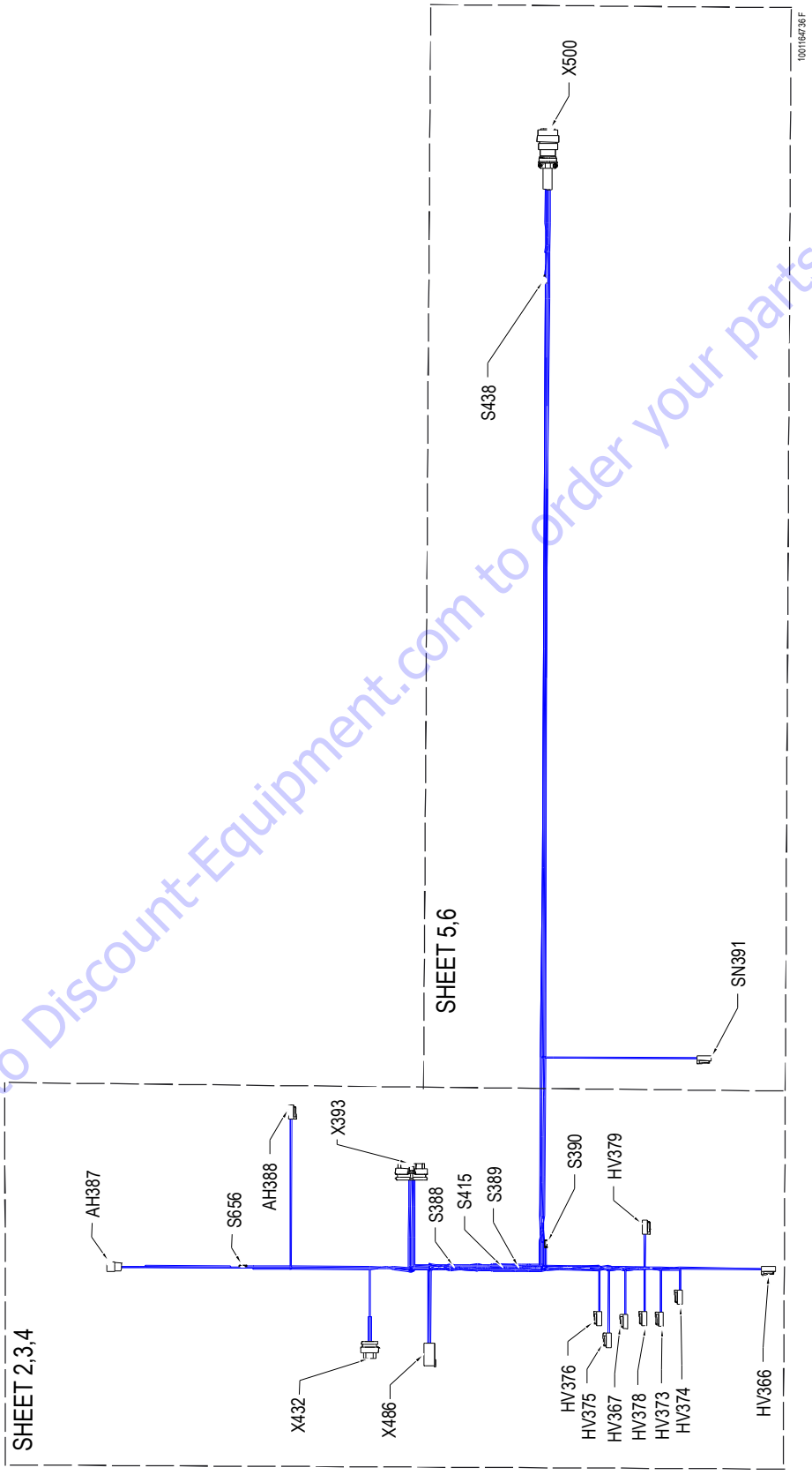





**Figure 7-70. Main Valve Harness - Sheet 1 of 8**

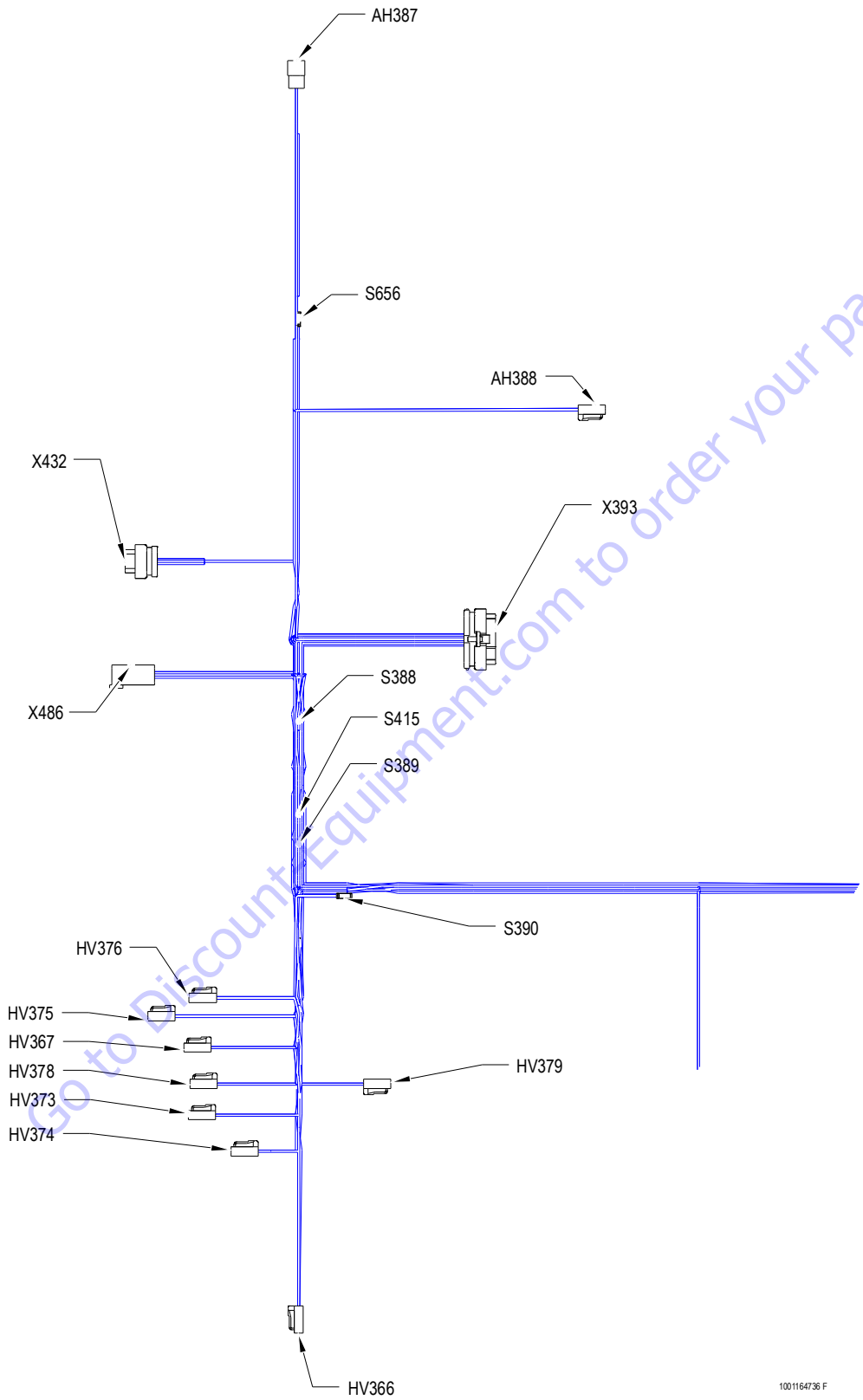





**Figure 7-71. Main Valve Harness - Sheet 2 of 8**

| AH387 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | WHT | 4-30 ALRM | 18 AWG | GXL | X432 (7) |
| B | WHT | 4-29 ALRM | 18 AWG | GXL | X393 (27) |
| C | BLK | 000-40-11 ALRM GND | 18 AWG | GXL | S656 (1) |

| AH388 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 77-1 WHT NOISE | 18 AWG | GXL | X393 (2) |
| 2 | BLK | 000-40-12 ALARM GND | 18 AWG | GXL | S656 (1) |

| X486 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-44 CF | 18 AWG | GXL | X432 (1) |
| 2 | WHT | 4-102 HEAD & TAIL LIGHTS | 18 AWG | GXL | X393 (26) |
| 3 | WHT | 4-105 CRIBBING | 18 AWG | GXL | X432 (9) |
| 4 | WHT | 5-101 JUMP ENABLE | 18 AWG | GXL | X432 (10) |

| X432 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-44 CF | 18 AWG | GXL | X486 (1) |
| 2 | BLK | 000-40-49 AUX TWR LIFT DOWN | 18 AWG | GXL | S438 (2) |
| 3 | | | | | |
| 4 | BLK | 000-40-38 CF | 18 AWG | GXL | S389 (2) |
| 5 | BLK | 000-40-42 CF | 18 AWG | GXL | S390 (2) |
| 6 | BLK | 000-40-33 CF | 18 AWG | GXL | HV375 (2) |
| 7 | WHT | 4-30 ALRM | 18 AWG | GXL | AH387 (A) |
| 8 | | | | | |
| 9 | WHT | 4-105 CRIBBING | 18 AWG | GXL | X486 (3) |
| 10 | WHT | 5-101 JUMP ENABLE | 18 AWG | GXL | X486 (4) |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | BLK | 000-40-35 CF | 18 AWG | GXL | S388 (2) |

| HV378 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-26 SWING RIGHT | 18 AWG | GXL | X393 (35) |
| 2 | BLK | 000-40-37 CF | 18 AWG | GXL | S389 (1) |

| HV379 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-27 SWING LEFT | 18 AWG | GXL | X393 (34) |
| 2 | BLK | 000-40-39 CF | 18 AWG | GXL | S389 (1) |

| HV367 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-15 TOWER LIFT UP | 18 AWG | GXL | X393 (20) |
| 2 | BLK | 000-40-26 | 18 AWG | GXL | S390 (1) |

| HV376 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-24 MAIN LIFT UP | 18 AWG | GXL | X393 (11) |
| 2 | BLK | 000-40-34 CF | 18 AWG | GXL | S388 (1) |

| HV375 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-23 FLOW CONTROL | 18 AWG | GXL | X393 (31) |
| 2 | BLK | 000-40-33 CF | 18 AWG | GXL | X432 (6) |

| HV366 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-14 MAIN DUMP | 18 AWG | GXL | X393 (13) |
| 2 | BLK | 000-40-25 | 18 AWG | GXL | X393 (30) |

| HV374 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-22 STEER LEFT | 18 AWG | GXL | X393 (19) |
| 2 | BLK | 000-40-32 | 18 AWG | GXL | S415 (1) |

| HV373 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-21 STEER RIGHT | 18 AWG | GXL | X393 (8) |
| 2 | BLK | 000-40-32 | 18 AWG | GXL | S415 (1) |



**Figure 7-72. Main Valve Harness - Sheet 3 of 8**

| X393 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | WHT | 77-1 WHT NOISE | 18 AWG | GXL | AH388 (1) |
| 3 | | | | | |
| 4 | WHT | 4-19 MAIN TELE IN | 18 AWG | GXL | X500 (E) |
| 5 | WHT | 4-8 LEVEL UP | 18 AWG | GXL | X500 (C) |
| 6 | BLK | 000-40-45 | 18 AWG | GXL | SN391 (I) |
| 7 | WHT | 4-11 LEVEL DOWN | 18 AWG | GXL | X500 (B) |
| 8 | WHT | 4-21 STEER RIGHT | 18 AWG | GXL | HV373 (1) |
| 9 | WHT | 4-16 TOWER LIFT DOWN | 18 AWG | GXL | X500 (N) |
| 10 | | | | | |
| 11 | WHT | 4-24 MAIN LIFT UP | 18 AWG | GXL | HV376 (1) |
| 12 | | | | | |
| 13 | WHT | 4-14 MAIN DUMP | 18 AWG | GXL | HV366 (1) |
| 14 | BLK | 000-40-7 | 18 AWG | GXL | X500 (A) |
| 15 | | | | | |
| 16 | WHT | 4-20 MAIN TELE OUT | 18 AWG | GXL | X500 (D) |
| 17 | | | | | |
| 18 | | | | | |
| 19 | WHT | 4-22 STEER LEFT | 18 AWG | GXL | HV374 (1) |
| 20 | WHT | 4-15 TOWER LIFT UP | 18 AWG | GXL | HV367 (1) |
| 21 | WHT | 4-103 MAIN LIFT DOWN AUX | 18 AWG | GXL | X500 (G) |
| 22 | WHT | 4-104 MAIN LIFT DOWN | 18 AWG | GXL | X500 (J) |
| 23 | BLK | 4-93 AUX TOWER LIFT DOWN | 18 AWG | GXL | X500 (L) |
| 24 | | | | | |
| 25 | WHT | 4-75 FUEL SWITCH | 18 AWG | GXL | SN391 (2) |
| 26 | WHT | 4-102 HEAD & TAIL LIGHTS | 18 AWG | GXL | X486 (2) |
| 27 | WHT | 4-29 ALRM | 18 AWG | GXL | AH387 (B) |
| 28 | BLK | 000-40-53 | 18 AWG | GXL | S415 (2) |
| 29 | BLK | 000-40-10 ALRM GND | 18 AWG | GXL | S656 (2) |
| 30 | BLK | 000-40-25 | 18 AWG | GXL | HV366 (2) |
| 31 | WHT | 4-23 FLOW CONTROL | 18 AWG | GXL | HV375 (1) |
| 32 | | | | | |
| 33 | | | | | |
| 34 | WHT | 4-27 SWING LEFT | 18 AWG | GXL | HV379 (1) |
| 35 | WHT | 4-26 SWING RIGHT | 18 AWG | GXL | HV378 (1) |

| S390 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-42 CF | 18 AWG | GXL | X432 (5) |
| 2 | BLK | 000-40-26 | 18 AWG | GXL | HV367 (2) |
| 2 | BLK | 000-40-27 | 18 AWG | GXL | X500 (14) |

| S388 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-34 CF | 18 AWG | GXL | HV376 (2) |
| 2 | BLK | 000-40-35 | 18 AWG | GXL | X432 (14) |
| 2 | BLK | 000-40-63 | 18 AWG | GXL | X500 (10) |

| S415 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 2 | BLK | 000-40-53 | 18 AWG | GXL | X393 (28) |
| S415415:1 | BLK | 000-40-32 | 18 AWG | GXL | HV373 (2) |
| S415415:1 | BLK | 000-40-32 | 18 AWG | GXL | HV374 (2) |

| S656 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-11 ALRM GND | 18 AWG | GXL | AH387 (C) |
| 1 | BLK | 000-40-12 ALARM GND | 18 AWG | GXL | AH388 (2) |
| 2 | BLK | 000-40-10 ALRM GND | 18 AWG | GXL | X393 (29) |

| S389 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-37 CF | 18 AWG | GXL | HV378 (2) |
| 1 | BLK | 000-40-39 CF | 18 AWG | GXL | HV379 (2) |
| 2 | BLK | 000-40-38 CF | 18 AWG | GXL | X432 (4) |



**Figure 7-73. Main Valve Harness - Sheet 4 of 8**

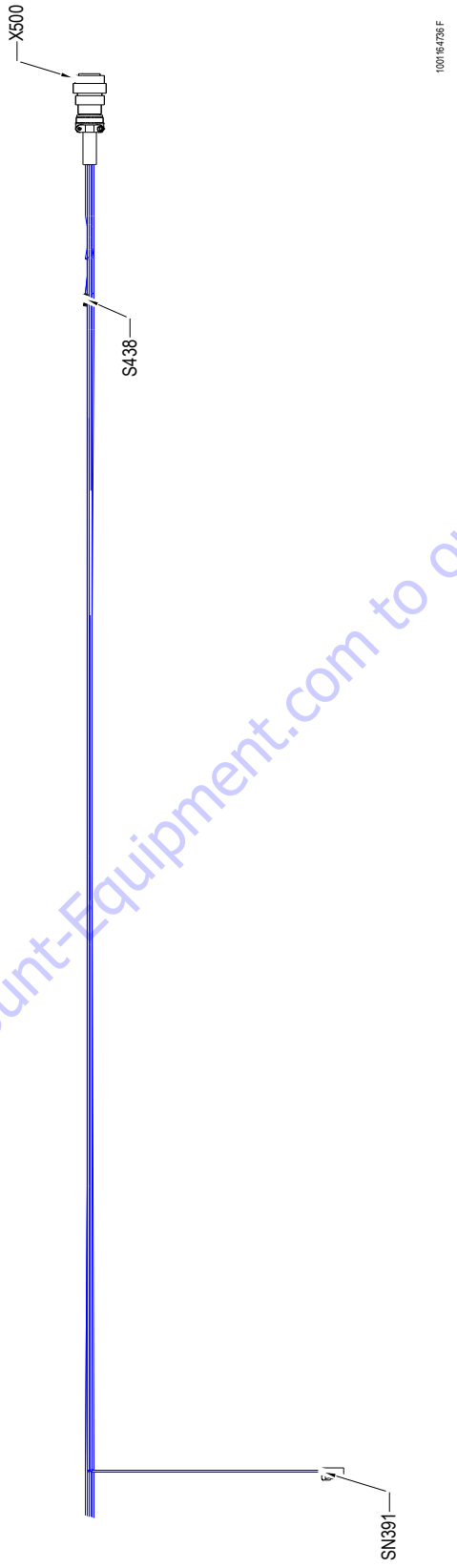



Figure 7-74. Main Valve Harness - Sheet 5 of 8

| SN391 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-45 | 18 AWG | GXL | X393 (6) |
| 2 | WHT | 4-75 FUEL SWITCH | 18 AWG | GXL | X393 (25) |

| X500 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | BLK | 000-40-7 | 18 AWG | GXL | X393 (14) |
| B | WHT | 4-11 LEVEL DOWN | 18 AWG | GXL | X393 (7) |
| C | WHT | 4-8 LEVEL UP | 18 AWG | GXL | X393 (5) |
| D | WHT | 4-20 MAIN TELE OUT | 18 AWG | GXL | X393 (16) |
| E | WHT | 4-19 MAIN TELE IN | 18 AWG | GXL | X393 (4) |
| F | | | | | |
| G | WHT | 4-103 MAIN LIFT DOWN AUX | 18 AWG | GXL | X393 (21) |
| H | BLK | 000-40-62 | 18 AWG | GXL | S438 (1) |
| J | WHT | 4-104 MAIN LIFT DOWN | 18 AWG | GXL | X393 (22) |
| K | BLK | 000-40-63 | 18 AWG | GXL | S388 (2) |
| L | BLK | 4-93 AUX TOWER LIFT DOWN | 18 AWG | GXL | X393 (23) |
| M | BLK | 000-40-61 | 18 AWG | GXL | S438 (1) |
| N | WHT | 4-16 TOWER LIFT DOWN | 18 AWG | GXL | X393 (9) |
| P | BLK | 000-40-27 | 18 AWG | GXL | S390 (1) |

| S438 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-61 | 18 AWG | GXL | X500 (N) |
| 1 | BLK | 000-40-62 | 18 AWG | GXL | X500 (H) |
| 2 | BLK | 000-40-49 AUX TWR LIFT DOWN | 18 AWG | GXL | X432 (2) |



**Figure 7-75. Main Valve Harness - Sheet 6 of 8**

| WIRE NO | COLOR | WIRE GAUGE | JACKET | LENGTH (mm) | FROM | | TO | |
|---|---|---|---|---|---|---|---|---|
| | | | | | REFERENCE | PIN | REFERENCE | PIN |
| 000-40-10 | BLK | 18 | GXL | 525 | X393 | 29 | S656 | 2 |
| 000-40-11 | BLK | 18 | GXL | 247 | AH387 | C | | |
| 000-40-12 | BLK | 18 | GXL | 398 | | | AH388 | 2 |
| 000-40-25 | BLK | 18 | GXL | 947 | HV366 | 2 | X393 | 30 |
| 000-40-26 | BLK | 18 | GXL | 307 | HV367 | 2 | S390 | 2 |
| 000-40-27 | BLK | 18 | GXL | 2168 | X500 | 14 | S390 | 2 |
| 000-40-32 | BLK | 18 | GXL | 405 | HV374 | 2 | S415 | 1 |
| 000-40-32 | BLK | 18 | GXL | 417 | HV373 | 2 | S415 | 1 |
| 000-40-33 | BLK | 18 | GXL | 650 | HV375 | 2 | X432 | 6 |
| 000-40-34 | BLK | 18 | GXL | 393 | HV376 | 2 | S388 | 2 |
| 000-40-35 | BLK | 18 | GXL | 197 | X432 | 14 | S388 | 1 |
| 000-40-37 | BLK | 18 | GXL | 349 | HV378 | 2 | S389 | 2 |
| 000-40-38 | BLK | 18 | GXL | 324 | X432 | 4 | S389 | 1 |
| 000-40-39 | BLK | 18 | GXL | 338 | HV379 | 2 | S389 | 2 |
| 000-40-42 | BLK | 18 | GXL | 434 | X432 | 5 | S390 | 1 |
| 000-40-44 | BLK | 18 | GXL | 278 | X486 | 1 | X432 | 1 |
| 000-40-45 | BLK | 18 | GXL | 1215 | SN391 | 1 | X393 | 6 |
| 000-40-49 | BLK | 18 | GXL | 2351 | S438 | 2 | X432 | 2 |
| 000-40-53 | BLK | 18 | GXL | 419 | X393 | 28 | S415 | 2 |
| 000-40-61 | BLK | 18 | GXL | 247 | S438 | 1 | X500 | 12 |
| 000-40-62 | BLK | 18 | GXL | 246 | X500 | 8 | S438 | 1 |
| 000-40-63 | BLK | 18 | GXL | 2392 | X500 | 10 | S388 | 2 |
| 000-40-7 | BLK | 18 | GXL | 2705 | X393 | 14 | X500 | 1 |
| 4-102 | WHT | 18 | GXL | 407 | X486 | 2 | X393 | 26 |
| 4-103 | WHT | 18 | GXL | 2710 | X500 | 7 | X393 | 21 |
| 4-104 | WHT | 18 | GXL | 2683 | X500 | 9 | X393 | 22 |
| 4-105 | WHT | 18 | GXL | 290 | X486 | 3 | X432 | 9 |
| 4-11 | WHT | 18 | GXL | 2703 | X500 | 2 | X393 | 7 |
| 4-14 | WHT | 18 | GXL | 945 | HV366 | 1 | X393 | 13 |
| 4-15 | WHT | 18 | GXL | 777 | HV367 | 1 | X393 | 20 |
| 4-16 | WHT | 18 | GXL | 2726 | X500 | 13 | X393 | 9 |
| 4-19 | WHT | 18 | GXL | 2696 | X500 | 5 | X393 | 4 |
| 4-20 | WHT | 18 | GXL | 2705 | X500 | 4 | X393 | 16 |
| 4-21 | WHT | 18 | GXL | 899 | HV373 | 1 | X393 | 8 |
| 4-22 | WHT | 18 | GXL | 814 | HV374 | 1 | X393 | 19 |
| 4-23 | WHT | 18 | GXL | 882 | HV375 | 1 | X393 | 31 |
| 4-24 | WHT | 18 | GXL | 699 | HV376 | 1 | X393 | 11 |
| 4-26 | WHT | 18 | GXL | 817 | HV378 | 1 | X393 | 35 |
| 4-27 | WHT | 18 | GXL | 762 | HV379 | 1 | X393 | 34 |
| 4-29 | WHT | 18 | GXL | 779 | AH387 | B | X393 | 27 |
| 4-30 | WHT | 18 | GXL | 648 | AH387 | A | X432 | 7 |
| 4-75 | WHT | 18 | GXL | 1231 | SN391 | 2 | X393 | 25 |
| 4-8 | WHT | 18 | GXL | 2706 | X500 | 3 | X393 | 5 |
| 4-93 | BLK | 18 | GXL | 2716 | X500 | 11 | X393 | 23 |
| 5-101 | WHT | 18 | GXL | 285 | X432 | 13 | X486 | 4 |
| 5-131 | WHT | 18 | GXL | 276 | X486 | 5 | X432 | 10 |
| 77-1 | WHT | 18 | GXL | 751 | AH388 | 1 | X393 | 2 |



**Figure 7-76. Main Valve Harness - Sheet 7 of 8**

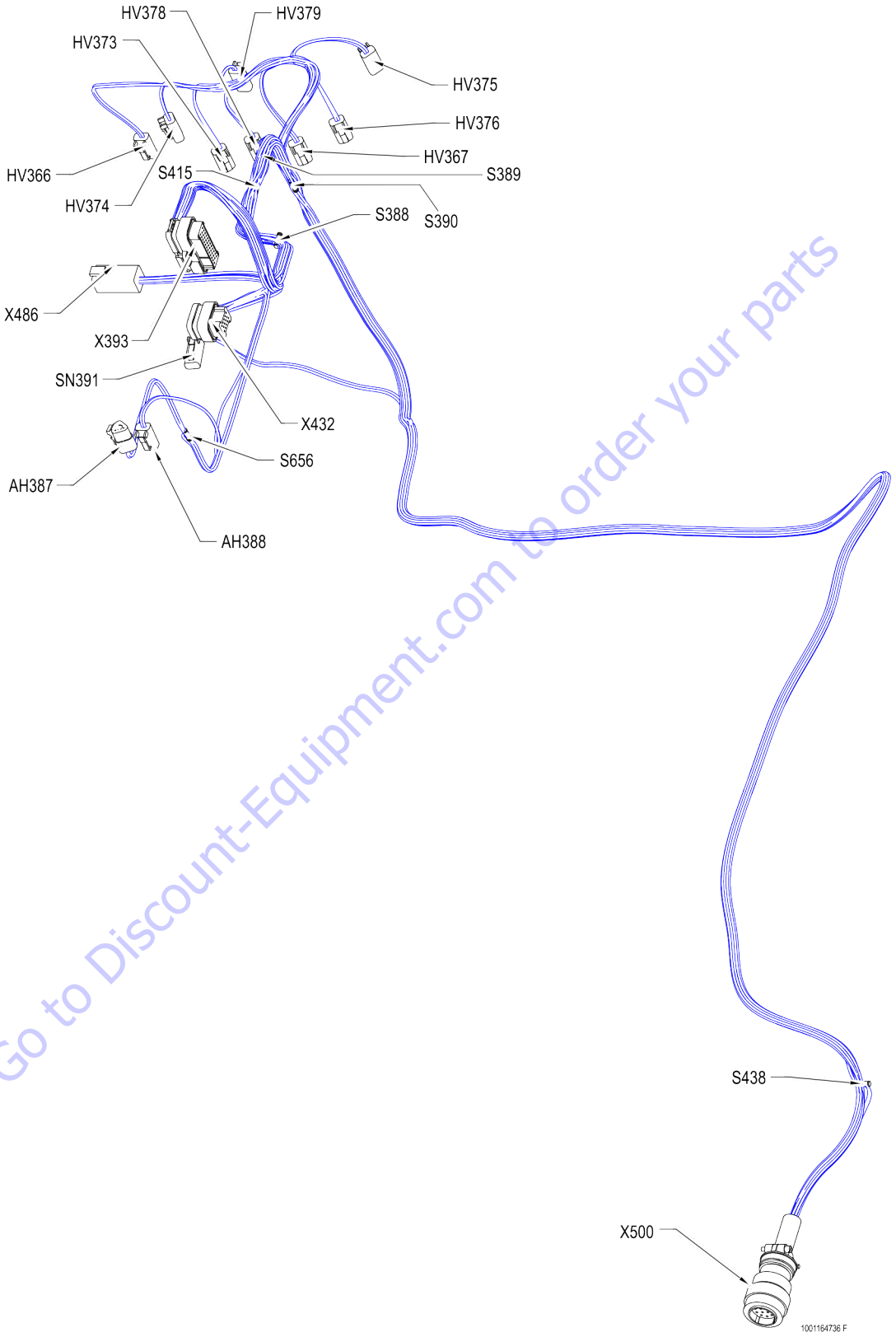





**Figure 7-77. Main Valve Harness - Sheet 8 of 8**

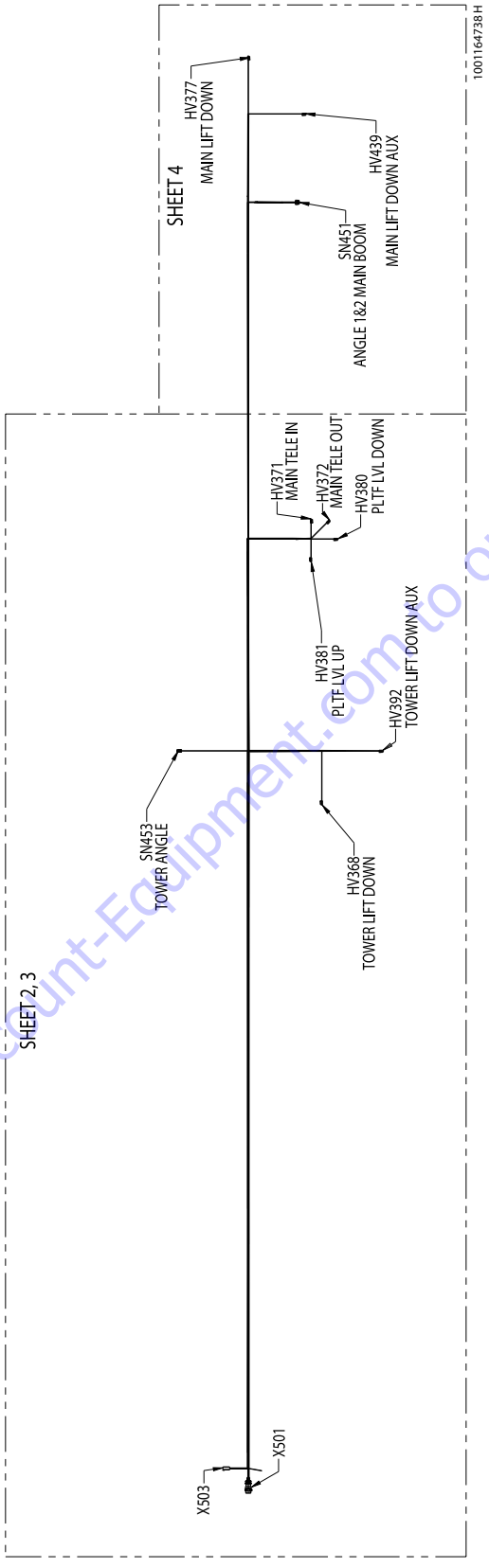





**Figure 7-78. Tower Upright Valve Harness - Sheet 1 of 5**

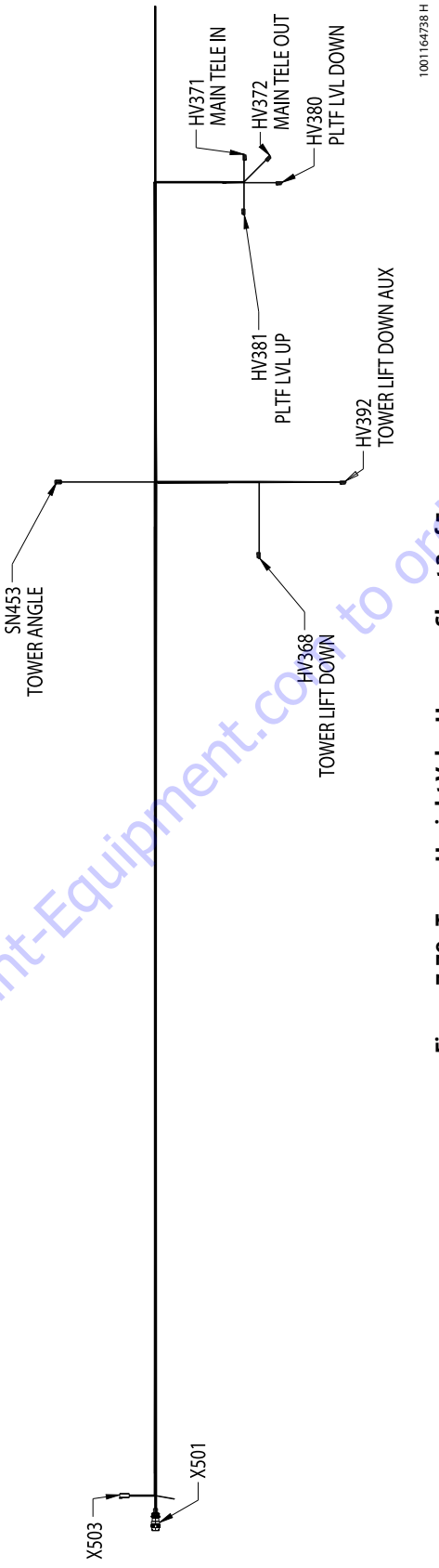



**Figure 7-79. Tower Upright Valve Harness - Sheet 2 of 5**

| X501 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | BRNBLK | CABLE 4 | 18AWG | TFFN | S465 (2) |
| B | YEL/BLK | CABLE 4 | 18AWG | TFFN | HV380 (1) |
| C | ORN/ BLK | CABLE 4 | 18AWG | TFFN | HV381 (1) |
| D | BLU/ BLK | CABLE 4 | 18AWG | TFFN | HV372 (1) |
| E | BLK/ RED | CABLE 4 | 18AWG | TFFN | HV371 (1) |
| F | | | | | |
| G | ORG | CABLE 3 | 16AWG | CABLE | HV439 (1) |
| H | BLU | CABLE 3 | 16AWG | CABLE | HV439 (2) |
| J | RED | CABLE 3 | 16AWG | CABLE | HV377 (1) |
| K | BLK | CABLE 3 | 16AWG | CABLE | HV377 (2) |
| L | BLU | CABLE 2 | 16AWG | CABLE | HV392 (1) |
| M | ORG | CABLE 2 | 16AWG | CABLE | HV392 (2) |
| N | RED | CABLE 2 | 16AWG | CABLE | HV368 (1) |
| P | BLK | CABLE 2 | 16AWG | CABLE | HV368 (2) |

| X503 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK/ RED | CABLE 5 | 18AWG | TFFN | S471 (1) |
| 2 | BLU/ BLK | CABLE 5 | 18AWG | TFFN | SN451 (C) |
| 3 | ORN/ BLK | CABLE 5 | 18AWG | TFFN | S472 (1) |
| 4 | BRN/ BLK | CABLE 5 | 18AWG | TFFN | SN451 (D) |
| 5 | WHT | CABLE 1 | 18AWG | CABLE | SN453 (2) |
| 6 | BLK | CABLE 1 | 18AWG | CABLE | SN453 (3) |

| HV392 - TOWER LIFT DOWN AUX | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLU | CABLE 2 | 16AWG | CABLE | X501 (L) |
| 2 | ORG | CABLE 2 | 16AWG | CABLE | X501 (M) |

| HV371 MAIN TELE IN | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK/ RED | CABLE 4 | 18AWG | TFFN | X501 (E) |
| 2 | BLK | 000-50-52 | 18AWG | GXL | S465 (2) |

| HV381 PLTF LVL UP | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | ORN/ BLK | CABLE 4 | 18AWG | TFFN | X501 (C) |
| 2 | BLK | 000-50-54 | 18AWG | GXL | S465 (1) |

| HV380 PLTF LVL DOWN | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL/BLK | CABLE 4 | 18AWG | TFFN | X501 (B) |
| 2 | BLK | 000-50-49 | 18AWG | GXL | S465 (1) |

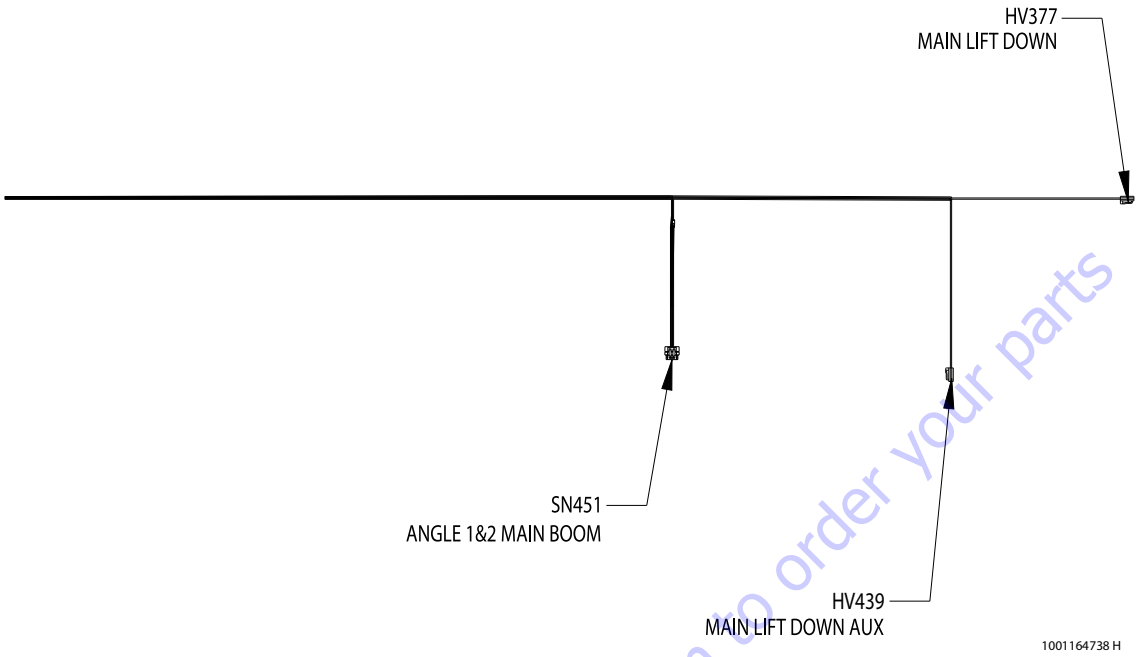
| HV372 MAIN TELE OUT | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLU/ BLK | CABLE 4 | 18AWG | TFFN | X501 (D) |
| 2 | BLK | 000-50-53 | 18AWG | GXL | S465 (1) |

| SN453 - TOWER ANGLE | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | WHT | CABLE 1 | 18AWG | CABLE | X503 (5) |
| 3 | BLK | CABLE 1 | 18 AWG | CABLE | X503 (6) |
| 4 | S | | | | |

| HV368 TOWER LIFT DOWN | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | CABLE 2 | 16AWG | CABLE | X501 (N) |
| 2 | BLK | CABLE 2 | 16AWG | CABLE | X501 (P) |



**Figure 7-80. Tower Upright Valve Harness - Sheet 3 of 5**




| SN451<br>ANGLE 1&2 MAIN BOOM | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | ORN/BLK | CABLE 5 | 18AWG | TFFN | S472 (2) |
| B | YEL/BLK | CABLE 5 | 18AWG | TFFN | S471 (2) |
| C | BLU/BLK | CABLE 5 | 18AWG | TFFN | X503 (2) |
| D | BRN/BLK | CABLE 5 | 18AWG | TFFN | X503 (4) |
| E | BLU/RED | CABLE 5 | 18AWG | TFFN | S472 (2) |
| F | BLK/RED | CABLE 5 | 18AWG | TFFN | S471 (2) |

| HV377<br>MAIN LIFT DOWN | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | CABLE 3 | 16AWG | CABLE | X501 (J) |
| 2 | BLK | CABLE 3 | 16AWG | CABLE | X501 (K) |

| HV439<br>MAIN LIFT DOWN AUX | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | ORG | CABLE 3 | 16AWG | CABLE | X501 (G) |
| 2 | BLU | CABLE 3 | 16AWG | CABLE | X501 (H) |



**Figure 7-81. Tower Upright Valve Harness - Sheet 4 of 5**

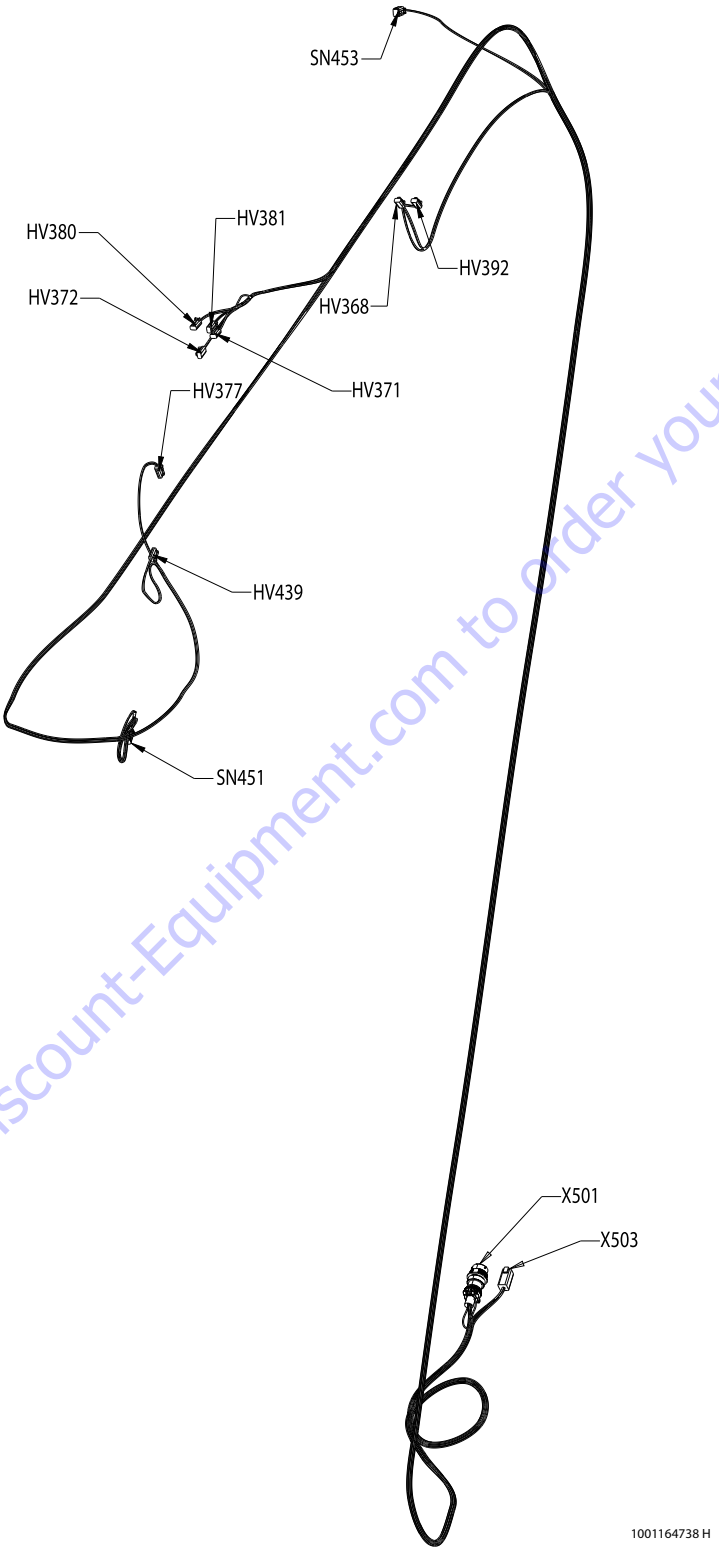





**Figure 7-82. Tower Upright Valve Harness - Sheet 5 of 5**

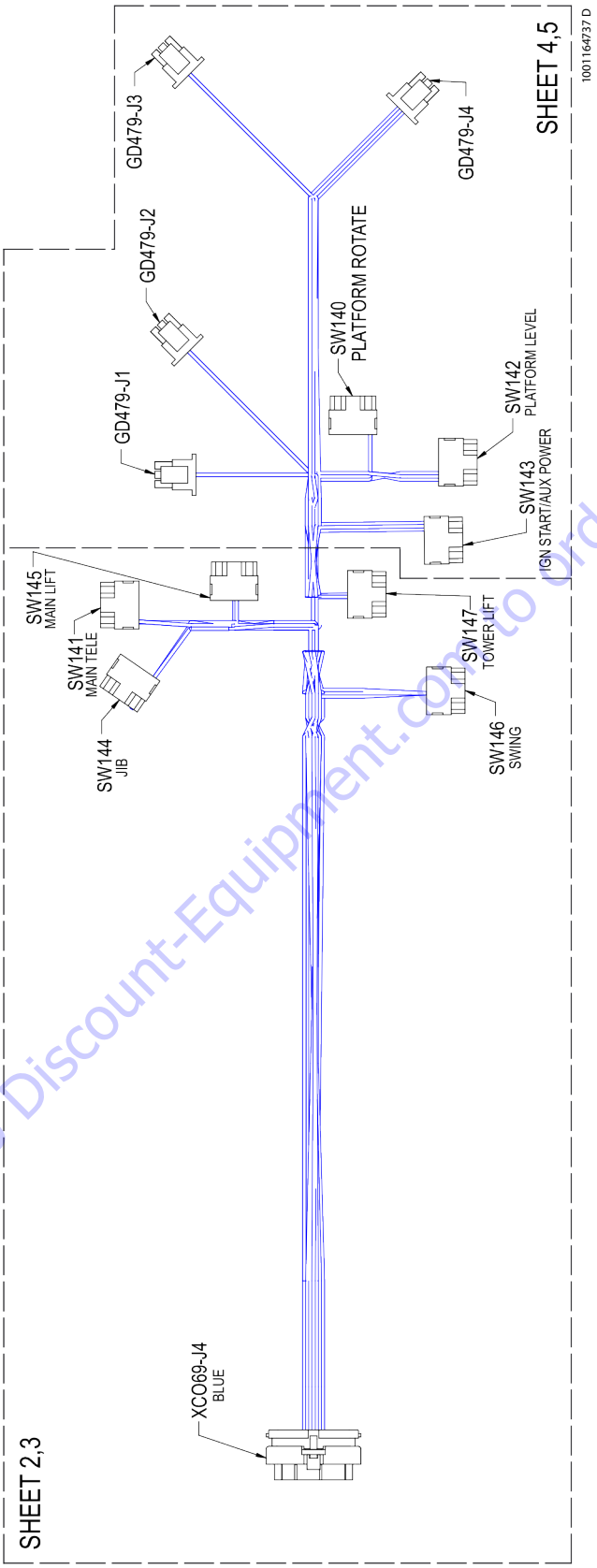



**Figure 7-83. Ground Control Panel Harness - Sheet 1 of 6**

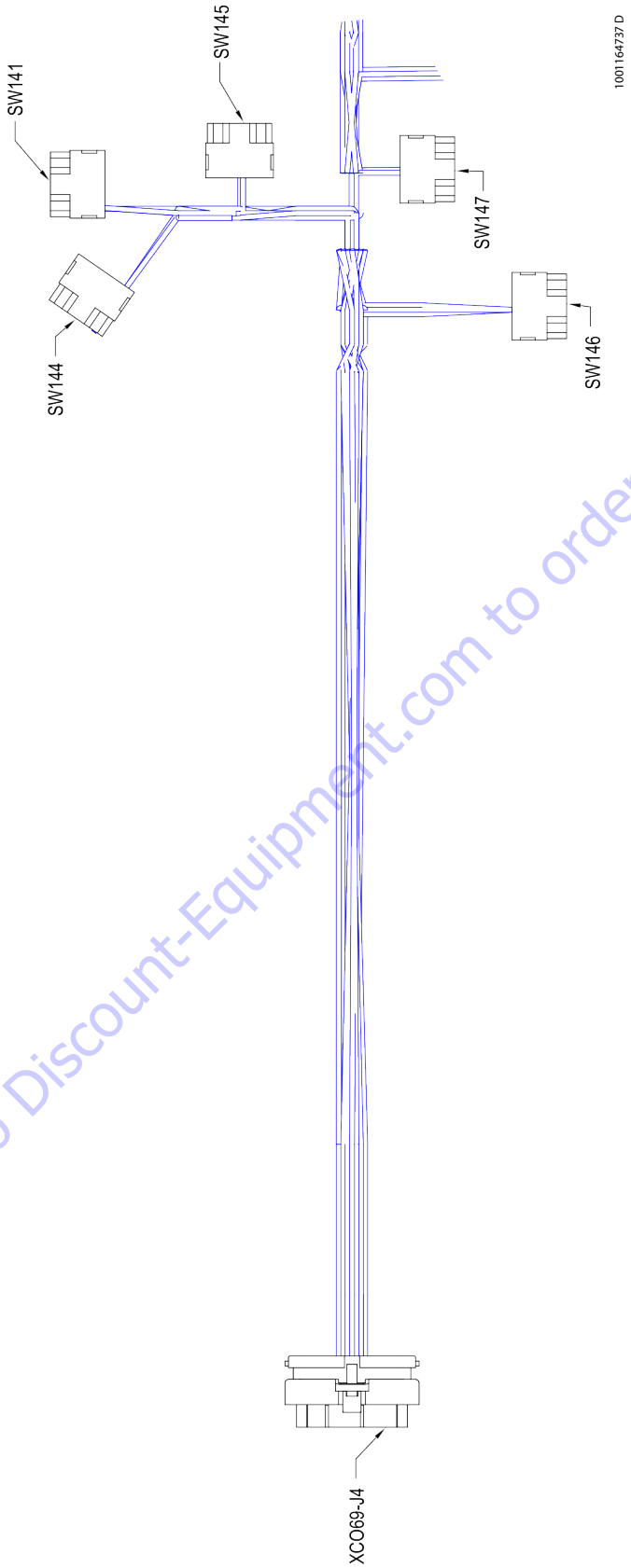



**Figure 7-84. Ground Control Panel Harness - Sheet 2 of 6**

## XCO69-J4 BLUE

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 5-23 CRIBBING ENABLED | 18 AWG | GXL | GD479-J3 (1) |
| 2 | WHT | 5-35 SYSTEM FAULT | 18 AWG | GXL | GD479-J4 (5) |
| 3 | WHT | 5-24 GLOW PLUG | 18 AWG | GXL | GD479-J2 (3) |
| 4 | WHT | 5-9 IGNITION START | 18 AWG | GXL | SW143 (3) |
| 5 | WHT | 5-6 LEVEL DOWN | 18 AWG | GXL | SW142 (1) |
| 6 | WHT | 5-4 ROTATE LEFT | 18 AWG | GXL | SW140 (1) |
| 7 | WHT | 5-1 TELE IN | 18 AWG | GXL | SW141 (1) |
| 8 | WHT | 5-11 JIB DOWN | 18 AWG | GXL | SW144 (3) |
| 9 | | | | | |
| 10 | WHT | 5-16 TOWER LIFT UP | 18 AWG | GXL | SW147 (3) |
| 11 | | | | | |
| 12 | | | | | |
| 13 | WHT | 5-40 LOW FUEL | 18 AWG | GXL | GD479-J1 (5) |
| 14 | WHT | 5-25PLATFORM OVERLOAD | 18 AWG | GXL | GD479-J3 (6) |
| 15 | | | | | |
| 16 | WHT | 5-8 AUX POWER | 18 AWG | GXL | SW143 (1) |
| 17 | WHT | 5-5 LEVEL UP | 18 AWG | GXL | SW142 (3) |
| 18 | WHT | 5-3 ROTATE RIGHT | 18 AWG | GXL | SW140 (3) |
| 19 | WHT | 5-10 JIB UP | 18 AWG | GXL | SW144 (1) |
| 20 | | | | | |
| 21 | WHT | 5-17 TOWER LIFT DOWN | 18 AWG | GXL | SW147 (1) |
| 22 | | | | | |
| 23 | WHT | 5-12 MAIN LIFT UP | 18 AWG | GXL | SW145 (3) |
| 24 | | | | | |
| 25 | WHT | 5-26 SWITCH POWER | 18 AWG | GXL | SW141 (2) |
| 26 | WHT | 5-22 NO CHARGE | 18 AWG | GXL | GD479-J4 (1) |
| 27 | | | | | |
| 28 | WHT | 5-21 ENGINE HIGH TEMPERATURE | 18 AWG | GXL | GD479-J4 (3) |
| 29 | WHT | 5-20 ENGINE LOW OIL PRESSURE | 18 AWG | GXL | GD479-J4 (2) |
| 30 | WHT | 5-2 TELE OUT | 18 AWG | GXL | SW141 (3) |
| 31 | BLK | 000-50-1 GND | 18 AWG | GXL | GD479-J2 (6) |
| 32 | BLK | 00_50_501 GND | 18 AWG | GXL | GD479-J1 (4) |
| 33 | WHT | 5-13 MAIN LIFT DOWN | 18 AWG | GXL | SW145 (1) |
| 34 | WHT | 5-15 SWING LEFT | 18 AWG | GXL | SW146 (1) |
| 35 | WHT | 5-14 SWING RIGHT | 18 AWG | GXL | SW146 (3) |

## SW141 MAIN TELE

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 5-1 TELE IN | 18 AWG | GXL | XCO69-J4 (7) |
| 2 | WHT | 5-26 SWITCH POWER | 18 AWG | GXL | XCO69-J4 (25) |
| 2 | WHT | 5-27 | 18 AWG | GXL | SW140 (2) |
| 3 | WHT | 5-2 TELE OUT | 18 AWG | GXL | XCO69-J4 (30) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

## SW145 MAIN LIFT

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 5-13 MAIN LIFT DOWN | 18 AWG | GXL | XCO69-J4 (33) |
| 2 | WHT | 5-31 | 18 AWG | GXL | SW144 (2) |
| 2 | WHT | 5-32 | 18 AWG | GXL | SW146 (2) |
| 3 | WHT | 5-12 MAIN LIFT UP | 18 AWG | GXL | XCO69-J4 (23) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

## SW147 TOWER LIFT

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 5-17 TOWER LIFT DOWN | 18 AWG | GXL | XCO69-J4 (21) |
| 2 | WHT | 5-33 | 18 AWG | GXL | SW146 (2) |
| 3 | WHT | 5-16 TOWER LIFT UP | 18 AWG | GXL | XCO69-J4 (10) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

## SW146 SWING

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 5-15 SWING LEFT | 18 AWG | GXL | XCO69-J4 (34) |
| 2 | WHT | 5-32 | 18 AWG | GXL | SW145 (2) |
| 2 | WHT | 5-33 | 18 AWG | GXL | SW147 (2) |
| 3 | WHT | 5-14 SWING RIGHT | 18 AWG | GXL | XCO69-J4 (35) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

## SW144 JIB

| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
|---|---|---|---|---|---|
| 1 | WHT | 5-10 JIB UP | 18 AWG | GXL | XCO69-J4 (19) |
| 2 | WHT | 5-30 | 18 AWG | GXL | SW143 (2) |
| 2 | WHT | 5-31 | 18 AWG | GXL | SW145 (2) |
| 3 | WHT | 5-11 JIB DOWN | 18 AWG | GXL | XCO69-J4 (8) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |



**Figure 7-85. Ground Control Panel Harness - Sheet 3 of 6**

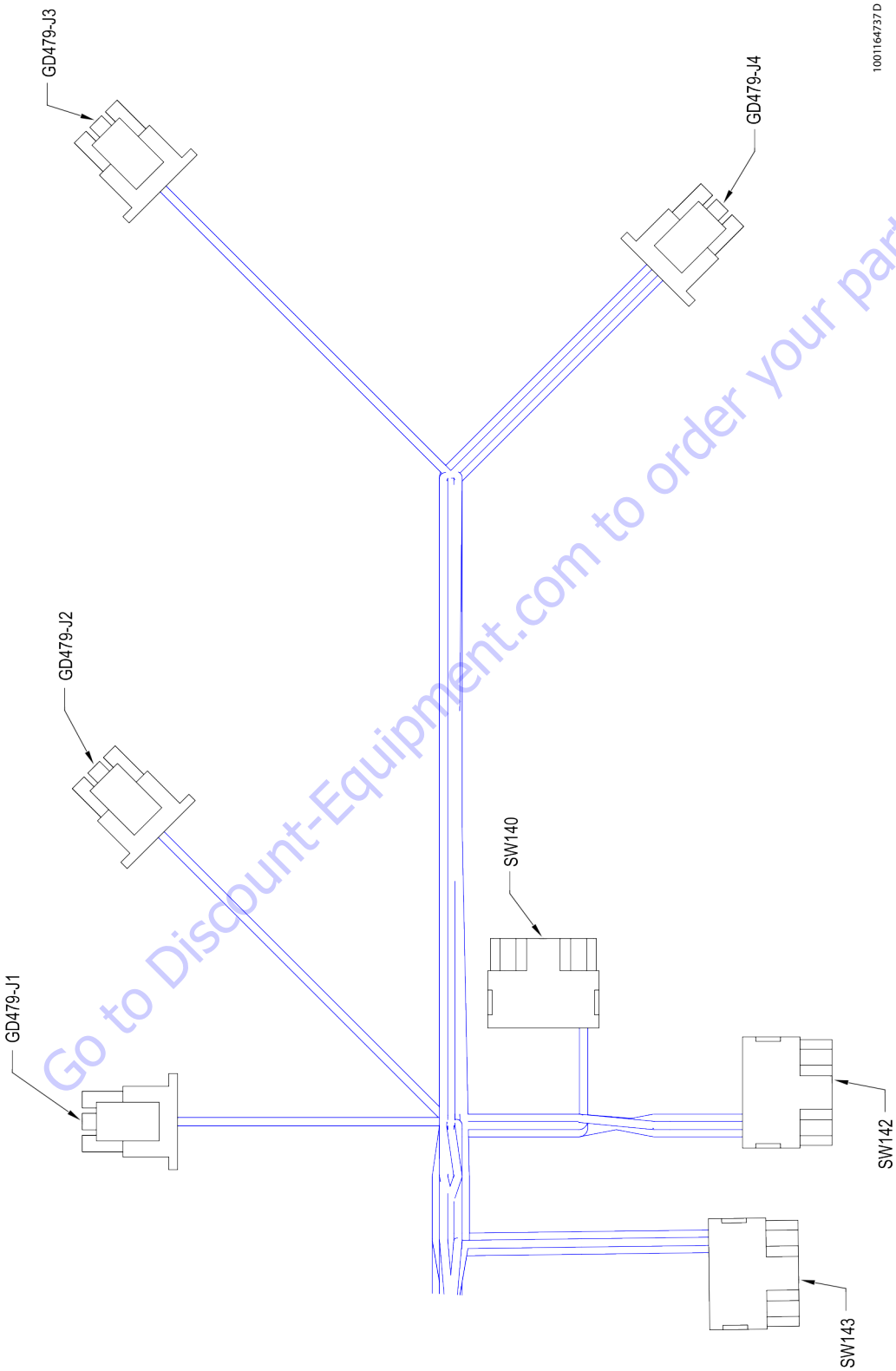



**Figure 7-86. Ground Control Panel Harness - Sheet 4 of 6**

| SW143<br>IGN START/ AUX POWER | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 5-8 AUX POWER | 18 AWG | GXL | XCO69-J4 (16) |
| 2 | WHT | 5-29 | 18 AWG | GXL | SW142 (2) |
| 2 | WHT | 5-30 | 18 AWG | GXL | SW144 (2) |
| 3 | WHT | 5-9 IGNITION START | 18 AWG | GXL | XCO69-J4 (4) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW142<br>PLATFORM LEVEL | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 5-6 LEVEL DOWN | 18 AWG | GXL | XCO69-J4 (5) |
| 2 | WHT | 5-28 | 18 AWG | GXL | SW140 (2) |
| 2 | WHT | 5-29 | 18 AWG | GXL | SW143 (2) |
| 3 | WHT | 5-5 LEVEL UP | 18 AWG | GXL | XCO69-J4 (17) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| SW140<br>PLATFORM ROTATE | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 5-4 ROTATE LEFT | 18 AWG | GXL | XCO69-J4 (6) |
| 2 | WHT | 5-27 | 18 AWG | GXL | SW141 (2) |
| 2 | WHT | 5-28 | 18 AWG | GXL | SW142 (2) |
| 3 | WHT | 5-3 ROTATE RIGHT | 18 AWG | GXL | XCO69-J4 (18) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

| GD479-J1 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | BLK | 00_50_501 GND | 18 AWG | GXL | XCO69-J4 (32) |
| 5 | WHT | 5-40 LOW FUEL | 18 AWG | GXL | XCO69-J4 (13) |
| 6 | | | | | |

| GD479-J2 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | | | | | |
| 3 | WHT | 5-24 GLOW PLUG | 18 AWG | GXL | XCO69-J4 (3) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | BLK | 000-50-1 GND | 18 AWG | GXL | XCO69-J4 (31) |

| GD479-J3 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 5-23 CRIBBING ENABLED | 18 AWG | GXL | XCO69-J4 (1) |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | WHT | 5-25PLATFORM OVERLOAD | 18 AWG | GXL | XCO69-J4 (14) |

| GD479-J4 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 5-22 NO CHARGE | 18 AWG | GXL | XCO69-J4 (26) |
| 2 | WHT | 5-20 ENGINE LOW OIL PRESSURE | 18 AWG | GXL | XCO69-J4 (29) |
| 3 | WHT | 5-21 ENGINE HIGH TEMPERATURE | 18 AWG | GXL | XCO69-J4 (28) |
| 4 | | | | | |
| 5 | WHT | 5-35 SYSTEM FAULT | 18 AWG | GXL | XCO69-J4 (2) |
| 6 | | | | | |



**Figure 7-87. Ground Control Panel Harness - Sheet 5 of 6**

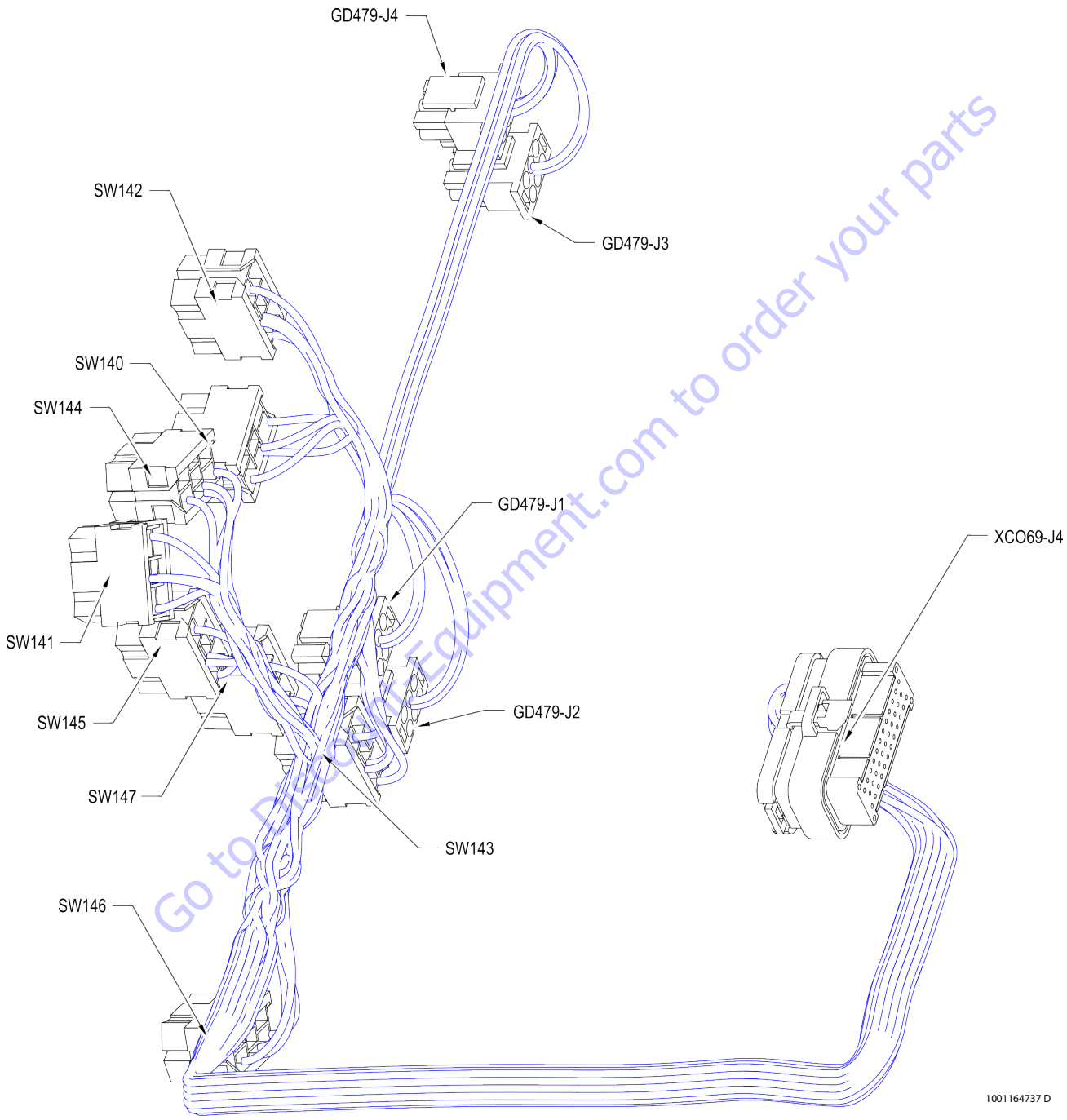
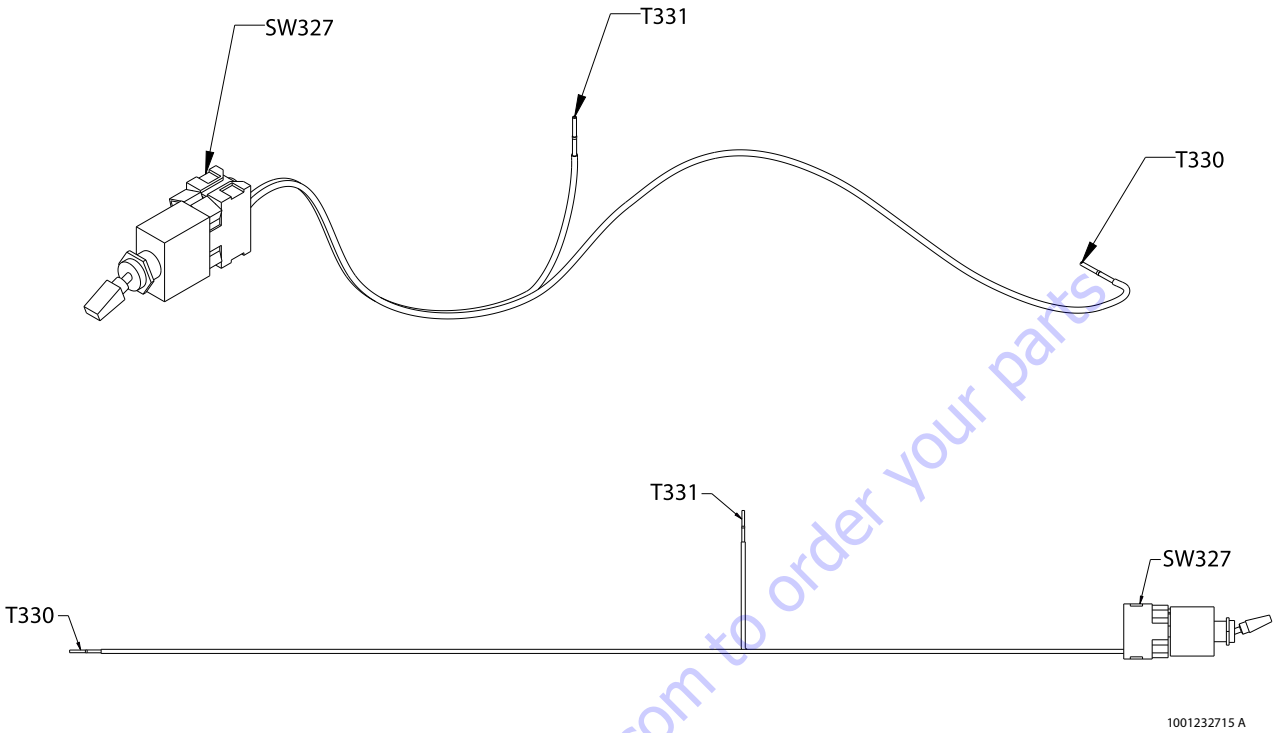





**Figure 7-88. Ground Control Panel Harness - Sheet 6 of 6**




| T330 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-105 CRIBBING | 18AWG | GXL | SW327 (3) |

| T331 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 4-31 IGN | 18AWG | GXL | SW327 (2) |

| SW327 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | YEL | 4-31 IGN | 18AWG | GXL | T331 (1) |
| 3 | WHT | 4-105 CRIBBING | 18AWG | GXL | T330 (1) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

**Figure 7-89. Cribbing Enable Harness**


| X238 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | BLK | 000-6-1 GROUND | 16AWG | TFFN | X206 (1) |
| 3 | | | | | |

| X481 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | RED | CABLE | 18AWG | CABLE | S484 (1) |
| B | BLK | CABLE | 18AWG | CABLE | S483 (2) |
| C | SHIELD | 6-50 | 18AWG | SHLD | X237 (6) |

| X237 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 6-16 | 18AWG | GXL | S240 (1) |
| 2 | WHT | 6-25 | 14AWG | GXL | RL267-86 (1) |
| 3 | RED | CABLE CAN HI | 18AWG | CABLE | S484 (1) |
| 4 | BLK | CABLE CAN LO | 18AWG | CABLE | S483 (1) |
| 5 | RED | 6-51 16AWG | 16AWG | GXL | EC255-D+ (1) *** |

| X206 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-6-1 GROUND | 16AWG | TFFN | X238 (2) |
| 2 | BLK | 000-6-3 | 18AWG | GXL | X239 (B) |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | WHT | 6-23 | 18AWG | GXL | X239 (L) |
| 11 | WHT | 6-23 | 18AWG | GXL | X239 (K) |
| 12 | RED | CABLE | 18AWG | CABLE | S484 (2) |
| 13 | BLK | CABLE CAN LO | 18AWG | CABLE | S483 (2) |
| 14 | WHT | 6-15 DIAGNOSTIC | 18AWG | GXL | S240 (2) |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |



**Figure 7-90. Deutz T4I Engine Harness - Sheet 1 of 3**

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

| RL234-86 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 6-18 GLOW | 18AWG | GXL | X238 (4) |

| EC255-D+ | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 6-51 16AWG | 16AWG | GXL | X237 (5) |

| RL267-86 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 6-25 | 14AWG | GXL | X237 (2) |

**Figure 7-91. Deutz T4I Engine Harness - Sheet 2 of 3**

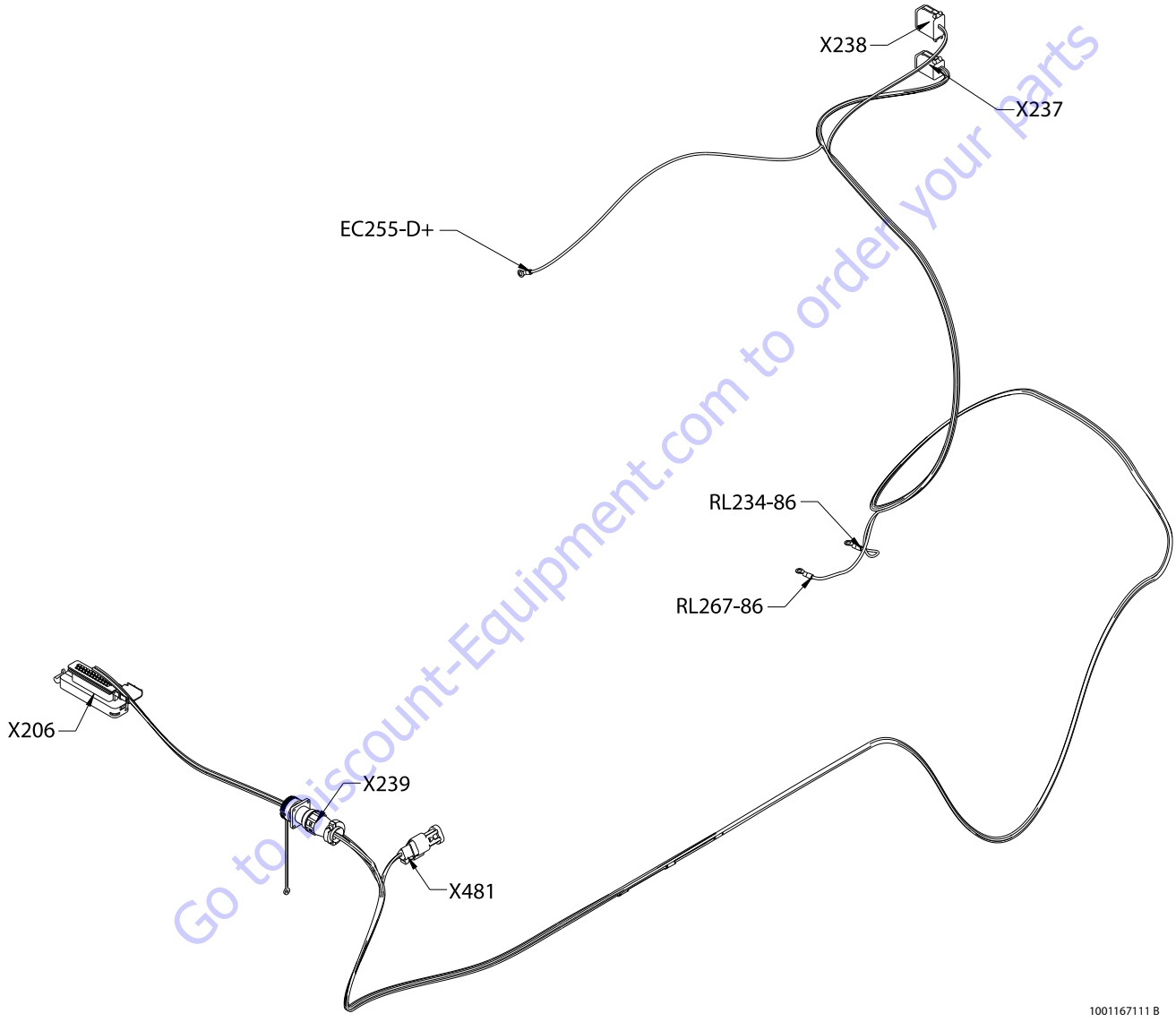





**Figure 7-92. Deutz T4I Engine Harness - Sheet 3 of 3**

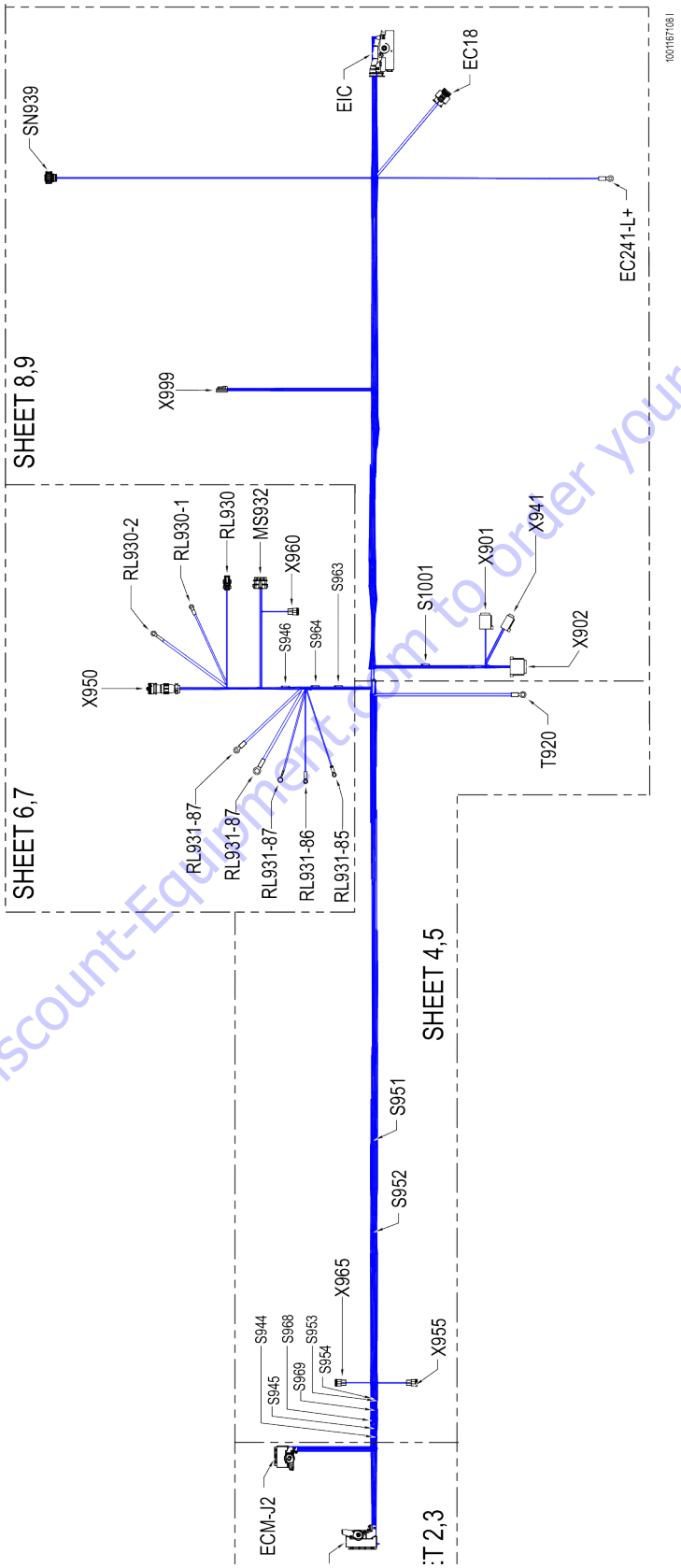





**Figure 7-93. Deutz 2.9 Harness - Sheet 1 of 12**

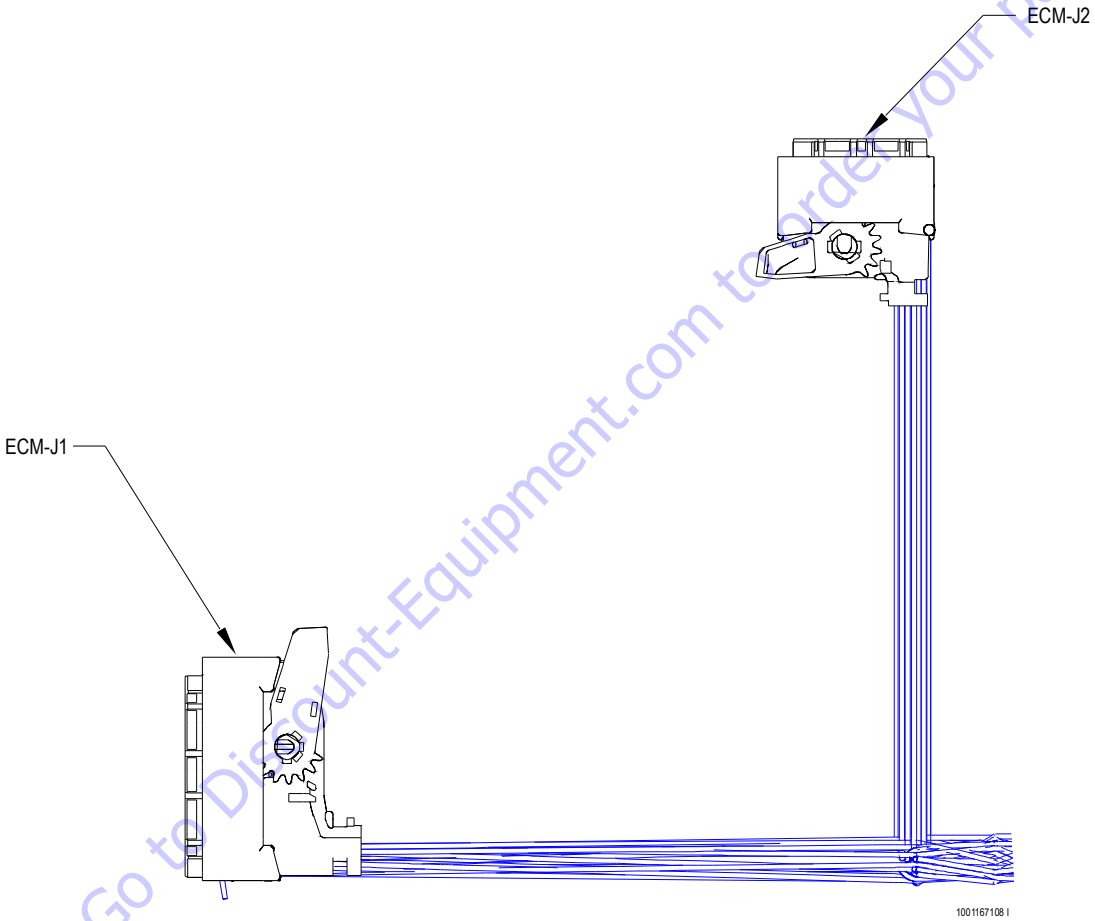





**Figure 7-94. Deutz 2.9 Harness - Sheet 2 of 12**

| ECM-J1 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 148-1 ECM PWR | 2.5 mm² | FLRYW | S944 (2) |
| 2 | BLK | 148-2 ECM GND | 2.5 mm² | FLRYW | S945 (2) |
| 3 | RED | 148-3 ECM PWR | 2.5 mm² | FLRYW | S944 (2) |
| 4 | BLK | 148-4 ECM GND | 2.5 mm² | FLRYW | S945 (2) |
| 5 | RED | 148-5 ECM PWR | 2.5 mm² | FLRYW | S944 (2) |
| 6 | BLK | 148-6 ECM GND | 2.5 mm² | FLRYW | S945 (2) |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | BLK | 148-13 COOLANT LEVEL SIG | 0.75 mm² | FLRYW | SN939 (3) |
| 14 | | | | | |
| 15 | BLK | 148-15-68 CLUTCH SWITCH | 0.75 mm² | FLRYW | ECM-J1 (68) |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |
| 26 | BLK | 148-26 FUEL PUMP RELAY CONTROL GND | 0.75 mm² | FLRYW | RL930 (2) |
| 27 | | | | | |
| 28 | BLK | 148-28 START RTN | 0.75 mm² | FLRYW | EIC (2) |
| 29 | BLK | 148-29 COOLANT LEVEL PWR | 0.75 mm² | FLRYW | SN939 (1) |
| 30 | | | | | |
| 31 | | | | | |
| 32 | | | | | |
| 33 | | | | | |
| 34 | | | | | |
| 35 | BLK | 148-35-2 START | 0.75 mm² | FLRYW | S1001 (1) |
| 36 | | | | | |
| 37 | | | | | |
| 38 | BLK | 148-38 THROTTLE FLAP 4 | 0.75 mm² | FLRYW | EIC (52) |
| 39 | | | | | |
| 40 | | | | | |
| 41 | | | | | |
| 42 | | | | | |
| 43 | | | | | |
| 44 | BLK | 148-44 EHXAUST GAS RECIRCULATION | 0.75 mm² | FLRYW | EIC (50) |
| 45 | | | | | |
| 46 | | | | | |
| 47 | | | | | |
| 48 | | | | | |
| 49 | | | | | |
| 50 | | | | | |
| 51 | | | | | |
| 52 | | | | | |
| 53 | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | S968 (1) |
| 54 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | S953 (1) |
| 55 | | | | | |
| 56 | BLK | 148-56 AIR INLET TEMP | 0.75 mm² | FLRYW | EIC (34) |
| 57 | BLK | 148-57 WATER IN FUEL SW RTN | 0.75 mm² | FLRYW | X941 (2) |
| 58 | | | | | |
| 59 | | | | | |
| 60 | | | | | |
| 61 | BLK | 148-61 FUEL LOW PRESSURE | 0.75 mm² | FLRYW | EIC (17) |
| 62 | | | | | |
| 63 | | | | | |
| 64 | BLK | 148-64 WATER IN FUEL SW | 0.75 mm² | FLRYW | X941 (1) |
| 65 | | | | | |
| 66 | | | | | |
| 67 | | | | | |
| 68 | BLK | 148-15-68 CLUTCH SWITCH | 0.75 mm² | FLRYW | ECM-J1 (15) |
| 69 | | | | | |
| 70 | | | | | |
| 71 | | | | | |
| 72 | BLK | 148-72 THROTTLE FLAP 3 | 0.75 mm² | FLRYW | EIC (49) |
| 73 | BLK | 148-73 START SIG | 0.75 mm² | FLRYW | EIC (3) |
| 74 | | | | | |
| 75 | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | S969 (1) |
| 76 | GRN | CAN 1 LO CUSTOMER CAN LOW | 18 AWG | J1939 CABLE | S954 (1) |
| 77 | | | | | |
| 78 | | | | | |
| 79 | | | | | |
| 80 | | | | | |
| 81 | | | | | |
| 82 | BLK | 148-82 EHXAUST GAS RECIRCULATION | 0.75 mm² | FLRYW | EIC (51) |
| 83 | | | | | |
| 84 | | | | | |
| 85 | BLK | 148-85 EHXAUST GAS RECIRCULATION | 0.75 mm² | FLRYW | EIC (46) |
| 86 | | | | | |
| 87 | BLK | 148-87 COOLANT LEVEL GND | 0.75 mm² | FLRYW | SN939 (2) |
| 88 | BLK | 148-88 IGNITION | 0.75 mm² | FLRYW | S946 (2) |
| 89 | | | | | |
| 90 | | | | | |
| 91 | | | | | |
| 92 | | | | | |
| 93 | | | | | |
| 94 | | | | | |
| NC | SHLD | CAN 1 SHLDCUSTOMER CAN SHIELD | 18 AWG | J1939 CABLE | X901 (6) |

| ECM-J2 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | BLK | 248-2 INJECTOR 3 | 1.5 mm² | FLRYW | EIC (61) |
| 3 | BLK | 248-3 INJECTOR 2 | 1.5 mm² | FLRYW | EIC (41) |
| 4 | BLK | 248-4 MPROP ACTUATOR | 1.5 mm² | FLRYW | EIC (19) |
| 5 | BLK | 248-5 MPROP ACTUATOR | 1.5 mm² | FLRYW | EIC (20) |
| 6 | | | | | |
| 7 | BLK | 248-7 RAIL PRESSURE FUEL | 0.75 mm² | FLRYW | EIC (32) |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | BLK | 248-16 INJECTOR 1 | 1.5 mm² | FLRYW | EIC (35) |
| 17 | | | | | |
| 18 | BLK | 248-18 INJECTOR 4 | 1.5 mm² | FLRYW | EIC (37) |
| 19 | BLK | 248-19 EHXAUST GAS RECIRCULATION | 1.5 mm² | FLRYW | EIC (47) |
| 20 | BLK | 248-20 EHXAUST GAS RECIRCULATION | 1.5 mm² | FLRYW | EIC (48) |
| 21 | | | | | |
| 22 | | | | | |
| 23 | BLK | 248-23 GLOW SENSE | 0.75 mm² | FLRYW | MS932 (E) |
| 24 | BLK | 248-24 BOOST PRESSURE / TEMP | 0.75 mm² | FLRYW | EIC (22) |
| 25 | BLK | 248-25 RAIL PRESSURE FUEL | 0.75 mm² | FLRYW | EIC (31) |
| 26 | BLK | 248-26 RAIL PRESSURE FUEL | 0.75 mm² | FLRYW | EIC (25) |
| 27 | BLK | 248-27 BOOST PRESSURE / TEMP | 0.75 mm² | FLRYW | EIC (29) |
| 28 | BLK | 248-28 COOLING TEMPERATURE | 0.75 mm² | FLRYW | EIC (24) |
| 29 | BLK | 248-29 OIL PRESSURE | 0.75 mm² | FLRYW | EIC (27) |
| 30 | | | | | |
| 31 | | | | | |
| 32 | BLK | 248-32 INJECTOR 3 | 1.5 mm² | FLRYW | EIC (38) |
| 33 | BLK | 248-33 INJECTOR 1 | 1.5 mm² | FLRYW | EIC (62) |
| 34 | | | | | |
| 35 | BLK | 248-35 GLOW RELAY CONTROL GND | 0.75 mm² | FLRYW | RL931-85 (1) |
| 36 | | | | | |
| 37 | BLK | 248-37 ENGINE SPEED CAMSHAFT | 18 AWG | CABLE | EIC (14) |
| 38 | SHLD | 248-38 ENGINE SPEED CRANKSHAFT | 18 AWG | CABLE | EIC (1) |
| 39 | BLK | 248-39 ENGINE SPEED CRANKSHAFT | 18 AWG | CABLE | EIC (15) |
| 40 | BLK | 248-40 AIR INLET TEMP | 0.75 mm² | FLRYW | EIC (28) |
| 41 | | | | | |
| 42 | | | | | |
| 43 | BLK | 248-43 OIL PRESSURE | 0.75 mm² | FLRYW | EIC (23) |
| 44 | BLK | 248-44 OIL PRESSURE | 0.75 mm² | FLRYW | EIC (26) |
| 45 | | | | | |
| 46 | BLK | 248-46 INJECTOR 2 | 1.5 mm² | FLRYW | EIC (40) |
| 47 | | | | | |
| 48 | BLK | 248-48 INJECTOR 4 | 1.5 mm² | FLRYW | EIC (42) |
| 49 | | | | | |
| 50 | | | | | |
| 51 | | | | | |
| 52 | WHT | 248-52 ENGINE SPEED CAMSHAFT | 18 AWG | CABLE | EIC (13) |
| 53 | SHLD | 248-53 ENGINE SPEED CAMSHAFT | 18 AWG | CABLE | EIC (9) |
| 54 | WHT | 248-54 ENGINE SPEED CRANKSHAFT | 18 AWG | CABLE | EIC (21) |
| 55 | | | | | |
| 56 | | | | | |
| 57 | | | | | |
| 58 | | | | | |
| 59 | | | | | |
| 60 | | | | | |



**Figure 7-95. Deutz 2.9 Harness - Sheet 3 of 12**

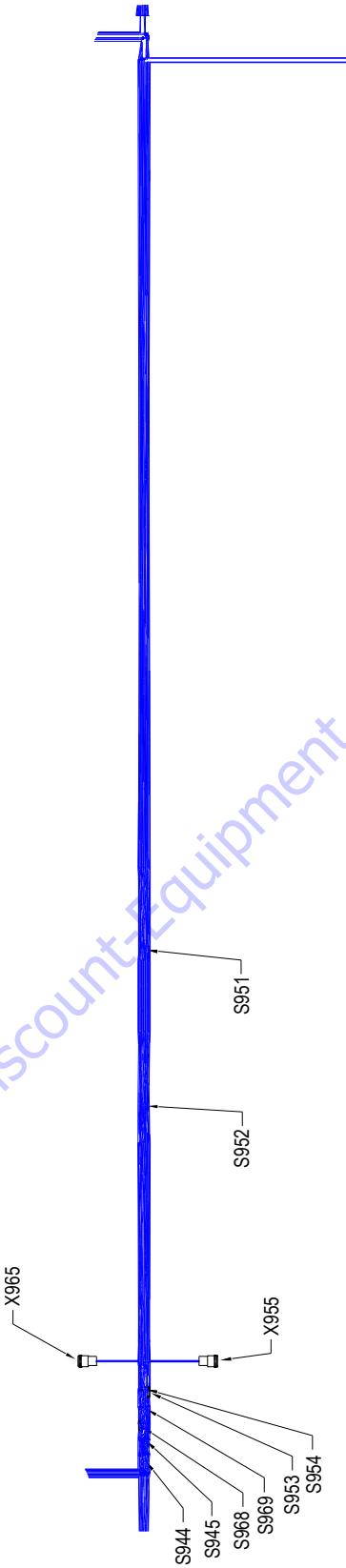





**Figure 7-96. Deutz 2.9 Harness - Sheet 4 of 12**

| S951 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | S953 (2) |
| 2 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | X901 (3) |
| 2 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | X950 (M) |

| S952 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | GRN | CAN 1 LO CUSTOMER CAN LOW | 18 AWG | J1939 CABLE | S954 (2) |
| 2 | GRN | CAN 1 LO CUSTOMER CAN LO | 18 AWG | J1939 CABLE | X901 (4) |
| 2 | GRN | CAN 1 LO CUSTOMER CAN LO | 18 AWG | J1939 CABLE | X950 (F) |

| S968 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | ECM-J1 (53) |
| 2 | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | S963 (1) |
| 2 | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | X965 (B) |

| S969 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | ECM-J1 (75) |
| 2 | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | S964 (1) |
| 2 | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | X965 (A) |

| S953 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | ECM-J1 (54) |
| 2 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | S951 (1) |
| 2 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | X955 (A) |

| S954 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | GRN | CAN 1 LO CUSTOMER CAN LOW | 18 AWG | J1939 CABLE | ECM-J1 (76) |
| 2 | GRN | CAN 1 LO CUSTOMER CAN LOW | 18 AWG | J1939 CABLE | S952 (1) |
| 2 | GRN | CAN 1 LO CUSTOMER CAN LOW | 18 AWG | J1939 CABLE | X955 (B) |

| X955 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | S953 (2) |
| B | GRN | CAN 1 LOCUSTOMER CAN LOW | 18 AWG | J1939 CABLE | S954 (2) |
| C | | | | | |

| X965 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | S969 (2) |
| B | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | S968 (2) |
| C | | | | | |

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

| S944 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 1-148-135 ECM PWR | 8 AWG | GXL | RL930-2 (1) |
| 2 | RED | 148-1 ECM PWR | 2.5 mm² | FLRYW | ECM-J1 (1) |
| 2 | RED | 148-3 ECM PWR | 2.5 mm² | FLRYW | ECM-J1 (3) |
| 2 | RED | 148-5 ECM PWR | 2.5 mm² | FLRYW | ECM-J1 (5) |

| S945 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-148-246 ECM GND | 8 AWG | GXL | T920 (1) |
| 2 | BLK | 148-2 ECM GND | 2.5 mm² | FLRYW | ECM-J1 (2) |
| 2 | BLK | 148-4 ECM GND | 2.5 mm² | FLRYW | ECM-J1 (4) |
| 2 | BLK | 148-6 ECM GND | 2.5 mm² | FLRYW | ECM-J1 (6) |



**Figure 7-97. Deutz 2.9 Harness - Sheet 5 of 12**

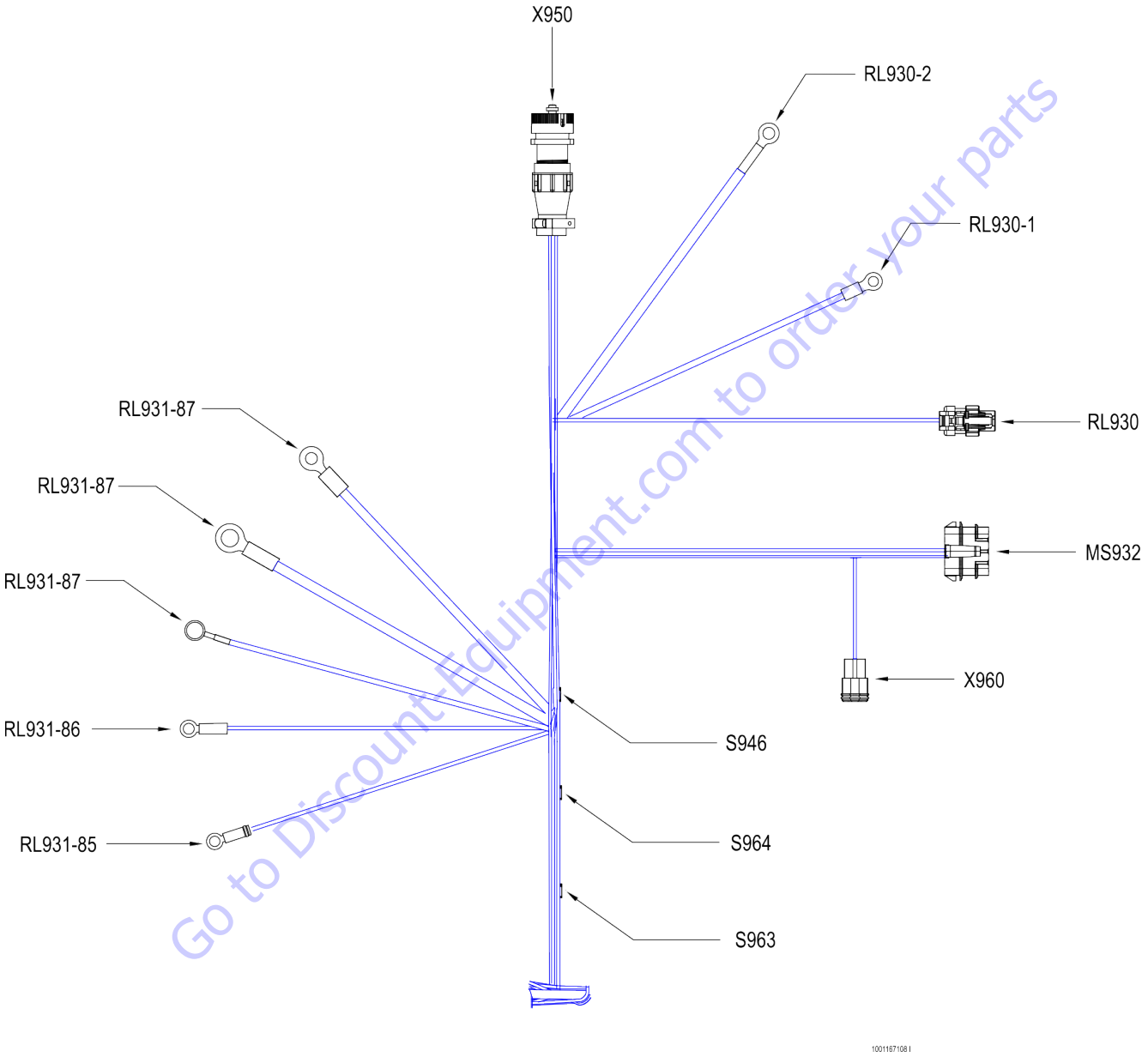





**Figure 7-98. Deutz 2.9 Harness - Sheet 6 of 12**

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

| S946 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 2-48-1 IGNITION | 16 AWG | GXL | MS932 (H) |
| 1 | YEL | 2-48-2 IGNITION | 18 AWG | GXL | X950 (A) |
| 2 | YEL | 2-48-3 IGNITION | 18 AWG | GXL | RL931-86 (1) |
| 2 | YEL | 2-48-4 IGNITION | 18 AWG | GXL | RL930 (1) |
| 2 | BLK | 148-88 IGNITION | 0.75 mm² | FLRYW | ECM-J1 (88) |

| MS932 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | | | | | |
| B | | | | | |
| C | | | | | |
| D | | | | | |
| E | BLK | 248-23 GLOW SENSE | 0.75 mm² | FLRYW | ECM-J2 (23) |
| F | ORG | 248-23-1 GLOW SENSE | 18 AWG | GXL | RL931-87 (1) |
| G | YEL | 2-1-99 IGNITION | 18 AWG | GXL | X902 (1) |
| H | YEL | 2-48-1 IGNITION | 16 AWG | GXL | S946 (1) |

| S964 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | S969 (2) |
| 2 | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | X950 (H) |
| 2 | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | X960 (A) |

| S963 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | S968 (2) |
| 2 | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | X950 (G) |
| 2 | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | X960 (B) |

| RL930 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 2-48-4 | 18 AWG | GXL | S946 (2) |
| 2 | BLK | 148-26 | 0.75 mm² | FLRYW | ECM-J1 (26) |

| RL930-2 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 1-148-135 ECM PWR | 8 AWG | GXL | S944 (1) |

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

| RL931-85 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 248-35 GLOW RELAY CONTROL GND | 0.75 mm² | FLRYW | ECM-J2 (35) |

| RL931-87 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | ORG | 248-23-1 GLOW SENSE | 18 AWG | GXL | MS932 (F) |

| RL931-87 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 48-13 GLOW | 8 AWG | GXL | EC18 (1) |

| RL931-87 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 48-14 GLOW | 8 AWG | GXL | EC18 (2) |

| RL931-86 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 2-48-3 IGNITION | 18 AWG | GXL | S946 (2) |

| X960 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | YEL | CAN 2 HI DIAG CAN HIGH | 18 AWG | J1939 CABLE | S964 (2) |
| B | GRN | CAN 2 LO DIAG CAN LOW | 18 AWG | J1939 CABLE | S963 (2) |
| C | | | | | |



**Figure 7-99. Deutz 2.9 Harness - Sheet 7 of 12**

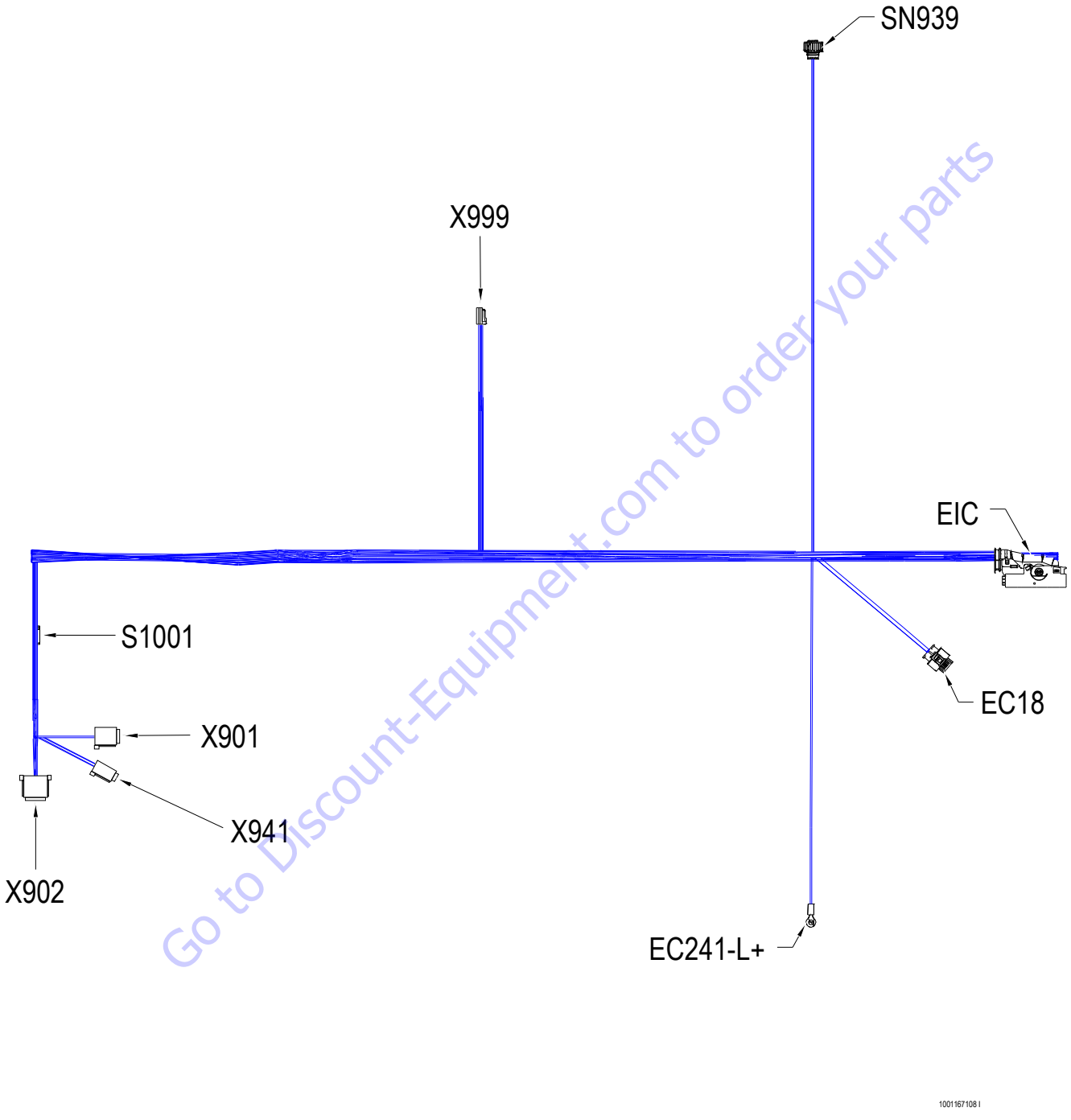





**Figure 7-100. Deutz 2.9 Harness - Sheet 8 of 12**

| EIC | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | SHLD | 248-38 | 18 AWG | CABLE | ECM-J2 (38) |
| 2 | BLK | 148-28 | 0.75 mm² | FLRYW | ECM-J1 (28) |
| 3 | BLK | 148-73 | 0.75 mm² | FLRYW | ECM-J1 (73) |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | SHLD | 248-53 | 18 AWG | CABLE | ECM-J2 (53) |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | WHT | 248-52 | 18 AWG | CABLE | ECM-J2 (52) |
| 14 | BLK | 248-37 | 18 AWG | CABLE | ECM-J2 (37) |
| 15 | BLK | 248-39 | 18 AWG | CABLE | ECM-J2 (39) |
| 16 | | | | | |
| 17 | BLK | 148-61 | 0.75 mm² | FLRYW | ECM-J1 (61) |
| 18 | | | | | |
| 19 | BLK | 248-4 | 1.5 mm² | FLRYW | ECM-J2 (4) |
| 20 | BLK | 248-5 | 1.5 mm² | FLRYW | ECM-J2 (5) |
| 21 | WHT | 248-54 | 18 AWG | CABLE | ECM-J2 (54) |
| 22 | BLK | 248-24 | 0.75 mm² | FLRYW | ECM-J2 (24) |
| 23 | BLK | 248-43 | 0.75 mm² | FLRYW | ECM-J2 (43) |
| 24 | BLK | 248-28 | 0.75 mm² | FLRYW | ECM-J2 (28) |
| 25 | BLK | 248-26 | 0.75 mm² | FLRYW | ECM-J2 (26) |
| 26 | BLK | 248-44 | 0.75 mm² | FLRYW | ECM-J2 (44) |
| 27 | BLK | 248-29 | 0.75 mm² | FLRYW | ECM-J2 (29) |
| 28 | BLK | 248-40 | 0.75 mm² | FLRYW | ECM-J2 (40) |
| 29 | BLK | 248-27 | 0.75 mm² | FLRYW | ECM-J2 (27) |
| 30 | | | | | |
| 31 | BLK | 248-25 | 0.75 mm² | FLRYW | ECM-J2 (25) |
| 32 | BLK | 248-7 | 0.75 mm² | FLRYW | ECM-J2 (7) |
| 33 | | | | | |
| 34 | BLK | 148-56 | 0.75 mm² | FLRYW | ECM-J1 (56) |
| 35 | BLK | 248-16 | 1.5 mm² | FLRYW | ECM-J2 (16) |
| 36 | | | | | |
| 37 | BLK | 248-18 | 1.5 mm² | FLRYW | ECM-J2 (18) |
| 38 | BLK | 248-32 | 1.5 mm² | FLRYW | ECM-J2 (32) |
| 39 | | | | | |
| 40 | BLK | 248-46 | 1.5 mm² | FLRYW | ECM-J2 (46) |
| 41 | BLK | 248-3 | 1.5 mm² | FLRYW | ECM-J2 (3) |
| 42 | BLK | 248-48 | 1.5 mm² | FLRYW | ECM-J2 (48) |
| 43 | | | | | |
| 44 | | | | | |
| 45 | | | | | |
| 46 | BLK | 148-85 | 0.75 mm² | FLRYW | ECM-J1 (85) |
| 47 | BLK | 248-19 | 1.5 mm² | FLRYW | ECM-J2 (19) |
| 48 | BLK | 248-20 | 1.5 mm² | FLRYW | ECM-J2 (20) |
| 49 | BLK | 148-72 | 0.75 mm² | FLRYW | ECM-J1 (72) |
| 50 | BLK | 148-44 | 0.75 mm² | FLRYW | ECM-J1 (44) |
| 51 | BLK | 148-82 | 0.75 mm² | FLRYW | ECM-J1 (82) |
| 52 | BLK | 148-38 | 0.75 mm² | FLRYW | ECM-J1 (38) |
| 53 | | | | | |
| 54 | | | | | |
| 55 | | | | | |
| 56 | | | | | |
| 57 | | | | | |
| 58 | | | | | |
| 59 | | | | | |
| 60 | | | | | |
| 61 | BLK | 248-2 | 1.5 mm² | FLRYW | ECM-J2 (2) |
| 62 | BLK | 248-33 | 1.5 mm² | FLRYW | ECM-J2 (33) |

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

| S1001 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 148-35-2 START | 0.75 mm² | FLRYW | ECM-J1 (35) |
| 1 | BLK | 148-35-3 - | 18 AWG | GXL | X999 (1) |
| 2 | BLK | 148-35-1 START | 18 AWG | GXL | X901 (2) |

| X941 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 148-64 WATER IN FUEL SW | 0.75 mm² | FLRYW | ECM-J1 (64) |
| 2 | BLK | 148-57 WATER IN FUEL SW RTN | 0.75 mm² | FLRYW | ECM-J1 (57) |
| 3 | WHT | 48-96 FUEL PUMP | 14 AWG | GXL | RL930-1 (1) |
| 4 | BLK | 000-48-1 ENG GND | 14 AWG | GXL | T920 (1) |

| X902 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | YEL | 2-1-99 IGNITION | 18 AWG | GXL | MS932 (G) |

| X901 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | | | | | |
| 2 | BLK | 148-35-1 START | 18 AWG | GXL | S1001 (2) |
| 3 | YEL | CAN 1 HI CUSTOMER CAN HIGH | 18 AWG | J1939 CABLE | S951 (2) |
| 4 | GRN | CAN 1 LO CUSTOMER CAN LO | 18 AWG | J1939 CABLE | S952 (2) |
| 5 | RED | 47-8 ALT EXCITE | 16 AWG | GXL | EC241-L+ (1) |
| 6 | SHLD | CAN 1 SHLD CUSTOMER CAN SHIELD | 18 AWG | J1939 CABLE | ECM-J1 (NC) |

| EC241-L+ | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 47-8 ALT EXCITE | 16 AWG | GXL | X901 (5) |

| EC18 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | RED | 48-13 GLOW | 8 AWG | GXL | RL931-87 (1) |
| 2 | RED | 48-14 GLOW | 8 AWG | GXL | RL931-87 (1) |

| SN939 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 148-29 COOLANT LEVEL PWR | 0.75 mm² | FLRYW | ECM-J1 (29) |
| 2 | BLK | 148-87 COOLANT LEVEL GND | 0.75 mm² | FLRYW | ECM-J1 (87) |
| 3 | BLK | 148-13 COOLANT LEVEL SIG | 0.75 mm² | FLRYW | ECM-J1 (13) |
| 4 | | | | | |



**Figure 7-101. Deutz 2.9 Harness - Sheet 9 of 12**

| WIRE NO | COLOR | WIRE GAUGE | JACKET | LENGTH (mm) | FROM | | TO | |
|---|---|---|---|---|---|---|---|---|
| | | | | | REFERENCE | PIN | REFERENCE | PIN |
| 000-148-246 ECM GND | BLK | 8 | GXL | 85 | T920 | 1 | S945 | 1 |
| 000-48-1 ENG GND | BLK | 14 | GXL | 17 | T920 | 1 | X941 | 4 |
| 000-48-2 ENG GND | BLK | 18 | GXL | 22 | T920 | 1 | X950 | B |
| 000-48-3 GND | BLK | 18 | GXL | 40 | T920 | 1 | X999 | 2 |
| 1-148-135 ECM PWR | RED | 8 | GXL | 96 | RL930-2 | 1 | S944 | 1 |
| 2-1-99 IGNITION | YEL | 18 | GXL | 26 | MS932 | G | X902 | 1 |
| 2-48-1 IGNITION | YEL | 16 | GXL | 11 | MS932 | H | S946 | 1 |
| 2-48-2 IGNITION | YEL | 18 | GXL | 8 | X950 | A | S946 | 1 |
| 2-48-3 IGNITION | YEL | 18 | GXL | 10 | RL931-86 | 1 | S946 | 2 |
| 2-48-4 IGNITION | YEL | 18 | GXL | 13 | RL930 | 1 | S946 | 2 |
| 47-8 ALT EXCITE | RED | 16 | GXL | 74 | EC241-L+ | 1 | X901 | 5 |
| 48-14 GLOW | RED | 8 | GXL | 65 | RL931-87 | 1 | EC18 | 2 |
| 48-96 FUEL PUMP | WHT | 14 | GXL | 25 | RL930-1 | 1 | X941 | 3 |
| 148-13 COOLANT LEVEL SIG | BLK | 0.75 | FLRYW | 165 | ECM-J1 | 13 | SN939 | 3 |
| 148-15-68 CLUTCH SWITCH | BLK | 0.75 | FLRYW | 1 | ECM-J1 | 15 | ECM-J1 | 68 |
| 148-1 ECM PWR | RED | 2.5 | FLRYW | 11 | S944 | 2 | ECM-J1 | 1 |
| 148-26 FUEL PUMP RELAY CONTROL GND | BLK | 0.75 | FLRYW | 109 | RL930 | 2 | ECM-J1 | 26 |
| 148-28 START RTN | BLK | 0.75 | FLRYW | 149 | ECM-J1 | 28 | EIC | 2 |
| 148-29 COOLANT LEVEL PWR | BLK | 0.75 | FLRYW | 166 | ECM-J1 | 29 | SN939 | 1 |
| 148-2 ECM GND | BLK | 2.5 | FLRYW | 12 | S945 | 2 | ECM-J1 | 2 |
| 148-35-1 START | BLK | 18 | GXL | 5 | X901 | 2 | S1001 | 2 |
| 148-35-2 START | BLK | 0.75 | FLRYW | 93 | ECM-J1 | 35 | S1001 | 1 |
| 148-35-3 - | BLK | 18 | GXL | 33 | S1001 | 1 | X999 | 1 |
| 148-38 THROTTLE FLAP 4 | BLK | 0.75 | FLRYW | 148 | EIC | 52 | ECM-J1 | 38 |
| 148-3 ECM PWR | RED | 2.5 | FLRYW | 11 | ECM-J1 | 3 | S944 | 2 |
| 148-44 EHXAUST GAS RECIRCULATION | BLK | 0.75 | FLRYW | 149 | EIC | 50 | ECM-J1 | 44 |
| 148-4 ECM GND | BLK | 2.5 | FLRYW | 12 | ECM-J1 | 4 | S945 | 2 |
| 148-56 AIR INLET TEMP | BLK | 0.75 | FLRYW | 148 | EIC | 34 | ECM-J1 | 56 |
| 148-57 WATER IN FUEL SW RTN | BLK | 0.75 | FLRYW | 98 | X941 | 2 | ECM-J1 | 57 |
| 148-5 ECM PWR | RED | 2.5 | FLRYW | 11 | S944 | 2 | ECM-J1 | 5 |
| 148-61 FUEL LOW PRESSURE | BLK | 0.75 | FLRYW | 149 | EIC | 17 | ECM-J1 | 61 |
| 148-64 WATER IN FUEL SW | BLK | 0.75 | FLRYW | 97 | X941 | 1 | ECM-J1 | 64 |
| 148-6 ECM GND | BLK | 2.5 | FLRYW | 12 | S945 | 2 | ECM-J1 | 6 |
| 148-72 THROTTLE FLAP 3 | BLK | 0.75 | FLRYW | 148 | EIC | 49 | ECM-J1 | 72 |
| 148-73 START SIG | BLK | 0.75 | FLRYW | 147 | ECM-J1 | 73 | EIC | 3 |
| 148-82 EHXAUST GAS RECIRCULATION | BLK | 0.75 | FLRYW | 150 | EIC | 51 | ECM-J1 | 82 |
| 148-85 EHXAUST GAS RECIRCULATION | BLK | 0.75 | FLRYW | 148 | EIC | 46 | ECM-J1 | 85 |
| 148-87 COOLANT LEVEL GND | BLK | 0.75 | FLRYW | 169 | ECM-J1 | 87 | SN939 | 2 |
| 148-88 IGNITION | BLK | 0.75 | FLRYW | 97 | ECM-J1 | 88 | S946 | 2 |
| 248-16 INJECTOR 1 | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 16 | EIC | 35 |
| 248-18 INJECTOR 4 | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 18 | EIC | 37 |
| 248-19 EHXAUST GAS RECIRCULATION | BLK | 1.5 | FLRYW | 146 | ECM-J2 | 19 | EIC | 47 |
| 248-20 EHXAUST GAS RECIRCULATION | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 20 | EIC | 48 |
| 248-23-1 GLOW SENSE | ORG | 18 | GXL | 19 | MS932 | F | RL931-87 | 1 |
| 248-23 GLOW SENSE | BLK | 0.75 | FLRYW | 109 | MS932 | E | ECM-J2 | 23 |
| 248-24 BOOST PRESSURE / TEMP | BLK | 0.75 | FLRYW | 148 | ECM-J2 | 24 | EIC | 22 |
| 248-25 RAIL PRESSURE FUEL | BLK | 0.75 | FLRYW | 148 | ECM-J2 | 25 | EIC | 31 |
| 248-26 RAIL PRESSURE FUEL | BLK | 0.75 | FLRYW | 148 | ECM-J2 | 26 | EIC | 25 |



**Figure 7-102. Deutz 2.9 Harness - Sheet 10 of 12**

| WIRE NO | COLOR | WIRE GAUGE | JACKET | LENGTH (mm) | FROM | | TO | |
|---|---|---|---|---|---|---|---|---|
| | | | | | REFERENCE | PIN | REFERENCE | PIN |
| 248-27 BOOST PRESSURE / TEMP | BLK | 0.75 | FLRYW | 148 | ECM-J2 | 27 | EIC | 29 |
| 248-28 COOLING TEMPERATURE | BLK | 0.75 | FLRYW | 149 | ECM-J2 | 28 | EIC | 24 |
| 248-29 OIL PRESSURE | BLK | 0.75 | FLRYW | 146 | ECM-J2 | 29 | EIC | 27 |
| 248-2 INJECTOR 3 | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 2 | EIC | 61 |
| 248-32 INJECTOR 3 | BLK | 1.5 | FLRYW | 148 | ECM-J2 | 32 | EIC | 38 |
| 248-33 INJECTOR 1 | BLK | 1.5 | FLRYW | 148 | ECM-J2 | 33 | EIC | 62 |
| 248-35 GLOW RELAY CONTROL GND | BLK | 0.75 | FLRYW | 106 | RL931-85 | 1 | ECM-J2 | 35 |
| 248-37 ENGINE SPEED CAMSHAFT | BLK | 18 | CABLE | 148 | ECM-J2 | 37 | EIC | 14 |
| 248-38 ENGINE SPEED CRANKSHAFT | SHLD | 18 | CABLE | 146 | EIC | 1 | ECM-J2 | 38 |
| 248-39 ENGINE SPEED CRANKSHAFT | BLK | 18 | CABLE | 146 | ECM-J2 | 39 | EIC | 15 |
| 248-3 INJECTOR 2 | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 3 | EIC | 41 |
| 248-40 AIR INLET TEMP | BLK | 0.75 | FLRYW | 147 | ECM-J2 | 40 | EIC | 28 |
| 248-43 OIL PRESSURE | BLK | 0.75 | FLRYW | 146 | ECM-J2 | 43 | EIC | 23 |
| 248-44 OIL PRESSURE | BLK | 0.75 | FLRYW | 149 | ECM-J2 | 44 | EIC | 26 |
| 248-46 INJECTOR 2 | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 46 | EIC | 40 |
| 248-48 INJECTOR 4 | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 48 | EIC | 42 |
| 248-4 MPROP ACTUATOR | BLK | 1.5 | FLRYW | 146 | ECM-J2 | 4 | EIC | 19 |
| 248-52 ENGINE SPEED CAMSHAFT | WHT | 18 | CABLE | 147 | ECM-J2 | 52 | EIC | 13 |
| 248-53 ENGINE SPEED CAMSHAFT | SHLD | 18 | CABLE | 149 | ECM-J2 | 53 | EIC | 9 |
| 248-54 ENGINE SPEED CRANKSHAFT | WHT | 18 | CABLE | 147 | ECM-J2 | 54 | EIC | 21 |
| 248-5 MPROP ACTUATOR | BLK | 1.5 | FLRYW | 147 | ECM-J2 | 5 | EIC | 20 |
| 248-7 RAIL PRESSURE FUEL | BLK | 0.75 | FLRYW | 147 | ECM-J2 | 7 | EIC | 32 |
| 48-13 GLOW | RED | 8 | GXL | 67 | RL931-87 | 1 | EC18 | 1 |
| CAN 1 HI CUSTOMER CAN HIGH | YEL | 18 | J1939 CABLE | 59 | X950 | M | S951 | 2 |
| CAN 1 HI CUSTOMER CAN HIGH | YEL | 18 | J1939 CABLE | 29 | S953 | 2 | S951 | 1 |
| CAN 1 HI CUSTOMER CAN HIGH | YEL | 18 | J1939 CABLE | 55 | X901 | 3 | S951 | 2 |
| CAN 1 HI CUSTOMER CAN HIGH | YEL | 18 | J1939 CABLE | 15 | ECM-J1 | 54 | S953 | 1 |
| CAN 1 HI CUSTOMER CAN HIGH | YEL | 18 | J1939 CABLE | 6 | S953 | 2 | X955 | A |
| CAN 1 LO CUSTOMER CAN LO | GRN | 18 | J1939 CABLE | 64 | X901 | 4 | S952 | 2 |
| CAN 1 LO CUSTOMER CAN LOW | GRN | 18 | J1939 CABLE | 18 | S954 | 2 | S952 | 1 |
| CAN 1 LO CUSTOMER CAN LO | GRN | 18 | J1939 CABLE | 69 | X950 | F | S952 | 2 |
| CAN 1 LO CUSTOMER CAN LOW | GRN | 18 | J1939 CABLE | 16 | ECM-J1 | 76 | S954 | 1 |
| CAN 1 LO CUSTOMER CAN LOW | GRN | 18 | J1939 CABLE | 6 | S954 | 2 | X955 | B |
| CAN 1 SHLD CUSTOMER CAN SHIELD | SHLD | 18 | J1939 CABLE | 99 | X901 | 6 | ECM-J1 | NC |
| CAN 2 HI DIAG CAN HIGH | YEL | 18 | J1939 CABLE | 12 | S964 | 2 | X960 | A |
| CAN 2 HI DIAG CAN HIGH | YEL | 18 | J1939 CABLE | 10 | X950 | H | S964 | 2 |
| CAN 2 HI DIAG CAN HIGH | YEL | 18 | J1939 CABLE | 14 | ECM-J1 | 75 | S969 | 1 |
| CAN 2 HI DIAG CAN HIGH | YEL | 18 | J1939 CABLE | 79 | S964 | 1 | S969 | 2 |
| CAN 2 HI DIAG CAN HIGH | YEL | 18 | J1939 CABLE | 7 | S969 | 2 | X965 | A |
| CAN 2 LO DIAG CAN LOW | GRN | 18 | J1939 CABLE | 14 | S963 | 2 | X960 | B |
| CAN 2 LO DIAG CAN LOW | GRN | 18 | J1939 CABLE | 12 | X950 | G | S963 | 2 |
| CAN 2 LO DIAG CAN LOW | GRN | 18 | J1939 CABLE | 13 | ECM-J1 | 53 | S968 | 1 |
| CAN 2 LO DIAG CAN LOW | GRN | 18 | J1939 CABLE | 80 | S963 | 1 | S968 | 2 |
| CAN 2 LO DIAG CAN LOW | GRN | 18 | J1939 CABLE | 8 | S968 | 2 | X965 | B |



**Figure 7-103. Deutz 2.9 Harness - Sheet 11 of 12**

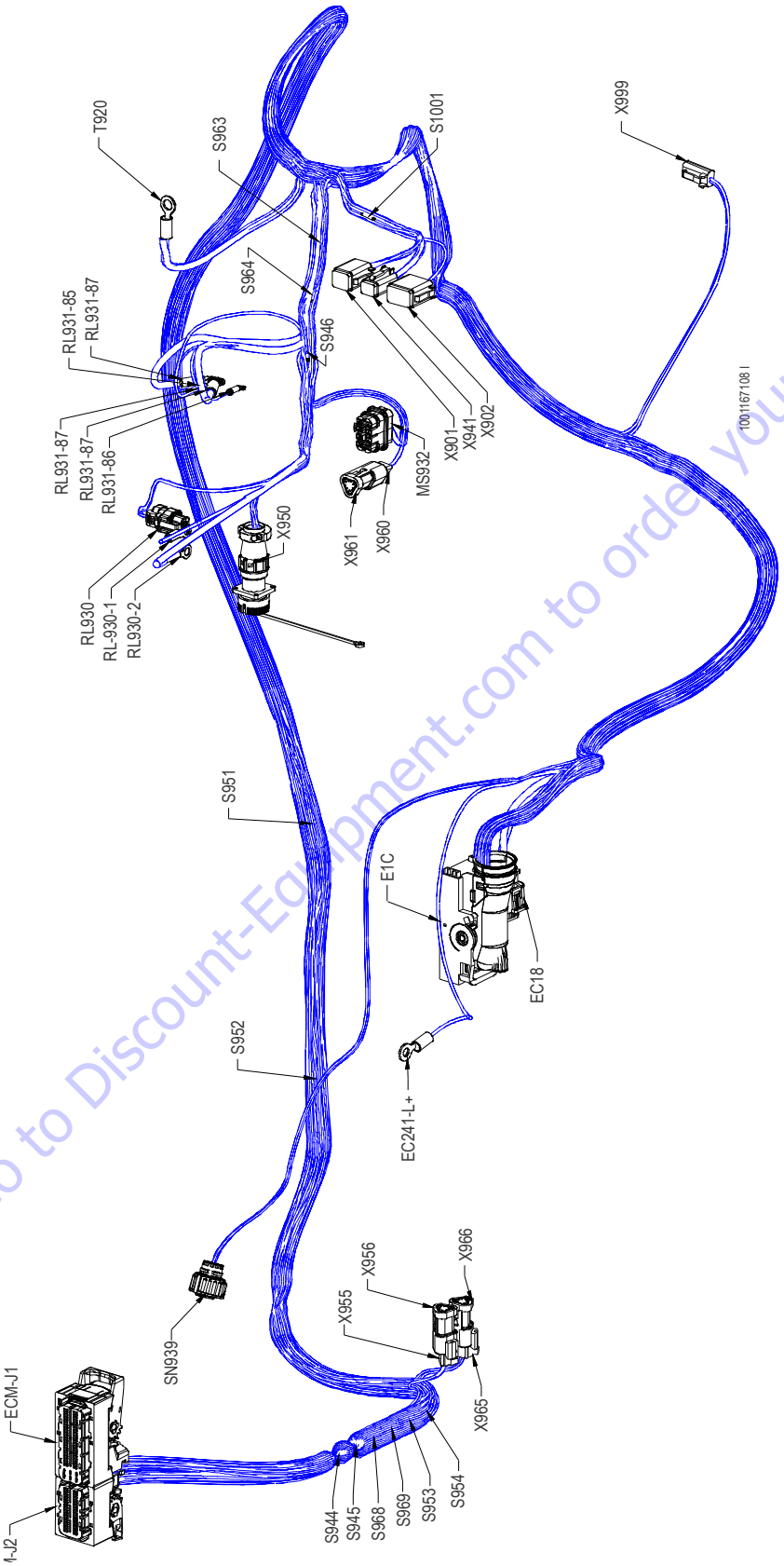





**Figure 7-104. Deutz 2.9 Harness - Sheet 12 of 12**

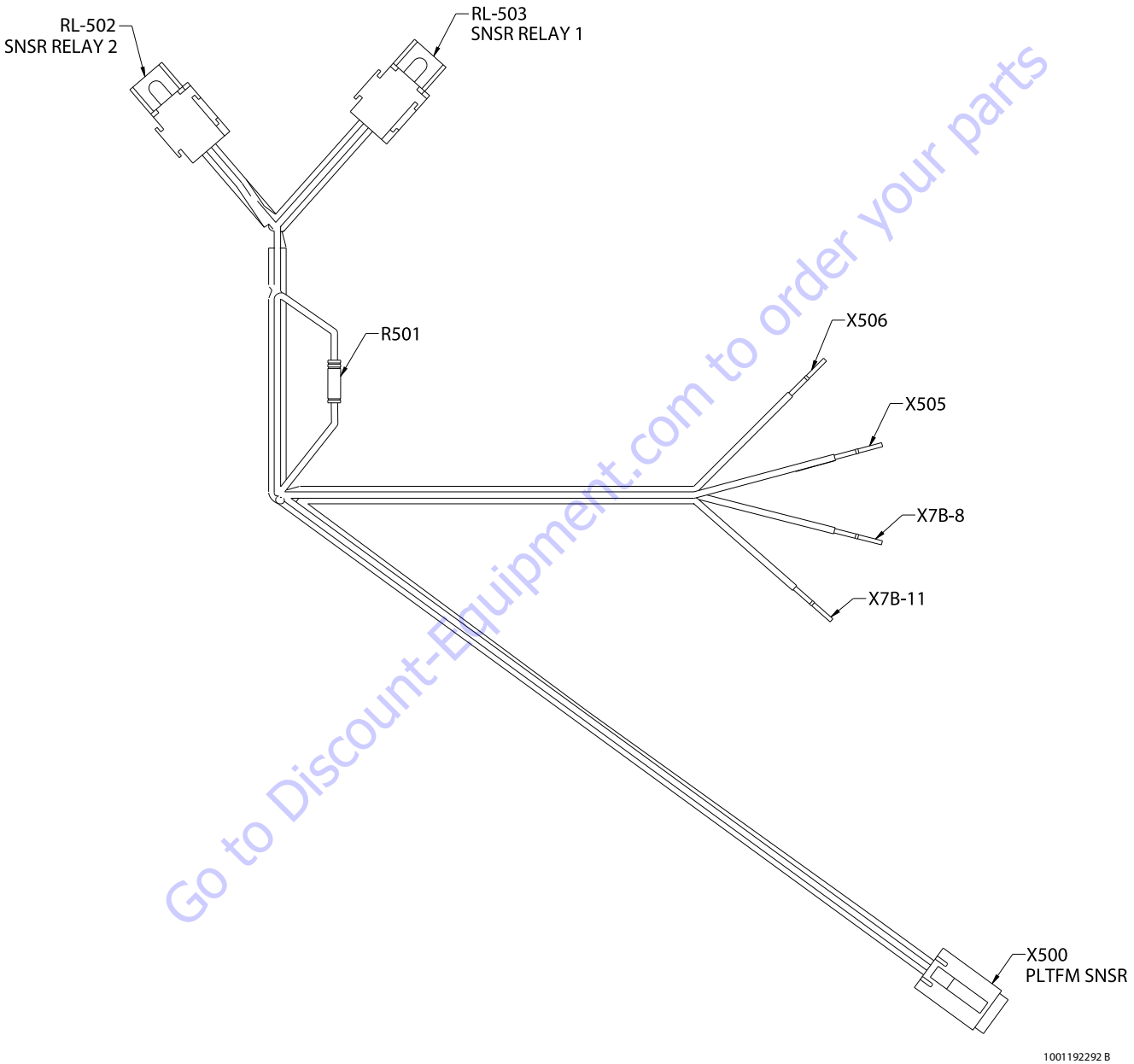





**Figure 7-105. Skyguard Harness - Sheet 1 of 2**

| RL-503 - SNSR RELAY 1 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 30 | WHT | P9 | 18AWG | GXL | X505 (1) |
| 30 | WHT | P9-1 | 18AWG | GXL | RL-502 (30) |
| 85 | WHT | P5-1 | 18AWG | GXL | RL-502 (85) |
| 86 | WHT | P4-1 | 18AWG | GXL | RL-502 (86) |
| 87 | WHT | P1 | 18AWG | GXL | X506 (1) |
| 87a | | | | | |

| R501 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | P2 | 18AWG | GXL | X505 (1) |
| 2 | WHT | P10 | 18AWG | GXL | X500 (1) |

| RL-502 - SNSR RELAY 2 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 30 | WHT | P9-1 | 18AWG | GXL | RL-503 (30) |
| 85 | WHT | P5 | 18AWG | GXL | X500 (4) |
| 85 | WHT | P5-1 | 18AWG | GXL | RL-503 (85) |
| 86 | WHT | P4 | 18AWG | GXL | X500 (3) |
| 86 | WHT | P4-1 | 18AWG | GXL | RL-503 (86) |
| 87 | WHT | P3 | 18AWG | GXL | X7B-11 (1) |
| 87a | | | | | |

| X506 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | P1 | 18AWG | GXL | RL-503 (87) |

| X505 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | P2 | 18AWG | GXL | R501 (1) |
| 1 | WHT | P9 | 18AWG | GXL | RL-503 (30) |

| X7B-8 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | P6 | 18AWG | GXL | X500 (2) |

| X7B-11 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | P3 | 18AWG | GXL | RL-502 (87) |

| X500 - PLTFM SNSR | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | P10 | 18AWG | GXL | R501 (2) |
| 2 | WHT | P6 | 18AWG | GXL | X7B-8 (1) |
| 3 | WHT | P4 | 18AWG | GXL | RL-502 (86) |
| 4 | WHT | P5 | 18AWG | GXL | RL-502 (85) |



**Figure 7-106. Skyguard Harness - Sheet 2 of 2**

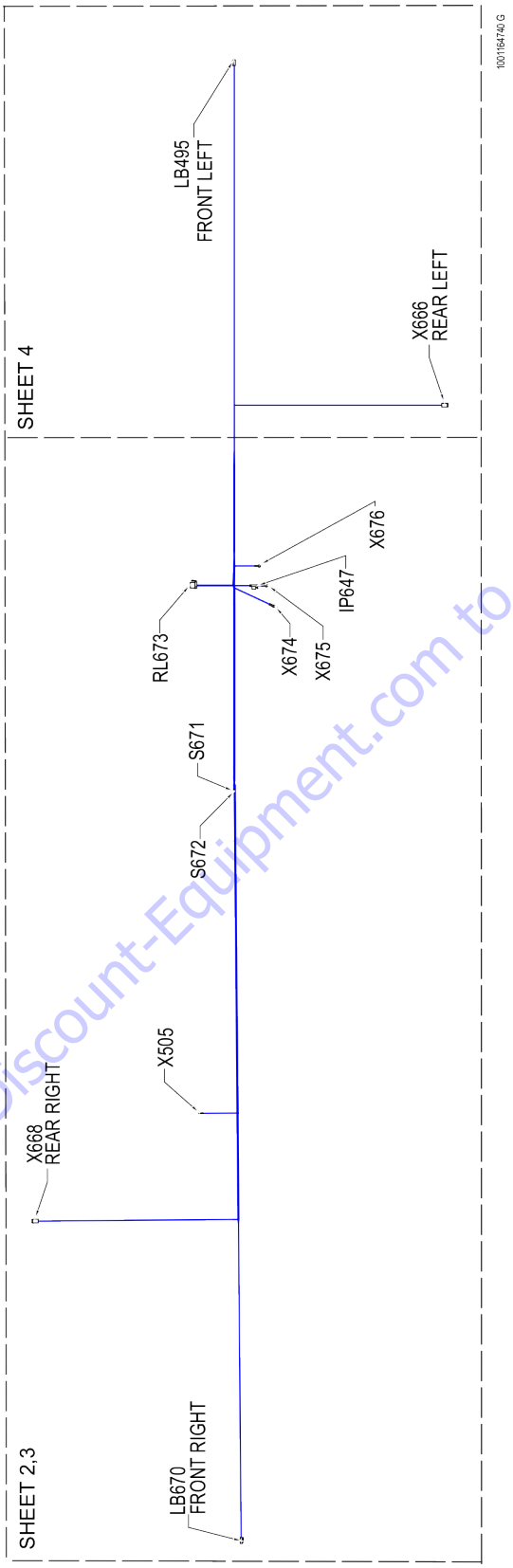



**Figure 7-107. Chassis Head and Tail Lights Harness - Sheet 1 of 5**

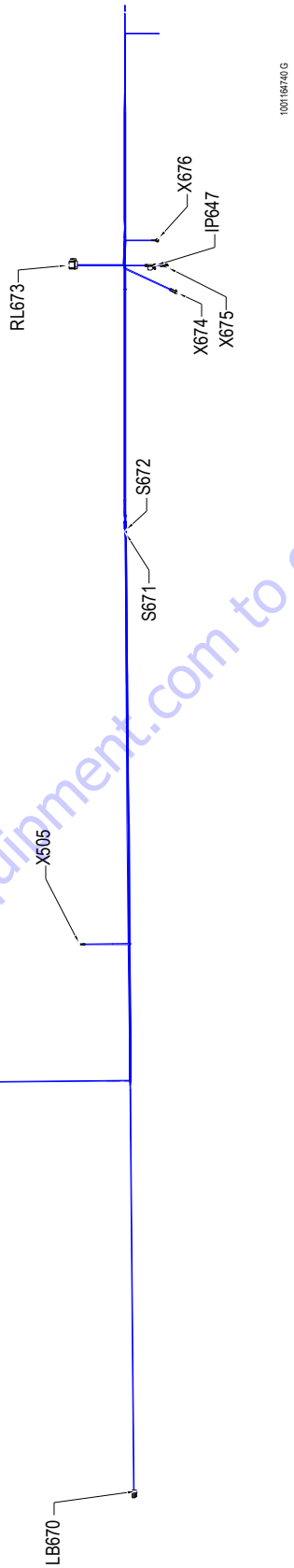





**Figure 7-108. Chassis Head and Tail Lights Harness - Sheet 2 of 5**

| S671 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 6-11 12V+ | 16 AWG | GXL | LB495 (2) |
| 1 | WHT | 6-29 12V+ | 16 AWG | GXL | LB670 (2) |
| 2 | WHT | 6-13 12V+ | 16 AWG | GXL | X666 (3) |
| 2 | WHT | 6-30 12V+ | 16 AWG | GXL | X668 (3) |
| 2 | WHT | 6-8 12V+ | 14 AWG | GXL | RL673 (4) |

| RL673 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-146 PWR | 16 AWG | GXL | IP647 (2) |
| 2 | BLK | 000-40-109 GND | 16 AWG | GXL | X676 (1) |
| 3 | | | | | |
| 4 | WHT | 6-8 12V+ | 14 AWG | GXL | S671 (2) |
| 5 | WHT | 4-145 | 18 AWG | GXL | X505 (1) |

| X674<br>CONNECT TO CASE GROUND ON AUX PUMP RELAY | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 4-122 | 14 AWG | GXL | S672 (2) |

| X675<br>CONNECT TO B+ OF AUX PUMP RELAY | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | FUSE HOLDER LEAD | 16 AWG | GXL | IP647 (1) |

| X505<br>CONNECT TO X434 PIN 2 | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 4-145 | 18 AWG | GXL | RL673 (5) |

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

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

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

| X676<br>CONNECT TO CASE GROUND ON AUX PUMP RELAY | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 000-40-109 GND | 16 AWG | GXL | RL673 (2) |

| IP647<br>CONNECTOR MUST INCLUDE 7.5A MINI FUSE | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | FUSE HOLDER LEAD | 16 AWG | GXL | X675 (1) |
| 2 | WHT | 4-146 PWR | 16 AWG | GXL | RL673 (1) |



**Figure 7-109. Chassis Head and Tail Lights Harness - Sheet 3 of 5**


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

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



**Figure 7-110. Chassis Head and Tail Lights Harness - Sheet 4 of 5**

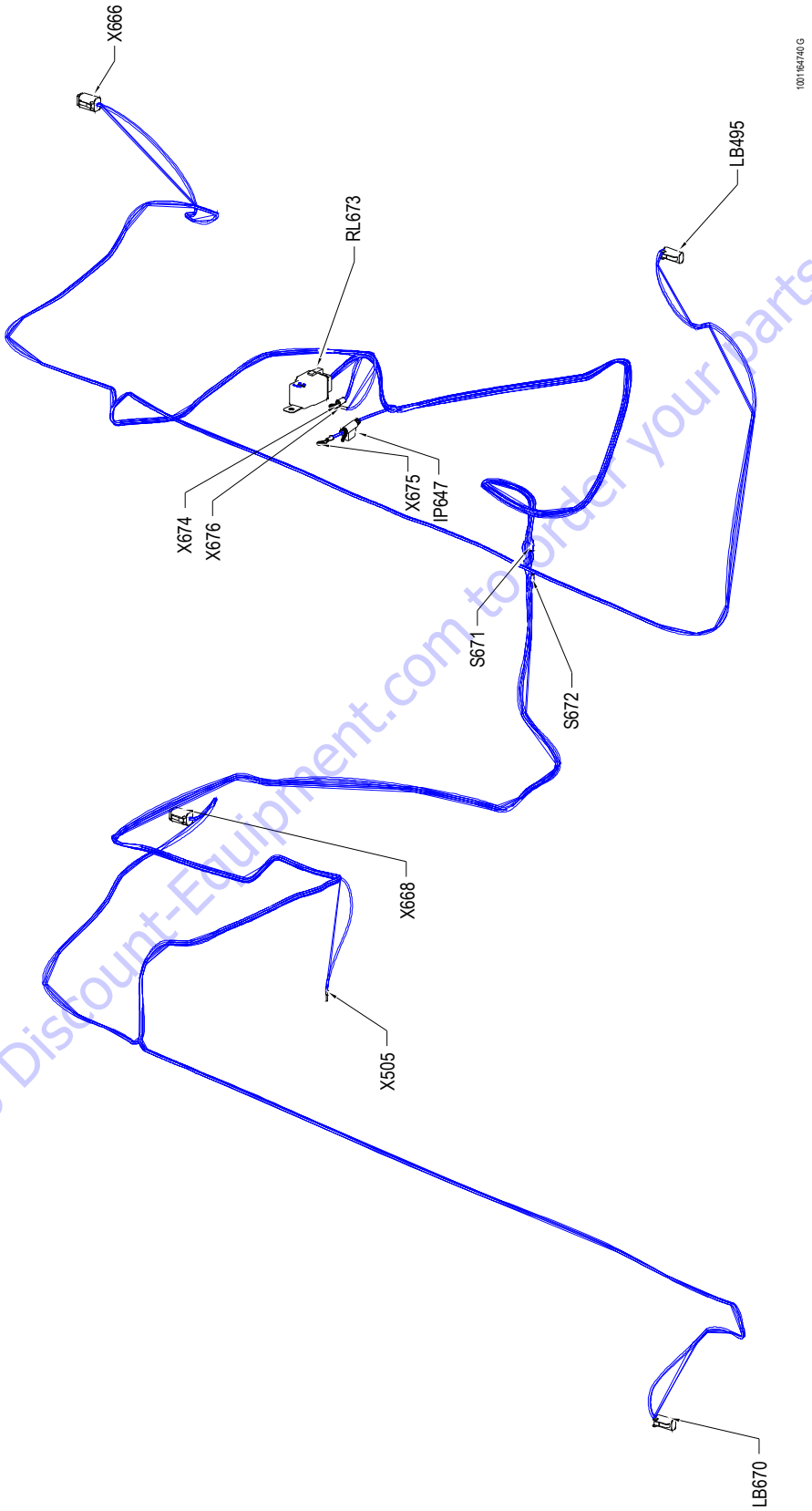
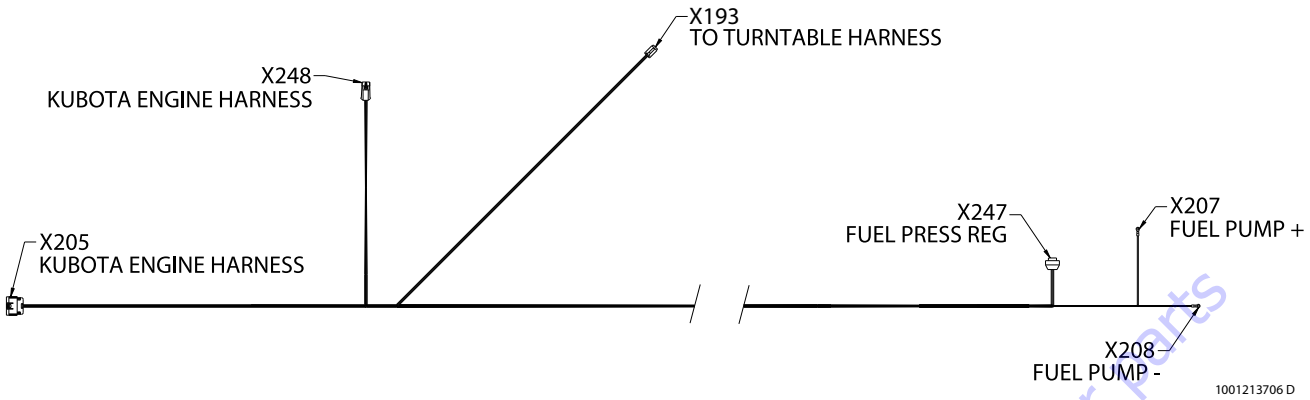





**Figure 7-111. Chassis Head and Tail Lights Harness - Sheet 5 of 5**




| X205 KUBOTA ENGINE HARNESS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| A | WHT | 6-14 IGNITION | 18 AWG | TXL | X193 (1) |
| B | | | | | |
| C | BLK | 000-60-11 FUEL PUMP NEGATIVE | 16 AWG | TXL | X208 (1) |
| D | WHT | 6-54 FUEL PUMP POSITIVE | 16 AWG | TXL | X207 (1) |
| E | | | | | |
| F | WHT | 6-12 ENGINE START | 18 AWG | TXL | X193 (2) |
| G | | | | | |
| H | | | | | |
| J | | | | | |
| K | | | | | |
| L | | | | | |
| M | | | | | |
| N | RED | CAN HI | 18 AWG | CABLE | X193 (3) |
| P | BLK | CAN LO | 18 AWG | CABLE | X193 (4) |
| R | | | | | |
| S | | | | | |

| X193 TO TURNTABLE HARNESS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 6-14 IGNITION | 18 AWG | TXL | X205 (A) |
| 2 | WHT | 6-12 ENGINE START | 18 AWG | TXL | X205 (F) |
| 3 | RED | CAN HI | 18 AWG | CABLE | X205 (N) |
| 4 | BLK | CAN LO | 18 AWG | CABLE | X205 (P) |
| 5 | | | | | |
| 6 | | | | | |

| X247 FUEL PRESS REG | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 6-19 | 18 AWG | TXL | X248 (1) |
| 2 | WHT | 6-20 | 18 AWG | TXL | X248 (2) |
| 3 | RED | 6-21 | 18 AWG | TXL | X248 (3) |
| 4 | GRN | 6-22 | 18 AWG | TXL | X248 (4) |

| X208 FUEL PUMP - | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 00-60-11 FUEL PUMP NEGATIVE | 16 AWG | TXL | X205 (C) |

| X207 FUEL PUMP + | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | WHT | 6-54 FUEL PUMP POSITIVE | 16 AWG | TXL | X205 (D) |

| X248 KUBOTA ENGINE HARNESS | | | | | |
|---|---|---|---|---|---|
| CONN POS | WIRE COLOR | WIRE LABEL | GAUGE | JACKET | TO |
| 1 | BLK | 6-19 | 18 AWG | TXL | X247 (1) |
| 2 | WHT | 6-20 | 18 AWG | TXL | X247 (2) |
| 3 | RED | 6-21 | 18 AWG | TXL | X247 (3) |
| 4 | GRN | 6-22 | 18 AWG | TXL | X247 (4) |



**Figure 7-112. Kubota Engine Harness**

## 7.9 ELECTRICAL SCHEMATICS

SHEET 2: PLATFORM
CONSOLE BOX HARNESS
SHEET 3: PLATFORM AND BOOM COMPONENTS
PLATFORM VALVE HARNESS
LOW TEMP CUTOUT, LSS, 4 CELL LSS
BOOM LOWER - STANDARD, ARCTIC
BOOM UPPER - STANDARD, ARCTIC
SHEET 4: CHASSIS, TURNTABLE
TURNTABLE HARNESS
CHASSIS SOLENOID HARNESS
SHEET 5: GROUND USER INTERFACE
MAIN VALVE
UPPER UPRIGHT
GROUND CONTROL PANEL
CRIBBING OPTION HARNESS
SHEET 6: ENGINE SCHEMATICS DEUTZ T4I
DEUTZ ENGINE T4I
T4I ENG POS, T4I END NEG
POS BATTERY, NEG BATTERY, AUX TO AUX
SHEET 7: ENGINE SCHEMATIC DEUTZ T4F
DEUTZ ENGINE T4F, DEUTZ FUEL
T4F ENG POS, T4F ENG NEG
POS BATTERY, NEG BATTERY, AUX TO AUX
SHEET 8: SKYGUARD
SHEET 9: PLATFORM LIGHTS, CHASSIS HEAD AND TAIL LIGHTS, CLEARSKY
SHEET 10: KUBOTA ENGINE
KUBOTA ENGINE HARNESS
ALTERNATOR
POS BATTERY
NEG BATTERY
KUBOTA D/F PWR



**Figure 7-113. Electrical Schematic - Sheet 1 of 18**

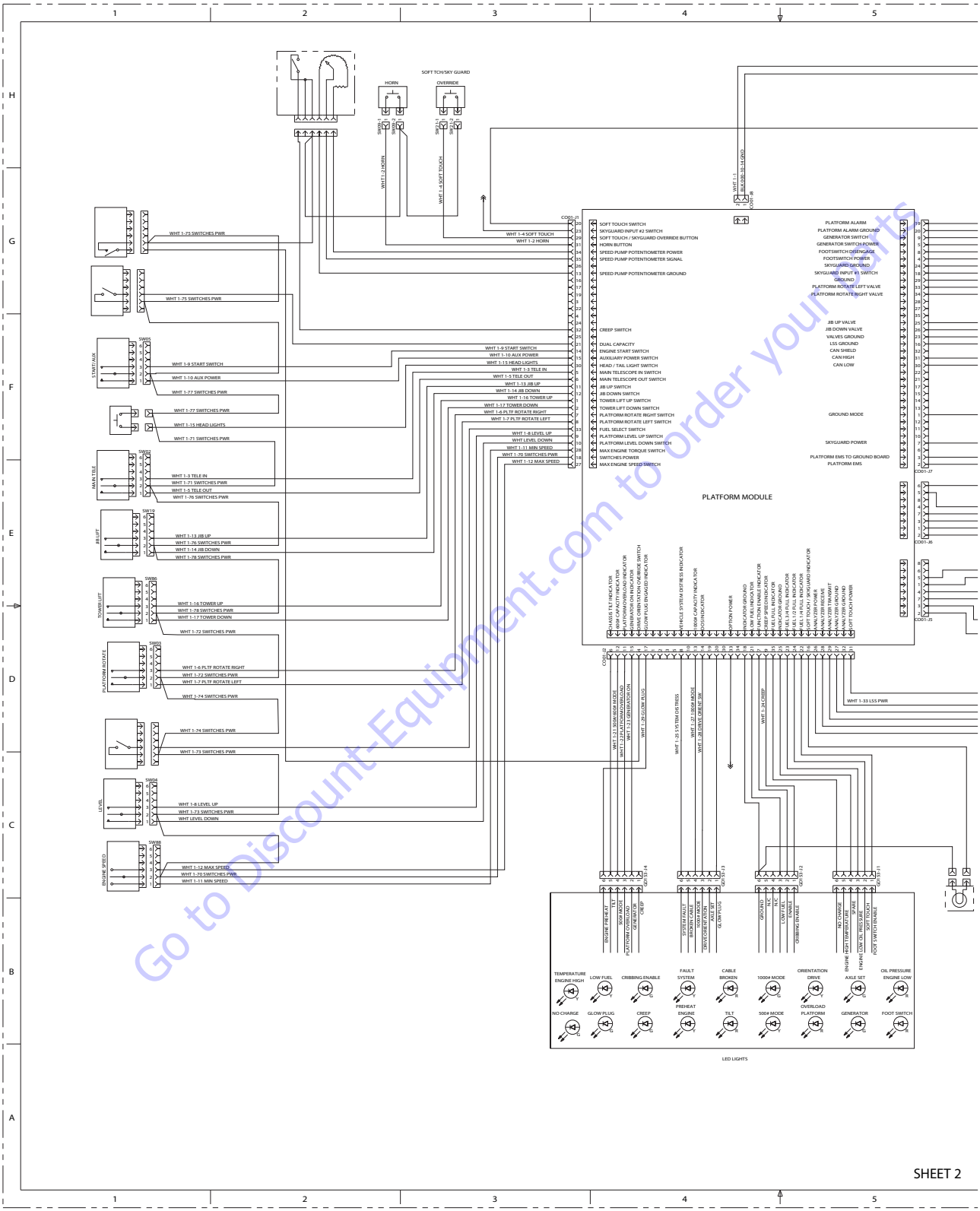





**Figure 7-114. Electrical Schematic - Sheet 2 of 18**

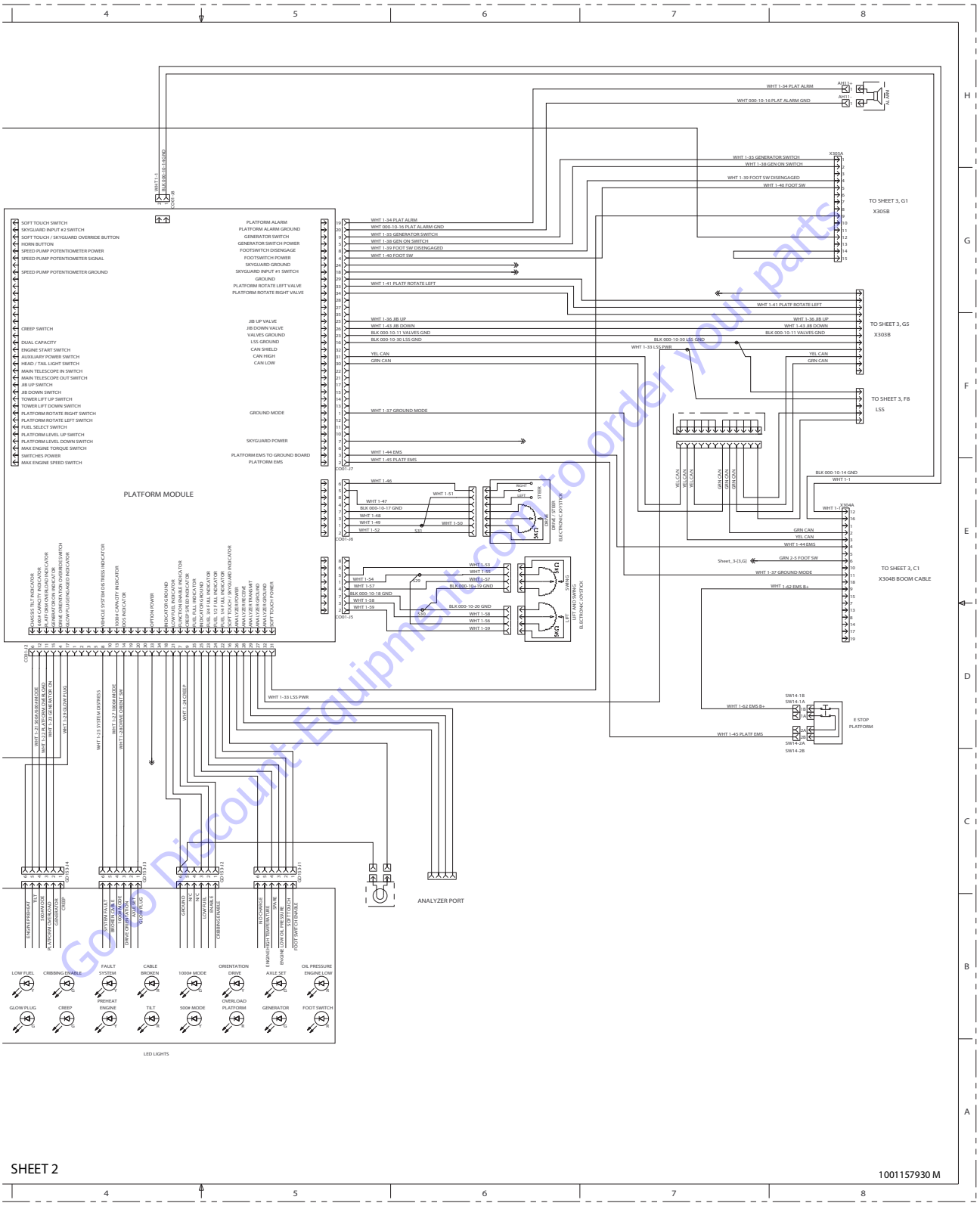





**Figure 7-115. Electrical Schematic - Sheet 3 of 18**

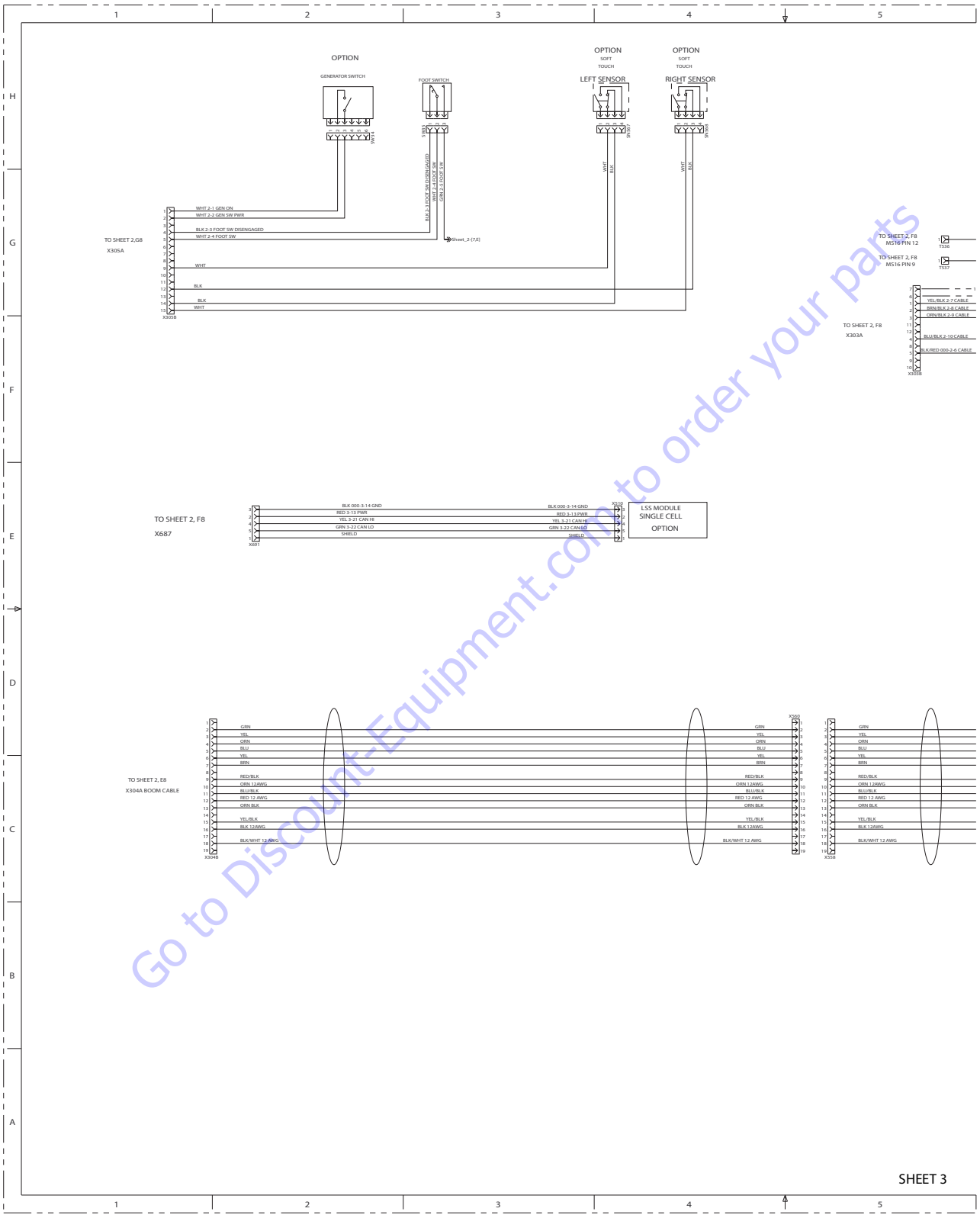





**Figure 7-116. Electrical Schematic - Sheet 4 of 18**

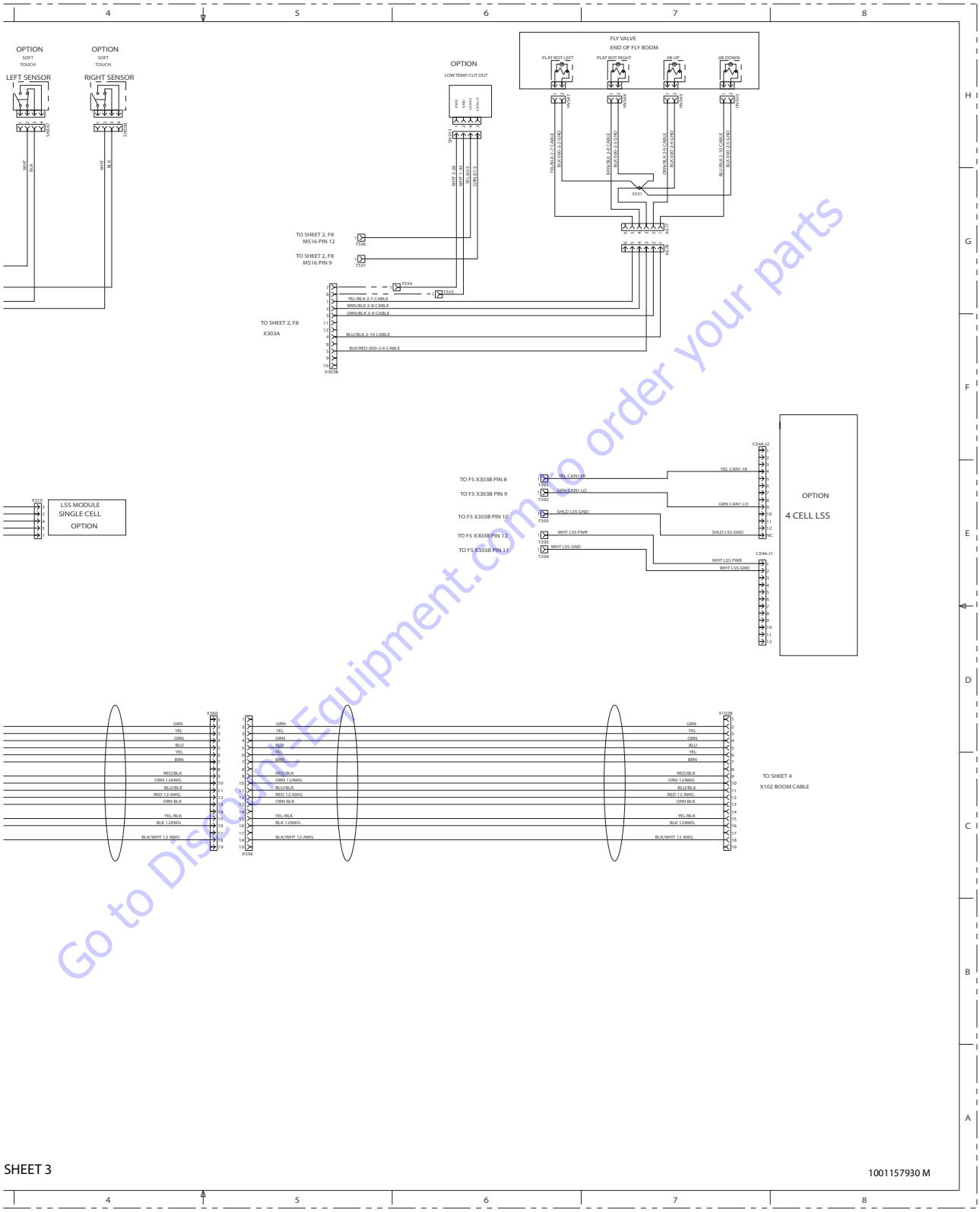





**Figure 7-117. Electrical Schematic - Sheet 5 of 18**

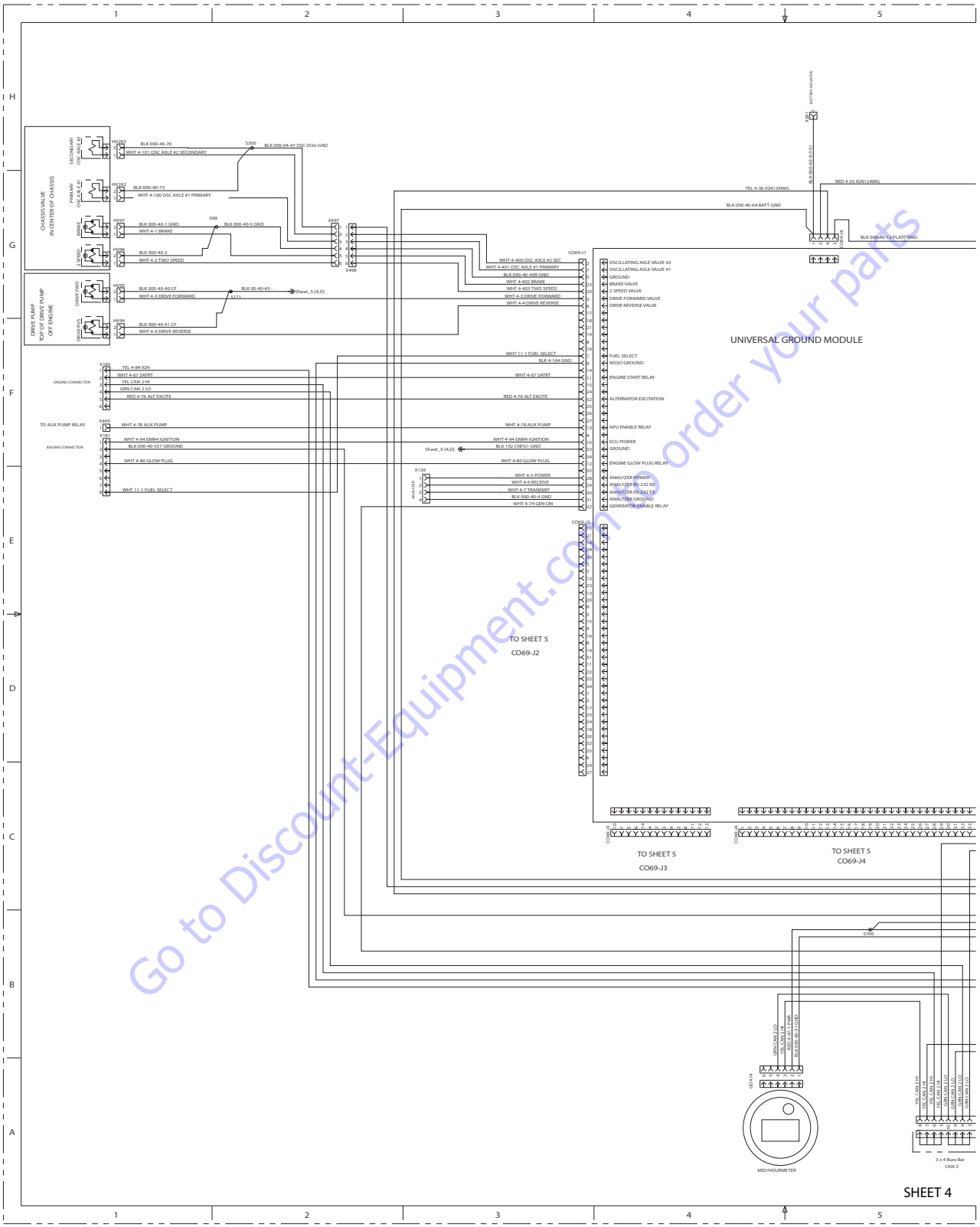





**Figure 7-118. Electrical Schematic - Sheet 6 of 18**

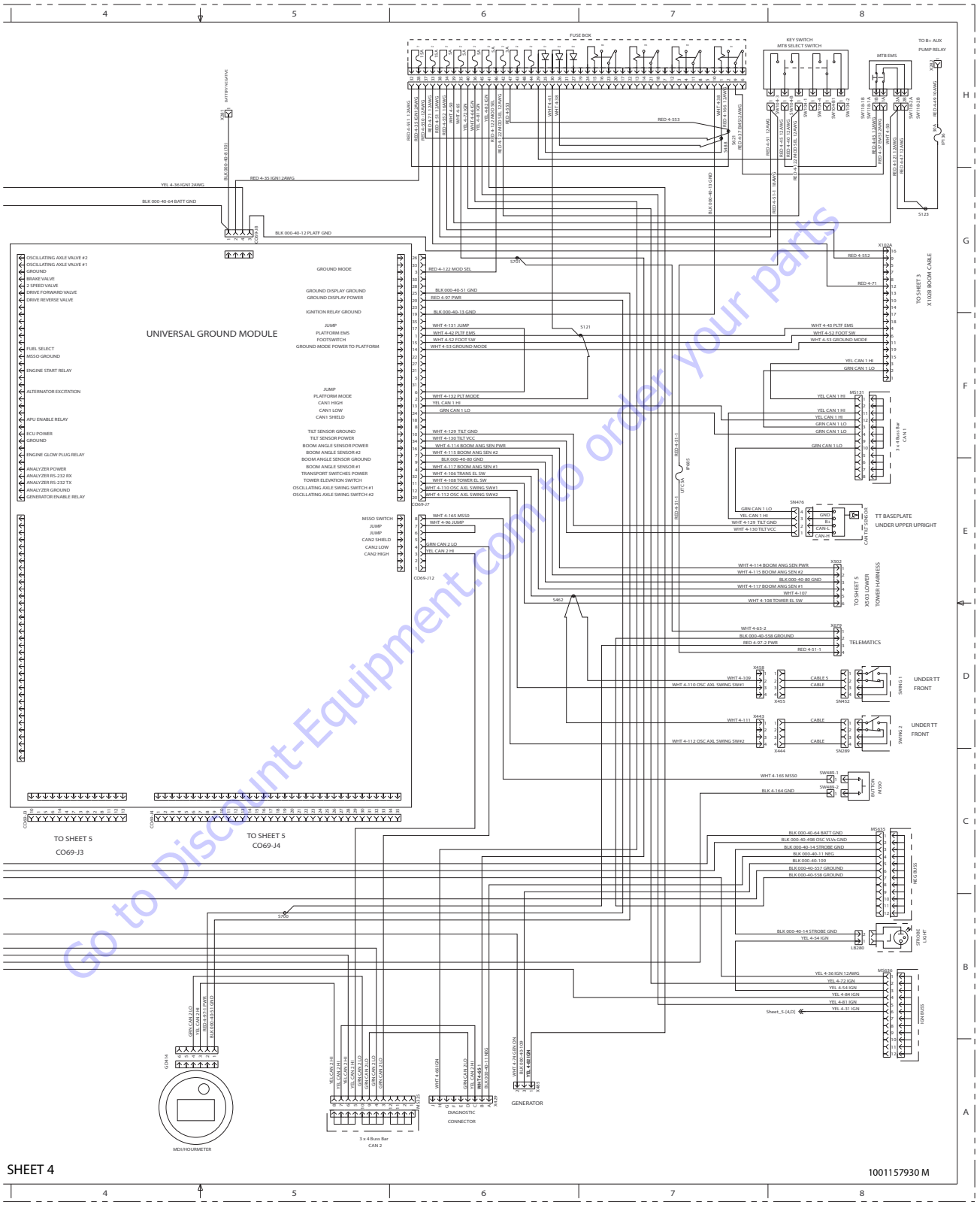





**Figure 7-119. Electrical Schematic - Sheet 7 of 18**

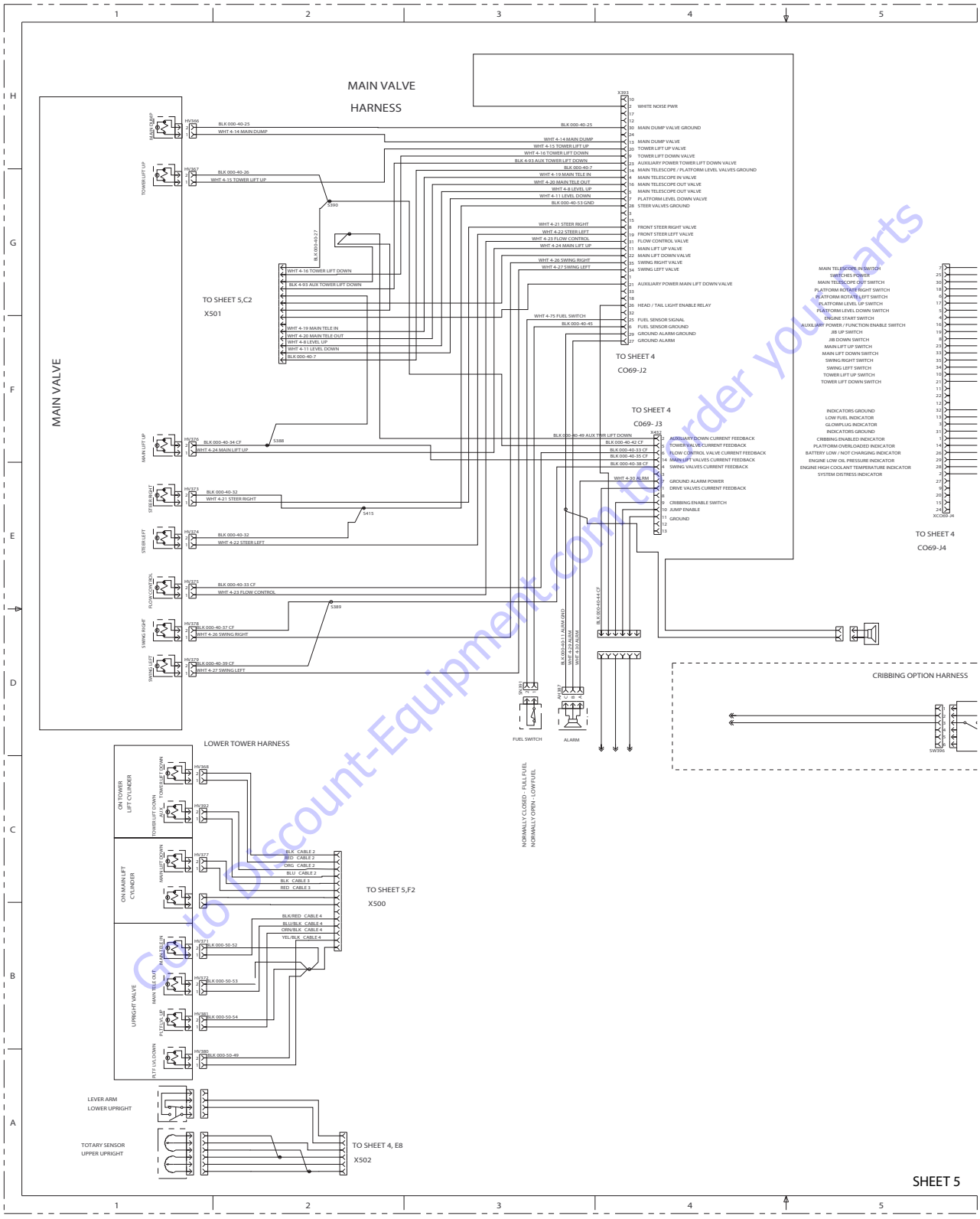





**Figure 7-120. Electrical Schematic - Sheet 8 of 18**

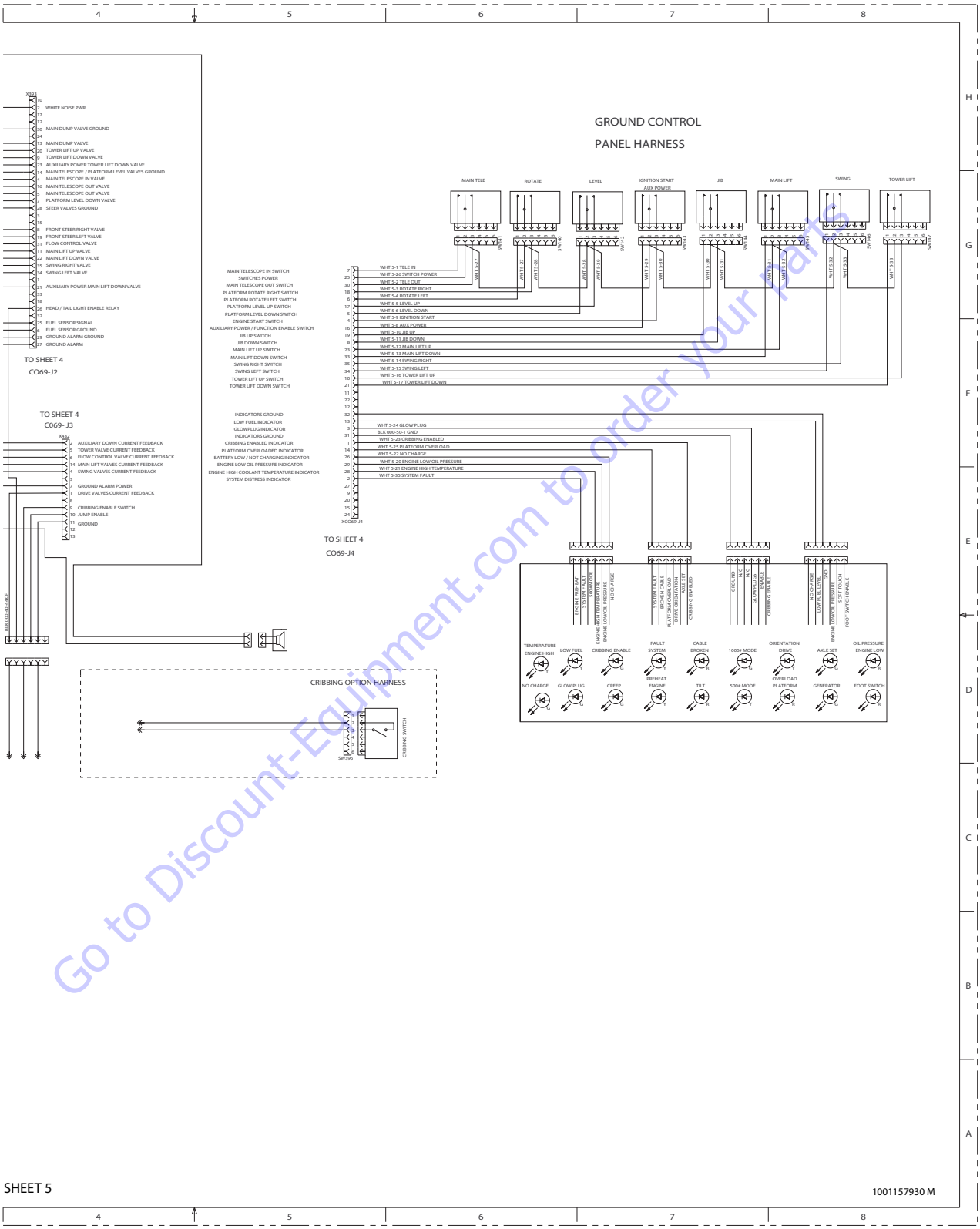





**Figure 7-121. Electrical Schematic - Sheet 9 of 18**

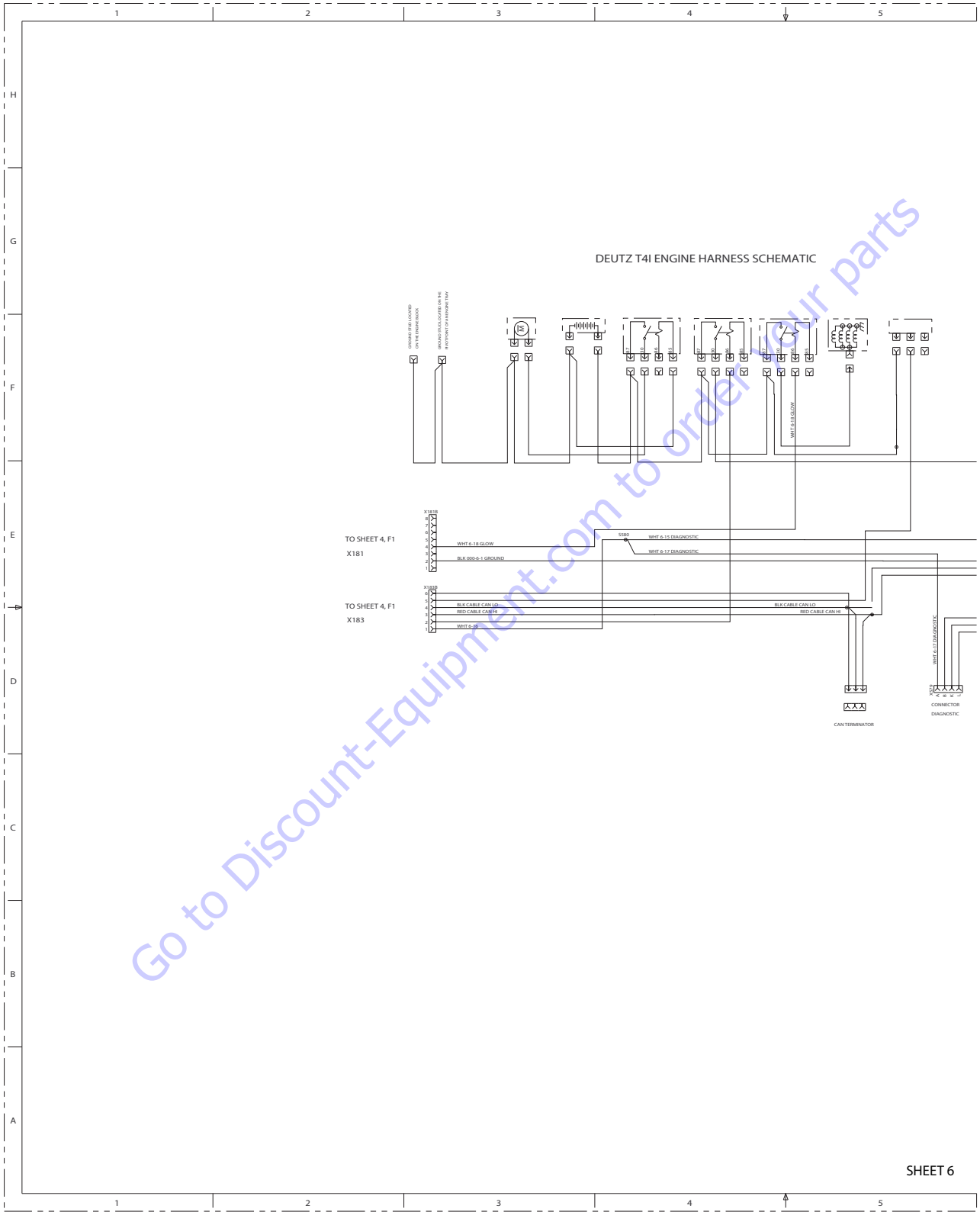





**Figure 7-122. Electrical Schematic - Sheet 10 of 18**

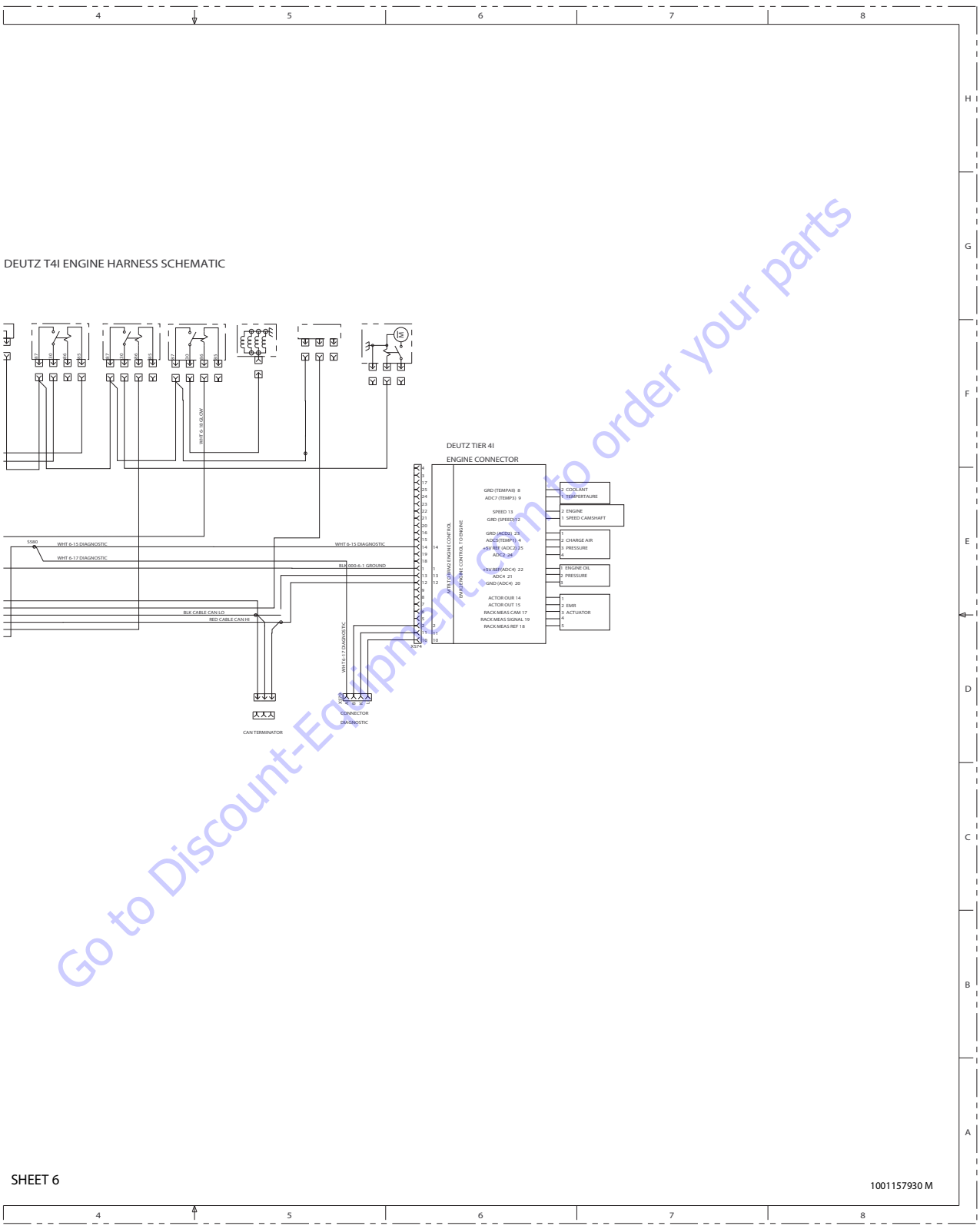





**Figure 7-123. Electrical Schematic - Sheet 11 of 18**

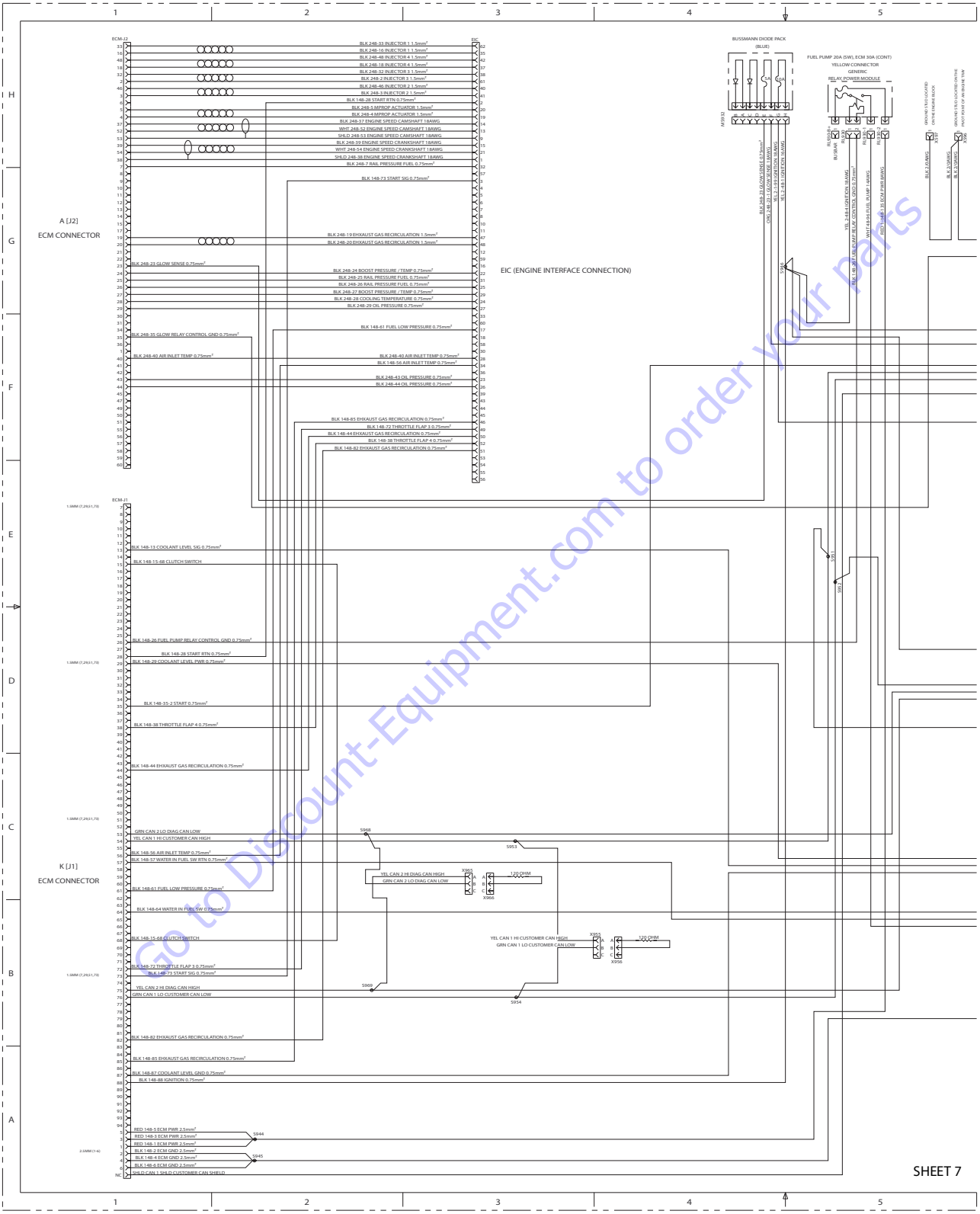





**Figure 7-124. Electrical Schematic - Sheet 12 of 18**

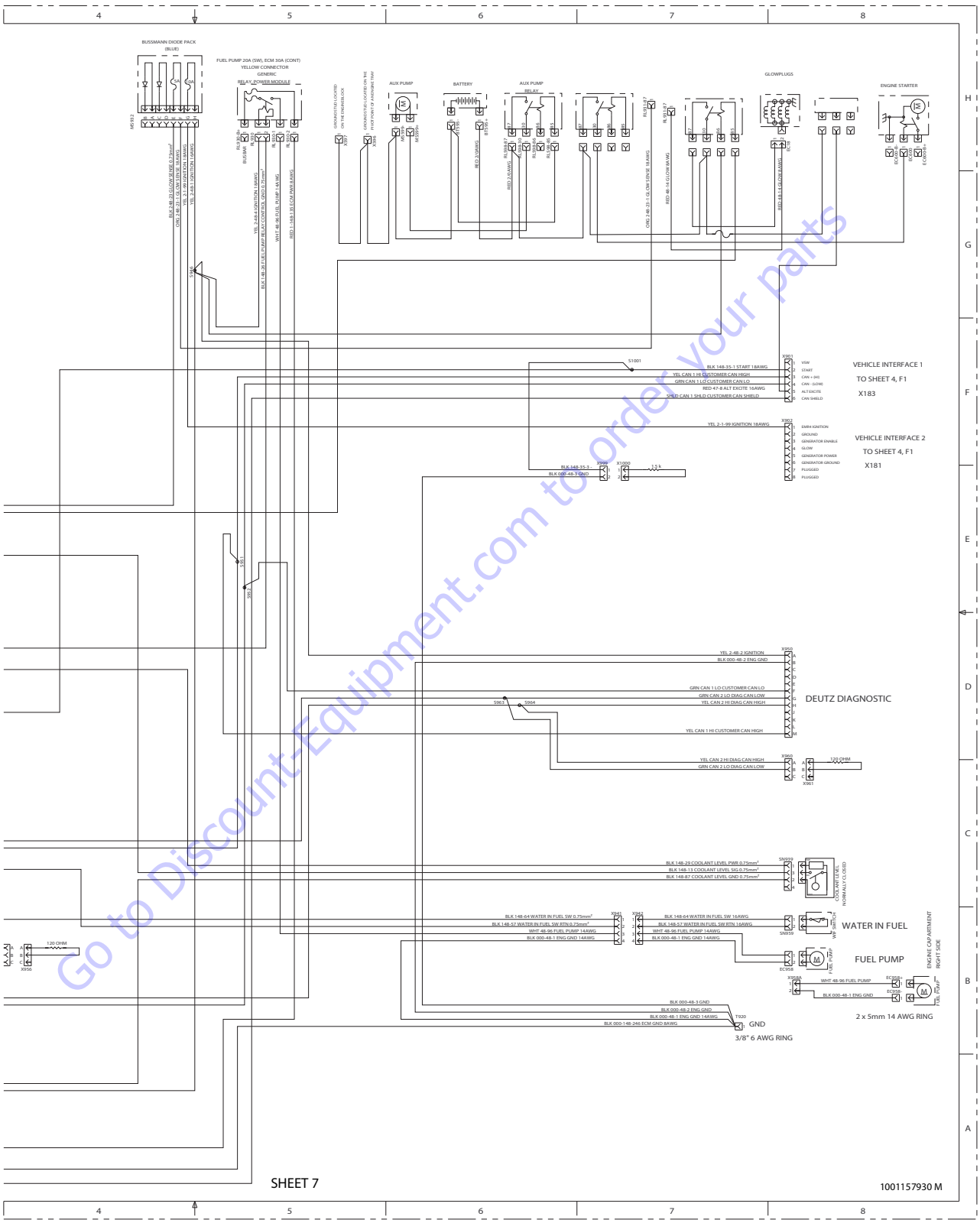





**Figure 7-125. Electrical Schematic - Sheet 13 of 18**

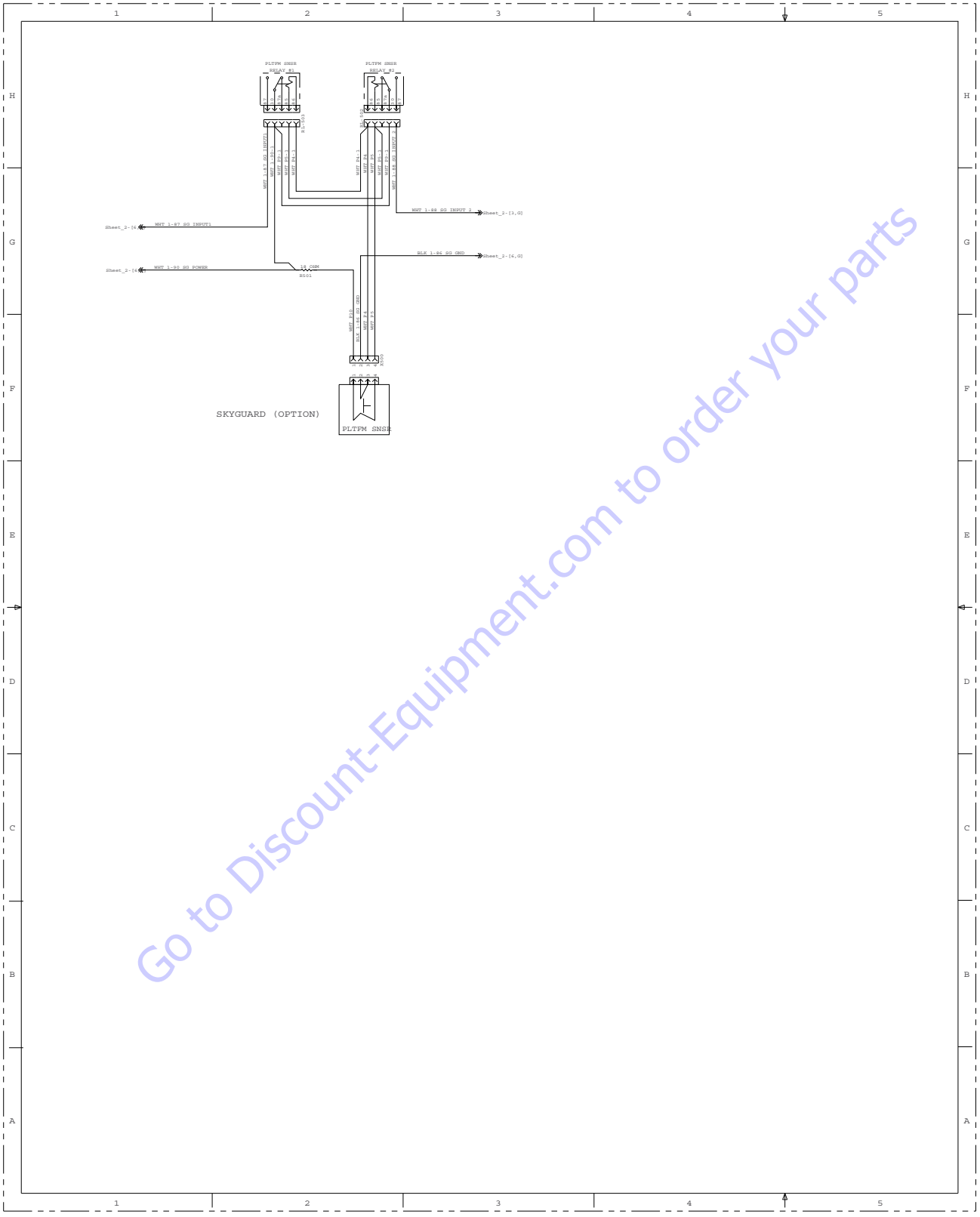





**Figure 7-126. Electrical Schematic - Sheet 14 of 18**

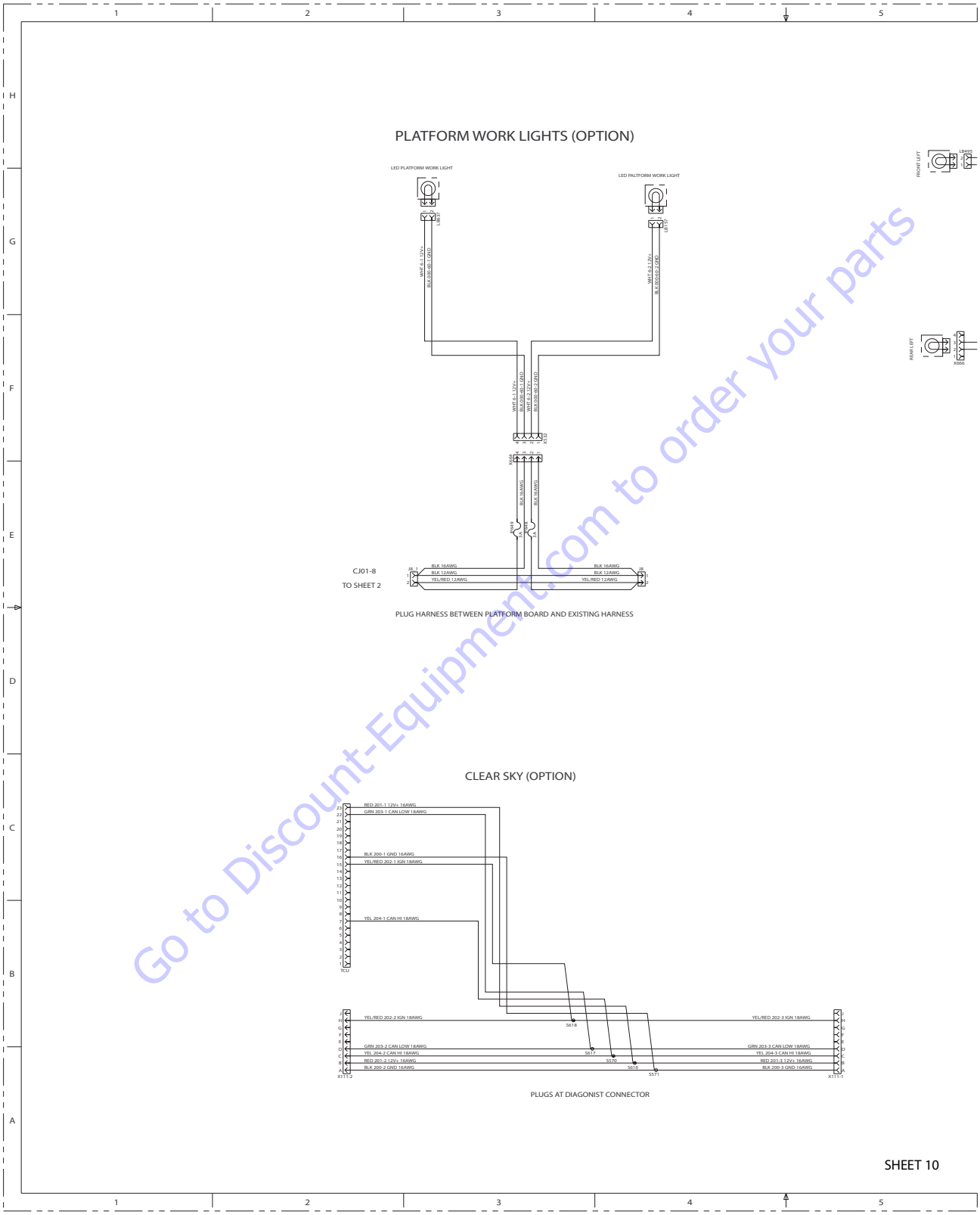





**Figure 7-127. Electrical Schematic - Sheet 15 of 18**

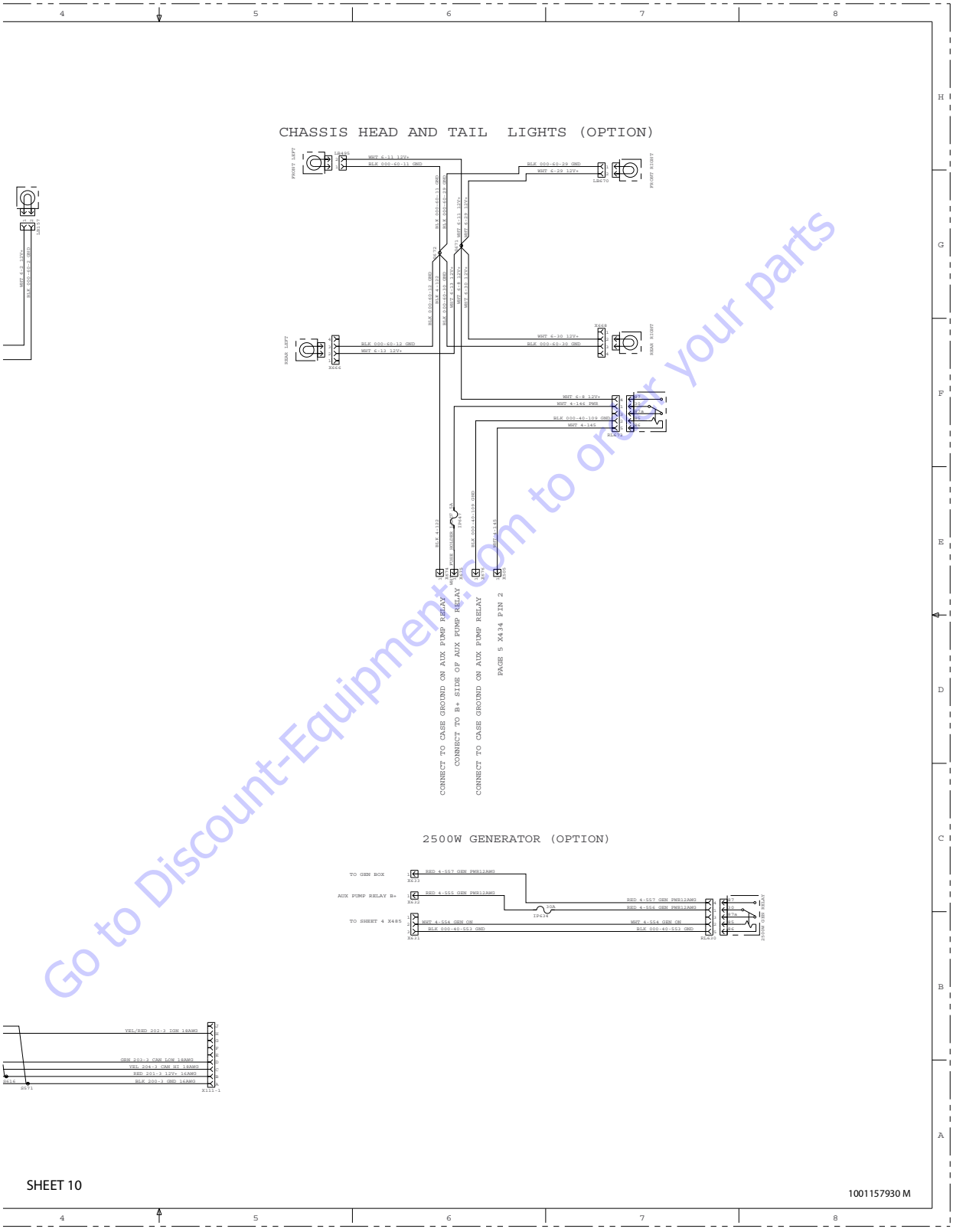





**Figure 7-128. Electrical Schematic - Sheet 16 of 18**

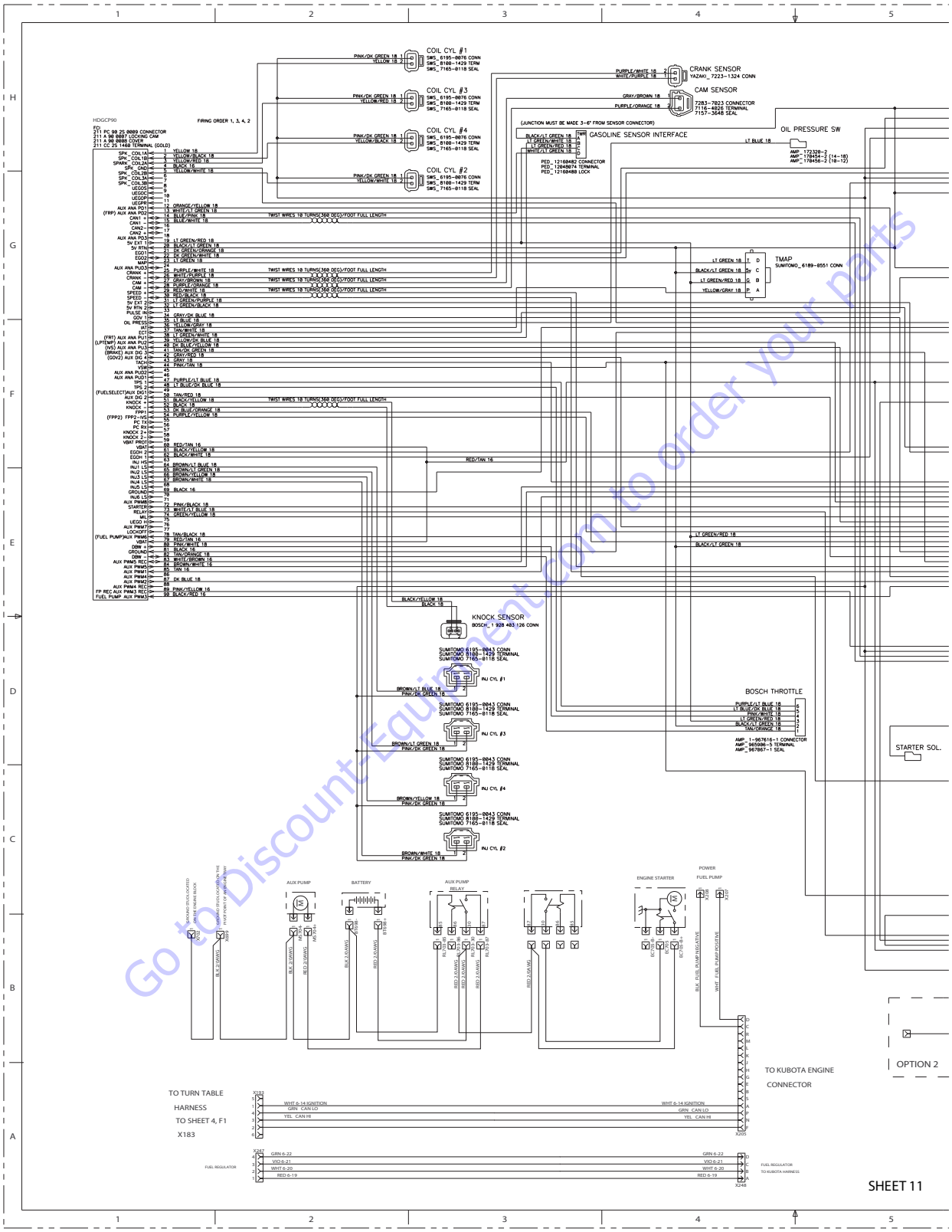





**Figure 7-129. Electrical Schematic - Sheet 17 of 18**

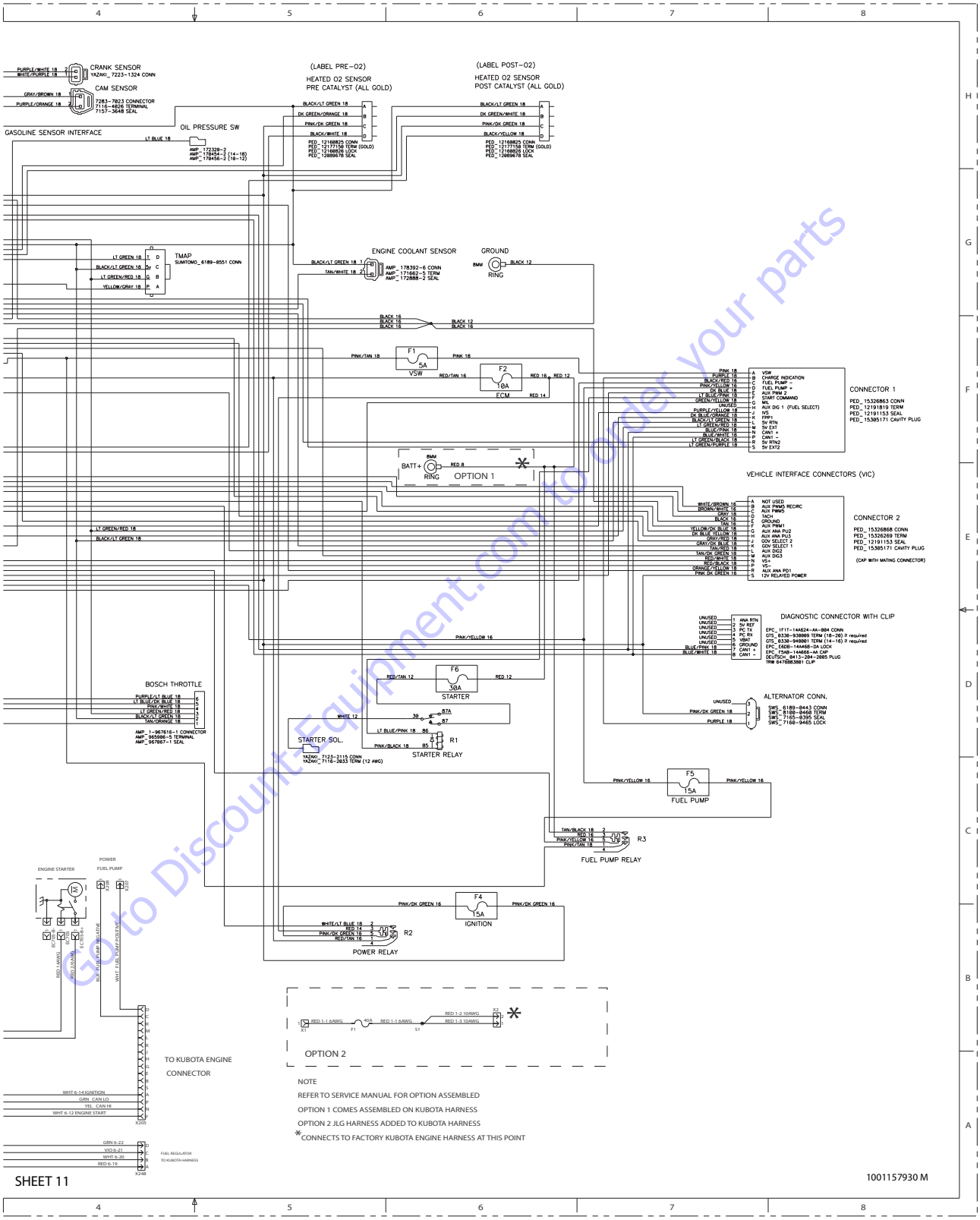





**Figure 7-130. Electrical Schematic - Sheet 18 of 18**

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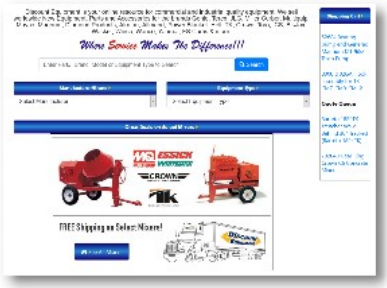

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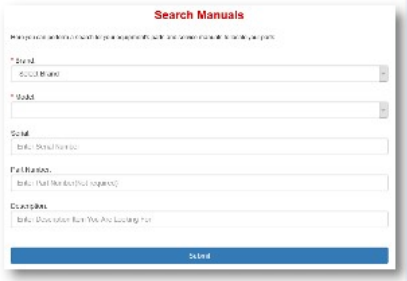


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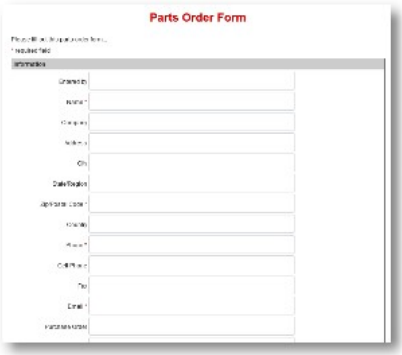


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