2. Use a soft mallet to tap a new wiper seal into the applicable cylinder head gland groove. Install a new wear ring into the applicable cylinder head gland groove.

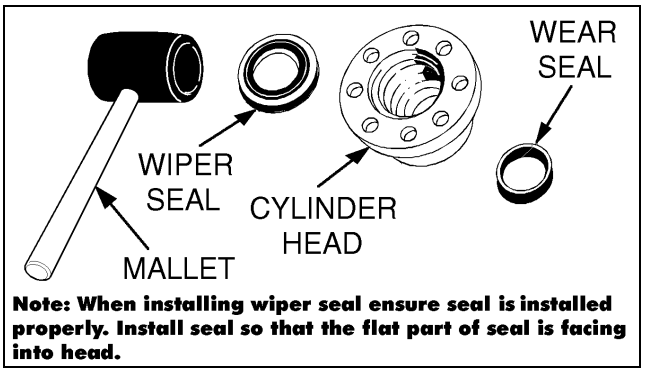


Figure 5-136. Wiper Seal Installation

3. Place a new o-ring and backup ring in the applicable outside diameter groove of the cylinder head.

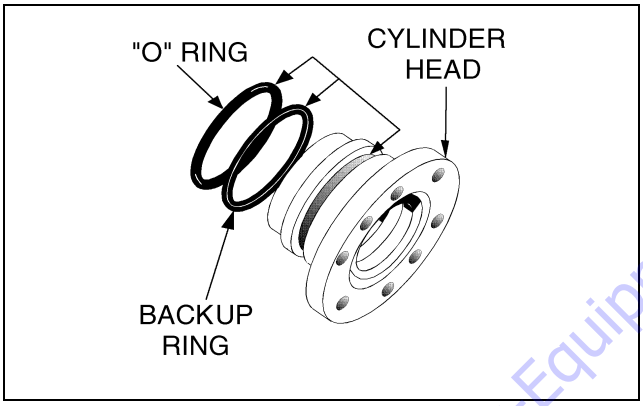


Figure 5-137. Installation of Head Seal Kit

4. Install washer ring onto rod, carefully install the head gland on the rod, ensuring that the wiper and rod seals are not damaged or dislodged. Push the head along the rod to the rod end, as applicable.
5. Using suitable protection, clamp the cylinder rod in a vise or similar holding fixture as close to piston as possible.
6. Place a new o-ring and backup rings in the inner piston diameter groove.
7. Carefully thread the piston on the cylinder rod and hand tight, ensuring that the o-ring and backup rings are not damaged or dislodged.
8. Thread piston onto rod until it abuts the spacer end and install the tapered bushing.

NOTE: *When installing the tapered bushing, piston and mating end of rod must be free of oil.*

9. Assemble the tapered bushing loosely into the piston and insert capscrews through the drilled holes in the bushing and into the tapped holes in the piston.

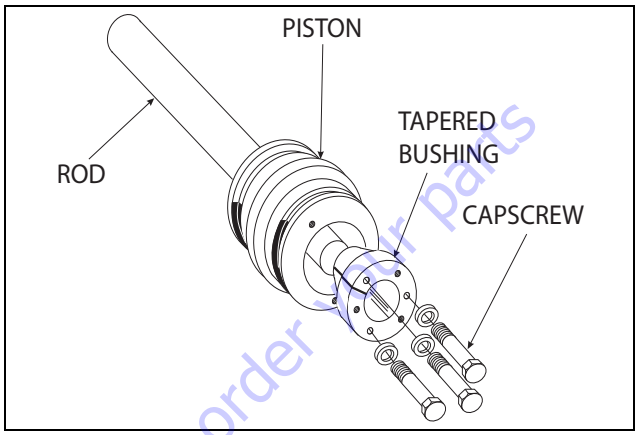


Figure 5-138. Tapered Bushing Installation

10. Tighten the capscrews evenly and progressively in rotation to 9 ft. lbs. (12 Nm).
11. After the screws have been torqued, tap the tapered bushing with a hammer (16 to 24 oz.) and brass shaft (approximately 3/4" in diameter) as follows;
    a. Place the shaft against the cylinder rod and in contact with the bushing in the spaces between the capscrews.
    b. Tap each space once; this means the tapered bushing is tapped 3 times as there are 3 spaces between the capscrews.

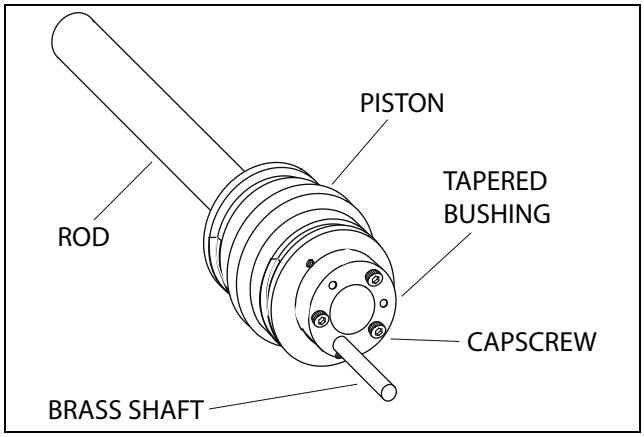


Figure 5-139. Seating the Tapered Bearing

12. Rotate the capscrews evenly and progressively in rotation to 9 ft. lbs. (12 Nm).
13. Remove the cylinder rod from the holding fixture.
14. Place new T-seal and wear rings in the outer piston diameter groove. (A tube, with I.D. slightly larger than the O.D. of the piston is recommended to install the solid seal).

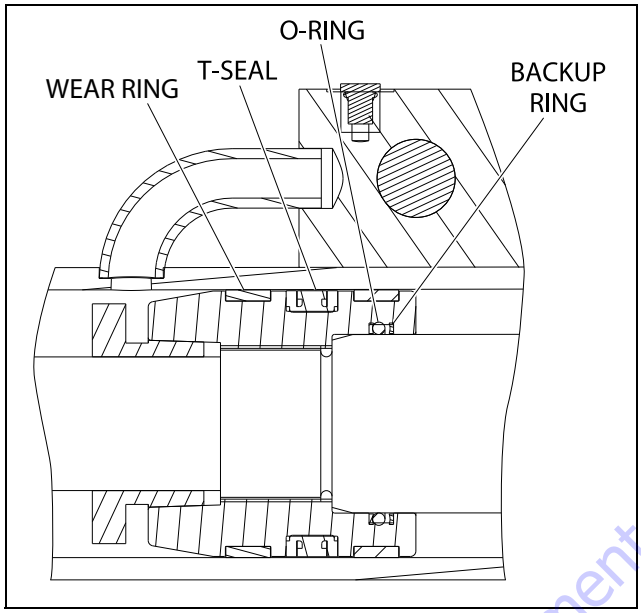


Figure 5-140. Piston Seal Kit Installation

15. Position the cylinder barrel in a suitable holding fixture.

NOTICE

EXTREME CARE SHOULD BE TAKEN WHEN INSTALLING THE CYLINDER ROD, HEAD, AND PISTON. AVOID PULLING THE ROD OFF-CENTER, WHICH COULD CAUSE DAMAGE TO THE PISTON AND CYLINDER BARREL SURFACES.

16. With barrel clamped securely, and while adequately supporting the rod, insert the piston end into the barrel cylinder. Ensure that the piston loading wear ring and T-seals are not damaged or dislodged.
17. Continue pushing the rod into the barrel until the cylinder head gland can be inserted into the barrel cylinder.

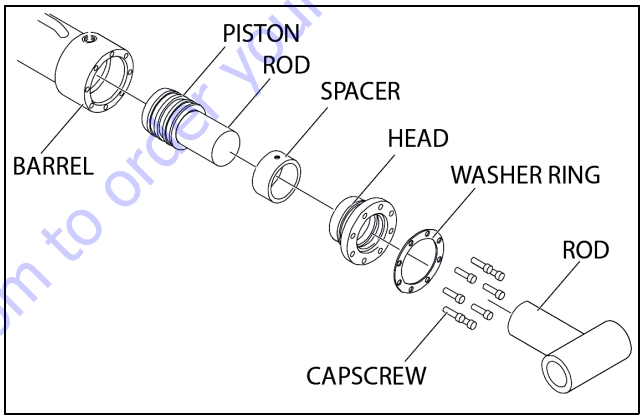


Figure 5-141. Rod Assembly Installation

18. Apply JLG Threadlocker P/N 0100011 to the socket head bolts and secure the cylinder head gland using the washer ring and bolts. Torque bolts to 40 ft. lbs. (55 Nm).
19. After the cylinder has been reassembled, the rod should be pushed all the way in (fully retracted) prior to the re-installation of any holding valve or valves.
20. Install the valve assembly. Torque capscrews to 30-55 ft. lbs. (41-48 Nm).

5.5 CYLINDER REMOVAL AND INSTALLATION

Main Boom Telescope Cylinder Removal

1. Place machine on a flat and level surface, with main boom in the horizontal position. Extend telescope up to gain to pin #1.
2. Shut down engine. Support main boom basket end with a prop (See Figure 5-145., Boom Positioning and Support, Cylinder Repair).

NOTICE

HYDRAULIC LINES AND PORTS SHOULD BE CAPPED IMMEDIATELY AFTER DISCONNECTING LINES TO AVOID THE ENTRY OF CONTAMINANTS INTO THE SYSTEM.

3. Tag and disconnect hydraulic lines to telescope cylinder. Use suitable container to retain any residual hydraulic fluid. Cap hydraulic lines and ports.
4. Remove the retaining rings that retain the telescope cylinder rod to the fly boom.
5. Using a suitable brass drift, carefully drive telescope cylinder rod pin #1 from the fly boom.
6. Remove mounting hardware securing the telescope cylinder barrel end to the base boom.
7. Attach a suitable sling to the telescope cylinder. Using a suitable lifting device attached to the sling, carefully pull the cylinder partially from the aft end boom assembly.
8. Secure the cylinder with a suitable sling and lifting device at the approximate center of gravity.
9. Carefully lift the cylinder clear of the boom assembly and lower to the ground or suitably supported work area.

Main Boom Telescope Cylinder Installation

1. Attach a hydraulic power supply to the telescope cylinder ports. Using suitable supports or lifting devices at each end of the cylinder, extend the rod so that the cylinder pin attach holes are the same distance apart as the boom pin attach holes.
2. Using suitable lifting equipment, carefully lower the cylinder to the boom assembly.
3. Install the cylinder into the boom assembly.
4. Remove the lifting devices from the telescope cylinder.
5. Carefully install telescope cylinder rod pin #1 through the fly boom and secure it with the retaining rings.
6. Carefully install the telescope cylinder barrel end support into slots in base boom and secure with blocks and bolts. Use Loctite #242 on bolts. Shim as necessary.
7. Remove applicable hydraulic line and port caps and correctly connect the hydraulic lines to the telescope cylinder. Ensure all hoses are correctly routed.

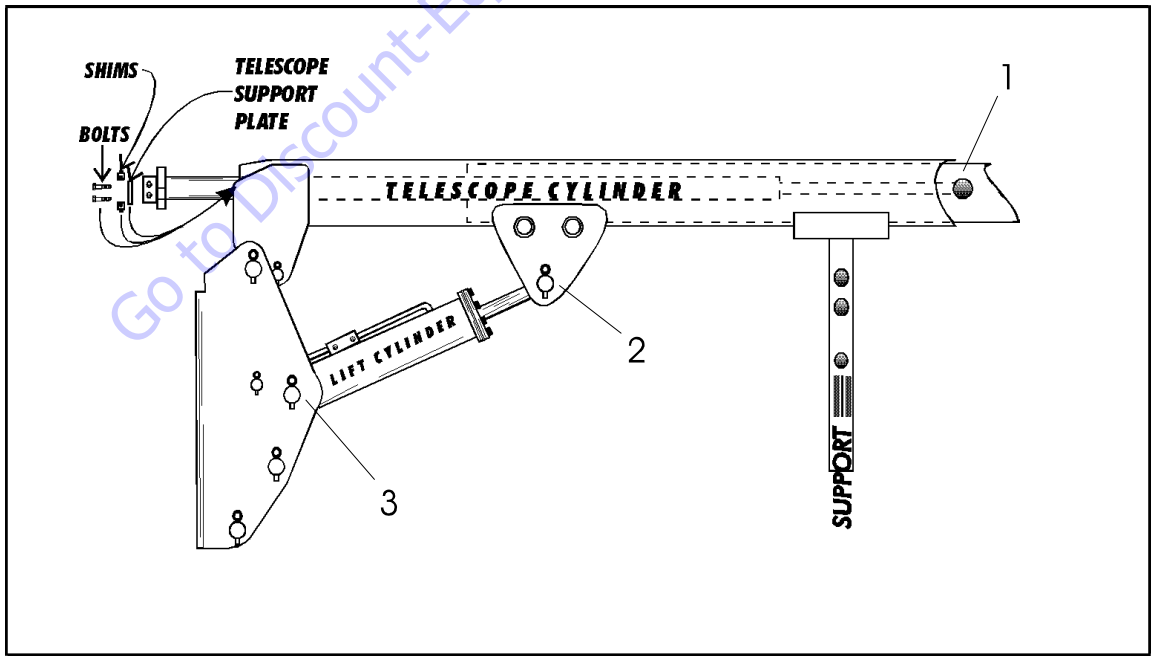


Figure 5-142. Location of Components - Telescope and Lift Cylinder

8. Remove boom prop and overhead crane. Activate hydraulic system.
9. Using all applicable safety precautions, operate the boom functions. Check for correct operation and hydraulic leaks. Secure as necessary.
10. Check fluid level of hydraulic tank and adjust as necessary.

Main Boom Lift Cylinder Removal

1. Place the machine on a flat and level surface. Start the engine and place the main boom in the horizontal position. Shut down engine and prop the boom. (See Figure 5-145., Boom Positioning and Support, Cylinder Repair).
2. Remove the hardware retaining the cylinder rod attach pin #2 to the boom. Using a suitable brass drift, drive out the cylinder rod attach pin.
3. Using auxiliary power, retract the lift cylinder rod completely.
4. Disconnect, cap and tag the main boom lift cylinder hydraulic lines and ports.
5. Remove barrel end attach pin #3 retaining hardware.
6. Using a suitable brass drift drive out the barrel end attach pin from the upright.
7. Remove the cylinder from the boom and place in a suitable work area.

Main Boom Lift Cylinder Installation

1. Install lift cylinder in place using suitable slings or supports, aligning attach pin mounting holes on the upright.
2. Using a suitable drift, drive barrel end attach pin #3 through the mounting holes in the lift cylinder and the upright. Secure in place with the pin retaining hardware.
3. Remove cylinder port plugs and hydraulic line caps and correctly attach lines to cylinder ports.
4. Using auxiliary power extend the cylinder rod until the attach pin hole aligns with those in the boom. Using a suitable drift drive cylinder rod attach pin #2 through the aligned holes, taking care to align the grooved pin holes. Secure the pin in place with attaching hardware.
5. Remove boom prop and overhead crane. Activate hydraulic system.
6. Using all applicable safety precautions, operate the boom functions. Check for correct operation and hydraulic leaks. Secure as necessary.
7. Check fluid level of hydraulic tank and adjust as necessary.

Upright Level Cylinder Removal

1. With the aid of an assistant, manually override the Plunger Valve with a pry bar, and from Ground Control, using auxiliary power, extend the tower telescope out to gain access to leveling cylinder rod end pin #3.

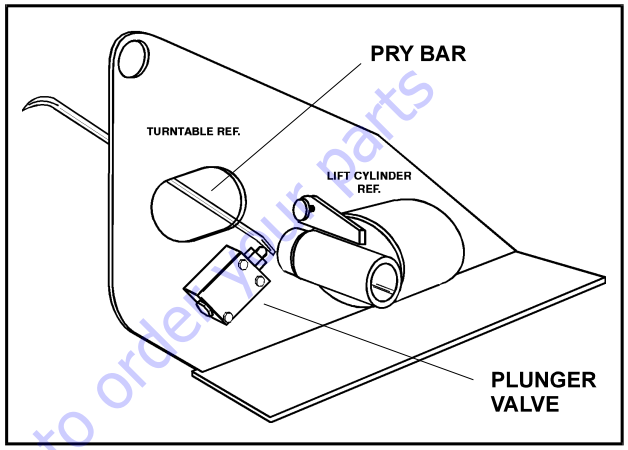


Figure 5-143. Overriding the Plunger Valve

2. With the main boom positioned and supported as shown in Leveling Cylinder Removal, prepare to remove the upright level cylinder.
3. Remove the mounting hardware from pin #1, securing leveling cylinder to upright.
4. With overhead crane supporting upper boom assembly. Raise boom until tension is released from cylinder pin #1.
5. Using a suitable drift, drive the barrel end attach pin #1 through the mounting holes in the upright and leveling cylinder.
6. Remove the mounting hardware from upright pivot pin #2 which secures upright to tower boom assembly.
7. Using a suitable drift, drive pivot pin #2 through the mounting holes in the upright and tower boom assembly.
8. Using all applicable safety precautions, operate the overhead crane to move upright and upper boom assembly forward to clear tower boom.
9. Using all applicable safety precautions, operate the overhead crane to move upright and upper boom assembly forward to clear tower boom.
10. After moving assemblies forward, operate overhead crane to the left far enough to remove leveling cylinder.

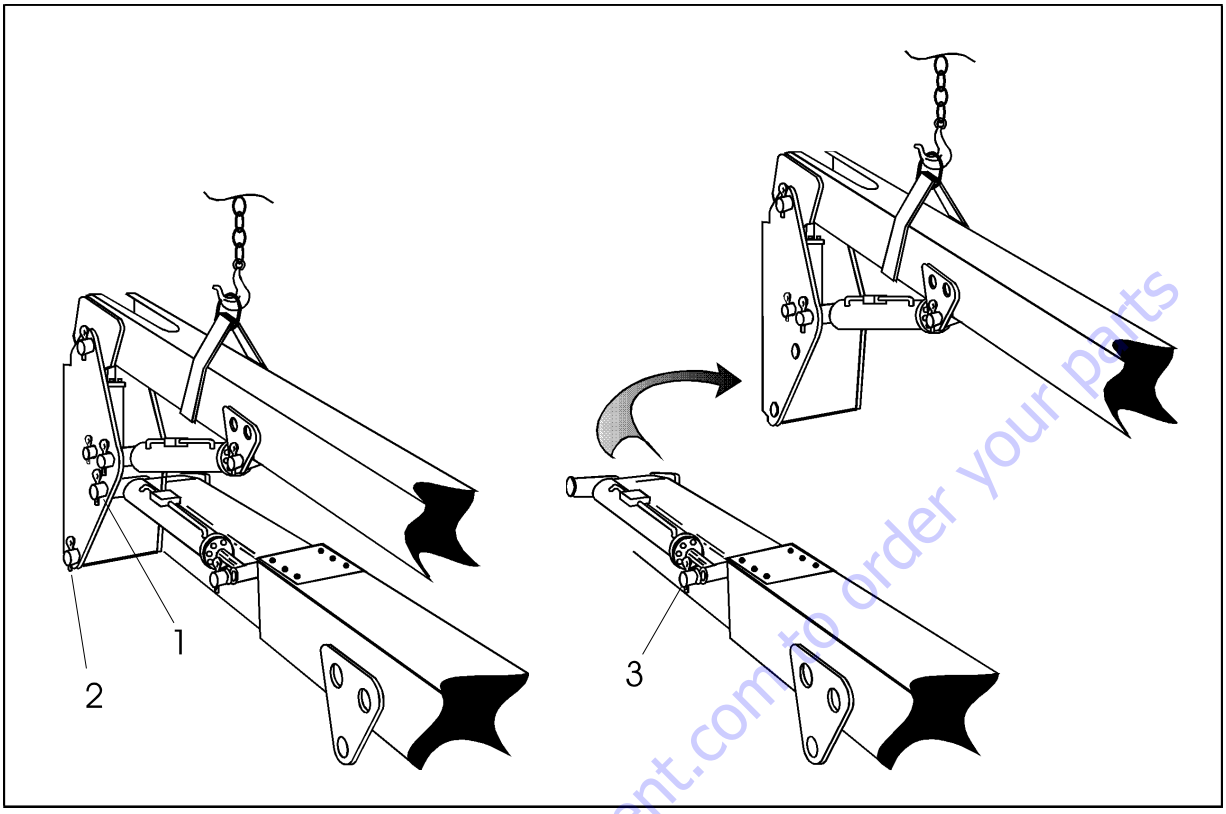


Figure 5-144. Leveling Cylinder Removal

11. Tag, disconnect and cap hydraulic lines to level cylinder.

12. Remove the mounting hardware from leveling cylinder rod end pin #3 which secures cylinder to tower boom fly assembly.

13. Using a suitable drift, drive leveling cylinder pin #3 through the mounting holes in the tower boom fly and leveling cylinder, then remove leveling cylinder.

Upright Level Cylinder Installation

1. Place the leveling cylinder in position in the tower boom, then align holes in tower boom and leveling cylinder. Install leveling cylinder attach pin #3 using a suitable rubber mallet.

2. Secure pin to tower boom with mounting hardware.

3. Remove cylinder port plugs and hydraulic line caps and correctly attach lines to cylinder ports.

4. Using all applicable safety precautions, operate the overhead crane to move upright and upper boom assembly in proper position with tower boom.

5. Align holes in upright and tower boom assembly and install upright pivot pin #2 using a suitable rubber mallet. Secure pin with mounting hardware.

6. Align holes in upright and leveling cylinder barrel end and install leveling cylinder pin #1 using a suitable rubber mallet. Secure pin with mounting hardware.

7. Remove overhead crane from upper boom. Activate hydraulic system.

8. Using all applicable safety precautions, operate the boom functions. Check for correct operation and hydraulic leaks. Secure as necessary.

9. Check fluid level of hydraulic tank and adjust as necessary.

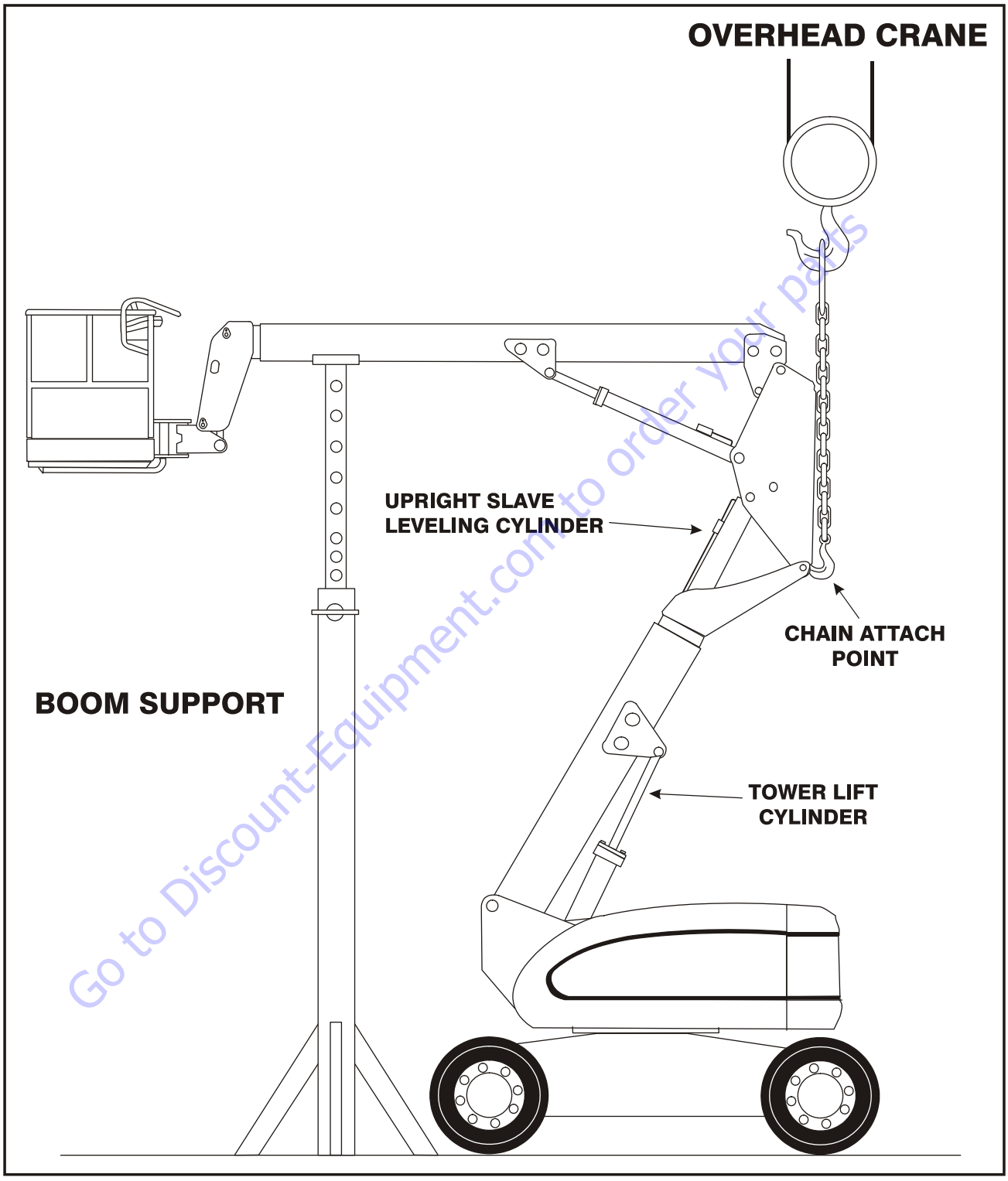


Figure 5-145. Boom Positioning and Support, Cylinder Repair

Tower Boom Lift Cylinder Removal

1. Place machine on a flat and level surface. Place the main boom in a horizontal position with the telescope cylinder fully retracted. Place the tower boom in a fully elevated and fully retracted position (See Figure 5-145., Boom Positioning and Support, Cylinder Repair).
2. Support the main boom with a prop. Support the upright with an overhead crane. (See Figure 5-145., Boom Positioning and Support, Cylinder Repair).
3. Using slings restrain tower lift cylinder.
4. Remove mounting hardware securing the cylinder rod pin to the tower boom. Using a suitable brass drift, drive out the cylinder rod attach pin.
5. Tag, disconnect and cap the tower lift cylinder hydraulic lines and ports.
6. Remove mounting hardware securing the cylinder barrel pin to the turntable. Using a suitable brass drift, drive out the cylinder barrel pin.
7. Carefully remove restraining slings and remove tower lift cylinder from turntable. Place in a suitable work area.
8. If necessary, use an auxiliary power source and fully retract lift cylinder.

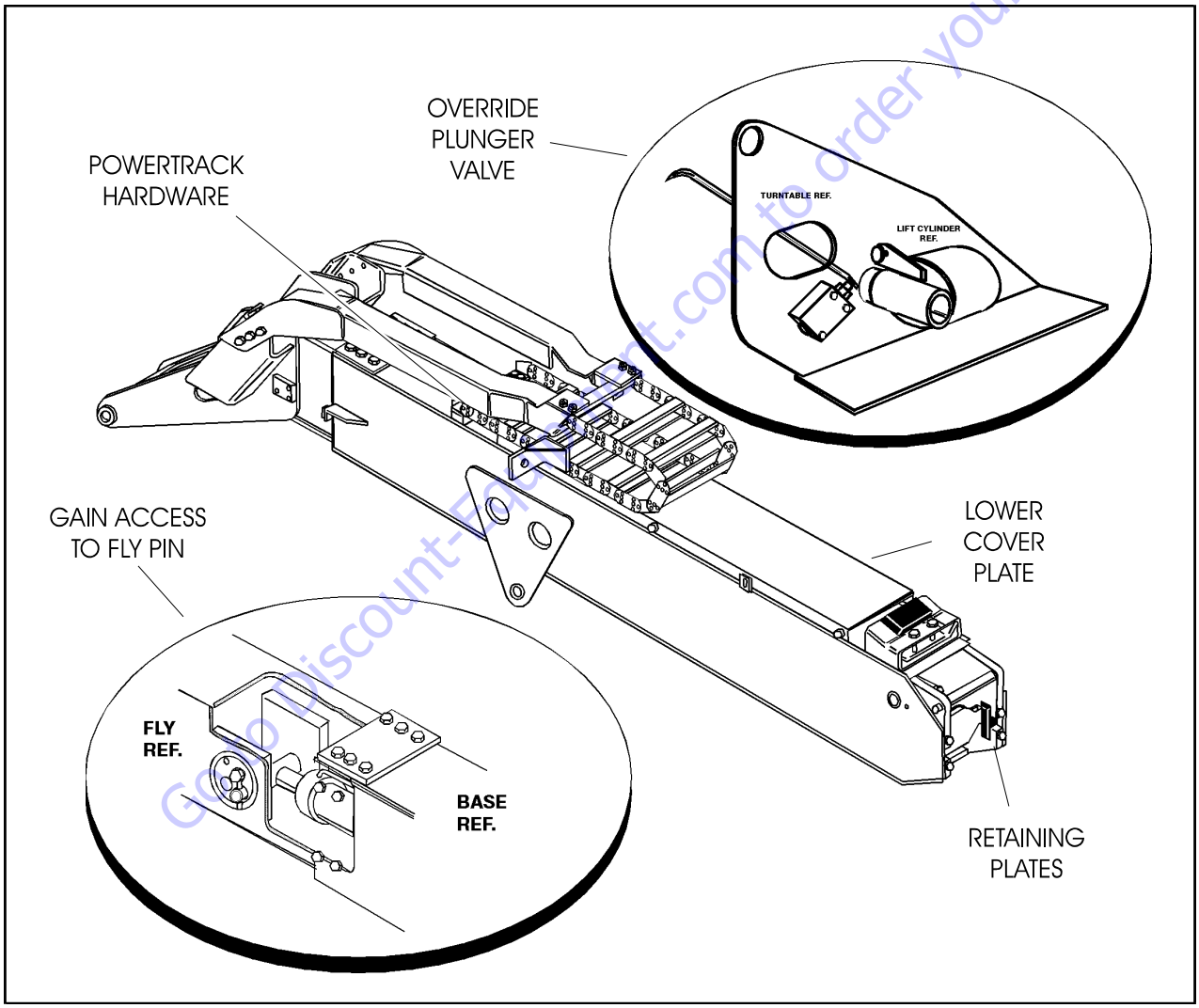


Figure 5-146. Tower Telescope Cylinder Removal

Tower Boom Lift Cylinder Installation

1. With the main boom and tower boom positioned and supported as in Figure 5-145., Boom Positioning and Support, Cylinder Repair, place the tower lift cylinder in position on the turntable and secure in place using slings.
2. Align holes in turntable and lift cylinder. Using a suitable rubber mallet, install the cylinder barrel pin and secure with mounting hardware.
3. Connect an auxiliary power source to the cylinder and extend cylinder rod until the cylinder rod bushing aligns with bushings on boom.
4. Using an appropriate brass drift, drive the rod attach pin through the aligned bushings. Secure pin with attaching hardware.
5. Remove caps from cylinder hydraulic lines and correctly install lines to cylinder as previously tagged.
6. Remove boom prop and overhead crane. Activate hydraulic system.
7. Using all applicable safety precautions, operate the boom functions. Check for correct operation and hydraulic leaks. Secure as necessary.
8. Check fluid level of hydraulic tank and adjust as necessary.

Tower Telescope Cylinder Removal

1. Place machine on a flat and level surface, with main boom in the horizontal position. Shut down engine and prop the boom See Figure 5-146., Tower Telescope Cylinder Removal.
2. With the aid of an assistant, manually override the Plunger Valve with a pry bar, and from Ground Control, using auxiliary power, extend the tower telescope out to gain access to fly attach pin.
3. Remove lower cover plate.
4. Remove mounting hardware securing powertrack to tower boom assembly. After removing mounting hardware, slide powertrack backward far enough to move holes and wiring harness to the side to gain access to telescope cylinder.
5. Tag, disconnect and cap hydraulic hoses to Tower Telescope Cylinder. Plug cylinder ports.
6. Remove mounting hardware securing upper cylinder pin to fly boom. Using a suitable brass drift, drive out the cylinder rod pin.
7. Remove mounting hardware attaching retaining plates to base boom and remove plate.
8. Carefully slide the telescope cylinder from the boom. Place cylinder on a suitable work area.

Tower Telescope Cylinder Installation

1. With the boom positioned as in Figure 5-146., Tower Telescope Cylinder Removal, slide the telescope cylinder into the boom, aligning the cylinder port block end with slotted holes in Base Boom. Secure telescope cylinder with mounting hardware.
2. Remove caps and plugs from hydraulic lines and ports. Properly connect hydraulic lines to cylinder as tagged during Removal. Reinstall cover plate.
3. Start engine. With the aid of an assistant, manually override the plunger valve. Activate Tower telescope out to align attaching pin holes in Fly Boom. Shut down engine.
4. Using a brass drift, drive in the attach pin. Secure in place with mounting hardware.
5. Align holes in base boom and powertrack. Secure the powertrack with mounting hardware.
6. Remove boom prop and overhead crane. Activate hydraulic system.
7. Using all applicable safety precautions, operate the boom functions. Check for correct operation and hydraulic leaks. Secure as necessary.
8. Check fluid level of hydraulic tank and adjust as necessary.

5.6 VARIABLE DISPLACEMENT PUMP (M46 SERIES)

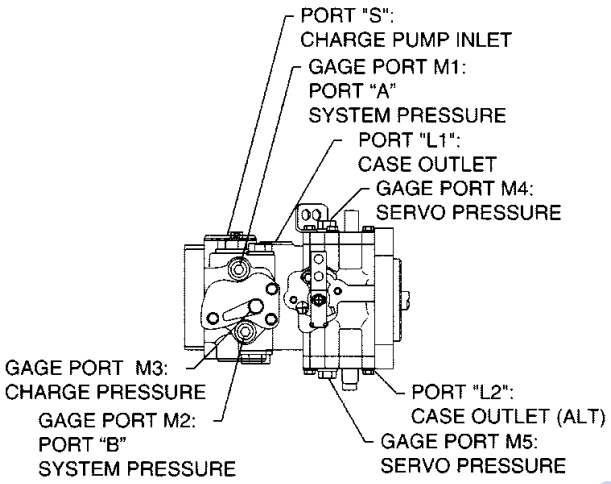
Troubleshooting

GAUGE INSTALLATION

It will be necessary to install a high pressure gauge into the system pressure gauge ports to check the setting of the high pressure relief valves.

Measuring the charge pump inlet vacuum will help locate restrictions in the inlet lines, filter, etc.

Case pressure readings can help locate restrictions in the return lines, oil cooler, and return filter.



Gauge Information		
M1	System Pressure Port A	10,000 PSI or 600 Bar Gauge
		9/16-18 O-ring Fitting
M2	System Pressure Port B	10,000 PSI or 600 Bar Gauge
		9/16-18 O-ring Fitting
M3	Charge Pressure	1000 PSI or 60 Bar Gauge
		9/16-18 O-ring Fitting or Tee into Charge Pressure Filter Outlet Line
L1 L2	Case Pressure	1000 PSI or 60 Bar Gauge
		1-1/16-12 O-ring Fitting
S	Charge Pump Inlet Vacuum	Vacuum Gauge
		Tee into Charge Pump Inlet Line
M4	Servo Pressure	1000 PSI or 60 Bar Gauge
		9/16-18 O-ring Fitting
M5	Servo Pressure	1000 PSI or 60 Bar Gauge
		9/16-18 O-ring Fitting

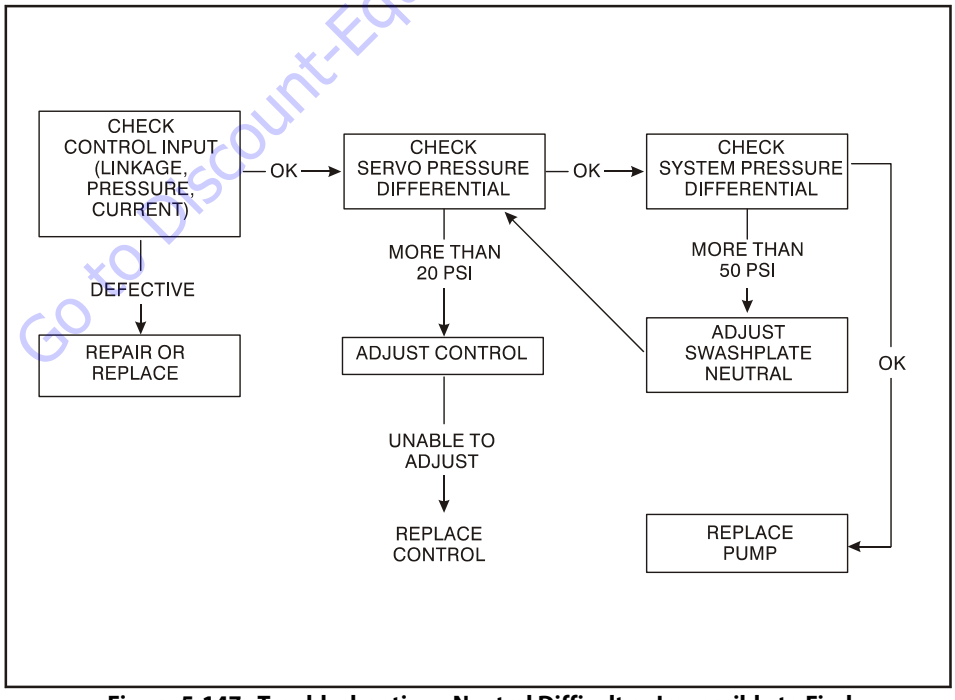


Figure 5-147. Troubleshooting - Neutral Difficult or Impossible to Find

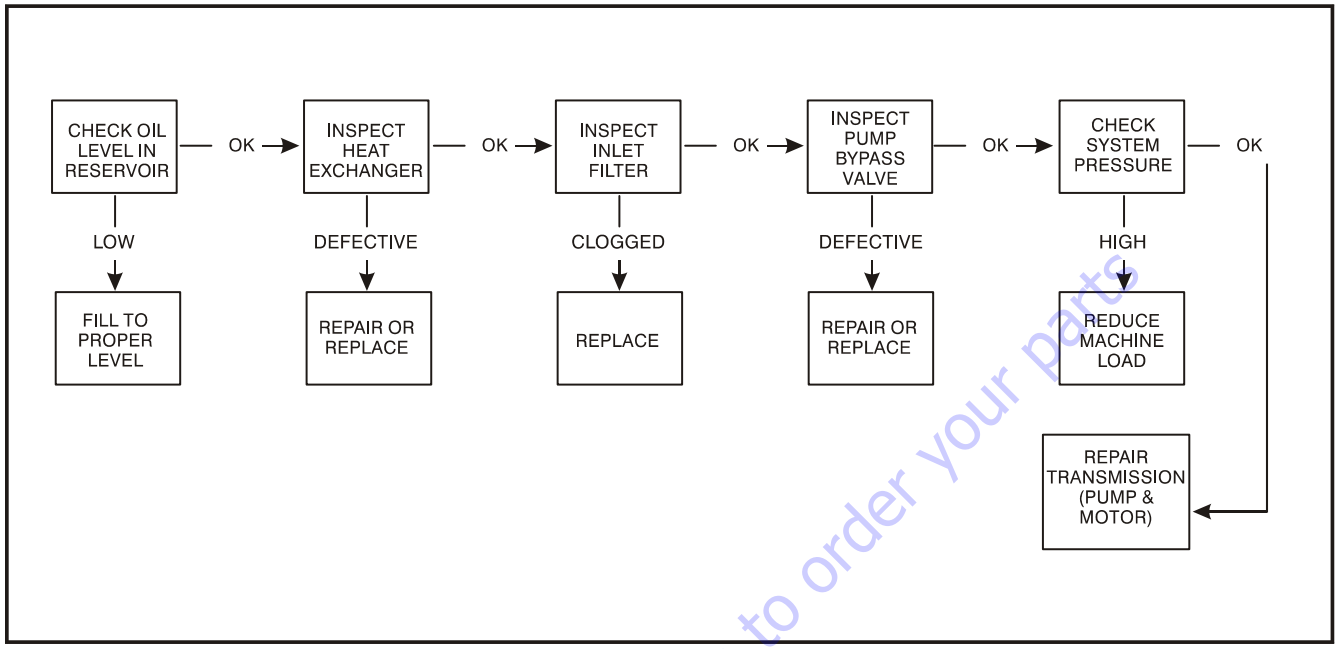


Figure 5-148. Troubleshooting - System Operating Hot

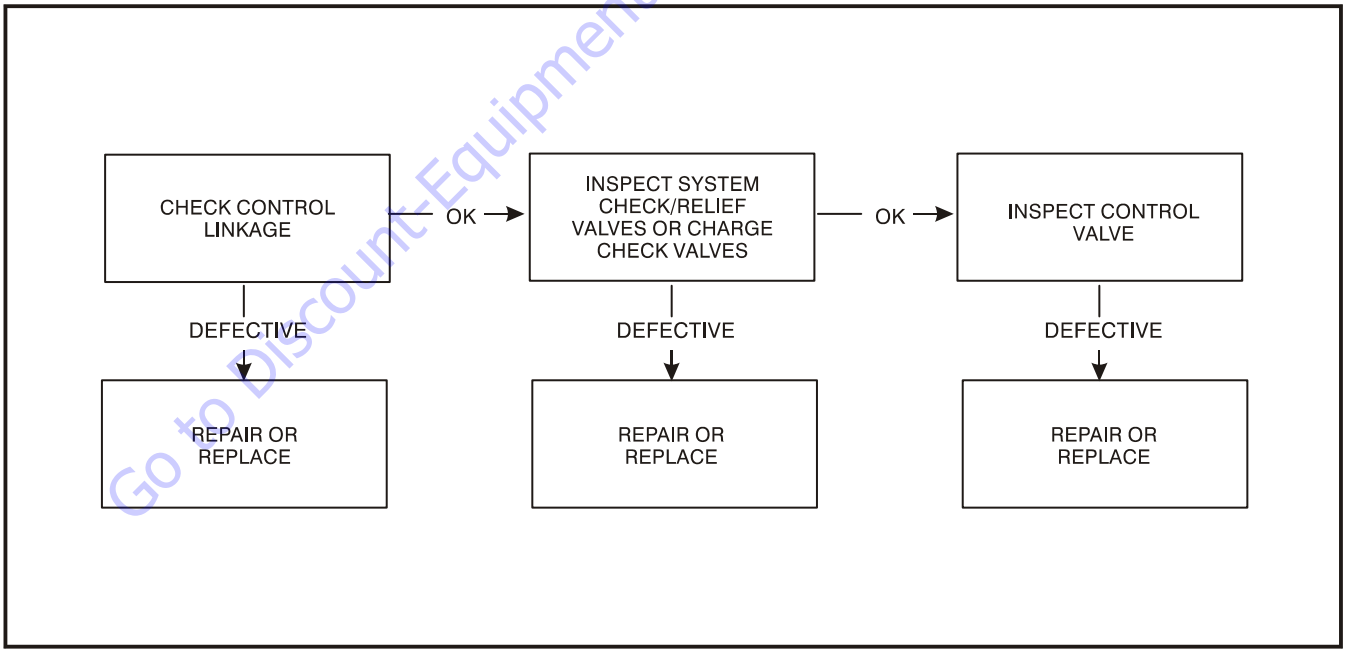


Figure 5-149. Troubleshooting - Transmission Operates in One Direction Only

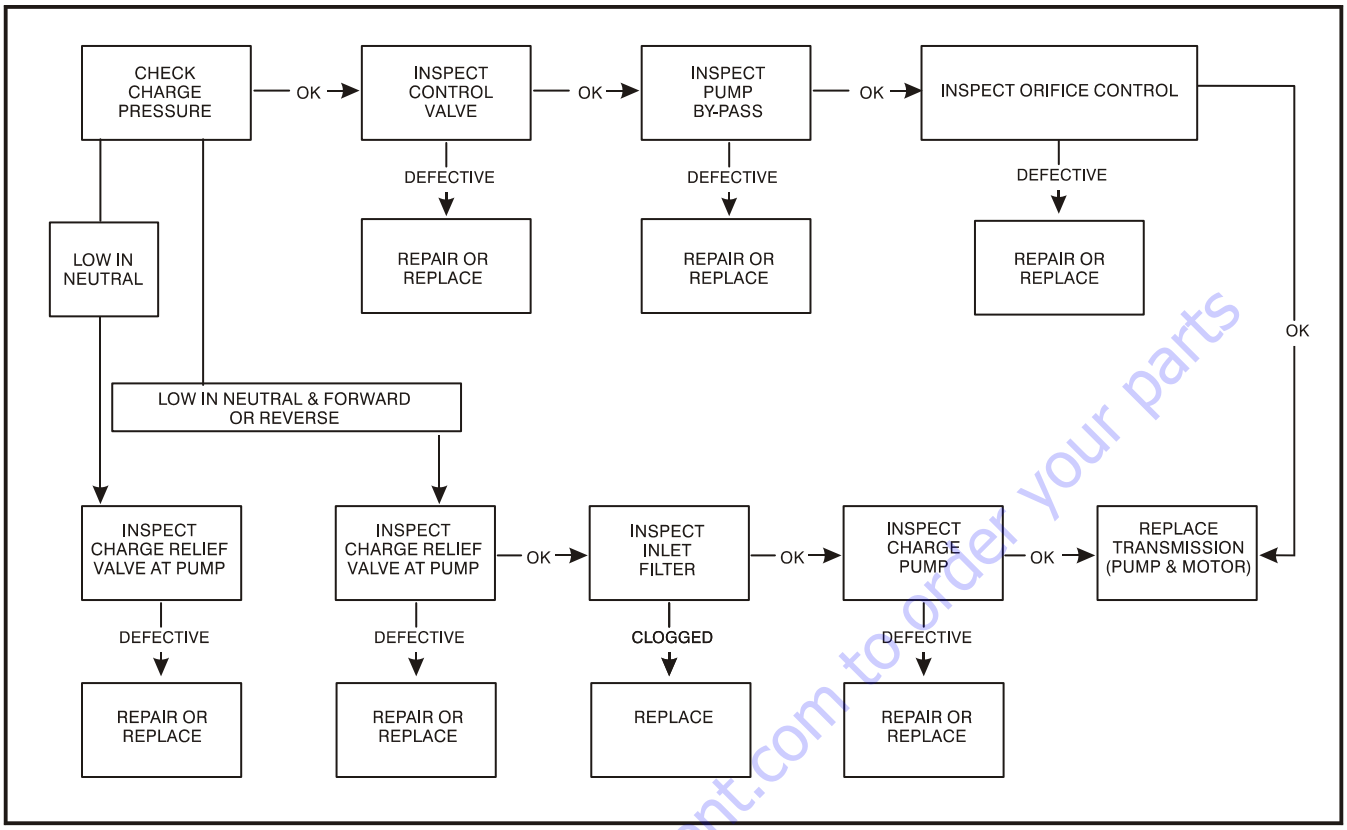


Figure 5-150. Troubleshooting - System Response is Sluggish

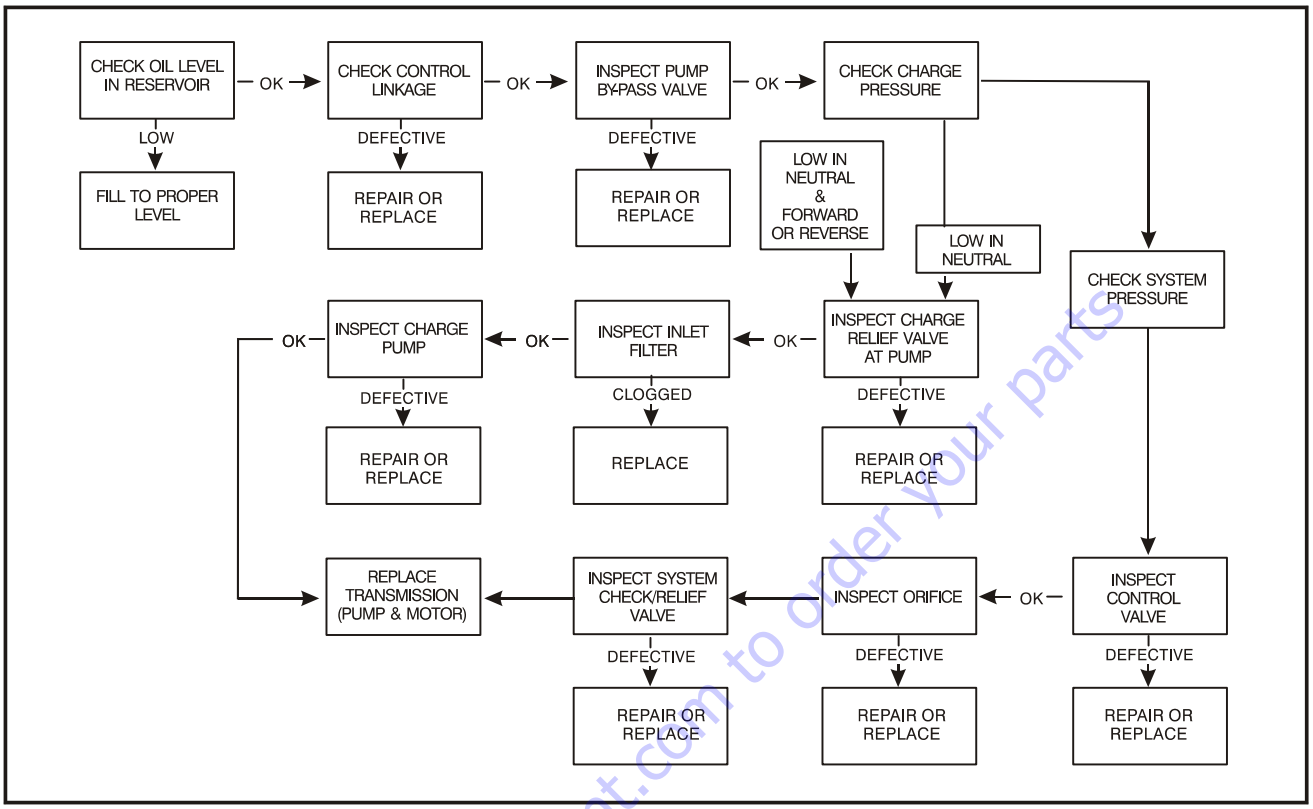
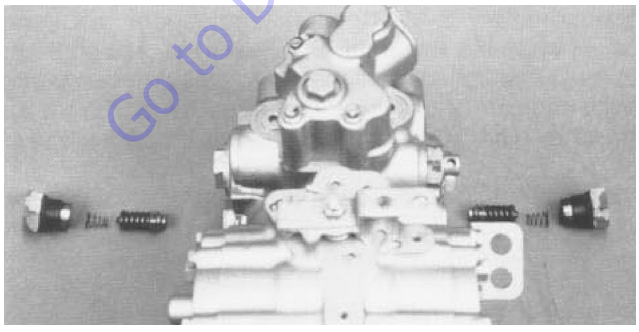


Figure 5-151. Troubleshooting - System Will Not Operate in Either Direction

Inspections and Adjustments

CHECK/HIGH PRESSURE RELIEF VALVES

The system check/relief valves have the dual purpose of providing make-up oil during by-directional rotation and providing protection from system over pressure. When the problem occurs in one direction only, interchange the check/relief valves to see if the problem changes to the other direction. If so, one check/relief valve cartridge is either malfunctioning or does not have the proper setting.

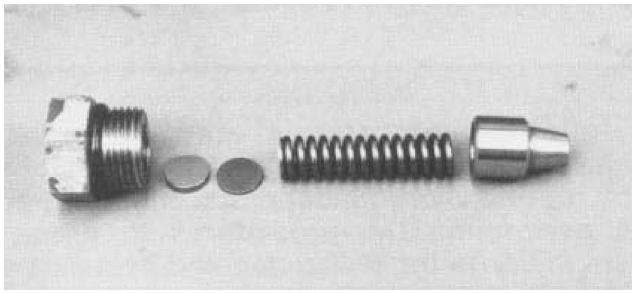


⚠ CAUTION

THE RELIEF VALVES ARE FACTORY SET AND SHOULD NOT BE TAMPERED WITH EXCEPT FOR REPLACING THE ENTIRE CARTRIDGE. DISASSEMBLY MAY CHANGE THE SETTING AND CAUSE ERRATIC UNIT OPERATION OR PREMATURE FAILURE.

PUMP CHARGE RELIEF VALVE

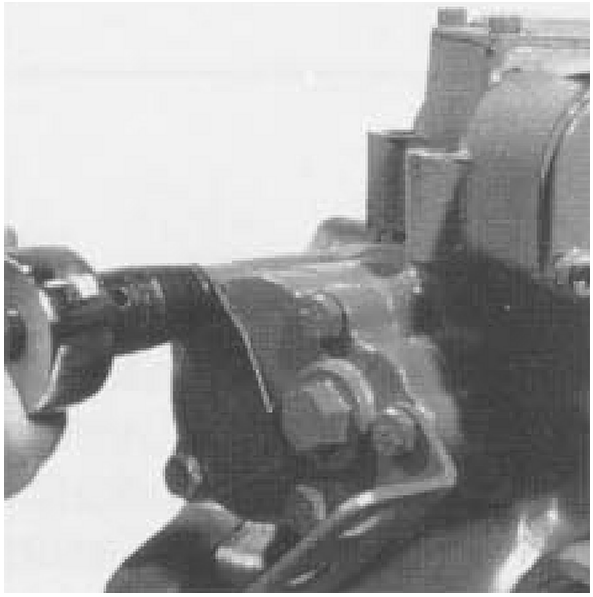
If charge pressure is low (less than 220 psi [15.2 Bar] above case pressure), the charge relief valve should be inspected. Inspect for foreign material holding the poppet open, and for scoring or wear on the poppet and seat in the housing. Adjustments of the charge pressure is accomplished by changing the shim thickness behind the spring.



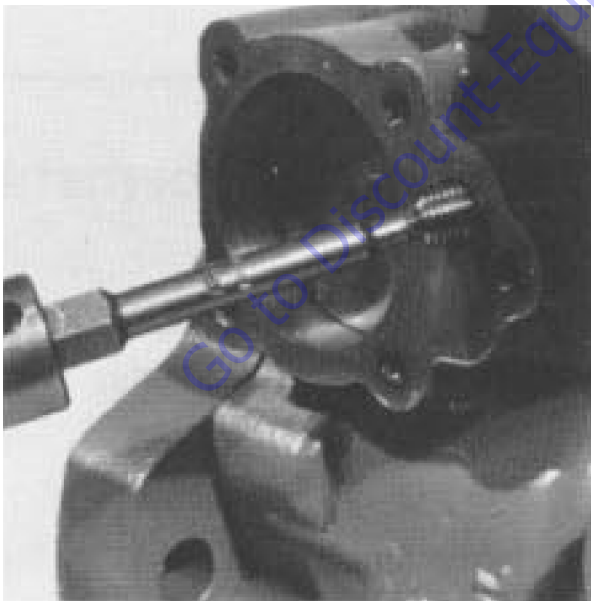
ELECTRICAL DISPLACEMENT CONTROL ORIFICES

NOTE: *The pump should have two control orifices located under the servo covers.*

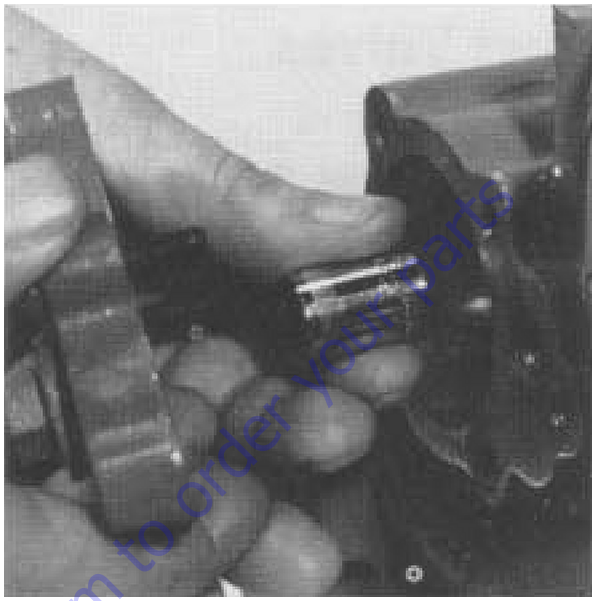
1. With a 7/16" wrench, remove the five bolts from the servo cover opposite the neutral adjustment (cover without the adjustment screw).



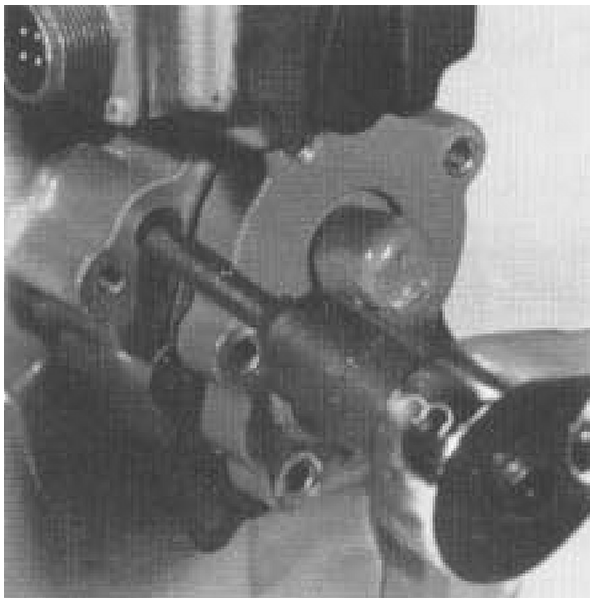
2. With a 7/32" internal wrench, remove and inspect the orifice.



3. Remove the bolts from the servo cover on the neutral adjustment side. Install a spacer or sprocket, approximately 0.75 in. (19 mm) long, under the servo cover opposite the neutral adjustment.



4. Re-install the bolts and tighten until the servo cover on the neutral adjustment side of the pump separates 0.125 in. (3 mm) from the housing. Turn the cover and remove and inspect the orifice.

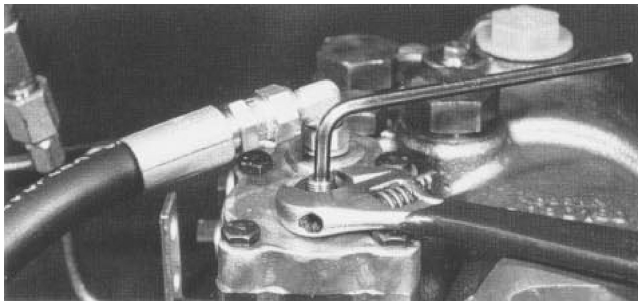


NOTE: *The Displacement Control may first have to be removed in order to rotate the servo cover.*

5. Remove spacer, re-install orifices, gaskets, and covers. Torque grade 5 bolts 8 to 11 ft.lbs. (10.8 to 14.9 Nm) and grade 8 bolts 11 to 13 ft.lbs. (14.9 to 17.8 Nm).

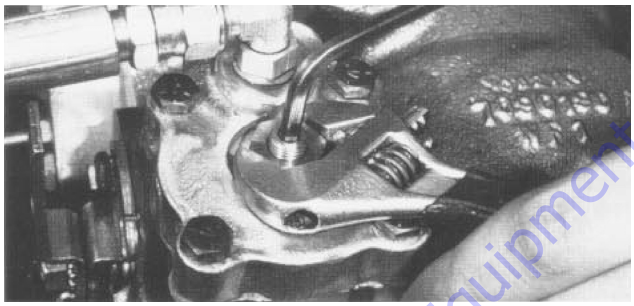
SWASHPLATE NEUTRAL ADJUSTMENT

1. Using a low pressure line (500 psi [35 Bar] min.), cross port servo port F to servo port G. This removes the effects of any control pressure on the servo piston.



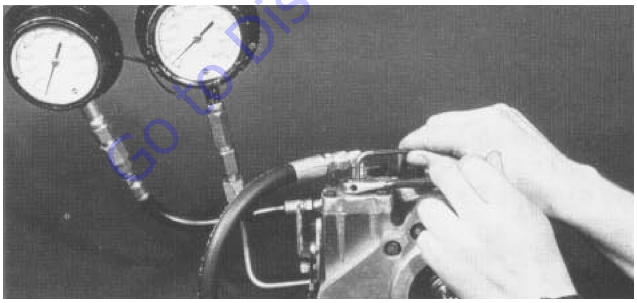
2. Install pressure gauges (10,000 psi [690 Bar]) in the system pressure gauge ports. Start the engine and slowly accelerate to normal operating RPM.

3. Remove the protective cap and loosen the servo lock nut while holding the servo adjustment screw in position.



4. Turn the servo adjustment screw until the two system pressure gauge readings are equal.

5. Turn the servo adjustment screw clockwise until one of the system pressures starts to increase.



6. Noting the amount of rotation, turn the servo adjustment screw counter-clockwise until the other system pressure starts to increase.

7. Turn the servo adjustment screw clockwise half the amount of rotation noted above.

8. While holding the servo adjustment screw from turning, torque the servo lock nut 13 to 18 ft.lbs. (17.6 to 24.4 Nm). Stop the engine, install a new protective cap, remove the servo cross-port line, and proceed to the appropriate control adjustment.

EDC NEUTRAL ADJUSTMENT

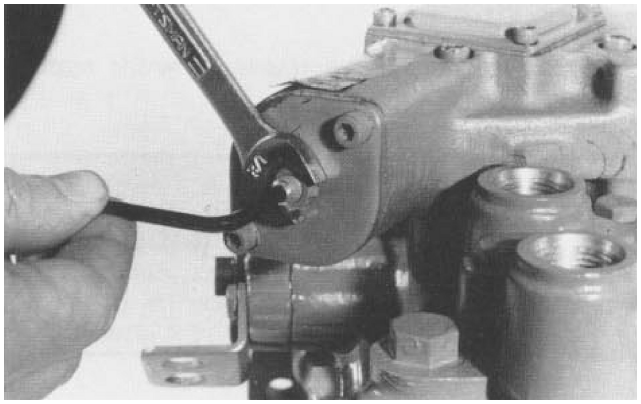
1. Remove the electrical connector at the EDC. Remove the servo cross port line (installed while making the swash plate neutral adjustment) and install a 0 to 300 PSI (0 to 21 BAR) gauge in each servo port.

⚠ WARNING

THE FOLLOWING PROCEDURE MAY REQUIRE THE MACHINE TO BE DISABLED (WHEELS RAISED OFF THE GROUND, WORK FUNCTION DISCONNECTED, ETC.) WHILE PERFORMING THE PROCEDURES IN ORDER TO PREVENT INJURY TO THE TECHNICIAN AND BYSTANDERS.

2. Start the engine and accelerate to normal operating RPM.

3. Loosen lock nut with 1/2" wrench and slowly rotate the neutral adjustment screw, with 5/32" internal hex wrench, until the pressure is equal on both servo gauges.



4. Slowly rotate the neutral adjustment screw until one of the servo gauges starts to increase in pressure.

5. Noting the amount of rotation, slowly rotate the neutral adjust screw in the opposite direction until the other servo gauge begins to increase in pressure.

6. Turn the neutral adjust screw back one - half the amount noted above. Hold the neutral adjust screw and torque the lock nut to 25 to 30 in.lbs. (2.8 to 3.4 NM).

7. Stop the engine. Connect the control input. Remove the servo pressure gauges. Return the machine to normal operating condition. Restart the engine and assure that the hydrostatic system is in neutral.

Minor Repair and Replacement

Minor repairs may be performed, following the procedures in this section.

Cleanliness is a primary means of assuring satisfactory transmission life, on either new or repaired units. Cleaning parts by using solvent wash and air drying is usually adequate. As with any precision equipment, all parts must be kept free of foreign materials and chemicals.

Protect all exposed sealing surfaces and open cavities from damage and foreign material.

It is recommended that all gaskets and O-rings be replaced. Lightly lubricate all O-rings with clean petroleum jelly prior to assembly. All gasket sealing surfaces must be cleaned prior to installing new gaskets.

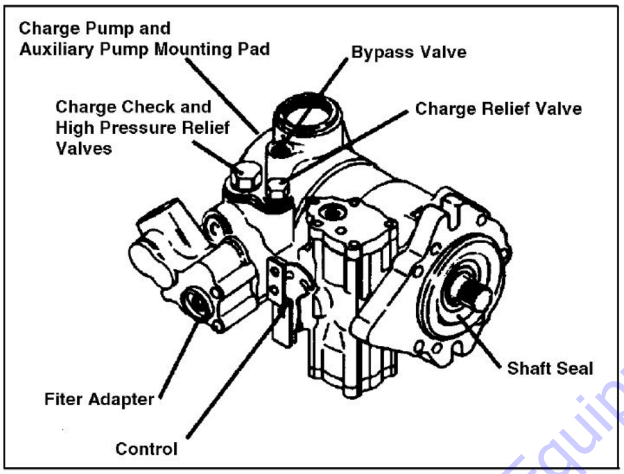
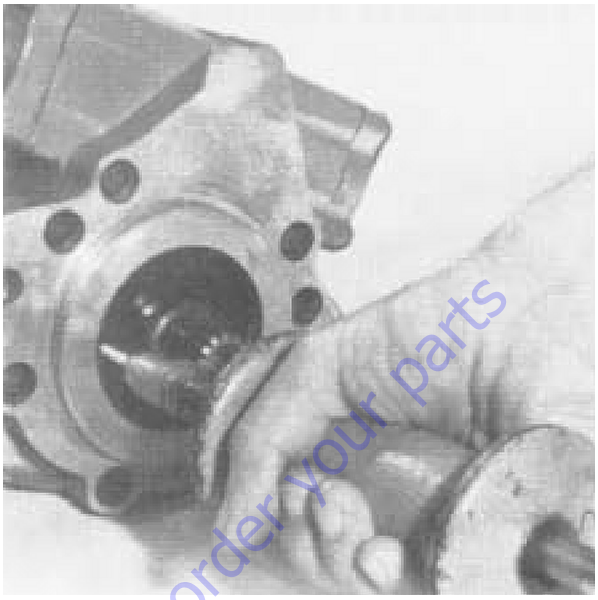


Figure 5-152. Variable Displacement Pump

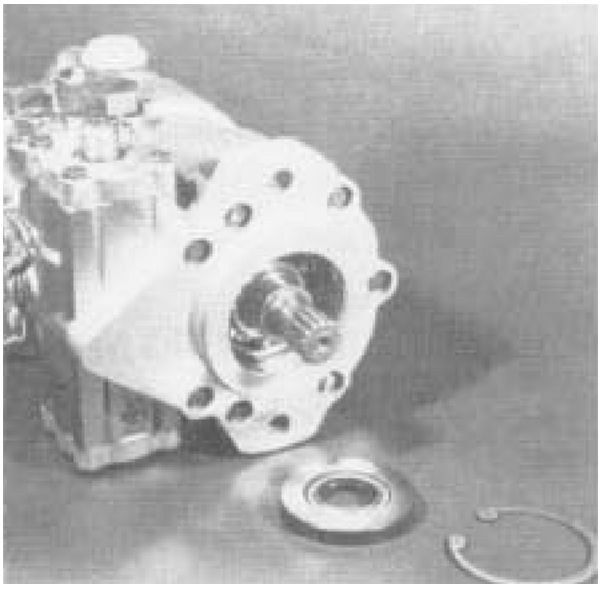
SHAFT SEAL

Lip type shafts are used on Series 40 - M46 pumps and motors. These seals can be replaced without major disassembly of the unit. However, replacement of the shaft seal requires removal of the pump from the machine.

1. Remove the retaining ring from the housing.



2. Carefully remove the seal from the housing bore. The face of the seal may be punctured with a sharp instrument (such as a screw driver) to aid in prying the seal out, or a slide hammer type puller may be used to remove the seal. Care must be taken so as not to damage the housing bore or shaft. Once removed, the seal is not reusable.

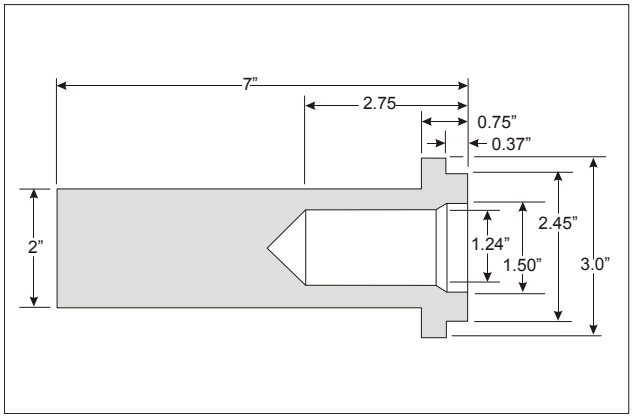


3. Prior to installing the new seal, inspect the sealing area on the shaft for rust, wear, or contamination. Polish the sealing area on the shaft if necessary.

4. Wrap the spline or key end of the shaft with thin plastic to prevent damage to the seal lip during installation. Lubricate the inside diameter of the new seal with petroleum jelly.

NOTE: *The outside diameter of the seal may be lightly coated with sealant (such as Loctite High Performance Sealant #59231) prior to installation. This will aid in preventing leaks caused by damage to the housing seal bore.*

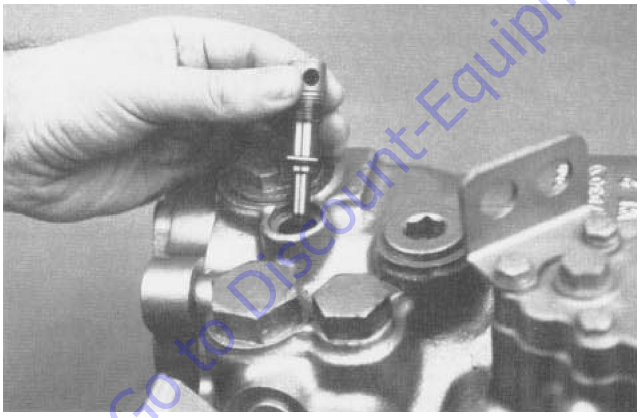
5. Slide the new seal over the shaft and press it into the housing bore. Be careful not to damage seal. A seal installer tool can be made to aid in installing the seal.



6. Reinstall the seal retaining ring.

BYPASS VALVE (PUMP)

1. Unscrew the bypass valve from the housing. Inspect the valve and mating seat for damage or foreign material. It is recommended that the O-ring and back - up ring be replaced.

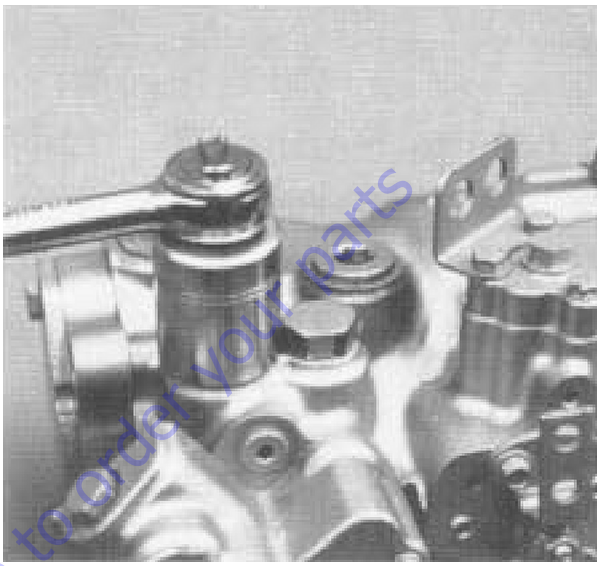


NOTE: *Bypass valves are available with integral bypass orifices for specific applications. Refer to the appropriate Service Parts Manual for more information.*

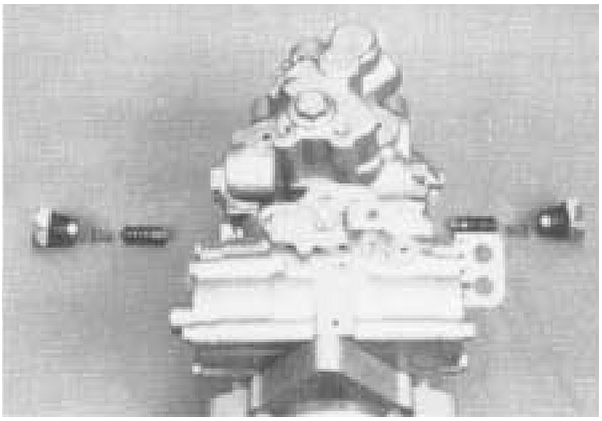
2. Reinstall the bypass valve into the housing. Torque to 7 to 10 ft. lbs. (9.5 - 13.6 Nm).

CHARGE CHECK AND HIGH PRESSURE RELIEF VALVES

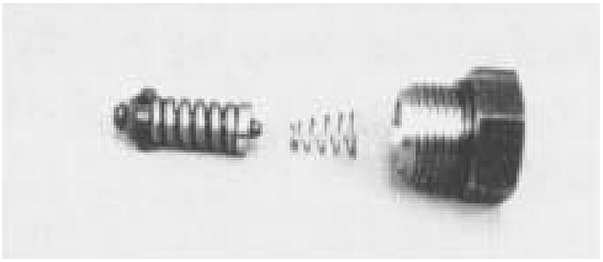
1. Remove the charge check and high pressure relief valve hex plug.



2. Remove the spring and check poppet or valve cartridge from the housing. Inspect the valve and mating seat in the housing for damage or foreign material. It will be necessary to replace the housing if the seat is damaged.



3. Several designs of charge check and high pressure relief valves have been used. Do not attempt to mix different vintage parts.



The appropriate check valve kit and/ or check and relief valve kit should be used. Refer to appropriate Service Parts Manual.

NOTE: *Always replace ball type charge check valves with the poppet type.*

4. Reinstall the valve cartridge, spring, and plug (with O-ring) into the housing. Torque the plug to 30 to 70 ft. lbs. (41 to 95 Nm).

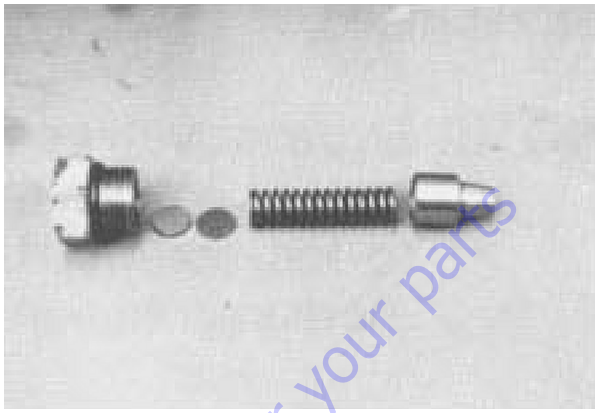
⚠ CAUTION

THE RELIEF VALVES ARE FACTORY SET AND SHOULD NOT BE TAMPERED WITH EXCEPT FOR REPLACING THE ENTIRE CARTRIDGE. DISASSEMBLY MAY CHANGE THE SETTING AND CAUSE ERRATIC UNIT OPERATION OR PREMATURE FAILURE.

CHARGE PRESSURE RELIEF VALVE

1. Remove charge relief valve hex plug.

2. Remove the spring and poppet from the housing. Do not alter the shims or interchange parts with another valve. Inspect the poppet and mating seat in the end cap for damage or foreign material.



3. Reinstall the poppet, spring, and plug (with shims and O-ring) into the housing. Torque the plug to 30 to 70 ft. lbs.(41 to 95 Nm).

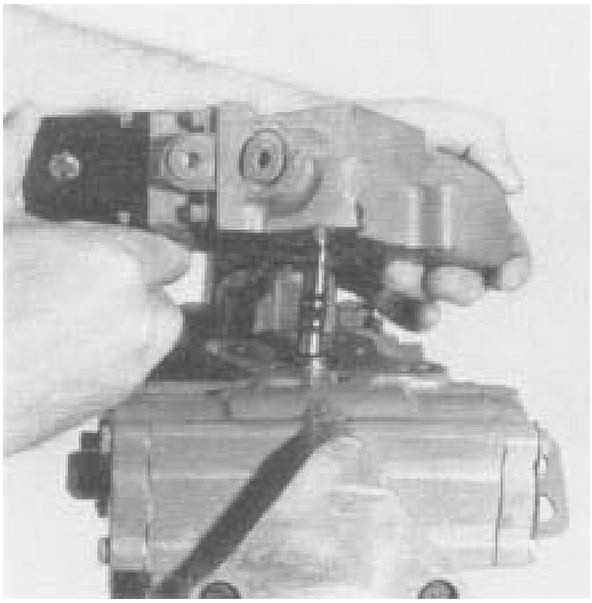
ELECTRICAL DISPLACEMENT CONTROLS (EDC)

⚠ CAUTION

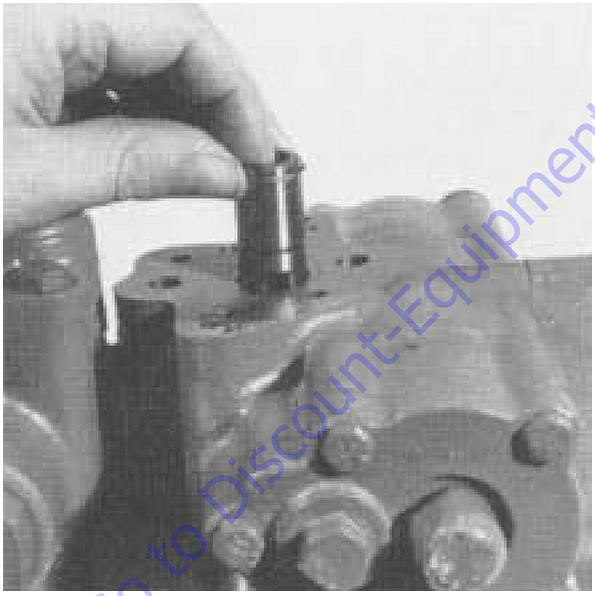
THE REMOVAL OF ANY PORTION OF THE CONTROL MECHANISM MAY RESULT IN LOSS OF NEUTRAL, WHICH WILL NECESSITATE READJUSTMENT.

1. Remove the four control mounting screws using an internal hex wrench (3/16").

2. Carefully lift the control off the pump housing.



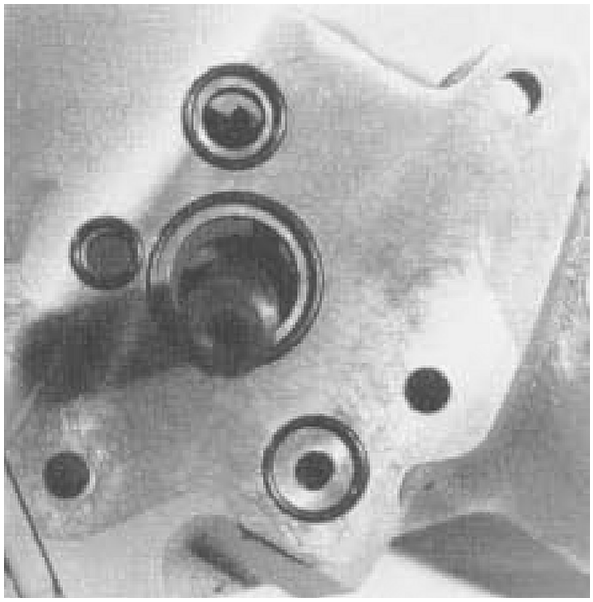
3. Remove the control sleeve from the pump.



4. Remove the control inlet screen plug from the inlet passage next to the control sleeve bore, using an internal hex wrench (5/32").

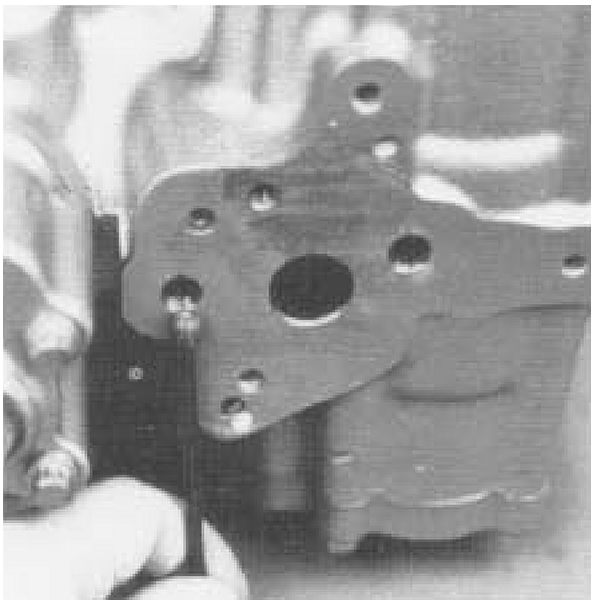
5. The control orifice plugs are located in threaded passages under the servo piston cover. Remove the servo piston cover and gasket, and remove the orifice plugs using an internal hex wrench (7/32").

6. Replace the O-ring on the bottom of the control housing.Lightly lubricate all O-rings with clean petroleum jelly prior to assembly. The control spool and sleeve are a matched set and are not available separately.



7. Reinstall the control orifice plugs into their passages and replace the servo piston covers.

8. Install the control inlet screen plug and torque to 20 to 30 in.lbs. (2.2 to 3.4 Nm). Always install a screen plug (with a 0.156" (3.96 mm.) thru hole) when servicing earlier production pumps. Pumps prior to date c ode 86 - 14 use a plug with a thread that is different from later units. Refer to the Service Parts Manual for plug part numbers.



9. Align the control sleeve so its slot will engage the swash plate feedback pin (slot positioned toward the pump cover) and insert the sleeve into the housing. Carefully align the control spool with the sleeve and install the control onto the pump housing. Install the four mounting screws and torque to 10 to 11 ft.lbs. (13 to 14 Nm).

10. Install the four cover screws and torque to 18 to 24 in. lbs. (2.0 to 2.7 Nm).

11. Readjust the neutral position of the control. Refer to the instructions in the Inspections and Adjustment.

5.7 VALVES - THEORY OF OPERATION

Solenoid Control Valve - Rexroth

Control valves used are four-way three-position solenoid valves of the sliding spool design. When a circuit is activated and the control valve solenoid energizes, the spool is shifted and the corresponding work port opens to permit oil flow to the component in the selected circuit with the opposite work port opening to reservoir. Once the circuit is deactivated (control returned to neutral) the valve spool returns to neutral (center) and oil flow is then directed through the valve body and returns to reservoir. A typical control valve consist of the valve body, sliding spool, and two solenoid assemblies. The spool is machine fitted in the bore of the valve body. Lands on the spool divide the bore into various chambers, which, when the spool is shifted, align with corresponding ports in the valve body open to common flow. At the same time other ports would be blocked to flow. The spool is spring loaded to center position, therefore when the control is released, the spool automatically returns to neutral, prohibiting any flow through the circuit.

Relief Valves

Relief valves are installed at various points within the hydraulic system to protect associated systems and components against excessive pressure. Excessive pressure can be developed when a cylinder reaches its limit of travel and the flow of pressurized fluid continues from the system control. The relief valve provides an alternate path for the continuing flow from the pump, thus preventing rupture of the cylinder, hydraulic line or fitting. Complete failure of the system pump is also avoided by relieving circuit pressure. The relief valve is installed in the circuit between the pump outlet (pressure line) and the cylinder of the circuit, generally as an integral part of the system valve bank. Relief pressures are set slightly higher than the load requirement, with the valve diverting excess pump delivery back to the reservoir when operating pressure of the component is reached.

5.8 PRESSURE SETTING PROCEDURES

NOTICE

COLD TEMPERATURES HAVE A SIGNIFICANT IMPACT ON PRESSURE READINGS. JLG INDUSTRIES, INC. RECOMMENDS OPERATING THE MACHINE UNTIL THE HYDRAULIC SYSTEM HAS WARMED TO NORMAL OPERATING TEMPERATURES PRIOR TO CHECKING PRESSURES. JLG ALSO RECOMMENDS USING A CALIBRATED GAUGE. PRESSURE READINGS ARE ACCEPTABLE IF WITHIN +/- 5% OF SPECIFIED PRESSURES.

To ensure all pressures are set correctly, the following procedures must be followed in order.

1. All applicable steps must be followed.
2. Set up of the function pump.
3. Adjustments Made at the Main Valve Block.
4. Adjustments Made at the Platform Valve Block.

Main Relief, Steer, Swing and Lift Down

1. Install pressure gauge at quick disconnect on port MP on main valve
2. With the aid of an assistant, activate telescope in.
3. While monitoring pressure gauge, adjust main relief to 3000 PSI (206.85 Bar).
4. With the aid of an assistant, activate steer left.
5. While monitoring pressure gauge, adjust steer left relief to 1800 PSI (124.1 Bar).
6. With the aid of an assistant, activate steer right.
7. While monitoring pressure gauge, adjust steer right relief to 1800 PSI (124.1 Bar).
8. With the aid of an assistant, activate swing left or right.
9. While monitoring pressure gauge, adjust swing relief to 1700 PSI (117.2 Bar).
10. With the aid of an assistant, activate lift down.
11. While monitoring pressure gauge, adjust lift down relief to 1200 PSI (82.7 Bar).

Platform Level

1. Install pressure gauge at quick disconnect on port M3 on main valve.
2. With the aid of an assistant, activate platform level forward.
3. While monitoring pressure gauge, adjust platform level relief to 2800 PSI (193.06 Bar).
4. Install pressure gauge at quick disconnect on port M4 on main valve.
5. With the aid of an assistant, activate platform level backward.
6. While monitoring pressure gauge, adjust platform level relief to 1800 PSI (124.11 Bar).

Jib Boom (If Equipped)

1. Install pressure gauge at quick disconnect on valve.
2. With the aid of an assistant, activate jib up.
3. While monitoring pressure gauge, adjust jib up relief to 1500 PSI (103 Bar).
4. With the aid of an assistant, activate jib down.
5. While monitoring pressure gauge, adjust activate jib down relief to 1200 PSI (83 Bar).

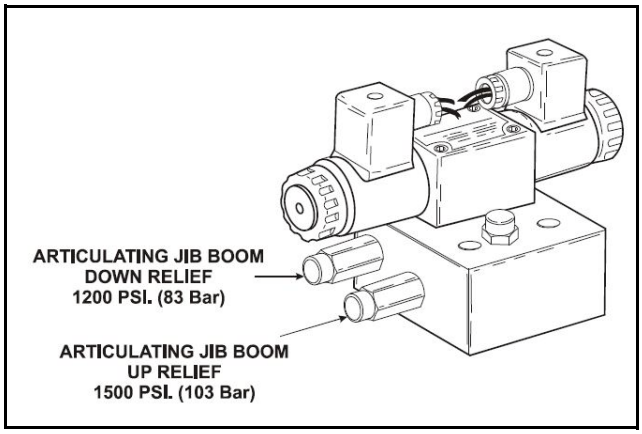
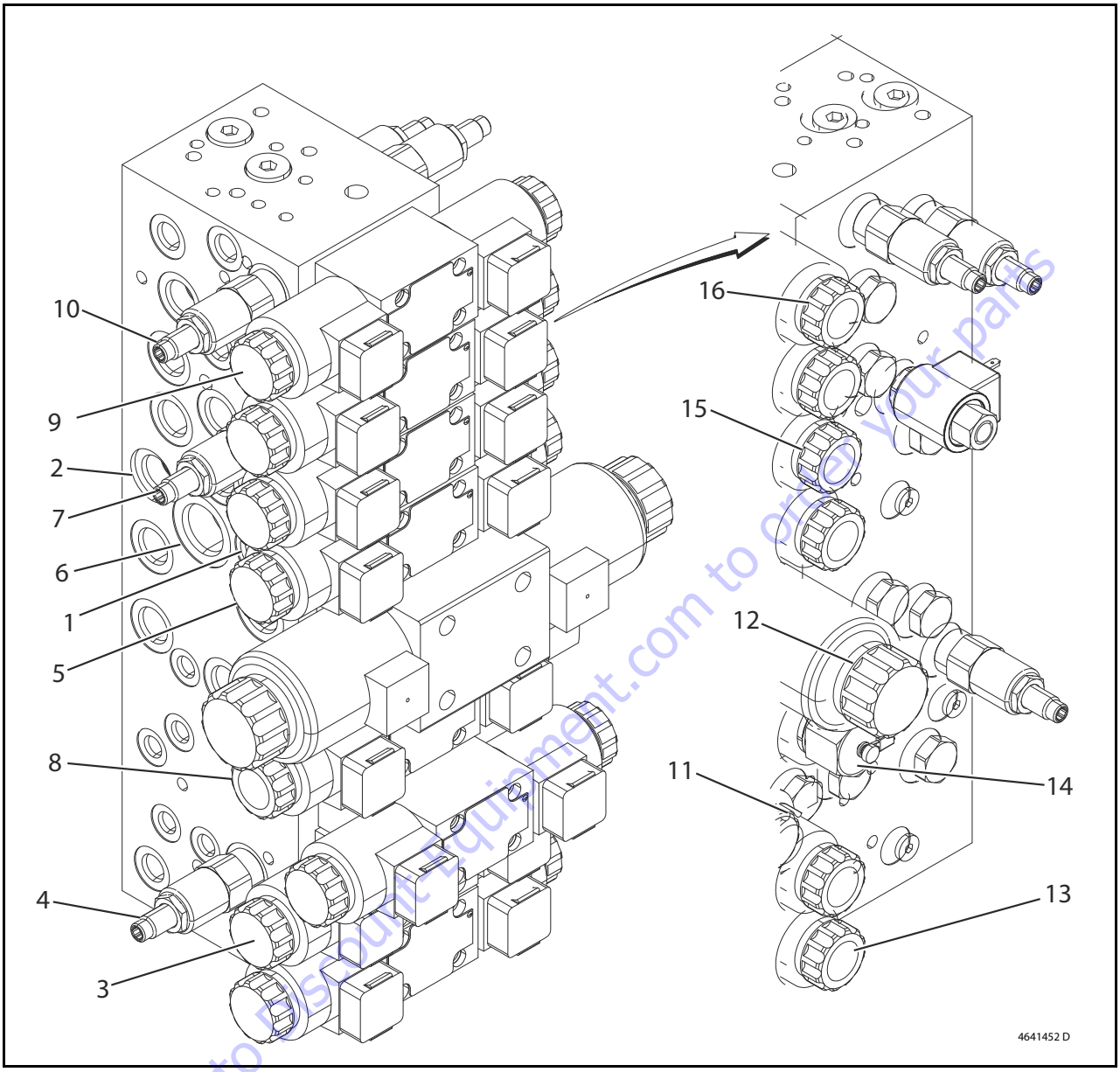


Figure 5-153. Jib Boom Pressure Adjustments



1. Pressure Control Load Sense Valve
2. Main Relief Valve Direct Operated
3. Directional Control Valve (Platform Level)
4. Direct Operated Relief Valve
5. Load Shuttle Valved
6. Load Shuttle Valve
7. Direct Operated Relief Valve
8. Directional Control Valve (tower Lift)
9. Directional Control Valve (Main Lift)
10. Directional Control Valve (Steer)
11. Directional Control Valve (Platform Rotator)
12. Directional Control Valve (Main Tele)
13. Directional Control Valve (Tower Tele)
14. Rotate Sandwich Check Valve
15. Directional Control Valve (Main Lift)
16. Directional Control Valve (Steer)

Figure 5-154. Main Valve Components (SN 0300087000 through 0300177361, SN B300000100 through B300001392)

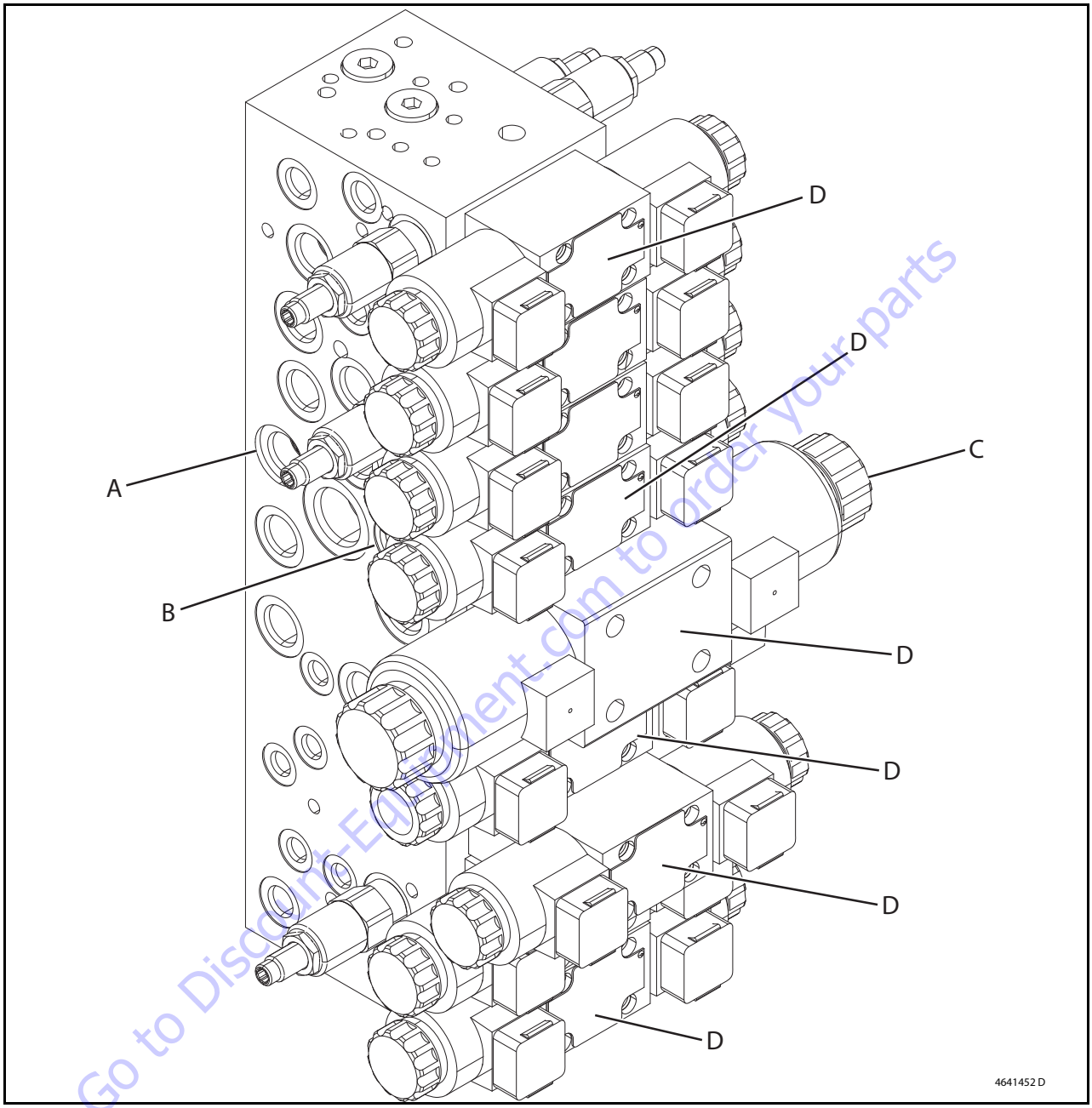


Table 5-1. Cartridge Pressure Values

POS	PSI	BAR
A	3000	207
B	250	17
C	50	3
D	3300 (max)	228

Figure 5-155. Main Valve Pressure Adjustments (SN 0300087000 through 0300177361, SN B300000100 through B300001392)

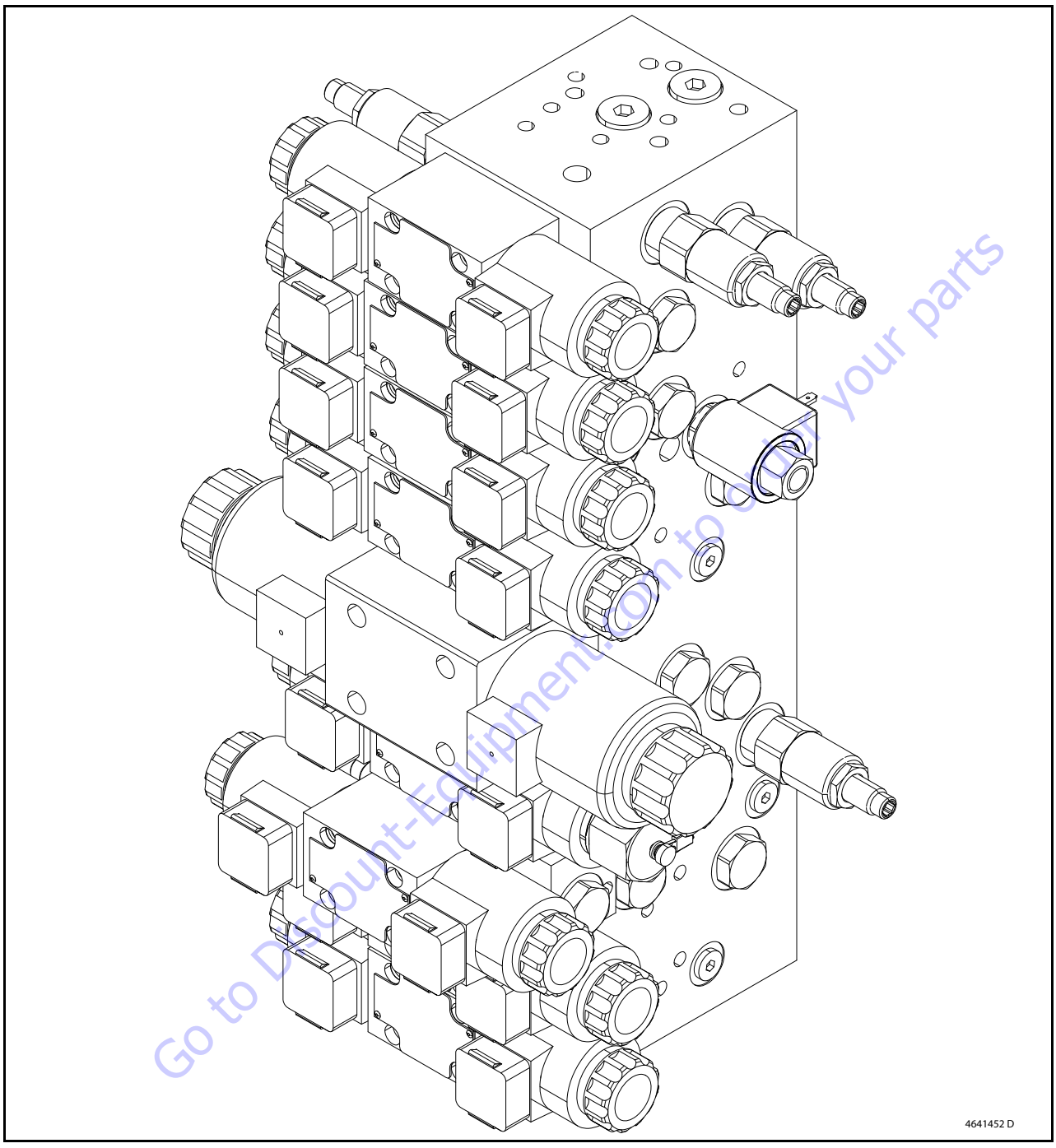
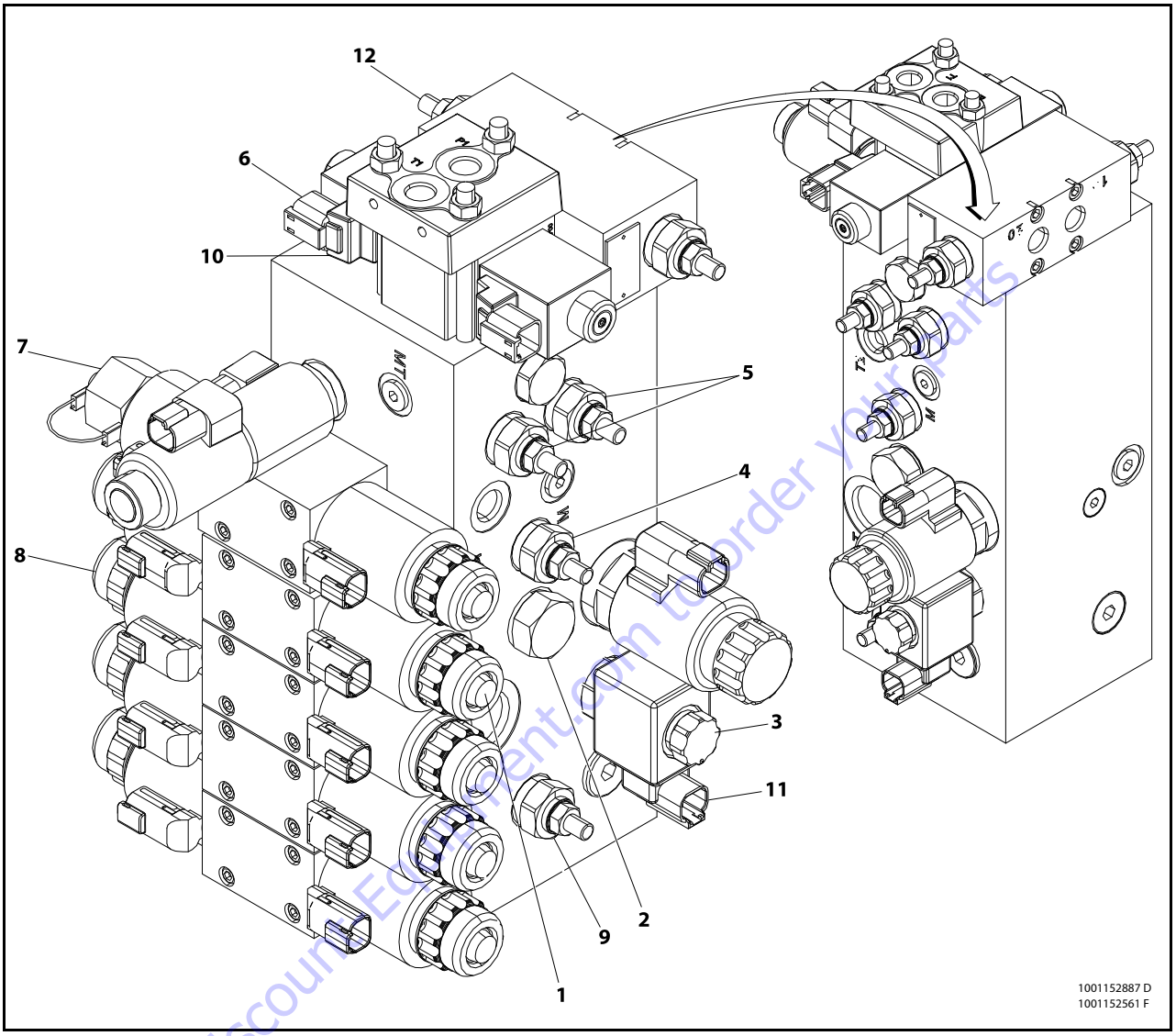


Figure 5-156. Main Valve Torque (SN 0300087000 through 0300177361, SN B300000100 through B300001392)



1. Directional Control Valve (Lower Lift)
2. Load Sense Valve
3. Directional Control (Pump Valve)
4. Pressure Relief Valve (Main Boom)
5. Pressure Relief Valve (Front Steer)
6. Directional Control Valve (Front Steer)
7. Directional Control Valve (Lower Lift)
8. Directional Control Valve (Tower Telescope)
9. Pressure Relief Valve (Main Boom)
10. Directional Control Valve (Rear Steer)
11. Load Shuttle Valve
12. Pressure Relief Cartridge Valve (Rear Steer)

Figure 5-157. Main Valve Components (SN B300001393 to Present)

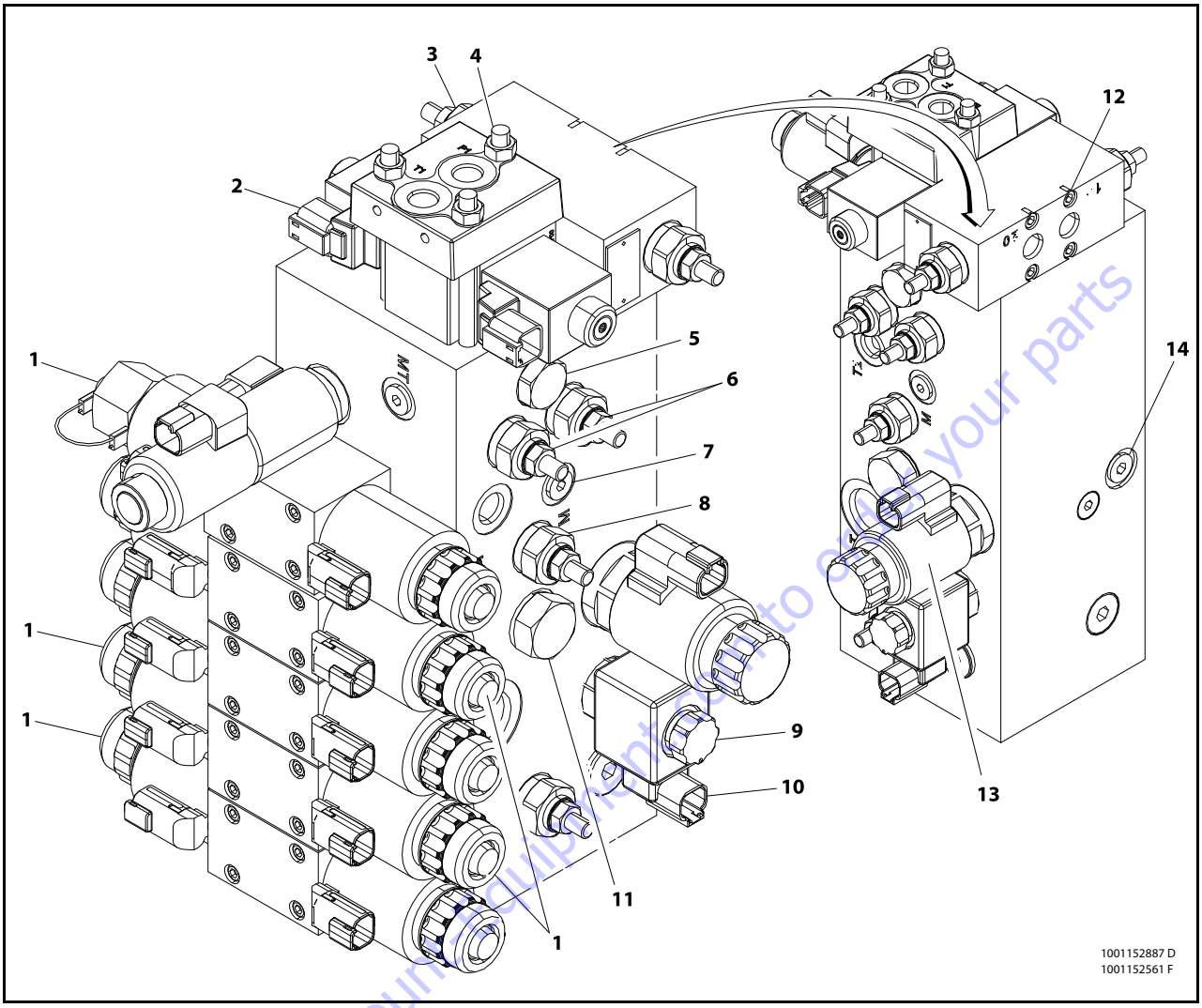


Table 5-2. Cartridge Torque Values

POS	ft. lbs.	Nm	POS	ft. lbs.	Nm
1	6.5	8.81	8	25-30	33.9-40.7
2	40.7-44.3	55.2-60	9	32.5-41.3	44-56
3	25-30	33.9-40.7	10	25-30	33.9-40.7
4	14.8-16.2	20--22	11	30-35	41-47.5
5	40	54.23	12	3.7-4.4	5-6
6	25-30	33.9-40.7	13	121.7-132.8	165-180
7	13	17.6	14	23	31.1

Figure 5-158. Main Valve Torque Values (SN B300001393 to Present)

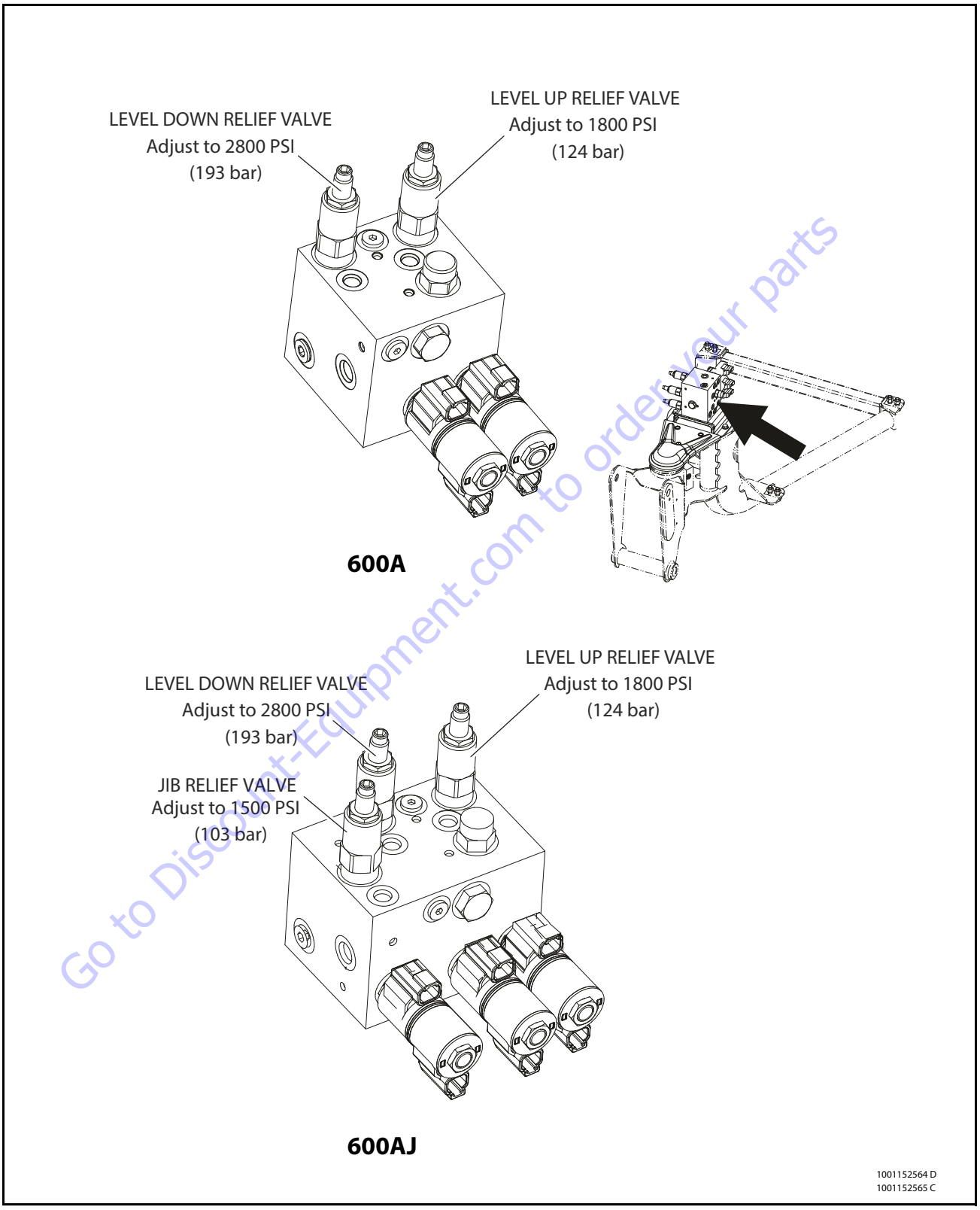


Figure 5-159. Platform Control Valve Pressure Adjustments

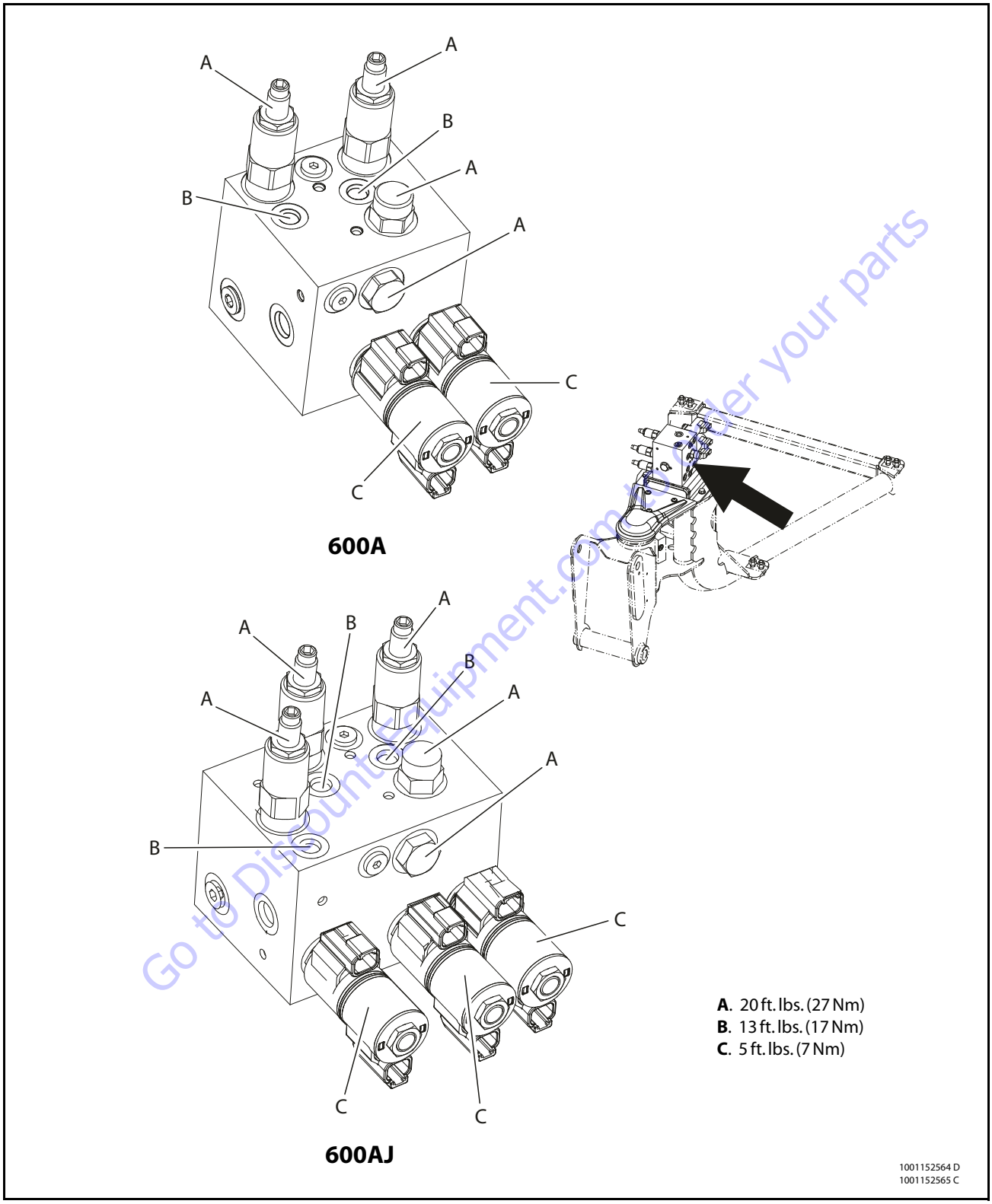


Figure 5-160. Platform Control Valve Component Torque

4 Wheel Steer (If Equipped)

1. At the platform console using the steer select switch activate “2 wheel steer”.
2. Install a pressure gauge in port MP on main control valve.
3. With the aid of an assistant, activate steer left and right, adjust front steer relief valve to 2500 PSI (172.4 Bar). This pressure only affects the front axle.
4. At the platform console using the steer select switch activate “crab” or “coordinated” steer.
5. At the main control valve block disconnect the wire din connectors on the front steer valve. When steer is activated only the rear steer will work.
6. Install a pressure gauge in port MP on main control valve.
7. With the aid of an assistant, activate steer left and right, adjust rear steer relief valve to 2500 PSI (172.4 Bar). Reading at the valve bank 2500 PSI (172.4 Bar) will give you 2000PSI (137.9 Bar) at the cylinders.
8. Re-connect the front steer din connectors at the valve bank.

5.9 HYDRAULIC COMPONENT START-UP PROCEDURES AND RECOMMENDATIONS

From a hydrostatic component standpoint, the goal at system start up is to put into functional operation, the hydrostatic system in such a way as to preserve the designed life span of the system. The following start-up procedure should be adhered to whenever a new pump or motor is initially installed into a machine, or a system is restarted after either a pump or motor has been removed and/or replaced.

⚠ WARNING

THE FOLLOWING PROCEDURE MAY REQUIRE THE MACHINE TO BE DISABLED (WHEELS RAISED OFF THE GROUND, WORK FUNCTIONS DISCONNECTED, ETC.) WHILE PERFORMING THE PROCEDURE IN ORDER TO PREVENT INJURY. TAKE NECESSARY SAFETY PRECAUTIONS BEFORE MOVING THE VEHICLE/MACHINE.

Prior to installing the pump and/or motor, inspect the unit(s) for damage that may have been incurred during shipping and handling. Make certain that all system components (reservoir, hoses, valves, fittings, heat exchanger, etc.) are clean prior to filling with fluid.

Fill the reservoir with recommended hydraulic fluid. This fluid should be passed through a 10 micron (nominal, no bypass) filter prior to entering the reservoir. The use of contaminated fluid will cause damage to the components, which may result in unexpected vehicle/machine movement.

NOTE: *If a pump or motor is being replaced due to internal damage, the remaining units (pump or motors) need to be inspected for damage and contamination, and the entire hydraulic system will need to be flushed and the fluid replaced. Failure to do so may cause considerable damage to the entire system.*

The inlet line leading from the reservoir to the pump must be filled prior to start-up. Check the inlet line for property tightened fittings and make sure it is free of restrictions and air leaks.

NOTE: *In most cases, the reservoir is above the pump inlet so that the pressure head created by the higher oil level helps to keep the inlet pressures within an acceptable range and prevent high vacuum levels. However, due to hose routing or low reservoir locations, there may be air trapped within this line. It is important to assure that the air is bled from this line. This can be accomplished by loosening the hose at the fitting closest the pump. When oil begins to flow, the line is full, the air has been purged, and the fitting can be retightened to its specified torque. If the tank needs to be pressurized in order to start the flow of oil, a vacuum reading should be taken at the inlet of the pump during operation in order to verify that the pump is not being asked to draw an inlet vacuum higher than it is capable of.*

Be certain to fill the pump and/or motor housing with clean hydraulic fluid prior to start up. Fill the housing by pouring filtered oil into the upper case drain port.

NOTE: *It is highly recommended to use the highest possible case drain port, this ensures that the housing contains as much oil as possible and offers the greatest amount of lubrication to the internal components.*

NOTE: *In initial start-up conditions, it may be convenient to fill the housing, just prior to installing the case drain line. Component, (especially motor), location may be such that access to the case drain port after installation is not realistic.*

NOTE: *Make certain that the oil being used to fill the component housing is as clean as possible, and store the fill container in such a way as to prevent it from becoming contaminated.*

Install a 60 bar (or 1000 psi) pressure gauge in the charge pressure gauge port in order to monitor the charge pressure during start-up.

It is recommended that the external control input signal, (electrical connections for EDC), be disconnected at the pump control until after initial start-up. This will ensure that the pump remains in its neutral position.

⚠ WARNING

DO NOT START THE ENGINE UNLESS PUMP IS IN THE NEUTRAL POSITION (0 DEGREES SWASHPLATE ANGLE). TAKE PRECAUTIONS TO PREVENT MACHINE MOVEMENT IN CASE PUMP IS ACTUATED DURING INITIAL START-UP.

"Jog" or slowly rotate the engine until charge pressure starts to rise. Start the engine and run at the lowest possible RPM until charge pressure has been established. Excess air should be bled from the system lines as close to the motors as possible.

NOTE: *With the engine on low idle, "crack", (loosen-don't remove), the system lines at the motor(s). Continue to run the engine at low idle and tighten the system lines as soon as oil is observed to leak from them. When oil is observed to "leak" at the motor the line is full, the air has been purged, and the system hoses should be retightened to their specified torque.*

Once charge pressure has been established, increase speed to normal operating RPM. Charge pressure should be as indicated in the pump model code. If charge pressure is inadequate, shut down and determine the cause for improper pressure.

⚠ WARNING

INADEQUATE CHARGE PRESSURE WILL AFFECT THE OPERATOR'SABILITY TO CONTROL THE MACHINE.

Shut down the engine and connect the external control input signal. Also reconnect the machine function(s), if disconnected earlier. Start the engine, checking to be certain the pump remains in neutral. With the engine at normal operating RPM, slowly check for forward and reverse machine operation.

Charge pressure may slightly decrease during forward or reverse operation. Continue to cycle slowly between forward and reverse for at least five minutes.

Shut down engine, remove gauges, and plug ports. Check reservoir level and add filtered fluid if needed.

The machine is now ready for operation.

5.10 HYDRAULIC PUMP W/HAYES PUMP DRIVE COUPLING LUBRICATION

Any time pump or pump drive coupling is removed coat, pump and drive coupling splines with Lithium Soap Base Grease (TEXACO CODE 1912 OR EQUIVALENT) coupling is greased prior to assembly.

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5.11 HYDRAULIC SCHEMATICS

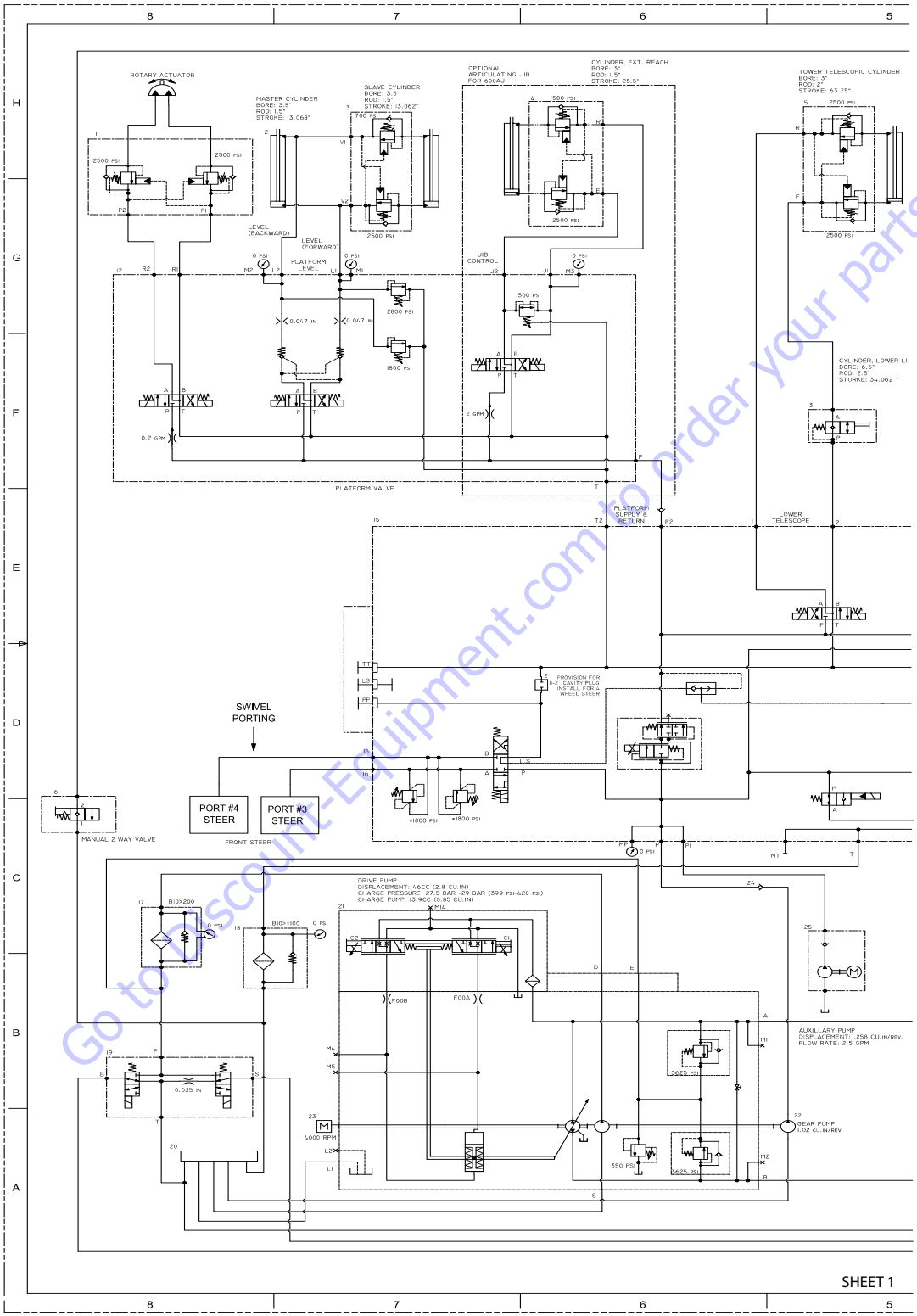


Figure 5-161. Hydraulic Schematic (2 Wheel Steer)- Sheet 1 of 8

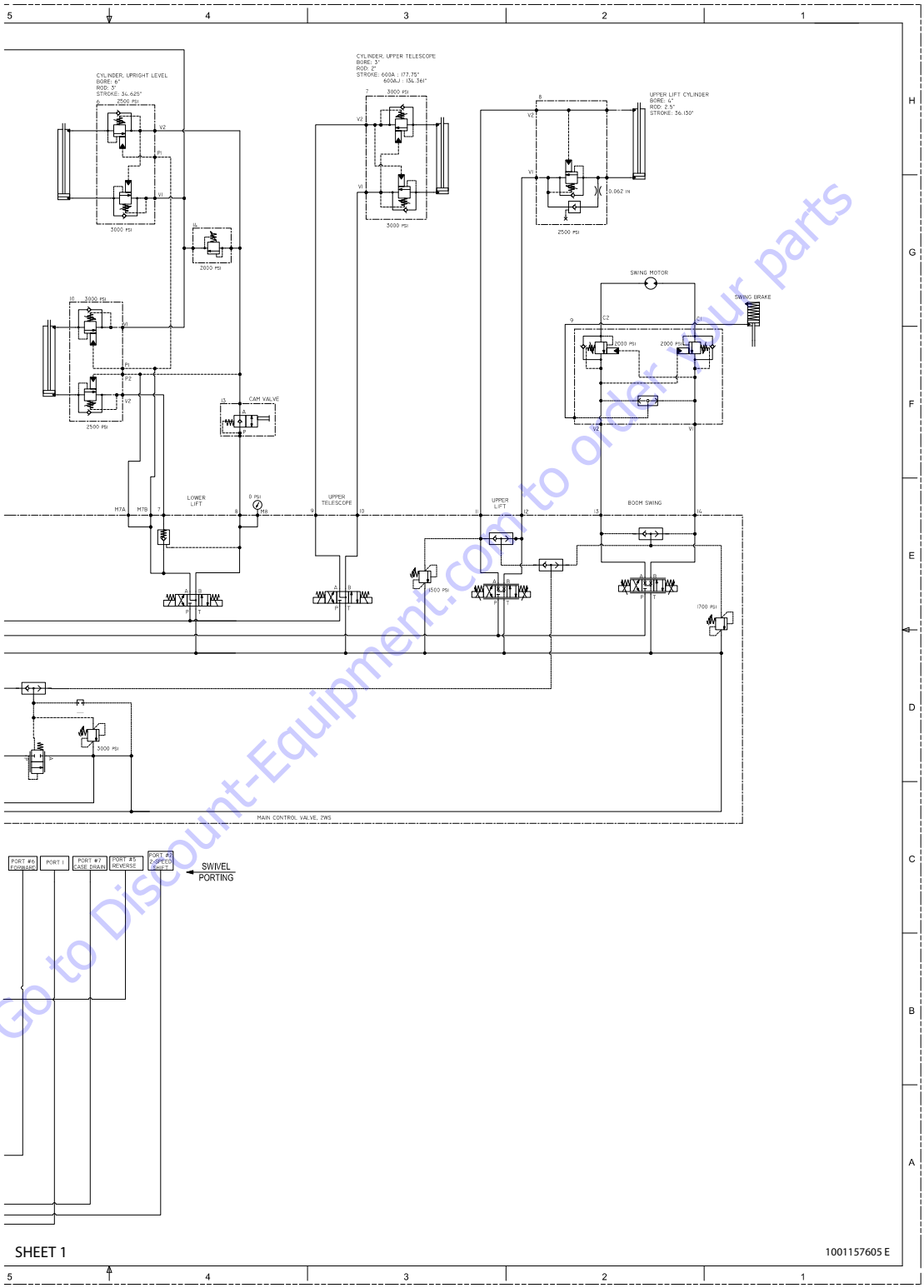


Figure 5-162. Hydraulic Schematic (2 Wheel Steer)- Sheet 2 of 8

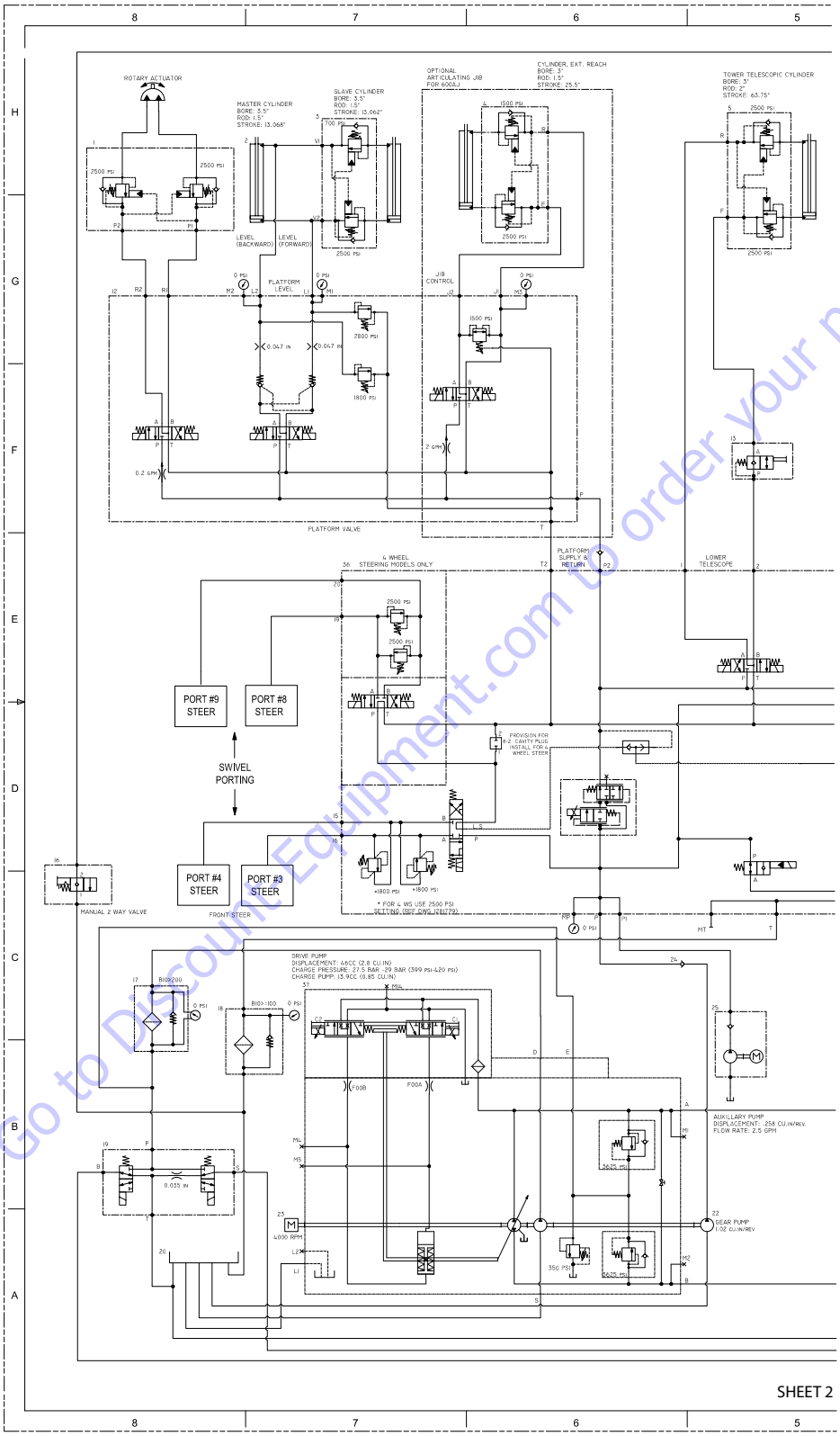


Figure 5-163. Hydraulic Schematic (2 Wheel Steer)- Sheet 3 of 8

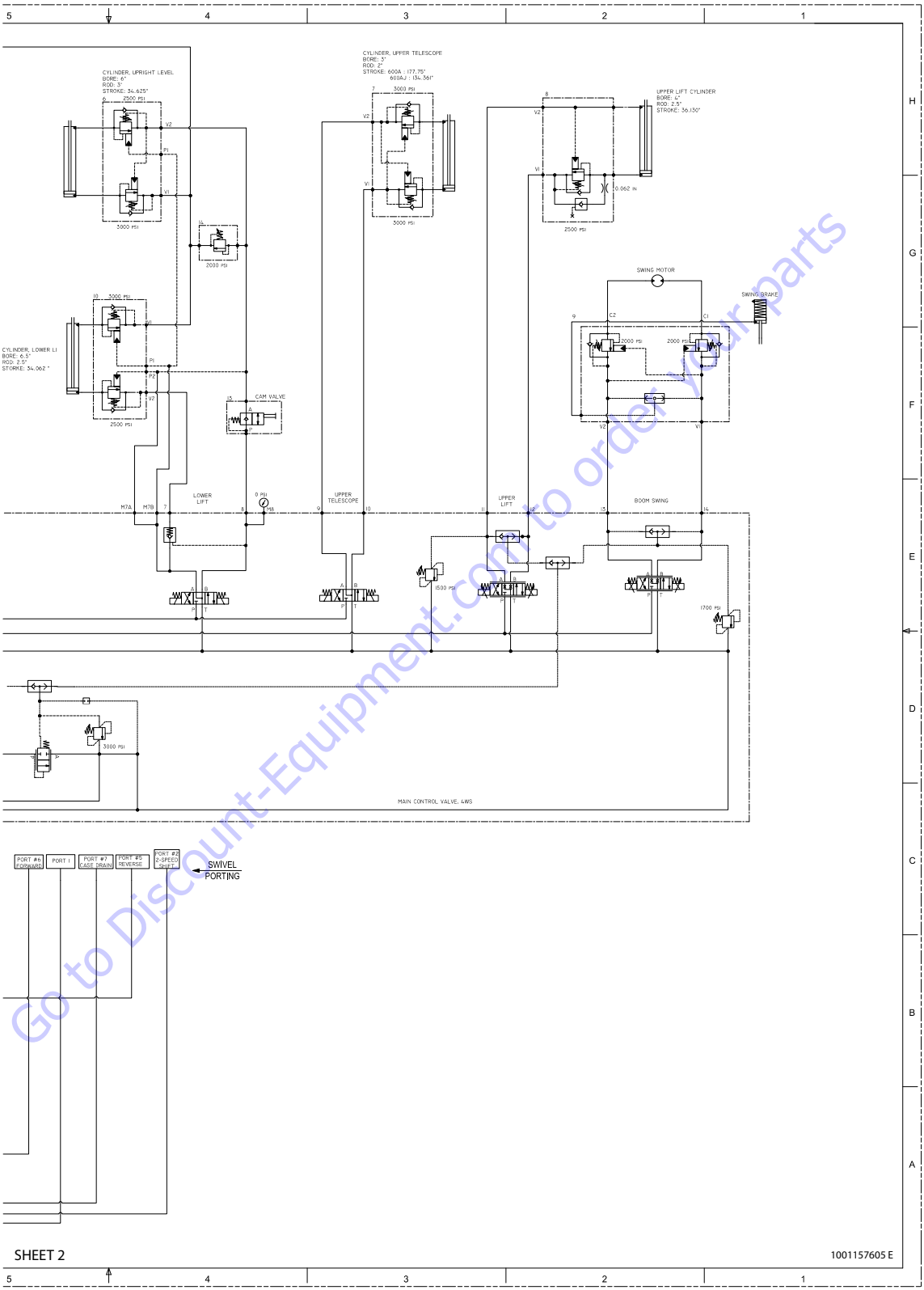


Figure 5-164. Hydraulic Schematic (2 Wheel Steer)- Sheet 4 of 8

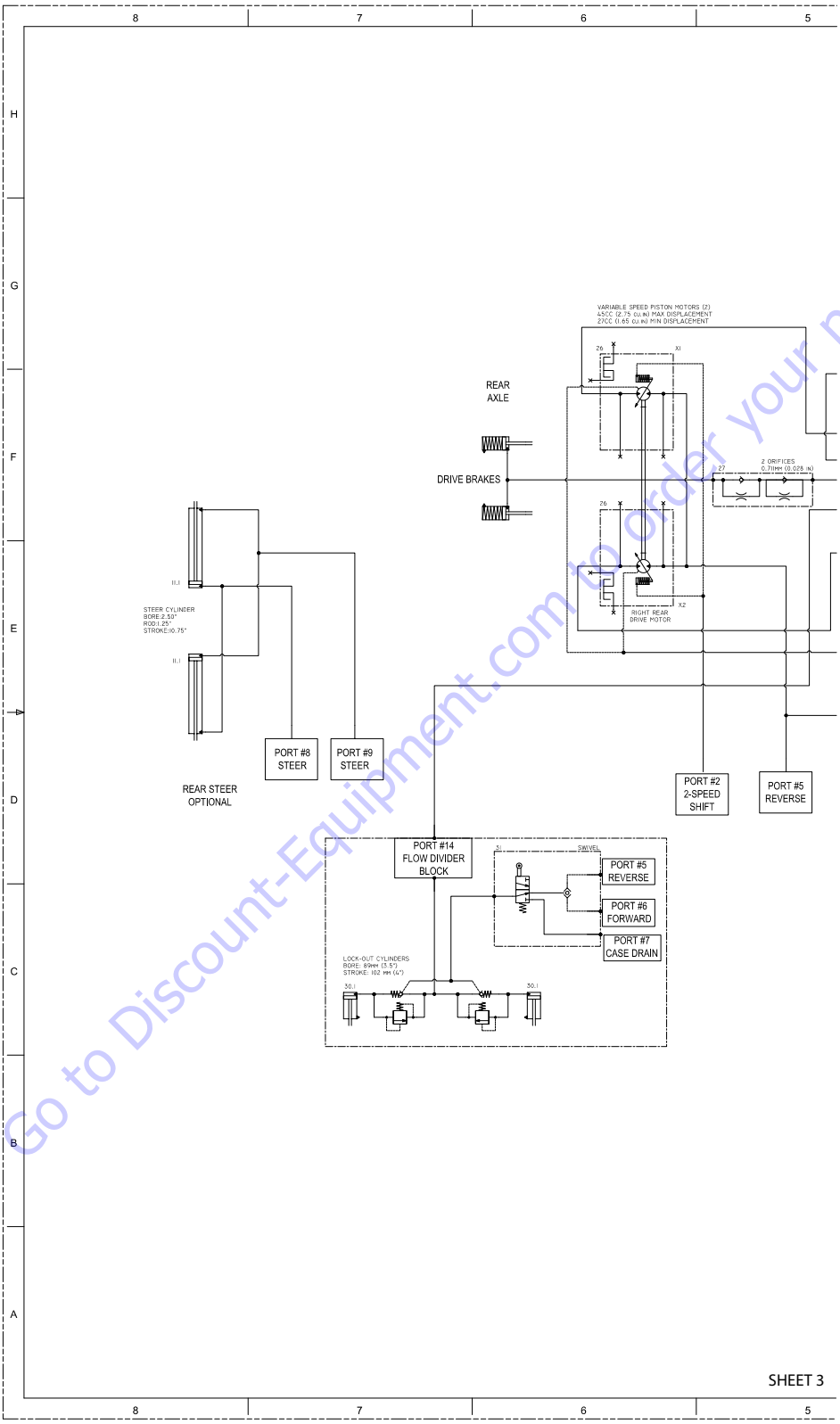


Figure 5-165. Hydraulic Schematic (2 Wheel Steer)- Sheet 5 of 8

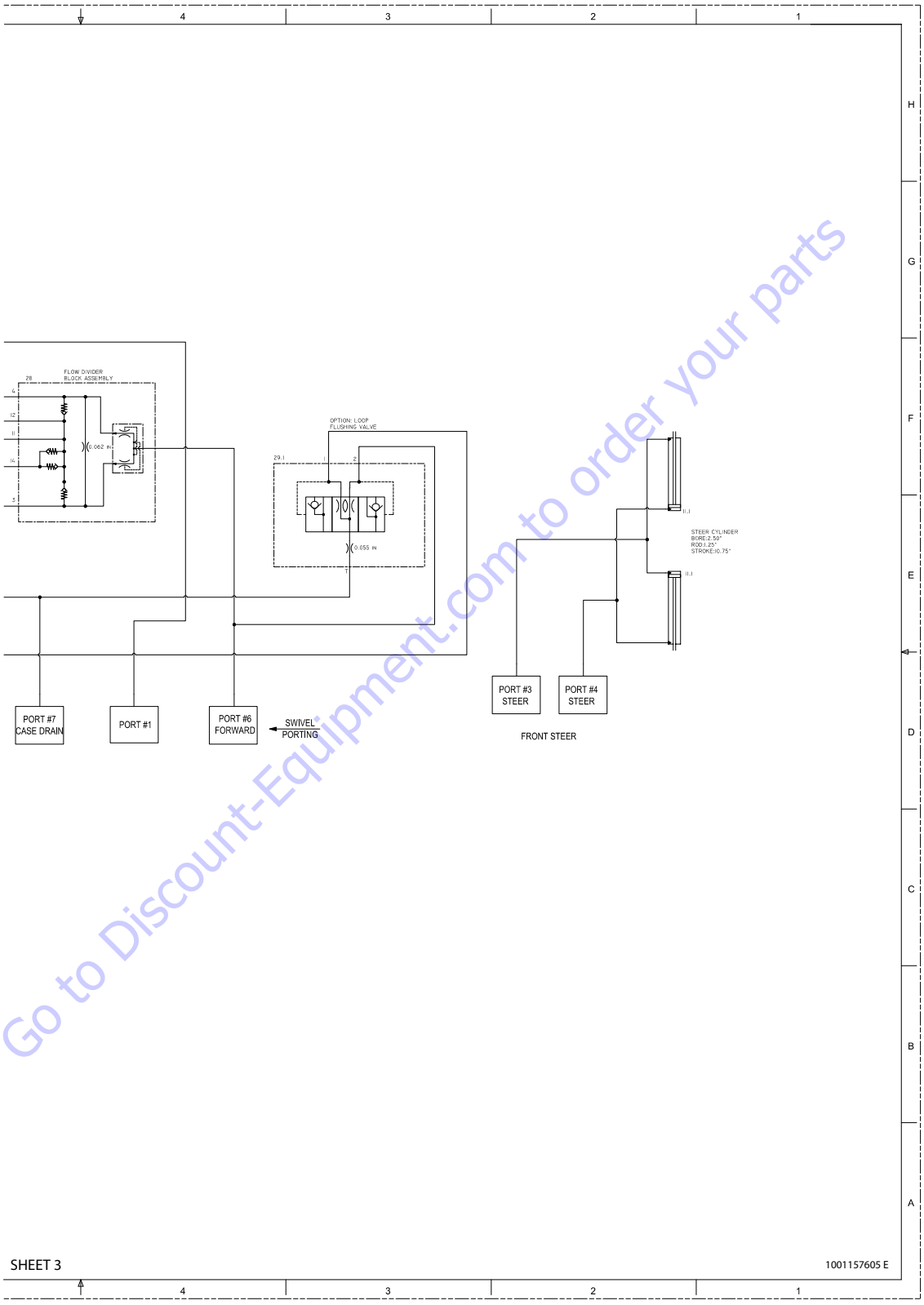


Figure 5-166. Hydraulic Schematic (2 Wheel Steer)- Sheet 6 of 8

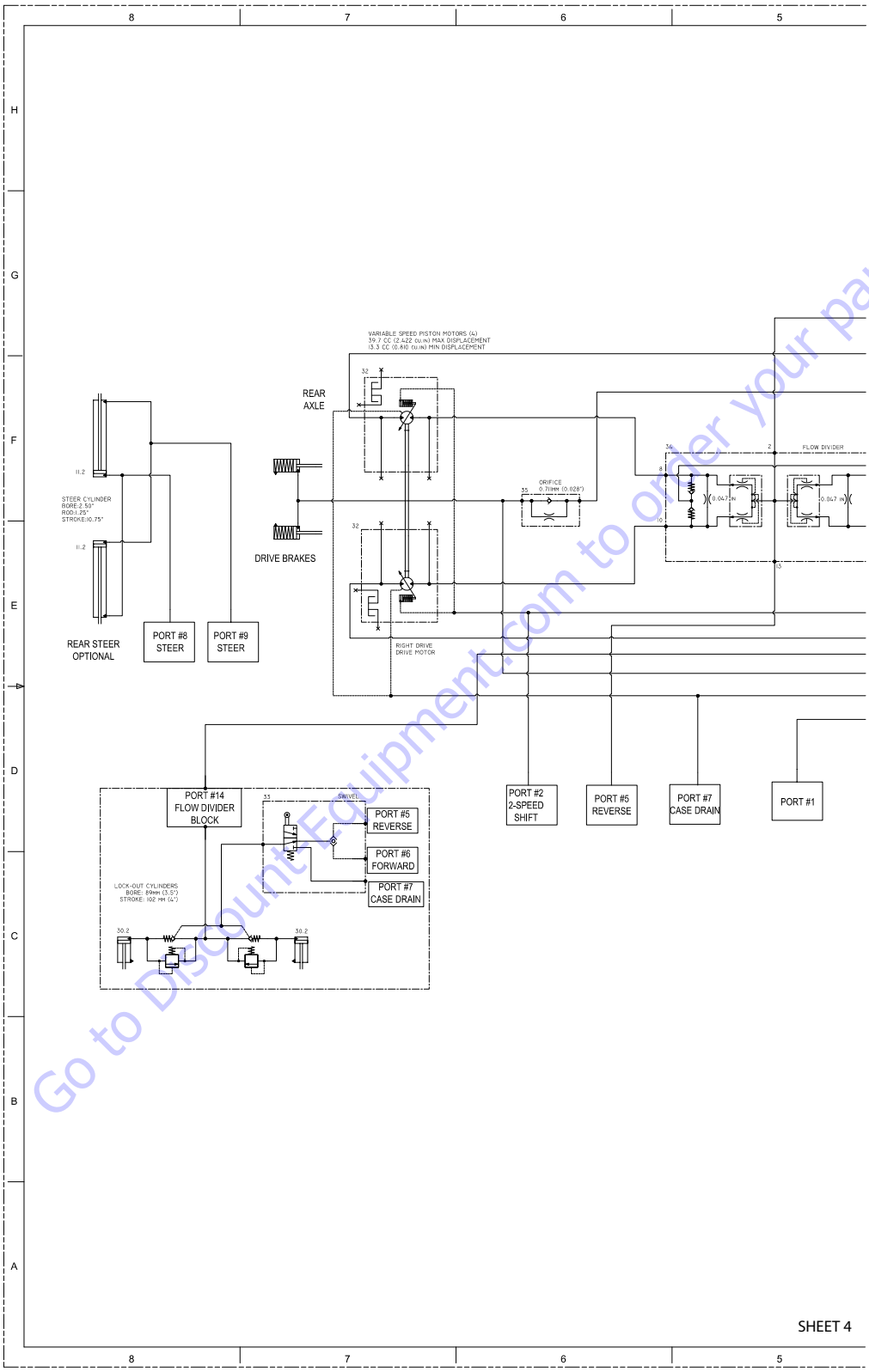


Figure 5-167. Hydraulic Schematic (2 Wheel Steer)- Sheet 7 of 8

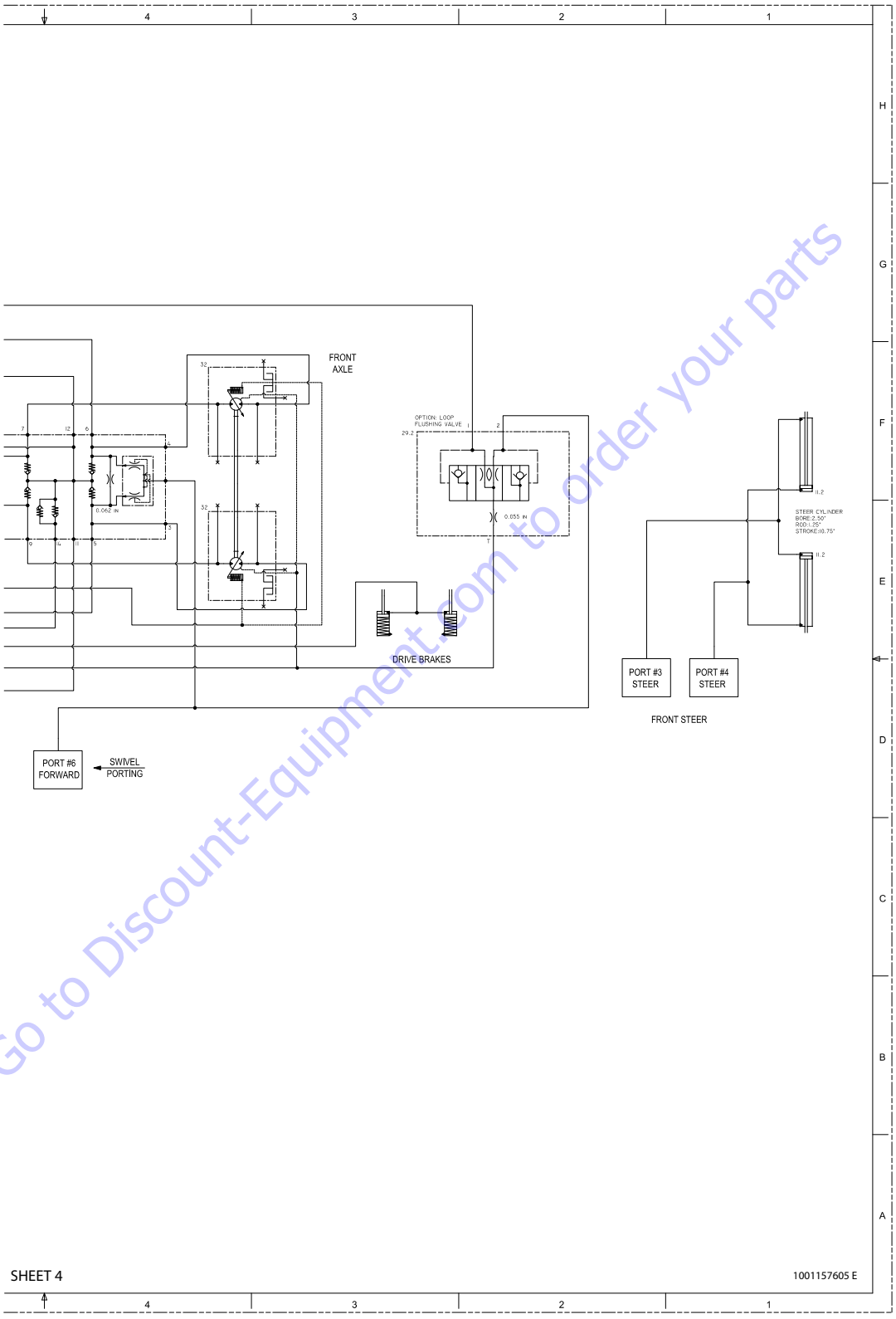


Figure 5-168. Hydraulic Schematic (2 Wheel Steer)- Sheet 8 of 8

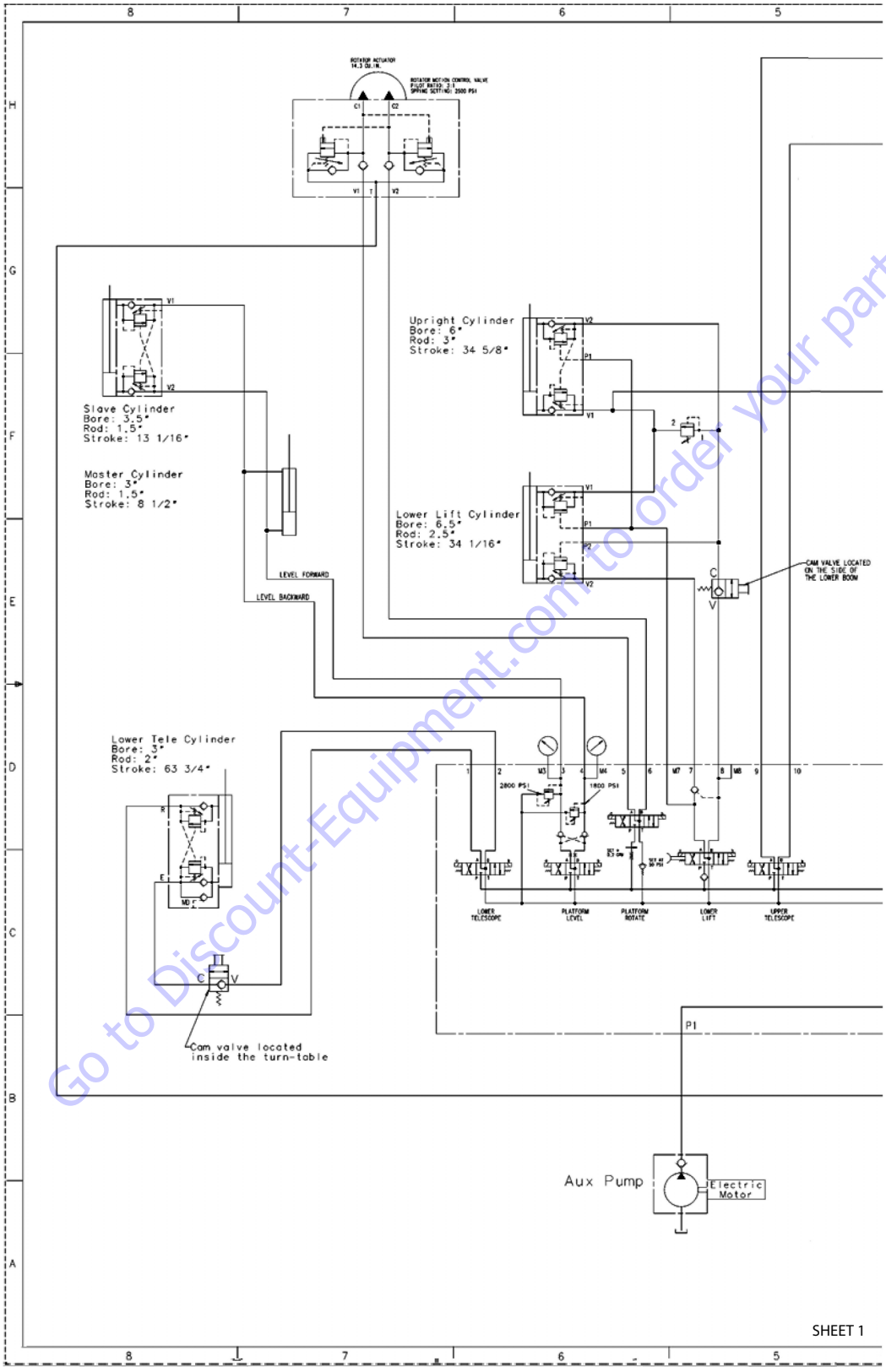


Figure 5-169. Hydraulic Schematic (4 Wheel Steer)- Sheet 1 of 6

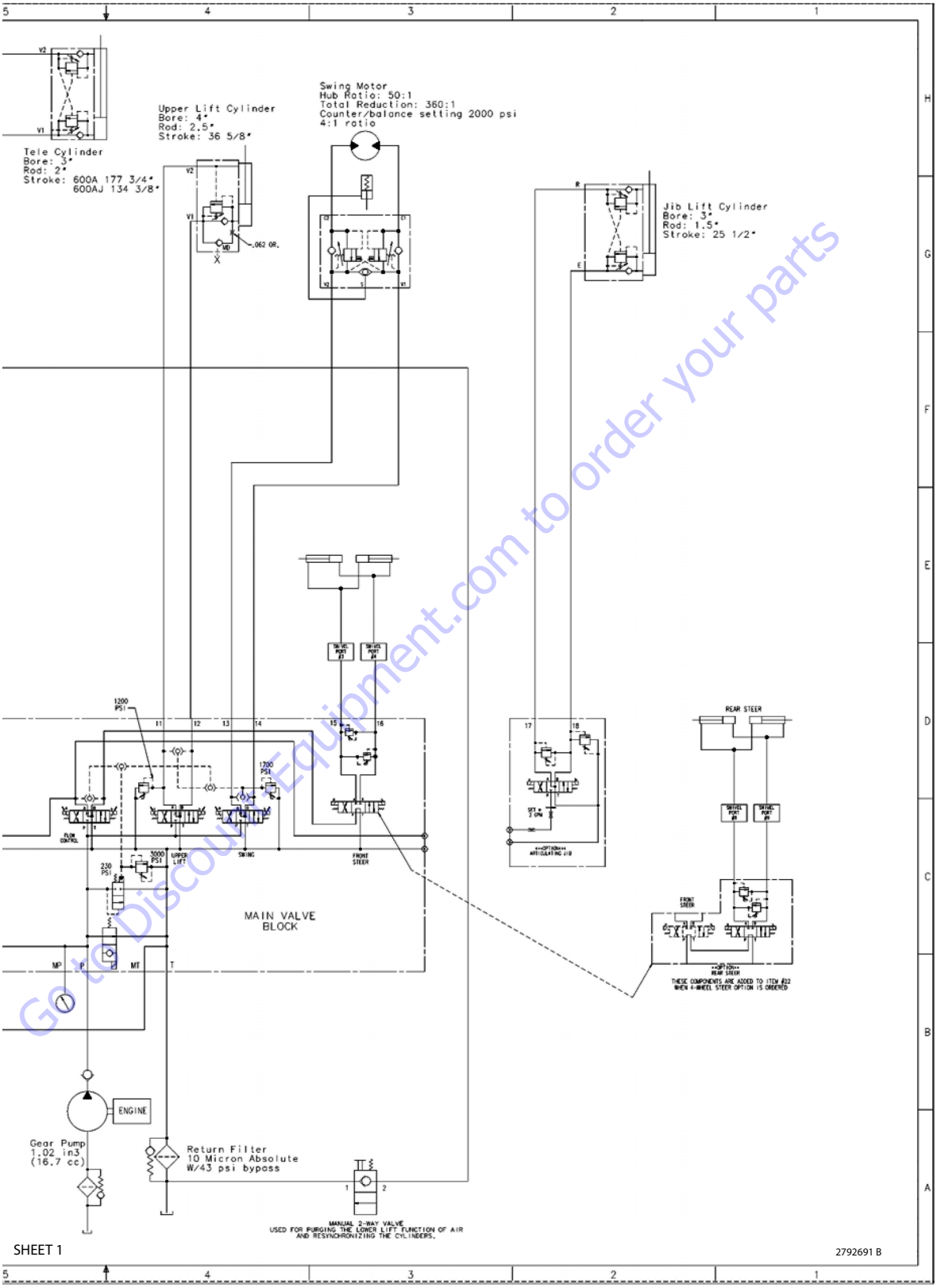


Figure 5-170. Hydraulic Schematic (4 Wheel Steer)- Sheet 2 of 6

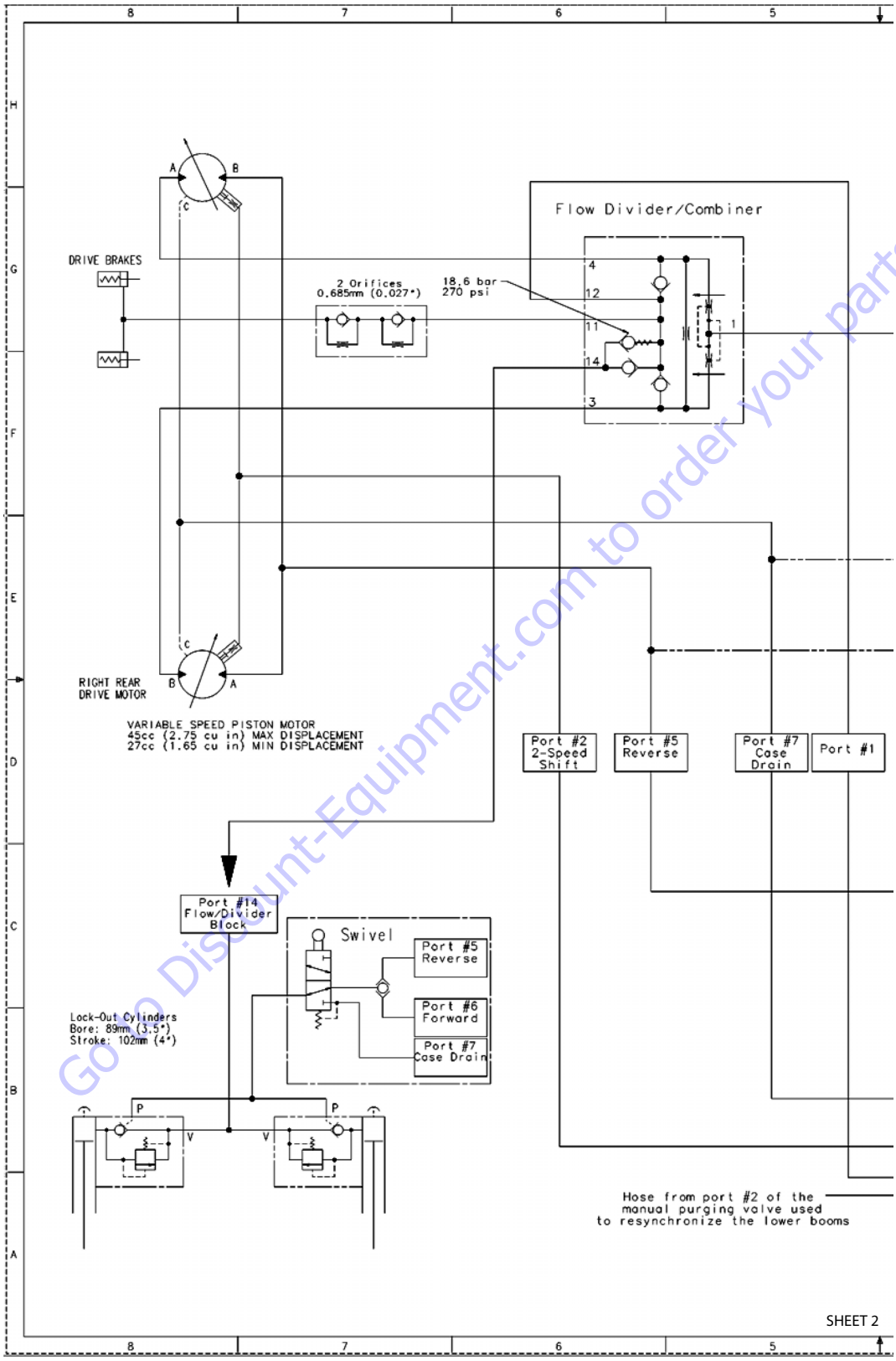


Figure 5-171. Hydraulic Schematic (4 Wheel Steer)- Sheet 3 of 6

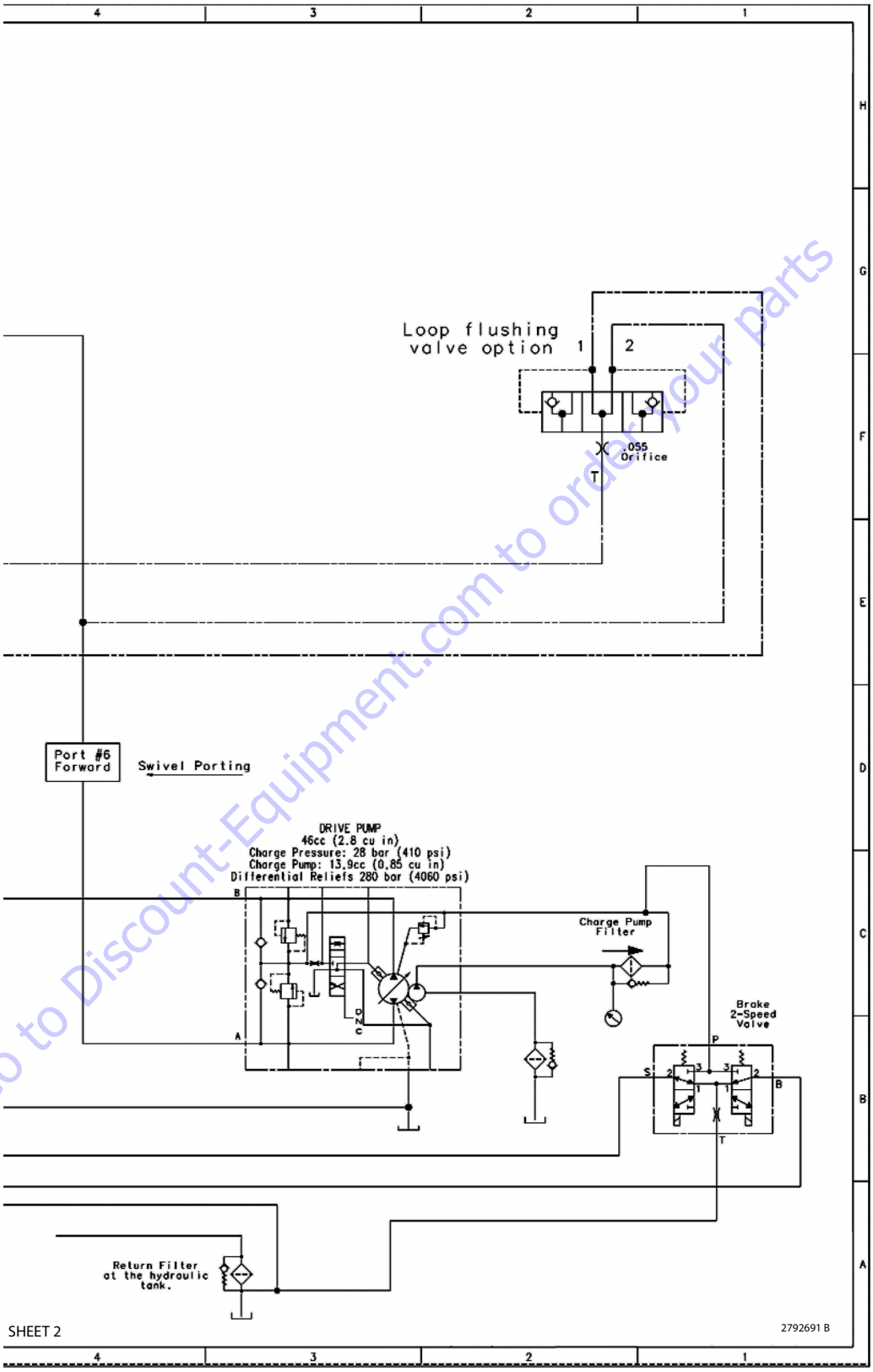


Figure 5-172. Hydraulic Schematic (4 Wheel Steer)- Sheet 4 of 6

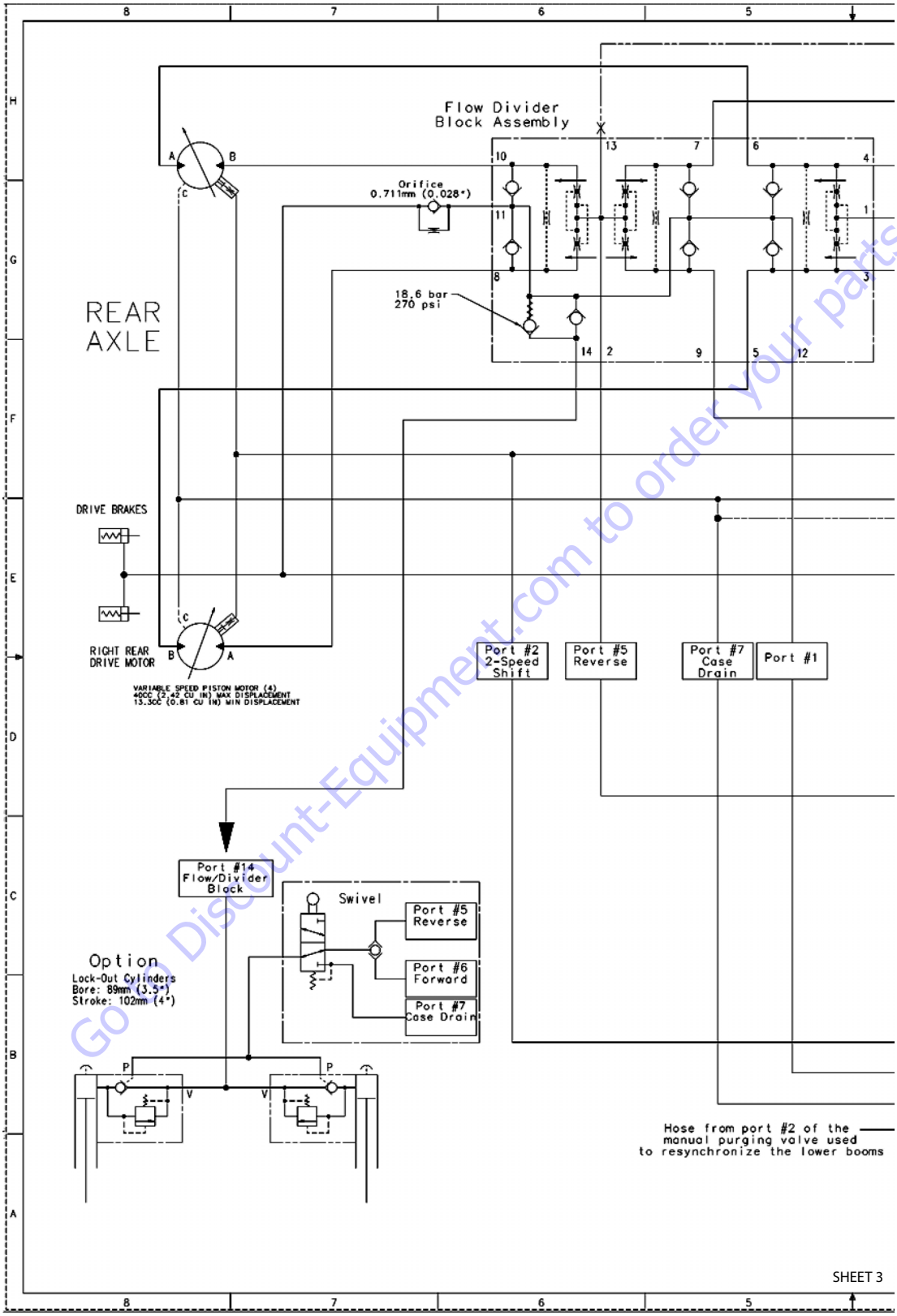


Figure 5-173. Hydraulic Schematic (4 Wheel Steer)- Sheet 5 of 6

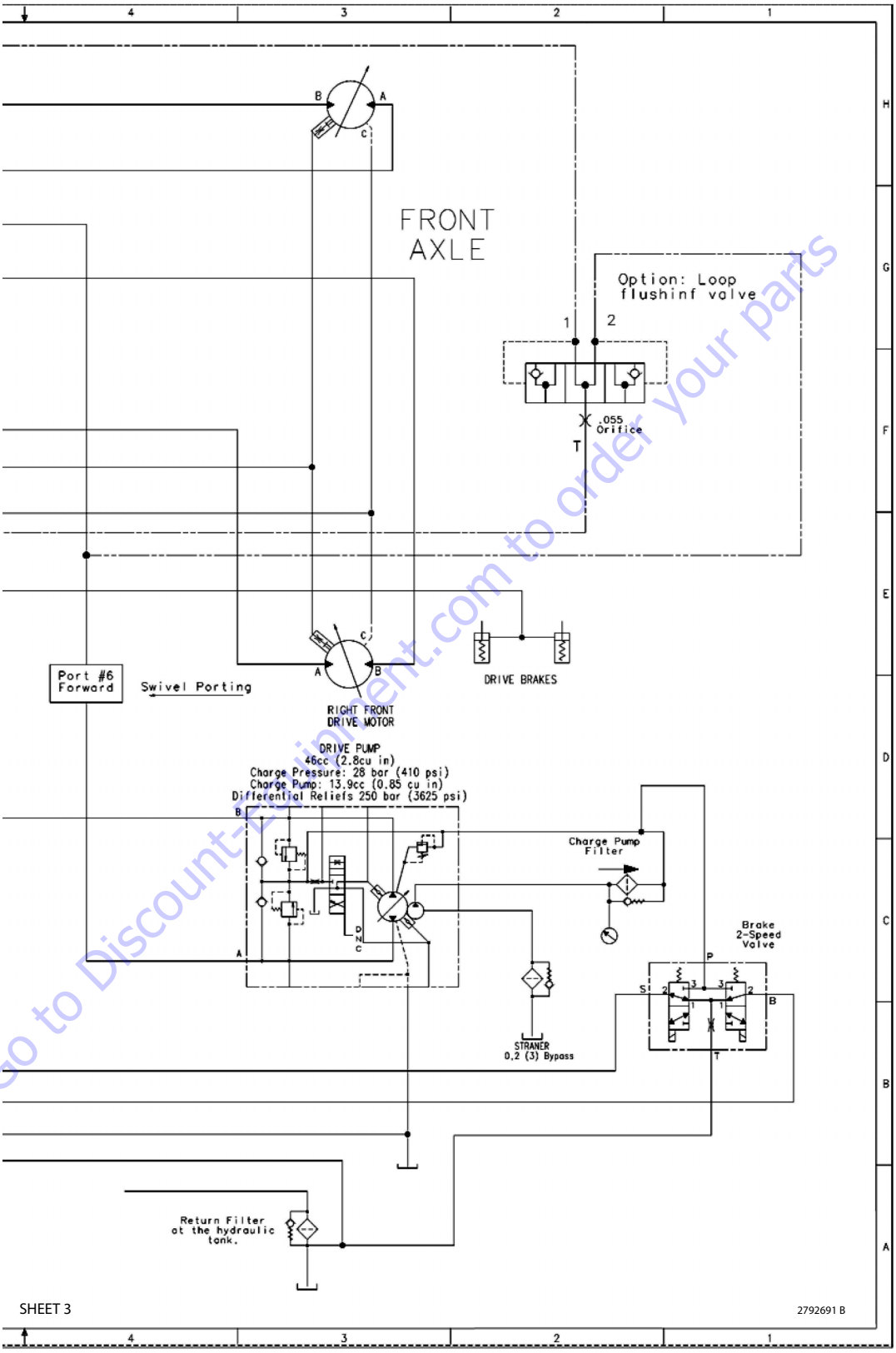
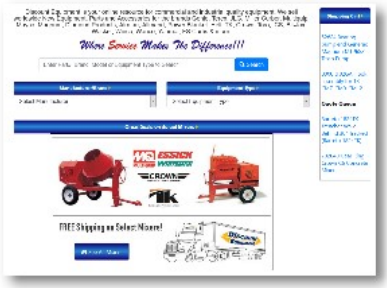


Figure 5-174. Hydraulic Schematic (4 Wheel Steer)- Sheet 6 of 6

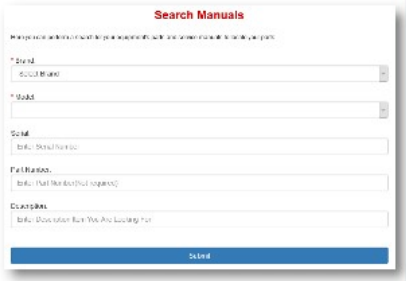
PARTS FINDER

Search Website by Part Number

Discount Equipment



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



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Florida: 561-964-4949 Outside Florida TOLL FREE: 877-690-3101

Need parts?

Click on this link: http://www.discount-equipment.com/category/5443-parts/ and choose one of the options to help get the right parts and equipment you are looking for. Please have the machine model and serial number available in order to help us get you the correct parts. If you don't find the part on the website or on once of the online manuals, please fill out the request form and one of our experienced staff members will get back to you with a quote for the right part that your machine needs.

We sell worldwide for the brands: Genie, Terex, JLG, MultiQuip, Mikasa, Essick, Whiteman, Mayco, Toro Stone, Diamond Products, Generac Magnum, Airman, Haulotte, Barreto, Power Blanket, Nifty Lift, Atlas Copco, Chicago Pneumatic, Allmand, Miller Curber, Skyjack, Lull, Skytrak, Tsurumi, Husquvarna Target, , Stow, Wacker, Sakai, Mi-T- M, Sullair, Basic, Dynapac, MBW, Weber, Bartell, Bennar Newman, Haulotte, Ditch Runner, Menegotti, Morrison, Contec, Buddy, Crown, Edco, Wyco, Bomag, Laymor, Barreto, EZ Trench, Bil-Jax, F.S. Curtis, Gehl Pavers, Heli, Honda, ICS/PowerGrit, IHI, Partner, Imer, Clipper, MMD, Koshin, Rice, CH&E, General Equipment, ,AMida, Coleman, NAC, Gradall, Square Shooter, Kent, Stanley, Tamco, Toku, Hatz, Kohler, Robin, Wisconsin, Northrock, Oztec, Toker TK, Rol-Air, Small Line, Wanco, Yanmar

SECTION 6. JLG CONTROL SYSTEM

6.1 JLG CONTROL SYSTEM ANALYZER KIT INSTRUCTIONS

Introduction

NOTICE

WHEN INSTALLING A NEW POWER MODULE CONTROLLER ON THE MACHINE, IT WILL BE NECESSARY TO PROGRAM THE CONTROLLER FOR THE PROPER MACHINE CONFIGURATION, INCLUDING OPTIONS.

NOTICE

IT IS A GOOD PRACTICE TO AVOID PRESSURE-WASHING ELECTRICAL/ELECTRONIC COMPONENTS. SHOULD PRESSURE-WASHING BE UTILIZED TO WASH AREAS CONTAINING ELECTRICAL/ELECTRONIC COMPONENTS, JLG INDUSTRIES, INC. RECOMMENDS A MAXIMUM PRESSURE OF 750 PSI (52 BAR) AT A MINIMUM DISTANCE OF 12 INCHES (30.5 CM) AWAY FROM THESE COMPONENTS. IF ELECTRICAL/ELECTRONIC COMPONENTS ARE SPRAYED, SPRAYING MUST NOT BE DIRECT AND BE FOR BRIEF TIME PERIODS TO AVOID HEAVY SATURATION.

The JLG designed Control System is a 12 volt based control unit installed on the boom lift.

The JLG Control System has reduced the need for exposed terminal strips, diodes and trimpots and provides simplicity in viewing and adjusting the various personality settings for smooth control of: acceleration, deceleration, creep, min speed and max. speed for all boom, drive and steering functions.

The main lift, swing and drive are controlled by individual joysticks, with steering being controlled by a rocker switch built into the top the drive joystick. To activate Drive, Lift, and Swing simply pull up on the slide lock location on the joystick and move the handle into the direction desired.

The control system will control the voltage output to the valves and pump, as programmed for smooth operation and maximum cycle time. Ground control speeds for all boom functions can also be programmed into the control system.

The JLG Control System controller has a built in LED to indicate any faults. The system stores recent faults which may be accessed for troubleshooting. Optional equipment includes a soft touch system, head and tail lights and ground alarm. These options may be added later but must be programmed into the control system when installed.

The Control System may be accessed utilizing a custom designed, hand held analyzer (Analyzer Kit, JLG part no. 2901443) which will display two lines of information at a time, by scrolling through the program.

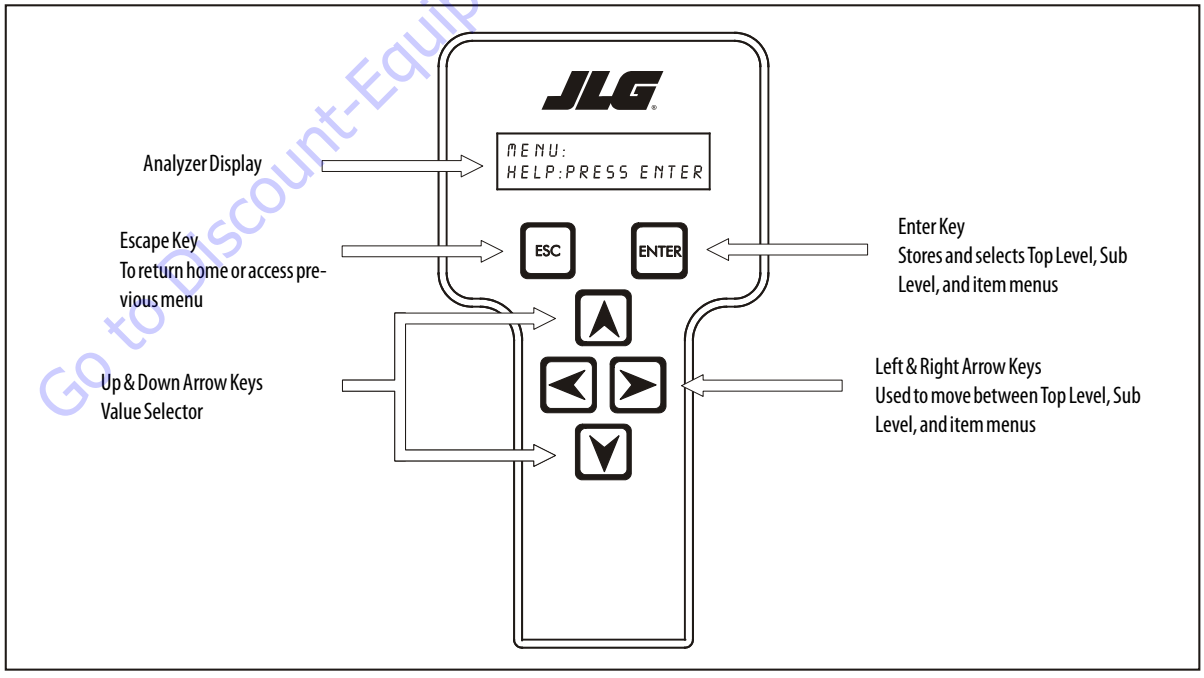


Figure 6-1. Hand Held Analyzer

To Connect the JLG Control System Analyzer

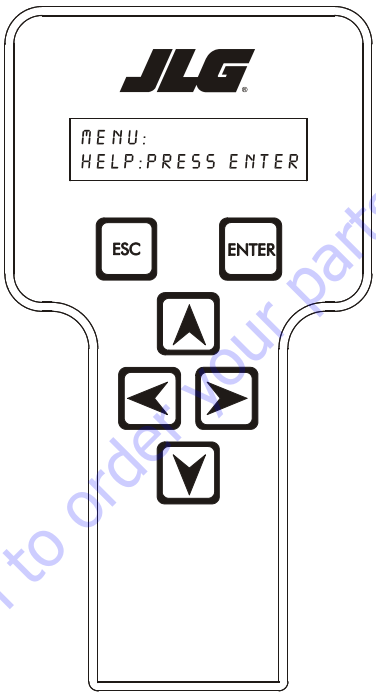
1. Connect the four pin end of the cable supplied with the analyzer, to the controller module located in the platform box or at the controller module in the ground control box and connect the remaining end of the cable to the analyzer.

NOTE: *The cable has a four pin connector at each end of the cable; the cable cannot be connected backwards.*

2. Power up the Control System by turning the lower key to the platform or ground position and pulling both emergency stop buttons on.

Using the Analyzer

With the machine power on and the analyzer connected properly, the analyzer will display the following:



HELP:
PRESS ENTER

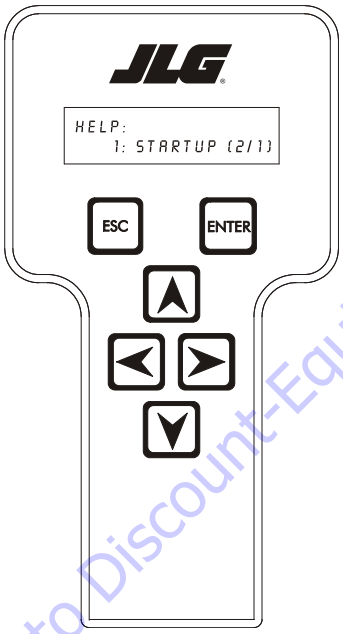
At this point, using the RIGHT  and LEFT  arrow keys, you can move between the top level menu items. To select a displayed menu item, press ENTER  . To cancel a selected menu item, press Escape  ; then you will be able to scroll using the right and left arrow keys to select a different menu item.

The top level menus are as follows:

HELP
DIAGNOSTICS
ACTIVATE TEST
ACCESS LEVEL
PERSONALITIES
MACHINE SETUP
LEVEL VEHICLE (level 1 only)
CALIBRATIONS (view only)

If you press **ENTER** ENTER, at the **HELP: PRESS ENTER** display, and a fault is present, the analyzer display will scroll the fault across the screen. If there was no fault detected, the display will read: **HELP: EVERYTHING OK.** If powered up at the ground station, the display will read: **GROUND OK.**

If **ENTER** ENTER is pressed again, the display moves to the following display:



LOGGED HELP
1: STARTUP (2/1)

At this point, the analyzer will display the last fault the system has seen, if any are present. You may scroll through the fault logs to view what the last 25 faults were. Use the right and left arrow keys to scroll through the fault logs. To return to the beginning, press **ESCAPE** ESC two times. **STARTUP (2/1)** indicates a power up.

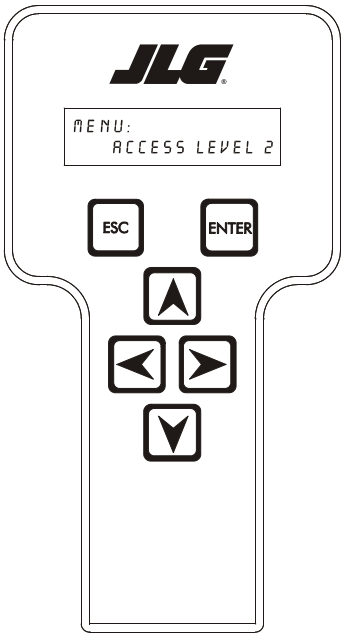
When a top level menu is selected, a new set of menu items may be offered: for example:

DRIVE
BOOM
SYSTEM
DATALOG
VERSIONS

Pressing **ENTER** ENTER with any of the above displayed menus, will display additional sub-menus within the selected menu. In some cases, such as **DRIVE**, the next level is the parameter or information to be changed. Refer to the flow chart for what menus are available within the top level menus. You may only view the personality settings for selected menus while in access level 2. Remember, you may always cancel a selected menu item by pressing the **ESCAPE** ESC key.

Changing the Access Level of the Hand Held Analyzer

When the analyzer is first connected, you will be in access level 2 which enables you to only view most settings which cannot be changed until you enter a password to advance to a lower level. This ensures that a setting cannot be accidentally altered. To change the access level, the correct password must be entered. To enter the password, scroll to the **ACCESS LEVEL** menu. For example:



ACCESS LEVEL 2:
CODE 00000

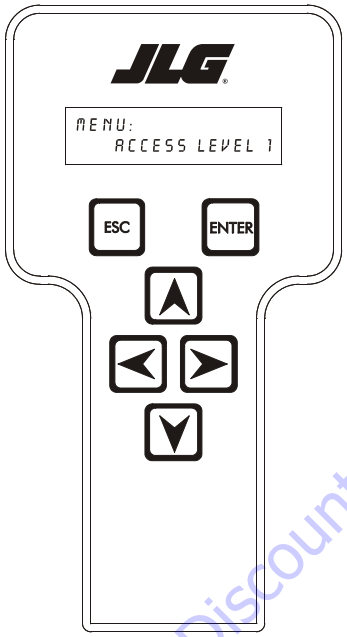
Press **ENTER** (ENTER) to select the **ACCESS LEVEL** menu.

Using the **UP** (▲) or **DOWN** (▼) arrow keys, enter the first digit of the password, 3.

Then using the **RIGHT** (►) arrow key, position the cursor to the right one space to enter the second digit of the password.

Use the **UP** (▲) or **DOWN** (▼) arrow key to enter the second digit of the password which is 33271.

Once the correct password is displayed, press **ENTER** (ENTER). The access level should display the following, if the password was entered correctly:

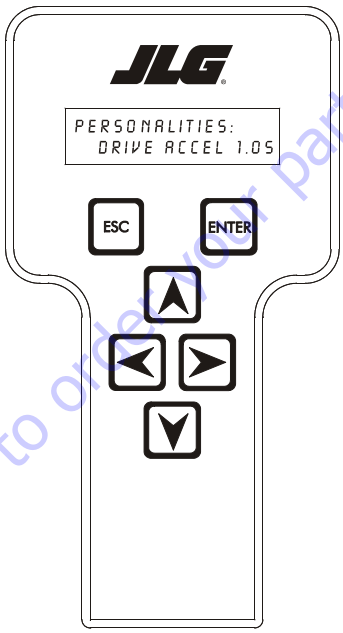


MENU:
ACCESS LEVEL 1

Repeat the above steps if the correct access level is not displayed or you can not adjust the personality settings.

Adjusting Parameters Using the Hand Held Analyzer

Once you have gained access to level 1, and a personality item is selected, press the **UP** (▲) or **DOWN** (▼) arrow keys to adjust its value, for example:

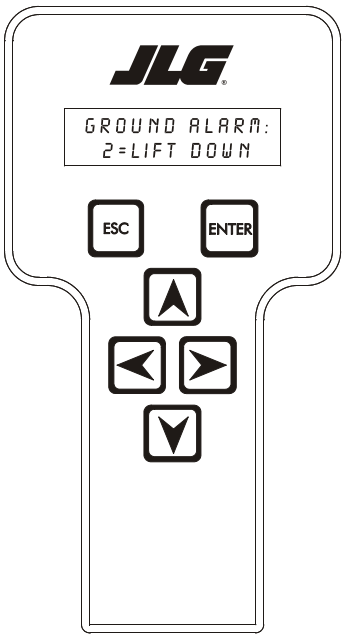


PERSONALITIES:
DRIVE ACCEL 1.5s

There will be a minimum and maximum for the value to ensure efficient operation. The Value will not increase if the **UP** (▲) arrow is pressed when at the maximum value nor will the value decrease if the **DOWN** (▼) arrow is pressed and the value is at the minimum value for any particular personality. If the value does not change when pressing the up and down arrows, check the access level to ensure you are at access level 1.

Machine Setup

When a machine digit item is selected, press the **UP** or **DOWN** arrow keys to adjust its value, for example:



GROUND ALARM:
2 = LIFT DOWN

The effect of the machine digit value is displayed along with its value. The above display would be selected if the machine was equipped with a ground alarm and you wanted it to sound when driving. There are certain settings allowed to install optional features or select the machine model.

When selection the machine model to match the size of the machine, the personality settings will all default to the factory recommended setting.

NOTE: *Refer to Personality Ranges/Defaults for the recommended factory settings.*

NOTE: *Password 33271 will give you access to level 1, which will permit you to change all machine personality settings.*

There is a setting that JLG strongly recommends that you do not change. This setting is so noted below:

ELEVATION CUTBACK

⚠ WARNING

CHANGING THIS SETTING MAY ADVERSELY AFFECT THE PERFORMANCE OF YOUR MACHINE.

NOTICE

ITS IS A GOOD PRACTICE TO AVOID PRESSURE-WASHING ELECTRICAL/ELECTRONIC COMPONENTS. SHOULD PRESSURE-WASHING BE UTILIZED TO WASH AREAS CONTAINING ELECTRICAL/ELECTRONIC COMPONENTS, JLG INDUSTRIES INC. RECOMMENDS A MAXIMUM PRESSURE OF 750 PSI (52 BAR) AT A MINIMUM DISTANCE OF 12 INCHES (30.5CM) AWAY FROM THESE COMPONENTS. IF ELECTRICAL/ELECTRONIC COMPONENTS ARE SPRAYED, SPRAYING MUST NOT BE DIRECT AND BE FOR BRIEF TIME PERIODS TO AVOID HEAVY SATURATION.

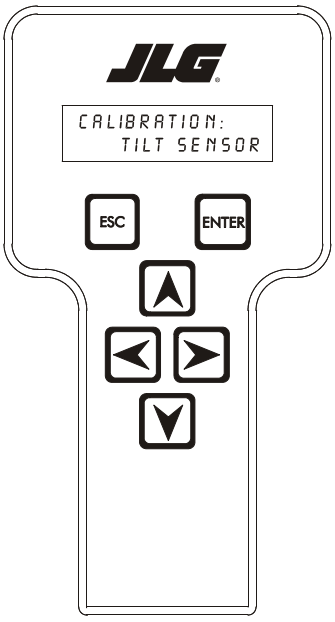
Level Vehicle Description

NOTICE

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

⚠ WARNING

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



Place machine in stowed position with the boom between the rear wheels.

To level machine chose:

CALIBRATION:
TILT SENSOR

Press ENTER.

When prompted, swing machine 180°

Press ENTER.

Table 6-1. Analyzer Abbreviations

ABBREVIATION	MEANING
ACCEL	ACCELERATE
ACT	ACTIVE
A/D	ANALOG DIGITAL CONVERTER COUNT
AMB.	AMBIENT
ANG	ANGLE
AUX	AUXILIARY
BCS	BOOM CONTROL SYSTEM
BM	BOOM LENGTH ANGLE MODULE
BLAM	BOOM LENGTH ANGLE MODULE
BR	BROKEN
BSK	BASKET
CAL	CALIBRATION
CL	CLOSED
CM	CHASSIS MODULE
CNTL	CONTROL
CNTRL	CONTROL
C/O	CUT OUT
CONT(S)	CONTRACTOR(S)
COOR	COORDINATED
CRK PT	CRACK POINT
CRP	CREEP
CUT	CUTOUT
CYL	CYLINDER
DECEL	DECELERATE
D	DOWN
DN	DOWN
DWN	DOWN
DEG.	DEGREE
DOS	DRIVE ORIENTATION SYSTEM
DRV	DRIVE
E	ERROR
E&T	ELEVATED & TILTED
ELEV	ELEVATION
ENG	ENGINE
EXT	EXTEND
F	FRONT
FL	FLOW
FNT	FRONT
FOR	FORWARD
FWD	FORWARD
FSW	FOOT SWITCH
FUNC	FUNCTION
G	GROUND

Table 6-1. Analyzer Abbreviations

ABBREVIATION	MEANING
GND	GROUND
GRN	GREEN
GM	GROUND MODULE
H	HOURS
HW	HARDWARE
HWFS	HARDWARE FAILSAFE
I	IN or CURRENT
JOY	JOYSTICK
L	LEFT
LB	POUND
LEN	LENGTH
LIM	LIMIT
LT	LEFT
LVL	LEVEL
M	MINUTES
MIN	MINIMUM
MAX	MAXIMUM
M	MAIN
MN	MAIN
NO	NORMALLY OPEN or NO
NC	NORMALLY CLOSED
O	OUT
O/C	OPEN CIRCUIT
OP	OPEN
O/R	OVERRIDE or OUTRIGGER
O//R	OVERRIDE
OSC	OSCILLATING
OVRD	OVERRIDE
P	PLATFORM
P	PRESSURE
PCV	PROPORTIONAL CONTROL VALVE
PLAT	PLATFORM
PLT	PLATFORM
PM	PLATFORM MODULE
POT	POTENTIOMETER
PRES	PRESSURE
PRS	PRESSURE
PT	POINT
R	REAR or RIGHT
REV	REVERSE or REVISION
RET	RETRACT
ROT.	ROTATE
RT	RIGHT

Table 6-1. Analyzer Abbreviations

ABBREVIATION	MEANING
S/C	SHORT CIRCUIT
SEL	SELECTOR
SN	SERIAL NUMBER
SPD	SPEED
STOW	STOWED
STOWD	STOWED
SW	SWITCH or SOFTWARE
TELE	TELESCOPE
TEMP	TEMPERATURE
TORQ.	TORQUE
TRN	TRANSPORT
T/T	TURNTABLE
T	TOWER
TURNTBL	TURNTABLE
TWR	TOWER
U	main or UP
V	VOLT
VER	VERSION
VLV	VALVE
WIT	WITNESS
YEL	YELLOW

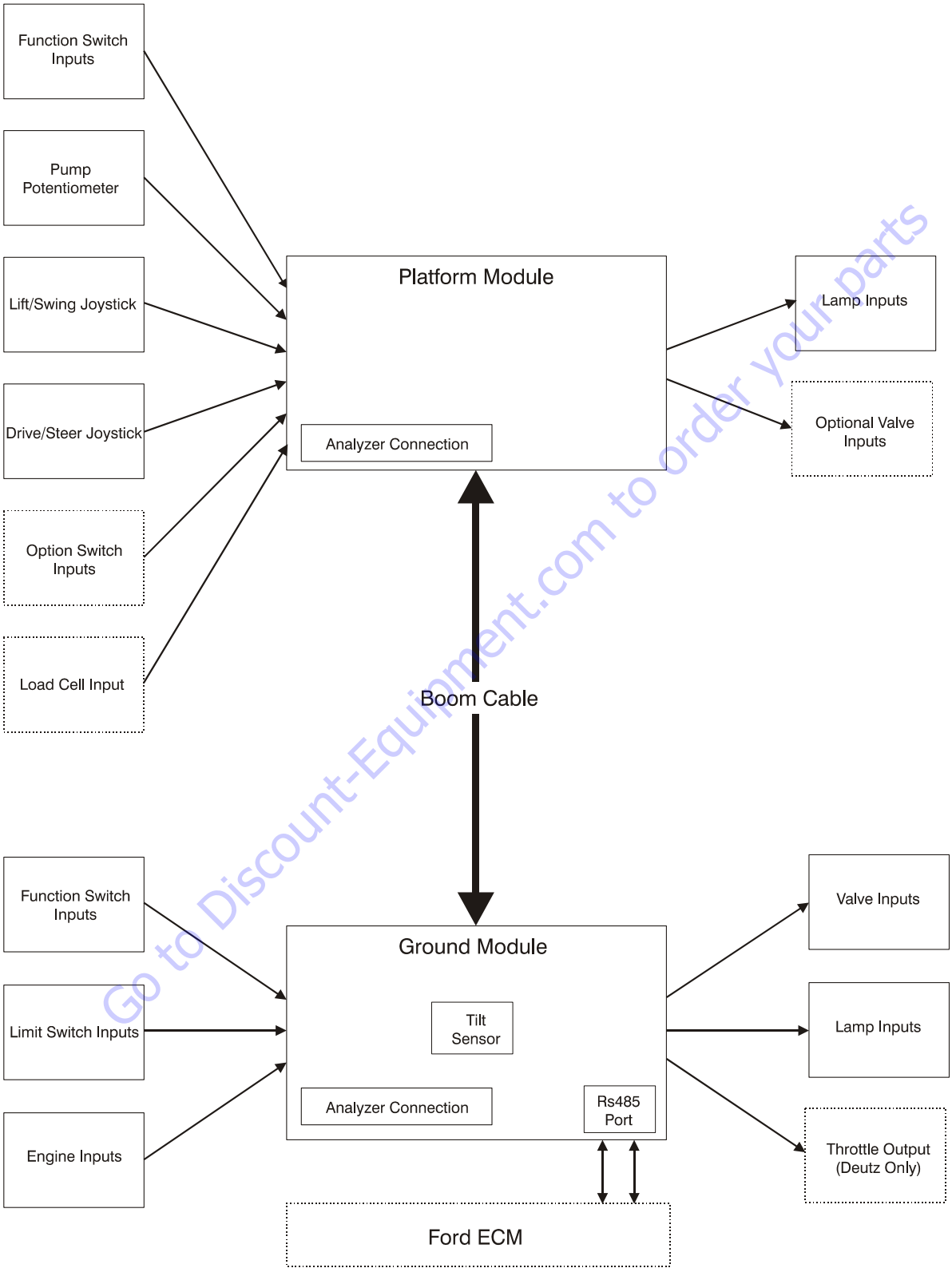


Figure 6-2. ADE Block Diagram

Table 6-2. Machine Configuration Programming Information Prior to Software Version P5.3

Configuration Digit	Number	Description	Default Number
MODEL NUMBER: 1	**1** 2 3 4 5 6 7 8 9 10	**400S** 450A 510A 600S 600A 600SC 601S 740A 800A 800S	**1**
MARKET: 2	**0** 1 2 3 4 5	**ANSI USA** ANSI EXPORT CSA CE AUSTRALIA JAPAN	**0**
ENGINE: 3* * Engine selections vary depending on model selection.	1 2 3 4 5 6 7 8 9 10 **11**	FORD EFI GAS: Ford LRG425 EFI Gas (Tier 1) FORD EFI D/F: Ford LRG425 EFI dual fuel (Tier 1) DEUTZ F4 TIER1: Deutz F4M1011F Diesel (Tier 1) DEUTZ F3 TIER1: Deutz F3M1011F Diesel (Tier 1) CAT. 3024C: CAT 3024C Diesel (Tier 2) CAT. 3044C: CAT 3044C Diesel (Tier 2) DEUTZ F4 TIER2: Deutz F4M2011 Diesel (Tier 2) DEUTZ F3 TIER2: Deutz F3M2011 Diesel (Tier 2) FORD GAS TIER2: Ford LRG425 EFI Gas (Tier 2) FORD D/F TIER2: Ford LRG425 EFI Dual Fuel (Tier 2) **DEUTZ ECM: Engine Control Module - ECM**	**11**
FLYWHEEL TEETH: 4* * This menu item is only visible if Deutz engine selections 3 or 4 are selected.	0 **1**	133 TEETH: 133 flywheel teeth. **110 TEETH: 110 flywheel teeth.**	**1**

Table 6-2. Machine Configuration Programming Information Prior to Software Version P5.3

Configuration Digit	Number	Description	Default Number
GLOW PLUG: 5	0	NO GLOW PLUGS: No glow plugs installed.	**1**
	1	**W/O STARTER LOCK: Automatic pre-glow time determined by ambient air temperature; engine start can be attempted at any time during pre-glow.**	
	2	W/ STARTER LOCK: Automatic pre-glow time determined by ambient air temperature; engine start is NOT permitted until pre-glow is finished.	
ENGINE SHUTDOWN: 6	0	DISABLED: No engine shutdown.	**1**
	1	**ENABLED: Shutdown engine when coolant temperature is greater than 110 deg. C or the oil pressure is less than 8 psi.**	
TILT: 7* *Certain market selections will limit tilt options.	**1**	**5 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also reduces drive speed to creep.**	**1**
	2	4 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also reduces drive speed to creep.	
	3	3 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also reduces drive speed to creep.	
	4	4 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up.	
	5	3 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up. *Note: Any of the selections above will light the tilt lamp when a tilted condition occurs and will sound the platform alarm when the machine is also above elevation.*	
JIB: 8* *Only visible under certain model selections	**0**	**NO: No jib installed.**	**0**
	1	YES: Jib installed which has up and down movements only.	
4 WHEEL STEER: 9* *Only visible under certain model selections.	**0**	**NO: No four-wheel steer installed.**	**0**
	1	YES: Four-wheel steer installed.	
SOFT TOUCH: 10* *Only visible under certain model selections.	**0**	**NO: No soft touch system installed.**	**0**
	1	YES: Soft touch system installed.	
GEN SET/WELDER: 11	**0**	**NO: No generator installed.**	**0**
	1	BELT DRIVE: Belt driven setup.	

Table 6-2. Machine Configuration Programming Information Prior to Software Version P5.3

Configuration Digit	Number	Description	Default Number
GEN SET CUTOUT: 12* *Only visible if Gen Set / Welder Menu selection is not 0.	**0** 1	**MOTION ENABLED: Motion enabled when generator is ON.** MOTION CUTOUT: Motion cutout in platform mode only.	**0**
H & T LIGHTS: 13	**0** 1	**NO: No head and tail lights installed.** YES: Head and tail lights installed.	**0**
CABLE SWITCH: 14* *Only visible under certain model selections. *Certain market and model selections will alter the default setting.	**0** 1	**NO: No broken cable switch installed.** YES: Broken cable switch installed.	**0**
LOAD SYSTEM: 15* *Only visible under certain model selections. *Certain market selections will limit load system options or alter default setting.	**0** 1 2 3 4	**NO: No load sensor installed.** WARN ONLY: Functions in creep, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT PLATFORM: All functions cutout, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT ALL: All functions cutout, flash overload light (500mS on, 500mS off), platform alarm beeps (5 sec ON, 2 sec OFF). SPECIAL 1: Functions in creep, overload lamp lit, disables main telescope out & main lift up, platform alarm beeps (5 sec ON, 2 sec OFF).	**0**
LOAD SENSOR: 16* *Only visible if Load Sensor Menu selection is not 0. *Market selections will limit certain load sensor options.	0 **1**	1 ON ROTATOR: Use the on-board load sensor for all models except those which use the Leveling Platform Module. **4 UNDER PLATFORM: Use the EIM for load sensing.**	**1**
FUNCTION CUTOUT: 17* *Only visible under certain market selections. *Certain market selections will limit function cutout options or alter default setting.	**0** 1 2 3	**NO: No drive cutout.** BOOM CUTOUT: Boom function cutout while driving above elevation. DRIVE CUTOUT: Drive cutout above elevation. DRIVE CUT E&T: Drive cutout above elevation and tilted.	**0**
GROUND ALARM: 18* *Certain market selections will alter default setting.	**0** 1 2 3	**NO: No ground alarm installed.** DRIVE: Travel alarm sounds when the drive function is active (Option). DESCENT: Descent alarm sounds when lift down is active (Option). MOTION: Motion alarm sounds when any function is active (Option).	**0**
DRIVE: 19* *Only visible under certain model selections.	**0** 1 2	**4WD: Four wheel drive.** 2WD: Two wheel drive. 2WD W/ 2-SPEED: Two wheel drive with 2-speed valve.	**0**

Table 6-2. Machine Configuration Programming Information Prior to Software Version P5.3

Configuration Digit	Number	Description	Default Number
TEMPERATURE: 20	0	CELSIUS: Celsius unit selection.	**1**
	1	**FAHRENHEIT: Fahrenheit unit selection.**	
LEVELING MODE: 21* * Only visible on 800S models.	**0**	**ALL FUNCTIONS: Platform level with all functions.**	**0**
	1	LEVEL LIFT/TELESCOPE: Platform level on lift and telescope only.	

4150364-14

Table 6-3. Machine Configuration Programming Information Software Version P5.3 to P6.1

Configuration Label/Digit	Number	Description	Default Number
MODEL NUMBER: 1	**1**	**400S**	**1**
	2	450A	
	3	510A	
	4	600S	
	5	600A	
	6	600SC	
	7	601S	
	8	740A	
	9	800A	
	10	800S	
MARKET: 2	**0**	**ANSI USA**	**0**
	1	ANSI EXPORT	
	2	CSA	
	3	CE	
	4	AUSTRALIA	
	5	JAPAN	

Table 6-3. Machine Configuration Programming Information Software Version P5.3 to P6.1

Configuration Label/Digit	Number	Description	Default Number
ENGINE: 3* *Engine selections vary depending on model selection.	1	FORD EFI GAS: Ford LRG425 EFI Gas (Tier 1)	**7**
	2	FORD EFI D/F: Ford LRG425 EFI dual fuel (Tier 1)	
	3	DEUTZ F4 TIER1: Deutz F4M1011F Diesel (Tier 1)	
	4	DEUTZ F3 TIER1: Deutz F3M1011F Diesel (Tier 1)	
	5	CAT. 3024C: CAT 3024C Diesel (Tier 2)	
	6	CAT. 3044C: CAT 3044C Diesel (Tier 2)	
	7	**PERKINS 404C (Tier 2)**	
	8	DEUTZ F4 TIER2: Deutz F4M2011 Diesel (Tier 2)	
	9	DEUTZ F3 TIER2: Deutz F3M2011 Diesel (Tier 2)	
	10	FORD GAS TIER2: Ford LRG425 EFI Gas (Tier 2)	
	11	FORD D/F TIER2: Ford LRG425 EFI Dual Fuel (Tier 2)	
	12	DEUTZ ECM: Engine Control Module - ECM	
	13	DUAL FUEL ECM: GM/PSI 3.0L Dual Fuel (Tier 2)	
FLYWHEEL TEETH: 4* *This menu item is only visible if Deutz engine selections 3 or 4 are selected.	0	133 TEETH: 133 flywheel teeth.	**1**
	1	**110 TEETH: 110 flywheel teeth.**	
GLOW PLUG: 5	0	NO GLOW PLUGS: No glow plugs installed.	**2**
	1	AIR INTAKE: Glow plugs installed in the air intake on the manifold.	
	2	**IN-CYLINDER: Glow plugs installed in each cylinder.**	
STARTER LOCKOUT: 6	**0**	**DISABLED: Automatic pre-glow time determined by ambient air temperature; engine start can be attempted at any time during pre-glow.**	**0**
	1	ENABLED: Automatic pre-glow time determined by ambient air temperature; engine start is NOT permitted until pre-glow is finished.	

Table 6-3. Machine Configuration Programming Information Software Version P5.3 to P6.1

Configuration Label/Digit	Number	Description	Default Number
ENGINE SHUTDOWN: 7	0 **1**	DISABLED: No engine shutdown. **ENABLED: Shutdown engine when coolant temperature is greater than 110 deg. C or the oil pressure is less than 8 PSI.**	**1**
TILT: 8* *Certain market selections will limit tilt options and alter default setting. *Note: Any of the selections above will light the tilt lamp when a tilted condition occurs and will sound the platform alarm when the machine is also above elevation.*	**1** 2 3 4 5	**5 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also reduces drive speed to creep.** 4 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also reduces drive speed to creep. 3 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also reduces drive speed to creep. 4 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up. 3 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up.	**1**
JIB: 9* *Only visible under certain model selections.	**0** 1	**NO: No jib installed.** YES: Jib installed which has up and down movements only.	**0**
4 WHEEL STEER: 10* *Only visible under certain model selections.	**0** 1	**NO: No four-wheel steer installed.** YES: Four-wheel steer installed.	**0**
SOFT TOUCH: 11* *Only visible under certain model selections.	**0** 1	**NO: No soft touch system installed.** YES: Soft touch system installed.	**0**
GEN SET/WELDER: 12	**0** 1	**NO: No generator installed.** BELT DRIVE: Belt driven setup.	**0**
GEN SET CUTOUT: 13* *Only visible if Gen Set / Welder Menu selection is not 0.	**0** 1	**MOTION ENABLED: Motion enabled when generator is ON.** MOTION CUTOUT: Motion cutout in platform mode only.	**0**

Table 6-3. Machine Configuration Programming Information Software Version P5.3 to P6.1

Configuration Label/Digit	Number	Description	Default Number
H & T LIGHTS: 14	**0** 1	**NO: No head and tail lights installed.** YES: Head and tail lights installed.	**0**
CABLE SWITCH: 15* *Only visible under certain model selections. *Certain market and model selections will alter the default setting.	**0** 1	**NO: No broken cable switch installed.** YES: Broken cable switch installed.	**0**
LOAD SYSTEM: 16* *Only visible under certain market selections. *Certain market selections will limit load system options or alter default setting.	**0** 1 2 3 4	**NO: No load sensor installed.** WARN ONLY: Functions in creep, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT PLATFORM: All functions cutout, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT ALL: All functions cutout, flash overload light (500mS on, 500mS off), platform alarm beeps (5 sec ON, 2 sec OFF). SPECIAL 1: Functions in creep, overload lamp lit, disables main telescope out & main lift up, platform alarm beeps (5 sec ON, 2 sec OFF).	**0**
LOAD SENSOR: 17* *Only visible if Load Sensor Menu selection is not 0 and under certain market selections. *Certain market selections will limit load sensor options.	0 **1**	1 ON ROTATOR: Use the on-board load sensor for all models except those which use the Leveling Platform Module. **4 UNDER PLATFORM: Use the EIM for load sensing.**	**1**
FUNCTION CUTOUT: 18* *Only visible under certain market selections. *Certain market selections will limit function cutout options or alter default setting.	**0** 1 2 3	**NO: No drive cutout.** BOOM CUTOUT: Boom function cutout while driving above elevation. DRIVE CUTOUT: Drive & steer cutout above elevation. DRIVE CUT E&T: Drive & steer cutout above elevation and tilted.	**0**

Table 6-3. Machine Configuration Programming Information Software Version P5.3 to P6.1

Configuration Label/Digit	Number	Description	Default Number
GROUND ALARM: 19* *Certain market selections will alter default setting.	0 1 2 **3**	NO: No ground alarm installed. DRIVE: Travel alarm sounds when the drive function is active (Option). DESCENT: Descent alarm sounds when lift down is active (Option). **MOTION: Motion alarm sounds when any function is active (Option).**	**3**
DRIVE: 20* *Only visible under certain model selections.	**0** 1 2	**4WD: Four wheel drive.** 2WD: Two wheel drive. 2WD W/ 2-SPEED: Two wheel drive with 2-speed valve.	**0**
TEMPERATURE: 21* *Certain market selections will alter default setting.	0 **1**	CELSIUS: Celsius unit selection. **FAHRENHEIT: Fahrenheit unit selection.**	**1**
LEVELING MODE: 22* *Only visible on 800S models.	**0** 1	**ALL FUNCTIONS: Platform level with all functions.** LEVEL LIFT/TELESCOPE: Platform level on lift and telescope only.	**0**

4150364-18

Table 6-4. Machine Configuration Programming Information Software Version P6.1 to Present

Configuration Label/Digit	Number	Description	Default Number
MODEL NUMBER: 1	1	400S	1
	2	450A	
	3	510A	
	4	600S	
	5	600A	
	6	600SC	
	7	601S	
	8	740A	
	9	800A	
	10	800S	
MARKET: 2	0	ANSI USA	0
	1	ANSI EXPORT	
	2	CSA	
	3	CE	
	4	AUSTRALIA	
	5	JAPAN	

Table 6-4. Machine Configuration Programming Information Software Version P6.1 to Present

Configuration Label/Digit	Number	Description	Default Number
ENGINE: 3* *Engine selections vary depending on model selection.	1	FORD EFI GAS: Ford LRG425 EFI Gas (Tier 1)	14
	2	FORD EFI D/F: Ford LRG425 EFI dual fuel (Tier 1)	
	3	DEUTZ F4 TIER1: Deutz F4M1011F Diesel (Tier 1)	
	4	DEUTZ F3 TIER1: Deutz F3M1011F Diesel (Tier 1)	
	5	CAT. 3024C: CAT 3024C Diesel (Tier 2)	
	6	CAT. 3044C: CAT 3044C Diesel (Tier 2)	
	7	PERKINS 404C (Tier 2)	
	8	DEUTZ F4 TIER2: Deutz F4M2011 Diesel (Tier 2)	
	9	DEUTZ F3 TIER2: Deutz F3M2011 Diesel (Tier 2)	
	10	FORD GAS TIER2: Ford LRG425 EFI Gas (Tier 2)	
	11	FORD D/F TIER2: Ford LRG425 EFI Dual Fuel (Tier 2)	
	12	DEUTZ ECM: Engine Control Module - ECM (Tier 2 and Tier 3)	
	13	DUAL FUEL ECM: GM/PSI 3.0L Dual Fuel (Tier 2)	
	14	PERKINS ECM	
	15	CAT ECM	
FLYWHEEL TEETH: 4* *This menu item is only visible if Deutz engine selections 3 or 4 are selected.	0	133 TEETH: 133 flywheel teeth.	1
	1	110 TEETH: 110 flywheel teeth.	
GLOW PLUG: 5	0	NO GLOW PLUGS: No glow plugs installed.	2
	1	AIR INTAKE: Glow plugs installed in the air intake on the manifold.	
	2	IN-CYLINDER: Glow plugs installed in each cylinder.	
STARTER LOCKOUT: 6	0	DISABLED: Automatic pre-glow time determined by ambient air temperature; engine start can be attempted at any time during pre-glow.	0
	1	ENABLED: Automatic pre-glow time determined by ambient air temperature; engine start is NOT permitted until pre-glow is finished.	

Table 6-4. Machine Configuration Programming Information Software Version P6.1 to Present

Configuration Label/Digit	Number	Description	Default Number
ENGINE SHUTDOWN: 7	0 1	DISABLED: No engine shutdown. ENABLED: Shutdown engine when coolant temperature is greater than 110 deg. C or the oil pressure is less than 8 PSI.	1
TILT: 8* *Certain market selections will limit tilt options and alter default setting. *Note: Any of the selections above will light the tilt lamp when a tilted condition occurs and will sound the platform alarm when the machine is also above elevation.*	1 2 3 4 5	5 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also reduces drive speed to creep. 4 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also reduces drive speed to creep. 3 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also reduces drive speed to creep. 4 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up. 3 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up.	1
JIB: 9* *Only visible under certain model selections.	0 1	NO: No jib installed. YES: Jib installed which has up and down movements only.	0
4 WHEEL STEER: 10* *Only visible under certain model selections.	0 1	NO: No four-wheel steer installed. YES: Four-wheel steer installed.	0
SOFT TOUCH: 11* *Only visible under certain model selections.	0 1	NO: No soft touch system installed. YES: Soft touch system installed.	0
GEN SET/WELDER: 12	0 1	NO: No generator installed. BELT DRIVE: Belt driven setup.	0
GEN SET CUTOUT: 13* *Only visible if Gen Set / Welder Menu selection is not 0.	0 1	MOTION ENABLED: Motion enabled when generator is ON. MOTION CUTOUT: Motion cutout in platform mode only.	0

Table 6-4. Machine Configuration Programming Information Software Version P6.1 to Present

Configuration Label/Digit	Number	Description	Default Number
H & T LIGHTS: 14	0 1	NO: No head and tail lights installed. YES: Head and tail lights installed.	0
CABLE SWITCH: 15* *Only visible under certain model selections. *Certain market and model selections will alter the default setting.	0 1	NO: No broken cable switch installed. YES: Broken cable switch installed.	0
LOAD SYSTEM: 16* *Only visible under certain market selections. *Certain market selections will limit load system options or alter default setting.	0 1 2 3 4	NO: No load sensor installed. WARN ONLY: Functions in creep, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT PLATFORM: All functions cutout, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT ALL: All functions cutout, flash overload light (500mS on, 500mS off), platform alarm beeps (5 sec ON, 2 sec OFF). SPECIAL 1: Functions in creep, overload lamp lit, disables main telescope out & main lift up, platform alarm beeps (5 sec ON, 2 sec OFF).	0
LOAD SENSOR: 17* *Only visible if Load Sensor Menu selection is not 0 and under certain market selections. *Certain market selections will limit load sensor options.	0 1	1 ON ROTATOR: Use the on-board load sensor for all models except those which use the Leveling Platform Module. 4 UNDER PLATFORM: Use the EIM for load sensing.	1
FUNCTION CUTOUT: 18* *Only visible under certain market selections. *Certain market selections will limit function cutout options or alter default setting.	0 1 2 3	NO: No drive cutout. BOOM CUTOUT: Boom function cutout while driving above elevation. DRIVE CUTOUT: Drive & steer cutout above elevation. DRIVE CUT E&T: Drive & steer cutout above elevation and tilted.	0

Table 6-4. Machine Configuration Programming Information Software Version P6.1 to Present

Configuration Label/Digit	Number	Description	Default Number
GROUND ALARM: 19* *Certain market selections will alter default setting.	0 1 2 3	NO: No ground alarm installed. DRIVE: Travel alarm sounds when the drive function is active (Option). DESCENT: Descent alarm sounds when lift down is active (Option). MOTION: Motion alarm sounds when any function is active (Option).	3
DRIVE: 20* *Only visible under certain model selections.	0 1 2	4WD: Four wheel drive. 2WD: Two wheel drive. 2WD W/ 2-SPEED: Two wheel drive with 2-speed valve.	0
TEMPERATURE: 21* *Certain market selections will alter default setting.	0 1	CELSIUS: Celsius unit selection. FAHRENHEIT: Fahrenheit unit selection.	1
LEVELING MODE: 22* *Only visible on 800S models.	0 1	ALL FUNCTIONS: Platform level with all functions. LEVEL LIFT/TELESCOPE: Platform level on lift and telescope only.	0
DRIVE CONTROL: 23	0 1 2	NORMAL: Drive coils are energized from the Ground Module. PROPULSION: Drive coils are energized from the Propulsion Module. ENHANCED: Drive coils are energized from the Ground Module and the ground side of the drive coils are brought back to current feedback returns.	2
CLEARSKY: 24	0 1	NO: Clearsky (telematics) option is disabled. YES: Clearsky (telematics) option is enabled.	0
CRIBBING OPTION: 25	0 1	NO: Cribbing Option is disabled. YES: Cribbing Option is enabled.	0

4150364-19

Table 6-5. Machine Configuration Programming Information

Configuration Digit	Number	Description	Default Number
NOTE: *For version **6.X software**, some screens may not be available depending upon machine configuration and software versions.* ***NOTE:*** *The machine configuration must be completed before any personality settings can be changed. Changing the personality settings first and then changing the model number of the machine configuration will cause the personality settings to return to default values.*			
MODEL NUMBER: 1	**1** 2 3 4 5 6 7 8 9 10	**400S** 450A 510A 600S 600A 600SC 601S 740A 800A 800S	**1**
MARKET: 2	**0** 1 2 3 4 5 6	**ANSI USA** ANSI EXPORT CSA CE AUSTRALIA JAPAN GB	**0**

Table 6-5. Machine Configuration Programming Information

Configuration Digit	Number	Description	Default Number
ENGINE: 3* *Engine selections vary depending on model selection.	1	FORD EFI GAS: Ford LRG425 EFI Gas (Tier 1)	**14**
	2	FORD EFI D/F: Ford LRG425 EFI dual fuel (Tier 1)	
	3	DEUTZ F4 TIER1: Deutz F4M1011F Diesel (Tier 1)	
	4	DEUTZ F3 TIER1: Deutz F3M1011F Diesel (Tier 1)	
	5	CAT. 3024C: CAT 3024C Diesel (Tier 2)	
	6	CAT. 3044C: CAT 3044C Diesel (Tier 2)	
	7	PERKINS 404C (Tier 2)	
	8	DEUTZ F4 TIER2: Deutz F4M2011 Diesel (Tier 2)	
	9	DEUTZ F3 TIER2: Deutz F3M2011 Diesel (Tier 2)	
	10	FORD GAS TIER2: Ford LRG425 EFI Gas (Tier 2)	
	11	FORD D/F TIER2: Ford LRG425 EFI Dual Fuel (Tier 2)	
	12	DEUTZ ECM: Engine Control Module - ECM (Tier 2 and Tier 3)	
	13	DUAL FUEL ECM: GM/PSI 3.0L Dual Fuel (Tier 2)	
	14	**PERKINS ECM**	
	15	CAT ECM	
	16	DEUTZ ECM T4F: Deutz Engine Control Module (Tier 4 Final)	
	17	FORD DUAL FUEL	
FLYWHEEL TEETH: 4* *This menu item is only visible if Deutz engine selections 3 or 4 are selected.	0	133 TEETH: 133 flywheel teeth.	**1**
	1	**110 TEETH: 110 flywheel teeth.**	

Table 6-5. Machine Configuration Programming Information

Configuration Digit	Number	Description	Default Number
GLOW PLUG: 5	0 1 **2**	NO GLOW PLUGS: No glow plugs installed. AIR INTAKE: Glow plugs installed in the air intake on the manifold. **IN-CYLINDER: Glow plugs installed in each cylinder.**	**2**
STARTER LOCKOUT: 6	**0** 1	**DISABLED: Automatic pre-glow time determined by ambient air temperature; engine start can be attempted at any time during pre-glow.** ENABLED: Automatic pre-glow time determined by ambient air temperature; engine start is NOT permitted until pre-glow is finished.	**0**
FUEL CUTOUT 7 *This menu item is only visible if non dual fuel engines are selected.	**0** 1 2	**RESTART: Engine allowed to be restarted multiple times when very low fuel level is reached.** ONE RESTART: Engine allowed to be restarted once for 2 minutes when very low fuel level is reached. ENGINE STOP: Engine not able to restart when very low fuel level is reached.	**0**
ENGINE SHUTDOWN: 8	0 **1**	DISABLED: No engine shutdown. **ENABLED: Shutdown engine when coolant temperature is greater than 110 deg. C or the oil pressure is less than 8 PSI (0.55 bar).**	**1**
TILT: 9* *Certain market selections will limit tilt options and alter default setting. *Note: Any of the selections above will light the tilt lamp when a tilted condition occurs and will sound the platform alarm when the machine is also above elevation.*	**1** 2 3 4 5 6	**5 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also reduces drive speed to creep.** 4 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also reduces drive speed to creep. 3 DEGREES: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also reduces drive speed to creep. 4 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 4 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up. 3 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 3 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up. 5 DEGREES + CUT: Reduces the maximum speed of all boom functions to creep when tilted more than 5 degrees and above elevation; also disallows tower lift up, tower telescope out, drive, main telescope out and main lift up.	**1**

Table 6-5. Machine Configuration Programming Information

Configuration Digit	Number	Description	Default Number
JIB: 10* *Only visible under certain model selections.	**0** 1	**NO: No jib installed.** YES: Jib installed which has up and down movements only.	**0**
4 WHEEL STEER: 11* *Only visible under certain model selections.	**0** 1	**NO: No four-wheel steer installed.** YES: Four-wheel steer installed.	**0**
ST TOUCH / SKYGUARD: 12	**0** 1 2 3	**NONE: No soft touch or skyguard system installed.** SOFT TOUCH - Soft touch only installed. SKYGUARD - Skyguard only installed. BOTH (CUTOUT) - Soft touch and Skyguard installed.	**0**
GEN SET/WELDER: 13	**0** 1	**NO: No generator installed.** BELT DRIVE: Belt driven setup.	**0**
GEN SET CUTOUT: 14* *Only visible if Gen Set / Welder Menu selection is not 0.	**0** 1	**MOTION ENABLED: Motion enabled when generator is ON.** MOTION CUTOUT: Motion cutout in platform mode only.	**0**
H & T LIGHTS: 15	**0** 1	**NO: No head and tail lights installed.** YES: Head and tail lights installed.	**0**
CABLE SWITCH: 16* *Only visible under certain model selections. *Certain market and model selections will alter the default setting.	**0** 1	**NO: No broken cable switch installed.** YES: Broken cable switch installed.	**0**

Table 6-5. Machine Configuration Programming Information

Configuration Digit	Number	Description	Default Number
LOAD SYSTEM: 17* *Only visible under certain market selections. *Certain market selections will limit load system options or alter default setting. *LOAD SYSTEM will not be visible in CE and defaulted to CUTOUT ALL for machines equipped with MSSO.	**0** 1 2 3 4	**NO: No load sensor installed.** WARN ONLY: Functions in creep, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT PLATFORM: All functions cutout, overload lamp lit, platform alarm beeps (5 sec ON, 2 sec OFF). CUTOUT ALL: All functions cutout, flash overload light (500mS on, 500mS off), platform alarm beeps (5 sec ON, 2 sec OFF). SPECIAL 1: Functions in creep, overload lamp lit, disables main telescope out & main lift up, platform alarm beeps (5 sec ON, 2 sec OFF).	**0**
LOAD SENSOR: 18* *Only visible if Load Sensor Menu selection is not 0 and under certain market selections. *Certain market selections will limit load sensor options.	0 **1**	1 ON ROTATOR: Use the on-board load sensor for all models except those which use the Leveling Platform Module. **4 UNDER PLATFORM: Use the EIM for load sensing.**	**1**
FUNCTION CUTOUT: 19* *Only visible under certain market selections. *Certain market selections will limit function cutout options or alter default setting.	**0** 1 2 3	**NO: No drive cutout.** BOOM CUTOUT: Boom function cutout while driving above elevation. DRIVE CUTOUT: Drive & steer cutout above elevation. DRIVE CUT E&T: Drive & steer cutout above elevation and tilted.	**0**
GROUND ALARM: 20* *Certain market selections will alter default setting.	0 1 2 **3**	NO: No ground alarm installed. DRIVE: Travel alarm sounds when the drive function is active (Option). DESCENT: Descent alarm sounds when lift down is active (Option). **MOTION: Motion alarm sounds when any function is active (Option).**	**3**
DRIVE: 21* *Only visible under certain model selections.	**0** 1 2	**4WD: Four wheel drive.** 2WD: Two wheel drive. 2WD W/ 2-SPEED: Two wheel drive with 2-speed valve.	**0**

Table 6-5. Machine Configuration Programming Information

Configuration Digit	Number	Description	Default Number
DISPLAY UNITS: 22* *Certain market selections will alter default setting.	**0** 1	**IMPERIAL: DEG F, PSI, LBS.** METRIC: DEG C, KPA, KGS	**0**
LEVELING MODE: 23* *Only visible on 800S models.	**0** 1	**ALL FUNCTIONS: Platform level with all functions.** LEVEL LIFT/TELESCOPE: Platform level on lift and telescope only.	**0**
DRIVE CONTROL: 24	0 1 **2**	NORMAL: Drive coils are energized from the Ground Module. PROPULSION: Drive coils are energized from the Propulsion Module. **ENHANCED: Drive coils are energized from the Ground Module and the ground side of the drive coils are brought back to current feedback returns.**	**2**
DRIVE PUMP 25* *Only visible on 600A, 600S, and 800S models.	**0** 1 2 3	**SAUER DANFOSS: Machine equipped with Sauer Danfoss drive pump** EATON: Machine equipped with Eaton drive pump. M46 - XXXX: Machine equipped with M46 - XXXX drive pump. 830XXXXX: Machine equipped with 830XXXXX: drive pump.	**0**
BOOM CONTROL: 26	**0** 1	**NORMAL: Boom function coils are energized from the Ground Module.** ENHANCED: Boom function are energized from the Ground Module and the ground side of the drive coils and brought back to current feedback returns.	**0**
FUNCTION SPEED KNOB: 27	**0** 1	**YES: Machine is equipped with Function Speed Knob.** NO: Machine is equipped with Operation Speed Switch.	**0**
CLEARSKY: 28	**0** 1	**NO: Clearsky (telematics) option is disabled.** YES: Clearsky (telematics) option is enabled.	**0**

Table 6-5. Machine Configuration Programming Information

Configuration Digit	Number	Description	Default Number
CRIBBING OPTION: 29	**0** 1	**NO: Cribbing Option is disabled.** YES: Cribbing Option is enabled.	**0**
FUEL TANK SIZE: 30	**0** 1	**31 Gallon Tank** 52 Gallon Tank	**0**
ALARM / HORN: 31	**0** 1	**SEPERATE: Separate alarm and horn.** COMBINED: Combination alarm / horn.	**0**
ALERT / BEACON: 32	**0** 1	**OFF FOR CREEP: Alert beacon will not flash while in Creep.** 20 FPS FOR CREEP: Alert beacon will flash at 20 FPS while in Creep.	**0**
TEMP CUTOUT: 33	**0** 1	**NO: Temp Cutout is Disabled** YES: Temp Cutout is Enabled	**0**
PLAT LVL OVR CUT: 34	**0** 1	**NO: Platform Level Override will always be functional.** YES: Platform Level Override will only be functional when In Transport.	**0**
WATER IN FUEL SENSOR: 35* *This menu item is only visible if Deutz EMR 4 engine is selected. *Only visible under certain market selections.	**0** 1	**NO: Water in Fuel Sensor Disabled.** YES: Water in Fuel Sensor Enabled.	**0**

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Table 6-6. 600A Machine Configuration Programming Settings

600 A	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Model Number	5	5	5	5	5	5	5
Market	0	1	2	3	4	5	3
Engine	12	12	12	12	12	12	12
Flywheel Teeth	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Glow Plugs	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Starter Lockout	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Fuel Cutout	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Engine Shut-down	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Tilt	1	1	1	X	X	1	X
	2	2	2	X	2	2	X
	3	3	3	X	3	3	X
	4	4	4	4	4	4	4
	5	5	5	5	5	5	5
	6	6	6	X	X	6	X
Jib	0	0	0	0	0	0	0
4 Wheel Steer	0	0	0	0	0	0	0
Stouch/Sky-guard	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
Gen Set / Welder	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Gen Set Cutout	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Head & Tail-lights	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Cable Breaks Switch	0	0	0	0	0	0	0
	1	1	1	1	1	1	1

Table 6-6. 600A Machine Configuration Programming Settings

600 A	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Load System	0	0	0	0	0	0	0
	X	1	X	X	X	1	X
	X	2	X	2	2	2	2
	X	3	X	3	X	3	3
	X	4	X	X	X	4	X
Load Sensor	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Function Cut-out	0	0	0	0	0	0	0
	X	1	1	1	1	1	1
	2	2	2	X	2	2	2
	X	3	3	X	3	3	3
Ground Alarm	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
Drive Type	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Display Units	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Leveling Mode	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Drive Control	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Drive Pump	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
Boom Control	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Function Speed Knob	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
Clearsky	0	0	0	0	0	0	0
	1	1	1	1	1	1	1

Table 6-6. 600A Machine Configuration Programming Settings

600 A	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Cribbing Option	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Fuel Tank Size	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Alarm / Horn	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Alert Beacon	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Temp Cutout	X	**0**	X	**0**	X	X	**0**
	X	1	X	1	X	X	1
Plat Lvl Ovr Cut	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Water In Fuel Sensor	X	**0**	X	X	X	X	**0**
	X	1	X	X	X	X	1

NOTE: **BOLD TEXT** *indicates the default setting. Plain text indicates another available selection.* ***RED ITALIC*** *text indicates the default when option is factory installed. SHADED CELLS indicate hidden menu or selection.*

Table 6-7. 600AJ Machine Configuration Programming Settings

600 AJ	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Model Number	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Market	**0**	**1**	**2**	**3**	**4**	**5**	**3**
Engine	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Flywheel Teeth	0	0	0	0	0	0	0
	1	**1**	**1**	**1**	**1**	**1**	**1**
Glow Plugs	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	**2**	**2**	**2**	**2**	**2**	**2**
Starter Lockout	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Fuel Cutout	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Engine Shutdown	0	0	0	0	0	0	0
	1	**1**	**1**	**1**	**1**	**1**	**1**
Tilt	**1**	**1**	**1**	X	X	**1**	X
	2	2	2	X	**2**	2	X
	3	3	3	X	3	3	X
	4	4	4	4	4	4	4
	5	5	5	5	5	5	**5**
	6	6	6	X	X	6	X
Jib	**1**	**1**	**1**	**1**	**1**	**1**	**1**
4 Wheel Steer	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Stouch/Skyguard	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
Gen Set / Welder	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Gen Set Cutout	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Head & Taillights	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Cable Breaks Switch	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1

Table 6-7. 600AJ Machine Configuration Programming Settings

600 AJ	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Load System	**0**	**0**	**0**	0	0	0	0
	X	***1***	X	X	X	**1**	X
	X	2	X	2	**2**	2	2
	X	3	X	**3**	X	3	**3**
	X	4	X	X	X	4	X
Load Sensor	0	0	0	0	0	0	0
	1	**1**	**1**	**1**	**1**	**1**	**1**
Function Cutout	**0**	**0**	**0**	0	**0**	**0**	**0**
	X	1	1	**1**	1	1	1
	2	2	2	X	2	2	2
	X	3	3	X	3	3	3
Ground Alarm	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	**3**	**3**	**3**	**3**	**3**	**3**
Drive Type	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
Display Units	**0**	**0**	0	0	0	0	0
	1	1	**1**	**1**	**1**	**1**	**1**
Leveling Mode	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Drive Control	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	**2**	**2**	**2**	**2**	**2**	**2**
Drive Pump	X	X	X	X	X	X	X
	X	X	X	X	X	X	X
	2	**2**	**2**	**2**	**2**	**2**	**2**
	3	3	3	3	3	3	3
Boom Control	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Function Speed Knob	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Clearsky	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1

Table 6-7. 600AJ Machine Configuration Programming Settings

600 AJ	ANSI USA	ANSI Export	CSA	CE	Australia	Japan	GB
Cribbing Option	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Fuel Tank Size	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Alarm / Horn	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Alert Beacon	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Temp Cutout	X	**0**	X	**0**	X	X	**0**
	X	1	X	1	X	X	1
Plat Lvl Ovr Cut	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	1	1	1	1	1	1	1
Water In Fuel Sensor	X	**0**	X	X	X	X	**0**
	X	1	X	X	X	X	1

NOTE: **BOLD TEXT** *indicates the default setting. Plain text indicates another available selection.* ***RED ITALIC*** *text indicates the default when option is factory installed. SHADED CELLS indicate hidden menu or selection.*

6.2 MACHINE PERSONALITY SETTINGS AND FUNCTION SPEEDS

NOTE: *Personality settings can be adjusted within the adjustment range in order to achieve optimum machine performance.*

Table 6-8. Machine Personality Settings

SUBMENU (DISPLAYED ON ANALYZER 1ST LINE)	PERSONALITY	RANGE	DEFAULTS (600A M46-XXX)
DRIVE:	ACCELeration	0.0 to 5.0 s	2.0
	DECELeration	0.0 to 3.0 s	2.0
	FORward MINimum speed	1 to 35%	4
	FORward MAXimum speed	1 to 100%	32
	REVerse MINimum speed	1 to 35%	4
	REVerse MAXimum speed	1 to 100%	31
	ELEVATED MAXimum speed	1 to 100%	15
	CREEP MAXimum speed	1 to 90%	20
STEER:	MAXimum speed	1 to 100%	100
MAIN LIFT:	ACCELeration	0.0 to 5.0 s	2.0
	DECELeration	0.0 to 3.0 s	0.7
	MINimum UP speed	1 to 60%	50
	MAXimum UP speed	1 to 100%	73
	CREEP maximum UP speed	1 to 65%	59
	MINimum DOWN speed	1 to 60%	46
	MAXimum DOWN speed	1 to 100%	67
	CREEP maximum DOWN speed	1 to 75%	52
TOWER LIFT:	ACCELeration	0.0 to 5.0 s	1.0
	DECELeration	0.0 to 3.0 s	0.5
	MINimum UP speed	1 to 60%	30
	MAXimum UP speed	1 to 100%	80
	MINimum DOWN speed	1 to 60%	30
	MAXimum DOWN speed	1 to 100%	75
	Medium Speed	0.01 to 1.00	0.30
SWING	ACCELeration	0.0 to 5.0 s	2.0
	DECELeration	0.0 to 3.0 s	1.5
	MINimum LEFT speed	1 to 50%	50
	MAXimum LEFT speed	1 to 100%	73
	CREEP maximum LEFT speed	1 to 65%	55
	MINimum RIGHT speed	1 to 50%	48
	MAXimum RIGHT speed	1 to 100%	73
	CREEP maximum RIGHT speed	1 to 65%	59

Table 6-8. Machine Personality Settings

SUBMENU (DISPLAYED ON ANALYZER 1ST LINE)	PERSONALITY	RANGE	DEFAULTS (600A M46-XXX)
MAIN TELESCOPE:	ACCELeration	0.0 to 5.0 s	3.5
	DECELeration	0.0 to 3.0 s	1.2
	MINimum IN speed	1 to 65%	31
	MAXimum IN speed	1 to 100%	75
	MINimum OUT speed	1 to 65%	35
	MAXimum OUT speed	1 to 100%	75
	Medium Speed	0.01 to 1.00	0.45
TOWER TELESCOPE:	ACCELeration	0.0 to 5.0 s	1.0
	DECELeration	0.0 to 3.0 s	0.5
	MINimum IN speed	1 to 65%	26
	MAXimum IN speed	1 to 100%	70
	MINimum OUT speed	1 to 65%	28
	MAXimum OUT speed	1 to 100%	75
	Medium Speed	0.01 to 1.00	0.40
PLATFORM LEVEL:	ACCELeration	0.0 to 5.0 s	2.5
	DECELeration	0.0 to 3.0 s	0.5
	MINimum UP speed	1 to 65%	21
	MAXimum UP speed	1 to 100%	52
	MINimum DOWN speed	1 to 65%	22
	MAXimum DOWN speed	1 to 100%	50
	Medium Speed	0.01 to 1.00	0.40
PLATFORM ROTATE:	ACCELeration	0.0 to 5.0 s	1.4
	DECELeration	0.0 to 3.0 s	0.7
	MINimum LEFT speed	1 to 100%	18
	MAXimum LEFT speed	1 to 100%	50
	MINimum RIGHT speed	1 to 100%	17
	MAXimum RIGHT speed	1 to 100%	50
	Medium Speed	0.01 to 1.00	0.45
JIB LIFT	Lift ACCELeration	0.0 to 5.0 s	1.8
	Lift DECELeration	0.0 to 3.0 s	0.8
	MINimum UP speed	1 to 65%	17
	MAXimum UP speed	1 to 100%	25
	MINimum down	1 to 65%	18
	MAXimum Down	1 to 100%	25
	Medium Speed	0.01 to 1.00	0.35

Table 6-8. Machine Personality Settings

SUBMENU (DISPLAYED ON ANALYZER 1ST LINE)	PERSONALITY	RANGE	DEFAULTS (600A M46-XXX)
GROUND MODE	Tower LIFT UP speed	1 to 100%	79
	Tower LIFT DOWN speed	1 to 100%	79
	Main LIFT UP speed	1 to 100%	72
	Main LIFT DOWN speed	1 to 100%	66
	SWING speed	1 to 100%	72
	Main TELEscope speed	1 to 100%	70
	Tower TELEscope speed	1 to 100%	69
	PLATFORM ROTATE speed	1 to 100%	49
	PLATFORM LEVEL speed	1 to 100%	51
	JIB LIFT speed	1 to 100%	24
	JIB SWING speed	1 to 100%	N/A
Note: Ground Mode speed are automatically limited to being lower than platform speed for a given function.			

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6.3 MACHINE ORIENTATION WHEN SETTING FUNCTION SPEEDS

Lift: Boom Retracted, Telescope Retracted, Lift Up, Record Time, Lift Down, Record Time.

Swing: Boom at Full Elevation. Telescope Retracted. Swing the Turntable off center and stop. Swing the opposite direction and start the test when the turntable is centered up. This eliminates ramp up and down on the controller affecting times.

Telescope: Boom at Full Elevation; Telescope Retracted; Telescope Out, Record Time. Telescope In, Record Time.

Drive (Forward/Reverse): Test should be done on a smooth level surface. Drive Select Switch should be set to high speed. Start approximately 25 ft. (7.62 m) from the starting point so that the unit is at maximum speed when starting the test. Results should be recorded for a 200 ft. (60.96 m) course. Drive Forward, Record Time. Drive Reverse, Record Time.

Drive (Above Horizontal): Test should be done on a smooth level surface. Drive Select Switch should be set to High Engine, High Speed. The boom should raised above horizontal. The platform speed control knob should be selected out of creep speed. Results should be recorded for a 50 ft. (15.2 m) course. Drive Forward, Record Time. Drive Reverse, Record Time.

Platform Rotate: Platform level and completely rotated one direction. Rotate the opposite direction, Record Time. Rotate the other direction, Record Time.

Jib: Platform level and centered with the boom. Start with the Jib down. Jib Up, Record Time. Jib Down, Record Time.

Lower Lift: Upper boom horizontal, telescoped in, Lower Lift up, Record Time. Lower Lift Down, Record Time.

Lower Telescope: Lower Lift fully elevated, Upper Boom horizontal, telescoped in. Lower Tele Out, Record Time. Lower Tele In, Record Time.

Test Notes

1. Stop watch should be started with the function, not with the controller or switch.
2. All speed tests are run from the platform. These speeds do not reflect the ground control operation.
3. The platform speed knob control must be at full speed (turned clockwise completely).
4. Function speeds may vary due to cold thick hydraulic oil. Test should be run with the oil temperature above 100° F (38° C).

Table 6-9. Function Speeds

Function	Speed (In Seconds)
Main Lift Up	26-32
Main Lift Down	26-32
Swing Right & Left	79 - 101
NOTE: *Not more than 10% difference between swing left and swing right.*	
Main Telescope In	22-30
Main Telescope Out	35-50
Platform Rotate Right & Left	16 -25
NOTE: *Not more that 15% difference between rotator left and rotator right.*	
Jib Up	22-34
Jib Down	16-26
Lower Lift Up	37-50
Lower Lift Down	28-38
Lower Telescope Out	15-23
Lower Telescope In	09-15
Drive Forward & Reverse (2WD & 4WD) Other Engines	30-34 (4.25 MPH)
Drive Forward & Reverse (2WD & 4WD) Deutz Engine	34-38 (4.02 MPH)
Drive Above Horizontal Forward & Reverse (2WD & 4WD)	46-54 (0.68 MPH)

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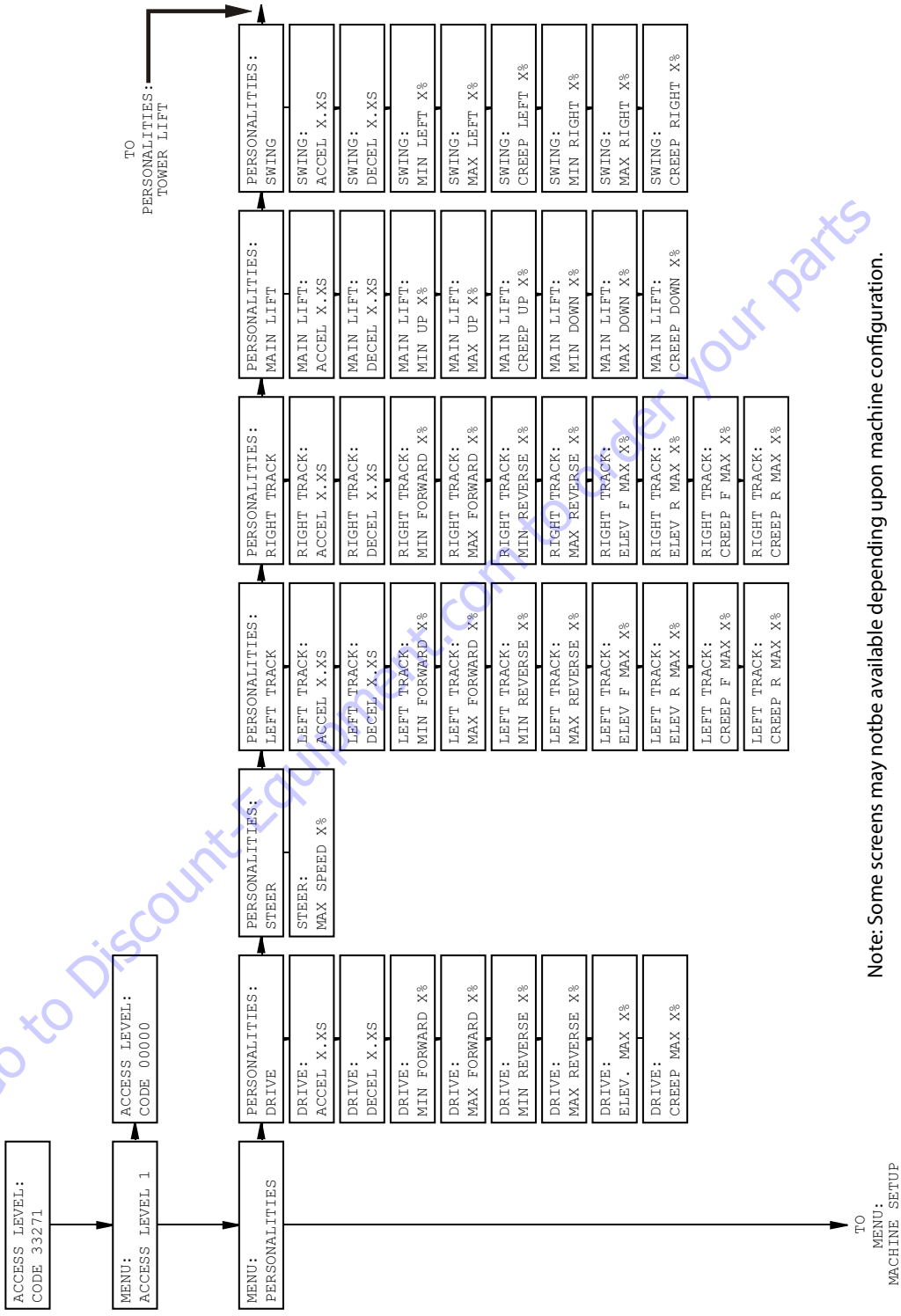


Note: Some screens may notbe available depending upon machine configuration.

Figure 6-3. Analyzer Flow Chart, Prior to Version 5.X Software - Sheet 1 of 4

Figure 6-4. Analyzer Flow Chart, Prior to Version 5.X Software - Sheet 2 of 4

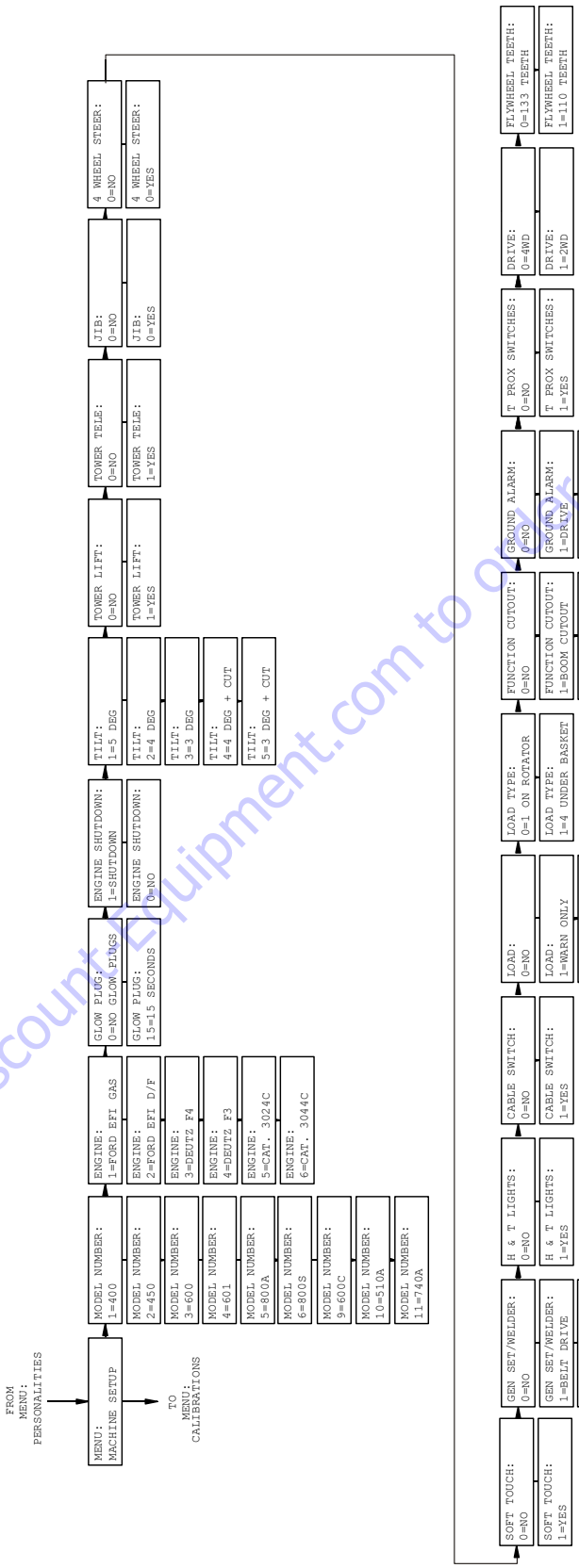
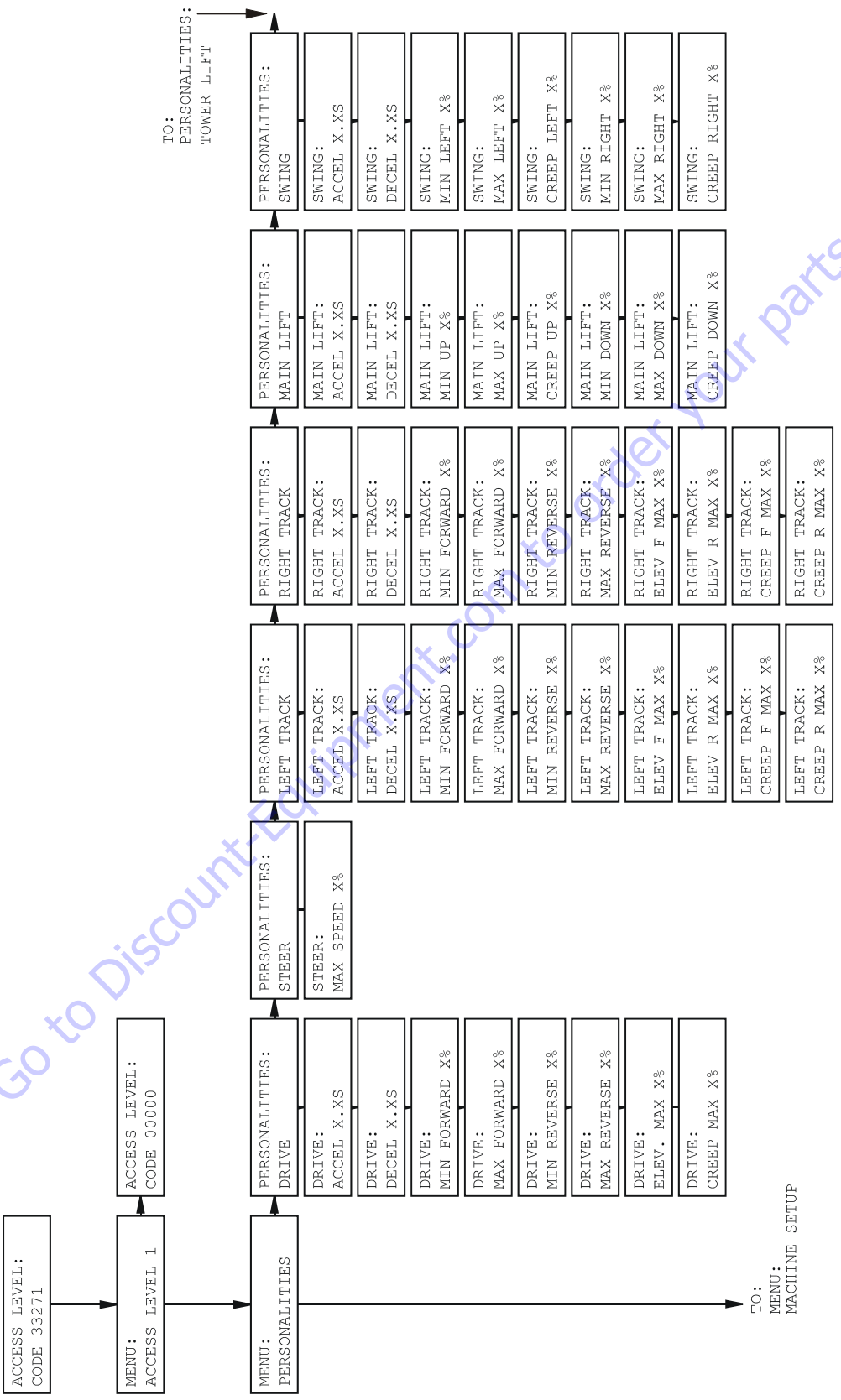


Figure 6-5. Analyzer Flow Chart, Prior to Version 5.X Software - Sheet 3 of 4

Figure 6-6. Analyzer Flow Chart, Prior to Version 5.X Software - Sheet 4 of 4



NOTE: *Some screens may not be available depending upon machine configuration.*

Figure 6-7. Analyzer Flow Chart, Version 5.X Software - Sheet 1 of 4

Figure 6-8. Analyzer Flow Chart, Version 5.X Software - Sheet 2 of 4

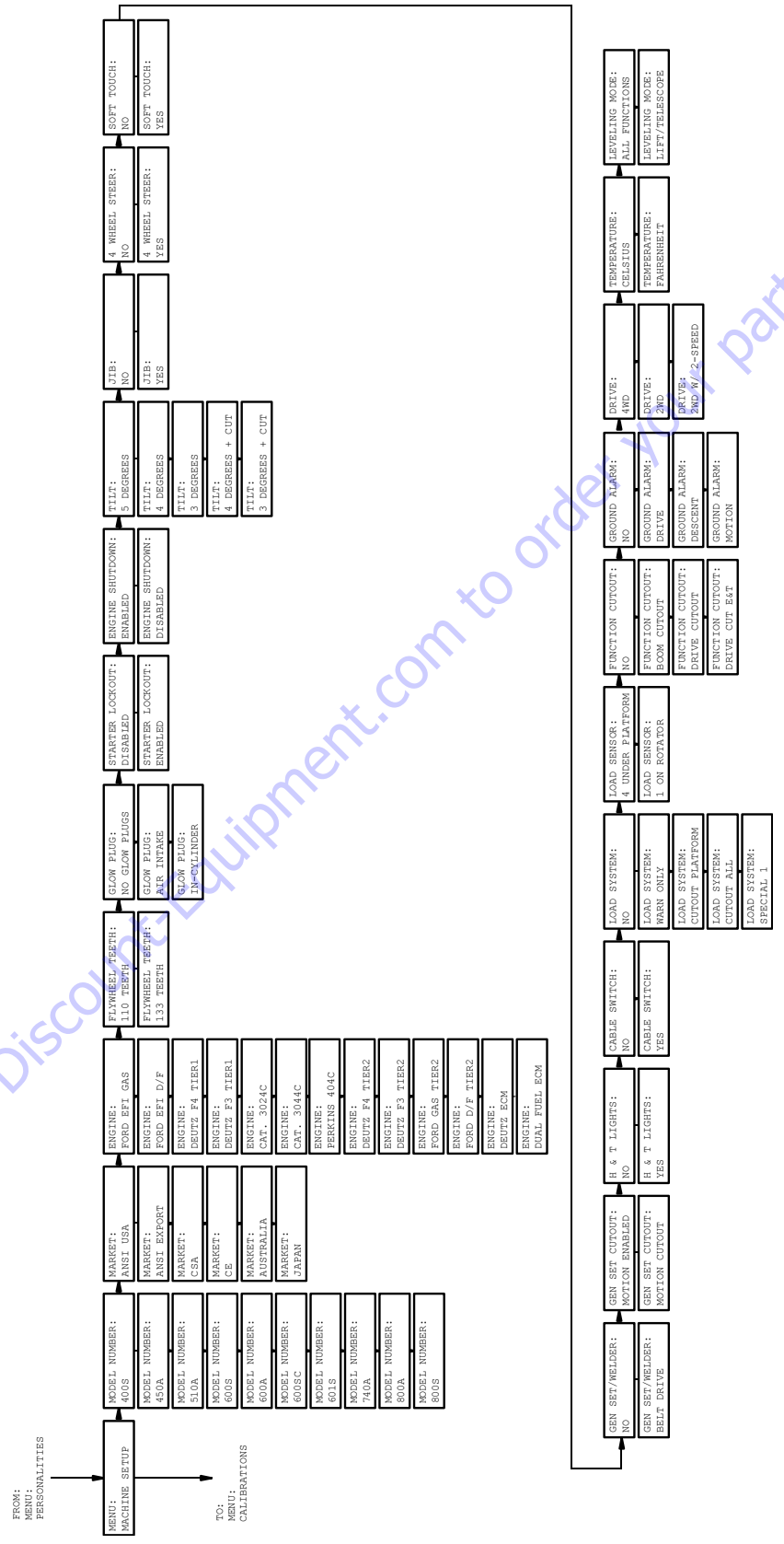


Figure 6-9. Analyzer Flow Chart, Version 5.X Software - Sheet 3 of 4

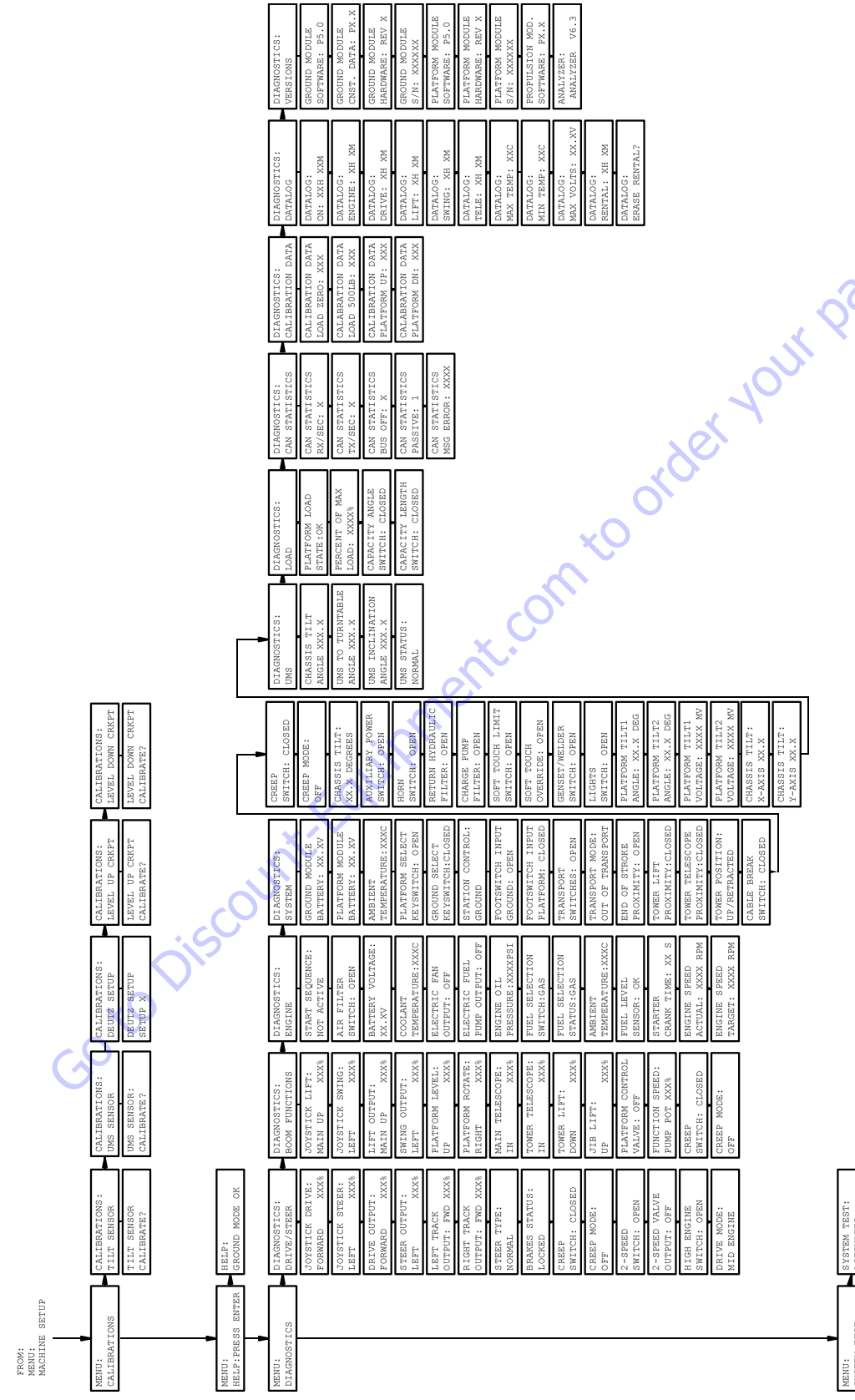
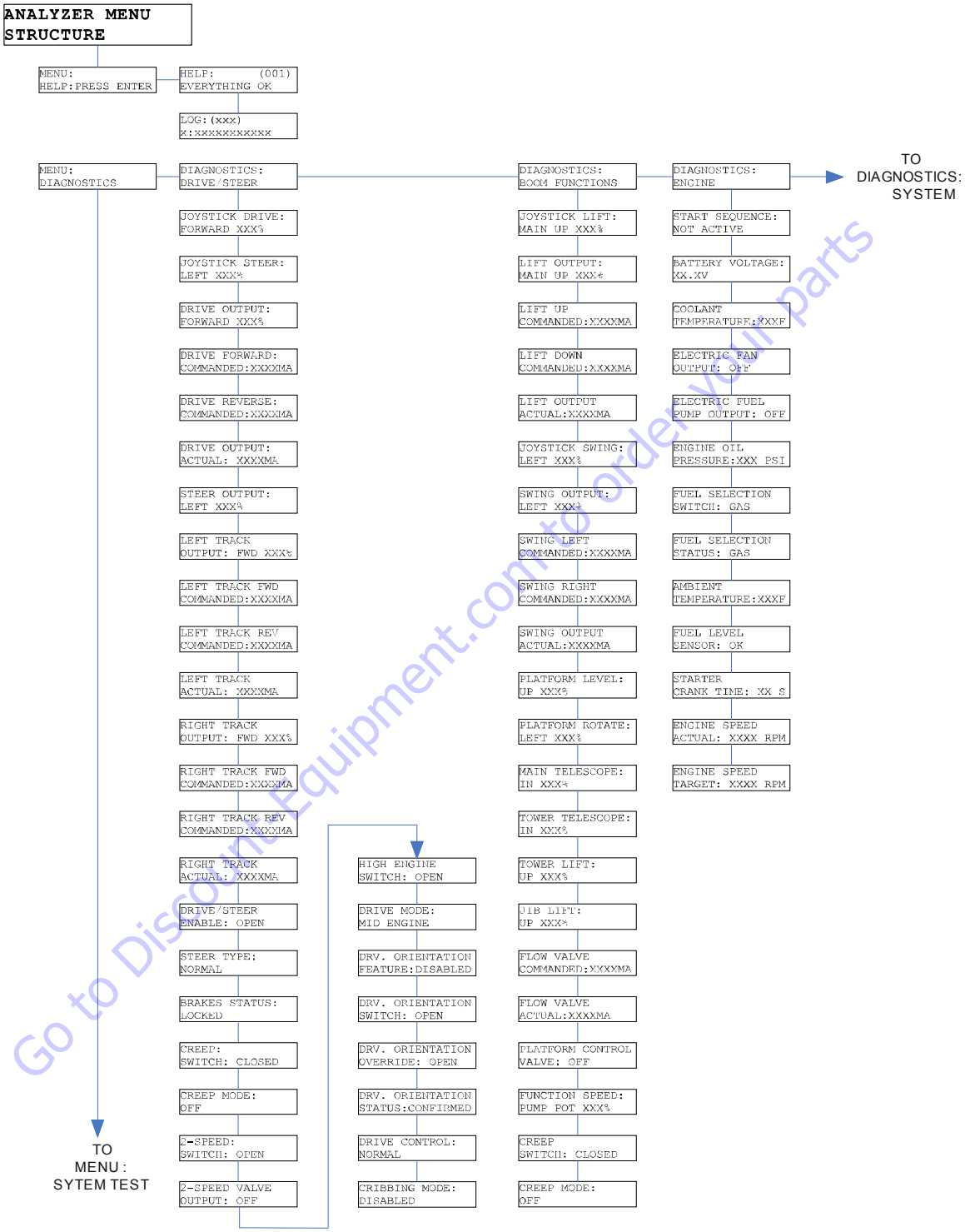
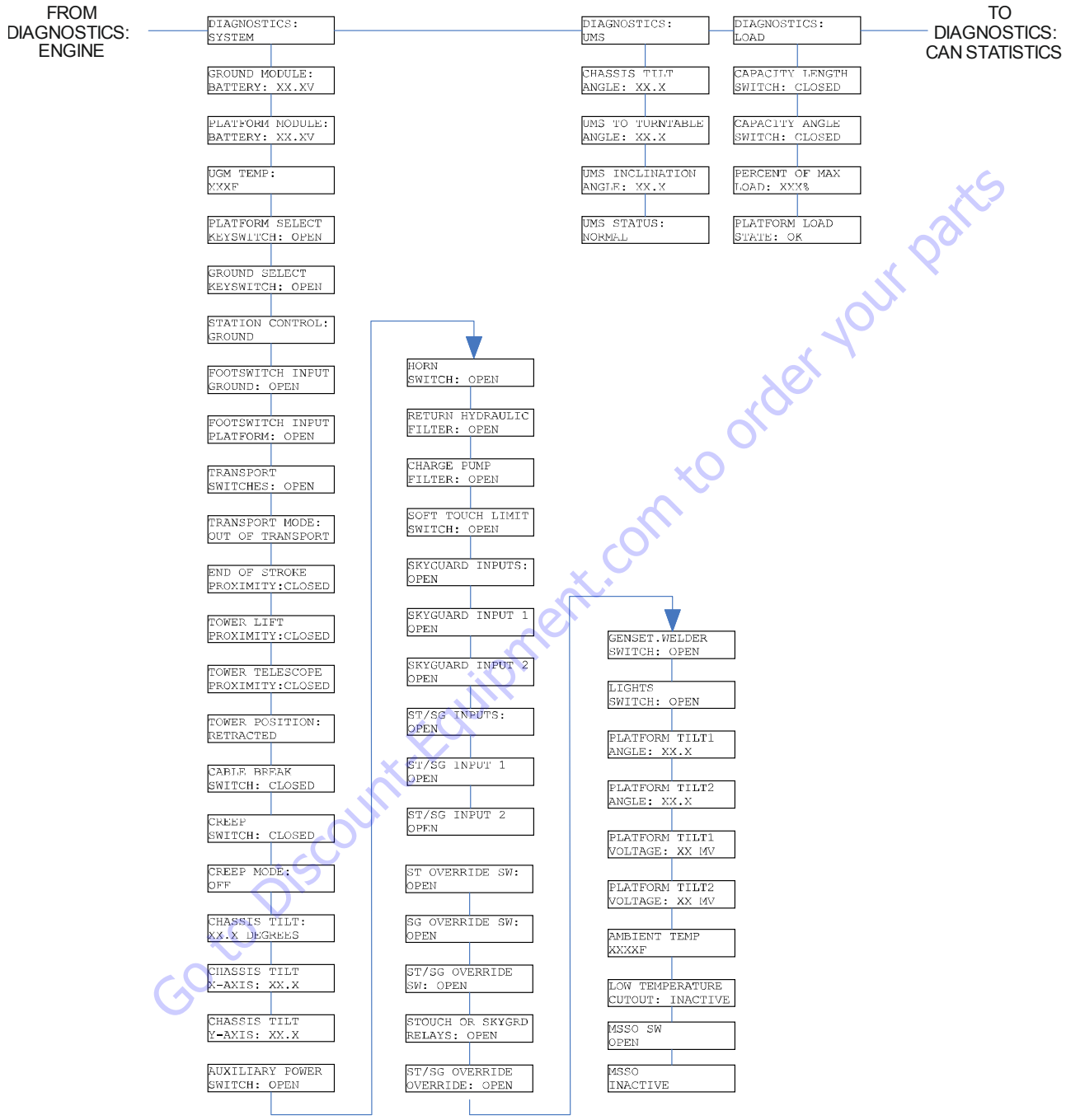


Figure 6-10. Analyzer Flow Chart, Version 5.X Software - Sheet 4 of 4



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

Figure 6-11. Analyzer Flow Chart Version 6.X Software -Sheet 1 of 8

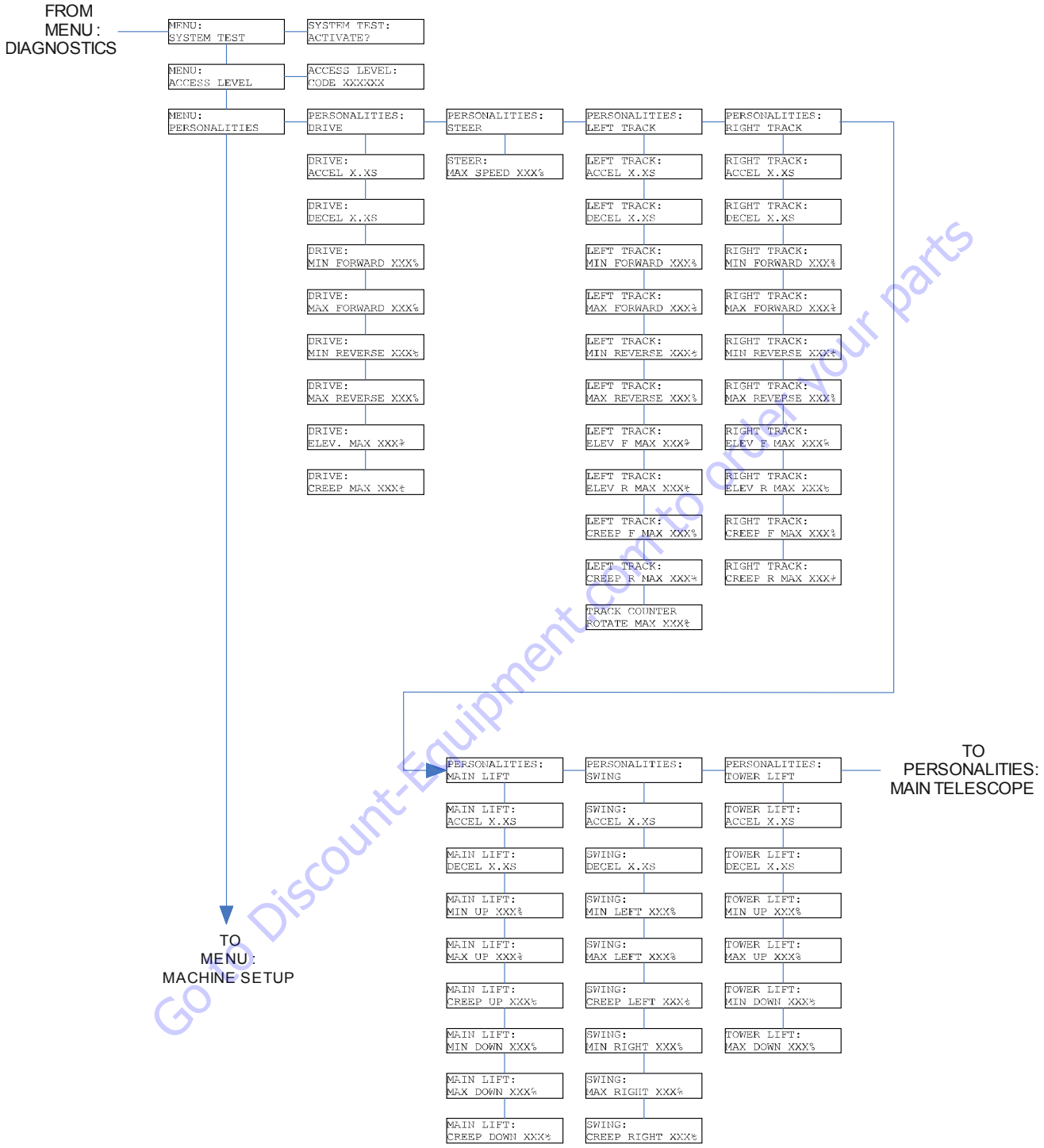


NOTE: *The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration and software versions.*

Figure 6-12. Analyzer Flow Chart Version 6.X Software -Sheet 2 of 8

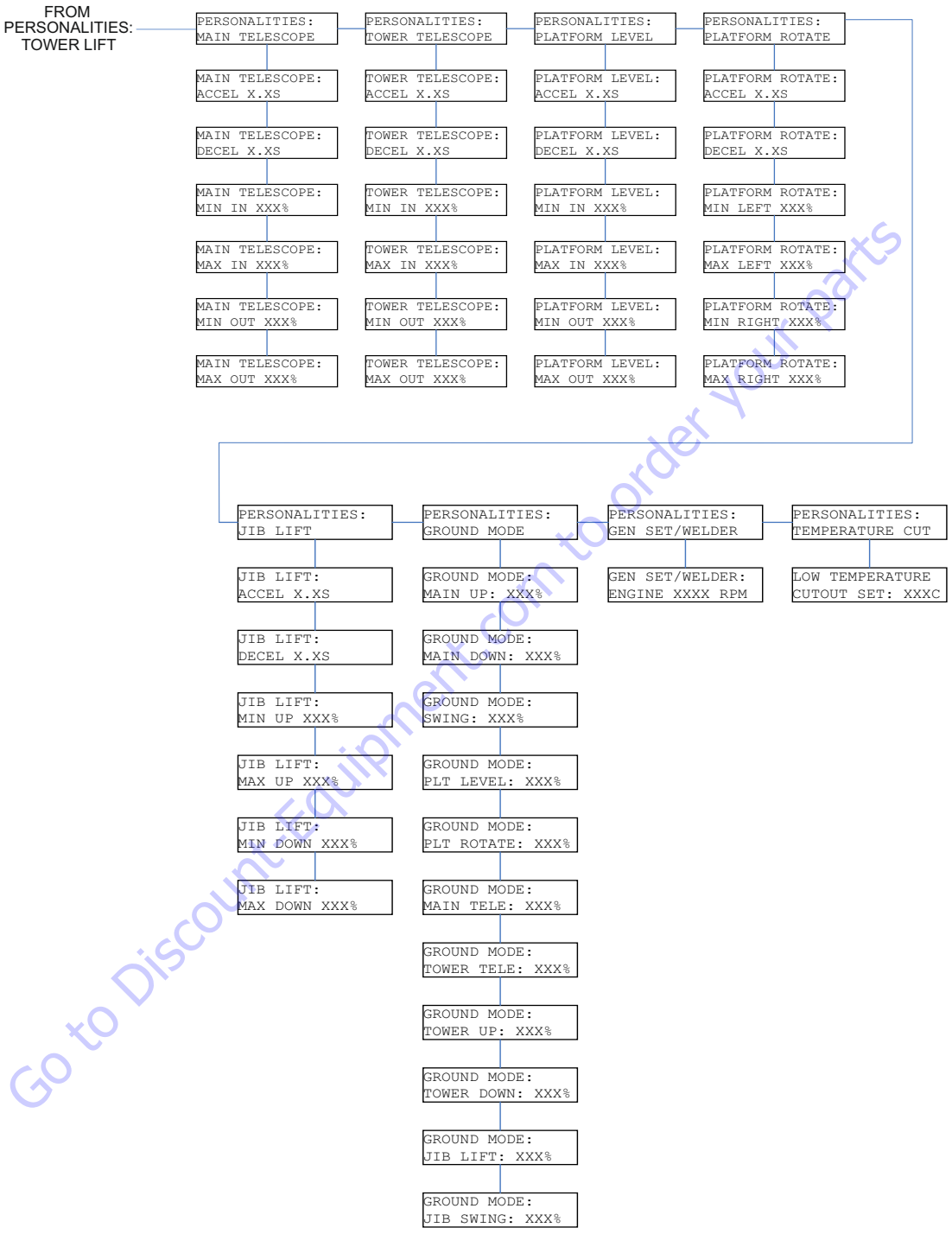
NOTE: *The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration and software versions.*

Figure 6-13. Analyzer Flow Chart Version 6.X Software -Sheet 3 of 8



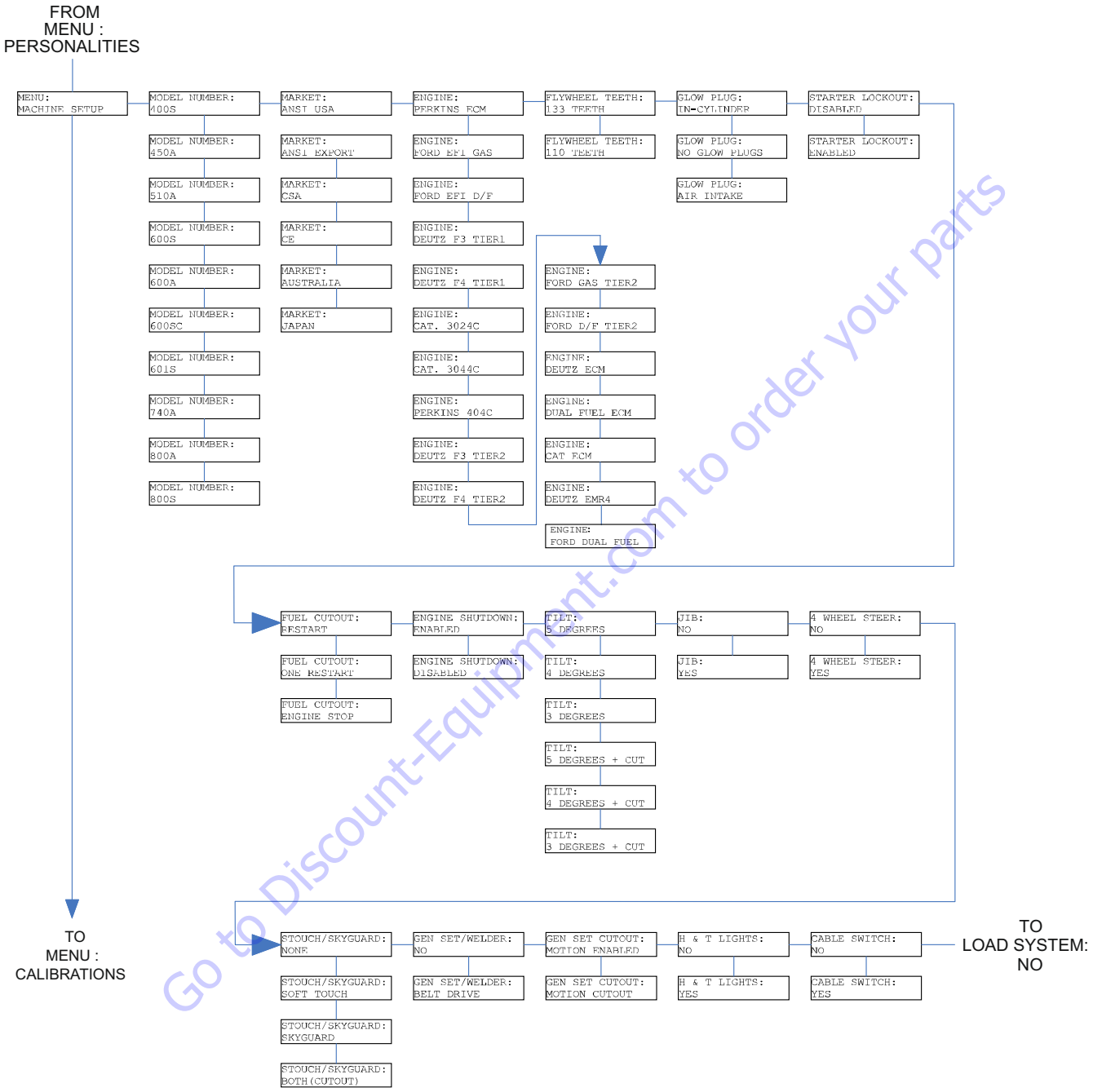
NOTE: *The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration and software versions.*

Figure 6-14. Analyzer Flow Chart Version 6.X Software -Sheet 4 of 8



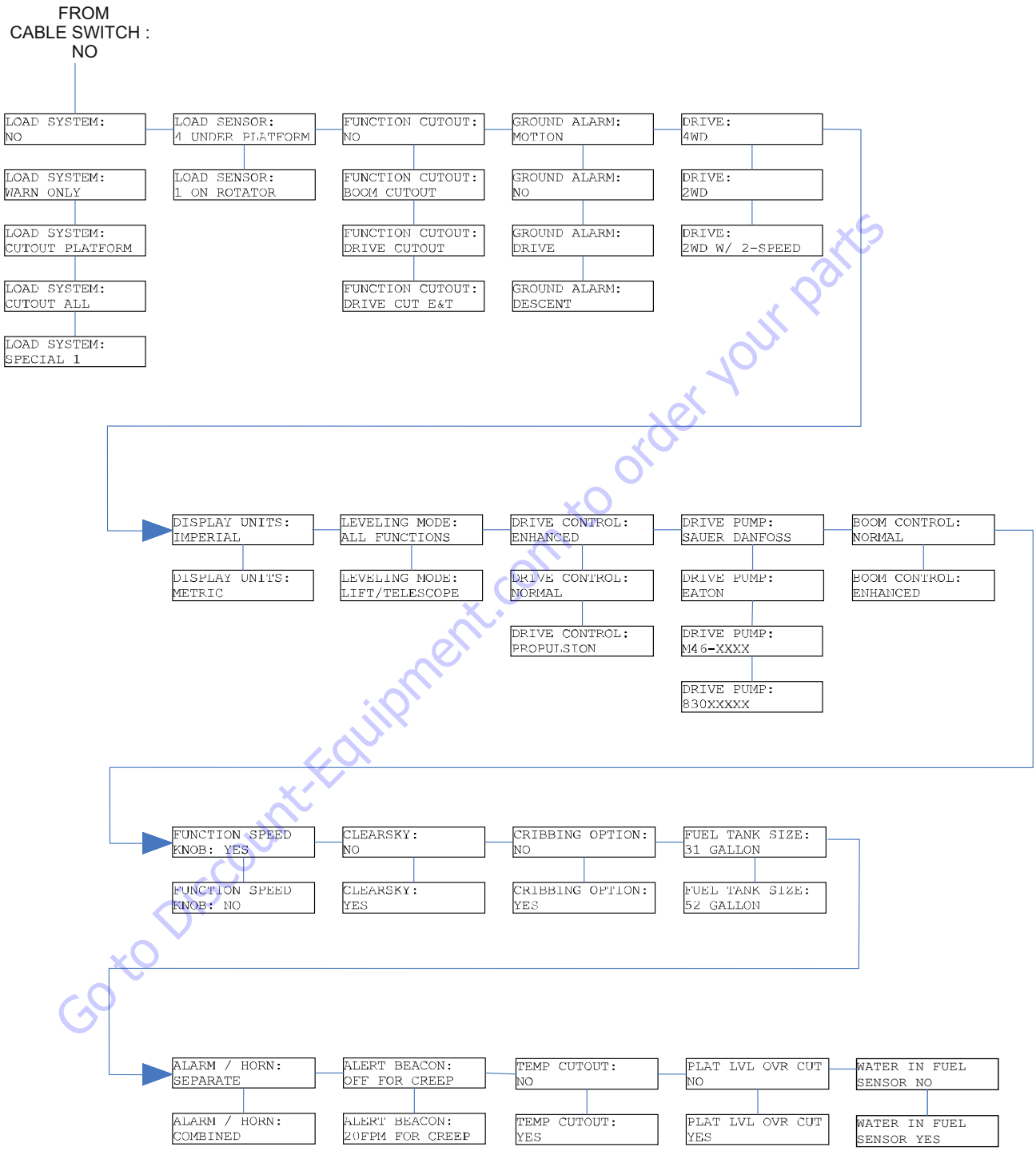
NOTE: *The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration and software versions.*

Figure 6-15. Analyzer Flow Chart Version 6.X Software -Sheet 5 of 8



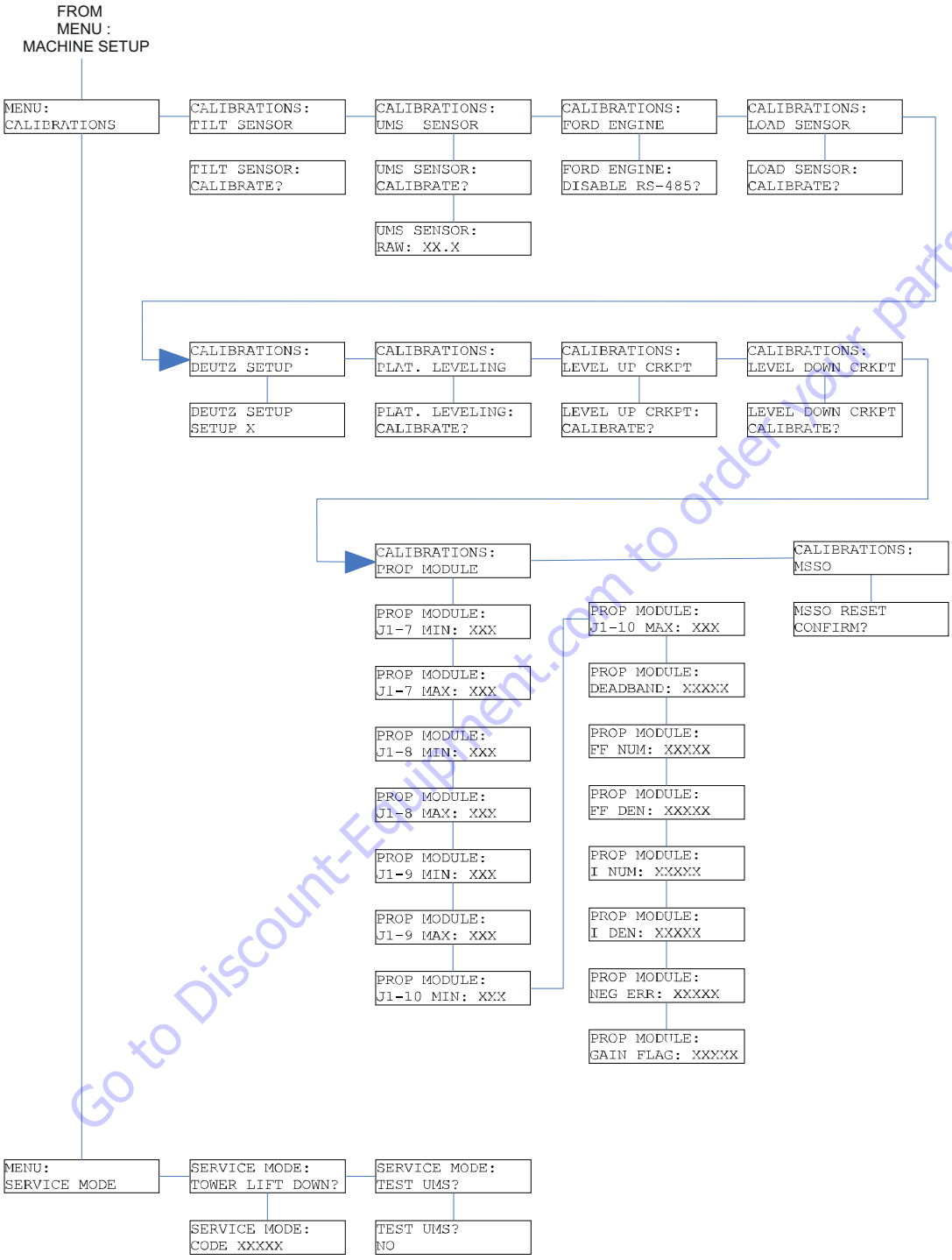
NOTE: *The layout shown includes all possible analyzer screens. Please note that some screens may not be available depending upon machine configuration and software versions.*

Figure 6-16. Analyzer Flow Chart Version 6.X Software -Sheet 6 of 8



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

Figure 6-17. Analyzer Flow Chart Version 6.X Software -Sheet 7 of 8



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

Figure 6-18. Analyzer Flow Chart Version 6.X Software -Sheet 8 of 8

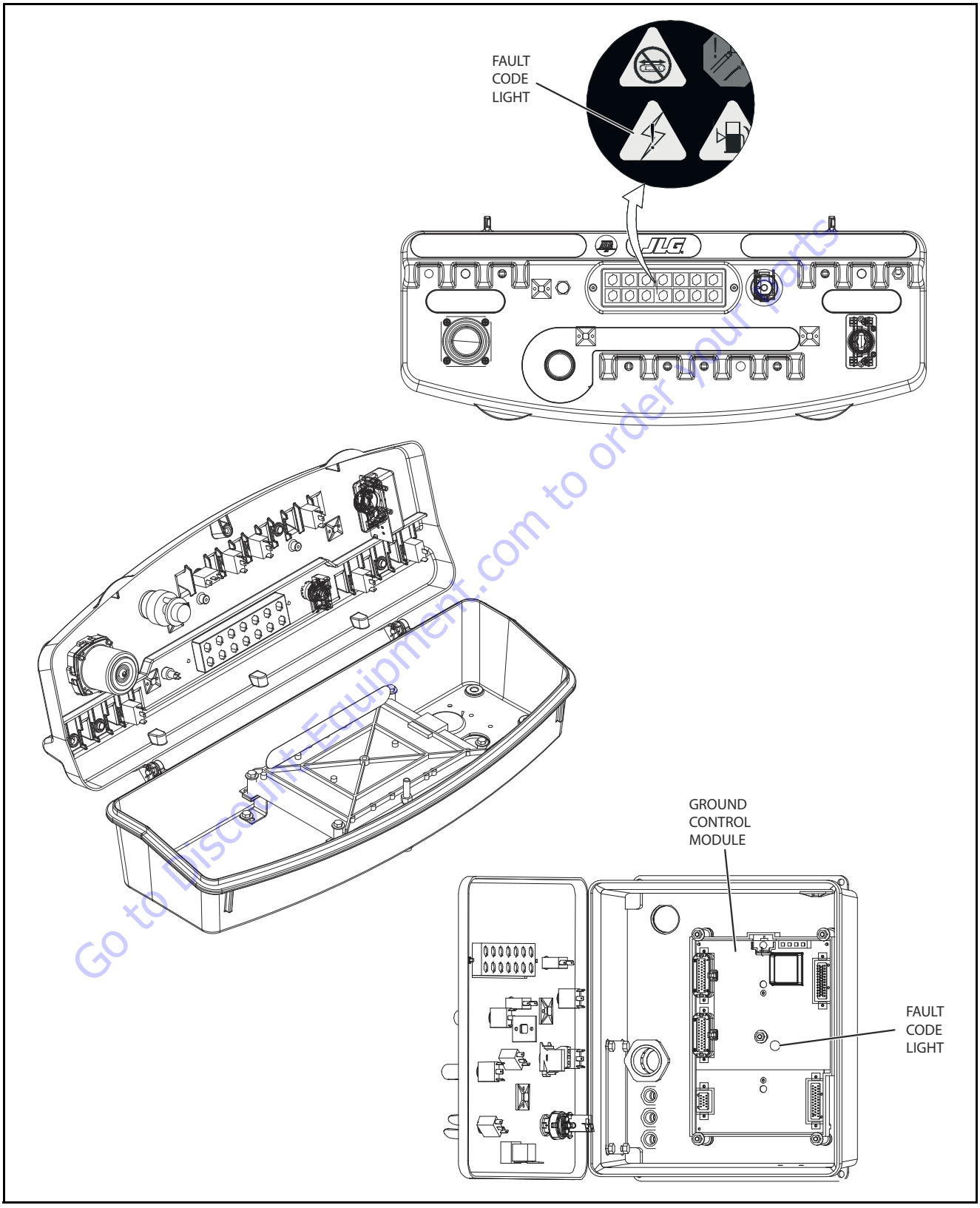
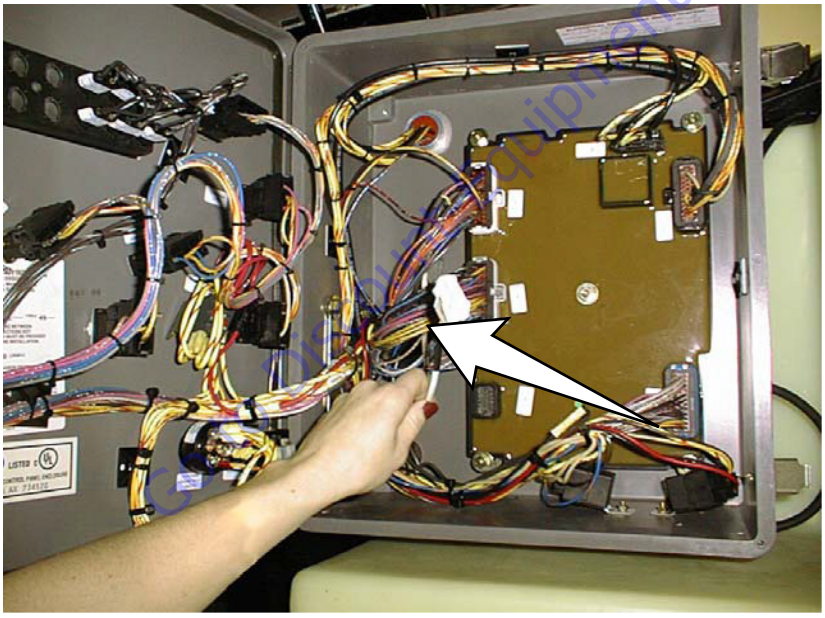


Figure 6-19. Fault Code Light Location

PLATFORM CONNECTION



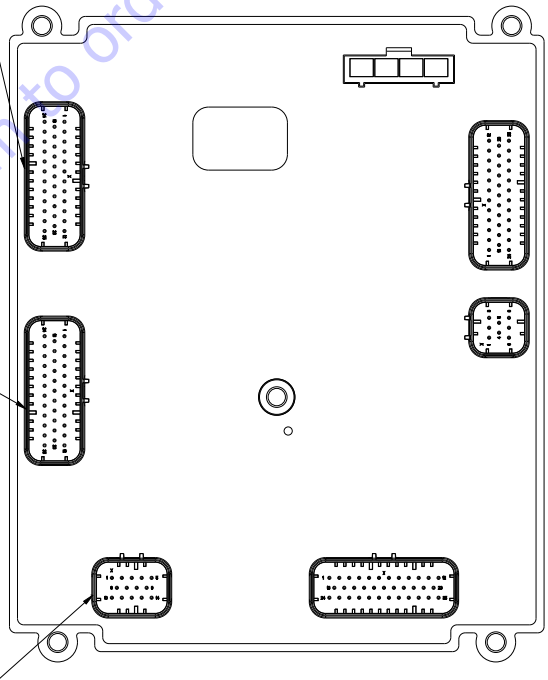
GROUND CONTROL CONNECTION

Figure 6-20. Analyzer Connecting Points

Connector	Pin	Function	Type	
J1 (Natural)	1	ENGINE THROTTLE ACTUATOR	DIGITAL	OUTPUT
	2	LP START ASSIST	DIGITAL	OUTPUT
	3	DRIVE / LEFT TRACK FORWARD COIL	DIGITAL	OUTPUT
	4	GROUND	GROUND	INPUT
	5	GROUND	GROUND	INPUT
	6	DRIVE / LEFT TRACK REVERSE COIL	DIGITAL	OUTPUT
	7	LP LOCK / ELECTRIC FAN DRIVE	DIGITAL	OUTPUT
	8	GROUND	GROUND	INPUT
	9	GROUND	GROUND	INPUT
	10	IGNITION ON RELAY / ALTERNATOR EXCITATION / FUEL ON SOLENOID	DIGITAL	OUTPUT
	11	START SOLENOID	DIGITAL	OUTPUT
	12	ENGAGE GLOW PLUGS	DIGITAL	OUTPUT
	13	APU ENABLE RELAY	DIGITAL	OUTPUT
	14	ENGINE COOLANT TEMPERATURE	ANALOG	INPUT
	15	ENGINE OIL PRESSURE	ANALOG	INPUT
	16	ENGINE SPEED	FREQUENCY	INPUT
	17	GROUND	GROUND	INPUT
	18	GROUND	GROUND	INPUT
	19	GROUND	GROUND	INPUT
	20	2-SPEED VALVE	DIGITAL	OUTPUT
	21	CHARGE PUMP FILTER BY-PASS	DIGITAL	INPUT
	22	GENERATOR ENABLE RELAY	DIGITAL	OUTPUT
	23	BRAKE VALVE	DIGITAL	OUTPUT
	24	NOT CONNECTED	N/C	N/C
	25	RS-485 HIGH	SERIAL	I/O
	26	RS-485 LOW	SERIAL	I/O
	27	GROUND	GROUND	INPUT
	28	ANALYZER POWER	VOLTAGE	OUTPUT
	29	ANALYZER RS-232 RX	SERIAL	INPUT
	30	ANALYZER RS-232 TX	SERIAL	OUTPUT
	31	ANALYZER GROUND	GROUND	INPUT
	32	ALTERNATOR EXCITATION	DIGITAL	OUTPUT
	33	RS-485 GROUND	GROUND	INPUT
	34	AIR FILTER BY-PASS	DIGITAL	INPUT
	35	NOT CONNECTED	DIGITAL	INPUT

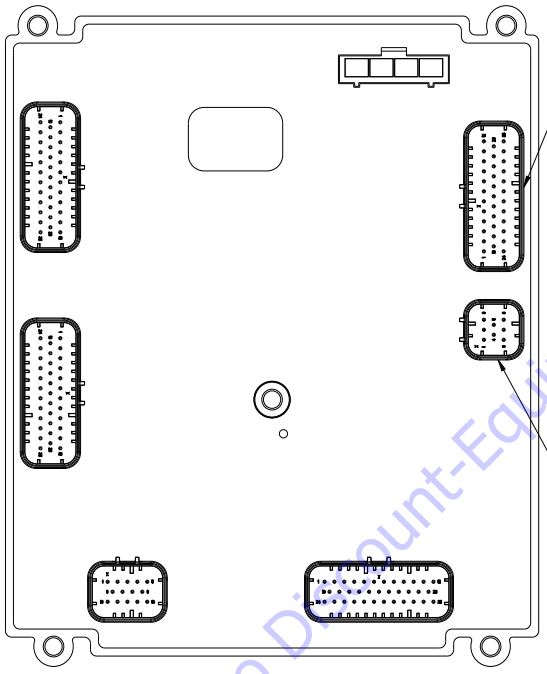
Connector	Pin	Function	Type	
J2 (Gray)	1	STEER DUMP VALVE	DIGITAL	OUTPUT
	2	HORN OUTPUT	DIGITAL	OUTPUT
	3	TOWER TELESCOPE IN SOLENOID	DIGITAL	OUTPUT
	4	MAIN TELESCOPE IN SOLENOID	DIGITAL	OUTPUT
	5	PLATFORM LEVEL UP SOLENOID	DIGITAL	OUTPUT
	6	GROUND	GROUND	INPUT
	7	PLATFORM LEVEL DOWN SOLENOID	DIGITAL	OUTPUT
	8	RIGHT TRACK REVERSE COIL	DIGITAL	OUTPUT
	9	NOT ALLOCATED	DIGITAL	OUTPUT
	10	PLATFORM ROTATE LEFT SOLENOID	DIGITAL	OUTPUT
	11	MAIN LIFT UP SOLENOID	DIGITAL	OUTPUT
	12	JIB UP SOLENOID	DIGITAL	OUTPUT
	13	MAIN DUMP VALVE	DIGITAL	OUTPUT
	14	GROUND	GROUND	INPUT
	15	TOWER TELESCOPE OUT SOLENOID	DIGITAL	OUTPUT
	16	MAIN TELESCOPE OUT SOLENOID	DIGITAL	OUTPUT
	17	GROUND	GROUND	INPUT
	18	GROUND	GROUND	INPUT
	19	RIGHT TRACK FORWARD COIL	DIGITAL	OUTPUT
	20	NOT ALLOCATED	DIGITAL	OUTPUT
	21	PLATFORM ROTATE RIGHT SOLENOID	DIGITAL	OUTPUT
	22	MAIN LIFT DOWN SOLENOID	DIGITAL	OUTPUT
	23	JIB DOWN SOLENOID	DIGITAL	OUTPUT
	24	RETURN FILTER BY-PASS	DIGITAL	INPUT
	25	FUEL LEVEL SENSOR	ANALOG	INPUT
	26	HEAD / TAIL LIGHT ENABLE RELAY	DIGITAL	OUTPUT
	27	ALARM OUTPUT	DIGITAL	OUTPUT
	28	GROUND	GROUND	INPUT
	29	GROUND	GROUND	INPUT
	30	GROUND	GROUND	INPUT
	31	FLOW CONTROL VALVE	DIGITAL	OUTPUT
	32	TOWER LIFT DOWN SOLENOID	DIGITAL	OUTPUT
	33	TOWER LIFT UP SOLENOID	DIGITAL	OUTPUT
	34	SWING LEFT SOLENOID	DIGITAL	OUTPUT
	35	SWING RIGHT SOLENOID	DIGITAL	OUTPUT

Connector	Pin	Function	Type	
J3 (Black)	1	DRIVE / LEFT TRACK CURRENT FEEDBACK	GROUND	INPUT
	2	RIGHT TRACK CURRENT FEEDBACK	GROUND	INPUT
	3	GROUND	GROUND	INPUT
	4	SWING CURRENT FEEDBACK	GROUND	INPUT
	5	NOT CONNECTED	GROUND	INPUT
	6	FLOW CONTROL CURRENT FEEDBACK	GROUND	INPUT
	7	BATTERY VOLTAGE	VBAT	OUTPUT
	8	UMS ANGLE SENSOR	DIGITAL	INPUT
	9	CRIBBING ENGAGE SWITCH	DIGITAL	INPUT
	10	NOT CONNECTED	DIGITAL	INPUT
	11	CONFIGURATION #1	DIGITAL	INPUT
	12	NOT CONNECTED	VOLTAGE	OUTPUT
	13	NOT CONNECTED	ANALOG	INPUT
	14	LIFT CURRENT FEEDBACK	GROUND	INPUT



1001103667 V

Figure 6-21. Ground Control Module - Sheet 1 of 3



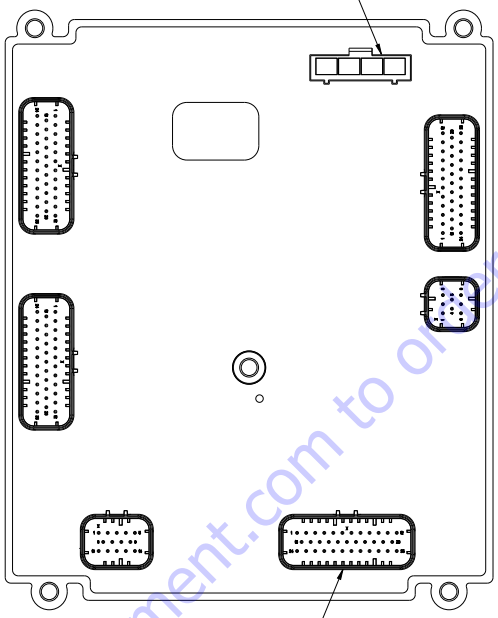
Connector	Pin	Function	Type	
J7 (Black)	1	PLATFORM EMS	DIGITAL	INPUT
	2	PLATFORM MODE	DIGITAL	INPUT
	3	GROUND MODE	DIGITAL	INPUT
	4	CAPACITY ANGLE SWITCH	ANALOG	INPUT
	5	+5 VOLTS	VOLTAGE	OUTPUT
	6	CAN1 TERMINATOR	TERM	I/O
	7	CAPACITY LENGTH SWITCH	ANALOG	INPUT
	8	NOT CONNECTED	ANALOG	INPUT
	9	GROUND	GROUND	INPUT
	10	GROUND	GROUND	INPUT
	11	IN/OUT OF TRANSPORT SWITCHES	DIGITAL	INPUT
	12	BROKEN CABLE SWITCH	DIGITAL	INPUT
	13	CAN1 HIGH	SERIAL	I/O
	14	GROUND MODE POWER TO PLATFORM	DIGITAL	INPUT
	15	FOOTSWITCH	DIGITAL	INPUT
	16	+5 VOLTS	VOLTAGE	OUTPUT
	17	CAN1 TERMINATOR	TERM	I/O
	18	CAN1 SHEILD	GROUND	INPUT
	19	GROUND	GROUND	INPUT
	20	NOT CONNECTED	ANALOG	INPUT
	21	TOWER TELESCOPE PROXIMITY (800A ONLY)/DRIVE ORIENTATION SWITCH	DIGITAL	INPUT
	22	TOWER LIFT PROXIMITY (800A ONLY)	DIGITAL	INPUT
	23	GROUND FUNCTION ENABLE AVAILABLE	DIGITAL	INPUT
	24	CAN1 LOW	SERIAL	I/O
	25	GROUND	GROUND	INPUT
	26	+5 VOLTS	VOLTAGE	OUTPUT
	27	+5 VOLTS	VOLTAGE	OUTPUT
	28	GROUND	GROUND	INPUT
	29	BATTERY VOLTAGE	VBAT	OUTPUT
	30	BATTERY VOLTAGE	VBAT	OUTPUT
	31	BATTERY VOLTAGE	VBAT	OUTPUT
	32	BATTERY VOLTAGE	VBAT	OUTPUT
	33	BATTERY VOLTAGE	VBAT	OUTPUT
	34	BATTERY VOLTAGE (PROPULSION MODULE)	VBAT	OUTPUT
	35	BOOM ANGLE PROXIMITY SWITCH (800S ONLY)/DRIVE ORIENTATION SWITCH	DIGITAL	INPUT

Connector	Pin	Function	Type	
J12 (Black)	1	NOT CONNECTED	FREQUENCY	INPUT
	2	NOT CONNECTED	FREQUENCY	INPUT
	3	CAN2 HIGH (TELEMATICS)	SERIAL	I/O
	4	CAN2 LOW (TELEMATICS)	SERIAL	I/O
	5	CAN2 SHIELD (TELEMATICS)	GROUND	INPUT
	6	CAN2 TERMINATOR	TERM	I/O
	7	CAN2 TERMINATOR	TERM	I/O
	8	MSSO	DIGITAL	INPUT

1001103667 V

Figure 6-22. Ground Control Module - Sheet 2 of 3

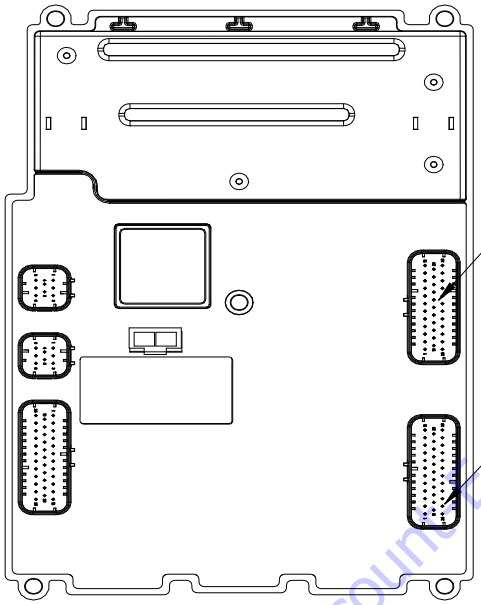
Connector	Pin	Function	Type	
J8 (Black)	1	MODULE GROUND	GROUND	OUTPUT
	2	MODULE POWER	VBAT	INPUT
	3	GROUND TO PLATFORM MODULE	GROUND	INPUT
	4	POWER TO PLATFORM MODULE	VBAT	OUTPUT



Connector	Pin	Function	Type	
J4 (Blue)	1	CRIBBING ENGAGED INDICATOR	DIGITAL	OUTPUT
	2	500 LB CAPACITY LAMP	DIGITAL	OUTPUT
	3	GLOWPLUG INDICATOR	DIGITAL	OUTPUT
	4	ENGINE START	DIGITAL	INPUT
	5	PLATFORM LEVEL DOWN	DIGITAL	INPUT
	6	PLATFORM ROTATE LEFT	DIGITAL	INPUT
	7	MAIN TELESCOPE IN	DIGITAL	INPUT
	8	JIB DOWN	DIGITAL	INPUT
	9	JIB LEFT	DIGITAL	INPUT
	10	TOWER LIFT UP	DIGITAL	INPUT
	11	TOWER TELESCOPE IN	DIGITAL	INPUT
	12	HOURMETER	DIGITAL	OUTPUT
	13	RETURN FILTER BY-PASS LAMP	DIGITAL	OUTPUT
	14	PLATFORM OVERLOADED INDICATOR	DIGITAL	OUTPUT
	15	BOOM MALFUNCTION INDICATOR	DIGITAL	OUTPUT
	16	AUXILIARY POWER / FUNCTION ENABLE	DIGITAL	INPUT
	17	PLATFORM LEVEL UP	DIGITAL	INPUT
	18	PLATFORM ROTATE RIGHT	DIGITAL	INPUT
	19	JIB UP	DIGITAL	INPUT
	20	JIB RIGHT	DIGITAL	INPUT
	21	TOWER LIFT DOWN	DIGITAL	INPUT
	22	TOWER TELESCOPE OUT	DIGITAL	INPUT
	23	MAIN LIFT UP	DIGITAL	INPUT
	24	BATTERY VOLTAGE	VBAT	OUTPUT
	25	BATTERY VOLTAGE - (GROUND ENABLE PRESENT)	VBAT	OUTPUT
	26	BATTERY LOW / NOT CHARGING INDICATOR	DIGITAL	OUTPUT
	27	CHARGE PUMP FILTER BY-PASS LAMP	DIGITAL	OUTPUT
	28	ENGINE HIGH COOLANT TEMPERATURE INDICATOR	DIGITAL	OUTPUT
	29	ENGINE LOW OIL PRESSURE INDICATOR	DIGITAL	OUTPUT
	30	MAIN TELESCOPE OUT	DIGITAL	INPUT
	31	GROUND	GROUND	INPUT
	32	GROUND	GROUND	INPUT
	33	MAIN LIFT DOWN	DIGITAL	INPUT
	34	SWING LEFT	DIGITAL	INPUT
	35	SWING RIGHT	DIGITAL	INPUT

1001103667 V

Figure 6-23. Ground Control Module - Sheet 3 of 3



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

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

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Figure 6-24. Platform Control Module - Sheet 1 of 2

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

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J5 NATURAL	1	LIFT / SWING JOYSTICK SUPPLY VOLTAGE	SUPPLY VOLTAGE
	2	LIFT CENTER TAP	INPUT
	3	LIFT SIGNAL	INPUT
	4	SWING SIGNAL	INPUT
	5	SWING CENTER TAP	INPUT
	6	NOT CONNECTED	INPUT
	7	LIFT / SWING JOYSTICK RETURN	GROUND
	8	GROUND RETURN	GROUND

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

CONNECTOR	PIN	ASSIGNMENT	FUNCTION
J7 BLACK	1	GROUND MODE	GROUND MODE
	2	PLATFORM EMS	PLATFORM EMS
	3	PLATFORM EMS TO GROUND MODULE	PLATFORM MODE
	4	FOOTSWITCH (FUNCTION ENABLE SWITCH) POWER	BATTERY VOLTAGE
	5	GENERATOR SWITCH POWER	BATTERY VOLTAGE
	6	JIB BLOCK LIMIT SWITCH POWER	BATTERY VOLTAGE
	7	SOFT TOUCH LIMIT SWITCH POWER	BATTERY VOLTAGE
	8	FOOTSWITCH SIGNAL	DIGITAL INPUT
	9	GENERATOR ON SIGNAL	DIGITAL INPUT
	10	+7 REFERENCE VOLTAGE	+7 REFERENCE VOLTAGE
	11	LOAD CELL INPUT 1	ANALOG INPUT
	12	LOAD CELL INPUT 2	ANALOG INPUT
	13	UNALLOCATED	ANALOG INPUT
	14	GROUND RETURN	GROUND
	15	LOAD CELL REFERENCE VOLTAGE	+7 REFERENCE VOLTAGE
	16	LOAD CELL RETURN	GROUND
	17	JIB BLOCK LIMIT SWITCH	HS DIGITAL INPUT
	18	SOFT TOUCH LIMIT SWITCH	HS DIGITAL INPUT
	19	PLATFORM ALARM	LAMP OUTPUT
	20	ALARM RETURN	GROUND
	21	UNALLOCATED/NOT POPULATED	ME DIGITAL OUTPUT
	22	UNALLOCATED/NOT POPULATED	ME DIGITAL OUTPUT
	23	GROUND RETURN	GROUND
	24	GROUND RETURN	GROUND
	25	UNALLOCATED/NOT POPULATED	ME DIGITAL OUTPUT
	26	UNALLOCATED/NOT POPULATED	ME DIGITAL OUTPUT
	27	UNALLOCATED	ME DIGITAL OUTPUT
	28	UNALLOCATED	ME DIGITAL OUTPUT
	29	GROUND RETURN	GROUND
	30	CAN LOW	CAN LOW
	31	CAN HIGH	CAN HIGH
	32	CAN SHIELD	CAN SHIELD
	33	UNALLOCATED/NOT POPULATED	ME DIGITAL OUTPUT
	34	UNALLOCATED/NOT POPULATED	ME DIGITAL OUTPUT
	35	GROUND RETURN	GROUND

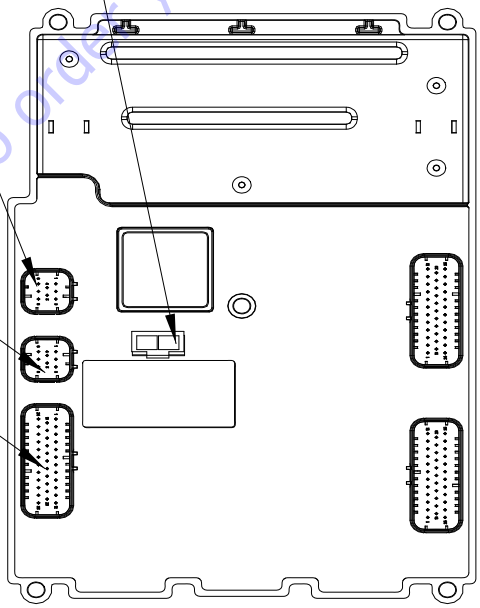

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Figure 6-25. Platform Control Module - Sheet 2 of 2

Analyzer Diagnostics Menu Structure

In the following structure descriptions, an intended item is selected by pressing ENTER; pressing ESC steps back to the next outer level. The LEFT/RIGHT arrow keys move between items in the same level. The UP or DOWN arrow keys alter a value if allowed.

Table 6-10. ADJUSTMENTS - Personality Descriptions

DRIVE	
ACCEL	Displays/adjusts drive acceleration
DECEL	Displays/adjusts drive deceleration
MIN FORWARD	Displays/adjusts minimum forward drive speed
MAX FORWARD	Displays/adjusts maximum forward drive speed
MIN REVERSE	Displays/adjusts minimum reverse drive speed
MAX REVERSE	Displays/adjusts maximum reverse drive speed
ELEVATED MAX	Displays/adjusts maximum drive speed NOTE: used when elevation cutout switches are limiting maximum speed
CREEP MAX	Displays/adjusts maximum drive speed NOTE: used when creep switch on pump pot is active
STEER MAX	Displays/adjusts the maximum steer speed
LIFT	
ACCEL	Displays/adjusts main lift acceleration
DECEL	Displays/adjusts main lift deceleration
MIN UP	Displays/adjusts minimum main lift up speed
MAX UP	Displays/adjusts maximum main lift up speed
CREEP UP	Displays/adjusts maximum main lift up speed NOTE: used when creep switch on pump pot is active
MIN DOWN	Displays/adjusts minimum main lift down speed
MAX DOWN	Displays/adjusts maximum main lift down speed
CREEP DOWN	Displays/adjusts maximum main lift down speed NOTE: used when creep switch on pump pot is active
SWING	
ACCEL	Displays/adjusts swing acceleration
DECEL	Displays/adjusts swing deceleration
MIN LEFT	Displays/adjusts minimum swing left speed
MAX LEFT	Displays/adjusts maximum swing left speed

Table 6-10. ADJUSTMENTS - Personality Descriptions

CREEP LEFT	Displays/adjusts maximum swing left speed NOTE: used when creep switch on pump pot is active
MIN RIGHT	Displays/adjusts minimum swing right speed
MAX RIGHT	Displays/adjusts maximum swing right speed
CREEP RIGHT	Displays/adjusts maximum swing right speed NOTE: used when creep switch on pump pot is active
main TELESCOPE	
ACCEL	Displays/adjusts telescope acceleration
DECEL	Displays/adjusts telescope deceleration
MIN IN	Displays/adjusts minimum telescope in speed
MAX IN	Displays/adjusts maximum telescope in speed
MIN OUT	Displays/adjusts minimum telescope out speed
MAX OUT	Displays/adjusts maximum telescope out speed
BASKET LEVEL	
ACCEL	Displays/adjusts basket level acceleration
DECEL	Displays/adjusts basket level deceleration
MIN UP	Displays/adjusts minimum basket level up speed
MAX UP	Displays/adjusts maximum basket level up speed
MIN DOWN	Displays/adjusts minimum basket level down speed
MAX DOWN	Displays/adjusts maximum basket level down speed
BASKET ROTATE	
ACCEL	Displays/adjusts basket rotate acceleration
DECEL	Displays/adjusts basket rotate deceleration
MIN LEFT	Displays/adjusts minimum basket rotate left speed
MAX LEFT	Displays/adjusts maximum basket rotate left speed
MIN RIGHT	Displays/adjusts minimum basket rotate right speed
MAX RIGHT	Displays/adjusts maximum basket rotate right speed
JIB LIFT	Not displayed if JIB = NO
ACCEL	Displays/adjusts jib acceleration
DECEL	Displays/adjusts jib deceleration
MIN UP	Displays/adjusts minimum jib up speed
MAX UP	Displays/adjusts maximum jib up speed
MIN DOWN	Displays/adjusts minimum jib down speed

Table 6-10. ADJUSTMENTS - Personality Descriptions

MAX DOWN	Displays/adjusts maximum jib down speed
MIN LEFT	Displays/adjusts minimum jib left speed
MAX LEFT	Displays/adjusts maximum jib left speed
MIN RIGHT	Displays/adjusts minimum jib right speed
MAX RIGHT	Displays/adjusts maximum jib right speed
STEER	
MAX SPEED	Displays/adjusts maximum steer speed, which applies when vehicle speed is at minimum
GROUND MODE	
LIFT UP	Displays/adjusts fixed lift up speed
LIFT DOWN	Displays/adjusts fixed lift down speed
SWING	Displays/adjusts fixed swing speed
TELE	Displays/adjusts fixed telescope speed
BASKETLEVEL	Displays/adjusts fixed basket level speed
BASKETROTATE	Displays/adjusts fixed basket rotate speed
JIB (U/D)	Displays/adjusts jib lift speed Not displayed if JIB = NO
JIB (L/R)	Displays/adjusts jib swing speed Not displayed if JIB = NO

Table 6-11. Diagnostic Menu Descriptions

DRIVE	
DRIVE FOR	Displays drive joystick direction & demand
STEER	Displays steer switch direction & demand NOTE: steer demand is inversely proportional to vehicle speed
BRAKES	Displays brake control system status
CREEP	Displays pump pot creep switch status
TWO SPEED	Displays two speed switch status
2 SPEED MODE	Displays status of two speed valve
HIGH ENGINE	Displays high engine switch status
BOOM	
U LIFT UP	Displays lift joystick direction & demand
SWING LEFT	Displays swing joystick direction & demand
LEVEL UP	Displays basket level switch direction & demand NOTE: demand is controlled by the pump pot
ROT. LEFT	Displays basket rotate switch direction & demand NOTE: demand is controlled by the pump pot
U TELE IN	Displays telescope switch direction & demand NOTE: demand is controlled by the pump pot
JIB UP	Displays jib lift switch direction & demand NOTE: demand is controlled by the pump pot Not displayed if JIB = NO
JIB LEFT	Displays jib swing switch direction & demand NOTE: demand is controlled by the pump pot Not displayed if JIB = NO
PUMP POT	Displays pump pot demand
ENGINE	
START	Displays start switch status
AIR FILTER	Displays air filter status
BATTERY	Displays measured battery voltage
COOLANT	Displays coolant temperature
OIL PRS	Displays oil pressure status
FUEL SELECT	Displays selected fuel (Dual Fuel only)
FUEL LEVEL	Displays fuel level status
RPM	Displays Engine RPM
GM BATTERY	Displays battery voltage at ground module

Table 6-8. Diagnostic Menu Description

PM BATTERY	Displays battery voltage at platform module
TEMP	Displays ground module temperature
ELEV. CUTOUT	Displays elevation cutout switch status
FUNC. CUTOUT	Displays elevation cutout switch status
CREEP	Displays creep switch status
TILT	Displays measured vehicle tilt
AUX POWER	Displays status of auxiliary power switch
HORN	Displays status of horn switch
R FILTER	Displays status of return filter switch
C FILTER	Displays status of charge pump filter
LOAD LENGTH	Displays length switch status
ANGLE	Displays angle switch status
LOAD	Displays load sensor value NOTE: Not displayed if load = 0.
DATALOG	
ON	Displays total controller on (EMS) time
ENGINE	Displays engine run time
DRIVE	Displays total controller drive operation time
LIFT	Displays total controller lift operation time
SWING	Displays total controller swing operation time
TELE	Displays total controller tele operation time
MAX.TEMP	Displays maximum measured heatsink temp.
MIN.TEMP	Displays minimum measured heatsink temp.
MAX.VOLTS	Displays maximum measured battery voltage
RENTAL	Displays total controller operation time NOTE: can be reset
ERASE RENTAL	Not available at password level 2
YES:ENTER, NO:ESC	ENTER resets rental datalog time to zero
DATALOG	
GROUND	Displays ground module software version
PLATFORM	Displays platform module software version
ANALYSER	Displays Analyzer software version

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
001	EVERYTHING OK
002	GROUND MODE OK
0010	RUNNING AT CUTBACK - OUT OF TRANSPORT POSITION
0011	FSW OPEN
0012	RUNNING AT CREEP - CREEP SWITCH OPEN
0013	RUNNING AT CREEP - TILTED AND ABOVE ELEVATION
0014	CHASSIS TILT SENSOR OUT OF RANGE
0015	LOAD SENSOR READING UNDER WEIGHT
0035	APU ACTIVE
211	POWER CYCLE
212	KEYSWITCH FAULTY
213	FSW FAULTY
227	STEER SWITCHES FAULTY
2211	FSW INTERLOCK TRIPPED
2212	DRIVE LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH
2213	STEER LOCKED - SELECTED BEFORE FOOTSWITCH
2214	DRIVE/STEER LOCKED - JOYSTICK MOVED BEFORE ENABLE
2216	D/S JOY. OUT OF RANGE HIGH
2217	D/S JOY. CENTER TAP BAD
2218	L/S JOY. OUT OF RANGE LOW
2219	L/S JOY. OUT OF RANGE HIGH
2220	L/S JOY. CENTER TAP BAD
2221	LIFT/SWING LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH
2222	WAITING FOR FSW TO BE OPEN
2223	FUNCTION SWITCHES LOCKED - SELECTED BEFORE ENABLE
2224	FOOTSWITCH SELECTED BEFORE START
234	FUNCTION SWITCHES FAULTY - CHECK DIAGNOSTICS/BOOM
235	FUNCTION SWITCHES LOCKED - SELECTED BEFORE AUX POWER
236	FUNCTION SWITCHES LOCKED - SELECTED BEFORE START SWITCH
237	START SWITCH LOCKED - SELECTED BEFORE KEYSWITCH
259	MODEL CHANGED - HYDRAULICS SUSPENDED - CYCLE EMS
2513	GENERATOR MOTION CUTOUT ACTIVE
2514	BOOM PREVENTED - DRIVE SELECTED
2516	DRIVE PREVENTED - ABOVE ELEVATION
2517	DRIVE PREVENTED - TILTED & ABOVE ELEVATION
2518	DRIVE PREVENTED - BOOM SELECTED
2519	DRIVE PREVENTED - TILTED & EXTENDED OR HIGH ANGLE
2520	FUNCTIONS LOCKED OUT - CONSTANT DATA VERSION IMPROPER
2530	UMS SENSOR FORWARD LIMIT REACHED
2531	UMS SENSOR OUT OF USABLE RANGE
2532	UMS SENSOR BACKWARD LIMIT REACHED
331	BRAKE - SHORT TO BATTERY
332	BRAKE - OPEN CIRCUIT

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
3311	GROUND ALARM - SHORT TO BATTERY
3316	RIGHT FORWARD DRIVE PUMP - SHORT TO GROUND
3319	RIGHT FORWARD DRIVE PUMP - SHORT TO BATTERY OR OPEN CIRCUIT
3320	RIGHT REVERSE DRIVE PUMP - SHORT TO GROUND
3323	RIGHT REVERSE DRIVE PUMP - SHORT TO BATTERY OR OPEN CIRCUIT
3324	LEFT FORWARD DRIVE PUMP - SHORT TO GROUND
3327	LEFT FORWARD DRIVE PUMP - SHORT TO BATTERY OR OPEN CIRCUIT
3328	LEFT REVERSE DRIVE PUMP - SHORT TO GROUND
3331	LEFT REVERSE DRIVE PUMP - SHORT TO BATTERY OR OPEN CIRCUIT
3332	FORWARD DRIVE PUMP - SHORT TO GROUND
3333	FORWARD DRIVE PUMP - SHORT TO BATTERY OR OPEN CIRCUIT
3334	REVERSE DRIVE PUMP - SHORT TO GROUND
3335	REVERSE DRIVE PUMP - SHORT TO BATTERY OR OPEN CIRCUIT
3336	ALTERNATOR POWER - SHORT TO GROUND
3340	AUX POWER - SHORT TO GROUND
3341	AUX POWER - OPEN CIRCUIT
3342	AUX POWER - SHORT TO BATTERY
3346	ELECTRIC FAN - SHORT TO GROUND
3347	ELECTRIC FAN - OPEN CIRCUIT
3348	ELECTRIC FAN - SHORT TO BATTERY
3349	ELECTRIC PUMP - SHORT TO GROUND
3350	ELECTRIC PUMP - OPEN CIRCUIT
3351	ELECTRIC PUMP - SHORT TO BATTERY
3352	LP LOCK - SHORT TO GROUND
3353	LP LOCK - OPEN CIRCUIT
3354	LP LOCK - SHORT TO BATTERY
3355	LP START ASSIST - SHORT TO GROUND
3356	LP START ASSIST - OPEN CIRCUIT
3357	LP START ASSIST - SHORT TO BATTERY
3358	MAIN DUMP VALVE - SHORT TO GROUND
3359	MAIN DUMP VALVE - OPEN CIRCUIT
3360	MAIN DUMP VALVE - SHORT TO BATTERY
3361	BRAKE - SHORT TO GROUND
3362	START SOLENOID - SHORT TO GROUND
3363	START SOLENOID - OPEN CIRCUIT
3364	START SOLENOID - SHORT TO BATTERY
3365	STEER DUMP VALVE - SHORT TO GROUND
3366	STEER DUMP VALVE - OPEN CIRCUIT
3367	STEER DUMP VALVE - SHORT TO BATTERY
3368	TWO SPEED VALVE - SHORT TO GROUND
3369	TWO SPEED VALVE - OPEN CIRCUIT
3370	TWO SPEED VALVE - SHORT TO BATTERY
3371	GROUND ALARM - SHORT TO GROUND

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
3372	GROUND ALARM - OPEN CIRCUIT
3373	GEN SET/WELDER - SHORT TO GROUND
3374	GEN SET/WELDER - OPEN CIRCUIT
3375	GEN SET/WELDER - SHORT TO BATTERY
3376	HEAD TAIL LIGHT - SHORT TO GROUND
3377	HEAD TAIL LIGHT - OPEN CIRCUIT
3378	HEAD TAIL LIGHT - SHORT TO BATTERY
3379	HOUR METER - SHORT TO GROUND
3382	PLATFORM LEVEL UP VALVE - SHORT TO GROUND
3383	PLATFORM LEVEL UP VALVE - OPEN CIRCUIT
3384	PLATFORM LEVEL UP VALVE - SHORT TO BATTERY
3385	PLATFORM LEVEL UP OVERRIDE VALVE - SHORT TO GROUND
3386	PLATFORM LEVEL UP OVERRIDE VALVE - OPEN CIRCUIT
3387	PLATFORM LEVEL UP OVERRIDE VALVE - SHORT TO BATTERY
3388	PLATFORM LEVEL DOWN VALVE - SHORT TO GROUND
3389	PLATFORM LEVEL DOWN VALVE - OPEN CIRCUIT
3390	PLATFORM LEVEL DOWN VALVE - SHORT TO BATTERY
3391	PLATFORM LEVEL DOWN OVERRIDE VALVE - SHORT TO GROUND
3392	PLATFORM LEVEL DOWN OVERRIDE VALVE - OPEN CIRCUIT
3393	PLATFORM LEVEL DOWN OVERRIDE VALVE - SHORT TO BATTERY
3394	PLATFORM ROTATE LEFT VALVE - SHORT TO GROUND
3395	PLATFORM ROTATE LEFT VALVE - OPEN CIRCUIT
3396	PLATFORM ROTATE LEFT VALVE - SHORT TO BATTERY
3397	PLATFORM ROTATE RIGHT VALVE - SHORT TO GROUND
3398	PLATFORM ROTATE RIGHT VALVE - OPEN CIRCUIT
3399	PLATFORM ROTATE RIGHT VALVE - SHORT TO BATTERY
33100	JIB LIFT UP VALVE - SHORT TO GROUND
33101	JIB LIFT UP VALVE - OPEN CIRCUIT
33102	JIB LIFT UP VALVE - SHORT TO BATTERY
33103	JIB LIFT DOWN VALVE - SHORT TO GROUND
33104	JIB LIFT DOWN VALVE - OPEN CIRCUIT
33105	JIB LIFT DOWN VALVE - SHORT TO BATTERY
33106	TOWER LIFT UP VALVE - SHORT TO GROUND
33107	TOWER LIFT UP VALVE - OPEN CIRCUIT
33108	TOWER LIFT UP VALVE - SHORT TO BATTERY
33109	TOWER LIFT DOWN VALVE - SHORT TO GROUND
33110	TOWER LIFT DOWN VALVE - OPEN CIRCUIT
33111	TOWER LIFT DOWN VALVE - SHORT TO BATTERY
33112	TOWER TELESCOPE IN VALVE - SHORT TO GROUND
33113	TOWER TELESCOPE IN VALVE - OPEN CIRCUIT
33114	TOWER TELESCOPE IN VALVE - SHORT TO BATTERY
33115	TOWER TELESCOPE OUT VALVE - SHORT TO GROUND
33116	TOWER TELESCOPE OUT VALVE - OPEN CIRCUIT

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
33117	TOWER TELESCOPE OUT VALVE - SHORT TO BATTERY
33118	SWING RIGHT VALVE - SHORT TO GROUND
33119	SWING RIGHT VALVE - OPEN CIRCUIT
33120	TELESCOPE IN VALVE - SHORT TO BATTERY
33121	SWING RIGHT VALVE - SHORT TO BATTERY
33122	SWING LEFT VALVE - SHORT TO GROUND
33123	TELESCOPE OUT VALVE - SHORT TO BATTERY
33124	LIFT UP DUMP VALVE - SHORT TO GROUND
33125	LIFT UP DUMP VALVE - OPEN CIRCUIT
33126	LIFT UP DUMP VALVE - SHORT TO BATTERY
33127	LIFT DOWN HOLDING VALVE - SHORT TO GROUND
33128	LIFT DOWN HOLDING VALVE - OPEN CIRCUIT
33129	LIFT DOWN HOLDING VALVE - SHORT TO BATTERY
33130	THROTTLE ACTUATOR - SHORT TO GROUND
33131	THROTTLE ACTUATOR - OPEN CIRCUIT
33132	THROTTLE ACTUATOR - SHORT TO BATTERY
33133	PLATFORM CONTROL VALVE - SHORT TO GROUND
33134	PLATFORM CONTROL VALVE - OPEN CIRCUIT
33135	PLATFORM CONTROL VALVE - SHORT TO BATTERY
33170	LIFT DOWN VALVE - OPEN CIRCUIT
33171	LIFT DOWN VALVE - SHORT TO BATTERY
33172	LIFT DOWN VALVE - SHORT TO GROUND
33175	JIB ROTATE LEFT VALVE - OPEN CIRCUIT
33176	JIB ROTATE LEFT VALVE - SHORT TO BATTERY
33177	JIB ROTATE LEFT VALVE - SHORT TO GROUND
33178	JIB ROTATE RIGHT VALVE - OPEN CIRCUIT
33179	JIB ROTATE RIGHT VALVE - SHORT TO BATTERY
33180	JIB ROTATE RIGHT VALVE - SHORT TO GROUND
33186	TELESCOPE OUT VALVE - OPEN CIRCUIT
33188	TELESCOPE OUT VALVE - SHORT TO GROUND
33189	TELESCOPE IN VALVE - OPEN CIRCUIT
33190	TELESCOPE IN VALVE - SHORT TO GROUND
33207	HORN - OPEN CIRCUIT
33208	HORN - SHORT TO BATTERY
33209	HORN - SHORT TO GROUND
33279	GLOWPLUG - OPEN CIRCUIT
33280	GLOWPLUG - SHORT TO BATTERY
33281	GLOWPLUG - SHORT TO GROUND
33295	SWING LEFT VALVE - OPEN CIRCUIT
33306	SWING LEFT VALVE - SHORT TO BATTERY
33314	FLOW CONTROL VALVE - OPEN CIRCUIT
33315	FLOW CONTROL VALVE - SHORT TO BATTERY
33316	FLOW CONTROL VALVE - SHORT TO GROUND

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
33317	DRIVE FORWARD VALVE - OPEN CIRCUIT
33318	DRIVE FORWARD VALVE - SHORT TO BATTERY
33319	DRIVE FORWARD VALVE - SHORT TO GROUND
33320	DRIVE REVERSE VALVE - OPEN CIRCUIT
33321	DRIVE REVERSE VALVE - SHORT TO BATTERY
33322	DRIVE REVERSE VALVE - SHORT TO GROUND
33323	LIFT UP VALVE - OPEN CIRCUIT
33324	LIFT UP VALVE - SHORT TO BATTERY
33325	LIFT UP VALVE - SHORT TO GROUND
33331	DRIVE - CURRENT FEEDBACK READING TOO LOW
33332	LEFT TRACK - CURRENT FEEDBACK READING TOO LOW
33333	RIGHT TRACK - CURRENT FEEDBACK READING TOO LOW
33408	LEFT TRACK - CURRENT FEEDBACK READING LOST
33409	RIGHT TRACK - CURRENT FEEDBACK READING LOST
33410	DRIVE - CURRENT FEEDBACK READING LOST
341	PLATFORM LEVEL UP VALVE - OPEN CIRCUIT
342	PLATFORM LEVEL UP VALVE - SHORT TO BATTERY
343	PLATFORM LEVEL UP VALVE - SHORT TO GROUND
344	PLATFORM LEVEL UP VALVE - SHORT TO BATTERY OR OPEN CIRCUIT
345	PLATFORM LEVEL DOWN VALVE - OPEN CIRCUIT
346	PLATFORM LEVEL DOWN VALVE - SHORT TO BATTERY
347	PLATFORM LEVEL DOWN VALVE - SHORT TO GROUND
348	PLATFORM LEVEL DOWN VALVE - SHORT TO BATTERY OR OPEN CIRCUIT
349	PLATFORM ROTATE LEFT VALVE - OPEN CIRCUIT
3410	PLATFORM ROTATE LEFT VALVE - SHORT TO BATTERY
3411	PLATFORM ROTATE LEFT VALVE - SHORT TO GROUND
3412	PLATFORM ROTATE RIGHT VALVE - OPEN CIRCUIT
3413	PLATFORM ROTATE RIGHT VALVE - SHORT TO BATTERY
3414	PLATFORM ROTATE RIGHT VALVE - SHORT TO GROUND
3415	JIB LIFT UP VALVE - OPEN CIRCUIT
3416	JIB LIFT UP VALVE - SHORT TO BATTERY
3417	JIB LIFT UP VALVE - SHORT TO GROUND
3418	JIB LIFT DOWN VALVE - OPEN CIRCUIT
3419	JIB LIFT DOWN VALVE - SHORT TO BATTERY
3420	JIB LIFT DOWN VALVE - SHORT TO GROUND
3421	JIB ROTATE LEFT VALVE - OPEN CIRCUIT
3422	JIB ROTATE LEFT VALVE - SHORT TO BATTERY
3423	JIB ROTATE LEFT VALVE - SHORT TO GROUND
3424	JIB ROTATE RIGHT VALVE - OPEN CIRCUIT
3425	JIB ROTATE RIGHT VALVE - SHORT TO BATTERY
3426	JIB ROTATE RIGHT VALVE - SHORT TO GROUND
431	FUEL SENSOR - SHORT TO BATTERY
432	FUEL SENSOR - SHORT TO GROUND

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
433	OIL PRESSURE - SHORT TO BATTERY
434	OIL PRESSURE - SHORT TO GROUND
435	COOLANT TEMPERATURE - SHORT TO GROUND
436	FORD FAULT CODE ##
437	ENGINE TROUBLE CODE
438	HIGH ENGINE TEMP
439	AIR FILTER BYPASSED
4310	NO ALTERNATOR OUTPUT
4311	LOW OIL PRESSURE
4312	485 COMMUNICATIONS LOST
4313	THROTTLE ACTUATOR FAILURE
4314	WRONG ENGINE SELECTED - ECM DETECTED
4322	LOSS OF ENGINE SPEED SENSOR
4323	SPEED SENSOR READING INVALID SPEED
441	BATTERY VOLTAGE TOO LOW - SYSTEM SHUTDOWN
442	BATTERY VOLTAGE TOO HIGH - SYSTEM SHUTDOWN
445	BATTERY VOLTAGE LOW
662	CANBUS FAILURE - PLATFORM MODULE
664	CANBUS FAILURE - ACCESSORY MODULE
665	CANBUS FAILURE - PROPULSION MODULE
666	CANBUS FAILURE - ENGINE CONTROLLER
6620	CANBUS FAILURE - UMS SENSOR
671	ACCESSORY FAULT
813	CHASSIS TILT SENSOR NOT CALIBRATED
815	CHASSIS TILT SENSOR DISAGREEMENT
816	UMS SENSOR NOT CALIBRATED
817	UMS SENSOR FAULT
825	LSS HAS NOT BEEN CALIBRATED
826	RUNNING AT CREEP - PLATFORM OVERLOADED
827	DRIVE & BOOM PREVENTED - PLATFORM OVERLOADED
828	LIFT UP & TELE OUT PREVENTED - PLATFORM OVERLOADED
831	PLATFORM LEVELING OVERRIDE ON
832	PLATFORM LEVELING OVERRIDE OFF
833	PLATFORM LEVEL UP CRACKPOINT - NOT CALIBRATED
834	PLATFORM LEVEL DOWN CRACKPOINT - NOT CALIBRATED
835	PLATFORM LEVEL SENSOR #1 - NOT ZERO CALIBRATED
836	PLATFORM LEVEL SENSOR #1 - ZERO OUT OF RANGE
837	PLATFORM LEVEL SENSOR #1 - SHORT TO BATTERY
838	PLATFORM LEVEL SENSOR #1 - SHORT TO GROUND OR OPEN CIRCUIT
839	PLATFORM LEVEL SENSOR #2 - NOT ZERO CALIBRATED
8310	PLATFORM LEVEL SENSOR #2 - ZERO OUT OF RANGE
8311	PLATFORM LEVEL SENSOR #2 - SHORT TO BATTERY
8312	PLATFORM LEVEL SENSOR #2 - SHORT TO GROUND OR OPEN CIRCUIT

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
8313	PLATFORM LEVEL SENSOR #1 - REFERENCE VOLTAGE OUT OF RANGE
8314	PLATFORM LEVEL SENSOR #2 - REFERENCE VOLTAGE OUT OF RANGE
8315	PLATFORM LEVELING SENSOR - DISAGREEMENT
8316	PLATFORM LEVEL SENSOR #1 - COMMUNICATIONS LOST
8317	PLATFORM LEVEL SENSOR #2 - COMMUNICATIONS LOST
8318	PLATFORM LEVELING SYSTEM TIMEOUT
8639	FRONT LEFT STEER VALVE - OPEN CIRCUIT
8640	FRONT LEFT STEER VALVE - SHORT TO BATTERY
8641	FRONT LEFT STEER VALVE - SHORT TO GROUND
8642	FRONT RIGHT STEER VALVE - OPEN CIRCUIT
8643	FRONT RIGHT STEER VALVE - SHORT TO BATTERY
8644	FRONT RIGHT STEER VALVE - SHORT TO GROUND
8645	REAR LEFT STEER VALVE - OPEN CIRCUIT
8646	REAR LEFT STEER VALVE - SHORT TO BATTERY
8647	REAR LEFT STEER VALVE - SHORT TO GROUND
8648	REAR RIGHT STEER VALVE - OPEN CIRCUIT
8649	REAR RIGHT STEER VALVE - SHORT TO BATTERY
8650	REAR RIGHT STEER VALVE - SHORT TO GROUND
8652	RIGHT TRACK FORWARD VALVE - OPEN CIRCUIT
8653	RIGHT TRACK FORWARD VALVE - SHORT TO BATTERY
8654	RIGHT TRACK FORWARD VALVE - SHORT TO GROUND
8655	RIGHT TRACK REVERSE VALVE - OPEN CIRCUIT
8656	RIGHT TRACK REVERSE VALVE - SHORT TO BATTERY
8657	RIGHT TRACK REVERSE VALVE - SHORT TO GROUND
8658	LEFT TRACK FORWARD VALVE - OPEN CIRCUIT
8659	LEFT TRACK FORWARD VALVE - SHORT TO BATTERY
8660	LEFT TRACK FORWARD VALVE - SHORT TO GROUND
8661	LEFT TRACK REVERSE VALVE - OPEN CIRCUIT
8662	LEFT TRACK REVERSE VALVE - SHORT TO BATTERY
8663	LEFT TRACK REVERSE VALVE - SHORT TO GROUND
871	RETURN FILTER BYPASSED
872	CHARGE PUMP FILTER BYPASSED
998	EEPROM FAILURE - CHECK ALL SETTINGS
9910	FUNCTIONS LOCKED OUT - PLATFORM MODULE SOFTWARE VERSION IMPROPER
9913	FUNCTIONS LOCKED OUT - PROPULSION MODULE SOFTWARE VERSION IMPROPER
9914	PLATFORM MODULE SOFTWARE UPDATE REQUIRED
9915	CHASSIS TILT SENSOR NOT GAIN CALIBRATED
9916	CHASSIS TILT SENSOR GAIN OUT OF RANGE
9917	HIGH RESOLUTION A2D FAILURE - INTERRUPT LOST
9918	HIGH RESOLUTION A2D FAILURE - REINIT LIMIT
9919	GROUND SENSOR REF VOLTAGE OUT OF RANGE
9920	PLATFORM SENSOR REF VOLTAGE OUT OF RANGE
9921	GROUND MODULE FAILURE - HIGH SIDE DRIVER CUTOUT FAULTY

Table 6-12. Diagnostic Trouble Code Listing

DTC	Analyzer Text
9922	PLATFORM MODULE FAILURE - HWFS CODE 1
9923	GROUND MODULE FAILURE - HWFS CODE 1
9924	FUNCTIONS LOCKED OUT - MACHINE NOT CONFIGURED
9944	CURRENT FEEDBACK GAINS OUT OF RANGE
9945	CURRENT FEEDBACK CALIBRATION CHECKSUM INCORRECT

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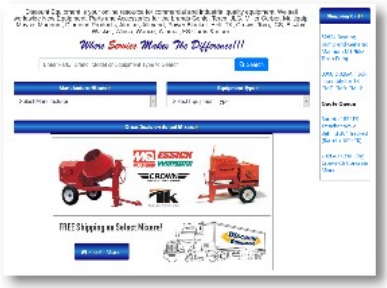

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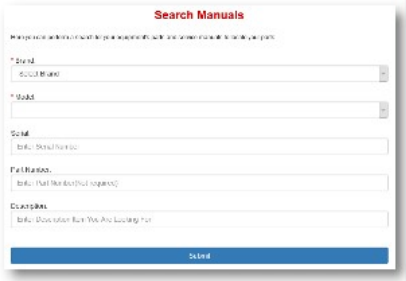

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SECTION 7. BASIC ELECTRICAL INFORMATION & SCHEMATICS

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.

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 multimeter's 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 back probing 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

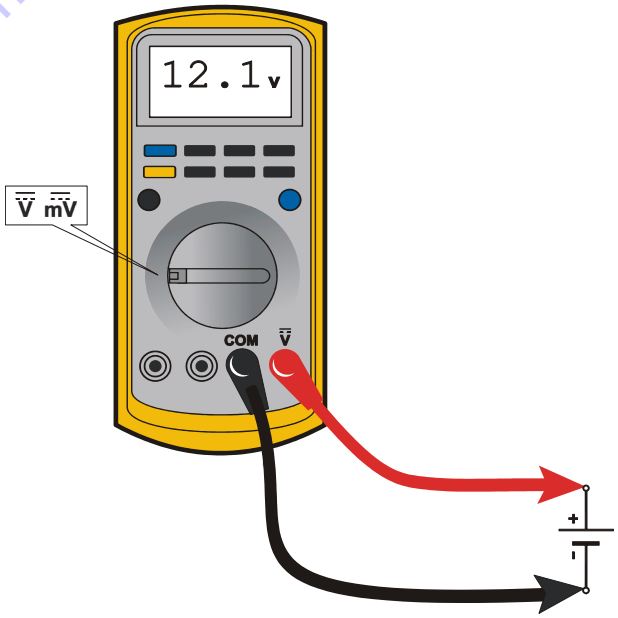


Figure 7-1. Voltage Measurement (DC)

- 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

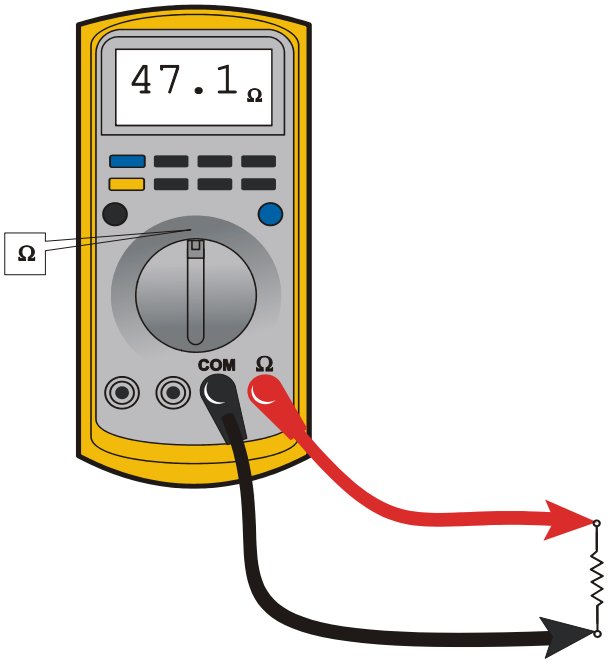


Figure 7-2. Resistance Measurement

- 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

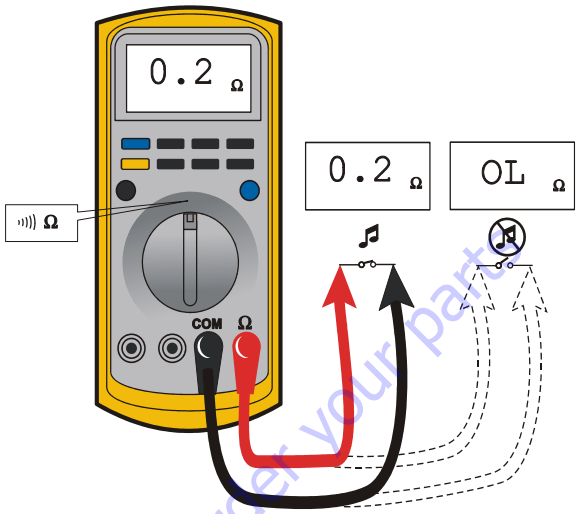


Figure 7-3. Continuity Measurement

- 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

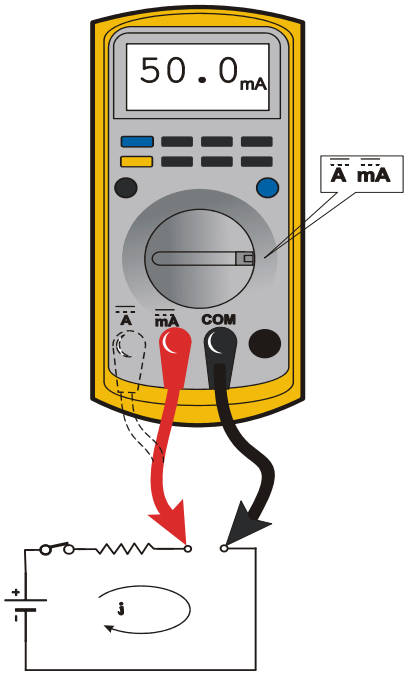


Figure 7-4. Current Measurement (DC)

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

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

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

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

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

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

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

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

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

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

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

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

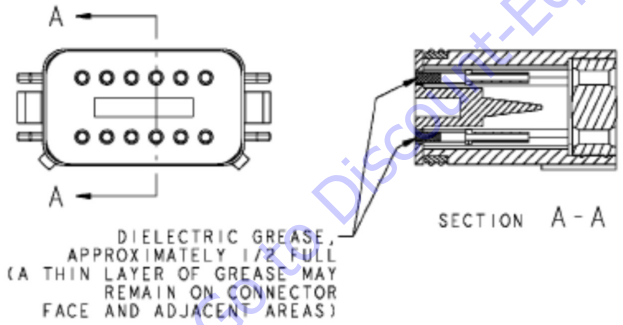
When applied to electrical connections, dielectric grease helps to prevent corrosion of electrical contacts and improper conductivity between contacts from moisture intrusion. Open and sealed connectors benefit from the application of dielectric grease.

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

Installation of Dielectric Grease

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

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



Deutsch HD, DT, DTM, DRC Series

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

AMP Seal

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

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

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

Figure 7-5. Application to Female Contacts

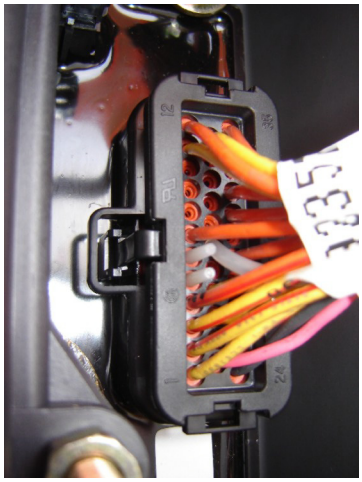
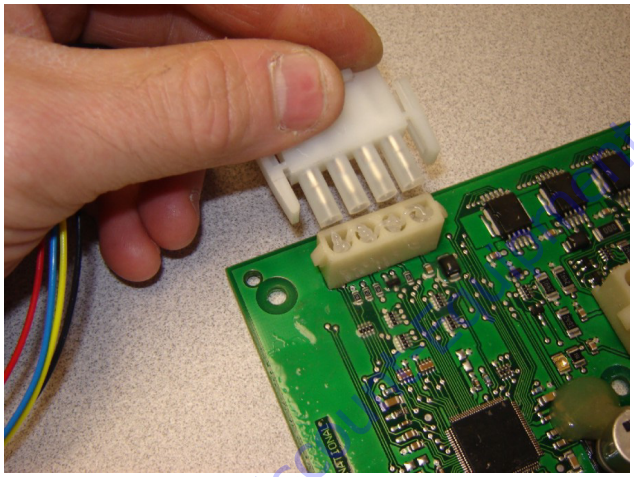


Figure 7-6. Use of Seal Plugs

AMP Mate-N-Lok

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 1250AJP Rotary Angle Sensors are examples of components with the M12 connector system.

AMP JUNIOR TIMER

This type of connector uses 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 EMR2 engine control module from Deutz employs this connector system (for example).

7.4 AMP CONNECTOR

Assembly

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

1. To insert a contact, push it straight into the appropriate circuit cavity as far as it will go (See Figure 7-9.).
2. Pull back on the contact wire with a force of 1 or 2 lbs. (4.5 or 9 N) to be sure the retention fingers are holding the contact (See Figure 7-9.).

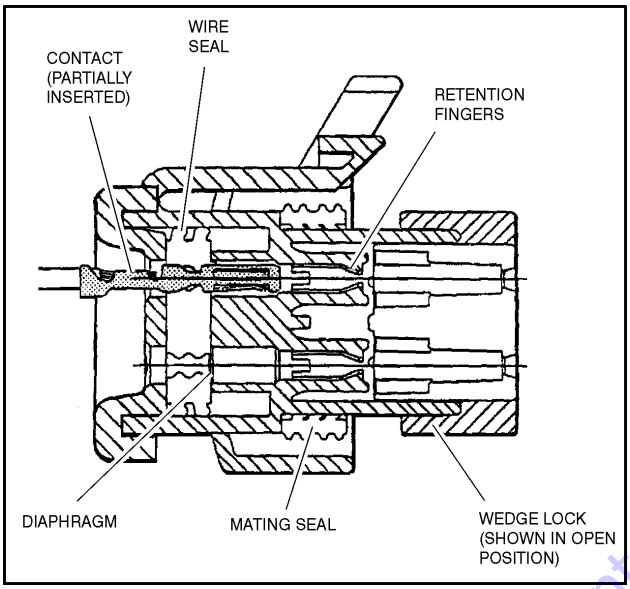


Figure 7-7. Connector Assembly Figure 1

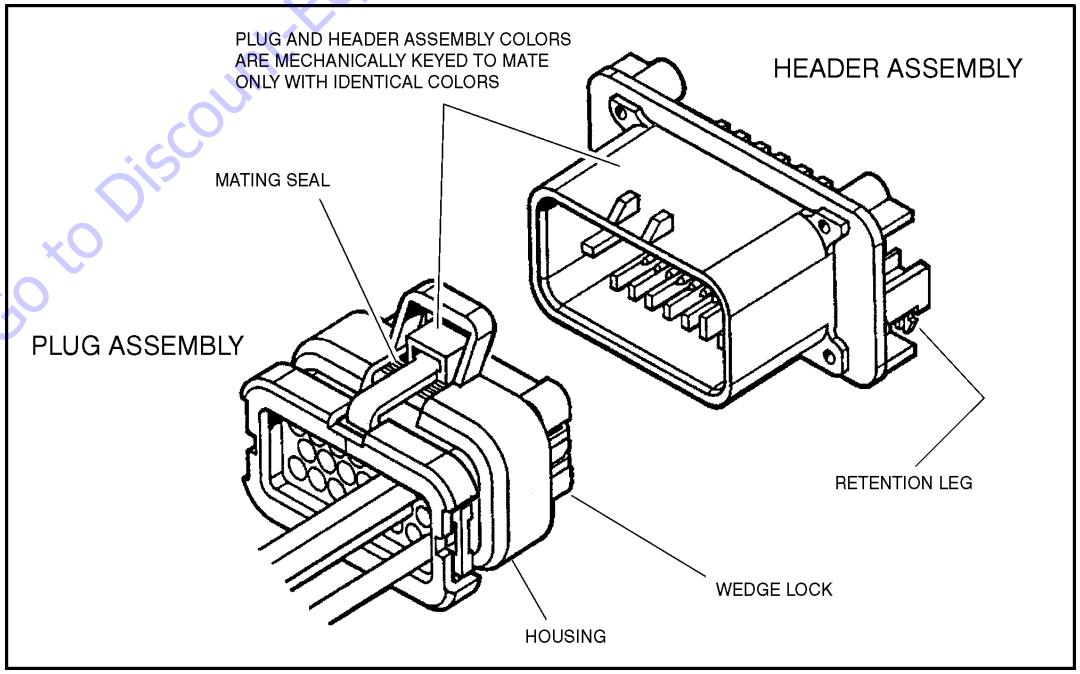


Figure 7-8. AMP Connector

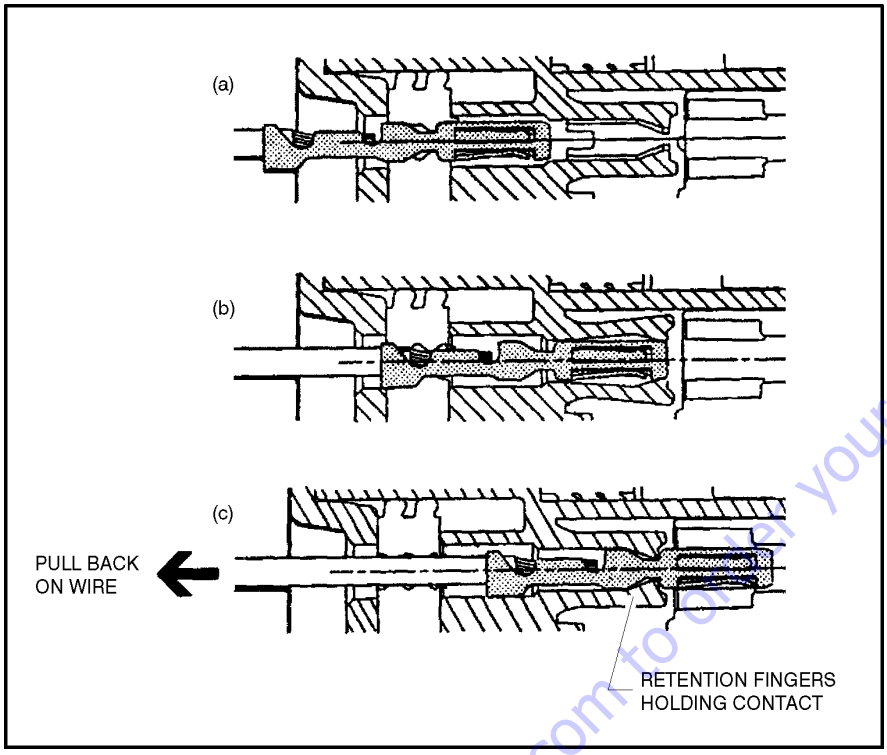


Figure 7-9. Connector Assembly Figure 2

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 7-10.).

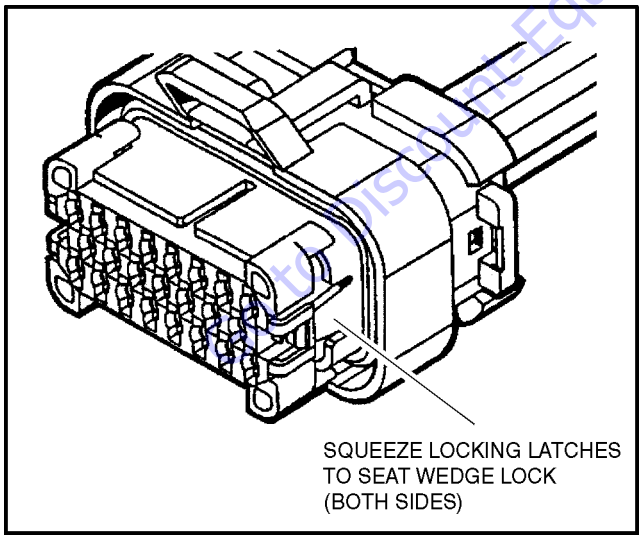


Figure 7-10. Connector Assembly Figure 3

4. Slide the wedge lock into the housing until it is flush with the housing (See Figure 7-11.).

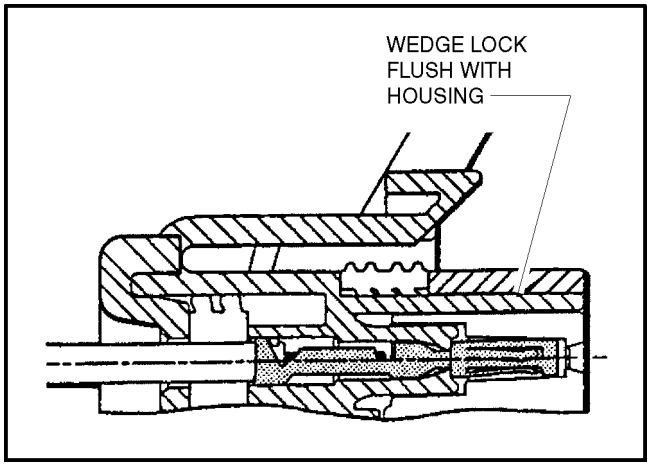


Figure 7-11. Connector Assembly Figure 4

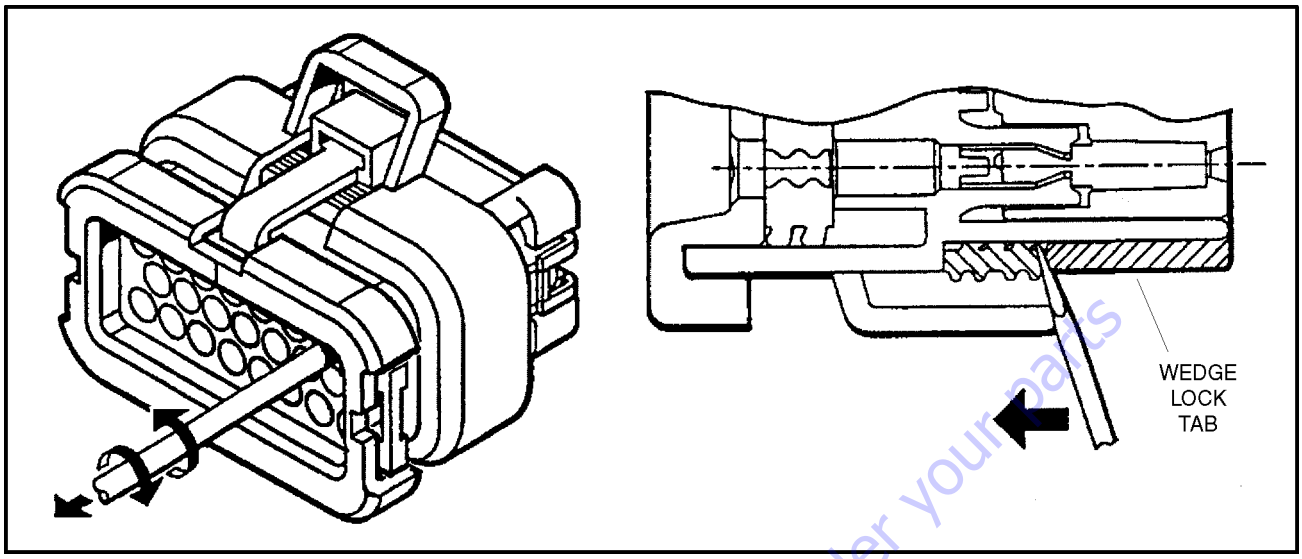


Figure 7-12. Connector Disassembly

Disassembly

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

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

Wedge Lock

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

Service - Voltage Reading

NOTICE

DO NOT PIERCE WIRE INSULATION TO TAKE VOLTAGE READINGS.

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

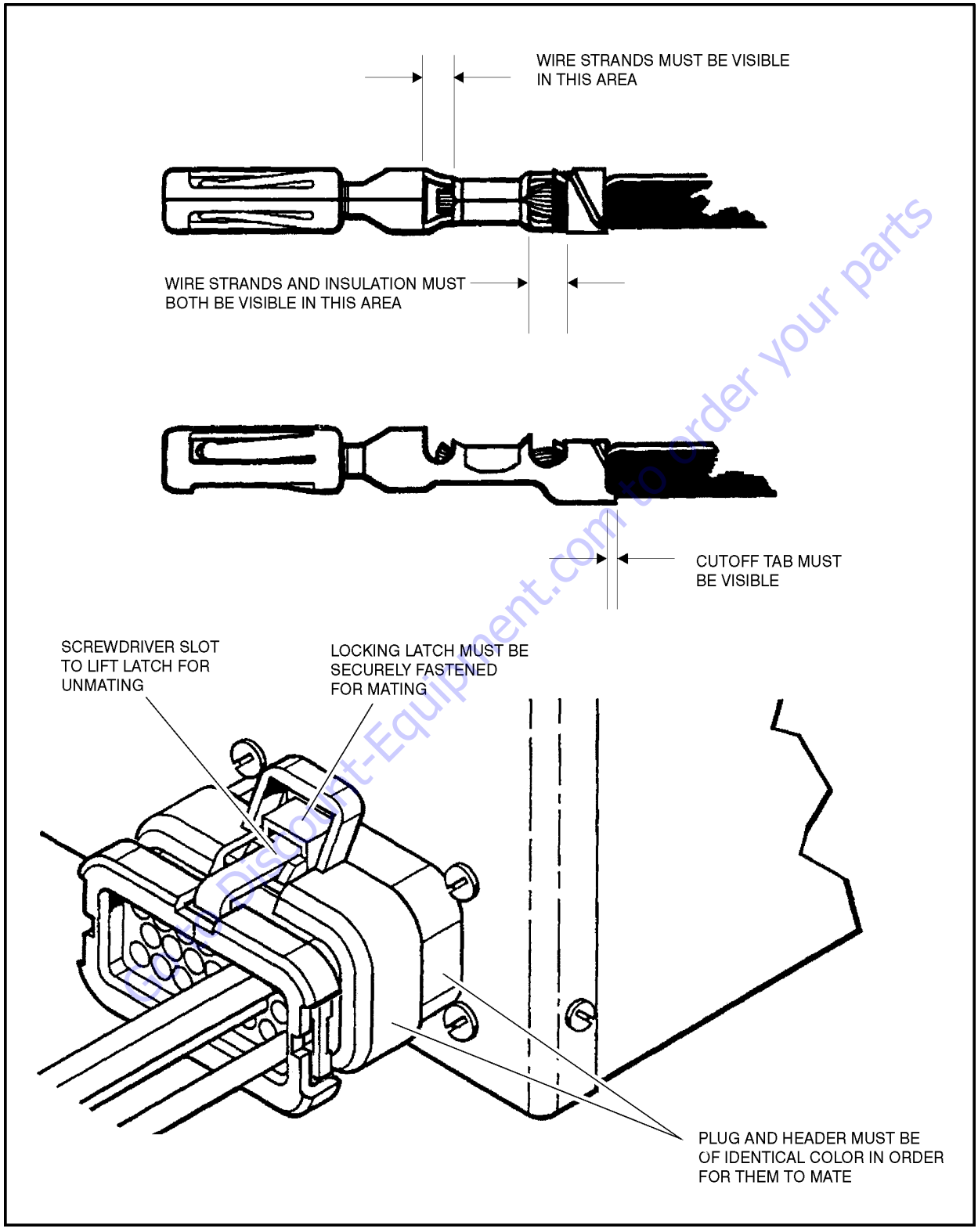


Figure 7-13. Connector Installation

7.5 DEUTSCH CONNECTORS

DT/DTP Series Assembly

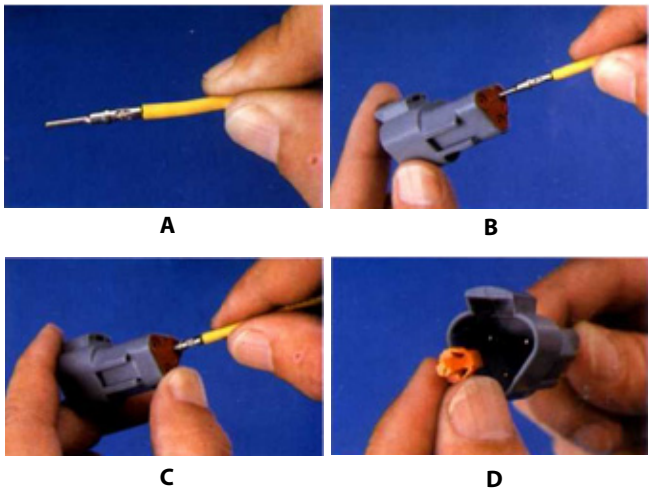


Figure 7-14. DT/DTP Contact Installation

1. Grasp crimped contact about 25mm behind the contact barrel.
2. Hold connector with rear grommet facing you.
3. Push contact straight into connector grommet until a click is felt. A slight tug will confirm that it is properly locked in place.
4. Once all contacts are in place, insert wedgelock with arrow pointing towards 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

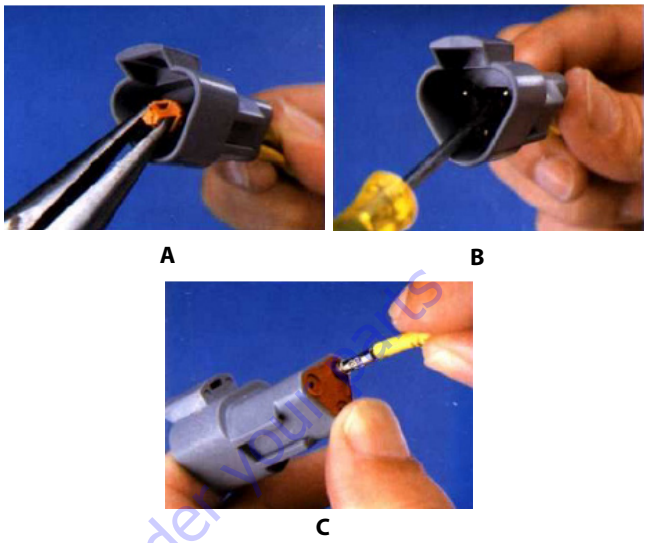


Figure 7-15. DT/DTP Contact Removal

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

HD30/HDP20 Series Assembly

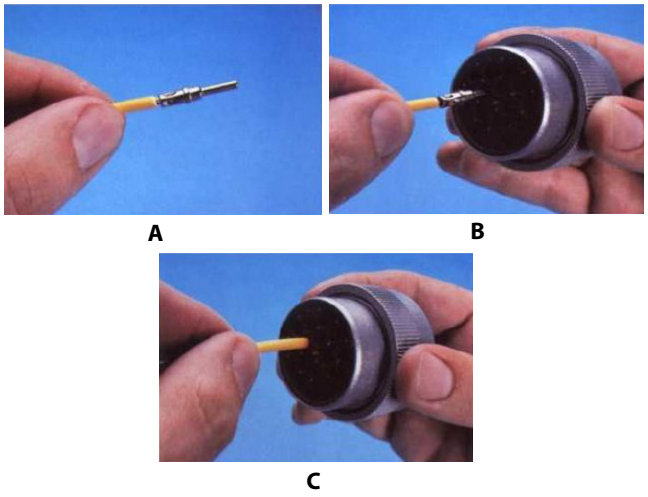


Figure 7-16. HD/HDP Contact Installation

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

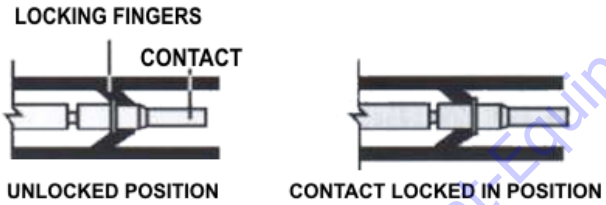


Figure 7-17. HD/HDP Locking Contacts Into Position

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

HD30/HDP20 Series Disassembly

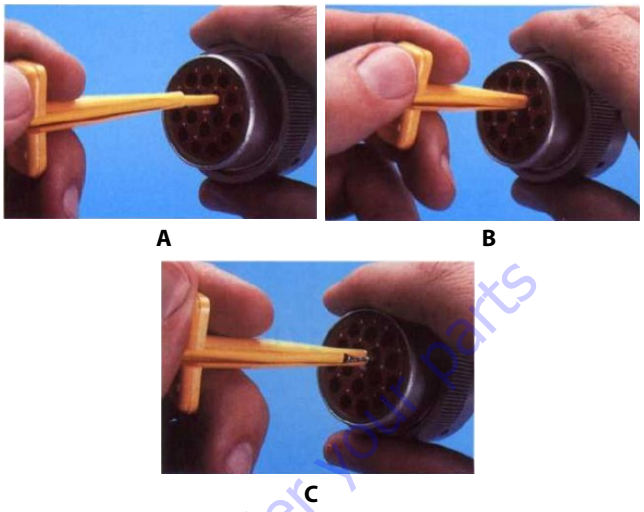


Figure 7-18. HD/HDP Contact Removal

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.

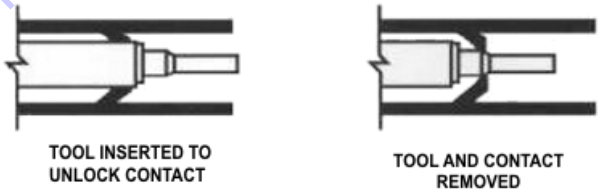


Figure 7-19. HD/HDP Unlocking Contacts

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

7.6 ELECTRICAL COMPONENT

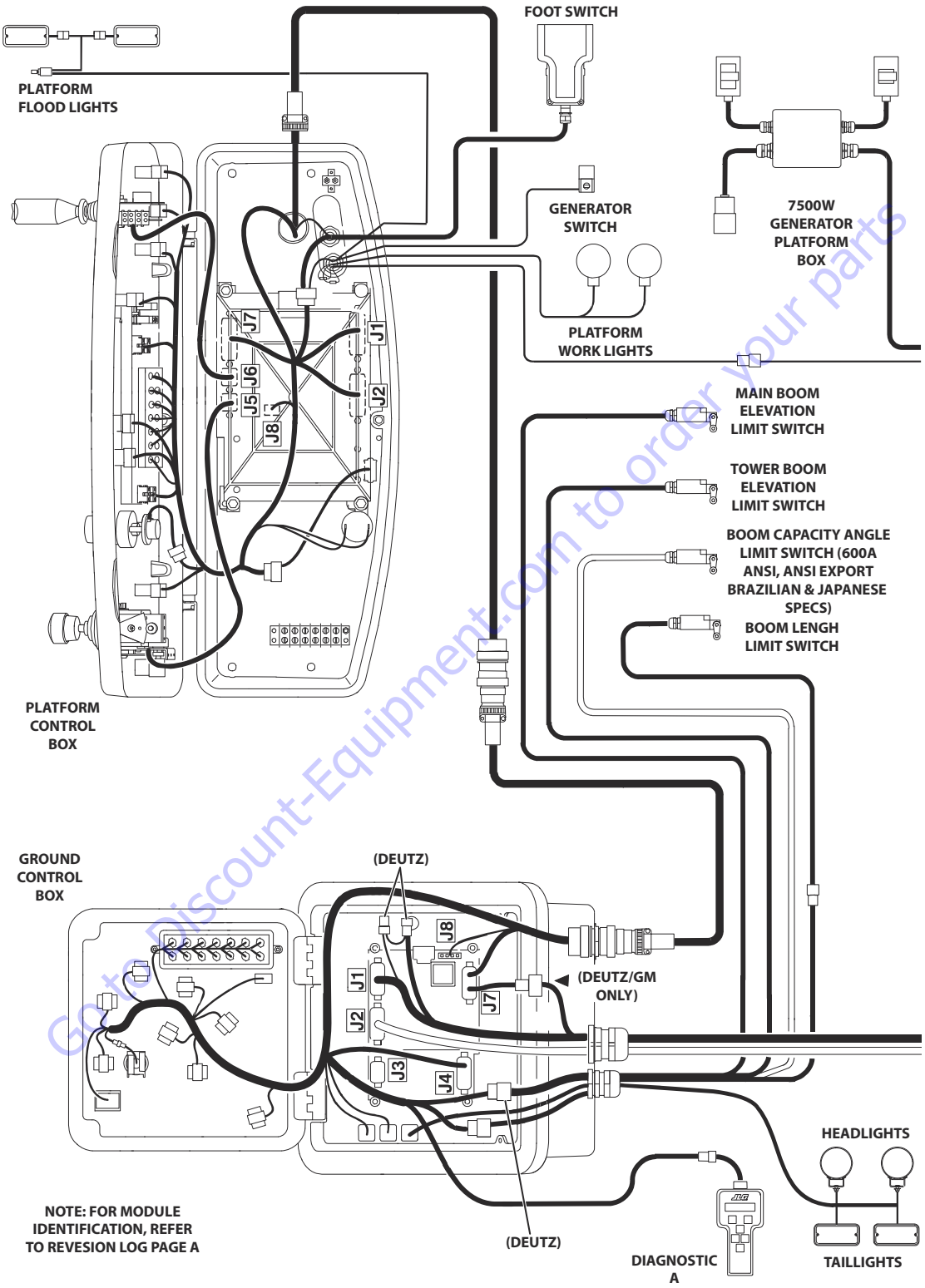


Figure 7-20. Electrical Components Installation without UGM - Sheet 1 of 2

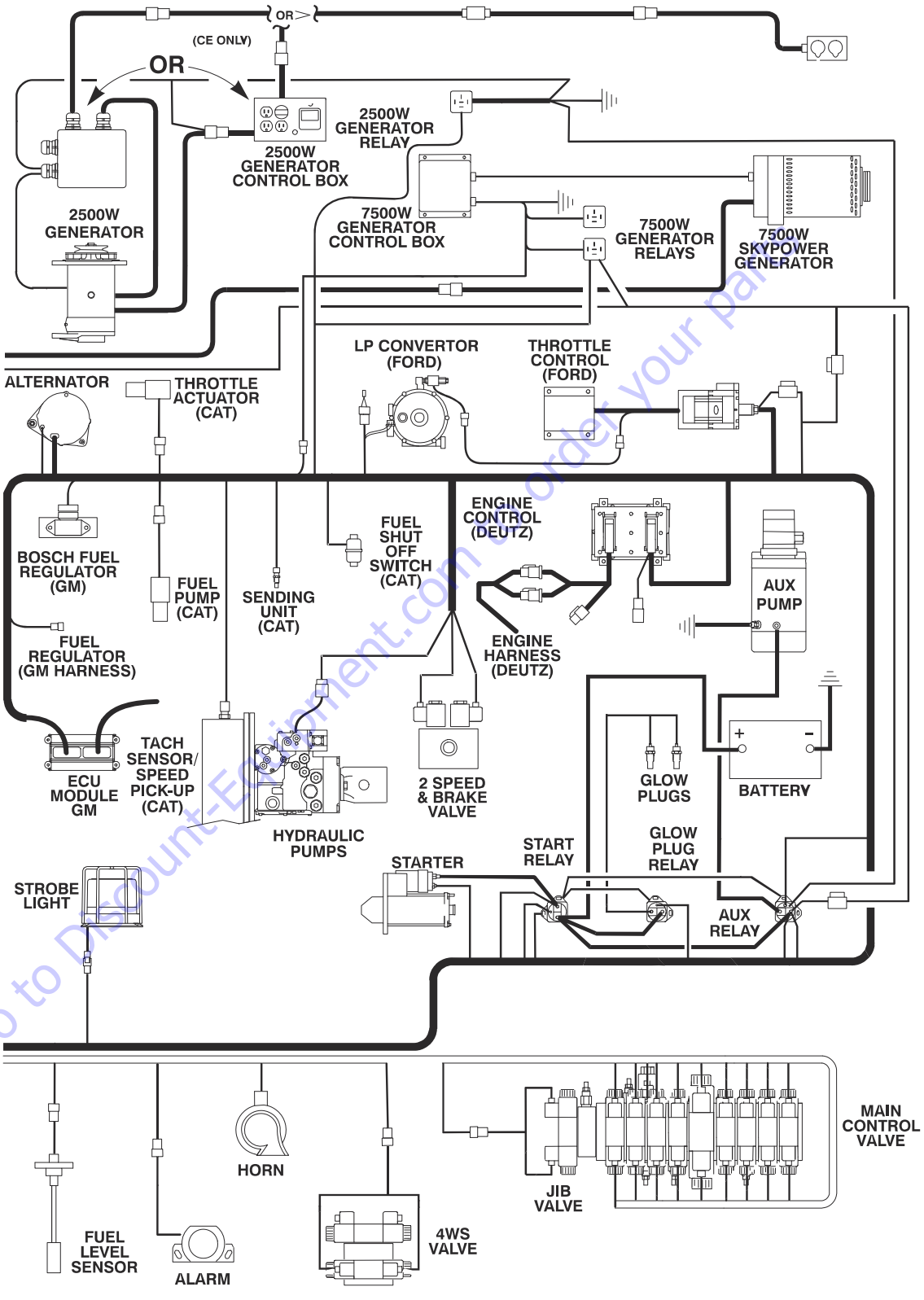


Figure 7-21. Electrical Components Installation without UGM - Sheet 2 of 2

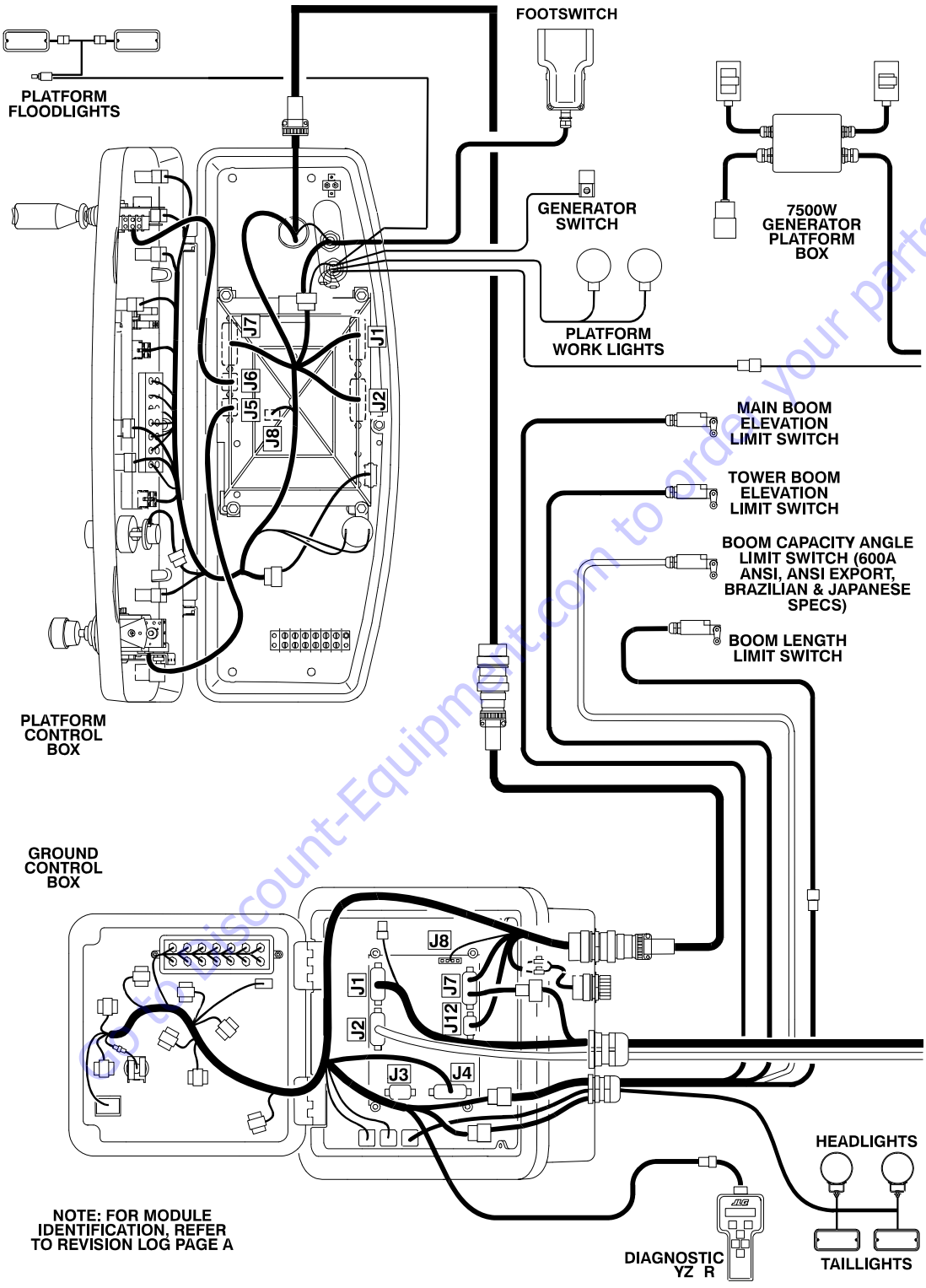


Figure 7-22. Electrical Components Installation with UGM (SN 0300087000 through 0300177361, SN B300000100 through B300001392) - Sheet 1 of 2

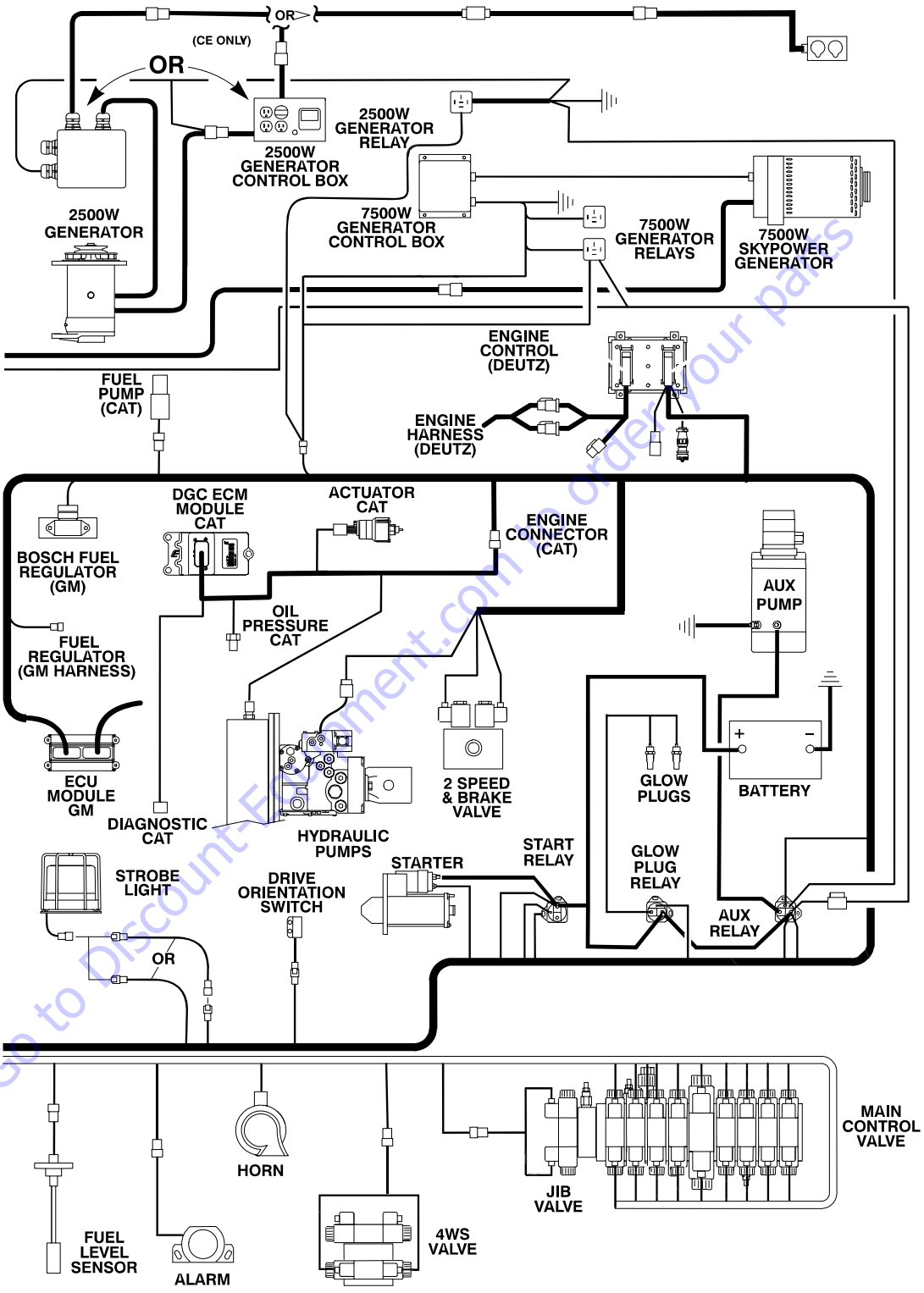


Figure 7-23. Electrical Components Installation with UGM (SN 0300087000 through 0300177361, SN B300000100 through B300001392) - Sheet 2 of 2

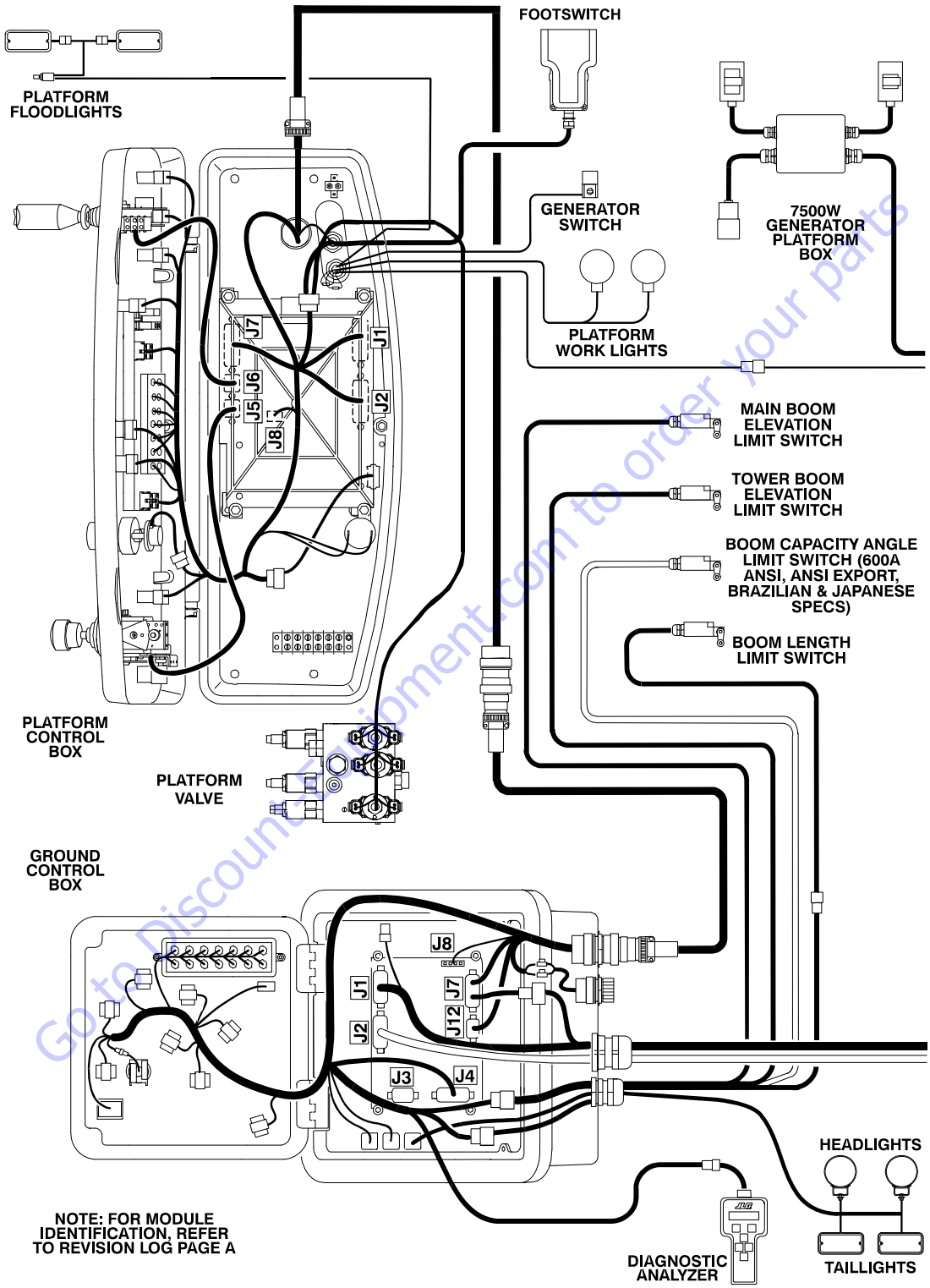


Figure 7-24. Electrical Components Installation with UGM (SN B300001393 to Present) - Sheet 1 of 2

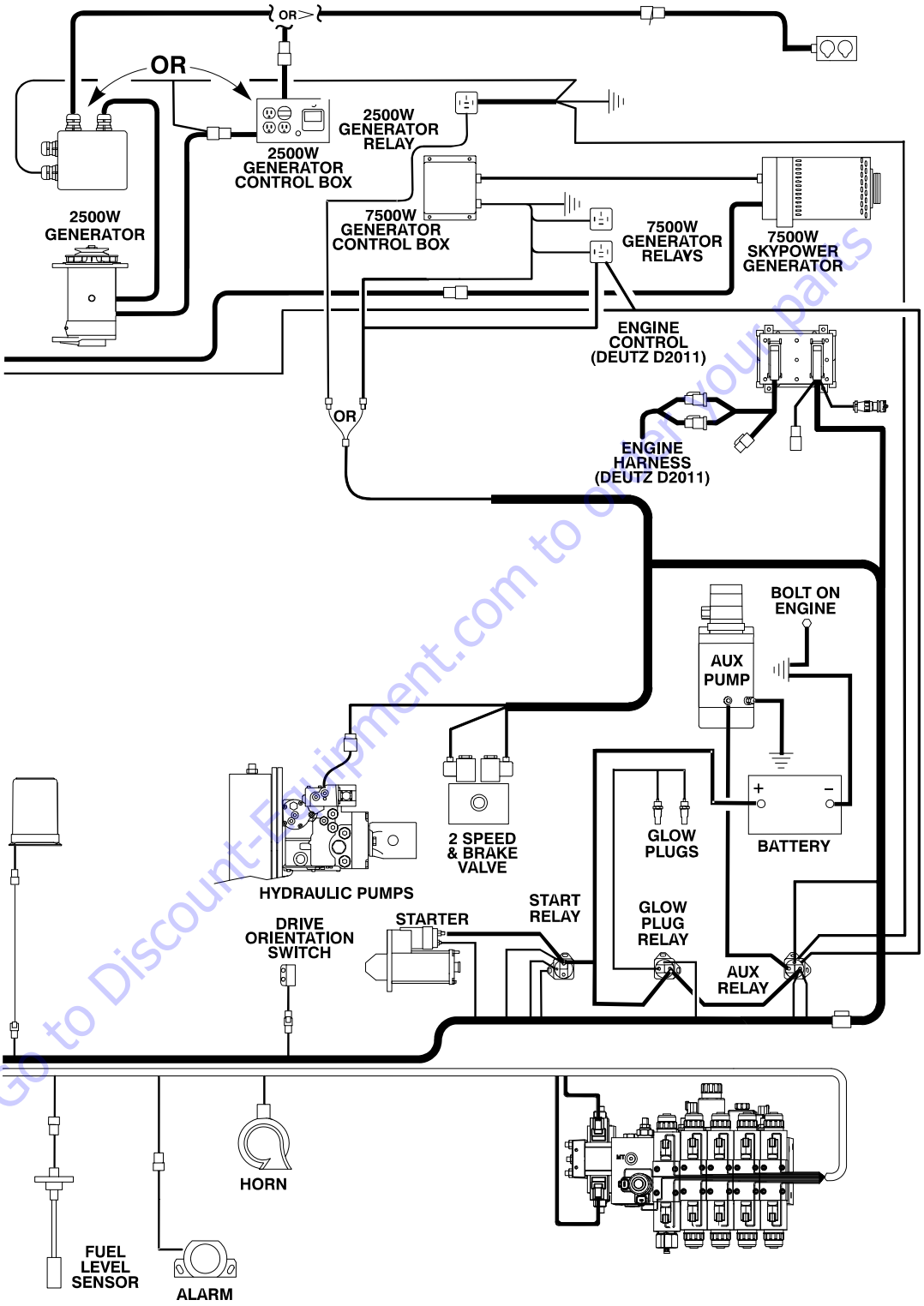


Figure 7-25. Electrical Components Installation with UGM (SN B300001393 to Present) - Sheet 2 of 2

7.7 ELECTRICAL SCHEMATICS

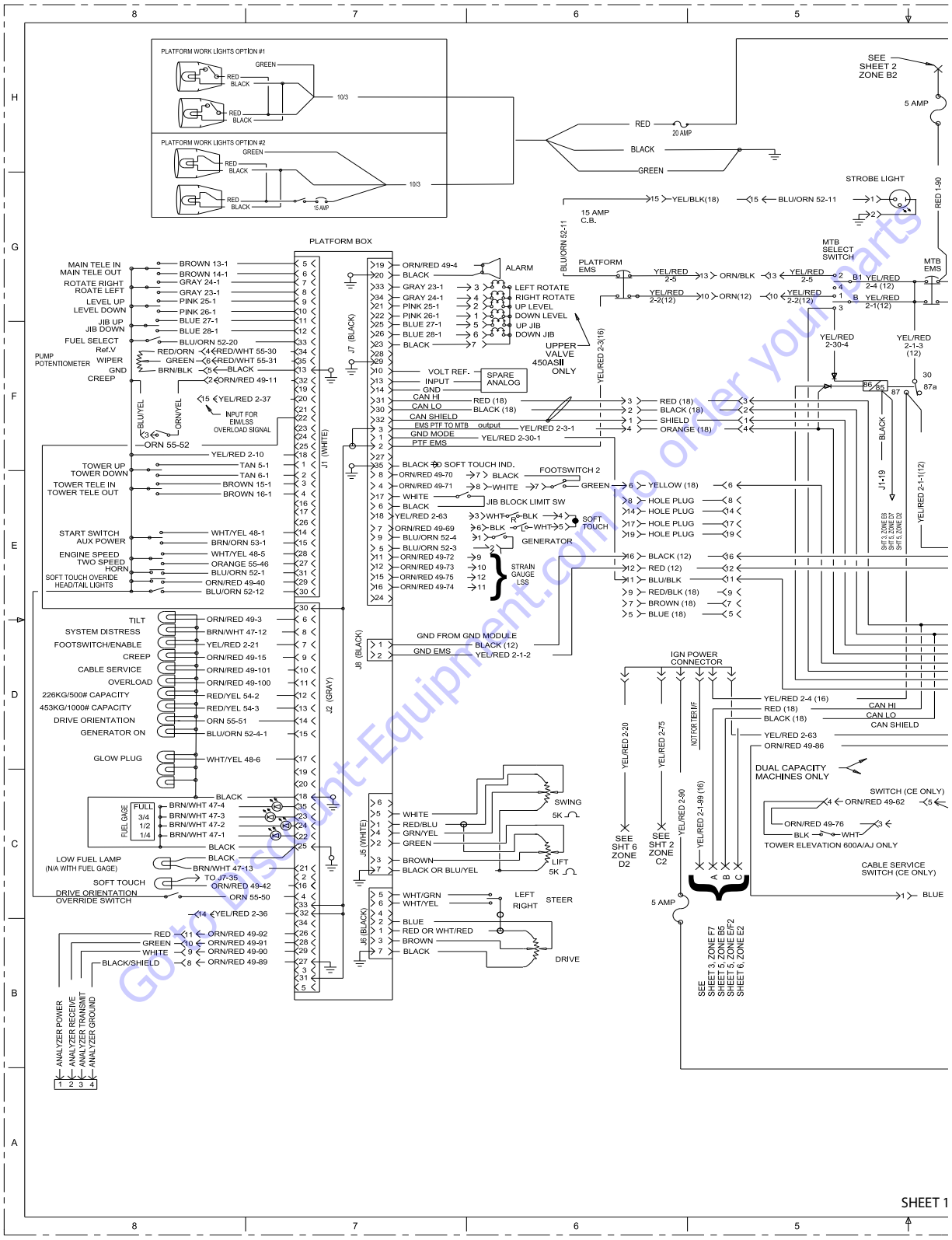


Figure 7-26. Platform and Ground Control Electrical Schematic - Sheet 1 of 10

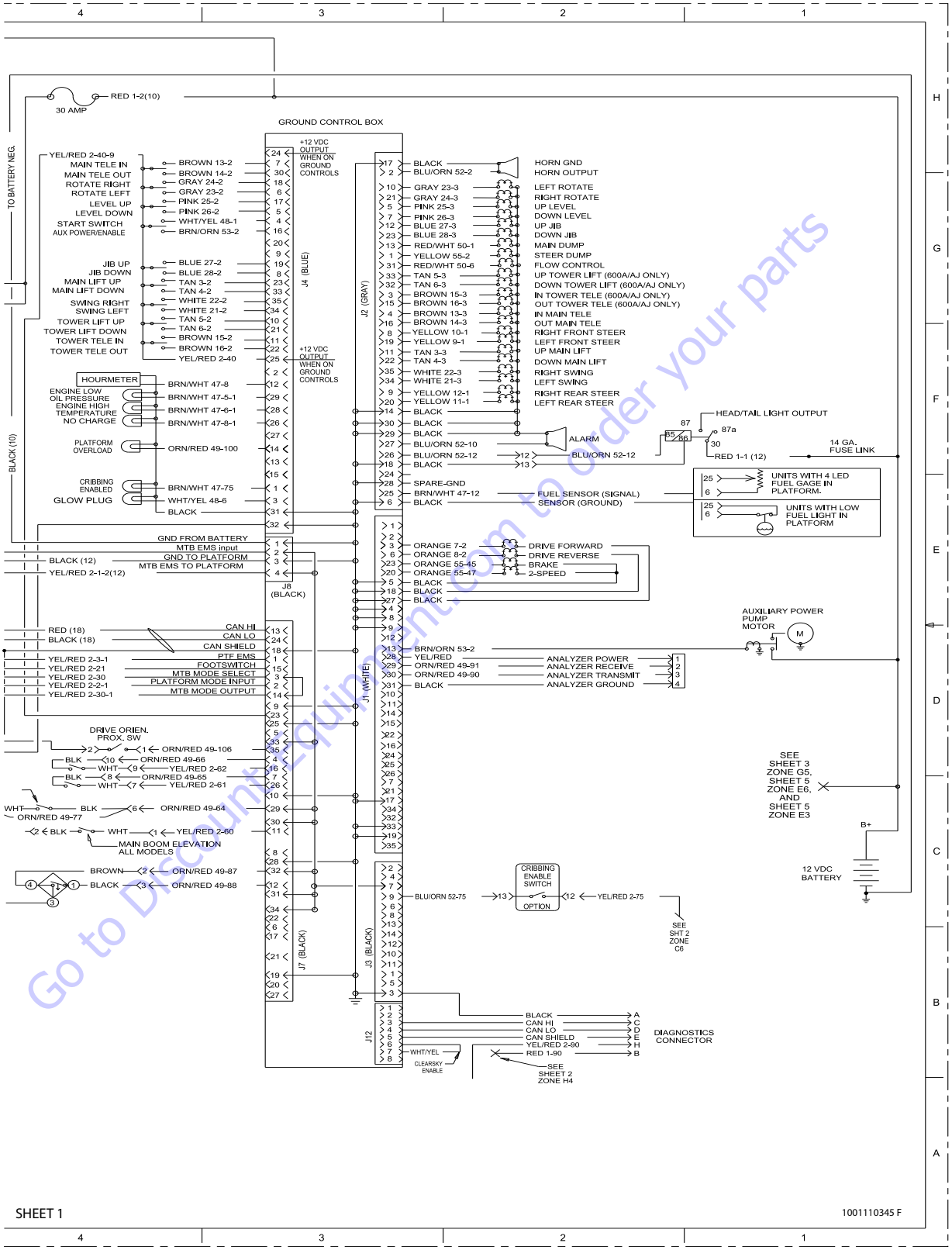


Figure 7-27. Platform and Ground Control Electrical Schematic - Sheet 2 of 10

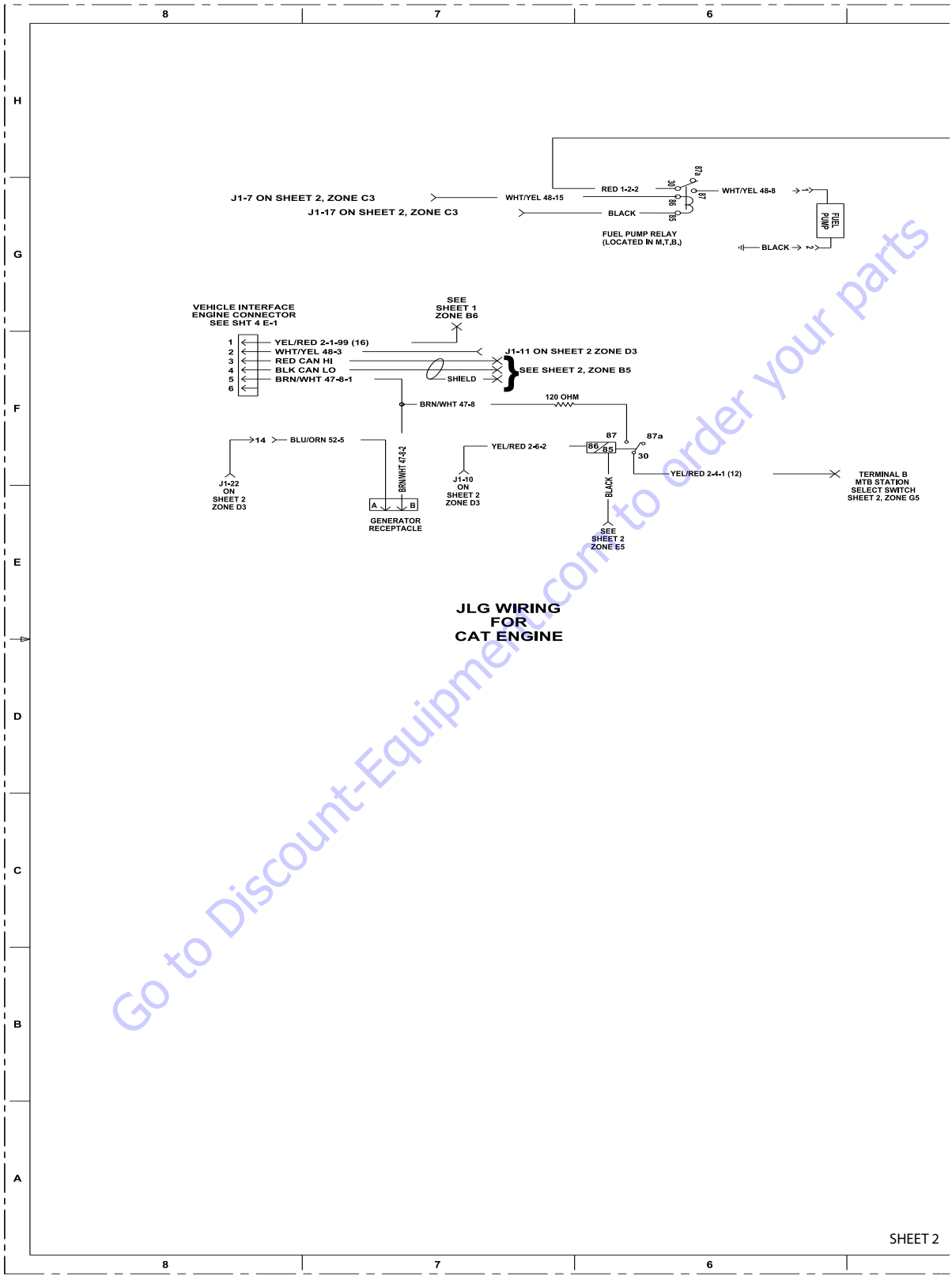
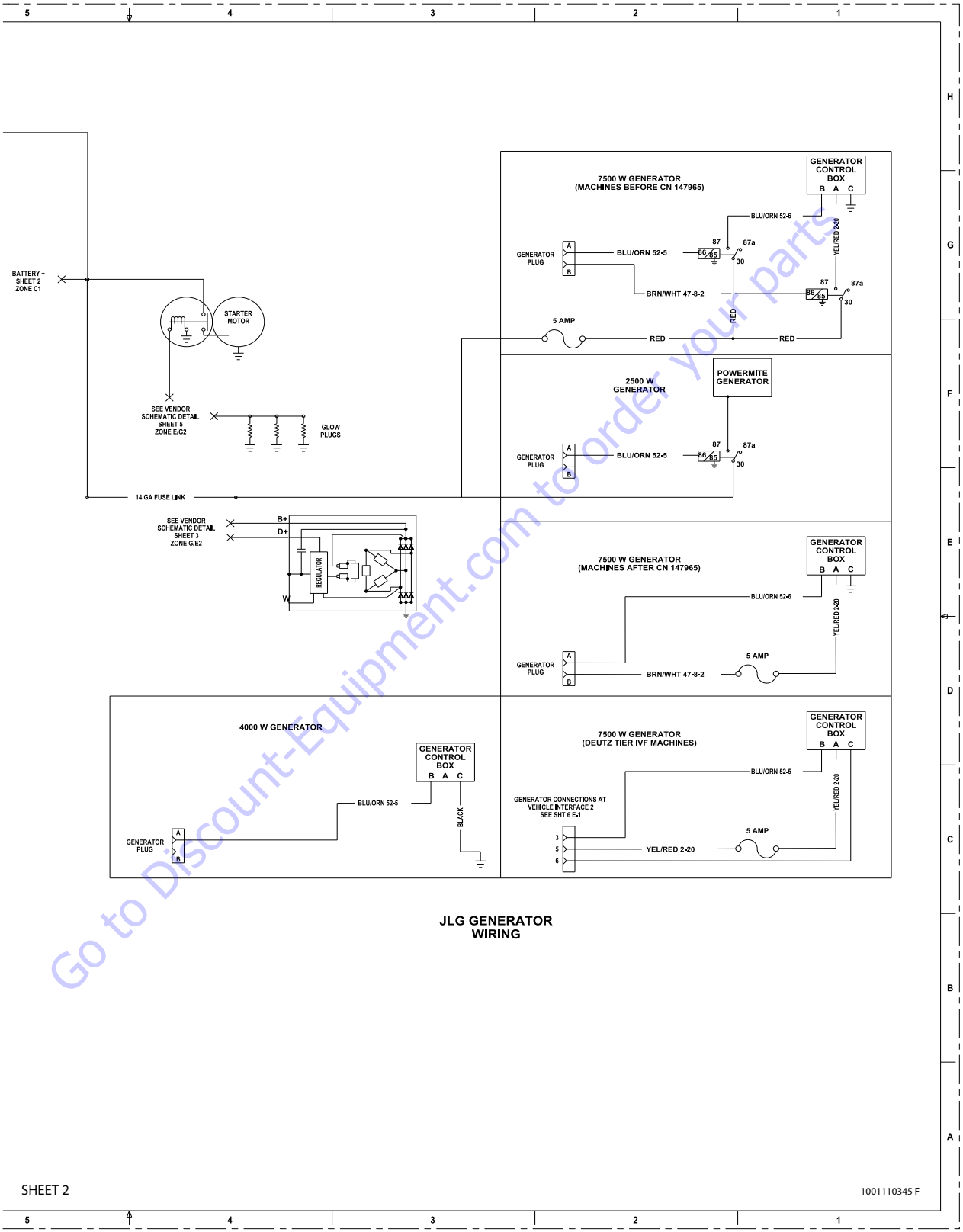


Figure 7-28. Generator Wiring and CAT interface Electrical Schematic - Sheet 3 of 10



JLG GENERATOR
WIRING

Figure 7-29. Generator Wiring and CAT interface Electrical Schematic - Sheet 4 of 10

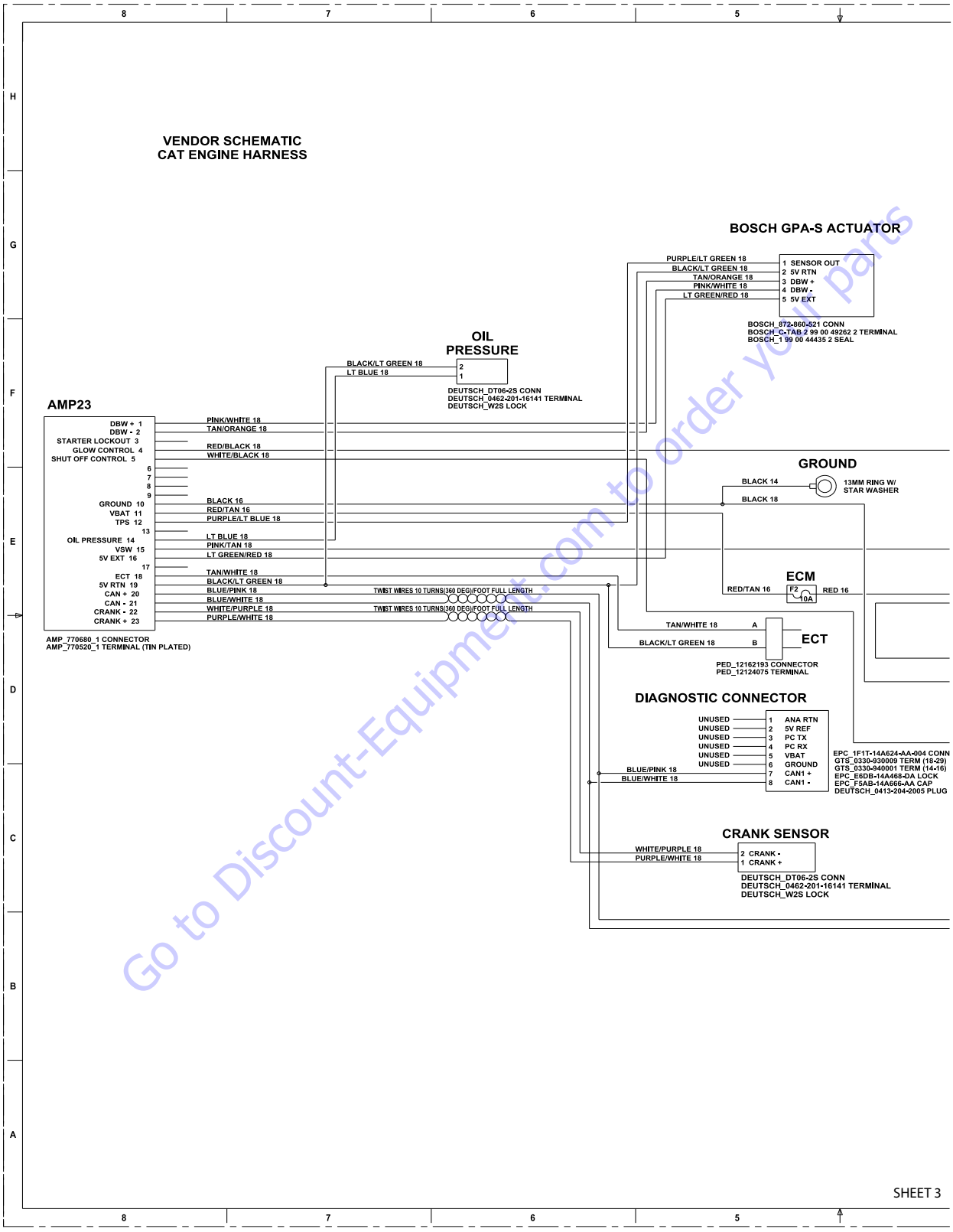


Figure 7-30. CAT Engine Electrical Schematic - Sheet 5 of 10

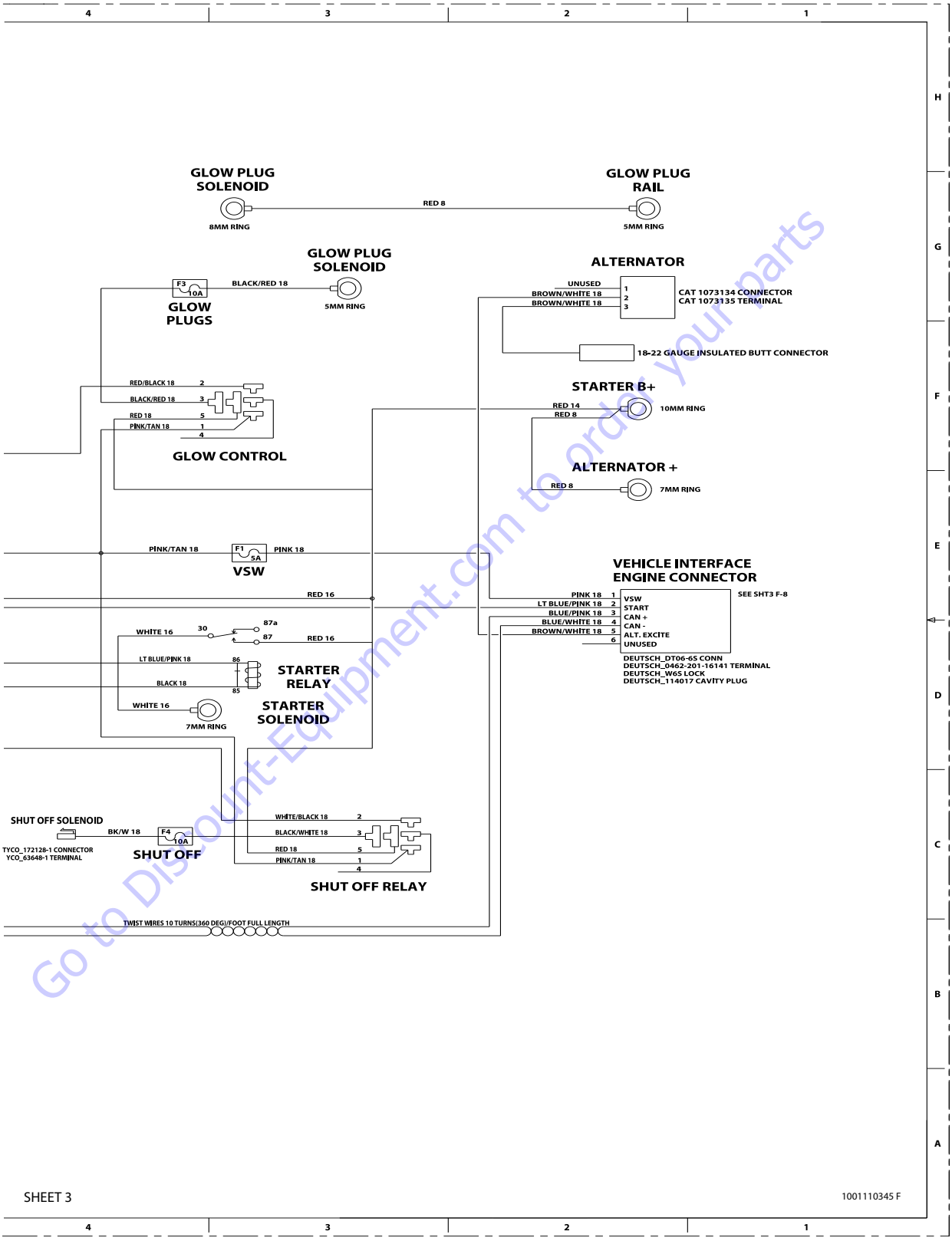


Figure 7-31. CAT Engine Electrical Schematic - Sheet 6 of 10

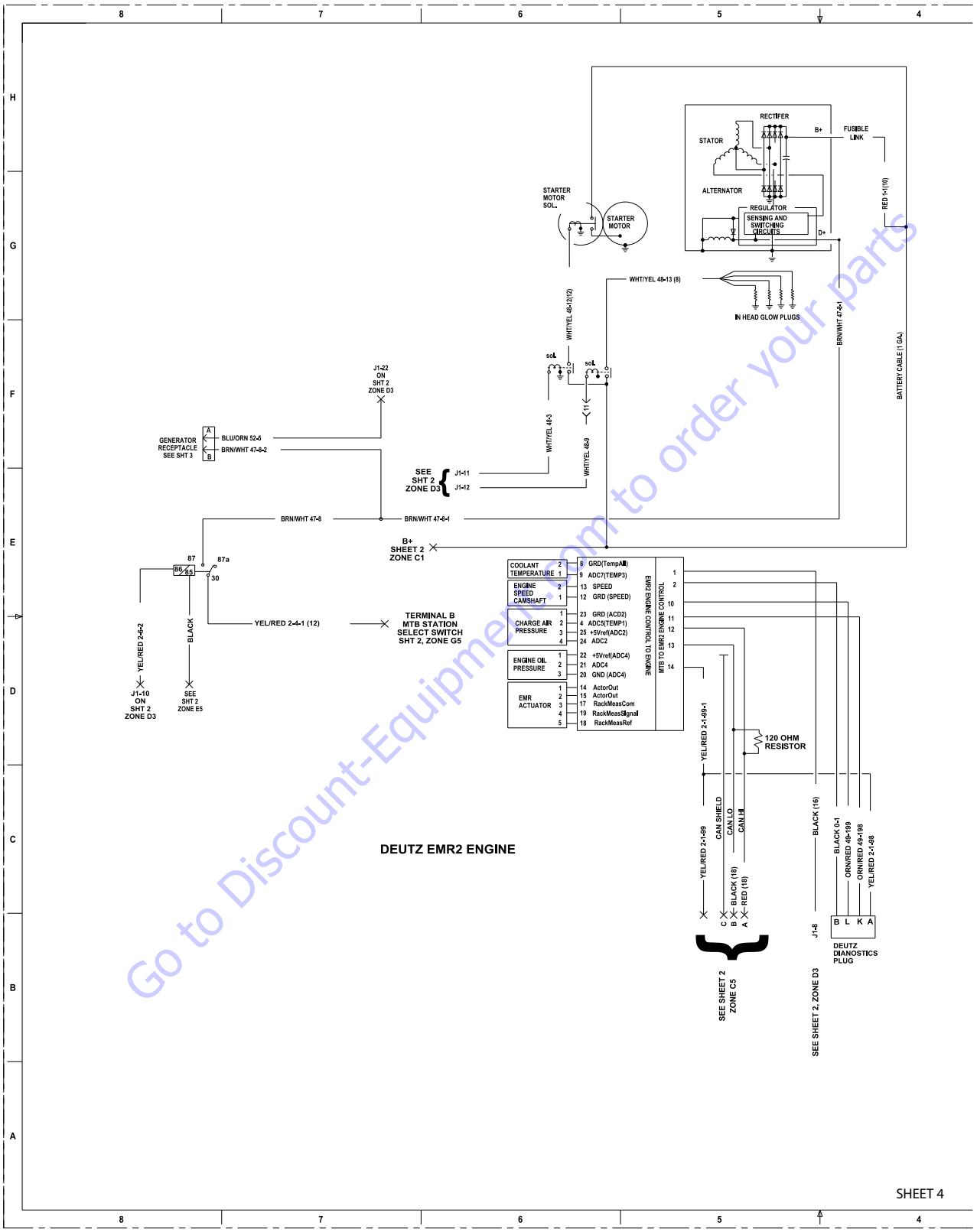


Figure 7-32. Deutz and GM/PSI Engine Electrical Schematic - Sheet 7 of 10

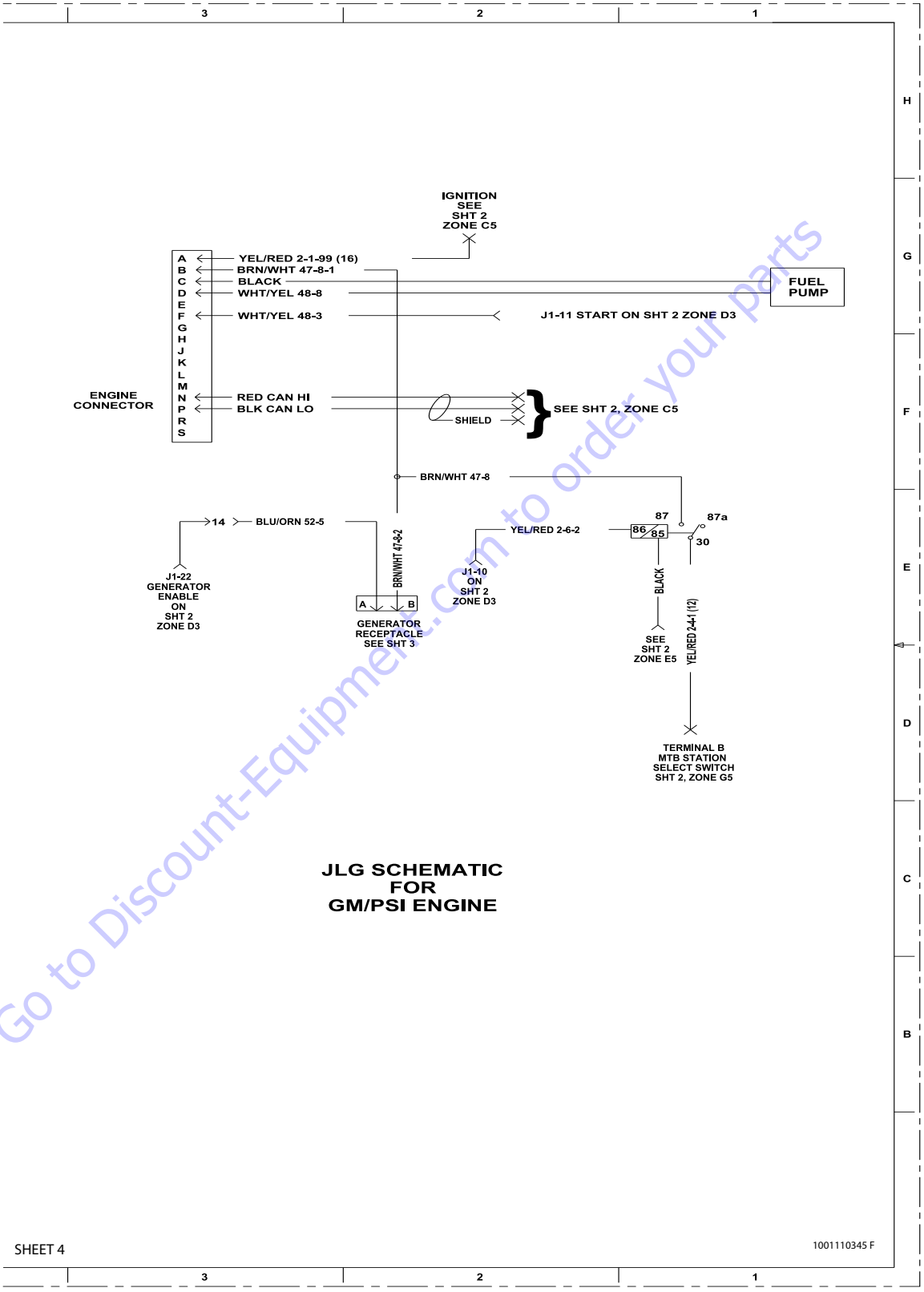


Figure 7-33. Deutz and GM/PSI Engine Electrical Schematic - Sheet 8 of 10

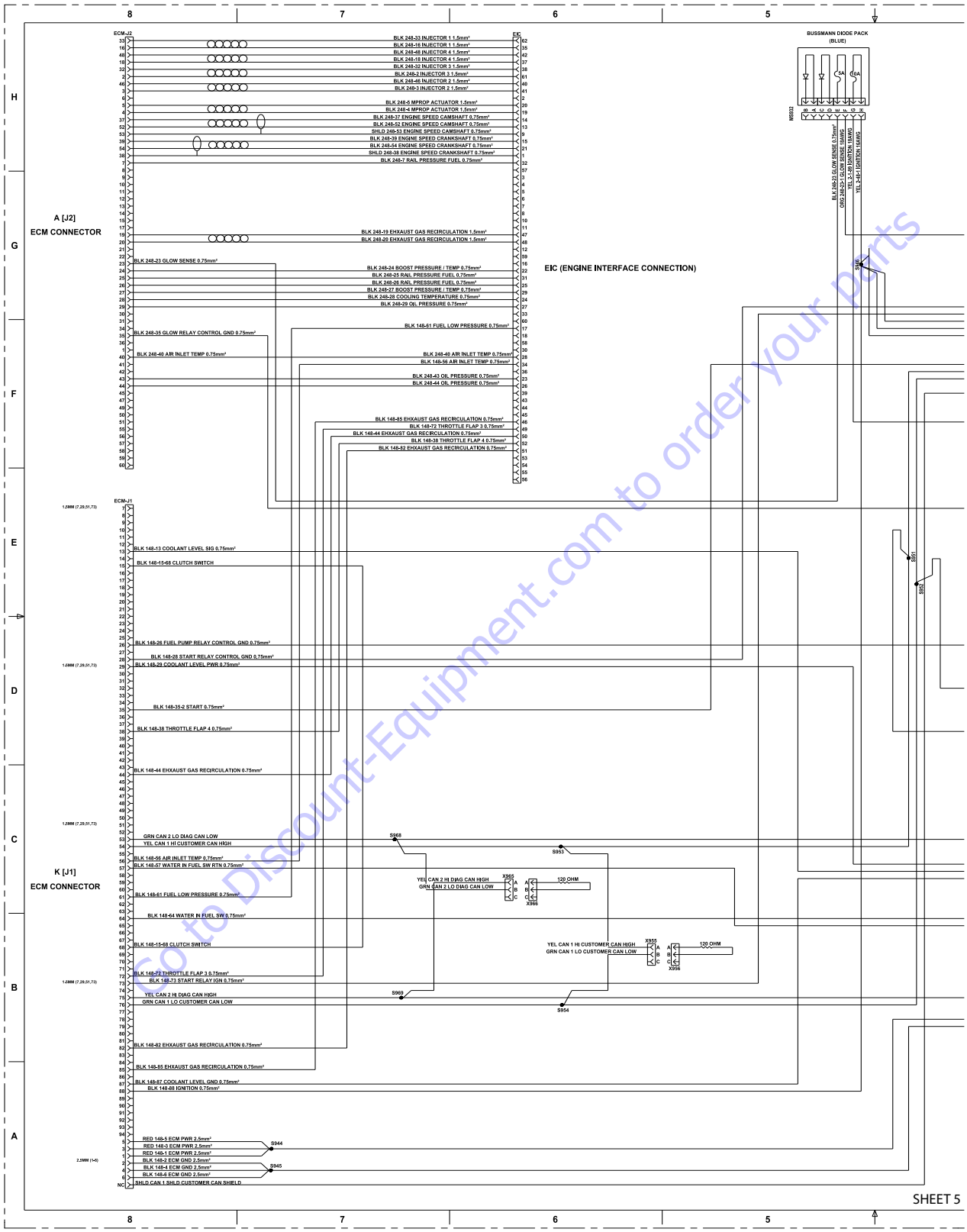


Figure 7-34. Deutz Tire 4 Final Engine Electrical Schematic - Sheet 9 of 10

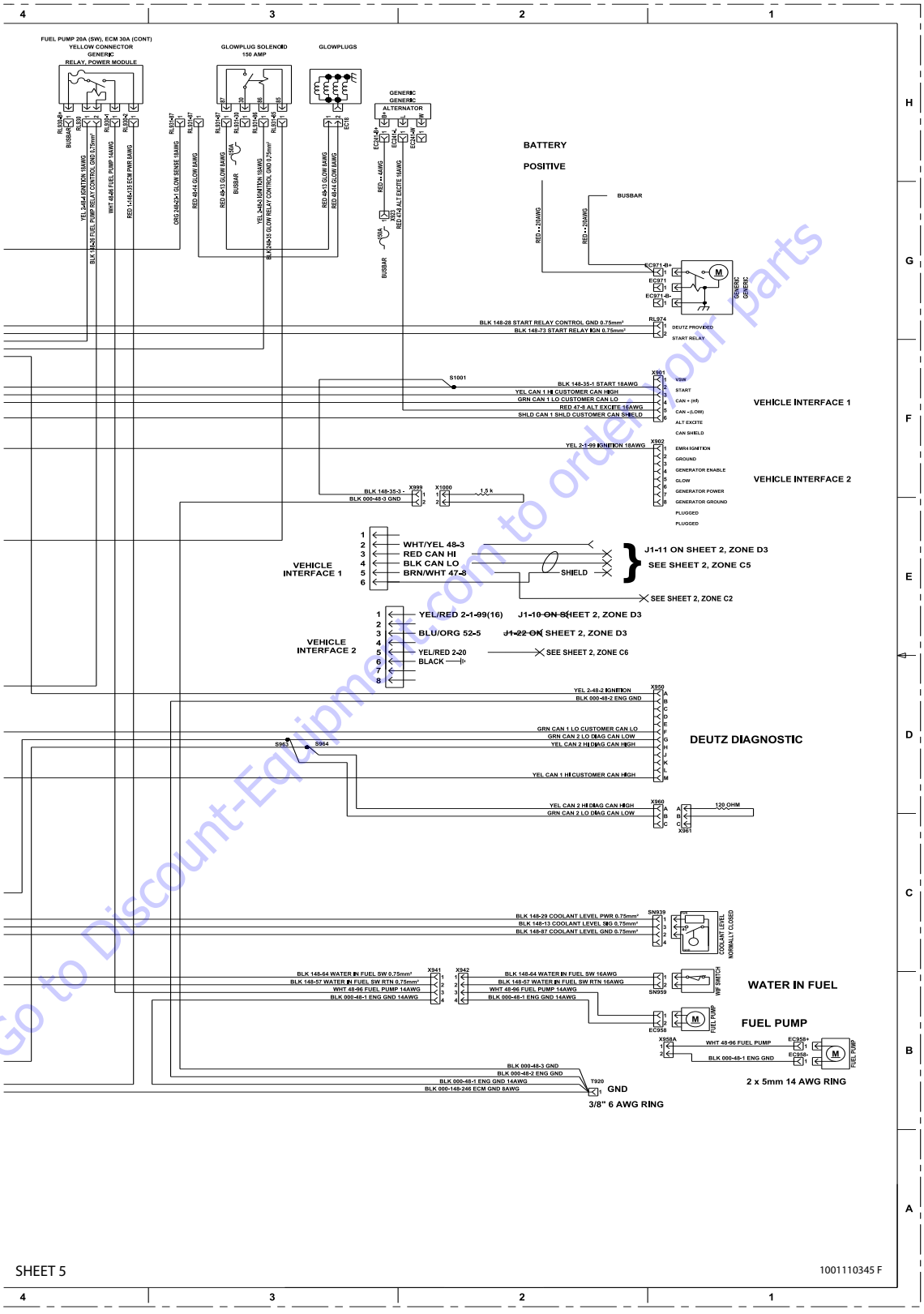


Figure 7-35. Deutz Tire 4 Final Engine Electrical Schematic - Sheet 10 of 10

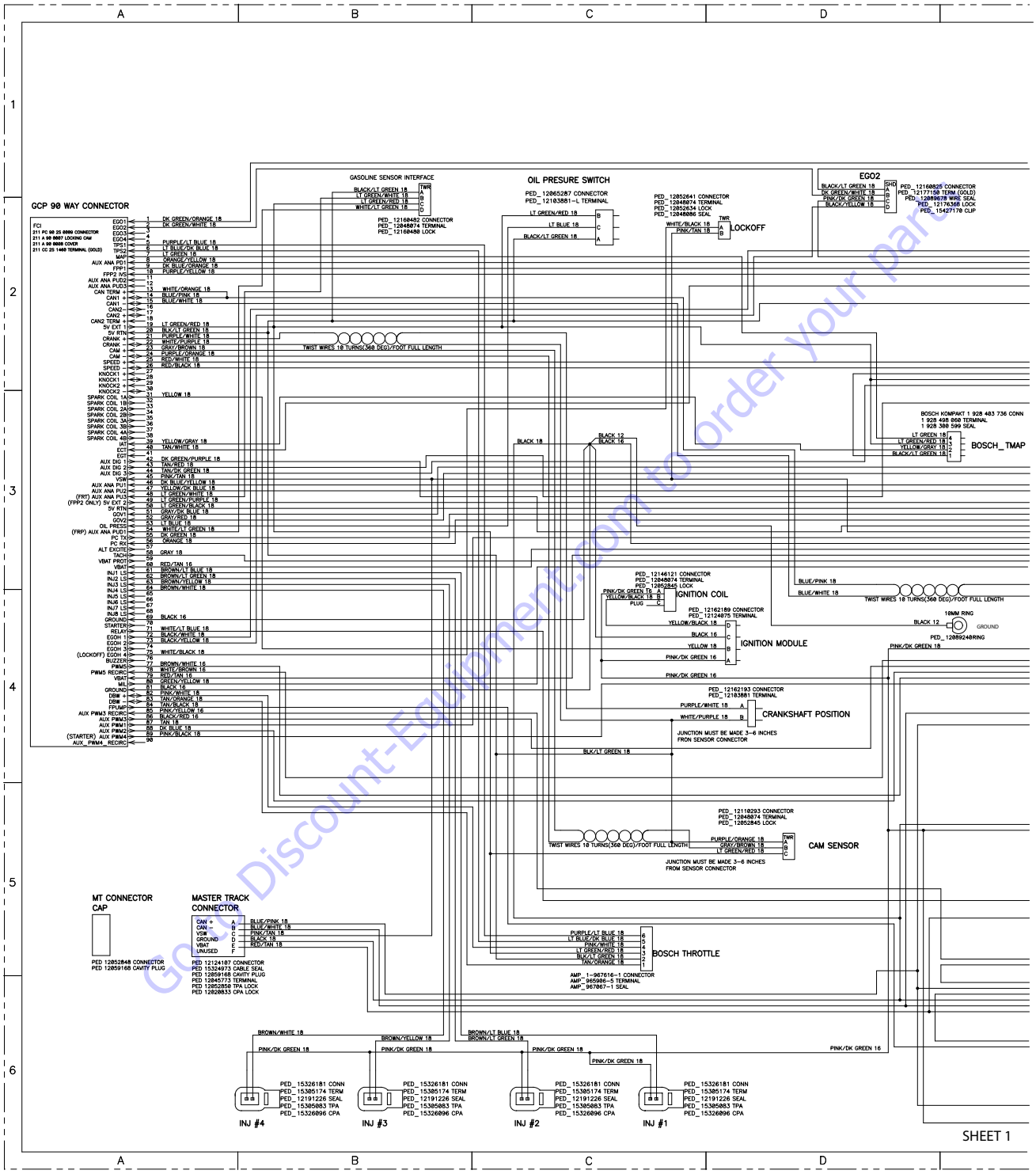


Figure 7-36. GM Electrical Schematic - Sheet 1 of 2

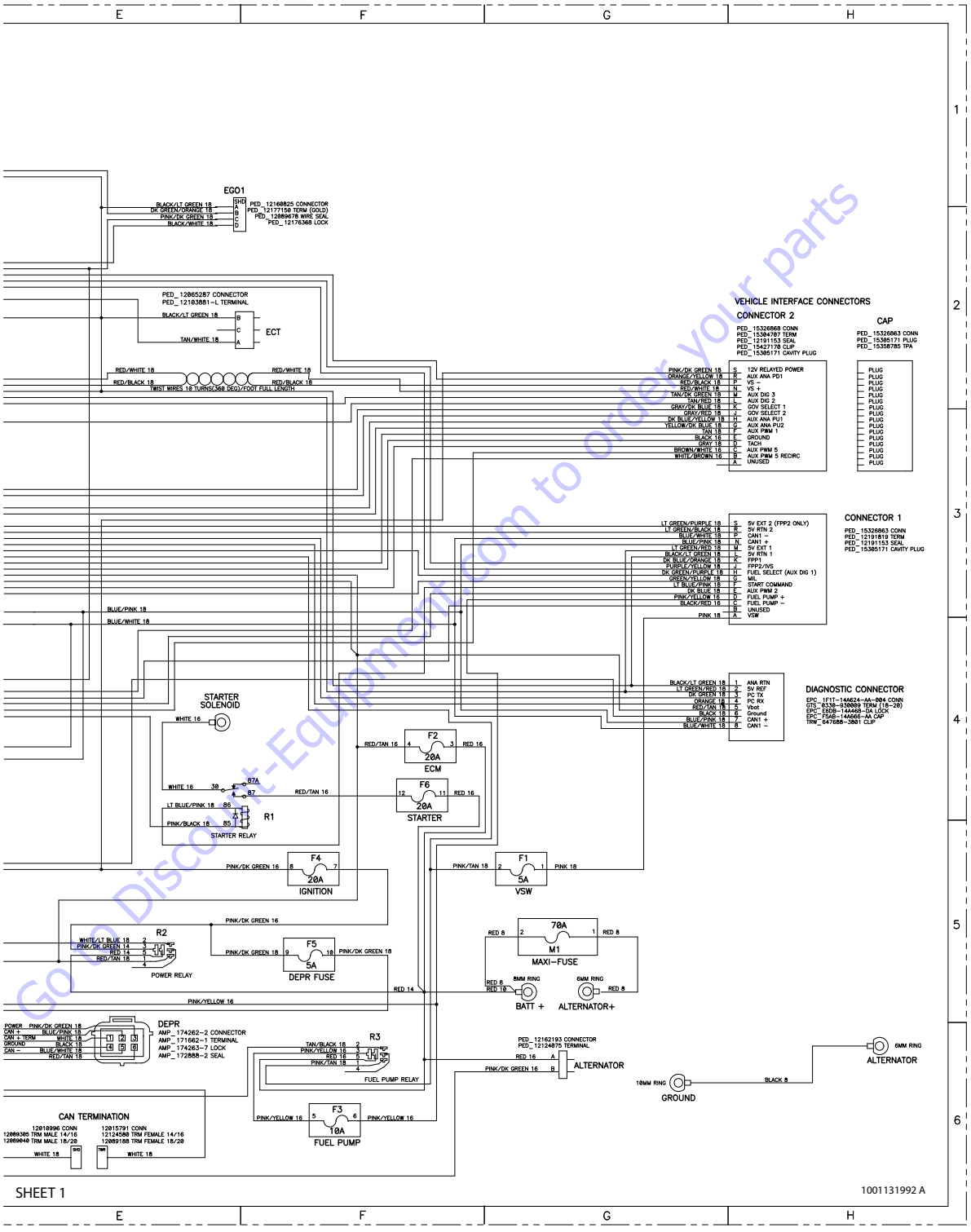


Figure 7-37. GM Electrical Schematic - Sheet 2 of 2

PROPOSITION 65 WARNING

- **Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm.**
- **Batteries also contain other chemicals known to the State of California to cause cancer.**
- **Wash hands after handling.**

⚠ WARNING: ⚠

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

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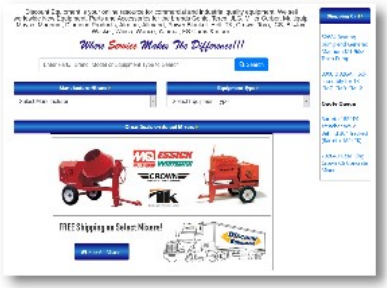
Discount Equipment



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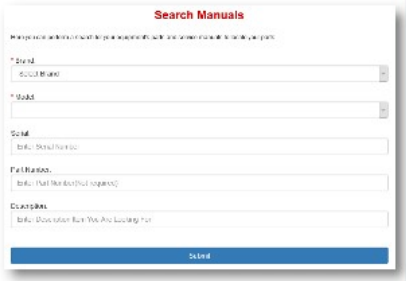

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