

ET207
Troubleshooting
the
CTS 450 Control

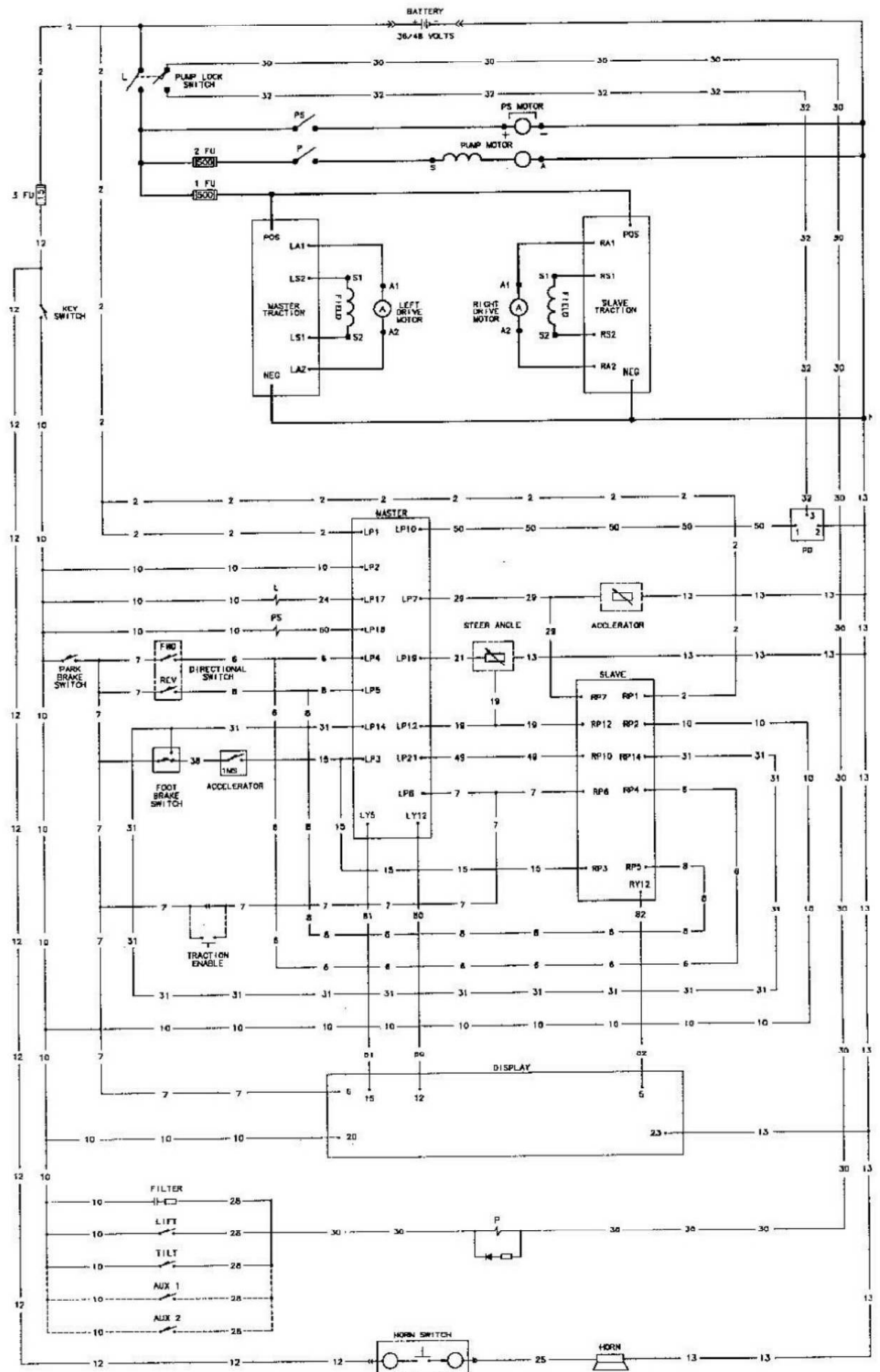


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Sequence #3a: Closing the Key Switch

- A. Closing the Key Switch will supply battery volts through wire #10 to:

LP2 and RP2 of the traction controls.
The Line Contactor Coil positive terminal.
The Power Steer (PS) Coil positive terminal.
The Parking Brake (PB) switch common terminal.
The Dash Display terminal #20.
All hydraulic control valve switches.

The battery volt input at the Dash Display terminal #20 signals the Display to start the Self Test mode, all indicator lamps will turn ON for approximately 2 seconds, and the Seat Belt Warning Buzzer and Indicator Lamp will turn ON for 8 to 10 seconds.

NOTE

Status Code 15 or 16 will be displayed if the battery voltage is less than or greater than the battery voltage setting pre-programmed in Function 15.

- B. The Traction Controls will send data signals through wires #80, 81, and 82 to the Dash Display to turn "ON" all the segments of the digital readout. If all segments are operating correctly the display should read "8888" for about 2 seconds.
- C. The Traction Controls senses the lack of battery volts at terminals LP6 and RP6 indicating that the Parking Brake switch is open (parking brake set). The control signals the dash to display a "-01" indicating to the operator that the Parking Brake is set. The Traction Controls will not operate until the Parking Brake is released (parking brake switch open) to prevent damage to the motors or brakes.

NOTE

The Wrench Symbol will turn "ON" anytime a status code is being displayed.

- D. The Dash Display will also sense the lack of battery volts at terminal #6 indicating that the Parking Brake is set (parking brake switch open). The Dash Display will turn "ON" the Parking Brake indicator lamp.

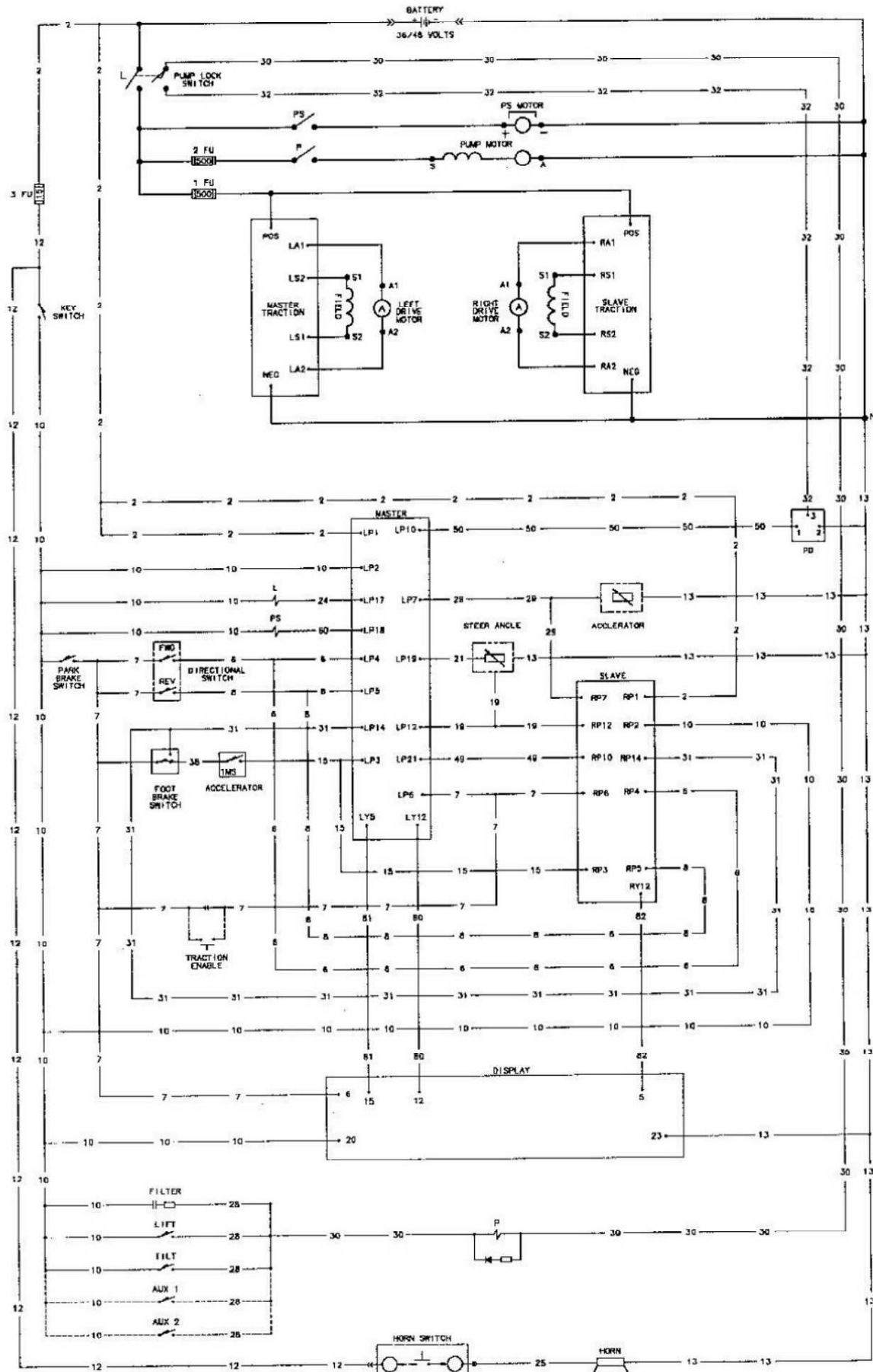
(SEQUENCE 3 CONTINUED ON PAGE 14).

NOTE

If the trucks hourmeter reading exceeds the pre-programmed reminder hours, (Functions 19 & 20), the control will signal the dash to turn "ON" the Maintenance Reminder indicator lamp and display a -99 status code for 4 seconds. The Traction Controls will be disabled while the -99 status code is being displayed.

Voltages Present

- A. Battery Positive Volts
B. N/A
C. 0 Volts
D. 0 Volts



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Sequence #3b: Closing The Key Switch

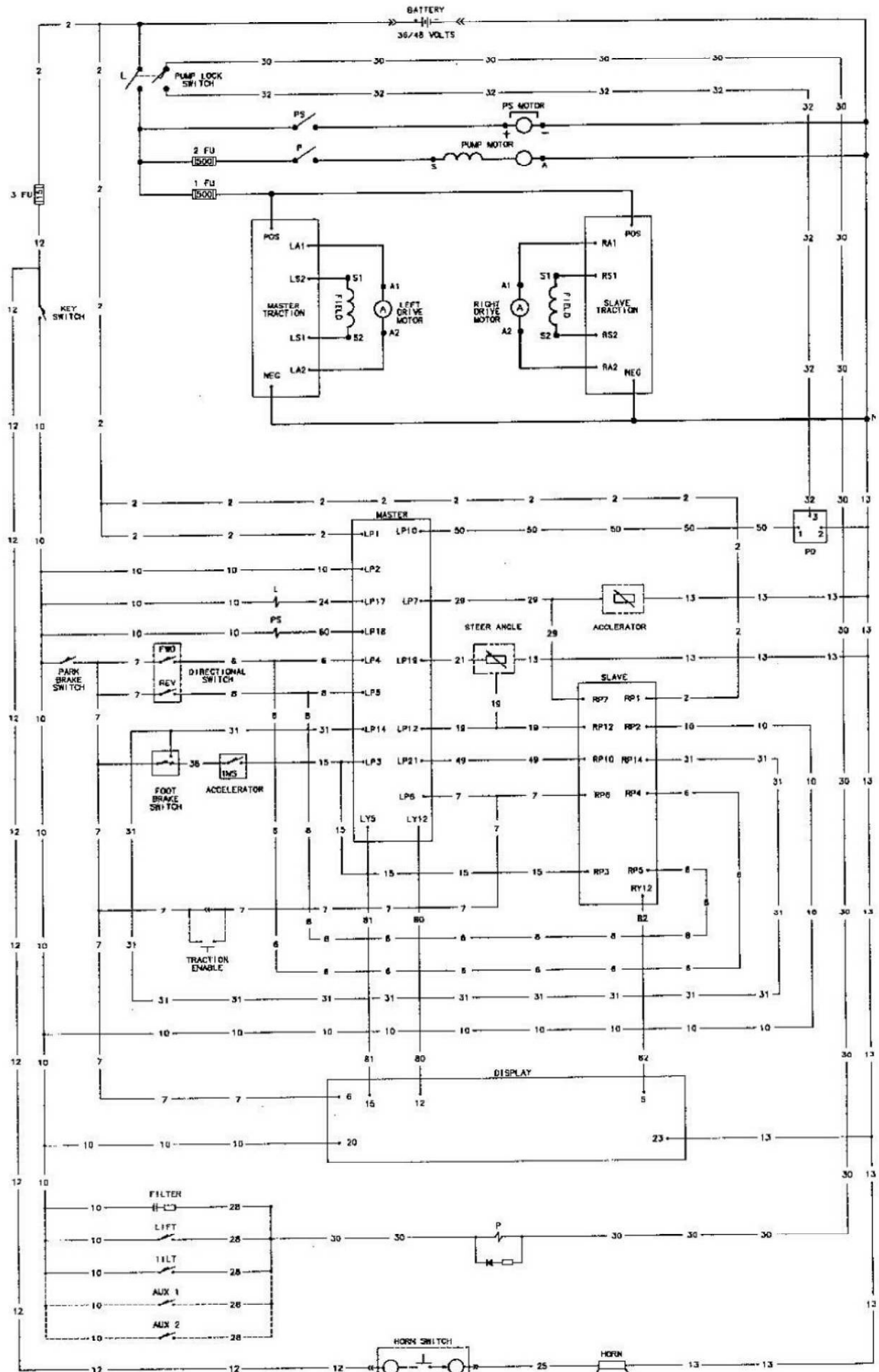
- E. If the internal capacitors of both controls are charged, the Master control will complete the circuit thru wire #24 at terminal LP17 to negative. This will energize the Line Contactor Coil and close the Line Contactor Power Tips.
- F. The closure of the Line Contactor Power Tips supply both Traction Controls with battery positive to operate the Traction Motors.
- G. The closing of the Line Contactor Tips will cause the pump interlock switch to close electrically. This switch ensures that the hydraulic functions will not operate until the Line Contactor is closed.
- H. The Traction Controls monitors the battery condition. If, the controls determine the battery has sufficient charge, the Master Control will supply a voltage thru wire #50, terminal LP 10 to terminal #1 of the Pump Driver turning the driver "ON" providing battery negative on terminal #3 and wire #32.
- J. The closure of the pump interlock switch will supply battery negative from Pump Driver terminal #3, thru wire #32, to wire #30 at the Pump Contactor Coil negative terminal.

NOTE

Status code -50 will be displayed if the capacitor voltage of each control does not remain above 85% battery volts after the Line Contactor closes.

Voltages Present:

- E. Approximately 10 to 13 volts across the Line Contactor Coil
- F. Battery Volts across the Positive & Negative terminals of each Traction Control
- G. N/A
- H. 1.75 to 6 volts on wire #50
- J. Battery Negative Volts on wire #30 & #32



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Sequence #4: Park Brake & Static Return to Off (SRO) Checks

- A. Releasing the parking brake lever will close the Parking Brake Switch supplying battery positive volts on wire #7 to:
- The Forward & Reverse Directional switch common terminals.
 - To the Dash Display terminal #6.
 - Through the Foot Brake switch, to wire #38, and on to the IMS switch.
 - To the Traction Controls terminals LP6 and RP6.
- B. Battery positive volts will be supplied through wire #7 to the dash display on terminal #6. The parking brake indicator will now turn off.
- C. Battery positive volts will also be supplied to terminals LP6 & RP6 of the CTS-40 Master and Slave controls. The -01 status code on the display will now be replaced with the battery state of charge display or some other status code if the truck has a problem.
- D. Battery positive volts will also be supplied to the common terminals of the F & R directional switches and to the IMS switch through the normally closed contacts of the brake pedal switch through wire #38.
- E. The controls will not allow the truck to start until the following SRO checks are satisfied:
- 1) Terminals LP6 & RP6 of the CTS 450 Master and Slave controls must be at battery positive voltage. **(Status code -01 if at 0 volts)**
 - 2) Checks for open F and R switch inputs, terminals LP4, RP4, LP5 and RP5 must be 0 volts for at least 1 second after voltage is applied to terminals LP6 and RP6. **(Status code -02 or -03 if battery volts)**
 - 3) Checks for open IMS switch input, terminals LP3 and RP3 must be 0 volts for at least 1 second after voltage is applied to terminals LP6 & RP6. **(Status code -11 if at battery volts)**
 - 4) Checks the accelerator input voltage at terminals LP7 and RP7. Must be greater than 3.0 volts. **(Status code -06 if less than 3.0 volts).**

NOTE

The CTS 450 controls will repeat the SRO checks anytime the parking brake switch is opened for more than 2 seconds.

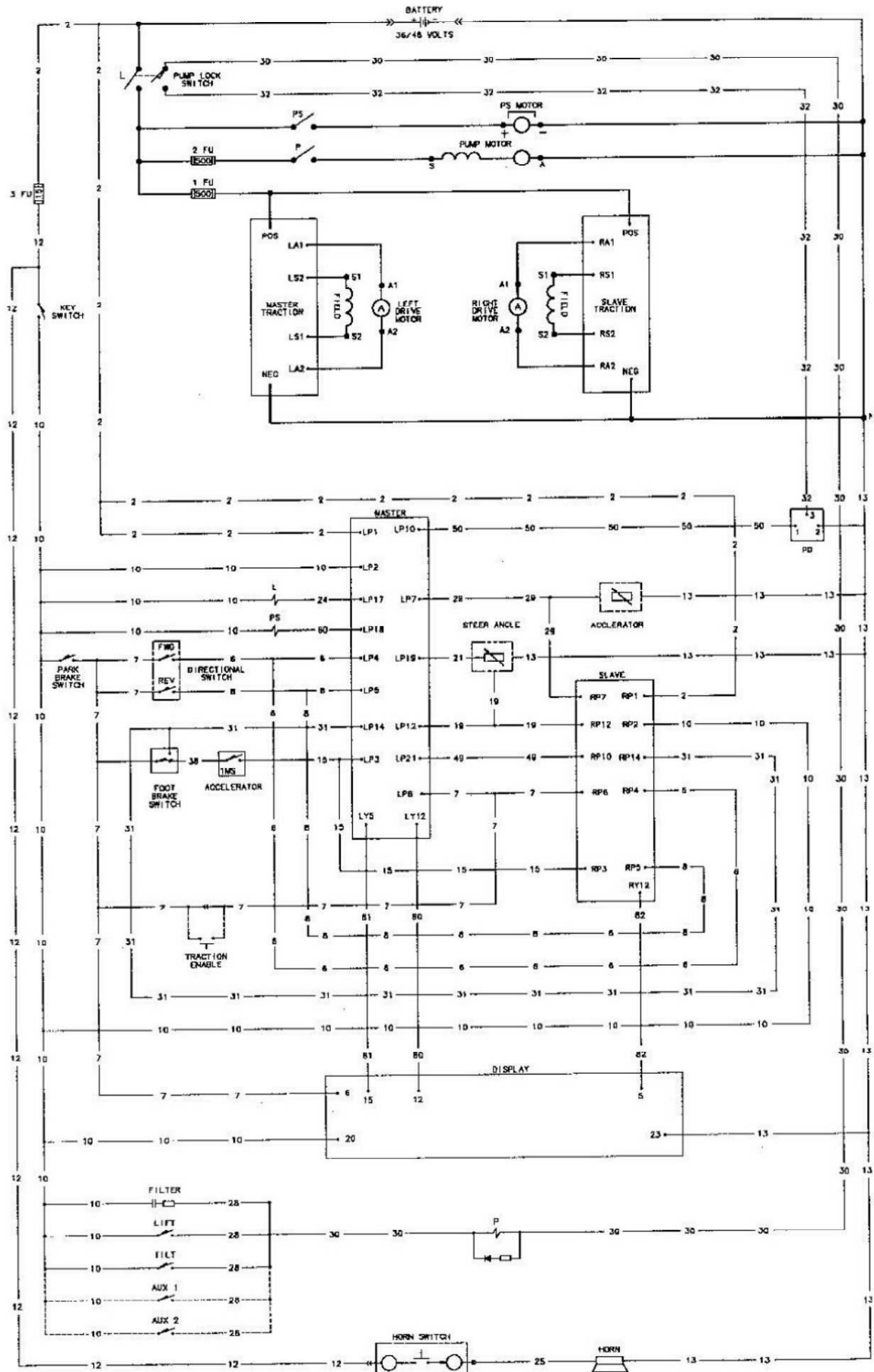
- F. If all the above SRO checks are satisfied, the CTS 450 control will send a signal to the dash display to show the battery state of charge.

NOTE

The battery state of charge is displayed as a 3 digit number changing as the battery is discharged. The battery symbol indicator will be on in this mode.

Voltages Present:

- A. Battery positive volts
- B. Battery positive volts
- C. Battery positive volts
- D. Battery positive volts
- E. See explanation 1 through 4 above
- F. Data signals, cannot be measured.



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