

ET202

Troubleshooting the EV 100 Control



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TECHNICAL TRAINING

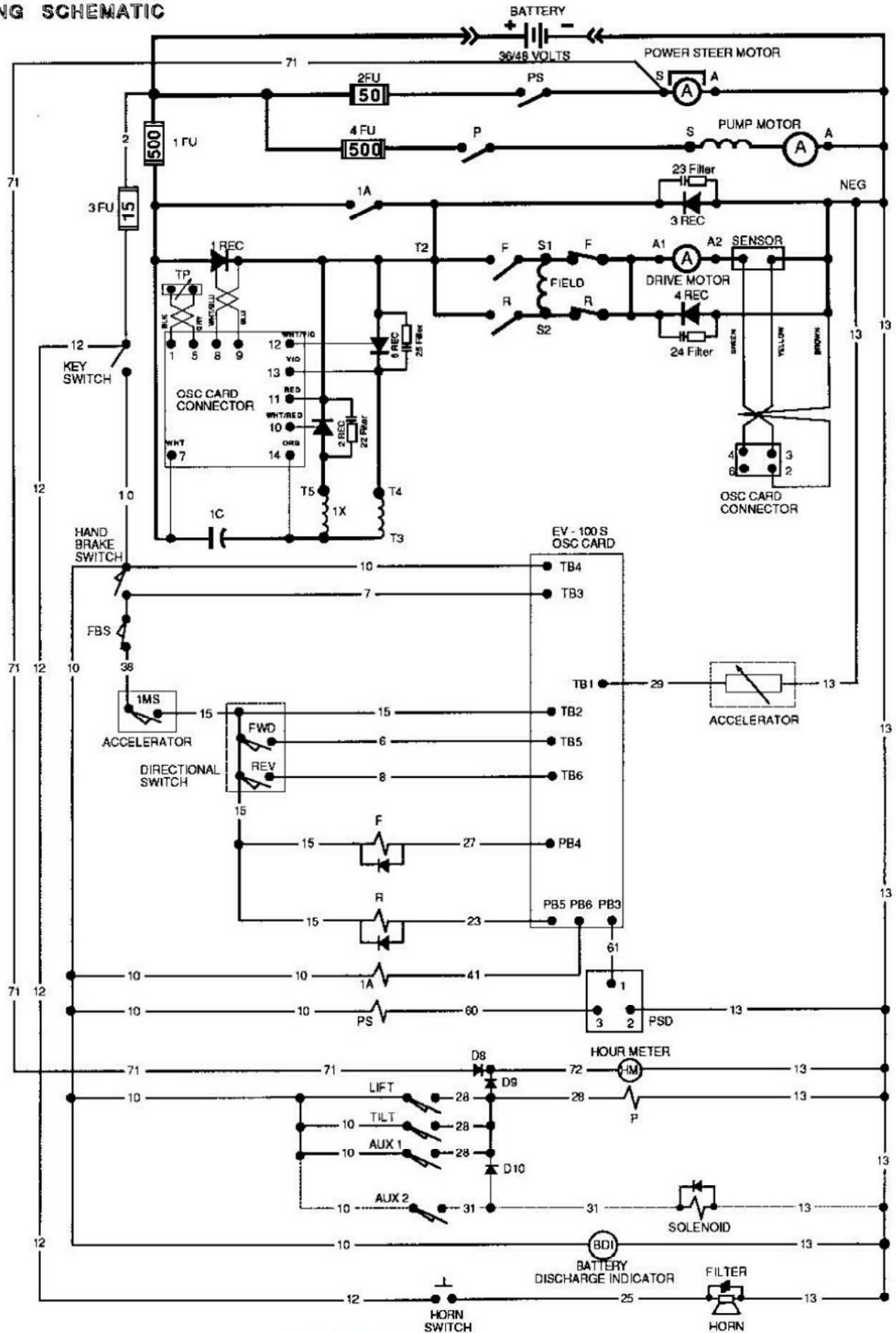
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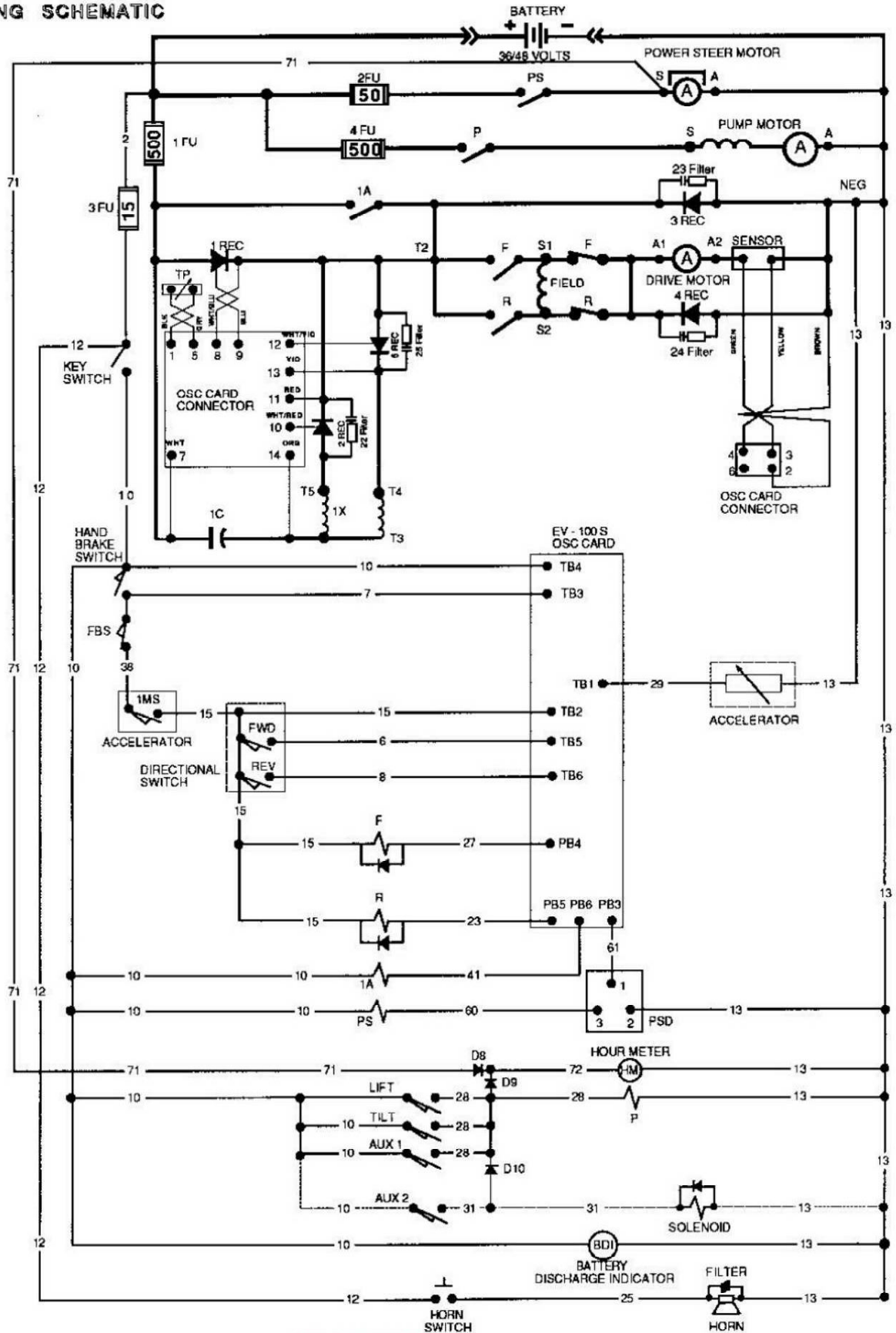
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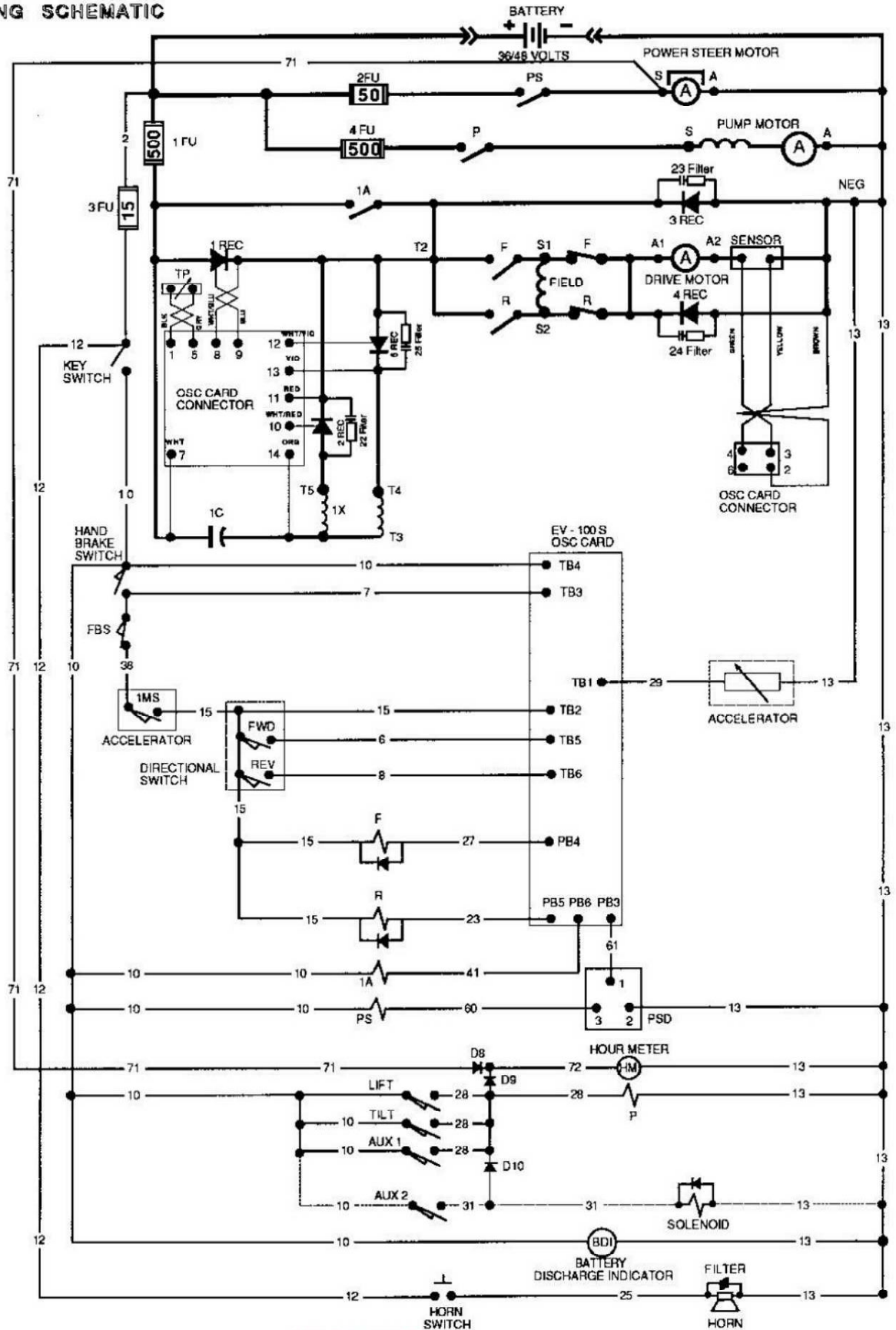
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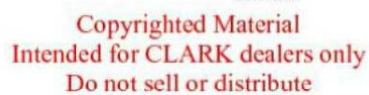
Sequence 4. Hour Meter, Power Steering Operation, and S.R.O.

After the key switch has been turned on, and with the hand brake released,

- A. The Hand Brake (HB) switch closes.
- B. Wire #7 applies voltage to the card at TB-3.
- C. Moving the directional switch to forward will close the forward switch.
- D. Closing the directional switch signals the oscillator card to supply a voltage signal from PB3 through wire #61 to terminal #1 of the Power Steering Driver (PSD).
- E. This signal turns on the PSD and the power steering coil is energized.
- F. The power steering contactor closes and the steer motor operates because current flows from battery positive through 2FU to the steer motor and to battery negative. (Note permanent magnet motor).
- G. The hour meter will now operate because battery positive is supplied through wire #71, blocking diode and wire #72 to the hour meter positive (see Note).
- H. SRO (Static Return to Off) explanation.
 - 1. The card monitors the sequence of voltage applied to TB-4, TB-3, TB-2, and TB-5 or TB-6.
 - 2. Directional contactors will not be allowed to close if the directional switch is closed before the key switch and/or Hand Brake Switch.
 - 3. This is done by the card sending voltage from TB-2 to the directional switch and sensing when the voltage returns to TB-5 (forward) or to TB-6 (reverse).
 - 4. The card also monitors the accelerator output voltage at terminal TB1. The card will not allow the directional contactors to close if the output voltage is below 2.5 volts at initial start-up.

Note The hour meter operates when either the power steering contactor is closed (which only operates when in either forward or reverse) or by the hydraulic control circuit.

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Sequence 5. Energizing the Directional Contactors

The directional control switch has been moved to a forward position in a previous sequence.

- A. The brake pedal must be released to close the brake switch points. The brake switch is provided to prevent operating the motor with the brakes applied, since this wastes energy and may overheat components.
- B. Depressing the accelerator pedal slightly will close the 1MS switch points.
- C. With all switches in the forward directional control circuits closed, battery positive will be applied to terminals TB-2 and TB-5 of the card. This voltage, coupled with the voltage from the key switch on terminals TB-3 and TB-4, causes the card to complete the circuit from terminal PB-4 to forward contactor coil negative.
- D. The forward contactor coil is energized.
- E. If #1 REC is shorted, or the 1A tips are stuck closed, the blue wire to the card plug pin 9 will be greater than 85% battery volts and the card will hold the contacts open (see Note).
- F. If the #3 Rec or the #23 Rec is shorted, the blue wire to the card plug pin 9 will be less than 25% battery volts and the card will hold the contactors open.
- G. If the accelerator output voltage at terminal TB1, wire #29, is below 2.5 volts before the directional switch is closed, the card will hold the contactors open.

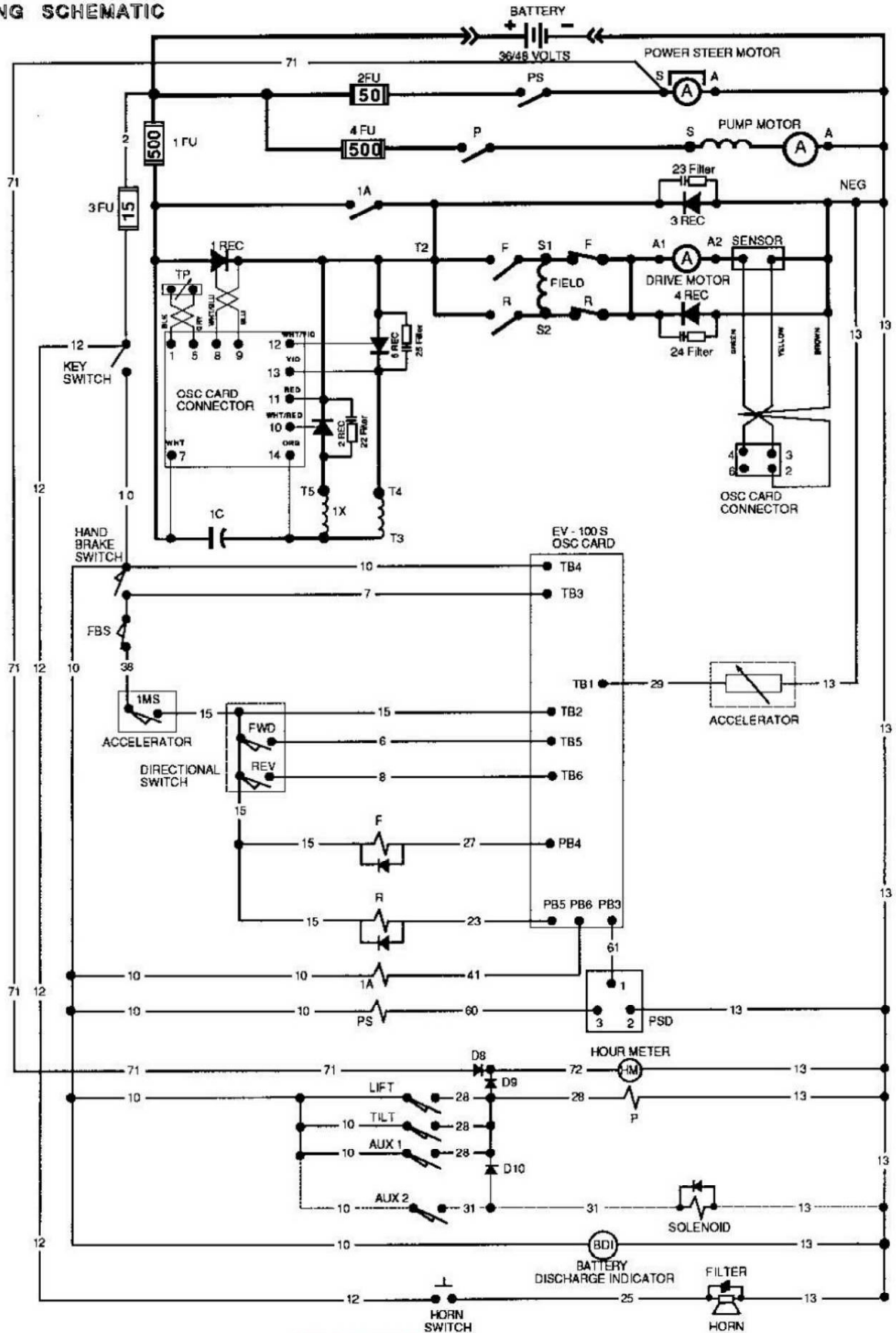
Voltages present:

- A. Battery volts
- B. Battery volts
- C. Battery volts on terminals TB-2 and TB-5
- D. 10-13 volts across the F coil
- G. Approximately 3.5 volts.

Note: Wires are twisted in pairs to aid in suppressing voltage spikes generated by all coil type components in the control system.

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Sequence 6. Contactor Closing and Capacitor Precharge

When the forward contactor coil is energized:

- A. The coil's magnetic fields pull the N. O. power contacts closed and open the N.C. power contacts.
- B. The card turns on the #2 REC by applying voltage to the white/red gate lead. The #2 REC red lead provides gate lead filtering and is gate current return path.
- C. Positive potential in the #2 REC anode side of the capacitor now conducts to negative. This leaves the capacitor 1C charged to battery volts.
- D. The card monitors the capacitor precharge. If card plug 14 (orange wire) does not drop to battery negative, the card will not turn on #1 REC. This would occur if the capacitor were open or shorted, or if #2 REC will not gate on or is open.

Voltages present:

- A. Not Applicable
- B. Not Applicable
- C. Battery volts across capacitor
- D. Battery negative.