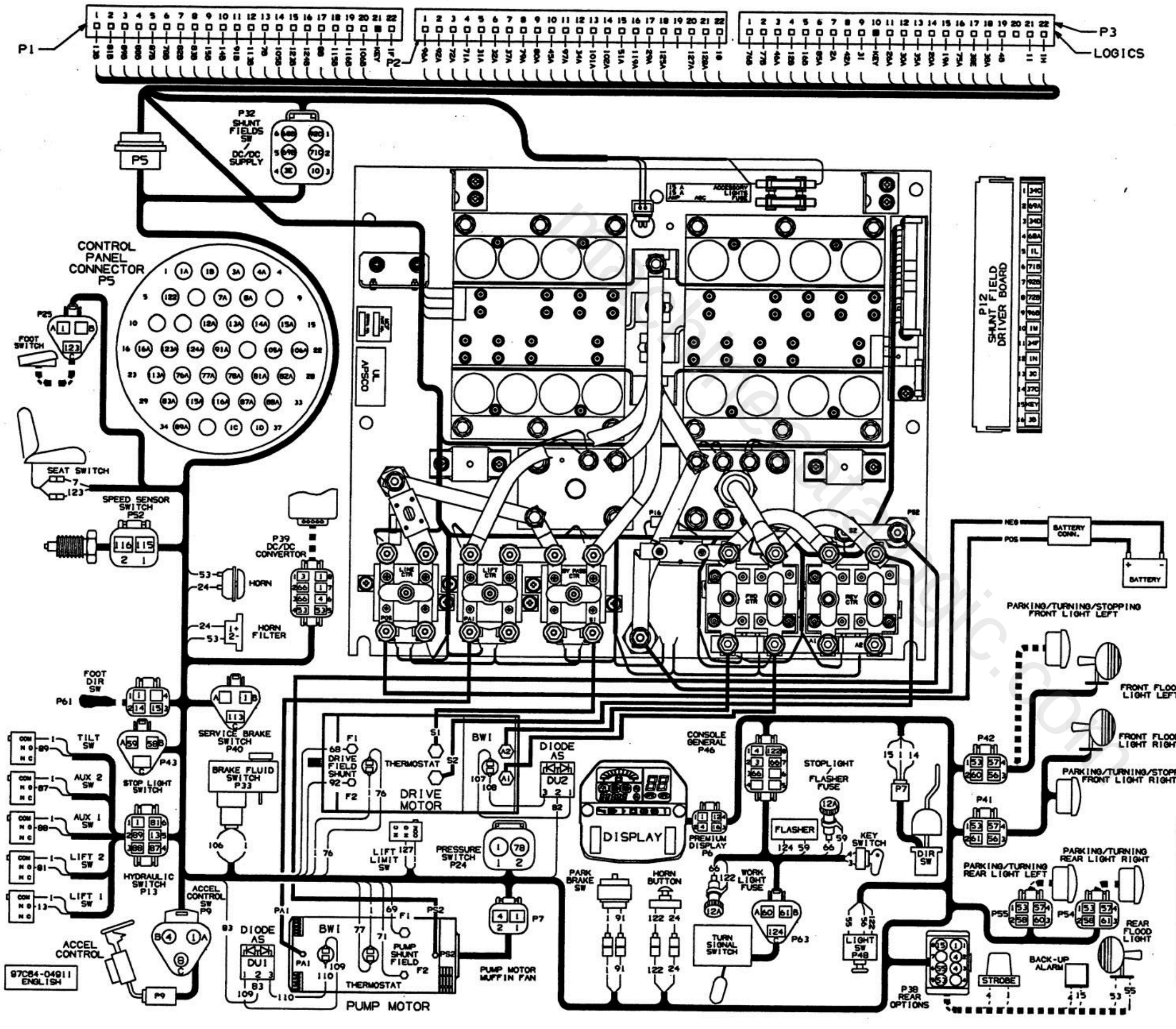
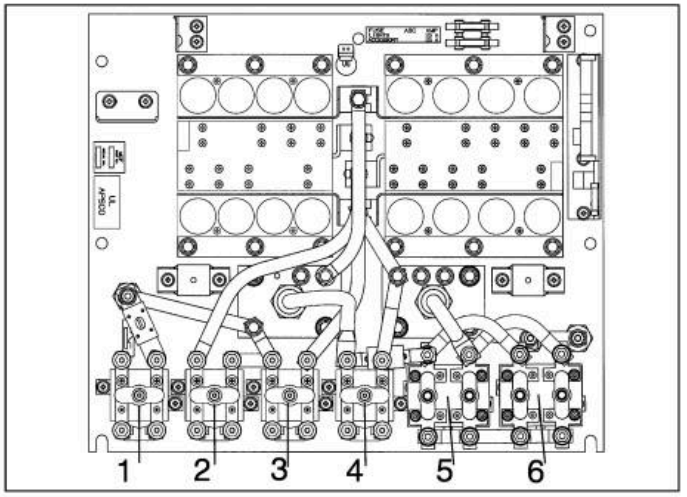


Schematic No.	Used for	Truck Model	Serial No.
97C64-04911	99759-60100	EP16 36/48v	E1EP1-62001-up
		EP16 72/80v	E1EP1-82001-up
		EP18 36/48v	E1EP1-72001-up
		EP18 72/80v	E1EP1-87001-up
		EP20 36/48v	E1EP2-62001-up
		EP20 72/80v	E1EP2-82001-up
		EP25 36/48v	E1EP2-72001-up
		EP25 72/80v	E1EP2-85001-up
		EP30 36/48v	E1EP3-62001-up
		EP30 72/80v	E1EP2-82001-up

Pub. No. 99759-60100

Tests “O” Through “T”

The remaining tests check contactor operation. You will toggle the DRS switch from DIAG to RUN to activate the contactor being tested, then toggle the switch back to DIAG to deactivate it. You must visually observe the contactors for proper operation during these tests.The seat switch must be closed for the contactor tests.



Contactor Locations. Panel with regen is shown. Plug-only panels will not have regen contactor (4).
(1) Line contactor (2) Pump bypass contactor
(3) Drive bypass contactor (4) Regen contactor
(5) Forward contactor (6) Reverse contactor

Test O: Line Contactor Circuit

Move the DRS switch to RUN.

Display = 12 and the line contactor (1) does not close. Circuit is defective.
See Troubleshooting Problem 50.

Display = 12 and line contactor (1) closes. Line contactor circuit OK.

Move the DRS switch to DIAG.

Display = 13 and the line contactor (1) opens.

Test P: Pump Bypass Contactor Circuit

Move the DRS switch to RUN.

Display = 13 and the pump bypass contactor (2) does not close. Circuit is defective.
See Troubleshooting Problem 50.

Display = 13 and pump bypass contactor (2) closes. Pump bypass contactor circuit OK.

Move the DRS switch to DIAG.

Display = 14 and the pump bypass contactor (2) opens.

Test Q: Drive Bypass Contactor Circuit

Move the DRS switch to RUN.

Display = 14 and the drive bypass contactor (3) does not close. Circuit is defective.
See Troubleshooting Problem 50.

Display = 14 and drive bypass contactor (3) closes. Drive bypass contactor circuit OK.

Move the DRS switch to DIAG.

Display = 15 and the drive bypass contactor (3) opens.

Test R: Regen Contactor Circuit

Move the DRS switch to RUN.

Display = 15 and the regen contactor (4) does not close. Circuit is defective.
See Troubleshooting Problem 50.

Display = 15 and regen contactor (4) closes. Regen contactor circuit OK.

Move the DRS switch to DIAG.

Display = 16 and the regen contactor (4) opens.

Test S: Forward Contactor Circuit

Move the DRS switch to RUN.

Display = 16 and the forward contactor (5) does not close. Circuit is defective.
See Troubleshooting Problem 50.

Display = 16 and forward contactor (5) closes. Forward contactor circuit OK.

Move the DRS switch to DIAG.

Display = 17 and the forward contactor (5) opens.

Test T: Reverse Contactor Circuit

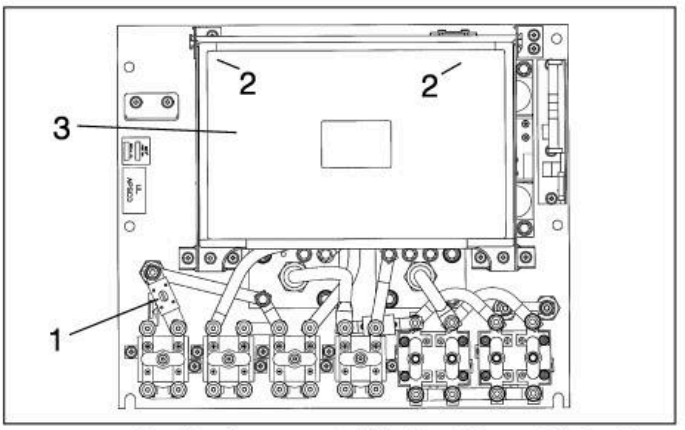
Move the DRS switch to RUN.

Display = 17 and the reverse contactor (6) does not close. Circuit is defective.
See Troubleshooting Problem 50.

Display = 17 and reverse contactor (6) closes. Reverse contactor circuit OK.

Move the DRS switch to DIAG.

Display = DONE and the reverse contactor opens.



Location of components: 1.Line Fuse 2.Screws 3.Logics Cover

This completes the self-diagnostics tests. The contactor tests may be repeated by moving the DRS switch to RUN and back to DIAG.

If you are finished with self diagnostics, do the following:

1. Turn off the truck.
2. Disconnect the battery and install the line fuse (1).
3. Move the DRS switch to the RUN position.
4. Install the logics cover (3) and tighten screws (2).

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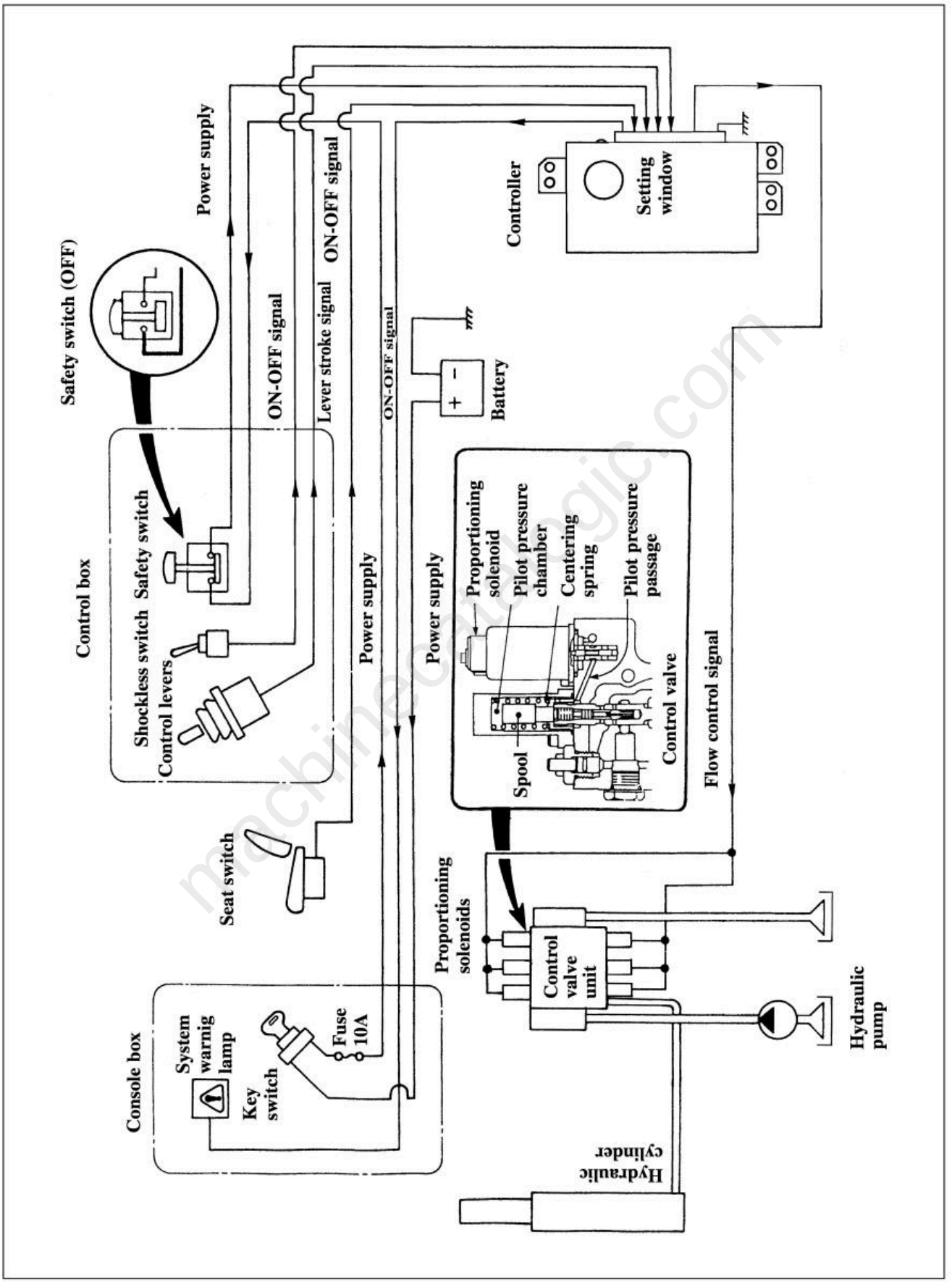
FINGER CONTROL SYSTEM



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PROBLEM 7

Over temperature indicator ON. Truck accelerator slower than normal. Bypass contactor will not close. Pump motor operation normal. E1 stored in fault code area.

POSSIBLE CAUSES

Traction motor overheated: traction motor thermal switch defect; open wiring; logics defect; display unit defect.

CHECKS

Allow truck to cool 15 minutes.

Over temperature Indicator Still ON

Check stored fault codes. Verify E1 is present.

E1

Measure the voltage at P3-1 (wire #76) on the logics board (silver area). Scrape coating off board if needed. Do NOT disconnect from logics.

High

Disconnect the battery. With the traction motor at close to room temperature, disconnect the thermal switch connector P8. Check continuity of thermal switch. Should have continuity below 69°C (156°F).

Continuity

Disconnect P3 from the logics unit. Check continuity from P3-1 to battery negative (wire #1).

Continuity

Find short to battery negative in the harness. Repair or replace wire.

No Continuity

Verify problem still exists.

No Continuity

Replace thermal switch.

Low

Replace display unit.

No E1

Replace display unit.

Display OK

Traction motor was overheated: resume normal operation. If condition repeats, check the following:

- Current limit calibration
- BDI calibration
- Operating cycle for excessive ramp climbing, towing, or pushing
- Brake drag, park brake adjustment
- Service brake interrupt switch operation.

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PROBLEM 32

Display = "60": (!) action light flashing: no lift truck operation. Line contactor closes then opens.

POSSIBLE CAUSES

Serial communications fault between display and logics.

CHECKS

Check the following wires for continuity. Also visually inspect their connections for burnt or discolored terminals, loose connections, smashed or compressed connectors, corrosion or foreign materials.

P3-4 to P6-4 (wire #12).
P3-5 to P6-3 (wire #16).
P6-2 to key switch (wire #4).
P6-1 to battery negative (wire #1).
P3-19 to key switch (wire #4).
P3-21, to battery negative (wire #1).

Checks OK

Check for short to battery negative (wire #1) in the following wires:
Wire #12.
Wire #16.
Wire #4.

Checks Not OK

Repair or replace open wires.

Checks OK

Connect a spare display unit to harness plug P6 and turn the key switch on.

Checks Not OK

Fix shorts.

Spare Display Functions Properly

Replace display.

Display = "60"

Replace logics.

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PROBLEM 56

Slow steering, but pump motor does turn. Drive and lift systems operation normal.

POSSIBLE CAUSES

Steering pressure switch defect: wiring defect: failed logics.

CHECKS

Check the battery, close the seat switch and key switch. Put the direction lever in forward. Disconnect pressure switch connector P24.

Pump Motor Speed Remains the Same

With P24 disconnected, check for a short circuit between P1-6 (silver area) and battery negative.

Not Shorted

Test the head capacitors of both traction and pump module.

Test OK

Replace logics.

Test Failed

Replace failed module or repair connections and wiring.

Shorted

Repair or replace faulty wiring.

Pump Motor Speed Increases

Replace the steering pressure switch.

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Plugging Circuit

When the speed of the truck slows to less than 2kph (1.2mph), the traction motor is no longer turning fast enough to generate enough current to charge the battery. The logics monitors this condition through the current sensor and reactivates the regen contactor. To prevent contactor tip arcing, the electrical braking of the truck is paused while the regen contactor tips close.

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Rapid Tune-Up Procedure

The rapid tune-up procedure establishes a starting point for logic card adjustments. The following procedure allows the truck to be operated for test purposes without damage to the truck or its components.

Always verify that the jumper on the logic board is in its proper position for the voltage of the lift truck being tuned.

J1 = 36V	J2 = 48V	J3 = 72V	J4 = 80V

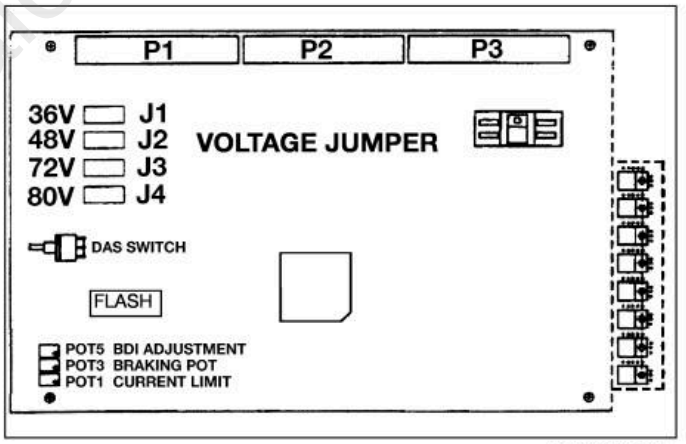
Service exchange logic boards do not need a rapid tune-up procedure. These boards are preadjusted from the factory and their programmable features are set to the default values. However, Option #52 must be programmed to the correct truck type and size. The current limit, electrical braking, and BDI should be checked and adjusted by certified technicians.

⚠ WARNING

The lift truck can move suddenly. Injury to personnel or damage to the lift truck is possible. Safely lift the drive wheels off the floor. Put blocks of wood under the frame so that both drive wheels are free to turn.

NOTE: *All programmable features should be set to their default values before making any adjustments. See the topic "Activating Default Settings" in the Systems Operation section of this manual.*

1. Turn current limit potentiometer P1 fully counterclockwise, then eight turns clockwise.
2. Turn electrical braking potentiometer P3 fully counterclockwise, then eight turns clockwise.
3. Make the final adjustments, as specified in each of the Testing and Adjusting Procedures, before putting the truck back into service. Perform these procedures in the following order.
   1. Current Limit-P1
   2. Electrical Braking-P3
   3. Battery Discharge Indicator (BDI)-P5



Logics Board

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Full Version Available

Caterpillar EP30 36-48V MCIII Forklift Electrical Schematic (99759-60100)

Caterpillar EP30 36-48V MCIII wiring schematic, covers circuit routing, connectors, and electrical diagnostics. Instant PDF download.

VIEW THE FULL MANUAL

https://machinecatalogic.com/caterpillar-ep30-36-48v-mciii-forklift-electrical-schematic-99759-60100/