FORM NO. SENB8558

FOR USE IN SERVICE MANUAL:
EP13T, EP15T, EP18T, EP20T LIFT TRUCKS
SENB8580 & SENB8585

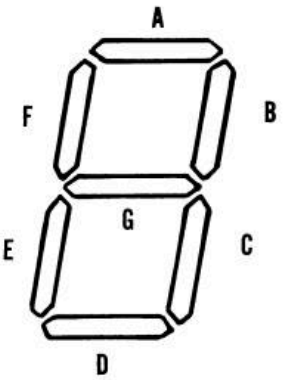
CATERPILLAR®

Specifications Systems Operation Testing & Adjusting

EP13T, EP15T, EP18T, EP20T Lift Trucks
MicroCommand Control System

2NM1-UP
4SM1-UP
5TM1-UP
6MM1-UP

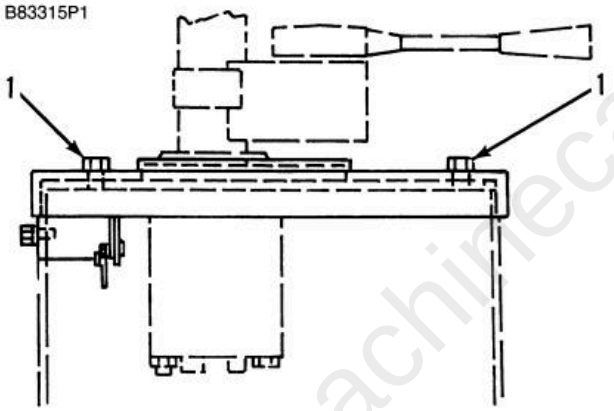
LED Display Layout



C25548P1

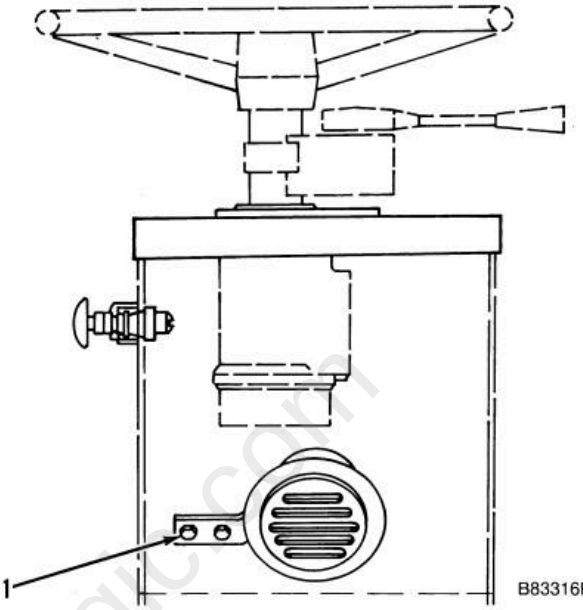
Instrument Panel

B83315P1



(1) Tighten screws that fasten the instrument panel to a torque of ..... 3 to 4 N•m (27 to 35 lb in)

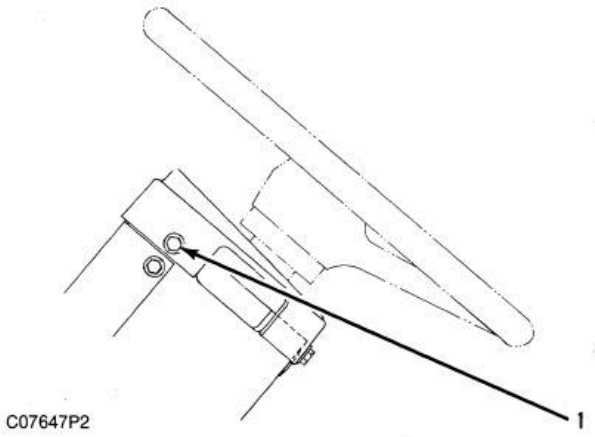
Horn



B83316P1

(1) Tighten screws to a torque of ..... 3 to 4 N•m (27 to 35 lb in)

Console



C07647P2

(1) Tighten bolts that fasten the cover to a torque of ..... 1.5 to 2.5 N•m (13 to 22 lb in)

Display = "C" Thermal Protection Circuit (Control Panel)

A normally close thermal switch is installed in the center of the positive heatsink (POS HS). If the power transistors and the heatsink get too hot, the thermal switch will open and cause the current limit to be reduced. The letter "C" will be displayed if the accelerator pedal is released or the direction lever placed in neutral. When the heatsink cools, the thermal switch closes and the lift truck returns to normal operation.

Display = "A" Steer Angle Sensor Defect

If a steer angle sensor defect is detected, the truck travel speed will be reduced to a constant creep range. This enables the operator to move to a service area and prevents high speed operation.

NOTE: The following two-digit fault codes appear by alternate display of the letter "F" and a second letter or number on the single-digit BDI indicator.

Display = "F0" Drive Motor Current

If current limit is maintained during transistor pulsing for longer than the time set in Programmable Feature 4, "F0" will be displayed. It can also occur if high currents are present in bypass operation for longer than the time set in Programmable Feature A. The current level in bypass cannot be changed, but both these features can be disabled if justified by the application.

Display = "Fr" "FL" or "F" Failure Protection Circuit

The Failure Protection Circuit guards against a condition that could cause the operator to lose control of the lift truck speed. If there is a short circuit in the drives, the logics will deactivate the line contactor and the contactor tips will open.

The microprocessor determines the difference between a right and a left side failure. Emitter wire 37 for the right transistor emitter and wire 41 for the left emitter are monitored, and if these are high voltage when they should be low, the appropriate fault code is displayed.

- Fr - right emitter, wire 37 high
- FL - left emitter, wire 41 high
- F - both right and left emitters, wires 37 and 41 high

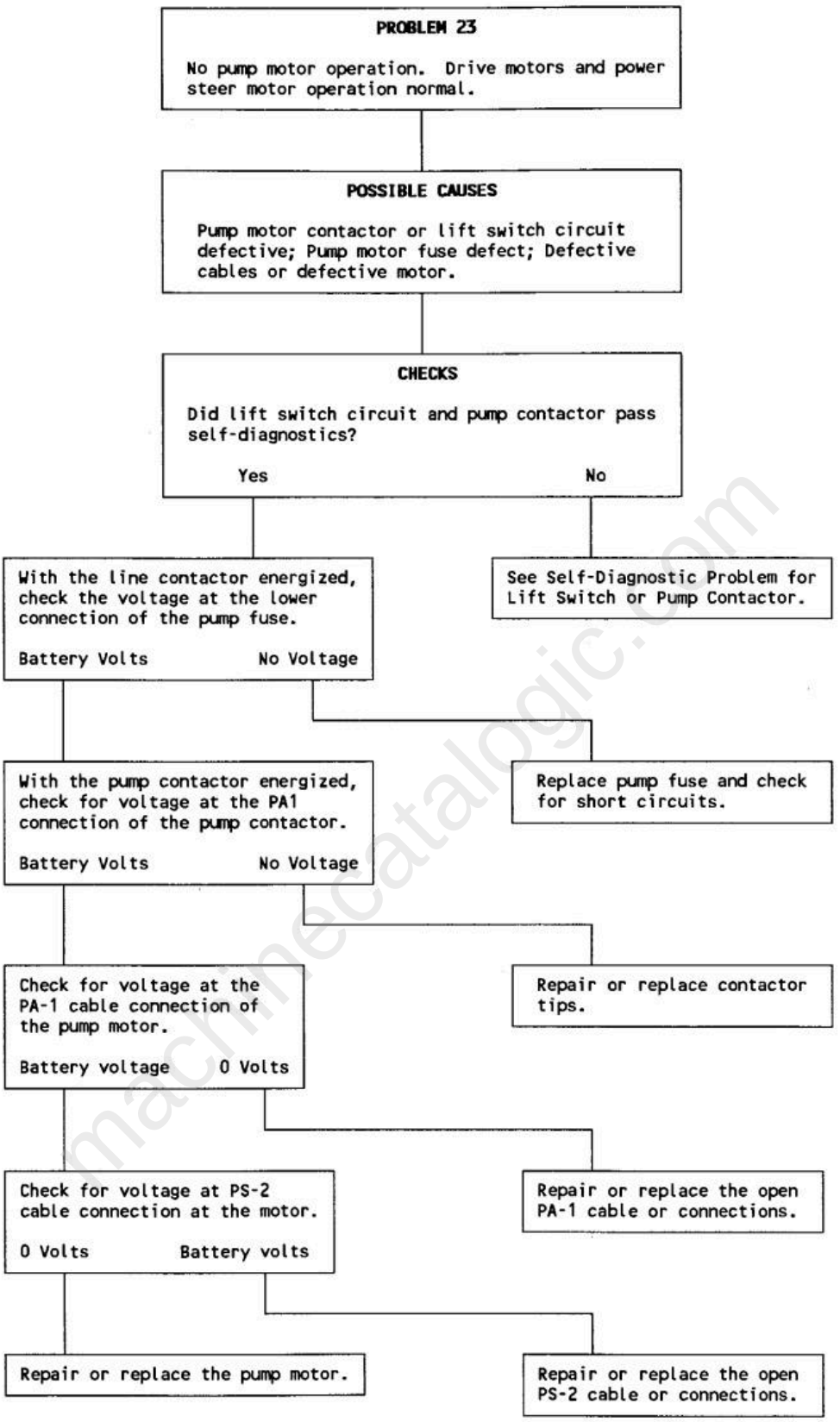
Display = "FE" Non-volatile Memory

If the non-volatile memory fails, "FE" will be displayed. Try reprogramming the logic card to the default settings. (See Activating Default Settings.) If the fault code reappears, the logic board must be replaced.

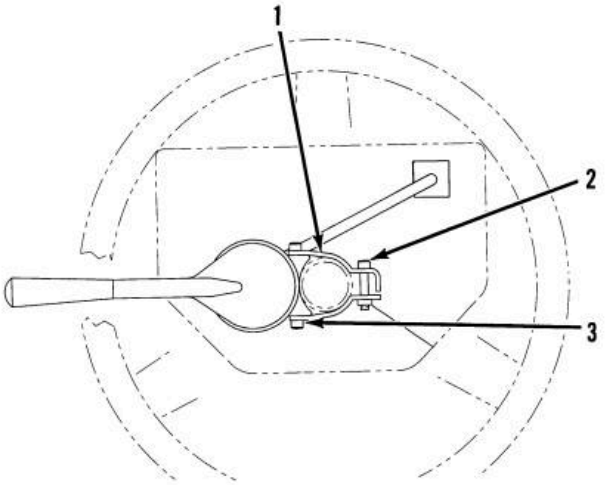
Chat Mode

If the seat switch is closed, key turned to ON and the direction lever is left in neutral with no other operator requests, the line contactor will deactivate after the time delay set in Programmable Feature 3. The delay may be set in 3-second increments between 3 and 27 seconds; or, 0 disables the timer. This is useful on trucks equipped with optional foot direction control, which when released always puts the truck in neutral, starting the chat timer immediately.

The truck will remain in chat mode until the operator activates the direction switch, accelerator pedal, or a control valve lever. The line contactor then reactivates.



Direction Switch



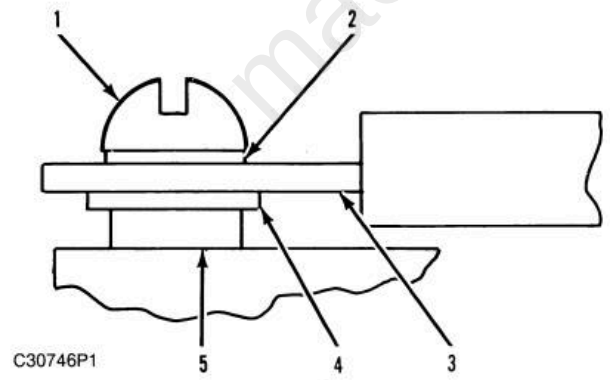
C23473P1

(1) Put a bead of 9S3263 Thread Lock on the inner radius of clamp before installation.

(2) Torque bolts that hold clamp to steering column to ..... 2.8 to 3.4 N•m (25 to 31 lb in)

(3) Torque bolts that hold clamp to switch to ..... 3.4 to 3.9 N•m (31 to 35 lb in)

Head Capacitor



NOTE: Proper torque and assembly of capacitor hardware is critical. Avoid disassembly unless capacitor has to be replaced.

(1) Tighten capacitor terminal screw to a torque of ..... 2.2 to 2.8 N•m (19 to 25 lb in)

(2) Spring washer 925805

(3) Ring terminal of wire assembly

(4) Lockwasher 8C7507

(5) Head Capacitor terminal

Thermal Switch

Contacts open at ..... 76 to 84°C (169 to 183°F)

Contacts close at ..... 64 to 72°C (147 to 162°F)

Contactors

Torque for nuts that hold contactor bridge assembly ..... 1.4 N•m (12 lb in)

Tip Clearance (Gap)

Line ..... 3.15 ± .10 mm (.124 ± .004 in)

Directional (left and right) ..... 2.62 ± .08 mm (.103 ± .003 in)

Bypass ..... 3.15 ± .10 mm (.124 ± .004 in)

Pump ..... 3.15 ± .10 mm (.124 ± .004 in)

Fuses

24 Volt Trucks

Pump ..... 500 A

Power Steering ..... 80 A

Logic ..... 10 A

Drive ..... 600 A

Horn ..... 3 A

36/48 Volt Trucks

Pump ..... 300 A

Power Steering ..... 60 A

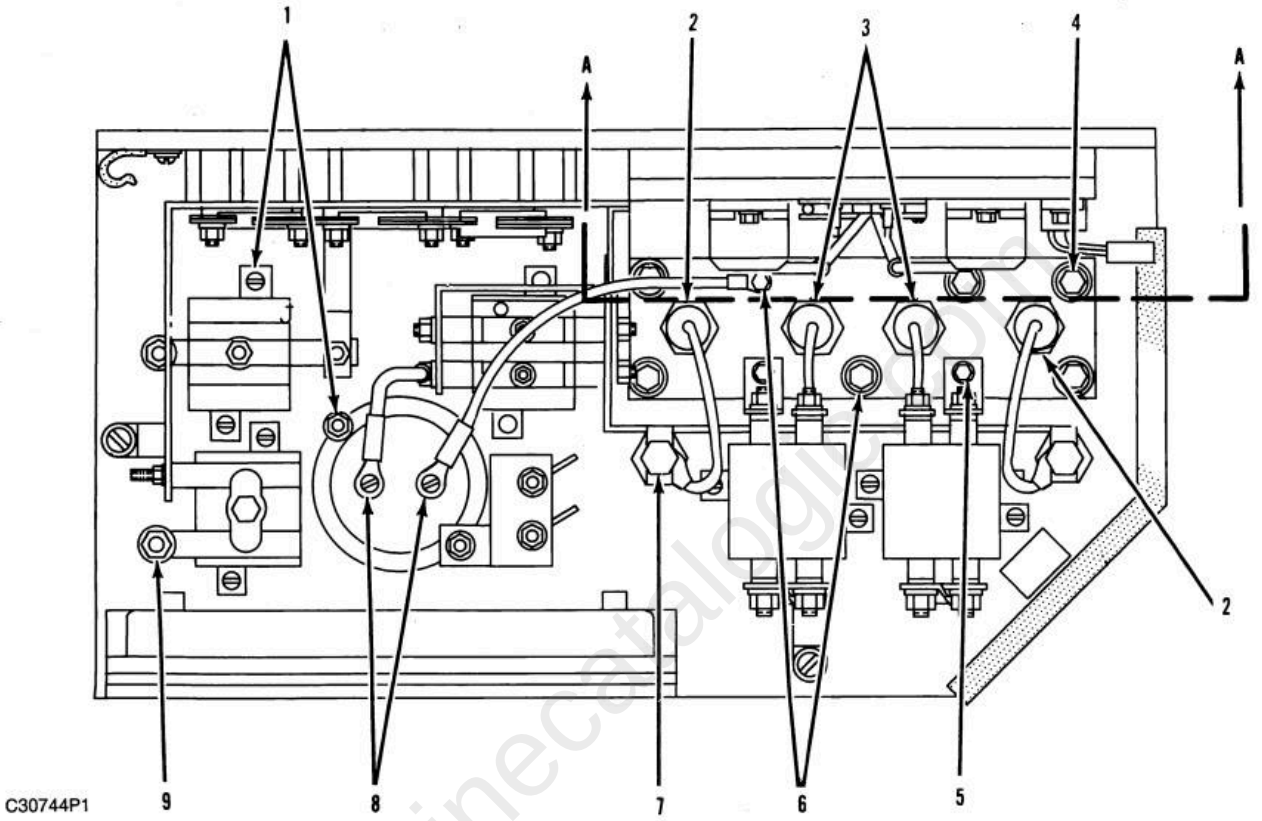
Logic ..... 10 A

Drive ..... 600 A

Horn ..... 3 A

Control Panel

Panels With 927566 Transistors



NOTE: Put a small amount of 5P8937 or 5P9210 Thermal Joint Compound on the surface of the transistor, diode or thermal switch that contacts the heatsink.

(1) Put 9S3263 Thread Lock on the threads of all screws that are used to fasten components on the control panel.

(2) Tighten 4 diode (left and right) to a torque of ..... 11.4 to 15.4 N•m (101 to 136 lb in)

(3) Tighten 5 diode (left and right) to a torque of ..... 11.4 to 15.4 N•m (101 to 136 lb in)

(4) Apply 9S3263 Thread Lock to the threads of the four bolts that hold the negative heatsink to the control panel. Tighten to a torque of ..... 5.5 to 9.5 N•m (49 to 84 lb in)

(5) Apply 9S3263 Thread Lock to the threads.

(6) Tighten bolts to a torque of ..... 4 to 6 N•m (35 to 55 lb in)

(7) Apply 9S3263 Thread Lock to the threads and tighten bolts to torque of ..... 3 to 4 N•m (27 to 35 lb in)

(8) Tighten Head Capacitor terminal screws to a torque of ..... 2.2 to 2.8 N•m (19 to 25 lb in)

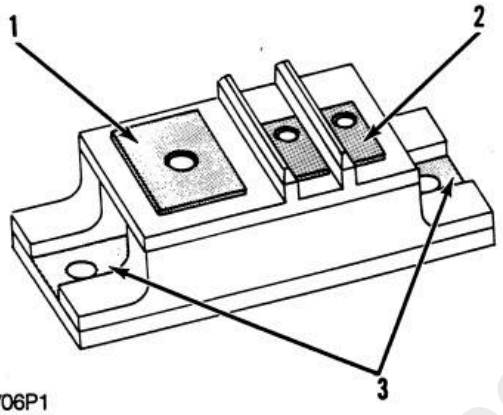
(9) Use a wrench (backup wrench) to hold bolts and tighten the nuts that fasten the cables or buss bars to the contactors to a torque of ..... 4 to 6 N•m (35 to 55 lb in)

Transistor Measurements

Specifications			
Multimeter Setting	**(+) Test Lead**	**(–) Test Lead**	**927566 Results**
Resistance	Emitter	Base	45 to 135 Ω
Diode	Base	Collector	.3 to .9V
Diode	Collector	Base	OL
Diode	Emitter	Collector	.3 to .9V
Diode	Collector	Emitter	OL

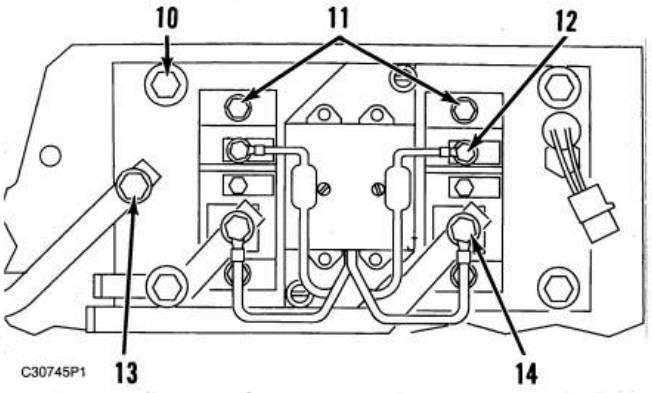
Transistor Connections

927566



C30706P1

(1) Emitter. (2) Base. (3) Collector.



View A-A

(10) Tighten bolts that hold the positive heatsink to the control panel to a torque of ..... 10 to 14 N•m (90 to 125 lb in)

(11) Tighten screws that fasten power transistors (1 TRN L, 1 TRN R) to positive heatsink to a torque of ..... 4 to 6 N•m (35 to 55 lb in)

(12) Tighten screws at power transistors (1 TRN L, 1 TRN R) base connections to a torque of ..... 1.3 to 1.7 N•m (11.5 to 15 lb in)

(13) Tighten the bolts that fasten the buss bars to the heatsink to a torque of ..... 3 to 4 N•m (27 to 35 lb in)

(14) Tighten the bolts that fasten the buss bars to the power transistors to a torque of ..... 4 to 6 N•m (35 to 55 lb in)

Full Version Available

Caterpillar EP15T 48V Forklift Service Manual (SENB8558)

Caterpillar EP15T 48V service manual, covers wiring, controller diagnostics, hydraulics, mast, and drive systems. Instant PDF download.