SP 3500 SERIES

AC Traction

MAINTENANCE MANUAL



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Event Codes

ACCESS Module Listing:

ACCESS 1: Display Control Module (DCM)

ACCESS 3: Traction Control Module (TCM)

ACCESS 4: Vehicle Control Module (VCM)

ACCESS 5: Steering Control Module (SCM)

ACCESS 6: Guidance Control Module (GCM)

Some Troubleshooting Basics

Statistically the majority of malfunctions occur in or at hardware components, contactors and motors. The next components to test are connectors, wiring and input devices such as switches, potentiometers or encoders. The last component to suspect is the motor control system. In all instances, you should begin your troubleshooting procedure at the driven device, proceed to inputs devices, then, and only then, move on to the control to which these devices attach.

WARNING

Never key "ON" truck with any control connectors disconnected. In addition, never remove or connect any control connectors while truck is keyed "ON".

When a Malfunction Occurs

- Go to the display and access the Level 2: Field Service Mode as follows.

NOTE

Your monitoring system can be accessed at three levels of authorization:
Level 1: Operator Mode
Level 2: Field Service Mode (Full Truck Operation)
Level 3: Analyzer/Test Mode (No Truck Operation)

This section deals with the Level 2 and Level 3. For information on Level 1 see the Operators Manual. Refer to ACCESS 1 2 3...System for display information.

No Event Code?

When the truck malfunctions and no event code is displayed it usually means the malfunction is not electrical.

If the truck powers up, but a code is not displayed, the malfunction is probably mechanical or hydraulic rather than electrical. Information regarding mechanical and hydraulic troubleshooting is located in the appropriate section in this Manual.

To Locate Malfunctioning Components

Component and Wiring Location Maps are provided at strategic locations to help you quickly determine the physical location of items in question.

All components are clearly marked at the connection points.

Test Points

Test points referenced in the event code descriptions are located on the distribution panel.

Power Cable Connections

CAUTION

Due to capacitance voltage present on the motor control panel, whenever performing maintenance which may permit contact with the bus bars and associated power cables, discharge capacitor on the traction control panel by placing a minimum 100 ohm, 2 watt resistor (062033-030) between positive (+) and negative (-) of capacitor for 3 or more seconds.

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TT Mast Column Roller Removal

Before starting the mast column roller removal for shimming, it is a good idea to review Shim Basics and Mast Testing portions of this chapter. To determine where shims are required on the mast, the mast must be fully extended and each column roller checked for proper tolerance. Refer to Shim Measurements (Tolerances).

The truck must be in an area with enough overhead clearance to fully extend the mast. Make lifting equipment connections to the top of the mast assembly. The equipment used to lift and move the mast assembly must be of sufficient capacity or size to safely handle the mast assembly. Lifting equipment such as hoists or other lift trucks with insufficient capacity may break or become unstable and an unsafe condition may arise, which must be prevented. The weight of the TT mast assembly is 1050 - 1850 kg (2350 - 4100 lb). Platform weight including forks is 500 - 750 kg (1100 - 1650 lb) Power unit weight including battery is 1650 - 1900 kg (3650 - 4130 lb).

WARNING

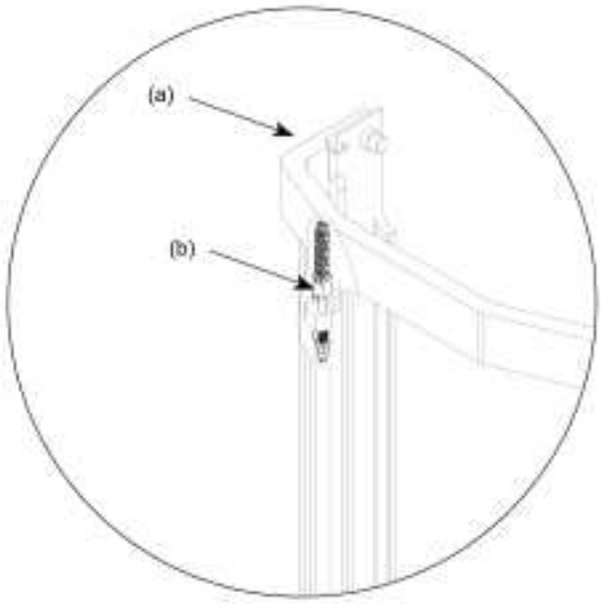
Wear appropriate protective items such as safety glasses, steel-toe shoes, etc. whenever performing maintenance work. To avoid injury, DO NOT place fingers, hands, arms or feet through mast or position them at pinch points. Make sure lifting device is sufficiently rated to lift various parts of the mast sections either individually or as a group. Make sure that the blocking material is strong enough to withstand the weight. Never work under or around a truck that is not securely blocked. Refer to Control of Hazardous Energy Lockout/Tagout chapter for lifting and blocking procedures.

Disconnect battery.

If necessary for repairs, remove platform. For platform removal and shimming procedures, refer to Platform and Control of Hazardous Energy Lockout/Tagout.

Using a lifting device, raise the load wheels 150 mm (6.0 in) and block each outrigger and power unit. Avoid wire guidance sensors under the power unit skirt edge if present on truck. Refer to Figure 10066-02.

Using a lifting device, raise the 3rd stage mast enough to loosen the lift chain anchored to the 3rd stage mast. Remove nuts from chain anchors at top of main frame. Remove chain anchors and secure to one side.



(a) Top of Main Frame
(b) Chain Anchor

Figure 17005-01

Remove control cable pulleys and free lift hose pulley on 2nd stage mast and secure to one side.

Lower 3rd stage mast to expose column rollers on the bottom of the 3rd stage mast and top of the 2nd stage mast.

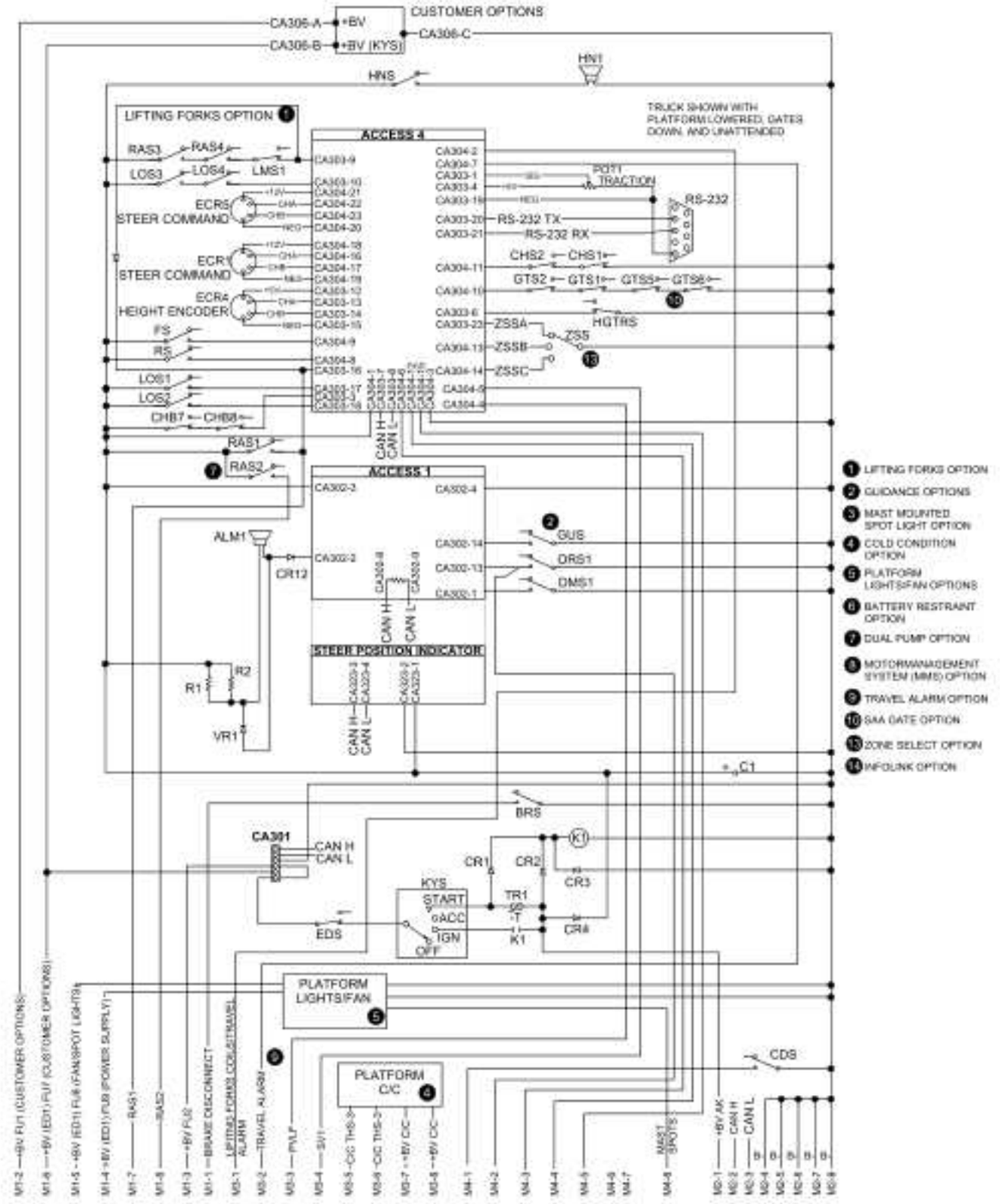
WARNING

When lowered, the platform will rest on top of the outriggers. Keep feet and hands clear when platform is being lowered.

Remove column rollers and note number of shims on each roller stud. Remove the column rollers carefully. Many times shims will cling to the back of the column roller and fall off after removal.

Remove screws securing top of the lift cylinders to the 2nd stage mast. Remove hydraulic hose guide on the lift cylinder and secure to one side. Loosen screws that secure bottom of the lift cylinders to the main frame. Refer to Figure 17006-01.

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