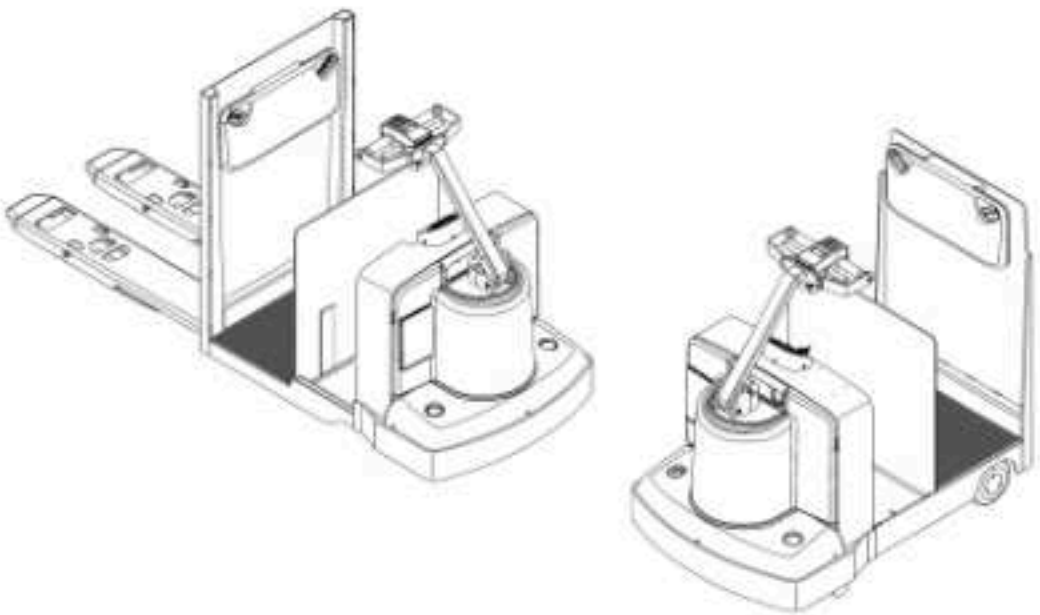
SERVICE MANUAL

C476 (T5ZAC, T7ZAC)



Rev. 07/14

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This section is for the following models:

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This section is for the following models:

(B60Z) [A230];
(W60Z) [A231];
(W65Z) [A229];
(B80Z) [A233];
(W80Z) [A234];
(T5Z) [A476];
(T7Z) [A477];
(C60Z) [A478];
(C80Z) [A479];
(T5ZAC) [B476];
(T7ZAC) [B477];
(C60ZAC) [B478];
(C80ZAC) [B479];
(W30-40ZA) [B453];
(W20-30ZR) [B455];
(W25-30-40ZC) [B454];
(B60ZAC) [B230];
(B80ZAC) [B233];
(B60ZHD) [A262];
(B80ZHD) [A257, B257*];
(B60ZHD, B80ZHD) [B262*];
(B60ZAC) [C230];
(T5ZAC, T7ZAC) [C476]

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Two different MDU designs are used:

Top Mount Handle

Bottom Mount Handle

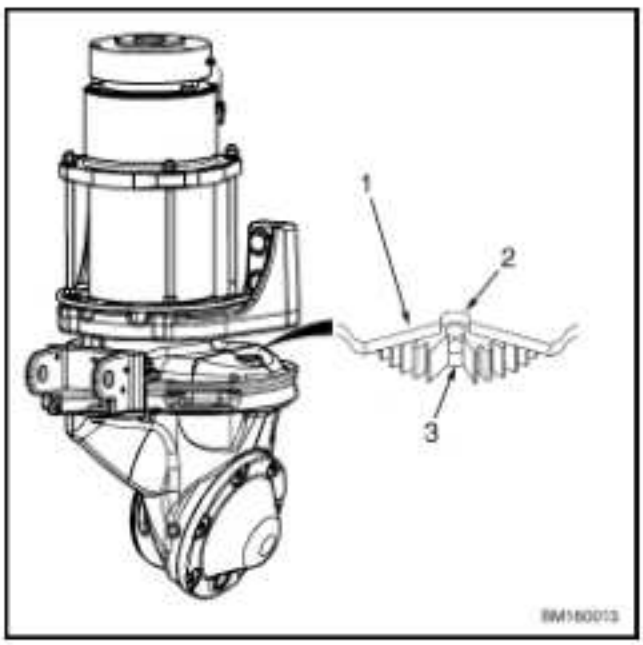
The MDUs for these trucks are the Carraro™ MDU115 and MDU150. These assemblies are available with three different gear ratios. Refer to Table 1. The highest ratio is 16:1 which will produce higher output speed with lower torque. The lowest ratio (25:1) produces lower output speed with higher torque.

Table 1. Drive Unit Specifications

Model	Gear Ratio	MDU
W60/65/80Z, W30/40ZA, W20/30ZR, W25/30/40ZC	25:1	Carraro™ MDU115
B80Z, T7Z, C80Z, $T7Z^{AC}$, $C80Z^{AC}$, $B80Z^{AC}$, $B80Z^{HD}$	17.8:1	Carraro™ MDU150
B60Z, T5Z, C60Z, $T5Z^{AC}$, $C60Z^{AC}$, $B60Z^{AC}$, $B60Z^{HD}$	16:1	Carraro™ MDU115

CHECK OIL LEVEL

1. Rotate the steering control handle until the oil fill plug is exposed.
2. Remove the oil fill plug.
3. Move the directional control knobs, turning the drive wheel slightly forward or backward until one of the gear holes lines up with the fill hole. Check the level of lubricant. There is enough lubricant in the MDU when the lubricant level is up to the bottom of the gear or halfway to the top of the gear. See Figure 4.
4. If the lubricant level is low, add additional lubricant. See the following section for your truck:
   - **Capacities and Specifications** 8000SRM1033 for unit codes A476, A477, A478, A479, B476, B477, B478, and B479
   - **Capacities and Specifications** 8000SRM0918 for unit codes A229, A230, A231, A233, and A234
   - **Capacities and Specifications** 8000SRM1299 for unit codes B230 and B233
   - **Capacities and Specifications** 8000SRM1028 for unit codes B453, B454, and B455
   - **Capacities and Specifications** 8000SRM1454 for unit codes A257 and A262
   - **Capacities and Specifications** 8000SRM1633 for unbit codes B257, C230, C476 and C477



1. MASTER DRIVE UNIT FRAME
2. OIL FILL HOLE
3. OIL LEVEL SHOULD BE AT THE BOTTOM EDGE OF GEAR OR HALFWAY UP.

Figure 4. Check Oil Level

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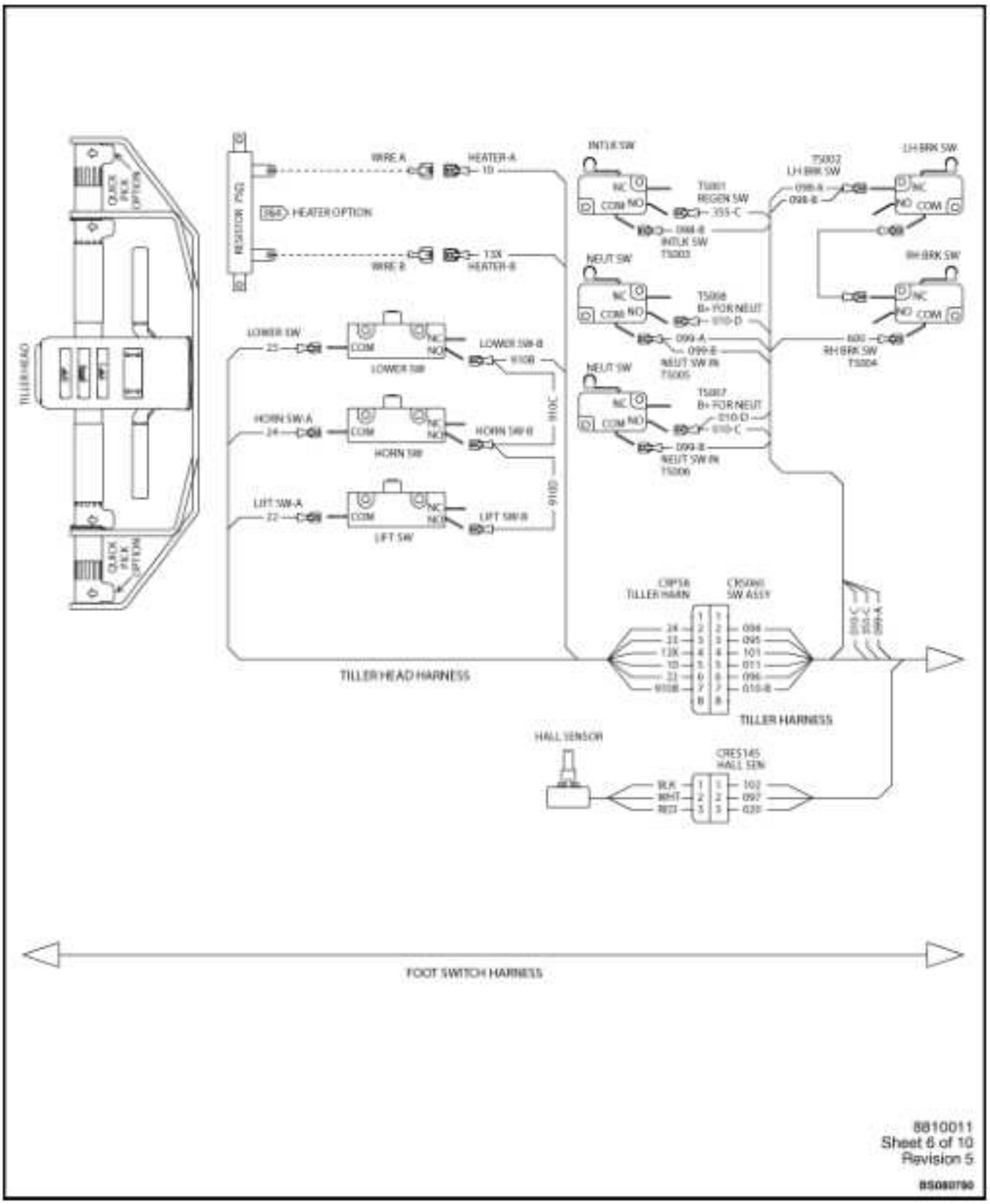


Figure 1. Schematic/Wiring (Sheet 6 of 10)

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How To Use This Troubleshooting Manual

GENERAL INSTRUCTIONS AND SAFETY INFORMATION

WARNING

DO NOT add to or modify the lift truck. Any modification that affects the safe operation of the truck cannot be undertaken without written authorization of the Hyster company.

Any change to the lift truck, the tires, or its equipment can change the lifting capacity. The lift truck must be rated as equipped and the nameplate must show the new rating capacity.

WARNING

The technician must be aware of, and follow, all general safety precautions that are published in the Operating Manual and that are posted as Safety Decals on and in the lift truck.

Before starting, the technician should be familiar with certain policies, requirements, and instructions used in the troubleshooting procedures. Using the troubleshooting procedures correctly helps the technician to perform the procedure safely and prevents damage to the machine and support equipment.

HOW TO USE DIAGNOSTIC TROUBLESHOOTING MANUAL

Manual Layout:

Section: This manual consists of one section which is further divided into groups.

- 9030 – Electrical System

Groups: The 9030 Electrical System is divided into two groups that identify specific electrical troubleshooting procedures.

- 03 – General Maintenance/Diagnostic Data
  The General Maintenance and Diagnostic Data group includes general troubleshooting, discharging the capacitors, basic electrical troubleshooting, multiplexing, User Iterface, and status codes and descriptions.
- 20 – Diagnostic Trouble Codes
  The Diagnostic Trouble Codes group includes all troubleshooting procedures for status codes reported by a given Node or system.

For a listing of all Diagnostic Trouble Codes and descriptions, see the Status Codes and Descriptions section of this manual.

GENERAL INSTRUCTIONS

1. Become familiar with the content, layout, and access provisions of data in this manual. This will improve your efficiency and decrease the time required to resolve the problems.
2. Once you begin a troubleshooting procedure, do not skip steps.
3. If you reach the end of a procedure without resolving the problem and you are not directed to another procedure contact Resident Service Engineering through the Contact Management System.
4. Do not limit yourself, remember to apply your own experience and knowledge to assist in resolving the problems, but do not compromise safety in doing so.
5. Most of the cross-reference data in the manual will be electronically linked for rapid and easy access. Use the links wherever the cursor highlights an item as a linkable option.

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DTC 32085
Combi - Key input - Voltage Low

POSSIBLE CAUSE

A. KEY INPUT WIRING FAULT

B. FAULTY COMBINATION CONTROLLER

NOTE

Please refer to the end of this procedure for supporting diagrams.

COMPONENT OPERATIONAL CHECK

NOTE: Always check battery condition and state of charge before performing electrical troubleshooting. A faulty or low charged battery will cause electrical features to not operate as designed and give incorrect readings while performing electrical tests.

PROCEDURE OR ACTION:

1. Conduct a visual inspection of all connectors/wiring associated with the fault code.
   Are any faults detected/observed?
   YES: Repair/replace connector or wiring associated with faults found. Refer to the appropriate **Electrical System** SRM.
   NO: Proceed to Step 2.
2. Re-key the vehicle.
   Is the code still present?
   YES: Proceed to Step 3.
   NO: Problem may be intermittent.
3. Locate input diagnostics (D2.32) and view key input voltages (D2.32.11, D2.32.13) to verify actual key voltage and minimum captured key voltage.
   Is key input voltage currently below 24 ± 2.5 Vdc?
   YES: Check battery state of charge and proceed to Cause A.
   NO: If battery is fully charged and code returns, proceed to Cause B.

CAUSE A - KEY INPUT WIRING FAULT

PROCEDURE OR ACTION:

NOTE: Perform Step 1 with key in ON position.

1. Disconnect the Combination controller connector CPS005 and measure voltage between socket 10 and B(-).
   Is voltage 24 ± 2.5 Vdc?
   YES: Proceed to Cause B.
   NO: Inspect circuit 010-C for open, short, or source of excessive resistance.

CAUSE B - FAULTY COMBINATION CONTROLLER

PROCEDURE OR ACTION:

1. If no faults are found, replace controller. Make sure to indicate the DTC code(s) on the warranty claim to include an accurate problem description leading to controller replacement.

END POSSIBLE CAUSES

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DTC xx109
CANBus Communications - Display

POSSIBLE CAUSE

A. CANBUS COMMUNICATION FAULT
B. DISPLAY WIRING FAULT
C. FAULTY DISPLAY

NOTE

Please refer to the end of this procedure for supporting diagrams.

COMPONENT OPERATIONAL CHECK

NOTE: Always check battery condition and state of charge before performing electrical troubleshooting. A faulty or low charged battery will cause electrical features to not operate as designed and give incorrect readings while performing electrical tests.

PROCEDURE OR ACTION:

1. Conduct a visual inspection of all connectors/wiring associated with the fault code.
   Are any faults detected/observed?
   YES: Repair/replace connector or wiring associated with faults found. Refer to the appropriate **Electrical System** SRM.
   NO: Proceed to Step 2.
2. Re-key the vehicle.
   Is the code still present?
   YES: If display diagnostic menu is operational, proceed to Step 3. If display is inoperative, proceed to Cause A.
   NO: Problem may be intermittent.
3. Using input diagnostics (D2.10), determine if other nodes are offline.
   Are other nodes offline?
   YES: Verify CAN HI and CAN LO voltages of offline node(s).
   NO: Proceed to Cause A.

CAUSE A - CANBUS COMMUNICATION FAULT

PROCEDURE OR ACTION:

NOTE: Perform Step 1 and Step 2 with key in ON position.

1. Disconnect the display connector CRS060 and measure voltage between socket 3 and B(-).
   Is CAN HI voltage approximately 2.5 Vdc?
   YES: Proceed to Step 2.
   NO: Inspect CAN HI circuit for open or short. If voltage is 0 volts, the CAN HI circuit is shorted to ground or open. If voltage is above 5 volts, the CAN HI circuit is shorted to power.
2. Measure voltage between the display connector CRS060, socket 4 and B(-).
   Is CAN LO voltage approximately 2.5 Vdc?
   YES: Disconnect battery and proceed to Step 3.
   NO: Inspect CAN LO circuit for open or short. If voltage is 0 volts, the CAN LO circuit is shorted to ground or open. If voltage is above 5 volts, the CAN LO circuit is shorted to power.
3. Measure resistance between the display connector CRS060, socket 3 and socket 4.
   Is resistance 60 ± 6 ohms?
   YES: No communication faults are present, connect battery and proceed to Cause B.

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