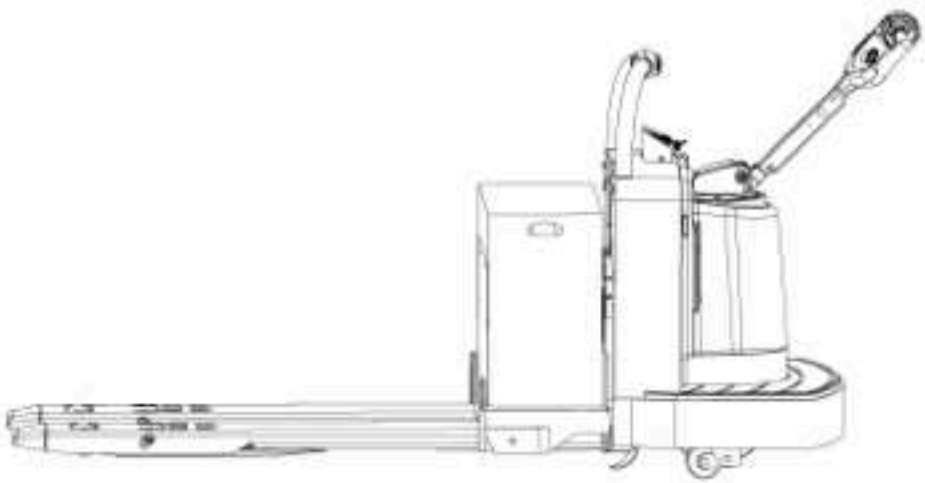
SERVICE MANUAL

B257 (B60ZHD, B80ZHD)



Rev. 07/14

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TABLE OF CONTENTS

General 1
Lead-Acid Batteries 1
Specific Gravity 2
Chemical Reaction in a Cell 3
Electrical Terms 4
Battery Selection 5
Battery Voltage 6
Battery as a Counterweight 6
Battery Ratings 7
  Kilowatt-Hours 7
Battery Maintenance 7
  Safety Procedures 7
  Maintenance Records 8
  New Battery 8
  Cleaning Battery 8
  Adding Water to Battery 10
  Hydrometer 11
  Battery Temperature 12
  Charging Battery 12
    Types of Battery Charges 13
    Methods of Charging 14
    Troubleshooting Charger 15
    Knowing When Battery Is Fully Charged 15
  Where to Charge Batteries 16
    Equipment Needed 16
  Battery Connectors 16
  Battery Care 16

This section is for the following models:

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TABLE OF CONTENTS

General 1
Threaded Fasteners 1
Nomenclature, Threads 1
Strength Identification 2
Cotter (Split) Pins 2
Fastener Torque Tables 7
Conversion Table 9

This section is for the following models:

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TABLE OF CONTENTS

Safety Precautions 1
General 3
Check Oil Level 4
Change Gear Oil (T5-7ZAC, B60-80ZAC, C60-80ZAC and B60-80ZHD 5
Drive Tire 5
Remove 5
Install 5
Master Drive Unit 5
Remove 5
Install 12
Troubleshooting 13

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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Special Precautions

DISCHARGING THE CAPACITORS

WARNING

The capacitor in the transistor controller can hold an electrical charge after the battery is disconnected. To prevent electrical shock and personal injury, discharge the capacitor before inspecting or repairing any component. Wear safety glasses. Make certain the battery has been disconnected. DO NOT use a screwdriver to discharge the traction motor controller.

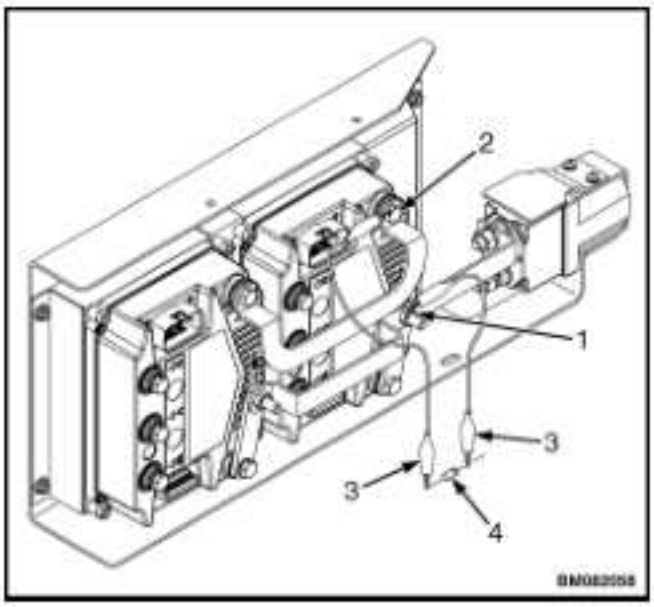
WARNING

To avoid personal injury and prevent electrical shock, perform the following steps before performing any troubleshooting or adjustments, and connecting or disconnecting a handset or PC.

CAUTION

To avoid controller damage, always disconnect the battery. Discharge the capacitor and never put power to the controller with any power wire disconnected. Never short any controller terminal or motor terminal to battery. Make sure to use proper procedures when servicing the controller.

1. Turn the key switch to the **OFF** position and disconnect the battery.
2. Remove the electrical compartment cover for access to the traction motor controller. Remove the capscrews retaining the cover to the frame.
3. Discharge the capacitors in the controllers by connecting a 200-ohm, 2-watt resistor across the controller's B+ and B− terminals using insulated jumper wires. See Figure 1. **DO NOT** short across the motor controller terminals with a screwdriver or jumper wire. Remove the 200-ohm, 2-watt resistor before reconnecting the battery.



1. NEGATIVE CONNECTION
2. POSITIVE CONNECTION
3. INSULATED JUMPER WIRES
4. 200-OHM, 2-WATT RESISTOR

Figure 1. Discharging the Capacitors

Traction Motor Repair

REMOVE

WARNING

Capacitors inside the controllers can hold an electrical charge after the battery is disconnected. discharge the capacitors before servicing the electrical system to prevent injury or electronic damage.

WARNING

The AC traction motor is heavy. To prevent injury, use a lifting device of adequate capacity for lifting the assembly.

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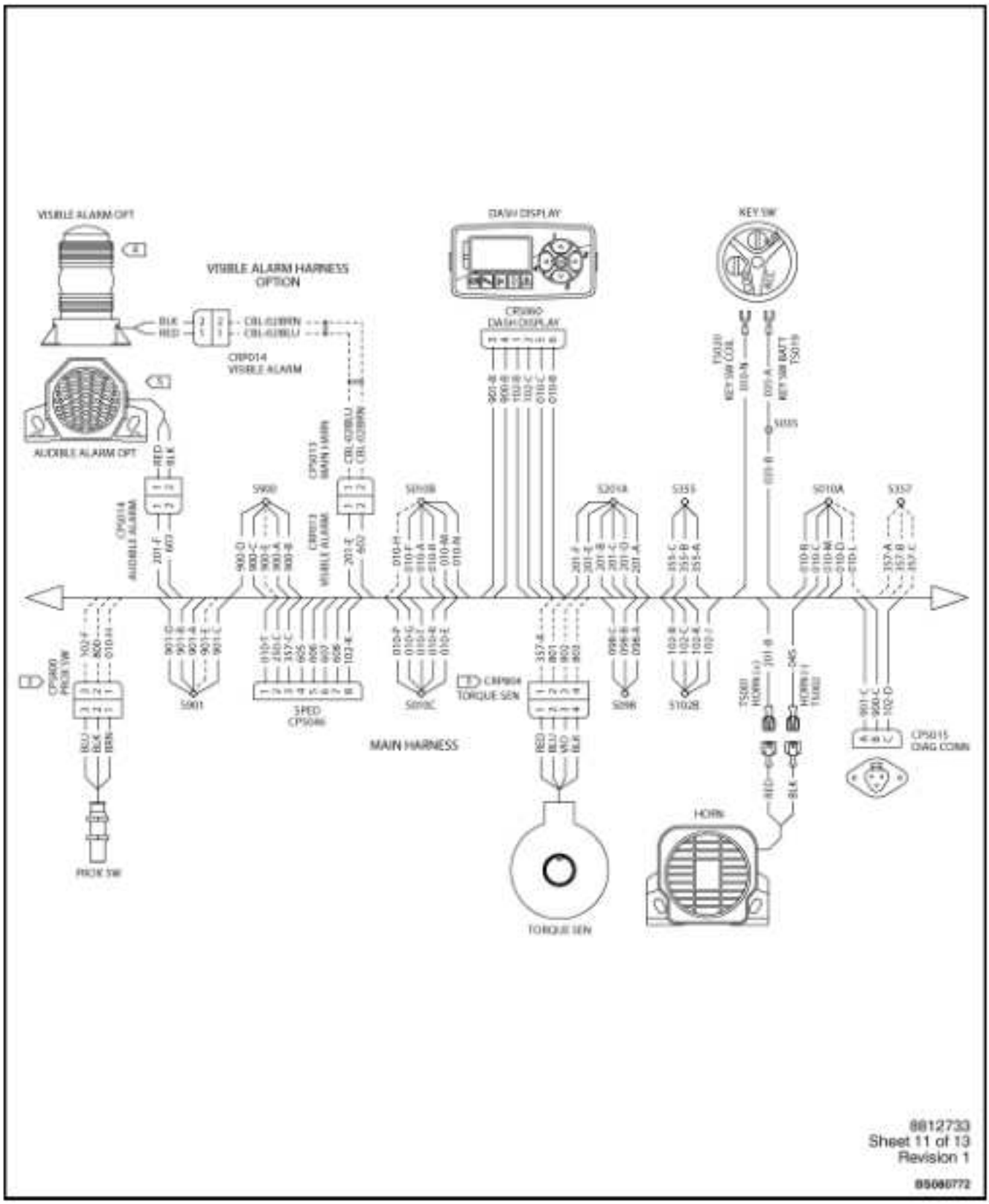


Figure 1. Schematic/Wiring (Sheet 11 of 13)

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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 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: Ensure key is in ON position when performing this test.

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-A 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.

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