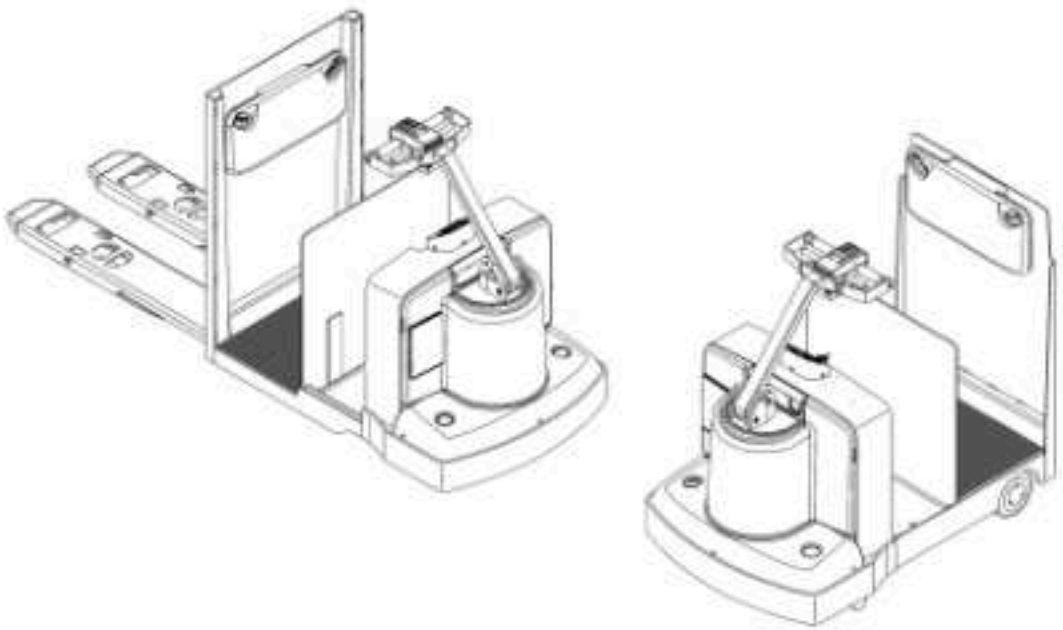
SERVICE MANUAL

A282 (C60ZHD, C80ZHD)



Rev. 07/14

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This section is for the following models:

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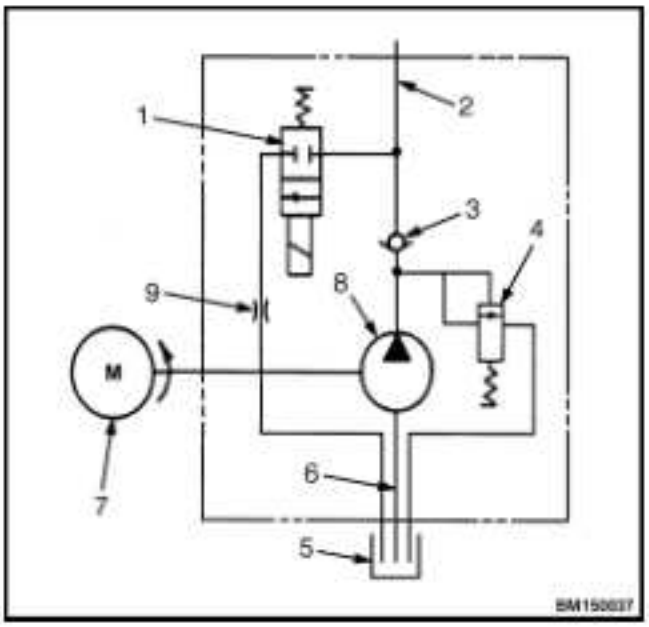
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This section is for the following models:

(N30ZDR2, N35-40ZR2) [E470];
(N30ZDRS2, N35-40ZRS2) [B265];
(N35ZDR2, N45ZR2) [D264];
(R30XMF3) [A169];
(R30XMA3) [A185];
(R30XMS3) [E174];
(R30XM3) [H118];
(B60ZHD) [B262];
(B80ZHD) [B257];
(C60ZHD) [A373];
(C80ZHD) [A282];
(T5ZAC, T7ZAC) [C477];
(BE80ZHD, BE100ZHD) [A244]

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1. LOWERING SOLENOID VALVE
2. TO LIFT CYLINDER
3. CHECK VALVE
4. RELIEF VALVE
5. RESERVOIR
6. INLET LINE
7. PUMP MOTOR
8. LIFT PUMP
9. ORIFICE

Figure 1. Lift Pump and Motor Assembly Schematic

The lift cylinder rod extends to operate the lift linkages to raise the forks.

The connecting hoses and tubing connect the various hydraulic components in the lift truck to complete the hydraulic circuit. See Figure 2.

LIFTING A LOAD

To raise a load, the lift button must be depressed. Depressing this button will activate the lift pump motor. Torque is transferred to the pump from the motor through the motor shaft and the coupling.

Hydraulic oil is pumped through the system as the pump begins to operate. Atmospheric pressure forces oil into the low pressure area at the pump inlet. Air, which is drawn into the reservoir through the breather, displaces the pumped oil, allowing oil to be sent through the system. See Figure 1.

As oil is displaced by the pump, it passes through a one-way check valve to the lift cylinder. The check valve prevents oil from flowing back to the pump when lifting ceases, which holds the lift cylinder in the raised position until lowered.

The piston will begin to lift the load when fluid pressure acting against it is high enough to overcome the weight of the load.

When the piston is fully extended to the end of its stroke or if the load is too heavy, pressure will continue to build until the rated pressure needed to operate the relief valve is reached. When this occurs, the relief valve, which is normally closed, is forced back against its spring, creating a path for the fluid to flow back to the reservoir.

When relief pressure is reached, hydraulic oil will continue to be diverted from the relief valve to the reservoir until the lift button is released, controller time-out is reached, or electrical power is interrupted.

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Table 1. Voltage Checks

LIFT TRUCK WILL NOT MOVE IN EITHER DIRECTION.
NO FAULT IS DISPLAYED ON THE CONTROLLER.

Possible Causes:

1. Battery not connected.
2. Control fuse is damaged.
3. Key switch or brake switch is damaged.
4. Transistor controller connector unplugged.
5. Transistor controller is damaged.

1.0 Check for battery voltage on the battery side of control fuse.	1.01 Battery voltage at control fuse. Check for open control fuse.
	1.02 No battery voltage at control fuse. Connect battery or check wiring between battery and fuse.
1.1 Check for battery voltage at control fuse terminal of key switch.	1.1.1 Battery voltage at key switch. Check for damaged key switch. Check connector.
	1.1.2 No voltage at key switch. Wire to key switch or connections is damaged.
1.3 Key switch closed. Brake switch closed. Check for battery voltage at B+ terminal of transistor controller.	1.3.1 Battery voltage at B+ terminal. Check fault code. If no fault code, possible damaged control handle card.
	1.3.2 No voltage at B+ terminal. Check B- terminal. Check fault code.

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Master Drive Unit Specifications

Model	Motor Power	Gear Ratio	Capacity	Oil Specification
	4.0 kW (5.36 hp)	16:1	1.7 liter (1.8 qt)	Gear Oil
	4.0 kW (5.36 hp)	18:1	2.2 liter (2.4 qt)	Gear Oil

Gear Oils

Operating Condition	Standard/CS/Freezer/Food Processing	Arctic
SAE Grade	80W-90	75W-90
Type	Multipurpose EP	Multipurpose EP
Base Oil	Conventional Petroleum	Synthetic
MIL-Specification No.	MIL-L-2105C	MIL-L-2105C
API Service Classification	GL-5	GL-5
Anticipated Ambient Temperature	−18 to 49°C (−15 to 100°F) Most **HYSTER** lift truck operations will fall within this temperature range.	As low as −60°C (−51°F) Primarily intended for cold storage and/or Arctic conditions; can be used as high as 90°C (32°F).
Approved Sources		
Chevron	Chevron Universal Gear Lube 80W/90	No Product
Exxon	Exxon Gear Oil GX 80W/90	No Product
Mobil	Mobilube HD 80W/90	Mobilube SHC 75W/90
Pennzoil	Pennzoil MP 4092	No Product
Phillips 66	Philube SMP Gear Oil 80W/90	No Product
Solene Lub. Inc.	Solene Gear Oil #905	No Product
Sun	Sunfleet GL-5 Gear Lube 80W/90	No Product
Union 76	Unocal MP Gear Lube LS 80W/90	No Product
Field Personnel Note: The products listed above are the approved sources that meet or exceed **HYSTER** specifications. The use of products other than that listed above is unauthorized.		

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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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