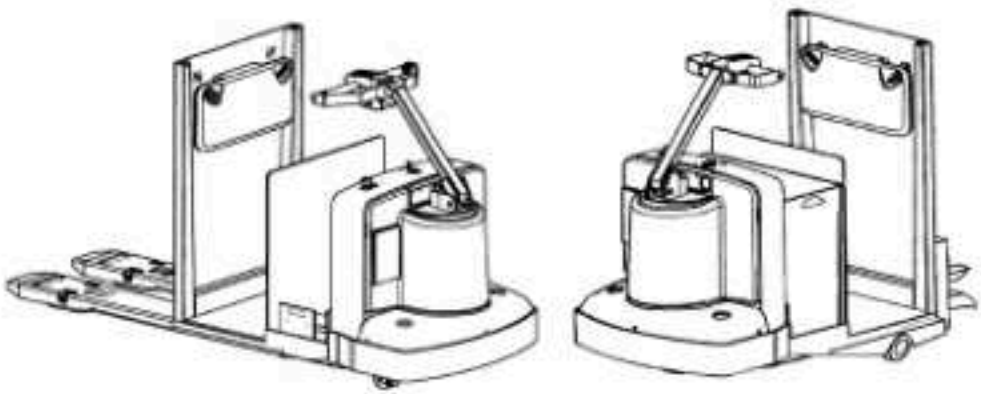
SERVICE MANUAL

A478 (C60Z)



FORM 1524194-A478 Rev. 03/14

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This section is for the following models:

All Electric Lift Trucks

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Battery Discharge Indicator (BDI)/Hourmeter

The 8-character LCD on the optional BDI/Hourmeter displays provides a continuous sequence of hourmeter, battery state of charge, and fault messages. See Figure 21. Fault messages are displayed using the same codes that are flashed by the controller's LED. For example, code "3,2" (Main Contactor Welded) appears as CODE 32.

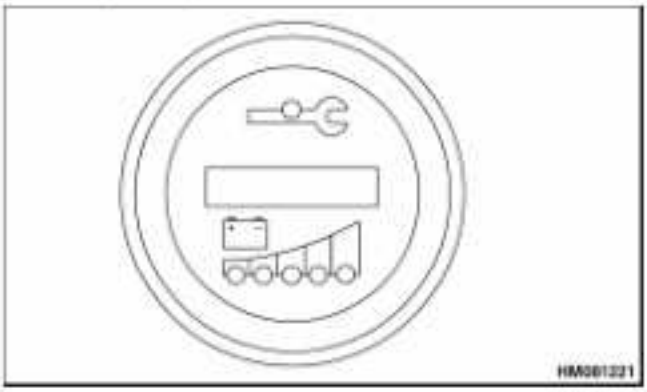


Figure 21. BDI/Hourmeter

LED Fault Codes

The Curtis 1297 controller has a Status LED built into it and can be seen through a window in the label on top of the controller. This Status LED displays fault codes. During normal operation, with no faults present, the Status LED flashes steadily on and off like a heartbeat. If the controller detects a fault, a two-digit fault identification code is flashed until the fault is corrected. For example, code "3,2" (Main Contactor Welded) appears as: 3 flashes, short pause, 2 flashes, long pause; repeat.

NOTE: Only one fault is recognized and indicated at a time by the Status LED. Multiple faults may be read using the programmer handset. See 1307 Programmer Handset.

The 3 most common Status LED messages are shown in Table 7.

Table 7. Status LED Fault Codes

LED Codes		Description
LED Off	■■■■■	No power or defective controller
Solid On	□□□□□	Controller or microprocessor fault
0,1	■ □	Controller operational; no known faults

Fault codes 11, 13, 23, 32, 34, or 42 may intermittently appear during truck use. These signals may be sent as a result of power loss to the 1297 controller from the battery. Turning the key switch **OFF** and then **ON** again will usually clear these fault codes. If the codes remain after cycling the key switch, the lift truck must be serviced.

If these intermittent faults continually appear, perform the following checks:

- Check for loose cable connections at the battery cable connectors.
- Check for loose wiring and wire connectors at the controller.
- Check for loose cable connections at the battery.
- Check battery cells for proper voltage and state of charge.

If a loose wire or connection if found, make the necessary repairs before returning the truck to service.

Fault codes 20, 32, or 34 may also intermittently appear after the battery has been changed. If the BDI indicator will not reset, this may indicate that the battery is not properly charged. Always install fully charged, properly functioning batteries to the lift truck.

NOTE: Minimum reset voltage for the BDI is 25.2 volts (open cell), specific gravity should be approximately 1.250 per cell.

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Two different MDU designs are used:

Top Mount Handle

Bottom Mount Handle

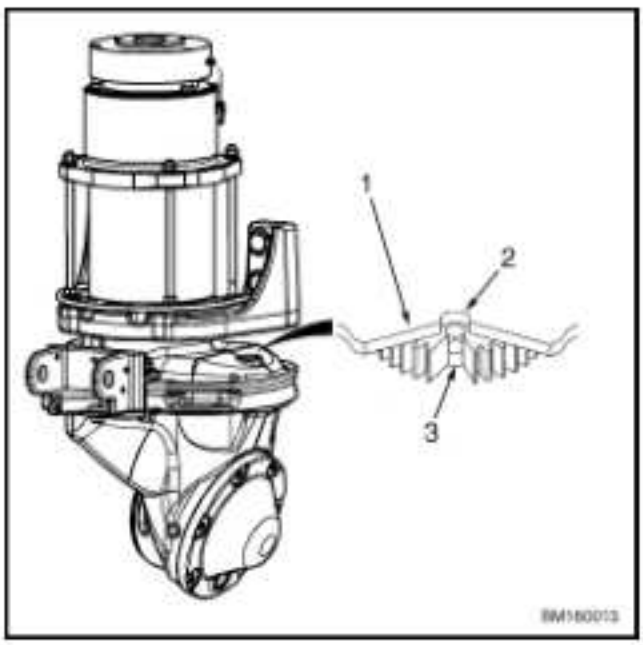
The MDUs for these trucks are the Carraro™ MDU115 and MDU150. These assemblies are available with three different gear ratios. Refer to Table 1. The highest ratio is 16:1 which will produce higher output speed with lower torque. The lowest ratio (25:1) produces lower output speed with higher torque.

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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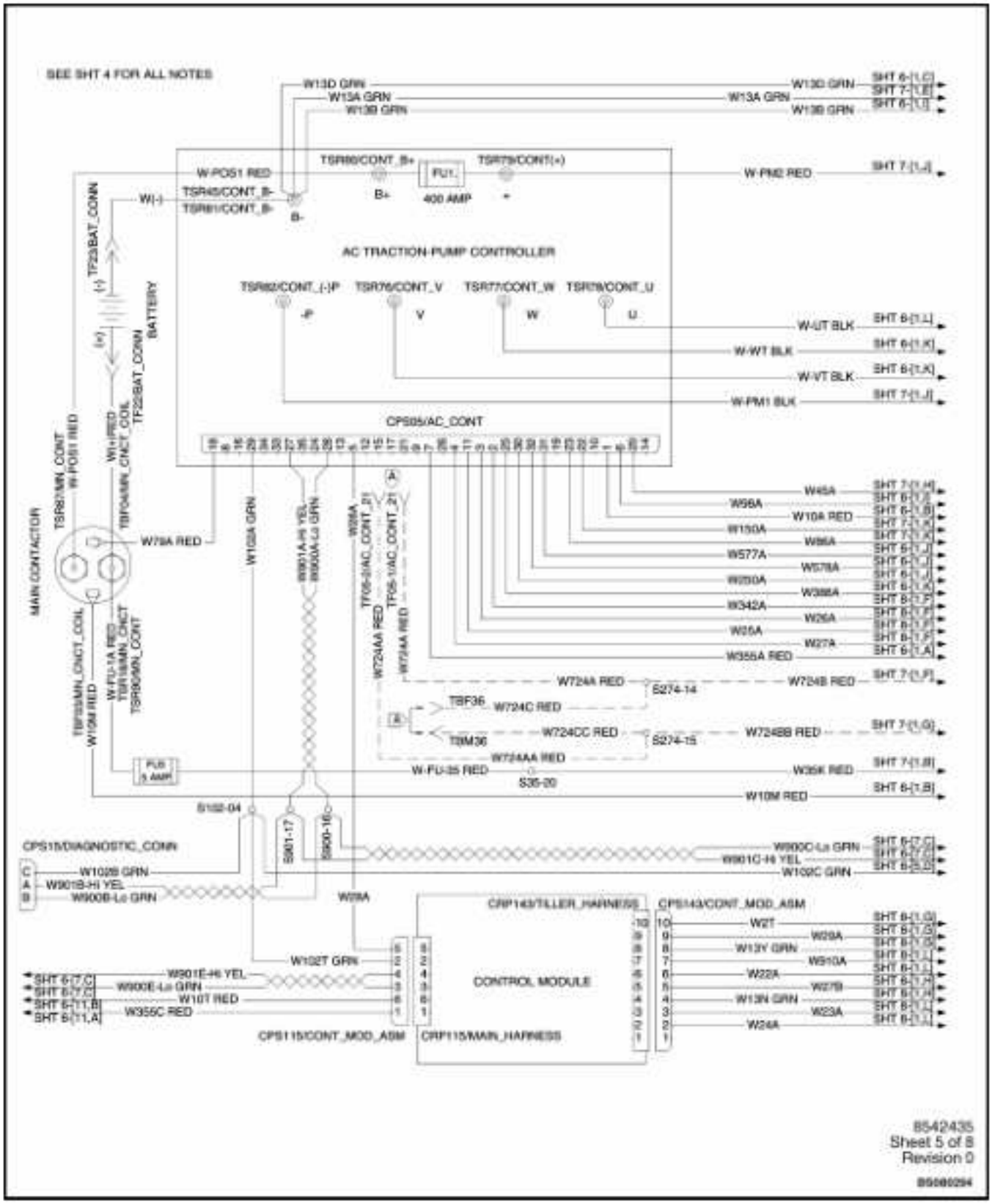


Figure 9. Schematic / Wiring Diagrams (Sheet 5 of 8)

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