Supplement 913−1117
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Titles: LT and LC Transfer Switch Operator's, Installation, and Service Manuals
Numbers: 913−0102, dated 5-1996
913−0103, dated 5-1999
913−0503, dated 2-1997
913−0504, dated 10-2001
913−0600B, dated 2-2003
913−0601, dated 2-2003

PURPOSE

This supplement updates the LT and LC Transfer Switch Operator's, Installation, and Service Manuals to include information on the 15/12-amp battery charger option which replaces the 10-amp battery charger option currently described in these manuals.

SUPPLEMENT USE

Much of the information currently included in the manuals applies only to the 2-amp and/or 10-amp battery chargers that were originally available on the transfer switches. If your installation includes the new 15/12-amp battery charger, refer only to the information included in this supplement.

Write ***Refer to Supplement*** on the pages of the manuals listed above that refer to the 10-amp battery charger.

Insert this supplement inside the front cover of the manuals listed above.

DESCRIPTION

The 15/12-ampere battery charger is rated for 15 amperes at 12 VDC or 12 amperes at 24 VDC.

There are two types of 15/12-amp PowerCommand battery chargers (see Figure 1). All 15/12-amp battery chargers have a 20 amp DC circuit breaker switch on the front of the battery charger. The 120, 208, and 240 VAC battery chargers include two 10 amp AC circuit breaker switches and a circuit breaker guard, while the 277, 380, 416, and 600 VAC battery chargers include two AC fuse holders.

Control Panel

The battery charger control panel includes a digital display, a RESET button, and an LED status indicator (see Figure 2).

- The 2-line x 16-character digital display displays menus and faults.
- The RESET button is used to select menu options and to clear fault messages.
- The status LED is displays the appropriate color for the following conditions.
  - **Green** − On solid indicates unit is charging
  - **Amber** − On solid indicates Equalizing
  - **Red** − On solid indicates a fault condition. The fault number is shown on the digital display.

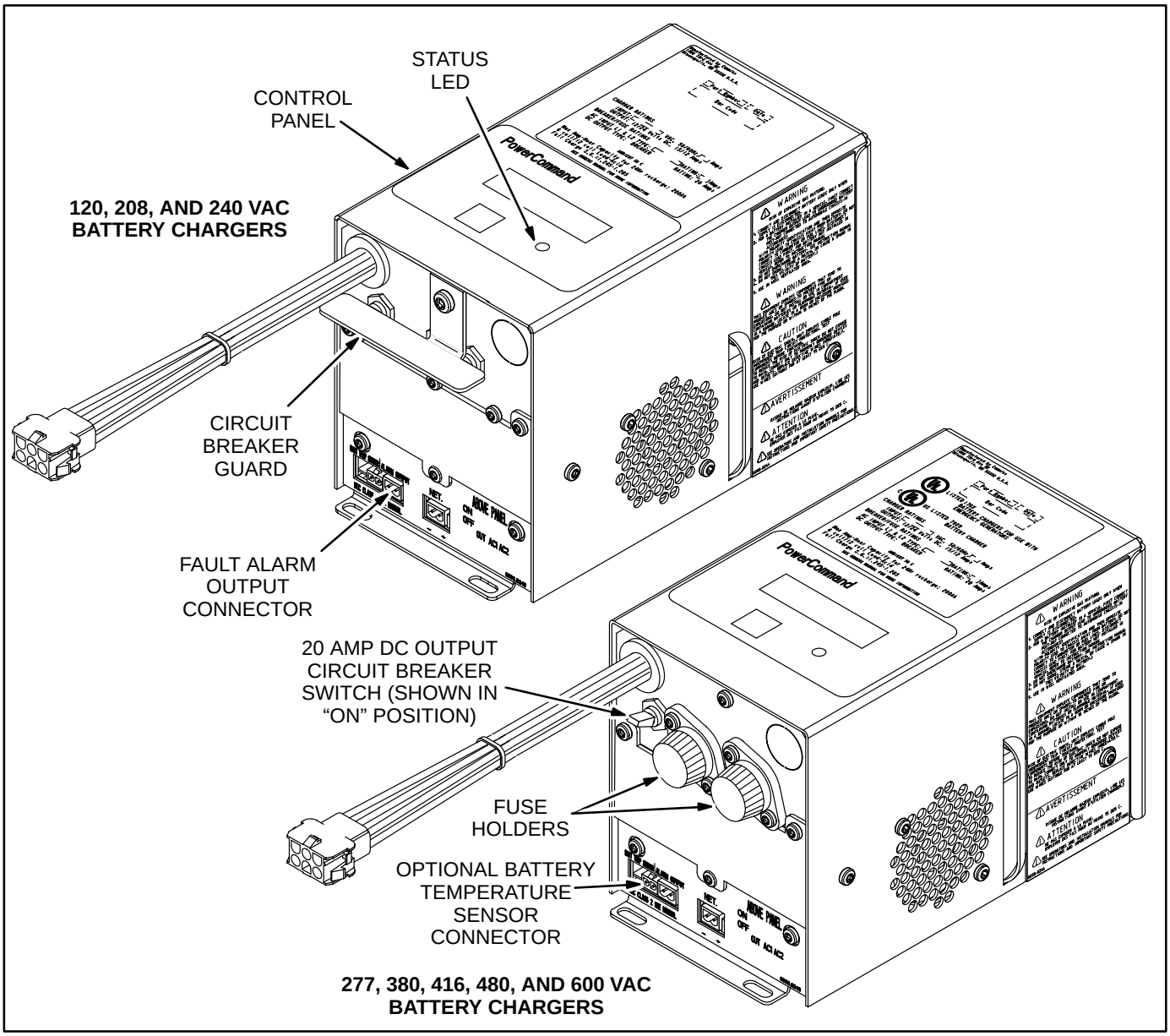

FIGURE 1. 15/12-AMP POWERCOMMAND BATTERY CHARGERS

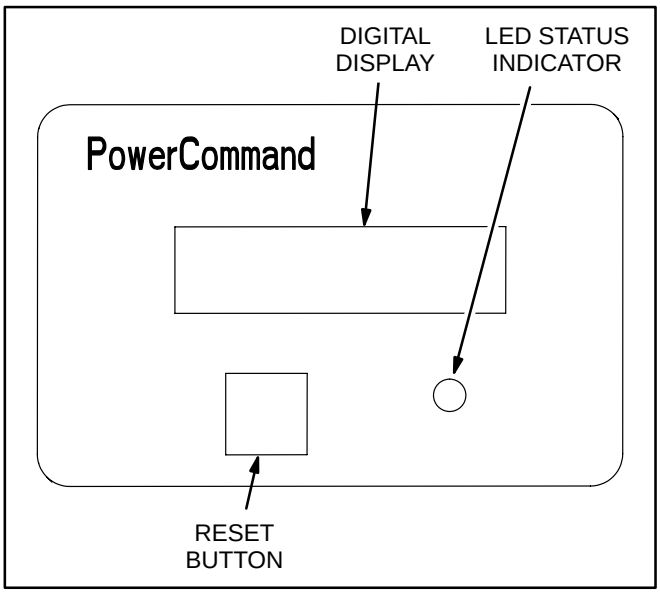

FIGURE 2. CONTROL PANEL

Optional Battery Temperature Sensor

A connector for an optional battery temperature sensor is located on the front of the battery charger (see Figure 1). When used to monitor battery temperature, the optional battery temperature sensor is connected from the battery charger to the positive terminal of the battery. A fault message (fault code 2263) is displayed if the battery temperature is too high (reaches 131 degrees F (55 degrees C)).

BATTERY CHARGER CONFIGURATION

The **RESET** button on the control panel (see Figure 2) is used to configure the battery charger. (More information on Setup menus is included in the Battery Charger Operator's Manual.)

Battery Voltage and Type

The battery charger must be correctly configured, using the Setup menus, for the correct battery voltage and type before it is connected to the battery. The battery voltage can be set for 12 or 24 VDC (default = 12 VDC). The battery type can be set for Lead-Acid, Gel, Ni-Cad, or AGM batteries (default = Lead-Acid).

NOTE: A factory installed battery charger is set up for the proper DC battery voltage requested on the production order, with the Lead-Acid battery type selected as the default.

Battery Equalization

Battery equalization is available for lead-acid batteries that are completely charged, using the Equalize Battery screen in the Setup menus. When battery equalization is in process, the LED status indicator turns amber.

TROUBLESHOOTING AND FAULTS

The 15/12-amp battery charger includes one set of Form B alarm contacts (corresponding to the status LED on the control panel). When red, this LED indicates a fault condition. The control panel also displays the fault codes listed in Table 1.

When a fault occurs, the red fault LED lights and a brief description of the fault and the numeric fault code is displayed on the digital display (see Figure 2). To correct the fault, find the fault code number in Table 1 and take the suggested corrective actions. If the problem persists, call an authorized Cummins Power Generation distributor for help.

Clearing Faults

Most displayed faults are cleared by the fault code being removed when the fault is corrected. However, faults 379 − OVER CURR, 442 − HIGH BATT VOLT, and 9115 − BATT FAIL can only be cleared by cycling completely through the Setup menus or by powering down the charger. (More information on Setup menus is included in the Battery Charger Operator's Manual.)

Fault Alarm Output Connector

The battery charger includes a fault output relay that is activated (contacts close) when faults occur. The contacts are rated at 2 amps/30 VDC. This feature can be used by wiring a fault indicator to the fault alarm output connector located on the front of the battery charger (see Figure 1).

TABLE 1. TROUBLESHOOTING USING FAULT CODES

⚠ WARNING ***Some battery charger service procedures present hazards that can result in severe personal injury or death. Only trained and experienced personnel may perform service.***

⚠ WARNING ***Ignition of explosive battery gasses can cause severe personal injury. Do not smoke or cause any spark, arc, or flame while servicing batteries.***

Fault	Description	Possible Cause	Solution
379 − OVER CURR	Output Overload	Output current is excessive. Charger control may be failing.	Cycle through the Setup menus to try and clear the fault. If the fault returns, the charger control may have failed.
441 − LOW BATT VOLT	Low Battery Voltage	1. No battery connected.	Connect the battery.
		2. Output breaker is in the “Off” (down) position.	Verify the output breaker is in “On” (up) position.
		3. A 12V battery is connected but the charger is set for 24V charging.	Attach a 24V battery or set the charger for 12V charging.
		4. Battery can no longer maintain charge.	Replace the battery.
		5. The wire between the charger and the battery is loose or broken.	Check the wire.
442 − HIGH BATT VOLT	High Battery Voltage	1. A 24V battery is connected but the charger is set for 12V charging.	Attach a 12V battery or set the charger for 24V charging.
		2. Large load dump may have caused momentary voltage rise.	Cycle through the Setup menus to clear the fault and restart charging.
2331 − LOW AC VOLT	Low Input Voltage	AC input voltage is more than 10% below nominal rated voltage.	Check level of input voltage. Charger will not operate with voltage 10% or more below nominal.
2358 − HIGH AC VOLT	High Input Voltage	AC input voltage is more than 10% above nominal rated voltage.	Check level of input voltage. Charger will not operate with voltage 10% or more above nominal.
2263 − HIGH BATT TEMP (For installations that include the optional battery temperature sensor)	Battery Temp above 55 degrees C	1. Battery’s ambient temperature is too high.	Move the battery into a cooler location. Charger will automatically begin charging again after the battery temperature lowers.
		2. Possible shorted cells within the battery is causing an excessive battery temperature increase.	Replace the battery.

TABLE 1. TROUBLESHOOTING USING FAULT CODES (CONT.)

⚠ WARNING Some battery charger service procedures present hazards that can result in severe personal injury or death. Only trained and experienced personnel may perform service.

⚠ WARNING Ignition of explosive battery gasses can cause severe personal injury. Do not smoke or cause any spark, arc, or flame while servicing batteries.

Fault	Description	Possible Cause	Solution
2544 − OVER TEMP	Charger is overheating	1. Charger's ambient temperature is too high.	Move the charger to a cooler location. The charger will automatically begin charging again after the internal temperature lowers.
		2. Charger's internal cooling fan is blocked, failed, or air inlets are covered.	Verify that the charger's air inlets on the side of the charger are not blocked and nothing is interfering with fan rotation.
9115 − BATT FAIL	Unrecoverable battery	The battery can no longer hold a charge or has been damaged excessively due to extremely deep discharge.	Replace the battery and cycle through the Setup menus to clear the fault.

NOTE: The following faults can only be cleared by cycling completely through the Setup menu or powering down the charger.
379 − OVER CURR
442 − HIGH BATT VOLT
9115 − BATT FAIL

Battery Charger Fails to Charge

⚠WARNING AC power within the cabinet and the rear side of the cabinet door presents a shock hazard that can cause severe personal injury or death. Use extreme caution to avoid touching electrical contacts whenever the cabinet door is open.

⚠WARNING Ignition of explosive battery gases can cause severe personal injury. Do not smoke or cause any spark or flame while servicing batteries.

For 120, 208, and 240 VAC battery chargers, verify that the two 10 amp AC circuit breaker switches have not been tripped (are in the up position). If the circuit breakers are in the "On" position, call your dealer or distributor.

For 277, 380, 416, and 600 VAC battery chargers, check the battery charger fuse(s). Replace, if necessary, with fuses of the correct rating. Fuse ampere ratings are shown on the charger faceplate. If the fuse is OK, call your dealer or distributor.

Battery Loses Charge

Battery charger float voltage could be too low (if equipped with battery charger). Call your dealer or distributor.

SERVICE MANUALS 913−0503 AND 913−0504

The following information describes the battery charger feature codes that are now available with LT and LC transfer switches.

FEATURE DESCRIPTION	FEATURE OPTION
Battery Charges:	
2 Amp, 12/24VDC	K001
15 Amp, 12VDC	KB59
12 Amp, 24VDC	KB60

Troubleshooting

Most troubleshooting issues result in fault codes that are displayed on the battery charger's digital display (see Table 1). Overload conditions or equipment failures may require additional troubleshooting (see Table 2).

Loss of AC Power

When there is a loss of power, the battery charger relay contacts announce this fault as an AC power loss. Since the charger is no longer powered, nothing is displayed on the digital display.

Replacing Fuses

When replacing a blown fuse on battery charger models that use them, be sure to use a fuse of the same rating and type. Do not use fuses of a higher rating. Fuses must be UL and CSA certified. Replacement fuses are listed in the battery charger Operator's Manual.

⚠WARNING ***Voltages within the charging system present an electrical shock hazard that can cause severe personal injury or death. Disconnect all sources of AC and DC power from the battery charger before servicing.***

1. Disconnect the battery charger from AC power and the battery.
2. Unscrew the fuse holders from the front of the battery charger.
3. Check the fuses and replace the blown fuses(s).
4. Reinstall the fuse holders.
5. Reconnect the battery charger to AC power and reconnect the charger to the battery.

TABLE 2. TROUBLESHOOTING PROCEDURES

⚠WARNING ***AC power within the cabinet and the rear side of the cabinet door presents a shock hazard that can cause severe personal injury or death. Some battery charger service procedures present hazards that can result in severe personal injury or death. The following procedures are to be performed only by trained and experienced personnel. Use extreme caution to avoid touching electrical contacts when the cabinet door is open. Do not wear jewelry or loose clothing. Stand on a dry, non-conductive surface such as a rubber mat or wooden platform. Remove power to the door by disconnecting connector J1/P1 (on the accessory control panel) before removing and replacing components.***

⚠WARNING ***Improper operation of the generator set presents multiple hazards that can cause severe personal injury or death. Observe all safety precautions in your generator set manuals.***

⚠WARNING ***Ignition of explosive battery gasses can cause severe personal injury. Do not smoke or cause any spark, arc, or flame while servicing batteries.***

Trouble	Possible Cause	Corrective Action
No DC Output	1. Tripped DC circuit breaker.	1. Correct the possible overload and reset the circuit breaker.
	2. Blown AC fuse(s) (277, 380, 416, 480, and 600 VAC battery chargers).	2. Correct the possible overload and replace the fuse(s), as described below.
	3. Tripped AC circuit breaker(s) (120, 208, and 240 VAC battery chargers).	3. Correct the possible overload and reset the circuit breaker.
Low DC Output	1. Faulty battery	1. Replace the battery.
	2. Charger failure	2. Call a service representative.
High DC Output	Charger failure	Call a service representative.