

September 5-1958

PROJECT CD-183/3

Operation and Adjustment of The Silvercel Battery Charger

This battery charger is designed to charge silver-zinc type of batteries such as the Yardney silvercel batteries. The charger requires 110v. 60 or 50 cycles A. C. power input. (It can be rewired to accept 220v. A. C. - see instructions) For continuous operation, the maximum charging rate should not exceed one ampere. This charger can be used for charging batteries with fully charged voltage as high as 40 volts.

Circuit Description:

This charger consists of five subunits. The transformer and rectifier on the left hand side of the circuit diagram is a commercial Fansteel power unit. This transformer has two separate primary windings and a multiple-tap secondary. The primary winding is connected in parallel for 110 v. operation, and in series for 220 v. Since this battery charger is intended for charging batteries with charged voltage less than 40 volts the lowest tap on the secondary winding, point *L*, is used.

The D. C. output from the rectifiers goes to the battery through an automatic control circuit and a current limiting circuit. The control circuit automatically removes the charging current when the battery is fully charged and switches the indicating lamps from "charging" to "charged" condition. This control circuit uses a voltage sensitive meter relay in conjunction with a power relay. When the battery voltage reaches the set cut off voltage the relays energize and remove the charging current. The

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limiting circuit consists of three power resistors in series. They are adjusted to provide an average charging current of one ampere.

Operation:

1. Set cut off voltage to set position. (All the way to the right)
This is a precautionary step to protect the meter switch and to insure proper starting.
2. Connect charging leads to the battery terminals (+ of the charger to + of the battery and - of the charger to - of the battery)
3. Adjust cut off control to desire cut-off voltage. The 16 cell silver-zinc battery has a full charge of 32 volts, therefore, set the red pointer to 32 volt position.
4. Connect a. c. power cord to a 110 v. 50 or 60 cycle source.
5. Leave charger on until battery is fully charged.
6. When battery is fully charged, disconnect the battery first and then disconnect the power cord.

Maintenance:

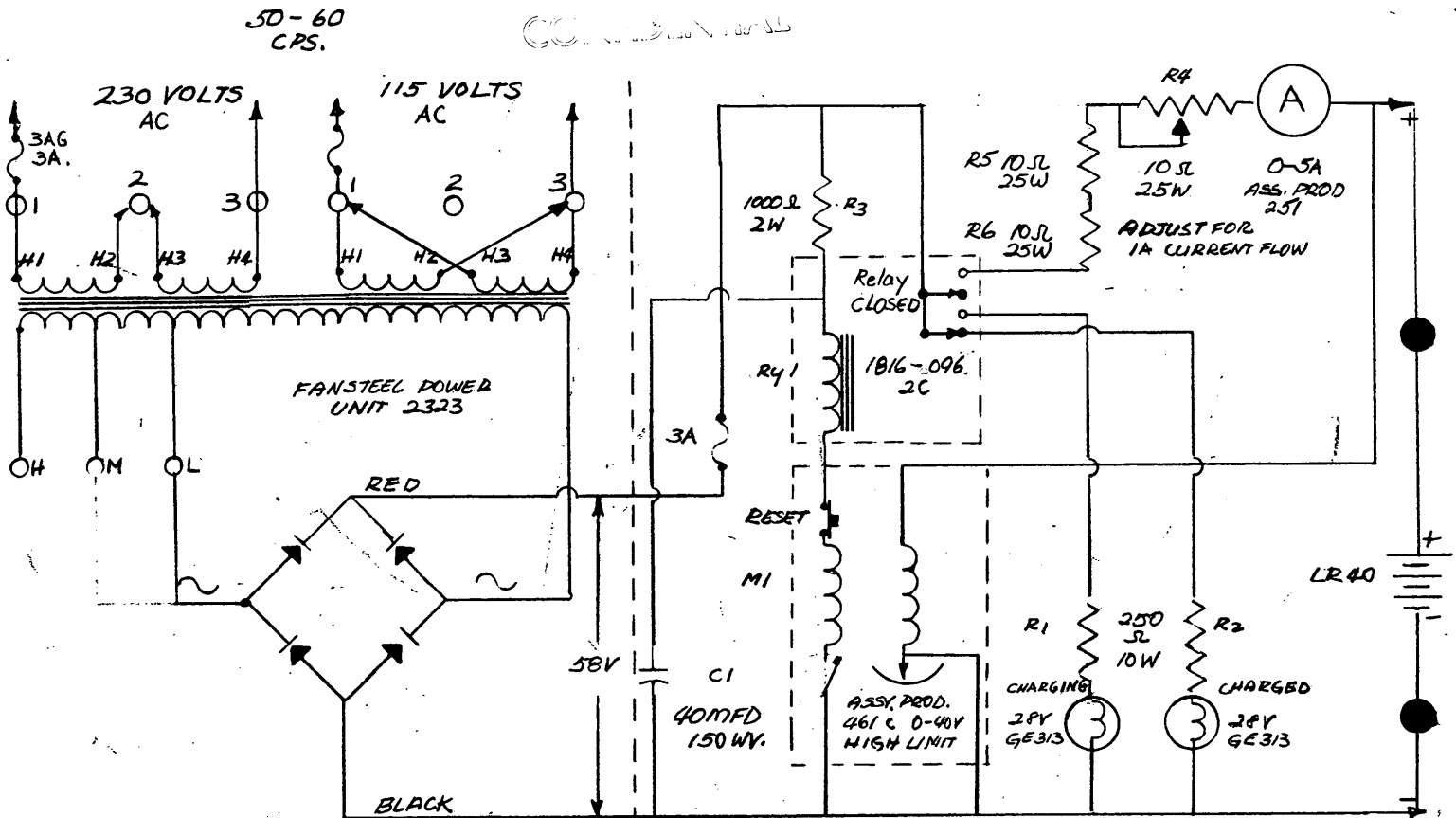
- a. Wiring for 230 volts operation - rewiring of two wires on the transformer primary is required, the wire from H₂ to terminal No. 3 is changed to terminal No. 2, and the wire from H₃ to terminal No. 1 is changed to terminal No. 2, the same point that H₂ is connected.

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- b. Adjusting charging current - when the battery voltage is low, less than 24 volts, it may be necessary to use an external resistor to limit the current to the recommended charging rate of one ampere. For charging the silver cell 16-LR 40 battery it is not necessary to adjust the current limiting resistor R₄ even though the initial charging current is greater than one ampere, for this current will drop as the battery charges:
- c. Replacement of parts - this charger is designed for long life operation without maintenance. The parts that may require change are the fuses in case of accidental short circuiting, and the light bulbs after many hours of operation. Under excessive uses it may be necessary to clean the meter relay contacts so as to prevent unreliable control operation.



BATTERY CHARGER

FOR YARDNEY SILVERCEL

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