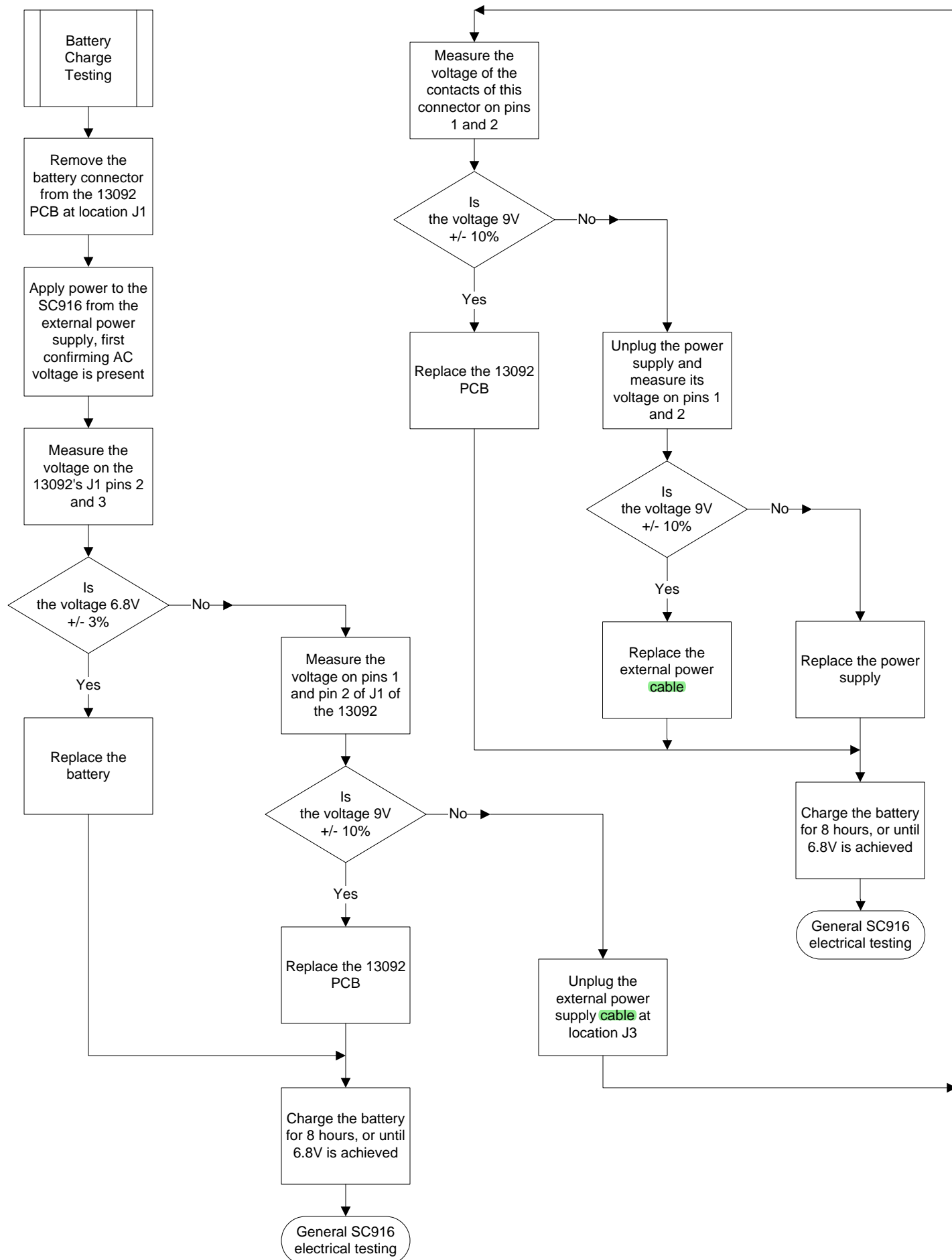


* Contact Heart Systems perform properly on roughly 87% of the population, according to latest data from Salutron. Many factors affect the pulse strength at the user's palms.



Due to requiring many pieces of test equipment, this procedure does not test the complete functionality of the charger but rather its final "float" state. If the battery voltage is less than 3V, no more than 50mA is applied. From 3V to 6.8V current control applies nearly .5A until voltage control or float state is entered. Batteries can only be tested under load. Even if it measures 6V or more unloaded, it can still produce little or no voltage under load as a defective battery's internal impedance increases.

Alternator Testing

To minimize the complexity of the flowchart, this section will best be described in terms of system theory.

The colored connections to the alternator are as follows:

White-B+, Alternator output voltage

Brown-Field, Alternator Control Current

Black-Ground, Alternator return

Prior to proceeding with tests below, perform continuity checks on the alternator **cable**, and confirm **cable** is securely fastened to the alternator and the 13092.

Resistance over gravity is performed by the alternator in the SC916. When a user first steps on the pedal arms, and prior to starting a workout, the console should be enabling full field current to the alternator. Field current is enabled by asserting the signal at TP11 to 5V. At this time, initial field current is provided by the internal battery.

The alternator's B+ should rise as a result of this, but its voltage will depend on the weight of the user. Resistance is achieved by the oppositions of internal magnetic fields when field current is applied. The user's weight will affect the alternator's RPM under this condition, and under full field current conditions the voltage is not controlled. For an average weight user, a 6V to 8V level on B+ would be a normal condition.

Once a user starts a workout, the console controls the alternator's field current attempting to maintain the desired step rate. Again, this accomplished on TP11, and this signal is Pulse Width Modulated (PWM) from 0V to 5V. If the step rate is fast, the console will assert TP11 high longer, if the step rate is slow, it will assert TP11 low longer.

When TP11 is high, the alternator field current is limited current limited to 3.25A. So regardless of the voltage measured at B+, 3.25A is the maximum field current available. When TP11 is low, no field current should flow.

The only situation where a PWM signal would not be present on TP11 during a workout, is if a very light weight person was attempting to achieve a step rate that could not be achieved by their weight overcoming the frictional resistance of the system. In this case, the console would keep TP11 low (no field current, or no induced resistance).

During workouts when step rates of 25 Steps/Minute are targeted, the alternator's B+ increases as a function of speed and user weight. For high level workouts with heavy weight users, B+ levels of 40V could be witnessed. Once B+ exceeds 7V, battery maintenance and self-sustaining power console power will be provided.

If the alternator's B+ is not powering on but the console is, first confirm TP11 is 5V. If it is, and no resistance is felt, measure the field voltage with respect to ground. If this is 5V or greater with no B+, replace the alternator.

If maximum resistance is always felt, determine if TP11 is ever being driven low. If TP11 is driven low and full field current exists, suspect a defective 13092 PCB. If TP11 never goes low, suspect a bad console or shorted interface **cable**.

If no field voltage is detected, and if the console is on and configured as a stepper, measure the alternator's field resistance. Unplug the alternator from the 13092's J4, and measure the resistance from the brown wire to the black wire. 4ohms is typical for Prestolite units. If this is 4ohms or more, replace the 13092 PCB. If it's way less or shorted, replace the alternator.

If the step rates or B+ voltage are sporadic first look for loose connections. This type of problem could be caused by a defective alternator or 13092. If a known-good 13092 unit is available it will be the easiest component to replace. If the problem goes away, confirm the other PCB still causes sporadic behavior, and the problem was not in fact a loose connection.

The external 2.5ohm load resistor acts as a resistive ballast on the alternator. Once B+'s level exceeds 16V, this 2.5ohm load is switched onto B+. The resistance of the load can be confirmed by an ohm meter. If a known workout condition exists that drives B+ above 16V, confirm a voltage is measured across this 2.5ohm load. If it is not, check its **cable** continuity to the 13092 and B+. If the continuity checks, or if the voltage across the resistor always measures the value of B+ replace the 13092.

