

**Heavy discharge test**

These batteries do not have accessible inter-cell connectors, and must not in any circumstances be drilled. A heavy discharge cell tester cannot be used on these batteries.

**Testing battery cell voltage**

This requires a cell tester probe fitted with twin cadmium sticks, connected to a high resistance voltmeter reading 1.5 to 3.0 volts.

Cell voltages are registered on the voltmeter when the tips of the cadmium sticks are placed in the electrolyte of adjacent cells, commencing at the positive end and working through to the negative end.

Twin cadmium probes and cell voltmeter is available from Crypton Triangle Ltd., Bridgwater, Somerset. "Cadmium Sticks 450" are a small diameter suitable for the "A" type battery.

**Battery test procedure**

**Test 1. Capacity test.**

Discharge the battery at 3 times the Ampere hour capacity, (20 hour rate) for 15 seconds. If the battery voltage at the end of the discharge period is 9.6 volts (9.3 volts at ambient temperature below 7°C.) or more, the battery is considered serviceable. No further tests are required.

If battery voltage is below 9.6 volts (9.3 volts below 7°C.) proceed to Test 2.

**Test 2. Three minute charge test.**

Charge the battery at 40 amperes for three minutes. Whilst still on charge, check the battery voltage, and if cadmium sticks are available, the individual cell voltages.

a. If battery voltage is less than 15.5 volts and the maximum difference between cells is within 0.15V the battery is satisfactory but discharged, and only requires recharging.

b. If battery voltage is 15.5 volts and the maximum difference between cells is within 0.15V the battery is discharged and may in addition be sulphated. It should be charged at the normal recharge rate until the specific gravities of the cells cease to rise, then allowed to stand for twelve hours and Test 3 applied.

**Test 3. Repeat capacity test.**

Discharge the battery at 3 times the Ampere hour capacity (20 hour rate) for 60 seconds.

If the battery voltage at the end of the discharge period is 9.6 volts (9.3 volts below 7°C.) or more, the battery is satisfactory.

If the battery voltage at the end of the discharge period is below 9.6 volts (9.3 volts below 7°C.) the battery needs replacing.

Battery type	Ampere. hour capacity at 20 hour rate
A7	30
D7/9, F7	33
F9	39
D9, A9	40

**RECHARGING THE BATTERY**

**"D" type battery.** Remove the manifold cover before connecting the battery to the charger.

**"F" type battery.** Remove the vent chamber cover and the balls from the cell tops before connecting the battery to the charger.

**"A" type battery. THE COVER MUST ALWAYS BE IN THE CLOSED POSITION DURING CHARGING.** Failure to observe this will result in acid flooding the top of the battery.

With the "D" and "F" type batteries the electrolyte should be kept level with the top of the separators or splash guard during charge.

Maximum electrolyte temperatures should not exceed:  
"D" and "A" types

38°C. (100°F.) in climates below 27°C. (80° F.)

50°C. (120°F.) in climates above 27°C. (80°F.)

"F" type

52°C. (125°F.) in all climates

Recharging rate in amperes should be

D7/9, A7,	3.0	F9	4.0
D9, A9, F7	3.5		

Charging should be continued at the recommended rate until the specific gravity and terminal voltage show no increase over three successive hourly readings.

A battery in which all cells show a general falling off in efficiency will often respond to "cycling". This consists of fully charging the battery, discharging it at the same rate by connecting it to a lamp board until terminal voltage falls to 10.8 volts—fully discharged, and then recharging it.

The battery should be capable of providing the discharge current for seven hours before its terminal voltage falls to 10.8 volts. If it discharges in a shorter time, repeat the cycle of charge and discharge.