

NI-CAD BATTERY - DESCRIPTION AND OPERATION

1. General

- A. The Model 208 may incorporate a 25.2 VDC, 40 ampere hour (20 cell) nickel-cadmium battery, located on the right forward side of the firewall.

2. Description

A. Battery.

- (1) The electrolyte in a nickel-cadmium battery is a solution of distilled water and potassium hydroxide. The electrolyte is used only as a conductor and does not react with the plates as does the electrolyte in a lead-acid battery. The state of battery charge cannot readily be determined by a specific gravity reading, since the electrolyte does not change appreciably. For this reason, it is not possible to determine the charge state of a nickel-cadmium battery by checking the electrolyte with a hydrometer. Neither can the charge be determined by a voltage test, because of the inherent characteristic that the voltage remains constant during 90 percent of the discharge cycle. However, a visual indication is beneficial because the plates are porous and absorb the electrolyte while discharging and expel the electrolyte while charging.
- (2) The negative plates in the battery are cadmium hydroxide, the positive plates are nickel hydroxide. During charging, all oxygen is driven out of the negative plates and only metallic cadmium remains. The oxygen dispelled from negative plates is picked up by the positive plates to form nickel dioxide. Toward the end of the charging process, the electrolyte will gas due to electrolysis taking place in the electrolyte. A slight amount of gassing is necessary to completely charge the battery.
- (3) During discharge, the reverse chemical action takes place. The negative plates gradually gain back the oxygen, as the positive plates lose oxygen. Due to this interchange of oxygen, the chemical energy of the plates is converted into electrical energy and the electrolyte is absorbed by the plates. For this reason, the level of the electrolyte should be checked only when the battery is fully charged.