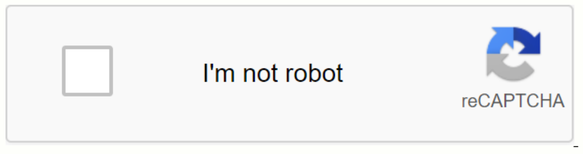

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Construction and working of nickel cadmium battery pdf

The basic theory and maintenance procedures for Joe Escobar nickel cadmium batteries, commonly referred to as NiCad batteries, are widely used in the aviation industry. With proper maintenance, you can provide years of trouble-free service. Let's take a look at some maintenance issues to keep in mind when working with the basic configuration of these batteries. Construction cells are the primary unit of niCad batteries. It consists of anode plates and negative plates, separators, electrolytes, cell vents, and cell containers. The anode plate is made of a porous plaque with nickel-fishery acid deposited. Cathodes are made from similar plaques where cadmium-fishery is deposited. In both cases, nickel powder nickel powder can be sintered with a micromesh wire screen to obtain a porous plaque. Sintering is the process of fusing very small powder granules at high temperatures. After the active positive and negative material is deposited in the plaque, it is formed and cut to the appropriate plate size. Nickel tabs are welded to the corners of each plate, and plates are assembled into tabs welded to the appropriate terminals. Plates are separated from each other by continuous strips of porous plastic. The electrolyte used in NiCad batteries is a 30% solution of potassium hydroxide (KOH) in distilled water. Certain gravity of the electrolyte remains between 1.240 and 1.300 at room temperature. It is important to note that there is no significant change in the electrolyte during charge or discharge. Because of this, it is not able to determine the battery charging by a specific gravity test of the electrolyte. The electrolyte level should be maintained directly above the top of the plate. When the NiCad battery is charged, the cathode plate loses oxygen and begins to form metal cadmium when the charging current is applied to the NiCad battery. Nickel hydroxide is an active substance of the anode plate is more oxidized. This process continues while the charging current is applied or until all oxygen is removed from the sound board and only cadmium remains. Towards the end of the filling cycle the cells release gas. This also happens when the cell is overcharged. This gas is caused by the decomposition of the electrolyte's water from the cathode plate into hydrogen and the decomposition of oxygen in the cathode plate. The voltage and temperature used during charging determine when the gas will occur. To fully charge the NiCad battery, some gas, but a little, must be done; Therefore, some water is used. The discharge reverses the chemical action during the discharge. The amniotic plate slowly gives up oxygen, which is recovered by the sound plate. This process converts chemical energy into electrical energy. During discharge, the plate absorbs the amount of electrolyte. When you charge the level of the electrolyte and fully charge the electrolyte It can be the highest level. Therefore, you should only add water if the battery is fully charged. NiCad batteries that change from lead to NiCad can typically be replaced with lead acid batteries. When replacing lead acid batteries with NiCad batteries, the battery compartment slot should be clean and dry and free of any trace of existing batteries. The compartment should be washed and neutralized with ammonia or boric acid solution, allowing thorough drying, and then painting with alkaline resistant varnish. The pads in the battery passbook jar should be saturated with a boric acid and 3% (weight) solution of water before the battery vent system is connected. There are significant differences in the service methods required for NiCad batteries and lead-acid batteries to service NiCad batteries. The most important things to observe are: NiCad batteries must be provided with a separate storage and maintenance area. Electrolytes are chemically opposed to sulfuric acid used in lead acid batteries. Smoke from lead acid batteries can contaminate the electrolytes in nickel cadmium batteries. This precaution should include equipment such as hand tools and syringes used in lead acid batteries. In fact, all possible precautions should be taken to keep everything containing acid in the NiCad battery shop. Potassium hydroxide electrolytes used in NiCad batteries are highly corrosive. Protective equipment such as goggles, rubber gloves and rubber apron should be used to handle and service batteries. If electrolytes spill into clothing or skin, it is necessary to provide adequate washing facilities. When exposed to electrolytes, it is should be rinsed immediately with water or vinegar, lemon juice or boric acid solution. When potassium hydroxide and distilled water are mixed to make electrolytes, potassium hydroxide must be slowly added to water, and vice versa. Do not use a wire brush to clean the battery. Using a wire brush can cause serious quotes. In addition, vent plugs must be closed during cleaning and batteries should not be cleaned with acid, solvent or chemical solutions. Spilled electrolytes can react with carbon dioxide to form a crystal of potassium carbonate. Non-toxic and non-corrosive, they can be released with a fiber brush and wiped with a damp cloth. If potassium carbonate is formed on a properly serviced battery, the voltage adjustment may not be adjusted, indicating that the battery is being overcharged. Additional water should not be added to the battery 3-4 hours before it is fully charged. If you need to add water, use only distilled or desalted water. In addition, be careful not to over-service the battery with water. If a portion of the liquid needs to be removed, the concentration of potassium hydroxide in the cell decreases. This affects that. Because electrolytes do not react chemically with cell plates, that particular gravity does not change significantly. Therefore, it is impossible to determine the charging status of the NiCad battery with hydrometer. In addition, the voltage of the NiCad battery remains constant for 90% of the discharge cycle, so voltage testing cannot confirm the charging of the NiCad battery. Service interval NiCad batteries should be serviced regularly based on experience, as water consumption varies depending on ambient temperature and operating methods. At larger intervals, the battery should be removed from the aircraft and bench checked in the store. When the battery is completely discharged, some cells may have a potential of zero and charge it in reverse. This can affect the way you don't maintain the full capacity charge. In this case, you need to discharge the battery and balance each cell before charging it. This is called equalization. Charging can be done by constant voltage or constant current. For constant potential charging, the charging voltage is kept constant until the charging current collapses below 3 aampesres, causing the battery cell temperature to decrease without exceeding 100 degrees Fahrenheit. Trickle Charging Trickle Charge is the process of constantly charging the battery while overcharged, keeping the battery active. Some manufacturers do not recommend charging procedures, but some operators have chosen this method to charge NiCad batteries. With trickle chargers, water consumption over time due to the gas effects previously described. You must adjust the electrolyte level before placing the battery on board. Otherwise, there is a risk of battery accidents because the cells can dry before the normal termination of the maintenance interval. Safe handling of NiCad batteries is generally not dangerous during normal operation and is robust enough to withstand punctures in normal damage scenarios. However, if it ruptures for some reason, it can be very dangerous. Potassium hydroxide in NiCad batteries is a dangerous and corrosive alkaline solution for the skin. This fluid can be released if the battery is damaged. If it comes into contact with the skin, it can cause burns. Contact with the eye can permanently damage the eye. It is toxic when ingested. Do not breathe smoke in closed areas, as it can cause irritation to the mouth, throat and lungs. Prolonged exposure to potassium hydroxide can cause liver and kidney disease, and has been identified as a possible carcinogen by OSHA. The person handling the NiCad battery should avoid contact with the internal parts and wash the hands thoroughly after handling them. If there is a spill, Or PVC gloves, eye goggles and face shields. Of course, do not attempt to clean up hazardous material spills unless properly trained. Shipments contain hazardous substances in NiCad batteries and must be marked and documented in accordance with the current IATA regulations (UN2797 or UN2800) to manage the shipment of ventilated NiCad batteries. After all, you can help to ensure the long life of your NiCad battery by good maintenance practices. All employees who maintain or even handle them must be trained for proper practices. You must follow all manufacturer recommended procedures. If possible, take advantage of the training provided by the manufacturer or distributor. After all, knowing the proper procedures can ensure a long and safe life of your battery. Additional RESource FAA Advisory Circular 00-33B Nickel-Cadmium Battery Operation, Maintenance and Overhaul Practices. Marathon Battery P.O. Box 8233 Waco, TX 76714 (254) 776-0650 www.mptc.com Saft 711 Industrial Boulevard Baldosta, GA 31601 (229) 247-2331 www.saftbatteries.com Aviation Pro enewsletterenage e-newsletter