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SERVICE LETTER

Addressed to: All operators using Hawker Main Ship Batteries, P/N 9750WXXXX

Subject: Achieving Maximum Life of Main Ship Batteries

Reason: Operators may not be experiencing maximum attainable life of Hawker main ship batteries.

Description: The following information discusses the importance of maintaining a full charge on Hawker main ship batteries when installed on aircraft. These batteries should always be maintained in a fully charged state regardless of installation status. This document is directed at aircraft operators for the purpose of helping them understand why it is important to keep the batteries charged. Suggestions will be made which will allow operators to know if a battery is at a full state of charge and how to give it a full charge without a lot of extra labor.

To achieve maximum battery life from Hawker battery products, the most important factor is to fully charge the battery as soon as possible after each use. The two main factors affecting battery life are the number of discharge cycles and the depth to which the battery is discharged during these cycles. However, if the battery consistently does not start a discharge cycle with a full state of charge, its life, and performance will be reduced.

Most business aircraft operations fly between 400 and 800 hours per year. Those using Hawker batteries that are achieving more than three or four years of service, are most likely using their batteries in a full state of charge 90% of the time. Aircraft operators getting less than three years of life from their batteries should consider the possibility that their batteries are not being maintained with a full state of charge.

What is the leading root cause of undercharged batteries? Experience has shown us that the main culprit is simply not enough charge time between discharge events. One example would be a double engine start, then a short flight leg of 20 minutes. If this is repeated throughout the day, the batteries would be very low by the end of the day. This is not necessarily bad if the removed energy can be fully replaced by the beginning of the next day's flight operations.

Other scenarios may include frequent use of the main ship battery for lighting up areas around the airplane, frequently raising and lowering flight stairs, running internal avionics and lighting on battery power for lengthy periods, etc. If these are familiar scenarios, it is not the end of the world as long as the energy used by these activities is replaced once the "work" day is over.

The aforementioned scenarios are not uncommon in the business aircraft world and one would not expect operational flight plans and requirements to be changed due to the care and feeding of a battery. Hawker batteries are designed in a manner such that they can take a day (or even many days) of

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heavy use and deep discharges. The battery can be discharged 100% more than 400 times.

How does one tell if the main ship battery has not been fully charged? The easiest way is to check the battery voltage at its terminals after it has rested overnight or for at least eight hours. Prior to connecting to ground power or powering up anything on the airplane, measure the voltage at the battery terminals with any commercially available multi-meter. In most cases, this can be accomplished without having to disconnect the battery's main power connector. Most aircraft connectors are built such that the power terminals can be accessed with the meter's probes. A voltage reading of 25.6 volts or higher should be seen. If readings are consistently seen below 25.5 volts, then the battery is not receiving a full charge as often as it should be to ensure maximum life.

The trick to getting the maximum life from the battery in the above scenarios is to put the removed energy back at the end of the day's flight operations. This can be accomplished by connecting ground power to the airplane and allowing the battery to charge for a few hours, or by connecting small charge units such as the Blue 24 Aviation battery charger or the Power Products Activator 282 to the battery overnight. These are small charge units which can be connected to the battery while it is in the aircraft. No need for battery removal. They can also be connected to the battery for long periods of time while the aircraft is not in use, thus ensuring a full state of charge prior to the next flight.

Keeping Hawker batteries in a full state of charge will ensure maximum life regardless of operations profile. Random, periodic checks of the battery's terminal voltage should show a reading of 25.6 volts or higher. This will give the operator confirmation that the aircraft batteries are full and that maximum life can be expected.

Tips/Advice: Please contact Securaplane Technologies technical support with any questions regarding this information.