



Concorde Battery Corporation

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# TECHNICAL BULLETIN

**Subject: Parasitic Drain**

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## 1. What is a parasitic drain?

A parasitic drain is an electrical load that takes power from the battery even when the aircraft main power switch is turned off. Parasitic loads are present, to a greater or lesser degree, in almost all modern aircraft. Examples of loads that can cause parasitic drain are clocks, lights, relays, current sensors, voltage protection devices, and power monitoring circuits. These loads are generally low amperage (under 50 milliamperes), but since they are continuously present they can deplete the battery's capacity if the aircraft is inactive for an extended time. In some aircraft, the parasitic drain is so high (over 1 ampere) that the battery becomes depleted within a few days.

## 2. How do I test for parasitic drain?

The parasitic drain can be directly measured using a standard digital multimeter (DMM) equipped with both 10 Amp and milliamperage jacks for its test leads. Turn the main power switch to the OFF position. Turn off all accessories (e.g. cabin lights, radio) that are typically not powered when the aircraft is shut down. Connect the ammeter leads between the negative terminal of the battery and the negative battery cable. The positive terminal of the battery must remain connected to the positive cable to complete the circuit (use a jumper if necessary). The ammeter should initially be set to the 10 Amp range, and then lowered into the milliamperage range if the measured current does not exceed the meter's range (generally 400 mA). The milliamperage range will give a more accurate reading.

**CAUTION:** Be sure to use a meter that has a fused ammeter in case the current to be measured exceeds the ammeter rating.

## 3. What is the effect of a parasitic drain?

The parasitic drain slowly depletes the battery capacity and causes the plates to sulfate. Sulfated plates make the battery harder to recharge and can lead to premature failure of the battery. A long term, low drain rate can deeply discharge the battery, deeper than can occur with normal aircraft loads. Repeated deep discharges of this nature will shorten the battery life substantially and batteries deeply discharged in this manner may not be recoverable with normal charging methods. If the parasitic drain is high, the battery will become completely discharged in a few days and render the aircraft inoperable (AOG).



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4. Can I eliminate the parasitic drain?

The items responsible for the parasitic drain are generally integrated in the aircraft electrical system and alteration may affect FAA certification. In some aircraft, modifications can be made to reduce or eliminate the parasitic drain. Contact the aircraft manufacturer for more information on this subject.

5. How can I mitigate the effect of a parasitic drain?

To protect the battery from the effects of parasitic drain (i.e., sulfation, short life and/or AOG), the following procedure is recommended:

- a. Measure the parasitic drain as described above in paragraph 2.
- b. Determine how long it will take to deplete 25% of the battery capacity using the following formula:

Time (hours) =  $0.25 \times C1 / I_p$ , where  
C1 is the battery's rated capacity in Ah and  $I_p$  is the parasitic drain in amperes.

For example, if  $C1 = 28\text{Ah}$  and  $I_p = 0.05$  amperes (50 milliamperes), then  
Time (hours) =  $0.25 \times 28 / .05 = 140$  hours = 5.8 days.

- c. If the aircraft will be inactive for more than the time calculated in step (b), either:
  - Disconnect the battery plug (preferred), or
  - Connect an approved maintenance charger to the battery (effective, but may reduce the battery life if it is always left on\*).

**\*CAUTION:** Make sure the charger is set to the correct float voltage (13.2 volts for 12 volt batteries and 26.4 volts for 24 volt batteries, at 25°C/77°F) and use a charger that compensates for the battery temperature. Excessive float voltage may shorten the battery life even more than the parasitic drain!