Phase One of the Lightweight Battery Install

Vans RV8

Lycoming 0-360 & Catto 3 Blade Prop

180 HP

This aircraft currently has an Odyessy PC680 battery and service has been excellent with temperatures to -25 C. The goal was to decrease the total weight (battery mount and battery).

The acquired battery was a Full Spectrum P3 battery. Three were procured as they will be going into service in two of my other aircraft, an Acrosport II and DR107 One Design. The RV8 was chosen as a test bed as it is fully equipped and has several circuits that will draw current to 'warm' the battery before engine start, whereas the other two aircraft do not.

Typical winter temperatures in the Ottawa , Canada area average -15 C/5F. This winter has been cold and there have been several periods of -25C/-15F. This was a true test of the battery in these conditions.

As thought, the battery would not crank the engine through compression. If one turned on the landing/taxi/strobe lights for 2 minutes (20 amp), it would crank OK. As it warmed it just got better ! This battery would not be suitable in this climate in the other two aircraft without work. I have heard that a short charge with the Pacemaker Charger to get the juice flowing may help; it did not

It was -18C or 0f this morning and the battery has been in the cold since Tuesday night (Sunday today) . I put the pacemaker charger on the P3 for 20 minutes and tried a start; same result as before. The engine would not really crank past a compression stoke .The lights were turned on for 2 minutes and crank was pretty good .

One thing that worried me was the charge; I was seeing 40 amps out from the alternator where with the

Odyessy I would typically see around 15 Amps out with the same load on. This concerned me as the battery was cold and I have read about charging with cold cells.

I went flying and pulled some G to warm me up.Upon returning, with everything toasty, the damn thing could have taxied on starter alone. There was no comparison to the Odyessy in that regard.

I feel that the batteries are great but obviously the methodology of use has to be changed compared to that of your typical battery. The weight savings in the Acrosport is going to be 20 lbs !!

So, for cold weather with no current pulling devices (Pitts, Acro, One Design, etc) to 'warm' the battery, I see a couple of options:

1.Pull it out if accessible and put it back in before flying (works for me in the Acro but none of the others)

2. Have an engine compartment heater other than the block heaters that I currently have on all aircraft.

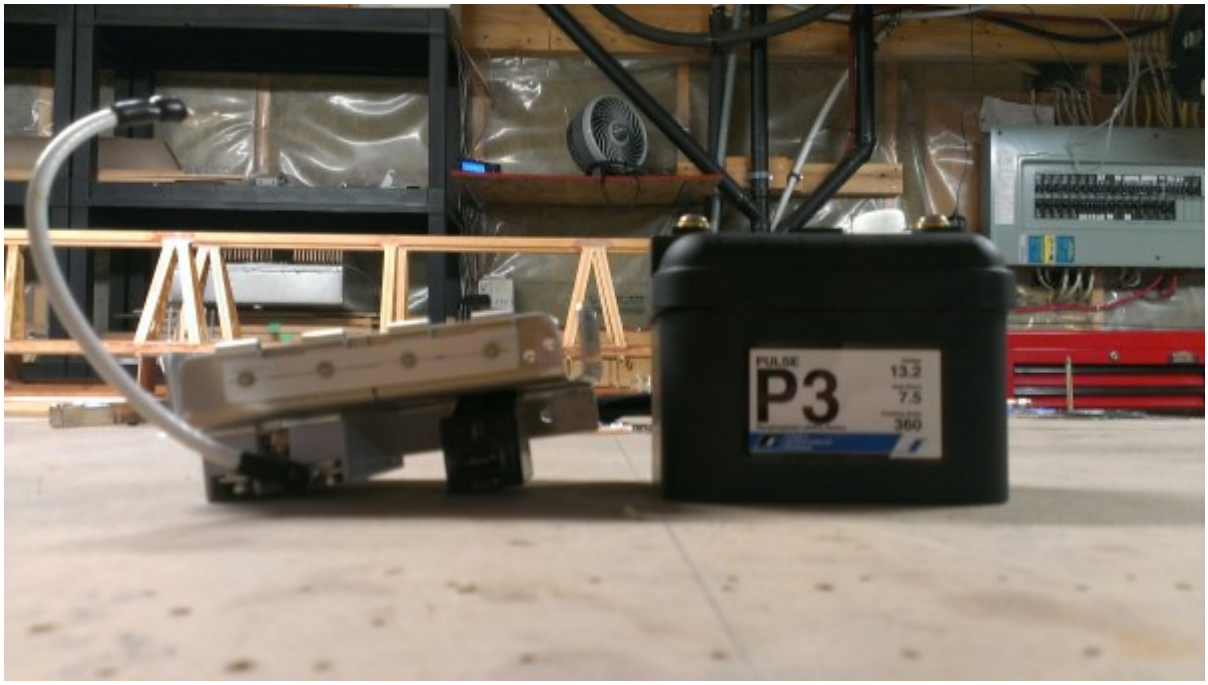
3.Have a dedicated battery heater (weight is extremely low) like these pads that I just ordered:

http://www.ebay.com/itm/Heated-Grips-Inserts-Handlebar-Hand-Warmer-Fits-Universal-Grip-ATV-Motorcycle12V-/221353587581?pt=Motorcycles_Parts_Accessories&hash =item3389b3b37d&vxp=mtr

The pads arrived and I decided to try just two per battery; one on the side and one on the bottom. If this does not prove to be sufficient, I will use three; both sides and bottom.

Here are the pads:

Here is the P3 and the battery case. You can also see the start relay and electronic master solenoid on the bottom (phase 2).



The pads are self-adhesive. I then covered them with a silicon tape which holds up to the operating temperatures.

On the bottom: