



15th. Dec. 2022

## **BRCA ELECTRIC BOARD. LITHIUM BATTERY CHARGING PROCEDURES - CLARIFICATION.**

Following a recent enquiry and some subsequent discussions, the BRCA Electric Board consider there is a need to clarify the detail in the EB rules that cover the charge voltage when using Lithium based batteries.

The current Electric Board rules that cover charging procedures are:-

**3.3** The main paragraph of this rule details the nominal voltage maximum of Lithium cells that can be used and the number of cells that can be connected 'in series' for each of the battery types that are used (1S, 2S, 4S).

**BUT:** The rule ends with the sentence:-

**The maximum charging cut-off voltage will remain at 4.20v per. cell.**

It seems that some organisers have interpreted this to mean that monitoring each competitors charger setting is the way to control battery maximum voltage.

**This is not the case !!** The sentence was intended to relate to battery final voltage. (and will be amended).

However -- Rule 3.7 states clearly that there are maximum battery voltages that are allowed and it is this parameter that should be monitored and controlled by Tech. Officers.

**3.7** LiPo/LiFe batteries may be charged to a maximum of:-

4S Batteries may be charged to a maximum of 16.80v (LiPo) resp. 14.80v (LiFe).

2S Batteries may be charged to a maximum of 8.40v (LiPo) resp. 7.40v (LiFe).

1S Batteries may be charged to a maximum of 4.20v (LiPo) resp. 3.70v (LiFe).

LiPo/LiFe drive batteries must be a 'Lipo sack' at all times when being charged or discharged.

When these rules were originally drafted, many chargers had fixed settings.

The current chargers have more expansive and complicated settings, but the value shown on the charger volt meter cannot be trusted (we have no idea of the calibration status).

There have been many cases where a charger setting (at 4.2v per. cell) has resulted in batteries being overcharged when checked at Tech. The setting at the charger is not a guarantee that the cells are not above the mandatory battery voltage limits as detailed above and in BRCA General Rules.

The only way to check if a battery is not over the maximum voltage allowed:- is to check the actual voltage of the battery when disconnected from the charger with a quality volt meter (that is calibrated). This should be done for each car before going onto the track.

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