

11<sup>th</sup> February 2018

**Dear FES owners,**

Thank you for your continued patience and support. Following our earlier newsletter on the subject we would like to provide an update regarding battery progress over the past three months.

All three manufacturers of EASA certified FES equipped powered sailplanes have received their Major Change Approvals:

-Schempp-Hirth, [Major change approval 10063863](#) (date 27.11.2017), in accordance with the modification bulletin 863-13.

-HPH Sailplanes, [Major change approval 10064072](#) (date 15.12.2017), in accordance with their modification bulletin G304MS - 08 a.

-Sportine Aviacija ir Ko, [Major change approval 10064174](#) (date 20.12.2017), in accordance with the modification bulletin 017B-FES.17.002\_rev1.

Part of the necessary work can be done by the relevant manufacturer or local maintenance organizations. However, the FES battery packs will need to be overhauled by LZ Design. It was our initial intention to conduct only certain inspections, but we have soon decided to completely rebuild all battery packs according to our new and much improved specification. We consider performing the work in-house to be essential in order to minimize any risk of further issues and to provide owners with the highest confidence and peace of mind with regard to the reliability and safety of the FES system.

Owners of Silent 2 Electro should contact [Alisport s.r.l.](#), for instructions regarding required actions to be performed.

## **REFURBISHMENT AND UPDATES OF FES BATTERY PACKS**

The refurbishment by LZ Design involves a complete rebuild of each FES battery pack via replacement of the composite casing, modification to several components, re-use of the original cells, and the addition of new parts. The procedure, performed for each pair of batteries, is outlined below:

First the battery cover, terminals, and BMS (Battery Management System) circuit board are removed. The composite casing is then carefully cut open on the sides so that cells can be extracted, silicon stripped away, and BMS adapter plate removed. The cells are separated, cleaned, and carefully checked for any signs of damage. The edges of each cell pouch are then insulated with special self-adhesive isolation tape. They are then reassembled in a pack, with additional insulator sheets placed between each cell. Newly manufactured anodised aluminium lower connector plates are also installed. The refurbished cell pack is then resealed in a newly manufactured pre-preg fibreglass high temperature-resistant casing, with new fire resistant carrying strap, BMS and terminals installed, and equipped with new G-load ShockWatch decals. Each battery is then charged, tested under full load, and discharged to 50% SOC (State of Charge).

Taking the opportunity, we have decided to further improve all older battery packs according to recent modifications to be more secure and user-friendly. This includes:

- updating the BMS hardware and firmware to the latest version. One of the new features is that the SOC is initially displayed via the row of LED's after turning ON the BMS.
- installation of improved positive (+) and negative (-) terminal covers. These are now in red and blue colour injection-moulded plastic and completely encase the socket terminals to provide better insulation.
- modification of the LED's on the BMS circuit board. Illumination conducting rods are now installed at each LED to prevent dust, moisture or other contaminants from reaching the BMS circuit board.
- the addition of spring clip retainers for the data connectors. These prevent the data connectors from disengaging. Milling of the aluminium top plate is included. Also furnished with this are two sets of connector retainer plates, screws, and nuts together with suitable pairs of modified connector shells so that both data connectors in the glider can be upgraded.
- replacing the cooling fan power connectors on older BMS circuit boards. This makes them compatible with the latest standard connector type.

All this entails a great deal of work, for which we have had to hire five more skilled technical workers. With more people involved we had to establish new processes, procedures, develop some specialized tools, and purchase new equipment to accomplish the work effectively. As you can imagine it's a very labour intensive and time-consuming process. As a point of reference for the magnitude of work, please keep in mind that LZ Design needs to disassemble and reassemble all the batteries which were produced over the past 8 years. We are committed to the task and are doing our best to return refurbished and updated batteries to their owners as rapidly as possible after receiving them.

The financial weight is significant for our company and logically establishes constraints on how we are able to respond. Batteries still within the battery warranty period will be fully refurbished and updated to the latest specifications free of charge. However, for older batteries which are outside of the warranty period, we are compelled to charge for the updates and cost of materials involved (without labour costs). The charge is 650€+VAT per pair of batteries (or approximately only 9% of the new batteries value).

Please be aware that this price reflects our direct costs and is the lowest number that still allows the work to be accomplished. LZ Design earns no profit from the rework and each battery is ultimately improved to a higher safety standard with new features.

Due to the diversity of customer locations and varied logistics, shipping and eventual insurance costs are additional. LZ Design and our regional agents will consolidate shipments where possible to minimize these costs.

## OPTIONAL WORKS

Customers who send us their FCU instruments can have the internal SD card module installed. This will log all FES parameters, useful for diagnostics in the event of an incident or other issue. Note however that the SD card installation is not required in order to comply with the AD, and the cost is 50€+VAT. For FCU instruments receiving the optional SD card, LZ Design will also perform the software update (to v3.06) at the same time, which is required by the AD. Alternately the software update can be done by a local maintenance workshop.

## RECOMMENDATIONS

We would like to encourage owners of existing FES equipped gliders to consider the purchase of the new FES stainless steel transport/storage cases (to protect their valuable battery packs) and the FES Discharging Assistant. The Discharging Assistant enables users to discharge their battery packs to an optimum SOC level of 50% for safe and long-term storage.

Further details of these and other FES System Accessories are available via the FES website at <http://www.front-electric-sustainer.com/accesories.php>

Finally - we would like to ask for your continued patience during the refurbishment of the battery packs. It represents a huge undertaking and you can be assured that my team and I are doing our very best to complete the work in time so that the fewest owners are affected for the 2018 soaring season. Again, thank you for your continued support and understanding.

Kind regards,

Luka Žnidaršič, LZ design d.o.o.

