

**NEWS**

**LETTER**

JANUARY 2021 | QUARTERLY

**TLMOTO**  
  
 **TÉCNICO LISBOA**

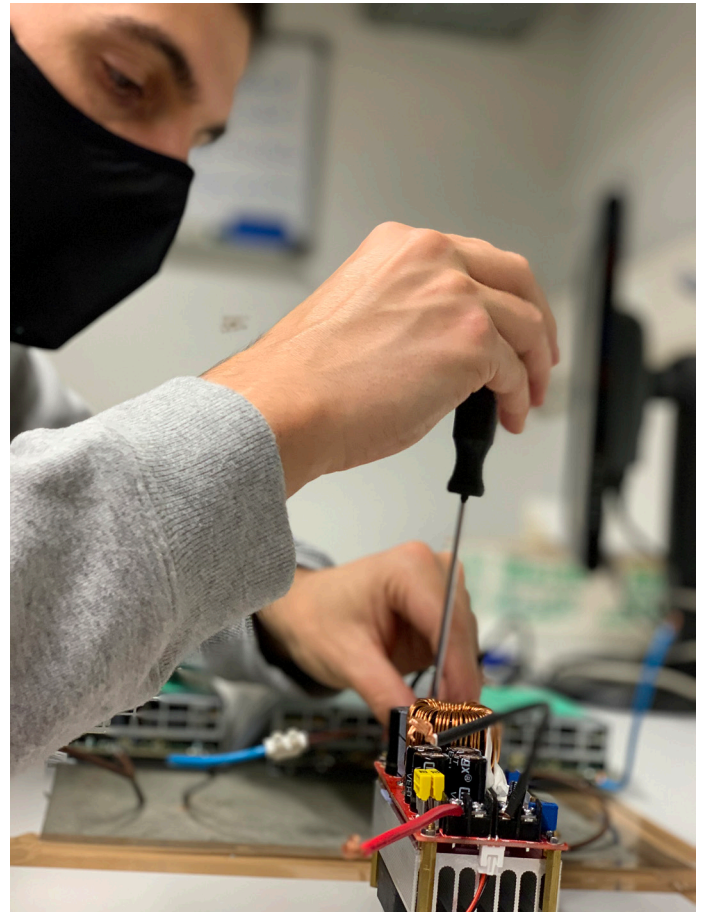
# TLM03E THE LAST STEPS

With the worsening of the pandemic situation in Europe and the rest of the world, MotoStudent decided to postpone the final event of the competition to July 2021. With this change, some deliveries required by the competition were also postponed. However, now that we are on the final stretch, the pace at the workshop did not slow down, always complying with the safety measures, and the deadlines imposed by the team were maintained and strictly followed!

## ELECTRONICS

Our Electronics members have been very busy these past three months. Regarding the charger, our system, made from reconditioned server sources, was tested and the PCB design was also made for the automatic monitoring and control of the charging process.

Regarding Telemetry, much of the necessary programming has already been carried out and the location system (GPS) has been subjected to several tests.



As for the BMS (Battery Management System), it was also tested with the complete VHS (High Voltage System), which includes the batteries, the motor, and the controller, and some programming improvements were also made.

Finally, with regard to the Dashboard, the members programmed the interface on the new TLM03e touchscreen and assembled, together with the Structures team, the components in the prototype.

# STRUCTURES

---

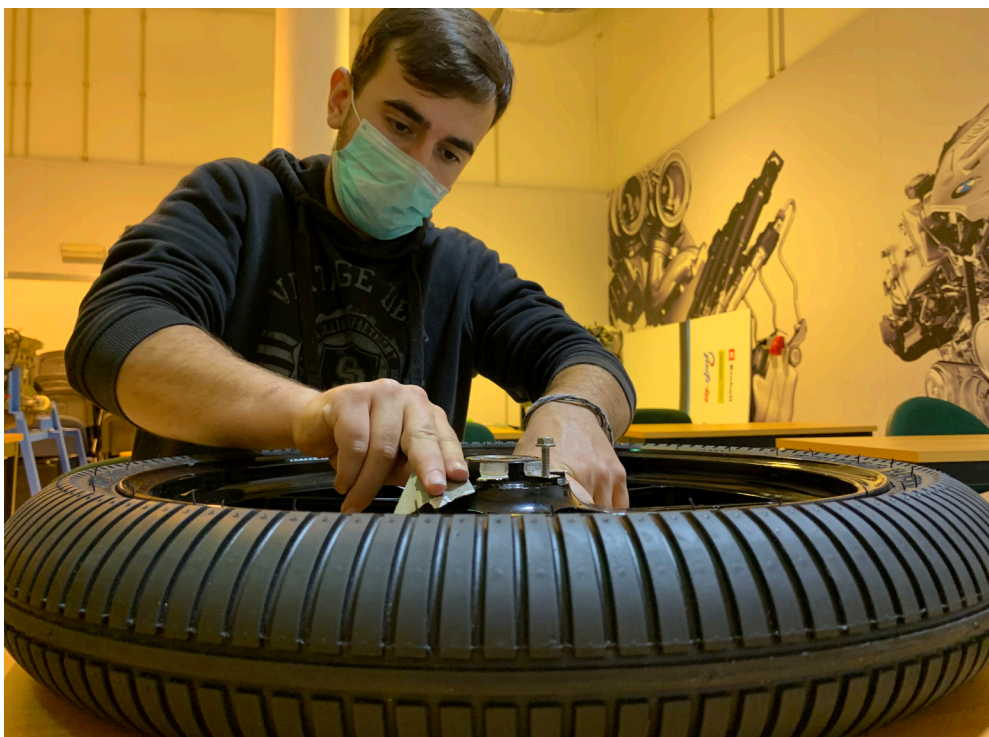
In the last three months, the members of the Structures area have been busy with the assembly, and respective adjustments, of all the sets that make up the structure of TLM03e.

They started with the front assembly, which consists of the front wheel, the suspension, the clip-ons, and the shaft. Then, the central components, connected to the mainframe - the engine and engine support, the battery box support, the swingarm, and the respective rear wheel set were assembled.

The last set to be mounted on the bike and, by far, the most challenging was undoubtedly the battery pack set. This was due to the different adjustments that had to be made during its assembly: the dimensions initially thought of the walls of the different modules of the battery box were, smaller than expected, preventing the entry of the boxes in its structure.

---

**DESPITE THESE MINOR NECESSARY CORRECTIONS, TLM03E'S STRUCTURE WAS ASSEMBLED AT A GLANCE!**



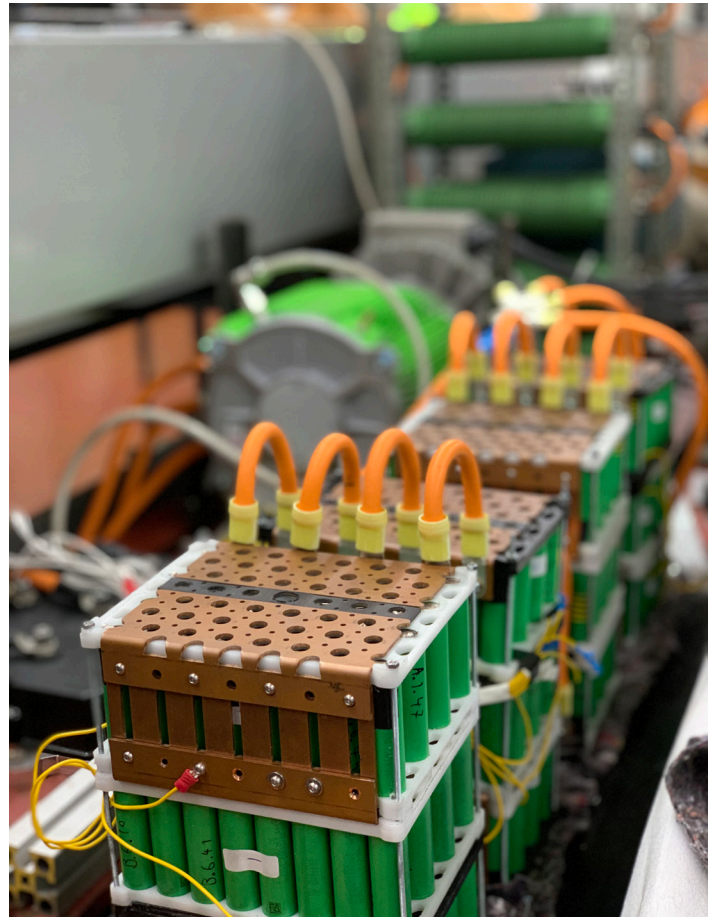
# POWERTRAIN

---

Regarding our Powertrain team, the members completed the construction of the first prototype of one of the five Battery boxes and carried out all the necessary tests in order to assess its proper functioning and reliability.

These tests consisted of measuring the voltages and checking if the system was able to pass all the current without overheating or other failures. Other tests were carried out, together with the structures team, related to the dimensions of the battery pack and the respective assembly process.

After this was completed, members proceeded to check all batteries to confirm that they were functioning correctly. The same was done with the motor and the controller, for example, by adjusting certain values. They also checked the functionality of the BMS (Battery Management Systems).



---

**ONCE THE TESTS WERE COMPLETED, THE MEMBERS PROCEEDED TO ASSEMBLE ALL OF THESE COMPONENTS IN THE PROTOTYPE, FOLLOWING THE ASSEMBLY OF THE STRUCTURAL PARTS AND FOCUSED THEIR ATTENTION ON THE NECESSARY WIRING AT THE DRIVETRAIN.**

# AERODYNAMICS AND COOLING

---

The members of the Aerodynamics and Cooling area, on the other hand, were finishing the manufacture of the negative molds and dealing with the lamination of the deposit, made in carbon fiber, and the spare seat, which was already in fiberglass.

In the competition, the seat will be tested with a load of 2500N, which implies that it must be structurally very resistant, so the choice of the final seat's manufacture using pre-impregnated carbon fiber has become quite obvious, allowing the bench to resist this load while maintaining a very low weight.

The members were also finishing the machining of the molds for the fairing, made mostly in MDF (Medium Density Fiberboard) at the IStartLab CNC. Some of the molds were made using 3D printing, also using IStartLab 3D printers. The use of these materials makes it possible to manufacture components with very acceptable tolerances and relatively low costs when compared to other materials.



In the end, it is expected that the manufacture of all these components in carbon fiber and the optimization of the fiber layers using FEM (Finite Element Method) software will allow a weight reduction of more than 65% in relation to the TLM02e.

---

**65% WEIGHT REDUCTION  
COMPARED TO TLM02E**

# MOTOJORNAL

A novelty for our team is our new partner, Motojornal, the largest magazine on motorcycling in Portugal! This biweekly magazine, written by and for lovers of Portuguese motorcycling, is the source to turn to when you want to know the latest news from the "world of engines with two wheels".

This partnership came about when we were contacted by Domingos Janeiro, from the magazine's editorial staff, to support the testing of an electric scooter, providing the necessary information on motorcycles and electric vehicles and their differences compared to combustion models.

**BEING QUITE DIFFERENT FROM THE ONES WE HAVE HAD SO FAR, WE ARE VERY EXCITED ABOUT THIS PARTNERSHIP AND ALL THE OPPORTUNITIES IT WILL PROVIDE US!**

Hence the opportunity for Motojornal to continue to follow TLMoto closely arose, making our project and prototypes known to all motorcycle lovers. In addition, we hope that Motojornal readers will have the opportunity to follow the entire design and manufacture process of our next prototype, bringing a new perspective on a process normally hidden from the public!



# RECRUITMENT

---

In November we opened a new recruitment phase and had a wave of interested parties like never before! After some introductory quizzes about the team, our 40 recruits went on to the 1st phase, a phase focused on research and presentation of information about each area of the team.

Currently, they are all already in the 2nd phase, and they are now learning and getting to know all the tools they will have to work with in the future. In the case of the areas of Management and Marketing and Design, recruits have already started to perform more specific tasks in their areas and even to help some of the current members in others.

---

**AS WITH THE PREVIOUS RECRUITMENT, THIS ONE IS ALSO TAKING PLACE ONLINE. HOWEVER, THE WEEKLY MEETINGS AND THE BET ON ONLINE TEAM-BUILDINGS HAVE ENSURED THE GOOD ATMOSPHERE AND MOTIVATION FOR WHICH WE ARE KNOWN!**





DO YOU WANT TO KNOW SOME MORE?  
VISIT OUR SOCIAL NETWORKS AND GET IN TOUCH WITH OUR STORY!



[tlmoto.tecnico.ulisboa](http://tlmoto.tecnico.ulisboa)



[TLMotoStudent](https://www.facebook.com/TLMotoStudent)



[@tlmotostudent](https://www.instagram.com/tlmotostudent)