NEWSLETTER

TLMOTO

TÉCNICO LISBOA

NOVEMBER 2022 / QUARTELY

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Afonso Magalhães

Afonso Magalhães is the current team leader. 4th year student of Aerospace Engineering, he has a great passion for the project and the team and wants to leave his mark in the history of TLMoto!

How did you find out about TLMoto and why did you decide to join?

I heard about TL through my friends. More specifically, through (Gonçalo) Jacob, the former leader, when he did not yet hold that position. He told me that he was in this group and that the people here got along very well: it was a different group from the rest, because, in addition to the good work, many friendships and connections with people were also created. So, how this interested me a lot, I decided to join.

How was your journey in TLMoto?

I joined in November 2020 for an area that had just been created: Dynamics. It was the first recruitment they made for this area. However, as it was very recent, there wasn't much to teach, so I started doing work for the area right away, at the end of a month. I worked a lot during MotoStudent's time, and, after the competition, a new school year began and the Dynamics leader left: it was here that I became the area leader. A few months later, in May, I was invited to be the Team Leader and I accepted.

What do you think that made you team leader?

First of all, I have a lot of passion for the project. I don't think anyone can dedicate so much time to a project if they don't value it, if they don't have the idea that what they're doing is something different and something they'll never have the opportunity to do again in their lives. I was also chosen for having some interpersonal skills, although they are being developed even more, because, after all, this still is a learning position. So, I think I was chosen essentially for these two things: for the commitment and passion that I have always shown for the project and for the facility with which I have in talking to people and setting interpersonal connections.

What are the biggest challenges as a team leader?

Time management and stress management, because there is always a lot going on: you need to organize the week very well, plan the next day very well, to not have dead times. Are also many problems that arise at the last, so it is important to know how to remain calm and how to quickly resolve these conflicts. In addition, it is also essential to understand how to motivate the team and make sure they are ok.

And, regarding the competition in Italy, what were the biggest difficulties for you?

The competition was very intense and there were many days of stress, but, how everyone was focused on that, I think that the preparation for the competition itself was more complicated. This was absolutely one of the biggest challenges. Not only for me, but especially for all the areas that had a very intense work - such as, for example, Logistics and Sponsors, who had to organize the entire trip, see the material that had to be taken, deal with carriers, etc. On the other hand, leaving the moto perfect for the competition was also very intense, because there was always some aspect that didn't work as planned, so there were several problems to solve during the summer. Coordinating all this, especially with people at a distance, was very complicated.

Do you think it's difficult to combine studying with TLMoto?

It's not easy, but with good time management, it's possible. Nothing comes for free in life, we always have to sacrifice something (for example, less night outs…). However, it is sometimes difficult because of the stress. For example, I have my day planned and I think "now I'm going to study and I'm not going to do anything in TL", but then some TL emergencies appear and I have to coordinate myself, which turns out to be complicated. However, it is still possible, and this challenge of having to reconcile two things improves me a lot on a personal level. It made me a much more organized, productive and calm person in stressful situations.

What skills did you gain with TLMoto?

As I said before, as a team leader it was time management, stress management, interpersonal communication... But I also gained some techniques, as a member. For example, working with simulation programs, especially rigid body simulation, and knowing how they work. I may not have worked very deeply, but I followed the development of these types of programs. Also, I learned how develop something that was really our goal. With TL, we learn to apply the theoretical concepts they teach us in school, and to manage ourselves, in case things go wrong.

What advice would you give someone that wants to join the team?

Take a risk. I always give this advice, but this is it: take a risk. You have nothing to lose, if you don't like it you can always leave, there is no commitment and it is a valuable experience. By taking a risk, you will always have an advantage. First, if you don't, you won't know if it's for you or not and you'll live in doubt. On the other hand, when they go through the recruitment process, they may enjoy it and learn a lot. TL is a university experience that I find completely enriching, both personally and in terms of work experience. So the best advice I can give you is "take a risk". Then you can see if you like it or not.

What was the biggest motivation for you to remain on the team?

First, something I've always said, which I think is amazing to see and the whole team feels it, is to see a product that you are developing grow, in any of the areas. Seeing the moto grow, seeing the frame being made, the arm being made, receiving the MotoStudent kit and seeing the engine, the brakes… Seeing these kinds of things appear and the moto being assembled is a great feeling! And then, what continues to motivate me are also the people. TL students are different students. They are committed and hardworking people. They are good people, with whom I identify and get along well. So TL members and the team spirit is what keeps me motivated!

Do you feel that TL somehow made you change your mind about what you want to do professionally?

Yes, absolutely! Luckily, my journey in TL was very varied, so I went through several positions and started noticing what I like more or less. I always thought that I would prefer to work in front of the computer, but, after all, it's not really my thing. As I had several experiences, I realized that I prefer to "have my hands in the dough" than to sit at the desk. I prefer plan and be on the ground following things, realizing that I have a goal and thinking about how I will reach it. TL gave me this experience of thinking about the whole process until we reach our goal. Eventually, I also realized that I like coordinating more than being coordinated, and I always thought it was the opposite. Although it is more stressful, it gives me more pleasure.

What can we expect from TL in the future with you as the leader?

My biggest goal is to see the TLM04e race on the Aragón track. However, in addition, I want the people of TL, when their time to leave arrives, to think that it was an enriching experience and that, in a few years, they will look at the group as an added value in their lives. More than a good moto performance, my main focus, as a leader, is, in a few years, passing by the current members and hearing that TL gave them something in life that is very important for what they are doing.

Who is your favorite MotoGP pilot?

Oh, it will always be Miguel Oliveira, without a doubt. We even have a cardboard Miguel Oliveira in the oficine.

MEI COMPETITION

TLMoto debuted in the Italian competition MEI (Moto Engineering Italy) with its most recent prototype - the TLM03e. It was 5 days of sweat, despair, happiness, confusion and dedication that left no one indifferent. The team arrived at Bologna's airport around 11am on September 24th and settled into a hostel in the Bologna San Vitale area. The next day began with a train ride to Imola, check-in at the Enzo and Dino Ferrari Autodromo, and organize the team's future workspace. On the third day, September 26, protocol technical inspections followed, giving the final approval for the bike to enter the competition. That same afternoon the opening ceremony took place, where the team leaders and their riders gathered and the schedules were announced and the events that would shape the Italian competition were explained.

During testing, the team was informed that some aspects of their prototype needed to be changed to ensure the safety of the driver and the rest of the competition. The next day, part of the team attended a tech talk, where they presented their project in front of a scoring jury. This tech talk gave the team room to shine and received many compliments. In the afternoon, photos were taken with all the teams on the track.Three days before the end of the competition, the dynamic tests took place. The team was busy calibrating the bike and optimizing it for each of the tests. Due to the size and geometry of its prototype, the TLM03e had good acceleration, but at the expense of worse agility. Thus, in the acceleration tests the bike achieved an excellent fifth place. However, failures in the timing system forced the competition to cancel the best brake and acceleration test.

It was quickly discovered that during one of the rain tests some water had accumulated in one of the battery packs, leading to its unexpected behavior. It was, however, 7 laps in a single battery, an extraordinary achievement for the team, which had a battery pack designed for only 5+1 cooldown lap. It also turned out that the lap times simulations performed in house were extremely accurate.

For safety reasons, the battery pack was removed as quickly as possible from the bike and promptly neutralized. It should be noted that the modular battery system, despite adding some weight to the bike and having raised doubts among others as to its role and usefulness, proved to be crucial in this last moment, leaving aside any question that had been raised before.

After much debate and deliberation, the team unanimously decided to prioritize the safety of everyone on track, and officially declared they would not participate in the final big race.

Despite not having the outcome that the team had envisioned, on the last day of the competition, the team was able to coldly analyze all the events of the grueling race, ensuring that the same mistakes would not be made in the future. The competition ended with a score of 294 for statics, 115 for dynamics, for a total score of 409, which placed the team in 7th place. On the podium, the eLaketric Racing Team UAS Constance took third place, followed by Impulse Modena Racing in second and the UniBoMotosport team, which took home the cup.

RECRUITMENT

On October 29, the team opened recruitment for some of its areas, namely Electronics, Propulsion, Sponsors, Logistics, Marketing and Design, and Human Resources. Applications were open until November 16, and during this period a session was held to present the team and clarify doubts for those interested in joining the team. After the selection phase, where the motivation of the candidates is first evaluated, an individual interview and a case study are then conducted, the performance of each one is finally evaluated by performing several tasks in the area they applied for. After these steps, the team welcomes the recruits who have shown the best performance and motivation and, therefore, finish the selection process and officially join the team.

FROM COMBUSTION TO SMARTENERGY

SMARTENERGY

Two is the number of motorcycles the team has already built, carrying an electrical certificate. However, this wasn't always the case. It all started in 2012, with only 20 members and 5 areas. The focus was crystal clear: the TLMoto's big dream was to be able to take a motorcycle to competition, built from scratch, by the hands of ist students, regarding any adjacent problems. Over time, the team was able to develop in number, as well as in mindset, and with the growing appeal to reduce fossil fuels consumption, a window to a new world arrived - electric motorcycles. The big transformation took place in 2018. TLMoto was going to start its process of entering the electrics world, leaving the footprint of combustion behind and looking ahead, in search of resorting only to smart energy. The process was time consuming, exhausting and demanded a lot from all the areas, but it was also this turnaround that made TLMoto of today. But how did this process affect the various areas? Well, in the next edition, the present section will give rise to the answer to this question. Stay tuned!

POWERTRAIN

Regarding the TLM03e, Powertrain had a lot of work before the MEI competition. They dedicated to the maintenance of the batteries, carried out improvements to the moto itself and several tests on kart tracks and, consequently, analyzed the telemetry of the same. In Italy, certain modifications had to be made to the control of the high voltage system in order to enable TLMoto to participate.

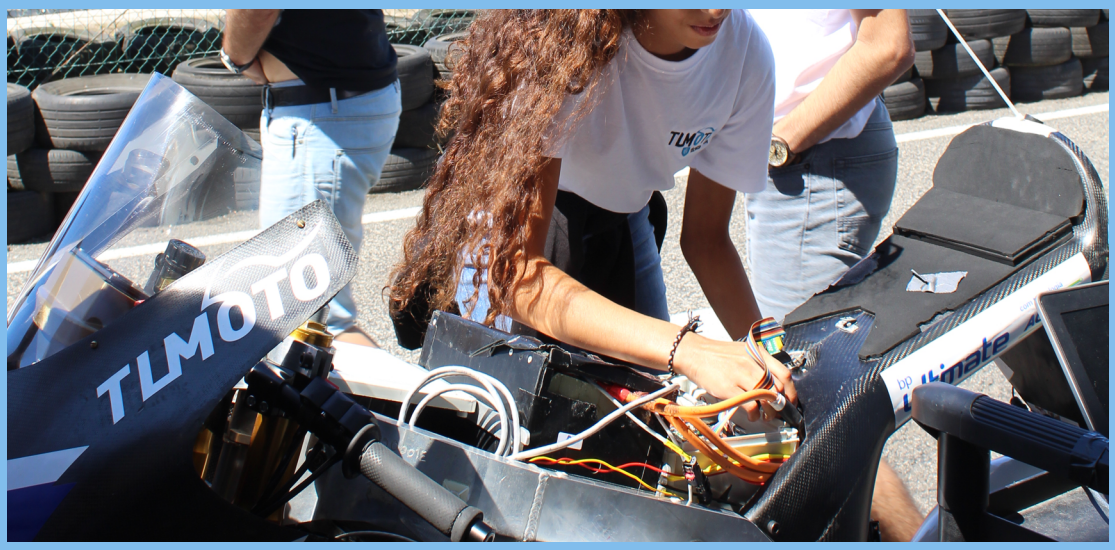
With regard to the TLM04e, the report on the development of the concept, the schematics of the motorcycle's electrical systems (the 1st special delivery from MS) were concluded and the discharge of a cell along the length of the cell test bench was simulated. of the run, to confirm that it has capacity for the entire run and the number of cells required for this.

In addition, the design and electrical simulations of the busbars (copper or aluminum parts responsible for connections between cells) and the prototyping (in 3D printing) of the busbars and battery pack modules were conceived. Finally, with the arrival of the MS Kit, measurements of its parameters, quality control and controller programming began.

ELETRONICS

Electronics, during these 3 months, has been making some adjustments to the prototype that went to the Italian competition..

Regarding the TLM04e, they had been writing the general report for the 1st delivery of MotoStudent, and then entered the phase of developing the board schematics and structuring the low voltage systems. Thus, it was possible to write, during this last month, together with the Powertrain area, the report with the motorcycle's wiring diagram, for the October delivery, required by Motostudent. It is now in the PCB design phase.



AERODYNAMICS AND COOLING

In the last quarter, the Aerodynamics and Cooling area was working on the new prototype, TLM04e, creating innovative design concepts and preparing the arrival of its engine. In addition, they developed new thermal models of the moto and worked on the design of the cooling system. Finally, the various components of the motorcycle were thermally tested and subsequent cooling simulations were carried out.

DYNAMICS

The Modeling & Simulation subarea continued the development of the Motus program, and is currently developing the power bank to be used in the design of the TLM04e. In addition, new simulations were performed in order to optimize geometric parameters that underwent changes during the transition to the design phase. At Laptime, a path optimization algorithm is being implemented, allowing the existence of a more realistic program.

Relatively to the Tests & Dynamic Components subarea, they modeled the linkage system to be used on the TLM04e, while actively working with the sponsors area to guarantee sponsorship for the new prototype's suspensions. On a less practical level, they wrote a suspension setup guide to make adjusting them on the track easier.

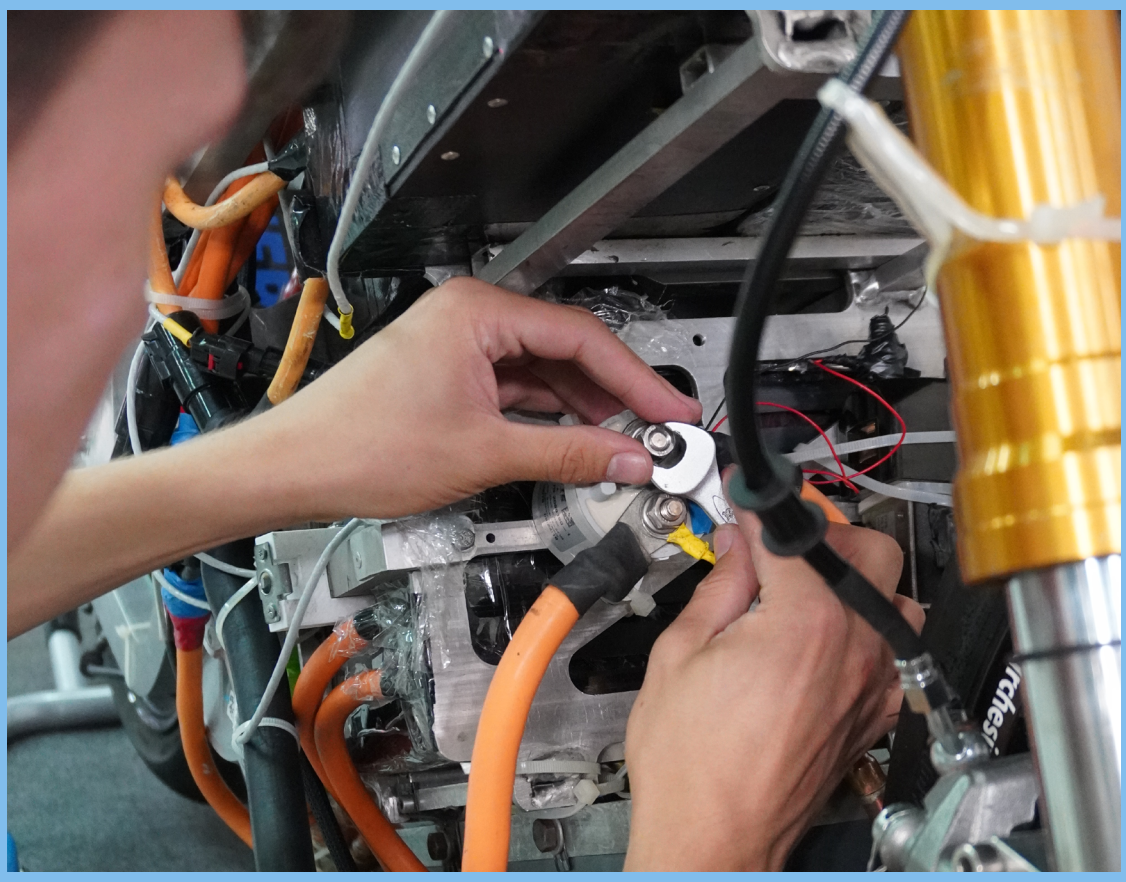
STRUCTURES

During September, Structures was taking care of the preparations for the MEI competition and, in parallel, trying to finish the design phase of the box, arm and frame. After the return of the competition, there was a week of break, organization of ideas and restructuring, caused by the needs observed by the competition. Subsequently, in the Main Structures subarea, the table was stopped waiting for the rest of the box system, such as the arm, although it will be resumed in the near future.

n Boxes, the design for integrating the batteries in a box is being finalized. In the Production sub-area, support has been provided to the system, researching some materials to be used in the modules, and manufacturing organization has been resumed. Finally, in Connecting Pieces, significant advances are being seen in the independent parts of the frame.

HUMAN RESOURCES

During the last three months, the Human Resources area updated the team's teamcharter, prepared a report on know-how and team structure for the Motostudent competition. They continued to monitor the areas, developed training and a manual of good practices. In October, the area also carried out performance evaluations for all leaders, sub-leaders and members. Finally, as it is an area with a fundamental role in recruitment, it is responsible for the integration of new members, who entered the team in September, and dealt with the planning of the new recruitment that opened in October.



SPONSORS

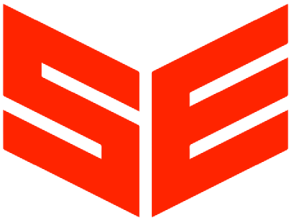
In the last three months, the Sponsors area closed the partnership with the company Mouser, dealt with the contact with new companies for sponsorships and obtained feedback from current sponsors, with whom it discussed the follow-up of sponsorship for the new season.

LOGISTICS

In this last quarter, the Logistics area played an important role in the preparation of the competition in Italy: organizing the necessary material and sending it by the carrier. In addition, they were also responsible for providing support to the other members on the track. Apart from the competition, they took care of scheduling the tests at SAKI and organized the material and shifts for the fairs the team was present at (AEIST fair, FIC.A and Taguspark anniversary). Given the works in our workshop, there was a need to organize and plan the future disposition of everything that belongs to us. They are currently preparing the team's Christmas dinner, because TL is not all about work!

MARKETING & DESIGN

The Marketing and Design area prepared a presentation to deliver at the competition in Italy and, during it, took care of the collection of photographic and video material responsible for all the promotion of the team at the event. In addition, they carried out an analysis of the performance of TLMoto's social networks, and was also in charge of developing an item for the MotoJornal magazine. They created a new box, roll-up and flyer for the team and took care of all the promotion of the recruitment, which took place in October/November, and the respective presentation.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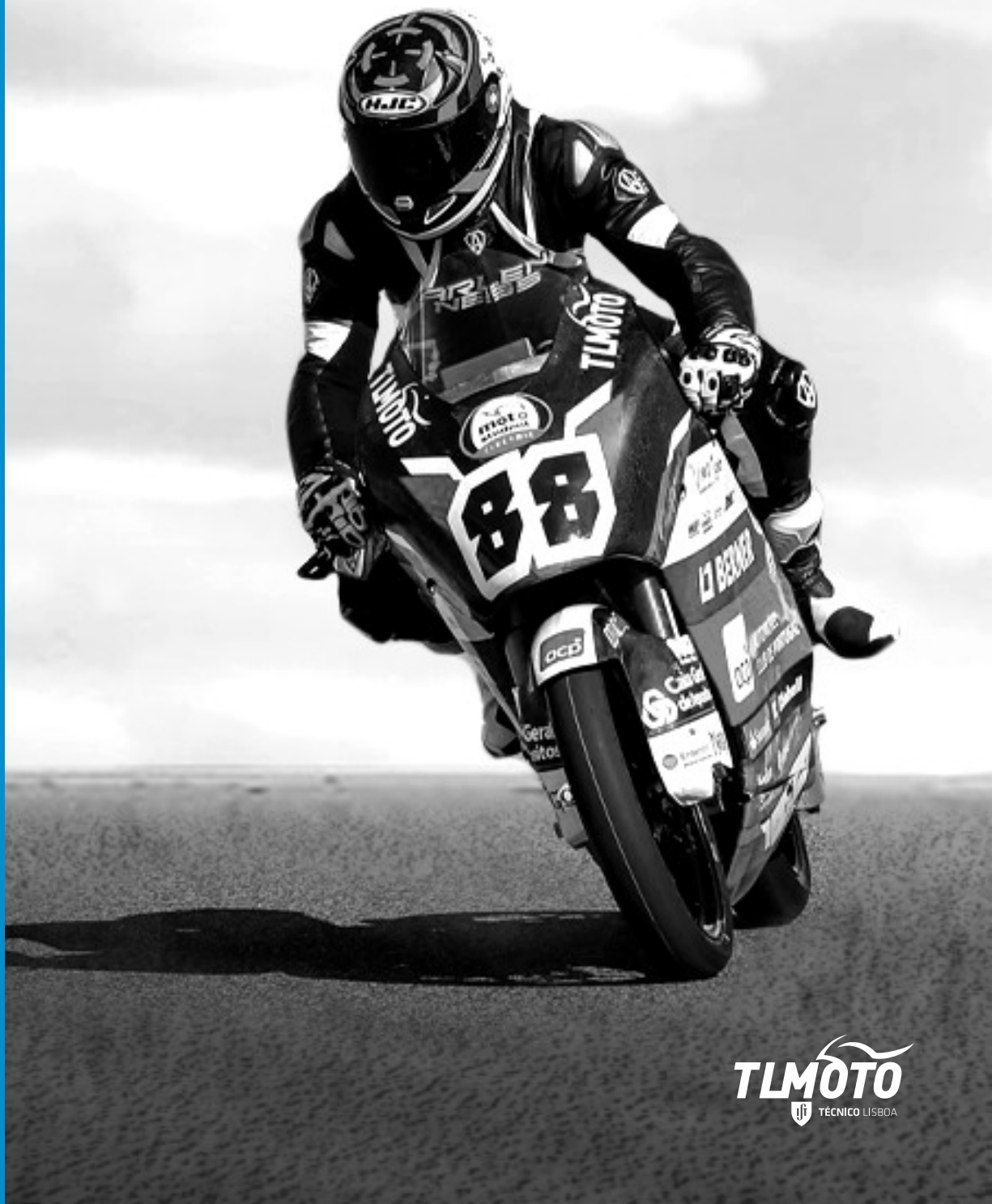

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