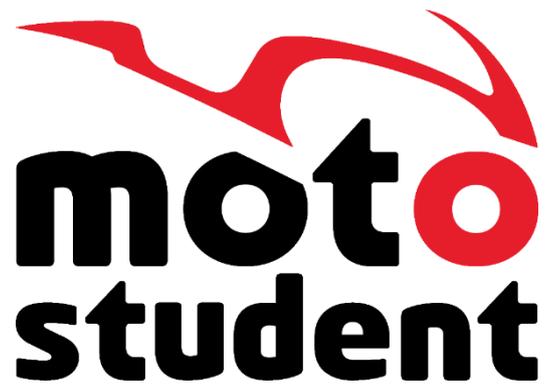


# VIII



## INTERNATIONAL COMPETITION

2024 - 2025

### Competition Regulations

Rev. 1/2024



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# SECTION A

## ADMINISTRATIVE REGULATIONS

## ARTICLE 1: INTRODUCTION TO MOTOSTUDENT COMPETITION

### A.1.1 MotoStudent objectives

A.1.1.1 | MotoStudent is a university challenge between student teams, that must design and develop a competition motorbike project (electric or petrol) which will be evaluated and tested in a Final Event to be held at the MotorLand Aragón facilities in Alcañiz (Teruel), Spain.

A.1.1.2 | MotoStudent is an education advanced program that prepares undergraduate and graduate students in a variety of fields related with the mobility sector, focusing on the professionals that will drive the future of innovation, by challenging them with a real motorsport project. Through the different phases on which the teams will be involved they will develop their talent on areas that include:

- Project management with acumen on economic aspects and budget targets, marketing, resource management, document analysis and preparation, and milestones competition.
- Develop a real prototype under the given rules, with special focus on the market development and motorsport basis.
- Compete, work and collaborate within the team and with other worldwide university teams.

### A.1.2 Event promoter

A.1.2.1 | The MotoStudent Competition, promoted by the Moto Engineering Foundation (hereinafter MEF) and TechnoPark MotorLand, both entities are part of the Competition Organization, responsible for its full development.

A.1.2.2 | The Organization has the right to adapt and modify the Competition Rules & Regulations as well as any other official document, committing itself to communicating to the participating teams with sufficient time for the proper development of the activities of the competition.

### A.1.3 Competition categories

A.1.3.1 | The MotoStudent competition has two different categories:

- MotoStudent Petrol.
- MotoStudent Electric.

A.1.3.2 The **MotoStudent Petrol** category is characterized by using an internal combustion engine as the propulsion method. The regulations related to the category are defined throughout these Competition Rules & Regulations in their corresponding sections.

A.1.3.3 The **MotoStudent Electric** category is characterized by using a 100% electric system as a propulsion method. The regulations related to the category are defined throughout these Competition Rules & Regulations in their corresponding sections.

A.1.3.4 Each category will be developed in parallel and independently with its evaluation and corresponding score, as well as the tests and milestones to be fulfilled throughout the competition, including the Final Event.

#### **A.1.4 Phases of the competition**

A.1.4.1 The projects and prototypes presented will be judged and assessed in a series of different tests, divided into two different phases, called MS1 and MS2.

A.1.4.2 The **MS1** phase primarily evaluates teams' engineering and management skills, emphasizing resourcefulness over resources. It offers students a chance to apply their academic knowledge in a practical, professional setting, showcasing the challenges and procedures involved in a real-world project development, from inception to completion.

A.1.4.3 The **MS2** Phase consists of a series of tests aimed at assessing the dynamic behavior and the performance of the manufactured prototype.

A.1.4.4 Any stage can incur penalties if the organization deems it necessary.

A.1.4.5 The organization reserves the right to not accept the access to any of the different phases to a given team.

#### **A.1.5 Awards**

A.1.5.1 The MS1 Phase will have the following awards, for both categories:

- Best MS1

- Best Design
- Best Innovation

A.1.5.2 The MS2 Phase will have the following awards, for both categories:

- 1<sup>st</sup> classified of the MS2 Phase
- 2<sup>nd</sup> classified of the MS2 Phase
- 3<sup>rd</sup> classified of the MS2 Phase

A.1.5.3 In addition to the specific awards for each phase, the following general prizes will be awarded, for both categories:

- *Best MotoStudent*: Awarded to the team that obtains the maximum score in the sum of the MS1 and MS2 phases
- *Best MotoStudent Rookie*: Awarded to the newly incorporated team (representing a campus not registered in any of the previous MotoStudent) that obtains the maximum score in the sum of the results of the MS1 and MS2 phases.
- *MotoStudent Fair Play*: Awarded to the team that has competed with the most integrity, respect and honesty, inside and outside the racetrack and the Final Event.
- *Excellence Showcase*: Awarded to the team that a group of selected top juries from the automotive industry select as the team with the best project showcase in front of the whole attending public during the MotoStudent Awards Ceremony in the Final Event.

A.1.5.4 Summary of the MotoStudent International Competition awards:

MotoStudent Petrol	MotoStudent Electric
<b>MS1 Phase awards</b>	
<b>Best MS1</b>	<b>Best MS1</b>
<b>Best Design</b>	<b>Best Design</b>
<b>Best Innovation</b>	<b>Best Innovation</b>
<b>MS2 Phase</b>	
<b>1<sup>st</sup> classified</b>	<b>1<sup>st</sup> classified</b>
<b>2<sup>nd</sup> classified</b>	<b>2<sup>nd</sup> classified</b>
<b>3<sup>rd</sup> classified</b>	<b>3<sup>rd</sup> classified</b>

General awards	
Best MotoStudent	Best MotoStudent
Best Rookie Team	Best Rookie Team
MotoStudent Fair Play	
Excellence Showcase	

Table 1 - MotoStudent awards summary

A.1.5.5 | The economic and material value of each prize will be published by the Organization to all registered teams.

### A.1.5 Entries

A.1.5.1 | MotoStudent accepts registrations from teams of students representing universities around the world.

A.1.5.2 | The registration period starts on 01/03/2024 being formalized through the website of the Competition: [www.motostudent.com](http://www.motostudent.com).

A.1.5.3 | The entry fee for a team amounts to **4.385,00 €** (VAT included).

A.1.5.4 | The registration as an official team includes:

- The rights to participate at the VIII Edition of the MotoStudent International Competition as an official team.
- The rights to use the MotoStudent Kit during the current edition that includes common compulsory parts for teams that must be installed in the prototype. The shipping cost of the Kit is also included. There are not included the duties or special taxes of the destination countries, states or other areas.
- The rights for 10 students' slots (9 Team Members and 1 Team Leader) and 2 Team Tutors to participate at the VIII Edition of the MotoStudent International Competition.
- Access as a team to Challenges in partnership with external companies i.e. the Red Bull MotoBoost KTM Call Challenge.
- The right of access to services, supplies, discounts and opportunities offered by the Organization and the collaborating companies.

- A.1.5.5 | The fee for adding additional Team Members slots amounts to **235,00 €** (VAT included). Additional Team Members can be registered until 30 days before the first day of the Final Event.
- A.1.5.6 | The registration as a Team Member includes:
- Passes for the Final Event, with exclusive access to areas for Team Members.
  - Right to a certificate validating participation in the VIII Edition of the International MotoStudent Competition.
  - Access to specialized on-site or online training courses via the MotoStudent Platform with its corresponding official certificate and with possible discounts.
  - Access to the MotoStudent Talent Roadshow in order to keep you updated on the latest job offers of the top automotive companies.
- A.1.5.7 | The fee for adding additional Team Tutors' slots amounts to **115,00 €** (VAT included). Additional Team Tutors can be registered until 30 days before the first day of the Final Event.
- A.1.5.8 | The registration as a Team Tutor includes:
- Passes for the Final Event, with exclusive access to areas for Team Members.
  - Right to a certificate validating participation in the VIII Edition of the International MotoStudent Competition.
  - Access to specialized on-site or online training courses via the MotoStudent Platform with its corresponding official certificate.
- A.1.5.9 | For a team, Team Member, Team Leader, Team Tutor, to be considered as registered, it must have received the official confirmation of the Organization via email.
- A.1.5.10 | The organization can deny the registration of a team, Team Member or Team Tutor.
- A.1.5.11 | The number of available places for teams is limited. These vacancies will be covered by order of registration. Teams that have not paid the registration fees

will not be considered as registered, therefore it will not be possible to reserve their place for the Competition.

A.1.5.12 | The entry fees of the competition are not refundable. Even if for any reason outside the Organization, the competition has to be interrupted, canceled, or a variation in the scheduled terms has been determined (such as the dates of the Final Event), the Organization reserves the right not to return the amount totally or partially of these registration fees.

#### **A.1.6 Official publications and Final Event information**

A.1.6.1 | All official communications, regulations, annexes, etc. will be published on the official website of the competition: [www.motostudent.com](http://www.motostudent.com).

A.1.6.2 | Teams are required to read, understand and be familiar with all publications that the Organization makes.

A.1.6.3 | The Organization may use the email system, the private messages on the MotoStudent Platform or other electronic means to send news and information about the competition.

A.1.6.4 | Any official communication issued by the Organization will have the same officiality as the present Competition Rules & Regulations and, therefore, the teams will have the same compliance obligation.

A.1.6.5 | The Organization reserves the right to use any other channel as their official channel with the previous communication to the teams.

#### **A.1.7 Official languages**

A.1.7.1 | The official languages of the MotoStudent International Competition will be the following:

- English.
- Spanish.

A.1.7.2 | Official publications and documents will be published in English.

A.1.7.3 | The communications between the participating teams and the Organization must be made in one of the two official languages.

### **A.1.8 Official time**

- A.1.8.1 | The official time of the MotoStudent International Competition is the one in force in mainland Spain:
- Winter Schedule: CET (UTC+1).
  - Summer Schedule: CEST (UTC+2).

## **ARTICLE 2: APPLICATION OF THE MOTOSTUDENT REGULATIONS**

### **A.2.1 Ambiguities in the Regulations**

- A.2.1.1 | The possible ambiguities or questions about the meaning or intention of the Competition Rules & Regulations will only be resolved by the Organization.
- A.2.1.2 | Everything not permitted and specified in these Competition Rules & Regulations is strictly forbidden. Teams must ask for authorization, and the decision of the Committee will be published on a technical note

### **A.2.2 Validity of the Regulations**

- A.2.2.1 | The Competition Rules & Regulations of the MotoStudent International Competition published on the website [www.motostudent.com](http://www.motostudent.com), including its possible future versions, are the only regulations valid for the VIII Edition of the MotoStudent International Competition.
- A.2.2.2 | The Regulations from past editions (I, II, III, IV, V, VI or VII Edition) of the MotoStudent International Competition will not be valid for the VIII Edition of the MotoStudent International Competition.
- A.2.2.3 | For any situation or sports infraction not included in this Competition Rules & Regulations or in another official communication issued by the Organization, the RFME Sporting Regulations of the Spanish Speed Championship ([ESBK](#)) 2025 will regulate the procedure to be followed.

### **A.2.3 Compliance of the Regulations**

- A.2.3.1 | By taking part in the MotoStudent International Competition the team, Team Members, Team Leader, Team Tutors, Riders and any other university staff

member as individuals, accept and must comply with all the rules imposed by the Organization both in the Competition Rules & Regulations and in subsequent official documents, as well as the rules of the sports complex where the Final Event takes place.

A.2.3.2 | The Organization reserves the right to sanction all those teams that do not comply with aspects of the Competition Rules & Regulations and established schedules, as well as those teams that demonstrate unsportsmanlike behavior, or may endanger persons and facilities.

A.2.3.3 | During the MS2 phase, Race Direction may apply the relevant penalties for noncompliance with sports regulations. These penalties may be accompanied by score penalties.

A.2.3.4 | Disobedience to orders given by the Organization or Race Direction, unsportsmanlike or aggressive behavior, acts prejudicial to the people attending, etc. can result in a disqualification penalty.

A.2.3.4 | Teams or riders must avoid any public statement or press release that could damage or negatively affect the MotoStudent International Competition. Consequently, is the obligation of riders, Team Members, Team Tutors and Team Leaders to refrain from publishing any public pronouncement that may irresponsibly harm the legitimate interest of the MotoStudent Officials or that may be contrary to the integrity of the MotoStudent International Competition or the sport.

A.2.3.5 | Public statements that may irresponsibly harm the legitimate interest of the MotoStudent International Competition or that may be contrary to the integrity of the Competition or the sport, will include, but not be limited to:

- Public statements or comments to the media that attack, belittle, discredit, or irresponsibly harm Competition Officials.
- Public comments from Team Members, Team Leaders, Team Tutor and drivers who know, or should reasonably know, that they will irresponsibly harm the reputation, image, or interests of the sport and/or any of the Competition Officials are expressly covered by this rule.
- Responsible expressions of legitimate disagreement with Competition Officials and/or Competition policies are not prohibited.

#### **A.2.4 Penalty types**

- A.2.4.1 | The Not Compliance (hereinafter NC) will substitute the penalized delivery score for 0 points.
- A.2.4.2 | The Not Presented (hereinafter NP) will substitute the penalized delivery score for 0 points.
- A.2.4.3 | The Minor Penalty (hereinafter MP) will deduct 10 points into the total score of MotoStudent.
- A.2.4.4 | The Severe Penalty (hereinafter SP) will deduct 50 points into the total score of MotoStudent.
- A.2.4.5 | The Disqualification (hereinafter DQ) penalty will count as a 0 in the phase to be evaluated. Depending on the seriousness of the fault, the organization may convey the automatic expulsion of the team and its members from the competition.
- A.2.4.6 | Any sports related penalty derived from MS2, is to be determined by the Race Direction.
- A.2.4.7 | The organization reserves the right to apply any penalty not defined in the Art. A.2.4 if it deems necessary.

## **A.2.5 Right to claims and impugnments**

- A.2.5.1 | Any team has the right to protest and suggest. The Organization will review any doubt, breach or penalty presented by the official method.
- A.2.5.2 | A team can file a claim based on any disagreement with any action by the Organization, either in the scoring of the competition or other official action that can be considered as causing damage to its team.
- A.2.5.3 | A team may request an impugnment against another participating team if they observe any breach of the Competition Rules & Regulations or improper conduct.
- A.2.5.4 | Every protest and/or complaint must be submitted to the Organization following the presentation format reflected in Section J, Annex 1, of these Competition Rules & Regulations, stating the article of the regulation which is considered to have been breached, with enough proof to be verified. The protests and complains 30 days prior to the first day of the Final Event may be sent scanned or digitally signed by email to [faq@motostudent.com](mailto:faq@motostudent.com), while protests and complaints during the Final Event must be submitted in writing to the Organization.

- A.2.5.5 | To make a claim or an impugment, the applicant team must deposit 50 points on the score of the phase or test to protest and €800. If the Organization approves the resolution in favor of the applicant team, the 50 points and €800 will be given back to the applicant team, if not, and the protest is refused, the team will lose the 50 points and €800.
- A.2.5.6 | The period of presentation for claims or impugnments related to any aspect of the tests developed during the Final Event, must be submitted within a maximum of 30 minutes after the publication of the results of the test affected.
- A.2.5.7 | The Organization will be responsible for the final decision on the protest. This decision will be final and cannot be appealed.
- A.2.5.8 | Only in the purely sporting field it will be possible to request an appeal procedure: As it is stated in Art. 119 of the RFME Sporting Regulations, any participant may appeal to penalties imposed or decisions taken by the Organization and Race Direction to the Disciplinary Court of the RFME. Any appeal may be presented in writing, signed by the interested party and accompanied by a deposit of 800€. The right for appeal expires after fifteen days, including post terms, from the communication of the resolution.
- A.2.5.9 | As it is stated in the RFME Sporting Regulations, in its article 119, at the request of a team it is possible to lodge appeals to the FIM, through the RFME, being the only one to judge the opportunity of the formulated appeal, being able to refuse the process without being obliged to explain the causes and reasons that induce it. The right of appeal does not imply the suspension of the penalty or sanction; however, when RFME accedes to raise an appeal to the FIM, the appellant may obtain, prior to the appropriate request, that the appeal may lead to the temporary suspension of the decision, but in this case, it must submit, together with the appeal, the guaranteed deposit stipulated by the FIM.

## **A.2.6 Right of confiscation**

- A.2.6.1 | The Organization reserves the right to confiscate or hold during the Final Event any prototype, component, tool or rider equipment at its discretion that considers non-complying with the Competition Rules & Regulations.
- A.2.6.2 | Any material confiscated by the Organization during the Final Event will be returned to its owner team at the end of the Final Event.

- A.2.6.3 | The organization reserves the right to confiscate, hold or recall any component from the MotoStudent Kit if it's used outside the MotoStudent International Competition without prior authorization of the MotoStudent International Competition Organization.

## **A.2.7 Changes to the Competition Rules & Regulations**

- A.2.7.1 | The Organization has the right to change the Competition Rules & Regulations, as well as the official calendar of the competition, if it considers it necessary. Any change to the regulations, will be added in Section I, and will be published on the official website.
- A.2.7.2 | The Organization will announce the changes to the regulations through the means considered as most appropriate to make the changes known. Regardless of the means used, the most updated Competition Rules & Regulations document will always be the one published on the website of the Competition.

## **ARTICLE 3: PARTICIPATION REQUIREMENTS**

### **A.3.1 Team eligibility**

- A.3.1.1 | The Competition has a purely academic objective, being a multidisciplinary project with a great importance in the areas of engineering, economics, marketing and project management. Although the project is based on the development and manufacture of a racing motorcycle prototype, it is not a conventional speed championship.
- A.3.1.2 | Only universities and/or Vocational Training schools/colleges whose main activity is not training in the field of motor racing in any of its forms are allowed.
- A.3.1.3 | There is no limit in the number of teams set for each university. Each university may submit as many teams as they like for any category of the Competition.
- A.3.1.4 | Each registered team can only submit one project and one prototype.
- A.3.1.5 | Every university team participating in MotoStudent must include in their team name the name of the university or college they belong to.
- A.3.1.6 | Each participating team must choose a bike number, between 1 and 99. This number will be given at the election of each team, by order of registration in the competition. The numbers 1, 2 and 3 will be exclusively reserved for the teams representing the finalist universities in the first, second and third place

respectively in the Best MotoStudent award of the VII Edition of the MotoStudent International Competition.

### **A.3.2 Participants**

A.3.2.1 Teams and Team Members, Team Leader and Team Tutors registered in the Competition will be considered as “participants of the Competition” from the moment they enter until the end of the Final Event.

A.3.2.4 Students from Training Centers (enrolled in the Vocational Training Center in the 2023-2024 and/or 2024-2025 academic year) can also be part of the team. To do this, the team must present a proof of agreement agreed between the Training Center and the participating university.

A.3.2.5 The consideration of the competition and its compatibility with the curriculum will be decision of each university. The represented university has no obligation of including MotoStudent International Competition in its curriculum, not even as free-elective formation.

A.3.2.6 To participate at the competition, in the academic aspect students must be enrolled in 2023-2024 and/or 2024-2025 courses, regardless of the percentage of subjects or credits passed.

A.3.2.7 All students must be over 18 years old at the beginning of the Final Event.

### **A.3.3 Liability Waiver**

A.3.2.1 All participants, including students, tutors and rider, must sign a liability waiver when entering MotoStudent. The rest of the people attending the Final Event with the teams will be considered as general public.



*Picture 1 - Motorsport can be dangerous*

#### **A.3.4 Team Tutor duties**

- A.3.4.1 | Each team must designate at least one tutor, who will be recognized as the Team Tutor who may advise their teams on any aspect of the project.
- A.3.4.2 | A Team Tutor must have a contractual relationship with the university at the time of his registration.
- A.3.4.3 | The Team Tutor will be considered the highest responsible person of the team in case of any major event during the whole competition.
- A.3.4.4 | The Team Tutor should accompany the team during the Final Event. If the Team Tutor is not able to attend the Final Event, the responsibility will be delegated to the Team Leader as the maximum responsible of the team.
- A.3.4.5 | The Team Tutor cannot take part in the development, assembly or manufacture of any document, presentation or component of the prototype.
- A.3.4.6 | Any Team Tutor has to represent the university in administrative terms over the full length of the Competition.
- A.3.4.7 | If there are any changes in the figure of the Team Tutor, for justified reasons, it must be communicated as soon as possible to the Organization to take into account the new positions. This change will carry an administrative fee

#### **A.3.5 Team Leader duties**

- A.3.5.1 | Each team must designate one Team Member as their Team Leader.

A.3.5.2 | The Team Leader will have the same rights and obligations as the rest of enrolled students, but it will act as a communication link with the Organization and representation of the team.

A.3.5.3 | If there are any changes in the figure of the Team Leader, it must be communicated as soon as possible to the Organization to take into account the new positions. This change will carry an administrative fee.

### **A.3.6 Replacements**

A.3.6.1 | Only role modifications of Team Members or Team Leader will be allowed. Those modifications will entail the payment of an administrative fee for management expenses, according to Art A.3.8.1, and will be only accepted up to 30 days before the first day of the Final Event.

A.3.6.2 | No Team Member or Team Tutor registration fee can be cancelled or reimbursed.

A.3.6.3 | All the modifications permitted on the participating students must be communicated to the Organization by the Team Tutor or the Team Leader through the MotoStudent Platform.

### **A.3.7 Insurances**

A.3.7.1 | The registered universities must cover the activities derived from the participation of the MotoStudent competition with its own school insurance.

A.3.7.2 | The registered teams must have its own insurance for the Final Event in order to cover their Team Members, Team Leader, Team Tutor, Rider and any possible harm that could be derived from the development of the event against third parties.

A.3.7.3 | The Final Event will have the necessary medical and security means in terms of sporting requirements.

A.3.7.4 | The Organization is not liable for material or physical damage that may be caused during the development or handling of the prototype by each team.

### **A.3.8 Administrative procedures and fees**

- A.3.8.1 | The administrative procedures requested by the teams to the Organization of the Competition, and that are not part of the development of the milestones and activities of MotoStudent, will entail standard administrative fees for management expenses of € 30 (VAT included). Some examples of administrative procedures are:
- Issuance of certificates and other justification documents (excluding those issued generically by the Organization).
  - Issuance of duplicates of documentation.
  - Modification of each given team data: designation of tutor and Team Leader, team name and/or university, etc.
  - Management of parcels, shipments, and storage of prototypes and other team elements for the MotoStudent Final Event.
  - Rider data modification that is not mandatory by the organization (i.e. injured rider).

#### **ARTICLE 4: MANUFACTURING THE MOTORBIKE**

##### **A.4.1 Prototype manufacturing**

- A.4.1.1 | The motorbikes taking part in MotoStudent must be created, designed and assembled by the students registered in the team without the direct involvement of professional engineers, race engineers, professional mechanics, etc. The team commits to this by signing the document in accordance with the Organization and the Regulations of the Competition.

##### **A.4.2 MotoStudent Kit**

- A.4.2.1 | The Organization will provide all teams with a Kit including parts that are compulsory to be installed in the prototypes. The technical regulations regarding this Kit are defined in sections B, C and D of this regulations.
- A.4.2.2 | The MotoStudent Kit for the teams registered in the MotoStudent Competition includes the following components:
- An internal combustion engine (only for the MotoStudent Petrol category).

- A permanent magnet electric motor (only for the MotoStudent Electric category).
- A set of front and rear slick tires.

Other compulsory parts to be used in the prototype will be included in the MotoStudent Kit. Those parts from third parties (e.g. the IMD or the brake system) will be explained in the MotoStudent Accepted Parts sheet.

- A.4.2.3 | The shipping cost of the MotoStudent Kit to the facilities indicated by the teams will be covered by the Organization. However, each team will be responsible for the taxes and duties derived from the import policies of the country, zone or region to which the Kits are sent.
- A.4.2.4 | The teams must be informed previously to the sending of the Kits about tariff policies and logistical limits derived from the shipping destination to avoid retentions of the material, telling the Organization about special requirements in case of being necessary.
- A.4.2.5 | It is possible that, depending on the country where the team is located, the shipment of any of the components included in the MotoStudent Kit is not allowed. In this case, the Organization will contact the team to find alternative solutions for the management of these components.
- A.4.2.6 | The parts included in the MotoStudent Kit for both categories must only be used for the development of their own prototypes for the MotoStudent competition and their participation in it, being strictly forbidden to give them other applications outside of this one.
- A.4.2.7 | The parts included in the MotoStudent Kit are enumerated at their corresponding article in each category specific section of this regulation code.
- A.4.2.8 | The components included in the MotoStudent Kit will incorporate an identification mark. This marking must remain intact, since it will be reviewed by the Technical Staff of the organization during the final event. In case of breakage or damage of these markings, the teams should contact the organization to determine its solution.
- A.4.2.9 | It is not possible to cover any identification mark of the components supplied by the organization.
- A.4.2.10 | Any technical question regarding the components included in the MotoStudent Kit must be channeled through the organization. Direct contact between the

participating teams and the supplying companies for technical issues related to the MotoStudent Kit is prohibited.

## ARTICLE 5: PARTICULARITIES FOR NON-EUROPEAN TEAMS

### A.5.1 Transport and import of the prototype

A.5.1.1 Shipments and imports of prototypes and material must comply with all relevant requirements regarding transportation, import and export established by Spanish laws and regulations.

A.5.1.2 Is recommended to manage the delivery and customs clearance as a temporary importation with a specialized company.

A.5.1.3 In no case the Organization or the management company of the Speed Circuit will be the recipient of the transport, nor will it manage the reception of the prototype.

A.5.1.4 The organization will accept deliveries for the Final Event a month prior to its date.

A.5.1.5 The data for the shipment to the place of the Final Event where its delivery date is before the week of the Final Event will be:

- **Addressee:** Team or University name.
- **Address:** TechnoPark MotorLand, Ed. Dr. Joaquín Repolles, Oficina 1, 44600 Alcañiz – Teruel (Spain)
- **Contact phone:** Team’s contact phone

A.5.1.6 The data for the shipment of deliveries during the Final Event’s week will be:

- **Addresse:** Team or University name
- **Address:** MotorLand Aragón – Circuito de Velocidad, Ctra. TE-V-7033 km. 1, 44600 Alcañiz – Teruel (Spain)
- **Contact phone:** Team’s contact phone

### A.5.2 Visa

A.5.2.1 | The registration documents in the MotoStudent Competition and other participation accreditations of the team in the Competition can be used as justification or demonstration to issue the visa, in case of requiring it.

The Organization recommends non-EU teams to ensure all aspects of the visa and travel in general as soon as possible to avoid unexpected incidents.

All the information and doubts about the requirements to travel to Spain are included in the website of the Ministry of Foreign Affairs and Cooperation of the Government of Spain: [www.exteriores.gob.es](http://www.exteriores.gob.es).

A.5.2.2 | The Organization will not grant any type of visa or invitation letter, nor will it intervene with any organism, embassy, or consulate to resolve any question regarding the visa of the members of each team.

## ARTICLE 6: COMPETITION CALENDAR

### A.6.1 Official deadlines and calendar

A.6.1.1 | The MotoStudent International Competition takes place during three semesters over the period 2023-2024. During this period there are some milestones that all teams must meet to complement the final evaluation of the Competition. The following Calendar shows the main deadlines of the Competition.

Period	DATE Start - End	2024												2025									
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Team Registration	30 days before the Final Event																						
Additional team members and team tutors registration	30 days before the Final Event																						
MS1 1 <sup>st</sup> milestone, Team plan	01/11 - 30/11																						
MSS 1 <sup>st</sup> delivery, Team plan video	01/11 - 30/11																						
MSS 2 <sup>nd</sup> delivery, Characteristics page	01/12 - 31/12																						
MS1 2 <sup>nd</sup> milestone, Product definition	01/02 - 28/02																						
MSS 3 <sup>rd</sup> delivery, Product definition video	01/02 - 28/02																						
MSE 1 <sup>st</sup> delivery, Electric and battery pack scheme	01/03 - 31/03																						
MS1 3 <sup>rd</sup> milestone, Innovation	01/04 - 30/04																						
MSS 4 <sup>th</sup> delivery, Innovation video	01/04 - 30/04																						
MSS 5 <sup>th</sup> delivery, Abstract and Title	01/04 - 30/04																						
MS1 4 <sup>th</sup> milestone, Prototype CAD and drawings	01/05 - 31/05																						
MS1 5 <sup>th</sup> milestone, Economical plan	01/05 - 31/05																						
MS1 6 <sup>th</sup> milestone, Pitch presentation	01/06 - 30/06																						
MSE 2 <sup>nd</sup> delivery, Electrical precheck	01/07 - 30/07																						
MSS 6 <sup>th</sup> delivery, Rider declaration	01/08 - 31/08																						
MS1 7 <sup>th</sup> milestone, Final event presentation	Autumn 2025																						
MSS 7 <sup>th</sup> delivery, Fair play	Autumn 2025																						
MSS 8 <sup>th</sup> delivery, Excellence Showcase presentation	Autumn 2025																						
Final Event	Autumn 2025																						



Picture 2 - VIII Edition calendar

## A.6.2 Team Registration Period

A.6.2.1 | The Team Registration period is open at 01/03/2024 until all available places have been filled.

## A.6.3 Additional Team Members and Team Tutors registration

A.6.3.1 | The additional Team Members and Team Tutors registration period is open from 01/03/2024 until a month prior the first day of the Final Event.

## A.6.4 MS1 milestones

A.6.4.1 | The *MS1 1<sup>st</sup> milestone, Team plan*, has the objective to give a general overview of the team composition, team objectives and its internal organization.

- A.6.4.2 | The *MS1 2<sup>nd</sup> milestone, Product definition*, has to describe to the jury the different solutions opted for the prototype, and its calculations in order to assure the safety of the theoretical design.
- A.6.4.3 | The *MS1 3<sup>rd</sup> milestone, Innovation*, expects that the teams make changes in something established, especially introducing new methods, ideas or products to the prototype. This innovation must be focused on the direct impact on track, being measurable in the *MS2 Test 8: Race result*.
- A.6.4.4 | The *MS1 4<sup>th</sup> milestone, Prototype CAD and drawings*, the teams must deliver a 3D CAD from their prototype and a set of defined drawings from the prototype.
- A.6.4.5 | The *MS1 5<sup>th</sup> milestone, Economical plan*, must let the teams know the total amount of money collected, their expenses, the total value of the prototype and their economic future.
- A.6.4.6 | The *MS1 6<sup>th</sup> milestone, Pitch presentation*, must showcase the development of the project during the MotoStudent International Competition. It must be a compilation of the different videos that the team has already published in their different social networks.
- A.6.4.7 | The *MS1 7<sup>th</sup> milestone, Final event presentation*, faces the different teams to the jury during the Final Event. There each team must explain the project decisions, its changes and the innovation project delivered. Also, the jury will make a round of questions at each team box in order to bear out the presentation.

#### **A.6.5 MSE deliveries**

- A.6.5.1 | The *MSE 1<sup>st</sup> delivery, Electric and battery pack schemes*, is a special delivery only for those teams taking part in the MotoStudent Electric category. The teams must deliver their electrical schematics of the prototype and the different mechanical and electrical configuration from the battery pack.
- A.6.5.2 | The *MSE 2<sup>nd</sup> delivery, Electrical precheck*, the teams must review each article from the Chapter D from this Rules & Regulation Code and deliver a brief explanation with graphical evidence of its compliance.

#### **A.6.6 MSS deliveries**

- A.6.6.1 | The *MSS 1<sup>st</sup> delivery, Team plan video*, must dynamically summarize the team structure, internal organization and its reasons on why they are participating in MotoStudent.

- A.6.6.2 | The *MSS 2<sup>nd</sup> delivery, Characteristics page*, is a quiz on the MotoStudent Platform where each team must fill the prototype main dimensions and other physical characteristics, such as center of gravity, that they want to achieve during the development of the prototype.
- A.6.6.3 | The *MSS 3<sup>rd</sup> delivery, Product definition video*, must highlight the prototype's design and their main features.
- A.6.6.4 | The *MSS 4<sup>th</sup> delivery, Innovation video*, must showcase the innovation developed, how does impact to the prototype and the improvement realized to the motorbike.
- A.6.6.5 | The *MSS 6<sup>th</sup> delivery, Abstract and title*, is a quiz on the MotoStudent Platform, where each team must set a title and give a brief overview (one paragraph long approximately) to their presented *MS1 3<sup>rd</sup> milestone, Innovation*.
- A.6.6.6 | The *MSS 7<sup>th</sup> delivery, Rider declaration*, each team must present their rider sporting career and its achievements, so the Organization can check their compliance with the regulations.
- A.6.6.7 | The *MSS 8<sup>th</sup> delivery, Fair play*, is a quiz that can be found in the MotoStudent Platform, where each team must nominee another team that has been the most respectful (inside and outside the track) with its peers and with the MotoStudent International Competition spirit.
- A.6.6.8 | The *MSS 8<sup>th</sup> delivery, Excellence Showcase presentation*, where the two bests teams from each category will explain their project to a set of jurors and to the whole world during the Awards ceremony at the Final Event. There, the winner for the Best MS1 of each category will be decided.

## **A.6.18 Final Event**

- A.6.18.1 | The Final Event will take place during autumn (dates to be confirmed by the organization) at the MotorLand Aragón Speed Circuit. The specific date and time of tests and activities will be published by the Organization.

## **ARTICLE 7: COMUNICATION BETWEEN TEAMS AND ORGANIZATION**

### **A.7.1 Publication of questions: Frequently Asked Questions (FAQ)**

A.7.1.1 | By sending a question to the Organization, teams accept that the Organization can partially or totally reproduce the question and the official response in the FAQ Database, available to all registered teams through the official platforms.  
<https://www.motostudent.com/blocks/helpdesk/new.php>.

A.7.1.2 | [FAQ Database](#) will collect the common doubts regarding MotoStudent sent by the teams, and will be updated by the Organization.

A.7.1.3 | Registered teams must read the updates of the FAQ Database, which will have the same officiality as the present regulations.

## **A.7.2 Types of questions**

A.7.2.1 | The Organization will answer all the questions that are not described in the Competition Rules & Regulations or in the FAQ Database.

A.7.2.2 | The Organization may not answer a question whose answer is clearly reflected in the Competition Rules & Regulations, FAQ, registry or any other official document.

## **A.7.3 Consultation procedure**

A.7.3.1 | All questions addressed to the Organization must be sent through the platform established by the Organization for that purpose and must comply with the following format:

- Full name of the person asking the question.
- Category (MotoStudent Electric / MotoStudent Petrol).
- Bike number.
- Team Name.
- Affected article/s of the Regulations or FAQ number affected.
- Question.

A.7.3.2 | It is recommended to not attach any picture, drawing or file which exceeds 500KB in size.

A.7.3.3 | The Organization will not solve any doubts by telephone. All questions must be submitted and solved using the consultation procedure defined in this article.

#### **A.7.4 Response time**

- A.7.4.1 | The Organization undertakes to answer all questions as soon as possible. Considering the fact that some questions may need more time to be answered due to the complexity or need for external consultation, the estimated maximum response time will be 15 calendar days.

### **ARTICLE 8: OTHER COMPETITIONS**

#### **A.8.1 Other competitions**

- A.8.1.1 | The present Competition Rules & Regulations have been created exclusively for the VIII Edition of the MotoStudent International Competition, so prototypes manufactured according to the specifications indicated on these regulations do not have to adhere to the requirements of other speed competitions outside MotoStudent. The Organization is not responsible for the use that the different teams can make with the prototypes presented at MotoStudent in other competitions.

# SECTION B

## GENERAL TECHNICAL REGULATIONS

## ARTICLE 1: TECHNICAL REQUIREMENTS OF THE PROTOTYPE AND RESTRICTIONS

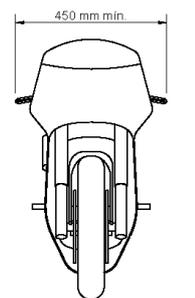
### B.1.1 Introduction to Technical Regulations

- B.1.1.1 | **EVERYTHING NOT PERMITTED AND SPECIFIED IN THESE REGULATIONS IS STRICTLY FORBIDDEN.** Teams must ask for authorization, and the decision of the Committee will be published on a technical note.
- B.1.1.2 | The design and manufacture of the presented prototypes must comply with the rules imposed by these Regulations in order to participate in the scoring phases of Competition.
- B.1.1.3 | The prototypes must maintain all the specifications required in the regulations during all the tests of the Final Event. The Organization may review the correct compliance with the regulations at any time during the Final Event.
- B.1.1.4 | Any failure to comply with the technical requirements and restrictions should be corrected and re-inspected before the prototype can participate in any test during the Final Event.
- B.1.1.5 | The rules reflected in this section equally affects both the "MotoStudent Petrol" and the "MotoStudent Electric" categories of MotoStudent, except for the articles where are indicated special requirements for a specific category.
- B.1.1.6 | The frame, subframe and swingarm must be self-designed.
- B.1.1.7 | All the eligible parts for the MototStudent International Competition are defined in the *MS Eligible Parts List* sheet, included those whose use is mandatory. If a part is not included in their corresponding list, its use is prohibited.
- B.1.1.8 | If a part does not have a list of eligible components, its configuration and selection are free, as long as they comply with the regulations defined here.

## ARTICLE 2: GENERAL DESIGN REQUIREMENTS

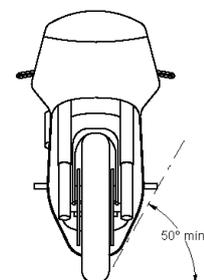
### B.2.1 Dimensions

- B.2.1.1 | The dimensions of the prototype are free, except for those requirements explained in the Art B.2.1.
- B.2.1.2 | The minimum width between the ends of the semi-handlebars must be 450mm.



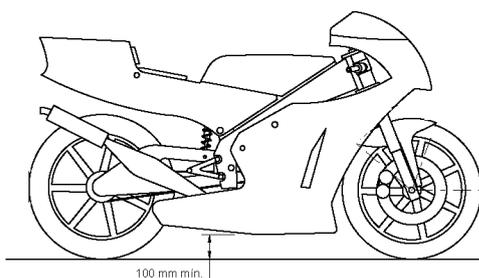
Picture 3 - Minimum prototype width

- B.2.1.3 The minimum tilt angle of the prototype without any of its elements (except the tires) touching the road surface must be 50°. This measurement will be made with an unloaded prototype (without the rider) but fully equipped, fluids included, for its correct operation.



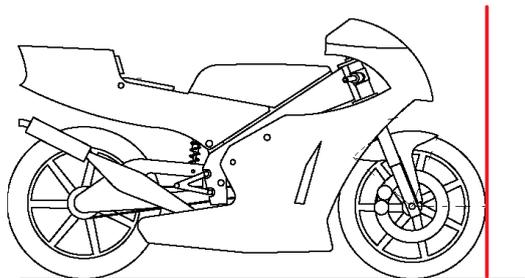
Picture 4 - Minimum tilt angle

- B.2.1.4 The minimum distance between the prototype in upright position and the road surface must be of at least 100mm in rest situation. This measurement will be done with the prototype unloaded (without the rider), but with all the equipment and liquids for its operation and the tires set at 2 bar pressure.



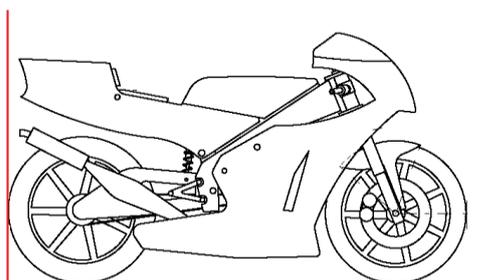
Picture 5 - Minimum ground clearance distance

- B.2.1.5 No element of the prototype shall protrude from the front vertical line drawn tangentially with respect to the external circumference of the front tire.



Picture 6 - Front vertical line

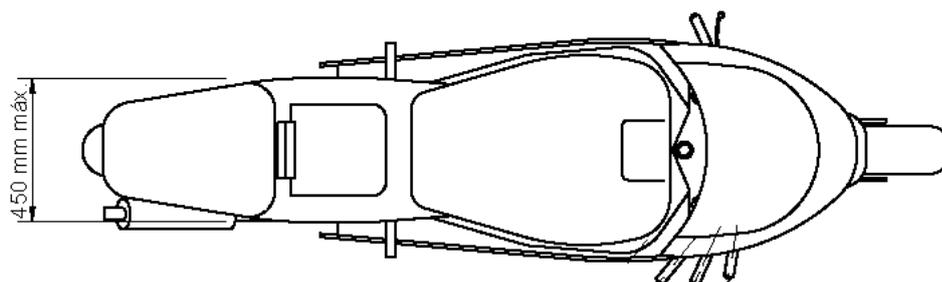
- B.2.1.6 | No element of the prototype shall protrude from the vertical line drawn tangentially with respect to the external circumference of the rear tire.



Picture 7 - Rear vertical line

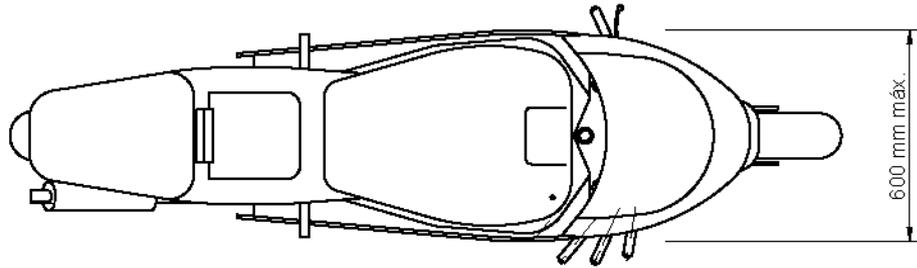
- B.2.1.7 | The tire tread shall have a minimum clearance of 15mm along its outer circumference to any part of the prototype in any position and with any geometry set-up.

- B.2.1.8 | The maximum width of the seat must not exceed 450mm. No other element of the prototype shall protrude from this width from the seat to the rear except for the exhaust system for prototypes of the "MotoStudent Petrol" category.



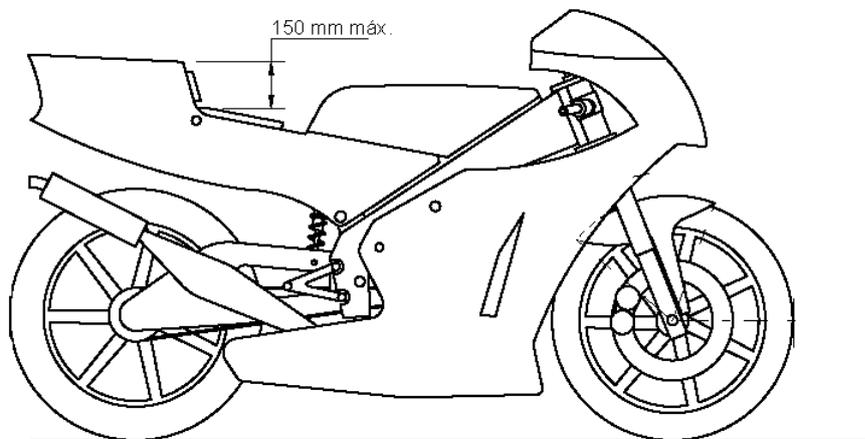
Picture 8 - Maximum seat width

- B.2.1.9 | The maximum width of the fairing shall be 600mm.



Picture 9 - Prototype maximum fairing width

- B.2.1.10 | The maximum height difference between the height of the seat and the highest part of the tail shall be 150mm.



Picture 10 - Prototype maximum seat height difference

## B.2.2 Weight

- B.2.2.1 | The total minimum weight of the prototype without the rider shall be 85kg for both categories, including all fluids that may be necessary for the correct operation of the prototype.
- B.2.2.2 | The weight of the complete prototype shall not be below the minimum weight indicated in Art. B.2.2.1. at any time during the Final Event. Technical Scrutineering may check the weight of a prototype at any time during the Final Event.
- B.2.2.3 | The use of ballast to reach the minimum weight of the prototype is allowed. In case of using it, the ballast must be declared to the Technical Staff during scrutineering.
- B.2.2.4 | In case of use of ballast, it must be properly fixed and secured to the chassis so it cannot become detached from the prototype in case of crash or fall, i.e. screwed.

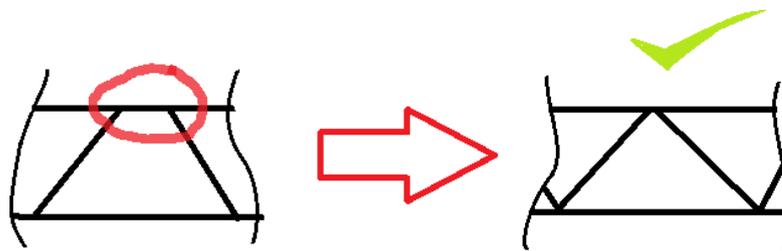
## ARTICLE 3: FRAME

### B.3.1 Design

- B.3.1.1 | There are no restrictions in the type of design or materials of the frame, swingarm or subframe, provided that the result complies with the rules imposed by these Regulations.
- B.3.1.2 | In case of doubt about the safety of the frame design submitted, the Organization may request a safety justification report that includes analysis using the finite element method, simulations or other demonstration tests.
- B.3.1.3 | The structure of the prototype must be designed in such a way that all elements of the engine, fuel and combustion intake, and electrical and electronic control and safety systems, including battery packs, are protected in case of a fall, especially in case of lateral fall.
- B.3.1.4 | The use of a commercial frame is not allowed, not even a commercial modified unit. It must be a self-designed frame prototype.  
The main frame, the subframe and the swingarm are included in this article.
- B.3.1.5 | The use of magnesium, light alloys or composite materials are forbidden for swing arm spindles, wheels spindles or handlebars.

### B.3.2 Welding and unions

- B.3.2.1 | Structures of jalousie type must search the correct triangulation in the nodes of the structure.



Picture 11 - Example of correct triangulation

- B.3.2.2 | Welding of structural elements by any means is permitted, but the final structure must be consistent.

### **B.3.3 Crash protectors**

B.3.3.1 | It is mandatory to use protection caps made of nylon, fiber or materials of similar hardness, to protect the chassis and propulsion system laterally in case of fall.

B.3.3.2 | The chassis crash protectors are mandatory. They may be installed both inside and outside the fairing, and properly fixed to the frame, to protect the entire frame and propulsion system in case of crash.



*Picture 12 - Example of crash protector*

B.3.3.3 | As additional protection, wheel axles, handlebars ends or other locations are also allowed to have crash protectors, assuring that they protect laterally the entire frame and propulsion system in case of crash.

## **ARTICLE 4: FAIRING**

### **B.4.1 General requirements**

B.4.1.1 | All edges and finishes of the fairing must be rounded. Minimum radius 1mm.

B.4.1.2 | The fairing cannot cover the rider sideways, except for the forearms (this exception is only applicable in minimum aerodynamic resistance position of the rider).

B.4.1.3 | There are no restrictions regarding the manufacturing material of the fairing.

B.4.1.4 | It is allowed to install any aerodynamic device (wings, fins, bulges, etc.) protruding from the fairing or bodywork, if they do not exceed the maximum dimensions stated in this Regulations and are correctly fixed to the fairing.

B.4.1.5 | Any leading edge of the aerodynamic devices will have a minimum external radius of 2.5 mm.

B.4.1.6 | Any aerodynamic device will have a maximum deflection of 10mm in any point, when a 50N vertical load is applied in the downward direction. In case of doubt

regarding track safety due to the use of wings or other aerodynamic elements, the decision of the Technical Staff of the Organization will be final.

B.4.1.7 | Mobile wings or other mobile aerodynamic elements are allowed (Active devices allowed too).

#### **B.4.2 Lower fairing**

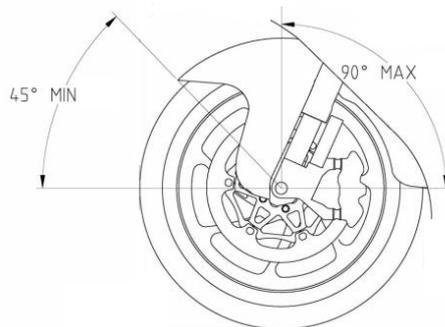
B.4.2.1 | The lower fairing must be manufactured to contain, in case of an incident, at least the half of the liquids (fuel excluded) of the prototype, with a minimum of 2.5 liters of liquid.

B.4.2.2 | The lower fairing must include a hole with a diameter of 25mm located in the lowest part of the fairing. This hole must remain closed with a cap in dry conditions and may only be opened in case of rain.

#### **B.4.3 Mudguards**

B.4.3.1 | The use of front and rear mudguards is compulsory.

B.4.3.2 | Front mudguard cannot cover more than 135° of the wheel circumference measured from the rear part of the tire; the origin of the angle being on the horizontal line crossing the wheel shaft. Anchor points of the mudguards to the front fork, fork or brake discs covers may exceed this restriction.



*Picture 13 - Prototype front mudgard*

B.4.3.3 | The rear rim cannot be covered in more than 180°.

#### **B.4.4 Protection against trapping**

- B.4.4.1 | If by means of its design, the swingarm does not cover the inferior part of the chain or transmission belt, a guard must be fitted in such a way as to prevent trapping between the lower drive chain run and the final drive sprocket.



Picture 14 - Example of "Shark fin"

## ARTICLE 5: HANDLEBARS AND FOOTRESTS

### B.5.1 Handlebars and manual controls

- B.5.1.1 | The use of handlebars or semi-handlebars made of light alloys, such as magnesium or titanium is not allowed. Welded/repared handlebars are forbidden.
- B.5.1.2 | The supports of the handlebar or semi-handlebar must be designed so as to minimise the risk of a fracture in case of a crash.
- B.5.1.3 | Minimum radius of 2 mm must be used at the parts that constitute the handlebars and their anchorages.
- B.5.1.4 | The throttle grip must include an auto return feature in order to make sure that the throttle will be shut down whenever the rider lets it go.
- B.5.1.5 | The manual lever for clutch (in case of including it) is for free choice, provided the distance between the pivot point and the outer end do not exceed 200mm and are ball ended (diameter of this ball to be at least 16mm, can be flattened with rounded edges and a minimum thickness of 14mm).
- B.5.1.6 | Installation of a front brake lever protection is mandatory. This protector must protect the lever from being accidentally activated in case of contact with another prototype.



Picture 15 - Examples of front brake lever protections

B.5.1.7 | The TSMS, electric ignition or start button must be located on the handlebar.

## B.5.2 Footrests and their controls

B.5.2.1 | The footrests can be fixed or “folding in case of crash” type. In case of folding type these must be fitted with a device that will make them return to their normal position as well as avoid any easy folding during the race. In rest position without the rider, footrests must be unfolded.

B.5.2.2 | The end of each footrest must present a continuous round end, until a minimum spherical radius of 8mm.

B.5.2.3 | It is mandatory the installation of a cap at the outer end of footrests, made of aluminum, plastic, Nylon or any other equivalent material in terms of strength, permanently fixed. The surface must be designed to **reach the widest possible area of the footrest.**



Picture 16 Footrest ends. Left, footrest with hole, not allowed; Right, footrest with cap, allowed.

B.5.2.4 | The footrests must be fitted with side protections to avoid the rider's boot to interfere with mobile elements such as the chain or the rear tire.

B.5.2.5 | The choice of rear brake pedal is free.

B.5.2.6 | The choice of the gear shift pedal (in case of having one) is free.

## ARTICLE 6: BRAKE SYSTEM

### B.6.1 Allowed type of brake system

- B.6.1.1 | Only single-disc hydraulic-driven systems are allowed both in the front and in the rear shaft

### B.6.2 Command and control

- B.6.2.1 | Combined brake systems are not allowed. The front and rear systems must be completely independent of each other.
- B.6.2.2 | The braking system for the front wheel should be commanded by a hand lever installed next to the throttle grip on the right handlebar.
- B.6.2.3 | The braking system for the rear wheel must be commanded by foot by a cam system installed in the area of the right footrest.

### B.6.3 Discs

- B.6.3.1 | The brake discs are free-choice.
- B.6.3.2 | The brake discs must be made of steel alloys. The use of carbon or ceramic compound brake discs is strictly forbidden.
- B.6.3.3 | The use of discs with inner ventilation is forbidden.
- B.6.3.4 | Brake discs must be installed on front and rear rims.
- B.6.3.5 | Installation of brake disc spacers between the rim and the disc is permitted.
- B.6.3.6 | The prototype must be fitted with a single-disc hydraulic-driven brake system both in the front and rear shaft

### B.6.4 Brake calipers

- B.6.4.1 | The rear brake caliper must be installed with at least one anchoring element directly fixed to the swingarm.

- B.6.4.2 | It is allowed to mount the rear caliper over a non-fixed support system placed by the rear wheel axle, provided that the system has at least one direct fixing for the swingarm, as indicated in Art. B.6.4.1.
- B.6.4.3 | The front and rear brake pads are free-choice.
- B.6.4.4 | The pins of the front and rear brake pads can be changed. Quick change systems are allowed.
- B.6.4.5 | No supplementary cooling pipes conducting fresh air to the caliper are allowed.
- B.6.4.6 | The modification of the body of the brake calipers provided by the Organization is forbidden. The realization of recesses or chamfers is not allowed. Therefore, teams must choose or adapt anchorages for proper installation of the supplied calipers.
- B.6.4.7 | The use of the brake calipers from the *MotoStudent Eligible Parts sheet*, both for the front and the rear shaft, is compulsory.

#### **B.6.5 Brake pumps**

- B.6.5.1 | The use of the brake pumps from the *MotoStudent Eligible Parts sheet*, both for the front and the rear shaft, is compulsory.
- B.6.5.2 | The activation lever for the front brake pump needs an authorization to be replaced. Authorized parts will be published on the MS eligible parts list by the Organization.
- B.6.5.3 | It is forbidden to modify any authorized activation lever for the front brake pump.

#### **B.6.6 Brake ducts**

- B.6.6.1 | Brake hoses are free-choice.
- B.6.6.2 | The passage of the hoses for the front brake caliper must be made ahead the lower steering plate.
- B.6.6.3 | Quick connectors on the brake hoses are allowed.

#### **B.6.7 ABS System**

- B.6.7.1 | The use of an anti-block system (ABS) is not allowed.

## **B.6.8 Brake fluid**

- B.6.8.1 | The hydraulic fluid of the brake system is free-choice.
- B.6.8.2 | The specifications of the brake fluid must comply or exceed the recommendations of the brake system supplier.

## **ARTICLE 7: SUSPENSION SYSTEM**

### **B.7.1 General aspects**

- B.7.1.1 | Suspension systems are free configuration, except for the rules set forth below in Article 7.
- B.7.1.2 | All active or semi-active suspension systems and/or electronic controls of any type for the suspension, including those that control the height adjustment are forbidden.
- B.7.1.3 | The settings of the suspension can only be made manually and by means of mechanic/hydraulic adjustments.
- B.7.1.4 | The Organization shall not accept the participation of a prototype which suspension system is determined to be dangerous for the participation in track tests.
- B.7.1.4 | Mass damper systems are considered as a suspension system.

### **B.7.2 Front suspension**

- B.7.2.1 | Front suspension system of any kind is permitted: conventional fork, inverted fork, telelever, duolever, front swingarm, etc. Both commercial and self-designed / modified systems are allowed.
- B.7.2.2 | The front suspension assembly may have mechanical or hydraulic adjustment systems, such as spring preload, compression, extension or rebound regulation.

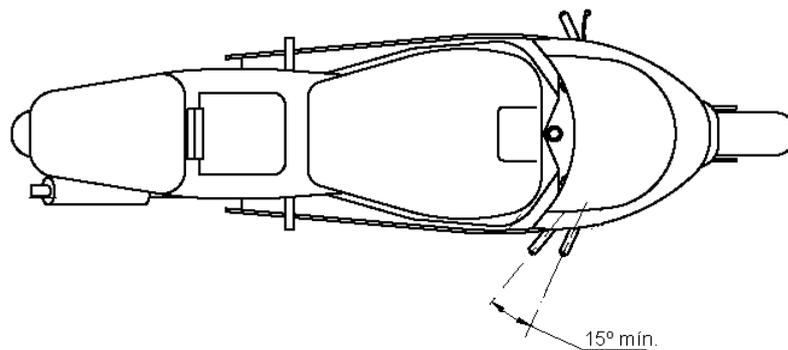
### **B.7.3 Rear suspension**

- B.7.3.1 | Rear suspension system of any kind is permitted. Both commercial and self-designed / modified systems are allowed.
- B.7.3.2 | The rear suspension assembly may have mechanical or hydraulic adjustment systems, such as spring preload regulation, compression, extension or rebound regulation.

## ARTICLE 8: STEERING SYSTEM

### B.8.1 Restrictions and geometry

- B.8.1.1 | The minimum turning angle of the steering must be  $15^\circ$  measured on either side of the longitudinal axis of the prototype.



Picture 17 - Minimum turning angle

- B.8.1.2 | The turning angle must be limited with stoppers on both sides. These stoppers should be made of nylon, aluminum or materials of similar hardness. Neither the chassis, nor any other part of the prototype may act as a steering stopper.
- B.8.1.3 | There must not be any element interfering in a tolerance of 30mm around the handles of the handlebars and actuators, all along the steering stroke. The aim is to avoid damage to the hands and fingers of the rider in case of a crash.

### B.8.2 Steering dampers

- B.8.2.1 | The use of steering dampers is allowed.
- B.8.2.2 | The settings of the steering dampers can only be made manually and by means of mechanic/hydraulic adjustments.
- B.8.2.3 | The steering damper cannot act as a device that limits the turning angle.

## ARTICLE 9: RIMS AND TIRES

### B.9.1 Rims

B.9.1.1 The sizes of the rims (considering areas enabled for the tires fitment) must be:

- Front rim: 2.5" x 17"
- Rear rim: 3.5" x 17"

B.9.1.2 Rims made of composites (like carbon fiber or reinforced glass fiber) are forbidden. Rims must be made of steel, aluminum or magnesium.

B.9.1.3 The use of nylon protectors at the ends of the shafts for possible crashes is allowed. These protectors must be rounded, with a diameter that is equal or larger than the used shaft.

B.9.1.4 The ends of the wheel shafts cannot protrude more than 30mm from their housing. Possible nylon protectors are not considered in this measure (see Art. B.9.1.3).

B.9.1.5 Rims will be freely chosen by each team.

### B.9.2 Tires

B.9.2.1 Should the team wish to have more tires for dry conditions they will be able to purchase them through the Organization. Wet tires will only be available for purchase during the Final Event, and limited to two sets per team. Tires will be supplied randomly from available stock.

B.9.2.2 The use of tire warmers is allowed.

B.9.2.3 A maximum of two sets of dry tires (two front tires and two rear tires) must be declared for its use during the Final Event to accomplish with B.9.2.1. A first set of tires must be declared before the dynamic scrutineering and the second set can be declared during the Final Event in the Technical Control Area. Tires declaration template can be found on Annex 4.

B.9.2.4 The use of declared tires is compulsory for dynamic scrutineering, test 1, test 2, test 3, free practices sessions, qualifying session, play-off race and final race. Non-

compliance with this rule will result in the cancellation of any results obtained in the test.

**B.9.2.5** Only those tires supplied by the Official Tire Supplier of the respective competition edition can be used at MotoStudent. The Organization will supply a set (front and rear) of dry-condition slicks to each team within the MotoStudent Kit.

The technical information regarding the official tire set will be sent to all teams participating in the Competition.

## ARTICLE 10: ELECTRONIC SYSTEMS

### **B.10.1 Riding assistance electronic systems**

**B.10.1.1** It is forbidden to use electronic control or assistance systems that provide for a clear riding advantage, such as traction control, ABS, anti-wheelie systems, etc.

### **B.10.2 Rider information systems**

**B.10.2.1** The information systems and alerts in the dashboard for the rider are freely configurable.

### **B.10.3 Data recording systems**

**B.10.3.1** Data recording systems are permitted. These systems can acquire data relative to motor/engine parameters, motorcycle dynamics and rider behavior.

**B.10.3.2** The use of all types of sensors is allowed, provided that its installation does not affect any rule of these Technical Regulations.

**B.10.3.3** The live reading systems of telemetry are prohibited. The data acquisition may only be read at the stops in box. Direct download of data is allowed using a wired connection or a wireless one (e.g., Bluetooth or WIFI) as long as the connection and data download is only made during stops in box.

**B.10.3.4** All components and wiring of the data acquisition system must be properly fixed and placed in safe areas.

**B.10.3.5** MotoStudent Organization may request totally or partially the acquired data to any team at any time along the competition if it deems it appropriate, with special attention to the powertrain data.

#### **B.10.4 Transponder**

B.10.4.1 | Prior to performing the MS2 tests during the Final Event, the Organization will supply a transponder to all the teams to be installed on the prototype.

B.10.4.2 | The transponder must be properly fixed using zip ties on the left suspension bottle of the front fork, focused towards the outside of the prototype, and in an easily accessible area. In case the design of the prototype does not allow this placement, the Technical Staff of the Organization will indicate to the team the correct location.

B.10.4.3 | Transponder will have a rental price of 25€, not included in the MotoStudent registration fee.

#### **B.10.5 On-board cameras**

B.10.5.1 | The use of on-board cameras is forbidden at any time during MS2 phase.

B.10.5.2 | The only allowed on-board cameras will be installed by the Organization on any prototype.

#### **B.10.6 Rear Safety Light**

B.10.6.1 | All motorcycles must have a functioning red light mounted at the rear of the machine for rain or low visibility conditions. The team must ensure that the light is switched on any time the motorcycle is on the track or being ridden in the pit-line whenever a rain tyre is fitted on the motorcycle. All lights must comply with the following:

- Lighting direction must be parallel to the motorcycle running direction, and be clearly visible from the rear at least 15 degrees to both left and right sides of the prototype centre line.
- The rear light must be mounted near the end of the seat/rear fairing and approximately on the machine centre line, in a position approved by the Organization. In case of dispute over the mounting position or visibility, the decision of the Organization will be final.
- Power output/luminosity equivalent to approximately: 10 – 15W (incandescent), 0.6 – 5 W (LED).

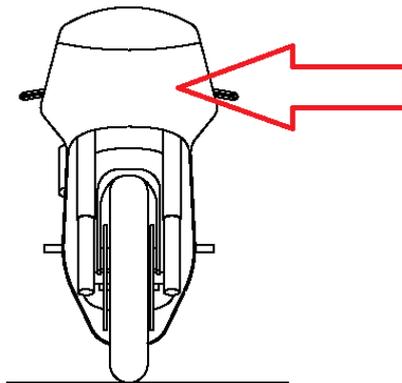
- The output must be continuous - no flashing safety light whilst on track, flashing is allowed in the pit lane when pit limiter is active.
- Safety light power supply may be separated from the motorcycle.
- The Organization has the right to refuse any light system not satisfying this safety purpose.

**ARTICLE 11: IDENTIFICATION, ADVERTISING AND COMPETITION NUMBERS**

**B.11.1 Bike Numbers**

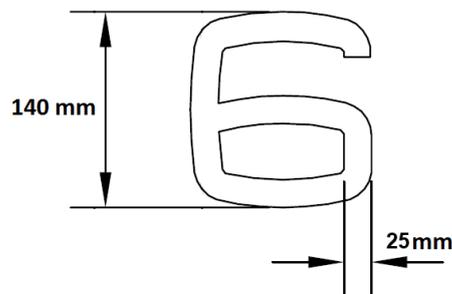
B.11.1.1 Each prototype must include 3 identifying bike numbers on its fairing, according to the bike number assigned to each team as stated in Art. A.3.1.6.

B.11.1.2 The front number must be placed on the front part of the fairing. It may be located in the central part or lopsided, provided that it is perfectly readable.



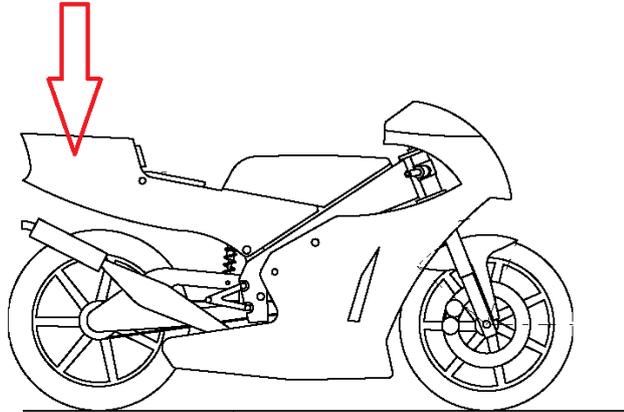
Picture 18 - Front number prototype position

B.11.1.3 In the front number, the minimum dimension of each character must be 140mm in height and the minimum stroke width of each character must be 25mm. The minimum distance between characters must be 10mm.



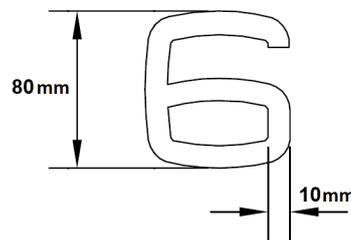
Picture 19 - Prototype front number minimum dimensions

- B.11.1.4 | A bike number must be placed on either side. on the rear side of the fairing (tail). The location for the numbers on each side of the motorcycle can be on the lower rear portion of the main fairing near the bottom, or on the rear side of the fairing (tail).



Picture 20 - Rear bike number placement

- B.11.1.5 | In the side numbers, the minimum dimension of each character must be 80mm in height and the minimum stroke width of each character must be 10mm. The minimum distance between characters must be 5mm.



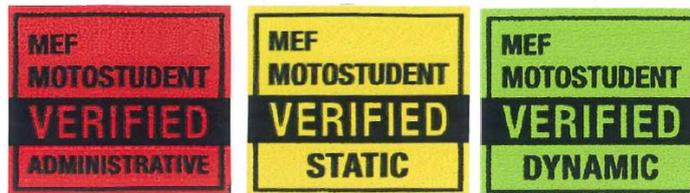
Picture 21 – Prototype rear number minimum dimensions

- B.11.1.6 | The numbers must be totally black color. No combination of colors is allowed.
- B.11.1.7 | The font used for bike numbers is free, as long as the Technical Staff of the Organization considers it readable. The inclusion of graphics or logos in the number is not allowed.
- B.11.1.8 | The background behind the numbers should be a continuous homogeneous white area, and shall cover an area encompassing at least 25 mm around the numbers

## B.11.2 Identification

B.11.2.1 | The name of the represented university, its logo or its initials must appear on all prototypes, occupying an area with a minimum height and width of 100mm.

B.11.2.2 | There must be a space on the left external side (considering riding direction) of the frame for the scrutineering stickers. The stickers must be visible with the fairing mounted and directly stuck to the frame. The Organization will place 3 rectangular labels with a maximum size of 35x35mm.



Picture 22 - MotoStudent scrutineering stickers

B.11.2.3 | Every prototype must have an identifying number engraved in the frame and swingarm, on a visible place during scrutineering. The said number/code will be the following:

**MSCXXYYZ(Z).**  
e.g.: MSP01251

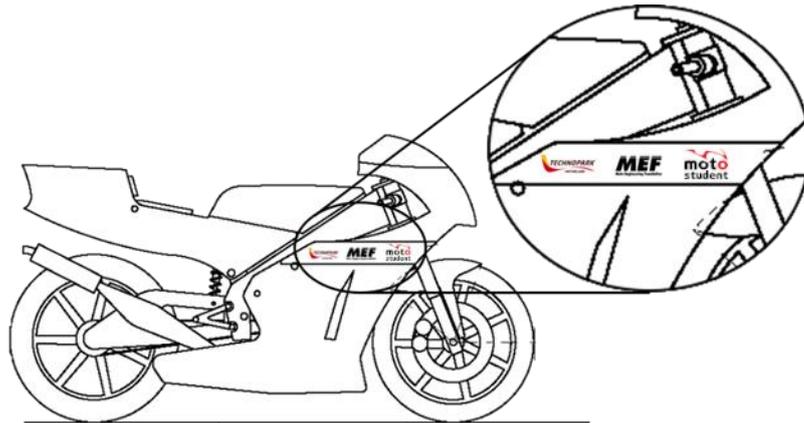
Where:

- MS is the acronym of MotoStudent.
- C is the category which the team is taking part. P for MotoStudent Petrol category and E for MotoStudent Electric category (the example shows a MotoStudent Petrol prototype).
- XX is the bike number (the example shows the bike number 01).
- YY is the last two digits of the production year of the frame/swingarm (the example shows the part produced in the year 2025).
- Z(Z) is the unit number of the frame/swingarms in case that more than 1 frame has been produced. (Z) is for more than 9 frames/swingarms produced (the example shows the 1<sup>st</sup> produced part).

### B.11.3 Competition Logos and Advertising

B.11.3.1 | In the final design of the prototype, all participating teams must include in the upper part of the side fairing a strip which must meet the following specifications:

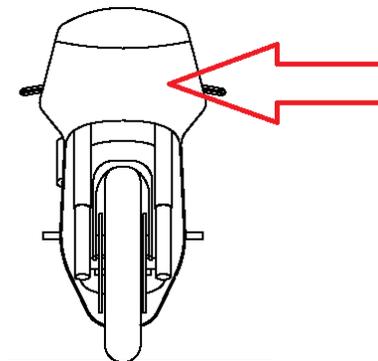
- The strip must be white.
- This strip must cross from the rear of the side fairing to the front.
- The strip must be horizontal to the ground with a  $\pm 15^\circ$
- The minimum length of the strip will be 400mm.
- The minimum width of the strip must be 70mm.



Picture 23- White strip example

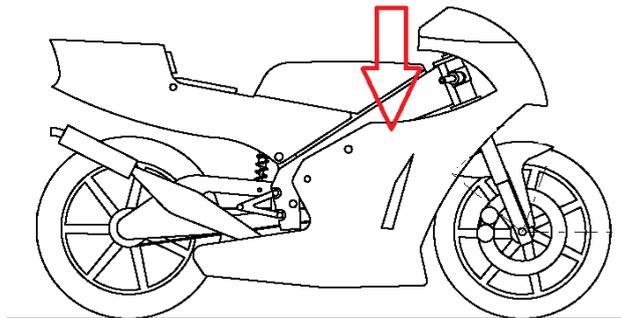
B.11.3.2 | Apart from the stripe indicated in Art.B.11.3.1, three spaces should be available to include category stickers that will be fixed by the Organization during the Final Event. These category stickers will have a maximum area of 150mm wide x 100mm high. Location of the spaces are defined on B.11.3.3 and B.11.3.4.

B.11.3.3 | A category sticker will be placed in the front part of the fairing, near the front number, under the windscreen.



Picture 24 - Front category sticker placement

B.11.3.4 | A category stickers will be placed in each side of the prototype (one sticker by side) of the front fairing at the top.



Picture 25 - Lateral category sticker placement

B.11.3.5 | The Organization may require space for its brand logo or name on both sides of the swingarm and front mudguard. Maximum dimensions will be:

- 200x70mm for the swingarm.
- 60x80mm for the front fairing.

B.11.3.6 | In case of not following the spaces stated in this article for the Organization stickers, the Organization will decide to place them where it considers more convenient, without caring if it is placed under any existing logo, promotional sticker or fairing element, without giving the chance to the team to appeal or change them.

B.11.3.7 | Is strictly forbidden to include advertising of alcoholic drinks, gambling or tobacco on the prototype or any other corporate environment of the team.

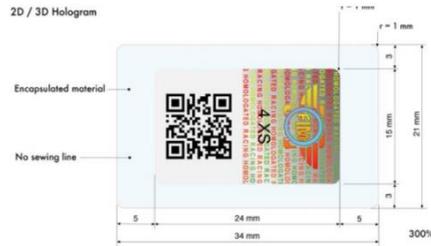
B.11.3.8 | Is strictly forbidden to include advertising or other messages that violate human dignity (violence, intolerance, xenophobia, racism, etc.), or that may offend the sensibilities of some people, both on the prototype as in any other corporate environment of the team. Likewise, the Organization reserves the right to review and analyze the advertising content and ban it if it is considered appropriate

## ARTICLE 12: RIDER EQUIPMENT

### B.12.1 Helmet

B.12.1.1 | The rider must wear a homologated helmet, according to the following homologations:

- a) FHRPhe-01 or FHRPhe-02



Picture 26 - FHRPhe-01 homologation example

b) ECE 22-05 “P” or ECE 22.06 “P”



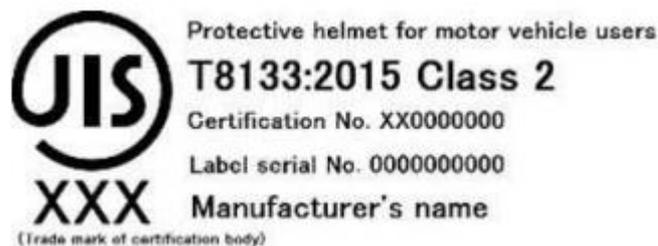
Picture 27 - ECE 22-05 homologation example

c) SNELL M 2015 o MD2020D o 2020R



Picture 28 - SNELL M 2015 homologation example

d) JIS T 8133:2015



Picture 29 - JIS T 8133:2015 homologation example

B.12.1.2 | The use of disposable screen covers is allowed (tear-off).

B.12.1.3 | The screen must be made of a shatterproof material.

B.12.1.4 | Riders must wear a helmet which is in good condition, provides a good fit and is properly fastened during all MS2 tests.

**B.12.2 Safety clothing**

- B.12.2.1 | The rider must be fitted with a whole one-piece suit, preferably made of leather or other great resistance material, which cover full torso and extremities, and provides special protection of elbows and knees (EN 1621-1).



Picture 30 - Rider equipment

- B.12.2.2 | Use of EN 1621-2 homologated back protectors and EN 1621-3 chest protectors is mandatory
- B.12.2.3 | Use of undamaged boots of leather or similar material protection is mandatory.
- B.12.2.4 | Use of undamaged leather gloves with fingers protection is mandatory.
- B.12.2.5 | The use of underwear homologated for competition is recommended. This underwear must not be made of a synthetic material which might melt and cause damage to the riders' skin.

# SECTION C

## SPECIFIC TECHNICAL REGULATIONS FOR THE CATEGORY "MOTOSTUDENT PETROL"

## ARTICLE 1: ENGINE

### C.1.1 Preliminary information

C.1.1.1 | The Organization will supply an internal combustion engine, which will be common for the teams entered in the “MotoStudent Petrol” category. Engines will be property of the MotoStudent Organization that lend the engine to teams in order to develop their prototypes and compete in the MotoStudent International Competition.

Teams must return to the organization the engine at the end of the edition if the Organization deems it necessary, in the same conditions as delivered to teams.

C.1.1.2 | The engine supplied has passed rigorous quality control checks prior to its shipment, and its design has been tested on road racing competition. As it will be mounted on an external bench and/or prototype without OEM parts, the Organization will assume no responsibility for any damage the engine may suffer during its use or test, and Teams must assume the repair of the unit.

C.1.1.3 | The given engines can only be used in the MotoStudent International Competition and its related activities (e.g. testbench, circuit practices, etc.). Their use in other activities non-related to MotoStudent, during this period is strictly prohibited. Violations of this rule will be subject to sanctions by the MotoStudent organizers.

C.1.1.4 | Rules described above are set to ensure the availability of the same motor for the next six years, so each team can have the necessary time to develop and perfect its prototype and its motor control.

C.1.1.5 | Each team will cover the transportation costs for repairs or replacement engines, from their facilities to MEF headquarters and back from MEF headquarters to their facilities.

C.1.1.6 | The price for a replacement petrol engine will be determined and outlined in the Official Petrol Engine INFO document upon the engine's announcement. Additionally, the standard maintenance price will also be specified in the same document

C.1.1.7 | For non-standard repairs, Teams will receive a quotation once the engine has been inspected.

### C.1.2 Sealing

C.1.2.1 | The use of the engine provided by the Organization is compulsory. The engine provided by the Organization will be sealed and it is strictly forbidden to

manipulate it. Any broken or damaged seal shall be reason to declare a technical nonconformity.

C.1.2.2 | In case of breakdown or malfunction of any internal part to which the team is not allowed to access, the team shall inform the Organization, who shall take the convenient steps.

### **C.1.3 Engine technical specifications**

C.1.3.1 | Technical information about the engine will be published and sent by the Organization to all the teams registered in the Competition.

C.1.3.2 | The engine supplied by the Organization will have a displacement between 240cc and 340cc.

C.1.2.2 | The engine supplied by the Organization shall have an internal liquid cooling system.

### **C.1.3 Crankcase, cylinder head and engine block**

C.1.3.1 | External and internal modifications of the engine assembly are not allowed.

C.1.3.2 | Modifications in the engine block are not allowed, not even in its anchorages. The frame supports for the engine must be designed according to its original geometry.

C.1.3.3 | Modifications in the original cooling ducts supplied with the engine are not allowed. The external cooling system must be developed according to the original cooling ducts of the engine.

C.1.3.4 | Modifications in the intake and exhaust housing supplied with the engine are not allowed. Intake and exhaust systems must be developed according to the original geometry and dimensions of the engine.

C.1.3.5 | The installation of protective engine covers or cases is recommended, provided that their installation does not involve the structural modification of the engine, being able to use the original screw housings of the engine covers or carters as anchoring. In no case shall the protective cases cover the Organization seals or labels, nor any identifying reference engraved on the engine. Only metal protectors or FIM homologated protectors are allowed.

C.1.3.6 | The original oil pump integrated in the engine block cannot be modified.

C.1.3.7 | The original water pump integrated in the engine block cannot be modified.

#### **C.1.4 Modifications**

C.1.4.1 | Any change or modification on the engine that is not specified in these Regulations is not allowed.

C.1.4.2 | In case of a dispute about these changes, the decision of the Organization will be final.

### **ARTICLE 2: AIR INTAKE SYSTEM**

#### **C.2.1 Intake pipes**

C.2.1.1 | The composition, dimension and position of the air intake pipes are free, provided that they comply with the dimensional requirements of the general dimensions of the prototype.

C.2.1.2 | It is allowed to install mobile devices in the intake system before the intake valves of the combustion chamber, with the only purpose to modify the length of the intake duct.

C.2.1.3 | The presence of an air-fuel mix and recycled engine gases is only allowed in the intake pipes. The additional injection of other elements, such as ethanol, methanol, water, etc. is not allowed.

#### **C.2.2 Intake flap**

C.2.2.1 | Only one flap or an equivalent mechanical system is allowed, to be activated only by mechanical means (e.g. cable) handled by the rider. A bypass could be implemented for controlling the idle speed of the engine.

C.2.2.2 | "Ride by wire" systems are not allowed.

C.2.2.3 | In case of commanding system failure, it must be ensured that the flap or equivalent system gets closed.

#### **C.2.3 Overpressure systems**

C.2.3.1 | The use of "turbo" systems to increase the gas pressure in the intake is forbidden. It is only allowed to make use of the aerodynamics of the vehicle movement by means of air intakes.

#### **C.2.4 Airbox and air filtering**

C.2.4.1 | The design of the airbox is free, except for the rules set forth below.

C.2.4.2 | Airbox with air filter is mandatory.

C.2.4.3 | The air box must have a minimum volume of 2.4 liters.

C.2.4.4 | The air filter is free choice and must filter particles with a minimum diameter of 1mm.

#### **C.2.5 Recycling of gases**

C.2.5.1 | It is allowed the recycling of breather gases of the engine.

C.2.5.2 | The installation of a closed gas recycling system that directs the excess gases from the engine block to the intake system is allowed. These engine breathing lines can pass through a filtration and oil capture tank.

C.2.5.3 | In case that the recycling system indicated in Art.C.2.5.2 is not installed, a breathing duct must be installed to discharge the remains of oil in a tank of at least 200cc, specifically installed for this function.

C.2.5.4 | Under no circumstances shall the breather gases without previous oil residues filtration be discharged directly on the track or on any part of the prototype not indicated in this article.

### **ARTICLE 3: FUEL SUPPLY SYSTEM**

#### **C.3.1 Fuel tank**

C.3.1.1 | Fuel tanks, regardless their design or manufacturing material, must be **full filled** with mousse type flame retardant foam (preferably Explosafe, ExploStop or similar foam).



Picture 31 - Example of flame retardant foam

- C.3.1.2 | It is mandatory to install a breathing duct in the fuel tank to prevent possible overpressures. This duct must be provided with a retention valve that allows the free circulation of air (fuel gases) but blocks the circulation of liquids (fuel), to avoid spills of gasoline in case of an accident. The exit of the breathing tubes must be done in a recovery container specific for this use, which must have a minimum capacity of 250cc.
- C.3.1.3 | In case of "non-metallic" fuel tanks (made of carbon fiber, aramid fiber, fiberglass, polymeric materials, etc.) the installation of a second additional internal homologated bladder is mandatory. If the non-metallic tanks have FIM/CE approval (demonstrable with the corresponding FIM/CE label), the installation of this internal bladder is not mandatory. The purpose of this inner safety bladder is to prevent spillage of fuel to the outside in the event of tank breakage. **Safety fuel tanks bladders must conform or exceed the specification FIM/FCB-2005 or have FIA FT3 homologation, both cases must include its certificate that will be shown during the Static Checks.**
- C.3.1.4 | The lowest part of the fuel tank must be above the height of the engine intake valves.
- C.3.1.5 | The fuel tank cap must be fitted with a threaded opening/closing system. Lockable caps are forbidden.
- C.3.1.6 | The fuel tank cap must ensure a watertight seal, which prevents the possibility of fuel leaks in the event of a fall.
- C.3.2 Fuel pipes**
- C.3.2.1 | All fuel pipes going from the tank to the carburettor or to the injection system must be fitted with at least one self-closing valve (quick connector), so that if the tank becomes detached from the motorcycle it will be the connector that gets disconnected and no other connections of the pipe. The strength needed to open

the connector must be, maximum, 50% of the strength needed to loosen any other connection or breakage of the pipe material.



Picture 32 - Example of self-closing quick connector

### C.3.3 Injection system

C.3.3.1 Replacement or modification of the original fuel supply system of the supplied engine is allowed. Either carburetion or injection systems are allowed.

C.3.3.2 The fuel injector must be installed before the admission valves of the cylinder. Direct injection into the combustion chamber is not allowed.

C.3.3.3 It is allowed to install a second injector in the airbox.

C.3.3.4 Supplied injector must be used (same brand/reference) in the throttle body.

C.3.3.5 Second injector for the airbox is free choice from *MotoStudent Eligible Parts* sheet. If an injector is not on the list, please contact with the Organization.

C.3.3.6 The Art. C.1.1.1 does also apply to the injector body delivered with the MotoStudent Kit as part of the internal combustion engine.

### C.3.4 Fuel cooling

C.3.4.1 The artificial cooling of the fuel is not allowed. Only the aerodynamic design may be used for cooling the fuel system.

### C.3.5 Fuel pressure

C.3.5.1 It is only allowed to install one fuel pump. There are no restrictions on the type of pump to be installed.

C.3.5.2 The fuel pressure must not be over 3.5 bar in any part of the supply circuit.

C.3.5.3 The refueling operation must be done from a non-pressurized recipient.

C.3.5.4 It is forbidden to artificially pressurize the fuel tank.

## ARTICLE 4: FUEL AND LUBRICANTS

### C.4.1 Fuel

C.4.1.1 | The fuel set for the Competition must be unleaded with a maximum RON of 102 octanes (ISO 5164). During the Final Event, only the Official Fuel distributed by the Organization must be used.

The technical information and sales prices of the Official Fuel will be published by the Organization to all teams

C.4.1.2 | Any alteration of the fuel with additives or any other treatment is forbidden.

C.4.1.3 | At any time during the Final Event, the Organization may require samples of fuel. In case of not using the Official Fuel, the team can be disqualified from the test in process or even from the Competition.

C.4.1.4 | It should be taken into account that the composition of the fuel will comply with the chemical requirements established in the European Union. Non-EU countries may find different chemical composition of lubricants, so it is recommended to take this factor into account when setting up and adjusting the prototype.

### C.4.2 Engine lubricating oil

C.4.2.1 | The lubricating oil to be used is free-choice.

C.4.2.2 | The installation of radiators to cool the oil is not allowed.

C.4.2.3 | Oil filler cap, Oil drainage plug, and oil filter cap's bolts must be wired sealed to prevent oil leakages during MS2 phase. Engines are sent to Teams with all required bolts wired sealed as reference.

## ARTICLE 5: COOLING SYSTEM

### C.5.1 Cooling systems

C.5.1.1 | The design and manufacturing of the external cooling system is free.

- C.5.1.2 | The number, position, size and composition of the cooling liquid radiators are free-choice, provided that they comply with the dimensional requirements of the general dimensions of the prototype.

## **C.5.2 Cooling fluids**

- C.5.2.1 | Only distilled water may be used as cooling fluid.
- C.5.2.2 | The use of additives in the distilled water is forbidden.

## **ARTICLE 6: EXHAUST SYSTEM**

### **C.6.1 Exhaust system design**

- C.6.1.1 | The exhaust system design is free, provided that it complies with the general dimensional requirements of the prototype and the noise regulations.
- C.6.1.2 | No mobile parts are allowed in the exhausts starting from the exhaust valves of the engine (i.e. additional valves, deflectors, etc.).
- C.6.1.3 | The use of a lambda sensor is compulsory, it can be used for passive engine tuning. It is compulsory to record lambda value at any time the engine is running. Data acquired may be required by the Organization at any time.
- C.6.1.4 | Maximum lambda value must be 0,88. Traction control or shifter actuation transient states will not be taken into consideration.

### **C.6.2 Noise**

- C.6.2.1 | The maximum noise level allowed for the exhaust is 105 dB/A measured statically at 6,000 RPM.  
No tolerance will be applied unless after a race session. After a race session it will be applied a tolerance of +3dB/A.

## **ARTICLE 7: TRANSMISSION SYSTEM**

### **C.7.1 Clutch**

- C.7.1.1 | The original clutch type must be maintained.
- C.7.1.2 | Clutch disks can be replaced.

- C.7.1.3 | Clutch springs can be replaced.
- C.7.1.4 | Clutch basket can be replaced.
- C.7.1.5 | The installation of clutch systems with limited slip (anti-skid or anti-bounce type) is allowed, and recommended.

## **C.7.2     Gearbox**

- C.7.2.1 | The original gearbox is integrated in the supplied engine and shares the lubrication system with the engine itself.
- C.7.2.2 | The original gearbox cannot be replaced or modified.
- C.7.2.3 | External quickshift type systems are allowed.
- C.7.2.4 | Shift lever can be replaced.

## **C.7.3     Secondary transmission**

- C.7.3.1 | Only secondary transmission systems by chain are allowed.
- C.7.3.2 | The original output pinion of the gearbox included in the engine can be replaced. The variation of geometry and number of teeth is allowed.
- C.7.3.3 | The rear wheel sprocket and the chain are free-choice.

## **ARTICLE 8: ELECTRIC INSTALLATION**

### **C.8.1     ECU**

- C.8.1.1 | It is only allowed the use of the Electronic Control Unit (ECU) of the engine published on the *MotoStudent Eligible Parts* sheet by the MotoStudent Organization.
- C.8.1.2 | Under no circumstances may the signal from the sensors integrated in the engine be distorted to exceed the engine speed limit (14.000rpm) set by the manufacturer. The limit of revolutions may be verified by the Technical Staff of the Organization at any time during the Final Event.

C.8.1.3 | Ignition and injection modifications will be limited by the ECU tuning software, with user license. Base maps cannot be modified. Any Team that modifies any value not allowed by the user license of the Official project, released in the MotoStudent Platform, will be disqualified from the test in which the Team has taken part from the last ECU check.

C.8.1.4 | MotoStudent Organization may request to connect and download the configuration of the ECU at any time along the competition if deems it appropriate. If the Team does not guarantee the means to the Organization to connect with the ECU, it will mean the no conformity with the Article C.8.1.3.

## **C.8.2 Battery**

C.8.2.1 | It is compulsory to install a battery with an operating voltage of between 8V and 18V.

## **C.8.3 Electric installation**

C.8.3.1 | The configuration of the electric installation by the teams is free.

C.8.3.2 | The use of commercial installations is allowed.

C.8.3.3 | The type of cable, the design and the wiring are for free configuration, provided that they are properly insulated.

C.8.3.4 | The connector type is free. Teams should bear in mind that the electric functioning of the prototype must also be guaranteed in wet conditions.

C.8.3.5 | The use of commercial components is allowed (coil, batteries, regulators, connectors, etc.).

C.8.3.6 | All prototypes must fit a safety stop button on the left-hand side of the handlebar. This button must be highlighted in red to be easily locatable in case of emergency. The stop button must stop the engine when it is activated.

C.8.3.7 | Only the use of one ignition coil is allowed.

C.8.3.8 | The electrical installation must be perfectly integrated into the whole of the prototype. It is forbidden leaving distances larger than 15cm of wires unfixed.

C.8.3.9 | The length of the cable must be the proper one, so that it is forbidden to coil the excess cable length.

C.8.3.10 | It is recommended to remove the electrical installation as much as possible from the hot spots of the engine, as well as cooling and exhaust systems. Under no circumstances may the electric cables and components be in direct contact with parts of the prototype that reach high temperatures.

#### **C.8.4 Start system**

C.8.4.1 | The cancellation of the electric start system integrated in the Official Engine is forbidden.

C.8.4.2 | In the event of a fault in the electric starter motor, during the start procedure of the race session will not be allowed to start the engine with external starters. Only in the event of a breakdown will it be possible to start the prototype by pushing.

#### **C.8.5 Data Logging**

C.8.5.1 | The use of a data logging system is compulsory. Commercial loggers are recommended.

C.8.5.2 | Engine speed, engine temperature and Lambda value must be monitored at any time the engine is running, including the first engine start, until the last session of the Final Event.

#### **C.8.6 Launch Control and Traction Control**

C.8.6.1 | Launch Control and Traction Control functionalities of the homologated Petrol ECU can be used as the only exception to the rule B.10.1.1. No other Launch Control or Traction Control system are allowed, apart from the homologated ECU system.

# **SECTION D**

## **SPECIFIC TECHNICAL REGULATIONS FOR THE CATEGORY “MOTOSTUDENT ELECTRIC”**

**ARTICLE 1: DEFINITIONS AND GENERAL ASPECTS****D.1.1 High Voltage - HV, Low Voltage - LV, Volts Direct Current – VDC.**

D.1.1.1 Any circuit with a potential difference over 60 VDC (included) will be defined as High Voltage (HV). The maximum voltage allowed in the prototype at any time cannot be over 126 VDC (not included).

D.1.1.2 The High Voltage System (HVS) is defined as all the electric parts that have a HV voltage. A component can be part of both HVS and the LVS.

D.1.1.3 Any circuit with a potential difference between 0 VDC (included) and 60 VDC (not included) will be defined as Low Voltage (LV).

D.1.1.4 The Low Voltage System (LVS) is defined as all the electric parts that have a LV voltage. A component can be part of both HVS and LVS.

**D.1.2 High Voltage System – HVS**

D.1.2.1 The HVS must be electrically separated from the prototype chassis, ground or any metallic part exposed to the outside.

D.1.2.2 Any component from the HVS must be shielded

D.1.2.3 The use of software elements to control the maximum and minimum voltage of the HVS is allowed

D.1.2.4 It is compulsory to place clearly visible labels indicating danger on housings or areas near the components working with High Voltage (HV). These labels must include the text "HIGH VOLTAGE".



*Picture 33 - High Voltage mandatory label*

D.1.2.5 Any component from the HVS must be duly insulated and protected against direct or indirect contact including the Team Members working outside and inside the vehicle.

- D.1.2.6 | The HVS connections must be properly encapsulated with insulating components, so that it becomes impossible to access them with a cylindrical tube of 100mm in length and 6 mm in diameter.
- D.1.2.7 | Any cable or conductor of the HVS must be orange (or clearly marked with orange all the way through it) and non-flammable grade UL-94 V0, FAR25, ISO 6722 or equivalent.
- D.1.2.8 | Any insulation material must be rated for the expected surrounding temperatures and voltages and possible scratches. Using only insulating tape or rubber-like paint or an anodization process is prohibited.
- D.1.2.9 | Any cable or conductor that is not part of the HVS cannot be orange.
- D.1.2.10 | Any component or container of the HVS must be protected against moisture and water in the form of rain or puddles.

### **D.1.3 Low Voltage System - LVS**

- D.1.3.1 | The use of DC/DC converters for the LVS supply is allowed.
- D.1.3.2 | The use of any type of battery permitted by the Art. D.3.1. as a LV source is allowed being it does not exceed its maximum limit. In this case, it will be considered as part of the battery pack, therefore, it must comply with the Art. 3.
- D.1.3.3 | In case of using batteries as the LVS source, it is mandatory to put them in a separated battery container.

### **D.1.3 Insulation between HVS and LVS**

- D.1.3.1 | The HVS and the LVS must be physically or galvanically separated.
- D.1.3.2 | The minimum physical separation between two parts or pieces inside a container with a voltage difference lower than 100 VDC will be 10 mm.
- D.1.3.3 | The minimum separation between two parts or pieces inside a container with a voltage difference higher or equal than 100 VDC will be 20 mm.
- D.1.3.4 | Minimum distances from Art D.1.3.2 and Art D.1.3.3 shall not apply if there exists a humidity and electrical insulating barrier with a minimum temperature resistance degree of 150 °C.

- D.1.3.5 | The minimum separation between any part or piece from the HVS and the LVS that are in the same PCB board will be 6.4 mm over the surface, 3.2 mm through the air and 2 mm if they are under a coating.
- D.1.3.6 | Any optocoupler, transceiver, sensor or integrated circuit in general with a minimum rated voltage equal to the HV are exempt the minimum distances from Art D.1.4.5
- D.1.3.7 | All parts of the prototype that may be able to conduct electricity must be referenced electrically to the LVS ground.

## ARTICLE 2: ELECTRIC MOTOR AND POWER DEMAND

### D.2.1 Preliminary information

- D.2.1.1 | The Organization will supply an electric motor which will be common for the teams entered in the “MotoStudent Electric” category. Motors will be property of the MotoStudent Organization that lend it to teams. In order to develop their prototypes and compete in the MotoStudent International Competition.  
  
Teams must return to the organization the motor at the end of the edition if the organization deems it necessary, in the same conditions as delivered.
- D.2.1.2 | The motors supplied has passed rigorous quality control checks prior to its shipment, and its design has been tested on road racing competition. As it will be mounted on an external bench and/or prototype without OEM parts, the Organization will assume no responsibility for any damage the engine may suffer during its use or test, and Teams must assume the repair the unit.
- D.2.1.3 | The given engines can only be used in the MotoStudent International Competition and its related activities (e.g. testbench, circuit practices, etc.). Their use in other activities non-related to MotoStudent, during this period is strictly prohibited. Violations of this rule will be subject to sanctions by the MotoStudent organizers.
- D.2.1.4 | Rules described above are set to ensure the availability of the **same motor** for the next **six years**, so each team can have the necessary time to develop and perfect its prototype and its motor control.
- D.2.1.5 | Each team will cover the transportation costs for repairs or replacement motors, from their facilities to MEF headquarters and back from MEF headquarters to their facilities.

D.2.1.6 | The price for a replacement Electric motor will be determined and outlined in the Official Electric Motor INFO document upon the motor's announcement. Additionally, the standard maintenance price will also be specified in the same document

D.2.1.7 | For non-standard repairs, Teams will receive a quotation once the motor has been inspected.

## **D.2.2 Sealing**

D.2.2.1 | The use of the engine provided by the Organization is compulsory. The motor provided by the Organization will be sealed and it is strictly forbidden to manipulate it. Any broken or damaged seal shall be reason to declare a technical nonconformity.

D.2.2.2 | In case of breakdown or malfunction of any internal part to which the team is not allowed to access, the team shall inform the Organization, who shall take the convenient steps.

## **D.2.3 Electric motor technical datasheet**

D.2.2.1 | Technical information about the motor will be published and sent by the Organization to all the teams registered in the Competition.

D.2.2.2 | The motor supplied by the Organization will have a minimum nominal value of:

- 30 Nm of torque
- 15 kW of power

D.2.2.3 | The motor supplied by the Organization will have a minimum peak value of:

- 60 Nm of torque
- 30 kW of power

D.2.2.4 | The motor supplied by the Organization will be water cooled.

D.2.2.5 | The distribution of the technical motor datasheet is strictly forbidden to other third parties. The organization reserves the right to set the appropriate penalization or even take legal actions against the team or person.

### **D.2.3 Inverter**

D.2.3.1 | The inverter is defined as the hardware device controlling the speed and torque of the electric motor. It can be either commercial or self-developed as well as its control software.

D.2.3.2 | The inverter must be fitted in between the motor and the accumulator, so that there cannot be a direct connection between the motor and the accumulator.

D.2.3.3 | The use of active inverters is allowed.

D.2.3.4 | In case of internal fault from the inverter the speed and torque of the electric motor must be zero. It is highly recommendable to control the line contactor with the inverter so in case of an error detection it can be set to open.

### **D.2.4 Throttle potentiometer**

D.2.4.1 | It is compulsory to include a throttle potentiometer with an auto return feature and an integrated normally open on/off switch.

D.2.4.2 | The throttle potentiometer must be controlled from the right-side handlebar of the prototype.

D.2.4.3 | The potentiometer signal must be used to configure the speed/torque demand from the motor.

D.2.4.4 | The on/off switch signal must be directly connected to the inverter. Whenever the switch state is set to open, the inverter speed/torque demand must be equal to zero.

D.2.4.5 | The throttle potentiometer signal can be digitally and/or analogically transmitted.

D.2.4.6 | The inverter must be set to zero speed/torque demand whenever is detected the next failures or any other failure related to the system transmission:

- Open circuit
- Short circuit to ground or to supply voltage
- Out of range potentiometer signal
- Data corruption

- Loss and/or delay of messages

#### **D.2.5 Motor brake**

- D.2.5.1 | It is allowed to configure the motor brake with an additional hand lever or a thumb lever situated in the left handlebar.
- D.2.5.2 | An additional lever protection is mandatory (only if the hand lever is present) for the motor brake, its requirements are explained in the Art. B.5.1.6.
- D.2.5.3 | Configuring the inverter to reuse the generated motor brake energy as energy regeneration is allowed.

### **ARTICLE 3: ENERGY STORAGE**

#### **D.3.1 Permitted storage systems**

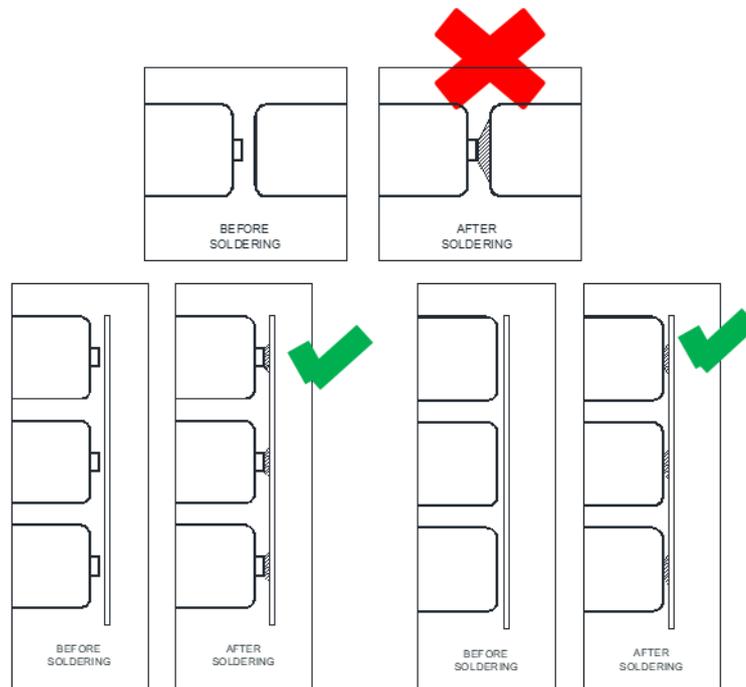
- D.3.1.1 | Any type of battery may be used as an energy storage system (including supercapacitors), except for molten salt batteries (thermal batteries) and fuel cells.
- D.3.1.2 | A battery pack is defined as any set of batteries or supercapacitors used as an electric energy storage system.
- D.3.1.3 | Only one battery pack can be used by each prototype.

#### **D.3.2 Battery container**

- D.3.2.1 | A battery container is defined as any receptacle that contains a part or the whole battery pack. Every battery must be located inside a container.
- D.3.2.2 | A battery pack can be composed by multiple battery containers. Each one of them must comply with the same prescriptions established for a single battery container.
- D.3.2.3 | It must be possible to open any battery container during the final event if the organization request it.

#### **D.3.3 Electrical configuration of the battery pack**

- D.3.3.1 | The terminals of the cells or supercapacitors must be correctly protected and insulated with an electrically insulating material.
  
- D.3.3.2 | If the container is made of an electrically conductive, the inner wall in contact with the battery cells must be properly insulated and protected against possible punctures or scratches. Prismatic cells with a rigid electrical insulated housings are excluded from this requirement.
  
- D.3.3.3 | Any connection from the battery pack to the outside of it (e.g. power cable, signal cable, etc.) must include a fuse whose current breakdown limit is lower than the breakdown current from the circuit that it is protecting.
  
- D.3.3.4 | The use of electronic fuses (eFuses) for HV applications is forbidden.
  
- D.3.3.5 | Each battery container must include, at least one, line contactor present at its positive terminal. Whenever the HVS disconnection circuit or the Charging disconnection circuit is set to open, it must assure no HV outside the battery container (Only exception set on Art. D.7.3).
  
- D.3.3.6 | It is not allowed the direct connection between cell terminals by means of welding or soldering. Indirect welding or soldering is permitted through a conductive material (plates, plates, cables, fusible wire). The welding or soldering of the BMS conductors to the terminals is allowed. In the case of "pouch" type cells, direct welding between their plates is allowed, if they are available.



Picture 34 - Correct battery cell welding

### **D.3.4 Mechanical configuration of the battery container**

- D.3.4.1 | Any battery container must be built with a mechanically resistant material and correctly anchored to the frame.
- D.3.4.2 | Any battery container that may be part of the frame of the prototype, must comply with the appropriate stiffness and resistance conditions.
- D.3.4.3 | Any battery container must be protected against any impact, puncture and hit.
- D.3.4.4 | The cells must be protected against any relative movement inside the container.
- D.3.4.5 | Ventilation openings cannot cover a complete side of the battery container and must include some type of permanent filtering element in order to avoid the entry of dust, particles and liquids into the container. Holes for passing wires are not considered ventilation openings (no filter is required) but they must also prevent the entry of dust, particles and liquids too.
- D.3.4.6 | Should a container be completely and tightly sealed; it must include an escape valve to prevent the gas concentration from reaching critical pressure.
- D.3.4.7 | The use or adaptation of commercially available containers or cases is allowed, provided that they comply with the characteristics established in this article.
- D.3.4.8 | The battery container joints must be correctly insulated against the entry of dust, particles and liquids into the container.
- D.3.4.9 | The filtering element must be correctly dimensioned and protected for its use in rain and dust conditions, also for possible projections (e.g. rocks or debris). It is prohibited its withdrawal or modifications of those filtering and protecting elements.

### **D.3.5 Battery Management System – BMS**

- D.3.5.1 | The Battery Management System (BMS) is any component that monitors and/or controls every cell of the battery pack and itself.
- D.3.5.2 | The installation of a battery management system (BMS) is compulsory.
- D.3.5.3 | It is allowed to artificially cool the battery pack meanwhile the HVS disconnection circuit is deactivated.

- D.3.5.4 | The BMS must monitor the hottest interior temperature of each battery container.
- D.3.5.5 | A failure state of the BMS is defined as any overheat, overcurrent, overvoltage and undervoltage of any cell, component from the battery pack and battery containers. At any time, the failure state limits cannot exceed those defined by the cell technical specs.
- D.3.5.6 | It is mandatory that the BMS balances the battery pack cells. It is allowed to balance them inside or outside the battery pack by another device or the BMS. In any of both cases, the charging disconnection circuit has to be active.
- D.3.5.7 | The use of active and passive cell balancing is allowed. In any of both cases, the components used must be correctly rated and protected.

#### ARTICLE 4: DISCONNECTION SYSTEMS AND CIRCUITS

##### D.4.1 Emergency Shutdown Button (ESDB)

- D.4.1.1 | The ESDB will be a red mushroom-type push-rotary (press to open and turn to close) type button, located in reach range for a marshal in case of crash or the rider in case of a system malfunction.



Picture 35 - ESDB button type

- D.4.1.2 | The ESDB must be protected against crashes or accidental contact by the rider or any third party.
- D.4.1.3 | The ESDB cannot be installed on any quick removable element (such as the fairing). Preferably it should be placed on supports fixed to the frame.

##### D.4.2 Insulation Monitoring Device (IMD)

D.4.2.1 | The insulation monitoring device (IMD) ensures the proper electrical isolation between the HVS and the chassis of the prototype.

D.4.2.2 | The correct installation of this insulation monitoring device is mandatory.

D.4.2.3 | The IMD failure states are those defined in the datasheet published by the Organization.

#### **D.4.3 Traction System Master Switch**

D.4.3.1 | The Traction System Master Switch (TSMS) must be a mechanical switch.

D.4.3.2 | The TSMS must be located in reach range of the rider and protected against indirect contact.

D.4.3.3 | The TSMS must be protected against indirect contact.

#### **D.4.4 Line contactor**

D.4.4.1 | The line contactor consists of a normally open mechanical relay controlled by the HVS disconnection circuit.

D.4.4.2 | As minimum, the line contactor must have:

- A common terminal connected to the positive terminal of the battery pack.
- A normally open terminal directly connected to the powertrain terminal of the inverter.
- A coil terminal connected to LVS ground.
- A coil terminal connected to the HVS disconnection circuit output.

#### **D.4.5 Other HVS contactors**

D.4.5.1 | It is allowed to use normally open mechanical relays for low power high voltage components (e.g. power supply of the inverter) that are located outside a battery container.

D.4.5.2 | These contactors must be located inside a battery container.

- D.4.5.3 | As minimum, the contactor must have:
- A common terminal connected to the positive terminal of the battery pack.
  - A normally open terminal connected directly to the positive low power supply of the HVS component.
  - A coil terminal connected to the HVS disconnection circuit output.

#### **D.4.5 Precharge circuit**

- D.4.5.1 | It is mandatory to install a precharge circuit for the inverter. Defining a precharge circuit as any system that gradually introduces electrical charge to the motor inverter, equalizing voltages and preventing high inrush currents when the line contactors close.
- D.4.5.2 | The minimum precharge level must be 90% of the real battery pack voltage and/or 10 V difference between terminals.
- D.4.5.3 | The precharge circuit must be composed by, at least a normally open mechanical relay, reference from here on as the precharge contactor.
- D.4.5.4 | It is optional to use the precharge system built in the inverter if it has one. In this case, there is no need of a precharge contactor.
- D.4.5.5 | The maximum time between closing the precharge circuit and the line contactors is 1 minute.

#### **D.4.6 HVS disconnection circuit**

- D.4.6.1 | The HVS disconnection circuit manages the opening and closing of the precharge (if exists) and line contactor(s). Its control must be done analogically.
- D.4.6.2 | The HVS disconnection circuit will consist of, at least:
- A Tractive System Master Switch (TSMS).
  - An emergency shut-down button (ESDB).

- A normally open mechanical relay controlled directly by the insulation monitoring device (IMD).
  - A normally open mechanical relay controlled directly by the Battery Management System (BMS).
- D.4.6.3 | Whenever the HVS disconnection circuit opens, the line contactors and the precharge contactor (if exists) must open instantaneously as well.
- D.4.6.5 | The IMD relay must remain open whenever a failure state is detected by the IMD.
- D.4.6.6 | The BMS relay must remain open whenever a failure state is detected by the BMS.
- D.4.6.7 | When either the TSMS, ESDB, BMS relay or IMD relay set their state to open, instantaneously, the HVS disconnection circuit must open as well.
- D.4.6.8 | Any additional elements added to the HVS disconnection circuit must assure the instant shutdown/aperture of the line contactors (specially, in case of breakdown or malfunction). The organization reserves the right to demand any modification to any additional element of the HVS disconnection circuit.
- D.4.6.9 | In case of a failure in the BMS signal and/or IMD signal, the corresponding relays must set their state to open.
- D.4.6.10 | The TSMS and the ESDB must be connected in series with the HVS disconnection circuit, assuring instant shutdown as per Art D.4.6.8.
- D.4.6.11 | Whenever the LVS disconnection circuit state is set to open, the BMS and IMD relay must set their state to open.
- D.4.7 LVS disconnection circuit**
- D.4.7.1 | The LVS disconnection circuit will consist of, at least:
- A Low Voltage System Master Switch (LVSMS).
  - Any LV source (i.e., a DC/DC or an external battery) present in the prototype.
- D.4.7.2 | The LVSMS must be a switch that prevents self-consumption of the LV source.
- D.4.8 Charging disconnection circuit**

- D.4.8.1 | The charging disconnection circuit can use a part or completely the HVS disconnection circuit and the LVS disconnection circuit. Its control must be done analogically.
- D.4.8.2 | The charging disconnection circuit will consist of, at least:
- Two emergency shut-down buttons (ESDB).
  - A mechanical relay controlled directly by the insulation monitoring device (IMD).
  - A mechanical relay controlled directly by the Battery Management System (BMS).
  - A mechanical relay controlled directly by the charger.
- D.4.8.3 | An ESDB of the charging disconnection circuit must be located in the prototype.
- D.4.8.4 | An ESDB of the charging disconnection circuit must be located in the charger.
- D.4.8.5 | The IMD relay must open whenever a failure state is detected by the IMD.
- D.4.8.6 | The BMS relay must remain open whenever a failure state is detected by the BMS.
- D.4.8.7 | The charger relay must remain open whenever a failure state is detected by the charger or the HVS disconnection circuit state is closed.
- D.4.8.8 | When either the ESDB, IMD relay, BMS relay or charger relay set their state to open, immediately, the charging disconnection circuit must open as well.
- D.4.8.9 | Any additional elements added to the Charging disconnection circuit must assure the instant shutdown of the charging contactor whenever the ESDB, BMS relay, IMD relay or charger relay set their state to open. The organization reserves the right to demand any modification to any additional element of the HVS disconnection circuit.
- D.4.8.10 | In case of a failure in the BMS and/or IMD and/or charger, must result in an open circuit.
- D.4.8.11 | In case of a failure in the BMS signal and/or IMD signal and/or charger signal, must result in an open circuit.

## ARTICLE 5: BATTERY PACK CHARGING

### D.5.1 Charger types

- D.5.1.1 | The charger must have a rated input power minor or equal to 22 kW (maximum 32 rated amps in three-phase network side configuration).
- D.5.1.2 | The charger must be fitted with a respective ground conductor which must be duly protected and connected to the case of the charger.
- D.5.1.3 | The main connector can be single-phase (230 VAC, 50 Hz) or three-phase (400 VAC, 50 Hz).
- D.5.1.4 | No parallel configuration of different chargers is permitted. Series configuration is allowed.
- D.5.1.5 | It is allowed to store energy for charging purposes during the Final Event. This energy storages must comply with this regulation.

### D.5.2 Connection to the prototype

- D.5.2.1 | The charger, its connector and its cables are part of the HVS.
- D.5.2.2 | The charging connector present on the prototype must be inaccessible when closed.
- D.5.2.3 | The charging connector must have a tightness degree of IP-65 when closed. When it is not used, a cap must be correctly installed.
- D.5.2.4 | The charging connector must be located in a protected area of the prototype to prevent damages due to possible crashes, contacts or impacts.

### D.5.3 Charging process

- D.5.3.1 | A Team Member must be present during the whole charging process, who is prepared to face any kind of problem that may surge.
- D.5.3.2 | It is mandatory to own fire extinguisher with a minimum capacity of 2 kg for electric fire (F500/CO2 type or similar), located at a maximum distance of 2 m from the prototype while charging. F500 or specific agent for lithium batteries recommended.

- D.5.3.3 | The charging of the prototype must be done outside, in the area defined by the organization for this purpose. During the Final Event, only after passing the static verifications, may a team charge the prototype from 08:00 to 20:00 so the organization can be present in case of a possible fire.
- D.5.3.4 | A failure state from the charger is defined as any current leak, internal component malfunction, battery pack under or over voltage, open circuit, overcurrent, undercurrent and charger under or over temperature.
- D.5.3.5 | While the prototypes are being charged, the use of panels that partially or completely limit the visibility to the Organization or scrutineers to the prototype is prohibited.

## ARTICLE 6: GENERAL INSTALLATION AND WIRING

### D.6.1 Wiring

- D.6.1.1 | The wire length must be exact.
- D.6.1.2 | The passage of the electric installation through possible hot points must be correctly dimensioned for that temperature.
- D.6.1.3 | Any wiring that is near to a moving or rotating part of the prototype must be tightly secured against any movement.

### D.6.2 Overcurrent protection

- D.6.2.1 | All electrical systems must have an appropriate overcurrent protector.
- D.6.2.2 | The current rating of a given overcurrent protector cannot exceed the smallest maximum current rating of any electrical conductor or device that it protects.
- D.6.2.3 | The maximum permitted voltage for a given overcurrent protector must be greater than the highest voltage in the electrical systems that protects.

## ARTICLE 7: CONTROL AND CONTROL DEVICES

### D.7.1 LEDs cluster

- D.7.1.1 | A cluster of LEDs, hereinafter, LEDs cluster, is a set of light-emitting diodes (LED) with the whole purpose of indicating the current state of the prototype (error, safe, engaged).

- D.7.1.2 | The LEDs cluster must have the following states:
- *Safe*: Whenever the TSMS, line contactor, precharge contactor and charging contactor are open and the IMD relay, BMS relay, charger relay and all ESDB are closed.
  - *Engaged*: Whenever the line contactor, charging contactor or precharge contactor are closed.
  - *Error*: Whenever the IMD relay, BMS relay, charger relay or ESDB are open.
- D.7.1.3 | The LEDs cluster must be continuously green whenever the *Safe* state is active.
- D.7.1.4 | The LEDs cluster must be blinking green (1Hz frequency) whenever the *Engaged* state is active.
- D.7.1.5 | The LEDs cluster must be continuously red whenever the *Error* state is active.
- D.7.1.6 | Two states cannot be active at the same time.
- D.7.1.7 | All the LED from the LEDs cluster must be close to each other, by a maximum of 10 mm from each other.
- D.7.1.8 | Three LED clusters must be located in the prototype:
- Two at each side of the prototype, properly subjected to the frame or battery pack.
  - In the motorbike dashboard, inside the dome.
- D.7.1.9 | Any of the LED clusters must be clearly visible from 5 m apart by any third party or marshall in case of crash and in the starting grid with the rider in the riding and standing position.
- D.7.1.10 | In case of error in the signal of any LED from the LED cluster (with the cable, sensor or logic) must remain set to off.
- D.7.1.11 | The LEDs from the LEDs cluster must have a minimum of 1 W of power.

## D.7.2 Voltage Display

- D.7.2.1 | A display (hereinafter Voltage Display) showing the total voltage output from the battery pack must be placed on the prototype.
- D.7.2.2 | The Voltage Display must be visible by the rider in straight line riding position.
- D.7.2.3 | The Voltage Display must be clearly visible by any third party or marshall in case of crash.
- D.7.2.4 | If the Voltage Display reads the voltage value from a digitally transmitted signal, it must prevent data corruption and loss and/or delay of messages.
- D.7.2.5 | The Voltage Display must read the voltage value before the line contactor and charge relay. Therefore, it always must display the battery voltage.

### **D.7.3 Voltage measuring point – VMP**

- D.7.3.1 | The Voltage Measuring Point (VMP) must be composed by a panel connector with at least 4 pins and with a minimum of IP66D rating and a voltage rating over 500 VDC.
- D.7.3.2 | The VMP must be connected to:
- The normally open terminal of the line contactor, referred as “B+”.
  - The normally open terminal of the charging relay, referred as “C+”.
  - The HVS ground, referred as “B-”.
  - The common terminal of the line contactor, referred as “HV+”.
- D.7.3.3 | The VMP must be cleared marked with its referred acronym.
- D.7.3.4 | The VMP must be located in each battery container and it must be accessible by the scrutineers or organization without using any tools.
- D.7.3.5 | The VMP must be protected against direct or indirect contact with a cap that must be always placed if the VMP is not being used.
- D.7.3.6 | It is mandatory to protect the “HV+” pin with a *TBA*<sup>1</sup> resistor.

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<sup>1</sup> TBA: To be announced

- D.7.3.7 | In order to let the scrutineers realize the different tests and measures, the team must bring the mating connector of the VMP, connected to a 4mm shrouded banana plug.



Picture 36 - 4mm shrouded banana plug example

- D.7.3.8 | Each cable from the mating connector must be clearly marked as per which pin from the VMP belongs to. Additionally, it has to be marked with the team's name, Team Leader name and phone.
- D.7.3.9 | The cable from the mating connector must be at least 500 mm.
- D.7.3.10 | The mating connector cable will be collected during the MS2 verifications and it will be returned to the teams at the end of the MS2 phase. The Team Leader must collect it at the technical box. If a team does not recover their mating connector cable, the organization will proceed to its destruction.

## ARTICLE 8: TRANSMISSION SYSTEM

### D.8.1 Types of transmission

- D.8.1.1 | Any type of primary transmission system is allowed: gearbox, CVT variator, etc.
- D.8.1.2 | Direct transmission between the output shaft of the motor and the rear wheel is allowed.
- D.8.1.3 | There are no limitations on the installation of clutch elements between components of the transmission system.

### D.8.2 Secondary transmission

- D.8.2.1 | There is no limitation regarding the type of secondary transmission used: chains, belt, etc.

- D.8.2.2 | Any element of the transmission that might imply a trapping risk for the rider must be covered with a rigid housing fixed by mechanic means.

## ARTICLE 9: COOLING SYSTEM

### D.9.1 Overview of the cooling systems

- D.9.1.1 | The design of the cooling system for the different components is freely configurable.

- D.9.1.2 | The cooling of components is allowed both by air and by liquid cooling systems.

### D.9.2 Liquid cooling systems

- D.9.2.1 | Only distilled water may be used as cooling liquid.

- D.9.2.2 | The use of additives in the distilled water is forbidden.

## ARTICLE 10: DOCUMENTATION OF THE PROTOTYPE

### D.10.1 Documents to be submitted

- D.10.1.1 | The Organization requires to the teams of the MotoStudent Electric Category, to submit some additional documentation about the electric prototype.  
These documentation deliveries are reflected on the Art F.1.2.

- D.10.1.2 | For safety reasons, the Technical Staff of the Organization may require technical information additional to that described in this article if it considers it for the inspection of one or more specific prototypes.

# SECTION E

## SCRUTINEERING

## ARTICLE 1: OBJECTIVE AND METHODOLOGY

### E.1.1 Objective

E.1.1.1 | The objective of the scrutineering is to check that the prototypes that have been presented to the Competition by the participating teams comply with the specifications in terms of performance and safety as established in the Technical Regulations (Sections B, C and D), as well as checking that the chosen rider is eligible to take part in the MS2 Phase of the Competition

E.1.1.2 | The scrutineering will not score towards the MotoStudent International Competition, but it may entail the exclusion if any deviation from the Regulations is detected or if the prototype is not considered as safe enough to take part in the tests.

E.1.1.3 | The scrutineering will be carried out by experienced scrutineers and qualified Technical Staff of the Organization.

E.1.1.4 | In case of dispute over the non-compliance of the rules stated in the Technical Regulations, or the safety of the prototype on track, the decision of the Technical Staff of the Organization will be final.

E.1.1.5 | The values measured with the Organization's instruments will be final

### E.1.2 Responsibility of the teams

E.1.2.1 | Teams are responsible for making sure that their prototype complies with all the rules established in the Competition Technical Regulations.

E.1.2.2 | When presenting the prototype for Scrutineering, the team acknowledges that they have made sure that the prototype complies with the Regulations established by the Organization.

### E.1.3 Procedure

E.1.3.1 | The Scrutineering consists of three stages:

- Administrative Check.
- Static Scrutineering.
- Dynamic Safety Check.

## ARTICLE 2: ADMINISTRATIVE CHECK

### E.2.1 Process

- E.2.1.1 Teams, at the beginning of the Final Event, must perform the Administrative Check, in which the Organization will confirm the total fulfillment of the federative requirements of the rider. Once these aspects have been approved, the corresponding Administrative Check sticker will be placed on the prototype, and the team will be able to proceed to the next scrutineering stage.



Figure 37 - Administrative check sticker example

- E.2.1.2 The Administrative Check will be carried out in the Paddock General Office.
- E.2.1.3 Teams will not be able to access the Static Scrutineering without having passed the Administrative Check.
- E.2.1.4 In case the rider attends to the Final Event later than the team, the team will also have to pass the Administrative Check, bringing to the Paddock General Office a valid **rider's identification document** (ID card or passport), **rider's federative license** and "**start permission**" (if needed), having the rider to complete the signature and confirmation when he/she arrives to the Event.

## ARTICLE 3: STATIC SCRUTINEERING

### E.3.1 Process

- E.3.1.1 The **Static Scrutineering** consists on a series of checks on the prototype to verify its compliance with the Competition Technical Regulations and its safety. Rider clothing will be also verified in order to check if it is appropriate to take part in the MS2 Phase.
- E.3.1.2 Scrutineering checks described in this article affect the prototypes presented for both the "MotoStudent Petrol" and "MotoStudent Electric" categories.

### **E.3.2 Development**

- E.3.2.1 | The Static Scrutineering will be carried out in the Technical Control Area.
- E.3.2.2 | The prototype must be presented under the appropriate conditions to participate in the MS2 Phase, strictly complying with all the rules indicated in the competition.
- E.3.2.3 | Using components not verified by the Organization during the Static Scrutineering will entail the immediate exclusion of the team from the Competition.
- E.3.2.4 | Only 2 Team Members can access the Technical Control Area during Static Scrutineering. These members will be the responsible of transporting the prototype and some kind of support that allows it to be presented in static position for its examination.
- E.3.2.5 | The team must bring any tool necessary in order to disassemble the prototype's fairing, minimum.

### **E.3.3 Visual check**

- E.3.3.1 | At this check, the scrutineers will review the prototype in order to compliance with the regulation code, section B.

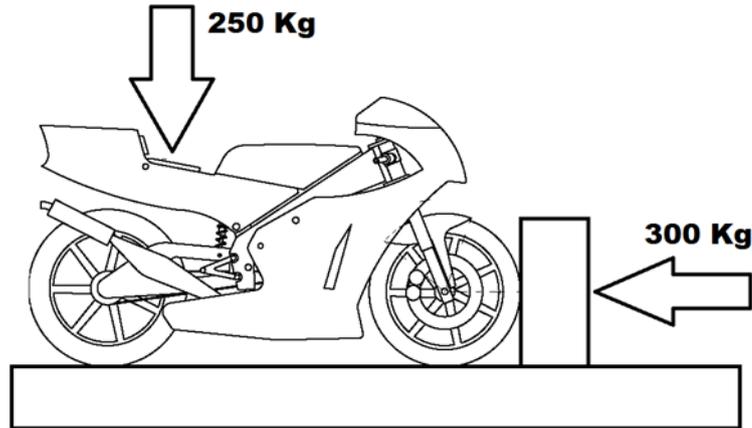
### **E.3.4 Weight check**

- E.3.4.1 | At this check, the scrutineers will weigh the prototype with two scales, one located at the rear wheel and a second located at the front wheel.
- E.3.4.2 | The total sum from both scales will be the total weight of the prototype.
- E.3.4.3 | The final weight of the prototype must exceed the minimum weight indicated in the **Art B.2.2.1**.

### **E.3.5 Load check**

- E.3.5.1 | At this check, the prototype will be tested to horizontal and vertical forces in order to verify the rigidity of the frame, the correct assembly and behavior of the suspensions.
- E.3.5.2 | The following forces will be applied to the prototype:

- 250 kg on the saddle.
- 300 kg on the front wheel.



Picture 38 - Load test forces diagram

E.3.5.3 | These loads will be applied alternately and progressively, checking that in compression situation there is no interference between any elements, as well as the correct behavior of all the systems that integrate the structure of the prototype.

### E.3.6 Brake check

E.3.6.1 | At this check, the correct behavior of the front and rear brake will be tested on a roller brake tester.



Picture 39 - Brake check

E.3.6.2 | The brake strength values from the prototype must be over:

- Front shaft: 0.3 kN.

- Rear shaft: 0.25 kN.

### **E.3.7 Approval**

- E.3.7.1 | If the prototype passes all the static checks from the Static Scrutineering (including those specific to each category), it will be marked with the respective sticker and allowed to access the Dynamic Safety Check



*Picture 40 - Static scruteneering sticker*

## **ARTICLE 4: STATIC SCRUTINEERING SPECIFIC TO “MOTOSTUDENT PETROL” CATEGORY**

### **E.4.1 Visual check**

- E.4.1.1 | At this check, the scrutineers will review the prototype in order to compliance with the regulation code, section C.
- E.4.1.2 | This check will be done during the Art E.3.3 check.

### **E.4.2 Noise check**

- E.4.2.1 | At this check, the scrutineers will measure the exhaust noise
- E.4.2.2 | The maximum permitted exhaust noise is stated in Art. C.6.2. of this regulation code
- E.4.2.3 | The noise will be measured at approx. 50cm from the end of the exhaust pipe and at 45° angle measured from the center-line of the exhaust end and at the height of the exhaust pipe, but at least 20cm above the ground. If this is not possible, the measurement can be taken at 45 degrees angle upwards.
- E.4.2.4 | The noise test must take place in a clear area adjacent to the Technical Control at least 5 meters from any possible noise reflecting obstruction.

- E.2.4.5 The rider or Team Member shall keep his engine running out of gear and must increase the engine speed until it reaches the specified revolutions per minute (RPM).  
Measurements will be taken when the specified RPM is reached.
- E.2.4.6 The surrounding sound should not exceed 90 dB/A within a 5 meters radius from the power source during tests.
- E.2.4.7 The sound level meter must be equipped with a calibrator for control and adjustment of the meter during periods of use.
- E.2.4.8 The “slow response” setting must always be used.

## ARTICLE 5: STATIC SCRUTINEERING SPECIFIC TO “MOTOSTUDENT ELECTRIC” CATEGORY

### E.5.1 Electric visual check

- E.5.1.1 At this check, the scrutineers will review the prototype in order to compliance with the regulation code, section D

### E.5.2 Isolation resistance measurement check

- E.5.2.1 At this check, the scrutineers will test the isolation between the HVS and the LVS of the prototype
- E.5.2.2 The isolation between the VMP of the battery pack and the prototype chassis must be at least 100  $\Omega/V$
- E.5.2.3 The measurement method for testing the isolation of the prototype will have the following steps:
- The battery pack voltage will be recorded (from here on  $U_b$ ) at the VMP, between “HV+” and “B-” terminals
  - The voltage between the “B-” terminal of the VMP and the vehicle chassis will be recorded (from here on  $U_1$ )
  - The voltage between the “HV+” terminal of the VMP and the vehicle chassis will be recorded (from here on  $U_2$ )

- From the terminal whose recorded voltage is the minimum, a  $R_o$  resistor will be placed between it and the vehicle chassis and the voltage will be recorded again (now as  $U_1'$  or  $U_2'$ )

- The  $R_i$  will be calculated as follows:

$$R_i = R_o * U_b * \left( \frac{1}{U_2'} - \frac{1}{U_2} \right) \text{ if } U_2 > U_1$$

$$R_i = R_o * U_b * \left( \frac{1}{U_1'} - \frac{1}{U_1} \right) \text{ if } U_1 > U_2$$

- The isolation value will be the result from dividing  $R_i$  between  $U_b$

E.5.2.4 | The  $R_o$  used in the isolation test will be of 15 k $\Omega$

### E.5.3 IMD check

E.5.3.1 | At this check, the scrutineers will test the correct behavior of the IMD and the disconnection circuit of the prototype.

E.5.3.2 | The test will consist of connecting the socket with the lowest recorded voltage from the previous tests ( $U_1$  or  $U_2$ ) to the vehicle chassis via a 50 k $\Omega$  resistor.

E.5.3.3 | The disconnection circuit will have at least 30 seconds to open the circuit.

E.5.3.4 | The ESDB and the TSMS will also be tested (by pressing them).

E.5.4.5 | For a disconnection circuit deemed open, the main relay and the charging relay must be open. This will be checked by measuring the voltage between the "B+" and "B-" and the "C+" and "B-" terminal of the VMP being equal to 0.

### E.5.4 Rain check

E.5.4.1 | This check will only affect to those prototypes from the "MotoStudent Electric" category

E.5.4.2 | At this check, the scrutineers will test the isolation of the prototype during rain and high humidity conditions

E.5.4.3 | During this check, the prototype must have the HV active, with the drive wheel raised without contact on the ground (on a stand).

- E.5.4.4 | Water will be projected simulating the effect of fine rain over the prototype in different directions for a minimum period of 60 seconds. Under no circumstances will high pressure jets be projected towards the prototype.
- E.5.4.5 | The check shall be approved if the IMD has not act during the minimum 60 seconds of spray or during the next 60 seconds after the spray has ended. The minimum total duration of the check will therefore be 120 sec.
- E.5.4.6 | The Technical Staff will also verify that there is no accumulation of water in areas at risk for the electrical system.
- E.5.4.7 | In order to check that the IMD has not acted during the minimum 60 seconds, the following ways shall be used:
- By testing if the motor works and turns
  - By measuring the voltage between the “B+” and “B-“ at the VMP

#### ARTICLE 4: DYNAMIC SAFETY CHECK

##### E.4.1 Process

- E.4.1.1 | The Dynamic Safety Check stage consists of a series of on-track verifications on the prototypes made by professional riders of the Organization. The verifications described in this article affect the prototypes presented for both the "MotoStudent Petrol" and the "MotoStudent Electric" Categories.

##### E.4.2 Procedure

- E.4.2.1 | An Official Rider from the Organization will carry out a series of dynamic tests on the track to check the correct working of the prototype.
- E.4.2.2 | In order for the prototype to be approved for the participation in MotoStudent it shall comply with the following:
- The prototype must start up and move under its own power.
  - The prototype must brake correctly both when riding softly and sportively.
  - The prototype must be able to carry out a series of turns at different speeds.

- E.4.2.3 | The Official Rider will determine if the prototype meets the basic safety requirements to participate in the Competition.

#### **E.4.3 Lap around the track**

- E.4.3.1 | Once checked the different aspects, the Official Rider of the Organization may make a complete lap around the Speed Racing Track in order to check the on-track behaviour of the prototype.

#### **E.4.4 Approval**

- E.4.4.1 | If the prototype passes the Dynamic Safety Check, it will be marked with the respective sticker and the team will be able to take part in the MS2 Phase.



*Picture 41 - Example of approval sticker*

### **ARTICLE 5: CHANGES AND REPARIS**

#### **E.5.1 Rectification time**

- E.5.1.1 | If the prototype is considered as "not approved" after any of the Scrutineering stages, the Organization will provide a time period to allow the team to rectify the failures detected by the Organization in their own box. After this period of time the prototype shall be presented again at the scrutineering to verify whether it complies with the Regulations.

- E.5.1.2 | No prototype will be accepted in MS2 Phase without having passed the Scrutineering stages within the established timetables. Motostudent Organization reserves the right of not to admit for scrutineering any prototype once the scrutineering scheduled has been finished.

#### **E.5.2 Changes and repairs**

E.5.2.1 | Once the scrutineering has been passed and the prototype has been validated for the MotoStudent International Competition, any change or replacement not explicitly permitted without the supervision of the Technical Staff of the Organization will be strictly forbidden. Before carrying out any modification, the Organization must be informed, which must approve it and re-inspect the prototype after it has been applied.

Changes allowed after the Scrutineering that do not involve supervision by the Organization are:

- Secondary transmission adjustment
- Brake system adjustment
- Changes and adjustments in the data recording systems
- Tire pressure adjustment
- Refilling fluids
- General set-up adjustments
- Engine set-up adjustments

Should a prototype need to be repaired, the repair must be approved by the Organization. Once it has been repaired, the Organization must give the approval to let the prototype return to the Competition after checking it.

## ARTICLE 6: ADDITIONAL SCRUTINIERING ROUNDS

### E.6.1 Additional testing rounds

E.6.1.1 | The organization can make multiple additional scrutineering rounds during the Final Event in order to ensure the compliance of the regulation code

# SECTION F

## COMPETITION STRUCTURING

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## ARTICLE 1: OBJECTIVES

### F.1.1 Competition objectives

F.1.1.1 The MotoStudent International Competition has the objective to serve as an advanced educational program. This program will prepare the motivated young talent for their future careers in the industry, more specially in the mobility sector, fostering innovation and professionalism through real motorsport projects. The participants will develop their skills in project management, economical aspects, marketing, resource management, and collaboration while adhering to industry standards and competing with teams globally.

### F.1.2 MS1 phase objectives

F.1.2.1 The MS1 Phase is a structured project management stage, which aims to guide teams in developing a prototype within the MotoStudent competition. It tracks the evolution of the project itself and requires to the teams to demonstrate their complete design and development process to the jury. This phase provides students with a chance to apply their educational knowledge to a professional project, showcasing the complexities and stages involved in bringing a product to fruition in a real-world scenario.

F.1.2.2 The MS1 Phase is specially focused in assessing the engineering, managerial and marketing skills of the teams. It is not about who has the best means, but about who makes the best use of the means they have.

F.1.2.3 It requires teams to function as university racing teams participating in MotoStudent, developing a genuine prototype, either from scratch or an evolution from a previous one, under a given project management guidelines for the VIII Edition of the MotoStudent International Competition. Teams must be ready to present their entire project, covering phases like design, prototype development, manufacturing, and economic management, to the jury and organization for competition participation.

### F.1.3 MS2 phase objectives

F.1.3.1 The MS2 Phase consists of a series of tests aimed at assessing the dynamic behavior and the performance of the manufactured prototype.

F.1.3.2 The different tests of the MS2 phase are focused on testing the different capabilities of each team and their final design that have been working all competition long. It aims to test those exposed ideas during the development of the MS1 phase in a real racing weekend configuration.

## ARTICLE 2: PHASES OF THE COMPETITION

### F.2.1 MS1 project milestones.

F.2.1.1 The MotoStudent Phase 1 (**MS1**) is divided in the following milestones:

- MS1 1<sup>st</sup> milestone: Team plan.
- MS1 2<sup>nd</sup> milestone: Product definition.
- MS1 3<sup>rd</sup> milestone: Innovation.
- MS1 4<sup>th</sup> milestone: Prototype CAD and drawings.
- MS1 5<sup>th</sup> milestone: Economical plan.
- MS1 6<sup>th</sup> milestone: Pitch presentation
- MS1 7<sup>th</sup> milestone: Final event presentation.

F.2.1.2 The MS1 1<sup>st</sup> milestone, **Team management plan**, deadline is from the **1<sup>st</sup> of November 2024** to the **30<sup>th</sup> of November 2024**.

F.2.1.3 The MS1 2<sup>nd</sup> milestone, **Product definition**, deadline is from the **1<sup>st</sup> of February 2025** to the **28<sup>th</sup> of February 2025**.

F.2.1.4 The MS1 3<sup>rd</sup> milestone, **Innovation**, deadline is from the **1<sup>st</sup> of April 2025** to the **30<sup>th</sup> of April 2025**.

F.2.1.5 The MS1 4<sup>th</sup> milestone, **Prototype CAD and drawings**, deadline is from the **1<sup>st</sup> of May 2025** to the **31<sup>st</sup> of May 2025**.

F.2.1.6 The MS1 5<sup>th</sup> milestone, **Economical plan**, deadline is from the **1<sup>st</sup> of May 2025** to the **31<sup>st</sup> of May 2025**.

F.2.1.7 The MS1 6<sup>th</sup> milestone, **Pitch presentation**, deadline is from the **1<sup>st</sup> of June 2025** to the **30<sup>th</sup> of June 2025**.

F.2.1.8 The MS1 7<sup>th</sup> milestone, **Finals presentation**, will be held during the **Final Event** (autumn 2025).

## F.2.2 MotoStudent Electric category delivery.

F.2.2.1 The MotoStudent Electric (**MSE**) category will have a set of specific deliveries:

- MSE 1<sup>st</sup> delivery: Electric and battery pack scheme.
- MSE 2<sup>nd</sup> delivery: Electrical precheck.

F.2.2.2 The MSE 1<sup>st</sup> delivery, ***Electric and battery pack scheme***, deadline is from the ***1<sup>st</sup> of March 2025*** to the ***30<sup>th</sup> of March 2025***.

F.2.2.3 The MSE 2<sup>nd</sup> delivery, ***Electrical precheck***, deadline is from the ***1<sup>st</sup> of July 2025*** to the ***31<sup>st</sup> of July 2025***.

## F.2.3 MotoStudent Special delivery

F.2.3.1 The MotoStudent Special (**MSS**) will have a set of specific delivery:

- MSS 1<sup>st</sup> delivery: Team plan video.
- MSS 2<sup>nd</sup> delivery: Characteristics page.
- MSS 3<sup>rd</sup> delivery: Product definition video.
- MSS 4<sup>th</sup> delivery: Innovation video.
- MSS 5<sup>th</sup> delivery: Abstract and Title.
- MSS 6<sup>th</sup> delivery: Rider declaration.
- MSS 7<sup>th</sup> delivery: Fair play.
- MSS 8<sup>th</sup> delivery: Excellence Showcase presentation.

F.2.3.2 The MSS 1<sup>st</sup> delivery, ***Team plan video***, deadline is from the ***1<sup>st</sup> of November 2024*** to the ***30<sup>th</sup> of November 2024***.

F.2.3.3 The MSS 2<sup>nd</sup> delivery, ***Characteristics page***, deadline is from the ***1<sup>st</sup> of December 2024*** to the ***31<sup>st</sup> of December 2024***.

F.2.3.4 The MSS 3<sup>rd</sup> delivery, ***Product definition video***, deadline is from the ***1<sup>st</sup> of February 2025*** to the ***28<sup>th</sup> of February 2025***.

- F.2.3.5 | The MSS 4<sup>th</sup> delivery, ***Innovation video***, deadline is from the ***1<sup>st</sup> of March 2025*** to the ***31<sup>st</sup> of March 2025***.
- F.2.3.6 | The MSS 5<sup>th</sup> delivery, ***Abstract and Title***, deadline is from the ***1<sup>st</sup> of March 2025*** to the ***31<sup>st</sup> of March 2025***.
- F.2.3.7 | The MSS 6<sup>th</sup> delivery, ***Rider declaration***, deadline is from the ***1<sup>st</sup> of August 2025*** to the ***30<sup>th</sup> of August 2025***.
- F.2.3.8 | The MSS 7<sup>th</sup> delivery, ***Fair play***, deadline is from the first day to the last day of the Final Event.
- F.2.3.9 | The MSS 8<sup>th</sup> delivery, ***Excellence Showcase presentation***, deadline is the day of the Awards Ceremony during the Final Event.

### **ARTICLE 3: MS1 1<sup>st</sup> MILESTONE, TEAM PLAN**

#### **F.3.1 Section 1: Executive summary**

- F.3.1.1 | This section must summarize the team's purpose and its principal goals to be achieved. Has to give a brief overview of the team (two or three paragraphs long approximately) for the jury to understand, in a glance, the whole goals of the project.

#### **F.3.2 Section 2: Team's structure**

- F.3.2.1 | The main objective of this second section is to explain to the human composition of the team. Giving an overview of the structure, the different departments, the different leaders, how are the decisions made, the different task develop by each department, etc. Also, it is highly recommendable to expose the different degrees/masters that the team members are studying in order to paint a bigger picture of the project.

#### **F.3.6 Section 3: Team goals**

- F.3.6.1 | The product goals must accurately describe what is intended to be achieved within this edition. Every goal must be specific, measurable, achievable and relevant, helping the team to develop the best project.
- F.3.6.2 | Each organizational unit from the previous section must have a set of goals to be fulfilled for the edition. An organizational unit may have a main goal and a set of subgoals, so they can focus better in accomplishing them.

F.3.6.3 | The goals must be presented in a table with their following KPI (Key Performance Indicator), in order to track the goals competition.

F.3.6.4 | Each goal must be assigned to a workgroup, responsible and/or department to be achieved and be tracked.

### **F.3.7 Section 7: Milestones, deliveries and goals timeline**

F.3.7.1 | This section must explain the different activities and milestones of the team in a time driven chart (e.g., a Gantt chart) so that it can be feasible to achieve the established goals.

F.3.7.2 | This chart must include the different milestones established by the own organization (e.g. the final race, the different deliveries, ...).

F.3.7.3 | It is highly recommended to add multiple reviews for the different goals, so it can be clear to all the Team Members if the established goals at the season start are on track to be accomplished or if some changes must be done.

F.3.7.4 | A milestone can be a percentage to be achieved of a KPI, in order to make it easier to the team organization to keep track of its accomplishment.

### **F.3.8 Section 8: Maximum scores**

F.3.8.1 | The maximum score for the 1<sup>st</sup> milestone is **75** points.

F.3.8.2 | The maximum score for the first section is **6** points, divided into:

- Team purpose explanation.
- Exposition of team's goal or goals.

F.3.8.3 | The maximum score for the second section is **21** points, divided into:

- Definition of team's structure.
- Analysis on team structure.
- Assessment regarding team's composition.
- Explanation of team's decision making.

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	<ul style="list-style-type: none"><li>- Analysis of the team's management.</li><li>- Explanation of different tasks for each organizational unit</li></ul>
F.3.8.7	<p>The maximum score for the third section is <b>24</b> points, divided into:</p> <ul style="list-style-type: none"><li>- Goal's precision and clarity.</li><li>- Goal's quantitative metric.</li><li>- Goal's concordance with team composition.</li><li>- Goal's feasibility, further analysis and examples.</li><li>- Goal's timeframe definition.</li><li>- Goal's exposed in a table format.</li><li>- Goal's designated to a responsible.</li></ul>
F.3.8.8	<p>The maximum score for the fourth section is <b>24</b> points, divided into:</p> <ul style="list-style-type: none"><li>- Creation of a time driven chart.</li><li>- Inclusion of organization milestones.</li><li>- Goal's tracking milestones inclusion.</li><li>- Prototype development milestones definition and inclusion.</li><li>- Deliveries development milestones definition and inclusion.</li></ul>

#### **ARTICLE 4: MS1 2<sup>nd</sup> MILESTONE, PRODUCT DEFINITION**

##### **F.4.1 Milestone preamble**

F.4.1.1	<p>The product to be defined shall be a motorbike prototype with a preset combustion engine or electric motor (depending in which category the team takes part). This product has to be ridden by a human and therefore must be designed with a pretty accurate set of loads and the convenient safety margins. Also, the prototype design must evaluate the riding position and its ergonomics.</p>
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#### **F.4.2 Section 1: Functional systems trade-off**

F.4.2.1 | The main objective of this first section is to evaluate the opted solution by the team to be used in the prototype. Giving the pros and cons regarding the selected design and stating which studies or markets has the team based their choice (i.e. street market, other MotoStudent teams or their older team, other competitions, etc.)

#### **F.4.3 Section 2: Failure Modes and Effect Analysis (FMEA)**

F.4.3.1 | The main objective of this second section is to evaluate the different design requirements, restrictions, risk reducing actions and application factors regarding each system of the prototype. In the FMEA shall explain how a system can fail, their consequences and any risk reduction actions that may be applied.

#### **F.4.4 Section 3: Make/Buy**

F.4.4.1 | The main objective of this third section is to expose which elements of the prototype will be developed and made by the own team, which ones are store bought. If the team decides to reuse a part or element from previous edition it must be marked (i.e. with a footnote or similar).

F.4.4.2 | The elements defined as made, are those whose partial or completely development and/or production is made by the team.

F.4.4.3 | The elements defined as buy, are those whose can be bought from a third party (i.e., a supplier or a shop).

F.4.4.4 | In case of reusing an element from a previous edition, it must be accounted and correctly classified. If the part was classified as made, it must keep that classification and vice versa.

#### **F.4.5 Section 4: Proposed design**

F.4.5.1 | The main objective of this fourth section is to give a visual representation (in 2D and 3D) of the prototype. Geometrical and dimensional restrictions and rider integration must be presented. Also, including the expected center of gravity (CoG), minimum prototype weight, ergonomics and dimensions.

F.4.5.2 | The 2D representation must include the representation of the rider, with its dimensions (total height, arm length, femur length...).

F.4.5.3 Both the 3D and 2D representations must include a minimum of front, top and side views of the prototype without fairings. Also, including those aforementioned views with the fairing is highly recommended.

#### F.4.6 Section 5: Loads definitions

F.4.6.1 The main objective of this fifth section is to define the different loads that the prototype must support during the final event. If available, numeric simulations are recommended. Empirical simulations are also convenient, especially if the team has verified those values in the MotorLand racetrack.

F.4.6.2 The loads included in this section must be the following:

- Static verification loads.
- Maximum braking loads.
- Maximum acceleration loads.
- Cornering loads.
- Turning loads (i.e., a fast chicane or left-right corner).
- Aerodynamic loads.

F.4.6.3 The loads defined must include the rider previously defined in its calculation. **Please, consider that a person will be riding the vehicle.**

#### F.4.7 Section 6: Structural calculations

F.4.7.1 The main objective of this sixth section is to evaluate the different stress and deformations of the structural parts of the prototype under the multiple maximum loads' cases defined in the previous section.

F.4.7.2 It is ***highly recommended*** to use a finite elements simulation in order to obtain the different results. For lower complexity components, analytical methodologies can be used in order to calculate the forces (i.e. some bolted joints).

F.4.7.3 Is mandatory to simulate the frame, swing-arm and subframe.

F.4.7.4 If a bought component is structurally compromised it must be simulated.

F.4.7.5 | The different safety margins must be explicitly stated in order to achieve vehicle integrity.

#### F.4.8 Maximum scores

F.4.8.1 | The maximum score for the 2<sup>nd</sup> delivery is **100** points.

F.4.8.2 | The maximum score for the first section is of **10** points, divided into:

- Enumeration of the different solutions opted for each system.
- Analysis of the strengths and weakness of the selected solution regarding a defined market solution.
- System solution justification.
- Assessment on the environmental impact of the opted solutions.

F.4.8.3 | The maximum score for the second section is **15** points, divided into:

- Completeness of the FMEA.
- Accuracy on the risk assessment of the parts.
- Risk priority numbering
- Occurrence and detection ranking of the different parts and systems.
- Systems needing a higher attention as consequence of the FMEA
- Risk reducing actions completeness and its minimizing effects.

F.4.8.4 | The maximum score for the third section is **10** points, divided into:

- List of the different elements.
- Decision assessment.

F.4.8.5 | The maximum score for the fourth section is **20** points, divided into:

- 2D and 3D geometrical restrictions.
- Prototype 2D design assessment.

- Prototype 3D design assessment.
- Rider positioning and dimensioning.

F.4.8.6 The maximum score for the fifth section is **25** points, divided into:

- Permanent and transient static loads calculation.
- Suspension stiffness curve.
- Multibody calculations, analysis and fading.
- Deformation and fatigue calculations.
- Aerodynamic analysis and calculations.

F.4.8.7 The maximum score for the sixth section is **20** points, divided into:

- Stress and deformation simulations.
- Strength and stiffness calculation and justification.
- Properly dimensioned and justified safety margins.

## ARTICLE 5: MS1 3<sup>rd</sup> MILESTONE, INNOVATION

### F.5.1 Milestone preamble

F.5.1.1 As per the innovation definition: *“Make changes in something established, especially introducing new methods, ideas or product”*, the jury expects that the different teams present a change, evolution or a new of a part or method of the prototype or its processes with direct and measurable impact in the *MS2 Test 8: Race result*.

F.5.1.2 Those projects with a higher level of concreteness, a great analysis, an accurate development process explanation and a biggest justified short-term impact on the prototype (with its improvement measurement) shall be evaluated as the best innovation projects.

F.5.1.3 The innovation presented in this milestone must be integrated in the prototype during the Final Event.

F.5.1.4 | The innovation improvement must be measured with a direct comparison between the prototype total race time with and without the innovation presented.

## **F.5.2 Section 1: Starting point**

F.5.2.1 | The main objective of this first section is that each team must expose the different reasons why the team develops this innovation and what will be improved. Also, the team must concrete the impact that they do expect in the prototype. The selected innovation must be aligned with the goals defined in the previous chapters.

## **F.5.3 Section 2: Buy vs DIY**

F.5.3.1 | The main objective of this second section is to reflect if investing time and resources to this idea will help to the prototype to achieve the goals stated in the 1<sup>st</sup> milestone and in the milestone preamble. A comparison between different solutions (available in the market or DIY) with its pros and cons must be included.

F.5.3.2 | If no solution is available by a third party for your problem, it must be compared to the nearest solution that will partially solve the presented issue.

F.5.3.3 | In case of a system or element that it is prohibited to be bought by the regulation code, it must be cleared stated and the comparison must be done between different technological solutions.

## **F.5.4 Section 3: Development phases**

F.5.4.1 | The main objective of this third section is to summarize all the development phases, from the first sketch or idea to the last prototype. It shall help to the jury to visualize the different phases and the different decisions taken during the development so it is easier to comprehend the final result.

F.5.4.2 | It is highly recommendable to include a timeline containing the different milestones of the project (i.e., kickoff, first concept release, design freeze, production release, tests done...) and also a brief explanation of the different status/work done during these milestones.

F.5.4.3 | It is highly recommendable to realize different tests in order to compare the results with the expected improvement outcome.

## **F.5.5 Section 4: Proof of Concept (PoC)**

F.5.5.1 | The main objective of this fourth section is to present the final product, reviewing it, comparing the expected improvement obtained at the start of the delivery and the final improvement obtained.

F.5.5.2 | It is mandatory to include photos of the Proof of Concept.

#### **F.5.6 Section 5: Bill of materials (BOM) and budget**

F.5.6.1 | The main objective of this fifth section is to list the costs and different elements used during the development phases and the PoC.

F.5.6.2 | A Bill of Materials (BOM) is a list with all the materials and consumables used during the development phases and the PoC.

F.5.6.3 | A budget must include, not only, the cost of each component and consumable from the BOM. Also, the costs of the number of hours invested in the project and the consumables derived from the project development.

#### **F.5.7 Section 6: Conclusions**

F.5.7.1 | The main objective of this sixth section is to conclude the innovation milestone by reevaluating the expected direct impact on the prototype and a long-term explanation of improvements to be done.

#### **F.5.8 Maximum scores**

F.5.8.1 | The maximum score for the 3<sup>rd</sup> milestone is **150** points:

F.5.8.2 | The maximum score for the first section is **6** points, divided into:

- Origin of the innovation.
- Direct contribution to the prototype.
- Innovation alignment with team's goals.

F.5.8.3 | The maximum score for the second section is **18** points, divided into:

- Market available solutions and other technological variants assessment.

- Technical feasibility evaluation.
  - Human resources to be invested assessment.
  - Justification of the resources to be invested regarding its costs.
- F.5.8.4 The maximum score for the third section is **57** points, divided into:
- Development phases explanation and evaluation.
  - Assessment on milestones objectives and the project evolution.
  - Evaluation and testing development.
  - Analysis and justification of the different decisions.
- F.5.8.5 The maximum score for the fourth section is **30** points, divided into:
- Expected vs final improvement obtained.
  - Concept presentation evaluation.
  - Graphical resources of the PoC.
- F.5.8.6 The maximum score for the fifth section is **24** points, divided into:
- BOM completeness.
  - Cost evaluation compared to other presented solutions.
- F.5.8.7 The maximum score for the sixth section is **15** points, divided into:
- Analysis on the final expected impact to the prototype.
  - Long-term evolution possible solutions and technical feasibility.
- F.5.8.8 A multiplication factor to the final score will be applied (ranging from 0 to 1, with 2 decimals precision) with the following criteria:
- Concreteness of the final improvement.
  - Clarity of the improvement direct impact.

## ARTICLE 6: MS1 4<sup>th</sup> DELIVERY, PROTOTYPE CAD AND DRAWINGS

### F.6.1 Section 1: Prototype CAD

F.6.1.1 | The objective of this first section is to deliver the latest CAD from the prototype's structure.

F.6.1.2 | This section must be delivered as a single 3D file in **.step** format. This file must include the frame, subframe and swingarm.

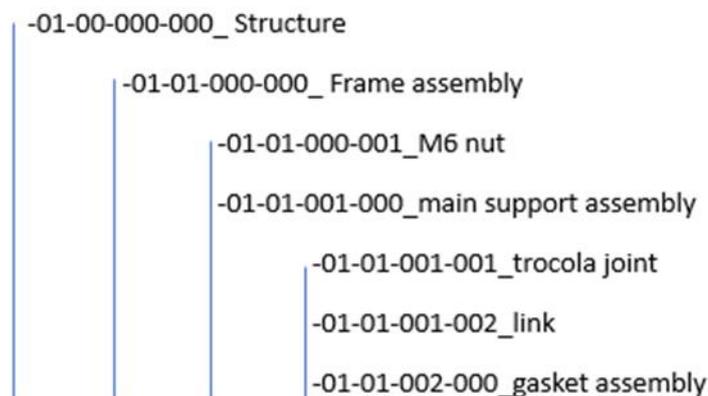
### F.6.2 Section 2: Model tree

F.6.2.1 | The objective of this second section is to show the structure of the 3D design, without forgetting any component.

It must show the structure of the Assemblies, sub-assemblies and parts. It must include the alphanumeric reference for each assembly/part (see Art.F.6.2.2), and its name.

- A part or subassembly can appear more than once if it is mounted in different assemblies or subassemblies.

00-00-000-000\_MotoStudent Prototype



F.6.2.2 | The nomenclature for the parts and assemblies must be as follows:

An alphanumeric reference assigned by the team that identifies each part or element, with the next format:

- **System:** The whole prototype will be broken down into the following 7 systems:

- 01 – Structure

- 02 – Powertrain
- 03 – Suspensions
- 04 – Wheels
- 05 – Brakes
- 06 – Aerodynamics
- 07 – Others
- **Assembly:** Level set immediately below systems.
- **Subassembly:** Level set immediately below assemblies.
- **Part:** The number of the art pertaining the subassembly. Numbering must be ascending. For subassemblies, the part number must be 000.

<u>System</u>	<u>Assembly</u>	<u>Subassembly</u>	<u>Part</u>
00	AA-	111-	222

*Picture 42 - Drawings nomenclature*

### F.6.3 Section 3: Drawings

F.6.3.1 The objective of this third section is to deliver example drawings for the manufacture of the prototype. It must be delivered:

- Complete Prototype (Front, side, top and isometric views).
- Rear Suspension assembly drawing.
- Top triple clamp part drawing.

F.6.3.2 The assembly / subassembly drawing must include its own bill of materials (BOM) and part/subassemblies must be referenced with ballons.

F.6.2.4 Commercial parts must also be named in the bill of materials of the drawing.

### F.6.3 Maximum scores

- F.6.4.1 | The maximum score for this the 4<sup>th</sup> milestone is **60** points.
- F.6.4.2 | The maximum score for the first section is **12** points, divided into:
- Structure CAD with the correct format.
  - Definition level.
- F.6.4.3 | The maximum score for the second section is **20** points, divided into:
- Correct nomenclature.
  - All assemblies included.
  - All parts included.
  - Clear levels and relations.
- F.6.4.4 | The maximum score for the second section is **28** points, divided into:
- Correct nomenclature.
  - Assemblies with dimensions.
  - Bill Of Materials and ballons.
  - Dimensions of the parts.
  - Materials of the parts.
- Tolerance, finish, paint and treatments of parts.

## ARTICLE 7: MS1 5<sup>TH</sup> MILESTONE, ECONOMICAL PLAN

### F.7.1 Section 1: Total costs

- F.7.1.1 | The objective of this section is to overlay any cash expense that the team has had from the team enrollment to the milestone delivery date.
- F.7.1.2 | This section must reflect **the expenses incurred in the prototype production and prototypes** that must have been done.

- F.7.1.3 | It is mandatory to differentiate between:
- **Production derived costs** (i.e., materials, parts acquisitions, prototyping parts, ...).
  - **Marketing derived costs** (i.e., team clothes, pamphlets, congress derived costs, ...).
  - **Other costs** (i.e., rent, water bill, electricity bill, ...).
- F.7.1.4 | The appropriate tax must be included in each one of the expenses.
- F.7.1.5 | Each cost must include at least the following fields:
- Date when the cash left the team's account.
  - Concept of the expense (i.e., Aluminum purchase for the chassis).
  - Expense cost without tax.
  - Expense cost with tax.
- F.7.1.6 | At the end of the section, the total expense (with tax included) must be calculated.
- F.7.1.7 | In this section, any donations from sponsors or similar that are in kind must be accounted as an expense (like if you bought the part or service from them).
- F.7.2      Section 2: Total income**
- F.7.2.1 | The objective of this section is to account for all the income that the team had from the team enrollment to the milestone delivery date.
- F.2.5.2 | This section must reflect the **multiple cash contributions that the team incurred during the established timeline.**
- F.2.5.3 | In this section, any donations from sponsors (monetary or in kind) must be detailed and accounted for.
- F.2.5.4 | Each cash income must include at least the following fields:
- Date when the cash entered the team's account.
  - Concept of the income (i.e., sponsorship deal from MEF Foundation).

- Income amount.

F.2.5.5 | At the end of the section, the total income must be included.

### **F.7.3 Section 3: Prototype value**

F.7.3.1 | The objective of this section is to analyze the total costs invested in this prototype (e.g. your team wants to exactly reproduce the prototype without sponsors).

F.7.3.2 | All the parts and assemblies must follow the nomenclature define in Art F.5.2.2.

F.7.3.3 | The prototype value must be presented in a table format.

F.7.3.4 | For all the system parts (system, assembly, subassembly and parts), an entry in the table must be done with the following fields:

- Alphanumeric reference.
- Full name and part reference (in case of store bought).
- Total of hours (in case of have been build).
- Total cost of the part.

F.7.3.5 | The total cost of a part has to include the total cost in hours at a standard rate of 30 €/h (or its equivalent in other divisas) and the total cost of the materials needed in order to build that part.

$$\textit{Total cost of the part} = (30 \text{ €/h} * \textit{number of hours}) + \textit{material costs}$$

F.7.3.6 | If the team has bought the system/assembly/subassembly/part, the total number of hours must be 0.

F.7.3.7 | If a system/assembly/subassembly/part has been self-designed by the team, the number of hours must be those that the team has expended in that part.

F.7.3.8 | If a system/assembly/subassembly/part has been donated from a sponsor, it must be accounted as a bought part.

F.7.3.9 | The total number of hours expended in a self-designed part are the ones needed in order to build a replica of that product.

#### F.7.4 Section 4: Team's liquidity

- F.7.4.1 | The objective of this section is to detail the team's actual funds.
- F.7.4.2 | This section must reflect the **final value of the difference between sections 2 and 1**.
- F.7.4.3 | The result of this section must be equal to the team's cash balance.
- F.7.4.4 | If a team starts with a positive amount of money in the bank, it must be explained and accounted in this section.

#### F.7.5 Section 5: Future budget

- F.7.5.1 | The objective of this section is to detail the team's future expenses and income from the day after delivering this milestone to the last day of the competition (including the costs that may arise after the competition, i.e., traveling back to your hometown).
- F.7.5.2 | This section must reflect an **estimate on the amount of money needed in order to finalize this edition**.
- F.7.5.3 | It is mandatory to differentiate the between:
- **Expected income** (i.e., sponsorship deals signed but the money has not been paid yet).
  - **Production expected costs** (i.e., missing pieces from the prototype, spare parts, circuit days, ...).
  - **Marketing expected costs** (i.e., team clothes, pamphlets, congress derived costs, ...).
  - **Traveling derived costs** (i.e., prototype transport, team accommodation, ...).
  - **Other costs** (i.e., rent, water bill, electricity bill, ...).
- F.7.5.4 | The appropriate tax must be included in each one of the expenses.
- F.7.5.5 | The final sum of the expected income, minus the costs, can be either positive, negative or zero. No penalties will be derived from a negative result.

#### F.7.6 Section 6: Economic viability of the project

- F.7.6.1 | The objective of this section is to explain and justify the team's economic viability from the expected value obtained in the "Future budget" section plus the actual cash value from the section "Team's liquidity".
- F.7.6.2 | This section must **explain to the jury the team's economical results** and try to find a **conclusion** for the economical part.
- F.7.6.3 | The team should explain the causes and motives, how will they revert the result (in case of a negative outcome) or how will be used that surplus (in case or a positive result).
- F.7.6.4 | It is highly recommended to show the results in a table format, with the income, expenses and the future income expenses laid out.
- F.7.6.5 | In either a positive or negative outcome, it will be evaluated the process that led to this economical result. No penalties will be applied in case of a negative result.

#### **F.7.7 Maximum scores**

- F.7.7.1 | The maximum score for the 5<sup>th</sup> milestone is **75** points.
- F.7.7.2 | The maximum score for the first section is **9** points, divided into:
- Completeness of the expense table.
  - Expenses correctly formatted and accounted.
  - Concepts correctly justified.
- F.7.7.3 | The maximum score for the second section is **6** points, divided into:
- Completeness of the income table.
  - Income correctly formatted and accounted.
  - Concepts correctly justified.
- F.7.7.4 | The maximum score for the third section is **27** points, divided into:
- Completeness of the valuation table.
  - Correctly formatted table and fields.

- Correctly differentiation between parts.
  - Hours needed correctly accounted.
- F.7.7.5 | The maximum score for the fourth section is **9** points, divided into:
- Correctly justification of the actual cash account.
- F.7.7.6 | The maximum score for the fifth section is **15** points, divided into:
- Completeness of the budget table.
  - Expenses correctly formatted and accounted.
  - Income correctly formatted and accounted.
  - Missing parts (if exists) correctly justified.
  - Justification of the different costs and incomes.
- F.7.7.7 | The maximum score for the sixth section is **9** points, divided into:
- Correctly justification of the final result.

## **ARTICLE 8: MS1 6<sup>th</sup> MILESTONE, PITCH PRESENTATION**

### **F.8.1 Milestone preamble**

- F.8.1.1 | The main objective is to showcase to the jury the whole development of the project, in concordance with the videos previously uploaded in the MSS. This milestone shall be a recompilation of the videos that your team has already published in social media and expand a little bit that information
- F.8.1.2 | This video must show the essence of the whole project, the team, the prototype, the innovation, the design, the sponsorships... It has to sell the essence of all the work done in an original, different, dynamic and entertaining way. Sell who you are, what you have done, how you have done it and why you have done it. Impact the public in less than 5 minutes.  
The content of the videos previously uploaded in the MSS, can be used as part of the Pitch Presentation video.
- F.8.1.3 | The video must have the following characteristics:

- The video maximum length is 5 minutes.
- It must be presented in a vertical format.
- In the first 5 seconds of the video must appear the MotoStudent logo and the team logo.
- In the last 5 seconds of the video, it must appear the team logo and logos of MEF and TechnoPark with the following text: “Powered by” just above the MEF and TechnoPark logos.
- Throughout the video, the MotoStudent logo must appear in the upper right corner, and the team logo in the lower left corner.
- The video must be recorded in English.

The logos and any additional resources will be available in the MotoStudent Platform.

F.8.1.4 | The video must be posted on the team's Instagram account before the deadline for this delivery, and optionally on other social media platforms, always tagging MotoStudent. Additionally, the link to the post must be attached to the specific Quiz on the MotoStudent Platform.

F.8.1.5 | In addition, a form must be filled in with the data on audiences, views and reach of the three previous videos submitted to MSS.

## F.8.2 | **Maximum scores**

F.8.2.1. | The maximum score for the 7<sup>th</sup> delivery is **60** points.

F.8.2.2 | The maximum score for the production quality section is **8** points, divided into:

- Editing
- Visual quality
- Audio quality and clarity

F.8.2.3 | The maximum score for the content section is **20** points, divided into:

- Creativity and originality
- Clarity of the message

- Relevance of the requested content
  - Impact and persuasiveness of the viewer
- F.8.2.4 The maximum score for the unification section is **12** points, divided into:
- Consistency in bringing all previous milestones together.
  - Well-prepared full summary
- F.8.2.5 The maximum score on the reach of the three MSS videos is **40** points, divided into:
- Inclusion of information from MS1 1<sup>st</sup> milestone, Team Plan
  - Inclusion of information from the MS1 2<sup>nd</sup> milestone, Product definition
  - Inclusion of information from MS1 3<sup>rd</sup> milestone, Innovation

## ARTICLE 9: MS1 7<sup>th</sup> MILESTONE, FINALS PRESENTATION

### F.9.1 Milestone preamble

- F.9.1.1 This milestone is going to be a formal presentation held during the Final Event in front of a jury from the motorsport and automotive industry.
- F.9.1.2 This presentation is the crowning moment of the MS1 phase and must show to the jurors the process of the project. Focused on the deviations from the original concept to the built prototype and the innovation presented.
- F.9.1.3 The presentation will have a maximum time of 30 minutes. The juries will have the right to ask questions during the presentation.
- F.9.1.4 After the presentation, the jury will have a timeslot for questions in the team box in presence of the prototype.
- F.9.1.5 A maximum of three students shall make the exposition. The rest of Team Members, Team Leader and Team Tutors may stay on these as attendance.
- F.9.1.6 A digital screen with HDMI connection will be provided by the organization for the presentation. The presenting students must carry their own laptop and the corresponding adapters or chargers. No ethernet connection will be granted during the Final Event

## F.9.2 Section 1: Product definition and changes

F.9.2.1 The main objective of this first section is to explain to the jury the product definition and the process of the project. It should be focus in the deviations from the original presented prototype.

## F.9.3 Section 2: Innovation project

F.9.3.1 The main objective of this second section is to expose the innovation project developed by the team during the edition. Expose how did it improve the prototype and how will affect directly to it. Also, explaining the different decisions taken during the development process and the proof of concept that is used in the prototype.

## F.9.4 Maximum scores

F.9.4.1 The maximum score for the 7<sup>th</sup> delivery is **60** points.

F.9.4.2 The maximum score for the first section is **20** points. The different aspects that the jury will take into account will be the following:

- Correct explanation of the start of the project.
- Realistic goals set by the team at the start of the project.
- Good quality of the materials used.
- Ease of explanation.

F.9.4.3 The maximum score for the second section is **40** points, divided into:

- Correct justification of the selected parts to be improved.
- List of parts to be upgraded in the prototype.
- Quality of the materials used in the presentation.
- Subject mastery.

## ARTICLE 11: MOTOSTUDENT ELECTRIC DELIVERIES

### F.11.1 MSE 1<sup>st</sup> delivery: Electric and battery pack scheme

F.11.1.1 | The main objective of this milestone is to review the electrical and battery pack scheme for the prototypes taking part in the MotoStudent Electric category.

F.11.1.2 | This delivery must include:

- All the different wiring of the motorbike
- A general description of the battery pack
- A 3D design of the battery containers
- Type of cells and its basic characteristics
- Mechanical protections of the pack and the cells
- List of electrical components from the pack and the motorbike, including its name and its location (the datasheet is not needed unless the Organization demands it specifically)

F.11.1.3 | The organization reserves the right to demand more information or possible changes to the delivered schematics.

F.11.1.4 | It is highly recommendable to use a unifilar type of schematic in order to represent the whole wiring and connections of the prototype.

F.11.1.5 | The organization will get in contact with the teams in order to give feedback of the delivery within 90 calendar days from the deliverable deadline.

### F.11.2 MSE 2<sup>nd</sup> delivery: Electrical precheck

F.11.2.1 | The main objective of this milestone is to make a beforehand review of the different aspects of the regulation code before the final event and the static scrutineering.

F.11.2.2 | This delivery must review article by article the whole **Section D** of this regulation code and include graphical evidence (like a photography) of the compliance with the article.

F.11.2.3 | The organization reserves the right to demand more information or to make possible changes to the delivery if it deems it necessary.

- F.11.2.4 | The organization will get in contact with the teams in order to give feedback of the delivery within 90 natural days from the deliverable deadline.

## ARTICLE 12: MOTOSTUDENT SPECIAL DELIVERIES

### F.12.1 MSS 1<sup>st</sup> delivery: Team plan video

- F.12.1.1 | The purpose of this delivery is to introduce the team and generate visibility, building a strong identity that can open new doors to collaborations and sponsorships. It's an opportunity to make known who they are, what they do, and how they do it.

- F.12.1.2 | The video should dynamically summarize the team's objectives, structure, and organization and highlight why they are participating in MotoStudent. They can also showcase team members, the work environment, university facilities, daily routines, as well as the motivations, commitments, or passions that drive the team in MotoStudent

- F.12.1.3 | The video must have the following characteristics:
- The video length must be between 60 and 90 seconds.
  - It must be presented in a vertical format.
  - In the first 5 seconds of the video must appear the MotoStudent logo and the team logo.
  - In the last 5 seconds of the video, it must appear the team logo and logos of MEF and TechnoPark with the following text: "Powered by" just above the MEF and TechnoPark logos.
  - Throughout the video, the MotoStudent logo must appear in the upper right corner, and the team logo in the lower left corner.
  - The video must be recorded in English.

The logos and any additional resources will be available in the MotoStudent Platform.

- F.12.1.3 | The video must be posted on the team's Instagram account before the deadline for this delivery, and optionally on other social media platforms, always tagging MotoStudent. Additionally, the link to the post must be attached to the specific Quiz on the MotoStudent Platform.

F.12.1.4 | The assessment of the quality of production, creativity and originality of the content, clarity of the message, and the impact achieved in that publication will be considered in the evaluation of the *MS1 6<sup>th</sup> milestone, Pitch presentation*.

### F.12.2 **MSS 2<sup>nd</sup> delivery: Characteristics page**

F.12.2.1 | Each team must fill all the fields of the **MSS 2<sup>nd</sup> delivery** that can be located in the MotoStudent Platform as a quiz.

F.12.2.3 | The presented **MSS 2<sup>nd</sup> delivery** must comply with the competition regulations.

F.12.2.4 | If the **MSS 2<sup>nd</sup> delivery** provided to the organization deems to be incomplete or infringes the regulation code, a NP will be applied to the *MS1 2<sup>nd</sup> milestone, Product definition*.

F.12.2.5 | Any penalty derived from this delivery (i.e. late submission, no submission, etc), **Characteristics page**, will be applied to the *MS1 2<sup>nd</sup> milestone, Product definition* score.

### F.12.3 **MSS 3<sup>rd</sup> delivery: Product definition video**

F.12.3.1 | In this delivery, the objective is to dynamically present the prototype and its design. It's a unique opportunity to show the world what they have created and how they have achieved it.

F.12.3.2 | The video should highlight the prototype's design and its main features. It can showcase the working process, the prototype's evolution, or the selection of materials. It is essential to present how they would like to introduce their product to the world and what aspects they wish to emphasize about it.

F.12.3.3 | The video must have the following characteristics:

- The video length must be between 60 and 90 seconds.
- It must be presented in a vertical format.
- In the first 5 seconds of the video must appear the MotoStudent logo and the team logo.
- In the last 5 seconds of the video, it must appear the team logo and logos of MEF and TechnoPark with the following text: "Powered by" just above the MEF and TechnoPark logos.

- Throughout the video, the MotoStudent logo must appear in the upper right corner, and the team logo in the lower left corner.
- The video must be recorded in English.

The logos and any additional resources will be available in the MotoStudent Platform.

F.12.3.4 | The video must be posted on the team's Instagram account before the deadline for this delivery, and optionally on other social media platforms, always tagging MotoStudent. Additionally, the link to the post must be attached to the specific Quiz on the MotoStudent Platform.

F.12.3.5 | The assessment of the quality of production, creativity and originality of the content, clarity of the message, and the impact achieved in that publication will be considered in the evaluation of the *MS1 6<sup>th</sup> milestone, Pitch presentation*.

#### **F.12.4 MSS 4<sup>th</sup> delivery: Innovation video**

F.12.4.1 | The purpose of this delivery is to showcase the team's talent through the innovation implemented in the project, through an engaging video.

F.12.4.2 | The video should highlight how they have improved the product, emphasizing the innovations implemented. They can include new methods used, the challenges faced and how they overcame them, as well as the tools used in the innovative process. It is crucial to show the team's creativity and ingenuity in developing innovative solutions.

F.12.4.3 | The video must have the following characteristics:

- The video length must be between 60 and 90 seconds.
- It must be presented in a vertical format.
- In the first 5 seconds of the video must appear the MotoStudent logo and the team logo.
- In the last 5 seconds of the video, it must appear the team logo and logos of MEF and TechnoPark with the following text: "Powered by" just above the MEF and TechnoPark logos.
- Throughout the video, the MotoStudent logo must appear in the upper right corner, and the team logo in the lower left corner.
- The video must be recorded in English.

The logos and any additional resources will be available in the MotoStudent Platform.

F.12.4.4 | The video must be posted on the team's Instagram account before the deadline for this delivery, and optionally on other social media platforms, always tagging MotoStudent. Additionally, the link to the post must be attached to the specific Quiz on the MotoStudent Platform.

F.12.4.5 | The assessment of the quality of production, creativity and originality of the content, clarity of the message, and the impact achieved in that publication will be considered in the evaluation of the *MS1 6<sup>th</sup> milestone, Pitch presentation*.

### **F.12.5 MSS 5<sup>th</sup> delivery: Abstract and Title**

F.12.5.1 | Each team must fill the **MSS 5<sup>th</sup> delivery** in the MotoStudent Platform as a quiz, with their title and a simple abstract for their *MS1 3<sup>rd</sup> milestone, Innovation*.

F.12.5.2 | In case of a team not filling up correctly the quiz, the *MS1 3<sup>rd</sup> milestone, Innovation* will be accounted as NP.

### **F.12.6 MSS 6<sup>th</sup> delivery: Rider declaration**

F.12.6.1 | Each team must submit the **MSS 6<sup>th</sup> delivery** deliverable that can be located in the MotoStudent Platform.

F.12.6.2 | Each rider must include its riding career in the **MSS 6<sup>th</sup> delivery**.

F.12.6.3 | The presented delivery must comply with the regulations of the **Art G.2**.

F.12.6.3 | If the rider career provided to the organization deems to be incomplete or infringes the regulation code, the team must supply the required documentation.

### **F.12.7 MSS 7<sup>th</sup> delivery: Fair play.**

F.12.7.1 | Each team must submit the **MSS 7<sup>th</sup> delivery** that can be located in the MotoStudent Platform.

F.12.7.2 | Each team must nominate another team that has competed with the most integrity, respect and honesty, inside and outside the racetrack and the Final Event. This award has the objective to preserve the fundamental goals of the MotoStudent International Competition and grant a just and fair competition for any of the participant teams.

## F.12.8 MSS 8<sup>th</sup> delivery: Excellence Showcase presentation

F.12.8.1 This delivery objective is to expose, in a 5 minutes presentation in front of a jury and everyone attending at the Awards Ceremony of the MotoStudent International Competition.

This presentation must sum up the whole project, exposing how did the team organize, how did the decision making have been made, the different tests that they have realized, etc. Basically, summarize all the different milestones that have been delivered during the MS1 phase of the MotoStudent International Competition.

F.12.8.2 This presentation shall be delivered with the prototype on stage and with a .pdf presentation that shall be provided to the Organization 2 hours before the ceremony.

F.12.8.3 This milestone is exclusively to the two best teams from each category that achieve the highest sum in the following milestones minus their respectively penalties:

- MS1 6<sup>th</sup> milestone: Pitch presentation (maximum of **80** points).
- MS1 7<sup>th</sup> milestone: Final event presentation (maximum of **60** points).

During the morning before the Awards Ceremony, the Organization will publish the delivery ranking in order to inform to the teams its position and with the aim to increase the competition transparency.

F.12.8.4 The Organization will provide a room with internet connection and a TV with HDMI connection so the teams can develop and practice the presentation.

F.12.8.5 The jury will select the team as winner that answers the following question: ***Why your project is the most excellence?***

In addition, the following criteria will also be taken in account:

- Project objectives and decision making are clear and well defined.
- The presentation gives a clear image about regarding the team and its internal organization.
- Originality.
- Structured presentation.

## ARTICLE 13: MS2 PHASE

### F.13.1 Objectives and procedure

- F.13.1.1 | The dynamic tests consist of a series of exercises prepared to demonstrate and evaluate the behavior and performance of the prototypes.
- F.13.1.2 | Each category will have its own separated score and compete in parallel.
- F.13.1.3 | The tests must be carried out by the rider presented by the team at the Admin Milestone
- F.13.1.4 | The dimensions, speeds, schedules and/or measurements indicated in this article may vary during the Final Event if the organization determines so.
- F.13.1.5 | The Test 1, 2 and 3 may have two rounds, taking the best score of the two as the valid for the team.

### F.13.2 Test 1: Brake

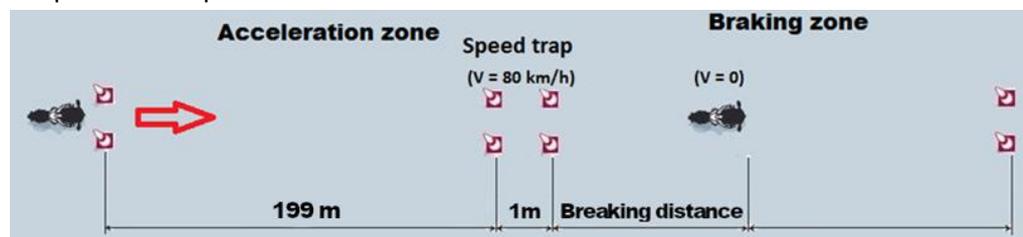
- F.13.2.1 | The brake test is an evaluation of the distance needed to bring the prototype to a complete stop from a minimum speed of 80 km/h.
- F.13.2.2 | The start will be given by a signal of a sport marshal at the starting point.
- F.13.2.3 | The rider will have a maximum time of 10 seconds from the signal to the start of the test.
- F.13.2.4 | The total length of the acceleration straight is 200 m.
- F.13.2.5 | The speed reached at the end of the acceleration straight is measured by the Organization.
- F.13.2.6 | The marshal will measure the distance between the foremost part of the prototype and the speed trap in order to obtain the brake test value.
- F.13.2.7 | If the speed measured by the organization is lower than the minimum value defined in the regulation, the following penalty will be applied to the measured distance:
  - < 80,00 km/h and  $\geq$  79,00 km/h: 4 m.
  - < 79,00 km/h and  $\geq$  78,00 km/h: 6 m.

- < 77,00 km/h and  $\geq$  76,00 km/h: 8 m.
- < 76,00 km/h and  $\geq$  75,00 km/h: 10 m.
- < 75,00 km/h and  $\geq$  74,00 km/h: 12 m.
- < 74,00 km/h and  $\geq$  70,00 km/h: 20 m.

F.13.2.8 | If the speed measured < 70,00 km/h the test results as NC (Not Compliance).

F.13.2.9 | Two photocells will be placed at before the breaking zone, 1 meter apart, in order to record the speed during the test.

F.13.2.10 | Graphical description of the test:



Picture 43 - Graphic description of MS1 Test 1: Brake

F.13.2.11 | The score of the test is assigned according to the classification of the distances obtained (plus the penalties) from lowest to highest distances based on the next criteria:

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	80	18 <sup>th</sup>	33	35 <sup>th</sup>	16
2 <sup>nd</sup>	75	19 <sup>th</sup>	32	36 <sup>th</sup>	15
3 <sup>rd</sup>	70	20 <sup>th</sup>	31	37 <sup>th</sup>	14
4 <sup>th</sup>	65	21 <sup>st</sup>	30	38 <sup>th</sup>	13
5 <sup>th</sup>	61	22 <sup>nd</sup>	29	39 <sup>th</sup>	12
6 <sup>th</sup>	57	23 <sup>rd</sup>	28	40 <sup>th</sup>	11
7 <sup>th</sup>	53	24 <sup>th</sup>	27	41 <sup>st</sup>	10
8 <sup>th</sup>	50	25 <sup>th</sup>	26	42 <sup>nd</sup>	9
9 <sup>th</sup>	47	26 <sup>th</sup>	25	43 <sup>rd</sup>	8
10 <sup>th</sup>	44	27 <sup>th</sup>	24	44 <sup>th</sup>	7
11 <sup>th</sup>	42	28 <sup>th</sup>	23	45 <sup>th</sup>	6
12 <sup>th</sup>	40	29 <sup>th</sup>	22	46 <sup>th</sup>	5
13 <sup>th</sup>	38	30 <sup>th</sup>	21	47 <sup>th</sup>	4
14 <sup>th</sup>	37	31 <sup>st</sup>	20	48 <sup>th</sup>	3
15 <sup>th</sup>	36	32 <sup>nd</sup>	19	49 <sup>th</sup>	2
16 <sup>th</sup>	35	33 <sup>rd</sup>	18	50 <sup>th</sup>	1
17 <sup>th</sup>	34	34 <sup>th</sup>	17	...	1

Table 2 - MS2 Test 1: Brake scores

**F.13.3 Test 2: Gymkhana**

F.13.3.1 | The second test will consist of a small circuit in order to test the agility, the acceleration and maneuverability of the prototypes.

F.13.3.2 | The start will be given by a signal of a sport marshal at the starting point.

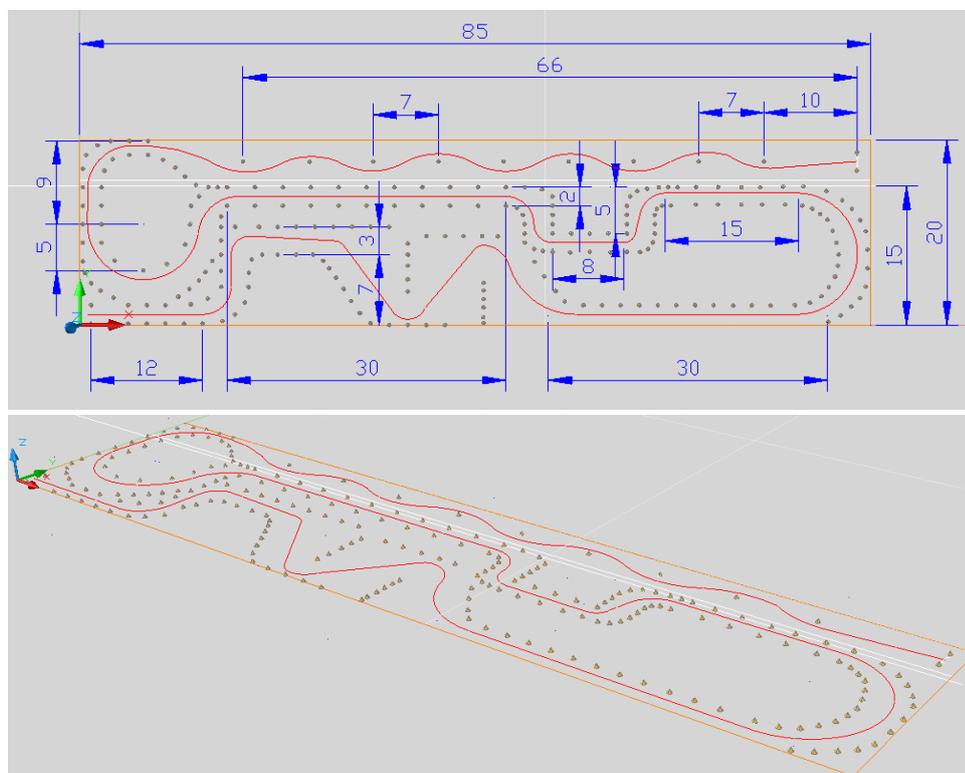
F.13.3.3 | Two photocells will be placed at the start and end of the course in order to record the start and end time for each prototype, being its difference the total time.

F.13.3.4 | The rider will have a maximum time of 10 seconds from the signal to start the test.

F.13.3.5 | If a cone has been moved or pulled by the rider or prototype, it will lead to a 5 s penalty for each cone. If the total number of moved or pulled cones > 5, the test must result as NC.

F.13.3.6 | If the rider or prototype surpasses a cone through the wrong side, a 10 s penalty must be applied by each cone. If the total number of cones is > 3, the test score must result as NC.

F.13.3.7 | Graphic description of the test:



Picture 44 - Graphical description of MS2 Test 2: Gymkhana. Measures indicated in meters (m)

F.13.3.8 The score is assigned according to the classification of the time difference obtained between the start and the end of the test (plus penalties) from lowest to highest based on the next criteria:

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	60	18 <sup>th</sup>	31	35 <sup>th</sup>	14
2 <sup>nd</sup>	55	19 <sup>th</sup>	30	36 <sup>th</sup>	13
3 <sup>rd</sup>	52	20 <sup>th</sup>	29	37 <sup>th</sup>	12
4 <sup>th</sup>	50	21 <sup>st</sup>	28	38 <sup>th</sup>	11
5 <sup>th</sup>	48	22 <sup>nd</sup>	27	39 <sup>th</sup>	10
6 <sup>th</sup>	46	23 <sup>rd</sup>	26	40 <sup>th</sup>	9
7 <sup>th</sup>	44	24 <sup>th</sup>	25	41 <sup>st</sup>	9
8 <sup>th</sup>	42	25 <sup>th</sup>	24	42 <sup>nd</sup>	8
9 <sup>th</sup>	40	26 <sup>th</sup>	23	43 <sup>rd</sup>	8
10 <sup>th</sup>	39	27 <sup>th</sup>	22	44 <sup>th</sup>	7
11 <sup>th</sup>	38	28 <sup>th</sup>	21	45 <sup>th</sup>	6
12 <sup>th</sup>	37	29 <sup>th</sup>	20	46 <sup>th</sup>	5
13 <sup>th</sup>	36	30 <sup>th</sup>	19	47 <sup>th</sup>	4
14 <sup>th</sup>	35	31 <sup>st</sup>	18	48 <sup>th</sup>	3
15 <sup>th</sup>	34	32 <sup>nd</sup>	17	49 <sup>th</sup>	2
16 <sup>th</sup>	33	33 <sup>rd</sup>	16	50 <sup>th</sup>	1
17 <sup>th</sup>	32	34 <sup>th</sup>	15	...	1

Table 3 - MS2 Test 2: Gymkhana scores

### F.13.4 Test 3: Acceleration

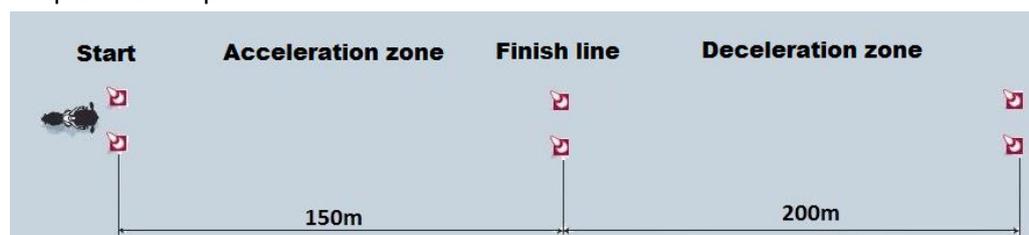
F.13.4.1 The third test will consist of a 150m straight line in order to check the maximum speed at the end.

F.13.4.2 The start will be given by a signal or a sport marshall at the starting point.

F.13.4.3 Two photocells will be placed at the end of the line 1 meter apart in order to record the maximum speed during the test.

F.13.4.4 The rider will have a maximum time of 10 seconds from the signal to start the test.

F.13.4.5 Graphical description of the test:



Picture 45 - Graphical description of MS2 Test 3: Acceleration

F.13.4.6 | The score is assigned according to the classification of the speed obtained by the photocells from lowest to highest based on the next criteria.

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	80	18 <sup>th</sup>	33	35 <sup>th</sup>	16
2 <sup>nd</sup>	75	19 <sup>th</sup>	32	36 <sup>th</sup>	15
3 <sup>rd</sup>	70	20 <sup>th</sup>	31	37 <sup>th</sup>	14
4 <sup>th</sup>	65	21 <sup>st</sup>	30	38 <sup>th</sup>	13
5 <sup>th</sup>	61	22 <sup>nd</sup>	29	39 <sup>th</sup>	12
6 <sup>th</sup>	57	23 <sup>rd</sup>	28	40 <sup>th</sup>	11
7 <sup>th</sup>	53	24 <sup>th</sup>	27	41 <sup>st</sup>	10
8 <sup>th</sup>	50	25 <sup>th</sup>	26	42 <sup>nd</sup>	9
9 <sup>th</sup>	47	26 <sup>th</sup>	25	43 <sup>rd</sup>	8
10 <sup>th</sup>	44	27 <sup>th</sup>	24	44 <sup>th</sup>	7
11 <sup>th</sup>	42	28 <sup>th</sup>	23	45 <sup>th</sup>	6
12 <sup>th</sup>	40	29 <sup>th</sup>	22	46 <sup>th</sup>	5
13 <sup>th</sup>	38	30 <sup>th</sup>	21	47 <sup>th</sup>	4
14 <sup>th</sup>	37	31 <sup>st</sup>	20	48 <sup>th</sup>	3
15 <sup>th</sup>	36	32 <sup>nd</sup>	19	49 <sup>th</sup>	2
16 <sup>th</sup>	35	33 <sup>rd</sup>	18	50 <sup>th</sup>	1
17 <sup>th</sup>	34	34 <sup>th</sup>	17	...	1

Table 4 - MS2 Test 3: Acceleration test score

#### F.13.5 Test 4: $V_{max}$

F.13.5.1 | This fourth test consist in recording the speed at the speed trap during the Free Practice 2 session.

F.13.5.2 | Any passage through the speed trap (including laps without passing through the finish line) will count for the test without exceeding track limits.

F.13.5.3 | The maximum speed recorded by each team will be used for calculating the test score.

F.13.5.4 | At the end of the test, the final score will be assigned according to the classification of maximum speeds (from highest to lowest) for each team, based on the next criteria

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	30	18 <sup>th</sup>	10	35 <sup>th</sup>	7
2 <sup>nd</sup>	28	19 <sup>th</sup>	10	36 <sup>th</sup>	6
3 <sup>rd</sup>	26	20 <sup>th</sup>	10	37 <sup>th</sup>	6
4 <sup>th</sup>	24	21 <sup>st</sup>	9	38 <sup>th</sup>	6
5 <sup>th</sup>	22	22 <sup>nd</sup>	9	39 <sup>th</sup>	6
6 <sup>th</sup>	20	23 <sup>rd</sup>	9	40 <sup>th</sup>	6
7 <sup>th</sup>	19	24 <sup>th</sup>	9	41 <sup>st</sup>	5
8 <sup>th</sup>	18	25 <sup>th</sup>	9	42 <sup>nd</sup>	5
9 <sup>th</sup>	17	26 <sup>th</sup>	8	43 <sup>rd</sup>	5

10 <sup>th</sup>	16	27 <sup>th</sup>	8	44 <sup>th</sup>	5
11 <sup>th</sup>	15	28 <sup>th</sup>	8	45 <sup>th</sup>	5
12 <sup>th</sup>	14	29 <sup>th</sup>	8	46 <sup>th</sup>	4
13 <sup>th</sup>	13	30 <sup>th</sup>	8	47 <sup>th</sup>	4
14 <sup>th</sup>	12	31 <sup>st</sup>	7	48 <sup>th</sup>	4
15 <sup>th</sup>	11	32 <sup>nd</sup>	7	49 <sup>th</sup>	4
16 <sup>th</sup>	10	33 <sup>rd</sup>	7	50 <sup>th</sup>	4
17 <sup>th</sup>	10	34 <sup>th</sup>	7	...	1

Table 5 - MS2 Test 4:  $V_{max}$  scores

### F.13.6 Test 5: Regularity

F.13.6.1 The fifth test consist in achieving the greatest regularity of time in the sector 2 of the Speed Circuit, taking as reference 3 laps in the Warm-up.

F.13.6.2 Any time measurement of the sector 2 during the test (including laps without passing through the finish line) will count for the test.

F.13.6.3 The regularity time for a given team is obtained by sorting by time the sector 2 times and calculating the minimum difference from the  $n^{\text{th}}$  and the  $n^{\text{th}}+2$  for  $n = 1$  to  $n = m - 2$ , where  $m$  is equal to the total number of recorded passes.

$$\min (|x_n - x_{n+2}|)$$

F.13.6.4 The final score of the test will be assigned according to the classification of the final time differences obtained by each team (from lowest to highest time) based on the following criteria:

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	30	18 <sup>th</sup>	10	35 <sup>th</sup>	7
2 <sup>nd</sup>	28	19 <sup>th</sup>	10	36 <sup>th</sup>	6
3 <sup>rd</sup>	26	20 <sup>th</sup>	10	37 <sup>th</sup>	6
4 <sup>th</sup>	24	21 <sup>st</sup>	9	38 <sup>th</sup>	6
5 <sup>th</sup>	22	22 <sup>nd</sup>	9	39 <sup>th</sup>	6
6 <sup>th</sup>	20	23 <sup>rd</sup>	9	40 <sup>th</sup>	6
7 <sup>th</sup>	19	24 <sup>th</sup>	9	41 <sup>st</sup>	5
8 <sup>th</sup>	18	25 <sup>th</sup>	9	42 <sup>nd</sup>	5
9 <sup>th</sup>	17	26 <sup>th</sup>	8	43 <sup>rd</sup>	5
10 <sup>th</sup>	16	27 <sup>th</sup>	8	44 <sup>th</sup>	5
11 <sup>th</sup>	15	28 <sup>th</sup>	8	45 <sup>th</sup>	5
12 <sup>th</sup>	14	29 <sup>th</sup>	8	46 <sup>th</sup>	4
13 <sup>th</sup>	13	30 <sup>th</sup>	8	47 <sup>th</sup>	4
14 <sup>th</sup>	12	31 <sup>st</sup>	7	48 <sup>th</sup>	4
15 <sup>th</sup>	11	32 <sup>nd</sup>	7	49 <sup>th</sup>	4
16 <sup>th</sup>	10	33 <sup>rd</sup>	7	50 <sup>th</sup>	4
17 <sup>th</sup>	10	34 <sup>th</sup>	7	...	1

Table 6 - MS2 Test 5: Regularity scores

### F.13.7 Test 6: Pole position

F.13.7.1 | The test consists in obtaining the fastest lap time on the racetrack during the Qualifying session.

F.13.7.2 | The test score will be awarded according to the classification of the lap times obtained (from lowest to highest time) based on the following criteria:

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	40	18 <sup>th</sup>	13	35 <sup>th</sup>	7
2 <sup>nd</sup>	36	19 <sup>th</sup>	13	36 <sup>th</sup>	6
3 <sup>rd</sup>	34	20 <sup>th</sup>	12	37 <sup>th</sup>	6
4 <sup>th</sup>	32	21 <sup>st</sup>	12	38 <sup>th</sup>	6
5 <sup>th</sup>	30	22 <sup>nd</sup>	11	39 <sup>th</sup>	5
6 <sup>th</sup>	28	23 <sup>rd</sup>	11	40 <sup>th</sup>	5
7 <sup>th</sup>	26	24 <sup>th</sup>	10	41 <sup>st</sup>	5
8 <sup>th</sup>	24	25 <sup>th</sup>	10	42 <sup>nd</sup>	4
9 <sup>th</sup>	22	26 <sup>th</sup>	10	43 <sup>rd</sup>	4
10 <sup>th</sup>	20	27 <sup>th</sup>	9	44 <sup>th</sup>	4
11 <sup>th</sup>	19	28 <sup>th</sup>	9	45 <sup>th</sup>	3
12 <sup>th</sup>	18	29 <sup>th</sup>	9	46 <sup>th</sup>	3
13 <sup>th</sup>	17	30 <sup>th</sup>	8	47 <sup>th</sup>	3
14 <sup>th</sup>	16	31 <sup>st</sup>	8	48 <sup>th</sup>	2
15 <sup>th</sup>	15	32 <sup>nd</sup>	8	49 <sup>th</sup>	2
16 <sup>th</sup>	14	33 <sup>rd</sup>	7	50 <sup>th</sup>	2
17 <sup>th</sup>	14	34 <sup>th</sup>	7	...	1

Table 7 - MS2 Test 6: Pole position scores

### F.13.8 Test 7: Best Race Lap

F.13.8.1 | The test consists in obtaining the fastest lap time during the Play-Off race and the Final race.

F.13.8.2 | Those teams taking part in both Play-off and Final race, the best time recorded must be from the Final race.

F.13.8.3 | The test score is assigned according to the classification of the best lap times obtained (from lowest to highest time) based on the next criteria:

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	30	16 <sup>th</sup>	10	31 <sup>st</sup>	5
2 <sup>nd</sup>	28	17 <sup>th</sup>	10	32 <sup>nd</sup>	5
3 <sup>rd</sup>	26	18 <sup>th</sup>	9	33 <sup>rd</sup>	4
4 <sup>th</sup>	24	19 <sup>th</sup>	9	34 <sup>th</sup>	4
5 <sup>th</sup>	22	20 <sup>th</sup>	9	35 <sup>th</sup>	4

6 <sup>th</sup>	20	21 <sup>st</sup>	8	36 <sup>th</sup>	3
7 <sup>th</sup>	19	22 <sup>nd</sup>	8	37 <sup>th</sup>	3
8 <sup>th</sup>	18	23 <sup>rd</sup>	8	38 <sup>th</sup>	3
9 <sup>th</sup>	17	24 <sup>th</sup>	7	39 <sup>th</sup>	2
10 <sup>th</sup>	16	25 <sup>th</sup>	7	40 <sup>th</sup>	2
11 <sup>th</sup>	15	26 <sup>th</sup>	7	41 <sup>st</sup>	2
12 <sup>th</sup>	14	27 <sup>th</sup>	6	42 <sup>nd</sup>	1
13 <sup>th</sup>	13	28 <sup>th</sup>	6	43 <sup>rd</sup>	1
14 <sup>th</sup>	12	29 <sup>th</sup>	6	44 <sup>th</sup>	1
15 <sup>th</sup>	11	30 <sup>th</sup>	5	...	0

Table 8 - MS2 Test 7: Best Race Lap scores

### F.13.9 Test 8: Race result

F.13.9.1 | The final race result from both Play-Off and Final races, being the first teams the ones from the Final Race, and the following ones the Play-Off race teams (except those teams promoted to the Final race).

F.13.9.2 | The score for the race result is based on the following criteria:

Rank	Score	Rank	Score	Rank	Score
1 <sup>st</sup>	150	16 <sup>th</sup>	65	31 <sup>st</sup>	20
2 <sup>nd</sup>	140	17 <sup>th</sup>	60	32 <sup>nd</sup>	18
3 <sup>rd</sup>	130	18 <sup>th</sup>	55	33 <sup>rd</sup>	16
4 <sup>th</sup>	125	19 <sup>th</sup>	50	34 <sup>th</sup>	14
5 <sup>th</sup>	120	20 <sup>th</sup>	45	35 <sup>th</sup>	12
6 <sup>th</sup>	115	21 <sup>st</sup>	40	36 <sup>th</sup>	10
7 <sup>th</sup>	110	22 <sup>nd</sup>	38	37 <sup>th</sup>	8
8 <sup>th</sup>	105	23 <sup>rd</sup>	36	38 <sup>th</sup>	7
9 <sup>th</sup>	100	24 <sup>th</sup>	34	39 <sup>th</sup>	6
10 <sup>th</sup>	95	25 <sup>th</sup>	32	40 <sup>th</sup>	5
11 <sup>th</sup>	90	26 <sup>th</sup>	30	41 <sup>st</sup>	4
12 <sup>th</sup>	85	27 <sup>th</sup>	28	42 <sup>nd</sup>	3
13 <sup>th</sup>	80	28 <sup>th</sup>	26	43 <sup>rd</sup>	2
14 <sup>th</sup>	75	29 <sup>th</sup>	24	44 <sup>th</sup>	1
15 <sup>th</sup>	70	30 <sup>th</sup>	22	...	0

Table 9 - MS2 Test 8: Race result scores

## ARTICLE 14: MOTOSTUDENT AWARDS

### F.14.1 MS1 related awards

F.14.1.1 | The **Best MS1** award will be given to the team, from each category, that achieves the best score (maximum of **600** points), summing their score in the following milestones, minus their respective penalties:

- MS1 1<sup>st</sup> milestone: Team plan (maximum of **75** points).
- MS1 2<sup>nd</sup> milestone: Product definition (maximum of **100** points).
- MS1 3<sup>rd</sup> milestone: Innovation (maximum of **150** points).
- MS1 4<sup>th</sup> milestone: Prototype CAD and drawings (maximum of **60** points).
- MS1 5<sup>th</sup> milestone: Economical plan (maximum of **75** points).
- MS1 6<sup>th</sup> milestone: Pitch presentation (maximum of **80** points).
- MS1 7<sup>th</sup> milestone: Final event presentation (maximum of **60** points).

F.14.1.2 The **Best Design** award will be given to the team, from each category, that achieves the best score (maximum of **180** points), summing their score in the following milestones, minus their respective penalties:

- MS1 2<sup>nd</sup> milestone: Product definition (maximum of **100** points).
- MS1 4<sup>th</sup> milestone: Prototype CAD and drawings (maximum of **60** points)
- MS1 7<sup>th</sup> milestone: Final event presentation, section 1 (maximum of **20** points)

F.14.1.3 The **Best Innovation** award will be given to the team, from each category, that achieves the best score (maximum of **190** points), summing their score in the following milestones, minus their respective penalties:

- MS1 3<sup>rd</sup> milestone: Innovation (maximum of **150** points).
- MS1 7<sup>th</sup> milestone: Final event presentation, section 2 (maximum of **40** points)

F.14.1.4 In case of a tie in any of the mentioned awards, the Organization will apply the tie-breaker methodology that it considers and justifies.

F.14.1.5 The tie-breaker is applied only to the awarded teams. The score classification is not affected by the tie-breaker decision.

F.14.1.6 In order to give a more visual representation of the MS1 awards and its scores, the teams can use the following table:

MS1 related Awards		Milestones						
		1st	2nd	3rd	4th	5th	6th	7th
Best MS1 (out of 600 points)	Best Design (out of 180 points)		100		60			20
	Best Innovation (out of 190 points)			150				40
		75				75	80	

Table 10 - MS1 related awards

## F.14.2 MS2 related awards

F.14.2.1 The total score for the MS2 phase is obtained by adding up all the scores from the following test for each team:

- Test 1: Brake.
- Test 2: Gymkhana.
- Test 3: Acceleration.
- Test 4:  $V_{max}$ .
- Test 5: Regularity.
- Test 6: Pole position.
- Test 7: Best race lap.
- Test 8: Race result.

F.14.2.2 The **MS2** award is given to the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> teams with the maximum MS2 score for each category.

F.14.2.3 If for reasons outside the Organization, it should cancel one or more of the scoring tests, the Organization Sports Committee reserves the right to change the assignment of scores, with previous notification to the participant teams.

F.14.2.4 In case of a tie in the **Best MS2** award, the deciding order is based on the following scores until a tie-breaker is found:

- **Best MS1** award score

F.14.2.5 | The tie-breaker is applied only to the awarded teams. The score classification is not affected by the tie-breaker decision.

### F.14.3 MS awards

F.14.3.1 | The **Best Motostudent** award is given to the team, from each category, that achieves the best score (summing their scores and minus their penalties) in the following awards:

- **Best MS1** award score.
- **Best MS2** award score.

F.14.3.2 | The **Best Rookie** award is given to the rookie team (representing a campus not registered in any previous edition of that MotoStudent Category), from each category, that achieves the best score (summing their scores and minus their penalties) in the following awards:

- **Best MS1** award score.
- **Best MS2** award score.

F.14.3.3 | The **MotoStudent Fair Play** award is given to the team that achieves the most votes in the following delivery:

- **MSS 7<sup>th</sup> delivery, Fair Play**

It will not have any impact in other award or score.

F.14.3.4 | The **Excellence Showcase** award is given to the team that the jury selects as the best project in the **MSS 8<sup>th</sup> delivery: Excellence Showcase**.

This award will only be given to a team, from the four that have been selected for the presentation during the Awards Ceremony, that a selected jury declares as winner. It will not have any impact in other award or score.

F.14.3.5 | In case of a tie in the **Best Motostudent** award, the deciding order is based on the following scores until a tie-breaker is found:

- **Best MS1** award score.

F.14.3.6 | In case of a tie in the **Best Rookie** award, the deciding order is based on the following scores until a tie-breaker is found:

- **Best MS1** award score.

F.14.3.7 | In case of a tie in the **MotoStudent Fair Play** award or in the **Excellence Showcase** award, the Organization will apply the tie-breaker methodology that it considers and justifies.

F.14.3.8 | In case of a tie still remaining after applying their tie-breaker, the jury will select the awarded team.

F.14.3.9 | The tie-breaker is applied only to the awarded teams. The score classification is not affected by the tie-breaker decision.

#### **F.14.4 General considerations**

F.14.4.1 | The economic and material value of each award will be published by the Organization to all registered teams.

F.14.4.2 | No award can be shared or transferred to other team.

F.14.4.3 | The Organization reserves the right to add new awards through the development of the MotoStudent International Competition

F.14.4.4 | In the event that a test is declared null or canceled, the organization reserves the right to declare a new points distribution for that test.

### **ARTICLE 15: DELIVERABLES AND MILESTONES PENALTIES**

#### **F.15.1 MotoStudent MS1 milestones specific penalties**

F.15.1.1 | Each delivery must be done in a digital format (except the Finals Presentation) via the MotoStudent Platform.

F.15.1.2 | If a delivery author is not registered as an official Team Member, that delivery score will result in NC.

F.15.1.3 | If a delivery is presented in a language different from the official competition languages, that delivery score results in NC.

F.15.1.4 | If a deliverable does not include a cover or index page, that delivery score must be penalized with a MP.

- F.15.1.5 | Each page of the deliverable must be numbered except the covers and/or index that may not feature the page number but still count for the page limit. The infraction of this article must be penalized with a MP in the given delivery score.
- F.15.1.6 | No extra annexes or documentation can be delivered except those defined in the regulation code. The infraction of this article must be penalized with a MP in the given delivery score.
- F.15.1.7 | The failure of compliance from any the articles defined in the Section B, C and/or D will be registered as a NC score.
- F.15.1.8 | Any deliverable cannot exceed 50 pages long (including cover and index page). Each extra page will count as a MP.
- F.15.1.9 | Any extra page from a deliverable will not be taken into account into its correction. Therefore, its content will not be corrected.
- F.15.1.10 | The format used must be the following:
- Indentation:
    - Left: 3 cm
    - Right: 3 cm
    - Upper: 2,5 cm
    - Lower: 2,5 cm
  - Line spaced: 1,5
  - Paragraphs spacing:
    - Previous: 0 points
    - Below: 6 points
  - Font:
    - Type: Arial
    - Size: 11 (except title, sub-titles and tables)

- F.15.1.11 | The organization reserves the right to not accept any delivery submitted 10 days after the deadline (240 hours later), resulting in a NP in that delivery score.
- F.15.1.12 | Submission of any milestone within 10 days after its deadline (240 hours later), will result as a MP penalty in that delivery score.
- F.15.1.13 | The minimum possible score of a deliverable is 0 points.

**F.15.2 MotoStudent Electric deliveries specific penalties**

- F.15.2.1 | Submission of any documentation within 10 days after its deadline (240 hours later) will result as a MP equally distributed for each MS1 delivery score.
- F.15.2.2 | Failure to submit or submission later than 10 days after the deadline (240 hours later) will result as a SP equally distributed for each MS1 delivery score. In this case, the team must inform the organization via ticket in order to review the delivery.
- F.15.2.3 | The organization reserves the right to not accept any delivery submitted 10 days after the deadline (240 hours later), resulting in a NP in that delivery.
- F.15.2.4 | In case of a NP score in any of the MSE deliveries before the Final Event, the team shall contact the organization. The organization reserves the right to not scrutineer any bike that has a score a NP on any MSE delivery.

**F.15.3 MotoStudent Special deliveries specific penalties**

- F.15.3.1 | Submission of any documentation within 10 days after its deadline (240 hours later) will result as a MP distributed for each MS1 delivery score (5 deliveries in total).
- F.15.3.2 | Failure to submit or submission later than 10 natural days after the deadline (240 hours later) will result as a SP distributed for each MS1 delivery score (5 deliveries in total). In this case, the team must inform the organization via ticket in order to review the delivery.
- F.15.3.3 | The organization reserves the right to not accept any delivery submitted 10 days after the deadline (240 hours later).



# SECTION G

## SPORTING REGULATIONS FOR MS2 PHASE

## ARTICLE 1: GOALS AND CONDITIONS

### G.1.1 MS2 definition.

G.1.1.1 | The MS2 Phase consists of a series of tests aimed at assessing the dynamic behavior and the performance of the manufactured prototype.

### G.1.2 Requirements

G.1.2.1 | To take part in MS2 Phase, the Organization imposes a series of requirements indicated below.

G.1.2.2 | The prototypes must have passed the Scrutineering (Section E) to participate in the MS2 Phase and must be presented in suitable conditions to take part in the dynamic tests. The Technical Staff of the Organization can check the conditions of the prototypes at any times.

### G.1.3 MS2 Sports Committee

G.1.3.1 | The MS2 Phase will be controlled and managed by the MS2 Sports Committee, which will be formed, at least, by the following official positions:

- Competition General Manager
- Competition Sport Director
- Race Director
- Race Director Assistant
- Sporting Jury (Officials' coordinators)
- Timekeeping Director
- Competition Technical Director
- Chief Scrutineer

## ARTICLE 2: RIDER

### G.2.1 Rider definition

G.2.1.1 | Each team must nominate a rider who will be in charge of riding the prototype during the MS2 Phase tests. In order to equalize advantages between teams, and since the goal of MotoStudent is to evaluate the prototype and the engineering work done by the teams, the Organization has taken the following considerations about the chosen rider:

## G.2.2 Rider eligibility

G.2.2.1 | The rider is considered as a Team Member from the moment he/she is approved by the Organization, and he/she shall have the same rights and obligations as any other Team Member, except for the academic requirements, which are not applicable to him/her.

G.2.2.2 | The rider does not need to pay any entry fee for the Competition.

G.2.2.3 | The rider must be 18 years or older at the day of start of the 2025 Final Event.

G.2.2.4 | The participation of riders who have raced since 2015 (included) in any Circuit Racing organized by FIM international competition, FIM Europe, FIM Asia, FIM North America, FIM Latin America, Fim Africa, FIM Oceania, or any **main National Championship** is not allowed.

In this Article is included any rider who has participated as a Wild Card, or replacement rider one event or more.

To clarify, the participation in previous editions of MotoStudent is excepted from this article.

G.2.2.5 | A student can federate or be federated, and participate as a rider. However, if he/she is not registered as a Team Member he/she only will be able to ride the prototype.

G.2.2.6 | Each rider will be enrolled in a specific team, and must only participate with that team in the Category where he is exclusively registered. The same rider cannot be shared between different teams, even those that represent the same university, even if they participate in different categories.

G.2.2.7 | The rider is obliged to attend the briefing sessions prior to the tests of the MS2 Phase, as well as to meet with the Organization if required.

G.2.2.8 | In case of retirement of the rider during the Final Event (either by medical leave or by another force majeure) it will not be possible to assign a substitute rider to complete the MS2 Phase.

### G.2.3 Rider Federative requirements

G.2.3.1 The rider must prove to be federated in order to take part in the Final Event. To do so, he/she must be covered by a Federative License of an Official Motorcycling Federation that allows its participation in a FIM International Competition such as MotoStudent. Moto track day insurances or other federation licenses that do not cover the characteristics of International FIM Competition will not be valid for participation in MotoStudent.

G.2.3.2 Riders participating in MotoStudent must comply the following documentation\*:

- RFME:
  - Homologated RFME license
  - Or
  - One Event homologated RFME License
  
- FIM
  - FIM International Racing Meetings Annual license.
  - Or
  - FIM International Racing Meetings- One event license.
  - Or
  - FIM Superbike/Supersport world championship license.
  - Or
  - FIM World Endurance Championship.
  
- Others:
  - **\*\*For FIM Europe Countries only\*\***: National license + Start Permission.

\* These federative requirements may vary according to the conditions imposed by the motorcycle federations involved (FIM, RFME and FARAM) for the 2025 season.

G.2.3.3 Teams can process temporary licenses for their riders online through any of the following federations:

- Aragonese Motorcycling Federation ([www.faram.es](http://www.faram.es)).
- Royal Spanish Motorcycling Federation ([www.rfme.com](http://www.rfme.com)).

## **G.2.4 Communication with the rider**

- G.2.4.1 | Radio or any other communication between the team and the rider during the MS2 Phase tests is forbidden.
- G.2.4.2 | The communication between the team and the rider is only allowed by means of a board shown on the Pit Wall and only during the Free Practice, Warm Up, Qualifying and Race sessions.
- G.2.4.3 | The information board must be light, with a maximum size of 1m in width and 1.5m in height.
- G.2.4.4 | The information board must be shown by only one Team Member, who must hold the board firmly in order to avoid the board from crashing onto the track.
- G.2.4.5 | The information board can only be shown when the rider passes the Finish Straight, and afterwards it must be stored in the pit lane wall, never on the track surface.

## **G.2.5 Rider replacement**

- G.2.5.1 | A replacement rider needs to be authorized by the Organization. Feasible causes for a rider replacement are, among others, the following:
- Main rider injury.
  - Main rider not available during the Final Event due to schedule calendar modifications.
- G.2.5.2 | Rider replacement will carry an administrative fee.
- G.2.5.3 | Rider replacement during the Final Event will carry a **double administrative fee**.

## **ARTICLE 3: SPORT BEHAVIOUR**

### **G.3.1 Weather conditions**

- G.3.1.1 | In case of rain the Organization may establish two different rain levels:
- Moderate.

- Intense.

- G.3.1.2 | If the Organization establishes "moderate" rain: both MotoStudent Petrol and MotoStudent Electric Categories teams will be able to carry out the MS2 Phase tests, but it may become advisable to use wet weather tires.
- G.3.1.3 | If the Organization establishes "intense" rain: it will not be possible to carry out the MS2 Phase tests for any category and all prototypes that are outside their respective Box must return to it immediately.
- G.3.1.4 | In case of "intense" rain, the Organization will decide and notify the participants if a test is cancelled or postponed.
- G.3.1.5 | For any other situation or unforeseen weather, the MS2 Sport Committee will decide and announce if there is any postponement or cancellation.
- G.3.1.6 | The Organization reserves the right to modify schedules and even assessment methods due to weather unforeseen events.

### **G.3.2 Access to the track**

- G.3.2.1 | Prototypes must access to the track through the exits enabled by the Organization for each test.

### **G.3.3 Behavior on the track:**

- G.3.3.1 | Any manoeuvre of a rider in the opposite direction of the race is strictly forbidden.
- G.3.3.2 | In the event of an accident or breakdown, the rider must immediately take his prototype **off-track**, in a place where it does not represent any danger to the normal development of the Competition and always out of the path of the rest of the riders.
- G.3.3.3 | On the track, it is forbidden for anyone to approach a prototype stopped at the circuit, with the exception of the rider himself, the Race Director, his deputies, the marshals or Technical Staff.

### **G.3.4 Behavior at the Pit Lane**

- G.3.4.1 | The speed limit throughout the Pit Lane is set up to 60kmph.

- G.3.4.2 | During the development of the competition, only people with the proper accreditation may be in the Pit Lane. The Organization will be able to evict from these zones all those persons whose stay is not duly justified.
- G.3.4.3 | In case of oil or any other liquid spillage from a prototype in the Pit Lane soil (work zone), it will not be allowed to start up that prototype before the affected area and prototype are completely cleaned.
- G.3.4.4 | For Petrol Category, to start the engine up and get to the track, in case the automatic start device of the engine does not work, two people may help the rider pushing the prototype up to the Pit Lane exit. Additional batteries are not allowed to start the prototype.
- G.3.4.5 | If a rider going out from his/her Box, has a problem in the prototype before the exit of the Pit Lane, can return to the Box with the engine/motor off through the work zone and accompanied by a Pit Lane marshal.
- G.3.4.6 | During pit stops only registered members can manipulate the prototype in pit lane. Failure to comply with this rule may result in the exclusion of the team.
- G.3.4.7 | During pit stops a maximum of 5 people (rider included) may manipulate the prototype. Any contact with the prototype will be considered as manipulation (even if the rider stays on it, although he/she does not intervene).
- G.3.4.8 | If the work is done inside the Box, the number of registered Team Members working on the prototype is not limited. **During the race sessions, introducing the prototype inside the Box may mean the exclusion of the team from that session,** (See Article G.6.2.1(17) and G.6.2.2(17)).
- G.3.4.9 | Oil or other liquids exchange and cleaning must be done over a recipient and inside the Box. After this operation the team must ensure that the area remains perfectly clean.
- G.3.4.10 | It is forbidden to stop the prototype at the fast lane of the Pit Lane (from the red line on the floor to the Pit Wall).
- G.3.4.11 | It is forbidden to smoke, drink, eat, use bicycles, use electric scooters or use any other kind of vehicle on the Pit Lane.
- G.3.4.12 | The use of chairs or tables is not allowed on the Pit Lane.

### **G.3.5 Signals with flags**

G.3.5.1 | The following flag code will be used to alert the riders during the course of the MS2 Phase tests:

- Red flag: Waved at each flag marshal post. Means the interruption of the session.
- Black flag: Waved at each flag marshal post together with the rider's number. The rider must stop at the pits at the end of the current lap.
- Black flag with orange disk: Waved at each flag marshal post together with the rider's number. This flag informs the rider that his prototype has mechanical problems likely to endanger himself or others, and that he must **immediately** leave the track.
- Yellow flag: imminent hazard onto track. Rider needs to proceed with caution and it is forbidden to overtake.
  - 1 flag: hazard out of the track.
  - 2 flags: hazard on the track.
- White flag with a diagonal red cross: rain drops in that section of the track.
- Yellow and red striped flag: The adhesion on this section of the track could be affected by any reason other than rain, giving unexpected surface conditions.
- Green Flag: track is clear. End of the overtaking prohibition.
- Blue Flag: shown to a slow rider who is going to be overtaken by a faster one/s. The slow rider must give way to the faster ones.
- Chequered Black/White flag: waved at the finish line to indicate the finish of a Practice session or a race.
- Chequered Black / White and blue flag: Chequered flag waved together with the blue flag at the finish line when a rider(s) precedes closely the leader during the final lap before the finish line (See Article G.6.4.1).

G.3.5.2 | Any infraction or ignorance of the signals may be penalized.

### G.3.6 Regulations priority order

- G.3.6.1 | Any situation or infraction not contemplated in the MotoStudent Regulations, will be ruled by the ESBK Sporting Regulations 2025, and if not contemplated there, will be ruled by the RFME Sporting Regulations of 2025 speed competitions.

Current RFME ESBK Sporting Regulations can be found on the following link:

<https://rfme.com/campeonatos/campeonato-de-espana-de-superbike/>

Current RFME Sporting Regulations can be found on the following link:

<https://rfme.com/rfme/estatutos-y-codigos-rfme/>

#### **ARTICLE 4: PRACTICE SESSIONS (WARM-UP INCLUSIVE)**

##### **G.4.1 Practice session track**

- G.4.1.1 | Practice sessions will be held in the FIM Grand Prix International layout of MotorLand Aragón, with a length of 5.077,65m. Such tracing is represented in Annex 2 of Section J of these Regulations.

##### **G.4.2 Development of the sessions**

- G.4.2.1 | Riders will commence practice from the pit lane when the green light is displayed at the exit of the pit lane.

- G.4.2.2 | The duration of practice will commence from the illumination of the pit exit's green light. A visible board or count-down will be shown in the pit lane to indicate the minutes of practice remaining.

- G.4.2.3 | The end of the practice will be indicated by the waving of one or two chequered flags, at which time the pit exit will be closed. A rider's time will continue to be recorded until he passes the official chequered flag at the finish line after the allotted time has elapsed. After the chequered flags riders may complete the lap to the pit entry.

- G.4.2.4 | If a practice is interrupted due to an incident or any other reason, then a red flag will be waved at the start line and at all marshals' posts. All riders must return slowly to the pit lane.

When a practice is restarted, the time remaining will be that shown on the monitors of the official timekeepers and on the count-down device in the pit lane, at the moment the red flags were displayed.

- G.4.2.5 | In case the maximum number of prototypes capable of competing in any of the Categories exceeds the maximum allowed limit of prototypes on the track, the

Organization will establish two groups for the performance of the Practice sessions.

#### **G.4.3 Number and duration of Qualifying/Practices sessions for each Category**

G.4.3.1 | Two **Free Practice** session of **20 minutes** for each Category.

G.4.3.2 | One **Qualifying** session of **20 minutes** for each Category.

G.4.3.3 | One **Warm-Up** session of **15 minutes** for each Category.

#### **G.4.4 Lap Time**

G.4.4.1 | All laps of the riders will be timed.

G.4.4.2 | The lap time is the subtraction of the time between two consecutive crossings of the plane of the finish line indicated by the line painted on the track.

#### **G.4.5 Qualifying session results**

G.4.5.1 | The results will be based on the fastest time recorded by the riders in the qualifying practice.

G.4.5.2 | In case the Qualifying session have been cancelled, the results will be based on the fastest time recorded by the riders in Free Practice session.

G.4.5.3 | In the event of a tie, riders' second and subsequent best times will be taken into account.

G.4.5.4 | The results of the Qualifying session will be finalized 30 minutes after the publication of the Qualifying session results for that category. After this time the results are final and are not subject to protest or appeal and will not be revised for any infringements discovered by or reported to the Race Direction or to the MotoStudent Organization after this time. Play Off Race grid will be published according to those results.

#### **G.4.6 Qualification for the Final Race**

G.4.6.1 | Direct Qualification:

- Based on Qualifying session results, the fastest half of the riders authorized to take part in the Qualifying practice, rounded up to the nearest whole number, will promote directly to Final Race. Riders on the authorized list that have not performed a lap during the Qualifying session will also be taken into account.

**G.4.6.2** Promotion to the Final Race from the Play Off Race:

- All riders authorized to take part in the Qualifying practice and not promoted directly to the Final Race (G.4.5.1) will take part in the Play Off Race.
- 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> classified in Play-Off Race will also progress to the Final Race.
- If any Team officially abandon, from the final results of the Qualifying session to the publication of the Final Race Grid, next classified on the Play Off Race will promote to fill the Final Race Grid.

**G.4.6.3** To qualify for the Final Race, only if the Play Off Race is cancelled, the rider must achieve a lap time at least equal to 112% of the time recorded by the fastest rider in the Qualifying session.

**G.4.6.4** The Organization reserves the right not to admit teams that are considered as a safety risk for the race due to issues such as lap times or top speed.

**G.4.7 MS2 test developed during sessions**

**G.4.7.1** Test 4 Top Speed will be developed during the second Free Practice session.

**G.4.7.2** Test 6 Pole Position will be developed during the Qualifying session.

**G.4.7.3** Test 5 Regularity will be developed during the Warm-Up session.

**G.4.7.4** Test 7 Best Race Lap and Test 8 Race result will be developed during race sessions.

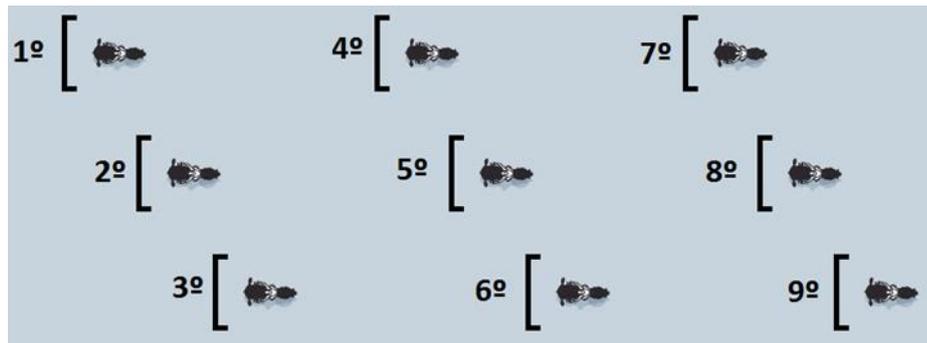
**ARTICLE 5: GRID POSITIONS**

**G.5.1 Grid**

**G.5.1.1** The starting grid will be arranged in the 3-3-3-3 configuration “in echelon”.

**G.5.1.2** Each line will be offset.

**G.5.1.3** There will be a distance of 9 metres between each row.



Picture 46 - Starting grid positions

## G.5.2 Grid Allocation

### G.5.2.1 Play Off Race

Grid positions will be determined by the fastest lap time recorded by each rider in the Qualifying session as follows:

- Based on the Qualifying session times (See Article G.4.6), Teams that don't promote directly to the Final Race will be allocated starting with the fastest time, that will be first placed, followed by the 2nd fastest time second placed etc, until fulfilling the starting grid.

### G.5.1.3 Final Race

Grid positions will be determined by the fastest lap time recorded by each rider in the Qualifying session, and the results of the Play Off Race results as follows:

- Based on the Qualifying session times (See Article G.4.6), Teams that promote directly to the Final Race will be allocated starting with the fastest time, that will be first placed, followed by the 2nd fastest time second placed etc. followed by the riders that promote from the Play Off Race, in the same order achieved on the Play Off Race results.

G.5.1.4 If a team, due to a technical problem or a crash, cannot participate in the Qualifying session, Race Direction may allow the team to take part in the Play Off Race, under request, if the team has performed at least one complete lap during the Free Practice session. In this case the team will have the opportunity to start the race from the last position.

In case of multiple teams in the same situation, the order on the grid will be defined by the best time achieved during the Free Practice session.

## G.5.2 MS1 Handicaps

The result of the Teams in the MS1 Phase of the Competition may have direct influence on the application of handicap during the Race sessions.

- G.5.2.1 | If the total scoring of a Team in the MS1 Phase is not equal or greater than 200 points, the team must make a time penalty applied to the time for the allocation on grid (Play Off Race or Final Race grid allocation), not for promotion to the Final Race.
- G.5.2.2 | If a Team is not promoted directly to the Final Race, the handicap will be applied only in the Play Off Race grid allocation. It will not be applied again in the Final Race in case the rider promotes to that race.
- G.5.2.3 | The total penalty time is determined based on the total scoring obtained in the MS1 Phase:

Scoring intervals	Handicap time
200 > MS1 Score ≥ 150	2"
150 > MS1 Score ≥ 100	5"
100 > MS1 Score ≥ 50	10"
50 > MS1 Score	30"

Table 11 - Handicap time

## ARTICLE 6: RACES

### G.6.1 Number of races

- G.6.1.1 | During the Final Event each Category will run two different types of Races:
  - 1 Play Off Race: Promotion session to the Final Race. The first three classified of this race will promote to the Final Race.  
Race length:  
Electric Category: **6 laps**  
Petrol Category: **6 laps**
  - 1 Final Race: Top positions in the MS2 tests that take place during the races will be set.  
Race length:  
Electric Category: **7 laps**  
Petrol Category: **9 laps**
- G.6.1.2 | Play-Off race may be cancelled if the MS2 Committee deems it necessary.

G.6.1.3 | Electric Category and Petrol category will run independent races.

## G.6.2 Start procedures

### G.6.2.1 Standard Start procedure for Petrol Category

1. Only riders who have completed at least one sighting lap will be permitted to start the race from their position published on the final grid. Under no circumstances they may push their motorcycle onto the grid from the pit lane.
2. Approximately 20 minutes before the Start of the Race – (except in the case of a restarted or reschedule race).
  - Pit lane exit opens for sighting laps.
  - Green lights on at the pit lane exit.
  - Count-down boards are shown at the pit exit.
  - Riders may complete more than one sighting lap by passing through the pit lane where they may make adjustments, change tires or refuel.
3. Approximately 15 minutes before the Start of the Race.
  - Pit lane exit closes.
  - Red lights on at the pit lane exit.
4. Riders who do not go onto the grid may start the warm up lap from the pit lane under the instructions of a marshal positioned at the pit lane exit. Riders starting the warm-up lap from the pit lane must start the race from the back of the grid.
5. When riders reach the grid after the sighting lap(s) they must stop at the rear of the grid and turn off the engine. The motorcycle will then be pushed at walking pace by a Team Member to the grid position. The rider may dismount or remain on the motorcycle to be pushed to the grid position. All attendants on the grid must wear a pass with grid access. Officials will display panels, at the side of the track, indicating the row of the grid, to assist riders in locating their grid position.
6. The Race Director will, at this stage, declare the race as “wet” or “dry” and will indicate this to the riders on the grid and those who may still be in the pit lane by the display of a board. If no board is displayed the race will automatically be “dry”.
7. Riders on the grid at this stage can make adjustments to the machine or change tires to suit the track conditions.

Tire warmers may be used on the grid.

One generator per prototype may be used to power tire warmers on the grid. The generator must be a compact portable type, with a maximum supply power of 2kW. **All generators must be carried on a trolley with wheels and must have, on the generator's base, a closed tray in order to contain any possible leak of fluids.** Any generator deemed not safe by the Technical Scrutineers will be removed from the grid immediately. Technical Scrutineer's decision will be final.

The trolley must be allocated to the rear of the prototypes.

To ensure ease of mobility when clearing the grid, the size and type of grid equipment such as generator trolleys, etc. is subject to the approval of the Organization.

All adjustments must be completed by the display of the 3 Minutes board. After this board is displayed, riders who still wish to make adjustments on their prototype must push their prototype to the pit lane.

Such riders and their prototype must be clear of the grid and in the pit lane before the display of the 1 Minute board. There, they may continue to make adjustments.

Such riders will start the warm up lap from the pit lane and will start the race from the back of the grid.

8. At all time, refueling or changing fuel tank on the grid is forbidden.
9. 5 Minutes before the Start of the Warm-Up Lap – Display of 5 Minutes Board on the grid.
10. 3 Minutes before the Start of the Warm-Up Lap – Display of 3 Minutes Board on the grid.  
Generators must be disconnected and all trolleys must be removed from the grid as quickly as possible.  
At this point, only the rider and three Team Members per team are allowed to stay on the grid, the rest of the Team's personnel must leave the grid as quickly as possible.  
Riders must put their helmets on.  
Nobody can access to the grid anymore.
11. 1 Minute before the Start of the Warm-Up Lap – Display of 1 Minute Board on the grid.  
Immediate removal of tire warmers from prototypes on the grid.  
Engines must be started.  
Only the rider is allowed to stay on the grid, the rest of the Team must immediately vacate the grid.

12. 30 Seconds before the Start of the Warm-Up Lap – Display of 30 Seconds Board on the grid.

Any rider with the engine off will be removed to the pit lane, under the control of the grid marshals. Such rider may start the warm up lap from the pit lane and will start the race from the back of the grid.

13. Approximately 5 minutes before the Start of the Race – Green flag waved to start warm up lap.

Any rider who stalls his engine on the grid or who has other difficulties must signal by raising an arm. Under the supervision or assistance of an official, the rider and machine will exit the grid to the pit lane as quickly as possible where mechanics may provide assistance. Such rider may start the warm up lap from the pit lane and will start the race from the back of the grid, provided they exit before the pit lane is closed and reach the grid before the Safety Car.

If they do not exit before pit lane is closed, they will start the race from pit lane.

The riders will make one lap, at unrestricted speed, followed by a safety car. The safety car will overtake slow riders.

As soon as the riders that started from the grid have passed the pit lane exit point, the pit lane exit light will be turned green, and any rider waiting in the pit lane will be permitted to join the warm up lap. Thirty seconds later, the light will turn red closing the pit lane exit.

If two or more riders must start from the back of the grid, they will take up position in the order, according with the starting grid.

An official will stand at the front of the grid holding a red flag motionless.

Any rider who arrives at the pit lane entry point at any time after the safety car, must enter the pit lane and start the race from the pit lane exit (therefore a rider who does not make the race start from the grid at the correct time, must make the start from the pit lane exit). Reference lap time of the Safety Car will be 4'30".

Any rider who encounters a problem with his/her prototype on the warm up lap may return to the pit lane and make repairs.

Any rider who stalls his engine on the grid or who has other difficulties must remain on the motorcycle and raise an arm. It is not permitted to delay the start by any other means. Attempting to restart the motorcycle on the grid is not permitted. Under the supervision or assistance of an official the rider and machine will exit the grid to the pit lane where the Team may provide assistance.

As each row of the grid is completed, the officials will lower the panels indicating that their row is complete. When all panels have been lowered and the safety car has taken up its position, an official at the rear of the grid will wave a green flag.

The Starter will then instruct the official at the front of the grid, displaying the red flag, to walk to the side of the track.

14. A red light will be displayed for between 2 and 5 seconds. The red light will go out to start the race.  
A Safety Car will follow behind the motorcycles for the whole of the first lap. The safety car will overtake slow riders.  
Any rider who anticipates the start will be penalized by the Race Direction. The standard penalty is two Long Lap Penalties.  
In case of minor movement Race direction will be the sole judge of whether an advantage has been gained.
15. If, after the start of the race, a rider stalls his motorcycle, **officials** will assist to push the motorcycle into the pit lane, where his Team may provide assistance.
16. After the riders have passed the pit lane exit point, the green light at the pit lane exit will be switched on to start any riders still in the pit lane.  
A pit lane race start will be made from a stationary position as indicated by the officials. However, a rider who is delayed and arrives after the pit lane exit is open (and before it gets closed) will not be required to stop at pit exit before joining the race.  
If more than one rider has to start the race from pit lane, it will be applied Article 1.18.1-16) of the Spanish Championship (ESBK).
17. If a motorcycle that has been active in the race enters the pit box, this machine is deemed to be retired and may not reenter again in the race.

#### G.6.2.2 Standard Start procedure for Electric Category

1. Approximately 25 minutes before the Start of the Race.  
Teams must be ready on the “Slow Lane” of the Pit Lane to push their prototypes onto the grid through the pit wall door.
2. Approximately 20 minutes before the Start of the Race – (except in the case of a restarted or reschedule race).  
Pit lane wall opens for the access of Teams and prototypes.
3. Approximately 15 minutes before the Start of the Race.  
Pit lane wall closes.
4. Riders who do not go onto the grid may start the warm up lap from the pit lane under the instructions of a marshal positioned at the pit lane exit.  
Riders starting the warm-up lap from the pit lane must start the race from the back of the grid.

5. When riders reach the grid through the pit wall, one mechanic must push the prototype, at walking pace, to the grid position. The use of the electric motor is not allowed.  
All attendants on the grid must wear a pass with grid access.  
Officials will display panels, at the side of the track, indicating the row of the grid, to assist riders in locating their grid position.
6. The Race Director will, at this stage, declare the race as “wet” or “dry” and will indicate this to the riders on the grid and those who may still be in the pit lane by the display of a board. If no board is displayed the race will automatically be “dry”.
7. Riders on the grid at this stage can make adjustments to the machine or change tires to suit the track conditions.  
Tire warmers may be used on the grid.  
One generator per prototype may be used to power tire warmers on the grid. **The generator cannot be powered by any kind of fuel**, it must have a Pb battery (gel/AGM/sealed battery) and a commercial sinusoidal wave inverter with a maximum supply power of 2kW. **All generators must be carried on a trolley with wheels and must have on the generator’s base a closed tray in order to contain any possible leak of fluids.** Any generator deemed not safe by the Technical Scrutineers will be removed from the grid immediately. Technical Scrutineer’s decision will be final.  
The trolley must be allocated to the rear of the prototypes.  
To ensure ease of mobility when clearing the grid, the size and type of grid equipment such as generator trolleys, etc. is subject to the approval of the Organization.  
All adjustments must be completed by the display of the 3 Minutes board. After this board is displayed, riders who still wish to make adjustments on their prototype must push their prototype to the pit lane.  
Such riders and their prototype must be clear of the grid and in the pit lane before the display of the 1 Minute board. There, they may continue to make adjustments.  
Such riders will start the warm up lap from the pit lane and will start the race from the back of the grid.
8. At all time, charge the prototype’s battery on the grid is forbidden.
9. 5 Minutes before the Start of the Warm-Up Lap – Display of 5 Minutes Board on the grid.
10. 3 Minutes before the Start of the Warm-Up Lap – Display of 3 Minutes Board on the grid.

Generators must be disconnected and all trolleys must be removed from the grid as quickly as possible.

At this point, only the rider and three Team Members per team are allowed to stay on the grid, the rest of the Team's personnel must leave the grid as quickly as possible.

Riders must put their helmets on.

Nobody can access to the grid anymore.

11. 1 Minute before the Start of the Warm-Up Lap – Display of 1 Minute Board on the grid.

Immediate removal of tire warmers from prototypes on the grid.

Prototypes must be on, ready to race.

Only the rider is allowed to stay on the grid, the rest of the Team must immediately vacate the grid.

12. 30 Seconds before the Start of the Warm-Up Lap – Display of 30 Seconds Board on the grid.

Any rider with the prototype off will be removed to the pit lane, under the control of the grid marshals. Such rider may start the warm up lap from the pit lane and will start the race from the back of the grid.

13. Approximately 5 minutes before the Start of the Race – Green flag waved to start warm up lap.

Any rider who “stalls” his powertrain on the grid or who has other difficulties must signal by raising an arm. Under the supervision or assistance of an official, the rider and machine will exit the grid to the pit lane as quickly as possible where mechanics may provide assistance. Such rider may start the warm up lap from the pit lane and will start the race from the back of the grid, provided they exit before the pit lane is closed and reach the grid before the Safety Car.

If they do not exit before pit lane is closed, they will start the race from pit lane.

The riders will make one lap, at unrestricted speed, followed by a safety car. The safety car will overtake slow riders.

As soon as the riders that started from the grid have passed the pit lane exit point, the pit lane exit light will be turned green, and any rider waiting in the pit lane will be permitted to join the warm up lap. Thirty seconds later, the light will turn red closing the pit lane exit.

If two or more riders must start from the back of the grid, they will take up position in the order, according with the starting grid.

An official will stand at the front of the grid holding a red flag motionless.

Any rider who arrives at the pit lane entry point at any time after the safety car, must enter the pit lane and start the race from the pit lane exit (therefore a rider who does not make the race start from the grid at the

correct time, must make the start from the pit lane exit). Reference lap time of the Safety Car will be 4'30".

Any rider who encounters a problem with his/her prototype on the warm up lap may return to the pit lane and make repairs.

Any rider who "stalls" his prototype on the grid or who has other difficulties must remain on the motorcycle and raise an arm. It is not permitted to delay the start by any other means. Attempting to restart the prototype on the grid is not permitted. Under the supervision or assistance of an official the rider and machine will exit the grid to the pit lane where the Team may provide assistance.

As each row of the grid is completed, the officials will lower the panels indicating that their row is complete. When all panels have been lowered and the safety car has taken up its position, an official at the rear of the grid will wave a green flag.

The Starter will then instruct the official at the front of the grid, displaying the red flag, to walk to the side of the track.

14. A red light will be displayed for between 2 and 5 seconds. The red light will go out to start the race.

A Safety Car will follow behind the motorcycles for the whole of the first lap. The safety car will overtake slow riders.

Any rider who anticipates the start will be penalized by the Race Direction. The standard penalty is two Long Lap Penalties.

In case of minor movement Race direction will be the sole judge of whether an advantage has been gained.

15. If, after the start of the race, a rider stalls his motorcycle, **officials** will assist to push the motorcycle into the pit lane, where his Team may provide assistance.

16. After the riders have passed the pit lane exit point, the green light at the pit lane exit will be switched on to start any riders still in the pit lane.

A pit lane race start will be made from a stationary position as indicated by the officials. However, a rider who is delayed and arrives after the pit lane exit is open (and before it gets closed) will not be required to stop at pit exit before joining the race.

If more than one rider has to start the race from pit lane, it will be applied Article 1.18.1-16) of the Spanish Championship (ESBK).

17. If a prototype that has been active in the race enters the pit box, this machine is deemed to be retired and may not reenter again in the race.

### G.6.2.3 Start delayed

If any problem that may mean a safety risk during the start procedure, the Starter will invoke the Start Delayed procedure as follows:

- A red flag is waved from the Starter's rostrum and the red light will stay on.
- The Starter will show the "Start Delayed" board, and marshals will wave a yellow flag at each row of the starting grid.
- Riders must stay in their grid position with helmets on, engines may be switched off.
- The prototype which caused the "Start Delayed" will be removed to the pit lane, regardless if the problem can be solved before the new race start. If the problem can be fixed, the rider may start the warm up lap from pit lane, and will start the race from the back of the grid.
- After the Start Delayed board is shown, only two Team Members per prototype are allowed on the grid. Only tire warmers, and stands are allowed. No generators or trolleys are allowed on the grid.
- As soon as possible the start procedure will be re-commenced at the 3 Minutes board.
- After the 30 Seconds board the riders will complete one additional warm up lap and the race will automatically be reduced by one lap. If Race Direction deemed it necessary, it can be reduced more than one lap.

#### G.6.2.4 Quick Start Procedure

When a race is stopped, riders must return to pit lane, unless otherwise instructed by officials. If there is to be a second part to the race, minor repairs may be carried out. The following procedure will take place:

- Upon arrival in the pit lane, Teams may make adjustments to their machine. Refueling is permitted in pit boxes for Petrol Category and Recharging is permitted in the pit lane for Electric Category.
- When all riders have entered the pit lane, the Race Director will announce the time remaining to the re-opening of the pit lane.
  - a) The duration between the red flag and the actual opening of the pit exit will be 10 minutes or more.
  - b) The re-opening hour will be published on timing screens and may be communicated to Teams through any other official

communication channel. Count-down boards may be shown at the pit exit.

- When time period has elapsed:
  - a) (For Petrol Category) Pit Lane will be opened for SIXTY SECONDS only. Riders will make one lap at unrestricted speed to the starting grid, followed by a Safety Car. Any rider delaying the progress of the sighting lap will be overtaken by the Safety Car. Any rider arriving behind the Safety Car must go onto the pit lane. Such riders will have to start the warm up lap from the pit lane and will start the race from the back of the grid.
  - b) (For Electric Category) Pit Lane wall will be opened for TWO MINUTES only. Prototypes will be placed on its grid positions.
- Any riders remaining in the pit lane after pit lane or pit wall has been closed will have to start the warm up lap from the pit exit and start the race from the back of the grid.
- After the closure of the pit lane exit or pit wall, tire warmers must be removed from all machines remaining in the pit lane.
- Only one Team Member is allowed on grid, without tools, to primarily indicate to his/her rider his/her position on the grid.
- When the rider takes his grid position, the mechanic must **immediately** leave the grid.
- Petrol Category must keep the engine running on grid and Electric Category must turn on the prototype as soon as they reached its grid position.
- As soon as the Safety Car arrives on the back of the grid, a 30 Seconds board will be shown. These 30 seconds may be reduced at the discretion of the Race Direction when the grid is cleared and it is considered safe.
- After 30 seconds have elapsed a green flag will be shown to start the warm up lap.
- The warm up lap will be completed at unrestricted speed, followed by a Safety Car. Upon the start of the warm up lap, the normal start procedure will be followed, with the start signal given in the normal manner.

### G.6.3 Finish of a Race and Race results

G.6.3.1 | When a leading rider has completed the designated number of laps for the race, they will be shown a Chequered flag by an official located at the finish line, behind the 1<sup>st</sup> protection line. The Chequered flag will continue to be displayed to the subsequent riders.

When the Chequered flag is shown to the leading rider, no other rider will be permitted to enter the track from the pit lane.

As soon as the Chequered flag is shown to the leading rider, the red light will be switched on at the pit lane exit and a marshal showing a red flag will stand in the pit lane exit.

If a rider(s) closely precedes the leader during the final lap before the finish line, the official will show to the rider(s) and to the leader simultaneously the Chequered flag and the Blue flag. That means that the race is finished for the leader while the rider(s) closely preceding the leader has (have) to complete the final lap and take the Chequered flag.

G.6.3.2 | To be counted as a finisher in the race and be included in the results a rider must:

- a) Complete 75% of the race distance or laps completed, rounded up to the nearest whole number of laps.
- b) Cross the finish line on the race track (not in the pit lane) within five minutes of the race winner. In case the rider is not in contact with the machine, the finish time is determined by the first part of the rider or machine to cross the finish line, whichever arrives last.

G.6.3.3 | The results will be based on the order in which the riders cross the finish line and the number of laps completed.

G.6.3.4 | In case of a photo-finish between two, or more, riders, the decision shall be taken in favor of the competitor whose front wheel leading edge crosses the plane of the finish line first.

In case the rider is not in contact with the machine, the finish time is determined by the first part of the rider or machine to cross the finish line, whichever arrives last.

G.6.3.5 | At the end of the Race, prototypes will be escorted to Parc Fermé.

#### **G.6.4 Interruption of a Race**

- G.6.4.1 | If the Race Director decides to interrupt a race at any point from the start of the warm up lap onwards, then red flags will be displayed at the finish line and at all marshals' posts and red lights around the circuit will be switched on.
- G.6.4.2 | The results will be established taken into consideration the last point where the leader had completed a full lap without the red flag being displayed, and the classification established as follows:
- a) For all the riders who had crossed the finish line on the same lap as the leader before the red flag was shown, a partial classification will be established at the end of this lap.
  - b) For all the riders who had not crossed the finish line on the same lap as the leader before the red flag was shown, a partial classification will be established at the end of the previous lap.
  - c) The complete classification will be established by combining both partial classifications as per the lap/time procedure.
  - d) Riders who have entered pit lane, which then closes due to a red flag, may be classified according to the number of laps completed and the time of crossing the virtual finish line in the pit lane as follows:  
If the rider has crossed the virtual finish line in the pit lane, the rider's last crossing of the finish line is used.  
If the rider has not crossed the virtual finish line in pit lane, the rider's last crossing of the finish line is used.
- G.6.4.3 | At the time the red flag is displayed, riders who are not actively competing in the race will not be classified.
- G.6.4.4 | Within 5 minutes after the red flag has been displayed, riders who have not entered the pit lane, crossing the designated pit lane entry timing point, together with their prototype, will not be classified.
- An exemption may be granted in exceptional circumstances (eg. Post-race celebration in an interrupted race deemed to have been completed).
- G.6.4.5 | If more than two thirds of the original race distance have been completed by the leader of the race, rounded down to the nearest whole number of laps, the race will be deemed to have been completed and full points will be awarded.
- G.6.4.6 | If less than two thirds of the original race distance have been completed by the leader of the race, rounded down to the nearest whole number of laps, the race will be restarted according to Article G.6.6. If it is found impossible to restart the race, then the results will be awarded as follows:

- Completed less than 50%\* of the original race distance = Null Race, no points awarded.
- Completed more than 50%\* of the original race distance = Full Points awarded.

\*50% rounded down to the nearest whole number of laps.

G.6.4.7 For the purposes of these regulations, “active” and “actively competing” are defined as the rider riding on track, or attempting to repair/restart the engine(motor) or to rejoin the track or return to pit lane with the prototype in a condition fit to rejoin the track. The Race Direction will be the sole judge of whether a rider is actively competing including the condition of the prototype, and no appeal is possible against the Race Direction decision.

## **G.6.5 Re-Starting a Race that has been interrupted**

G.6.5.1 Re-Started races will in principle follow the protocols defined in this Article. However, as local track and climatic conditions and circumstances may vary, Race Direction may reschedule re-started races in the race program as necessary, and will make the final decision on whether, when and how many times to re-start any interrupted race according to circumstances.

Note that in all cases or restarted races, the calculation of race distance required to declare a result (2/3 distance) is based on the number of laps of the current race, not the original Race distance.

G.6.5.2 If a race has to be re-started, the time for the new start procedure to begin will be displayed on time keeping screens. Additionally, it may also be communicated to Teams using any of the official communication channels of the Organization.

G.6.5.3 Any race that has to be re-started, the start procedure for the re-started race will be Quick Start.

G.6.5.4 Conditions for the re-started race will be as follows:

a) In case that less than 3 laps have been completed:

- All riders may start, including riders who may not have completed the sighting or warm up lap for the original start.
- Prototypes may be repaired.
- Refueling/recharging is permitted.

- Distance for the new race will be number of laps required to complete the original distance of the race.
  - Grid positions will be as for the original race.
- b) In case that have been completed more than 3 laps and less than 2/3 of the race:
- Only riders classified in the original race may re-start. To be eligible to re-start the rider must enter pit lane, riding or pushing his prototype, withing 5 minutes after the red flag was displayed in the interrupted race (using the homologated track).
  - Motorcycles may be repaired.
  - Refueling/recharging is permitted.
  - Distance for the new race will be number of laps required to complete the original distance of the race.
  - The grid position will be based on the finishing order of the first race (Article G.6.5.2)

## ARTICLE 7: PARK FERMÉ

### G.7.1 Practice Sessions

- G.7.1.1 | At the end of any practice session the first three classified riders in the session or in any test performed during the session may be required to stop at the Technical Control Area to perform any checks set by the Chief Scrutineer.  
Random riders may also be stopped at the Technical Stewards.

### G.7.2 Race Sessions

- G.7.2.1 | At the end of the race, or the final part of a race that has been interrupted, all the prototypes will be directed to a compulsory check area (Parc Fermé) pending inspection by the Technical Stewards or potential protests. It is the responsibility of the Teams and riders to ensure that the machine is in the parc fermé.

## ARTICLE 8: ABANDONEMENT DURING THE EVENT

G.8.1.1 | Any Team that enters in the Final Event must inform the organizer if, subsequently, they decide not to participate in the event, or abandon during the Event.

**G.8.2 Abandonment process**

G.8.2.1 | If a Team cannot continue due to irreparable technical problems, rider's injury or any other reason, the Team Leader or Faculty Advisor **must** go to the Paddock General Office to sign the abandon.

G.8.2.2 | Abandonment process is **not reversible**. This means that if a Team sign the abandon of the Team, will not be allowed to take part in any of the remaining sessions or races even if their problem has been solved.

# SECTION H

FINAL EVENT

## ARTICLE 1: SCHEDULE

### H.1.1 Official Schedules during the Final Event

- H.1.1.1 The Organization will establish a series of schedules in which it will cite the teams to carry out the tests corresponding to the Scrutineering, MS1 Phase and MS2 Phase. These schedules will be published and sent to the teams prior to the Final Event.
- H.1.1.2 Failure to comply with the schedules set by the Organization for the Final Event will result in the team being penalized in the corresponding test, or even the exclusion of said test if, for operational reasons, it is considered under justified causes.
- H.1.1.3 In the MotoStudent Electric Category, a minimum of 40 minutes between tests will be guaranteed to facilitate battery recharges.
- H.1.1.4 The Organization reserves the right to make any changes to the schedule in the tests presented.

## ARTICLE 2: AREAS AND FACILITIES DURING THE FINAL EVENT

### H.2.1 Definition of areas

- H.2.1.1 The participating teams undertake to take care of the facilities where the Final Event will take place. Otherwise, the Organization will be entitled to apply sanctions or expel the offenders from the Competition.
- H.2.1.2 Annex 3 indicates the orientative distribution of the different areas of the Final Event described below. (to be confirmed in the *Event Guide for Teams* document)
- H.2.1.3 Start – Finish Straight: finish straight of the Grand Prix FIM International track of the MotorLand Aragon circuit. Apart from the start and finish point during the races, the straight will house dynamic test of the MS2 Phase of the Competition, as well as other parallel activities.
- H.2.1.4 Pit Lane: route that connects the circuit layout with the team Boxes. This area is restricted only to students, tutors and riders enrolled in the Competition. Public access to Pit Lane is prohibited.
- H.2.1.5 Pit Building: main building of the circuit. It has three floors:

- Ground floor: houses the team Boxes, as well as bathrooms and showers.
- 1st floor: houses the presentation rooms, restaurant, services, bathrooms, terraces and briefing room.
- 2nd floor: public terraces.

The floors are connected by stairs through the towers A, B, C, D, E and F. Tower E has an elevator for handicapped.

H.2.1.6 | Public Terraces: distributed along the Pit Building, terraces are open to the public to watch the activities on track.

H.2.1.7 | Team Boxes: working Boxes for teams.

H.2.1.8 | Technical Control Area: Scrutineering area where the Organization will carry out the inspection of the participating prototypes (Static Scrutineering).

H.2.1.9 | MotoStudent General Office: main office of the Competition Organization to attend registered teams.

H.2.1.10 | Paddock General Office (PGO): Paddock offices where teams may be called by different organizational committees (MS1, MS2, Technical, Disciplinary, etc.) for issues related to complaints, irregularities, disciplinary applications, etc.

H.2.1.11 | MotoStudent Shop: official shop of the Organization. Payments in the shop during the Final Event may be made by cash (€) or by credit card. Credit cards accepted are:



Picture 47 - Credit cards accepted

H.2.1.12 | Tires Technical Service: service point for the supply and mounting of tires.

H.2.1.13 | Fuel Area: facility to supply the Official Fuel.

H.2.1.14 | Dynamic Area: Paddock area reserved for dynamic activities (Dynamic Safety Check, regulated practices area, ...).

H.2.1.15 | Parc Fermé: closed park.

H.2.1.16 | MotoStudent Arena: Paddock area where events like the MS1 Awards Ceremony, presentations and other activities will take place.

H.2.1.17 | Fan Zone: commercial and show area.

H.2.1.18 | Medical Center: medical attention center.

H.2.1.19 | Working Vehicles Parking: area reserved for the working vehicles, up to 8 meters long.

## **H.2.2 Installations of teams**

H.2.2.1 | The Organization will enable and assign, free of charge, a work area (located inside a Box) to each team where they must carry out repairs and tuning of the prototype.

H.2.2.2 | The Boxes have 230V power sockets with European model plug or 230V industrial socket and three-phase 400V sockets. They are also equipped with a TV socket with access to live timing, compressed air, water connections and bathroom.

H.2.2.3 | Personal and transportation vehicles must be parked in the areas authorized for this purpose. Track and test areas can only be accessed by the Organization vehicles.

## **ARTICLE 3: PARTICIPANTS ACCREDITATION**

### **H.3.1 Accreditation**

H.3.1.1 | When accessing the Final Event, the Organization will provide an accreditation pass and bracelet to each of the Team Members, rider, and tutor/s. This identification will serve as an indication to the Organization for the follow-up of the tests and interventions in the prototype.

H.3.1.2 | The accreditation passes and bracelets will be placed to the registered Team Members at the time of entering the Final Event, and they must wear them until it finishes.

H.3.1.3 | Passes and bracelets will only be given to officially registered members as part of the team. Any unregistered person accompanying the team will be considered a general public and, therefore, will not have the same privileges of access and activity as the registered students.

## ARTICLE 4: BEHAVIOR RULES

### H.4.1 Behavior of the participants during the Final Event

H.4.1.1 To achieve a good coexistence during the Final Event the following actions are strictly prohibited:

- Cooking inside the Boxes and spaces not specifically allowed by the Organization.
- Sleeping inside the Boxes.
- Installing tents in spaces not specifically allowed by the Organization.
- Entry of pets in the Paddock.
- Smoking, lighting fires or depositing gas containers inside the Boxes.
- Parking an unauthorized vehicle inside the Paddock.
- The exchange of people and vehicles passes.
- Paint, drill, disassemble or misuse circuit facilities.
- Any commercial activity that may harm the public health

### H.4.2 Authorized vehicles in Paddock

H.4.2.1 The prototype can only be moved by its own means during the tests, for the rest of the movements through the Paddock it must be pushed or moved with the engine/motor stopped.

H.4.2.2 Vehicle traffic through the Paddock is restricted only to vehicles of the Organization and the following light vehicles:

- Vehicles without motor (scooters, bicycles ...).
- Personal mobility vehicles (motorized scooter, assisted bicycle, ...).
- Scooters.

H.4.2.3 | The circulation of any vehicle on the Pit Lane (except for prototypes) is strictly forbidden, except for the access of non-motorized vehicles during the time allowed for the track inspection.

H.4.2.4 | The circulation of the vehicles indicated in Art. H.4.2.2 shall be governed by the following rules:

- No more than two people can travel.
- Children under 14 years old will not be able to drive any vehicle.
- Reckless driving inside the paddock is prohibited.
- The circulation of vehicles will be prohibited during the hours of silence (23:00 - 07:00 hours).
- **The use of helmet is mandatory.**

### **H.4.3 Prototype manipulation**

H.4.3.1 | For safety reasons, the manipulation of the prototype must meet the following rules. Failure to comply with these rules may result in a penalty or even expulsion from the Competition.

H.4.3.2 | Repairs and manipulations on the prototype during the Final Event can only be made inside the Box of each team.

H.4.3.3 | The transfer of the prototype outside the circuit facilities during the Final Event is allowed (e.g. for practices in karting circuit).

## **ARTICLE 5: COMMUNICATION**

### **H.5.1 Contact with the Organization during the Final Event**

H.5.1.1 | The contact between the teams and the Organization during the Final Event must be carried out primarily through the MotoStudent General Office.

H.5.1.2 | During the Final Event, any Team Tutor, Team Leader or rider can be summoned by the Organization to report incidents. Teams must attend these appointments at the place indicated in a maximum period of 15 minutes from the corresponding notice.

## **H.5.2 Briefings**

- H.5.2.1 | During the Final Event, the Organization will hold several briefings to explain the development of the Competition to teams, tutors and riders.
- H.5.2.2 | Team Leaders, tutors or riders must attend the briefings to which they are summoned by the Organization. The non-attendance at these briefings without a justified cause will be penalized.

## **H.5.3 Communication of schedules and results**

- H.5.3.1 | The Organization will communicate the schedules of tests and results through different means.
- H.5.3.2 | The Organization will publish on the bulletin board enabled in the Paddock the results obtained in each of the tests.
- H.5.3.3 | The timing results of “Free Practice”, “Qualifying” and “Race” sessions will be broadcast live by the internal TV signal of the circuit. In addition to being broadcast by screens in common facilities, all Boxes and the Pit Wall will have TV sockets to access the live timing broadcast.
- H.5.3.4 | The timing results of “Free Practice”, “Qualifying” and “Race” sessions will be broadcast live through the internet. The Organization will communicate to the teams the web platform to which they can access to follow live timing.
- H.5.3.5 | The final results obtained in each test may be published on the web once the Competition is over.

# SECTION I

## MODIFICATIONS GLOSSARY

# SECTION J

## ANNEXES

**ANNEX 1: CLAIMS AND IMPUGNMENTS MODEL**

Mr/Ms \_\_\_\_\_ with personal ID-number \_\_\_\_\_, as  
Tutor/Team Leader of the team \_\_\_\_\_, representing University of  
\_\_\_\_\_ with bike number \_\_\_\_\_ participant in the MotoStudent  
\_\_\_\_\_ Category, hereby applies (*mark with X*):

a **CLAIM** over the Organization of the VI MotoStudent International Competition:

an **IMPUGNMENT** over team \_\_\_\_\_ with bike number \_\_\_\_\_:

For that reason, it considers violated the Article \_\_\_\_\_ of the Competition  
Regulations where it stipulates:

Also provides the following evidences to be taken into account by the Organization when  
verifying this claim:

And for the record, signs this document in \_\_\_\_\_, on \_\_\_\_\_, \_\_\_\_\_ 20\_\_

Mr/Ms. \_\_\_\_\_

ANNEX 2: TRACK LAYOUT

