10th Edition
International Championship

EUSKELEC

Championships Regulations

Ref. 9-2026

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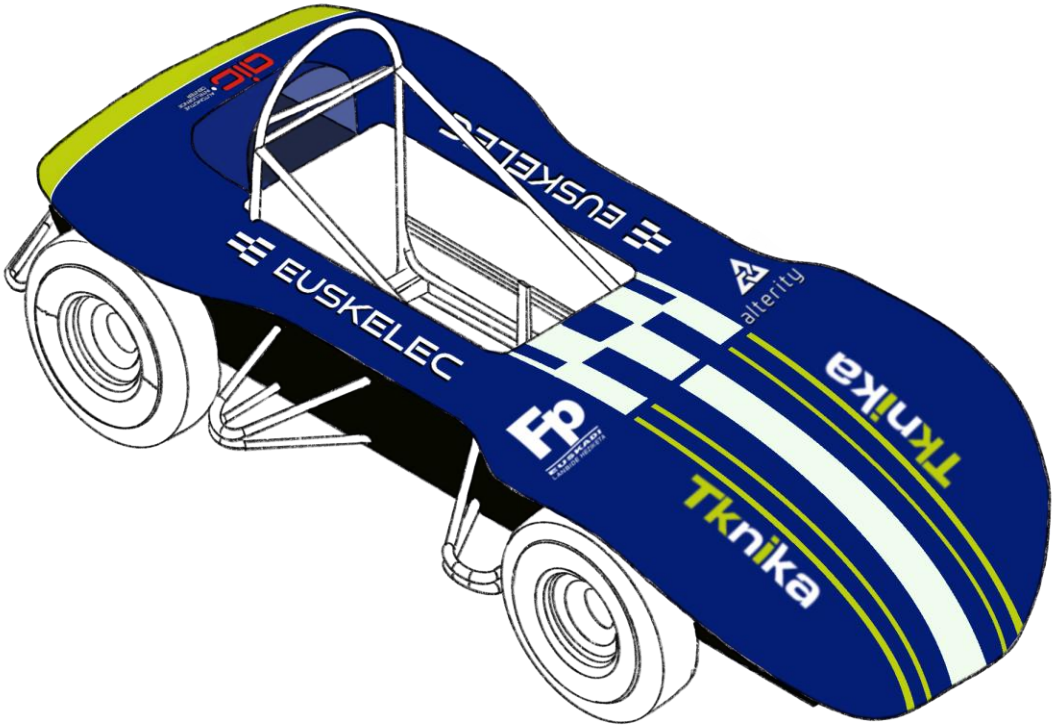
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EUSKELEC ELECTRIC VEHICLE CHAMPIONSHIP REGULATIONS (10TH EDITION)



EUSKELEC

1 INTRODUCTION

1.1 CHAMPIONSHIP REGULATORY AUTHORITY

The Championship Regulations have been validated by Tknika as applied VET research centre in Euskadi and organiser of the challenge.

Tknika is the championship's regulatory authority and, as such, shall appoint the work team who will form part of the championship's technical management.

1.2 COMPETITION PHASES

All projects and prototypes submitted by participants shall be assessed in different tests, divided into two phases:

- Phase 1: technical and creative fields, starting in September and continuing throughout the 2026-2027 school year.
- Phase 2: Dynamic tests, held in May 2027.

The championship consists of different tests which, depending on their purpose, may or may not provide points to the teams:

Tests	Eliminating	Scoring
Phase 1: Technical and Creative	Yes	Yes
Technical Inspections	No	Yes
Phase 2: Dynamic tests	Yes	Yes

Table 1: Tests to pass

1.2.1 Phase 1: Technical and Creative

Phase 1 is a demonstrative phase, where teams must show, explain, and justify the design for the prototype they have made and the process to manufacture it.

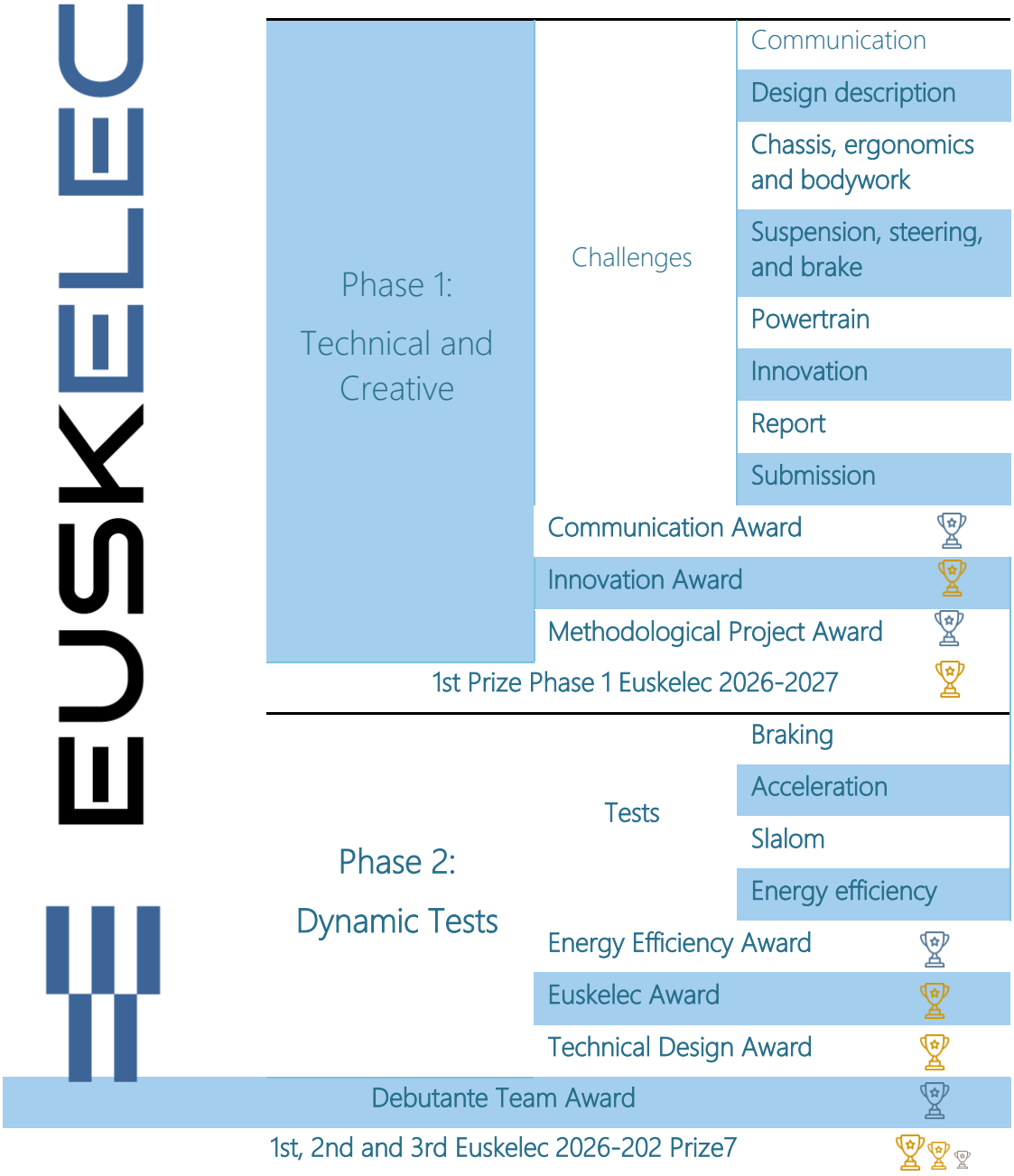
Standards and information regarding Phase 1 of the championship are described in section 3.1 of these regulations.

1.2.2 Phase 2: Dynamic Tests

Standards and information regarding Phase 2 of the championship are described in section 3.2 of these regulations.

1.3 BREAKDOWN OF THE EUSKELEC 2026-2027 CHAMPIONSHIP

1.3.1 Euskelec 2026-2027 Awards



1.3.2 Communication Award

"This award will be granted to the team whose communication and advertising campaign is considered the most noteworthy. The methods used to promote the project will be assessed, along with the efficacy and degree of innovation of the strategies used."

1.3.3 Innovation Award

All aspects of innovation will be assessed in the Innovation Challenge, in the Report Challenge, and in the Submission Challenge.

The project must include an innovation that brings some degree of novelty to any aspect related to participation in the championship. Innovations of any type that bring value to the executed project shall be accepted.

This section scores:

- The creativity and originality of the innovation.
- The value brought and its potential.
- Capability of implementation.

Along with the organisation, the board of judges will assess the teams' innovation during Phase 1 submission. The top-scored innovation will be awarded.

1.3.4 Methodological Project Award

This award is granted to the team that demonstrates noteworthy implementation of active-collaborative methodologies in the classroom, successfully fostering a dynamic, participatory and motivating learning process for students.

1.3.5 Energy Efficiency Award

This award will be given to the team who successfully completes the most laps around the circuit throughout the test (after subtracting penalties).

1.3.6 Euskelec Award

This award will be given to the team who best represents the competition's fundamental values, such as ethics, sportsmanship, teamwork, attitude, and initiative. Assessment considers performance of the teams in Phase 1 and Phase 2 and, in general, their day-to-day behaviour throughout the competition.

1.3.7 Technical Design Award

This will be given to the team who submits the best technical, innovative and educational solution during Phase 1 and that is capable of implementing these solutions in their vehicle during Phase 2 of the competition.

1.3.8 Debutante Team Award

This award will be given to the debutante team who has scored the highest number of points at the end of the competition. In the event that said team is also winner of the general competition, the award will be granted to the second debutante team with the highest score.

1.3.9 Award for Commitment to Equality and Women's Participation

This will be awarded to the team with the highest women's participation, with a commitment to fostering women's talent in innovation and making progress in the electric mobility sector.

1.3.10 Scoring System

Points for the different tests are counted with a maximum score as defined in the table below:

EUSKELEC VIII GENERAL SCORING SYSTEM		
PHASE 1	Challenge Submission	50%
	Collaborative Methodological Project	20%
PHASE 2	Dynamic tests + Resistance race	30%

Technical and Creative	Challenges	Communication	70
		Design description	60
		Chassis, ergonomics and bodywork	60
		Suspension, steering, and brake	60
		Powertrain	40
		Innovation	70
		Report	40
		Submission	50
	Collaborative Methodological Project		200
	Pre-Inspection Attendance		50
Phase 1 Total:	700		
Dynamic Tests:	Braking		80
	Acceleration		60
	Slalom		60
	Energy Efficiency		100
Phase 2 Total:	300		
TOTAL:	1000		

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Each one of the tests will be assessed and scored individually. Scores obtained from all the tests in each phase will be added together to obtain the total points scored in said phase. To determine the championship's final score, the points obtained in both phases are added together, the sum of which is the final score for each team in the competition.

2 ADMINISTRATIVE REGULATION

2.1 PARTICIPANTS

The 10th edition of Euskelec is open to the participation of any vocational educational training centre. Said centres shall be provided with the basic drivetrain elements of the vehicle (motor, motor controller, battery, display and accelerator pedal). With these elements, students must develop a vehicle suitable for the requirements of the championship's technical regulations.

2.1.1 Teams

Each team represents one or more training centres that offer intermediate-level, higher-level, and/or basic vocational educational training programmes. Teams consist of a **minimum of 5 members.** There is no maximum limit on the number of team members that may participate in the construction of the electric single-seater. However, the competition reserves the right to limit the number of people who can attend the Phase 1 event or reserved event areas in Phase 2 (pits, racetrack, etc.).

The possibility exists to create a team with participants from more than one centre, provided that the Organisation is informed beforehand and grants its approval. As of that moment, the team will be considered as represented by those two centres as a whole.

All participants must be registered on one single team, and all members of the team must be registered and/or belong to the training centre during the school year during which the competition takes place. Former students will only be allowed if they studied at the centre the year beforehand.

Each team must appoint one or two educator assessors as the supervisor and co-supervisor of the team, as well as a team leader who, along with the selected supervisors, will act to represent the team to the organisation and as spokespersons with the organisation. Under no circumstances will be supervisors count as members of the team when counting the number of people registered for each team.

Throughout the course of the entire competition, supervisors shall always hold the role of assessor and/or coordinator and may **advise** the teams on any aspect of the project.

Under no circumstances may supervisors design any part of the vehicle or participate in the development of any sort of documentation or submission.

Supervisors may not assemble or manufacture any component of the vehicle and may not even repair or help in repairs during the event. As such, supervisors may not handle the vehicle under any circumstance.

2.1.2 Driver

Each team must provide a driver who will be in charge of driving the vehicle during the dynamic tests in Phase 2 of the championship. In order to balance out advantages between teams, and given that the championship's objective is to assess the vehicle and the team's preparation work, the following considerations have been made:

- The driver must be a part and member of the team, and as such counts in the total number of members in registration.
- The driver will have the same rights and obligations as any other member of the team without exception.
- The driver must be at least 16 years old the day of the championship event.

The team must appoint a substitute driver to substitute the main driver in the event that they cannot participate in the Phase 2 tests of the event for a justified reason. However, during practise and the tests in Phase 2, only one single driver can conduct the event's tests. Additionally, only the driver can remain on the vehicle while conducting the tests.

The driver who participates in safety dimension and weight measurements is the one who will participate in the race. If the driver is replaced, it is mandatory to measure safety dimensions and weight again.

2.1.3 Team Formation

The initial composition of the team, along with the supervisors and team leader, must be submitted in the documentation "TEAM AND COMMUNICATION PLAN SUBMISSION."

The educator assessor and/or team leader must promptly communicate any modifications in participant students to the Organisation by email at admin@euskelec.eus.

2.1.4 Guest Teams

The organisation reserves the right to invite teams to participate who do not fulfil certain requirements. They need not fulfil and follow all regulatory requirements.

It is mandatory for guest teams to comply with main safety measures set forth in the regulations to participate in the dynamic tests.

2.2 TEAM SPONSORS

Team sponsors may enter areas reserved for teams, provided they do not conduct advertising or promotional actions not authorised by the organising committee.

The team or sponsor may conduct sales actions and/or sell objects under the framework of the competition, provided that this has been explicitly authorised by the organising committee and that this occurs within the space set forth to this end. These activities must be reported to EUSKELEC's management with sufficient advance notice to conduct necessary procedures and process permits.

2.3 CHAMPIONSHIP REGULATORY SCOPE

These regulations for the 10th Euskelec 2026-2027 Championship have been prepared solely for the execution of said championship and shall not be valid beyond the scope of this competition.

2.3.1 Compliance with Rules

Teams participating in the championship are responsible for knowing the regulations and agree to abide by their implementation, interpretation, and any procedures arising from their application. **Acting against the intent of the regulations is considered a breach of compliance with the regulation.**

Throughout the course of the competition, all teams must commit to following the instructions of organisation staff.

The organisation is entitled to sanction any team that fails to comply with any aspect of these regulations or established schedules, as well as teams that demonstrate an unsportsmanlike behaviour, or that put people or facilities in danger, with a suitable penalty as set forth in section 3.3 of these regulations.

2.3.2 Right to Lodge a Complaint

Any participating team may submit complaints or suggestions. The Organising Committee shall swiftly review all doubts, breaches of compliance, or sanctions submitted by the official method.

A team may lodge a complaint if they disagree with any action carried out by the Organisation, whether the scoring of the championship or any other action that they consider has harmed their team.

Any team may challenge another participating team if they observe a failure to comply with the Championship Regulations or for undue behaviour.

All complaints and challenges must be submitted to the Organisation following the submission format set forth in section 5.2 of these Regulations, indicating the section of the regulation that they deem has been violated, along with the proof necessary for verification. Complaints or challenges before the Final Event may be sent as a scan or with a digital signature by email to admin@euskelec.eus and they will be assessed and responded to within a maximum timeframe of 15 business days as of reception, while complaints or challenges sent during the Event **must be submitted in writing to Organisation staff** and a response will be provided the same day as quickly as possible.

3 GENERAL REGULATIONS

The Euskelec championship consists of two phases:

- Phase 1: Technical and Creative
  - Team submission + Communication
  - Design description
  - Chassis, ergonomics and bodywork
  - Suspension, steering, and brake
  - Powertrain
  - Innovation + Additive fabrication
  - Report
  - Submission
- Methodological Project and Values
- Technical Inspections
- Phase 2: Dynamic Tests
  - Braking
  - Acceleration
  - Slalom
  - Energy efficiency

Scoring for each test is defined in section 1.3.10 of these regulations.

3.1 PHASE 1: TECHNICAL-CREATIVE

Following the championship calendar, Phase 1 challenges will be announced on the Moodle platform, where participants must deliver in different digital formats to the organisation, complying with the deadlines and file formats set forth in the document "Desafíos Euskelec 2026 (Euskelec 2026 Challenges)."

Teams that upload challenges past the deadline set by the organisation as explained in section 3.3.1 of these regulations will be penalised. Challenges score points and are mandatory.

A technical jury for the competition will assess the challenges and projects based on the requirements and objectives set for each challenge.

3.2 PHASE 2: DYNAMIC TESTS

The championship has 4 dynamic tests:

- Brake test
- Acceleration test
- Slalom test
- Energy efficiency test

3.2.1 Dynamic test standards

For the different dynamic tests, both drivers and teams must follow race management and event organisation guidelines at all times.

All championship tests must be executed solely with the battery provided by the organisation. Throughout the course of the championship, it is strictly forbidden to recharge the battery without the organisation's express authorisation. We recommend that teams bring the battery charged to 100%. If battery recharging is detected or witnessed outside the time permitted by the organisation, this bears a very severe penalty, so the team will be expelled from Phase 2 of the championship.

Throughout the course of the tests, the teams must remain in the pit area, behind the pit lane line, and may not enter the circuit at any time. In the event of stoppage or breakdown, the organisation may authorise the team members necessary to assist the vehicle to enter the circuit, always following race management and circuit marshal instructions.

The number of repetitions in each test may vary from 1 to a maximum of 5. The number of repetitions varies depending on the circuit's characteristics. The best result obtained from each one of the measurements taken will be used. Participation in at least one lap is mandatory.

Marshals are in charge of determining whether the teams' execution of each test is valid. In the event that a test is deemed invalid due to circumstances beyond the teams' or the organisation's control, the marshals reserve the right to assess the situation and take necessary measures to properly conduct the test, prioritising safety.

3.2.2 Preparation and Starting Tests

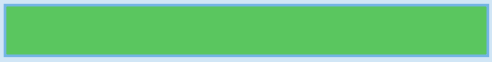
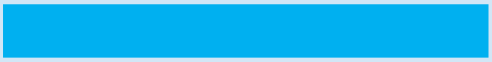
Before beginning any test, the teams must remain in their respective pits. When the organisation's marshals signal the start of a test, the drivers must enter their vehicles and take a lap around the circuit, exiting their pits and taking their position in the starting grid for the respective test, based on the pre-established order for the championship. Drivers must wait their turn in a queue. At the marshal's signal, the driver begins the test. After completing the test, the driver must join the main circuit and finish the rest of the circuit, from the end of the test to the entrance to the pits and park their vehicle back inside the pit. In the event of failure to comply with the regulation, the team may be penalised based on the penalty scale in these regulations.

3.2.3 Formation of the Starting Grid

The starting grid is created as an inverted grid, with the starting positions being the opposite to the best result in one of the three tests.

3.2.4 Flags

While the electric single-seater is on the track, the marshals and the organisation use flags to communicate with the drivers. The meaning of the message based on the flag's colour is shown below.

Flag	Meaning
	Track clear
	Caution, overtaking forbidden
	Track closed, slowly enter pits
	Enter pits for mechanical issue, reprimand for behaviour, or penalty
	Allow car behind to overtake
	End of race, return to pits

3.2.5 Maximum Braking

The objective of the teams in this test is to successfully brake the vehicle in the shortest distance possible to calculate maximum deceleration with the car's brake system. The winner of the test is the individual who obtains the best deceleration number. The other teams are classified by how close they are to the winning result. If there are teams who obtain the same result in the test, the teams will receive the same score as the higher position that would have been held by the best result. In this case, the positions beneath the tied teams will not be scored.

This test begins by accelerating the vehicle to **a speed equal to or greater than 20km/h.** The driver must begin to brake when the front axle crosses the braking line marked with two cones. In the event that they cross the line to begin braking at a speed under the minimum or begin braking before crossing this line, the team's score in this braking round will be zero.

In the circuit, the driver will have a speedometer for their reference. The formula to calculate deceleration is:$V^2 = V_0^2 + 2 \times a \times \Delta s$where: V is always 0 (zero); V_0**is the average speed; Δs is the braking distance measured from the reference line to the front of the vehicle (not counting the tow hook).**

3.2.6 Acceleration

The acceleration test consists of travelling a distance between **40-60 metres** in the shortest time possible. The driver who crosses the finish line in the least amount of time is winner of the test; the other participants are classified by how close they are to the winning result. If there are teams who obtain the same result in the test, the teams will receive the same score as the higher position that would have been held by the best result. In this case, the positions beneath the tied teams will not be scored.

Once the marshal shows the driver the green flag, they may accelerate whenever they wish. The test begins when the driver begins to move and ends the moment the driver crosses the finish line, thereby establishing the time obtained by their team.

3.2.7 Slalom

The Slalom test is to measure the vehicle's dynamic and, as such, its ability to agilely change direction. The driver who crosses the finish line in the least amount of time, properly completing the signposted circuit, wins the test. The other drivers are classified by how close they are to the winner's result. If there are teams who obtain the same result in the test, the teams will receive the same score as the higher position that would have been held by the best result. In this case, the positions beneath the tied teams will not be scored.

The test begins at the marshal's signal. After this, the driver must travel the marked circuit in the least amount of time possible. The circuit, which will be designed according to the final site where the dynamic tests will be held, may consist of straights no longer than 80 m, constant-radius curves with a diameter of up to 50 m, a cone slalom with cones in a straight line and spaced 8 to 12 m apart, chicanes, decreasing-radius curves, changes in elevation, etc. The minimum track width is 3 m, and the radius of all curves must be at least 3.5 m.

3.2.8 Energy efficiency

The energy efficiency test is to test the range and efficiency of the vehicles. To this end, teams must take as many laps as possible around the circuit for an approximate 1-hour period. This time may vary depending on the circuit's technical characteristics.

The winner of this test is the driver who takes the most laps during the stipulated time. If two teams take the same number of laps, the winner will be the one with the best result from the 3 previous dynamic tests. It is necessary to cross the finish line at the end of the race to win.

The test begins with a safety distance between the cars and the race manager waving the green flag and signalling the start of the test.

Throughout the course of the test, overtaking zones will be provided, which will be pointed out to participants in the briefing before the test. In the area intended for overtaking, drivers must let themselves be overtaken by any vehicle behind them if it catches up and is therefore driving faster. To overtake a vehicle, the driver in front must be alerted by sounding the horn. This allows the driver being overtaken to confirm that the overtaking driver is in their slipstream. Track marshals also indicate the overtake by waving a blue flag. When overtaken, drivers do not modify their route or speed to facilitate the overtaking driver overtaking them. The overtaking driver must overtake cleanly, without cutting off the overtaken driver, who cannot stop the driver behind them from overtaking them. During the test briefing, the organisation indicates the overtaking zones based on the route's characteristics.

If a driver is trapped by another and impedes overtaking or overtakes another vehicle in non-overtaking zones, thereby potentially creating risky situations, they will be penalised with the removal of laps or expelled, depending on the incident and per the judgement of race management.

The race manager or guest invited by the organisation will indicate the end of the test with chequered flags. At this moment, drivers must complete a lap until they reach the pits. This last lap after the chequered flag does not count in the sum of laps for the test. Only laps completed until signalling the end of the test with the first wave of the chequered flag count.

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3.2.9 Dynamic Test Scoring

The scoring table for Phase 2 of the Championship will be published in advance, providing scoring criteria for each one of the tests.

The team with the highest score in each one of the individual tests will be declared winner.

The general winner is the one with the highest score in the global count of all tests.

3.3 PENALTIES

3.3.1 Phase 1 Penalties

Deadlines stipulated by the championship organisation must be met. In the event of delay in delivering the stipulated challenges, the following penalties will be applied:

Delay in delivery of each challenge bears a penalty of **1 point** for each day of delay, to a maximum of **50%** of the total score for the challenge.

Penalties accumulated in Phase 1 due to penalties in the championship will apply to the final score of Phase 1 and will be distributed upon completion of this phase based on the score distribution set forth in section 1.3.10. Penalties cannot spill over from Phase 1 to Phase 2 or vice-versa.

To participate in Phase 2 of the championship, it is mandatory to deliver and participate in the challenges, Report and Submission. The team cannot continue the championship until they effectively deliver the non-delivered challenge, accepting the pertinent penalty for delay in delivery, as mentioned above.

Deliveries of challenge are **complete and definitive** and will be assessed to assign the final score.

3.3.2 Inspection Penalties

In the event of a breach of regulations, there are 3 degrees of penalties.

- Slight Anomaly:
  - A slight anomaly is any incident that breaks the regulation.
  - That does not pose danger.
  - That can be modified or repaired.

  The sanction is 10 points for each section breached, with a maximum of 10 points.

- Severe Anomaly:
    - A severe anomaly is set forth in section 3.3.2 Phase 2 Penalties of the regulations.
    - Any incident that breaks the regulation,
        - this breach cannot be modified.
        - It poses no danger.
        - Repeated warnings of a slight anomaly that has not been rectified.

  The sanction is 150 points.

- Very Severe Anomaly:
    - A severe anomaly is set forth in section 3.3.2 Phase 2 Penalties of the regulations.
    - Any anomaly that breaches the technical regulation and is considered by the organisation as dangerous for the driver, any member of the team, or test spectators.

  The sanction is expulsion from the test.

  These pints will be subtracted from the total sum in Phase 2.

  Cases that cannot be assessed based on the aforementioned criteria will be assessed by sport/technical management and the event organisers.

  The decision will be final and irrevocable, with no right to review under any circumstances that may arise.

3.3.3 Phase 2 Penalties

Each section of the regulations stipulates the criteria to be assessed in each test. Not following the regulations or failure to comply with the minimum requirements for any test in the competition will be grounds for sanction based on the following:

General Penalties

A. Slight: During Phase 2, event organisers may sanction teams with 10 points, due to inappropriate behaviour, as well as manoeuvres not allowed during dynamic tests, such as: Overtaking in a zone where this is not permitted, not following speed limits in the pit area, not using the horn while overtaking, not following the flags, not having adequate or sufficient equipment (the same as allowed for participation in tests).

B. Severe: the team will be sanctioned and penalised with the subtraction of 150 points from the total in the competition. Serious infractions are disrespectful behaviour against any individual or item and breach of any section of the technical regulations.

C. Very severe: the team will be sanctioned with expulsion from the championship. Very severe infractions are infractions related to the safety of any human being, the modification of any element provided by the organisation, and unsportsmanlike behaviours.

If a team is repeatedly sanctioned, three severe sanctions are equal to a very severe sanction, and the team will therefore be expelled from the competition with no reimbursement for registration costs.

The judges of the competition will apply pertinent penalties based on the scales set forth in these regulations. They will do so objectively, based on safety, test model, and competition rules.

4 TECHNICAL REGULATIONS

For the design of the vehicle, its construction, and championship planning, teams participating in Euskelec must use the material supplied by the organisation as the traction system for the vehicles they design.

This material must be mounted on a frame that has been entirely designed and constructed by each team. Pre-manufactured frames with modifications are not valid.

The design of the cockpit provided by the organisation is mandatory.

4.1 GENERAL VEHICLE ASPECTS

Each team must design and manufacture the frame for a four-wheel vehicle with a cockpit that is wide and long enough for a driver at least 1.70m tall and 65 kg at minimum. However, the driver need only comply with the conditions set forth in section 2.1.2 of the regulations to act as driver.

It is mandatory for teams to use the elements provided by the organisation as the foundation for manufacturing the vehicles and as the mandatory powertrain kit.

The vehicle must be designed to withstand the various irregularities that may be found on public roads, such as small potholes, manholes, changes in level, etc. Circuits may even have different kinds of surfaces, but they will never include deformable surfaces such as mud, gravel, grass, carpet, etc.

4.1.1 Powertrain Kit

The elements in the powertrain kit provided by the organisation are:

- EUS21 three-phase permanent-magnet motor
- EUS21 Guilera motor controller
- EUS20 Alterity lithium battery
- EUS20 battery charger
- EUS20 traction contactor
- EUS20 complete accelerator pedal
- EUS210 Alterity electrical wiring harness assembly kit
- EUS20 display and display wiring
- EUS20 manual maintenance disconnect switch

These elements cannot be modified under any circumstance. The organisation is entitled to examine, weigh, and/or seal off some or all of the components in the powertrain kit at any time during the championship to verify whether any of them have been modified. If any of the kit components are tampered with or modified, the team who carried out this action will be sanctioned with a very severe penalty and will therefore be expelled from the championship.

The organisation may request that teams hand over any element of the kit for review, updating, and modification of any component at any time.

4.1.2 Dimensions

Vehicles must have the critical measurements stipulated by the organisation. Critical measurements are those set forth below, and must fall between:

- Length between **2200 and 2500 mm**, measured horizontally between the imaginary vertical lines that go from the far two ends of the vehicle's profile.
- Overall width must be **1000mm minimum** and **1200mm maximum,** measured between the outermost points of the wheels on the widest axle.
- Minimum distance between axles is **900mm**
- Minimum track width is **780mm**
- Maximum height is **1010mm**, from the ground to the highest point of the vehicle or driver's helmet without considering the roll bar.
- Distance from the ground to the vehicle's lowest point between **70mm and 100mm at maximum.**
- Minimum distance from the foremost point of the frame (structural) to the nearest point of the front wheels is **50mm,** measured parallel to the vehicle's longitudinal axis.
- Dimensions for the driver's space are **minimum 740mm long x 410mm wide,** which applies to the entire cockpit zone.

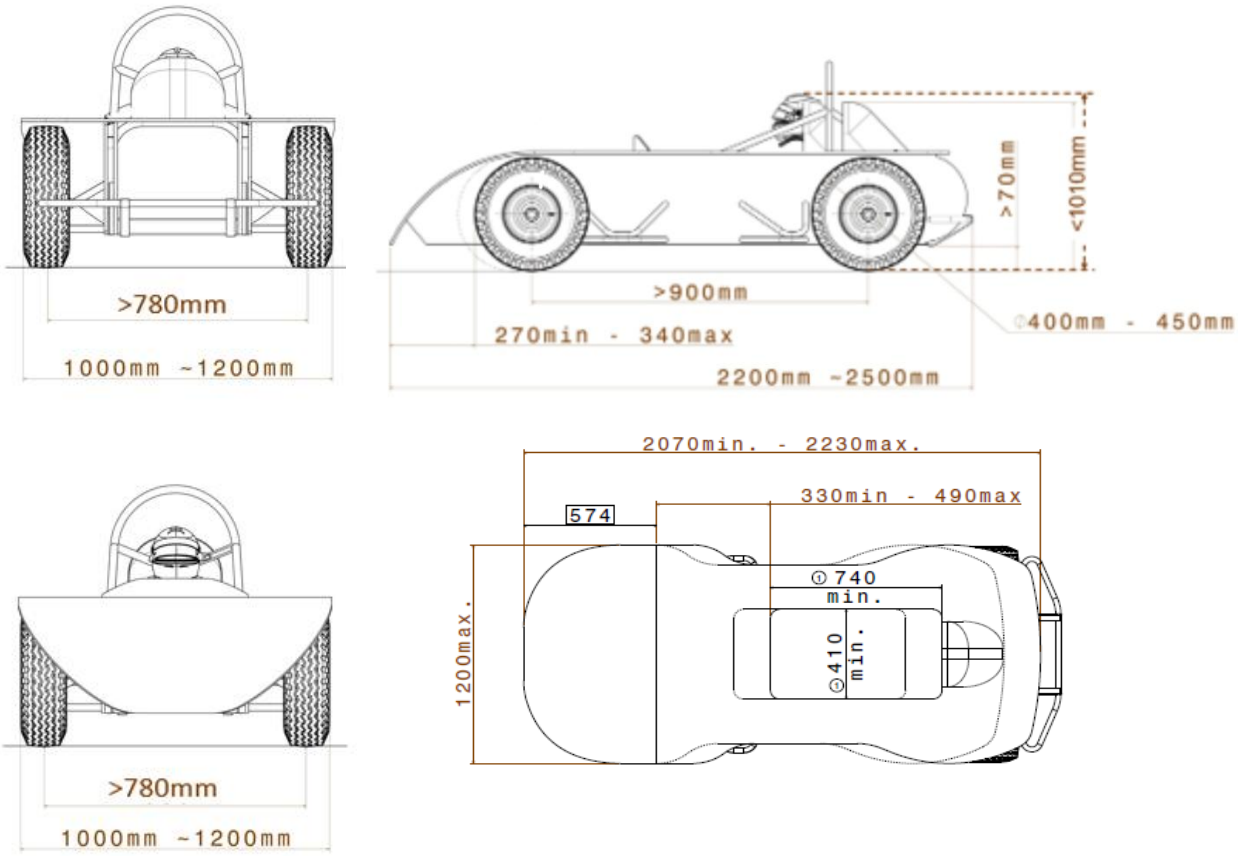


Illustration 1

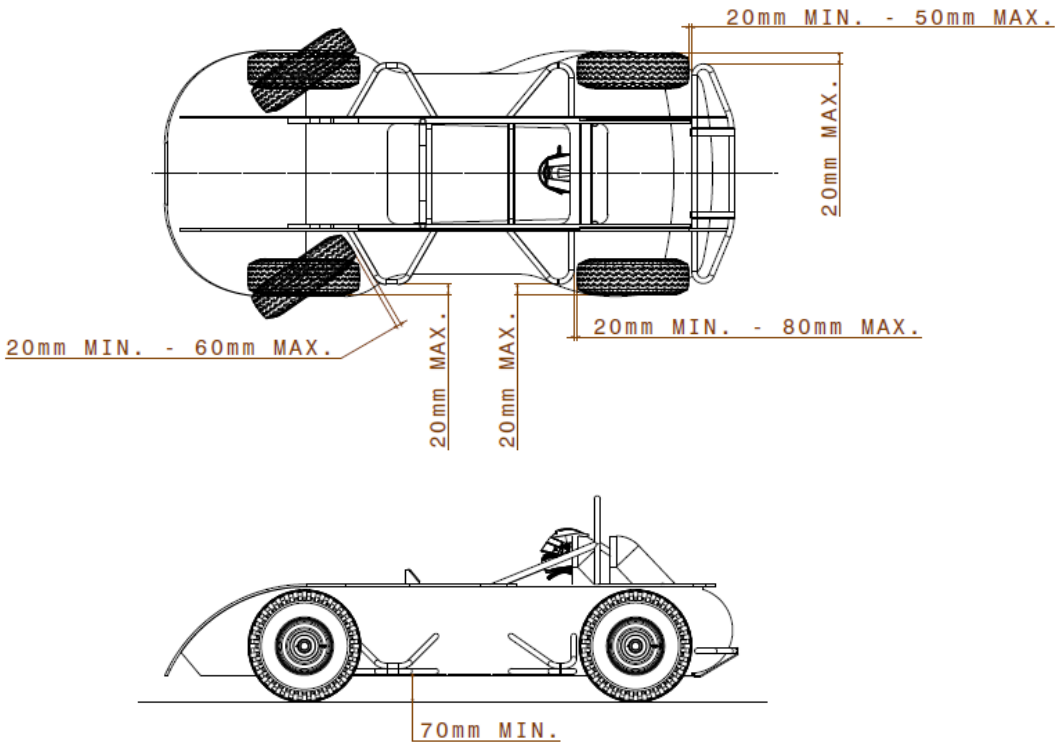


Illustration 2

The vehicle must have side protectors to prevent vehicles from overlapping during competition, as shown in Illustration 2.

The geometry of these protections is free choice. It must respect the frame's interior limits, and it is not allowed to exceed the front or back track width.

The main distances for tyres, minimum height from ground and maximum width are shown in Illustrations 1 and 2.

Geometries that are non-continuous or with a separation between protectors greater than 200mm where a tyre (wheel) may be trapped will not be accepted.

4.1.3 Dimensional sketch of driver positioning:

Illustrative drawing showing the position and space for the driver in the cockpit:

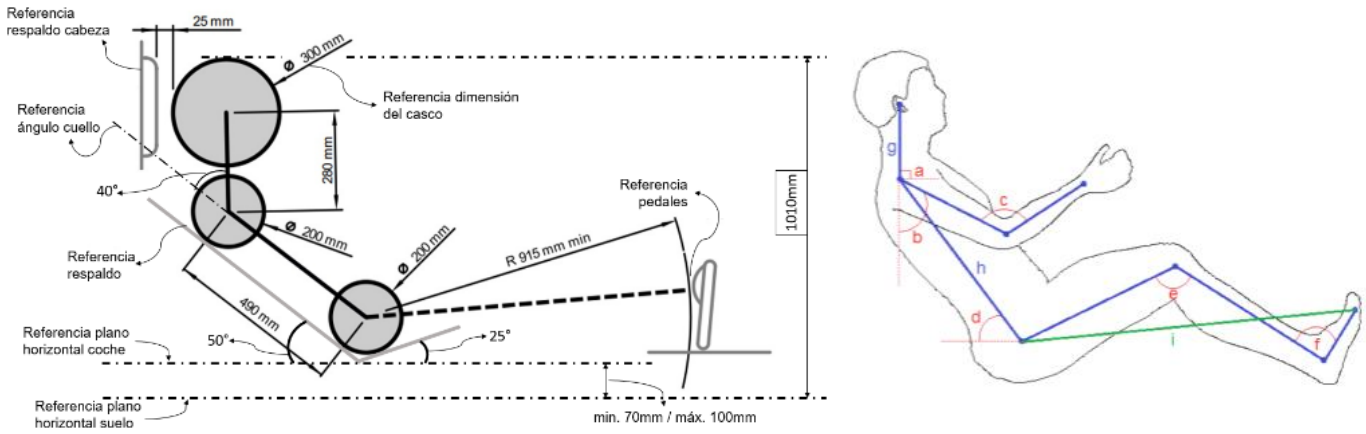


Illustration3

4.1.4 Visibility

The driver must have access to a lateral visibility arc of at minimum **180º, which means 90º to both sides.**

Attached is a drawing for an illustrative calculation of the driver's front field of vision.

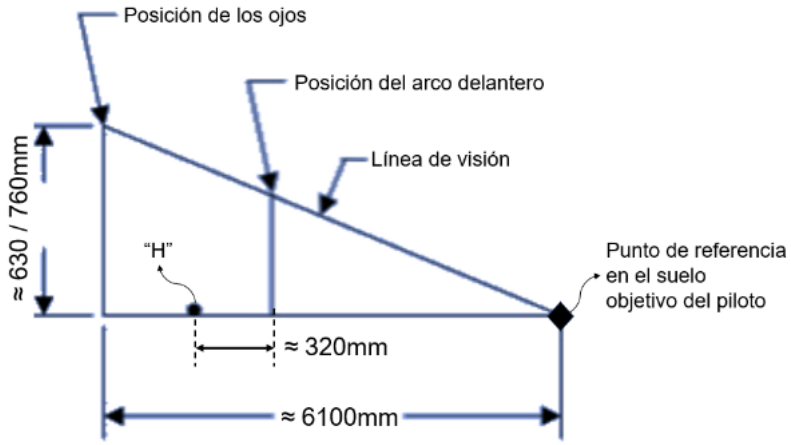


Illustration4

4.1.5 Rear sight elements

The vehicle must be fitted with **two rear-view mirrors or rear cameras,** one on each side of the vehicle in symmetrical position with the vehicle's longitudinal line. The rear-view mirrors, cameras, or screens must be positioned such that the driver has a clear vision of them without needing to modify their driving position and that they provide a rear view without obstructions.

4.2 STRUCTURAL ELEMENTS OF THE VEHICLE

4.2.1 Definition of structural elements of the vehicle

Frame:

Structural element of the vehicle designed on one hand to shelter the driver and, on the other, to act as a frame for the other vehicle systems, such as suspension, braking systems, steering system, motor, transmission, active and passive safety, coachwork, etc.

Assembly may consist of one single piece manufactured with composite or metal materials welded together of built with 2 or more structural elements (sub-structures), one of which must be the cockpit (driver's cabin).

Cockpit:

This is the frame element that guarantees the driver's safety and the structural integrity of the frame as an ensemble consisting of the aforementioned systems. The following must be installed in the cockpit: steering systems (wheel), seat, safety harness, headrest, pedals, and other controls that allow the driver to adequately drive the vehicle.

It must at all times protect the driver from possible impacts, detached parts or spilled liquids, as well as prevent entry of objects that could harm the driver during the event, whether static or dynamic tests.

To guarantee this and other safety functions, there must be side, front, rear, and bottom (floor) closure panels installed.

Upper panels must be installed in areas that do not impede or hinder the entry or exit of the driver. Normally, these upper panels are only installed in the front zone to protect the driver's legs.

Bodywork:

More exterior vehicle element. Besides aesthetics, its main roles include aerodynamic protection and, in some cases, a structural role to hold other elements of the vehicle. It is also widely used to carry small loads or allow the marshals to push broken vehicles that cannot move on their own.

It should be designed and manufactured such that it constitutes an additional protective element for the driver and any individual who interacts with the vehicle during handling, inspection, maintenance, and use (mechanics, marshals, audience), protecting them from hot parts, moving parts, electrical or delicate elements that could jeopardise the vehicle's proper operation or pose bodily harm. This being identified, the structural rigidity of the bodywork at key points must be considered during the project phase and when selecting materials.

4.2.2 Frame design

No commercial or derivative frame may be used. The frame must be self-manufactured.

The frame design must be the team's own manufacture prototype. Frames from previous editions may only be entirely reused on justified grounds. The frame must be at least re-manufactured or improved in some way based on experience from the previous year. **Modifications to the frame must be notified to the organisation, who will conduct a study to determine whether or not the frame is valid for use in the test.**

There are no limitations on the frame design, provided (for safety reasons) that the driver is in seated position, meaning that the weight of the torso must be partially borne by the back and the back thighs of the driver.

The frame must provide protection to the driver in the event of impact from any direction.

Any bar or element against which the driver may have contact or impact during normal use or in an accident must be cushioned with fire-resistant foam or similar, at least 10mm thick, such that no part of the driver's body can hit against a surface that is not sufficiently cushioned and can absorb part of the energy from the blow.

Exceptional cases must be notified to the EUSKELEC organisation to assess whether the degree of protective safety is satisfactory.



Illustration5

The frame must have a panel to act as the floor of the cockpit, securely attached to the structure. This panel must cover all the surface area necessary to guarantee that no part of the driver's body can contact the floor under any circumstance. Moreover, it must be sufficiently rigid that it does not deform under the driver's weight. The maximum permitted deformation is **5mm** under circumstances of normal use: getting in and out of the vehicle, resting feet in the pedal zone... The base must have a hole for draining liquids.

Under no circumstances shall designs with exposed sharp or cutting edges that could pose danger to any participant in the test, official, and/or member of the public be accepted.

No loose element may be incorporated inside the vehicle.

The vehicle's structure must be sufficiently resistant to withstand the loads to which it will be subjected during the competition.

All kinds of protection that are added both to protect the frame from possible incidents and to protect the bodywork will be accepted.

If there is doubt regarding the safety of the submitted frame, the organisation may require modification or reject use of said frame for participation in the competition.

4.2.3 Roll Bars

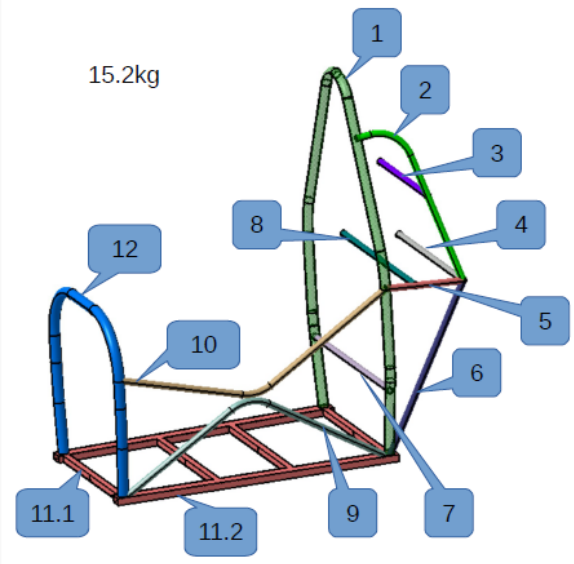
It is **mandatory** to follow the instructions provided on the **construction blueprints attached to this** document.

At minimum, the driver's cockpit must be fitted with two **roll bars:** a front bar and a main bar.

Each bar must be **made of one single curved part,** with no discontinuities in the main element. Bars made of several sections joined together are not allowed, nor bars with **holes, cuts, or welding** on the bar's main element, except for unions with **side and rear reinforcements of the frame** when necessary.

The bars must be made with the following dimensions and materials or greater:

Material	Profile	Minimum yield strength	Side/outside diameter	Thickness
Steel	Round	260 MPa	> 30 mm	> 2mm
Steel	Square	260 MPa	> 30 mm	> 2 mm



id	Qty.	Mat.	Dimension (mm)	Mass (kg)
1	1	acero	Ø30.0x2.0	3.133 (2.4m)
2	2	acero	Ø20.0x2.0	0.5 (0.6m)
3	1	acero	Ø20.0x1.5	0.247
4	1	acero	Ø20.0x2.0	0.434
5	2	acero	Ø20.0x2.0	0.226
6	2	acero	Ø20.0x2.0	0.471
7	1	acero	Ø20.0x1.5	0.4
8	1	acero	Ø20.0x2.0	0.5
9	2	acero	Ø20.0x1.5	0.631 (1m)
10	2	acero	Ø20.0x1.5	0.588 (0.9m)
11.1	4	acero	20x20x1.5	3.7
11.2	2	acero	40x20x1.5	
12	1	acero	Ø30.0x2.0	1.865 (1.5m)

Illustration6

The recommended steel quality for other frame construction elements is**E275**/S275, DIN St44-2, ASTM A572 Grade 42.

Thicknesses greater than 1.5mm are recommended for steel elements.

If using thicknesses less than recommended, event management must be informed beforehand, and the team must submit a technical report to justify the dimensions of the structural elements that are less than recommended.

The front bar must securely hold the securing elements of the steering column and be securely joined to the other structural elements of which the frame is composed.

The main roll bar must, at minimum, protect the driver in the event of a rollover, act to hold reinforcement elements, and have a place to attach the headrest, as well as also be securely joined to the frame's other structural elements.

The main roll bar must be placed at a distance less than 150mm immediately behind the back of the driver's head with a helmet. This must cover at least the total width of the driver's shoulders. And **it must prevent the head from passing through with the headrest,** which must be a part of the frame and completely stop any movement of the back part of the driver's head in normal driving position.

It must also be **vertical** or tilted toward the back at **no more than 10º** and extend under the driver's lowest part. This rear bar requires two reinforcements toward the back of the frame. The reinforcements must form a **minimum 30º angle** in terms of the vertical when seen from the side, or a minimum of **80mm** in the bottom area behind the safety roll bar. Maximum height from the union of the reinforcements with the safety roll bar must be **less than 160mm**, measured from the highest point of the bar.

If a safety roll bar with dimensions other than those set forth in the blueprints provided by the organisation is designed, a technical report must be provided at least 8 weeks before the main event, showing its equivalence in terms of the rigidity and durability of the materials proposed in these regulations to be validated by the organisation.

Side reinforcement bars pointing toward the front part of the vehicle must be installed, following recommendations to construct reinforcements on the back part of the roll bar.

In terms of configuration for these reinforcements, the alternatives shown in the images below are allowed:

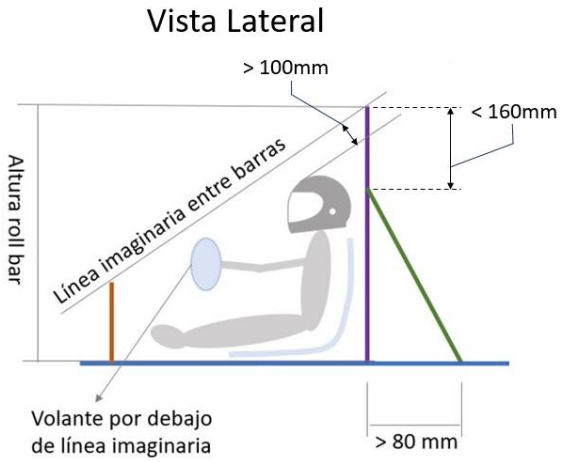


Illustration7

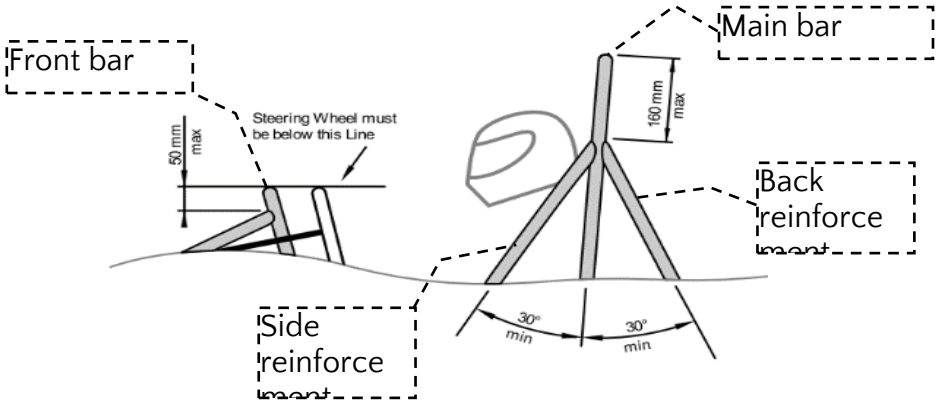


Illustration8

Construction recommendation: Do not leave any "loose" joints.

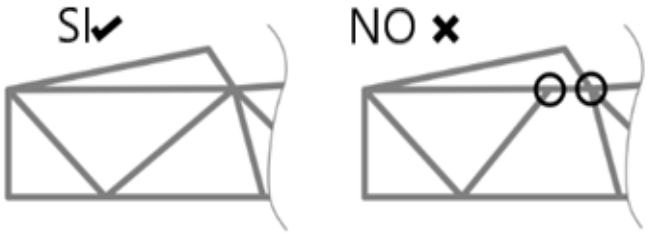


Illustration9

The second front safety bar is placed on the front such that the imaginary line joining both bars will not allow the helmet any nearer than 100mm to the floor in the event the vehicle upturns. The wheel also cannot leave the imaginary line joining both bars in any position (turning and straight).

The safety roll bar must comply with the structure and minimum dimensions shown in the following image:

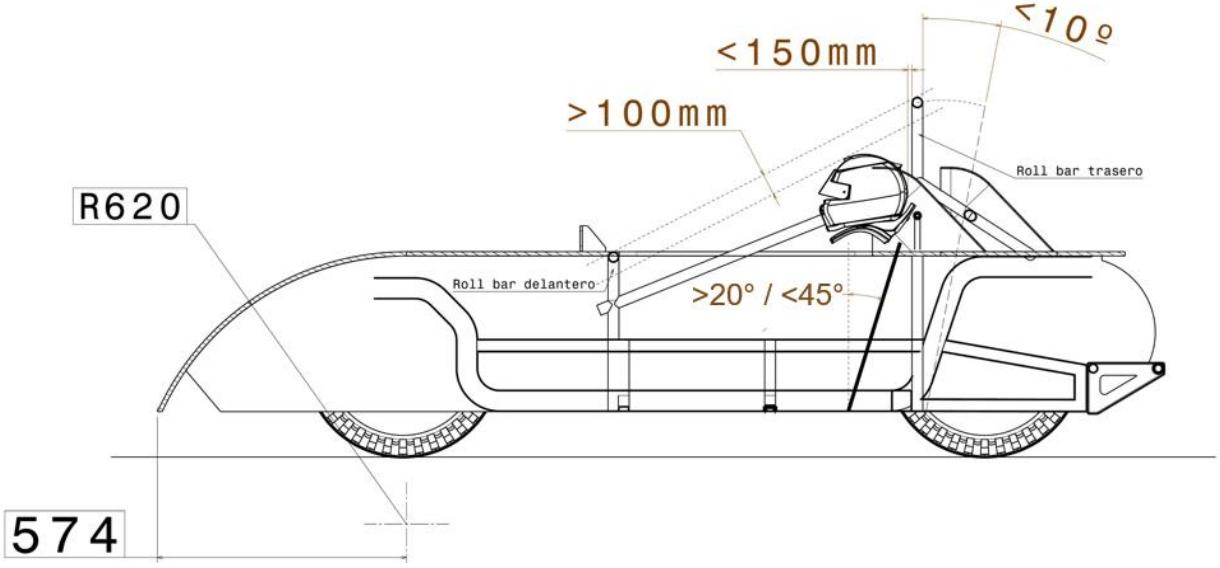


Illustration10

The roll bar must be welded to the frame. The front bar and the rear bar must be joined by a sufficiently resistant structure so that, in the event of an accident, the driver cockpit remains unaltered.

The joints of screwed pipes must comply with the examples below. Screws must be a minimum M8 diameter and minimum 9.8 grade.

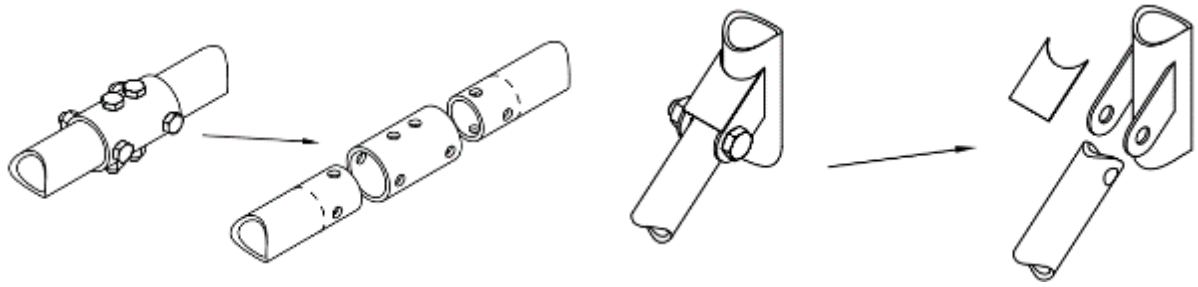


Illustration11

Riveted joints between the main frame components are not permitted. Where welding is not possible or there is insufficient space for recommended joints, rivets are permitted provided they are made of steel, structural, and can withstand a tensile load of >14kN and have a minimum shear strength of >2kN, always with diameters greater than 9mm. Teams whose vehicles have these characteristics must submit a technical report to the organisation for study and assessment before manufacture.

For joints constructed of materials made of fibre and resin, they must incorporate metal joining elements for connection to other structural elements, such as inserts. The attachment points must correspond to the ones shown in the figures below.

The fibre/resin structure must have firmly secured metallic inserts that act as structural anchoring points.

The fixing screws must be M12, grade 12.9.



Illustration12

4.2.4 Materials

The cockpit must be manufactured with steel matching the characteristics and grades set forth in section 4.2.3.

Other structural elements may be manufactured with steel. Other alloys are considered alternative material and require the execution of testing and additional documentation in coordination with EUSKELEC management to provide proof that the structural characteristics are satisfactory.

For remaining areas of the vehicle, and to foster innovation and development of new manufacturing techniques, the use of materials such as steel alloys, aluminium alloys, titanium alloys, magnesium, ceramic materials, and carbon-fibre or aramid-fibre composite materials, among others, is permitted.

Compound materials require submission of a test to prove that they have the same or greater mechanical strength as their steel equivalent.

Wheel axles must be made of steel and must be firmly secured to the frame, subframe, or steering knuckles, with no possibility of bending. Bearings may not be used to secure any axle that allow lateral movement of the axle.

4.2.5 Cockpit

The driver's seat must be firmly secured to the frame structure and the vehicle's roll bar.

The driver's backrest must have a minimum angle of 20 to 45º toward the rear of the vehicle, relative to the vertical.

The seat must fully accommodate the two circles (backrest and lower seat section) of the DUMMY in the figure below and in section 4.1.3. Neither circle may be left unsupported or overhanging.

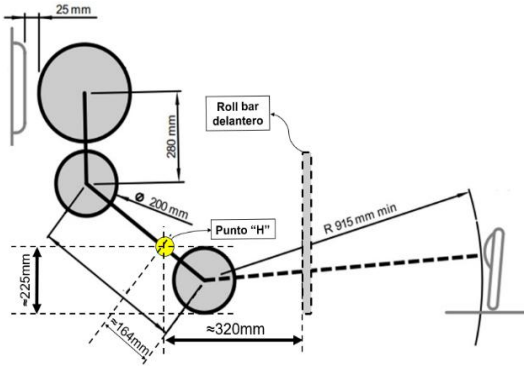


Illustration13

Reference to front roll bar and "H" point: (approximate dimensions, design not to scale)

Please check the driver's position as follows. The inspection template must be positioned thus:

· The lower 200mm circle must be placed on the lower part of the seat, where the distance between the centre of this circle and the distance from the pedals is no less than 915mm.

· The central 200mm circle, representing the shoulders, must be placed on the seat.

· The upper 300mm circle must be placed no more than 25mm from the head. In the restraint system, this is normally where the driver's helmet would be positioned while driving.

The Display indicator component *and ElEUS20 display wiring* must be located inside the cockpit, be visible to the driver, and accessible to the organisation at all times.

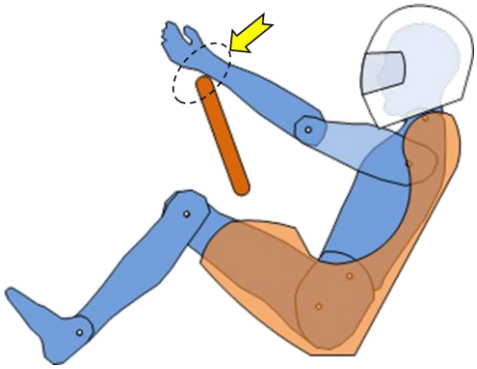


Figure A

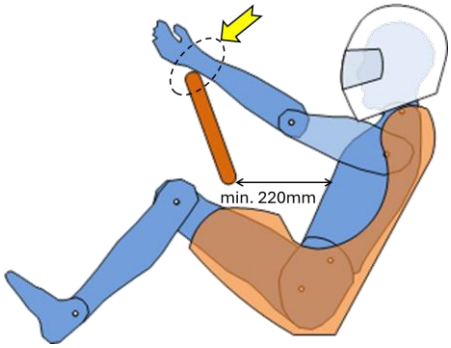


Figure B

Illustration14

The distance between the bottom part of the steering wheel and the driver's chest can be no less than 220mm, as shown in Figure "B."

Foot and leg area

The driver's feet and legs must be entirely inside the main structure when the driver is seated normally, and their feet touch the pedals.

In side and front views, no part of the driver's feet or legs should protrude above or outside the driver cockpit structure. Preferably, this area should be enclosed by anti-intrusion side panels.

In front view, the front protective structure must remain below the upper level of the driver's pedals.

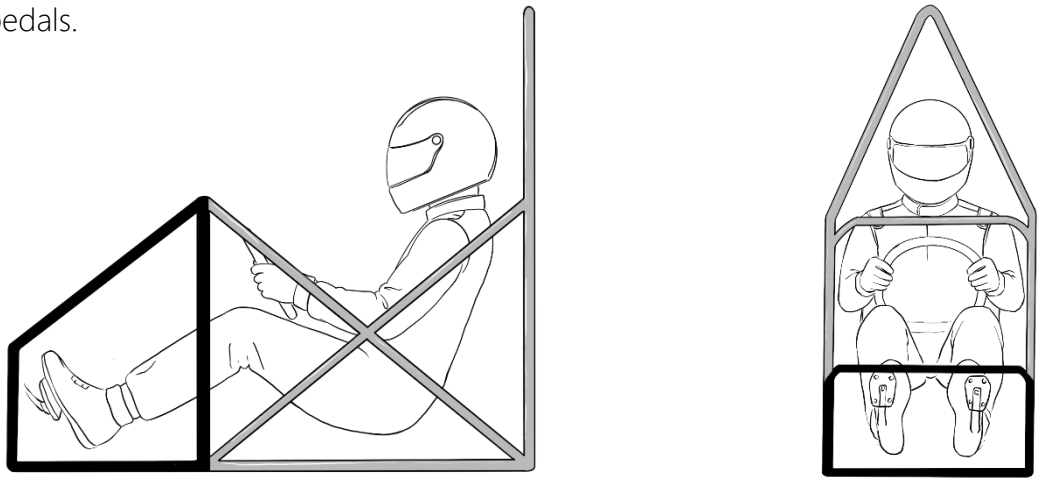


Illustration15

Fireproof bulkhead

The vehicle must have a fireproof bulkhead to separate the cockpit from all components in the transmission system, the hydraulic circuits (except for those belonging to the brake and shock absorber systems), flammable liquids, batteries, and any other component located in the back of the vehicle.

This fireproof bulkhead must completely cover the separation area between the cockpit and the rear of the vehicle, preventing any element from the rear of the vehicle from coming into or intruding into the driver area.

.The material used in this area must be steel with a quality equivalent to the quality specified for other frame construction elements. Using E274/S275 steel, according to DIN St44-2 or ASTM A572 Grade 42, with a minimum thickness of 1.5mm, is recommended.

You may use alternative materials, provided you previously notify Euskelec management and submit a technical report to justify and validate that their mechanical and strength properties are equivalent to or greater than those of the specified material.

4.2.6 Weight

Vehicles must weigh at least 150kg and at most 250kg under running condition. The vehicle will be weighed with each of the drivers inside, wearing the same clothing they will use during the tests, including helmet and gloves. Four automotive scales will be used for weighing.

If ballast is required to reach the minimum weight, it must be placed inside the vehicle and outside the driver's reach, such that it does not hinder the driver's driving or pose a danger to them. The ballast must be properly secured to the vehicle's frame. It may be bolted or clamped or attached in another way. Once this ballast has been installed, the championship's technical management will seal the component, and it cannot be extracted or modified in any way throughout the course of the championship.

4.3 STEERING, TRACTION, SUSPENSION, AND BRAKES

4.3.1 Steering

While there are no restrictions on the kind of steering system to use (rack and pinion, direct, etc.), it must be firmly secured with no appreciable flex or play of any kind (torsion in the column, flex in the steering rod when reaching stops). The steering wheel must be mechanically connected to the steered wheels. Cable connections are not permitted. The steering system must be designed to have a turning radius in both directions, as set forth in section 4.7.3 of the regulations.

The steering and suspension system must be designed to avoid all contact between the tyre and the suspension, bodywork, and frame area, during any movement of the steering or suspension.

The minimum distance of the tyre to any element of the frame, bodywork, and suspension and transmission elements must be 20mm.

The steering wheel may be fixed or removable, but in any event, it must be securely attached and rigidly connected to the steering shaft. The steering wheel must be operated with both hands at once with a turning motion and must not, under any circumstances, touch the driver's legs or knees.

Handlebars, levers, steering bars, joysticks, indirect systems or electrical systems are not permitted.

4.3.2 Wheels

All vehicles must have four identical wheels (rim and tyre set), with tyres up to 10" and overall assembly diameter between 390 and 450 mm. Tyres must be road-legal models, either slick or treaded, but never knobbly. Conventional tube or tubeless tyres are permitted. Bicycle rims are prohibited.



Illustration16

Minimum tyre pressure is as specified by the manufacturer for each case. Maximum tyre pressure permitted is 4.9 bar or the maximum pressure permitted for the tyre, whichever is lowest. The organisation reserves the right to check tyre pressure at any time during the championship.

4.3.3 Motor and transmission

The only motor and motor controller permitted are supplied by the organisation and none of their components may be opened or modified.

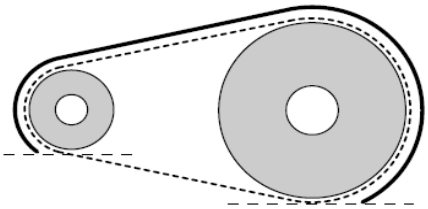
All power cables for the traction battery and electric motor must have orange outer insulation. This wiring cannot be modified without the organisation's express authorisation, and it cannot be wrapped with tape or sleeves not intended for this purpose.

The position of the motor and controller must provide easy verification of the inspection seal applied by the organisation. Any type of transmission system to driven wheels is allowed.

The drivetrain must be protected so that it is never possible at any time for fingers, hair or clothing of the driver of any individual near the car to enter into contact and become trapped in the system. Protection must also provide protection in the event of breakage of any drivetrain element.

The protection must be metal to withstand possible drivetrain breakage. The metals used may be steel with a 1.5mm minimum thickness, or aluminium with a 2mm minimum thickness. No part of the drivetrain should be accessible when the protection is in place.

This protection must be removable for adjustment, maintenance, and inspection work.



It should not be possible for the chain or belt to reach the driver without being intercepted by this protection.

4.3.4 Accelerator

It is mandatory to use the EUS20 accelerator pedal, unless expressly authorised otherwise by the organisation. Please remember that, as part of the power kit, it is strictly forbidden to dismantle or modify it.

4.3.5 Suspension

The vehicle must be equipped with fully operative front and rear suspension systems, consisting of at least one articulated component, a shock absorber, and a spring with at least two tyres on each axle.

Suspension may either be independent or a solid axle.

It must have minimum total vertical travel of 25mm, obtained through the kinematic movement of the articulated element, regardless of whether the shock absorber or springs are fitted.

Operation of suspension may not be blocked by the use of rigid components that inhibit the movement of articulated joints during dynamic tests.

4.3.6 Brakes

Vehicles must have a **hydraulic brake** system that acts on the four wheels simultaneously and with one single control.

All components used must originally be used in **automotive, motorcycle/scooter, karting, or FIA/FIM/FIK/FISD category competition** systems. For self-manufactured braking components or systems, a technical study on forces, pressures, materials, and joints must first be conducted and approved by the EUSKELEC organisation. **Under no circumstances are brake elements or components used in bicycles or other human-powered means of transport accepted.**

The braking system must have dual circuits and, although activated with one single control, the front system must be independent from the rear system, so that in the event that one axle fails, the other continues to operate. Crossed systems are also permitted (front left wheel with right rear wheel and front right wheel with rear left wheel). No electrical intervention of any kind is allowed in the brakes (ABS, braking assistance systems, etc.).

The driver must be able to operate the brakes without removing their hands from the steering wheel.

The brake system must be capable of **entirely stopping the vehicle at a speed of 20 km/h, without deviating from its trajectory, within a distance of no more than 8 metres.**

The action of braking must be indicated by a red light. This signal must be clearly visible in daylight and must consist of at least one **light** at the rear of the vehicle, visible to other championship drivers.

Braking torque at each wheel must be **greater than 120Nm.** The organisers may verify this at any time during the competition.

4.4 ELECTRICAL SYSTEM

4.4.1 Electrical component requirements

The vehicle's propulsion system must be easily and entirely accessible to conduct inspection tasks and measurements on the electrical components.

The vehicle must have the following electrical installations, at least:

- Traction electrical system, consisting essentially of:
  - *EUS21 three-phase permanent-magnet motor*
  - *EUS21 Guilera motor controller*
  - *EUS20 Alterity lithium battery*
  - *EUS20 traction contactor*
  - *EUS20 complete accelerator pedal*
  - *EUS210 Alterity electrical wiring harness assembly kit*
  - *EUS20 display and display wiring*
  - *EUS20 manual maintenance disconnect switch*

These components are supplied by the organisation, and no additional motorisation, power supply or energy storage system may be incorporated into the traction system.

It is mandatory to use all components provided by the organisation unless expressly authorised otherwise.

- **Auxiliary electrical system:**

This system can be powered either by a nominal 12 V DC auxiliary batter, as set forth in section 4.4.2, or with a 12 V, 3 A maximum DC/DC converter integrated into the controller, as set forth in the Euskelec electrical blueprint.

The following components are mandatory:

- At least one rear position light, as set forth in section 4.6.10, which must be illuminated whenever the vehicle is in position.
- At least one rear brake light, in accordance with section 4.6.10.
- Horn, in accordance with section 4.6.6.

All buttons, switches, and/or controls must be accessible to the driver while wearing the safety harness.

All remaining electrical and/or electronic components installed in the vehicle in this system or others must be shown on the blueprint with their power consumption, voltages, and operating current.

All components must be correctly fixed to the vehicle's frame and/or bodywork, avoiding plastic cable ties. They must be accessible and electrically verifiable without being removed.

Vehicle wiring must be protected, secured, and properly routed. Wiring must be located within the cockpit and exposed connections avoided at all times (bare wires, wiring routed on the outside of the vehicle, unprotected connections, etc.).

All electrical installations must be accessible. They may be covered by removable covers.

You may be asked to remove them during inspections.

Terminal protectors must be used on all motor and battery connectors or terminals connected to the controller.

It is not permitted to use the frame as a conductive element for any electrical circuit in the vehicle, whether positive or negative.

The use of a digital voltmeter, ammeter, and speedometer with their own power supply is allowed. They must be firmly secured to the structure of dashboard, and their batteries must not exceed 50 Wh and 14 V.

The vehicle's electrical system must be suitable for operation under wet weather conditions to prevent malfunctions.

4.4.2 Electrical energy storage systems

The vehicles must have the following energy storage systems:

Mandatory:

- Traction system battery:

It is mandatory to use the battery provided by the organisation. No additional or alternative energy storage system may be connected to it.

Any modification or tampering with the traction system battery is strictly prohibited, as is extracting energy from it outside the traction and control circuit specified in the Euskelec power kit.

It must be possible to quickly remove the battery. The organisation may request its removal at any time.

It is mandatory to use the battery charger supplied in the kit. You may never charge this battery with a different charger or modify the charger. The organisation may request inspection of this component at any time.

All power cables for the traction battery and electric motor must have orange outer insulation. This wiring cannot be modified without the organisation's express authorisation, and it cannot be wrapped with tape or sleeves not intended for this purpose.

The vehicle must be equipped with an auxiliary battery or energy storage unit of at least 12 V-4 Ah, along with a protection system and end connector as set forth in section 4.4.3.2. 5G Camera.

Auxiliary battery: an energy storage system must be used that is designed exclusively to power the vehicle's auxiliary services (position and brake lights, horn, 5G connection, others as applicable). Under no circumstances may this battery be used to feed power back into the traction system or main battery. Additionally, this system must have overload protection, in accordance with section 4.4.3.

Some devices may be powered by batteries other than the propulsion or auxiliary batteries, provided that they use internal batteries. These devices may include: radio communication systems, data acquisition systems and/or monitoring systems. The use of these systems is subject to the organisation's specific approval upon submission of the electric blueprint.

Location of the different batteries:

- Maximum height of the battery above the ground may be no greater than 400mm.
- It may not be located in front of the driver's seat.
- It may be under or behind the driver's seat, always protected by a firewall/bulkhead, securely attached to the frame or cockpit and easily accessible to marshals.
- It may be located on the sides of the vehicle, outside the cockpit, but inside the area protected by the anti-overlap side protection structures.
- Batteries must be easily accessible and removable for any inspection required.

Team members handling batteries must use appropriate protective gloves and safety goggles specifically designed for this purpose.

4.4.3 Electrical protections

The Euskelec power kit already has the short-circuit and overload protections required for use in the competition. They cannot be tampered with or eliminated in any way.

All the vehicle's electrical system must be protected against short-circuiting. This protection may be a fuse or a circuit breaker. Automatically resetting devices are prohibited.

The short-circuit protection must be installed in the positive conductor and as close as possible to the batteries. The protection device's range of action must be selected such that the fuse is capable of interrupting the short-circuit current required to open the device at any time.

All the vehicle's electrical system must be protected against overloads, either by using electrical controllers to keep current levels within specified limits or with appropriately rated fuses.

The propulsion battery must have both the positive and negative conductors electrically isolated from the vehicle frame and the auxiliary battery circuit.

All electrical boxes, or at least their covers, must clearly be able to display circuits and the components of which they are comprised through easy disassembly, such that the circuits can be traced. The protection device's range of action must be selected such that the battery is capable of supplying the short-circuit current required to open the device at any time (the fuse must be selected to suit and protect the circuit, and the fuse must be able to be interrupted by the current supplied by the battery).

The wire cross-section must be sufficient to carry at least the current for which said circuit was designed. For the power circuit, both the DC stage and the three-phase AC stage must have a minimum cross section of 10AWG or 6mm2mm^2 of copper per conductor.

4.4.3.1 Maintenance disconnect

This element is supplied with the power kit and must be used to guarantee that the vehicle is de-energised before conducting any work. More details on its installation in section 4.6.8.

4.4.3.2 5G camera

The teams must have a 5G video camera installed by the organisers, subject to availability.

It is mandatory for the vehicle to have an auxiliary battery or energy storage battery with minimum capacity of 12 V-4 Ah.

At minimum, this battery must provide power to the camera and 5G router throughout all Phase-2 tests.

Technical specifications are as follows:

Device	Consumption	Observations
Router RUTX500	12VDC (+9 - +15VDC)	Idle: < 4W, Max: 18W18/12=1.5A
UHD-NDI3-IP67 Camera	12V 2A	2A
Tknika car kit (total)	**12*3.5=42W**	**Maximum: 3.5A**

A circuit with a protection system and a final connector to be defined

must be installed.

4.5 BODYWORK

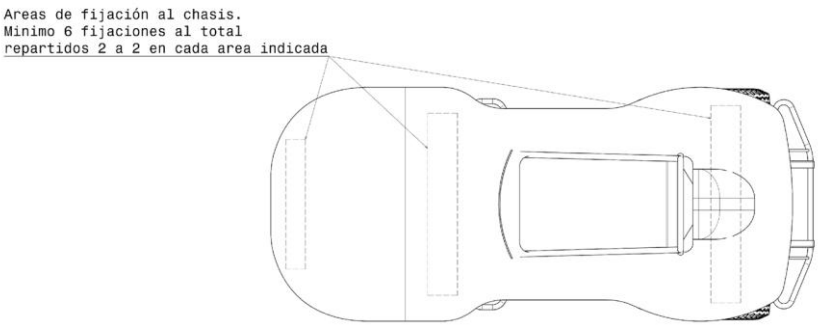
4.5.1 Design

The organisation provides the exterior design of the bodywork with blueprints. It is mandatory to comply with the established dimensions and shapes.

Any material set forth in section 4.2.3 of the regulations may be used to manufacture the exterior bodywork, provided it is sufficiently robust to withstand a load of 15kg in any area of the bodywork without breaking or causing fractures under normal competition conditions.

For wheel arch areas, the bodywork must be able to withstand a 15kg load without permanent deformation. Moreover, with the suspension in its fully compressed position, the minimum distance between the wheel and the bodywork cannot be less than 20mm.

The bodywork must have 6 anchoring points to the frame. These anchoring points must be placed in the 3 zones indicated on the blueprints. Attachments must be sufficiently strong and secure to withstand vehicle movement throughout the entire competition. These attachments between the bodywork and the frame must be designed such that they can be easily fitted and removed for inspections or checks required at any time during the test.



The entire frame must be externally enclosed. To this end, any material described in section 4.2.3 of the regulations may be used.

All mechanical elements, motors, bolts, chains, wheels, and batteries must be kept out of the driver's reach from the driving position. There must be no line of sight between any mechanical drivetrain element and the driver.

The bodywork must provide the driver with 180º visibility at minimum and correct driver evacuation in accordance with section 4.6.3.

Designs with sharp or cutting edges that may pose a danger to other participants are not allowed. For safety reasons, all bodywork edges and finishes must be rounded with a minimum 5mm radius, both inside and outside the bodywork.

A protection must be fitted to the rear part of the vehicle, which must cover the entire rear track width and be no more than 200mm from the ground.

It must be made of steel or aluminium with sufficient strength to withstand the driver's standing weight, with both feet on it.

KART bumpers are permitted as long as they are fitted with all their original components. Only modifications to the Euskelec frame to accommodate these safety components will be accepted.

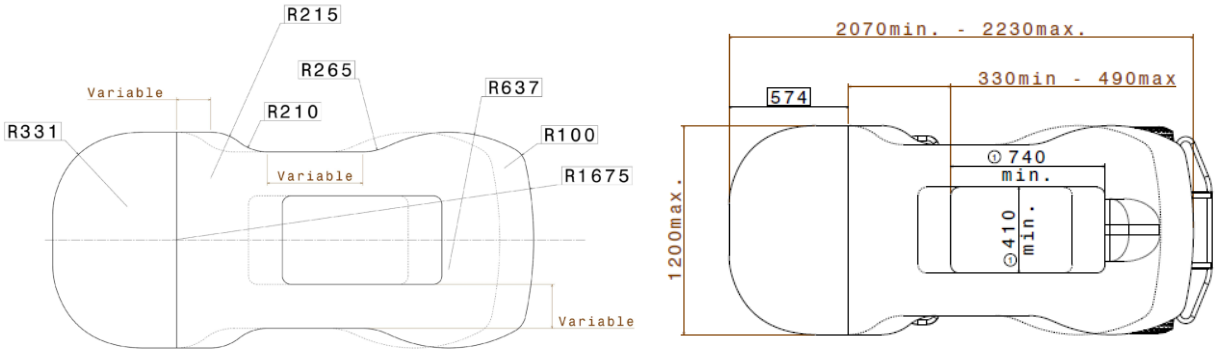


Illustration19

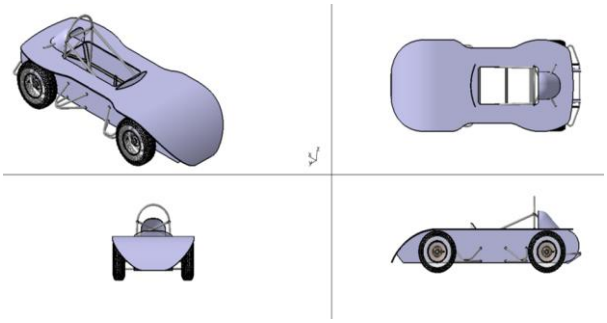


Illustration 20

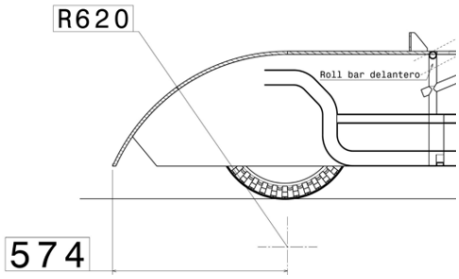


Illustration 21

If there is doubt regarding safety, the organisation may require modification or reject use of said component for participation in the competition.

Bodywork elements and frame enclosures must be manufactured with elements and materials commonly founded in the professional automotive sector. Any other "unusual" or novel material or manufacturing method must be discussed with event organisers before carrying out Phase 2. Non-compliance may lead to the team being disqualified from the dynamic tests during Phase 2 of the event.

If you have any questions about bodywork manufacture, please contact the organisation by email at

4.5.2 Cockpit side enclosure

Vehicles must have complete enclosure around the side areas of the cockpit to prevent the intrusion of any object from outside the driver's cockpit from below or through the sides of the bodywork.

The anti-intrusion protection zones must be manufactured with materials that guarantee adequate resistance to impacts and intrusion.

The selected material must have mechanical properties equal to or greater than those set forth in section **4.2.5 Cockpit - Fireproof bulkhead** of these regulations. Use of materials other than indicated must be notified and approved in advance by **Euskelec Management,** along with a technical report demonstrating the suitability and resistance to intrusion.

4.5.3 Mandatory stickers and race numbers

Each vehicle must include **3 identifying race numbers** on the bodywork: one on the side of the vehicle, another on the front, and another on the rear. These are provided by competition organisers.

Race numbers must not be installed horizontally or such that the vehicle is difficult to identify when in movement during the tests.

In order to accommodate the mandatory championship stickers and identification of the educational centre, the race numbers, and the championship's technical inspection marks, a **15x21cm space (A5 landscape)** on each side of the vehicle, a 15x21cm area on the front, and a 15x21cm area on the rear must be reserved. The teams' race numbers must be visible from both sides and from the front of the vehicle. The organisation will provide them the day of the event.

Race numbers are assigned based on the finishing position in the previous edition of the championship or based on order of registration if the team did not participate previously.

4.5.4 Identification

The name and logo of the educational centre represented must be displayed on all prototypes. The logo or initials must occupy a minimum area of **120mm** in height and width.

There must be a space on the frame for technical inspection stickers. No element identifying the components supplied by the organisation can be covered with paint or adhesive film.

4.5.5 Advertising

The inclusion of advertising or promotional content related to **alcoholic beverages, tobacco products, or betting services and establishments** is **strictly forbidden,** both on the vehicle and in any other **corporate media or communication materials of the team.** It is strictly forbidden to include advertising or any other kind of message that violates human dignity (violence, intolerance, xenophobia, racism, etc.) or that may offend certain people, both on the vehicle and in any other corporate media of the team. Additionally, the organisation reserves the right to review and analyse advertising content and prohibit it at its discretion.

4.6 SAFETY EQUIPMENT

4.6.1 Driver equipment

The driver must wear a closed protective helmet with an integral, non-removable chin guard and integrated visor/face shield. The helmet must be approved for use and may be either a motorcycle or motorsport helmet, and must comply with one of the following homologation standards:

- SFI SPECS-31.1/2010, 31.1/2015, 41.1/2010, 41.1/2015
- FIA -FIA 8860-2004, FIA 8860-2010, FIA 8860-2018, FIA 8859-2015, FIA 8870-2018
- Snell-, M2015, M2020, SA2010, SAH2010, SA2015, SA2020, CMR2016, K2015, K2020
- UNECE 22.05 Type P -ECE 22.05/22.06
- JIS T8133 2015 Type 2 Full face
- FIM FRHPhe-01

It is mandatory to use a karting-type neck brace or HANS restraint system homologated to FIA 8858-2002 / 8858-2010. **This restraint system is valid provided that the helmet is equipped with the required attachment pints and that the helmet and HANS system are compatible.**

It is mandatory to use a fire-resistant balaclava compliant with FIA regulations.

The driver must wear a full one-piece suit compliant with FIA homologation requirements. The suit must be fire-resistant, and **the use of fire-resistant underwear is advised.**

The driver must wear gloves compliant with FIA or FIM regulations.

-FIA 8856-2018

-FIA 8877-2022

Footwear that entirely covers the foot and complies with FIA regulations or applicable footwear safety regulations is mandatory.

- FIA Standard 8856-2000
- FIA Standard 8856-2018
- ASTM F2413-18 minimum recommended: EH / I/C (US)
- EN ISO 20345:2022 minimum recommended: SR / S1P o S1PS / CR
- EN ISO 20345:2012, if a purchase receipt dated before March 2023 is provided

All clothing used by the driver must comply with and bear the label of one of the following FIA certifications:

-FIA 8856-2000

-FIA 8856-2018

-CIK-FIA N2013.1--FIA 8877-2022

4.6.2 Safety harness

The vehicle must have a safety harness with at least 4 attachment points to keep the driver in their seat in the event of an accident. The safety harness must be specifically manufactured for use in motorsports with FIA standards and certificate. Under no circumstances may its original specifications be tampered with or modified. It must prevent any upward or forward movement of the driver's chest. Any slack in the harness must be adjusted with the device's length adjuster. The adjuster must be placed as close as possible to the attachment point.

When the harness is fasted, the buckle mechanism should be on the soft part of the thorax (navel), above the waist and never above the ribs and/or hips, i.e., in the navel area.

The 4 independent straps must be firmly attached to the vehicle's main structure as shown in the photo below, with the specified dimensions:

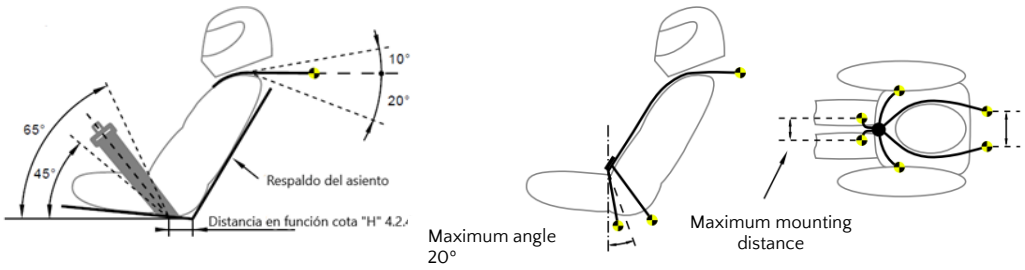


Illustration 22

The safety harness must always be worn tightly and fastened and buckled to prevent the driver's free movement when the vehicle is in motion.

The safety harness must be able to withstand a minimum load of 70kg at each one of the attachment points.

4.6.3 Driver evacuation

The driver needs to be able to exit the vehicle at any time and without aid in less than 12 seconds without removing the bodywork. The driving position must provide for the driver to be easily evacuated by emergency services if necessary.

4.6.4 Towing points

It is advisable to have a clearly visible front and another rear towing point. These elements must be capable of withstanding towing of the vehicle or able to withstand a load of 2.5KN. Examples of towing points or eyes that may be correctly used as towing points are shown below:



Illustration 23

Under no circumstances may rigid towing systems protrude beyond the bodywork's limits.

4.6.5 Traction system isolation (firewall)

There must be a metal wall or panel at least 2mm thick for aluminium or 1.5mm for steel. It must be fixed, rigid, and resistant, and separate the driver's cockpit from the traction system: motor, motor controller, battery, and associated wiring.

4.6.6 Horn

Every vehicle must be fitted with an electric horn, fitted on the front part of the vehicle, which is audible to the drivers, other vehicles, and track marshals, with at least 80 dBA, measured at a horizontal distance of 2 metres from the vehicle and 1 metre in a direction perpendicular to the ground plane.

The driver must be able to operate it with a momentary push-button.

4.6.7 Speedometer

It is recommended, although not mandatory, that the driver have a speedometer to have a reference for speed.

The speedometer's configuration must take into account the vehicle's development and outside diameter of the wheels.

4.6.8 Emergency stop

This circuit has 3 rotary switches with a latching mechanism to activate the emergency stop. They act on the motor controller and battery. There must be at least one switch visible from any angle from which a marshal may approach the vehicle. If necessary, additional switches may be added.

The 3 switches must be securely mounted. Two emergency stop switches must be located on each side of the vehicle, accessible from the outside, with a 40mm minimum diameter. A third emergency stop must be placed in the driver's cockpit and accessible from the normal driving position, with the safety harness buckled. The minimum diameter of the cockpit switch is 24mm. The vehicle's propulsion must stop when one button is pushed or two or three are pushed simultaneously, in whichever combination, and without any other control being necessary for this procedure.

The emergency switches must electrically disconnect the propulsion battery from the vehicle's electrical system or go through the emergency stop circuit. It is mandatory to follow the connection stipulated in the Euskelec '21 electric blueprint to ensure the system operates correctly while the vehicle is in motion. A sticker with the electric risk pictogram (ISO 7010-W012) must be placed on each emergency switch. Below are examples of switches and the electrical hazard pictogram that are suitable for installation.



Illustration 24

4.6.9 Maintenance stop

A maintenance stop system must be installed in the vehicle. It must be placed between the traction battery and the motor controller, securely mounted and positioned such that the disconnect can be operated without removing any of the vehicle's components.

The maintenance disconnect has a removable key to ensure that the system is de-energised at all times until work on the vehicle has been completed. When the key is removed from the disconnect, the circuit is open. After work is complete, the key must be turned again to close the circuit.

Every team must be aware of the vehicle's isolation protocol in accordance with the "Powertrain" challenge and the maintenance disconnect may be required of them at any time.

The maintenance switch must ensure electric isolation of the positive conductor in any position or state of controls, buttons, or switches.

4.6.10Position and brake light

There must be at least 1 light source at the rear of the vehicle, called the position light. This component must emit a red light when illuminated and must be visible from 50m in full daylight. The purpose of this component is to increase visibility among participants.

It is mandatory to have at least 1 brake light source, which may be shared with the position light. It must be located on the rear of the vehicle, it must be activated by a button, and a steady light must be emitted whenever the brake pedal is pressed, no matter how gently. The intensity of the light must be greater than the position light and it must be distinguishable from the position light at a 50m distance in full daylight.

Activation of the brake light must not interfere with the controller system and must be independent of the actuation sensor of the Guilera EUS21 controller.

4.7 VEHICLE INSPECTION

Before each event held at the circuit, all vehicles must undergo a technical inspection to assess whether they comply with all requirements set forth in this section of the technical and safety regulations for vehicles, given that it is essential that a technical jury validate the vehicle to grant it access to the track, whether for free practise or competition.
This inspection shall be conducted by a technical jury appointed by the organisation, which will inspect the vehicles based on the following checklist, declaring each vehicle eligible or ineligible for participation in the championship.
Specifically, the following aspects of the vehicle will be inspected:

1. The dimensions and shapes of the vehicle, as well as the total weight of the vehicle and driver with gear.
2. The presence of all mandatory mechanical elements, such as roll bars, rear-view mirrors, covers, race numbers, etc., and that they operate correctly.
3. The brake system.
4. The steering system.
5. Attachment of the safety harness.
6. Tyre control.
7. Isolation of wheels and propulsion system from the driver.
8. Driver visibility in normal driving position.
9. Proper operation of all emergency stop and maintenance disconnect controls, both while vehicle is running and before it is started.
10. The vehicle's electrical system (components, connections, wiring, component mounting, etc.)
11. Visual indication of braking.
12. Proper horn operation and compliance with required dB level.
13. Deactivation of the accelerator signal when the brake pedal is pressed. The controller automatically deactivates the motor when the brake is pressed, so fitting a brake sensor and correctly connecting it to the controller is sufficient.
14. Inspection of safety markings, stickers and seals.
15. Inspection of compliance with minimum turning radius.
16. Driver evacuation.
17. Driver equipment: suit, footwear, gloves, helmet, and neck brace.

These inspections are NOT scored and act to verify that the vehicles meet minimum technical requirements required by the competition.

4.7.1 Driver evacuation inspection

The driver needs to be able to exit the vehicle at any time and without aid in less than 12 seconds without operating any door or moving any panels. The driving position must provide for the driver to be easily evacuated by emergency services if necessary.

This inspection simulates an emergency evacuation and will be timed by an organisation judge. The driver has three attempts, where the judge will inspect whether the driver is able to leave the vehicle within a maximum of 12 seconds. If the driver does not pass this test, they may not participate in the competition.

4.7.2 Brake inspection

The braking test is to ensure that the braking system works. It is mandatory to pass this test to participate in the dynamic tests.

Vehicles must completely brake within the distances described as follows:

- Dry track: The vehicle must completely brake within a maximum distance of 8 metres at a minimum speed of 20km/h, on a track at least 1.8 metres wide.
- Wet track: In the event of adverse weather conditions that may affect the asphalt and/or driving of vehicles, the organisation reserves the right to modify this inspection in the interest of the safety of drivers and attendees. A static braking verification test may be conducted.

If the vehicle is unable to reach the indicated speed of 20km/h, the maximum permitted braking distance is calculated based on the vehicle's speed, according to the table below:

Speed (km(/h)	Permitted braking distance (m)
19	7.2
18	6.5
17	5.8
16	5.1
15	4.5

A vehicle that exceeds the maximum braking distance, regardless of the speed at which the test is conducted, that crosses the lines marking track boundaries, or that the judges determine has braked before reaching the braking line, will not pass the test and must repeat it. There is no maximum number of attempts. If a team does not pass this test, they may make necessary adjustments and rejoin the queue behind the last team waiting to conduct the test. The maximum duration of this test is limited to the time that the organisation stipulates for technical inspections.

At any time, the organisation may inspect the braking system with any appropriate test equipment or a force-based testing procedure. The braking system must have minimum braking torque of 120 Nm.

4.7.3 Turning radius inspection

With this test, vehicles must be able to complete 3 full laps between a circle with an inner radius of 3.2m and a circle with an outer radius of 4.7m (see sketch template) in both directions.

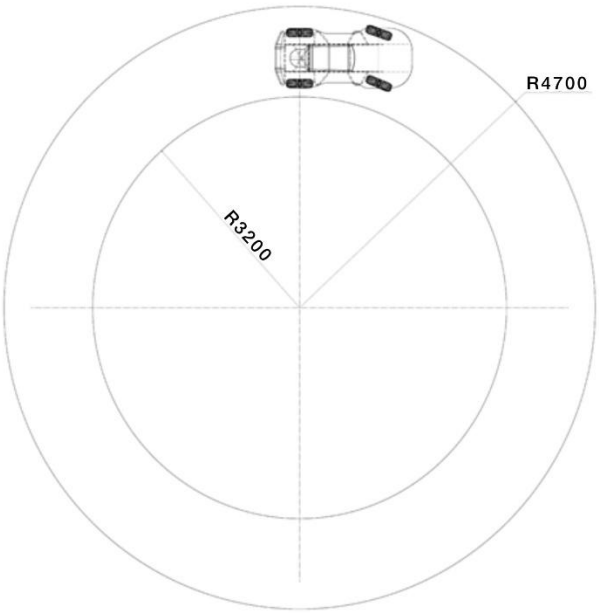


Illustration 25

The vehicle under inspection passes if it manages to follow the track without crossing its boundaries or knocking over any cones. Otherwise, the vehicle will not be deemed eligible. There is no maximum number of attempts. If a team does not pass this test, they may make necessary adjustments and rejoin the queue behind the last team waiting to conduct the test. The maximum duration of this test is limited to the time that the organisation stipulates for technical inspections.

Failure to comply with the required turning radius bears a 5-point penalty for each cone the vehicle touches. This penalty is applied to the score in Phase 2.

4.7.4 Right to inspection

The organisation reserves the right to inspect any team at any time during the championship if it deems that the driver or vehicle does not comply with the technical regulations or poses a risk to participants, the audience, and/or the organisers.

Additional inspections shall be conducted if, after passing the technical inspection, important parts have been replaced in the vehicle, such as the motor, the battery, the controller, the brakes, or other components that may affect the driver's safety. The vehicle must be approved by the organisation again.

The organisation may conduct inspections with no prior notice at any time.

4.7.5 Rectification of problems or adjustments

Teams may conduct repairs, adjustments, or modifications to their vehicles during the waiting period between inspection and verification or between tests. These periods are marked by the championship organisation, and teams will be informed before the day of the event. They may be modified during the course of the event due to unforeseen circumstances or delays the day of the event. Teams may modify any aspect of the vehicle, as long as they always follow these regulations and the championship schedule. The organisation reserves the right to conduct inspections at any time to verify compliance with regulations after any adjustments. It is the teams' responsibility to arrive at the start of each test on time. Failure to do so means teams may lose the opportunity to compete in the test and, therefore, to score points. The structural frame of the vehicle cannot be modified without authorisation from the competition (for repairs). The height of the vehicle from the ground cannot be changed, either. Adjustments may be made between tests to components such as: brake bias, the angle of aerodynamic components, tyre pressure, damper or roll bar stiffness, transmission sprocket changes, etc.

All repairs, adjustments, or modifications must be made in each team's pit area and under no circumstances may anyone outside the championship work on the vehicle.

5 EVEN REGULATIONS

5.1 EVENT GUIDE

All information regarding the running of Phases 1 and 2 of the championship is set forth in the *"Event Guide,"* which provides details on the location, layout, and schedules for different championship phases. In the event of a conflict or discrepancy between the *"Event Guide"* document and these regulations, these regulations shall prevail.

5.2 COMPLAINTS FORM

To submit a complaint to the organisation or lodge a complaint against another team, you must request the relevant form from the organisation, who will provide it.

You must also send an email to admin@euskelec.eus to provide photographs or further in-detail explanations if necessary.

The organisation will send an automatic notification of receipt by email and will attempt to respond as swiftly as possible.

5.3 CLARIFICATION FORM

For questions regarding regulations, please send an email to admin@euskelec.eus, providing photographs or more in-depth explanations.

After receiving your email and reviewing all the documentation, the organisation will attempt to respond as swiftly as possible. Moreover, teams can find support in the form of technical documents, training, and a contact form on the website www.euskelec.eus.

6 CHANGES TO REGULATIONS