FÉDÉRATION INTERNATIONALE
DE MOTOCYCLISME

TECHNICAL RULES
TRIAL

2021

RÈGLEMENTS TECHNIQUES
TRIAL

Technical Rules Trial
~~(Including rules for Sidecars~~)

Règlements Techniques Trial
~~(Règlements pour Sidecars inclus)~~

YEAR 2021		
Version	**Applicable as from**	**Modified articles**
0	01.02.2021	Redesigned and Sidecars removal
1		
2		
3		

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A.INTRODUCTION

Any references to the male gender in this document are made solely for the purpose of simplicity, and refer also to the female gender except when the context requires otherwise.

The term motorcycle covers all vehicles having, in principle, less than four wheels, propelled by an engine and designed essentially for the carriage of one or more persons of which one is the rider of the vehicle. The wheels must normally be in contact with the ground except momentarily or in certain exceptional circumstances. Furthermore, in order to traverse certain surfaces one or all of the wheels can be replaced with skis, rollers or chains.

B.DEFINITION

1. FREEDOM OF CONSTRUCTION

A motorcycle must conform to the requirements of the FIM regulations, to the Supplementary Regulations, as well as to a number of specific conditions that the FIM may require for certain competitions. No restriction is placed on the make, construction or type of motorcycle used.

All solo motorcycles (Group A1) must be constructed in such a way that they are entirely controlled by a rider. Motorcycles with Sidecars (Group B) must be constructed to carry a passenger.

2. CATEGORIES AND GROUPS OF MOTORCYCLES

Motorcycles are divided into categories and groups which must be observed for all meetings.

In principle, it is forbidden for different categories, groups and classes to compete together, unless the Supplementary Regulations state otherwise.

Category I

Vehicles propelled by a thermal engine and by the action of only one driving wheel in contact with the ground in only one direction.

Category II

Vehicles propelled by an electrical engine and the action of only one driving wheel in contact with the ground in only one direction (see Art. F).

3. CLASSES

Groups are again separated into classes according to cylinder capacities as detailed below. Generally, these classes must be observed for all meetings.

Class	over (cc)	up to (cc)
Trial- E	Electrical engine	
50	-	50
TRIAL125	50	125
TRIAL2	125	300
TRIALGP	250	-

4. TELEMETRY

No signal of any kind may be transmitted to or from a moving motorcycle.

The only authorised equipment for transmitting data are:

- time keeping transponder
- automatic lap timing devices
- approved on-board cameras (with prior written approval from the Championship Promoter/Organiser, ~~which cannot be granted for helmet mounted cameras~~).

5. DEFINITION OF A PROTOTYPE

A prototype motorcycle is a vehicle which must conform to the safety requirements as required by the FIM Sporting Code and Appendices applicable to the type of competition for which it is to be used.

6. PROHIBITED MATERIAL

Concerning material verification, in case of doubt, a sample or the part in question shall be taken and analysed at a Material Testing laboratory.

6.1. Titanium

The use of titanium in the construction of the frame, the front forks, the handlebars, the swinging arms, the wheel- and swinging arm-spindles is forbidden.

The use of titanium alloy nuts and bolts is allowed.

6.2. Carbon fibre

The use of carbon fibre reinforced materials is authorised (with the exception of handlebars and wheel rims).

6.3. Ceramic materials

The use of ceramic parts is forbidden.

7. DATA RECORDING

The use of data recording devices is allowed.

8. LEGAL CONFORMITY OF THE MOTORCYCLES AND THEIR REGISTRATION PLATES

Motorcycles and their equipment must comply with the national legal requirements for road traffic of the country in which the vehicle is registered and with other rules specified in the Supplementary Regulations.

The electrical generator must operate continuously and normally with respect to current and voltage during the competition and at post competition control. The electrical connections must be retained.

9. DANGEROUS MACHINES

If, during practice or the race, a Technical Steward finds that a machine is defective and might constitute a danger to other riders, he must immediately notify the Clerk of the Course/FIM Race Director or his deputy. It is their duty to exclude such a machine either from the practice or from the race itself.

C.MOTORCYCLE AND ENGINE

ENGINE

10. SUPERCHARGING

Supercharging by means of a device of any kind is forbidden in all meetings.

An engine, whether 2-stroke or 4-stroke, coming within any one of the recognised classes (determined by the capacity of the working cylinder) shall not be considered as supercharged when, in respect of one engine cycle, the total capacity, measured geometrically, of the fuel charging device or devices, including the capacity of the working cylinder (if used for injecting the fuel), does not exceed the maximum capacity of the class in question.

11. STARTING DEVICES

Starting devices for the engine are compulsory.

Fuel

12. FUEL TANKS

The fuel tank and oil tank must be securely mounted.

The fuel tank must be marked throughout the event. Unmarked fuel tanks will be reported to the Jury President or Race Director.

Fuel tanks shall only be filled in the Paddock or in officially designated "refuelling area(s)".

These area(s) shall be equipped with fire extinguishers and environmental mats. The Promoter/Organiser shall inform the participants on the location of these areas.

13. FUEL AND LUBRICANT

All vehicles must be fuelled with one of these:

- unleaded fuel (from public pump station or race type)
- a mixture of unleaded fuels
- a mixture of unleaded fuel(s) and lubricant in the case of 2-stroke engines.

The unleaded fuel or the mixture of unleaded fuels used must comply with the FIM specifications as set out in Art. C from **FIM Fuel Regulation.**

The mixture of unleaded fuel(s) and lubricant must comply with the FIM specifications as set out in Art. D from **FIM Fuel Regulation**.

If a Riders/team is using Race Fuel, they must declare to the FIM Technical Director (or the FMNR Chief Technical Steward when there is no FIM Technical Director appointed) the make and type of fuel to be used during practices and race(s), upon presentation of the rider/team's motorcycle(s) at the initial Technical Verifications. They are also recommended to provide a certificate issued by the fuel company which certify that the fuel has been tested and is in conformity with FIM specifications.

13.1. Oxidizer

Only ambient air may be mixed with the fuel as an oxidant.

14. FUEL TESTING

The FIM may require fuel controls, i.e. controls of the unleaded fuel, mixture of unleaded fuels or mixture of unleaded fuel and lubricant, used by riders/teams at events. The sampling procedure is described in the **FIM Fuel Regulation**.

Controls

15. HANDLEBAR

15.1. Handlebar width

The width of handlebars must be not less than 600 mm and not more than 850 mm.

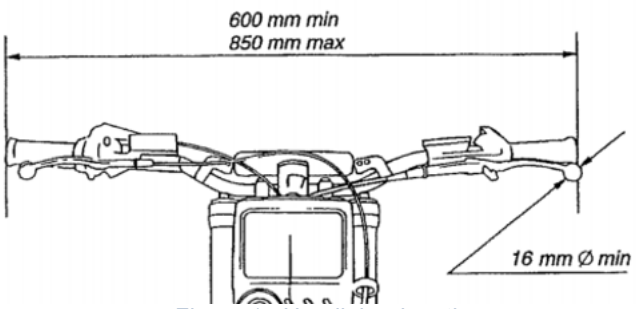


Figure 1 : Handlebar length

15.2. Handlebar covering

The handlebars must be equipped with a protection pad on the cross bar. Handlebars without a cross member must be equipped with a protection pad located in the middle of the handlebars, covering completely the handlebars clamps.

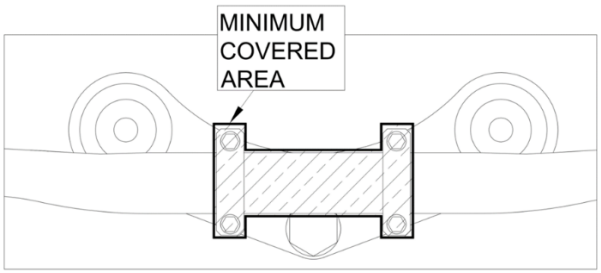


Figure 2 : Handlebar covering

15.3. Handlebar clamp

Handlebar clamps must be very carefully radiused on all exposed edges and engineered so as to avoid any fracture points in the handlebar.

15.4. Handlebar ends

Exposed handlebar ends must be plugged with a solid material or rubber covered.

15.5. Hand protectors

When hand protectors are used, these must be made of a shatter-resistant material and have a permanent opening for the hand.

15.6. Handlebar material

Handlebars made of composite materials are not authorised.

15.7. Handlebar repair

Repair by welding of light alloy handlebars is prohibited.

15.8. Handlebar stops

Solid stops (when on full-lock, other than steering dampers) must be fitted. These must ensure a minimum clearance of 30 mm between the handlebar with levers and the tank to prevent trapping the rider's fingers.

16. CONTROL LEVERS

16.1. Handlebar control lever

All handlebar levers (clutch, brake, etc.) must be in principle ball ended (diameter of this ball to be at least 16 mm, see **Figure 1**Figure 1 : Handlebar length). This ball can also be flattened, but in any case, the edges must be rounded (minimum thickness of this flattened part 14 mm). These ends must be permanently fixed and form an integral part of the lever. If the gear lever consists of a tube, then its edge must be rounded.

16.2. Control lever pivots

Each control lever (hand and foot levers) must be mounted on an independent pivot.

16.3. Foot brake

The brake lever if pivoted on the footrest axis must work under all circumstances, such as the footrest being bent or deformed.

16.4. Control levers modifications

Hand- and foot-controls may be modified for mobility challenged riders.

17. THROTTLE CONTROLS

Throttle controls must be self-closing when not held by the hand. The throttle operation (opening and closing) shall only be activated by mechanical cable from the twist grip directly attached to the throttle valve. Electronically controlled throttle valves are forbidden. All air intakes into the cylinder must pass through the throttle body. No other means allowing ambient air into the inlet track of the cylinder head are allowed.

18. IGNITION CUT-OUT SWITCH

It is compulsory that all motorcycles be equipped with an operational cut-off switch, connected through a lanyard to the rider (max. length - 1m). Once the rider steps off the motorcycle, the lanyard must disconnect from the cut-off switch and cut the power to the engine.

In the case of vehicles belonging to Group J (Electric vehicles), refer to Art. **46.6**.

Wheels

19. RIMS

Any modification to the rim or spokes of an integral wheel (cast, moulded, riveted) as supplied by the manufacturer, or of a traditional detachable rim other than for spokes, valve or security bolts, is prohibited.

The only exception is for tyre retention screws sometimes used to prevent tyre movement relative to the rim. If the rim is modified for these purposes, bolts, screws etc., must be fitted.

20. TYRES

A tolerance of +0.2 mm is applicable for all dimensions of Art. **20.1 to 20.5**. The measurement of all tyres will be taken when they are mounted on the rim at a pressure of 1 [bar] (14,5 [psi]); measurements are taken at a tyre section plane with a 90° angle with the ground plane.

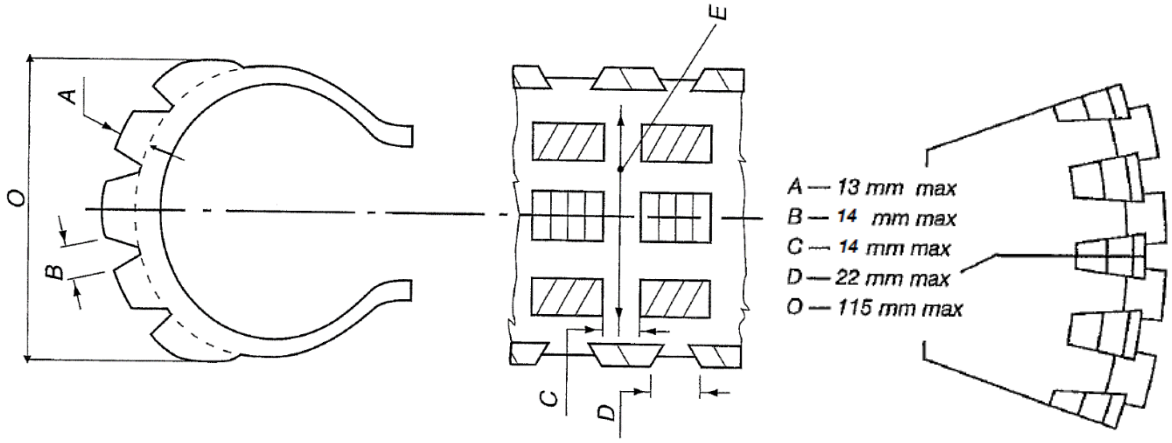


Figure 3 : Tyre dimensions

20.1. Width

The overall width of the tyre when fitted must not exceed 115 mm.

20.2. Tread groove depth

The tread groove depth (A) must not exceed 13 mm. Such a depth shall be measured between the "minimum" of the tread groove and a line tangent with the top of the block. All blocks in the same circumference must be of the same depth.

20.3. Space between blocks

The space between the blocks must not exceed **14** [mm] across the tyre (B) **and 14** [mm] in a circumferential direction (C).

20.4. Space between shoulder blocks

The space between shoulder blocks (D) must not exceed 22 [mm].

20.5. Space across the tread

The space across the tread (E) cannot extend completely across the tyre, measured at right angles to the wall of the tyre, unless broken by a block.

20.6. Tread blocks shape

All tread blocks (with the exception of the shoulder blocks) must be nominally rectangular with sides parallel with or at right angles to the tyre axis.

20.7. Type of tyres

Only tyres available from commercial or retail sources for use on the public highway are authorised.

They shall be approved according to UN Vehicle Regulation 75 Rev. 2 (2010) with the following specific features:

Category of use (5.2): it shall be "snow" or "special"
Speed category symbol (5.4): M (130 Km/h) or above
Load capacity index (5.5): 45 (165 Kg) or above.

The E (or the DOT) approval mark and number as defined by the UN Vehicle Regulation R75 must be present on both the front and rear tyre sidewalls.

20.8. Availability of tyres

The tyres shall appear in the tyre manufacturers range catalogue or tyre specification lists available to the general public.

Safety

21. OPEN TRANSMISSION GUARDS

A guard must be fitted to the countershaft sprocket in such a way that protection is provided for and covers both lower and upper chain runs. This aims at protecting from trapping fingers.

22. DRIVEN SPROCKET GUARDS

A chain guard must be fitted in such a way to prevent trapping between the lower chain run and the final driven sprocket at the rear wheel.

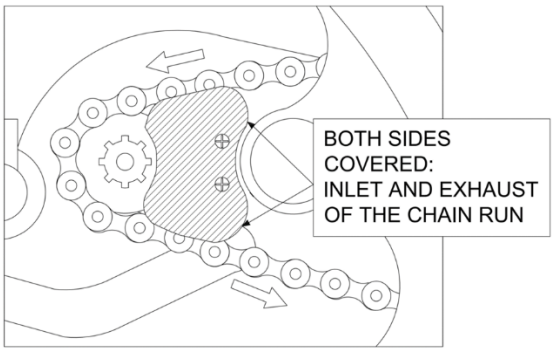


Figure 4 : Front sprocket protection

The external side of the rear sprocket must be completely covered by a hard, solid plastic sheet. No holes on the sprocket may remain visible.

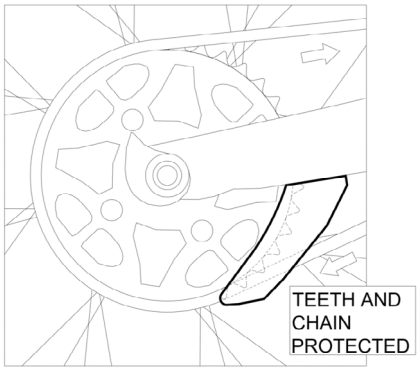


Figure 5 : Rear sprocket protection

23. EXHAUST PIPES AND SILENCERS

Exhaust pipes and silencers must fulfil all the requirements concerning sound control (see also **FIM Sound Regulation**).

23.1. Silencers position

The axis of the silencer end must be parallel (with tolerance of 15 [°]) to the longitudinal plane of the vehicle and to the flat ground. The extremity of the silencer must not pass the vertical tangent of the rear tyre.

23.2. Silencer edge

The edge of the silencer shall not be dangerous in case of accidental contact with the riders or helpers. If the final tube protrudes more than 3 mm, the edge must be rolled to an angle of 180° or radiused (see pictures below). In both cases, the edge thickness shall be 3 mm minimum.

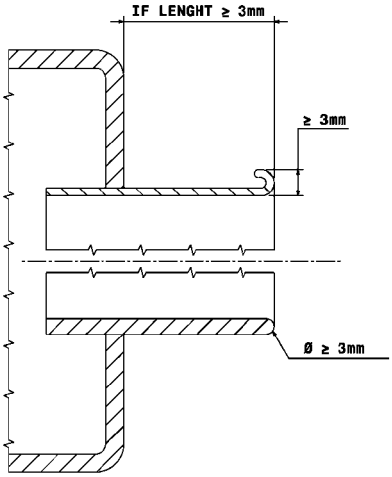


Figure 6 : Silencer edge

23.3. Exhaust fumes

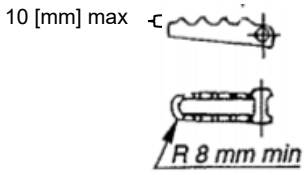
Exhaust fumes must be discharged towards the rear but not in such a manner as to raise dust, foul the tyres or brakes, or any other rider.

24. FOOTRESTS

Footrests must be folding type and must come back automatically to the normal position after folding.

The footrest bracket must be solidly fixed to the motorcycle.

The footrest teeth shall not be sharp. The height of the footrest teeth must be 10 [mm] maximum. The end of the footrest must have at least 8 [mm] radius.



25. BRAKES

All motorcycles must have at least two efficient brakes (one on each wheel) operated independently and operating concentrically with the wheel.

Brake discs with sharp edges (saw tooth design) are forbidden.

25.1. Rear brake disk

The openings in the rear disk must be able to block a cylindrical gauge of 6 [mm] diameter. Brake disks with openings larger than 6 [mm] are allowed, but they must be covered by a rigid plastic protection and must also be compliant with **Art. 25.2**.

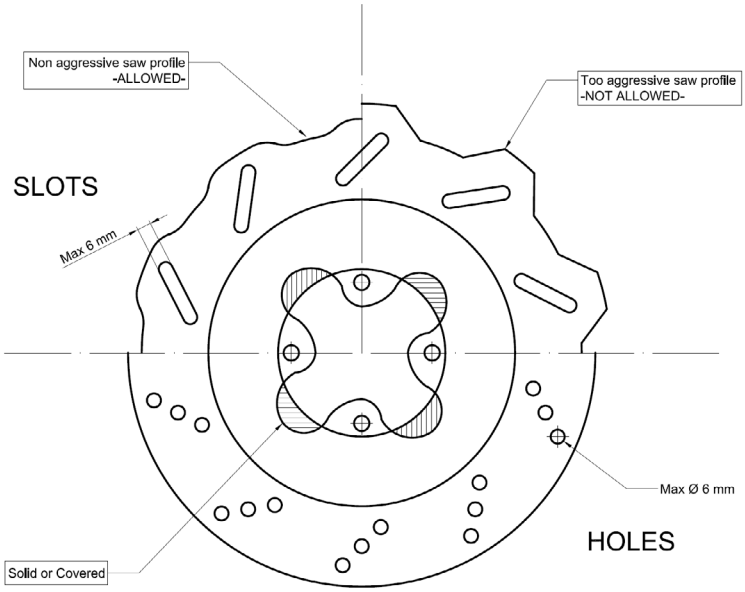


Figure 7 : Rear brake disk holes

25.2. Brakes protections

An external protection made from a rigid plastic material must cover the front and rear brake discs (fully in the front, partially on the rear or fully on the rear if the rear brake disk is not compliant with Art. **25.1**). Holes for aeration and evacuation of materials must be able to block a cylindrical gauge up to 10 mm diameter.

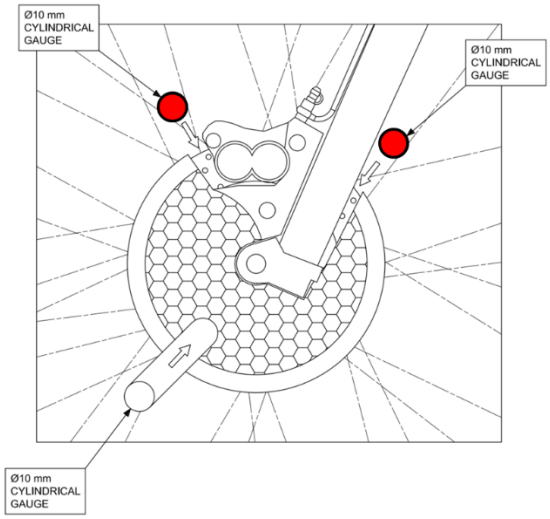


Figure 8 : Front brake disk protective cover

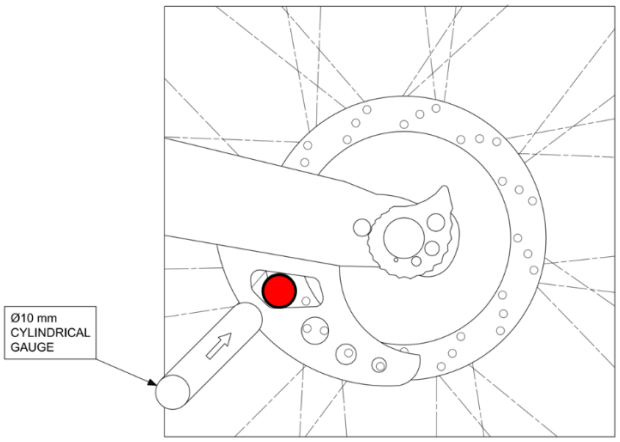


Figure 9 : Rear brake disk protective cover

26. MUDGUARDS AND WHEEL PROTECTION

Motorcycles must be fitted with front and rear mudguards.

26.1. Front mudguard

The front mudguard must cover at least 100 [°] of the circumference of the wheel. The angle formed by one line drawn from the front edge of the mudguard to the centre of the wheel and one drawn horizontally through the centre of the wheel must be between 45 and 60 [°].

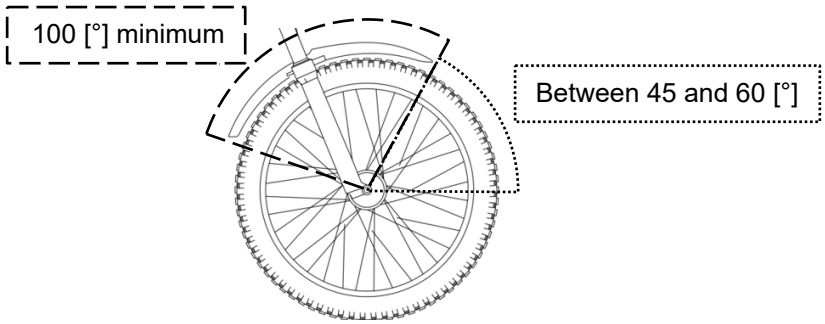


Figure 10 : Front mudguard position

26.2. Rear mudguard

The rear mudguard must cover at least 80 [°] of the circumference of the wheel. The angle formed by two lines, one drawn from the rear edge of the mudguard to the centre of the wheel and one drawn horizontally through the centre of the wheel, shall not exceed 60[°].

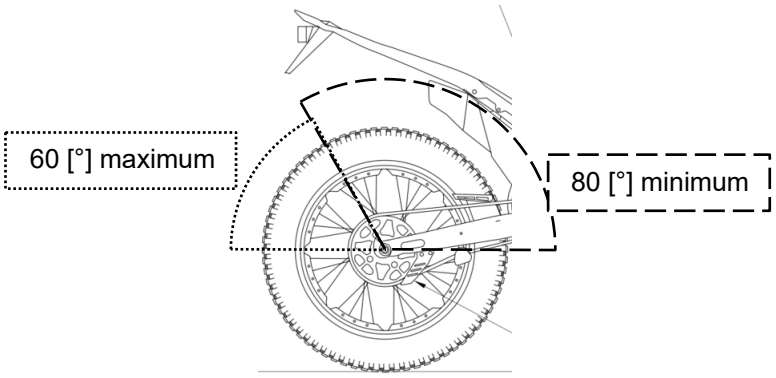


Figure 11 : Rear mudguard position

Weight

27. MOTORCYCLE WEIGHTS

27.1. Minimum weight

The weight (without rider and with all operational fluids) of the Trial motorcycles must not at any time be less than:

- For motorcycles ≤ 125cc: 67 [kg]
- For motorcycles > 125cc: 69 [kg]
- For electrical motorcycles: no minimum weight

These are absolute limits and no tolerance is applied when the machine is checked before the race. A 1% tolerance in the weight of the machine is accepted when checked during or after the event, in order to take into account the variability of the test conditions.

A scale with a minimum resolution of 100g must be used.

A rider may be asked to submit his machine for a weight control in between laps or after the last lap.

27.2. Ballast

The use of ballast to stay over the minimum weight is forbidden. The term "ballast" refers to any component, device or part, whose primary function is to add weight to the machine.

D. RIDER'S EQUIPMENT

The FIM cannot be held liable for any injuries that a rider or passenger may sustain from the use of a specific item of equipment or protective clothing.

28. CLOTHING AND PROTECTORS

It is compulsory that riders, their Assistant and their Team Manager wear a suit or trousers, a long-sleeve shirt, a back protector and a knee protector.

It is recommended that all riders, their Assistant and their Team Manager wear chest and elbow protectors.

It is compulsory that all protective devices are clearly marked with the relative norms and comply with the following standard:

- EN 1621-1, Level 2, for shoulders, elbows, hips and knees
- EN 1621-2, Level 1 or 2, for the back protector: CB (Central Back) or FB (Full Back)
- EN 1621-3 (or EN 14021), Level 1 or 2, for the chest

Repaired overalls are acceptable provided that the repair guarantees protection to the same standard as the original garment.

The Chief Technical Steward has the right to refuse any temporary repairs which are not deemed to provide the same protection as the original garment.

29. FOOTWEAR

Footwear, in a good condition, made of leather or other materials having equivalent properties, shall be worn by riders, their Assistant and their Team Manager and have a minimum height of 30 cm.

30. GLOVES

Riders, their Assistant and their Team Manager shall wear gloves made of leather or other materials having equivalent properties.

31. EYE PROTECTION

Riders, their Assistant and their Team Manager can wear goggles. The use of glasses, helmet visors and "tear offs" or "roll offs" is also permitted. The material used for glasses, goggles and visors must be made of shatter-proof material. Helmet visors must not be an integral part of the helmet.

Eye protectors which cause visual disturbance (e.g. scratched) must not be used.

32. HELMET

It is compulsory for all participants (including riders, their assistant and their Team Manager) taking part in practice and races to wear a protective helmet. The helmet must be properly fastened, be of a good fit, and be in good condition. The helmet must be correctly fastened at all time.

For all participants using a helmet with a protective or non-protective chin guard, the chin guard shall not block the rider's vision. Moreover, only chin guards designed by the manufacturer for the helmet in question may be used.

32.1. Helmet type approval

All helmets must be marked with one of the official international standard marks mentioned below. Any FMN approval marks do not substitute the official international standard marks.

- EUROPE ECE R22-05 or ECE R22-06
- JAPAN JIS T 8133:2015
- USA SNELL M 2015 or SNELL M2020R or SNELL M2020D

Attaching any object (such as camera, communication devices…) to the helmet will immediately remove its Type approval (i.e. is no more “road legal”) and the helmet won’t be accepted.

Making any modification to the helmet will also remove its Type approval (i.e. is no more “road legal”) and the helmet won’t be accepted

A helmet is made to provide protection. It is not a platform to attach foreign objects.

Examples of labels are reported below (for Europe, the country numbers which have granted the approval are also indicated):

EUROPE	 **051406/J-1952** a/3 a = 8 mm min. 3/ 1 for Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for the Czech Republic, 9 for Spain, 10 for Yugoslavia, 11 for the United Kingdom, 12 for Austria, 13 for Luxembourg, 14 for Switzerland, 15 (vacant), 16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal, 22 for the Russian Federation, 23 for Greece, 24 for Ireland, 25 for Croatia, 26 for Slovenia, 27 for Slovakia, 28 for Belarus, 29 for Estonia, 30 (vacant), 31 for Bosnia and Herzegovina, 32 for Latvia, 33 (vacant), 34 for Bulgaria, 35 (vacant), 36 for Lithuania, 37 for Turkey, 38 (vacant), 39 for Azerbaijan, 40 for The former Yugoslav Republic of Macedonia, 41 (vacant), 42 for the European Community (Approvals are granted by its Member States using their respective ECE symbol), 43 for Japan, 44 (vacant), 45 for Australia, 46 for Ukraine, 47 for South Africa and 48 for New Zealand. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify or accede to the Agreement Concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.
JAPAN	
USA	

32.2. NATIONAL COLOURS FOR HELMETS

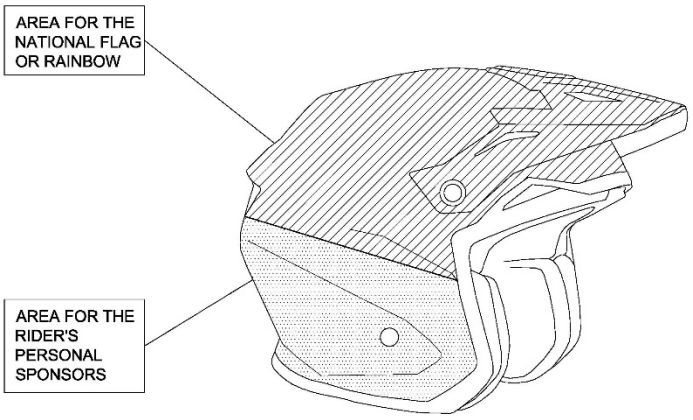
In competitions between national teams (e.g. FIM Trial of Nations), it is compulsory that the helmet's overall graphics represent the colours of the team's national flag or the colours as mentioned in the table below. The national flag can be replicated in stripes, bands or other patterns.

Andorra	FMA	White with vertical blue, yellow and red bands
Argentina	*CAMOD*	*White with blue horizontal band*
Australia	MA	Green and yellow sides, red, white & blue representation of the Australian flag across the top
Austria	OeAMTC	Bright red with a 60 mm wide black band and the label of the OeAMTC in a white field on the front side
Belgium	FMB	Yellow
Brazil	CBM	Yellow and green
Bulgaria	BMF	Green and red
Canada	CMA	White and 3 Red Maple leaves, one on front and one on each side
Chile	FMC	Red with blue band and yellow stars
China	CMSA	Red and yellow
Czech Republic	ACCR	Blue with red, white and blue border
Denmark	DMU	Red and white
Finland	SML	White with blue cross
France	FFM	Blue
Germany	DMSB	White with black border
Great Britain	ACU	Green
Greece	ELPA	White with blue border
Hungary	MAMS	Red and green
Ireland	MCUI	Green and orange
Italy	FMI	Red with one green and one white horizontal band
Japan	MFJ	White with red circle on top
Kenya	KMSF	Black, Red, Green, with white bands and the country name KENYA on both sides.
Luxembourg	MUL	Purple
Mexico	FMM	White with green and red border
Monaco	MCM	Blue and white
Netherlands	KNMV	Orange
New Zealand	MNZ	White with black kiwi on front
Norway	NMF	Red and blue
Peru	FPEM	Red with 75 mm wide white strips and blue and yellow chequered border
Poland	PZM	White with red band
Portugal	FNM	White
Rumania	FRM	Black with vertical blue, yellow and red bands with national emblem.
Russia	MFR	White with a red border and a vertical red band with star

San Marino	FSM	White with the San Marino National emblem
Slovakia	SMF	Blue, red and white
South Africa	MSA	Black, green, blue and red with yellow and white bands
Spain	RFME	Yellow and red
Sweden	SVEMO	Blue and yellow
Switzerland	FMS	Red with white cross
Uruguay	FUM	Light blue
USA	AMA	Blue with 2 white bands

In addition, the defending FIM Team World Champion is allowed to wear the rainbow colours on the helmet.

The rider's personal sponsors may be part of the overall graphics or displayed in a separate and dedicated area below the goggles strap (usually horizontal). The helmet model of each of the riders of a team may be different, but the graphics must have a similar visual appearance.



The overall graphics on the helmet must always be approved, in any case, by the FMN of the team.

Whenever a team is using a helmet and there is a case of *force majeure* (e.g. change of rider, broken helmet, etc.), the helmet in question can be replaced by any other helmet, provided that it complies with the FIM Technical Rules for the current year and has been presented to the Technical Stewards of the event.

E. TECHNICAL VERIFICATION

33. PREPARATION

Before the START of the competition, a closed and guarded area shall be prepared.

Inspection must take place under cover with a large enough area.

Inspection area must be supplied with the necessary equipment, including tables, chairs, electric light and power outlet.

34. FMNR CHIEF TECHNICAL STEWARD AND TECHNICAL STEWARDS

The Chief Technical Steward must be in attendance at an event one hour before the Technical Verifications are due to begin. He must inform the Clerk of the Course/FIM Race Director and FIM Technical Director, if present, of his arrival.

The Chief Technical Steward must ensure that all technical stewards appointed for the event carry out their duties in a proper manner. The Chief Technical Steward shall appoint the technical stewards to individual posts for the race, practices and final control.

Scrutineers can have different tasks, but the team of scrutineers must have a minimum of three persons. The FMNR Chief Technical Steward must be a holder of an FIM SENIOR Technical Stewards Licence and at least one Technical Steward must (only recommended for X-Trial) hold a FIM Technical Stewards Licence.
A minimum number of scrutineers is required according to the following:
- Checking of documentation: one
- Sound test, silencer marking: two
- Machine weight: one
- Machine inspection, helmet and clothing: two

The Sound Control Officer (SCO) must be holder of a valid FIM Technical Stewards' license, come with good knowledge and experience of the sound control and application of the test method. The FMNR may propose the services from a special technician (acoustic engineer) if there is no FIM licenced Technical Steward available to act as SCO.

The Chief Technical Steward must inform the Clerk of the Course/FIM Race Director of the results of the Technical Verifications. The Chief Technical Steward will then draw up a list of accepted machines and submit this list to the Clerk of the Course/FIM Race Director.

The Chief Technical Steward has the right to look/ inspect any part of the motorcycle at any time of the event.

All technical stewards shall be well informed and shall make sure their FMN has supplied them with all technical "updates" that may have been issued subsequent to the printing of the Technical Rules books.

35. FIM TECHNICAL DIRECTOR

The FIM Technical Director is appointed by the Director of the FIM International Technical Commission in consultation with the Director of the FIM Trial Commission.

The FIM Technical Director is not responsible for the technical verifications but will ensure that they are carried out in accordance with the FIM Technical Rules.

The FIM Technical Director works in cooperation with the FIM Race Director and the FIM Delegate.

The authority and duties of the FIM Technical Director include but are not limited to (Please, also refer to the FIM Technical Rules):

The FIM Technical Director will report any concerns or deficiencies relating to the technical verifications to the FIM Race Director and FIM Delegate and present proposals to resolve such concerns.

The FIM Technical Director is the final arbiter in relation to technical issues at the event.

The FIM Technical Director will examine with the Chief Technical Steward the motorcycle(s) and the protective equipment of any rider(s) involved in serious or fatal accidents and present a written report to the FIM Delegate.

The FIM Technical Director will attend all meetings of the Race Direction, but without voting rights.

36. TECHNICAL VERIFICATION EQUIPMENT

Weighing apparatus must be accurate, practical and have a minimum resolution of 100g. Weighing scales must have been certified by a National Institute within the period of 24 months before the event. Certified master weights and their certificate must be available for verifying.

The necessary tools are listed below:

Revolution meter
Sound meter, calibrator and spare batteries
Slide calliper (for verifying engine capacity, carburettor diameter, etc.)
Depth gauge
Steel measuring tape
Arrangement for measuring ground clearance (for Sidecars)
Seals
Weighing apparatus and set of reference weights (to be provided by the Promoter)
Tools for measuring the engine capacity
Lampoil tester is recommended and when used, it indicates the cylinder capacity. When a more precise measurement is required, the Chief Technical Steward may ask to take the cylinder head off the cylinder.
Colour for marking parts
Heat resistant stickers or paint for marking the silencer (and solvent)
Magnet
Adequate fuel sample bottles
PC with CD Drive + updated operating system
Printer, etc. are recommended
Calculator

The necessary documents are listed below:

Supplementary Regulations

FIM Technical Rules - current year
FIM Rules of the discipline concerned
FIM Sporting Code
Homologation papers (if applicable)
Writing material
Technical Verifications forms

All necessary measures and administrative equipment should be in place at least 1/2 hour before the start of the Technical Verifications is due to open (time in Supplementary Regulations).

37. BADGE OF THE FIM

Under certain circumstances the FIM may permit the use of the FIM badge on certain equipment in order to show that the latter conforms to the standards laid down by the FIM. When this authorisation is granted and provided the equipment on which it appears is in good condition, the badge is then the guarantee of the conformity with the standard set by the FIM.

For the motorcycle control, a sticker or other piece of material (preference goes to plastics) must be fixed to the front of the main frame (and with preference on the same side of the frame on all the motorcycles).

38. PRESENCE AT THE TECHNICAL CONTROL

The rider and/or the assistant and/or the Team Manager must attend at least once the Technical Verifications with the (rider's) machine within the time limits stated in the Supplementary Regulations.

The maximum number of persons present at the technical verification will be the rider and/or assistant and/or the Team Manager.

A rider remains at all times responsible that his machine and his personal protective gear are in conformity with the FIM Technical Rules for Trial motorcycles.

The rider and/or assistant and/or the Team Manager must present a clean motorcycle in conformity to the FIM rules.

The rider and/or assistant and/or the Team Manager must present a motorcycle without fuel tank cover.

The rider and/or assistant and/or the Team Manager must present one (1) motorcycle for the Individual Trial World Championship and up to two (2) motorcycles for the Indoor Trial World Championship.

The rider and/or assistant and/or the Team Manager must present the rider's protective wear (equipment), e.g. helmet and bib with prescribed starting number. The assistant's helmet must be presented too.

Any rider failing to report as required by the provisions below may be excluded from the meeting.

The Clerk of the Course/FIM Race Director may prohibit any person who does not comply with the rules, or any rider who could be a danger to other participants or to spectators, from taking part in the competitions.

39. MEASUREMENT OF CAPACITY

39.1. Reciprocating movement engine, "Otto" Cycle

The capacity of each engine cylinder is calculated by the geometric formula which gives the volume of a cylinder; the diameter is represented by the bore, and the height by the space swept by the piston from its highest to lowest point:

$$\text{Capacity} = \frac{D^2 \times 3.1416 \times C}{4}$$

where D = bore
and C = stroke

When a cylinder bore is not circular, the cross sectional area must be determined by a suitable geometrical method or calculation, then multiplied by the stroke to determine capacity.

When measuring, a tolerance of 1/10 mm is permitted in the bore. If with this tolerance the capacity limit is exceeded for the class in question, a further measurement should be taken with the engine cold, to 1/100 mm limits.

39.2. Rotary engines

The capacity of an engine which determines the class in which the motorcycle shall compete in a meeting shall be calculated by:

$$\text{Capacity} = \frac{2 \times V}{N}$$

where V = total capacity of all the chambers comprising the engine
and N = number of turns of the motor necessary to complete one cycle in a chamber.

This engine is classified as a 4-stroke.

39.3. Wankel system

For Wankel system engines with a triangular piston, the capacity is given by the formula:

$$\text{Capacity} = 2 \times V \times D$$

where V = capacity of a single chamber
and D = number of rotors

This engine is classified as a 4-stroke.

40. VERIFICATIONS

The Technical Verifications before the official practice should last at least 30 min, before the race last at least one hour, after the race last at least 30 min.

The Technical Verifications must be carried out in conformity with the procedure and times fixed in the CTR Rules and the Supplementary Regulations of the event.

The Sound control must be carried out first. The Sound level will be recorded in the Technical Verifications form. The exhaust silencer will be marked with paint.

An example of minimum verifications that shall be performed is given below:

- Sound[1]
- Make and model
- Cut-off switch
- Self-closing throttle
- Lights (front, rear, brake)[2]
- Race fuel certificate2
- Vehicle identification plate/chassis number
- Crankcase
- Wheels (hubs)
- Registration plate + insurance (green card)[2]
- Weight + ballast
- Fuel tank[1]
- Silencer[1]
- Carburettor / Injection throttle body[1]
- Guard for the countershaft sprocket and rear sprocket
- Handlebar ends + protection + levers
- Front/rear brake disc protection
- Side stand[2]
- Tyres
- Helmet(s) + national colours[2]
- Protective clothing

An overall inspection of the motorcycle must be carried out in conformity with the FIM rules. Accepted motorcycles will be marked with paint or a sticker on frame, engine and fuel tank.

The Technical Verifications will be recorded on the Technical Verification form signed by the rider and/or his assistant and/or his Team Manager.

Non-marked motorcycle components can be changed at any time during the event except during Sections.

[1] Except for electrical vehicles
[2] If applicable

40.1. Spare silencers

The rider or the mechanic can present at the sound control, together with the vehicle, one (1) spare silencer to be checked.

Other spare silencers may be presented after all participants have presented their vehicles, or on the following days of the event.

40.2. Engine or frame damage

In the case of inability to continue the event with the same marked frame and engine, the rider will have to state the technical reasons justifying the request for change to the Race Direction. The rider and/or his assistant, and/or his team manager can be asked to present the faulty frame and engine to the Chief Technical Steward or Technical Director who will decide on the unfixable character of the machine. The new frame or engine shall be presented to the Technical Verifications in order to be marked. This is not possible during Qualifying (Q1 & Q2) or during a Competition.

40.3. Exhaust silencer damage

If an exhaust silencer is accidentally damaged, rendering the motorcycle excessively noisy, then the rider may replace the silencer but will have to keep and show the damaged silencer to the Chief Technical Steward or Technical Director at the completion of the lap. The new silencer shall also be presented in order to be marked (except if the already checked and marked spare silencer was used). Any motorcycle which has had the exhaust silencer replaced (except if the already checked and marked spare silencer was used) will be subject to a sound level control at the final control.

40.4. Fuel tank damage

If the fuel tank is accidentally damaged, rendering the motorcycle inoperable, the rider can replace the fuel tank but will have to keep and show the damaged tank to the Chief Technical Steward or Technical Director at the completion of the lap. The new fuel tank shall also be presented in order to be marked.

40.5. Helmet control

Scrutineers, under the supervision of the Chief Technical Steward, may check prior to practice and the races that all helmets meet the technical requirements.

If a helmet does not meet the technical requirements or is found to be defective, the Technical Steward must clearly mark in red (e.g. with a red dot) all international marks without destroying them and retain the helmet until the end of the event. The rider must submit another helmet for approval by the Technical Steward. After an accident involving impact, the helmet must be presented to the Technical Steward for examination.

40.5.1. Helmet good fit condition

The Chief Technical Steward/Technical Steward may ask a rider for the following checks before the rider is permitted to take part in practice of the race:

- That the helmet fits well on the rider's head.
- That it is not possible to slip the retention system over the chin, when fully fastened.
- That it is not possible to pull the helmet over the rider's head by pulling it from the back of the helmet.

41. DECISION

Action and decisions will depend on the Sporting Discipline concerned, and decisions taken during prior discussions with the FIM Technical Director and/or the Chief Technical Steward.

42. FINAL EXAMINATION

In a competition which requires a final examination of machines before the results are announced, this examination must include a sound control measurement of at least three machines chosen at the discretion of the Clerk of the Course/FIM Race Director in co-operation with the Chief Technical Steward. Refer to each discipline for more info.

F. ADDITIONAL SPECIFICATIONS FOR ELECTRIC POWERED VEHICLES (EPVS, GROUP J)

43. EPV INTRODUCTION

EPVs refer to two wheels autonomous electric powered motorcycles, having traction on one or both wheels.

The number of electric motors is free.

44. SPECIFIC REQUIRMENTS

44.1. Race Procedures

Same as category I, Group A1, class Trial125.

44.2. Race Format

Same as category I, Group A1, class Trial125.

44.3. Battery charging

Energy supply will be provided in the paddock at the times and locations determined by the Organiser.

Charging may only be done with the energy supply provided by the race Organiser. Battery recharging is only allowed in the Paddock.

The Organiser shall supply energy with standard voltages/frequencies of 110V/60Hz or 230V/50Hz and plugs shucko 230VAC 10/16A single phase 50Hz or CETAC 230V 32A, 3 pins. Plugs shall be weatherproof or contained in a weatherproof case.

Mechanical protection is compulsory on all power wires.

Power distribution units shall be in conformity with IP68 for components beyond 20VDC/30VAC.

The charging system must be separate from the machine and comply with all electrical safety requirements including thermal overload trip, fusing and be equipped with a ground leakage circuit breaker protection.

44.4. Battery Swap ~~Pit Stop~~

~~Pit Stop/Assistance Area (PA2) is defined as the service area situated on the Course provided by the Organiser.~~

Battery swap is forbidden in all other areas except in the ~~Pit Stop/Assistance Area (PA2)~~ **Refuelling Area** and Paddock.

This **Refuelling** Area (6x12 m. minimum) must be flat and fenced, with two openings for the entry and exit of the motorcycle. During the batteries swap only the rider, his Assistant and his Team Manager are allowed inside the fenced area.

Race Direction will indicate the precise location of the ~~Pit Stops/Assistance Areas (PA2)~~ **Refuelling Area**.

44.5. Transponder timing

Machines may be equipped with an official transponder.

44.6. Technical Verifications

As a condition of entry, all safety items on-board the motorcycle must be precisely described and presented at the Technical Verifications.

The FIM Technical Director/Chief Technical Steward shall check both the motorcycle and the rider for compliance with the technical specifications, as well as the employment of good engineering construction practice, the provision of adequate electrical insulation and weatherproofing.

The rider shall present his helmet, gear, bib, gloves and boots to the Technical Verifications to demonstrate good condition and fit. Refer to Art. **D**.

Damaged motorcycles must be returned to the Technical Verifications area for examination after race or practice. In such circumstances it is the responsibility of the competitor to ensure both his machine and clothing have been rechecked and approved before further use in the event. If stickers/marks are used, a new sticker/mark must be in place.

It is the responsibility of the rider to ensure that a machine used in competition is electric, mechanically and structurally in a safe condition.

In case of a dispute, the decision of the FIM Technical Director will be final.

44.7. Conformity

It is the duty of each competitor to show the Technical Stewards of the meeting that his vehicle fully complies with these rules and the rules governing the meeting in their entirety at all times.

45. GENERAL VEHICLE SPECIFICATIONS

All motorcycles must comply in every respect with all the requirements for racing as specified in this regulation (same as thermal engine motorcycle), unless otherwise specified.

The power circuit consists of all those parts of the electrical equipment which are used to propel the motorcycle. The on-board circuit consists of all those parts of the electrical equipment which are used for signalling, lighting or communication.

The accumulator is defined as any on-board equipment used for the storage of electrical energy supplied by the charging unit.

Recovering energy generated by the kinetic energy of the vehicle is permitted.

The use of any external source of energy in any form whatsoever with the aim of improving the performance of the vehicle is strictly prohibited.

46. ELECTRICAL SAFETY

It must be ensured that the components used cannot cause injury under any circumstances, either during normal operation or in foreseeable cases of malfunction. It must be ensured that the components used for protecting persons or objects can reliably fulfil their function for the period of the competition.

46.1. Electrical components

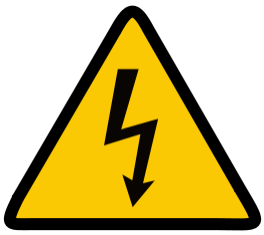
All parts of the electrical equipment must be protected to at least the equivalent of IP 44 type protection (dust proof and splash proof). Exposed connectors/wires must be protected against abrasion in case of accident (side covers).

46.2. Power bus maximum voltage

The maximum allowed voltage in the main power bus is 120VDC or 85VAC. A secondary power bus may be used to supply energy to the critical systems at a maximum voltage of 20VDC or 14VAC.

46.3. High voltage symbols

Symbols warning of 'HIGH VOLTAGE' must be displayed on or near the electrical equipment protective covers; all symbols must comprise a black flash of lightning inside a yellow triangle with a black border. The sides of the triangle must measure at least 8 cm, but may be larger if practical.



46.4. Insulation

Every part of the electrical equipment must be electrically insulated relative to all live components and system ground. Maximum default current is 1mA.

Wiring insulators can be required to be checked at any time by the FIM Technical Director/Chief Technical Steward. Double insulation will be required in high voltage or high current wires. The technical data sheets of the wires used will prevail under all circumstances.

Plus and minus wires from the battery must be insulated with respect to the chassis to withstand battery maximum voltage at least.
All electrically conducting non-live parts must be connected with the system ground.

In cases where the voltage of the power circuit exceeds 36VDC, the power circuit must be separated from the on-board circuit by an appropriate insulator.

Insulating material not having sufficient mechanical resistance, i.e. paint coating, enamel, oxides, fibre coatings (soaked or not) or insulating tapes are not accepted.

46.5. Power Indicator

When the vehicle is in a ready state, there must be two clearly visible indicators, one light on the instrument panel/on the front close the centre of the handlebar and one light on the rear of the vehicle.

The rear light must be red and visible from at least 10m away, from the rear or the side.

46.6. General circuit breaker – 'Emergency Stop'

The lanyard must disconnect from the cut-off switch and discharge the main bus voltage below 60V. This system will be referred to as general circuit breaker or “Emergency stop”.

Low power accumulators provided for low voltage circuits, e.g. auxiliary circuits, do not have to be isolated by the general circuit breaker (Emergency Stop) provided that they are completely isolated from the main power accumulators.

46.7. Fuses (over-current trip switches)

An over-current trip is a device which automatically interrupts the electrical current in which it is installed if the level of this current exceeds a defined limit value for a specific period of time.

Over-current trips must under no circumstances replace the general circuit breaker (Emergency Stop).

46.8. Capacitors

Voltage across capacitors belonging to the power circuit should fall below 65 volts within 5 seconds after the general circuit breaker is opened or the over-current trips of the accumulator are blown.

46.9. Power control

A ‘self-closing’ throttle (power control) must be applied.

46.10. Accumulator (storage battery)

The type, dimensions and weight of accumulator/s cannot be changed between official practices and race, including the exchange of accumulators.

IMPORTANT: As a condition of entry, a Material Safety Data Sheet (MSDS) for the accumulator, including all relevant details as to the energy accumulator chemistry, light metals content, human and environmental hazards, handling and specific fire risks and precautions, must be always available for the Technical Verifications.

46.11. Accumulator fastening

The accumulator must be installed securely inside the vehicle and be protected against short-circuits and leakage. The accumulator must be attached to the frame or chassis using metal clamps with an insulating covering.

The fixing method must be designed in such a way that neither the accumulator nor the fastening device itself nor its anchorage points can come loose, even when subjected to a crash.

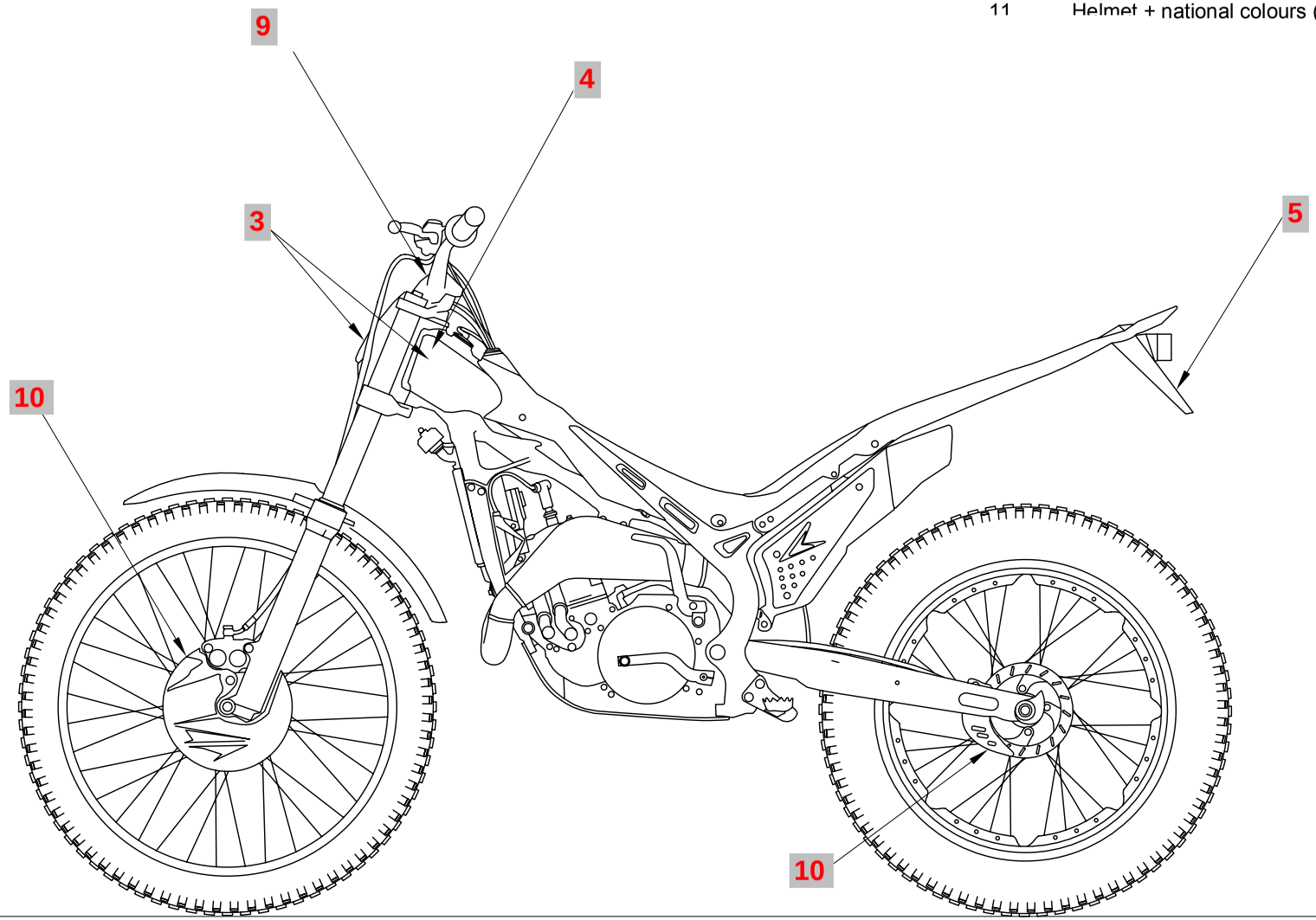
A solid partitioning bulkhead must separate the location of the accumulator from the rider. Each accumulator box must provide its own cooling and/or venting system. In modular battery systems, a heat shield is strongly recommended between modules, by means of an adiabatic shield or intumescent protection.

The accumulator installation must ensure that in the event of accumulator cell leakage or explosion, the contents are kept away from the rider and do not interfere in any way with the rider’s vision or the safe handling of the machine.

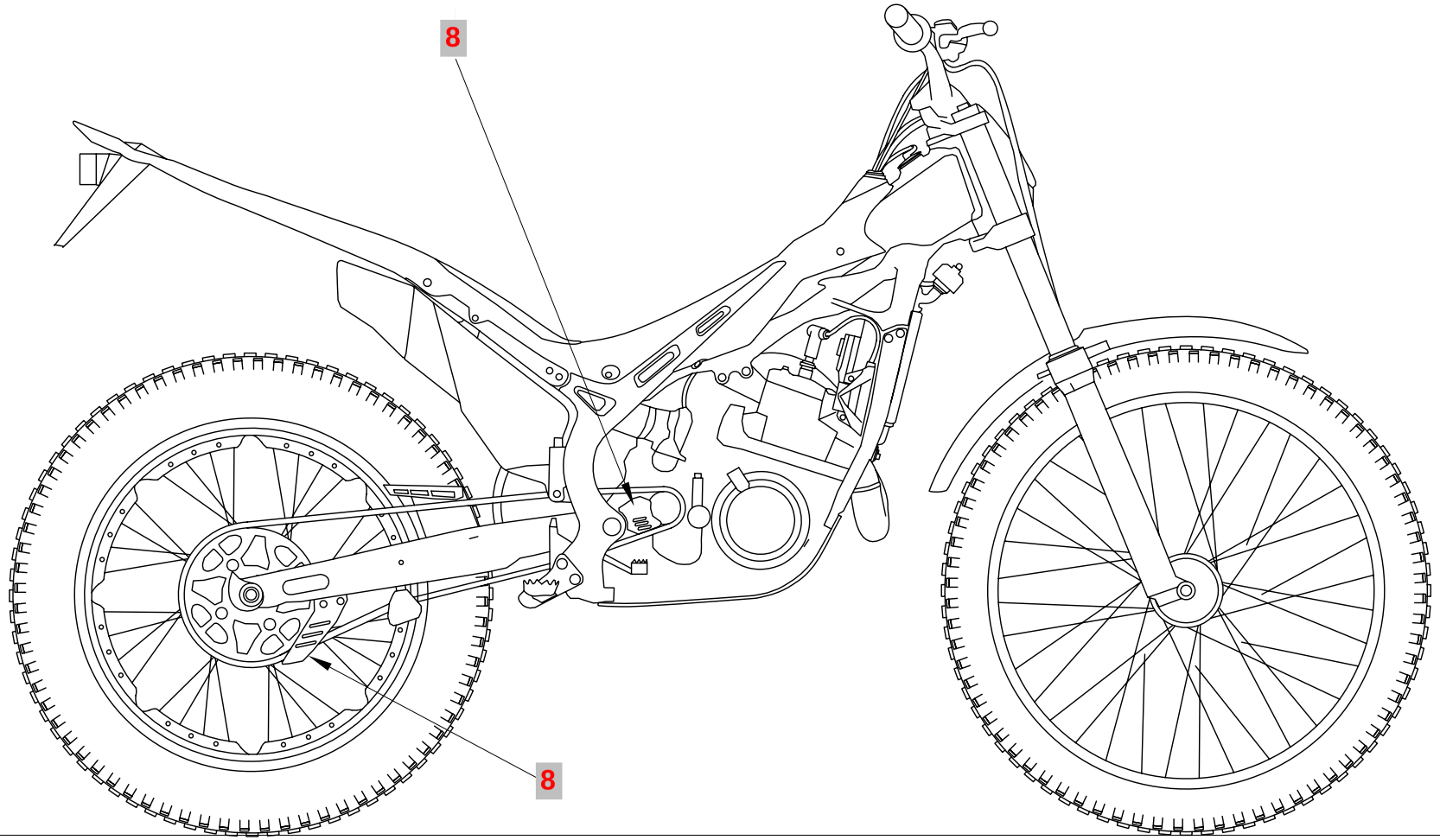
G. DIAGRAMS

CHECKLIST

1. Sound test (if applicable)
2. Cut-off switch + self-closing throttle control
3. Make + model + fuel
4. Vehicle identification plate and chassis number
5. Registration plate (if applicable)
6. Weight + ballast
7. Fuel tank (if applicable)
8. Guard for the countershaft sprocket and rear sprocket
9. Handlebar protection
10. Front/rear disc brake protection (if applicable)
11. Helmet + national colours (if applicable)



CHECKLIST



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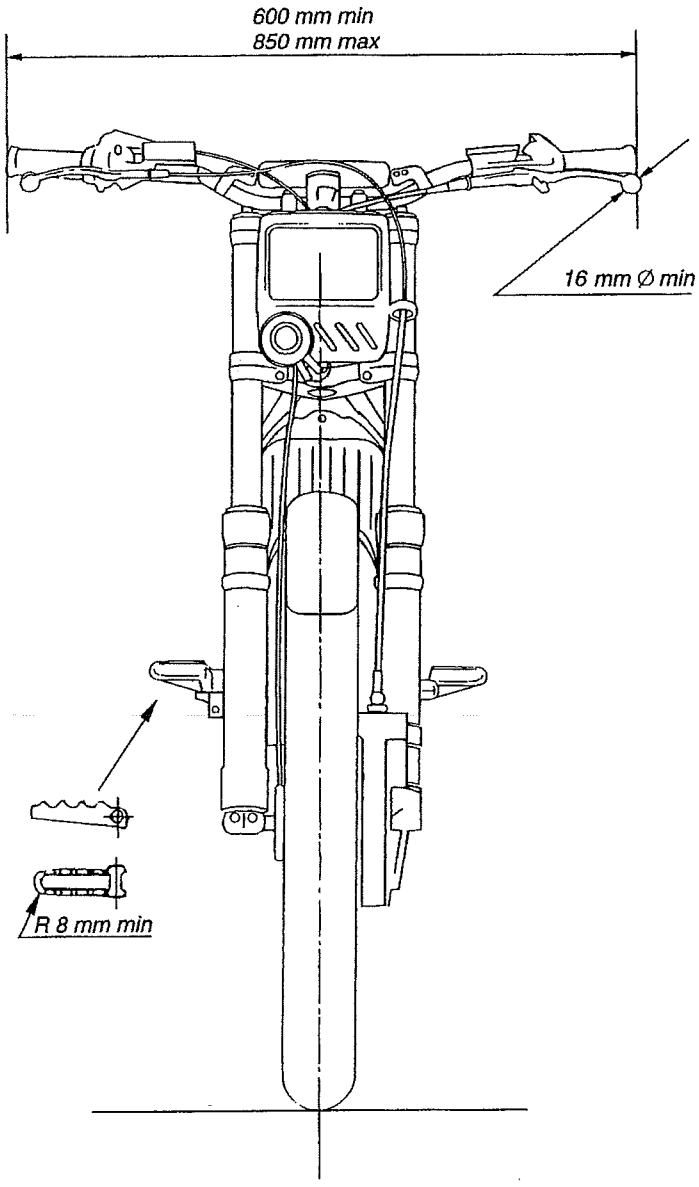

TEN FITTING TESTS FOR HELMETS
DIX TESTS D'ADAPTATION POUR LES CASQUES

1. *Obtain correct size by measuring the crown of the head*
   Avoir la bonne grandeur en mesurant le sommet de la tête

2. *Check there is no side to side movement*
   Vérifier qu'il n'y ait pas de déplacement d'un côté à l'autre

3. *Tighten strap securely*
   Serrer solidement la jugulaire

4. *With head forward, attempt to pull up back of helmet to ensure helmet cannot be removed this way*
   Tête en avant, essayer de soulever le casque pour s'assurer qu'il ne peut pas être enlevé de cette façon

5. *Check ability to see clearly over shoulder*
   Vérifier si vous pouvez voir clairement par-dessus l'épaule

6. *Make sure nothing impedes your breathing in the helmet and never cover your nose or mouth*
   S'assurer que rien ne gêne votre respiration dans le casque et ne jamais couvrir le nez ou la bouche

7. *Never wind scarf around neck so that air is stopped from entering the helmet. Never wear scarf under the retention strap*
   Ne jamais enrouler une écharpe autour du cou, car cela empêche l'air d'entrer dans le casque. Ne jamais porter d'écharpe sous la jugulaire

8. *Ensure that visor can be opened with one gloved hand*
   S'assurer que la visière peut être ouverte avec une main gantée

9. *Satisfy yourself that the back of your helmet is designed to protect your neck*
   S'assurer que l'arrière de votre casque a une forme telle qu'il vous protège la nuque

10. *Always buy the best you can afford*
    Toujours acheter le meilleur que vous pouvez vous offrir

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