



FÉDÉRATION
INTERNATIONALE
DE MOTOCYCLISME



**Road Racing International Meetings
Appendices**

***Annexes des Manifestations
Internationales de Courses sur Route***

&

**Technical Appendices for
International Road Racing Meetings**

***Annexes Techniques des Manifestations
Internationales de Courses sur Route***



2004

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2004

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2004

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Articles amended as from 01.01.2004 are in bold type
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2nd part / 2^{ème} partie

**Technical Appendices
for International Road Racing Meetings**

(Including Appendices for Sprinters, Drag Racers and Electrical Vehicles)

***Annexes Techniques
des Manifestations Internationales
de Courses sur Route***

(Annexes pour Sprinters, Dragsters et Véhicules électriques inclus)

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01.01 INTRODUCTION

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.

01.03 FREEDOM OF CONSTRUCTION

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

All solo motorcycles (Group A) 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.

01.05 CATEGORIES AND GROUPS

Motorcycles are divided into categories which must be observed for all meetings and world record attempts.

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

Category I

Motorcycles propelled by the action of one wheel in contact with the ground.

Category II

Special vehicles propelled by the action of one or more wheels in contact with the ground but which are not covered by the conditions for Category I.

Category III

Electric vehicles.

These categories are divided into groups:

Category IV

Special vehicles not propelled by wheels in contact with the ground.

Category I

Group A1 - Solo Motorcycles

2-wheeler vehicles making only one track on the ground.

Group A2 - Scooters

Motorcycles with special characteristics.

A scooter is a motorised vehicle with 2 wheels, providing a seat for the rider and having a free space in front of the seat for the rider's legs.

The characteristics of a scooter are as follows:

The scooter must be fitted with a leg shield, of minimum 400 mm in width. The leg shield must start below the handlebar and extend down and to the rear, to either side of the seat, forming a platform with a minimum length of 250 mm and sufficient to fit the rider's feet.

The space between seat and handlebar shall be free of any obstructions. It must allow a rider to put his knees together, when seated normally with both feet on the platform.

The diameter of the wheel rims must not exceed 400 mm irrespective of engine capacities.

The scooter must be fitted with a starting device. The electrical equipment and lighting must conform to the International Convention for Road Vehicles.

Group A3 - Automatic 50 cc

Motorcycles driven by an engine capacity up to 50 cc and having automatic transmission.

Scooter specification: a scooter must have its crankcase/swing-arm constructed as one single, rigid unit. Its transmission must be by a continuous variator transmission (CVT).

Group B1

Vehicles with three wheels making two tracks on the ground, consisting of a motorcycle making one track and a Sidecar for a passenger making the other.

Group B2 - Motorcycles with permanent Sidecar

Vehicles with three wheels making two or three tracks on the ground in the direction of forward travel, with a permanently attached Sidecar forming a complete integral unit.

If three tracks are made, the centre-line of the two tracks made by the motorcycle wheels must not be more than 75 mm apart. A track is determined by the longitudinal centre-line of each of the vehicle's wheels in the direction of forward travel.

Group B3 - Cycle-cars

3-wheeler vehicles making three tracks on the ground forming a complete integral unit and having accommodation for a rider and passenger.

A cycle-car is a motorcycle with 3 wheels differing from a Sidecar in that 2 of the wheels are mounted on the same geometric horizontal axis. These may be on the front or rear of the vehicle and shall ensure stability of the vehicle.

The passenger can be by the side of the rider but not necessarily in the same frontal alignment. He can also be placed behind the rider.

Steering must be by handlebars with a minimum length of 500 mm or by a wheel with a minimum diameter of 300 mm.

If bodywork does not enclose the wheels, they must be protected by mudguards.

The dimensions for Sidecar tyres and wheel diameters also apply to cycle-cars.

Category II

- Group C – Special 2 wheeler motorcycles
- Group D – Special 3 wheeler motorcycles
- Group E – Snowmobiles
- Group F – Sprinters and Drag Bikes (Dragsters)
- Group G – Quad Racers
- Group H – –
- Group I – –

Category III

Group J – Electric Vehicles (see Art. 01.82)

Category IV

Group Y – SPECIAL TWO WHEELED MOTORCYCLES

A maximum of two wheels (in the form of stabilisers or skids) may be fitted to the vehicle, only to aid stability at low speeds. These aids must be retracted during the record attempt.

01.07 CLASSES

Groups are again separated into classes according to cylinder capacities as detailed below. These classes must be observed for all meetings and World Record Attempts.

Category I

Groups A1 and A2

Class	over (cc)	up to (cc)
50	–	50
80	50	80
100	80	100
125	100	125
175	125	175
250	175	250
350	250	350
500	350	500
750	500	750
Supermono		4-stroke 800 single cylinder
1000	750	1000
1300	1000	1300
unlimited	1300	open

Group A3

50	–	50
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Groups B1, B2 and B3

Same as groups A1 and A2 over 175 cc.

Category II

Groups C and D

Appendices governing the classes on these groups to be issued as each case is presented.

Group F

Sprint and Drag racing machines with a maximum engine capacity of 3000 cc.

Class 2000: over 1300 cc up to 2000 cc

Class 3000: over 2000 cc up to 3000 cc

01.11 MEASUREMENT OF CAPACITY

11.11 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 must be taken with the engine cold (at ambient temperature), to 1/100 mm limits.

11.13 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.

11.15 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.

Classified as a 4-stroke.

01.17 SUPERCHARGING

Supercharging by means of a device of any kind is forbidden in all meetings, except for record attempts, Drag racing and Sprinting.

The direct injection of fuel is not considered to be supercharging.

An engine whether 2-stroke or 4-stroke coming within any one of the recognised classes as 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 inspiring the fuel) does not exceed the maximum capacity of the class in question.

01.18 TELEMETRY

Information must not be transmitted in any way to or from a moving motorcycle. An official signalling device may be required on the machine. Automatic lap timing devices are not considered as "telemetry". Automatic lap timing devices must not disrupt any official time keeping methods and equipment.

01.19 MOTORCYCLE WEIGHTS

Weighing scales must have been certified by a National Institute within two years prior to use and the certificate must be available to the Technical Steward.

A 1 % tolerance in the weight of the machine at the post-race control is accepted.

A 2 kg discount, without fuel tank, irrespective of engine capacity, will be allowed.

19.01 Weights of motorcycles without fuel

The minimum weights are:

80 cc		55 kg
125 cc		70 kg
250 cc		100 kg
500 cc	1/2 cylinders	101 kg
	3 cylinders	116 kg
	4 cylinders	131 kg
Sidecars	See Art. 53.02	385 kg
Supermono	1 cylinder	95 kg

19.04 Ballast

On three wheeler vehicles and cycle-cars, where the participation of a passenger is not compulsory, a 60 kg ballast must be fixed to the machine on an area provided for this purpose. The ballast must be shown during verification and properly sealed to the motorcycles.

19.05

For Groups B1 and B2 at all competitions (except World Record attempts) a passenger must be carried.

19.06

For record attempts in Groups B1 and B2 the body of the motorcycles must be constructed in such a way as to allow accommodation of a passenger. If there is no passenger, a 60 kg ballast must be securely fixed to the Sidecar.

01.21 DESIGNATION OF MAKE

When two manufacturers are involved in the construction of a motorcycle the name of both must appear on the machine as follows:

- The name of the chassis manufacturer
- The name of the engine manufacturer

This applies where no commercial interests are involved.

01.23 DEFINITION OF A PROTOTYPE

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

4-stroke prototype motorcycles : Over 350cc up to 990cc

A four stroke prototype motorcycle must have an engine of original design and must not use castings of the crankcase, cylinder of cylinder head derived from the industrial production. The moving parts (crankshaft, pistons, connecting rods, gearbox etc.) are not taken into consideration.

01.25 GENERAL SPECIFICATIONS

The following specifications apply to all vehicles of the groups indicated and to all types of competitions except where otherwise stated in the corresponding section of the FIM Code.

They should also be applied to all national competitions unless the FMNR (National Motorcycling Federation) has otherwise directed.

Further specifications for some competitions may also be required and these will be detailed in either the appropriate section of the FIM Sporting Code or in the Supplementary Regulations for the competition in question.

25.01 Materials

The use of titanium in the construction of the frame, the front forks, the handlebars, the swing arms, the swing arm spindles and the wheel spindles is forbidden. For wheel spindles, the use of light alloys is also forbidden. The use of titanium alloy nuts and bolts is allowed.

25.01.1 Titanium test to be performed on the track: Magnetic test (titanium is not magnetic).

25.01.2 3 % nitric acid test (titanium does not react. If metal is steel, the drop will leave a black spot).

25.01.3 Specific mass of titanium alloys 4,5-5, of steel 7,5-8,7 can be ascertained by weighing the part and measuring its volume in a calibrated glass filled by water (intake valve, rocker, connecting rod, etc.)

25.01.4 In case of doubt, the test should take place at a Materials Testing Laboratory.

25.02

Aluminium alloys can be ascertained visually.

25.05

General specifications for motorcycles are as follows.

125 cc	over 80 cc to 125 cc	1 cylinder max.	6 gears max.
250 cc	over 175 cc to 250 cc	2 cylinders max.	6 gears max.
500 cc	over 350 cc to 500 cc	4 cylinders max.	6 gears max.

S/cars	500 cc maximum	2-stroke	4 cylinders max.	6 gears max.
	1200 cc maximum	4-stroke	4 cylinders max.	6 gears max.

For Supermono

up to 800 cc	4-stroke	1 cylinder max.	6 gears max.
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25.06

The number of cylinders in an engine is determined by the number of combustion chambers.

25.07

If separate combustion spaces are used they must be connected by an unrestricted passage of minimum cross sectional area at least 50 % of the total inlet port area.

01.26 DEFINITION OF A MAIN FRAME OF A SOLO MOTORCYCLE

The structure or structures used to join any steering mechanism at the front of the machine to the engine/gear box unit and to all components of the rear suspension.

01.27 STARTING DEVICES

They are only compulsory for Endurance racing.

01.29 OPEN TRANSMISSION GUARDS

29.01

For all motorcycles, including Sprinters, if the primary transmission is exposed, it must be fitted with a guard as a safety measure. The guard must be conceived in such a manner that under no circumstances can the rider or the passenger come into accidental contact with the transmission parts. It must be designed to protect the rider from injuring his fingers.

29.02

For Sidecars, a guard is required if secondary transmission is not shielded by the bodywork.

29.03

A guard must be fitted to the countershaft sprocket for Sprinters.

29.04

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

01.31 EXHAUST PIPES

Exhaust pipes and silencers must fulfil all the requirements concerning noise control.

31.01

The end of the exhaust pipe, over a minimum distance of 30 mm must be horizontal and parallel to the central axis of the solo machine (with a tolerance of $\pm 10^\circ$).

31.02

Exhaust fumes must be discharged towards the rear but not in a manner as to raise dust, foul the tyres or brakes, or inconvenience a passenger, if there is one, or any other riders.

31.03

The extremity of the exhaust pipes on solo motorcycles must not pass the vertical tangent of the rear tyre, if they keep the exhaust pipes system as originally homologated (see diagrams A,B,C).

31.04

On a Sidecar machine the exhaust must discharge horizontally and towards the rear, at a maximum angle of 30° to the axis of the machine, and at the end be of constant diameter over a distance of 30 mm.

01.33 HANDLEBARS

33.01

The width of handlebars is: Up to 80 cc, not less than 400 mm.

33.02

For all other machines (incl. Sidecars) not less than 450 mm.

33.04

The grips must be attached in such a way that at least the minimum width for handlebars is reached when measured between the outside ends of the grips.

33.05

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

33.06

The minimum angle of rotation of the handlebar on each side of the centre line or mid position must be of 15° for solo motorcycles and 20° Sidecars.

33.07

Whatever the position of the handlebars the front wheel must never touch the streamlining if any.

33.08

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

33.09

Handlebar clamps must be very carefully radiused and engineered so as to avoid fracture points in the bar.

33.11

The repair by welding of light alloy handlebars is prohibited.

01.35 CONTROL LEVERS

35.01

All handlebar levers (clutch, brake, etc.) must be in principle ball ended (diameter of this ball to be at least 19 mm). 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.

35.03

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

35.04

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

01.37 THROTTLE CONTROLS

37.01

Throttle controls must be self-closing when not held by the hand.

37.02

For Sidecars and special 3-wheeler motorcycles, an ignition cut-out must be fitted to operate when the rider leaves the machine. This ignition cut-out system must interrupt the primary circuit and must be wired for both the supply and return of the current.

It must be placed as near to the centre of the handlebar as possible and must be operated by a non-elastic string of adequate length and thickness and strapped to the rider's right-hand wrist. A spiral cable (similar to that of a telephone wire) of maximum 1 m extended length is permitted.

01.38 FUEL PUMPS

Electric fuel pumps must be wired through a circuit cut-out which will operate automatically in the event of an accident.

A test facility must be incorporated in the design of electrically operated fuel pumps for use at the technical control.

01.39 FOOTRESTS

39.01

Footrests may be of a folding type but in this case must be fitted with a device which automatically returns them to the normal position, and an integral protection is to be provided at the end of the footrest which must have at least 8 mm solid spherical radius (see diagrams A & C).

39.02

Non folding '**metallic**' footrests must have an end (plug) which is permanently fixed, made of plastic, Teflon[®] or an equivalent type material (min. Ø 16mm).

01.41 BRAKES

41.01

Vehicles in Group A must have at least 2 efficient brakes (one on each wheel) operated independently and concentrically with the wheel.

The split of the front brake lines for both front brake callipers must be made above the lower fork bridge (lower triple clamp).

41.02

Vehicles in Group B, including sprinters, must be fitted with at least 2 efficient brakes operating on at least 2 of the wheels and operated independently and concentrically with the wheel.

41.03

For Sidecars, a Sidecar wheel brake must be fitted.

41.03.1 All road racing vehicles in Group B2 must have the following braking system: One main system with at least two circuits operating separately. One of the circuits must work upon at least two of the three wheels.

41.03.2 If one system fails the other system must work efficiently.

01.43 MUDGUARDS AND WHEEL PROTECTION

Mudguards must comply with the following requirements:

43.01

They must project laterally beyond the tyre on each side.

43.02

The front mudguard must cover at least 100° of the circumference of the wheel. In this area, the wheel may be covered, respecting the angles mentioned below. 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°. The angle formed by one line 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 20°.

43.03

The rear mudguard must cover at least 120° 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 20° (see diagram A).

43.04

Mudguards are not required if there is streamlining. If there is no streamlining, mudguards are required. If the fairing or the saddle reaches the vertical tangent of the outside of the rear tyre (with a tolerance of – 50 mm) a rear mudguard is not required.

01.45 STREAMLINING

The streamlining of Solo machines must correspond to the following specifications:

45.01

The front wheel with the exception of the tyre and the part hidden behind the mudguard must be clearly visible from each side.

45.02

No part of the streamlining must be in front of a vertical line drawn 100 mm in front of the wheel axle. Mudguards shall not be considered as streamlining.

45.03

No part of the streamlining must be to the rear of a vertical line drawn through the rear wheel axle and the rim of the rear wheel must be clearly visible over the 180° of its circumference to the rear of this line. No part of the motorcycle shall project to the rear of a vertical line drawn through the exterior edge of the rear wheel.

45.04

Air foils or spoilers may only be fitted on solo machines when they are an integral part of the fairing or seat. They must not exceed the width of the fairing nor the height of the handlebar. sharp edges must be rounded off with a minimum radius of 8 mm.

45.05

The windscreen edge and the edges of all other exposed parts of the streamlining must be rounded.

45.06

In the normal driving position, the rider must be completely visible with the exception of his forearms (and his legs if it is a Sidecar) from either side from the rear and from above. The minimum space between the face of the rider, or his helmet and the streamlining (including the windscreen) must be 100 mm. It is forbidden to use transparent materials to evade these rules.

45.07

The maximum height of the back of the rider's seat is 150 mm. This will be measured from the lowest point of the rigid base of the seat to the uppermost part of the fairing behind the rider.

45.08

Whatever the position of the handlebars, there must be a space of at least 20 mm between the streamlining and the ends of the handlebars or other steering systems, including any attachments thereto.

45.09

The front inclination where the number plate is fixed must not exceed an angle of 30° to the rear of the vertical (see diagram A).

45.11

The width of the seat or anything to its rear shall not be more than 450 mm, exhaust systems excepted.

45.12

The fuel cap must be fitted in such a way that it does not protrude in relation to the tank profile and cannot be torn off in a crash.

45.13

For all four stroke motorcycles only, equipped with a fairing, the lower fairing has to be constructed to hold in case of an engine breakdown, at least half of the total oil and engine coolant capacity used in the engine. The lower edge of openings in the fairing must be positioned at least 50 mm above the bottom of the fairing.

The lower fairing should incorporate a maximum of two holes of 25mm. These holes must remain closed in dry conditions and must be only opened in « wet » race conditions as declared by the Clerk of the Course.

Minimum modifications with relation to the profile of the lower fairing are allowed, only to fulfil this rule.

01.46 INCLINATION AND SUSPENSION OF MOTORCYCLES

Solo motorcycles in road racing and production machine racing, when unloaded, must be capable of being inclined to an angle of 50° from the vertical without any part other than the tyre being in contact with the ground (see diagrams A and C).

01.47 WHEEL RIMS, TYRES
(See Table 1)

47.01

All tyres will be measured mounted on the rim at a pressure of 1 kg/cm² (14 lb./sq.in.); measurements taken at a tyre section located at 90° from the ground.

47.02

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

The maximum rear wheel rim widths are:

125 cc	3.5"
250 cc	5.5"
500 cc	6.25"

For information, the distance is measured inside flange walls of the wheel rim in accordance with ETRTO.

01.49 TYRES FOR SOLOS
(including Hill Climbs)

49.01

The width of tyres used in the individual classes must not be less than the values shown in Table 1

49.03

The minimum rim diameter is 400 mm.

49.04 Interior - fixture - width of tyre

The tyre must be mounted on a corresponding rim. The interior (fixture) width values for respective dimensions of tyres are shown in Table 1. The rim interior (fixture) must not be deformed or damaged.

49.05 Permitted maximum speed

The speed categories for use in individual classes are shown in Table 1. This does not apply to slick tyres.

49.06 Tyre surface tread pattern

- 49.06.1** The surface of the tyre can be smooth (i.e. without tread grooves) or treaded.
- 49.06.2** The tread pattern is unrestricted.
- 49.06.3** The tread pattern must be made by a manufacturer when producing the tyre.
- 49.06.4** Additional tread grooves, cuts, etc., are allowed provided that they are made by a tyre manufacturer or a person duly authorised by a tyre manufacturer by means of special purpose-built equipment.
- 49.06.5** Thus, subsequently modified tyres must bear the distinguishing mark or stamp of the manufacturer. This stamp must be placed near to the manufacturer's mark.
- 49.06.6** The choice of a certain type of tread pattern is left entirely up to the individual rider.
- 49.06.7** The use of slick tyres will also be at the discretion of the rider. If conditions should become problematic however, he must take into account the recommendations of the Technical Stewards and if need be, of the appropriate representative of the tyre manufacturers.
- 49.06.8** As a safe minimum, the depth of the tyre tread over the whole pattern at pre-race control must be at least 2.5 mm. In the 80 cc class only, this minimum depth is 1.5 mm.
- 49.06.9** Tyres which at the preliminary examination have a tread depth of less than 1.5 mm are considered as non-treaded tyres and the restrictions applying to slick tyres will then apply to them.
- 49.06.10** The surface of a slick tyre must contain three or more hollows at 120° intervals or less, indicating the limit of wear on the centre and shoulder areas of the tyre. When at least 2 of these indicator hollows become worn on different parts of the periphery, the tyre must no longer be used.

49.07

The minimum distance between the surface of the tyre (at its largest point) and any fixed parts of a motorcycle is shown in Table 1 .

49.08 Wearing of the tyre's surface

In order to obtain optimal tyre adhesion, new unused tyres can be adapted by scuffing the surface. The rules concerning grooves and hollows (refer to Art. 49.06.8) and the depth of the latter must however still be respected after any such scuffing.

The use of slick tyres is forbidden in all solo hill climb meetings.

01.51 TYRES FOR SIDECARS

The appendices mentioned above for solo motorcycle tyres also apply to Sidecars. Slick tyres are authorised on Sidecars in hill climbs.

51.01

The maximum width of the front tyre tread measured from the point where the wall of the tyre finishes and the tread pattern starts, to the point where the tread pattern stops and the wall of the tyre's other side starts (only the section of the tread pattern normally in contact with the ground is measured) must not exceed 220 mm.

51.02

The rear tyre must not exceed 254 mm, similarly measured.

51.03

When the springs are compressed to their maximum, there must still remain a minimum wheel clearance of 15 mm to every fixed part.

51.04

The minimum diameter of an inflated tyre must be 400 mm.

There is no restriction on the tyres used at World Record attempts.

01.53 ADDITIONAL SPECIFICATIONS VALID FOR SIDECARS

53.01 Maximum Capacities

Minimum capacity for two stroke engines	350 cc
Maximum capacity for two stroke engines	500 cc
Minimum capacity for four stroke engines	850 cc
Maximum capacity for four stroke engines	1200 cc

53.02 Minimum Weight (see also Art. 01.19.01)

Minimum weight with rider and passenger fully equipped: 385 kg.

At any time during the meeting, the sidecar must exceed the minimum weight, regardless of the tank content.

53.03 Front Number Plate

The front inclination where the number plate is fixed must not exceed an angle of 30° to the rear of the vertical (see diagram A).

53.04 Fuel

All sidecar engines must function on normal unleaded fuel with a maximum lead content of **0.005** g/l (unleaded) and a maximum MON of 90 (see also Art. 01.63 for full specification).

53.05 Dimensions

Maximum dimensions are (see diagram B):

Overall width:	1700 mm (including the exhaust system)
Maximum overall height:	800 mm (with the exception of the airbox – max height: 950 mm).
Overall length:	3300 mm
Wheel base:	2300 mm

53.06 Dimensions of Passenger Space

The minimum dimensions of the passenger's space on the platform are (see Diagram B):

Length: 800 mm
Width: 300 mm
(both measured 150 mm above the platform).

Height of the screen protecting the passenger: 300 mm

53.07 Distance Between Tracks

The distance between the tracks left by the centre lines of the rear motorcycle wheel and the Sidecar wheel must be at least 800 mm and not more than 1150 mm.

53.08 Riders Position

The rider's position regardless of whether or not a driving seat is fitted, must be such that the rider's feet are positioned behind the knees when looking in the driving direction.

53.09 Passenger Visibility

Passengers must be completely visible from above and be able to lean out to either side of the Sidecar. For this purpose, the vehicle must be equipped with a suitable facility for the passenger to hold on to when leaning out. It is forbidden to use transparent materials to evade these rules.

53.10 Rider or Passenger's Position

Neither the rider, nor the passenger must be covered from above nor may they be attached to the vehicle in anyway.

The passenger must be able to lean out on either side.

53.11 Protection

Vehicles must have a solid and effective protection between the rider and the engine. This protection must prevent direct contact between the rider's body or his clothes and escaping flames or leaking fuel and oil.

53.12 Streamlining

The forward extremity of the streamlining shall be not more than 400 mm in front of the foremost part of the tyre (see diagram B).

The extreme rear edge of the streamlining must be not more than 400 mm beyond the extreme edge of the rear wheel (see diagram B).

The sidecar wheel must be enclosed by the fairing down to the height of its axle centreline.

53.13 Aerodynamic Devices

Spoilers and other aerodynamic devices are authorized on condition that they do not extend beyond the overall dimensions of the bodywork and are an integral part of the fairing and/or body.

53.14 Windscreen

The windscreen edge and the edges of all other exposed parts of the streamlining must be rounded.

53.15 Ground Clearance

The ground clearance measured over the entire length and width of the frame and other mechanical parts (engine, oil bay, exhaust and platforms) excluding the fairing, race ready, fully loaded with rider and passenger in a static racing position, must not be less than 65 mm with the handlebars in straight position.

No devices are permitted to reduce the ground clearance during the course of the race. After the race, a tolerance of - 5 mm is authorised. After a 'wet' race, this check is not performed.

53.16 Fixing of the Sidecar

The Sidecar must be fixed to the motorcycle in at least three points, if it is not an integral part of the chassis.

The fixing points must not allow movement at the joints. If the angle of the inclination is changeable, it must be locked in such a way that it is completely secured and not only clamped on.

53.17 Banking Sidecars

Banking Sidecars are strictly forbidden.

53.18 Steering

The motorcycle must be steered by a handlebar.

The handlebar extremities must not be lower than the front wheel spindle nor more than 500 mm behind the front wheel spindle in the straight ahead position.

The steering axis must not be offset more than 75 mm from the front wheel centre line.

To reduce the torque in the steering it is allowed to displace the front wheel and the rear wheel. (See also Art. 01.05, Group B2).

53.19 Handlebars

Whatever the position of the handlebars, there must be a space of at least 20 mm between the streamlining and the ends of the handlebars or other steering systems, including any attachments thereto.

53.20 Suspension

Suspension of the front wheel must be designed so that under suspension action and in a straight ahead position, the wheel shall only move vertically and in a single plane relative to the motorcycle – the plane must be in the driving direction.

This must occur without changes to the camber or the side-tracking. The vertical travel of the front and rear wheel spindles under suspension action must be at least 20 mm.

53.21 Drive

The drive shall be transmitted to the ground only through the rear wheel of the motorcycle.

53.22 Wheels

The rear wheel and Sidecar wheel must be enclosed down to the level of the Sidecar platform on the inside.

53.23 Brakes

Only ferrous brake disks are allowed.

Carbon, carbon fiber brake disks are not allowed.

Carbon, carbon fiber brake pads are not allowed.

53.24 Fuel Tank

The fuel tank must be independently protected from the ground.

53.25 Fuel Cap

The fuel cap must be fitted in such a way that it does not protrude in relation to the fairing or the tank profile and cannot be torn off in a crash.

53.26 Battery

The battery must be covered in such a way that neither the rider nor the passenger can come directly into contact with the battery or its contents.

53.27 Engine

The engine must be positioned in such a way that the centre-line of the engine (by definition a position midway between centre lines of outermost cylinders for transversal engines, or the crankshaft for in-line engines) shall not exceed 160 mm beyond the centre-line of the rear wheel of the motorcycle. The engine must be positioned in front of the rear wheel.

53.27.1 Two Stroke Engines

- Maximum capacity of 500cc.
- Prototype engine design is allowed.
- Maximum of 4 cylinders.
- Maximum of 6 speed transmission.

53.27.2 Four Stroke Engines

For all international Sidecars meetings, the name of the engine fitted in the sidecar is used to identify the 'manufacturer'.

- Motorcycle engines of mass production only. (Minimum production quantities: 1000 units/year).
- The maximum capacity of 1200cc.
- Maximum of 4 cylinders.
- The crankshaft is free.
- The stroke is free.
- Balancing is allowed.
- Lightening is allowed.
- Connecting rods may be changed, however the use of titanium or carbon is not allowed in their construction.
- Piston rings and pins may be changed.
- The original cylinder head may be modified, however the number of ports and valves must remain as originally produced by the manufacturer.
- Camshafts may be altered or replaced.
- The method of cam drive must remain as originally produced by the manufacturer.
- The ignition system may be altered or replaced.
- Maximum of a 6 speed transmission.
- The type of clutch must remain as originally produced by the manufacturer.
- Clutch springs and plates may be altered or replaced.
- The generator may be removed.
- The electric starter may be removed.
- Carburetors may be altered or replaced.
- The fuel injection can only be used as offered on the original engine by the manufacturer.
- The use of exotic materials is not allowed i.e. ceramics, metal matrix (aluminum beryllium).
- The oil lubrication system is free.

53.28 Oil and Coolant Containment

In the area directly below the engine, the oil containment tray must be constructed to hold, in case of an engine breakdown at least half of the total oil and engine coolant capacity used in the engine (min 5 litres).

The surrounding edges of the tray must be at least 30 mm above the bottom of the tray.

This tray should incorporate a maximum of two holes of 25 mm in diameter and be closed with rubber plugs. These holes must remain closed in dry conditions and only opened when wet race conditions have been declared by the clerk of the course.

The frontal edge from the oil bay reservoir wall must be extended upwards to arrive just below (within 20 mm) the exhaust ports of the engine.

Holes for engine mounts (hangers) must be sealed.

From a vertical view, the engine must be located completely inside the oil bay platform.

The rear wheel must be protected from any possible oil spray. To make this protection, the engine and the rear wheel compartment must be separated. This separation must be created by installing a solid divider (wall) running from the top of the inside of the bodywork to the bottom of the oil tray. This divider (wall) must overlap the rear edge of the oil tray down to the bottom.

4 stroke machines must use this tray.

Oil lines containing positive pressure, if replaced, must be of metal reinforced construction with swaged or treaded connectors. Manufactured solid construction oil lines, where practical, must be replaced also.

Oil cooler must not be mounted on or above the body of the sidecar.

The location of the oil tank and oil cooler should be placed in a location where it is least likely to be damaged in an accident.

53.29 Exhaust Pipe

The exhaust pipe must not extend beyond the width of the Sidecar and the furthest extremity of the exhaust pipe must not exceed the vertical line drawn at a tangent to the rear edge of the Sidecar body.

Exhaust pipes fitted to the side of the Sidecar must be covered so that it is impossible for the passenger to be burnt. The ends of the exhaust pipes fitted to the Sidecar must be so positioned or protected that it is impossible for them to become entangled with another machine.

53.30 Fog Lamp

Sidecars must be equipped with a functional rear red anti-fog lamp measuring a minimum of 35 cm² and a maximum of 100 cm² fitted with a 2.5 watt halogen bulb or 10 watt conventional bulb or LED lights.

The light must be installed at the rear of the main body (suspended part) and mounted above the driving wheel, at minimum 40 cm above the ground and ensure no obstruction from the fairing and/or the passenger.

The anti-fog lamp must be visible at all times.

54.01 TECHNICAL SPECIFICATIONS - SUPERMONO

Open to single cylinder motorcycles up to 800 cc.

Engines may operate on the four stroke principle only.

Engines must be naturally aspirated.

54.01.1 Minimum Weights

Supermono: Minimum weight 95 kg.

Ballast may be added to achieve the minimum weights, but it must be securely fixed to the frame.

Without fuel tank, a 2 kg discount is allowed (see Art. 01.78).

In the final inspection at the end of the race, the inspected machines will be weighed dry (tank on the machine without fuel).

Dry weight (no fuel) for liquid cooled motorcycles. Water may be added to the radiator prior to weighing.

A 1% tolerance in the weight of the machine at the post race control is accepted. Except for the addition of water to a radiator, established weight limit must be met after a race in the condition the motorcycle finished the race. All machine weights are without fuel or additional equipment such as time keeping senders, camera equipment, electronic data recording equipment etc.

54.01.2 Number Plate

Racing numbers must be affixed to the front and the two sides of the motorcycle so that they are clearly visible to the spectators and officials.

Number plates must be rectangular in shape with minimum measurements 285 mm x 235 mm (see diagram 0).

One plate must be fixed to the front inclined not more than 30° rearwards from the vertical. The others must be placed, one on each side of the motorcycle. They must be fixed in such a manner as to be clearly visible and they must not be masked by any part of the motorcycle or by the rider when seated in the driving position. Holes can be perforated between the numbers on a front number plate. However, under no circumstances must the actual numbers be perforated.

In place of separate plates, a space of equivalent size in matt colours can be painted or fixed on the bodywork or streamlining.

There must be a clear area around the numbers of at least 50 mm.

The background colours and figures for Supermono are black background with yellow numbers. With the RAL colour table values being black 9005 and yellow being 1003 (See Art. 01.55).

In case of a dispute concerning the legibility of numbers, the decision of the Technical Steward will be final.

54.02 Fuel

All Supermono engines must function on normal unleaded fuel with a maximum lead content of 0.005 g/l (unleaded) and a maximum MON of 90 (see also Art. 01.63 for full specification).

54.03 Machine Specifications

54.03.1 Main Frame Body

The use of titanium and/or magnesium in the construction of the frame is not permitted.

54.03.2 Front Forks

The use of titanium in the construction of the front forks is not permitted. The surface treatment is free.

There must be at least 15 degrees of movement of the steering each side of the centre line.

Stops must be fitted to ensure a clearance of at least 30 mm between the handlebar and the tank when at the extremes of lock.

The steering damper cannot act as a steering lock limiting device (See Art. 01.33).

54.03.3 Rear Fork (Swing arm)

The use of titanium, magnesium and composites in the construction of the rear fork (swing arm) spindle is not permitted.

54.03.4 Wheels

Maximum front wheel rim width is 4.0 in.

Maximum rear wheel rim width is 6.25 in.

Minimum wheel diameter is 16 in.

The use of titanium or any other light alloy in the construction of the wheel spindles is not permitted.

54.03.5 Brakes

Supermonos must have a minimum of one brake on each wheel that is independently operated. The use of carbon fibre or carbon composite discs is not allowed.

54.03.6 Tyres

Racing tyres must be used.

54.03.7 Foot Rest/Foot Controls

Footrests may be of a folding type but in this case must be fitted with a device which automatically returns them to the normal position, and an integral protection must be provided at the end of the footrest.

Non folding **metallic** footrests must have an end (plug) which is permanently fixed, made of plastic, Teflon® or equivalent type of material (min. radius of 8mm).

54.03.8 Handlebars and Hand Controls

Handlebars must have a width of not less than 450 mm and their ends must be solid or rubber covered. The width of the handlebar is defined as the width measured between the outside of the handlebar grips or throttle twistgrips.

The use of titanium in the construction of handlebars is not permitted.

Throttle controls must be self closing when not held by the hand.

Lever must not be longer than 200 mm measured from the pivot point.

Engine stop switch must be located on the handlebars.

54.03.9 Fairing/Body Work

The front wheel with the exception of the tyre and the part hidden behind the mudguard must be clearly visible from each side.

No part of the streamlining must be in front of a vertical line drawn 100 mm in front of the front wheel axle. Mudguards shall not be considered as streamlining.

Mudguards are not compulsory. When fitted, front mudguards must not extend in front of a line drawn upwards and forwards at 45 degrees from a horizontal line through the front wheel spindle or below a line drawn horizontally and to the rear of the front wheel spindle.

The windscreen edge and the edges of all other exposed parts of the streamlining must be rounded.

The front inclination where the number plate is fixed must not exceed an angle of 30° to the rear of the vertical (see diagram A).

Whatever the position of the handlebars, there must be a space of at least 20 mm between the streamlining and the ends of the handlebars or other steering system, including any attachments thereto.

The maximum width of bodywork must not exceed 600 mm. The width of the seat or anything to its rear shall not be more than 450 mm, exhaust systems excepted.

The maximum height of the back of the riders seat is 150 mm. This will be measured from the lowest point of the rigid base of seat to the uppermost part of the fairing behind the rider.

No part of the streamlining (fairing) must be to the rear of a vertical line drawn through the rear wheel axle.

The rim of the rear wheel must be clearly visible over 180° of its circumference to the rear of this line.

There must be a clearance of at least 15 mm around the circumference of the tyre at all positions of the motorcycle suspension and all positions of the rear wheel adjustment.

No part of the motorcycle shall project to the rear of a vertical line drawn through the exterior edge of the rear tyre.

The motorcycle, unloaded, must be capable of being leaned at an angle of 50 degrees from the vertical without touching the ground, other than the tyres.

Air foils or spoilers may only be fitted on solo machines when they are an integral part of the fairing or seat. They must not exceed the width of the fairing nor the height of the handlebar. Sharp edges must be rounded off with a minimum radius of 8 mm. Moving aerodynamic devices are not permitted.

The rider in the normal driving position must be completely visible, with the exception of his forearms, from either side, from the rear and from above. The minimum space between the face of the rider, or his helmet and the streamlining (including the windscreen) must be 100 mm. It is forbidden to use transparent materials to evade these rules.

The fuel cap must be fitted in such a way that it does not protrude in relation to the tank profile and cannot be torn off in a crash.

The lower fairing has to be constructed to hold, in case of an engine breakdown, at least half of the total oil and engine coolant capacity used in the engine (min. 5 litres).

The lower fairing should incorporate a maximum of two holes of 25 mm. These holes must remain closed in dry conditions and can only be open in wet race conditions as declared by the Clerk of the Course.

All exposed edges must be rounded.

54.03.10 Fuel Tank

Fuel tank must be completely filled with a fire retardant material (i.e. "Explosafe").

Fuel tanks with tank breather pipes must be fitted with non-return valves that discharge into a catch tank with a minimum volume of 250 cc made of a suitable material.

Fuel caps, when closed, must be leak proof. Additionally, they must be secured to prevent accidental opening at any time.

The fuel cap must be fitted in such a way that it does not protrude in relation to the tank profile and cannot be torn off in a crash.

54.03.11 Seat

The seat/rear cowl must allow for proper number display.

The width of the seat shall not be more than 450 mm.

The maximum height of the back of the riders seat is 150 mm. This will be measured from the lowest point of the rigid base of seat to the uppermost part of the fairing behind the rider.

All exposed edges must be rounded.

54.03.12 Radiator/Oil Cooler

Oil cooler must not be mounted on or above the rear mudguard.

54.03.13 Air Box

The air box is compulsory and must be completely closed around the induction bell mouth and all engine breather tubes, with air ingress only above the lowest point of the bell mouths lip (see diagram C). Carburation instruments may be entirely within the airbox.

The air box drains must be sealed.

All Supermono motorcycles must have a closed breather system. The oil breather line must be connected and discharge in the airbox.

The breather system (airbox plus any breather oil collector box) must be capable in the event of drain pipe blockage, of retaining a minimum of 1000 cc of discharged fluid.

54.03.14 Engine

Maximum capacity is 800 cc.

Engines may operate on the four stroke principle only.

Engines must be normally aspirated.

Cubic capacity of the engine will be defined by the swept volume of the cylinder, i.e. the area of the bore of the cylinder multiplied by the stroke.

No tolerance on capacities is permitted.

Engine capacity must be measured at ambient temperature.

54.03.15 Oil Lines

Oil lines containing positive pressure must be of metal reinforced construction with swaged or treaded connectors.

54.03.16 Transmission/Gearbox

The maximum number of gears is limited to six speeds.

54.03.17 Exhaust System

Maximum noise limit is 105 dB/A measured at a mean piston speed of 11 m/sec for 4-stroke engines.

The correct stroke must be marked on a clearly visible position of the crankcase.

The outlet of the exhaust must not extend behind a line drawn vertically through the edge of the rear tyre.

The last 30 mm of the pipe must be horizontal and parallel to the centre line of the motorcycle with a tolerance of +/- 10 degrees.

54.04 The following items MUST BE incorporated

Motorcycles must be equipped with a functional ignition kill switch or button mounted on either side of the handlebar (within reach of the hand while on the hand grips) that is capable of stopping a running engine.

Throttle controls must be self closing when not held by the hand.

Electric fuel pumps must be wired through a circuit cut out which will operate automatically in the event of an accident.

A test procedure for the circuit cut out must be incorporated in the design of electrically operated fuel pumps for use upon inspection.

Safety bars, centre and side stands, if fitted, must be removed.

All drain plugs must be wired. External oil filter(s) screws and bolts that enter an oil cavity must be safety wired.

All Supermono motorcycles must have a closed breather system. The oil breather line must be connected and discharge in the airbox.

The breather system (airbox plus any breather oil collector box) must be capable in the event of drain pipe blockage, of retaining a minimum of 1000 cc of discharged fluid.

Where an oil breather pipe is fitted, the outlet must discharge into a catch tank located in an easily accessible position and which must be emptied before the start of a race.

Oil cooler must not be mounted on or above the rear mudguard.

The minimum size of a catch tank shall be 250 cc for gear box breather pipes and 500 cc for engine breather pipes.

Head lamp, rear lamp and turn indicators, if fitted, must be removed. The openings must be covered by a suitable material.

54.05 Additional Equipment

Additional equipment may be fitted, however Art 01.18 Telemetry must be respected.

01.55 NUMBER PLATES

They must be fitted as follows:

55.03

They must be rectangular shape and made from a rigid and solid material with minimum measurements 285 mm x 235 mm (see diagram 0).

55.04

The plates curved not more than 50 mm out of a true plane must not be covered or bent.

55.05

One plate must be fixed to the front inclined not more than 30° rearwards from the vertical. The others must be placed, one on each side of the motorcycle. They must be fixed in such a manner as to be clearly visible and they must not be masked by any part of the motorcycle or by the rider when seated in the driving position. Holes can be perforated between the numbers on a front number plate. However, under no circumstances must the actual numbers be perforated.

55.06

In place of separate plates, a space of equivalent size in matt colours can be painted or fixed on the bodywork or streamlining,

55.07

The figures must be clearly legible and like the background must be painted in matt colours to avoid reflection from sunlight. The minimum dimensions of the letters being:

Height of figure:	140 mm
Width of figure:	80 mm
Width of stroke:	25 mm
Space between 2 figures:	15 mm

55.08

Figures must conform to one of the forms as printed in diagram 0.

55.09

All other number plates or markings on a motorcycle liable to cause confusion with the number must be removed before the start of a competition.

55.10

A space of at least 5 cm must be left free around all number plates in which no advertising may appear. Motorcycles with number plates that do not comply with this rule will not be passed by the Technical Steward for the race.

55.12 Number plate colours

The background colours and figures vary according to the class of motorcycle and the type of competition, the details being indicated in the SR for each meeting. The following colours shall be used; and they must be matt colours following the RAL colour table, i.e.:

BLACK	9005
BLUE	5010
YELLOW	1003
ORANGE	2007

RED	3020
GREEN	6002
WHITE	9010

55.12.2 Road Races

3 wheelers and 80 cc	White background	Black numbers
125 cc	Black background	White numbers
250 cc	Green background	White numbers
500 cc	Yellow background	Black numbers
1000 cc	White background	Black numbers

55.12.6 Supermono

	Black background	Yellow numbers
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55.12.7 Drag Bikes

Pro Stock	Yellow background	Black numbers
Competition Bike	White background	Black numbers
Super Twins	Orange background	Black numbers

55.12.8 Automatic 50 cc

European Trophy		Black background/white numbers
50 cc Scooters	Standard class	Yellow background/black numbers
Group 2	Modified	White background/black numbers
Group 3	Prototypes	Black background/white numbers
Mopeds	Modified	Blue background/white numbers

55.13

In case of a dispute concerning the legibility of numbers, the decision of the Technical Steward will be final.

01.56 FUEL AND OIL TANKS (with the exception of Dragsters and Sprinters)

56.01

The maximum capacities of fuel tanks in solo competitions are:

Prototypes 24 litres

56.01.1 Fuel must be contained in a single tank securely fixed to the machine. Seat tanks and auxiliary tanks are forbidden. The use of a quickly detachable replacement tank as a means of refuelling is strictly forbidden in all types of competition.

56.01.2 Moreover, the use of temporary filling material to reduce the capacity of a tank is forbidden.

56.01.3 Fuel tank must be completely filled with fuel cell foam (preferably with "Explosafe®").

56.02 Oil catch tanks and breather systems

Where an oil breather pipe is fitted, the outlet must discharge into a catch tank located in an easily accessible position and which must be emptied before the start of a race.

The minimum size of a catch tank shall be 250 cc for gear box breather pipes and 500 cc for engine breather pipes.

All 4-stroke motorcycles must have a closed breather system. The oil breather line must be connected and discharge in the airbox (See Diagram C).

All possible measures must be taken to prevent the possible loss of waste oil so that it does not hinder a following rider.

56.03 Oil drain plugs and supply pipes

All oil drain plugs must be tight and must be drilled and wired in position. Oil supply lines must be correctly and securely wired in position. External oil filters and screws or bolts that enter an oil cavity must be safety wired.

56.04 Fuel tank breather pipes

Non-return valves must be fitted to fuel tank breather pipes and these have to discharge into a catch tank with a minimum volume of 250 cc made of a suitable material.

56.05 Fuel and oil filler caps

Fuel and oil filler caps, when closed, must be leak proof. Additionally, they must be securely locked to prevent accidental opening at any time.

01.63 FUEL AND OIL

All motorcycles must be fuelled with unleaded petrol, as this term is generally understood.

63.01 Physical properties for unleaded fuel

63.01.1 Unleaded petrol must comply with the FIM specification.

63.01.2 Unleaded petrol will comply with the FIM specification if:

(a) It has the following characteristics:

Property	Units	Min.	Max.	Test Method
RON		95.0	102.0	ISO 5164
MON		85.0	90.0	ISO 5163
Oxygen	% m/m		2.7	ASTM D 5622 ASTM D 4815 (1)
Nitrogen	% m/m		0.2	ASTM D 4629
Benzene	% v/v		1.0	EN 238
RVP	kPa		90	EN 12
Lead	g/l		0.005	EN 237 (2)
Density at 15°C	kg/m ³	720.0	780.0	ASTM D 4052
Oxidation stability	minutes	360		ASTM D 525
Existent gum	mg/100 ml		5.0	EN ISO 6246
Sulphur	mg/kg		150	ASTM D 5453
Copper corrosion	rating		C1	ISO 2160
Distillation:				
E at 70°C	% v/v	15.0	50.0	ISO 3405
E at 100°C	% v/v	46.0	71.0	ISO 3405
E at 150°C	% v/v	75.0		ISO 3405
Final Boiling Point	°C		215	ISO 3405
Residue	% v/v		2.0	ISO 3405
Appearance	Clear and bright			Visual Inspection

Property	Units	Min.	Max.	Test method
Olefins	% v/v		18.0	ASTM D 1319 (3)
Aromatics	% v/v		42.0	ASTM D 1319 (3)
Total diolefins	% m/m		1.0	GCMS / HPLC

Notes:

- (1) GC/MS methods may also be applied to fully deconvolute the GC trace
- (2) The above maximum values for olefins and aromatics are corrected for fuel oxygenate content according to clause 13.2 of ASTM D 1319:1998.

For two stoke fuel, the test method for olefins and aromatics will be gas chromatography.

- (b) The total of individual hydrocarbon components present at concentrations of less than 5% m/m must constitute at least 30% m/m of the fuel. The test method will be gas chromatography and/or GC/MS.
- (c) The total concentration of naphthenes, olefins and aromatics classified by carbon number must not exceed the values given in the following table:

% (m/m)	C4	C5	C6	C7	C8	C9+
Naphthenes	0	5	10	10	10	10
Olefins	5	20	20	15	10	10
Aromatics	–	–	1.2	35	35	30

The total concentration of bicyclic naphthenes and bicyclic olefins may not be higher than 1% (m/m). The test method used will be gas chromatography.

- (d) Only the following oxygenates are permitted:
- methanol, ethanol, iso-propyl alcohol, iso-butyl alcohol, methyl tertiary butyl ether, ethyl tertiary butyl ether, tertiary amyl methyl ether, di-isopropyl ether, n-propyl alcohol, tertiary-butyl alcohol, n-butyl alcohol, secondary-butyl alcohol
- (e) Manganese is not permitted in concentrations above 0.005 g/l. For the present this is solely to cover possible minor contamination by other fuels. The fuel will contain no substance that is capable of an exothermic reaction in the absence of external oxygen.

Lead replacement petrols, although basically free of lead, are not an alternative to the use of unleaded petrol. Such petrols may contain unacceptable additives not consistent with the FIM Fuel Regulations.

- (f) For oil used in two stroke mixtures, the following tolerances on the fuel specifications will be allowed:

• Density at 15°C	Plus/minus 30 kg/m ³
• Distillation residue	Not controlled

63.03 Air

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

63.04 Primary Tests

63.04.1 The FIM may require tests of fuels to be administered before, or at the time of delivery to, a meeting at which such fuels are to be used.

63.04.2 The FIM may request any person or organisation, being a potential supplier of fuel, to submit a sample for testing for conformity with the fuel specifications.

63.05 Fuel Test Procedures

63.05.1 Fuel tests may be administered at any time and place during the course of any meeting under the authority of the FIM.

63.05.2 The CTI Bureau, in consultation with the relevant Commission President, has sole authority to, and may, direct the administration of fuel tests during the course of an international meeting.

Such direction must be by written document (Fuel Test Order) which must be delivered to the Jury President before the meeting. The Jury President must deliver the Fuel Test Order to the Chief Technical Steward for the meeting who is responsible for the administration of the fuel tests. The Fuel Test Order must nominate:

- (a) The criteria (which may be random) for selection of the machines from which samples are to be taken; and
- (b) The officials who must administer the tests.
- (c) At least 3 of the characteristics specified in Arts. 63.01 to be the subject of the tests, or only 1 characteristic when using an ASTM approved "short test" or "field test method" for the detection of only one of the characteristics in a fuel sample.

63.05.3

Fuel tests must be administered according to the Fuel Test Order and must comply with the following procedures:

- (a) Only nominated officials may take samples.
- (b) Containers for holding samples:
 - (i) must be clean and constructed of robust, fuel non-reactive, impermeable material;
 - (ii) must be sealable;
 - (iii) must have provision for identification.
- (c) Equipment used for the extraction of fuel from machines must be clean and constructed of fuel non-reactive material.
- (d) The FMNRs must ensure that there is a supply of at least 12 containers (12 X 1 litre each).
- (e) Each sample must be divided into two and placed in separate containers, (2 samples of maximum 1 litre each). Each sample may be initially tested for one of the characteristics, using an ASTM approved field test method. The results obtained from such a test must be given immediately to the International Jury. The containers must be immediately sealed and identified by reference to the machine from which the sample was taken. This information must be entered on a certificate (FIM Fuel Sample Certificate) which must certify the date, place and time of taking the sample, the identity of the machine from which the sample was taken, and the identity of its rider.

- (f) Both samples (sample A and sample B) must remain in the control of the Technical Steward. The rider or the representative of the rider/ team must sign the FIM Fuel Sample Certificate acknowledging that a sample was taken, and must be given a copy of the Certificate.
- (g) At the end of the meeting the Technical Steward must deliver both samples (sample A and sample B) to a courier authorised by the FIM, Jury President or the Technical Steward. The Technical Steward must return a copy of the Fuel Sample Certificate, signed by the courier, to the Jury President.
- (h) The authorised courier must deliver both samples (sample A and sample B), together with copies of the relevant Fuel Sample Certificates, to an FIM authorised laboratory, where they must be tested for content in accordance with standard scientific procedures.
- (i) The results obtained from such testing must be attached to the laboratory's copy of the Fuel Sample Certificate and delivered to the FIM as soon as practicable after the results have been obtained.
- (j) In case of non conformity to the rules, the FIM must as soon as practicable after receipt of the results notify:
 - (i) the relevant riders or team representatives;
 - (ii) the relevant FMNR;
 - (iii) the Jury President for the relevant meeting.

63.05.4 The FIM may authorise one or more named laboratories for testing fuels. Such authorisation must be by written document.

63.05.5 A Jury may direct the administration of fuel tests during the course of any international meeting. Such direction must be by Fuel Test Order which must be delivered to the Technical Steward.

Such Fuel Test Order has the same authority as if it had been issued by the CTI Bureau under Art. 63.05.2. The procedures for the administration of fuel tests under this Article must comply with the procedures under Arts. 63.05.2 and 63.05.3.

- 63.05.6** For tests under Art. 63.04 all characteristics specified in Art. 63.01 must be present for the tested fuel to comply.
- 63.05.7** For tests under Arts. 63.05.2 and 63.05.5 tested fuel must comply with the characteristics specified in the relevant Fuel Test Order.
- 63.06 Fuel Test Costs**
- 63.06.1** The costs of fuel tests conducted under Arts. 63.04.1, 63.04.2 and 63.05.2 will be paid by the FIM.
- 63.06.2** The costs of fuel tests conducted under Art. 63.05.5. will be paid by the organiser of the meeting.
- 63.06.3** Where a fuel test is ordered by a Jury in relation to a protest, the party which loses the protest must bear the entire cost of the fuel test, or such proportion thereof as is directed by the Jury.
- 63.07 Fuel Storage**
- 63.07.1** At all international meetings where the fuel used is supplied by the Organiser, there must be officially designated and controlled fuel storage areas. Outside these areas, fuel may only be stored in metal containers.
- 63.07.2** A maximum of 60 litres of fuel stored in a sealable can, is allowed in the competitor's pit, in addition to his motorcycle's normal fuel tank capacity. For Endurance **meetings**, a quick fill installation (i.e. fuel tower) for refuelling is allowed.
- 63.07.3** The officially designated storage and supply area must be in conformity with the building criteria. Fire fighting equipment, protective devices and staff must conform to the requirements imposed by the local authorities and by-laws.
- 63.07.4** The organiser must have fire extinguishers of a size and type approved by the local by-laws, available to each competitor in the pit area.

01.64 COOLANTS

The only liquid engine coolants permitted other than lubricating oil shall be water or water mixed with ethyl alcohol.

01.65 EQUIPMENT AND PROTECTIVE CLOTHING **Clothing and Footwear**

During practising and racing, the riders and passengers must wear the following clothing and footwear:

65.01 For road and sprint races

Both rider and passenger must wear a complete (all-in-one, not zipped together at waist) leather suit of at least 1.2 mm in thickness (on all parts of the suit). Non leather material may be used if it meets with the requirements laid down by the FIM in Art. 65.07.

Two-piece zipped together racing suits are allowed in Drag racing.

The following areas must be padded with at least a double layer of leather or enclosed plastic foam at least 8 mm thick:

- Shoulders
- Elbows
- Both sides of the torso and hip joint
- The back of the torso
- Knees

65.02

Both the rider and the passenger must wear complete undergarments if they use suits which are not lined. Suitable undergarments may be of the Nomex type, they may also be of silk or simply cotton. It is recommended that linings or undergarments are not made of a synthetic material which might melt and cause damage to the riders' skin.

65.03

Riders' footwear must be of leather or an approved substitute material and of a minimum height of 200 mm to provide, with the suit, complete protection.

65.04

Both rider and passenger must also wear gloves and boots made of resistant materials, which with the suit provides complete coverage from the neck to the feet.

65.05

The fabric or substance of all clothing and its lining must be tested and certified by an official Scientific Institute taking into account the fire and wear resistant qualities of all parts of the clothing which come into direct contact with the skin. It must be anti-inflammable and may be approved by an FMN (National Motorcycling Federation).

65.07 Material equivalent to leather

The following characteristics of the material must be at least equivalent to 1.5 mm of cowhide (not split leather):

65.07.1 Fire retardant quality

65.07.2 Resistance to abrasion

65.07.3 Coefficient of friction against all types of asphalt

65.07.4 Perspiration absorbing qualities

65.07.5 Medical test – non toxic and non-allergenic

65.07.6 Fabric of a quality that does not melt.

65.07.7 Clothing in material other than leather must bear a sticker or label which says "in conformity with the FIM rules". This label must be sewn or attached to the clothing in a permanent way.

65.08

FMNS (National Motorcycling Federations) which approve protective clothing must present the certificate of a testing institute to the FIM for the records. The suits must carry an FMN approval mark, only if required by the FMN.

01.67 WEARING OF HELMETS

It is compulsory for all participants 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 have a chin strap type 'retention system'.

Helmets constructed with an outer shell of more than one piece are permitted, provided that, in case of emergency, they can be quickly and easily removed from the rider's head by releasing or cutting the chin strap only.

All helmets must be marked with one of the official international standard marks mentioned in Art. 01.70 or the Approval Mark (stamp) of the FMN of the rider. Helmets marked by an FMN must comply with one of the International Standards listed in Art. 01.70 before approval by an FMN.

Failure to observe the above rules will entail exclusion.

01.69 HELMET OPERATIVE INSTRUCTIONS

69.01

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

69.02

If a helmet does not meet the technical requirements and is found to be defective, the Technical Steward must remove all approval marks and retain the helmet until the end of the meeting. 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 (see also Art. 77.02.14).

69.03

All helmets must be intact and no alteration must have been made to their construction.

69.04

The Technical Steward and/or the Technical Steward MAY perform the following checks before the rider is permitted to take part in practice:

69.04.1 That the helmet fits well on the rider's head.

69.04.2 That it is not possible to slip the retention system over the chin, when fully fastened.

69.04.3 That it is not possible to pull the helmet over the rider's head by pulling it from the back of the helmet.

01.70 RECOGNISED INTERNATIONAL APPROVAL MARKS

- Europe ECE 22-04 & ECE 22-05, 'P' (integral)
- Great-Britain BS 6658 GRADE A
- Japan JIS T 8133 2000
- USA SNELL M 2000

(see International Helmet Standards in diagram section)

01.71 EYE PROTECTION

The use of glasses, protective goggles as well as helmet visors and "tear offs" is permitted. The material used for eye protectors and glasses must be made of shatterproof material. Helmet visors must not be an integral part of the helmet. Eye protectors which cause visual disturbance (scratched, etc.) must not be used.

01.75 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 with 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.

01.77 CONTROL

77.01 General Verification

A rider is at all times responsible for his machine.

77.01.1 The Chief Technical Steward must be in attendance for a meeting at least 1 hour before the technical verifications are due to begin. He must inform the Clerk of the Course, the Jury President and the CTI Delegate, if present, of his arrival.

77.01.2 He must ensure that all Technical Stewards, appointed for the meeting, carry out their duties in a proper manner.

77.01.3 He shall appoint the Technical Stewards to individual posts for the race, practices and final control.

- 77.01.4** Technical inspections will only be carried out when the technical specification form of the motorcycle has been distributed by the Organiser (during the preliminary controls).
- 77.01.5** The rider, or his mechanic, must be present with the machine for Technical control within the time limits stated in the Supplementary Regulations. The maximum number of persons present at the technical verification will be the rider, plus two others. In addition, for Team meetings, the Team Manager will also be allowed.
- 77.01.6** The Chief Technical Steward must inform the International Jury of the results of the Technical control. The Chief Technical Steward will then draw up a list of accepted machines and submit this list to the Clerk of the Course.
- 77.01.7** The Chief Technical Steward has the right to inspect any part of the motorcycle at any time of the meeting.

77.02 Procedure

Any rider failing to report as required below may be excluded from the meeting. The International Jury may forbid any participant who does not comply with the rules, or any rider who can be a danger to other participants or to spectators, to take part in the practice sessions or in the races.

- 77.02.1** The Technical control must be carried out in accordance with the procedure and times fixed in the CCR & FIM Technical Rules and the Supplementary Regulations of the meeting.

Transponders, where required, must be installed after a machine has successfully passed the technical inspection.

- 77.02.2** The rider or mechanic must present a clean motorcycle and in conformity to the FIM rules. He must also present a duly filled in and confirmed technical card.

- 77.02.3** 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.

The Chief Technical Steward has the final authority in case of a dispute on the conformity of the parts in question and for acceptance thereof.

- 77.02.4** The rider is permitted to use whichever motorcycle he chooses from the accepted motorcycles.
- 77.02.5** Before each practice the Technical Steward must confirm that the motorcycle has passed the Technical control by checking the Technical control sticker before the motorcycles go on the track.
- 77.02.6** Only accepted motorcycles may be used in a race and practice. A change of motorcycle is accepted in accordance with the prescriptions of the sporting appendix.
- 77.02.7** All machines must be controlled before they are placed in the closed park area. For Endurance races, only one (1) motorcycle per team qualified for the race is accepted in the closed park area.
- 77.02.8** The first three machines and one at random (for race class) and all classified machines from each class, will be placed in a closed park for 30 minutes after the race has finished, in case of protest or should further examination be required.
- Competitors must retrieve their machines within 30 minutes after the opening of the closed park area, except for those machines chosen for disassembly. After this time limit, the closed park officials will no longer be responsible for the machines left behind.
- 77.02.9** Approximately 30 minutes after the Technical control has been completed, the Chief Technical Steward must submit to the International Jury list of accepted motorcycles and riders in the individual classes.
- 77.02.10** If a motorcycle is involved in an accident, the Technical Steward must check the machine to ensure that no defect of a serious nature has occurred. However, it is the responsibility of the rider to present his machine for this re-examination together with helmet and clothing.
- If the helmet is clearly defective, the Technical Steward must retain this helmet. The organiser must send this helmet, together with the accident and medical report (and pictures and video, if available) to the Federation of the rider. If there are head injuries stated in the medical report, the helmet then must be sent to a neutral institute for examination.

77.04 Other classes (if not otherwise stated)

77.04.1 The rider must present his equipment. The helmet must be marked.

77.04.2 The rider may present several motorcycles for the Technical control.

77.04.3 The noise control will be carried out first. The exhaust silencer must be marked with paint. The noise level will be recorded in the technical card.

77.04.4 The motorcycle must be weighed and the weight recorded in the technical card.

77.05 Dangerous machines

If during practising 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 International Jury. It is their duty to exclude such a machine from either the practice or from the race itself.

01.78 TECHNICAL VERIFICATION GUIDELINES

- Make sure all necessary measures and administrative equipment are in place at least 1 hour before the Technical control (see separate list) is due to open (time in Supplementary Regulations).
- Decide who is doing what and note decisions. "Efficiency" must be the watchword. Always keep cheerful and remember the reasons for Technical controls: **SAFETY AND FAIRNESS**.
- Be well informed. Make sure your FMN has supplied you with all technical "updates" that may have been issued subsequent to the printing of the Technical Rule Books and that these documents are in your possession.
- Inspection must take place under cover with a large enough area (min. surface 100 sq. metres) to handle two lines if all classes are taking part.
- Weighing apparatus must be accurate and practical. Certified master weights and their certificate must be available for verifying.
- Rules regarding noise level and measurement must be respected.

78.01 International races

At each circuit, an area must be designated as the Technical control Area. In this area, under the control of the Chief Technical Steward; suitable equipment will be available to conduct proper inspections.

The Technical control will be carried out in accordance with the schedule set out in the meetings' Supplementary Regulations.

Technical Stewards must be available throughout the entire meeting to check motorcycles and equipment as required by the Chief Technical Steward.

The Chief Technical Steward will appoint 3 Technical Stewards to do the inspections of the participants in the work area.

The Technical control of the permanent participants will take place in the teams' box or the teams' working area. However, if the team or rider prefers, they may present the machine in the technical Technical control area.

Presentation of a machine will be deemed as an implicit statement of conformity with the technical appendices.

The Technical Stewards must inspect the motorcycles for obvious safety omissions.

The Technical Stewards must inspect that the motorcycle conforms to all technical rules.

The scales and noise meter will be available to the teams or riders for pre-race checking in the technical Technical control area.

Noise test should take place in a clear area adjacent to the Technical control at least 5 metres from any possible noise reflecting obstruction.

The riders and teams must be aware that the weight and noise may be controlled at random during practice in the pit-lane and at the end of each race.

Claiming that the noise and weight were not officially controlled before the race will not be grounds for appeal. Conformity of the rules is the responsibility of the rider and the team (or the participants).

The Chief Technical Steward reserves the right to spot check the weight and noise of any machines on pit row during free practice and official practice. This can occur at any time during the free practice and in the first forty minutes of any official (timed) practice. This will be carried out with the least possible inconvenience to the rider or the team.

Machines arriving later than the first free practice must be controlled in the technical Technical control area.

At the conclusion of the inspections, a small sticker or coloured mark will be placed on the frame indicating that the machine had passed inspection

The Technical Stewards must re-inspect any machine that has been involved in an accident.

The Technical Stewards must be available, based on instructions from the Chief Technical Steward, to re-inspect any motorcycle for technical compliance during the meeting.

At the end of the race, the Chief Technical Steward will ensure that all classified machines from each class will be placed in a closed park (parc fermé) for thirty minutes after the race has finished.

During the technical inspection in the closed park the mechanics must assist with the inspections. A maximum of two (2) team members per rider are allowed in the closed park during the post-race technical inspection. Downloading of data is allowed in the closed park.

Representatives of the tyre manufacturers are allowed in the closed park.

Equipment list

- Revolution meter
- Sound meter and calibrator
- Slide caliper
- Depth gauge
- Steel measuring tape
- Seals
- Weighing apparatus (scales) with calibration weights
- Tools for measuring engine capacity
- Tools for measuring valve lift
- Weighing apparatus for investigation of valve weights
- Colour for marking parts
- Magnet for materials testing

Documents list

- FIM Technical rules CURRENT YEAR
- FIM CCR Appendices CURRENT YEAR
- FIM Sporting Code
- Supplementary Regulations
- Technical control forms
- Writing materials

78.02 Minimum tasks

	<u>Minimum number of Stewards required</u>
• Checking of documentation (entry forms, licence, etc.).	2 persons
• Noise test, silencer marking.	2 persons
• The machine weight will be checked : 1) In case of doubt, the team and/or the Chief Technical Steward can request for the machine to be weighed with an empty fuel tank, to verify the weight of a complete motorcycle. 2) At the final or post-race inspection.	2 persons
• Machine inspection, compliance with rules and safety check on 4-stroke enlarged breather systems.	2 persons
• Helmet and clothing	1 person

Friday and Saturday: Technical control on day before start of official practice

- Minimum control time per category. 3 hours
- Noise test should take place in a clear area adjacent to the Technical control at least 5 metres from any possible noise reflecting obstruction.
- Documents and tools (see separate list).

- Chief Technical Steward reports to Jury on completion of examinations.
- Continue visual control of all machines.

During Race Day

- Free use of weighing equipment by all teams.
- Safety check before every race.
- Visual check of helmet security on starting grid.
- After the race, ensure machines go directly to the Closed Park and are retained for 30 minutes. That is :

All classes = First 3 machines and one at random

Verification:

All classes = According to protest or Jury decision

Verify all selected machines for :

- Noise
- Weight
- One engine and up to a maximum of three engines, chosen at random, can be checked internally for capacity in each class and for compliance with the rules.

The random choice can be determined by finishing positions selected prior to the race by the Chief Technical Steward, who may at his absolute discretion require the control of an additional motorcycle (or motorcycles).

List of tools and documents

1) Tools

- Revolution meter
- Sound meter and calibrator
- Slide calliper (for verifying engine capacity, valve sizes and lift, port sizes, carb size, etc.)
- Depth gauge
- Steel measuring tape
- Arrangement for measuring ground clearance
- Seals
- Arrangement for measuring the angle of rotation of the handlebar
- Weighing apparatus (to be furnished by the Organiser); set of weights to adjust the scales (180 kg)
- Tools for measuring the engine capacity
- Colour for marking parts
- Label, temperature stable, if taken for marking silencer
- Magnet for testing titanium
- Burette for investigation of the compression ratio, graduated 0-100 cc
- Measurement tolerance : Plus one (ratio)
- (Use SAE 5 grade suspension fluid)
- Small weighing apparatus for investigation of valve weight (from 0.5 g to 50 g)
- Adequate fuel sample containers

2) Documents

- Supplementary Regulations for the meeting
- FIM Technical Rules of the current year
- Technical control Forms
- Writing material

OFFICIAL FIM SPECIFICATION DECLARATION FOR ROAD RACING

All sections must be completed by the Technical Steward in the presence of the rider or rider's representative (See also Art. 01.77)

Particulars of the Meeting : _____

Title of the **meeting** : _____ IMN N° : _____

Place : _____ Date of the **meeting** : _____

Particulars of the Rider : _____

Rider's Name : _____ Rider's first name : _____

Nationality : _____ Date of birth : _____

Rider's Licence N° : _____ Medical examination : _____

Section I	1st Machine	2nd Machine
(1 FMN Senior Technical Steward + 1 Assistant)		
Administration		
Equipment and protective clothing		
Helmet (Standard + No.)		
Machine (Make + Type)		
Bore and Stroke		
Frame No.		
Section II		
(1 FMN Senior Technical Steward + 1 Assistant)		
Noise dB/A		
Ignition cut-out alternator		
Section III		
(1 FMN Senior Technical Steward + 1 Assistant)		
Fire retardant material (56.01.4)		
Weight		
Fuel tank with fix points		
Oil catch tank		
Breather system (4-stroke)		
Section IV		
(1 FMN Senior Technical Steward + 1 Assistant)		
Brakes/Tyres		
Bearing (Wheels, steering unit)		
Number + Plates		
Fairing		
Throttle control		
Oil drain/Filler plugs, etc. wired		
Ground clearance (Sidecar)		

OFFICIAL FIM SPECIFICATION DECLARATION

Comments : _____

Name of Technical Steward : _____

International Official's Licence N° : _____

Acceptance of a machine for competition does not preclude the possibility of further post-race control to ensure compliance with the competition Technical rules.

Acceptance stamp of
Technical Steward

I hereby declare that the
information given above
is accurate in every respect

Signature : _____ Rider's signature : _____

01.79 NOISE CONTROL (Drag Racing excepted)

Noise will be controlled to limits as stated in Art. 79.11.

79.01

With the microphone placed at 50 cm from the exhaust pipe at an angle of 45° measured from the centre-line of the exhaust end and at the height of the exhaust pipe, but at least 20 cm above the ground. If this is not possible, the measurement can be taken at 45° upwards.

79.02

During a noise test, machines not equipped with a gear box neutral must be placed on a stand.

79.03

The silencers will be marked when they are checked and it is not allowed to change them after the verification, except for any spare silencer which has also been checked and marked.

79.04

The driver shall keep his engine running out of gear and shall increase the engine speed until it reaches the specified Revolutions Per Minute (RPM). Measurements must be taken when the specified RPM is reached.

79.05

The RPM depends upon the mean piston speed corresponding to the stroke of the engine.

The RPM will be given by the relationship:

$$N = \frac{30,000 \times cm}{l}$$

in which N = prescribed RPM of engine
cm = fixed mean piston speed in m/s
l = stroke in mm

79.06 Noise control

79.06.1 Due to the similarity of the piston stroke in different engine configurations within the capacity classes, the noise test will be conducted at a fixed RPM (Supermono excepted). For reference only, the mean piston speed at which the noise test is conducted, is calculated at 13 m/sec (2-stroke engines) and 11 m/sec (4-stroke engines).

Racing engines and GP formula :

	1 cylinder	2 cylinders	3 cylinders	4 cylinders
125 cc (2-stroke)	7,000 RPM			
250 cc (2-stroke)		7,000 RPM		
500 cc (2-stroke)		5,500 RPM	7,000 RPM	7,000 RPM

79.06.2 For Supermono class, the test RPM will continue to depend upon the mean piston speed corresponding to the stroke of the engine, according to the following table.

79.06.3

Noise control - RPM Figures (for Supermono class only)

Stroke in mm	2-stroke	4-stroke	Stroke in mm	2-stroke	4-stroke
30	13,000	11,000	66	5,909	5,000
31	12,580	10,645	67	5,820	4,925
32	12,187	10,313	68	5,735	4,853
33	11,818	10,000	69	5,652	4,783
34	11,470	9,706	70	5,571	4,714
35	11,142	9,429	71	5,492	4,648
36	10,833	9,167	72	5,416	4,583
37	10,540	8,919	73	5,342	4,521
38	10,263	8,684	74	5,270	4,459
39	10,000	8,462	75	5,200	4,400
40	9,750	8,250	76	5,132	4,342
41	9,512	8,049	77	5,065	4,286
42	9,285	7,857	78	5,000	4,231
43	9,069	7,674	79	4,937	4,177
44	8,863	7,500	80	4,875	4,125
45	8,666	7,333	81	4,815	4,074
46	8,478	7,174	82	4,756	4,024
47	8,297	7,021	83	4,699	3,976
48	8,125	6,875	84	4,643	3,929
49	7,959	6,735	85	4,588	3,882
50	7,800	6,600	86	4,535	3,837
51	7,647	6,471	87	4,483	3,793
52	7,500	6,346	88	4,432	3,750
53	7,358	6,226	89	4,382	3,708
54	7,222	6,111	90	4,333	3,667
55	7,090	6,000	91	4,286	3,626
56	6,964	5,893	92	4,239	3,587
57	6,842	5,789	93	4,194	3,548
58	6,724	5,690	94	4,149	3,510
59	6,610	5,593	95	4,105	3,474
60	6,500	5,500	96	4,063	3,438
61	6,393	5,410	97	4,021	3,402
62	6,290	5,323	98	3,980	3,367
63	6,190	5,238	99	3,939	3,333
64	6,093	5,156	100	3,900	3,300
65	6,000	5,077			

79.07

The noise level for engines with more than one cylinder will be measured on each exhaust end.

79.08

A machine which does not comply with the noise limits may be presented several times at pre-race control.

79.09

For Supermono class only, when presented for examination, the correct stroke must be stamped in a clearly visible position on the crankcase.

79.10

For Wankel, the noise level will be measured at 6 000 RPM.

79.11 Noise limits in force (except in Drag racing for Competition and Pro Stock Bikes)

Max. 105 dB/A measured at a mean piston speed of 13 m/sec for 2-stroke engines, and 11 m/sec for 4-stroke engines. The fixed RPM specified in Art. 79.06.1 may be used.

79.12

The surrounding noise should not exceed 90 dB/A within a 5 metres radius from the power source during tests.

79.13

Apparatus for noise control must be to international standard IEC 651, Type 1 or Type 2.

The sound level meter must be equipped with a calibrator for control and adjustment of the meter during periods of use.

79.14

The "slow response" setting must always be used.

79.15

Due to the influence of temperature on noise tests, all figures are correct at 20°C. For tests taken at temperatures below 10°C there will be a + 1 dB/A tolerance and for tests below 0°C, a + 2 dB/A tolerance.

79.16 Noise control after the competition

In a competition which requires a final examination of machines before the results are announced, this examination must include a noise control measurement of at least the first three machines listed in the final classification. At this final test, there will be a 3 dB/A tolerance.

79.17 Noise control during a competition

In a competition which requires noise control tests during the meeting, machines must comply with the noise limits without the tolerance in Art. 79.16.

01.80 GUIDELINES FOR USE OF SOUND LEVEL METERS

80.01 Introduction

The Noise Control Officer (NCO) must arrive in sufficient time for discussions with the Clerk of the Course and other Technical Stewards in order that a suitable test site and testing policy can be agreed.

80.02

Sound level measuring equipment must include a compatible calibrator, which must be used immediately before testing begins and always just prior to a re-test if a disciplinary sanction may be imposed.

Two sets of equipment must be available in case of failure of tachometer, sound level meter or calibrator during technical control.

80.03

Before testing, the NCO should if possible liaise with a maximum of two holders of FIM Sponsor's or Manufacturer's licences, or team managers, who have noise test equipment including calibrators, in order to agree the accuracy of the official sound level meter.

80.04

Tests should not take place in rain or excessively damp conditions. Machines considered excessively noisy must be individually tested if conditions allow.

80.05

In other than moderate wind, machines should face forward in the wind direction. (Mechanical noise will blow forward, away from microphone).

80.06

'Slow' meter response must be used.

80.07

'A' weighted setting on sound level meter.

80.08

Always round down meter reading, that is: 103.9 dB/A = 103 dB/A.

80.09 **Correction**

Type 1 meter : deduct 1 dB/A

Type 2 meter : deduct 2 dB/A

80.10 **Ambient temperature**

Below 10° Celsius: deduct 1 dB/A

Below 0° Celsius : deduct 2 dB/A

All tolerances are accumulative. Action taken will depend on the sporting discipline concerned, and decisions taken during prior discussions with the Clerk of the Course.

01.82 TECHNICAL RULES FOR SOLAR OR ELECTRICAL POWERED MOTOCYCLES

Introduction

Electric propulsion motorcycles are Category III vehicles with 2 wheels having traction on one wheel, driven by a motor (or motors) operated by means of electricity only. Wheels must normally be in contact with the ground.

In the races organised by FIA, with the agreement of FIM, the solar and/or electrically powered motorcycles are classified in the Category IV of the FIA-FIM Electrical and Solar Commission regulations under the name of “Solar and/or electrically powered lightweight vehicles”.

82.01 Groups and classes

82.01.1 Solar electrically powered vehicles

Vehicles propelled by the direct or indirect conversion of solar energy.

82.01.2 Electrically powered vehicles

Vehicles which use electric energy stored on board and which is not necessary or essentially propelled by the conversion of solar energy.

82.01.3 Weight classes

The solar and/or electrically powered motorcycles are divided into two weight classes as follows:

- CLASS 1: Motorcycles up to 150 kg. Pedal drive is permitted in exceptional circumstances at the organiser’s discretion.
- CLASS 2: Motorcycles over 150 kg and up to 300 kg. Pedal drive is not permitted.

82.02 Vehicle technical passport

In the races promoted by FIA and under Electric and Solar Commission regulations, all motorcycles must receive an homologation by FIA through a technical passport.

The passport contains an exact description of the vehicle along with all the data necessary for the identification of the model concerned. The technical passport must contain drawings of the power circuit of the vehicle and its location in it (see article 1.4.6. of FIA technical rules). The technical passport must be presented at Technical Control.

The organiser has the right to refuse or allow a competitor to take part in the meeting if the said competitor fails to submit the technical passport of the motorcycle. It shall be the responsibility of the competitor to obtain the technical passport for the vehicle, along with any amendments or addenda to the said form, from the FIA.

82.03 Vehicle road licence

In the races promoted by FIA and under Electric and Solar Commission regulations (races on closed track promoted by FMNs or FIM excluded), motorcycles must possess an official national licence (individual testing or vehicle type testing), or must at least fulfil all the conditions necessary for obtaining a national or state licence of the country where the meeting is taking place.

82.04 IEC Publications

If no specific rule exists in these Technical Appendices, the relevant IEC Standard (International Electro-technical Commission Standard) or Report has to be observed. These IEC Publications, which are available from the national representative or member of the IEC, are the following:

- **IEC 529** Degrees of protection provided by enclosures (IP Code).
- **IEC 718** Electrical equipment for the supply of energy to battery powered road vehicles (This International Standard applies to the charging of batteries forelectrical road vehicles. The aspects covered include battery chargers, their effects upon the electricity supply system and the connection of their batteries to the power supply source).
- **IEC 783** Wiring and connectors for the road vehicles (This report is applicable to cabling and connectors used in battery electric road vehicles).
- **IEC 784** Instruments for electric road vehicles (This report is applicable to the instrumentation of electric road vehicles, excluding those items which are used as instrumentation in vehicles with internal combustion engines).

– **IEC 785** Rotating machines for electric road vehicles
(This report is applicable to rotating electrical machines [traction motors and auxiliary motors] of electric road vehicles including hybrids, which are fed from the main traction batteries).

– **IEC 786** Controllers for electric road vehicles
(This report is applicable to the equipment on electric vehicles which control the rate of energy transfer between the traction battery or batteries and the motor or motors).

82.05 General Prescription

All motorcycles must comply in every respect with all the requirements for road racing as specified in the Road Racing Technical Rules, unless not specifically reported in this set of rules.

82.06 Minimum Weight

This is the actual minimum weight of the empty motorcycle (without any of the supporting tools used during a meeting). All the liquid tanks (lubrication, cooling, braking) must be at their normal level defined by the manufacturer.

82.07 Dimensions

The maximum length must not exceed the 5.0 meters and the maximum width must not exceed the 1,2 meters.

82.08 Ballast

It is permitted to make up the weight by using one or several ballast, provided that they are strong and unitary blocks, fixed by means of tools and able to have seals affixed to them by the Technical Stewards. An accumulator cannot be used as ballast.

82.09 Engine

Only electric motors, of various designs, may be used. Other types of motors are expressly prohibited. A label made from durable material must be affixed in an easily accessible location and must permanently display the name of the manufacturer, the motor number, the nominal power output, the type of motor, the nominal voltage and the IP protection.

82.10 Transmission

The propulsion of the motorcycles must be effected via the wheel (or the wheels if three-wheels). In race conditions, the vehicle must be capable of effecting a standing start on an uphill slope with a gradient of 18%.

82.11 Chassis / Frame

The use of titanium in the construction of the chassis/frame or any important structure is forbidden. The use of titanium alloy nuts and bolts is allowed.

82.12 Wheels and Tyres

A wheel consists of the flange and the rim. A complete wheel is defined as the flange, rim and tyre. The wheels must be equipped with pneumatic tyres.

Only wheels and tyres which have already been approved for public road use may be used.

Heating of tyres by any method or their treatment by any chemical substance is prohibited.

For circuit races, motorcycles will be able to use special tyres, but these must be made by a recognised manufacturer.

82.13 Chassis number

A unique number must be embossed visibly on an easily accessible part of the chassis. In addition, a label made from durable material must be affixed in a easily accessible location and must permanently display the name of the manufacturer, the make of the vehicle and its chassis number.

82.14 Bodywork

Bodywork externally: all the entirely suspended parts of the vehicle licked by the air-stream.

All parts of the bodywork must be fully finished and manufactured with due care.

82.15 Lighting

All lighting equipment and head must comply with the legal requirements of the country in which the meeting is taking place, or with the International Conventions on road traffic. Only lighting equipment bearing the EU test mark or a national equivalent may be used.

The lighting equipment (if it exists) must be in working order throughout the duration of the meeting, even if the entire meeting is run in daylight.

Throughout the duration of the meeting, the on-board accumulator and/or circuit must have a voltage of 13 volts, with a tolerance of +/- 1 volt, for a 12 volt lighting installation. For any other installation, the voltage must be appropriate to that of the lighting installation. This must be the case when the vehicle's accumulator is partially or totally discharged.

In race, motorcycles can remove or must tape all lights.

82.16 Conformity with the appendices

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

82.17 Electrical equipment

82.17.1 Accumulator (storage battery)

The accumulator must be defined as any equipment used for the intermediate storage of electrical energy supplied by the solar generator or by the charging unit. The accumulator must be checked and sealed at Technical Control. The Technical Stewards may permit, that the accumulator may be changed (partially or as a whole) during the meeting, under the control of the Chief Technical Steward.

Any on-board accumulator is considered as an integral part of the vehicle's accumulator. All on-board electrical equipment, unless consisting of items originally powered by dry batteries, small accumulator or their own solar cells, must receive its energy supply from the vehicle's official accumulator (this also applies to communication's equipment).

The following accumulators are permitted:

- Lead-Acid
- Nickel-Cadmium
- Nickel-Iron
- Zinc-Bromium
- Nickel-Metal-Hydride

Request for additions to this list must be sent to the Commission 3 months in advance, giving full details of chemistry. A fee may be required.

Accumulators, more than 5% of whose weight consists of gold, silver or platinum, are not allowed.

82.17.2 Operating voltage

The voltage is limited to 1000 volts between two points (See Art 82 for safety provisions).

82.17.3 Energy capacity of the accumulator

The capacity C1 is the capacity of the accumulator in Ah at a battery temperature of 25°C and for a complete battery discharge within a maximum of 1 hour.

The capacity C5 is the capacity of the accumulator in Ah at a battery temperature of 25°C and for a complete battery discharge within a maximum of 5 hours.

The capacity C20 is the capacity of the accumulator in Ah at a battery temperature of 25°C and for a complete battery discharge within a maximum of 20 hours.

The energy is calculated as the result of the product of the nominal voltage of the vehicle's accumulator in volts and the capacity C5 in Ah. The energy capacity must be expressed in KWh.

82.17.4 Charging the accumulator

The vehicle's accumulators must be charged at the times and locations determined by the organiser of the meeting. Vehicles must recharge their accumulators at the main recharging station ("grid compounding station").

By day between 08.00 a.m. and 08.00 p.m., the minimum charging time will be 1 hour and the maximum charging 4 hours.

By night, between 08.00 p.m. and 08.00 a.m., the minimum charging time will be 8 hours.

82.17.5 Measurement conditions of the maximum voltage

The maximum voltage has to be measured at least 15 minutes after the end of charging of the accumulator.

82.17.6 Energy recovery

It is permitted to recover energy generated by the kinetic energy of the vehicle. It is not permitted to have stored energy in such devices before the start of the meeting.

82.17.7 Use of outside energy sources

The use of any other source of energy in any form whatsoever with the aim of improving the performance of the vehicle is strictly prohibited. The cooling system must be driven only by the vehicle's official accumulator.

82.18 Solar generator

82.18.1 Solar cell

A solar cell is a photo-voltaic element which is used to convert solar radiation into electrical energy. All types of solar cells may be used.

82.18.2 Module

A module consists of several solar cells put together to make one mechanical unit.

82.18.3 Solar generator

A solar generator is the interconnection of modules made up of any number of solar cells. Throughout the duration of the meeting, the size of the solar generator must be neither increased, nor reduced.

In the event of a defect, individual modules may be replaced. It is also permitted to optimise, by electronic means, the operation point of the solar generator.

The solar generator must be firmly fixed to the competing motorcycle, and installed in such a way that its position in relation to the motorcycle cannot be changed whilst the vehicle is in motion. The entire active surface of the solar generator must be exposed to the sun when the motorcycle is in motion.

To charge the accumulators while the vehicle is at standstill, the position of the solar generator's surface may be altered or the motorcycle may be jacked up.

Between the solar generator and the accumulator, two measuring points (plus and minus polarity) must be inserted, allowing the measurement of the total solar generator output.

During the measurement, the entire generator must be electrically separated from the remaining vehicle circuit.

The solar generator may be used to generate electricity for the competing motorcycles as follows:

Two wheel vehicles may carry a solar generator of maximum output 120 Wp. The stationary solar generator system must have a power output of at least 200 Wp.

82.18.4 Measurements

All data and measurements and the calculations based upon them for solar generators and other parts of the electrical equipment must be valid at an ambient temperature of 25°C.

When the solar generator power output is to be converted from ambient temperature to cell temperature, the following operation must be applied:

The power at an ambient temperature of 25°C, multiplied by 1.17, equals the power of generator for a cell temperature of 25°C.

The tolerance for measuring the electrical circuits is +/- 5%. Maximum power point (MPP): This is the maximum power for a solar radiation of 1 kW/m² at the level of the solar generator.

82.19 Certificate of access to solar energy recharging station

At Technical Control, all motorcycles must present an official certificate for the possession of, or the right to obtain, power from such a station (grid compounding station).

82.20 Charging units

Charging units are not compulsory on board solar and/or electrical motorcycles (FIA Category IV).

82.21 Charging from the mains

For each vehicle designed for mains power charging, there must be an officially assigned mains power connection (socket) at the grid compounding station. The socket and the plug of the charging unit cable of the vehicle must be marked during the meeting with the starting number of the motorcycle. Schuko-sockets (German - system) or IEC sockets will normally be used.

The organiser must publish the kind of sockets in the latest communication.

Each socket must be protected by a corresponding automatic fuse (see current of the charging unit) and an automatic ground fault current interrupter (FI) with 0,03 Ampere release current.

During possible random checks, the mains voltage and current consumption will be measured with a volt- and an ampere-meter at the official socket of the motorcycle at the grid compounding station over a period of 1 to 2 minutes.

In cases where the effective (root-mean-square) mains current (“I eff”) of the charging unit exceeds the following maximum values, measured at the official socket of the vehicle at the grid compounding station, the competitor shall be fined.

Nominal mains voltage	Effective mains current (I eff)
100 V to 130 V	32 Ampere
200 V to 250 V	16 Ampere

The charging energy obtained from the grid compounding station must be measured for rallies and may be measured for races by the organiser using energy meters (counter). An official is required to monitor the grid compounding station continuously.

Where a motorcycle’s accumulator is charged by means of a socket other than the official assigned socket or by means of a socket belonging to another competitor, the guilty competitor shall be excluded.

82.22 Electrical drawings

One electrical drawing (A4 dimension) of all essential power circuits of the electrical equipment of the motorcycle is compulsory.

This circuit drawing must contain accumulators, fuses, circuit breakers, power switches, capacitors, motor controller or chopper, motor(s), charging units and junction cables.

All components in the circuit drawing must be labelled with their detailed electrical specifications. A second drawing of the vehicle in plan form (from above) must show the location of these components within the vehicle.

Both said electrical drawings are an integral part of the vehicle technical passport.

82.23 Safety equipment

82.23.1 Dangerous construction

Any motorcycle whose construction is deemed to be dangerous must be excluded by the Technical Stewards of the meeting.

82.23.2 Optional devices

If any device is optional, it must be fitted in a way that complies with the appendices.

82.23.3 Cables, lines and electric equipment

Brake lines, electrical cables and electrical equipment must be protected against any risk of damages (stones, corrosion, mechanical failure, etc.) when fitted outside the vehicle. If the series production fitting is retained, no additional protection is necessary.

82.23.4 Brakes

Art. 01.41 of the Road Racing Technical Rules is valid in general.

In general, minimum mean braking deceleration must be:

- Both brakes together: 4.5 m/s²
- One brake alone: 2.5 m/s²

82.23.5 Rear view

On open road, the rear view must be ensured by means of two mirrors. During races on closed tracks, the rear mirrors must be taken off.

82.23.6 Electrical safety

All vehicles must comply exactly with the regulations of the national authorities with regard to the standardisation and control of low-voltage electrical installations (see Art. 82.14.2 regarding operating voltage).

Likewise, the regulations of the IEC (International Electro-technical Commission Standard) (e.g. IEC 529,718,783,784,785 and 786), or of the national representative or member of the IEC (e.g. VDE/SEV) must be observed.

In no part of electrical equipment may there be voltages of more than 500 volt referred to earth and system ground respectively (system ground is the ground of the electrical equipment). Between system ground and chassis or body of the vehicle no more than 50 volts are allowed.

The voltage is limited to 1000 volt between two points. In cases where the voltage of the power circuit exceeds 42 volt, this power circuit must be separated from the onboard circuit by an adequate insulator.

Symbols warning of 'High Voltage' must be displayed on or near the electrical equipment protective covers; the symbol must comprise a black flash of lightning inside a yellow triangle with a black border. The sides of the triangle must measure at least 12 cm.

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

All parts of the electrical equipment must be protected using at least IP 44 type protection (dust proof and splash proof). However, it is recommended that IP 55 type protection be used (fully dust – and splash proof)
(See e.g. IEC 529 – art. 4.2).

82.23.7 General circuit breaker - 'Emergency Stop'

The general circuit must include a red button – the Emergency Stop Button – and a yellow disc of at least 8 cm in diameter reading 'Emergency' in red or black letters.

When seated in a normal riding position, the rider must be capable of interrupting all electrical transmission between the accumulators and the energy consumers by means of a spark-proof general circuit breaker – the Emergency Stop Button – situated in front of him. This button must be located in such a way that it can be also operated from outside the vehicle.

In order to prevent contact melting of the general circuit breaker its [$I^2 t$] (ampere square seconds characteristics, representing heat energy dissipated on the breaker contacts during switching) must be sufficient to guarantee proper operation of the circuit breaker, even under surge current conditions, in particular those occurring during the connection of the accumulator to the power plug.

82.23.8 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.

Fuses and circuit breakers (but never the motor circuit breaker) count as over-current trips. Extra fast electronic circuit fuses and fast fuses are appropriate. The fuses must be in an easily accessible location and as close as possible to the accumulator at both polarities.

All electrical cables inside the motorcycle must be protected by means of over currents trips rated according to the diameter of the individual conductors. Over-current trips must under no circumstances replace the circuit breaker (Emergency Stop Button).

82.23.9 General electric 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 an appropriate length of time.

82.23.10 Insulation resistance

Every part of the electrical equipment must have a minimum insulation resistance between all live components and earth.

For equipment with up to 300 volt to earth, the insulation resistance must reach the following value: 250 k Ohms.

For equipment with more than 300 volt to earth, the insulation resistance must reach the following value: 500 k Ohms.

The measurement of the insulation resistance must be carried out using a d.c. voltage of at least 100 volt.

82.23.11 Dielectric strength

All electrical equipment of the vehicle conducting electrically must fulfil the following conditions:

With regard to the dielectric strength, a distinction must be made between material with light, normal or reinforced insulation.

Normal insulation is insulation which can withstand a test voltage of at least 2000 volt at 50 hertz for a period of one minute. It must only be used for electrical circuits with a nominal voltage not exceeding 500 volt.

Reinforced insulation is insulation which can withstand a test voltage of at least 4000 volt at 50 hertz for a period of one minute. It must only be used for components with a nominal voltage not exceeding 1000 volt.

Light insulation must not be used (except for the on board circuit). All electrically live parts must be protected against accidental contact. Insulating material not having sufficient mechanical resistance, i.e. paint coating, enamel, oxides, fibre coatings (soaked or not) or insulating tapes are not accepted.

All electrically conducting non live parts must be connected with the motorcycle ground.

82.23.12 Capacitors

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

82.23.13 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 body using metal clamps with an insulating covering, fixed by bolts and nuts (bolts with a diameter of at least 10 mm).

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 accumulator from the rider. Each accumulator box must include an air intake with its exit.

82.23.14 Horn

All vehicles must be fitted with a homologated acoustic horn, capable of generating an uninterrupted sound of 90 dB(A).

82.23.15 Speedometer

Motorcycles running on open road must be fitted with a speedometer which must be situated within the driver's field of vision. The indicated speed must not be less than the actual speed of the vehicle.

01.83 TECHNICAL RULES FOR DRAG BIKES

83.01 General Construction Rules

83.01.1 Brakes

Motorcycles must be equipped with two independent brakes, working on two wheels. Disc brake minimum diameter 175 mm, drum brake minimum diameter 150 mm. Motorcycles over 500 cc must have front disc brake.

Minimum 250 x 5 mm for single disc. Minimum 220 x 5 mm for dual discs. (See also Art. 01.41).

83.01.2 Wheels

The motorcycle must be equipped with a front wheel made for a motorcycle. The rear rim should not be more than 50 mm narrower than contact surface of rear tyre. The minimum front rim should be WM 1 x 16".

83.01.3 Tyres and Tubes

Tyres should be slick type, or have a minimum tread depth of 2 mm. Motorcycles with top speed exceeding 200 km/h should have front tyres with at least 'V'-rating, or be of road racing type. Tubes for rear tyres should be of natural rubber, racing type. (See also Art. 49.06.10). Metal dust caps with rubber gasket must be fitted.

83.01.4 Frames

Stress-bearing tubes in the frame should be at least 20 x 1,5 mm. If a single backbone tube is used, it should be at least 50 mm. The engine should not be a stressed part of the frame. The engine should be located so that a safe weight distribution is achieved.

83.01.5 Ground Clearance

Minimum ground clearance with rider in position and 0.5 bar tyre pressure is 50 mm. It must be possible to lean the motorcycle 12 degrees to each side from the upright position, without any part of the motorcycle, except the wheels, touching the ground.

83.01.6 Front Forks

The front fork must be of the hydraulic type. Fork tubes may not extend more than 30 mm above the top fork crown. Minimum stroke 50 mm. No part of the motorcycle, except the wheels, may touch the ground with the forks bottomed.

Top fork tubes must have a minimum diameter of: 350-750 cc motorcycles, 28 mm, 750 cc and larger, 32 mm.

83.01.7 Handlebars - See Art. 01.33

83.01.8 Control Levers - See Art. 01.35

83.01.9 Streamlining

Streamlining must be made so the rider can jump on and off the motorcycle without removing any parts of it. It must not create difficulties for the rider to control the motorcycle.

83.01.10 Seats

Seats must be constructed to give the rider a safe riding position, and must not be dangerously uncomfortable.

83.01.11 Wheeliebars

Wheeliebars are permitted, and strongly recommended in Competition Bike, Funny Bike and Pro Stock Bike.

83.01.12 Protective Covers

All open transmissions must have a cover to prevent accidental contact with rotating parts. Mechanically driven compressors must have a cover of at least 3 mm steel, 5 mm aluminium or approved explosion-proof blanket. Outboard mounted clutches must have a cover of at least 3 mm aluminium, or 1 mm steel.

83.01.13 Compressors

Mechanically driven compressors, on motorcycles running on nitromethane, must have a "pop-off valve", rubber connection to the intake manifold or some other device to protect it from explosions.

83.01.14 Fuel Tanks

Fuel tank must be securely mounted to the frame.

83.01.15 Fuel Systems

All motorcycles must have operational fuel shut-off valves. All fuel lines must be locked or wired. Pump driven fuel injection systems must have high pressure tubes such as aeroquip or similar. Motorcycles running other fuels than gasoline or alcohol, and engines which cannot be stopped with the ignition must have a fast acting fuel shut-off valve. It must be positioned so the rider can operate it from the handlebar with both hands on the handlebar.

It must also be designed to shut off the fuel to the engine if the rider leaves the motorcycle, and must work in any direction. The shut-off valve must always be connected to the rider by a cord of not more than one metre extended length when starting the engine.

83.01.16 Carburettors and Fuel Injection

All motorcycles must have the throttle controlled by a hand operated twist grip, incorporating a positive acting spring attached directly to the carburettor mechanism.

The throttle must close automatically upon releasing the twist grip. For any motorcycle running on nitromethane fuel, it is mandatory to have a positive return cable as well as a return spring, i.e. a push-pull twist grip.

Motorcycles using automatic clutches must be fitted with a safety device that will prevent the throttle opening whilst the assistant pushes the machine back to the starting line after the burn out.

83.01.17 Kill Switch

The motorcycle must be equipped with an electrical contact which disconnects all electricity to the engine (and nitrous oxide system, if used) if the rider should lose control of the motorcycle. This must be connected to the rider whenever the engine is started.

83.01.18 Oil Catch Tanks

Where an oil breather pipe is fitted, the outlet must discharge into a catch tank. (See also Arts. 56.02 and 56.04). The catch tank capacity being of 0.5 litre for atmospheric engines and 2 litres for supercharged engines.

83.01.19 Safety Wiring

All oil drain plugs and nuts and bolts that will cause an instant oil leak if they come lose, must be safety-wired. (See Art. 56.03). Other nuts and bolts must be secured by any locking agents.

83.01.20 Chain

Chain should be of closed type without master link, or the master link should be safety-wired.

83.01.21 Exhaust Pipes

Exhaust pipes may not extend behind the rear wheel, and should be directed away from the rider, gas tank and tyres. Flexible pipes are not allowed.

83.01.22 Gear Change

The gear change mechanism must be constructed so it can be operated by the rider with both hands on the handlebar.

83.01.23 Ballast

The ballast must be securely fastened to the frame or the engine. (See also Art. 19.04).

83.01.24 Starting

All motorcycles must be self-starting. Rollers or push-start are not allowed.

A portable starting device which operates with the motorcycle clutch, working as a neutral, with the drive disengaged, is permitted.

83.01.25 Centrifugal Clutches

Motorcycles with engine driven centrifugal clutches may not be run in the pits unless the rear wheel is elevated off the ground on a strong, safe support stand.

83.01.26 Car Engines

Car engines are only allowed if the motorcycle is constructed so the weight and weight distribution is similar to a motorcycle with a motorcycle engine.

83.01.27 Computers

Computers may be used, during practice, for information gathering only. All electronic systems, including electronically assisted traction control system, apart from the ignition and injection, are strictly forbidden during the race. Throttle operation, shifting, clutch actuation, and braking, etc. are to be solely under the control of the rider.

83.01.28 Number plates - See Art. 55.12.7

83.02 Special Appendices for Pro Stock Bike

83.02.1 Definition

This class will be for standard appearance (factory produced motorcycles available to the general public, modified for drag racing) gasoline burning motorcycles.

83.02.2 Frames

After market frames are permitted. Steering head geometry, trail and wheel base may be changed if done in a safe and professional manner. Steering head angle may not be less than standard rake or more than 40 degrees maximum rake. Maximum wheel base is 1780 mm, measured from the most extendible point on the swing arm.

83.02.3 Front Suspension

Minimum usable travel: 40 mm, inner tube diameter minimum 34 mm. Replacement front ends are allowed. A steering dampener is recommended and may not act as a fork stop

83.02.4 Brakes

Hydraulic type, minimum front brake diameter: dual 200 mm X 5 mm width; single 250 mm diameter X 5 mm

83.02.5 Controls

All handlebar controls must remain in standard location. Replacement bars are permitted. Welded aluminium bars are prohibited. Welded steel or chrome-moly extensions are allowed but cannot extend more than 100 mm from standard location. Minimum handlebar width is 500 mm.

Brake pedals and foot pegs may be rear set, but must be at least 380 mm in front of rear axle. Foot pegs must be rounded with a solid spherical radius of not less than 8 mm.

83.02.6 Body

All main body parts must have standard appearance and shape and cannot be mixed between models. Body parts must have originally been produced with a motorcycle, with an engine capacity of 750 cc or larger.

Replacement parts must have retained the shape of the standard parts they replace. Lower portion of the fairing may be modified for exhaust pipe clearance or removed completely.

The body must have a simulated head- and taillight of the same configuration and design from the specific body it replaces. Additional holes for air passage are prohibited.

All aerodynamic devices are prohibited unless originally incorporated in the same OEM of that year.

The windscreen may be trimmed.

83.02.7 Seats

Custom seats with a step to prevent the rider from sliding backwards is permitted. Seat tail section and rear fender may be incorporated in one unit. Minimum seat height from lowest point of seat to ground is 500 mm.

83.02.8 Wheels

Replacement wheels are permitted front and rear. Front: 16" minimum, 19" maximum, or as standard. Rear: 15" minimum.

83.02.9 Tyres

Front tyre minimum width 2.75". Maximum rear tyre (rubber on ground) 10

83.02.10 Wheeliebar

Maximum length of 3,300 mm from centre of front axle to centre of wheeliebar axle, measured in a straight line from axle to axle. Wheels must be non metallic.

83.02.11 Engine

Manufacturer of the engine will determine the make of the bike. The engine must be of a type specifically designed and manufactured for a production motorcycle. The original manufacturer's crankshaft and its standard stroke must be used. Any modifications to the main engine cases are not allowed, except for repair purposes. Two cylinder and two stroke engine crank and cases may be changed.

83.02.12 Cylinder head

Cylinder head casting must be manufactured by the same manufacturer of the main engine cases. The original cylinder head casting can be modified.

83.02.13 Fuel Injection

Original Equipment Manufacturer (OEM) electronic fuel injection modifications are unlimited provided the injector bodies are OEM parts.

83.02.14 Ignition

Any ignition is allowed, including magnetos.

83.02.15 Fuel

Pump fuel or racing gasoline is permitted. As of 01.01.2001, fuel must comply with the specifications as written in Art. 01.63.

83.02.16 Weight Limits

Minimum weights of bike and rider equipped with:

2-valve DOHC	265 kg	max. 1500 cc
4 or 5 valve	265 kg	max. 1300 cc
4 or 5 valve	270 kg	max. 1350 cc
4 or 5 valve	280 kg	max. 1500 cc
2 cylinder / pushrod	250 kg	max. 2300 cc
2 cylinder	220 kg	max. 1000 cc
2-stroke	220 kg/n ² o allowed	max. 1000 cc

83.02.17 Transmission

Any transmission with a minimum of four forward and a maximum of six forward gears may be used. The transmission must be shifted from gear to gear manually or by air shifter. RPM or computer-shifted gear boxes are prohibited. The transmission must be contained within the standard crankcases, except for two cylinder or 2-stroke engines.

01.84 SPECIFICATIONS FOR SPRINTERS

Vehicles in Group B, including sprinters, must be fitted with at least 2 efficient brakes operating on at least 2 of the wheels and operated independently and concentrically with the wheel.

84.01 Specification of vehicle

All machines must be Category II motorcycles and also comply with the following requirements.

84.02 Size of tyres

There is no restriction on the type or size of tyres to be used.

84.03 Mudguards

Mudguards are not compulsory.

84.04 Exhaust pipes

The end of the exhaust pipe or pipes may project beyond any part of the vehicle or its body work. Any provision for the discharge of waste or surplus oil must be so made that it does not inconvenience a following rider.

84.05 Superchargers

The use of superchargers is permitted (see Art. 01.17).

84.06 Handlebars

The minimum angle of rotation of the handlebars, each side of the centre-line mid-position must be 20°.

Whatever the position of the handlebars, it must not be possible for the front wheel to come into contact with any part of the streamlining.

It is compulsory to fit a stop or stops or other devices to ensure a minimum clearance of 30 mm between the handlebars and tank, when on full lock, to prevent the trapping of the rider's fingers.

84.07 Footrests

The footrests for the rider must be positioned to give easy access to any control pedal. The ends of the footrest must be rounded with a spherical radius of not less than 8 mm (see Art. 39).

84.08 Streamlining

Unless otherwise stated in the Supplementary Regulations, there is no restriction on the type of streamlining of a motorcycle, except that there must be a clearance of at least 20 mm between the streamlining and the extremities of the handlebars or other form of steering device, including any attachments thereto, whatever the position of the handlebars.

Should the streamlining totally enclose the rider and/or passenger, a fire wall must be installed between the engine and the rider and passenger and, a substantial roll bar must be securely fitted.

Any streamlining must be approved by the Technical Steward, before the motorcycle can be driven in any meeting or in the practice.

84.09 Additional Specifications for three-wheeler Sprinters

All vehicles in groups B1 and B2 shall comply with the following:

84.09.1 The three road wheels may be disposed to give either two or three tracks.

84.09.2 The wheel track, or lateral distance between tracks must be at least 800 mm.

- 84.09.3** The position of the engine is optional. The engine may drive one or more road wheels.
- 84.09.4** The provision of the coach work or streamlining is optional, but the vehicle must have accommodation for one or more passengers.
- 84.09.5** The passenger must always be completely protected from the road wheels and drive (both primary and final), either by mudguards or some other means.
- 84.09.6** A passenger or ballast must be carried in addition to the rider. If a passenger is replaced by ballast, the ballast must weight not less than 60 kg and must be securely affixed under the supervision of the Technical Steward.

01.85 TECHNICAL RULES FOR AUTOMATIC 50 CC

85.01 General specifications

All vehicles must belong to Category I, Group A2 and Group A3, as specified in this Appendix and must comply with the following requirements.

A minimum quantity of 1000 units per year must be produced by the manufacturers and homologated for road use and conform to the Vienna Convention of 1968.

In case of conflict, the following specifications have priority.

85.02 Classes

- 50 cc Scooter
- Moped

85.03 Weight

- 50 cc Scooter: 65 kg
- Moped: 55 kg

85.04 Materials

It is forbidden to use the following materials: composite fibres, magnesium and titanium.

85.05 Engine

The original crankcase/swing-arm unit may be modified, but from parts normally available from commercial or retail sources. (They shall appear on a manufacturer's range catalogue or an equipment retailer's catalogue, specialised in parts for competition).

Devices aimed at automatically modifying distribution diagrams of the engine are forbidden (fixed port and/or valve, inlet and exhaust timing only, if not installed on the originally homologated model, with the exception of the CDI).

85.06 Carburettor

The section of the carburettor (venturi) must be :

- 50 cc Scooter: Maximum \varnothing 19 mm
- Moped: Maximum \varnothing 19 mm

85.07 Cooling system

- 50 cc Scooter: Same system as original
- Moped: Free

85.08 Exhaust Pipe

See Arts. 31.01, 31.02, 31.03. Devices aimed at automatically modifying exhaust pipe volumes are forbidden.

85.09 Transmission

85.09.1 Transmissions must, in principle, be automatic. However, it is permitted to incorporate a manually operated transmission ratio locking device, except for scooters.

85.09.2 Manual clutch forbidden.

85.09.3 Exposed rotating parts of engine or transmission must be fitted with guards in such a manner that under no circumstances can the rider come into accidental contact. The original clutch basket must be reinforced with a steel ring (see Art. 29.01).

85.10 Main frame

For Moped: Main frame and frame parts normally available from commercial or retail sources. They shall appear on the Moped manufacturer's range catalogue or adaptable spare parts lists available to the general public.

For Scooters: The original frame may be only reinforced, the engine/swing-arm mounting can be reinforced, and the rubber absorption blocks may be substituted by bearings.

85.11 Handlebar

The width of the handlebar shall be between 400 mm and 650 mm maximum (see also Art. 33.05).

85.12 Mudguards

Front mudguards are compulsory, if mounted on the originally homologated model (see Arts. 43.01, 43.02 and 43.03).

85.12.1 Scooter supplementary

No other fairings or aerodynamic devices may be used, apart from the original streamlining or fairing.

85.13 Fairing/Body work

For scooters only, the headlight fairing, if originally mounted must turn with the handlebars.

85.14 Footrests

For safety reasons, pedals must be removed for competition racing. Footrests (except for Scooters) must be of the folding type or made from easily breakable material (plastic, etc.)

For scooters, the rider will drive with his feet on the platform for footrests (Art. 01.05 RRTR: category I - group A3).

85.15 Tyres

Only tyres normally available from commercial or retail sources as equipment for road use are permitted. They shall appear on the tyre manufacturer's range catalogue or tyre specification lists available to the general public.

For mopeds, the total width of the tyre, mounted, shall not be more than 3.00" or 80 mm (see also Art. 47.01).

For scooters, tyres must be as original and the maximum rim diameter must not exceed 400 mm. Tyre dimensions are free, but compatible with the ETRTO.

85.16 Ignition cut-out

An ignition cut-out must be fitted to operate when the rider leaves the machine. This ignition cut-out system must interrupt the primary circuit and must be wired for both the supply and return of the current. It must be placed as near to the centre of the handlebar as possible and must be operated by a non-elastic string of adequate length and thickness and strapped to the rider's right-hand wrist. A spiral cable (similar to that of a telephone wire) of maximum 1 m extended length is permitted. The handlebars and the forks cannot be used as part of the electrical circuit: compulsory for mopeds, recommended for scooters.

85.17 Noise

The maximum noise level is 95 dB/A, measured at 5,000 RPM. During the noise control, the moped must be placed on a stand. The rider shall keep his engine running and shall increase the engine speed until it reaches the RPM level indicated above (see also Arts. 79.01, 79.03, 79.08 and 79.12 to 79.16).

85.18 Fuel and Oil Tank

Must remain as original.
