

fédération internationale de l'automobile

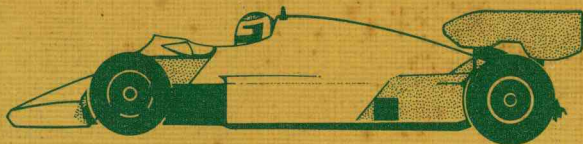


**annuaire
du sport
automobile**

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**year book of
automobile
sport**

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Annexe "J"

au Code Sportif International, 1985 (classification, définition et spécifications des voitures)

En cas de divergence d'interprétation entre les termes des diverses traductions des règlements officiels de la FISA, le texte français fera seul foi. Toute modification paraîtra dans le Bulletin Sportif mensuel de la FISA.

Appendix "J"

to the International Sporting Code, 1985 (classification, definition and specifications of cars)

In the case of differences of interpretation as regards the terms used in the various translations of official FISA regulations, only the French text will be considered authentic. Any amendments will be published in the monthly FISA Motor Sport Bulletin.

Anhang "J"

des Internationalen sportgesetzes, 1985 (Einteilung, Begriffsbestimmungen und Erläuterungen der Fahrzeuge)

Im Falle von Streitfragen bei FISA-Bestimmungen ist stets der französische Originaltext verbindlich. Alle nachträglichen Änderungen werden im monatlich erscheinenden Motorsport-Bulletin der FISA veröffentlicht.

Allegato "J"

al Codice Sportivo Internazionale, 1985 (Classificazione, definizione e caratteristiche dell' vetture)

In caso di divergenza nell'interpretazione dei termini delle diverse traduzioni dei regolamenti FISA, farà fede il testo francese. Eventuali modifiche saranno pubblicate nel bollettino mensile della FISA.

Annexe "J"

to the International Sporting Code

Classification, definition and specification of cars

CONTENTS

<i>Art 251 - Classification and definitions</i>	119
<i>Art 252 - General prescriptions for Groups N, A, B</i>	131
<i>Art 253 - Safety equipment (Category 1)</i>	137
<i>Art 254 - Specific regulations for Group N</i>	157
<i>Art 255 - Specific regulations for Group A</i>	163
<i>Art 256 - Specific regulations for Group B</i>	179
<i>Art 257 - Group C1 Prototype regulations</i>	181
<i>Art 258 - Group C2 Prototype regulations</i>	201
<i>Art 274 - Formula 3000 Technical Regulations</i>	203
<i>Art 275 - International Formula N° 2/N° 3</i>	229
<i>Art 277 - International Formulae racing cars</i>	251
<i>Title 5 - National Formulae</i>	253

Art. 251 - Classification and definitions

1) CLASSIFICATION

1.1) CATEGORIES AND GROUPS

The cars used in competition shall be divided up into the following categories and groups:

Category I: Group N: Large scale series production touring cars.

Group A: Large scale production.

Group B: Series-production grand touring cars.

Category II: Group C :Sports cars.

Group D: International Formula racing cars.

Group E: Formula libre racing cars.

1.2) CUBIC CAPACITY CLASSES

The cars will be divided up into following 15 classes according to their cubic capacity.

- | | | | |
|----|--|----------|----------|
| 1. | Cylinder-capacity lower than or equal to 500 cc | | |
| 2. | Cylinder-capacity exceed. 500 cc and lower than/equal to | 600 cc | |
| 3. | " " " | 600 cc | " " " |
| 4. | " " " | 700 cc | " " " |
| 5. | " " " | 850 cc | " " " |
| 6. | " " " | 1,000 cc | " " " |
| | | | 700 cc |
| | | | 850 cc |
| | | | 1,000 cc |
| | | | 1,150 cc |

7.	"	"	"	1,150 cc	"	"	"	1,300 cc
8.	"	"	"	1,300 cc	"	"	"	1,600 cc
9.	"	"	"	1,600 cc	"	"	"	2,000 cc
10.	"	"	"	2,000 cc	"	"	"	2,500 cc
11.	"	"	"	2,500 cc	"	"	"	3,000 cc
12.	"	"	"	3,000 cc	"	"	"	4,000 cc
13.	"	"	"	4,000 cc	"	"	"	5,000 cc
14.	"	"	"	5,000 cc	"	"	"	6,000 cc
15.	"	"	over	6,000 cc				

Unless otherwise specified in special provisions imposed by the FIA for a certain category of events, the organisers are bound to include all the above-mentioned classes in the Supplementary Regulations and, furthermore, they are free to group two or more consecutive classes, according to the particular circumstances of their events.

No class be subdivided.

2) DEFINITIONS

2.1) GENERAL CONDITIONS

2.1.1) Production cars (Category I):

Cars of which the production of a certain number of identical examples (see definition of this word hereinafter) within a certain period of time has been verified at the request of the manufacturer, and which are destined for normal sale to the public (see this expression).

2.1.2) Competitions cars (Category II):

Cars built as single examples and destined solely for competition.

2.1.3) Identical cars:

Cars belonging to the same production series and which have the same bodywork (outside and inside), same mechanical components and same chassis (even though this chassis may be an integral part of the bodywork in case of a monocoque construction).

2.1.4) Model of car:

Car belonging to a production-series distinguishable by specific conception and external general lines of the bodywork and by an identical mechanical construction of the engine and the transmission to the wheels.

2.1.5) Normal sale:

Means the distribution of cars to individual purchasers through the normal commercial channels of the manufacturer.

2.1.6) Homologation:

Is the official certification made by the FIA/FISA that a minimum numbers of cars a specific model has been made on series-production terms to justify classification in Groups N, A or B of these regulations. Application for homologation shall be submitted to the FIA/FISA by the ASN of the country in which the vehicle is manufactured and shall entail the drawing up of a homologation form (see below). It must be established in accordance with the special regulations called "Regulations for homologation", laid down by the FIA/FISA. Homologation of a series-produced car will become null and void 5 years after the date which the series-production of the said model has been stopped (series-production under 10 % of the minimum production of the group considered).

The homologation of a model can only be valid in one group, A/N or B. If a

model already homologated in Group B passes into Group A/N, the Group B homologation is cancelled.

2.1.7) Homologation forms:

All cars recognised by the FIA/FISA shall be the subject of descriptive form called homologation form on which shall be entered all data enabling identification of the said model.

This homologation form defines the series as indicated by the manufacturer. According to the group in which the competitors race, the modification limits allowed in international competition for the series are stated in Appendix J.

The presentation of the forms at scrutineering and/or at the start may be required by the organisers who will be entitled to refuse the participation of the entrant in the event in case of non-presentation.

With regard to Group N, apart from the specific form for this group, the Group A form must also be submitted (or the FISA transfer to Group A).

In case of any doubt remaining after the checking of a model of car against its homologation form, the scrutineers should refer either to the maintenance booklet published for the use of the make's distributors or to the general catalogue in which are listed all spare parts.

In case of lack of enough accurate documentation, scrutineers may carry out direct scrutineering by comparison with an identical part available from a concessionaire. It will be up to the competitor to obtain the homologation concerning his car from the ASN of the manufacturing country of the vehicle, or from the FIA/FISA.

Description. A form breaks down in the following way:

- 1) A basic form giving a description of the basic model.
- 2) At a later stage, a certain number of additional sheets describing "homologation extensions", which can be "variants", or "errata" or "evolutions"

a) Variants (VF, VO)

These are either supply variants (VF) (two suppliers providing the same part for the manufacturer and the client does not have the possibility of choice), or options (VO) (supplied on request and available at the concessionaires).

b) Erratum (ER)

Replaces and cancels an incorrect piece of information previously supplied by the constructor on a form.

c) Evolution (ET)

Characterised by modifications made on a permanent basis to the basic model (complete cessation of the production of the car in its original form).

Use

1) Variants (VF, VO)

The competitor may use any variant as he wishes, only on condition that all the technical data of the vehicle, so designed, conforms to that described on the homologation form applicable to the car, or expressly allowed by Appendix J.

For example, the fitting of a brake calliper as defined on a variant form is only possible if the braking surface, the dimensions of the brake linings, etc. obtained in this way, are indicated on a form applicable to the car in question. (For Group N, see also Art. 254.2).

2) Evolution (ET) (For Group N, see also Art. 254.2).

The car must comply with a given stage of evolution (independent of the date when it left the factory), and thus an evolution must be wholly applicable or not at all.

Besides, from the moment a competitor has chosen a particular evolution, all the previous evolutions should be applied, except where they are incompatible: for example, if two brake evolutions happen one after another, only that corresponding to the date of the stage of evolution of the car will be used.

This homologation form defines the series as indicated by the manufacturer. According to the group, in which the competitors race, the modification limits allowed in international competition for this series are stated in Appendix J.

2.1.8) Mechanical components

All those necessary for the propulsion, suspension, steering and braking as well as all accessories whether moving or not which are necessary for their normal working.

2.2) DIMENSIONS

Perimeter of the car seen from above:

The car as presented on the starting grid for the event in question.

2.3) ENGINE

2.3.1) Cylinder capacity: Volume generated in cylinder (or cylinders) by the upward or downward of the pistons. For all calculations relating to cylinder capacity the symbol π will be regarded as equivalent to 3.1416.

2.3.2) Supercharging :

Increasing the weight of the charge of the fuel-air mixture in the combustion chamber (over the weight induced by normal atmospheric pressure, ram effect and dynamic effects in the intake and/or exhaust systems) by any means whatsoever.

The injection of fuel under pressure is not considered to be supercharging (See Article 3.1 of the General Prescriptions for Groups N, A, B).

2.3.3) Cylinder block:

The crankcase and the cylinders.

2.3.4) Intake manifold:

— Part collecting the air-fuel mixture from the carburettor(s), and extending to the entrance ports of the cylinder head, in the case of the carburettor induction system, and the part collecting the air from the air intake control device and extending to the ports on the cylinder head, in the case of an injection intake system.

— Part collecting the air at the air filter outlet and extending to the cylinder head entrance ports in the case of a diesel engine.

2.3.5) Exhaust manifold :

Part collecting together the gases from the cylinder head and extending to the first gasket separating it from the rest of the exhaust system.

2.4) RUNNING GEAR

2.4.1) Wheel:

Flange and rim: by complete wheel is meant flange, rim and tyre.

2.4.2) Friction surface of the brakes:

Surface swept by the linings on the drum, or the pads on both side of the disc when the wheel achieves a complete revolution.

2.4.3) Mac Pherson suspension:

Any suspension system in which a telescopic strut, not necessarily providing the springing and/or damping action, but incorporating the stub axle, is anchored on the body or chassis through single attachment point at its top end, and is pivoted at its bottom and either on a transversal link located longitudinally by an anti-roll bar, or by a tie rod.

2.5) CHASSIS-BODYWORK**2.5.1) Chassis:**

The overall structure of the car around which are assembled the mechanical components and the bodywork including any structural part of the said structure.

2.5.2) Bodywork:

— **externally**: all the entirely suspended parts of the car licked by the airstream.

— **internally**: cockpit and boot.

Bodywork is differentiated as follows;

- 1) completely closed bodywork
- 2) completely open bodywork
- 3) convertible bodywork with a hood in either supple (drop-head) or rigid (hard-top) material.

2.5.3) Seat:

The two surfaces making up the seat cushion and seatback or backrest.

Seatback or backrest:

Surface measured upwards from the bottom of a normally seated person's spine.

Seat cushion:

Surface measured from the bottom of the same person's spine towards the front.

2.5.4) Luggage compartment(s):

All volume(s) distinct from the cockpit and the engine compartment inside the vehicle.

This (these) volume(s) is (are) limited in length by the fixed structure(s) provided for by the manufacturer and/or by the rear of the seats and/or, if this is possible reclined at a maximum angle of 15°.

This (these) volume(s) is (are) limited in height by the fixed structure(s) and/or by the detachable partition(s) provided for by the manufacturer, or in the absence of these by the horizontal plane passing through the lowest point of the windscreen.

2.5.5) Cockpit:

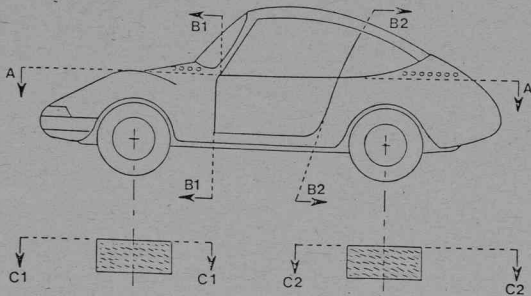
Inner volume which accommodates the driver and the passenger(s).

2.5.6) Bonnet:

Outer part of the bodywork which opens to give access to the engine.

2.5.7) Mudguard:

A mudguard will be considered to be the area defined as follows, provided that it is riveted, screwed or bolted on to the bodywork:



(bolt
 (
 o (or screw
 (
 (or rivet

Front mudguard: the area defined by the inner of the complete wheel of the standard car C1/C1 and the lower edge of the side window(s) A/A and the front edge of the front door (B1/B1).

Rear mudguard: the area defined by the inner face of the complete wheel of the standard car (C2/C2) and the lower edge of the side window(s) (A/A) and the rear edge of the rear door (B2/B2).

In the case of two-door cars (B1/B1) and (B2/B2) will be defined by the front and rear of the same door.

2.6) ELECTRICAL SYSTEM

Headlight: any signal the focus of which creates an in-depth luminous beam directed towards the front.

2.7) FUEL

Fuel tank: any container holding fuel likely to flow by any means whatsoever towards the main tank or the engine.

Art. 252 - **General prescriptions for groups N, A, B**

1) **GENERAL REMARKS**

1.1) All modifications are forbidden unless expressly authorised by the regulations specific to the group in which the car is entered or by the general prescriptions below or imposed under the chapter "safety equipment".

1.2) **Application of the general prescriptions**

The general prescriptions must be observed in the event that the specifications of the group of cars of groups N to B do not lay down a more strict prescription.

1.3) **Conditions for changes of groups and authorized regroupings**

Cars originally belonging to group N but having been subject to modifications or additions duly declared and which exceed the limits provided for this group may pass into Group A if it is laid down in the event's supplementary regulations and if they conform to the prescriptions of this group.

2) **DIMENSIONS AND WEIGHT**

2.1) **Ground clearance:** no part of the car must touch the ground when all the tyres on one side are deflated.

2.2) **Minimum weight:** is the real minimum weight of the empty car (without persons or luggage aboard) without tools, jack, air conditioning, radio, electric windows equipment and sunroofs, headlight washers. All the safety elements normally provided for are included in this weight (Gr. A and B only).

All the liquid tanks (lubrication, cooling, braking, heating, where applicable) must be at the normal level foreseen by the manufacturer, with the exception of the windscreen wiper, brake, cooling system, fuel and water injection tanks, which shall be empty.

2.3) **Ballast:** it is permitted to complete the weight of the car by one or several ballasts provided that they are strong and unitary blocks, fixed by means of tools with the possibility to fix seals, placed on the floor of the cockpit, visible and sealed by the scrutineers.

Application : Groups A, B; no kind of ballast is authorised on cars of Group N. In rallies, however, the carrying of tools and spare parts for the car will be allowed under the conditions laid down in Art. 253 a. Any object of a dangerous nature (battery, inflammable products, etc.) must be carried outside the cockpit.

3) **ENGINE**

3.1) **Supercharging :** in case of supercharging, the nominal cylinder-capacity will be multiplied by 1.4 and the car will pass into the class corresponding to the fictive volume thus obtained. The car will be treated in all respects as if its cylinder-capacity thus increased were its real capacity. This shall particularly be the case for assigning the car to its cylinder-capacity class, its interior dimensions, its minimum number of places, etc.

N.B.: The FISA reserves the right to change, the supercharging coefficient as from January 1st 1987.

3.2) Equivalence formula, between reciprocating piston and rotary engines (of the type covered by the NSU Wankel patents)

The cubic capacity equivalent is twice the volume determined between the maximum capacity of the combustion chamber.

3.3) Equivalence formula between reciprocating piston and turbine engines

This formula is the following:

$$C = \frac{S(3,10 \times R) - 7,63}{0,09625}$$

S = High pressure nozzle area — expressed in square centimetres by which is meant the area of the air-flow at the exit from the stator blades (or at the exit from the first stage if the stator has several stages). Measurement is done by taking the minimum area. In cases where the first stage turbine stator blades are adjustable, they will open to their greatest extent to present the greatest area for the determination of area S.

The area of the high pressure nozzle is thus the product of the height (expressed in cm) by the width (expressed in cm) and by the number of vane spaces.

R = The pressure ratio is the ratio of the compressor of the turbine engine. It is obtained by multiplying together the value for each stage of the compressor, as indicated hereafter:

Subsonic axial compressor : 1.15 per stage.

Trans-sonic axial compressor : 1.5 per stage.

Radial compressor : 4.25 per stage.

Thus a compressor with one radial and six axial subsonic stages will be designated to have a pressure of:

$$4.25 \times 1.15 \times 1.15 \times 1.15 \times 1.15 \times 1.15 \times 1.15 \text{ or } 4.25 \times 1,15^6$$

C = Equivalent cubic capacity for reciprocating piston engines in cm³.

3.4) Equivalences between reciprocating piston engines and new types of engines

The FISA reserves the right to make modifications on the basis of comparisons established between classic engines and new types of engines, by giving a two year notice from the 1st January following the decision taken.

3.5) Exhaust system and silencer

Even when the specific provisions for a group allow the replacement of the original silencer, the cars competing in an open-road event shall always be equipped with an exhaust silencer complying with the traffic regulations of the country(ies) through which the event is run.

The orifices of the exhaust pipes shall be placed at a maximum of 45 cm and a minimum of 10 cm from the ground. The exit must be located aft of a vertical plane passing through the wheelbase centre and may not project at any point beyond the side of the bodywork. Moreover, adequate protection must be provided in order to prevent heated pipes from causing burns.

3.6) **Starting on board the vehicle:** starter with electric or other source of energy on board operable by the driver when seated in the seat.

4) TRANSMISSION

All cars must be fitted with a gearbox including a reverse gear which must be in working order when the car starts the event, and be able to be operated by the driver when he is normally seated.

5) WHEELS

Mesuring wheel width : the wheel width is to be measured with the wheel mounted on the car, or the ground, the vehicle in race condition, driver aboard, at any point along the circumference of the tyre, except in the area in contact with the ground. When multiple tyres are fitted as part of a complete wheel, the latter must comply with the maximum dimensions for the Group in which tyres are used (See Article 255.5.4 and Article 256.5).

Application : Groups A, B.

6) COACHWORK

6.1) Convertible vehicles must comply in all respects with the specifications applying to open cars.

6.2) Minimum inside dimensions

If a modification authorised by Appendix J affects a dimension stated on the homologation form this dimension may not be retained as an eligibility criterion for the car.

6.3) **Cockpit:** only the following accessories may be installed in the cockpit - spare wheel(s), spare parts, safety equipment, communication equipment, ballast (if permitted), windscreen washer water container (Gr. A an B only). The passenger compartment and seat of an open car must in no way be covered.

7) LIGHTING

A fog light may be changed for another provided that the original mounting remains the same.

8) FUEL-COMBUSTIVE

8.1) The use of "commercial fuel" is obligatory, that is to say the use of motor fuel produced by an oil company and currently distributed at road refuelling stations throughout one same country.

May therefore be used, all commercial fuels of the country in which the event takes place, with no other additive except that of a lubricant of current sale which cannot increase the octane number, or water.

May also be used, under the same conditions, any commercial fuel(s) which — in France, Germany, Great Britain and Italy — is (are) of the highest octane rating, according to the Research Method.

If the above-mentioned fuel cannot be easily imported into the country where the event is taking place, it may be replaced by another one of similar quality and with the same octane number (RON) — with a tolerance of + 1 — specially made by an oil company.

Whenever, in France, Great Britain, German and Italy, a new commercial fuel is made available which has higher octane rating than those sold so far, the oil company producing the said fuel shall give notice to the FIA by a registered letter and this new commercial fuel (or its equivalent as specified hereabove) may be used for racing 30 days after the registered letter has been mailed.

The oil companies who supply fuel directly to the entrants of a race shall

have to send to the promoters the characteristics and a sample of the fuel delivered in such quantity as is sufficient to carry out the necessary analyses, and also a declaration stating that the fuel complies with the present specifications.

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

8.3) Refuelling procedure Standardised coupling

— In case of a centralised system provided by the circuit or a system provided by the competitors, the refuelling hose shall be provided with a leak-proof coupling to fit the standardised fitting mounted on the car. The dimensions of this fitting are given in the diagram on page 260.

— All cars must be provided with a fuel fitting complying with this diagram. This leak-proof fitting must comply with the dead man principle and must not therefore incorporate any retaining device when in an open position (spring-loaded, bayonet, etc.).

— The air vent(s) must be equipped with non return valves and valves having the same closing system as that of the standard fitting and having the same diameter. During refuelling the outlet of the air-vent must be connected with the appropriate coupling either to the main supply-tank or to a transparent portable container with a minimum capacity of 20 litres provided with a closing system rendering it completely leak-proof. The venting catch tanks must be empty at the beginning of the refuelling operation. In cases where the circuits are unable to provide the entrants with a centralised system, they will have to refuel the above procedure. The level of the reserve tank may in no case be more than 3 metres above the level of the track where the refuelling is effected. This applies to the whole duration of the event.

Applications: For Groups A, B, refer to the general prescriptions of the FIA Championship.

Art. 253 - **Safety equipment (category I)**

SAFETY DEVICES FOR ALL CARS OF CATEGORY I COMPETING IN EVENTS ENTERED ON THE FIA INTERNATIONAL CALENDAR:

1) A car, the construction of which is deemed to be dangerous, may be excluded by the Stewards of the meeting.

2) If a device is optional, it must be fitted in a way that complies with regulations.

3) CABLES, LINES AND ELECTRICAL EQUIPMENT

Fuel, oil lines and brake cables must be protected externally against any risk of deterioration (stones, corrosion, mechanical breakages, etc.) and internally against all risks of fire.

If the series production fitting is retained, no additional protection is necessary.

Application: obligatory for Groups A, B.

4) BRAKING SAFETY SYSTEM

Double circuit operated by the same pedal: the pedal shall normally control all the wheels; in case of a leakage at any point of the brake system

pipes or of any kind of failure in the brake transmission system, the pedal shall still control at least two wheels.

Application: compulsory fitting on all cars of Groups N, A and B. If this system is fitted in series production, no modifications are necessary.

5) ADDITIONAL FASTENERS

One or more additional fasteners for the front and rear bonnet and boot lid, the original fasteners having been rendered inoperative.

Large objects carried on board the vehicle (such as the spare wheel, tool-kit, etc.) must be firmly fixed.

Application: obligatory for Groups A and B. Optional for Group N.

6) SAFETY BELTS

Wearing of a diagonal strap and one abdominal strap: fixation points on the shell: 3.

Application: Compulsory for all cars of Groups N together with A, B participating in rallies.

Wearing of two shoulder straps and one abdominal strap: fixation points on the shell: two for the abdominal strap - two or possibly one symmetrical in relation to the seat for the shoulder straps.

Application: compulsory for all cars of Groups A, B (except in rallies).

A hole may be made in a series production seat to allow the passage of a safety belt.

7) EXTINGUISHERS - EXTINGUISHING SYSTEMS

They must have the following characteristics:

RALLY, CIRCUIT, SLALOM, HILL CLIMBS	Groups N, A and B (minimum qualities) 4 kg Halon 1211 or 1301 powder or equivalent* (in 2 bottles maximum)
--	--

**éivalent* : a product having a efficiency and non-toxicity at least equal to that of Halon 1211.

N.B.: Installed systems are allowed in Group A and B as replacements for the systems laid down in this article. In this case please refer to the Group C regulations (Article 4.4).

7.1.1) Installation

Each extinguisher bottle must be installed in such a way that it is capable of withstanding accelerations of up to 25 g no matter how these are applied, and that it may be easily detached from its fixation.

7.1.2) Operation - Triggering

The extinguisher(s) must be easily accessible to the driver and co-driver.

7.1.3) Checking

The type extinguishant, its quantity, and the total weight of the bottle must be specified on the bottle(s).

7.2.1) Circuits, Rallies, Slaloms, Hillclimbs

The cars must be equipped with one or two bottles containing a minimum of 4 kg of Halon 1211 or 1301 (BCF-BTM) powder or equivalent.

8) ROLLBAR

8.1) DEFINITIONS

8.1.1) Rollcage

A structural framework made up of tubes, connections and fixation points. It is designed to prevent serious deformation in the case of a collision or a car turning over.

8.1.2) Rollbar

Structural framework made up of a main rollbar, a front rollbar, connections and fixation points.

8.1.3) Safety cage

Structural framework made up of a main rollbar, a front rollbar, connections and fixation points.

8.1.4) Main rollbar

A structure which should be made out of a vertical frame situated in transversal plane in relation to the car's axis, near the back of the front seats.

8.1.5) Front rollbar

Identical to the main rollbar but its shape follows the windscreen mountings and the front part of the roof.

8.1.6) Lateral rollbar

A rollcage made up of a vertical framework situated in a longitudinal plane or in relation to the car's axis placed on the right or the left. The rear pillar must be placed against or behind the back of the driver's seat or that of his co-driver. The front bar must be near the windscreen and dashboard. The driver and his co-driver must be able to get in and out of the vehicle without any inconvenient difficulty.

8.1.7) Longitudinal strut

Longitudinal tubes belong neither to the main rollbar nor to the front rollbar.

8.1.8) Diagonal strut

Tube crossing the car from one of the corners of the main rollbar to any fixation point of the other side of the rollbar or of the near longitudinal strut.

8.1.9) Framework reinforcement

Tube fixed to the rollcage improving its efficiency.

8.1.10) Reinforcement plates

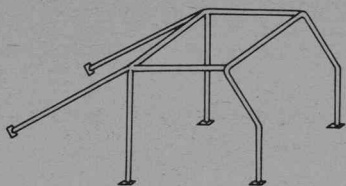
Metal plates, fixed to the chassis structure of the cars on which the rollbar rests.

8.1.11) Fixing plates

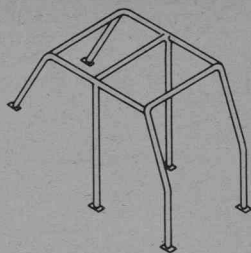
Plates which are attached to the tubes and allow their fixation to the chassis.

8.1.12) Removable connections

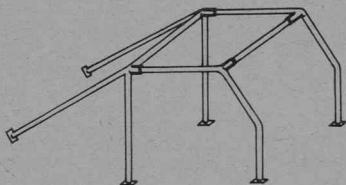
Optional connection of lateral or diagonal struts to the main rollbar or the front rollbar. It must be possible to dismantle these pieces of equipment.



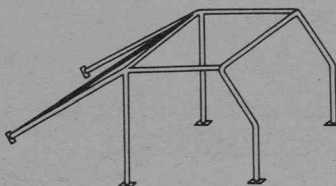
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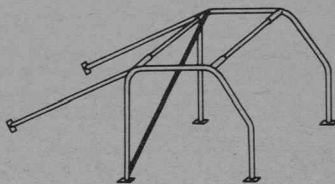
Dessin/drawing No 4



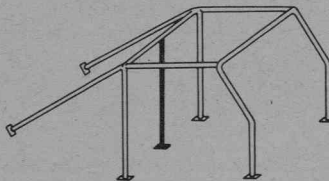
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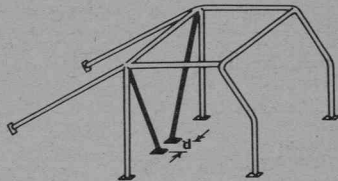
Dessin/drawing No 5



Dessin/drawing No 6



Dessin/drawing No 7



Dessin/drawing No 8
($d \leq 30$ cm)

8.2) SPECIFICATIONS

8.2.1) General comments

8.2.1.1) Safety cages should be designed and constructed in such a fashion that after they have been properly built in, they prevent the bodywork from deforming and thus reduce the risks of injury to people on board the vehicle.

The essential characteristics of safety cages come from a finely detailed construction, suitable adaptation and fixation to the car plus snug fitting against the bodywork. The rollbars must never be used as pipes for liquids.

The bar or bars must be constructed in such a way that it they do not obstruct access to the front seats and do not encroach on the space provided for the driver an co-driver. However parts of the rollcage may encroach upon the front passenger space by passing through the lateral upholstery of the rear seats.

Any modification to the homologated rollbars (see Art. 8.6) is forbidden, even with regard to the fixations and welds.

8.2.1.2) Basic rollcage (drawings 1 & 2)

Rollbar : group N and groups A + B up to 2 000 cm³.

Rollcage : groups A + B more than 2,000 cm³ (optional for group N and groups A + B up to 2,000 cm³) (drawings 3 & 4).

8.2.1.3) Different possibilities of installing the obligatory strut (with the exception of rallies) (drawings 5, 6, 7, 8).

The obligatory strut can be fixed as illustrated in all basic rollcages (drawings 1-4).

The combinaison of several struts (drawings 5-8) is permitted.

8.2.1.4) Different possibilities of installing the optional reinforcements of the rollcage (drawings 9, 10, 11).

Each type of reinforcement (drawings 9-11) may be used separately or combined with one or several others.

These reinforcements can be installed in each of the basic rollcages (drawings 1-4).

8.2.2) Technical specifications

8.2.2.1) Main and front and lateral rollbars

The rollbars must be in a single piece. Their construction must be impeccable without unevenness or cracks. The fitting must be done in such a way it marries the interior shape of the car, or straight if it cannot be directed upwards. If it is necessary for the lower parts of the rollbar to be rounded, these parts must be strengthened and follow the interior shape exactly.

Minimum bending $r_m = 3 \times$ tube diameter.

In order to get an efficient installation of the roll-cage, it is allowed to locally modify the original upholstery, directly on the legs of the roll-cage, for example by cutting or embedding (deformation).

This is only valid for the vertical pillars A and B and for the longitudinal upright at the front door level.

However, this modification can in no case allow the removal of entire parts of the upholstery.

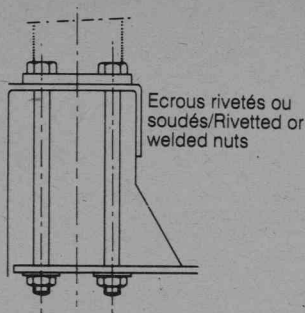
8.2.2.2) Fixation of the rollbars to the body

Minimum fixations for the safety rollcage:

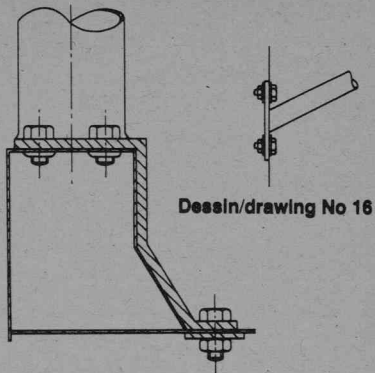
1 for each pillar of the main or lateral rollbar.

1 for each pillar of the front rollbar.

1 for each pillar of the rear longitudinal strut.



Dessin/drawing No 14



Dessin/drawing No 15

1 for each pillar of the main rollbar, and each rear pillar of the lateral rollbar at the fixation point for the front seat belt, or in the approximate area of this position.

The fixation of the rollbar pillars must be done with at least 3 bolts.

The attachment points of the rollbars on the body must be reinforced with a steel plate of a least 3 mm thick and with a surface area of 60 cm.

The various possibilities are given in drawings 12, 13, 14 and 15. Hexagonal bolts or similar, of a minimum diameter of 8 mm (minimum quality 8-8 as per the ISO specifications) shall be used.

The nuts shall be self-tapping, self-locking or fitted with washers.

These fixations represent a minimum. It is possible to increase the number of bolts, to weld the steel rollbar bases of the bodyshell.

8.2.2.3) Longitudinal Struts

They must be fixed to the left and to the right above and outside the main rollbar, then going directly backwards and as near as possible to the interior side contour.

A rounded construction (with a large bend) is allowed if it is placed as near the roof as possible.

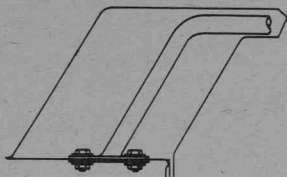
The diameter, the thickness and the material of the longitudinal struts should correspond to the norms fixed for the rollcages.

The forces must be efficiently divided and absorbed. The attachment points must be strengthened by plates if their location does not allow them to absorb forces. (See drawings 16, 17, 18).

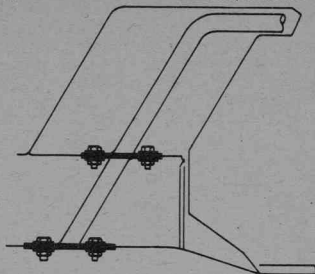
8.2.2.4) Diagonal Struts

With the exception of rallies, the installation of at least one diagonal strut is obligatory.

Their construction must be carried out in accordance with drawings 5, 6, 7, 8 without bends.



Dessin/drawing No 17



Dessin/drawing No 18

The attachment points of the diagonal struts must be so located that they cannot cause injuries.

They must preferably have the same diameter as the tubes of the main structure.

8.2.2.5) Optional reinforcements of the rollcage

The diameter, the thickness and the material of the reinforcements must correspond to the norms fixed for the rollcages.

They shall be either welded into position or installed by means of a detachable connection (obligatory for the front transversal reinforcements).

The reinforcement tubes should never be attached to the actual bodywork of the car.

8.2.2.5.1) Transversal struts

The fitting of 2 transversal struts as shown in illustrations 9 and 10 is permitted. The transversal strut fixed to the front bar must not, however, encroach upon the space reserved for the occupant(s). It must be placed as high as possible under the dashboard and must be detachable.

8.2.2.5.2) Longitudinal struts (lateral protection)

The fixing of a longitudinal strut at the side(s) of the vehicle at door level is permitted. The tube making up this reinforcement must be built into the safety rollcage and its angle with the horizontal tube must not exceed 15° (angled downwards towards the front). No point of the side protection should be higher than on third of the total height of the door measured from the base of the door.

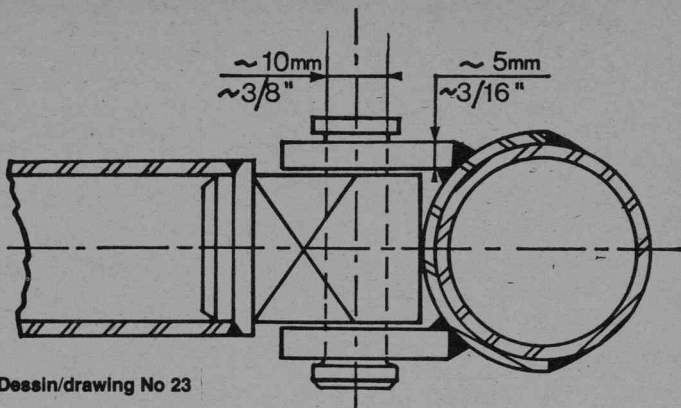
8.2.2.5.3) Roof reinforcement

The reinforcement of the upper part of the rollcage by the strut(s) as shown in illustration 10 is permitted.

8.2.2.5.4) Angle reinforcement

The reinforcement of the upper angles between the main rollbar and the longitudinal connections with the front rollbar is permitted, as is the reinforcement of the upper rear angles of the lateral rollbars, as shown in illustration 11.

The upper fixation of these reinforcements shall, under no circumstances, be situated to the fore of the middle of the longitudinal linking tube, and their lower fixation shall, under no circumstances, be situated lower than the middle of the vertical pillar of the rollbar.



Dessin/drawing No 23

8.2.2.6) Padding for protection

The padding of the dangerous points on the rollbars is recommended in order to prevent injury.

The rollbar may be covered with a detachable protective casing.

8.2.2.7) Removable connections

Should removable connections be used in the construction of the rollbar they must comply with or be similar to a type approved by the FIA (see drawings 22-25).

The screws and bolts must be of a sufficient minimum diameter, and of the best possible quality (preferably aircraft type).

8.2.2.8) Welding instructions

All welding should be of the highest quality possible with full penetration (preferably arc welding and in particular heliarc).

Although good outside appearance of a weld does not necessarily guarantee its quality, poor looking welds are never a sign of good workmanship.

When using heat treated steel the special instructions of the manufacturers must be followed (special electrodes, helium protected welding).

It must be pointed out above all else that the manufacture of heat treated steel, and high carbon steels may cause certain problems and that bad construction may result in a decrease in strength (crinking) and an absence of flexibility.

8.3) MATERIAL PRESCRIPTIONS

Specifications of the tubes used:

Minimum material:	Minimum tensile strength:	Minimum dimensions:
Cold drawn seamless carbon steel	350 N/m ²	38 × 2.5 or 40 × 2 in mm

These dimensions represent the minima allowed.

In choosing the quality of the steel, attention must be paid to the elongation properties and the weldability.

8.4) REGULATIONS FOR CARS**8.4.1) Group N cars**

The fitting of a rollbar is compulsory for all events.

8.4.2) Cars of Group A and B

The fitting of a safety cage is obligatory for all events. The diagonal strut although not obligatory for rallies, is desirable.

Rules of application are as follows:

- up to 2,000 cm³: rollbar obligatory, rollcage optional.
- More than 2,000 cm³: rollcage obligatory.

8.5) EXCEPTIONS

However manufacturers of safety rollcage may also propose a rollbar of free conception to the ACN as regards the material used, the dimensions of the tubes and the implantation of the braces provided that the construction is certified to withstand stress minima given hereafter (and applied simultaneously):

- 1,5 w lateral*;
- 5,5 w fore and aft;
- 7,5 w vertical.

*w = weight of the car + 75 kg.

It must be possible to submit a certificate signed by a qualified technician to the event's scrutineers. It must be accompanied by a drawing or photo of the rollbar in question declaring that this rollbar can resist the forces mentioned above.

8.6) HOMOLOGATION

The FISA being aware of the problem of competency being raised by the use of safety rollcages proposes that each car manufacturer recommends a type of safety rollcage complying with FISA standards.

This rollbar must be described on an homologation extension form presented to the FISA for approval and may not be modified (see Article 8.2.1.1).

9) REAR VIEW

This shall be provided by an inside mirror commanding a rear window with a least a 10 cm vertical opening, maintained along a width of at least 50 cm. However, if the straight line connecting the upper and lower edges of the rear window opening makes an angle inferior to 20° with the horizontal, the rear view must be efficiently obtained by other means (two outside mirrors or any other system of equivalent efficiency). Furthermore, all these cars should be equipped with two outside mirrors for circuit events.

Application : obligatory for Groups N, A, B.

10) TOWING-EYE

All cars will be equipped with a rear and front towing-eye for all events. This towing-eye will only be used if the car can move freely and it must not be used to lift the car. It will be clearly visible and painted in yellow, red or orange.

Application : Groups N, A, B.

11) WINDSHIELD

A windshield made of laminated glass is compulsory.

Application : Groups N, A, B.

12) SAFETY FIXING DEVICES FOR WINDSHIELDS

Such devices may be used freely.

Application : optional for Groups N, A, B.

13) GENERAL CIRCUIT BREAKER

The general circuit breaker must cut all electrical circuits, battery, alternator or dynamo, lights, hooters, ignition, electrical controls, etc.). It must be a spark-proof model, and will be accessible from inside and outside the car. As for the outside, the triggering system of the circuit breaker will compulsorily be situated at the lower part of the windscreen mouting of driver's side for closed cars. It will be marked by a red spark in a white-edged blue triangle with a base of at least 12 cm.

Application: compulsory fitting for all Group A and B cars taking part in speed events on circuits or hill-climbs. The fitting is recommended for other events. Optional for Group N.

14) FIA APPROVED SAFETY FUEL TANKS

Whenever a competitor uses a safety fuel tank, it must come from a manufacturer approved by FIA.

In order to obtain the FIA's agreement, a manufacturer must have proved the constant quality of its products and its compliance with the specifications approved by the FIA.

Safety tank manufacturers recognised by the FIA must undertake to deliver to their customers exclusively tanks complying with the norms approved. To this end, on each tank delivered the name of the manufacturer, the model, the exact specifications according to which this tank has been manufactured, the date of the manufacturing, and the series number, shall be printed.

14.1) Technical specifications:

The FIA reserves the right to approve any other set of technical specifications after study of the dossier submitted by the manufacturers concerned.

14.2) Specifications FIA/Spec/FT3:

The technical specifications for these tanks are available, on request, from the FISA Secretariat.

14.3) Ageing of tanks:

The ageing of safety tanks entails a considerable reduction in the strength characteristics after approximately five years.

Therefore, all fuel cells must be replaced by new ones at the latest five years after the fabrication date indicated on the cell.

14.4) List of agreed manufacturers:**Federal Republic of Germany:**

Uniroyal Englebert GmbH, Westerbachstr. 122, 6230 Frankfurt/Main 80.

United States:

Don Allen Inc, 401 Agee Road, Grants Has, Oregon 97526.

Aero Tecs Labs, Hewson Avenue, Warcick, NJ 07463.

Fuel Safe Corporation, 15545 Computer Lane, Huntington Beach, California 92649.

Goodyear Fuel Cell Labs, the Goodyear Tire and Rubber Company, Akron, Ohio 44316.

France:

Kléber Colombes, Division Tissus Enduits et Applications, 4, rue Lesage-Maille, 76230 Caudebec-les-Elbœuf.

Ets J. RICHE - BP 14 - 14690 Pont-D'Ouilly.

Société Lyonnaise des Réservoirs Souples, 18 rue Guillaume-Tell, 75017 Paris.

Superflexit SA, 45, rue des Minimes, 92 Courbevoie.

Great Britain:

FTP Industries Ltd, The Airport, Portsmouth, Hants.
 Marston Excelsior Ltd, Wobaston Road, Wolverhampton, Staffs.
 Premier Fuel Systems Ltd, Burnaston Old Airfield, Burnaston, Derby.

Italy:

Gipi, Via Abruzzi 7, 20090 Opera, Milano.
 Pirelli, Viale Rodi 15, Milano.

Japan:

Fujikura Rubber Works Ltd., N° 20, 2-chome, Nishigotandu, Shinagawa-ku, Tokyo.

Kojima Press Ltd, 3-30 Shimoichibacho Toyota, Aichiken.

Sakura Rubber Co Ltd, 48-14-1 Chome Sasazuka, Shibuya Ku, Tokyo.

Sumitomo Electric Industries Ltd, 15-5 Chome Katahama, Migashi Ku, Osaka.

14.5) Applications of these specifications:

Group A and B cars may be equipped with a safety fuel tank if the modifications necessary do not exceed those allowed by the regulations.

15) PROTECTION AGAINST FIRE

An efficient protective screen must be placed between the engine and the occupants' seat, in order to prevent the direct passage of flames, in case of fire.

Art. 254 - Specific regulations for Group N**1) DEFINITION**

Large scale series production touring cars.

2) HOMOLOGATION

At least 5000 identical units must have been produced in 12 consecutive months and homologated by the FISA in Group A.

The Optional Variants (VO) of the Group A form shall not be valid in Group N, unless they refer to:

- fly-wheel for automatic gearboxes;
- fuel tank;
- automatic gearboxes;
- sun roof;
- 2/4 doors versions;
- safety roll cage.

Likewise evolutions of the type (ET) homologated in Group A are not valid in Group N.

Group N cars must derive from cars homologated in Group A in a stage of evolution after 1.1.1979 or from cars homologated in Group 1 1981 on the basis of their automatic transfer by the FISA into Group A.

The FISA shall only grant its homologation to a model which does not present any differences compared with the basic form of the country of construction which would affect the basis characteristics.

3) NUMBER OF SEATS

Cars must have at least 4 seats, in accordance with the dimensions defined for Group A.

4) MODIFICATIONS AND ADJUNCTIONS ALLOWED OR OBLIGATORY

All the modifications which are not allowed are expressly forbidden.

The only work which may be carried out on the car is that necessary for its

normal servicing; or for the replacements of parts worn through use or accident. The limits of the modifications and fittings allowed are specified hereinafter. Apart from these, any part worn through use or accident can only be replaced by an original part identical to the damaged one.

The cars must be strictly series production models identifiable by the homologation form data.

5) MINIMUM WEIGHTS

Cars must have at least the weights appearing on the homologation form plus the weight of the safety devices.

6)

6.1) ENGINE

The accelerator cable may be replaced or doubled by another one regardless of whether it comes from the manufacturer or not.

— **Ignition:** make and type of plugs are free as are rev-limiters and high tension cables.

— **Cooling system:** the thermostat is free as is the control system and the temperature at which the fan cuts in

Locking system for the radiator cap is free.

— **Fuel feed:** Carburettor(s) parts of fuel injection system parts regulating the quantity of fuel reaching the engine may be changed, provided that they have no influence on air admission.

6.2) TRANSMISSION

— **Clutch:** linings are free as well as their fixing method.

6.3) SUSPENSION

The mounting points of the suspension (including those of the shock absorbers, the springs and the stabiliser), on the bodyshell may be locally reinforced by welding. It will only be allowed to reinforce parts which are without any doubt in relation with the suspension anchorage. The reinforcement shall only be done by welding within 5 cm of the perimeter defined by the original welding points.

— **Shock absorbers:** free, provided that their number, their type, their working principle, their attachment points and the spring trim position remain unchanged.

Gas filled dampers, regarding their working principle, will be considered as hydraulic dampers.

If, in order to change the damping element of a MacPherson suspension, or a suspension operating in a identical manner, it is necessary to replace the entire MacPherson strut, the replacement parts must be mechanically equivalent to the original ones and have the same mounting points and the same spring position.

6.4) RUNNING GEAR

The rims must be those homologated by the manufacturer. The tyres shall be free provided that they may be fitted to these rims.

6.5) BRAKING SYSTEM

Brake linings are free, as well as their mountings (riveted, bonded, etc.) provided that the contact surface of the brakes is not increased.

Protection plates may be dismantled or bent.

In the case of a car fitted with servo-assisted brakes, this device may be disconnected.

6.6) BODYWORK

6.6.1) **Exterior :** hubcaps must be removed.

Protective headlight covers may be fitted provided that their only function is to cover the glass, and that have no influence on the car's aerodynamics. Underbody protection may be fitted during rallies.

Any locking system may be used for the cap of the petrol tank.

6.6.2) Passenger space

All accessories which have no effect on the vehicle's behaviour are allowed without restrictions, such as those concerning the aesthetics or interior comfort (lighting, heating, radio, etc.), on the express condition that they do not influence, even in a secondary manner, the efficiency of the engine, steering, strength, transmission, braking, or road-holding.

All the controls must be those provided by the manufacturer and they must retain their original function but they can be worked on to make them more accessible or more easily useable ; for example, the addition of an extension to the handbrake lever, of an additional flange to the brake pedal, etc.

The following is allowed in particular:

1) Additional measuring instruments, counters, etc. may be freely installed, provided that their fitting is not likely to create any dangers.

2) The horn may be changed or an additional one for the passenger's use added.

3) A fly-off handbrake is allowed.

4) Seat supports may be modified, and all kinds of seat-covers may be added including those creating bucket seats.

5) Bucket seats are allowed provided that they have at least the same minimum weight as the original seats or provided that they are ballasted to bring them up to the weight of the original seat.

6) Additional compartments may be added to the glove compartment as well as additional pockets to the doors.

7) Steering wheel is free.

6.6.3) Reinforcement bars

It is permitted to fit to the front reinforcement bars between the suspension mounting points to the body-shell to prevent separation and (or) convergence, on condition that they are removable and fixed exclusively by bolts on to the suspension or spring mounting points.

A hole may also be bored in the upper suspension trim of Mac Pherson suspensions in order to fit these rods. These bars may also be fitted at the rear, in the same conditions.

6.7) ELECTRICAL SYSTEM

— **Battery:** the make, capacity, and battery cables are free. The tension and the site of the battery must be retained.

— **Generator:** may be replaced by a more powerful one (watts). A dynamo may not be replaced by an alternator and vice-versa.

— **Lighting system:**

Additional headlights including the corresponding relays are allowed, provided that the total does not exceed six (tail and parking lights not included). They may not be housed within the bodywork.

Headlights and other exterior lights must always exist in pairs. A reversing light may be fitted provided it can only be used when police regulations on this subject are observed.

Fuses may be added to the electrical system.

Art. 255 - Specific Regulations for Group A**1) DEFINITION**

Large scale series production cars.

2) HOMOLOGATION

At least 5.000 identical examples of these cars must have been manufactured in 12 consecutive months.

3) NUMBER OF SEATS

The touring cars must have 4 seats minimum.

4) WEIGHTS

Group A cars are subject to the following scale of minimum weights in relation to their cubic capacity.

up to:	1,000 cm ³ :	620 kg
	1,300 cm ³ :	720 kg
	1,600 cm ³ :	800 kg
	2,000 cm ³ :	880 kg
	2,500 cm ³ :	960 kg
	3,000 cm ³ :	1,035 kg
	4,000 cm ³ :	1,185 kg
	5,000 cm ³ :	1,325 kg
over:	5,000 cm ³ :	1,400 kg

The weights are those of the cars in racing trim (according to the General prescriptions Gr. N, A, B, Art. 2.2), but including the safety equipment defined in Article 253.

The use of ballast is permitted in the conditions provided for under Article 2.3 of the general prescriptions for groups N, A, B.

5) MODIFICATIONS AND ADJUNCTIONS ALLOWED**GENERAL CONDITIONS**

Irrespective of the parts for which the present article lays down freedom of modification, the original mechanical parts having undergone the normal machining operations laid down by the manufacturer for series production may be subjected to all tuning operations through finishing, scraping but not replacement. In other words provided that the origin of the series production part may always be established, its shape may be ground, balanced, adjusted, reduced or modified through machining.

However, the modifications defined by the above paragraph are allowed on condition that the weights and dimensions mentioned on the homologation form are respected.

Adjunction of material: any adjunction of material or parts is forbidden unless it is specifically allowed by an Article in these regulations.

Nuts and bolts: throughout the car, any nut, bolt, screw may be replaced by another nut, bolt, screw.

5.1) ENGINE**5.1.1) Cylinder-block - Cylinder-head**

A rebore of 0.6 mm maximum is allowed in relation to the original bore without this leading to the capacity class limit being exceeded. The resleeving of the engine is allowed within the same conditions as for rebores, and the sleeve material may be modified.

Planing of the cylinderblock is allowed.

Cylinder head: planing authorized.

5.1.2) Volumetric ratio: free.

5.1.3) **Cylinder head gasket:** free.

5.1.4) **Pistons:** free as well as the piston-rings, gudgeon pins and their securing mechanism.

5.1.5) **Connecting rods, crankshaft:** besides the modifications laid down in the paragraph "General Conditions" above, the original crankshaft and connecting rods may receive chemical or heat treatment different to the laid down for series production parts.

5.1.6) **Bearings:** make and material are free; they must however retain their original type and dimensions.

5.1.7) **Flywheel:** it may be modified in accordance with the above paragraph "General Conditions" provided that the original flywheel may still be identified.

5.1.8) **Fuel feed:**

The original system, as specified on the homologation form (such as K-Jetronic) must be retained.

Carburettor(s) parts or fuel injection system parts regulating the quantity of fuel reaching the engine may be changed, provided they have no influence on air admission.

Anti-pollution elements may be removed provided that this does not lead to an increase in the quantity of air admitted.

Provided that the original air filter box is retained it may be modified (as per Article 5 "General Conditions") and in particular, the filter may be removed, and grates may be added on the air inlet. An additional air filter may be fitted. The air ducting devices situated in front of the air filter are free in the engine compartment.

In the case of injection, it is possible to select a different air measuring device, provided that this still complies with Article 324 c on the homologation form, Articles C1 to C5 being able to be modified in this way.

Fuel pump(s) are free provided that they are not installed in the cockpit. Should this be an original fitting, the pump may remain in place, but must be well protected.

The accelerator linkage may be replaced or doubled by another whether or not it is supplied by the manufacturer.

The number, the characteristics and the principle of operation of the heat exchangers are free, provided that the original model was fitted with at least one exchanger.

5.1.9) **Camshaft(s):** free (except the number and number of bearings). Timing is free.

With regard to the cylinder head orifices (inner side of the engine), in the case of rotary engine, only those dimensions which have been entered on the Homologation Form have to be respected.

5.1.10) **Valves:** the material and the shape of the valves are free, but their characteristic dimensions (mentioned on the homologation form) must be retained (including the respective angles of the valves axis). Maximum valve lift must be maintained, with a tolerance of + 0.3 mm.

The cups, cotters and guides (even if they do not exist as original parts) are not subject to any restrictions. Shims may be added under the springs.

5.1.11) **Rocker arms and tappets:** they may be modified in accordance with the paragraph "General Conditions" above.

5.1.12) **Ignition:** the ignition coil(s), condenser, distributor, interrupter and

plugs are free subject to the ignition system (battery/coil or magneto), remaining the same as provided by the manufacturer for the model concerned.

The fitting of an electronic ignition system, even without a mechanical interrupter, is allowed provided no mechanical part other than those mentioned hereabove is modified or replaced. In the same conditions, it shall be possible to change an electronic ignition for a mechanical ignition. The number of plugs may not be modified; that of the coils is free.

5.1.13) Cooling: Provided the original fitting on the car is retained, the radiator and its fixation are free, as are the lines linking it to the engine. A radiator screen may be fitted.

Thermostat is free. Dimensions and material of the fan/turbine are free, as are their number.

The fitting of a water catch tank is allowed. The radiator cap may be locked.

The water injection devices may be disconnected, but not removed.

5.1.14) Lubrification: radiator, oil/water exchanger, lines, sump and filter, are free. However, the fitting of an oil radiator outside the bodywork is only allowed below the horizontal plane passing through the hub in such a way that it does not protrude beyond the general perimeter of the car seen from above as it stands on the starting line.

Fitting an oil radiator in this manner does not allow the addition of an enveloping aerodynamic structure. All air vents must have the sole of inducing the necessary air for the cooling of the radiator, and must not have any aerodynamic effect.

Oil pressure may be increased by changing the discharge valve spring.

If the lubrication system includes an open type sump breather it must be equipped in such a way that the oil flows into a catch tank.

This must have a capacity of 2 litres for cars with a cubic capacity equal to or below 2,000 cc, and 3 litres for cars with a cubic capacity of over 2,000 cc. This container shall be made either out of plastic or shall include a transparent window.

5.1.15) Engine - Suspension - Angle and position

Supports are free provided that the angle and position of the engine within its compartment are not modified, and that Articles 5.7.1 et 5 - General Conditions are respected.

5.1.16) Exhaust: below the exhaust manifold exit the exhaust is free provided that the sound levels in the country(ies) crossed are not exceeded if it is an event on open roads. The exhaust exit must be inside the car's perimeter. (See General Prescriptions, Article 3.5).

For cars with turbocharged engines the exhaust manifold can only be modified after the turbocharger.

5.1.17) Driving pulleys and belts for ancillaries situated outside the engine: may not be removed but their material and dimensions are free.

5.1.18) Gaskets: free.

5.1.19) Engine: springs: in the event of supercharging the spring(s) limiting the pressure in the inlet must remain unchanged.

Other springs are not subject to any restrictions but they must keep their original functioning principle.

5.1.20) Starter: it must be conserved, but its make and type are free.

5.2) TRANSMISSION

5.2.1) **Clutch:** the clutch and its mechanism are free provided that it has the same number of plates as the series production item, that the original housing is retained, and the type of clutch operation (hydraulic or mechanical) as fitted in series production is not changed in any way.

The operation lever of a mechanical clutch may be changed from "push" to "pull" and vice-versa.

5.2.2) Gearbox

An additional lubrication and oil cooling device is allowed (circulation pump, radiator, and air intakes situated under the car) in the same conditions as for Article 5.1.14, but the original lubrication principle must be retained.

The gears of the additional gear box on the homologation form may be changed, provided that they respect the information given on this form.

5.2.3) Final drive and differential

A limited-slip differential is allowed provided that it can be fitted into the original housing without any modification other than those laid down in the above paragraph "General Conditions". The original differential may also be locked.

The original lubricating principle for the rear axle must be retained. However, an additional lubricating and oil cooling device is allowed (circulation pump, radiator, and air intakes situated under the car) under the same conditions as for Article 5.1.14.

5.3) SUSPENSION

The position of the mounting points of the suspension to the wheel uprights and to the shell must remain unchanged.

5.3.1) Reinforcement bars between the suspension mounting points to the body shell may be installed.

5.3.2) Strengthening by the adjunction of material, of the mounting points and existing suspension parts, the running gear and all the suspension parts is allowed.

5.3.3) **Anti-roll bar:** The anti-roll bars homologated by the manufacturer may be replaced or removed, provided that their mounting points on the chassis remain unchanged.

5.3.4) The joints may be of a different material from the original ones. Rubber articulations may therefore be replaced by "Uniball" joints, if this modification is possible without adding any material other than, that of the joint.

5.3.5) The material and main spring dimensions are free (but not the type). The spring seats may be made adjustable even if this includes the adjunction of material.

A coil spring may be replaced with two or more springs of the same type, concentric or in series, provided that they are fully interchangeable with the original and can be fitted without any modifications other than those specified in this article.

5.3.6) **Shock Absorbers:** Make is free, but not the number, the type (telescopic, arm, etc.), the system of operation (hydraulic, friction, mixed, etc.) nor the supports.

With regard to their principle of operation, gas-filled shock-absorbers will be considered as hydraulic shock-absorbers. If in order to change the damping element of a Mac Pherson suspension, or suspension working on an identical principle, it is necessary to replace the entire Mac Pherson strut,

the replacement part must be mechanically equivalent to the original one, except for the damping element, and the spring cup.

5.4) WHEELS AND TYRES

Complete wheels (complete wheel = flange + rim + tyre) are free provided that they can be housed within the original bodywork; this means the upper part of the wheel (rim flange and tyre flank), located vertically over the wheel hub centre, must be covered by the bodywork, when measured vertically.

In no case should the width of the rim-tyre assembly in relation to the cubic capacity of the car, exceed the following:

up to:	1,000 cm ³ :	7"
	1,300 cm ³ :	7.5"
	1,600 cm ³ :	8.0"
	2,000 cm ³ :	9.0"
	3,000 cm ³ :	10.0"
	4,000 cm ³ :	11.0"
	5,000 cm ³ :	12.0"
over:	5,000 cm ³ :	13.0"

The rim diameter may be increased or reduced by up to 2 inches in relation to the original dimensions.

The wheels do not necessarily have to be of the same diameter.

5.5) BRAKING SYSTEM

5.5.1) Brake linings

Material and mounting method (riveted or bonded) are free provided that the dimensions of the linings are retained.

5.5.2) Servo brakes and braking force adjusters (pressure limiters)

They may be disconnected but not removed. The adjusting device free.

5.5.3) Cooling of brakes

Protection shields of homologated may be modified or removed, but material may not be added.

A circular flexible pipe to channel air to the brakes of each wheel is allowed, but its interior diameter must not exceed 10 cm.

The air pipes must not go beyond the perimeter of the car, seen from above.

5.5.4) **Brake discs:** the only operation allowed is rectification.

5.5.5) The handbrake device may be disconnected but only for closed course races (circuit, hillclimbs).

5.6) STEERING

The assistance may be suppressed.

5.7) BODYWORK - CHASSIS

5.7.1) Lightening and reinforcements

Strengthening of the suspended part is allowed provided that the material used follows the original shape and is in contact with it.

Insulating material may be removed from under the car floor, from the engine compartment, the luggage boot, and the wheel arches.

5.7.2) Exterior

5.7.2.1) Bumpers: Overrides may be removed.

5.7.2.2) **Hub-caps and wheel embellishers:** hub-caps may be removed. Wheels embellishers must be removed.

5.7.2.3) **Windscreen wipers** : motor position, blades and mechanism are free but there should be at least one windscreen wiper provided for the windscreen. The windscreen washer device may be disconnected.

5.7.2.4) External decorative strips may be removed.

5.7.2.5) Jacking points may be strengthened, moved, and increased in number.

5.7.2.6) Headlight covers may be fitted provided their sole aim is to protect the headlight glass and that they have no effect on the car's aerodynamics.

5.7.2.7) Taking into account the different police regulations in each country registration plate locations are free.

5.7.2.8) The registration plate mountings may be disconnected but not their lighting system.

5.7.2.9) Additional safety fastenings for the windscreen and the side windows may be fitted provided they do not improve the aerodynamic qualities of the car.

5.7.2.10) The fitting of underbody protection is allowed in rallies only.

5.7.2.11) The edges of the wing panels may be folded back if they protrude inside the wheel housing.

5.7.2.12) Removable pneumatic jacks are permitted, but without the compressed air bottle on board (circuits only).

5.7.3) Cockpit

5.7.3.1) Seats : seats and their mountings are free, but they must include a headrest. The front seats may be moved backwards but not beyond the vertical plane defined by the front edge of the original rear seat.

The front seats may be moved backwards but not beyond the vertical plane defined by the front edge of the original rear seat.

The passenger's seat may be removed as well as the rear seats (including their backrests).

5.7.3.2) Should the fuel tank be installed in the boot and the rear seats removed, a fireproof and liquid-proof bulkhead must separate the cockpit from the fuel tank.

5.7.3.3) **Dash board**: standard, however the trimmings situated below this and which are not a part of it may be removed.

5.7.3.4) **Doors** : The following is allowed:

— the removal of soundproofing material provided that this does not modify the shape of the doors.

— the replacement of electric winders by manual ones.

5.7.3.5) **Roof**: padding and insulating material may be removed provided that the shape of the ceiling is not modified.

5.7.3.6) **Floor**: insulating and padding materials may be removed. Carpets are free and may thus be removed.

5.7.3.7) **Other padding and soundproofing materials** may be removed.

5.7.3.8) **Heating system** : The original heating equipment may however, be replaced by another also provided by the manufacturer, and mentioned in his catalogue as supplied on demand.

5.7.3.9) **Air conditioning**: may be added or removed but heating must be assured.

5.7.3.10) **Steering wheel:** free, the anti-theft device may be removed.

The steering can be on either the right or left provided that it is a question of a simple inversion of the driving wheels control, laid down and supplied by the manufacturer without any other mechanical modifications except those made necessary by the inversion.

5.7.3.11) A rollcage may be fitted. (See Art. 253.9).

5.7.3.12) The rear removable window shelf in two-volume cars may be removed.

5.7.3.13) **Fluid pipes:** liquid pipes may pass through the cockpit, but these pipes should not have any connections in the cockpit.

Air pipes may only pass through the cockpit if these are intended for the ventilation of the cockpit.

5.7.4) **Additional accessories**

All those which have no influence on the car's behaviour are allowed, for example equipment which improves the aesthetics or comfort of the car interior (lighting, heating, radio, etc.). In no case can these accessories increase the engine power or influence the steering, transmission, brakes, or roadholding even in an indirect fashion. All controls must retain the role laid down for them by the manufacturer. They may be adapted to facilitate their use and accessibility, for example a longer handbrake lever, an additional flange on the brake pedal, etc.

The following is allowed:

1) The original windscreen may be replaced by a laminated windscreen with defrosting equipment incorporated.

2) Instruments such as speedometers, etc. may be installed or replaced without this causing any risks.

3) The horn may be changed or an additional one added, within reach of the passenger.

4) Circuit breakers may be freely changed vis-a-vis their use, position, or number in the case of additional accessories.

5) A "fly-off" hand brake may be installed.

6) Spare wheel(s) is/are not compulsory. However if there is/are any, it/they must be securely fixed, and not installed in the space reserved for the driver and front passenger (if he is on board). No exterior modification of the bodywork must result from its/their installation.

7) Additional compartments may be added to the glove compartment and additional pockets in the doors provided they use the original panels.

8) Insulating material may be added to the existing bulkheads to protect the passengers from fire.

9) It is permitted to change the joints of gear-box change systems.

5.8) **ELECTRICAL SYSTEM**

5.8.1) The nominal voltage of the electrical system including that of the supply circuit of the ignition must be retained.

5.8.2) The addition of relays and fuses to the electrical circuit is allowed as is the lengthening or addition of electric cables.

Electric cables and their sleeves are free.

5.8.3) **Battery:** the make and capacity of the battery(ies) are free. Each battery must be securely fixed and covered to avoid any short circuiting or leaks. Their location is free, however it (they) must not be placed in the cockpit. The number of batteries laid down by the manufacturer must be retained.

5.8.4) **Generator and voltage regulator** : free, but neither the position nor the driving system of the generator may be modified. The position of the voltage regulator may be changed but may not be placed in the cockpit unless it was placed there originally.

5.8.5) **Lighting - Indicating**

All lighting and signalling devices must comply with the legal requirements of the country of the event or with the Convention on international road traffic.

Taking this comment into account the location of the indicators and parking lights may be modified, but the original orifices must be sealed. The make of the lighting devices is free.

Lighting devices which are part of the standard equipment must be those foreseen by the manufacturer and must comply where their functioning is concerned with what the manufacturer has foreseen for the model in question.

However, the operating system of the retractable headlights, as well as its energy source, may be modified.

Freedom is granted with regard to the frontal glass, the reflector and the bulbs. The mounting of additional headlights is authorised provided that a total of 8 is not exceeded (parking lights and side lights not included) and provided that the total is an even one.

They may, if necessary, be fitted into the front part of the coachwork or into the radiator grille, but such openings as needed in this case must be completely filled by the headlights. The replacement of a rectangular headlight by two circular ones, or vice-versa, fitted on a support corresponding to the dimensions of the aperture and sealing it completely is allowed. The fitting of a reverse-light is authorised, if necessary by embedding it into the coachwork, but provided it will only switch on when the reverse-gear is engaged and provided the police regulations are respected.

The Supplementary Regulations of an event may give waivers to the above mentioned prescriptions.

5.9) **FUEL TANKS**

5.9.1) The total capacity of the fuel tanks must not exceed the following limits.

Cars up to 700 cc		
Cars from 700 cc to 1,000 cc	"	: 70 l
" " 1,000 cc to 1,300 cc	"	: 80 l
" " 1,300 cc to 1,600 cc	"	: 90 l
" " 1,600 cc to 2,000 cc	"	: 100 l
" " 2,000 cc to 2,500 cc	"	: 110 l
Cars over 2,500 cc	"	: 120 l

5.9.2) The fuel tank may be replaced by a safety fuel tank homologated by the FIA (specification FT3) or by another tank homologated by the car manufacturer. In this case, the number of tanks is free and the tank may be placed inside the luggage compartment but provision should be made for a collector hole to collect any petrol which may have leaked in this compartment. The various homologated tanks and the FT3 tanks may also be combined (including the standard tank), insofar as a total of their capacities does not exceed the limits determined by Article 5.9.1.

The position of the original tank may only be modified in cars of which the tank had been placed by the manufacturer inside the cockpit and close to the occupants. In this case it shall be permissible either to install a protective device between the tank compartment, and, if need be, to modify its supple-

mentary accessories (refuelling orifice, petrol pump, overflow pipe). In any case, the changes of the position of the tanks should not give rise to any lightnings or reinforcements other than those provided for under Article 5.7.1 but the opening remaining after the removal of the original tank may be closed by the installation of a panel.

The position and the dimension of the filter hole as well as that of the cap may be changed as long as the new installation does not protrude beyond the bodywork and guarantees that no fuel shall leak into one of the interior compartments of the car.

5.9.3) The use of an increased-capacity fuel tank may be authorised by the ASN with the agreement of the FIA for events organised under special geographic conditions (crossing desert or tropical country for example).

Art. 256 - Specific regulations for Group B

1) DEFINITION

Grand Touring Cars.

2) HOMOLOGATION

At least 200 identical units (minimum 2 seats) of these cars must have been built in 12 consecutive months.

3) FITTINGS AND MODIFICATIONS ALLOWED

All those allowed for Group A with the following modifications.

4) WEIGHT

Group B cars are subjected to the following minimum weight scale in relation to their cubic capacity.

up to	1,000 cm ³ :	580 kg
	1,300 cm ³ :	675 kg
	1,600 cm ³ :	750 kg
	2,000 cm ³ :	820 kg
	2,500 cm ³ :	890 kg
	3,000 cm ³ :	960 kg
	4,000 cm ³ :	1,100 kg
	5,000 cm ³ :	1,235 kg
over	5,000 cm ³ :	1,300 kg

5) WHEELS AND TYRES

Same text as for Group A, (Art. 5.4) except for the maximum widths which will be the following:

In rallies:

The total of the widths of two rim-tyre assemblies on the same side of the car must be less than or equal to:

up to	1,000 cm ³ :	16"
	1,300 cm ³ :	17"
	1,600 cm ³ :	18"
	2,000 cm ³ :	20"
	3,000 cm ³ :	22"
	4,000 cm ³ :	24"
	5,000 cm ³ :	26"
over	5,000 cm ³ :	28"

For other events:

In no case should the width of each complete rim-tyre assembly, in relation to the cubic capacity of the car, exceed the following:

up to	1,000 cm ³ :	8"
	1,300 cm ³ :	8,5"
	1,600 cm ³ :	9"
	2,000 cm ³ :	10"
	3,000 cm ³ :	11"
	4,000 cm ³ :	12"
	5,000 cm ³ :	13"
over	5 000 cm ³ :	14"

Art. 257 - Group C1 Prototype regulations**1) DEFINITION**

Two seater competition automobiles built specially for races on closed circuits.

2) SPECIFICATIONS**2.1) Engine**

By engine is understood the whole made up by the block, cylinders and cylinderhead(s). All modifications are allowed.

The maximum amount of fuel which may be carried on board is 100 l.

The maximum total quantity of fuel allocated for the whole distance or for the whole duration of the event is limited to:

800 km-500 miles	:	425 l
1 000 km	:	510 l
9 hours	:	830 l
12 hours	:	1 105 l
24 hours	:	2 210 l

2.2) Weight

The minimum weight is 850 kg.

This is the real weight of the empty car (with no persons or baggage on board, the car being fully equipped). All the safety parts normally prescribed are included in this weight.

The weight may be checked at any time during an event with the quantity of liquid remaining in the tanks (on the understanding that it is forbidden to add oil, water or any other liquid before the weighing) and after emptying the car of all the fuel.

The weight of the car may be completed by means of one or several ballasts incorporated in the material of the car provided that these are solid and unitary blocks, fixed by means of tools and offering the possibility for seals to be affixed if the scrutineers deem it necessary.

2.3) Main Structure

The fully sprung structure of the vehicle to which the suspension and/or spring loads are transmitted, extending longitudinally from the foremost front suspension mounting on the chassis to the rearmost one at the rear.

3) OTHER PRESCRIPTIONS

Valid at all times during the event.

3.1) Exterior dimensions

Maximum width: 200 cm ;

Maximum length: 480 cm ;

Height: The height measured vertically from the lowest point of the flat surface of 100 x 80 cm as defined under Article 3.7 to the highest point of the glazed part of the windscreen must be at least 920 mm.

The height measured vertically from this same point of the flat surface to the highest point of the car must not exceed 1 030 mm.

- Front plus rear overhangs must not exceed 80 % of the wheelbase.
- Difference between front and rear overhangs must not exceed 15 % of the wheelbase.

3.2) Doors

Two doors are obligatory. The word door should be taken as meaning that part of the bodywork which opens to give access to the seats. The doors, when open, must afford free access to the seats. (No mechanical part should obstruct access to the seats).

The outside door handle on closed cars must be clearly indicated.

The dimensions of the lower door panel (the part which is normally opaque) must be such as to allow a rectangle or a parallelogram of at least 50 cm wide and 30 cm high, measured vertically, to be inserted in it. The corners of the rectangle or parallelogram may be rounded to a maximum radius of 15 cm.

Cars with sliding doors will not be allowed unless they include a safety system enabling a quick and easy evacuation of the car's occupants in case of accident.

The doors should have a window of transparent material into which a parallelogram should be able to be inscribed, the horizontal sides of which shall measure at least 40 cm. The height measured on the surface of the window perpendicularly to the horizontal sides, shall be at least 25 cm. The angles may be rounded in accordance with a maximum radius of 5 cm. The measurements shall be taken across the chord of the arc. The doors should be designed in such a way as to never restrict the lateral vision of the driver.

3.3) Windscreen

A windscreen of single piece, made of laminated glass, is compulsory.

The shape of the windscreen must be such that at a distance of 5 cm measured vertically downwards from the highest point of the transparent part, the width of the glazed surface is at least 25 cm measured across the chord of the arc on either side of the longitudinal axis of the car.

The shape of the screen must be such that its upper edge forms a regular, continuous convex line.

It must be possible to fit on the windscreen a band 10 cm high (measured vertically) by 95 cm measured horizontally across the chord of the arc between the inner faces of the pillars of the windscreen (and/or of the front roll-bar) the centre of which will be 30 cm from the highest point of the car.

3.4) Cockpit

Definition of the cockpit: inner volume in which the driver and the passenger sit. No component may be fitted in this space, apart from a communication system, fire extinguisher(s) and the rollbar, and a tool kit.

Definition of the term "seat": the two surfaces constituting the seating cushion and the seat-back or back rest.

Seat-back or back rest: surface measured upwards from the bottom of the spine of a person normally seated.

Seat cushion: surface measured forwards from the bottom of the spine of the same person.

Minimum elbow width above the front seats : 130 cm (51 in), measured hori-

zontally between the padding or inner surface of the doors. It must be possible to occupy simultaneously the driver's and passenger's seats which must be identical and shall be located symmetrically on either side of the centreline of the car.

The seats must be firmly fixed to the car, but may provide for adjustment for the size of the occupant.

Two footwells must be provided, disposed symmetrically about the longitudinal centreline of the car. These footwells must be identical dimensionally. The only components allowed to intrude into the footwells will be the steering column and its joints.

The size of the footwells will be defined by the following dimensions:

The section perpendicular to the longitudinal axis of the car, which must have a minimum cross section of 750 cm² and a minimum width of 25 cm, and the length from the foot pedals to the vertical projection of the centre of the steering wheel.

An efficient ventilation system with a fresh air inlet and a used air outlet must be provided for.

3.5) **Wheels and tyres**

The number of wheels is fixed at 4. The use of wheels with a device to hold on the tyres is recommended. Should "knockoff" nuts be used these should never protrude beyond the rims.

The maximum width of the complete wheel is limited to 16".

The width shall be measured with the tyre at normal running pressure, and the complete wheel mounted on the car resting on the ground in running order with the driver aboard. This measurement of the width will only be taken at the widest point of the tyre, above the hub-level. In no case can the width measured where the beads join the rim exceed the width of the tyre.

The fitting of multiple tyres on one and the same rim is authorized.

3.6) **Transmission**

Free, but a reverse gear which the driver may operate from his seat is obligatory.

3.7) **Bodywork**

All elements of the bodywork shall be completely and neatly designed and finished, with no temporary or makeshift elements.

The body shall cover all mechanical components.

Air intakes must not be any higher than the highest points of the roof or windscreen.

In the case of open cars, the opening above the seats must be symmetrical in relation to the longitudinal axis of the car.

An open car is defined by the following prescriptions:

— The shape of the bodywork seen from one side must be identical to the shape seen from the other side.

— Seen from above, a central part separating the driver from the passenger, even if this part is not connected to the bodywork at the seat-back, can be accepted, as long as the opening is of the same size for the driver and for the passenger.

— The bodywork can be made with transparent material, but the rules concerning the windscreen must be respected.

The bodywork shall project over the wheels so as to provide efficient covering of at least 1/3 of their circumference, and at least the whole width of the tyre. Behind the rear wheels, the bodywork should terminate below the axis of the rear wheels.

Cooling holes directed to the rear must be fitted with louvers or any other device to always prevent the tyre being visible from the rear.

Any part having an aerodynamic influence and any part of the bodywork must be rigidly secured to the entirely sprung part of the car (chassis-body unit), must not have any degree of freedom, must be securely fixed and remain immobile in relation to this part while the car is in motion.

On the bottom of any car, rearward of the vertical plane tangent to the rear of the complete front wheels, and fore of the vertical plane tangent to the fore of the complete rear wheels, a solid, flat, hard, rigid and continuous surface must be provided in which a rectangle of 100 cm (measured along the transverse axis of the car) and 80 cm (measured along the longitudinal axis of the car) can be inscribed. The entire surface of this plate, which must be an integral part of the chassis-body unit, must not have any degree of freedom nor any provision for adjustment in relation to this unit.

No part having an aerodynamic influence and no part of the bodywork may, under any circumstances, be located below the geometrical plane produced by the surface as defined above.

Any transverse, longitudinal or other flexible, retractable, pivoting or sliding device bridging the gap between the body and the road surface is forbidden.

3.8) Lighting equipment

At the rear, the cars will be equipped with at least 2 "stop" lights, as well as 2 rear red lights. They will be situated symmetrically on either side of the car's longitudinal axis in a visible position. The cars shall be equipped with a rear red "rain/fog" light (of 25 watts minimum) which shall be clearly visible from the rear.

Moreover, the cars must be equipped with at least two headlights as powerful as those with which touring cars are usually fitted plus direction indicators (with side indicators mounted to the rear of the axis of the hub of the front wheels) mounted at the front and rear.

The lighting equipment must be in working order throughout the whole duration of the race, even if the entire race is run in daylight.

3.9) Battery - Batteries

It must be fitted outside the cockpit and be firmly fixed and completely protected by a box in insulating material.

3.10) Windscreen wiper(s)

At least one windscreen wiper, in working order, is obligatory.

3.11) Oil tanks

The quantity of oil carried on board may not exceed 20 litres. All oil tanks must be efficiently protected.

All oil storage tanks situated outside the main structure of the car must be surrounded by 10 mm thick crushable structure.

No part of the car containing oil may be situated aft of the gearbox or final drive casing on any rear wheel driven car. In case of front wheel drive, no part containing oil may be situated behind the complete rear wheels.

All oil lines external to the cockpit, with the exception of lines permanently mounted on the engine, must be capable of withstanding a pressure of 70 kg/cm² (1 000 psi) and an temperature of 230° C.

3.12) Starting

Only the on board source of energy may be used to start the engine, operated by the driver from his seat.

3.13) Fuel

For petrol engines, the only fuel permitted is petrol having the following characteristics :

— a maximum of 102 RON, the measurement being made according to the standard ASTM D 2699, the fuel being accepted or rejected according to ASTM D 3244 with a confidence limit of 95 %, and

— a maximum of 2 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any alcohols, nitro-compounds or other power boosting additives.

Each organiser must arrange for fuel to be supplied by one supplier only giving details of the quality and specifications of the product.

In countries where no fuel suitable for use in Group C 1 Prototype engines is commercially available and where the laws of the country prohibit importation of such fuel, the ASN must obtain a dispensation form the FISA for the use of aviation fuel which will then be supplied by the organiser and must be used by all competitors.

For diesel engines:

The fuel must correspond to the following specifications:

- Hydro-carbon content, % w 99,0 min.
- Density, kg/l 0,860 max.
- Cetane n° (ASTM D613) or
- Calculated Cetane index (ASTM D976/80) 60 max.

3.14) Only air may be mixed with the fuel as an oxydant.

4) SAFETY EQUIPMENT**4.1) Cables, lines and electrical equipment**

Except if the cables, lines and electrical equipment such as battery, fuel pump, ect. are in compliance with the requirements of the aircraft industry as regards their location, material and connections, they must be placed or fitted in such a way that any leakage cannot result in:

- accumulation of liquid;
- entry of liquid into the cockpit;
- contact between liquid and any electrical line or equipment.

Should the cables, lines or electrical equipment pass through or be fitted in the cockpit, they must be fully enclosed in a cover of a liquid-tight and fire-proof material.

All fuel lines external to the cockpit, with the exception of fuel lines permanently mounted on the engine, should be of a reinforced construction, attached by screw-on connectors. They must withstand a 70 kg/cm² (1,000 psi) pressure and a 230° C temperature.

All electrical circuits should be enclosed in a fire-proof material.

4.2) Additional protection of the pipes

An additional protection of fuel pipes and brake lines outside the coachwork against any risk of damage (stones, corrosion, breaking of mechanical pieces, etc.) and inside the cockpit against any risk of fire (fuel pipes only) is compulsory.

4.3) Safety harnesses

Wearing of two shoulder straps, one abdominal strap and two straps between the legs is obligatory; fixation points on the bodyshell: two for the abdominal strap, two, or else one symmetrical in relation to the seat for the shoulder straps, two for the straps between the legs.

4.4) Extinguishing systems

Installation: Each extinguisher bottle must be installed in such a way that

it is capable of withstanding accelerations of up to 25 g no matter how these are applied.

Operation - Triggering:

The two systems must be triggered simultaneously.

Any triggering system is allowed. However a source of energy not coming from the main source must be provided in the case of a triggering system which is not exclusively mechanical.

The driver seated normally at his steering wheel with his safety harness attached must be able to trigger the system manually; the same applies to any person outside the car. The means of triggering from the exterior must be positioned close to the circuit breaker or combined with it, and must be marked by the letter "E" in red inside a white circle of a least 10 cm diameter with a red edge.

Automatic triggering by heat sensors is recommended.

The system must work in any position, even when the car is upside down.

Checking: the type of extinguishant, its quantity, and the total weight of the bottle must be specified on the bottle(s).

Minimum capacities of extinguisher systems:

Closed cars: cockpit: 2.5 kg
engine: 5 kg

Open cars: cockpit: 5 kg
engine: 2.5 kg.

The extinguishant must be Halon 1211 or 1301 (BCF-BTM) only.

Extinguishing equipment must withstand fire and be protected against impacts.

The extinguisher system nozzles must be installed in such a way that they are not directly pointed at the driver (danger of burns caused by cold).

Discharge time:

Cockpit: 30 secs for Halon 1211.
60 secs for Halon 1301.

Engine: 10 secs.

4.5) Safety roll-bars

4.5.1) Two roll-bars, to the front and to the rear of the chest of the driver and the passenger must be provided. They shall correspond in shape to the inner profile of the upper part of the cockpit, shall be connected at their base by the chassis of the car and linked at the top by a least one tubular strut or box-member. In addition, the rear roll-bar shall comprise a diagonal reinforcement bar and two braces directed rearwards (see drawing 1).

This structure shall be built with tubes having at least the following characteristics:

Cold-drawn seamless	Diam. 48,3
Carbon steel - E30 daN	× 2.6
Alloy steel	Diam. 42.4
Type 25 CD4	× 2.6
SAE 4125 etc	
E-50 daN	

Steel tubes of diam. 1 3/4 inch × 0.90 are also accepted.

General considerations

1) The basic purpose of such devices is to protect the driver if the car turns over or is involved in a serious accident. This purpose should always be borne in mind.

2) Whenever bolts and nuts are used, the bolts should be of a sufficient minimum diameter according to the number used. They should be of the high-

best possible quality (preferably aircraft). Square head bolts and nuts should not be used.

3) One continuous length of tubing should be used for the main structure with smooth continuous bends and no evidence of crimping or wall failure.

4) All welding should be of the highest quality possible with full penetration (preferably arc welding and in particular herliarc). Although good outside appearance of a weld does not necessarily guarantee its quality poor looking welds are never a sign of good workmanship.

5) Braces should preferably be of the same size tubing as used for the main structure. Their fixation points should be as close as possible to the top of the roll-bar, and in any case at least 3/4 way up the total height of the roll-bar.

6) For space-frame constructions it is important that the safety roll-bar is attached to the car in such a way as to spread the loads over a wide area. It is not sufficient to simply attach the roll-bar to a single tube or junction of tubes. The roll-bar should be designed in such a way as to be an extension of the frame itself, not simply an attachment to it.

Considerable care should be attached to the necessary strengthening of the basic structure, for instance by adding reinforcement bars or plates so as to properly distribute the loads.

7) For monocoque constructions it is preferable to use a roll-bar hoop of 360 degrees completely around the inside of the car, and attached with suitable mounting plates. This type of roll-bar then becomes an integral part of the chassis.

Attachment of the roll-bars to the body

It is specified that roll-bars must make use of two plates:

— a steel plate, welded, riveted, or bolted on to the chassis body shell, at least 2 mm thick with an extension along a vertical component of the body (for instance, a door pillar see drawing 20).

This plate must have a total surface of at least 35 cm², a third of which at least constitutes the link with the vertical body component.

— a plate attached to the tube, having the same thickness as the metal of the tube to which it is fixed.

These two plates shall be joined together by a least three hexagonal headed bolts and nuts, at least 8 mm in diameter or by at least three high-resistance Allen screws and bolts of a minimum diameter of 8 mm. In no case may the roll-over bar be welded directly on to the body shell/chassis.

When the roll-bar rests on a box-member, the latter must be locally reinforced by a structure constituted of either welded bolts or welded tubing ends (see drawing 21).

Should the roll-bar be supported on a rear shelf which is not rigid enough, the roll-bar must be strengthened by adding struts, which must conform to roll-bar specifications (material, connections, fixation) between this rear shelf and the car's monocoque.

Removable connections

Should removable connections be used in the roll-bar construction, they must comply with a type approved by the FIA. Are approved up to now: a tapered connection and a twin lug connection with axis working under double shearing conditions and a muff-connection complying with drawings 22, 23 and 24.

The twin lug connection may however be used only for longitudinal brace-rods and not for the basic frame of the roll-bar(s).

The connection in accordance with drawing 25 may be used outside the main structure.

4.5.2) However, recognised and traditional manufacturers may also present a roll-bar of free design with regard to the dimensions of the tubes and the attachment of the bracerods providing that the construction is certified to withstand stress minima given hereafter. "w" being the weight of the car in starting order (driver aboard, full tanks), the roll-bar must be able to withstand three simultaneously applied loads:

- 1.5 w lateral
- 5.5 w fore and aft
- 7.5 w vertical, these loads being carried over into the primary structure

of the chassis

A certificate signed by a qualified technician must be submitted to the Scrutineers of an event, and state that this roll-bar can withstand the above mentioned loads.

4.6) General Circuit breaker

The general circuit breaker must cut all electrical circuits (battery, alternator or dynamo, lights, hooters, ignition, electrical controls, etc.). It must be of a spark-proof model, and will be accessible from inside and outside the car. As for the outside, the triggering system of the circuit breaker must be situated at the lower part of the windscreen pillar on the driver's side for closed cars, at the lower part of the main hoop of the roll-bar, indifferently on the right or the left, for open cars. It will be marked by a red spark in a white-edged blue triangle with a base of at least 12 cm.

4.7) Oil catch tank

When cars have a lubrication system which includes an open type sump breather, they must be equipped in such a way as to prevent oil spillage. For all cars the oil catching device shall have a minimum capacity of 3 litres. The container shall either be made out of translucent plastic or include a transparent panel.

4.8) Towing-eye

A towing-eye (minimum inner diameter: 80 mm) must be securely fitted to the front and the rear of the cars for all events.

This towing-eye will only be used if the car can move freely and it must not be used to lift the car.

This towing-eye shall be clearly visible and painted in yellow, red or orange.

4.9) Tank fillers and air-vents

Competitors are reminded that the tank fillers and their caps must not protrude beyond the coachwork.

The caps must be designed in such a way as to ensure an efficient locking action which reduces the risks of an accidental opening following a crash impact or incomplete locking after closing.

The fillers must be placed away from points which are vulnerable in case of an accident. The air-vents must be located at places which present no danger.

4.10) Standardised coupling

In all cases, the refuelling hose must be provided with a leak-proof cou-

pling to fit the standardized filler mounted on the car. The dimensions of this filler are given in the diagram.

All cars must be provided with a fuel filler complying with the diagram shown. The leak-proof filler must comply with the dead-man principle and must not therefore incorporate any retaining device when in an open position (spring loaded, bayonet, etc.).

The air-vent(s) must be equipped with non return valve or valves having the same closing system as that of the standard filler, and of the same diameter.

During refuelling the outlet of the air-vent must be connected with the appropriate coupling, either to the main supply-tank or to a transparent portable container with a minimum capacity of 20 litres provided with a closing system rendering it completely leak-proof.

In the case where the circuits are unable to provide the entrants with a centralised system, these will have to refuel according to the above procedure. In no case the level of the reserve tank may exceed two metres above the track where refuelling takes place, for all the duration of the event.

4.11) Petrol tanks

All the cars must be equipped with safety fuel tanks conforming to the specifications FIA/Spec/FT3 or FTA and supplied by an approved manufacturer.

The total capacity of the tank(s), including the collector tank, may not exceed 99 litres.

The maximum outer diameter of the lines going from the engine to the tanks must be 20 mm and their path as direct as possible.

The tank(s) may not be placed more than 65 cm from the longitudinal axis of the car and must be located within the limits defined by the front and rear axes of the wheels.

They shall be isolated by means of bulkheads so that in case of spillage, leakage or accident happening to the tank, the fuel will not pass into the driver or engine compartment or come into contact with any part of the exhaust system.

The fuel tanks must be efficiently protected.

The competitors must provide an illustration of the entire fuel circuit of the vehicle.

Low points must be provided for in the circuit enabling all the fuel to be speedily drained when the vehicle is positioned on a horizontal surface.

4.12) Headrest

A headrest must be fitted.

It must be designed in such a way that the driver's head may not become trapped between the safety structure and the headrest.

4.13) Firewall and floor

Cars shall have an adequate firewall to prevent the passage of flame from the engine compartment or under the car to the cockpit. Openings in the firewall for the passage of engine controls, wires and lines shall be of the minimum size necessary. The cockpit floor shall be constructed to protect the driver by preventing the entry of gravel, oil, water and debris from the road or from the engine. Bottom panels or belly panels shall be adequately vented to prevent the accumulation of liquid.

4.14) Crushable structures

The bottom of the tanks licked by the airflow shall be protected by a crushable structure, the entire surface of which shall be 1 cm thick.

All the petrol tanks less than 20 cm from the lateral flanks must be protected by a crushable structure, the entire surface of which shall be 10 cm thick.

The crushable structure should be a sandwich construction based on fire-resistant core of a minimum crushing strength of 25 lb/square inch (18 N/cm²). Water pipes may be passed through this core, but not fuel, oil or electrical lines.

The sandwich construction must include two sheets of 1.5 mm thickness, one of which shall be aluminium alloy sheet having a tensile strength of 14 tons/square inch (225 N/mm²) and minimum elongation of 5 per cent.

4.15) Frontal protection

The chassis shall include an impact absorbing structure (which may be attached) ahead of the driver's feet.

It shall be an extension of all the skins of the main chassis construction to a point at least 30 cm ahead of the soles of the driver's feet when normally resting on the pedals in the inoperative position.

At this point 30 cm ahead of the driver's feet it shall have a cross section of a least 200 cm².

Material and thickness will be the same as the corresponding skins of the main chassis structure. The cross section of the material will be at least 3 cm² in non-stabilised material and 1.5 cm² in stabilised material.

Holes or cutouts must be strongly reinforced to maintain the cross section of any wall of this base over more than 50 %.

This structure may not be an integral part of the chassis, but must be securely fixed to it.

An identical structure will be provided, symmetrically, for the passenger. In case of a multi-tubular chassis, the structure of the frontal protection shall afford the same resistance as that offered by the chassis tubes.

4.16) Rear-view

Rear-view mirrors giving an efficient view towards the rear must be fitted on both sides (Minimum surface 100 cm² for each one).

4.17) Brake

The braking system must be designed in such a way that the brake pedal controls all wheels normally. In case of any kind of failure in the brake transmission, the pedal shall still control at least two wheels.

4.18) Exhaust system

It shall be directed either rearwards or sideways. If the outlet pipes are pointing rearwards, their orifices shall be placed at a height neither superior to 45 cm nor below 10 cm in relation to the ground. If the exhaust pipes are directed sideways, their orifices must be located aft of a vertical line passing through the wheelbase centre and may not project in any way beyond the bodywork.

4.19) Position of the pedals

The axis of the pedals must never be situated to the fore of the axis of the front wheels.

N.B. : The prescriptions under articles 4.5 and 4.19 are compulsory for any new car built as from 1st January 1985. Those cars which were built before this date following the 1984 regulations are provisionally admitted until 31st December 1986 provided that proof of the date of construction is supplied.

Art. 258 - Group C2 prototype regulations

The Group C2 Prototype cars must be in conformity with the Group C Technical Regulations (Article 257 of Appendix J) apart from with regard to the following points:

1) **Weight:**

The minimum weight is set at 700 kg.

2) **Maximum global fuel allowance**

Maximum total quantity of fuel allocated for each car for the whole distance or the whole duration of the race :

500 Miles/800 km	275 litres
1 000 km	330 litres
9 hours	495 litres
12 hours	715 litres
24 hours	1.430 litres

Article 274 - Formula 3000 technical regulations

SUMMARY

Article 1: Definitions

- 1) Formula 3000 car
- 2) Automobile
- 3) Land vehicle
- 4) Coachwork
- 5) Wheel
- 6) "Automobile Make"
- 7) Event
- 8) Weight
- 9) Racing Weight
- 10) Cubic Capacity
- 11) Supercharging
- 12) Sprung suspension
- 13) Main structure

Article 2: Regulations

- 1) Role of the FIA
- 2) Publication date for modifications
- 3) Dangerous construction
- 4) Permanent compliance with regulations
- 5) Measurements
- 6) Duty of Competitor

Article 3: Coachwork and dimensions

- 1) Overall width
- 2) Width ahead of front wheels
- 3) Width and shape between the front wheels and the rear wheels
- 4) Width behind the centre-line of the rear wheels
- 5) Overhang
- 6) Height
- 7) Aerodynamic devices

Article 4: Weight

- 1) Minimum weight
- 2) Ballast

Article 5: Engine

- 1) Types of engine eligible
- 2) Limitation of the engine rev speed
- 3) Water injection

Article 6: Piping, fuel tanks, cables

- 1) Fuel tank location
- 2) FTA/FT3 rubber bladders
- 3) Rubber bladder manufacturers

- 4) Printing code on rubber bladders
- 5) Rubber bladder limited period of use
- 6) Other sets of technical specifications
- 7) Fuel fittings
- 8) Connections with the chassis
- 9) Fuel lines
- 10) Cables, fuel lines and electrical equipment
- 11) Reinforced piping
- 12) Crushable structures
- 13) Tank fillers and caps
- 14) Refuelling during the race

Article 7: Oil

- 1) Location - Crushable structure
- 2) Oil lines
- 3) Catch tank
- 4) Part of the car containing oil: Location
- 5) Oil replenishment

Article 8: Starting

- 1) Compulsory starter
- 2) Start of the engine

Article 9: Transmission to the wheels

- 1) Ban on 4-wheel drive cars
- 2) Gear ratios
- 3) Reverse gear

Article 10: Brakes

- 1) Double circuit
- 2) Prohibition of carbon fibre brakes

Article 11: Wheels and tyres

- 1) Location
- 2) Dimensions
- 3) Maximum number of wheels

Article 12: Cockpit

- 1) Architecture, access, dimensions
- 2) Rear view mirrors
- 3) Safety belts

Article 13: Safety

- 1) Fire extinguishers
- 2) Life support system
- 3) Master switch
- 4) Red light
- 5) Suspension: Chromium plating
- 6) Magnesium sheet

7) Titanium

- 8) Safety structures

Article 14: Fuel

- 1) Commercial fuel
- 2) Air

Article 15: Final text**ARTICLE 1: DEFINITIONS**

1) **Formula 3000 car:** An automobile designed solely for speed races on circuits or closed courses.

2) **Automobile:** A land vehicle running on at least four non-aligned complete wheels, of which at least two are for steering and at least two for propulsion.

3) **Land vehicle:** A locomotive device, propelled by its own means, moving by constantly taking real support on the earth's surface, of which the propulsion and steering are under the control of a driver aboard the vehicle.

4) **Coachwork:** All entirely sprung parts of the car licked by the external air stream, except the safety roll-over structures and the parts definitely associated with the mechanical functioning of the engine, transmission and running gear. The air-box(es) and all radiators shall be considered to be part of the coachwork.

5) **Wheel:** Flange and rim. Complete wheel : Flange, rim and tyre.

6) **"Automobile Make":** In the case of Formula racing cars, an automobile make is a complete car. When the car manufacturer fits an engine which it does not manufacture, the car shall be considered a hybrid and the name of the engine manufacturer shall be associated with that of the car manufacturer. The name of the car manufacturer must always precede that of the engine manufacturer. Should a hybrid car win a Championship Title, Cup or Trophy, this will be granted to the manufacturer of the car.

7) **Event:** An event shall consist of official practice and the race.

8) **Weight:** Is the weight of the car without the fuel and the driver at all times during the event.

9) **Racing weight:** Is the weight of the car in running order with the driver aboard and all fuel tanks full.

10) **Cubic capacity:** Means the volume swept in the cylinder(s) of the engine by the movement of the piston(s). This volume shall be expressed in cubic centimetres. In calculating engine cubic capacity, the number π shall be 3.1416.

11) **Supercharging:** Increasing the weight of the charge of the fuel-air mixture in the combustion chamber (over the weight induced by normal atmospheric pressure, ram effect and dynamic effects in the intake and/or exhaust systems) by any means whatsoever. The injection of fuel under pressure is not considered to be supercharging.

12) **Sprung suspension:** All road wheels/axles must be suspended from the chassis/body unit by springing mediums (i.e. axles or wheels must not be connected directly to the chassis/body unit). The springing medium must not be comprised of bolts located through flexible bushes or flexible mountings.

There must be independant movement of the axles/wheel uprights/stub

axles giving suspension travel from "bump" to "droop" in excess of the flexibility of the mounting location attachments.

13) **Main structure:** The fully sprung structure of the vehicle to which the suspension and/or spring loads are transmitted, extending longitudinally from the foremost front suspension on the chassis to the rearmost one at the rear and within the lateral protection structures.

ARTICLE 2: REGULATIONS

1) The following regulations governing the construction of Formula 3000 cars listed below are issued by the FIA.

2) Each year, in October, the FIA will publish all changes made to these regulations. All changes affecting the manufacturing of engines will become effective as from the fourth 1st January following the announcement. All other changes will become effective as from the third 1st January following the announcement. Changes made for safety reasons may come into force without notice.

3) If an automobile is deemed to be dangerous, it may be excluded by the Stewards of the Meeting.

4) Automobiles must comply with these regulations in their entirety at all times during an event.

5) All measurements must be made while the car is stationary on a flat horizontal metallised surface.

6) It is the duty of each competitor to satisfy the scrutineers and the Stewards of the Meeting that his automobile complies with these regulations in their entirety at all times during the event.

ARTICLE 3: COACHWORK AND DIMENSIONS

1) Overall width of the car, including complete wheels shall not exceed 200 cm, with the steered wheels in the straight ahead position.

2) The coachwork ahead of the front wheels may be extended to an overall maximum width of 150 cm. Nevertheless, any part of the coachwork ahead of the front wheels exceeding an overall width of 110 cm shall not extend above the height of the front wheel rims with the driver aboard seated normally, and irrespective of the fuel load.

3) The overall maximum width of the coachwork behind the rearmost edge of the complete front wheels and in front of the centre-line of the rear wheels shall not exceed 130 cm. The crushable structure is included in this width. Between the rear edge of the complete front wheels and the front edge of the complete rear wheels all sprung parts of the car visible from directly beneath the car must lie on one plane within a tolerance of ± 5 mm.

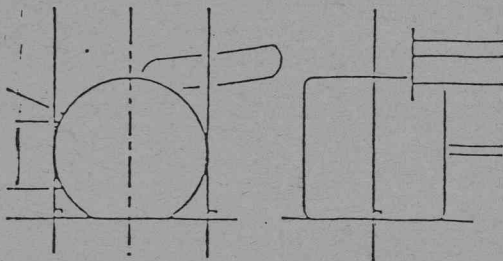
All these parts must produce a uniform, solid, hard, rigid (no degree of freedom in relation to the body/chassis unit), impervious surface, under all circumstances.

The periphery of the surface formed by these parts may be curved upwards with a maximum radius of 5 cm.

No parts of the bodywork in front of the centre-line of the rear wheels and extending above the height of the rear complete wheels may project beyond 45 cm each side of the longitudinal axis of the car.

4) Coachwork behind the centre-line of the rear wheels shall not exceed 90 cm in width.

5) Except in the case of front-wheel drive when the measurement will be taken from the centre-line of the rearmost substantial load-carrying wheels, no part of the car shall be more than 60 cm behind the centre-line of the rearmost driving wheels. No part of the car shall be more than 120 cm in front of the centre-line of the foremost front wheels. The centre-line of any wheel shall be deemed to be half way between two straight edges, perpendicular to the surface on which the car is standing, placed against opposite sides of the complete wheel at the centre of the tyre-tread.



Dessin N° 1 : Article 3.5 - Détermination de l'axe d'une roue.

Drawing N° 1: Article 3.5 - Wheel centre-line determination.

6) **Height:** Except for the safety roll-over structures, no part of the car shall be higher than 90 cm from the ground with the car in normal racing trim with the driver aboard seated normally.

Any part of any safety roll-over structure higher than 90 cm from the ground must not be shaped to have a significant aerodynamic influence on the performance of the car.

7) Any specific part of the car influencing its aerodynamic performance:

- must comply with the rules relating to coachwork;
- must be rigidly secured to the entirely sprung part of the car (rigidly secured means not having any degree of freedom);
- must remain immobile in relation to the sprung part of the car.

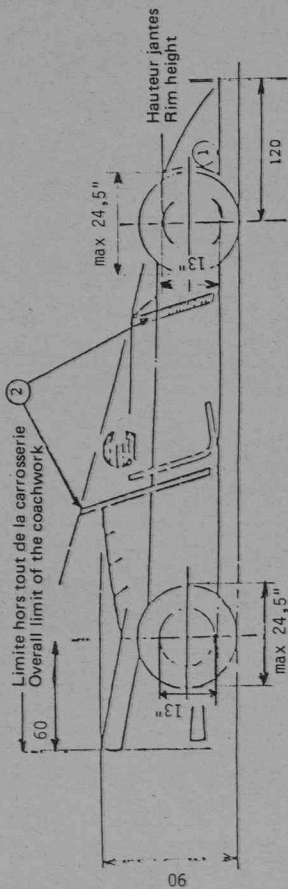
Any device or construction that is designed to bridge the gap between the sprung part of the car and the ground is prohibited under all circumstances.

No part having an aerodynamic influence and no part of the coachwork may under any circumstances be located below the geometrical plane generated by the plane surface provided for by Article 3.3.

ARTICLE 4: WEIGHT

1) The weight of the car must not be less than 540 kg.

2) Ballast can be used provided it is secured in such a way that tools are required for its removal and/or its fixation. The competitor is obliged to declare to the scrutineers the presence of ballast in his car. It must be possible to fix seals if deemed necessary by the scrutineers.



Dessin N° 2 : Formule 3000 - Dimensions maximum et minimum (cf. texte).

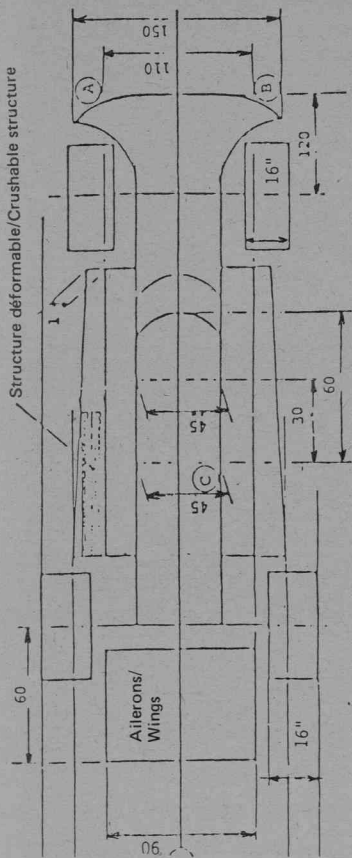
1. Pour toute partie de plus de 110 cm de large.
- 2 Arceau de sécurité.

N.B. : Dimensions en **cm**, sauf le pneu.

Drawing N° 2 : Formula 3000: Maximum and minimum dimensions (see text).

1. For all parts wider than 110 cm.
2. Safety roll bar.

N.B. Dimensions in **cm**, except for tyre.



Dessin N° 3 : Formule 3000 - Dimensions maximum et minimum (cf. texte).

A.B. Parties ne devant pas dépasser la hauteur de la jante AV.

C. Point le plus reculé du siège.

D. Largeur maximale : 130 cm.

E. Largeur maximale hors-tout : 200 cm.

N.B. : Dimensions en **cm**, sauf le pneu.

Drawing N° 3 : Formula 3000: Maximum and minimum dimensions (see text).

A.B. Parts that must not protrude above level of front rims.

C. Most rearward point of seat.

D. Maximum width: 130 cm.

E. Maximum overall width: 200 cm.

N.B. Dimensions in **cm**, except for tyre.

The weight may be checked at any time during an event without the driver on board and with the quantity of liquid remaining in the tanks and after the tanks have been emptied of all fuel.

No solid, liquid, gas or other substance or matter of whatsoever nature may be added to placed on or removed from the car prior to or during the weighing.

No solid, liquid, gas or other substance or matter of whatsoever nature may be added to placed on or removed from the car or the driver or his apparel during the race.

The adding to the car during the race of any liquid or other material whatsoever or the replacement during the race of any part of the car with another materially heavier is forbidden.

ARTICLE 5: ENGINE

1) Types of engine eligible

4-stroke engines with reciprocating pistons :

— engine cubic-capacity without supercharging : lower than or equal to 3 000 cc ;

Number of cylinders: maximum 12.

The Wankel, Diesel, 2-stroke engines and turbines are forbidden.
Supercharging is forbidden.

2) Limitation of the engine rev speed

Maximum crankshaft r.p.m. authorized: 9000.

In order to ensure that all the competitors respect the maximum limit of 9000 revs per minute, an electronic limiter, approved by the FISA, must be fitted to each car and used throughout the entire duration of the race and also during timed practice. The scrutineers may inspect the electronic limiter at any time during the event.

Any element discovered, enabling its functioning to be tampered with, shall be used to cancel all the times obtained in practice or to exclude the car from the classification of the race. These penalties are not exhaustive.

3) Water injection : it is not authorised.

ARTICLE 6: PIPING AND PETROL TANKS, CABLES AND ELECTRICAL EQUIPMENT

1) All fuel tanks must be situated within the main structure of the car. The stocking of petrol at more than 40 cm from the longitudinal axis of the car and in the longitudinal box members, defined by article 13-8-g, is forbidden.

2) All fuel tanks must be rubber bladders conforming to or exceeding the specifications of FTA/Spec/FT3.

3) All rubber bladders must be made by manufacturers recognised by the FIA. (In order to obtain the FIA's agreement, a manufacturer must prove the compliance of his product with the specifications approved by the FIA. These manufacturers must undertake to deliver to their customers exclusively tanks complying with the norms approved).

List of recognised manufacturers:

Federal Republic of Germany

Uniroyal Englebert GmbH, Westerbachstr. 122, 6230 FRANKFURT/MAIN 80.

United States

Don Allen Inc., 401 Agee Road, Grants Has., OREGON 97526;

Aero Tec Labs, Hewson Avenue, WARCICK, NJ 07463;
 Fuel Safe Corporation, 15545 Computer Lane, HUNTINGDON BEACH, California 92649;
 Goodyear Fuel Cell Labs, The Goodyear Tire and Rubber Company, AKRON, OHIO 44316.

France

Kléber-Colombes, Division Tissus Enduits et Applications, 4, rue Lesage-Maille, 76230 CAUDELEC-LES-ELBEUF;
 Ets J. RICHE, BP 14, 14690 PONT-D'OUILLY;
 Société Lyonnaise des Réservoirs Souples, 18, rue Guillaume-Tell, 75017 Paris;
 Superflexit SA, 45, rue des Minimés, 92000 COURBEVOIE;

Great Britain

FTP Industries Ltd, The Airport, PORTSMOUTH, Hants;
 Marston Excelsior Ltd, Wobaston Rd, WOLVERHAMPTON, Staffs;
 Premier Fuel Systems Ltd, Burnaston Old Airfield, BURNASTON Derby.

Italy

Pirelli, Viale Rodi 15, MILANO;
 Gipi, Via Abruzzi 7, 20090 OPERA, MILANO.

Japan

Fujikura Rubber Works Ltd. N° 20, 2-chome, Nishigotanda, Shinagawa-ku, Tokyo.
 Kojima Press Ltd, 3-30 Shimoichibacho Toyota, Aichiken.
 Sakura Rubber Co Ltd, 48-14-1 Chome Sasazuka, Shibuya Ku, Tokyo.
 Sumitomo Electric Industries Ltd, 15-5 Chome Katahama, Migashi-ku, Osaka.

4) All rubber bladders shall have a printed code indicating the name of the manufacturer, the specifications to which the tank has been manufactured and the date of manufacture.

5) No rubber bladders shall be used more than five years after the date of manufacture.

6) The FIA reserves the right to approve any other set of technical specifications after study of the dossier submitted by the manufacturers concerned.

7) All fuel fittings (including air vents, inlets, outlets, tank fillers, inter tank connectors and access openings) must be metal fittings bonded in to the fuel tank.

8) All connections between any fuel tank and the chassis (including tank fillers, air vents, access openings, inlets and outlets) must be frangible. By frangible is meant that should the fuel tank move relative to the chassis during an accident, the connection between the fuel tank and the chassis will fail at a load which is less than 50 per cent of the load required to pull the bonded metal fitting out of the tank.

9) All fuel lines between any fuel tank and the engine must have a self-sealing breakaway valve. This valve must separate at less than 50 per cent of the load required to fail the fuel line fitting out of the fuel tank.

10) **Cables, lines and electrical equipment:** Except if the cables, lines and electrical equipment are in compliance with the requirements of the aircraft industry as regards their location, material and connections, they must be placed or fitted in such a way that any leakage cannot result in:

- accumulation of liquid;
- entry of liquid in the cockpit;
- contact between liquid and any electrical line or equipment.

Should the cables, lines or electrical equipment pass through or be fitted in the cockpit, they must be fully enclosed in a cover of a liquid-tight and fire-resistant material.

11) All fuel lines external to the cockpit, with the exception of lines permanently mounted on the engine, must be capable of withstanding a pressure of 70 kg/cm² (1 000 psi) and a temperature of 260° C (500° F).

12) **Crushable structure:** The entire fuel tank area of the car in direct contact with the open air stream must incorporate a crushable structure which is an integral part of the car conforming to the specifications hereafter.

This area includes the complete external area of the body/monocoque construction irrespective of such added items as water radiators, inlet ducts, windscreens, etc.

a - The crushable structure should be a sandwich construction based on fire-resistant core of a minimum crushing strength of 25 lb/square inch (18 N/cm²). It shall be permitted to pass water pipes through this core, but not fuel, oil or electrical lines.

The sandwich construction must include two sheets of 1.5 mm thickness, one of which shall be aluminium alloy sheet having a tensile strength of 14 tons/square inch (225 N/mm²) and minimum elongation of 5 per cent. Alternatively, the sandwich construction must include two sheets of 1.5 mm thickness having a tensile strength of 14 tons/square inch (225 N/mm²).

b - The minimum thickness of the sandwich construction must be 1 cm.

13) **Tank fillers and caps:** The tank fillers and their caps shall not protrude beyond the coachwork. The filler shall have a sufficient diameter to allow for the air exhausted at the time of quick refuelling (in particular those done under pressure). Any breather pipe connecting the tank with the atmosphere shall be designed to avoid liquid leakage when the car is running and its outlet must not be less than 25 cm to the rear of the cockpit. All filler caps must be designed to ensure an efficient locking action which reduces the risks of an accidental opening following a crash impact or incomplete locking after refuelling.

14) **Refuelling during the race :** Refuelling during the race is forbidden.

ARTICLE 7: OIL

1) All oil storage tanks situated outside the main structure of the car must be surrounded by 1 cm thick crushable structure.

No part of the car containing oil may be situated aft of the gearbox or final drive casing on any rear-wheel-driven car. In case of front-wheel-drive, no part containing oil may be situated behind the complete rear wheels.

2) All oil lines external to the cockpit, with the exception of lines permanently mounted on the engine, must be capable of withstanding a pressure of 70 kg/cm² (1 000 psi) and a temperature of 260° C (500° F).

3) **Oil catch tank:** When a car's lubrication system includes an open type sump breather, this breather must vent into a catch tank of at least 3 litres capacity.

4) No part of the car containing oil may be more than 65 cm from the longitudinal centre-line of the car.

5) No oil replenishment is allowed during a race.

ARTICLE 8: STARTING

1) **Compulsory starter** with electrical or other source of energy carried aboard the car, and able to be controlled by the driver when normally in his seat.

2) A supplementary external source of energy temporarily connected to the car may be used to start the engine both on the starting grid and in the pits.

ARTICLE 9: TRANSMISSION TO THE WHEELS

- 1) Four-wheel drive cars are forbidden.
- 2) Five gearbox ratios, not including the reverse gear, as maximum.
- 3) All automobiles must have a reverse gear which must be in working order when the car starts the event and which can be operated by the driver when seated normally in the car.

ARTICLE 10: BRAKES

- 1) All cars must have a brake system which has at least two separate circuits operated by the same pedal. This system must be designed so that if leakage or failure occurs in one circuit, the pedal shall still operate the brakes on at least two wheels.
- 2) Carbon fibre brakes are forbidden.

ARTICLE 11: WHEELS AND TYRES

1) Complete wheels shall be external to the coachwork with the car viewed in plan with the rear aerodynamic device removed.

2) a - The maximum width of any rim and tyre assembly shall not exceed 16 inches.

Compulsory diameter of the wheels: 13 inches.

Maximum compulsory diameter of the complete wheels: 24,5 inches.

b - The width shall be measured with the tyre at normal running pressure, and the complete wheel mounted on the car resting on the ground, in running order, with the driver aboard.

These measurements will be taken horizontally at axle height.

3) The number of wheels is fixed at four.

ARTICLE 12: COCKPIT

1) The opening giving to the cockpit must have following minimum dimensions:

— length: 60 cm;

— width: 45 cm, maintained over 30 cm from the most rearward point of the seat-back-rest towards the front.

The driver must be able to enter and get out of his seat without it being necessary to open a door or move any part of the car. Sitting at his steering wheel, the driver must be facing forward.

The cockpit must be so conceived that the maximum time necessary for the driver to get out does not exceed 5 seconds with steering wheel in place.

2) All cars must have at least two mirrors mounted so that the driver has visibility to the rear on both sides of the car (minimum reflective surface of each one: 55 cm²).

3) **Safety belts:** The wearing of two shoulder straps, one abdominal strap and two straps between the legs is mandatory. These straps must be securely fixed to the car.

ARTICLE 13: SAFETY

1) **Fire extinguishers.**

a. **Extinguishing product:** BCF (CF₂ ClBr) - BTM (CBrF₃) - TDE (C₂ Br₂ F₄).

b. **Minimum capacity:**

- driver's compartment: 5 kg ;
 - engine compartment: 2.5 kg.
- c. **Location - Mounting method:** The extinguisher bottle must be adequately protected and the bottle for the driver's compartment must be mounted within the main structure of the car. In all cases, the bottle mountings must be able to withstand a 25 g acceleration, no matter how these are applied.

d. **Discharge time:**

- engine compartment: 10 seconds minimum;
- driver's compartment: 30 ± 5 seconds for BCF and TDE. 60 ± 5 seconds for BTM.

Both bottles should be released simultaneously.

E. **Drive system:** Any triggering system having its own source of energy is permitted, provided it is possible to operate all extinguishers in case the main electric circuits of the car fail.

Automatic triggering by heat sensors is recommended. The driver must be able to trigger all extinguishers manually when seated normally in the car with his belts fastened and steering wheel in place. The same applies to any person outside the car. The means of triggering from the exterior must be positioned close to the circuit breaker or combined with it, and must be clearly marked by a red letter "E" in a white circle with a red edge, of at least 10 cm diameter.

f. **Checking of bottles:** The following weights shall be indicated on each bottle: weight of the empty bottle; weight of the extinguishing agent; total charged weight.

g. **Operation:** The two systems must be triggered simultaneously.

Any triggering system is allowed. However, a source of energy not coming from the main source must be provided in the case of a triggering system which is not exclusively mechanical.

Concerning triggering in the interior, and to avoid accidental triggering a warning symbol must be fitted.

The system must work in any position even when the car is upside down.

2) **Life support system:** A life-support system consisting of a medical air bottle and flame resistant pipe for connections to the driver's helmet, shall be fitted to the car and available for connection to the driver's helmet at all times.

3) **Master-switch:** The driver, seated normally with safety belt fastened and the steering wheel in place, must be able to cut off all electrical circuits by means of a spark proof circuit breaker which will be also accessible from outside the car. There must also be a clearly indicated external handle rescue personnel can operate at a distance by a hook. This handle must be located near the base of the main roll-over bar structure, and be marked by a symbol showing a red spark in a white-edged blue triangle with a base of at least 10 cm.

4) All cars must have a red warning light of at least 25 watts in working order at the start of a race which: faces rearward; is clearly visible from the rear; is mounted not more than 10 cm from the car centre-line; has a minimum surface of 20 cm²; a maximum surface of 40 cm²; can be switched on by the driver when seated normally in the car.

5) Chromium plating of steel suspension members of over 45 tons/inch² (725 N/mm²) tensile strength is forbidden.

6) The use of magnesium sheet less than 3 mm thick is forbidden.

7) The use of titanium is forbidden, except for the engine.

8) Safety structures:

a. The basic purpose of safety structures is to protect the driver. This purpose is the primary design consideration.

b. All cars must have at least two roll-over structures:

i) The first roll-over structure must be in front of the steering wheel, not more than 25 cm forward of the steering wheel rim and at least as high as the top of the steering wheel rim.

ii) The second roll-over structure must not be less than 50 cm behind the first and high enough for a line extended from the top of the first structure to the top of the second to pass over the driver's helmet when he is seated normally in the car with his helmet on and seat belts fastened. If the second structure is not located behind the driver, there must be a structure behind him which is high enough so that a line extended from its top to the top of either structure in front of him will pass over the top of his helmet when he is seated normally with his helmet on and seat belts fastened.

c. All safety structures required by paragraph b must, when attached to the car, be capable of withstanding three loads applied simultaneously to the top of the structure which are 1.5 w laterally, 5.5 w longitudinally, and 7.5 w vertically, w being the racing weight of the car.

d. The design concept of the safety structures required by paragraph b shall be free. Forward facing stays which restrict the dimensions of cockpit access required by Article 12, paragraph 1, are permitted provided the driver can exit the cockpit in the time required in that paragraph.

e. General Considerations:

— Whenever bolts and nuts are used, the bolts should be of a sufficient minimum diameter, according to the number used. They should be of the highest possible quality (preferably aircraft). Square head bolts and nuts should not be used.

— All welding should be of the highest quality possible with full penetration (preferably arc welding and in particular heliarc).

— Considerable care should be attached to the necessary strengthening of the basic structure, for instance by adding reinforcement bars or plates so as to properly distribute the loads.

— Consideration should be given to using a roll-bar hoop of 360 degrees completely around the inside of the car, and attached with suitable mounting plates. This type of roll-bar then becomes a substitute for the frame.

f. All cars must have a structure immediately behind the driver's seat which is wider than and extends above his shoulders when he is seated normally in the car with his seat belts fastened. This structure must be capable of withstanding a sustained lateral load of 1.5 w applied to its top, w being the racing weight of the car.

g. Survival cell :

1. The chassis structure shall include two continuous box members, one on each side of the driver.

The chassis must incorporate at least one transversal hoop at the main rollbar level, one in front of the pedal box and a further hoop between these two.

2. Each box member shall extend from behind the driver to a point at least 50 cm in front of the soles of his feet with the driver seated normally and with his feet on the pedals and the pedals in the inoperative position. The foremost 40 cm of each box member need not be an integral part of the chassis, but must be solidly fixed to it.

3. Throughout its length, the structural material in the cross section of

each box member shall have a minimum area of 10 cm², a minimum tensile strength of 31 kg/mm² and a minimum panel thickness of 1 mm on unstabilised skins or 5 cm² area and 0.5 mm thickness on stabilised skins.

4. Throughout its length from behind the driver to the soles of his feet, each box must have a minimum cross sectional area of 150 cm². Forward of this, the boxes may taper to a minimum cross section of 100 cm² and a minimal structural material cross section of 5 cm² for unstabilised skins or 2.5 cm² with stabilised skins.

5. All holes and cutouts in the boxes shall be strongly reinforced and all material sections through these holes shall comply with minimum area requirement of 10 cm² for unstabilised and 5 cm² for stabilised skins.

6. The internal cross sectional area of the cockpit from the soles of the driver's feet to behind his seat shall nowhere be less than 700 cm² and the minimum width must be 25 cm over the whole length of the cockpit.

7. The minimum height of the box between the front and rear roll-over bar structures shall be no less than 30 cm.

h. All cars must have a headrest which does not deflect more than 5 cm rearwards when a rearward force of 85 kg is applied. It must be designed so that the driver's head cannot be trapped between the roll-over structure and the headrest.

i. Panels which, projected on a vertical plane parallel to the longitudinal axis of the car, are at least 20 cm high and of a total length of at least 50 % of the wheel-base, shall be situated between the front and rear complete wheels on either side and at least 55 cm from the car's longitudinal centre line and shall be the outermost extremities of the coachwork. These panels shall be made from a composite material at least 10 mm thick with a honeycomb core in metal or nomex with expanding foam giving adequate resistance to compression. The external covering shall be in aluminium alloy, plastic, or carbon fibre of minimum thickness of 0.5 mm or in another assembly of materials of equivalent efficiency. The panels must be fixed in such a manner as not to move relative to the main structure of the car and to ensure absorption of a lateral impact. The radiators may play the role of the protective panels or of the transversal struts.

ARTICLE 14: FUEL

- 1) The only fuel permitted is petrol having the following characteristics:
 - a maximum of 102 RON, the measurement being made according to the standard ASTM D 2699, the fuel being accepted or rejected according to ASTM D 3244 with a confidence limit of 95 % and
 - a maximum of 2 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any alcohols, nitrocompounds or other power-boosting additives.

In countries where no fuel suitable for use in current F 3000 engines is commercially available, and where the laws of the country prohibit importation of such fuel, the ASN must obtain a dispensation from the FISA for the use of aviation fuel which will then be supplied by the organiser and must be used by all competitors.

- 2) Only air may be mixed with the fuel as an oxidant.

ARTICLE 15: FINAL TEXT

The final text for these regulations shall be the French version which will be used should any dispute arise over their interpretation.

Article 275 - International formula n° 2/n° 3

SUMMARY

Art. 1: Definitions

- 1) Formula 2 and 3
- 2) Automobile
- 3) Land vehicle
- 4) Coachwork
- 5) Aerodynamic device
- 6) Wheel
- 7) "Automobile make"
- 8) Event
- 9) Weight
- 10) Racing weight
- 11) Cylinder capacity
- 12) Supercharging
- 13) Induction system
- 14) Main structure

Art. 2: Regulations

- 1) Role of the FIA
- 2) Publication date for modifications
- 3) Previous notice for change in the throttling flange (F3)
- 4) Dangerous construction
- 5) Permanent compliance with regulations
- 6) Measurements

Art. 3: Coachwork and regulations

- 1) Overall width
- 2) Width ahead of front wheels
- 3) Width and shape between the front wheels and the rear wheels
- 4) Width of the rear wing
- 5) Overhang
- 6) Height
- 7) Wheel base and track (F3)
- 8) Aerodynamic devices

Art. 4: Weight

- 1) Minimum weight
- 2) Ballast

Art. 5: Engine

- 1) Engine with reciprocating pistons
- 2) Wankel engines (F3)

- 3) Engine modifications
- 4) Induction system control (F3)
- 5) Exhaust pipes

Art. 6: Transmission

- 1) Number of gearbox ratios
- 2) Number of driving wheels

Article 7: Fuel lines and tanks, cables and electrical equipment

- 1) Cables, fuel lines and electrical equipment
- 2) Reinforced piping
- 3) FTA/FT3 rubber bladders
- 4) Crushable structures
- 5) Tank fillers and caps
- 6) Refuelling during the race

Art. 8: Oil

- 1) Location - crushable structure
- 2) Oil lines
- 3) Catch tank
- 4) Oil replenishment

Art. 9: Starting

- 1) Starter
- 2) External energy source

Art. 10: Reverse gear

Art. 11: Brakes

Art. 12: Wheels and tyres

- 1) Number of wheels
- 2) Location
- 3) Dimensions

Art. 13: Cockpit

- 1) Architectural access, dimensions
- 2) Rear view mirrors
- 3) Safety belts

Art. 14: Safety

- 1) Fire extinguishers
- 2) Life support system (F2)
- 3) Master switch
- 4) Red light
- 5) Safety structures

- 6) Headrest
- 7) Chromium plating of suspension
- 8) Magnesium sheet
- 9) Titanium use

Art. 15: Fuel

- 1) Commercial fuel
- 2) Air

Art. 16: Final text**ARTICLE 1: DEFINITIONS**

- 1) **Formula 2 and 3 cars:** A four-wheel automobile designed solely for speed races on circuits or closed courses.
- 2) **Automobile:** A land vehicle running on at least four non-aligned wheels, of which at least two are used for steering, and at least two for propulsion.
- 3) **Land vehicle:** A locomotive device, propelled by its own means, moving by constantly taking real support on the earth's surface, of which the propulsion and steering are under the control of a driver aboard the vehicle.
- 4) **Coachwork:** All entirely sprung parts of the car licked by the external air stream, except the safety roll-over structures and the parts definitely associated with the mechanical functioning of the engine, transmission and running gear. The radiators shall be considered to be part of the coachwork.
- 5) **Aerodynamic device:** Any part of the car whose primary function is to influence aerodynamic performance.
- 6) **Wheel:** Flange and rim. **Complete wheel:** Flange, rim and tyre.
- 7) **"Automobile make":** In the case of Formula racing cars, an "automobile make" is a complete car. When the car manufacturer fits an engine which it does not manufacture, the car shall be considered a hybrid and the name of the engine manufacturer shall be associated with that of the car manufacturer. The name of the car manufacturer must always precede that of the engine manufacturer. Should a hybrid car win a Championship Title, Cup or Trophy, this will be granted to the manufacturer of the car.
- 8) **Event:** An event shall consist of official practice, timed and untimed, and the race.
- 9) **Weight:** is the weight of the car at any time during the event, with neither fuel nor driver on board.
- 10) **Racing weight:** is the weight of the car in running order with the driver aboard and all fuel tanks full.
- 11) **Cylinder capacity:** Means the volume swept in the cylinder(s) of the engine by the movement of the piston(s). In calculating engine cylinder capacity, the number π shall be 3.1416.
- 12) **Supercharging:** Increasing the weight of the charge of the fuel-air mixture in the combustion chamber (over the weight induced by normal atmospheric pressure, ram effect and dynamic effects in the intake and/or exhaust systems) by any means whatsoever. The injection of fuel under pressure is not considered to be supercharging.
- 13) **Inlet system:** All the elements of the inlet system included between the head and external side of the throttling flange.
- 14) **Main structure:** The fully sprung structure of the vehicle to which the suspension and/or spring loads are transmitted, extending longitudinally from the foremost front suspension on the chassis to the rearmost one at the rear.

ARTICLE 2: REGULATIONS

- 1) The following regulations governing the construction of F2 and F3 cars listed below are issued by the FIA.

2) Each year, the FIA will publish all changes made to these regulations. All such changes will take effect on the third 1st January following their publication.

Changes made in consideration of safety matters may come under validity immediately.

3) The FISA reserves its right in F3 to modify the dimensions of the throttling flange with a one year notice.

4) If an automobile is deemed to be dangerous, it may be excluded by the Stewards of the Meeting.

5) Automobiles must comply with these regulations in their entirety at all times during an event.

6) All measurements must be made while the car is stationary on a flat horizontal metallised surface.

ARTICLE 3: COACHWORK AND DIMENSIONS

1) Overall width of the car, including complete wheels with the steered wheels in the straight ahead position, shall not exceed: F2-200 cm; F3-185 cm.

2) The coachwork ahead of the front wheels may be extended to an overall maximum width of: F2-150 cm; F3-135 cm.

Nevertheless, any part of the coachwork ahead of the front wheels exceeding an overall width of: F2-110 cm; F3-95 cm, shall not extend above the height of the front wheels rims, with the driver aboard seated normally, and irrespective of the fuel load.

3) The overall maximum width of the coachwork behind the forward edge of the front wheels and in front of the centre-line of the rear wheels shall not exceed 130 cm.

The crushable structure is included in this width.

4) Coachwork behind the centre-line of the rear wheels shall not exceed in width: F2-110 cm; F3-95 cm.

5) Except in the case of front-wheel drive when the measurement will be taken from the centre-line of the rearmost substantial load carrying wheels, no part of the car shall be more than 80 cm behind the centre-line of the foremost front wheels.

The centre-line of any wheel shall be deemed to be half way between two straight edges, perpendicular to the surface on which the car is standing, placed against opposite sides of the complete wheel at the centre of the tyre tread.

6) **Height** : Except for the safety roll-over bars, no part of the car shall be higher than 90 cm from the ground with the car in normal racing trim with the driver aboard seated normally.

Any part of any safety roll-over bar higher than 90 cm from the ground must not be shaped to have a significant aerodynamic influence on the performance of the car.

7) For F3:

Minimum wheelbase: 200 cm

Minimum track: 120 cm.

8) Between the rear edge of the complete front wheels and the front edge

of the complete rear wheels, all sprung parts of the car visible from directly beneath the car must lie on one plane within a tolerance of ± 5 mm. All these parts must produce an uniform, solid, hard, rigid (no degree of freedom in relation to the body/chassis unit), impervious surface, under all circumstances. The periphery of the surface formed by these parts may be curved upwards with a maximum radius of 5 cm.

Any specific part of the car influencing its aerodynamic performance:

- must comply with the rules relating to coachwork;
- must be rigidly secured to the entirely sprung part of the car (rigidly secured means not having any degree of freedom);
- must remain immobile in relation to the sprung part of the car.

Any device or construction that is designed to bridge the gap between the sprung part of the car and the ground is prohibited under all circumstances.

No part having an aerodynamic influence and no part of the coachwork may under any circumstances be located below the geometrical plane generated by the plane surface provided for by this article.

ARTICLE 4: WEIGHT

- 1) The weight of the car must not be less than: F2-515 kg; F3-455 kg.
- 2) Ballast can be used provided it is secured in such way that tools are required for its removal. It must be possible to fix seals if deemed necessary by the scrutineers.

The weight may be checked at any time during an event without the driver on board and with the quantity of liquid remaining in the tanks (on the understanding that it is forbidden to add oil, any other liquid or extinguishants before the weighing) and after the tanks have been emptied of all fuel.

N.B.: Formula 2 cars taking part in the European F3000 Championship must have a minimum weight of 540 kg.

ARTICLE 5: ENGINE

1) Engines with reciprocating pistons

- a) Engine cylinder capacity: less than or equal to 2,000 cm³.
- b) Maximum number of cylinders: F2-6; F3-4.
- c) Supercharging forbidden.

2) For F3 only:

Rotary piston engines: Cars with rotary piston engines covered by NSU-Wankel patents will be admitted on the basis of a piston displacement equivalence. This equivalence is twice the volume determined by the difference between the maximum and minimum capacity of the working chamber.

3) For F3 only:

The engine block and engine head castings, machining completed, must be those of an engine equipping a car model of which the FIA has ascertained the series-production of a least 5,000 units in 12 consecutive months. The original engine block and cylinder head may be modified freely by removal of material to the exclusion of any addition of material. However, it is permitted to sleeve an engine block that originally is not fitted with sleeves.

The type of crankshaft bearings may not be modified (the replacement of a plain bearing by a roller bearing is therefore forbidden).

It is pointed out that whatever the type of the engine used, it is not compulsory that the different mechanical components of the engine should proceed from the original engine.

The induction system is free but it must be fitted with a throttling flange of 3 mm in length having a circular section, and with a parallel hole of 24 mm diameter maximum. All the air feeding the engine must pass through this throttling flange, which must be made of metal or metal alloy.

The material of the air box is free, provided that it is not porous. It is prescribed that the entire inlet system including manifolds, injectors, air-box and restrictor must fit into a box of 1 m long, 50 cm wide and 50 cm high. It will also be prescribed that the inlet system may be removed from the engine as one unit with the cylinder head(s).

The maximum cylinder-capacity may be obtained by increasing or reducing either the bore or stroke or both dimensions.

The other original parts of the engine may be replaced or modified without restriction. It is permitted to weld the sleeves to the block for the conventional engine.

Water injection: it shall only be authorised if it is effected upstream of the air restrictor.

For F2: Free.

4) For F3 only:

Vacuum tightness control apparatus of the induction system for F3 engines:

The control apparatus described hereafter represents the ultimate method of verification of the vacuum tightness of F3 induction systems, without the possibility of appeal. All F3 event organisers will have to put such an apparatus at the disposal of the scrutineers for verification purposes, both before and after the race.

The apparatus aims to create artificially a vacuum in the induction system and includes:

— A membrane suction-pump, with the nominal output of 25 to 28 litres/minute, and capable of obtaining a vacuum of 55 to 65 cm Hg for zero air flow.

— A rubber tubular stop perfectly adjusted to the flange.

— A vacuum-gauge connected to the piping between the rubber stop and the suction-pump.

The procedure to be respected for the checking is the following:

a) Rotate the engine into such a position that, in each cylinder, at least one of the valves is closed.

b) Open the injection slide or the carburettor butterflies.

c) Check on the vacuum-gauge that the suction-pump creates in the induction system a depression more than or equal to 15 cm Hg.

d) If condition a) cannot be met, disconnect the rocker-arms or remove the camshaft, in order to shut all inlet valves. If one or several valves have been damaged during the event, the entrant may repair them under the steward's control before undergoing the testing procedure. In these last cases, the minimum vacuum to be obtained shall be 20 cm Hg instead of 15.

5) Exhaust pipes: The outlet orifices of the exhaust pipes, when directed to the rear, must be placed at a height of less than 60 cm above the ground.

ARTICLE 6: TRANSMISSION

1) F2 only: Five gearbox ratios, not including the reverse gear, as maximum.

2) The car must be driven by two wheels only.

ARTICLE 7: FUEL LINES AND TANKS, CABLES AND ELECTRICAL EQUIPMENT

1) Except if the cables, lines and electrical equipment are in compliance with the requirements of the aircraft industry as regards their location, material and connections, they must be placed or fitted in such a way that any leakage cannot result in:

- Accumulation of liquid in the cockpit.
- Entry of liquids into the cockpit.
- Contact between liquid and any electrical line or equipment.

Should the cables, lines or electrical equipment pass through or be fitted in the cockpit, they must be fully enclosed in a cover of a liquid-tight and fire-resistant material.

2) All fuel lines external to the cockpit, with the exception of lines permanently mounted on the engine, must be capable of withstanding a temperature of 230° C and a pressure of:

- 70 kg/cm² for those lines working under pressure.
- 7 kg/cm² for others.

3) All fuel tanks, except for a collector tank not exceeding 5 litres capacity, must be rubber bladders conforming to or exceeding the specifications of FIA/Spec/FT3.

a) Safety fuel tanks approved by the FIA:

The FIA reserves its right to approve any other set of technical specifications after study of the dossier submitted by the manufacturers concerned.

b) Safety tank manufacturers recognised by the FIA:

Entrants must use safety fuel tanks made by a manufacturer recognised by the FIA. In order to obtain the FIA's agreement, a manufacturer must prove the compliance of its product with the specifications approved by the FIA.

These manufacturers must undertake to deliver to their customers exclusively tanks complying with the norms approved. To this end, on each tank delivered there shall be printed a code indicating the name of the manufacturer, the exact specification according to which the tank has been manufactured and the date of the manufacturing.

c) Ageing of safety fuel tanks:

The ageing of safety fuel tanks entails a considerable reduction in the strength characteristics after approximately five years. Therefore, all fuel cells must be replaced at the latest five years after the date of manufacture indicated on the cell.

d) List of recognised manufacturers

Federal Republic of Germany:

Uniroyal Englebert GmbH, Westerbachstr. 122, 6230 Frankfurt/Main 80.

United States:

Don Allen Inc, 401 Agee Road, Grants Has, Oregon 97526.

Aero Tec Labs, Hewson Avenue, Warcick, NJ 07463.

Goodyear Fuel Cell Labs, The Goodyear Tire & Rubber Co. Akron, Ohio 44316.

Fuel Safe Corporation, 15545 Computer Lane, Huntington Beach, California 92649.

France:

Kléber Colombes, Division Tissus Enduits et Applications, 4, rue Lesage-Maille, 76230 Caudebec-les-Elbœuf.

Ets J. RICHE, BP 14, 14690 Pont-d'Ouilley.

Société Lyonnaise des Réservoirs Souples, 18, rue Guillaume-Tell, 75017 Paris.

Superflexit SA, 45, rue des Minimes, 92000 Courbevoie.

Great Britain:

FTP Industries Ltd, The Airport, Portsmouth, Hants.

Marston Excelsior Ltd, Wobaston Road, Wolverhampton, Staffs.

Premier Fuel Systems Ltd, Burnaston Old Airfield, Burnaston Derby.

Italy:

Gipi, Via Abruzzi 7, Opera, Milano.

Pirelli, Viale Rodi 15, Milano.

Japan

Fujikura Rubber Works Ltd. N° 20, 2-chome, Nishigotanda, Shinagawa-ku, Tokyo.

Kojima Press Ltd, 3-30 Shimoichibacho Toyota, Aichiken.

Sakura Rubber Co Ltd, 48-14-1 Chome Sasazuka, Shibuya Ku, Tokyo.

Sumitomo Electric Industries Ltd, 15-5 Chome Katahama, Migashi-ku, Osaka.

4) Crushable structures (Compulsory for F2, optional for F3): The entire fuel tank area of the car in direct contact with the open air stream must incorporate a crushable structure which is an integral part of the car conforming to the specification hereafter.

This area includes the complete external area of the body/monocoque construction irrespective of such added items as water radiators, inlet ducts, windscreens, etc.

a) The crushable structure should be a sandwich construction based on fire resistant core of a minimum crushing strength of 25 lb/square inch (18 N/cm²). It shall be permitted to pass water pipes through this core, but not fuel, oil or electrical lines.

The sandwich construction must include two sheets of 1.5 mm thickness, one of which shall be aluminium, alloy sheet having a minimum tensile strength of 14 tons/square inch (225 N/mm²) and minimum elongation of 5 per cent.

Alternatively the sandwich construction may include two sheets of 1.5 mm thickness having a tensile strength of 14 tons/square inch (225 N/mm²).

b) The minimum thickness of the sandwich construction must be 1 cm. The side of the fore and aft fuel tank area, however, must contain a crushable structure of at least 10 cm thickness at such crushable structure's thickest point, the position of this widest point to be at the constructor's discretion, over a length of at least 35 cm after which it may be gradually reduced to 1 cm.

5) Tank fillers and caps: The tank fillers and their caps shall not protrude beyond the coachwork.

The filler shall have a sufficient diameter to allow for the air exhausted at the time of quick refuelling (in particular those done under pressure). Any breather pipe connecting the tank with the atmosphere shall be designed to avoid liquid leakage when the car is running, and its outlet must not be less than 25 cm to the rear of the cockpit.

All filler caps must be designed to ensure an efficient locking action which reduces the risk of an accidental opening following a crash impact or incomplete locking and refuelling.

6) Refuelling during the race: In the event that any fuel is added after the race starts, the container from which fuel is being added must have a leak-

proof coupling which connects it to the tank filler on the car. The air vent of the container must be fitted with a non-return valve.

ARTICLE 8: OIL

1) An oil storage tank situated outside the main structure of the car must be surrounded by 1 cm thick crushable structure.

No part of the car containing oil may be situated aft of the gearbox, or final drive casing on any rear wheel driven car. In case of front wheel drive, no part containing oil may be situated behind the complete rear wheels.

2) Oil lines external to the cockpit with the exception of lines permanently mounted on the engine, must be a reinforced construction. They must withstand a pressure of:

- 70 kg/cm² for those lines working under pressure;
- 7 kg/cm² for others.

3) **Oil catch tank:** When a car lubrication system includes an open type sump breather, this breather must vent into a catch tank of at least 2 litre capacity.

The container shall either be made out of translucent plastic, or include a transparent panel.

4) No oil replenishment is allowed during a race.

ARTICLE 9: STARTING

1) Compulsory starter with electrical or other source of energy carried aboard the car, and able to be controlled by the driver when normally in his seat.

2) A supplementary external source of energy temporarily connected to the car may be used to start the engine both on the starting grid and in the pits.

ARTICLE 10: REVERSE GEAR

All vehicles must have a reverse gear which must be in working order when the car starts the event, and which can be operated by the driver when seated normally in the car.

ARTICLE 11: BRAKES

All cars must have a brake system which has at least two separate circuits operated by the same pedal. This system must be designed so that if leakage or failure occurs in one circuit, the pedal shall still operate the brakes on a least two wheels.

ARTICLE 12: WHEELS AND TYRES

1) Number of wheels: 4.

2) Complete wheels shall be external to the coachwork with the car viewed in plan, with the rear aerodynamic device removed.

3) a) **For F2**, the maximum width of any rim and tyre assembly shall not exceed 16 inches.

Compulsory diameter of the rear wheels: 13 inches.

For F3: The width of the complete wheels is limited to 11.5 inches.

Compulsory diameter of the rear wheels: 13 inches.

b) The width shall be measured with the tyre at normal running pressure, and the complete wheel mounted on the car resting on the ground, in running order, with the driver aboard.

This measurement of the width will only be taken at the widest point of the tyre, above the hub-level. In no case can the interior width measured where the beads join the rim exceed the width of the tyre.

- 4) The fitting of multiple tyres on one and the same rim is authorised.

ARTICLE 13: COCKPIT*

1) The opening giving access to the cockpit must have the following minimum dimensions:

- Length: 60 cm ;
- Width: 45 cm, maintained over 30 cm from the most rearward point of the seat backrest towards the front.

The driver must be able to enter and get out of his seat without it being necessary to open a door or move any part of the car. Sitting at his steering wheel, the driver must be facing forward.

The cockpit must be so conceived that the maximum time necessary for the driver to get out does not exceed five seconds with steering wheel in place.

2) All cars must have at least two mirrors mounted so that the driver has visibility to the rear on both sides of the car (minimum surface of each one : 55 cm²).

3) **Safety belts:** The wearing of two straps, one abdominal strap and two straps between the legs is mandatory. These straps must be securely fixed to the car.

ARTICLE 14 : SAFETY

1) **Fire Extinguishers - Extinguisher systems**

a) **Extinguishant:** Halon 1211 ou 1301 (BCF-BTM).

b) **Minimum capacity:**

Cockpit 5 kg ;

Engine compartment: 2.5 kg.

c) **Location: Mounting method:** The extinguisher bottle must be adequately protected, and the bottle for the driver's compartment must be mounted within the main structure of the car. In all cases, the bottle mountings must be able to withstand 25 g accelerations, no matter how these are applied.

d) **Discharge Time:**

Engine compartment: 10 seconds ;

Driver's compartment : 30 ± /5 seconds for Halon 1211 ;

60 ± /5 seconds for Halon 1301.

e) **Drive System:**

Any triggering system having its own source of energy is permitted, provided it is possible to operate all extinguishers in case the main electric circuits of the car fail.

Automatic triggering by heat sensors is recommended. The driver must be able to trigger all extinguishers manually when seated normally in the car with his belts fastened and steering wheel in place. The same applies to any person outside the car. The means of triggering from the exterior must be positioned close to the circuit breaker or combined with it, and must be clearly marked by a red letter "E" in a white circle with a red edge.

f) **Checking of bottles:**

The type of extinguishant, the total weight of the bottle and the quantity of extinguishant must be specified on each bottle.

g) **Working:****The two systems must be triggered simultaneously.**

Any triggering system is allowed. However, a source of energy not coming from the main source must be provided in the case of a triggering system which is not exclusively mechanical.

Concerning triggering in the interior, and to avoid accidental triggering a warning symbol must be fitted.

The system must work in any position even when the car is upside down.

2) **For F2 only:**

Life support system: A life-support consisting of a medical air bottle and flame resistant pipe for connection to the driver's helmet, shall be fitted to the car and available for connection to the driver's helmet at all times

3) **Master-switch:** The driver seated normally with his safety belt fastened and the steering wheel in place must be able to cut off all electrical circuits by means of a spark proof circuit breaker, which will be also accessible from outside the car. There must also be a clearly indicated external control switch which may be operated at a distance by the safety personnel, by means of a hook. This switch must be situated near the base of the main safety structure (Art. 13.5.C). It will be marked by a red spark in a white-edged blue triangle with a base of a least 10 cm.

4) All cars must have a red warning light of a least 15 watts in working order at the start of a race which faces rearward, is clearly visible from the rear, is mounted not more than 10 cm from the car centre-line, has a minimum surface of 20 cm², a maximum surface of 40 cm², and can be switched on by the driver.

5) **Safety Structures:**a) **Survival cell**

1) The chassis structure shall include two continuous box members, one each side of the driver.

2) Each box member shall extend from behind the driver to a point in front of the fully depressed pedal position and terminate in transverse bulkheads.

3) Throughout its length the structural material in the cross section of each box member shall have a minimum area of 10 cm², a minimum tensile strength of 30 kg/mm² and a minimum panel thickness of 1 mm on unstabilised skins or 5 cm² area and 0.5 mm thickness on stabilised skins.

4) Throughout its length each box must have a minimum cross sectional area of 150 cm².

5) All holes and cutouts in the boxes shall be strongly reinforced and all material sections through these holes shall still comply with minimum area requirement of 10 cm² for unstabilised and 5 cm² for stabilised skins.

6) The internal cross sectional area of the cockpit from the soles of the driver's feet to behind his seat shall nowhere be less than 700 cm² and the minimum width must be 25 cm over the whole length of the cockpit.

7) The minimum height of the box between the front and rear roll-over bar structures shall be no less than 30 cm.

8.1) The chassis shall include an impact absorbing structure (which may be detachable) ahead of the front transverse bulkhead.

Radiators may be incorporated in this structure. If detachable this structure must be securely fixed.

8.2) At a point 30 cm ahead of the front transverse bulkhead it shall have a cross section of at least 200 cm².

8.3) Material will be the same as the skins of the main chassis structure. The cross section of the material will be at least 3 cm² with minimum thickness of 1 mm in non-stabilised material and 1.5 cm² in stabilised material of minimum thickness 0.5 mm. A securely mounted radiator will be considered to meet these requirements.

Holes or cutouts must be strongly reinforced to maintain the original strength.

b) Lateral protection structures

They will be 10 cm high minimum.

These shall be of minimum length 60 % of the wheel base on either side and at least 55 cm from the car's longitudinal centre line. Each to consist of a structure with minimum cross sectional area of 20 cm² and a minimum tensile strength of 30 kg/mm².

The structures shall be linked transversally to the tub to ensure the absorption of lateral impact. Radiators may be incorporated into these structures.

c) Roll-over bars

1) The basic purpose of safety structures is to protect the driver. This purpose is the primary design consideration.

2) All cars must have at least two roll-over structures, but the use of titanium is forbidden.

The first roll-over structure must be in front of the steering wheel, not more than 25 cm forward of the steering wheel rim and at least as high as the top of the steering wheel rim.

The second roll-over structure must be not less than 50 cm behind the first. It must be high enough for a line extending from the top of the first structure to the top of the second, to pass over the driver's helmet when he is seated normally in the car with his helmet on and seat belts fastened.

This second structure behind the seat must be symmetrical about the lengthwise centre-line of the car and comply with the following figures:

— The minimum height must be at least 90 cm measured vertically from the base of the monocoque.

— The top of the roll-bar must also be at least 5 cm above the driver's helmet when the driver is sitting in a normal driving position.

Furthermore, the top of this second structure must have a passage enabling the use of a hook for lifting the car.

Strength:

The roll-bar, of entirely free conception, must be capable of withstanding the stress minima indicated as follows, applied simultaneously to the top of the structure, which are 1.5 w laterally, 5.5 w longitudinally in both directions and 7.5 w vertically, w being the racing weight of the car, the induced loads being carried over into the primary structure of the chassis.

A certificate signed by a qualified technician must be submitted to the scrutineers of an event. It must be accompanied by a drawing or a photograph of said roll-bar, and state that this roll-bar can withstand the above mentioned loads.

GENERAL CONSIDERATIONS

1) Whenever bolts and nuts are used, the bolts should be of a sufficient minimum diameter, according to the number used. They must be of the highest possible quality (preferably aircraft). Square head bolts and nuts should not be used.

2) One continuous length of tubing should be used for the main structure with smooth continuous bends and no evidence of crimping or wall failure.

3) All welding should be of the highest quality possible with full penetration (preferably arc welding and in particular heliarc).

4) For space-frame constructions, it is important that roll-over structures are attached to cars in such a way as to spread the loads over a wide area. It is not sufficient to simply attach the roll-bar to a single tube or junction of tubes. The roll-bar should be designed in such a way as to be an extension of the frame itself, not simply an attachment to the frame.

Considerable care should be attached to the necessary strengthening of the basic structure, for instance by adding reinforcement bars or plates so as to properly distribute the loads.

5) For monocoque constructions, consideration should be given to using a roll-bar hoop of 360 degrees completely around the inside of the car, and attached with suitable mounting plates. This type of roll-bar then becomes a substitute for the frame.

6) All cars must have a headrest which does not deflect more than 5 cm rearwards, when a rearward force of 85 kg is applied. It must be designed so that the driver's head cannot be trapped between the roll-over structure and the headrest.

7) **Chromium plating** of steel suspension members of over 45 tons/square inch (725 N/mm²) tensile strength is forbidden.

8) **The use of magnesium sheet** less than 3 mm thick is forbidden.

9) **The use of titanium** in suspension and steering parts, or in the roll-over structures is forbidden.

ARTICLE 15: FUEL

1) In piston engines, the only fuel permitted is petrol having the following characteristics:

a) A maximum of 102 RON, the measurement being made according to the standard ASTM D 2699, the fuel being accepted or rejected according to ASTM D 3244 with a confidence limit of 95 %, and

b) A maximum of 2 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any alcohols, nitro-compounds or other power boosting additives.

In countries where no fuel suitable for use in current F2/F3 engines is commercially available, and where the laws of the country prohibit importation of such fuel, the ASN must obtain a dispensation from the FISA for the use of aviation fuel which will then be supplied by the organisers and must be used by all competitors.

2) Only air may be mixed with the fuel as an oxydant.

ARTICLE 16: FINAL TEXT

The final text for these regulations shall be the French version which will be used should any dispute arise over their interpretation.

Article 277 - International formulae racing cars (Group E)

It is permitted to organise sporting competitions open to other racing cars than those defined in one of the previous Groups of Appendix J.

All specifications concerning the vehicles and particularly the limitations of the cylinder-capacity are in this case at the discretion of promoters and it rests with them to list these specifications as clearly as possible in the Supplementary Regulations of the event, which anyway have to be approved by the National Sporting Authority answerable to the FIA.

However, racing cars, which do not comply with any of the International Racing Formulae, must for security reasons be in conformity with the General Prescriptions listed under Art. 257.4.1, 257.4.2, 257.4.3, 253.15, 253.14, 253.4, 253.10, 253.5, 257.4.9, 275.13.4 et de l'Art. 274.3.5 (1st paragraph, see 1981 Appendix J - F1 Regulations):

The dimensions of the roll-bars must be as follows: the minimum height must be at least 36 inches (92 cm) measured along the line following the driver's spine, from the seat's metal shell to the top of the roll-bar. The top of the roll-bar must also be at least at 5 cm above the driver's helmet when the driver is sitting in normal driving position. The width must be at least 38 cm measured inside the roll-bar between the two vertical pillars of the sides. It must be measured at 60 cm above the seat's metal shell on the perpendicular to the line following the driver's spine.

Strength: In order to obtain a sufficient strength for the roll-bar, two possibilities are left to the manufacturers:

a) The roll-bar, of entirely free structural conception, must be capable of withstanding the stress minima indicated in Art. 257.4.5.

b) The tubes and brace(s) must have a diameter of at least 1 3/8 inch (3.5 cm) and at least 0.090 inch (2 mm) wall thickness. The material should be molybdenum chromium SAE 4130 or 4125 (or equivalent in DIN, NF, etc.).

There must be at least one brace from the top of the bar rearwards at an angle not exceeding 60° with the horizontal. The diameter and material of the brace must be the same as those of the roll-bar itself.

In the case of two braces, the diameter of each of them may be reduced to 20/26 mm. Removable connections between the main hoop and the brace must comply with drawings listed in Art. 253.9.2.2.7.

Forward fitted stays are allowed.

2) The extinguisher system is left up to the ASNs. However the directives laid down in Art. 257.4.4. are strongly recommended.

Title 5) National Formulae

Registration of National Racing Formulae

The FISA will accept to study the registration of "national" formulae, in order to have their technical prescriptions known at an international level and to ensure a certain stability and a standardisation of the regulations which rule them.

1) In pursuance of Art. 251, any ASN has the right to define regulations applying to given types of "Formula libre" racing cars denominated hereafter: "National Formulae".

2) Are eligible for registration only the applications presented by at least 2 National Sporting Authorities and concerning a National Formula used in at least 2 countries.

3) The FIA will accept, in compliance with the preceding Art. 2 to register on an voluntary basis any set of prescriptions defining such National Formulae.

The regulations thus registered by the FIA will be applicable in countries, the ASNs of which have declared to abide by them. The declaration made by

the National Sporting Authority to adopt the regulations of a determined National Formula is exclusively valid for the regulations such as they were originally deposited at the FIA, and this National Sporting Authority is entitled to withdraw this declaration if the regulations are altered afterwards.

The withdrawal of a declaration for another reason than the one hereabove mentioned, must compulsorily be communicated to the FIA before December 31 st in order to be valid as from the following year.

4) From the time when such a National Formula is registered, its appellation can be used in those countries where the ASNs have adopted the registered regulations, only for cars entirely complying with the regulations deposited at the FIA.

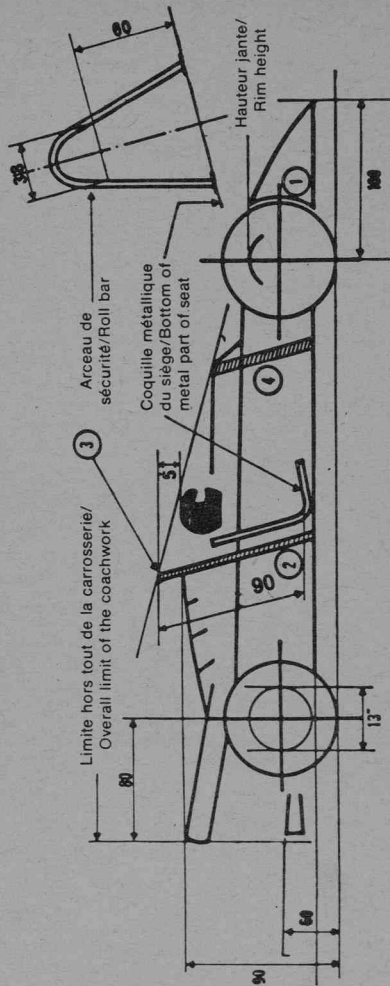
5) Any application for the registration of regulations for a National Formula should be addressed to the FIA at the latest on October 1st, to be valid as from January 1st of the following year. The National Formulae can (but it is not compulsory) form the subject of restrictions as regards the engine or other manufacturing elements, in order to allow exclusively the use of castings of a given make. Such a one-make Formula may have a distinct commercial name related to the imposed design restrictions.

6) The National Sporting Authorities which have adopted a determined National Formula may file an application at the FIA in view of the organisation of an award including several countries.

Any application of that kind will be submitted to the appreciation of the FISA whose decision will depend on the number of countries interested by the organisation of an event included in that award and on the advisability or the necessity, for the general interest of Automobile Sport, to introduce such a form of competition.

7) The organisation of any other type of international award without the FIA's agreement, as prescribed in the above Art. 6 will entail the application of penalties.

NB: Cotes en cm/Dimensions in cm

Dessin No 26: Formule 2: Dimensions maximum et minimum/
Drawing No 26: Formula 2: Maximum and minimum dimensions

1 — Pour toute partie de plus de 110 de large/For all parts wider than 110

2 — Fond de la coque de métal du siège/Bottom of the metal part of the seat

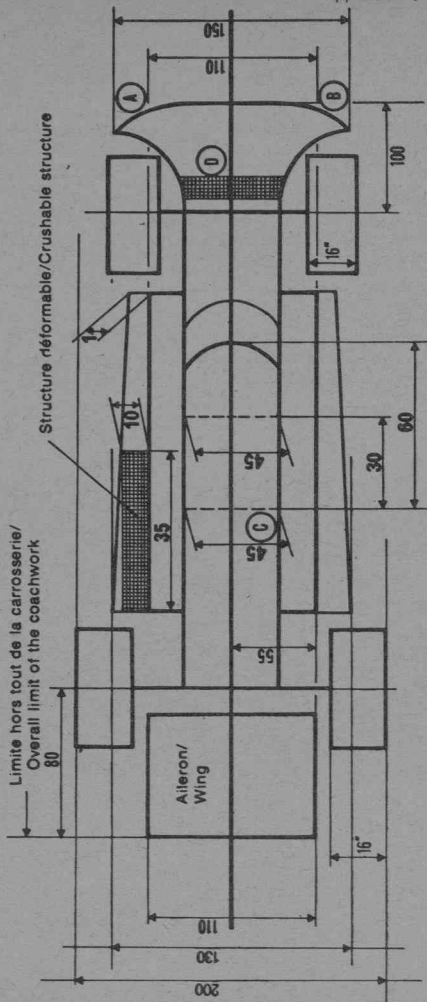
3 — Arceau de sécurité/Safety roll bar

4 — Structure substantielle/Substantial structure

NB: Les chiffres en gras représentent des dimensions minimales/Figures in bold are minimum dimensions

NB: Cotes en cm/Dimensions in cm

Dessin No 27: Formule 2: Dimensions maximum et minimum/
 Drawing No 27: Formula 2: Maximum and minimum dimensions

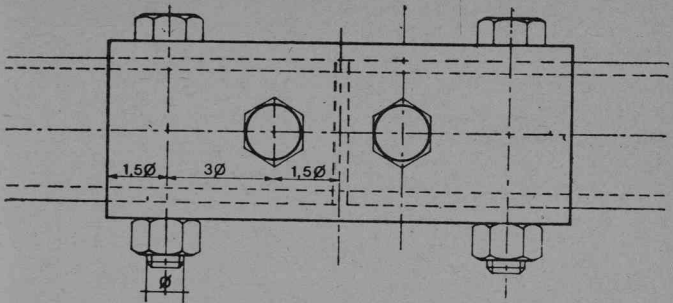


A B — Parties ne devant pas dépasser la hauteur de la jante AV/Parts that must not protrude above level of front rims

C — Point le plus reculé du siège/Most rearward point of seat

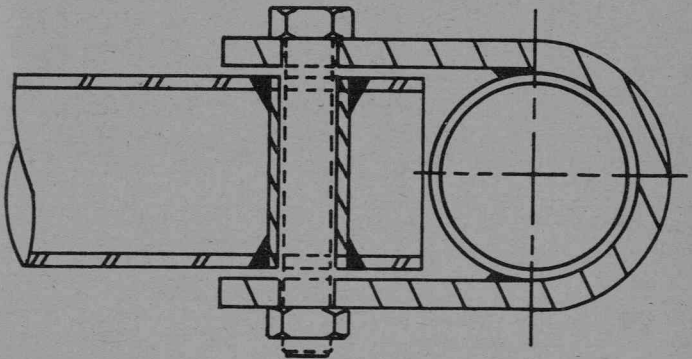
D — Structure substantielle/Substantial structure

NB: Les chiffres en gras représentent des dimensions minimales/Figures in bold are minimum dimensions

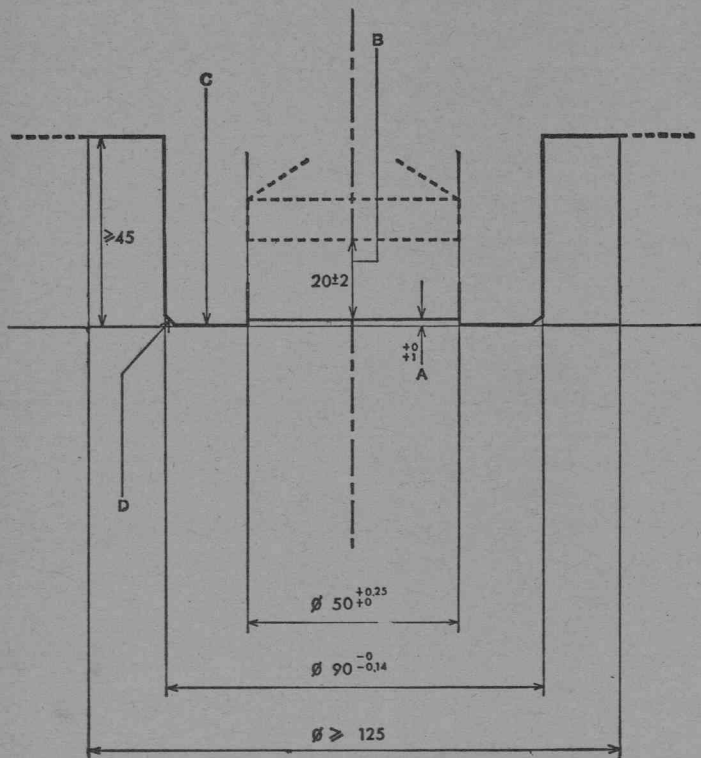


Dessin/drawing No 24

$\varnothing = 14 \text{ mm}$ (tube $\geq 40 \text{ mm} < 50 \text{ mm}$ diam. ext)
 16 mm (tube $\geq 50 \text{ mm}$ diam. ext)



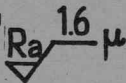
Dessin/drawing No 25: En dehors de l'arceau principale/Outside the main roll-bar.



Orifice de remplissage standardisé pour voitures/Standardised car fuel filler

Alliage recommandé/Recommended material : AU4G
(aluminium, cuivre/copper, magnesium)

Usinage/Machining



μ = Micron, Ra = Rugosité admise
average roughness of a surface.
Toutes cotes en mm/All dimensions in mm.

A : Position du clapet au repos/position of the released valve.

Clapet normalement fermé et étanche à la pression de 100 m. bar (1.5 psi)/Valve normally shut and leak proof under 100 m. bar of pressure (1.5 psi).

B : Ouverture du clapet/valve lift (20 ± 2 mm).

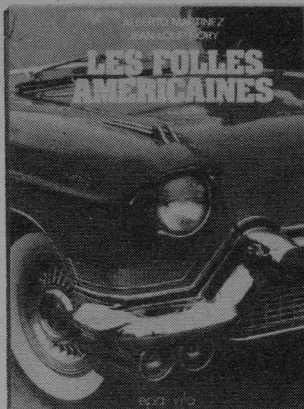
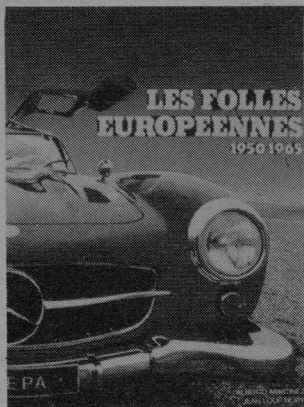
C : Plan de joint ; tolérance de surfaçage : 0.05 mm/Gasket facing plane, unswerving tolerance : 0.05 mm.

D : Chanfrein 1 + 1 à 45° ou arrondi (rayon 1mm)/

+0
Bevel cut 1 + 1 at 45°, or rounded at 1 mm radius.
+0

L'attention des fabricants de l'accoupleur (côté-stands) est attiré sur le fait que la partie en contact avec la surface C de l'orifice de remplissage doit être munie d'un joint Vitton. Aussi, il est recommandé de ne pas dépasser un guidage initial, avant l'ouverture des soupapes, de 18 mm, de telle sorte qu'à l'ouverture maximale autorisée de la soupape (22 mm) la pénétration totale ne dépasse pas 40 mm, laissant ainsi 5 mm minimum de tolérance.

The attention of the manufacturers of the coupling (pit-side) is drawn to the fact that the part in contact with the area C of the filler must be provided with a Vitton joint. It is advised not to exceed an initial locating penetration of 18 mm, before the opening of the valve, so that, with the valve open to the authorised maximum (22 mm), the total penetration does not exceed 40 mm, leaving thus a minimum of 5 mm tolerance.



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