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Annexe "J"

**au Code Sportif International, 1990
(classification, définitions 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.

LES TEXTES DES DIFFERENTES REGLEMENTATIONS ETABLIES PAR LA FISA (Code Sportif International et ses Annexes et Règlements des Championnats Internationaux de la FIA) FIGURANT DANS CET ANNUAIRE SONT CEUX ETABLIS AU 15 OCTOBRE 1989.

TOUTE MODIFICATION PARAITRA A PARTIR DE CETTE DATE DANS LE BULLETIN OFFICIEL MENSUEL DE LA FISA.

Appendix "J"

**to the International Sporting Code, 1990
(classification, definitions 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.

TEXTS OF THE VARIOUS REGULATIONS DRAFTED BY THE FISA (International Sporting Code and its Appendices and regulations of the FIA International Championships) APPEARING IN THIS YEAR BOOK ARE THOSE DRAWN UP ON 15 OCTOBER 1989.

ANY AMENDMENTS WILL BE PUBLISHED AFTER THIS DATE IN THE OFFICIAL FISA MONTHLY BULLETIN.

Appendix "J" to the International Sporting Code

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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: Production Cars
 — Group A: Touring Cars
 — Group B: Sports Cars
 — Group T1: Series Cross-Country Cars
 — Group T2: Improved Cross-Country Cars
 Category II: — Group T3: Prototype Cross-Country Cars
 — Group C: Sports Prototype Cars
 — Group D: International Formula Racing Cars
 — Group E: Free Formula Racing Cars
 Category III: — Group F: Racing Trucks
 — Group T4: Cross-Country Trucks

1.2) CUBIC CAPACITY CLASSES

The cars will be divided up into the following 18 classes according to their cubic capacity.

- | | | |
|-----|---|--|
| 1. | Cyl.-capacity lower than or equal to 500 cc. | |
| 2. | Cyl.-capacity exceed 500 cc and inf/equal to 600 cc | |
| 3. | " " " 600 cc " " " 700 cc | |
| 4. | " " " 700 cc " " " 850 cc | |
| 5. | " " " 850 cc " " " 1,000 cc | |
| 6. | " " " 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 " " " 3,500 cc | |
| 13. | " " " 3,500 cc " " " 4,000 cc | |
| 14. | " " " 4,000 cc " " " 4,500 cc | |
| 15. | " " " 4,500 cc " " " 5,000 cc | |
| 16. | " " " 5,000 cc " " " 5,500 cc | |
| 17. | " " " 5,500 cc " " " 6,000 cc | |
| 18. | " " " over 6,000 cc | |

Unless otherwise specified in special provisions imposed by the FISA for a certain category of events, the organisers are not 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 can be subdivided.

2) DEFINITIONS

2.1) GENERAL CONDITIONS

2.1.1.) Series 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).

Cars must be sold in accordance with the homologation form.

2.1.2.) Competition cars (category II):

Cars built as single examples and destined solely for competition.

2.1.3.) Trucks (Category III)

2.1.4.) 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 mono-coque construction).

2.1.5) Model of car:

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

2.1.6.) Normal sale:

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

2.1.7.) Homologation:

Is the official certification made by the FISA that a minimum number of cars of a specific model has been made on series-production terms to justify classification in Production Cars (Group N), Touring Cars (Group A), Sports Cars (Group B), Series Cross-Country Cars (Group T1) of these regulations. Application for homologation shall be submitted to the 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 FISA. Homologation of a series-produced car will become null and void 5 years after the date on 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, Production Cars (Group N)/Touring Cars (Group A)/Series Cross-Country Cars (Group T1) or Sports Cars (Group B). If a model already homologated in Sports Cars (Group B) passes into Production Cars (Group N)/Touring Cars (Group A)/Series Cross-Country Cars (Group T1), the first homologation is cancelled.

2.1.8.) Homologation forms:

All cars recognised by the FISA will be the subject of a 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. (For the Cross-Country Cars, the regulations can be obtained from the ASNs).

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 Production Cars (Group N), apart from the specific form for this group, the Touring Cars (Group A) form must also be submitted.

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 sufficient accurate documentation, scrutineers may carry out direct scrutineering by comparison with an identical part available from a concessionnaire. It will be up to the competitor to obtain the homologation concerning his car from his ASN.

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 concessionnaires).

b) Erratum (ER)

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

c) Evolution (ET-ES)

Characterises modifications made on a permanent basis to the basic model

(complete cessation of the production of the car in its original form in the case of the evolution of the type (ET), or sporting evolution (ES) intended to render a model more competitive.

Use:

1) Variants (VF, VO)

The competitor may use any variant or any part of a 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 dimensions of the brake linings, etc. obtained in this way, are indicated on a form applicable to the car in question. (For Production Cars (Group N), see also Art. 254.2).

2) Evolution of the type (ET)

(For Production Cars (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 applied 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.

3) Sporting evolution (ES)

Since the ES form refers to a previous extension, or to the basic form, the car must correspond to the stage of evolution corresponding to this reference; moreover, the

Sporting Evolution must be applied in full.

2.1.9.) 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 V generated in cylinder (or cylinders) by the upward or downward movement of the piston(s).

$$V = 0.7854 \times b^2 \times s \times n$$

where b = bore

s = stroke

n = number of cylinders.

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.

— Part situated between the valve of the device regulating the air intake 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.

2.3.6.) For cars with a turbocharger, the exhaust begins after the turbocharger.

2.3.7) **Sump:** The elements bolted below and to the cylinder block which contain and control the lubricating oil of the engine. These elements must not have any mounting part of the crankshaft.

2.4) **RUNNING GEAR**

The running gear includes all parts totally or partially unsuspended.

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 sides 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 pivots at its bottom end either on a transversal wishbone locating it transversally and longitudinally, or on a single 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 the 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 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:**

Any volume distinct from the cockpit and the engine compartment inside the vehicle.

These volumes are limited in length by the fixed structures 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°. These volumes 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 according to drawing n° 251.1 (page 270), provided that it is riveted, screwed or bolted on to the bodywork:

Front mudguard:the area defined by the inner face 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 production cars (Group N), Touring Cars (Group A), Sports Cars (Group 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".

The components of the car must retain their original function.

1.2) APPLICATION OF THE GENERAL PRESCRIPTIONS

The general prescriptions must be observed in the event that the specifications of Production Cars (Group N), Touring Cars (Group A), Sports Cars (Group B) do not lay down a more strict prescription.

1.3) CONDITIONS FOR CHANGES OF GROUPS AND AUTHORIZED REGROUPINGS

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

1.4) MAGNESIUM

The use of magnesium alloy sheet metal with a thickness less than 3 mm is prohibited.

1.5) 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.

1.6) Damaged threads can be repaired by screwing on a new thread with the same interior diameter ("helicoil" type).

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. This test shall be carried out on a flat surface under race conditions (driver(s) on board).

2.2) 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. In these conditions a spare wheel may be used as ballast.

Application: Touring Cars (Group A), Sports Cars (Group B); no kind of ballast is authorised on Production Cars (Group N) (except for what concerns seats - Art. 254.6.6.2.5).

In rallies, however, the carrying of tools and spare parts for the car will be allowed under the conditions laid down in Article 253.

3) ENGINE

3.1) SUPERCHARGING

In case of supercharging, the nominal cylinder-capacity will be multiplied by 1.7 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, its minimum weight, etc.

3.2) EQUIVALENCE FORMULA, BETWEEN RECIPROCATING PISTON AND ROTARY ENGINES

(of the type covered by the NSU Wankel patents)

The cubic capacity equivalent is 1.8 times the volume determined by the difference between the maximum and minimum capacities 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 between the fixed blades of the high pressure turbine first stage. In cases where the first stage turbine stator blades are adjustable, they must be opened 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 blades.

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:

$$4.25 \times 1.15 \times 1.15 \times 1.15 \times 1.15 \times 1.15 \times 1.16 \text{ or } 4.25 \times (1.15)^6$$

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

3.4) All engines into which fuel is injected or in which fuel is burned after an exhaust port are prohibited for the time being.

3.5) 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 1 st January following the decision taken.

3.6) 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 of the exhaust pipe must be situated within the perimeter of the car and less than 10 cm from this perimeter, and aft of the vertical plane passing through the centre of the wheelbase. Moreover, adequate protection must be provided in order to prevent heated pipes from causing burns.

The exhaust system must not be provisional. Exhaust gas may only exit at the end of the system. Parts of the chassis must not be used to evacuate exhaust gasses.

Catalytic exhausts: Should two possible versions of one car model be homologated (catalytic and other exhaust) the differences characterizing the catalytic model shall be included under "additional information" on the basic form.

The cars must comply with one or other version, all combinations of the two versions being prohibited.

3.7) 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

Measuring wheel width:

The width is to be measured with the wheel mounted on the car, on 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 these tyres are used (See Article 255.5.4 and Article 256.5).

Application: Touring Cars (Group A), Sports Cars (Group 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), tools, spare parts, safety equipment, communication equipment, ballast (if permitted), windscreen washer water container (Touring Cars (Group A) and Sports Cars (Group B) only). The passenger area and seat of an open car must in no way be covered.

Containers for helmets and tools situated in the cockpit must be made of non-inflammable material and they must not, in case of fire, give off toxic vapours.

6.4) All body panels of the vehicle must be at all times of the same material as those of the original homologated car and must be of the same material thickness as that of the original homologated car (tolerance $\pm 10\%$).

6.5) HOLES FOR MOUNTING HEADLAMPS

The boring of holes in the front bodywork for light brackets is authorised, limited solely to mountings.

6.6) Any object of a dangerous nature (battery, inflammable products, etc.) must be carried outside the cockpit.

7) ELECTRICAL SYSTEM

7.1) LIGHTING

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

7.2) The mounting of the alternator is free.

8) FUEL - COMBUSTIVE

8.1) The fuel may be used to a maximum octane rating of 99 RON, with no other additive except that of a lubricant on current sale which cannot increase the octane number, or water.

The fuel must have the following characteristics:

Either (leaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 2.5 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitro-compounds or other power-boosting additives.

— maximum density 0.78 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.4 g/l.

— maximum quantity of benzene: 5 % in volume.

Or (unleaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 3.7 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitro-compounds or other power-boosting additives.

— maximum density 0.79 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.013 g/l.

— maximum quantity of benzene: 5 % in volume.

If the fuel of the country of the event is not of a sufficient quality for use by competitors, the ASN of the organising country must ask the FISA for a waiver in order to enable the use of fuel corresponding to the characteristics defined above.

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

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 pages 136-137.

— 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 the cases where the circuits are unable to provide the entrants with a centralised system, they will have to refuel according to 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.

The overflow bottles must conform to one of the diagrams n° 252.1 or 252.2 (page 270).

The reserve tank and all metal parts of the refuelling system from the coupling over the flow meter up to the tank and its rack must be connected electrically to the earth.

The application of the following is recommended:

1. Each pit should be equipped with two aircraft type grounding connections.

2. The refuelling system (including tower, tank, hose, nozzle, valves and vent bottle) should be connected to one of the above grounding connections for the entire duration of the race.

3. The car should be connected, at least momentarily, to the other grounding connection as soon as it stops in the pit.

4. No fuel hose connection (fill or vent) unless and until conditions 2 and 3 have been fulfilled.

5. All fuel-handling pit crew members should wear non-static protective clothing.

The refuelling tank may be one of the following:

— models made of rubber, of the type FT3, built by an approved manufacturer, or

— tanks conforming to one of the diagrams n° 252.3 or 252.4 (pages 270-271).

Applications: For Touring Cars (Group A), Sports Cars (Group B), refer to the general prescriptions of the FIA Championships.

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 and brake lines 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 Touring Cars (Group A), Sports Cars (Group B), optional for Production Cars (Group N).

It is recommended that there be no connections in the cockpit, apart from on the front bulkhead and the rear bulkhead, in accordance with the drawings 253.1 (page 271).

The bulkheads may also be penetrated according to drawings 253.2 (page 271).

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. If this system is fitted in series production, no modifications are necessary.

5) ADDITIONAL FASTENERS

At least two 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, toolkit, etc.) must be firmly fixed.

The original boot and bonnet fasteners may be removed.

Application: obligatory for Touring Cars (Group A) and Sports Cars (Group B). Optional for Production Cars (Group N).

6) SAFETY BELTS

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

Application: compulsory for all Production Cars (Group N) together with Touring Cars (Group A), Sports Cars (Group 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 Touring Cars (Group A), Sports Cars (Group 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

7.1) IN RALLIES

— Group N:

The systems mounted in accordance with Art. 7.3 are recommended.

— Groups A and B:

These systems are compulsory.

Furthermore, hand-operated extinguishers are compulsory for all Groups (see Art. 7.4).

7.2) IN CIRCUIT EVENTS, SLALOMS, HILLCLIMBS

Hand-operated extinguishers are compulsory.

In circuits events, an automatic extinguisher (see Art. 7.3) may replace the manual extinguisher.

7.3) SYSTEMS MOUNTED

7.3.1) Fixation:

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.

7.3.2) 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 at 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.

7.3.3) Checking

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

7.3.4) Specifications

Minimum capacities of extinguisher systems:

Closed cars: cockpit: 2.5 kg.

engine : 5 kg

Open cars: cockpit: 5 kg.

engine : 2.5 kg.

Alternatively a single bottle of 7.5 kg may be used if the extinguishant is distributed according to the above specifications.

In circuit events a single 4 kg bottle will be accepted, the extinguishing agent being shared between the cockpit and the engine. 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).

7.3.5) Discharge time

Cockpit: 30 secs for Halon 1211

60 secs for Halon 1301.

Engine: 10 secs.

7.4) MANUAL EXTINGUISHERS

7.4.1) Installation

Each extinguisher bottle must be installed in such a way that it is capable of withstanding accelerations up to 25 g no matter how these are applied. Only rapid release metal mountings with metal straps will be accepted.

7.4.2) Operation - Triggering

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

7.4.3) Checking

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

7.4.4) 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 a product having an efficiency and non-toxicity at least equal to that of Halon 1211.

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, connections and fixation points.

8.1.3) Safety cage

Structural framework made up of a main rollbar and a front rollbar, or of two lateral rollbars, connections and fixation points.

8.1.4) Main rollbar

A structure made out of a vertical frame situated in a 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 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. In case where the main rollbar is used as the pillar, the connection must be near the roof. 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 which 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.

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 and co-driver.

However parts of the rollcage may encroach upon the front passenger space by passing through the dashboard and the lateral upholstery as well at the rear by passing through the upholstery or the rear seats. The rear seat may be folded down.

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

8.2.1.2) Basic rollcage (drawings 1 & 2). (For Rallies only).

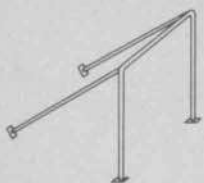
Rollbar: Production Cars (Group N) and Touring Cars (Group A), Sports Cars (Group B) up to 2,000 cm³.

Rollcage: Touring Cars (Group A), Sports Cars (Group B) more than 2,000 cm³ (optional for Production Cars (Group N) and Touring Cars (Group A), Sports Cars (Group B) up to 2,000 cm³ (drawings 3 & 4).

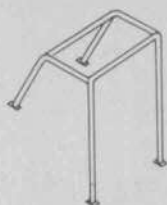
8.2.1.3) Different possibilities of installing the obligatory strut (with the exception of rallies):

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

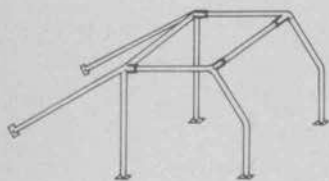
The combination of several struts (drawings 5-8) is permitted.



Dessin/drawing n° 1



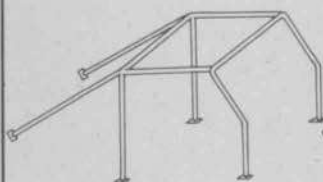
Dessin/drawing n° 2



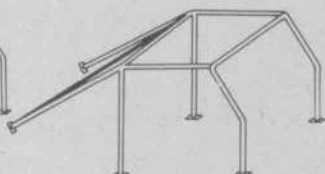
Dessin/drawing n° 3



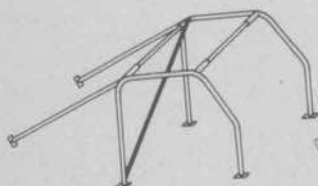
Dessin/drawing n° 4



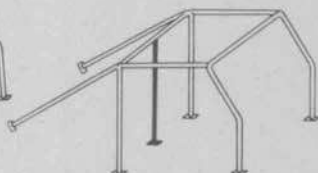
Dessin/drawing n° 4a



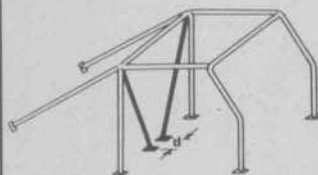
Dessin/drawing n° 5



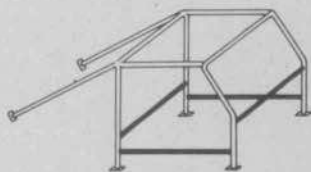
Dessin/drawing n° 6



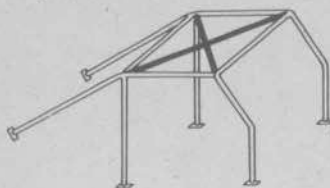
Dessin/drawing n° 7



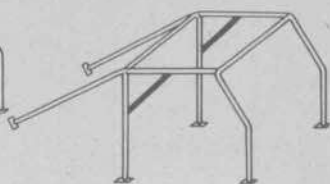
Dessin/drawing n° 8
($d \leq 30$ cm)



Dessin/drawing n° 9

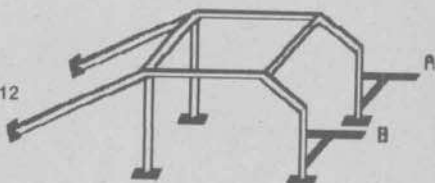


Dessin/drawing n° 10

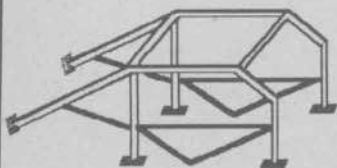


Dessin/drawing n° 11

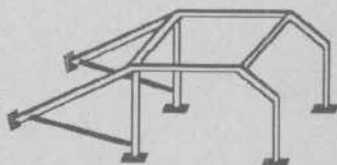
Dessin/drawing n° 12



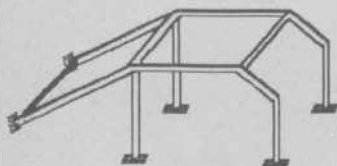
A et B sont les ancrages de suspension
A and B are the suspension anchorage points



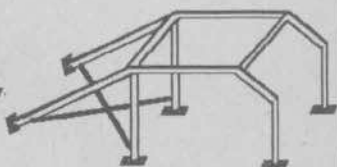
Dessin/drawing n° 13



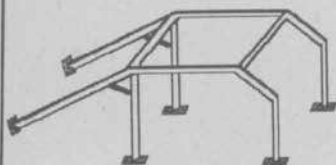
Dessin/drawing n° 14



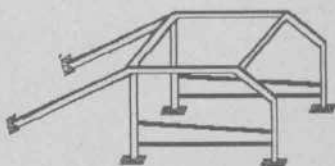
Dessin/drawing n° 15



Dessin/drawing n° 16



Dessin/drawing n° 17



Dessin/drawing n° 18

8.2.1.4) Different possibilities of installing the optional reinforcements of the rollcage:

Each type of reinforcement (drawings 9-18) 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, 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 that 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 $r = 3 \times \text{tube diameter}$

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).

Only those parts of the interior lining which hinder the passage of the rollbar can be withdrawn.

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.

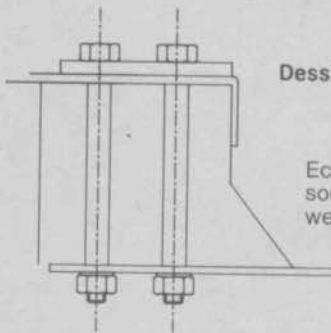
1 for each pillar of the rear longitudinal strut.

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.

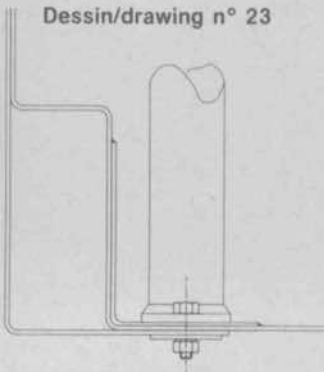
The attachment points of the front and main rollbars on the body must be reinforced with a steel plate of at least 3 mm thick and with a surface area of 120 cm², welded to the body.

The various possibilities are given in drawings 19 to 33.

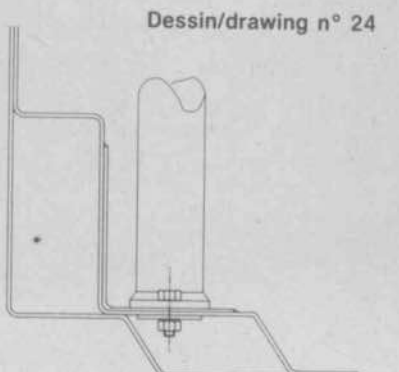


Dessin/drawing n° 22

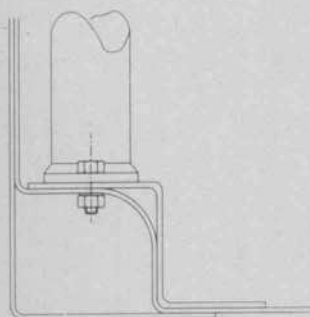
Ecrous rivetés ou
soudés/Riveted or
welded nuts



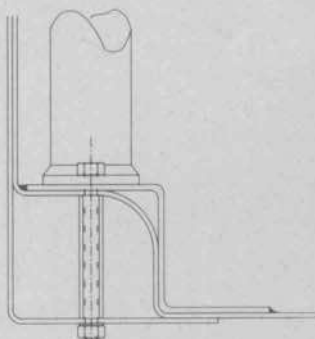
Dessin/drawing n° 23



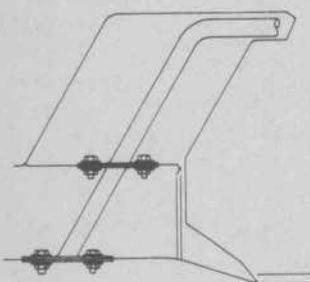
Dessin/drawing n° 24



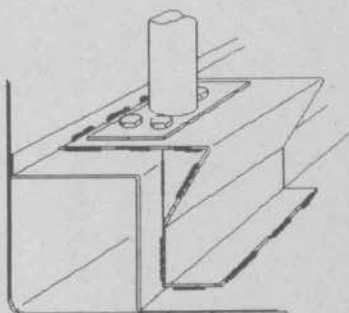
Dessin/drawing n° 25



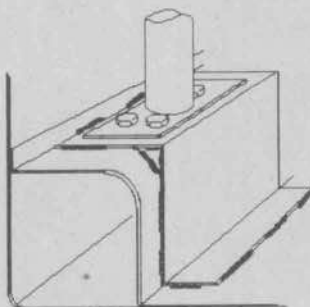
Dessin/drawing n° 26



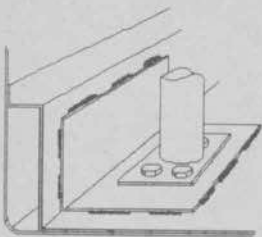
Dessin/drawing n° 27



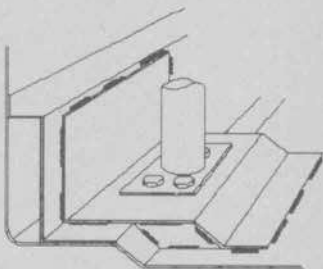
Dessin/drawing n° 28



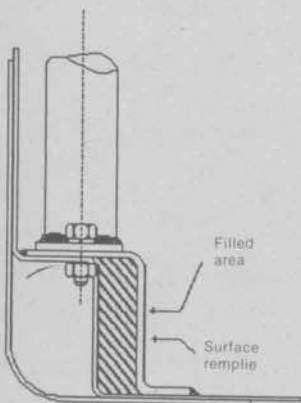
Dessin/drawing n° 29



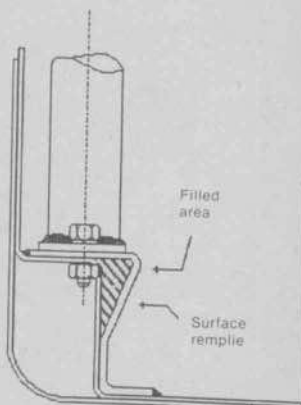
Dessin/drawing n° 30



Dessin/drawing n° 31



Dessin/drawing n° 32



Dessin/drawing n° 33

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-locking or fitted with washers.

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

The additional fixations may be bolted and/or welded to the body.

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.

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 to 8 without bends.

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 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 longitudinal strut should be higher than one third of the total height of the door measured from its base.

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 reinforcements 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 in the middle of the vertical pillar of the rollbar.

8.2.2.6) Padding for protection

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

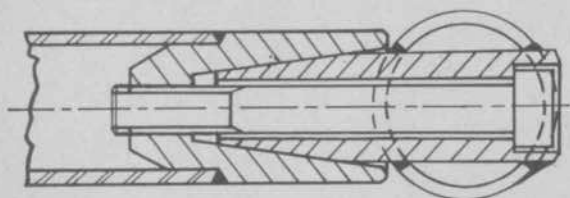
The rollbar may be covered with a detachable protective casing.

8.2.2.7) Removable connections

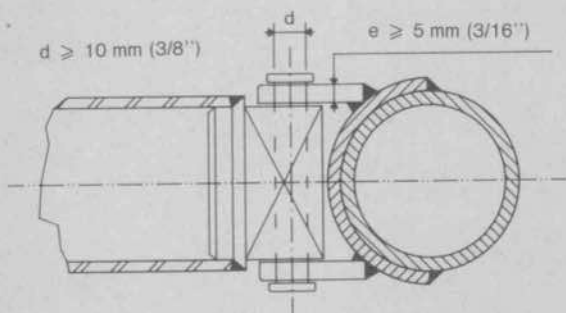
Should removable connections be used in the construction of the rollbar they must comply with or be similar to a type approved by the FISA (see drawings 34 to 38).

The screws and bolts must be of a sufficient minimum diameter, and of the best possible quality (8.8).

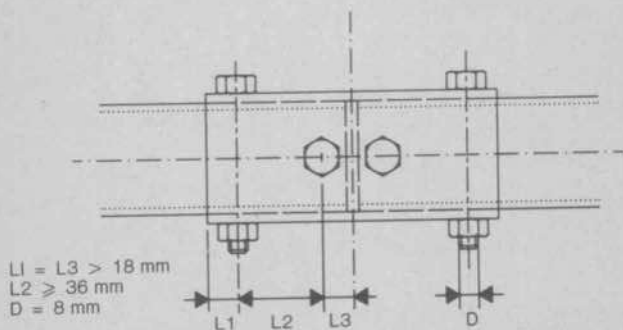
Dessin/drawing n° 34



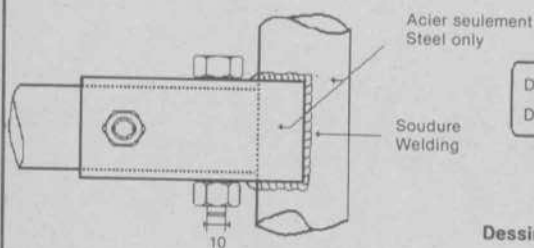
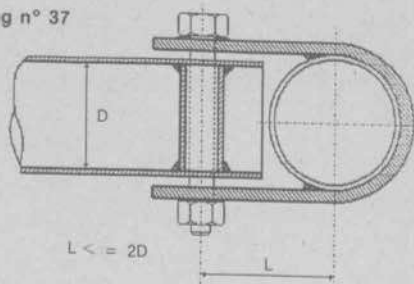
Dessin/drawing n° 35



Dessin/drawing n° 36

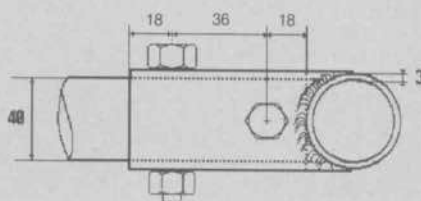


Dessin/drawing n° 37



Dimensions in mm
Dimensions en mm

Dessin/drawing n° 38



Dessin/drawing n° 39

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, welding under protecting gas).

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/mm ²	38 x 2.5 or 40 x 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) Production Cars (Group N)**

The fitting of a rollbar or roll-cage is compulsory for all events.

It is authorised to move the fuse box to enable a rollcage to be fitted.

8.4.2) Touring Cars (Group A) and Sports Cars (Group 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 rollcages may also propose a rollbar of free conception to an ASN for approval 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, on a form approved by the ASN, 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.

Rollbars must not be modified.

8.6) HOMOLOGATION

The FISA being aware of the problem of habitability 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, made from steel, must be described on a homologation extension form presented to the FISA for approval, and must 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 at least a 10 cm vertical opening, maintaining 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 all Groups.

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: All groups.

11) WINDSHIELD

A windshield made of laminated glass is compulsory.

Application: All groups.

12) SAFETY FIXING DEVICES FOR WINDSHIELD

Such devices may be used freely.

Application: optional.

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 mounting of the 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. This outside triggering system only concerns closed cars.

Application: compulsory fitting for all cars taking part in speed events on circuits or hill-climbs. The fitting is recommended for other events.

14) FISA APPROVED SAFETY FUEL TANKS

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

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

Safety tank manufacturers recognised by the FISA 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 FISA 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 W. Allen Inc, 401 Agee Road, Grants Pass, Oregon 97526.

Aero Tecs Labs, Spear Road Industrial Park, Ramsey, New Jersey 07446.

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

France:

Kléber Colombes, Division Tissus Enduits et Applications, 4, rue Lesage Maille, 76320 Caudebec-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 Minimes, 92405 Courbevoie.

Great Britain:

Aero Tec Labs, 37 Clarke Road, Mount Farm Industrial Estate, Bletchley, Milton Keynes, MK1 - 1LG.

Marston Palmer Ltd, Wobaston Road, Fordhouses, Wolverhampton, WV10 6QJ Staffs.

Premier Fuel System Ltd, Willow Road, Trent Lane Industrial Estate, Castle Donington, Derby DE7 2NP.

Italy:

Gipi, Via Abruzzi 7, 20090 Opera, Milano.

SEKUR SpA - Gruppo PIRELLI, Via di Torrespeccata 140, 00169 Roma.

Japan:

Fujikura Rubber Works Ltd., N°, 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) APPLICATION OF THESE SPECIFICATIONS

Production Cars (Group N), Touring Cars (Group A) and Sports Cars (Group B) may be equipped with a safety fuel tank if the modifications necessary do not exceed those allowed by the regulations.

As far as Production Cars are concerned, the maximum capacity of the FT3 tanks must be that of the homologated tank, and the original tank must be removed.

15) PROTECTION AGAINST FIRE

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

Should this screen be formed by the rear seats, it is advisable to cover them with a flameproof coating.

Art. 254 - **Specific regulations for Production Cars (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 Touring Cars (Group A).

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

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

The use of tanks homologated in VO on the Touring Car (Group A) form must be carried out under the conditions laid down in Article 5.9.2 of the Touring Car (Group A) regulations, and Article 254.6.8.

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

Production Cars (Group N) must derive from cars homologated in Touring Cars (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 basic characteristics.

3) NUMBER OF SEATS

Cars must have at least 4 places, in accordance with the dimensions defined for Touring Cars (Group A).

4) MODIFICATIONS AND ADJUNCTIONS ALLOWED OR OBLIGATORY

All the modifications which are not allowed by the present regulations 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 WEIGHT

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

As far as rollcages or rollbars which cannot be removed from the car and which were manufactured in accordance with Articles 253.8.2, 8.3 and 8.4 of Appendix J are concerned, the following weights will be taken as a basis for the safety cage:

- | | |
|---|-------|
| — Rollbar manufactured according to drawings 1/2: | 15 kg |
| — Rollcage manufactured according to drawings 3/4/4a/5/6/7/11/12: | 25 kg |
| — Rollcage manufactured according to drawings 8/9/10: | 30 kg |

This is the real minimum weight of the empty car (without persons or luggage aboard) without tools, jack. 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 or headlight wiper, brake, cooling system, fuel and water injection tanks, which shall be empty. Additional headlights which do not appear on the homologation form must be removed before weighing.

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 or fuel injection system parts regulating the quantity of fuel reaching the engine may be modified, provided that they have no influence on air admission. The original injection system must be maintained. The injectors may be changed for injectors which are identical except with regard to the size of the pintle nozzle hole at the end. Competitors using cars with any hydraulic valve lift system whatsoever must be able to supply the scrutineers with a mechanical valve lifter to enable them to measure the valve lift.

— The elastic material of the engine mountings is free, but not their number.

— The electrical resistances situated in the electronic box may be modified.

— **Exhaust (Rally only):**

It will be possible:

- either to remove the inside of the original silencer;

- or to modify the exhaust from the first silencer to the exit, the maximum dimensions of the duct being those of the pipe situated upstream of the first silencer (see drawing n° 254.3, page 272). Should two inlets exist in the first silencer, the section of the modified duct must be less than or equal to the total of the two original sections.

Only one pipe may be present at the exit.

The exit should be situated in the same position as that of the series production exhaust system.

These liberties must not entail any bodywork modifications and must respect the laws of the country in which the event is run with regard to noise levels. Additional parts for the mounting of the exhaust are authorized. If an exhaust silencer is added, it must be of the original type and must contain noise-absorbing material.

— **Cruising speed controller:** This controller may be disconnected.

— **In rallies only:** the cubic capacity is limited as follows for normally aspirated engines:

- 3 l maximum for two valves per cylinder.
- 2.5 l maximum for more than two valves per cylinder.

In the event of supercharged engines being used:

The supercharged system must comply with that of the homologated engine.

The maximum diameter of the air intake into the compressor must be 40 mm, maintained for a minimum distance of 3 mm measured downstream of a plane perpendicular to the rotational axis situated at a maximum of 50 mm upstream of a plane passing through the most upstream extremities of the wheel blades (see drawing n° 254.4).

The compressors respecting the above dimensions must be retained. The others must be fitted with a restrictor fixed to the compressor housing and coupling with the dimensions defined above. This restrictor must not be an integral part of the compressor housing; it must be an added part.

In case of an engine with two parallel compressors, each compressor must be limited to a maximum intake diameter of 28 mm.

6.2) TRANSMISSION

— **Clutch:** the disc is free, including the weight, with the exception of the number and diameter.

6.3) SUSPENSION

— **Springs:**

Coil springs:

The length is free, as is the number of coils, the wire diameter, the type of spring (progressive or not), the external diameter and the form of the spring seats.

Leaf springs:

The length, width, thickness and vertical curvature are free.

Torsion bars:

The diameter is free.

These freedoms on the suspension springs do not authorise one to disregard article 205 of the homologation form (minimum height of the centre of the hubcab, wheel passage opening).

— **Shock absorbers:** free, provided that their number, their type (telescopic, arm, etc), their working principle (hydraulic, friction, mixed, etc.), and their attachment points 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 an 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.

The form of the spring seats in McPherson suspensions is free.

6.4) WHEELS AND TYRES

The wheels are free, respecting the homologated diameter (Article 801a), and the homologated width (Article 801b) which is considered as a maximum.

They must be covered by the wings (same checking system as in Group A, Article 255.5.4), and the maximum track given on the homologation form must be kept.

Tyres are free provided that they can be mounted on those wheels.

The spare wheel may be brought inside the driving compartment, on condition that it is firmly secured there and that it is not installed in the space reserved for the driver and the front seat passenger.

Wheels fixations by bolts may be changed to fixations by pins and nuts provided that the number of attachment points and the diameter of the threaded parts as indicated on drawing n° 254.1 (page 272) are respected.

Air extractors added on the wheels are forbidden.

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 or an anti-locking device, this device may be disconnected.

The same applies for anti-lock braking systems.

Brake lines may be changed for aviation type lines.

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 they have no influence on the car's aerodynamics.

The fitting of underbody protections is authorized in rallies only, provided that these really are protections which respect the ground clearance, which are removable and which are designed exclusively and specifically in order to protect the following parts: engine, radiator, suspension, gearbox, tank, transmission, exhaust, extinguisher bottle.

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

If the spare wheel is fixed underneath the bodywork, (i.e. if it is licked by the airflow), or inside the engine compartment, it may be brought inside the cockpit, on condition that it is firmly secured and that it is not installed in the space reserved for the driver and the front-seat passenger.

The fitting of external rear view mirrors is authorised, as is the changing of the windscreen wiper blades both front and rear.

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 passenger seats, if occupied, must be fitted with a headrest.

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 usable; 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 danger.
- 2) The horn may be changed or an additional one, possibly for the passenger's use, added.
- 3) The mechanism of the handbrake lever may be adapted in order to obtain instant unlocking (fly-off handbrake).
- 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.
- 8) It is authorised to replace the electric windows by manually-operated windows.

6.6.3) Reinforcements

It is permitted to fit to the front reinforcement bars on condition that they are removable and fixed exclusively by bolts onto the suspension or spring mounting points. A hole may also be bored in the upper suspension trim to fit these rods. These bars may also be fitted at the rear, in the same conditions.

These bars may be fixed, on each side, at a maximum of two points. The distance between these two points must be less than 10 cm. The distance between one of these points and the suspension fixation is at most 10 cm.

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

6.6.4) When the spare wheel is originally set in a closed accommodation, and when this wheel is changed for a thicker one (see Article 6.4), situated in this space, it is possible to remove from the cover of the location of the wheel the surface induced by the diameter of the new wheel (drawing n° 254.2, page 272).

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. 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 eight (tail and parking lights not included) provided that this is accepted by the laws of the country. They may not be housed within the bodywork.

Headlights and other exterior lights must always exist in pairs. The original headlights can be made inoperative and covered with adhesive tape. They can be replaced by other headlights, in compliance with this article. A reversing light may be fitted provided it can only be used when the gear lever is in the "reverse" position, and provided that the police regulations on this subject are observed. Fuses may be added to the electrical system.

6.8) FUEL CIRCUIT

Providing the original tank is equipped with an electric pump and an interior filter, it is possible when using an FT3 tank to place a filter and a pump with identical characteristics to the homologated one outside. These parts must be protected in adequate fashion.

Should an FT3 tank be used, the Group A regulations may be used for the fitting of a filler hole.

Fuel lines must be changed for aviation type lines if an FT3 tank is used, the route of these lines being free. Should a series production tank be used, this changed is optional.

The total capacity of the tanks must not exceed that indicated in Article 401d of the Group A homologation form.

6.9) JACK

The jack is free on condition that its lifting points on the car are not modified.

Art. 255 - Specific Regulations for Touring Cars (Group A)

1) DEFINITIONS

Large scale series production Touring Cars.

2) HOMOLOGATION

At least 5,000 identical examples of these cars must have been manufactured in 12 consecutive months.

3) NUMBER OF SEATS

Touring cars must have 4 seats minimum.

4) WEIGHT

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 :	700 kg
"	1 600 cm ³ :	780 kg
"	2 000 cm ³ :	860 kg
"	2 500 cm ³ :	940 kg
"	3 000 cm ³ :	1,020 kg
"	3 500 cm ³ :	1,100 kg
"	4 000 cm ³ :	1,180 kg
"	4 500 cm ³ :	1,260 kg
"	5 000 cm ³ :	1,340 kg
"	5 500 cm ³ :	1,420 kg
Over:	5 500 cm ³ :	1,500 kg

This is the real minimum weight of the car, without driver nor co-driver nor their equipment. At no time during the event may a car weigh less than the minimum weight stated in this article. In case of doubt, the Scrutineers may drain the tanks to check the weight.

The use of ballast is permitted in the conditions provided for under Article 2.2 of the "General Prescriptions for Production Cars (Group N), Touring Cars (Group A), Sports Cars (Group 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 necessary for the propulsion, suspension as well as all accessories necessary for their normal functioning, excepting any steering or braking part, 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. Chemical and heat treatment are allowed, in addition to the above. However, the modifications defined by the above paragraph are allowed on condition that the weights and dimensions mentioned on the homologation form are respected.

Nuts and bolts: throughout the car, any nut, bolt, screw may be replaced by any other nut, any other bolt, any other screw and have any kind of locking device (washer, lock nut, etc.).

Adjunction of material: any adjunction of material or parts is forbidden unless it is specifically allowed by an Article in these regulations. Any material removed may not be reused.

5.1) ENGINE

5.1.1) Cylinder-block - Cylinder-head

It is permitted to close the unused apertures in the cylinder block and cylinder head, if the only purpose of this operation is that of closing.

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 reboring, and the sleeve material may be modified.

Planing of the cylinder-block is allowed.

In the case of rotary engines, on condition that the original dimensions of the intake inlet ports and of the exit of the exhaust are respected, the dimensions of the inlet and exhaust ducts into the engine block are free.

Cylinder head: planing authorised.

5.1.2) **Compression 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, heat or chemical treatment different from that 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 air filter, including the filter box and the plenum chamber, is free.

The air filter along with its box may be removed, moved in the engine compartment or replaced by another (see drawing n° 255.1, page 273).

The pipe between the air filter and the carburettor(s) or the air measuring device (injection) is free.

Likewise, the pipe between the air measuring device and the intake manifold or the supercharging device is free.

The air intake may be fitted with a grill.

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

Fuel pumps are free. They may not be fitted in the cockpit unless this is an original fitting, in which case they must be well protected.

Petrol filters, with a maximum unit capacity of 0.5 l may be added to the fuel feed circuit.

The accelerator linkage is free.

The original heat exchangers and intercoolers, or any other device fulfilling the same function, must be retained, and remain in their original location.

The pipes between the supercharging device, the intercooler and the manifold are free, but their only function must be to channel air.

Any water injection fitted must be homologated and must not be modified.

The use of any other substance or device to reduce the temperature of the mixture is forbidden.

The drawings on page 14 of the homologation form must be respected.

The inner dimensions of the ports are free in the rotary chambers for rotary engines and for 2-stroke engines.

5.1.8.1) **Carburettor**

The element of the carburettor(s) regulating the metering of the quantity of petrol admitted to the engine may be modified, but not the diameter of the venturi, and the carburettor must stay in its original position.

5.1.8.2) **Injection**

The original system and its type, as specified on the homologation form of the vehicle (such as K-Jetronic) must be retained, as must its location.

The elements of the injection device regulating the metering of the quantity of fuel admitted to the engine may be modified, but not the diameter of the opening of the butterfly.

The air measuring device is free.

The injectors are free, except for their number, their position, their assembly axis and their operating principle.

The petrol lines feeding them are free.

The electronic box is free, insofar as it does not incorporate more data.

The fuel pressure regulator is free.

5.1.8.3) **Restrictor for rallies**

The cubic capacity is limited as follows for normally aspirated engines:

— 3 l maximum for two valves per cylinder.

— 2.5 l maximum for more than two valves per cylinder.

In the event of supercharged engines being used:

The supercharged system must comply with that of the homologated engine.

The maximum diameter of the air intake into the compressor must be 40 mm, maintained for a minimum distance of 3 mm measured downstream of a plane perpendicular to the rotational axis situated at a maximum of 50 mm upstream of a plane passing through the most upstream extremities of the wheel blades (see drawing n° 254.4 page 273).

The compressors respecting the above dimensions must be retained. The others must be fitted with a restrictor fixed to the compressor housing and coupling with the dimensions defined above. This restrictor must not be an integral part of the compressor housing; it must be an added part.

In case of an engine with two parallel compressors, each compressor must be limited to a maximum intake diameter of 28 mm.

5.1.9) Camshaft(s)

Free (except the number and number of bearings). Timing is free. The material, type and dimensions of the pulleys, chains and belts for driving the camshafts are free. The route and the number of belts and chains are free. The guides and tensioners associated with these chains or belts are also free.

With regard to the cylinder head orifices (inner side of the engine), in the case of rotary engines, 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). Valve lift is free.

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

The material of the seats is free.

5.1.11) Rocker arms and tappets

Rocker arms may only be modified in accordance with Article 5 "General Conditions" above. Tappets are free, provided they are interchangeable with the original ones. It is possible to use bracking plates to adjust them.

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 changed, with the exception of the crankshaft, the flywheel or the crankshaft pulley, for which modifications limited to the necessary additions will be possible. 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.

The fan and its drive system can be changed freely, or be withdrawn. It is allowed to add a fan per function.

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.

The expansion chamber may be modified; if one does not exist originally, one may be added.

5.1.14) Lubrication

Radiator, oil/water exchanger, lines, thermostat, 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, without modifying the bodywork.

Fitting an oil radiator in this manner does not allow the addition of an enveloping aerodynamic structure.

All air openings must have the sole effect 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.

An air/oil separator can be mounted outside the engine (maximum capacity 1 litre), in accordance with the following drawing n° 255.3, page 274.

The oil must only flow from the oil catch tank towards the engine by the force of gravity.

A fan may be fitted for cooling the engine oil, but must have no aerodynamic effect.

5.1.15) Engine - Mountings - Angle and position

Mountings are free (but not their number) provided that the angle and position of the engine within its compartment are not modified, and that Articles 5.7.1 and 5 - General Conditions are respected.

Supports may be welded to the engine and to the bodywork and their position is free.

In Rallies only, it is possible to cut out a part of the bulkhead situated in the engine compartment for the fitting of one or more air filters or for the intake of air; however, such cut-outs must be strictly limited to those parts necessary for this installation (see drawing n° 255.6, page 275).

Furthermore, if the air intake ventilating the driving compartment is in the same zone as the air intake for the engine, this zone must be isolated from the air filter unit, in case of fire.

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 3.6).

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

In the case of rotary engines, and on condition that the original dimensions of the inlet ports of the exhaust manifold are respected, the dimensions of the ducts in the manifold are free.

Thermal screens may be fitted on the exhaust manifold, the turbocharger and on the exhaust device, with, however, the sole function of thermal protection.

5.1.17) Driving pulleys, belts and chains for ancillaries situated outside the engine:

The material, type and dimensions of the pulleys, chains and belts for driving the ancillaries are free. The route and the number of belts and chains are free.

5.1.18) Gaskets: Free.

5.1.19) Engine springs

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

5.1.20) Starter

It must be retained, but its make and type are free.

5.1.21) Supercharging pressure

This pressure may be modified by Article 5.1.19 and Article 5 - General Conditions.

With this in view, the connection between the housing and the waste-gate may be made adjustable if it is not originally so. The original system of operation of the waste-gate may be modified and be rendered adjustable but this system has to be maintained. A mechanical system has to stay mechanical and an electrical system has to stay electric, etc.

5.2) TRANSMISSION

5.2.1) Clutch

Clutch is free, but the homologated bell-housing must be retained, together with the operation type.

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.

However, a gearbox homologated as an additional one with an oil pump can be used without this pump.

A fan may be fitted for cooling the gearbox oil, but must have no aerodynamic effect.

The gears of the additional gearbox on the homologation form may be changed, provided that they respect the informations given on this form.

Gearbox supports are free, but not their number.

May be used:

- The series housing with series ratios or one of the two sets of additional ratios;
- One of the additional housings only with one of the additional sets of ratios.

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. The differential supports are free.

5.3) SUSPENSION

The position of the rotational axes of the mounting points of the suspension to the wheel uprights and to the shell (or chassis) must remain unchanged.

5.3.1) Reinforcement bars on the suspension mounting points to the body shell (or chassis) may be installed. The distance between a suspension fixation point and the anchorage point of the bar cannot be more than 100 mm, unless the bar is a transversal strut homologated with the rollbar, and unless there is an upper bar fixed to a MacPherson suspension or similar. In the latter case the maximum distance between the anchorage point of the bar and the upper articulation point will be 150 mm (drawing n° 255.4, page 274). Apart from these two points, this bar must not be mounted on the bodyshell or the mechanical parts. One and the same bar may only be fixed to two of these points situated on the original chassis (bodyshell) (drawing n° 252.2, page 270).

5.3.2) Strengthening of the mounting points and of the running gear, by adjunction of material, 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.

These anchorage points can be used for the mounting of reinforcement bars.

5.3.4) The joints may be of a different material from the original ones.

The suspension mounting points to the bodyshell or chassis may be modified:

— by using a "Unibal" joint. The original arm can be cut and a new seat for the "Unibal" welded. Braces will be used next to the "Unibal" itself.

— by using a screw with a greater diameter.

— by reinforcing the anchorage point through the addition of material.

The position of the centre of the articulation cannot be changed (See drawing n° 255.5, page 274).

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 (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 may be housed within the original bodywork; this means the upper part of the wheel (rim flange and tyre flange), located vertically over the wheel hub centre, must be covered by the bodywork, when measured vertically.

Wheel fixations by bolts may be freely changed to fixations by pins and nuts. The use of tyres intended for motor cycles is forbidden.

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 cm³ : 6,5"

1 300 cm³ : 7"

1 600 cm³ : 7,5"

2 000 cm³ : 8,5"

3 000 cm³ : 9"

3 500 cm³ : 10"

4 000 cm³ : 10"

4 500 cm³ : 11"

5 000 cm³ : 11"

5 500 cm³ : 12"

Over: 5 500 cm³ : 12"

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.

Should the wheel be fixed using a central nut, a safety spring must be in place on the nut throughout the duration of the event and must be replaced after each wheel change.

The springs must be painted "Dayglo" red. Spare springs must be available at all times.

The aerodynamic devices situated on the wheels are limited as follows (see drawing n° 255.9, page 275):

- maximum diameter less than the inner diameter of the rim;
- maximum offset 40 mm;
- attachment by nuts, bolts or screws, not just by pressure.

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, braking force adjusters, anti-locking devices

They may be disconnected but not removed. The adjusting device is free. The braking force adjusters may not be moved from the compartment in which they are originally situated (cockpit, engine compartment, exterior, etc.).

5.5.3) Cooling of brakes

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

Only one flexible pipe to bring the air to the brakes of each wheel is allowed, but its inside section must be able to fit into a circle with a 10 cm diameter.

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).

5.5.6) Hydraulic pipes may be replaced by lines of aircraft quality.

5.6) STEERING

Power steering may be disconnected but not removed.

5.7) BODYWORK - CHASSIS**5.7.1) Lightening and reinforcements**

Strengthening of the sprung parts of the chassis and bodywork is allowed provided that the material used follows the original shape and is in contact with it. Reinforcements by composite materials are allowed in accordance with this article, whatever their thickness, according to the drawing n° 255.8 (page 275).

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

Unused supports (eg spare wheel) situated on the chassis/bodywork can be removed, unless they are supports for mechanical parts which cannot be moved or removed.

It is possible to close the holes in the cockpit, the engine and luggage compartments, and in the wings. The holes may be closed using sheet metal or plastic materials, and may be welded, stuck or riveted. The other holes in the bodywork may be closed, by adhesive tape only.

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 dismantled. The capacity of the washer tank may be increased and the tank may be moved inside the cockpit in accordance with Article 252.6.3.

5.7.2.4) External decorative strips may be removed. Any parts following external contour of the bodywork and less than 25 mm high will be considered as decorative strips.

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 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 and type are free.

5.7.2.8) The registration plate mountings may be dismantled 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 protections is authorised in rallies only, provided that these really are protections which respect the ground clearance, which are removable and which are designed exclusively and specifically in order to protect the following parts: engine, radiator, suspension, gearbox, tank, transmission, exhaust, extinguisher bottles.

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

The plastic sound-proofing parts may be removed from the interior of the wheel passages. These plastic elements may be changed for aluminium elements of the same shape. It is possible to fit plastic protection parts in the wings, on the same ground as aluminium parts.

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

5.7.2.13) "Skirts" are banned. All non-homologated devices or constructions designed so as to fully or partially fill the space between the sprung part of the car and the ground is forbidden in all circumstances. No protection authorised by Article 255.5.7.2.10 can play a role in the aerodynamics of the car.

5.7.2.14) It is authorised to remove or replace existing supports between the bodywork and the chassis, but it is not possible to change or add locations.

5.7.3) Cockpit

5.7.3.1) Seats

Occupants 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 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.

In the case of twin-volume cars it will be possible to use a non-structural partition wall in transparent, non-inflammable plastic between the cockpit and the tank arrangement.

5.7.3.3) Dash board

The trimmings situated below this and which are not a part of it may be removed.

It is permitted to remove the part of the centre console which contains neither the heating nor the instruments (according to the drawing n° 255.7, page 275).

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

All padding, insulating material and roof lining may be removed from the underside of the roof.

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 materials may be removed.

5.7.3.8) Heating system

The original heating equipment may be replaced by another also provided by the manufacturer, and mentioned in his catalogue as supplied on demand.

It is permitted to blank off the water supply of the internal heating device, in order to prevent water spillage during an accident, providing an electric demist system or similar is available.

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 steering 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 Article 253.8).

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) Measuring instruments such as speedometers etc. may be installed or replaced, and possibly have different functions. Such installations must not involve any risk.

However, the speedometer may not be removed, if the supplementary regulations of the event prevent this.

3) The horn may be changed or an additional one added, within reach of the passenger. The horn is not compulsory on closed roads.

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 are any, 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 bulkhead 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.

Should the battery be moved from its original position, it must be attached to the body using a metal seat and two metal clamps with an insulating covering, fixed to the floor by bolts and nuts. For attaching the battery, clamp securing bolts with a diameter of at least 10 mm must be used, and under each bolt, a counterplate at least 3 mm thick and with a surface of at least 20 cm² beneath the metal of the bodywork.

The battery must be covered by a leakproof plastic box, attached independently of the battery. It will be possible to place the battery in the cockpit but only behind the front seats. In this case, the protection box must include an air intake with its exit outside the cockpit (see drawings n° 255.10 and 255.11, page 276).

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 the total

number of headlights equipping the car does not exceed 8 (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. Original headlights may be rendered inoperative and may be covered with adhesive tape. The replacement of a rectangular headlights 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. If a new registration plate support is provided for with lighting, the original system (support + lighting) may be removed. On circuits, plate lighting is not compulsory.

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	:	60 l
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 FISA (specification FT3) or by another tank homologated by the car manufacturer. In this case, the number of tanks is free and the tank must be placed inside the luggage compartment or in the original location but provision should be made for a collector hole to collect any petrol which may have leaked in this compartment. The construction of collector tanks with a capacity of less than 1 litre is free.

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 has been placed by the manufacturer inside the cockpit or close to the occupants.

In this case it shall be permissible either to install a protective device between the tank and the occupants of the car, or to place the tank in the luggage compartment, and, if need be, to modify its supplementary accessories (refuelling orifice, petrol pump, overflow pipe).

In any case, these changes of the position of the tanks should not give rise to any lightenings 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 filler 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.

These orifices may be located in the window panels.

If the filler hole is situated inside the car, it must be separated from the cockpit by a liquid-tight protection.

It is possible to fit a radiator in the fuel circuit (maximum capacity one litre).

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

Art. 256 - Specific regulations for Sports Cars (Group B)

1) DEFINITION

Sports 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 Touring Cars (Group A) with the following modifications. However, Article 255.5.1.8.3 (Restrictor) has not to be applied.

4) WEIGHT

Cars are subjected to the following minimum weight scale in relation to their cubic capacity.

Up to	1,000 cm ³	: 620 kg
"	1,300 cm ³	: 700 kg
"	1,600 cm ³	: 780 kg
"	2,000 cm ³	: 860 kg
"	2,500 cm ³	: 940 kg
"	3,000 cm ³	: 1 020 kg
"	3,500 cm ³	: 1 100 kg
"	4,000 cm ³	: 1 180 kg
"	4,500 cm ³	: 1 260 kg
"	5,000 cm ³	: 1 340 kg
"	5,500 cm ³	: 1 420 kg
Over	5,500 cm ³	: 1,500 kg

5) WHEELS AND TYRES

Same text as for Touring Cars (Group A), (Art. 5.4) except for the rim diameter and the maximum widths (in rallies only).

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

Up to	1,000 cm ³	: 13"
"	1,300 cm ³	: 14"
"	1,600 cm ³	: 15"
"	2,000 cm ³	: 17"
"	2,500 cm ³	: 18"
"	3,000 cm ³	: 18"
"	3,500 cm ³	: 20"
"	4,000 cm ³	: 20"
"	4,500 cm ³	: 22"
"	5,000 cm ³	: 22"
"	5,500 cm ³	: 24"
Over	5,500 cm ³	: 24"

In rallies: The rim diameter cannot exceed 16" (or 415 mm for metric dimensions).

Art. 257 - **Group C Sports-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).

The normal section of each cylinder must be circular, except for rotary engines. No water injection is allowed.

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

Category 1: Reciprocating normally aspirated engines

Maximum cubic capacity 3.5 l - Maximum 12 cylinders.

The maximum total quantity of fuel allocated for the whole distance or for the whole duration of the event is free.

Category 2: Other engines (until 31.12.90).

The maximum total quantity of fuel allocated for the whole distance or for the whole duration of the event is calculated (in litres) by the product: distance of the race in km \times 0.51.

For a race of 24 hours, the total quantity of fuel allocated is 2550 litres.

For supercharged engines:

The only authorised means of supercharging shall be one or more turbochargers, exclusively driven by the exhaust gases of the engine, which shall not be mounted in series. Each turbocharger shall consist of a single compression stage of the intake air and of a single expansion stage of the exhaust gases.

Temperature of the charge:

Any device, system, procedure, construction or design the purpose and/or effect of which is any decrease whatsoever of the temperature of the intake air and/or of the charge (air and/or fuel) of the engine is forbidden with the sole exception of heat exchanger(s) whose only function is to directly exchange heat between the charge and the ambient air ("air to air intercoolers"). Such heat exchanger(s) shall not be driven by energy from any other source and shall not have any moving part.

Internal and/or external spraying or injection of water or any substance or matter whatsoever is forbidden (other than fuel for the normal purpose of combustion in the engine).

The adjustment of the supercharging pressure from the cockpit and/or by remote control is forbidden.

2.2) **Weight**

The minimum weight is:

— 750 kg (cars fitted with a Category 1 engine).

— 900 kg (cars fitted with a Category 2 engine).

This is the weight of the car with no persons on board but fully equipped. All the safety parts prescribed and components mentioned in Article 3.4 are included in this weight.

The weight may be checked at any time during the event with the quantity of liquids remaining in the tanks except after the race where the car will be emptied of all the fuel before weighing.

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.

N.B.: Chromium plating of suspension parts is forbidden.

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 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 1030 mm.

— Front plus rear overhangs must not exceed 80 % of the wheelbase.

— The difference between the 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 a 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 windscreen, the centre of which will be 30 cm vertically from the highest point of the roof.

3.4) Cockpit

a) **Definition of the cockpit:** Inner volume in which the driver and the passenger sit.

b) The structural volume of the cockpit must be symmetrical on either side of the longitudinal centre line of the car.

c) Up to a height of 30 cm from the floor, the driver in his normal driving position must be located on one side of the longitudinal centre line of the car.

d) The minimum elbow with above the seat must be 130 cm, measured horizontally and perpendicularly to the longitudinal centre line of the car between the inner faces of the doors.

e) The car must have two footwells defined as two free volumes, symmetrical on either side of the longitudinal centre line of the car. The only components allowed to intrude into the footwells are the steering column and its joints.

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

— its vertical section perpendicular to the longitudinal centre line of the car, which has a minimum cross section of 750 cm² and its minimum width of 25 cm maintained up to a height of minimum 25 cm.

— its length from the pedals to the vertical projection of the centre of the steering wheel.

f) Only the following components can be fitted in the cockpit: communications system, fire extinguisher(s), driver cooling system, rollbar, tool kit, ignition box and other electronic equipment.

These components must not reduce the access defined by the doors and must respect the free sections of the footwells defined above.

They must be covered by a rigid protection if they have sharp edges that could cause injury.

Their fixations must withstand a 25 g deceleration.

g) 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 authorised.

A safety spring must be in place on the nut throughout the duration of the event and must be replaced after each wheel change. These springs must be painted dayglo red/orange. Spare springs must be available at all times.

Alternatively, any other system approved by FISA must be used.

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, in vertical projection, seen from above.

The limit of the air intakes is given by the top of the windscreen for open cars, and by the highest point of the roof for closed cars.

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, considering that the opening is of the same size for the driver and for the passenger.

— The bodywork can be made from 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 a half of their circumference, and at least the whole width of the tyre. Behind the rear wheels, the bodywork must terminate below the axis of the rear wheels.

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

All parts having an aerodynamic influence and all parts 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 forward of the vertical plane tangent to the fore of the complete rear wheels, a solid, flat, hard, rigid and continuous surface must be provided over the whole width of the car and over a length of at least 90 cm (measured along the longitudinal axis of the car). This plate, the entire surface of which must be an integral part of the chassis-body unit, must not have any degree of freedom or any provision for adjustment in relation to

this unit. No space may exist between the flat bottom defined above and the chassis-body 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.

- The maximum height of any point of the rear air extraction tunnel (venturi) measured from the plane defined by the reference plate defined above must under no circumstances exceed 280 mm.

A tunnel/venturi includes any underside surface of the bodywork facing the ground, excluding the wheel arches, the rearmost wing and the bodywork behind the complete rear wheels in frontal projection.

All these surfaces must be solid, hard, rigid, fixed, impervious and geometrically continuous.

No flexible material may be used to close the only apertures allowed in tunnels/venturi for suspension components, driveshafts and jacks.

Exhausts cannot exit in the tunnels.

3.8) Lighting equipment

At the rear, the cars will be equipped with at least two "stop" lights, as well as two rear red lights. They will be situated symmetrically on either side of the car's longitudinal axis in a visible position. All cars will be equipped with a rear red rain light, of which the optical seen from the rear will have a flat vertical surface of at least 50 cm² (minimum 21 Watts) and will be clearly visible from the rear. It is recommended that the optical conforms to the EEC 77/538 or EEC 38 standards for high intensity lamps.

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 the 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 (1000 psi) and a temperature of 230°C (446° F).

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

Fuel may be used up to a maximum octane rating of 99 RON, with no other additive except that of a lubricant on current sale which cannot increase the octane rating, or water.

The fuel must have the following characteristics:

- A maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 % and

- a maximum of 2.5 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitro-compounds or other power-boosting additives.

— Maximum density of 0.78 (measured according to the standard ASTM D1298).

— Maximum lead quantity: 0.40 g/l.

— Maximum benzene quantity: 5 % in volume.

If the fuel of the country of the event is not of a sufficient quality for use by competitors, the ASN of the organising country must ask the FISA for a waiver in order to enable the use of fuel corresponding to the characteristics defined above.

The storing of fuel on board the car at a temperature more than 10 degrees centigrade below the ambient temperature is forbidden.

The use of a specific device (either on board or outside the car) to reduce the fuel temperature below the ambient temperature is forbidden.

For diesel engines:

The fuel must correspond to the following specifications:

— Hydro-carbon content, % in weight 99.0 min

— Density 0.860 max

— Cetane n° (ASTM D613) or calculated 60 max

Cetane index (ASTM D976/80)

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

4) SAFETY EQUIPMENT

4.1) Cables, lines and electrical equipment

Unless the cables, lines and electrical equipment such as battery, fuel pump, etc. 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 liquid-tight and fireproof 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 pressure (1,000 psi) and a 230°C (446°F) temperature.

All electrical circuits should be enclosed in 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 parts, etc.) and inside the cockpit against any risk of fire (fuel pipes only) is compulsory.

4.3) Safety harnesses

The wearing of two shoulder straps, one abdominal strap and two straps between the legs is obligatory; fixation points on the bodysell: 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. This harness must comply with FIA Standard n° 8853.

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.

Extinguisher bottles must not be located forward of the front wheel axis.

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 at 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 compartment: 10 secs.

4.5) Safety Rollbars

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 at 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 257.1, page 277).

The installation on each side of the car of two longitudinal tubes completing the structure of the roll cage is recommended. The tubes must not inhibit access to the cockpit and must comply with the characteristics defined below.

The various authorised diagonal struts are the following: MQ, MS, NP, NR.

The safety roll-bars must be covered with non-combustive shock absorber foam.

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

- Cold-drawn seamless Carbon steel - E30 daN \varnothing 48.3 x 2.6
 - Alloy steel Type 25 CD4 SAE 4125 etc... E-50 daN \varnothing 42.4 x 2.6
- Steels tubes of \varnothing 1.75 inch x 0.090 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 highest possible quality (preferably aircraft). Square headed bolts and nuts should not be used.

3) A 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 under protecting gas).

Although the good external 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 diameter as the tubing 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 of the 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 3 mm thick with an extension along a vertical component of the body (see drawings 19 to 33, Article 253, Appendix J).

This plate must have a total surface of at least 120 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 at 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 drawings 22 to 33, Article 253).

Should the roll-bar be supported on a rear shelf which is not sufficiently rigid, 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 34 to 39, Article 253, Appendix J.

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 connections in accordance with drawings 35 and 37 must be used only 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. It must be accompanied by a drawing or a photograph of the said roll-bar, 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, or at the lower part of the main hoop of the roll-bar, either on the right or on 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. It must be located inside the contour of the bodywork.

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 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 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 coupling to fit the standardised filler mounted on the car. The dimensions of this filler are given in the diagram of Article 252, Appendix J.

— 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 a non return valve or valves having the same closing system as that of the standard filler, and 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.

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

The overflow bottles and the independent storage tanks must comply with the diagrams n° 252-1 or 252-2 and 252-3 or 252-4 of Article 252 in Appendix J.

— All metal parts of the refuelling system from the coupling over the flow-meter to the tank and its rack must be connected electrically to the earth.

A 90° cut off valve situated close to the main supply tank, controlling the fuel flow, must be manned at all times during refuelling.

All hoses, valves, fittings and couplings used must have a maximum inner diameter of 50 mm (2 inches).

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 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 cockpit or engine compartment or come into contact with any part of the exhaust system.

The fuel tanks must be efficiently protected (see Article 4.14).

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

Headrest of a minimum area of 20 x 20 cm must be fitted, covered with non-combustive shock absorber foam.

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 shall be at least 20 cm from the lateral flanks and 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 a 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.

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).

4.15) Survival cell and frontal protection

The chassis structure must include two continuous box members, one on the driver side and one on the passenger side.

To connect these side box members which are an integral part of the chassis, the chassis must have at least one transversal hoop at the main rollbar level, one at the front rollover bar level and one in front of the pedal box.

Between the main rollbar and the transversal hoop in front of the pedal box, the side-protection structure must have a minimum height of 30 cm.

Each box member shall extend from behind the driver to a point at least 60 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.

It must be an extension of all the skins or tubes of the main chassis construction or additional reinforcements like tubes, etc. and must determine a chassis cross-section of at least 800 cm² at a point 30 cm before the pedals in inoperative position. The structure in front of this area need not be an integral part of the chassis but it must be solidly attached. (i.e. through bolts requiring tools for removal) and must be designed according to the drawing n° 257.2 page 277.

This frontal impact absorbing structure must respect the minimum total chassis cross-section of 800 cm².

Throughout its length from behind the driver to the transversal hoop in front of the pedal box, each box member must have a minimum area of 150 cm².

The structural material in the cross-section of each box member shall have a minimum tensile strength of 31 kg/mm², a minimum area of 10 cm² and a minimum panel thickness of 1.5 mm on composite or non metallic materials, or an area of 5 cm² and a thickness of 1 mm on metallic materials.

Forward of the front hoop, the box members may taper to a minimum cross-section of 100 cm² and a minimum structural material cross-section of 5 cm² for composite or non metallic materials, or 2.5 cm² for metallic materials.

All holes and cutouts in the boxes shall be strongly reinforced and all material sections through these holes shall comply with the minimum material area requirements for unstabilized and for stabilized skins.

The space in the members must be reinforced by transversal connections or sandwich structures.

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.

This frontal protection in front of the plane at 30 cm before the driver's feet in the inoperative position can be designed freely when the total car undergoes a crash test as follows:

- The total weight of the car must be:
 - 850 kg - Category 1
 - 1000 kg - Category 2
- The velocity of impact 13.9 m/s.
- The protective structure must be rigid and fixed and must have no freedom of movement during the crash procedure.

The result of the test must correspond with the following data:

- Maximum average deceleration 25 g.
- Deformation tolerance (m): Max: 0.50/Min: 0.40

All deformations after the crash must be exclusively in the zone in front of the driver's feet.

Such tests must be carried out in recognised test laboratories approved by FISA in either Italy, Japan, Great Britain, the USA, Germany or France.

A dossier defining the structure, test method and results shall be submitted to FISA before the use in a Group C event of the relevant model of car.

Any significant modification introduced into the frontal part of the chassis structure shall require it to undergo a further test.

N.B.: For cars which took part in the 1988 World Sports Prototype Championship, the above mentioned conditions will not be compulsory in 1989 and 1990, but the prescriptions of article 4.15 of the 1988 regulations shall be applicable, replacing the prescribed distance of 50 cm in front of the soles of the driver's feet by a distance of 60 cm.

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) Brakes

The braking system must be designed in such a way that the brake pedal controls all wheels normally. In the event 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 between 45 cm and 10 cm above 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.

Art. 259 - **Group GTC Grand Touring Competition Regulations** (until 31.12.1990)

Cars in the GTC Grand Touring Competition Group must conform to the Group B regulations (Art. 256 of Appendix J) except with regard to the following points:

1) Evolutions (ET or ES) are authorised.

2) Minimum weight: 1000 kg.

3) The doors, bonnet, boot and windows (except the windscreen) may be made from a different material but their shape must be identical to the homologated parts.

4) The fuel feed system (Paragraph 5.1.8. of the Group A/B regulations) and the exhaust system (Paragraph 5.1.16.) including the manifolds, are free.

5) For supercharged engines, the compressors and/or turbochargers must conform to the homologated models, subject to modifications authorised by paragraph 5 - General Conditions of the Group A/B regulations.

Adjustment of the supercharging pressure from inside the cockpit or from a distance is forbidden.

6) The width of the rim/tyre assemblies must conform to the Group B regulations or to the original dimensions homologated.

7) The maximum total quantity of fuel allocated for the whole distance or for the whole duration of the event is calculated (in litres) by the product: distance of the race in km \times 0.51.

For a race of 24 hours, the total quantity of fuel allocated is 2,550 litres.

8) The maximum amount of fuel which can be carried on board is 100 l.

Art. 260 - **Group C3 Sports-Prototype Junior Regulations**

Same specifications as for Group C, apart from with regard to the following points:

2) SPECIFICATIONS

2.1) Engine

By engine is understood the whole made up by the block, cylinders and cylinderhead(s). All modifications are allowed, but the engine must compulsorily be a reciprocating engine, without forced induction, with a maximum cubic capacity of 2.1 litres, Wankel type (coefficient 1.8). Oval pistons and water injection are forbidden.

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

2.2) Weight

The cars must have the following minimum weight:

Engine capacity less than or equal to 1000 cc:	500 kg
" " from 1000 cc to 1300 cc:	535 kg
" " from 1300 cc to 1600 cc:	560 kg
" " from 1600 cc to 2000 cc:	600 kg
" " from 2000 cc to 2500 cc:	640 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 and after emptying the car of all the fuel (on the understanding that it is forbidden to add oil, water or any other liquid before the weighing)

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.

3) OTHER PRESCRIPTIONS

3.1) Exterior dimensions

Maximum width: 200 cm.

Maximum length: 480 cm.

The height measured vertically from the lowest point of the flat surface defined in Article 3.8 to the highest point of the car must not exceed 1030 mm, except with regard to the rollbar which must not give rise to an aerodynamic structure.

- 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

Closed cars: See Group C.

Open cars: Doors are optional. If they exist, they must respect the dimensions laid down in the previous paragraph (closed cars), as far as the opaque part is concerned. If they do not exist, the bodywork at the sides of the cockpit must respect these dimensions.

3.3) Windscreen

Closed cars: See Group C.

Open cars:

In the case of an open car, a windscreen is optional and its dimensions are free.

3.4) Cockpit

See Group C, except:

— For cars manufactured before 1.1.87, by providing proof of their date of manufacture, this minimum width can be reduced to 110 cm and to 100 cm for cars of less than 1000 cc.

— For open cars, it must be possible to insert vertically the horizontal template shown on drawing 259.2, page 278, into the bodywork and chassis openings corresponding to the volume for the pilot and the passenger. This measurement will be done with the steering wheel removed down to the seat back rests.

3.6) Transmission

See Group C, except:

The maximum number of gearbox ratios is set at 5, not including the reverse gear.

3.7) Suspension parts

It is forbidden to chromium-plate steel suspension parts.

3.8) Bodywork

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

The body shall cover all mechanical components; the only parts which may protrude are the exhaust and/or intake pipes and the top of the engine.

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, considering that the opening is of the same size for the driver and 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 louvres 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 (tolerance ± 5 mm), hard, rigid and continuous surface must be provided in which a rectangle of 100 cm (measured along the transverse axis of the car) by 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 space will exist between the flat bottom defined above and the chassis-body 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.

3.9) Lighting equipment

See Group C, except the second paragraph which will only be applicable in case of night racing.

3.11) Windscreen wipers

If the cars equipped with a windscreen, at least one windscreen wiper, in working order, is obligatory.

3.14) Fuel

For petrol engines:

— In Hill-Climbs:

The fuel may be used to a maximum octane rating of 99 RON, with no other additive except that of a lubricant on current sale which cannot increase the octane number, or water.

The fuel must have the following characteristics:

Either (leaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 2.5 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitro-compounds or other power-boosting additives.

— maximum density 0.78 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.4 g/l.

— maximum quantity of benzene: 5 % in volume.

Or (unleaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 3.7 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitro-compounds or other power-boosting additives.

— maximum density 0.79 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.013 g/l.

— maximum quantity of benzene: 5 % in volume.

If the fuel of the country of the event is not of a sufficient quality for use by competitors, the ASN of the organising country must ask the FISA for a waiver in order to enable the use of fuel corresponding to the characteristics defined above.

For other events:

For petrol engines, only commercial fuel or petrol having the following characteristics will be permitted:

— 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 Sports-Prototype Group 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.

For diesel engines: See Group C.

4.5) Safety roll-bars

4.5.1) Closed cars: 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 at 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 n° 257.1, page 277).

The various authorized diagonal struts are the following: MQ, MS, NP, NR.

The safety roll-bars will be covered with non-combustible shock-absorber foam. This structure shall be built with tubes with at least the following characteristics:

- | | |
|---|----------------|
| — Cold-drawn seamless
Carbon steel
E30 daN | Diam. 45 x 2.5 |
| — Alloy steel Type 25 CD4
SAE 4125 etc
50 daN | Diam. 40 x 2.5 |

Steels tubes of Diam. 1.75 inch x 0.090 are also accepted.

4.5.2) Open cars: The main roll-bar behind the front seats must be symmetrical in relation to the longitudinal axis of the car, and must respect the following dimensions:

— **Height:** the top of the roll-bar must protrude at least 5 cm beyond the height of the driver's helmet when he is normally seated behind the steering wheel.

— **Width:** Measured within the limits of the vertical pillars of the roll-bar, the width should be at least 20 cm, measured at a point 60 cm above the driver's and forward passenger's seats (on line perpendicular to the vertebral column) from the longitudinal axis of the seat towards the outside.

— **Longitudinal position:** the longitudinal distance between the top of the roll-bar and the driver's helmet when he is normally seated at the wheel must not exceed 25 cm. Will also be considered as open cars, cars which do not have a supportive structure between the top of the windscreen side posts and those of the rear window (if there is one).

The structure of the rollbar must conform to the drawing n° 259.1, page 277, or to the drawing n° 257.1, page 277, and to the foregoing table, to the specifications concerning removable connections, and to the General Considerations.

The fitting of frontal struts, facing forward, intended for the protection of the driver is authorised for open cars, on condition that these struts are removable.

- | | |
|--|----------------------|
| — Cold-drawn seamless
Carbon steel E-30 daN | Diameter 45
x 2.5 |
| — Alloy steel
Type 25 CD4 SAE 4125 etc.
E 50 daN | Diameter 40
x 2.5 |

The various authorized diagonal struts are the following: MQ, MS, NP, NR.

4.11) Petrol tanks

See Group C and in addition:

For hill-climbs, if the total capacity of the fuel tank(s) is not greater than 20 l, the safety tank will not be compulsory on condition that the position of the tank does not protrude beyond 30 cm in any direction from the longitudinal axis of the car, and that it is surrounded by a crushable structure 1 cm thick.

The safety tank is also optional for circuit races of less than 100 km, under the same conditions of installation.

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 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 driver's feet it shall have a cross section of at 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.

N.B.: The prescriptions under Art. 4.15, 4.19, 3.1, 4.5.1 et 4.5.2 are compulsory for any new car built as from 1 st January 1987. The cars which were built before this date are admitted, provided that proof of the date of construction is supplied.

In the case of the latter:

— **Art. 3.1:** The prescriptions concerning the sum and the difference of the overhangs are not to be respected, nor is the maximum width of 200 cm, which is then fixed at 210 cm.

— **Art. 4.5.1 and 4.5.2:** The dimensions of the tubes for the rollbars should then be respectively:

- 42.4 × 2.6 for carbon steel
- 35 × 2 for alloy steel.

Art. - Formula 3000**SUMMARY****Article 1: Definition**

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Article 15: Final text

ARTICLE 1: DEFINITIONS**1) Formula 3000 car:**

Automobile designed solely for speed races on circuits or closed courses.

2) Automobile:

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:

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:

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 Champion Title or Cup, this will be granted to the manufacturer of the car.

7) Event:

An event shall consist of official practice, timed or untimed, and the race.

8) Weight:

Is the weight of the car without 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). 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 system) by any means whatsoever. The injection of fuel under pressure is not considered to be supercharging.

12) Suspension:

All road wheels in contact with the ground, and their 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 independent movement of the axles/wheels and uprights/stub axles giving suspension travel from "bump" to "drop" in excess of the flexibility of the mounting location attachments.

13) Active suspension:

A device whereby vehicle/track conditions are analysed to provide continuously variable load distribution.

Active suspensions are forbidden.

14) Main structure:

Fully sprung structure of the vehicle to which the suspension and/or spring loads are transmitted, extending longitudinally from the foremost front suspension fixation 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 F3000 listed below are issued by the FISA.

2) Each year, in October, the FISA will publish all changes made to these regulations. All changes affecting the manufacturing of engines will become effective as from the fourth 1 st January following the announcement. All other changes will become effective as from the third 1 st 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 the event.

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

6) Is it 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.

a) The tolerance of plus or minus 5 mm has been introduced into the rules to cover any possible manufacturing problem and not to permit designs against the spirit of the "flat bottom".

b) Any skids, skirts, or other devices protruding from the "flat bottom" (also if into the plus or minus 5 mm) must be removed from the flat bottom area because it could be seen as infringing article 3.7.

c) To protect the bottom of the car skids can be placed outside the flat bottom area but in respect of Art. 3.

d) All other specific part of the car influencing its aerodynamic performance must respect article 3.7. This means that, for example, the lower parts of the front wing end plates must not be flexible and must not be lower than the geometrical plane generated by the "flat bottom" plane surface.

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 (see drawing n° 274.1, page 278).

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.

8) The bodywork around the main rollover structure must permit the installation of a rope/strap (minimum opening 6 x 3 cm) or hook for lifting the car.

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. It must be possible to fix seals if deemed necessary by the scrutineers.
- 3) The adding to the car during the race of any liquid or other material whatsoever or the replacement during the race of any part with another materially heavier is forbidden.

ARTICLE 5: ENGINE

1) Type of engine eligible:

4-stroke engines with reciprocating pistons:

Engine cubic-capacity without supercharging: lower than or equal to 3000 cc;

Number of cylinders: maximum 12.

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

Engines with more than 4 valves per cylinder are forbidden, as well as oval pistons and supercharging.

The normal section of each cylinder must be circular.

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 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 FT3 specifications.

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

List of recognized 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, Spear Road, Industrial Park, Ramsey, NJ 07446.

Fuel Safe Corporation, 15545 Computer Lane, HUNTINGDON BEACH, California 92649.

France:

Kléber-Colombes, Division Tissus Enduits et Applications, 4, rue Lesage-Maille, 76230 CAUDEBEC-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 Minimes, 92400 COURBEVOIE.

Great Britain:

Aero Tec Labs, 37 Clarke Road, Mount Farm Industrial Estate, Bletchley, Milton Keynes, MK1-1LG.

Marston Palmer Ltd, Wobaston Road, Fordhouses, Wolverhampton, WV10 6QJ Staffs.

Premier Fuel Systems Ltd, Willow Road, Trent Lane Industrial Estate, Castle Donington, Derby DE7 2NP.

Italy:

Sekur SpA, Gruppo Pirelli, Via di Torrespaccata 140, 00169 ROMA.

Gipi, Via Abruzzi 7, 20090 OPERA, MILANO.

Japan:

Fujikura Rubber Works Ltd, N° 2-Chome, Nishigotanda Shinagawa-ku, Tokyo.

Kojima Press Ltd, 3-30 Shimolchibacho 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 FISA 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 break the fuel line or to pull it 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 (1000 psi) and a temperature of 230°C (446°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, windcreens, 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.

Fuelling the car on the grid other than by gravity from a maximum height of 2 metres above the ground is forbidden.

Any storage of fuel on board the car at a temperature more than ten degrees centigrade below ambient temperature is forbidden.

The use of any specific device (whether on board or otherwise) to decrease the temperature of the fuel below the ambient temperature 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 (1000 psi) and a temperature of 230°C (446°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.

The container shall include a lateral transparent panel to check the possible oil level.

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, at any time during the event, can be selected while the engine is running and used normally, 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.

3) Air ducts for the purpose of cooling the front brakes shall not protrude beyond:

— A plane parallel to the ground situated at a distance of 140 mm above the horizontal centre line of the wheel.

— A plane parallel to the ground situated at a distance of 140 mm below the horizontal centre line of the wheel.

— A vertical plane parallel to the inner face of the front rim and displaced from it by 120 mm toward the centre line of the car.

Furthermore, such ducts, when viewed from the side must not protrude beyond the periphery of the tyre in a forward sense or the rim in a rearward sense.

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 complete wheel 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.

4) The manufacturer shall be obliged to supply three sets of tyres per car and per event, that is six front and six rear tyres, all of which have the same technical characteristics and comply with the same specifications.

Each tyre must bear on its wall and in block letters the reference Formula 3000, the date of manufacturing of the tyre, and the name or logo of the manufacturer.

The manufacturer's logo must not exceed a length of 16 cm.

A section of the wall of the tyre, measuring 12 x 6 cm, must be foreseen for the positioning of a code.

This code will serve the purpose of individualizing the tyres according to the events in which they are used, in order that the tyres distributed for one event may, under no circumstances, be used again for another event.

5) A safety spring must be in place on the fixation nut throughout the duration of the event and must be replaced after each wheel change. These springs must be painted dayglo red/orange.

Alternatively, any other system approved by FISA must be used.

ARTICLE 12: COCKPIT

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

— length: 60 cm;

— width: 45 cm, maintained over 30 cm in a horizontal plane 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.

This harness must conform to FISA standard n° 8853.

ARTICLE 13: SAFETY

1) **Fire extinguishers**

a) **Extinguishing product:**

BCF (CF₂ClBr) - BTM (CBrF₃) - TDE (C₂Br₂F₄).

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 the 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 control switch which may be operated at a distance by the rescue personnel by means of 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 21 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 50 cm²; can be switched on by the driver when seated normally in the car.

The optical (lens and reflector) must conform to the EEC standard for rear fog lamps of motor vehicles and must carry the corresponding approval marking.

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 these 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, nor 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, the lower part of which fits exactly to the inner profile of the bodyshell, and attached with suitable mounting plates. This type of roll-over 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 monocoque structure shall include two continuous box members, one on each side of the driver. If necessary, these box members can be coupled. The monocoque 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 to be an integral part of the monocoque, 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 cm^2 , a minimum tensile strength of 31 kg/mm^2 and a minimum panel thickness of 1 mm on unstabilised skins or 5 cm^2 area and 0.5 mm thickness on stabilised skins.

4. Throughout its length from behind the driver of the soles of his feet, each box must have a minimum cross sectional area of 150 cm^2 . Forward of this, the boxes may taper to a minimum cross section of 100 cm^2 and a minimal structure material cross section of 5 cm^2 for unstabilised skins or 2.5 cm^2 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 cm^2 for unstabilised and 5 cm^2 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 cm^2 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. Furthermore, at least that part of the box members forward of a transversal section 20 cm to the rear of the soles of the driver's feet, in static position, shall be subjected to an impact test again a solid vertical barrier placed at right angles to the longitudinal axis of the car.

If such a part of the box members is tested independently of the rest of the monocoque structure, it must be attached to the trolley in such a way as to not increase its impact resistance. For the purposes of the test, the total weight of the trolley and test structure or complete car shall be 740 kg and the velocity of impact 10 metres per second.

The resistance of the box members must be such that during the impact an average deceleration of not more than 25 g is recorded, and the final deformation is contained within the zone ahead of the soles of the driver's feet.

Such tests must be carried out under the supervision of a FISA technical

delegate in recognized testing laboratories in either Italy, Great Britain, USA, Germany or France approved by FISA.

A dossier defining the structure, test method and results shall be submitted to FISA before the use in an F3000 event of the relevant model of the car. Any significant modification introduced into the frontal part of the chassis structure shall require it to undergo a further test.

To test the fixations of the forward part of the box members to the monocoque, a side load test shall be performed on a vertical plane passing 40 cm forward of the soles of the driver's feet using a pad of 10 cm length and 30 cm height conforming to the shape of the structure with the centre of area of the pad at the mid point of the height of the structure. A constant transverse horizontal load of 2000 kgf shall be applied to the pad at its centre of area through a ball jointed junction. After half a minute of application there shall be no structural failure of the box members and of any fixation between the box members and the monocoque. During that test, the same part of the box members as defined in the test of § 8 above or the monocoque will be solidly secured but not in such a way as to increase the strength of the fixations being tested. This load test must be carried out with supervision and dossiers similar to those required by § 8 above, with measuring equipment verified by FISA.

Any significant modification introduced in the area tested shall require it to undergo another test.

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) Fuel may be used to a maximum octane rating of 99 RON, with no other additive except that of a lubricant on current sale which cannot increase the octane number, or water.

The fuel must have the following characteristics:

Either (leaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 2.5 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitro-compounds or other power-boosting additives.

— maximum density 0.78 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.4 g/l.

— maximum quantity of benzene: 5 % in volume.

Or (unleaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 3.7 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitro-compounds or other power-boosting additives.

— maximum density 0.79 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.013 g/l.

— maximum quantity of benzene: 5 % in volume.

If the fuel of the country of the event is not of a sufficient quality for use by competitors, the ASN of the organising country must ask the FISA for a waiver in order to enable the use of fuel corresponding to the characteristics defined above.

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

ARTICLE 15: FINAL TEXT

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

Art. 275 - Formula n° 3**SUMMARY****Art. 1: Definitions**

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- 3) Land vehicle
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- 7) Automobile make
- 8) Event
- 9) Weight
- 10) Racing weight
- 11) Cylinder capacity
- 12) Supercharging
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- 2) Publication date for modifications
- 3) Previous notice for change in the throttling flange
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- 1) Braking system
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Art. 12: Wheels and tyres

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- 1) Architecture access, dimensions
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Art. 14: Safety

- 1) Fire extinguishers
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- 3) Red light
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- 5) Headrest
- 6) Chromium plating of suspension
- 7) Magnesium use
- 8) Titanium use

Art. 15: Fuel

- 1) Fuel
- 2) Air

Art. 16: Final text

ARTICLE 1: DEFINITIONS

1) **Formula 3 car:** Four-wheel automobile designed solely for speed races on circuits or closed courses.

2) **Automobile:**

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:**

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:**

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 Champion Title or Cup, 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 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.

15) **Active suspension:**

A device whereby vehicle/track conditions are analysed to provide continuously variable load distribution.

ARTICLE 2: REGULATIONS

1) The following regulations governing the construction of F3 cars listed below are issued by the FISA.

2) Each year, the FISA will publish all changes made to these regulations.

All such changes will take effect on the third 1 st January following their publication.

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

3) The FISA reserves its right 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 Sporting 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 metal surface.

7) Active suspensions are forbidden.

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 185 cm.

2) The coachwork ahead of the front wheels may be extended to an overall maximum width of 135 cm.

Nevertheless, any part of the coachwork ahead of the front wheels exceeding an overall width of 95 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 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.

No part 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 47.5 cm each side of the longitudinal axis of the car.

4) Coachwork behind the centre-line of the rear wheels shall not exceed in width 95 cm.

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

No part of the car shall be more than 100 cm in front of the 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) 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 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.

a) The tolerance of plus or minus 5 mm has been introduced into the rules to cover any possible manufacturing problem and not to permit designs against the spirit of the "flat bottom".

b) Any skids, skirts, or other devices protruding from the "flat bottom" (also if into the plus or minus 5 mm) must be removed from the flat bottom area because it could be seen as infringing the remainder of this article.

c) To protect the bottom of the car skids can be placed outside the flat bottom area but in respect of Article 3.d

d) All other specific part of the car influencing its aerodynamic performance must respect the remainder of this article. This means that, for example, the

lower parts of the front wing end plates must not be flexible and must not be lower than the geometrical plane generated by the "flat bottom" plane surface.

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.
- must not be in contact with any not entirely suspended 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 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.

ARTICLE 5: ENGINE

1) Engines with reciprocating pistons:

- a) Engine cylinder capacity: inferior or equal to 2,000 cm³.
- b) Maximum number of cylinders: 4.
- c) Supercharging: forbidden.

2) **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 1.8 the volume determined by the difference between the maximum and minimum capacity of the working chamber.

3) The engine block and engine head castings, machining completed, must be those of an engine equipping a car model of which the FISA has ascertained the series-production of at 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 and to use "helicoils" and to modify or close the lubrication holes in the cylinderhead. As the position of the injectors is free, the standard holes can be closed by adding material or parts.

The parts added to the induction system must be permanently attached only to the inlet manifold not to the cylinder head.

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

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.

4) Vacuum tightness control apparatus of the induction system for engines:

The control apparatus described hereafter represents the ultimate method of verification of the vacuum tightness of induction systems, without the possibility of appeal. All 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 section-pump creates in the induction system a depression superior 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) 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.

- 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 FT3.

- a) **Safety fuel tanks approved by the FISA:**

The FISA 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 FISA:

Entrants must use safety fuel tanks made by a manufacturer recognised by the FISA. In order to obtain the FISA's agreement, a manufacturer must prove the compliance of its product with the specifications approved by the FISA.

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 W. Allen Inc, 401 Agee Road, Grants Pass, Oregon 97526.

Aero Tec Labs, Spear Road, Industrial Park, Ramsey, New Jersey 07446.

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

France:

Kléber Colombes, Division Tissus Enduits et Applications, 4, rue Lesage Maille, 76320 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, 92405 Courbevoie.

Great Britain:

Aero Tec Labs, 37 Clarke Road, Mount Farm Industrial Estate, Bletchley, Milton Keynes, MK1-1LG.

Marston Palmer Ltd, Wobaston Road, Fordhouses, Wolverhampton, WV10 6QJ Staffs.

Premier Fuel Systems Ltd, Willow Road, Trent Lane Industrial Estate, Castle Donington, Derby DE7 2NP.

Italy:

Gipi, Via Abruzzi 7, Opera, Milano.

SEKUR SpA - Gruppo PIRELLI, Via di Torrespeccata 140, 00169 ROMA.

Japan:

Fujikura Rubber Works Ltd., N° 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 (optional): 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, windcreens, 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 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.

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 leakproof 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 a 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.

2) Oil lines external to the cockpit with the exception of lines permanently mounted on the engine, 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 automobiles must have a reverse gear which, at any time during the event, can be selected while the engine is running and used normally by the driver when seated normally in the car.

ARTICLE 11: BRAKES

1) All cars must have a break 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.

Carbon brakes are banned.

2) Air ducts for the purpose of cooling the front brakes shall not protrude beyond:

— A plane parallel to the ground situated at a distance of 140 mm above the horizontal centre line of the wheel.

— A plane parallel to the ground situated at a distance of 140 mm below the horizontal centre line of the wheel.

— A vertical plane parallel to the inner face of the front rim and displaced from it by 120 mm toward the centre line of the car.

Furthermore, such ducts, when viewed from the side must not protrude beyond the periphery of the tyre in a forward sense or the rim in a rearward sense.

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) 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.

5) A safety spring must be in place on the fixation nut throughout the duration of the event and must be replaced after each wheel change. These springs must be painted dayglo red/orange.

Alternatively, any other system approved by FISA must be used.

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 in a horizontal plane from the most rearward point of the seatbackrest towards the front.

The driver must be able to enter and get out of this 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 shoulder straps, one abdominal strap and two straps between the legs is mandatory. These straps must be securely fixed to the car and must be in conformity with the 1985-FISA norma n° 8853 (obtainable from FISA).

ARTICLE 14: SAFETY

1) Fire Extinguishers - Extinguishers systems

a) **Extinguishant:** Halon 1211 or 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 the 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) **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. 14.5.C). It will be marked by a red spark in a white-edged blue triangle with a base of at least 10 cm.

3) All cars must have a red warning light of at least 21 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 50 cm², and can be switched on by the driver.

The optical (lens and reflector) must conform to the EEC standards for rear fog lamps of motor vehicles and must carry the corresponding approval marking.

4) **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 a 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 kg/mm².

The structures shall be linked transversally to the hub 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 not be 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.

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 the said roll-over, and state that this roll-bar can withstand the above mentioned loads.

GENERAL CONSIDERATIONS

a) 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.

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

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

d) 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.

e) For monocoque constructions, consideration should be given to using a roll-bar hoop of 360 degrees, the lower part of which fits exactly to the inner profile of the bodyshell, and attached with suitable mounting plates. This type of roll-bar then becomes a substitute for the frame.

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

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

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

8. The use of titanium in suspension and steering parts, or in the roll-over structure is forbidden.

ARTICLE 15: FUEL

1) The fuel may be used to a maximum octane rating of 99 RON, with no other additive except that of a lubricant on current sale which cannot increase the octane number, or water.

The fuel must have the following characteristics:

Either (leaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 2.5 % and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitrocompounds or other power-boosting additives.

— maximum density 0.78 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.4 g/l.

— maximum quantity of benzene: 5 % in volume.

Or (unleaded fuel):

— a maximum of 99 RON, the measurement being made according to the standard ASTM D2699, the fuel being accepted or rejected according to ASTM D3244 with a confidence limit of 95 %.

— a maximum of 3.7 % oxygen and 1 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitrocompounds or other power-boosting additives.

— maximum density 0.79 (the measurement being made according to the standard ASTM D1298).

— maximum quantity of lead: 0.013 g/l.

— maximum quantity of benzene: 5 % volume.

If the fuel of the country of the event is not of a sufficient quality for use by competitors, the ASN of the organising country must ask the FISA for a waiver in order to enable the use of fuel corresponding to the characteristics defined above.

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.

Art. 277 - **Free formula (Group E)**

1) 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 FISA.

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, 253.13, 253.14, 253.4, 253.9, 257.4.7, 257.4.9, 275.14.3, and Art. 274.3.5 - (1 st paragraph, see 1981 Appendix J - F1 Regulations).

1) 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 to withstand 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 SAE 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 connection 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.

Art. 278 - **National Formulae**

REGISTRATION OF NATIONAL 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 FISA will accept, in compliance with the preceding Art. 2 to register on a voluntary basis any set of prescriptions defining such National Formulae.

The regulations thus registered by the FISA 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 FISA, 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 FISA before December 31 st in order to be valid as from the following year.

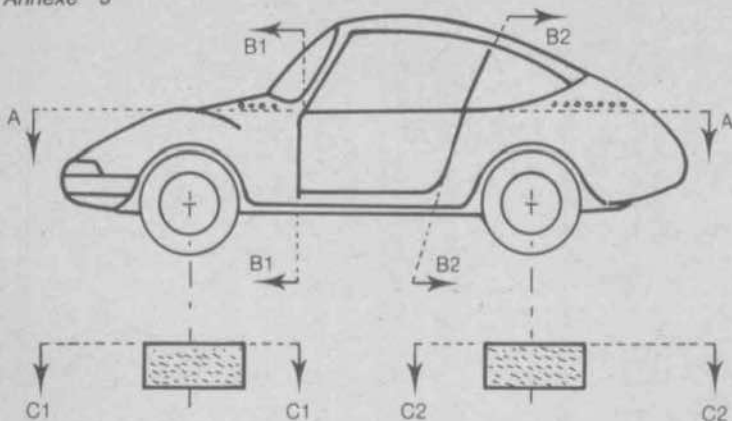
4) From the time when such National Formula is registered, its appellation can be used in those countries where the ASNs have adopted the registered regulations, only for cars entirely complying with the regulations deposited at the FISA.

5) Any application for the registration of regulations for a National Formula should be addressed to the FISA at the latest on October 1 st, to be valid as from January 1 st 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.

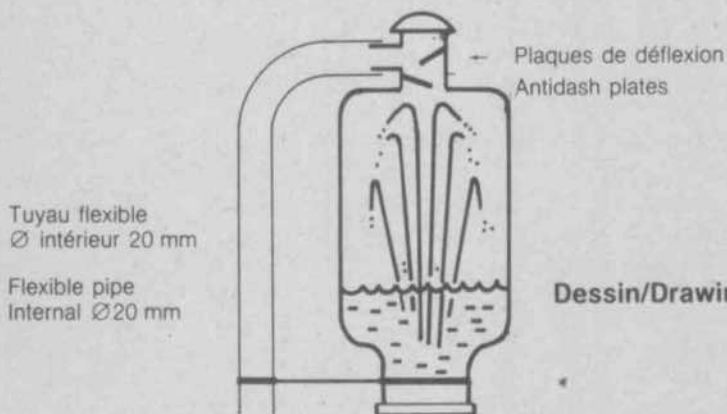
6) The National Sporting Authorities which have adopted a determined National Formula may file an application at the FISA in view of the organisation of an award including several countries.

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.

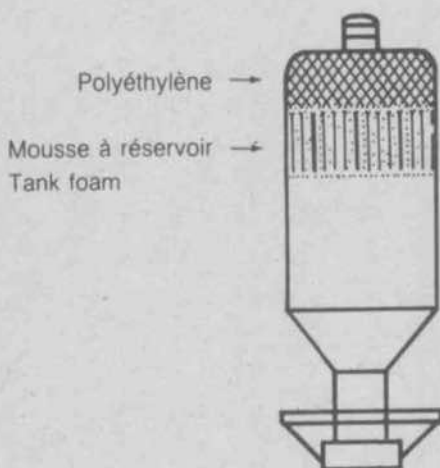
7) The organisation of any other type of international award without the FISA's agreement, as prescribed in the above Art. 6 will entail the application of penalties.



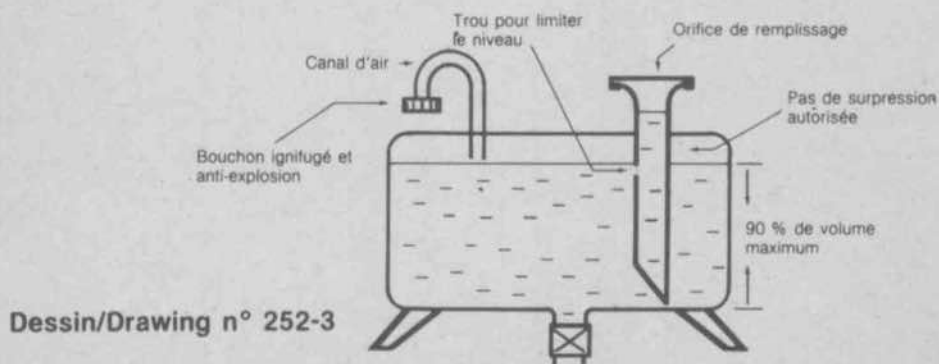
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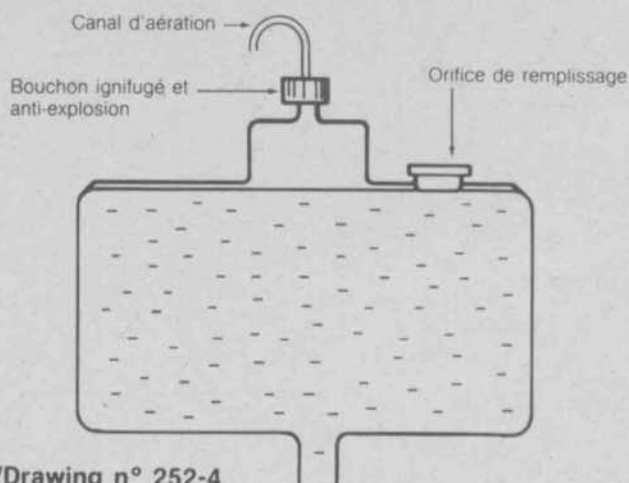
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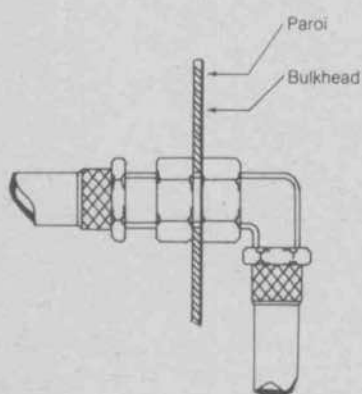
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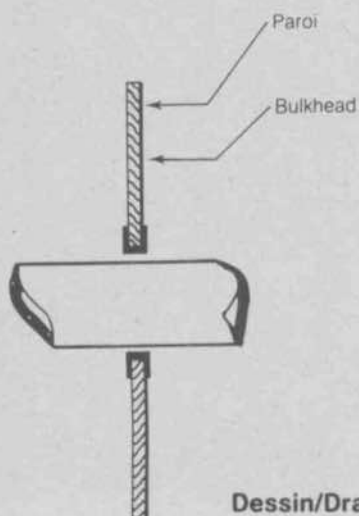
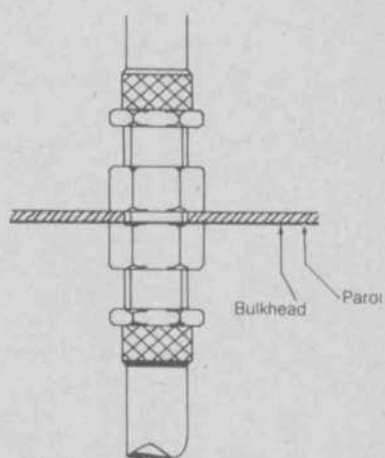
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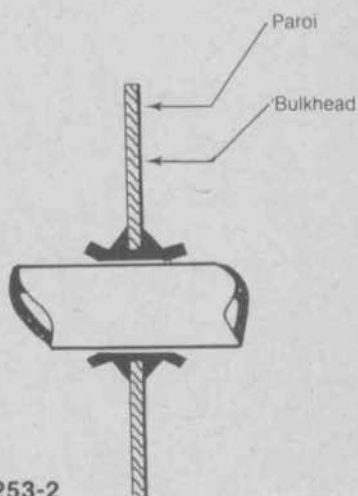
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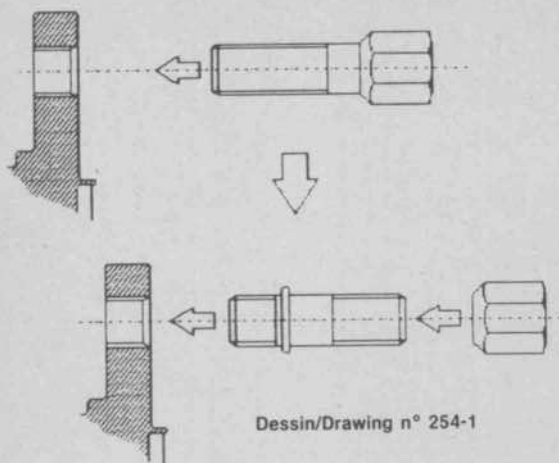


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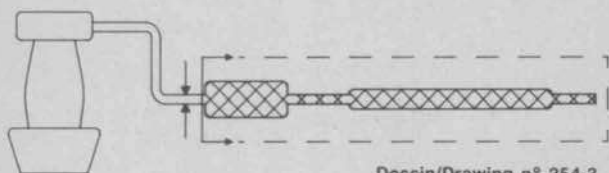
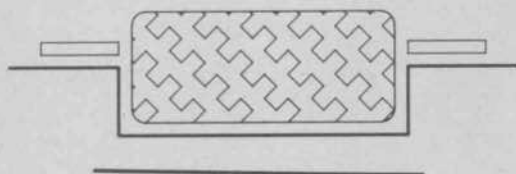


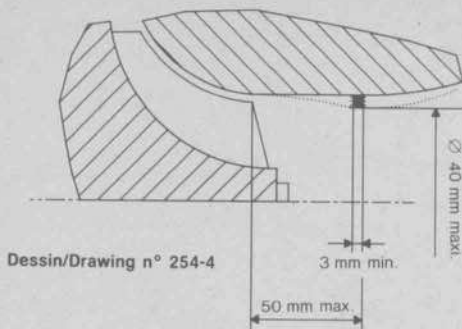
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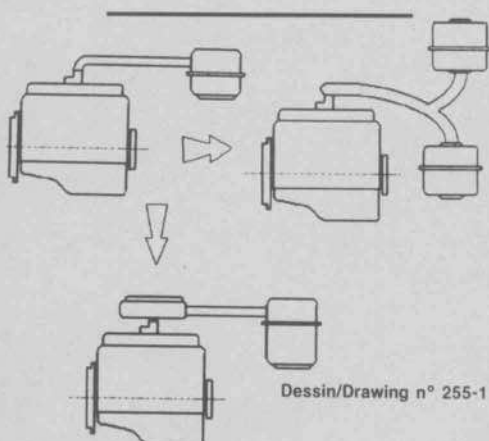


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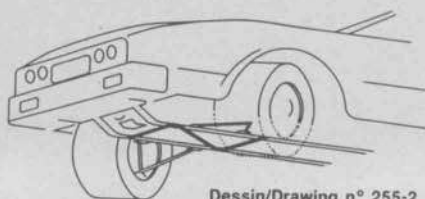
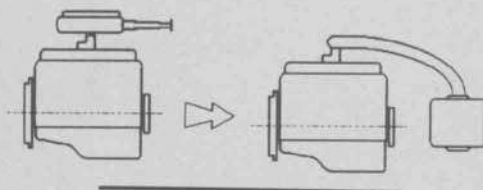




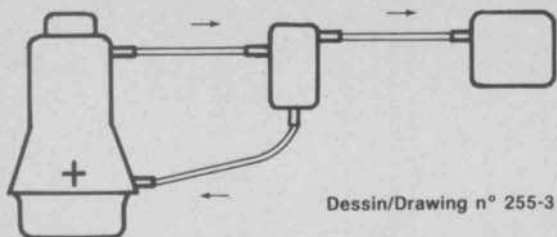
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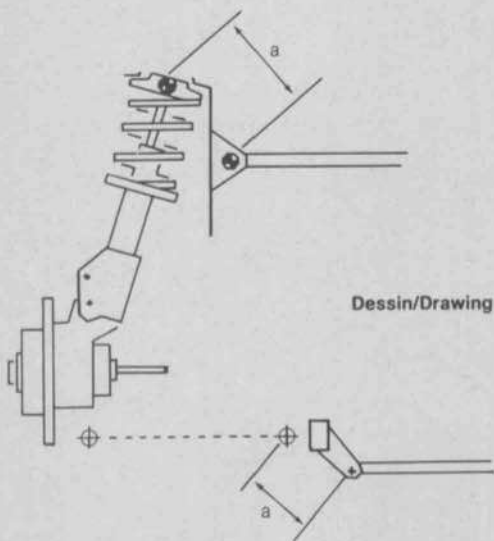
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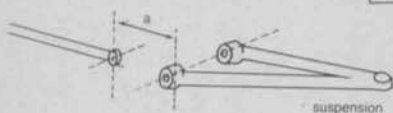
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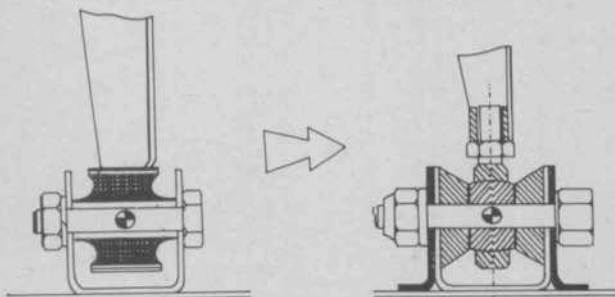
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Dessin/Drawing n° 255-4



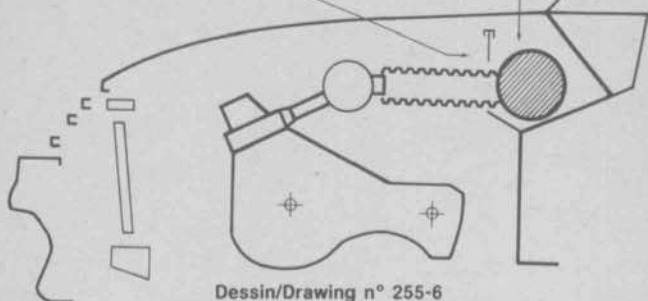
$a \leq 100 \text{ mm}$



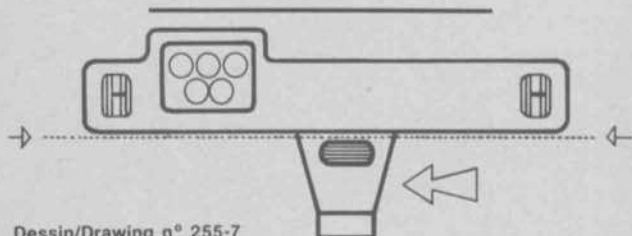
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Trou dans la paroi
Hole in the bulkhead

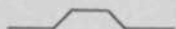
Filtre à air
Air filter



Dessin/Drawing n° 255-6



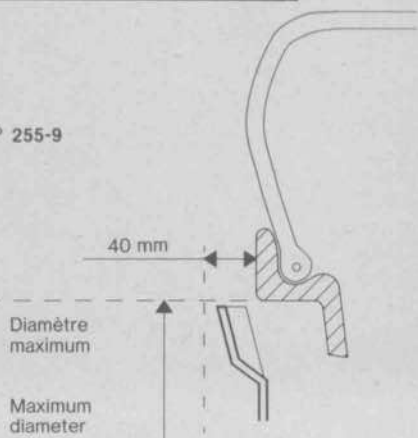
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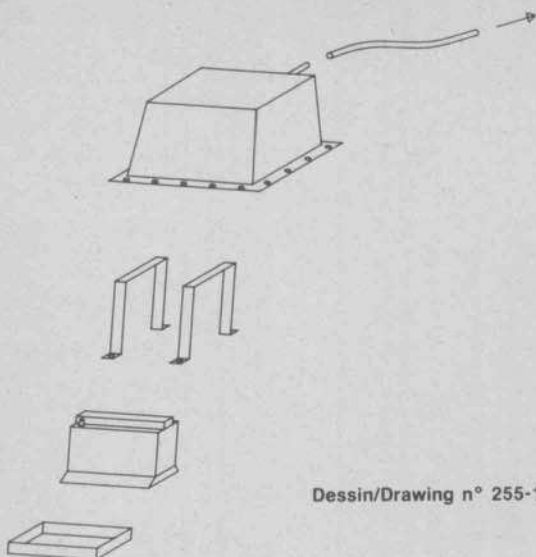


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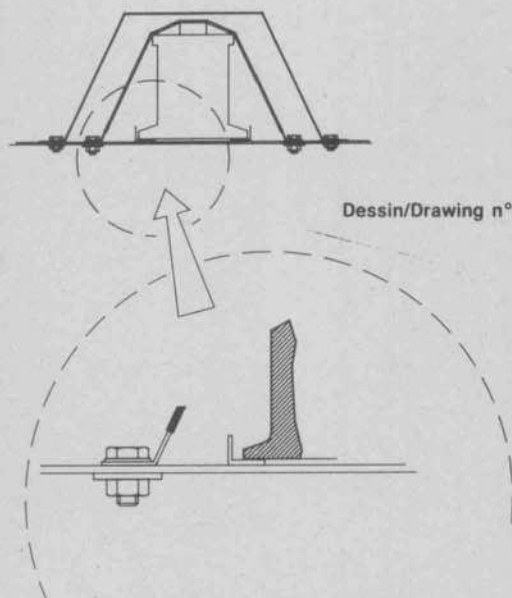


Dessin/Drawing n° 255-9

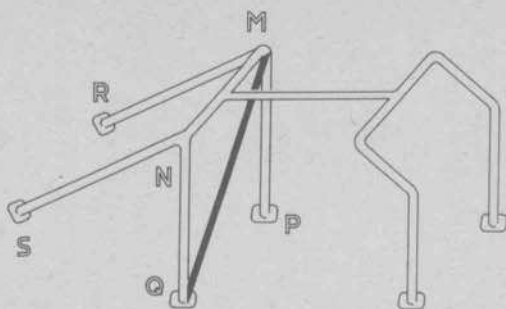




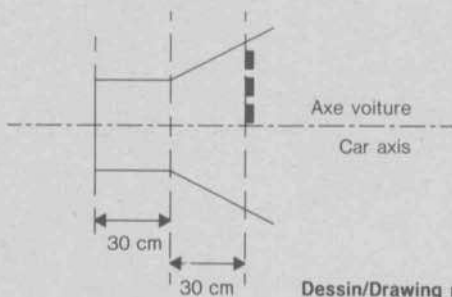
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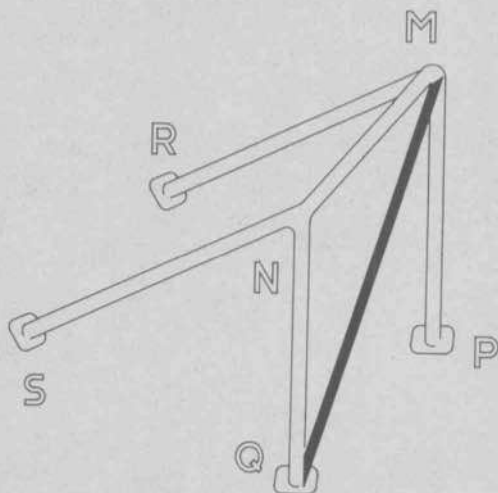
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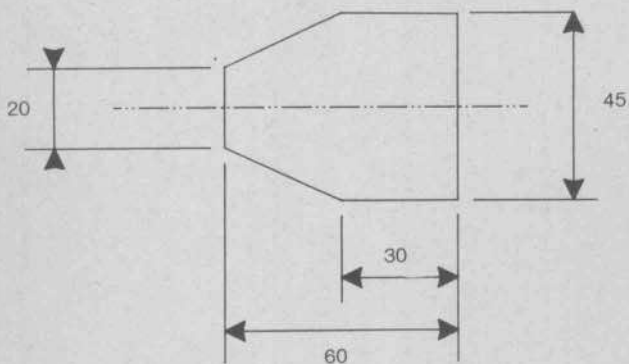
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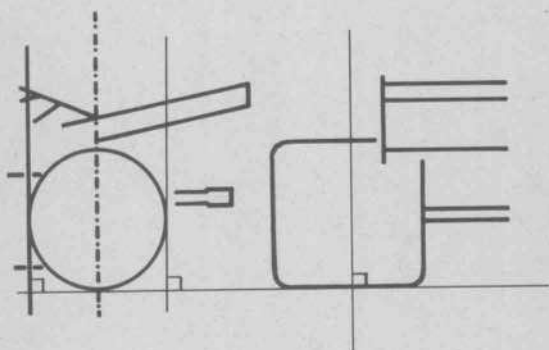
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Dessin/Drawing n° 259-1



Dessin/Drawing n° 259-2



Dessin/Drawing n° 274-1 :