GROUP C TECHNICAL REGULATIONS 1991

SUMMARY

ARTICLE 1 : DEFINITIONS

1) Group C car
2) Automobile
3) Land vehicle
4) Coachwork
5) Automobile make
6) Event
7) Weight
8) Racing weight
9) Wheels
10) Doors
11) Cockpit
12) Survival cell
13) Cubic capacity
14) Supercharging
15) Sprung suspension
16) Main structure
17) Mechanical components

ARTICLE 2 : REGULATIONS

1) Role of the FIA
2) Publication date for modifications
3) Dangerous construction
4) Compliance with regulations
5) Measurements

ARTICLE 3 : COACHWORK AND EXTERIOR DIMENSIONS

1) Length
2) Width
3) Height
4) Overhangs
5) Doors
6) Windscreen
7) Bodywork

ARTICLE 4 : WEIGHT

1) Minimum weight
2) Ballast
3) Adding during the race
4) Liquids

ARTICLE 5 : ENGINE

1) 4 Stroke engines only
2) Cubic capacity
3) Supercharging
4) Cylinders
5) Forbidden engines
6) Spraying of water
7) Exhaust

ARTICLE 6 : FUEL SYSTEM

1) Fuel specification
2) Fuel lines, pumps and filters
3) Fuel tank
4) Tank fillers and caps
5) Refuelling
6) Fuel capacity

ARTICLE 7 : OIL SYSTEM

1) Oil tanks
2) Oil catch tank
3) Oil lines

ARTICLE 8 : ELECTRICAL EQUIPMENT

1) Battery
2) Windscreen wiper(s)
3) Starting
4) Lighting equipment
5) Cables

ARTICLE 9 : TRANSMISSION

1) Four wheel drive
2) Reverse gear

ARTICLE 10 : BRAKES

1) Dual circuits

ARTICLE 11 : WHEELS AND TYRES

1) Width of the complete wheel
2) Number of wheels
3) Safety springs

ARTICLE 12 : COCKPIT

1) Cockpit definition
2) Elbow width
3) Footwells
4) Equipment permitted in the cockpit
5) Cockpit exit time
6) Ventilation
7) Pedals
8) Dashboard hoop
9) Lines in the cockpit

ARTICLE 13 : SAFETY EQUIPMENT

1) Fire extinguishers
2) Safety belts
3) Rear view mirrors
4) Headrest
5) Circuit breaker
6) Towing eye

ARTICLE 14 : SAFETY STRUCTURES

1) General
2) Roll over structures
3) Crushable structures
4) Firewall and floor
5) Survival cell and frontal protection

ARTICLE 1 : DEFINITIONS

1) Group C Car : A two seater closed automobile designed solely for speed races on circuits or closed courses.

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

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

4) Coachwork : All entirely sprung parts of the car licked by the external air stream, except the parts definitely associated with the mechanical functioning of the engine, transmission and running gear. Any air intake shall be considered to be part of the coachwork.

5) Automobile Make : An automobile make is a complete car. When a 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 the name of the car manufacturer. The name of the car manufacturer shall always precede that of the engine manufacturer. Should a hybrid car win a Championship Title, Cup or Trophy, this will be granted to the manufacturer of the car.

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

7) Weight : Is the weight of the car without the driver at all times during the event.

8) Racing weight : Is the weight of the car in running order with the driver aboard and the fuel tank full.

9) Wheels : Flange and rim.
Complete wheels : Flange, rim and tyre.

10) Doors : That part of the coachwork that opens to give access to the driver and passenger compartments.

11) Cockpit : Inner structural volume which accomodates the driver and the passenger.

12) Survival cell : A continuous closed structure containing the cockpit and the fuel tank.

13) Cubic capacity : The volume swept in the cylinders of the engine by the movement of the pistons. This volume shall be expressed in cubic centimetres. In calculating engine capacity the number Pi shall be 3.1416.

14) 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.

15) Sprung suspension : All road wheels/axles must be suspended from the body/chassis unit by a springing medium (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 uprights/stub axles giving suspension travel from "bump" to "droop" in excess of the flexibility of the mounting location attachments.

16) 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.

17) 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.

ARTICLE 2 : REGULATIONS

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

2) Each year in October, the FIA will publish all changes made to these regulations. All such changes will take effect on the second 1st January following their publication. Changes made for safety reasons may come into force without notice.

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

4) 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 an event.

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

ARTICLE 3 : COACHWORK AND EXTERIOR DIMENSIONS

1) Length : The overall length of the car must not exceed 4800 mm.

2) Width : The overall width of the car including the complete wheels shall not exceed 2000 mm, with the steered wheels in the straight ahead position.

3) Height : The height measured vertically from the lowest point of the flat surface as defined under Article 3.7.3 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.

4) Overhangs : 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.

5) Doors

5.1 - Two doors are compulsory.

5.2 - 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 500 mm wide and 300 mm high measured vertically, to be inserted in it. The corners of the rectangle or parallelogram may be rounded to a maximum radius of 150 mm.

5.3 - The doors must have a window of transparent material into which a parallelogram must be able to be inscribed, the horizontal sides of which shall measure at least 400 mm. The height measured on the surface of the window perpendicularly to the horizontal sides, shall be at least 250 mm.
The corners of the parallelogram may be rounded to a maximum radius of 50 mm. The measurements shall be taken across the chord of the arc.

5.4 - Each door must have only one outside handle which must be of a lever type operated by pulling upwards, and must be clearly indicated by an arrow of a red or contrasting color.

5.5 - The doors when open must afford free access to the driver and passenger compartments.

5.6 - The doors must be designed in such a way as to never restrict the lateral visibility of the driver.

5.7 - Sliding doors are forbidden.

6) Windscreen

6.1 - A windscreen made of one piece of laminated glass, or equivalent material approved by FISA, is compulsory.

Windscreen safety fixing devices bolted or screwed to the car structure are compulsory (minimum number : 5).

6.2 - The shape of the windscreen must be such that at a distance of 50 mm measured vertically downwards from the highest point of the transparent part, the width of the glazed surface is at least 250 mm measured across the chord of the arc on either side of the longitudinal axis of the car.

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

6.4 - It must be possible to fit on the windscreen a vertical band 100 mm high by 950 mm (measured horizontally) across the chord of the arc between the inner faces of the windscreen, the centre of which shall be 300 mm vertically downwards from the highest point of the roof, excluding the air intakes.

7) Bodywork :

7.1 - The bodywork must cover all mechanical components in vertical projection seen from above.

7.2 - Any air intake higher than the highest point of the windscreen must not be forward of that point.

7.3 - 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, hard, impervious, flat, rigid and continuous surface must be provided over the whole width of the car and over a length of at least 900 mm measured along the longitudinal axis of the car.
This entire surface must be an integral part of the chassis/body unit and 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.
To help overcome any possible manufacturing difficulties a tolerance of +/- 5 mm will be permitted on the "flat bottom" referred to above. This tolerance is not to permit designs against the spirit of the "flat bottom".

7.4 - No part having an aerodynamic influence and no part of the coachwork may under any circumstances be located below the geometrical plane generated by the plane surface provided for by Article 3.7.3.

7.5 - Any part having an aerodynamic influence and any part of the coachwork 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.

7.6 - 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.

7.7 - The maximum height of any point of the rear air extraction tunnel or venturi measured from the geometrical plane referred to in Article 3.7.3 must not exceed 280 mm.
A tunnel or 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 holes allowed in the tunnels or venturis for suspension components, driveshafts and jacks.
Exhausts cannot exit in the tunnels.

7.8 - Behind the rear wheels, the bodywork should terminate below the axis of the rear wheels.
Any cooling holes in the bodywork directed to the rear must be fitted with louvres or any other similar device to always prevent the tyres being visible from the rear.
The bodywork shall project over the complete wheels so as to cover at least half of their circumference and their whole width.

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

7.10 - In the case of open cars, the opening above the seats must be symmetrical on either side of the longitudinal axis of the car.
An open car is defined by the following prescriptions :
- The shape of the bodywork seen from one side must be identical to the shape seen from the other side.
- Seen from above, a central part separating the driver from the passenger, even if this part is not connected to the bodywork at the seat-back, can be accepted, as long as the opening is of the same size for the driver and for the passenger.
- The bodywork can be made with transparent material, but the rules concerning the windscreen must be respected.

7.11 - The fasteners of the front and rear covers must be clearly indicated by arrows of a red or constrasting color and must be manoeuvrable without tools.

ARTICLE 4 - WEIGHT

1) The weight of the car must not be less than 750 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 solid material whatsoever or the replacement during the race of any part of the car with another materially heavier is forbidden.

4) 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.

ARTICLE 5 : ENGINE

1) Only 4 Stroke engines with reciprocating pistons are allowed.

2) Maximum engine capacity : 3500 cc.

3) Supercharging is forbidden.

4) The maximum number of cylinders is 12.
The normal section of each cylinder must be circular.

5) Wankel, Diesel, 2-stroke and Turbine engines are forbidden.

6) 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 of water or any substance whatsoever is forbidden (other than fuel for the normal purpose of combustion in the engine).

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

ARTICLE 6 : FUEL SYSTEM

1) Fuel specification :

1.1 - The fuel must be used 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 :

- a maximum of 100 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 (or 3.7 % if the lead content is lower than 0.013 g/l) and 0.5 % nitrogen by weight, the remainder of the fuel consisting exclusively of hydrocarbons and not containing any nitrocompounds or other power-boosting additives.
- Density between 0.72 and 0.785 (the measurement being made according to the standard ASTM D1298).
- Maximum quantity of lead : 0.4 g/l or the standard of the country in which the event takes place if it is lower.
- Maximum quantity of benzene : 5 % volume.

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

1.2 - The storing of fuel on board the car at a temperature of more than 10°C below the ambient temperature is forbidden.
The use of any device, whether on board the car or not, to reduce the temperature of the fuel below the ambient temperature is forbidden.

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

2) Fuel lines, pumps and filters :

2.1 - All lines containing fuel must have screw-on connectors, must incorporate a protective outer braid and must be capable of withstanding a pressure of 70 kg/sq.cm and a temperature of 230°C.

2.2 - No lines containing fuel may pass through the cockpit.

2.3 - No fuel pumps or fuel filters may be fitted inside the cockpit.

2.4 - All fuel lines, filters and pumps must be positioned in such a way, that in the event of leakage, it cannot result in fuel entering the cockpit.

3) Fuel tank :

3.1 - All cars must be equipped with a single fuel tank.

3.2 - All the fuel stored on board the car must be situated between the front face of the engine and the driver's back when viewed in lateral projection. However, a maximum of 2 litres of fuel may be kept outside the fuel tank but only that which is necessary for the normal running of the engine.
The fuel tank must be situated at not more than 65 cm from the longitudinal axis of the car.

3.3 - The fuel tank must be a rubber bladder conforming to or exceeding the specifications of FIA/FT3.

3.4 - All rubber bladders must be made by manufacturers recognised by the FIA. In order to obtain the agreement of the FIA a manufacturer must prove the compliance of its product with the specifications approved by the FIA. These manufacturers must undertake to deliver to their customers exclusively tanks complying with the approved standards.
A list of approved manufacturers is available from the FIA.

3.5 - 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.

3.6 - No bladders may be used more than five years after the date of manufacturer.

3.7 - All fuel fittings in the tank (including air vents, inlets, outlets, tank fillers, inner tank connectors and access openings) must be metal fittings bonded into the fuel tank.

3.8 - All connections between the 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 in relation to the chassis in the event of an accident, the connection between the fuel tank and the chassis will fail at a load which is less than 50 % of the load required to pull the bonded metal fitting out of the tank.

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

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

4) Tank fillers and caps :

4.1 - All cars must be fitted with fuel tank fillers and vents which must be single or combined units installed on both sides of the car.
Both fillers and air vents must be equipped with leakproof dry break couplings complying with the dead man principle and therefore not incorporating any retaining device when in an open position (spring loaded balls, bayonet, etc.).
Couplings dimensions are given in the diagrams of Article 252, Appendix J. All filler and vent 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.

4.2 - The tank fillers and caps must not protrude beyond the bodywork.

4.3 - The tank fillers and breathers must be placed where they would not be vulnerable in the event of an accident.

4.4 - Any breather pipe connecting the tank to atmosphere must exit on the outside of the bodywork, must be fitted with a non-return valve and must be designed in such a way as to avoid any liquid leakage when the car is running or upside down.

5) Refuelling :

Refuelling the car by any other means than by gravity with a maximum head of 2 metres above the ground is forbidden throughout the duration of the event.
In the pits, only one individual supply tank complying with the diagram N° 257.2 must be used per car.
The refuelling hose (maximum 40 mm inner diameter) must be provided with a leak-proof coupling to fit the filler mounted on the car.
During refuelling the outlet of the air-vent must be connected with the appropriate coupling to the main supply-tank by an identical 40 mm I/D hose.
All metal parts of the refuelling system from the coupling to the supply tank and its rack must be connected electrically to the earth.
A 90° cut off valve of maximum diameter 40 mm (1"1/2) situated close to the main supply tank and controlling the fuel flow must be manned at all times during refuelling.
All hoses used must have a maximum inner diameter of 40 mm (1"1/2 inches).
Only an unpressurised container not exceeding 12 litres capacity which is vented to air and has a leak proof coupling connecting it to the tank filler on the car can be used for refuelling on the starting grid, as well as an overflow bottle of the type defined in Article 252, Appendix J.

6) Fuel capacity :

The maximum amount of fuel which may be carried on board is 100 l. Any device, system, procedure, construction or design, the purpose and/or effect of which is any increase whatsoever, even temporarily, of the total fuel storage capacity beyond the maximum of 100 litres is forbidden.

ARTICLE 7 : OIL SYSTEM

1) Oil tanks

1.1 - The quantity of oil carried on board must not exceed 20 litres.

1.2 - All oil storage tanks must be located no further than the lateral extremities of the survival cell are from the longitudinal axis of the car, with a maximum of 65 cm from the axis. No part of the car containing oil may be situated aft of the gearbox or final drive casing on a rear wheel drive car. In the case of front wheel drive, no part of the car containing oil may be situated behind the complete rear wheels.

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

2) Oil catch tank : If a car has a lubrication system which includes an open type sump breather, it must vent into a catch tank of at least 3 litres capacity. The catch tank should either be made of transparent material or include a transparent panel.

3) Oil lines

3.1 - All lines containing oil must have screw-on connectors, must incorporate a protective outer braid and must be capable of withstanding a pressure of 70 kg/sq.cm and a temperature of 230°C.

3.2 - No lines containing oil may pass through the cockpit.

ARTICLE 8 : ELECTRICAL EQUIPMENT

1) Battery : The battery or batteries must not be located in the cockpit, must be securely fixed and be completely protected by a box made of insulating material.

2) Windscreen Wiper(s) : The car must be fitted with at least one windscreen wiper which must be in working order throughout the event.

3) Starting : A starter is compulsory with electrical or other source of energy carried aboard the car, and able to be controlled by the driver when normally in his seat.

4) Lighting equipment :

4.1 - All lighting equipment must be in working order throughout the event, even if the event is held entirely in daylight.

4.2 - All cars must be fitted with two red stop lights and two red rear lights. They must be located symmetrically on either side of the longitudinal axis of the car and be mounted in a visible position.

4.3 - All cars must be fitted with at least two headlights.

4.4 - All cars must be fitted with direction indicators mounted at the front and rear of the vehicle (with side indicators mounted to the rear of the front wheel axis).

4.5 - All cars must have at least one red rain light of at least 21 watts in working order throughout the event which :

. Faces rearward and is clearly visible from the rear ;

. Is not mounted more than 10 cm from the car centre line or, in case of two lights, are mounted symmetrically on either side of the longitudinal axis of the car and on the bodywork behind the rear wheels in frontal projection ;

. Has a minimum surface of 50 sq.cm ;

. Can be switched on by the driver when seated normally in the car ;

In addition the lens and reflector must conform to the standards EEC 77/538 or ECE 38 for rear fog lamps of motor vehicles and must carry the corresponding approval marking.

5) Cables :

All electrical circuits must be enclosed in a fire-resistant material.

ARTICLE 9 : TRANSMISSION

1) Four wheel drive cars are forbidden.

2) All cars must have a reverse gear which must be in working order throughout the event. It must be possible for the driver to select the reverse gear while seated normally and with the engine running.

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 operate the brakes on at least two wheels.

ARTICLE 11 : WHEELS AND TYRES

1) The maximum width of the complete wheel is 16".
This measurement will be taken horizontally at axle height, with the tyre at normal running pressure and the car in running order with the driver aboard.

2) The number of wheels is fixed at four.

3) A safety spring must be in place on the wheel nut throughout the duration of the event and must be replaced after each wheel change. These springs must be painted dayglo red or orange.
Alternatively, any wheel retaining device which has been approved by FISA must be used throughout the event.

ARTICLE 12 : COCKPIT

1) Cockpit definition :

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

1.2 - 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.

2) Elbow width :

The minimum elbow width in the cockpit must be 110 cm, maintained over a height of 10 cm and 25 cm in length. This measurement will be taken horizontally and perpendicularly to the longitudinal centre line of the car.

3) Footwells :

3.1 - The car must have two footwells, defined as two free volumes on either side of the longitudinal centre line of the car, each one having a minimum vertical cross section of 750 sq.cm.
This cross section must be maintained from the pedal faces back to the vertical projection of the centre of the steering wheel.

3.2 - The minimum width of each footwell is 25 cm and this width must be maintained over a height of at least 25 cm.

4) Equipment permitted in the cockpit :

4.1 - The only components which can be fitted in the cockpit are :

- . Safety equipment and structures
- . Tool kit
- . Seat and controls necessary for the driving
- . Electronic equipment
- . Driver cooling system.

4.2 - Any of these components must still respect the 750 sq.cm free footwell sections, each side of the centre line of the car.

4.3 - When any of the above equipment is installed in the cockpit, it must still be possible to exit the cockpit in the time specified in Article 12.5.1.

4.4 - These components must be covered by a rigid protection if they have sharp edges that could cause injury. Their fixations must withstand a 25 g deceleration.

5) Cockpit exit time :

5.1 - The cockpit must be designed so as to allow the driver to get out from his normal driving position in 7 seconds through the driver's door and in 9 seconds through the passenger's door.

5.2 - For the purposes of the above tests, the driver must be wearing all normal driving equipment, the seat belts must be fastened, the steering wheel must be in place in the most inconvenient position, and the doors must be closed.

6) Ventilation :

A fresh air inlet to the cockpit and a used air outlet must be fitted to all cars.

7) Pedals :

The soles of the feet of the driver, seated in the normal driving position and with his feet on the pedals and the pedals in the inoperative position, shall not be situated to the fore of the vertical plane passing through the centre line of the front wheels. Should the car not be fitted with pedals, the driver's feet at the maximum forward extension shall not be situated to the fore of the vertical plane referred to above.

8) Dashboard hoop :

The driver, normally seated in his driving position with his seat belts fastened and with the steering wheel in place must be able to raise both legs together so that his knees

reach the plane of the steering wheel in the rearward direction. This action must not be obstructed by any part of the car.

9) Lines in the cockpit :

No lines containing fuel, cooling water, lubricating oil or hydraulic fluid may pass through the cockpit. Only brake lines may pass through the cockpit but without any connection installed inside.
Lines containing hydraulic fluid must have screw-on connectors, must have a protective outer braid and must be capable of withstanding a minimum pressure of 70 kg/cm2 or higher according to operating pressure, and a temperature of 230°C.

ARTICLE 13 : SAFETY EQUIPMENT

1) Fire extinguishers :

1.1 - Extinguishing products allowed are :
BCF (CF2C1Br) ; BTM (CBrF3) ; TDE (C2Br2F4).

1.2 - The minimum capacities are :
. Cockpit : 2.5 kg (closed cars)
5 kg (open cars).
. Engine compartment :
5 kg (closed cars)
2.5 kg (open cars).

1.3 - The extinguisher bottles must be adequately protected, must be mounted in the main structure of the car and must not be mounted forward of the centre line of the front wheels. In all cases the mountings of the extinguishers must be capable of withstanding a deceleration of 25 g. The extinguishing equipment must withstand fire.

1.4 - In the event of discharge both bottles must be released simultaneously.
Discharge time must be as follows :
. Engine compartment : 10 seconds minimum.
. Cockpit : 30 seconds +/- 5 for BCF and TDE
60 seconds +/- 5 for BTM.

1.5 - Any triggering system having its own source of energy is permitted provided it is possible to operate all extinguishers in case of failure of the car's main electric circuit.
The driver must be able to trigger all extinguishers manually when seated normally in the car with his safety belts fastened and the steering wheel in place.

Furthermore a means of triggering from the outside must be combined with the circuit breaker handle (see Article 13.5). It must be marked with a letter "E" in red inside a white circle of at least 10 cm diameter with a red edge.

1.6 - The following weights shall be clearly marked on each bottle :

- Weight of the empty bottle.
- Weight of the extinguishing agent.
- Total charged weight.

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

1.8 - The extinguisher nozzles must be installed in such a way that they are not directly pointed at the driver.

2) Safety belts :

2.1 - The wearing of two shoulder straps, one abdominal strap and two straps between the legs is compulsory. These straps must comply with FIA standard N° 8853.

2.2 - A static test of the anchorages must be performed with loads and procedures as defined in FIA standard N° 8853-85. A dossier including all details of the test must be submitted to FISA.

3) Rear view mirrors :

The car must be fitted with two rear view mirrors, one fitted on each side of the car in order to give an efficient view to the rear. Each mirror must have a minimum area of 100 sq.cm.

4) Headrest :

4.1 - A headrest of a minimum area of 400 sq.cm must be fitted to all cars. Its surface must be continuous and without protruding parts.

4.2 - The headrest must deflect less than 5 cm under an 85 kgf rearward force.

4.3 - The headrest shall be located in a position such that the headrest is the first point of contact with the driver's helmet in the event of an impact projecting the driver's head rearwards, when he is seated in the normal driving position. The distance between the driver's helmet and the headrest should be kept to a minimum so that the distance moved by the helmet under the above mentioned force is less than 5 cm.

5) Circuit breaker :

The driver when seated normally with the 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.
The internal switch must be marked by a symbol showing a red spark in a white edged blue triangle.
There must also be a clearly indicated external handle which rescue personel can operate from a distance by a hook. This handle must be located at the lower part of the windscreen pillar on the driver's side.

6) Towing eye :

6.1 - A towing eye with a minimum inner diameter of 80 mm must be securely fitted to the front and rear structures of all cars.

6.2 - It must be positioned in such a way that it can be used should the car be stopped in a gravel bed.

6.3 - The towing eye must be clearly visible and painted in yellow, red or orange and must be located inside the contour of the bodywork when viewed from above.

ARTICLE 14 : SAFETY STRUCTURES

1) General :

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

1.2 - Chromium plating of suspension parts is forbidden. The use of magnesium alloy sheet less than 3 mm thick is forbidden.

2) Rollover structures :

2.1 - The car must be fitted with two rollbars, one to the front and one to the rear of the chest of the driver and of the passenger. Both rollbars must correspond in shape to the inner profile of the upper part of the cockpit, and must be linked at the top by at least one tubular member (preferably two with their junctions as apart as possible) or a box member. In addition, the rear rollbar shall comprise at least one diagonal reinforcing member and two backstays directed rearwards (see drawing N° 257.1).
The various authorized diagonal members are the following : MQ, MS, NP, NR.

2.2 - When no static load test is performed, the structure shall be built with steel tubes exclusively having at least the following characteristics :

Cold drawn seamless	Diam. 48.3
Carbon steel - E 30 daN	x 2.6 mm

Alloy steel type 25CD4, SAE 4125 Diam. 42.4
etc x 2.6 mm
E 50 daN

Design must be made according to the following considerations :

2.2.1 - Whenever bolts and nuts are used, the bolts must be of a sufficient minimum diameter according to the number used. They must be of the highest possible quality (preferably aircraft) and at least of ISO standard 8.8. Square head bolts and nuts must not be used.

2.2.2 - One continuous length of tubing must be used for the rollbars with smooth continuous bends and no evidence of crimping or wall failure.
Centreline bend radius of the tube must not be smaller than 3 times the tube diameter.

2.2.3 - All welding must be of the highest quality possible with full penetration (preferably arc welding and in particular gas shielded arc). Although the 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, gas protected welding, etc.).

2.2.4 - Reinforcing members and backstays must be of the same tubing size as that used for the rollbars.
Diagonal member and backstays must be straight, not curved.

2.2.5 - The upper mounting points of the backstays must be as close as possible to the top of the rollbar and in any case at least 3/4 of the way up the total height of the rollbar.
The upper and lower ends of the diagonal member must join the main rollbar or backstay or monocoque the nearest as possible to the top junction rollbar to backstay or to the rollbar lower mounting foot.

2.2.6 - Mounting of the rollcage to the monocoque/ chassis :
The rollbars must make use of two plates :
- a steel plate, stich welded or riveted or bolted onto the monocoque, at least 3 mm thick with an extension along a vertical component of the monocoque (see drawings 19 to 33, Article 253 of 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 at least 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 of at least 8 mm diameter or by at least three high-resistance Allen screws and bolts of

a minimum 8 mm diameter. More bolts may be used or the rollbar legs may in addition be welded to the reinforcement plates. In no case may the rollbar be welded directly on to the monocoque without a reinforcement plate.
Where the rollbar rests on a box member, the latter must be locally reinforced with for example additional plates, skins of increased thickness, etc.
Identical reinforcing plates must be used for diagonal members or backstays fixed to the monocoque. Each backstay must be fixed to the main structure of the car by bolts having a cumulative section area at least two thirds of that specified for the rollbar mounting foot.

2.2.7 - Removable members :
Should removable members be used in the structure, the demountable joints must comply with a type approved by FISA. The following joints are approved : a tapered connection, a twin lug connection with axis working under double shearing conditions and a muff-connection complying with drawings 34 to 39, Article 253 of Appendix J.
These demountable joints cannot be used for the front and rear rollbars.

2.3 - Recognised car or rollbar manufacturers may also present a rollcage of free design with regard to the material, the dimensions of the tubes and the mounting provided that the entire rollover structure is subjected to a static load test by applying three loads simultaneously, which are 1.5 w laterally, 5.5 w longitudinally in the rearward direction and 7.5 w vertically, "w" being 900 kg. These loads will be applied to the top of the structure through a rigid pad resting on the front and rear rollbars and inclined laterally of the same angle as the loading axis.
During the test, the rollover structure must be attached to the complete monocoque and main structure, supported on its underside by a flat plate and prevented from moving laterally and longitudinally in such a way as not to increase the resistance of the rollover structures.
Under the load, the deformation of the top of the inside structure must be less than 50 mm and there must be no structural failure of the monocoque/chassis, of the rollover structures and of their junctions.

3) Crushable structures :

3.1 - The bottom and the sides in lateral projection of the fuel tank must be protected by a crushable structure at least 1 cm thick.
Radiators can be used as crushable structures.

3.2 - If the fuel tank is situated less than 20 cm from the lateral flanks of the car, the entire surface must be protected by a crushable structure at least 10 cm thick.

3.3 - The crushable structure must be a sandwich construction based on a fire resistant core with a minimum

crushing strength of 18 N/sq.cm., and two sheets of at least 1.5 mm thickness and having a tensile strength of 225 N/sq.mm.

3.4 - Only water pipes may pass through the crushable structure, but not fuel, oil or electrical lines.

4) Firewall and floor :

4.1 - Cars must be equipped with a firewall between the driver and engine to prevent the passage of flames from the engine compartment to the cockpit. Any holes in the firewall must be of the minimum size for the passage of controls and wires and must be completely sealed.

4.2 - A crushable structure of 1 cm thick similar to that detailed in Article 14.3.3, must be the basis of the cockpit floor.

5) Survival cell and frontal protection :

5.1 - General prescriptions :

5.1.1 - The car structure must include a survival cell extending from behind the fuel tank to a plane at least 20 cm in front of the soles of the driver's feet, with his feet resting on the pedals and the pedals in the inoperative position. The survival cell must have openings corresponding to the doors, the minimum dimensions of which are given in Article 3.5.
Any other openings in the survival cell must be of the minimum size to allow access to mechanical components.
The safety structures described in Article 14.2 must be a part of the survival cell or solidly attached to it.

5.1.2 - An impact absorbing structure must be fitted in front of the survival cell. This structure need not be an integral part of the survival cell but must be solidly attached to it (i.e. with bolts which require tools for removal).

5.1.3 - The minimum height of the survival cell, in every point of any transverse section but not considering the structure higher than the bottom of the windscreen, must be 30 cm.

5.2 - Basic specifications :

5.2.1 - The survival cell and frontal absorbing structure must include two continuous box members, one on the driver's external side and one on the passenger's external side.

5.2.2 - The side box members of the survival cell must be connected by at least two closed bulkheads, one at the frontal extremity and one at the main rollover bar level and by a further hoop at the front rollover bar level.

5.2.3 - The frontal absorbing structure must connect the forward box members all along their length and must be a continuation of the skins of the survival cell. This structure must be metallic using honeycomb sandwich construction but radiators may be incorporated in this structure between the box members.
The frontal absorbing structure must have a minimum length of 40 cm and a minimum height of 15 cm in every point of any transverse section.

5.2.4 - The minimum total cross section of the frontal absorbing structure and survival cell must be 800 cm2.

5.2.5 - The minimum cross section of each box member must be 250 cm2 between the main rollover bar and the foremost point of the front rollover bar mountings ; it may then taper to 150 cm2 up to the survival cell frontal extremity (considering only areas located at more than 25 cm from the car' centre line) and then 100 cm2 up to the frontal absorbing structure extremity.

5.2.6 - The minimum structural material cross sections in the box members across the sections mentioned above are 12, 10 and 5 cm2 respectively.

5.2.7 - The structural material of the box members must have a minimum tensile strength of 31 kg/mm2 for composite materials or 23 kg/mm2 for metallic materials. The total of all the skin thickness across the section of each box member must be at least 3 mm.

5.2.8 - All holes and cutouts in the boxes must be strongly reinforced and all material minimum cross sections complied with.

5.3) Crash testing of the frontal absorbing structure :

5.3.1 - The frontal absorbing structure can be designed freely when at least that part of the survival cell forward of a transversal section 20 cm to the rear of the soles of the driver's feet in static position and the frontal absorbing structure are subjected to an impact test against a solid, vertical barrier placed at right angle to the longitudinal axis of the car.
The test structure must be solidly attached to the trolley in such a way as not to increase its impact resistance. For the purpose of the test, tne total weight of the trolley and test structure or complete car shall be 900 kg and the velocity of impact 13,9 metres/second.
During the test, the maximum average deceleration must not exceed 25 g and the final deformation must be contained within the zone ahead of the soles of the driver's feet.
This test must be carried out under the supervision of a FISA technical delegate in recognised testing centres in either France, Italy, USA, Great Britain, Germany or Japan approved by FISA.
A list of approved testing centres is available from FISA.

5.3.2 - In addition to the above frontal impact test, and to test the fixations of the absorbing structure onto the survival cell, a side load test shall be performed on a vertical plane passing 50 cm forward of the front wheel axis 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 1/2 minute of application there shall be no structural failure of the absorbing structure or survival cell or of any fixation between the two. During that test, the same part of the box members as defined in the frontal impact test above or the complete survival cell will be solidly secured to a flat plate but not in such a way as to increase the strength of the fixations being tested.

5.4) Crash testing of the complete car :

The survival cell and frontal absorbing structure can be designed freely without considering the basic specifications of paragraph 5.2 above subject to the following conditions :

5.4.1 - The general prescriptions of paragraph 5.1 above must be followed.

5.4.2 - The crash testing defined in paragraph 5.3 above must be performed identically but with the complete monocoque including the frontal absorbing structure, the survival cell and the crushable structure around the fuel tank. During that test, the fuel tank must be full of water.

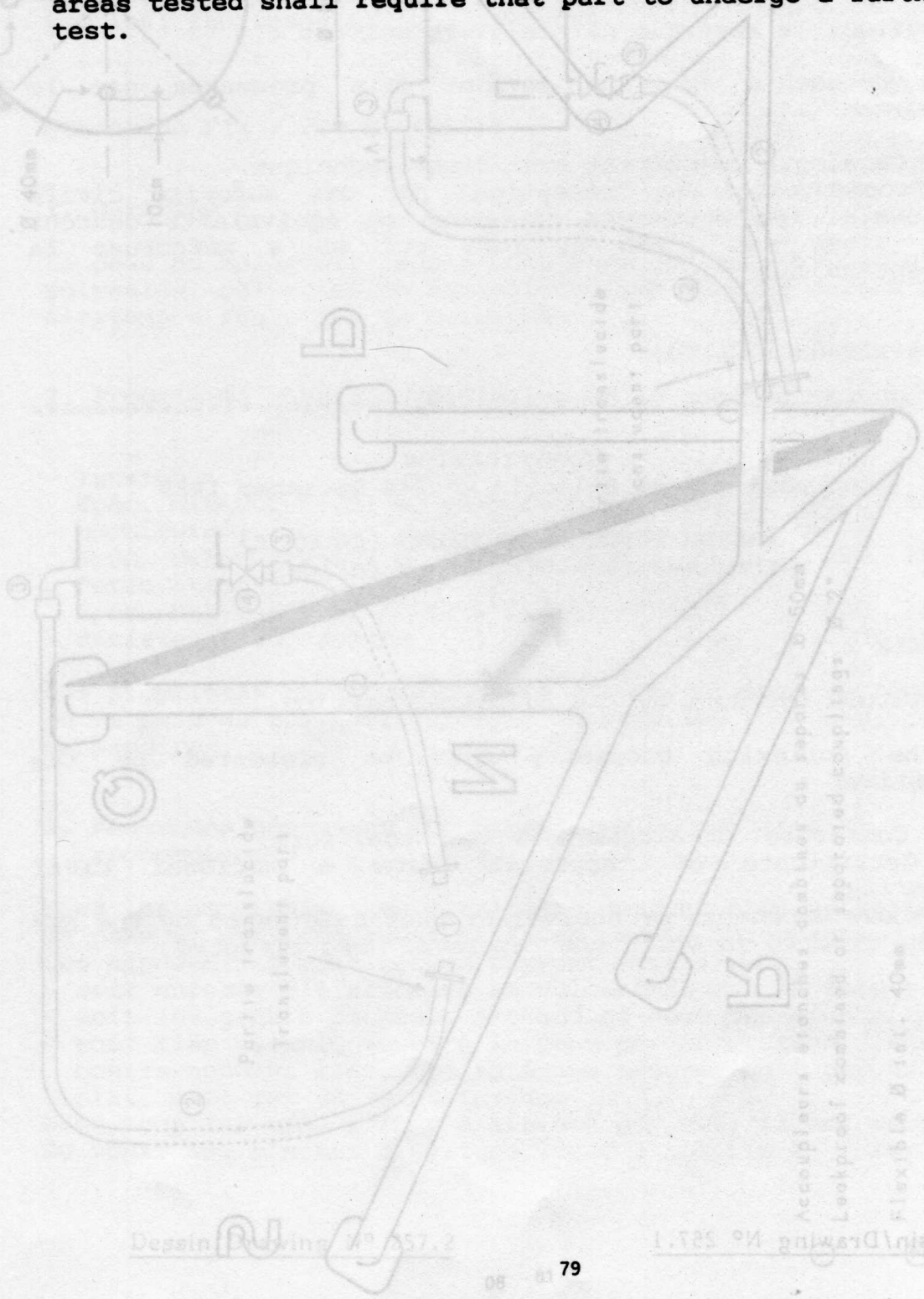
5.4.3 - In addition to the impact test described above, the survival cell shall be subjected to four separate static lateral load tests :

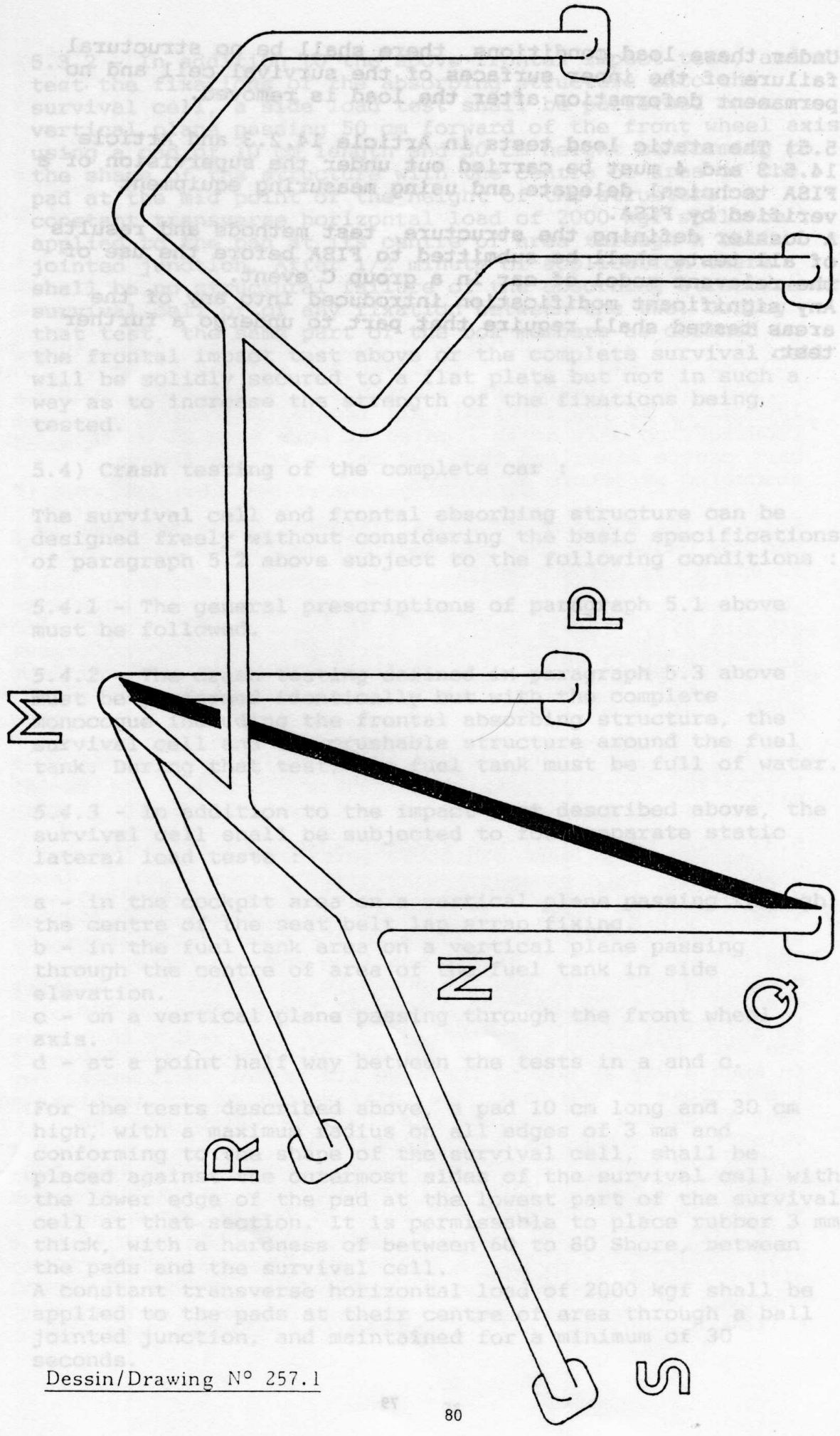
a - in the cockpit area on a vertical plane passing through the centre of the seat belt lap strap fixing.
b - in the fuel tank area on a vertical plane passing through the centre of area of the fuel tank in side elevation.
c - on a vertical plane passing through the front wheel axis.
d - at a point half way between the tests in a and c.

For the tests described above, a pad 10 cm long and 30 cm high, with a maximum radius on all edges of 3 mm and conforming to the shape of the survival cell, shall be placed against the outermost sides of the survival cell with the lower edge of the pad at the lowest part of the survival cell at that section. It is permissable to place rubber 3 mm thick, with a hardness of between 60 to 80 Shore, between the pads and the survival cell.
A constant transverse horizontal load of 2000 kgf shall be applied to the pads at their centre of area through a ball jointed junction, and maintained for a minimum of 30 seconds.

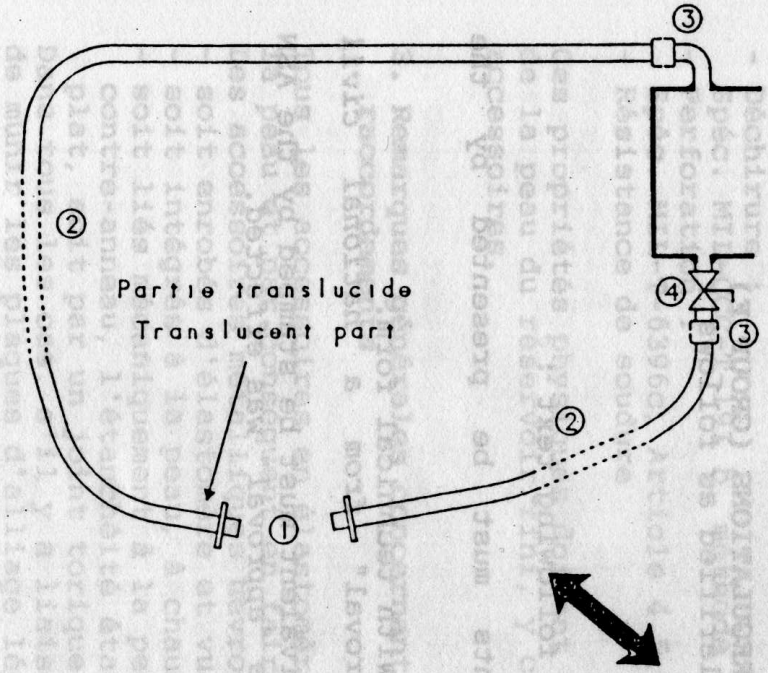
Under these load conditions, there shall be no structural failure of the inner surfaces of the survival cell and no permanent deformation after the load is removed.

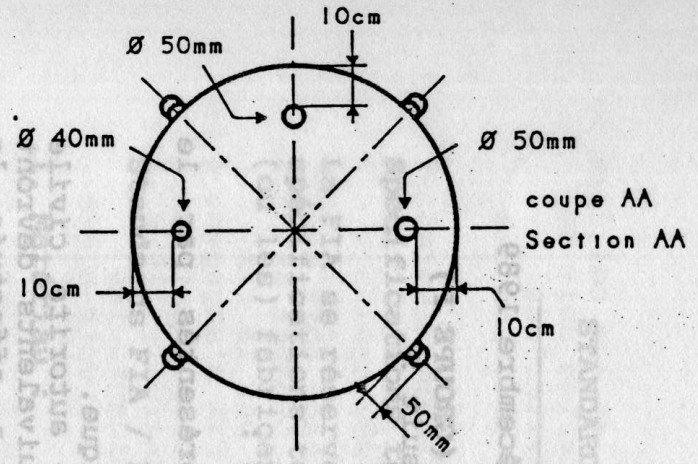
5.5) The static load tests in Article 14.2.3 and Article 14.5.3 and 4 must be carried out under the supervision of a FISA technical delegate and using measuring equipment verified by FISA.
A dossier defining the structure, test methods and results of all tests shall be submitted to FISA before the use of the relevant model of car in a group C event.
Any significant modification introduced into any of the areas tested shall require that part to undergo a further test.

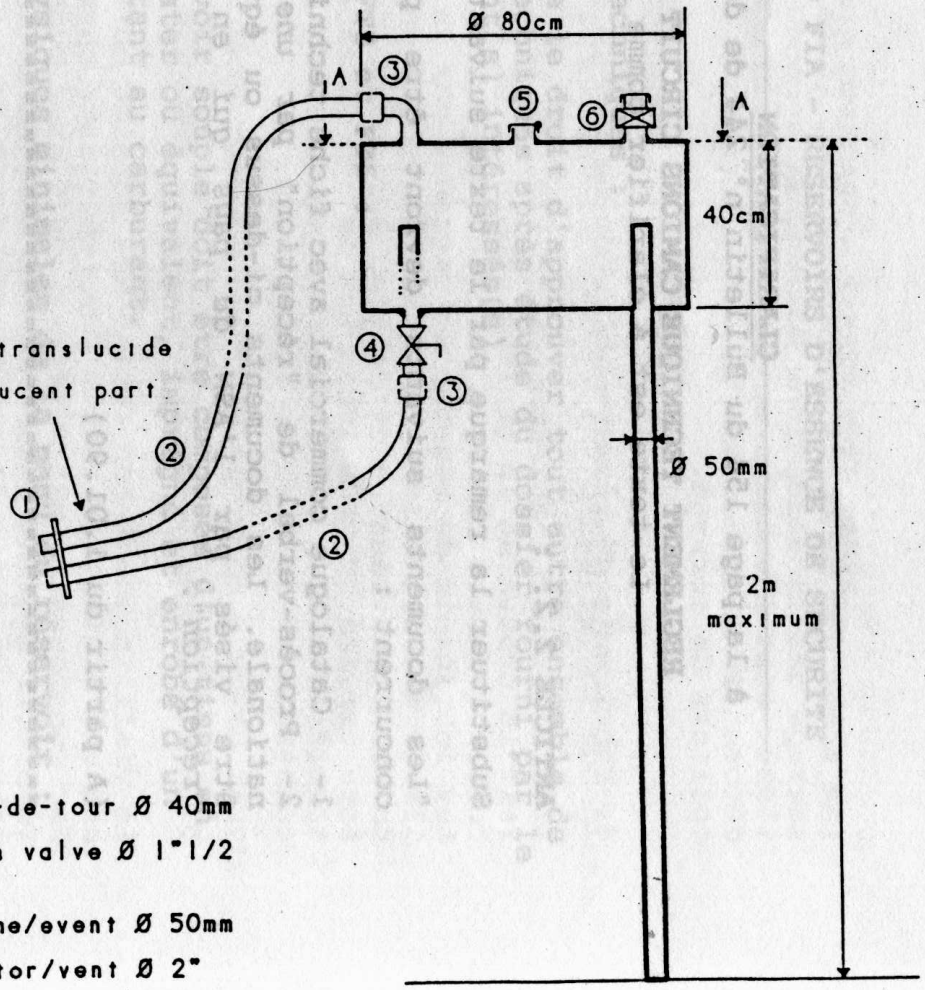




Dessin/Drawing N° 257.1







① Accoupleurs etanches combines ou separes Ø 50mm
Leakproof combined or separated couplings Ø 2"

② Flexible Ø int. 40mm
Hose internal diam. 1"1/2

③ Raccord rapide Ø 40mm
Quick coupling Ø 1"1/2

④ Vanne quart-de-tour Ø 40mm
Quarter turn valve Ø 1"1/2

⑤ Bouchon rapide de remplissage Ø 50mm
Quick filling cap Ø 2"

⑥ Arrete-flamme/event Ø 50mm
Flame arrestor/vent Ø 2"