2004 TECHNICAL REGULATIONS
"LE MANS" PROTOTYPE ("LM"P1 AND "LM"P2)

ART. 1 - DEFINITIONS

1.1 - "LE MANS" PROTOTYPE ("LM"P / "LM"GTP) is a racing car with no production minimum required and meeting the prescriptions regarding :

a/ The safety regulations issued by FIA ;

b/ The Technical Regulations issued by the **A**UTOMOBILE-**C**LUB DE L'**O**UEST **(ACO)**.

1.1.1. - "LE MANS" PROTOTYPE category includes :

a/ "LE MANS" PROTOTYPE 1 ("LM"P1) : open or closed (*) car.

b/ "LE MANS" PROTOTYPE 2 ("LM"P2) : open or closed (*) car.

(*) Closed car must have a windscreen and one door on each side ;

1.1.2. - Non conventional specifications ***:***

Cars the specifications of which are considered today as unusual in motor racing may be eligible :

a/ On the basis of special regulations made by the ACO so as to maintain the balance of performance between the cars.

b/ Provided the rules established by the administration and by the ASN of the country where the event is organised are respected.

1.2 - Homologation Form :

1.2.1 - Prototypes "LM"P and "LM"GTP cars shall comply with the homologation form filled by the manufacturer and agreed after the inspection carried out by the ACO.

1.2.2 - Modifications : the specifications listed in the Homologation Form and all the aerodynamic elements of the car can be changed only by the car manufacturer and with the ACO agreement.

1.2.3 - Once the Homologation Form has been agreed by ACO, the manufacturer shall give a copy of it to the owner of every car sold after filling the first page (chassis number, name and address of the owner)

1.2.4 - A car is not permitted to undergo scrutineering before taking part in an event if it has not been homologated by the ACO.

1.2.5 - The Homologation form must be presented by the competitor during scrutineering.

1.3 - 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.

1.4 - Main structure / Chassis

Entirely sprung part of the structure of the vehicle, to which all the suspension and/or spring loads are transmitted, extending longitudinally from the foremost suspension mounting point on the chassis to the rearmost suspension mounting point on the chassis.

Mechanical components are not part of the main structure even if they are fully or partially load-bearing.

1.5 - Bodywork :

1.5.1 - The bodywork concerns all entirely sprung parts of the car in contact with the external air stream apart from parts in relation to the mechanical functioning of the engine, of the drive train and of the running gears.

1.5.2 - As viewed from above (plan view), in side elevation, from the front and from the rear, the bodywork must not allow mechanical components to be seen, unless explicitly authorised by the present regulations.

1.5.3 - Movable bodywork parts/elements are forbidden when the car is in motion.

1.6 - Air intakes :

1.6.1 - Air intakes are part of the bodywork.

1.6.2 - If air intakes or air extractors make mechanical parts visible, they must be fitted with louvres or mesh about 10 mm (to Scrutineers' appreciation).

1.7 - Weight :

1.7.1 - Except for the weighing procedure used during the practice sessions, it is the weight of the car with no driver and no fuel on board.

1.7.2 - The car must comply with the minimum weight at all times throughout the event. The checking of the weight of any part that may have been replaced during the event is at the discretion of the scrutineers.

1.8 - Cockpit :

Internal volume of the car to accommodate the driver and the passenger.

- **Closed car :**

1.8.1 - The cockpit is the internal volume inside the main structure which is defined by the top of the car, the floor, the doors, the side panels, the glass areas and the front and rear bulkheads.

1.9 Automobile Make :

1.9.1 - An automobile make corresponds to a complete car.

1.9.2 - The name of the chassis manufacturer shall always precede the name of the engine manufacturer if different.

1.10 - Electronic systems :

1.10.1 - Any automatic or electronic control system or function is forbidden : chassis control, automatic or semi-automatic transmissions, clutches, final drive differential system, shock absorbers, suspension or ride height adjustment, four wheel steering, etc.

1.10.2 - A simple open-loop non automatic electrical switch activated by the driver acting on one (LMP2) or more (LMP1) system(s) is not considered to be an electronic control.

1.10.3 - A closed-loop electronic control system is a system in which :

a/ An actual value (controlled variable) is continuously monitored ;

b/ The "feed back" signal is compared with a desired value (reference variable) ;

c/ The system is then automatically adjusted according to the result of that comparison.

1.10.4 - Unless specified in these regulations and apart from engine monitoring systems, no such system is permitted. A traction control system operating exclusively on the engine is authorised.

1.11 - Telemetry :

Apart from any other process, are permitted :

1) Legible messages on a signaling pit board.
2) The driver's body movements.
3) Telemetry signals from the car to the pits (one direction).
4) "Lap trigger" signals for the start or the end of a lap :
   a/ Lap marker transmitters (lap triggers) must be autonomous and not connected to any pit equipment (wires, cable, optical fibers, etc.) ;
   b/ The only function of these transmitters is to mark the laps.
5) Two way verbal communications between the driver and his pit.

• The use of any other communication device is only permitted after the agreement and under the control of the Organiser.

ART. 2 – REGULATIONS

2.1 - What is not expressly permitted by the Automobile Club de l'Ouest is prohibited. Eligibility of a car is within the exclusive competence of the ACO.

2.2 - Changes made on grounds of safety may be enforced without notice and immediately.

2.3 - Compliance with the regulations

It is the duty of each competitor to satisfy the Scrutineers and the Stewards of the Meeting that his car complies with these regulations in their entirety at all times during an event.

2.4 - Measurements

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

2.5 - Material

The use of a metallic material which has a specific yield modulus greater than 40 GPa/g/cm^3 is forbidden.
The use of magnesium sheet less than 3 mm thick is forbidden.
The use of parts made from titanium is authorised, but welding is forbidden for parts of the suspension, steering or braking systems.

ART. 3 - BODYWORK & DIMENSIONS

3.1 - Dimensions :

Except what is permitted by Art. 3.6 below, inside and outside measurements (length, width, overhangs, wheelbase, windscreen, windows, etc.) and the general shape of the bodywork elements must be maintained as in the A.C.O. homologation form.

3.1.1 - Dimensions :

a/ Wheelbase : Free but it must be identical to that registered in the A.C.O. homologation form.

b/ Overall length : 4650 mm maximum (rear wing included)

c/ Overall width : 2000 mm maximum

d/ Height : no part of the bodywork is permitted to be more than 1030 mm above the reference surface (See Art. 3.5.1), except the rear rollover structure fairing that may be 10 mm maximum above the rear rollover structure.

3.1.2 - Overhangs :

a/ The front overhang is limited to 1000 mm.

b/ The rear overhang is limited to 750 mm (including the rear wing).

3.2 - Doors :

3.2.1 - **Closed car** :

a/ Doors must provide a normal access to the cockpit through the opening specified in article 14.1.5.b.7 ;

b/ Opening (hinges) or locking (locks) devices must be designed to allow a quick release of the entire door in case of emergency from the interior as from the exterior of the cockpit.
They need a prior written agreement from the ACO ;

3.3 - Windscreen & Glass areas :

3.3.1 **- Open car :** windscreen optional.

3.3.2 **- Closed car :**

a/ Windscreen : mandatory, made of one piece laminated glass or equivalent material approved by the ACO :
The upper edge of the windscreen must be :
- lower than the highest point of the roof (excluding the air inlet) ;
- at a minimum of 920 mm in height from the reference surface (see article 3.5.1) over a minimum width of 300 mm.

b/ Glass areas :
b.1 - Side windows made of polycarbonate are permitted ;
b.2 - Viewed from the side, the perimeter of the transparent area of the side windows must allow the fitting of a 300 mm (perpendicular to the reference surface) x 500 mm (parallel to the reference surface) rectangle.
The base of this rectangle must be at a minimum height of 500 mm from the reference surface.
b.3 - Additional fasteners are recommended ;
b.4 - An opening (louvre) of 40 cm^2 minimum for extracting air from the cockpit must be made on the rear part of each side window. Air intakes are allowed only for the ventilation of the cockpit and on condition that they do not reduce the visibility of the driver.

3.4 - Bodywork :

3.4.1 **-**

a/ As viewed from the side :
It must cover the whole circumference of the complete wheels (wheels and tyres**)** above the axle centreline**s** level with no empty space or cut-out in the bodywork :
Wheel arches must be open exclusively as viewed from outside.
- The complete area situated :

-between a vertical and transversal plane 415 mm rearward of the front axle centreline and a vertical and transversal plane 415 mm forward of the rear axle centreline,
- up to a height of 400 mm from the reference surface,
must be completely covered by one or several bodywork elements.
All visible part of this or these elements must not be set back more than 150 mm from the overall width of the bodywork (horizontal measurement).

b/ As viewed from the rear :
Mechanical components must not be visible above the horizontal plane passing through the axle centreline :
If this is the case, a wire mesh about 10 mm or louvres are mandatory.
The rear part of the bodywork must be fitted with two transversal plates perpendicular to the reference surface.
They must :
- comply with drawing n°5 ;
- be situated at the rear end of the bodywork ;
- have a minimum constant thickness of 10 mm and their edges may be rounded with a minimum constant radius of 5 mm.

c/ As viewed from above :
- The complete area situated :

- between a vertical and transversal plane 415 mm rearward of the front axle centreline and the front end of the cockpit opening defined in article 14.1.5,
- over a minimum width equal to the overall width of the bodywork minus 300 mm, distributed symmetrically about the longitudinal centreline of the car,
must be completely covered by one or several bodywork elements.
All visible parts of this or these elements must be at a minimum height of 200 mm from the reference surface (see article 3.5.1).
- The complete area situated :

- between the front end of the cockpit opening and a vertical and transversal plane 415 mm forward of the rear axle centreline,
- over a minimum width equal to the overall width of the bodywork minus 300 mm, distributed symmetrically about the longitudinal centreline of the car,
must be completely covered by one or several bodywork elements.
With exception of the cockpit opening (open cars only), all visible parts of this or these elements, must be at a minimum height of 400 mm from the reference surface (see article 3.5.1).

3.4.2 **-** Engine covers must be fitted with two safety fasteners as a minimum, both clearly indicated (red arrows or any other contrasting colour).

3.4.3 **-** It must be possible to remove the engine covers without the use of tools.

3.4.4 **-** Bodywork joints in the vicinity of the refuelling coupling systems must be designed so as to prevent any leakage into the engine compartment or into the cockpit.

3.4.5 **-** Air intakes :

a/ They must comply with article 3.4.1 above.

b/ They must not protrude beyond the perimeter of the bodywork as viewed from above ;

c/ They must not protrude more than 150 mm (200 mm for the engine air intakes) over the surface of the bodywork:
- Measurement made vertically from the highest point of the air intake opening down to a horizontal bodywork element at least 100 mm wide across.

d/ **Closed car :**
On the top of the car, area defined by the upper line of the windscreen, the side windows and the rear window (*****), air intake(s) must :

d.1 - Be located aft the highest point of the windscreen ;
d.2 - Be integrated into the curved line of the roof.

3.4.6 - Air extractors :

a/ They must comply with article 3.4.1 above.
b/ They must not protrude beyond the perimeter of the bodywork, viewed from above ;
c/ They are mandatory above the front wheels without protruding more than 20 mm (louvers) :

- Total area of the openings : 25 sq. in. (160 cm^2) as a minimum on each side.

3.5 – Underside of the car :

Rearward of the front axle centreline and except for the skid block (cf. Art. 3.5.6), no entirely sprung part must protrude beyond the reference surface, the rear diffuser and the lateral parts (included the rounded sides), as defined below.
The only openings permitted are the minimum gaps necessary for wheel and suspension part movements (suspension travel and steering), air jack holes, closed hatches (maintenance operations) and the overflow fuel pipe.

3.5.1 - Reference surface

A reference surface, flat , continuous, rigid and complying with drawing n°1 is mandatory underneath the car.

a/ It must become an integral part of the main structure/survival cell (tub) as a minimum over a rectangular area the measurements of which are 800 mm (longitudinally) x 900 mm (across) :
b/ The underneath of the reference surface will serve as a reference for checking all vertical height measurements.
c/ The edges common to the rear diffuser and its vertical panels (Cf. Art. 3.5.2) as well as to the lateral parts (cf. Art. 3.5.3), may be curved with a maximum radius of 10 mm.
d/ The reference surface must not be visible as viewed from above. The bodywork elements following the upper side of the reference surface will be considered as part of the reference surface.

3.5.2 - Rear diffuser

An inclined surface (rear diffuser), flat, continuous and rigid is mandatory underneath the car and at the rear.

a/ It must be inclined relative to the reference surface and it must comply with the maximum volume defined by drawing n°1 ;
b/ No part of the diffuser must be more than 200 mm above the reference surface and its rear end must be plumb with the perimeter of the bodywork (rear wing removed) ;
c/ The panels joining the rear diffuser to the reference surface must be vertical. In addition, from the rear axle centreline to the rearmost edge of the diffuser, the outer panels joining the rear diffuser to the reference surface must remain parallel to the longitudinal centreline of the car ;
d/ A maximum radius of 10 mm is authorised to connect the rear diffuser to the vertical panels ;
e/ A maximum of two vertical fins may be added to the rear diffuser, but their surfaces must :
e.1 – be at right angles to the diffuser ;
e.2 – be flat and parallel to one another and to the longitudinal centreline of the car ;
e.3 – be positioned symmetrically about the longitudinal centreline of the car.

3.5.3 - Lateral parts

These are the parts situated on both sides of the reference surface (Cf. Art. 3.5.1 and of the rear diffuser (Cf. Art. 3.5.2).
Rearward of the front axle centreline, they must form an inclined plane relative to the reference surface, according to drawing n°1.
To join up with the bodywork, the lateral parts :
- may be curved upwards with a maximum radius of 50 mm rearward of the front wheels and forward of the rear wheels (see area 1 of drawing n°1).
- must be curved upwards with a minimum radius of 50 mm between front and rear wheels in order to join up to a vertical plane (see area 2 of drawing n°1).
The edges common to the rear diffuser and its vertical panels (Cf. Art. 3.5.2) may be curved with a maximum radius of 10 mm.

3.5.4 - Front part

In the area situated :
- forward of the front axle centreline,
- over a minimum width of 1000 mm,
any sprung part of the car must be situated more than 50 mm above the reference surface.

3.5.5 - Ground clearance :

a/ Any system, other than the suspension, which is designed so as to modify the ground clearance is not permitted (Art. 10.2 below) ;
b/ No sprung part of the car is allowed lower than the plane generated by the reference surface, except the mandatory block described below ;
c/ Friction blocks are not permitted.

3.5.6 - Skid block :

One rectangular block (skid block) must be affixed underneath the reference surface.

a/ It must :
a.1 - extend longitudinally from the front axle centreline to the rear axle centreline ;
a.2 - comply with the transversal section in drawing n°2 ;
a.3 - have a minimum uniform thickness of 20 mm ;
a.4 - have no holes or cut outs other than :
– those necessary to fit the fasteners permitted by article 3.5.6c ;
– the one possibly necessary for an air jack ;
a.5 - be made from an homogeneous material with a specific gravity between 1.3 and 1.45 ;
a.6 - be fixed symmetrically about the centreline of the car in such a way that no air may pass between it and the reference surface.

b/ The leading and trailing edges of the skid block may be chamfered to a depth of 16 mm over a longitudinal distance of 200 mm.

c/ As viewed from below, fasteners used to attach the skid block to the reference surface must :

c.1 – have a total area no greater than 400 cm^2 when viewed from beneath the car ;

c.2 – have an individual area no greater than 20 cm^2 when viewed from beneath the car ;

c.3 – be fitted in order that their entire lower surfaces are visible from beneath the car and are flush with the lower surface of the skid block when new .

3.6 - Aerodynamic devices :

3.6.1 - With the exception of the rear wing defined in article 3.6.3, no bodywork or underbody element having a wing profile (*) is permitted :

(******) *"Wing profile"* **:** *section generated by two arcs with different curves joining a leading edge at the front to a trailing edge at the rear, the purpose being to exert an aerodynamic effect, lift or down force.*

3.6.2 - Forward of the front axle centreline, only bodywork panels having parallel planes and a constant thickness are permitted.

Two aerodynamic elements maximum can be added at the front of the front fenders provided that :

- They do not obstruct the driver's view
- They do not mask the headlights ;
- They are not situated more than 600 mm above the reference surface ;
- They are approved by the manufacturer and the ACO (homologation form of the car).

3.6.3 - Rear wing :

a/ The primary device inducing down force (negative lift) shall be a single aerodynamic device, adjustable, mounted at the rear of the car, with two wing profiles as a maximum (main wing and flap) ;

b/ This rear wing must :

b.1 - Be framed by a volume measuring 300 mm horizontally x 150 mm vertically x overall width of the bodywork;

b2 - Be mounted so that no part of the wing is situated more than 965 mm above the reference plane :

b.3 - Not be adjustable from within the cockpit ;

b.4 - A rigid trim tab/gurney is mandatory (only after 01/01/2006). It must be :

- 15 mm high as a minimum above the wing plane ;
- At right angle to the plane defined by the top of the main wing or the flap ;
- Solidly fixed all along the wing by means of tools if the gurney is not an integral part of the main wing or the flap. A locking system at each end is not enough.

b.5 - The section of the rear wing must be symmetrical in relation to the longitudinal centreline of the car.

c/ Vertical supports :

c.1 - Length : 400 mm maximum horizontally ;

c.2 - The supports must be 1650 mm apart as a maximum ;

c.3 - Surfaces must be flat and parallel to the longitudinal centreline of the car ;

c.4 - The leading edge may be made round (constant radius) and the rear edge (trailing edge) may be bevelled no more than 20 mm ;

c.5 - The rear wing must be rigidly attached to the main structure of the car and not just to the bodywork.

c.6 –The rear bonnet must be able to be removed without disturbing the wing mounting.

c.7 –With the attachments of the end plates to the bodywork disconnected, the vertical supports must be able to withstand a vertical load of 10 kN, equally applied on the surface of rear wing.

d/ End plates :

d.1 – They must fit into a rectangle of 765 x 300 mm and must have a minimum area of 1000 cm^2. They may be in two parts (one on the rear wing and the other on the bodywork) but the part fitted on the rear wing must have a minimum area of 150 x 300 mm ;

d.2 – They may be fixed to the bodywork on condition that they comply with article 3.6.3.c.7 above ;

d.3 - They must have a minimum constant thickness of 10 mm ;

d.4 – They must have edges rounded with a minimum constant radius of 5 mm.

ART. 4 – WEIGHT

4.1 - Minimum weight :

"LM"P1	**"LM"P2**
900 kg	750 kg

The minimum weight includes the skid block defined in article 3.5.6.

4.2 - Ballast :

Ballast must be secured so that tools are required for its removal and so as to allow the fixing of seals by the scrutineers.

Any movable ballast system is forbidden.

4.3 - Liquids :

The weight may be checked at any time during the event with the quantity of liquids remaining in the tanks, but at the end of the practice sessions or the race the car will have all fuel drained before being weighed.

ART. 5 – ENGINE

5.1 - ***Engine specifications :***

	"LM"P1	**"LM"P2**	
5.1.1 **-** Engine:	free	free	homologated (∗)
5.1.2 **-** Displacement limit			
a/ Normally aspirated engines	6000 cm^3	3400 cm^3 8 cyl. maximum	4000 cm^3
b/ Turbo/Supercharged engines (gasoline)	4000 cm^3	2000 $cm^{3\,(**)}$ 6 cyl. maximum	forbidden
c/ Turbo/Supercharged engines (diesel)	5500 cm3	forbidden	forbidden

(∗) No stressed engine homologated in "LM"GT and complying with the "LM"GT technical rules.

(∗∗) Only one single stage charging device and air/air and/or air/water heat exchanger.

5.1.3 **-** Inlet manifolds must be fitted with air restrictors made of metal or metal alloy the diameter of which must be minimum 3 mm in length (Appendix 1 below).

5.2 - Turbocharged engines :

5.2.1 **-** Air restrictors location : a one piece and airtight right cone must be fitted between the restrictor(s) and the inlet diameter of the charging device :

a/ The cone must have a mandatory opening of 7° minimum ;

b/ To each base of the cone, over 10 mm maximum in length, a round shape is permitted within the diameter of both the restrictor(s) and the charging device inlet.

5.2.2 **-** Charging devices incorporating ceramic components, variable diameter inlets and adjustable internal vanes are forbidden.

5.2.3 **-** Boost pressure : see Appendix 1.

5.3 - Temperature of the charge :

5.3.1 **-** Apart from intercoolers, 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 :

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

5.3.2 **-** Internal and/or exterior spraying or injection of water or any substance whatsoever is forbidden other than fuel for the normal purpose of combustion in the engine.

5.4 - Intake system : free

5.4.1 **-** Are not permitted :

a/ Variable length manifolds (except for rotary engines) ;

b/ Variable valve timing :

Any device that allows the modification of the valve opening timing and/or lift is considered as variable valve timing.

This is authorised only for engines derived from a series production engine fitted with a variable valve timing system, and it must remain original.

The vehicle from which the engine originally comes must have a "Full type" road homologation and must be produced in a minimum of 200 units in 12 consecutive months.

5.4.2 **-** Throttle :

- "LM"P1 : Free
- "LM"P2 : Only a direct mechanical linkage (rod, cable) is permitted between the throttle pedal and the supply control system (fuel and/or air) of the engine.

5.4.3 **-** Air box(es) :

a/ All the air feeding the engine must pass through the restrictor(s) ;

b/ Air tightness must be total in all circumstances : no pipe is allowed to intrude into or to exit from the air box(es) ;

c/ Closing the intake system at restrictor(s) level must stall the engine immediately. For the normally aspirated engines, the depression measured in the air box when the engine stop must be :

- equal to the atmospheric pressure at the place where the test is carried out – 150 millibar ;
- maintained during half a second ;

d/ A standard connection "Dash 3 male" is mandatory on the air box for the possible junction of the data recording system of the organizer (see appendix 1). The diameter of the air outlet must be 2.4 mm (3/32") minimum. This connection must be :

- Easily accessible ;
- Outside the air flows above the induction trumpets ;
- Preferably facing the air intake(s) ;
- Sealed when the data recording system of the organizer is disconnected ;

e/ If the air box(es) is(are) made of several parts, they must be put together in an efficient way so as to ensure a total air tightness ;

f/ Air box(es) will be sealed by the Scrutineers ;

g/ Any faulty functioning is the Competitor's responsibility.

5.5 - Exhaust system :

5.5.1 - Noise level : see sporting regulations.

5.5.2 - Exhaust pipe outlets : they must exit :

a/ Aft the middle of the wheelbase ;

b/ Within the contour of the bodywork as viewed from above.

5.5.3. - Smoke

The engine must not produce visible exhaust emissions under race conditions.

ART. 6 - PIPING AND FUEL TANKS

The fuel system is free provided the provisions in Art. 6.1, 6.2 and 6.3 are complied with.

6.1. - Fuel tank(s) :

6.1.1 - No part of the fuel tank(s) is allowed to be :

a/ More than 675 mm from the longitudinal centreline of the car ;

b/ Outside the area between the front and rear axle centrelines.

6.1.2 - The fuel tank(s) must be surrounded by a crushable structure at least 10 mm thick.

6.1.3 - A firewall must separate the fuel cell(s) from the cockpit and/or the engine compartment.

6.1.4 - The fuel tanks must be rubber bladders meeting or exceeding the FIA/FT3 specifications**.**

6.1.5 - Rubber bladders must be made by manufacturers recognised by the FIA :

- A list of approved manufacturers is available from the FIA.

6.1.6 - Rubber bladders must have a printed code indicating the name of the manufacturer, the specifications and the date of manufacture.

6.1.7 - No rubber bladder shall be used more than 5 years after its date of manufacture, unless inspected and recertified by the manufacturer for a new period not exceeding 2 years.

6.2 - Fittings and piping :

6.2.1 - Any equipment included in the tank walls (air vents, inlets, outlets, tank fillers, inter tank connectors and access openings) must be metal or composite made fittings and bonded inside the fuel tank.

6.2.2 - Fuel lines between the fuel tank and the engine must include a self sealing breakaway valve the parts of which must separate under a pressure less than half the load required to break the fuel line fitting or to pull it out of the fuel tank.

6.2.3 - No line containing fuel, cooling water or lubricating oil may pass through the cockpit.

6.2.4 - The lines must be fitted in such a way that any leakage cannot result in accumulation of fluid in the cockpit.

6.2.5 - Flexible lines must have threaded connectors and an outer braid resistant to abrasion and flame.

6.2.6 - Fuel and lubrication oil lines must have a minimum burst pressure of 41 bar at a maximum operating temperature of 135°C.

6.2.7 - Hydraulic fluid lines :

a/ Lines which are not subjected to abrupt changes in pressure, with the exception of lines under gravity head, must have a minimum burst pressure of 408 bar at a maximum operating temperature of 204°C (steel connectors) and 135°C (aluminium connectors) ;

b/ Lines subjected to abrupt changes in pressure must have a minimum burst pressure of 816 bar at the maximum operating temperature of 204°C ;

c/ Are only permitted in the cockpit hydraulic fluid lines fitted with threaded connectors and secured by means of a metallic wire.

6.2.8 - Fuel pumps must be in operation only when the engine is running or being started.

6.3 - Fuel Tank Fillers :

6.3.1 - Cars must be fitted with fuel tank fillers and vents which may be either combined or separate units on each side of the car.

6.3.2 - Both fillers and air vents must be equipped with leak proof dry break couplings complying with the dead man principle and therefore without any retaining device when in open position :

- Coupling devices dimensions : FIA Appendix J - drawing 252.5 with internal diameter : $D \leq 50$ mm.

6.3.3 - Tank fillers, vents and caps:

a/ must be placed where they would not be vulnerable in the event of an accident ;

b/ Must not protrude beyond the surface of the bodywork ;

c/ An overflow pipe is permitted to exit through the reference surface.

6.3.4 - Any breather pipe connecting the tank to atmosphere must :

a/ Exit on the outside of the bodywork ;

b/ Be fitted with a non return valve ;

c/ Be designed such as to avoid any liquid leakage when the car is running or if upside down.

6.3.5 - Cars must be fitted with a self sealing connector which can be used by the Scrutineers as to take a sample of fuel from the tank. This connector must be :

a/ Approved type ;

b/ Fitted immediately before the injector nozzles.

6.4 - Refuelling during the Race :

6.4.1 - Refer to Appendix A below : Refuelling.

6.4.2 - The refuelling equipment **(with the car number affixed)** and the tank of the car shall always remain at the outside ambient temperature and atmospheric pressure.

6.5 - Fuel Capacity :

6.5.1 - 90 litres maximum on board whatever the outside ambient temperature and atmospheric pressure.

6.5.2 - Any device or system the purpose and/or effect of which is to increase the fuel storage capacity on board is prohibited.

ART. 7 - OIL SYSTEM

The following provisions must be complied with :

7.1 - Oil tanks :

7.1.1 - If the oil tank is located forward the front axle centreline or aft the rear axle centreline, it must be surrounded by a 10 mm minimum thick crushable structure.

7.1.2 - The external wall of an oil tank cannot be more than 650 mm from the longitudinal centreline of the car.

7.1.3 - No tank or pipe containing lubricating oil is permitted :

a/ In the cockpit ;

b/ Aft the gearbox ;

c/ More than a transversal distance of 900 mm from the car centreline.

7.2 - Catch tank :

The open type sump breather (if any) must vent into a catch tank of at least 3 litre capacity.

ART. 8 - ELECTRICAL EQUIPMENT :

The following provisions must be complied with :

8.1 - Battery(ies) :

Batteries must be located in the cockpit in the place of the passenger and must be strongly secured and protected inside a box made of insulating material.

8.2 –Starting system :

8.2.1 - It must be possible for the driver to start the engine at any time when seated normally at the wheel, and without any external assistance.

8.3 - Lighting equipment :

8.3.1 - Lighting equipment must always be in working order.

8.3.2 - Cars must be fitted with :

a/ At the front :

a.1 - Two main headlights as a minimum, approved by the ACO, symmetrical to the longitudinal centreline of the car and separated by a minimum of 1350 mm ;

a.2 - Headlights must produce a white beam.

b/ At the rear :

b.1 - Two red lights and two "Stop" lights fitted symmetrically about the longitudinal centreline of the car and separated by a minimum of the rear track measurement ;

b.2 - Two red "Rain" or "Fog" lights (minimum 21 Watt) or any equivalent device approved by the FIA and located at the rear and the highest possible on each side symmetrically to the longitudinal centreline of the car.

c/ On each side : front and rear direction indicators.

ART. 9 – TRANSMISSION

9.1- Electronics :

Any resort to electronics incorporated in the operation of any part of the transmission is forbidden except if in compliance with the prescriptions of Art. 1.10 above.

9.2 - Gearbox :

9.2.1 - Maximum 6 forward speeds.

9.2.2 - Electronic or electric management and selection devices, and semi-automatic or automatic transmissions are not permitted.

9.2.3 - Only for “LM”P1, a single switch may operate several systems (Art. 1.10) including the control of a value but if, for any reason whatsoever, these systems do not respond to the driver's order or if the value checked is not the good one, the driver will have to actuate the switch again.

9.2.4 - Sensors are only permitted when their purpose is :

a/ to give information to the driver

b/ to control a value at the driver's request exclusively (see Art. 9.2.3. above).

9.2.5 - Reverse gear : mandatory :

- It must be possible for the driver seated in a normal position to select the reverse gear while the engine is running.

9.3 - Differential(s) :

9.3.1 - Are only permitted : Mechanical limited slip differentials working without the help of a hydraulic or electric system.

- A visco-coupling system is not considered as a hydraulic slip control device provided that no control is possible when the car is running.

9.4 - Four wheel drive : not permitted.

9.5 - Clutch :
Only one clutch is authorised.
Only designs actuated and controlled directly by the driver are permitted.

9.6 - Disconnecting the transmission :
9.6.1 - The transmission must be designed such that, should the car be stopped and the engine stalled, it is still possible to push or to tow it.
9.6.2 - A pneumatic assistance device is permitted thanks to a compressed air bottle fitted outside the cockpit (0,5 kg maximum) as to select neutral and to allow the car to be moved.

ART. 10 – SUSPENSION

Free.
10.1 - Changing the adjustment of the springs, the shock absorbers and the anti-roll bars from inside the cockpit is forbidden.

10.2 - Any system other than the suspension parts, whatever the functioning principle, activated or not by the driver the purpose of which is to modify the ground clearance is forbidden.

10.3 - A anti-intrusion bar must mandatorily be fitted at the base of the front suspension wishbones if these are potentially dangerous for the driver's legs.

10.4 - The suspension arms :
a/ Must not be chromium plated ;
b/ Must be made from an homogeneous metal.

ART. 11 – STEERING

Free.
11.1 - Only a continuous mechanical link between the driver and the wheels is permitted.
The steering column must be submitted to the tests described in appendix 2, and approved by the FIA.
a/ The manufacturers shall give ACO in writing an early notification of any scheduled test in order that one of its representatives may eventually attend at manufacturer's expense.
b/ The manufacturer must supply a copy of the FIA approval certificate.

11.2 - Four wheel steering : not permitted.

11.3 - Power steering :
Permitted but such system may not carry out any function other than reduce the physical effort required to steer the car and must allow the steering to continue to function when all hydraulic and/or electric power is shut down.

11.4 - Quick release system : mandatory.
The quick release mechanism must consist of a flange concentric to the steering wheel axis, coloured yellow through anodisation or any other durable yellow coating, and installed on the steering column behind the steering wheel.
The release must be operated by pulling the flange along the steering wheel axis.

ART. 12 - BRAKE SYSTEM

Free.
12.1 - Separate circuits :
12.1.1 - At least two separate circuits operated by the same pedal are compulsory :
- The only connection allowed between the two circuits is a mechanical system for adjusting the brake force balance between the front and rear axles.

12.1.2 - No device or system is permitted between the master-cylinders and the callipers :
- Sensors to collect information, stop lights switches or mechanical brake pressure controls adjustable by means of tools are not considered as "systems" and they must be fitted at the very exit of the master-cylinders.

12.2 - Brake callipers :
12.2.1 - Only one calliper with 6 pistons maximum is permitted per wheel.
12.2.2 - The section of each calliper piston must be circular.
12.2.3 - The body of the callipers must be made from aluminium alloy with a modulus of elasticity no greater than 80 Gpa.

12.3 - Disc brakes and brake pads :
12.3.1 - Material : free.
12.3.2 - Discs: one per wheel maximum ;

12.3.3 - Carbon brake equipment (discs and brake pads) :

a/ Maximum diameter of the discs:

- "LM"P1 15" (380 mm)
- "LM"P2 14" (356 mm)

b/ Carbon discs the 2nd wear warnings of which are not visible before use are not permitted.

12.4 - Anti-lock braking systems :

Any anti-lock braking function and any power braking function are prohibited.

ART. 13 - WHEELS & TYRES

13.1 - Number and position of the wheels :

13.1.1 - Number : four (4).

13.1.2 - Above the plane passing through the axle centreline, it must be possible to house the complete wheels inside the wheel arches.

13.1.3 - As viewed from above, the wheels aligned for the car to proceed straight ahead must not be visible above the plane passing through the axle centreline.

13.2 - Dimensions :

- Complete wheel measured horizontally at wheel hub level.

	"LM"P1	"LM"P**2**
13.2.1 - Width (maximum) :	16"	14"
13.2.2 - Diameter (maximum) :	28.5"	28"

13.3 - Weight of the wheel, tyre removed (kg) :

	"LM"P1	"LM"P**2**
13.3.1 - Front (minimum) :	8.0	7.5
13.3.2 - Rear (minimum) :	9.0	8.5

13.4 - Material :

13.4.1 - Metallic.

13.4.2 - One piece wheels : recommended.

13.5 - Rims :

13.5.1 - Front and rear diameter : 18" maximum.

13.5.2 - Flanges must :

a/ Be symmetrical and the diameters measured at the level of the inner and outer rim edges of a wheel must be identical, with a tolerance of +/- 1.5 mm ;

b/ Not be more than 19.2 mm maximum high.

13.5.3 - Removable wheel/hub caps are not permitted.

13.6 - Wheel attachment :

Free.

13.6.1 - If the wheel is attached by means of a single nut, a safety spring (painted red or "dayglo" orange) must be on the nut whenever the car is running, and it must be put back after every wheel change.

13.6.2 - another method of retaining the wheels attachment system may be used, provided it has been approved by the FIA.

13.7 - Pressure control valves : not permitted.

13.8 - Pneumatic jacks : permitted :

It is forbidden to carry on board compressed air bottles for their operation.

13.9 – Sensors : Sensors for the pressure and the temperature of the tyres when the car is in motion are strongly recommended.

If these sensors are used, there must be at least one warning light to notify the driver of a possible failure.

ART. 14 – COCKPIT

14.1 - The cockpit must provide the best protection for the driver.

14.1.1 - It must be possible to fit symmetrically about the vertical plane passing through the longitudinal centreline of the car two seats of equal shape and size excluding the shoulder supports and/or the mandatory protections mentioned in articles 15.4, 16.1.1 and 16.3.

14.1.2 - The driver's feet must be located aft of the vertical plane passing through the front axle centreline.

14.1.3 - Empty volumes :

Two volumes of equal dimensions defined by six flat surfaces with 90° angles and symmetrical to the longitudinal centreline of the car must be provided for the legs of both occupants.

a/ Dimensions :

a.1 -; Length : from the pedals vertical plane to the vertical projection of the steering wheel centreline ;

a.2 - Minimum width : 330 mm ;

a.3 - Minimum height : 300 mm.

At Scrutineers' request, the competitor must show the two volumes during scrutineering.

b/ The only components allowed to intrude into these volumes, any other being excluded including the bulkheads across, are :

b.1 - The steering column and its universal joints ;

b.2 - The suspension arms pick-up points if not a danger for the driver ;

b.3 - The foot-rest and the protection stuffing for the driver if removable in order to allow the empty volumes to be controlled.

14.1.4 - The areas adjacent to the driver must include a protection padding.

14.1.5 – Cockpit opening and volume :

a/ **Open car**

a.1 - The cockpit must allow the insertion of template 1, the dimensions and position of which are defined by drawing n°3. For this check, equipment mentioned in article 14.1.6.a may be removed.

a.2 – All the points of the chassis structure that delimit the cockpit opening on the sides, at the front and at the rear must be at least 500 mm above the reference surface ;

a.3 - Are only permitted on top of the cockpit opening safety devices mandatory in Art. 15 ;

a.4 – The forward extremity of the cockpit opening must be at least 50 mm in front of the steering wheel, whatever its operational position.

b/ **Closed car**

b.1 - The cockpit must allow the insertion of template 1, the dimensions and position of which are defined by drawing n°3. For this check, equipment mentioned in article 14.1.6.a may be removed.

b.2 – Except the door openings, all the points of the chassis structure that delimit the cockpit opening at the sides, front and rear must be at least 500 mm above the reference surface ;

b.3 – The forward extremity of the cockpit opening must be at least 50 mm in front of the steering wheel, whatever its operational position.

b.4 - In order to ensure that the door openings giving access to the cockpit are of adequate size, they must allow the insertion of templates 5 and 6, the dimensions and position of which are defined by drawing n°8.

For this test, the lower surfaces of the templates will be held parallel to the reference surface and their rear edges aligned transversally.

The templates will be moved transversally until their inner surfaces are 150 mm from the longitudinal centreline of the car.

The seat and all padding, including fixings, may be removed.

b.5 - Interior volume of the cockpit :

The cockpit of closed cars must allow the insertion of template 2 defined by drawing n°4, positioned parallel to the reference surface from the windscreen to the rear bulkhead.

Viewed from the front and with the exception of the windscreen wiper and its mechanism, the front part of this template must be completely visible through the windscreen at any time.

14.1.6 - Equipment in the cockpit :

a/ Are permitted but only outside the two empty volumes (Art. 14.1.3 above) :

- Safety equipment and structures, tool kit, seat(s), driving controls, electronic equipment, driver cooling system, ballast, pneumatic jacks, battery(ies), ventilation ducts ;

b/ These components must be covered by a rigid and efficient protective material in the event of a crash if a danger for the driver ;

c/ Nothing may hinder the cockpit exit (Art. 14.1.7 below) ;

d/ The way the equipment permitted is fitted in the cockpit is subject to Scrutineers' assessment.

14.1.7 - Cockpit exit time :

The cockpit must be design so as to allow the driver wearing his complete driving equipment, being seated in a normal position with the seat belts fastened and the steering wheel in place to get out :

a/ Open car: in 7 sec. maximum ;

b/ Closed car: in 7 sec. maximum (driver's side).

14.1.8 - Test for helmet removal :

With the driver seated in his normal driving position in the car which he is entered to race, wearing a cervical collar appropriate to his size and with the seat harness tightened, a member of the medical service must demonstrate that the helmet which the driver will wear in the race can be removed from his head without bending the neck or spinal column.

ART. 15 - SAFETY EQUIPMENT

15.1 - Fire extinguisher :

The use of the following products is prohibited: BCF, NAF

All cars must be equipped with an extinguishing system homologated by the FIA in accordance with article 253-7.2, with the exception of the means of triggering from the outside.

The means of triggering from the outside must be combined with the circuit breaker switch and be operated by a single lever. It must be marked with a letter "E" in red inside a white circle at least 100 mm in diameter and with a red edge.

15.2 - Safety belts :

15.2.1 - Two shoulder straps, one abdominal strap and two straps between the legs are compulsory :

a/ These straps must comply with FIA standard 8853-98.

15.2.2 - Safety belts with two buckles are prohibited.

15.2.3 - Safety belt mounting points must be capable of resisting a 25 g deceleration.

15.3 - Rear view mirrors :

15.3.1 - Two rear view mirrors (one each side) must provide an efficient vision to the rear.

15.3.2 - The scrutineers must be assured through a practical demonstration that the driver, seated normally, can clearly see the vehicles following him.
To this end, the driver will be asked to identify letters or figures, 15 cm high and 10 cm wide, displayed at random on boards placed behind the car according to the following instructions :
- Height : Between 40 cm and 100 cm from the ground.
- Width : 2 m one side or the other of the centreline of the car.
- Position : 10 m behind the centreline of the rear axle of the car.

15.3.3 - Minimum area : 100 cm^2 for each mirror.

15.4 – Headrest and head protection :

15.4.1 - All cars must be equipped with three areas of padding for the driver's head protection which :
a/ are so arranged that they can be removed from the car as one part ;
b/ are located by two horizontal pegs behind the driver' head and two fixings at the front corners which are clearly indicated and easily removable without tools (open cars only) ;
c/ are made from a material specified by the FIA ;
d/ are fitted with a cover manufactured from 60-240 g/m^2 materials which use suitable thermo-setting resin systems;
e/ are positioned so as to be the first point of contact for the driver's helmet in the event of an impact projecting his head towards them during an accident.

15.4.2 - The first area of padding for the driver's head must be positioned behind him and be between 75 mm and 90 mm thick over an area of at least 40000 mm^2.

15.4.3 - The two further areas of padding for the driver's head must be positioned directly alongside each side of his helmet.
The upper surfaces of these areas of padding must be at least as high as the protective structure for the driver (see Art. 16.3) over their entire length.
Each area of padding must be between 75 mm and 90 mm thick over an area of at least 25000 mm^2 and may have a radius of 10 mm along its upper inboard edge. When calculating their area, any part which is greater than 75 mm thick and which lies between the front face of the rear area of padding and the furthest forward part of the driver's helmet whilst he is seated normally, will be taken into account.
The thickness will be measured perpendicular to the car centreline.

15.4.4 – Open car
Forward of the side areas of padding, further cockpit padding must be provided on each side of the protective structure for the driver (see Art. 16.3). The purpose of the additional padding is to afford protection to the driver's head in the event of an oblique frontal impact and it must therefore be made from the same material as the other three areas of padding.
These extensions must :
- be positioned symmetrically about the centreline of the protective structure for the driver and form a continuation of the side areas of padding ;
- be positioned with their upper surfaces at least as high as the protective structure for the driver over their entire length;
- have a radius on their upper inboard edge of no more than 10mm ;
- be positioned such that the distance between the two is no less than 360mm ;
- be as high as practicable within the constraints of driver comfort.

15.4.5 - All of the padding described above must be so installed that, if movement of the driver's head, in any expected trajectory during an accident, were to compress the foam fully at any point, his helmet would not make contact with any structural part of the car.
Furthermore, for the benefit of rescue crews, all of the padding described above must be installed using the system described in appendix to the Formula One technical regulations. The method of removal must also be clearly indicated.

15.4.6 - No part of the padding described above may obscure sight of any part of the driver's helmet when he is seated normally and viewed from directly above the car.

15.5 - Master switch :

15.5.1 - When seated normally behind the wheel with the safety belt fastened, the driver must be able to cut off all electrical circuits and turn the engine off by means of a spark proof circuit breaker switch.

15.5.2 - The switch of the circuit breaker must be located on the dashboard in a place which can be reached easily by the driver or from outside :
- It must be clearly marked by a symbol showing a red spark in a white edged blue triangle.

15.5.3 - There must be also an exterior switch, with a handle or a ring capable of being operated from a distance by a hook.
This switch must be positioned :
a/ On the left of the upper part of the bodywork ;
b/ If possible next to the lower part of the main roll bar.

15.6 - Towing eyes :

15.6.1 - Front and rear towing eyes must :
a/ Be rigid, made from steel, with no chance of breaking, have an inner diameter between 80 and 100 mm and be 5 mm minimum thick (round section for not cutting or damaging the straps used by the marshals) ;
b/ Be securely fitted to the chassis/structure by means of a metallic rigid piece (cable hoops are not permitted)
c/ Be within the perimeter of the bodywork as viewed from above ;
d/ Be easily identified and painted in yellow, red or orange ;
e/ Allow the towing of a car stuck in a gravel bed.

15.6.2 - Penalty during the race :

a/ Should a towing eye break during the race, the track marshals will pull the car into a safe position using any part of the chassis or the bodywork whatsoever that they judge strong enough and the car will be excluded ;

b/ Competitors will have no right to lodge protests in case the car has been damaged.

15.6.3 - The rear rollover structure (open car) may be used for pulling the cars out of a gravel bed provided that :

a/ It makes it possible to pull or lift the car ;

b/ The Competitor gives a written permission so that the Organiser will not be deemed responsible in the event of possible damages.

Art. 16 - Safety structures

16.1 - Rollover structures :

16.1.1 - Main rollover structures :

a/ Two safety rollover structures (front and rear) are mandatory.

They must be :

a.1 - At least 660 mm (920 mm for closed cars) at the front and 1020 mm (open cars only) at the rear above the reference surface ;

a.2 - Separated a minimum of 860 mm longitudinally (600 mm for closed cars);

a.3 - Covered with fireproof foam (FIA approved) as far as tubes close to the driver are concerned.

a.4 - Be symmetrical to the longitudinal centreline of the car.

b/ The driver at the wheel, the helmet must be at a minimum distance of 80 mm from the line connecting the top of front and rear rollover structures. (see drawing n°9).

c/ As viewed from the front, the steering wheel, whatever its position, must not protrude from the front rollover structure (open cars only) ;

d/ Should streamlining or fairing cover the front and/or rear rollover structures its upper part must have a maximum length of 200 mm (longitudinal measurement) and it must allow inspection of the mounting areas on the main structure, by the Scrutineers.

e/ The rear structure must also :

e1 - have a minimum overall length of 300 mm measured at the level of the mountings on the survival cell.

e.2 - have a minimum height of 165 mm (open cars only) relative to the secondary rollover structure of the survival cell, described in article 16.1.2 (see drawing n°9).

e.3 - on a frontal projection, the external sides must form an angle of 30° minimum to one another (see drawing n°10).

16.1.2. - Secondary rollover structure :

The part of the survival cell situated rearward of the driver must form a secondary rollover structure, the purpose of which is to protect the occupants in the case of a failure of the main rear rollover structure described in article 16.1.1 above.

Viewed from the front, this structure must be symmetric about the longitudinal centreline of the car and must always extend beyond the outline of the driver's helmet.

Its external sides must form an angle of 40° minimum to one another and its upper part must have a minimum diameter of 280 mm (see drawing n°10).

The secondary rollover structure must have a minimum height of 855 mm relative to the reference surface.

16.1.3 - Rollover structures approval :

a/ Every rollover structure must be submitted to the tests described in appendix 2 and approved by the FIA.

b/ The manufacturers shall give ACO in writing an early notification of any scheduled test in order that one of its representatives may eventually attend at manufacturer's expenses.

c/ The competitor must supply to the ACO a copy of the FIA approval certificate.

16.2 - Survival cell and frontal protection :

16.2.1 - General prescriptions :

a/ The chassis structure must include a survival cell including the fuel tank, extending from the vertical plane at least 150 mm in front of the driver's feet to behind the fuel tank, the driver's feet resting on the undepressed pedals ;

b/ The survival cell must provide lateral protections 500 mm high as a minimum along the total length of the cockpit opening (with the exception of the door openings. The vertical outside walls of the lateral protections must be separate from one another for a minimum of 900 mm across, and this for 80 % minimum of the length of the cockpit opening ;

c/ Special 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 it must be securely attached to it.

16.2.2 – Approval of the survival cell and the frontal absorbing structure :

a/ the survival cell and the frontal absorbing structure must be submitted to the tests described in appendix 2 and approved by the FIA.

b/ The manufacturers shall give ACO in writing an early notification of any scheduled test in order that one of its representatives may eventually attend at manufacturer's expenses.

c/ The competitor must supply to the ACO a copy of the FIA approval certificate.

16.3 - Protective structure for the driver (open cars only):

a/ The survival cell must be fitted with a protective structure surrounding the driver, on top of the cockpit opening defined in article 14.1.5 ;

b/ It must be attached to or integrated into the survival cell and must be positioned between the front and rear rollover structures.

c/ It must maintain a minimum thickness of 30 mm all round and must comply with the dimensions defined in drawing n°6.

d/ In order to ensure that the opening giving access to the cockpit is of adequate size, it must allow the insertion of templates 3 and 4 defined by drawing n°7.
For this test, the templates, with their rearmost edges aligned transversally, must be held parallel to the reference surface and lowered perpendicularly to the reference surface from above the car until their lower edges are 500 mm above the reference surface.
The steering wheel, steering column, seat and all padding including fixings may be removed.

e/ The forward extremity of the protective structure must be at least 50 mm in front of the steering wheel, whatever its operational position.

16.4 - Modifications :
Any significant modification regarding any of the structures tested will make mandatory a new test carried out the same way.

16.5 - Magnesium : permitted, apart from sheets less than 3 mm thick.

16.6 - Firewalls :

16.6.1 - A perfectly sealed metallic firewall preventing the passage of flames from the engine compartment into the cockpit is mandatory :

- A bulkhead made from a fireproof sandwich material and covered with an metallic adhesive sheet is acceptable.

16.6.2 - Any holes in the firewall must be of the minimum size for the passage of controls and cables, and must be completely sealed.

ART.17 - FUEL

17.1 - Fuel :
The Organiser will supply only one type of fuel for the gasoline engines and one type of fuel for the diesel engines.

***17.2* - Specifications :**
See International Sporting Code - Appendix J Art. 258.16.

17.3 - The use of any other fuel is subject to a special request submitted to the agreement of the Automobile-Club de l'Ouest and the ASN if necessary.

ART. 18 - FINAL TEXT – DISPUTES

a/ The **French version** is the only one valid regarding the implementation and interpretation of the regulations.

b/ Any interpretation regarding these regulations is the AUTOMOBILE-CLUB DE L'OUEST exclusive responsibility.

ART. 19 – "HYBRID" CAR
Cars built before 01/01/2004 in compliance with the 2003 ACO technical regulations for "LM"P and "LM"GTP cars, may be modified in order to comply completely with the present regulations.
The modifications do not concern article 14.1.5 (cockpit opening and volume), 15.4 (headrest and head protection), 16.1 (rollover structures) and 16.2 (survival cell and frontal protection) of the present regulations.
Modifications to the bodywork must :

- Permit to integrate the secondary rollover structure (article 16.1.2. above) ;
- be exclusively designed and made by the manufacturer of the car, who must register with the ACO a detailed technical dossier describing the whole of these modifications.

These "Hybrid" cars will be allowed until **31/12/2006**

"LE MANS" PROTOTYPE ("LM"P)- Appendix 1

The tables below (air restrictor diameter and boost pressure limit) are made out in order to balance the performance of the LMP1 on the one hand and of the LMP2 on the other hand.
In case of force majeure, ACO reserves the right to make any change which they will consider necessary as to maintain a fair balance during the Events.

A - "LM"P1 :

A.1. - Restrictors for gasoline Normally Aspirated Engines (Diameter in mm)

	More than 2 valves / cylinder		2 valves / cylinder		Rotary engines	
Number of restrictors	1	2	1	2	1	2
Up to 3000 cm^3	47,8	34,1	49,4	35,3	52,5	37,5
Over 3000 cm^3 and up to 3500 cm^3	47,3	33,8	48,9	35,0	52,0	37,1
Over 3500 cm^3 and up to 4000 cm^3	46,8	33,4	48,4	34,5	51,4	36,7
Over 4000 cm^3 and up to 4500 cm^3	46,3	33,1	47,9	34,2	50,9	36,4
Over 4500 cm^3 and up to 5000 cm^3	45,8	32,7	47,4	33,8	50,3	35,9
Over 5000 cm^3 and up to 5500 cm^3	45,3	32,4	46,8	33,5	49,8	35,6
Over 5500 cm^3 and up to 6000 cm^3	44,8	32,0	46,3	33,1	49,2	35,1

A.2. - Restrictors for gasoline Supercharged Engines (Diameter in mm)

	1 restrictor	2 restrictors
More than 2 valves / cylinder	45,3	32,4
2 valves / cylinder	46,8	33,4

A.3. – Absolute supercharging pressure for gasoline Supercharged Engines (mbar)

Cylinder capacity (cm^3)	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800	4000
Max. pressure (mbar) More than 2 valves / cylinder	3000	2730	2500	2310	2150	2000	1880	1770	1670	1580	1500
Max. pressure (mbar) 2 valves / cylinder	3410	3100	2840	2630	2440	2270	2130	2010	1900	1790	1700

A.4. - Restrictors (Diameter in mm) and absolute supercharging pressure (mbar) for diesel Supercharged Engines

	1 restrictor	2 restrictors	Max. pressure (mbar)
Up to 4000 cm^3	55,9	39,9	3870
Over 4000 cm^3 and up to 4250 cm^3	55,9	39,9	3680
Over 4250 cm^3 and up to 4500 cm^3	55,9	39,9	3500
Over 4500 cm^3 and up to 4750 cm^3	55,9	39,9	3340
Over 4750 cm^3 and up to 5000 cm^3	55,9	39,9	3190
Over 5000 cm^3 and up to 5250 cm^3	55,9	39,9	3060
Over 5250 cm^3 and up to 5500 cm^3	55,9	39,9	2940

B. - "LM"P2 :

B.1. - Restrictors for gasoline Normally Aspirated Engines (Diameter in mm)

	More than 2 valves / cylinder	2 valves / cylinder	Rotary engines
Up to 3000 cm^3	44,7	46.2	49,1
Over 3000 cm^3 and up to 3200 cm^3	44,3	45.8	48,7
Over 3200 cm^3 and up to 3400 cm^3	44,0	45,5	48,3
homologated engines up to 4000 cm3	44,7	46.2	

B.2. - Restrictors (Diameter in mm) and absolute supercharging pressure (mbar) for gasoline Supercharged Engines

	1 restrictor	Max. pressure (mbar)
More than 2 valves / cylinder	43,0	2500
2 valves / cylinder	44,5	2500

APPENDIX J - ARTICLE 258A - APPENDIX 2

APPROVAL OF SAFETY STRUCTURES FOR SPORTS CARS

ARTICLE 1 : APPROVAL PROCEDURE FOR SAFETY STRUCTURES

1.1 Safety structures

The following safety structures may be the subject of FIA approval :

- Survival cell
- Frontal absorbing structure
- Front and rear rollover structures

1.2 Request for approval

In order to obtain the approval for one of the above-mentioned safety structures, the FIA must first of all receive a written request from the manufacturer or competitor at the following address:

FIA Technical Department
Chemin de Blandonnet 2,
CH1215 Geneva 15
Switzerland

For the tests described in article 2, no approval will be possible without an FIA technical delegate in attendance and without the use of measuring equipment verified by the FIA.

1.3 Approval procedure

- On receipt of the written request, the FIA will send a technical dossier to the manufacturer or competitor, to be filled in and sent back to the FIA.
- On receipt of this dossier, the FIA will decide if the necessary tests may be carried out.
- The manufacturer or the competitor will then propose to the FIA a date and venue for each test, and the FIA will appoint a technical delegate to supervise each of the scheduled tests.
- For each trip made by an FIA technical delegate, the manufacturer or competitor who made the request for approval will be charged according to a fee decided annually by the FIA (1700 Euros for the current year).
- On receipt of the report from the technical delegate, the FIA will draw up a certificate for each safety structure that has successfully undergone the tests necessary for its approval, and will send it to the manufacturer or competitor.
- The manufacturer or competitor will provide all information and documents that the FIA deems necessary for drawing up the certificates.

ARTICLE 2 : APPROVAL TESTS FOR SAFETY STRUCTURES

2.1 Survival cell

The survival cell must be subjected to four separate static load tests.

2.1.1) Static side load tests on the survival cell :

A constant transversal and horizontal load of 3000 daN shall be applied through a ball-jointed junction at the centre of area of a pad :

- On a vertical plane passing halfway between the front axle centreline and the top of the front rollover structure.
- In the cockpit area on a vertical plane passing through the centre of the seat belt lap strap fixing.
- In the fuel tank area on a vertical plane passing through the centre of area of the fuel tank in side elevation.

It must be applied in less than 3 minutes and maintained for a minimum of 30 seconds.
The survival cell must be fixed onto the test device in such a way that its transversal displacement is left free and its rigidity not modified.
This transversal displacement must be blocked through a pad identical to the one used to apply the load and positioned symmetrically relative to it (see diagram 1).
These pads must :
- be 100 mm long and 300 mm high, with a maximum radius on all edges of 3 mm
- conform to the shape of the survival cell at that section
- 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 permissible to place rubber 3 mm thick between the pads and the survival cell.
Under these load conditions, there shall be no structural failure of the inner or outer surfaces of the survival cell.

The deformation shall be measured at the top of the pads across the inner surfaces of the survival cell. and any permanent deformation must be less than 1 mm after the load has been released for 1 minute.

2.1.2) Static vertical load tests on the fuel tank floor :

A constant vertical load of 1700 daN shall be applied through a pad of 200 mm diameter in the centre of area of the fuel tank floor.

Under these load conditions, there shall be no structural failure of the inner or outer surfaces of the survival cell.

2.2 Frontal absorbing structure

The frontal absorbing structure must be subjected successively to a static side load test and a crash test.

2.2.1) Tests of the frontal absorbing structure with the complete survival cell :

a) Static side load test on the frontal absorbing structure :

To test the attachments of the frontal absorbing structure to the survival cell, a static side load test shall be performed.

For this test, the frontal absorbing structure must be fixed to the complete survival cell.

A constant transversal and horizontal load of 4000 daN, passing through a vertical and transversal plane situated 500 mm forward of the front axle centreline, must be applied to one side of the frontal absorbing structure using a pad identical to the one used in the static side load tests on the survival cell (see article 2.1.1).

The centre of area of the pad must pass through the vertical and transversal plane mentioned above and the mid point of the height of the structure at that section.

During that test, the complete survival cell must be solidly secured to a flat plate but not in such a way as to increase the strength of the attachments being tested, and must be blocked laterally through a pad of identical dimensions to the one used to apply the load, positioned before the junction with the frontal absorbing structure (see diagrams 2 and 3).

After 30 seconds of application, there must be no failure of the structure or of any attachment between the structure and the survival cell.

b) Crash testing of the frontal absorbing structure :

The frontal absorbing structure and the complete survival cell must be subjected to an impact test against a solid, vertical barrier placed at right angles to the longitudinal axis of the car.

The frontal absorbing structure and the complete survival cell must previously have been subjected to the static side load test described in article 2.2.1a).

The complete survival cell must be solidly fixed to the trolley through its engine mounting points but not in such a way as to increase its impact resistance.

The fuel tank must be full of water.

A dummy weighing at least 75 kg must be installed in the survival cell with the safety belts defined in Article 15.2 fastened.

With the safety belts unfastened, the dummy must be able to move forwards freely in the cockpit.

The following must also be installed :

- The extinguishers, as described in article 258A-15.1;
- The battery, according to article 258A-8.1.

The test conditions are as follows :

The total weight of the trolley and test structures shall be equal to the minimum weight defined in article 258A-4.1 + 150 kg and the velocity of impact 14 m/s.

During the test, the maximum average deceleration of the trolley must not exceed 25 g.

In addition, there must be no damage to the survival cell or to the mountings of the safety belts or fire extinguishers or battery.

Furthermore, the peak deceleration in the chest of the dummy must not exceed 60 g for a cumulative time of more than 3ms, this being the resultant of the data from the three axes.

2.3 Rollover structures

Each rollover structure must be subjected successively to the following static load tests :

2.3.1) Front structure :

- A vertical load of 75 kN must be applied on top of the structure, downward and in front of the driver.

2.3.2) Rear structure :

a) Combined load :

The following loads must be applied simultaneously on top of the structure, behind the driver :

- 60 kN longitudinally rearward
- 50 kN transversally inward
- 90 kN vertically downward.

b) Longitudinal load :

One of the following tests must be carried out at the discretion of the technical delegate :

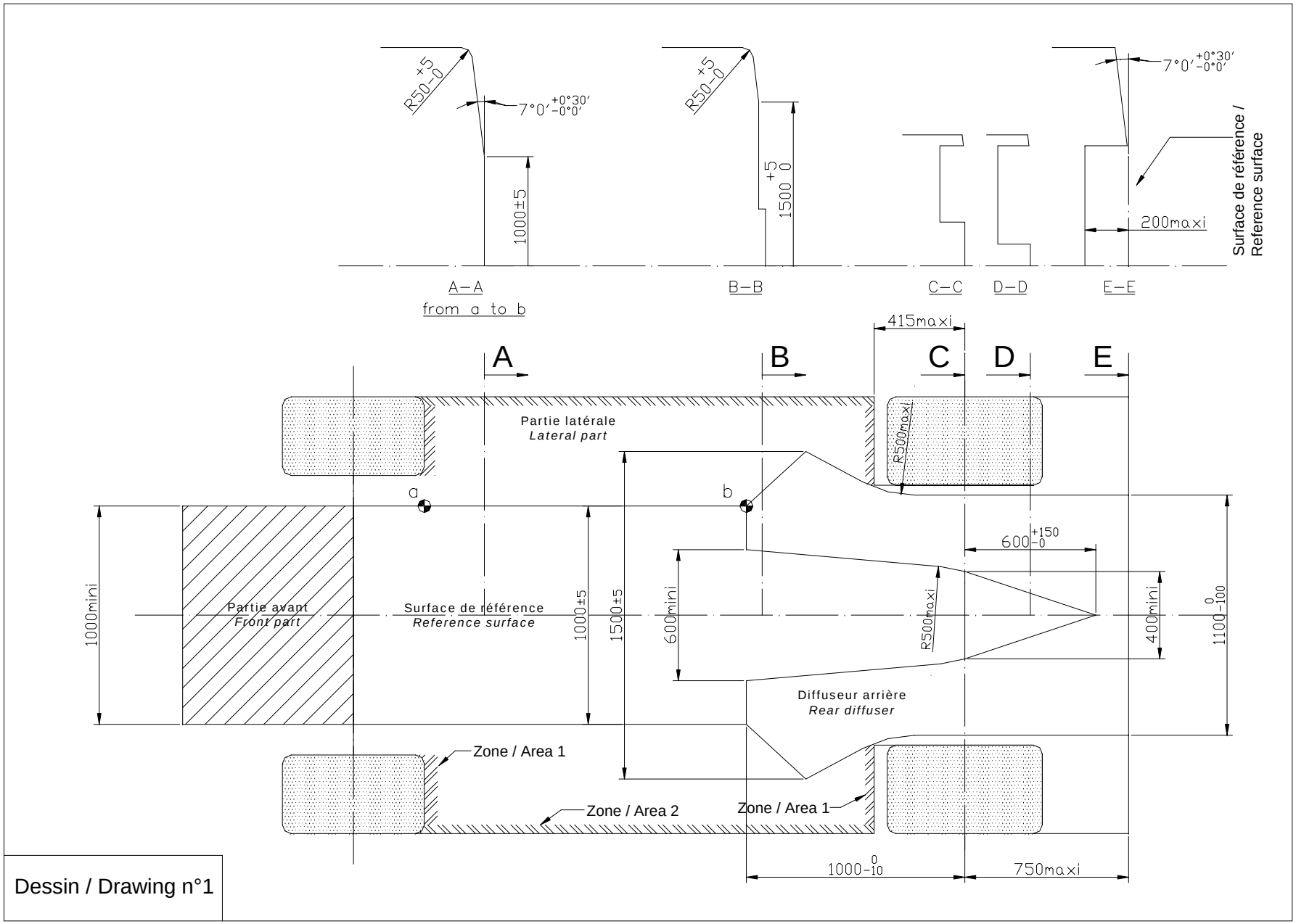
- A longitudinal load of 60 kN, applied forward, on top of the structure.
- A longitudinal load of 60 kN, applied rearward, on top of the structure.

The load may be applied indiscriminately on one side or the other relative to the longitudinal axis of the car, at the discretion of the FIA technical delegate.
The resultant of these loads shall be applied through a rigid flat pad with a diameter of 200 mm, positioned perpendicularly to the axis of this resultant.
If the front rollover structure is not directly accessible or is part of the survival cell, the load may be applied straight onto the survival cell, through a plate fitting the cell's local shape, the surface of which must be less than or equal to that of a disc 200 mm in diameter.
It will be permissible to place rubber 3 mm thick between the pad and the survival cell.
The rollover structures must be attached to the survival cell.
The survival cell must be supported on its underside on a flat plate, fixed to it though its engine mounting points and wedged laterally by pads 100 mm wide by 300 mm long.
The deformation must be less than 50 mm, measured along the axis of load application, and any structural failure must be limited to 100 mm below the top of the rollover structure, measured vertically.

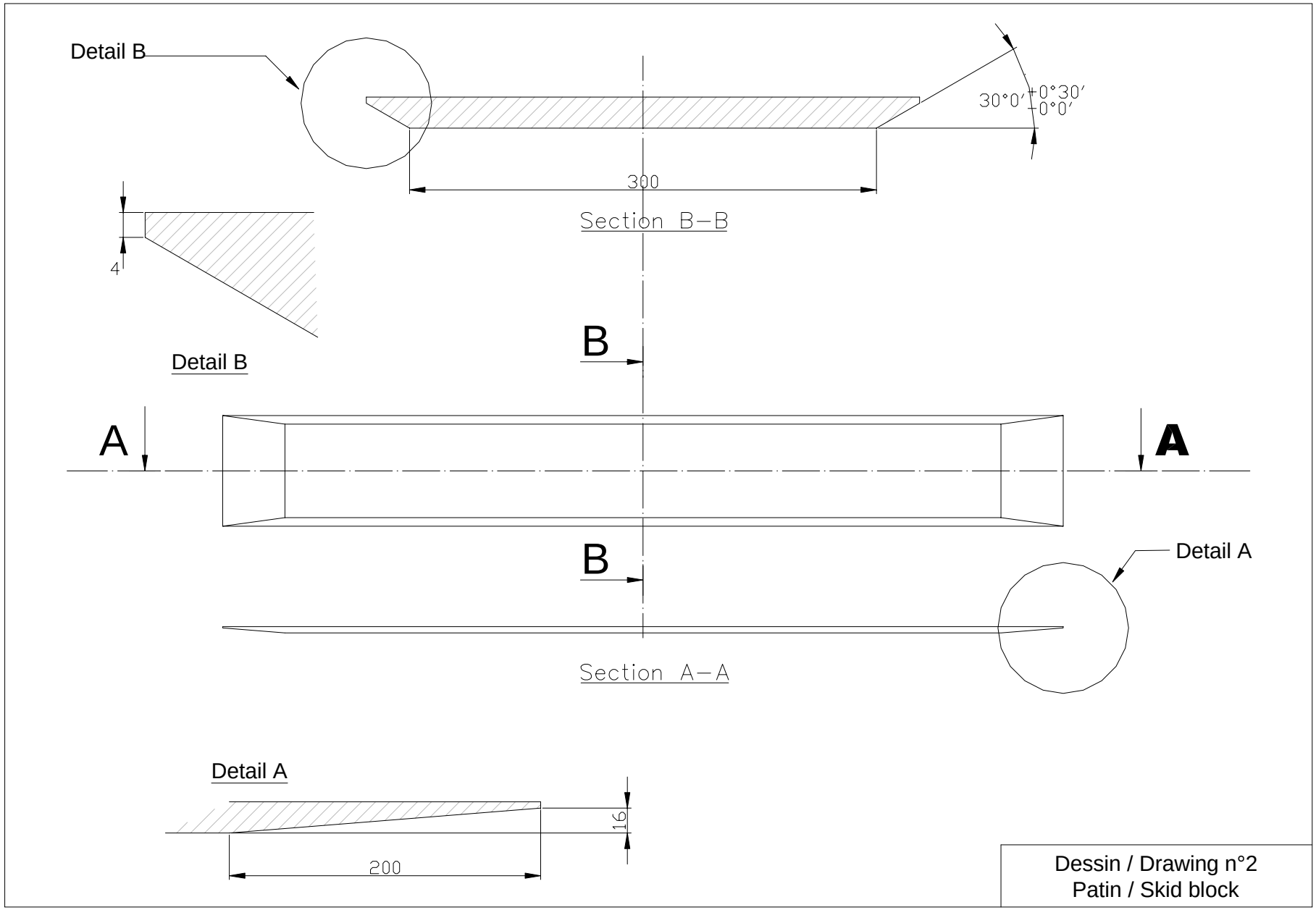
2.4 Steering column

Crash testing of the steering column :

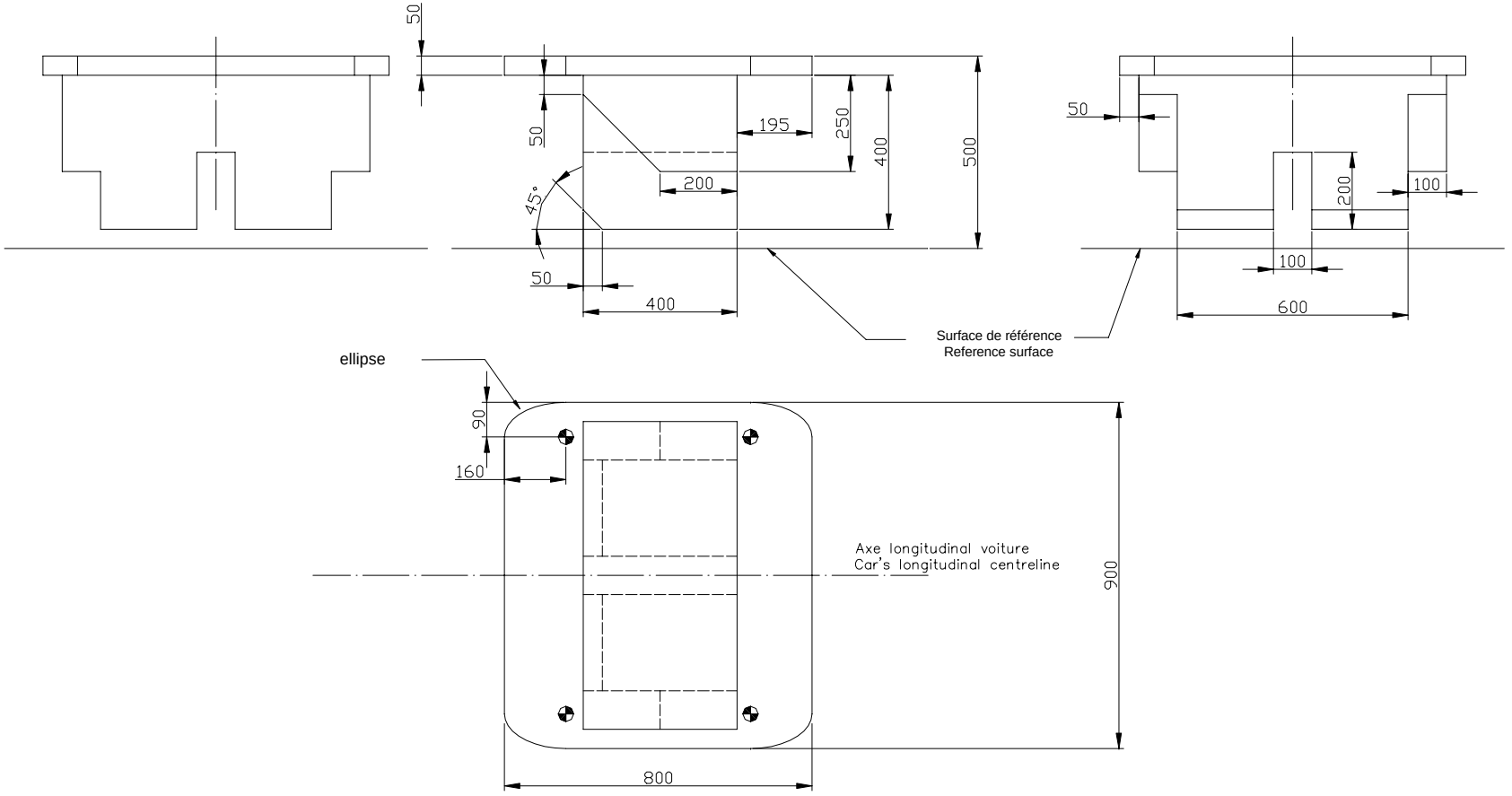
The steering wheel, steering column and steering rack assembly must be mounted on a representative test structure, as must any other parts which could materially affect the outcome of the test.
The test structure must be firmly fixed to the ground and a solid object, having a mass of 8kg and travelling at a velocity of 7m/s, will be projected onto it.
The object used for this test must be hemispherical with a diameter of 165 mm.
For the test, the centre of the hemisphere must strike the structure at the centre of the steering wheel along the same axis as the main part of the steering column.
During the test the striking object may not pivot in any axis and the test structure may be supported in any way provided that this does not increase the impact resistance of the parts being tested.
The resistance of the test structure must be such that, during the impact, the peak deceleration of the object does not exceed 80 g for more than a cumulative 3 ms, this being measured only in the direction of impact.
After the test, all substantial deformation must be within the steering column and the steering wheel quick release mechanism must still function normally.



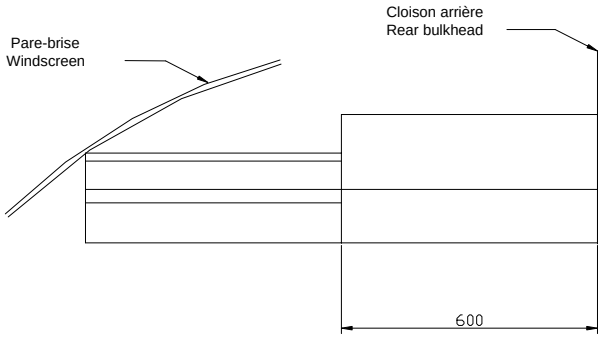
Dessin / Drawing n°1

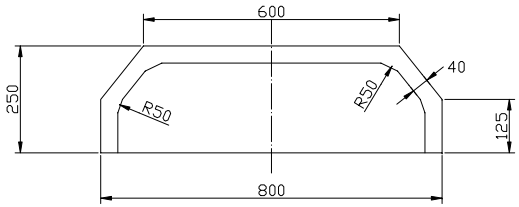


Dessin / Drawing n°2
Patin / Skid block

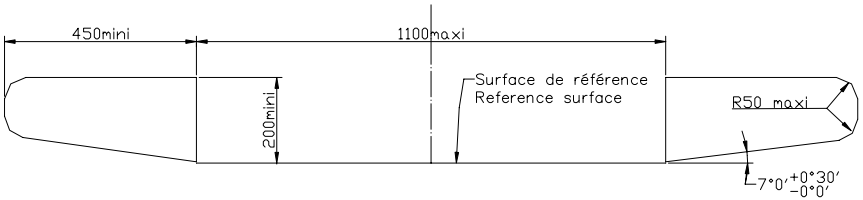


Dessin / Drawing n°3
Gabarit / Template n°1

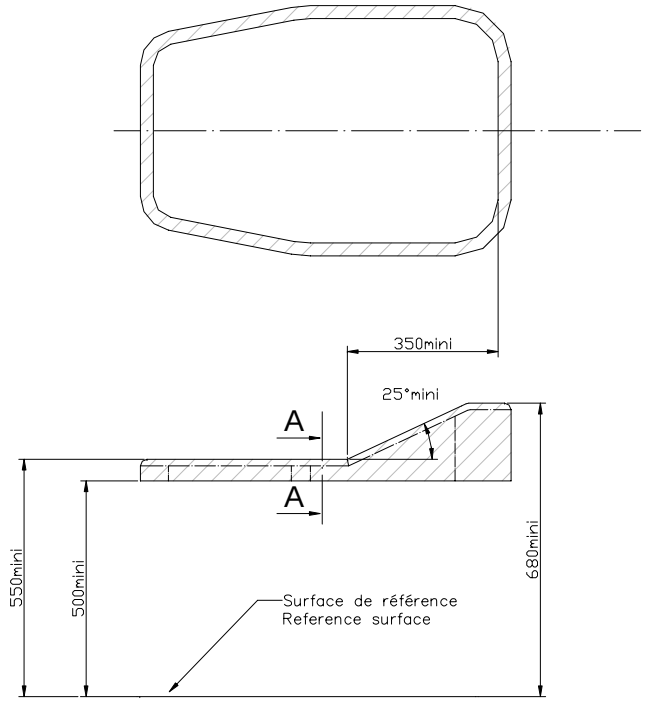


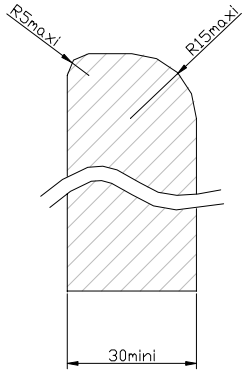


Dessin / Drawing n°4
Gabarit / Template n°2



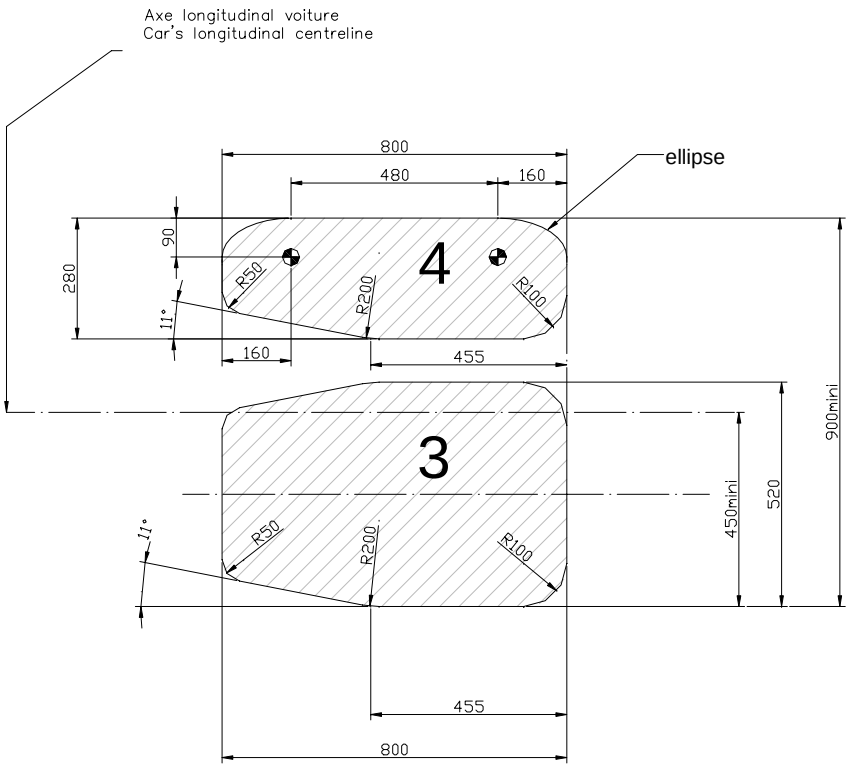
Dessin / Drawing n°5



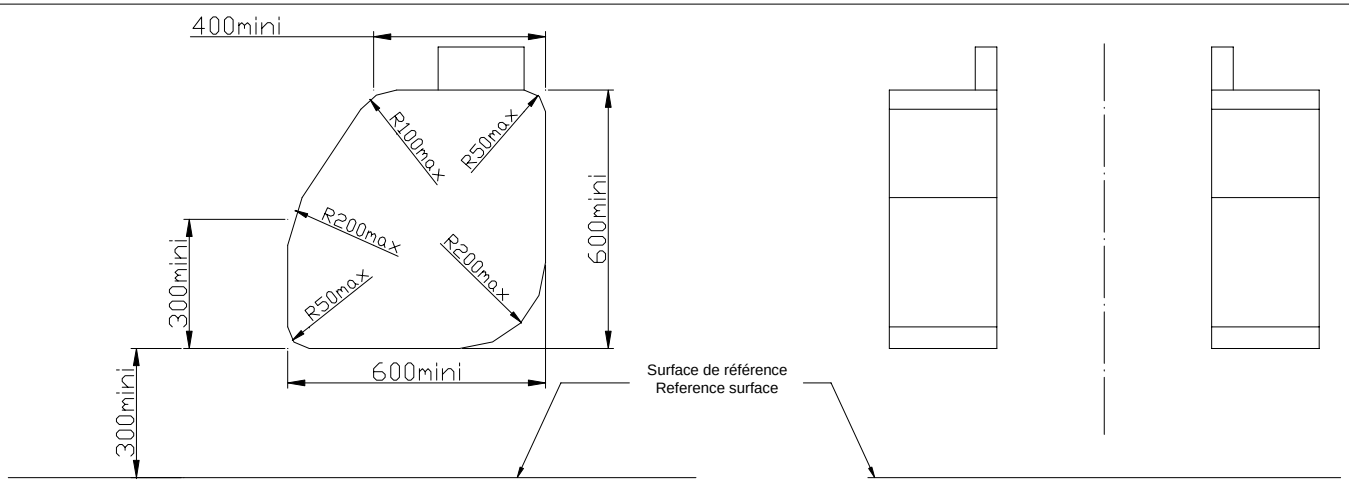


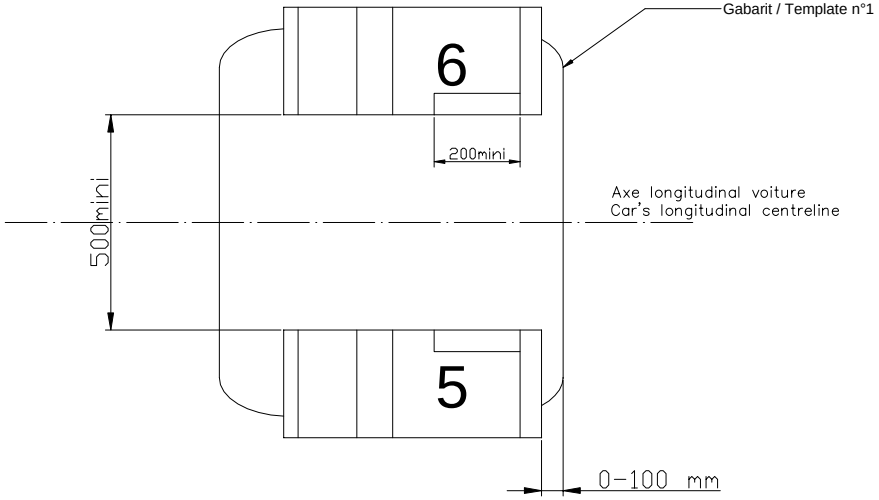
Section A-A (applicable allround)

Dessin / Drawing n°6

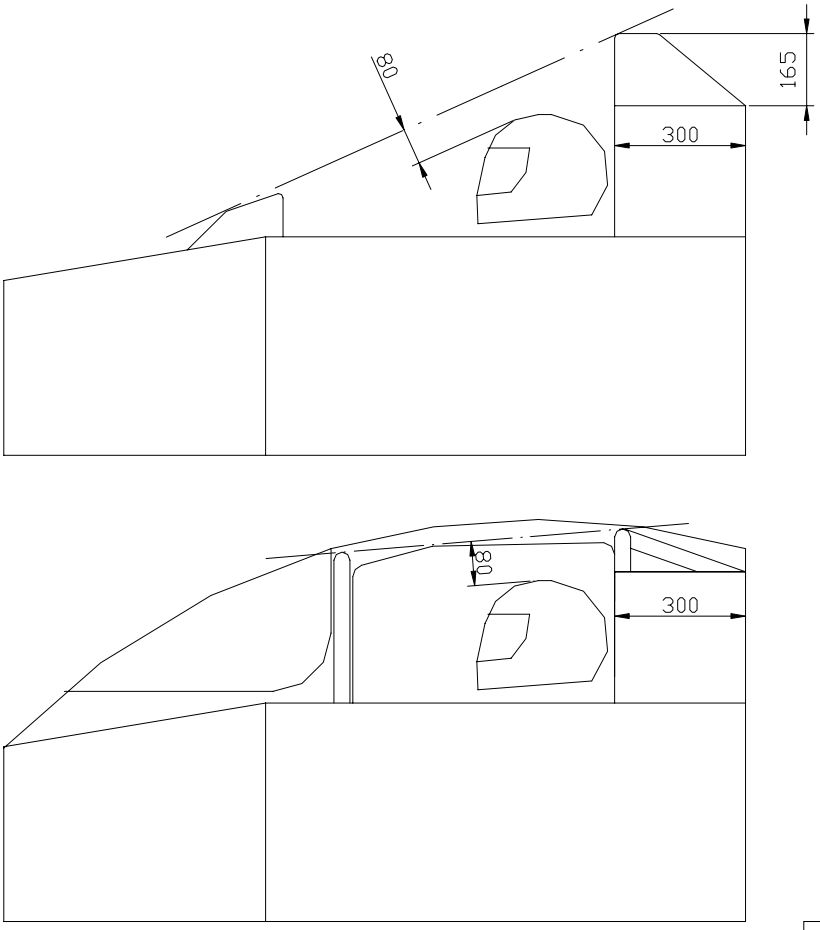


Dessin / Drawing n°7
Gabarits / Templates n° 3 and 4

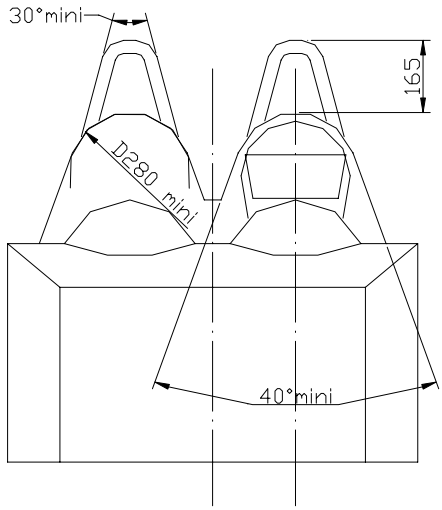




Dessin / Drawing n°8
Gabarits / Templates n°5 et / and 6



Dessin / Drawing 9



Dessin / Drawing 10