SPECIFICATIONS OF AUTOMOBILES

All vehicles in races and other speed events must comply with the General Requirements of Automobiles (see "General Requirements for Cars and Drivers" in the CAMS Manual of Motor Sport).

Ist Category – Racing Cars
Formula 4000

National Association:

Formula 4000 Association
Contact: CAMS

1. PREAMBLE

A single-seat open-wheeled automobile designed solely for speed events on closed courses using an approved Holden V6 four-stroke reciprocating engine.

The following are the regulations governing the construction of Formula 4000 cars.

2. COACHWORK AND DIMENSIONS

Refer to the relevant sections of this article to determine bodywork requirements for designated vehicles. The letter in parenthesis will be used as a suffix on the relevant regulation and thus the regulation, together with the suffix, will determine the modifications permitted for the designated year of car.

(a) **(for cars designated 1993 or earlier)**

Cars designated by the manufacturer as being a 1993 or earlier Formula 3000 model, at least two examples of which having been constructed and raced prior to 1st August 1993 in either the FIA International Formula 3000 or British Formula 3000/F2 or Japanese F3000/Formula Nippon Championships.

(b) **(for cars designated 1994)**

Cars designated by the manufacturer as being a 1994 Formula 3000 model, at least two examples of which having been constructed and raced prior to 1st August 1994 in either the FIA International Formula 3000 or British Formula 3000/F2 or Japanese F3000/Formula Nippon Championships.

(c) **(for cars designated 1995 to 1998)**

Cars designated by the manufacturer as being a 1995 Formula 3000 model, at least two examples of which having been constructed and raced prior to 1st August 1995 in either the FIA International Formula 3000 or British Formula 3000/F2 or Japanese F3000/Formula Nippon Championship.

2 (a) (for cars manufactured up to 31/12/93)

2.1 (a) All measurements must be made whilst the car is stationary on a flat horizontal surface.

2.2 (a) The overall width of the car including complete wheels shall not exceed 200cm with the steered wheels in the straight ahead position.

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

2.4 (a) The overall width of the coachwork behind the rearmost edge of the complete front wheels and in front of the centre line of the rear wheels shall not exceed 130cm. The crushable structure is included in the width.

2.5 (a) Between the rear edge of the complete front wheels and the front edge of the complete rear wheels, all sprung parts of the car visible from directly beneath the car with the exception of the rear view mirror on each side of the car, must lie on one plane within a tolerance of plus or minus 5mm. (This tolerance provides for possible manufacturing problems and does not permit designs contrary to the spirit of the "flat bottom" requirement.) To protect the bottom of the car, skids may be placed outside the flat bottom area.

2.6 (a) All other specific parts of the car influencing its aerodynamic performance must respect the whole of Regulation 2 – "Coachwork and Dimensions". (This means for example, the lower parts of the front wing

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end plates must not be flexible and must not be lower than the geometrical plane generated by the "flat bottom" surface.)

All of these parts must produce a uniform, solid, hard, rigid (no degree of freedom in relation to the body/chassis unit) impervious surface under all circumstances. The periphery of the surface formed by these parts must be curved upwards with a maximum radius of 5cm. No parts of the bodywork in front of the centre line of the rear wheels and extending above the height of the complete rear wheels may project beyond 45cm each side of the longitudinal axis of the car.

2.7 (a) Coachwork behind the centre line of the rear wheels shall not exceed 90cm in overall width or extend beyond 45cm from the longitudinal axis of the car. The coachwork of cars manufactured in Australia must not exceed 110cm and 55cm respectively.

2.8 (a) No part of the car shall be more than 60cm behind the centre line of the rear wheels, nor more than 120cm ahead of the centre line of the front wheels. The coachwork of cars manufactured in Australia must not exceed 80cm and 100cm respectively.

2.9 (a) All cars must have side structures, the length of which must be at least 50% of the wheel-base of the car, with a minimum width of 55cm, each side of the longitudinal centre line of the vehicle. These side structures shall be the outermost extremities of the coachwork and must comply with the regulations applying to coachwork.

2.10 (a) Except for the safety roll over structures, no part of the car shall be higher than 90cm from the ground with the car in normal racing trim with the driver aboard seated normally. Any part of the safety roll over structure more than 90cm from the ground must not be shaped so as to have a significant aerodynamic influence on the performance of the car.

2.11 (a) Any specific part of the car influencing its aerodynamic performance:

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

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

No part having an aerodynamic influence and no part of the coachwork may, under any circumstances be located below the geometric plane generated by the place provided for by Regulation 2.5(a).

2 (b) (for cars designated 1994)

2.1 (b) All measurements must be made whilst the car is stationary on a flat horizontal surface.

2.2 (b) **Width:** Overall width of the car, including complete front wheels shall not exceed 200cm, with the steered wheels in the straight ahead position.

2.3 (b) **Width ahead of the front wheels centre line:** The bodywork ahead of the front wheel centre line is limited to an overall width of 150cm. Nevertheless, any part of the body work ahead of the front wheel centre line exceeding an overall width of 110cm must not extend above the height of the front wheel rims with the driver aboard seated normally, and irrespective of the fuel load.

2.4 (b) **Width and shape between the front and rear wheels:** The maximum width of the bodywork behind the centre line of the front wheels and in front of the centre line of the rear wheels is 130cm.

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

To help overcome any possible manufacturing problems, a tolerance of plus or minus 5mm is permissible across this surface. To protect the underside of the car, a maximum of six wooden blocks may be fitted in the flat area referred to above. These blocks must be no more than 100mm in diameter or 5mm thick. In addition, their centres must be at least 250mm apart. No part of the bodywork in front of the rear wheel centre line and extending above the height of the complete rear wheels may project beyond 45cm each side of the longitudinal axis of the car. With the exception of the brake cooling ducts, in plan view, there must be no bodywork in the area formed by two longitudinal lines parallel to and 40cm and 100cm from the car centre line and two transversal lines, one 5cm forward of the front edge and one 20cm behind the rear edge of the complete front wheel.

2.5 (b) **Width behind the rear wheel centre line:** Bodywork behind the centre line of the rear wheels must not exceed 90cm in width.

2.6 (b) **Overhangs:** No part of the car shall be more than 60cm behind the centre line of the rear wheels or more than 120cm in front of the centre line of the front wheels. The centre line of any wheel shall be deemed to be half way between two straight edges, perpendicular to the surface on which the car is standing, placed against opposite sides of the complete wheel at the centre of the tyre tread.

2.7 (b) **Height:** Except for the roll over structures, no part of the car may be higher than 90cm from the ground with the car in normal racing trim with the driver aboard and seated normally. Any part of the roll over structures higher than 90cm from the ground must not be shaped to have a significant aerodynamic influence on the performance of the car.

2.8 (b) **Aerodynamic Influence:**

- Any specific part of the car influencing its aerodynamic performance:
- Must comply with the rules relating to bodywork.

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- Must be rigidly secured to the entirely sprung part of the car (rigidly secured means not having any degree of freedom).
- Must remain immobile in relation to the sprung part of the car.

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

No part having an aerodynamic influence and no part of the bodywork may under any circumstances be located below the geometrical plane generated by the flat surface described in Article 3.3.

No part of the bodywork in front of the front wheel axis and more than 20cm from the longitudinal centre line of the car may be closer than 25mm to the geometrical plane referred to above.

2.9 (b) **Roll hoop access:** The second roll over structure must be designed to provide a clearly visible unobstructed opening in order that a strap whose section measures 6cm x 3cm can pass through it to lift the car.

2 (c) (for cars designated 1995 to 1998)

2.1 (c) **Width:** Overall width of the car, including complete front wheels shall not exceed 200cm, with the steered wheels in the straight ahead position.

2.2 (c) **Width ahead of the front wheels centre line:** The bodywork ahead of the front wheel centre line is limited to an overall width of 150cm. Nevertheless, any part of the body work ahead of the front wheel centre line exceeding an overall width of 110cm must not extend above the height of the front wheel rims with the driver aboard seated normally, and irrespective of the fuel load.

2.3 (c) **Width and shape between the front and rear wheels:** The maximum width of the bodywork behind the centre line of the front wheels and in front of the centre line of the rear wheels is 130cm. Between the rear edge of the complete front wheels and the front edge of the complete rear wheels all sprung parts of the car visible from directly beneath the car with the exception of the rear view mirror on each side of the car, must lie on one plane. All these parts must produce a uniform, solid, hard, rigid (no degree of freedom in relation to the body/chassis unit), impervious surface, under all circumstances. The periphery of the surface formed by these parts may be curved upwards with a maximum radius of 5cm. To help overcome any possible manufacturing problems, a tolerance of plus or minus 5mm is permissible across this surface. Beneath the surface formed by all parts lying on the reference plane, a rectangular skid block may be fitted. This skid block may comprise more than one piece but must:

(i) extend longitudinally from the rear edge of the complete front wheels to the centre line of the rear wheels.

(ii) be made from an homogeneous material with a specific gravity between 1.3 and 1.45.

(iii) have a width of 30cm with a tolerance of plus or minus 2mm.

(iv) have a thickness of 10mm with a tolerance of plus 1mm.

(v) have a uniform thickness when new.

(vi) have no holes or cut outs other than those necessary to attach it to the car or those which will be used to measure its thickness.

(vii) have six precisely placed holes in order that its thickness can be measured at any time. These holes must be 50mm in diameter and must be placed in the positions detailed in Fig 1. In order to establish the conformity of the skid block after use, its thickness will only be measured in these holes.

(viii) have no more than 10 fasteners, each with a maximum area of 20cm^2, which are flush with its lower surface. Any other fasteners must be at least 1mm above its lower surface.

(ix) be fixed symmetrically about the centre line of the car in such a way that no air may pass between it and the surface formed by the parts lying on the reference plane.

The lower edge of the periphery of this block may be chamfered at an angle of 30° to a depth of 8mm, the trailing edge however may be chamfered over a distance of 200mm to a depth of 8mm.

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

With the exception of the brake cooling ducts, in plan view, there must be no bodywork in the area formed by two longitudinal lines parallel to and 40cm and 100cm from the car centre line and two transversal lines, one 5cm forward of the front edge and one 20cm behind the rear edge of the complete front wheel.

2.4 (c) **Width behind the rear wheel centre line:** Bodywork behind the centre line of the rear wheels must not exceed 90cm in width.

2.5 (c) **Overhangs:** No part of the car shall be more than 60cm behind the centre line of the rear wheels or more than 120cm in front of the centre line of the front wheels.

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

2.6 (c) **Height:** Except for the roll over structures, no part of the car can be higher than 90cm from the ground with the car in normal racing trim with the driver aboard and seated normally. Any part of the roll over structures higher than 90cm from the ground must not be shaped to have a significant aerodynamic influence on the performance of the car.

2.7 (c) **Aerodynamic influence:**

- Any specific part of the car influencing its aerodynamic performance.
- Must comply with the rules relating to bodywork.

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- Must be rigidly secured to the entirely sprung part of the car (rigidly secured means not having any degree of freedom).
- Must remain immobile in relation to the sprung part of the car.

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

  No part having an aerodynamic influence and no part of the bodywork may under any circumstances be located below the geometrical plane generated by the flat surface described in Article 2.3(c).

  No part of the bodywork in front of the front wheel axis and more than 20cm from the longitudinal centre line of the car may be closer than 25mm to the geometrical plane referred to above.

2.8 (c) **Roll hoop access:** The second roll over structure must be designed to provide a clearly visible unobstructed opening in order that a strap whose section measures 6cm x 3cm can pass through it to lift the car.

3. RACING WEIGHT

The racing weight of the car must be at least 675kg for cars using the approved 1990 3800 V6 Holden engine or 650kg for cars using the approved Alloytech 3600 engine.

During any race or practice therefore, it is forbidden to add any liquid or other material, or to replace any part of the car with another which is materially heavier. Ballast may be used provided it is secured in such a way that tools are required for its removal. It must be possible to affix seals if deemed necessary by the scrutineers.

Note: CAMS reserves the right to vary the above weights in the case of major performance discrepancy between the 3600 V6 and Alloytech-engined cars.

4. PIPING AND PETROL TANKS, CABLES AND ELECTRICAL EQUIPMENT

4.1 All fuel tanks must be situated within the main structure of the car. The storing of petrol at more than 40cm from the longitudinal axis of the car and in the longitudinal box members as defined by Regulation 11.12 is forbidden.

4.2 All fuel tanks except for a collector tank not exceeding five litres in capacity must be rubber bladders conforming to the specifications of FIA FT3 or any other specification as may be approved by CAMS.

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

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

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

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

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

(i) 6800 kPa (950 psi) for those lines working under pressure; or

(ii) 700 kPa (100 psi) for other lines.

4.6 The entire fuel tank area of the car in direct contact with the open air stream must incorporate a crushable structure which is an integral part of the car conforming to the specification hereafter. This area includes the complete area of the body/monocoque construction, irrespective of such added items as water radiators, inlet ducts etc.

The crushable structure should be a sandwich construction based on a fire-resistant core of minimum crushing strength of 25psi (18 kPa). It shall be permitted to pass water pipes through this core but not fuel, oil, or electrical lines. The sandwich construction must include two sheets of at least 1.5mm thickness, one of which shall be aluminium alloy sheet, having a minimum tensile strength of 225 MPa (14 ton/in^2) and a minimum elongation of 5%. The minimum thickness of the sandwich construction must be 1cm.

4.7 The tank fillers and their caps shall not protrude beyond the coachwork. Fillers shall have sufficient diameter to allow for air to be exhausted at the time of refuelling. Any breather pipes connecting the tanks with the atmosphere shall be designed to avoid liquid leakage at all times. All filler caps must be designed to ensure efficient closure to reduce the risk of accidental opening following a crash impact or incomplete locking after refuelling.

Fuel tank air vents must be located at least 25cm to the rear of the cockpit. Fuel tanks may not be vented through or into the safety roll over structure. Vents must be designed to prevent leakage, even if the car is in an inverted position.

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5. OIL TANKS AND LINES

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

No part of the car containing oil may be situated aft of the gearbox or final drive casing.

All oil lines external to the cockpit, with the exception of lines permanently mounted on the engine, must be capable of withstanding a pressure of 7000 kPa (1000psi) and a temperature of 230°C.

Any open-type sump breather must vent into a catch tank of at least two litres capacity. The overflow from the catch tank must feed into a container of at least 500ml capacity.

No part of the car containing oil may be more than 65cm from the longitudinal axis of the car.

No oil replenishment is permitted during the race.

6. STARTER

6.1 A starter with electrical or other source of energy carried aboard the car, and able to be controlled by the driver when normally in his seat must be fitted to all cars.

6.2 A supplementary external source of energy temporarily connected to the car may be used to start the engine both on the starting grid and in the pits (see also Regulation 14.4(vi)).

7. TRANSMISSION

7.1 Four-wheel drive is forbidden. Cars must drive to the rear wheels only.

7.2 Five gearbox ratios not including reverse are the maximum permitted. All automobiles must have a reverse gear which must be in working order when the car starts the event and which can be operated by the driver when seated normally in the car.

7.3 Carbon fibre clutches, or clutches with a titanium outer drive ring and driven plate hub, are permitted.

7.4 Any device which electronically monitors and controls the delivery of power between the input shaft of the gearbox and the rear wheels is prohibited.

8. BRAKES

8.1 All cars must be equipped with a braking system which has at least two separate circuits operated by the same pedal. This system must be designed so that if leakage or failure occurs in one circuit, the pedal shall still operate the brakes on at least two wheels.

8.2 Carbon fibre brakes are forbidden. The use of cross-drilled discs is prohibited.

8.3 Electronic wheel anti-locking systems are prohibited.

8.4 Air ducts for the purpose of cooling the front brakes must not protrude beyond:

- a plane parallel to the ground 140mm above the horizontal centre line of the wheel;
- a plane parallel to the ground 140mm below the horizontal centre line of the wheel;
- a vertical plane parallel to the inner face of the front rim and displaced from it by 120mm toward the centre line of the car.

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

9. WHEELS AND TYRES

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

9.2 The maximum width of the complete wheel is 16". The width shall be measured with the tyre at normal operating pressure and the complete wheel mounted on the car resting on the ground in running order with the driver normally seated in the car. This measurement is made at axle height.

9.3 The wheel diameter shall be 13" nominal. The maximum number of wheels on each car is four.

9.4 Tyres are free.

9.5 Throughout any race meeting, it is prohibited to use any device to artificially pre-heat the tyres.

9.6 The use of tyre pressure release (pop off) valves is prohibited.

10. COCKPIT

10.1 The opening giving access to the cockpit must have the following minimum dimensions:

- length 60cm
- width 45cm maintained over 30cm from the most rearward point of the seat backrest towards the front.

10.2 The cockpit must be so conceived that the maximum time necessary for the driver to get out does not exceed five seconds.

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

10.4 There must be a firewall between the engine and the driver's compartment to prevent the passage of flame and debris.

10.5 All cars must have at least two mirrors mounted so that driver has visibility to the rear on both sides of the car. The minimum reflective surface of each shall be 55cm^2.

10.6 A six-strap restraining system incorporating two crotch restraint straps must be fitted.

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II. SAFETY

11.1 All cars must be equipped with an integrated on-board fire extinguisher. The extinguishing agent must one permitted by CAMS. Halon 1211/1301 (BCF) is not permitted. The minimum total capacity of the fire extinguisher/s is 5kg and it must discharge into both the driver's compartment and the engine compartment.

11.2 The extinguisher bottle/s must be adequately protected and mounted within the main structure of the car. The bottle mountings must be able to withstand 25G acceleration, no matter how this force is applied.

11.3 A triggering system having its own source of energy is permitted, provided it is possible to operate the extinguisher in the case of main circuit failure. The driver must be able to trigger all extinguishers when seated normally in the car with his safety belts fastened and the steering wheel in place. The system must work in any position even if the car is inverted.

11.4 The type of extinguishant, the total weight of the charged bottle and the quantity of extinguishant must be specified on each bottle.

11.5 The location of the means of triggering the fire extinguisher by a person outside the car must be clearly marked by a red letter "E" in a white circle of at least 10cm diameter. The white circle must have a red edge.

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

11.7 All cars must be fitted with a red warning lamp of at least 18 watts in working order at the start of each race or practice session. The lamp must face rearwards and be clearly visible from the rear of the car. It must be mounted not more than 10cm from the car centreline and have a surface area between 20 sq.cm and 40 sq.cm When required, the lamp must be able to be switched on by the driver when seated normally in the car with seat belts fastened.

11.8 Chromium plating of steel suspension members of over 725 MPa (45 tons/in^2) tensile strength is forbidden.

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

11.10 The use of titanium in any part of the car is prohibited unless it is specifically authorised.

11.11

(i) The monocoque may be made of carbon fibre and/or carbon fibre/Kevlar combination materials (composite construction), subject to the monocoque being designated by the manufacturer as being a 1993 or earlier Formula 3000 model, at least two examples of which having been constructed and raced prior to 1 August, 1994 in either the FIA International Formula 3000 or British F3000/F2 or Formula Nippon Championships.

The foregoing applies only to cars manufactured outside Australia. See also Regulation 2.7 and 2.8 (Coachwork and Dimensions).

(ii) Cars employing composite monocoque but not complying with Regulation 11.11(i) may be eligible at the sole discretion of CAMS.

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

(i) All cars must have at least two roll over structures:

(a) The first roll over structure must be in front of the steering wheel rim and at least as high as the top of the steering wheel rim.

(b) The second roll over structure must be not less than 50cm behind the first and high enough that a line extended from the top of the first structure to the top of the second structure passes over the top of the driver's helmet when he is seated normally in the car with his seat belt fastened.

(ii) All safety structures must, when attached to the car, be capable of withstanding three loads applied simultaneously to the top of the structure – 1.5w laterally, 5.5w longitudinally, and 7.5w vertically *("w" being the racing weight of the car).*

(iii) The design concept of the safety structures required by paragraph (i) above is free. Forward facing stays which restrict the dimensions of the cockpit as specified at Regulation 10.1 are permitted provided that the driver can still leave the car in the time required in that paragraph (five seconds).

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

- All welding should be of the highest quality possible with full penetration (preferably TIG).
- Considerable care should be exercised with the necessary strengthening of the basic structure, for example by adding reinforcement bars or plates to properly distribute the loads.

(v) All cars must incorporate a structure immediately behind the driver's seat which is wider than and extends above his shoulders when he is seated normally in the car with his seat belt fastened. This structure must be capable of withstanding a sustained weight of 1.5w applied at the top *("w" being the racing weight of the car).*

(Note: the function of this structure can be carried out by the second roll over structure described at Regulation 11.12 (i) (b) if the dimensions of that structure are suitable.)

(vi) The chassis (main structure) must be of a monocoque construction. Tubular construction is not permitted.

(a) The chassis structure shall include two continuous box members, one on each side of the driver. If necessary these box members can be coupled. The chassis must incorporate at least one transversal hoop at the main roll bar level, one in front of the pedal box, and a further hoop between these two.

(b) All cars manufactured before 1 January, 1988, must have a substantial structure to protect the driver's

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feet which is capable of withstanding a compression load of 25G applied to the front of the car without allowing the pedals to move rearward more than 15cm. The magnitude of this force will be calculated using the weight of the car with the driver and all fuel tanks full.

On cars manufactured after 1 January, 1988, each box member must extend from behind the driver to a point at least 50cm in front of the soles of his feet with the driver seated normally, his feet on the pedals and the pedals in the inoperative position. The foremost 40cm of each box member need not be an integral part of the main chassis but must be solidly fixed to it.

(c) Throughout its length the structural material in the cross section of each box member shall have a minimum area of 10 sq. cm, a minimum tensile strength of 300 MPa and a minimum panel thickness of 1mm on unstabilised skins or 5cm^2 and 0.5mm thickness on stabilised skins. Throughout its length from behind the driver to the soles of his feet, each box must have a minimum cross sectional area of 150 sq.cm. Forward of this, the boxes may taper to a minimum cross section of 100 sq.cm and minimum structural material cross section of 5cm^2 for unstabilised skins and 2.5cm^2 for stabilised skins.

(d) For cars manufactured after 1 January, 1988, all holes and cut outs in the boxes shall be strongly reinforced and all material sections through these holes shall comply with minimum area requirements for 10cm^2 for unstabilised skins and 5cm^2 for stabilised skins.

(e) For all cars, the internal cross sectional area of the cockpit from the soles of the driver's feet to behind his seat shall nowhere be less than 700cm^2. The minimum width must be at least 25cm over the whole length of the cockpit.

(f) For cars manufactured after 1 January, 1988, the minimum height of the box between the front and rear roll over structures shall be not less than 30cm.

(g) All cars must be fitted with a head restraint which does not deflect more than 5cm rearwards when a rearward force of 85kg is applied. It must be designed so that the driver's head cannot be trapped between it and the roll over structure.

11.13 All competing vehicles must be equipped with the appropriate tools to enable the onsite removal of the front wing/nose assembly. These tools must be securely fixed to the vehicle.

11.14 Each vehicle must be fitted with substantial, low mounted rear towing eye that is positioned behind the centre line of the rear axle.

12. SUSPENSION

All road wheels/axles must be suspended from the chassis/body by springing media (ie, axles or wheels must not be connected directly to the chassis/body unit). The springing medium must not consist of bolts located through flexible bushes or flexible mountings. There must be independent movement of the axles/wheel uprights/stub axles, giving suspension travel from "bump" to "droop" in excess of the flexibility of the mounting location attachments.

Any electrical device or system capable of controlling ride height whilst the car is in motion is prohibited.

13. FUEL

Only fuel as defined by CAMS in Schedule G (refer "General Requirements for Cars and Drivers" in the CAMS Manual of Motor Sport) may be used. For the Alloytech engine only unleaded fuel may be used. At any time during an event, officials may take fuel samples from competitors' cars and/or containers which may be compared with a control sample lodged with a CAMS-approved testing laboratory. Any discrepancy between these samples may be referred to the Stewards of the Meeting.

14. HOLDEN 1990 3800 V6 ENGINE

14.1 General: The engine must conform to the specifications and dimensions shown in the CAMS Formula 4000 Recognition Form Number 01/89 as revised. The modification of any part, variation to the function of any part, or substitution of any part is prohibited unless specifically authorised within these Regulations or any addition or variation thereto.

14.2 Specified components: By "specified components" is meant those components listed under the heading "specified components" on the Recognition Form.

The use of all specified components nominated by part number and title on the Recognition Form is mandatory.

14.3 Modifications to specified components: It is permitted to lighten, balance, modify in shape by machining and otherwise refinish the specified components (unless specifically restricted) provided it always remains possible to positively identify the origin of the component. It is not permitted to extend or add material to any specified component unless specifically authorised in these Regulations.

It is permitted to lengthen or shorten the electrical cables on the engine wiring harness (part no. AD57138); but the connector plugs must remain unmodified and retain their original function.

It is not permitted to extend, add material, or include spacers between any specified components unless specifically authorised in these regulations.

14.4 Other components subject to conditional freedoms: The following components, not being specified components, are free, subject to the following conditions:

(i) **Connecting rods:** free subject to the requirements of the Recognition Form.

(ii) **Inlet valves and exhaust valves:** free subject to the requirements of the Recognition Form.

(iii) **Flywheel:** free, subject to the flywheel being manufactured of ferrous material.

(iv) **Camshaft:** free, subject to the requirements of the Recognition Form.

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(v) **Accelerator linkage:** free, subject to the use of standard butterfly and spindle.

(vi) **Exhaust system:** free, subject to the following requirements:

(a) The single outlet, when directed to the rear, must not be higher than 600mm from the ground, and may not protrude beyond the rearmost portion of the car.

(b) Alteration of the configuration of the exhaust system whilst the engine is operating is prohibited.

(c) Exhaust outlet may not pass through the diffuser body.

(vii) **Self starters:** free subject to the requirement that at all times during a competition the engine must be capable of being started using the energy source carried on board (see also Regulation 6).

14.5 Optional modifications to specified components: The following modifications to specified components are permitted:

(i) **Inlet manifold:** it is permitted to reverse the mounting thereof. It is permitted to fit the adaptor Part No. J46, so as to rotate the throttle body/elbow (ie, from horizontal to vertical).

(ii) **Cylinder head:** it is permitted to fit valve guide inserts.

(iii) **Alternator:** the location and method of mounting the alternator are free.

(iv) **Cylinder liners:** it is permitted to sleeve the cylinder block.

(v) **Enrichment:** it is permitted to fit a either a fuel bias control (part no. AD57182) or fix resistor/s to the engine wiring harness for the sole purpose of adjusting the enrichment of the engine.

14.6 Components subject to unrestricted freedoms: All other components associated with the functioning of the engine and not restricted within these Regulations or the Recognition Form are free. This includes nuts, bolts, washers, studs, fuel pump, oil pump, sump (dry sumping is permitted), oil pressure relief valve, pulleys and belts.

14.7 Other requirements/prohibitions: Notwithstanding any of the foregoing, the following must be observed:

(i) save for components permitted in article 7.3, the use of titanium in any component is prohibited;

(ii) the use of carbon fibre (composite) materials is prohibited;

(iii) no modification to the calibration of the electronic control module is permitted;

(iv) the ECM Diagnostic Connector must be mounted on the left-hand side of the car at the base of the roll over bar and must be readily accessible for use by scrutineers.

15. HOLDEN ALLOYTECH 3600 V6 ENGINE

15.1 General:

The engine must conform to the specifications and dimensions shown in the CAMS Formula 4000 Alloytech 3600 V6 Recognition Form Number F4000-05/01 or as amended. The modification of any part, variation to the function of any part, or substitution of any part is prohibited unless specifically authorised within these regulations or any addition or variation thereto.

15.2 Specified components: By "specified components" is meant those components listed under the heading "specified components" on the Recognition Form.

The use of all specified components performing their intended function nominated by part number and title on the Recognition Form is mandatory. It is not permitted to extend, add material, or include spacers between or adjacent to any specified components.

15.3 Seals: Tampering with or removing any seal applied to the engine without written authorisation from the Series Technical Commissioner is prohibited.

15.4 Other components subject to conditional freedoms: The following components, not being specified components are free subject to the following conditions.

(i) **Flywheel:** Free subject to the flywheel being manufactured of ferrous material.

(ii) **Accelerator Linkage:** Free subject to the use of standard butterfly and spindle.

(iii) **Exhaust System**: Free subject to the following requirements.

(a) The single outlet, when directed to the rear, must not be higher than 600mm from the ground, and may not protrude beyond the rearmost portion of the car.

(b) Alteration of the configuration of the exhaust system whilst the engine is operating is prohibited.

(c) Exhaust outlets may not pass through the diffuser body.

(iv) **Self Starters:** Free subject to the requirement that at all times during a competition the engine must be capable of being started using the energy source carried on board. (Refer also to Regulation 6.)

15.5 Components subject to unrestricted freedoms: All other ancillary components associated with the functioning of the engine and not restricted within these Regulations or the Recognition Form are free. This includes nuts, bolts, washers and studs not forming part of the sealed engine assembly, fuel pump and oil scavenge pump.

15.6 Other requirements/prohibitions: No modification to the calibration, firmware or hardware of the electronic control module (ECM) is permitted.

16. VEHICLE RECOVERY

16.1 Cars must be equipped with properly mounted tools to enable the on site removal of the front wing/nose cone assembly together with the provision of a substantial low mounted rear towing eye with a 40mm diameter hole.

The towing eye must be located behind the rear axle centre line.

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