

Modified Article	Date of Application	Date of Publication

## 1. INTRODUCTION

**Sports Racer:** A restricted design open, centre seated, sports-racing car with a mid-mounted engine driving the rear wheels only and intended for use in speed events and races.

Each vehicle shall be subject of a vehicle description document approved and issued by *Motorsport Australia*. Each applicant is required to submit the *Motorsport Australia* vehicle homologation form with the log book application or where such a document does not yet exist, shall be required to submit the necessary information to *Motorsport Australia* to produce the required document.

## 2. GENERAL CHARACTERISTICS

### 2.1 CONSTRUCTION:

The basic design of the *Automobile* may consist of:

- (a) Space frame chassis made from ferrous material;
- (b) Aluminium monocoque;
- (c) Carbon fibre monocoque; or
- (d) A combination of the above.

to which the engine, front suspension, drivetrain and Bodywork are attached. Stress-bearing panels may be attached to a ferrous spaceframe but need not be of ferrous material.

### 2.2 DRIVETRAIN:

It must have four wheels of which the rear two are used for propulsion and front two for steering.

### 2.3 STRUCTURAL INTEGRITY:

It must adhere to the requirements of a structural integrity test with a minimum torsional rigidity of 4000m per degree of deflection. Any vehicle which suffers damage and has its log book is endorsed by event scrutineers reflecting significant accident damage must be re-tested for torsional rigidity and be accompanied with the appropriate certification at its next event. Any chassis constructed of ferrous material with a yield-strength of greater than 450MPa requires certification from a commercial heat treating company confirming the heat treatment applied to the chassis. This certification is to accompany the vehicle log book application. The method of measurement is as defined in Article 15 of these Regulations.

### 2.4 MATERIALS:

- (a) The use of carbon fibre and/or Kevlar® composites in any suspension is prohibited.
- (b) The use of titanium alloys except on any internal engine components is prohibited.
- (c) The use of magnesium sheeting less than 1.6mm thick is prohibited.

### 2.5 MONITORING:

*Motorsport Australia* reserves the right to require a competitor to fit an approved rev monitor in addition to any rev limiting device that may be fitted in accordance with these regulations. The wiring loom for the rev monitor must be separate and clearly visible.

### 2.6 IDENTIFICATION:

Each car must be fitted with a manufacturer's ID plate which details the vehicle model and VIN or chassis number.

### **3. BODYWORK AND EXTERIOR DIMENSIONS**

#### **3.1 LENGTH:**

The overall length of the car must not exceed 4700mm.

#### **3.2 WIDTH:**

The overall width of the car including the complete wheels shall not exceed 1800mm when the steered wheels are in the straight-ahead position.

#### **3.3 HEIGHT:**

The height measured vertically from the ground to the highest part of the car with the driver aboard shall not exceed 1100mm, except as regards the rollover bar, which must not constitute an aerodynamic element.

#### **3.4 DIFFUSER:**

Each diffuser must not exceed 1350mm in length at any point.

#### **3.5 OVERHANGS:**

The sum of the overhangs shall not exceed 85% of the wheelbase. The difference between front and rear overhangs must not exceed 15% of the wheelbase.

#### **3.6 DOORS:**

Doors are not permitted.

#### **3.7 WINDSCREEN:**

Windscreens are optional, but if fitted must comply with 3.3 above.

#### **3.8 BODYWORK:**

- (a) The use of carbon fibre and/or Kevlar® for the manufacturing of the bodywork is permitted.
- (b) Unless otherwise specified, the bodywork shall cover all the mechanical components (including drivetrain and suspension components); only the exhaust and air intake ducting may project.
- (c) On all cars, the height of any air intakes must comply with Article 3.3.
- (d) The underside of each automobile, extending from the vertical plane passing through the front wheel centreline to the vertical plane passing through rear bulkhead or main roll hoop, and from one side of the automobile to the other, must be a continuous solid flat surface (with a tolerance of  $\pm 10$ mm). This surface must form an integral part of the bodywork and must have no freedom of movement or provision for adjustment in relation to the automobile's chassis. The aim of this tolerance is to prevent designs that go against the spirit of the "flat bottom" yet allow for manufacturing variations and/or repair of accident damage, which would otherwise render a car ineligible due to its floor not being perfectly flat.
- (e) No part having an aerodynamic effect and no part of the bodywork may under any circumstances be located below the geometric plane of the flat surface provided for in article.
- (f) Any part having an aerodynamic effect and all parts of the bodywork must:
  - (i) be rigidly secured to the entirely sprung part of the car (chassis/body unit);
  - (ii) must have no freedom of movement;
  - (iii) must be solidly fixed and must remain immobile in relation to this part while the car is in motion.
- (g) At the rear, the bodywork shall project over the complete wheels in such a way as to cover at least 210° of their circumference, and their entire width.
- (h) If the vehicle is fitted with an external fuel filler, the engine cover and its junction with the bodywork/cockpit must be designed so as to prevent any leakage of fuel into the interior of the engine compartment during refuelling. Holes may be drilled for fasteners, wiring, fuel, brake and oil lines.

### **4. WEIGHT**

The minimum racing weight at any time including the driver with helmet and wearing all apparel (e.g., as at the end of a race or practice) shall be:

- (a) Cars with an engine capacity up to 1000cc: 480kg
- (b) Cars with an engine capacity 1001 - 1355cc: 500kg

Any ballast which is carried must be securely fixed (e.g., welded, riveted, or bolted) and located in a position able to be readily checked.

## 5. ENGINE

### 5.1 ENGINE LIST:

(a) The engine must be the factory standard production engine from the following list:

Engine	Years of Manufacture
Kawasaki ZX10R 1000	2003 – current
Kawasaki ZX14 / 14R	2001 – current
Suzuki GSXR 1000	2003 – current
Suzuki Hayabusa 1300 / 1340	2003 – current
Honda CBR 1000RR	2004 – current
BMW S 1000RR	2009 – current
Yamaha YZFR1	1998 - current
Aprilia RSV4	2009 - current
MV Augusta F4	2006 – current
KTM 1190 RC8	2008 – current
KTM 1290 Super Duke R	2014 - current
Triumph Speed Triple	1994 - current

The maximum engine rotational speed is:

- (i) 0 – 1000cc as per original manufacturer specifications;
- (ii) 1001 – 1450cc is 11000rpm.

The engine must be fitted with a rev limiter so as to permit easy access and interrogation by scrutineers. It must be set to prevent the engine from producing power above the rotational speeds indicated. This rev limiter may form part of the engine management system.

- (b) The material, type and number of engine mountings are free, as is the position and inclination of the engine in its compartment.
- (c) The cooling radiator and the lines connecting it to the engine are free, as are the thermostat and the fan, and their location. The water pump is free.
- (d) The exhaust is free. The exhaust pipe outlets must be directed either rearwards or sideways. The engine lubrication system is free.
- (e) The timing chain tensioner may be replaced with another of free design.

## 6. SEALING

### 6.1 SEALING INSTRUCTIONS:

- (a) Any component may be sealed at the discretion of the Chief Scrutineer.
- (b) Component seals must only be removed by the Chief Scrutineer, or his nominee.

## 7. FUEL SYSTEM

### 7.1 FUEL SYSTEM:

- (a) Fuel must be a Pump Fuel in compliance with Technical Appendix, *Schedule G* of the *Manual*.
- (b) No fuel pumps, fuel filters or fuel lines may be positioned inside or pass through the cockpit unless protected by a cover that is impervious to the passage of flame and/or fluid.

- (c) Fuel tanks must be properly protected. All fuel tanks situated outside the main structure of the car must be surrounded by a 10mm thick crushable structure. The tank must be isolated by means of bulkheads preventing the fuel from passing into the cockpit or engine compartment or coming into contact with exhaust piping, in the event of spillage, leakage or any other accident occurring to the tank.

## **8. OIL SYSTEM**

### **8.1 OIL SYSTEM:**

- (a) All oil tanks must be properly protected. All oil tanks situated outside the main structure of the car must be surrounded by a 10mm thick crushable structure.
- (b) All lubricating oil lines operating at a pressure of 350kPa or above, must have a minimum burst pressure of 4100kPa at the minimum operating temperature of 135°C. When flexible, these lines must have threaded connectors and an outer braid resistant to abrasion and flame (will not sustain combustion).
- (c) No lines containing lubricating oil may pass through the cockpit unless protected by a cover that is impervious to the passage of flame and/or fluid.

## **9. ELECTRICAL EQUIPMENT**

### **9.1 ELECTRICAL EQUIPMENT:**

- (a) Batteries must be located outside the cockpit, unless they are military grade dry cell type. They must be securely fixed.
- (b) A starter with an electrical or other power source must be carried on board the car. It must be possible for the driver to operate it when seated normally in the car. The starter must be capable of starting the engine at all times.
- (c) Each car must be fitted with a minimum of one rear facing red stoplight. Where only one stoplight is fitted, it must be located on the centreline of the car and have a minimum view angle of 40° when viewed from directly behind. If two lights are fitted, they must be located symmetrically on either side of the longitudinal axis at the rear of the car and must be mounted in a visible position.
- (d) The alternator must be the standard production unit supplied with the engine and shall be fully operational.

## **10. TRANSMISSION**

### **10.1 GEARBOX:**

- (a) The gearbox must comprise factory production standard gears and ratios only. Undercutting is permitted to damaged gears. Each car must have a working reversing mechanism. It must be possible for the driver to select the reversing mechanism while seated normally at the wheel and with the engine running.
- (b) Automatic gearboxes are prohibited.
- (c) Gear selector forks are free.

### **10.2 CLUTCH AND FLYWHEEL:**

The clutch basket and flywheel are free provided the replacement components do not weigh less than that of the OEM components.

### **10.3 FINAL DRIVE ASSEMBLY:**

The final drive assembly and differential are free.

## **11. SUSPENSION**

### **11.1 SUSPENSION:**

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

- (b) Active suspension systems are prohibited, as are all systems enabling the flexibility of springs, shock absorbers and the ground clearance height of the car to be controlled while the car is in motion. Cockpit adjustment of anti-roll bars is permitted.
- (c) Electroplating of steel suspension elements is prohibited.
- (d) The minimum unsprung weight is as follows:

<b>Front Suspension</b>	20kg
<b>Rear Suspension</b>	24kg

The minimum unsprung weight is measured by disconnecting the pushrod and removing the wheels and does not include the weight of the pushrod or damper (if applicable).

## 12. BRAKES

Brakes are free except for the following:

- (a) Carbon fibre brake rotors are prohibited.
- (b) The total number of calipers per vehicle must not exceed four (4)
- (c) The total number of pistons per brake caliper must not exceed four (4)

## 13. WHEELS, TYRES AND STEERING

### 13.1 WHEELS, TYRES AND STEERING:

- (a) Wheels and tyres are free subject to the requirements of Technical Appendix, *Schedule E* of the *Manual*.
- (b) Cars equipped with four-wheel steering systems are prohibited.
- (c) There must be a continuous mechanical connection between the steering wheel and the steered wheels.
- (d) The minimum weight for each wheel with a dry tyre fitted is:

<b>Front Wheel</b>	9kg
<b>Rear Wheel</b>	12kg

## 14. COCKPIT

### 14.1 SEATING POSITION:

The cockpit seating position must be central in relation to the centerline of the vehicle.

### 14.2 STEERING COLUMN:

The point at which the steering column passes through the dashboard and the pedals are attached to the chassis can be located centrally or to one side of the vehicle centreline.

### 14.3 FOOTWELLS:

The minimum width of the driver's footwell is 250mm and this width must be maintained over a height of at least 250mm.

### 14.4 FITTED COMPONENTS:

The only components that may be fitted in the cockpit are the following:

Safety equipment and structures	Electronic equipment
Driver cooling system	Fire extinguisher
Instruments	Seat/s and controls required to drive the car

These components must be covered by a rigid protection if they have sharp edges, which may cause injury.

Their fastenings must be able to withstand a 25G deceleration.

#### 14.5 PEDALS:

The soles of the driver's feet, when he is seated in the normal driving position with his feet on the pedals and with the pedals in the inoperative position, shall not be situated less than 14cm behind the front bulkhead of the tubular steel frame forward of the vertical plane passing through the centreline of the front wheels.

#### 14.6 COCKPIT OPENING:

The driver's seat shall be capable of being entered without the removal or manipulation of any part or panel (except for a removable steering wheel and removable cockpit padding). The cockpit opening of the metallic chassis shall have the following minimum dimensions:

Length	60cm
Width	38cm

The minimum width shall extend over a minimum length of 30cm. This minimal rectangular opening may exist anywhere forward of the bracing, and required padding will not be considered in these dimensions. The cockpit opening shall meet the *FIA* homologation requirements (refer *FIA* Article 258A or 275). The maximum time for the driver to exit the cockpit must not exceed seven seconds.

#### 14.7 BRAKE LINES:

Brake lines may pass through the cockpit provided there are no connections in the cockpit area.

#### 14.8 STEERING WHEEL:

The steering wheel must be fitted with a quick release mechanism.

#### 14.9 HEAD RESTRAINT:

Where a head restraint is not part of the seat, then a separate head restraint with a minimum area of 180cm<sup>2</sup> must be fitted. Its surface must be continuous, without any protruding parts. The head restraint must not deflect more than 50mm under an 850N rearward force. The head restraint shall be located in a position such that it will be the first point of contact with the driver's helmet in the event of an impact projecting the driver's head rearwards when he is in the normal driving position. The distance between the driver's helmet and the head restraint should be kept to a minimum such that the helmet will move less than 50mm under the abovementioned force.

### 15. SAFETY STRUCTURES

#### 15.1 SAFETY CAGE/ROLLOVER PROTECTION STRUCTURE:

- (a) The safety cage structure shall conform to Technical Appendix, *Schedule J* – Safety Cage Structures of the *Manual*, and be of at least Type 1 or Type 2. The material specification and dimensions shall be in accordance with *Schedule J*. Alternatively, the safety cage structure may be certified in accordance with *FIA* Article 277 – Free Formula Technical Regulations. Forward-facing braces within 50mm of the driver's helmet shall be covered with padding to the *FIA* 8857-2001 or SFI 45.1 standard.
- (b) Additionally, the position of the main rollbar behind the front seat must meet the following dimensional criteria:
  - (i) **Height:** The top of the rollbar must be at least 50mm higher than the top of the driver's helmet when the driver is seated normally at the wheel.
  - (ii) **Width:** The minimum width measured between the outside faces of the vertical members of the rollbar must be at least 200mm, measured 200mm below the top of the rollbar.
  - (iii) **Longitudinal position:** The longitudinal distance between the top of the rollbar and the helmet of the driver seated normally at the wheel must not exceed 250mm. The rollbar structure should conform to *Schedule J*, Type 1. The Material Specifications are as per Article 4 of *Schedule J* and the rollbar and braces dimensions are as per 1st Category cars under 700kg.

#### 15.2 FRONT IMPACT-ABSORBING STRUCTURE:

The vehicle must include a front impact-absorbing structure installed in front of the driver's feet, which complies with at least one of the following types:

- (a) A front impact-attenuation structure meeting the load requirements of *FIA* Appendix J, Article 277 – evidence of compliance must be supplied.
- (b) A structure meeting the requirements of the SCCA-approved front impact-attenuation structure specified for SCCA formula cars is permitted for cars with prior SCCA certification. This specifies a

structure with a minimum cross-section of 200 sq cm at least 400 mm forward of the clutch and brake pedals (nondepressed).

- (c) A structure that extends more than 300mm in front of the front bulkhead of the tubular steel frame, with a cross section of 200 sq cm measured at a position 200mm in front of the bulkhead.
- (d) Type 2 and 3 structures above must be constructed of either:
  - (i) A minimum of eighteen (18) gauge 6061-T4 or equivalent aluminium using honeycomb sandwich construction, with a panel thickness of 13.9mm minimum.
  - (ii) Full composite construction of carbon fibre or Kevlar with a minimum of two 141.75g/m<sup>2</sup> (5oz) inner and outer layers of laminate over a honeycomb polyurethane foam core with a minimum thickness of 20mm.
- (e) The impact-absorbing structure must be securely attached to the front bulkhead of the tubular steel frame. This structure must be independent of the main bodywork and must be solidly fixed to the extremities of the bulkhead (i.e. with bolts requiring tools for removal). A vehicle subject of a vehicle log book issued prior to 31 December 2011 is not required to comply with this requirement provided it is fitted with the OEM impact absorbing structure.

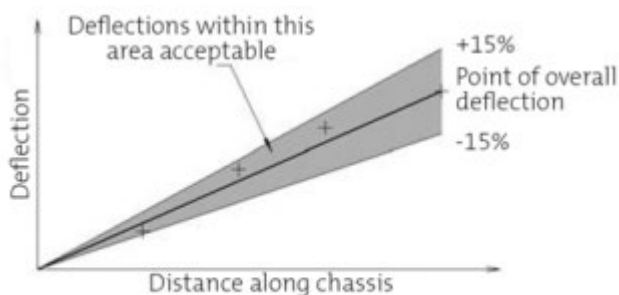
## 16. CHASSIS STRUCTURAL INTEGRITY

### 16.1 CHASSIS TORSIONAL RIGIDITY:

The aim of this article is to define a torsional rigidity requirement that will ensure a minimum chassis structural integrity standard in this sports-racing prototype category.

Chassis torsional rigidity is defined as the torque, measured in Nm, required to twist the chassis through one degree about an axis parallel to the longitudinal centreline of the chassis. There are two requirements that must be met; an overall rigidity figure, and a requirement that the torsional rigidity of the structure not vary by more than 15% over four subsections of approximately equal length along the chassis.

- (a) The minimum torsional rigidity shall be 4000 Nm/degree, as measured along the full length of the wheelbase of the car.
- (b) The angular deflection across each of four "subsections" of the chassis along the wheelbase, each of approximately equal length, must not vary by more than 15% from the theoretical uniform angular deflection of the chassis as per drawing 6SR-1 below.



Drawing 6SR-1

### 16.2 TEST METHOD:

The full test procedure, including detailed requirements, from Motorsport Australia Technical: [technical@motorsport.org.au](mailto:technical@motorsport.org.au) .