

SCHEDULE XC

Standing Technical Regulations covering Cross Cars

1.0 INTRODUCTION

- 1.1** Cross Cars are rear engine 4-wheel single-seater vehicles with a multi-tubular space frame chassis and integrated safety cage as an integral part of the chassis. As defined in Article 9, the vehicles must be rear wheel drive.
- 1.2** Cross Cars have been introduced as a form of motorsport that provides affordable, low maintenance vehicles of a controlled specification, designed as a stepping stone for other forms of motorsport. To keep within the spirit of fair competition across Club Sport events, all Cross Cars must at all times comply fully with these regulations when competing in events where Schedule XC is mandated. Cross Cars can be checked at any time during an event and any breach will lead to exclusion.
- 1.3** These technical regulations are to be enforced at all events where Schedule XC is authorised in the Supplementary Regulations including any Cross Car Championship or stand-alone Cross Car event.
- 1.4** Cross Cars may only be sourced from one of the approved makes detailed in Article 2.1, or a New Zealand Agent fully authorised by one of the manufacturers detailed in Article 15.0.

2.0 ELIGIBILITY

- 2.1** Only commercially sourced Cross Cars from the following approved manufacturers are eligible for Cross Car Championships or identified key events. Brands may be added or removed:
- (a)** Speedcar
 - (b)** Yacar
 - (c)** Camotos
 - (d)** La Base
 - (e)** TN5
 - (f)** Kamikaz
 - (g)** Semog
- 2.1.1** Anyone wishing to import one of the approved brands or wishing to become an Agent for one of the approved brands must contact MotorSport NZ in the first instance.
- 2.1.2** A list of MotorSport NZ authorised agents for each Make is contained in Article 15.0.

- 2.2** For Cross Cars to be eligible for competition in Motorsport NZ events, the following must be provided at each event:
- (a)** MSNZ Competition Logbook.
 - (b)** Safety Cage Certificate issued to that vehicle.
 - (c)** The engine must have been sealed by the authorised agent for that make of Cross Car and the seal number recorded in the logbook. The car may be inspected before, during or after the event as required by the appointed Cross Car officials.
- 2.3** Cross Cars must always maintain full compliance with Schedule XC during any event where Schedule XC is authorised.
- 2.4** A Cross Car official will be appointed for each championship round and any stand-alone event where Schedule XC is authorised, who will control and check competitors based on Schedule XC. Random checks can happen at any time during an event.
- 2.5** **ECU control.** The ECU supplied with each Cross Car will be sealed prior to sale by the authorised agent for that Make, and the seal number recorded in the logbook. It is not permissible to break the seal once applied. If an ECU seal is broken, the ECU must be returned to the agent to have the control tune installed and the ECU resealed.

3.0 GENERAL TECHNICAL

- 3.1** Any modification that is not specifically detailed within these regulations is prohibited.
- 3.1.1** Where optional devices are permitted, they must be installed in a manner that complies with Schedule XC.
- 3.1.2** Unless explicitly authorised by these regulations, the use of the following materials is prohibited unless they correspond exactly to the material of the original part:
- (a)** Titanium alloy
 - (b)** Ceramics
- 3.1.3** **Damaged threads** may be recovered using a helicoil type insert providing the original thread size is retained.
- 3.1.4** **Fuel** shall only be commercially available pump fuel as detailed in Appendix Two Schedule A 3.9. No leaded or oxygenated fuels. The only Ethanol blended fuels permitted are those commercially available up to 10% ethanol. Fuel testing may be carried out during any event.
- 3.1.5** **Driving aids** are specifically prohibited unless authorised in Schedule XC. This includes but is not limited to; ABS, ASR, Traction control, ESP.
- 3.1.6** **Energy recovery** systems other than that provided by the engine are prohibited.

3.1.7 On board data recorders are permitted. These systems, with or without memory may only permit the reading of:

- (a) Engine revs
- (b) Two indications of temperature
- (c) One wheel speed sensor (front wheel only)
- (d) An X/Y/Z accelerometer
- (e) GPS data
- (f) Lap times
- (g) Brake pressure
- (h) Throttle position
- (i) Gear position sensor

On board cameras are permitted and must be installed in compliance with Schedule A.

4.0 SAFETY

- 4.1 Safety harnesses** of at least six straps are mandatory and shall be in compliance with FIA 8853-98 or FIA 8853-2016 and shall be installed in compliance with Appendix Two Schedule A. The two shoulder straps and the lap straps must have separate anchorage points or be mounted as homologated in the original manufacturers design.
- 4.2 Safety Cages** are mandatory as homologated and must not be modified in any way. Repairs may only be carried out under the instructions of the manufacturer.
- 4.3 A competition seat** in compliance with FIA 8855-1999 or 8862-2009 shall be installed or the following approved seats;
- Racetech RT4100V-110
 - Racetech RT4100WTV-110
 - Racetech RT4CKV-110
 - Racetech RT4CWTV-110
 - Racetech 4100CCV

Mounting must comply with Schedule A. It is recommended that the seat manufacturers brackets are used for mounting.

- 4.4 A fire extinguisher** shall be installed with a minimum fire rating of 10B. A 1Kg extinguisher is recommended. Mounting shall comply with Schedule A.
- 4.5 Towing eyes** are mandatory and shall be located at the front and at the rear of the vehicle. Towing eyes must be clearly visible and marked in either; yellow, red or orange. They must be of a strap or webbing type or a steel eye that allows the passage of a 40mm diameter cylinder.

- 4.6 Mudguards** are mandatory and shall be affixed behind each wheel. They must be made of a flexible plastic/rubber material at least 2.5mm thick and must be firmly mounted. The mudguards must project over the wheels and provide an efficient covering of at least half of the circumference of the tyre and at least the entire width of the tyre. Mudguards situated behind the driven wheels must be no more than 7cm above the ground. Mudguards or their brackets must have no perforations or sharp angles. Should it be necessary to reinforce the mudguards, this may be done with an aluminium alloy tubing with a maximum diameter of 21mm. Under no circumstances may the mudguard reinforcement be used as a pretext for the construction of crash bars. or bumpers.

5.0 GENERAL PRESCRIPTIONS FOR CROSS CARS

- 5.1** Cross Cars shall at all times during an event comply with the requirements of Appendix Two Schedule A and Schedule XC.
- 5.1.1 Maximum Dimensions** of the car shall be:
- | | |
|--------------------|---|
| (a) Overall length | 2600mm |
| (b) Overall width | 1600mm (excluding mudguards) |
| (c) Height | 1400mm (excluding engine water radiator intake) |
- 5.1.2 Air intake** for the purpose of cooling liquid is permitted above the roof line by no more than 150mm over the entire width of the roof. Air intake scoops are also permitted on either side of the Main Rollbar, a maximum of one scoop per side, and shall not extend laterally more than 150mm beyond the Main Rollbar.
- 5.1.3 Wheelbase** and track dimensions are free, providing the maximum dimensions in Article 5.1.1 are respected.
- 5.1.4 Ground clearance:** No part of the car may touch the ground when both tyres on one side are deflated. This test must be carried out on a flat surface with the car in race trim (driver on board).
- 5.1.5 Competing Weight** of the vehicle, measured with the driver on board wearing their full racing apparel, must be greater than 425kg at all times during the competition. The Car minimum weight is 345kg. This is the real weight of the car, with neither the driver nor their full racing apparel. At no time during the competition may a car weigh less than this minimum weight.
- 5.1.6 Ballast** is permitted to complete the weight of the car by one or more unitary blocks. Ballast shall be securely mounted using, at a minimum two(2) 10mm ISO 8.8 bolt for the first 10Kg of ballast – 1 bolt per 5kg thereafter. There must be provision for seals to be fitted to the mountings. All ballast must be mounted under the seat or in the engine bay.
- 5.1.7 Measurements:** All measurements must be made while the car is stationary on a flat horizontal surface.

6.0 ENGINE

- 6.1 General:** The engine must not be modified and must remain as per OEM specifications unless such modifications are explicitly authorised manufacturer. Written permission must be provided for this to be valid.

Engines must be 4 stroke OEM motorcycle engine. All OEM engine specifications will be used as reference in the case of engine checks. Engine must have been produced prior to Jan 1 2011. No late model engines are permitted.

The recommended engine is Suzuki GSXR-750, 2005-2008. For approval of any other engines, written permission is required. This is set to allow for control of performance based on ECU and engine controls as pointed out in Appendix 2 of FIA Appendix J Article 279B Technical Regulations for Cross Cars. Other engine makes may be approved in consultation with MotorSport NZ.

- 6.2 Cylinder capacity:** The maximum cylinder capacity is 750 cm³.
- 6.3 Cycle and type:** Only 4-stroke (Otto principle) engines with reciprocating pistons and integrated gearbox are authorised.
- 6.4 Number and layout of cylinders:** **Maximum of four(4).** Layout of cylinders is free.
- 6.5 Injection:** Original OEM fuel injectors must be used. All sensors and actuators including, but not limited to, crank angle and camshaft position sensors, must remain original, in their original location with a mounting tolerance. The installation of additional sensors or actuators is prohibited – except as noted for logging requirements as per Article 3.1.8. The injection control unit or combined ignition-injection control unit (ECU) must remain OEM as supplied from distributor or OEM. The electrical harness is free while retaining only its original functions. **No Timing Retard Eliminators are permitted.**
- 6.6 Ignition:** All sensors and actuators must remain original, in their original location. The installation of additional sensors or actuators is prohibited. The ignition control unit (ECU) must remain original OEM. The electrical harness is free while retaining only its original functions. Flashing of the ECU is prohibited and can only be done by the manufacturer or the authorised NZ Agent.
- 6.7 Batteries:** Each car must have an on-board battery. The use of any outside source of energy to start the engine of the car on the grid or during a race is prohibited.
- 6.7.1 Starting on board the car** Electronic starter motor operated by the driver is compulsory.
- 6.8 Exhaust system:** The exhaust manifold is free after the cylinder head outlet, but it must then include a silencer that enables it to remain within the noise limits below. A limit of 95 dB/A is imposed for all vehicles as defined in Appendix Two Schedule A. The noise may also be measured in accordance with the FIA noise measuring

procedure using a sonometer regulated at "A" and "SLOW", placed at an angle of 45° to and a distance of 500 mm from the exhaust outlet, with the car's engine running at 4500 rpm.

- 6.8.1 The exhaust pipe must exit the rear of the car and must be situated at the perimeter of the car.
- 6.8.2 Exhaust pipe outlets which point downwards are prohibited.
- 6.8.3 Where exhaust pipes are exposed, they must include guarding to prevent burns.
- 6.9 **Air filter:** The air filter is free, as is the air-filter housing, the filtering components, and the connecting pipes.
- 6.10 **Water radiator:** The water radiator and its capacity are free. Its location is free, provided that it does not encroach upon the cockpit and is located inside the bodywork. The air cooling lines upstream of the water radiator as well as the water pipes are free.
- 6.11 **Cooling system:** The thermostat is free, as is the control system and the temperature at which the fan cuts in. The radiator cap and its locking system are free. The expansion chamber is free, provided that the capacity of the new chamber does not exceed 2.5 litres. The liquid cooling lines external to the engine block and their accessories are free. Lines of a different material and/or diameter may be used.
 - 6.11.1 No part of the cooling system may be inside the cockpit.
 - 6.11.2 The fitting of extra cooling fans is permitted up to a maximum of two (2).
 - 6.11.3 At any time, the maximum distance between the rear face of the radiator core and the rearmost part of the cooling fan blades is 150 mm. A duct may be fitted between the radiator core and the cooling fan. I
 - 6.11.4 Any system for spraying water onto the engine water radiator is prohibited.
- 6.12 **Engine oil cooling:** The oil radiators and their connections are free, provided they do not give rise to any modifications to the bodywork and are situated within the perimeter of the bodywork.

7.0 FUEL CIRCUIT

- 7.1 **Fuel pumps** (including their number) are free provided that they are installed either: Inside the fuel tank, or outside the fuel tank, protected by a leak-proof and flameproof cover and must be outside the cockpit. Petrol filters with a maximum unit capacity of 0.5L may be added to the fuel feed circuit.
- 7.2 **Fuel lines:** Standard or braided fuel lines may be used.

- 7.3 Fuel tank:** The location of the fuel tank must respect the following conditions:
- (a) The tank must not be located in the cockpit
 - (b) It must be situated behind the seat in side view and must be separated from the cockpit by a sealed bulkhead
 - (c) It must be securely mounted within the chassis structure and between the front and rear wheel axle line.
- 7.4** The fuel circuit must comprise of only the following parts:
- (a) One fuel supply outlet from the pump to the engine
 - (b) One fuel return into the tank
 - (c) One breather
 - (d) Fuel pressure regulator
- 7.5 Filling and venting:** The location of the filler, return and breather lines is free, but they must not protrude beyond the perimeter of the chassis. No modifications to the body work is permitted to access filling.

8.0 ELECTRICAL EQUIPMENT

- 8.1 Battery(ies):** The batteries shall be of a sealed type but otherwise are free as is their location. The live terminal and cable shall be insulated but otherwise are free.
- 8.1.1** The battery shall be securely retained by metal brackets / straps that provide a positive location in all planes, attached with a minimum of two (2) M6 ISO 8.8 standard fixations or equivalent in combination with counter-plates at least 3mm thick with a surface area of 20cm² beneath the surface.
- 8.2 Alternator / Generator / Starter:** are free.
- 8.3 General circuit breaker:** A general circuit breaker must cut all electrical circuits, battery, alternator or dynamo, fuel pumps, lights, horns, ignition, electrical controls, etc.) and must also stop the engine. It must be a spark-proof model and must be accessible from inside and outside the car (via easy latch mesh window). The location of the circuit breaker must be displayed.
- 8.4 Lights:** Rear lights are mandatory and must be switched on whenever the car is competing. The rear lights must have both tail-light and brake light functions. The lights must be of Ø 80 mm (36 LEDs minimum). Either one centrally located light, or two lights symmetrically located around the longitudinal axis of the car are permitted. The lights must be positioned between 800mm and 1400mm above ground level and on the same transverse plane.

9.0 TRANSMISSION

- 9.1** The **gearbox** shall be integrated with the engine as per the OEM design. No modification of the gearbox is permitted unless it is specifically detailed in these regulations.

- 9.1.1** Gear changes shall be carried out by means of a lever and linkage only operated by hands. Any form of paddle shift or similar is prohibited. Flat shift is permitted.
- 9.2 Transaxle system:** is free, but the two rear wheels must be attached to and driven by the single shaft. Universal joints are permitted. A secondary chain drive is permitted.
- 9.2.1 A reverse gear** is compulsory. A clutch switch is permitted for the activation of the reverse. Reverse switch/button must be reachable when belted into kart.
- 9.2.2 Traction control** and launch control are strictly prohibited.
- 9.3 Clutch:** is free but must be operated by the driver's foot.
- 9.4 Sensors:** No sensor, contact switch or electric wire is permitted on the four wheels or the gearbox with the exception of a gear cut sensor and a single sensor for displaying the gear ratio engaged. The gear ratio display sensor, wiring, and display shall be wired completely independent from the engine control system and the car's main wiring loom.

10.0 SUSPENSION

- 10.1 Suspension system:** Vehicles must be fitted with sprung suspension. The operating method and the design of the suspension system is free subject to the following exclusions:
- (a)** The use of active suspension is prohibited
 - (b)** Only coil springs made entirely of steel alloy shall be used but the number is free
 - (c)** Suspension parts made partially or entirely from composite materials are prohibited.
- 10.2 Shock absorbers:** Only one shock absorber per wheel is authorised. A maximum 3-way external adjustment systems is permitted. All shock absorbers must be independent of each other. Inertia shock absorber systems are prohibited.
- 10.2.1** The checking of the operating principle of the shock absorbers must be carried out as follows:
- (a)** With the springs removed, the car must sink down to the bump stops in less than 5 minutes from when the vehicle's weight was taken by the wheels.
- 10.2.2** With regard to their principle of operation, gas-filled shock absorbers are considered to be hydraulic shock absorbers.
- 10.2.3** A suspension travel limiter may be fitted. Only one cable per wheel is allowed, and its sole function must be to limit the travel of the wheel when the shock absorber is not compressed.
- 10.2.4** Water cooling or heating systems are prohibited.

- 10.2.5** Shock absorber design shall not incorporate the use of internal ball or roller bearings.
- 10.2.6** Any mechanism that has the capability to change either spring or damper settings from the cockpit is prohibited.
- 10.3** **Anti-roll bars** supplied by the Manufacturer may be used on the rear suspension only.

11.0 RUNNING GEAR

- 11.1** **Wheels** The rims must have a maximum diameter of 10" and a maximum width of 6" at the front and 8" at the rear. Rims must be made from either iron-based alloy or aluminium alloy.
- 11.2** **Wheel attachment:** shall be by studs and nuts or bolts. Central wheel nut fixation systems are prohibited.
- 11.3** **Tyres** shall be "treaded tyres" (as defined in Appendix Two Schedule A) with an 'all purpose' tread pattern. The rear tyres are a control tyre and are Goldspeed CR 225/40-10 Yellow Compound. The front control tyre is Goldspeed CR 165/70-10 or SD 165/70-10. Compound is free. The tyre with a minimum tread depth of 1mm is required for championship events.
- 11.3.1** **Pressure control valves:** on the wheels are prohibited.
- 11.4** **Brakes:** are free, but must comply with Schedule A. Brake discs must be made from iron-based alloys. Carbon brake discs are prohibited.
- 11.4.1** **A central braking system** on the rear axle is permitted.
- 11.4.2** **A hydraulic handbrake** system is permitted. It must be efficient and must control both rear wheels simultaneously.
- 11.5** **Steering:** The steering system and its position are free including the use of electric power steering.
- 11.5.1** With the exception of electric power steering only a direct mechanical linkage between the steering wheel and the steered wheels is permitted. Flexible steering controls, e.g. chain, cable, etc. are prohibited.
- 11.5.2** **Four-wheel steering** is prohibited.
- 11.5.3** **Steering column:** The steering wheel must be fitted with a quick release mechanism in compliance with FIA Appendix J Article 255-5.7.3.9

12.0 CHASSIS

- 12.1** The multi-tubular space frame structure formed by the compulsory base construction of the safety cage, compulsory reinforcement tubes and any other tubular structure or elements welded together for the functioning of the car, should be considered as “the chassis”.
- 12.1.1** Only chassis from one of the authorised brands in Article 2.1 or their authorised agent will be accepted.
- 12.1.2 A Safety Cage** which is homologated by an ASN shall be installed and must be identified by means of an identification plate affixed to it by the manufacturer. This identification plate must be neither copied nor moved (e.g. embedded, engraved, metallic plate). The identification plate must bear the name of the manufacturer, the homologation or certification number of the ASN homologation form or certificate. A valid copy of the safety cage certificate bearing the same numbers, approved by the ASN and signed by qualified technicians representing the manufacturer, must be provided. This certification will be recognised by MotorSport NZ and a copy of that recognition, along with the certificate must be retained in the vehicle logbook.
- 12.1.3** All repairs to a homologated or certified safety cage, damaged after an accident, must be carried out by the authorised manufacturer or with their approval.
- 12.2 Cockpit:** All vessels that contain fluid such as fuel, oils, coolant, must be isolated from the cockpit so that there is no possibility of any fluids entering the cockpit. Brake reservoirs with fluid are permitted in the foot well.
- 12.2.1 Floor:** The floor of the cockpit extended to the front of pedal box must be closed with a metallic sheet, minimum thickness 1.2mm or aluminium alloy sheet minimum thickness 2mm. The metallic sheet must be securely fixed to the chassis.
- 12.1.2 Fireproof bulkhead:** A fireproof and liquid-proof metallic bulkhead, minimum thickness 0.8 mm, must separate the cockpit from the engine compartment. Behind the driver's seat the bulkhead must be located from the floor up to the roof. Any object of a dangerous nature (flammable products, etc.) must be carried outside the cockpit.
- 12.2.3 Roof:** A rigid roof panel made from steel sheet, minimum 1.5 mm thick, above the driver is mandatory. The panel may be fixed by welding to the safety cage tubes, or with a minimum of 6 M6 mm ISO 8.8 metallic bolts. The panel fixation brackets must be welded to the safety cage tubes. If the welded panel or the fixation brackets have to be repaired, the work can only be done with written authorisation from the authorised agent. If this plate is damaged in any way, the vehicle is deemed unsafe to continue until repaired.

12.2.4 Internal parts: No part of the cockpit, or parts situated in the cockpit, may have sharp or pointed parts. Particular care must be taken to avoid any protrusion which could injure the driver.

12.2.5 Cockpit - lateral openings: The car must have lateral openings that are accessible from both sides of the cockpit allowing the exit of the driver. The cockpit must be designed so as to allow the driver to exit it from their normal position in the car within 7 seconds. For the purpose of the above tests, the driver must be wearing all their safety equipment applicable to the event being entered. The seat belts must be fastened, the steering wheel must be in place and in the most inconvenient position and the openings must be closed. These openings must be closed completely to prevent the passage of a hand or arm. This closing must be affected by a metal wire grill with a maximum mesh of 25 mm x 25 mm, with a wire diameter that is a minimum of 1 mm and a maximum of 2 mm.

12.2.6 Pedal box: The axis of the pedal box must be situated behind or directly above the axis of the front wheels. The minimum width of the footwell must be 250 mm, maintained to a height of 250 mm, measured horizontally and perpendicularly to the longitudinal axis of the chassis directly above the pedals.

13.0 Bodywork and Exterior

13.1 Front and side bodywork: The bodywork must cover the front part of the chassis entirely. At the front and at the sides there must be hard, opaque bodywork providing protection against stones. At the front, this bodywork must rise at least to the level of the centre of the steering wheel, and its height must not be less than 42 cm measured from the driver's seat mounting. The height of the side bodywork must not be less than 42 cm, measured in relation to the plane passing through the driver's seat mounting.

13.1.1 Bumpers are not permitted.

13.2 Rear bodywork: All mechanical elements necessary for propulsion (engine, transmission) must be covered by the bodywork or mudguards. Viewed from above, all parts of the engine must be covered by sturdy, hard and opaque bodywork. The panels used must not be more than 10 mm thick.

13.3 Rear view mirrors: An external rear-view mirror must be present on each side of the car.

13.4 Aerodynamic devices: Front aerodynamic devices are prohibited. Rear aerodynamic devices may be allowed if they are an integral part of the bodywork moulding. There can be no facility for adjustments. Only one device permitted and single pane wing only. Must not be wider than the bodywork of car and no higher than 50mm of the roofline.

13.5 Windscreen: Must be made of polycarbonate or be a metal grill.

13.5.1 Polycarbonate windscreen: The thickness must not be less than 5 mm. Vehicles with windscreens which are damaged to such an extent that visibility is seriously impaired or that there is a likelihood of their breaking further during the competition will be rejected. Windscreens must not be tinted.

13.5.2 Metal grill: The windscreen may be replaced, or protected, by a metal wire grill covering the entire surface of the windscreen opening. The mesh size must be between 10 mm x 10 mm and 25 mm x 25 mm, and the minimum diameter of the wire from which the mesh is formed must be 1 mm, maximum 2 mm. In vehicles which have a windscreen or which have the metal grill defined above, motorcycle type goggles or a visor fitted on the helmet must be worn by the driver.

13.5.3 Metal grill panels sourced from the manufacturer and incorporating a fail-safe quick release mechanism may be fitted to the cockpit side openings. This is strongly recommended.

14.0 Competition Numbers

14.1 Competition numbers must be clearly displayed one on each side of the car and on each side of a panel on the roof and additionally or on the engine bonnet. The car must bear no other number likely to cause confusion. The roof number must be permanently fixed on a vertical support, 24 cm x 35 cm, with no sharp edges and must be positioned along the longitudinal axis of the car. The number must be 18 cm high and the strokes forming it must be 4 cm thick.

15.0 MotorSport NZ authorised Cross Car Agents

Manufacturer	NZ Authorised Agent
Speedcar	
Yacar	
Camotos	
La Base	
TN5	
Kamikaz	
Semog	Cross Car Racing Products NZ 19 Omahi Street, Waikanae. Jeff Ward 021 738 000