

TCR Racer International Series Technical Regulations 2016

ART. 1	GENERAL REMARKS
	<p>Unless otherwise defined in the present regulations, TCR International Series 2016 respects following FIA rules: -FIA App. J, Art. 251, 253, 277 -FIA General Prescriptions applicable to International Series</p> <p>The present regulations points also to the FIA App. J, Art. 255 and 263.</p> <p>The Technical Form has to be completed by the Manufacturer or Tuner with all requested information and will be common for all race cars of the model. Manufacturers or their representatives have to accept that the car of the make will be prepared according to TCR Regulation.</p> <p>WSC reserves the right to forbid the use of any part that is deemed outside of the TCR concept and to accept waivers to these regulations on request of Manufacturers or Tuners.</p> <p>Any action related to the employed parts not explicitly allowed by these regulations is forbidden. Everything not expressly permitted, is prohibited.</p>
ART. 2	DEFINITION
2.1	<p>Bodywork</p> <p>See App. J; Art. 251.2.5.2 Any air intake is considered to be part of the bodywork.</p>
2.2	<p>Chassis (Body shell)</p> <p>The main body of the car into which is fitted the engine, transmission, running gear, electrical systems, seats, controls, bodywork, etc.</p>
2.3	<p>Production (part)</p> <p>As fitted to the basic mass production car; the proof rests with the competitors.</p>
2.4	<p>Original</p> <p>As fitted to the WSC-certified car and in compliance with the TCR Technical Form.</p>
2.5	<p>Minimum Weight</p> <p>is the weight of the car without driver, with empty tanks of consumable fluids (fuel, wind screen wash & drinking water, etc.) and with all other tanks filled at the working level. (Certification)</p>
2.6	<p>Minimum Racing Weight</p> <p>is the minimum weight of the car with the driver imposed to be respected at any time during the competition. The minimum racing weight can vary following WSC decisions for BoP and the Success Ballast allocation.</p>
2.7	<p>Cockpit</p> <p>The interior volume of the main structure which is reserved for the occupants. Its limits are defined by the roof, the floor, the doors, the lateral parts, the glazed parts and the front and rear bulkheads (or the back plane of the rear seats).</p>
2.8	<p>Turbo Charging</p> <p>Increasing the mass of the charge of the fuel/air mixture in the combustion chamber (over the weight induced by normal atmospheric pressure, ram effect and dynamic effects in the intake and/or exhaust system) using a turbo charger.</p>
2.9	<p>Location</p> <p>A site defined relative to the production: centre line of the car, axles centre (middle of the wheelbase on the centre line), cockpit, luggage compartment and engine compartment.</p>
2.10	<p>Position</p> <p>The site defined by dimensions from the production car data, e.g. axles centre and centre line of the car. For position evaluation will be used a tolerance of $\pm 5\text{mm}$.</p>
2.11	<p>Telemetry</p> <p>The transmission of data between a moving car and the pit or to anyone connected with the entry of that car.</p>
2.12	<p>Mass Production</p> <p>The Minimum Production requested for eligibility of car models and parts coming from other cars like engine, turbocharger, water cooler, intercooler, etc. is 5000 pieces / 12 consecutive months.</p>
2.13	<p>Model of car</p> <p>All the identical cars belonging to a family (see below) and to a production series distinguishable by an identical conception and an identical external general lines of the bodywork, and by an identical mechanical conception of the engine and the transmission to the wheels.</p>
2.14	<p>Family of car</p> <p>Different series models belonging to one and the same production series of the same manufacturer.</p>

2.15	Certification
	The TCR Technical Form is the official documentation of TCR Cars certified by WSC.
2.16	OEM (Original Equipment Manufacturer)
	OEM is a manufacturer of the mass produced cars and the supplier of the original spare parts.
2.17	Reference Part, Component or Unit
	Certificated part, electronic control unit or aggregate listed by WSC, which are deposited with the technical delegate and can be installed in the race cars on his decision at any time of the competition.
2.18	OEM Part
	Component coming from any OEM mass produced car and in normal sale.
2.19	WSC
	World Sporting Consulting Ltd is the organiser of the TCR International Series.
ART. 3	REGULATIONS
3.1	Role of the WSC
	The present technical regulations for TCR International Series are issued by WSC.
	The basic principles of the TCR International Series are the respect of a Weight/Power Ratio and of Balance of Performance (BoP).
	<p>WSC will:</p> <ul style="list-style-type: none"> -Certificate TCR cars -Ensure the BoP at the start of the International Series and take all necessary decision to keep it through the season.
	All WSC decisions regarding the regulations will be communicated by means of Notifications and Technical Bulletins.
3.2	Eligible cars
	<p>Eligibility criteria for TCR Touring Car:</p> <ul style="list-style-type: none"> -The model of car is on the list of TCR eligible cars for 2016 published by the WSC (only front-wheel drive cars). -The cars correspond to FIA Homologation Criteria for Touring Cars (FIA Group A). -The model of car is produced by an OEM and belongs to a mass produced family. -4/5 doors -Minimum length 4.2m -Mono turbo charged 4-stroke petrol mass production Engines with cylinder capacity from 1750cm³ to maximum 2000cm³. -Hybrid propulsion is not allowed.
	WSC reserves the right to accept other cars, when the general characteristics match with the TCR concept. WSC reserves also the right to approve or to refuse applications which might not be in compliance with the above criteria.
	Without a WSC authorization only one Technical Form per car model will be accepted. The Technical Form Number and the certificating manufacturer, importer or tuner will be documented on the WSC List.
	For certification the minimum race car production will be 10 units in 12 consecutive months starting with the date of the application. After the certification the cars have to be offered on the market with maximum 3 months delivery time.
	Each TCR car, identified through the chassis no., will receive individually an original Technical Form.
	New race car models will be allowed to take part to the TCR International Series Races before certification for tests purposes without scoring points but being classified. The Draft of the Technical Form will be presented to WSC 30 days before the 1 st entry in a TCR event.
3.3	Compliance with the regulations
	All vehicles must be conformed to these regulations, TCR Technical Form, TCR Technical Passport and to all WSC Notification and Technical Bulletins.
	All parts not mentioned in these regulations have to remains those from the basic production car or another production model of the same manufacturer and correspond to the Manufacturer's Parts Catalogue for the produced model and may not be modified in any way.
	In case of doubt about the conformity of any part the Technical Delegate may ask the replacement with a reference part without any further explanation. All cost of such operations will be covered by the Competitor.
	It is the duty of each competitor to satisfy the Scrutineers and the Stewards of the competition that his car complies with these regulations in their entirety at all times during a competition.
	A car, the construction of which is deemed to be dangerous, may be excluded by the Stewards.
3.4	Measurements
	All cars' measurements must be taken while the car is stationary on a flat horizontal surface in the location stated in the Sporting or in the Supplementary Regulations.
3.5	Material
	Titanium or magnesium alloys, ceramic or exotic materials and sophisticated coatings are not permitted unless used for the

production part or explicitly authorised by these regulations.

All flexible supports (engine, transmission, sub frames, etc.) may be replaced by stiffer brackets with same functional dimensions. If not otherwise defined by the present regulations the aggregate's position may not be modified. (Certification)

External bodywork parts may be repaired by adding material respecting the certified properties (minimum weight, functional shape, etc.). Such operation needs the approval of the technical delegate.

3.6 Data logging

The car must be fitted with the scrutineering data logging system (memotec) providing following data:

- Speed of the 4 wheels (failing that, of one front wheel and one rear wheel)
- Engine revs
- Longitudinal acceleration
- Lateral acceleration
- Throttle pedal position
- Engine load (position of the throttle valve or of any other control element)
- Engine Water Temperature
- Boost pressure (monitored by an additional sensor)
- Front Brake Calliper pressure
- Lap trigger
- Lambda-signal
- Ignition angle timing
- GPS

The Scrutineering Data Logger system consisting of an AIM evo4 box and a TCR kit (specific bracket, sensors and loom) must be installed corresponding to the instructions.

Manufacturers will offer for sale race cars equipped with scrutineering data logging system.

The collected data remain at WSC disposal.

The use of Team Data Logger is allowed. The scrutineering data logger may be used as Team Data Logger but it is forbidden to change the setup of the Scrutineering Data Logger or to delete recorded data without Technical Delegate's explicit permission.

3.7 Telemetry

The use of telemetry is forbidden.

3.8 Driving aids

Driving aids are not permitted.

- If the race car using mass production engine management cannot be operated without the Driving Aids, the mass production systems including mechanical parts and Electronic Control Units [Anti-lock Braking System (ABS), Electronic Stability Program (ESP) & Traction Control System (TCS)].not included] may be used on condition that the original hardware and software are maintained (only changes to the wiring are permitted). It is not allowed to the driver sitting in the car to change settings. The systems may be also switched off or removed (Certification).

The pit speed limiter and the launch control (as described below) are permitted. For the launch control 1 (one) additional engine rev-limiter is allowed. The rev-limiter is constant during the launch control phase. There is no closed loop control considering engine revs, wheel speed and clutch actuation allowed.

Other constant rev-limiter(s) is (are) permitted for imposed speed limits (pit speed, virtual safety car, circuit sections with speed limit, etc.).

3.9 Balance of Performance (BoP)

All Manufacturers or Tuners must communicate the requested specific numbers for the definition of the numeric model for the BoP evaluation.

Parameters which may be modified for BoP:

- Minimum Weight; max. penalty 70kg; max. weight reduction 20kg
- Engine performance level implemented by monitored electronic components (100%, 95% and 90%)

WSC reserves the right to take further measures in order to guarantee proper BOP.

3.10 Period of Certification

WSC will release 1 (one) Technical Form per model and year. The race cars will be defined by the "year built".

Technical Form's modification will be allowed during the season only for following reasons:

- Safety
- Reliability
- Obvious lack of performance

ART. 4 BODYWORK

4.1 Chassis (Certification)

The chassis cannot be modified unless permitted by the present regulations.

Following condition must be respected:

- Width of bodywork: Maximum 1950mm

- All chassis modifications have to be approved by WSC.
- If not otherwise defined by the present regulations any non-movable element must be attached with the use of tools.
- Wheel arch modifications allowed, for the sole purpose to accommodate race tyres.
- Front bulkhead may not be modified except for a modified passage of the gearshift control, electrical loom(s), brake lines, fuel lines and extinguisher lines.
- No modification of McPherson turrets except of local reinforcement following the original shape and through metal ribs or fins as connection between turrets and front bulkhead for strengthening of strut mounting area. Production reinforcements and openings may be locally reworked without weakening the structure to allow access to the strut.
- Seam welding replacing or reinforcing production part spot welding is authorized.
- Local modifications of the chassis or sub frames are permitted to provide clearance to the exhaust system, transmission and suspension.
- Temporarily removal of the roof outer skin is permitted only to allow the safety cage's correct installation.
- All modification will be certified in the Technical Form.

Sub frames may not be modified for the fixation on the body shell or for the attachment of suspension elements. All sub frame modifications have to be approved by WSC. Reinforcements, modifications for air jack installation and the removal of unused supports are permitted. (Certification)

For the following elements the FIA App. J, Art. 263.903 applies:

- Strengthening
- Removal of unused supports for accessories or trims
- Passage of the gearshift control
- Mountings and bearings of antiroll bars
- Mounting of pedal box and master cylinders
- Central tunnel and/or floor on the driver's side to allow correct driver's position
- Panel on top of fuel tank area
- Installation of air jacks

4.1.1 **Bonnet and boot lids**

It must be possible to open them without use of tools.

The retaining springs (not the hinges) may be removed, but the car must have supports to hold the bonnet and the boot lid in open position. (Certification)

Openings in the engine bay bonnet are allowed up to a maximum total surface of 1050cm², including any original opening(s). Trims around the openings can be added to the bonnet provided that they do not protrude from the outer surface more than 15mm outwards and 50mm inwards. Cut-outs in the original production bonnet for the trims are allowed up to a total surface of maximum 2350cm² including any original cut outs. The production internal reinforcements may be removed in the opening zone. (Certification)

4.1.2 **Doors**

The production door locks, door-hinges, anti-intrusion bars, external door handles, and the driver side window lifters stay as original and in operation.

It must be possible to open all doors from outside (original handles) and the front doors also from the inside. Controls for opening the rear doors from the inside may be removed.

The other side window lifters may be removed, but the side windows must be locked in place and secured from all movement.

The removal of door soundproofing material and decorative strips is allowed.

Original inner trim panels must be replaced and be made from plastics (including composite materials) at least 1mm thick. The panels must totally cover the door, its handles, locks and window winding mechanisms.

Air inlets for driver cooling in the area of the external mirrors are accepted. (Certification)

4.1.3 **Engine & Luggage Compartments**

The FIA App. J, Art. 263.901-2 applies.

4.2 **Windscreen and windows**

The use of the mass production windscreen is permitted.

Plastic wind screen (polycarbonate or PMMA ensuring the same transparency as the original glass) with or without heating similar to FIA Art. 263.902 however with minimum thickness 5.85mm is allowed. (Certification).

Plastic rear window min. 3.85mm is allowed.

The internal face of side and rear glass windows as well as that of glass rear-view mirrors must be covered with a transparent and colourless plastic safety film with a maximum thickness of 0.1mm in order to avoid the shattering and spraying of glass in the event of an accident. It must be fitted in a manner that facilitates checking.

4.3 **Exterior**

If not differently defined by these regulations FIA App. J, Art. 263.902 applies.

The only body parts that can be replaced and changed in shape are:

- Front bumper; Shape resemble the original must be approved by WSC prior to production; no dive planes allowed.
- Front fenders; Shape must be approved by WSC prior to production (no louvres allowed)
- Side sills (these may be added if not present in the production car)
- Rear wheel arch extensions
- Rear door bulge compatible with the rear arch extensions
- Rear bumper; Shape resemble the original must be approved by WSC prior to production

-Wheel arch liners

No flat floor behind the vertical plane tangent to the back side of the front wheels and the foremost point of the rear bumper. It is not allowed to tape the joints between bodywork panels. The hood's and boot lid's original position may not be changed.

4.4 Aerodynamic devices

Rear wing

- Profile, Chord & Position on the car are as per App. J, Art. 263.902
- Aluminium extruded profile (WSC delivery)
- Maximum width is no greater than defined in App. J, Art. 263.902
- Brackets as per App. J, Art. 263.902 except freedom for the mounting surface on the car and on wing profile
- TCR side plates (WSC delivery); All edges will be rounded with at least R3mm (Safety)

The front splitter will be WSC delivered and will be adapted to each car. Brackets are free. The foremost edge of the front splitter at $y=0$ will protrude the bumper contour by max. 35mm in vertical projection. (Certification)

Adaptation of the WSC front splitter is possible by keeping the effective shape. It will also be possible to reduce the front splitter's protrusion into the wheel arch in case of collision with the front tire's enveloping curve. (WSC approval and Certification)

Rear diffuser included in the rear bumper:

- One single plane between a vertical plan minimum 380mm behind the rear axle centre line and the bumper's vertical projection
- Hollow area for the exhaust end pipe(s) allowed
- Maximal width: 1650mm
- Max inclination to the doors' lower edge: 25°
- No air circulation over the diffuser

Mass production flexible skirts reducing the ground clearance may be removed. (Certification) The ground clearance check will consider these parts as bodywork

4.5 Interior

If not differently defined by these regulations FIA App. J, Art. 263.901-1 applies.

Dashboard trims; Centre console

Trims situated below the dashboard and which are not parts of it may be removed. It is permitted to remove the part of the centre console. (Certification)

Dash board (Certification)

- General shape, appearance, mounting points and position must remain similar to production part.
- Thermoplastic material free
- Minimum weight: 2kg including ducting and fixation elements.

Instruments (Certification)

Display and indicators can be freely fixed on the dash board or to the steering column. The installation shall not interfere with the driver's vision or safety.

Switches (Certification)

Standard switches may be replaced by switches of different design (robust and reliable) and may be fitted at different locations on the dashboard or on the centre console. Any opening resulting from this must be covered.

Production Pedal Box: metallic pedals may replace the production plastic parts. New master cylinders and new arrangement in the engine bay may be used. (Certification)

Of shelf pedal box (hanging or floor mounted) and master cylinders in the cockpit: Modifications are authorised provided they have no other function than to allow the fixing of the master cylinders and/or the pedal box (Certification).

ART. 5 WEIGHT

5.1 Minimum Racing Weight

The target minimum racing weight (with driver) is 1,285kg.

The minimum front axle load proportion is 60% to be respected in any conditions during the event.

5.2 Ballast, Success Ballast

Ballast, including success ballast, must be made from metallic plates or blocks and must be fixed in the cockpit or in the boot according to the App. J Art. 263.201.

The ballast and success ballast will be declared as such at the scrutineering.

The ballast fixing system must allow to the Technical Delegate to seal the bolts. The ballast must be designed such, that tools are required for its removal.

5.3 Liquids

The weight may be checked at any time during the competition with the quantity of liquids in the tanks, except after the race when the car may be emptied of all the consumable liquids before weighing.

ART. 6 ENGINE

6.1 Engine generals

Turbo charged mass production engines without modifications.

- The make and type of the spark plugs are free.
- It is allowed to change the injectors with OEM parts similar dimensions. (Certification)
- The mass production high pressure fuel pump from the TCR certified engine cannot be modified. (Certification)
 - The electric loom and connection(s) may be modified to improve durability. (Certification)
- Cylinder head gasket may be changed with another one with identical dimensions. (Certification)
- Crankshaft bearings may be changed with another one with identical dimensions. (Certification)

Engine position: Production; The crankshaft's axis within a cylinder with R=20mm

The use of a different standard engine coming from another mass production car of the same group is allowed. In this case the engine's position, defined by the crankshaft's axis within a cylinder with R=20mm, the inclination, defined by the cylinder sleeve axes and the y-position, defined by the gearbox fitting surface may not be modified.

Engine shall be sealed by the Manufacturer or Tuner, to ensure it is in compliance with certification.

Air feed for engine and engine cooling: FIA App. J, Art. 263 applies. It is not allowed to put ice or any other cooling system in the intake pipes or in front of the intercooler.

Indicative Engine Performance (ECE-R 85-5 Norm):

- Maximum Torque around 410Nm
- Maximum Power around 330HP

6.2 Engine Cooling

Intercooler

Mass production intercooler from another OEM may be used (Certification).

The position and brackets are free without any modification of the bodywork. Air hoses and water pipes are free (Certification)

Water Cooling

Radiator: mass production part free provided that the radiator is fitted in the production location without any modification to the bodywork (see exception below), water hoses and water pipes are free (Certification)

Thermostat: free (Certification)

Electric & mechanic fans for radiator cooling: free (Certification)

Air Ducts: free between air inlet and cooler core (Certification)

Upper radiator front cross member may be modified or removed without negative effects for rigidity of the chassis structure (Certification).

In justified cases, Manufacturers may apply for removal or modifications of radiator cross members without negative effects for rigidity of the chassis structure (WSC approval and Certification).

Engine oil cooling

The type of the used oil cooler (air/oil radiators or water/oil heat exchanger) and their connections are free. No modifications to the bodywork are allowed. The parts have to be situated within the perimeter of the bodywork in safe position. (Certification)

It is allowed to put tape in the grilles of the front bumper to regulate the engine cooler temperature (in car colour).

Only ambient air may be used for heat dissipation.

6.3 Lubrication

Following is allowed:

- Pressure accumulator (Certification)
- Baffles and deflectors in production oil wet sump; The distance between the planes of the oil sump gasket on the engine block and on the oil sump may not be increased by more than 6mm. (Certification)

If the lubrication system includes an open type sump breather, it must be equipped in such a way that the oil flows into a catch tank. (App. J, Art. 255. 5.1.14)

6.4 Engine control unit

The choice of the engine Electronic control unit (ECU), engine control software, sensors and engine loom are free. (Certification)

The software and all data sets are frozen and cannot be overwritten. ECU box will be sealed by the Manufacturer or Tuner and the access to modify software and parameters will be closed to prevent manipulation.

Manufacturers will provide to the technical delegate free of charge for the duration of participation of their cars to the TCR International Series engine Electronic Control Unit(s) (ECU) for all registered engine performance level(s) defined for BoP purposes.

The WSC Technical Delegate may at any time oblige the competitor to use the reference unit registered with the WSC by the Manufacturer or Tuner.

Any manipulation, modification or disconnection of any certified sensor is forbidden. The Competitor is responsible for the quality of the sensor signals.

The software and the map(s) for the all certified engine performance level(s) are frozen and cannot be modified without WSC agreement. (Certification)

ECU housing will be sealed by the corresponding manufacturer or tuner and the access to modify software and parameters will be blocked.

Every manufacturer or tuner has to provide software tools (free of charge and without limitations concerning the required number of copies and licenses) to allow to the TCR Technical Delegate to monitor the engine control software. The interface cable, that is needed to access the engine control unit while it is installed in the car, has to be provided for the TCR Technical Delegate by all participating competitors free of charge. The engine control software and the datasets have to be provided in a binary format to the TCR Technical Delegate by the manufacturer or tuner.

The software tools have a minimum functionality of:

- Upload/Download program software and data sets
- Calculate Checksum of program software and datasets after uploading them

6.5 Intake system

One (1) supplementary opening in the front bumper without protrusion above bumper's exterior surface can be made. (Certification)

The air filter housing and the air filter element may be replaced with a catalogue part (Certification). The air feed pipes to the air filter housing and from the filter housing to the turbo are free. (Certification)

1 (one) different mass production Mono Turbo Charger coming from engines with cylinder capacity smaller than 2000cm³ may be used. (Certification)

It is allowed to change the impeller in case the Turbo Charger is integrated in the exhaust manifold. (Certification)

The turbo charger must have the possibility to be sealed.

Antipollution air circulation may be removed and the connections may be closed.

6.6 Exhaust

The exhaust system is free downwards the turbo charger and its regulating system. It will fit FIA homologated catalytic converter(s) (FIA List no. 8), will have nominal wall thickness minimum 1.2mm and will have the exit(s) at the car's rear end below the rear bumper. (Certification)

If a different turbo charger is certified an adapter between this and exhaust manifold may be used, (Certification).

Sound level and measuring method similar to FIA App. J, Art. 263.328

Manufacturers may apply for one option exhaust muffler system for low noise circuits. (Certification)

6.7 Fly-wheel assembly (Certification)

Flywheel: production part or modified respecting following conditions:

- Fly wheel can be re-manufactured solely to allow for a replacement clutch.
- Minimum weight 6kg (without fasteners)
- Machined from a single block of steel (no weight reduction bores, pockets or cut-outs)
- The starter gear must have same or bigger dimensions.

ART. 7 FUEL SYSTEM

7.1 Fuel tanks

The fuel cell, the filling and ventilation systems must be separated from the cockpit by a fireproof and liquid-proof protective device and must be certified.

Designs have to be WSC approved before implementation.

External refuelling can be used (Art. 253). (Certification). Several refuelling systems for different sporting regulations can be certificated (VO).

For fuel tanks with filler necks FIA homologated non-return valve are mandatory (App. J. Art. 253.14.5)

a) Production fuel tank or corresponding to App. J, FIA Art. 253.14 with a total volume of max. 100liters. (Certification).

Manufacturer may apply to certificate 2 (two) Fuel Cells: 1 (one) using the Production fuel tank and 1 (one) using a FIA Safety Fuel Cell.

An add-on fuel cell (FT3 1999, FT3.5 or FT5) on the top of the production unit may be used up to the total maximal fuel volume. (Certification)

For the WSC supplementary fuel cell only the installation has to be certified.

b) If FIA Safety Fuel Cell is in use this will satisfy the following conditions (Certification):

- be conform or exceed the specifications of FIA/FT3 1999, FT3.5 or FT5
- complies with the prescriptions of App. J, Art. 253.14
- Have a Fuel Cell Housing corresponding to Art. 263.401
- have similar position and shape of the inferior surface of the fuel cell housing as the production fuel cell
- Located within the safety cage, forward of the centre line of the rear wheels, no more than 65cm from the vertical plane through the longitudinal axis of the car
- Fuel cell cover's lowest surface should have similar area and position in the car as the production fuel cell. (WSC approval)
- The rest of the fuel cell including its cover has to be higher than 40mm in respect to production fuel cell's lowest surface.
- Simple tunnel (no closed opening through fuel cell) for exhaust tube is allowed.

- In case of option with total fuel volume of 100liters the level of the fuel cell lower surface including its cover has to be higher than 25mm in respect to production fuel cell's lowest surface.
- Floor pan cut above the original fuel cell compartment exclusive for the installation of the supplementary fuel cell volume in the cockpit is permitted. Structural panels cannot be cut or modified.
- The upper housing may be of mild steel 1.5mm minimum nominal thickness bolted or welded to the body shell or be crushable structure (Art. 263.401).
- Fuel cell housing fixation to the body shell will be made using at least 6 (six) fixing points with M8 grade 8.8 bolts installed according to the FIA Drawing 253-65. WSC approved fixing systems with equivalent solidity may be used. (Certification)

c) It is also possible to use a catalogue rectangular shaped FIA Safety Fuel Cell coming from an FIA-approved manufacturer (FIA FT3 1999 minimum specifications). (Certification).

The Fuel Cell must be fitted as follows:

- located within the safety cage
- forward of the centre line of the rear wheels
- behind the vertical plane tangent to the most rear point of the driver's seat back
- no more than 65cm from the vertical plane through the longitudinal axis of the car
- Installed in a fabricated mild steel vane (housing) 1.5mm minimum nominal thickness bolted or welded to the body shell; or in a housing corresponding to the Art. 263.401 bolted to the body shell. The housing will follow the fuel tank's shape and will not have any other function. (certification)
- Cut-out of the floor pan is permitted.
- Lower surface of the tank vane at least 100mm above road (measured by ride height of 80mm).
- mild steel 1.5mm minimum nominal thickness fuel cell cover bolted or welded to the body shell (fire wall) (Certification)

In case of bolting (fuel cell housing or cover) minimum M6 8.8 bolts spaced at max. 200mm must be used. Different designs have to be WSC approved before implementation.

7.2 Fuel circuit

Fuel lines:

Mass Production Fuel Lines may be used outside the cockpit. The protection will correspond to Appendix J, Art. 253.3.1.

Other fuel lines must correspond to the prescriptions of Article 253-3 of Appendix J.

The installation is free provided that the prescriptions of Article 253-3 of Appendix J are respected.

Fuel sampling connector

The car must be fitted inside the engine compartment with a FIA approved self-sealing connector for fuel sampling (Technical list n°5) on the fuel feed line directly before the fuel high pressure pump.

The competitors will provide to the Technical Delegate on his request a connection hose to this connector.

7.3 Electric Fuel Pumps (Certification)

All Electric Fuel Pumps must stop by stalling engine.

ART. 8 ELECTRICAL EQUIPMENT

8.1 Windscreen wiper

Any production wiper motor system may be used with at least 1 (one) original working wiper blade to clear the screen directly in front of the driver. (Certification)

The windscreen washer tank may be modified (free position) or removed.

Complete rear window wiper and washer system may be removed.

8.2 Engine Starter

The production starter must be fitted and must be in working order at all times of the competition.

The driver must be able to operate the starter when seated normally.

8.3 Lighting equipment

8.3.1 The exterior lighting equipment must at least ensure the following functions: headlights, front and rear direction indicators, stop lights, rain light (see 8.3.2) and rear tail lights and must be in working order at all times of the competition.

The exterior surface and appearance of the other lights cannot be modified but the interior elements may be removed. (Certification). Exception for the fender indicators which are free.

8.3.2 Rain lights:

Rain Light is compulsory. (Certification)

Following arrangement may be used:

- One FIA approved unit (Technical List n°19) located in the tail gate, boot lid or replacing the 3rd brake light placed on the car's centre line.
- Production 3rd brake light in combination with the production rear fog light(s).

8.4 Starter Battery

Type: dry

Number: 1

Location: In the production location, boot or in the cockpit. If in the cockpit, it must be situated behind a vertical and transversal tangent plane to the rearmost point of driver's seat.

Fixation: Should the battery be moved from its production position App. J, Art.255.5.8.3 applies.

Insulating cover: The terminals must be electrically protected with an insulating cover.

It must be possible at all times to start the engine with the energy of the battery transported on board the vehicle.

8.5 Electric loom (engine, car & data logger)

Production or racing loom (Certification).

ART. 9 TRANSMISSION**9.1 Transmission system**

For cars fitted with a paddle shift and/or a power-driven clutch with electronic or pneumatic control, the Technical Delegate may at any time oblige the competitor to use in competition the reference unit(s) registered with the WSC by the Manufacturer or Tuner.

9.2 Clutch

The clutch has to be the mass production one or certified under following conditions:

- Racing Catalogue pressed-type multi-discs sinter-cerametallc
- Minimum Discs Dia. 183mm (7¼")
- Clutch Control System hydraulic or mechanic actuated by the driver's foot
- Clutch release bearing is free (catalogue parts).

9.3 Gearbox

Mass production gearbox coming from the production model or from another car of the same group may be used (Certification). In the latter case a gear box adapter to the engine and gearbox brackets may be used. (Certification)

The use of paddle shift on mass production gearbox using catalogue (after-market) parts may be certified. The gear box control unit will be sealed and may be at any time be replaced by the technical delegate with the reference part. It is not allowed to alter the certified operating data. Manufacturers will provide to the technical delegate free of charge for the duration of participation of their cars to the TCR International Series transmission Electronic Control Unit(s) (ECU).

One racing sequential gearbox with one set of ratios may be certified under following conditions:

- A maximum of 6 (six) forward gears
- 1 (one) reverse gear, selectable at any moment by the driver while the engine is running and the car is stopped
- Every gear must be able to be engaged and in working order.
- Gear changes must be made mechanically or using Paddle Shift (catalogue part).
- Interference to Engine Control for shifting allowed (Ignition cut or power reduction)
- Each individual gear change must be separately and solely initiated and commanded by the driver.
- Any system that permits more than one gear pair to be engaged to the drive train at any time is prohibited.
- Instantaneous gearshifts are forbidden.
- Gearshifts have to be distinct sequential actions where the extraction of the current dog gear is subsequently followed by the insertion of the target dog gear.
- The dog gear is considered extracted when its position is not able to transmit any torque.

The target minimum racing weight (with driver) for cars using mass production gearbox is 1,250kg.

The mass production gearbox may be also be certified and used under following conditions:

- Mass production ratios
- 1 (one) reverse gear, selectable at any moment by the driver while the engine is running and the car is stopped
- Every gear must be able to be engaged and in working order.
- Gear changes must be made mechanically or using Paddle Shift (after-market or catalogue part).
- Interference to Engine Control for shifting allowed (Ignition cut or power reduction)
- Each individual gear change must be separately and solely initiated and commanded by the driver.

The mass production gearbox and the sequential gearbox may be certified on the same Technical Form.

A new gearbox cooling using catalogue parts (pump, filter, cooler, lines, thermostat, etc.) may be certified. Mass Production Gearbox Cooling may be used without modification. Modified mass production gearbox cooling must be also certified.

9.4 Final Drive

The final drive may be production or new (Certification).

For each certified gear box one new final drive ratio or one new final drive ratio pair (for transmission using two final gear pairs for gearboxes with 2 lay shafts) in the certified housing may be certified.

Final drive cooling using catalogue parts (pump, filter, cooler, lines, thermostat, etc.) may be certified.

9.5 Limited Slip Differential

Any mass production limited slip differential may be used with production parameters but the settings cannot be modified during driving. (Certification)

The mass production differential fitted in the mass production gearbox may be replaced by a catalogue mechanical limited slip differential inside the drive unit housing (Certification).

It is permitted to remove material from the inside of the production housing. It must at all times be possible to clearly recognize the housing as the certified standard housing. (Certification)

Only one (1) mechanical limited slip differential may be offered for racing sequential gearbox. (Certification).

For each mechanical limited slip differentials 4 (four) pairs of pressure angles machined on one or several pressure rings pairs may be certified.

9.6 Transmission Shafts

Production transmission shafts including their joints may be replaced with steel catalogue parts. (Certification)

ART. 10 AXLES, SUSPENSION AND STEERING

10.1	<p>Generals</p> <p>No modifications of the chassis for new suspension pick up points</p> <ul style="list-style-type: none"> -The position of the new pick-up points is free; max ± 20mm adjustment in all directions (Certification) - Bolted brackets for suspension elements are free (Certification) <p>Position of the front and rear axles, wheel base and overhangs correspond to the Art. 263, Appendix J.</p>
10.2	<p>Wheel Hubs and Bearing</p> <p>The wheel hubs may be re-machined using similar wheel fixation (number of fixation points, same bolt PCD and thread), to allow the use of a stronger mass production wheel bearing. (Certification)</p>
10.3	<p>Bearings, Silent blocks, Rubber bearing</p> <p>Production bearing on suspension arms may be replaced by uniballs or bush bearings (Certification). No rolling contact bearings accepted.</p>
10.4	<p>Front wishbones/upright/struts</p> <p>The working principle and the number of pivot points on the wishbones/upright/struts and on the chassis/subframe have to be maintained. The parts are free. (Certification)</p> <p>Double-wishbone axle may be changed to triangular control arm axle. (Certification)</p>
10.5	<p>Rear suspension</p> <p>Production suspension parts may be reinforced or modified. Simple links (strut with two joints) may be replaced by new parts (Certification)</p> <p>Twist beam may be changed into double trailing arm, keeping the same external pivot points and adding two additional points on chassis. (Certification)</p>
10.6	<p>Anti-roll bars</p> <p>Anti-roll bars made from ferrous material, their bearings and their actuation are free. Adjustable lever arms (no turning blades) may be used without adjustment from the cockpit. (Certification)</p> <p>If the production axle is not fitting anti-roll bar, it may be added. (Certification)</p> <p>The anti-roll bars may be disconnected but must remain in the car.</p>
10.7	<p>Springs</p> <p>Cylindrical, linear steel springs are free; the combination of one helper with one suspension spring is allowed.</p> <p>The spring seats are free. (Certification)</p> <p>Bump stops and packers are free.</p>
10.8	<p>Minimum Ride height</p> <p>The minimum ride height has to be respected at any time during the event.</p> <p>For the checking of the minimum ride height, the pressure of the tyres must not be less than 1.5bars.</p> <p>Reference Minimum Ride Height: 80mm.</p>
10.9	<p>Shock absorbers</p> <p>Only commercial 2 way shock absorbers allowed. (Certification)</p> <p>Inertial shock absorbers and rolling contact bearings are forbidden.</p> <p>Teams may use shock absorbers of own choice only with formal manufacturers' approval. (Certification for the team's cars)</p>
10.10	<p>Steering</p> <p>The steering lock must be dismantled and the column adjusting system must be locked with tools. Steering column brackets may be replaced. The new brackets may be connected to the chassis or to the safety cage (Certification)</p> <p>A catalogue closed steering wheel can be used. The fitting of displays, switches and control lights on the steering wheel is allowed if offered by the steering wheel supplier. (Certification)</p> <p>The steering wheel must be fitted with a quick release system. (Certification)</p>
10.11	<p>Power steering</p> <p>For cars fitted with an automatically variable power steering the Technical Delegate may at any time oblige the competitor to use the reference unit WSC registered by the Manufacturer or Tuner.</p>
ART.11	BRAKES
11.1	<p>Generals</p> <p>Master cylinder(s) are free; The type and make will be certified.</p> <p>Max brake diameter 380mm (width free); certified diameter and bells</p> <p>Steel brake discs (no ceramic coating allowed)</p> <p>Max 6 pistons front calliper (Certification)</p> <p>Max 2 pistons rear calliper (Certification)</p>

	<p>The brake callipers must be made from aluminium materials with a modulus of elasticity no greater than 80Gpa. (Certification)</p> <p>Simple brake effort repartition system(s) (hydraulic or/and mechanic) is (are) allowed. (Certification)</p>
11.2	<p>Brake fluid tanks</p> <p>The brake and clutch fluid tanks will be fixed in the engine bay. The brake fluid hoses may pass through the cockpit. (Certification)</p>
11.3	<p>Brake cooling</p> <p>Ducts may be metallic (steel or aluminium sheet), flexible hoses or be made in composite material. (Certification)</p> <p>Certified apertures in the bodywork may be used to bring the cooling air to the brakes.</p> <p>The connection of the air ducts to the certified apertures in the bodywork is free. (Certification)</p> <p>Two supplementary openings in the front bumper may be done with no other function (Certification):</p> <ul style="list-style-type: none"> -The connection parts to the bumper will have an internal diameter of maximum 100mm, will not protrude more than 15mm above bumper's outer surface having transition radius to the bumper shape max 10mm. -Flexible or firm air ducts with maximal inside dimensions of nominal 100mm diameter for circular versions or the corresponding inside area for non-circular versions may be used. <p><u>Brake disc cooling :</u></p> <p>Ducts must channel air towards the inner face of the brake disc only and must not be bigger than the disc diameter.</p> <p><u>Brake calliper cooling :</u></p> <p>Ducts may wrap the calliper up to a maximum of 20mm around it.</p> <p>Tape on the external air inlets to regulate the brake temperature is allowed (in car colour).</p>
11.4	<p>Parking brake</p> <p>The parking brake working on the brake system (not on the transmission) is mandatory.</p> <p>The production parking brake may be removed or replaced by a hydraulic valve or master cylinder operated manually by the driver without any intermediate system. (Certification)</p>
ART. 12	WHEELS AND TYRES
12.1	<p>Generals</p> <p>The tyre types will be decided by WSC.</p> <p>Any system allowing the car to be driven without pressure in the tyres is forbidden.</p> <p>Pressure and temperature sensors are forbidden.</p>
12.2	<p>Dimensions</p> <p>Wheels: similar to FIA App. J, Art. 263.801 (Certification)</p> <ul style="list-style-type: none"> -Dimensions of the 4 wheels: identical -Rim's maximum dimensions : 10"x18" (width x diameter) -Complete wheel: Maximum width at 2bars : 280mm -The diameters at inner and outer rim edges must be identical with a tolerance of ± 2.0mm. -Rim's minimum weight: 11kg -Rim's material: Cast aluminium alloy -Rim's Construction: Single unit -Metal inserts are allowed for the passage of the drive to the wheel. -Air extractors are forbidden. -Dry and wet weather tyres will have similar dimensions. -Teams may use of rims own choice only with formal manufacturers' approval. (Certification for the team's cars)
12.3	<p>Wheel visibility</p> <p>The upper part of the complete wheel (flange+rim+tire) in straight ahead position and above the wheel's centre must be vertically covered by the bodywork.</p>
12.4	<p>Wheel attachment</p> <p>Wheel fixations by bolts may be changed to studs fixations respectively knurled-head screws and nuts, provided that the number of fixation points, as mentioned above, remains unchanged. (Certification)</p> <p>Certified wheel spacers are allowed.</p>
12.5	<p>Pressure control valves</p> <p>Pressure control valves on the wheels are forbidden.</p>
ART. 13	COCKPIT
13.1	<p>Equipment permitted in the cockpit</p> <p>The only components which can be added in the cockpit are:</p> <ul style="list-style-type: none"> - Safety equipment and structures - Seat, instruments and any other controls necessary for driving including the brake balance adjuster - Electronic and electrical equipment; it is permitted to channel air towards the electronic equipment on condition that the ventilation devices comply with the present regulations. - team communication radio - Driver cooling and ventilation equipment

- Ballast
- Braking and clutch system hydraulic lines with properly secured connectors
- Pneumatic jacks and their pipes
- Battery
- Fuel, hydraulic lines with properly secured connectors (App. J. Art. 253.3.2)

None of the above items may hinder cockpit exit or the driver's visibility.

The above components must be covered where necessary by a rigid protective material to minimise injury, and their mountings must be able to withstand 25g deceleration.

13.2 Cockpit exit time

The driver, seated in his normal driving position, must be able to get out from the cockpit in 7 seconds through the driver's door and in 9 seconds through the passenger's door.

For the purposes of these tests, the driver must be wearing all normal driving equipment, the seat belts must be fastened, the steering wheel must be in place, and the doors must be closed.

13.3 Test for helmet removal

With the driver seated in his normal driving position in the car with which he is entered, wearing a frontal head restraint systems according to FIA Standard 8858-2010 (FIA List No. 29) appropriate to his size and with the seat harness tightened, it must be possible, that the helmet which the driver will wear in the race can be gently removed from his head without bending his neck or spinal column.

ART. 14 SAFETY EQUIPMENT

14.1 Fire extinguishers

All cars must be equipped with an extinguishing system homologated by the FIA in accordance with Article 253.7.2. (FIA Technical List 16)

14.2 Safety belts

The safety belts must comply with FIA Standards N°8853/98. (FIA Technical List 24)

14.3 Rear view mirrors

The car must be fitted with 2 (two) production external rear view mirrors.

14.4 Driver Seat

The driver's seat must be FIA homologated and not modified:

- FIA Standard 8855-1999 (FIA Technical List 12) using exclusively WSC certificated seat brackets. (Certification)
- FIA Standard 8862-2009 (FIA Technical List 40)

Maximum total thickness of cushions used between the driver and the homologated seat is 50mm.

If the original seat attachments points on the body shell are changed, the new attachments points for seat or seat supports must comply with the provisions of App. J, Art. 253.16. (Certification)

The seat must be mounted by means of at least four (4) M8 bolts of at least 10.9 quality.

Seat position

- Transversally: Seat centreline must not be less than 270mm from the car's centreline.
- Longitudinally limit based on FIA App. J, Art. 263.1002; the most rear seat position will be documented in the Technical Form related to the chassis.

14.5 General Circuit Breaker

The driver, when seated normally at the steering wheel with the safety belts fastened, must be able to cut off all the electrical circuits and switch off the engine by means of a spark-proof breaker switch.

The switch must be positioned on the dashboard or in any other place easily accessible and must be able to be handled from inside the car by the driver seated and secured by his safety belts

An exterior General Circuit Breaker must be installed and clearly identified by a symbol showing a red spark in a white-edged blue triangle.

- Recommended location: at the lower part of the driver's side windscreen pillar.
- Location following FIA Art 253.13 will be also accepted.

14.6 Window Net

A protective net is compulsory.

It must meet the following specifications:

- the net must be made up of woven strips at least 19mm (3/4") wide;
- the meshes must be a minimum of 25 x 25mm and a maximum of 60 x 60mm. The woven strips must be non-flammable and sewn together at each point of crossing. The net must not be of a temporary nature.
- viewed from the side, it must reach from the centre of the steering wheel to the B-pillar.

Fixation:

The net must be attached either to the safety cage or to the chassis, above the driver's window, by means of a rapid release system that will function even if the car turns over.

It must be possible to detach the net with one hand. To this end, the handle or lever must have coloured markings ("dayglo" orange).

	<p>A push-button release system is authorised provided that it respects the prescriptions of this article. The push-buttons must be visible from the outside, be of a contrasting colour and be marked "press".</p>
14.7	<p>Towing devices</p> <p>All cars will be equipped with certified rear and front towing devices. It will be clearly visible and coloured in yellow, red or orange.</p> <p>The towing devices must be within the perimeter of the bodywork as viewed from above.</p> <p>It must allow the passage of a cylinder with a diameter of 60mm.</p> <p>It must allow moving the car with blocked wheels using the cars braking system on a dry surface (concrete or asphalt) by applying traction on a plane parallel to the ground, with an angle of $\pm 15^\circ$ to the longitudinal centreline of the car.</p> <p>The car must be fitted with the series dry weather tyres.</p> <p>Flexible towing devices must be always in good condition without abrasions or kinks.</p>
14.8	<p>Fuel system</p> <p>Fuel lines :</p> <p>Flexibles lines inside the cockpit must be of aviation quality (App. J, Art. 253.3.2).</p> <p>The installation is free provided that the prescriptions of App. J, Art. 253.3 are respected.</p>
14.9	<p>Hydraulic pressure lines</p> <p>App. J, Art. 253.3.2 applies.</p>
14.10	<p>Side Protection Panel</p> <p>A side protection panel made of composite material complying with Art. 263.902 may be optionally used. (Certification)</p>
ART. 15	<p>SAFETY STRUCTURES</p> <p>Safety cage</p> <p>The safety cage must be homologated or certified by an ASN (App. J, Art. 253.8.1.b), or homologated by the FIA (App. J, Art. 253.8.1.c).</p> <p>The tubes closer the 50cm to the driver's head must be padded with non-flammable foam approved by the FIA. (FIA Technical List 23)</p>
ART. 16	<p>FUEL</p>
16.1	<p>Fuel specification</p> <p>The fuel must comply with the official samples at any time of the competition. Additives of any kind are forbidden.</p> <p>The fuel temperature may not be more than 20°C lower than the ambient temperature.</p>
16.2	<p>Air</p> <p>Only air may be mixed with the fuel as an oxidant.</p>
ART. 17	<p>FINAL TEXT</p> <p>The binding text of these regulations is the English version.</p>