

## **BaTCC FORMULA HISTORIC TECHNICAL REGULATIONS**

**Confirmed by:**

\_\_\_\_\_ RACING COMMISSION

### **1. General**

These Technical Regulations are valid from 01 01 2018. The Regulations and their amendments for the class that were valid up to 01 01 2018 are voided.

Eligible cars:

The basic car must be manufactured including, but not later than 1996, with exception to Formula Estonia production.

The basic car includes a monocoque/frame, wheel suspension attachments, wheel rims, and with gearbox casings.

Each car must be in accordance with its age and design. Different to original car manufacturers model and modification parts shall not be used with the original car.

The competitor has an obligation to show the age of his own car in respect of the basic car.

### **2. Definitions**

#### **2.1. Formula Car**

Automobile designed solely for speed races on circuits or closed courses. Land vehicle running on at least four non-aligned complete wheels, of which at least two are for steering and at least two for propulsion.

#### **2.2. Bodywork**

All entirely sprung parts of the car in contact with the external air stream, except the rollover structures and the parts definitely associated with the mechanical functioning of the engine, transmission and running gear. Airboxes and radiators are considered to be part of the bodywork.

#### **2.3. Wheel**

Flange and rim. Complete wheel: flange, rim and tyre.

#### **2.4. Weight**

The weight of the car with the driver, fuel and complete racing apparel.

#### **2.5. Event**

An event shall consist of official practice and the race.

#### **2.6. Cubic Capacity**

The volume swept in the cylinders of the engine by the movement of the pistons. This volume shall be expressed in cubic centimeters. In calculating engine cubic capacity, the value of  $\pi$  shall be 3.1416.

#### **2.7. Supercharging**

Increasing the weight 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) by any means whatsoever. The injection of fuel under pressure is not considered to be supercharging.

#### **2.8. Main Structure**

The fully sprung structure of the vehicle to which the suspension and/or spring loads are transmitted, extending longitudinally from the foremost front

suspension on the chassis to the rearmost one at the rear.

#### 2.9. Cockpit

The volume, which accommodates the driver.

#### 2.10. Survival cell

A continuous closed structure containing all fuel tanks and the cockpit.

### 3. Regulations

#### 3.1. Autosport Vehicle Technical Card

All competitors must be in possession of a Autosport Vehicle Technical Card (AVTC) for their car, which will be issued by the relevant ASN and must accompany the car at all times.

No car will be permitted to take part in an event unless the AVTC is available for inspection at initial scrutineering.

3.2. Car must comply with the technical regulations the whole time of the event.

3.3. If scrutineering finds a car technically dangerous, it can be disqualified from the event by a decision of jury.

3.4. All measurements must be made while the car is stationary on a flat horizontal surface, with driver in car.

3.4. Above mentioned vehicles should match safety rules of FIA Appendix J period 1990, Article 275:

[https://historicdb.fia.com/sites/default/files/regulations/1439544717/appendix\\_j\\_1990.pdf](https://historicdb.fia.com/sites/default/files/regulations/1439544717/appendix_j_1990.pdf)) and further described regulations.

### 4. Bodywork and dimensions

4.1. The overall width of the car including complete wheels shall not exceed 1850mm, with the steered wheels in the straight-ahead position.

4.2. The bodywork ahead of the front edge of the complete front wheels is limited to a maximum width of 1350mm. Bodywork, that is in front of the front edge of front wheels and is outside of 950mm width, cannot be higher than the highest point of front wheel rims.

4.3. The maximum width of the bodywork behind the rear edge of the complete front wheels and in front of the centerline of the rear wheels is 1300mm.

4.4. Bodywork behind the centerline of the rear wheels must not exceed 950mm in width.

4.5. No part of the car shall be more than 800mm behind the centerline of the rear wheels or more than 1000mm in front of the centerline of the front wheels.

4.6. Except for the rollover structures, no part of the car can be higher than 950mm from the ground. However, any part of the rollover structures more than 900mm from the ground must not be shaped to have a significant aerodynamic influence on the performance of the car.

4.7. Any specific part of the car influencing its aerodynamic performance:

- must comply with the rules relating to bodywork.

- must be rigidly secured to the entirely sprung part of the car

4.8. Any part of the bodywork, located more than 500 mm from longitudinal axis must have minimum ground clearance of 20 mm.

4.9. Cars with stepped floor cannot be altered and must comply entirely for FIA F3 body rules of the date of their manufacture. Competitor must have

documentation for his stepped floor car, where all concerning FIA rules are presented.

4.10. Minimum wheelbase: 2000mm.

4.11. Minimum track: 1200mm.

## **5. Weight**

5.1. The weight of the car must not be less than **535** kg, with the pilot and his racing apparel.

5.2. Ballast can be used provided it is secured in such a way that tools are required for its removal. It must be possible to fix seals if deemed necessary by the scrutineers.

5.3. Adding liquid of any kind to the car is forbidden during races.

5.4. The weight may be checked at any time during an event with the driver on board and with the quantity of liquid remaining in the tanks, on the understanding that it is forbidden to add oil, any other liquid or extinguishants right before the weighing (or during weighing).

## **6. Engine VW/Audi GTI; GTE 1600cc**

6.1. Only in-line engines with reciprocating pistons and maximum of two valves per cylinder are allowed. The maximum number of cylinders is 4. Two-stroke engines are forbidden. Supercharging is forbidden.

6.2. Engine capacity must not exceed 1610 cm<sup>3</sup>.

6.3. Modifications to the engine:

6.3.1. The engine block and engine head castings, machining completed, must be those of a car engine equipping a car model of which the FIA has ascertained the series production of at least 5000 units in 12 consecutive months and production started not later than 1990/31/12

6.3.2. The original engine block and cylinder head may be modified by the removal of material, but addition of material is not permitted. However, it is permitted to sleeve an engine block, by welding if necessary, that originally is not fitted with sleeves, to modify or close the lubrication holes, close standard injector holes or to use helicoils. Unused apertures in the cylinder head or block may be closed provided the only purpose is that of closing.

6.3.3. The type of crankshaft bearings cannot be modified. The crankshaft has to be with the same stroke as described by the engines original manufacturer. Competitor must have documentation concerning his crankshaft stroke, confirmed by manufacturers representative.

6.3.4. All other engine components can be modified, replaced or not used. The use of titanium parts is strictly forbidden.

6.3.5. Variable length intake systems are forbidden. Fuel injection is forbidden. Airboxes are forbidden. There must be one trumpet per each cylinder, with air intake orifices directed to the centerline of the car. Otherwise carburetors are free. Intake is free.

6.3.6. Maximum number of carburetors is two, both with maximum two barrels.

6.4. The outlet orifices of the exhaust pipes must be directed to the rear and must be less than 600mm from the ground. Variable length exhaust systems are forbidden.

## **7. Engine 1800 cc (F4)**

Engine has to comply with following rules:

### **7.1. Engine**

The engine has to be VW/Audi GTI/GTE 1,8 liter, with maximum bore of 81,61 mm and maximum stroke of 86,40 mm. The biggest allowed engine capacity is 1808 cm<sup>3</sup>. The engine has to be built using only VW/Audi 1,8 liter parts in spite of some exceptions, which are separately mentioned later on.

The

block deck surface can be machined, but under no circumstances can the piston rise more than 1,0 mm above the block deck.

### **7.2. Carburetors**

Maximum number of carburetors is two, both with maximum two barrels. The maximum allowed choke diameter is 34mm. The maximum allowed bore diameter is 45 mm. Otherwise carburetors are free. Intake is free.

### **7.3. Supercharging**

Mechanical or chemical supercharging is forbidden.

### **7.4. Adding material**

All sorts of material adding (welding, gluing, galvanizing etc) are forbidden.

### **7.5. Cylinder walls**

Damaged cylinder walls can be replaced with standard size cylinder sleeves.

### **7.6. Balancing**

Removing material to balance moving parts is allowed only in places meant for it by manufacturer.

### **7.7. Cam cover (Valve cover)**

Cam cover can be changed, given that it will not enhance in any way the performance of the engine.

### **7.8. Valve train**

Except for valve springs, all valve train parts must be standard. Use of washers

under the valve spring is allowed. Cam followers can be altered to mechanical cup type, adjustable by inner washers beneath working surface.

### **7.9. Oil system**

Oil system is free. The material and shape of oil sump is free.

### **7.10. Oil coolers**

Oil coolers are free, as long as they comply with other rules.

### **7.11. Cooling system**

Fluid based cooling system is mandatory, but radiators and water pumps are free. If a radiator has an air-directing device, it has to comply with rules set for bodywork.

### **7.12. Fuel pump**

Fuel pump is free, but it must be located outside the cockpit. Fuel pressure regulators are allowed.

### **7.13. Distributor**

The distributor is free, providing its location and use is as original. Other devices that brake, time or distribute ignition current are not allowed. Pointer for flywheel, for camshaft - crankshaft timing is allowed.

A mechanical or electric rev limiter is allowed, but cannot be adjusted from cockpit by driver. Shift light is allowed.

#### 7.14. Gaskets

Gaskets are free, except cylinder head gasket, which has to be VW/Audi original, with part number 026103383 or similar both in dimensions or material. The minimum thickness of compressed cylinder head gasket is 1.7 mm.

#### 7.15. Alternator

Alternator is free.

#### 7.16. Pulleys

Belt driven pulleys are free. Camshaft drive system is free.

#### 7.17. Breathers

Crankcase breathers are free and can be removed. All breathers must lead to at least 2L catch tank.

#### 7.18. Mechanical tachometer

Mechanical tachometer is allowed.

#### 7.19. Bearings

Standard oversize bearings are allowed.

#### 7.20. Cylinder head

Cylinder head has to be VW/Audi original, with casting number 026103373.

Spare part number is 026103351 as new or 026103265 as a replacement.

Attention: after the number, there may be letters, depending on the manufacturing year.

Cylinder head has to be standard in all dimensions, weight, shape and material. Same applies to valve train. Cylinder head machining is allowed for straightening purposes, but combustion chamber capacity has to be at least 28 cm<sup>3</sup>. Valve seats can be machined, but original 45-degree angle has to be kept.

Valve seat inner diameter has to be: intake 34 mm and exhaust 28 mm.

Valves have to be original or identical to original parts.

Original part numbers:

- \* Intake valve with mechanical lifter 026109601 D
- \* Intake valve with hydraulic lifter 026109601 C
- \* Exhaust valve with mechanical lifter 026109611 F
- \* Exhaust valve with hydraulic lifter 026109611 B

Changing valve surface and form is allowed, given that valve stems keep the original diameter. The maximum allowed diameter of intake valve is 40,1 mm and exhaust 33,3 mm.

#### 7.21. Camshaft

Camshaft shape has to be completely standard, manufactured by VW/Audi.

Machining of camshaft is forbidden. Surface hardening and glass ball blasting is allowed, other types of blasting and polishing is forbidden. Camshaft characteristics are:

Lobe separation at maximum lift: 110+/- 1 degrees.

Maximum lift: intake 10,35 mm and exhaust 10,8 mm

Normal VW manufacturing tolerances are allowed.

Camshaft part numbers:

- \* With mechanical lifters 049109101 N
- \* With hydraulic lifters 026109101 G

Also camshafts produced by ENEM and marked as Z15 are allowed.

- Duration 296 degrees
- Maximum lift 12 mm

If using ENEM Z15 camshaft, material can be cut from the edges of lifter bores, so the camshaft can rotate freely.

#### 7.22. Crankshaft

Crankshaft has to be standard and it can be balanced. Surface hardening, grinding and glass ball blasting is allowed. The minimum weight of crankshaft is 12,95 kg.

#### 7.23. Pistons

Pistons have to be VW/Audi originals, meant for this specific engine. Pistons can only be machined for balancing; piston crowns cannot be changed in any way. Aftermarket pistons are allowed, if their shape, weight, dimensions and material are the same as the originals. Piston rings have to be similar to original VW/Audi rings by their dimensions and material.

#### 7.24. Connecting Rods

Connecting rods have to be standard. Balancing is allowed in balancing hoops.

Surface hardening is allowed. Polishing and sandblasting is forbidden. The minimum weight of connecting rods is 0,630 kg.

#### 7.25. Flywheel and clutch

Flywheel and clutch are free.

### 8. Piping and Fuel tanks

#### 8.1. Fuel tanks

8.1.1. Maximum capacity of fuel tank may not exceed 50 liters.

8.1.2. Fuel tank cannot be more than 550mm from the longitudinal axis of the car. Fuel tank must be isolated from the cockpit and engine and protected from side impacts.

8.1.3. Fuel tank filling holes cannot be outside bodywork.

#### 8.2. Fittings and piping

8.2.1. No lines containing fuel, cooling water or lubricating oil may pass through the cockpit.

8.2.2. All lines must be fitted in such a way that any leakage cannot result in the accumulation of fluid in the cockpit.

8.2.3. All flexible fuel and oil lines must have an outer braid, which is resistant to abrasion and flame. It is strongly recommended, that lines with threaded connectors and outer braid should be used.

### 9. Exhaust system

9.1. The outlet orifices of the exhaust pipes must be directed to the rear and must be less than 600mm from the ground. Variable length exhaust systems are forbidden.

9.2. Noise level limit is set up to 105 dB +3% measurement device accuracy at 3500 rpm using required measurement method should not be exceeded. Event organizer or particular racetrack defined limits can differ from stated limits within technical regulations.

### 10. Oil system

#### 10.1. Location of Oil tanks.

All parts containing lubricating oil must be situated between the front wheels

axis and the rearmost gearbox casing longitudinally, and cannot be located more than 550 mm from longitudinal axis.

#### 10.2. Catch tank

When a car's lubrication system includes an open type sump breather, this breather must vent into a catch tank of at least 2-liter capacity.

#### 10.3. Oil replenishment

No oil replenishment is allowed during a race.

### 11. Starting

#### 11.1. Starter

A starter must be fitted with electrical or other source of energy carried aboard the car, and able to be controlled by the driver when seated normally.

#### 11.2. Starting the engine

A supplementary device temporarily connected to the car may be used to start the engine both on the grid and in the pits.

### 12. Transmission to wheels

#### 12.1. Four-wheel drive is forbidden.

#### 12.2. Gearbox

All cars must have no more than five forward gears. All cars must have a reverse gear, which, at any time during the event, can be selected while the engine is running and used by the driver when seated normally.

#### 12.3. Sequential gearboxes are forbidden.

#### 12.4. The use of traction and launch controls is forbidden.

### 13. Suspension and Steering

#### 13.1. Active suspension is forbidden.

#### 13.2. Chromium plating of any steel suspension components is forbidden.

#### 13.3. All suspension members must be made from a homogeneous metallic material.

#### 13.4. Cars must be fitted with sprung suspension.

#### 13.5. The steering must consist of a mechanical link between the driver and the wheels.

### 14. Brakes

#### 14.1. Separate circuits

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

#### 14.2. Brake discs

Brake discs must be made from ferrous material.

#### 14.3. Air ducts for brake cooling are allowed.

### 15. Wheels and Tires

#### 15.1. Dimensions

Maximum complete wheel width: 11.5 inches. Compulsory wheel diameter: 13.0 inches. These measurements will be taken horizontally at axle height.

#### 15.2. The number of wheels is fixed at four.

#### 15.3. Wheel attachment

A safety spring must be in place on the wheel nut throughout the event. It is recommended, that these springs be painted in red or orange.

## **16. Cockpit**

The opening of the cockpit must at least 600 mm in length. The opening has to be at least 450 mm wide for at least 300 mm, starting from the back of driver's seat.

The cockpit must be so conceived that the maximum time necessary for the driver to get out from his normal driving position does not exceed 5 seconds with all driving equipment being worn and starting with the safety belts fastened.

## **17. Safety Equipment**

### **17.1. Fire Extinguishers**

All cars must be fitted with a fire extinguishing system, which must comply with current FIA F3 regulations and must discharge into the cockpit and into the engine compartments.

17.1.1. Any extinguishant, which has been specifically approved by the FIA, is permitted. The quantity of extinguishant may vary according to the type of extinguishant used. A list is available from the FIA.

17.1.2. Each pressure vessel must be equipped with a means of checking its pressure, which may vary according to the type of extinguishant used.

A list is available from the FIA.

17.1.3. The following information must be visible on each container with extinguishant:

- Type of extinguishant
- Weight or volume of the extinguishant
- Date the container must be checked which must be no more than two years after the date of filling.

17.1.4. Any triggering system having its own source of energy is permitted, provided it is possible to operate all extinguishers should the main electrical circuits of the car fail. There must be an exterior trigger, which must be situated at the base of rollover structure and can be combined with circuit breaker switch. It must be marked with a letter "E" in red inside a white circle of at least 100mm diameter, with a red edge.

17.1.5. All pressure vessels must be situated inside the Main structure.

17.1.6. The system must work in any position, even when the car is inverted.

### **17.2. Master switch**

17.2.1. The driver, when seated normally with safety belt fastened and steering wheel in place, must be able to cut off all electrical circuits to the ignition, all fuel pumps and the rear light by means of a spark proof circuit breaker switch. This switch must be located on the dashboard and must be clearly marked by a symbol showing a red spark in a white edged blue triangle.

17.2.2. There must also be an exterior switch. This switch must be situated at the base of the main rollover structure on the right-hand side. Both switches must be able to cut off all electrical circuits, not depending on the others position.



## **18. Rear view mirrors**

All cars must have at least two mirrors mounted so that the driver has visibility to the rear and both sides of the car and they must have at least 5500 mm<sup>2</sup> of reflective surface.

## **19. Safety belts**

The wearing of two shoulder straps, one abdominal strap and two straps between the legs is mandatory. These straps must be securely fixed to the car and must comply with existing FIA standard.

## **20. Rear light**

All cars must have a red light, in working order throughout the event, which:

- Is at least 21W or LED type lamp – at least 90% of LED diodes must be in working order.
- Faces rearwards at 90° to the car centerline.
- Is clearly visible from the rear.
- Is not mounted more than 100mm from the car centerline.
- Can be switched on by the driver when seated normally in the car.

## **21. Headrest**

All cars must be equipped with headrests, which have no sharp edges or corners.

They must be so positioned as to be the first point of contact for the driver's helmet in the event of an impact projecting his head backwards or sideways when he/she is seated normally.

## **22. Safety structures**

### **22.1. Roll structures**

22.1.1. All cars must be fitted with at least two roll structures.

First Roll structure must be in front of steering wheel, not more than 250 mm from the center of the steering wheel and it must be higher than the top of the steering wheel rim.

Second roll structure must be situated at least 50 cm behind the first roll structure. Minimum height of the second roll structure is 95 cm from the floor of the car. The second roll structure must be at least 5 cm higher than the drivers helmet and the two roll structures must be of sufficient height, to ensure the drivers helmet is below a straight line, drawn between their highest points.

There are two options for the rear roll structure design.

The roll structure must be manufactured from 35mm $\times$  chromium molybdenum tube, with wall thickness of at least 2 mm. It must have at least one longitudinal strap of same material or two straps from 25mm tube, with also 2mm wall thickness. The angle of the straps must be 60 degrees or less from horizontal.

Roll structures with free design are allowed. These roll structures must comply with FIA F3 regulations from the year of the cars manufacturing.

### **22.2. Front protection**

22.2.1. Cars with tubular frame must have a design strong enough to protect driver's legs.

22.2.2. Cars with monocoque chassis must have metal or carbon composite

wall in front of driver's legs. Only small holes, for cars communications, are permitted in these walls.

22.3. The driver's feet in resting position must be behind front axle line.

### **23. Fuel**

The fuel must be commercial petrol, which is available from retail shops, max octane rating according to E98 fuel.