

## Technical regulations 2015 BMW 325 CUP

### 1. GENERAL

#### 1.1 Race car

Only series production cars manufactured by BMW AG with model code E36 325i with either saloon or coupe bodywork are eligible to participate. There are allowed to use only original or similar parts, unless these regulations state differently.

#### 1.2 Changes

All changes are forbidden, unless allowed by these regulations. It is forbidden to machine or change the original parts in any way. Reducing weight by drilling, removing material or replacing with lighter materials is forbidden. Making changes to construction or working principal of components is forbidden, unless allowed by these regulations.

1.2.1 Parts that may be removed from the race car are listed in 3.1.12.

#### 1.3 Original part

Original parts are considered hereafter parts meant for BMW E36 325i car by the manufacturer with the part number and markings of the original part.

#### 1.4 Similar part

Similar part must resemble original part in terms of function, material and dimensions, except for manufacturers part number.

#### 1.5 "Free" part

"Free" means that the original part, as well as its function (-s), may be removed or replaced with a new part, on condition that the new part has no additional function relative to the original part.

#### 1.6 Fuel

Fuel in use must be unleaded (up to 0,013 g/L) and comply with FIA International sporting code Appendix J article 252 section 9.1. It is allowed to use only unleaded gasoline with octane rating RON95 and RON98 that is available through retail chains. Racing fuels are forbidden. Adding fuel additives is forbidden.

#### 1.7 Minimum weight

Minimum weight of the car (including the driver and his driving gear) under *parc fermé* rules, is 1280 kg. It is allowed to use weight ballast, according to Super 2000 rules, FIA International sporting code Appendix J article 263.

##### 1.7.1 Minimum weight in long 45min race

If two drivers take part in the long race in one car, the minimum weight is calculated with average weights of two drivers (1280 kg).

## **1.8 Safety**

Safety and construction must comply with the FIA International sporting code Appendix J unless the regulations state differently.

## **1.9 Rules interpretations**

In case of the problems with the rules interpretations there will be a authorized personnel to solve legality issues.

## **2. SAFETY REGULATIONS**

### **2.1 Safety cage**

2.1.1 All materials, installations and necessary documents according to FIA International sporting code Appendix J article 253.8. Mentioned documents hereafter are according to FIA document released 12.09.2014.

2.1.2 Basic structure: according FIA Appendix J article 253 section 8.3.1 (drawings 253-1, 253-2, 253-3).

2.1.3 Diagonal members: at least 2 diagonal members are mandatory (either 253-4 and 253-5 together or 253-7). Installation according to section 8.3.2.1.1.

2.1.4 Doorbars: "X"-shape on both sides (drawing 253-9). Installation according to section 8.3.2.1.2.

2.1.5 Roof reinforcement: according to section 8.3.2.1.3 (drawings 253-12; 253-13 or 253-14). In the case of drawing 253-12, only one diagonal member may be fitted but its front connection must be on the driver's side.

The ends of the reinforcements must be less than 100 mm from the junction between rollbars and members.

2.1.6 It is allowed to connect parts of the safety cage inside the cockpit to the body structures.

2.1.7 Extensions connecting safety cage and front suspension top mounting points (drawing 253-25) are allowed. Roll cage may be connected to the rear shock absorber structures and rear subframe fixing points.

### **2.2 Safety harness**

2.2.1 Safety harness must be according to FIA International sporting code Appendix J article 253.6.

2.2.2 Shoulder straps should be fixed separately to car body or to safety cage.

2.2.3 Safety harness cannot be worn and must have valid homologation.

2.2.4 In case of a collision it's mandatory to present the safety harness to the technical stewards for their evaluation which can forbid further use of the particular harness.

### **2.3 Fire extinguishing system**

2.3.1 Fire extinguishing system is mandatory. The extinguishing system must be according to FIA VM Appendix J Art. 253-7.

2.3.2 The pressure gauge of the system must show green and the tank must have valid certificate from the manufacturer and cannot be older than 5 years.

2.3.3 In case of the use of the electrical extinguishing system, it must have separate battery, that can be tested.

## **2.4 Drivers safety equipment**

2.4.1. Helmet must be approved by FIA standard. Use of the HANS device is mandatory.

2.4.2 Suits and underwear must be homologated according FIA standard No 8856-2000 and have corresponding markings.

2.4.3 Drivers seat must be FIA homologated and must be fixed to body through 4 points (2 in front and 2 in back), bolts M8 with minimum strength class of 8,8. Attachments according to FIA International sporting code Appendix J article 253.16. The seat cannot be fitted directly to the floor, but must be fitted on two tubes that connect to gearbox tunnel and door threshold. Minimum measurements of the tubes are 25x25x2, in case of round tube 38x2. The tubes both ends must be strengthened with metal plates, that can be welded to the body sheetmetal, given that the weld goes continuously around the metal plates.

2.4.4 Seats with FIA homologation 8855-1999 can be used 2 years after expiration of original validation date, without any additional checks.

## **2.5 General circuit breaker**

General circuit breaker switch is mandatory and must be set up so, that driver can switch it off when in driving position and it can also be switched off from outside of the vehicle. As for the outside, the triggering system of the circuit breaker must compulsorily be situated at the lower part of the windscreen mountings. It must be marked with a red spark on a white-edged blue triangle with a base of at least 12 cm.. The general circuit breaker must cut all electrical circuits (battery, alternator or dynamo, lights, hooters, ignition, electrical controls, etc.) and must also stop the engine. General circuit breaker must comply with to FIA Appendix J Art. 253-13.

## **2.6 Towingeye**

Towingeye must be both in front and rear. They cannot extend out from the perimeter of the car, when viewed from above and they must be painted bright yellow, orange or red. Towing eyes must be easy to find. It is recommended to have a bright colored arrow, pointing towards them. Towingeye or a loop must have a diameter from 60 to100 mm.

## **2.7 Windows**

Cars that have worn windshield and/or cracked to the extent where the visibility is limited, can be removed from the race. Stickers, dark shades or paint are allowed 25 cm from the top of the windshield upper edge. It is recommended to cover side windows with transparent safety film.

## **3. CAR**

### **3.1 Body**

3.1.1 Strengthening the body by adding material is forbidden, except in cases allowed by these regulations. If body shell repairs have been carried out, the resulting structure strength and appearance must be similar to the original body. Spot welds can be strengthened with the continuous welding. Subframes, suspension top fixing points and jacking points may be

strengthened locally. Their position must stay original.

3.1.2 Hood and trunk lid locks must be removed and replaced with quick release locks that can be opened from outside.

3.1.3 Heating system may be removed, though it is recommended to keep it. Visibility through windshield must be guaranteed at all times.

3.1.4 Mirrors are free. It is mandatory to have two external rear-view mirrors (one on the right and one on the left) and one inside rear-view mirror.

3.1.5 There must be a guard plate or structure to protect engine oil sump. The guard plate material is free. It can extend maximum 100 mm rearwards from the engine oil sump. Original X-brace part number 51718410212 is allowed.

3.1.6 Body moldings maybe removed, their fixing holes must be covered.

3.1.7 Cars appearance must be correct, without damage and rust.

3.1.8 Machining of the inner side of the fenders/wheel arches is allowed only for the wheel clearance, material removal is forbidden. Machining can not change the outer shape/appearance of the fenders/wheel arches.

3.1.9 Plastic or fiberglass part of bumper must resemble original or M Pack bumper. Lower lip spoiler, similar to M Pack is allowed, it must be fixed in its original place.

3.1.10 Strut bars are allowed.

3.1.11 It is allowed to add air scoop on the roof and in this case to make the cockpit air exhaust holes in the rear of the car.

3.1.12 Following parts can be removed from the car:

- sound and heat insulation materials
- headlight washers
- license plate lights
- windshield washer tank with all the tubing
- spare wheel mounting fittings
- interior body moldings and their fittings
- splashguards from the wheelwells
- door, hood and trunk lid rubber moldings
- purge canister
- all plastic parts and fittings in the engine compartment

## **3.2 Aerodynamics**

3.2.1 Front splitter/spoiler is allowed, as described in 3.1.9. Front spoiler can rest on the forward edge of guard plate.

3.2.2 Underbody aerodynamical elements are forbidden.

3.2.3 Spoilers can not touch the ground while both tires on one side of the car are flattened.

3.2.4 Rear wing is allowed. It is allowed to use a single continuous element with a maximum cord length of 250 mm. Rear wing mounts can not have any positive aerodynamical downforce effect. Maximum allowed width of the rear wing with the end plates is 1500 mm. Rear wing end plates must be planar with the maximum horizontal length 260 mm and vertical length 150mm. Rear wing must fit into cars projection from above. Rear wing, its fasteners and endplates can not be higher than highest part of the car. Gurney flap is allowed its maximum height is 10 mm.

### **3.3 Lights**

3.3.1. Lights must be in working condition including indicators. It is mandatory to use original or similar lights both in the front and rear of the car. It's recommended to cover lights with the safety film.

3.3.2. Rear foglights are mandatory and must be used during rain. They must have 21 W bulb in them or LED element with similar brightness. Additional rear foglights are allowed. Front fog lights are free.

3.3.3 Additional brake light is mandatory and must be installed in such a way, that it can be seen if viewed 10 meters from behind at the height of 1 meter. It can be installed inside the trunk lid, in which case cutting appropriate holes is allowed. It can also be installed inside the cockpit to the rear window. The additional brake light must have 15 W bulb or LED element with similar brightness.

### **3.4 Engine**

3.4.1 It is allowed to use only six cylinder cast iron block BMW 325i engines M50B25 and M50B25TU. In any instance there is not allowed to interchange parts between engines M50B25 and M50B25TU and vice versa.

3.4.2 Cylinder bore is 84 and stroke 75 mm. Cylinders can be bored to max 84,5mm but compression ratio cannot exceed 10,6:1. It is allowed to weight balance pistons and connecting rods, given that one piston and one connecting rod has not been machined. The combined length of engine block, cylinder head gasket and cylinder head cannot be less than 411,4 mm.

3.4.3 Air filter element is free and the original airbox can be removed. Intake system must be original starting from MAF sensor to cylinder head. It's allowed to use a tube to direct air to air filter through one of the front pumper original design fog light holes. That tube cannot rise higher than front lower frame element upper surface. Additional screens can be built around the outlet of that tube. Inlet air temperature sensor is free.

3.4.4 Vanos locking is allowed, but the camshafts and their timing must remain original. It is not allowed to use M50B25TU cylinder head with 6 mm valve stems with non Vanos camshaft. Camshafts must have BMW logo and part number on them. Vanos can be removed.

3.4.5 Intake and exhaust runners machining is allowed only 20 mm from the valve seats measured from combustion chamber side. It is allowed to use shims under valve springs, to adjust spring preload. Valve seat and valve contact area machining is allowed.

3.4.6. Oil pan can have additional baffles. Additional oil cooler is allowed, as long as it is not placed lower than cooling radiator and is attached to the body with rubber bushings. It is allowed to use M3 oil pickup tube and filter housing.

3.4.7 Engine mounting rubber bushings are free and can be removed, yet the aluminum engine fittings are mandatory and engine position must remain original.

3.4.8 Cooling ventilators and their management is free. Cooling screens can be used, if this does not strengthen the body. Cooling radiator is free.

3.4.9 Crankcase ventilation can be directed to additional catch tank that has at least 1L capacity and additional breather output.

3.4.10 Throttle body may be excluded from the cooling system.

3.4.11 All repair work carried out within the engine must comply with manufacturers specifications and procedures unless stated otherwise by these regulations.

3.4.12 Two fasteners of the camshaft cover should be pierced to allow the engine to be sealed by the scrutineers.

### **3.5 Fuel system**

3.5.1 It is allowed to use two fuel pumps. It is also allowed to use additional 2 liter collection tank with additional fuel pump, given that it is properly connected and positioned inside the original spare wheel compartment. All the fuel pumps must only operate when the engine is running, except during the starting process.

3.5.2 Fuel pressure before the fuel regulator cannot exceed 3,5 bar +/-0,2 bar measured with vacuum house disconnected.

3.5.3 Fuel lines can run inside the cockpit if they pass through the sheet metal according to FIA Appendix J Article 253 drawings 253-59 and 253-60

3.5.4 Fuel tank may be filled with safety foam.

### **3.6 Exhaust**

3.6.1 Exhaust system is free from the end of the original exhaust manifold. The noise level may not exceed 110 dBA, measured according to FIA regulations. Sensor is in position A/Slow, microphone is at 45 degrees 50 cm from the tip of the exhaust and engine is running at 4500 rpm. Exhaust pipe end cannot go beyond cars projections and must be located in the original position.

3.6.2 Catalytic converter is free and not mandatory.

### **3.7 Electronics and electrical**

3.7.1 Chiptuning is forbidden. It is allowed to use only Bosch ECM. All ECM-s must pass inspection and must be sealed by Särg AA OÜ or Special Tuning Harinen OY before car is allowed to race.

3.7.2 Original diagnostics connector must be operational and in its original position.

3.7.3 Engine rev limiter must not be higher than 6500 rpm.

3.7.4 Dataloggers are allowed. Additional sensors for data logging purposes are allowed.

3.7.5 Spark plugs are free. Ignition coils must be original or similar.

3.7.6 Battery is free, it must be located in one of its original places, firmly fixed. Battery positive connector must be covered.

3.7.7 Wiring harness except engine wiring may be modified. Engine wiring can be modified only to add additional wires between original sensors and data logger, only parallel wiring is allowed. Wiring harness must be installed correctly to avoid short circuits. Electrical wiring must be fixed and covered. It is allowed to replace original ignition switch with toggle switch and start push-button.

### **3.8 Interior**

3.8.1 It is allowed to cut the dashboard to fit safety structures. Additional gauges are allowed and lower part of the dash can be removed.

3.8.2 Drivers seat must be positioned left from the cars center line.

3.8.3 Battery must be isolated from the cockpit, so that no liquid can drain from there after a collision.

3.8.4 These items must be removed from the cockpit: seats, original seatbelts, safety airbags,

floor mat, roof upholstery, sound isolation, all upholstery, sunvisors and all unnecessary equipment for racing, such as sound system etc. Dashboard, gauges, light and wiper switches must remain.

3.8.5 Driver's door inside must be covered with upholstery of non flammable material, with minimum thickness of 1mm.

3.8.6 Firewall that divides the cockpit from engine bay must be in their original place and fire and liquid proof.

### **3.9 Steering mechanism**

3.9.1 Steering lock must be removed. Steering wheel is free, quick release fixings are allowed, if they are meant for racing.

3.9.2 Steering column position can be changed both height and lengthwise. Steering column must be firmly fixed and cannot be adjustable, except original adjustable steering column.

3.9.3 Power steering and its components can be removed. Steering rack must be original or from BMW Z3, part No.: 32131095575.

3.9.4 Power steering pump pulley is free. Steering fluid additional cooling is allowed.

3.9.5 Rubber bushing in the steering column (OEM part number 32311115092) may be replaced with U Joint (OEM part number 32311150489)

### **3.10 Suspension**

3.10.1 Suspension must be either KW Variant 3 (marking should include: front helper springs 20-60-80, front springs 70-170, rear springs 2003) or Bigem (Extreme Race).

3.10.1.1. Using KW Variant 3 suspension maximum diameters for the roll-bars are: 25,5 mm front, 19 mm rear.

3.10.1.2. Using Bigem (Extreme Race) suspension, diameter for the front anti-roll bar is 24 mm, rear anti-roll bar is forbidden.

3.10.1.3. Suspension type in use will be checked in the scrutineering it can not be changed during the competition.

3.10.2 Suspension bushings are free, but rod ends, spherical bearings and other metal to metal bushings are forbidden, except front strut upper bushings where spherical bearings are allowed.

3.10.3 Strengthening front and rear wishbones is allowed. Rear lower lateral link outer bushing may be replaced with rear upper lateral link outer joint. Front wishbone outer joint may be replaced with „stiff“ B spare part joint.

3.10.4 Front anti-roll bar connection link to the front suspension may be moved from wishbone to the shock absorber.

3.10.5 Camber plates on top of the front struts are allowed. Front camber may also be adjusted adding washers between the front shock absorber and knuckle. Rear upper lateral link outer bolt hole may be widened to achieve allowed maximum negative camber. Rear trailing arm fixing bracket 3 holes may be widened to achieve proper wheel alignment.

3.10.6 Maximum negative camber: front 7 degrees, rear 4 degrees

3.10.7 Rear subframe bushings are free.

3.10.8 Maximum wheelbase 2710 mm.

### **3.11 Drivetrain**

3.11.1 Differential lock is allowed at 25 % slip, as factory original setting. It is checked by raising one rear wheel up and turning it with maximum 75 Nm torque, by which point it should rotate. Maximum allowed final drive ratio 3,73. Rear differential casing may be ventilated, oil cooling is free, bushings are free.

3.11.2 Only BMW E36 325i original ZF manual, automatic or Getrag 5 speed H-type manual gearboxes with synchronizers are allowed. Gearlever and its linkage is free, gearbox bushings are free.

3.11.3 Clutch disk is free, but multiple discs are forbidden. Clutch main assembly must resemble the one used for BMW E36. Flywheel is free, its minimum weight is 5800 g tolerance +/- 1 % including ring gear and fixing bolts.

### **3.12 Brakes**

3.12.1 Brake discs machining is allowed, grooves are forbidden, crossdrilling is forbidden.

3.12.2 Brake fluid is free. Brake pads are EBC.

3.12.3 Handbrake is free, removal is allowed.

3.12.4 Brake booster and ABS can be removed.

3.12.5 Pedal covers are free. Pedal covers cannot extend towards driver more than 20 mm from the original pedal pad.

3.12.6 Brake pipes and hoses can be changed for braided steel hoses, that can take up to 70 bar pressure and 232 °C temperature and have threaded fittings. Brake lines can be positioned inside the cockpit if they pass through a sheetmetal according to FIA Appendix J Article 253 drawings 253-59 and 253-60.

3.12.7 Brake cooling pipes are allowed, dustcovers are free.

3.12.8 Brake caliper slider bushings can be replaced with metal ones.

3.12.9 It is allowed to add brake proportioning valve (P Valve) it should be located inside the cockpit.

### **3.13 Tyres and wheels**

3.13.1 Rims and wheel bolts are free. Rim diameter 15 inches maximum width 8 inches, minimum weight 6kg.

3.13.2 Tyres are 200/590R15 Yokohama Advan A048.

3.13.3 It's allowed to use 6 new tyres for first race weekend and 4 new and 2 used tyres from following race weekends. All the tires will be evaluated and marked by the scrutineering. Tyre marking is entirely competitors responsibility.

3.13.4 Wheels cannot protrude outside the wheelarches, nor touch them. A car must fit through the gate that is 1750 mm wide and 500 mm high so that there's enough room for the paper to move freely through the part of the car and the measuring device. Rear axle must fit through the gate that is 1735 mm wide.

3.13.5 Spare wheel carrying under *parc fermé* rules is prohibited.

### **3.14 Competitor number and advertising on the car**

3.14.1 Competitor numbers must be on both front doors, in black standard arabic numbers on



white rectangle box. Additional white number must be placed on windshield without background on passenger side upper corner, under the advertising space.

Number background: white rectangle min. 50 cm width and 38 cm height (with additional letter double number rectangle min. 55 cm width)

Number: min height 28 cm and 5 cm wide black line

Additional letter: min height 15 cm and 2 cm wide black line

Windshield number: min height 13 cm and 2 cm wide white line

3.14.2 There must be 15 cm height of space for organizers advertisement above the rear license plate location.

3.14.3 There has to be a competitor name and home country flag on both rear side window.

3.14.4 Any part of the numbers or advertising can not be away from the cars body.

Advertising on the car must not come in conflict with esthetics and legislation.

### **3.15 Changes and scrutineering**

3.15.1 If there is a need to change structures or make changes to the car to secure safety and these changes come in conflict with regulations, then they must be made with written approval of technical committee, where changes are described. This could be done only if safety is not decreased.

3.15.2 All costs that might come to the competitor in proving the cars accordance to the regulations, will be solely covered by the competitor. Fuel testing is made only by the initiative of the scrutineering.

3.15.3 Serious violations of current regulations during the season may come to complete disqualification from all points for this season. Serious violations are: engine, fuel, electronics and ignition system regulations violations.