BMW Masters series technical regulations 2020

1. GENERAL

1.1 Race car

Only series production cars manufactured by BMW AG with model code E36 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 (homologation A/N-5440 and A/N-5454).

1.2 Changes

1.2.1 All changes are forbidden, unless allowed by these regulations. It is forbidden to machine or change the original parts in any way. Therefore, 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.

1.2.2 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 FFF (form, fit and function), material and dimensions, except for manufacturer's part number.

1.5 Definition of "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 distributors. Racing fuels are forbidden. Adding fuel additives is forbidden.

1.7 Minimum weight

1.7.1 Minimum weight of the car (including the driver and his driving gear) under parc fermé rules is 1280 kg.

1.7.2 It is permitted to complete the weight of the car by adding a single unit of ballast that may be made from stacked metallic plates. The plates must be fixed by means of tools and must be placed visibly on the floor of the cockpit in the front passenger's location. The ballast must be attached to the bodyshell/chassis by bolts of at least two 8.8-class with a minimum diameter of 8 mm, with counter plates. The minimum area of contact between bodyshell /chassis and counter plate is 40 cm2 for each fixing point. Any movable ballast system is forbidden.

1.7.3 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.

2. SAFETY REGULATIONS

2.1 Safety cage

2.1.1 Safety cages of cars with Technical Passports (class BMW325Cup/BMW Xtreme) issued before 01.05.2018 by ASN are allowed.

2.1.2 Safety cages of cars with Technical Passports issued after 01.05.2018 by ASN, 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 applicable from 01.01.2018..

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

2.1.4 Doorbars: Only the images 253-9, 253-10 or 253-11 doorbars are allowed. Installation according to section 8.3.2.1.2.

2.1.5 Windscreen wiper motor can be relocated only as much as necessary for mounting of front suspension mounting points of safety cage (drawing 253-25).

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 shall have separate mounting points 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 comply with FIA standard. Use of the HANS/FHR device which comply with FIA standard is mandatory.

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

2.4.3 The seat must be fitted on two cross members that connect to gearbox tunnel and bodyshell lower rails. Minimum measurements of the cross members are in case of square tube 25x25x2mm, in case of circular tube 38x2mm. Cars with Technical Passports issued by ASN from 01.05.2018 onwards, seats must be fixed to body according to FIA International sporting code Appendix J article 253.16 (FIA document 01.01.2018).

2.4.4 Drivers seat must be FIA homologated and in compliance with 8855-1999 FIA standard or 8862-2009 FIA standard. The limit for use is 10 years from the year of manufacture.

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 Towing eye

Towing eye must be both in front and rear of the car. 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. Towing eye or a loop must have a diameter from 60 to100 mm.

2.7 Windows

2.7.1 Cars that have worn and/or cracked windshield 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. Side windows must be covered with transparent safety film.

2.7.2 Use of nets affixed to the safety cage is mandatory. These nets must have the following characteristics:

- Minimum width of the strips: 19 mm
- Minimum size of the meshes: 25 x 25 mm
- Maximum size of the meshes: 60 x 60 mm

Net must close up the window opening to the center of the steering wheel.

2.7.3 Lift mechanism for the windows may be replaced with a device that locks windows in the closed position.

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 or stitch 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 It is mandatory to have external rear-view mirrors, one in each side of the car. These shall be original mirrors or aftermarket units with minimum of the original mirror reflection area. Additionally, one rear view mirror in cockpit is mandatory.

3.1.5 There must be a sump guard or structure to protect engine oil sump. The sump guard plate 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 can be 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.

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 wheel wells

- 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 front edge of guard plate.

3.2.2 Underbody aerodynamical elements are forbidden.

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

3.2.4 The use of rear wing is not obligatory. However, if the wing be used, it should be according to the following rules.

3.2.4.1 Only one rear wing with single element is allowed.

3.2.4.2 In any case, it may not exceed the outline of the car body.

3.2.4.3 The rear wing is not higher than 25 cm measured from the center of trunk lid end.

3.2.4.4 The rear wing maximum overall width of 1350 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 fog light is mandatory and must be used during rain. They must have 21 W bulb in them or LED element with similar brightness. Additional rear fog lights 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. All the components used in the engine must belong to the engine type in question.

3.4.2 Cylinder bore is 84 and stroke 75 mm. Cylinders can be bored to max 84,5mm. 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 (height) of engine block, cylinder head gasket and cylinder head cannot be less than 411,4 mm. Measure from head cylinder upper surface to piston, when is in TDC, must be no less than 144,4 mm in M50B25 engine and 141,0mm in M50B25TU engine.

3.4.3 Air filter element is free and the original air box 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 the air filter through one of the front pumper original design fog light holes or the bumper can add round hole maximum diameter 100 mm. Inlet air temperature sensor is free. Any cooling of the combustion air is prohibited.

3.4.4 If the VANOS system is disabled, sprocket must be locked mechanically and all parts of the VANOS to be removed. (M50B25TU). Cylinder head cover (Part number 11 12 1 738 171) must be original. Camshafts and their timing must remain original.

3.4.5 Intake and exhaust port 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. Engine supporting brackets are free as long as they are not lighter than original brackets. 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 +/-0,1 bar measured with vacuum hose 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.

3.5.4 It is allowed to use FIA FT3, FIA FT5 and SFI standard safety fuel tanks. It must be located in rear trunk and separated from the cockpit by fireproof and liquid-proof bulkhead or case. All safety fuel tanks can be used up to 2 years after end of validity period. In any case, original fuel tank must stay attached in original location

3.6 Exhaust

3.6.1. Exhaust manifold is original

3.6.2 Exhaust system secondary pipes and end pipe shall remain original until the point where it originally enters to the first catalytic converter. If these pipes are not original (i.e aftermarket item), they still must match with all original measures.

From that original catalyst converter inlet point downstream, it is allowed to change the rest of the exhaust system to be 2.5" maximum external diameter.

3.6.3 Silencers/mufflers are the only additional elements allowed to exhaust system (compared to original system)

3.6.4. Catalytic converter is free and not mandatory.

3.6.5 The exhaust exit must be inside the car's perimeter and it must be located in original position

3.6.6 Wrapping of the exhaust system is allowed.

3.6.7 Noise level must comply with requirements according to supplementary regulation of the event.

3.7 Electronics and electrical

3.7.1 Chiptuning is forbidden. It is allowed to use only Bosch ECU. All ECM-s must pass inspection and must be sealed by BMW Masters scrutineering before car is allowed to race. All ECU's are checked and sealed by BMW Masters scrutineers. Only accepted and sealed ECU's are allowed to use in race. Scrutineering has the right to change the engine control box to one of the same type.

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

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

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

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

3.7.6 Wiring harness may be modified. 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 pushbutton.

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 car's centerline.

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, sun visors 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 Bulkhead 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.

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).

3.9.6 The original speed or high-speed steering of the original steering rack is allowed.

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 Xtreme Race Cup kit.

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

3.10.1.2. Using Bigem Xtreme Race Cup kit suspension, if front anti-roll bar is in use, diameter for the front anti-roll bar is 24 mm, rear antiroll bar is forbidden.

3.10.2 Suspension bushings are free, but spherical bearings (“uniball”) and other metal to metal bushings are forbidden, except front strut upper bushings.

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 Chassis mounting points of the rear subframe can be reinforced by connecting it to safety cage for the cars with Technical Passports issued by ASN before 01.05.2018. Cars with Technical Passports issued by ASN after 01.05.2018, chassis mounting points of the rear subframe can be reinforced by connecting it to rear suspension top fixing points.

3.10.9 Maximum wheelbase is 2710 mm.

3.10.10 Throughout the race over the weekend only one type of suspension set (shock absorbers, springs, stabilizers). Team must notify the form to be delivered to the technical inspector before qualification.

3.10.11 Bigem Xtreme Race Cup kit suspension can be serviced only by producer (www.bigem.fi).

3.11 Drivetrain

3.11.1 Differential lock is allowed only as factory original setting, including 2-way ramp angles (45 degrees) and number of discs. Discs are free. It is checked by raising one rear wheel up and turning it with maximum 75 Nm torque, by which point it should rotate. Allowed final drive ratios 3,64 and 3,73. Rear differential casing may be ventilated, oil cooling is free, bushings are free.

3.11.2 Only BMW E36 325i original ZF H-type manual, automatic or Getrag 5 speed H-type manual gearboxes with synchronizers are allowed. Gearlever and its linkage is free, gearbox bushings are free. It is allowed to reinforce gearlever fixation to body by adding material.

3.11.3 Clutch disk diameter of a minimum of 228mm, the material free, multiple discs are forbidden. Clutch main assembly must resemble the one used for BMW E36. Flywheel is free, but its minimum weight is 5800 g including ring gear and fixing bolts.

3.12 Brakes

3.12.1 Brake discs are free.

3.12.2 Brake fluid is free.

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 sheet metal according to FIA Appendix J Article 253 drawings 253-59 and 253-60.

3.12.7 Brake cooling pipes are allowed. For this purpose, the bumper can add holes. Dustcovers are free.

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

3.12.9 It is allowed to add rear brake control. The valve should be located inside the cockpit.

3.12.10 Brake pads are free.

3.13 Tires and wheels

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

3.13.1.1 Tire type is Nankang AR-1 Sportnex 205/50-15.

3.13.2 In every event, the number of tires is limited in qualification and in race. In every event, it is allowed to use 8 new tires.

3.13.3 The maximum allowed width of the front axle is to be 1745 mm and back axle 1730 mm, measured from the lowest point of the rim.

3.14 Changes scrutineering and technical inspection

3.14.1 If there is a need to change structures or make changes to the car as additional safety and these changes come in conflict with regulations, then they must have written approval (“waiver”) of technical committee. In this approval changes must be described and this approval shall be available when requested for review. This waiver could be done only if safety is not decreased.

3.14.2 All costs that might come to the competitor in proving the cars compliance with the regulations, will be solely covered by the competitor. Fuel testing is made only by the initiative of the scrutineering. Competitor cannot refuse from the technical inspection in the threat of the exclusion.

3.14.3 Serious violations of current regulations during the season may come to complete disqualification from all points for this season.

3.14.4 Organizer/scrutineering can seal any part of the car during the event. Competitor is responsible that the sealing remains in whole event or as otherwise stated by the scrutineering.