



## TECHNICAL REGULATIONS

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## 2.0 TECHNICAL REGULATIONS

Amendments to the technical regulations may be made by the MotoAmerica Permanent Bureau at any time.

**During free practices, qualifying practices, and warm-up sessions:** If a motorcycle is found not to be in conformity with the technical regulations during or after the session, its rider will be given a penalty for the event such as a ride-through, a drop of any number of grid positions for the next race, suspension and/or withdrawal of championship or cup points.

**Races:** If a motorcycle is found not to be in conformity with the technical regulations during or after a race, its rider will be given a penalty such as a time penalty or disqualification.

## 2.1 INTRODUCTION

Motorcycles for the MotoAmerica Superbike Championships must be motorcycles with a valid road homologation in one of the following areas: USA, EU or Japan.

These motorcycles must be available for sale to the public in the shops and the dealerships representing the manufacturer in at least one of the above areas before the third event of the current championship in order to be allowed to be used in the remaining championship events.

## 2.2 CLASSES

2.2.1 The production based racing classes will be designated by engine capacity and level of technical freedom.

## 2.3 GENERAL ITEMS

### 2.3.1 Main Frame

- a. The main frame is considered as any structure that joins the steering tube, engine and swing-arm pivot. If the steering tube, engine mounts or swing-arm is connected through a removable bracket (with engine removed) then those brackets will be considered as part of the main frame. If the steering tube, engine mounts and rear swing-arm pivot connect to the main frame without removable brackets, then any additional brackets will not be considered as part of the main frame. If there is any part in question the Technical Directors decision is final.
- b. If the rear section (rearward of the engine, meant for the riders seating) of a frame is not removable then there is no rear sub-frame and only a main frame. Regulations applying to the rear sub-frame will not apply to main frames.

### 2.3.2 Materials

The use of titanium in the construction of the frame, front forks, handlebars, swing arm, swing arm spindles and the wheel spindles is forbidden. For wheel spindles, the use of light weight alloys is also forbidden. The use of titanium alloy nuts and bolts is allowed **in certain classes specified in their respective sections.**

### 2.3.3 Handlebars and Control Levers

- a. Exposed handlebar ends must be plugged with a solid material or rubber covered.
- b. The minimum angle of rotation of the steering on each side of the center line or mid position must be of 15° for all motorcycles.
- c. The front wheel, tire and the mudguard must maintain a minimum gap of 10 mm from any part of the machine that can cause binding, regardless of the handlebar position.

- d. Solid stops, other than steering dampers, must be fitted to ensure a minimum clearance of 30 mm between the handlebar with levers and the tank, frame and/or other bodywork when on full lock in order to prevent trapping of the rider's fingers (see diagrams A, B, C).
- e. Repair by welding of light weight alloy handlebars is prohibited.
- f. Composite handlebars are not allowed in any class.
- g. All handlebar levers (clutch, brake, etc.) must be ball ended. The diameter of this ball is to be at least 16 mm. This ball can also be flattened in any case but the edges must be rounded. The minimum thickness of this flattened part is to be 14 mm. These ends must be permanently fixed and form an integral part of the lever.
- h. Each control lever (hand and foot levers) must be mounted on an independent pivot.
- i. The brake lever, if pivoted on the footrest axis, must work under all circumstances, such as the footrest being bent or deformed.
- j. Modified rider controls will be considered for the mobility challenged subject to a report by the Medical Director, the Technical Directors decision is final.
- k. Clutch lever may have a guard fitted equivalent to a brake lever guard.

#### **2.3.4 Compulsory Safety Items**

- a. All drain plugs must be lock wired (safety wired). The use of clips is not permitted. External oil filter(s), screws and bolts that enter an oil cavity must be safety wired (i.e. on crankcases) or have a secondary retention mechanism.
- b. Brake caliper bolts must be safety wired or have a secondary retention method. The use of clips is permitted.
- c. Motorcycles must be equipped with brake lever protection, intended to protect the handlebar brake lever from being accidentally activated in case of collision with another motorcycle.
  - i. Composite brake lever guards are not permitted, however, FIM approved guards will be permitted without regard to the material. Only composite guards need FIM approval.
  - ii. The Technical Director has the right to refuse any guard not satisfying this safety purpose.
- d. A solid protective cover (shark fin) shall be securely fixed (bolted or riveted, bonding permitted with the approval of the Technical Director) to the swing-arm and must always cover the opening between the lower chain run, swingarm and the rear wheel sprocket, irrespective of the position of the rear wheel.
- e. All fasteners must meet factory torque specification. If any fasteners (i.e. axles, pinch bolts, brake calipers, etc.) are found to be loose while on the race course the competitor will be subject to penalties.
- f. Where breather or overflow pipes are fitted they must discharge via existing outlets. The original closed system must be retained; no direct atmospheric emission is permitted.
- g. Motorcycles must be equipped with a red light on the instrument panel that will illuminate in the event of oil pressure drop.

#### **2.3.5 Wheels and rims**

- a. Any modification to the rim or spokes of an integral wheel (cast, molded, riveted) as supplied by the manufacturer or of a traditional detachable rim other than for spokes, air valve or security bolts is prohibited.
- b. Tire retention screws may be used to prevent tire movement relative to the rim. If the rim is modified for these purposes, bolts and/or screws must be fitted.
- c. The distance between the rim walls is measured inside the flange walls in accordance with ETRTO.
- d. A non-slip coating/treatment may be applied to the bead area of the rim.
- e. Wheel balance weights may be discarded, changed or added to.
- f. Aluminum or steel inflation valves are compulsory. Angled valves are recommended.

### **2.3.6 Tires**

Tires must be replaced from those fitted to the homologated motorcycle.

- a. The tread pattern must be made exclusively by the manufacturer when producing the tire.
- b. As a safe minimum, the depth of the tire tread over the whole pattern at pre-race control must be at least 2.5 mm.
- c. Tires which at the preliminary examination have a tread depth of less than 1.5 mm are considered as non-treaded tires and the restrictions applying to slick tires will then apply to them.
- d. The surface of a slick tire must contain three (3) or more hollows at 120° intervals or less, indicating the limit of wear on the center and muster areas of the tire. The rider shall not enter the track if at least two (2) of these indicator hollows are worn on different parts of the periphery.

### **2.3.7 Tire warmers**

- a. The use of tires warmers and suspension pre-heaters is allowed.

### **2.3.8 Use of tires**

- a. The competitors shall only use tires listed on the allocation sheet provided by the official supplier.
- b. For each event, all tires must be made of the same quality and shall be strictly identical.
- c. All tires to be used must be easily identifiable with a color marking or a numerical system, to be applied by the official supplier at the time of manufacturing.
- d. The official supplier shall provide the Technical Director with a written description of the markings and the general characteristics of the different types of tires.
- e. At the beginning of the event, the official supplier may be requested by the Technical Director to deliver to him four (4) samples of each type of tire to be used at the event.
- f. Any modification of the tread pattern by the official supplier is not permitted after the start of the practices.
- g. Any modification or treatment (cutting, grooving) is forbidden.
- h. Every tire used during the event must be marked with an adhesive sticker with a number allocated by the Technical Director.
- i. Tire allocation stickers must be applied on the left side of each tire by the entrant.

- j. The tire stickers will be given to the teams in a sealed envelope before the first practice after the rider's machine has passed technical pre-inspection. The rider is solely responsible for the use and safe keeping of the tire stickers.
- k. The use of motorcycles without the official stickers will be immediately reported to the Race Direction whom will take appropriate action.
- l. The allocation of individual tires will be made on a random basis, with no involvement of any representative from the tire supplier, teams or riders. Those tires will be individually identified and may not be exchanged between riders, including between teammates, and may not be exchanged by the tire supplier after the allocation, except with the permission of the Race Direction.
- m. In exceptional cases, should the sticker be damaged or applied in the wrong way, up to two (2) extra stickers may be provided at the sole discretion of the Technical Director. However, the damaged sticker must be returned to the Technical Director and/or the tire it was applied to and must be absolutely intact and unused.
- n. The Technical Director may, at his discretion, require the exchange of one (1) or more competitors' tire(s) for a tire sample under his control. The tires exchanged remain under his control and he can exchange them for the tires of another competitor.

#### 2.3.7.1 Tire allocations by class

- a. The Technical Director and/or Race Direction has the ability to modify the tire allotments based on the official schedule; this modification will be noted in the event supplementary regulations. During a normally scheduled event, the tire allotments will be as follows:

Class	Single Race Event	Two-Race Events
<b>Superbike</b>	N/A	16
<b>Supersport</b>	10	12
<b>Stock 1000</b>	8	10
<b>Twins Cup</b>	8	10
<b>Junior Cup</b>	7	8

#### 2.3.8 Ballast

- a. The use of ballast is allowed in order to comply with the minimum weight limit. The use of ballast must be declared to the Technical Director at the preliminary checks.
- b. The ballast must be made of (a) solid metallic piece(s) firmly and securely connected either through an adapter or directly to the main frame or engine with a minimum of two (2) steel bolts (min. 8 mm diameter, 8.8 grade or over). Other equivalent technical solutions must be submitted to the Technical Director for his approval.
- c. Fuel in the fuel tank can be used as ballast. Nevertheless, the verified weight may never fall below the required minimum weight.

#### 2.3.9 Timekeeping instruments

All motorcycles must have a correctly positioned timekeeping transponder.

- a. Teams must provide their own transponder. MotoAmerica will not provide transponders.

- b. The transponder must be approved by the official timekeeper. See Team Handbook for compatible models.
- c. The transponder should be fitted centrally on the machine and as low to the ground as possible avoiding being shielded by bodywork. The manufacture suggested direction of the transponder should also be respected.
- d. It is the team's responsibility to ensure that the transponder is located in an optimal position and working properly. Any machine without a working transponder is not allowed on the circuit.

Correct attachment of the transponder bracket consists of a minimum of tie-wraps but preferably consists of screws or rivets. Any transponder retaining clip must also be secured by a tie-wrap. Velcro or adhesive alone will not be accepted. The transponder must be working at all times during practices, qualifying, and races, also when the engine is switched off.

### **2.3.10 Wings and Aerodynamic Aids**

Wings and other aerodynamic aids will only be considered legal if originally fitted to the homologated road specification machine in all of Europe, Japan and North America. For race use the wings must follow the dimensions, profiles and positions of the homologated shapes exactly (+-1mm). For copies of the OEM parts the leading edges (including end plates) must have a minimum circumference of 4mm and must have a rounded end (8mm radius) or be enclosed / integrated into the fairing.

The OEM parts may be used 'as is' with the exception that the wing root and 10mm from the end face maybe be modified to allow mounting to the (race) fairing. This may not be in the form of an extension and the size of the wing will be measured with reference to the face of the wing root.

The wing must be fitted in the same 'relative' position (accepting the tolerance allowed for the fairing) and the angle of attack must be within +/-4° of the original angle of attack relative to the chassis.

For active or dynamic aerodynamic parts, ONLY the standard homologated mechanism may be used. The range of movement must be the same as that used by the homologated road machine in normal use - not the mechanical maximum.

The Technical Directors decision will be final.

### **2.3.11 Crash Protection**

Crash protection may be fitted to the frame, using existing mounting points, or pressed into the ends of the wheel axles. Wheel axles may not be modified for the fitment of crash protection. (this does not apply to SBK or Twins Cup). Crash protection (frame sliders) may not provide an aerodynamic advantage unless originally fitted to the homologated machine see art. 2.3.10.

### **2.3.12 Homologated Parts**

Homologated parts are the OEM parts supplied fitted to the machine during manufacture and as delivered. Unless stated otherwise these parts may not be remade, refinished, treated, coated or modified in any way.

Parts from different homologations may not be used on machines from another homologation including when sharing the model name but excepting when the part is superseded for production reasons and also accepted by the FIM.

See FIM homologation rules for details.

### **2.3.13 Approved Parts**

All approved parts must be approved by the Technical Director before they are allowed to be used. The approved part list can be found at:  
<http://www.motoamericaregistration.com/competitor-info/>

Provisional

## SUPERBIKE TECHNICAL REGULATIONS

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## 2.4 SUPERBIKE TECHNICAL SPECIFICATIONS

The following rules are intended to give freedom to modify or replace some parts in the interest of safety, research and development and improved competition between various motorcycle concepts.

### **EVERYTHING THAT IS NOT AUTHORIZED AND PRESCRIBED IN THIS RULEBOOK IS STRICTLY FORBIDDEN**

**If a change to a part or system is not specifically allowed in any of the following articles, then it is forbidden.**

Superbike motorcycles require an FIM homologation (see FIM homologation procedure for Superstock, Supersport and Superbike motorcycles). All machines must be normally aspirated. All motorcycles must comply in every respect with all the requirements for road racing as specified in these technical regulations, unless they are already equipped as such on the homologated model.

Once a motorcycle has obtained the homologation, it may be used for racing in the corresponding class for a maximum period of 8 years (see Homologation art 1.4.4), or until such time that the homologated motorcycle is disqualified by new rules or changes in the technical specifications of the corresponding class.

The appearance from the front, rear and the profile of Superbike motorcycles must (except when otherwise stated) conform in principle to the homologated shape (as originally produced by the manufacturer). The appearance of the exhaust system is excluded from this rule.

### 2.4.1 **Motorcycle specifications**

All parts and systems not specifically mentioned in the following articles must remain as originally produced by the manufacturer for the homologated motorcycle.

### 2.4.2 **Engine configurations and displacement capacities**

The following engine configurations comprise the Superbike class.

Over 750cc up to 1000cc	4 stroke	3- and 4-cylinder
Over 850cc up to 1200cc	4 stroke	2- cylinder

The displacement capacity bore and stroke must remain at the homologated size. Modifying the bore and stroke to reach class limits is not allowed.

### 2.4.3 **Balancing various motorcycle concepts**

In order to equalize the performance of motorcycles with different engine configurations, an air restrictor may be applied according to their respective racing performances.

This handicap is applied only to the '1200cc 2-cylinder' motorcycles.

A new 2-cylinder entry will not be included in the 'Balancing various motorcycle concepts' rules until the performance is proven during the first two years of use

in the MotoAmerica Superbike Championship. In the case that a new 2-cylinder entry wins a race in the Dry in the first year, restrictors will be applied from the start of the second year.

A new 2-cylinder entry is considered an entry by a new manufacturer to the championship, not a new model of machine from an existing manufacturer.

The air restrictor handicap will be applied according to the relevant provisions described in Art 2.4.3.3: the size of the intake ports will be changed by means of air restrictors. These changes to the size of the air restrictor diameter will be applied in 2 mm steps.

Each racing season will begin with the same balancing level as the preceding season finished.

The MotoAmerica Permanent Bureau can at any time modify the handicap system to ensure fair competition.

#### **2.4.3.1 Balancing calculation**

- a. After three events, the best manufacturers of the 1000cc 4-cylinders and 1200cc 2-cylinders will be selected according to the sum of the points of the best two riders for each manufacturer.
- b. By taking the race points of the riders of the selected 1000cc 4-cylinder manufacturer and of the selected 1200cc 2-cylinder manufacturer in each race, an average will be calculated after every event, the '*event average*'.

If in any of the races there is only one finisher from one of the selected manufacturers, the '*event average*' will be calculated from the first rider of each selected manufacturer in each race.

No '*event average*' points will be calculated if one of the selected manufacturers has no finishers. The '*event average*' will then be calculated based on the results of the other race from the same event.

If neither race has any finishers from one of the selected manufacturers, the event will not be considered.

- c. 'Wet' races (as declared by the Race Direction) are not taken in account for the calculation of an '*event average*'.

#### **2.4.3.2 Air restrictors for 1200cc 2-cylinders**

Application: Only the 1200cc 2-cylinder engines may be fitted with air restrictors. Should a restrictor be required, then the first restrictor size to be installed will be equivalent to a Ø52mm circular area. Air restrictor size will be adjusted in steps equivalent to a change of 2mm in diameter, between Ø52mm and to a minimum of Ø46mm (None <> Ø52mm <> Ø50mm <> Ø48mm <> Ø46mm), if needed during the Championship, as described below in Art. 2.4.3.4

Definition: An air restrictor is a metallic device with a tract of constant controlled section which is placed in the induction tract between the throttle body and the cylinder head. The length of the controlled tract must be at least 3 mm. No air and/or air-fuel mixture to the engine must by-pass the restrictor. No part of the fuel injection system (injector, needle, slide, etc.) shall extend through the restrictor.

The manufacturer must supply the FIM/MotoAmerica with 10 sets of plug-calibers (-gauges) to check the diameter of the air restrictor when using one of the prescribed sizes (Ø52, Ø50, Ø48, Ø46 mm).

A manufacturer may have a non-circular air restrictor, provided that the area of this restrictor is equivalent to the area of a nominal circular restrictor. In this case, the manufacturer must supply the FIM/MotoAmerica with 10 sets of plug-calibers (-gauges) for measuring the restrictor during the technical verifications.

The FIM/MotoAmerica may also request the manufacturer to supply a cut section of the air restrictor(s) in each of the prescribed sizes.

#### **2.4.3.3 Air restrictor adjustment**

The minimum air restrictor size is increased or decreased in 2 mm steps in diameter of equivalent circular area, according to the following procedure:

- a. If the gap in the average value of '*event averages*', calculated as described in article 2.4.3.1 is more than 5 points in favor of the 1000cc 4-cylinder manufacturer,

and

If a rider of a 1000cc 4-cylinder motorcycle is leading the riders' MotoAmerica Superbike Championship standings at that time, then

The initial air restrictor size of all the 1200cc 2-cylinder motorcycles will be increased by one size, or as a last step, the air restrictor will be withdrawn.

- b. If the resulting gap of the average value of 'event averages', calculated as described in article 2.4.3.1, is more than 5 points in favor of the 1200cc 2-cylinder manufacturer, and

If a rider of a 1200cc 2-cylinder motorcycle is leading the riders' MotoAmerica Superbike Championship standings at that time, then

The initial air restrictor size of the 1200cc 2-cylinder manufacturers will be reduced by one size, or as a last step, to a minimum of Ø46 mm (or the equivalent area 1661.9 mm<sup>2</sup>).

If the air restrictor size is not updated, then the results of three more events will be considered and the best manufacturers for each engine configuration will be updated considering the sum of points of the best two riders from each selected manufacturer over six events, and updated every third event. A new average value of the 'event averages' will be calculated over six events, until the points gap of the average value of the 'event averages' from the last minimum weight update is higher than 5 points.

The MotoAmerica Technical Director will inform all the teams about the possible air restrictor size adjustments, within 24 hours from the end of the last event, where the average value of the 'event averages' was calculated. The new air restrictor size adjustments must be applied from the first following event.

#### **2.4.4 Minimum weight**

All machines      168kg (370.5lbs)

At any time during the event, the weight of the whole motorcycle (including the tank and its contents) must not be less than the minimum weight.

There is no tolerance on the minimum weight of the motorcycle.

During the final technical inspection at the end of each race, the selected motorcycles will be weighed in the condition they finished the race, and the established weight limit must be met in this condition. Nothing may be added to the motorcycle. This includes all fluids.

During the practice and qualifying sessions, riders may be asked to submit their motorcycle to a weight control. In all cases, the rider must comply with this request.

The use of ballast is allowed to stay over the minimum weight limit and may be required due to the handicap system. The use of ballast and weight handicap must be declared to the Technical Director at the preliminary checks.

#### **2.4.5 Numbers and number plates**

Numbers must be easily legible, in a clear simple font and contrast strongly with the background color. Backgrounds must be of one single color over an area large enough to provide a minimum clear area of 25 mm around the numbers.

The sizes for all the front numbers are:

Minimum height:	140 mm
Minimum width:	80 mm
Minimum stroke:	25 mm
Minimum space between numbers:	10 mm

The sizes for all the side numbers are:	Minimum height:	120 mm
	Minimum width:	70 mm
	Minimum stroke:	20 mm
	Minimum space between numbers:	10 mm

The allocated number (& plate) for the rider must be affixed on the motorcycle as follows:

- a. Once on the front, either in the center of the fairing or slightly off to one side; the number must be on a strongly contrasting background. No advertising is allowed within 25mm in all directions.
- b. Once on each side of the lower rear portion of the lower fairing. The number must be on a strongly contrasting background with no advertising within 25mm in all directions.
- c. Any outlines must be of a contrasting color and the maximum width of the outline is 3mm. The background color must be clearly visible around all edges of the number (including outline). Reflective or mirror type numbers are not permitted.
- d. Numbers cannot overlap

In case of a dispute concerning the legibility of numbers, the decision of the Technical Director will be final.

#### **2.4.6 Fuel**

- a. The designated fuel is VP Racing Fuels MGP.
- b. Please refer to Article: 2.10 for additional details

#### **2.4.7 Tires**

- a. The maximum number of tires, of any type, available to each rider during the event will be specified in Article: 2.3.7.1
- b. A maximum of 11 tires per rider can be mounted at any time.
- c. For Superbike races only, wet tires will not need to be marked with a tire sticker. They will not be considered in the total number of tires available for use; however normal allocation limits still apply.
- d. **Qualifying tires will be allocated and can only be used during the session designated on the official tire allocation document. If the qualifying tire is used during any other session, the rider will lose his qualifying time and must start from the back of the grid.**
- e. During free practices, qualifying practices, warm-up sessions and races, front and rear tires are required to be marked with tire stickers.
- f. See article. 2.3.7

#### **2.4.8 Engine**

The following engine specifications and components may not be altered from the homologated motorcycle except as noted:

- a. The homologated engine design model cannot be changed.
- b. The method of cam drive must remain as homologated.

- c. The method of valve retention must remain the same as the homologated model. No pneumatic valve retention devices are allowed unless fitted to the homologated model.
- d. The sequence in which the cylinders are ignited (i.e. 1-2-4-3), must remain as originally designed on the homologated model. Simultaneous firing of two (2) cylinders is also forbidden if not adopted on the homologated motorcycle. Up to five (5) degrees firing difference in two (2) cylinders is regarded as 'simultaneous' firing.

#### **2.4.8.1 Fuel injection systems**

'Fuel injection systems' refers to the throttle bodies, fuel injectors, variable length intake tract devices, fuel-pump and fuel pressure regulator.

- a. The original homologated fuel injection system must be used without any modification.
- b. The fuel injectors must be stock and unaltered from the original specification and manufacture.
- c. Air funnels may be altered or replaced.
- d. Primary throttle valves cannot be changed or modified.
- e. Secondary throttle valves and shafts may be removed or fixed in the open position and the electronics may be disconnected or removed.
- f. Variable intake tract devices cannot be added if they are not present on the homologated motorcycle and they must remain identical and operate in the same way as the homologated system. All the parts of the variable intake tract device must remain exactly as homologated (except the air funnels). Variable intake tract devices may be replaced with fixed air funnels.
- g. Air and air-fuel mixture must go to the combustion chamber exclusively through the throttle bodies.
- h. Electronically controlled throttle valves, known as 'ride-by-wire', may be only used if the homologated model is equipped with the same system.
- i. If the variable intake tract actuation mechanism mounts or fuel injector mount is an integrated part of the air funnel, then those parts alone may be redesigned maintaining the exact geometry of the original parts.

#### **2.4.8.2 Cylinder head**

The cylinder head must be the originally fitted and a homologated part. The following modifications are allowed:

- a. The cylinder head must begin as a finished production part using homologated materials and castings. Material may only be added by epoxy or removed by machining. No machining or modification is allowed in the cam box / valve mechanism area.
- b. The intake and exhaust system including the number of valves and/or ports (intake and exhaust) must be as homologated.
- c. Porting and polishing of the cylinder head normally associated with individual tuning such as gas flowing of the cylinder head, including the combustion chamber, is allowed. Epoxy may be used to shape the ports.
- d. The throttle body intake insulators may be modified.
- e. The compression ratio is free.
- f. The combustion chamber may be modified.

- g. Valves must remain as homologated.
- h. Valve seats can be modified or replaced for repair. The material must remain as homologated.
- i. Valve guides must remain as homologated. Modifications in the port area are allowed by machining.
- j. Valve springs may be altered or replaced; their material must remain as homologated. An additional spring may be added or the spring may be removed.
- k. Valve spring retainers, collets and/or spring seats may be altered or replaced.
- l. Valves must remain in the homologated location and at the same angle as the homologated valves.
- m. Rocker arms (if any) must remain as homologated.
- n. The exhaust air bleed system must be blocked and the external fittings on the cam cover(s) may be replaced by plates.
- o. The shim buckets / tappets may be replaced but must be the same height, diameter, material type, surface finish and shim to top surface dimension as the homologated part. The weight must be equal to or greater than the homologated part.
- p. The homologated cylinder head / cam cover may be replaced by a cosmetic replica of higher specific weight material (i.e. replace magnesium part with aluminum).

#### **2.4.8.3 Camshaft**

- a. Camshafts may be altered or replaced from those fitted to the homologated motorcycle.
- b. Offsetting the camshaft is not allowed. The camshaft must remain in the homologated location.

#### **2.4.8.4 Cam sprockets or cam gears**

- a. Camshaft sprockets, pulleys or gears may be altered or replaced to allow degreasing of the camshafts.
- b. The cam chain or cam belt tensioning device(s) can be modified or changed.
- c. The cam chain may be altered or replaced but must remain the same type.

#### **2.4.8.5 Cylinders**

- a. Cylinders must be the originally fitted and homologated part with no modification allowed.
- b. The cylinder base gasket(s) may be changed.
- c. The top face of the cylinder may be ground to adjust deck height.

#### **2.4.8.6 Pistons**

- a. Must be the originally fitted and homologated part with no modification allowed.

#### **2.4.8.7 Piston rings**

- a. Must be the originally fitted and homologated part with no modification allowed.

#### **2.4.8.8 Piston pins and clips**

- a. Must be the originally fitted and homologated part with no modification allowed.

#### **2.4.8.9 Connecting rods**

- a. Connecting rods may be altered or replaced from those fitted to the homologated

motorcycle. The weight must be the same or greater than the original homologated part.

- b. The material must be the same type as the homologated item (e.g. steel, titanium, alloy) or steel.
- c. If the original connecting rod is fitted with a little end insert, then the replacement connecting rods may also have an insert of the same material as fitted in the original homologated connecting rod.
- d. If the original homologated connecting rod is not fitted with a little end insert then the replacement connecting rods may be fitted with an insert of the same material as the connecting rod or steel.
- e. The center to center (little end to big end) length of the rod must be the same as the original homologated item.
- f. Connecting rod bolts are free.

**From 2019 for any newly homologated machines:**

- g. The connecting rod must be the originally fitted and homologated part with no modification allowed.
- h. Connecting rod big end bolts may be changed but must be of the same weight or heavier, same material or of higher specific weight material.
- i. The weight of the connecting rod assembly is the homologated weight (normally the weight of the middle weight rod) with a tolerance of +/-3%.

**2.4.8.10 Crankshaft**

Only the following modifications are allowed to the homologated crankshaft:

- a. Bearing surfaces may be polished.
- b. Surface treatments may be applied to the crankshaft.
- c. Balancing is allowed but only by the same method as the homologated crankshaft. For example, heavy metal (i.e. Mallory metal inserts), is not permitted unless originally specified in the homologated crankshaft.
- d. The addition or reduction in weight of the crankshaft in order to reach a racing balance can be no higher than **3%** of the homologated weight without the tolerance as shown on the homologation specification of the crankshaft.
- e. The balancing must be performed by the original method (e.g. drilling or machining) and in the same position (e.g. edge of flywheels).
- f. Polishing of the crankshaft is not allowed.
- g. Balance shaft must remain as homologated. No modifications are allowed.

**2.4.8.11 Crankcase / Gearbox housing**

- a. Crankcases must be the originally fitted and homologated part with no modification allowed. If the crankcases have integral cylinders, then the top face of the cylinder may be machined to adjust deck height. Oil spray nozzles may be modified. No other modifications are allowed (including painting, polishing and lightening).
- b. It is not allowed to add a pump used to create a vacuum in the crankcase. If a vacuum pump is installed on the homologated motorcycle, then it may be used only as homologated.
- c. Oil-pan (sump) may be altered or replaced and oil pick up may be altered or replaced.

- d. One threaded port may be altered for direct oil pressure/temperature sensor fitting in the crankcases or engine covers.
- e. See 2.4.10.1/k./iv.
- f. The oil breather cover must remain as homologated but the internal breather/damper plate can be modified or replaced.

#### **2.4.8.11.1 Lateral covers and protection**

- a. Lateral (side) covers may be altered, modified or replaced (excluding pump covers). If altered or modified, the cover must have at least the same resistance to impact as
- b. the original one. If replaced, the cover must be made in material of the same or higher specific weight and the total weight of the cover must not be less than the original one.
- c. Titanium bolts may be used to fasten lateral covers.
- d. Oil containing engine covers cannot be secured with aluminum bolts.
- e. All lateral covers/engine cases containing oil and which could be in contact with the ground during a crash, must be protected by a second cover made from metal such as aluminum alloy, stainless steel, steel or titanium. Each side (left and right) of the engine must have at least one (1) protective cover installed on the farthest protruding engine cover containing oil. Composite covers are not permitted. FIM approved covers will be permitted without regard of the material or dimensions.
  - i. The secondary cover must cover a minimum of 1/3 of the original cover. It must not have sharp edges that could damage the track surface. Covers must be fixed properly and securely with a minimum of three (3) case cover screws that also mount the original covers/engine cases to the crankcases.
  - ii. Heavy duty engine case covers may be used in lieu of secondary case covers.
  - iii. The Technical Director has the right to refuse any cover not satisfying this safety purpose.
- f. Plates or crash bars from aluminum or steel also are permitted in addition to these covers. All of these devices must be designed to be resistant against sudden shocks, abrasions and crash damage.

#### **2.4.8.12 Transmission / Gearbox**

- a. Transmission shafts and gear set must begin as originally fitted and homologated. Shimming is allowed.
- b. Undercutting and surface treatments are permitted.
- c. OEM shift drum detent stars may be modified or replaced.
- d. External quick-shift systems are permitted (including wire and potentiometer).
- e. Countershaft sprocket, rear wheel sprocket, chain pitch and size can be changed. Chain master links must be rivet type.
- f. Final drive system, if not by chain, may be modified to chain type using kits specified on the eligible equipment list.
- g. The sprocket cover may be modified or eliminated

#### **2.4.8.13 Clutch**

- a. Aftermarket or modified clutches are permitted including:
  - i. Friction plates and steel plates



- ii. Clutch hub
  - iii. Springs
  - iv. Hardware
- b. The clutch basket (outer) must be the originally fitted and homologated part but may be reinforced.
  - c. Back torque limiters are permitted.
  - d. No power source (i.e. hydraulic or electric) can be used for clutch operation if not installed in the homologated model for road use. Human power is excluded from the ban.
  - e. Clutch system type (wet or dry / single or multi-plate) and method of operation (cable/hydraulic) must remain as homologated.

#### **2.4.8.14 Oil pumps and oil lines**

- a. The originally fitted and homologated oil pump must be used. The oil pressure relief spring is free.
- b. Oil lines may be modified or replaced. Oil lines containing positive pressure, if replaced, must be of braided reinforced construction with swaged or treaded connectors.

#### **2.4.8.15 Cooling System**

- a. The only liquid engine coolant permitted is water.
- b. The water pump must remain as homologated.
- c. The original radiator or oil cooler may be altered or replaced from those fitted to the homologated motorcycle.
- d. Additional radiators or oil coolers may be added.
- e. The original oil/water heat exchanger may be modified, replaced or removed.
- f. The cooling system hoses and catch tanks may be changed.
- g. The radiator fan and wiring may be changed, modified or removed.
- h. The oil cooler must not be mounted on or above the rear mudguard.
- i. The appearance from the front, rear and profile of the motorcycle must in principle conform to the homologated shape after the addition of additional radiators or oil coolers.

#### **2.4.8.16 Air box**

- a. The air box must be the originally fitted and homologated part with no modification allowed except as noted in the following:
  - i. If the homologated air box is used to mount top type fuel injectors, then the air box and the attached systems must remain as homologated.
  - ii. If the homologated air box is used to mount variable intake tract devices, then the air box and the attached systems must remain as homologated and function in the same way (excepting the air funnels – see article 2.4.8.1).
  - iii. If used, variable intake tract devices must function in the same way as on the homologated system (see article 2.4.8.1).
- b. Air filters, internal flap type valves, sensors and vacuum fittings may be removed, modified or replaced with aftermarket parts. Should any modification be required for the fitment of these parts it will be at the discretion of the Technical Director.

- c. Any holes in the air box to the outside atmosphere resulting from the removal of components must be completely sealed from incoming air.
- d. The air box drains must be sealed.
- e. Ram air tubes or ducts running from the fairing to the air box may be modified, replaced or removed. If tubes/ducts are utilized, they must be attached to the original, unmodified air box inlets.
- f. All motorcycles must have a closed breather system. All the oil breather lines must be connected (may pass through an oil catch tank) and exclusively discharge in the air box.
- g. If the top of the air box is formed by the bottom of the tank, then that part of the tank will be considered as the air box and must conform to its homologated shape excepting two (2) mm variance in corner radii and must be the same volume. A dry-break / quick-release connector may be fitted (see article 2.4.8.17).
- h. Additional heat shielding is allowed to be applied to the lower face / side of the air box (i.e. foil heat tape).

#### **2.4.8.17 Fuel Supply**

- a. The fuel pump and fuel pressure regulator must be the originally fitted and homologated part with no modification allowed.
- b. The fuel pressure must be as homologated. The pressure tolerance at the technical control is +/- 0.5 bar in respect to the maximum pressure of the homologated motorcycle. All motorcycles must have a special device on the fuel line in accordance with FIM specifications for fuel pressure checks, or teams must provide a temporary adaptor to allow checks.
- c. Fuel lines from the fuel tank up to the injectors (fuel hoses, delivery pipe assembly, joints, clamps, fuel canister) may be replaced and must be located in such a way that they are protected from crash damage.
- d. Quick connectors or dry break connectors may be used.
- e. Fuel vent lines may be replaced.
- f. Fuel filters may be added.

#### **2.4.8.18 Exhaust system**

- a. Exhaust pipes, catalytic converters and silencers may be altered or replaced from those fitted to the homologated motorcycle. Catalytic converters must be removed.
- b. The number of the final exhaust silencer(s) must remain as homologated. The silencer(s) must be on the same side(s) as on the homologated model.
- c. For safety reasons, the exposed edge(s) of the exhaust pipe(s) outlet(s) must be rounded to avoid any sharp edges.
- d. Wrapping of exhaust systems is not allowed except in the area of the rider's foot or an area in contact with the fairing for protection from heat.

The noise limit for Superbikes will be 115 dB/A (with a 3 dB/A tolerance after the race only) measured at 6000rpm (4-cylinder) and 5500rpm (2-, 3- cylinder).

The test will be carried out according to the details noted in Article 2.14

#### **2.4.9 Electronic control system**

- a. The engine control system (including ECU) must be either:
  - i. A DWO/FIM approved "Superbike Kit" system (See art 2.4.9.1)

- ii. A MotoAmerica approved “Superbike Kit” system (See art 2.4.9.2)
- iii. The homologated ECU with or without software changes (See art 2.4.9.3)
- iv. DWO/FIM approved “Superstock 1000” kit model
- b. The central unit (ECU) may be relocated.
- c. The original speedometer and tachometer may be altered or replaced.
- d. The wiring harness is free.
  - i. Each team must provide a download connection lead to the Technical Director.
- e. Telemetry (remote signals to or from the bike) is not allowed.
- f. No remote or wireless connection to the bike for any data exchange or setting is allowed whilst the engine is running or, the bike is moving.
- g. Spark plugs, spark plug caps and HT leads (if applicable) are free.
- h. Battery is free.
- i. **Proposed for 2023: Follow FIM / Manufacturers recommended electronics systems.**

**2.4.9.1 The DWO/FIM approved “Superbike Kit” system must meet the following:**

- a. The system must be a complete package including all electrical / electronic parts not supplied on the homologated motorcycle required for full operation of all strategies – except the wiring harness.
- b. Only the machine manufacturer or one approved partner can submit a single system for approval.
- c. The total price of the complete system including ECU, dashboard/display, all additional sensors essential for full operation of all strategies, IMU, software, enable codes, data logging, analysis software, ECU ‘tuning’ or ‘setting’ software, data logger, download/connection cable, example harness design, manual for use, (not a complete list), is €8000 Euro (excluding taxes). Data logging only sensors are excluded from the price cap.
- d. There must be at least 50 “Superbike Kit” systems (currently approved system) available worldwide per season, if ordered, through authorized distributors or dealers. The “Superbike Kit” system must be marked and considered as for race use only.
- e. Lead time less than 8 weeks
- f. **No other external ignition/injection controllers, traction control modules or other active expansion modules or calculation units may be fitted.**
- g. The ECU must be from the FIM/DWO approved superbike ECU list.
- h. The following sensors may be used:
  1. Throttle position (multiple)
  2. Map sensor, map sync (pressure sensor on the intake port used to synchronize the engine during the start)
  3. Air box pressure
  4. Engine pick-ups (cam, crank) (Crank trigger may be replaced.)
  5. Lambda
  6. Exhaust valve/motor position/feedback

7. Twist grip position
  8. Front speed
  9. Rear speed
  10. Gearbox output shaft speed
  11. Gear position
  12. Gear shift load cell
  13. Front brake pressure
  14. Rear brake pressure
  15. Oil pressure
  16. Air pressure
  17. Water temperature
  18. Air temperature
  19. IMU (various signals)
  20. Transponder / lap time signal
  21. Knock sensor
  22. Fuel pressure
  23. Oil temperature
  24. Fork position
  25. Shock position
  26. Tilt / tip-over switch
  27. GPS unit
  28. Rear tire temperature (external) (multiple)
  29. Rear tire monitor (temperature and pressure)
  30. Front tire monitor (temperature and pressure)
- i. Sensors on the above list that are originally fitted to the standard machine may be replaced with alternative sensors, however they must be included in the Superbike Kit System and inside the total price (article 2.4.9.1.c).
  - j. Two (2) additional sensor channels (that are not included in the above list) may be added to the machine. These sensors must be declared to the Technical Director, they may be changed only between meetings and if changed a new declaration must be made.
  - k. Redundant/doubled sensors are allowed but must be included in the "Superbike Kit" system if they are required for safe operation.
  - l. Analog/logic to CAN sensors are allowed.
  - m. The sensors originally fitted to the homologated machine and used as homologated, will not be included in the price limit.
  - n. When the following sensors are damaged through crashes they may be replaced by parts of the same function but do not have to be the same specific part from the "Superbike Kit" system:
    - i. Fork and shock potentiometers

- ii. Brake pressure sensors
- iii. Gear shift sensor (but must remain the same type included with the kit – i.e. load cell, switch, etc.)
- o. Before the pre-season test, before the mid-season test(s) or at the season midpoint and within three hours of the last race of the season any firmware / software updates being used by the factory teams must be made available to all same manufacturer customer SBK teams (more frequent updates are allowed).
- p. The manufacturer must provide current strategies but may remove the ability to change or see these settings. Base mapping must be provided.
- q. Only firmware and software from the FIM/DWO approved software and firmware list may be used.
- r. Factory teams may use any development firmware and software which will be made available to teams according to the update schedule.
- s. Any essential hardware updates required must be made available to customer teams from the same race as the factory team and available free of charge to update those “Superbike Kit” systems purchased in the current season.
- t. The transponder is NOT included in the “Superbike Kit” system.
- u. The selection of logged channels is free.
- v. Coils and coil drivers are free and must be included in the “Superbike Kit” system if altered.
- w. No other external ignition/injection controllers, traction control modules or other active expansion modules or calculation units may be fitted unless included in the Superbike System.
- x. The factory teams must use the current season’s “Superbike Kit System”. No backdated parts may be used.
- y. Superbike kit systems remain approved for three (3) seasons (first season inclusive).

Manufacturer nominated “Superbike Kit” system suppliers please also see “Superbike Kit System Approval Requirements” documentation.

#### **2.4.9.2 The MotoAmerica approved “Superbike Kit” system must meet the following:**

- a. The system must be the MoTec M130 spec system with MotoAmerica approved activations. See Technical Bulletin 01-2019.
- b. There must be at least 50 “Superbike Kit” systems (currently approved system) available worldwide per season, if ordered, through authorized distributors or dealers. The “Superbike Kit” system must be marked and considered as for race use only.
- c. Lead time less than 8 weeks
- d. **No other external ignition/injection controllers, traction control modules or other active expansion modules or calculation units may be fitted.**
- e. The ECU must be from the MotoAmerica approved superbike ECU list.
- f. The following sensors may be used:
  - 1. Throttle position (multiple)
  - 2. Map sensor, map sync (pressure sensor on the intake port used to synchronize the engine during the start)

3. Air box pressure
  4. Engine pick-ups (cam, crank) (Crank trigger may be replaced.)
  5. Lambda
  6. Exhaust valve/motor position/feedback
  7. Twist grip position
  8. Front speed
  9. Rear speed
  10. Gearbox output shaft speed
  11. Gear position
  12. Gear shift load cell
  13. Front brake pressure
  14. Rear brake pressure
  15. Oil pressure
  16. Air pressure
  17. Water temperature
  18. Air temperature
  19. IMU (various signals)
  20. Transponder / lap time signal
  21. Knock sensor
  22. Fuel pressure
  23. Oil temperature
  24. Fork position
  25. Shock position
  26. Tilt / tip-over switch
  27. GPS unit
  28. Rear tire temperature (external) (multiple)
  29. Rear tire monitor (temperature and pressure)
  30. Front tire monitor (temperature and pressure)
- g. Sensors on the above list that are originally fitted to the standard machine may be replaced with alternative sensors, however they must be included in the Superbike Kit System and inside the total price (article 2.4.9.2.b).
- h. Two (2) additional sensor channels (that are not included in the above list) may be added to the machine. These sensors must be declared to the Technical Director, they may be changed only between meetings and if changed a new declaration must be made.
- i. Redundant/doubled sensors are allowed but must be included in the "Superbike Kit" system if they are required for safe operation.
- j. Analog/logic to CAN sensors are allowed.
- k. The sensors originally fitted to the homologated machine and used as homologated, will not be included in the price limit.

- I. When the following sensors are damaged through crashes they may be replaced by parts of the same function but do not have to be the same specific part from the “Superbike Kit” system:
  - i. Fork and shock potentiometers
  - ii. Brake pressure sensors
  - iii. Gear shift sensor (but must remain the same type included with the kit – i.e. load cell, switch, etc.)
- m. Before the pre-season test, before the mid-season test(s) or at the season midpoint and within three hours of the last race of the season any firmware / software updates being used by the factory teams must be made available to all same manufacturer customer SBK teams (more frequent updates are allowed).
- n. The manufacturer must provide current strategies but may remove the ability to change or see these settings. Base mapping must be provided.
- o. Only firmware and software from the MotoAmerica approved software and firmware list may be used.
- p. Any essential hardware updates required must be made available to customer teams from the same race as the factory team and available free of charge to update those “Superbike Kit” systems purchased in the current season.
- q. The transponder is NOT included in the “Superbike Kit” system.
- r. The selection of logged channels is free.
- s. Coils and coil drivers are free and must be included in the “Superbike Kit” system if altered.
- t. No other external ignition/injection controllers, traction control modules or other active expansion modules or calculation units may be fitted unless included in the Superbike System.
- u. The factory teams must use the current season’s “Superbike Kit System”. No backdated parts may be used.
- v. Superbike kit systems remain approved for three (3) seasons (first season inclusive).

#### **2.4.9.3 Homologated ECU and DWO/FIM approved ‘Superstock 1000’ kit model.**

- a. The originally fitted and homologated ECU may be used with or without software changes.
  - i. The homologated ECU cannot have any hardware or physical modifications.
  - ii. No extra sensors may be added for control strategies except for shift rod sensors and lambda sensors.
  - iii. Software changes may include, but are limited to, the same control strategies as the “Superbike Kit” system. (See 2.4.9.1)
  - iv. Maximum retail price of the ECU, software and combined or separate data logging systems must meet the same requirements as the DWO/FIM Superstock 1000 kit. (See Article 2.6.9.1-)
- b. For complete DWO/FIM approved Superstock 1000 kit requirements, see article 2.6.9.1

#### **2.4.9.4 Generator, alternator, electric starter**

- a. The stator/coils must be the originally fitted and homologated parts with no modification allowed.

- b. The flywheel may be modified or replaced.
- c. The ACG must generate sufficiently to maintain battery charge.
- d. The use of a 'booster' battery is permitted except during parc fermé.
- e. The electric starter must operate normally and always attempt to start the engine during the event.
- f. The starter motor gear system must be the originally fitted and homologated parts. Surface and hardening treatments are allowed.
- g. Motorcycles should self-start on the starting grid in neutral. Push-starting on the starting grid is not allowed, however start line officials may push start the motorcycle if necessary (in gear).
- h. During parc fermé, the starter must crank the engine at a suitable speed for starting for a minimum of 2 seconds without the use a boost battery. No boost battery may be connected to the machine after the end of the session.

#### **2.4.10 Main frame and spare motorcycle**

- a. During the entire duration of the event each rider may only use one (1) complete motorcycle, as presented for technical control, with the frame clearly identified with a seal. In case the frame needs to be replaced, the rider or the team must request the use of a spare frame to the Technical Director.
- b. One (1) spare complete motorcycle is allowed per rider.
- c. A team may opt to have one (1) spare machine shared by two or more riders.

#### **Explanation of Procedures**

Only one (1) complete motorcycle may be presented for the preliminary technical checks and it will be the only motorcycle allowed on the track and in the front of pit box during the practices, qualifying, and races.

The frame of this motorcycle will be officially sealed by the Technical Director or by his appointed staff. The seal will bear a serial number, which will be recorded. Any attempt made to remove the seal will damage it irreparably.

At any time during the event the technical stewards, under the direction of the Technical Director, may check the seal and verify that it conforms to the motorcycle and rider it was assigned to. For cross reference, every frame must have a unique number (VIN) punched on the steering-head.

If the primary or active motorcycle is damaged in a crash or in any other incident and is declared unrepairable (safely and in the available time) by the Technical Director or his appointed staff then the seal on the damaged motorcycle will be destroyed by the technical staff and the chassis of this motorcycle must not be used for the remainder of the event. The new serial number will be recorded by the Technical Director.

During set up day (usually the day before first official practice session) no restrictions apply regarding the location of the spare motorcycle. From the start of the first practice session, any spare motorcycle must be kept out of view. It is recommended that team working areas incorporate an area for this purpose. During an event, minor adjustments may be made to the spare motorcycle, the intent being to allow teams to maintain parity with the primary bike.

In the event the spare motorcycle is used in competition, the primary machine is taken out of competition. At that time, the damaged machine must be kept out of view.

The spare machine can only be used in the next session to which the incident occurred rendering the primary bike not able to be used. In a race situation, if the primary bike is required to be replaced with the spare machine at any time during Race 1, the first



opportunity to use the spare machine is the next session or race. A race will be deemed to have begun when the rider exits pit lane for the sighting laps. All restarts, including those three laps or less, are a continuation of the original race or session.

The team may rebuild the original primary machine, however only in the case of TOTAL PROVEN WRECKAGE with the spare bike can an application be made to utilize the original machine. The decision of the Technical Director regarding this is final.

The damaged frame may be impounded by the Technical Director for later examination.

#### **2.4.10.1 Frame body and rear sub-frame**

- a. The main frame must be the originally manufactured, fitted and homologated part with only the following modifications allowed.
- b. In all the following cases the main frame may only be altered by the addition of gussets, tubes or plates unless stated otherwise. The additions may be welded or bonded. No gussets or tubes may be removed, other allowed modifications are detailed within the following section of these rules. These additions must be documented by the reference team (or manufacturer).
- c. Holes may be drilled on the frame only to fix approved components (i.e. fairing brackets, steering damper mount).
- d. The homologated position (of engine, steering stem or pivots) is considered as the position in which the production motorcycle is supplied. (Fore and aft is considered along the bottom plane of the original bearing seat).
- e. Suspension linkage mounting points on the frame must remain as homologated.
- f. If the original chassis includes adjustable inserts for the engine mounting position then:
  - i. The inserts are free BUT the chassis cannot be modified further (except as mentioned in b).
  - ii. There is no limit to the range of adjustment.
- g. If the original chassis has fixed engine mounts then the engine must be mounted in the homologated position.

#### **Steering Stem Position:**

- h. if the homologated machine has adjustable/exchangeable bearing inserts/bushes for the steering stem position then:
  - i. The inserts/bushes can be used to adjust the fore and aft position of each bearing.
  - ii. No part of these bushings may protrude axially more than 3 mm from the original steering head pipe location nor may the bearing be inset.
  - iii. A slot and clamp may be machined/added to allow easier bushing exchange. Other positive retention mechanism may be allowed at the discretion of the Technical Director.
  - iv. The chassis cannot be modified further except as mentioned in point b.
- i. If the original chassis has a fixed steering stem position, then the steering stem axis/position may be adjusted by moving the steering head bearings.
  - i. The fore and aft position of each bearing can be a maximum +/-6 mm in respect to the original bearing location (excluding tolerances).
  - ii. The original bearing seats may be modified (ovaed) or increased in diameter to insert special bushings.

- iii. No part of these special bushings may protrude axially more than 3 mm from the original steering head pipe location nor may the bearing be inset.
- iv. The steering head pipe can be reinforced in the area of the bearing seats.
- v. Welding and machining is allowed for the purpose of making these modifications.

Swingarm Pivot Position:

- j. If the original chassis includes adjustable inserts for the swinging arm pivot axis, then:
  - i. Inserts/bushings are free
  - ii. The chassis cannot be modified further (except as mentioned in b).
  - iii. There is no limit to the range of adjustment.
- k. If the original chassis has a fixed swingarm mounting pivot axis:
  - i. The swing arm pivot axis may be moved a maximum of 5 mm radially (excluding tolerances) measured from the homologated axis.
  - ii. Modifications may be made to the frame at the swing arm pivot area to allow this. Welding and machining is allowed for the purpose of making this modification, regardless of the technology used and the dimensions of the component or section of the frame (i.e.: cast, fabricated, etc.).
  - iii. The method of adjustment is free - e.g. bushings, inserts, offset axles. For machines fitted with exchangeable inserts as standard then the homologated position is considered as the position in which the production motorcycle is supplied.
  - iv. Should this pivot / axles pass through the crankcases then the relevant crankcase mounting hole may be machined larger, no welding or other modifications will be permitted. Crankcases may be machined for swingarm clearance only.
- l. The original lock stops may be removed from the frame body by grinding or machining. However, another form of lock stop must be fitted.
- m. All motorcycles must display a vehicle identification number punched on the frame body (a proper 'legal VIN' or a unique designation by the team to which the Technical Director may choose to append). No detachable plates are permitted.
- n. No polishing or surface refinishing is allowed but the paint scheme is not restricted.
- o. Fairing brackets may be altered or replaced.
- p. Front and rear sub frame may be changed altered or removed.
- q. Crash protectors may be fitted to the frame using existing points (max. length: 50 mm) or pressed into the ends of the wheel axles (max. length: 30mm).

#### 2.4.10.2 Suspension - General

- a. Participants in the Superbike class must only use the approved and listed suspension units for that season. **Proposed for 2023: Suspension price caps will be reduced to \$6,000 for Forks and \$2,500 for Shocks.**
- b. The approved products from the manufacturers must be available to all participants at least one month before the first round of the Superbike season and remain available all season. The products must be available within six (6) weeks of a confirmed order.
- c. Setting parts and tuning parts must be provided by the suspension manufacturers

to all customers/teams/participants using the manufacturer's products. These parts can be used by all participants during the season. These parts shall be available for immediate delivery to all teams/customers.

- d. Teams may not modify any part of the forks or shock absorber. All setting parts must be supplied by the suspension manufacturer and available to all teams/riders.
- e. The suspension manufacturers are allowed to offer service contracts when a team is using the approved and listed suspension products. The suspension manufacturers cannot demand a service contract for a customer or participant in order to obtain a suspension product.
- f. Electronic suspension **cannot be used**.
- g. An electronic controlled steering damper can only be used if installed on the homologated model for road use. However, it must be completely standard (any mechanical or electronic part must remain as homologated).

#### **2.4.10.3 Front Suspension**

- a. The front fork in whole or part may be changed but must be the same type homologated (e.g. leading link, telescopic, etc.).
- b. The upper and lower fork clamps (triple clamp, fork bridges) and stem may be changed or modified.
- c. A steering damper may be added or replaced with an 'after-market' damper.
- d. The steering damper cannot act as a steering lock limiting device.

#### **2.4.10.4 Swing-arm (rear fork)**

- a. The rear fork may be altered or replaced from those fitted to the homologated motorcycle. However, the type (single or double sided) must remain as homologated.
- b. The use of carbon fiber or Kevlar materials is not allowed if not homologated on the original motorcycle.
- c. Rear wheel stand brackets may be added to the rear fork by welding or by bolts.
- d. Brackets must have rounded edges (with a large radius). Fastening screws must be recessed.
- e. Swing arm spindle (pivot) may be modified or replaced. **Proposed for 2023: Only approved and price capped swing arms will be allowed.**

#### **2.4.10.5 Rear suspension unit**

- a. Rear suspension unit may be changed but a similar system must be used (i.e. dual or mono).
- b. The rear suspension linkage may be modified or replaced.
- c. The original fixing points on the frame (if any) must be used to mount the shock absorber, linkage and/or rod assembly fulcrum (pivot points).
- d. Removable top shock mounts may be replaced. If replaced they must retain their homologated geometry.

#### **2.4.10.6 Wheels**

- a. Wheels may be replaced but not modified (see article 2.3.5) and associated parts may be altered or replaced from those fitted to the homologated motorcycle.
- b. Aftermarket wheels must be made from aluminum (aluminum) alloys.
- c. The use of the following alloy materials for the wheels is not allowed: Beryllium

(>=5%), Scandium (>=2%), Lithium (>=1%).

- d. Each specific racing wheel model must be approved and certified according to JASO (Japanese Automotive Standards Organization) T 203-85 where W (maximum design load) of art. 11.1.3 is 195 kg for front wheel and 195 kg for rear wheel, K = 1.5 for front and rear wheels. Static radius of tire: front 0.301 m, rear 0.331 m.
- e. Wheel manufacturers must provide copy of the certificate for their wheel(s) as proof of compliance to the Technical Director when requested.
- f. The homologated road bike wheel and sprocket carrier assembly may be used with no modification irrespective of material. They must meet article 2.4.10.6(d)(e). Bearings and spacers may be changed.
- g. On motorcycles equipped with a double-sided swing arm (rear fork), the rear sprocket and brake rotor must remain on the rear wheel when the wheel is removed.
- h. Bearings, seals, and axles may be altered or replaced from those fitted to the homologated motorcycle. The use of titanium and light alloys is forbidden for wheel spindles (axles).

Wheel rim diameter size (front and rear)	17 inches
Front wheel rim width:	3.50 inches
Rear wheel rim width:	6.00 inches

#### 2.4.10.7 Brakes

- a. Participants in the Superbike season must only use the approved and listed front brake parts (calipers, master cylinders, brake discs, brake pads and dry break systems) for that season. **Proposed for 2023: Approved list will be revised and price cap will be reduced.**
- b. The approved products from the manufacturers must be available to all participants at least one month before the first round of the MotoAmerica Superbike season, and remain available all season. The products must be available within four (4) weeks of a confirmed order.
- c. No parts can be added to the approved list during the current season. Performance related updates are not allowed. Any product changes due to manufacturing or material supply issues must be approved in advance.
- d. Front brake master cylinders may be altered or replaced from those fitted to the homologated motorcycle.
- e. Front brake calipers may be altered or replaced from those fitted to the homologated motorcycle.
- f. Rear brake master cylinders may be altered or replaced from those fitted to the homologated motorcycle.
- g. Rear brake calipers may be altered or replaced from those fitted to the homologated motorcycle.
- h. Brake pads or shoes may be altered or replaced from those fitted to the homologated motorcycle.
- i. Brake hoses and brake couplings may be altered or replaced from those fitted to the homologated motorcycle. The split of the front brake lines for both front brake calipers must be made above the lower fork bridge (lower triple clamp).
- j. Hydraulic anti-knockback systems may be fitted to the brake lines/caliper.

- k. Brake discs may be altered or replaced from those fitted to the homologated motorcycle. Only steel (max. carbon content 2.1 wt. %) is allowed for brake discs. Alloys containing beryllium are not allowed to be used for brake calipers.
- l. The Anti-Lock Brake System (ABS) cannot be used.
- m. The Anti-Lock Brake System (ABS) ECU can be disconnected or dismantled. The ABS rotor wheel can be deleted, modified or replaced.
- n. Front brake system cooling ducts are allowed.

#### **2.4.10.8 Handlebars and hand controls**

- a. Handlebars, hand controls (subject to Art 2.4.8.1) and cables may be altered or replaced from those fitted to the homologated motorcycle.
- b. Cable operated throttles (grip assembly) must be equipped with both an opening and a closing cable including when actuating a remote ride by wire grip/demand sensor.
- c. Motorcycles must be equipped with a functional ignition kill switch or button mounted on the right-hand handlebar (within reach of the hand while on the hand grips) that is capable of stopping a running engine. The button/switch must be red.

#### **2.4.10.9 Footrest and foot controls**

- a. Footrests, hangers/brackets and hardware may be replaced and relocated but the hangers/brackets must be mounted to their original frame mounting points.
- b. Foot controls: gearshift and rear brake must remain operated manually by foot.
- c. Foot rests may be rigidly mounted or a folding type which must incorporate a device to return them to the normal position.
- d. The end of the footrest must have at least an eight (8) mm solid spherical radius.
- e. Non-folding footrests must have an end (plug) which is permanently fixed, made of aluminum, plastic, Teflon or equivalent type of material (min. radius of eight (8) mm). The plug surface must be designed to reach the widest possible area of the footrest. The Technical Director has the right to refuse any plug not satisfying this safety purpose.

#### **2.4.10.10 Fuel tank**

- a. The fuel tank must conform in principle to the homologated appearance and location of the original tank; however, its actual shape can be slightly changed to suit the rider's preference and increased fuel volume. The tank may also be modified below the upper frame line and under the seat.
- b. The tank may be replaced by a fuel cell and a structural cover.
- c. The material of construction of the fuel tank may be altered from the one of the tank fitted to the homologated motorcycle.
- d. All fuel tanks must be filled with fire retardant material (e.g. fuel cell foam), or be fitted with a fuel cell bladder.
- e. Fuel tanks made of composite materials (carbon fiber, aramid fiber, glass fiber, etc.) must have passed the FIM Standards for fuel tanks or be lined with a fuel cell bladder.
- f. Tanks made of composite material must bear the label certifying conformity with FIM Fuel Tank Test Standards. Fuel tanks without a fuel cell bladder must bear a label certifying conformity with FIM Fuel Tank Test Standards. Such labels must include the fuel tank manufacturer's name, date of tank manufacture and name of testing laboratory.

- g. Each manufacturer is required to inform the FIM/CCR Secretariat of its fuel tank model(s) which have passed the FIM test standards, together with a copy of the fuel tank label. Full details of the FIM Fuel Tank Test Standards and Procedures are available from the FIM (See 'Fuel Tank Test Standards' below).
- h. All fuel bladders must conform to the FIA Standard FT3.5-1999, specifically for the chapters 2 (Fuel bladder lifetime), 3 (General requirements), 4 (Fittings and connections), 5 (Sampling and pretreatment), 6 (Testing) and 7 (Performance requirements).

This includes also that, as stated in 3, all fuel bladders should be supplied with a suitable fuel resistant polyurethane foam baffling, conforming to Mil Spec MIL-B-83054, SAE-AIR-4170 or equivalent. This foam shall fill a minimum of 80 % of the volume of the fuel bladder. Where rapid refueling is expected, an anti-static foam conforming to Mil-Spec MIL-F-87260 (USAF) should be employed.

- i. The fuel tank must be fixed to the frame from the front and the rear with a crash-proof assembly system. Bayonet style couplings cannot be used, nor may the tank be fixed to any parts of the streamlining (fairing) or any plastic part. The Technical Director has the right to refuse a motorcycle if he is of the opinion that the fuel tank fixation is not safe.
- j. The original tank may be modified to achieve the maximum capacity of 24 liters, provided the original profile is as homologated.
- k. A cross over line between each side of the tank is allowed (maximum inside diameter 10 mm).
- l. Fuel tanks with tank breather pipes must be fitted with non-return valves which discharge into a catch tank with a minimum volume of 250 cc made of a suitable material.
- m. Fuel tank filler caps may be altered or replaced from those fitted to the homologated motorcycle, and when closed, must be leak proof. Additionally, they must be secured to prevent accidental opening at any time.
- n. The same size fuel tank used in practice must be used during the entire event.

#### **2.4.10.10.1 Fuel tank homologation**

- a. Any fuel tanks, made of non-ferrous materials (with the exception of aluminum) must be tested according to the test procedure prescribed by the FIM.
- b. Each manufacturer is responsible for testing its own fuel tank model(s) and will certify that the fuel tank exceeds the FIM test standard, if it has passed the FIM test procedure for fuel tanks.
- c. Each manufacturer must affix a quality and test label on each fuel tank type that is produced for competition use. This quality and test label will be the recognition of a fuel tank model which has passed the FIM test procedure.
- d. All fuel tanks that are made to the same design, dimensions, number of fiber layers, grade of fiber, percentage of resin, etc., must be identified with the same quality and test label.
- e. The quality and test label will include the following information on each label affixed to each fuel tank: name of the fuel tank manufacturer, date of fabrication, code or part number, name of testing laboratory, fuel capacity.
- f. Each manufacturer is requested to inform the FIM/CCR Secretariat of its fuel tank model(s) which have passed the FIM test procedure, with a copy of the quality and test label.
- g. Only fuel tanks that have passed the FIM test procedure will be accepted.

#### 2.4.10.11 Fairing / Bodywork

- a. The fairing, mudguards and body work must conform in principle to the homologated shape as originally produced by the manufacturer. Headlights must be included even when considered external.
- b. The fairing has a tolerance of +/-15mm from the original homologated road fairing, respecting the design and features of the homologated fairing, with the exception of the oil containing portion of the lower fairing, seat area and the area supporting the screen. The front upper fairing section (cowling) above the area of the front wheel cavity (front view) may have its frontal area increased in width by up to 30 mm per side (60 mm overall). It must still conform to the style of the original machine (scaled +/-15 mm planar) incorporating all included design features, however it may not exceed the homologated maximum width of the fairing side panels (excluding wings). The decision of the Technical Director will be final.
- c. The windscreen may be replaced.
- d. The ram-air intake must maintain the originally homologated shape and dimensions.
- e. The original air ducts running between the fairing to the air box may be altered or replaced from those fitted to the homologated motorcycle. Particle grilles or "wire-meshes" originally installed in the openings for the air ducts may be removed.
- f. The lower fairing has to be constructed to hold, in case of an engine breakdown, at least half of the total oil and engine coolant capacity used in the engine (min. 5 liters). The lower edge of openings in the fairing must be positioned at least 70 mm above the bottom of the fairing.
- g. There may not be exit air vents in the front half of the lower fairing 40mm below a horizontal centerline between the wheel axles of the machine. The Technical Director may give permission for the lower fairing to have additional vents added if vents have been fitted to meet this and the oil containment requirements.
- h. Any added vents will not allow the exit of air in the front half of the fairing lower if they are behind a water or oil radiator.
- i. Exceptions may be made to 2.4.10.11.f/g with the sole agreement of the Technical Director if a manufacturer produced an FIM approved close fitting, oil containing engine shroud and it is fitted in addition to the belly pan. In this case, OEM shaped air vents will be allowed in the front lower half of the fairing.
- j. Any vents in the fairing lower must have their inner surface leading edge in-line with the trailing edge or overlap to reduce the risk of liquid spraying from the machine.
- k. The lower fairing must incorporate one hole of 25 mm in the bottom of the front lower area. This hole must remain closed in dry conditions and must be opened only in wet race conditions, as declared by the race director.
- l. A feature may be built into the shape of the belly pan on its rear lower section. It may not extend around the tire. The maximum dimensions when viewed from below (normally z-minus axis) are 120mm front to rear and 200mm in width. The feature may project 30mm from the bottom of the original belly pan shape. The feature must have rounded edges and must not create a 'plough' action (for safety and to stop issues in the gravel traps). The only aerodynamic effect must be to redirect the airflow laterally around the rear tire. No downforce may be created. If there is any doubt about the aerodynamic effects then a CFD run of the whole machine (with rider) must be submitted to the Technical Director with and without the feature indicating the resultant forces. The Technical Director's decision on suitability is final.
- m. Minimal changes are allowed in the fairing to permit the use of an elevator (front

stand) for wheel changes and to add plastic protective cones to the frame or the engine.

- n. Holes may be drilled or cut in the fairing or bodywork to allow additional increased intake air to the oil cooler. Holes bigger than 10 mm must be covered with a particle grill or fine wire mesh. Grill/mesh must be painted to match the surrounding material.
- o. Original openings for cooling in the lateral fairing/bodywork sections may be partially closed only to accommodate sponsors' logos/lettering. Such modification shall be made using wire mesh or perforated plate(s). The material is free but the distance between all opening centers, circle centers and their diameters must be constant. Holes or perforations must have an open area ratio > 60%.
- p. If the upper fairing has a rear edge/section that returns to the frame, reducing airflow between the fairing and frame (or sealing the fairing to the frame), then slots/notches may be removed from that area only. No material can be removed from the lateral (side) surfaces of the fairing. A maximum of 50% of the rear face may be removed.
- q. A Gurney flap (lip/deflector) may be fitted at the edge of the lateral air vents or the rear edge of the fairing to increase vent effectiveness. The Gurney flap may project a maximum of four (4) mm from the lateral surface of the fairing and must have a rounded end. It should be formed from the same material and be a molded part of the fairing. The Technical Director's decision on suitability is final.
- r. The front fender must conform in principle to the homologated shape originally produced by the manufacturer.
- s. Holes may be drilled in the front mudguard to allow additional cooling. Holes bigger than 10 mm must be covered with metal gauze or fine mesh. Mesh must be painted to match the surrounding material.
- t. A rear fender may be added or removed.
- u. Material of construction of the front mudguard, rear mudguard and fairing is free.

#### **2.4.10.12 Seat**

- a. The seat may be altered or replaced from those fitted to the homologated motorcycle. The appearance from front, rear and profile must conform in principle to the homologated shape.
- b. The top portion of the rear body work around the seat may be modified to a solo seat.
- c. Holes may be drilled in the seat or rear cowl to allow additional cooling. Holes which are bigger than 10 mm must be covered with metal gauze or fine mesh. Mesh must be painted to match the surrounding material.
- d. Material of construction of the seat is free.
- e. All exposed edges must be rounded.

#### **2.4.10.13 Rear safety light**

All motorcycles must have a functioning red light mounted at the rear of the machine. This light must be switched on any time the motorcycle is on the track or being ridden in the pit lane and the session is declared WET. All lights must comply with the following:

- a. Lighting direction must be parallel to the machine center line (motorcycle running direction) and be clearly visible from the rear at least 15 degrees to both left and right sides of the machine center line.



- b. The rear light must be mounted near the end of the seat/rear bodywork and approximately on the machine center line, in a position approved by the Technical Director. In case of dispute over the mounting position or visibility, the decision of the Technical Director will be final.
- c. Power output/luminosity equivalent to approximately: 10 – 15 (incandescent), 0.6 – 1.8 W (LED).
- d. The output must be continuous, no flashing safety light is allowed while on track. Flashing is allowed in the pit lane when the pit limiter is active.
- e. The safety light power supply may be separated from the motorcycle.
- f. The Technical Director has the right to refuse any light system not satisfying this safety purpose.

**2.4.11 The following items MAY BE altered or replaced from those fitted to the homologated motorcycle.**

- a. Any type of lubrication, brake or suspension fluid may be used.
- b. Gaskets, seals and gasket material
- c. Bearings (ball, roller, taper, plain, etc.) of any type or brand may be used.
- d. Fasteners (nuts, bolts, screws, etc.) may be altered or replaced. Internal engine bolts must remain of standard homologated materials or materials of higher specific weight.
- e. Thread repair may be made using inserts of different material such as Helicoils and Timeserts.
- f. External surface finishes and decals

**2.4.12 The following items MAY BE removed**

- a. Instrument and instrument bracket and associated cables
- b. Tachometer
- c. Speedometer and associated wheel spacers
- d. Chain guard

**2.4.13 The following Items MUST BE removed**

- a. Headlamp, rear lamp and turn signal indicators (when not incorporated in the fairing). Openings must be covered by suitable materials.
- b. Rear-view mirrors
- c. Horn
- d. License plate bracket
- e. Tool box
- f. Helmet hooks and luggage carrier hooks
- g. Passenger foot rests
- h. Passenger grab rails
- i. Safety bars, center and side stand brackets welded to the main frame may be removed.

Provisional

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## 2.5 SUPERSPORT AND SUPERSPORT NEXT GENERATION TECHNICAL SPECIFICATIONS

The following rules are intended to give freedom to modify or replace some parts in the interest of safety, research and development and improved competition between various motorcycle concepts.

### **EVERYTHING THAT IS NOT AUTHORISED AND PRESCRIBED IN THIS RULE IS STRICTLY FORBIDDEN**

**If a change to a part or system is not specifically allowed in any of the following articles, then it is forbidden.**

Supersport motorcycles require the relevant FIM Phase 2 homologation (see Appendix FIM Homologation procedure). All machines must be normally aspirated. All motorcycles must comply in every respect with all the requirements for road racing as specified in these Technical Regulations unless they are already equipped as such on the homologated model.

Once a motorcycle has obtained the homologation, it may be used for racing in the corresponding class for a maximum period stated in (see Homologation art 1.4.4). Or until such time that the homologated motorcycle is disqualified by new rules or changes in the technical specifications of the corresponding class.

The appearance from the front, rear and the profile of Supersport motorcycles must (except when otherwise stated) conform in principle to the homologated shape (as originally produced by the manufacturer). The appearance of the exhaust system is excluded from this rule.

#### **2.5.1 Motorcycle specifications**

All parts and systems not specifically mentioned in the following articles must remain as originally produced by the manufacturer for the homologated motorcycle.

#### **2.5.2 Engine configurations and displacement capacities**

The following engine configurations comprise the Supersport class:

Over 400cc up to 600cc	4 stroke	4 cylinders
Over 500cc up to 675cc	4 stroke	3 cylinders
Over 600cc up to 750cc	4 stroke	2 cylinders

The displacement capacity bore and stroke must remain at the homologated size. Modifying the bore and stroke to reach class limits is not allowed.

Machines outside of these classifications will be considered upon application by the FIM and DWO. They must be equipped with a Ride by Wire throttle system (OEM or as part of a compulsory kit). If approved these machines will be known as Supersport Next Generation Machines. Manufacturers may resubmit currently homologated machines as Supersport Next Generation.

**2024: All machines must meet requirements of the Supersport Next Generation regulations**

### 2.5.3 Balancing various motorcycle concepts

In order to equalize the performance of motorcycles used in the Supersport Championship, A system of performance enhancements or restrictions 'balancing factors' may be applied – including but not limited to:

- Concession Parts
- Torque limited map with Rev Limit
- Minimum Weight
- Air restrictor
- Modifications

The eligible concession parts (and modifications) supersede all the following regulations (Supersport). The range of concession parts are decided by mutual agreement of SBK Commission. These agreed concession parts will be documented in the Eligible Parts for Competition.

The specification of Supersport Next Generation machines will be agreed between the machine manufacturer and the Technical Director. The specification will be published in the Eligible Parts for Competition List and will supersede all of the following regulations. The specification will be fixed for the entire season.

Balancing level will be continued between seasons.

#### 2.5.3.1 Balancing Calculation

- 1) The DWO algorithm will be used to analyse the performance of the machines relative to one another.
- 2) The algorithm may include but not be limited to the following signals:
  - a. Lap time relative to all other competitors
  - b. Speed traps
  - c. Number of riders per brand
  - d. Anticipated individual rider performance
    - i. Per track
    - ii. Considering preceding rounds
  - e. Race results
  - f. Laps led
  - g. Overall race time
  - h. Change in balance following any rpm limiter changes
  - i. Bias towards recent results reflecting current performance
  - j. Any concession part updates being applied
- 3) The balancing factors may be updated (according to Art. 2.5.3) at the end of every 3<sup>rd</sup> event provided at least 3 events remain in the season. The balance will be weighted to the data collected during the previous 6 events.

- 4) The primary method of balancing will be torque limited maps updated in increments of +- x %
- 5) The balancing factors may also be updated at the end of the season.
- 6) FIM/DWO/MotoAmerica reserves the right to update the balance at their discretion in the case of an imbalance.

### 2.5.3.2 Rev Limit

RPM Limit		
Brand	Type	Limit
Ducati Panigale V2*	2cy 955cc	11,xxx rpm
Honda CBR600RR	4cy 600cc	16,400 rpm
Kawasaki ZX-636R	4cy 600cc	16,xxx rpm
Kawasaki ZX-636R*	4cy 600cc	16,xxx rpm
MV Agusta F3	3cy 675cc	15,800 rpm
MV Agusta F3 800*	3cy 800cc	14,xxx rpm
MV Agusta F3 Superveloce*	3cy 800cc	14,xxx rpm
Suzuki GSX-R600	4cy 600cc	16,xxx rpm
Triumph Daytona 675R	3cy 675cc	15,500 rpm
Triumph ST765RS*	3cy 765cc	14,xxx rpm
Yamaha YZF-R6	4cy 600cc	16,xxx rpm

\*As Supersport Next Generation

### 2.5.4 Minimum weight

Brand	Bike Weight		Combined Minimum Bike and Rider Weight*
	Hard Minimum	Soft Maximum	
Ducati Panigale V2	161 kg	173 kg	242 kg
Honda CBR600RR	161 kg	173 kg	242 kg
Kawasaki ZX-636R	161 kg	173 kg	242 kg
MV Agusta F3	161 kg	173 kg	242 kg
MV Agusta F3 800	161 kg	173 kg	242 kg
MV Agusta Superveloce	161 kg	173 kg	242 kg
Suzuki GSX-R600	161 kg	173 kg	242 kg
Triumph Daytona 675R	161 kg	173 kg	242 kg
Triumph ST765RS	161 kg	173 kg	242 kg
Yamaha YZF-R6	161 kg	173 kg	242 kg

- a. Combined weight is the weight of the rider (in full racing equipment) and bike, as used on track.

- b. IF the bike has achieved or exceeded the 'Soft Maximum Weight' then the combined minimum weight does not need to be reached. The bike alone may never at any time be below the 'Hard Minimum Weight'.
- c. At any time during the event, the weight of the whole motorcycle (including the tank and its contents) must not be less than the minimum weight.
- d. There is no tolerance on the minimum weight of the motorcycle.
- e. During the final technical inspection at the end of the race, the selected motorcycles will be weighed in the condition they finished the race, and the established weight limit must be met in this condition. Nothing may be added to the motorcycle. This includes all fluids.
- f. During the practice and qualifying sessions, riders may be asked to submit their motorcycle to a weight control. In all cases the rider must comply with this request.
- g. The use of ballast is allowed to stay over the minimum weight limit and may be required due to the handicap system. The use of ballast and weight handicap must be declared to the Technical Director at the preliminary checks.

### 2.5.5 Numbers and number plates

The background colors and figures (numbers) for Supersport are a white background with blue numbers:

The sizes for all the front numbers are:	Minimum height:	140 mm
	Minimum width:	80 mm
	Minimum stroke:	25 mm
	Minimum space between numbers	10 mm

The sizes for all the side numbers are:	Minimum height:	120 mm
	Minimum width:	70 mm
	Minimum stroke:	20 mm
	Minimum space between numbers	10 mm

The allocated number (& plate) for the rider must be affixed on the motorcycle as follows:

- a. The numbers must use the design/font and precise colors prescribed by DWO in for the season (Industry Ultra Italic). The reigning World Champion if using the number one plate is excepted from this but the design must be approved by the Superbike Technical Director in advance.
- b. Only single or double digit numbers will be allowed.

- c. Once on the front, either in the center of the fairing or slightly off to one side. The number must be centered on the white background with no advertising within 25mm in all directions.
- d. Once on each side on the lower rear portion of the lower fairing. The number must be centered on the white background. Any change to this position must be pre-approved a minimum of 2 weeks before the first race by the SBK Technical Director.
- e. A single outline is permitted and the outline must be of a contrasting color and the maximum width of the outline is 3mm. The background color must be clearly visible around all edges of the number (including outline). Reflective or mirror type numbers are not permitted.
- f. Numbers cannot overlap.
- g. No machine may enter the circuit if it does not meet the above regulations. If the rider does enter the circuit then no lap times will be recorded and Race Direction will at their discretion black flag the rider.

In case of a dispute concerning the legibility of numbers, the decision of the FIM SBK Technical Director will be final.

#### **2.5.6 Fuel**

See article 2.8 for full Fuel regulations

#### **2.5.7 Tires**

- a. The maximum number of tires, of any type, available to each rider during the event will be specified in Article 2.3.7.1.
- b. A maximum of ten (10) tires per rider can be mounted at any time.
- c. For both Supersport races only, wet tires will not need to be marked with a tire sticker. They will not be considered in the total number of tires available for use; however, normal allocation limits still apply.
- d. During free practices, qualifying practices, warm-up sessions and races, front and rear tires are required to be marked with tire stickers.
- e. See article 2.3.7

#### **2.5.8 Engine**

**For Supersport Next Generation: No modifications may be made to the engine (all of 2.5.8 and 2.5.9) unless noted in the text or in the Eligible Parts for Competition List.**

**There is no limit to the number of engines that may be used. If the Technical Director wishes to inspect an engine at the current or future rounds then the engine may be sealed for future inspection. If the engine is not presented when arranged then all points that were earned by this engine will be removed from the rider, team and manufacturer standings.**

See Art. 2.3.9 for Sealing and Usage Details



Engines may be chosen and impounded for Dyno testing (during events, between events or after the season) on track or at an approved balancing facility for comparison to the reference engine (see homologation). One team representative may attend the test.

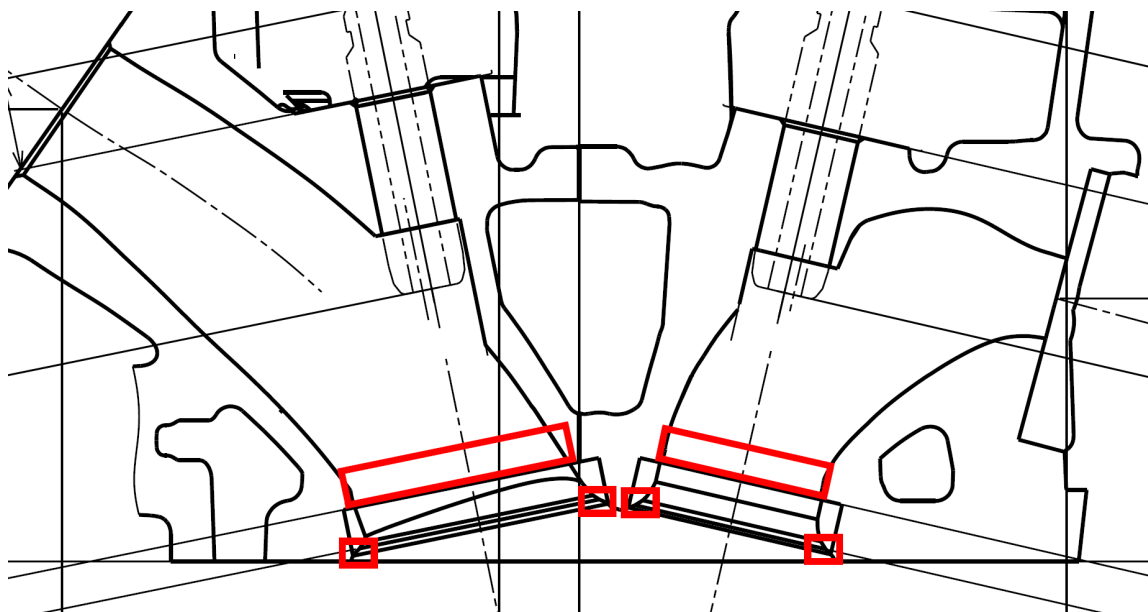
#### 2.5.8.1 Fuel injection system

- a. The original homologated fuel injection system must be used without any modification.
- b. The fuel injectors must be stock and unaltered from the original specification and manufacture.
- c. Air funnels (including their fixing points) may be altered or replaced. (See eligibility list)
- d. Butterflies cannot be changed or modified.
- e. Variable intake tract devices cannot be added if they are not present on the homologated motorcycle and they must remain identical and operate in the same way as the homologated system (excepting the air funnels). Variable intake tract devices may be replaced with fixed air funnels.
- f. Vacuum slides may be fixed in the open position.
- g. Secondary throttle valves and shafts may be removed or fixed in the open position and the
- h. Electronically controlled throttle valves, known as 'ride-by-wire', may be only used if the homologated model is equipped with the same system. Software may be modified but all the safety systems and procedures designed by the original manufacturer must be maintained.

#### 2.5.8.2 Cylinder head

Cylinder head must be the originally fitted and homologated part. The following modifications are allowed:

- i. Surface grinding of the cylinder head surface on the head gasket side
  - ii. Polishing of the combustion chamber
  - iii. Original valve seats must be used, but modifications are allowed to the shape in the valve contact area, but not to the internal diameter of the main seat material.
  - iv. The area 10mm into the intake and exhaust ports relative to the valve seat may be filled (with epoxy), machined and polished - to blend (align) the valve seat and the port. The work may not extend past this point nor modify the valve seat. (See diagram below)
  - v. Valve spring retainers may be replaced or modified, but their weight must be the same as, or higher than, the original ones.
  - vi. Valve springs may be changed
  - vii. The valves must remain as originally equipped and homologated.
  - viii. Rocker arms (if any) must remain as homologated.
  - ix. The shim buckets / tappets must remain as originally equipped and homologated.
- a. The exhaust air bleed system must be blocked and the external fittings on the cam cover(s) may be replaced by plates.
  - b. Compression ratio is free, but the combustion chamber may be modified only by taking material off.
  - c. The throttle body intake insulators may be modified to match to the inlet port shape.
  - d. It is forbidden to add any material to the cylinder head unless as described above.



### 2.5.8.3 Camshaft

- a. Camshaft may be altered or replaced from those fitted on the homologated motorcycle. **Only the originally homologated or the championship eligible concession camshafts from the Eligible Parts for Competition list may be used.**
- b. The method of drive must remain as homologated.
- c. The duration is free, the maximum lift must remain as homologated.
- d. The camshafts must be available from the concession parts supplier 30 days before start of 2022 season opener. The price limit is €1000 per camshaft in an inline 3 or 4 cylinder engine and €650 per camshaft in a V engine.

### 2.5.8.4 Cam sprockets or cam gears

- a. Cam sprockets or cam gears may be modified or replaced to allow the degreeing of camshafts.
- b. The cam-chain/cam-belt tensioning device(s) can be changed or modified.

### 2.5.8.5 Cylinders

- a. Cylinders must be the originally fitted and homologated parts with only the following modification allowed.
  - i. Cylinder head gasket surface may be machined to allow the adjustment of compression ratio or resurfacing to repair a warped cylinder surface deck.
- b. The surface finish of the cylinder bore must remain as homologated.

### 2.5.8.6 Pistons

- a. Pistons must be the originally fitted and homologated parts with no modification allowed.
- b. Polishing and lightening is not allowed.

#### **2.5.8.7 Piston rings**

- a. Piston rings must be the originally fitted and homologated parts with no modification allowed.
- b. All piston rings must be fitted.

#### **2.5.8.8 Piston pins and clips**

- a. Piston pins and clips must be the originally fitted and homologated parts with no modification allowed.

#### **2.5.8.9 Connecting rods**

- a. Connecting rod assembly must be the originally fitted and homologated parts with no modification allowed.

#### **2.5.8.10 Crankshaft**

- a. Crankshaft must be the originally fitted and homologated parts with no modification allowed.
- b. Polishing and lightening is not allowed.
- c. Modifications of the flywheels are not allowed.

#### **2.5.8.11 Crankcase / Gearbox housing**

- a. Crankcases must be the originally fitted and homologated parts with no modification allowed.
- b. It is not allowed to add a pump used to create a vacuum in the crankcase. If a vacuum pump is installed on the homologated motorcycle then it may be used only as homologated.
- c. One thread may be altered or created to allow for oil pressure/temperature measurement. The sensor must be positioned so it cannot sustain impact in the case of a crash.

#### **2.5.8.11.1 Lateral covers and protection (including Supersport NG)**

- a. Lateral (side) covers may be altered, modified or replaced. If altered or modified, the cover must have at least the same resistance to impact as the original one. If replaced, the cover must be made in material of same or higher specific weight and the total weight of the cover must not be less than the original one.
- b. Titanium bolts may be used to fasten lateral covers.
- c. Oil containing engine covers cannot be secured with aluminum bolts.
- d. All lateral covers/engine cases containing oil and which could be in contact with the ground during a crash, must be protected by a second cover made from metal, such as aluminum alloy, stainless steel or steel or titanium, composite covers are not permitted.

- e. The secondary cover must cover a minimum of 1/3 of the original cover. It must have no sharp edges to damage the track surface.
- f. Plates or crash bars from aluminum or steel also are permitted in addition to these covers. All these devices must be designed to be resistant against sudden shocks, abrasions and crash damage.
- g. Covers from the Eligible Parts for Competition – List 2022 will be permitted without regard of the material or dimensions.
- h. These covers must be fixed properly and securely with a minimum of three (3) with case cover screws that also mount the original covers/engine cases to the crankcases.
- i. Oil containing engine covers cannot be secured with aluminum bolts.
- j. The Technical Director has the right to refuse any cover not satisfying this safety purpose.

#### **2.5.8.12 Transmission / Gearbox**

- a. Stock transmission shafts and gear set must be the originally fitted and homologated part. Shimming is allowed.
- b. Quick-shift systems are allowed (including wire and potentiometer).
- c. Countershaft sprocket, rear wheel sprocket, chain pitch and size may be changed.
- d. The sprocket cover may be modified or eliminated.
- e. If it is not incorporated in the rear fender, the chain guard may be removed.

#### **2.5.8.13 Clutch (including Supersport NG)**

- a. Clutch system (wet or dry type) and the method of operation (by cable or hydraulic) must remain as homologated.
- b. Friction and drive discs may be changed.
- c. Clutch springs may be changed.
- d. The clutch basket (outer) must be the originally fitted and homologated part but may be reinforced.
- e. The original clutch inner assembly may be modified or replaced by an aftermarket clutch, also including back torque limiting capabilities (slipper type).
- f. No power source (i.e. hydraulic or electric) can be used for gear selection, if not installed in the homologated model for road use. Human power is excluded from the ban.

#### **2.5.8.14 Oil pumps, water pumps and oil lines**

- a. The originally fitted and homologated oil pump may be modified but oil pump housing, mounting points and oil feed points must remain as original.
- b. Oil lines may be modified or replaced. Oil lines containing positive pressure, if replaced, must be of braided reinforced construction with swaged or threaded connectors.  
**(Including Supersport NG)**

#### **2.5.8.15 Cooling System (including Supersport NG)**

- a. The only liquid engine coolants permitted will be water.
- b. The water pump must remain as homologated.

- c. The radiator may be changed with an aftermarket radiator, or an additional radiator added that fits in the standard location and does not require any modifications to the main frame or to the fairings' outer appearance.
- d. Modifications to the homologated oil-cooler are allowed only **if** they do not require any modifications to the main frame or to the fairings' outer appearance. A heat exchanger (oil/water) may be replaced with an oil-cooler.
- e. The cooling system hoses and catch tanks may be changed.
- f. Radiator fan and wiring may be changed, modified or removed.
- g. Additional oil coolers are not allowed.
- h. The oil cooler must not be mounted on or above the rear mudguard.

#### **2.5.8.16 Airbox**

- a. The airbox must be the originally fitted and homologated part with no modification allowed.
- b. The air filter element may be removed or replaced.
- c. The airbox drains must be sealed.
- d. All motorcycles must have a closed breather system. All oil breather lines must be connected, may pass through an oil catch tank and must exclusively discharge in the airbox. Only the original breather vents may be used.
- e. No heat protection may be attached to the airbox.

#### **2.5.8.17 Fuel supply**

- a. Fuel pump and fuel pressure regulator must be the originally fitted and homologated parts with no modification allowed.
- b. The fuel pressure must be as homologated.
- c. Fuel lines from the fuel tank up to the injectors (fuel hoses, delivery pipe assembly, joints, clamps, fuel canister) may be replaced and must be located in such a way that they are protected from crash damage.
- d. **Fuel level sensors may be removed.**
- e. Quick connectors or dry break connectors may be used.
- f. Fuel vent lines may be replaced.
- g. Fuel filters may be added.

#### **2.5.8.18 Exhaust system (including Supersport NG)**

- a. Exhaust pipes, silencers and exhaust mounts may be altered or replaced from those fitted on the homologated motorcycle. Catalytic converters must be removed.
- b. The number of final exhaust silencer(s) must remain as homologated. The silencer(s) must be on the same side(s) as on the homologated model.
- c. For safety reasons, the exposed edge(s) of the exhaust pipe(s) outlet(s) must be rounded to avoid any sharp edges.
- d. Wrapping of exhaust systems is not allowed except in the area of the rider's foot or an area in contact with the fairing for protection from heat.
- e. The noise limit for Supersport will be 107 dB/A (with a 3 dB/A tolerance after the race only).

- f. Supersport Next Generation machines will have limitations on the exhaust specification defined at the time of the balance test and specified in the Eligible Parts list for Competition.

## 2.5.9 Electrics and electronics (including Supersport NG)

The complete electronics system must be either:

### For 2022:

- i. National series' current kit or OEM electronics See art 2.5.9.1
- ii. Next generation Supersport Control Electronics System. See art 2.5.9.2

### For 2024:

- i. Next generation Supersport Control Electronics System. See art 2.5.9.2

### 2.5.9.1 If using a kit or OEM system: (Current Homologations until 2024)

- a. The system may have FIM/DWO/MotoAmerica approved external ignition and/or injection module(s) added.
- b. The total combined retail price (software and tuning tools included) on sale to the general public cannot be higher than €2500 (tax excluded).
- c. Central unit (ECU) may be relocated.
- d. Optional equipment sold by the motorcycle manufacturer for the homologated model is considered not homologated with the bike and must follow the requirements for approved electronics/data loggers.
- e. During an event, the Technical Director has the right to ask a team to substitute their ECU or external module with the sample received from the manufacturer. The change must be done before Sunday warm-up.
- f. No extra sensors may be added for control strategies except shift rod sensors, wheel speed sensors and lambda sensors. Wheel speed sensors must be included in the kit ECU and harness package if required.
- g. Other additional electronic hardware equipment not on the original homologated motorcycle cannot be added with the exceptions noted below.
- h. The characteristics of approved data logging systems must be the following:
  - i. Maximum retail price of the unit (hardware + software, excluding sensors and wiring harness) cannot exceed €3000 (VAT excluded) if it is a standalone unit.
  - ii. The data logger unit must be available for sale to the public and on the list of FIM/DWO/MotoAmerica approved data loggers.
  - iii. A maximum of seven (7) simultaneously working sensors (connected to the additional data logger) may be added to the original sensors on the motorcycle.
  - iv. The sensors must be simple function.

- v. Approved data loggers with internal inertial platforms (IMU or gyros) may be used for data collection but may not be used for control strategy. Also see 2.5.9.1/i./vii.
- vi. Type of sensor is free.
- vii. Communication from the ECU to an approved data logger (logger can receive data only; no data transmission is allowed) is allowed without any limitation in  
CAN channel logger number.
- i. The maximum total price of other active/control/calculation units such as lambda driver modules, quick shifter, analogue to CAN, air bleed control and traction control units is €750. These devices must be approved by FIM/DWO/MotoAmerica.
- j. The addition of a device for infra-red (IR) transmission of a signal between the racing rider and his team, used exclusively for lap timing, is allowed and considered in the seven (7) sensors.
- k. The addition of a GPS unit for lap timing/scoring purposes is allowed and considered in the seven (7) sensors.
- l. Telemetry is not allowed.
- m. No remote or wireless connection to the bike for any data exchange or setting is allowed whilst the engine is running, or the bike is moving.
- n. Harness:
  - i. The main wiring harness may be replaced by the kit wire harness as supplied for the kit ECU model that is produced and/or approved by the manufacturer of the motorcycle and by FIM/DWO/MotoAmerica. The kit wiring harness may incorporate the data logging harness.
  - ii. A kit harness that incorporates the data logging harness may only accommodate seven (7) additional sensors.
  - iii. A sample of the kit wiring harness may be requested by the FIM/MotoAmerica.
  - iv. The key/ignition lock may be relocated, replaced or removed.
  - v. Cutting of the original main wiring harness is allowed.
- o. Data logger harness:
  - i. The data logger wire harness cannot include any other sensors with the exception of the seven (7) sensors that are allowed. The only function of the approved data logger wire harness is to connect the seven (7) sensors to the data logger, to transmit the data and supply the power.
- p. For the Superstock kit to be approved, samples of the ECU kits, kit harnesses and external modules with their tuning tools must be sent by the manufacturers to the MotoAmerica Technical Director with technical data and selling price.
- q. For the ignition and/or injection module, quick shifter or stand-alone data

logger to be approved, samples must be sent by the manufacturer of the device to the MotoAmerica Technical Director with technical data and selling price.

- r. The original speedometer and tachometer may be altered or replaced (see also 2.5.11).
- s. Electric cables, connectors, battery and switches are free
- t. Spark plugs, plug caps, coils and wires may be replaced.

#### **2.5.9.2 If using the FIM approved ECU: (All Supersport next generation)**

- a. The ECU must be the Supersport 600 control ECU – the Mectronik MKE7 (part number WSS600\_A). The sole official supplier of the ECU is Solo Engineering. [www.soloengineering.com](http://www.soloengineering.com), [sales@solengineering.com](mailto:sales@solengineering.com)
- b. The firmware and manufacturer (engine) map must be declared eligible by the championship and from the Eligible Parts for Competition – List 2022

#### **2.5.9.3 Electrics and electronics ECU (All Supersport Next Generation)**

- a. The ECU/Dashboard must be the Supersport control ECU and dashboard - Sole official supplier of the ECU is Solo Engineering. [www.soloengineering.com](http://www.soloengineering.com), [sales@solengineering.com](mailto:sales@solengineering.com)
- b. The firmware and manufacturer (engine) map must be declared eligible by the championship and from the Eligible Parts for Competition – List 2022.
- c. The ECU must have the 'FIM Settings' section up to date at all times – it is the team's responsibility to ensure that this is done.
- d. External quickshift modules/sensors may be fitted but may only provide a signal to the Control Supersport ECU
- e. No other external modules may be fitted except:
  - a. Part of a quickshifter where the module may only provide a signal to the control ECU.
  - b. Championship mandated devices (e.g. 2 way RF system).
  - c. Datalogger.
- f. 2 CAN connections must be made available for Championship devices. One must be located in the rear of the seat unit of the bike. They must be connected to the ECU CAN bus and the TPMS system (if fitted) must be connected to the same bus. 12v power should be available switched by the main switch (not switched by the ignition switch). The devices may be championship mandated or nominated by the Technical Director.
- g. The ECU may be freely located but must be fitted securely, in a damped mounting without vibration.
- h. During an event the Technical Director has the right to ask a team to substitute their ECU. The change has to be done before Sunday warm up.
- i. During an event the Technical Director or his appointed deputy has the right to read and save the teams calibration file, it will not be shared except for conformity checks with control electronics system partners but may be used in Dyno tests.



- j. The following sensors must be connected directly to the ECU only **and must be the original OEM sensors unless stated**.
- a. Throttle position (multiple allowed)
  - b. Map sensor, Map Sync (pressure sensor on the intake port used to synchronize the engine during the start)
  - c. Airbox Pressure
  - d. Engine pick-ups (Cam, crank)
  - e. Twist grip position
  - f. Front Speed **(add only if not available OEM)**
  - g. Rear Speed **(add only if not available OEM)**
  - h. Gearbox output shaft speed (if on OEM machine)
  - i. Gear position
  - j. Air pressure
  - k. Water temperature
  - l. Air temperature
  - m. Tip-Over Switch (No lean angle – **except from ECU**) (all ECU's feature crash detection **(by IMU)**).

**The following can be added (and not OEM sensors)**

- n. Gear shift load cell / switch (Non-OEM parts must be from the Eligible Parts for Competition – List 2021 (Shift controlled by ECU only)
- o. Lambda - Bosch LSU4.9 only (one sensor only).
- p. Fork position
- q. Shock position
- r. Front brake pressure
- s. Rear brake pressure
- t. Fuel pressure (not temperature)
- u. Oil pressure
- v. Oil temperature
- w. Switches (Left and right)
- x. Rear TPMS Monitor (Temperature and Pressure, **must be CAN**)\*
- y. Front TPMS Monitor (Temperature and Pressure, **must be CAN**)\*

**\* The OEM phonic/speed sensor rings must be used (ZX636)**

**\* Must be from the Eligible Parts for Competition – List 2022**

- k. The data logger must be from the Eligible Parts for Competition – List 2022 (Data Logger list). The characteristics of eligible data logging systems must be the following:
- a. Maximum retail price of the unit (hardware + software, excluding sensors and wiring harness) cannot exceed €3.000 Euro (VAT excluded) unit. The 'unit' may consist of multiple parts, input module, recording module etc.
  - b. The Data Logger unit must be available for sale to the public.
  - c. The data logger may **ONLY** be connected to the CAN bus and to those sensors listed in section 2.5.9.1.k.
- l. Only the following may be connected directly to the logging system.
- a. GPS Unit (Lap timing and track position)
  - b. Transponder / Lap time signal

- c. Rear tyre temperature (Infra-Red)(External)(Maximum 3)
- d. Any exceptions noted in Eligible Parts for Competition List.
- m. Telemetry is not allowed.
- n. No remote or wireless connection to the bike for any data exchange or setting is allowed while the engine is running or the bike is moving.
- o. All shift lights must be only 'White'.
- p. Plug caps and coils must remain as homologated.
- q. Electric cables, harness, connectors, battery and switches are free but the harness must comply with the wiring schematic that is available from [www.soloengineering.com](http://www.soloengineering.com).
- r. Spark plugs and wires may be replaced

#### 2.5.9.4 Generator, alternator, electric starter (including Supersport NG)

- a. The generator (ACG) must be the originally fitted and homologated part with no modification allowed.
- b. The stator must be fitted in its original position and without offsetting.
- c. The electric starter must operate normally and always be able to start the engine during the event.
- d. During parc fermé the starter must crank the engine at a suitable speed for starting for a minimum of 2 seconds without the use a boost battery. No boost battery may be connected to the machine after the end of the session.

#### 2.5.10 Main frame and pre-assembled spare frame

- a. During the entire duration of the event, each rider can only use one (1) complete motorcycle, as presented for technical control, with the frame clearly identified with a seal.
- b. In case the frame needs to be replaced, the rider or the team can request the use of a spare frame to the Technical Director.
- c. The pre-assembled spare frame must be presented to the Technical Director to receive the permission to rebuild the motorcycle. The pre-assembly of the frame shall be strictly limited to:
  - i. Main frame and swing-arm
  - ii. Bearings (steering pipe, swing arm, etc.)
  - iii. Rider controls (handlebars, rear sets, shift/brake linkage), front and rear mud guard.
  - iv. Rear suspension linkage and shock absorber
  - v. Upper and lower triple clamps, front forks, braking system and wheels.
  - vi. Wiring harness, ECU, dash associated electronics, throttles, airbox and associated cables.
- d. The spare frame will not be allowed in the pit box before the rider or the team has

received authorization from the Technical Director.

- e. The motorcycle, once rebuilt, must be inspected before its use by the technical stewards for safety checks and a new seal will be placed on the motorcycle frame.
- f. No complete spare machine may be at the track. If found, penalties will be applied. For the remainder of the event, the machine will be impounded, and no part of that machine may be used for spare parts.

### **Explanation of Procedures**

Only one (1) complete motorcycle may be presented for the preliminary technical checks and it will be the only motorcycle allowed on the track and in the pit box during the practices, qualifying, warm-up and race.

The frame of this motorcycle will be officially sealed by the Technical Director or by his appointed staff. The seal will bear a serial number, which will be recorded. Any attempt made to remove the seal will damage it irreparably.

At any time during the event the technical stewards, under the direction of the Technical Director, may check the seal and verify that it conforms to the motorcycle and rider it was assigned to. For cross reference, every frame must have a unique number punched on it, preferably on the steering-head.

If the motorcycle is damaged in a crash or in any other incident, it is permitted to use the pre-assembled spare frame to rebuild the motorcycle.

The spare frame may be pre-assembled with the following items: main frame assembly, swing-arm, rider controls, rear suspension linkage, shock-absorber, steering head bearings, upper and lower triple clamps, front forks braking system, wheels, wiring harness, dash, ECU, associated electronics, throttles, airbox, front and rear mud guards.

When a team decides that a crashed or damaged motorcycle requires a change of frame, the team must inform the Technical Director. Only at this point may the pre-assembled spare frame be brought into the pit box.

Parts may be transferred from the damaged motorcycle for the assembly of the replacement motorcycle.

Once the assembly of the replacement motorcycle is completed, it will then undergo technical and safety checks and it will be officially sealed. The seal on the damaged motorcycle will be destroyed by the technical staff and the chassis of this motorcycle must not be used for the remainder of the event. The new serial number will be recorded by the Technical Director.

The replacement motorcycle may be used on the track only after the end of the practice and qualifying sessions or race in which the damage occurred. The damaged motorcycle must be removed from the pit box as soon as possible and put in storage outside the pit box.

After the pre-assembled spare part frame has been used, should it become necessary to replace the frame again because of a further crash or damage, the assembly work must be done using a bare frame with no components attached. The Technical Director must inspect the bare frame and give his approval before work can start.

Any actions contrary to these procedures will result in a penalty as described in the sporting regulations.

#### 2.5.10.1 Frame body and sub-frames

- a. The frame must be the originally fitted and homologated part with no modification allowed.
- b. Holes may be drilled on the frame only to fix approved components (i.e. fairing brackets, steering damper mount, sensors).
- c. The sides of the frame-body may be covered by a protective part made of a composite material. These protectors must fit the form of the frame.
- d. Crash protectors may be fitted to the frame using existing points (max. length: 50 mm) or pressed into the ends of the wheel axles (max. length: 30mm). Without exception, the wheel axles cannot be modified.
- e. Nothing else may be added or removed from the frame body.
- f. All motorcycles must display a vehicle identification number punched on the frame body.
- g. Engine mounting brackets or plates must remain as originally produced by the manufacturer for the homologated motorcycle.
- h. Front sub frame / fairing mount may be changed or altered, **the material is free.**
- i. Rear sub frame may be changed or altered. **The material must be metal, no composites are allowed.**
- j. Additional seat brackets may be added, non-stressed protruding brackets may be removed if they do not affect the safety of the construction or assembly. Bolt-on accessories to the rear sub-frame may be removed.
- k. The paint scheme is not restricted but polishing the frame body or sub-frame is not allowed.

#### 2.5.10.2 Suspension - General

- a. Participants in the Supersport class must only use units from the Eligible Parts for Competition – List 2022.  
The price limits are:
  - a. Fork: For the fork kit, including all parts such as but not limited to cartridge, springs (1 set), adjusters, fork caps, blanking inserts, seals, bushes but excepting oil and fitting the price limit is €2200 excluding tax
  - b. Shock Absorber/RCU: For the complete shock absorber / RCU including but not limited to spring (1 of), pre-load adjuster and length/ride height adjuster the price limit is €2000 excluding tax
- b. The eligible products from the suspension manufacturers must be available to all participants at least one month before the first round of the MotoAmerica season and remain available all season. The products must be available within 6 weeks of a confirmed order.
- c. Setting parts and tuning parts must be provided by the suspension manufacturers to all customers/ teams/ participants using the manufacturer's products. These parts can be used by all participants during the season. These parts shall be available for immediate delivery to all teams/customers.

- d. Teams may not modify any part of the forks or shock absorber; all setting parts must be supplied by the Suspension manufacturer and available to all teams/riders.
- e. The suspension manufacturers are allowed to offer service contracts when the team is using the eligible suspension products. The suspension manufacturers cannot demand a service contract for a customer or participant in order to obtain a suspension product.
  - i. No aftermarket or prototype electronically-controlled suspensions may be used. Electronically-controlled suspension may only be used if already present on the production model of the homologated motorcycle.
  - ii. The electronically-controlled valves must remain as homologated. The shims, spacers and fork/shock springs not connected with these valves can be changed.
  - iii. The ECU for the electronic suspension must remain as homologated and cannot receive any motorcycle track position or sector information; the suspension cannot be adjusted relative to track position.
  - iv. The electronic interface between the rider and the suspension must remain as on the homologated motorcycle. It is allowed to remove or disable this rider interface.
  - v. The original suspension system must work safely in the event of an electronic failure.
  - vi. Electro-magnetic fluid systems which change the viscosity of the suspension fluid(s) during operation are not permitted.
- f. Electronic controlled steering damper cannot be used if not installed in the homologated model for road use. However, it must be completely standard (any mechanical or electronic part must remain as homologated).

### 2.5.10.3 Front suspension

- a. Forks must be the originally fitted and homologated parts with the following modifications allowed:
- b. Original internal parts of the homologated forks may be modified or changed.
- c. Only aftermarket damper kits or valves from the Eligible Parts for Competition – List 2022 may be installed (2.5.10.2.a)
- d. Fork springs may be modified or replaced.
- e. Fork caps may be modified or replaced to allow external adjustment.
- f. **The fork kit manufacturer will be wholly responsible for ensuring the safe operation of the fork.**
- g. Dust seals may be modified, changed or removed if the fork is totally oil-sealed.
- h. The original surface finish of the fork tubes (stanchions, fork pipes) may be changed. Additional surface treatments are allowed.
- i. The front fender mounts integrated in the fork lower may be modified or removed and replaced.
- j. The axle bore in the fork lower cannot be modified. The front axle nut/sleeve may be added or modified and/or made captive.
- k. The upper and lower fork clamps (triple clamp, fork bridges) must remain as originally produced by the manufacturer on the homologated motorcycle.
- l. A steering damper may be added or replaced with an aftermarket damper.
- m. The steering damper cannot act as a steering lock limiting device.

### 2.5.10.4 Rear fork (swing-arm)

- a. The rear fork must be the originally fitted and homologated part with no modification allowed.
- b. Rear fork pivot bolt must be the originally fitted and homologated part with no modification allowed.
- c. Rear axle chain adjuster may be modified or changed. The wheel axle nut may be replaced and/or made captive.
- d. Rear axle chain adjuster slot may be enlarged to allow the brake caliper mounting to become captive.
- e. A solid protective cover (shark fin) shall be fixed to the swing-arm, and must always cover the opening between the lower chain run, swingarm and the rear wheel sprocket, irrespective of the position of the rear wheel.
- f. Rear wheel stand brackets may be added to the rear fork by welding or by bolts. Brackets must have rounded edges (with a large radius). Fastening screws must be recessed. An anchorage system or point(s) to keep the original rear brake caliper in place may be added to the rear swing-arm.
- g. Wheel support rails/guides may be added to permit quick wheel changes.
- h. The sides of the swing-arm may be protected by a thin vinyl cover only, no composite or structural covers are allowed.

#### **2.5.10.5 Rear suspension unit**

- a. Rear suspension unit (shock absorber) may be replaced with a unit from the Eligible Parts for Competition – List 2021 (see 2.5.10.2.b).
- b. The original attachment points to the frame and rear fork (or linkage) must be as homologated.
- c. All the rear suspension linkage parts must be the originally fitted and homologated parts with no modification allowed.
- d. Removable top shock mounts must remain as homologated. A nut may be made captive on the top shock mount and shim spacers may be fitted behind it.

#### **2.5.10.6 Wheels**

- a. Wheels must be the originally fitted and homologated parts with no modification allowed.
- b. The wheels may be overpainted but the original finish cannot be removed.
- c. A non-slip coating / treatment may be applied to the bead area of the rim.
- d. If the original design included a cushion drive for the rear wheel, it must be the originally fitted and homologated parts with no modification allowed.
- e. Wheel axles may be modified or replaced but must be of the same material as the originally homologated part. The shank section of the axle must remain the same diameter as the originally homologated axle but the threaded area may be reduced in diameter.
- f. Wheel spacers can be modified or replaced.
- g. Bearing spacers are free.
- h. Wheel balance weights may be discarded, changed or added to.
- i. Aluminum or steel inflation valves are compulsory.
- j. **The only allowed rim sizes are:**

**Wheels Size**

Front	3.5"
Rear	5.5"

In the case the machine is not fitted with the aforementioned sizes, a single alternative wheel will be agreed between the manufacture and the Superbike Technical Director. It should be an OEM type production wheel. The inertia must be within 10% of the originally fitted wheel. The inertia must be within the range of homologated wheels in the other machines.

### 2.5.10.7 Brakes

- a. Front and rear brake discs may be replaced with aftermarket brake discs that must fit the original calliper and mounting. **The maximum outside diameter is 320mm.** However, the offset, wheel mounting and the ventilation system must remain the same as on the homologated motorcycle. Internally ventilated discs are not allowed if not present on the homologated motorcycle.
- b. Only Steel (max. carbon content 2.1 wt%) is allowed for replacement brake discs.
- c. Front brake calipers as well as all the mounting points and mounting hardware (mount, carrier, hanger) must be the originally fitted and homologated parts with no modification allowed. (see Art. 2.5.10.3). Spacers may be fitted between the caliper and fork lower to fit larger diameter discs.
- d. Rear brake calipers must be the originally fitted and homologated parts with no modification allowed. The mounting points must remain as homologated
- e. In order to reduce the transfer of heat to the hydraulic fluid it is permitted to add metallic-shims to the calipers, between the pads and the calipers, and/or to replace light alloy pistons with steel pistons made by the same manufacturer of the caliper.
- f. The front brake master cylinder **can** be the originally fitted and homologated part with no modification allowed **or may be replaced with a unit from the Eligible Parts for Competition. The retail price limit for the front master cylinder (including lever) is €450. The brake lever design is free.**
- g. The rear brake master cylinder **can** be the originally fitted and homologated parts with no modification allowed **or may be replaced with a unit from the Eligible Parts for Competition – List 2022. The retail price limits are:**
  - a. Thumb brake (including lever and mounts) €450
  - b. Hand brake €450
  - c. Foot operate master €140

The use of thumb or hand brakes is allowed in addition to or instead of the foot operated system. An adaptor may be fitted to the reservoir input of the OEM master cylinder to facilitate this.
- h. Front and rear hydraulic brake lines may be changed. The brake fluid reservoir may be replaced and/or repositioned. Quick connectors may be used. The split of the front brake lines for both front brake callipers must be made above the lower edge of the fork bridge (lower triple clamp). Brake line hose fittings (including banjo bolts) can only be Steel or Titanium.
- i. Front and rear brake pads may be changed. Brake pad locking pins may be modified for quick change type.
- j. Additional air ducts are not allowed.

- k. The ABS System must be removed.
- l. Motorcycles must be equipped with brake lever protection, intended to protect the handlebar brake lever from being accidentally activated in case of collision with another motorcycle. Composite guards are not permitted. Guards from the Eligible Parts for Competition – List 2022 will be permitted without regard to the material. The Technical Director has the right to refuse any guard not satisfying this safety purpose.

#### **2.5.10.8 Handlebars and hand controls**

- a. Handlebars may be replaced
- b. Handlebars and hand controls may be **replaced and** relocated.
- c. Throttle controls must be self-closing when not held by the hand.
- d. Throttle assembly and associated cables may be modified or replaced but the connection to the throttle body and to the throttle controls must remain as on the homologated motorcycle.
- e. Cable operated throttles (grip assembly) must be equipped with both an opening and a closing cable including when actuating a remote drive by wire grip/demand sensor.
- f. Clutch **assembly** and brake lever may be replaced with an after-market model. An adjuster to the brake lever is allowed.
- g. Switches may be changed but the electric starter switch and engine stop switch must be located on the handlebars.
- h. Motorcycles must be equipped with a functional ignition kill switch or button mounted on the right hand handlebar (within reach of the hand while on the hand grips) that is capable of stopping a running engine. The button or switch must be red.

#### **2.5.10.9 Foot rest and foot controls**

- a. Foot rests, hangers/brackets and hardware may be replaced and relocated but the hangers/brackets must be mounted to their original frame mounting points.
- b. Foot controls; gear shift must remain operated manually by foot.
- c. Foot rests may be rigidly mounted or a folding type which must incorporate a device to return them to the normal position.
- d. The end of the foot rest must have at least an 8 mm solid spherical radius. (see diagram A & C).
- e. Non folding footrests must have an end (plug) which is permanently fixed, made of aluminum, plastic, Teflon® or an equivalent type of material (minimum radius 8mm). The plug surface must be designed to reach the widest possible area. The SBK Technical Director has the right to refuse any plug not satisfying this safety purpose.

#### **2.5.10.10 Fuel tank**

- a. Fuel tank must be the originally fitted and homologated parts with no modification allowed.
- b. All fuel tanks must be completely filled with fire retardant material (open-celled mesh, i.e. "Explosafe®").
- c. Fuel tanks with tank breather pipes must be fitted with non-return valves that discharge into a catch tank with a minimum volume of 250 cc made of a suitable material.
- d. Fuel caps may be changed. Fuel caps when closed, must be leak proof. Additionally, they must be securely locked to prevent accidental opening at any time.



- e. A rider spacer/pad may be fitted to the rear of the tank with non-permanent adhesive. It may be constructed of foam padding or composite material.
- f. The tank may not have a cover fitted over it unless the homologated machine also features a full cover.
- g. The sides of the fuel tank may be protected with a cover made of a composite material. These covers must fit the shape of the fuel tank.
- h. Fuel tank may have heat reflective sheet attached to its bottom surface.

#### 2.5.10.11 Fairing / Bodywork

- a. Fairing, mudguards and body work must conform in principle to the homologated shape as originally produced by the manufacturer. The use of carbon fibre or Kevlar® materials is not allowed in fairing, fuel tank cover, seat, seat base and associated bodywork construction. Specific reinforcements in Kevlar® or carbon are allowed locally around holes and stressed areas. Headlights must be included even when considered external.
- b. For all bodywork paint and decal design is free.
- c. The fairing has a tolerance of +/-10mm from the original homologated road fairing, respecting the design and features of the homologated fairing and any articles below. The overall width of the frontal area may be +10mm maximum. The decision of the Technical Director is final.
- d. For Supersport Next Generation - The fairing has a tolerance of +/-8mm from the original homologated road fairing, respecting the design and features of the homologated fairing and any articles below. The overall width of the frontal area may be +5mm maximum. The decision of the Technical Director is final.
- e. Wind screen may be replaced.
- f. Fairing brackets may be altered or replaced.
- g. The ram-air intake must maintain the originally homologated shape and dimensions.
- h. For Supersport: The original air ducts running between the fairing and the airbox may be altered or replaced. Particle grilles or “wire-meshes” originally installed in the openings for the air ducts may be removed. Air ducts cannot be added if they are not present on the original machine.
- i. For Supersport Next Generation: The original air ducts running between the fairing and the airbox may be replaced by exact cosmetic replicas of the original parts. Particle grilles or “wire-meshes” originally installed in the openings for the air ducts may be removed. Flap valves systems may be removed. Air ducts cannot be added if they are not present on the original machine.
- j. The lower fairing has to be constructed to hold, in case of an engine breakdown, at least half of the total oil and engine coolant capacity used in the engine (min. 5 liters). The lower edge of openings in the fairing must be positioned at least 50 mm above the bottom of the fairing.
- k. The lower fairing must incorporate one hole of 25 mm in the bottom of the front lower area. This hole must remain closed in dry conditions and must be opened only in wet race conditions, as declared by the Race Director.
- l. Minimal changes are allowed in the fairing to allow clearance for protective engine covers.
- m. Motorcycles may be equipped with a radiator shroud to improve the air stream towards the radiator but the appearance of the front, the rear and the profile of the motorcycle must not be changed.

- n. Front mudguard must conform in principle to the homologated shape originally produced by the manufacturer. Front mudguards may be replaced and the use of carbon fibre or Kevlar® composites are allowed.
- o. Front mudguard may be spaced upward for increased tire clearance.
- p. Rear hugger type mudguards fixed on the swing-arm may be replaced with a cosmetic duplicates of the original part. The use of carbon fibre or Kevlar® composites are allowed.
- q. The chain guard may be removed as long as it is not incorporated in the rear hugger. If the chain guard is incorporated in the hugger then the chain guard section may be removed or modified to accommodate larger diameter rear sprockets.
- r. The chain guard may be removed as long as it is not incorporated in the rear fender.
- s. The existing rear mudguard under the seat may be removed.
- t. The exact appearance, shape, size and location of the front headlights of the homologated motorcycle must be respected, and should be obtained by applying a plastic or metallic film on the front of the motorcycle.
- u. **Supersport Next Generation, in the event that the proposed machine is not fitted with a fairing, then a fairing from the manufacturers range may be used by agreement with DWO and the Technical Director. A bellypan is compulsory.**

#### **2.5.10.12 Seat**

- a. Seat, seat base and associated bodywork may be replaced. The appearance from front, rear and profile must conform in principle to the homologated shape.
- b. The top portion of the rear body work around the seat may be modified to a solo seat.
- c. Holes may be drilled in the seat or rear cowl to allow additional cooling. Holes which are bigger than 10 mm must be covered with metal gauze or fine mesh. Mesh must be painted to match the surrounding material.
- d. Same materials as fairing must be used (article 2.5.10.11.a)
- e. All exposed edges must be rounded.

#### **2.5.10.13 Fasteners**

- a. Standard fasteners may be replaced with fasteners of any material and design.
- b. Aluminium fasteners may only be used in non-structural locations.
- c. Titanium fasteners may be used in structural locations, but the strength and design must be equal to or exceed the strength of the standard fastener it is replacing, internal engine bolts must remain of standard homologated materials or materials of higher specific weight.
- d. Special steel fasteners may be used in structural locations, but the strength and design must be equal to or exceed the strength of the standard fastener it is replacing.
- e. Fasteners may be drilled for safety wire, but intentional weight-saving modifications are not allowed.
- f. Thread repair using inserts of different material such as helicoils and timeserts.
- g. Fairing/bodywork fasteners may be changed to the quick disconnect type.

#### **2.5.10.14 Rear Safety Light**

All motorcycles must have a functioning red light mounted at the rear of the machine, this light must be switched on any time the motorcycle is on the track or being ridden in the pit lane and the session is declared WET. All lights must comply with the following:

- a. Lighting direction must be parallel to the machine center line (motorcycle running direction) and be clearly visible from the rear at least 15 degrees to both left and right sides of the machine center line.
- b. The rear light must be mounted near the end of the seat/rear bodywork and approximately on the machine center line, in a position approved by the Technical Director. In case of dispute over the mounting position or visibility, the decision of the Technical Director will be final.
- c. Power output/luminosity equivalent to approximately: 10 – 15 (incandescent), 0.6 – 1.8 W (LED).
- d. The output must be continuous - no flashing safety light whilst on track, flashing is allowed in the pit lane when pit limiter is active.
- e. Safety light power should be supplied by the control ECU.
- f. The SBK Technical Director has the right to refuse any light system not satisfying this safety purpose.

**2.5.11 The following items MAY BE altered or replaced from those fitted to the homologated motorcycle**

- a. Any type of lubrication, brake or suspension fluid.
- b. Bearings (ball, roller, taper, plain, etc.) of any type or brand may be used.
- c. Gaskets and gasket materials.

**2.5.12 The following items MAY BE removed**

- a. Emission control items (anti-pollution) in or around the airbox and engine (O2 sensors, air injection devices).
- b. Speedometer and related wheel spacers.
- c. Bolt on accessories on a rear sub frame.

**2.5.13 The following items MUST BE removed**

- a. Headlamp, rear lamp and turn signal indicators (when not incorporated in the fairing). Openings must be covered by suitable materials.
- b. Rear-view mirrors.
- c. Horn.
- d. License plate bracket.
- e. Tool box.
- f. Helmet hooks and luggage carrier hooks
- g. Passenger foot rests.
- h. Passenger grab rails.
- i. Safety bars, center and side stands must be removed (fixed brackets must remain).
- j. Catalytic convertors
- k. Rear mudguards affixed to the seat unit

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## 2.5 STOCK 1000 TECHNICAL SPECIFICATIONS

The following rules are intended to permit limited changes to the homologated motorcycle in the interests of safety and improved competition between various motorcycle concepts.

### **EVERYTHING THAT IS NOT AUTHORIZED AND PRESCRIBED IN THIS RULEBOOK IS STRICTLY FORBIDDEN**

#### **If a change to a part or system is not specifically allowed in any of the following articles, then it is forbidden**

Stock 1000 motorcycles require a Superstock 1000 FIM homologation. (see FIM homologation procedure for Superstock, Supersport and Superbike motorcycles). All motorcycles must comply in every respect with all the requirements for road racing as specified in these technical regulations unless they are already equipped as such on the homologated model.

Once a motorcycle has obtained homologation, it may be used for racing in the corresponding class for a maximum period of eight (8) years (see Homologation art 1.4.4), or until such time that the homologated motorcycle is disqualified by new rules or changes in the technical specifications of the corresponding class.

The appearance from the front, rear and the profile of Stock 1000 motorcycles must (except when otherwise stated) conform to the homologated shape (as originally produced by the manufacturer). The appearance of the exhaust system is excluded from this rule.

### 2.6.1 Motorcycle specifications

All parts and systems not specifically mentioned in the following articles must remain as originally produced by the manufacturer for the homologated motorcycle.

**For 2021: 2019-Present Ducati V4R is accepted as homologated for MotoAmerica competition. Effective 6-26-2020 the Ducati V4R will be balanced per Article 2.6.3 adjusting the minimum weight to 180 kg.**

### 2.6.2 Engine configurations and displacement capacities

The following engine configurations comprise the Stock 1000 class:

Over 750cc up to 1000cc	4-stroke	3 and 4 cylinders
Over 850cc up to 1200cc	4-stroke	2 cylinders

The displacement capacity, bore and stroke (new), must remain at the homologated size. All machines must be normally aspirated.

### 2.6.3 Balancing various motorcycle concepts

In order to equalize the performance of motorcycles used in the Stock 1000 Championship, a system of performance enhancements or restrictions can be developed (such as minimum weight, air restrictor or REV limit may be applied according to their respective racing performances). The decision to apply a balancing system to a motorcycle will be taken by the MotoAmerica Permanent Bureau based on decisions made by the Superbike Commission at any time deemed necessary to ensure fair competition.

### 2.6.4 Minimum weight

All machines (unless balanced) 170 kg (374 lbs.)

At any time of the event, the weight of the whole motorcycle (including the tank and its contents) must not be lower than the minimum weight.

There is no tolerance on the minimum weight of the motorcycle.

During the final technical inspection at the end of the race, the selected motorcycles will be weighed in the condition they finished the race, and the established weight limit must be met in this condition. Nothing may be added to the motorcycle. This includes all fluids.

During the practice and qualifying sessions, riders may be asked to submit their motorcycle to a weight control. In all cases, the rider must comply with this request.

The use of ballast is allowed to stay over the minimum weight limit and may be required due to the handicap system. The use of ballast and weight handicap must be declared to the Technical Director at the preliminary checks.

### **2.6.5 Numbers and number plates**

The background colors and figures (numbers) for Stock 1000 are red (pantone 186c) background with white numbers:

The sizes for all the front numbers are:

Minimum height:	140 mm
Minimum width:	80 mm
Minimum stroke:	25 mm
Minimum space between numbers:	10 mm

The sizes for all the side numbers are:

Minimum height:	120 mm
Minimum width:	70 mm
Minimum stroke:	20 mm
Minimum space between numbers:	10 mm

The allocated number (& plate) for the rider must be affixed on the motorcycle as follows:

- a. Once on the front, either in the center of the fairing or slightly off to one side. The number must be centered on the red background with no advertising within 25 mm in all directions.
- b. Once, on each side of the motorcycle. The preferred location for the numbers on each side of the motorcycle is on the lower rear portion of the main fairing near the bottom. The number must be centered on the red background. Any change to this position must be pre-approved a minimum of two (2) weeks before the first race by the Technical Director.
- c. The numbers must use the fonts as detailed after Art. 2. Any numbers not using these fonts must have the design of the numbers and the layout pre-approved by the MotoAmerica Technical Director a minimum of two (2) weeks before the first race. All digits must be of standard form.
- d. Any outlines must be of a contrasting color and the maximum width of the outline is three (3) mm. The background color must be clearly visible around all edges of the number (including outline). Reflective or mirror type numbers are not permitted.
- e. Numbers cannot overlap

In case of a dispute concerning the legibility of numbers, the decision of the Technical Director will be final.

### **2.6.6 Fuel**

- a. The designated fuel is VP Racing Fuels MGP.
- b. Please refer to Article 2.10 for additional details

## **2.6.7 Tires**

- a. The maximum number of tires, of any type, available to each rider during the event will be specified in Article 2.3.7.1.
- b. A maximum of six (6) tires per rider can be mounted at any time.
- c. For Stock 1000 races only, wet tires will not need to be marked with a tire sticker. They will not be considered in the total number of tires available for use; however, normal allocation limits still apply.
- d. During free practices, qualifying practices, warm-up session and races, front and rear tires are required to be marked with tire stickers.
- e. see article 2.3.7

## **2.6.8 Engine**

### **2.6.8.1 Fuel injection system**

#### **2.6.8.1.1 Fuel injection systems refer to throttle bodies, fuel injectors, variable length intake tract devices, fuel pump and fuel pressure regulator.**

- a. The original homologated fuel injection system must be used without any modification.
- b. The fuel injectors must be stock and unaltered from the original specification and manufacture.
- c. Air funnels must remain as originally produced by the manufacturer for the homologated motorcycle.
- d. Butterfly valves cannot be changed or modified.
- e. Variable intake tract devices cannot be added if they are not present on the homologated motorcycle and they must remain identical and operate in the same way as the homologated system. All the parts of the variable intake tract device must remain exactly as homologated.
- f. Air and air/fuel mixture can go to the combustion chamber exclusively through the throttle body butterflies.
- g. Electronically controlled throttle valves, known as 'ride-by-wire', may be only used if the homologated model is equipped with the same system. Software may be modified but all the safety systems and procedures designed by the original manufacturer must be maintained.

### **2.6.8.2 Cylinder head**

- a. No modifications are allowed.
- b. No material may be added or removed from the cylinder head.
- c. The gaskets may be changed.
- d. The valves, valve seats, guides, springs, tappets, oil seals, shims, cotter valve, rocker arms, spring base and spring retainers must be as originally produced by the manufacturer for the homologated motorcycle. Only normal maintenance interventions as prescribed by the manufacturer in the service manual of the motorcycle are authorized.
- e. Valve spring shims are not allowed.

### **2.6.8.3 Camshaft**

- a. The camshaft must be the originally fitted and homologated part with no modification.



- b. At the technical checks: for direct cam drive systems, the cam lobe lift is measured; for non-direct cam drive systems (i.e. with rocker arms), the valve lift is measured.

#### **2.6.8.4 Cam sprockets or gears**

- a. Cam sprockets may be slotted to allow the adjustment of cam timing.
- b. Pressed on cam sprockets may be replaced with an adjustable boss and cam sprocket.
- c. The cam chain must remain as homologated.
- d. The cam chain tensioner must remain as homologated.

#### **2.6.8.5 Cylinders**

- a. Must be the originally fitted and homologated part with no modification.

#### **2.6.8.6 Pistons**

- a. Must be the originally fitted and homologated part with no modification.

#### **2.6.8.7 Piston rings**

- a. Must be the originally fitted and homologated part with no modification.
- b. All piston rings must be fitted.

#### **2.6.8.8 Piston pins and clips**

- a. Must be the originally fitted and homologated part with no modification.

#### **2.6.8.9 Connecting rods**

- a. Must be the originally fitted and homologated part with no modification.

#### **2.6.8.10 Crankshaft**

- a. Must be the originally fitted and homologated part with no modification.
- b. The balancer shaft must be the originally fitted and homologated part with no modification.

#### **2.6.8.11 Crankcase / Gearbox housing**

- a. Must be the originally fitted and homologated part with no modification (including painting, polishing and lightening).
- b. It is not allowed to add a pump used to create a vacuum in the crankcase. If a vacuum pump is installed on the homologated motorcycle, then it may be used only as homologated.

#### **2.6.8.11.1 Lateral covers and protection**

- a. Lateral (side) covers may be altered, modified or replaced. If altered or modified, the cover must have at least the same resistance to impact as the original one. If replaced, the cover must be made in material of the same or higher specific weight and the total weight of the cover must not be less than the original one.
- b. Oil containing engine covers cannot be secured with aluminum bolts.
- c. All lateral covers/engine cases containing oil, and which could be in contact with the ground during a crash, must be protected by a second cover made from metal such as aluminum alloy, stainless steel, steel or titanium. Each side (left and right) of the engine must have at least one (1) protective cover installed on the farthest protruding engine cover containing oil. Composite covers are not permitted. FIM approved covers will be permitted without regard of the material or dimensions.
  - i. The secondary cover must cover a minimum of 1/3 of the original cover. It

must not have sharp edges that could damage the track surface. Covers must be fixed properly and securely with a minimum of three (3) case cover screws that also mount the original covers/engine cases to the crankcases.

ii. Heavy duty engine case covers may be used in lieu of secondary case covers.

d. The Technical Director has the right to refuse any cover not satisfying this safety purpose.

#### **2.6.8.12 Transmission / Gearbox**

- a. No modifications are allowed except shimming.
- b. Quick-shift systems are allowed (including wire and potentiometer).
- c. Countershaft sprocket, rear wheel sprocket, chain pitch and size may be changed.
- d. The sprocket cover may be modified or eliminated.
- e. The chain guard, if it is not incorporated in the rear fender, may be removed.

#### **2.6.8.13 Clutch**

- a. Aftermarket or modified clutches are permitted.
- b. Only friction and drive discs may be changed, but their number must remain as original.
- c. Clutch springs may be changed.
- d. The clutch basket (outer) must be the originally fitted and homologated part but may be reinforced.

#### **2.6.8.14 Oil pumps and oil lines**

- a. No pump modifications are allowed.
- b. Oil lines may be modified or replaced. Oil lines containing positive pressure, if replaced, must be of braided reinforced construction with swaged or threaded connectors.

#### **2.6.8.15 Radiator, cooling system and oil cooler**

- a. The only liquid engine coolant permitted is water.
- b. Protective meshes may be added in front of the oil and/or water radiator(s).
- c. The cooling system hoses and catch tanks may be changed.
- d. Radiator fans and wiring may be removed. Thermal switches, water temperature sensors and thermostats may be removed inside the cooling system.
- e. Radiator cap is free.
- f. An additional water radiator may be fitted but the appearance of the front, the rear and the profile of the motorcycle must not be changed. Extra mounting brackets to accommodate the additional radiator is permitted.

#### **2.6.8.16 Air box**

- a. The air box must remain as originally produced by the manufacturer on the homologated motorcycle but the air box drains must be sealed.
- b. The air filter element may be modified or replaced **but not removed** and must be mounted in the original position.
- c. The air box drains must be sealed.
- d. All motorcycles must have a closed breather system. All oil breather lines must be

connected and discharge in the air box.

- e. Additional heat shielding is not allowed (e. g. gold or silver heat tape).

#### **2.6.8.17 Fuel supply**

- a. The fuel pump and fuel pressure regulator must remain as homologated.
- b. The fuel pressure must be as homologated.
- c. Fuel lines from the fuel tank to the delivery pipe assembly (excluded) may be replaced.
- d. Quick connectors or dry break connectors may be used.
- e. Fuel vent lines may be replaced.
- f. Fuel filters may be added

#### **2.6.8.18 Exhaust system**

- a. Exhaust pipes and silencers may be modified or changed. Catalytic converters must be removed.
- b. The number of the final exhaust silencer(s) must remain as homologated. The silencer(s) must be on the same side(s) of the homologated model.
- c. For safety reasons, the exposed edges of the exhausts pipe(s) outlet must be rounded to avoid any sharp edges.
- d. Wrapping of exhaust systems is not allowed except in the area of the rider's foot or an area in contact with the fairing for protection from heat.
- e. The noise limit for Stock 1000 will be **115** dB/A (with a three (3) dB/A tolerance after the race only) except for where local rules prevail.

### **2.6.9 Electrics and electronics**

#### **2.6.9.1 Ignition / Engine Control System (ECU)**

- a. The engine control system (ECU) must be an ECU (Kit or OEM) applicable to the specific homologated model. The ECU may have its software changed, but the ECU may not be physically modified. The Ducati V4R must use the homologated ECU with control software provided by Ducati. No other software will be allowed for usage. The rider is responsible for using the most recent version of the control software.
- b. The system may have FIM/DWO/MotoAmerica approved external ignition and/or injection module(s) added. Ducati V4R may not use any external ignition modules this includes quick shift modules that connect directly to the ignition harness.
- c. The total combined retail price (software and tuning tools included) on sale to the general public cannot be higher than €3000 (tax excluded) or €3750 if it is a kit ECU than includes data logging facility.
- d. Central unit (ECU) may be relocated.
- e. Optional equipment sold by the motorcycle manufacturer for the homologated model is considered not homologated with the bike and must follow the requirements for approved electronics/data loggers.
- f. During an event, the Technical Director has the right to ask a team to substitute their ECU or external module with the sample received from the manufacturer. The change must be done before Sunday warm-up.
- g. No extra sensors may be added for control strategies except shift rod sensors, wheel speed sensors and lambda sensors. Wheel speed sensors must be included

in the Kit ECU and harness package if required.

- h. Other additional electronic hardware equipment not on the original homologated motorcycle cannot be added with the exceptions noted below.
- i. The characteristics of approved data logging systems must be the following:
  - i. Maximum retail price of the unit (hardware + software, excluding sensors and wiring harness) cannot exceed €3.000 (VAT excluded) if it is a standalone unit.
  - ii. Maximum retail price of the unit if incorporated into the ECU (hardware + software, excluding sensors and wiring harness) is €3750.
  - iii. The data logger unit must be available for sale to the public and on the list of FIM/DWO/MotoAmerica approved data loggers.
  - iv. A maximum of seven (7) simultaneously working sensors (connected to the additional data logger) may be added to the original sensors on the motorcycle.

**The sensors must be from the following list:**

1. Lambda (must be supplied in the kit if used for strategy)
  2. Fork position
  3. Shock position
  4. Front brake pressure
  5. Rear brake pressure
  6. Fuel pressure (not temperature)
  7. Oil pressure
  8. Oil temperature
  9. Transponder / lap time signal
  10. GPS unit (lap timing and track position)
- v. The sensors must be simple-function.
  - vi. Approved data loggers with internal inertial platforms (IMU or gyros) may be used for data collection but may not be used for control strategy. Also see 2.6.9.1/i./vii.
  - vii. CAN (or other data) communication from the ECU to an approved data logger (logger can receive data only; no data transmission is allowed) is allowed without any limitation in CAN channel logger number.
  - j. The maximum total price of other active/control/calculation units such as lambda driver modules, quick shifter, and analogue to CAN and traction control units is €750. These devices must be approved by FIM/DWO/MotoAmerica.
  - k. Telemetry is not allowed.
  - l. No remote or wireless connection to the bike for any data exchange or setting is allowed whilst the engine is running or the bike is moving.
- m. Harness:
- i. The main wiring harness may be replaced by the kit wire harness as supplied for the Kit ECU model, produced and/or approved by the manufacturer of the motorcycle and by FIM/DWO/MotoAmerica.
  - ii. The Kit wiring harness may incorporate the data logging harness.
  - iii. A kit harness that incorporates the data logging harness may only

accommodate seven (7) additional sensors.

- iv. A sample of the kit wiring harness may be requested by the FIM/MotoAmerica.
- v. The key/ignition lock may be relocated, replaced or removed.
- vi. Cutting of the original main wiring harness is allowed.
- n. Data logger harness:
  - i. The data logger wire harness cannot include any other sensors with the exception of the seven (7) sensors that are allowed. The only function of the approved data logger wire harness is to connect the seven sensors to the data logger, to transmit the data and supply the power.
  - o. For the Stock 1000 Kit to be approved, samples of the ECU kits, kit harnesses and external modules with their tuning tools must be sent by the manufacturers to the MotoAmerica Technical Director with technical data and selling price.
  - p. For the ignition and/or injection module, quick shifter or standalone data logger to be approved, samples must be sent by the manufacturer of the device to the MotoAmerica Technical Director with technical data and selling price.
  - q. Spark plugs may be replaced.
  - r. The original speedometer and tachometer may be altered or replaced.
  - s. Battery is free

#### **2.6.9.2 Generator, alternator, electric starter**

- a. Must be the originally fitted and homologated part with no modification.
- b. The electric starter must operate normally and always be able to start the engine during the event.
- c. During parc fermé, the starter must crank the engine at a suitable speed for starting for a minimum of two (2) seconds without the use of a boost battery. No boost battery may be connected to the machine after the end of the session.

#### **2.6.10 Main frame and pre-assembled spare frame**

- a. During the entire duration of the event, each rider can only use one (1) complete motorcycle, as presented for technical control, with the frame clearly identified with a seal.
- b. In case the frame needs to be replaced, the rider or the team can request the use of a spare frame to the Technical Director.
- c. The pre-assembled spare frame must be presented to the Technical Director to receive the permission to rebuild the motorcycle. The pre-assembly of the frame shall be strictly limited to:
  - i. Main frame and swing-arm
  - ii. Bearings (steering pipe, swing arm, etc.)
  - iii. Rider controls (handle bars, rear sets, shift/brake linkage), front and rear mud guard.
  - iv. Rear suspension linkage and shock absorber
  - v. Upper and lower triple clamps, front forks, braking system and wheels.
  - vi. Wiring harness, ECU, dash associated electronics, throttles, airbox and associated cables.
- d. The spare frame will not be allowed in the pit box before the rider or the team has

received authorization from the Technical Director.

- e. The motorcycle, once rebuilt, must be inspected before its use by the technical stewards for safety checks and a new seal will be placed on the motorcycle frame.
- f. No complete spare machine may be at the track. If found, penalties will be applied. For the remainder of the event the machine will be impounded, and no part of that machine may be used for spare parts.

*See 2.5.10 for complete explanation of procedures*

#### **2.6.10.1 Frame body and rear sub frame**

- a. The frame must remain as originally produced by the manufacturer for the homologated motorcycle.
- b. Holes may be drilled on the frame only to fix approved components (i.e. fairing brackets, steering damper mount, sensors).
- c. The sides of the frame-body may be covered by a protective part made of a composite material. These protectors must fit the form of the frame.
- d. Nothing else may be added or removed from the frame body.
- e. All motorcycles must display a vehicle identification number punched on the frame body (a proper "legal VIN" by the team to which the Technical Director may choose to append). No detachable plates are permitted.
- f. Engine mounting brackets or plates must remain as originally produced by the manufacturer for the homologated motorcycle.
- g. Front sub frame / fairing mount may be changed or altered.
- h. Rear sub frame may be changed or altered, but the type of material must remain as homologated, or material of a higher specific weight.
- i. Additional seat brackets may be added. Non-stressed protruding brackets may be removed if they do not affect the safety of the construction or assembly. Bolt-on accessories to the rear sub-frame may be removed.
- j. The paint scheme is not restricted but polishing the frame body or sub frame is not allowed.

#### **2.6.10.2 Suspension - General**

- a. Participants in the Stock 1000 class must only use the approved and listed suspension units for that season. The price limits are:
  - i. Fork: For the fork kit, including all parts such as but not limited to cartridge, springs (1 set), adjusters, fork caps, blanking inserts, seals, bushes except oil and fitting the price limit is €2200 excluding tax.
  - ii. Shock absorber/RCU: For the complete shock absorber / RCU including but not limited to spring (1 of), pre-load adjuster and length/ride height adjuster the price limit is €2000 excluding tax.
- b. The approved products from the suspension manufacturers must be available to all participants at least one month before the first round of the MotoAmerica Stock 1000 season and remain available all season. The products must be available within six (6) weeks of a confirmed order.
- c. Setting parts and tuning parts must be provided by the suspension manufacturers to all customers/ teams/ participants using the manufacturer's products. These parts can be used by all participants during the season. These parts shall be available for immediate delivery to all teams/customers.

- d. Teams may not modify any part of the forks or shock absorber; all setting parts must be supplied by the suspension manufacturer and available to all teams/riders.
- e. The suspension manufacturers are allowed to offer service contracts when the team is using the approved and listed suspension products. The suspension manufacturers cannot demand a service contract for a customer or participant in order to obtain a suspension product.
- f. Electronic Suspension must be removed.
- g. Electronic controlled steering dampers cannot be used if not installed in the homologated model for road use. However, it must be completely standard (any mechanical or electronic part must remain as homologated).

### **2.6.10.3 Front suspension**

- a. Forks must remain as originally produced by the manufacturer for the homologated motorcycle.
- b. Original internal parts of the homologated forks may be modified or changed. After-market damper kits or valves may be installed.
- c. The original surface finish of the fork tubes (stanchions, fork pipes) may be changed. Additional surface treatments are allowed.
- d. Fork caps and external damping adjusters may be modified or replaced.
- e. The upper and lower fork clamps (triple clamp, fork bridges, and stem) must remain as originally produced by the manufacturer for the homologated motorcycle.
- f. Steering head pivot position must remain in the homologated position (as supplied on the production bike). If the standard bike has inserts, then the orientation/position of the original insert may be changed but the insert cannot be replaced or modified.
- g. A fork brace may be installed. Fork bottoms may be modified for speed and suspension sensors.
- h. Fender brackets may be modified to maintain stock tire to fender clearance when using race tires or to provide clearance for caliper mounting brackets.
- i. A steering damper may be added or replaced with an after-market damper.
- j. The steering damper cannot act as a steering lock limiting device.
- k. Electronic forks may have their complete internal parts (including all electronic control) replaced with a conventional damping system and it will be considered as a mechanical fork.

### **2.6.10.4 Swing arm (rear fork)**

- a. The rear fork must remain as originally produced by the manufacturer for the homologated motorcycle.
- b. The rear fork pivot bolt must remain as originally produced by the manufacturer for the homologated motorcycle.
- c. Rear pivot position must remain in the homologated position (as supplied on the production bike). If the standard bike has inserts then the orientation/position of the original insert may be changed but the insert cannot be replaced or modified.
- d. Rear wheel stand brackets may be added to the rear fork by welding or by bolts. Brackets must have rounded edges (with a large radius). Fastening screws must be recessed. An anchorage system or point(s) to keep the original rear brake caliper in place may be added to the rear swing-arm.

- e. Rear axle adjusters must remain as originally produced by the manufacturer for the homologated motorcycle.
- f. The sides of the swing-arm may be protected by a thin vinyl cover only; no composite or structural covers are allowed.

#### 2.6.10.5 Rear suspension unit (shock)

- a. The rear suspension unit may be changed but a similar system must be used (i.e. dual or mono).
- b. All rear suspension linkage parts must remain as originally produced by the manufacturer for the homologated motorcycle.
- c. Mechanical Suspension: Rear suspension unit (shock absorber) may be modified or replaced, but the original attachments to the frame and rear fork (swing arm) must be as homologated.
- d. Electronic suspension may be used if such suspension is already present on the production model of the homologated motorcycle, and it must remain completely standard (all mechanical and electronic parts must remain as homologated except for shims and springs). The original suspension system must work properly and safely in the event of an electronic failure. The electronic shock absorber can be replaced with a mechanical one.

#### 2.6.10.6 Wheels

- a. Wheels may be replaced but not modified (see article 2.3.5) and associated parts may be altered or replaced from those fitted to the homologated motorcycle.
- b. Aftermarket Wheels Maximum retail price \$2600 USD.
- c. **See Eligibility list for list of approved aftermarket wheels**
- d. Aftermarket wheels must be made from aluminum (aluminum) alloys.
- e. The use of the following alloy materials for the wheels is not allowed: Beryllium ( $\geq 5\%$ ), Scandium ( $\geq 2\%$ ), Lithium ( $\geq 1\%$ ).
- f. Each specific racing wheel model must be approved and certified according to JASO (Japanese Automotive Standards Organization) T 203-85 where W (maximum design load) of art. 11.1.3 is 195 kg for front wheel and 195 kg for rear wheel, K = 1.5 for front and rear wheels. Static radius of tire: front 0.301 m, rear 0.331 m.
- g. Wheel manufacturers must provide copy of the certificate for their wheel(s) as proof of compliance to the Technical Director when requested.
- h. The homologated road bike wheel and sprocket carrier assembly may be used with no modification irrespective of material. They must meet article 2.4.10.6(d)(e). Bearings and spacers may be changed.
- i. On motorcycles equipped with a double-sided swing arm (rear fork), the rear sprocket and brake rotor must remain on the rear wheel when the wheel is removed.
- j. Bearings, seals, may be altered or replaced from those fitted to the homologated motorcycle. The use of titanium and light alloys is forbidden for wheel spindles (axles).

Wheel rim diameter size (front and rear)	17 inches
Front wheel rim width:	3.50 inches
Rear wheel rim width:	6.00 inches

- k. Wheel axles must remain as homologated; wheel spacers may be modified or replaced.



### 2.6.10.7 Brakes

- a. Brake discs may be replaced by aftermarket discs which comply with following requirements:
  - i. Only steel (max. carbon content 2.1 wt. %) is allowed for brake discs.
  - ii. The carrier must retain the same material as the homologated disc and carrier.
  - iii. The outside and inner diameters of the brake disc must not be larger than the ones on the homologated disc.
  - iv. The thickness of the brake disc may be increased but the disc must fit into the homologated brake caliper without any modification. The number of floaters is free.
  - v. The fixing of the carrier on the wheel must remain the same as on the homologated disc.
- b. The front and rear brake caliper (mount, carrier, hanger) must remain as originally produced by the manufacturer for the homologated motorcycle.
- c. To reduce the transfer of heat to the hydraulic fluid, it is permitted to add metallic shims to the calipers between the pads and the calipers and/or to replace light alloy pistons with steel pistons made by the same manufacturer of the caliper.
- d. The rear brake caliper bracket may be mounted fixed on the swing- arm, but the bracket must maintain the same mounting (fixing) points for the caliper as used on the homologated motorcycle. Also see Article 2.6.10.4 e.
- e. Front master cylinder may be replaced with a maximum MSRP of \$400.00 USD.
- f. Front and rear hydraulic brake lines may be changed.
- g. The split of the front brake lines for both front brake calipers must be made above the lower fork bridge (lower triple clamp).
- h. "Quick" (or "dry-brake") connectors in the brake lines are allowed.
- i. Front and rear brake pads may be changed. Brake pad locking pins may be modified for quick change type.
- j. Front brake system cooling airducts are allowed.
  - i. Air ducts shall be routed to cool the discs or directed onto the brake caliper bodies. Viewed from the side, the airducts opening shall not pass the vertical line drawn by the front axle shaft. Viewed from the front, the airducts must fall inside the shape drawn by the fairing (aerodynamic winglets excluded) and must be positioned as close as possible to the front fork leg/foot. For safety reasons, the airflow shall not be directed onto the brake pads.
  - ii. air-ducts may be made of composite materials. The complete assembly must be presented and validated by the Technical Director in prior of its use.
- k. The anti-lock brake system (ABS) must be removed.

### 2.6.10.8 Handlebars and hand controls

- a. Handlebars may be replaced.
- b. Handlebars and hand controls may be relocated.
- c. Throttle controls must be self-closing when not held by the hand.
- d. Throttle assembly and associated cables may be modified or replaced but the

connection to the throttle body and to the throttle controls must remain as on the homologated motorcycle.

- e. The clutch and brake lever may be replaced with an after-market model. An adjuster to the brake lever is allowed.
- f. Switches may be changed but the electric starter switch and engine stop switch must be located on the handlebars.
- g. Motorcycles must be equipped with a functional ignition kill switch or button mounted on the right-hand handlebar (within reach of the hand while on the hand grips) that is capable of stopping a running engine. The button or switch must be red.

#### **2.6.10.9 Footrest / Foot controls**

- a. Footrests, hangers/brackets and hardware may be replaced and relocated but the hangers/brackets must be mounted to their original frame mounting points.
- b. Foot controls: gear shift and rear brake must remain operated manually by foot.
- c. Footrests may be rigidly mounted or a folding type which must incorporate a device to return them to the normal position.
- d. The end of the foot rest must have at least an eight (8) mm solid spherical radius.
- e. Non-folding footrests must have an end (plug) which is permanently fixed, made of aluminum, plastic, Teflon® or an equivalent type material (minimum radius 8 mm). The plug surface must be designed to reach the widest possible area.
- f. The Technical Director has the right to refuse any plug not satisfying this safety aim.

#### **2.6.10.10 Fuel tank**

- a. The fuel tank must begin as originally produced by the manufacturer for the homologated motorcycle. If the standard tank is of insufficient capacity to achieve full race distance then with the prior agreement of the Technical Director, the tank may be modified to increase its fuel capacity but must maintain its original external appearance.
- b. All fuel tanks must be completely filled with fire retardant material (i.e. fuel tank foam).
- c. Fuel tanks with tank breather pipes must be fitted with non-return valves that discharge into a catch tank with a minimum volume of 250cc made of a suitable material.
- d. Fuel caps may be changed. Fuel caps when closed must be leak proof. Additionally, they must be securely locked to prevent accidental opening at any time.
- e. A spacer/pad may be fitted to the rear of the tank with non-permanent adhesive. It may be constructed of foam padding.
- f. The tank may not have a full cover fitted unless the homologated machine also features a full cover.
- g. The sides and rear of the fuel tank may be protected with a cover made of vinyl or a composite material. These covers must follow the shape of the fuel tank exactly.

#### **2.6.10.11 Fairing / Bodywork**

- a. Fairing and bodywork may be replaced with exact cosmetic duplicates of the original parts, but must appear to be as originally produced by the manufacturer for the homologated motorcycle, with slight differences due to the racing use (different

pieces mix, fixing points, fairing bottom, etc.). The material may be changed. The use of carbon fiber or carbon composite materials is not allowed. Specific reinforcements in Kevlar® or carbon are allowed locally around holes and stressed areas.

- b. Overall size and dimensions must be the same as the original part.
- c. The windscreen may be replaced.
- d. Motorcycles that are not originally equipped with streamlining are not allowed to add streamlining in any form, except for a lower fairing device, as described in point (g). This device cannot exceed above a line drawn horizontally from wheel axle to wheel axle and must follow the specifications described at point (g).
- e. The original combination instrument/fairing brackets may be replaced, but the use of titanium and carbon (or similar composite materials) is forbidden. All other fairing brackets may be altered or replaced.
- f. The original air ducts running between the fairing and the air box may be altered or replaced. Carbon fiber composites and other exotic materials are forbidden. Particle grills or “wire-meshes” originally installed in the openings for the air ducts may be removed.
- g. The lower fairing must be constructed to hold, in case of an engine breakdown, a minimum six (6) liters. The lower edge of all the openings in the fairing must be positioned at least 70 mm above the bottom of the fairing.
- h. The upper edge of the rear transverse wall of the lower fairing must be at least 70 mm above the bottom. The angle between this wall and the floor must be  $\leq 90^\circ$ .
- i. Original openings for cooling in the lateral fairing/bodywork sections may be partially closed only to accommodate sponsors' logos/lettering. Such modification shall be made using wire mesh or perforated plates. The material is free but the distance between all opening centers, circle centers and their diameters must be constant. Holes or perforations must have an open area ratio  $> 60\%$ .
- j. The lower fairing must incorporate a single opening of  $\varnothing 25$  mm diameter in the front lower area. This hole must remain sealed in dry conditions and must be only opened in wet race conditions as declared by the race director.
- k. Front fender may be replaced with a cosmetic duplicate of the original parts and may be spaced upward for increased tire clearance.
- l. The rear fender fixed on the swing arm may be modified, changed or removed.
- m. Motorcycles may be equipped with inner ducts to improve the air stream towards the radiator but the appearance of the front, the rear and the profile of the motorcycle must not be changed.

#### **2.6.10.12 Seat**

- a. The seat, seat base and associated bodywork may be replaced with parts of similar appearance as originally produced by the manufacturer for the homologated motorcycle. The appearance from the front, rear and profile must conform to the homologated shape.
- b. The top portion of the rear bodywork around the seat may be modified to a solo seat.
- c. The homologated seat locking system (with plates, pins, rubber pads etc.) may be removed.

#### **2.6.10.13 Rear safety light**

All motorcycles must have a functioning red light mounted at the rear of the

machine; this light must be switched on any time the motorcycle is on the track or being ridden in the pit-lane and the session is declared WET. All lights must comply with the following:

- a. Lighting direction must be parallel to the machine center line (motorcycle running direction) and be clearly visible from the rear at least 15 degrees to both left and right sides of the machine center line.
- b. The rear light must be mounted near the end of the seat/rear bodywork and approximately on the machine center line, in a position approved by the Technical Director. In case of dispute over the mounting position or visibility, the decision of the Technical Director will be final.
- c. Power output/luminosity equivalent to approximately: 10 – 15 (incandescent), 0.6 – 1.8 W (LED).
- d. The output must be continuous; no flashing safety light is allowed whilst on track. Flashing is allowed in the pit lane when the pit limiter is active.
- e. The safety light power supply may be separated from the motorcycle.
- f. The Technical Director has the right to refuse any light system not satisfying this safety purpose.

#### **2.6.10.14 Fasteners**

- a. Standard fasteners may be replaced with fasteners of any material and design but titanium fasteners cannot be used. The strength and design must be equal to or exceed the strength of the standard fastener.
- b. Fasteners may be drilled for safety wire, but intentional weight-reduction modifications are not allowed.
- c. Thread repairs may be made using inserts of different material such as Helicoils and Timeserts.
- d. Fairing / bodywork fasteners may be replaced with the quick disconnect type.
- e. Aluminum fasteners may only be used in non-structural locations.

#### **2.6.11 The following items MAY be altered or replaced from those fitted to the homologated motorcycle**

- a. Any type of lubrication, brake or suspension fluid may be used.
- b. Gaskets, seals and gasket materials
- c. Instruments, instrument bracket(s) and associated cables
- d. Painted external surface finishes and decals
- e. Protective covers for the frame, chain, footrests, etc. may be made in other materials like fiber composite material if these parts do not replace original parts mounted on the homologated model.

#### **2.6.12 The following items MAY BE removed**

- a. Emission control items (anti-pollution) in or around the air box and engine (O2 sensors, air injection devices)
- b. Chain guard as long as it is not incorporated in the rear fender
- c. Bolt-on accessories on a rear sub frame

#### **2.6.13 The following items MUST BE removed**

- a. Headlamp, rear lamp and turn signal indicators (when not incorporated in the fairing). Openings must be covered by suitable materials.

- b. Rear-view mirrors
- c. Horn
- d. License plate bracket
- e. Toolkit
- f. Helmet hooks and luggage carrier hooks
- g. Passenger foot rests
- h. Passenger grab rails
- i. Safety bars, center and side stands must be removed (fixed brackets must remain).

Provisional

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## 2.7 BAGGER TECHNICAL SPECIFICATIONS

The following rules are intended to give freedom to modify or replace some parts in the interest of safety, research and development and improved competition between various motorcycle concepts.

### **EVERYTHING THAT IS NOT AUTHORIZED AND PRESCRIBED IN THIS RULE IS STRICTLY FORBIDDEN**

#### 2.7.1 Motorcycle specifications

- Harley-Davidson FL Touring (All Years)
- Indian Bagger or Touring (All Years)

#### 2.7.2 Engine configurations and displacement capacities

##### **Harley-Davidson Motorcycles:**

- a. Originally equipped air-cooled pushrod V-Twin engines, maximum displacement of 131.8ci. normally aspirated.
- b. S&S or Jim's air-cooled pushrod Twin Cam engines w/MSO are acceptable up to 131.8ci. normally aspirated.
- c. Forced induction air-cooled pushrod V-Twin engines allowed with maximum displacement of 107ci.

##### **Indian Motorcycles:**

- a. Originally equipped water-cooled V-Twin Engine, maximum displacement of 112ci. normally aspirated.
- b. Originally equipped air-cooled pushrod V-Twin Engine, maximum displacement of 131.8ci. normally aspirated.
- c. Forced induction air-cooled pushrod V-Twin engines allowed with maximum displacement of 111ci.

#### 2.7.3 Balancing various motorcycle concepts

In order to equalize the performance of motorcycles used in the King of the Baggers Championship, a system of performance enhancements or restrictions can be developed (such as minimum weight, air restrictor or REV limit may be applied according to their respective racing performances). The decision to apply a balancing system to a motorcycle will be taken by the MotoAmerica Permanent Bureau based on decisions made by the Superbike Commission at any time deemed necessary to ensure fair competition.

#### 2.7.4 Minimum weight

**All machines 281.22 kg (620 lbs.)**

At any time of the event, the weight of the whole motorcycle (including the tank and its contents) must not be lower than the minimum weight.

There is no tolerance on the minimum weight of the motorcycle.

During the final technical inspection at the end of the race, the selected motorcycles will be weighed in the condition they finished the race, and the established weight limit must be met in this condition. Nothing may be added to the motorcycle. This includes all fluids.

During the practice and qualifying sessions, riders may be asked to submit their motorcycle to a weight control. In all cases, the rider must comply with this request.

The use of ballast is allowed to stay over the minimum weight limit and may be required due to the handicap system. The use of ballast and weight handicap must be declared to the Technical Director at the preliminary checks.

#### **2.7.5 Numbers and number plates**

The background colors and figures (numbers) for Baggers may be any color but must be strongly contrasting.

#### **2.7.6 Fuel**

a. All competitors must use VP Supplied Fuel. Fuel Specification T4.

#### **2.7.7 Tires**

a. All machines must be fitted with Dunlop tires. Specification (TBA)

#### **2.7.8 Engine**

##### **2.7.8.1 Fuel system**

- a. The original equipped fuel system must be used. Fuel injection systems refer to throttle bodies, fuel injectors, variable length intake tract devices and fuel pumps.
- b. Air funnels, throttle bodies and airbox may be altered or replaced.
- c. Air and air/fuel mixture must go to the combustion chamber exclusively through the throttle bodies.

##### **2.7.8.2 Cylinder Head**

**The cylinder head must be the originally fitted and a homologated part. The following modifications allowed**

- a) Porting and polishing of the cylinder head normally associated with individual tuning such as gas flowing of the cylinder head, including the combustion chamber, is allowed. Welding is allowed. No machining or modification is allowed in the cam box / valve mechanism area.
- b) The throttle body insulators may be modified.
- c) Modifications of the inlet and exhaust ports are free
- d) Surface grinding of the cylinder head surface on the head gasket side
- e) Original homologated valve guides may be replaced materials are free
- f) Polishing of the combustion chamber is allowed.
- g) Original valve seats may be modified or replaced
- h) Compression ratio is free, but the combustion chamber may be modified only by taking material off.
- i) Welding of material for cooling purpose is allowed. Must be approved by Technical Director
- j) It is forbidden to add any material to the cylinder head unless as described above.



- k) Rocker arms (if any) may be modified or replaced
- l) Valves may be modified or replaced.
- m) Valve springs may be modified or replaced.
- n) Valve spring retainers, collets and/or spring seats may be altered or replaced.
- o) The shim buckets / tappets must remain as homologated

#### **2.7.8.3 Camshaft**

- a. Camshafts may be altered or replaced.

#### **2.7.8.4 Cam sprockets or cam gears**

- a. Camshaft sprockets, pulleys or gears may be altered or replaced to allow degree adjustments of the camshafts.
- b. The cam chain or cam belt tensioning device(s) can be modified or changed.

#### **2.7.8.5 Cylinders**

- a. May be altered or replaced.
- b. Normally aspirated air-cooled pushrod engines may increase the bore to a maximum total displacement of **131.8ci**.
- c. normally aspirated water-cooled engines limited to **112ci**.
- d. Forced induction engines: Harley Davidson air-cooled 107ci./ Indian air-cooled 111ci.

#### **2.7.8.6 Pistons, rings, pins and clips.**

- a. **May be modified or replaced**

#### **2.7.8.7 Connecting rods**

- a. Connecting rod may be altered or replaced.
- b. Connecting rod bolts are free but must be of the same weight or heavier, and of the same material as the original bolt or of higher specific weight material.

#### **2.7.8.8 Crankshaft**

Only the following modifications can be made to the crankshaft:

- a. Crankshaft/flywheel are free. Displacement limits must be respected.
- b. Bearing surfaces may be polished.
- c. Surface treatments may be applied to the crankshaft.
- d. Balancing is allowed.
- e. Air-cooled pushrod V-Twin engines removal of the balancing shaft is allowed.

#### **2.7.8.9 Crankcase / Gearbox housing**

- a. Crankcases must be the originally fitted part with only the following modifications allowed. If the crankcases have an integral cylinder, then the top face of the cylinder may be ground to adjust deck height. Oil Spray nozzles may be modified. No other modifications are allowed (including painting, polishing and lightening).
- b. Air-cooled pushrod V-Twin engines crankcase may be relieved to allow installation of tapered roller bearings for the output shaft

- c. Air-cooled pushrod V-Twin engines crankcase may be modified to allow for installation of 131.8ci cylinder.
- d. Only the original or an approved sump Oil-pan (sump) and oil pick up can be used.
- e. Oil breather cover must remain as original, but the internal breather/damper plate can be modified or replaced.
- f. Oil tank breathers are acceptable and may run through an external catch-can but all exits must ultimately be routed to the intake system.
- g. Engine crankcase/transmission cases may be modified to allow clearance of chain/swingarm line only. Must be approved by Technical Director

#### **2.7.8.9 Lateral covers and protection**

- a. Lateral (side) covers may be altered, modified, or replaced (excluding pump covers). If altered or modified, the cover must have at least the same resistance to impact as the original one. If replaced, the cover must be made in material of same or higher specific weight and the total weight of the cover must not be less than the original one.
- b. All lateral covers/engine cases containing oil, and which could be in contact with the ground during a crash, must be protected by a second cover made from metal such as aluminum alloy, stainless steel, steel, or titanium.
- c. All drain and fill plugs must be lock wired (safety wired). The use of clips is not permitted. External oil filter(s), screws and bolts that enter an oil cavity must be safety wired (i.e. on crankcases) or the oil filter may optionally have a secondary retention mechanism.

#### **2.7.8.10 Transmission / Gearbox**

- a. The layout of the transmission shafts must be the same as on the homologated motorcycle.
- b. The gear design and material are free.
- c. Final drive belt systems may be converted to chain type systems.
- d. External quick-shift systems are permitted

#### **2.7.8.11 Clutch**

- a. Aftermarket or modified clutches are permitted (including plates/springs etc.).

#### **2.7.8.12 Oil pumps, cam plates and oil lines**

- a. The oil pump and cam plate may be modified or replaced.
- b. Oil lines may be modified or replaced. Oil lines containing positive pressure, if replaced, must be of braided reinforced construction with wedged or threaded connectors.

#### **2.7.8.13 Cooling System**

- a. The only liquid engine coolants permitted is water.
- b. Additional radiators or oil coolers may be added.

- c. The original oil/water heat exchanger may be modified, replaced or removed.

#### **2.7.8.14 Airbox**

- a. The airbox may be modified or replaced.
- b. Airboxes should be designed to retain oil from the crankcases in the event of engine failure or tip-over.
- c. Where breather or overflow pipes are fitted, they must discharge via existing outlets. Catch cans may be used but the original closed system must be retained; no direct atmospheric emission is permitted.

#### **2.7.8.15 Fuel supply**

- a. Fuel lines from the fuel tank up to the injectors (fuel hoses, delivery pipe assembly, joints, clamps, fuel canister) may be replaced and must be in such a way that they are protected from crash damage.
- b. Quick connectors or dry break connectors may be used.
- c. Fuel vent lines may be replaced.
- d. Fuel filters may be added.

#### **2.7.8.16 Exhaust system**

- a. Exhaust pipes, catalytic converters and silencers may be altered or replaced from those fitted to the homologated motorcycle. Catalytic converters may be removed.
- b. For safety reasons, the exposed edge(s) of the exhaust pipe(s) outlet(s) must be rounded to avoid any sharp edges.
- c. Wrapping of exhaust systems is allowed.
- d. The noise limit for Baggers will be 115 dB/A measured at 3000 RPM. See Art. 2.14 for complete sound testing procedure. (with a 3 dB/A tolerance after the race only).

### **2.7.9 Electrics and Electronics**

#### **2.7.9.1 Engine control system**

- a. The engine control system (ECU) must be:
  - i. Original system as homologated, with or without a change of software
  - ii. An approved aftermarket system with series specified software
- b. Central unit (ECU) may be relocated.
- c. Optional equipment sold by the motorcycle manufacturer for the homologated model is considered not homologated.
- d. At any time during an event the Technical Director has the right to make a team substitute their ECU or external module with the MotoAmerica sample.
- e. The original sensors may not be replaced or modified. No additional sensors may be added to the machine for data collection.
- f. No extra sensors may be added for control strategies except the lambda sensor and shift rod sensor.
- g. Oil temperature sensor may be added
- h. The MotoAmerica approved external fuel injection modules may not alter any sensor signal relating to the ride by wire system or control/actuate any part of the machine

excepting the fuel injectors and ignition coils. No external module may add traction control strategies. The modules may only connect to the fuel injectors, ignition coils, lambda sensor, power supply and “piggyback the Throttle Position, Gear and RPM signals”. Lambda closed loop/auto tuning is permitted.

- i. Other additional electronic hardware equipment not on the original homologated motorcycle cannot be added with the exceptions noted below.
- j. Resistors/load may be added to replace the parts of the electrical system that has been removed (including lights and lambda sensors), to prevent ECU errors.
- i. Telemetry is not allowed.
- j. No remote or wireless connection to the bike for any data exchange or setting is allowed whilst the engine is running, or the bike is moving.
- k. Harness:
  - i. The key/ignition lock may be relocated, replaced or removed.
  - ii. Cutting and removal of excess and unused wiring in the original main wiring harness is allowed. All connectors must remain as originally fitted. No wires may be added to the main harness. Sub-harness may be modified for the purpose of powering or operating components.
- l. A lap timer may be fitted, including GPS lap timers. Data collection from the machines sensors or ECU is allowed. Data collection by the lap timer by way of GPS and internal IMU is permitted. See 2.7.9/f.
- m. Plug cap must remain as homologated.
- n. Spark plugs may be replaced.
- o. Battery is free.

#### **2.7.9.2 Generator, alternator, electric starter**

- a. The stator/coil must be the originally fitted parts with no modification allowed.
- b. Motorcycles should self-start on the starting grid in neutral. Push-starting on the starting grid is not allowed, however start line Officials may push start the motorcycle if necessary (in gear).

#### **2.7.10 Main frame and spare motorcycle**

- a. During the entire duration of the event, each rider may only use one (1) complete motorcycle.

##### **2.7.10.1 Frame body and rear subframe**

- a. The main frame must be the originally manufactured and fitted part.
- b. Holes may be drilled on the frame only to fix approved components (i.e. fairing brackets, steering damper mount).
- c. The original position (of engine, steering stem or pivots) is considered as the position in which the production motorcycle is supplied and must be retained.
- d. All motorcycles must display a vehicle identification number punched on the frame body (a proper ‘legal VIN’)
- e. Crash protectors may be fitted to the frame using existing points or pressed into the ends of the wheel axles.

## Indian Motorcycle

- a. Lower portion of front frame spares may be modified for ground clearance only. Must be pre-approved beforehand by the Technical Director

### 2.7.10.2 Suspension – General

- a. Participants in the King of the Bagger class must only use the approved and listed suspension units for that season. **Suspension price caps will be \$6,000 for Forks and \$2,000 for Shocks.**
- b. The approved products from the manufacturers must be available to all participants at least one month before the first round of the King of The Bagger season and remain available all season. The products must be available within six (6) weeks of a confirmed order.
- c. Setting parts and tuning parts must be provided by the suspension manufacturers to all customers/teams/participants using the manufacturer's products. These parts can be used by all participants during the season. These parts shall be available for immediate delivery to all teams/customers.
- d. All setting parts must be supplied by the suspension manufacturer and available to all teams/riders.
- e. The suspension manufacturers are allowed to offer service contracts when a team is using the approved and listed suspension products. The suspension manufacturers cannot demand a service contract for a customer or participant in order to obtain a suspension product.
- f. Electronic suspension **cannot be used.**
- g. An electronic controlled steering damper can only be used if installed on the homologated model for road use. However, it must be completely standard (any mechanical or electronic part must remain as homologated).

### 2.7.10.3 Front Suspension

- a. The front fork in whole or part may be changed but must be the same type homologated (leading link, telescopic, etc.).
- b. The upper and lower fork clamps (triple clamp, fork bridges) and stem may be changed or modified.
- c. A steering damper may be added or replaced with an 'after-market' damper.
- d. The steering damper cannot act as a steering lock limiting device.

### 2.7.10.4 Swing-arm (Rear Fork)

- a. Swing-arms may be replaced or modified.
- b. A solid protective cover (shark fin) shall be fixed to the swing-arm and must always cover the opening between the lower chain run, swingarm and the rear wheel sprocket, irrespective of the position of the rear wheel.
- c. Rear wheel stand brackets may be added to the rear fork by welding or by bolts.
- d. Brackets must have rounded edges (with a large radius). Fastening screws must be recessed.
- e. Swingarm spindle (pivot) may be modified or replaced.

### **2.7.10.5 Rear Suspension Unit**

- a. Rear suspension unit may be changed but a similar system must be used (i.e. dual or mono).
- b. The original fixing points on the frame (if any) must be used to mount the shock absorber, linkage and rod assembly fulcrum (pivot points).
- c. Removable top shock mounts may be replaced. If replaced they must retain their homologated geometry

### **2.7.10.6 Wheels**

- a. Wheels may be replaced, and associated parts may be altered or replaced from those fitted to the homologated motorcycle.
- b. Aftermarket wheels must be made from aluminum alloys.
- c. The use of the following alloy materials for the wheels is not allowed: Beryllium ( $\geq 5\%$ ), Scandium ( $\geq 2\%$ ), Lithium ( $\geq 1\%$ ).
- d. Bearings, seals, and axles may be altered or replaced from those fitted to the homologated motorcycle. The use of titanium and light alloys is forbidden for wheel spindles (axles).
- e. Wheel balance weights may be discarded, changed or added to.
- f. Aluminum or steel inflation valves are compulsory.
- g. Front and rear wheel sizes must be 17-19 inches

### **2.7.10.7 Brakes**

- a. Front brake master cylinder may be altered or replaced.
- b. Front brake calipers may be altered or replaced.
- c. Rear brake master cylinder may be altered or replaced.
- d. Rear brake calipers may be altered or replaced.
- e. Brake pads or shoes may be altered or replaced.
- f. Brake hoses and brake couplings may be altered or replaced.
- g. Hydraulic anti-knockback systems may be fitted to the brake lines/caliper.
- h. Brake discs may be altered or replaced. Only Steel (max. carbon content 2.1 wt.%) is allowed for brake discs. Alloys containing beryllium are not allowed to be used for brake calipers.
- i. ABS systems should be removed. If used the system may not be altered.

### **2.7.10.8 Handlebars and hand controls**

- a. Handlebars, hand controls and cables may be altered or replaced from those fitted to the homologated motorcycle.
- b. Cable operated throttles (grip assembly) must be equipped with both an opening and a closing cable including when actuating a remote drive by wire grip/demand sensor.
- c. Motorcycles must be equipped with a functional ignition kill switch or button mounted

on the right-hand handlebar (within reach of the hand while on the hand grips) that can stop a running engine. The button or switch must be RED.

#### **2.7.10.9 Footrest and foot controls**

- a. Footrests, hangers/brackets and hardware may be replaced and relocated but the hangers/brackets must either be mounted to their original frame mounting points or another location that does not require the modification of the frame.

#### **2.7.10.10 Fuel tank**

- a. The fuel tank must conform in principle to the homologated appearance and location of the original tank
- b. **Fuel Tank must remain as homologated material.**

#### **2.7.10.11 Fairing / Bodywork**

- a. The fairing, mudguards and body work must conform in principle to the homologated shape as originally produced by the manufacturer. Material is free. Headlights may be included even when considered external. All glass and plastic lenses should be covered by a clear vinyl or a vinyl replicating the look of the lens.
- b. **Air duct for cooling purposes maybe used as long as it conforms in principle to the homologated appearance of the motorcycle. Must be approved by Technical Director**
  - 1) Harley Davidson: must run a batwing fairing or Road Glide fairing. Either model fairing is acceptable regardless of the model HD motorcycle.
  - 2) Indian Motorcycles: must replicate the originally fitted and homologated part
- c. The windscreen must be installed and may be replaced.
- d. A lower catch/belly pan must be constructed to hold, in case of an engine breakdown, at least half of the total oil and engine coolant capacity used in the engine (min. 5 liters water-cooled/ 2.5 liters air-cooled).
- e. The saddlebags must conform in principle to the homologated appearance remaining stock size, position height may be altered a maximum of 4" in respect to the homologated vertical distance from the rear axle. The lid must be functional and lock in closed position. Each saddle bag must be able to enclose a 13.6" x 5.4" x 9" box and be at least 2000 cubic inches of volume. Material is free. saddlebags must be mounted in such a way that allows the bag to "break away" in the event of a crash.

#### **2.7.10.12 Seat**

- a. Seat may be altered or replaced.

#### **2.7.11 The following items MAY BE altered or replaced from those fitted to the homologated motorcycle.**

- a. Any type of lubrication, brake or suspension fluid may be used.
- b. Gaskets, seals, and gasket material.
- c. Bearings (ball, roller, taper, plain, etc.) of any type or brand may be used.
- d. Fasteners (nuts, bolts, screws, etc.), but internal engine bolts must remain of standard homologated materials or materials of higher specific weight.
- e. Thread repair using inserts of different material such as helicoils and timeserts.

- f. External surface finishes and decals.

**2.7.12 The following items MAY BE removed**

- a. Instrument and instrument bracket and associated cables.
- b. Tachometer.
- c. Speedometer and associated wheel spacers.
- d. Chain guard.

**2.7.13 The Following Items MUST BE Removed**

- a. Rear-view mirrors.
- b. Horn.
- c. License plate bracket.
- d. Toolbox.
- e. Safety bars, center and side stand brackets welded to the main frame may be removed. If the side stand is not removed it must be held in the up position by a secondary device.



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### 2.8 MOTOAMERICA TWINS CUP TECHNICAL SPECIFICATIONS

The following rules are intended to give freedom to modify or replace some parts in the interest of safety, research and development and improved competition between various motorcycle concepts.

#### **EVERYTHING THAT IS NOT AUTHORIZED AND PRESCRIBED IN THIS RULEBOOK IS STRICTLY FORBIDDEN**

#### **If a change to a part or system is not specifically allowed in any of the following articles, then it is forbidden**

Twins Cup motorcycles require a MotoAmerica homologation. (See MotoAmerica homologation procedure for Twins cup). All motorcycles must comply in every respect with all the requirements for road racing as specified in these technical regulations.

Once a motorcycle has been homologated, it may be used for racing in the corresponding class for a maximum period of **twenty (20)** years or until such time that the homologated motorcycle is disqualified by new rules or changes in the technical specifications of the corresponding class.

The appearance from the front, rear and the profile of the Twins Cup motorcycles must (except when otherwise stated) conform in principle to the homologated shape (as originally produced by the manufacturer). The appearance of the exhaust system is excluded from this rule.

#### 2.8.1 Motorcycle specifications

All parts and systems not specifically mentioned in the following articles must remain as originally produced by the manufacturer for the homologated motorcycle.

#### 2.8.2 Engine configurations and displacement capacities

The following engine configurations comprise the Twins Cup class.

Over 600cc up to 750cc	4 stroke	2- cylinder water cooled
Over 600cc up to 800cc	4 stroke	2- cylinder air cooled

Modifying the bore and stroke to reach class limits is not allowed. All machines must be normally aspirated.

### 2.8.3 Balancing various motorcycle concepts

In order to equalize the performance of motorcycles used in the Twins Cup Championship, a system of performance enhancements or restrictions can be developed (such as minimum weight, air restrictors or REV limits may be applied according to their respective racing performances). The decision to apply a balancing system to a motorcycle will be made by the MotoAmerica Permanent Bureau based on decisions made by the Technical Director at any time deemed necessary to ensure fair competition.

**See MotoAmerica Technical Bulletin 02-2021 for Aprilia RS660 engine restrictions.**

### 2.8.4 Minimum weight

#### 2.8.4.1 The minimum weight will be:

Over 600cc up to 800cc 135 kg (297.6 lbs.)

At any time during the event, the weight of the whole motorcycle (including the tank and its contents) must not be less than the minimum weight.

There is no tolerance on the minimum weight of the motorcycle.

During the final technical inspection at the end of each race, the selected motorcycles will be weighed in the condition they finished the race and the established weight limit must be met in this condition. Nothing may be added to the motorcycle. This includes all fluids.

During the practice and qualifying sessions, riders may be asked to submit their motorcycle to a weight control. In all cases, the rider must comply with this request.

The use of ballast is allowed to stay over the minimum weight limit and may be required due to the handicap system. The use of ballast and weight handicap must be declared to the Technical Director at the preliminary checks.

### 2.8.5 Numbers and number plates

The background colors and figures (numbers) for the Twins Cup are blue (pantone 281c) background with white numbers:

The sizes for all the front numbers are:	Minimum height:	140 mm
	Minimum width:	80 mm
	Minimum stroke:	25 mm
	Minimum space between numbers:	10 mm

The sizes for all the side numbers are:	Minimum height:	120 mm
	Minimum width:	70 mm
	Minimum stroke:	20 mm
	Minimum space between numbers:	10 mm

The allocated number (& plate) for the rider must be affixed on the motorcycle as follows:

- Once on the front, either in the center of the fairing or slightly off to one side. The number must be centered on the blue background with no advertising within 25 mm in all directions.
- Once, on each side of the motorcycle. The preferred location for the numbers on each side of the motorcycle is on the lower rear portion of the main fairing near the bottom. The number must be centered on the blue background. Any change to this position must be pre-approved a minimum of two (2) weeks before the first race by the Technical Director.
- The numbers must use the fonts as detailed after Art 2. Any numbers not using these fonts must have the design of the numbers and the layout pre-approved by the Technical Director a minimum of two (2) weeks before the first race. All digits must be of standard form.

- d. Any outlines must be of a contrasting color and the maximum width of the outline is three (3) mm. The background color must be clearly visible around all edges of the number (including outline). Reflective or mirror type numbers are not permitted.
- e. Numbers cannot overlap.

In case of a dispute concerning the legibility of numbers, the decision of the Technical Director will be final.

#### **2.8.6 Fuel**

- a. The designated fuel is VP Racing Fuels MGP.
- b. Please refer to Article 2.10 for additional details

#### **2.8.7 Tires**

- a. The maximum number of tires, of any type, available to each rider during the event will be specified in Article 2.3.7.1.
- b. A maximum of six (6) tires per rider can be mounted at any time.
- c. For the race only, wet tires will not need to be marked with a tire sticker. They will not be considered in the total number of tires available for use; however, normal allocation limits still apply.
- d. During free practices, qualifying practices, warm-up sessions and races, front and rear tires are required to be marked with tire stickers
- e. See article. 2.3.7

#### **2.8.8 Engine**

##### **2.8.8.1 Fuel injection system**

##### **2.8.8.1.1 Fuel injection systems refer to throttle bodies, fuel injectors, variable length intake tract devices and fuel pumps.**

- a. The original homologated fuel injection system must be used without any modification with the following exceptions:
  - i. Air funnels may be modified.
  - ii. Throttle bores may be modified.
  - iii. Butterfly valves may be modified to fit increased throttle size but must include the same safety features as stock.
  - iv. Secondary throttle valves and shafts may be removed or fixed in the open position and the electronics may be disconnected or removed.
- b. The fuel injectors must be stock and unaltered from the original specification and manufacture.
- c. Variable intake tract devices cannot be added if they are not present on the homologated motorcycle and they must remain identical and operate in the same way as the homologated system. All parts of the variable intake tract device must remain exactly as homologated.
- d. Air and air/fuel mixture must go to the combustion chamber exclusively through the throttle body butterflies.
- e. Electronically controlled throttle valves, known as 'ride-by-wire', may be only used if the homologated model is equipped with the same system. Software may be modified but all the safety systems and procedures designed by the original manufacturer must be maintained.

##### **2.8.8.2 Cylinder head**

The cylinder head must be the originally fitted and a homologated part. The following modifications are allowed:

- a. Porting and polishing of the cylinder head normally associated with individual tuning such as gas flowing of the cylinder head, including the combustion chamber, is allowed. Welding is not allowed. No machining or modification is allowed in the cam box / valve mechanism area.
- b. The throttle body insulators may be modified.
- c. Modifications of the inlet and exhaust ports by taking off or adding material (welding is forbidden). Epoxy may be used to shape the ports.
- d. Surface grinding of the cylinder head surface on the head gasket side
- e. Original homologated valve guides may be replaced.
- f. Polishing of the combustion chamber is allowed.
- g. Original valve seats must be used, but modifications are allowed to the shape.
- h. Compression ratio is free, but the combustion chamber may be modified only by taking material off.
- i. It is forbidden to add any material to the cylinder head unless as described above.
- j. Rocker arms (if any) must remain as homologated.
- k. The valves may be replaced but the valve face must remain the same diameter as homologated.
- l. Valve springs may be changed but the number must remain as homologated.
- m. Valve spring retainers, collets and/or spring seats may be altered or replaced.
- n. The shim buckets / tappets must remain as homologated.

#### **2.8.8.3 Camshaft**

- a. Camshafts may be modified or replaced (see article 2.8.8.2 a).
- b. At the technical checks: for direct cam drive systems, the cam lobe lift is measured; for non-direct cam drive systems (i.e. with rocker arms), the valve lift is measured.

#### **2.8.8.4 Cam sprockets or gears**

- a. Cam sprockets may be slotted to allow the adjustment of cam timing.
- b. Pressed on cam sprockets may be replaced with an adjustable boss and cam sprocket.
- c. The cam chain must remain as homologated.
- d. Cam chain tensioner may be replaced.

#### **2.8.8.5 Cylinders**

- a. Cylinders may be bored to a maximum of 2mm over standard bore or up to a maximum total displacement of 700 cc, whichever is less. Machines with a standard displacement greater than 700cc must remain as homologated.
- b. Cylinder coatings must remain as homologated or replaced with a steel sleeve.

#### **2.8.8.6 Pistons**

- a. May be modified or replaced

#### **2.8.8.7 Piston rings**

- a. May be modified or replaced

#### **2.8.8.8 Piston pins and clips**

- a. May be modified or replaced

#### **2.8.8.9 Connecting rods**

- a. Connecting rods may be altered or replaced from those fitted to the homologated motorcycle.
- b. The material must be the same type as the homologated item (e.g. steel, titanium, alloy) or steel.
- c. If the original homologated connecting rod is not fitted with a little end insert, then the replacement connecting rods may be fitted with an insert of any material.
- d. The center to center (little end to big end) length of the rod must be the same as the original homologated item.
- e. Connecting rod bolts are free.

#### **2.8.8.10 Crankshaft**

Only the following modifications are allowed to the originally fitted and homologated crankshaft:

- a. Bearing surfaces may be polished.
- b. Surface treatments may be applied to the crankshaft.
- c. Balancing is allowed but only by the same method as the homologated crankshaft. For example, heavy metal (e.g. Mallory metal inserts) is not permitted unless originally specified in the homologated crankshaft.
- d. The reduction in weight of the crankshaft can be no higher than 5% of the homologated weight without the tolerance as shown on the homologation drawing of the crankshaft.
- e. There is no limit to the addition of crankshaft weight.
- f. The balancing must be performed by the original method (e.g. drilling or machining) and in the same position (e.g. edge of counter weights).
- g. Polishing of the crankshaft is not allowed.
- h. The balance shaft must remain as homologated. No modifications are allowed.

#### **2.8.8.11 Crankcase / Gearbox housing**

- a. Crankcases must remain as homologated. No modifications are allowed (including painting, polishing and lightening).
- b. Bolt-on brackets and/or bracing may be added internally to the crankcase to increase strength, however welding on the crankcase and external bracing is not allowed.
- c. It is not allowed to add a pump used to create a vacuum in the crankcase. If a vacuum pump is installed on the homologated motorcycle, then it may be used only as homologated.

##### **2.8.8.11.1 Lateral covers and protection**

- a. Lateral (side) covers may be altered, modified or replaced (excluding pump covers). If altered or modified, the cover must have at least the same resistance to impact as the original one. If replaced, the cover must be made in material of the same or higher specific weight and the total weight of the cover must not be less than the original one.
- b. Titanium bolts may be used to fasten lateral covers.
- c. Oil containing engine covers cannot be secured with aluminum bolts.
- d. All lateral covers/engine cases containing oil, and which could be in contact with the ground during a crash, must be protected by a second cover made from metal such as aluminum alloy, stainless steel, steel or titanium. Each side (left and right) of the engine must have at least one (1) protective cover installed on the farthest protruding engine cover containing

oil. Composite covers are not permitted. FIM approved covers will be permitted without regard of the material or dimensions.

- i. The secondary cover must cover a minimum of 1/3 of the original cover. It must not have sharp edges that could damage the track surface. Covers must be fixed properly and securely with a minimum of three (3) case cover screws that also mount the original covers/engine cases to the crankcases.
  - ii. Heavy duty engine case covers may be used in lieu of secondary case covers.
- e. The Technical Director has the right to refuse any cover not satisfying this safety purpose.

#### **2.8.8.12 Transmission / Gearbox**

- a. The stock transmission shafts and gear set only are permitted. Shimming is allowed.
- b. Undercutting and surface treatments are permitted.
- c. OEM shift drum detent stars may be modified or replaced.
- d. Quick-shift systems are allowed (including wire and potentiometer).
- e. The countershaft sprocket, rear wheel sprocket, chain pitch and size may be changed.
- f. The sprocket cover may be modified or eliminated.
- g. The chain guard may be removed.

#### **2.8.8.13 Clutch**

- a. The clutch system (wet or dry type) and the method of operation (by cable or hydraulic) must remain as homologated.
- b. Friction and drive discs may be changed.
- c. Clutch springs may be changed.
- d. The original clutch assembly (including the clutch basket) may be modified or replaced by an aftermarket unit. The maximum retail price of the complete assembly is €1200. The clutch may include back torque limiting capabilities (slipper type).
- e. No power source (i.e. hydraulic or electric) can be used for gear selection if not installed in the homologated model for road use. Human power is excluded from the ban.

#### **2.8.8.14 Oil pumps and oil lines**

- a. The originally fitted and homologated oil pump may be modified but the oil pump housing, mounting points and oil feed points must remain as original.
- b. Oil lines may be modified or replaced. Oil lines containing positive pressure, if replaced, must be of braided reinforced construction with swaged or threaded connectors.

#### **2.8.8.15 Cooling System**

- a. The only liquid engine coolant permitted is water.
- b. Protective meshes may be added in front of the oil and/or water radiator(s).
- c. The cooling system hoses and catch tanks may be changed.
- d. The radiator fan and wiring may be removed. Thermal switches, water temperature sensors and thermostats may be removed inside the cooling system.
- e. The radiator may be changed with an aftermarket radiator or additional radiator.
- f. Oil coolers may be modified. Heat exchangers (oil/water) may be replaced with an oil cooler.
- g. Oil coolers must not be mounted on or above the rear fender.

h. The radiator cap is free.

#### **2.8.8.16 Air box**

- a. The air box design is free but must be able to allow the engine to operate in all climatic conditions at all times (i.e. rain should not stall the engine).
- b. The air box drains must be sealed.
- c. Ram air tubes or ducts running from the fairing to the air box may be modified, replaced or removed.
- d. All motorcycles must have a closed breather system. All oil breather lines must be connected and discharge in the air box.
- e. Additional heat shielding is allowed (i.e. gold or silver heat tape).

#### **2.8.8.17 Fuel supply**

- a. Fuel pumps must remain as homologated.
- b. The fuel pressure regulator may be modified or replaced.
- c. Fuel lines from the fuel tank up to the injectors (fuel hoses, delivery pipe assembly, joints, clamps, fuel canister) may be replaced and must be located in such a way that they are protected from crash damage.
- d. Fuel petcocks may be altered, replaced or removed from those fitted to the homologated motorcycle.
- e. Quick connectors or dry break connectors may be used.
- f. Fuel vent lines may be replaced.
- g. Fuel filters may be added.

#### **2.8.8.18 Exhaust system**

- a. Exhaust pipes, catalytic converters and silencers may be altered or replaced from those fitted to the homologated motorcycle. Catalytic converters must be removed.
- b. The number of the final exhaust silencer(s) is free.
- c. For safety reasons, the exposed edge(s) of the exhaust pipe(s) outlet(s) must be rounded to avoid any sharp edges.
- d. Wrapping of exhaust systems is not allowed except in the area of the rider's foot or an area in contact with the fairing for protection from heat.
- e. The noise limit for the Twins Cup will be 107 dB/A (with a three (3) dB/A tolerance after the race only) except for where local rules prevail.

### **2.8.9 Electrics and electronics**

#### **2.8.9.1 Ignition / Engine Control System (ECU)**

- a. The engine control system (ECU) may be modified or replaced with the following:
  - i. The original and homologated ECU with or without software changes and /or FIM/DWO/MotoAmerica approved external ignition/ injection module(s). Price limit €1500 (tax and OEM ECU price excluded but includes software, upgrades/ flashes)
  - ii. A MotoAmerica approved race ECU. For the race ECU to be approved the retail price including software, any activations and upgrades or necessary hardware (e.g. ignition driver and lambda modules) must be less than: €1500 excluding data logger or €2750 including data logger
  - iii. The maximum total price of other active/control/calculation units such as lambda driver modules, quick shifters, analogue to CAN, air bleed control, dash and ABS defeat

modules and traction control units is €750. These devices must be approved by FIM/DWO/MotoAmerica.

- b. For the ignition and or injection module, or quick shifter to be approved, samples must be sent by the manufacturer of the device to the Technical Director with technical data and selling price.
- c. Optional equipment sold by the motorcycle manufacturer for the homologated model is considered not homologated with the bike and must follow the requirements for approved electronics/data loggers.
- d. During an event, the Technical Director has the right to ask a team to substitute their ECU or external module with the sample received from the manufacturer. The change must be done before Sunday warm-up.
- e. No extra sensors may be added for control strategies except shift rod sensors, wheel speed sensors and lambda sensors.
- f. Other additional electronic hardware equipment not on the original homologated motorcycle cannot be added with the exceptions noted below.
- g. The characteristics of approved data logging systems must be the following:
  - i. The maximum retail price of the unit (hardware + software, excluding sensors and wiring harness) cannot exceed €3000 (tax excluded) if it is a standalone unit and €3750 (tax excluded) if combined with the ECU.
  - ii. The data logger unit must be available for sale to the public.
  - iii. A maximum of seven (7) simultaneously working sensors (connected to the additional data logger) may be added to the original sensors on the motorcycle.
  - iv. The sensors must be simple-function.
  - v. Approved data loggers with internal inertial platforms (IMU or gyros) may be used for data collection but may not be used for control strategy. Also see 2.6.9.1/i./vii.
  - vi. Type of sensor is free.
  - vii. Communication from the ECU to an approved data logger (logger can receive data only; no data transmission is allowed) is allowed without any limitation in CAN channel logger number.
- h. The addition of a device for infra-red (IR) transmission of a signal between the racing rider and his team, used exclusively for lap timing, is allowed and considered in the seven (7) sensors.
  - i. The addition of a GPS unit for lap timing/scoring purposes is allowed and considered in the seven (7) sensors.
- j. Telemetry is not allowed.
- k. No remote or wireless connection to the bike for any data exchange or setting is allowed whilst the engine is running or the bike is moving.
- l. Harness:
  - i. Wiring harness is free.
- m. The original speedometer and tachometer may be altered or replaced.
- n. Spark plugs may be replaced.
- o. The central unit (ECU) may be relocated.
- p. The battery is free.

### **2.8.9.2 Generator, alternator, electric starter**



- a. The generator (ACG) must remain as homologated; no modifications are allowed.
- b. The flywheel may be modified or replaced.
- c. The ACG must generate sufficiently to maintain battery charge.
- d. The stator must be fitted in its original position and without offsetting.
- e. The electric starter must operate normally and always be able to start the engine during the event.

During parc fermé, the starter must crank the engine at a suitable speed for starting for a minimum of two (2) seconds without the use of a boost battery. No boost battery may be connected to the machine after the end of the session.

#### **2.8.10 Main frame and pre-assembled spare frame**

- a. During the entire duration of the event, each rider can only use one (1) complete motorcycle, as presented for technical control, with the frame clearly identified with a seal.
- b. In case the frame needs to be replaced, the rider or the team can request the use of a spare frame to the Technical Director.
- c. The pre-assembled spare frame must be presented to the Technical Director to receive the permission to rebuild the motorcycle. The pre-assembly of the frame shall be strictly limited to:
  - i. Main frame and swing-arm
  - ii. Bearings (steering pipe, swing arm, etc.)
  - iii. Rider controls (handle bars, rear sets, shift/brake linkage), front and rear mud guard.
  - iv. Rear suspension linkage and shock absorber
  - v. Upper and lower triple clamps, front forks, braking system and wheels.
  - vi. Wiring harness, ECU, dash associated electronics, throttles, airbox and associated cables.
- d. The spare frame will not be allowed in the pit box before the rider or the team has received authorization from the Technical Director.
- e. The motorcycle, once rebuilt, must be inspected before its use by the technical stewards for safety checks and a new seal will be placed on the motorcycle frame.
- f. No complete spare machine may be at the track. If found, penalties will be applied. For the remainder of the event the machine will be impounded and no part of that machine may be used for spare parts.

*See 2.5.10 for a complete explanation of procedures*

#### **2.8.10.1 Frame body and sub-frames**

- a. The main frame must remain as originally produced by the manufacturer for use on the homologated machine.
- b. Gussets or tubes may not be added or removed; other modifications are allowed within the following section of these rules. Brackets may be welded or bolted to the main frame for the purpose of constructing a detachable front or rear sub-frame or attaching fairings. These brackets may not be used to change the rigidity of the main frame. (See 2.8.10.1/ j)
- c. Holes may be drilled in the frame only to fix approved components (i.e. fairing brackets, steering damper mount).
- d. The engine must be mounted in the homologated position.
- e. Suspension linkage mounting points on the frame must remain as homologated.

- f. If the homologated machine has exchangeable bearing inserts/ bushes:
  - i. The bushings/inserts are free to make the above adjustment and the homologated position is considered as the position in which the production motorcycle is supplied.
- g. If the homologated motorcycle has fixed bearing positions for the steering stem:
  - i. Steering angle changes are permitted by fitting inserts onto the bearing seats of the original steering head. The original bearing seats may be modified (ovaed) or increased in diameter to insert special bushings. No part of these special bushings may protrude axially more than three (3) mm from the original steering head pipe location nor may the bearing be inset.
- h. All motorcycles must display a vehicle identification number punched on the frame body (a proper "legal VIN" which the Technical Director may choose to append). No detachable plates are permitted.
- i. No polishing or surface refinishing is allowed but the paint scheme is not restricted.
- j. The front and rear sub frame may be changed, altered or removed. If the rear sub frame is integral to the main frame, additional seat brackets may be added and non-stressed protruding brackets may be removed if they do not affect the safety of the construction or assembly. Rear sub frames that are integral to the main frame may be removed and replaced with a detachable sub-frame. Titanium or composites may not be used for the construction of the subframe. Bolt-on accessories to the rear sub-frame may be removed. Also see 2.8.11/f.
- k. Approved sub-frames will be permitted without regard of the material.

#### **2.8.10.2 Suspension - General**

- a. Participants in the Twins Cup class must only use the approved and listed suspension units for that season.
- b. The approved products from the manufacturers must be available to all participants at least one (1) month before the first round of the Twins Cup season and remain available all season. The products must be available within six (6) weeks of a confirmed order.
- c. Setting parts and tuning parts must be provided by the suspension manufacturers to all customers/teams/participants using the manufacturer's products. These parts can be used by all participants during the season. These parts shall be available for immediate delivery to all teams/customers.
- d. Teams may not modify any part of the forks or shock absorber; all setting parts must be supplied by the suspension manufacturer and available to all teams/riders.
- e. The suspension manufacturers are allowed to offer service contracts when the team is using the approved and listed suspension products. The suspension manufacturers cannot demand a service contract for a customer or participant in order to obtain a suspension product.
- f. Electronically controlled suspension must be removed.

#### **2.8.10.3 Front suspension**

- a. The front fork in whole or part may be changed but must be the same type as the homologated (leading link, telescopic, etc.).
- b. Forks from the Twins Cup approved list, or from any other FIM homologated Supersport or Superstock 1000 machine, may be used.
- c. The upper and lower fork clamps (triple clamp, fork bridges) and stem may be changed or modified.
- d. A steering damper may be added or replaced with an after-market damper.

- e. The steering damper cannot act as a steering lock limiting device.

#### **2.8.10.4 Swing-arm (rear fork)**

- a. The rear fork must remain as originally produced by the manufacturer for the homologated motorcycle.
- b. The rear swing-arm pivot position may be modified by use of a modified pivot bolt (smaller or elongated) but the frame must remain as homologated. If the standard bike has inserts then the orientation/position of the original insert may be changed but the insert cannot be replaced or modified.
- c. Rear wheel stand brackets may be added to the rear fork by welding or by bolts. Brackets must have rounded edges (with a large radius). Fastening screws must be recessed. An anchorage system or point(s) to keep the original rear brake caliper in place may be added to the rear swing-arm.
- d. The rear axle chain adjuster may be modified or changed.

#### **2.8.10.5 Rear suspension unit (shock)**

- a. The rear suspension unit may be changed but a similar system must be used (i.e. dual or mono).
- b. The rear suspension linkage may be modified or replaced.
- c. The original fixing points on the frame (if any) must be used to mount the shock absorber, linkage and rod assembly fulcrum (pivot points).
- d. Removable top shock mounts may be replaced. If replaced, they must retain their homologated geometry.

#### **2.8.10.6 Wheels**

- a. Wheels may be replaced (see article 2.3.4) and associated parts may be altered or replaced from those fitted to the homologated motorcycle.
- b. OEM wheels that do not meet the size requirements must be replaced.
- c. Aftermarket wheels must be made from aluminum alloys.
- d. The use of the following alloy materials for the wheels is not allowed: Beryllium ( $\geq 5\%$ ), Scandium ( $\geq 2\%$ ), Lithium ( $\geq 1\%$ ).
- e. Each specific racing wheel model must be approved and certified according to JASO (Japanese Automotive Standards Organization) T 203-85 where W (maximum design load) of art. 11.1.3 is 195 kg for the front wheel and 195 kg for the rear wheel; K = 1.5 for front and rear wheels. Static radius of tire: front 0.301 m, rear 0.331 m.
- f. Wheel manufacturers must provide a copy (or copies) of the certificate for their wheel(s) as proof of compliance to the Technical Director when requested.
- g. The homologated wheel and sprocket carrier assembly may be used with no modification, irrespective of material.
- h. **The wheels may be overpainted, but the original finish cannot be removed.**
- i. On motorcycles equipped with a double-sided swing arm (rear fork), the rear sprocket and brake rotor must remain on the rear wheel when the wheel is removed.
- j. Bearings, seals, and axles may be altered or replaced from those fitted to the homologated motorcycle. The use of titanium and light alloys is forbidden for wheel spindles (axles).

Wheel rim diameter size (front and rear):	17 inches
Front wheel rim width:	3.50 inches
Rear wheel rim width:	5.25-5.5 inches

### 2.8.10.7 Brakes

- a. Participants in the Twins Cup season may use the following front brake parts:
  - i. The originally fitted and homologated front and rear master cylinder and calipers
  - ii. The front and rear master cylinder and calipers from an FIM homologated Supersport or Superstock 1000 machine
  - iii. The front and rear master cylinder and calipers from the Twins Cup approved list
  - iv. Any combination of the above
- b. The approved products from the manufacturers must be available to all participants at least one month before the first round of the MotoAmerica Twins Cup season and remain available all season. The products must be available within four (4) weeks of a confirmed order.
- c. No parts can be added to the approved list during the current season. Performance related updates are not allowed. Any product changes due to manufacturing or material supply issues must be approved in advance.
- d. Front and rear brake calipers, as well as all the mounting points and mounting hardware (mount, carrier, hanger), must remain in the homologated position (see also article 2.8.10.4 c). When using brake systems from other homologated machines you may use the same mounting technique that the systems originated from. (i.e. rear brakes may be converted to underslung if the caliper was made for that purpose and vice versa)
- e. Brake pads or shoes may be altered or replaced from those fitted to the homologated motorcycle.
- f. Brake hoses and brake couplings may be altered or replaced from those fitted to the homologated motorcycle. The split of the front brake lines for both front brake calipers must be made above the lower fork bridge (lower triple clamp).
- g. Only steel (max. carbon content 2.1 wt. %) is allowed for brake discs.
- h. The ABS system must be removed.

### 2.8.10.8 Handlebars and hand controls

- a. Handlebars may be replaced.
- b. Handlebars and hand controls may be relocated.
- c. Throttle controls must be self-closing when not held by the hand.
- d. Throttle assembly and associated cables may be modified or replaced but the connection to the throttle body and to the throttle controls must remain as on the homologated motorcycle.
- e. The clutch and brake lever may be replaced with an after-market model. An adjuster to the brake lever is allowed.
- f. Switches may be changed but the electric starter switch and engine stop switch must be located on the handlebars.
- g. Motorcycles must be equipped with a functional ignition kill switch or button mounted on the right-hand handlebar (within reach of the hand while on the hand grips) that is capable of stopping a running engine. The button or switch must be RED.

### **2.8.10.9 Footrest and foot controls**

- a. Footrests, hangers/brackets and hardware may be replaced and relocated but the hangers/brackets must be mounted to their original frame mounting points.
- b. Foot controls, gear shift and rear brake must remain operated manually by foot.
- c. Footrests may be rigidly mounted or a folding type which must incorporate a device to return them to the normal position.
- d. The end of the foot rest must have at least an eight (8) mm solid spherical radius.
- e. Non-folding footrests must have an end (plug) which is permanently fixed, made of aluminum, plastic, Teflon® or an equivalent type material (minimum radius 8 mm). The plug surface must be designed to reach the widest possible area. The Technical Director has the right to refuse any plug not satisfying this safety purpose.

### **2.8.10.10 Fuel Tank**

- a. The fuel tank must be the originally fitted and homologated part with no modification allowed.
- b. All fuel tanks must be completely filled with fire retardant material (i.e. fuel tank foam).
- c. Fuel tanks with tank breather pipes must be fitted with non-return valves that discharge into a catch tank with a minimum volume of 250cc made of a suitable material.
- d. Fuel caps may be changed. Fuel caps, when closed, must be leak proof. Additionally, they must be securely locked to prevent accidental opening at any time.
- e. A rider spacer/pad may be fitted to the rear of the tank with non-permanent adhesive. It may be constructed of foam padding or composite material.
- f. The tank may have a fitted cover.
- g. The sides **and rear** of the fuel tank may be protected with a cover made of a composite material.

### **2.8.10.11 Fairing / Bodywork**

- a. The fairing and body work may conform in principle to the homologated shape as originally produced by the manufacturer or replicate any full fairing type motorcycle within the following limits:
  - i. No wings or winglets
  - ii. No excessive aerodynamics that may interfere with the safe operation of the motorcycle
- b. The use of carbon fiber or Kevlar® materials is not allowed in fairing, fuel tank cover, seat, seat base and associated bodywork construction. Specific reinforcements in Kevlar® or carbon are allowed locally around holes and stressed areas.
- c. "Naked" or fairing-less is acceptable but must have a belly pan that conforms with 2.8.10.11 (e)(f).
- d. The windscreen may be replaced or added if not originally equipped.
- e. The original air ducts running between the fairing to the airbox may be altered or replaced from those fitted to the homologated motorcycle.
- f. The lower fairing must be constructed to hold, in case of an engine breakdown, at least half of the total oil and engine coolant capacity used in the engine (min. 5 liters). The lower edge of openings in the fairing must be positioned at least 50 mm above the bottom of the fairing.

- g. The lower fairing must incorporate one hole of 25 mm in the bottom of the front lower area. This hole must remain closed in dry conditions and must be only opened in wet race conditions, as declared by the race director.
- h. The front fender design and material are free but no excessive aerodynamics that may interfere with the safe operation of the motorcycle. The decision will be made by the Technical Director and is final.
- i. The rear fender design and material are free, may be added or removed. No excessive aerodynamics that may interfere with the safe operation of the motorcycle. The decision will be made by the Technical Director and is final.

#### **2.8.10.12 Seat**

- a. The seat may be altered or replaced from those fitted to the homologated motorcycle.
- b. The top portion of the rear body work around the seat may be modified to a solo seat.
- c. Holes may be drilled in the seat or rear cowl to allow additional cooling. Holes which are bigger than 10 mm must be covered with metal gauze or fine mesh. Mesh must be painted to match the surrounding material.
- d. Material of construction of the seat may be altered or replaced from those fitted to the homologated motorcycle.

#### **2.8.10.13 Rear safety light**

All motorcycles must have a functioning red light mounted at the rear of the machine. This light must be switched on any time the motorcycle is on the track or being ridden in the pit lane and the session is declared WET. All lights must comply with the following:

- a. Lighting direction must be parallel to the machine center line (motorcycle running direction) and be clearly visible from the rear at least 15 degrees to both the left and right sides of the machine center line.
- b. The rear light must be mounted near the end of the seat/rear bodywork and approximately on the machine center line, in a position approved by the Technical Director. In case of dispute over the mounting position or visibility, the decision of the Technical Director will be final.
- c. Power output/luminosity equivalent to approximately: 10 – 15 (incandescent), 0.6 – 1.8 W (LED).
- d. The output must be continuous; no flashing safety light is allowed whilst on track. Flashing is allowed in the pit lane when the pit limiter is active.
- e. The safety light power supply may be separated from the motorcycle.
- f. The Technical Director has the right to refuse any light system not satisfying this safety purpose.

#### **2.8.10.14 Fasteners**

- a. Standard fasteners may be replaced with fasteners of any material and design.
- b. Aluminum fasteners may only be used in non-structural locations.
- c. Titanium fasteners may be used in structural locations but the strength and design must be equal to or exceed the strength of the standard fastener it is replacing. See article 2.8.10.6/j.
- d. Special steel fasteners may be used in structural locations but the strength and design must be equal to or exceed the strength of the standard fastener it is replacing.
- e. Fasteners may be drilled for safety wire, but intentional weight-saving modifications are not allowed.

- f. Threads repairs may be made using inserts of different material such as Helicoils and Timeserts.
  - g. Fairing/bodywork fasteners may be changed to the quick disconnect type.
- 2.8.11 The following items MAY BE altered or replaced from those fitted to the homologated motorcycle**
- a. Any type of lubrication, brake or suspension fluid may be used.
  - b. Gaskets, seals and gasket materials
  - c. Bearings (ball, roller, taper, plain, etc.) of any type or brand may be used.
  - d. Instruments, instrument bracket(s) and associated cables
  - e. Painted external surface finishes and decals
  - f. Material for brackets connecting non-original parts (fairing, exhaust, instruments, etc.) to the frame (or engine) cannot be made from titanium or fiber reinforced composites except the exhaust silencer hanger that may be in carbon.
  - g. Protective covers for the frame, chain and footrests may be made in other materials, like fiber composite material, if these parts do not replace original parts mounted on the homologated model.
- 2.8.12 The following items MAY BE removed**
- a. Instrument, instrument bracket and associated cables
  - b. Tachometer
  - c. Speedometer and associated wheel spacers
  - d. Chain guard
- 2.8.13 The following items MUST BE removed**
- a. Headlamp, rear lamp and turn signal indicators (when not incorporated in the fairing). Openings must be covered by suitable materials.
  - b. Rear-view mirrors
  - c. Horn
  - d. License plate bracket
  - e. Tool box
  - f. Helmet hooks and luggage carrier hooks
  - g. Passenger foot rests
  - h. Passenger grab rails
  - i. Safety bars, center and side stand brackets welded to the main frame may be removed.

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## 2.9 MOTOAMERICA JUNIOR CUP TECHNICAL SPECIFICATIONS

The following rules are intended to permit limited changes to the homologated motorcycle in the interests of safety and improved competition between various motorcycle concepts.

### **EVERYTHING THAT IS NOT AUTHORIZED AND PRESCRIBED IN THIS RULEBOOK IS STRICTLY FORBIDDEN**

#### **If a change to a part or system is not specifically allowed in any of the following articles, then it is forbidden**

Junior Cup motorcycles require an FIM homologation (see Appendix FIM homologation procedure for Superstock, Supersport and Superbike motorcycles). All motorcycles must comply in every respect with all the requirements for road racing as specified in these technical regulations, unless they are already equipped as such on the homologated model. FIM homologated machines must also enter into a participation agreement with MotoAmerica to be eligible for the class.

Once a motorcycle has been homologated, it may be used for racing in the corresponding class for a maximum period of 8 years (see homologation art 1.4.4), or until such time that the homologated motorcycle is disqualified by new rules or changes in the technical specifications of the corresponding class.

The appearance from the front, rear and the profile of Junior Cup motorcycles must (except when otherwise stated) conform to the homologated shape (as originally produced by the manufacturer). The appearance of the exhaust system is excluded from this rule.

### 2.9.1 **Motorcycle specifications**

All parts and systems not specifically mentioned in the following articles must remain as originally produced by the manufacturer for the homologated motorcycle.

### 2.9.2 **Eligible machines**

The class will be based around the machines sold in Europe as A2 class machines and excluding the A1 class machines. The MotoAmerica/FIM Commission has the right to decide which machines will be eligible in the class.

For 2021 the following will be legal (this list can be amended at any time by the MotoAmerica Commission):

- Kawasaki Ninja 400
- KTM RC390
- KTM RC390 R
- Yamaha YZF-R3 (Euro 3)
- Yamaha YZF-R3A (Euro 4)
- Yamaha YZF-R3 2020 (Euro 3 and 4)

### 2.9.3 **Balancing various motorcycle concepts**

The MotoAmerica/FIM Commission reserve the right to apply balancing to the machines in the class as they see fit in order to maintain equality amongst machines. Methods may include but are not limited to the following:

- rev limit
- weight limit changes
- restrictor plates/throttle stops
- approved parts (**see approved parts list including restrictors at:**  
<http://www.motoamericaregistration.com/competitor-info/>)

The decision to apply the handicap will be taken by the MotoAmerica/FIM Commission at any time deemed necessary to ensure fair competition. Balancing parts and modifications will be documented in the approved parts list published on [www.motoamericaregistration.com](http://www.motoamericaregistration.com) and supersede all following regulations.

See technical bulletin 08-2018 for JRC cup balancing information.  
[Letterhead \(motoamericaregistration.com\)](http://www.motoamericaregistration.com)

#### 2.9.4 Minimum weight

The minimum weight for each model is as follows:

Brand	Bike Weight		Combined Minimum Bike and Rider Weight*
	Hard Minimum	Soft Maximum	
KTM RC 390 R	133 kg	146 kg	202
Ninja 400	137 kg	150 kg	210
YZF-R3 (All)	137 kg	150 kg	204

- Combined weight is the weight of the rider (in full racing equipment) and bike, as used on track.
- IF the bike has achieved or exceeded the 'Soft Maximum Weight' then the combined minimum weight does not need to be reached. The bike alone may never at any time be below the 'Hard Minimum Weight'. This limits the maximum amount of ballast that can be added to the machines.

At any time of the event, the weight of the whole motorcycle (including the tank and its contents) must not be lower than the minimum weight.

There is no tolerance on the minimum weight of the motorcycle.

During the final technical inspection at the end of the race, the selected motorcycles and riders will be weighed in the condition they finished the race, and the established weight limit must be met in this condition. Nothing may be added to the motorcycle. This includes all fluids.

During the practice and qualifying sessions, riders may be asked to submit their motorcycle to a weight control. In all cases the rider must comply with this request.

The use of ballast is allowed to stay over the minimum weight limit and may be required due to the handicap system. The use of ballast and weight handicap must be declared to the Technical Director at the preliminary checks.

#### 2.9.5 Numbers and number plates

Numbers must be easily legible, in a clear simple font and contrast strongly with the background color. Backgrounds must be yellow (pantone yellow c).

The sizes for all the front numbers are:	Minimum height:	140 mm	allocated number (& plate) for the rider must be affixed on the motorcycle as follows:
	Minimum width:	80 mm	
	Minimum stroke:	25 mm	
	Minimum space between numbers:	10 mm	
The sizes for all the side numbers are:	Minimum height:	120 mm	
	Minimum width:	70 mm	
	Minimum stroke:	20 mm	
	Minimum space between numbers:	10 mm	

- a. Once on the front, either in the center of the fairing or slightly off to one side. The number must be centered on the yellow background with no advertising within 25mm in all directions.
- b. Once, on each side of the motorcycle. The preferred location for the numbers on each side of the motorcycle is on the lower rear portion of the main fairing near the bottom. The number must be centered on the yellow background. Any change to this must be pre-approved a minimum of two (2) weeks before the first race by the MotoAmerica Technical Director.
- c. The numbers must use the fonts as detailed after Art 2. Any numbers not using these fonts must have the design of the numbers and the layout pre-approved by the MotoAmerica Technical Director a minimum of two(2) weeks before the first race. All digits must be of standard form.
- d. Any outlines must be of a contrasting color and the maximum width of the outline is three (3) mm. The background color must be clearly visible around all edges of the number (including outline). Reflective or mirror type numbers are not permitted.
- e. Numbers cannot overlap.

In case of a dispute concerning the legibility of numbers, the decision of the Technical Director will be final.

#### **2.9.6 Fuel**

- a. The designated fuel is VP Racing Fuels MGP.
- b. Please refer to Article 2.10 for additional details.

#### **2.9.7 Tires**

- a. The maximum number of tires, of any type, available to each rider during the event will be specified in Article: 2.3.7.1
- b. For the Junior Cup race only, wet tires will not need to be marked with a tire sticker. They will not be considered in the total number of tires available for use, however normal allocation limits still apply.
- c. During free practices, qualifying practices, warm-up session and races, front and rear tires are required to be marked with tire stickers
- d. See article. 2.3.7

#### **2.9.8 Engine**

Machines may be randomly chosen for dyno testing.

##### **2.9.8.1 Fuel injection system**

- 2.9.8.1.1** Fuel injection systems refer to throttle bodies, fuel injectors, variable length intake tract devices, fuel pumps and fuel pressure regulators.
  - a. The original homologated fuel injection system must be used without any modification.
  - b. The fuel injectors must be stock and unaltered from the original specification and manufacture.
  - c. Air funnels must remain as originally produced by the manufacturer for the homologated motorcycle.
  - d. Butterfly valves cannot be changed or modified.
  - e. Secondary throttle valves may be removed or fixed in the open position and the electronics may be disconnected or removed. Secondary throttle shafts must remain in place.

- f. Variable intake tract devices cannot be added if they are not present on the homologated motorcycle and they must remain identical and operate in the same way as the homologated system. All the parts of the variable intake tract device must remain exactly as homologated.
- g. Air and air/fuel mixture must go to the combustion chamber exclusively through the throttle bodies.
- h. Electronically controlled throttle valves, known as 'ride-by-wire', may only be used if the homologated model is equipped with the same system.

#### **2.9.8.2 Cylinder head**

- a. Must be the originally fitted and homologated part with no modification allowed.
- b. The exhaust air bleed system must be blocked and the external fittings on the cam cover(s) may be replaced by plates.
- c. Valve spring shims maybe changed freely.
- d. Head and base gasket – see approved parts list for allowed head gaskets (per manufacturer).
- e. A restrictor may be required to be fitted between the cylinder head and inlet manifold. It will be a flat plate. No blending or filling will be allowed with sealant or otherwise. See approved parts list: <http://www.motoamericaregistration.com/competitor-info/>
- f. The minimum squish clearance (per machine) will be listed in the approved parts list available at <http://www.motoamericaregistration.com/competitor-info/>

#### **2.9.8.3 Camshaft**

- a. The camshaft(s) must be the originally fitted and homologated part with no modification allowed.
- b. At the technical checks: for direct cam drive systems, the cam lobe lift is measured; for non-direct cam drive systems (i.e. with rocker arms), the valve lift is measured.

#### **2.9.8.4 Cam sprockets or gears**

- a. Cam gears may be slotted or replaced with an adjustable part. Cam sprockets must be on the approved parts list.
- b. The cam chain must remain as homologated.
- c. Cam chain tensioning devices must remain as homologated.

#### **2.9.8.5 Cylinders**

- a. Must be the originally fitted and homologated parts with no modification allowed.

#### **2.9.8.6 Pistons**

- a. Must be the originally fitted and homologated parts with no modification allowed.

#### **2.9.8.7 Piston rings**

- a. Must be the originally fitted and homologated parts with no modification allowed.
- b. All piston rings must be fitted.

#### **2.9.8.8 Piston pins and clips**

- a. Must be the originally fitted and homologated parts with no modification allowed.

#### **2.9.8.9 Connecting rods**

- a. Must be the originally fitted and homologated parts with no modification allowed.

#### **2.9.8.10 Crankshaft**

- a. Must be the originally fitted and homologated parts with no modification allowed.

#### **2.9.8.11 Crankcase / Gearbox housing**

- a. Must be the originally fitted and homologated parts with no modification allowed.

##### **2.9.8.11.1 Lateral covers and protection**

- a. Lateral (side) covers may be altered, modified or replaced. If altered or modified, the cover must have at least the same resistance to impact as the original one. If replaced, the cover must be made in material of the same or higher specific weight and the total weight of the cover must not be less than the original one.
- b. Oil containing engine covers must be secured with steel bolts.
- c. All lateral covers/engine cases containing oil, and which could be in contact with the ground during a crash, must be protected by a second cover made from metal such as aluminum alloy, stainless steel, steel or titanium. Each side (left and right) of the engine must have at least one (1) protective cover installed on the farthest protruding engine cover containing oil. Composite covers are not permitted. FIM approved covers will be permitted without regard of the material or dimensions.
  - i. The secondary cover must cover a minimum of 1/3 of the original cover. It must not have sharp edges that could damage the track surface. Covers must be fixed properly and securely with a minimum of three (3) case cover screws that also mount the original covers/engine cases to the crankcases.
  - ii. Heavy duty engine case covers may be used in lieu of secondary case covers.
- d. The Technical Director has the right to refuse any cover not satisfying this safety purpose.

#### **2.9.8.12 Transmission / Gearbox**

- a. Must be the originally fitted and homologated parts with no modification allowed except:
  - i. Shimming is allowed.
  - ii. Undercutting and surface treatments are permitted.
  - iii. Shift star and detent may be replaced but must function as originally designed.
- b. Downshift auto-blipping is not allowed.
- c. The countershaft sprocket, rear wheel sprocket, chain pitch and size may be changed.
- d. The sprocket cover may be modified or eliminated.
- e. The chain guard as long as it is not incorporated in the rear fender may be removed.

#### **2.9.8.13 Clutch**

- a. The clutch system (wet or dry type) and the method of operation (by cable or hydraulic) must remain as homologated.
- b. Friction and drive discs may be changed.
- c. Clutch springs may be changed.
- d. The clutch basket (outer) must be the originally fitted and homologated part but may be reinforced.
- e. The original clutch assembly may be modified or replaced by an aftermarket clutch, also may include back torque limiting capabilities (slipper type).

#### **2.9.8.14 Oil pumps, oil lines and water pump**

- a. The oil pump and oil lines must be the originally fitted and homologated parts with no modification allowed.
- b. The water pump must be the originally fitted and homologated part.

### 2.9.8.15 Radiator / Oil cooler

- a. The only liquid engine coolant permitted is water.
- b. Protective meshes may be added in front of the oil and/or water radiator(s).
- c. The cooling system hoses and catch tanks may be changed.
- d. Radiator fans and wiring may be removed. Thermal switches, water temperature sensors and thermostats may be removed inside the cooling system.
- e. The radiator cap is free.
- f. An additional water radiator may be fitted but the appearance of the front, the rear and the profile of the motorcycle must not be changed. Extra mounting brackets to accommodate the additional radiator is permitted.

### 2.9.8.16 Air box

- a. The air box must be the originally fitted and homologated part with no modification allowed.
- b. The air filter element may be modified or replaced but not eliminated and must be mounted in the original position.
- c. The air box drains must be sealed.
- d. All motorcycles must have a closed breather system. All the oil breather lines must be connected (may pass through an oil catch tank) and exclusively discharge in the air box.
- e. No heat protection may be attached to the air box.

### 2.9.8.17 Fuel supply

- a. The fuel pump and fuel pressure regulator must be the originally fitted and homologated parts with no modification allowed
- b. The fuel pressure must be as homologated.
- c. Fuel lines from the fuel tank up to the delivery pipe assembly (delivery pipe excluded) may be replaced and must be located in such a way that they are protected from crash damage.
- d. Quick connectors or dry break connectors may be used.
- e. Fuel vent lines may be replaced.
- f. Fuel filters may be added.

### 2.9.8.18 Exhaust system

- a. Exhaust pipes and silencers may be modified or changed. Catalytic converters must be removed.
- b. The number of the final exhaust silencer(s) is free.
- c. For safety reasons, the exposed edges of the exhausts pipe(s) outlet must be rounded to avoid any sharp edges.
- d. Wrapping of exhaust systems is not allowed except in the area of the rider's foot or an area in contact with the fairing for protection from heat.
- e. The noise limit for the Junior Cup will be 110 dB/A (with a three (3) dB/A tolerance after the race only).
- f. The test RPM will be as follows:

Machine:	Test rpm
Kawasaki Ninja 400	6,500rpm
Yamaha YZF-R3	7,500rpm
KTM RC390	5,500rpm

## 2.9.9 Electrics and electronics

### 2.9.9.1 Ignition / Engine Control System (ECU)

a. **The engine control system (ECU) must be either:**

- i. The Supersport 300 Control Electronics System **or a MotoAmerica approved electronics system. See Art. 2.9.9.2. See bulletin 08-2018**
- ii. The original system (with homologated ECU and software or MotoAmerica approved software) with a MotoAmerica/DWO approved external fuel injection module and data logger added. See Art 2.9.9.3

b. The maximum rpm for each machine is as follows (start of 2020):

Machine:	Max rpm
Kawasaki Ninja 400	10,350 rpm
KTM RC390	11,000 rpm
KTM RC390 R	11,000 rpm
Yamaha YZF-R3	13,000 rpm

### 2.9.9.2 Supersport 300 Control Electronics System

- a. The ECU/Dashboard/Harness must be the Supersport 300 approved Control Electronic System. The sole official supplier of the Control Electronics System is Solo Engineering. [www.soloengineering.com](http://www.soloengineering.com), [sales@solengineering.com](mailto:sales@solengineering.com) as documented in the approved parts list.
- b. The software and firmware used must be from the list of legal software/firmware versions published at [www.fim-live.com](http://www.fim-live.com).
- c. Optional equipment sold by the motorcycle Manufacturer for the homologated model is considered not homologated with the bike and must follow the requirements for approved electronics/data loggers.
- d. At any time during an event the Technical Director has the right to make a team substitute their ECU with an FIM sample.
- e. Sensors may not be replaced, modified or substituted unless noted and the allowed OEM ECU sensors/channels are:
  1. Throttle position sensor(s)
  2. Map sensor, map sync (pressure sensor on the intake port used to synchronize the engine during the start)
  3. Airbox pressure
  4. Engine pick-ups (cam, crank)
  5. Twist grip position
  6. Front speed (from ABS sensor)
  7. Rear speed (from ABS sensor)
  8. Gearbox output shaft speed
  9. Gear position
  10. Barometric air pressure
  11. Water temperature
  12. Air temperature

13. Oil pressure switch
14. Tip-over switch (Internal to ECU)

The following may be added:

1. Gear shift load cell/switch (signal to ECU only)
  2. Lambda sensor (Bosch LSU4.9)
  3. Left- and Right-Hand switches (may be replaced from kit)
  4. Fork position (teams' choice)
  5. Shock position (teams' choice)
  6. Front brake pressure sensor (teams' choice)
  7. Transponder/lap time signal
  8. GPS receiver unit
- f. No external modules may be fitted (except as part of a quickshifter where it may only provide a signal to the approved ECU and only be connected to the battery and the quick shift connector on the approved harness.
- g. The data logger must be:
- i. From the DWO/FIM approved Supersport 300 approved logger list.
  - ii. The firmware/software of any data logging units must be an FIM/DWO approved version.
  - iii. A copy of the software and documentation must be submitted by the manufacturer to the Technical Director before it can be approved for use.
  - iv. An external logger may only connect to the 'CAN' connections in the harness. These supply CAN and 12v Power.
  - v. A GPS receiver/aerial may be connected to an external logging device.
  - vi. No other connections can be made to the data logger
  - vii. Free analysis software must be available.
- h. Plug cap must remain as homologated.
- i. Spark plugs may be replaced.
- j. Battery is free.

### 2.9.9.3 Original Electronics System

- a. The engine control system (ECU) must be either:
- i. ~~The original system as homologated, with no change of software or with a manufacturer approved software.~~ **MotoAmerica approved flash installed only. See bulletin 08-2018 for approved MotoAmerica Flash**
  - ii. The original system (with the homologated ECU and software or MotoAmerica approved software) (option i) with an FIM/DWO approved external fuel injection module added.
  - iii. During an event FIM/DWO will exchange ECU's with samples held by FIM/DWO. The exchange will take place on the grid or in a holding area before the pit lane opens. The team will have the option to use the same ECU in the morning warm-up and it will be impounded between warm-up and the race. Also see point g.
- b. The software and the firmware must be supplied and approved by the machine's manufacturer or a MotoAmerica approved supplier. The Technical Director must be



supplied with the software/firmware and it must be added to the approved parts list before it may be used.

- c. The manufacturer or approved supplier must provide MotoAmerica with the tools/software to perform software checks.
- d. Throughout the season the manufacturer may update the software and the updates must be made available simultaneously to all users of the system with no charge, updating by a team is not compulsory.
- e. Central unit (ECU) may be relocated.
- f. Optional equipment sold by the motorcycle manufacturer for the homologated model is considered not homologated with the bike and must follow the requirements for approved electronics/data loggers.
- g. At any time during an event the Technical Director has the right to make a team substitute their ECU or external module with the MotoAmerica sample.
- h. Sensors may not be replaced, modified or substituted unless noted and the allowed OEM ECU sensors/channels are:
  1. Throttle position (multiple allowed)
  2. Map sensor, Map Sync (pressure sensor on the intake port used to synchronize the engine during the start)
  3. Airbox pressure
  4. Engine pick-ups (Cam, crank)
  5. Twist grip position
  6. Rear speed only (from ABS sensor)
  7. Gearbox output shaft speed
  8. Gear position
  9. Air pressure
  10. Water temperature
  11. Air temperature
  12. Tip-over Switch (No lean angle)
  13. Gear shift load cell/switch (Championship approved part – see Art 2.9.9.3/k.)
  14. Lambda sensor (may be OEM or a replacement sensor see Art. 2.9.9.3/j. It may be connected to the original harness/ECU or to the FIM/DWO approved lambda control module).
- i. No extra sensors may be added for control strategies except the shift rod sensor of the FIM/DWO approved rev-limiter/quickshifter.
- j. The FIM/DWO approved external fuel injection modules may not alter any sensor signal relating to the ride by wire system or control/actuate any part of the machine excepting the fuel injectors. No fuel module may add traction control strategies. The modules may only connect to the fuel injectors, lambda sensor, power supply and “piggyback the Throttle Position, Gear and RPM signals”. Lambda closed loop/auto tuning is permitted. ONLY FIM/DWO approved auto tuning units may be used.
- k. A compulsory FIM/DWO rev limiter/quick shift unit must be fitted, it is the team’s discretion whether to use the quick shift function. This must always remain fitted and active. It must only be installed as detailed in the supplied instructions.
- l. The FIM/DWO quick shift unit is €500 + taxes + delivery.

- m. **See Bulletin 08-2018 for the latest contact information.**
- n. Machine Part Numbers
- Kawasaki Ninja 400 (EX400) HMGP-KA1712
  - Yamaha YZF-R3 HMGP-YA1016
  - KTM RC390 No ABS HMGP-KT1016A
  - KTM RC390 ABS HMGP-KT1016B
  - KTM RC390R 2017 (Euro 4) HMGP-KT1712
- o. HM Quickshifter wheel speed kits may be noted on the FIM approved parts list.
- p. It is the team's responsibility to inform the Technical Director or his appointed staff if they believe that the rev limiter is not acting correctly.
- q. The following strategies are NOT allowed:
- i. Traction control (including anti-spin/rate of change of rpm)
  - ii. Launch Control
  - iii. Anti-Wheelie
  - iv. Closed loop Engine Brake Control
  - v. Corner by Corner/Distance based adjustments
  - vi. Rider adjusted trims
- r. Other additional electronic hardware equipment not on the original homologated motorcycle cannot be added with the exceptions noted below.
- s. Resistors/load may be added to replace the parts of the electrical system that have been removed (including lights and lambda sensors), to prevent ECU errors.
- t. The characteristics of DWO/FIM approved Supersport 300 complete data logging systems must be the following:
- i. Must be from the DWO/FIM approved Supersport 300 logging Kit list. The firmware/software of any data logging units must be an FIM/DWO approved version. A copy of the software and documentation must be submitted to the Technical Director before it can be used.
  - ii. Maximum retail price of the complete kit (hardware, software, sensors and wiring harness) cannot exceed €1500 Euro (VAT excluded). The sum price of the components individually cannot exceed €1650 (VAT excluded)
  - iii. If any sensors are supplied as options, then the total price including ALL options must respect 2.9.9.3/r/ii).
  - iv. The Data Logger system must be available for sale to the public. The datalogging system supplier must apply to the FIM for approval before January 31st.
  - v. The system may only include following sensors:
    1. Fork position
    2. Shock position
    3. Front brake pressure switch (not pressure sensor)
    4. Transponder/Lap time signal
    5. GPS Unit (Lap timing and track position)
    6. Rear wheel speed (if not fitted to OEM machine)

- vi. The system may only log the following channels (by connecting to or “piggybacking” in the case of the original sensors unless noted otherwise):
  - 1. Fork position
  - 2. Shock position
  - 3. Front brake pressure switch (not pressure sensor)
  - 4. Lap time
  - 5. Rear wheel speed (allowed from K-Line)
  - 6. Engine RPM (allowed from K-Line)
  - 7. Throttle Position (allowed from K-Line)
  - 8. Water temperature (allowed from K-Line)
  - 9. Transponder/Lap time signal
  - 10. GPS Position/time/speed
- u. Telemetry is not allowed.
- v. No remote or wireless connection to the bike for any data exchange or setting is allowed whilst the engine is running, or the bike is moving.
- w. Harness:
  - i. The key/ignition lock may be relocated, replaced, or removed.
  - ii. Cutting and removal of excess and unused wiring in the original wiring harness is allowed. All connectors must remain as originally fitted. No wires may be added.
  - iii. DWO/FIM approved manufacturer Kit Harness is allowed.
- x. Data logger Harness:
  - i. The Data Logger wire harness cannot connect any sensors other than those specified. The harness may connect to or “piggyback” the OEM sensors that it is allowed to log. The only function of the approved data logging wiring harness is to connect the specified sensors to the Data Logger, to transmit the data and supply the power. It CANNOT be connected to the motorcycles CAN bus but may be connected to the K-line only to receive signals noted in 2.9.9.3/r/vi).
- y. To be approved samples of external modules with their tuning tools must be sent by the Manufacturers to the Technical Director at least 3 weeks before the beginning of the Championship, with technical data and selling price. The manufacturer must provide MotoAmerica with the tools to control the module.
- z. Dashboard is free however it may only replace the functions of the standard dashboard (including switch logic and display) and may not perform any other logic function on the bike. It may incorporate the datalogger then it is part of the logging system and the “Supersport 300 datalogging kit” price limit will be applied to the whole system – not just to the logging option/upgrade in the dashboard, (the complete unit price will be considered). The dashboard may only display those channels noted in 2.9.9.3/r). There must remain a working tachometer display.
- aa. A lap timer may be fitted.
- bb. Plug cap must remain as homologated.
- cc. Spark plugs may be replaced.
- dd. Battery is free.

#### **2.9.9.4 Generator, alternator, electric starter**

- a. Must be the originally fitted and homologated part with no modification allowed.
- b. The stator must be fitted in its original position and without offsetting.
- c. The electric starter must operate normally and always be able to start the engine during the event.
- d. During parc fermé the starter must crank the engine at a suitable speed for starting for a minimum of two (2) seconds without the use a boost battery. No boost battery may be connected to the machine after the end of the session.

### **2.9.10 Main Frame**

- a. During the entire duration of the event, each rider can only use one (1) complete motorcycle, as presented for technical control, with the frame clearly identified with a seal.
- b. In case the frame needs to be replaced, the rider or the team can request the use of a spare frame to the Technical Director.
- c. The pre-assembled spare frame must be presented to the Technical Director to receive the permission to rebuild the motorcycle. The pre-assembly of the frame shall be strictly limited to:
  - i. Main frame and swing-arm
  - ii. Bearings (steering pipe, swing arm, etc.)
  - iii. Rider controls (handlebars, rear sets, shift/brake linkage), front and rear mud guard.
  - iv. Rear suspension linkage and shock absorber
  - v. Upper and lower triple clamps, front forks, braking system and wheels.
  - vi. Wiring harness, ECU, dash associated electronics, throttles, airbox and associated cables.
- d. The spare frame will not be allowed in the pit box before the rider or the team has received authorization from the Technical Director.
- e. The motorcycle, once rebuilt, must be inspected before its use by the technical stewards for safety checks and a new seal will be placed on the motorcycle frame.
- f. No complete spare machine may be at the track. If found penalties will be applied. For the remainder of the event the machine will be impounded, and no part of that machine may be used for spare parts.

For a full explanation of the procedures see article 2.5.10

#### **2.9.10.1 Frame body and rear sub frame**

- a. The frame must be the originally fitted and homologated part with no modification allowed.
- b. Holes may be drilled in the frame only to fix approved components (i.e. fairing brackets, steering damper mount, sensors).
- c. The sides of the frame-body may be covered by a protective part made of a composite material. These protectors must fit the form of the frame.
- d. Crash protectors may be fitted to the frame using existing points (max. length: 50 mm) or pressed into the ends of the wheel axles (max. length: 30 mm). Without exception, the wheel axles cannot be modified.
- e. The side stand bracket may be cut or removed.
- f. Nothing else may be added or removed from the frame body.
- g. All motorcycles must display a vehicle identification number punched on the frame body (chassis number).

- h. Engine mounting brackets or plates must remain as originally produced by the manufacturer for the homologated motorcycle.
- i. The front sub frame / fairing mount may be changed or altered.
- j. The rear sub frame may be changed or altered, **(if equipped as indicated in section 2.3.1b)** but the type of material must remain as homologated or be material of a higher specific weight.
- k. Additional seat brackets may be added. Non-stressed protruding brackets of the subframe (if equipped as indicated in section 2.3.1b) may be removed if they do not affect the safety of the construction or assembly. Bolt-on accessories to the rear sub-frame may be removed.
- l. The paint scheme is not restricted but polishing the frame body or sub frame is not allowed

### **2.9.10.2 Suspension - General**

- a. Participants in the Junior Cup class must only use the approved and listed suspension units for that season. The price limits are:
  - i. Forks: For the fork kit, including all parts such as but not limited to cartridge, springs (1 set), adjusters, fork caps, blanking inserts, seals, bushes but excepting oil and fitting the price limit is €700 excluding tax.
  - ii. Shock Absorber/RCU: For the complete shock absorber / RCU including but not limited to spring (1 of), the price limit is €850 excluding tax. The pre-load adjuster is free and excluded from the price limit.
- b. The approved products from the suspension manufacturers must be available to all participants at least one (1) month before the first round of the MotoAmerica season, and remain available all season. The products must be available within six (6) weeks of a confirmed order.
- c. Setting parts and tuning parts must be provided by the suspension manufacturers to all customers/ teams/ participants using the manufacturer's products. These parts can be used by all participants during the season. These parts shall be available for immediate delivery to all teams/customers.
- d. Teams may not modify any part of the forks or shock absorber; all setting parts must be supplied by the suspension manufacturer and available to all teams/riders.
- e. The suspension manufacturers are allowed to offer service contracts when the team is using the approved and listed suspension products. The suspension manufacturers cannot demand a service contract for a customer or participant in order to obtain a suspension product.
- f. Electronically-controlled suspension must be removed.
- g. Electronic controlled steering damper cannot be used if not installed in the homologated model for road use. However, it must be completely standard (any mechanical or electronic part must remain as homologated).

### **2.9.10.3 Front forks**

- a. Forks (stanchions, stem, wheel spindle, upper and lower crown, etc.) must be the originally fitted and homologated parts with the following modifications allowed:
- b. The upper and lower fork clamps (triple clamp, fork bridges) must remain as originally produced by the manufacturer on the homologated motorcycle.
- c. The steering stem pivot position must remain in the homologated position (as supplied on the production bike). If the standard bike has inserts, then the orientation/position of the original insert may be changed but the insert cannot be replaced or modified.

- d. A steering damper may be added or replaced with an after-market damper.
- e. The steering damper cannot act as a steering lock limiting device.
- f. Fork caps may only be modified or replaced to allow external adjustment.
- g. Dust seals may be modified, changed or removed if the fork remains totally oil-sealed
- h. Original internal parts of the homologated forks may be modified or changed. Only approved after-market damper kits or valves may be installed. The original surface finish of the fork tubes (stanchions, fork pipes) may be changed.

#### **2.9.10.4 Swing-arm (rear fork)**

- a. The rear fork must be the originally fitted and homologated part with no modification allowed.
- b. The rear fork pivot bolt must be the originally fitted and homologated part with no modification allowed.
- c. The rear swing-arm pivot position must remain in the homologated position (as supplied on the production bike). If the standard bike has inserts then the orientation/position of the original insert may be changed but the insert cannot be replaced or modified.
- d. A chain guard must be fitted in such a way as to reduce the possibility that any part of the riders' body may become trapped between the lower chain run and the rear wheel sprocket.
- e. Rear wheel stand brackets may be added to the rear fork by welding or by bolts. Brackets must have rounded edges (with a large radius). Fastening screws must be recessed. An anchorage system or point(s) to keep the original rear brake caliper in place may be added to the rear swing-arm.
- f. The sides of the swing-arm may be protected by a thin vinyl cover only: no composite or structural covers are allowed.

#### **2.9.10.5 Rear suspension unit (shock)**

- a. The rear suspension unit (shock) may be modified or replaced, but the original attachments to the frame and swing arm or linkage must be as homologated.
- b. All the rear suspension linkage parts must be the originally fitted and homologated parts with no modification allowed.
- c. Removable top shock mounts must be the originally fitted and homologated parts with no modification allowed. A nut may be made captive on the top shock mount and shim spacers may be fitted behind it to adjust ride height.
- d. Rear suspension unit and spring may be changed.

#### **2.9.10.6 Wheels**

- a. Wheels must be the originally fitted and homologated part with no modification allowed.
- b. The wheels may be overpainted, but the original finish cannot be removed.
- c. If the original design includes a cushion drive for the rear wheel, it must remain as originally produced for the homologated motorcycle.
- d. Wheel axles must remain as homologated, wheel spacers may be modified or replaced.

#### **2.9.10.7 Brakes**

- a. Brake discs may be replaced by aftermarket discs which comply with the following requirements:
  - i. Brake discs must retain the same material as the homologated disc or be steel (max. carbon content 2.1 wt.%).

- ii. Non-floating or single piece discs may be replaced with floating discs. The disc carrier must be the same material as the homologated carrier, steel or aluminum.
- iii. The outside and inner diameters of the brake disc must not be larger than the homologated disc.
- iv. The fixing of the carrier on the wheel must remain the same as on the homologated disc.
- v. The thickness of the brake disc may be increased but the disc must fit into the homologated brake caliper without any modification. The number of floaters is free.
- b. The front and rear brake calipers (mount, carrier, hanger) must be the originally fitted and homologated parts with no modification allowed.
- c. In order to reduce the transfer of heat to the hydraulic fluid it is permitted to add metallic shims to the calipers, between the pads and the calipers, and/or to replace light alloy pistons with steel pistons made by the same manufacturer of the caliper.
- d. The rear brake caliper bracket may be mounted fixed on the swing-arm, but the bracket must maintain the same mounting (fixing) points for the caliper as used on the homologated motorcycle.
- e. The swing-arm may be modified for this reason to aid the location of the rear brake caliper bracket, by welding, drilling or by using Helicoils.
- f. The front and rear master cylinders must be the originally fitted and homologated parts with no modification allowed.
- g. Front and rear brake fluid reservoirs may be changed.
- h. Front and rear hydraulic brake lines may be changed.
- i. The split of the front brake lines for both front brake calipers must be made above the lower fork bridge (lower triple clamp).
- j. "Quick" (or "dry-break") connectors in the brake lines are not allowed.
- k. Front and rear brake pads may be changed. Brake pad locking pins may be modified for quick change type.
- l. Additional air scoops or ducts are not allowed.
- m. If equipped the anti-lock brake system (ABS) must be removed. The ABS units electronic board may remain fitted to stop ECU errors.

#### **2.9.10.8 Handlebars and hand controls**

- a. Handlebars may be replaced (except for the brake master cylinder).
- b. Handlebars and hand controls may be relocated.
- c. Throttle controls must be self-closing when not held by the hand.
- d. The throttle assembly and associated cables may be modified or replaced but the connection to the throttle body and to the throttle controls must remain as on the homologated motorcycle. Cable operated throttles (grip assembly) must be equipped with both an opening and a closing cable including when actuating a remote drive by wire grip/demand sensor.
- e. Clutch and brake lever may be replaced with an after-market model. An adjuster to the brake lever is allowed.
- f. Switches may be changed but the electric starter switch and engine stop switch must be located on the handlebars.

- g. Motorcycles must be equipped with a functional ignition kill switch or button mounted on the right-hand handlebar (within reach of the hand while on the hand grips) that is capable of stopping a running engine. The button or switch must be RED.

#### **2.9.10.9 Footrest / Foot controls**

- a. Footrests, hangers/brackets and hardware may be replaced and relocated but the hangers/brackets must be mounted to their original frame mounting points.
- b. Foot controls; gear shift and rear brake must remain operated manually by foot.
- c. Footrests may be rigidly mounted or a folding type which must incorporate a device to return them to the normal position.
- d. The end of the foot rest must have at least an eight (8) mm solid spherical radius. (see diagram A & C).
- e. Non-folding footrests must have an end (plug) which is permanently fixed, made of aluminum, plastic, Teflon® or an equivalent type material (minimum radius 8mm). The plug surface must be designed to reach the widest possible area. The Technical Director has the right to refuse any plug not satisfying this safety aim.

#### **2.9.10.10 Fuel tank**

- a. The fuel tank must be the originally fitted and homologated part with no modification allowed.
- b. All fuel tanks must be completely filled with fire retardant material (open-celled mesh, i.e. Explosafe□).
- c. Fuel tanks with tank breather pipes must be fitted with non-return valves that discharge into a catch tank with a minimum volume of 250cc made of a suitable material.
- d. Fuel caps may be changed. Fuel caps when closed must be leak proof. Additionally, they must be securely locked to prevent accidental opening at any time.
- e. A rider spacer/pad may be fitted to the rear of the tank with non-permanent adhesive. It may be constructed of foam padding or composite material.
- f. The tank may not have a full cover fitted over it unless the homologated machine also features a full cover.
- g. The sides and rear of the fuel tank may be protected with a cover made vinyl or a composite material. These covers must follow the shape of the fuel tank exactly.
- h. Fuel tank cannot have heat reflective sheet attached to its bottom surface.

#### **2.9.10.11 Fairing / Bodywork**

- a. The fairing and bodywork may be replaced with exact cosmetic duplicates of the original parts but must appear to be as originally produced by the manufacturer for the homologated motorcycle, with slight differences due to the racing use (different pieces mix, fixing points, fairing bottom, etc.). The material may be changed. The use of carbon fiber or carbon composite materials is not allowed. Specific reinforcements in Kevlar® or carbon are allowed locally around holes and stressed areas. Headlights must be included even when considered external.
- b. For all bodywork paint and decal design is free.
- c. Overall size and dimensions must be the same as the original part, with a tolerance of  $\pm 5$  mm, respecting the design and features of the homologated fairing as far as possible. The overall width of the frontal area may be +5 mm maximum. The decision of the Technical Director is final.
- d. The wind screen may be replaced.



- e. Fairing brackets may be altered or replaced.
- f. The ram-air intake must maintain the originally homologated shape and dimensions.
- g. The original air ducts running between the fairing and the air box may be altered or replaced. Carbon fiber composites and other exotic materials are forbidden. Particle grilles or “wire-meshes” originally installed in the openings for the air ducts may be removed.
- h. The lower fairing must be constructed to hold, in case of an engine breakdown, a minimum of four (4) liters. The lower edge of all the openings in the fairing must be positioned at least 70 mm above the bottom of the fairing.
- i. The upper edge of the rear transverse wall of the lower fairing must be at least 70 mm above the bottom. The angle between this wall and the floor must be  $\leq 90^\circ$ .
- j. Original openings for cooling in the lateral fairing/bodywork sections may be partially closed only to accommodate sponsors' logos/lettering. Such modification shall be made using wire mesh or perforated plates. The material is free but the distance between all opening centers, circle centers and their diameters must be constant. Holes or perforations must have an open area ratio  $> 60\%$ .
- k. Motorcycles may be equipped with a radiator shroud (inner ducts) to improve the air stream towards the radiator but the appearance of the front, the rear and the profile of the motorcycle must not be changed.
- l. The lower fairing must incorporate a single opening of  $\varnothing 25$  mm diameter in the front lower area. This hole must remain sealed in dry conditions and must be opened only in wet race conditions as declared by the race director.
- m. The front fender may be replaced with a cosmetic duplicate of the original parts and may be spaced upward for increased tire clearance.
- n. The rear fender fixed on the swing arm may be modified, changed or removed

#### **2.9.10.12 Seat**

- a. The seat, seat base and associated bodywork may be replaced
- b. The appearance from the front, rear and profile must conform to the homologated shape
- c. The top portion of the rear bodywork around the seat may be modified to a solo seat.
- d. The homologated seat locking system (with plates, pins, rubber pads etc.) may be removed.
- e. The same material as the fairing must be used (article 2.9.10.11.a)
- f. All exposed edges must be rounded.

#### **2.9.10.13 Rear safety light**

All motorcycles must have a functioning red light mounted at the rear of the machine. This light must be switched on any time the motorcycle is on the track or being ridden in the pit lane and the session is declared WET. All lights must comply with the following:

- a. Lighting direction must be parallel to the machine center line (motorcycle running direction) and be clearly visible from the rear at least 15 degrees to both the left and right sides of the machine center line.
- b. The rear light must be mounted near the end of the seat/rear bodywork, and approximately on the machine center line, in a position approved by the Technical Director. In case of dispute over the mounting position or visibility, the decision of the Technical Director will be final.
- c. Power output/luminosity equivalent to approximately: 10-15 (incandescent), 0.6 – 1.8 W (LED).

- d. The output must be continuous; no flashing safety light is allowed whilst on track. Flashing is allowed in the pit lane when the pit limiter is active.
- e. The safety light power supply may be separated from the motorcycle.
- f. The Technical Director has the right to refuse any light system not satisfying this safety purpose.

#### **2.9.10.14 Fasteners**

- a. Standard fasteners may be replaced with fasteners of any material and design but titanium fasteners cannot be used. The strength and design must be equal to or exceed the strength of the standard fastener.
- b. Fasteners may be drilled for safety wire, but intentional weight-reduction modifications are not allowed.
- c. Thread repair may be made using inserts of different material such as Helicoils and Timeserts.
- d. Fairing / bodywork fasteners may be replaced with the quick disconnect type.
- e. Aluminum fasteners may only be used in non-structural locations.

#### **2.9.11 The following items MAY be altered or replaced from those fitted to the homologated motorcycle**

- a. Any type of lubrication, brake or suspension fluid may be used.
- b. Gaskets, seals and gasket materials.
- c. **All bearings (ball, roller, taper, plain, ect.) must be the exact OEM bearing replacement in regard to size, shape and material.**
- d. Painted external surface finishes and decals.
- e. Material for brackets connecting non-original parts (fairing, exhaust, instruments, etc.) to the frame (or engine) cannot be made from titanium or fiber reinforced composites except the exhaust silencer hanger that may be in carbon.
- f. Protective covers for the frame, chain and footrests may be made in other materials like fiber composite material if these parts do not replace original parts mounted on the homologated model.

#### **2.9.12 The following items MAY BE removed**

- a. Emission control items (anti-pollution) in or around the air box and engine (O2 sensors, air injection devices).
- b. Bolt-on accessories on a rear sub-frame or rear portion of the frame.

#### **2.9.13 The following items MUST BE removed**

- a. Headlamp, rear lamp and turn signal indicators (when not incorporated in the fairing). Openings must be covered by suitable materials.
- b. Rear-view mirrors
- c. Horn
- d. License plate bracket
- e. Toolkit
- f. The following if not welded to the frame:
  - i. Helmet hooks and luggage carrier hooks
  - ii. Passenger foot rests

- iii. Passenger grab rails
- g. Safety bars, center and side stands must be removed (fixed brackets must remain excepting side stand bracket).

Provisional

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