

## DMSB Technical Regulations 2018 for the Superbike 1000 class

As at: 13.04.2018 – changes are shown in *italics*

In case of doubt only the German text of the regulations is binding.

The following rules are intended to give freedom to modify a homologated model in the interest of safety and improved competition between various motorcycle concepts.

Everything that is not explicitly authorised and prescribed in the following rules is forbidden.

Superbike 1000 motorcycles require an FIM homologation or a DMSB homologation for the class Superstock 1000. All motorcycles must comply in every respect with the following Technical Regulations and the Technical Regulations for road racing (see DMSB Motorcycle Yearbook, orange section), unless they are already equipped as such on the homologated model.

The appearance from the front, rear and the profile of Superbike 1000 motorcycles must, except when otherwise stated, conform to the homologated shape (as originally produced by the manufacturer).

Any homologation extension of parts submitted by the manufacturer and approved by the FIM will only be eligible in the following year and after verification and approval by the DMSB.

The following reference parts must be submitted to the DMSB until **15<sup>th</sup> April**:

- Cylinder head
- Intake and exhaust camshaft(s)
- Camshaft sprockets
- Intake and exhaust valves including valve springs, retainers, collets and tappets
- Pistons including piston rings, pins and clips
- Connecting rods
- ECU-Kit
- *Kit Software and access*

*Should the reference parts not be submitted until the given deadline, a provisional approval of the corresponding motorcycles is issued. If a check cannot be carried out due to missing reference parts, the corresponding parts will be secured by the scrutineers and the check will be carried out as soon as the required reference parts are available.*

### 1. Motorcycle specification

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

### 2. Division into classes

Over 750 cm <sup>3</sup> up to 1000 cm <sup>3</sup>	4 stroke	3 and 4 cylinder
Over 850 cm <sup>3</sup> up to 1200 cm <sup>3</sup>	4 stroke	2 cylinder

All machines must be normally aspirated.

### 3. Balancing various motorcycle concepts

In order to equalize the performance of motorcycles with different engine configurations, amendments of the minimum weight may be applied according to their respective racing performances.

The DMSB may at any time take the decision to apply any such handicap to ensure fair competition.

### 4. Minimum weight

The minimum weight may *not be less than 170 kg*.

At no time during the event may the weight of the whole motorcycle (including the tank and its contents) 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 in which they finished the race. 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 chief scrutineer at the preliminary checks.

The ballast must be made of solid metallic pieces, firmly and securely connected, either through an adapter or directly to the main frame or engine, with a minimum of 2 steel bolts (min. 8 mm diameter, 8.8 grade or over). Other equivalent technical solutions must be submitted to the chief scrutineer for his approval.

Fuel in the fuel tank can be used as ballast. Nevertheless, the verified weight may never fall below the required minimum weight.

## 5. Start numbers

*All start numbers must be visibly displayed on the front (1 x in the centre or 1 x on each side) and at least once on each side of the motorcycle.*

- Height of the front figures: 160 mm
- Height of the side figures at wedge/fairing pan 150 mm  
(free 1 x tail unit from rear view in driving direction 150 mm)

*The colour combinations: white background / black figures*

*Accepted typefaces:*

- Verdana / Bold
- Futura Heavy / Bold

*Figures may only consist of one or two figures (#1-99).*

*See also DMSB Motorcycle Yearbook, blue section, drawings to the Technical Regulations.*

## 6. Fuel

See DMSB Motorcycle Yearbook, blue section, FIM fuel regulations.

## 7. Tyres

The use of moulded, commercially available slicks (no-profile tyres) and rain tyres is permitted. The tyres must be commercially available on the free market to the public. Like for commercial tyres, both side walls of the tyres must be marked with the manufacturer's name, the product specification, the dimensions etc. The marking of the tyres shall take place during the heating process and must not be applied subsequently in form of stickers or rubber labels etc. The depth of the tyre tread over the whole pattern at pre-event scrutineering must be at least 2.0 mm.

For slick tyres, the wear indicator must show at least 2.0 mm.

All tyres must comply with the general safety standards of the corresponding manufacturer.

The use of tyre warmers is permitted.

## 8. Engine

Engines will be allocated as follows, the calculated number shall always be rounded off:

$$\text{Number of allocated engines} = \frac{\text{Number of events}}{2}$$

### 8.1. Engine sealing

The engines must in advance be prepared for sealing.

The total number of engines that a rider may use during the entire championship is limited the "allocated number". When a permanent rider changes teams during the championship, his engine limit should not change, but in extra-ordinary circumstances will be reviewed by the Race Direction.

The total number of engines that a team may use during the entire championship is limited to the "allocated number" per permanent registration. When a permanent rider is replaced during the championship, the total engine allocation for the teams' entry will not change. Should a new team enter the championship part way through the season, the number of engines allowed will be proportional to the season remaining.

Wild card riders (and one event riders) will be allowed to use two sealed engines during the event in which they take part. Should the same rider choose to enter a second event as a wildcard, one extra engine will be added. For any further entry, the rider and/or team will be considered a permanent registration.

The scrutineers must be notified of all engine changes and therefore know at all times which engine is in current use.

The number of engines that may be used during each event is only limited by the remaining allocation.

Each engine must be sealed by the scrutineers before it may be used during an event.

An engine is considered in use or active from the moment it crosses the line at the pit exit.

Seals will bear a serial number, which will be recorded.

Any attempt made to remove the seal will damage it irreparably. Seals may only be removed under the supervision of the scrutineers.

A broken or damaged seal will be considered as if the engine has been used and will be counted as part of the rider's allocation for the season.

A team must request sealing of an engine/engines before its/their use.

A previously sealed engine may be resealed following repair or revision; this will be considered a new engine and count towards the total number of engines allowed.

All seals including the seals on an engine that has completed its life cycle or is in need of repair may only be broken in front of a scrutineer. At the time of the breaking of the seals the scrutineer may ask for this engine to be disassembled to check for compliance of the technical rules.

The crankcases will be sealed in such a way not to allow the disassembly for repair, replacement or adjustment of the crankshaft, connecting rods and/or associated bearings, pistons, piston pins or piston rings.

The cylinder, cylinder head(s) and head cover/cam cover will be sealed to prevent repairs, replacement or adjustment on the cylinder head, valves, valve seats or any other repairs or service work on the valve train.

Valve clearance adjustments may be made after approval of the chief scrutineer and under the supervision of a scrutineer. Approval must be requested in advance to the chief scrutineer. A new seal will subsequently be applied.

The cassette gearbox door and/or crankcases will be sealed to control the gearbox use.

The right and left hand engine side covers will not be sealed as to allow repair or adjustment to the generator, clutch system, water pump or other accessory systems located behind these covers.

If an engine is found not to be in compliance with the regulations, any penalties imposed will apply retrospectively to each race this engine was used in.

## **8.2. Engine inspection**

When any engine is unsealed and stripped for inspection following a protest or at the discretion of the chief scrutineer and found to be fully compliant with the rule(s) which is (are) the subject of the inspection, then the team will be given one additional seal allocation to reseat the rebuilt engine.

When an engine has reached an agreed "end of life" then the chief scrutineer may at his discretion choose to have that engine stripped to check for compliance.

## **8.3. Fuel injection system**

Fuel injection systems refers to throttle bodies, fuel injectors, intake tract devices, fuel-pump and fuel pressure regulator and may not be modified.

Variable intake tract devices may not 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. Air and air/fuel mixture must go to the combustion chamber exclusively through the throttle body valves.

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 changed, all the safety systems and procedures as originally provided by the manufacturer must however be retained.

## **8.4. Cylinder head**

The gaskets may be replaced.

Only normal maintenance interventions as prescribed by the manufacturer in the service manual of the motorcycle are authorised.

## **8.5. Camshaft**

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

## 8.6. Cam sprockets or cam gears

Cam Sprockets may be slotted to allow the adjustment of cam timing.  
Pressed on cam sprockets may be replaced with an adjustable boss and cam sprocket.

## 8.7. Crankcase/ Gearbox housing

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.

### 8.7.1. Lateral covers and protection

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.

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 aluminium alloy, stainless steel, steel or titanium, composite covers are not permitted.

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.

Plates or crash bars made from aluminium 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.

FIM/DMSB approved covers are permitted without regard of the material or the dimensions.

These covers must be fixed properly and securely with a minimum of three case cover screws that also mount the original covers/engine cases to the crankcases.

Oil containing engine covers must be secured with steel bolts. The chief scrutineer has the right to refuse any cover not satisfying this safety purpose.

## 8.8. Transmission/Gearbox

*Electronic* quick-shift systems and *shift indicator for upshifting as well as quick-shift systems to downshifting (blipper)* are allowed.

Countershaft sprocket, rear wheel sprocket, chain pitch and size may be changed.

The sprocket cover may be modified or eliminated.

Chain guard as long as it is not incorporated in the rear fender may be removed.

## 8.9. Clutch

Only friction and drive discs may be changed, but their number must remain as original.

Clutch springs may be changed.

## 8.10. Oil pumps and oil lines

Oil lines may be modified or replaced. Oil lines containing positive pressure, if replaced, must be of metal reinforced construction with swaged or threaded connectors.

## 8.11. Radiator, cooling system and oil cooler

The only liquid engine coolants permitted is water.

Protective meshes may be added in front of the oil and/or water radiator(s).

The cooling system hoses and catch tanks may be changed.

Radiator fan and wiring may be removed. Thermal switches, water temperature sensor and thermostat may be removed inside the cooling system.

The radiator cap is free.

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 are permitted.

## 8.12. Airbox

The air filter element may be modified or replaced but must be mounted in the original position.

The air box drains must be sealed.

All motorcycles must have a closed breather system. All the oil breather lines must be connected, may pass through an oil catch tank and must exclusively discharge in the airbox.

No heat protection may be attached to the airbox.

## 8.13. Fuel supply

Fuel lines from the fuel tank to the delivery pipe assembly (excluded) may be replaced.

Quick connectors or dry break connectors may be used.

Fuel vent lines may be replaced.

Fuel filters may be added.

## 8.14. Exhaust system

Exhaust pipes and silencers may be modified or changed. Catalytic converters must be removed.

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.

For safety reasons, the exposed edges of the exhausts pipe(s) outlet must be rounded to avoid any sharp edges.

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 is 107 dB/A (with a 3 dB/A tolerance after the race only).

## 9. Electrics and electronics

### 9.1. Ignition / Engine Control Unit (ECU)

The engine control unit (ECU) must be either:

- a) The original system as homologated, a change of software is allowed.
- b) An FIM/DWO/DMSB approved "Superstock Kit" model (produced and/or approved by the motorcycle manufacturer) may be used. A special connector/adaptor may be used to connect the ECU(s) and the original wiring harness. The combined retail price of the full system including software, tuning tool, download/connection cable, any activations, upgrades and wiring harness(s) must be less than:
  1. €3000 (VAT excluded) if the system excludes data logging,
  2. €3750 (VAT excluded) if the system includes data logging.The ECU (with software and activations) and harness parts must be individually priced and available separately. The separate ECU and harness total must respect the above limits.
- c) *It is permitted to add commercially available external modules for the ignition and/or fuel injection to the original system (with the standard ECU or Kit-ECU). The combined retail price (including software and tuning tools) must not be more than €1000 (VAT excluded). A special connecting part may be used to connect the module/s and the ECU.*

Central unit (ECU) may be relocated.

Corner by corner or distance/position based adjustments are not allowed.

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.

During an event the chief scrutineer 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 warm-up.

No extra sensors may be added for control strategies except shift rod sensor, wheel speed sensors and lambda sensors. Wheel speed sensors must be included in the Kit ECU and Harness package if required.

Other additional electronic hardware equipment not on the original homologated motorcycle may not be added with the exceptions noted below.

The characteristics of approved data logging systems must be the following:

- a) Maximum retail price of the unit (hardware + software, excluding sensors and wiring harness) may not exceed €3000 Euro (VAT excluded) if it is a standalone unit. The logger must be from the FIM approved logger list.
- b) Maximum retail price of the unit if incorporated into the ECU (hardware + software, excluding sensors and wiring harness), see article 9.1.c.
- c) The Data Logger unit must be available for sale to the public and on the list of FIM/DWO "Superstock 1000" approved data loggers.
- d) A maximum of 9 simultaneous 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)
  11. *Wheel speed front*
  12. *Wheel speed rear*
- e) The sensors must be simple-function. No inertial platforms may be added (if an inertial platform is not installed originally on the homologated motorcycle).
- f) CAN communication (or other data protocol, k-line, LIN) from the ECU to an approved data logger is allowed without any limitation in CAN channel logger number.

The maximum total price of other active/control/calculation units such as lambda driver modules, quick shifter and analogue to CAN is €750 (VAT excluded). These devices must be approved by FIM/DWO or the DMSB.

Telemetry is not allowed.

No remote or wireless connection to the bike for any data exchange or setting is *generally* allowed whilst the engine is running or the bike is moving. *For the sole purpose of TV transmission, the following information may, however, be transmitted to the motorcycle: camera pictures, speed, revs and inclination angle.*

Harness:

- a) 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/DMSB.
- b) The data logging harness may be incorporated in the kit wiring harness.
- c) A kit harness that incorporates the data logging harness may only accommodate 9 additional sensors.
- d) The key/ignition lock may be relocated, replaced or removed.
- e) Cutting of the original main wiring harness is allowed.

Data logger Harness:

The Data Logger wire harness may not include any other sensors with the exception of the *nine* sensors that are allowed. The only permitted 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.

External modules may not alter any sensor signal relating to the ride by wire system or control/actuate any part of the machine with the exception of the ignition coils, the fuel injectors *and the blipper (see Article 8.8)*. Changes of firmware and software are allowed, provided that all the above regulations are respected.

The original speedometer and tachometer may be altered or replaced (see also Article 12).

Spark plugs may be replaced.

The battery is free, but the use of lithium polymer batteries is prohibited.

## **9.2. Generator, alternator, electric starter**

The stator must be fitted in its original position and without offsetting. The electric starter must operate normally and always be able to start the engine during the event without the use of a boost battery.

## **10. Main frame**

*From the timed practice, each rider may only use one complete motorcycle, as presented for Technical Control, with the frame clearly identified with a seal. In case the frame/ the motorcycle will need to be replaced the rider or the team must request the use of a spare frame/ spare motorcycle to the chief scrutineer. In this case, the frame must be irreparably damaged. In case of an engine failure, a spare motorcycle is not permitted. The original motorcycle must in this case be fitted with a spare engine which must be presented at scrutineering, see also Article 8.1.*

The pre-assembled spare part frame/ the spare motorcycle must be presented to the chief scrutineer to obtain the permission of rebuilding.

The rebuilt motorcycle must be inspected before its use by the scrutineers for safety checks and a new seal will be placed on the motorcycle frame.

## **10.1. Frame body and rear sub frame**

The use of titanium in the frame construction is prohibited.

Holes may be drilled on the frame only to fix approved components (i.e. fairing brackets, steering damper mount, sensors).

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.

Nothing else may be added or removed from the frame body.

All motorcycles must display a vehicle identification number punched on the frame body (chassis number).

Front sub frame / fairing mount may be changed or altered.

Rear sub frame may be changed or altered, but the type of material must remain as homologated, or material of a higher specific weight may be used as an alternative.

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.

The paint scheme is not restricted but polishing the frame body or sub frame is not allowed.

## **10.2. Front forks**

The use of titanium in the construction of the front fork and wheel spindle is prohibited. For wheel spindles, the use of light metal alloy is equally prohibited.

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 may not be replaced or modified.

Steering dampers may be added or replaced with after-market dampers.

The steering damper may not act as a steering lock limiting device.

Fork caps on the mechanical forks may only be modified or replaced to allow external adjustment. (This does not include the mechanical fork leg that is part of the homologated electronic fork set).

Dust seals may be modified, changed or removed if the fork remains totally oil-sealed.

Mechanical forks: Original internal parts of the homologated forks may be modified or changed. After-market damper kits or valves may be installed. The original surface finish of the fork tubes (stanchions, fork pipes) may be changed. Additional surface treatments are allowed.

### Electronic forks:

No after-market or prototype suspension parts with electronic control may be used. Electronic suspensions may be used if installed on the production model of the homologated motorcycle. However, it must be completely standard (any mechanical or electronic part must remain as homologated) with the exception of the discs and springs. The original suspension system must work safely in the event of an electronic failure.

The electronic front suspension may be replaced with a mechanical system from a similar homologated model from the same manufacturer.

Electronic forks may have their complete internal parts (including all electronic control) replaced with a conventional damping system and it will then be considered as a mechanical fork.

## **10.3. Rear fork (Swing-arm)**

The use of titanium in the construction of the swing-arms, the swing-arm axis and the spindle axis is prohibited. For spindle axis, the use of light metal alloy is equally prohibited.

Rear swingarm pivot position *may be modified by 3 mm in any direction compared to the standard position but the frame may not be modified for that purpose.*

A chain guard must be fitted in such a way to reduce the possibility that any part of the riders' body may become trapped between the lower chain run and the rear wheel sprocket.

Rear wheel stand brackets may be added to the rear fork by welding or by bolts. This device 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 calliper in place may be added to the rear swing-arm.

## **10.4. Rear suspension unit**

Rear suspension units (shock absorbers) may be modified or replaced, but the original attachments to the frame and rear fork (swing arm) (or linkage) must be as homologated.

A nut may be made captive on the top shock mount and shim spacers may be fitted behind it to adjust ride height.

Mechanical suspension: Rear suspension unit and spring may be changed.

Electronic suspension:

No after-market or prototype suspension parts with electronic control may be used. Electronic suspensions may be used if installed on the production model of the homologated motorcycle. However, it must be completely standard (any mechanical or electronic part must remain as homologated) with the exception of the discs and springs.

If the standard system has no facility for ride height adjustment the standard shock may be modified to allow shock length change if no hydraulic parts are modified. The original suspension system must work safely in the event of an electronic failure. The electronic shock absorber may be replaced with a mechanical one.

## 10.5. Wheels

- a) Wheels may be replaced and associated parts that are fitted to the homologated motorcycle may be altered or replaced.
- b) Aftermarket wheels must be made from aluminium 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) The homologated road bike wheel and sprocket carrier assembly may be used with no modification, irrespective of material. Bearings and spacers may be changed.
- e) On motorcycles equipped with a double-sided swing arm (rear fork), the rear sprocket must remain on the rear wheel when the wheel is removed.
- f) Bearings, seals and axles may be altered or replaced from those fitted to the homologated motorcycle.
- g) Wheel balance weights may be discarded, changed or added to.
- h) The valves are free.

Permitted wheel rim diameter size:	17 inches
Permitted front wheel rim width:	3.50 inches
Permitted rear wheel rim width:	6.00 inches

Any modification to the rim or spokes of an integral wheel (cast, moulded, riveted) as supplied by the manufacturer or of a traditional detachable rim is prohibited, except for modifications on the spokes, valves, safety bolts and tyre retention screws sometimes used to prevent tyre movement relative to the rim. If the rim is thus modified, bolts, screws etc. must be fitted for this purpose.

The distance between the rim walls is measured inside the flange walls in accordance with ETRTO.

A non-slip coating/treatment may be applied to the bead area of the rim.

If the original design includes a cushion drive for the rear wheel, it must remain as originally produced for the homologated motorcycle.

Wheel axles must remain as homologated, wheel spacers may be modified or replaced.

Wheel balance weights may be discarded, changed or added to.

Any inflation valves may be used.

## 10.6. Brakes

Brake discs may be replaced by aftermarket discs which comply with following requirements:

- a) Brake discs and carrier must retain the same material as the homologated disc and carrier.
- b) The outside and inner diameters of the brake disc must not be larger than the ones on the homologated disc.
- c) The thickness of the brake disc may be increased but the disc must fit into the homologated brake calliper without any modification. The number of floaters is free.

In order to reduce the transfer of heat to the hydraulic fluid it is permitted to add metallic shims to the callipers, between the pads and the callipers. The brake calliper pistons are free. *For the purpose of cooling the brakes, it is permitted to add air baffles with a surface of maximum 150 cm<sup>2</sup> to the brake callipers.*

The rear brake calliper bracket may be mounted fixed on the swing-arm, but the bracket must maintain the same mounting (fixing) points for the calliper as used on the homologated motorcycle.

The swing-arm may be modified for this reason to aid the location of the rear brake calliper bracket, by welding, drilling or by using a helicoil.



The front master cylinder may be replaced. *The spare parts must be freely available on the market and the retail price must not be higher than €499 (VAT excluded).*

Front and rear brake fluid reservoirs may be replaced by after-market parts.

Front and rear hydraulic brake lines may be replaced.

The split of the front brake lines for both front brake callipers must be made above the lower fork bridge (lower triple clamp).

“Quick” (or “dry-break”) connectors in the brake lines are allowed.

Front and rear brake pads may be changed. Brake pad locking pins may be modified for quick change type.

An Antilock Brake system (ABS) may be used only if installed in the homologated model for road use. However, it must be completely standard (any mechanical or electronic part must remain as homologated, brake discs and master cylinder excluded), and only the software of the ABS may be modified.

The Antilock Brake system (ABS) may be disconnected and its ECU may be dismantled. The ABS rotor wheel may be removed, modified or replaced.

*An additional manual control of the rear brakes (so-called thumb-brake) is permitted. Both systems must operate independently. If a thumb-brake is used, the rear master brake cylinder is free but, compared to the originally homologated component, it must have no other function than providing a connection for a thumb-brake and its control. Moreover, the interior diameter of the foot brake cylinders must comply with the homologated dimensions of the manufacturer.*

*Brake fluid containers may be modified or replaced.*

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. DMSB approved guards will be permitted without regard of the material.

The chief scrutineer has the right to refuse any guard not satisfying this safety purpose.

## **10.7. Handlebars and hand controls**

The use of titanium in the construction of the handlebars is prohibited.

Exposed handlebar ends must be plugged with a solid material or rubber covered.

The minimum angle of rotation of the steering on each side of the centre line or mid position must be of 15° for all motorcycles.

Whatever the position of the handlebars, the front wheel, tyre and the mudguard must maintain a minimum gap of 10 mm.

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 or other bodywork when on full lock to prevent trapping the rider's fingers (see diagram A, DMSB Motorcycle Yearbook, blue section).

Repair by welding of light alloy handlebars is prohibited.

Composite handlebars are not allowed.

All handlebar levers (clutch, brake, etc.) must be ball ended (diameter of this ball to be at least 16 mm). This ball can also be flattened, but in any case the edges must be rounded (minimum thickness of this flattened part 14 mm). These ends must be permanently fixed and form an integral part of the lever.

Each control lever (hand and foot levers) must be mounted on an independent pivot.

The brake lever, if pivoted on the footrest axis, must work under all circumstances, such as the footrest being bent or deformed.

Handlebars may be replaced (except for the brake master cylinder).

Handlebars and hand controls may be relocated.

Throttle controls must be self-closing when the rider releases the control.

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. Throttle controls with Bowden cable operation must be equipped with both an opening and a closing cable, including when actuating a remote drive by wire grip/demand sensor.

Clutch and brake lever may be replaced with an after-market model. An adjuster to the brake lever is allowed.

Switches may be changed but the electric starter switch and engine stop switch must be located on the handlebars.

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.

## **10.8. Foot rest / Foot controls**

Foot rests/foot controls may be relocated but the hangers/brackets must be mounted to their original frame mounting points.

Foot rests may be rigidly mounted or a folding type but folding types must incorporate a device to return them to the normal position.

The end of the foot rest must have at least an 8 mm solid spherical radius.

Non-folding footrests must have an end (plug) which is permanently fixed, made of aluminium, plastic, Teflon<sup>®</sup> or an equivalent type material (minimum radius 8 mm). The plug surface must be designed to reach the widest possible area. The chief scrutineer has the right to refuse any plug not satisfying this safety aim.

## **10.9. Fuel tank**

All fuel tanks must be completely filled with fire retardant material (preferably Explosafe<sup>®</sup>).

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 and made of a suitable material.

Fuel caps may be replaced. Fuel caps when closed must be leak proof. Additionally, they must be securely locked to prevent accidental opening at any time.

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.

## **10.10. Fairing / Bodywork**

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 fibre or carbon composite materials is not allowed. Specific reinforcements in Kevlar<sup>®</sup> or carbon are allowed locally around holes and stressed areas.

Overall size and dimensions must be the same as the original part, with a tolerance of +/-10 mm, respecting the design and features of the homologated fairing as far as possible. The overall width of the frontal area may be +10 mm maximum. The decision of the chief scrutineer is final.

The windscreen may be replaced with an aftermarket product. The height of the windscreen is free, within a tolerance of +/- 15 mm referred to the vertical distance from/to the upper fork bridge. The shape of the windscreen is free. From a top view the length of the windscreen may be shortened by 25 mm to allow clearance for the rider. The edges of the screens must have no sharp edges.

Motorcycles that are not originally equipped with streamlining are not allowed to add streamlining in any form, with the exception of a lower fairing device, as described below. This device may not exceed above a line drawn horizontally from wheel axle to wheel axle and must follow the specifications described below.

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.

The original air ducts running between the fairing and the air box may be altered or replaced. *Carbon fibre composites are permitted for fairing mounting and air ducts.*

Particle grilles or "wire-meshes" originally installed in the openings for the air ducts may be removed. The lower fairing must to be constructed to hold, in case of an engine breakdown minimum 6 litres. The lower edge of all the openings in the fairing must be positioned at least 70 mm above the bottom of the fairing.

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  $\leq 90^\circ$ .

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. The material is free but the distance between all opening centres, circle centres and their diameters must be constant. Holes or perforations must have an open area ratio  $> 60\%$ .

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 may be opened only in wet race conditions as declared by the Race Director.

Front mudguards may be replaced with a cosmetic duplicate of the original parts and may be spaced upward for increased tyre clearance.

Rear mudguard fixed on the swing arm may be modified, changed or removed.

Motorcycles may be equipped with inner air 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.

### **10.11. Seat**

Seat, seat base and associated bodywork may be replaced by parts of the same shape as originally produced by the manufacturer for the homologated motorcycle. The appearance from front, rear and profile must conform to the homologated shape.

The top portion of the rear bodywork around the seat may be modified to a solo seat.

The homologated seat locking system (with plates, pins, rubber pads etc.) may be removed.

### **10.12. Fasteners**

Standard fasteners may be replaced with fasteners of any material and design but titanium fasteners may not be used. The strength and design must be equal to or exceed the strength of the standard fastener.

Fasteners may be drilled for safety wire, but intentional weight-reduction modifications are not allowed.

Thread repair using inserts of different material such as helicoils and timeserts.

Fairing/bodywork fasteners may be replaced with the quick disconnect type.

Aluminium fasteners may only be used in non-structural locations.

### **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:

Lighting direction must be parallel to the machine centre line (motorcycle running direction), and be clearly visible from the rear at least 15 degrees to both left and right sides of the machine centre line. The rear light must be mounted near the end of the seat/rear bodywork and on the machine centre line, in a position approved by the chief scrutineer. In case of dispute over the mounting position or visibility, the decision of the chief scrutineer will be final.

Power output/luminosity equivalent to approximately: 10 - 15 (incandescent), 0.6 – 1.8 W (LED).

The output must be continuous - no flashing safety light whilst on track, flashing is allowed in the pit lane when pit limiter is active.

Safety light power supply may be separated from the motorcycle.

The chief scrutineer has the right to refuse any light system not satisfying this safety purpose.

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

- Any type of lubrication, brake or suspension fluid may be used.
- Gaskets and gasket materials.
- Instruments, instrument bracket(s) and associated cables.
- Painted external surface finishes and decals.
- Material for brackets connecting non-original parts (fairing, exhaust, instruments, etc.) to the frame (or engine) cannot be made from titanium.
- Protective covers for the frame, chain and footrests may be made in other materials like fibre composite material if these parts do not replace original parts mounted on the homologated model.

## **12. The following items MAY be removed**

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

### **13. The following items MUST be removed**

- Headlamp, rear lamp and turn signal indicators (if not incorporated in the fairing). Openings must be covered by suitable materials.
- Rear-view mirrors.
- Horn.
- License plate bracket.
- Toolkit.
- Helmet hooks and luggage carrier hooks.
- Passenger foot rests.
- Passenger grab rails.
- Safety bars, centre and side stands must be removed (fixed brackets must remain).

### **14. The following items MUST be altered**

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.

All drain plugs must be wired. External oil filter(s) screws and bolts that enter an oil cavity must be safety wired (e.g. on crankcases).

All motorcycles must have a closed breather system. All the oil breather lines must be connected and must exclusively discharge in the airbox.

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.

Motorcycles must be equipped with a red light on the instrument panel that will illuminate in the event of oil pressure drop.

### **15. Equipment and protective clothing**

Rider clothing / equipment in compliance with FIM Article 1.65 is mandatory.

The rider's name must appear on the right arm of the rider's clothing near the wrist (embroidered, patch).

### **16. Camera / Camera mounting**

*It is permitted to mount a camera to the motorcycle. It must be solidly connected to the vehicle, e.g. using clamp brackets. The use suction pad mountings or magnetic foot mountings is prohibited. The camera must moreover be additionally secured, e.g. with a cable which is attached both to the camera housing and to the motorcycle. The camera must be fitted to the motorcycle when it is presented for scrutineering. It is at the discretion of the scrutineers to decide whether the camera is safely mounted.*