



# SUPERTWIN REGULATIONS 2021

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INTERNATIONAL ISLE OF MAN TOURIST TROPHY RACES

ISLE OF MAN TT® RACES

# INTRODUCTION

## SUPERTWIN TT TECHNICAL REGULATIONS 2021

Dear teams and competitors,

The following regulations represent the latest evolution of this highly competitive class.

In order to allow participation of a wider variety of manufactures I have, after consultation with both the TT promoters and competitor teams, drafted a new set of technical regulations. This will allow water cooled twin cylinder machines up to 700cc to compete.

In drafting this new set of regulations and in order to accommodate the larger capacity, but as yet un-tested machines, I felt it was important to keep any overall changes to the existing regulations to a minimum. Having said that, there are some restrictions to machine weight and throttle bodies for the over 650 machines.

In truth, we will not know how evenly matched these bikes will be until they have raced on the TT course for the first time. This change for 2021 should be very much viewed as a starting point. It is for this reason that I reserve the right to revisit these regulations for future events with a view to maintaining parity between the different capacity machines.

**Dave Hagen**

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*Technical Director*

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ISLE OF MAN TT RACES

# REGULATIONS

## SUPERTWIN TT TECHNICAL REGULATIONS 2021

**Supertwin machines competing in the 2021 Isle of Man TT Races must comply with the Isle of Man TT Supertwin Technical Regulations. These are as follows and are correct at the time of publication but are subject to any amendments made by the Race Management Team which will be issued by means of a Bulletin and published by the Race Organisers.**

*Any four-stroke twin cylinder motorcycle available for purchase to the general public for road use with a water-cooled engine of up to 700cc may be used provided it adheres to the following regulations. Eligible machines must be, or have been available for sale to the general public and be homologated / Type approved for road use in the UK from 2009 or later. This class is for serial production machines only. One off or prototype machines are not permitted.*

### 1. FRAME AND SWING ARM

- Frame must remain as originally produced by the manufacturer for the homologated machine. Surplus attachment brackets may be removed and replaced with those more suitable for race fairings, sub frame attachment, instrument brackets and rear sub frame may be removed, replaced or modified.
- Swing arm may be replaced from a model of the same manufacturer provided the original attachment to frame and rear suspension remains the same as the standard motorcycle. No bracing or strengthening is allowed. Chain adjusters / rear axle blocks may be modified or replaced.

### 2. SUSPENSION

- Forks may be changed or modified. Fork yokes / triple clamp may be changed. Original internal parts of the fork may be modified or replaced. Aftermarket damper kits or valves may be installed. Fork springs may be replaced. Fork caps may be modified or replaced beyond the homologated standard to allow external adjustments. The use of carbon fibre for structural elements of the fork is not permitted.
- Steering damper may be added or changed. The addition of steering damper mounting lugs to the chassis by welding is permitted.
- Rear suspension unit can be changed or modified, but the original attachment to the frame and swing arm must remain as found on the standard machine.

### 3. BRAKES

- Front and rear brake discs may be changed. Only ferrous materials are allowed for brake discs.
- Front Brake and rear brake calipers may be changed or modified.
- Front and rear brake pads may be changed.
- Front and rear master cylinders may be changed.
- Front and rear hydraulic brake lines may be changed. The split of the front brake lines for both front brake calipers must be made above the lower fork bridge (bottom yoke).
- 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.

#### 4. WHEELS AND TYRES

- Wheels may be replaced. Carbon fibre or composite wheels are not permitted.
- Wheel rim diameter and width are free.
- All tyres must be moulded treaded type. Slick or cut slick tyres are not permitted.

#### 5. CONTROLS

- Footrest and foot controls may be replaced or relocated.
- Handlebars, hand controls and cables may be altered or replaced. Engine starter switch and kill switch must be located on the handlebars and must be operational at technical checks.

#### 6. BODYWORK, TANK, FAIRING AND SEAT UNIT

- Fairing, mudguards and seat unit may be altered or replaced.
- Windscreen, if fitted, may be replaced with transparent material only.
- The original instruments and fairing brackets may be removed, replaced or added to.
- The petrol tank capacity may be no greater than 20 litres. The unleaded baffle in the tank may be removed and the filler replaced. Fuel tank materials may be changed but must be metal (steel / aluminum / titanium). The use of carbon composite or plastic fuel tanks are not permitted unless they are as fitted to the standard motorcycle and remain unmodified. The fuel tank breather must vent via a non-return valve into a catch tank with a minimum capacity 250cc. This must be visible so it can be checked at technical checks.
- 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 (minimum 5 litres). The lower edge of openings in the fairing must be positioned at least 50 mm above the bottom of the fairing.

#### 7. BATTERY

- The size and type of the battery may be changed and relocated.

#### 8. ENGINE

- Bore and Stroke must remain as per the standard machine.
- Original OEM cylinder head, pistons, valves, cylinders may be modified, polished or lightened. Gas flow modifications normally associated with individual tuning is permitted.
- Compression ratio of the engine may be changed.
- Pistons may be replaced.
- Conrods may be modified or replaced but the material must remain the same type as found on the standard machine (steel rods can only be replaced by steel rods) and the rods must be the same weight or heavier than standard.
- Crankshaft may be modified or changed but must be no lighter than that used on the standard machine.
- Camshaft timing may be changed by the slotting of cam sprockets. Cam lift and dwell is free. The thermostat may be removed from the housing to aid cooling, if required.

## 9. IGNITION/FUEL SYSTEM AND THROTTLE BODIES

- The ECU must remain as fitted to the homologated machine or a machine of similar type and construction from a previous model and from the same manufacturer. However, it is permitted to use a secondary fuel and/or ignition module such as a Power Commander / Bazzaz etc "Flashing the standard ECU is also allowed.
- The use of an aftermarket ECU (e.g. Motec, IgniTech etc) is not permitted.
- **RPM Limits: 650cc machines: 11000 RPM | 651cc to 700cc machines: 11000 RPM**

Machines may be selected for mandatory Dyno Testing for verification of RPM limit.

- For machines under 651cc, the throttle bodies and injectors can be changed, bored out, polished and modified. The use of multiple injectors per cylinder is allowed.
- For machines over 651cc, the throttle bodies and injectors must be as found on the standard machine. No modifications are permitted with the exception of removal or fixing the position of any secondary butterfly's only.
- Bell mouths may be modified, removed or changed.
- Air boxes may be modified or replaced.

## 10. TRANSMISSION

- Gearbox may be changed or modified. The number of gears must remain as found on the standard machine.
- Additions to the gearbox or selector mechanism, such as quick shift systems are permitted.
- Clutch springs; friction and drive plates may be replaced.
- The use of slipper clutch assemblies is permitted.
- Front and rear external drive sprockets, chain pitch, width and length can be changed.

## 11. ELECTRICS

- The engine must start using the standard on board electric start.
- The alternator may be modified or changed.
- The original wiring harness may be modified or replaced.
- It is recommended that machines be equipped with a red light on the instrument panel. This light must flash in the event of oil pressure drop.

## 12. SAFETY LIGHTS

- A functioning red light must be securely fitted at the rear of the motorcycle and be switched on at all times during every practice/race session. 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.
- Mounted on the seat/rear bodywork approximately on the machine centre line, in a position rearward of a vertical line drawn up from a position 100mm forward of the of the rear wheel axle centre line. In case of a dispute over the mounting position or visibility, the decision of Technical Director will be final. See Appendix H, Fig 2.

### 13. EXHAUST SYSTEM

- Exhaust pipe and silencers may be altered or replaced from those fitted to the homologated motorcycle. The number of final exit(s) to the exhaust may be altered from that of the homologated machine.

### 14. BREATHERS

- All motorcycles must have a closed breather system. All oil breather lines must be connected and discharge in the air box only. The lines must discharge above the throttle bodies. They cannot discharge into the inlet tract or the exhaust air inlet system. The breather line must go engine to airbox direct or engine to catch tank to air box. All connections must be sealed so there are no direct atmosphere emissions.
- 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 only be used as homologated.

### 15. ENGINE CRASH COVERS

- All lateral covers/engine cases containing oil and which could be in contact with the ground during an incident 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 one third of the original cover. The Technical Directors decision on suitability is final.
- Plates or crash bars from aluminium or steel are also permitted in addition to those covers outlined above. All covers must be designed to be resistant against sudden shocks, abrasions and crash damage.
- FIM approved covers will be permitted without regard of the material or dimensions.
- 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 crankcase.
- The Technical Director has the authority to refuse any cover not complying with the above.

### 16. FASTENERS

- Standard fasteners may be replaced with fasteners of any material and design. The strength and design must be equal to or exceed the strength of the standard fastener it is replacing for structural applications.
- The use of titanium in the swing arm spindles and the wheels spindles is forbidden. For wheel spindles the use of light alloys is also forbidden. The use of titanium alloy nuts and bolts is allowed. Aluminium fasteners may only be used in non-structural locations.

### 17. THE FOLLOWING ITEMS MUST BE REMOVED

- Headlamp, rear lamp and turn signal indicators. Rear view mirrors, horn, license plate bracket, tool box, helmet hooks and luggage carrier hooks, passenger foot rests, passenger grab rails, safety bars, centre and side stands must be removed.

### 18. CHAIN GUARDS

- A guard must be fitted in such a way as to prevent trapping between the lower drive chain run and the final drive sprocket at the rear wheel. See Appendix H, Fig. 1.

## 19. FUEL

- Only Unleaded fuel as specified in the 2021 IOM TT Regulations is permitted. The use of fuel additives is strictly prohibited.

## 20. RADIATOR AND OIL COOLER

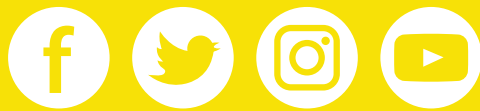
- Original radiator and oil cooler can be replaced. An oil cooler can be added if not fitted as standard. The radiator breather must vent into a catch tank with a minimum volume of 250cc.

## 21. OIL PUMPS, OIL SUMPS, OIL LINES AND WATER PUMPS

- All external engine oil drain plugs must be correctly torqued and be security lock wired.
- Where practical, all external oil gallery plugs, pressure / temperature sensors containing positive oil pressure must be correctly torqued and secured with lock wire or some other form of security device. As an absolute minimum all external plugs must be installed with the use of a high strength thread locking agent and paint marked to verify that this is the case.
- Any external oil lines containing positive oil pressure must be of suitable material and construction. All oil line fasteners should be lock wired or at the very least be secured with a high strength locking agent.
- External oil filters (including those with a drilled HEX) must be secured using a suitable hose clamp (Jubilee type) and secured with lock wire in such a way as to prevent it from undoing.

## 22. MINIMUM WEIGHT

- **650cc machines: 150kgs | 651cc to 700cc machines: 160kgs**
- At any time during the event, the weight of the whole machine (including the fuel tank and its contents) must not be less than the minimum weight.
- There is no tolerance on the minimum weight of the motorcycle.
- In the post-race inspection, the checked machines will be weighed in the condition they were at the end of the race
- The established weight limit must be met in the condition the machine finished the race. Nothing can be added to the machine including water, oil, fuel or tyres.
- During the practice/qualifying sessions competitors may be asked to submit their motorcycle to weight control which the competitor and his team must comply with.
- The use of ballast is allowed in order to stay over the minimum weight limit. This must be securely mounted to the main body of the chassis and be declared at technical inspection.



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