

2.8 MOTOAMERICA TWINS 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 motorcycles require a MotoAmerica homologation. (See MotoAmerica homologation procedure for Twins). 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 t e n (10) 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 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 class.

Over 600cc up to 800cc 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. 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 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.

2.8.4 Minimum weight

2.8.4.1 The minimum weight will be:

Over 600cc up to 700cc	135 kg (297.6 lbs.)
Over 700cc up to 800cc	145 kg (319.6 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 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:

- 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 blue 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 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) Sunoco Apex is the designated fuel.
- 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, Superpole for Superbike, 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.
- 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 may be replaced or modified but their weight must be the same as or higher than the original parts.
- 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. No modifications are allowed. Bore must remain as homologated.

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. 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 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. 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. All lateral covers/engine cases containing oil and which could be in contact with the ground during a crash, must be either replaced by a 'heavier' engine cover or protected by a second cover made from metal such as aluminum alloy, stainless steel, steel or titanium. Composite covers are not permitted.

- d. Any secondary covers must cover a minimum of 1/3 of the original cover. It must have no sharp edges to damage the track surface. These 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.
- e. 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.
- f. FIM approved covers will be permitted without regard of the material or dimensions.
- g. These covers must be fixed properly and securely with case cover screws that also mount the original covers/engine cases to the crankcases.
- h. Oil containing engine covers cannot be secured with aluminum bolts.
- i. 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 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 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.

2.8.8.14 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 metal reinforced construction with swaged or threaded connectors.

2.8.8.15 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. 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 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 €2500 (tax and OEM ECU price excluded but includes software, upgrades/ flashes)
 - ii. A MotoAmerica approved race ECU (must include any ignition driver parts). Price limit excluding data logger €2500, including data logger €3750
 - 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 has to 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. No inertial platforms are allowed (if an inertial platform is not installed originally on the homologated motorcycle).
 - v. Type of sensor is free.
 - vi. 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
 - ii. Bearings (steering pipe, swing arm, etc.)
 - iii. Swing arm
 - iv. Rear suspension linkage and shock absorber
 - v. Upper and lower triple clamps
 - vi. Wiring harness
- 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.
- 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. Bolt-on accessories to the rear sub-frame may be removed.

2.8.10.2 Suspension - General

- a. Participants in the Twins 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 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.
 - 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. Removing or disabling this rider interface is allowed.
- 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.

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 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. 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. 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 Art. 2.3.4) 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. 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.
- e. 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.
- f. The homologated road bike wheel and sprocket carrier assembly may be used with no modification, irrespective of material.
- 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).
- i. Wheel balance weights may be discarded, changed or added to.
- j. Any inflation valves may be used.

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 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 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 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).
- 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.
- i. 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 guards are not permitted. FIM approved guards will be permitted without regard to the material. Only composite guards need to be approved.
 - ii. The technical director has the right to refuse any guard not satisfying this safety purpose.
- j. **Brake caliper bolts must be safety wired; the use of clips is permitted.**

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 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 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 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 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.

2.8.10.11 Fairing / Bodywork

- a. The fairing, mudguards 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. "Naked" or fairing-less is acceptable but must have a belly pan that conforms with 2.8.10.11 (e)(f).
- c. The windscreen may be replaced or added if not originally equipped.
- d. The original air ducts running between the fairing to the airbox may be altered or replaced from those fitted to the homologated motorcycle.
- e. 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.
- f. 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.
 - g. Minimal changes are allowed in the fairing to permit the use of an elevator (stand) for wheel changes and to add plastic protective cones to the frame or the engine.
 - h. The front fender must conform in principle to the homologated shape originally produced by the manufacturer.
 - i. Holes may be drilled in the front mudguard to allow additional cooling.
 - j. A rear fender may be added or removed.
 - k. Material of construction of the front mudguard, rear mudguard and fairing may be altered or replaced from those fitted to the homologated motorcycle. 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.

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.
- 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 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.

2.8.14 The following items MUST BE altered

- a. All drain plugs must be wired. External oil filter(s), screws and bolts that enter an oil cavity must be safety wired (i.e. on crankcases).
- b. 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.
- c. Motorcycles must be equipped with a red light on the instrument panel that will illuminate in the event of oil pressure drop.