



Moto3TM ***JUNIOR***
WORLD CHAMPIONSHIP

2019
TECHNICAL REGULATIONS

2. TECHNICAL REGULATIONS

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

2.1 Introduction

2.1.1

The Championship is for motorcycles, i.e. vehicles with two wheels that make one track propelled only by an internal combustion engine, controlled by one rider.

2.1.2

Providing that the following Regulations are complied with, the constructors are free to be innovative with regard to design, materials and overall construction of the motorcycle.

2.1.3

In the Technical Regulations section, the term “Organiser” refers to the Championship Organiser and/or Promoter.

2.2 Classes

The following classes will be accommodated, which will be designated by engine type:

Moto3™ Junior

(ref. Section 2.3)

Up to 250cc. 4-stroke only, single cylinder only, maximum cylinder bore 81mm.

European Moto2™

(ref. Appendices 5 & 6)

Moto2™ Official Engine & Superstock 600 class also allowed.

European Talent Cup

(ref. Appendix 7)

HONDA NSF 250 (Type MR03) Official Motorcycle

2.3 Moto3™ Junior Technical Regulations

2.3.1 Definition

Up to 250cc. 4-stroke only, single cylinder only, maximum cylinder bore 81mm – prototypes.

2.3.2 Engines

2.3.2.1 Description

1. Engines may operate on the reciprocating piston four stroke principle only. The normal section of each engine cylinder and piston in plan view must be circular. Circular section cylinders & pistons are defined as having less than 5% difference in the diameter measured at any two points.
2. Engines must be normally aspirated.
3. Cubic capacity of the engine will be defined by the swept volume of the cylinder, ie. the area of the bore of the cylinder multiplied by the stroke, multiplied by the number of cylinders.
No tolerance on capacities is permitted.
Engine capacity will be measured at ambient temperature.
4. Maximum engine RPM in acceleration is controlled by the official ECU. The RPM Limiter strategy target is set at 13,500 rpm.
5. Maximum of 1 ignition driver.
6. Pneumatic and/or hydraulic valve systems are not permitted.
7. Valve timing system drive must be by one chain. An intermediate drive gear which rotates on only one axle or rotation centre is allowed in the system (refer to Appendix 1 for some examples of permitted systems).

2.3.2.2 Electronics

1. The only allowed Electronic Control Unit (ECU) is the Race version of Dellorto DoPE 2.0 and DoPE 3.0 ECU. The ECU must use FW 2017 or subsequent. This ECU will have a maximum of one ignition driver and include an engine RPM limiter, and the ECU must remain unmodified in hardware and software. The use of any additional device or module to modify the signals sent from the ECU to the actuators is forbidden. Injectors, bypass systems and ignition must be operated exclusively by the original and unmodified ECU signal.
2. Both “Team” and “Manufacturer” version of the ECU software supplied by the ECU manufacturer can be used by the team to modify the ECU configuration file. The only permitted changes by the team are the setting (tuning) options included in this software.
3. The only allowed dashboard is Dellorto DoDASH. The dashboard includes a GPS, to be used for data acquisition. The upper edge of the dashboard with GPS antenna must not be shielded.
4. Compulsory data acquisition channel list provided by Dellorto must be used. Data acquisition file in format .dop and .dopz. must be supplied to Organizer upon request for technical controls.
5. The datalogger download cable in the wiring harness must be of the approved standard type or one which is completely compatible with it. Details of connector type and connection are detailed in the online documents from the official ECU supplier.*
* for all ECU and electronic items identified with this symbol, details are available at the website: <http://www.dellorto-pe.com/>

6. Compulsory Engine Management features:
Refer to Appendix 2 for details of compulsory engine management equipment and design, including dashboard, ignition and sensors.
7. Recommended Engine Management features:
Refer to Appendix 3 for details of recommended engine management and electronic equipment and design, including timing pattern, O² sensor, knock sensor, idle control.
8. There is a compulsory official Initial Mapping and Set Up Procedure for new engines manufacturers to be compatible with the official ECU. Refer to Appendix 4 for initial ECU set-up procedure options.

2.3.2.3 Fuel system

1. Maximum relative fuel pressure is 5.0 Bar.
2. Variable-length inlet systems are not permitted.
3. Only one throttle control valve is permitted to control the power demand by the rider, which must be controlled exclusively by mechanical means (eg. cable) operated by the rider only. No other powered moving devices (except injectors and the idle control air bypass) are permitted in the inlet tract before the engine intake valve.
No interruption of the mechanical connection between the rider's input and the throttle is allowed.
4. Idle speed (including engine braking) adjustment by means of an air bypass system, controlled by the ECU is allowed. The maximum size of such air bypass is 12mm equivalent diameter; control systems may include a butterfly-type control valve.
5. Fuel injectors must be located upstream of the engine intake valves.
6. A maximum of 2 fuel injectors per throttle body, and 2 independent fuel injector drivers, controlled by the ECU, is permitted.
7. Other than engine sump breather gases, only air or air/fuel mixture is permitted in the inlet tract and combustion chamber.
8. Only fuel of the current year from the appointed fuel supplier is permitted. This fuel will be available at all official events, and will conform to the FIM Moto3™ Junior World Championship specification.
The use of this fuel without any addition or alteration is mandatory during all events (free practices, qualifying practices, warm-up and races).
9. The fuel on the motorcycle must not be below the prevailing ambient temperature, as measured by the Technical Director. Other than a simple removable fuel tank cover, the use of any device on the motorcycle to artificially decrease the fuel temperature below ambient temperature is forbidden.
10. Any quality of oil may be used.

2.3.2.4 Exhaust

1. Only reciprocating inlet and exhaust valves are permitted, with a maximum of 2 valves each inlet and exhaust.
2. The outlet of the exhaust must not extend behind a line drawn vertically through the edge of the rear tyre.
3. For safety reasons the exposed edge of the exhaust pipe outlet must be rounded to avoid any sharp edges.
4. Variable length exhaust systems are not permitted.
5. Exhaust Gas Recirculation (EGR) systems are not permitted.
6. No moving parts (e.g. valves, baffles...) are allowed in the exhaust systems.

7. The noise limit will be a maximum of 115 dB/A, measured in a static test at 5.500rpm.

2.3.2.5 Control systems

1. The use of hydraulic and/or pneumatic pressurized powered systems is not allowed. All hydraulic systems on the motorcycle must be powered only by the rider's manual inputs with the following clarifications:
 - Normal hydraulic hand/foot controls such as master/slave cylinders for brakes/clutch are allowed.
 - Oil/water pumps for engine lubricating/cooling are allowed.
 - The use of engine lubricating oil for any purpose other than lubrication and cooling (such as powered hydraulic systems) is not allowed.
2. Variable valve timing and variable valve lift systems, driven by hydraulic and/or electric/electronic systems are not permitted.
Decompression systems which operate only at engine start are permitted, but variable valve timing/valve lift systems which operate other than at engine start, are not permitted.

2.3.2.6 Transmission

1. A maximum of six (6) gears ratios is permitted.
2. Twin clutch transmission systems (DSG) are not permitted.
3. Continuously Variable Transmission systems (CVT) are not permitted.
4. Automatic transmission systems are not permitted. Only manually transmissions with gearshifts assisted by a quick-shifter systems are permitted.
5. A maximum of 2 possible gear ratios for each gearbox speed and 3 possible ratios for the primary drive gear is permitted. Teams will be required to declare the gearbox ratios chosen for each gear at the beginning of the season, and only these ratios may be used during the entire season.
6. Gearbox systems must be of the conventional type. That is constant-mesh with engagement dogs as an integral part of the gear, actuated by shift forks and shift cam or drum, with only one set of gears engaging at one time. So-called "seamless shift" transmissions (also known as Automated Manual Transmission, Instantaneous Gearchange System, etc.) are not permitted.
7. Electro-mechanical or electro-hydraulic clutch actuating systems are not permitted.

2.3.2.7 Materials

NB. "X-based alloy" or "X materials" here means the element X (e.g. Fe, for ferrous or iron-based alloy) must be the most abundant element in the alloy, on a % w/w basis.

1. The use of titanium in the construction of the following parts is forbidden:
 - The frame/chassis, excluding bolts and fasteners (the decision of the Technical Director will be final when determining what constitutes a part of the chassis).
 - The swinging arm, excluding bolts and fasteners.
 - The swinging arm spindles
 - The wheel spindles (for wheel spindles, the use of light alloys is also forbidden).
 - The handlebars.

- The front suspension inner and outer tubes and bottoms (ie. Axle mounting point).
 - The shock absorber piston shaft and damper tube.
2. The basic structure of the crankshaft and camshafts must be made from ferrous materials, steel or cast iron. Inserts of a different material are allowed in the crankshaft for the sole purpose of balancing.
 3. Pistons, cylinder heads and cylinder blocks may not be composite structures which use carbon or aramid fibre reinforcing materials.
 4. Brake calipers must be made from aluminium materials with a modulus of elasticity no greater than 80 GPa.
 5. **All connectors from the brake hose to the brake calipers (front and rear) and the brake master cylinders must have structural components (*) manufactured from either steel or titanium alloys with a tensile strength no less than 500 Mpa.**
 - * **Brass connectors are permitted for rear brake hoses only.**
 6. No parts of the motorcycle or engine may be made from metallic materials which have a specific modulus of elasticity greater than 50 GPa / (g/cm³).
 7. The use of MMC (Metal Matrix Composite) and FRM (Fibre Reinforced Metal) materials is forbidden.
 8. The following materials restrictions apply:
 - a) Engine crankcases, cylinder blocks and cylinder heads must be made from cast aluminium alloys.
 - b) Pistons must be made from an aluminium alloy.
 - c) Piston pins must be made from ferrous materials.
 - d) Connecting rods, valves and valve springs must be made from either ferrous or titanium-based alloys.

2.3.3 Chassis

Chassis must be a prototype, the design and construction of which is free within the constraints of the FIM Moto3™ Junior Technical Regulations.

2.3.3.1 Weights

1. Minimum total weight of Motorcycle + Rider: 149 kg.
2. Ballast may be added to achieve the minimum weights.
3. Weight may be checked at the initial technical control, but the main control of weight will be made at the end of practice sessions or at the end of the race. The weight of the motorcycle will be that measured in the form that the motorcycle participated, with fuel tank on and including normal levels of oil and water, and all additional equipment attached to the motorcycle, for example timekeeping transponders, camera equipment, electronic datalogging equipment, etc.
The weight checked will be the total of the rider with full protective clothing plus the weight of the motorcycle. Random weight controls may be carried out during practice in a designated weighing area.

2.3.3.2 Safety and construction criteria

Note: please also refer to **Appendix 9**.

1. Throttle Twist grips
The throttle twist-grip must close automatically when released.
2. Steering
 - a) Handlebars must have a width of not less than 450 mm and their end must be solid or rubber covered. The width of the handlebar is defined as the width measured between the outside of the handlebar grips or throttle twist grips.
 - b) There must be at least 15 degrees of movement of the steering each side of the centre line.
 - c) Stop must be fitted to ensure a clearance of at least 30 mm between the handlebar and the fuel tank frame and/or bodywork when at the extremes of steering lock.
3. Footrests
Footrest must have rounded ends with a minimum solid spherical radius of 8 mm.
4. Handlebar levers
Handlebar levers must not be longer than 200 mm measured from the pivot point.
5. Clearances
 - a) The motorcycle, unloaded, must be capable of being leaned at an angle of 50 degrees from the vertical without touching the ground, other than with the tyre.
 - b) There must be a clearance of at least 15 mm around the circumference of the tyre at all positions of the motorcycle suspension and all positions of the rear wheel adjustment.
6. Breather pipes
Any breather pipe from the engine or gearbox must discharge into the airbox and/or a suitable container.
7. 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.
8. Engine Covers
Lateral engine covers containing oil and which could be in contact with the ground during a crash, should be protected by a second cover made from composite materials, e.g. nylon, carbon or Kevlar®. Plates and/or bars from aluminium or steel are also permitted. All these devices must be designed to be resistant against sudden shocks and abrasion and must be fixed properly and securely.
Such protection is mandatory as directed by the Technical Director.
9. Timing transponders
 - a) All machines must have a correctly-positioned timekeeping transponder, of the correct type. The transponders will not be handed out by the time keeping staff of the circuits any longer. For this reason, the purchase or hiring of the transponders are the solely responsibility of the teams. The models allowed are: Tranx 2, Tranx 260, Tranx Pro DPI - DPT, X2 Pro, X2 Pro plus and X2 Club.
 - b) The X2 transponder must be mounted on the front of the bike to optimize performance and cooling. Always use the supplied rubbers and top hats or mounting bracket to mount the transponder. The cable which connects to the transponder needs to be placed as close as possible to the transponder, on the same mounting area where the transponder is positioned. Avoid running any other cables and/or electronics in an area of 5cm around the transponder as this will affect the transponder signal. There has to be a Kevlar window in the fairing under the Transponder, as big as possible around the transponder area. The transponders cannot be mounted on or near the engine and/or the exhaust due to heat and vibrations. The transponder must always receive power supply; even in

the case that the rider stops the bike. For optimal mounting conditions check **Appendix 10**. Any other models must be installed according to **Appendix 10**.

- c) Transponders must be fully functional on the motorcycle as required by the Organiser, including wiring, power supply, and inputs / outputs for data or signals purposes.

10. Safety lights

All motorcycles must have a functioning red light mounted at the rear of the machine, to be used in rain or low visibility conditions. The team must ensure that the light is switched on whenever a rain tyre is fitted on the motorcycle.

Lights must comply with the following:

- a) The lighting direction must be parallel to the center line of the motorcycle (running direction) and it must be clearly visible from the rear, at least 15 degrees to both the left and right sides of the center line of the motorcycle.
- b) It must be safely mounted on the very end of seat/rear bodywork and approximately on the center line of the motorcycle. In case of dispute over the mounting position or visibility of the Rear Safety Light, the decision of the Technical Director will be final.
- c) The power output/luminosity must be equivalent to approximately 10-15W (incandescent) or 0.6-1.8W (led).
- d) Able to be switched on and off by the rider when seated on the machine.
- e) Safety light power supply may be separated from the motorcycle main wiring and battery.

2.3.3.3 Brakes

- 1. Motorcycles must have a minimum of one brake on each wheel that is independently operated.
- 2. Only brake discs of ferrous materials are allowed.
- 3. The proportion of ceramic composite materials in brakediscs must not exceed 2% by mass. Ceramic materials are defined as inorganic, non metallic solids (e.g. Al_2O_3 , SiC , B_4C , Ti_5Si_3 , SiO_2 , Si_3N_4).

Refer to Art. 2.3.2.7. 4) and 5) for other permitted materials in brake component construction.

- 4. Motorcycles must be equipped with brake lever protection, intended to protect the handlebar brake lever(s) from being accidentally activated in case of collision with another machine. Acceptable protection includes the fairing extending sufficiently to cover the brake lever, as viewed from the front.

Such devices must be strong enough to function effectively and designed so that there is no risk for the rider to be injured or trapped by it, and it must not be considered a dangerous fitting (at the sole discretion of the Technical Director).

In case the brake lever protection is attached to any part of the braking system (e.g. brake master cylinder), then the brake system manufacturer must officially confirm in writing to the Technical Director that the device does not interfere with the proper brake operation.

- 5. Anti-lock Brake Systems (ABS) are not permitted. Braking inputs must be powered and controlled solely by the rider's manual inputs. Conventional hydraulic hand/foot controls such as master/slave cylinders for brake systems are allowed (refer also to Art. 2.3.2.5 Control Systems) but no increase or control of brake pressure by electronic or mechanical systems apart from the rider's direct manual inputs are

allowed. Specifically, brake systems designed to prevent the wheel from locking when the rider applies the brake are forbidden.

2.3.3.4 Suspensions and dampers

1. Electric/electronic controlled suspension, ride height and steering damper systems are not allowed. Adjustments to the suspension and steering damper systems may only be made by manual human inputs and mechanical/hydraulic adjusters.

2.3.3.5 Fuel tanks

1. Fuel caps must be leak proof and have a positive closing device.
2. Fuel tank breather pipes must include a non-return valve. Fuel tank breather pipes must discharge into a suitable container, one per motorcycle with a minimum capacity of 200cc.
3. Fuel tanks of all construction types must be filled with fire retardant material or be lined with a fuel cell bladder.
4. Except for the case that a fuel tank is fixed on the chassis with bolts, all fuel lines from the fuel tank to the engine/injector system should have a self sealing breakaway valve. This valve must separate at less than 50% of the load required to break any part of the fuel line or fitting or to pull it out of the fuel tank.
5. Refuelling may only be carried out from an unpressurised container, and the motorcycle fuel tank may not be artificially pressurised above atmospheric pressure at any time. It is allowed to vent the fuel tank to the atmosphere via the airbox in order to equalise pressure in the airbox and fuel tank.

2.3.3.7 Bodywork

Note: please also refer to Appendix 9.

1. The windscreen edge and the edges of all other exposed parts of the streamlining must be rounded.
2. The maximum width of bodywork must not exceed 600 mm. The width of the seat or anything to its rear shall not be more than 450 mm (exhaust pipes excepted).
3. Bodywork must not extend more than 150mm beyond a line drawn vertically from the center of the front wheel spindle and a line drawn vertically at the rearward edge of the rear tyre. The suspension should be fully extended when the measurement is taken.
4. When viewed from the side, it must be possible to see:
 - a) At least 180 degrees of the rear wheel rim.
 - b) The whole of the front rim, other than the part obscured by the mudguard, forks, brake parts or removable air-intake.
 - c) The rider, seated in a normal position with the exception of the forearms.

Notes: No transparent material may be used to circumvent the above rules. Covers for brake parts or wheels are not considered to be bodywork obstructing the view of wheel rims in regard to the above rules.
5. No part of the motorcycle may be behind a line drawn vertically at the edge of the rear tyre.

6. The seat unit shall have a maximum height of the (approximately) vertical section behind the rider's seating position of 150 mm. The measurement will be taken at a 90° angle to the upper surface of the flat base at the rider's seating position, excluding any seat pad or covering.
7. Mudguards are not compulsory. When fitted, front mudguards must not extend:
 - a) In front of a line drawn upwards and forwards at 45 degrees from a horizontal line through the front wheel spindle.
 - b) Below a line drawn horizontally and to the rear of the front wheel spindle.
 The mudguard mounts/brackets and fork-leg covers, close to the suspension leg and wheel spindle, and brake disc covers are not considered part of the mudguard.
8. Devices or shapes protruding from the fairing or bodywork and not integrated in the body streamlining (eg. wings, fins, bulges, etc.), that may provide an aerodynamic effect (eg. providing downforce, disrupting aerodynamic wake, etc.) are not allowed. The Technical Director will be the sole judge of whether a device or fairing design falls into the above definition.
Moving aerodynamic devices are prohibited.
9. 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 2.5 liters). This measurement should be taken with the fairing fitted to the motorcycle, whilst both wheels are on the ground and the motorcycle is upright at 90° to the horizontal.
The lower fairing should incorporate a maximum of two holes of 25mm. These holes must remain closed in dry conditions and must be only opened in wet race conditions.

2.3.3.8 Wheel rims

1. The only permitted wheel rim sizes are:
Front 2.50" x 17"

Rear 3.50" x 17"
2. Composite construction wheels (including carbon fibre reinforced, glass fibre reinforced, and similar) are not permitted. The permitted materials for wheel construction are magnesium and aluminium alloys.
- ~~3. The use of any device on the wheel to adjust the tyre pressure whilst on track is prohibited.~~

2.3.3.9 Tyre restrictions

1. Only tyres from the official tyre supplier may be used and each team must sign a contract.
The tyre specifications available at each event will be determined by the Championship Promoter. Only homologated tyres in each event are permitted.
The use of any device on the wheel to adjust the tyre pressure whilst on track is prohibited.
2. The maximum number of rear tyres allowed to use during the qualifying practice are THREE (3). Only the rear slick tyres need to be marked with a tyre sticker.

The wet tyres will not need to be marked with a tyre sticker and will not be considered in the total number of tyres available for use.

A maximum of ONE (1) rear slick tyre per race may be used. Only the race rear slick tyre shall be marked with a code differentiable qualifying tyres.

The wet tyres will not need to be marked with a tyre sticker and will not be considered in the total number of tyres available for use.

During the preliminary technical inspection, the adhesive stickers used for marking the tyres will be delivered to the teams. Each team will be responsible of marking their tyres.

The Technical Stewards may perform random controls during the qualifying practices.

If the riders are shown a red flag during the practice, or the race/s, the Permanent Race Direction is allowed to authorize the use of a supplementary tyre. All checked tyres must be easily identifiable with a colour marking or a numerical system.

In case of a dispute, the Technical Director will be the sole judge to take the appropriate decision.

2.3.3.10 Numbers and backgrounds

1. The front plate must be located in the middle of the fairing's front or on the side facing the official time keeping staff.
2. Rear or side numbers are optional. If they are fitted, must govern the same rules as the front.
3. The dimensions for the number plates must be: 140mm x 25mm minimum. Numbers from 1 to 9 can be wider. Only numbers between 1 and 99 will be admitted.
4. Backgrounds must be of one single colour over an area large enough to provide a minimum clear area of 25 mm around the numbers.
5. Numbers cannot overlap.
6. In case of a dispute concerning the legibility of numbers, the decision of the Technical Director will be final.

The numbers and backgrounds will be as follows:

	Background	Number
Moto3™	Black	White

2.3.4 General

2.3.4.1 Fuel and oil

Refer to Appendix 11

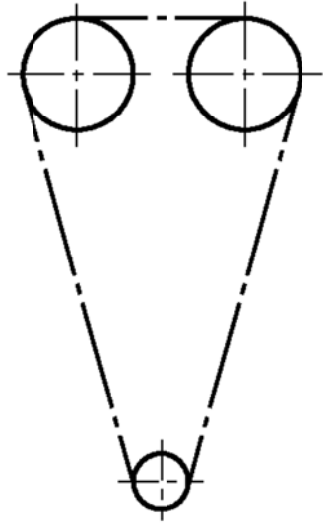
2.3.4.2 Rider's Safety Equipment

Refer to Appendix 12 and 13

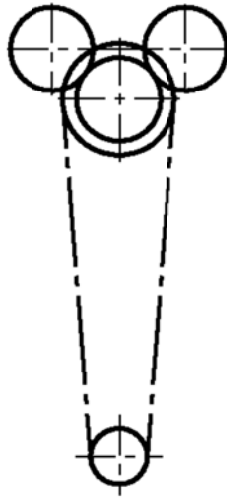
2.3.4.3 Procedures for Technical Control

Refer to Appendix 14

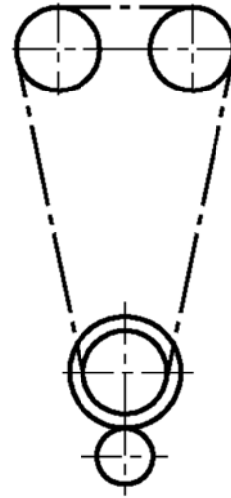
Moto3 Junior Appendix 1



A) Simple chain drive



B) Chain drive + upper gear



C) Chain drive + lower gear

Moto3 Junior Appendix 2

Compulsory Engine Management features

Ignition	Must be of the inductive type. Maximum ignition coil current must be less than 30A
Throttle Position Sensor	Voltage output must be 0 – 5V
Crankshaft Pickup Sensor	Must be of the inductive type. Voltage at 300rpm must be at least 0.8V, and maximum voltage less than 100V
Camshaft Pickup Sensor (if any)	Must be of the Hall-effect type. “0” voltage must be less than 0.5V, “1” voltage must be $4.5V \pm 0.5V$
Battery	Is compulsory. Must be in the 8 – 16.5V range (measured at the voltage acquisition channel) to ensure proper engine management function
Datalogger Download Connector	Must be type: Lemo PEN.1F.308.XLM or one completely compatible with this. Connected as detailed in Dell’Orto online documentation, http://www.dellorto-pe.com/
UEGO O ₂ Sensor	Bosch LSU 4.9
Dashboard	Dell’Orto DoDash. Refer to website http://www.dellorto-pe.com/

Moto3 Junior Appendix 3

Recommended Engine Management features

(NB. Different design choices must be agreed separately with the official ECU supplier)

Idle Speed Stepper Motor	Dell'Orto. Refer to website http://www.dellorto-pe.com/
Timing Option 1 Crankshaft Pickup only	Crankshaft timing pattern is "n-2" type, where "n" can be between 12 and 60. For optimum performance it is recommended that the first tooth after the missing teeth corresponds to TDC (top dead centre)
Timing Option 2 Crankshaft and Camshaft Pickups	Crankshaft timing wheel has between 12 and 60 teeth, and the camshaft timing pattern is one single tooth
ECU Mounting	Dell'Orto ECU Safety Fixing Kit. Refer to website http://www.dellorto-pe.com/
Ignition Module	Dell'Orto IGBT Ignition Module. Refer to website http://www.dellorto-pe.com/

Moto3 Junior Appendix 4

Initial ECU Mapping and Set Up Procedure

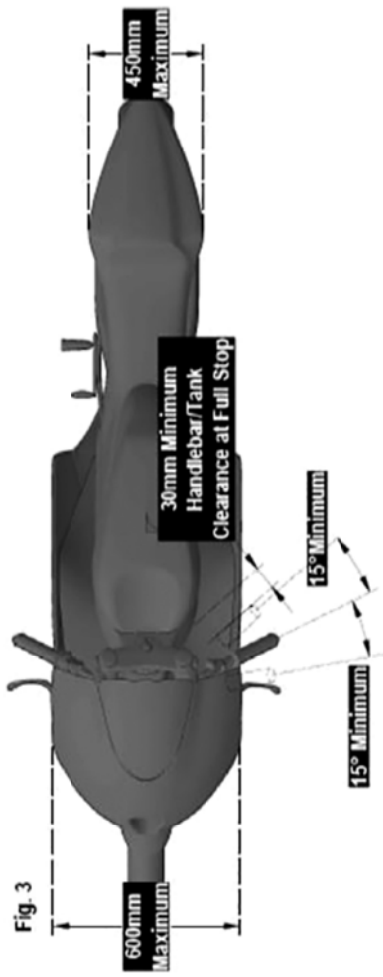
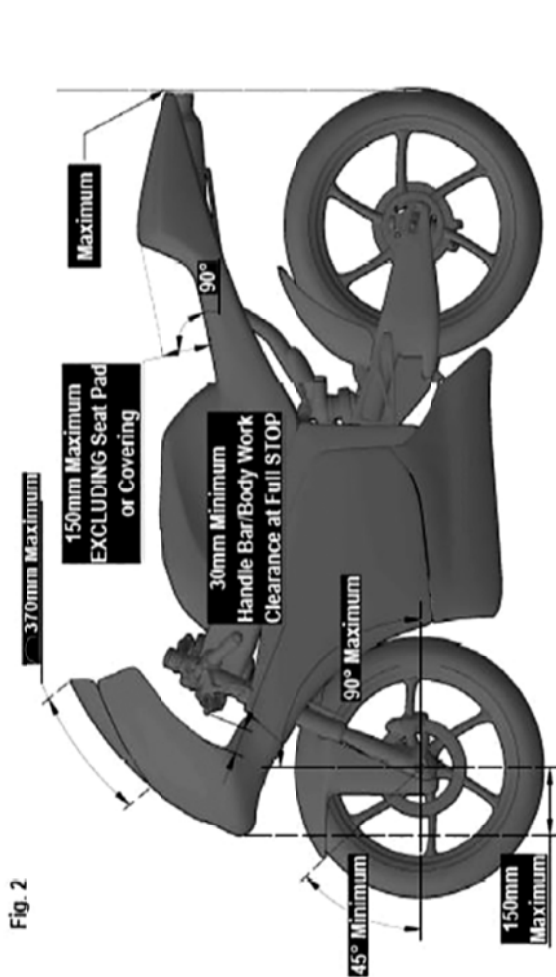
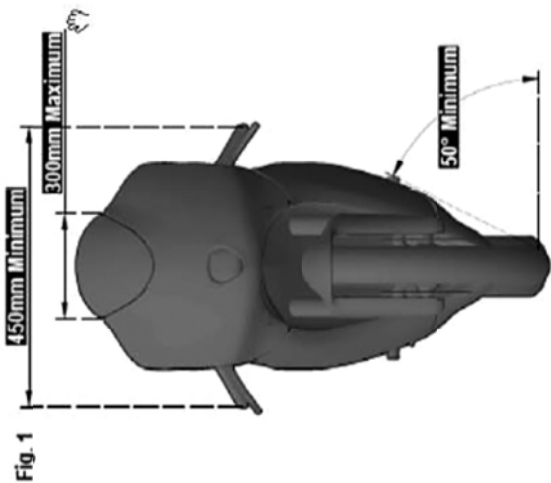
The official ECU start-up procedure is to ensure manufacturers will be supplied with the official ECU with an initial map to suit their engine in time for the first official Moto3™ tests of the season. The initial map is intended for safe and trouble-free engine function, and not maximum performance. Performance mapping is the responsibility of the engine manufacturer or the Team.

NB. Detailed information on engine control strategies for Moto3™ engine manufacturers is available from the ECU supplier, upon completion of a non-disclosure agreement. Refer to the website: <http://www.dellorto-pe.com/>

For an engine design to be eligible for the Moto3™ class, one of the following two options for the ECU start-up procedure must be followed:

OPTION 1 Initial Mapping and Set Up by ECU Supplier	Manufacturers will be guaranteed supply of the official ECU with initial maps to suit their engine before the first Moto3™ official tests of the season, provided that:
By October 15 th of the year preceding first entry in Moto3™	<ol style="list-style-type: none">1. the completed Moto3™ Engine Manufacturer Entry Form is submitted to the organisers. (form available at http://www.fim-live.com/en/sport/official-documents-ccr/other-documents/)2. two complete working engines (including throttle body, idle bypass actuator, transmission, sensors, spark plugs, wiring harness with ECU connector) and one complete airbox, cooling system and exhaust are delivered to the ECU supplier for mapping tests. Engines and parts will be returned by January of the following year.3. a deposit of 10,000 Euros is lodged with the official ECU supplier.
OPTION 2 Initial Mapping and Set Up by Engine Manufacturer	Engine Manufacturers can make an agreement with the ECU supplier to carry out their own Initial mapping procedure, with the following conditions:

General Appendix 9



General Appendix 10



Installation of the model X2 Pro and X2 Pro Plus



Installation of any other model

General Appendix 11

Fuel Specifications

1. All motorcycles must be fuelled with unleaded petrol, which must comply with the specification **below** for each racing class.
2. Unleaded petrol will comply with the specification **below** if:
 - a. It has the following characteristics:

Property	Units	Min.	Max.	Test Method
RON		95.0	102.0	ISO 5164
MON		85.0	90.0	ISO 5163
Oxygen	% (m/m)		2.7	ISO 22854
Benzene	% (v/v)		1.0	ISO 22854
Vapour Pressure (DVPE)	kPa		90	EN 13016-1
Lead	mg/L		5.0	EN 237
Density at 15°C	Kg/m ³	720.0	775.0	ASTM D 4052
Oxidation Stability	minutes	360		ASTM D 525
Existent gum	mg/100 mL		5.0	EN ISO 6246
Sulphur	mg/kg		10	ASTM D 5453
Nitrogen	% (m/m)		0.2	ASTM D 4659
Copper Corrosion	Rating		Class 1	ISO 2160
Distillation:				
At 70°C	% (v/v)	22.0	50.0	ISO 3405
At 100°C	% (v/v)	46.0	71.0	ISO 3405
At 150°C	% (v/v)	75.0		ISO 3405
Final Boiling Point	°C		210.0	ISO 3405
Residue	% (v/v)		2.0	ISO 3405
Olefins (*)	% (v/v)		18.0	ISO 22854
Aromatics (*)	% (v/v)		35.0	ISO 22854
Total di-olefins	% m/m		1.0	GCMS / HPLC GCMS / HPLC
Apperance		clear and bright		Visual inspection

All test methods include a precision statement. In cases of dispute, the procedures for resolving the dispute and interpretation of the results based on test method precision, described in ISO 4259, shall be used.

- b. The total of individual hydrocarbon components, containing only hydrogen and carbon, present at concentrations of less than 5% m/m must be at least 30% m/m of the fuel.

Compliance with the compositional regulation is calculated on the following basis:

$$A = 100 - B - C$$

where:

A is the total concentration (in % m/m) of individual hydrocarbon components present at concentrations less than 5 % m/m,

B is the total concentration (in % m/m) of oxygenates present in the fuel, and C is the total concentration (in % m/m) of individual hydrocarbon components present at concentrations greater than 5% m/m.

The test method will be gas chromatography.

- c. The total concentration of naphthenes, olefins and aromatics in each carbon number group will not exceed the limits given in the following table.

% m/m	C4	C5	C6	C7	C8	C9+
Naphthenes	0	5	10	10	10	10
Olefins	5	20	20	15	10	10
Aromatics			1.2	35	35	30

Bicyclic and polycyclic olefins are not permitted. The fuel must contain no substances which are capable of exothermic reaction in the absence of external oxygen.

- d. Only the following oxygenates will be permitted:

Methanol, Ethanol, Iso-propyl alcohol, Iso-butyl alcohol, Methyl tertiary butyl ether, Ethyl tertiary butyl ether, Tertiary amyl methyl ether, Di-isopropyl ether, n-Propyl alcohol, Tertiary butyl alcohol, n-Butyl alcohol, Secondary butyl alcohol.

- e. Manganese (<1 mg/L), lead (<5 mg/L), iron (<5 mg/L) and nickel (<5 mg/L) additives are not permitted above these limits.
- f. In **all classes**, the fuel specification will be determined by the appointed fuel supplier in consultation with the Organisers and may be changed at any time by mutual agreement.

3. All classes fuel :

- a. Only fuel from the appointed fuel supplier is permitted. This fuel will be available at all official events, and will conform to **this appendix** specification. Use of this fuel without any addition or alteration is mandatory.

4. Fuel Sampling and Testing

- a. The Technical Director will appoint a senior Technical Scrutineer to take responsibility for the administration and supervision of the fuel sampling procedure.
- b. Motorcycles selected for fuel controls will usually be amongst the first three finishers, and will be directed to the "parc fermé" for technical controls.

- c. Other finishers may be chosen at random for fuel controls. A Technical Scrutineer will be posted at the entrance to the pit box of the selected rider(s) whose machine must immediately accompany the Technical Scrutineer to the technical control area or "parc fermé".
- d. The fuel to be tested will be transferred into two bottles, "A" and "B" identified by reference to the rider, team and machine from which the sample was taken. The bottles will be closed, sealed and labelled by the Technical Director and/or Technical Scrutineer.
- e. Only new bottles will be used for the samples and only new materials will be used to transfer the fuel.
- f. The Fuel Sample Declaration form will be filled out immediately, containing all necessary information, including the riders and machines identity, date and place of fuel sampling. A responsible team member will sign this declaration, after verifying that all the information is correct.
- g. Sample "A" will be sent to the official appointed laboratory, accompanied by a copy of the Fuel Sample Declaration form. The fuel sample will be compared with the approved fuel. If necessary the concentration of other elements, including lead, manganese, iron, nickel, nitrogen and oxygen may be measured at the request of the Technical Director to ensure that octane and power boosters have not been added.
If any observed deviations indicate that they are due to mixing with one other fuel, which has been approved by the FIM/Dorna for use by the team, the fuel sample will be deemed to comply, provided the fuel sample still falls within **the** specification as described in **this appendix**. Costs for the analyses of sample "A" will be paid by FIM/Dorna.
- h. Sample "B" will be handed over to the FIM designated storage facility for safeguarding in case of protests and/or requirement of a counter analysis by the appointed laboratory. Costs for the analyses of sample "B" will be paid by the team concerned.
- i. Both samples will be transported by an authorised courier.
- j. The laboratory must deliver the results of the fuel sample analyses to the Technical Director, with a copy to the **Race Direction**, as soon as possible after receipt of the samples.
- k. In the case of non-conformity, the Technical Director must notify, as soon as practical after receipt of the results, the **Race Direction**, the **FIM Administration** and the rider/team representative concerned.
Within 48 hours of the receipt of the notification of the results of the laboratory test of sample "A", the team must notify the **Race Direction** and the Technical Director if counter-expertise is required (or not required) for sample "B".
The **Race Direction** will take a decision at the event immediately following the notification of the results of the final expertise. Any appeal against the decision of the **Race Direction** will be heard by the FIM

Stewards appointed for the event at which the **Race Direction** decision is taken.

If there is no more **events** following the notification of the results of the final expertise, the **Race Direction** will take a decision as soon as practical. Any appeal against the decision of the FIM Stewards will be heard by the **CDI** appointed by the FIM for this specific task.

- l. The director of fuel analysis at the official laboratory must confirm to the Technical Director that the identification and the seal status of the “B” sample is correct before any B sample analysis is carried out.
- m. Failure of the sample to comply to approved petrol and/or the addition of octane and power boosters, as described **in this Appendix**, will automatically result in the disqualification of the competitor from the entire meeting.
The result of the competitor’s fuel sample analysis (“A” or “B” sample) more favourable to the competitor will be taken into account.

5. Fuel Temperature

In the Moto3 class fuel on the motorcycle must not be below the prevailing ambient temperature. Other than a simple removable fuel tank cover, the use of any device on the motorcycle to artificially decrease the fuel temperature below ambient temperature is forbidden.

6. Fuel Handling Safety

- a. The use of anti-static mats and grounding wrist straps is mandatory when filling fuel containers used for transferring fuel to motorcycles.
- b. The use of approved fuel fillers/fuel dumps is mandatory when adding fuel to motorcycle fuel tanks.

Gasoline Sample Declaration Form



FIM WORLD CHAMPIONSHIPS, CUPS AND PRIZE EVENTS

Gasoline Sample Declaration Form

Discipline	
IMN(xxx/xx)	
Rider/team's name	
Rider/team's number	
Rider/team's email or telephone number	
Team	
Vehicle's make	
Gasoline's make and type	
Gasoline's origin (public station or race supplier)	
Gasoline samples taken on date (dd/mm/yy) and time (hh:mm)	

Gasoline samples taken at (right before or after) on:

☐

QP1

☐

QP2

☐

WARM UP

☐

RACE N. _____

	Container seal n°
Sample A	
Sample B	

The above listed details refer to gasoline samples taken from the gasoline tank of the motorcycle specified.

Sample A is the first testing sample to be used by the FIM appointed laboratory. Sample B can be used for a second analysis if required by the FIM.

The serial numbers of the vial seals and the accuracy of the listed information have been verified.	
Rider or Team responsible's name	
Rider or Team responsible's signature	
FIM Technical Director/FMNR Chief Technical steward's name	
FIM Technical Director/FMNR Chief Technical Steward's signature	

General Appendix 12

1. It is compulsory that each contracted rider must begin each race event with at least one complete set of undamaged safety equipment. A complete set of safety equipment shall contain:
 - Helmet
 - Leather Suit, 1-piece
 - Gloves
 - Boots
 - Back Protector
 - Chest Protector

The equipment must be worn, correctly fastened, at all times during on-track activity.

2. Safety Equipment Control

- a) At Technical Control, one complete set of undamaged safety equipment must be presented and checked for the following:
 - Helmet: a marking indicating certification to one of the helmet standards listed in **Appendix 13**.
 - Leather Suit, Boots, Gloves: undamaged conditions
 - Back and Chest Protector: undamaged conditions
- b) At any time during the season, the Technical Director may request a piece of rider's equipment in order to check that it meets the requirements listed.

3. FIM Rider's Equipment Minimum Requirements (REMR)

- a) Standards for Helmet and Visor:
 - Helmets must be of the full face type and conform to at least one of the following recognised International Standards, and be labeled: Refer to **Appendix 13**.

EUROPE	ECE 22-05 (only "P" type)
JAPAN	JIS T 8133:2007 (valid until 31.12.2019) JIS T 8133:2015 (only "Type 2 Full face")
USA	SNELL M 2010 (valid until 31.12.2019) SNELL M 2015
FIM	FRHPhe-01

- Visors must be made of a shatterproof material.
- Disposable visor 'tear-offs' are permitted.
- A protective lower face cover must be present and must be not detachable, not moveable and made of the same material of the shell.
- Helmets constructed with an outer shell made of more than one piece are not permitted (e.g. they must not contain any seam).
- A retention system with a strap and the double D ring closing system is recommended.

As from 2020, only FIM homologated helmets according to FRHPhe-01 (with a valid FIM Homologation Label) will be allowed.

4. Post-crash Riders Safety Equipment Check

After a crash the Technical Director may at his discretion request that the rider's safety equipment is checked prior to the start of the following practice session, warm up or race.





In the event that any item of equipment is considered, by either the Technical Director or the representative of the manufacturer of the item, to be too damaged for use on track, the rider will be required to replace or repair the item before being permitted on track.

Any question concerning the condition and suitability for use of the riders safety equipment shall be decided by the Technical Director, who may consult with the manufacturers of the product before making a final decision.

General Appendix 13

International Helmet Standards

Examples of **current valid** labels are reported below (for Europe, the country numbers which have granted the approval are also indicated):

<p>EUROPE</p>	 <p>051406/P-1952</p> <p>3/ 1 for Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for the Czech Republic, 9 for Spain, 10 for Yugoslavia, 11 for the United Kingdom, 12 for Austria, 13 for Luxembourg, 14 for Switzerland, 15 (vacant), 16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal, 22 for the Russian Federation, 23 for Greece, 24 for Ireland, 25 for Croatia, 26 for Slovenia, 27 for Slovakia, 28 for Belarus, 29 for Estonia, 30 (vacant), 31 for Bosnia and Herzegovina, 32 for Latvia, 33 (vacant), 34 for Bulgaria, 35 (vacant), 36 for Lithuania, 37 for Turkey, 38 (vacant), 39 for Azerbaijan, 40 for The former Yugoslav Republic of Macedonia, 41 (vacant), 42 for the European Community (Approvals are granted by its Member States using their respective ECE symbol), 43 for Japan, 44 (vacant), 45 for Australia, 46 for Ukraine, 47 for South Africa and 48 for New Zealand. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify or accede to the Agreement Concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.</p>
<p>JAPAN</p>	 <p>Protective helmet for motor vehicle users T8133:2015 Class 2 Certification No. XX00000000 Label serial No. 0000000000 XXX Manufacturer's name <small>(Trade mark of certification body)</small></p>
<p>USA</p>	 <p>WARNING: SOME REASONABLY FORESEEABLE IMPACTS MAY EXCEED THIS HELMET'S CAPABILITY TO PROTECT AGAINST SEVERE INJURY OR DEATH.</p> <p>SAMPLE OF THIS HELMET MODEL HAS PASSED THE SNELL STANDARD AND IS SO CERTIFIED.</p> <p>SNELL MEMORIAL FOUNDATION</p>
<p>FRHPhe-01 (FIM)</p>	 <p>TO RACING HOMOLOGATED NG k... HOMOLOGATED RACING HOMOLOGATED RACING HOMOLOGATED RACING HOMOLOGATED RACING</p>