

## 2. TECHNICAL REGULATIONS

### 2.1 Introduction

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

### 2.2 Classes

- 2.2.1 The following classes will be accommodated, which will be designated by engine capacity:

125 Over 80cc up to 125cc - Maximum one cylinder

250 Over 175cc up to 250cc - Maximum two cylinders

Motogp **The maximum engine size capacity is 800cc and 2-stroke engines are not allowed.**

Four stroke motorcycles participating in the Motogp class must be prototypes. Those that are not entered by a member of MSMA must be approved for participation by the Grand Prix Commission.

### 2.3 Engines

- 2.3.1 Engines may operate on the two stroke or four stroke principal only.
- 2.3.2 Engines must be normally aspirated.
- 2.3.3 Cubic capacity of the engine will be defined by the swept volume of the cylinder, i.e. the area of the bore of the cylinder multiplied by the stroke.

- 2.3.4 No tolerance on capacities is permitted.
- 2.3.5 Engine capacity must be measured at ambient temperature.

## 2.4 Gears

- 2.4.1 There must be a maximum of six gears.

## 2.5 Weights

- 2.5.1 The following are the minimum weights permitted:

–	125cc		motorcycle + rider	136 kg
–	250cc	1 cylinder	motorcycle	100 kg
		2 cylinders	motorcycle	100 kg
–	Motogp (4 stroke)	<b>2 cylinders or less</b>	motorcycle	<b>133 kg</b>
		<b>3 cylinders</b>	motorcycle	<b>140,5 kg</b>
		<b>4 cylinders</b>	motorcycle	<b>148 kg</b>
		<b>5 cylinders</b>	motorcycle	<b>155,5 kg</b>
		6 cylinders or more	motorcycle	<b>163 kg</b>
		<b>The use of oval pistons is forbidden.</b>		

- 2.5.2 Ballast may be added to achieve the minimum weights.
- 2.5.3 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 senders, camera equipment, electronic telemetry equipment etc.

For the 125cc class 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.

## **2.6 Fuel Tanks**

- 2.6.1 Fuel caps must be leak proof and have a positive closing device.
- 2.6.2 Fuel tank breather pipes must include a non-return valve. Breather pipes must discharge into a suitable container with a capacity of at least 250cc.
- 2.6.3 Fuel tanks of all construction types must be filled with fire retardant material or be lined with a fuel cell bladder.

In all classes, fuel tanks made of non-metallic composite materials (carbon fibre, aramid fibre, glassfibre, etc.) must be fitted with a fuel cell bladder, or have passed the appropriate FIM test standards for composite material fuel tanks as described in the FIM Fuel Tank Test Procedure for fuel tank homologation.

Such composite fuel tanks without a fuel cell bladder must bear a label certifying conformity with FIM Fuel Tank Test Standards. Such labels must include the fuel tank manufacturer's name, date of tank manufacture, and name of testing laboratory.

Each manufacturer is requested to inform the FIM/CCR Secretariat of its fuel tank model(s) which have passed the FIM test standards, together with a copy of the fuel tank label.

Full details of the FIM Fuel Tank Test Standards and Procedures are available from the FIM.

Fuel cell bladders must conform to or exceed the specification FIM/FCB-2005. Full details of this standard are available from the FIM.

- 2.6.4 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/carburettor 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.  
This rule is mandatory for the Motogp class.

2.6.5 The fuel tank capacities for prototype motorcycles are:

- 2-stroke engines: maximum 32 litres
- 4-stroke engines: maximum **21** litres

In defining fuel tank capacity all containers of the motorcycle capable of supplying fuel to the carburettors/injectors may be taken into account.

2.6.6 Refuelling may only be carried out from an unpressurised container, and the motorcycle fuel tank may not be pressurised above atmospheric pressure at any time, other than the small pressure increase due to normal tank ventilation to the atmosphere on the moving motorcycle.

## **2.7 Safety and Construction Criteria**

Note: Please also refer to diagrams 1, 2 and 3.

### **2.7.1 Throttle Twistgrips**

Throttle twistgrips must close automatically when released.

### **2.7.2 Steering**

2.7.2.1. Handlebars must have a width of not less than 450mm and their ends 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 twistgrips.

2.7.2.2. There must be at least 15 degrees of movement of the steering each side of the centre line.

2.7.2.3. Stops must be fitted to ensure a clearance of at least 30mm between the handlebar and the tank when at the extremes of lock.

### **2.7.3 Brakes**

2.7.3.1 Motorcycles must have a minimum of one brake on each wheel that is independently operated.

In the 125cc and 250cc classes, only brake discs of ferrous materials are allowed

## **2.7.4 Exhausts**

2.7.4.1 The outlet of the exhaust must not extend behind a line drawn vertically through the edge of the rear tyre.

2.7.4.2 For safety reasons the exposed edge of the exhaust pipe outlet must be rounded to avoid any sharp edges.

## **2.7.5 Footrests**

2.7.5.1 Footrests must have rounded ends with a minimum solid spherical radius of 8mm.

## **2.7.6 Handlebar Levers**

2.7.6.1 Levers must not be longer than 200mm measured from the pivot point.

## **2.7.7 Bodywork**

2.7.7.1 The windscreen edge and the edges of all other exposed parts of the streamlining must be rounded.

2.7.7.2 The maximum width of bodywork must not exceed 600mm. The width of the seat or anything to its rear shall not be more than 450mm (exhaust pipes excepted).

2.7.7.3 Bodywork must not extend beyond a line drawn vertically at the leading edge of the front tyre and a line drawn vertically at the rearward edge of the rear tyre. The suspension should be fully extended when the measurement is taken.

2.7.7.4 When viewed from the side, it must be possible to see:

- a. At least 180 degrees of the rear wheel rim.
- b. The whole for the front rim, other than the part obscured by the mudguard, forks or removable air-intake.
- c. The rider, seated in a normal position with the exception of the forearms.

Note : No transparent material may be used to circumvent the above rules.

- 2.7.7.5 No part of the motorcycle may be behind a line drawn vertically at the edge of the rear tyre.
- 2.7.7.6 There shall be a maximum differential of 150mm between the base of the seat and the highest point of the seat.
- 2.7.7.7 Mudguards are not compulsory. When fitted, front mudguards must not extend:
- In front of a line drawn upwards and forwards at 45 degrees from a horizontal line through the front wheel spindle.
  - Below a line drawn horizontally and to the rear of the front wheel spindle.
- 2.7.7.8. Wings may be fitted provided they are an integral part of the fairing or seat and do not exceed the width of the fairing or seat or the height of the handlebars. Any sharp edges must be rounded. Moving aerodynamic devices are prohibited.
- 2.7.7.9 On motorcycles with four stroke engines, 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 litres).

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, as declared by the Race Director.

## **2.7.8 Clearances**

- 2.7.8.1. 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.
- 2.7.8.2. There must be a clearance of at least 15mm around the circumference of the tyre at all positions of the motorcycle suspension and all positions of the rear wheel adjustment.

## **2.7.9 Breather Pipes**

Any breather pipe from the engine or gearbox must discharge into a suitable container with a minimum capacity of 250cc. There must be a separate container for each breather pipe.

## 2.7.10 Materials

The use of titanium in the construction of the frame, the front forks, the handle-bars, the swinging arm spindles, and the wheel spindles is forbidden. For wheel spindles, the use of light alloys is also forbidden.

The basic structure of the crankshaft and camshafts must be made from steel or cast iron. Pistons, cylinder heads and cylinder blocks may not be composite structures which use carbon or aramid fibre reinforcing materials.

Brake callipers must be made from aluminium materials with a modulus of elasticity no greater than 80 Gpa.

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/cm<sup>3</sup>).

## 2.7.11 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.

## 2.8 Rims

Maximum rim widths are as follows:

	<u>Front</u>	<u>Rear</u>
125cc	2.5"	3.5"
250cc	4.0"	5.5"
Motogp	4.0"	6.25"

## 2.9 Tyre restrictions for MotoGP

- 2.9.1 **Wet tyres are not subject to supply restriction.**  
**A wet tyre is defined as a tyre which has a land to sea ratio of at least 20% overall, and a minimum ratio of 7% in each third of the section profile.**

The tyre may be moulded or hand cut, but each groove must have a minimum depth of three millimetres over 90% of its length.

Any tyre with a land to sea ratio of less than 20% will be deemed a slick tyre. In case of dispute the decision of the Technical Director will be final.

- 2.9.2 Prior to the start of the season (defined as the day before the start of the first IRTA MotoGP test of the current year), each team must register the brand of tyre it will be using with the Grand Prix Technical Director.

Should a team choose to change its designated brand of tyre during the season it must inform the Technical Director in writing prior to the start of scrutineering at the event where the change will take place.

- 2.9.3 Teams that are supplied by a tyre manufacturer that has achieved at least two MotoGP race wins in dry conditions since the first race of the 2006 season will be restricted in the quantity of slick tyres that each of the teams riders may use at a single event as follows:

During all practice sessions, warm up and the race a maximum of 31 slick tyres, specifically

Front tyres: 14

Rear tyres: 17

When a tyre manufacturer, not subject to the limitation at the beginning of the season, achieves two MotoGP wins in dry conditions during the current season, it will become subject to the restrictions at the third event after the one where the second win was achieved.

- 2.9.4 Between 12.00 hrs. and 17.00 hrs. on the day prior to the start of official practice, the Technical Director will mark the tyres available for the exclusive use of each entered rider.

- 2.9.5 Each slick or hand cut tyres (as defined in Art. 2.9.1) fitted to a motorcycle entering the track or delivered to the starting grid must be checked for compliance.

- 2.9.6 In the case of an interrupted race, a rider must use tyres from his allocation of marked tyres for the restarted race.



- 2.9.7 **In the unlikely event of a tyre being accidentally damaged during the fitting process it may be replaced with a tyre of the same specification with the permission of the Technical Director. Such replacement tyres will be marked and included in the allocation of the rider concerned.**
- 2.9.8 **Should an exceptional and unpredictable safety problem arise for a manufacturer during an event, so as to prevent a team supplied with its tyres from safely competing in the race, then that manufacturer must inform and prove to the satisfaction of the Technical Director the severity of the problem. The Technical Director may then ask the Race Direction to grant an exemption. Such request must be made before 17.00 hrs. on the day of qualifying practice.**

**The exemption if granted will apply as follows:**

**Each rider using tyres supplied by the manufacturer granted the exemption will be supplied with three tyres of a new specification (front and/or rear depending on the determination of the problem). Such replacement tyres will be marked by the Technical Director, and only these tyres may be used in the race.**

**A new provisional starting grid will be published with all of the riders supplied with the tyres of the manufacturer granted the exemption starting at the rear of the grid in the order of their qualifying positions.**

## **2.10 Numbers and Backgrounds**

- 2.10.1 **Racing numbers must be affixed to the front and the two sides of the motorcycle so that they are clearly visible to the spectators and officials.**
- 2.10.2 **Numbers must be a minimum height of 140mm.**
- 2.10.3 **Numbers must be of a colour which is distinctive when viewed against the background colour.**
- 2.10.4 **Backgrounds must be of one single colour over an area large enough to provide a minimum clear area of 25mm around the numbers**
- 2.10.5 **In case of a dispute concerning the legibility of numbers, the decision of the Technical Director will be final.**

## 2.11 Fuel, Oil and Coolants

All motorcycles must be fuelled with unleaded petrol

2.11.1 Unleaded petrol must comply with the FIM Grand Prix specification.

2.11.2 Unleaded petrol will comply with the FIM Grand Prix specification 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	ASTM D 4815
Benzene	% v/v		1.0	EN 238
RVP	kPa		90	EN 13016-1
Lead	g/l		0.005	EN 237
Density at 15 °C	kg/m <sup>3</sup>	720.0	<b>775.0</b>	ASTM D 4052
Oxidation Stability	minutes	360		ASTM D 525
Existent gum	mg/100 ml		5.0	EN ISO 6246
Sulphur	<b>mg/kg</b>		<b>50.0</b>	ASTM D 5453
Nitrogen	% m/m		0.2	ASTM D 4629
Copper Corrosion	rating		C1	ISO 2160
Distillation:				
E at 70 °C	% v/v	<b>22.0</b>	50.0	ISO 3405
E at 100 °C	% v/v	46.0	71.0	ISO 3405
E at 150 °C	% v/v	75.0		ISO 3405
Final Boiling Point	°C		<b>210.0</b>	ISO 3405
Residue	% v/v		2.0	ISO 3405
Olefins(*)	% v/v		18.0	ASTM D 1319:1998 Gas Chromatography
Aromatics(*)	% v/v		<b>35.0</b>	ASTM D 1319:1998 Gas Chromatography
Total di-olefins	% m/m		1.0	GCMS/HPLC
Appearance	clear and bright			visual inspection

The measurement error in each test method is included in the min./max. values given in the table and will not be added following the analysis.

In case of a dispute, the test method will be Gas Chromatography (\*).

- (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) Oil for two stoke mixtures will comply with the FIM Grand Prix specifications if:

Test	Limits		Test Method
	low	high	
Metals			ICP-OES GC-AED
Lead (mg/kg)		10	
Manganese (mg/kg)		10	
Iron (mg/kg)		10	
Nickel (mg/kg)		10	
Percentage boiling under 250°C (g/100g)		10	Simulated Distillation

4 volumes of oil will be added to 100 volumes super unleaded and the following tests will be carried out on the mixture.

	Limits		Test Method
	low	high	
Research Octane Number (RON): difference in research octane number between petrol with and without oil	- 2	+ 1	ISO 5164
Motor Octane Number (MON): Difference in motor octane number between petrol with and without oil	- 2	+ 1	ISO 5163
Density at 15°C (kg/m <sup>3</sup> ) difference in density between petrol with and without oil		+ 30	ASTM D 4052

The distillation behaviour of the oil will be used to identify it after the race.

The oil may not alter the fingerprint of the petrol.

- (g) For 2-stroke mixtures the following tolerances on the petrol specifications will be allowed:

• Density at 15 °C	plus 30 kg/m <sup>3</sup>
• Distillation residue	not controlled

### 2.11.3 **Implementation of the fuel regulation**

When a rider taking part in a meeting is under contract or agreement for the exclusive use of a certain brand of petrol or oil, the Organisers must give free access to the circuit for that fuel or oil.

Any final dispute will be settled in accordance with the FIM Grand Prix Disciplinary and Arbitration Code.

### 2.11.4 **Fuel Analysis Procedure**

#### 2.11.4.1 **Fuel Approval**

1. All fuel in use in the Championship must be approved prior to the race in which the fuel is to be used. Fuel companies supplying petrol to participating teams must submit ten litres (2 x 5 L) to the laboratory appointed by the FIM/Dorna for analysis in accordance with the specification. Providing the petrol is within the specification, a certificate containing a test report number will be issued. The test report number must be given to the appropriate teams before they take part in a race.
2. All companies supplying oil, for mixing with petrol to create a two stroke mixture, to participating teams must submit two litres (2 x 1 L) of the oil to the laboratory appointed by the FIM/Dorna for approval. If the oil conforms to the specifications, a certificate will be issued. The test report number given on the certificate must be supplied to teams which intend to use the oil.

3. During Thursday's technical control, each team will declare the certificate test report numbers corresponding to the petrol and oil to be used. This information will be entered in the Technical Control Book of each motorcycle at every Grand Prix.

Therefore, the fuel which is to be used must be approved by the Thursday afternoon before the race in which the fuel is to be used.

4. When a fuel sample is requested at any Grand Prix Circuit, either during practice, warm up or following the race, the certificate test report numbers corresponding to the petrol and oil used must be declared to the Grand Prix Technical Director by the team. Failure to provide the correct number will result in a fine.
5. Each fuel and/or oil Company will be responsible for payment to the laboratory for these batch analyses costs and establishment of the basic fingerprints.

#### 2.11.4.2 Fuel Sampling and Testing

1. The Grand Prix Technical Director has the sole responsibility for the administration and supervision during the taking of fuel samples.
2. Motorcycles selected for fuel controls will usually be amongst the first three finishers, and will be directed to the "parc fermé" for weight controls.
3. Other finishers will be chosen at random for fuel controls. A Technical Scrutineer will be posted at the entrance to the pit box of the selected rider whose **machine must immediately** accompany the Technical Scrutineer to the technical control area or "parc fermé".
4. The fuel to be tested will be transferred into two 25 ml bottles, marked "A" and "B" and identified by reference to the machine from which the sample was taken. The bottles will be closed, sealed and labelled by the Technical Director and/or Chief Technical Scrutineer.
5. Only new bottles will be used for the fuel samples and only new materials will be used to transfer the fuel.

6. The Fuel Sample Declaration form will be filled out immediately, containing all information as shown in the example sheet, 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.
7. Sample "A" will be sent to the FIM/Dorna appointed laboratory, accompanied by a copy of the Fuel Sample Declaration form. The fuel sample will be compared with the approved petrol and oil using gas chromatography. Additionally, the lead, manganese, iron, nickel, nitrogen and oxygen content will be measured to ensure that octane and power boosters have not been added. Costs for the analyses of sample "A" will be paid by FIM/Dorna.
8. Sample "B" will be handed over to the FIM for safeguarding in case of protests and/or requirement of a counter-expertise by the FIM/Dorna appointed laboratory. Costs for the analyses of sample "B" will be paid by the team concerned.
9. Both samples will be transported by an authorised courier.
10. The laboratory must deliver the results of the fuel sample analyses to the Grand Prix Technical Director, with a copy to the FIM, as soon as possible after receipt of the samples, and before the Friday evening of the following Grand Prix event.
11. In the case of non-conformity, the Technical Director must notify, as soon as practical after receipt of the results, the FIM, the Grand Prix Race Direction 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 FIM and the Technical Director if counter-expertise is required (or not required) for sample "B".

The Race Direction will take a decision at the Grand Prix 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 Grand Prix event at which the Race Direction decision is taken.

If there is no more Grand Prix 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 Race Direction will be heard by the FIM Stewards appointed by the FIM for this specific task.

12. The Technical Director must be present at the sample "B" test to confirm the identification and the seal status of the "B" sample.

Failure of the sample to correspond to approved petrol and oil, and/or the addition of octane and power boosters 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.

- 2.11.5 No fuel on the motorcycle may be more than fifteen degrees C (15°C) below ambient temperature. The use of any device on the motorcycle to artificially decrease the temperature of the fuel below ambient temperature is forbidden.

## **2.12 Protective Clothing and Helmets**

- 2.12.1 Riders must wear a complete leather suit with additional leather padding or other protection on the principal contact points, knees, elbows, shoulders, hips etc.
- 2.12.2 Linings or undergarments must not be made of a synthetic material which might melt and cause damage to the riders' skin.
- 2.12.3 Riders must also wear leather gloves and boots, which with the suit provides complete coverage from the neck down.



- 2.12.4 Leather substitute materials may be used, providing they have been checked by the Chief Technical Scrutineer.
- 2.12.5 Use of a back protector is highly recommended.
- 2.12.6 Riders must wear a helmet which is in good condition, provides a good fit and is properly fastened.
- 2.12.7 Helmets must be of the full face type and conform to one of the recognised international standards:
- Europe ECE 22-05 'P'
  - Japan JIS T 8133 : 2000
  - USA SNELL M 2005
- 2.12.8 Visors must be made of a shatterproof material.
- 2.12.9 Disposable "tear-offs" are permitted.
- 2.12.10 Any question concerning the suitability or condition of the riders clothing and/or helmet shall be decided by the Technical Director, who may, if he so wishes, consult with the manufacturers of the product before making a final decision.

## **2.13 Procedures for Technical Control**

- 2.13.1 At each circuit an area must be designated as the Technical Checking Area. In this area, under the control of the Chief Technical Scrutineer and the supervision of the Technical Director, suitable equipment will be installed to conduct the various tests viz:
- i ) Equipment for measuring the noise of the motorcycle.
  - ii ) Weighing scales with check weights for calibration purposes.
  - iii ) Instruments for measuring engine capacity.
  - iv) Rulers and degree discs and gauges for measuring other dimensions.
- 2.13.2 The technical control procedure will be carried out in accordance with the schedule set out in the Regulations. The technical scrutineers must be available throughout the event to check motorcycles and equipment as required by the Technical Director.

- 2.13.3 Presentation of a machine will be deemed as an implicit statement of conformity with the technical regulations. A rider's presence at the technical control is not mandatory, except in the case of the 125cc class when the rider must be present together with his helmet and all protective clothing.
- 2.13.4 Motorcycles will be inspected under the name of the team, with a record of the riders in the team entitled to use the motorcycle.
- 2.13.5 For each motorcycle the technical scrutineers will prepare a technical control card on to which will be recorded, amongst other information, the team presenting the motorcycle and the riders in that team entitled to use the motorcycle.
- 2.13.6 The technical scrutineers should inspect the motorcycle for obvious safety omissions and may also at their discretion choose to check the motorcycles for technical compliance with other aspects of the Regulations.
- 2.13.7 The Technical Director will refuse any machine that does not have a correctly-positioned positive transponder attachment. The transponder must be fixed to the motorcycle in the position and orientation as shown in the timekeeping information given to teams pre-season and available at each Grand Prix. Positive attachment of the transponder bracket consists of a minimum of tie-wraps, but preferably by screw or rivet. Velcro or adhesive alone will not be accepted. The transponder retaining clip must also be secured by a tie-wrap.
- 2.13.8 At the conclusion of the check, the technical scrutineers will place a small sticker on the motorcycle frame indicating that it has passed the safety checks.
- 2.13.9 The Chief Technical Scrutineer will prepare a report on the results of technical control which, will be submitted to the Event Management Committee via the Technical Director.
- 2.13.10 The technical scrutineers should re-inspect any machine that has been involved in an accident. This would normally be carried out at the pit of the rider concerned.
- 2.13.11 The technical scrutineers must be available, based on instructions from the Technical Director, to re-inspect any motorcycle for technical compliance during the meeting or after the race and to supervise inspection of a motorcycle following a protest on a technical matter.

- 2.13.12 At the end of the race, the Chief Technical Scrutineer will ensure that the motorcycles placed in the first three positions, plus any other motorcycles designated by the Technical Director, are placed in the Check Area for a period of 60 minutes pending any protest.

The motorcycles should be checked for compliance with the noise and weight regulations, and any other technical requirement, under the control of and as requested by the Technical Director

- 2.13.13 The Technical Director may require a team to provide such parts or samples as he may deem necessary.

## 2.14 Noise Tests

- 2.14.1 Noise tests must be conducted in an open area with a space of at least 10 metres between the motorcycle being tested and walls or other obstacles. There should be a minimum amount of ambient noise in the area.

- 2.14.2 The measuring equipment must be calibrated prior to the test and recalibrated at regular intervals.

- 2.14.3 The measuring equipment should be placed 50 cm from the end of the exhaust pipe and at 45 degree angle to the pipe either to the side or above.

- 2.14.4 The maximum noise levels at all times are:

- 2 stroke: 113 dB/A
- 4 stroke: 130 dB/A

measured at a mean piston speed of 13 metres per second (two stroke) and 11 metres per second (four stroke).

For the convenience, made possible by the similarity of piston stroke per engine configuration within capacity classes, the test may be conducted at a fixed RPM.

	1 cylinder	2 cylinders	3 cylinders	4 cylinders and more
125 cc (2-stroke)	7'000 RPM			
250cc (2-stroke)		7'000 RPM		
<b>MotoGP</b>		<b>5'000 RPM</b>	<b>5'500 RPM</b>	<b>5'500 RPM</b>

2.14.5 To determine the RPM at which the engine should be run the following formula should be used:

$$\text{RPM} = \frac{30,000 \times Y}{X}$$

where

Y = mean piston speed in metres per second

and

X = the stroke of the motorcycle in mm.

The graphs shown in diagrams 4 and 5 may be used to determine the RPM to be used.