

- Be well informed. Make sure your FMN has supplied you with all technical "updates" that may have been issued subsequent to the printing of the Technical Rule Books. Copies of all homologation documents must be in your possession.
- Inspection must take place under cover with a large enough area (min. surface 50 sq. metres).
- Inspection area must be supplied with the necessary equipment, including tables, chairs, electric light and power outlet.
- Weighing apparatus must be accurate and practical. Certified master weights and their certificate must be available for verifying.
- Prepare before the START of the competition, a closed and guarded area (closed parc/parc-fermé).
- Rules regarding sound level and -measurement must be respected.

<b><u>Procedures</u></b>	<b><u>Minimum number of Scrutineers required</u></b>
• Checking of documentation (entry forms, licence, helmet, clothing, etc.).	1 person
• Sound level test, silencer marking.	2 person
• The machine weight (with empty tank):	1 persons
• Machine inspection (with strict check of carburettor). Compliance with rules and safety. Items must be marked.	2 persons
• Scrutineers can have different tasks, but the team of scrutineers must have a minimum of 3 persons. At least one (1) person must be a holder of an FIM <b>SENIOR</b> Technical Stewards Licence.	

**Technical control on day before or on the same day of the start of OFFICIAL PRACTICE:**

- Minimum time: 1/2 hour
- Minimum safety checks, marked items and weight. 2 persons
- Free use of the weighing equipment by all teams.

**Technical control on day before or on the same day of the start of the RACE:**

- Minimum time: 1 hour

- Free use of the weighing equipment by all teams.
- General machine inspection, helmet and clothing.

#### **Technical control after the race:**

- After the race, ensure that ALL machines go directly to the Closed Parc and are retained 30 minutes.
- Post race inspection (machines weighted with tank empty).

#### **Verification:**

- According to protest or Jury Decision

#### **List of Tools and Documents**

##### Tools :

- Revolution meter
- Sound meter and calibrator
- Durometer for tyre control ('Shore' hardness gauge)
- Slide calliper (for verifying engine capacity, carburettor diameter, etc.)
- Depth gauge
- Steel measuring tape
- Arrangement for measuring ground clearance
- Seals
- Weighing apparatus (to be furnished by the Organiser); set of weights to adjust the scales (180 kg), vertical balance (0 –10 kg)
- Tools for measuring the engine capacity
- **Lampoil tester for measuring the cylinder capacity**
- Colour for marking parts
- Label, temperature stable, if taken for marking silencer
- Magnet for testing titanium
- Adequate fuel sample bottles
- PC with CD Drive + WIN98, Printer, etc. are recommended
- Calculator

##### Documents :

- Supplementary Regulations
- FIM Technical Rules - current year
- FIM Rules of the discipline concerned, e.g. CCP, CTI
- FIM Sporting Code
- Homologation papers, if necessary, for the discipline
- Writing material
- Technical Control Forms



## FIM Technical Report Machine Examination in Track Racing

### Event

Title of the event:	IMN N°:
Location:	Country:

### Rider Information

Name:	First name:
Nationality:	FMN:
Start N°:	FIM Licence N°:

### Machine Information

Machine	Engine Make	Engine N°	Frame Make	Frame N°	Dirt deflector	Ignition cut of	Weight
1							
2							
3							

### Carburettor

### Silencer information

Machine	Carburettor Make	Section diameter mm	Silencer Make	Serial N°	dB/A output
1					
2					
3					

### Protective Clothing

### Equipment

Protective clothing	Approval Mark:	N° Helmets	Helmets make	Approval Mark
MX-Style:		1		
Leathers:		2		
		3		
		4		

### During and after the Event

Machine weight:	Heat N°:		
Kg:			
Engine Capacity:	Bore:	Stroke:	Vol <sup>cc</sup> :
		Environment mat	
Name of the FIM Chief Technical Steward:			
International Official's Licence N°:			

Acceptance of a machine for competition does not preclude the possibility of further post-race control to ensure compliance with the FIM Technical rules for Track Racing.

Acceptance stamp of the FIM Chief Technical Steward:	I hereby declare that information's given here above is accurate in every respect
Date:	
Signature:	Rider's signature

## **01.79        SOUND LEVEL CONTROL**

Sound will be controlled to limits as stated in Article 79.11.

### **79.01        The '2 metre max' method – The new test method to verify the sound levels**

In order to pursue the measures taken to reduce the sound level in favour of environment and in the framework of the 'RIDE QUIET' campaign, a new method for measuring the sound level called '2 metre max' will progressively be applied as from 2010 in all 'all-terrain' disciplines (and more specifically in Motocross, Enduro and Track Racing).

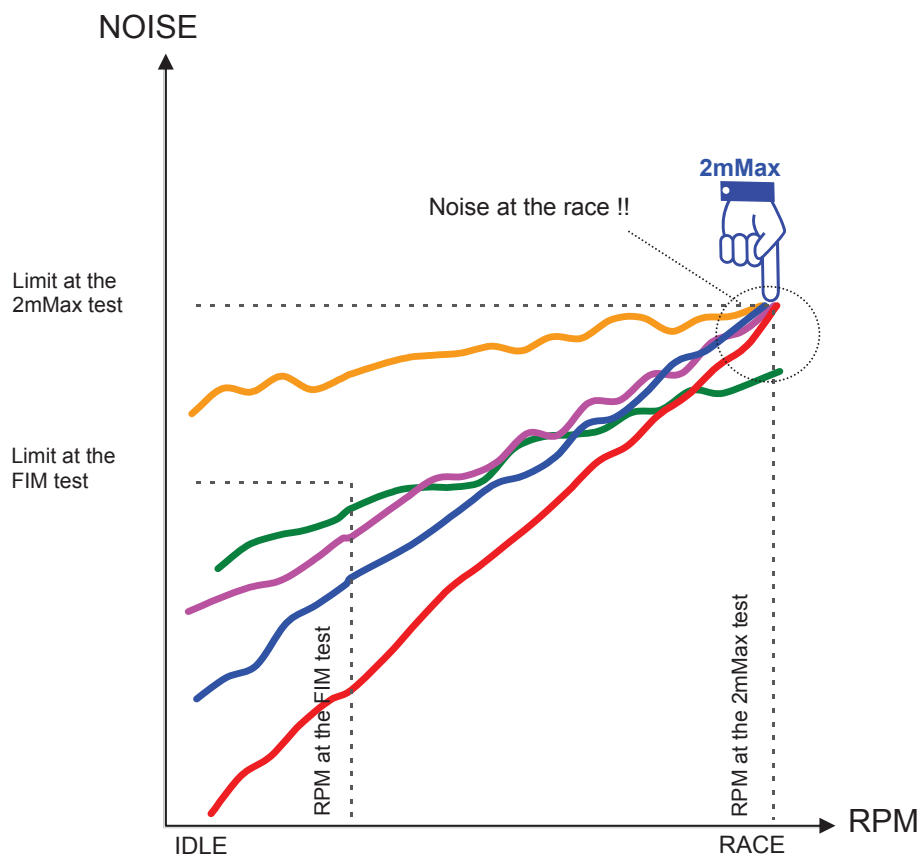
#### **WHAT DOES IT CONSIST OF?**

The 2 metre max method shows a very good correlation between the sound power level (LwA) issued by motorcycles in full acceleration, and the maximum sound pressure levels measured at proximity of the same motorcycles, with engines at idle and quickly taken to their maximum rotational speeds.

The technical specifications and the resources to initiate the application of this new method, for the use of the technical stewards and officials are mentioned in Art. 79.01 of these Technical Regulations. This article will detail the "2metre max" method, the sound levels, the indispensable tools, but also the tolerances applied in 2010 - use of the old method as default, etc.)

Only the sound levels measured with the '2 meter max' method will be considered by the technical stewards and the jury of the event to decide whether the motorcycle is in conformity with the maximum sound levels authorised.

#### **THE 2 METER MAX METHOD - IN FOCUS**



## THE OPERATING PROCEDURE

The '2 metre max' method will consist in quantifying not only the sound level produced by the silencer of the exhaust, but the maximum global sound level achieved by the motorcycle when the engine rpm's are raised to the maximum engine speed, limited by

- ⇒ natural regulation for 2T, or
- ⇒ rev limiter for 4T.

For 250cc and 500cc (4 stroke) engines used in Speedway, Long track and Ice Racing, without rev limiter, it would be advisable to limit the full open the throttle for 1 or 2 seconds maximum.

## THE PREPARATION OF THE SOUND METER

**For all FIM Championship-and Prize events, a sound meter Class 1 (type 1) is required to measure the sound levels. For all other Championships, a sound meter of Class 1 or 2 (type 1 or 2) is required**

- Activate the '**A**' weighing
- **FAST** time weighting must be activated
- Select range High **80~130 dB**

- Calibrate the sound meter at 93,5 dB or 113.5 dB to take into account the incidence of the wind foam ball
- Position the wind foam ball on the microphone
- Activate the function MAX MIN – set on **MAX**

## **THE SET UP OF THE SOUND METER AND THE MOTORCYCLE**

- The sound levels will be measured with the sound meter/microphone fixed on a tripod, in the horizontal position, at the rear of the motorcycle.
- For the place and position of the motorcycle, ensure that there are no solid obstacles within 10 meters around the microphone.
- The sound meter will be positioned at a distance of 2 metres behind the motorcycle, at an angle of 45° from the centerline, on the exhaust side and at a height of 1.35 metre above the ground. The sound meter must be level and horizontal.
- The 2 metre distance is measured from the point where the centre of rear tyre touches the ground.
- It is preferred to make the tests on soft ground, not reverberating, i.e. grass or fine gravel.
- In other than moderate wind, machines should face forward in the wind direction.
- The ambient sound level must remain lower than 100 dB/A.

## **THE POSITIONING OF THE MOTORCYCLE (see illustrations following)**

### **The reference points:**

- For a motorcycle: the contact point of the rear wheel on the ground.
- For motorcycles fitted with 2 exhaust outputs, the measurement will be made on the side of the air intake. If a central positioned air intake is used, both sides will be tested.
- For Side-cars: the contact point of the side wheel on the ground.
- For Quad vehicles: the vertical line to the ground from the centre point of the rear axle.
- For Quad vehicles with exhaust outlet moved from the median axis, the measurement will be made on the offset side.

To make repetitive measurements, all motorcycles can be positioned into a small frame fixed on the ground.

## **THE NEW 2 METRE MAX METHOD – THE OPERATION – PROTECT YOUR HEARING – USE EAR PROTECTION**

- The measurement is made with motorcycle on its wheels, with a hot engine.
- The technical steward takes place besides the motorcycles, opposite to the microphone, not to screen or stand between the bike and the microphone. **A mechanic, placed on the left side of the motorcycle, shall disengage the clutch.**
- If a second steward is permanently attending the sound level checks, it is strongly advised for him to use earplugs, a headset or ear protectors.
- The Inspector shall open throttle as fast as possible until full open throttle (instantly, within 0.3 seconds). He will keep the engine at max engine 'rpm' for at least 1 second. To conclude, the inspector will release the throttle quickly.
- If the result exceeds the limit, including 'after fire', the Inspector shall test the motorcycle a maximum of two more times.
- For motorcycles equipped with an engine rpm limiter, the throttle will be opened - instantly, within 0.3 seconds - and kept open until at least 1 second has passed and/or until there is an audible sign that the engine is over-revving.
- For motorcycles without an engine 'rpm' limiter, the throttle will have to be opened for less than 2 seconds and/or until there is an audible sign of over-revving the engine.
- If the engine starts to misfire close the throttle slightly and re-open the throttle.
- If detonations appear, the measurement must be started again.

The numbers obtained from the test shall not be rounded down.

For the sound level measurement, only the Inspector shall handle the throttle. He shall open the throttle himself in order to minimize any influence by another operator (it is helpful to have the microphone equipped with an extension cable to the sound meter).

**! INSERT HERE: The 2 metre max test 'timing' illustration (pdf)**

## **THE MEASUREMENT – RECORDING OF THE SOUND LEVEL**

- When the measurement is considered acceptable, write down the result, then reset (push on the sideline) the MAX MIN setting until the previously displayed value disappears.
- Push again on the MAX MIN sideline to arm the sound level meter.
- The sound level meter is then ready for the following measurement.

Any attempt by a participant to prevent his/her engine from reaching the maximum published rpm figure will be considered a breach of the rules.

Even after a motorcycle has passed the sound control, if there is any doubt, it may be checked again.

A noticeably lower engine speed is detected easily by hearing. In case of doubt, check the value of the rpm limiter with a tachometer.

Sound levels will be checked against the limits stated in the section pertaining to the relevant discipline (CMS, CEN, CCP).

For the initial sound control and technical inspection, a rider (or his mechanic) shall present only one spare silencer per machine.

Other spare silencers may be presented after all participants have presented their motorcycles, or on the following days of the event.

### **79.03 Sound control during and after the competition**

In a competition which requires a final examination of machines before the results are announced, this examination must include a sound control measurement of at least three machines chosen at the discretion of the Clerk of the Course in co-operation with the Chief Technical Steward. Refer to each discipline for more info.

### **79.05**

The RPM depends upon the mean piston speed corresponding to the stroke of the engine (See Sound Level Control table). The RPM will be given by the relationship:

$$N = \frac{30,000 \times cm}{l}$$

in which      N      = prescribed RPMs of engine  
                     cm      = fixed mean piston speed in m/s  
                     l        = stroke in mm



79.06

SOUND LEVEL CONTROL - RPM FIGURES

Stroke (in mm)	R P M	Stroke (in mm)	R P M
30	11,000	66	5,000
31	10,645	67	4,925
32	10,313	68	4,853
33	10,000	69	4,783
34	9,706	70	4,714
35	9,429	71	4,648
36	9,167	72	4,583
37	8,919	73	4,521
38	8,684	74	4,459
39	8,462	75	4,400
40	8,250	76	4,342
41	8,049	77	4,286
42	7,857	78	4,231
43	7,674	79	4,177
44	7,500	80	4,125
45	7,333	81	4,074
46	7,174	82	4,024
47	7,021	83	3,976
48	6,875	84	3,929
49	6,735	85	3,882
50	6,600	86	3,837
51	6,471	87	3,793
52	6,346	88	3,750
53	6,226	89	3,708
54	6,111	90	3,667
55	6,000	91	3,626
56	5,893	92	3,587
57	5,789	93	3,548
58	5,690	94	3,510
59	5,593	95	3,474
60	5,500	96	3,438
61	5,410	97	3,402
62	5,323	98	3,367
63	5,238	99	3,333
64	5,156	100	3,300
65	5,077		

## **79.07**

The sound level for engines with more than one cylinder will be measured on each exhaust end.

## **79.08**

A machine which does not comply with the sound limits can be presented several times.

## **79.09**

When presented for examination, the correct stroke must be stamped in a clearly visible position on the crankcase.

## **79.11 Sound limits in force**

All motorcycles with 250cc and 500cc single cylinder engines  
As from 2011, all other machines

Only homologated silencers tested with the '2 metre max' must be used.  
115 dB/A, measured with the '2 metre max method. method)

**Motoball:**

**115 dB/A, measured with the 2 metre max method.**

## **79.16 Sound level control after the competition**

In a competition which requires a final examination of machines before the results are announced, this examination must include a sound level control measurement of at least the first three machines listed in the final classification. **See Art. 80.03.**

Homologated silencers made according to Art. 31.07.4 may be controlled for sound in case of doubt.

## **79.17 Sound level control during the competition**

In a competition which requires sound level control tests during the event, machines must comply with the sound limits without the tolerance in Art. 79.16.

# **01.80 RULES AND GUIDELINES FOR USE OF SOUND LEVEL METERS**

## **80.01**

The Sound Control Officer (SCO) must arrive in sufficient time for discussions with the Clerk of the Course and other Technical Officials in order that a suitable test site and testing policy can be agreed.

## **80.02**

Sound level measuring equipment must include a compatible calibrator, which must be used immediately before testing begins and always just prior to a re-test if a disciplinary sanction may be imposed.

Two sets of equipment must be available in case of failure of tachometer, sound level meter or calibrator during technical control.

### **80.03 Corrections**

**Corrections are presented as the 'precision of the method' (table below).** All corrections are cumulative.

<b>TRACK RACING</b>		<b>2 metre max method</b>
All categories, all engine types	<b>117 dB/A</b>	<b>Target: 115 dB/A</b> Following the present system using <b>FIM homologated Silencers or 115 dB/A + 2dB/A for the precision of the method.</b>

### **80.04 Ambient temperature** No deductions.

**80.05** Action and decisions will depend on the Sporting Discipline concerned, and decisions taken during prior discussions with the FIM Technical Director and/or the Chief Technical Steward.

## **01.81 TIMEKEEPING**

Since 1.1.1993, responsibility for Timekeeping has been with ~~referred to~~ the Sporting Commission.

### **81.01 Timekeeping Instruments**

All motorcycles (in CMS, CEN and in CTR and CCP where applicable) must have a correctly positioned transponder support. The transponder must be supplied or approved by the official Timekeeper and fixed to the motorcycle (for off-road models, typically on the front fork), on either the left or right side, avoiding being shielded by carbon pieces.

Correct attachment of the transponder bracket consists of a minimum of tie-wraps, but preferably by screws or rivets. Any transponder retaining clip must also be secured by a tie-wrap. Velcro or adhesives alone will not be accepted.

## **01.82 TECHNICAL SPECIFICATIONS FOR MOTOBALL MOTORCYCLES (Diagram I)**

### **82.01 Weight**