



FEDERAL SUBSIDIARY LEGISLATION

ENVIRONMENTAL QUALITY ACT 1974 [ACT 127]

P.U.(A) 244/87

ENVIRONMENTAL QUALITY (MOTOR VEHICLE NOISE) REGULATIONS 1987

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Preamble

IN exercise of the powers conferred by sections 21, 45 and 51 of the Environmental Quality Act, 1974 [Act 127], the Minister, after consultation with the Environmental Quality Council, makes the following regulations:

Regulation 1. Citation and commencement.

These Regulations may be cited as the **Environmental Quality (Motor Vehicle Noise) Regulations, 1987** and shall come into force on the 16th July 1987.

Regulation 2. Interpretation.

In these Regulations, unless the context otherwise requires -

"authorized officer" means an officer appointed under section 3 of the Act or any other officer to whom the Director General has delegated his power under section 49 of the Act;

"dB (A)" means Decibel-A-weighted, being a unit of measurement of sound level obtained when using a sound level meter corrected to the "A" weighted scale using a reference pressure of 20 micropascals;

"motor vehicle" means any description of vehicle propelled by means of mechanism contained within itself and constructed or adapted so as to be capable of being used on roads, and includes a trailer;

"sound level" means ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals;

"sound level meter" means an instrument designed to measure sound pressure levels.

Regulation 3. Application.

The provisions of regulations 4 and 5 shall not apply to -

- (a) motor vehicles assembled or manufactured before the 1st January 1970;

(b) motor vehicles used for racing purposes in designated racing circuits or in approved racing events.

Regulation 4. Maximum sound level permitted for motor vehicles having two wheels or three wheels.

(1) The maximum level of sound which may be emitted by motor vehicles having two wheels or three wheels shall be the sound level of Standard A as prescribed in the First Schedule.

(2) Notwithstanding sub-regulation (1), the maximum level of sound which may be emitted by motor vehicles having two wheels or three wheels manufactured or assembled on or after the 1st January 1990 shall be the sound level Standard B as prescribed in the First Schedule.

Regulation 5. Maximum sound level permitted for motor vehicles having more than three wheels.

The maximum level of sound which may be emitted by motor vehicles having more than three wheels shall be the sound level of Standard C as prescribed in the Second Schedule.

Regulation 6. Tests to be conducted by assembler or manufacturer.

(1) For the purpose of verifying sound emission under these Regulations, the Director General may require any assembler or manufacturer of motor vehicles to conduct sound level tests, in the presence of an authorized officer, on each model of motor vehicle assembled or manufactured and the assembler or manufacturer shall bear the costs of such tests.

(2) For the purpose of sub-regulation (1), samples of motor vehicles shall be selected at random at a continuous rate and shall be of a ratio not exceeding one motor vehicle per 100 units or any other ratio approved by the Director-General.

(3) Where the Director-General has directed any assembler or manufacturer to conduct tests under this regulation, the assembler or manufacturer shall submit the results of such tests to the Director-General monthly.

Regulation 7. Sound level tests.

(1) Sound level tests for motor vehicles having two wheels or three wheels shall be conducted in accordance with the Third Schedule.

(2) Sound level tests for motor vehicles having more than three wheels shall be conducted in accordance with the Fourth Schedule.

Regulation 8. Recording of tests.

Any test conducted to determine sound level for the purposes of these regulations shall be recorded in the form prescribed in the Fifth Schedule.

Regulation 9. Offences which may be compounded.

Offences under section 23 of the Act for contravening the acceptable conditions specified in regulations 4, 5 and 6 may be compounded.

FIRST SCHEDULE

MAXIMUM SOUND LEVEL PERMITTED FOR MOTOR VEHICLES HAVING TWO WHEELS OR THREE WHEELS

(Regulation 4)

STANDARD A

<i>Category of Vehicle</i>	<i>Maximum Sound Level Permitted (dB (A))</i>
1. 125 cc. and below	95
2. Above 125 c.c.	99

STANDARD B

<i>Category of Vehicle</i>	<i>Maximum Sound Level Permitted (dB (A))</i>
1. Below 90 cc.	92
2. 90 c.c. and above	95

SECOND SCHEDULE

MAXIMUM SOUND LEVEL PERMITTED FOR MOTOR VEHICLES HAVING MORE THAN THREE WHEELS

(Regulation 5)

STANDARD C

<i>Category of Vehicle</i>	<i>Maximum Sound Level Permitted (dB (A))</i>
1. Used for the carriage of passengers and comprising not more than 9 seats	80

(including the driver's seat)	
2. Used for the carriage of passengers and comprising more than 9 seats. Permitted maximum weight does not exceed 3.5 tonnes	81
3. Used for the carriage of goods. Permitted maximum weight does not exceed 3.5 tonnes. Engine is less than 200 h.p. DIN	81
4. Used for the carriage of passengers and comprising more than 9 seats. Permitted maximum weight exceeds 3.5 tonnes. Engine is less than 200 h.p. DIN	82
5. Used for the carriage of passengers and comprising more than 9 seats. Permitted maximum weight exceeds 3.5 tonnes. Engine is 200 h.p. DIN or more	85
6. Used for the carriage of goods. Permitted maximum weight exceeds 3.5 tonnes. Engine is less than 200 h.p. DIN	86
7. Used for the carriage of goods. Permitted maximum weight exceeds 3.5 tonnes. Engine is 200 h.p. DIN or more	88

THIRD SCHEDULE

SOUND LEVEL TEST FOR MOTOR VEHICLES HAVING TWO WHEELS OR THREE WHEELS

(Regulation 7)

I. INSTRUMENTATION.

1. The sound level meter (or an equivalent measuring system) shall meet a type 1 or 0 instrument according to IEC Publication 651.
2. The measurements shall be made using the frequency weighting "A", and the time weighting characteristic "F".

3. The calibration of the sound level meter shall be checked and adjusted according to the manufacturer's instructions or with a standard sound source (for example a pistonphone) at the beginning and at the end of each series of measurements. If the errors of the sound level meter obtained from these calibrations change by more than 1 dB during a series of measurements, the test shall be considered invalid.

II. TEST SITE.

1. Any open space may be considered as a suitable test site if it consists of a flat area made of concrete, asphalt or hard material having a high acoustical reflectivity, excluding compressed or other earth surfaces.

2. The edges of the test site shall be at least 3 metres from the extremities of the vehicle and there shall be no feature or object present on the test site which is likely to affect the reading of the sound level meter; in particular, the vehicle shall be at a distance of not less than one metre from a pavement edge when the exhaust noise is measured.

3. Any significant obstacles outside the test site shall, in addition, not be closer than 3 metres to the microphone during the test.

4. With the exception of the observer and driver, no person shall remain in the test site during the test.

III. BACKGROUND NOISE AND WIND INTERFERENCE.

1. The level of background noise (including any wind noise) at each measurement position shall be at least 10 dB less than the levels measured during the test.

2. Measurements shall not be made in adverse weather conditions. Tests shall not be made if the wind speed at microphone height exceeds 5 m/s.

IV. TEST PROCEDURE.

A - Number of Measurements.

1. At least three measurements shall be carried out at each measuring position.
2. The measurements shall be considered valid if the range of three measurements made immediately one after the other is not greater than 2 dB.
3. The arithmetic mean value given by these measurements shall constitute the result.

B - Position and Preparation of the Vehicle.

1. The vehicle shall be located in the centre of the test area, with the gear in neutral and with the clutch engaged.
2. Before each series of measurements the engine shall be brought to its normal operating temperature.
3. In the case of a vehicle with no neutral gear position, measurements shall be carried out with the rear wheel raised off the ground.

C - Microphone Positions.

1. The height of the microphone above the ground shall be equal to that of the outlet orifice of the exhaust gases, but in any case shall not be less than 0.2 metre.
2. The microphone shall be pointed towards the outlet orifice and located at a distance of 0.5 metre from the orifice.
3. Unless otherwise indicated by the manufacturer of the sound level meter, its reference axis for free field conditions shall be parallel to the ground and shall make an angle of $45^{\circ} \pm 10^{\circ}$ with the vertical plane containing the direction of the gas flow. In relation to this plane, the microphone shall be placed towards the external side of the vehicle as shown in Figure 1.
4. In the case of a vehicle provided with two or more exhaust outlets spaced not more than 0.3 metre apart and connected to a single silencer, only one measurement position shall be used; the microphone position shall be related to the outlet orifice nearest to the

external side of the vehicle or, when such an outlet orifice cannot be determined, to the outlet which is the highest above the ground.

5. For vehicles provided with exhaust outlet orifices spaced more than 0.3 metre apart, one measurement shall be made for each outlet as if it were the only one, and the highest level noted.

6. Where the vehicle design is such that the microphone cannot be placed according to Figure 1 because of the presence of obstacles being part of the vehicle, a figure clearly showing the place chosen for the microphone shall be drawn when the measurement is carried out. As far as possible, the microphone shall be placed at a distance greater than 0.5 metre from the nearest obstacle and its reference axis for free field conditions shall be orientated towards the exhaust gas orifice at a place which is the least masked by the obstacles.

D - Engine Operating Conditions

1. The engine speed shall be stabilized at $n/2$ if n is greater than 5000 rev/mm. or $3n/4$ if n is less than 5000 rev/min., where n is the engine speed at which the engine produces its maximum power as indicated by the manufacturer.

2. The throttle shall then be suddenly closed, and the noise measured during a period of operation consisting of a brief maintenance of the above constant engine speed and throughout the deceleration. The highest level only shall be recorded.

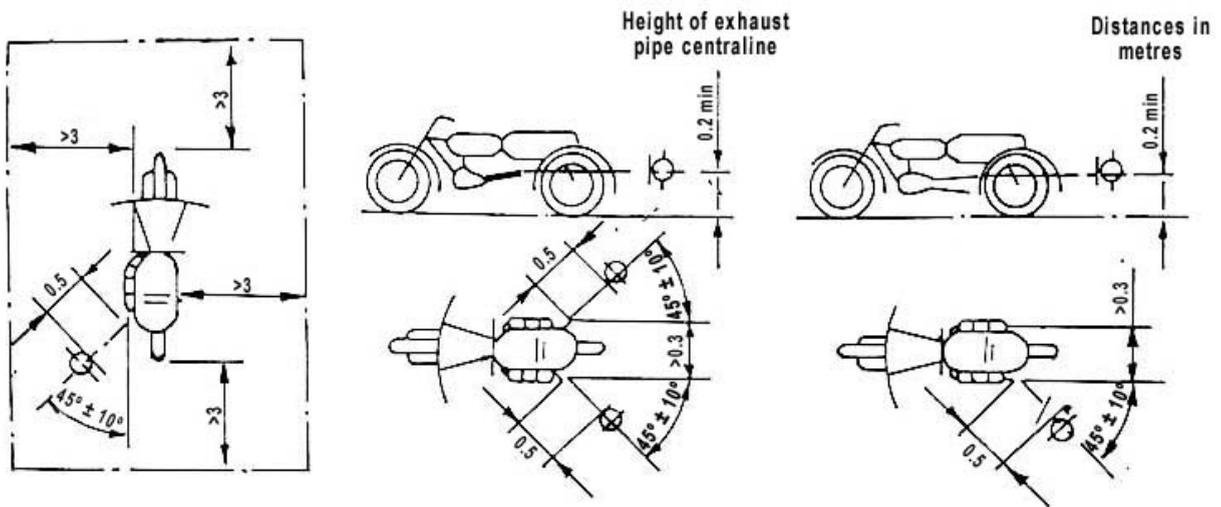


Figure 1: TEST SITE AND MICROPHONE POSITION FOR MEASURING EXHAUST NOISE.

FOURTH SCHEDULE

SOUND LEVEL TEST FOR MOTOR VEHICLES HAVING MORE THAN THREE WHEELS

(Regulation 7)

I. INSTRUMENTATION.

A - Instrument for Acoustical Measurements.

1. The sound level meter (or an equivalent measuring system) shall at least meet the requirements of a type 1 instrument according to IEC Publication 651.
2. The measurements shall be made using the frequency weighting "A", and the time weighting "F".

3. The calibration of the sound level meter shall be checked and adjusted according to the manufacturer's instructions or with a standard sound source (for example a pistonphone) at the beginning and at the end of each series of measurements. If the errors of the sound level meter obtained from these calibrations change by more than 1 dB during a series of measurements, the test shall be considered invalid.

B - Instrument for Speed Measurement.

The rotational speed of the engine and the road speed of the vehicle. during the approach shall be measured with instruments with an accuracy of 3% or better.

II. TEST SITE.

1. The test site shall be substantially level, the surface dry and its texture such that it does not cause excessive tyre noise.

2. The test site shall be such that hemispherical divergence exists between the noise source and the microphone to within ± 1 dB. This condition is deemed to be satisfied if the following requirements are met:

(a) within a radius of 50 m around the centre of the track the space shall be free of large reflecting objects such as fences, rocks, bridges or buildings;

(b) the test track and the surface of the site up to 10 m from the centre O of the track shall consist of concrete, asphalt or similar hard material and be free from absorbing materials such as long grass or ashes;

(c) in the vicinity of the microphone there shall be no obstacle that could influence the acoustical field and no person shall remain between the microphone and the noise source.

III. BACKGROUND NOISE AND WIND INTERFERENCE.

1. The level of background noise (including any wind noise) shall be at least 10 dB below that produced by the vehicle under test.

2. Measurements shall not be made in adverse weather conditions. Tests shall not be carried out if the wind speed at microphone height exceeds 5 m/s.

IV. TEST PROCEDURE.

A - Microphone Positions.

1. The distance from the microphone positions to the reference line CC (see Figure 2) on the test track shall be 7.5 m.

2. The microphone shall be located 1.2 m above ground level. Unless otherwise indicated by the manufacturer of the sound level meter, its reference axis for free field conditions shall be horizontal and directed perpendicularly towards the path of the vehicle (line CC).

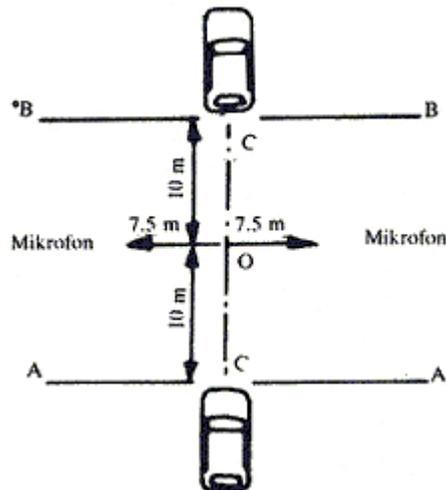


Figure 2: MICROPHONE POSITIONS FOR MEASUREMENTS.

B - Number of Measurements.

1. At least two measurements shall be made on each side of the vehicle.

2. The results shall be considered valid if the differences between two consecutive measurements made on the side of the vehicle which gives the higher sound pressure level do not exceed 2 dB.

3. The highest value given by these measurements shall constitute the result.

C - Conditions of the Vehicle.

Measurements shall be made on vehicles unladen except for the driver and, except in the case of non-separable vehicles, without trailer or semi-trailer.

D - Operating Conditions.

1. General conditions:

(1) The vehicle shall approach the line AA with the path of its centre line following as closely as possible the line CC as specified in paragraphs 2 (1) to 2 (3) as appropriate.

(2) When the front of the vehicles reaches the line AA, the throttle shall be fully opened as rapidly as practicable (without operating the kick-down, if any) and held fully open until the rear of the vehicle reaches line BB; the throttle shall then be closed as rapidly as possible.

(3) Any trailer which is not readily separable from the towing vehicle shall be ignored when considering the crossing of the line BB.

(4) If the vehicle is fitted with more than two-wheel drive, it shall be tested in the drive which is intended for normal road use.

(5) If the vehicle incorporated equipment such as a concrete mixer, a compressor, etc., the equipment shall not be in operation during the test.

2. Special conditions.

(1) Vehicles without gear-box.

The vehicle shall approach the line AA at a uniform vehicle speed corresponding to one of the following:

(i) an engine rotational speed equal to $\frac{3}{4}$ of the speed, n , at which the engine produces its net maximum power; or

(ii) $\frac{3}{4}$ of the engine maximum rotational speed allowed by the governor, at full load conditions of the engine; or

(iii) 50 km/h,

whichever is the lowest.

(2) *Manual transmission vehicle.*

(a) *Approach speed.*

The vehicle shall approach the line AA at a uniform vehicle speed corresponding to one of the following:

(i) an engine rotational speed equal to $\frac{3}{4}$ of the speed, n , at which the engine produces its net maximum power; or

(ii) $\frac{3}{4}$ of the engine maximum rotational speed allowed by the governor, at full load conditions of the engine; or

(iii) 50 km/h,

whichever is the lowest.

(b) *Choice of the gear ratio.*

Commercial vehicles having a maximum authorized total weight of not more than 3.5 tonnes and passenger cars fitted with a gear-box having four or fewer forward gears shall be tested in second gear. When fitted with a gear-box having

more than four forward gears, they shall be tested in both second and third gears. The average value of the sound levels recorded for these two conditions shall be calculated.

Commercial vehicles having a maximum authorized total weight of more than 3.5 tonnes and buses whose whole number of forward gears is N (including those obtained by means of an auxiliary transmission or multi-gear axle) shall be tested successively with the gear selection equal to or higher than $N/2$. Only the condition giving the highest sound pressure level shall be reported.

(3) Automatic transmission vehicle.

(a) Vehicles without a manual selector shall be tested at various uniform approach-speeds of 30, 40 and 50 km/h or at $3/4$ of the on-road maximum speed if this value is lower. The condition with the highest sound pressure level shall be reported.

(b) If a manual selector with N forward positions fitted to the vehicle, the test shall be performed with the selector in the position N; external downshifts (for example by kick-down) shall be excluded. The approach speed shall be that specified in paragraph 2 (2).

If an automatic downshift occurs after the line AA, the test shall be rejected and repeated using the position N-1, N-2, etc., as necessary, until the selector is placed in the highest position that allows the test to be performed without automatic downshift, external downshifts (kickdown) being always excluded.

(c) If the vehicle is fitted with an auxiliary manual transmission or a multi-gear axle, the position used for normal urban driving shall be used.

In all cases, the special selector's positions for slow movements, parking, or braking shall be excluded.

V. DEFINITION.

In this Schedule -

(a)"automatic downshift" means a gear change to a lower gear (higher numerical ratio) which occurs outside the control of the driver;

(b)"external downshift" means a gear change to a lower gear (higher numerical ratio) which can be initiated at the will of the driver.

FIFTH SCHEDULE

RECORD OF TESTS

(Regulation 8)

	Registration No:
	Test No:

1. Measurement Procedure:

2. Category of Vehicle:

3. Type of Vehicle: Make:

Model:

Engine capacity (cc):

Horsepower (hp):

Transmission system:

Fuel: Petrol/Diesel/LPG*

Remarks:

Exhaust system: Make:

Model:

4. The Test Site: Ground condition

Hard/Soft*

5. Weather Conditions: Wind speed m/s

Rain: none/light/heavy*.

6. Measurement *Make Model*

Sound Level Meter.....

Sound Level Recorder.....

Engine-tachometer.....

wind screen with/without*

7. Engine operating speed used for the test r.p.m.

8. Vehicle road speed used for the test km/h.

9. Transmission gears used for the test:

10. Background sound level: dB (A).

11. Number of sound level measurements made:

12. Sound level of vehicle tested: dB (A).

13. Date and time of test: a.m/p.m*.

Authorized officer,

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for Director General of Environmental Quality.

* Delete if not applicable.

Made the 13th June 1987.

[KST & AS (U) 902/JAS/2/4; PN. (PU²) 280/II.]

DATUK AMAR STEPHEN K.T. YONG,
Minister of Science, Technology and Environment

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