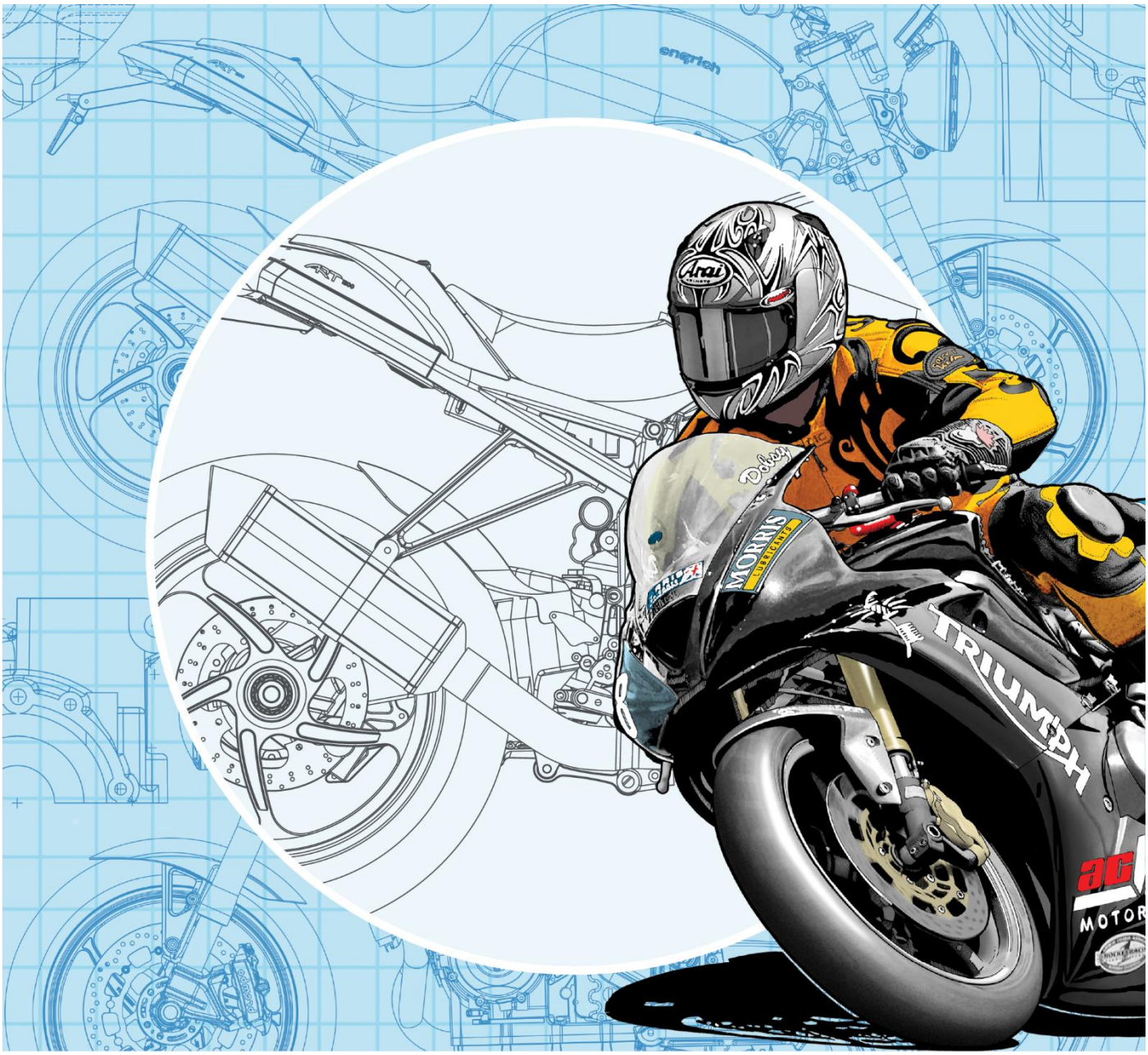
Low Volume Vehicle Technical Association (inc)

Helping New Zealanders Build & Modify Safe Vehicles

New Zealand Motorcycle Construction Manual

Chapter 11 (Part 1)
Exhaust Noise & Gas Emissions - Motorcycles

Version 1 | Effective from 1 October 2025



Chapter 11 (Part 1)
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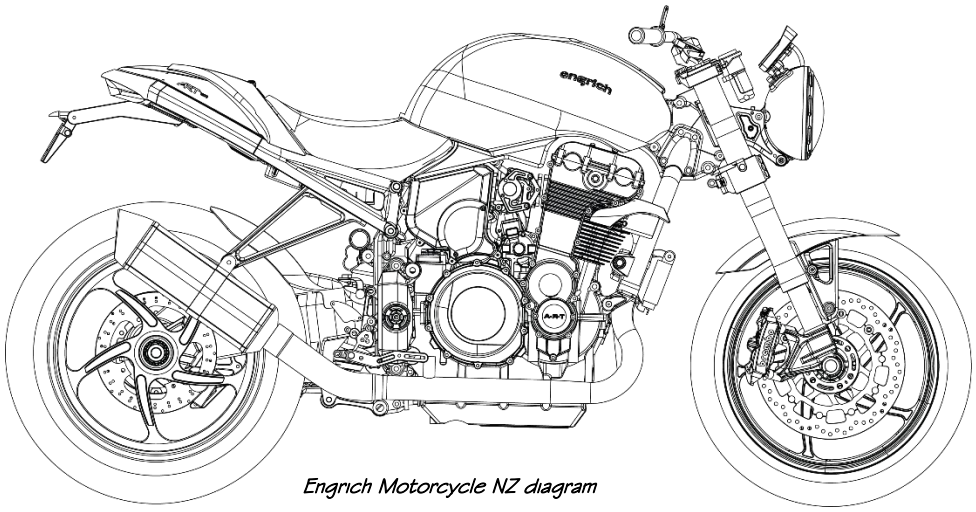

Engrich Motorcycle NZ diagram

Approval Record

Signed in accordance with clause 1.3(5) of the *Low Volume Vehicle Code* of the LVVTA	
On (date)..... on behalf of	
New Zealand Transport Agency	Low Volume Vehicle Technical Association .....

Amendment Record

Amendment details	Version #	Issue date	Effect date
• MCM Chapter 11 (Part 1) – Original Issue	Version 1	2 Sept 2025	1 Oct 2025

About Motorcycle Construction Manual Chapters

NZ Motorcycle Construction Manual Chapters (the chapters) provide the necessary detailed technical requirements, and helpful information, to enable a modified or scratch-built motorcycle to comply with the corresponding low volume vehicle standards (LVV standards). The chapters provide modifiers and constructors with the same information that an LVV Certifier will use when inspecting a modified or scratch-built motorcycle which requires LVV certification.

Author, Publisher, & Owner

This chapter is authored, published, and owned by the Low Volume Vehicle Technical Association Incorporated (LVVTA). LVVTA is an incorporated society established in 1992, that represents a group of specialist automotive organisations (in turn representing approximately 150,000 members) who are dedicated to ensuring that motor vehicles, when scratch-built or modified, meet the highest practicable safety standards.

The information in this chapter has stemmed from work undertaken by LVVTA founding member organisations that commenced in 1989 and has been progressively developed as an integral part of the New Zealand Government's land transport regulatory system, by agreement and in consultation with the New Zealand Transport Agency (NZTA).

As a result, the considerable experience in applied safety engineering built up by LVVTA and its specialist automotive member groups over the past several decades can be of benefit to members of the New Zealand public who also wish to build or modify motor vehicles.

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Availability & Current Version

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Note that printed copies of this chapter, like any other printed LVVTA documents, may have been superseded by an amended version and become out of date. Therefore, this and all other LVVTA documents should not be relied upon without first ensuring that the Version # (on the right-hand side of the header above) is the current version – please visit www.lvvta.org.nz/nzmcm to check that this chapter is in fact the latest version.

Users' Feedback

This chapter is constantly undergoing an evolutionary development process in order to keep pace with changing trends and technology. To assist in this, LVVTA invites users of this chapter to engage in an ongoing consultation process with us by making submissions for any changes, additions, or clarifications which might improve the chapter, at any time.

Any submissions made via this rolling consultation process will be thoroughly considered, and incorporated, where appropriate, at the next available amendment opportunity.

Submissions should be made to submission@lvvta.org.nz, with the name of this chapter in the Subject line.

Supporting Information

This chapter may be supported by other documents (referred to as 'supporting information') on the same subject, which could be helpful to someone using this chapter. Supporting information, if available, can be found at www.lvvta.org.nz/nzmcm and is all free of charge.

Legal Status & Copyright

This chapter supports *LVV Standard 145-45: Exhaust Noise Emissions*, which is incorporated within the *Low Volume Vehicle Code* (*LVV Code*). The *LVV Code* is, in turn, incorporated by reference within *Land Transport Rule: Vehicle Standards Compliance 2002*.

Disclaimer

LVVTA has made all reasonable efforts to provide sound and correct advice, based on the historical knowledge and best practice experiences of all parties involved in the development and production of this chapter.

However, no responsibility or liability is accepted by LVVTA for any error or omission, or any loss suffered by any person relying directly or indirectly on this chapter. Any person who builds or modifies a motor vehicle accepts that there may be some associated risks, and does so in the full knowledge of this, and accepts full responsibility for their own actions.

Credits

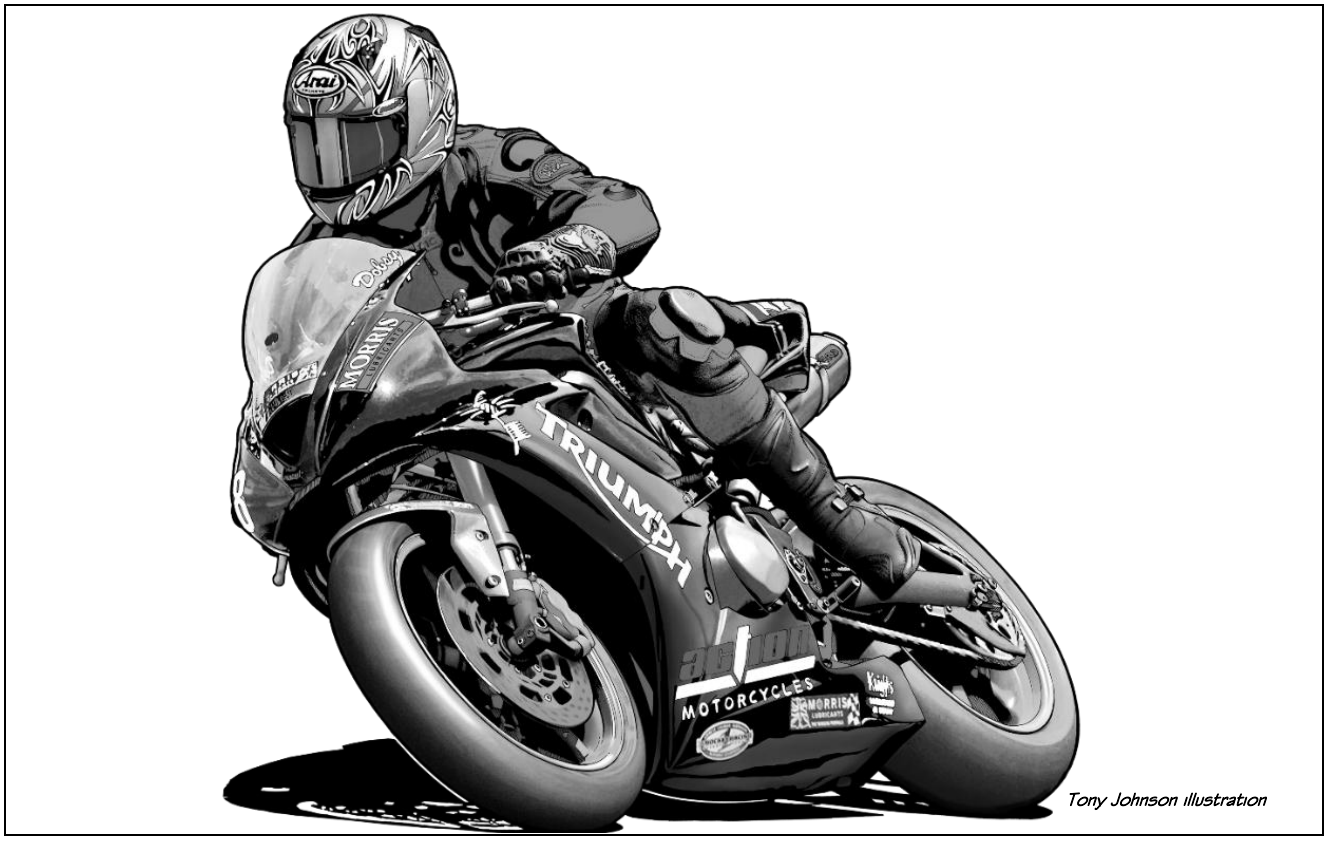
LVVTA acknowledges the following contributors for their assistance in the development of this chapter:

- Technical content: Kiwi Trikers' Social Club (Inc), LVVTA Technical Advisory Committee, LVVTA technical staff
- Cover & page 2 CAD diagram: Engrich Motorcycle New Zealand
- Motorcycle illustrations on the cover, and on pages 4 and 7: Tony Johnson

Type Key (For full details of Type Key, refer to Chapter 2 – About this Manual)

Normal type:	Provisions of the NZ Motorcycle Construction Manual for all motorcycles.
Italicised type:	Used when referencing external documents that are not part of this chapter.
Normal type in shaded box:	Special provisions of the NZ Motorcycle Construction Manual for motorcycles built or modified before specified dates.
Script type:	Helpful hints, tips, explanations, clarifications, and interpretations.
Grey shaded text & grey vertical stroke in margin:	Latest amendments since previous version. Note that text which is highlit in grey shows amendments that have been made since the document's previous version, and a grey vertical stroke to the left of the text denotes new or changed information which is important (rather than just a grammatical, formatting, or numbering change).

Chapter 11 (Part 1) Contents



Tony Johnson illustration

CHAPTER 11 (PART 1): EXHAUST NOISE EMISSIONS

Introduction

The purpose of this chapter (Part 1) is to specify a set of technical requirements, together with an associated testing process, for measuring exhaust noise emissions – known as 'objective noise testing', or 'ONT'. The chapter provides a test method and procedure that has been developed by LVVTA, derived from international best-practice, which is applied in controlled conditions, and will result in accurate, repeatable, and legally defensible outcomes.

Where a motorcycle is fitted with its original unmodified exhaust system, the requirements in this chapter do not apply, provided it has not been 'green-stickered' or 'pink-stickered' for emitting excessive noise.

For conciseness, all references to 'motorcycle' in this chapter mean a motorcycle that, due to being modified or scratch-built, is legally classified as a low volume vehicle.

General Safety Requirements

11.0 Suitability and Condition

11.0.1

An exhaust system fitted to a motorcycle must be:

(a) of a good design using materials suitable for the purpose; and

(b) in good condition and free of leaks; and

(c) securely attached, using a mounting system that enables necessary engine movement without stressing the exhaust system; and

(d) designed to prevent exhaust gases being directed towards the rider or pillion passenger.

Exhaust System Design Requirements

11.1 Exhaust System Interference

11.1.1

An exhaust system fitted to a motorcycle must be designed, constructed, and fitted in such a way that:

(a) the exhaust system, or components within the exhaust system, cannot be removed, altered, or interfered with, without the use of hand tools; or

(b) its performance or operation cannot be altered while the motorcycle is in motion, in such a way that the decibel levels specified in 11.21 are exceeded, unless the motorcycle is fitted with such a system as original equipment by the mass-produced motorcycle manufacturer.

11.1.1(b)
This means that a multi-mode exhaust system cannot be designed into a scratch-built motorcycle or retro-fitted into a modified production motorcycle, unless the maximum permissible decibel levels in 11.21 are not exceeded in any available mode.

11.2 Exhaust System External Projections

11.2.1

Sections of an exhaust system which extend beyond the outer longitudinal extremity of a motorcycle must not incorporate any open exhaust tubing or sharp edges facing towards the front of the motorcycle.

11.3 Exhaust System Protection

11.3.1

Sections of an exhaust system fitted to a motorcycle must be provided with adequate heat-shielding, where it can be contacted by a rider or pillion passenger when:

(a) in a normal seated position; and

(b) mounting and dismounting the motorcycle.

Testing Requirements

11.4 Test Site Requirements

11.4.1

A test site used in the application of this chapter must be an open outdoor site that:

(a) is predominantly flat, particularly within the immediate test area; and

(b) incorporates within a radius of not less than 3 metres (10 feet) from the sound level meter microphone:

(i) a space free from large sound-reflecting surfaces including buildings, walls, billboards, vehicles, trees, or shrubs; and

(ii) a solid surface such as concrete or asphalt, free of any loose or sound-absorbing material.

11.4.1 & 11.4.2

Accurate and repeatable exhaust noise emission test results can only be obtained by using a large space with a solid ground surface like a big car park, with no sound reflecting surfaces.

11.4.2

Exhaust noise emission testing on a motorcycle may be carried out under a canopy, provided that no part of the canopy, including its supports, are within 3 metres (10 feet) of the sound level meter microphone.

11.5 Field Calibrator Requirements

11.5.1

11.5.1(c) & 11.6.1(c)

The process of collection, re-calibration, and re-issue of the field calibrators and sound level meters will be arranged by LVVTA.

A field calibrator used in the application of this chapter must be:

(a) specifically approved and issued for that purpose by LVVTA; and

(b) in good operating condition; and

(c) re-calibrated by an approved calibration laboratory at intervals specified by LVVTA.

11.6 Sound Level Meter Requirements

11.6.1

11.6.2

The use of a Type-2 sound level meter is strictly limited to preliminary 'quick-check' work. This reduces costs and inconvenience to the motorcycle owner leading up to the full test, so that the likelihood of a 'pass' when applying the full test is maximised.

No written approval may be provided by an LVV Certifier through the use of a Type-2 meter, or a 'quick check' process, unless it is for the purpose of informing an Authorised Vehicle Inspector (AVI) that a motorcycle which has failed a WoF for exhaust noise clearly passes.

A sound level meter used in the application of this chapter must be:

(a) a Class-1, Type-0 or Type-1 meter, specifically approved and issued for that purpose by LVVTA; and

(b) in good operating condition; and

(c) re-calibrated by an approved calibration laboratory at intervals specified by LVVTA.

11.6.2

An LVV Certifier may use a Type-2 sound level meter in conjunction with the test process prescribed by this chapter, provided that the Type-2 sound level meter is:

(a) used only for the purpose of establishing a motorcycle's approximate exhaust noise level prior to a full test conducted in accordance with this chapter being carried out; and

(b) specifically approved and issued for that purpose by LVVTA; and

(c) in good operating condition.

11.7 Tachometer Requirements

11.7.1

A tachometer used in the application of this chapter must where practical, be proven by calibration to be within +/- 2% accuracy, and be:

(a) specifically approved and issued for that purpose by LVVTA; and

(b) in good operating condition.

11.7.2

A tachometer used in the application of this chapter may be either:

(a) a calibrated remote inductive pick-up tachometer issued by LVVTA; or

(b) where a tachometer specified in 11.7.1 will not enable a reliable engine speed reading to be received due to the type of ignition system used within the motorcycle, a calibrated infra-red tachometer issued by LVVTA; or

(c) where neither tachometer specified in 11.7.1 nor 11.7.2(a) or (b) will enable a reliable reading to be received, the motorcycle's original equipment tachometer or other trusted engine speed measurement device.

11.7.1
An approved tachometer may be used either as a means by which to measure engine speed during the exhaust noise emission test, or as a means by which to verify the motorcycle's original equipment tachometer.

11.7.2(c)
In cases where the supplied tachometers are not suitable and the motorcycle is not equipped with a tachometer, in the interests of completing the test, the LVV Certifier may elect to use an alternative engine speed measurement device that is known to have good accuracy, such as a suitably equipped professional timing light or automotive multi-meter with inductive input.

Engine Speed Selection Requirements

11.8 Determining Applicable Engine Speed

11.8.1

The applicable engine speed used during an exhaust noise emission test must be within a tolerance of +/- 5% of either:

(a) in the case of an engine that has a manufacturer's engine speed maximum power (ESMP) that is known to the LVV Certifier, 50% of that figure; or

(b) in the case of an engine that does not have a manufacturer's ESMP that is known to the LVV Certifier, or the manufacturer's ESMP has become irrelevant because the engine is now outside of its original specification:

(i) 6000 RPM if the engine is a 2-stroke single-cylinder engine; or

(ii) 5000 RPM if the engine is a 2-stroke multi-cylinder engine; or

(iii) 3000 RPM if the engine is a 4-stroke single-cylinder engine; or

(iv) 2500 RPM if the engine is a 4-stroke twin-cylinder engine with 2 valves per cylinder; or

(v) 4000 RPM if the engine is a 4-stroke twin-cylinder engine with 3 or more valves per cylinder; or

(vi) 4500 RPM if the engine is a 4-stroke engine that has 3 or more cylinders;

or

(c) in the case where an LVV Certifier believes the engine speeds specified in 11.8.1(b) are unreasonably high, taking into account the type and age of the engine, they may apply an engine speed for the purpose of the sound level test at which they believe is appropriate for the engine, and at which the engine may be safely operated.

Motorcycle Preparation Requirements

11.9 Operating Temperature

11.9.1

The engine in a motorcycle which undergoes an exhaust noise emission test, must, prior to the commencement of the test, be brought up to normal operating temperature.

11.10 Positioning

11.10.1

A motorcycle which undergoes an exhaust noise emission test must be positioned centrally within a test site that meets the requirements specified in 11.4, and must:

(a) be stationary; and

(b) have the gear selector positioned either:

(i) in the case of a manual transmission-equipped motorcycle, in neutral; or

(ii) in the case of an automatic transmission-equipped motorcycle, in neutral or park.

11.10.1(b)(ii)

Where a motorcycle has a built-in rev-limiter that does not allow the engine speed required in 11.8.1(b) to be reached in park, the gear selector may need to be moved to the neutral position, or the motorcycle may need to be put in a service or maintenance mode electronically.

11.11 External Noise Sources

11.11.1

In a case where it is believed that one or more noises emitted by the motorcycle, other than exhaust outlet noise, is adversely influencing the total noise recorded, the exhaust outlet noise may be isolated from the other noise sources by using shielding around the motorcycle, providing that the shielding material:

(a) is not within 50 mm of the exhaust outlet; and

(b) does not obstruct the clear path between exhaust outlet and microphone position.

11.11.1

Suitable shielding may include acoustic partitions, layers of fibre 'batts' insulation, or sand-bags. Care must be taken to avoid the risk of combustion of shielding material.

Test Procedure Requirements

11.12 Background Noise Testing

11.12.1

The combination of wind or other background noise present at an exhaust noise emission test, if any, must:

(a) be at least 10 dBA below the sound level of the motorcycle being tested; and

(b) be measured both prior to, and after the completion of, the exhaust noise emission test process.

11.12.1

Wind can cause high readings to be displayed on a sound level meter, and consistent motorcycle engine noise measurements cannot be made when wind is affecting the readings. By meeting the requirements specified in 11.12.1, any additional noise caused by wind and any other sources producing background noise will not adversely affect the exhaust noise emission testing outcome.

11.13 Field Calibration Checking

11.13.1

A sound level meter used in the application of this chapter must, before and after each exhaust noise emission test:

(a) undergo a field calibration check against a field calibrator issued by LVVTA; and

(b) record a difference between the two checks of not more than 0.5 dBA.

11.13.1

If more than 0.5 dBA difference is recorded between the two calibration checks, the test must be disregarded and carried out again.

11.14 Microphone Set-up and Positioning

11.14.1

The sound level meter microphone, when testing a motorcycle for exhaust noise emissions, in all cases, including those specified in 11.15.1 to 11.17.1, must:

(a) be protected by a foam wind-shield at all times during the noise emission test set-up and testing process; and

11.14.1

Where a motorcycle's exhaust outlet is closer to the ground than 200 mm, the microphone must be positioned no lower than 200 mm from the ground. This is in order to avoid 'sound bounce' affecting the test results.

(b) be positioned at (see Diagrams 11.1 and 11.2):

(i) a distance from the exhaust outlet of 500 mm (+/- 10 mm); and

(ii) an angle of 45 degrees (+/- 5 degrees) to the direction of gas flow, always using the position furthest from the motorcycle's longitudinal centreline; and

(iii) the same height as the exhaust outlet, however not closer to the ground than 200 mm.

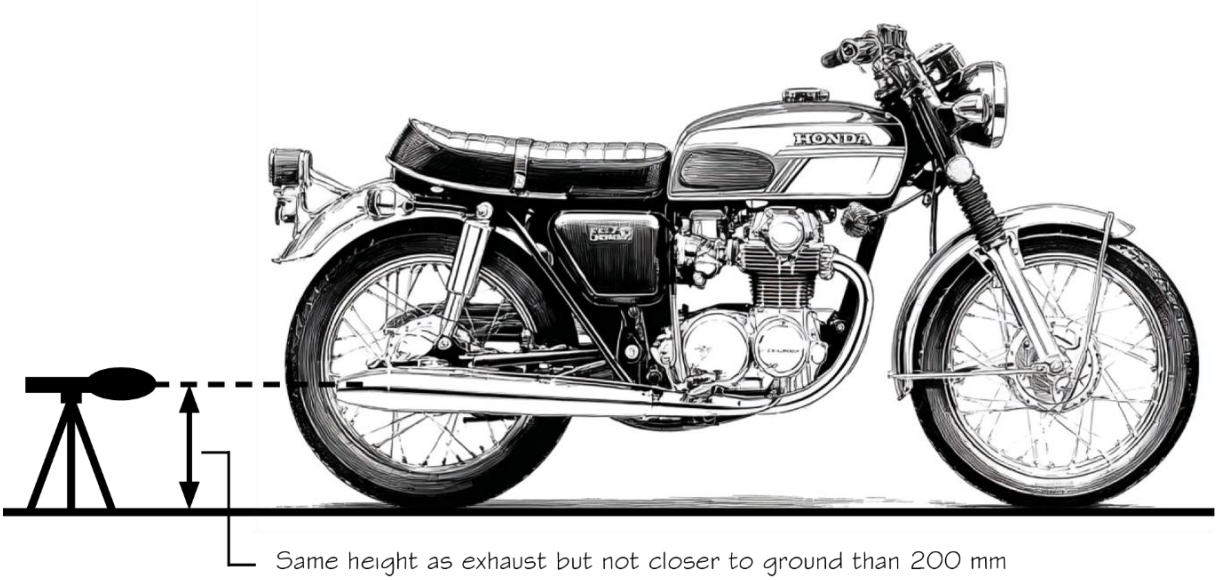


Diagram 11.1 Microphone Positioning for Single Exhaust Outlet (Side View)

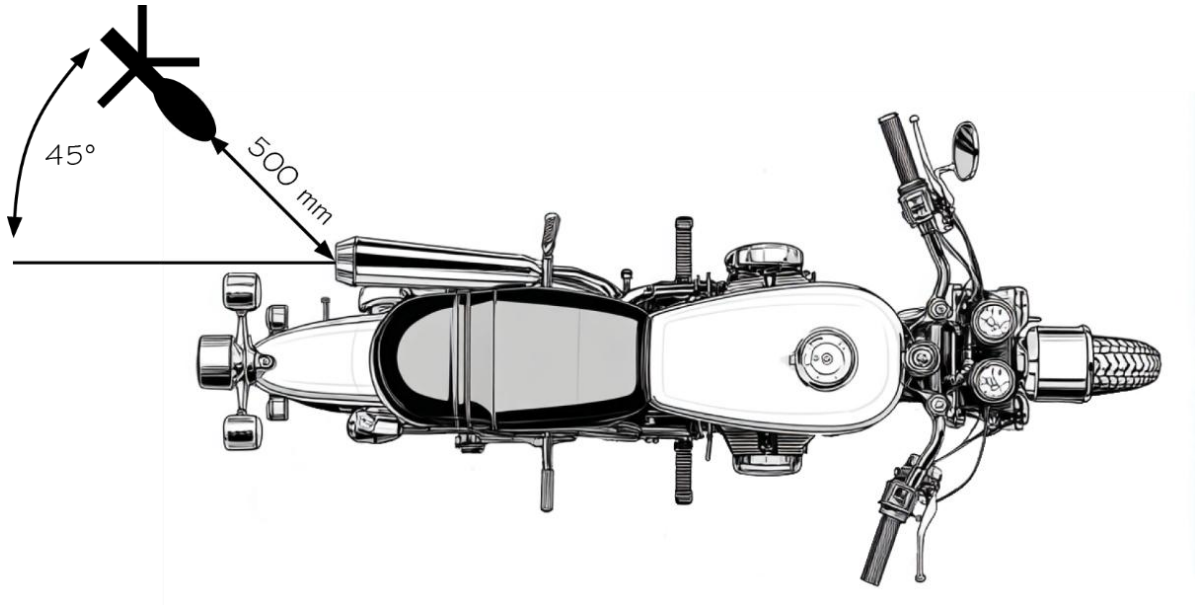


Diagram 11.2 Microphone Positioning for Single Exhaust Outlet (Plan View)

11.15 Microphone Positioning with Two Exhaust Outlets

11.15.1

In the case of a motorcycle with two exhaust outlets, and the two outlets are less than 300 mm apart, the outlets must be treated as one and measured together, with the sound level meter microphone positioned at the exhaust outlet that is furthest from the motorcycle's longitudinal centreline.

11.15.2

In the case of a motorcycle with two exhaust outlets, and the two outlets are more than 300 mm apart (see Diagram 11.3), the outlets must be treated as two separate outlets and measured individually, with the figure from the loudest outlet taken as the result.

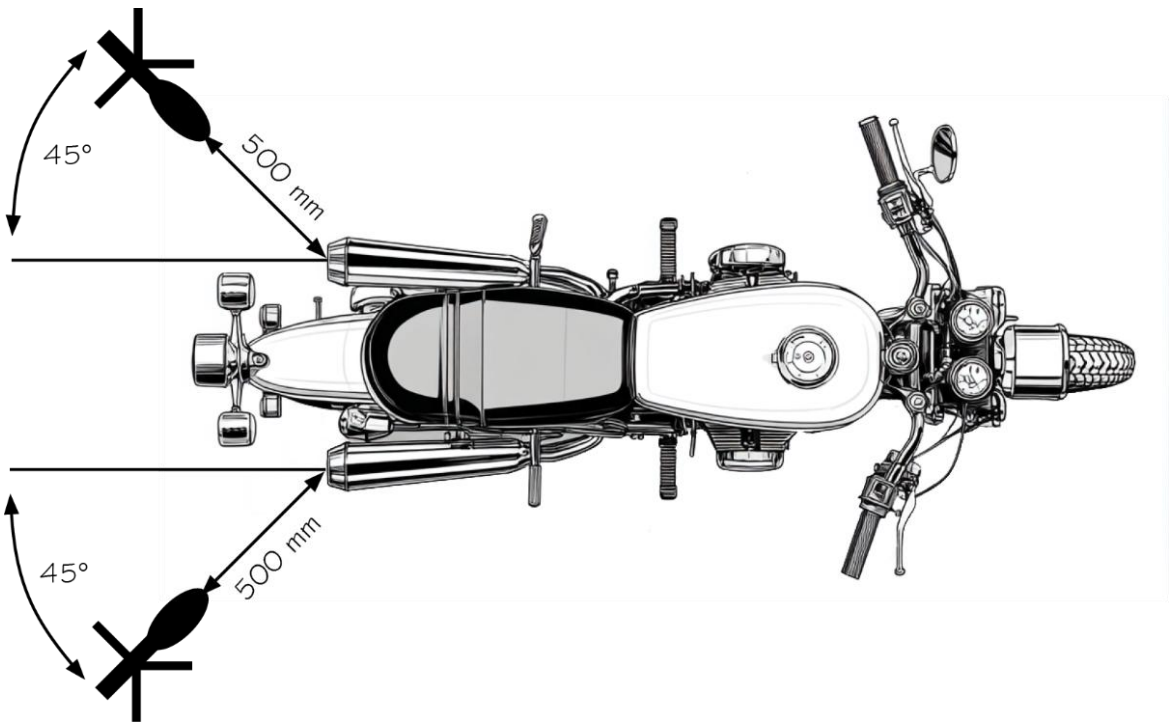


Diagram 11.3 Microphone Positioning for Twin Exhaust Outlets (more than 300 mm apart)

11.16 Microphone Positioning with Other Unusual Outlets

11.16.1

In the case of a motorcycle that has an exhaust outlet located at an angle to the motorcycle's longitudinal centreline, the sound level meter microphone must be positioned at the point which is furthest from the engine (see Diagram 11.4).

11.16.1

For other exhaust outlet positions not described in this chapter, an LVV Certifier should seek advice from LVVTA.

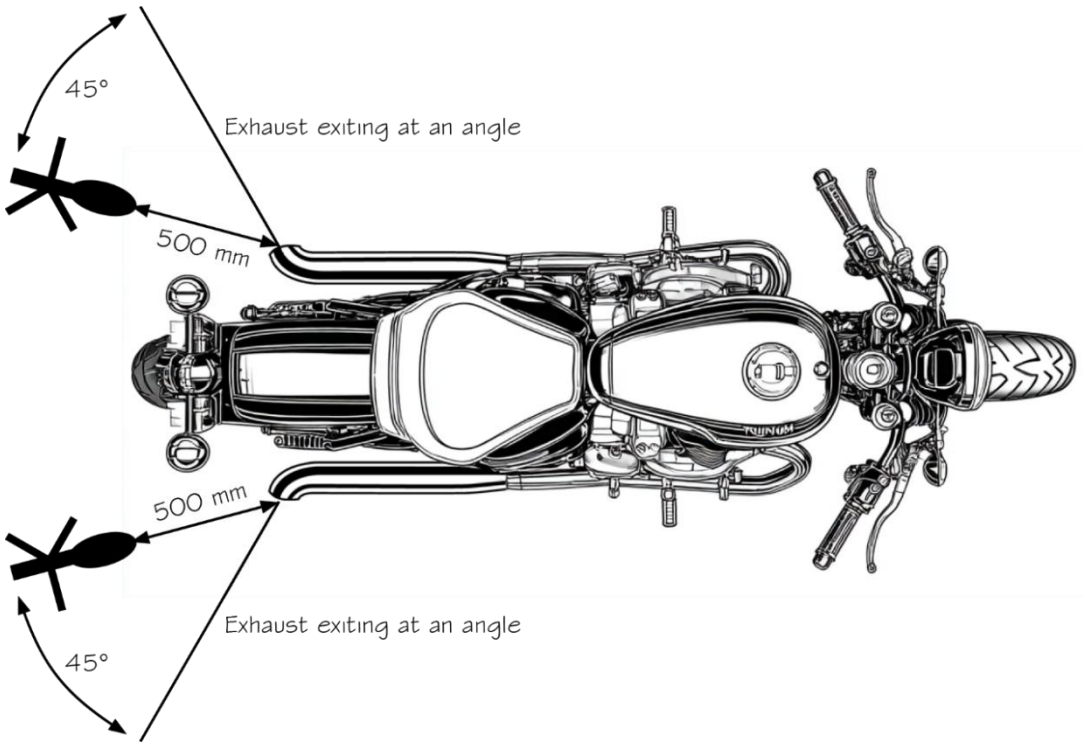


Diagram 11.4 Microphone Positioning for Angled Exhaust Outlets

11.17 Testing Multi-mode Exhaust Systems

11.17.1

In the case of a motorcycle that is fitted with a multi-mode exhaust system and a manual exhaust control, the exhaust noise emission test must be carried out with the mode switch in all positions, with the highest sound level recorded taken as the test figure.

11.18 Sound Level Meter Setting

11.18.1

When testing a motorcycle for exhaust noise emissions:

(a) the sound level meter microphone must be self-supported; and

(b) the sound level meter must be set at:

(i) 'curve-A' or 'A-weighted' sound pressure level; and

(ii) 'fast response', or 'time weighting F'.

11.19 Sound Level Meter Activation and Recording

11.19.1

During exhaust noise emission testing on a motorcycle, no person may be present within a radius of 3 metres (10 feet) of the motorcycle undergoing sound level testing, other than:

(a) the LVV Certifier; and

(b) if required, one additional person appointed by the LVV Certifier to assist with the exhaust noise emission test.

11.19.2

During exhaust noise emission testing of a motorcycle, the sound level meter must record the exhaust noise level held constantly for a period of not less than one second at the selected engine speed specified in 11.8.1(b) and throughout the deceleration period back to idle.

11.20 Interpretation of Sound Level Test Results

11.20.1

The figure recorded for each exhaust noise emission test of a motorcycle must be to one decimal point.

11.20.2

The result of an exhaust noise emission test of a motorcycle must be calculated from the average of three separate and consecutive measurements, each of which must be within 2 dBA of each other.

11.20.3

The final decibel figure established for a motorcycle after an exhaust noise emission test, and application of the factoring, where applicable, specified in 11.22.1 must be rounded to the nearest whole dBA value.

11.20.4

An unusual or unrelated noise spike or peak that occurs when carrying out an exhaust noise emission sound level test on a motorcycle must not be taken into account as part of the test results, in which case the test must be repeated until a satisfactory result is achieved.

Decibel Level Requirements

11.21 Decibel Limits

11.21.1

The maximum permissible decibel level emitted by a motorcycle tested in accordance with this chapter, must not, except where the factoring specified in 11.22.1 applies, exceed:

(a) in the case of a moped (LA or LB-Class), 91 dBA; or

(b) in the case of a motorcycle with an engine capacity of 125 cc or less (LC, LD, or LE-Class), 96 dBA; or

11.19.2

The standardised test process for sound level meter activation and recording must incorporate the following steps:

- adjust the throttle to bring the engine speed up to the selected level;
- begin recording noise output;
- hold the engine speed for at least one second;
- release the throttle and allow the engine speed to fall naturally back to idle;
- once at idle, stop recording noise output.

11.20.4

A noise spike or peak does not include an exhaust over-run 'boom', but rather is intended to apply to unusual or intermittent one-off sounds unrelated to the exhaust noise from the surrounding environment, such as a loud bang, aircraft flying past, or a barking dog.

Rattling noises such as those made at certain engine speeds by number plates or non-exhaust heat-shields during the test can also cause an unwanted spike or peak.

11.21.1

These decibel figures are set by the Government, as specified in *Land Transport Rule: Vehicle Equipment 2004*, and may change from time to time as Government policy dictates. Any such changes will be reflected in an amendment to this chapter.

(c) in the case of a motorcycle with an engine capacity of more than 125 cc (LC, LD, or LE-Class), 100 dBA; or

11.22 Decibel Factoring for Specific Situations

11.22.1

A factor of 5 dBA may be subtracted from the average decibel level recorded in 11.21.1, in the case of a scratch-built sub-category 'Historic Replica' motorcycle, or scratch-built sub-category 'Reproduction' motorcycle, first registered in New Zealand on or after 1 June 2008, that is a replication or reproduction of a motorcycle manufactured before 1 January 1985.

Reporting Requirements

11.23 Required Information

11.23.1

The information that must be recorded and provided when performing an exhaust noise emission test on a motorcycle is:

(a) the make, model, year, and VIN of the motorcycle to which the exhaust noise emission test has been applied; and

(b) the location of the test site; and

(c) the make, model, and serial number of the sound level meter used; and

(d) the background noise level measured before and after the tests; and

(e) the selected engine operating speed used for the test; and

(f) the applicable decibel limit from 11.21.1 that applies to the motorcycle for the test; and

(g) a clear indication of whether the motorcycle has passed the test; and

(h) reference to this chapter; and

(i) a detailed description of the motorcycle's exhaust system, which records the length, diameter, type, and material of the various components used within the system, and the basic shape, configuration, and positioning of the system.

11.24 Required Photographs

11.24.1

Clear, high-resolution photographs must be taken and provided when performing an exhaust noise emission test on a motorcycle of:

11.21.1 (cont'd)
See the Useful Information section at the back of this chapter for information about 'dB' and 'dBA.

(a) the motorcycle's exhaust system, including the components listed in 11.23.1(i); and

(b) the motorcycle's manufacturer-assigned chassis number or NZTA-assigned VIN; and

(c) the LVV Electronic Data Plate once affixed to the motorcycle, with its number clearly visible; and

(d) the LVV Electronic Data Plate, showing the location of its fitment on the motorcycle.

11.24.1(a)

For the sake of clarity, the photographs are only intended to record the exhaust system as it was at the time the ONT was carried out, and to identify the location of the EDP on the motorcycle. These do not imply any kind of assessment, approval, or LVV certification of any other modifications.

Exclusions

No exclusions apply to this chapter.

Useful Information

About Decibel Levels

A decibel (commonly abbreviated to dB) is a logarithmic measurement unit that describes a sound's relative loudness, though it can also be used to describe the relative difference between two power levels. In sound, decibels generally measure a scale from 0 (the threshold of hearing) to 120-140 dB (the threshold of pain). A 10 dB difference is required to double the subjective volume.

Generally, if the distance from the noise source is doubled, the noise level will be 6 dB lower. A 2-3 dB difference over a broad frequency range is noticeable to most people.

An A-weighted decibel (commonly abbreviated to dBA) is an adjustment process that takes into account the varying sensitivity of the human ear, to different decibel levels at different frequencies. Low frequency sounds are quieter to the human ear.

The 'A' weighting curve primarily takes into account the 500-10,000 Hz frequency range.

Challenges for Older Motorcycles

The more modern a motorcycle is, the greater the level of silencing technology that is incorporated within the engine. Newer engines feature improved silencing technology within their design; including the block, cylinder heads, component materials, casting techniques, water-jacket positioning, induction system design, and cooling fan and ancillary equipment design.

For this reason, more work may need to go into effectively silencing a scratch-built or modified production motorcycle which incorporates an older engine.

Terms & Definitions for Chapter 11 (Part 1): Exhaust Noise Emissions

AVI	(Authorised Vehicle Inspector) means a person who carries out WoF inspections on behalf of NZTA.
Aftermarket	means a manufacturer or supplier, other than a mass-produced vehicle manufacturer or an OE manufacturer, that produces components or systems on a production-run and catalogued basis.
Applicable requirements	means any technical or operational requirement referred to in the *LVV Code* which an LVV must comply with in order to be approved for LVV certification.

Automatic transmission	means a type of gearbox, or transmission, which automatically varies the ratios between the input shaft and the output shaft to suit engine speeds automatically, without the driver having to physically select the gears.
Class	(also known as Type) in relation to a sound level meter, describes its accuracy as defined by the relevant international standards. The ANSI S1.4 and older IEC 60651 standards refer to the level of accuracy as 'Type', whereas the new standard IEC 61672 refers to the level of accuracy as 'Class'.
Certify	is, as defined in the *Land Transport Rule: Vehicle Standards Compliance 2002*, to verify that a vehicle complies with safety-related legal requirements prescribed by New Zealand land transport legislation.
Compliant	(also known as compliance) means a condition where evidence exists that an LVV complies with the applicable requirements specified in the *LVV Code*.
dB	is as explained in the Useful Information section in this chapter.
dBA	is as explained in the Useful Information section in this chapter.
ESMP	(Engine Speed at Maximum Power) means a specified engine speed applicable to the particular make and model of engine, when carrying out an ONT.
Gear lever	(also known as gear selector) means the device by which the different gear ratios in the gearbox are selected by the driver.
Heat shield	means a heat-resistant piece of material placed between a heat-generating component and a heat-sensitive component, to prevent or minimise heat transfer from one to the other.
Hz	(Hertz) means cycles per second.
Inspection	means the vehicle inspection process specified in section *2.4*, *2.5*, and *2.6* of the *LVV Code*, carried out by an LVV Certifier during the LVV certification of a low volume vehicle.
L-class	is an NZTA classification, which means, in very simple terms, a two-wheeled motorcycle or three-wheeled motor vehicle with a GVM of under 1000 kg.
Longitudinal	means in the fore-aft direction, running on or parallel to the centre-line of the vehicle.
LVV	(Low Volume Vehicle) means, in simple terms, LVVs which are modified or scratch-built in small numbers, and includes individually modified or scratch-built LVVs. The full definition of an LVV is contained in the *LVV Code*.
LVV Certifier	(Low Volume Vehicle Certifier) means a person appointed by NZTA under the provisions of *Land Transport Rule: Vehicle Standards Compliance 2002*, to carry out low volume vehicle certification of modified and scratch-built LVVs, as specified by *Part 2* of the *LVV Code*.
LVV Certification	(Low Volume Vehicle Certification) means the process specified by the *LVV Code*, by which the design of an LVV is determined to comply with any applicable requirements, and, in recognition of which, an LVV EDP is affixed.
LVV Certify	(Low Volume Vehicle Certify) means the same as LVV certification.

LVV Code	(*Low Volume Vehicle Code* or the *Code*) means an LVVTA document which is incorporated by reference into the *Land Transport Rule: Vehicle Standards Compliance 2002*, and all applicable individual *Land Transport equipment rules*, that provides the legal framework to enable the LVV certification of modified and scratch-built LVVs in New Zealand.
LVV EDP	(Low Volume Vehicle Electronic Data Plate) is an RFID tag, in use from February 2021, fitted to an LVV upon completion of the LVV certification process, which when scanned by an NFC-capable device, displays details and photographs of the modifications and construction features on the LVV to which it is affixed.
LVV ORS	(*Low Volume Vehicle Operating Requirements Schedule, LVV Operating Requirements Schedule,* or *ORS*) means the document, incorporated by reference under the *LVV Code*, which provides LVVTA's operational processes and systems necessary to meet applicable requirements. The *LVV ORS* sets out the obligations and responsibilities of LVVTA, and the LVV Certifiers.
LVVTA	(Low Volume Vehicle Technical Association) is an incorporated society comprised of specialist vehicle associations. Established in 1992, its objectives are to represent the interests of vehicle modifiers and builders in New Zealand, and to ensure high safety standards for modified and scratch-built LVVs. The LVVTA owns and administers the *LVV Code*.
Mass-produced (motorcycle)	(also known as production vehicle, or high-volume vehicle) means a vehicle which is manufactured in quantities of more than 500 at any one location in any one year for the mass market.
Modification	is defined in *Land Transport Rule: Vehicle Standards Compliance 2002*) to change a vehicle from its original state by altering, substituting, adding or removing any structure, system, component or equipment, but does not include repair. 'Modified' and 'modification' have corresponding meanings.
Modified Production (LVV)	means, in simple terms, a vehicle which, while modified, maintains a sufficient percentage of body or chassis from one primary mass-produced vehicle that it can still be considered to be that vehicle. The full legal definition of a Modified Production LVV is complex and currently under review, and will be incorporated within the *LVV Code* once revised.
Motorcycle	means a vehicle of Table-A class LA, LB, LC, LD, and LE, as defined in *Land Transport Rule: Vehicle Standards Compliance 2002*.
Muffler	means a device for reducing the noise of the exhaust gases before they are released into the atmosphere through the tailpipe.
NZTA	(New Zealand Transport Agency) is a Crown entity responsible for managing New Zealand's land transport system.
Pillion passenger	means a person who rides as a passenger on the pillion of a motorcycle.
RFID	(Radio Frequency Identification) is a technology which uses electromagnetic fields to automatically identify and track tags attached to objects. These tags link to electronically stored information, which can be accessed using RFID readers.
RPM	(revolutions per minute) means the number of times an engine's reciprocating assembly turns in one minute.

Scratch-built (LVV)	means, in simple terms, an LVV which has been individually constructed from unrelated components, or a mass-produced vehicle which has been modified to such an extent that it can no longer be considered to be a modified mass-produced vehicle. The full legal definition of a scratch-built LVV is currently under review, and will be incorporated within the *LVV Code* once revised.
Scratch-built Historic Replica (LVV)	means a sub-category of scratch-built low volume vehicle, as defined in *Chapter 2: LVV Classifications* of the *LVV Operating Requirements Schedule*.
Scratch-built Reproduction (LVV)	means a sub-category of scratch-built low volume vehicle, as defined in *Chapter 2: LVV Classifications* of the *LVV Operating Requirements Schedule*.
Sound level meter	means a device for measuring the level of sound output, in decibels, when carrying out an ONT.
Tachometer	means an instrument by which the rotational speed of an engine is measured.
VIN	(Vehicle Identification Number) means a 17-digit numbering system used world-wide as a primary means of individually identifying motor vehicles.
WoF	(Warrant of Fitness) means a safety inspection and approval process for in-service vehicle, issued by an NZTA-appointed AVI.