

# Exhaust

11-1 Exhaust system

11-2 Visible exhaust smoke

## Summary of legislation

### Applicable legislation

- Land Transport Rule: Vehicle Equipment 2004

### Mandatory equipment

1. A vehicle with an internal combustion engine must be fitted with an exhaust system (**Note 1**).

### Condition

2. An exhaust system must not be constructed or modified in a way that allows a person to interfere readily with its operation or reduce its effectiveness.
3. An exhaust system must be designed, constructed, positioned and maintained in a way that minimises the risk of heat or fumes emitted from the system harming the vehicle's occupants.

### Performance

4. An exhaust system must be effective and in good working order.
5. The noise output from the exhaust system of a class LE, MA, MB, MC, MD1, MD2 or NA vehicle:
  - a) Must be less than or similar to the noise output from the vehicle's original exhaust system at the time of the vehicle's manufacture, or
  - b) Must not exceed the applicable maximum decibel limit when tested in accordance with the LVVTA objective noise test.

### Modification

6. A class LE, MA, MB, MC, MD1, MD2 or NA vehicle that has been modified so as to increase its exhaust noise output must have the exhaust system inspected, tested and certified by an LVV specialist certifier, unless:
  - a) the increased noise output is clearly below (**Note 3**) the applicable noise limits, and
  - b) has been inspected in accordance with the requirements in this manual, including those for equipment, condition and performance.

## Reasons for rejection

### Mandatory equipment

1. A vehicle is not fitted with an exhaust system that includes a means of sound reduction (**Note 1**).

### Condition

2. An exhaust system is not securely mounted.
3. The exhaust system is so constructed or modified that its operation or effectiveness can be readily interfered with, eg the driver is able to interfere with the exhaust system by operating a manual switch.
4. The exhaust system is so constructed that emitted heat or fumes are likely to harm vehicle occupants, eg the exhaust gases are not directed away from the perimeter of the vehicle's passenger compartment.

### Performance

5. There is a leak of exhaust fumes from the exhaust system.
6. The exhaust noise output from a class LE, MA, MB, MC, MD1, MD2 or NA vehicle is not less than or similar to the noise output the vehicle (or a vehicle of a similar type – see **Note 2**) would have had when it was manufactured with its original exhaust system, and:
  - a) the increased noise output exceeds the relevant noise limit in **Table 11-1-1** when assessed by the vehicle inspector:
    - i. using their own experience, or
    - ii. using the Noise Quick Check specified in **Technical Bulletin 1**, or
  - b) there is no evidence that that the vehicle has passed an LVVTA objective noise test, ie:
    - i. The owner cannot produce a valid objective exhaust noise emission test certificate (**Figure 11-1-1**), or
    - ii. The exhaust system tail pipe is not fitted with a valid LVVTA noise test label (**Figure 11-1-2**).


**Table 11-1-1. Noise limits for the noise quick check**

Vehicle	Noise limit (decibels) (Note 3)
Class LE with an engine capacity of 125cc or less	93 dBA
Class LE with an engine capacity of more than 125cc	97 dBA
Class MA, MB, MC, MD1, MD2, NA first registered in NZ before 1/6/2008	92 dBA
Class MA, MB, MC, MD1, MD2, NA first registered in NZ on or after 1/6/2008 and:	
Manufactured before 1/1/1985	92 dBA
Manufactured on or after 1/1/1985	87 dBA

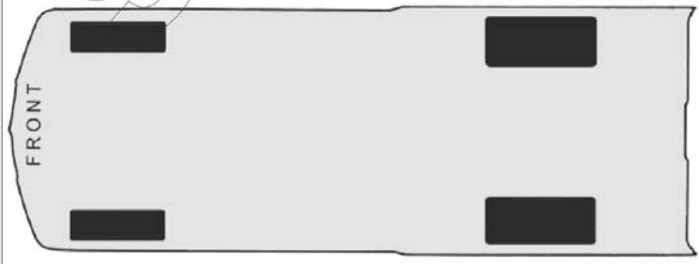
**Note 1** Exhaust system means a pipe assembly through which the engine exhaust gases pass to the atmosphere and includes some means of sound reduction such as a silencer or resonator.

**Note 2** For the purpose of reason for rejection, a vehicle of a similar type means a vehicle of similar age, vehicle size, body type, engine size and power output, and may be of a different make and model.

**Note 3** The noise limits in **Table 11-1-1** are lower than the noise limits specified in legislation, and considered to be 'clearly below' the legal noise limits. Vehicles with an exhaust noise output clearly below the legal limits do not require an Objective Noise Test.

**LOW VOLUME VEHICLE TECHNICAL ASSOCIATION Inc** 

**Objective Exhaust Noise Emission Test Certificate**

Vehicle and owner details: <span style="float: right;"><i>(white copy for vehicle owner)</i></span>			
Owner: (Name)		(Contact Ph #) ( )	
Vehicle: (Make)	(Model)	(Sub-model)	
(Year)	(Colour)	(VIN)	
Engine: (Make)	(Code if known)	(Modified?)	
(Cylinder configuration & #)		(Camshaft & valve arrangement)	
Exhaust system description & details:			
(a) Exhaust manifold(s): (make/type)			
(b) Front pipe(s): (OD/material/length)			
(c) Muffler(s)/resonator(s) #1: (make/material/length/OD)			
(d) Intermediate pipe(s): (OD/material/length)			
(e) Muffler(s)/resonator(s) #2: (make/material/length/OD)			
(f) Tail-pipe(s): (OD/material/length)			
(g) Other exhaust system details: (catalytic converter(s)/balance pipe/additional mufflers/other)			
Low Volume Vehicle Certifier's declaration:			
LVV Certifier: (Name)		(ID)	(Contact Ph #) ( )
<input type="checkbox"/> PASS:	Approval label: (Number)	(Location of label)	
<p>I, the above-named Low Volume Vehicle Certifier, appointed by the Low Volume Vehicle Technical Association (Inc) for the purpose of Objective Exhaust-Noise Emission Testing, declare that I carried out an objective exhaust noise emission test on the above-described vehicle in accordance with the procedures specified by Low Volume Vehicle Standard 90-20, and confirm that at the time of testing the vehicle complied with all requirements of, and emitted exhaust noise emissions not exceeding that specified by, Low Volume Vehicle Standard 90-20. (Signed) _____ (Date) _____</p>		<p>LVV certifier's authentication (only if pass is recorded):</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>[Authenticity sticker with hologram security feature]</p> </div>	
<input type="checkbox"/> <b>FAIL:</b> Recommendations to vehicle owner on bringing the exhaust system into compliance (expert advice is offered without any guarantee of a pass as a result of the advice given or implied).			
Vehicle exhaust system schematic:			
			
<small>© Copyright warning: Note that it is an offence for this form to be produced, or reproduced, in whole or in part, by any person unless by written request from an appointed representative of either the Low Volume Vehicle Technical Association (Inc) or Land Transport New Zealand. ©</small>			
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**Figure 11-1-1. Objective exhaust noise emission test certificate**



**Figure 11-1-2. Objective noise test label**

## Summary of legislation

### Applicable legislation

- Land Transport Rule: Vehicle Exhaust Emissions 2006

### Performance

1. A motor vehicle must not emit clearly visible smoke (**Note 2**) when the vehicle's engine is running at its normal operating temperature, under either of the following conditions:
  - a) for a continuous period of five seconds when the engine is idling
  - b) as the engine is being accelerated rapidly to approximately 2500 revolutions per minute or approximately half the maximum engine speed (whichever is lower).
2. Performance requirement 1 above does not apply if the driver of the vehicle produces documentation that proves that the engine is original equipment for the vehicle and the engine's design means the vehicle cannot reasonably comply (**Note 3**).

## Reasons for rejection

### Performance

1. A vehicle with the engine at normal operating temperature (**Note 1**) emits clearly visible smoke from the exhaust tail pipe (**Note 2**):
  - a) for a continuous period of five seconds when the engine is idling and does not meet the additional requirements in **Table 11-2-1**, or
  - b) as the engine is being rapidly accelerated to approximately 2500 rpm or approximately half the maximum engine speed (whichever is lower) and does not meet the additional requirements in **Table 11-2-1**.

**Table 11-2-1: Additional requirements**

Type of vehicle	Additional requirements
First registered on or after 1/1/1960 with four-stroke engine, or First registered before 1/1/1960 with four-stroke engine manufactured on or after 1/1/1960.	<ol style="list-style-type: none"> <li>1. Document produced by the vehicle operator that proves that (<b>Note 3</b>):               <ol style="list-style-type: none"> <li>a) the engine is original equipment for the vehicle, and</li> <li>b) its design means that the vehicle cannot reasonably comply with the visible smoke emission requirements.</li> </ol> <p><i>Note: No evidence is required if, during the acceleration test, a diesel-powered vehicle emits moderate smoke caused by turbo lag.</i></p> </li> <li>2. The smoke produced is not noticeably and significantly more visible than it would have been when the vehicle was manufactured and supplied with the fuel recommended by the manufacturer.</li> </ol>
First registered before 1/1/1960 with four-stroke engine manufactured before 1/1/1960, or Vehicle with two-stroke engine or rotary engine.	The smoke produced is not noticeably and significantly more visible than it would have been when the vehicle was manufactured and supplied with the fuel recommended by the manufacturer ( <b>Note 4</b> ).

#### **Note 1** Test procedure

- a) Carry out the idling and acceleration tests in Reason for rejection 1. A vehicle that passes both tests with the engine below normal operating temperature is deemed to have passed with the engine at normal operating temperature.
- b) If the vehicle has failed either test, ensure the engine is at normal operating temperature. Then purge the system by increasing the engine speed to 2500 rpm (or half the maximum engine speed if this is lower) and holding it there for about 5 seconds. Repeat the idling and acceleration tests in Reason for rejection 1.

**Note 2** Visible emissions caused by the condensation of water vapour do not count as smoke.

**Note 3** Acceptable evidence is:

- a) a letter on the letterhead of the manufacturer or manufacturer's representative, or
- b) a letter on the letterhead of an appropriate automobile club, or
- c) evidence of equal authority to a) or b) above, eg from an appropriate expert.

**Note 4** The vehicle inspector may need to take into account further information about unusual or older vehicles, eg from an appropriate expert such as an office holder in a vintage car club.

