

Vehicle Standards Bulletin 14

**NATIONAL CODE OF PRACTICE
for
LIGHT VEHICLE CONSTRUCTION
and
MODIFICATION**

**SECTION LT
TEST PROCEDURES**

VERSION 2.0 JANUARY 2011

Vehicle Standards Bulletin 14

National Code of Practice for Light Vehicle Construction and Modification (VSB 14)

Important Information for Users

Users of VSB 14 need to be aware that this document needs to be used in conjunction with the appropriate administrative requirements of the jurisdiction in which they wish to either register a vehicle or to obtain approval for a modification for an already registered vehicle. *Administrative requirements* include, amongst other things, processes for vehicle registration, obtaining exemptions, obtaining modification approvals, vehicle inspections, preparation and submission of reports and the payment of appropriate fees and charges.

If unsure of any of the requirements specified in VSB 14, or if more information is needed for any other issues concerning the administrative requirements, users should contact their relevant Registration Authority **prior** to commencing any work.

While VSB 14 provides advice on the construction of Individually Constructed Vehicles (ICVs) and the execution of modifications, it is not to be taken to be a design manual. Determination of component strength, performance, suitability and functionality must be either calculated or determined on a case by case basis by suitably qualified personnel experienced in each matter under consideration.

Users of VSB 14 also need to ensure that they refer to the most recent version of the relevant Section/s when working on a project. The version is identified by the version number and date on the face page of each Section. The version and date is also located in the footer of each page in each Section. On the website the version number is specified in the Section file name for easy identification.

If a project is taking a long time to complete, check the currency of the version you are using.

Users must be familiar with the provisions stated in the Preface and Introduction. These two Sections provide the necessary background information to assist users in understanding how VSB 14 is administered by Registration Authorities across Australia, on how it is structured, and the meaning of the types of modification codes specified in VSB 14. If not already done so, users should download them for study and reference.

Understanding these requirements is important to ensure that the correct processes are followed thereby reducing the likelihood of having work rejected by Registration Authorities.

Many of the Sections refer to other Sections within VSB 14 for further information or additional requirements. Users must read and apply all relevant Sections.

If in doubt about any issue concerning or contained in VSB 14, users should seek clarification from the appropriate State or Territory Registration Authority.

Please do not contact Vehicle Safety Standards (VSS) of the Australian Government Department of Infrastructure and Transport in Canberra about VSB 14. VSS provides the website as a service only.

Document Amendments by Version

Version

Version 2.0

Published 1 January 2011

Amendments

Code LT2.

Diagrams for lane change test have been included, and the maximum test speed has been reduced to 100 km/h for all vehicles other than passenger cars.

Clauses on vehicle condition, pre-conditioning the vehicle before testing and securing of test loads have also been included.

Code LT4

The updated version of the *National Stationary Exhaust Noise Test Procedure for In-Service Motor Vehicles*, which includes tests for both pre and post ADR 83/00 vehicles, is now referenced in Code LT4.

This document has also a number of editorial amendments that have had no affect on its technical content.

CONTENTS

1	Scope	5
2	Test Procedures (LT Codes)	5
LT1	Beaming and Torsion Tests	6
	Reporting Form LT1	11
	Checklist	15
LT2	Lane Change Manoeuvre Test	18
	Checklist	24
LT3	Exhaust Emissions - IM240 Test	26
	Checklist	28
LT4	Noise Test	30
	Checklist	31

1 SCOPE

This Section outlines the minimum requirements to enable certification of tests for light vehicles under individual LT Codes.

The need to conduct any of the individual tests contained in this Section, are specified within other Sections of this *Vehicle Standards Bulletin No 14 - National Code of Practice for Light Vehicle Construction and Modification (VSB 14)*.

Registration Authorities may also require tests to be carried out to these codes for modifications not specifically covered by the VSB 14.

2 TEST PROCEDURES (LT CODES)

This Section specifies particular requirements and covers limitations on work that may be performed under individual LT Codes.

Each Code is supplemented with a checklist (refer Table LT-1).

Table LT-1 LT Code Directory

LT Codes		Page
LT1	Beaming and Torsion Tests	6
	Reporting Form	11
	Checklist	15
LT2	Lane Change Manoeuvre Tests	18
	Checklist	24
LT3	Exhaust Emissions - IM240Test	26
	Checklist	28
LT4	Noise Test	30
	Checklist	31

BEAMING AND TORSION TESTS

CODE LT1

SCOPE

This Section outlines the procedure and minimum performance requirements for beaming and torsional testing of motor vehicles. It applies to vehicles that are required to have a torsion test.

GENERAL REQUIREMENTS

Modifications to motor vehicles that involve extensions of the wheelbase or removal of the roof can dramatically reduce the strength of the vehicle structure. Subsequent strengthening may result in extra stiffness in certain areas of the chassis but overstressing in others. Consequently, it becomes necessary to demonstrate that the modified vehicle's beaming and torsional strengths are adequate when compared to the original vehicle.

This Section contains a very simplified test procedure in terms of vehicle structural analysis and, as such, the results of testing may be taken only as a guide to the structural integrity of the vehicle. For this reason the results should not be treated as absolute values.

TEST PROCEDURE

1 VEHICLE SETUP

All hinged panels are to be ajar at all times during testing - i.e. bonnet, boot lid, and doors to be open.

2 LOADING

If the Gross Vehicle Mass (GVM) of the unmodified vehicle is not known then the vehicle must be weighed prior to testing. This weighing must be carried out with the fuel tank filled to 75% capacity. Alternatively, an equivalent mass to the specified volume of fuel may be positioned near the fuel tank.

The GVM of the unmodified vehicle is determined by adding the payload capacity of the vehicle to the unladen mass (or weighed mass). In the case of a passenger vehicle, the payload must be at least 68 kg for each seating position.

3 JIG

The vehicle to be tested must be safely supported for loading up to the specified values and mounted through the hubs with its springs and dampers made incompressible or replaced by spacers. Figures LT-2 and LT-3 indicate the preferred mounting of the vehicle for beaming and torsional tests. Supports at the fixed end must be able to resist the up-thrust resulting from the applied torsional load. Other methods of supporting the vehicle will be considered provided that the support points are not located within the wheelbase.

4 MEASUREMENT POINTS

The deflections are to be measured at the points shown in Figures LT1-2 and LT1-3. Front and rear points are to be measured on the body member as close as possible to the suspension attachment points, i.e. approximately on the axle centreline. **Measurements at the outside of the mudguard are not acceptable.** Positions 2 and 5 must be at the extreme ends of the rocker panels.

Positions 3 and 4 must be approximately equally spaced between points 2 and 5. As an alternative, 3 intermediate positions within the wheelbase are acceptable as a minimum, with a similar positioning.

5 BEAMING TEST SEQUENCE

- Step 5.1 - With the unmodified vehicle mounted securely, load the vehicle in accordance with Step 5.3 below to settle the apparatus and to check that it is functioning correctly. No readings of deflection need be taken for this pre-load.
- Step 5.2 - Remove loading applied in Step 5.1 and zero all gauges.
- Step 5.3 - A load equivalent to twice the payload (i.e. 68 kg x 2) must be applied at each seating position. Other means of distributing an equivalent overall load within the passenger compartment of the vehicle will be considered provided the distribution of the load is similar to that resulting from applying the loads at the seating positions.
- Step 5.4 - Record deflections.
- Step 5.5 - Remove loading.
- Step 5.6 - Record deflections again and check that vehicle has returned to substantially the same zero position as recorded in Step 5.2. If there is any significant variation, Steps 5.2 to 5.6 must be repeated.

6 TORSIONAL TEST SEQUENCE

- Step 6.1 - With the unmodified vehicle mounted securely, load the vehicle in accordance with Step 6.5 below to settle the apparatus and to check that it is functioning correctly. No readings need be taken for this pre-load.
- Step 6.2 - Remove loading applied in Step 6.1 and zero all gauges.
- Step 6.3 - Calculate the required turning moment to be applied using the formula:
$$0.25 \times \text{GVM} \times \text{wheel track.}$$

(To calculate this, multiply 0.25 x GVM in kg x 9.81 x wheel track in metres, to obtain turning moment in units of Newton metres - Nm).
- Step 6.4 - Calculate the required loading force at the lever arm position to apply the turning moment determined in Step 6.3, correctly applying any necessary conversion of units, multiplication by constants etc.
- Step 6.5 - Apply this loading force in a gradual and controlled manner.
- Step 6.6 - Record deflections.
- Step 6.7 - Remove loading.
- Step 6.8 - Record deflections. Check that vehicle has returned to substantially the same zero position as recorded in Step 6.2. If there is any significant variation, Steps 6.2 to 6.8 must be repeated.

7 MODIFIED VEHICLE TEST PROCEDURE

The modified vehicle is to be tested in the same manner, and with the same loads used above. Where vehicles have changes to the number of seating positions (such as limousines) the original beaming load must be evenly distributed over each seating position. The turning moment applied in the original torsion test is to be reapplied to the modified vehicle.

8 DATA RECORDING

Test data, loads, etc. are to be recorded on the standard test reporting Form No. LT1.

A graphical plot of the average of the absolute deflections of the left and right hand sides respectively at each measuring location along the wheelbase with the applied load, and again with the load removed, must be provided for both the unmodified vehicle and the modified vehicle. A plot of each vehicle's angular deflection at each measuring location along the wheelbase, with the load applied and after the load has been removed, must also be provided.

Beaming deflection plots are to be reduced to a zero datum line through points *R* and *F* to eliminate the contribution of jig movement etc. to absolute values.

Angular deflections are to be similarly reduced by subtracting the rotation measured at the *fixed end* axle line from each absolute rotation value.

8.1 Validity of Torsion Test Results

If during a torsion test it is evident that the *fixed end* rotated by more than 20% of the angular rotation of the end that was being rotated, the test must be repeated. Measures must be taken to reduce any angular rotation of the *fixed end* to less than 20% of that of the end being rotated before testing recommences.

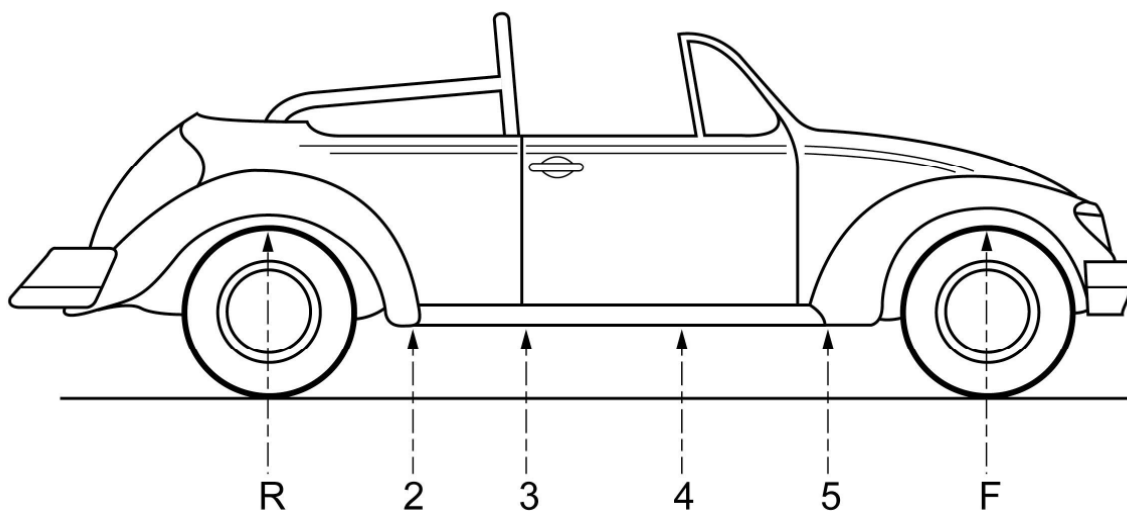


Figure LT1-1 Typical Location of Measuring Points

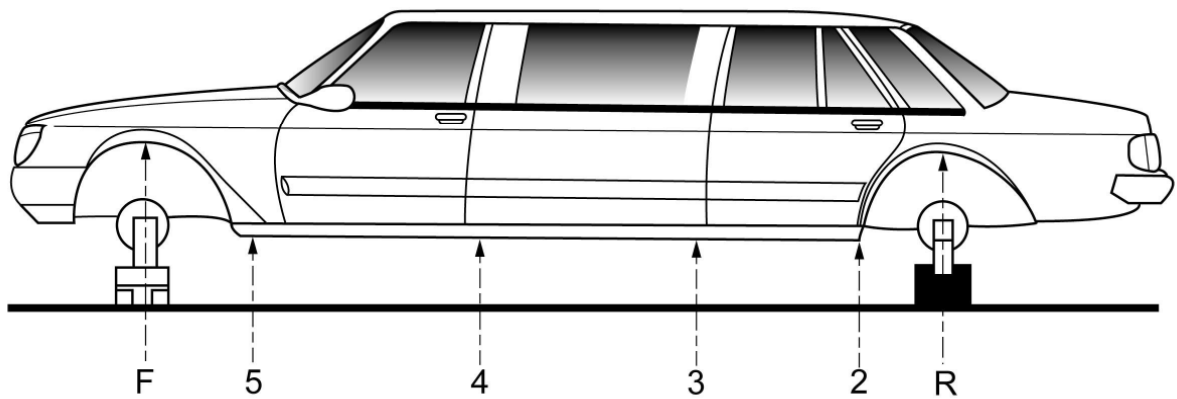
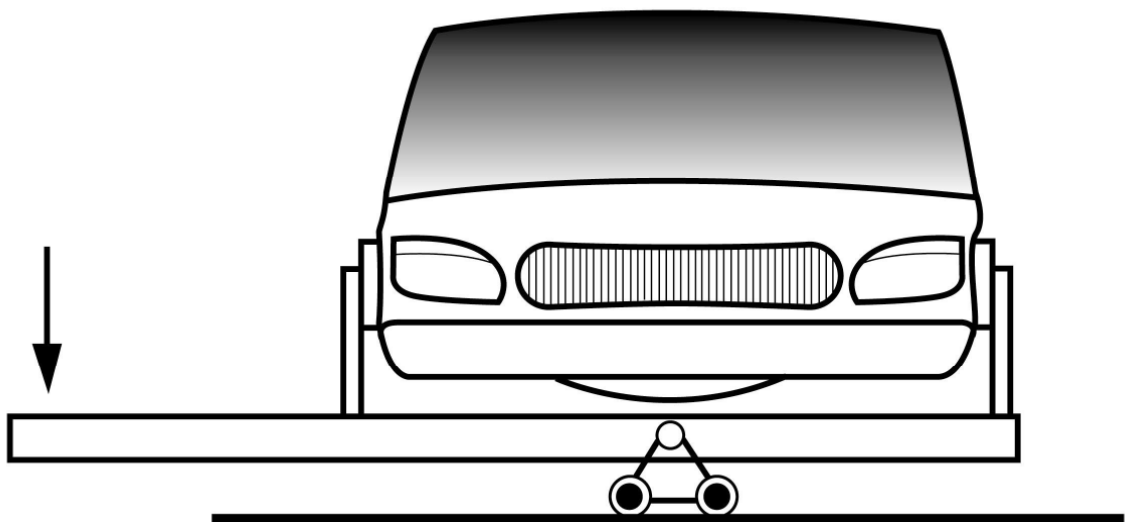


Figure LT1-2 Typical Test Rig – Side Elevation and Location of Measuring Points



Rollers or similar to allow transverse movement of hinge point as vehicle rotates.

Note: All hinged panels must be ajar during testing.

Figure LT1-3 Typical Test Rig – Front Elevation

9 ACCEPTANCE CRITERIA

9.1 Convertible and Cabriolet Vehicles

9.1.1 Beaming strength criteria

The average deflection of left and right hand sides from the datum line RF (under the maximum applied load) at any measuring position for the modified vehicle must not be greater than 1.5 times the deflection recorded for the unmodified vehicle.

9.1.2 Torsional strength criteria

The reduced angular deflections (under the maximum applied load) at any measuring position for the modified vehicle must not be greater than 1.5 times the reduced angular deflection recorded for the unmodified vehicle at the same measuring position.

9.2 Extended Wheelbase Vehicles

9.2.1 Beaming strength criteria

The beaming deflections (reduced to a zero datum line) of the modified vehicle when compared to that of the unmodified vehicle must not have increased in a proportion greater than the proportional increase in wheelbase.

9.2.2 Torsional strength criteria

The ratio of the torsional rigidity of the modified vehicle to that of the unmodified vehicle must not be lower than the ratio of the wheelbase of the unmodified vehicle to that of the modified vehicle.

9.3 Individually Constructed Vehicles (ICVs)

The structure of the ICV/Kit Car body/chassis must be such that there are no abrupt changes in the strength and stiffness of loaded sections. Abrupt changes in section must be avoided as they will produce stress concentrations and result in cracks and fatigue failure. Manufacturers should inform themselves in this respect or seek qualified assistance.

Torsional rigidity should be at least 4,000 Nm per degree over the wheelbase unless the vehicle has been professionally designed to operate at lower stiffness levels.

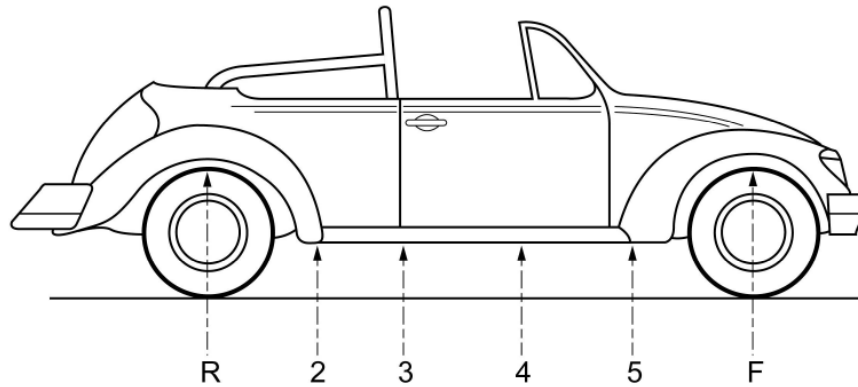
In any event the manufacturer of the ICV is responsible for the strength of the completed vehicle.

9.4 Uniformity of Body/Chassis Rigidity - All Vehicles

A key indication that a vehicle body/chassis will be likely to suffer from excessive flexing and fatigue cracking can be obtained from plots of the tested body/chassis deflections and rotations versus the position of the measurement points along the wheelbase. Where this plot does not exhibit essentially a straight-line, the body/chassis can be predicted to be susceptible to the aforementioned problems. The signatory must make an assessment of these plots and be satisfied that all safety concerns are addressed.

REPORTING FORM LT1

BEAMING AND TORSION TESTING - LT1



Gauge Positions

Longitudinal Dimensions			Transverse Dimensions		
R - 2	.....	(mm)	RR - LR	.....	(mm)
R - 3	.....	(mm)	R2 - L2	.....	(mm)
R - 4	.....	(mm)	R3 - L3	.....	(mm)
R - 5	.....	(mm)	R4 - L4	.....	(mm)
R - F	.....	(mm)	R5 - L5	.....	(mm)
			RF - LF	.....	(mm)

BEAMING TEST

Gauge Position	Deflection-Load applied (mm)					Deflection-Load removed (mm)				
	Left	Right	Left	Right	Average	Left	Right	Left	Right	Average
			red*	red*	red*			red*	red*	red*
R			0	0	0			0	0	0
2										
3										
4										
5										
F										

**Deflections reduced to datum line through points R and F.*

TORSIONAL TEST

Gauge Position	Load applied (mm)				Load removed (mm)			
	Deflection		Rotation	Rotation reduced *	Deflection		Rotation	Rotation reduced *
	Left (mm)	Right (mm)	(°)	(°)	Left (mm)	Right (mm)	(°)	(°)
R				0°				0°
2								
3								
4								
5								
F								

*Rotations reduced by subtracting rotation in rear plane LR-RR.

Loading Details

Beaming Deflection

Vehicle Mass kg
 Number of Seating Positions
 Total Load Applied kg
 GVM (or Vehicle Tare Mass + Load) kg

Torsion

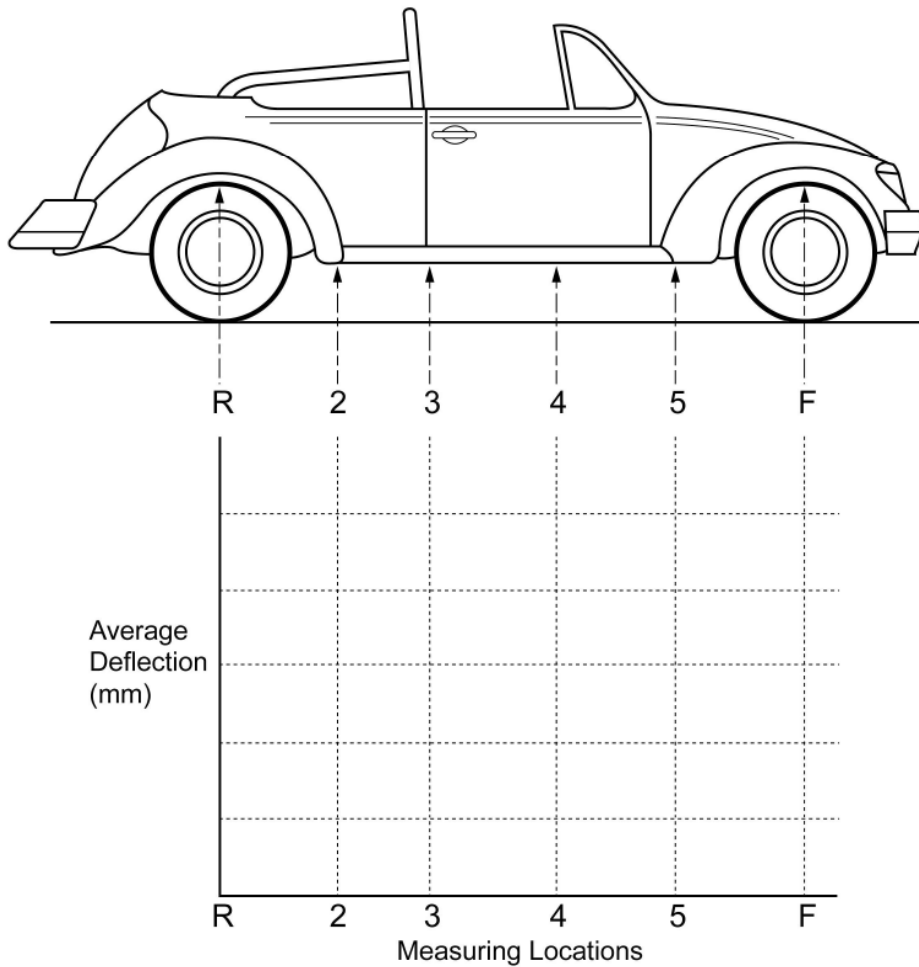
Vehicle Track - Front
 Rear
 Load Applied kg
 Moment Arm
 (from vehicle centre line) m
 Applied moment Nm
 Make Model Year of Manufacture

Chassis No. or VIN

Vehicle Modifications

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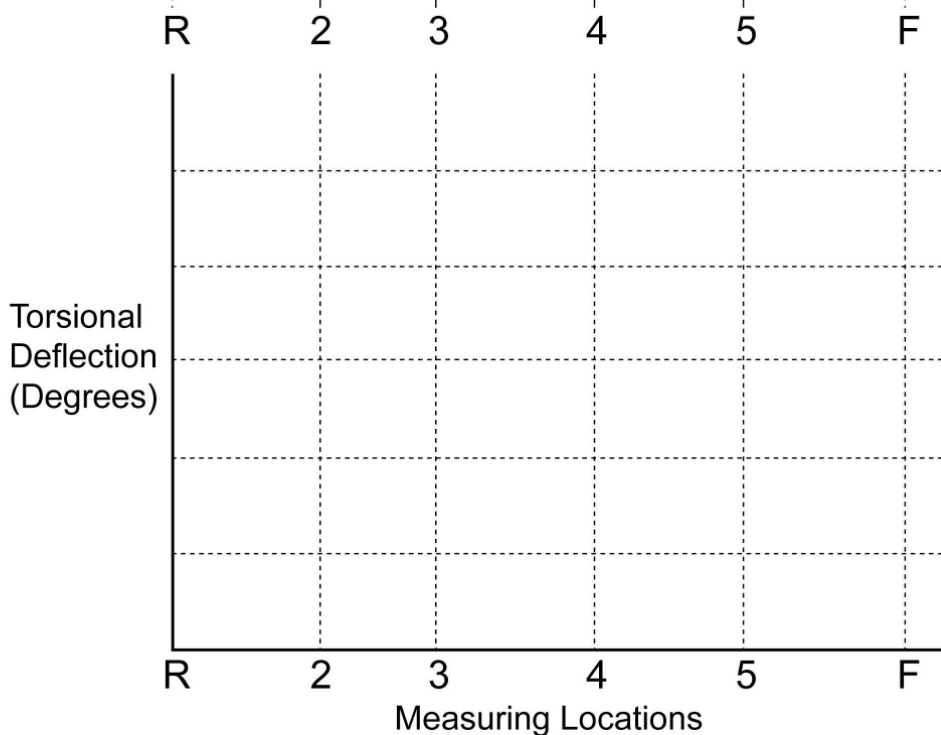
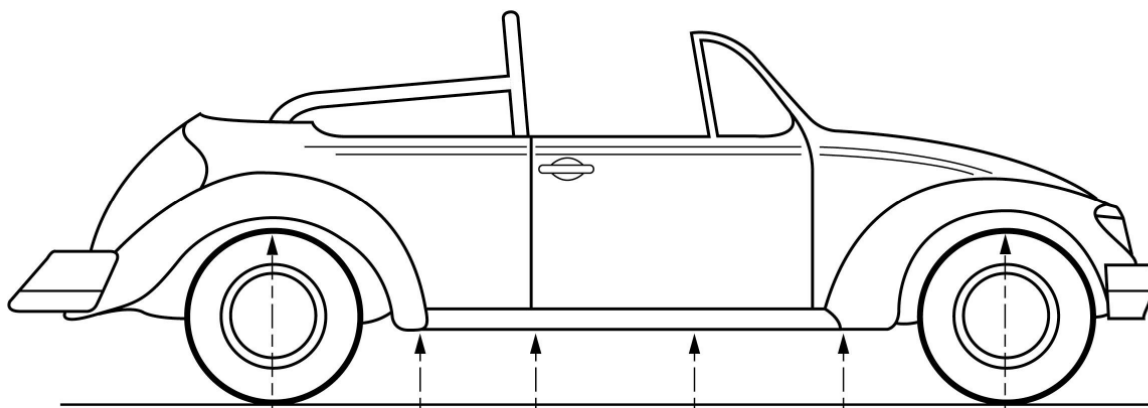
(Spaced between R and F in plot in same ratio as of positions along tested vehicle wheelbase).

NOTES

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Test witnessed by:

Signatory's Signature: Date:

CHECKLIST LT1
BEAMING AND TORSION TESTING
CODE LT1

(N/A=Not Applicable, Y=Yes, N=No)

1.	TEST PROCEDURES			
1.1	Has the Gross Vehicle Mass (GVM) of the unmodified vehicle been ascertained, by reference to manufacturer's data or by calculation? (In the case of a passenger vehicle, the payload must be at least 68 kg for each seating position)		Y	N
2.	JIG MEASUREMENTS			
2.1	Is the vehicle to be tested mounted through the hubs with springs or dampers etc. made incompressible or replaced by spacers?		Y	N
2.2	Are the deflections to be measured at the points shown in Figures LT1-1 and LT1-2?		Y	N
3.	BEAMING AND TORSIONAL TEST PROCEDURE			
3.1	Has the unmodified vehicle been tested in accordance with the details outlined in the <i>General Requirements</i> section?		Y	N
3.2	Has the modified vehicle been tested in the same manner as the unmodified vehicle? Note: All hinged panels are to be ajar at all times and fuel tank filled to 75% capacity during testing.		Y	N
4.	DATA RECORDING			
4.1	Have all test data, loads etc. been recorded on the standard testing reporting forms?		Y	N
4.2	Has a graphical plot of the average of the deflection on the left and right hand sides of each measuring location along the wheelbase with the load applied and again with the load removed been provided for the vehicle, where applicable?		Y	N
4.3	Has a plot of the vehicle's angular deflection at each measuring location along the wheelbase with the load applied and again with the load removed also been provided, where applicable?		Y	N

[Continued overleaf]

(N/A=Not Applicable, Y=Yes, N=No)

4.4	Have any beaming deflection plots been reduced to a zero datum line through points <i>R</i> and <i>F</i> to eliminate the contribution of jig movement etc. in absolute values?		Y	N
4.5	Have any angular deflections been similarly reduced by subtracting the rotation measured at the vehicle <i>fixed end</i> axle line from each absolute rotation value?		Y	N
5.	ACCEPTANCE CRITERIA			
5.1	Do the beaming deflections of the modified vehicle meet the acceptable criteria guidelines?		Y	N
5.2	Do the torsional deflections of the modified vehicle meet the acceptable criteria guidelines?		Y	N
5.3	Are the plots of the beaming and torsional deflections along the wheelbase of the modified vehicle to the satisfaction of the Signatory?		Y	N

Note: If the answer to any question is **No (N)**, the testing cannot be certified under Code LT1.

Vehicle Test Condition (tick appropriate box)

As originally manufactured

Post modification

(Pre-modification)

Design Details:

If the vehicle was tested in modified form, indicate Drawing Nos. to which it was constructed or the Signatory who certifies the design.

Design Approval (Signatory)

Signatory Employer (if applicable).....

Date of Design Approval:

Drawing / Design No:.....

[Continued overleaf]

CERTIFICATION DETAILS															
Make					Model					Year of Manufacture					
VIN															
Chassis Number (If applicable)															
Brief Description of Modification/s															
Vehicle Modified By															
Certificate Number (If applicable)															
Vehicle Certified By (<i>Print</i>)															
Signatory's Employer (If applicable)															
Signatory's Signature										Date					

LANE-CHANGE MANOEUVRE TEST

CODE LT2

SCOPE AND FIELD OF APPLICATION

The intent of these testing procedures is to subjectively determine the road holding ability and handling characteristics of vehicles that are required to be tested by other Sections of VSB 14. Testing is usually called for when vehicles are modified in such a way as to cause a significant change in the height of a vehicle's centre of mass, and/or a significant change in the longitudinal centre of mass, such that it affects the way a vehicle handles.

These tests are applicable only to vehicles with a Gross Vehicle Mass (GVM) up to and including 3.5 tonne.

The test must be carried out by an experienced test driver, who is required to produce a written report on the handling characteristics of the vehicle. Only when the owner can demonstrate prior experience as a test driver can he or she test his or her own vehicle. Since these are subjective tests, it is not sufficient for the driver to have negotiated the test successfully - the driver must also be confident that the vehicle was safe to drive.

The test procedure utilises the test track described in the following International Organization for Standardization (ISO), International Standard.

ISO Technical Report 3888-1:1999- Passenger cars - Test Track for a Severe Lane-Change Manoeuvre – Part 1: Double lane change test.

The procedure consists of driving a vehicle through a set track that simulates an emergency lane-change manoeuvre. The vehicle is driven from its initial lane to another lane (parallel to the initial lane), then returning to the initial lane. The length of each track section remains constant whilst the track width is a function of the test vehicle width.

The lane-change testing must be conducted under the guidance of a Signatory.

The lane-change track must be negotiated by skilled drivers with automotive road testing experience.

Copies of the ISO standard are available from Standards Australia or SAI Global.

1 TEST CONDITIONS

1.1 Lane-Change Track Dimensions

The dimensions of the track are specified in the appropriate ISO standard. Individual track segment length dimensions remain the same whilst track width varies according to the width of vehicle under test (refer Table LT2-1).

The overall length of the track must be 125m.

Table LT2-1 Track Segment Dimensions

Track Section	Length of Section (Metres)	Section Width (Metres)
1	15.0	1.1 x vehicle width plus 0.25
2	30.0	
3	25.0	1.2 x vehicle width plus 0.25
4	25.0	
5	15.0	1.3 x vehicle width plus 0.25
6	15.0	1.3 x vehicle width plus 0.25
Lane Offset 3.5 metres		

Note: *Vehicle width* means the overall width of the vehicle, but not including rear vision mirrors.

1.2 Marking of the Lane-Change Track

The lane change track must be marked with cones complying with Figure LT2-1 and placed at the points specified in Figure LT2-2. The track limits must be tangential to the base circles of the cones.

The measuring distance for calculating average speed starts at the beginning of track section 1 and finishes at the end of track section 5 (refer to Figure LT2-2 for location of track sections).

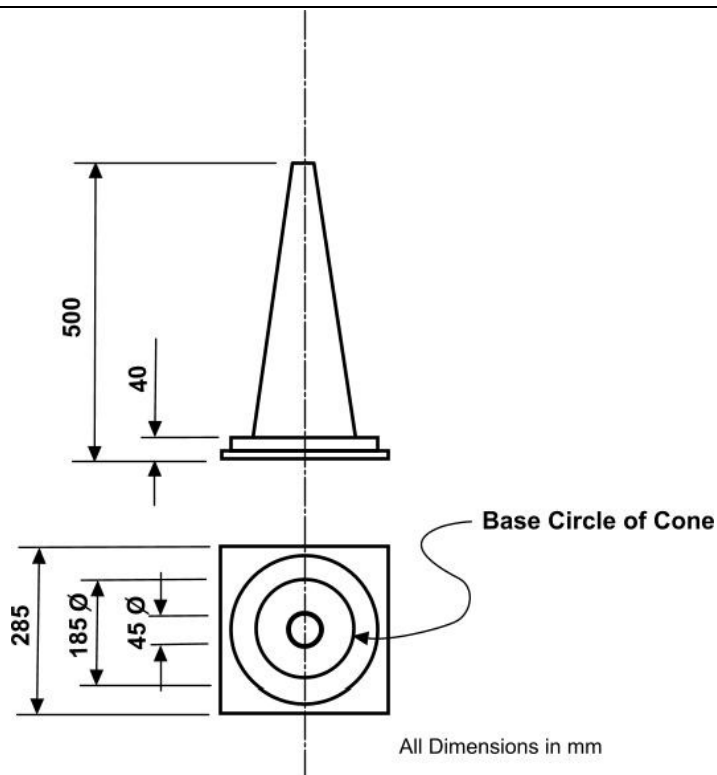


Figure LT2-1 Cones used for lane change delineation

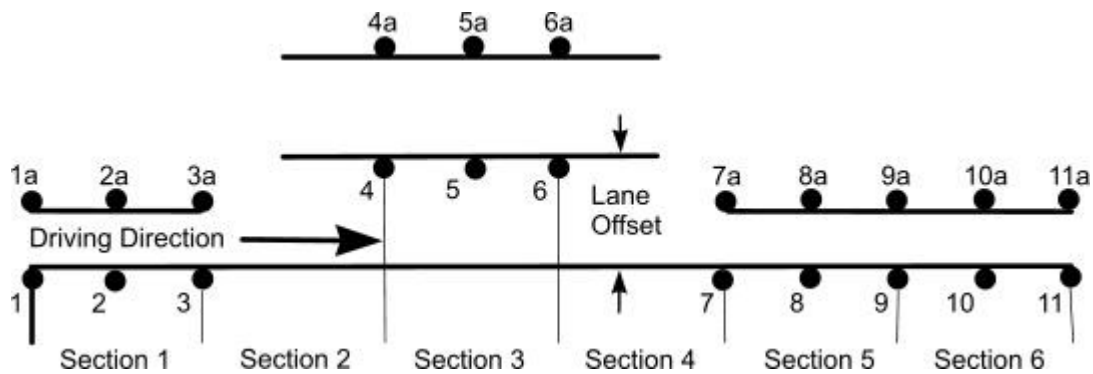


Figure LT2-2 Placement of cones for marking the lane change track

1.3 Track Surface

The surface must be sealed, dry and as hard and as planar as possible.

The test surface must be free of loose material and must have anti-skid properties of sufficient value to prevent the vehicle from skidding during the test.

Longitudinal deviation from horizontal must not be more than 1 degree.

Transverse deviation from horizontal must not be more than 2 degrees.

1.4 Ambient Conditions

Wind speed must not exceed 3 m/s (11 km/h).

1.5 Vehicle Test Tare Mass

The test vehicle must be equipped with all optional equipment that is likely to increase the tare mass of the vehicle. The vehicle must also have full complements of:

- Lubricants;
- Coolant (if needed);
- Washer fluid; and
- Fuel (tank to be filled to at least 90% of the capacity specified by the manufacturer).

If offered as standard equipment, the following equipment must also be included in the vehicle:

- Spare wheel;
- Fire extinguisher;
- Wheel chocks; and
- Standard tool-kit.

The mass of a vehicle equipped as described above, is the **test tare mass**.

Note: For convenience of testing or in cases where an item of standard equipment is missing, an equivalent mass may be used in place of a missing item – e.g. a spare tyre and rim weighing 20 kg may be replaced with a 20 kg sand bag provided it is located in the spare wheel well during testing.

1.6 Test Mass

The vehicle must be tested under both loading conditions described in 1.6.1 and 1.6.2 below, unless the Signatory is able to provide evidence that one test is sufficient.

In no case must the permissible axle loads be exceeded.

Masses must be placed in such a way so as not to substantially alter the vehicle's moment of inertia around the vertical axis.

1.6.1 Vehicle Test Mass 1

The *test tare mass* plus the mass of the driver. To meet this requirement the driver must weigh at least 68 kg. In the case where the driver's mass is less than 68 kg, additional mass must be added to account for the difference in mass between the driver's actual mass and 68 kg.

1.6.2 Vehicle Test Mass 2

For passenger vehicles:

As per *Vehicle Test Mass 1*, plus:

- 68 kg x number of seats in the passenger compartment, and
- 13.6 kg x number of seats, uniformly distributed over the luggage compartments.

Loading of the passenger compartment must be such that wheel loads obtained correspond to wheel loads obtained with loading each seat with 68 kg at its *H* point. Masses used for loading may be placed on the passenger compartment floor.

For goods carrying vehicles:

As per *Vehicle Test Mass 1* plus sufficient ballast, uniformly distributed over the goods carrying area, to load the vehicle to its GVM.

1.6.3 Security of Test Mass

The *vehicle test mass* and any additional test mass used in conformity with sub-section 1.5 must be well secured so that there is no likelihood of any part of the load moving while the vehicle is being tested. Items required to be left in the vehicle by sub-section 1.5 must also be safely stowed or restrained.

Any other loose items within the vehicle, including the boot, that are not essential to the test must be removed from the vehicle before testing commences.

1.7 Tyre Specifications and Condition

The tyres used during the test must be the tyres specified in the application to modify the vehicle. The tyres must be inflated to the recommended tyre pressure for the vehicle under test and must be checked before undertaking the test.

1.8 Vehicle Condition

The vehicle must be thoroughly checked and found to be roadworthy before it is subjected to the lane change test. Particular attention must be paid to the condition of brakes, tyres, steering and wheel alignment. The vehicle must not undergo testing until any faults that are found are satisfactorily repaired.

2 TEST PROCEDURES

2.1 Vehicle Pre-Conditioning

Prior to commencing the test, the subject vehicle must be driven by the test driver to assess whether the vehicle displays any unsatisfactory characteristics and for the driver to familiarise himself/herself with the vehicle and its controls.

At this stage the test driver may refuse to drive the vehicle through the test track if the test driver is not satisfied that the vehicle is in a suitable condition.

2.2 Test

The test must be conducted by an experienced and skilled driver (the *test driver*).

To ensure the safety of all concerned, the driver should commence testing at a speed not exceeding 80 km/h. Test speeds can then be incrementally increased up to the *maximum test speed* as the *test driver* and Signatory deem it safe to do so. The test speed increments must not exceed +5 km/h.

Maximum test speed must be the lowest of the following:

- 110 km/h +/- 3 km/h for all MA vehicles and all passenger cars; or
- 100 km/h +/- 3 km/h for all other vehicles; or
- the maximum speed the vehicle is allowed to be driven either by a limitation in regulation, condition of registration, condition of permit or posted speed limit for the vehicle in question.

A Registration Authority may set a lower speed for a specific vehicle where the design, construction or use of the vehicle warrants special consideration.

The vehicle must be driven through the lane-change track according to the following conditions:

- The vehicle must be driven into the designated test track at the maximum test speed for the vehicle and the exit speed must be stated in the test report;
- Over the test course the throttle position should be held as steady as possible and the gear position engaged during the test must be stated in the test report; and
- A successful pass through the lane-change track requires that none of the cones be displaced during the test.

3 SUBJECTIVE ASSESSMENT

Further to the above test, a subjective report assessing the overall handling characteristics of the subject vehicle must be prepared by the *test driver*. The assessment must include the general handling of the vehicle up to legal speed limits, not just its performance in the lane change test.

The *test driver* must consider the degree of difficulty encountered in achieving a successful pass through the lane-change track and may recommend that the vehicle fails the test even though the vehicle may have been driven through the test track at the maximum test speed if the *test driver* considers the vehicle was difficult to control during the test and would be unsafe in the hands of a driver who is not an experienced test driver.

CHECKLIST LT2

LANE-CHANGE MANOEUVRE TEST

CODE LT2

(N/A=Not Applicable, Y=Yes, N=No)

1.	TESTING CONDITIONS			
1.1	Has the vehicle been tested on a lane change track with the dimensions and gradients complying with the requirements outlined in sub-section 2 <i>Testing Conditions</i> ?		Y	N
1.2	Has the vehicle been tested with the mass of the vehicle complying with the requirements outlined in sub-section 1.6 <i>Test Mass</i> ?		Y	N
2.	TEST PROCEDURES			
2.1	Has the vehicle been tested in accordance with the test procedures outlined in sub-section 2 <i>Test Procedures</i> ?		Y	N
3.	ASSESSMENT			
3.1	Did the vehicle successfully complete the course without dislodging any cones?		Y	N
3.2	Was the driver satisfied the vehicle was safe to drive?		Y	N
3.3	Has an assessment report been prepared?		Y	N

Note: If the answer to any question is **N (No)**, the testing cannot be certified under Code LT2.

[Continued overleaf]

CERTIFICATION DETAILS																
Make						Model						Year of Manufacture				
VIN																
Chassis Number (If applicable)																
Brief Description of Modification/s																
Vehicle Modified By																
Certificate Number (If applicable)																
Vehicle Certified By (<i>Print</i>)																
Signatory's Employer (If applicable)																
Signatory's Signature											Date					

EXHAUST EMISSIONS - IM240 TEST

CODE LT3

SCOPE

This section outlines a procedure and its minimum requirements for testing gaseous emissions of motor vehicles that, according to their date of manufacture and Australian Design Rule (ADR) category, are required to comply with ADR 37/00 or later. It applies to vehicles that are fitted with modified engines or to vehicles fitted with engines that have not been certified to the ADR applicable to the modified or individually constructed vehicle.

This Code does not apply to after-market suppliers of engine management systems, turbochargers, superchargers and other equipment that may affect a vehicle's compliance with the ADRs and who may wish to obtain type approval for their products. Suppliers of this equipment will need to carry out the appropriate ADR emission tests applicable to the vehicle's date of manufacture and ADR category.

GENERAL REQUIREMENTS

The procedures for conducting the emission tests are outlined in the IM240 Test Procedures. These procedures are complex and are held by the test providers.

IM240 test reports will only be accepted from organisations or agencies that are endorsed by Department of Infrastructure and Transport (DIT), NATA certified or otherwise approved by a Registration Authority in Australia.

SPECIFIC REQUIREMENTS

The vehicle must not exceed the maximum gaseous emission levels specified below: The emission ADRs to which a vehicle must comply are listed in the ADR applicability tables in Section LO.

Note: ICV builders must consult the jurisdiction in which they intend to register their vehicle for additional information with respect to emission requirements and the date of manufacture that the jurisdiction will determine for that particular vehicle.

For vehicles required to comply with the Second Edition ADR 37A

- Emission levels as specified in ADR 37.

For vehicles required to comply with the Third Edition ADR 37/00

- Emission levels as specified in ADR 37/00.

For vehicles required to comply with the Third Edition ADR 37/01 and later emission ADRs.

- Emission levels as specified in ADR 37/01.

APPENDIX F SUMMARY OF EMISSION REQUIREMENTS FOR NEW LIGHT VEHICLES IN AUSTRALIA

Appendix F of Section LZ *Appendices* provides, for information purposes, a comprehensive summary of emission requirements for new light vehicles in Australia.

CHECKLIST LT3
EXHAUST EMISSIONS - IM240 TEST
CODE LT3

(N/A=Not Applicable, Y=Yes, N=No)

1.	TESTING EQUIPMENT			
1.1	Is the test facility a <i>recognised test facility</i> ? (I.e. Recognised by either the DIT, NATA or a Registration Authority).		Y	N
2.	TESTING			
2.1	Has the engine been tested in accordance with the requirements outlined in the IM240 test procedures?		Y	N
3.	RESULTS			
3.1	Are the results within those required for the vehicle according to its ADR category and date of manufacture?		Y	N
4.	MARKING and TAMPER-PROOFING			
4.1	Are there No visible indications that the vehicle's emission equipment as supplied by the manufacturer have been removed or tampered with?		Y	N

Note: If the answer to any question is **N (No)**, the testing cannot be certified under Code LT3.

[Continued overleaf]

CERTIFICATION DETAILS																
Make						Model						Year of Manufacture				
VIN																
Chassis Number (If applicable)																
Brief Description of Modification/s																
Vehicle Modified By																
Certificate Number (If applicable)																
Vehicle Certified By (<i>Print</i>)																
Signatory's Employer (If applicable)																
Signatory's Signature											Date					

NOISE TEST

CODE LT4

SCOPE

This Section outlines procedures and minimum requirements for testing noise emissions of motor vehicles using stationary noise tests. It applies to both modified and individually constructed vehicles as specified in other Sections of VSB 14.

GENERAL REQUIREMENTS

The procedures for conducting the stationary noise test are contained in the National Transport Commission (NTC) document: *National Stationary Exhaust Noise Test Procedure for In-Service Motor Vehicles* published in September 2006 - ISBN: 1 921168 50 1 (referred to hereinafter as the *Noise Test Procedure*).

These test procedures have been endorsed by the Australian Transport Council and the National Environment Protection Council. They are specified by Regulation in Division 3 *Noise emissions* of the Australian Vehicle Standard Rules 1999. They now contain test procedures for both:

- vehicles manufactured to ADR 83/00 *External Noise*; and
- pre ADR 83/00 *External Noise* vehicles.

The *Noise Test Procedure* may be downloaded from the NTC website. The following links provide a simple pathway to the document.

<http://www.ntc.gov.au/DocView.aspx?DocumentId=1392>

COMPLIANCE WITH IN-SERVICE REQUIREMENTS FOR ALL VEHICLES

Vehicles must not exceed the maximum noise levels specified in the Australian Vehicle Standard Rules for the ADR category of the vehicle and its date of manufacture.

VEHICLES MANUFACTURED TO ADR 83/00 SPECIFICATIONS

The stationary noise level of a motor vehicle that is certified to ADR 83/00 must not exceed, by more than 5 dB(A), the noise level that is established for the motor vehicle when it is certified.

Stationary Signature Noise Data for individual vehicle make and models can be accessed on the following Department of Infrastructure and Transport website:

<http://www.infrastructure.gov.au/roads/environment/noise.aspx>

CHECKLIST LT4
NOISE TEST
CODE LT4

N/A=Not Applicable, Y=Yes, N=No)

1.	TESTING EQUIPMENT			
1.1	Has testing been completed in conformity with the <i>National Stationary Exhaust Noise Test Procedure for In-Service Motor Vehicles (Noise Test Procedure)</i> ?		Y	N
1.2	Does the sound level meter comply with the requirements outlined in Section 2 <i>Measuring Instruments</i> of the <i>Noise Test Procedure</i> ?		Y	N
2.	TEST SITE			
2.1	Is the background noise level at least 10dB (A) below the noise level being measured?		Y	N
2.2	Does the test site comply with the requirements outlined in Section 3 <i>Test Site Ambient Requirements</i> of the <i>Noise Test Procedure</i> ?		Y	N
3.	TEST			
3.1	Does the microphone positioning comply with the requirements outlined in the relevant <i>Microphone Position</i> section of the <i>Noise Test Procedure</i> ?		Y	N
3.2	Has the noise level been measured in accordance with the requirements outlined in the relevant <i>Vehicle Operation and Noise Measurement</i> section of the <i>Noise Test Procedure</i> ?		Y	N
4.	RESULTS			
4.1	Is the measured noise level less than the maximum level specified in the Australian Vehicle Standard Rules for the vehicle under test?		Y	N

NOTE: If the answer to any question is **N (No)**, the test cannot be certified under Code LT4.

[Continued overleaf]

CERTIFICATION DETAILS															
Make						Model					Year of Manufacture				
VIN															
Chassis Number (If applicable)															
Brief Description of Modification/s															
Vehicle Modified By															
Certificate Number (If applicable)															
Vehicle Certified By (<i>Print</i>)															
Signatory's Employer (If applicable)															
Signatory's Signature										Date					