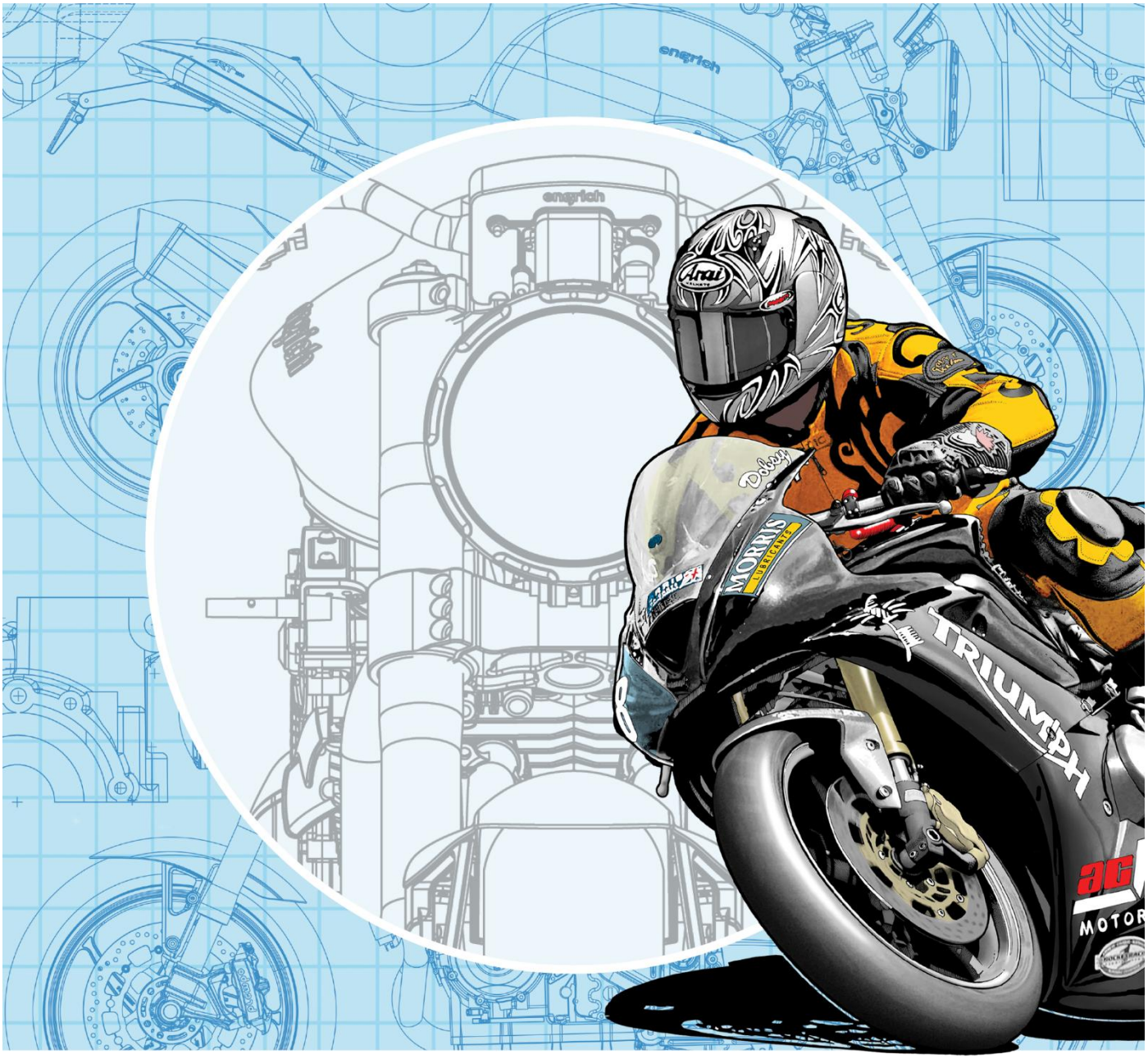
Low Volume Vehicle Technical Association (inc)

Helping New Zealanders Build & Modify Safe Vehicles

New Zealand Motorcycle Construction Manual

Chapter 15
Glazing & Vision

Version 1 | Effective from 1 January 2026



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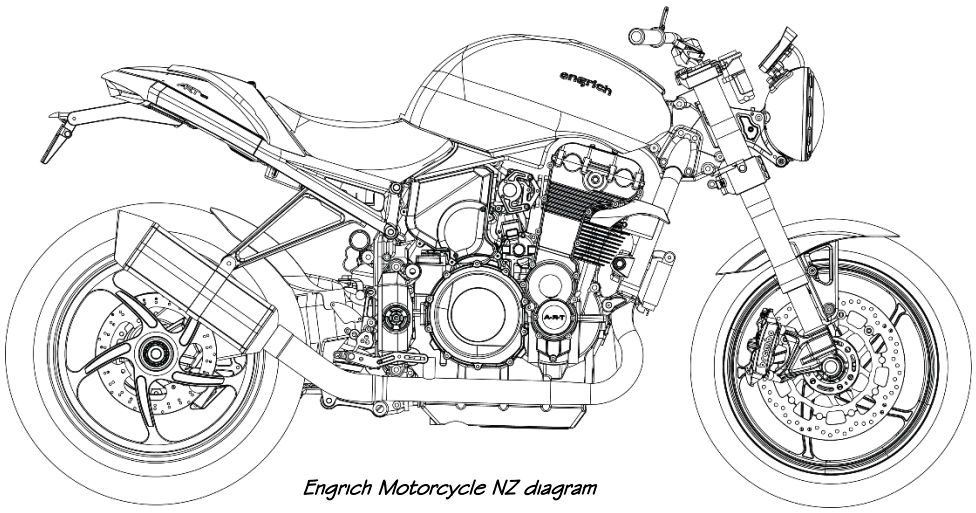

Engrich Motorcycle NZ diagram

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

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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

This chapter is printed and distributed by LVVTA, and is available to the public free of charge from the LVVTA website; www.lvvta.org.nz

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 145-65: Glazing & Vision - Motorcycles*, 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 6: 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).

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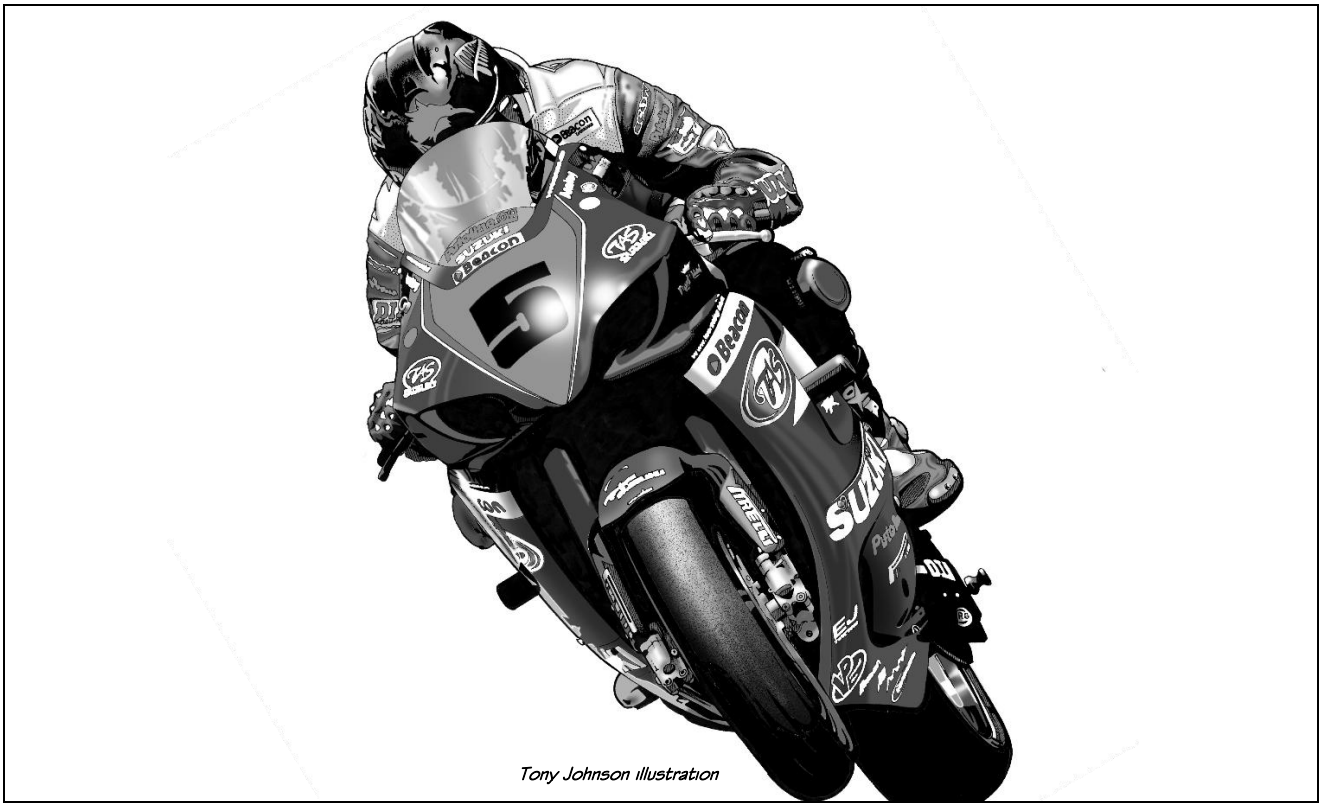

Tony Johnson illustration

CHAPTER 15: GLAZING & VISION

Introduction

The purpose of this chapter is to specify the requirements for glazing, whether the motorcycle is fitted with a wind deflector or a glass windscreen, to ensure optimal forward vision, and also requirements for rear vision.

Note that the requirements in this chapter do not apply to unmodified wind deflectors, windscreens, and rear-view mirrors attached in their original location using the original mounting systems.

Note also that additional helpful information and guidance on the subjects contained in this chapter can be found within *Chapter 15: Glazing & Vision* of the *New Zealand Car Construction Manual (CCM).*

Italics are used throughout this chapter when referencing '*external documents*' that are not part of this chapter.

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

15.0 Requirements Applicable to all Motorcycles

15.0.1

A motorcycle must:

(a) be designed and constructed using materials and components that are fit for their purpose; and

(b) be safe to be operated on the road.

15.0.1

This is from *2.3* of *Part 2* of the *Low Volume Vehicle Code* (slightly amended for clarity), which makes it clear that, regardless of what technical requirements are or are not in place, every vehicle certified to the *LVV Code* must be fit for its purpose, and must be safe.

15.0.2

A motorcycle must comply with the following general safety requirements:

(a) glazing must be mechanically sound, strong, and securely affixed to the motorcycle; and

(b) glazing must not be manufactured with, or modified to have, a mirrored effect sufficient to dazzle other road users; and

(c) a windscreen must be kept clean and free of obstruction to ensure that the rider has sufficient vision through the glazing to operate the motorcycle safely; and

(d) a windscreen must not have scratches or other defects that unreasonably impair the rider's vision through the glazing, or that compromise the strength of the glazing; and

(e) a laminated windscreen must not show signs of discolouration that could unreasonably impair the rider's vision through the glazing; and

(f) overlays must not have any bubbling or other defects that could unreasonably impair the rider's vision through the glazing; and

(g) the overall visible light transmittance of a windscreen must not be less than 70%.

15.0.2

These are the applicable general safety requirements from the *Land Transport Rule 32012 Glazing, Windscreen Wipe and Wash, and Mirrors* (slightly amended for clarity), which are required as part of this chapter, and are reproduced here in the interest of convenience.

Glazing Requirements

15.1 Wind Deflectors

15.1.1

A wind deflector fitted to a motorcycle must:

(a) if in the rider's field of vision, be constructed from a non-shattering transparent acrylic or polycarbonate material; and

(b) be securely attached; and

(c) be provided with a radius on all corners and edges of no less than 3 mm.

15.1.1

See the Terms & Definitions section at the back of this chapter for information about acrylic and polycarbonate materials.

15.1.2

A wind deflector fitted to a motorcycle must not:

(a) inhibit steering or suspension movement; or

(b) interfere with any vehicle controls over the full range of steering movement.

15.2 Windscreens

15.2.1

A glass windscreen fitted to a motorcycle must:

(a) be manufactured from approved automotive laminated safety glass which meets the requirements for glazing specified in *CCM Chapter 15: Glazing & Vision*; and

(b) incorporate full edge framing, which is either:

(i) provided with a radius on all corners and edges of no less than 3 mm; or

(ii) covered in a high-density energy-absorbing material of no less than 10 mm thickness.

15.2.1

Detailed information on glazing standards, and the relevant markings, can be found in *CCM Chapter 15: Glazing & Vision*.

It is recognised that the use of a glass windscreen on a motorcycle is unusual, however it does occur on occasion, usually in relation to scratch-built motorcycles.

15.3.1

In particular, additional equipment such as handlebars and sidecar bodies should not obstruct the view of the rider.

Vision Requirements

15.3 Forward Vision

15.3.1

A motorcycle must be designed and constructed so as to provide to the rider a clear view to the front and both sides of the motorcycle from the normal riding position.

15.4 Windscreen Wipers and Washers

15.4.1

A motorcycle which was constructed after 1 July 2000, and is fitted with a windscreen, must be fitted with:

(a) a windscreen wiping system; and

(b) a windscreen washing system.

15.4.2

A windscreen wiping system fitted to a motorcycle must:

(a) be of an efficient and electrically operated type; and

(b) be capable of keeping an adequate area of the windscreen clean and clear so as to enable the motorcycle to be safely operated in adverse weather conditions.

15.4.1 and 15.4.2

A 'windscreen' is defined in the Terms and Definitions section at the back of this chapter.

It is recognised that the need for windscreen wipers on a motorcycle is unusual, however it does occur on occasion, usually in relation to 'cabin-style' scratch-built motorcycles.

Further information on windscreen wiping and washing systems can be found in:

- the Useful Information section at the back of this chapter; and
- *CCM Chapter 15: Glazing & Vision.*

15.5 Rearward Vision

15.5.1

A motorcycle must be fitted with not less than one rear-view mirror.

15.5.2

A rear-view mirror fitted to a motorcycle must:

(a) be of such dimensions as to:

(i) be capable of reflecting to the rider as far as practicable, a clear view of the road to the rear of the motorcycle, and of any approaching or overtaking vehicles; and

(ii) not unreasonably obstruct the rider's forward vision;

and

(b) be securely attached; and

(c) be adjustable, and able to maintain its adjusted position; and

(d) be mounted so as to minimise the rider's vision through the rear-view mirror being obscured by vibration; and

(e) incorporate secure bonding of the glass to the mounting surface.

15.5.2(d)

A high level of vibration may be present on a motorcycle, with consequential effect on the rider's vision through the mirror.

Other Requirements

15.6 Fasteners

15.6.1

All fasteners incorporated within a glazing and vision system on a motorcycle must meet all fastening requirements specified from *18.2* to *18.6* in *MCM Chapter 18: Attachment Systems.*

15.7 Welding

15.7.1

All welding incorporated within a glazing and vision system on a motorcycle must meet all welding requirements specified in *18.7* and *18.8* in *MCM Chapter 18: Attachment Systems.*

Exclusions

No exclusions apply to this chapter.

Useful Information

Windscreen Wipers on Motorcycles

While windscreen wipers might seem as relevant to motorcycles as seatbelts or ashtrays, there are actually cases where a two-wheeled vehicle is fitted with a windscreen.

The law of the land (in this case, the *Land Transport Rule: Glazing, Windscreen Wipe and Wash, and Mirrors 1999*) states that where a vehicle is fitted with a windscreen, it must have a windscreen wiping system. Therefore, if (after 1 July 2000) a motorcycle is constructed with, or retrofitted with a windscreen, it needs to meet requirements for wiping and washing. These are not as complex as those for a car, but the same principles apply – the wiping system needs to function effectively and provide an adequately swept area for the rider to see through.

The reality however is that most glazing on a motorcycle will be classed as a 'wind deflector' rather than a 'windscreen'. A wind deflector is something the rider looks over, rather than through. So, unless it is impossible for the rider to look over the glazing rather than through it, it will be classed as a wind deflector. Realistically, this means 'cabin bikes' are about the only situation where a motorcycle would have a windscreen (and so would need a windscreen wiping and washing system).

Vision and Handlebars

The riding position of a motorcycle needs to provide the rider with a good forward view. This isn't usually such an issue on an off-road or sports bike, as the rider tends to sit either upright or hunched forward. However, on a cruiser-style bike like most Harley Davidsons, because the rider is usually sitting lower and further back, tall handlebar risers can adversely affect forward vision. With bikes modified in the chopper stye, this riding position is often exaggerated for aesthetic effect – the seat is lowered further, and the handlebars raised or frame extended upward. The amount of rake the bike has can also influence this – increasing the diameter of the front wheel can significantly increase the amount of rake a bike has.

Tubular risers are a better option in this scenario, as (in simple terms) a rider can still see through the middle of the riser, between the tubes. However, care needs to be taken with the amount of leverage on the attachment points and triple tree caused by the increased height of the handlebars.

More information about handlebars and riser construction can be found in *MCM Chapter 7: Steering Systems*.

Terms & Definitions for Chapter 15

Acrylic	in relation to glazing, is a clear plastic material with low impact-resistance, and which, upon impact, break into shards. It is not scratch-resistant, but can be coated to resist scratching. Impact-modified acrylic has much better impact-resistance than normal acrylic, and has the advantage over polycarbonate that it can be polished to remove scratches.
Aftermarket	means a component or system made by a manufacturer, other than a high-volume motor vehicle manufacturer, who produces catalogued components or systems on a production-run basis for the mass-market.
CCM	(*NZ Car Construction Manual*) means LVVTA's detailed technical standards, incorporated by reference under the *LVV Code*, which must be met to enable an LVV to comply with applicable requirements. The *CCM* is referred to by the corresponding *LVV Standard*.
Crush-tube	means a section of non-compressible material that is positioned within a cavity, through which a fastener passes, to prevent collapsing of the material surrounding the cavity, and consequential loosening of the fastener.
Custom	means a component or system fabricated by an individual person or small company on a one-off or limited-run basis, and is not intended as a high volume catalogued aftermarket part.

Full edge framing	means a form of protection fitted around a piece of glazing to cover a sharp edge, usually in the form of a plastic or rubber moulding.
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.
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 Standards	(*Low Volume Vehicle Standards*) means LVVTA's technical standards, incorporated by reference under the *LVV Code*, that set out the legal requirements which vehicles that are modified and scratch-built vehicles in New Zealand must meet. Each *LVV Standard* refers to a corresponding *CCM chapter* or *MCM chapter* for detailed technical requirements.
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*.
LVVTA TAC	(LVVTA Technical Advisory Committee) is an LVVTA-appointed panel of industry expert-level technical specialists, established to provide LVVTA with a very high level of technical support and direction on all technical matters relevant to the LVV certification system.
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.
MCM	(*NZ Motorcycle Construction Manual*) means LVVTA's detailed technical standards, incorporated by reference under the *LVV Code*, which must be met to enable an LVV to comply with applicable requirements. The *MCM* is referred to by the corresponding *LVV Standard*.
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*.
NZTA	(New Zealand Transport Agency) is a Crown entity responsible for managing New Zealand's land transport system.
OE	is an abbreviation for 'original equipment', which, in this context, are the parts and equipment used in the assembly process of a mass-produced vehicle.
OEM	is an abbreviation for 'original equipment manufacturer', which, in this context, is a company that produces parts and equipment used in the assembly process of a mass-produced vehicle.
Polycarbonate	in relation to glazing, is a hard clear plastic material with high impact-resistance, which does not break into shards. It is not scratch-resistant, but can be coated to resist scratching.
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.
Wind deflector	means a piece of glazing that, while the rider is seated in the normal riding position and viewing the road ahead, the rider looks over, rather than through.
Windscreen	means a piece of glazing that, while the rider is seated in the normal riding position and viewing the road ahead, the rider looks through, rather than over.