

Re-issue of 3 Amended Low Volume Vehicle Standards

Introduction:

This Information Sheet is intended to summarise a number of changes made to 3 low volume vehicle standards (standards) which have recently undergone an amendment process. These standards have been amended in the same way as the 13 standards that were amended during June 2016 and issued with LVV Information Sheet # 02-2016 in July 2016.

As with the first 13 standards re-issued in July, there is little in the way of new information or requirements contained within the amended standards, as the primary focus of the amendment process has been to incorporate any existing requirements that have been introduced over recent years within other documents (such as LVV Newsletters and LVV Information Sheets) into the standards in order to ensure that the standards themselves incorporate all current requirements.

An overview is provided below of the changes to each standard. You will note that each standard has been updated in terms of formatting and standardised headings and sub-headings, so as to be consistent with the current look and content of the latest standards.

There are also some standardised note-boxes included (which have been incorporated within more recent standards) which apply to all 3 standards, along with a Terms and Definitions section, and an Associated Information section at the front which provides guidance to users about where other relevant information can be found.

Standardised changes to all 3 amended Low Volume Vehicle Standards:

A number of changes have been made that are common to all 3 standards, which are explained as follows.

Amendment Record table

You will notice on the cover page of each amended standard, that a table has been provided to record the amendment dates and version numbers that have been applied to the standard. This is for the purpose of maintaining clear records of the amendment history of each standard.

One of the ways in which this could be helpful to LVV Certifiers and the public is to show which version of a standard was in force at the time that a vehicle was modified; - because the requirements change from version to version, the requirements that apply to a vehicle may vary dependent on modification date.

Associated Information table

On page 2 of each standard, a table is provided that identifies any associated reference material that should be read in conjunction with the standard. This is in the interests of ensuring that users of the standards are aware of, and have access to, any other information that may be useful in gaining a full understanding of the subject matter relating to the particular standard, and how it might apply to their project.

Tracking of amendments

LVV Certifiers should note that all changes that have been made to each standard during the amendment process have been highlighted (this will show up as grey shade in the hard copies mailed to LVV Certifiers as part of their LVV Certification Manual updates, and they will show as yellow highlight when viewed on-line).

You will notice that some amendments have a grey vertical stroke in the adjacent left-side margin, and that some amendments do not have this grey stroke. The difference is this; - those amendments which are more of a minor correction or formatting nature will not have the grey stroke, whereas those amendments which are of a technical or reference nature, or are considered important for LVV Certifiers to be aware of will have the grey vertical stroke.

These more minor amendments (without the grey vertical stroke) will have no fundamental impact on the LVV Certifiers' inspection and assessment processes.

Scope and application section:

All standards have been amended to bring the arrangement of the scope and application section into line with current thinking on how this should be presented. There is more change to older standards than more recent ones.

Application note-box:

A standardised note-box is provided at the end of the application section of each standard to make it clear that an LVV Certifier must consider and apply what is relevant, dependent on the relationship between the effect date of the standard and the date of the modifications. This has been applied more to older standards.

General Safety Requirement note-box:

An addition is made at the end of the note-box after 2.1(1) (General Safety Requirements) to reinforce that the LVV Code specifies that every vehicle certified to the Code must be fit for its purpose and safe, regardless of what technical requirements are in place.

Vehicles not covered by this standard:

In all standards, sub-section 4.1 'vehicles not covered by this standard' details that vehicles used for law enforcement or emergency services are not required to be certified to the Low Volume Vehicle Code.

Vehicles that pre-date legal requirements:

For most of the amended standards, within sub-section 4.2 'vehicles that pre-date legal requirements', explanation is provided that the allowance for certification not being necessary is dependent on the modifications not having been further changed.

Modifications that do not require certification:

Additions have been made to sub-section 4.3 'modifications that do not require certification' to clarify the various situations where vehicles are not required to be certified, and aligns those situations with the LVVTA

Modification Threshold Schedule and the relevant Modification Tables within the NZTA Vehicle Inspection Requirements Manual.

Specific changes to the 3 Low Volume Vehicle Standards:

A number of changes and updates have been made to each of the 3 standards, specific to each standard, and these are summarised as follows:

LVV Standard 195-00(01) Suspension Systems:

2.1(2): A new general safety requirement is copied from the Land Transport Rule to replace the previous GSR which was copied in from the relevant Transport (Vehicle Standards) Regulation 1990.

2.2(1): Clarification that the NZ Hobby Car Technical Manual must be referred to if a suspension modification is beyond the scope of the standard.

2.2(3): Includes an addition to give LVV Certifiers guidance on what is considered acceptable in terms of a minimum distance that suspension should extend from static ride height when the vehicle is jacked. This has been requested by a number of LVV Certifiers.

2.2(6): An additional paragraph is added to cover lever-actuated brake bias controls (when a vehicle is raised or lowered), bump-steer geometry, and ensuring that sufficient drive-shaft yoke is engaged into the gearbox during the full range of suspension travel.

2.2(7): Two new sub-paragraphs are added in regard to bump-stops, to give guidance on ensuring that bump-stops prevent suspension travel to the extent of introducing ball-joint bind or over-extension, or contact between the vehicle underside and the road.

2.2(8): An additional sub-paragraph has been added to ensure that drive-shaft universal angularity limitations are not exceeded as a result of too much suspension travel.

2.2(9): An additional sentence has been added to this geometry requirement to exclude motor sport vehicles.

2.2(10): Addition of a paragraph to cover negative camber limits. An associated Note reminds LVV Certifiers that they do not have to require a wheel alignment report if 1.5 degrees is not exceeded.

2.2(11): Wheel- offset maximum has been changed from 20% to 35% to align with the Wheel & Tyre Standard.

2.2(12): New paragraph to require some method of damping road shock through each wheel, and to control spring energy.

2.2(13): New paragraph to require compatibility between shock absorbers and springs, and the shock absorbers and vehicle weight and intended use.

2.2(14): Provides better defined option for progressive rate springs when a spring is shorter than OEM.

- 2.2(15): Addition to existing paragraph to require that a coil spring cannot achieve coil bind before suspension achieves full compression.
- 2.2(20): Specifies referral to Hobby Car Technical Manual if a spring is electroplated.
- 2.2(21): Specifies that any modification to a leaf spring (except for adding and removing leaves) must be done by an industry expert.
- 2.2(22): Specifies that a leaf spring cannot be certified if fitted upside down.
- 2.2(23): Introduces a new requirement for the reinforcement of any leaf spring shackle pin set that exceeds 150 mm in length.
- 2.2(25): Addition of good practice requirements for spacer blocks (as fitted with leaf springs).
- 2.2(26): Addition of good practice requirements for over-ride airbags when added to support leaf springs.
- 2.2(27): Requirement for height adjustable struts in relation to attachment, and locking devices.
- 2.2(28) to 2.2(29): These two paragraphs set out best practice requirements for when OE suspension struts are modified by way of conversion to a height-adjustable platform system.
- 2.2(30): New requirement around fasteners used to attach aftermarket geometry-adjustable struts, including a Note to clarify the relation on vibration-proof fasters when attaching top camber plates to strut towers.
- 2.2(31) and 2.2(32): New requirements relating to aftermarket suspension arms, which differentiate between known and reputable brands, and unknown brands.
- 2.2(33): Covers important requirements relating to ball-joints, in particular to ensure that a load-bearing ball-joint is in fact designed to support the corner weight of a vehicle.
- 2.2(34): The section covering spherical rod-ends has been copied from the Hobby Car Technical Manual into the standard due to the frequency with which these are appearing on main-stream modifications.
- 2.2(35): The section covering bushed rod-ends has also been copied in from the Hobby Car Technical Manual into the standard, again because of the frequency with which these are appearing on main-stream modifications.
- 2.2(36): Requirements are included to ensure that aftermarket stub axles – typically ‘dropped spindle’ style of stub axles (which are now common on main-stream modifications) - meet best-practice standards.
- 2.2(37): References Chapter 18 Attachment Systems of the Hobby Car Technical Manual for any welding undertaken.
- 2.2(38): References Chapter 18 Attachment Systems of the Hobby Car Technical Manual for any non-OEM fasteners used.
- 2.2(39): References Chapter 6 Suspension Systems and Chapter 7 Steering Systems of Hobby Car Technical Manual where any modifications exceed the scope of the standard.

2.3(4): A new paragraph requires that a vehicle fitted with adjustable damping shock absorbers must be tested in its firmest setting (with an exception for motor-sporting vehicles issued with an LVV Authority Card). Note that while this requirement is new for the LVV standard, it has been a form-set requirement for some time.

2.3(6): Although not a new requirement, this paragraph reflects the required practice of measuring suspension heights, and a diagram has been provided to show how the measurement is taken.

3.1(1): An exclusion has been provided for motor sport vehicles from having to meet the specified camber limitations.

3.1(2): An exclusion has been provided for motor sport vehicles from the requirement to be road-tested at the firmest available shock absorber setting.

LVV Standard 175-00(02) Seatbelt Anchorages:

1.1: Provides change to Scope section to align with current standards format.

1.1: Includes LE class to introduce seatbelt requirements agreed at trike workshop (actual requirement for seatbelt types haven't been added in)

1.2: Changes numbering to 1.2 for the 'application of this standard' to align with current standards format, and expand note-box to match other standards.

1.2(3): Adds the HCTM as an alternative method of compliance, and updates disability standard reference.

1.3(1): Expands out to clarify the meaning of each section.

1.3(3): Changes the name of the Land Transport Rule to correct terminology.

1.3(4): Note-box change under 'alternative systems proven by calculation' points out that prior agreement with LVVTA is required for any alternative methods of proof.

2.1: Changes to note-box under 2.1(2) to clarify direction of pull forces.

2.1(4): Change to clarify that vehicle structure can be strengthened where two anchorages are close together.

2.2(2): Changes the name of the Land Transport Rule to correct terminology.

2.2(2): Note box change to clarify that the requirements for which seatbelt type is to be fitted are complex and so are not listed here, but are available within the In-service VIRM, with some additional requirements in the HCTM.

2.2(4): Note-box clarification on damage; and general safety requirements update to exactly match the latest version in the NZTA seatbelt rule.

2.3(1): Clarification on wording of original seating position; change 'body frame' to the more widely known name of 'Body H-Frame'; and updated diagram from Hobby Car Technical Manual.

2.3(2): Changes to measurement of upper anchorage position to align with Hobby Car Technical Manual; plus updated diagrams from Hobby Car Technical Manual.

2.3(2): Note-box reinforces the importance of upper anchorage positioning, plus clarification of drop hanger measurement, and reference to Hobby Car Technical Manual for older vehicles.

2.3(3): Clarification of wording of original seating position; removal of ability for scratch-built vehicle upper anchorages to be 'as close as practicable' (they must be within permitted area); and a note-box reinforcing the importance of upper anchorage positioning.

2.3(4): Inclusion of a note-box regarding recent changes to child restraint law.

2.3(5): Change to specify that a window bar must have been tested and proven to comply on each vehicle variant it is supplied for, and that suitability must be reassessed when a window bar is designed for a new vehicle. Also, a note-box is added to refer to Hobby Car Technical Manual for older vehicles with B-pillars too far forward.

2.3(6): Wording is altered to match Hobby Car Technical Manual, to specify that a rear shelf must be comparable to a high volume vehicle with belts.

2.3(6): Note-box confirms that no allowance is provided for copying of anchorages on a much older vehicle (i.e only copy a more modern vehicle that has had seatbelt anchorages tested and approved), and a note-box from HCTM giving an example of shelf strengthening.

2.3(7): Change of wording to Hobby Car Technical Manual.

2.3(8): Change '4-point harness' to 'full-harness' to include 5-point harnesses; and reference to the requirements in the motorsport and drag racing manuals instead of Hobby Car Technical Manual.

2.3(9): Section is added for upper anchorage positioning on sidewalls, copying across the relevant requirements for lower anchorages on sidewalls.

2.4(1): Clarification of wording of original seating position; plus change of 'body frame' to the more widely known name of 'Body H-Frame'

2.4(2): Update of wording from Hobby Car Technical Manual to better define position of seat; plus updated diagram from Hobby Car Technical Manual.

2.4(4): Inclusion of seatbelt retractor in the requirement, with note on anchorage sharing.

2.4(5): Added to cover harness requirements for lower anchorages.

2.5(1): Added note-box to clarify that OE anchorage attachment systems on an identical vehicle can be replicated (such as 2nd row folding seat in a Hiace); plus an added note-box referring to Hobby Car Technical Manual for alternative anchorage attachment systems.

2.5(2): Clarification, and brings in a relevant requirement from 2.6(9).

2.5(4): Adds that a window bar can be positioned greater than 300 mm from a pillar, to highlight this more clearly than in the note-box below; also note-box clarifies that calculations can be used only for iterative

changes once a reference physical test has been completed, such as approving a new model of vehicle based on close similarities to the old model.

2.5(5): Change of welding requirements to those from the Hobby Car Technical Manual chapter 18.

2.5(6): Expands areas that can't be welded to, from floor to include pillars and other structural parts made from high strength steel (elsewhere in this standard allows for welding so this was contradictory).

2.5(8): Grades 1, 3.6, 2 and 4.6 are removed from the table to reinforce that only grades 5 and 8.8 are acceptable, others are not; also added requirement for 2 full threads to protrude through the nut.

2.5(10): Changes the name of the Land Transport Rule to correct terminology; plus note-box added to allow use of bolts with an eyelet on the head in lower anchorage positions, so that a motorsport harness can be attached to the eyelet, for off-road use. This avoids the situation of undoing the lower anchorages each time the harness is to be fitted.

2.5(11): Reference is added to an exclusion in 3.1(1), for clarification.

2.5(12): Reference to Hobby Car Technical Manual is updated.

2.5(13): Requirement is added that a smaller nut, usually 10mm, can't be drilled out for a larger seatbelt bolt to be fitted. This has been done for buckle to floor/tunnel when changing to a sports seat.

2.6(1): Confirmation that doubler plates must be one-piece, not pieces of scrap steel welded together; and that doubler plates must be one-piece and have minimal clearance in the hole for the bolt.

2.6(1): Notes added to require that doubler plate thickness is 3mm (to allow some deformation); and that non-steel applications must be referred to LVVTA; and to define what is panel steel and what is treated as chassis-type material.

2.6(4): Changed wording to align with Hobby Car Technical Manual, no change in meaning, improves clarity.

2.6(5): Specifies that rivets can be minimum 3.2 mm diameter instead of 4.8 mm as this is what Hobby Car Technical Manual says (and it is common practice and was the basis of IMVDA tests many years ago).

2.6(5): Also clarifies the correct orientation of rivets (aligned with Hobby Car Technical Manual); the diagram is deleted as it was wrong (contradicted the Hobby Car Technical Manual); the length of the rivet shank is increased from 3.2mm to 5mm based on datasheets (rivet needs to be longer to get an effective clamping area to hold the plates together); and a note explaining rivet numbering is added.

2.6(6): Clarification of orientation of plates, plus two notes on plate size matching and direction of pull.

2.6(8): Clarification of wording to ensure the plate is changed, not the floor; add a note to allow for localised hammering to get plates to mate fully; and changed diagram to Hobby Car Technical Manual version.

2.6(9): Requirements clarified in 2.6(8) and 2.5(2).

2.7(1): Note-box added that pillars with plastic trim could also use the same method.

2.7(5) and 2.7(6): Moved to 2.7(6) and 2.7(7) so that they can refer also to spacers.

2.7(7): Renumbered 2.7(5); and wording of wall thickness improved for better clarity.

2.8(3): Allows rear facing seat upper anchorages to be fitted underneath the front-facing anchorage, as this is often the only practical way of doing it. Note added to reinforce that this must be done carefully.

2.8(4): Section added for allowing retractor and lower anchorage to share a common mounting point.

2.8(5): Renumbered from 2.8(4); and reference added to to exclusions.

2.8(6): Renumbered.

2.8(7): Renumbered.

2.9(1): Requirement added for corrosion protection after welding.

2.9(2): Reference added to Hobby Car Technical Manual.

2.10(1): Changes +5 degrees, to allow for Autoliv belts having a 2 degree tolerance.

2.10(2): Scratch-built web-clamp requirement added.

2.10(3): Scratch-built full harness requirement added.

2.10(4): Requirement for smooth belt operation added.

2.10(5): Requirement for adequate belt length added.

2.10(6): Renumbered from 2.10(2).

2.10(7): Requirement added for belt to be easily reached.

2.10(8): Requirement added for belt to fit occupant properly.

2.10(9): Refers to Hobby Car Technical Manual solutions (as there is no Hobby Car Technical Manual seatbelt form-set these should be captured somewhere).

2.10(10): Requirement for belts on a stretcher added, from an LVVTA Information Sheet.

3.1(1): Updated reference to disability transportation systems standard.

3.2: Reference to a disability authority card (which was never instituted) removed.

3.3: Sections added on: (1) & (2) & (3) exclusions that are in the Rule; and (4) the upper anchorage exemption process; and (5) relaxation from Hobby Car Technical Manual for historic replica scratch-built to have a lap only belt.

4.2: Updated reference to NZTA added.

4.3: Updated content from Modification Threshold Schedule added.

LVV Standard 185-00 (02) Seats and Seat Anchorages:

- 1.1(2): Includes within scope LE class to introduce seat requirements for trikes with car-type seating.
- 1.2(2): Updates reference to Disability Transportation Systems standard.
- 1.2(3): Note 2 clarifies that Passenger Service Vehicle Rule requirements take precedence.
- 1.3(1): Expanded out to clarify the meaning of each option under the methods of compliance sub-section.
- 1.3(3): Note-box is added to point out that seats are usually tested on a rig and not fitted to a vehicle floor, so seat anchorages are often not tested.
- 1.3(4): Note-boxes 1 & 2 clarify the requirements for test reports and calculations.
- 2.1(1): Note-box change to clarify that the definition of a seat includes all runners and bracketry.
- 2.3(1): Updates correct name of Rule, and clarifies that the Passenger Service Vehicle Rule requirements take precedence.
- 2.3(3): Changed to align with seatbelt standard requirements for seatbelt positioning.
- 2.3(4): Amended to ensure a driver's seat is positioned for all average sized occupants to operate, and note-boxes 1 & 2 to clarify fore-aft seat adjustment isn't mandatory and vision requirements may be affected with a seat change.
- 2.3(5): Reminder of the requirement for occupant-friendly seat structures.
- 2.3(7): Updated reference to the Hobby Car Technical Manual.
- 2.3(8): Note-box provides a reminder that door handles must be accessible.
- 2.3(9): Note-box clarifies the need for suitable access to rear seats.
- 2.4(1): Wording added to help link the different relevant sections of the standard.
- 2.4(3): Provides reference to an existing exclusion to improve clarity of requirements, with a supporting note-box.
- 2.4(4): Clarifies that the requirement includes the need for adequate driver vision:
- 2.4(5): Note-box confirms that seat width refers only to multiple-occupant seats. Some sports seats designed to provide sideways support would not meet the minimum 410 mm useable width.
- 2.4(6): Change to wording to highlight that the seatbelt requirement is only for seats that have more than one position for use while in transit.
- 2.4(7) & 2.4(8): Change of word from 'sideways-facing' to the more commonly used 'side-facing', and prison vehicles are added to the list of vehicles permitted to have a side-facing seat.

2.4(9): Clarifies that the requirement applies to scratch-built vehicles as well as vehicles that have retro-fitted seats.

2.4(11): Clarifies that suitable production vehicle seats need to be no older than listed. This ensures that the seat is one that has met an approved standard.

2.4(12): Updated wording to add clarity as to which requirements apply to hinging, folding, and latching mechanisms, and link to requirements for interior impact.

2.5(2): Clarifies which vehicle classes are included, and add a new range of eligible vehicles from a wider range of countries such as Indonesia, Thailand, China and Turkey. Note-box clarifies that it is still acceptable to retro-fit an older seat as long as it is fitted to an older compatible vehicle.

2.5(3): Note-box includes additional information for assessing 'rigid construction'.

2.5(7) & note-box: Introduces an allowance from the Hobby Car Technical Manual for a seat to be supported by a bulkhead.

2.6(1): Note-box clarifies what constitutes an unstressed seat and includes information on suitable anchorages.

2.6(2): Changes made to align with 2.5(2) (see above) and wording which clarifies acceptable attachment methods, with note-box providing background information.

2.6(3): Clarifies that a report is required and introduces an alternative process for motorhomes.

2.7(2): Note-box explains the need for seatback and support bar to be close together and suitably positioned.

2.7(5): Note-box explains the need for seatback and support frame to be close together.

2.8(2): Note-box adds information on suitable placement over structure.

2.8(5): Amended to bring two related requirements together.

2.8(7): Requirement included from Hobby Car Technical Manual.

2.8(8): Requirement included from Hobby Car Technical Manual, and note-box refers to disability docking stations with link to associated standard.

2.8(9): Section revised to bring related requirements together in one place and add the requirement referred to in note-box 2.6(1).

2.8(10) and note-box: Clarifies that the floor must be suitable for the type of stressed seats fitted, related to number of anchorages and orientation.

2.8(11): Adds clarification that there are stressed seats with just a seatbelt buckle anchorage, such as the majority of modern car seats, and those with two lower seatbelt anchorages attached such as a centre seat position with lap-only belt. Part (a) adds allowance to replicate an OE installation system, and Part (c) adds allowance to use the underfloor channel system.

2.8(12): Adds allowance to use the underfloor channel system.

2.8(13): Clarifies the need for a test report.

2.8(14): Distinguishes between the different attachment requirements for a seat that has additional support and one that does not.

2.8(15): Adds allowance to use the underfloor channel system and clarifies requirements for an over-floor mounting bar system.

2.8(16): Note-box links to side-facing seat restrictions.

2.8(17): Welding requirements changed to those from the Hobby Car Technical Manual Chapter 18.

2.8(18) & note 1: Clarifies by repeating the exclusion for motorsport vehicles that is covered in section 3. Note 2 provides background information on past failures of welded seat anchorages.

2.8(19): Clarifies that manufacturer-supplied fasteners must be fitted as intended by the manufacturer, and refers to fastener sizing elsewhere in the document.

2.8(20): Fastener table updated to align with Hobby Car Technical Manual.

2.8(22) note-box: Information updated as it is now more common to attach seats to track systems in vans.

2.8(24): Reference to Hobby Car Technical Manual updated.

2.9(1): Note 2 clarifies that seatbelts mounted to non-steel structure need to be discussed with LVVTA. Note 3 provides a definition of panel steel.

2.9(2): Part (b) clarifies that a doubler plate must be made from a single piece of 3mm steel, not several pieces welded together. Part (c) confirms that the hole in both plates is of a specified dimension. Part (d) corrects the thread depth for an 8 mm nut.

2.9(3): Part (d) corrects the thread depth for an 8 mm nut.

2.9(4): Note 2 provides background information on 3 mm plate behaviour.

2.9(7): Wording aligns with seatbelt standard and allows for nuts and bolts, aligning with the Hobby Car Technical Manual. Note-box explains Monel rivet details.

2.9(8): Clarifies alignment requirements for the doubler plate.

2.9(9): Wording aligns with seatbelt standard and allows for nuts and bolts, aligning with the Hobby Car Technical Manual.

2.9(10): Clarifies that only minimal surface modification is allowed and note clarifies plate contact area requirements.

2.10(1): Reworded for simplification.

2.10(2) note-box: Clarifies requirements for an over-floor mounting bar system with a rear-facing seat.

2.10(3): Parts (b) and (c) allow a fastener system that has been tested with a seat to be used. Fastener grade added. Part (d) adds fastener sizing moved from 2.8(18) and 2.8(19). Part (e) is reformatted to suit addition of part (d).

2.10(4): Wording aligned with 2.11(2)(c).

2.11: Complete section added to describe the under-floor channel system that is an alternative to the over-floor mounting bar system.

2.13(3): Clarifies a requirement by including head restraint as well as seat.

2.13(4): Rule name change.

3.1: Heading made more specific.

3.2: Heading made more specific.

3.2(1): Part (a) clarifies that seatbelt loads must be included. Part (c) adds a reference to the disability transportation standard that was released since the last update of this standard.

3.3(1): The word 'unstressed' added for clarity.

3.4(1): Adds wording for clarity.

3.5(1): Wording updated to match actual wording used on the authority card.

3.5(2): Clarifies the exclusion for motorsport vehicles with a roll cage to have a welded seat anchorage. Note-box removes reference to a disability as this authority card which was never instituted.

3.6(1): PSV exclusion added to align with PSV Rule.

3.7(1): Motorhome seat exclusion added to align with info-sheet.

3.8(1): Exclusion added to align with info-sheet for repair of rusted Nissan Terrano/Mistral.

4.3(1): Updated content from threshold document.

Finally:

The amended and updated content of the standards will be explained during a series of LVV Certifier training sessions held throughout the country during August. In the meantime, if you require any explanation or clarification on the changes within the standards, please contact an LVVTA Technical Team member at the Wellington LVVTA office.

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