

Re-issue of Amended LVV Standard 85-40 (Engine & Drive-train) & NZ Car Construction Manual Chapter 9 (Engine & Drive-train)

Introduction:

This Information Sheet has been provided to summarise changes which have been made to LVV Standard 85-40 (Engine and Drive-train Conversions), and NZ Car Construction Manual Chapter 9 (Engine & Drive-train), which have recently been reconfigured. These changes have occurred because:

1. firstly, the LVV standard and the NZ Car Construction Manual chapter (CCM chapter) are due for a number of amendments and additions to the technical requirements in order to keep pace with changing trends and general information improvement; and
2. secondly, the LVV standard and the CCM chapter for Engine and Drive-train are the first LVV standard and CCM chapter being brought into line with the new system (developed this year) of how technical requirements will be presented within the LVV certification system into the future. This technical information change is known as the 'Next-generation Technical Document' system. A full explanation of this reconfiguration of technical requirements is provided within *LVVTA Information Sheet # 02 – 2020 'Explanation of 'Next-generation' LVVTA Technical Documents'*.

Changes to LVV Standard 85-40 (Engine & Drive-train):

Several changes have been made to bring the Engine & Drive-train LVV standard into line with the new 'Next-generation' technical document format. These changes are as follows:

Associated Information:

The 'Associated Information' section has been removed from the LVV standard, and referenced within CCM Chapter 9 (Engine & Drive-train), so that the LVV Standard doesn't have to be amended each time a new 'Associated Information' document is created.

Purpose of this standard:

A more relevant explanation of the purpose has been provided at the start of the standard.

Scope and Application sections:

The arrangement of the scope and application sections have been brought into line with current presentation practices.

Overarching technical principles:

The LVV standard has been stripped of its detailed technical requirements, and replaced with:

- a small number of overarching technical principles with which a low volume vehicle must comply; and

- reference to the relevant (detailed) technical requirements which are contained in CCM Chapter 9 (Engine & Drive-train).

Exclusions to the Standard:

The exclusion section has been removed, and any applicable exclusions have been shifted to CCM Chapter 9 (Engine & Drive-train), because that's where the corresponding technical requirements are now listed.

Modifications that do not require certification:

The list of modifications which are not required to be certified to the LVV standard has been removed, and the standard now simply refers to the Modification Threshold Schedule, or to the VIRM Tables, in order to save constant revision of the standard as the Modification Threshold Schedule or VIRM Tables are regularly updated.

Terms and Definitions:

Terms & Definitions have been deleted from the LVV standard and shifted to CCM Chapter 9 (Engine & Drive-train) so that the Definitions can be found with the requirements that the Terms are found in.

Changes to NZ Car Construction Manual Chapter 9 (Engine & Drive-train):

Several changes and updates have been made to the technical requirements specified in the CCM Chapter 9 (Engine & Drive-train), and these are summarised below. Please note that the more obvious and straight-forward changes have not been summarised.

Amendment Record Table:

As is provided within the LVV standards, a table has been provided on the cover page of the CCM chapter to record the amendment history dates and amendment numbers of the CCM chapter. One of the ways in which this could be helpful to both LVV Certifiers and the public, is by showing which amendment number of a CCM chapter was in force at the time a vehicle was modified (because the version requirements that apply to a vehicle may vary dependent on the modification date).

General safety requirements:

A new section has been added at the start of the CCM chapter called 'general safety requirements'. The general safety requirements are applicable to all vehicles, and originate from the Land Transport Rules. The general safety requirements are copied from LVV Standard 85-40 (Engine & Drive-train), and is the only information that appears in both the LVV standard and the CCM chapter.

Engine conversion requirements:

Engine mount design and construction:

9.1.2: Clarifies the requirement, and specifies that this applies only to a north-south configured engine.

9.1.5: Clarifies the requirement and refers to section 5.4 of CCM Chapter 5 for attachment of a crossmember to chassis rails.

9.1.6: Wording changed from 'bolts' to 'fasteners'.

Engine positioning:

9.2.1: Clarifies the requirement, and specifies that this applies only to a north-south configured engine.

9.2.3: Wording changed to clarify the requirement.

Engine compartment and floor modifications:

9.4.2: Clarifies the requirement for rotating components in an engine bay.

9.4.4: Wording changed to include floor or transmission tunnel, and 'occupant cell' changed to 'passenger compartment'.

Engine weight:

9.5.1: Wording changed to consider all load-bearing suspension components, and 'feature' changed to 'incorporate'.

9.5.1: Sidebar note added as a reminder regarding axle loadings, and to consider GVM.

Engine equipment and system requirements:

Superchargers and engine protrusions:

9.6.1: Clarifies the requirement for rotating components above the line of the engine hood.

9.6.2: Clarifies reasons for referring to other Chapters of the CCM.

9.6.3: Added a clause permitting a removed engine hood and/or side panels with an LVV Authority Card.

Nitrous oxide systems:

9.7.2: Wording changed from 'Department of Labour' to 'approved cylinder test facility' and from 'occupant cell' to 'passenger compartment'.

Oiling systems:

9.9.1: Added a section relating to oiling system components inside the passenger compartment.

Accelerator systems:

9.10.1: Added a clause to include an effective stop for the accelerator pedal.

Exhaust systems:

9.11.1: Changed wording to clarify the requirement.

9.11.2: Added clauses relating to the construction of an exhaust system.

9.11.2: Sidebar note added to clarify that LVV Certifiers should consider exhaust noise.

9.11.3: Added clauses relating to damage of critical components from exhaust heat.

9.11.4: Specifies clearance requirements for steering universal joint and exhaust system.

Braking systems:

9.12.1: Added a section relating to complying with braking requirements.

Vacuum systems:

9.13.1: Wording changed from 'fan-belt' to 'drive-belt'.

Electrical systems:

9.14.1: Added more information to clarify requirements for mounting a battery.

9.14.2: Added a clause describing the requirement to separate the battery and fuel systems.

9.14.5: Added a clause allowing specifically-designed electrical components within fuel systems.

Steering system modifications:

9.15.1: Wording changed to cover more than only engine-driven components to provide power steering pressure.

Gearbox conversion requirements:

Gearbox mount design and construction:

9.16.1: Refers to section 5.4 of Chapter 5 of the CCM for attachment of the crossmember to chassis rails.

Gearbox attachment:

9.17.1: Wording changed from 'bolts' to 'fasteners'.

Other gearbox requirements:

9.18.1: Wording change to include 'any part of its chassis or subframe structure'.

9.18.2: Wording changed to include 'visible'.

9.18.2: Sidebar note added to clarify what constitutes a gear position indicator.

9.18.3: Wording changed from 'feature' to 'incorporate'.

Drive-shaft requirements:

Drive-shaft modification and construction:

9.19.1: Side-bar note added about uprating tubing strength when converting a two-piece drive-shaft to a one-piece drive-shaft.

9.19.2: Clarifies requirements about drive-shaft lengthening.

9.19.3: Clarifies who can make or modify a drive-shaft.

9.19.4: Clarifies how to deal with a drive-shaft when the manufacturer or modifier isn't known.

9.19.6: Clarifies requirements for drive-shaft spacers.

Drive-shaft safety-loop requirements:

When drive-shaft safety-loops are required:

9.22.1: Specifies when a drive-shaft safety-loop is required.

9.22.2: Provides clarification that a drive-shaft safety-loop is not required in a same make and model variant engine situation, or a same make and model variant turbocharger or supercharger situation.

9.22.3: Specifies other situations where a drive-shaft safety-loop is not required.

Drive-shaft safety-loop design and construction:

9.23.1: Specifies design principles necessary for drive-shaft safety-loop manufacture.

Drive-shaft safety-loop positioning:

9.24.1: Specifies positioning requirements for drive-shaft safety-loops.

Drive-shaft safety-loop attachment:

9.25.1: Specifies basic attachment principles for drive-shaft safety-loops.

9.25.2: Specifies details on attachment of drive-shaft safety-loops to chassis sections or floor-pans.

9.25.3: Specifies details of top plates used to attach drive-shaft safety-loops.

9.25.4: Specifies when an under-floor mounting plate must be used for drive-shaft safety-loop attachment.

9.25.5: Specifies mounting surface preparation for drive-shaft safety-loop attachment.

Other drive-shaft safety-loop requirements:

9.26.1: Specifies protection details for hydraulic brake pipes near drive-shaft safety-loops.

Other requirements:

Welding of drive-train components:

9.29.1: Wording changed from 'All welding incorporated within' to 'Welding of any'.

Four-wheel drive to two-wheel drive conversions

9.30: Section added to provide requirements when converting four-wheel drive vehicles to two-wheel drive.

Exclusions:

An exclusion section has been added to NZ Car Construction Manual Chapter 9 (Engine & Drivetrain), however at this time no exclusions apply.

Useful information:

Additional information has been provided about drive-shaft safety-loops to draw reader's attention to the importance of well-designed and constructed loops.

Terms and definitions:

The terms and definitions which are relevant to the CCM Chapter 9 (Engine & Drive-train) have been added into the Chapter for convenience.

Identification of latest amendments:

Note that all changes made to LVV Standard 85-40 (Engine and Drive-train Conversions) and NZ Car Construction Manual Chapter 9 (Engine & Drive-train) during the amendment process have been shown in grey shade in the standard and NZCCM chapter hard copies mailed to LVV Certifiers, and are highlighted yellow when viewed on-line.

Amendments of a technical or reference nature, or those considered important for LVV Certifiers to be aware of, will have a grey vertical stroke in the adjacent left-side margin, while those considered more of a minor correction or formatting rectification, will not.

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

Finally:

The amended and updated content of the standard and CCM chapter will be discussed further, as necessary, during the next LVV Certifier training sessions held throughout the country in 2021.

In the meantime, if you require any explanation or clarification on the changes within the standard or CCM chapter, please contact an LVVTA technical staff member at the LVVTA office (04) 238-4343.
