Heavy vehicle specialist certification

News and updates

11 February 2026

Electronic certificate of authority (E-COA)

From mid-February inspecting organisation certificates of authority (COAs) will no longer be posted and sent by mail.

02 February 2026

Outcome of consultation on new light entry certification appointments

After receiving support from new light entry certifiers, we decided to adopt the proposed changes to the New Light Entry Certification appointment process.

27 January 2026

Reminder: check your saved VPN links to keep access

If you use our VPN, the most secure link begins with https://. Some users still have the old URL for the VPN saved, without the s. To keep our connections secure, we’re switching off the old link on 29 January 2026. Check your saved links include the 's'.

23 December 2025

Safety warning for Suzuki Fronx owners

NZTA is urging the owners of Suzuki Fronx vehicles in New Zealand to stop carrying passengers in the rear seats of the vehicles. This follows the failure of a safety belt in a laboratory crash test. If you get any questions from customers, tell them to contact Suzuki directly.

19 December 2025

Industry alert: Risk of trailers disconnecting from incorrect coupling and damaged couplings

NZ Transport Agency Waka Kotahi (NZTA) is issuing an industry alert to warn the heavy vehicle industry about the risk of trailers becoming disconnected.

16 December 2025

Inspection news issue 20 out now

The latest issue of *Inspection news* is now available to download.

Introduction

1 Purpose and scope

NZ Transport Agency Waka Kotahi (NZTA) has prepared this document, *Vehicle inspection requirements manual: Heavy vehicle specialist certification* to enable heavy vehicle specialist and manufacturing inspectors to achieve correct and consistent standards of inspection and certification. In this VIRM, any reference to the NZ Transport Agency, Waka Kotahi or NZTA includes reference to the Director of Land Transport (the Director).

Heavy vehicle specialist and manufacturing certifiers are required to certify specialist aspects of heavy vehicles. They are appointed by NZTA under section 2.2(1)(i) of the **Land Transport Rule: Vehicle Standards Compliance 2002** (the Rule) as vehicle inspectors and/or inspecting organisations.

In order to prepare a vehicle for operational service in New Zealand, the owner may be required to fit additional equipment and to modify the vehicle design to optimise the vehicle for the role in which it is to be employed.

This modification and mounting of additional equipment must result in a vehicle that is deemed by NZTA to be safe to operate.

This means that the modifications (including any repairs or addition of equipment):

- are designed to be technically sound
- are done to a high standard of workmanship
- use parts and materials that are fit for their purpose
- comply with any standards that are applicable
- do not give the vehicle any unacceptable characteristics.

NZTA appoints heavy vehicle specialist inspectors (HVS or HVM VI) and inspecting organisations (IO) to carry out technical assessment of repairs and modifications. Since the range of knowledge, expertise and experience needed to make these assessments is very wide, HVS certifiers are appointed to certify various aspects of a vehicle. In this manual, these inspectors are generally referred to as HVS certifiers.

Read more about the different roles and requirements to gain qualifications/be appointed as a heavy vehicle specialist certifier.

Heavy vehicle specialist applications

These aspects and NZTA requirements for them are covered in this manual. The purpose of this document is to:

- supplement the notices of appointment currently in force for HVS certifiers
- cover the requirements for the inspection and certification of specialist aspects of heavy vehicles.

This VIRM is published online only and is not supplied in hard copy.

Amendments to this manual will be issued from time to time as inspection requirements change and improvements are made. Details of amendments are available from the Amendments tab on the horizontal menu. Suggestions for improvement should be made using the feedback button found on every page.

Amendments

HVS/M certifiers must ensure they have access to, are familiar with and use, the latest version of the VIRM.

Where appropriate NZTA will consult with HVS/M inspecting organisations prior to the confirmation of amendments to this manual.

An appointed certifier or inspecting organisation (IO) cannot use the NZTA brand, logo or name in connection with their business unless such use is approved in writing by NZTA.

Contacting NZTA

Phone	0800 587 287 then follow the instructions
Technical queries	**hvscinfo@nzta.govt.nz**
Administrative queries	**vehicleinspections@nzta.govt.nz**

Safety Issues – safe work practices

Correct use of this VIRM may involve the use of hazardous materials, work practices or operations and equipment. It is the responsibility of the HVEx/HVxD certifier and IO to establish appropriate safety and health practices required by legislation. Safe work practice shall be employed at all times.

The methods and processes used for the manufacture or repair of a heavy vehicle (HV) combine the requirements of the Health and Safety at Work Act 2015 and any relevant manufacturer's recommendations – neither of which are administered by NZTA.

This also applies to the avoidance of damage to equipment or the work or, in the case of a repair, further damage to the item being repaired. Refer to your HSE manual and work instructions before commencing any work. For repairs most vehicle manufacturers also make recommendations on safe practices.

Page amended **1 November 2021** (see **amendment details**)

Page updated 21 August 20245 (see **details**)

2 Overview of the manual

The manual is in two main parts:

1. Introduction

The introduction summarises the duties and responsibilities of the HV certifier which are set out in detail in the relevant Notice(s) of Appointment, explains the inspection and certification process, complaints procedures, inspection premises and equipment, and appointment of HV certifiers.

Also included are definitions and abbreviations and sample certification documents.

The term 'he' in respect of an HV certifier, is intended to include 'she'.

2. Technical

This part of the manual covers the requirements for the certification of modifications, mounting of components, design and manufacture of vehicles and components and repairs to individual aspects of heavy vehicle components, structures and systems.

To use the manual:

- the HV certifier identifies each system, structure, component, aspect or performance characteristic affected by the modification, manufacture or repair
- the HV certifier selects the corresponding chapter(s) from the technical part and inspects the vehicle to determine whether the requirements have all been met.

Not all chapters in the technical section are devoted to aspects of vehicles that are to be certified. Some of them, such as **1-1 VIN**, **2-1 External projections**. and **3-1 Dimensions**, are to assist in the assessment of other aspects. Other chapters, such as **11-1 Welding** and **11-2 Conversion to right-hand drive** are also concerned with topics that are not aspects in themselves but pool all the requirements to be considered where these items are involved.

Each chapter of the technical part consists of up to six parts:

Required certifier categories	shows the certifiers who are concerned with the chapter material.
Summary of legislation	summarises the legislation that is relevant to that section.
Applicable references	refers to standards, codes and other documents that contain requirements.
Requirements of the legislation	contains a synopsis of the requirements in legislation and other directives of NZTA
Notes	are for additional guidance, where required.
Reasons for rejection	specifies the conditions that must result in the vehicle being rejected by the specialist certifier

Page amended **1 November 2021** (see **amendment details**)

3 Inspection and certification

3-1 Duties and responsibilities

In order to inspect and certify an aspect of a vehicle for a Heavy Vehicle Specialist Certificate (LT400), the HVS/M certifier must:

1. be appointed by NZTA or the Director under section 2.2 of the Rule for the aspect of the vehicle being certified

2. know the certifier's responsibilities

3. identify the vehicle class according to **section 3.4** of this introduction

4. identify whether the vehicle requires certification. **Section 3.3** of this introduction identifies the threshold for HV certification

5. establish whether the vehicle complies. **Section 3.5** and **section 3.6** of this introduction explain how to determine the vehicle's compliance with the requirements

6. complete the inspection documentation, Heavy Vehicle Specialist Certificate, LT400, and any other required labels or plates. **Section 3.7** of this introduction explains the requirements for handling and completing the form

7. when collecting fees take **section 3.8** of this introduction into account

8. to enable NZTA to efficiently contact the certifier, the certifier must provide and maintain an email address which NZTA must use to provide any notice required or permit to be sent out by NZTA to any or all HV certifiers or IO.

3.1.1 General duties and responsibilities

The HV certifier's prime duty is to ensure that a new, modified or repaired vehicle is safe and in compliance with the legal requirements for the aspect of the vehicle that the certifier is approved and required to certify as a Heavy Vehicle Specialist or Manufacturing Inspector or Inspecting Organisation, in **Land Transport Rule: Vehicle Standards**

Compliance 2002 (the Rule), and in this manual.

The HV certifier shall establish, and use at all times, appropriate and reasonable inspection and certification procedures that are efficient and comply with the Rule, the Notice(s) of Appointment, the VIRM and the law.

The HV certifier shall not certify any modification or repair to a vehicle unless and until they have first satisfied themselves that the design, manufacture and installation of the modification or repair take into account the original design, manufacture and installation, and that the vehicle meets the relevant applicable requirements and is safe at the time of certification.

1. HV certifier

HV certifier means an individual appointed by NZTA under 2.2(1)(i) of the Rule to carry out inspection and certification activities in accordance with requirements and conditions imposed by NZTA, or the Director, and who is responsible for the inspection and certification outcome.

In this document, a HV certifier is one appointed for the purpose of heavy vehicle specialist or manufacturing inspection and certification. This is defined in section 6.5(1)(d) and 7.5(1)(b) of the Rule as specialist inspection and certification of modifications or repairs to the:

- load anchorages
- chassis and structure
- suspension or steering, including drive train, engine transmission and axles
- brakes
- towing connections
- log bolster attachments
- PSV structural strength, stability and roof racks, as well as
- the static rollover threshold (SRT) of a heavy vehicle
- swept path and heavy vehicle dynamics
- structural composites.

2. Inspection and certification activities (section 2.2(1)(i) of the Rule)

HV certifiers must carry out inspection and certification of modifications or repairs to a heavy vehicle that has been modified since it was manufactured or last certified so as to affect its compliance with an applicable requirement.

3. Primary duty (section 2.1(2) of the Rule)

HV certifiers must carry out inspection and certification activities competently and diligently, and in accordance with the Rule, this document, their Notice of Appointment, the Model QMS and other relevant requirements of NZTA and legislation.

4. Inspection and certification activities that can be carried out (section 2.2(2) of the Rule)

HV certifiers may carry out only those inspection and certification activities for which NZTA or the Director has appointed them.

HV certifiers are appointed as one of the following types:

- engineer
- local manufacturer (NZ)
- SRT certifier.

They may be appointed for one or more certification categories:

Table 1. Certifier Categories

Category	Specialist aspect
HVEC HMCD	Chassis, suspension, steering, PSV, drive train, engine transmission and axles
HVET HMTD	Towing connections
HVEA HMAD	Load anchorages
HVEL HMLD	Log bolster attachments
HVEK HMKD	Brake modification
HVP1 HVP2	Swept path Heavy vehicle dynamics
HVS1 HVS2 HVS3	Static rollover threshold

5. Requirements, conditions and period of appointment (section 2.3(1) of the Rule)

NZTA may specify the period of appointment for an HV certifier and may impose requirements and conditions as to the performance of the inspection and certification activities, including the performance of those activities at individual sites. The Notice of Appointment states a period of appointment of seven years from the date the appointment starts. The period of appointment may be extended up to a maximum of ten years at the discretion of the Director. Appointments may be surrendered in writing by appointees, or be suspended or revoked by the Director in accordance with the Rule.

From the date of the end of an appointment for any reason (including surrender, suspension, or revocation) no inspection or certification activities can be carried out until the appointment is reinstated or renewed.

The HVSC Engineer Notice(s) of Appointment specify other requirements, including:

- a minimum number of inspections and certifications per annum
- self-reporting of information (such as information related to fitness and propriety)
- quality assurance and performance management systems
- making, maintaining and providing records of the activities
- management of conflicts of interest and other inappropriate influences
- insurance requirements

Please check your current notice of appointment for details.

6. Presentation and acceptance of emailed Inspection and certification documents

LT400s, chassis ratings and professional opinions from heavy vehicle specialist certifiers can be emailed to CoF vehicle inspectors and inspecting organisations provided:

(i) emails are sent directly to the vehicle inspector or inspecting organisation from the heavy vehicle specialist certifier, and

(ii) the electronic copy contains all of the information from the original copy and is clear and legible.

7. Delegation (section 2.4(1) of the Rule)

An HV certifier may be permitted by their Notice of Appointment to delegate certain functions or powers to carry out inspection and certification activities for which he was appointed.

An HV certifier may delegate certification work according to their appointment category and Table 2: Delegations:

Table 2. Delegations

Category	Duties (Note 1)	Delegation	To
Engineer	Initial assessment (excluding repairs)	Yes	A person reasonably considered by the HVSC to be competent and trustworthy. That person should consult with the HVSC before beginning any work and may use photographs for assistance. The HVSC remains responsible for all delegated work.
	Initial assessment (repairs)	Yes, but not for complex repairs or repairs of fatigue critical components (Note 3).	As above. Additionally, all parties involved must undertake best endeavours to determine the root cause of the issue to be repaired before starting work.
	Design	Yes, but must personally approve the design to be complete before manufacture	A person reasonably considered to be competent.
	Monitoring of manufacture or installation	Yes	A person reasonably considered to be competent
	Final inspection	No	
	Sign off (PDS/LT400 etc)	No	
Local manufacturer (IO)	Provide facilities to allow Local manufacturer VI to be effective	No	
Local manufacturer (VI)	Initial assessment	Yes	A person reasonably considered to be competent.
	Monitoring of manufacture or installation	No	Unless passed to an alternative Local manufacturer certifier or Engineer certifier with a SoDC.

Final inspection	No	Unless passed to an alternative Local manufacturer certifier or Engineer certifier with a SoDC.	
Sign off (PDS/LT400 etc)	No		
Static rollover threshold	Calculations for deriving the SRT and issuing a record of determination	Measurements	Another SRT certifier or a person who has passed the TERNZ SRT course.

Note 1

An engineering certifier may transfer responsibility for any of the duties listed in Table 2 to another engineering certifier using a SoDC. Both engineering certifiers must hold the appropriate certification category. Where an SoDC is used in this way this is not a delegation as the issuer of the SoDC takes responsibility only for the aspects covered by the SoDC, with the issuer of the LT400 taking responsibility for all other aspects. This differs from a delegation, where the delegating engineer keeps full responsibility for the work carried out by the person they delegate to.

Note 2

No other delegations may be made without the express written consent of NZTA.

Note 3

Inspection of damage to the following components may not be delegated and must be assessed in the as-damaged state by the engineer:

- towing connections (except for replacement of bent or worn tow eyes)
- log bolster attachments
- chassis flanges
- subsequent failure of a previous repair.

A task which has been delegated to a specified employee may not be delegated further by that employee. HV certifiers are responsible for the outcomes or consequences of any delegated task.

HV certifiers must maintain a record of all persons that they have approved in accordance with any specifications in the Performance Review System manual that supports this manual.

A local manufacturer certifier (IO), who derives their authority to certify any aspect of a vehicle from the qualifications and role of a staff member agrees to inform NZTA of any change to the role or employment of that staff member.

A local manufacturer certifier (VI), who derives, in part, their authority to certify any aspect of a vehicle from their role as a staff member of a Local manufacturer certifier (IO) agrees to inform NZTA of any change to their role or employment

status.

The HV certifier must ensure that, where any employee, agent or contractor to the HV certifier is authorised by the HV certifier in accordance with their appointment to carry out any part of the services on behalf of the HV certifier, that person complies in all respects with the obligations of the HV certifier under their appointment.

3.1.2 Inspection and certification

1. Heavy vehicle specialist inspection and certification (sections 6.5(1), 6.5(4), 6.5(5), 7.5(4) and 7.5(5) of the Rule)

The inspection and certification of a vehicle must be carried out in accordance with the requirements and conditions imposed by NZTA.

NZTA requirements and conditions are contained in this manual ('the VIRM'), HVS Memos, specified standards and codes, the **Model QMS**, and the Notice of Appointment.

The HV certifier will provide and perform the services in accordance with any published professional or ethical standards of professional bodies to which they belong.

2. Determining compliance of a specific aspect (sections 6.5(5), 7.4 and 11.1 of the Rule)

A specific aspect of a vehicle may be certified as meeting the requirements of the Rule if an HV certifier has identified the vehicle and has determined, on reasonable grounds, that the specific aspect:

a) has not compromised the safe operation of the vehicle

b) has been designed and constructed using components and materials that are fit for their purpose and is within safe tolerance of its state when manufactured or modified

c) complies with the applicable requirements

d) is lawful and no technically competent person (recognised by NZTA) would dispute that the inspection and certification of the vehicle complies with applicable requirements.

3. Record of determination (sections 6.6 and 7.6 of the Rule)

When an HV certifier has determined whether a specific aspect of a vehicle complies, the HVS certifier must make a record of that determination on the Heavy Vehicle Specialist Certificate, LT400 – for each certification (that is, one certification for each aspect certified).

Examples:

1. A semi-trailer that is fitted with a fifth wheel, kin pin, load anchorages, and log bolsters requires **five separate** Heavy Vehicle Specialist Certificates as in the table below:

Component	Certification Category	Code/Standard Certified to
Fifth wheel	HVET or HMTD	NZS 5450
Kin pin	HVET or HMTD	NZS 5451
Load anchorages	HVEA or HMAD	NZS 5444
Log bolsters	HVEL or HMLD	Bolster Attachment Code
Brakes	HVEK or HMKD	Schedule 5/Section 6 HVBR

2. A 4 x 2 truck that has the chassis lengthened, a tag axle fitted, new load anchorages, and a draw beam requires **four separate** Heavy Vehicle Specialist Certificates as in the table below:

Component	Certification Category	Code/Standard Certified to
Chassis, suspension,	HVEC or HMCD	HV Rule
Brakes	HVEK or HMKD	Schedule 5/Section 6 HVBR
Load anchorages	HVEA or HMAD	NZS 5444
Draw beam	HVET or HMTD	NZS 5446

3. A bus or coach **manufactured** in NZ that already has ‘brakes’ standard compliance, requires **two separate** Heavy Vehicle Specialist Certificates as in the table below: (Additional Certification will be required if the vehicle is fitted with a tow bar, roof rack, a wheelchair hoist, powered ramp or wheelchair/wheelchair occupant restraints or is modified and requires brake certification.)

Component	Certification Category	Code/Standard Certified to
Stability,	HVEC or HMCD	PSV Rule
Rollover Strength	HVEC or HMCD	PSV Rule

The HV certifier must immediately inform NZTA of any theft of any NZTA documents supplied to the HV certifier by NZTA or any agent of NZTA, or prepared by the HV certifier on behalf of NZTA.

The HV certifier must return to the document supplier or NZTA or destroy as required by NZTA any surplus or obsolete NZTA documents.

4. LT400

The LT400 presented must be the original or emailed directly to a CoF inspector or inspecting organisation. Where the original LT400 has been lost or destroyed the certifier may provide a duplicate (photocopy) provided it is signed and dated by the HV certifier.

5. Standards

Where an HV certifier is required to use a standard during the inspection and certification process, the latest version of the standard must be used except where otherwise specified.

The HV certifier must have available and use any and all standards which are referenced in the Rule or which the HV certifier references in certification.

The HV certifier must comply in all respects with any written instructions, interpretations or guidelines issued by NZTA to the HV certifier.

3.1.3 Re-inspection and re-certification (section 11.4 of the Rule)

If a Heavy Vehicle Specialist Certificate, LT400, has been revoked, NZTA may require the HV certifier to repeat the inspection and certification of the vehicle, issue (if appropriate) a new certification, and meet the re-inspection and re-certification costs.

3.1.4 Performance review (section 3.1(1) of the Rule)

NZTA, either directly or through an appointed agent, may monitor and review the performance of a HV certifier, including the performance of inspection and certification activities.

The requirements and conditions are contained in the Rule, this document, the Notice of Appointment and the **Model QMS**

NZTA may require a HV certifier to provide such information as NZTA reasonably considers relevant. A HV certifier must comply with these requirements (unless expressly stated in the Notice of Appointment or this VIRM, no functions, duties or powers which may be exercised by NZTA under any statute, regulation or rule, including under section 198 of the **Land Transport Act 1998**, are in any way restricted).

Costs of monitoring and review (section 3.1(4) of the Rule)

HV certifiers must bear the costs of the monitoring and reviewing of their performance in accordance with any fee prescribed in the Rule or other applicable legislation.

3.1.5 Investigations

1. Investigations (sections 3.2(1) and 3.2(8) of the Rule)

If NZTA has reason to believe that an HV certifier has failed to comply with any of the conditions of his appointment, NZTA may require the HV certifier to undergo an investigation and to provide such information as NZTA reasonably considers appropriate as part of the investigation. NZTA may observe or inspect the equipment or activities of the certifier and copy relevant books and records.

Refusal to undergo monitoring, review, or investigation will be a breach of the Rule and the Notice(s) of Appointment and may result in further regulatory action.

2. Notification of action (other than immediate suspension/imposition of conditions) (section 3.2(3) of the Rule)

Following an investigation and before carrying out action, NZTA will notify the HV certifier in writing of:

a) the action that is being considered

b) the reason for the action that is being considered

c) the date by which submissions may be made to NZTA in respect of the action that is being considered, which must be at least 21 days after the notice was given

d) where appropriate, the date on which the action that is being considered will take effect, which, unless NZTA determines otherwise, must be at least 28 days after the notice was given.

3. Responding to a notification of action (section 3.2(5) of the Rule)

If a HV certifier is notified as above, he must ensure that he provides NZTA with all information within the period specified in the notice.

4. NZTA will consider submissions (section 3.2(6) of the Rule)

NZTA will consider the submissions and information supplied, and will:

a) decide whether or not to take the action that is being considered

b) as soon as is practicable, provide written notification to the HV certifier of:

i. the NZTA decision, and

ii. if appropriate, the date on which the action is take effect, and

iii. if appropriate, the right of appeal under section 106 of the **Land TransportAct 1998**

5. Remedial action, suspension, revocation (sections 3.2(2) and 3.2(8) of the Rule)

If, following an investigation, NZTA is satisfied that the HV certifier has failed to comply with any of the conditions of his appointment, NZTA may do one or more of the following:

a) require that remedial action such as training or mentoring be undertaken by the HV certifier. The HV certifier cannot refuse to comply with the requirement

b) suspend the HV certifier for a specified period or until conditions are met

c) revoke the appointment of the HV certifier.

6. Immediate suspension or imposition of conditions (section 3.3(1) of the Rule)

If NZTA has reason to believe that a HV certifier has failed to comply with a condition of his appointment and that this presents a significant risk to land transport safety, NZTA may suspend the appointment with immediate effect, or impose any conditions on the appointment of the HV certifier.

7. Notification of immediate suspension or imposition of conditions (section 3.3(2) of the Rule)

When NZTA suspends the appointment, or imposes conditions on the appointment, NZTA will notify the HV certifier in writing of:

a) the grounds for the suspension or imposing of conditions

b) the fact that the certifier or organisation may make submissions to NZTA

c) the right of appeal under section 106 of the **Land Transport Act 1998**

8. NZTA will consider submissions following immediate suspension or imposition of conditions (section 3.3(3) of the Rule)

NZTA will, as soon as practicable, consider any submission made and notify the certifier or inspecting organisation in writing of the result of any such consideration.

9. Duration of immediate suspension or imposition of conditions (section 3.3(5) of the Rule)

A suspension or condition imposed remains in force until NZTA has determined the action to be taken and that action has been taken.

10. Withdrawal of immediate suspension or imposition of conditions (section 3.3(4) of the Rule)

NZTA may at any time withdraw a suspension or condition imposed.

11. Right of appeal against immediate suspension or imposition of conditions (section 3.3(6) of the Rule)

A HV certifier may appeal under section 106 of the **Land Transport Act 1998** against a decision by NZTA to suspend immediately or to impose conditions.

12. Costs of investigations (sections 3.2(7) and 3.2(8) of the Rule)

NZTA may require a HV certifier to bear the costs associated with an investigation or remedial action in accordance with any prescribed fee. Refusal to bear the costs will be a breach of the Rule and the Notice(s) of Appointment and may result in further regulatory action.

3.1.6 Consequences of termination or suspension

Upon revocation or termination of the appointment for any reason whatsoever, whether in whole or part, the HV certifier will:

a) cease provision of all or such part of the services under their appointment as may be required by NZTA

b) return to NZTA or authorised representative or destroy as required by NZTA any land transport documents (including unused LT400 forms), advertising and/ or display material featuring or referring to the services or the HV certifier's provision of the services under this appointment, as the case may be.

Upon suspension of appointment (whether in whole or part) of the HV certifier for any reason whatsoever, whether by NZTA or a duly authorised representative, the HV certifier shall immediately cease providing the relevant services during the period of suspension and shall, if so required, surrender all NZTA documents to NZTA or any authorised representative.

3.1.7 Disputes and appeals

Where there is any dispute arising between parties in relation to any matter arising out of the appointment, the parties shall endeavour to resolve such disputes promptly by consultation and negotiation in good faith.

- Where the HV certifier does not agree with any decisions of NZTA, including any decision or direction of a Certification Officer, the HV certifier should, notwithstanding any other rights they may have at law, seek from NZTA a review of that decision.
- Despite the previous two points, both parties recognise that NZTA has functions in respect of land transport safety and law enforcement and that, notwithstanding any dispute or appeal, NZTA may take whatever lawful action NZTA considers necessary in the interests of road safety. The specific reasons for the action taken will be provided.
- Where there is any dispute arising between the parties in relation to technical decisions, any available dispute resolution process described in the VIRM or in an issued HVS Memo may be invoked. This will permit the disclosure of otherwise privileged information, such as designs and PRS scores, to the adjudicating body, provided that this information is pertinent to the matter being judged.

Page amended **1 November 2021** (see **amendment details**)

3-2 Disqualification from certification

A HV certifier must not engage in any activities that may conflict with his independence of judgement and integrity in relation to the services delivered.

A HV certifier may have a professional interest in a vehicle they certify, such as a vehicle:

a) they have modified or repaired, or

b) that has been modified or repaired by a person working for the same company as the HV certifier, and at the same premises,

However, a HV certifier may not certify a vehicle they or their immediate family have a personal ownership interest in.

A HV certifier may not certify an aspect of a vehicle for which he is not appointed.

An HVS certifier must not inspect a vehicle if:

a) they do not hold a driver licence for that class of vehicle, and

b) they are required to drive it.

3-3 Establishing whether a vehicle must be HV certified

A vehicle must be inspected for heavy vehicle specialist certification if:

a) it requires certification for entry, re-entry or an in-service CoF

b) it is a vehicle of one of the following classes:

MD3, MD4, ME, NB, NC, TC, TD (see **Table 3-4-1. Vehicle equipment standards classifications**)

c) it has undergone modifications or qualifying repairs to:

i. chassis, structural bodywork, brakes, bolster attachments, towing connections, drive train, engine transmission, axles, load anchorages and wheels which affect compliance with applicable requirements (includes flood/water/fire damage)

ii. any item which could affect the vehicle's SRT

iii. corrosion in a structural part of the vehicle.

3.3.1 Repairs which do not require certification

The following types of repair do not require inspection and certification:

1. The replacement of bolted-on components covered by an existing certification which are identical and of the same, dimension, rating, and mounted in the same location.

- For clarity:
  - replacement of identical, bolted fifth wheels, bolted kingpins, bolted tow eyes and bolt-on tow couplings do not require certification
  - replacement of components which normally require certification and may be bolted or considered bolted such as log bolsters and attachments, draw beams, drawbars, skid plates, welded structures and other similar items require certification
  - if a repair requires welding to be conducted, then certification is likely required
  - replacing bolted components (only) does not supersede, extend, or increase any certified expiry or rating.

2. Repairs to the first failures of chassis cross-members, if that cross-member is not

a) the first or last cross-member of the chassis

b) fitted within 500mm of a suspension support

c) fitted with a driveshaft centre bearing

d) supporting a:

i. ball-race turntable

ii. tow coupling

iii. bolster attachment

iv. device that may place a concentrated load on to the chassis, for example a hoist or a hydraulic cylinder of a tipping body.

3. Repairs to coaming rails that do not support certified load anchorage points.

4. Tow-eyes fitted to the front of a vehicle for recovery purposes.

5. repairs to non-structural components only of a vehicle's monocoque body, for example bolt-on body panels.

6. Ferry tie down points that are attached using existing holes in the chassis and are not welded to components that require certification in themselves.

3.3.2 Certifications that require an LT400, but no statement of design compliance

The following is a list of tasks that certifying manufacturers can undertake without getting a statement of design compliance from a certifying engineer:

1. Repairs to existing certified load anchorages that are of a standard design from NZS5444, certified to this standard, and repaired using the method outlines in NZS5444. The repair must restore the same certified design in accordance with the requirements of NZS5444 and be certified to the Land Transport Rule: Vehicle Repair 1998.

2. A single rear steering axle fitted to a new quad axle semi-trailer certified in accordance with the Land Transport Rule: Vehicle Dimensions and Mass 2016.

3. A retractable axle fitted to a new trailer certified in accordance with the Land Transport Rule: Vehicle Dimensions and Mass 2016.

4. Other items as defined in the **manufacturing certifier section** of this manual.

Notes

- Identical replacement of some bolted components may not require certification but in some circumstances, certification can be requested (for example, when a vehicle inspector considers a vehicles safety performance has been affected). If no modification or repair has taken place and safe performance hasn't been affected, then a professional letter or statement can be issued by an HVEx certifier.
- The certifier is required to inspect the surrounding structure (system load path) in conjunction with the repair/replacement and extra care shall be taken in cases of repair/replacement due to damage to identify root cause.
- Repairs must use identical replacement components of the same dimensions and be fitted in the same location as originally certified.

3.3.3 Repairs that require both an LT400 and a statement of design compliance

All other repairs to heavy vehicle chassis, towing connections, log bolsters and load anchorages require input from a certifying engineer and therefore require a statement of design compliance before an LT400 can be issued by a manufacturing certifier, except where specifically allowed for in the manufacturing certifier section of this manual

Page amended **30 July 2025** (see **amendment details**)

3-4 Identifying the vehicle class

Since some decisions are made according to the class of the vehicle, the HV certifier must be able to identify the class of the vehicle to be inspected. The following table describes vehicle classes.

Table 3-4-1. Vehicle equipment standards classifications

Class	Description
AA (Pedal cycle)	A vehicle designed to be propelled through a mechanism solely by human power.
AB (Power-assisted pedal cycle)	A pedal cycle to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 300 watts.

LA (Moped with two wheels)*	A motor vehicle (other than a power-assisted pedal cycle) that:
	• has two wheels; and
	• either:
	  ○ has an engine cylinder capacity not exceeding 50ml and a maximum speed not exceeding 50km/h; or
	  ○ has a power source other than a piston engine and a maximum speed not exceeding 50km/h.

LB (Moped with three wheels)	A motor vehicle (other than a power-assisted pedal cycle) that:
	• has three wheels; and
	• either:
	  ○ has an engine cylinder capacity not exceeding 50ml and a maximum speed not exceeding 50km/h; or
	  ○ has a power source other than a piston engine and a maximum speed not exceeding 50km/h.
	An LB 1 motor vehicle has one wheel at the front and two wheels at the rear. An LB 2 motor vehicle has two wheels at the front and one wheel at the rear.

LC (Motorcycle)	A motor vehicle that:
	• has two wheels; and
	• either:
	  ○ has an engine cylinder capacity exceeding 50ml; or
	  ○ has a maximum speed exceeding 50km/h.

LD (Motorcycle and side-car)	A motor vehicle that:
	• has three wheels asymmetrically arranged in relation to the longitudinal median axis; and
	• either:
	  ○ has an engine cylinder capacity exceeding 50ml; or
	  ○ has a maximum speed exceeding 50km/h.

Class	Description
Side-car	A car, box or other receptacle attached to the side of a motorcycle and supported by a wheel.

LE (Motor tri-cycle)	A motor vehicle that:
	• has three wheels symmetrically arranged in relation to the longitudinal median axis; and
	• has a gross vehicle mass not exceeding one tonne; and
	• either:
	  ○ has an engine cylinder capacity exceeding 50ml; or
	  ○ has a maximum speed exceeding 50km/h.
	An LE 1 motor vehicle has one wheel at the front and two wheels at the rear. An LE 2 motor vehicle has two wheels at the front and one wheel at the rear.

Passenger vehicle	A motor vehicle that:
	• is constructed primarily for the carriage of passengers; and
	• either:
	  ○ has at least four wheels; or
	  ○ has three wheels and a gross vehicle mass exceeding one tonne.

MA (Passenger car)	A passenger vehicle (other than a class MB or class MC vehicle) that has not more than nine seating positions (including the driver's seating position).
MB (Forward control passenger vehicle)	A passenger vehicle (other than a class MC vehicle): • that has not more than nine seating positions (including the driver's seating position); and • in which the centre of the steering wheel is in the forward quarter of the vehicle's total length.

Class	Description

MC (Off-road passenger vehicle)	A passenger vehicle, designed with special features for off-road operation, that has not more than nine seating positions (including the driver's seating position), and that:
	• has four-wheel drive; and
	• has at least four of the following characteristics when the vehicle is unladen on a level surface and the front wheels are parallel to the vehicle's longitudinal centre-line and the tyres are inflated to the vehicle manufacturer's recommended pressure:
	  ◦ an approach angle of not less than 28 degrees;
	  ◦ a breakover angle of not less than 14 degrees;
	  ◦ a departure angle of not less than 20 degrees;
	  ◦ a running clearance of not less than 200mm;
	  ◦ a front-axle clearance, rear-axle clearance or suspension clearance of not less than 175mm.

Omnibus	A passenger vehicle that has more than nine seating positions (including the driver's seating position). An omnibus comprising two or more non-separable but articulated units shall be considered as a single vehicle.
MD (Light omnibus)	An omnibus that has a gross vehicle mass not exceeding 5 tonnes.
MD 1	An omnibus that has a gross vehicle mass not exceeding 3.5 tonnes and not more than 12 seats.
MD 2	An omnibus that has a gross vehicle mass not exceeding 3.5 tonnes and more than 12 seats.
MD 3	An omnibus that has a gross vehicle mass exceeding 3.5 tonnes but not exceeding 4.5 tonnes.
MD 4	An omnibus that has a gross vehicle mass exceeding 4.5 tonnes but not exceeding 5 tonnes.
ME (Heavy omnibus)	An omnibus that has a gross vehicle mass exceeding 5 tonnes.

Goods vehicle	A motor vehicle that:
	• is constructed primarily for the carriage of goods; and
	• either:
	  ◦ has at least four wheels; or
	  ◦ has three wheels and a gross vehicle mass exceeding one tonne.

Class	Description
For the purpose of this description: • a vehicle that is constructed for both the carriage of goods and passengers shall be considered primarily for the carriage of goods if the number of seating positions multiplied by 68kg is less than 50 percent of the difference between the gross vehicle mass and the unladen mass • the equipment and installations carried on special purpose vehicles not designed for the carriage of passengers shall be considered to be goods • a goods vehicle that has two or more non-separable but articulated units shall be considered to be a single vehicle.	

Class	Description
NA (Light goods vehicle)	A goods vehicle that has a gross vehicle mass not exceeding 3.5 tonnes.
NB (Medium goods vehicle)	A goods vehicle that has a gross vehicle mass exceeding 3.5 tonnes but not exceeding 12 tonnes.
NC (Heavy goods vehicle)	A goods vehicle that has a gross vehicle mass exceeding 12 tonnes.
Trailer	A vehicle without motive power that is constructed for the purpose of being drawn behind a motor vehicle.
TA (Very light trailer)	A single-axled trailer that has a gross vehicle mass not exceeding 0.75 tonnes.
TB (Light trailer)	A trailer (other than a class TA trailer) that has a gross vehicle mass not exceeding 3.5 tonnes.
TC (Medium trailer)	A trailer that has a gross vehicle mass exceeding 3.5 tonnes but not exceeding 10 tonnes.
TD (Heavy trailer)	A trailer that has a gross vehicle mass exceeding 10 tonnes.

3-5 Work procedure

Any work, to which this manual applies, to be done on a vehicle, must be:

- specified correctly
- designed correctly
- manufactured correctly
- certified as within safe tolerance of the original design or specification.

The design of the work by a HV engineer certifier, where the manufacture and installation is to be the responsibility of others, is to be accompanied by a **Statement of Design Compliance (SoDC)** that is signed by the HV engineer certifier.

The specification of the work is set out in the **Procedure Documentation Sheet (PDS)** that is drawn up by an HV certifier.

- Each certification must have its own unique PDS.

Manufacturing and installation work must also be monitored or verified by an HVS certifier. Where appropriate, the certification of manufacture may be done by a form of ‘type approval’.

Final certification is based on inspection by a qualified certifier with reference to any intermediate documents, including the SoDC, the PDS, supporting documentation from any delegated tasks, any applicable standards, documented histories of used components and worksheets and calculations.

Figure 3-5-1. Certification process: Engineer certifier

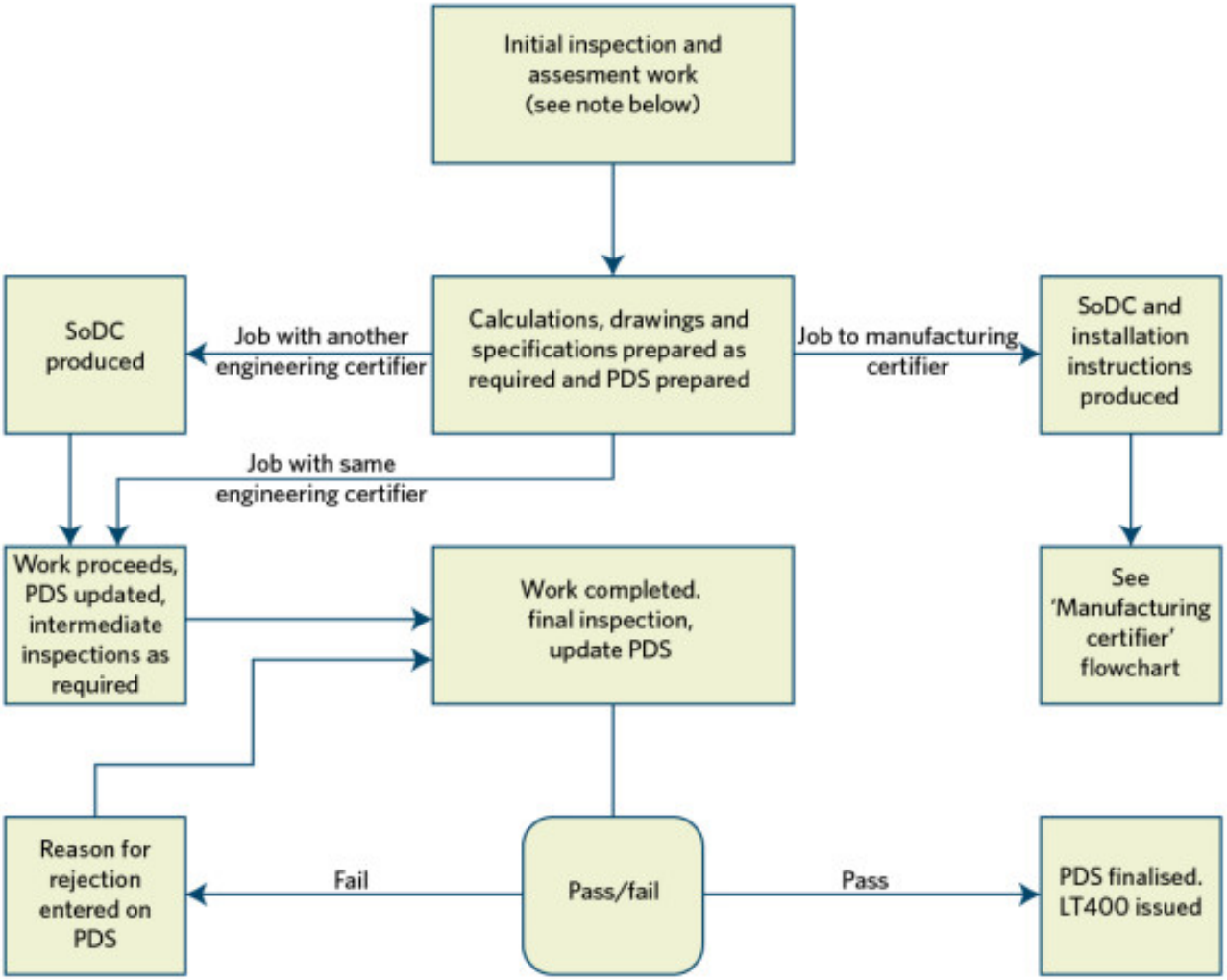
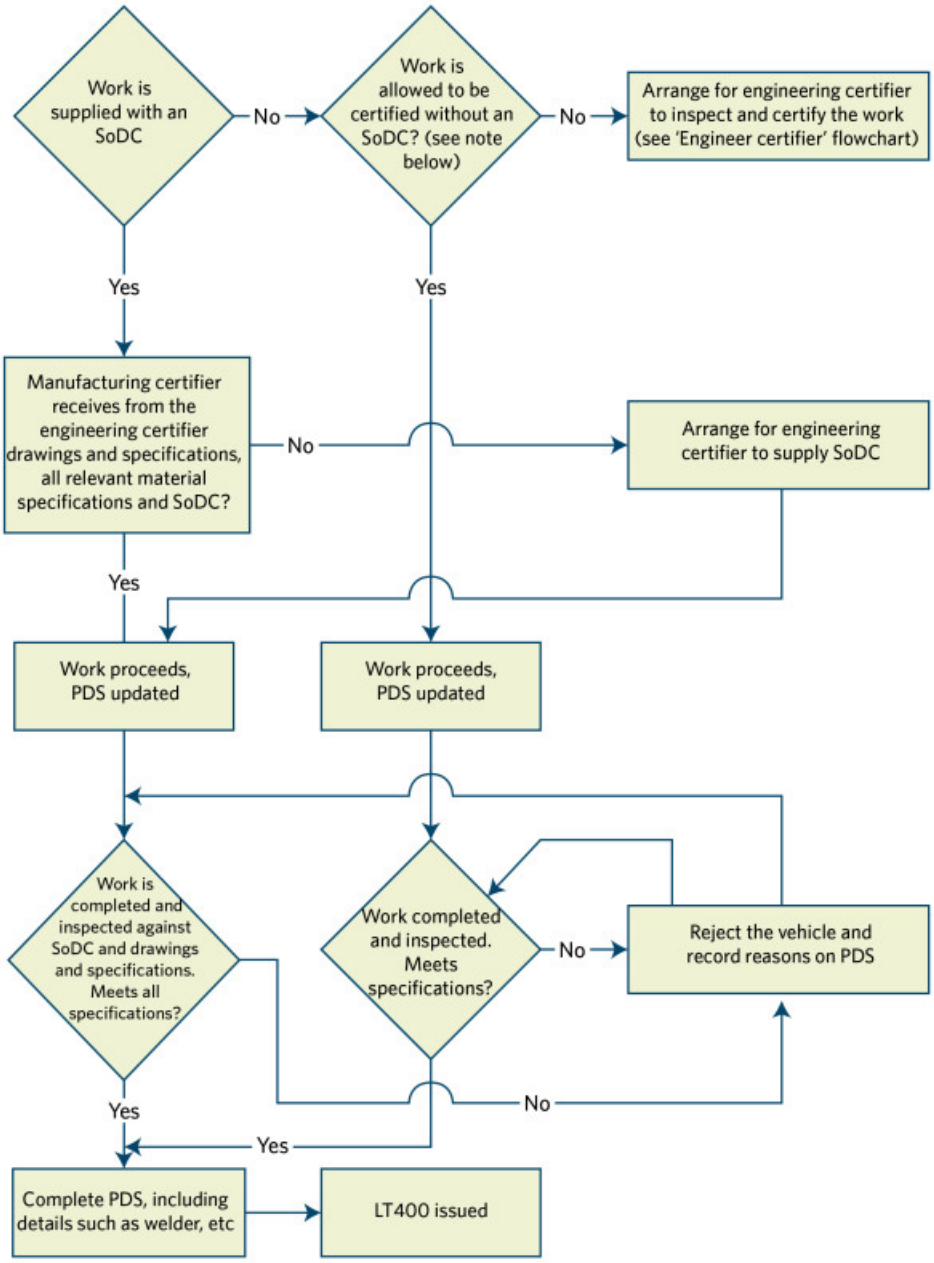


Figure 3-5-2. Certification process: Manufacturing certifier

(see Note 1)



Note 1

The following work is allowed to be completed by a manufacturing certifier without a SoDC.

- Load anchorages that are of a standard design from NZS5444, certified to this standard and repaired using the method outlined in NZS5444
- Worn or damaged fifth wheels replaced according to the fifth wheel manufacturer's instructions for replacing bolt on components
- Worn or damaged kingpins replaced according to the kingpin manufacturer's instructions on replacement
- Work certified by the HV certifier who has designed it.

Other work that may be certified by a HV manufacturing certifier is defined in the manufacturing certifier section of this manual.

How many certificates?

Each aspect of the vehicle that requires certification is to be certified separately and issued with a separate LT400. This means that any vehicle may need multiple certificates before it can qualify for a CoF (refer to **Technical bulletin 15**).

3.5.1 The statement of design compliance (SoDC)

The SoDC must include the name and signature of the certifier and the date of certification. The SoDC

must also have sections with information relevant to:

- the class of motor vehicle
- the vehicle description
- vehicle identifiers
- certification.

The SoDC must include information relevant to the purpose of specialist certification, for example:

- modifications
- repair
- vehicle dimensions
- matters relevant to the structure, systems, components or equipment of a vehicle or instillation or use of a vehicle's structure, systems, components or equipment
- alternative fuel system
- age or historic nature of a vehicle
- class of vehicle
- any other attribute of a vehicle.

The SoDC must confirm that the vehicle, or any aspect of it relevant to the purpose of specialist certification, complies with the requirements as specified in **Land Transport Rule: Vehicle Standards Compliance 2002**, and therefore must include the following statement:

I declare that I am a heavy vehicle specialist certifier – engineer and I hold a current valid appointment. I certify that this vehicle component design and this certification comply in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002; my Notice of Appointment and applicable requirements. To the best of my knowledge the information contained in this certificate is true and correct.

The SoDC must include drawing numbers and may include other relevant details.

HV manufacturing certifiers shall not accept an SoDC that does not contain the information outlined in the *Gazette* notice published during the week of 21 August 2000.

HV manufacturing certifiers shall not accept an SoDC from an HV certifying engineer who has ceased to practice. An SoDC issued by that person can no longer be considered valid as the HV certifying engineer does not hold a current appointment.

Consequently, any item or component manufactured using a SoDC from a non-practicing HV certifying engineer cannot be signed off by an HV manufacturing certifier, but must be re-certified by a current HV certifying engineer of the appropriate category.

SoDCs must be specific to individual vehicles and clearly identify the VIN/chassis number. SoDCs cannot be used for 'type' or 'model' approval of generic designs.

3.5.2 Issuing a professional letter or statement

Engineering certifiers may be asked for opinion on a component where it is determined that a LT400 is not required. This may include situations where a clean and treat is required, or inspection of damage recorded where certification is not yet required.

Where an LT400 **is not required**, the professional opinion should be on your company letterhead and should contain:

- vehicle details
- date of inspection
- details of the area assessed
- recording of any damage and any treatment completed
- effect on the vehicle's/components integrity and/or safety performance in relation to GVM/ratings
- your details, including category and ID
- the date and sign the document.

Page amended **1 April 2023** (see **amendment details**)

3-6 Establishing whether the vehicle aspect complies

Certifications by an engineer certifier

1. Start a Procedure Documentation Sheet (PDS) for the vehicle.

2. Inspect the vehicle to be certified at a location that allows adequate access and equipment to allow a full and detailed inspection.

3. Record all relevant details and dimensions for the proposed or existing aspect of the vehicle that requires certification.

4. Collect all relevant information that is required for the certification of that vehicle aspect.

5. Compare what the vehicle owner/workshop wants to do with the relevant sections of the VIRM and

ensure that no reasons for rejection will be invoked. If they are, the HV certifier should advise the owner/workshop in writing and detail the options.

6. Complete design drawings, specifications and calculations as required.

7. Complete a Statement of Design Compliance, if required (see **section 3.5**), and supply it as well as all drawings and specifications required to complete the proposed work to the workshop/vehicle owner. Such information should include dimensions, materials and welding specifications.

8. Supply any drawings and specifications required to complete the proposed work to the workshop/vehicle owner. Such information should include dimensions, materials and welding specifications as well as an inspection schedule from the HV certifier.

9. Carry out inspections of the work as required. If the vehicle is presented fully completed, disassembly of certain parts may be required at the discretion of the HV certifier. Compare the work against the requirements of the design drawings and specifications provided. The inspection should include the quality of materials and workmanship.

10. Compare the finished work and documentation against the VIRM for reasons for rejection and if any of the reasons for rejection apply, reject the vehicle for certification.

11. If the HV certifier requires further information in order to determine compliance with the requirements, he must reject the vehicle until the information has been obtained.

12. Complete the PDS and issue an LT400 for the aspect that has been certified if no reasons for rejection exist.

Certifications by manufacturing certifier

1. Start a PDS for the vehicle.

2. Inspect the vehicle to be certified at a premises that allows adequate access and equipment to allow a full and detailed inspection.

3. Inspect the vehicle against the Statement of Design Compliance, if required (see **section 3.5**), issued by a HV engineer certifier or against one of the approved pre engineered solutions. The inspection should include materials and workmanship.

4. Collect any relevant supporting documentation.

5. Compare the inspection results against the VIRM for reasons for rejection and if any exist, reject the vehicle for certification.

6. Complete the PDS and issue an LT400 for the aspect that has been certified if no reasons for rejection exist.

Prerequisite documentation

Certifications by engineer

1. Designs for the work involved in the vehicle aspect.

2. Statement of Design Compliance or LT400 signed by an HV Specialist Certifying Engineer for that aspect.

3. PDS.

Certifications by local manufacturer

1. Designs for the work involved in the vehicle aspect, where this involves the chassis, drawbar, drawbeam, heavy vehicle brakes or log bolsters.

2. Statement of Design Compliance or reference to pre engineered solutions, for the work involved in the vehicle aspect.

3. PDS.

3-7 Record of certification

1. The HV certifier must complete a Heavy Vehicle Specialist Certificate (LT400).

2.The HV certifier must include the Vehicle Identification Number (VIN) on the LT400.

3. The HV certifier must retain one copy of the LT400.

4. The HV certifier must provide one copy of the LT400 to the owner of the vehicle.

5. The HV certifier must hold all documentary evidence involved in the certification process.

One LT400 is required for each aspect of the vehicle that needs to be certified. If a single certifier who is appointed for more than one aspect of a vehicle certifies more than one aspect of the vehicle at the same time, a separate LT400 must be used for each aspect.

For some aspects of the vehicle an additional record of the determination, such as a component identification, usually in the form of a metal plate, must be issued and fixed to the vehicle. For some items, this identification may be impressed directly on to the item.

While a certifier may include an expiry date on the certification documents or certification records (eg identification plates), they are only valid if they are required by the legislation or the standard they are manufactured to, or are required by NZTA. If they are not specifically required they are not to be recorded in Landata (Where expiry dates are not specifically required by the legislation, the standard or NZTA then any certification carried out will be for the life of the vehicle).

Any vehicles or components certified after 1 December 2016 must contain the following information (on the plate or label) as a minimum:

Table 3-6-1. Data on plates and labels

Aspect	Minimum data on a plate
Drawbars and drawbeams	• Compliance certificate number (LT400) • Certifier's ID • Manufacturer or certifier's ID • VIN or vehicle chassis number (Note 1) • Maximum towed mass • Expiry date • Maximum vertical load (if applicable) Drawbar length (if applicable)
Log bolster	• Compliance certificate number (LT400) • Certifier's ID • VIN or vehicle chassis number (Note 1) • Number of bolsters fitted • Type of bolster attachments • Bolster rating • Expiry date
Load anchorages and headboard	• Compliance certificate number (LT400) • Certifier's ID • VIN or Vehicle chassis number (Note 1) • Anchorage type • Anchorage rating • Number of anchorages fitted • ID of the load anchorage manufacturer
Brake code (only where brake code is approved for re-certification)	• Compliance certificate number (LT400) • Certifier's ID • The words 'NZHVBC Edition No.' • The edition of the Brake Code used to certify the vehicle • Size of the brake chambers • Effective length of slack adjusters • Size of the tyres at certification • Grade of lining material used
PSV roof rack	• Purpose of the roof rack if other than for general baggage • Maximum weight it is allowed to carry • Manufacturer's name • Vehicle ID (VIN/chassis number and LT400 number if the roof rack has been rated and certified for use on a particular vehicle model) (Note 1)

Replacement plates

If a plate becomes illegible, damaged or lost it may be replaced provided that:

- the information that was on the plate can be determined from the original documentation, and
- visual inspection of the plated item shows it remains in a safe condition, and
- it is the original item.

Note 1

VIN is the primary vehicle identifier required and chassis number is acceptable only if the vehicle does not have a VIN.

Page amended **9 April 2018** (see **amendment details**)

3-8 Collecting fees

The **Land Transport (Certification and Other Fees) Regulations 1999**, regulations 5 and 8 stipulate that the fee that may be charged by an HV certifier for the certification of a vehicle is an amount determined by the individual HV certifier having regard to:

a) the time spent in inspecting the vehicle to ascertain whether it complies with the relevant requirements

b) any fees payable to NZTA

c) any standard or usual rate at which the HVS certifier charges for other work carried out in respect of motor vehicles.

3-9 Documentation of heavy vehicle specialist certification

The following table defines the minimum file content that should be present in any HVSC certification file. In addition to the listed minimum requirements, all files should contain sufficient information such that another HVSC can

independently verify the certification decision.

Required items	Certifier categories		
	HVEA, HVET, HVEC, HVEL, HVEK	**HMAD, HMTD, HMCD, HMLD, HMKD**	**HVS1, HVS2, HVS3, HVP1, HVP2**
PDS (identifying the vehicle, work carried out/certified, and the standards used)	?	?	?
LT400 (SODC if applicable)	?	?	?
Inspection notes and sketches	?	?	?
Photographs showing: • the entire vehicle, VIN and plate (if registered) • detailed views of the components • build/repair progress (if applicable) • the vehicle/component condition before repair (if applicable) • final inspection after all work completed • component rating and serial numbers* (if applicable)	?	?	?
Material specifications	?	?	
Calculations	?		?
Hubometer history and residual life assessment (for drawbar and drawbeam recertifications only)	?		?
Drawings/fabricator instructions	?		
Proprietary component data	?	?	
Welder qualifications (positions and techniques)	?	?	

Evidence of design that was followed, ie one of: • SoDC/DC and drawings • NZTA pre-approved solution (MRCoP) • A repair of a load anchor design from NZS 5444 • Manufacturers fitting instructions for replacement fifth wheel or kingpin • Design Certificate and drawings		?	
Vehicle information, eg data sheets, bodybuilder guide, vehicle history from LANDATA if already registered, et	?	?	
Welding/bolting procedures as appropriate		?	
NDT records as required		?	

Page added **9 December 2019** (see **amendment details**)

4 Complaints

Customers should be encouraged to direct any complaints to the HV certifier in the first instance.

To ensure that all written complaints are investigated, the HV certifier must maintain an effective complaints management process, which must provide:

1. a clear and concise statement that recognises the positive value of complaints.

2. clear and concise instructions to all customers on how to register a complaint. This can be accomplished in several ways, for example:

a) a conspicuous notice on the workplace wall, or

b) a clear statement on any receipt or invoice issued, or

c) a clear statement on the HVS certifier's checksheet

3. a straightforward explanation of the expected standards for resolution and the customer's right to appeal to NZTA if the proposed resolution is unsatisfactory

4. identification of the complainant and should address specific concerns about the service provided.

5. full documentation of each complaint processed, in accordance with the NZTA **Model QMS**, to enable subsequent investigation

6. acknowledgement in writing within three working days of any written complaint

7. a proposed resolution to the complainant within 20 working days of the complaint being made.

8. a record of each complaint, in accordance with the NZTA **Model QMS**

9. a clear direction to the NZTA helpdesk 0800 699 000 if a customer wishes to make a complaint or appeal a decision made by an HV certifier, or the complaint refers to legislation or NZTA policy.

Note: complaints must be in writing.

5 Inspection premises and equipment

The HV certifier must ensure that the premises used for the inspection and certification of modifications and repairs comply with the applicable requirements in this section.

HV certifiers who do not have their own premises should make their inspections on premises as described below.

5.1 Premises and equipment specifications

The HV certifier must use an inspection area that:

a) enables a safe and thorough inspection

b) is provided with sufficient lighting to enable good visibility of the vehicle being certified and the equipment used in the inspection process

c) have available suitable, calibrated equipment for the inspection being carried out.

5.2 Compliance with statutory requirements

The HV certifier must not carry out inspections if the premises and equipment do not comply with:

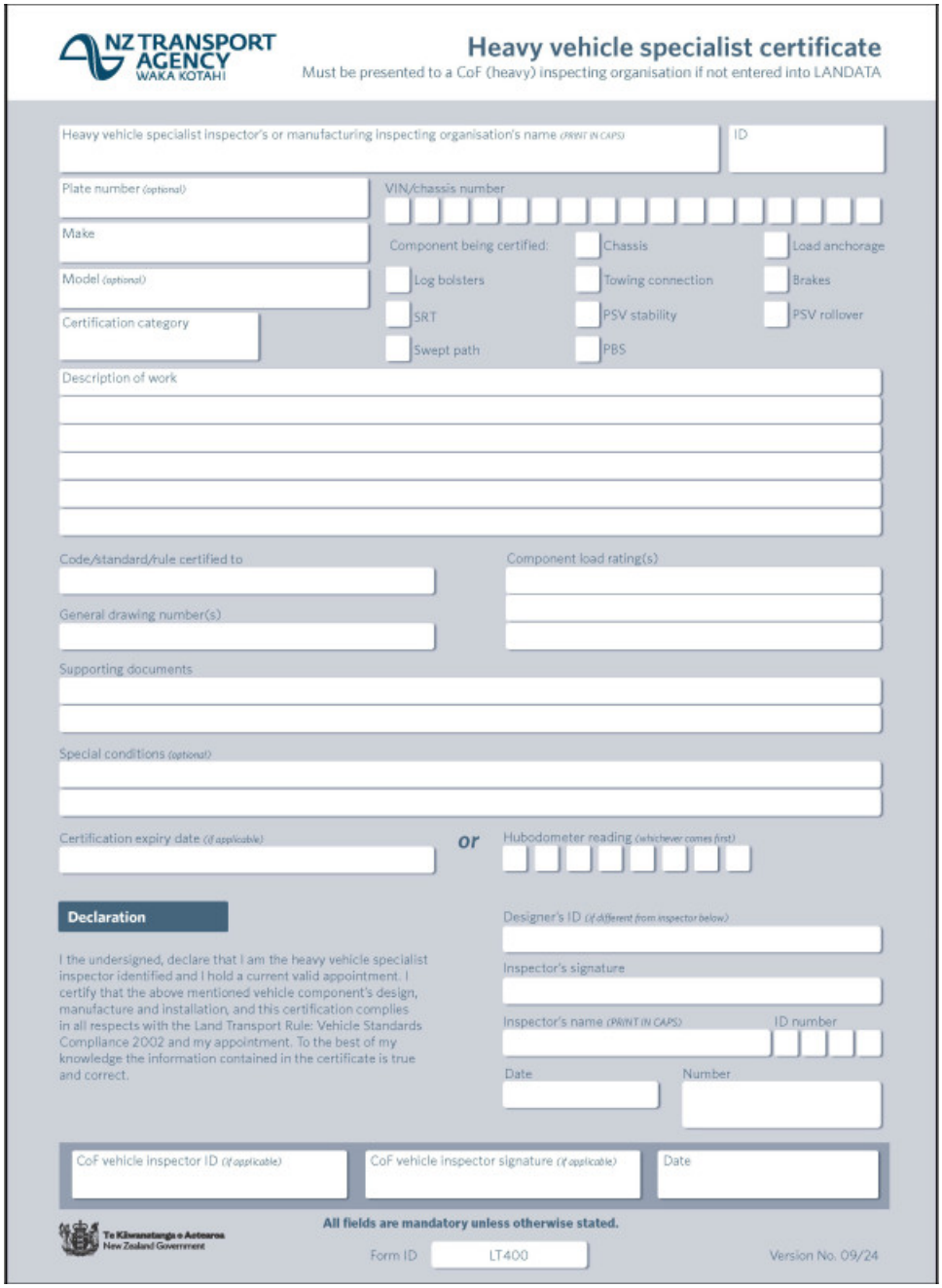
- Occupational Safety and Health requirements
- any other relevant Acts, regulations and local bylaws, as they apply to him or his business.

6 Appointments

Information on applying to be a heavy vehicle specialist certifier (HVSC) can be found in the Vehicle Inspection Portal Applications section.

Vehicle Inspection Portal HVSC Applications section

7 Sample certification documents



NZ TRANSPORT AGENCY
WAKA KOTAHI

Heavy vehicle specialist certificate

Must be presented to a CoF (heavy) inspecting organisation if not entered into LANDATA

Heavy vehicle specialist inspector's or manufacturing inspecting organisation's name *(PRINT IN CAPS)*

ID

Plate number *(optional)*

VIN/chassis number

Make

Component being certified:

- Chassis
- Load anchorage
- Log bolsters
- Towing connection
- Brakes
- SRT
- PSV stability
- PSV rollover
- Swept path
- PBS

Model *(optional)*

Certification category

Description of work

Code/standard/rule certified to

Component load rating(s)

General drawing number(s)

Supporting documents

Special conditions *(optional)*

Certification expiry date *(if applicable)*

or

Hubodometer reading *(whichever comes first)*

Declaration

I the undersigned, declare that I am the heavy vehicle specialist inspector identified and I hold a current valid appointment. I certify that the above mentioned vehicle component's design, manufacture and installation, and this certification complies in all respects with the Land Transport Rule: Vehicle Standards Compliance 2002 and my appointment. To the best of my knowledge the information contained in the certificate is true and correct.

Designer's ID *(if different from inspector below)*

Inspector's signature

Inspector's name *(PRINT IN CAPS)*

ID number

Date

Number

CoF vehicle inspector ID *(if applicable)*

CoF vehicle inspector signature *(if applicable)*

Date

Te Kāwanatanga o Aotearoa
New Zealand Government

All fields are mandatory unless otherwise stated.

Form ID LT400

Version No. 09/24

8 Definitions and abbreviations

Agricultural trailer	means a trailer constructed to be operated in connection directly with the operation or management of a farm but does not include a logging trailer.
Appointment	means the appointment by NZTA of the HV Certifier under the Notice of Appointment (NoA) and pursuant to **Land Transport Rule Vehicle Standards Compliance 2002**.
Applicable requirement	means any requirement specified in an Act, Regulation or Rule that applies to a specific vehicle.
Approved vehicle standard	means a vehicle standard with which a vehicle is required to comply by an applicable requirement.
Articulated vehicle	means any motor vehicle with a semi-trailer attached, so that part of the semi-trailer is superimposed on the motor vehicle and a substantial part of the mass of the semi-trailer and of its load is borne by the motor vehicle.
Aspect of a vehicle for heavy vehicle certification	means an aspect of the vehicle which belongs within certifier categories. These include chassis and frame structures, towing connections, load anchorages, bolster attachments, brakes and SRT.
Axle	means one or more shafts, spindles or bearings in the same vertical transverse plane by means of which, in conjunction with wheels mounted on those shafts, spindles or bearings, a portion of the weight of the vehicle is transmitted to the roadway, and: a) if two or more wheels of a motor vehicle are substantially in the same line transversely and some or all of them have separate axles, the axles of all those wheels are to be treated as one axle b) if the longitudinal centreline of an axle of a motor vehicle is less than 1m distant from the longitudinal centreline of another axle, the two axles are to be treated as one axle (‘a dual axle’).
Axle mass	means the lesser of: a) the maximum mass that can be carried by the axle, including the mass of the axle, as determined by the axle manufacturer, or b) the maximum mass that can be carried by the suspension system, including the mass of the axle, as determined by the suspension system manufacturer.
Axle set	means a single-axle set, a tandem-axle set, a twin-steer axle set, a tri-axle set, or a quad-axle set.
Axle-stop device	means a device to control the movement of the axle in the event of suspension failure.

Ballrace turntable	means a device incorporating a low friction ball bearing fitted between two substantial structural components of a vehicle to enable rotational motion between those components about a vertical axis.
Body	means the part of the vehicle that is designed for the use and accommodation of the occupants or to hold any goods.
Bolster Attachment Code	means the Bolster Attachment Code of the Log Transport Safety Council, approved by NZTA.
Brake control assembly	means an assembly containing the brake pedal assembly, the master cylinder or treadle valve, and associated components.
Brake pedal assembly	means an assembly containing the brake pedal and pedal pivot, pedal bracket, pedal return spring and associated components.
Cab-guard	means a structure attached to a vehicle that provides protection to the cab occupants from the effects of load impact, and may include a headboard.
Certificate of loading	means a certificate of loading issued under any regulation or rule made under the **Land Transport Act 1998**
Certify	means in relation to a vehicle, or specific aspect of a vehicle, to make a record of determination under 6.6(1)(a) or 7.6(1)(a) that confirms that the vehicle inspector or inspecting organisation has determined that the vehicle or specific aspect of the vehicle complies with the applicable requirements.
Chassis	means the structural lower part of a vehicle to which the running gear and, as applicable, engine, transmission, steering system and body may be attached.
Chassis assembly	means a chassis with running gear attached and, as applicable, engine, transmission and steering system attached.

Chassis rating	means: a) for a vehicle first registered before 1 February 1989 that has not been modified on or after 1 April 2005, a set of data, containing the gross vehicle mass, gross combination (if applicable) and maximum towed mass (if applicable), approved or determined by NZTA or a person appointed by NZTA b) for a vehicle first registered on or after 1 February 1989 or a vehicle that has been modified on or after 1 April 2005, a set of data, containing the permitted maximum axle and/or axle-set masses, gross vehicle mass, gross combination mass (if applicable) and maximum towed mass (if applicable), approved or determined by NZTA or a person appointed by NZTA.
Class	in relation to vehicles, means a category of vehicle of one of the groups A, L, M, N and T, as specified in Table A in **Land Transport Rule Heavy Vehicles 2004**
Combination vehicle	means a towing vehicle in combination with one or more trailers or other motor vehicle that is being towed.
Compliance label	means an attachment to the vehicle in the form of a label that confirms compliance with applicable requirements.
Construction	means the manufacture, assembly, reassembly or modification of a vehicle and includes all acts and activities related or incidental to the construction of a vehicle.
Coupling	means that part of a vehicle that is specifically designed to enable it to be connected to another vehicle; does not include a structural member of the towing or towed vehicle.
De-registered	means that a vehicle's New Zealand registration has been cancelled in accordance with the **Land Transport Act 1998**
Drawbar	means an assembly of components that includes: the trailer coupling that connects the trailer to the coupling of the towed vehicle; hinges (where applicable); the structural and other related components between the trailer coupling and trailer bogie or chassis.
Drawbeam	means the part of the towing vehicle to which a coupling is fitted to enable a heavy trailer to be connected and includes the attached coupling.
Dual steering	in relation to a vehicle, means the vehicle is able to be steered from both the left-hand and right-hand side of the vehicle.

EBS	means electronically controlled braking system. Refer to the Land Transport Rule: Heavy Vehicle Brakes 2006 for further information. **Land Transport Rule: Heavy Vehicle Brakes 2006**
Enter service	in relation to a vehicle means to begin to be operated in-service for the first time. For Public Service Vehicles the date of entry refers to the most recent entry or re-entry. For other vehicles the date of entry is the date of the first entry into the New Zealand fleet.
Evidence of vehicle inspection	has the same meaning as in the Act and the Rule.
Fifth wheel	means a device fitted to a vehicle to enable a semi-trailer to be connected to it by means of a kingpin so that the semi-trailer may be towed.
Fit and proper	has the meaning ascribed to it in Section 2 of the Rule.
Force Majeure	means any cause beyond the reasonable control of the party claiming its benefit and which that party is unable to overcome by the exercise of reasonable diligence.
g	means an acceleration of 9.81m/s^2.
Goods	means all kinds of movable property; includes articles sent by post and animals.
Gross combination mass	means, for a vehicle that is permitted to tow another vehicle, the maximum permitted combined mass of the towing vehicle and any combination of attached trailers or vehicles, determined by the vehicle manufacturer and approved by NZTA, or determined by NZTA.
Gross mass	in relation to any vehicle or combination vehicle, means the mass of that vehicle and its load, equipment and accessories, which may be determined by adding the mass on the vehicle's axles or axle sets.
Gross vehicle mass	means either: a) the maximum permitted mass of a vehicle, which includes the mass of the accessories, the crew, the passengers and load, and is, unless (b) applies, the gross vehicle mass specified (subsequent to the latest modification, if any) by the manufacturer of the vehicle, or b) if a person approved for the purpose by NZTA determines that the gross vehicle mass should differ from that specified by the manufacturer, taking into account evidence on the capability of the systems and components of the vehicle, or the effects of any modification, that mass determined by that person.

Headboard	means the substantially vertical part of the forward end of a flat deck or curtain-sided body of a vehicle.
Heavy motor vehicle	means a motor vehicle that: a) is of class MD3, MD4, ME, NB, NC, TC or TD, or b) has a gross vehicle mass that exceeds 3500kg and is not of a class specified in **Table 3-4-1. Vehicle equipment standards classifications**
Heavy vehicle Specialist Vehicle Inspection Requirements Manual	means the revision that was current at the time of issue of certification of the document published by NZTA indicating to the HV certifier and inspecting organisation how any vehicle must be inspected under the Rule and their Notice of Appointment.
Hook truck	means a vehicle recovery service vehicle with a crane hoist that partially lifts the vehicle to be recovered, which is then towed in this position.
HVS certifier	means a heavy vehicle specialist certifier appointed by NZTA under the Rule to certify certain aspects of vehicles before the vehicle can be given a certificate of fitness.
Inspection and certification	means the performance of two or more of the following, for the purposes of determining compliance with applicable requirements: a) examining vehicles b) determining whether or not a vehicle or specific aspect of a vehicle complies with applicable requirements c) issuing evidence of vehicle inspection d) recording and making available information about vehicles (including their systems, components, devices, fittings and equipment).
Inspection and certification document	means a document required, produced or issued in the inspection and certification process, including a plate, a label, an electronic record and a check sheet.
Inspection and certification outcome	in relation to a vehicle, means: a) production of a record of determination as appropriate to the inspection and certification activity, or b) provision of other records and information about the vehicle to NZTA or other persons, or c) production of evidence of vehicle inspection.
Inspecting organisation	means an organisation appointed under 2.2 of the Rule to carry out inspection and certification activities. An HVS certifier is an inspector and an inspecting organisation.

Kingpin	means a pin attached to the skid plate of a semi-trailer and used for connecting the semi-trailer to the fifth wheel of a towing vehicle.
Land transport document	has the same meaning as in the **Land Transport Act 1998**
Lifting gear	in relation to a vehicle recovery service vehicle, means any equipment used to lift another vehicle, and includes towing attachments.
Light trailer	means a trailer that has a gross vehicle mass of 3500kg or less.
Load	includes part of a load and: a) includes covers, ropes, ties, blocks, tackles, barrows or other equipment or objects used in the securing or containing of a load on a vehicle or the loading or unloading of a vehicle, whether or not any other load is on the vehicle, and b) does not include animal wastes discharged from animals being carried on a vehicle at the time.
Load anchorage point	means a device permanently attached to a vehicle to enable a load to be secured or attached to the vehicle.
Load rating	means the maximum force that can be withstood without incurring any loss of structural capacity.
Load securing equipment	means equipment or a device permanently fitted to a vehicle to secure, either by itself or in conjunction with other equipment or devices such as lashings, a load to a vehicle.
Load-sharing axle set	means an axle set suspension system that has effective damping characteristics on all axles of the set and is built to divide the load between the tyres on the set so that no tyre carries a mass more than 10% greater than the mass it would carry if: a) the load were divided in the axle set so that each tyre carries an equal load, or b) the axle set is a tandem axle set comprising a twin-tyred axle and a large single-tyred axle and is built to divide the load between the tyres on the set so that: i. 60% of the load is borne by the twin-tyred axle and 40% of the load is borne by the large single-tyred axle, or ii. 55% of the load is borne by the twin-tyred axle and 45% of the load is borne by the large single-tyred axle.

Logging bolster	means a vertically orientated member attached to a vehicle that is used to secure loads of timber logs.
Manufacturer's operating limits	means: a) in relation to a motor vehicle, the allowance provided by the vehicle manufacturer in terms of performance capability and dimensions, relative to deterioration, malfunction or damage beyond which the safe performance of the vehicle, as defined by the vehicle manufacturer, is compromised, and b) in relation to a system, component or item of equipment, incorporated in or attached to a vehicle, the allowance provided by the system, component or equipment manufacturer in terms of performance capability and dimensions, relative to the deterioration, malfunction or damage, beyond which the safe performance of the system, component or item of equipment (and consequently the vehicle) is compromised.
Mass	in relation to a vehicle, means the quantity of material contained in or on the vehicle that, when subjected to acceleration due to gravity, will exert downwards on a level surface a force that can be measured as the weight of the vehicle.
Maximum towed mass	means the maximum permitted mass of all vehicles that may be towed behind a vehicle as determined by the manufacturer of the towing vehicle and approved by NZTA.
Modify	in relation to a vehicle, means to change the vehicle from its original state by altering, substituting, adding or removing any structure, system, component or equipment but does not include repair.
Monocoque	in relation to a vehicle, means that the chassis of the vehicle is integral to the body.
Motor vehicle	means a vehicle drawn or propelled by mechanical power, including its structure, systems, components and equipment. This includes a trailer, but does not include: a) a vehicle running on rails b) an invalid carriage c) a trailer (other than a trailer designed solely for the carriage of goods) that is designed and used exclusively as part of the armament of the New Zealand Defence Force d) a trailer running on one wheel and designed exclusively as a speed measuring device or for testing the wear of vehicle tyres e) a vehicle designed for amusement purposes and used exclusively within a place of recreation, amusement or entertainment to which the public does not have access with motor vehicles f) a pedestrian-controlled machine.

Operate	in relation to a vehicle, means to drive or use the vehicle on a road, or to cause or permit the vehicle to be on a road or to be driven on a road, whether or not the person is present with the vehicle.
Original equipment	means equipment that is fitted by the vehicle manufacturer when the vehicle is manufactured or equipment that is approved by the vehicle manufacturer for use in a specific vehicle type for a specific purpose.
Outrigger	in relation to a vehicle that is fitted with a crane or hoist, means a device fitted to the vehicle that extends and stabilises the vehicle while the crane or hoist is in use.
Payload capacity	means the gross vehicle mass of a vehicle less its unladen mass.
Pole trailer	means a trailer that is attached to a towing vehicle by a telescoping or sliding pole, and is designed to support a common long load spanning between the trailer and the towing vehicle.
Power pack	means the engine, its radiator/cooling pack, induction and exhaust system, including layout, and any accessories or emissions control equipment, such as 'addblue', specified by the manufacturer.
Procedure documentation sheet	means a document that defines and records the procedures and calculations and design criteria and includes all documents relating to HVS specialist certification.
Quad-axle set	means a set of four axles, where: a) the centres of the first and fourth axles are spaced not less than 3.75m and not more than 4m apart, and b) all axles contain an equal number of tyres, and c) none of the axles is a single standard-tyred axle.
Record of determination	means a record, in paper or electronic form, that a vehicle or specific aspect of a vehicle complies or does not comply with applicable requirements. If the specific aspect of the vehicle complies, this is to be shown on an LT400. The results of inspections before the aspect complies are recorded on the Procedure documentation sheet.
Re-enter service	in relation to a vehicle previously certified for entry means to begin to be operated in-service again.
Registered	in relation to a vehicle, means registered under the **Land Transport Act 1998**.

Registration number	means the combination of numbers or letters on a registration plate, issued under the **Land Transport Act 1998**, for use on a registration plate.
Repair	in relation to a vehicle, means to restore a damaged or worn vehicle, its structure, systems, components or equipment, and includes the replacement of damaged or worn structures, systems, components and equipment with equivalent undamaged or new structures, systems, components and equipment.
Rigid tow-pole	means an inflexible bar with a coupling at each end that can be connected to the coupling fitted to the rear of a vehicle recovery service vehicle and to the coupling fitted to the front of a vehicle to be recovered without lifting that vehicle.
Rule	means the **Land Transport Rule Vehicle Standards Compliance 2002** and its amendments.
Safe tolerance	means the tolerance within which the safe performance of the vehicle, its structure, systems, components or equipment is not compromised, having regard to any manufacturer's operating limits.
Semi-trailer	means a trailer, with only one axle set, that is partially superimposed on the towing vehicle so that a substantial part of the trailer and its load is borne by the towing vehicle.
Sideboard	means the substantially vertical part of the side of a flat-deck body of a vehicle.
Single-axle set	means either one axle or two axles having their centres spaced less than 1m apart.
Skid plate	means the plate structure forming part of the semi-trailer that houses the kingpin and that mounts on the coupler plate to form the connection between the towing vehicle and the semi-trailer.
Specialist inspection and certification	means inspection and certification of a specific aspect of a vehicle.
Special purpose vehicle	means a vehicle that is a street sweeper, refuse collector, weed sprayer or road marker.
Statement of compliance	means a statement in a format specified by NZTA confirming that a vehicle or component complied with one or more approved vehicle standards when manufactured or modified.

Statement of Design Compliance	is a document that is drawn up and signed by an authorised HVS engineer certifier which contains the designs, calculations, materials, processes and methods for completing the design so that the finished vehicle or specific aspect will comply with all applicable requirements.
Steering axle	means the axle of a vehicle where the wheels can turn at an angle to the centreline of the vehicle.
Stinger-lift truck	means a vehicle recovery service vehicle with an arm that partially lifts the vehicle to be recovered, which is then towed in this position.
Stockcrate	means a container designed for transporting livestock, which can be secured to a vehicle.
Stockcrate retention device	means one or more restraining devices or lashings to facilitate the attachment of the stockcrate to the deck or chassis of a vehicle.
Suspension system	means a system that allows controlled and limited movement of an axle relative to the chassis or body of a vehicle; includes a spring and damping system and any associated controls.
Tailboard	means the substantially vertical part of the rear end of a flat-deck or curtain-sided body of a vehicle.
Tandem-axle set	means an axle set comprising two axles having their centres spaced not less than 1m and not more than 2m apart.
Three-point linkage	means, for a tractor or agricultural trailer, a towing connection that has three points of attachment.
Towbar	means the part of the towing vehicle to which a coupling for a light trailer is connected.
Towing connection	means the combination of components that enables one vehicle to tow or be towed by another vehicle; includes a towbar, drawbar, drawbeam and coupling.
Traction engine	has the same meaning as in section 2(1) of the **Land Transport Act 1998**
Tractor	means a motor vehicle (other than a traction engine) constructed principally for towing an agricultural trailer or powering agricultural implements.

Trailer	means a vehicle without motive power that is capable of being drawn or propelled by a motor vehicle from which it is readily detachable, but does not include: a) a sidecar attached to a motorcycle, or b) a vehicle normally propelled by mechanical power while it is being temporarily towed without the use of its own power.
Transmission	in relation to a motor vehicle, means the gearing system and related components, including a driveshaft, by which power is transmitted from the flywheel or the engine output shaft to the input shafts of the powered axles.
Transporter	in relation to a vehicle recovery service vehicle, means a vehicle equipped with a tray body that: a) can move back and be tilted so that the rear end of the tray rests on the ground, or b) remains fixed and onto which the vehicle to be recovered is moved up ramps or lifted.
Tri-axle set	means a set of three axles, where: a) the centre of the first and third axles are spaced not less than 2m and not more than 3m apart, and b) all axles contain an equal number of tyres, and c) none of the axles is a single standard-tyred axle.
Twin-steer axle set	means a tandem-axle set with single tyres, where both axles are connected to the same mechanism in order to steer similarly.
Two-point linkage	means, for an agricultural trailer, a towing connection that has two points of attachment.
UN/ECE	is an abbreviation for a regulation of the United Nations Economic Commission for Europe.
Unladen mass	in relation to a vehicle, means the mass of the vehicle together with the fuel in its fuel system (if any) and the equipment and accessories on it that are necessary for its operation for the purpose for which it was designed.
Vehicle identification number	means a group of letters and numbers consisting of 17 characters that: a) is affixed to a vehicle in accordance with the relevant standard prescribed under the **Land Transport Rule Vehicle Standards Compliance 2002**, and b) is capable of being decoded to provide identifying information about that vehicle.

Vehicle inspector	means an individual appointed under section 2.2 of the Rule to carry out inspection and certification activities.
Vehicle standard	means a technical specification with which a vehicle component or system must comply, and which is adopted by: a) the New Zealand Standards Council, or b) any international, national or regional organisation with functions similar to the New Zealand Standards Council.
Vehicle recovery service vehicle	means a vehicle used in a vehicle recovery service for towing or transporting on a road any motor vehicle; does not include a vehicle that is not designed or adapted for the purpose of towing or carrying motor vehicles.
Waka Kotahi, NZ Transport Agency, NZTA	New Zealand Transport Agency established by section 93 of the Land Transport Management Act 2003.

Page amended **4 November 2025** (see **amendment details**)

1 Vehicle Identification

1-1 VIN and chassis number

Important Ensure that the VIN or chassis number is recorded in full on the checksheet.

This number must be:

- the VIN if fitted – not the chassis number (locally allocated VIN)
- the stamped VIN on the VIN plate – not the VIN etched on the glazing.

Also refer to **Figure 1-1-1. Structure of a VIN issued by the NZ Transport Agency** and **Figure 1-1-2. Structure of a VIN issued by the vehicle manufacturer**.

Reasons for rejection

Mandatory requirements

1. A vehicle first registered or re-registered in New Zealand before 1 April 1994 does not have a VIN or chassis number (Note 1).

2. A vehicle first registered or re-registered in New Zealand from 1 April 1994 does not have a VIN number (Note 1).

3. A VIN number is not valid (Note 2).

Condition

4. A VIN or chassis number has been (Note 1) (Note 3):

a) removed, or

b) erased, or

c) altered, or

d) defaced, or

e) obscured, or

f) destroyed, or

g) obliterated, or

h) affixed unlawfully or by unauthorised persons (Note 3).

Note 1

A vehicle must be referred to a VIN issuing agent (**VTNZ**, **VINZ**, **NZAA**) to have a VIN attached if:

a) the vehicle does not have a VIN or chassis number, or

b) the VIN or chassis number has become illegible.

Note 2

A valid VIN is a unique number that has been assigned to the vehicle in the vehicle's country of origin or by a person appointed by the NZTA. It consists of 17 characters that never contain the letters I, O or Q, and that is capable of being decoded to provide identifying information about the vehicle.

Note 3

The vehicle inspector must advise the local police if there is reason to believe that the VIN or chassis number has been tampered with in any way.

Table 1-1-1. Location of New Zealand VIN numbers

Vehicle	Permitted VIN locations
Vehicles that are not forward controlled (passenger cars and off-road passenger vehicles)	• In the engine compartment on the right-hand side of the firewall • In the engine compartment on the right-hand side adjacent to the front suspension mounting point • In a location inside the engine compartment approved by the NZTA for a specified vehicle or vehicle model • On the firewall or inner guards so it is visible from the front of the vehicle.
Forward-controlled vehicles (passenger vans and off-road vehicles)	• In the passenger compartment, on the top of the right-hand side wheel arch adjacent to the seat cushion • In the passenger compartment, on the inner panel of the right-hand A-pillar, adjacent to where the floor meets the A-pillar • In the passenger compartment on the B-pillar.
Goods vehicles and light omnibuses	Vehicle with a separate chassis: • On the outside of the chassis adjacent to the right front wheel arch, Vehicle without a separate chassis: • As specified for forward-controlled vehicles.

If the vehicle is unfamiliar, and the VIN or chassis number cannot be located, the vehicle inspector should contact the manufacturer's agent or the local VIN issuing agent.

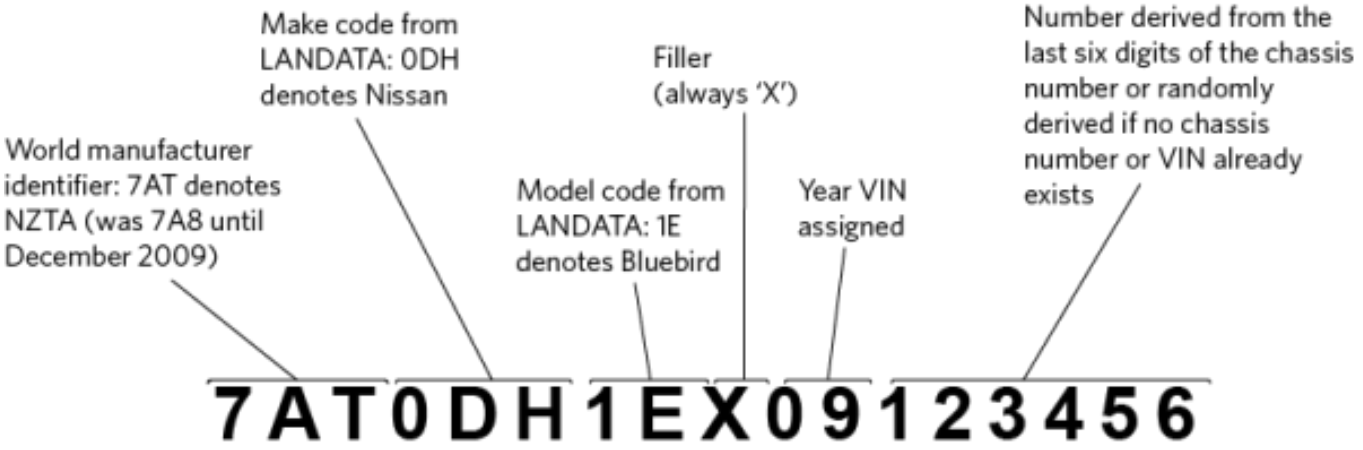


Figure 1-1-1. Structure of a VIN issued by the NZTA

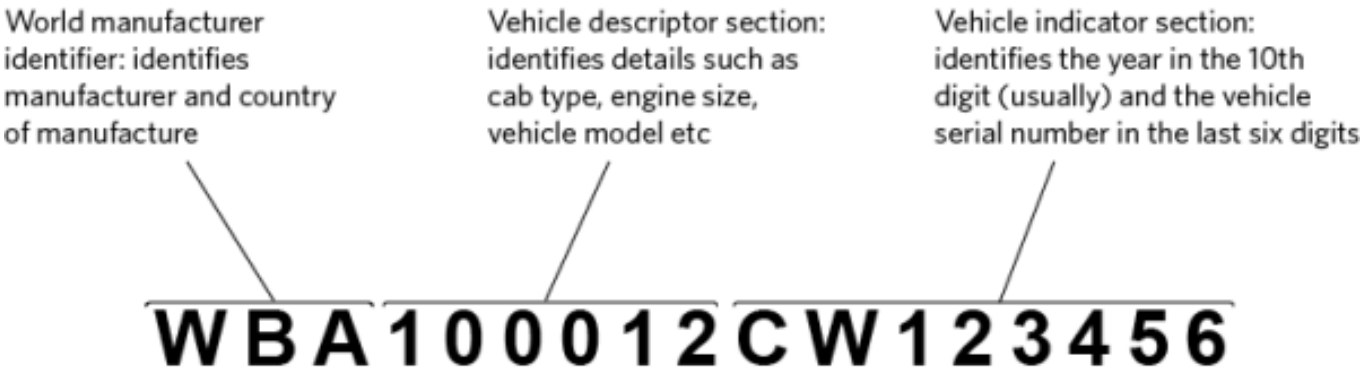


Figure 1-1-2. Structure of a VIN issued by the vehicle manufacturer

Summary of legislation

Applicable legislation

- Land Transport Rule: Vehicle Standards Compliance 2002

Mandatory requirements

1. A vehicle first registered or re-registered in New Zealand before 1 April 1994 must have a chassis number or VIN.

2. A vehicle first registered or re-registered in New Zealand from 1 April 1994 must have a VIN.

Condition

3. A VIN or chassis number must not have been removed, erased, altered, defaced, obscured, destroyed, obliterated or affixed unlawfully, or be unauthorised.

Page updated **14 August 2013** (see amendment details).

2 External projections

2-1 External projections

Certifier categories: **All**

Reasons for rejection

1. A component of a motor vehicle, including a damaged, corroded or exposed body panel, is such that it may:

    a) hook a vehicle, or

    b) hook or graze a person.

2. An ornamental object or fitting (Note 2) protrudes in such a way that it is:

    a) likely to injure a person, or

    b) affects the driver's vision or control.

3. A protruding object or fitting that has a functional purpose (Note 3):

a) is of excessively heavy construction for the purpose for which it has been fitted, or

b) has sharp corners, or

c) slopes forward, unless this is necessary to fit the contours of the vehicle, or

d) has an unnecessarily wide gap between the object or fitting and the front of the vehicle, or

e) exceeds the vehicle's width by more than 100 mm on either side, other than side mounted glass sheet transport racks and collapsible side mirrors, or

f) is a glass sheet transport rack that is not fitted with a front fairing to minimise the risk of injury to a person.

Note 1

External projections is not a certifiable aspect in itself, but compliance with the requirements in this chapter should be taken into account when designing other modifications.

Note 2

Ornamental object or fitting means an object or fitting that does not have a practical purpose, for example bonnet emblems. The external projections requirements relate to the design and maintenance of objects and fittings that protrude from the exterior of the motor vehicle with regard to the safety of other motor vehicles, pedestrians and cyclists.

Note 3

Functional object or fitting means an object or fitting that has a practical purpose, for example bullbars, winches, spare wheel carriers, glass racks and so on.

Note 4

Modify means 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.

Note 5

Repair means to restore a damaged or worn vehicle, its structure, systems, components or equipment to within safe tolerance of its condition when manufactured, including replacement with equivalent undamaged or new structures, systems, components or equipment.

Summary of legislation

Applicable legislation

- **Land Transport Rule: External Projections 2001**

General safety requirements (section 2.2)

1. An ornamental object or fitting must not protrude from a motor vehicle if the object or fitting is likely to injure a person.

2. A protruding object or fitting that has a functional purpose must, if installed and operated on a motor vehicle that is operated on a road, be such that the risk of the object or fitting causing injury to a person is minimised.

3. A protruding object or fitting must not adversely affect driver vision or driver control.

4. Components of a motor vehicle, including damaged or corroded body panels, must be such that the risk of their hooking a vehicle, or hooking or grazing a person, is minimised.

5. In assessing whether requirements 1 to 4 above are complied with, an HV certifier may take into account evidence that the external projections are within the motor vehicle manufacturer's operating limits.

Modification and repair (section 3)

Modification (section 3.1)

6. A modification to a motor vehicle that affects an external projection:

a) must not prevent the vehicle from complying with this rule, and

b) must be certified as specified in **Land Transport Rule: Vehicle Standards Compliance 2002**.

3 Dimensions

3-1 Dimensions

Certifier categories: **HVEC** | **HMCD** | **HVS1** | **HVS2** | **HVS3** | **HVP1** | **HVP2**

Reasons for rejection

1. A vehicle dimension does not comply with Table 3-1-1 and is not qualified to be overdimensional.

2. The inter-vehicle spacing between a towing vehicle and a full trailer when the combination is in a straight line is less than the greater of:

a) 1 metre, or

b) half the width of the foremost point of the trailer (including its load but excluding the drawbar and front dolly assembly).

3. An articulated bus cannot complete a 360-degree turn in either direction without any part of the vehicle (except collapsible mirrors) encroaching within a turning radius of 5.3m.

4. Except for the articulation mechanism, any parts of a vehicle combination come into contact when completing a 360-degree turn within a 25m diameter circle.

5. The mass on a front-axle set or twin-steer axle set of a heavy rigid vehicle is at any time less than 20% of the sum of the axle mass of the vehicle.

6. Axle spacing and masses do not meet the legal requirements.

7. An HPMV does not comply with one of the 'pro forma' designs in the Rule and is not approved as an alternative design.

Table 3-1-1

Dimension	Maximum distance (metres except where indicated otherwise)
Width:	
All vehicles	2.55 or 1.275 from each side of the longitudinal centreline of the vehicle.
Overall length (excluding collapsible mirrors):	
Towing vehicle, full trailer, simple trailer, pole trailer (excluding load)	11.5
Simple trailer	12.5
Rigid vehicle (not towing)	12.6
Rigid bus with 3 axles where the rearmost axle is a single-tyred steering axle that is: a) either positively and continuously linked to the front steer axle (except may be locked for reverse or high-speed operations), or b) automatically locked at a speed of 30km/h in the straight ahead position or for reverse operations.	13.5
Articulated bus	18
Towing vehicle and semi-trailer with: • a quad-axle set with two steering axles (and first registered before 1/2/17) • any other quad-axle set.	18 19
Towing vehicle and full trailer: • excluding load • including load if load overhanging th rear of the trailer does not exceed 2.3m width, or 1.15m from the longitudinal centreline of the vehicle	20 22
Towing vehicle and simple trailer	22

Dimension	Maximum distance (metres except where indicated otherwise)
Any other combination of vehicles	20
Height:	
All vehicles	4.3
Forward distance (excluding collapsible mirrors):	
Rigid vehicle	8.5 if fitted with tow coupling, 9.5 otherwise
Full trailer, simple trailer, pole trailer with drawbar at full extension, articulated bus (both front and rear sections)	8.5
Semi-trailer	9.2
Rear overhang:	
Heavy rigid vehicle	4.0 or 70% of wheelbase (whichever is less) for a vehicle whose rear-most axle is a non-steering axle 4.25 or 70% of wheelbase (whichever is less) for a vehicle whose rear-most axle is a steering axle
Articulated bus, heavy simple trailer, heavy pole trailer with one axle set	4.0 or 50% of forward distance (whichever is less)
Heavy semi-trailer other than a class TC caravan trailer	4.3 or 50% of forward distance (whichever is less)
Heavy full trailer, heavy pole trailer with two axle sets	4.0 or 50% of wheelbase (whichever is less)
Class TC caravan trailer that is a semi-trailer	4.0 or 65% of forward distance (whichever is less)
All other vehicles	4.0
Minimum ground clearance:	
Heavy motor vehicle	The greater of 100mm or 6% of the distance from the nearest axle to the point where the ground clearance is measured (except when vehicle is loading or unloading)

Dimension	Maximum distance (metres except where indicated otherwise)
Front overhang:	
Semi-trailer	2.04 radius arc ahead of kingpin centre
Simple trailer	2.04 radius ahead of tow coupling centre
Full trailer	2.04 radius arc ahead of turntable centre
Pole trailer	2.04 radius arc ahead of turntable centre on the towing vehicle
Agricultural motor vehicle	4.0
All other vehicles	3.0
Rear trailing unit distance:	
A-train, B-train, towing vehicle and two trailers	14.5
Articulated vehicle point of attachment (excluding articulated buses)	No further rearward than the rear-most axle of the towing vehicle or rear-most axle of the leading trailer, and if the towing vehicle is a rigid vehicle and has more than one axle in its rear set, not more than 300 mm rearward of the rear axis of the towing vehicle
Tow coupling position (for towing heavy trailer)	
Full trailer	45% of wheelbase towing vehicle
Simple trailer	At least 700mm rearward of the rear axis of the towing vehicle and not more than a distance equal to 50% of the wheelbase
Articulated bus	45% of wheelbase of the leading unit
Coupling point distance	
A-train	30% of forward distance of semi-trailer
Inter-vehicle spacing (between towing vehicle and trailer, except for a laden pole trailer)	4.0

Dimension	Maximum distance (metres except where indicated otherwise)
Outside turning circle in either direction for 360-degree turn	25.0 diameter (kerb to kerb, excluding collapsible mirrors)

Notes on Table 3-1-1

Note 1

A vehicle does not have to comply with the ground clearance requirements in Table 3-1-1 when the vehicles suspension is lowered temporarily to enable the vehicle to clear an overhead obstruction.

Note 2

Unless otherwise stated, the dimensions in Table 3-1-1 are maximum dimensions.

Note 3

The following items are not included in determining whether a vehicle complies with the width requirements in Table 3-1-1:

- side-marker lamps and direction indicators
- collapsible mirrors that extend not more than 240 mm beyond the side of a vehicle or its trailer and 1.49m when measured from a vehicle's longitudinal centre line
- central tyre inflation system hoses that extend not more than 75mm beyond the outside of the tyre on the drive axles of a heavy motor vehicle
- a hubodometer that extends not more than 50mm beyond one side of a vehicle from a non-lifting, non-steering axle whose outer casings are of a light colour, provided the hubodometer is fitted on the axle that causes the least overwidth
- cab exterior grab rails that extend not more than 1.325m when measured from a vehicle's longitudinal centre-line
- the bulge towards the bottom of a tyre
- trolley bus poles and their safety cables when extended to collect electric power from overhead conducting wires provided that there is a 2.5m ground clearance outside the body of the bus
- cameras or close-proximity monitoring systems mounted on the side exterior of a vehicle that extends not more than 70mm from the side wall of the vehicle
- devices for improving the aerodynamic performance of a vehicle that extend not more than 25mm from either side of a vehicle.

Note 4

Trolley bus poles when extended to collect electric power from an overhead conducting wire are not included in determining whether a vehicle complies with the height requirements in Table 3-1-1

Note 5

Ground clearance for a heavy motor vehicle does not include flexible mudflaps, wheels, tyres or devices designed to discharge static electricity.

Note 6

An engineer when designing or modifying a vehicle that will be outside the standard mass or dimensions should ensure that it can be used on the road. For this purpose, it must be either:

a) a specialist overdimension motor vehicle, or

b) a motor vehicle designed primarily to transport an overdimension load, or

c) a high productivity motor vehicle to one of the pro forma designs approved by the Transport Agency, or

d) a high productivity motor vehicle that is not a pro forma design but has been approved by the Transport Agency to operate on specified routes at greater dimensions and mass limits than otherwise allowed..

A motor vehicle that is not designed primarily to transport overdimension or overweight loads may exceed the dimension limits in this chapter, if the vehicle's primary purpose is to carry out a specialist function that requires overdimension equipment, and:

a) dismantling of the vehicle's equipment would make the equipment unusable for its intended purpose, or

b) it would take more than four hours to dismantle the vehicle's equipment.

Table 3-1-2. Dimension tolerances

Dimension	Permitted tolerance
Width	2550mm + 0
Height	4300mm + 0
General internal dimensions up to 5.0 m: height wheel base ground clearance distance between axles front and rear overhang tow coupling position inter-vehicle spacing	+ 10mm - 10mm + 10mm
Overall vehicle dimensions between 5.01 m and 13.0 m, which include: overall vehicle length forward distance	+ 15mm
Overall length of combination and all large dimensions over 13.01 m, which include rear trailing unit distance (rigid vehicle towing two trailers)	+ 30mm

Summary of legislation

Applicable legislation

- Land Transport Rule: Vehicle Dimensions and Mass 2016
- Land Transport Rule: Passenger Service Vehicles 1999

Vehicle Dimensions and Mass

General requirements for all vehicles

1. A vehicle and its load must comply with dimension requirements in this rule and must be manoeuvrable, fit safely on a road and interact safely with road users for the route on which it operates.

2. The distribution of the gross mass of a motor vehicle over its axles and the position of the centre of gravity of the vehicle must ensure that the dynamic handling characteristics of the vehicle remain safe in terms of stability and steering manoeuvres for the design speed of the road on which the vehicle operates.

Requirements for specific types of vehicle and vehicle configurations

3. Except as otherwise provided in this section a vehicle must comply with the applicable requirements in Table 3-1-1 and with other applicable requirements in this section.

Specific requirements for mass and dimension limits

4. The inter-vehicle spacing between a towing vehicle and a full trailer when in a straight line must not be less than the greater of 1 m or half the width of the foremost point of the trailer (including its load but excluding the drawbar and front dolly assembly).

5. An articulated bus must be able to complete a 360-degree turn in either direction without any part of the vehicle except for collapsible mirrors encroaching within a concentric internal radius of 5.3m.

6. In carrying out a 360-degree turn at the 25m diameter as specified in Table 3-1-1, no part of a vehicle in a combination, other than its articulation mechanism, may come into contact with the other vehicle in the combination.

Passenger Service Vehicles Rule: Safety design features and loading

7. A passenger service vehicle must be designed and constructed to ensure that at any normal loading condition of the vehicle no component overloading will occur.

8. For the purposes of requirement 7 the permitted loading imposed by the trailer must also be taken into account if the passenger service vehicle is fitted with a towbar.

Page amended **1 February 2017** (see **amendment details**).

4 Structure

> For welded components refer to **section 12-1 Welding**

Page amended **1 August 2014** (see **amendment details**).

4-1 Chassis frame

Certifier categories: **HVEC** | **HMCD** | **HVEK** | **HMKD**

Reasons for rejection

1. A structural member has been so affected by corrosion or weakening of its structure, apparent to visual inspection, that the vehicle is unsafe to operate.

2. The vehicle's frontal impact performance has been reduced below a safe tolerance of when manufactured by:

a) corrosion, or

b) modification, or

c) structural damage, or

d) repair, or

e) addition or removal of equipment.

3. The repair to a chassis rail has not returned the rail to within a safe tolerance of when manufactured or modified.

4. The repair method used does not take into account:

a) manufacturer’s recommendations and alternative methods, or

b) material specifications, or

c) the compatibility of the intended repair process and material specifications.

5. A fabricated section of the chassis rail or components has:

a) cracks, or

b) notches.

6. An attachment has been fastened to the flanges of the chassis in a region of high stress against the manufacturer’s practice without due consideration for the consequences.

7. A sliding axle set, a sliding chassis or an outrigger fitted to a vehicle does not have endstops or locking devices at the end of the slideway to prevent the separation of the sliding parts if the primary locking device fails.

8. An equipment locking device cannot be visually identified or verified.

9. A reinforcement is not securely attached to the chassis rail.

10. A chassis rail cut out located behind the rearmost front suspension mounting point does not have suitable reinforcement.

11. A chassis rail that has been straightened shows signs of:

a) buckling, or

b) indentation, or

c) cracking, or

d) elongation of holes, or

e) not being returned to its original profile.

12. The torsional stiffness of additional structural crossmembers is not similar to the original manufacturer’s crossmembers.

13. The vertical and horizontal load carrying capacity of additional structural crossmembers is less than that of an original crossmember used for the same application.

14. A hole has been made by means other than by drilling, without due regard for the consequences.

15. A hole has been drilled in a highly stressed region of a chassis rail without due regard for the consequences in:

a) the flanges of the chassis rail or crossmember against the practice of the manufacturer

b) being closer to the upper or lower flanges or closer to vertical bends of the chassis rails than is the manufacturer’s practice.

16. Bolts used for a structural purpose are not of an appropriate grade for the application.

17. A bolt used to secure suspension hangers and brackets to the chassis rails is not of an appropriate grade for the application.

18. A bolt used for a structural purpose has not been fitted with suitable washers or doubling plates.

19. The design of a new structure, modification or repair has been undertaken without due regard for appropriate load conditions and appropriate stress limits that should apply to satisfy both legal requirements and safe operating conditions.

20. Specifically a hoist, crane, logging bolster, tipping body or other special equipment that may result in increased stress to a localised area of the chassis or a significant redistribution of the load over the chassis has not had its chassis rating confirmed or had a new chassis rating reflecting the modifications made.

21. A chassis has been modified without taking into account:

a) manufacturer's specifications, or

b) AS 3990 *Mechanical Equipment Steelwork*, or

c) BS7603 *Code of Practice for Fatigue Design and Assessment of Steel Structures*, or

d) BS5400, or

e) That stresses are not higher when the vehicle is loaded to its new GVM, than those on the chassis of the unmodified vehicle loaded to its current GVM.

22. A heritage vehicle, over 40 years old and no longer in commercial service, has not had its corroded or fatigue damaged chassis reinstated to within safe tolerance of original manufacture and has not a had a new chassis rating issued and a new GVM and certificate of loading obtained to reflect its current condition (see **Technical bulletin 3: Heavy vehicle chassis ratings: modification thresholds to allow a heavy vehicle's GVM to be altered (and its chassis rating to be changed**).

23. A vehicle that has been damaged by immersion in water to the level of the chassis has not had its chassis inspected for corrosion and, where required, repaired to within safe tolerance of original manufacture or most recent certification, and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair thresholds**).

24. A vehicle that has been damaged by immersion in water to the level of the chassis has not had its fitted safety systems both mechanical and electrical/electronic, inspected and, where required, repaired to within safe tolerance of original manufacture or most recent certification, and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair thresholds**).

25. A vehicle that has been damaged by fire has not had the structural components of its chassis or body inspected to ensure that heat has not reduced its structural strength or damaged fitted safety systems and they have not been reinstated to within safe tolerance of original manufacture or most recent certification and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair thresholds**).

26. A vehicle that has been damaged in a crash has not had the structural components of its chassis or body inspected to ensure that damage has not occurred to structural or fitted safety systems, and they have not been reinstated to within safe tolerance of original manufacture or most recent certification and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair thresholds**).

27. A modification to an axle, the steering or the suspension that may affect the brakes has not been referred to a HV certifier with the brakes category (HVEK).

28. The brake system of an air braked heavy vehicle does not have priority of the supply of air from the air compressor.

29. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes without protecting the brake circuit.

30. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the external diameter of the supply hose or pipe is larger than 8mm.

31. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the device operates when the vehicle is moving.

32. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the vehicle manufacturer does not allow it.

33. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model has not been referred to a HV certifier with the brakes category (HVEK).

34. A powered vehicle with an hydraulic service brake has been fitted with an additional rear axle that does not have the same type of braking system as the original axle or an air operated disc brake as a service brake (HVEK).

35. A vehicle has been modified in such a way that the braking or braking system may have been affected and it has not been referred to a certifier with the Brakes category unless the modification is covered in the vehicle's body builders manual and the manufacturer has supplied written evidence that the vehicle remains within its original brake certification (refer to **Technical Bulletin 7**).

36. A vehicle, whether modified or not, has had its vehicle identification number (VIN) removed modified or altered without specific approval by the Transport Agency (see **Technical bulletin 19: Rebirthing**).

Note 1

Major reworking of the design of the vehicle relates to subsequent major modification of the standard vehicle as produced and tested by the vehicle manufacturer and includes:

a) fitting of different types of engines and the relocation of an engine and/or transmission

b) addition or removal of axles

c) alteration of wheelbase by:

i. moving axles on chassis rails

ii. extending or shortening the chassis

iii. replacement of the original chassis rails by a structure of different form

d) addition of heavy duty equipment for special purpose operations, for example hydraulic hoists which may place extra

stress on localised areas of the chassis and/or other equipment

e) conversion to left-hand drive dual steering (in special purpose vehicles only).

Note 3

When extending a chassis, it is recommended that the axles be slid rearward and the rear of the chassis be extended, unless the manufacturer specifies otherwise.

Note 4

When shortening a chassis, it is recommended that the axles are slid forward and the rear of the chassis is cut off, unless the manufacturer specifies otherwise.

Note 5

Change of engine or transmission certification as described is only necessary when there is a substantial change in characteristics, for example a significant increase in weight, power or torque, or where powerpack is being replaced to meet emissions requirements at entry, in such cases the repower must:

a) meet the applicable emissions standard

b) meet the specification of the powerpack manufacturer or be an approved alternative of the vehicle manufacturer

c) include alterations to the transmission, final drive or other conditions specified by the manufacturer, and

d) all changes to be noted in the certification.

Note 6

As a guide when altering a heavy vehicle's GVM, use the following:

a) an HV certifier recommends and justifies the rating against all of the below criteria. Use as a guide for maximum limits, percentage (over GVM) increases of:

i. twin steer – add 10% to manufacturer’s GVM

ii. lazy axle using front axle plus front axle springs or equivalent – add 10% to manufacturer’s GVM

iii. lazy axle and tag axle using rear axle plus rear axle springs or equivalent and single tyres – add 20% to manufacturer’s GVM

iv. lazy axle and tag axle using rear axle plus rear-axle springs or equivalent or extra-drive axle and dual tyres – add 40% to manufacturer’s GVM

v. trailing axle fitted behind tandem axles (designated as a tri-axle group) add 30% to manufacturer’s GVM of the tandem-drive vehicle

b) the increases do not amount to 25% or greater increase to the GVM.

Note 7

An HV certifier with the chassis (HVEC) category may set or alter chassis ratings for vehicles of the following classes:

MD3, MD4, ME, NB, NC, TC or TD built or modified in NZ.

The determination of a chassis rating must be supported by the design of a new vehicle or the modifications to an existing vehicle and be recoded on a **Notification of chassis rating for heavy vehicles** form. See **Technical bulletin 3** for additional information on an HV certifier's responsibility when altering a chassis rating.

Note 8

While the bin of a bin lifter truck does not require load anchorages to NZS 5444, the lifting mechanism, if it imposes point loads on the chassis will require chassis certification.

Summary of legislation

Applicable legislation

- **Land Transport Rule: Frontal Impact 2001**
- **Land Transport Rule: Heavy Vehicles 2004**
- **Land Transport Rule: Vehicle Repair 1998**
- **Land Transport Rule: Vehicle Standards Compliance 2002**

Applicable references

- Ladder frame chassis design and modification IRL/LTSA
- AS/NZS 2980:2018: Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding
- **Technical bulletin 10: Welding in the transport industry**

Frontal Impact Rule

General Safety Requirements (GSRs) (section 2.2)

1. The performance of a motor vehicle in relation to protecting occupants in a frontal impact collision must not be reduced below a safe tolerance of its state when manufactured or modified by any factors including corrosion, structural damage, material degradation, inadequate repair, the fitting of additional equipment or the removal of equipment.

2. In assessing whether the GSR's have been complied with an HVS certifier may take into account:

a) the function of the additional equipment fitted to the motor vehicle after manufacture and the measures taken to minimise the risk of injury from the equipment

b) evidence that the motor vehicle is within the manufacturer's operating limits

c) evidence that the motor vehicle has been damaged by fire or immersion in water.

Modification and repair (section 3.1)

3. A modification to a motor vehicle that affects its frontal impact performance:

a) must not prevent the vehicle from complying with this rule, and

b) must be certified as specified in **Land Transport Rule: Vehicle Standards Compliance 2002**

4. A repair to a component or a group of components that affects a motor vehicle's frontal impact performance must comply with the **Land Transport Rule: Vehicle Repair 1998** and must not prevent the vehicle from complying with this rule.

Vehicle Repair 1998 Rule (section 2.1)

5. A repair to a vehicle, its structure, systems, components or equipment, must restore the damaged or worn vehicle, structure, system, component or equipment so that they are within safe tolerance of the state of the vehicle, structure, system, component or equipment when manufactured.

6. If the vehicle has been certified as a modified vehicle, the repair must restore the vehicle, structure, system, component or equipment so that it is within safe tolerance of its state when certified as a modified vehicle.

Repair methods (section 2.2)

7. In repairing a vehicle to comply with requirements 6 and 7 a repairer must use a suitable repair method that takes into account the following:

a) the date of manufacture of the vehicle

b) the class, make and other relevant characteristics of the vehicle

c) the approved vehicle standards with which the vehicle is required to comply

d) the existence of relevant manufacturer's recommendations and alternative methods

e) the material specifications used for construction of the vehicle, structure, systems and components or equipment

f) the compatibility of the intended repair process with materials specifications.

New and used replacement systems, components and equipment

8. A repairer must use systems, components and equipment that will enable a vehicle to comply with section 2.1. The systems, components and equipment used to enable the vehicle to comply with section 2.1 may be new or used. Replacement systems, components and equipment used in a repair must comply with an approved vehicle standard applicable, as specified by the relevant rule or regulation, to the year of manufacture of the vehicle system, component or equipment

Heavy Vehicle Rule

General safety requirements (section 3.1)

9. The chassis and body of a vehicle must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed or modified.

10. The body of a vehicle of a monocoque construction must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed or modified.

11. A load bearing structure other than a chassis, a body fitted to a chassis or a monocoque body must be ofadequate strength for all conditions of loading and operation for which the vehicle was constructed or modified.

Vehicle body attachment (section 3.2)

12. The means by which a body is attached to the chassis of a vehicle manufactured on or after 1 October 2005, must be designed and constructed so that the stresses on the attachment, when calculated in accordance with requirement 14 below do not exceed 60% of the yield stress of the material from which the attachment is made.

13. The stresses in requirement 13 above must be calculated under each of the following loading conditions, when the forces are applied at the approximate centre of gravity of the load,

a) a longitudinally-acting force, equivalent to twice the combined weight of the payload capacity and the body mass,

b) a downward-acting force, equivalent to twice the combined weight of the payload capacity and the body mass,

c) a transversely-acting force, equivalent to the combined weight of the payload capacity and the body mass,

d) an upward-acting force, equivalent to the combined weight of the payload capacity and the body mass.

Equipment locking devices (section 3.9)

14. A sliding axle set or sliding chassis, or an outrigger fitted to a vehicle, must have an effective locking device so that other road users are not endangered by the inadvertent extension or separation of that equipment.

15. Locking of the equipment must be readily verifiable by visual inspection.

16. If the outriggers of a vehicle of class NB or class NC fitted with a swivelling crane can be operated from a position from which the locking device is not readily visible, the vehicle must be equipped with an audible or a visual alarm that can be heard or seen from the driver's seating position, by the date of issue of the first certificate of fitness issued on or after 1 March 2006.

17. The alarm signal must operate when the outrigger is not fully retracted and locked.

18. If the locking device incorporates a system that provides energy for its operation, the device must remain fully engaged in the locked position, or the locking action must be initiated immediately, if the energising system fails.

19. A sliding axle set or a sliding chassis must have endstops at the end of the slideway to prevent the separation of the sliding parts if the primary locking device fails.

Modification (section 6.1)

20. Section 6 applies to all modifications carried out after 1 April 2005.

21. A modification to a vehicle that may affect the safety of the vehicle's components or the overall safety of the vehicle must not prevent the vehicle from complying with this rule.

22. If practicable, a modification to a vehicle must be carried out in accordance with instructions from the vehicle manufacturer and the manufacturer of any equipment being fitted to the vehicle.

23. A modification to a vehicle must be carried out:

a) as specified by the manufacturer of the vehicle, if the manufacturer produces more than 1000 vehicles in a year for a market where compliance with Australian, Japanese, UN/ECE standards or the requirements of the United States, is compulsory, or

b) in accordance with the specifications of an HVS certifier.

24. A modification to a vehicle must be carried out using components that are suitable for automotive application.

Modification affecting chassis (section 6.4)

25. If a vehicle is modified by the addition, removal or relocation of an axle and suspension system, by the replacement of an axle or suspension system with a different type of axle or suspension system, or by the modification of its chassis:

a) a new chassis rating must be issued and a new certificate of loading obtained, or

b) the current chassis rating must be confirmed as being valid.

26. If a vehicle is modified by fitting a hoist, crane, logging bolster, tipping body or other special equipment, which may result in increased stress to a localised area of the chassis or significant redistribution of the load over the chassis:

a) a new chassis rating must be issued and a new certificate of loading obtained, or

b) the current chassis rating must be confirmed as being valid.

27. A modification to the chassis of a vehicle must be designed to stress levels:

a) as specified by the vehicle manufacturer, or

b) in accordance with AS 3990: 1993, Mechanical Equipment – Steelwork, or

c) in accordance with BS 7608: 1993, Code of Practice for Fatigue Design and Assessment of Steel Structures, or

d) in accordance with BS 5400, or

e) that are not higher, when the vehicle is loaded to its proposed new gross vehicle mass, than those of the chassis of the unmodified vehicle loaded to its current gross vehicle mass.

28. If the vehicle manufacturer does not prohibit the welding of the chassis members, a welding that is part of the modification of a chassis must be carried out:

a) as specified by the vehicle manufacturer, or

b) in accordance with AS/NZS: 1554, Parts 1–6, Structural Steel Welding.

Repair (section 7)

29. A repair to the chassis of a vehicle or to a structural element of a monocoque body of a vehicle must be carried out:

a) as specified by the manufacturer of the vehicle, if the manufacturer produces more than 1000 heavy vehicles in a year for a market in which compliance with Australian, Japanese, UN/ECE standards or the requirements of the United States, is compulsory, or

b) in accordance with the specifications of a HV certifier, or

c) in accordance with the pre-engineered solutionsde, approved by the NZTA and published by the New Zealand Truck-Trailer Manufacturers' Federation.

Modification (section 6)

30. The HVS certifier is to be satisfied regarding:

a) acceptability of the design

b) the standard of workmanship.

31. The modification shall not result in a reduction in, or impair the performance of, any of the original equipment.

32. Modifications must, where practicable, be carried out in accordance with instructions from the vehicle manufacturer and the manufacturer of any system, component or equipment being fitted to the vehicle

33. Modifications must be carried out:

a) As specified by the manufacturer of the vehicle, if the manufacturer produces more than 1000 heavy motor vehicles in a year for a market where compliance with Australian, Japanese or UN/ECE standards, or standards of the United States of America is compulsory, or

b) In accordance with the specifications of a HV certifier with the HVEC category

34. A modification to the engine or drive train (Note 5) must not

a) Result in the engine or drive train becoming unsuitable for the conditions of loading and operation for which the vehicle is modified

b) Adversely affect the engine or transmission performance

c) Exceed the performance limits of the driveshaft as specified by the manufacturer.

35. A modification affecting axles, suspension and steering must not:

a) result in an axle that has a load rating or performance characteristics that are not suitable for all conditions of loading and operation for which the vehicle has been modified.

b) result in a vehicle being fitted with tyres that alter the wheel track or number of tyres outside the manufacturer's limits unless:

i. a new axle load rating is established, or

ii. the current load rating is established as valid

c) result in a second steer axle being fitted that is incompatible with the existing steering components, or;

d) result in a steering system fitted to a twin steer set being unsuitable for twin steer operation.

36. A modification affecting axles, suspension or steering must not result in:

a) an axle, a suspension system, or an axle and suspension system that is modified, or that is fitted to a vehicle to replace the one fitted by the vehicle manufacturer, having a load rating and performance characteristics that are not suitable for all conditions of loading and operation for which the vehicle is modified.

b) an axle being fitted to a vehicle with tyres in a way that results in the wheel track being altered beyond the vehicle manufacturer's specified limits, or the number of tyres fitted to an axle exceeds the number specified by the vehicle manufacturer without, either:

i. a new axle load rating being established, or

ii. the current axle load rating being confirmed as being valid.

c) the second steering axle fitted to a vehicle not having a means of steering that is compatible with the existing steering components.

d) the steering system of a vehicle to which a second steering axle is fitted to form a twin-steer axle set not being suitable for operating a twin-steer axle set.

37. A modification affecting a chassis requires:

a) For a vehicle that is modified by the addition, removal or relocation of an axle and suspension system, by the replacement of an axle or suspension system with a different type of axle or suspension system, or by the modification of its chassis: (Note 6)

i. a new chassis rating must be issued and a new certificate of loading obtained, or

ii. the current chassis rating must be confirmed as being valid.

b) For a vehicle that is modified by fitting a hoist, crane, logging bolster, tipping body or other special equipment, which may result in increased stress to a localised area of the chassis or significant redistribution of the load over the chassis (Note 6):

i. a new chassis rating must be issued and a new certificate of loading obtained, or

ii. the current chassis rating must be confirmed as being valid.

c) A modification to the chassis of a vehicle being designed to stress levels:

i. as specified by the vehicle manufacturer, or

ii. in accordance with Australian Standard — 3990-1993: Mechanical equipment — Steelwork, or

iii. in accordance with British Standard 7608:1993, Code of practice for fatigue design and assessment of steelstructures, or

iv. that are not higher, when the vehicle is loaded to its proposed new gross vehicle mass, than those of the chassis of the unmodified vehicle loaded to its current gross vehicle mass.

d) That, if the vehicle manufacturer does not prohibit the welding of the chassis members, then welding that is part of the modification of a chassis must be carried out:

i. as specified by the vehicle manufacturer, or

ii. in accordance with Australian/New Zealand Standard: 1554, Structural steel welding Parts 1 to 6 (see Technical Bulletin 'Welding in the Transport Industry')

38. A conversion to right hand drive requires:

a) if practicable, original equipment be used, and

b) that non-original equipment must not be used unless approved by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

c) that the steering -column must be transferred without altering the integrity of the column or its collapse mechanism, and

d) that, except when fixing mountings to the chassis or body of the vehicle, steering components must not be welded, unless:

i. the welding is designed by the vehicle manufacturer or an HV certifier appointed to carry out specialist inspection and certification activities, and

ii. appropriate non-destructive testing is carried out by a qualified person, and

e) that steering performance and characteristics must be maintained, and

f) the parking brake, auxiliary brake, accelerator and clutch controls must be transferred to the right-hand side of the vehicle, and

g) that new mounting points for the parking brake, accelerator and clutch controls must be of equivalent strength and efficacy to the original mounting points

h) the service brake control assembly to be transferred to the right-hand side of the vehicle, or

i) the service brake pedal assembly to be transferred to the right-hand side of the vehicle and the motion of the brake pedal transmitted to the master cylinder or treadle valve by a **torque shaft**, or **levers and rods** where the master cylinder or treadle valve and the mechanism that transfers the braking effort from the right-hand side to the left-hand side are protected to ensure that the service brake can only be activated by the driver.

Changes that affect brakes

39. The compressor must supply only the brake reservoirs with compressed air until the pressure in those reservoirs reaches the pressure specified by the vehicle manufacturer or the brake manufacturer, or, if such information is not available, two thirds of the maximum operational pressure specified by the vehicle manufacturer or brake manufacturer.

40. An air brake must have priority of the supply of compressed air from the brake reservoir.

41. An air-operated device may be connected to the air brake of a vehicle, only if:

a) the brake is protected so that the operation or failure of the device cannot lower the pressure in [any service brake or parking brake reservoir(s)] below the pressure specified by the vehicle manufacturer or brake manufacturer, or, if such information is not available, two-thirds of its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer; and

b) the supply to the device is drawn from a reservoir separate from the service brake or parking brake reservoir(s) supplying the brake, except as specified in Requirement 42below.

42. Despite 41(b), an air-operated device may be supplied with compressed air from the service brake or parking brake reservoir(s), if:

a) the operation of the device requires only a small amount of compressed air and it is supplied with compressed air by a hose or pipe with an external diameter not exceeding 8mm, or

b) the device is operated only when the vehicle is stationary, or

c) the vehicle manufacturer allows it.

43. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model, must either:

a) be modified so as to continue to meet the technical and performance requirements of the approved standard in the Rule) with which the vehicle originally complied, or

b) comply with all other applicable requirements in this Rule.

44. A powered vehicle with an hydraulic service brake may be fitted with an additional rear axle that has an air operated disc brake as a service brake.

Replacement of chassis rails

45. Where a repair or modification to an original chassis rail or both chassis rails does not consist of an OEM replacement, the repair must be approved by an HVS certifier.

Design considerations

46. In assessing a vehicle to determine its GVM, the HVS certifier must include the aspects set out below:

a) chassis loading diagram, showing principal point and distributed loads. Reasonable assumptions should be made as to the possible ways of distributing the payload

b) shear force and bending moment diagrams derived from (a)

c) chassis member section properties and stresses at critical points changes in section, maximum shear force and bending moment

d) manufacturer’s ratings or recommendations for affected components such as steering boxes

e) where applicable, manual and power assisted steering inputs and calculated critical stresses in steering components

f) drawings and specifications in sufficient detail to allow verification of assumed loadings and calculated stresses.

Page amended **1 October 2020** (see **amendment details**)

4-2 Body and cab

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1. A motor vehicle is affected by corrosion or weakening of its structure that is apparent by visual inspection so that the vehicle is unsafe to operate.

2. The performance of a motor vehicle in relation to protecting occupants in a frontal impact collision has been reduced below a safe tolerance of its state when manufactured or modified by any factors including corrosion structural damage, material degradation, inadequate repair, the fitting of additional equipment or the removal of equipment (Note 1).

3. A repair or modification to a motor vehicle that affects its frontal impact performance prevents the vehicle from complying with **Land Transport Rule: Frontal Impact 2001**

4. A repair or modification to a vehicle, its cab, structure, systems, components or equipment, has not restored the damaged or worn vehicle, cab, structure, system, component or equipment to be within safe tolerance of the state of the vehicle, cab, structure, system, component or equipment when manufactured (Note 1).

5. In repairing a vehicle, a repairer has not used a suitable repair method that takes into account the following:

   a) the date of manufacture of the vehicle

   b) the class, make and other relevant characteristics of the vehicle

   c) the approved vehicle standards with which the vehicle is required to comply

   d) the existence of relevant manufacturers recommendations and alternative methods

   e) the material specifications used for construction of the vehicle, structure, systems and components or equipment

   f) the compatibility of the intended repair process with materials specifications.

6. A repairer has not used systems, components and equipment that enable a vehicle to comply with requirement 5 above.

7. The body of a monocoque construction or a load bearing structure other than a chassis, or a body fitted to a chassis is not of adequate strength for all conditions of loading and operation for which the vehicle was constructed.

8. For right-hand drive conversions, the right-hand firewall/bulkhead:

   a) does not replicate the original left-hand side profile

   b) has not been fabricated by using at least the same gauge material, or

   c) does not incorporate similar reinforcement to that used by the original manufacturer, or

   d) is not fully welded to the original firewall with an overlap of at least 10 mm, or

   e) the welding method is not suitable for the materials used.

9. All redundant openings in the firewall/bulkhead have not been permanently sealed to prevent entry of engine fumes into the passenger cabin.

10. A modification to the floorpan and inner guard area fouls steering or tyre clearances.

11. Materials used in a repair, modification or conversion are not of at least the same specification as the original materials.

12. A sill has been sectioned:

a) where this is not permitted in the manufacturer's instructions (Note 1), or

b) against either the manufacturer's instructions or a recognised repair research organisation's procedures (Note 2), or

c) in a manner that is not supported by design and certification from an HVS certifier.

13. A pillar has been sectioned

a) when the manufacturer prohibits repairs to the pillar, or

b) against either the manufacturer's methods or a recognised repair research organisation's procedures (Note 2), or

c) in a manner that is not supported by design and certification from an HV certifier.

14. Filler has been applied to the windscreen bonding face of the pillar where this is not permitted in the manufacturer's instructions.

15. An incorrect etch primer has been applied to the windscreen bonding face of the pillar.

16. A structure which is used as a point of attachment does not provide a secure mounting.

17. A body, fitted on or after 1 October 2005, has not been designed and constructed so that the stresses on the attachment do not exceed 60% of the yield strength of the material from which the attachment is made calculated to the legislated requirements (Summary of Legislation 14)

18. A motorhome manufactured or converted prior to 1 October 2003 does not have seatbelts and seatbelt anchorages as required in tables 2.1 to 2.3 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002**. Refer to **Technical bulletin 5**

19. A motorhome manufactured or converted on or after 1 October 2003 does not have seatbelts or seatbelt anchorages as required for class MB vehicles in table 2.4 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002** in the front seat positions. Refer to **Technical bulletin 5**

20. A motorhome manufactured or converted on or after 1 October 2003 does not have seatbelts or seatbelt anchorages as required for class MB vehicles in table 2.4 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002** in as may seating position in the rear so that there are at least as many seating positions with seatbelts as there are sleeping berths. Refer to **Technical bulletin 5**

21. A motorhome manufactured or converted on or after 1 October 2003 does not have a notice fitted recommending that, on safety grounds, when travelling in the rear compartment, passengers use seats fitted with seatbelts.

22. A motorhome manufactured or converted on or after 1 October 2003 does not have a notice advising passengers that it is compulsory to wear fitted seatbelts.

23. A seatbelt has been modified and the modification is not approved by the seatbelt manufacturer or, alternatively, the manufacturer of the vehicle it is fitted to.

24. A seatbelt retrofitted to a heavy vehicle on or after 1 April 2002 has not been assessed against the technical requirements of seatbelt anchorage, regarding geometry and load-carrying capacity, in any of the approved vehicle standards for seatbelt anchorages that apply to light motor vehicles.

25. A seatbelt retrofitted to a heavy vehicle on or after 1 April 2002 does not comply with section 2.3 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002**

26. A vehicle that has been damaged by immersion in water to the level of the cab or body has not had its fitted safety systems, both mechanical and electrical/electronic, as well as the structural components, inspected and, where required, repaired to within safe tolerance of original manufacture or most recent certification, and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair thresholds**).

27. A vehicle that has been damaged by fire has not had the structural components of its cab or body inspected to ensure that heat has not reduced its structural strength or damaged fitted safety systems or they have not been reinstated to within safe tolerance of original manufacture or most recent certification and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair thresholds**).

28 A vehicle that has been damaged in a crash has not had the structural components of its chassis or body inspected to ensure that damage has not occurred to structural or fitted safety systems, and they have not been reinstated to within safe tolerance of original manufacture or most recent certification and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair thresholds**).

Note 1

Certifiers must take into account applicable international legislation (eg, FMVSS 216a, UNECE Reg. 29, etc.) to which a vehicle originally complied when determining safe tolerance to the state of manufacture, especially with regards to modifications that may impact occupant safety.

Note 2

Damaged parts should be replaced at factory seams whenever practicable and when required by the vehicle manufacturer.

Summary of legislation

Applicable legislation

- **Land Transport Rule: Frontal Impact 2001**
- **Land Transport Rule: Heavy Vehicles 2004**
- **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002**
- **Land Transport Rule: Vehicle Repair 1998**
- **Land Transport Rule: Vehicle Standards Compliance 2002**

Applicable references

- AS/NZS 2980:2018: Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding
- **Technical bulletin 10: Welding in the transport industry**

Frontal Impact Rule

Section 2.2

1. The performance of a motor vehicle in relation to protecting occupants in a frontal impact collision must not be reduced below a safe tolerance of its state when manufactured or modified by any factors including corrosion, structural damage, material degradation, inadequate repair, the fitting of additional equipment or the removal of equipment.

2. In assessing whether requirement 2 has been complied with a certifier may take into account:

a) the function of the additional equipment fitted to the motor vehicle after manufacture and the measures taken to minimise the risk of injury from the equipment

b) evidence that the motor vehicle is within the manufacturer's operating limits.

Modification and repair (section 3)

3. A modification to a motor vehicle that affects its frontal impact performance:

a) must not prevent the vehicle from complying with the **Land Transport Rule: Frontal Impact 2001**, and

b) must be certified by an HV certifier.

Repair (section 3.2)

4. A repair to a component or a group of components that affects a motor vehicle's frontal impact performance must comply with **Land Transport Rule: Vehicle Repair 1998** and must not prevent the vehicle from complying with the **Land Transport Rule: Frontal Impact 2001**

Vehicle Repair 1998 (section 2)

5. A repair to a vehicle, its structure, systems, components or equipment, must restore the damaged or worn vehicle, structure, system, component or equipment so that they are within safe tolerance of the state of the vehicle, structure, system, component or equipment when manufactured or modified.

6. If the vehicle has been certified as a modified vehicle, the repair must restore the vehicle, structure, system, component or equipment so that they are within safe tolerance of its state when certified as a modified vehicle.

7. In repairing a vehicle, a repairer must use a suitable repair method that takes into account the following:

a) the date of manufacture of the vehicle

b) the class, make and other relevant characteristics of the vehicle

c) the approved vehicle standards with which the vehicle is required to comply

d) the existence of relevant manufacturers recommendations and alternative methods

e) the material specifications used for construction of the vehicle, structure, systems and components or equipment

f) the compatibility of the intended repair process with materials specifications.

8. A repairer must use systems, components and equipment that will enable a vehicle to comply with requirement 6 above. The systems, components and equipment used may be new or used. Replacement systems, components and equipment used in a repair must comply with an approved vehicle standard applicable as specified by the relevant rule or regulation to the year of manufacture of the vehicle, system, component or equipment.

Heavy Vehicle Rule

Section 3

9. The chassis and body of a vehicle must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed.

10. The body of a monocoque construction must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed.

11. A load bearing structure other than a chassis, a body fitted to a chassis or a monocoque body must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed.

Vehicle body attachment

12. The means by which a body is attached to the chassis of a vehicle manufactured on or after 1 October 2005 must be designed and constructed so that the stresses on the attachment when calculated in accordance with requirement 14, do not exceed 60% of the yield stress of the material from which the attachment is made.

13. The stresses referred to in requirement 13 must be calculated under each of the following loading conditions, when the forces are applied at the approximate centre of gravity of the load:

a) a longitudinally-acting force, equivalent to twice the combined weight of the payload capacity and the body mass

b) a downward-acting force, equivalent to twice the combined weight of the payload capacity and the body mass

c) a transversely-acting force, equivalent to the combined weight of the payload capacity and the body mass

d) an upward-acting force, equivalent to the combined weight of the payload capacity and the body mass.

Modification (section 6)

14. A modification to a vehicle that may affect the safety of the vehicle's components or the overall safety of the vehicle must not prevent the vehicle from complying with this rule.

15. If practicable, a modification to a vehicle must be carried out in accordance with instructions from the vehicle manufacturer and the manufacturer of any equipment being fitted to the vehicle.

16. A modification to a vehicle must be carried out:

a) as specified by the manufacturer of the vehicle, if the manufacturer produces more than 1000 vehicles in a year for a market where compliance with Australian, Japanese, UN/ECE standards or the requirements of the United States is compulsory, or

b) in accordance with the specifications of an HV certifier.

17. A modification to a vehicle must be carried out using components that are suitable for automotive application.

Repair (section 7)

18. A repair to a vehicle must comply with the Land Transport Rule: Heavy Vehicles 2004 and with Land Transport Rule: Vehicle Repair 1998.

19. A repair to the chassis of a vehicle or to a structural element of a monocoque body of a vehicle must be carried out:

a) as specified by the manufacturer of the vehicle, if the manufacturer produces more than 1000 heavy vehicles in a year for a market in which compliance with Australian, Japanese, UN/ECEstandards or the requirements of the United States is compulsory or

b) in accordance with the specifications of an HVS certifier or

c) by taking into account:

i. any information that is relevant to the vehicle, and

ii. the cause and type of failure, and

iii. any established methods of repair, including the Minor Repair Code, approved by the NZTA and published by the New Zealand Truck-Trailer Manufacturers' Federation.

Seatbelt and Seatbelt Anchorages Rule

Motorhomes

20. A motorhome manufactured before 1 October 2003, or a motor vehicle converted into a motorhome before 1 October 2003, must be equipped with the seatbelts and seatbelt anchorages in Tables 2.1 to 2.3 that are appropriate for the class of vehicle in which the vehicle was registered, when registered as a motorhome and a motorhome manufactured on or after 1 October 2003 and a motor vehicle converted into a motorhome on or after 1 October 2003 must be equipped with:

a) seatbelts and seatbelt anchorages that comply with the requirements for class MB vehicles in Table 2.4, in all front seating positions, and

b) lap (or lap and diagonal) seatbelts that comply with the requirements for class MB vehicles in Table 2.4, in at least as many rear seating positions as the number of sleeping berths exceeds the number of front seating positions, and

c) a notice, attached in a prominent position, that:

i. recommends, on safety grounds, that when the vehicle is travelling, passengers use seats that are fitted with seatbelts, and

ii. advises passengers that it is compulsory to wear fitted seatbelts.

Motor vehicles that transport detained persons

22. Where a heavy motor vehicle designed exclusively for transporting a person detained by the NZ Police or the corrections services, or by a person acting on their behalf, must be fitted with seatbelts and seatbelt anchorages in front seating positions, but does not have to comply with the requirements for other seating positions.

Modifications to seatbelts

23. A seatbelt must not be modified unless approved by the seatbelt manufacturer or vehicle manufacturer and is carried out in accordance with instructions issued by that manufacturer.

Seatbelt anchorages

24. A seatbelt anchorage that is retrofitted on or after 1 April 2002 in a heavy motor vehicle must comply with 2.3. by considering section 4.1(11) when assessing whether 2.3 is complied with, for the purposes of 4.1(10), the vehicle inspector or inspecting organisation must take into account the technical requirements, regarding geometry and load-carrying capacity, in any of the approved vehicle standards for seatbelt anchorages that apply to light motor vehicles.

Page amended **1 November 2018** (see **amendment details**)

4-3 Steering, suspension and axles

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1. An articulated bus cannot complete a 360° turn in either direction without any part of the vehicle except for collapsible mirrors encroaching within a concentric internal radius of 5.3m.

2. In carrying out a 360° turn at the 25m diameter, any part of a vehicle in a combination, other than its articulation mechanism, makes contact with the other vehicle in the combination.

3. A heavy rigid motor vehicle is not supported by:

a) one axle set towards the front of the vehicle, which is either a single-axle set or a twin-steer axle set, and

b) one axle set towards the rear of the vehicle which is a single set, a tandem set or a tri-axle set.

4. Except as provided in Note 3 a heavy motor vehicle has a rear-steering axle (Note 3).

5. Steering axles do not turn through an angle of at least 15° in either direction (Note 3).

6. A mobile crane does not have a mechanism to lock at least one rear axle.

7. A rigid motor vehicle or semi-trailer, fitted with rear-steering axles, does not comply in all configurations with the rear overhang requirements and forward distance requirements.

8. An axle set, apart from a twin-steer axle set, of a heavy motor vehicle is not load sharing.

9. A vehicle with a tandem-axle set (except for a tandem axle set in a heavy passenger service vehicle) that has a single large-tyred axle with a load-share ratio of 60%:40% or 55%:45%, has not been affixed with an indelible plate, so that it is clearly visible to the person who is weighing the vehicle, that specifies the:

a) load-share ratio of the axle set, and

b) tyre size on each axle, and

c) maximum individual axle ratings.

10. An A-train does not have two motor-driven axles in a tandem-axle set or a tri-axle set, or three motor-driven axles in a tri-axle set.

11. A semi-trailer is not supported by one axle set only which is set towards the rear of the vehicle and is:

a) a single-axle set, or

b) a tandem-axle set, or

c) a tri-axle set, or

d) a quad-axle set provided that the semi-trailer is not intended for use in an A-train or B-train combination.

12. The axle set towards the front of a full trailer does not connect all wheels for that part of the trailer to the drawbar steering system.

13. The axle set towards the front of a full trailer is not either a single-axle set or a tandem-axle set.

14. The axle set towards the rear of a full trailer is not one of the following:

a) a single-axle set

b) a tandem-axle set

c) a tri-axle set provided that the front axle set is a tandem-axle set.

15. A simple trailer is not supported by one of the following:

a) a single-axle set

b) a tandem-axle set

c) a tri-axle set.

16. On a pole trailer with two axle sets, the axle set towards the front of the trailer does not connect all wheels for that part of the trailer to the drawbar steering system.

17. The axle set towards the front of a pole trailer with two axle sets is not either a single-axle set or a tandem-axle set.

18. The axle set towards the rear of a pole trailer with two axle sets is not one of the following:

a) a single-axle set

b) a tandem-axle set

c) a tri-axle set provided that the front axle set is a tandem-axle set.

19. A heavy motor vehicle, other than an A-train or a B-train, has a retractable axle (Note 4) where:

a) the retractable axle is not in a rear-axle set, or

b) the retractable axle does not have an automated control that ensures the remaining axle or axles and axle set or axle sets in contact with the ground remain within all manufacturer's component ratings for all retractable axle configurations, or

c) the forward distance requirements and rear overhang requirements are not complied with when the axle is in contact with the road and is in a retracted position.

20. A specialist overdimension motor vehicle or a motor vehicle designed principally to transport an overdimension load or an overweight load or both does not have load sharing suspension.

21. A steering system on a motor vehicle, and associated systems and components that could directly or indirectly affect the directional control of the vehicle is not:

a) sound and in good condition and provides the vehicle with safe, efficient, convenient and sensitive control

b) strong, durable and fit for its purpose, taking into account whether adverse effects have resulted from a loss of integrity of any protective system used by a relevant component.

22. A motor vehicle capable of a speed more than 50km/h and equipped with a steering system with no direct mechanical connection between the driver's means of control and the wheels or other means of changing the vehicle's direction does not have at least one additional means of steering that:

a) is sound and in good condition and provides the vehicle with safe, efficient, convenient and sensitive control, and

b) is strong, durable and fit for its purpose, taking into account whether adverse effects have resulted from a loss of integrity of any protective system used by a relevant component, or

c) is approved by the NZTA.

23. A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle prevents the vehicle from having a steering system that is:

a) sound and in good condition and that provides the vehicle with safe, efficient, convenient and sensitive control

b) strong, durable and fit for its purpose, taking into account whether adverse effects have resulted from a loss of integrity of any protective system used by a relevant component

c) compatible with the manufacturer's design or specification for the vehicle.

24. An axle fitted to a vehicle is not of adequate strength or does not have appropriate performance characteristics for all loading and operation for which the vehicle was constructed.

25. (Note 4) A device for altering the distribution of mass between axles has been fitted to a vehicle when:

a) the device does not lift an unpowered axle clear of the ground, or

b) the device does not reduce the mass carried by an unpowered axle without lifting it clear of the ground, or

c) it does not have a control that is spring loaded so that, when the control is released, the mass on the unpowered axle reverts to what it was before the operation of the controls, or

d) it does not have a control with an automatic timing device with an activation time of not more than two minutes after which the mass on the unpowered axle reverts automatically to what it was before the operation of the control and with a non-activation time of at least 30 seconds during which the control cannot be activated again.

26. The suspension system of a vehicle is not of adequate strength or does not have appropriate performance characteristics for all conditions of loading and operation for which the vehicle was constructed.

27. An axle stop device fitted to a vehicle has not been maintained within safe tolerance of its original condition.

28. A modification to a vehicle has not been carried out:

a) in accordance with instructions from the vehicle manufacturer and the manufacturer of any equipment being fitted to the vehicle, or

b) in accordance with the design and certification of an HV certifier.

29. A modification to a vehicle has not been carried out using components that are suitable for automotive application.

30. An axle, a suspension system or an axle and suspension system, fitted to a vehicle to replace the one fitted by the vehicle manufacturer does not have a load rating and performance characteristics that are suitable for all normal conditions of loading and operation for which the vehicle was constructed.

31. If an axle of a vehicle is fitted with tyres in a way that results in the wheel track being altered beyond the vehicle manufacturer's specified limits, or the number of tyres fitted to an axle exceeds the number specified by the vehicle manufacturer, either:

a) a new axle load rating has not been established, or

b) the current axle load rating has not been confirmed as being valid by an HV certifier.

32. A second steering axle fitted to a vehicle does not have a means of steering that is compatible with the existing steering components.

33. A steering box has been used that is not the manufacturer's standard or option, and the origin and specifications have not been identified and recorded.

34. The replacement steering box component is not of at least equal specification to the original with regard to:

a) steering ratio

b) input/output torque.

35. If a new steering box or rack assembly is not used, then any second-hand components has not been crack tested or x-rayed at a non-destructive testing (NDT) authority approved by the Certification Board for Inspection Personnel, or the

steering box or steering rack has not been overhauled and all details recorded.

36. The steering column has not been transferred without alteration to the integrity of the column or any collapse mechanism contained therein.

37. Where new column mountings have been fabricated they are not at least of the strength of the original mounts.

38. The use of chain and sprocket, hydraulics or bevel drive boxes have been used where not specifically permitted (Note 7).

39. The original steering geometry has not been preserved and the vehicle does not meet the 25m turning circle requirement.

40. The steering box and steering idler assembly is not positioned so as to mirror the original.

41. When mounting the steering box, care has not been taken to ensure that it is positioned so that when at maximum travel (lock to lock), the chassis frame does not become excessively loaded.

42. The steering linkages contact the stops while there is still substantial travel remaining in the steering box.

43. Steering components other than mounting brackets have been welded on to the chassis or body and this is not supported by a welding procedure and certification by an HV certifier.

44. The primary steering position and controls do not remain on the right-hand side when a left-hand drive dual steering is added.

45. A replacement rear/drive axle does not have:

a) a mass rating that is adequate for the mass rating of the vehicle.

b) a suitable final drive ratio.

46. All welding performed on an axle housing is not in accordance with the axle manufacturer’s specifications or is not supported by a welding procedure and certification by an HV certifier.

47. The axles are not fitted within the axle manufacturer’s installation specifications.

48. If the axle final drive ratio has been changed, it is no longer suitable for the road speed or gradability or the speedometer accuracy is not maintained.

49. A replacement front axle does not have a mass rating that is adequate for the mass rating of the vehicle.

50. All welding performed on an axle housing is not in accordance with the axle manufacturer’s specifications.

51. The axle has not been installed within the vehicle/axle manufacturer’s specified caster angle limits.

52. If the front axle is driven, then the axle final drive ratio is not suitable for the road speed and gradability.

53. The mass rating of the modified suspension is not sufficient for the mass rating of the vehicle.

54. The modified suspension does not maintain the vehicle’s suspension balance under braking.

55. A modified suspension component fouls during its full travel.

56. The suspension system is not fitted according to the suspension manufacturer’s specifications.

57. Variable ride height and constant ride height mechanisms have not been fitted and adjusted in accordance with the suspension manufacturer’s specifications.

58. The wheel alignment has not been checked and adjusted to within the appropriate specifications.

59. Bump stops have been attached to the chassis flange.

60. Shock absorbers fully compress or fully extend through the full suspension travel.

61. A pitman arm has been heated, welded, bent or drilled and it has not been stress relieved.

62. A pitman arm has been welded and the affected area has not been x-rayed and demonstrated to be sound.

63. Steering stops have not been mounted in accordance with the specifications of the steering box manufacturer.

64. Not all hoses, steel tubing and reservoirs connected with a power steering pump are in accordance with the hydraulic standard, size, flow and pressure ratings recommended by the steering box or hydraulic cylinder manufacturer.

65. The steel tubing connected with a power steering pump is not of sufficient length to allow adequate cooling.

66. A hydraulic pump does not have a flow and pressure rating that is compatible with the steering box or hydraulic cylinder used.

67. Hoses and steel tubing have not been routed clear of exhaust areas and areas likely to cause abrasion or other damage.

68. The mounting point for the cylinder in a Ram type steering system has not been designed to take into account the cylinder’s peak loading and deflections or for fatigue.

69. The mounting of the cylinder does not allow the cylinder full and free movement through the entire arc of the steering components and suspension travel.

70. Drag links have not been made of one continuous length of material between end fittings or are not supported by certification of an HV certifier.

71. A power steering system has not been fitted with a pressure relief valve.

72. A forged or heat-treated steering component has been cut, welded or heated and is not supported by certification of an HV certifier.

73. Any replacement component does not have a rating suitable for the loading imposed on it.

74. Any standard part, such as splines, tapers and keyways does not conform to a recognised standard.

75. Any standard part that is a mating component does not comply with compatible standards.

76. End fittings, ball joints, plain bearing end fittings and idler arm pivots have been used and they do not have manufacturer’s ratings in excess of the loads or angular travel to be imposed on them.

77. A moving component may be fouled through its full travel movement and suspension movement.

78. For suspension, axle and steering system attachments, threaded fasteners are not of an appropriate grade for the application.

79. A vehicle has not been road-tested after a steering or suspension modification.

80. The steering system does not provide safe and positive handling of the vehicle.

81. The steering system is not free of any undue restrictions to operation through its range of operation.

82. The steering control is not in the normally accepted direction in relation to the effect on the vehicle.

83. The minimum steering effort with power assist is less than five newtons force measured at the steering wheel rim under all conditions.

84. The maximum steering effort measured at the steering wheel rim exceeds 250 newtons force when tested under the following conditions:

a) the vehicle is loaded to its GVM and is correctly distributed on the vehicle axles, and

b) the tyres are inflated at the recommended tyre pressure, and

c) the vehicle is travelling at a speed of 10 km/h or less, and

d) the steering wheel is turned at a constant rate so that in four seconds the steering angle acquired is sufficient to turn the vehicle within a 25-metre diameter circle, and

e) the turn is made to both the left and right.

85. With the power steering system disabled, the steering effort required exceeds 600 newtons when doing the above test, with the exception that the turn rate can be decreased to six seconds.

86. A repaired or replaced spring slipper has not been fitted or replaced in a tradesman like manner using materials that are fit for purpose and are within safe tolerance of original manufacture.

87. A spring slipper has been fitted to reduce spring lash and has not been certified by a HV certifier.

88. A spring slipper has been repaired more than once and is not supported by certification or a report from a HV certifier relating to the most recent repair.

89. A modification to an axle, the steering or the suspension that may affect the brakes has not been referred to a HV certifier with the brakes category (HVEK).

90. The brake system of an air-braked heavy vehicle does not have priority of the supply of air from the air compressor.

91. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes without protecting the brake circuit.

92.An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the external diameter of the supply hose or pipe is larger than 8mm.

93.An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the device operates when the vehicle is moving.

94.An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the vehicle manufacturer does not allow it.

95. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model has not been referred to a HV certifier with the Brakes category (HVEK).

96. A powered vehicle with an hydraulic service brake has been fitted with an additional rear axle that does not have the same type of braking system as the original axle or an air operated disc brake as a service brake.

97. A vehicle that has been damaged in a crash has not had its steering and suspension components inspected to ensure that damage has not occurred to these critical safety systems and they have not been reinstated to within safe tolerance of original manufacture or most recent certification and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair threesholds**).

98. A vehicle that has been damaged by fire has not had its steering and suspension components inspected to ensure that damage has not occurred to these critical safety systems and they have not been reinstated to within safe tolerance of original manufacture or most recent certification and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair threesholds**).

99. A vehicle that has been damaged by immersion in water has not had its steering and suspension components inspected to ensure that damage has not occurred to these critical safety systems and they have not been reinstated to within safe tolerance of original manufacture or most recent certification and certified appropriately (see **Technical bulletin 1: Heavy vehicle repair threesholds**).

Note 1

Notwithstanding requirement 1 of this section any person may operate any motor vehicle having the steering column to the left of the longitudinal centreline of the body of the vehicle if the vehicle:

a) was purchased from the Crown by the owner or any former owner, or

b) is for the time being exempt from subclause 1 of this regulation by virtue of an exemption granted under regulation 90 of these regulations.

Note 2

New and used replacement systems, components and equipment:

A repairer must use systems, components and equipment that will enable a vehicle to comply with requirement 8.

The systems, components and equipment used to enable the vehicle to comply with requirement 8 may be new or used.

Replacement systems, components and equipment used in a repair must comply with an approved vehicle standard applicable as specified by the relevant rule or regulation to the year of manufacture of the vehicle, system, component or equipment.

Note 3

A forklift, the rear unit of an articulated bus or a mobile crane may have one or more rear steering axles.

A rigid vehicle without a heavy tow coupling or a semi-trailer (other than a semi-trailer in an A-train combination or a B-train combination) may have steering axles in the rear-axle set, if no more than half of the axles within the axle set steer at any time.

A semi-trailer with a quad-axle set must have at least one but not more than two steering axles within the quad-axle set provided that they are:

a) the two rearmost axles which must be capable of turning in the same direction through an angle of at least 15 degrees, or

b) the foremost and rearmost axle which must be capable of turning in opposite directions through an angle of at least 15 degrees, or

c) where fitted with a single steering axle in a quad-axle set, the steering axle must be the rearmost axle.

A steering axle in the last case must be capable of turning through an angle of at least 15 degrees in either direction and have that confirmed by certification by a HVS certifier with the chassis category.

Note 5

A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle must be certified.

Note 6

Major reworking of the design of the vehicle relates to subsequent major modification of the standard vehicle as produced and tested by the vehicle manufacturer and includes:

a) fitting of different types of engine and relocation of engine and/or transmission

b) addition or removal of axles

c) alteration of wheelbase by:

i. moving axles on chassis rails

ii. extending or shortening the chassis

d) replacement of the original chassis rails by a structure of different form

e) addition of heavy duty equipment for special purpose operations, for example hydraulic hoists which may place extra

stress on localised areas of the chassis and/or other equipment

f) conversion to left-hand drive dual steering (in special purpose vehicles only).

Note 7

Dual steering conversions may only be carried out on special purpose vehicles such as street sweepers, weed sprayers, road markers, refuse collection and the like.

All of the relevant requirements also apply to dual steering conversions except where the left-hand steer position is being added, that is. the vehicle is originally right-hand steer. The steering motion may be transferred by way of chain and sprocket or bevel boxes.

Note 8

Where a spring slipper has been repaired or replaced a LT400 is not required if a CoF inspector is satisfied that the spring slipper plate has been repaired or replaced in a tradesman like manner, using components and materials that are fit for purpose and within safe tolerance of its state when manufactured.

However, if there is evidence of successive repairs or the spring slipper has been fitted in such a way that it may reduce spring lash then certification is required and a LT400 presented.

Summary of legislation

Applicable Legislation

- *New Zealand Gazette* 21 August 1980, page 2457 (Note 2)
- **Land Transport Rule: Frontal Impact 2001**
- **Land Transport Rule: Heavy Vehicles 2004**
- **Land Transport Rule: Steering Systems 2001**
- **Land Transport Rule: Vehicle Dimensions and Mass 2002**
- **Land Transport Rule: Vehicle Repair 1998**.

Frontal Impact Rule (section 2.2)

1. The performance of a motor vehicle in relation to protecting occupants in a frontal impact collision must not be reduced below a safe tolerance of its state when manufactured or modified by any factors including corrosion, structural damage, material degradation, inadequate repair, the fitting of additional equipment or the removal of equipment.

2. In assessing whether Requirement 1 above has been complied with a certifier may take into account:

a) the function of the additional equipment fitted to the motor vehicle after manufacture and the measures taken to minimise the risk of injury from the equipment,

b) evidence that the motor vehicle is within the manufacturer's operating limits.

3. A modification to a motor vehicle that affects its frontal impact performance (section 3.1):

a) must not prevent the vehicle from complying with this rule, and

b) must be certified.

4. A repair to a component or a group of components that affects a motor vehicle's frontal impact performance must comply with **Land Transport Rule: Vehicle Repair 1998** and must not prevent the vehicle from complying with this rule.

Vehicle Repair 1998, rule 34001 (section 2.1)

5. A repair to a vehicle, its structure, systems, components or equipment, must restore the damaged or worn vehicle, structure, system, component or equipment so that they are within safe tolerance of the state of the vehicle, structure, system, component or equipment when manufactured or modified.

6. In repairing a vehicle (section 2.2) to comply with Requirement 5 above, a repairer must use a suitable repair method that takes into account the following:

a) the date of manufacture of the vehicle

b) the class, make and other relevant characteristics of the vehicle

c) the approved vehicle standards with which the vehicle is required to comply

d) the existence of relevant manufacturer's recommendations and alternative methods

e) the material specifications used for construction of the vehicle, structure, systems and components or equipment

f) the compatibility of the intended repair process with materials specifications (Note 3).

Vehicle Dimensions and Mass 2016 (section 4)

7. An articulated bus must be able to complete a 360-degree turn in either direction without any part of the vehicle except for collapsible mirrors encroaching within a concentric internal radius of 5.3m.

8. In carrying out a 360-degree turn at the 25m diameter as specified in chapter 3-1 Dimensions, no part of a vehicle in a combination, other than its articulation mechanism, may come into contact with the other vehicle in the combination.

9. A heavy rigid motor vehicle must be supported by:

a) one axle set towards the front of the vehicle, which must be either a single-axle set or a twin-steer-axle set, and

b) one axle set towards the rear of the vehicle which must be a single set, a tandem set or a tri-axle set.

10. Except as provided in (Note 3) a heavy motor vehicle must not have any rear-steering axle.

11. A mobile crane must have at least one rear axle locked so that it is non-steering, when the crane is being operated on the road.

12. A rigid motor vehicle or semi-trailer, fitted with rear-steering axles must comply in all configurations with the rear overhang requirements and forward distance requirements in chapter **3-1 Dimensions**.

13. The axle sets, except a twin-steer axle set, of a heavy motor vehicle must be load sharing.

14. If a tandem-axle set has a single large-tyred axle with a load-share ratio of 60%:40% or 55%:45%, the manufacturer of the vehicle must securely affix to the vehicle an indelible plate, so that it is clearly visible to the person who is weighing the vehicle, that specifies the:

a) load-share ratio of the axle set, and

b) tyre size on each axle, and

c) maximum individual axle ratings.

15. An A-train must have two motor-driven axles in a tandem-axle set or a tri-axle set, or three motor-driven axles in a tri-axle set.

16. A semi-trailer must be supported by one axle set only which must be set towards the rear of the vehicle and must be:

a) a single-axle set, or

b) a tandem-axle set, or

c) a tri-axle set, or

d) a quad-axle set (except if the semi-trailer is in an A-train combination or a B-train combination).

17. The axle set towards the front of a full trailer must connect all wheels for that part of the trailer to the drawbar steering system and must be either a single-axle set or a tandem-axle set.

18. The axle set towards the rear of a full trailer must be one of the following:

a) a single-axle set,

b) a tandem-axle set,

c) a tri-axle set provided that the front axle set is a tandem-axle set.

19. A simple trailer must be supported by one of the following:

a) a single-axle set,

b) a tandem-axle set,

c) a tri-axle set.

20. A pole trailer with one axle set may only carry poles or long loads that are not part of the trailer and must be supported by a single-axle set, a tandem-axle set or a tri-axle set.

21. For a pole trailer with two axle sets the axle set towards the front of the trailer must connect all wheels for that part of the trailer to the drawbar steering system and must be either a single-axle set or a tandem-axle set.

22. The axle set towards the rear of a pole trailer with two axle sets must be one of the following:

a) a single-axle set,

b) a tandem-axle set,

c) a tri-axle set provided that the front axle set is a tandem-axle set.

23. A heavy motor vehicle, other than an A-train or a B-train, may have a retractable axle (Note 5) provided that:

a) the retractable axle is in a rear-axle set,

b) the retractable axle has an automated control that ensures the remaining axle or axles and axle set or axle sets in contact with the ground remain within the mass limits and within all manufacturer's component ratings for all retractable axle configurations,

c) the forward distance requirements and rear overhang requirements are complied with whether the axle is in contact with the road or is in a retracted position.

24. A specialist overdimension motor vehicle designed principally to transport an overdimension load or an overweight load or both must be load sharing.

Steering systems 2001 (sections 2 and 3)

25. A steering system on a motor vehicle, and associated systems and components that could directly or indirectly affect the directional control of the vehicle must be:

a) sound and in good condition and must provide the vehicle with safe, efficient, convenient and sensitive control

b) strong, durable and fit for their purpose, taking into account whether adverse effects have resulted from a loss of integrity of any protective system used by a relevant component.

26. A motor vehicle capable of a speed more than 30 km/h and equipped with a steering system with no direct mechanical connection between the driver's means of control and the wheels or other means of changing the vehicle's direction must have at least one additional means of steering that complies with requirement 27.

27. A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle must not prevent the vehicle from complying with requirement 27 (Note 6).

28. If a steering system or a system component that could affect the directional control is modified:

a) the steering system must be compatible with the performance and component specifications of the manufacturer of the vehicle or steering system for the original steering system, and

b) the loads and stresses on the steering system and its components must be demonstrably within the design and performance criteria established by their manufacturer for the specific application in which they were originally used.

29. A repair to a steering system, or a repair to a motor vehicle that affects its steering system must comply with all other requirements in this section.

Heavy Vehicle Rule

Section 3

30. An axle fitted to a vehicle must be of adequate strength and have appropriate performance characteristics for all loading and operation for which the vehicle was constructed.

31. A device for altering the distribution of mass between axles must not be fitted to a vehicle unless:

a) the device lifts an unpowered axle clear of the ground, or

b) the device reduces the mass carried by an unpowered axle without lifting it clear of the ground, and

i. it has a control that is spring loaded so that, when the control is released, the mass on the unpowered axle reverts to what it was before the operation of the controls, or

ii. it has a control with an automatic timing device with an activation time of not more than two minutes after which the mass on the unpowered axle reverts automatically to what it was before the operation of the control and with a non-activation time of at least 30 seconds during which the control cannot be activated again.

32. The suspension system of a vehicle must be of adequate strength and have appropriate performance characteristics for all conditions of loading and operation for which the vehicle was constructed.

33. An axle stop device fitted to a vehicle must be maintained within safe tolerance of its original condition.

Modification (section 6)

Section 6 applies to all modifications carried out after 1 April 2005.

34. A modification to a vehicle that may affect the safety of the vehicle's components or the overall safety of the vehicle must not prevent the vehicle from complying with this Rule.

35. If practicable, a modification to a vehicle must be carried out in accordance with instructions from the vehicle manufacturer and the manufacturer of any equipment being fitted to the vehicle.

36. A modification to a vehicle must be carried out:

a) as specified by the manufacturer of the vehicle, if the manufacturer produces more than 1000 vehicles in a year for a market where compliance with Australian, Japanese, UN/ECE standards or the requirements of the United States, is compulsory, or

b) in accordance with the specifications of an HVS certifier.

37. A modification to a vehicle must be carried out using components that are suitable for automotive application.

38. An axle, a suspension system or an axle and suspension system, fitted to a vehicle to replace the one fitted by the vehicle manufacturer, must have a load rating and performance characteristics that are suitable for all conditions of loading and operation for which the vehicle was constructed.

39. If an axle of a vehicle is fitted with tyres in a way that results in the wheel track being altered beyond the vehicle manufacturer's specified limits, or the number of tyres fitted to an axle exceeds the number specified by the vehicle manufacturer, either:

a) a new axle load rating must be established or

b) the current axle load rating must be confirmed as being valid.

40. A second steering axle fitted to a vehicle must have a means of steering that is compatible with the existing steering components.

41. The steering system of a vehicle fitted with a second steering axle, as part of a twin-steer axle set, must be suitable for operating a twin-steer axle set.

42. A repair to the chassis of a vehicle or to a structural element of a monocoque body of a vehicle must be carried out:

a) as specified by the manufacturer of the vehicle, if the manufacturer produces more than 1000 heavy vehicles in a year for a market in which compliance with Australian, Japanese, UN/ECE standards or the requirements of the United States is compulsory, or

b) in accordance with the specifications of an HVS certifier, or

c) in accordance with the Minor Repair Code, approved by the NZTA and published by the New Zealand Truck-Trailer Manufacturers' Federation.

Conversion of a vehicle to right-hand drive

45. If a vehicle is converted from left-hand drive to right-hand drive:

a) if practicable, original equipment must be used, and

b) non-original equipment must not be used unless approved by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

c) the steering -column must be transferred without altering the integrity of the column or its collapse mechanism, and

d) except when fixing mountings to the chassis or body of the vehicle, steering components must not be welded, unless:

i. the welding is designed by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

ii. appropriate non-destructive testing is carried out by a qualified person, and

e) steering performance and characteristics must be maintained, and

f) the parking brake, auxiliary brake, accelerator and clutch controls must be transferred to the right-hand side of the vehicle, and

g) new mounting points for the parking brake, accelerator and clutch controls must be of equivalent strength to the original mounting points.

46. If a vehicle is converted from left-hand drive to right-hand drive:

a) the service brake control assembly must be transferred to the right-hand side of the vehicle, or

b) the service brake pedal assembly must be transferred to the right-hand side of the vehicle and the motion of the brake pedal must be transmitted to the master cylinder or treadle valve by:

i. a torque shaft, or

ii. levers and rods.

47. For a vehicle to which 46(b) applies, the master cylinder or the treadle valve and the mechanism that transfers the braking effort from the right-hand side to the left-hand side must be protected to ensure that the service brake can be activated only by the driver.

Conversion of a vehicle to dual steering

48. A conversion to dual steering may be carried out only on a special purpose vehicle.

49.If a special purpose vehicle is converted to dual steering:

a) if practicable, original equipment must be used, and

b) non-original equipment must not be used unless approved by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

c) except when fixing mountings to the chassis or body of the vehicle, steering components must not be welded, unless:

i. the welding is designed by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

ii. appropriate non-destructive testing is carried out, and

d) steering performance and characteristics must be maintained, and

e) new mounting points for the parking brake, accelerator and clutch controls must be of equivalent strength to the original mounting points.

50. If a special purpose vehicle is converted to dual steering:

a) the service brake control assembly must be replicated on the other side of the vehicle in a way that prevents the hydraulic or pneumatic line pressure from acting on the non-operating master cylinder or treadle valve, or

b) the motion of the brake pedal must be transmitted to the master cylinder or treadle valve by:

i. a torque shaft, or

ii. levers and rods.

51. The steering motion on a special purpose vehicle that has been converted to dual steering may be transmitted by chain and sprocket or bevel gear boxes, if proper means are provided to eliminate backlash.

Priority and protection of air brakes

52. The compressor must supply only the brake reservoirs with compressed air until the pressure in those reservoirs reaches the pressure specified by the vehicle manufacturer or the brake manufacturer, or, if such information is not available, two thirds of the maximum operational pressure specified by the vehicle manufacturer or brake manufacturer.

53. An air brake must have priority of the supply of compressed air from the brake reservoir.

54. An air-operated device may be connected to the air brake of a vehicle, only if:

a) the brake is protected so that the operation or failure of the device cannot lower the pressure in [any service brake or parking brake reservoir(s)] below the pressure specified by the vehicle manufacturer or brake manufacturer, or, if such information is not available, two-thirds of its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer, and

b) the supply to the device is drawn from a reservoir separate from the service brake or parking brake reservoir(s) supplying the brake, except as specified in 55.

55. Despite 54(b), an air-operated device may be supplied with compressed air from the service brake or parking brake reservoir(s), if:

a) the operation of the device requires only a small amount of compressed air and it is supplied with compressed air by a hose or pipe with an external diameter not exceeding 8mm, or

b) the device is operated only when the vehicle is stationary, or

c) the vehicle manufacturer allows it.

56. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model, must either:

a) be modified so as to continue to meet the technical and performance requirements of the approved standard in the Rule with which the vehicle originally complied, or

b) comply with all other applicable requirements in this Rule.

57. A powered vehicle with an hydraulic service brake may be fitted with an additional rear axle that has an air operated disc brake as a service brake.

Page amended **2 December 2019** (see **amendment details**)

4-4 Engine and drive train

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1. Devices to protect against drive-shaft failure have not been maintained within safe tolerance of their original condition.

2. Fuels for a passenger service vehicle and the vehicle's equipment are not carried in permanent fuel tanks.

3. For a vehicle which entered service as a passenger service vehicle in New Zealand before 1 July 2000, the design and location of fuel tanks do not incorporate a device to compensate the internal pressure without fuel overflow and without fuel spillage, even in the case of roll-over of the passenger service vehicle.

4. Fuel tanks and fuel lines are not:

a) corrosion-resistant, or

b) designed and constructed of durable, fuel-resistant material, or

c) securely mounted, or

d) protected from suspension or steering component movement, or

e) reasonably protected from collision damage.

5. Access to the fuel-tank filling inlet is not from outside the body of the passenger service vehicle.

6. A filling inlet does not have a leak-proof cap.

7. The design, construction and maintenance of the exhaust system does not ensure that:

a) emitted heat or fumes cannot harm the occupants of the vehicle, or

b) the outlet pipe is not shielded or located in a position where other road users, or passengers entering or exiting the vehicle, cannot be burned by the exhaust, or

c) the outlet pipe does not discharge on the left-hand side of the vehicle at a low level

d) the exhaust outlet may affect pedestrians.

8. The transmission on a vehicle is not of adequate strength and have appropriate performance characteristics for all conditions of loading and operation for which the vehicle was constructed.

9. The transmission on a vehicle has not been installed in accordance with the transmission manufacturer's instructions and maintained within safe tolerance of its original condition.

10. A device fitted to a vehicle to restrict the field of swing of a drive shaft in the event of a drive shaft failure has not been maintained within a safe tolerance of its original condition.

11. A modification to a vehicle has resulted in the vehicle's engine or transmission becoming unsuitable for the conditions of loading and operation for which the vehicle is modified.

12. A modification to a vehicle has adversely affected the performance of the vehicle's engine or transmission.

13. A modification to a vehicle that affects the performance of the vehicle’s drive shaft has resulted in the drive shaft manufacturer’s specified limits being exceeded.

14. Any new mountings are not at least the same strength as the original or the movement of the accelerator linkages is impeded in any way.

15. A component has been used that is not within the manufacturer’s ratings.

16. Adequate protection from heat has not been provided for all hoses, electrical harnesses, fuel and hydraulic lines, electrical components, rubber/plastic components and any other heat sensitive components.

17. Engine mounts are not of sufficient strength to withstand the torsional and vertical loads.

18. Engine mounts are unable to restrict excessive engine movement.

19. Engine mounts have not been designed so that if they fail the engine will remain captive.

20. The engine mounts do not maintain sufficient clearance between the engine and the chassis/cab/body components.

21. The engine has not been mounted so as to maintain the correct alignment of the driveline.

22. Fuel lines have not been routed so that they are not affected by a heat source, for example the exhaust or the turbo charger.

23. Fuel lines are not adequately secured or protected from mechanical damage.

24. The exhaust system has been located under fuel tanks, or fuel or oil fillers.

25. The exhaust system does not expel the exhaust gases outside the vehicle perimeter.

26. The transmission does not have adequate capacity for the torque/power output of the engine.

27. Any openings required for the gearshift lever have not been adequately sealed to prevent exhaust gases and engine fumes entering the cabin.

28. The accuracy of the vehicle speedometer has been impaired by any modification or repair.

29. If the vehicle has an automatic transmission, the engine starter is not inoperative when the transmission lever is in a drive or reverse position.

30. The reverse lights do not operate when reverse gear is selected unless operated by an independent switch.

31. The transmission mounts are not of sufficient strength to withstand the torsional and vertical loads.

32. The transmission has not been mounted so as to maintain the correct alignment of the driveline.

33. The engine and transmission mounting method are not compatible, that is both flexible or both solid mounted.

34. The drive shaft has not been fabricated from one length of material between end fittings.

35. The drive shaft is not of sufficient strength to withstand the imposed loads.

36. The drive shaft is not correctly aligned within specifications.

37. The drive shaft has not been adequately balanced.

38. The maximum operating speed of the drive shaft is not within 65% of the critical or resonant speed of the drive shaft.

39. The drive shaft does not have sufficient clearance so that it will not come into contact with any part of the vehicle through the full suspension travel.

40. The universal joint has not been installed within the manufacturer’s specifications or is not correctly phased.

41. The universal joint is not of sufficient strength to withstand the imposed loads.

42. The universal joint does not have sufficient clearance so that it will not come into contact with any part of the vehicle through the full suspension travel.

43. The length of the slip joint is not sufficiently long so that, through the full suspension travel, the joint does not bottom out or become disengaged.

44. The minimum spline engagement with the joint fully extended is less than the manufacturer's specifications or, in the absence of manufacturer's specifications 1.5 times the spline diameter.

45. The minimum spline end clearance with the joint fully contracted is less than the manufacturer's specifications or, in the absence of manufacturer's specifications, one spline diameter.

46. When road tested, the drive line has unacceptable vibrations within the design speed range.

47. When a vehicle has been repowered prior to entering the fleet the powerpack does not:

a) meet the emissions requirements of the **Emissions Rule**, or

b) have all the components such as cooling system, exhaust system and treatment, induction systems and electronic controls systems fitted as required by the manufacturer to meet the emissions requirements of the **Emissions Rule**

- See also Technical bulletin 17: Heavy vehicle power pack upgrades to meet emissions requirements.

48. When a vehicle has been repowered prior to entry onto the fleet the powerpack does not meet the emissions requirement of the **Emissions Rule** (see also Technical bulletin 17: Heavy vehicle power pack upgrades to meet emissions requirements).

49. When a vehicle has been repowered prior to entry onto the fleet the powerpack does not include all the components such as the cooling system, exhaust system including treatment, induction system and electronic control system fitted as required by the manufacturer to meet the emissions requirements of the **Emissions Rule** (see also Technical bulletin 17: Heavy vehicle power pack upgrades to meet emissions requirements).

50. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the external diameter of the supply hose or pipe is larger than 8mm.

51. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the device operates when the vehicle is moving.

52. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the vehicle manufacturer does not allow it.

53. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model has not been referred to a HV certifier with the brakes category (HVEK).

54. A powered vehicle with an hydraulic service brake has been fitted with an additional rear axle that does not have the same type of braking system as the original axle or an air operated disc brake as a service brake.

Summary of legislation

Applicable legislation

- **Land Transport Rule: Heavy Vehicles 2004**

- **Land Transport Rule: Passenger Service Vehicles 1999**
- **Land Transport Rule: Vehicle Exhaust Emissions 2007**

Passenger Service Vehicles Rule

Suspension and drive line (section 6.7)

1. Devices to protect against drive-shaft failure must be maintained within safe tolerance of their original condition.

Fire fighting and protection against fire

2. The design and construction of a passenger service vehicle must minimise the risk of fire.

3. Materials used in the construction and fittings of a passenger service vehicle:

a) must be such that, if they are ignited, the risk of emission of harmful fumes and gases is minimised, and

b) must not be of a type which would contribute to the rapid spread of a fire.

4. The exhaust system, including any turbo-chargers and any other heat sources, must be installed, located, shielded and ventilated so that:

a) no ignitable or heat sensitive materials could fall on the exhaust system or heat source, and

b) material adjacent to any hot surface forming part of, or connected to, the exhaust system or any other heat source must not, under any operating condition, be heated sufficiently to cause degradation.

5. The design of the engine installation and engine compartment must ensure that no fuel, oil or other combustible materials could accumulate in the engine compartment or drip on to any high temperature surface.

6. The engine compartment must be lined with, or made of, fire-resistant materials in a manner that complies with the engine manufacturer's specifications for minimum clearances.

7. The engine compartment of a heavy passenger service vehicle, with an engine positioned rearward of the front axle set, must be maintained to ensure that the clearance space between the lining or compartment walls and the engine or its ancillary components is maintained within safe tolerance of the clearance that existed when the engine was installed.

8. Devices to protect against drive-shaft failure must be maintained within safe tolerance of their original condition.

Fuel tanks and protection against fumes and gases (section 6.2)

9. Fuels for a passenger service vehicle and the vehicle's equipment must be carried in permanent fuel tanks.

10. The design and location of fuel tanks must:

a) incorporate a device to compensate the internal pressure without fuel overflow and without fuel spillage, even in the case of roll-over of the passenger service vehicle, except as specified in b) below,

b) for a vehicle which entered service as a passenger service vehicle in New Zealand before 1 July 2000, ensure that any fuel overflow will not accumulate on any part of the vehicle.

11. Fuel tanks and fuel lines must be:

a) corrosion-resistant, and

b) designed and constructed of durable, fuel-resistant material, and

c) securely mounted, and

d) reasonably protected from collision damage.

12. Access to the fuel-tank filling inlet must be from outside the body of the passenger service vehicle. Each filling inlet must be provided with a leak-proof cap.

13. The design, construction and maintenance of the exhaust system must ensure that:

a) emitted heat or fumes cannot harm the occupants of the passenger service vehicle, and

b) the outlet pipe is shielded or located in a position where other road users, or passengers entering or exiting the vehicle, cannot be burned by the exhaust, and

c) the outlet pipe does not discharge on the left-hand side of the vehicle.

Heavy Vehicle Rule

Transmission (section 3.4)

14. The transmission on a vehicle must be of adequate strength and have appropriate performance characteristics for all conditions of loading and operation for which the vehicle was constructed.

15. The transmission on a vehicle must be installed in accordance with the transmission manufacturer's instructions and maintained within safe tolerance of its original condition.

19. A device fitted to a vehicle to restrict the field of swing of a drive shaft in the event of a drive shaft failure must be maintained within a safe tolerance of its original condition.

Modification affecting engine and transmission (section 6.2)

17. A modification to a vehicle must not result in the vehicle's engine or transmission becoming unsuitable for the conditions of loading and operation for which the vehicle is modified.

18. A modification to a vehicle must not adversely affect the performance of the vehicle's engine or transmission.

19. A modification to a vehicle that affects the performance of the vehicle's drive shaft must not result in the drive shaft manufacturer's specified limits being exceeded.

Priority and protection of air brakes

20. The compressor must supply only the brake reservoirs with compressed air until the pressure in those reservoirs reaches the pressure specified by the vehicle manufacturer or the brake manufacturer, or, if such information is not available, two thirds of the maximum operational pressure specified by the vehicle manufacturer or brake manufacturer.

21. An air brake must have priority of the supply of compressed air from the brake reservoir.

22. An air-operated device may be connected to the air brake of a vehicle, only if:

a) the brake is protected so that the operation or failure of the device cannot lower the pressure in [any service brake or parking brake reservoir(s)] below the pressure specified by the vehicle manufacturer or brake manufacturer, or, if such information is not available, two-thirds of its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer, and

b) the supply to the device is drawn from a reservoir separate from the service brake or parking brake reservoir(s) supplying the brake, except as specified in *23.*

23. Despite *22(b)*, an air-operated device may be supplied with compressed air from the service brake or parking brake reservoir(s), if:

a) the operation of the device requires only a small amount of compressed air and it is supplied with compressed air by a hose or pipe with an external diameter not exceeding 8 mm; or

b) the device is operated only when the vehicle is stationary; or

c) the vehicle manufacturer allows it.

24. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model, must either:

a) be modified so as to continue to meet the technical and performance requirements of the approved standard in the Rule) with which the vehicle originally complied; or

b) comply with all other applicable requirements in this Rule.

25. A powered vehicle with an hydraulic service brake may be fitted with an additional rear axle that has an air operated disc brake as a service brake.

Page amended **9 April 2018** (see **amendment details**)

4-5 PSV roof racks

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1 The roof rack fitted to a PSV is not fitted and rated for that particular make and model of PSV, or

2. The roof rack fitted to a PSV is not rated and certified by a person authorised by the Agency to do so.

3. The roof-rack does not have a sign or plate on the left-hand side stating:

a) the purpose of the roof-rack, if other than for general baggage, or

b) the maximum weight it is allowed to carry, or

c) the manufacturer of the roof-rack, or

d) either of the following:

i. identification of the passenger service vehicle to which it is fitted (make, model and registration number, or Vehicle Identification Number, or chassis number), or

ii. if rated and certified either by the vehicle manufacturer or by a person authorised by the NZTA to do so, for a vehicle model, the plate need not identify the individual vehicle, but must identify the approval for that vehicle model

4. A PSV fitted with a roof rack has been certified that it meets the static tilt requirements and the roof rack was not fully laden.

Summary of legislation

Applicable legislation

- **Land Transport Rule: Passenger Service Vehicles 1999**

Passenger Service Vehicles 1999 (section 7)

Roof-racks

1. The roof-rack must:

    a) be fitted and rated as appropriate for that particular make and model of passenger service vehicle, or

    b) be rated and certified by a person authorised by the NZTA to do so, and fitted in accordance with that authorised person's instructions.

2. The roof-rack must have a sign or plate on the left-hand side stating:

    a) the purpose of the roof-rack, if other than for general baggage, and

    b) the maximum weight it is allowed to carry, and

    c) the manufacturer of the roof-rack, and

    d) either of the following:

        i. identification of the passenger service vehicle to which it is fitted (make, model and registration number, or Vehicle Identification Number, or chassis number), or

        ii. if rated and certified either by the vehicle manufacturer or by a person authorised by the NZTA to do so, for a vehicle model, the plate need not identify the individual vehicle, but must identify the approval for that vehicle model

3. A motor vehicle which entered service as a passenger service vehicle in New Zealand on or after 1 July 2000 and is fitted with a roof rack must meet the stability requirements under the following conditions of static tilt:

- The roof-rack must be loaded with the maximum permitted load (see **section 7-2**).

5 Brakes

5-1 Brakes (General)

Certifier categories: **HVEK** | **HMKD**

Reasons for rejection

1. A vehicle that is not an armoured vehicle used exclusively by the NZ Defence Force, a steam powered vehicle, a vehicle with self laying tracks, a traction engine, a mechanically propelled roller, a tractor or machine used solely in farm or roading operations, whether for traction or otherwise, and not capable of a speed exceeding 30km/h, together with any trailer used on the road only while drawn by that tractor or machine, a vehicle normally propelled by mechanical power while it is being temporarily towed without the use of its own power or an agricultural trailer, does not have a service brake, a parking brake and an emergency brake unless it is a semi trailer first registered before 1 November 1990.

2. A semi trailer first registered before 1 November 1990 is not fitted with a service brake.

3. A vehicle that does not require a service brake, a parking brake and an emergency brake does not have a means for the driver to control the movement of the vehicle, stop it and hold it stationary under all conditions of use.

3. A brake is not easily adjustable to compensate for wear or does not have a means of automatic adjustment.

4. A brake is not maintained in good condition and efficient working order.

5. A brake is out of adjustment so that the braking effect across an axle is not approximately equivalent and there is no system operating where the braking effect is modulated by a control device to prevent wheel lock up or improve stability.

6. A brake is not maintained within safe tolerance of the vehicle manufacturer’s specifications.

7. The brake friction material is not secure, not in good condition or has defects that may adversely affect the performance of the brake.

8. A vehicle's brake is applied on a hard, dry, level surface that is free of loose material, and without assistance from the compression of the vehicle's engine or other auxiliary braking device that is not part of the vehicle's service brake the vehicle or its controls vibrates so as to noticeably and adversely affect the control of the vehicle.

9. A vehicle's brake is applied on a hard, dry, level surface that is free of loose material, and without assistance from the compression of the vehicle's engine or other auxiliary braking device that is not part of the vehicle's service brake the braking effect on each braked wheel of the vehicle does not provide stable and efficient braking without adverse effect on the directional control of the vehicle.

10. A vehicle's brake is applied on a hard, dry, level surface that is free of loose material, and without assistance from the compression of the vehicle's engine or other auxiliary braking device that is not part of the vehicle's service brake and if the vehicle is equipped with an anti-lock braking system, any of the vehicle's rotationally sensed wheels lock when the speed of the vehicle is above the ABS-activation parameters set by the vehicle manufacturer.

11. Except for brake pad warning systems, a warning system that is fitted to a vehicle and is part of, or associated with the use of, a brake component or system does not function correctly.

12. The service brake of a vehicle is not able to be applied by the driver from the driver's normal driving position in a controlled and progressive manner.

13. The service brake of a vehicle, not being a heavy haulage trailer or a military trailer, has a device fitted by which the driver would be able to adjust the brake force distribution between the axles or between the vehicles that are used in a combination vehicle.

14. The service brake of a vehicle, whether or not it is being operated as a combination vehicle, has more than one control except where it is being operated in a combination and is fitted with a trailer-brake hand control.

15. A vehicle that has been converted to dual steering does not have its service brake replicated on the other side of the vehicle.

16. A service brake is not capable of stopping the vehicle at any load condition up to the gross vehicle mass or gross combination mass, as applicable, either within a distance (s) in metres calculated by the following equation: **$s = 0.15v+(v2/130)$** where the speed of the vehicle (v) in km/h before the start of braking is at least the lesser of 50 km/h or 80% of the maximum speed of the vehicle, or within a distance of 7m from a speed of 30 km/h, measured from the point at which movement of the brake control commences and finishing at the point when the vehicle comes to a complete stop.

17. A vehicle of class MD3, MD4, ME, NB, NC, TC or TD, first registered in New Zealand on or after 1 November 1990, does not have a service brake that acts on each wheel.

18. The parking brake of a vehicle, whether or not it is being operated as a combination vehicle, is not able to be applied by the driver from the normal driving position using one control only except for a class TC vehicle.

19. A class TC vehicle is not able to have its parking brake activated by the driver from the normal driving position and the vehicle is not part of a dedicated combination and does not have an air brake or a brake that is operated with the

assistance of compressed air or it is not fitted with a temporary park brake that complies with the Rule or the control is not fitted in a readily accessible position or the towing vehicle is not fitted with appropriate signage.

20. The parking brake of a vehicle first registered in New Zealand on or after 1 November 1990 does not act on at least 40% of the wheels.

21. A class NB or NC vehicle fitted with a transmission/Cardan shaft park brake does not have a warning label, visible to the driver, advising that a transmission/Cardan shaft park brake is fitted to this vehicle (see Figure 5-1-1).

22. The parking brake of a vehicle, other than a semi-trailer, is not, at any load condition up to the gross vehicle mass or gross combination mass, as applicable, capable of stopping the vehicle within a distance of 18m from a speed of 30 km/h, or holding the vehicle stationary on a slope of 18% whether facing uphill or downhill.

23. A semi-trailer first registered in New Zealand on or after 1 November 1990, does not have a parking brake that generates a deceleration load of at least 20% of the maximum weight that can be carried on the axle or axle set.

24. A vehicle does not have an emergency brake that operates either in combination with the parking brake or the service brake of a powered vehicle, if the vehicle is fitted with a full dual-circuit service brake, and either one of those circuits activates the brake on all the front wheels and the other circuit activates the brake on all the rear wheel or each circuit activates the brake on at least 1/3 of the wheels.

25. For a powered vehicle first registered in New Zealand during the period beginning on 1 November 1990 and ending on 31 December 1994, the brake remains unmodified since the vehicle was manufactured, the vehicle has a mechanically-operated parking brake acting on the transmission and the vehicle does not have either a dual-line service brake that is fitted with a tandem/dual master cylinder or a single-line hydraulic service brake that is divided into two independent circuits through an excess flow prevention valve, and the brake fluid reservoir is fitted with a low-level warning device.

25. The emergency brake of a trailer does not operate immediately and automatically to stop and hold the trailer stationary if it becomes disconnected from the towing vehicle.

26. The emergency brake of a semi-trailer does not, as far as is practicable, act on the wheels that remain in contact with the ground if the semi-trailer becomes disconnected from the towing vehicle during operation.

27. The emergency brake of a vehicle first registered in New Zealand on or after 1 November 1990 does not act as directly as practicable on those wheels without the interposition of any differential gearing.

28. The emergency brake of a vehicle, other than a semi trailer, first registered in New Zealand on or after 1 November 1990 is not capable of stopping the vehicle at any load condition up to the gross vehicle mass or gross combination mass, as applicable, within a distance of 18 m from a speed of 30 km/h.

29. The emergency brake of a semi trailer, first registered in New Zealand on or after 1 November 1990, is not capable of generating brake forces to the sum of at least 20% of the maximum weight that can be carried on the axle or axle set.

30. An imported vehicle, other than a trailer, first registered in NZ on or after 1 July 2008 does not meet one of the approved brake standards in the Rule.

31. A vehicle used in combination, manufactured in NZ and first registered on or after 1 July 2008, is not certified to Schedule 5 of the Rule using:

a) manual calculations, or

b) the version of the approved proprietary software, with NZ compatibility requirements superimposed (Note 3), or

c) the NZ brake calculator current at the time of certification.

32. a vehicle not used in combination, manufactured in NZ and first registered on or after 1 July 2008 is not certified to Schedule 5 or Section 6 (Note 1) of the Rule.

33. A vehicle has been fitted with a retarder or an engine brake on or after 1 March 2007 that does not have a control that can be operated from the driver's normal driving position.

34. A vehicle has been fitted with a retarder or an engine brake on or after 1 March 2007 that is not designed so that its operation does not cause wheelslip that could result in loss of directional control of the vehicle.

35. A vehicle has been fitted with a retarder or an engine brake on or after 1 March 2007 and the retardation cannot be regulated by the driver using the control to prevent wheelslip that could result in loss of directional control of the vehicle.

36. A retarder or an engine brake of a powered vehicle, which activates the brake of a trailer that is being towed, may cause wheelslip on the vehicle that could result in loss of directional control.

37. A trailer is fitted with a device that allows the release of its parking brake even when the brake of the trailer is not connected to the brake of the towing vehicle but it does not ensure that the parking brake of the trailer is automatically applied when the trailer's brake is reconnected to the brake of the towing vehicle and the parking brake is reapplied.

38. A vehicle is fitted with a device that can be operated by the driver from the driver's normal driving position to keep the vehicle stationary temporarily but the device does not allow the safe operation of the service or parking brake of the vehicle.

39. A device in requirement 35 which can only be de-activated by the driver does not have a label permanently attached displaying the words: “NOT FOR PARKING”.

40. A device in requirement 35 that can be de-activated by the control system of the vehicle does not have either a label permanently attached displaying the words: “NOT FOR PARKING” or an audible warning device that operates when the driver's door is open while the device is activated and the parking brake is not fully applied.

41. A vehicle of class MD3, MD4, ME, NB or NC manufactured or modified in New Zealand on or after 1 July 2008 in a way that affects the performance of a brake, and that does not have a towing connection to tow a heavy trailer does not comply with requirement 40.

42. A heavy vehicle not fitted with a towing connection does not demonstrate compliance of the service brake with the requirements in requirements 7(b) and 11(a) by either certification for compliance with the requirements in Schedule 5 or stopping tests (Note 1).

43. An imported vehicle of class MD3, MD4, ME, NB or NC first registered in New Zealand on or after 1 July 2008 and that does not have a towing connection to tow a vehicle of class TC or class TD does not comply with one or more of the approved vehicle standards in requirement 23.

44. The brake of a heavy vehicle that has been fitted with a towing connection to tow a vehicle of class TC or class TD do not comply with requirement 42.

45. A vehicle imported into or manufactured in New Zealand prior to 1 March 2007 and certified for compliance with one of the codes or specifications in Schedules 1 to 4 does not comply with that code or specification, if that vehicle (Note 2):

a) has been modified on or after 1 March 2007, and/or

b) Is not being operated in a combination that has a gross mass exceeding 39,000kg but not exceeding 44,000kg.

46. A vehicle in requirement 42 first registered in New Zealand after 1 March 2007 and before 1 July 2008 that is being operated in a combination vehicle that has a gross mass exceeding 39,000kg but not exceeding 44,000kg, does not comply with:

a) the New Zealand Heavy Vehicle Brake Code, Second Edition (1997) in Schedule 4, or

b) the Interim Specification for Heavy Vehicle Braking in Schedule 1, or

c) the requirements with which a vehicle of the same class must comply if first registered in New Zealand or modified in New Zealand on or after 1 July 2008.

47. An imported vehicle of class NB or class NC to which 41 applies that is first registered in New Zealand on or after 1 July 2008 does not comply with:

a) at least one of the approved vehicle standards in requirement 23 (a) or (b), and

b) requirement 47, or

c) all of the following:

i. one or more of the approved vehicle standards in requirement 23(c), (d), (e), (f) and (g), and

ii. be fitted with an anti-lock braking system except for a logging vehicle, provided that the standard with which it complies does not require an ABS function, and

iii. requirement 47.

48. A vehicle of class NB or class NC in requirement 42 that is manufactured in New Zealand and is first registered on or after 1 July 2008, or a vehicle of class NB or class NC modified in New Zealand on or after that date, does not comply with requirements 61 to 64.

49. A vehicle in requirements 44, 45 or 46 that is fitted with an air brake does not, when the trailer becomes disconnected from the towing vehicle, have a means by which:

a) the air brake of the towing vehicle is protected from the loss of air pressure, or

b) the air brake of the trailer is activated.

50. A vehicle of class TC or class TD in requirement 42 first registered or modified in New Zealand on or after 1 July 2008 does not comply with the requirements in 61 to 64.

51. A vehicle of class TC or TD, certified for compliance with one of the codes or specifications in Schedules 1 to 4 before 1 March 2007 does not continue to comply with that code or specification and that vehicle:

a) has not been modified on or after 1 March 2007, or

b) is being operated in a combination vehicle that has a gross mass exceeding 39,000kg, but not exceeding 44,000kg.

52. A vehicle of class TC or TD, first registered in New Zealand or modified on or after 1 March 2007 and before 1 July 2008 that is being operated in a combination vehicle with a gross mass exceeding 39,000 kg but not exceeding 44,000 kg, does not comply with either:

a) the New Zealand Heavy Vehicle Brake Code, Second Edition (1997) in Schedule 4, or

b) the Interim Specification for Heavy Vehicle Braking in Schedule 1, or

c) requirements 61to 64.

53. A vehicle of class TC or class TD first registered in New Zealand on or after 1 July 2008, or modified on or after that date, does not comply with the requirements in requirements 61 to 64.

54. An air-braked vehicle of class TC or TD, except a vehicle that complies with the Interim Specification for Heavy Vehicle Braking in Schedule 1, or a vehicle that has an electronic control device which is capable of regulating and optimising vehicle deceleration according to an electric signal provided by the driver's brake control, does not have a threshold pressure between 55 and 80 kPa (inclusive).

55. An anti-lock braking system of a vehicle of class NB, NC, TC or TD first registered in New Zealand on or after 1 July 2008, or that was fitted to a vehicle of those classes in New Zealand on or after that date, is not capable of continuously

controlling and adjusting the braking effort on the wheels during braking to prevent:

a) the wheels from locking, or

b) the loss of directional control of the vehicle that could be caused by the application of the brake.

56. A control device in requirement 54 does not meet the technical requirements in

a) one or more of the approved vehicle standards in requirement 23, if those standards specify requirements for that device, or

b) requirements 56 to 59.

57. A control device to which requirement 55(b) applies does not act on each axle or is not capable of modulating the brake force separately for:

a) each axle set, or

b) each side of all axle sets except steering axles.

58. A control device to which requirement 55(b) applies does not have sensors to monitor the rotational speed of the wheels.

59. The wheel sensors are not fitted to at least one wheel on each side of all axle sets.

60. If an axle set consists of more than one axle, wheel sensors are not fitted as follows:

a) if the axle set consists of two axles designed to carry the same or a similar load, the sensors are fitted at least to the axle on which the wheels are more likely to lock during braking, or

b) if the axle set consists of two axles and they are designed to carry significantly different loads, the sensors are fitted at least to the axle that carries the greater load, or

c) if the axle set consists of more than two axles and they are designed to carry the same or a similar load, the sensors are fitted at least to the axle on which the wheels are neither the most likely nor the least likely to lock during braking, or

d) if the axle set consists of more than two axles and one of them is designed to carry a significantly greater load than other axles in the set, the sensors are fitted at least to the axle that carries the greatest load, or

e) if the axle set consists of more than two axles and two or more of them carry a greater load than the remaining axle or axles in the set, the sensors are fitted at least to an axle:

i. that is one of the axles carrying a greater load, and

ii. the wheels of which are most likely to lock

f) if the axle set consists of more than two axles and two or more of them carry a greater load than the remaining axle or axles in the set and the likelihood that their wheels will lock is similar, the sensors are fitted to any of the axles that carries the greater load, or

g) if the axle set consists of two or more axles that carry a similar load, and the likelihood that their wheels will lock is similar, the sensors are fitted to any of the axles.

61. A control device in 53 that is fitted to a trailer of class TC or class TD does not:

a) comply with the requirements in 53 to 60, without being connected to the control device of the towing vehicle, or

b) be capable of being supplied with power for its operation by means of an electric cable from the towing vehicle.

62. The power connection between vehicles that can be operated in a combination vehicle does not comply with Parts 1 and 2 of ISO 7638: 1997, Road vehicles – Electrical connectors for braking systems.

63. A vehicle first registered on or after 1 July 2008 is fitted with brake hoses or tubes that do not meet one of the approved standard in the Rule.

64. A vehicle modified on or after 1 July 2008 is fitted with brake hoses or tubes that are not OE and do not meet one of the approved standard in the Rule.

65. A vehicle has been modified in such a way that it no longer complies with the Rule.

66. A vehicle has been modified in a way that may affect compliance with this Rule, such as by alteration of a vehicle's wheelbase, fitment of an additional axle, removal of an axle, replacement of an axle with one that is not of the same make and model, or replacement of the brake of an axle with one that is not of the same make and model and the performance of the brake has not been checked and modified if necessary to ensure continued compliance with this Rule.

67. A vehicle that is modified has not been either modified so as to continue to meet the technical and performance requirements of the approved standard with which the vehicle originally complied or to comply with all other applicable requirements in this Rule.

68. A repair to a brake, or to a vehicle that affects its braking performance, does not comply with this Rule or with Land Transport Rule: Vehicle Repair 1998.

69. A brake lining or a brake pad on an axle has been replaced but all the brake linings or brake pads on that axle were not replaced or all the replacement brake linings and brake pads on that axle were not of the same make, type and grade.

70. A component used in a repair does not have equivalent performance characteristics to that of the original component.

71. A repair or adjustment of a brake does not ensure that the brake:

a) complies with this Rule, or

b) complies with Land Transport Rule: Vehicle Repair 1998.

72. A person who modifies a vehicle so as to affect the braking performance of the vehicle has not:

a) ensured that the modification does not prevent the vehicle from complying with this Rule, or

b) notified the operator that the vehicle must be inspected and, if necessary, certified by a person or organisation appointed to carry out specialist inspection and certification of heavy vehicle brakes (refer to **Technical bulletin 4**).

73. A vehicle inspector or inspecting organisation has certified a motor vehicle under Land Transport Rule: Vehicle Standards Compliance 2002 and they had reason to believe that the vehicle did not comply with this Rule.

74. During the certification of a vehicle, compliance of a vehicle's brakes with the performance requirements in this Rule has not been verified by means of appropriate tests, using approved testing devices and following correct test procedures.

75. For a vehicle to which requirement 11 applies, if a certifier an excessive delay between the time the driver starts to brake and when effective braking starts, has not verified compliance with the stopping-distance requirements by measuring the stopping distance as specified in requirement 13.

Note 1

Where a non-towing vehicle is being complied using Section 6 of the Rule instead of Schedule 5, the format below must be used with the certifier’s letterhead to record the test results used to prove compliance as part of certification.

- **Download MS Word version**

Company letterhead

HVEK certification record for stopping tests to Section 6 of Land Transport Rule Heavy-vehicle Brakes (Rule 32015).

This process may be used for heavy vehicles not used in combination which are manufactured or modified in New Zealand on or after 1 July 2008.

Vehicle

Make: _____ Model: _____

Registration: _____

VIN																	

Summary of Legislation

The Heavy-vehicle Brakes Rule 2006: Clause 6.1(2)

For a vehicle in this section, compliance of the service brake with the requirements in 2.2(8)(b) and 2.3(3)(a) must be demonstrated by:

(b) stopping tests:

(i) under the conditions in 2.2(8); and

(ii) with the vehicle unladen and laden to its legal maximum weight +0,-10%; and

(iii) from a speed of at least 50km/h; and

(iv) generating peak deceleration of at least 0.45g without any wheel locking when the service brake is applied.

Record of stopping tests without lockup

To demonstrate repeatability a minimum of three successful tests have been completed.

	Speed	Decel.	Stopping distance	Lockup Y/N		Speed	Decel.	Stopping distance	Lockup Y/N
Test 1(unladen)					Test 1 (laden)				
Test 2(unladen)					Test 2 (laden)				
Test 3(unladen)					Test 3 (laden)				
Test 4(unladen)					Test 4 (laden)				
Test 5(unladen)					Test 5 (laden)				

(attach printouts)

Equipment: _____

Calibration Record: _____

Declaration

This vehicle is not used in combination with another heavy vehicle and can be certified to comply with the requirements of the Land Transport Rule: Heavy-vehicle Brakes 2006, using the stopping tests as defined in Section 6 of the Rule.

Signed: _____ Certifier ID: _____

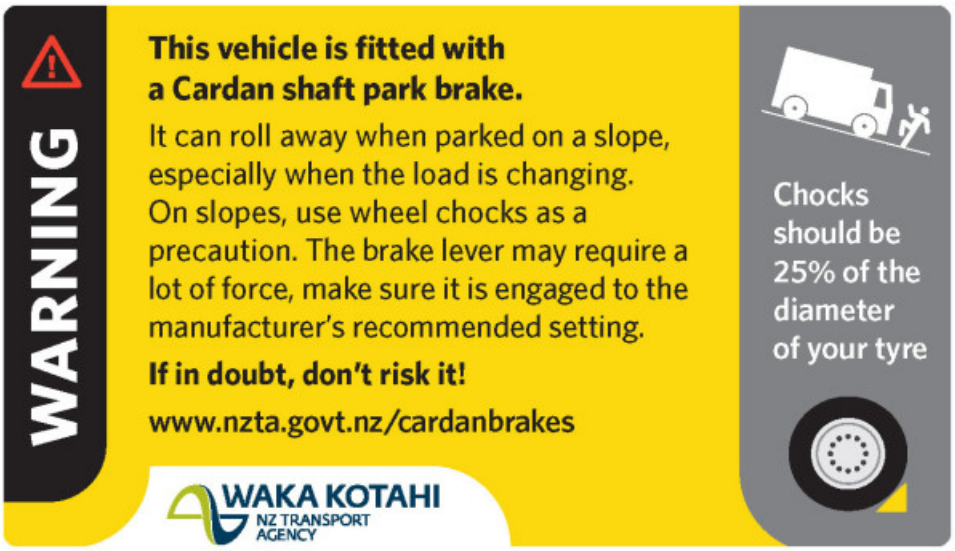
Note 2

Where a heavy vehicle first registered in New Zealand prior to 1/3/07 has been certified to Schedule 1 to 4 and is unmodified - but the brake friction material is unknown or unavailable - the vehicle can be re-certified to its original category with an alternative friction material provided it passes the certification requirements with the alternative material.

Note 3

Any proprietary software you use to calculate and commission the vehicle's brake system must be native to that system (approved by the manufacturer) and approved by NZTA.

Figure 5-1-1. Cardan shaft park brake warning sticker



Summary of legislation

Applicable legislation

- Land Transport Rule: Heavy Vehicles 2004
- Land Transport Rule: Heavy Vehicle Brakes 2006

Heavy Vehicle Brakes

1. A vehicle, other than an armoured vehicle used exclusively by the NZ Defence Forces, a steam powered vehicle, a vehicle with self laying tracks, a traction engine, a mechanically propelled roller, a tractor or machine used solely in farm or roading operations, whether for traction or otherwise, and not capable of a speed exceeding 30km/h, together with any trailer used on the road only while drawn by that tractor or machine, a vehicle normally propelled by mechanical power while it is being temporarily towed without the use of its own power, an agricultural trailer, must have a service brake, a parking brake and an emergency brake, except for a semitrailer first registered before 1 November 1990 that must have a service brake only.

2. Vehicles exempt the requirements in 1 must have a means by which the driver of the vehicle can control its movement and can stop and hold the vehicle stationary under all conditions of use.

3. A brake must:

a) be easily adjustable to compensate for wear or have a means of automatic adjustment, and

b) be maintained in good condition and efficient working order

4. A brake that simultaneously applies braking pressure on two wheels with a common axis must be adjusted or fitted so that the braking effect is approximately the same on both wheels when the brake is applied by the driver, except if the braking effect is modulated by a control device to prevent the wheels locking or to improve stability.

5. A brake must be maintained within safe tolerance of its state when manufactured, having regard to the vehicle manufacturer's or brake manufacturer's specifications.

6. The friction materials of a brake must be:

a) secure, and

b) in good condition, and

c) free of defects that could noticeably and adversely affect the performance of the brake.

7. When a vehicle's brake is applied on a hard, dry, level surface that is free of loose material, and without assistance from the compression of the vehicle's engine or other auxiliary braking device that is not part of the vehicle's service brake:

a) the vehicle or its controls must not vibrate so as to noticeably and adversely affect the control of the vehicle, and

b) the braking effect on each braked wheel of the vehicle must provide stable and efficient braking without adverse effect on the directional control of the vehicle, and

c) if the vehicle is equipped with an anti-lock braking system, the vehicle's rotationally sensed wheels must not lock, when the speed of the vehicle is above the ABS-activation parameters set by the vehicle manufacturer.

8. Except for brake pad warning systems, a warning system that is fitted to a vehicle and is part of, or associated with the use of, a brake component or system must function correctly.

Requirements for different types of brake

Service brake

9. The service brake of a vehicle:

Reasons for rejection

1. A vehicle using compressed air to operate the braking system is not equipped with one or more

a) air compressors or other means of generating compressed air, or

b) air reservoirs or other means of storing compressed air, or

c) pressure gauges and pressure warning devices.

2. The compressor of a passenger service vehicle first registered in New Zealand on or after 10 February 1978 is not capable of raising, in not more than 90 seconds, the pressure in the air storage system from the pressure in 3 to the maximum operating pressure specified by the vehicle manufacturer or brake manufacturer at either:

a) the maximum governed speed of the vehicle's engine, or

b) an engine speed determined by the certifier, if the engine is not governed.

3. The compressor of the air brake does not have the capacity required if measured by starting from the pressure to which the air brake falls from the maximum specified operating pressure as a result of five full service-brake applications made in accordance with requirement 14.

4. The compressor of a vehicle, other than a passenger service vehicle, is not capable of raising the pressure in the air storage system to the maximum operating pressure specified by the vehicle manufacturer or brake manufacturer, at a speed specified in requirement 2(a) or (b), in not more than:

a) 3 minutes, starting from the pressure at which the low-pressure warning device ceases to operate, or when the emergency brake operates, or

b) 90 seconds, starting from the pressure to which the air brake falls from the maximum operating pressure, specified by the vehicle manufacturer or brake manufacturer, as a result of fully applying and releasing the service brakes five times in accordance with requirement 14.

5. A powered vehicle to which requirements 8 to 10 applies, other than a passenger service vehicle first registered in New Zealand before 10 February 1978, is not fitted with a device that provides a continuous signal that is clearly visible or audible from the driver's normal driving position if any service brake reservoir is below the minimum safe operating pressure as defined in requirement 22.

6. A passenger service vehicle first registered in New Zealand on or after 10 February 1978 is not fitted with at least one gauge that:

a) is readily visible to the driver at all times from the driver's normal driving position

b) indicates, to the driver, the pressure in at least one service brake reservoir.

7. The compressed-air reservoir of the service brake of a passenger service vehicle that was first registered in New Zealand before 10 February 1978 is not fitted with:

a) a pressure gauge in requirement 7, or

b) a visual warning device in requirement 2.

9. A powered vehicle, other than a passenger service vehicle, is not fitted with at least one gauge that:

a) is readily visible to the driver at all times from the driver's normal driving position, or

b) indicates, to the driver, the pressure in at least one service brake reservoir.

10. A pressure gauge in requirements 7 to 9 does not indicate the pressure in pressure units, or on a coloured scale, or in an equivalent way

11 The compressed-air reservoir capacity of a passenger service vehicle first registered in New Zealand on or after 10 February 1978, and of a powered vehicle other than a passenger service vehicle, does not, when the air pressure in the brake is at its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer and the compressor is stopped, enable the reserve of compressed air of the brake to provide:

a) at least five full service-brake applications with full release of the brakes after each application before the low pressure warning device operates, or

b) two full service-brake applications with full release of the brakes after each application following activation of the low pressure warning device.

Except the at least three full service brake applications before the emergency valve operates as allowed for in a combination vehicle that is equipped with:

a) both:

i. an emergency or a breakaway valve on the trailer, and

ii. a tractor protection valve on the towing vehicle, or

b) other devices that are fitted to protect the air system of the towing vehicle and to activate the brake of the trailer when the trailer becomes disconnected from the towing vehicle. or

c) meets one of the approved standards in 5.1 Summary of Legislation 23 (a) or (b)

12. A full service-brake application is not made in that all brake actuators on the vehicle do not operate to apply their associated brakes in an effective manner.

13. The compressor does not supply only the brake reservoirs with compressed air until the pressure in those reservoirs reaches the pressure specified by the vehicle manufacturer or the brake manufacturer, or, if such information is not available, two thirds of the maximum operational pressure specified by the vehicle manufacturer or brake manufacturer.

14. An air brake does not have priority of the supply of compressed air from the brake reservoir.

15. An air-operated device is connected to the air brake of a vehicle, and:

a) the brake is not protected so that the operation or failure of the device cannot lower the pressure in any service brake or parking brake reservoir(s) below the pressure specified by the vehicle manufacturer or brake manufacturer, or, if such information is not available, two-thirds of its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer, or

b) the supply to the device is not drawn from a reservoir separate from the service brake or parking brake reservoir(s) supplying the brake, except as specified in 18.

16. Despite requirement 17(b), an air-operated device is supplied with compressed air from the service brake or parking brake reservoir(s), and the operation of the device requires a large amount of compressed air.

17. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the external diameter of the supply hose or pipe is larger than 8mm

18. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the device operates when the vehicle is moving

19. An air operated device has been fitted to a heavy vehicle and the device draws air directly from the air reservoir supplying the brakes and the vehicle manufacturer does not allow it

20. If a vehicle to which requirement 5 and/or 6 applies has more than one compressed-air service or parking brake circuit, a failure in any service or parking brake circuit that lowers the pressure in any service or parking brake reservoir, below the minimum safe operating pressure, reduces the pressure in any other service or parking brake reservoir below the minimum safe operating pressure.

21. The brake system does not meet the minimum safe operating pressure by meeting either:

a) the minimum safe operating pressure specified by the vehicle manufacturer or brake manufacturer, or

b) if no minimum safe operating pressure is specified by the vehicle manufacturer or brake manufacturer, 50% of the correctly adjusted cut-out pressure for the compressor-governor.

22. An air-braked vehicle that has been fitted with a towing connection to tow a vehicle of class TC or class TD or is a class TC or class TD trailer, except a vehicle that complies with the Interim Specification for Heavy Vehicle Braking in Schedule 1, or a vehicle that has an electronic control device which is capable of regulating and optimising vehicle deceleration according to an electrical signal provided by the driver's brake control, does not have a threshold pressure between 55 and 80 kPa (inclusive).

23. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model has not been referred to a HV certifier with the Brakes category (HVEK).

24. A powered vehicle with an hydraulic service brake has been fitted with an additional rear axle that does not have the same type of braking system as the original axle or an air operated disc brake as a service brake.

25. The air brake of a vehicle first registered in New Zealand on or after 1 March 2007 or modified on or after that date that can be operated in a combination vehicle is not capable of being connected to the air brake of the other vehicle by means of a two-line system.

26. A two-line system does not consist of:

a) a supply line that supplies compressed air from the towing to the towed vehicle, and

b) a control line that supplies a control signal, in the form of modulated air pressure, to regulate the intensity of the brake application on the towed vehicle or vehicles.

27. For vehicles towing semi-trailers and for semi-trailers, the hoses connecting the towed and towing vehicles are not part of the towing or towed vehicle or are not detachable at both ends.

28. For vehicles other than those towing semi-trailers, the hoses not part of the trailer or securely attached to the drawbar

29. A towing vehicle or a towed vehicle in requirement 26 is not fitted with a coupling device, approved by the Transport Agency, to connect the brake to, and disconnect it from, that of the other vehicle, or that device is not:

a) robust, durable, and suitable for automotive application, or

b) able to prevent, either through the design of the coupling device or through its installation, the incorrect connection of the control and supply lines, or

c) set so that it cannot adversely affect the performance of the brake of either the towing or towed vehicle(s), or

d) able to have an effective breakaway function.

30. Subject to requirement 31, if a vehicle is fitted with a duomatic- or triomatic-type coupling device, the control line in 25 is not connected to the port of the coupling device that is closest to the opening handle.

31. Subject to requirement 31, if a vehicle is fitted with a duomatic- or triomatic-type coupling device, the supply line in 26(a) is not connected to:

a) the middle port of the triomatic coupling device, or

b) the port of the duomatic coupling device that is farthest away from the opening handle.

32 . A vehicle, other than one that complies with the Interim Performance Specification for Heavy Vehicle Braking in Schedule 1, that was fitted with a duomatic- or triomatic-type coupling device before 1 July 2008 and that was not required to comply with the requirements in 29 and 30, does not comply with these requirements by the date of its first certificate of fitness inspection on or after 1 July 2008.

33. The socket of a duomatic- or triomatic-type coupling device is not fitted:

a) to the rear of a towing vehicle, or

b) to the front of a semi-trailer.

34. The socket of a coupling device in requirement 28 is not fitted as close as practicable to:

a) the centre-line of the vehicle, or

b) the towing connection by which the towed and towing vehicles are connected.

35. The socket of a coupling device in requirement 28 that is fitted to the front of a semi-trailer is fitted with a non-return valve.

36. The fitting of a coupling device in requirement 28 has been carried out without regard to the instructions of the vehicle manufacturer

Summary of legislation

Applicable legislation

- Land Transport Rule: Heavy Vehicle Brakes 2006

Use of compressed air

1. A vehicle using compressed air to operate the braking system must be equipped with one or more:

    a) air compressors or other means of generating compressed air, and

    b) air reservoirs or other means of storing compressed air, and

    c) pressure gauges and pressure warning devices.

Compressor capacity

2. The compressor of a passenger service vehicle first registered in New Zealand on or after 10 February 1978 must be capable of raising, in not more than 90 seconds, the pressure in the air storage system from the pressure in 3 to the maximum operating pressure specified by the vehicle manufacturer or brake manufacturer at either:

a) the maximum governed speed of the vehicle's engine, or

b) an engine speed determined by a vehicle inspector or inspecting organisation, if the engine is not governed.

3. For the purposes of 2, the compressor capacity of the air brake must be measured by starting from the pressure to which the air brake falls from the maximum specified operating pressure as a result of five full service-brake applications made in accordance with 13.

4. The compressor of a vehicle, other than a passenger service vehicle, must be capable of raising the pressure in the air storage system to the maximum operating pressure specified by the vehicle manufacturer or brake manufacturer, at a speed specified in 2a) or b), in not more than:

    a) 3 minutes, starting from the pressure at which the low-pressure warning device ceases to operate, or when the emergency brake operates, and

    b) 90 seconds, starting from the pressure to which the air brake falls from the maximum operating pressure, specified by the vehicle manufacturer or brake manufacturer, as a result of fully applying and releasing the service brakes five times in accordance with 13.

Pressure warning devices

5. A powered vehicle to which 7 to 9 applies, other than a passenger service vehicle first registered in New Zealand before 10 February 1978, must be fitted with a device that provides a continuous signal that is clearly visible or audible from the driver’s normal driving position if any service brake reservoir is below the minimum safe operating pressure as defined in 21.

6. The audible signal of the device in 5 may be rendered inoperative if the parking brake is fully applied or the vehicle is fitted with an automatic transmission and it is in the park position.

Pressure gauges

7. A passenger service vehicle first registered in New Zealand on or after 10 February 1978 must be fitted with at least one gauge that:

a) is readily visible to the driver at all times from the driver's normal driving position

b) indicates, to the driver, the pressure in at least one service brake reservoir.

8. The compressed-air reservoir of the service brake of a passenger service vehicle that was first registered in New Zealand before 10 February 1978 must be fitted with:

a) a pressure gauge in 6, or

b) a visual warning device in 2.

9. A powered vehicle, other than a passenger service vehicle, must be fitted with at least one gauge that:

a) is readily visible to the driver at all times from the driver's normal driving position, and

b) indicates, to the driver, the pressure in at least one service brake reservoir.

10. A pressure gauge in 6 to 8 must indicate the pressure in pressure units, or on a coloured scale, or in an equivalent way

Reservoir capacity

11 The compressed-air reservoir capacity of a passenger service vehicle first registered in New Zealand on or after 10 February 1978, and of a powered vehicle other than a passenger service vehicle, must, when the air pressure in the brake is at its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer and the compressor is stopped, enable the reserve of compressed air of the brake to provide:

a) at least five full service-brake applications with full release of the brakes after each application before the low pressure warning device operates, and

b) two full service-brake applications with full release of the brakes after each application following activation of the low pressure warning device.

12. The requirement for at least five full service-brake applications in 11(a) may be reduced to four for a vehicle that complies with the approved standard in 5.1 Summary of Legislation 23 (a) or (b)

13. The requirement for at least five full service-brake applications in 11(a) may be reduced to at least three before the emergency valve operates for a combination vehicle that is equipped with:

a) both:

i. an emergency or a breakaway valve on the trailer, and

ii. a tractor protection valve on the towing vehicle, or

b) other devices that are fitted to protect the air system of the towing vehicle and to activate the brake of the trailer when the trailer becomes disconnected from the towing vehicle.

14. For the purposes of 3, 4(b), 11 and 12, a full service-brake application is made when all brake actuators on the vehicle are operated to apply their associated brakes in an effective manner.

Priority and protection of air brakes

15. The compressor must supply only the brake reservoirs with compressed air until the pressure in those reservoirs reaches the pressure specified by the vehicle manufacturer or the brake manufacturer, or, if such information is not available, two thirds of the maximum operational pressure specified by the vehicle manufacturer or brake manufacturer.

16. An air brake must have priority of the supply of compressed air from the brake reservoir.

17. An air-operated device may be connected to the air brake of a vehicle, only if:

a) the brake is protected so that the operation or failure of the device cannot lower the pressure in any service brake or parking brake reservoir(s) below the pressure specified by the vehicle manufacturer or brake manufacturer, or, if such information is not available, two-thirds of its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer, and

b) the supply to the device is drawn from a reservoir separate from the service brake or parking brake reservoir(s) supplying the brake, except as specified in 18.

18. Despite 17b), an air-operated device may be supplied with compressed air from the service brake or parking brake reservoir(s), if:

a) the operation of the device requires only a small amount of compressed air and it is supplied with compressed air by a hose or pipe with an external diameter not exceeding 8 mm, or

b) the device is operated only when the vehicle is stationary, or

c) the vehicle manufacturer allows it.

19. If a vehicle to which 5 and/or 6 applies has more than one compressed-air service or parking brake circuit, a failure in any service or parking brake circuit that lowers the pressure in any service or parking brake reservoir, below the minimum safe operating pressure, must not reduce the pressure in any other service or parking brake reservoir below the minimum safe operating pressure.

Minimum safe operating pressure

20. **Minimum safe operating pressure** means:

a) the minimum safe operating pressure specified by the vehicle manufacturer or brake manufacturer, or

b) if no minimum safe operating pressure is specified by the vehicle manufacturer or brake manufacturer, 50% of the correctly adjusted cut-out pressure for the compressor-governor.

21. An air-braked vehicle that has been fitted with a towing connection to tow a vehicle of Class TC or Class TD or is a Class TC or Class TD trailer, except a vehicle that complies with the Interim Specification for Heavy Vehicle Braking in Schedule 1, or a vehicle that has an electronic control device which is capable of regulating and optimising vehicle deceleration according to an electrical signal provided by the driver's brake control, must have a threshold pressure between 55 and 80 kPa (inclusive).

Modifications

22. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model, must either:

a) be modified so as to continue to meet the technical and performance requirements of the approved standard in the Rule with which the vehicle originally complied, or

b) comply with all other applicable requirements in this Rule.

Modifications that do not require specialist certification

23. The following modifications do not require specialist certification:

a) an adjustment of the brake system for the purpose of complying with an 80kPa threshold pressure on a prime mover or trailer

b) the replacement of an air brake coupling device on a powered vehicle for the purpose of complying with 7.3

c) the fitting of an air brake coupling device to a powered vehicle that is carried out:

i. for the purpose of complying with 7.3, and

ii. in accordance with the manufacturer's recommendations

d) the fitting of a valve to a powered vehicle to allow the parking brake of any towed trailer(s) to operate.

Requirements for the connection of the air brake of vehicles in a combination vehicle

24. The air brake of a vehicle first registered in New Zealand on or after 1 March 2007 or modified on or after that date that can be operated in a combination vehicle must be capable of being connected to the air brake of the other vehicle by means of a two-line system.

25. A two-line system must consist of:

a) a supply line that supplies compressed air from the towing to the towed vehicle, and

b) a control line that supplies a control signal, in the form of modulated air pressure, to regulate the intensity of the brake application on the towed vehicle or vehicles.

26. For vehicles towing semi-trailers and for semi-trailers, the hoses connecting the towed and towing vehicles are to be considered as part of the towing or towed vehicle or to be detachable at both ends.

27. For vehicles other than those towing semi-trailers, the hoses are to be treated as part of the trailer and must be securely attached to the drawbar

28, A towing vehicle and a towed vehicle in 26 must be fitted with a coupling device, approved by the Agency, to connect the brake to, and disconnect it from, that of the other vehicle, and that device must:

a) be robust, durable, and suitable for automotive application, and

b) prevent, either through the design of the coupling device or through its installation, the incorrect connection of the control and supply lines, and

c) not adversely affect the performance of the brake of either the towing or towed vehicle(s), and

d) have an effective breakaway function.

29. Subject to 31, if a vehicle is fitted with a Duomatic- or Triomatic-type coupling device, the control line in 25 must be connected to the port of the coupling device that is closest to the opening handle.

30. Subject to 31, if a vehicle is fitted with a Duomatic- or Triomatic-type coupling device, the supply line in 25a)must be connected to:

a) the middle port of the Triomatic coupling device, or

b) the port of the Duomatic coupling device that is farthest away from the opening handle.

31 . A vehicle, other than one that complies with the Interim Performance Specification for Heavy Vehicle Braking in Schedule 1, that has been fitted with a Duomatic- or Triomatic-type coupling device before 1 July 2008 and that was not required to comply with the requirements in 29 and 30, must comply with these requirements by the date on which the first

Certificate of Fitness inspection is due on or after 1 July 2008.

32. The socket of a Duomatic- or Triomatic-type coupling device must be fitted:

a) to the rear of a towing vehicle, and

b) to the front of a semi-trailer.

33. The socket of a coupling device in 28 must be fitted as close as practicable to:

a) the centre-line of the vehicle, and

b) the towing connection by which the towed and towing vehicles are connected.

34. The socket of a coupling device in 28 that is fitted to the front of a semi-trailer must not be fitted with a non-return valve.

35. The fitting of a coupling device in 28 must be carried out having regard to the instructions of the vehicle manufacturer

5-3 Brakes (Hydraulic)

Reasons for rejection

1. A vehicle fitted with an hydraulic brake does not, comply with the requirements in the Heavy-vehicles Brake Rule.

2. The volume of the hydraulic fluid supplied by the master cylinder or booster cylinder of an hydraulic brake during a single stroke is not sufficient for the effective operation of the wheel brakes, even if all wheel brakes are worn to the permitted wear limit or are in the permitted maximum out-of-adjustment position.

3. A passenger service vehicle first registered in New Zealand on or after 10 February 1978, has a parking brake acting solely through the transmission and is fitted with an hydraulic service brake, does not have a dual or tandem master cylinder that allows:

a) one of those cylinders to actuate the brakes on the front wheels of the vehicle and the other cylinder to actuate the brakes on the rear wheels of the vehicle, or

b) each circuit to activate the brake on at least 1/3 of the wheels.

4. A vehicle of class NB or class NC first registered in New Zealand on or after 1 November 1990, that has a parking brake acting solely through the transmission and is fitted with an hydraulic service brake, does not have a dual or tandem master cylinder that allows:

a) one of those cylinders to actuate the brakes on the front wheels of the vehicle and the other cylinder to actuate the brakes on the rear wheels of the vehicle, or

b) each circuit to activate the brake on at least 1/3 of the wheels.

5. A passenger service vehicle first registered in New Zealand on or after 1 September 1954, fitted with a brake that is operated by pump-generated hydraulic pressure, is not fitted with the following devices that provide to the driver a signal that is clearly audible and readily visible from the driver's normal driving position to ensure that, at all times, the driver is aware immediately that the hydraulic pressure is less than the pressure necessary for the safe operation of the vehicle:

a) an audible warning device, and

b) either:

i. a warning lamp, or

ii. a suitable pressure gauge that is able to indicate both the maximum and minimum pressures being used.

6. A passenger service vehicle with more than nine seating positions first registered in New Zealand on or after 10 February 1978, which utilises vacuum to boost the force supplied by the driver to apply the brakes and is fitted with a vacuum reservoir, is not equipped with:

a) a warning device to give a continuous signal audible to the driver if the vacuum in the reservoir is less than 25kPa or its equivalent, and

b) a vacuum gauge to indicate to the driver, in kilopascals or other units, the vacuum available in the reservoir.

7. A powered vehicle with an hydraulic service brake has been fitted with an additional rear axle that does not have the same type of braking system as the original axle or does not have an air operated disc brake as a service brake.

8. A vehicle that is modified by fitting an additional axle, removing an axle, replacing an axle with one that is not of the same make and model, or replacing the brake of an axle with one that is not of the same make and model has not been referred to a HV certifier with the Brakes category HVEK).

Summary of legislation

Applicable legislation

- **Land Transport Rule: Heavy Vehicle Brakes 2006**

1. A vehicle fitted with an hydraulic brake, whether or not the operation of the brake is assisted by compressed air, vacuum or other means of energy, must comply with the requirements in this section.

2. The volume of the hydraulic fluid supplied by the master cylinder or booster cylinder of an hydraulic brake during a single stroke must be sufficient for the effective operation of the wheel brakes, even if all wheel brakes are worn to the permitted wear limit or are in the permitted maximum out-of-adjustment position.

3. A passenger service vehicle first registered in New Zealand on or after 10 February 1978, or a vehicle of class NB or class NC first registered in New Zealand on or after 1 November 1990, that has a parking brake acting solely through the transmission and is fitted with an hydraulic service brake, must have a dual or tandem master cylinder that allows:

a) one of those cylinders to actuate the brakes on the front wheels of the vehicle and the other cylinder to actuate the brakes on the rear wheels of the vehicle, or

b) each circuit to activate the brake on at least 1/3 of the wheels.

4. A passenger service vehicle first registered in New Zealand on or after 1 September 1954, fitted with a brake that is operated by pump-generated hydraulic pressure, must be fitted with the following devices that provide to the driver a signal that is clearly audible and readily visible from the driver's normal driving position to ensure that, at all times, the driver is aware

immediately that the hydraulic pressure is less than the pressure necessary for the safe operation of the vehicle:

a) an audible warning device, and

b) either:

i. a warning lamp, or

ii. a suitable pressure gauge that is able to indicate both the maximum and minimum pressures being used.

5. A passenger service vehicle with more than nine seating positions first registered in New Zealand on or after 10 February 1978, which utilises vacuum to boost the force supplied by the driver to apply the brakes and is fitted with a

vacuum reservoir, must be equipped with:

a) a warning device to give a continuous signal audible to the driver if the vacuum in the reservoir is less than 25kPa or its equivalent, and

b) a vacuum gauge to indicate to the driver, in kilopascals or other units, the vacuum available in the reservoir.

6. A powered vehicle with an hydraulic service brake may be fitted with an additional rear axle that has an air operated disc brake as a service brake.

5-4 Brakes (Electric)

Reasons for rejection

1. A vehicle, unless exempt, does not have a service brake operating on all wheels

2. A vehicle, unless exempt, does not have a parking brake operating on at least 40% of the wheels, (except a semitrailer first registered before 1 November 1990 that must have a service brake only).

3. A vehicle, unless exempt, does not have an emergency brake, (except a semitrailer first registered before 1 November 1990 that must have a service brake only).

4. The service brake of a vehicle is not able to be applied by the driver from the driver's normal driving position in a controlled and progressive manner.

5. The service brake of a vehicle, unless exempt, must not have any device fitted by which the driver would be able to adjust the brake force distribution between the axles or between the vehicles that are used in a combination vehicle (Note 1).

6. The service brake of a vehicle, whether or not it is being operated as a combination vehicle, does not have one control only except where a trailer brake hand control has been fitted

7. A service brake of class MD3, MD4, ME, NB, NC, TC and TD vehicles first registered in New Zealand on or after 1 November 1990 must act on each wheel.

8. The parking brake of a vehicle, whether or not it is being operated as a combination vehicle, is not able to be applied by the driver from the normal driving position using one control only (Note 1).

9. For a semi-trailer first registered in New Zealand on or after 1 November 1990, the total brake forces generated by the parking brake is not at least 20% of the maximum weight that can be carried on the axle or axle set.

10. The emergency brake of a vehicle does not have a separate circuit and is not combined with either:

a) the parking brake, or

b) the service brake of a powered vehicle, if the vehicle is fitted with a full dual-circuit service brake, and either:

i. one of those circuits activates the brake on all the front wheels and the other circuit activates the brake on all the rear wheels, or

ii. each circuit activates the brake on at least 1/3 of the wheels

11. The emergency brake of a trailer does not operate immediately and automatically to stop and hold the trailer stationary if it becomes disconnected from the towing vehicle.

12. The emergency brake of a semi-trailer does not act on the wheels that remain in contact with the ground if the semi-trailer becomes disconnected from the towing vehicle during operation.

13. The emergency brake of a vehicle first registered in New Zealand on or after 1 November 1990 does not:

a) act on at least 1/3 of the wheels, unless there is a front/rear split

b) act as directly as practicable on those wheels without the interposition of any differential gearing.

c) have capacity to:

i. stop the vehicle at any load condition up to the gross vehicle mass or gross combination mass, as applicable, within a distance of 18 m from a speed of 30 km/h, or

ii. for a semi-trailer, generate brake forces the sum of which are at least 20% of the maximum weight that can be carried on the axle or axle set.

14. A vehicle that needs it is not fitted with a device that can be operated by the driver from the driver's normal driving position to keep the vehicle stationary temporarily (Note 1)

15.A vehicle is fitted with a device that can be operated by the driver from the driver's normal driving position to keep the vehicle stationary temporarily but the device prevents the safe operation of the service brake or the parking brake of the vehicle.

16. A device in requirement 13 which can only be de-activated by the driver does not have a label permanently attached displaying the words: “NOT FOR PARKING” (Note 1)

17. A device in requirement 13 which can be de-activated by the control system of the vehicle does not have either:

a) a label permanently attached displaying the words: “NOT FOR PARKING”, or

b) an audible warning device that operates when the driver's door is open while the device is activated and the parking brake is not fully applied.

18. A heavy vehicle certified for compliance with one of the codes or specifications in *Schedules 1* to *4* before 1 March 2007 does not continue to comply with that code or specification.

19. A heavy vehicle certified for compliance with one of the codes or specifications in *Schedules 1* to *4* before 1 March 2007 and has been modified on or after 1 March 2007, and does not continue to comply with that code or specification.

20. A heavy vehicle certified for compliance with one of the codes or specifications in *Schedules 1* to *4* before 1 March 2007 does not continue to comply with that code or specification in that it is not being operated in a combination vehicle that has a gross mass exceeding 39,000 kg, but not exceeding 44,000kg.

21. A vehicle in requirement 17 or 23*,* first registered in New Zealand or modified on or after 1 March 2007 and before 1 July 2008 that is being operated in a combination vehicle with a gross mass exceeding 39,000kg but not exceeding 44,000kg, does not comply with either:

a) the *New Zealand Heavy Vehicle Brake Code*, Second Edition (1997) in *Schedule 4*, or

b) the *Interim Specification for Heavy Vehicle Braking* in *Schedule 1*, or

c) the specific performance requirements for vehicles manufactured or modified in New Zealand in the Heavy-vehicles Brake Rule (Note 1).

22. A vehicle of in requirement requirement 17 or 23 first registered in New Zealand on or after 1 July 2008, or modified on or after that date, must comply with the specific performance requirements for vehicles manufactured or modified in New Zealand in the Heavy-vehicles Brake Rule (Note 1).

23. An anti-lock braking system of a vehicle of class NB, NC, TC or TD first registered in New Zealand on or after 1 July 2008, or that was fitted to a vehicle of those classes in New Zealand on or after that date, are not able to continuously control and adjust the braking effort on the wheels during braking to prevent:

a) the wheels from locking, and

b) the loss of directional control of the vehicle that could be caused by the application of the brake.

24. A control device in requirement 26 does not meet the technical requirements in

a) one or more of the approved vehicle standards inthe Rule, if those standards specify requirements for that device, or

b) requirements 27 to 32.

25. A control device to which requirement 27(b) applies does not act on each axle or is not capable of modulating the brake force separately for:

a) each axle set, and

b) each side of all axle sets except steering axles.

26. A control device to which requirement 27(b) applies does not have sensors to monitor the rotational speed of the wheels.

27. The sensors in requirement 29 are not fitted to at least one wheel on each side of all axle sets.

28. If an axle set consists of more than one axle, the sensor in requirement 29 is not fitted as follows:

a) if the axle set consists of two axles and they are designed to carry the same or a similar load, the sensors must be fitted to the axle on which the wheels are more likely to lock during braking.

b) if the axle set consists of two axles and they are designed to carry significantly different loads, the sensors must be fitted to the axle that carries the greater load.

c) if the axle set consists of more than two axles and they are designed to carry the same or a similar load, the sensors must be fitted to the axle on which the wheels are neither the most likely nor the least likely to lock during braking.

d) if the axle set consists of more than two axles and one of them is designed to carry a significantly greater load than other axles in the set, the sensors must be fitted to the axle that carries the greatest load.

e) if the axle set consists of more than two axles and two or more of them carry a greater load than the remaining axle or axles in the set, the sensors must be fitted to an axle:

i. that is one of the axles carrying a greater load, and

ii. the wheels of which are most likely to lock.

f) if the axle set consists of more than two axles and two or more of them carry a greater load than the remaining axle or axles in the set and the likelihood that their wheels will lock is similar, the sensors may be fitted to any of the axles that carries the greater load.

g) if the axle set consists of two or more axles that carry a similar load, and the likelihood that their wheels will lock is similar, the sensors may be fitted to any of the axles.

29. A control device in requirement 26 that is fitted to a trailer of class TC or class TD does not:

a) comply with the requirements in requirement 26 to 36 without being connected to the control device of the towing vehicle, or

b) is not capable of being supplied with power for its operation by means of an electric cable from the towing vehicle.

30. The power connection between vehicles that can be operated in a combination vehicle does not comply with Parts 1 and 2 of *ISO 7638: 1997*, *Road vehicles – Electrical connectors for braking systems*[1].

31. The brake force applied to a wheel of a heavy vehicle first registered in NZ or modified on after 1. July 2008during braking on a hard, dry, clean and level surface is not approximately proportional to the load on the wheel, taking into account the dynamic load transfer that occurs during braking between the axles of a vehicle and that also may occur between the vehicles of a combination vehicle, at all conditions of loading up to the vehicle's gross vehicle mass even if not fitted with ABS other than a vehicle covered in 35(c).

32. The brake force applied to a wheel of a heavy vehicle first registered in NZ or modified on after 1. July 2008during braking on a hard, dry, clean and level surface is not, for a vehicle with ABS, be approximately proportional to the load on the wheel without relying on the operation of ABS, taking into account the dynamic load transfer that occurs during braking between the axles of a vehicle and that also may occur between the vehicles of a combination vehicle, when the vehicle is loaded to its gross vehicle mass.

33. A vehicle does not comply with the requirements in the specific performance requirements for vehicles manufactured or modified in New Zealand and it has been certified for compliance with the requirements in *Schedule 5* and is within safe tolerance of its state when certified.

34. A repair to a brake, or to a vehicle that affects its braking performance, does not comply with **Land Transport Rule: Heavy Vehicle Brakes 2006** and with **Land Transport Rule: Vehicle Repair 1998**.

35. When a brake lining or a brake pad on an axle has been replaced and all the brake linings or brake pads on that axle have not been replaced

36, When a brake lining or a brake pad on an axle has been replaced and the replacement brake linings and brake pads on that axle are not of the same make, type and grade.

37. A component used in a repair does not have equivalent performance characteristics to that of the original component.

38. A repair or adjustment does not comply with **Land Transport Rule: Vehicle Repair 1998**.

39. A modification to a vehicle that affects the braking performance of the vehicle does not ensure that the modification does not prevent the vehicle from complying with this Rule.

40. A modification to a vehicle that affects its braking performance is not certified by a person or organisation appointed to carry out specialist inspection and certification of heavy vehicle brakes.

41. An electric braked vehicle has not been certified as part of a dedicated combination (Note 1)(Note 2).

42. An electric braked vehicle in a dedicated combination has been certified without both vehicles in the combination being plated with the required certification details (Note 1).

43. An electric braked vehicle is fitted with an operating variable proportioning device (Note 1).

44. An electric braked vehicle is fitted with a brake proportioning switch that provides two levels of braking, laden and unladen, and the switch does not operate automatically when the load is laden or unladen (Note 1).

45. An electric braked vehicle is fitted with any form of indirect application controller (Note 1).

46. An electric braked vehicle has been certified without an exemption from meeting the requirement for compliance with *Schedule 5* of the Rule (Note 1).

Note 1

Electric braked TC trailers must continue to be certified to comply with the Heavy-vehicle Brakes Rule by a HVS certifier with the ‘brakes’ category (HVEK) and have an exemption from the requirements of Schedule 5.

Please view the content under the **Procedure** tab.

Note 2

An electric braked class TC trailer may be towed by a light vehicle and there are additional requirements for this covered in **Technical Bulletin 6**.

Summary of legislation

Applicable legislation

- **Land Transport Rule: Heavy Vehicle Brakes 2006**

General safety requirements

1. A vehicle, unless exempt, must have a service brake, a parking brake and an emergency brake, except a semitrailer first registered before 1 November 1990 that must have a service brake only.

2. A brake must:

a) be easily adjustable to compensate for wear or have a means of automatic adjustment, and

b) be maintained in good condition and efficient working order, and

c) enable the vehicle to comply with the requirements in *2.2(5)*, *2.2(8)*, *2.3(3)*, *2.3(5)* to *2.3(7)*, *2.3(11)* to *2.3(13)* and *2.3(17)*, when the brake is applied by the driver:

i. on a hard dry surface that is free of loose material, and that is level except when the parking brake is applied on a slope, and

ii. without assistance from the compression of the vehicle's engine or other auxiliary braking device in *section 5* that is not part of the vehicle's service brake.

Service brake

3. The service brake of a vehicle:

a) must be able to be applied by the driver from the driver's normal driving position in a controlled and progressive manner, and

b) except for a heavy haulage trailer or a military trailer, must not have any device fitted by which the driver would be able to adjust the brake force distribution between the axles or between the vehicles that are used in a combination vehicle.

4. The service brake of a vehicle, whether or not it is being operated as a combination vehicle, must have one control only except where a trailer hand control has been fitted

5. A service brake of class MD3, MD4, ME, NB, NC, TC and TD vehicles first registered in New Zealand on or after 1 November 1990 must act on each wheel

Parking brake

6. The parking brake of a vehicle, whether or not it is being operated as a combination vehicle, must be able to be applied by the driver from the normal driving position using one control only.

7. Despite *6*, the parking brake control of a class TC vehicle may be fitted to the vehicle if:

a) the vehicle is part of a dedicated combination and does not have an air brake or a brake that is operated with the assistance of compressed air, and

b) the vehicle is fitted with a compliant temporary brake, and

c) the control is fitted in a readily accessible position, and

d) the towing vehicle has a compliant NOT FOR PARKING markings.8. For a semi-trailer first registered in New Zealand on or after 1 November 1990, the total brake forces generated by the parking brake must be at least 20% of the maximum weight that can be carried on the axle or axle set.

Emergency brake

9. The emergency brake of a vehicle may be combined with either:

a) the parking brake, or

b) the service brake of a powered vehicle, if the vehicle is fitted with a full dual-circuit service brake, and either:

i. one of those circuits activates the brake on all the front wheels and the other circuit activates the brake on all the rear wheels, or

ii. each circuit activates the brake on at least 1/3 of the wheels, or

10. The emergency brake of a trailer must operate immediately and automatically to stop and hold the trailer stationary if it becomes disconnected from the towing vehicle.

11. The emergency brake of a semi-trailer must, as far as is practicable, act on the wheels that remain in contact with the ground if the semi-trailer becomes disconnected from the towing vehicle during operation.

12. The emergency brake of a vehicle first registered in New Zealand on or after 1 November 1990 must:

a) act on at least 1/3 of the wheels, except if there is a front/rear split

b) act as directly as practicable on those wheels without the interposition of any differential gearing.

c) be capable of:

i. stopping the vehicle at any load condition up to the gross vehicle mass or gross combination mass, as applicable, within a distance of 18 m from a speed of 30 km/h, or

ii. for a semi-trailer, generating brake forces the sum of which is at least 20% of the maximum weight that can be carried on the axle or axle set.

Devices to keep a vehicle stationary for a limited time

13. A vehicle may be fitted with a device that can be operated by the driver from the driver's normal driving position to keep the vehicle stationary temporarily, provided that the device does not prevent the safe operation of the service brake or the parking brake of the vehicle.

14. A device in 13 may utilise the service brake by:

a) applying the service brake, either partially or fully, on some or all of the vehicle's wheels, or

b) preventing the release of the service brake, when applied by the driver, on some or all of the vehicle's wheels.

15. A device in 13 which can only be de-activated by the driver must have a label permanently attached displaying the words: “NOT FOR PARKING”.

16. A device in 13 which can be de-activated by the control system of the vehicle must either have:

a) a label permanently attached displaying the words: “NOT FOR PARKING”, or

b) an audible warning device that operates when the driver's door is open while the device is activated and the parking brake is not fully applied.

Additional requirements for towing vehicles

17. The brake of a heavy vehicle that has been fitted with a towing connection to tow a vehicle of class TC or class TD must comply with 17 to 22.

18. A vehicle in 17 certified for compliance with one of the codes or specifications in *Schedules 1* to *4* before 1 March 2007 must continue to comply with that code or specification, if that vehicle:

a) has not been modified on or after 1 March 2007, and

b) is being operated in a combination vehicle that has a gross mass exceeding 39,000kg but not exceeding 44,000kg.

19. A vehicle in 17 first registered in New Zealand after 1 March 2007 and before 1 July 2008 that is being operated in a combination vehicle that has a gross mass exceeding 39,000kg but not exceeding 44,000kg, must comply with:

a) the *New Zealand Heavy Vehicle Brake Code*, Second Edition (1997) in *Schedule 4*, or

b) the *Interim Specification for Heavy Vehicle Braking* in *Schedule 1*, or

c) the requirements with which a vehicle of the same class must comply if first registered in New Zealand or modified in New Zealand on or after 1 July 2008.

20. An imported vehicle of class NB or class NC to which 17 applies that is first registered in New Zealand on or after 1 July 2008 must comply with:

a) at least one of the approved vehicle standards in the Rule that require ABS, and

b) all of the following:

i. one or more of the approved vehicle standards in the Rule, and

ii. be fitted with an anti-lock braking system except for a logging vehicle, provided that the standard with which it complies does not require an ABS function

21. A vehicle of class NB or class NC in 17 that is manufactured in New Zealand and is first registered on or after 1 July 2008, or a vehicle of class NB or class NC modified in New Zealand on or after that date, must comply with *7.5*.

22. A vehicle of class TC or class TD in 17 first registered or modified in New Zealand on or after 1 July 2008 must comply with the specific performance requirements for vehicles manufactured or modified in New Zealand.

Additional requirements for trailers

23. A vehicle of class TC or TDcertified for compliance with one of the codes or specifications in *Schedules 1* to *4* before 1 March 2007 must continue to comply with that code or specification, if that vehicle:

a) has not been modified on or after 1 March 2007, and

b) is being operated in a combination vehicle that has a gross mass exceeding 39,000 kg, but not exceeding 44,000kg.

24. A vehicle in 23, first registered in New Zealand or modified on or after 1 March 2007 and before 1 July 2008 that is being operated in a combination vehicle with a gross mass exceeding 39,000kg but not exceeding 44,000kg, must comply with either:

a) the *New Zealand Heavy Vehicle Brake Code*, Second Edition (1997) in *Schedule 4*, or

b) the *Interim Specification for Heavy Vehicle Braking* in *Schedule 1*, or

c) the specific performance requirements for vehicles manufactured or modified in New Zealand in the Heavy-vehicles Brake Rule.

25. A vehicle of class TC or class TD in 23 first registered in New Zealand on or after 1 July 2008, or modified on or after that date, must comply with the specific performance requirements for vehicles manufactured or modified in New Zealand in **Land Transport Rule: Heavy Vehicle Brakes 2006**.

Requirements for anti-lock brake systems (ABS)

26. An anti-lock braking system of a vehicle of class NB, NC, TC or TD first registered in New Zealand on or after 1 July 2008, or that was fitted to a vehicle of those classes in New Zealand on or after that date, must be capable of continuously controlling and adjusting the braking effort on the wheels during braking to prevent:

a) the wheels from locking, and

b) the loss of directional control of the vehicle that could be caused by the application of the brake.

27. A control device in 26 must meet the technical requirements in

a) one or more of the approved vehicle standards inthe Rule, if those standards specify requirements for that device, or

b) 28 to 32.

28. A control device to which 27(b) applies must act on each axle and must be capable of modulating the brake force separately for:

a) each axle set, and

b) each side of all axle sets except steering axles.

29. A control device to which 27(b) applies must have sensors to monitor the rotational speed of the wheels.

30. The sensors in 29 must be fitted to at least one wheel on each side of all axle sets.

31. If an axle set consists of more than one axle, the sensor in 29 must be fitted as follows:

a) if the axle set consists of two axles and they are designed to carry the same or a similar load, the sensors must be fitted to the axle on which the wheels are more likely to lock during braking.

b) if the axle set consists of two axles and they are designed to carry significantly different loads, the sensors must be fitted to the axle that carries the greater load.

c) if the axle set consists of more than two axles and they are designed to carry the same or a similar load, the sensors must be fitted to the axle on which the wheels are neither the most likely nor the least likely to lock during braking.

d) if the axle set consists of more than two axles and one of them is designed to carry a significantly greater load than other axles in the set, the sensors must be fitted to the axle that carries the greatest load.

e) if the axle set consists of more than two axles and two or more of them carry a greater load than the remaining axle or axles in the set, the sensors must be fitted to an axle:

i. that is one of the axles carrying a greater load, and

ii. the wheels of which are most likely to lock.

f) if the axle set consists of more than two axles and two or more of them carry a greater load than the remaining axle or axles in the set and the likelihood that their wheels will lock is similar, the sensors may be fitted to any of the axles that carries the greater load.

g) if the axle set consists of two or more axles that carry a similar load, and the likelihood that their wheels will lock is similar, the sensors may be fitted to any of the axles.

32. A control device in *26* that is fitted to a trailer of class TC or class TD must:

a) comply with the requirements for ABS in the Rule, without being connected to the control device of the towing vehicle, and

b) be capable of being supplied with power for its operation by means of an electric cable from the towing vehicle.

33. The power connection between vehicles that can be operated in a combination vehicle must comply with Parts 1 and 2 of *ISO 7638: 1997*, *Road vehicles – Electrical connectors for braking systems*.

Specific performance requirements for vehicles manufactured or modified in New Zealand

34. A vehicle to which *21*, *22*, *24(c)* or *25* applies must, in addition to complying with the other applicable requirements in this Rule, comply with the specific performance requirements for vehicles manufactured or modified in New Zealand.

35. The brake force applied to a wheel of a vehicle in 34 during braking on a hard, dry, clean and level surface must:

a) for a vehicle without ABS other than one in 35(c), be approximately proportional to the load on the wheel, taking into account the dynamic load transfer that occurs during braking between the axles of a vehicle and that also may occur between the vehicles of a combination vehicle, at all conditions of loading up to the vehicle's gross vehicle mass.

b) for a vehicle with ABS, be approximately proportional to the load on the wheel without relying on the operation of ABS, taking into account the dynamic load transfer that occurs during braking between the axles of a vehicle and that also may occur between the vehicles of a combination vehicle, when the vehicle is loaded to its gross vehicle mass.

c) for a class TC vehicle, a logging vehicle, a heavy haulage trailer or a military trailer, be the brake force specified in 35(a) only when the vehicle is loaded to its gross vehicle mass, even if ABS is not fitted.

36. A vehicle complies with the requirements in the specific performance requirements for vehicles manufactured or modified in New Zealand, if it has been certified for compliance with the requirements in *Schedule 5* and is within safe tolerance of its state when certified.

Repair

37. A repair to a brake, or to a vehicle that affects its braking performance, must comply with **Land Transport Rule: Heavy Vehicle Brakes 2006** and with **Land Transport Rule: Vehicle Repair 1998**.

38. When a brake lining or a brake pad on an axle is replaced:

a) all the brake linings or brake pads on that axle must be replaced, and

b) all replacement brake linings and brake pads on that axle must be of the same make, type and grade.

Replacement components for vehicle repair

39. Subclauses 41 and 42 apply to any component that affects the braking performance of a vehicle and that is:

a) manufactured, stocked or offered for sale in New Zealand, and

b) supplied for fitting to a vehicle to be operated on a New Zealand road.

41. A component used in a repair must have equivalent performance characteristics to that of the original component and must not prevent a vehicle from complying with this Rule.

42. A brake lining assembly used as a replacement component, whether or not the brake to which it is fitted is required to comply with an approved vehicle standard, complies with this Rule if it complies with *UN/ECE Regulation No. 90*, *Uniform Provisions concerning the approval of replacement brake lining assemblies and drum brake linings for power-driven vehicles and their trailers (E/ECE/324E/ECE/TRANS/505/Rev.1/Add.89)*.

Responsibilities of repairers

43. A person who repairs or adjusts a brake must ensure that the repair or adjustment:

a) does not prevent the vehicle from complying with this Rule, and

b) complies with **Land Transport Rule: Vehicle Repair 1998**.

Responsibilities of modifiers

44. A person who modifies a vehicle so as to affect the braking performance of the vehicle must:

a) ensure that the modification does not prevent the vehicle from complying with this Rule, and

b) notify the operator that the vehicle must be inspected and, if necessary, certified by a person or organisation appointed to carry out specialist inspection and certification of heavy vehicle brakes.

Responsibilities of vehicle inspectors and inspecting organisations

45. A vehicle inspector or inspecting organisation must not certify a motor vehicle under **Land Transport Rule: Vehicle Standards Compliance 2002** if they have reason to believe that the vehicle does not comply with this Rule.

46. During the certification of a vehicle, compliance of a vehicle's brakes with the performance requirements in this Rule must be verified by means of appropriate tests, using approved testing devices and following correct test procedures.

Functions and powers of the Transport Agency

47. The Transport Agency may revoke, by giving written notice, a record of determination issued after specialist inspection and certification that a vehicle complies with this Rule, if the Transport Agency is satisfiedon reasonable grounds that the applicable requirements have not been complied with.

Procedure

Electric braked TC trailers must continue to be certified to comply with the Heavy-vehicle Brakes Rule by a HVS certifier with the ‘brakes’ category (HVEK) and have an exemption from the requirements of Schedule 5.

This procedure is for use on electrically controlled braking systems fitted to TC trailers and their prime movers only. The purpose of the procedure is to ensure balanced braking between the vehicles in combination and is approved by exemption for the combination once all required tasks are completed and information, including the **CA11 Application for an exemption from land transport vehicle rules form** and applicable payment, are provided to:

HV Exemption Assessments

NZ Transport Agency

Private Bag 6995

Wellington 6141.

This procedure results in a dedicated combination in that only the towing vehicle that has been certified with it may tow the certified trailer. Reference should also be made to **Technical bulletin 6** where the TC trailer is towed by a light vehicle.

Park brake application and efficiency

Most TC trailers are fitted with electrically controlled brakes with no mechanical park brake mechanism. Electrically controlled braking systems on their own, are not capable of holding a vehicle stationary indefinitely because electric power is required to hold the brake on. These vehicles must be fitted with a brake system that incorporates a mechanical parking brake.

The Rule includes a clause, 2.3(9A) in the Rule, allowing a mechanical park brake control to be mounted in an easily accessible position on the towed vehicle as long as a temporary brake, operated by the driver from the normal driving position and consistent in design and operation with Section 5.3 in the Rule, is fitted to the towing vehicle. This can be in the form of a switch which controls the electric brake. This will result in a dedicated combination where only specified towing vehicle(s) may tow the specified trailer.

Variable proportioning devices

The Rule requires that no device is fitted which enables the driver to adjust the brake force distribution between axles or vehicles used in a combination [2.3(1)(b)]. So, any of these devices, which may be used by the engineer when setting up the brakes for the combination, must be permanently set or removed on certification.

Boat switch

As TC trailers are not required to be fitted with ABS there have been brake lockup problems reported with some vehicles, such as large boat trailers, with a large differential between laden and unladen weight. This issue may be addressed by switching the brake function between a ‘light’ and ‘heavy’ setting automatically by way of a switch operated by the loading and unloading of the boat or other load. Any switch must operate automatically with no independent input from the operator and be solely dependent on the actual loading or unloading of the trailer. Alternatively, there are electronic load sensing devices available from the major brake component suppliers which can be used to regulate brake force with respect to changing loads.

Inertia/timer operated brakes

The Rule requires that the service brake of a heavy vehicle, whether in combination or not, must be able to be applied from the driver's normal driving position in a controlled and progressive manner using one control only, [2.3(1)(a) and 2.3(2)]. This means that any Inertia or timer service brake controls fitted to a TC or TD trailer are not allowed by the Rule and must be replaced by a progressive control operated from the same control as the service brake of the towing vehicle.

Preparation

The foundation brake must be in good condition with all components well maintained, bedded in and operating within the manufacturer's tolerances. Brake shoes must be clean and dry and any wear should be even. The full face of the shoe must match up with the drum and the magnetic pad must be within the manufacturer's tolerance for wear and that wear must be even. Some systems may require heavier wiring to prevent excessive voltage losses or heat build up in the electrical system which can lead to inefficiency and inconsistent braking. It is unlikely that proper certification will be possible if the electric brake system has not been properly maintained or adequately bedded in.

Initial preparation

Prior to commencing the actual certification task certain calculations are required. Firstly, the axle weight transfer, due to a peak deceleration of 0.45g, as required in 6.1(2), must be calculated at full GVM [from 7.5(2)(c)]. This weight transfer calculation can be completed using a centre of gravity estimated by using the same calculation as for SRT for mixed freight. Then, calculate the residual axle load, the gross axle load less the weight transfer due to the 0.45g deceleration

previously calculated and complete a laden roller test at the residual axle weight and test to achieve a 0.45g deceleration on each axle without lockup or wheel slip occurring.

Certification to HVEK

These modifications must be certified by a HVS certifier with the HVEK category who must also certify the vehicle to the Rule. While TC trailers are not required to have ABS they must still meet the performance requirements of the NZ Heavy-vehicle Brake Specification as set out in Schedule 5 or Section 7 of the Rule. This certification can be proven by a combination of physical testing and calculation. To achieve this, the following steps are to be followed:

- In the first instance a coupling voltage needs to be established for the trailer to achieve a minimum 0.5g braking efficiency.
- Ensure the vehicle has its foundation brakes fully serviced and that they are operating to achieve a minimum braking efficiency of 0.5g and balanced from left to right and between axles (+/- 10% is suggested).
- Use an approved and calibrated RBM to test the combination for service and park brake performance to the requirements of section 2.3(3) & 2.3(11), or 2.3(12) for semi trailers.
- When setting up a semi trailer combination both the towing and towed vehicle should be tested at presented weight with no tie down. This will be reflected at CoF.
- Measure trailer and get split weights for calculation purposes.
- Carry out weight transfer calculations and braking requirements for testing.
- Put trailer's first axle over brake rollers and measure coupling voltage at 0.5g (typically 3 to 7 Volts).
- Test Temporary park brake.
- Test permanent park brake if fitted to the first axle.
- Repeat the above procedure until all axles have been completed, ensuring balanced braking.
- From the testing done on all axles, the HVEK is to establish the average voltage to brake trailer at 0.50g.
- Note this trailer testing should also validate weight transfer calculations carried out earlier to meet braking requirements of the Rule.

- Once a coupling voltage has been established for the trailer the truck controller needs to be calibrated to produce a matching coupling voltage when it is producing 0.5g braking efficiency.
- With the trailer attached and, providing a majority of the imposed load is through the rear axle of the towing vehicle, put the rear axle on the brake rollers and use this to calibrate the coupling voltage. If the position of the fifth wheel connection is significantly ahead of the rear axle then an average of both front and rear axles should be used to calibrate the coupling voltage.
- Run the brake rollers and apply the truck brakes to achieve a minimum balanced braking efficiency of 0.5g.
- Measure the voltage at the coupling and calibrate the brake controller to achieve the desired voltage to allow for weight transfer (for 5^{th} Wheel trailers). A different calculation for the coupling voltage differential is required for other trailer types (simple, full etc) dependent on the load they impose on the towing vehicle.
- At the onset of braking both vehicles in the combination should commence braking as close as possible to simultaneously. Any deviation from simultaneous operation should be biased towards the trailer where possible or towards the towing vehicle if the towed vehicle is a semi trailer.
- Road test with an approved decelerometer following the requirements of Section 6 of the rule, notwithstanding that these requirements are for non towing vehicles, and a minimum of three tests for each facet of the brake test is to be carried out.

Note: when weight transfer is calculated for a 5^{th} wheel trailer it generally requires a voltage reduction when calibrating the truck controller. From reported experience and road testing 10 – 20% works well achieving good smooth braking with no wheel lock up. For example, with a trailer coupling voltage of 5 Volts the truck coupling would typically be set at 4 to 4.5 Volts. If set at 5 Volts the trailer brakes may be set too aggressively resulting in wheel lock up.

The certifier to plate both vehicles with the following data:

- VIN numbers of both vehicles
- Brake Test Mass
- Certified Trailer Braking Efficiency
- Signal voltage/current @ Certified Braking Efficiency.

An exemption from the requirements of 7.5(3) is required as part of the certification of the combination.

Note: like all heavy vehicles, TC trailers are required to undergo CoF testing using an approved, calibrated roller brake machine.

6 Occupant features

6-1 Seatbelts and seatbelt anchorages

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1. A heavy motor vehicle manufactured before 1 October 2003 has been fitted with a seatbelt that does not comply with the applicable requirements in this chapter.

2. A heavy motor vehicle manufactured before 1 October 2003 has been fitted with a seatbelt attached to seatbelt anchorages that do not comply with the applicable requirements in this chapter.

3. A vehicle of class NB or class NC manufactured on or after 1 October 2003 does not have:

    a) lap-and-diagonal retractor seatbelts in the driver's seating position and front outer seating position, and

b) lap seatbelts in all front middle seating positions.

4. A seatbelt in a front outer seating position,

a) does not have a multiple-sensitive emergency-locking retractor, or

b) does not have a multiple-sensitive emergency-locking retractor seatbelt and has not been exempted from the requirement by notice in the Gazette.

5. A seatbelt fitted in a sideways-facing seating position in a motor vehicle first registered in New Zealand on or after 1 October 2002 is not a lap seatbelt.

6. A seatbelt is not of a design suitable for the vehicle.

7. The seatbelt webbing (including webbing attached to the buckle) has:

a) a cut, including a cut on the surface, or

b) a rip or tear, or

c) fraying, or

d) stretching (eg the belt has unusual web patterns or the webbing is deformed, will not lie flat or is curled or rippled), or

e) fading so that most of the colour has been bleached,

f) signs of chalking, or a powdery residue is evident on the webbing, or

g) become stiff, or

h) been dyed to conceal fading, or

i) contamination from grease, paint, solvents or similar products, or

j) is not securely attached to the tongue or the adjusting buckle or to any fittings that secure a seatbelt to the seatbelt anchorages, or

k) has otherwise deteriorated so as to reduce the performance of the seatbelt to below safe tolerance.

8. The seatbelt stitching:

a) is damaged or insecure, or

b) shows signs of home repairs, for example glueing, stitching by hand or home sewing machine, staples, bolts, or rivets, or

c) indicates that the ‘rip stitch’ system has been activated, that is the stitching is broken and a ‘REPLACE BELT’ label has been exposed near the lower seatbelt anchorage, or this label has been cut off.

9. A buckle and tongue:

a) are mismatched, or

b) do not lock, or

c) do not remain locked, or

d) do not release easily, or

e) are insecure when coupled.

10. A seatbelt stalk:

a) (wire-cable type) wires appear to be broken, or

b) (plastic covered webbing type) the webbing is deteriorated, frayed, cut or faded, or

c) (solid metal type) is corroded, cracked or buckled, or

d) is not the correct type for the vehicle or the seating position, or

e) has other weaknesses that reduce the performance of the seatbelt to below safe tolerance.

11. A seatbelt pretensioning system has not been replaced after activation.

12. A seatbelt anchorage shows signs of cracks or deformation.

13. The seatbelt webbing cannot be adjusted by the wearer.

14. A seatbelt cannot be readily fastened and released by the wearer.

15. When a seatbelt or part of a seatbelt is integral to a seat, the seat and the seat anchorages are not compatible in strength with the seatbelt or with that part of the seatbelt attached to the seat, as appropriate.

16. A seatbelt with a retractor that is not the vehicle manufacturer's original equipment specification has been fitted and the seatbelt:

a) adversely affects the safety performance of the motor vehicle, or

b) is not recognised by a seatbelt manufacturer or the vehicle manufacturer as being suitable for use in the particular vehicle and seating position.

17. A seatbelt with a retractor that is not the vehicle manufacturer's original equipment specification has been fitted and the seatbelt anchorages do not comply with the applicable requirements.

18. A seatbelt with a retractor that is not the vehicle manufacturer's original equipment specification has been fitted and modifications that adversely affect the seatbelt, seatbelt anchorages or the structure of the vehicle are required.

19. A seatbelt anchorage that has not been designed to be fitted with more than one seatbelt has been fitted with more than one seatbelt.

20. A specialist seatbelt, other than one that is the manufacturer's original equipment specification, has been fitted in any seating position in a heavy motor vehicle, and the seatbelt is not a specialist type approved by the NZTA.

21. If a seat in a motor vehicle can be rotated or reversed to face in different directions,

a) seatbelts are not provided for all seat directions, or

b) a notice has not been attached to the interior of the vehicle, so that it is easily visible to the vehicle's occupants, indicating the direction in which the seat must face so that a seatbelt can be worn when the vehicle is moving.

22. A seatbelt in a heavy motor vehicle does not comply with a version of an approved vehicle standard in Table 6-1-1, List A or List B.

23. A seatbelt anchorage is not of the following type:

a) two-point anchorage for lap seatbelts,

b) three-point anchorage for lap-and-diagonal seatbelts without retractors,

c) three- or four-point anchorage for lap-and-diagonal seatbelts with retractors.

24. A seatbelt that has to comply with an approved vehicle standard does not have markings that comply with the requirements of that standard (Note 1).

25. Seatbelt markings are not legible and securely attached to the seatbelt.

26. A motorhome manufactured or converted prior to 1 October 2003 does not have seatbelts and seatbelt anchorages as required in tables 2.1 to 2.3 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002**.

27. A motorhome manufactured on or after 1 October 2003 or a motor vehicle converted into a motorhome on or after 1 October 2003 is not equipped with:

a) seatbelts and seatbelt anchorages that comply with the requirements for heavy motor vehicles in table 2.4 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002** in all front seating positions, or

b) does not have seatbelts or seatbelt anchorages as required for class MB vehicles in table 2.4 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002** in as may seating position in the rear so that there are at least as many seating positions with seatbelts as there are sleeping berths, or

c) a notice, attached in a prominent position, that:

i. recommends, on safety grounds, that when the vehicle is traveling, passengers use seats that are fitted with seatbelts, and

ii. advises passengers that it is compulsory to wear fitted seatbelts.

28. A seatbelt has been modified (Note 3).

29. A seatbelt has been modified temporarily to accommodate a child restraint, and the modification, including any device or accessory used in the modification:

a) adversely affects the operation and effectiveness of the child restraint, or

b) breaches an instruction issued by the manufacturer of the child restraint on the installation and operation of the child restraint, or

c) is likely to cause injury to an occupant of the motor vehicle.

30. A seatbelt retrofitted to a heavy vehicle on or after 1 April 2002 has not been assessed against the technical requirements of seatbelt anchorage, regarding geometry and load-carrying capacity, in any of the approved vehicle standards for seatbelt anchorages that apply to light motor vehicles.

31. A seatbelt retrofitted to a heavy vehicle on or after 1 April 2002 does not comply with section 2.3 of **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002**.

32. A seatbelt anchorage that is retrofitted in a heavy motor vehicle does not comply with the general safety requirements for seatbelt anchorages.

33. A seatbelt anchorage and its mounting location:

a) is not of a strength appropriate to both the motor vehicle and the attached seatbelt, or

b) is not structurally sound and free of corrosion, or

c) is damaged or distorted.

34. A seatbelt anchorage retrofitted to the vehicle cab does not comply with the requirements of Low Volume Vehicle Standard 175-00(01), Seatbelt Anchorages, sections 2.2 to 2.10 when no calculations are completed.

35. If calculations are used for proof of compliance for a seatbelt anchorage they do not take into account local deformation of the panel the seatbelt anchorage is attached to.

36. The requirements for the permitted areas and loadings from different standards have been mixed to certify a seatbelt anchorage.

37. Retrofitted seatbelt anchorages have not been designed to accept Webbing Grabber seatbelts when designed for front outer seating locations.

38. A repair to a seatbelt or seatbelt anchorage, or a repair to a motor vehicle that affects a seatbelt or seatbelt anchorage, has not restored the damaged or worn seatbelt, seatbelt anchorage or vehicle so that it is within safe tolerance of:

a) the state of the seatbelt, seatbelt anchorage or vehicle when manufactured, or

b) for a retrofitted seatbelt anchorage, the state when retrofitted.

39. A seatbelt has been repaired by someone other than the seatbelt manufacturer or the manufacturer's agent, and the seatbelt repair is more extensive than a replacement of the webbing.

40. A vehicle that has been repaired after being involved in a crash has no diagnostic report completed by the manufacturer or an approved representative for seatbelts that are connected to an ECU.

41. A seatbelt that was worn during a crash and shows any sign of damage has not been replaced unless:

a) this is permitted in the manufacturer's instructions

b) the seatbelt has been inspected and certified to be within safe tolerance by the manufacturer or an approved agent.

42. A seatbelt assembly that has been immersed or was fitted to a water damaged vehicle has not been inspected and certified to be within safe tolerance by the manufacturer or an approved agent.

Note 1

A seatbelt that does not have markings complies with the seatbelt rule if it is the vehicle manufacturer's original equipment specification in a motor vehicle first registered in New Zealand before 1 January 1986, and it otherwise complies with applicable requirements.

Note 2

A motor vehicle that is designed exclusively for transporting a person detained by an officer of the Police or the corrections services, or by a person acting on behalf of the Police or the corrections services, must comply with the requirements for seatbelts and seatbelt anchorages in front seating positions, but does not have to comply with the requirements for other seating positions.

Note 3

A seatbelt may be modified if the modification is approved by the seatbelt manufacturer or vehicle manufacturer and is carried out in accordance with instructions issued by that manufacturer.

Table 6-1-1. Approved vehicle standards for seatbelts

List A	List B
Council Directive 77/541/EEC of 28 June 1977 on the approximation of the laws of the Member States relating to safety belts and restraint systems on motor vehicles	Council Directive 77/541/EEC of 28 June 1977 on the approximation of the laws of the Member States relating to safety belts and restraint systems on motor vehicles
UN/ECE Regulation No. 16, Uniform provisions concerning the approval of safety belts and restraint systems for adult occupants of power-driven vehicles (E/ECE324-E/ECE/TRANS/505/Rev.1/Add.15)	UN/ECE Regulation No. 16, Uniform provisions concerning the approval of safety belts and restraint systems for adult occupants of power-driven vehicles (E/ECE324-E/ECE/TRANS/505/Rev.1/Add.15)
Federal Motor Vehicle Safety Standard No. 209, Seat Belt Assemblies	Federal Motor Vehicle Safety Standard No. 209, Seat Belt Assemblies
Australian Design Rule 4, Seat Belts	Australian Design Rule 4, Seat Belts
Technical Standard for Seat Belt Assemblies (Japan)	Technical Standard for Seat Belt Assemblies (Japan)
Japanese Industrial Standard D 4604-1988, Seat Belts for Automobiles	Japanese Industrial Standard D4604-1988, Seat Belts for Automobiles
New Zealand Standard 5401: 1982, Specification for Seat Belt Assemblies for Motor Vehicles	New Zealand Standard 1662: 1969, Specification for Seat Belt Assemblies for Motor Vehicles
Australian Standard/New Zealand Standard 2596: 1995, Seat Belt Assemblies for Motor Vehicles	New Zealand Standard 5401: 1982, Specification for Seat Belt Assemblies for Motor Vehicles
	Australian Standard E35.1: 1970, Seat Belt Assemblies for Motor Vehicles
	Australian Standard E35.2: 1970, Seat Belt Assemblies (Including Retractors) for Motor Vehicles
	British Standard AU 160c: 1971, Specification for Seat Belt Assemblies for Motor Vehicles
South African Bureau of Standards 1080-1983, Standard Specification for Restraining Devices (Safety Belts) for Occupants of Adult Build in Motor Vehicles (Revised requirements)	South African Bureau of Standards 1080-1983, Standard Specification for Restraining Devices (Safety Belts) for Occupants of Adult Build in Motor Vehicles (Revised requirements)

Table 6-1-2. Approved vehicle standards for seatbelt anchorages

Approved vehicle standards for seatbelt anchorages are:
Council Directive 76/115/EEC of 18 December 1975 on the approximation of the laws of the Member States relating to anchorages for motor vehicle safety belts
UN/ECE Regulation No. 14, Uniform provisions concerning the approval of vehicles with regard to safety belt anchorages (E/ECE324-E/ECE/TRANS/505/Rev.1/Add.13)
Federal Motor Vehicle Safety Standard No. 210, Seat Belt Assembly Anchorages – Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses
Australian Design Rule 5, Anchorages for Seat Belts and Child Restraints
Technical Standard for Seat Belt Anchorages (Japan)

Summary of legislation

Applicable legislation

- **Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002**

Application of requirements

1. A heavy motor vehicle manufactured before 1 October 2003 does not have to be fitted with seatbelts, but if seatbelts are fitted, they must be attached to seatbelt anchorages that are of an appropriate type, as specified below, and:

a) the seatbelts must comply with the applicable requirements in this chapter, and

b) the seatbelt anchorages must comply with the applicable requirements in this chapter, and

c) the approved vehicle standards, if applicable, for seatbelts in Table 6-1-1 and for seatbelt anchorages in Table 6-1-2

Type of seatbelt required

2. A vehicle of class NB or class NC manufactured on or after 1 October 2003 must have:

a) lap-and-diagonal retractor seatbelts in the driver's seating position and front outer seating position, and

b) lap seatbelts in all front middle seating positions.

Sensitivity of retractors

3. A seatbelt in a front outer seating position must have a multiple-sensitive emergency-locking retractor, unless the seatbelt has been exempted from this requirement by notice in the Gazette.

4. A seatbelt in a rear seating position may have a single-sensitive emergency-locking retractor or a multiple-sensitive emergency-locking retractor.

Seatbelts in sideways-facing seating positions

5. A seatbelt fitted in a sideways-facing seating position in a motor vehicle first registered in New Zealand:

a) before 1 October 2002, may be of any type

b) on or after 1 October 2002, must be a lap seatbelt.

General safety requirements for seatbelts (section 2.2)

6. A seatbelt must be of a design suitable for the vehicle, and must be strong, secure, in sound condition and in good working order.

7. Seatbelt webbing must not be cut, stretched, frayed or faded, or have otherwise deteriorated so as to reduce the performance of the seatbelt to below safe tolerance.

8. Seatbelt webbing must be securely attached to the tongue or the adjusting buckle and to any fittings that secure a seatbelt to the seatbelt anchorages, and must be able to be adjusted by the wearer.

9. The strands of the steel cables of a seatbelt stalk must not be damaged or have deteriorated, and the seatbelt stalk must not have other weaknesses that could reduce the performance of the seatbelt to below safe tolerance.

10. Seatbelt buckles, retractor mechanisms, or any other fittings intended to ensure the safe use of the seatbelt, must not have deteriorated to below safe tolerance.

11. A seatbelt must be able to be readily fastened and released by the wearer.

12. In assessing whether requirements 6 to 11 are complied with, a certifier may take into account evidence that a seatbelt is within the seatbelt manufacturer’s operating limits.

General safety requirements for seatbelt anchorages (section 2.3)

13. A seatbelt anchorage and its mounting location:

a) must be of a strength appropriate to both the motor vehicle and the attached seatbelt, and

b) must be structurally sound and free of corrosion, and

c) must not be damaged or distorted.

14. When a seatbelt or part of a seatbelt is integral to a seat, the seat and the seat anchorages must be compatible in strength with the seatbelt or with that part of the seatbelt attached to the seat, as appropriate.

15. In assessing whether requirement 13 is complied with, a certifier may take into account evidence that the seatbelt anchorage is within the motor vehicle manufacturer’s operating limits.

16. In assessing whether requirement 14 is complied with, a certifier may take into account evidence that a seat or seat anchorage is within the motor vehicle manufacturer’s or component manufacturer’s operating limits, including the type of seatbelt for which it was originally designed.

Upgrading of seatbelts (section 2.4)

17. Any type of lap seatbelt or lap-and-diagonal seatbelt, including a lap-and-diagonal seatbelt with any type of retractor, may be fitted if a seatbelt is not required for that seating position in a heavy vehicle.

18. A seatbelt with a retractor that is not the vehicle manufacturer's original equipment specification may be fitted only if:

a) that seatbelt:

i. does not adversely affect the safety performance of the motor vehicle, and

ii. is recognised by a seatbelt manufacturer or the vehicle manufacturer as being suitable for use in a particular vehicle and seating position, and

b) the seatbelt anchorages comply with the applicable requirements, and

c) modifications that affect the seatbelt, seatbelt anchorages or the structure of the vehicle are not required.

19. A seatbelt anchorage may not be fitted with more than one seatbelt unless the anchorage has been designed to be fitted with more than one seatbelt.

Specialist seatbelts

20. A specialist seatbelt, other than one that is the manufacturer's original equipment specification, may not be fitted in any seating position in a heavy motor vehicle, unless the seatbelt is a specialist type approved by the NZTA.

Seats with variable orientation

21. If a seat in a motor vehicle can be rotated or reversed to face in different directions, and seatbelts are not provided for all seat directions, a notice must be attached to the interior of the vehicle, so that it is easily visible to the vehicle's occupants, indicating the direction in which the seat must face so that a seatbelt can be worn when the vehicle is moving.

Approved vehicle standards for seatbelts (section 2.5)

22. A seatbelt in a heavy motor vehicle must comply with a version of an approved vehicle standard in Table 6-1-1, List A or List B.

23. If a seatbelt is fitted, although it does not have to be fitted, that seatbelt must comply with a version of an approved vehicle standard in Table 6-1-1, List A.

Fitting, position and type requirements for seatbelt anchorages (section 2.6)

24. Seatbelt anchorages must be of the following types:

a) two-point anchorages for lap seatbelts,

b) three-point anchorages for lap-and-diagonal seatbelts without retractors,

c) three- or four-point anchorages for lap-and-diagonal seatbelts with retractors.

25. A seatbelt may be attached to seatbelt anchorages other than those of a type in requirement 24 if the seatbelt anchorages comply with all other applicable requirements in this chapter, and:

a) for a motor vehicle other than a scratch-built vehicle, the seatbelt is the vehicle manufacturer's original equipment specification and is attached to seatbelt anchorages that are the vehicle manufacturer's original equipment

b) for a scratch-built vehicle, the seatbelt anchorages comply with the general safety requirements.

Approved vehicle standards for seatbelt anchorages (section 2.7)

Retrofitted equipment

26. Retrofitted seatbelt anchorages must comply with the relevant requirements under modification and repair.

27. A seatbelt that has to comply with an approved vehicle standard must have markings that comply with the requirements of that standard (Note 1).

28. A seatbelt that does not have to comply with an approved vehicle standard must have markings that clearly identify that seatbelt as being of a recognised type for the motor vehicle concerned.

29. A seatbelt that complies with more than one vehicle standard may have more than one marking if at least one of the standards is an approved vehicle standard as required by this rule.

30. Seatbelt markings must be legible and be securely attached to the seatbelt.

Requirements for specific motor vehicles (section 3)

Motorhomes

31. A motorhome manufactured on or after 1 October 2003, or a motor vehicle converted into a motorhome on or after 1 October 2003, does not, for the purpose of this rule, belong to a class of vehicle in the Table of vehicle classes.

32. A motorhome manufactured on or after 1 October 2003 and a motor vehicle converted into a motorhome on or after 1 October 2003 must be equipped with:

a) seatbelts and seatbelt anchorages that comply with the requirements for heavy motor vehicles in all front seating positions, and

b) lap seatbelts that comply with the requirements for heavy motor vehicles in at least as many rear seating positions as the number of sleeping berths exceeds the number of front seating positions, and

c) a notice, attached in a prominent position, that:

i. recommends, on safety grounds, that when the vehicle is travelling, passengers use seats that are fitted with seatbelts, and

ii. advises passengers that it is compulsory to wear fitted seatbelts.

Modification and repair (section 4)

Modifications to seatbelts

33. A seatbelt must not be modified (Note 3).

34. A seatbelt may be modified temporarily to accommodate a child restraint, provided that the modification, including any device or accessory used in the modification:

a) does not adversely affect the operation and effectiveness of the child restraint, and

b) does not breach an instruction issued by the manufacturer of the child restraint on the installation and operation of the child restraint, and

c) is not likely to cause injury to an occupant of the motor vehicle, and

d) does not cause damage to the seatbelt.

Modifications to seatbelt anchorages

35. A modification to a motor vehicle that affects the performance of a seatbelt anchorage:

a) must not prevent the vehicle from complying with the applicable requirements in this rule, and

b) must be certified in accordance with Land Transport Rule: Vehicle Standards Compliance 2002.

Requirements for retrofitted seatbelt anchorages

36. A seatbelt anchorage that is retrofitted in a heavy motor vehicle must comply with the general safety requirements for seatbelt anchorages.

Repair and replacement (section 4.2)

37. A repair to a seatbelt or seatbelt anchorage, or a repair to a motor vehicle that affects a seatbelt or seatbelt anchorage, must restore the damaged or worn seatbelt, seatbelt anchorage or vehicle so that it is within safe tolerance of:

a) the state of the seatbelt, seatbelt anchorage or vehicle when manufactured, or

b) for a retrofitted seatbelt anchorage, the state when retrofitted.

38. A seatbelt may be repaired only by the seatbelt manufacturer or the manufacturer's agent, except if the repair consists only of a replacement of the seatbelt.

39. A repair to a seatbelt or seatbelt anchorage, or a repair to a motor vehicle affecting a seatbelt or seatbelt anchorage, must comply with **Land Transport Rule: Vehicle Repair 1998**.

Retrofitted anchorages

40. Retrofitted seatbelt anchorages must be certified as meeting the general safety requirements for seatbelt anchorages. In determining if the general safety requirements have been met, the HVSC must take into account the technical requirements regarding geometry and load carrying capacity from any one of the approved vehicle standards for seatbelt anchorages.

41. If using calculations to determine that the general safety requirements have been met, the HVSC must take into account the technical requirements regarding geometry and load carrying capacity from any one of the standards in Table 6-1-2.

42. Alternatively, seatbelt anchorages that comply with the design requirements of the Low Volume Vehicle Standard 175-00 can be certified as meeting the general safety requirements for seatbelt anchorages.

43. For the fitment of aftermarket UN/ECE R14 stressed seats in motorhomes, the HVSC must consider the seatbelt load requirements based on the M1 classification that applies to all motorhomes under the UN/ECE system regardless of GVM. However, an HVSC is permitted to determine whether or not these requirements are appropriate for a particular vehicle, and may design to a lower (M2 or M3) classification if it can be demonstrated that the M1 classification is not appropriate.

44. Retrofitted anchorages should be designed to accept webbing grabber seatbelts when designed for front outer seating locations.

Page added **1 April 2021** (see **amendment details**)

6-2 Wheelchair restraints

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1. Steps used for entry or exit:

    a) do not have a non-slip surface

    b) do not provide safe entry or exit for passengers

    c) extend more than 20mm beyond the adjacent body line of the vehicle when manually operated in either the extended or retracted positions.

2. Protruding steps have not been constructed to minimise any possibility of injury to a person.

3. The floor of a heavy passenger service vehicle at the entrance or exit door is more than 410mm above the surface of the level roadway

4. Where the floor of a heavy passenger service vehicle at the entrance or exit door is more than 410mm above the surface of the level roadway and a step or ramp has been fitted:

    a) the distance from the ground to the tread surface of the lowest entrance level is more than 410mm when measured with the vehicle unladen:

    b) a panel has not been fitted to prevent the feet of seated passengers from protruding into any nearby stairwell or ramp, or

    c) a guard-rail or equivalent item has not been fitted:

        i. to the rearward side of any stairwell or ramp, if passengers can stand or sit behind the stairwell or ramp, or

        ii. to the forward side of the stairwell or ramp if there is a rearward- or sideways-facing seat in front of it, or if passengers can stand in front of it, or

    d) retractable steps do not comply with the requirements of the version of UN/ECE Regulation No. 36 which was applicable either:

        i. if they were fitted before the vehicle entered service as a passenger service vehicle in New Zealand, at the time when the vehicle entered service as a passenger service vehicle in New Zealand, or

        ii. if they were fitted after the vehicle entered service as a passenger service vehicle in New Zealand, at the time the steps were fitted.

5. If more than one step is provided, the rise from one step to the next is more than 300mm (Note 2).

6. The step depth from front edge to inner riser is less than 200mm (Note 2).

7. The step width parallel to the doorway is less than 550mm.

8. Where more than one step is provided, any intermediate step which is cut away to allow space for the door to open is less than 180mm deep and 250mm wide.

9. A wheelchair hoist and its attachment to a passenger service vehicle cannot be shown to comply with either:

    a) the design and construction requirements of the versions of Australian Standard 3856.1-1991 and Australian Standard 3856.2-1991 or AS/NZS 3856.1 1998 and AS/NZS 3856.2 1998 that were applicable at the time of attachment, or

b) or be certified by an HV certifier as complying with, or being equivalent to, the technical requirements of Australian Standard 3856.1-1991 and Australian Standard 3856.2-1991 or AS/NZS 3856.1 1998 and AS/NZS 3856.2 1998 that were applicable at the time of attachment, or

c) all the following requirements:

i. from the driving position, there must be an unobstructed view, either directly or indirectly, of the exterior and interior of the doorway used for entry and exit, and of the ramp and wheelchair parking position, or

ii. ramps must have a non-slip surface, and

iii. ramps must be at least 800mm wide, or at least 760mm wide with a 20mm high safety ridge along the side edges, and

iv. ramps that do not have a small safety ridge along the side edges, must have a conspicuous stripe, at least 20mm wide, along the side edges of the ramp, and

v. there must be adequate illumination of the fully extended ramp to enable safe use during the hours of darkness, and

vi. power-operated ramps must comply with all of the following requirements:

d) if the ramp cannot be seen clearly by the driver, a sensor must be fitted so that the ramp stops or retracts if it meets an obstruction before it is fully extended, and

e) a device must be fitted which gives audible warning while the ramp is extending or retracting, and

f) there must be a safety system to prevent the vehicle from moving off while the ramp is extended. If this system is incorporated in the vehicle's brake system, it must be known to be a design appropriate to that particular chassis and be installed as is appropriate for that particular chassis or must be approved and certified by a person authorised by the NZTA to do so, and

g) the ramp must be able to be operated manually in the event of a power failure, and

h) a ramp which is fully extended from a vehicle parked on a flat level surface must not have a gradient that is steeper than 1 in 4.

10. A restraint system for a wheelchair, or for a wheelchair and occupant:

a) does not comply with the design and construction requirements of the version of Australian Standard 2942-1987 or the version of AS2942-1994/Amdt1-1998 that was applicable at the time it was fitted, or

b) has not been certified by a person approved by the NZTA to show that it complies with, or is equivalent to, the technical requirements of the version of Australian Standard 2942-1987 which was applicable at the time it was fitted, or

c) does not comply with all of the following requirements:

i. there must be a horizontal handrail adjacent to the wheelchair parking position for wheelchair occupants to steady themselves while the passenger service vehicle is moving, and

ii. the wheelchair must be prevented from tipping backwards, and

iii. a head support must be fitted if the back of the wheelchair occupant's head would be against a window, bulkhead or partition, and

iv. a restraint system must be fitted to prevent the wheelchair from swinging out of position or tipping over, and

v. there must be a sign adjacent to the wheelchair parking position stating that the restraint system must be secured and the wheelchair's brakes applied, and

vi. the restraint system must include easily accessible quick-release mechanisms, and

vii. an HV certifier must certify that the seatbelt anchorage or alternative wheelchair restraint system complies with the version of Australian Design Rule 5/03 which was applicable at the time it was installed, or can withstand equal loadings in the case of an alternative restraint system.

Note 1

The following passenger service vehicles do not need to comply with this rule:

a) motor vehicles used in a service which are exempted from requiring a Transport Services Licence, as specified in the

Transport Services Licensing Act 1989,

b) motor vehicles which are specified as exempt vehicles in the Transport Services Licensing Act 1989,

c) ambulances designed to carry recumbent patients,

d) motor vehicles designed or modified for lawfully-detained persons,

e) New Zealand Defence Force dual-purpose trucks with removable seating,

f) New Zealand Defence Force armoured vehicles,

g) motor vehicles operated under a safety plan from the Occupational Safety and Health Service which are either:

i. used in venture tourism, or

ii. trailers designed, constructed and permitted to be drawn at a maximum speed of 50 km/h or less,

h) motorcycles and motorcycles with sidecars.

Note 2

The step dimension criteria specified in requirements 5 and 6 do not apply to:

a) a left-front passenger entrance providing access for less than three passenger seating positions, or

b) any entrance of an outdoor-access vehicle.

Note 3

A passenger service vehicle which has been modified on or after 1 September 1999 must comply with the requirements of this section which:

a) are relevant to that modification and to the vehicle, and

b) would be applicable to a vehicle entering service for the first time on that date.

Summary of legislation

Applicable references

- Australian Standard 2942–1987
- UN/ECE Regulation No. 52
- Australian Standard 3856.1–1991
- Australian Standard 3856.2–1991
- AS/NZS 3856.1 1998
- AS/NZS 3856.2 1998.

Applicable legislation

- **Land Transport Rule: Passenger Service Vehicles 1999**

Entry and exit steps and ramps (section 2.3)

1. Entry and exit steps and ramps must provide safe entry or exit for the occupants of a passenger service vehicle, and the step-tread surfaces must be of a non-slip material.

2. Permanent external steps and ramps on the side of the passenger service vehicle must not extend more than 20mm beyond the adjacent body line of the vehicle, and must be constructed so that they are not likely to injure any person.

3. Manually operated extending steps on the side of the passenger service vehicle must not extend more than 20mm beyond the adjacent body line of the vehicle, and must be constructed so that they are not likely to injure any person either when they are folded away or when they are in the extended position.

Entry and exit steps and ramps (section 2.4)

4. If the floor of a heavy passenger service vehicle at the entrance or exit door is more than 410mm above the surface of the level roadway, there must be a step or ramp which complies with the following requirements:

a) the distance from the ground to the tread surface of the lowest entrance level must be less than 410 mm when measured with the unladen vehicle:

i. on a flat horizontal surface, and

ii. if the height of the suspension can be adjusted from the driver’s seat, the vehicle is in its lowest suspension position, and

b) a panel must be fitted to prevent the feet of seated passengers from protruding into any nearby stairwell or ramp, and

c) a guard-rail or equivalent item must be fitted:

i. to the rearward side of any stairwell or ramp, if passengers can stand or sit behind the stairwell or ramp, and

ii. to the forward side of the stairwell or ramp if there is a rearward- or sideways-facing seat in front of it, or if passengers can stand in front of it, and

d) retractable steps must comply with the requirements of the version of UN/ECE Regulation No. 36 which was applicable either:

i. if they were fitted before the vehicle entered service as a passenger service vehicle in New Zealand, at the time when the vehicle entered service as a passenger service vehicle in New Zealand, or

ii. if they were fitted after the vehicle entered service as a passenger service vehicle in New Zealand, at the time the steps were fitted.

5. Entry and exit steps must meet the following dimensional requirements:

a) if more than one step is provided, the rise from one step to the next must be less than 300mm, and

b) the step depth from front edge to inner riser must be at least 200mm, and

c) the step width parallel to the doorway must be at least 550mm.

6. If more than one step is provided, any intermediate step which is cut away to allow space for the door to open must be at least 180mm deep and at least 250mm wide.

Wheelchair hoists and ramps (section 8.2)

7. A wheelchair hoist and its attachment to a passenger service vehicle must either:

a) comply with the design and construction requirements of the versions of Australian Standard 3856.1-1991 and Australian Standard 3856.2-1991 or AS/NZS 3856.1 1998 and AS/NZS 3856.2 1998 that were applicable at the time of attachment, or

b) be certified in accordance with **Land Transport Rule: Vehicle Standards Compliance 2002** as complying with, or being equivalent to, the technical requirements of Australian Standard 3856.1-1991 and Australian Standard 3856.2-1991 or AS/NZS 3856.1 1998 and AS/NZS 3856.2 1998 that were applicable at the time of attachment.

8. A wheelchair ramp and its fitting to a passenger service vehicle must:

a) comply with the design and construction requirements of the versions of Australian Standard 3856.1-1991 and Australian Standard 3856.2-1991 that were applicable at the time of attachment, or

b) be certified in accordance with **Land Transport Rule: Vehicle Standards Compliance 2002** as complying with, or being equivalent to, the technical requirements of Australian Standard 3856.1-1991 and Australian Standard 3856.2-1991 thatwere applicable at the time of attachment, or

c) comply with all the following requirements:

i. from the driving position, there must be an unobstructed view, either directly or indirectly, of the exterior and interior of the doorway used for entry and exit, and of the ramp and wheelchair parking position, and

ii. ramps must have a non-slip surface, and

iii. ramps must be at least 800mm wide, or at least 760mm wide with a 20mm high safety ridge along the side edges, and

iv. ramps that do not have a small safety ridge along the side edges, must have a conspicuous stripe, at least 20mm wide, along the side edges of the ramp, and

v. there must be adequate illumination of the fully extended ramp to enable safe use during the hours of darkness, and

vi. power-operated ramps must comply with all of the following requirements:

d) if the ramp cannot be seen clearly by the driver, a sensor must be fitted so that the ramp stops or retracts if it meets an obstruction before it is fully extended, and

e) a device must be fitted which gives audible warning while the ramp is extending or retracting, and

f) there must be a safety system to prevent the vehicle from moving off while the ramp is extended. If this system is incorporated in the vehicle's brake system, it must be known to be a design appropriate to that particular chassis and be installed as is appropriate for that particular chassis or must be approved and certified by a person authorised by the NZTA to do so, and

g) the ramp must be able to be operated manually in the event of a power failure, and

h) a ramp which is fully extended from a vehicle parked on a flat level surface must not have a gradient that is steeper than 1 in 4.

Wheelchair and wheelchair-occupant restraints (section 8.4)

9. A restraint system for a wheelchair, or for a wheelchair and occupant, must:

a) comply with the design and construction requirements of the version of Australian Standard 2942-1987 version of AS2942-1994/Amdt1-1998 that was applicable at the time it was fitted, or

b) be certified in accordance with **Land Transport Rule: Vehicle Standards Compliance 2002** to show that it complies with, or is equivalent to, the technical requirements of the version of Australian Standard 2942-1987 that was applicable at the time it was fitted, or

c) comply with all of the following requirements:

i. there must be a horizontal handrail adjacent to the wheelchair parking position for wheelchair occupants to steady themselves while the passenger service vehicle is moving, and

ii. the wheelchair must be prevented from tipping backwards, and

iii. a head support must be fitted if the back of the wheelchair occupant's head would be against a window, bulkhead or partition, and

iv. a restraint system must be fitted to prevent the wheelchair from swinging out of position or tipping over, and

v. there must be a sign adjacent to the wheelchair parking position stating that the restraint system must be secured and the wheelchair's brakes applied, and

vi. the restraint system must include easily accessible quick-release mechanisms, and

vii. a person authorised by the NZTA must certify that the seatbelt anchorage or alternative wheelchair restraint system complies with the version of Australian Design Rule 5/03 which was applicable at the time it was installed, or can withstand equal loadings in the case of an alternative restraint system.

6-3 Seats and seat anchorages

The vehicle must comply with the requirements of the VIRM: In-service certification:

- **General vehicles 7-1: Seats and seat anchorages**
- **Heavy vehicles 7-1: Seats and seat anchorages**

Page amended **1 October 2020** (see **amendment details**)

7 Vehicle dynamic performance

7-1 PSV rollover

Certifier categories: **HVEC** | **HVCD**

Reasons for rejection

1. The structural strength of a passenger service vehicle is insufficient to provide reasonable protection for the occupants in the event of roof or wall deformation resulting from the vehicle rolling over.

2. The body of a passenger service vehicle is not fit for its purpose and securely fixed to the chassis.

3. The superstructure is not of robust design, and made of materials fit for the purpose.

4. The structural strength of the vehicle has deteriorated from:

    a) corrosion, or

    b) other damage, or

    c) modifications.

5. A heavy motor vehicle which entered service as a passenger service vehicle in New Zealand on or after 1 September 1999, or whose structure was modified after that date, does not comply with the version of at least one of the following vehicle standards which was applicable at the time the vehicle entered service as a passenger service vehicle in New Zealand or at the time of the modification:

    a) one of the four options of UN/ECE Regulation No. 66, or

    b) one of the four options of Australian Design Rule 59/00, or

    c) the heavy passenger service vehicle cannot be demonstrated to withstand, without permanent deformation, the simultaneous application of forces as follows:

        i. a force, equivalent to the weight of half the gross vehicle mass, applied horizontally at right angles to the longitudinal centreline of the vehicle at the cant-rail or at the topmost corner of the body, and

        ii. a force, equivalent to the unladen weight of the vehicle, applied vertically downwards at the same cant-rail or corner, and

        iii. the distribution of these forces must be at least approximately proportional to that of the gross vehicle mass along the length of the vehicle.

6. Compliance with the PSV strength requirements, when the vehicle has not been complied to a standard, has not been established by either:

    a) a full-scale test, or

    b) calculation.

7. If compliance with the PSV strength requirements is to be established by a full-scale test on the completed frame on its chassis:

    a) the heavy passenger service vehicle was not on a level surface, or

b) if the applied forces would cause the vehicle to tilt, restraint was not applied to the chassis or running gear so that the vehicle remains approximately in its normal upright position.

8. If the body structure is wholly or partly constructed of non-metallic materials, the full-scale test required for the PSV strength requirements has resulted in:

a) a permanent deformation, or

b) a local failure point, or

c) failure of the attachment to the chassis.

9. If compliance with the PSV strength requirements was established by calculation, for a heavy passenger service vehicle with a structure composed wholly or partly of non-metallic materials or metallic materials of unknown yield stress, the calculation was not based on the aggregated strength of the vehicle's ring-frames or body sections.

10. The strength of each ring-frame or body section as required for calculations if not known, was not established by physical testing.

11. The strength rating to be assigned to the ring-frame or body section from the physical testing of a ring-frame or body section is not the load at which the first point of failure occurred.

12. The ring-frame or body section was not tested until the second and third points of failure occurred.

13. The second point of failure to the ring-frame or body section is not within 65% to 85% of the rating given to the ring-frame or body section.

14. The third point of failure to the ring-frame or body section is not within 40% to 60% of the rating given to the ring-frame or body section.

15. A ring-frame or body section that is not identical in profile and construction to one previously tested uses the same rating as the tested ring-frame or body section.

16. If compliance with the PSV strength requirements is established by calculation for a heavy passenger service vehicle with a structure composed wholly of metallic material of known yield stress, the calculation was not carried out by:

a) finite element stress analysis, or

b) the simplified calculation method, or

c) other calculation methods approved by the NZTA for this purpose.

17. If compliance with the PSV strength requirements was established by finite element stress analysis for a heavy passenger service vehicle with a structure composed wholly of metallic material of known yield stress:

a) it did not include at least the whole body-frame structure (including the side-wall-to-floor-frame attachment and the body-frame-to-chassis attachment), or

b) butt-welded and mechanical joints were not separately assessed and justified, if necessary by means of mechanical tests, or

c) any assumption made on the performance of joints or other parts of the structure were not shown to be justified, if necessary, by means of tests, or

d) the calculation did not include an appropriate allowance for deterioration during the expected life of the vehicle, having regard to the material of the structure, the specific manufacturing technology, and the conditions under which the vehicle is likely to be operated.

18. If compliance with the PSV strength requirements was established by the simplified calculation method for a heavy passenger service vehicle with a structure composed wholly of metallic material of known yield stress, the following assumptions were not justified:

a) the horizontal force is equivalent to half the unladen weight, instead of half the gross vehicle mass, or

b) the roof is a rigid structure, or

c) the body is a rigid structure below the waistline, or

d) glazing makes no contribution to the structural strength, or

e) the window pillars are encased at the waistline, or

f) the roof-to-pillar attachment is of a hinged type, or

g) the load, imposed by the horizontal force, is shared by the pillars, and the distribution of load is statically indeterminate, or

h) the load, imposed by the vertical force, is shared by the pillars which are connected to the cant-rail where the force is applied, and the distribution of the load must be proportional to the area of the cross-section of the pillars.

19. If the simplified calculation method is used, the calculation did not include an appropriate allowance for deterioration during the expected life of the vehicle, having regard to the material of the structure, the specific manufacturing technology, and the conditions under which the vehicle is likely to be operated.

20. Compliance with the PSV strength requirements was not certified by a HVEC or HMCD certifier.

21. Any test equipment has not been certified by an organisation accredited by Joint Accreditation System of Australia and New Zealand.

Summary of legislation

Applicable references

- UN/ECE Regulation No. 66
- Australian Design Rule 59/00.

Applicable legislation

- **Land Transport Rule: Passenger Service Vehicles 1999**

Passenger Service Vehicles 1999 (section 7)

Structural strength

1. The structural strength of a passenger service vehicle must be sufficient to provide reasonable protection for the occupants in the event of roof or wall deformation resulting from the vehicle rolling over.

2. The body of a passenger service vehicle must be fit for its purpose and securely fixed to the chassis. The superstructure must be of robust design, and must be made of materials fit for the purpose.

3. The structural strength must be maintained throughout the service life of the passenger service vehicle.

Additional provisions for heavy passenger service vehicles

4. A heavy motor vehicle which entered service as a passenger service vehicle in New Zealand on or after 1 September 1999, or whose structure was modified after that date, must comply with the version of at least one of the following vehicle standards which was applicable at the time the vehicle entered service as a passenger service vehicle in New Zealand or at the time of the modification:

a) one of the four options of UN/ECE Regulation No. 66, or

b) one of the four options of Australian Design Rule 59/00, or

c) the structural strength specifications in requirements 9 to 20 below.

Structural Strength specifications for heavy motor vehicles

5. The heavy passenger service vehicle must be able to withstand, without permanent deformation, the simultaneous application of forces as follows:

a) a force, equivalent to:

i. the weight of half the gross vehicle mass, applied horizontally at right angles to the longitudinal centre line of the vehicle at the cant-rail or at the topmost corner of the body, and

ii. the unladen weight of the vehicle, applied vertically downwards at the same cant-rail or corner, and

b) the distribution of these forces must be at least approximately proportional to that of the gross vehicle mass along the length of the vehicle.

6. Compliance with requirement 6 must be established by either:

a) a full-scale test, or

b) calculation.

7. If compliance with requirement 6 is established by a full-scale test on the completed frame on its chassis:

a) the heavy passenger service vehicle must be on a level surface, and

b) if the applied forces would cause the vehicle to tilt, restraint must be applied to the chassis or running gear so that the vehicle remains approximately in its normal upright position.

8. If the body structure is wholly or partly constructed of non-metallic materials, the full-scale test in requirement 8 must not result in:

a) a permanent deformation, or

b) a local failure point, or

c) failure of the attachment to the chassis.

9. If compliance with requirement 6 is established by calculation, for a heavy passenger service vehicle with a structure composed wholly or partly of non-metallic materials or metallic materials of unknown yield stress, the calculation must be based on the aggregated strength of the vehicle’s ring-frames or body sections.

10. If the strength of each ring-frame or body section as required for calculations under requirement 10 is not known, this must be established by:

a) carrying out physical testing on a ring-frame or body section to establish the load at which the first point of failure occurs, and this is the strength rating to be assigned to the ring-frame or body section,

b) testing further to establish the loads at the second and third points of failure, with the result that the load at the second point of failure must be within 65% to 85% of the rating and the load at the third point of failure must be within 40% to 60% of the rating,

c) repeating the test on any ring-frame or body section that is not identical in profile and construction to one previously tested, until the strength rating of all ring-frames or body sections of the vehicle are known.

11. If compliance with requirement 6 is established by calculation for a heavy passenger service vehicle with a structure composed wholly of metallic material of known yield stress, the calculation must be carried out by:

a) finite element stress analysis, according to requirement 12, or

b) the simplified calculation method, according to requirement 13, or

c) other calculation methods approved by the NZTA for this purpose.

12. If compliance with requirement 6 is established by finite element stress analysis for a heavy passenger service vehicle with a structure composed wholly of metallic material of known yield stress:

a) it must include at least the whole body frame structure (including the side-wall-to-floor-frame attachment and the body-frame-to-chassis attachment), and

b) butt-welded and mechanical joints must be separately assessed and justified, if necessary by means of mechanical tests, and

c) any assumption made on the performance of joints or other parts of the structure must be shown to be justified, if necessary, by means of tests, and

d) the calculation must include an appropriate allowance for deterioration during the expected life of the vehicle, having regard to the material of the structure, the specific manufacturing technology, and the conditions under which the vehicle is likely to be operated.

13. If compliance with requirement 6 is established by the simplified calculation method for a heavy passenger service vehicle with a structure composed wholly of metallic material of known yield stress, the following assumptions must be made:

a) the horizontal force is equivalent to half the unladen weight, instead of the force defined in requirement 8(a)(i),

b) the roof is a rigid structure,

c) the body is a rigid structure below the waistline,

d) glazing makes no contribution to the structural strength,

e) the window pillars are encastre at the waistline,

f) the roof-to-pillar attachment is of a hinged type,

g) the load, imposed by the horizontal force, is shared by the pillars, and the distribution of load is statically indeterminate, it must be calculated on the basis of the flexible deflection of the pillars, and the deflection of each pillar is proportional to its L/IE factor and to the load imposed on it (where L = length of the pillar, I = moment of inertia, E = Young’s modulus),

h) the load, imposed by the vertical force, is shared by the pillars which are connected to the cant-rail where the force is applied, and the distribution of the load must be proportional to the area of the cross-section of the pillars.

14. If the simplified calculation method specified in requirement 14 above is used, the calculation must include an appropriate allowance for deterioration during the expected life of the vehicle, having regard to the material of the

structure, the specific manufacturing technology, and the conditions under which the vehicle is likely to be operated.

15. Compliance with the requirement 6 above must be certified by a HVEC or HMCD certifier.

16. Any test equipment must be certified by an organisation accredited by Joint Accreditation System of Australia and New Zealand.

7-2 PSV static rollover

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1. A motor vehicle that entered service as a passenger service vehicle in NZ on or after 1 July 2000 with a floor not more than 2m above the ground cannot achieve a sideways tilt of 35 degrees when tested.

2. A motor vehicle that entered service as a passenger service vehicle in NZ on or after 1 July 2000 with a floor not more than 2m above the ground cannot achieve a sideways tilt of 28 degrees when tested (Note 3). During testing the passenger service vehicle:

a) was not loaded with weights representing the occupants mass in accordance with the deemed mass in all seating positions on the upper deck of a double-decked vehicle and in all seating positions on a single decked vehicle, or

b) roof rack, if fitted, was not loaded with the maximum permitted load, or

c) suspension system was not in the uppermost position on a vehicle with a variable suspension system, or

d) tilt platform stop to prevent the lower wheels of the passenger service vehicle from slipping sideways exceeds the height from the tilt platform to the bottom edge of the wheel rim, or

e) lightweight strop fitted between the higher side of the passenger service vehicle and the platform to prevent the vehicle from rolling over has an influence on the test, or

f) stability test and the checking of the accuracy of the test equipment was not carried out under the guidance of a HVEC certifier.

4. The proof of the vehicle meeting the stability angle is not:

a) written documentation from the vehicle manufacturer, or

b) type approval, or

c) calculations, if the CoG can be established within 50mm of the longtitudinal centreline, or

d) practical testing.

5. The documentation for certification is incomplete.

Note 1

The deemed mass of each occupant is:

a) 80kg for adult occupants, and

b) 65kg for secondary school pupils, and

c) 55kg for intermediate school pupils, and

d) 42kg for primary school pupils.

Note 2

The CoG in the chassis rating is valid for the unladen vehicle in the configuration as approved in Japan.

This itself is not sufficient to establish the that the vehicle, which may be modified in NZ prior to registration, would comply with the stability requirements in the PSV Rule.

However, this data can be used, as one of the input data, when the position of the CoG of the modified and laden vehicle is determined, which can the be directly used to establish compliance.

Other input data to such a calculation could and should also include the number and position of passengers, mass and position of any toilet and kitchen facilities and equipment including water sontainment, mass & position of any air conditioning equipment, roof rack capacity and the position of the load on it, and other item that may be relevant.

Note 3

Fitting a roof rack to a PSV is a modification requiring certification by a HVEC and may require recalculation or testing of the vehicle's stability.

Summary of legislation

Applicable references

- UN/ECE Regulation No. 66
- Australian Design Rule 59/00.

Applicable legislation

- **Land Transport Rule: Passenger Service Vehicles 1999**

Passenger Service Vehicles 1999 (section 7)

Stability requirements

1. A motor vehicle which entered service as a passenger service vehicle in New Zealand on or after 1 July 2000 must be stable under the following conditions of static tilt:

a) a vehicle with a floor not more than 2m above the ground, and loaded with the deemed passenger weight (Note 1) in all positions on the upper deck of a double-decked vehicle and in all seating positions on a single-decked vehicle and the maximum weight for the roof rack, must be stable on a surface which is subjected to a sideways tilt of 35 degrees, as demonstrated by one of the following methods:

i. written documentation from the vehicle manufacturer, or

ii. type approval, or

iii. calculations, if the centre of gravity can be established within 50mm of the longitudinal centreline, or

iv. practical testing carried out in accordance with requirement with the following conditions:

b) the passenger service vehicle must be loaded with weights, representing the occupants' mass in accordance with the deemed mass (Note 1) in all seating positions on the upper deck of a double-decked vehicle and in all seating positions on a single-decked vehicle,

c) the roof-rack, if fitted, must also be loaded with the maximum permitted load,

d) a passenger service vehicle with a variable suspension system must be tested with the suspension system in the uppermost position,

e) the tilt platform may be fitted with a stop to prevent the lower wheels of the passenger service vehicle from slipping sideways, however, this stop must not exceed the height of the tyres, from the tilt platform to the bottom edge of the wheel rim,

f) a lightweight strop of sufficient strength may be fitted between the higher side of the passenger service vehicle and the platform to prevent the vehicle from rolling over, and the strop must be fitted in a suitable way while keeping its influence on the test to a minimum,

g) if the centre of gravity of the passenger service vehicle, loaded according to requirement 2, as determined by a certifier, is not within 50mm of the longitudinal centreline, the vehicle must be tested by being tilted to the side of the centre of gravity,

h) the stability test and the checking of the accuracy of the test equipment must be carried out under the guidance of a person authorised by the NZTA, and that person must certify that this specification has been complied with,

i) a vehicle with a floor 2m or more above the ground, and loaded with the deemed passenger weight in all positions on the upper deck of a double-decked vehicle and in all seating positions on a single-decked vehicle and the maximum weight for the roof rack, must be stable on a surface which is subjected to a sideways tilt of 28 degrees, as demonstrated by one of the following methods:

i. written documentation from the vehicle manufacturer, or

ii. type approval, or

iii. calculations, if the centre of gravity can be proven within 50mm, or

iv. practical testing carried out in accordance with the following conditions:

j) the passenger service vehicle must be loaded with weights, representing the occupants' mass in accordance with the deemed mass (Note 1) in all seating positions on the upper deck of a double-decked vehicle and in all seating positions on a single-decked vehicle,

k) the roof-rack, if fitted, must also be loaded with the maximum permitted load,

l) a passenger service vehicle with a variable suspension system must be tested with the suspension system in the uppermost position,

m) the tilt platform may be fitted with a stop to prevent the lower wheels of the passenger service vehicle from slipping sideways, however, this stop must not exceed the height of the tyres, from the tilt platform to the bottom edge of the wheel rim,

n) a lightweight strop of sufficient strength may be fitted between the higher side of the passenger service vehicle and the platform to prevent the vehicle from rolling over, and the strop must be fitted in a suitable way while keeping its influence on the test to a minimum,

o) if the centre of gravity of the passenger service vehicle, loaded according to this requirement, as determined by a certifier, is not within 50mm of the longitudinal centreline, the vehicle must be tested by being tilted to the side of the centre of gravity,

p) the stability test and the checking of the accuracy of the test equipment must be carried out under the guidance of a person authorised by the NZTA, and that person must certify that this specification has been complied with.

7-3 Static roll threshold (SRT)

Certifier categories: **HVS1** | **HVS2** | **HVS3**

Reasons for rejection

1. A class TD vehicle that must comply with SRT and be certified has an assessment below 0.35g (Note 1).

2. The method of calculating the SRT was not:

a) a physical test of the vehicle on a tilt table according to the procedure in SAE J2180 – Dec 1998 or by a procedure approved by International Accreditation New Zealand (IANZ), or

b) a method approved by the Transport Agency and published on the Transport Agency's website.

3. The load height has been incorrectly determined.

4. The load mass has been incorrectly determined.

5. Incorrect information has been input into the SRT calculator.

6. The load configuration used to calculate the centre of gravity of the load was not based on:

a) mixed freight, or

b) uniform density,

c) other loads.

7. For mixed freight 70% of the load mass was not used for the bottom half and 30% of the load mass for the top half of the load space.

8. For uniform density freight the centre of gravity has not been placed midway between the load bed and the load height.

9. The combination of load height and mass is inappropriate for the particular type of deck or body fitted to the vehicle.

10. A motor vehicle with retractable axles has not had the SRT calculated with the retractable axle in the non-retracted position.

11. The deck or body fitted to the vehicle has been changed and the SRT has not been recertified.

12. A semi trailer carrying import/export containers on an overweight permit has not had its SRT calculated in accordance with **Technical bulletin 8** and its amendments.

Note 1

The following vehicles of class NC and class TD do not have to comply with the minimum SRT requirements:

a) a vehicle of class NC that does not have a deck or body on which to carry a load and is fitted with a turntable coupling to tow a semi-trailer

b) a vehicle operating under *section 6*, or with a vehicle axle index above 1.1 and operating under an overweight permit, or both, provided that the operator of the vehicle complies with the conditions of the permit and the applicable requirements in section 6

c) a vehicle that is being used on a road or portion of a road that is designated as a road construction zone under *regulation 12* of the *Heavy Motor Vehicle Regulations 1974*

d) a vehicle that is being used on a road or portion of a road that is a roadworks zone approved by the road controlling authority

e) a vehicle that is not normally used on a road and that a road controlling authority has authorised to cross a road

f) a vehicle that is designed exclusively for transporting earth or other bulk material and that may only be used unladen on a road

g) a vehicle with a tipping body, but only when the tipping body is raised for the purpose of discharging a load at low speed

h) a vehicle recovery service vehicle that is principally designed to tow or transport a heavy motor vehicle;

i) a vehicle first registered before 1 January 1940

k)For the avoidance of doubt, a high-productivity motor vehicle must comply with the minimum SRT requirements, except if the vehicle is a vehicle described in *(g).*

Note 2

X1/Y1 represents the maximum allowable load height (X1) of the vehicle that is used to calculate the maximum safe gross mass (Y1) of the vehicle to meet an SRT of 0.35g.

Y2/X2 represents the maximum allowable gross mass (Y2) of the vehicle when loaded that is used to calculate the maximum safe load height (X2) of the vehicle to meet an SRT of 0.35g.

The procedure is fully explained in Summary of legislation 6 to 10.

Note 3

Level 1 assessment (HVS1):

Level 1 assessment is the most basic and requires minimal data, the computer programme relies on a number of generic default values for assessing the vehicle's performance. It also makes assumptions about the centre of gravity of the load, by offering two typical load scenarios, mixed freight or uniform density load. The use of Level 1 is not permitted when calculating SRT for overweight permits

Level 1 assessment caters for the following type situations:

a) full trailers (including pole trailers) with stanchions or relatively flat decks, or

b) semi-trailers: (flat decks, step-decks such as in low loaders or B-trains), or

c) simple trailers with relatively flat decks when:

i. carrying a load of uniform density (the centre of gravity is halfway up the load), or

ii. carrying a load of mixed freight (the centre of gravity is equivalent to 40% of the load height taken from the base of the load).

Note 4

Level 2 assessment (HVS2):

Level 2 assessment requires more detailed data about the vehicle's mechanical characteristics such as the actual stiffness values of the suspension and load characteristics.

This level also caters for scenarios where the load's centre of gravity cannot easily be assumed. Typical examples include irregular or complex shaped hoppers, body shapes of irregular cross section, non-uniform loads such as construction machinery and equipment.***** With these cases a Level 2 SRT Certifying Engineer must assess the vehicle.

A Level 2 assessment must be the basis for SRT certification when an operator is applying for an overweight permit to carry import/export containers as explained in **Technical bulletin 8** and its amendments.

***** Alternatively, the SRT mass and height limits for construction machinery and equipment carried on one of the level 1 trailers (as above) may be considered by level 1 assessment and taken to be the same as for a uniform density load, however this alternative is conservative with regard to mass and height limits.

Note 5

Level 3 assessment (HVS3):

Level 3 assessment is a practical assessment of the static roll performance and requires the test to be carried out to the requirements of SAE J2180 – Dec 1998 of the American Society of Automotive Engineers using a full size tilt table.

This level of certification is valid for all SRT requirements.

Note 6

The Transport Agency-approved SRT Certifier or SRT Vehicle Inspector will assess the vehicle's rollover performance at the maximum legal mass limits and maximum allowable load heights. The mass limits will be assessed at maximum potential axle set limits or a lower limit controlled by trailer/truck mass ratio if applicable.

If the operator carries overweight loads under the overweight permits, they may elect to increase the mass limit to a vehicle axle index (VAI) of 1.1. Unless the vehicle has a body that restricts the load height, the assessment will be undertaken at 4.3m. If the trailer at maximum potential load mass and height meets or exceeds the 0.35g SRT requirement, then an SRT certificate can be issued. The Certificate of Loading will be endorsed with these values. Alternative certification scenarios are covered in **Technical bulletin 8** and its amendments.

Note 7

If the trailer at maximum potential load mass and height meets or exceeds the 0.35g SRT requirement, then an SRT certificate can be issued. The Certificate of Loading will be endorsed with the maximum load and height values.

Note 8

SRT requirements for HPMV vehicles and vehicles operating on 'O' permits and carrying import and export containers are covered in **Technical bulletin 7**, **Technical bulletin 8**, **Technical bulletin 10**

Summary of legislation

Applicable references

- SAE J2180 – Dec 1998 of the American Society of Automotive Engineers.

Applicable legislation

- **Land Transport Rule: Vehicle Dimensions and Mass 2016**

Vehicle Dimension and Mass (section 3)

Section 3

Static Roll Threshold (SRT) performance requirements

Scope of this section

This section sets out Static Roll Threshold (SRT) performance requirements for heavy motor vehicles. These requirements are intended to ensure the stability of heavy motor vehicles when negotiating corners within posted advisory speeds, and when undertaking evasive manoeuvres to avoid a collision .

Minimum SRT values

1. Unless exempt (Note 1) a vehicle of class NC or class TD, whether laden or unladen, must comply with an SRT of at least 0.35g.

3.3 Compliance with SRT

2. A vehicle of class TD, other than an exempt vehicle (Note 1), that is first registered on or after 1 July 2002 and is required to comply with the SRT specified in *1*, must be certified for SRT in accordance with 7 to 9 if it has a body height or load height above the ground that exceeds 2.8m.

3. A vehicle of class NC, other than an exempt vehicle, must:

a) comply with the SRT specified in *1*, and

b) if checked for compliance with SRT, have the SRT determined by one of the methods specified in *7*.

Methods for determining SRT

4. SRT must be determined by one of the following methods:

a) a physical test of the vehicle on a tilt table according to the procedure in the *SAEJ2180-DEC 1998 of The American Societyof Automotive Engineers* and carried out using a procedure approved by International Accreditation New Zealand, or

b) a calculation using the “SRT Calculator” computer program approved by the Transport Agency, or

c) a method approved by the Transport Agency and published on the Transport Agency’s website .

Determining the appropriate loading of a vehicle

5. The following procedures must be applied to determine the appropriate vehicle loading:

a) for mixed freight loads and uniform density loads:

i. if the vehicle is loaded to the maximum internal body height or to the maximum height specified in *schedule 4* of the **Vehicle Dimension and Mass Rule**, the maximum allowable gross mass must be determined

ii. if the vehicle is loaded to the maximum allowable gross mass specified in *schedule 4* of the **Vehicle Dimension and Mass Rule**, the maximum allowable load height must be determined

b) for all other loads, for a particular height above ground level of the centre of gravity of the load, the maximum allowable gross mass of the vehicle and its load must be determined.

6. The combination of load height and load mass in *6* applies for a particular standard type of loading that must be appropriate for the particular type of deck or body with which a heavy motor vehicle is fitted, and must be one of the following types of load:

a) mixed freight, where 70% of the load mass is in the bottom half of the load space and 30% of the load mass is in the top half of the load space

b) uniform density, where the load is uniformly distributed between the load bed and the top of the load so that the centre of gravity of the load lies midway between the load bed and the load height

c) “other loads”, where the height above ground of the centre of gravity of the load is entered in the calculation.

7. If the deck or body fitted on a heavy motor vehicle is changed to allow a different type of load to be carried, the SRT must be determined, and the vehicle recertified, for the new loading.

8. A motor vehicle with a retractable axle or axles must be assessed under the procedures in *3.16(4)* of the **Vehicle Dimension and Mass Rule** with its axles in a non retracted position.

9. For a load of logs, the maximum allowable load height shall be determined by the following method:

a) measuring the height above ground of the highest point of the load, and

b) if the height in *(a)* does not comply with the SRT, then measuring the height above ground of the highest point at each end of the highest packet and calculating an average of the two measurements, and

c) if the height in *(a)* or *(b)* does not comply with the SRT, and the load comprises multiple packets and the highest points of all of the packets differ in height by no more than 1m, measuring the average height of each packet by the method described in *(b)* and calculating an average height of all packets.

Certifying results of SRT test

10. SRT test results must be:

a) verified for compliance with loading and mass specifications by a vehicle inspector or an inspecting organisation, and

b) specified in a document of compliance that complies with a form approved by the Transport Agency.

11. SRT test results must be displayed on a vehicle's certificate of loading with the options for load height and gross mass specified on the certificate as follows:

‘SRT 0.35g X1/Y1, Y2/X2

where:

X1 = maximum allowable load height above ground in metres to two decimal places

Y1 = maximum safe gross mass to nearest tonne to meet SRT of 0.35 g

Y2 = maximum allowable gross mass to nearest tonne

X2 = maximum safe load height above ground in metres to two decimal places to meet SRT of 0.35g' (Note 2)

Page amended **1 February 2017** (see **amendment details**).

7-4 Swept path

Certifier categories: **HVP1** | **HVP2**

Background

The Land Transport Rule Vehicle Dimensions and Mass 2016 (the Rule) specifies requirements for dimensions and mass limits for vehicles operating on New Zealand roads. The Rule sets in place a regulatory regime so that vehicles are operated safely.

The Rule includes requirements for overdimension vehicles including travel restrictions and piloting to manage the risk to public safety. The Rule also recognises that with appropriate design an overdimension vehicle can be configured to perform cornering manoeuvres and use no greater road space than a maximum size standard vehicle. Therefore the Rule provides for the road space requirements (swept path) of overdimension vehicles to be assessed and if appropriate be exempt from certain specific requirements in the Rule.

While not generally overdimension vehicles, the Rule also contains an exemption for certain classes of buses in respect of determining over-length or forward distance limits based on swept path performance measures.

The assessments for swept path compliance are to be carried out by a heavy vehicle specialist certifier by using a method approved by NZTA published on the NZTA website.

The following lists the provisions of the Rule which provide swept-path based exceptions and the performance measures applying to each provision.

Exception	Performance measure
Section 3.5(1) A bicycle rack fitted to the front of a bus of Class MD3, MD4 or ME is not included in determining the overall length or forward-distance. Specialist certification is not required when a vehicle of class MD3, MD4, or ME is fitted with a bicycle rack which has dimensions within the criteria specified in **Land Transport Rule: Vehicle Dimensions and Mass 2016 (Bicycle Racks on Urban Buses) Class Exemption Notice 2022**	1. Swept width must not exceed 7.0m 2. Frontal swing must not exceed 1.5m 3. Steady state low speed swept width must not exceed 5.25m
Section 6.9(1) A Category 2 overdimension motor vehicle may be operated in accordance with the operating requirements for a Category 1 overdimension motor vehicle, provided any load or equipment carried by or attached to the vehicle does not exceed the maximum dimensions specified by the vehicle inspector or inspecting organisation.	Not exceed 4.7m through a 90-degree turn inside a 50m radius wall at up to 5km/h
Section 6.28(1) A Category 1 or Category 2 overdimension vehicle does not have to comply with travel time requirements in sections 6.21(2), 6.22(2), or 6.22(3) of the Rule provided that the vehicle or any load or equipment it carries does not project outside the land in which it is traveling. Note: Ground spreader trucks operated without a trailer or towing a trailer not exceeding 2.55m in width and agricultural vehicles are also exempt the time travel requirements.	1. Swept width must not exceed 7.0m 2. Tail swing must not exceed 0.3m 3. Frontal swing must not exceed 0.75m 4. Steady state low speed swept width must not exceed 5.25m
Section 6.33(3) A motor vehicle whose dimensions are within Category 1 and whose width does not exceed 3.1m does not have to be escorted by a class 2 pilot vehicle. Note there are limitations to this exemptions set out in section 6.33(2) of the Rule.	1. Swept width must not exceed 7.0m 2. Tail swing must not exceed 0.3m 3. Frontal swing must not exceed 0.75m 4. Steady state low speed swept width must not exceed 5.25m

Exception	Performance measure
Section 6.34(4) An overdimension vehicle within Category 2 may be escorted by at least one class 2 pilot vehicle. (By contrast if the performance requirement is not met, at least one class 1 pilot vehicle and one class 2 pilot vehicle are required).	Not exceed 4.7m through a 90-degree turn inside a 50m radius wall at up to 5km/h

Certificates of compliance for swept path performance

- **Bicycle rack fitted to the front of a bus of class MD3, MD4 or ME is not included in determining the overall length or forward distance**
- **Giving a Category 2 overdimension vehicle the right to operate in accordance with Category 1 overdimension operating requirements**
- **Providing exemption from the travel time restrictions for an overdimension vehicle**
- **Providing exemption for an overdimension vehicle within category 2 from the requirement to have at least one Class 1 pilot vehicle and one Class 2 pilot vehicle**
- **Providing exemption from class 2 pilot vehicle escort**

Page amended **7 October 2022** (see **amendment details**).

7-5 Dynamic performance

Certifier category: **HVP2**

Reasons for rejection

1. A high productivity vehicle that is not a pro forma vehicle is not certified to the requirements of the Rule.

2. A pro forma vehicle has not been approved as a high productivity vehicle.

3. A high productivity vehicle has been certified by a HVS certifier with the incorrect category.

4. A high productivity vehicle has not been certified using the appropriate methodology (PBS or approved alternative) (Note 1).

5. A vehicle certified as a pro forma high productivity heavy vehicle does not have general access to the road network over 44 tonne.

6. A vehicle certified as a high productivity heavy vehicle but is not a pro forma or PBS vehicle has general access to the road network.

7. A vehicle certified as a high productivity does not have the equivalent safety performance as a standard motor vehicle for the proposed roads to be used under the permit.

8. A vehicle certified as a high productivity vehicle does not meet the applicable axle and axle set requirements and the gross mass limits in parts 3 and 4 of *Schedule 3*.

9. the towing vehicle in a combination certified as a high productivity vehicle does not have at least two motor driven axles in a tandem or tri axle set when operating above 39 tonne.

10. A semi-trailer certified as a high productivity vehicle that is not in a B-train does not have a tri-axle or quad-axle set with no more than one steering axle when operating above 44 tonne.

11. A semi-trailer certified as a high productivity vehicle that is in a B-train and does not have either a tandem or tri-axle set when operating above 44 tonne when operating above 44 tonne.

12. A full trailer that is certified as part of a high productivity combination does not have either two tandem axle sets or one tandem axle set and one tri-axle set.

13. A vehicle operating as a high-productivity motor vehicle has a gross mass which exceeds the gross vehicle mass, gross combination mass, maximum towed mass, or brake code mass if any of these limits apply to the vehicle.

14. A vehicle certified as a high productivity vehicle has been certified with a gross mass, axle mass, or dimension requirements less than that specified in the permit or the applicable requirements in the Rule.

15. A vehicle being operated as part of a combination vehicle on a 50Max permit does not have sufficient axles to ensure the dedicated combination it operates in has a minimum of 9 axles.

16. A vehicle operating as a high productivity vehicle operates outside the width or height dimension limits and does not have an exemption.

17. A vehicle operating as a high-productivity motor vehicle does not comply with the requirements of the Rule.

Note 1

For further information:

- **Vehicle dimension and mass permitting manual** (NZTA website)
- **HPMV permit questions and answers** (NZTA website)

Table 7-5-1. Dimension requirements[1] for vehicles and vehicle combinations

Dimension	Distance (metres except where indicated otherwise)
Width[2]	
Two-wheeled vehicles of classes AA, AB, LA, and LC	1.1
All other vehicles	2.55, or 1.275 from each side of the longitudinal centre-line of the vehicle
Overall length (excluding collapsible mirrors)	
Towing vehicle, full trailer, pole trailer (excluding load)	11.5
Simple trailer	12.5
Rigid vehicle (not towing)	12.6
Rigid bus with three axles where the rearmost axle is a single-tyred steering axle that is: (a) either positively and continuously linked to the front steer axle (except may be locked for reverse or high-speed operations), or (b) automatically locked at a speed of 30km/h in the straight-ahead position or for reverse operations	13.5
Articulated bus	18
Towing vehicle and semi-trailer with: • a quad-axle set with two steering axles (and first registered before 1/2/17) • any other axle set	 18 19
Towing vehicle and full trailer: • excluding load • including load if load overhanging the rear of the trailer does not exceed 2.3m in width, or 1.15m from the longitudinal centre-line of the vehicle	 20 22

Dimension	Distance (metres except where indicated otherwise)
Towing vehicle and simple trailer	22
Any other combination of vehicles	20
Height[3]	
All vehicles	4.3
Forward distance (excluding collapsible mirrors)	
Rigid vehicle	8.5 if fitted with tow coupling; 9.5 otherwise
Full trailer, simple trailer, pole trailer with drawbar at full extension, articulated bus (both front and rear sections)	8.5
Semi-trailer	9.2
Rear overhang	
Heavy rigid vehicle whose rearmost axle is a non-steering axle	4.0 or 70% of wheelbase (whichever is less)
Heavy rigid vehicle whose rearmost axle is a steering axle	4.25 or 70% of wheelbase (whichever is less)
Rigid bus that exceeds 12.6m in overall length	4.5 or 72% of wheelbase (whichever is less)
Articulated bus, heavy simple trailer, heavy pole trailer with one axle set	4.0 or 50% of forward distance (whichever is less)
Heavy semi-trailer other than a Class TC caravan trailer	4.3 or 50% of forward distance (whichever is less)
Heavy full trailer, heavy pole trailer with two axle sets	4.0 or 50% of wheelbase (whichever is less)
Class TC caravan trailer that is a semi-trailer	4.0 or 65% of forward distance (whichever is less)
All other vehicles	4.0
Minimum ground clearance[4]	

Dimension	Distance (metres except where indicated otherwise)
Heavy motor vehicle	The greater of 100mm or 6% of the distance from the nearest axle to the point where the ground clearance is measured (except when vehicle is loading or unloading)
Light motor vehicle	No requirement
Front overhang	
Semi-trailer	2.04 radius arc ahead of kingpin centre
Simple trailer	2.04 radius arc ahead of tow coupling centre
Full trailer	2.04 radius arc ahead of turntable centre
Pole trailer	2.04 radius arc ahead of turntable centre on towing vehicle
Agricultural motor vehicle	4.0
All other vehicles	3.0
Rear trailing unit distance	
A-train, B-train, towing vehicle and two trailers	14.5
Articulated vehicle point of attachment (excluding articulated buses)	No further rearward than the rearmost axle of the towing vehicle or rearmost axle of the leading trailer, and if the towing vehicle is a rigid vehicle and has more than one axle in its rear set, not more than 300 mm rearward of the rear axis of the towing vehicle
Tow coupling position[5] (for towing heavy trailer)	
Full trailer	45% of wheelbase of towing vehicle
Simple trailer	At least 700 mm rearward of the rear axis of the towing vehicle and not more than a distance equal to 50% of wheelbase

Dimension	Distance (metres except where indicated otherwise)
Articulated bus	45% of wheelbase of the leading unit
Coupling point distance[6]	
A-train	30% of forward distance of semi-trailer
Inter-vehicle spacing (between any two consecutive vehicles in a combination, except for a laden pole trailer)[7]	4.0
Outside turning circle in either direction for 360-degree turn[8]	25.0 diameter (kerb to kerb, excluding collapsible mirrors)

Notes:

1 Unless otherwise stated, the dimensions in Table 7-5-1 are maximum dimensions.

2 For items not included in determining whether a vehicle complies with width restriction, see section 3.4 *(***Land Transport Rule: Vehicle Dimensions and Mass 2016**).

3 For items not included in determining whether a vehicle complies with height restrictions, see section 3.6 *(***Land Transport Rule: Vehicle Dimensions and Mass 2016**).

4 Ground clearance for a heavy motor vehicle does not include flexible mudflaps, wheels, tyres or devices designed to discharge static electricity.

5 The tow coupling position is the distance rearward from the motor vehicle's rear axis to the centre of the tow coupling.

6 The coupling point distance (for an A-train) is the distance between the rear axis of the semi-trailer and the tow coupling centre of the full trailer.

7 For other requirements relating to the inter-vehicle spacing between a towing vehicle and a full trailer, see section 3.14(1) *(***Land Transport Rule: Vehicle Dimensions and Mass 2016**).

8 Includes all attachments to vehicles except collapsible mirrors. For requirements relating to turning circle, see section 3.7(1) and 3.7(2) *(***Land Transport Rule: Vehicle Dimensions and Mass 2016**).

Summary of legislation

High productivity vehicles (PBS or Pro-forma) may only be certified by a certifier with this category or by application to the Transport Agency. The Transport Agency reserves the right to set conditions.

Applicable legislation

- **Land Transport Rule: Vehicle Dimensions and Mass 2016**

8 Equipment fitting

8-1 Cranes, hoists etc

(includes cherry pickers, logging loaders, swing lifts, side lifts, stabiliser legs, etc)

Certifier categories: **HVEC** | **HMCD**

Reasons for rejection

1. The certifier has not established that the following was acceptable:

a) the design, or

b) the standard of workmanship.

2. The installation of the equipment has resulted in a significant reduction of the performance of the original equipment fitted to the vehicle.

3. The design of the fitment of the equipment has been undertaken without due regard for appropriate load conditions and appropriate stress limits that should apply to satisfy both legal requirements and safe operating conditions.

4. The welding has not been completed by an operator qualified to AS/NZS ISO9606.1: 2017, AS/NZS 2980-2018 or approved equivalent, where required.

5. The chassis and body of a vehicle is not of adequate strength for all conditions of loading and operation for which the equipment was added.

6. An outrigger fitted to a vehicle, does not have an effective locking device so that other road users are not endangered by the inadvertent extension or separation of that equipment.

7. Locking of the equipment is not readily verifiable by visual inspection.

8. The outriggers of a vehicle of class NB or class NC fitted with a swivelling or knuckle boom crane can be operated from a position from which the locking device is not readily visible and the vehicle has not been equipped with an audible or a visual alarm that can be heard or seen from the driver's seating position.

9. The alarm signal for an outrigger does not operate when the outrigger is not fully retracted and locked.

10. The locking device for an outrigger incorporates a system that provides energy for its operation, and, if the energising system fails, the device,

a) does not remain fully engaged in the locked position, or

b) the locking action does not initiate immediately.

11. Lifting gear fitted to a newly manufactured vehicle recovery service vehicle has not been constructed in accordance with:

a) AS 1418.1-1994: Cranes (Including Hoists and Winches) – General Requirements, and

b) AS 1418.5-1995: Cranes (Including Hoists and Winches) – Mobile and Vehicle-Loading Cranes, and

c) AS/NZS: 1554, Structural Steel Welding, and

d) AS 3990–1993: Mechanical Equipment – Steelwork.

12. The lifting gear of a class NB hook truck, stinger lift truck or transporter cannot satisfactorily complete a test lift of 1.25 times the lifting capacity stated by the manufacturer.

13. Lifting gear of a class NC hook truck, stinger lift truck or transporter has not been tested in accordance with AS 1418.5-1995: Cranes (Including Hoists and Winches) – Mobile and Vehicle-Loading Cranes.

14. The manufacturer's stated lifting capacity of a hook truck or stinger lift truck has not been clearly displayed, in kilograms, at the rear of the vehicle in letters and figures not less than 3cm high.

15. A component used in the construction of lifting gear fitted to a vehicle recovery service vehicle is not suitable for its intended use.

16. Towing equipment used on a hook truck is not designed or certified to the appropriate standard.

17. A vehicle has been modified by fitting a hoist, crane, logging bolster, tipping body or other special equipment, that has increased stress to a localised area of the chassis or significantly affected the distribution of the load over the chassis and:

a) a new chassis rating has not been issued and a new certificate of loading obtained, or

b) the current chassis rating has not been confirmed as being valid.

18. A modification to the chassis of a vehicle has not been undertaken with due regard for:

a) the stress levels as specified by the vehicle manufacturer, or

b) appropriate load conditions and appropriate stress limits that should apply to satisfy both legal requirements and safe operating conditions.

19. Welding has been completed as part of the modification/installation and:

a) the vehicle manufacturer prohibits the welding of the component, or

b) the welding has not been completed as specified by the vehicle manufacturer, or

c) the welding procedure has not been specified by an HVEC Certifier, or

d) the welding has not been completed in accordance with AS/NZS: 1554, Structural Steel Welding.

e) the welder is not qualified to AS/HZS2980-2018 or AS/NZS 1554 to the weld procedure(s) required to complete the modification/installation

20. The manufacturer's body building manual has not been followed when this is practicable.

21. The standard manufacturer's mountings and methods have not been used wherever this was practicable.

22. Attachment brackets do not have sufficient clearance on moving components.

23. A fastener grade is not appropriate for the loads and conditions of use.

24. Components of dissimilar metal have been bolted together without some means of preventing electrolysis.

25. A spacer has not been used when bolting through a box type chassis rail or over a flange, where crushing can occur.

26. The stability of the unit has not been considered at all loading angles.

27. The vehicle or crane manufacturer's mounting specifications have not been followed and alternate mounting not justified.

28. Where only one set of stabiliser legs has been fitted, an axle on the vehicle is overloaded or becomes unstable.

29. Subframes fitted in high chassis stress and flexure zones do not have ends that allow a gradual transition in section stiffness.

Note 1

The **Land Transport Rule Heavy Vehicles 2004** requires that any major modification of the standard vehicle (beyond the original manufacture) to be certified where the addition of heavy duty equipment for special purpose operations, for example hydraulic hoists, may place extra stress on localised areas of chassis and/or other equipment.

This means that any heavy duty equipment, including cranes, hinge and actuator mounting points of tipper bodies, should be certified unless the equipment was fitted by directly by the OE vehicle manufacturer in the same facility as the original build. For instance, stabilising legs on New Zealand manufactured container trailers do not require certification unless fitted by a third party.

The Rule also clarifies that a modification of a heavy vehicle involving the fitting of equipment such as tipping bodies places concentrated loads on the chassis requiring certification.

Note 2

Where a crane has been fitted to a heavy vehicle the correct operation of the crane to the manufacturer's instructions does not require certification by a a NZTA appointed certifier but is inspected and certified by an inspector appoint by the Ministry for Business, Innovation and Employment.

Summary of legislation

Applicable references

- AS 1418.1–1994: Cranes (Including Hoists and Winches) – General Requirements, and
- AS 1418.5–1995: Cranes (Including Hoists and Winches) – Mobile and Vehicle-Loading Cranes, and
- AS/NZS 1554, Structural Steel Welding, and
- AS 3990–1993: Mechanical Equipment – Steelwork.
- AS/NZS 2980-2018: Qualification of welders for fusion welding of steels - Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding
- Welding in the transport industry (see **Technical bulletin 10**).

Applicable legislation

- **Land Transport Rule: Heavy Vehicles 2004**

Heavy Vehicle Rule (General safety requirements) (Note 2)

Chassis and body strength

1. The chassis and body of a vehicle must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed.

2. The body of a vehicle of monocoque construction must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed.

3. A load-bearing structure, other than a chassis, a body fitted to the chassis or a monocoque body, must be of adequate strength for all conditions of loading and operation for which the vehicle was constructed.

Vehicle body attachment

4. Excluding the attachment of logging bolsters, the means by which a body is attached to the chassis of a vehicle must be designed and constructed so that the stresses on the attachment, when calculated in accordance with requirement 5, do not exceed 60% of the yield stress of the material from which the attachment is made.

5. The stresses in requirement 4 must be calculated under each of the following loading conditions, when the forces are applied at the approximate centre of gravity of the load:

a) a longitudinally-acting force, equivalent to twice the combined weight of the payload capacity and the body mass,

b) a downward-acting force, equivalent to twice the combined weight of the payload capacity and the body mass,

c) a transversely-acting force, equivalent to the combined weight of the payload capacity and the body mass,

d) an upward-acting force, equivalent to the combined weight of the payload capacity and the body mass.

Equipment locking devices

6. A sliding axle set or sliding chassis, or an outrigger fitted to a vehicle, must have an effective locking device so that other road users are not endangered by the inadvertent extension or separation of that equipment.

7. Locking of the equipment in requirement 6 must be readily verifiable by visual inspection or be equipped with a visual or audible alarm to warn the driver if the equipment is not locked in one of the locking positions.

8. If the outriggers of a vehicle of class NB or class NC fitted with a swivelling (or knuckle boom) crane must be fitted with locking devices that can be readily seen in the locked position with the outrigger retracted or the vehicle must be equipped with an audible or visual alarm to warn the driver if an outrigger is not in the fully retracted position.

9 An alarm in requirement 7 or 8 must be audible and visible from the driver's seating position and the alarm must operate when the vehicle's engine is running, except when the park brake is is fully applied or the gear selector of an automatic is in 'park'.

10. If the locking device in requirement 6 incorporates a system that provides energy for its operation, the device must remain fully engaged in the locked position, or the locking action must be initiated immediately, if the energising system fails.

11. A sliding axle set or a sliding chassis must have endstops at the end of the slideway to prevent the separation of the sliding parts if the primary locking device fails.

Vehicle recovery service vehicles

12. Lifting gear fitted to a vehicle recovery service vehicle on or after 1 October 2005 must be constructed in accordance with:

a) AS 1418.1-1994: Cranes (Including Hoists and Winches) – General Requirements, and

b) AS 1418.5-1995: Cranes (Including Hoists and Winches) – Mobile and Vehicle-Loading Cranes, and

c) AS/NZS: 1554, Parts 1 to 6, Structural Steel Welding, and

d) AS 3990-1993: Mechanical Equipment – Steelwork.

13. Lifting gear of a class NB hook truck, stinger lift truck or transporter must be able to satisfactorily complete a test lift of 1.25 times the lifting capacity stated by the manufacturer.

14. Lifting gear of a class NC hook truck, stinger lift truck or transporter must be tested in accordance with AS 1418.5-1995: Cranes (including Hoists and Winches) – Mobile and Vehicle-Loading Cranes.

15. The manufacturer's stated lifting capacity of a hook truck or stinger lift truck must on or after 1 October 2005 be clearly displayed, in kilograms, at the rear of the vehicle in letters and figures not less than 3cm high.

16. The manufacturer's stated lifting capacity in requirement 15 must be rounded to the nearest 50kg.

17. A component used in the construction of lifting gear fitted to a vehicle recovery service vehicle must be suitable for its intended use.

Modification affecting chassis

18. If a vehicle is modified by fitting a hoist, crane, logging bolster, tipping body or other special equipment, which may result in increased stress to a localised area of the chassis or significant redistribution of the load over the chassis:

a) a new chassis rating must be issued and a new certificate of loading obtained, or

b) the current chassis rating must be confirmed as being valid.

18. A modification to the chassis of a vehicle must be designed to stress levels:

a) as specified by the vehicle manufacturer, or

b) in accordance with AS 3990: 1993, Mechanical Equipment – Steelwork, or

c) in accordance with BS 7608: 1993, Code of Practice for Fatigue Design and Assessment of Steel Structures, or

d) that are not higher, when the vehicle is loaded to its proposed new gross vehicle mass, than those of the chassis of the unmodified vehicle loaded to its current gross vehicle mass.

19. If the vehicle manufacturer does not prohibit the welding of the chassis members, a welding that is part of the modification of a chassis must be carried out:

a) as specified by the vehicle manufacturer, or

b) in accordance with AS/NZS: 1554, Structural Steel Welding.

9 Towing connections

9-1 Drawbeams

Certifier categories: **HVET** | **HMTD**

Reasons for rejection

See also Table 3-1-1. in the Dimensions section

1. The towing connection fitted to the rear of a heavy vehicle recovery vehicle does not comply with NZS 5446.

2. A drawbeam rated 3500kg MTM or over does not meet the requirements of NZS 5446.

3. The coupling components are worn beyond the manufacturer's specifications.

4. New coupling fasteners have not been used if the coupling installed has been used in service.

5. The fasteners used do not meet the coupling manufacturer's specifications.

6. A coupling does not have:

    a) an effective locking device, or

    b) a separate means of retaining the locking device in the locked position, or

    c) a failsafe system that prevents unintentional release of an air assisted automatic coupling device (if fitted).

    - See also **Safety alert: Risk of vehicle separation – air operated auto coupling devices**

7. The locking of the coupling is not readily verifiable by visual inspection.

8. A coupling other than a 50mm or 1?" diameter ball coupling does not meet the specifications of NZS 5446.

9. A drawbeam has not been manufactured to the Certificate of Design Compliance specifications when an approved design is used for the certification of the component.

10. The drawbeam has not been attached according to the Certificate of Design Compliance specifications when an approved design is used for the certification of the component.

11. A drawbeam has been welded by an operator who is not known or is not qualified in both process and position .

12. The welding does not comply with the AS/NZS 1554 or other appropriate welding standards for the material and welding method employed.

13. A drawbeam repair does not comply with the applicable standard.

14. The attachment points and or the drawbeam is affected by corrosion or weakening, that is apparent by visual examination, and may make it unsafe.

15. The chassis of a vehicle fitted with a drawbeam is of insufficient strength to withstand the loads imposed on it.

16. The length of a towing vehicle exceeds 11.5m.

17. When towing a full trailer (GVM exceeding 3500kg) the tow coupling is located further rearwards of the rear axis of the rigid towing vehicle than 45% of the towing vehicle's wheelbase.

18. When towing a simple trailer (GVM exceeding 3500kg) the tow coupling is located less than 0.7m rearwards of the rear axis of the towing vehicle.

19. When towing a simple trailer (GVM exceeding 3500kg) the tow coupling is located more than 50% of the towing vehicle's wheelbase rearwards of the rear axis of the towing vehicle.

20. The maximum length of a combination vehicle exceeds 20.0m.

21. Parts of the towed and towing vehicle, other than its coupling mechanism, come into contact when completing a 360-degree turn at a diameter of 25m.

22. A drawbeam originally designed using the recommended practice for towing connections published by the New Zealand Truck-Trailer Manufacturer's Federation does not meet the requirements of NZS 5446: 1987.

23. The original date of manufacture and attachment to the vehicle of a drawbeam cannot be demonstrated.

24. The dimensions, material sizes and all welding details have not been recorded.

25. A full design stress analysis has not been completed or is unavailable.

25. An NDT inspection and report have not been completed to section 7 of AS/NZS 1554.1 when required.

26. The welds of the drawbar/beam or towbar that are inspected do not meet section 6 of AS/NZS 1554.1: 2000.

27. A drawbeam that requires re-certification does not meet the requirements for stress or residual life of the re-certification process shown in the charts in **section 12-3**

28. A drawbeam does not have an identification label as required by the standard (Note 1) (Note 2).

29. A vehicle has been modified in such a way that the braking or braking system may have been affected and it has not been referred to a certifier with the brakes category unless the modification is covered in the vehicle's body builders manual and the manufacturer has supplied written evidence that the vehicle remains within its original brake certification (refer to **Technical bulletin 4**).

Note 1

Where an identification plate is damaged, illegible or lost the original certifier may supply a replacement plate stating the original expiry date provided that the certifier can verify that the drawbeam has not been modified, repaired or has not exceeded its expiry date (see **Technical bulletin 14: Lost or illegible identification plates for drawbars, drawbeams and towbars)**.

Note 2

From 1 October 2020, where a rating is not applicable 'N/A' must be stamped on the plate.

Note: for dimension requirements see **Table 3-1-1 in the Dimensions section**

Summary of legislation

Applicable references

- NZS 5446: Heavy vehicle towing connections – Drawbeams and drawbars
- NZS 5467: 1993
- AS/NZS 1554 parts 1 to 6
- Welding in the transport industry (NZTA publication) - **Technical bulletin 10**

- AS/NZS 2980-2018: Qualification of welders for fusion welding of steels - Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding.

Applicable legislation

- **Land Transport Rule: Passenger Service Vehicles 1999**
- **Land Transport Rule: Vehicle Dimensions and Mass 2016**
- **Land Transport Rule: Heavy Vehicles 2004**.

Land Transport Rule: Vehicle Dimensions and Mass 2016

General requirements for dimension and mass limits

1. Except as otherwise provided in this section and in **Land Transport Rule: Vehicle Dimensions and Mass 2016**, a vehicle must comply with the applicable requirements of **Land Transport Rule: Vehicle Dimensions and Mass 2016**, and with other applicable requirements in this section.

2. The inter-vehicle spacing between a towing vehicle and a full trailer, when in a straight line, must not be less than the greater of 1m or half the width of the foremost point of the trailer (including its load but excluding the drawbar and front dolly assembly).

3. In carrying out a 360-degree turn at 25m diameter, no part of a vehicle in a combination, other than its articulation mechanism, may come into contact with the other vehicle in the combination.

4. A drawbeam must not be sliding or adjustable.

Towing requirements (section 4.6)

5. A trailer must be of one of the following types:

a) a simple trailer,

b) a semi-trailer,

c) a full trailer,

d) a pole trailer.

6. Except as provided in requirement 7 below, a light motor vehicle may not tow more than one trailer.

7. Despite requirement 6, a tractor may tow two light trailers, provided that the tractor manufacturer’s ratings are not exceeded.

8. A heavy motor vehicle may not tow more than one trailer, except if that vehicle is:

a) an A-train, or

b) a B-train, or

c) a rigid vehicle towing a converter dolly coupled to a semi-trailer, or

d) a rigid vehicle towing two trailers whose total gross mass is less than 20,000kg, provided the rearmost trailer is a light trailer, or

e) a vehicle operating as an overweight or overdimension vehicle.

9. Except as specified in requirement 10, a light motor vehicle may tow a trailer, provided that, if the light motor vehicle is towing a heavy trailer, the gross mass of the trailer does not exceed 1.5 times the gross mass of the towing vehicle or the maximum towed mass specified by the manufacturer.

10. A light passenger service vehicle may not tow a trailer that has a gross vehicle mass of 2000kg or more.

11. A heavy passenger service vehicle may not tow a trailer that has a gross vehicle mass exceeding 3500kg.

12. An articulated bus may not tow a trailer.

Heavy Vehicle Rule

Towing connection requirements

13. Towing connection components fitted to a vehicle must ensure that a secure connection can be maintained between the towing and towed vehicles under all conditions of loading and operation for which the vehicle was constructed.

Drawbeams and towbars (section 4.4)

14. A drawbeam fitted to a vehicle used in a combination must, unless requirement 15 applies, comply with NZS 5446 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers.

15. A drawbeam fitted to a vehicle that, before 1 February 1989, was certified for compliance with the *Recommended Practice for Towing Connections* published by the New Zealand Truck-Trailer Manufacturers' Federation, must, by the date of issue of the first Certificate of Fitness issued on or after 1 March 2006:

a) comply with *NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers*, or

b) be replaced with a drawbeam that complies with *NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers.*

16. A drawbeam, fitted to a vehicle before 1 March 2006, must comply with NZS 5446.

Couplings (section 4.6)

17. A coupling must have an effective locking device and a separate means of retaining this device in the locked position.

18. Locking of a coupling must be readily verifiable by visual inspection.

19. A hook, pin or ball-and-socket type coupling for towing a vehicle must comply with NZS 5446 unless it is a 50mm or 1?" ball fitted to a towbar to tow a light vehicle:

20. A device fitted to the front of a vehicle to enable it to be recovered, together with its connection to the chassis, must be suitable for this purpose.

Vehicle recovery service vehicles

21. A towing connection fitted to the rear of a vehicle recovery service vehicle for recovery purposes on or after 1 October 2005 must be designed and constructed in accordance with NZS 5446.

Page amended **4 November 2025** (see **amendment details**)

9-2 Drawbars

Certifier categories: **HVET** | **HMTD**

Reasons for rejection

1. The towing connection of a heavy vehicle recovery vehicle does not comply with NZS 5446.

2. A converter dolly with an oscillating fifth wheel is fitted with a hinged drawbar.

3. A converter dolly fitted with a fixed fifth wheel is fitted with a rigid drawbar.

4. A converter dolly, manufactured after 1 April 2005, with a hinged drawbar and fixed fifth wheel does not have a tandem-axle set.

5. A ballrace turntable fitted to a vehicle has not been securely fastened to the vehicle in accordance with the ballrace turntable manufacturer's instructions.

6. A ballrace turntable fitted to a vehicle has not been maintained within safe tolerance of its original condition.

7. The trailer is not a,

    a) simple trailer, or

    b) semi-trailer, or

    c) full trailer, or

    d) pole trailer.

8. A drawbar rated 3500kg MTM or over does not meet the requirements of NZS 5446.

9. A drawbar rated less than 3500 kgMTM does not meet the requirements of NZS 5467.

10. The coupling components are worn beyond the manufacturer's specifications.

11. New coupling fasteners have not been used if the coupling installed has been used in service.

12. The fasteners used do not meet the coupling manufacturer's specifications.

13. A coupling does not have:

    a) an effective locking device, or

    b) a separate means of retaining the locking device in the locked position.

14. The locking of the coupling is not readily verifiable by visual inspection.

15. A coupling other than a 50mm or 1?-inch diameter ball coupling does not meet the specifications of NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers.

16. When fitted to a full trailer a drawbar is extendable and not used for:

    a) the through loading of stock or goods, or

    b) transporting logs

17. An extendable drawbar fitted to a full trailer that is used for the through loading of goods or stock:

    a) has more than one set of holes for locking pins, or

    b) the locking pins lock when the drawbar is not in the fully extended position.

18. An extendable drawbar fitted to a full trailer used to transport logs:

a) has more than two fixed positions for short logs, or

b) has more than one sliding position for long logs, or

c) has more than one fixed position for storage of the drawbar when being transported on another vehicle.

19. An extendable drawbar is not fitted with,

a) endstops, or

b) a secondary locking device that will prevent separation if the primary locking device fails.

20. A drawbar has not been manufactured to the Certificate of Design Compliance specifications when an approved design is used for the certification of the component.

21. The drawbar has not been attached according to the Certificate of Design Compliance specifications when an approved design is used for the certification of the component.

22. A drawbar has been welded by an operator who is not known or is not qualified in both process and position.

23. The welding does not comply with the AS/NZS 1554 or other appropriate welding standards for the material and welding method employed.

24. A drawbar repair does not comply with the applicable standard.

25. The attachment points and or the drawbar is affected by corrosion or weakening, that is apparent by visual examination, that may make it unsafe.

26. The chassis of a vehicle fitted with a drawbar is of insufficient strength to withstand the loads imposed on it.

27. The length of a towed vehicle other than a semi-trailer exceeds 11.5m.

28. The maximum forward distance of a simple trailer or pole trailer with the drawbar fully extended exceeds 8.5m.

29. The maximum length of a combination vehicle exceeds 20.0m.

30. The inter-vehicle spacing between a towing vehicle and a full trailer, when in a straight line, is less than the greater of 1.0m or half the width of the of the foremost point of the trailer (including its load but excluding the drawbar and dolly assembly).

31. The rear trailing unit distance exceeds 14.5m.

32. The inter-vehicle spacing except for a laden pole trailer exceeds 4.0m.

33. Parts of the towed and towing vehicle, other than its coupling mechanism, come into contact when completing a 360-degree turn at a diameter of 25m.

34. A drawbar originally designed using the Recommended practice for towing connections published by the New Zealand Truck-Trailer Manufacturer’s Federation does not meet the requirements of NZS 5446: 1987.

35. The original date of manufacture and attachment to the vehicle of a drawbar cannot be demonstrated.

36. The dimensions, material sizes and all welding details have not been recorded.

37. A full design stress analysis has not been completed or is unavailable.

38. An NDT inspection and report have not been completed to section 7 of AS/NZS 1554.1: 2000 when required.

39. The welds of the drawbar/beam or towbar that are inspected do not meet section 6 of AS/NZS 1554.1.

40. A drawbar that requires re-certification does not meet the requirements for stress or residual life of the re-certification process shown in the charts in **section 12-3**

41. A drawbar does not have an identification label as required by the standard (Note 1)(Note 2).

42. A vehicle has been modified in such a way that the braking or braking system may have been affected and it has not been referred to a certifier with the brakes category unless the modification is covered in the vehicle's body builders manual and the manufacturer has supplied written evidence that the vehicle remains within its original brake certification (refer to **Technical bulletin 4**).

Note 1

Where an identification plate is damaged, illegible or lost the original certifier may supply a replacement plate stating the original expiry date provided that the certifier can verify that the drawbar has not been modified, repaired or has not exceeded its expiry date (see **Technical bulletin 14: Lost or illegible identification plates for drawbars, drawbeams and towbars)**.

Note 2

From 1 October 2020, where a rating is not applicable 'N/A' must be stamped on the plate.

Table 9-2-1. Dimension requirements for vehicles and vehicle combinations (abridged)

Dimension	Distance (metres except where indicated otherwise)
Overall length (excluding collapsible mirrors):	
Towing vehicle, full trailer, simple trailer, pole trailer (excludinvg load)	11.5
Any other combination of vehicles	20.0
Forward distance (excluding collapsible mirrors):	
Rigid vehicle	8.5 if fitted with tow coupling, 9.5 otherwise
Full Trailer, simple trailer, pole trailer with drawbar at full extension, articulated bus (both front and rear sections), semi-trailer	8.5
Rear overhang:	
Heavy rigid vehicle	4.0 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a non-steering axle
4.25 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a steering axle	
Articulated bus, heavy semi-trailer, heavy simple trailer, heavy pole trailer with one axle set	4.0 or 50% of forward distance (whichever is less)
Heavy full trailer, heavy pole trailer with two axle sets	4.0 or 50% of wheelbase (whichever is less)
All other vehicles	4.0
Rear trailing unit distance:	
A-Train, B-Train, towing vehicle and two trailers	14.5

Articulated point of attachment (excluding articulated buses)	No further rearward than the rearmost axle of the towing vehicle or rearmost axle of the leading trailer, and if the towing vehicle is a rigid vehicle and has more than one axle in its rear set, not more than 300 mm rearward of the rear axis of the towing vehicle
Tow coupling position (for towing heavy trailer):	
Full trailer	40% of wheelbase of towing vehicle

Summary of Legislation

Applicable references

- NZS 5446: Heavy vehicle towing connections – Drawbeams and drawbars
- AS/NZS 1554 parts 1 to 6
- Welding in the transport industry (NZTA publication) - **Technical bulletin 10**
- AS/NZS 2980:2018; Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding.

Applicable legislation

- **Land Transport Rule: Vehicle Dimensions and Mass 2002**
- **Land Transport Rule: Heavy Vehicles 2004**

General requirements for dimension and mass limits

1. Except as otherwise provided in this section and in 1.2(3) [of the Rule], a vehicle must comply with the applicable requirements in Table 4.1 [of the Rule (abridged in Table 9-2-1), and with other applicable requirements in this section.

2. The inter-vehicle spacing between a towing vehicle and a full trailer, when in a straight line, must not be less than the greater of 1 m or half the width of the foremost point of the trailer (including its load but excluding the drawbar and front dolly assembly).

3. In carrying out a 360-degree turn at the 25-m diameter, no part of a vehicle in a combination, other than its articulation mechanism, may come into contact with the other vehicle in the combination.

4. Requirements 5 to 7 below apply to a drawbar between a towing vehicle and a full trailer.

5. A drawbar may have only one operating position and must not be extendable, except if requirement 6 or 7 applies.

6. A drawbar may be retractable only to facilitate the through loading or unloading of livestock or goods, provided that the drawbar has only one set of holes for locking pins and that the holes are positioned so that the drawbar is fully extended when locked.

7. A trailer that is used to transport logs may have a drawbar with up to three fixed positions and one sliding position, provided that the drawbar has:

a) one sliding position for long logs, and

b) one or two fixed positions for short logs, and

c) a fixed position for storage of the drawbar when it is out of use while the trailer is being transported on a rigid vehicle or another trailer.

Towing requirements (section 4.6)

8. A trailer must be of one of the following types:

a) a simple trailer

b) a semi-trailer

c) a full trailer

d) a pole trailer.

9. Except as provided in requirement 11 below, a light motor vehicle may not tow more than one trailer.

10. Despite requirement 10, a tractor may tow two light trailers, provided that the tractor manufacturer's ratings are not exceeded.

11. A heavy motor vehicle may not tow more than one trailer, except if that vehicle is:

a) an A-train, or

b) a B-train, or

c) a rigid vehicle towing a converter dolly coupled to a semi-trailer, or

d) a rigid vehicle towing two trailers whose total gross mass is less than 20,000kg, provided the rearmost trailer is a light trailer, or

e) a vehicle operating as an overweight or overdimension vehicle.

Heavy Vehicle Rule

Towing connection requirements

12. Towing connection components fitted to a vehicle must ensure that a secure connection can be maintained between the towing and towed vehicles under all conditions of loading and operation for which the vehicle was constructed.

Ballrace turntables (section 3.7)

13. A ballrace turntable fitted to a vehicle must be securely fastened to the vehicle in accordance with the ballrace turntable manufacturer's instructions.

14. A ballrace turntable fitted to a vehicle must be maintained within safe tolerance of its original condition.

Drawbars (section 4.5)

15. A drawbar fitted to a vehicle used in a combination must, unless requirement 17 applies, comply with NZS 5446:

16. A drawbar fitted to a vehicle that, before 1 February 1989, was certified for compliance with the Recommended practice for towing connections published by the New Zealand Truck-Trailer Manufacturers' Federation, must, by the date of issue of the first Certificate of Fitness issued on or after 1 March 2006:

a) comply with NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers, or

b) be replaced with a drawbar that complies with NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers.

17. A telescopic drawbar must have endstops or a secondary locking device to prevent separation if the primary locking device fails.

18. A drawbar, fitted to a vehicle,that is modified or repaired on or after 31 March 2005 or 2007 must comply with NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers.

Couplings (section 4.6)

19. A coupling must have an effective locking device and a separate means of retaining this device in the locked position.

20. Locking of a coupling must be readily verifiable by visual inspection.

21. A hook, pin or ball-and-socket type coupling for towing a vehicle must comply with NZS 5446.

Page amended **1 October 2020** (see **amendment details**)

9-3 Towbars

Certifier categories: **HVET** | **HMTD**

Reasons for rejection

1. An articulated bus is fitted with a towing coupling.

2. The trailer is not a:

a) simple trailer, or

b) full trailer, or

c) pole trailer.

3. A towbar rated less than 3500kg MTM does not meet the requirements of NZS 5467.

4. A drawbar rated less than 3500kg MTM does not meet the requirements of NZS 5467.

5. A vehicle fitted with a towbar designed to tow trailers with a gross weight not exceeding 2000kg does not have a means of securely attaching a safety chain or cable.

6. The means of securing the safety chain or cable is not positively attached to the towing vehicle with a mechanical device of sufficient strength that will remain secure under all conditions.

7. The means of securing the safety chain or cable is a chain slot.

8. A trailer under 2000kg does not have a safety chain.

9. The coupling components are worn beyond the manufacturer’s specifications.

10. New coupling fasteners have not been used if the coupling installed has been used in service.

11. The fasteners used do not meet the coupling manufacturer’s specifications.

12. A coupling does not have:

a) an effective locking device, or

b) a separate means of retaining the locking device in the locked position.

13. The locking of the coupling is not readily verifiable by visual inspection.

14. A 50-mm-diameter ball coupling fitted does not comply with NZS 5232: 1993, Specification for Ball-and-Socket Type Trailer Couplings.

15. A 1? inch diameter ball coupling fitted does not comply with the performance and marking requirements of NZS 5232: 1993, Specification for Ball-and-Socket Type Trailer Couplings except that the ball size markings must be 1?".

16. A coupling other than a 50mm or 1? inch diameter ball coupling does not meet the specifications of NZS 5446: 1987.

17. A towbar has not been manufactured to the Certificate of Design Compliance specifications when an approved design is used for the certification of the component.

18. The towbar has not been attached according to the Certificate of Design Compliance specifications when an approved design is used for the certification of the component.

19. The welding does not comply with the AS/NZS 1554 or other appropriate welding standards for the material and welding method employed.

20. A towbar repair does not comply with the applicable standard.

21. The attachment points and or the towbar is affected by corrosion or weakening, that is apparent by visual examination, that may make it unsafe.

22. The chassis of a vehicle fitted with a towbar is of insufficient strength to withstand the loads imposed on it.

23. The length of a towing vehicle exceeds 11.5m.

24. The length of a towed vehicle other than a semi-trailer or a high productivity vehicle exceeds 12.5m.

25. The maximum forward distance of a simple trailer or pole trailer with the drawbar fully extended exceeds 8.5 m.

26. The maximum length of a combination vehicle other than a high productivity vehicle where the towed vehicle is a full trailer exceeds 20.0m excluding load.

27. The maximum length of a combination vehicle other than a high productivity vehicle where the towed vehicle is a simple trailer exceeds 22.0m.

28. The maximum length of a combination vehicle other than a high productivity vehicle where the towed vehicle is not a simple trailer or a full trailer, exceeds 20.0m.

29. The inter-vehicle spacing between a towing vehicle and a full trailer, when in a straight line, is less than the greater of 1.0 m or half the width of the of the foremost point of the trailer (including its load but excluding the drawbar and dolly assembly).

30. The rear trailing unit distance exceeds 14.5m.

31. The inter-vehicle spacing except for a laden pole trailer exceeds 4.0m.

32. Parts of the towed and towing vehicle, other than its coupling mechanism, come into contact when completing a 360-degree turn at a diameter of 25m.

33. The original date of manufacture and attachment to the vehicle of a towbar cannot be demonstrated.

34. The dimensions, material sizes and all welding details have not been recorded.

35. A full design stress analysis has not been completed or is unavailable.

36. An NDT inspection and report have not been completed to section 7 of AS/NZS 1554.1: 2000 when required.

37. The welds of the towbar that are inspected and do not meet section 6 of AS/NZS 1554.1: 2000.

38. A towbar that requires re-certification does not meet the requirements for stress or residual life of the re-certification process shown in the charts in **section 12-3**

39. A towbar does not have an identification label as required by the standard (Note 1)(Note 2).

Note 1

Where an identification plate is damaged, illegible or lost the original certifier may supply a replacement plate stating the original expiry date provided that the certifier can verify that the towbar has not been modified or repaired without subsequent certification (see **Technical bulletin 14: Lost or illegible identification plates for drawbars, drawbeams and towbars)**.

Note 2

From 1 October 2020, where a rating is not applicable ‘N/A’ must be stamped on the plate.

Table 9-3-1. Dimension requirements for vehicles and vehicle combinations (abridged)

Dimension	Distance (metres except where indicated otherwise)
Overall length (excluding collapsible mirrors):	
Towing vehicle, full trailer, simple trailer, pole trailer (excludinvg load)	11.5
Any other combination of vehicles	20.0
Forward distance (excluding collapsible mirrors):	
Rigid vehicle	8.5 if fitted with tow coupling, 9.5 otherwise
Full Trailer, simple trailer, pole trailer with drawbar at full extension, articulated bus (both front and rear sections), semi-trailer	8.5
Rear overhang:	
Heavy rigid vehicle	4.0 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a non-steering axle
4.25 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a steering axle	
Articulated bus, heavy semi-trailer, heavy simple trailer, heavy pole trailer with one axle set	4.0 or 50% of forward distance (whichever is less)
Heavy full trailer, heavy pole trailer with two axle sets	4.0 or 50% of wheelbase (whichever is less)
All other vehicles	4.0
Rear trailing unit distance:	
A-Train, B-Train, towing vehicle and two trailers	14.5

Articulated point of attachment (excluding articulated buses)	No further rearward than the rearmost axle of the towing vehicle or rearmost axle of the leading trailer, and if the towing vehicle is a rigid vehicle and has more than one axle in its rear set, not more than 300 mm rearward of the rear axis of the towing vehicle
Tow coupling position (for towing heavy trailer):	
Full trailer	40% of wheelbase of towing vehicle

Summary of Legislation

Applicable references

- NZS 5467: 1993
- NZS 5446: Heavy vehicle towing connections – Drawbeams and drawbars
- AS/NZS 1554 parts 1 to 6
- Welding in the transport industry (NZTA publication) - **Technical bulletin 10**
- AS/NZS 2980:2018; Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding.

Applicable legislation

- **Land Transport Rule: Passenger Service Vehicles 1999**
- **Land Transport Rule: Vehicle Dimensions and Mass 2002**
- **Land Transport Rule: Heavy Vehicles 2004**

General requirements for dimension and mass limits

1. Except as otherwise provided in this section and in 1.2(3) [of the Rule], a vehicle must comply with the applicable requirements in Table 4.1 [of the Rule (abridged in Table 9-3-1), and with other applicable requirements in this section.

2. In carrying out a 360-degree turn at the 25m diameter, no part of a vehicle in a combination, other than its articulation mechanism, may come into contact with the other vehicle in the combination.

Towing requirements (section 4.6)

3. A trailer must be of one of the following types:

a) a simple trailer

b) a semi-trailer

c) a full trailer

d) a pole trailer.

4. Except as provided in requirement 5 below, a light motor vehicle may not tow more than one trailer.

5. Despite requirement 4, a tractor may tow two light trailers, provided that the tractor manufacturer’s ratings are not exceeded.

6. A heavy motor vehicle may not tow more than one trailer, except if that vehicle is:

a) an A-train, or

b) a B-train, or

c) a rigid vehicle towing a converter dolly coupled to a semi-trailer, or

d) a rigid vehicle towing two trailers whose total gross mass is less than 20,000kg, provided the rearmost trailer is a light trailer, or

e) a vehicle operating as an overweight or overdimension vehicle.

7. Except as specified in requirement 8, a light motor vehicle may tow a trailer, provided that, if the light motor vehicle is towing a heavy trailer, the gross mass of the trailer does not exceed 1.5 times the gross mass of the towing vehicle or the maximum towed mass specified by the manufacturer.

8. A light passenger service vehicle may not tow a trailer that has a gross vehicle mass of 2000kg or more.

9. A heavy passenger service vehicle may not tow a trailer that has a gross vehicle mass exceeding 3500kg.

10. An articulated bus may not tow a trailer.

Passenger Service Vehicle Rule

Towing and towbars

11. The towbar of a motor vehicle which entered service as a passenger service vehicle in New Zealand on or after 1 September 1999, and a towbar fitted to a vehicle after this date, must comply with the version of New Zealand Standard 5467: 1993 that was applicable at the time the towbar was fitted, and must be certified accordingly.

12. The chassis of a passenger service vehicle fitted with a towbar must have sufficient strength to withstand the forces imposed on it by the trailer.

Heavy Vehicle Rule

Towing connection requirements

13. Towing connection components fitted to a vehicle must ensure that a secure connection can be maintained between the towing and towed vehicles under all conditions of loading and operation for which the vehicle was constructed.

Drawbeams and towbars (section 4.4)

14. A towbar fitted to a vehicle before 1 April 2006 must comply with:

a) NZS 5467: 1993, Code of Practice for Light Trailers, or

b) NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers, or

c) NZS 5446: 1987, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers amended by Appendix A to Policy Statement 5 for towbars rated for a maximum towed mass of 2000kg or less.

15. A towbar fitted to a vehicle on or after 1 April 2006 for towing a light trailer must comply with NZS 5467: 1993, Code of Practice for Light Trailers.

Couplings (section 4.6)

16. A coupling must have an effective locking device and a separate means of retaining this device in the locked position.

17. Locking of a coupling must be readily verifiable by visual inspection.

18. A 50mm diameter tow ball fitted to a vehicle for towing a light trailer must comply with NZS 5232: 1993, Specification for Ball-and-Socket Type Trailer Couplings

19. A 1? inch diameter tow ball fitted to a vehicle for towing a light trailer must comply with the performance and marking requirements of NZS 5232: 1993 Specification for Ball-and-Socket Type Trailer Couplings, except that the ball size marking must be 1?".

20. A device fitted to the front of a vehicle to enable it to be recovered, together with its connection to the chassis, must be suitable for this purpose.

Passenger Service Vehicle Rule

Towing and tow-bars (section 6.13)

21. A passenger service vehicle must not tow heavy trailers.

22. The tow-bar of a motor vehicle which entered service as a passenger service vehicle in New Zealand on or after 1 September 1999, and a tow-bar fitted to a vehicle after this date, must comply with the version of New Zealand Standard 5467: 1993 that was applicable at the time the tow-bar was fitted, and must be certified accordingly.

23. The chassis of a passenger service vehicle fitted with a tow-bar must have sufficient strength to withstand the forces imposed on it by the trailer.

Page amended **1 October 2020** (see **amendment details**)

9-4 Fifth wheels and kingpins

Certifier categories: **HVET** | **HMTD**

Reasons for rejection

1. A fifth wheel designed to accept a 50mm kingpin has not been mounted in accordance with NZS 5450 or AS/NZS 4968.1 and AS/NZS 4968.2 and AS 2174 or, if fitted as original equipment on an imported powered vehicle, to UN/ECE Reg 55.

2. A fifth wheel designed to accept a 90mm kingpin has not been mounted in accordance with AS 1773, AS 1771 or, if fitted after 29 December 2007, AS/NZS 4968.1 and AS/NZS 4968.2..

3. A vehicle fitted with a fifth wheel designed to accept a 90mm kingpin does not comply with AS/NZS 2174-1994 or, if fitted after 29 December 2007, AS 2174-2006.

4. A 50mm kingpin has not been mounted in accordance with NZS 5451 or AS/NZS 4968.1 and AS/NZS 4968.2 and AS 2174 or, if fitted as original equipment on an imported vehicle, to UN/ECE Reg 55.

5. A 90mm kingpin has not been mounted in accordance with AS/NZS 2175 and AS/NZS 2174.

6. A vehicle fitted with a 90mm kingpin does not comply with AS/NZS 4968.1, AS/NZS 4968.3 and AS 2174 if fitted after 29 December 2007.

7. A skid plate fitted to a vehicle with a 90mm diameter kingpin does not comply with AS/NZS 4698.3

8. A kingpin other than a 50mm or 90mm diameter kingpin has been fitted unless it is a tow ball or socket as part of a dedicated combination and certified to NZS 5446.

9. A skid plate has not been fitted.

10. The towing connection components do not ensure a secure connection between towed and towing vehicles can be maintained under normal operating conditions.

11. A fifth wheel other than one designed to fit a 50mm or 90mm kingpin has been used unless it is a tow ball or socket as part of a dedicated combination and certified to NZS 5446.

12. A kingpin that has been used in service has been fitted without being subjected to and passing an NDT examination by a person qualified to carry out NDT in the process used.

13. If a fifth wheel that has been used in service and is fitted in a new installation, new bolts of the correct size and grade have not been used.

14. A lube plate has been fitted to a skid plate or a fifth wheel so that the coupling distance between the jaws of the fifth wheel and the kingpin no longer comply with NZS 5450.

15. A fifth wheel has not been installed in accordance with the fifth wheel manufacturer's specifications or the appropriate standard.

16. The fifth wheel or its mounting is affected by corrosion or weakening that is apparent by visual inspection so that it is unsafe.

17. The kingpin or its mounting is affected by corrosion or weakening that is apparent by visual inspection so that it is unsafe.

18. The kingpin has been repaired or modified.

19. The fifth wheel has been modified or repaired without the manufacturer's approval excluding bolt on/off components.

20. A vehicle fitted with a fifth wheel designed to accept a 90mm diameter kingpin does not have clearly displayed in a position readily visible from the position the release handle of the fifth wheel is operated the wording '90mm fifth wheel' in letters not less than 60mm high.

21. A vehicle fitted with a 90mm diameter kingpin does not have clearly displayed in a position readily visible at the lower right-hand side of the front end of the vehicle the wording '90mm kingpin' in letters not less than 100mm high.

22. The forward length exceeds 9.2m on a semi-trailer.

23. The maximum front overhang of a semi-trailer measured from the centre of the kingpin exceeds an arc of 2.04m.

24. The fifth wheel is located further rearward than:

a) the rearmost axle of the towing vehicle or rearmost axle of the leading trailer, or

b) if the towing vehicle is a rigid vehicle and has more than one axle in its rear set, it is more than 300mm rearward of the rear axis of the towing vehicle.

25. The weight on the trailer axle set of a stinger steer at any time exceeds 1.5 times the sum of the axle weights of the towing vehicle.

26. The weight of the front axle set or twin-steer set of the towing vehicle of a stinger steer at any time is less than 20% of the sum of the axle weights of the towing vehicle.

27. The fifth wheel position for a stinger steer is less than 700mm rearward of the rear axis of the towing vehicle.

28. The fifth wheel position for a stinger steer is more than a distance equal to 50% of the towing vehicle wheelbase rearward of the rear axis of the towing vehicle.

29. A converter dolly fitted with an oscillating fifth wheel is not fitted with a rigid drawbar.

30. A converter dolly fitted with a fixed fifth wheel is not fitted with a hinged drawbar.

31. A converter dolly with a hinged drawbar and a fixed fifth wheel does not have a tandem-axle set.

32. A vehicle has been modified in such a way that the braking or braking system may have been affected and it has not been referred to a certifier with the brakes category unless the modification is covered in the vehicle's body builders manual and the manufacturer has supplied written evidence that the vehicle remains within its original brake certification (refer to **Technical bulletin 4**).

Table 9-4-1. Dimension requirements for vehicles and vehicle combinations (abridged)

Dimension	Distance (metres except where indicated otherwise)
Overall length (excluding collapsible mirrors):	
Towing vehicle, full trailer, simple trailer, pole trailer (excludinvg load)	11.5
Any other combination of vehicles	20.0
Forward distance (excluding collapsible mirrors):	
Rigid vehicle	8.5 if fitted with tow coupling, 9.5 otherwise
Full Trailer, simple trailer, pole trailer with drawbar at full extension, articulated bus (both front and rear sections), semi-trailer	8.5
Rear overhang:	
Heavy rigid vehicle	4.0 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a non-steering axle
4.25 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a steering axle	
Articulated bus, heavy semi-trailer, heavy simple trailer, heavy pole trailer with one axle set	4.0 or 50% of forward distance (whichever is less)
Heavy full trailer, heavy pole trailer with two axle sets	4.0 or 50% of wheelbase (whichever is less)
All other vehicles	4.0
Rear trailing unit distance:	
A-Train, B-Train, towing vehicle and two trailers	14.5

Articulated point of attachment (excluding articulated buses)	No further rearward than the rearmost axle of the towing vehicle or rearmost axle of the leading trailer, and if the towing vehicle is a rigid vehicle and has more than one axle in its rear set, not more than 300 mm rearward of the rear axis of the towing vehicle
Tow coupling position (for towing heavy trailer):	
Full trailer	40% of wheelbase of towing vehicle

Summary of Legislation

Applicable references

- AS/NZS 4968.1: 2003, Design Criteria and Selection Requirements for Fifth Wheel, Kingpin and Associated Equipment
- AS/NZS 4968.2: 2003, Testing and Installation of Fifth Wheel and Associated Equipment
- AS/NZS 4968.3: 2003, Kingpins and Associated Equipment
- AS 1773–1996: Articulated Vehicles – Fifth Wheel Assemblies
- AS 1771–1996: Installation of Fifth Wheel and Turntable Assemblies
- AS/NZS 2980:2018: Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding
- Welding in the transport industry (NZTA publication) - **Technical bulletin 10**
- NZS 5450: 1989: Specification for Coupling Devices for Articulated Vehicles – Fifth Wheel Assemblies
- NZS 5451: 1989: Specification for Coupling Devices for Articulated Vehicles – Fifth Wheel Kingpins
- AS/NZS 1554: Structural Steel Welding
- AS 3990: 1993: Mechanical Equipment – Steelwork
- AS 1110: 1984: ISO Metric Hexagon Precision Bolts and Screws
- AS 2174: 1994: Articulated Vehicles – Mechanical Coupling between Prime Movers and Semi-Trailers – Interchangeability Requirements
- AS 2174-2006: Articulated Vehicles – Mechanical coupling between Prime movers and semitrailers – interchangeability requirements
- UN/ECE Regulation 55: Uniform Provisions Concerning the Approval of Mechanical Coupling Components of Combinations of Vehicles E/ECE/342/Rev.1/Add.54/Rev.1/E/ECE/TRANS/505
- AS 2175-1995: Articulated Vehicles – Kingpins
- AS 4235-1994: Articulated Vehicles – Design Criteria for Fifth Wheel Skid Plates.

Applicable legislation

- **Land Transport Rule: Vehicle Standards Compliance 2002**
- **Land Transport Rule: Vehicle Dimensions and Mass 2016**
- **Land Transport Rule: Heavy Vehicles 2004**

1. Except as otherwise provided in this section and for vehicles operating under legislation prior to this rule, a vehicle must comply with the applicable requirements in Table 9-4-1, and with other applicable requirements in this section.

2. A heavy motor vehicle may not tow more than one trailer, except if that vehicle is:

a) an A-train, or

b) a B-train, or

c) a rigid vehicle towing a converter dolly coupled to a semi-trailer, or

d) a rigid vehicle towing two trailers whose total gross mass is less than 20,000kg, provided the rearmost trailer is a light trailer, or

e) a vehicle operating as an overweight or overdimension vehicle.

Land Transport Rule: Heavy Vehicles (section 4)

Vehicle and component requirements

3. Towing connection components fitted to a vehicle must ensure that a secure connection can be maintained between the towing and towed vehicles under all conditions of loading and operation for which the vehicle was constructed.

Tractors and agricultural trailers

4. A towing connection of a tractor, other than a three-point linkage, must, on or after 1 October 2005 have clearly displayed on or adjacent to the coupling:

a) the maximum mass of any vehicle that may be towed behind the tractor by means of this towing connection, and

b) the maximum vertical force permitted on the towing connection.

5. A towing connection, other than a two-point or three-point linkage, that is fitted to an agricultural trailer to enable it to be towed must, on or after 1 October 2005, have displayed on or adjacent to the towing connection:

a) the gross vehicle mass of the trailer, and the mass of any vehicles that may be towed by the trailer, and

b) the maximum vertical force at the coupling when the trailer is loaded to its gross vehicle mass.

6. The masses and forces in requirements 4 and 5 above must be:

a) established by:

i. the manufacturer of the vehicle, or

ii. the manufacturer of the towing connection, or

iii. a chartered mechanical engineer, or

iv. a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities.

b) displayed in kilograms, rounded to the nearest 100kg.

Fifth wheel assemblies

7. A vehicle that is constructed to tow a semi-trailer must:

a) be fitted with:

i. a 50mm diameter fifth wheel, or

ii. a 90mm diameter fifth wheel, and

b) comply with requirements 8 to 11 below as applicable.

8. A 50-mm-diameter fifth wheel that is fitted to a vehicle must comply with NZS 5450: 1989, Coupling Devices for Articulated Vehicles – Fifth Wheel Assemblies.

9. A 90-mm-diameter fifth wheel that is fitted to a vehicle must comply with:

a) AS 1773-1996: Articulated Vehicles – Fifth Wheel Assemblies, and

b) AS 1771-1996: Installation of Fifth Wheel and Turntable Assemblies, and

c) AS 2174-1994: Articulated Vehicles – Mechanical Coupling between Prime Movers and Semi-Trailers – Interchangeability Requirements.

10. A vehicle that is fitted with a 90-mm-diameter fifth wheel must have, clearly displayed in a position readily visible from the position from which the release handle of the fifth wheel is operated, ‘90-mm fifth wheel’ in letters and figures not less than 100-mm high.

11. A rigid fifth wheel fitted to a vehicle must be installed and maintained in accordance with the fifth-wheel manufacturer’s instructions.

Skid plates and kingpins (section 4.8)

12. A semi-trailer must:

a) be fitted with:

i. a 50mm diameter kingpin, or

ii. a 90mm diameter kingpin, and

b) be fitted with a skid plate, and

c) comply with requirements 13 to 16 below as applicable.

13. A 50-mm-diameter kingpin and associated skid plate fitted to a vehicle must comply with NZS 5451: 1989: Coupling Devices for Articulated Vehicles – Fifth Wheel Kingpins.

14. A 90-mm-diameter kingpin fitted to a vehicle must comply with:

a) AS 2175-1995: Articulated Vehicles – Kingpins, and

b) AS 2174-1994: Articulated Vehicles – Mechanical Coupling between Prime Movers and Semi-Trailers – Interchangeability Requirements.

15. A skid plate fitted to a vehicle in connection with a 90-mm-diameter kingpin must comply with AS 4235-1994: Articulated Vehicles – Design Criteria for Fifth Wheel Skid Plates.

16. A vehicle that is fitted with a 90mm diameter kingpin must have clearly displayed in a position readily visible at the lower right-hand side of the front end of the vehicle ‘90-mm kingpin’ in letters and figures not less than 100mm high.

17. A kingpin fitted to a vehicle must not have any cracks that can be detected

a) during a non-destructive test, or

b) by means of visual inspection.

18. Results from a test in requirement 18 must be uniquely identifiable with the kingpin tested and must be retained by the vehicle’s operator for the period that the kingpin is in service.

19. A test in requirement 18 must be carried out by a person qualified to carry out non-destructive testing.

Gazette notice

20. The weight on the trailer axle set of a stinger steer must not at any time exceed 1.5 times the sum of the axle weights of the towing vehicle.

21. The weight of the front axle set or twin-steer set of the towing vehicle of a stinger steer must at all times be at least 20% of the sum of the axle weights of the towing vehicle.

22. Fifth wheel position for stinger steer must be at least 700mm rearward of the rear axis of the towing vehicle and not more than a distance equal to 50% of the towing vehicle wheelbase.

Heavy Vehicle Rule definitions

23. A converter dolly must have either:

a) a rigid drawbar associated with an oscillating fifth wheel and a single-axle or a tandem-axle set, or

b) a tandem-axle set with a hinged drawbar with a fixed fifth wheel.

Page amended **6 March 2019** (see **amendment details**)

9-5 Vehicle recovery

Certifier categories: **HVET** | **HMTD**

Reasons for rejection

1. The towing connection of a heavy vehicle recovery vehicle fitted on or after 1 October 2005 does not comply with NZS 5446.

2. A rigid tow-pole that is used for vehicle recovery purposes does not comply with NZS 5446.

3. The lifting gear of the following class NB vehicles cannot complete a test lift of 1.25 times the manufacturer's lifting capacity:

a) a hook truck

b) a stinger lift truck

c) transporter.

4. The lifting gear of the following class NC vehicles has not been tested in accordance with AS 1418.5:

a) a hook truck

b) a stinger lift truck

c) transporter.

5. A component used in the construction of the lifting gear fitted to a recovery vehicle is not suitable for its intended use.

6. The lifting gear fitted to a recovery vehicle on or after 1 October 2005 has not been constructed in accordance with any of the following applicable standards:

a) AS 1418.1

b) AS 1418.5

c) AS/NZS 1554

d) AS 3990.

7. The manufacturer's stated lifting capacity of a hook truck or stinger lift truck is not clearly displayed, in kilograms, rounded to the nearest 50kg, at the rear of the vehicle in letters and figures not less than 30mm high.

8. A component used in the construction of lifting gear fitted to a vehicle recovery service vehicle is not suitable for its intended use.

9.Towing connection components fitted to a vehicle do not ensure that a secure connection is maintained between the towing and towed vehicles under all conditions of loading and operation for which the vehicle is constructed.

10. The towing coupling components are worn beyond the manufacturer’s specifications.

11. New coupling fasteners have not been used if the coupling installed has been used in service.

12. The fasteners used do not meet the coupling manufacturer’s specifications.

13. A coupling does not have:

a) an effective locking device, or

b) a separate means of retaining the locking device in the locked position.

14. The locking of the coupling is not readily verifiable by visual inspection.

15. A vehicle has been modified in such a way that the braking or braking system may have been affected and it has not been referred to a certifier with the Brakes category unless the modification is covered in the vehicle’s body builders manual and the manufacturer has supplied written evidence that the vehicle remains within its original brake certification (refer to Technical Bulletin 13-7).

Table 9-5-1. Dimension requirements for vehicles and vehicle combinations (abridged)

Dimension	Distance (metres except where indicated otherwise)
Overall length (excluding collapsible mirrors):	
Towing vehicle, full trailer, simple trailer, pole trailer (excludinvg load)	11.5
Any other combination of vehicles	20.0
Forward distance (excluding collapsible mirrors):	
Rigid vehicle	8.5 if fitted with tow coupling, 9.5 otherwise
Full Trailer, simple trailer, pole trailer with drawbar at full extension, articulated bus (both front and rear sections), semi-trailer	8.5
Rear overhang:	
Heavy rigid vehicle	4.0 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a non-steering axle
4.25 or 70% of wheelbase (whichever is less) for a vehicle whose rearmost axle is a steering axle	
Articulated bus, heavy semi-trailer, heavy simple trailer, heavy pole trailer with one axle set	4.0 or 50% of forward distance (whichever is less)
Heavy full trailer, heavy pole trailer with two axle sets	4.0 or 50% of wheelbase (whichever is less)
All other vehicles	4.0
Rear trailing unit distance:	
A-Train, B-Train, towing vehicle and two trailers	14.5

Articulated point of attachment (excluding articulated buses)	No further rearward than the rearmost axle of the towing vehicle or rearmost axle of the leading trailer, and if the towing vehicle is a rigid vehicle and has more than one axle in its rear set, not more than 300 mm rearward of the rear axis of the towing vehicle
Tow coupling position (for towing heavy trailer):	
Full trailer	40% of wheelbase of towing vehicle

Summary of Legislation

Applicable references

- NZS 5446: Heavy vehicle towing connections – Drawbeams and drawbars
- AS/NZS 1554 parts 1 to 6
- Welding in the transport industry (NZTA publication) - **Technical bulletin 10**
- AS/NZS 2980:2018: Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding.

Applicable legislation

- **Land Transport Rule: Vehicle Dimensions and Mass 2002**
- **Land Transport Rule: Heavy Vehicles 2004**

General requirements for dimension and mass limits

1. Except as otherwise provided in this section and in 1.2(3) [of **Land Transport Rule: Vehicle Dimensions and Mass 2002**], a vehicle must comply with the applicable requirements in Table 4.1 [of **Land Transport Rule: Vehicle Dimensions and Mass 2002** (abridged in Table 9-5-1), and with other applicable requirements in this section.

2. In carrying out a 360-degree turn at the 25m diameter, no part of a vehicle in a combination, other than its articulation mechanism, may come into contact with the other vehicle in the combination.

Heavy Vehicle Rule

Vehicle recovery service vehicles

1. Lifting gear fitted to a vehicle recovery service vehicle on or after 1 October 2005 must be constructed in accordance with:

a) *Australian Standard 1418.1-1994: Cranes (including hoists and winches) – General requirements*; and

b) *Australian Standard 1418.5-1995: Cranes (including hoists and winches) – Mobile and vehicle-loading cranes*; and

c) *Australian/New Zealand Standard: 1554, Structural steel welding Parts 1 to 6*; and

d) *Australian Standard 3990-1993: Mechanical equipment – Steelwork*.

2. A towing connection fitted to the rear of a vehicle recovery service vehicle for recovery purposes on or after 1 October 2005 must be designed and constructed in accordance with *NZS 5446*.

3. A rigid tow-pole that is used for vehicle recovery purposes must be designed and constructed in accordance with NZS 5446.

4. Lifting gear of a class NB hook truck, stinger lift truck or transporter must be able to satisfactorily complete a test lift of 1.25 times the lifting capacity stated by the manufacturer.

5. Lifting gear of a class NC hook truck, stinger lift truck or transporter must be tested in accordance with *Australian Standard 1418.5-1995: Cranes (including hoists and winches) — Mobile and vehicle-loading cranes*.

6. The manufacturer's stated lifting capacity of a hook truck or stinger lift truck must, on or after 1 October 2005, be clearly displayed, in kilograms, at the rear of the vehicle in letters and figures not less than 30mm high.

7. The manufacturer's stated lifting capacity in *requirement6* must be rounded to the nearest 50kg.

8. A component used in the construction of lifting gear fitted to a vehicle recovery service vehicle must be suitable for its intended use.

Towing connection requirements

9. Towing connection components fitted to a vehicle must ensure that a secure connection can be maintained between the towing and towed vehicles under all conditions of loading and operation for which the vehicle was constructed.

Couplings (section 4.6)

10. A coupling must have an effective locking device and a separate means of retaining this device in the locked position.

11. Locking of a coupling must be readily verifiable by visual inspection.

12. Unless requirement 13 or 14 applies, a hook, pin or ball-and-socket type coupling for towing a vehicle must comply with NZS 5446: 1987.

13. A 50-mm-diameter tow ball fitted to a vehicle for towing a light trailer must comply with NZS 5232: 1993, Specification for Ball-and-Socket Type Trailer Couplings

14. A 1?-inch-diameter tow ball fitted to a vehicle for towing a light trailer must comply with the performance and marking requirements of NZS 5232: 1993 Specification for Ball-and-Socket Type Trailer Couplings, except that the ball size marking must be 1?”.

15 . A device fitted to the front of a vehicle to enable it to be recovered, together with its connection to the chassis, must be suitable for this purpose.

10 Load retention

10-1 Load retention

Certifier categories: **HVEA** | **HVAD**

Reasons for rejection

1. A load anchorage has not been manufactured or fitted according to the approved designs from NZS 5444 when being certified by an HMAD.

2. A load anchorage has not been manufactured or fitted according to the Certificate of Design Compliance when being certified by an HMAD (refer to **Technical bulletin 5**).

3. The Statement of Design Compliance was not signed by an HV engineering certifier.

4. A load anchorage does not comply with the requirements of NZS 5444.

5. The condition of the load anchorage or its attachment has been affected by corrosion or weakening of its structure that is apparent by visual inspection so that the load anchorage is unsafe.

6. A vehicle that is constructed for the purpose of transporting timber logs has not been fitted with a cab-guard, if that vehicle has a cab.

7. A cab-guard and its attachment to a vehicle's chassis is not of adequate strength to protect the cab of the vehicle from forces that result from load impact during:

    a) loading or unloading of the vehicle, and

    b) emergency braking of the vehicle at 1g.

8. A cab-guard has not been fitted to a vehicle's chassis in a way that:

    a) does not adversely affect the strength and durability of the chassis, and

    b) does not cause the chassis to be damaged when the cab-guard is subjected to the forces in requirement 3.

9. A cab-guard attached to a vehicle's chassis:

    a) is not at least as wide as the cab of the vehicle, or

    b) is not at least as high as the cab of the vehicle, or

    c) has apertures of a shape and size that could allow any forward-moving portion of the vehicle's load to pass through the cab-guard.

10. A headboard, sideboard or tailboard fitted to a vehicle for the purpose of restraining a load on that vehicle is of inadequate strength to withstand, without incurring permanent deformation, a horizontal force uniformly distributed over its vertical area equal to:

    a) for lashed loads:

        i. for headboards, half the weight of the payload capacity, and

        ii. for sideboards and tailboards, a quarter of the weight of the payload, and

    b) for unlashed loads that are baulked or that occupy the entire deck of the vehicle:

        i. for headboards, the weight of the payload capacity, and

        ii. for sideboards and tailboards, half the weight of the payload capacity.

11. A headboard, sideboard or tailboard is fitted to a vehicle for the purpose of restraining a load on that vehicle in such a way that the parts of the vehicle to which it is attached cannot withstand the forces imposed by the headboard, sideboard or tailboard without incurring permanent deformation.

12. Load securing equipment that is fitted to a vehicle cannot ensure that the load can be securely contained on the vehicle under all conditions of loading and operation for which the vehicle was constructed.

13. A rating for a load anchorage hook is less than 600kg and (Note 10) applies.

14. A curtain-sided body that is constructed to secure a load and is fitted to a vehicle does not have a curtain that

a) has a manufacturer's load rating appropriate for all conditions of loading and operation of the vehicle, and

b) is clearly marked, in a position on the vehicle that is readily accessible for inspection purposes, with:

i. the manufacturer's load rating, in kilograms per metre, and

ii. the expiry date of the curtain as determined by the curtain manufacturer.

15. The load rating of the curtain anchorage system, including tie down rail, is inadequate.

16. For an imported vehicle fitted with load retention equipment, any welding of load retention equipment does not comply on visual inspection with section 6 of AS/NZS 1554.1.

17. For an imported vehicle fitted with load anchorages, where compliance of the load anchorages is established by calculation and the welder is unknown or unqualified, the weld design stress exceeds 75% of the permissible weld design stresses.

18. The condition or construction of the vehicle is such that the load anchorage restraint forces cannot be adequately transmitted to the basic vehicle structure.

19. The means by which the body is attached to the chassis of a vehicle manufactured from 1 September 2005 is not designed and constructed so that the stresses in requirement 21 on the attachment do not exceed 60% of the yield stress of the material from which the attachment is made.

20. A stockcrate retention device manufactured before 1 January 1994 and fitted to a vehicle with a gross vehicle mass of 6000 kg or more does not comply with section 5 of NZS 5413, Code of Practice for the Manufacture and Use of Stockcrates on Heavy Vehicles.

21. A stockcrate retention device and a monocoque stock vehicle manufactured and fitted to a vehicle of gross vehicle mass of 6000kg or more on or after 1 January 1994, does not comply with NZS 5413, Code of Practice for the Manufacture and Use of Stockcrates on Heavy Vehicles.

22. Not all modifications or repairs to the load anchorages have been certified.

23. A passenger service vehicle on which a roof rack is fitted does not comply with the **PSV Rule** section 7.3

24. When the roof rack is rated by the manufacturer who also supplies mounting instructions, the roof rack on the PSV has not been installed according to these instructions.

25. The roof rack when fitted to a passenger service vehicle does not have a sign or plate on the left-hand side stating:

a) the purpose of the roof rack, if other than for general baggage, and

b) the maximum weight it is allowed to carry, and

c) the manufacturer of the roof rack, and

d) either of the following:

i. identification of the passenger service vehicle to which it is fitted (make, model and registration number, or VIN or chassis number), or

ii. if rated and certified either by the vehicle manufacturer or by a person authorised by the NZTA to do so, for a vehicle model, the approval for that vehicle model.

26. A tipper body that includes load anchorage points does not have a body locking device that complies with the load requirements of NZS 5444 (Note 11).

Note 1

Attachment points on stockcrates must be constructed to the requirements of NZS 5413.

Note 2

If J Hooks are used then the coaming rail must be certified to NZS 5444 to allow J hooks.

Note 3

NZS 5413: 1993 also allows other types of attachment provided they comply with NZS 5444.

Note 4

In enclosed bodied vehicles designed to carry freight and use tie-down points to secure the load, those points must be designed and certified to NZS 5444 as load anchors.

Note 5

Any rope rails and droppers fitted as part of a curtain-sider installation must be certified to NZS 5444.

Note 6

The vehicle must have attached to the load platform an indelible label identifying the following:

a) Compliance Certificate Number

b) Manufacturer or Certifier

c) Vehicle Chassis or VIN Number

d) The type of Load Anchorages

e) The number of Load Anchorages fitted

f) Rating (tonnes).

Note 7

Where J hooks are being specifically certified for use for other than stockcrates the label may be attached to the bin or bulk container being restrained.

Note 8

SRT must be recalculated if a roof rack has been fitted after original certification (section 5.2).

Note 9

No person shall operate a motor vehicle, which is affected by corrosion or weakening of its structure, that is apparent by visual inspection, so that the vehicle is unsafe to operate (regulation 80).

Note 10

A vehicle that has been designed to carry a specific load, such as a skeletal container vehicle or a car transporter, may have a load anchorage rating applicable to that load and be exempted from requirement 1.2.8 of NZS 5444.

Note 11

Proprietary anti-rattle devices are unlikely to be suitable for use as a body lock in most cases.

Summary of legislation

Applicable references

- Truck Loading Code
- NZS 5413 1983, Code of Practice for Manufacture and Use of Stockcrates on Heavy Vehicles
- NZS 1554, Welding
- NZS 5444, Load Anchorage Points for Heavy Vehicles
- AS 3990, Mechanical Equipment – Steelwork
- AS/NZS 2980: Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: Qualification testing of welders – Fusion Welding
- **Technical bulletin 10: Welding in the transport industry**

Applicable legislation

- **Land Transport Rule: Heavy Vehicles 2004**
- **Land Transport Rule: Passenger Service Vehicles 1999**
- *New Zealand Gazette*, 26 April 2001, No 43, page 957.

Land Transport Rule: Heavy Vehicles

Cab-guards (section 3.3)

1. A vehicle that is constructed for the purpose of transporting timber logs must be fitted with a cab-guard, if that vehicle has a cab.

2. A cab-guard and its attachment to a vehicle's chassis must be of adequate strength to protect the cab of the vehicle from forces that result from load impact during:

a) loading or unloading of the vehicle, and

b) emergency braking of the vehicle at 1g.

3. A cab-guard must be fitted to a vehicle's chassis in a way that:

a) does not adversely affect the strength and durability of the chassis, and

b) does not cause the chassis to be damaged when the cab-guard is subjected to the forces in requirement 2.

4. A cab-guard attached to a vehicle's chassis:

a) must be at least as wide as the cab of the vehicle, and

b) must be at least as high as the cab of the vehicle, and

c) must not have apertures of a shape and size that could allow any forward-moving portion of the vehicle's load to pass through the cab-guard.

Headboards, sideboards, and tailboards (section 5.6)

5. A headboard, sideboard or tailboard fitted to a vehicle for the purpose of restraining a load on that vehicle must be of adequate strength to withstand, without incurring permanent deformation, a horizontal force uniformly distributed over its vertical area equal to:

a) for lashed loads:

i. for headboards, half the weight of the payload capacity, and

ii. for sideboards and tailboards, a quarter of the weight of the payload, and

b) for unlashed loads that are baulked or that occupy the entire deck of the vehicle:

i. for headboards, the weight of the payload capacity, and

ii. for sideboards and tailboards, half the weight of the payload capacity.

6. A headboard, sideboard or tailboard must be fitted to a vehicle in a way that ensures that the parts of the vehicle to which it is attached are able to withstand the forces imposed by the headboard, sideboard or tailboard without incurring permanent deformation.

7. A headboard fitted to a vehicle in New Zealand on or after 1 March 2006 must have a plate, clearly displayed in a visible and readily accessible position, marked with:

a) the headboard manufacturer's name, and

b) the headboard manufacturer's load rating in kilograms rounded to the nearest 100kg.

8. The width of the headboard should be at least equal to the width of the cab and preferably as wide as the deck.

9. The height of the headboard should be at least equal to the height of the cab.

10. Headboards should be of solid construction without apertures.

11. A headboard, tailboard or sideboard higher than 0.7m above the the main load carrying platform, the horizontal forces acting on them may be uniformly distributed over the vertical areas bound by a horizontal line no higher than 0.7m above the main load carrying platform and, if applicable, any mezzanine floor.

Load securing equipment (section 5.1)

12. A vehicle that is constructed to transport a load must be equipped with load securing equipment.

13. Load securing equipment that is fitted to a vehicle must be constructed to ensure that the load can be securely contained on the vehicle under all conditions of loading and operation for which the vehicle was constructed.

Containment by a vehicle body (section 5.2)

13. The body of a vehicle, that is constructed to contain goods without the use of lashings, chains or other devices, must be specifically designed to contain that type and size of load.

14. A tank body for transporting bulk liquids must, if necessary:

a) have sufficient transverse baffles, or similar devices, to prevent excessive longitudinal load-shifting that could adversely affect the tractive or braking performance of the vehicle; and

b) have a cross-section shape, longitudinal baffles or similar devices, to prevent excessive transverse load-shifting that could destabilise the vehicle.

Curtain-sided bodies (section 5.4)

15. A curtain-sided body that is constructed to secure a load and is fitted to a vehicle must have a curtain and a curtain anchorage system that:

a) has a manufacturer's load rating appropriate for all conditions of loading and operation of the vehicle, and

b) is clearly marked, in a position on the vehicle that is readily accessible for inspection purposes, with:

i. the manufacturer's load rating, in kilograms per metre.

16. The load rating of the curtain and curtain anchorage system must be established as the maximum load with which the following conditions are complied:

a) relative to the plane in which the curtain lies when it is secured but without load placed against it, the maximum sideways deflection of the curtain does not exceed 100mm, at any point, when the load is subjected to a uniform and sustained lateral acceleration of 0.5g, and

b) the curtain and curtain anchorage system do not fail when the load is subjected to a uniform and sustained lateral acceleration of 1g.

17. The load rating of the curtain and curtain anchorage system may also be established by a method developed by a heavy vehicle industry representative group and approved by the Agency by means of a notice in the *Gazette*.

Load anchorage points (section 5.5)

18. Unless the body of the vehicle is designed to contain the load without other load security devices, or the vehicle is fitted with a stockcrate, or the vehicle is a curtain sider that is load rated, a vehicle must have load anchorage points that comply with NZS 5444, Load Anchorage Points for Heavy Vehicles.

19. Unmodified load anchorage points fitted to an imported vehicle must comply with NZS 5444, Load Anchorage Points for Heavy Vehicles, except that, if compliance is established by calculation:

a) the welding is not required to be carried out by a qualified welder, provided the welding is satisfactory as established by visual inspection by an HVS Certifier to comply with section 6 of AS/NZS 1554.1 and

b) the weld design stresses permissible according to the standard are reduced by 25%.

Vehicle body attachment (section 3.2)

20. The means by which a body is attached to the chassis of a vehicle manufactured on or after 1 October 2005 must be designed and constructed so that the stresses on the attachment when calculated in accordance with requirement 21 below do not exceed 60% of the yield stress of the material from which the attachment is made.

21. The stresses in requirement 20 above must be calculated under each of the following loading conditions when the forces are applied at the approximate centre of gravity of the load:

a) a longitudinally-acting force, equivalent to twice the combined weight of the payload capacity and the body mass,

b) a downward-acting force, equivalent to twice the combined weight of the payload capacity and the body mass,

c) a transversely-acting force, equivalent to the combined weight of the payload capacity and the body mass,

d) an upward-acting force, equivalent to the combined weight of the payload capacity and the body mass.

Stockcrates (section 5.3)

22. A stockcrate retention device fitted to a vehicle with a gross vehicle mass of 6000 kg or more must comply with section 5 of NZS 5413, Code of Practice for the Manufacture and Use of Stockcrates on Heavy Vehicles.

23. Stockcrate anchorage points fitted to the deck of a vehicle must comply with *New Zealand Standard 5444, Load Anchorage Points for Heavy Vehicles*.

Land Transport Rule: Passenger Service Vehicles 1999

Roof racks (section 7.3)

24. Fitting a roof rack to a passenger service vehicle is a modification.

25. The roof rack must:

a) be fitted and rated as appropriate for that particular make and model of passenger service vehicle, or

b) be rated and certified by an HV certifier and fitted in accordance with that authorised person's instructions.

28. The roof rack must have a sign or plate on the left-hand side stating:

a) the purpose of the roof rack, if other than for general baggage, and

b) the maximum weight it is allowed to carry, and

c) the manufacturer of the roof rack, and

d) either of the following:

i. identification of the passenger service vehicle to which it is fitted (make, model and registration number, or VIN or chassis number), or

ii. if rated and certified either by the vehicle manufacturer or by an HV certifier, for a vehicle model, the plate need not identify the individual vehicle, but must identify the approval for that vehicle model.

29. Vehicles fitted with tipping bodies that includes load anchorage points must include a body lock that complies with the load requirements of NZS 5444.

Page amended **2 December 2019** (see **amendment details**)

10-2 Log bolster attachment

Certifier categories: **HVEL** | **HMLD**

Reasons for rejection

1. A unit fitted with sliding log bolsters is not fitted with effective locking devices to prevent the bolsters moving when loaded except where the unit is set up for shorts operation and the sliding bolster is part of a pair with the other bolster fixed.

2. A bolster fitted to a heavy truck or trailer for the first time on or after 1 May 2001 does not comply with the version of the Bolster Attachment Code (Scedule 1, Schedule 2 or Schedule 4) applicable at the time the logging vehicle was fitted with the bolsters

3. Bolster attachments on vehicles fitted with convertible bolsters for the carriage of long logs have been certified to the alternative option by a manufacturer of logging vehicles who is also a manufacturing certifier or by a Bolster Attachment Code Certifying Engineer certify that the particular design of the bolster attachments when it has not successfully completed on a single vehicle, 250,000km of service without any indication of cracking due to fatigue or other significant failure.

4. A trailer fitted before 27 November 1998 with load cells supporting log bolster attachmentsthat have not been certified for compliance with a version of the Bolster Attachment Code in Schedule 1 or 2 does not have a second safety chain of at least 6000kg minimum breaking force per bolster fitted over the logs and fitted to anchor points directly to the chassis of the vehicle:

5. A trailer fitted before 27 November 1998 with load cells supporting log bolster attachmentsthat have not been certified for compliance with a version of the Bolster Attachment Code in Schedule 1 or 2 does not have load anchorage points of at least 6000kg rated strength that comply with *New Zealand Standard 5444: 1989, Load Anchorage Points for Heavy Vehicles* fitted directly to the chassis to support the required safety chains.

Summary of legislation

Applicable references

- Truck Loading Code (2012)
- Bolster Attachment Code (LTSC Issue 27, November 1998 – Schedule 1)
- Bolster Attachment Code (LTSC, Revision 1 May 2001 – Schedule 2)
- Bolster Attachment Code (Revision 2, November 2010 – Schedule 4)
- AS/NZS 1554 Welding
- NZS 5444, Load Anchorage Points for Heavy Vehicles
- AS 3990: 1993, Mechanical Equipment – Steelwork
- AS/NZS 2980:2018: Qualification of welders for fusion welding of steels – Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding
- **Technical bulletin 10: Welding in the transport industry**

Applicable legislation

- NZ Gazette Notice 2937 26/4/2001 (Note 1)
- **Land Transport Rule: Heavy Vehicles 2004**

Vehicle Body & Equipment attachment (section 3.2)

1. Subject to requirement 2, logging bolster attachments fitted to a vehicle on or after 27 November 1998 must comply with the version of the *Bolster Attachment Code* in *Schedules 1, 2* or *4* that applied at the time of fitting

Section 9

2.Despite *requirement 1*, logging bolster attachments exempted by notice in the *Gazette* from having to comply with a version of the *Bolster Attachment Code* in *Schedule 1* or *2* do not have to comply with the Code.

3. A trailer fitted before 27 November 1998 with load cells supporting log bolster attachments that have not been certified for compliance with a version of the Bolster Attachment Code in Schedule 1 or 2 must:

a) in addition to the normal safety chain fitted to the bolster and any belly chains as otherwise required, have a second safety chain of at least 6000kg minimum breaking strength per bolster fitted over the load and secured to anchorage points mounted directly on the chassis of the vehicle; and

b) have load anchorage points of at least 6000kg rated strength that comply with *New Zealand Standard 5444: 1989, Load Anchorage Points for Heavy Vehicles*.

Note 1

Bolster attachments on vehicles fitted with convertible bolsters for the carriage of long logs must comply with the Bolster Attachment Code 2001 unless certified by a manufacturer of logging vehicles who is also a manufacturing certifier or by a Bolster Attachment Code Certifying Engineer that the particular design of the bolster attachments has successfully completed on a single vehicle, 250,000km of service without any indication of cracking due to fatigue or other significant failure. A certificate to this effect must be presented to the TSD Agent at the time of first presentation of the vehicle for registration.

Page amended **9 April 2018** (see **amendment details**)

11 Local manufacture and repair code of practice

11-1 Scope and tasks certifiable by a local manufacturing certifier (HMXD)

Applicability

In the event of any contradiction, the Act, Regulations, Land Transport Rules and the original manufacturer's repair or modification guidelines (manufacturer's body builders' manual) take precedence over this code. Persons repairing or certifying repairs to heavy vehicles must ensure that all applicable manufacturer's recommendations are complied with and that no regulatory compliance is invalidated, even as an unintended consequence of complying with this code. Where there is disagreement between this code and the manufacturer's body builder's manual, or the repair procedure in the body builder's manual is inappropriate, the repair must be referred to a HV engineering certifier with the appropriate category.

Repairers are obliged under **Land Transport Rule: Vehicle Repair 1998**, to repair vehicles in accordance with the Rule and the applicable requirements in the Rule. This rule also requires repairers to provide information or assistance to the Transport Agency when requested.

Range of tasks covered by this code

This Code of Practice applies to:

- The **minor** repair of heavy motor vehicles currently registered in New Zealand.
- The manufacture and/or fitting of new components covered by the **Appointments Section**

This code provides procedural requirements and examples of acceptable practice for a range of common repairs and standard manufactured components. It is intended to **supplement** the recommendations of the original vehicle manufacturer in relation to vehicle repair techniques or standards and provides guidelines where manufacturer's standards do not exist. It does not cover every eventuality.

Failure modes

The failure mode of a structural component of a HV, including the chassis, may be classified according to the following:

Minor	Failures that are unlikely to cause safety concerns and may be repaired according to good industry standard without welding and where certification isn't required. **Repairs in this category are covered in this code.**
Medium	Failures that may cause safety concerns unless repaired according to best industry practice, following either a properly designed repair specification or a pre- engineered solution reflecting industry best practice based on a detailed engineering analysis carried out by a HV engineering certifier with the appropriate category. **Repairs in this category are covered in this code.**
Critical	Failures with serious safety implications, including safety critical bolt-on items such as repaired steering or suspension items, that must always be repaired according to a repair specification based on a detailed engineering analysis carried out by a HV engineering certifier with the appropriate category. **Repairs without an SoDC in this category are not covered in this code.**

Note: Where a subsequent failure occurs in a repair that used a method selected from this code, **it must be considered a critical failure** and be referred to a HV engineering certifier with the appropriate category. This is due to the safety risk as the initial repair was demonstrably not adequate and thus resulted in the subsequent failure showing there were unrecognised risk factors in the original repair.

The repairs covered by this code are typically of a structural nature requiring the replacement or repair of an item which usually involves some welding. It does not cover components that are attached using fasteners that can be replaced in a bolt-on, bolt-off manner. These components do not need certification except as noted above but it is the repairer's responsibility that they are fit for purpose and meet the requirements of Land Transport Rule: Vehicle Repair 1998, of returning the vehicle to within safe tolerance of original manufacture. After market or pattern parts may not meet these criteria.

A repair carried out under this code cannot be used justify the alteration of a vehicle's chassis rating.

Table 11-1-1 Tasks for HV manufacturer certifiers allowed in this code

Component/item – repair type	Significance		
	Simple[1]	Minor[2]	Major[3]
Damage to web stiffener with no significant attachments		?	
Crossmember gusset with cracks in gusset		?	
Crossmember with cracks – 1st repair		?	
Crossmember with cracks – 2nd repair of same problem failure			?
Cracks in web - through crossmembers		?	
Cracks in web - crossmembers butt to web		?	
Chassis rail flange crack – in front/rear overhang (not load bearing)			?
Body component not part of monocoque framework		?	
Cracked crossmember more than 300 mm from a suspension		?	
Toweye weld (as per original)		?	
Proprietary Components (using manufacturer's instructions)			
Suspension hanger, spring seat.		?	
Unacceptable Repairs/Practices			
Unauthorised welded attachments to suspension components.			
Unauthorised bolted attachments to suspension components.			
Ballrace/turntables – welded repairs.			

Bolted Components			
Ballrace	?		
Bolted toweye	?		

1. Simple items do not require certification if repaired/replaced.

2. LT400 required.

3. LT400 and SoDC.

Background and acknowledgement

The manufacture and repair code of practice was created in 2003 by the NZ Truck and Trailer Manufacturers Federation (TTMF). That code was adapted by the NZTA in 2019 to reside within the *VIRM: Heavy vehicle specialist certification*.

Page added **9 December 2019** (see **amendment details**).

11-2 Vehicle service life and application

Fatigue life

The fatigue life of a vehicle in terms of kilometres travelled and the type of application it is operated under is significant when determining whether the failure should be considered acceptable, premature, or somewhere in between. When working in linehaul operation a chassis failure would not be expected. However, the rigors of logging and its poor road and skid site access and other off-road usage such as quarrying, means higher fatigue loadings that can result in a failure much earlier in the vehicle's life even if it is no longer operating in that high fatigue environment.

First failure of a chassis rail (only use this code after the vehicle has traveled these distances)

Truck or tractor units

After at least 250,000km for a unit used for at least 30% of its operating life, at time of failure, on unsealed roads or in off-road conditions (loggers and milk tankers are two vehicle groups that generally fall into this category).

After at least 500,000km for a unit that does not spend at least 30% of its operating life off-road or on unsealed roads.

Trailers

After at least 250,000km for a trailer that does not spend at least 30% of its operating life off-road or on unsealed roads.

Cross-members and gussets

Technical Bulletin 1 – Heavy vehicle repair thresholds identifies those cross-members where the first failure, at whatever mileage, may be repaired using this code without requiring HV engineer certification.

Subsequent failure of cross-members if the failure does not occur within 250,000km of the repair.

Failure of gussets or auxiliary components of the chassis occurring after 250,000km.

Page added **9 December 2019** (see **amendment details**).

11-3 Manufacturing and repair procedures

Background

This section contains information and Illustrations relating to a range of typical repairs and manufacturing tasks undertaken by the industry.

Each workshop should have a Quality Management System (QMS) and should develop and implement a comprehensive procedure for dealing with the range of manufacturing and repair tasks it is likely to deal with. This procedure should be formally incorporated in the workshop's QMS and refer to this code. As with all procedures this will evolve over time and the QMS must be audited and reviewed regularly and updated as required.

The various types of manufacture and repair processes will need a range of equipment, skills, instructions and records to complete the task so an evaluation of the task is necessary to ascertain whether it is within the capacity of the workshop, what resources are required and how it will be achieved.

The HV manufacturer IO will have a PDS which must cover all aspects of each certification.

Manufacturer's repair information

All repairs should be first referred to the manufacturer to establish:

- if they can provide and appropriate repair instruction
- if they specifically prohibit a repair
- if they cannot offer a repair procedure but would allow an appropriate repair to be undertaken

Where a manufacturers repair procedure is available this must comply fully with one of the pre-approved repairs or a DC in order for the repair to be certified without a SoDC from an HVSC.

If the manufacturer specifically prohibits the repair (refer "c" above) this position should be confirmed in writing and include the reasons. In this situation a repair must not be attempted without reference to a HV engineering certifier with the appropriate category.

Where a manufacturer cannot offer a repair procedure (eg if they don't specifically prohibit a repair) but would allow an appropriate repair to be undertaken, confirmation of this position should be requested for the job file and the design referred to a HV engineer certifier with the appropriate category.

Design certificates

Design certificates (DC) or 'Pre-engineered solutions' in this Code of Practice are designs for repairs or simple, repetitive manufacturing processes. The DCs have been commissioned by the TTMF, peer reviewed by a HV engineering certifier with the appropriate category and passed to the NZTA for inclusion in **11-7 Pre-approved repairs** of this code.

Individual manufacturing certifier IOs may also commission their own DCs from a HV engineering certifier with the appropriate category. These will not be published in this Code but will be the property of the IO that commissioned them. They must be made available to the Transport Agency for audit and feature in the job file as described in **11-5 Documentation**

Pre-approved repair of items covered by the VIRM

The repairs included in section **11-7 Pre-approved repairs** can be performed without a SoDC from a HV engineering certifier only if the scope of the repair is fully covered in that drawing and there is no conflict with the manufacturers repair instructions.

Page added **9 December 2019** (see **amendment details**).

11-4 Welding

Introduction

Welding is a specialised and skilled task. For example, some metals cannot be welded or can only be welded once without degradation of its properties. Others require the use of pre-heating or cooling, alternative grades of welding consumables and other specialised techniques. Only welders qualified to carry out the weld procedures appropriate to the particular task should be employed to weld items, whether for repair or the manufacture and fitting of components. Where there is doubt the repair or design must be referred to a HV engineer certifier with the appropriate category.

All welding shall follow the procedures specified by and comply with an appropriate standard:

Carbon Steel	AS/NZS 1554 Parts 1, 5 (Yield < 500 Mpa)
High strength quenched and tempered steel	AS/NZS 1554.4
Aluminium	AS/NZ 1665
Stainless Steel	AS/NZS 1554 Part 6, Industry Codes

All welders shall be currently qualified and certified in the appropriate position and technique being employed for the manufacture or repair of any structure or component.

Manufacturers' instructions and industry guidelines, including **Technical bulletin 10: Welding in the transport industry**, are to be followed at all times.

Welding repairs

Repair by welding may be required either during fabrication of a structure or component, or as a result of service failure. The following steps are important in developing a repair procedure:

- establish the cause of failure
- determine the material composition
- develop a repair procedure in accordance with the applicable code
- carry out the repair with the proper work instructions and weld procedure
    - carry out the required inspection/NDT
    - carry out post weld heat treatment (if specified/required)
- final inspection prior to certification.

Determining the material composition

While all materials in a new component or structure are specified this may not be the case with a repair and it is critical that all the materials involved in such a repair are identified. This identification is an essential first step in the development of an appropriate welding procedure. Contacting the original manufacturer or their agent is the primary source of information. However, material identification may not be straightforward in the case of post fabrication failures if the original drawings or manufacturer's information is not available. In this instance advice must sought from materials specialists such as HERA. If there is doubt then the repair must be referred to an HV engineering certifier with the appropriate category.

Developing a welding procedure

A weld procedure needs to define:

- pre-weld treatment/preparation
- pre-and post-heat treatment
- the welding process and equipment
- the welding consumable
- the welding parameters
- monitoring and inspection techniques
- the required inspection/NDT
- the identity of the welder.

Pre-weld treatment for repair includes examination of the extent of the defect, removal of existing cracks, cleaning and checking for base metal soundness and material preparation for the welding procedure to be used.

Pre-weld treatment for manufacturing new structure or components includes:

- ensuring substrate materials and consumables are correct to drawing
- specified weld procedure is appropriate
- cleaning and material preparation for specified weld procedure.

Page added **9 December 2019** (see **amendment details**).

11-5 Documentation

All manufacturing and repair activities must be documented for traceability and accountability. This shall be done as a function of the organisation’s QMS.

See **Introduction 3-9 Minimum file content** for further information.

Page added **9 December 2019** (see **amendment details**).

11-6 In-service conditional (28-day) permits

To assist with minimising delays in certifying repairs to heavy motor vehicles, the process for temporary permits, issued in place of a certificate of fitness (CoF) is outlined below. This process can only be used by a **HV manufacturer certifier**.

If a minor fault is identified on a heavy vehicle at the time of CoF that is not covered by a pre-engineered solution and would normally require input from an engineer before the repair can be certified, this temporary permit process is designed to allow the vehicle to remain in service until the normal certification process can be completed.

With the permit issued the vehicle is able to be operated on the road. Before the permit expires the normal certification process is to be undertaken so that an LT400 can be issued. It is important to note that only one permit per-repair will

be issued and no extension given.

If the certification process is not completed before the expiry date, the vehicle is not allowed to operate after this date until the process is complete and a full CoF has been issued.

Note 1

The HV manufacturer certifier documents the fault – documenting the exact location, type of failure and other relevant details in sketches, accurate descriptions of materials and photographs.

Note 2

Document the repair method – the applied technology (including electrode quality etc) and all relevant details regarding the repair method must be documented.

Note 3

Issuing a professional opinion – this is not a certification, so an LT400 **must not** be used. The professional opinion should be on your company letterhead and shall contain:

- vehicle details
- your details
- details of the fault
- a statement stating that it has been repaired to industry best practice and is safe to operate on the road for up to 28 days
- the date and sign the document.

Note 4

The normal certification process – an engineer or HV manufacturer certifier can certify the final repair and issue a LT400.

Questions

Why can only a CoF inspector issue the temporary 28 day permit?

The Vehicle Standards Compliance Rule (the Rule) does not allow for temporary certification to be issued by Specialist Certifiers. Clause 7.8(1) of the Rule allows a Vehicle Compliance Certifier (CoF Inspector) to issue a temporary permit, when a vehicle does not comply with all applicable requirements, but is nevertheless in a safe condition to be operated. Conditions on vehicle operations can be placed on the temporary permit.

Do I need to give a professional opinion?

If you do not wish to use this process and give a professional opinion you do not have to. You can use the normal certification process.

What does a certifier give to the CoF inspector when asked for a professional opinion?

Under this process the certifier is not issuing a certification. Do not use an LT400 or a Statement of Design Compliance. The certifier is giving a professional opinion to the CoF inspector, based on their experience and knowledge of vehicles,

whether they believe the vehicle to be safe to operate on the road while it awaits a fully certified repair. The information that should be placed in your professional opinion is stated in Note 3 above.

Page added **9 December 2019** (see **amendment details**).

11-7 Pre-approved repairs

Download all pre-approved repairs drawings (PDF)

Page added **9 December 2019** (see **amendment details**).

12 Additional topics

12-1 Welding

Certifier categories: **All**

Reasons for rejection

1. A welding procedure compliant to the appropriate part of AS/NZS 1554 has not been specified.

2. The specified welding procedure has not been followed.

3. The wrong class of weld has been used.

4. The required NDT has not been performed for Class SP and GP welds, or for other welds, as required, by an appropriately qualified person.

5. The welding quality does not comply with AS/NZS 1554 or another appropriate standard.

6. The welder is unknown or unqualified in either process or position to AS/NZS ISO9606: 2017, AS/NZS 2980:2018 or an alternative approved standard.

7. For load anchorages, the welder is unknown or unqualified in either process or position to AS/NZS 2980-2018 or an alternative approved standard and the calculated weld stress is greater than 75% of the allowable stress stated in the applicable standard if the allowance is appropriate.

8. Appropriate notice has not been taken of the NZTA publication *Welding in the Transport Industry* (Note 1).

Note 1

See ‘Welding in the Transport Industry, 28 February 2013’ **Technical bulletin 10**

Summary of legislation

Applicable references

- AS/NZS 1554 Welding
- AS/NZS 2980-2018: Qualification of welders for fusion welding of steels - Additional requirements for Australia and New Zealand
- AS/NZS ISO9606.1: 2017 Qualification testing of welders – Fusion Welding.

12-2 Conversion to RH drive

Certifier categories: **HVEC** | **HVCD**

Reasons for rejection

1. A steering system on a motor vehicle, and associated systems and components that could directly or indirectly affect the directional control of the vehicle are not:

    a) sound and in good condition or provide the vehicle with safe, efficient, convenient and sensitive control,

    b) strong, durable and fit for their purpose, taking into account whether adverse effects have resulted from a loss of integrity of any protective system used by a relevant component.

2. A motor vehicle capable of a speed more than 50km/h and equipped with a steering system with no direct mechanical connection between the driver's means of control and the wheels or other means of changing the vehicle's direction does not have at least one additional means of steering that complies with requirement 1.

3. A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle means the vehicle does not comply with requirement 1.

4. A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle is not certified

5. A steering system or a system component that could affect the directional control is modified and:

    a) the steering system is not compatible with the performance and component specifications of the manufacturer of the vehicle or steering system for the original steering system, or

    b) the loads and stresses on the steering system and its components are not demonstrably within the design and performance criteria established by their manufacturer for the specific application in which they were originally used.

6. A repair to a steering system, or a repair to a motor vehicle that affects its steering system does not comply with all other requirements in this section.

7. A left-hand drive vehicle has been certified for entry into service, or operation in service, in New Zealand and it is not:

    a) vehicles of the categories specified in *Schedule 1*, subject to the conditions specified in relation to each category, or

    b) an individual left-hand drive vehicle that was certified for entry into service in New Zealand before 1 April 2010.

8. A vehicle has been converted from left-hand drive to right-hand drive and:

    a) if practicable, original equipment has not been used, or

    b) non-original equipment has been used without approval by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, or

    c) the steering column has been transferred and the transfer has altered the integrity of the column or its collapse mechanism, or

    d) except when fixing mountings to the chassis or body of the vehicle, steering components have been welded, and:

        i. the welding is not designed by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

ii. no appropriate non-destructive testing has been carried out by a qualified person, or

e) steering performance and characteristics have not been maintained, and

f) the parking brake, auxiliary brake, accelerator or clutch controls have not been transferred to the right-hand side of the vehicle; or

g) new mounting points for the parking brake, accelerator and clutch controls are not of equivalent strength to the original mounting points.

9. A vehicle is converted from left-hand drive to right-hand drive and:

a) the service brake control assembly has not been transferred to the right-hand side of the vehicle, or

b) the service brake pedal assembly have not been transferred to the right-hand side of the vehicle and the motion of the brake pedal is not transmitted to the master cylinder or treadle valve by:

i. a torque shaft, or

ii. levers and rods.

10. For a vehicle to which requirement 9 applies, the master cylinder or the treadle valve and the mechanism that transfers the braking effort from the right-hand side to the left-hand side are not protected to ensure that the service brake can be activated only by the driver.

11. A conversion to dual steering has been carried out on a vehicle other than a special purpose vehicle.

12. A special purpose vehicle has been converted to dual steering and:

a) if practicable, original equipment is not used, or

b) non-original equipment has been used without the approved by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, or

c) except when fixing mountings to the chassis or body of the vehicle, steering components have been welded, unless:

i. the welding is designed by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

ii. appropriate non-destructive testing has been carried out, or

d) steering performance and characteristics have not been maintained, and

e) new mounting points for the parking brake, accelerator and clutch controls are not of equivalent strength to the original mounting points.

13. A special purpose vehicle is converted to dual steering and:

a) the service brake control assembly has not been replicated on the other side of the vehicle in a way that prevents the hydraulic or pneumatic line pressure from acting on the non-operating master cylinder or treadle valve, or

b) the motion of the brake pedal is not transmitted to the master cylinder or treadle valve by:

i. a torque shaft, or

ii. levers and rods.

14. The steering motion on a special purpose vehicle that has been converted to dual steering and is transmitted by chain and sprocket or bevel gear boxes, does not have proper means provided to eliminate backlash.

Note 1

Notwithstanding requirement 1 of this section any person may operate any motor vehicle having the steering column to the left of the longitudinal centre line of the body of the vehicle if the vehicle:

a) was purchased from the crown by the owner or any former owner, or

b) is for the time being exempt from subclause 1 of this regulation by virtue of an exemption granted under regulation 90 of these regulations.

Note 2

Gazette 21/8/80, p2457

Pursuant to subclause 1 of reg 90 of the traffic regulations 1976 the Secretary of transport hereby exempts from the requirements of reg 70 of the said regulations any heavy motor vehicle which is designed and constructed exclusively for road sweeping operations provided that for any vehicle fitted with dual steering the left-hand driving position is only used for the operation of the vehicle during road sweeping operations.

Note 3

A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle must be certified.

Note 4

Dual steering conversions may only be carried out on special purpose vehicles such as street sweepers, weed sprayers, road markers, refuse collection and the like.

All of the relevant requirements also apply to dual steering conversions except where the left-hand steer position is being added, i.e. the vehicle is originally right-hand steer. The steering motion may be transferred by way of chain and sprocket or bevel boxes.

Summary of legislation

Applicable references

- AS 3990: 1993 Mechanical Equipment — Steelwork
- AS/NZS 1554 Welding
- AS/NZS 2980 Qualification of welders for fusion welding of steel
- BS 5400
- BS 7608.

Applicable legislation

- **Land Transport Rule: Heavy Vehicles 2004**
- **Land Transport Rule: Vehicle Dimensions and Mass 2002**

Steering systems 2001 (Sections 2 and 3)

1. A steering system on a motor vehicle, and associated systems and components that could directly or indirectly affect the directional control of the vehicle must be:

a) sound and in good condition and must provide the vehicle with safe, efficient, convenient and sensitive control,

b) strong, durable and fit for their purpose, taking into account whether adverse effects have resulted from a loss of integrity of any protective system used by a relevant component.

2. A motor vehicle capable of a speed more than 50 km/h and equipped with a steering system with no direct mechanical connection between the driver's means of control and the wheels or other means of changing the vehicle's direction must have at least one additional means of steering that complies with requirement 1.

3. A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle must not prevent the vehicle from complying with requirement 1.

4. A modification to a steering system or to a system or component that could affect the directional control of a motor vehicle must be certified

5. If a steering system or a system component that could affect the directional control is modified:

a) the steering system must be compatible with the performance and component specifications of the manufacturer of the vehicle or steering system for the original steering system, and

b) the loads and stresses on the steering system and its components must be demonstrably within the design and performance criteria established by their manufacturer for the specific application in which they were originally used.

6. A repair to a steering system, or a repair to a motor vehicle that affects its steering system must comply with all other requirements in this section.

7. No left-hand drive vehicle may be certified for entry into service, or operation in service, in New Zealand except:

a) vehicles of the categories specified in *Schedule 1*, subject to the conditions specified in relation to each category, or

b) an individual left-hand drive vehicle that was certified for entry into service in New Zealand before 1 April 2010.

Heavy Vehicles Rule

Section 6.5

8. If a vehicle is converted from left-hand drive to right-hand drive:

a) if practicable, original equipment must be used, and

b) non-original equipment must not be used unless approved by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

c) the steering column must be transferred without altering the integrity of the column or its collapse mechanism, and

d) except when fixing mountings to the chassis or body of the vehicle, steering components must not be welded, unless:

i. the welding is designed by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

ii. appropriate non-destructive testing is carried out by a qualified person, and

e) steering performance and characteristics must be maintained, and

f) the parking brake, auxiliary brake, accelerator and clutch controls must be transferred to the right-hand side of the vehicle, and

g) new mounting points for the parking brake, accelerator and clutch controls must be of equivalent strength to the original mounting points.

9. If a vehicle is converted from left-hand drive to right-hand drive:

a) the service brake control assembly must be transferred to the right-hand side of the vehicle, or

b) the service brake pedal assembly must be transferred to the right-hand side of the vehicle and the motion of the brake pedal must be transmitted to the master cylinder or treadle valve by:

i. a torque shaft, or

ii. levers and rods.

10. For a vehicle to which requirement 9 applies, the master cylinder or the treadle valve and the mechanism that transfers the braking effort from the right-hand side to the left-hand side must be protected to ensure that the service brake can be activated only by the driver.

Conversion of a vehicle to dual steering (section 6.6)

11. A conversion to dual steering may be carried out only on a special purpose vehicle.

12. If a special purpose vehicle is converted to dual steering:

a) if practicable, original equipment must be used, and

b) non-original equipment must not be used unless approved by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

c) except when fixing mountings to the chassis or body of the vehicle, steering components must not be welded, unless:

i. the welding is designed by the vehicle manufacturer or a vehicle inspector or inspecting organisation appointed to carry out specialist inspection and certification activities, and

ii. appropriate non-destructive testing is carried out, and

d) steering performance and characteristics must be maintained, and

e) new mounting points for the parking brake, accelerator and clutch controls must be of equivalent strength to the original mounting points.

13. If a special purpose vehicle is converted to dual steering:

a) the service brake control assembly must be replicated on the other side of the vehicle in a way that prevents the hydraulic or pneumatic line pressure from acting on the non-operating master cylinder or treadle valve, or

b) the motion of the brake pedal must be transmitted to the master cylinder or treadle valve by:

i. a torque shaft, or

ii. levers and rods.

14. The steering motion on a special purpose vehicle that has been converted to dual steering may be transmitted by chain and sprocket or bevel gear boxes, if proper means are provided to eliminate backlash.

12-3 Recertification of drawbeams and drawbars of known identity

Certifier categories: **HVET** | **HMTD**

Flow diagram

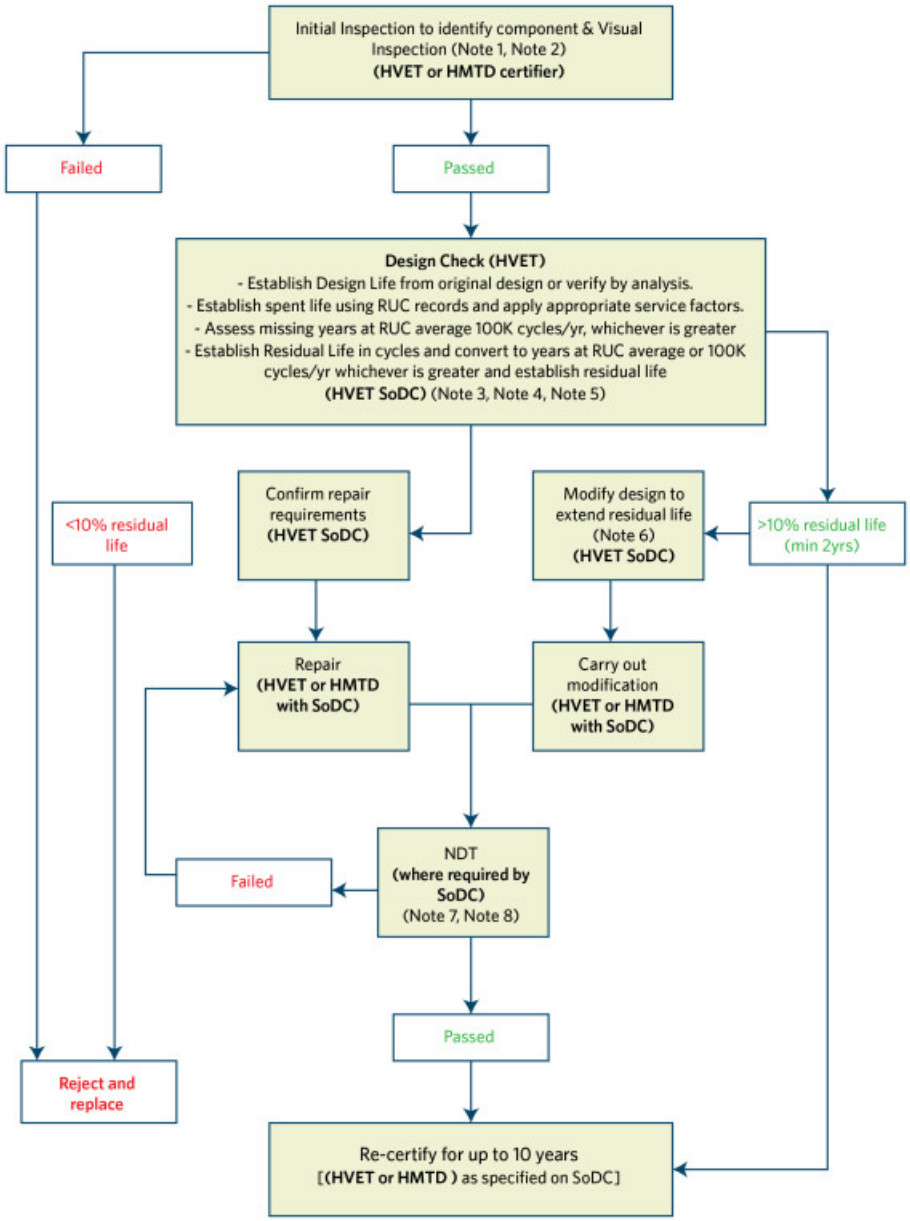
Re-certification of drawbars and drawbeams with unknown identity

If the original date of manufacture and attachment to the vehicle of a drawbar/beam/towbar **cannot be determined**, the component **must not be re-certified**.

If the identity of a drawbar or drawbeam cannot be established, then the design details and fatigue history of the components cannot be reliably ascertained. This means re-certification according to the current version of the re-certification process cannot be carried out.

Figure 12-3-1. Re-certification of drawbars and drawbeams of known identity

- For easy reference, download **Re-certification of drawbars & drawbeams of known identity**



Note 1

A complete visual inspection of the components must be carried out, either by a specialist engineering certifier (HVET) or a manufacturing certifier (HMTD) to identify the component and its original certifier. This must include the assessment of all welding details and must establish or verify the dimensions and material sections that are relevant to the re-certification. It must also include the details of any repairs or modifications carried out. All findings of the inspection must be recorded as part of the re-certification and must be sent to the specialist engineering certifier so those findings can be taken into account.

Note 2

Re-certification by an HMTD manufacturing certifier can only be carried out with reference to the original manufacturing drawings for that component. The HMTD must have a SoDC from an HVET engineering certifier that references the original manufacturing drawings, confirming the residual life and repair requirements (if necessary). There must be a separate SoDC for each recertification by an HMTD and the SoDC must be VIN specific. The SoDC must be produced specifically for the recertification, it is not acceptable to rely on the SoDC under which the component was originally certified. The HMTD is responsible for confirming that the component complies with the drawings, and isn't modified,

worn, cracked or damaged.

Note 3

The design check (full stress analysis) must always be carried out unless the re-certification is carried out by the HVET who originally designed/certified the item. In such cases, the HVET must have full records of the original calculations and must be able to demonstrate, when requested, that those calculations are correct. If repair or modification has been carried out then the HVET must carry out a full stress analysis unless they were both the original certifier and the certifier of the repair and/or modification.

Note 4

Where the flowchart requires the fatigue load history of a component to be determined, it must be based on the distance traveled, supported by documented evidence such as RUC or CoF records, etc. When assessing the fatigue load cycles for vehicles with low annual road mileage but considerable off highway or extreme highway mileage (such as loggers, bulk tippers, fertiliser spreaders etc.), the HVET must take into account, for example by using suitable dynamic factors such as the higher dynamic loads or higher fatigue frequencies, the higher stresses that are associated with the operational circumstances.

Note 5

A drawbar or drawbeam may be re-certified for up to 10 years. When doing so, the HVET must not consider the current operational circumstances (which may mean relatively lower annual mileage). The fatigue-based approach of NZS 5446, which considers 2 million cycles during an expected life of 20 years, must be followed, with appropriate adjustments made for arduous conditions.

Note 6

Where a drawbar or drawbeam was originally manufactured under a previous version of the Standard it may be recertified under that same Standard, however, if it is modified it is to be upgraded to meet the requirements of the latest version of the Standard.

Note 7

The HVET must make a decision, as to the type of NDT required and the specific points and areas of the component that must be tested. Where the repair is the result of fatigue type failure then NDT inspection MUST be specified to ensure all fatigue induced imperfections have been removed. All stress risers must be addressed by appropriate strengthening, reinforcement or finishing. When selecting the type of NDT to be carried out, and when the test results, including the imperfections and weld quality are evaluated, AS/NZS 1554 must be taken into account.

Note 8

Where NDT is specified, all relevant details of the NDT, such as the recommendation of the Inspector, the decision of the HVET and the test report of the Inspector must be recorded as part of the re-certification.

Summary of legislation

Applicable references

- AS 3990: , Mechanical Equipment – Steelwork
- AS/NZS 1554 Welding
- AS/NZS 2980, Qualification of welders for fusion welding of steels
- NZS5446, Code of Practice for Heavy Motor Vehicle Towing Connections: Drawbar Trailers
- NZS5467: Code of Practice for Light Trailers.

Applicable legislation

- Land Transport Rule: Heavy Vehicles 2004

Page amended **9 December 2019** (see amendment details)

12-4 Electrical

Certifier categories: **HVEC** | **HVEK** | **HMKD** | **HMCD**

Reasons for rejection

1. The voltage of the electrical systems and components in a vehicle are not suitable for all conditions of operation for which the vehicle was constructed.

2. The current ratings of electrical wires in a vehicle have been exceeded.

3. Electrical wires in a vehicle are not:

    a) insulated and protected from damage that could be caused by water, fuel, oil, other fluids, dirt or heat, or

    b) if practicable, clipped or otherwise gathered into looms with an insulated material.

4. Electrical wires and looms in a vehicle have not:

    a) been appropriately and securely fastened to the vehicle to protect them from damage, or

    b) where they pass through holes in the vehicle structure, been protected from damage.

5. Electronic control devices of safety systems fitted to a vehicle have not been protected from electrical interference that could adversely affect their operation.

6. Electrical or electronic systems operating specific functions such as ABS/EBS or SRS systems have been tapped into to operate other functions without the written consent of the manufacturer of the primary function.

Summary of legislation

Applicable legislation

- Land Transport Rule: Heavy Vehicles 2004

Electrical requirements (section 3.8)

1. The voltage of the electrical systems and components in a vehicle must be suitable for all conditions of operation for which the vehicle was constructed.

2. The current ratings of electrical wires in a vehicle must not be exceeded.

3. Electrical wires in a vehicle must:

    a) be insulated and protected from damage that could be caused by water, fuel, oil, other fluids, dirt or heat, and

    b) if practicable, be clipped or otherwise gathered into looms with an insulated material.

4. Electrical wires and looms in a vehicle must:

a) be appropriately and securely fastened to the vehicle to protect them from damage, and

b) where they pass through holes in the vehicle structure, be protected from damage.

5. Electronic control devices of safety systems fitted to a vehicle must be protected from electrical interference that could adversely affect their operation.

Technical bulletins

News and updates

11 February 2026

Electronic certificate of authority (E-COA)

From mid-February inspecting organisation certificates of authority (COAs) will no longer be posted and sent by mail.

02 February 2026

Outcome of consultation on new light entry certification appointments

After receiving support from new light entry certifiers, we decided to adopt the proposed changes to the New Light Entry Certification appointment process.

27 January 2026

Reminder: check your saved VPN links to keep access

If you use our VPN, the most secure link begins with https://. Some users still have the old URL for the VPN saved, without the s. To keep our connections secure, we’re switching off the old link on 29 January 2026. Check your saved links include the 's'.

23 December 2025

Safety warning for Suzuki Fronx owners

NZTA is urging the owners of Suzuki Fronx vehicles in New Zealand to stop carrying passengers in the rear seats of the vehicles. This follows the failure of a safety belt in a laboratory crash test. If you get any questions from customers, tell them to contact Suzuki directly.

19 December 2025

Industry alert: Risk of trailers disconnecting from incorrect coupling and damaged couplings

NZ Transport Agency Waka Kotahi (NZTA) is issuing an industry alert to warn the heavy vehicle industry about the risk of trailers becoming disconnected.

16 December 2025

Inspection news issue 20 out now

The latest issue of *Inspection news* is now available to download.

1 Heavy vehicle repair thresholds

This technical bulletin replaces and incorporates Memo 30 and 63.

Except as otherwise noted, any heavy vehicle that has been structurally damaged and requires repair also requires HV specialist certification.

Any heavy vehicle requiring repairs (including one that has been assessed by an insurer as requiring repairs) after an accident requires heavy vehicle specialist certification if repairs involve:

- structure (chassis), or
- brakes, or
- suspension, or
- steering, or
- any certifiable component (eg towing connection, load anchorage, etc.).

Note 1

The cab is a structural member and is included in this requirement. Heavy vehicle specialist certification is required where the cab structure has been damaged or where any part of the frontal impact protection system, seat mounting, seatbelt anchorage, cab mounts and latches and any other critical load path may have been compromised.

Note 2

Where the damage includes systems or components not normally certified by the HVSC, that certifier should use the skills of others but the HVSC takes ultimate responsibility for the repairs.

Note 3

Where critical suspension components such as axles, hubs, stubs, etc. are reused, they become part of the certification and the certifier must be satisfied that they have not been subject to forces which would preclude such reuse.

Water or fire damage

Any heavy vehicle that has been identified as water or fire damaged (whether written off by the insurer or not) requires the HVSC to carry out a comprehensive inspection of all areas and systems to ensure no structural damage has occurred from corrosion or heat and all critical safety systems (eg brakes, air bags, seatbelt pre-tensioners, etc.) operate safely.

Note 4

Table 9-1-1 in the **VIRM: Light vehicle repair certification** is a useful guide for acceptable repair of water-damaged vehicles.

Note 5

All repairs on heavy vehicle structures and certifiable components require the same levels of certification as there is not a different threshold of damage for in-service or ‘written off.

Repairs that do not require heavy vehicle specialist certification

The following repairs to heavy vehicles do not require HV specialist inspection and certification, ie an LT400.

- Replacement of bolted components, except for components that specifically require specialist inspection and certification (eg log bolster attachments, drawbars and drawbeams, etc.).
- Repairs to the **first failures** of chassis cross-members that are **not** one of the following:
    - the first or last cross-member of the chassis;
    - cross-members that are fitted within 500mm from engine or transmission mounts or suspension supports (e.g. spring hanger);
    - cross-members that are fitted or support a:
        - driveshaft centre bearing, or
        - ball-race turntable, or
        - tow coupling, or
        - fifth-wheel, or
        - king pin, or
        - bolster attachment, or

    - hoist, hydraulic cylinder of a tipping body, or any other devices that may place a concentrated load on the chassis.
- Repairs to coaming rails that do not support certified load anchorage points, including stock crate J-hooks.
- Tow-eyes fitted to a vehicle for recovery purposes.
- Repairs to a component of a freight or bus monocoque body (ie not a truck's driver/passenger cab) if the component is not part of the structural framework. (eg unstressed body panels)

Note 6

The vehicle inspector may reject the component during the CoF inspection if the welding that has been carried out as part of the repair is of poor quality, established by means of visual inspection.

Page amended **9 April 2018** (see **amendment details**)

2 Isuzu CXH450 chassis repairs and expectation for chassis repairs and certification

Isuzu CXH450 chassis failures

The premature failures of Isuzu CXH450 chassis rails have been analysed and the findings (with recommended permitted stress levels) have been summarised in two reports, prepared for Isuzu NZ by Transport Engineering Research New Zealand Ltd. (TERNZ).

The Transport Agency has been advised by Isuzu NZ that in their opinion a chassis that has been repaired and reinforced so that the stress levels are not exceeding those recommended in the two TERNZ reports, the chassis would have an acceptable service life.

Steps to be taken by HVSCs for Isuzu CXH450 chassis failures

1. Before starting to design the repair and reinforcement specification, the HVSC must obtain copies of both reports by TERNZ through Isuzu NZ.

2. The grade of steel of the chassis rails must be obtained in writing from Isuzu NZ (unless the HVSC has already received confirmed data of the chassis rail material).

3. The HVSC may need to check the Body Builders' Manual issued by Isuzu, covering CXH450 type vehicles. **Note:** The two TERNZ reports, the *Body Builders' Manual* and the information on the chassis rail material can be obtained from the Isuzu Product Engineer (phone +64 9 978 3624).

4. When the chassis repair and reinforcement is designed, the recommended maximum stress levels (included in the TRNZ reports) must be taken into account.

Expectation when a chassis repair is certified

1. If a chassis has been damaged due to a crash or the incorrect use of the equipment (equipment abuse), the repair must reinstate the chassis within safe tolerance of its state when manufactured (or last certified subsequent to its modification). A correct repair would not significantly affect the longevity of the chassis.

2. If a premature chassis failure occurs due to fatigue, it may indicate that the chassis rating of the vehicle might be inappropriate or the vehicle might be inappropriate for the type of service it is used in. In such a case, a repair that reinstates the vehicle within safe tolerance of its condition when manufactured is not sufficient; therefore the chassis must be repaired and reinforced.

3. Transport law is silent on the issue of longevity of a vehicle or its equipment or component, and there is no specific requirement for the minimum distance or time during which a vehicle or its equipment or component must not fail. However, it is expected that if the chassis of a vehicle is repaired and reinforced correctly, it will not fail in service significantly earlier than vehicles of other makes and models, which have similar payload capacities, intended for similar usage, and operated in a similar manner and conditions.

This technical bulletin replaces memo 37.

Page amended **9 April 2018** (see **amendment details**)

3 Heavy vehicle chassis ratings: modification thresholds to allow a heavy vehicle's GVM to be altered (and its chassis rating to be changed)

A vehicle's GVM is the maximum safe operating mass for a vehicle, which is derived from the design, capabilities, and capacities of the vehicle's construction, systems, and components.

This technical bulletin replaces the 57 series of memos and memo 75.

Chassis ratings determined by HVSCs

Chassis ratings can only be determined by those HVSCs holding the HVEC (chassis) category. Ratings can be applied only to New Zealand built or modified class TD and TC trailers, class NB and NC goods vehicles, and MD3, MD4 and ME omnibuses, as allowed for by 8.6(1) and 8.6(2) of **Land Transport Rule: Heavy Vehicles 2004**

A HVSC must not set a GVM that is higher or significantly lower than the vehicle's lowest rated component or system. Where a vehicle has an axle removed to reduce the GVM, any reduction in GVM must be reasonable.

For example, if a three-axle trailer with a GVM of 24 tonnes has one axle removed, then it is unlikely that a HVSC could justify a reduction in the GVM of more than 10 tonnes.

Note 1

If an HVSC wishes to make a change to a GVM of this magnitude then the justification should be discussed with the Heavy Vehicle Certification team (**hvscinfo@nzta.govt.nz**) before work is carried out.

Trailer manufacturers in series production

Where a trailer manufacturer is making a series of trailers to the same design, an HMCD (local manufacturing certifier) can sign off the chassis rating against a Statement of Design Compliance (SoDC) provided by an HVEC.

It is up to the HVEC to define the range of the SoDC, whether by a range of VIN numbers, a model number with an expiry date or other suitable system.

Chassis ratings currently covered by a type approval in the ICRAT screen of LANDATA remain valid for future ratings as long as the design of the model is unchanged and the vehicle is presented with a LT400 completed by an HVCD or HMCD confirming that the vehicle complies in all ways with the model type approved.

Modifications requiring additional category of heavy vehicle specialist certification

All modifications that fall outside the thresholds for certifier responsibility require an additional category of HVSC. If the vehicle changes class as a result of the modification brake certification is still required.

Gross combined mass (GCM) and maximum towed mass (MTM)

Changes to the GCM are likely to require changes to the driveline and/or chassis – which will also require a new chassis rating. However, these can only be determined by the manufacturer.

An HVSC may not alter the GCM of a heavy vehicle where the GVM has been reduced. This must be brought to the attention of the Transport Agency with supporting information from the HVSC and the OE manufacturer to ensure that the existing GCM remains appropriate or is changed to reflect the modifications made.

Changes to the MTM (within the towing vehicle's limits) are a function of the drawbeam or towbar certified to the heavy vehicle.

Modifications requiring new or re-validated chassis ratings

1. General thresholds of modifications

If these general thresholds are not met then there is no reason or justification to change the GVM of the vehicle:

- addition of an axle and suspension system or removal of an axle and suspension system
- relocation (>50mm) of an axle and suspension system
- the replacement of an axle or suspension system with a different type of axle or suspension system or modification of its chassis.

2. Removing an axle

Modifications such as removing an axle require that the HVSC carrying out the certification must consult a brake certifier (HVEK) to either:

- modify and re-certify the brakes, or
- provide certification that the brakes do not require further modification.

Note 2

The modifications to the chassis cannot be certified until the brake certification has been completed. The lead certifier (generally the HVEC) on the project cannot delegate the responsibility to the vehicle owner or the testing station.

Note 3

Where the vehicle has an electronic braking system or an integral stability control system the vehicle manufacturer must provide approval, in writing, for the modifications.

3. Modification to the track width

The following considerations must be taken into account for track width modifications:

- Approval from the axle manufacturer to increase the track and the axle component loadings at the original axle rating must be obtained or a detailed bearing load and axle bending moment calculation must be carried out to ensure loadings of the new configuration at the revised axle rating do not exceed the original installation.
- If such modification to the axle reduces the axle rating so that it is no longer sufficient to support the existing GVM then the GVM may be revised provided such a revision does not mean the GVM is greater than the sum of the axle ratings, but:
    - the suspension must be modified to reflect the altered loadings while ensuring the load sharing requirements in the **Land Transport Rule: Vehicle Dimensions and Mass Rule 2016** are maintained. This will require certification
    - the brake force distribution must be altered to reflect the altered load sharing on the axles or tyre adhesion if this falls outside the manufacturer's limits. Such a modification will require HVEK certification.
- Any change to the rear axis due to the new dual / single configuration may alter the rear overhang and place it outside the legal requirements in the **Land Transport Rule: Vehicle Dimensions and Mass Rule 2016**
- If the rear axle changes, then bending stresses in the chassis must be calculated and, if there are increased stresses due to the increased rear overhang, suitable mitigation must be undertaken and certified.
- The vehicle must be plated for the variance in load share of the rear axle group.
- Such modifications will affect the vehicle's SRT which must be confirmed as being at least 0.35g for a prime mover or certified as at least 0.35g for a trailer.

Note 4

This is not an exhaustive list of the requirements that need to be taken into account when contemplating this type of modification but shows the level of justification required for any re-rating.

4. Modifications to wheel and tyre configuration

When down-rating a vehicle's GVM by removing wheels from a dual axle set and replacing with single or large single wheels and tyres the following must be considered and covered in the job file:

- Spacers must be used to achieve correct wheel spacing on the hub. Wheels without tyres are not acceptable.
- Any axle rating reduction arising from changes to bearing loads must be fully calculated and accurately reflect the calculated results.
- Where wheel offset changes are made to achieve required loadings and new wheel centres are welded in then material specifications must be identified by a metallurgist and appropriate welding procedures to AS/NZS 1554 (or other applicable, approved standards) must be used along with the applicable inspection and NDT processes.
- Welding must be carried out by an appropriately qualified welder.
- Suspension alterations must be considered, as appropriate to the new axle ratings, to address and mitigate any drivability issues.
- Load sharing requirements must be considered.

5. Removing a wheel and tyre from a dual tyre set

When a vehicle is modified by removing an inner tyre of a dual tyre set, that wheel and tyre assembly should be removed. It is not acceptable for the redundant wheel minus tyre to be left in place acting as a spacer or for any other reason. This modification also requires that the engineer doing the modification ensure that the requirement for brake certification is addressed.

Note 5

These modifications cannot not be certified until the brake certification has been completed. The lead certifier on the project cannot delegate the responsibility to the vehicle owner or the testing station.

6. Modifications around certain thresholds

To de-rate a vehicle around any of the specific thresholds listed below, the vehicle must be significantly modified, as described in the Rule. However, where the manufacturer builds the vehicle in more than one weight bracket, to de-rate the chassis and reduce the GVM, the vehicle must be modified to exactly match the vehicle sold by that manufacturer in that weight class:

- from a GVM greater than 3.5 tonne to a GVM below 3.5 tonne, or
- from a GVM greater than 4.5 tonne to a GVM below 4.5 tonne, or
- from a GVM greater than 6 tonne to a GVM below 6 tonne.

Example

The following modifications must be made, as required: Suspension, axles, driveline and brakes must exactly match the vehicle in the target weight bracket even if these modifications mean that brake recertification (to Schedule 5, section 6 of the **Land Transport Rule:Heavy vehicle Brakes 2006**) is required.

Note 6

In the above example, the manufacturer's certification cannot be used if the two certifications are different. The vehicle must be recertified by an HVEK.

7. Different GVMs of the same base vehicle

If a manufacturer offers vehicles identical in every way (except for badges, labels, etc) but having different GVMs, individual vehicles cannot be swapped between weight classes by swapping the badges, labels, etc. or assuming they are the same vehicle.

In these cases, the chassis rating/GVM which may only be changed by significant modification.

Modifications that do not justify new chassis ratings

1. Removal of a spring leaf or resetting of a spring set

The removal of a spring leaf or the resetting of a spring set does not constitute 'a different type of suspension' and cannot be solely used to justify the down rating of a manufacturer’s chassis rating.

Note: In the situation that the ride height of a vehicle, such as an ambulance, has been reduced for operational reasons, by the re-arching of the leaf spring and this results in a limitation of the available suspension travel, effectively reducing the available axle rating and thus the GVM, this reduction may be acceptable but in each case must be approved by NZTA (**vehicleregulationtechnical@nzta.govt.nz**) before the modifications are carried out.

2. Minor wheelbase changes

A minor wheelbase change (eg 50mm) would require HVSC certification due the additional holes in the chassis to mount the relocated suspension, but would have no substantive effect on the chassis rating and cannot be used as a justification to reduce or increase the GVM.

These modifications cannot be certified until the brake certification has been completed. The lead certifier on the project cannot delegate the responsibility to the vehicle owner or the testing station.

3. Change in use

A change in use that does not affect the capacity of the load bearing components of a vehicle (eg a PSV being converted into a motorhome) is not a justification for altering the chassis rating of a vehicle and thus the GVM.

4. Change in suspension type with comparable load capacity

A spring suspension replaced with an air suspension system that has a comparable load capacity does not provide justification for any alteration of the chassis rating or GVM.

Note: For the avoidance of doubt regarding the acceptability of any alteration of a GVM due to a modification, contact NZTA (**vehicleregulationtechnical@nzta.govt.nz**)

Modifying a braking system

Modifying only a braking system to reduce braking capacity cannot be used as a reason or justification to reduce a vehicle's GVM.

GVMs for heritage vehicles

This process is intended to allow an operator with a vehicle over 40 years old who believes that the vehicle's GVM could be inappropriate due to age, capacity or fatigue life, to engage an HVSC with the chassis category (HVEC) to inspect the vehicle to determine whether the chassis and/or axle rating remain valid.

Note 7

Any vehicle used in any commercial operation where it may transport goods or people must not have its GVM re-rated using this process.

Note 8

This process is not intended to allow the reduction of a vehicle's GVM to any given 'price point' such as road user charges or driver licence limits, but to allow heritage vehicles to be maintained in as close as possible condition to their original manufacture without repairs or modifications that may compromise their heritage status.

Role of the HVSC

The certifier's role is to consider whether due to age, fatigue life, or overloading, the vehicle and all its structural systems are still capable of operating at its rated GVM. If, based on observations and calculations, using available data or justifiable assumptions, the certifier believes that the existing GVM is no longer valid, the certifier may re-rate the affected components and alter the GVM to reflect the current capability of the vehicle.

Any changes to the vehicle record must be supported by calculations and other documentary evidence and will need a LT400.

GVMs increased under Reg 8 of Goods Service Vehicle Construction Regulations 1936

Prior to 1 August 1987, there was an allowance permitted by Reg 8 of the Goods Service Vehicle Construction Regulations 1936 to increase the manufacturer's gross laden weight by one fourth on application. However, if such a vehicle was modified, the GVM would revert to the OE manufacturer's original GVM for the model variant.

For vehicles where the GVM has been affected by the addition of 25%, their chassis rating may be revised by a HVSC with the chassis category (HVEC) or a CoF IO. The certifier/IO can reverse the 25% increase and revise the vehicle details in ICRAT back to the OE manufacturer's original GVM for that make and model variant.

No other changes may be made without modification and certification.

Download **Notification of chassis rating for heavy vehicles** (MS Word).

Page amended **9 April 2018** (see **amendment details**)

Page updated 21 August 20245 (see **details**)

4 Heavy vehicle alterations and modifications that may affect the brakes

This technical bulletin replaces *Technical bulletin 4: Modification thresholds for the Heavy Vehicle Brakes Rule*, and *Technical bulletin 16: Engineers' responsibilities for modifications that may affect a heavy vehicle's brakes*.

Heavy vehicle specialist certifier responsibilities

A heavy vehicle brake system can be modified directly, or the vehicle may have a modification carried out on it that indirectly affects the brake system.

All modifications affecting the brake system (direct or indirect) must still ensure the brake system continues to meet the applicable requirements of the **Land Transport Rule: Heavy Vehicle Brakes 2006** (HVBR).

All heavy vehicle brake modifications (direct or indirect), except those specifically provided for in the HVBR, must be certified by a heavy vehicle specialist certifier (HVSC) with the brake (HVEK) category. No other category of HVSC can certify heavy vehicle brakes.

When a modification (direct or indirect) requires brake certification, the lead HVSC for a project must ensure that brake certification is carried out and that an HVEK LT400 is issued prior to HVSC certification for the finished project. The responsibility for obtaining brake certification cannot be delegated to another certifier or the vehicle owner or any other entity.

HVEK brake certification category

Brake certification for any heavy vehicle manufactured or modified in New Zealand and any heavy vehicle imported into New Zealand that has been modified after its original equipment (OE) manufacture **(Note 1)** can only be performed by an HVEK category certifier.

Use of Statement of Design Conformity (SoDC) or Design Certificates (DC)

When an engineering certifier issues a SoDC (or DC) for a modification that may affect the brakes, they must either determine compliance with the requirements of this technical bulletin or include specific instructions in the SoDC (or DC) to ensure compliance with the requirements of this technical bulletin.

Modifications that always require an LT400 by an HVEK

- A heavy vehicle that has had its braking system or any component of that system modified in any way which may affect continued compliance with the HVBR. This includes any modification after OE manufacture **(Note 1)**, **or** since entering service **or** since being last certified.
- A wheelbase alteration to a new standards compliant vehicle **(Note 2)** under-going entry certification, that is **not** supported with Acceptable Documentation **(Note 3)** from the OE manufacturer.
- A wheelbase alteration to any vehicle since entering service **or** since last certified by an HVEK certifier.
- Any alterations or modifications to the vehicle:

a) where the vehicle's original manufactured axle has changed, eg changing an axle to a different make, configuration or specification, **or**

b) where the vehicle's original manufactured axle rating or GVM is changed, except where an axle rating or GVM decrease is applied to a standards compliant NB or NC class vehicle **or**

c) where the vehicle is converted from non-towing to towing or from rigid to tractor unit or vice versa, **or**

d) where the vehicles originally manufactured axle configuration is changed to another configuration, eg it has been changed from a 4x2 to 6x2 or any other combination.

Note: when certifying the changes in (c) or (d) for an EBS/ESC equipped vehicle, the HVEK certifier must have evidence that the new configuration remains compliant with the standard it was manufactured to and confirmation from the OE manufacturer's representative **or** the brake system manufacturer that the control software has been updated or is re-confirmed.

- A heavy vehicle that has been brake certified to the Heavy Vehicle Brake Code, Second Edition (Schedule 4) and it cannot be established what friction material was used.

The vehicle may be re-certified to its original brake code mass using an alternative friction material provided no other alterations or modifications are made. This requires the original brake coding to be re-confirmed with the new friction material by an HVEK certifier trained or experienced with previous brake coding (NZHVBC) using an NZTA-approved brake calculator. Brake torque data, meeting the requirements of the HVBR must be used for the calculation and an LT400 issued confirming compliance with the Code.

Note: vehicles that were brake-coded to any of the earlier versions of the Brake Code (including the Interim Performance Specification for Heavy Vehicle Braking, and the Heavy Vehicle Braking Specification of 6 December 1988) that are modified, must meet the requirements of the HVBR.

- A brake-coded heavy vehicle that has had its braking system modified, even if its compliance curves remain within the braking rate and adhesion utilisation requirements of the Brake Code. The resultant vehicle is outside its original Brake Code certification and must be re-certified to Schedule 5 and issued an LT400.
- An air-operated spring parking brake that has been retrofitted to a vehicle to replace a wind-on parking brake must be certified by an HVEK.

Note: provided the retrofitted spring brake chamber provides the same service brake performance as the original and no other modification is made to the service brake, compliance to Schedule 5 is not required.

Modifications that do not require an LT400 by an HVEK

Only modifications that are exempted as per clause 8.2(1) of the HVBR do not require certification from an HVEK certifier:

1. Where the vehicle has had an adjustment to the brake system threshold pressure to comply with 7.1(8) or 7.2(5) of the HVBR, provided this does not affect the service brake performance. e.g. a change in the relay valve characteristics.
2. Where an air brake coupling device on a powered vehicle has been fitted in accordance with the manufacturers recommendations or where it has been replaced for the purposes of complying with 7.3 of the HVBR.
3. Where a park brake valve has been fitted to a powered vehicle to allow any towed trailer/s park brake to operate.

Other certification categories where an alteration or modification may affect the brake of a vehicle.

Towing connection certifier's responsibilities

When HVEK certification is required, the towing connection certifier will be the lead HVSC and must ensure brake certification is carried out prior to issuing an LT400 certification for the towing connection.

Standards compliant vehicle (brakes) post 1/7/2008

When a towing connection to tow another heavy vehicle is fitted to a standards compliant vehicle **(Note 2)** with OEM installed trailer brake supply and control circuits, the towing connection certifier may rely on Acceptable Documentation **(Note 4)** to prove compliance with section 7 of the HVBR (therefore HVEK certification is not required) and issue an LT400 for the towing connection. The documentation must be retained in the certification file.

Note: an approved air brake coupling device (see the HVBR) may be fitted at the same time as the towing connection provided OEM installed trailer brake supply and control circuits are utilised. HVEK certification is not required, but compliance with section 7.3 of HVBR must be confirmed by the towing connection certifier and recorded in the certification file.

Non-standards compliant vehicle (brakes) pre-1/7/2008

When a towing connection to tow another heavy vehicle is fitted to a non-standards compliant vehicle the towing connection certifier must ensure HVEK certification is complete before issuing an LT400 for the towing connection.

Any other vehicle (not included above)

When a towing connection is fitted to any other vehicle to tow another heavy vehicle it must have HVEK certification.

Note: Where an existing certified or approved ECE compliant fifth wheel is recertified or replaced, and the brakes are not affected, HVEK certification is not required.

Chassis certifier's responsibilities

When HVEK certification is required, the chassis certifier will be the lead HVSC and must ensure brake certification is carried out prior to issuing an LT400 certification for their work.

When an air supply is provided by the vehicle manufacturer for an auxiliary purpose, the chassis certifier can accept an added air powered auxiliary without requiring HVEK certification. The added air supply must comply with HVBR requirements and not be able to degrade the function or performance of the braking system through use or a fault.

Note 1

OE manufacturer means the original manufacturer of the vehicle. It does not mean:

- a second or third stage manufacturer, modifier or body builder
- a local dealer or reseller or parallel importer of the vehicle
- a VIN issuer, except when the VIN was issued by a regulator (eg NZTA), in which case the regulator may nominate the manufacturer.

Note 2

Standards compliant means a vehicle which, when it went through entry certification on or after 1 July 2008, was manufactured and is in compliance with one of the international standards approved in clause 2.5(2) of the HVBR, or being a vehicle manufactured or modified in New Zealand after 1 March 2007, was certified as compliant with Schedule 5 of the HVBR.

This technical bulletin replaces Technical bulletin 4: Modification thresholds for the Heavy Vehicle Brakes Rule and Technical bulletin 16: Engineers' responsibilities for modifications that may affect a heavy vehicle's brakes

Note 3

Acceptable documentation: The OE manufacturer or for the purposes of this bulletin the approved representative of the OE manufacturer has supplied auditable documentation that supports the alteration or modification being carried out. **Statements from local dealers, or departments not responsible for confirming compliance such as sales, service, marketing or help desks, are not acceptable**.

Acceptable documentation must:

- be issued from the OE manufacturer or for the purposes of this bulletin the approved representative responsible for compliance and approvals, eg the homologation department, **and**
- clearly identify the name, position, contact details and signature of the person providing the documents, **and**
- include official manufacturer's guidance for the body builder, or modifier or certification engineer that lists the model and sub-model of the vehicle, **and**
- confirm that the vehicle remains compliant with the brake standard, or a later version of the standard, that the vehicle originally complied with when manufactured.

Note 4

Acceptable documentation (for towing connections only): The OE manufacturer or for the purposes of this bulletin an approved representative of the OE manufacturer has supplied a Statement of Compliance (SOC) that includes,

- the duty of the vehicle (eg rigid, tractor), **and**
- the brake standard the vehicle complies with, **and**
- confirms the vehicle has OEM installed trailer brake supply and control circuits, **and**
- confirms the vehicle has tractor protection, **and**
- confirms the vehicles wheelbase, **and**
- confirms the air brake coupling meets the requirements of the HVBR (if fitted prior to the towing connection).

Sample Statement of compliance

Page amended **10 January 2021** (see **amendment details**)

5 HV manufacturer certifier (HMxD) use of design certificates for batch built or standard components

The following are examples where a design certificate (DC) can be used by an HV manufacturer certifier (HMxD) for batch built or standard components:

- An HVSC may provide a HV manufacturer certifier (HM*D) certifier (Note 1) with a single design certificate (DC) for seat belt anchorages fitted to heavy motorhomes, towbars or drawbeams fitted to heavy vehicles, provided that the DC is for specific vehicles (of the same make, model, sub-model) and specifies a fitting envelope which allows the design (once fitted to the vehicle) to meet all the design requirements of the relevant standards.
- This approval is extended to manufacturers who want to build certifiable components (eg load anchorages) in a batch and store them until they are fitted to a vehicle. These components may be built to a DC and certified, using an LT400 when fitted.
- A HMxD certifier may accept and use such a DC from a HVSC provided that any and all restrictions placed on the design are met. These restrictions may include limiting the DC to specific makes, models or fitting locations, numbers of vehicles or any other restriction the HVE certifier might apply. The HM*D engineering certifier must not go outside the requirements of the DC.

In these circumstances the HVSC takes responsibility for the design and that it is of sufficient strength and durability to do the job in the proposed application or applications. The following apply:

- The HVSC is responsible for any failure of the component that is not linked to faulty manufacture.
- The HMxD certifier takes responsibility for the manufacture and that all manufacturing instruction from the HVSC issuing the DC are met in full.
- Any fault linked to the manufacture of the component or its inappropriate installation are the sole responsibility of the HMxD certifier.

Additional points to provide clarification to HMxD certifiers

- Load anchorages and other standard fittings may not require a DC from a HVSC if they are manufactured or fitted to the relevant Standard. However, they may require specialist certification or a DC for the load path back to the chassis if this is not covered in the Standard or the vehicle manufacturer's body builders' manual. The HMxD certifier takes responsibility for both the manufacture and fitting of any component built against a DC.

This technical bulletin replaces memo 65.

Note 1

The following categories are summarised by (HMxD):

HMAD: Heavy Vehicle Manufacturer Certifier – Load anchorages

HMKD: Heavy Vehicle Manufacturer Certifier – Brakes

HMCD: Heavy Vehicle Manufacturer Certifier – Chassis

HMLD: Heavy Vehicle Manufacturer Certifier – Log bolster attachment

HMTD: Heavy Vehicle Manufacturer Certifier – Towing connections

Page amended **9 December 2019** (see **amendment details**)

6 Certification of light vehicles towing heavy trailers

This technical bulletin replaces memo 67.

When an HVEK certifier is presented with an electric-braked TC trailer towed by a light vehicle, the combination must be able to stop within the requirements of the Heavy Vehicles Brakes Rule. If the HVEK cannot verify this, the combination cannot be certified.

Because the HVEK certifier is required to include the light vehicle in the brake certification of the trailer and its dedicated combination, so an additional exemption to certify the modifications to the light vehicle must be requested to allow this.

Such a combination becomes a vehicle not of a class in Table A: Vehicle classes (**Land Transport Rule: Vehicle Standards Compliance 2002**). Some provisions of Land Transport Rules treat the combination while others treat the individual vehicle (eg the mass ratio of VDAM looks at the combination while the provisions of the **Heavy Vehicles Rule** applying to drawbeams are directed to the towing vehicle and don't apply to light vehicles).

The provisions of 4.5 of **Land Transport Rule: Vehicle Dimension and Mass 2016** apply and the gross mass (Note 1) of the heavy trailer must not be greater than 1.5 times the gross mass of the towing vehicle. Where the gross mass of the towing vehicle is not known, the 1:1.5 loading requirement must be used for guidance and the HVSC must ensure, to the best of their ability, that this requirement is not exceeded. Where the light vehicle manufacturer quotes a GVM or MTM this cannot be ignored.

Whilst the towing connection on the light vehicle doesn't require certification, the certifier should confirm that the towing connection fitted to the light vehicle has a rating compatible with the heavy trailer being towed.

The certifier must be satisfied that the towing connection:

- doesn't place undue strain on the towing vehicle when used as intended, and
- the combination is safe to operate.

Note 1

Gross mass means the total mass of that vehicle and its load, equipment, and accessories, which may be determined by calculating the sum of the mass on the vehicle's axles or axle sets.

Page amended **9 April 2018** (see **amendment details**)

Page updated **26 June 2018** (see **details**)

7 High Productivity and Overweight Permit attributes checks

Memo 70a – 28 Feb 2013

Background

On 1 May 2010 Amendment 5 to Land Transport Rule; Vehicle Dimensions and Mass (Rule 41001/5) came into force. This amendment had the effect of allowing High Productivity Motor Vehicles (HPMV) to be longer and/or heavier than a standard vehicle combination, without being wider or higher.

HPMV vehicle approval requires operators to apply for a permit. As part of the application process, the applicant is required to confirm that their vehicle combination is technically capable of carrying the heavier load within its

certifications. Audits on the first 100 applications have shown that many applicants have made errors, applying for masses higher than their vehicle or component capacity or certifications, particularly brake code mass.

These errors have created a considerable amount of work for the Agency's permit and technical staff resulting in long delays in the issuing of permits.

Vehicle attributes check

In light of this the Agency will no longer undertake the process of reviewing the applications so any applications without a properly filled out attributes sheet signed by an approved HV Certifier will have them returned unprocessed. Operators must have their vehicle combination's suitability assessed by a NZTA appointed HV certifier with either the chassis (HVEC or HMCD) or brakes (HVEK or HMKD) categories.

The Transport Agency has agreed to accept this assessment by the HV certifier on production, on letterhead, of a correctly filled out vehicle attributes sheet from the certifier confirming that the vehicles in a HPMV application comply with all the requirements of the permit application. **Technical bulletin 9** shows a sample form.

Where the certifier does not have the categories to confirm specific aspects of compliance or certification they must contact a certifier with the required category or categories to confirm compliance. Such confirmation shall be on letterhead and be kept on file by the recording certifier. This information from another certifier will indemnify the recording certifier against any claims if the information provided is false. While this activity does not require certification with an LT400 the certifier must have a PDS for the task. It will be included in their review process and the certifier will be held accountable. It is the responsibility of the certifier signing the Attributes Sheet to ensure that all required information is included. Only one attributes sheet will be accepted per vehicle with each application and only one vehicle is allowed per attributes sheet (except for 50Max which are dedicated combinations). Sheets must be complete for the permit being applied for or they will not be accepted

Once the form is correctly filled out the operator can then use it to support an HPMV application. The certifier is not held responsible if the operator, while using the form supplied by the certifier, makes an application for a HPMV permit which is not supported by the information recorded on the vehicle attributes form or where uncertified modifications have been made to the vehicle unless the certifier has been involved in such modifications.

Examples of what must be verified are:

- Vehicle identity
- Towing connections are appropriately certified for the weight to be carried
- Brakes, where appropriate, brake coding verified, including brake code mass. Due to the critical nature of brake capability and the amount of creep seen in brake coded vehicles brake components critical to brake coding such as ratio valves must be verified
- Electronic braking systems, including electronic stability control and roll stability control, are activated on settings appropriate for use.
- Where applicable SRT is verified and operational limits confirmed.

Note that dimensional accuracy is the responsibility of the operator and is based on laden weights as checked by the CVIU at roadside. These dimensions may be the subject of roadside checks by the Police, CVIU or NZTA Transport Officers.

Build data may be used to fill out an attributes sheet but, if the vehicle is no longer under the control of the manufacturer then the accuracy of such data must be confirmed by a physical check or by receipt of a signed declaration from the operator stating that the vehicle has not been modified since manufacture or since the most recent certification, in any way that may affect the information presented on the attributes sheet. The certifier must keep this declaration with the PDS for the job. For other vehicles, where build data is not being used to provide information, a physical inspection of

the vehicle will be necessary to ensure accuracy and confirm that no required attributes, such as brakes, have been modified. An attributes sheet may be reused for subsequent applications as long as the certifier who has signed it can confirm that there has been no change to any of the items featured on the attributes sheet or the operator makes a declaration that there have been no modifications which may affect the information presented on the attributes sheet.

SRT

Whether the vehicle is required to have an SRT of 0.35 (all trailers) or 0.4 (trailers without EBS/RSC) then that must be stated in a load v height matrix. Where the load is a closed container an SRT will only be accepted if it specifies uniform density. Mixed freight may only be used where the load is visible and the status can be verified.

Overweight permits

Similarly the changes to the **VDAM Rule** have also had the effect of focusing attention on the overweight permit (Opermit) process previously controlled solely by Transit with no access to vehicle information on Landata. Following the merger of Transit with LTNZ and the creation of the NZTA, which gave the permit staff access to Landata, the many inconsistencies in these Opermit applications have been highlighted so again operators are being required to verify vehicle details before permits are issued. Once again, this can be done in two ways; by waiting for the NZTA to verify details held, causing considerable delays for, often time sensitive, applications, or have those details independently verified by a HVS certifier with the 'chassis' category including noting where a vehicle has multiple chassis ratings and any conditions that may be attached such as speed limitations. It must be noted that where a vehicle may be used in a 'pusher' capacity not only must the GCM of it and the towing vehicle be cumulatively capable of supporting the total load, but the 'pusher' tow connection (front drawbeam) must be certified like any other drawbeam and capable of supporting its share of the load. It may therefore, be a limiting value for a combination where a pusher vehicle is proposed.

The same requirements as for the HPMV permit process are in force. A sample form is attached and these can be prepared for the operator and supplied as required with each permit application provided that there are no subsequent modifications which may affect the accuracy of the permit application

These attributes sheets from certifiers are accepted in lieu of an NZTA A&U approval as A&U will no longer carry out these attributes checks except for audit checks which will be carried out on both certifiers and operators.

It is important to note that the Permit Issuing Officers (PIO) have been tasked to check that the Attributes Sheets support the applications in that the attributes sheets list the design limits and the applied for mass should not exceed the lowest of these. Also, if the trailer does not have roll stability, then the 0.4 SRT requirement will be required to have a load height stated which will be noted as a restriction as a condition of the permit.

Note: Where there is a conflict between the data found during the physical selection and the data recorded on Landata the accuracy of the physical data must be confirmed and compared to the original build data and any differences recorded and reported to the NZTA so records can be updated and any missing certifications can be addressed.

The same requirements on certifiers as for the HPMV permit process are in force.

8 SRT requirements for 'O' Permit Export/Import containers

Memo 70c

Background

After recent vehicle rollovers, the Commercial vehicle Investigation Unit of NZ Police (CVIU) alerted the Transport Agency that the regulatory requirements for Static Roll Threshold (SRT), as defined in the **Land Transport Rule:**

Vehicle Dimensions and Mass 2016 (the VDAM Rule), were not being met by some operators of trucks using overweight permits and moving ISO shipping containers. The lack of SRT compliance presents a significant road safety issue for both the drivers of these trucks and other road users due to the higher probability of these vehicles rolling over.

The SRT of a vehicle is a static measure of the potential for that vehicle to become unstable and roll-over when moving. Vehicles with a low SRT (below 0.35g) are more likely to rollover than those with a higher SRT (those 0.35g and above). The lower the SRT, the less stable the vehicle, especially when turning sharp corners and during emergency manoeuvres such as sudden lane changes.

Previously the Agency has issued overweight permits to operators of ISO Container trucks on the assurance that these vehicles were being operated within the legal SRT requirements for mass and height. This reflected the fact that it is the permit holder's responsibility to operate within the regulatory requirements relating to SRT, as well as other conditions detailed in the permit or legislation. This includes ensuring the SRT of the vehicle is calculated appropriately depending on what the vehicle is carrying and how it is loaded.

As well as the SRT issues raised with the Agency there have also been concerns raised about the braking capability of brake coded vehicles obtaining overweight permits.

As a result of the concerns raised with us by the NZ Police and in the interests of improving road safety for all road users, Permit Issuing Officers (both internal Agency staff and external contractors) have now been directed to check for both SRT compliance and that there is sufficient brake capacity when issuing overweight permits for combinations carrying ISO containers.

Additionally, holders of existing overweight permits for ISO Container trucks have been requested by the NZTA State Highway Managers to provide confirmation that their currently permitted vehicles are SRT and brake compliant.

The way forward

The Agency has worked with the Road Transport Forum, TERNZ and the CVIU to find solutions that will ensure the greatest amount of compliance with the least possible disruption for the industry, and four options have been developed. All four options require an SRT Compliance Certificate to be completed by a Heavy Vehicle Specialist (HVS2) Certifier and a Vehicle Attributes Sheet for each prime mover and trailer to be completed by a Heavy Vehicle Specialist Certifier (HVEC or HVEK) and supplied with the Permit Application Form..

These four options are as follows:

1. A uniform density SRT overweight permit at height from road surface to highest point on the tallest container [maximum load (container) height = 4.3m]

2. A uniform density SRT overweight permit with a load height of at least 3.90m [within the container].

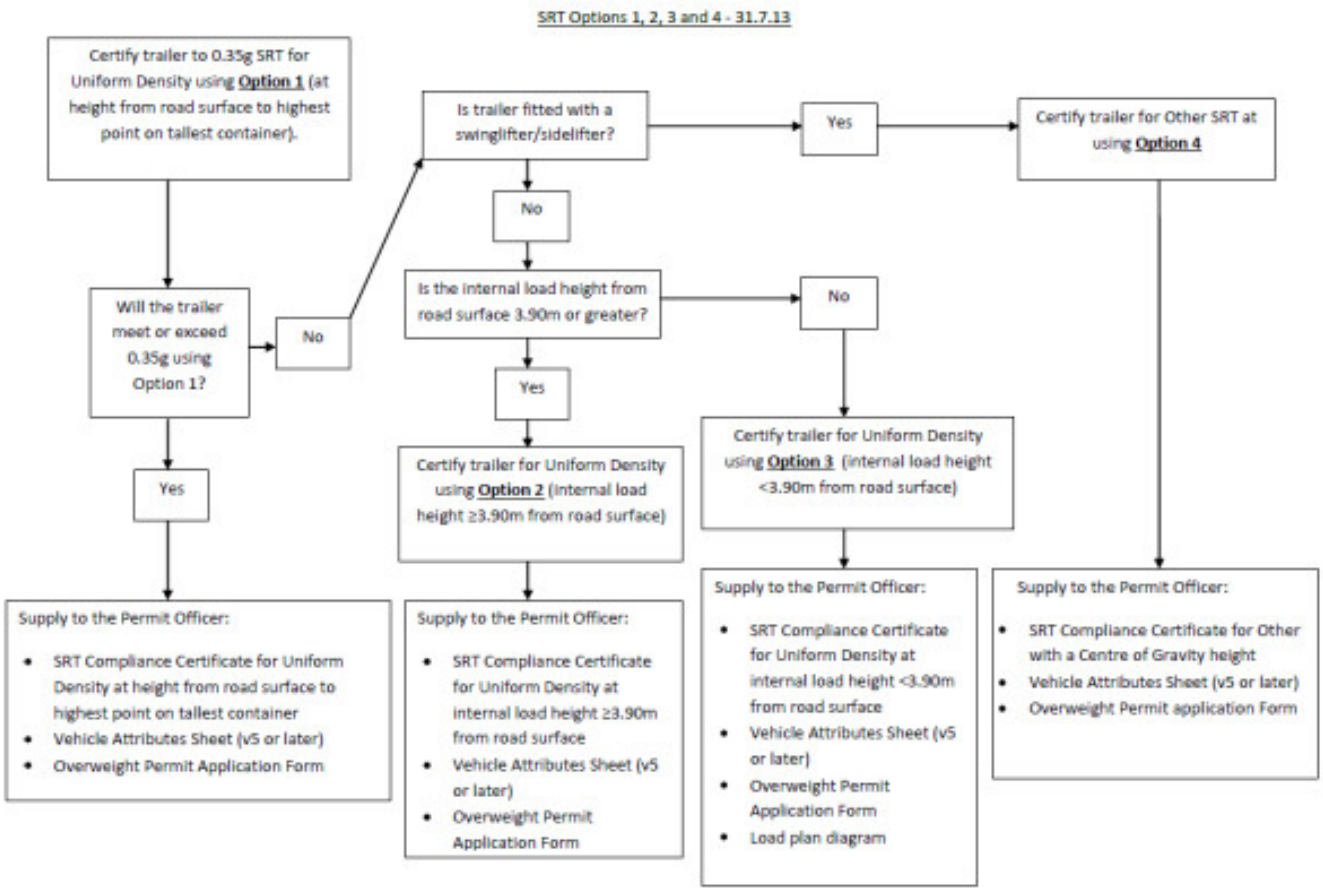
3. A uniform density SRT overweight permit at an internal load height of less than 3.90m [within the container].

4. An 'Other' SRT permit for swing lifter/sidelifter trailers.

The SRT compliance certificates should be at calculated using the weights on the trailer axle set, either listed on the overweight permit, the *Permit application* form, or at a realistic in-service weight.

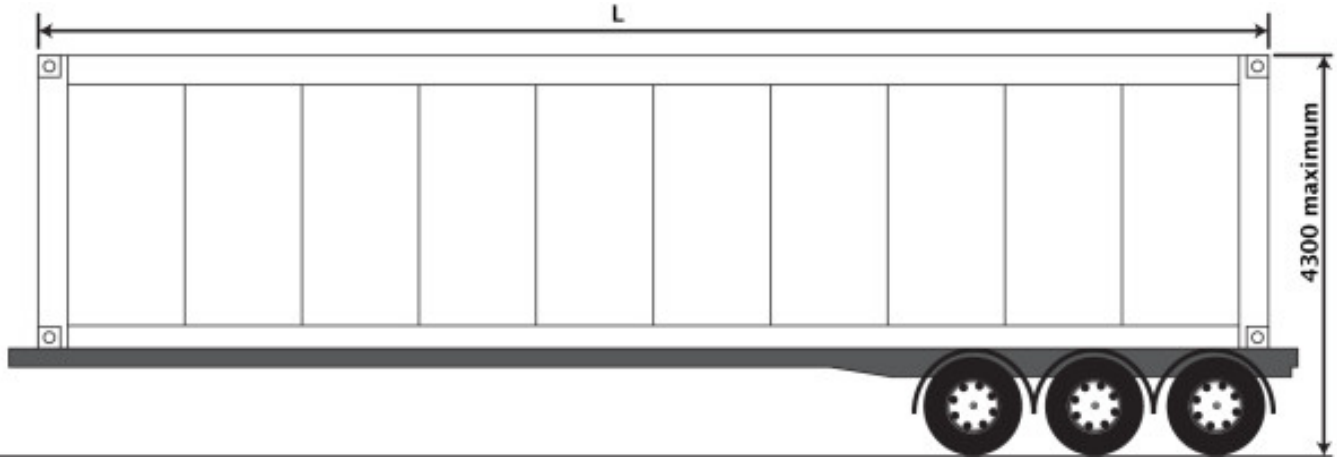
Please refer to the flowchart on the following page for advice on which option to select.

The Transport Agency will consider on a case-by-case basis extensions of up to one month from the 1 August 2013 deadline for those operators who have been unable to get a certifier to complete SRT compliance certificates. Operators will need to apply to their Permit Issuing Officer in writing.



- Download **SRT options flowchart** (PDF)

1. A Uniform Density SRT overweight permit at the maximum height from the road surface to the highest point on the tallest container (maximum load height of 4.3m).



This option is Uniform Density SRT calculated using the weights on the trailer axle set either listed on the Overweight Permit, the Permit Application Form, or at a realistic in-service weight, at the height from the road surface to the highest point on the tallest container, to a maximum height of 4.3m.

As this is the 'worst case' scenario it will cover the vehicle for every loading situation within the permit weights and specifically where the composition of the container load is not known.

A valid SRT Compliance Certificate for Uniform Density and using the height from the road surface to the highest point on the tallest container (to a maximum height of 4.3m) completed by an HV Certifier with the HVS2 category, must be

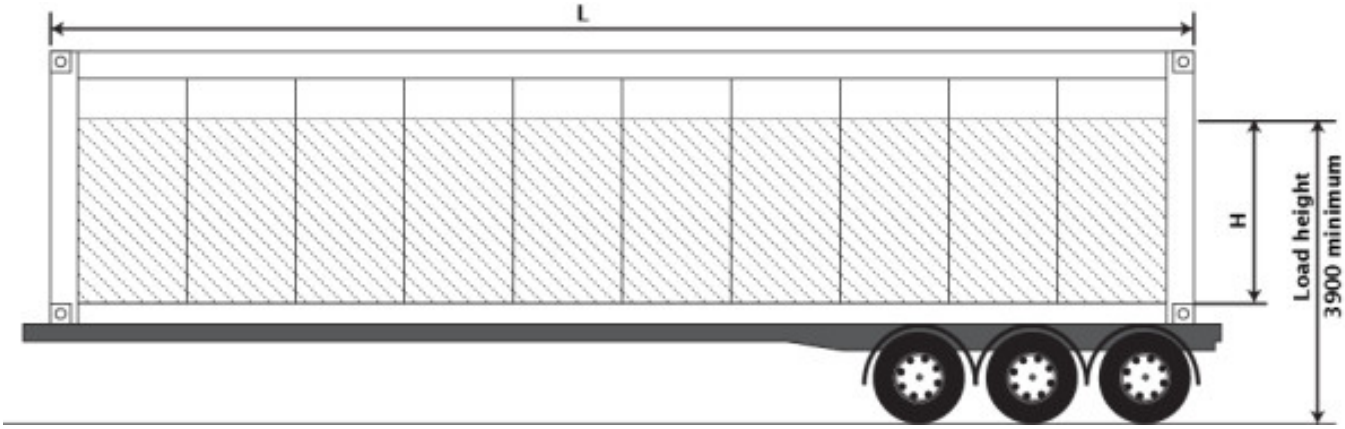
supplied with any overweight permit application form. The SRT compliance certificate must be carried on the vehicle and presented to the CVIU on request, together with the standard *evidence bona fide* listed in Section B3 of the Transport Agency's *Vehicle dimension and mass permitting manual*.

SRT Compliance Certificates do not have to be done at 22,000kg, as the maximum allowed for a tri-axle set is 21,780kg, depending on axle spacing, and calculating SRT at a higher weight than the permit will allow could lead to the trailer failing to meet the 0.35g compliance target.

Any permit operated outside of its conditions will be revoked under section 5.7 of the VDAM Rule.

Option 1 is recommended for all non-swinglifter/non-sidelifter trailers carrying import containers.

2. A Uniform Density SRT overweight permit with an internal load height of 3.90m or greater (Maximum load/container height 4.3m).



This option is for Uniform Density SRT calculated using the weights on the trailer axle set either listed on the Overweight Permit, the Permit Application Form, or at a realistic in-service weight.

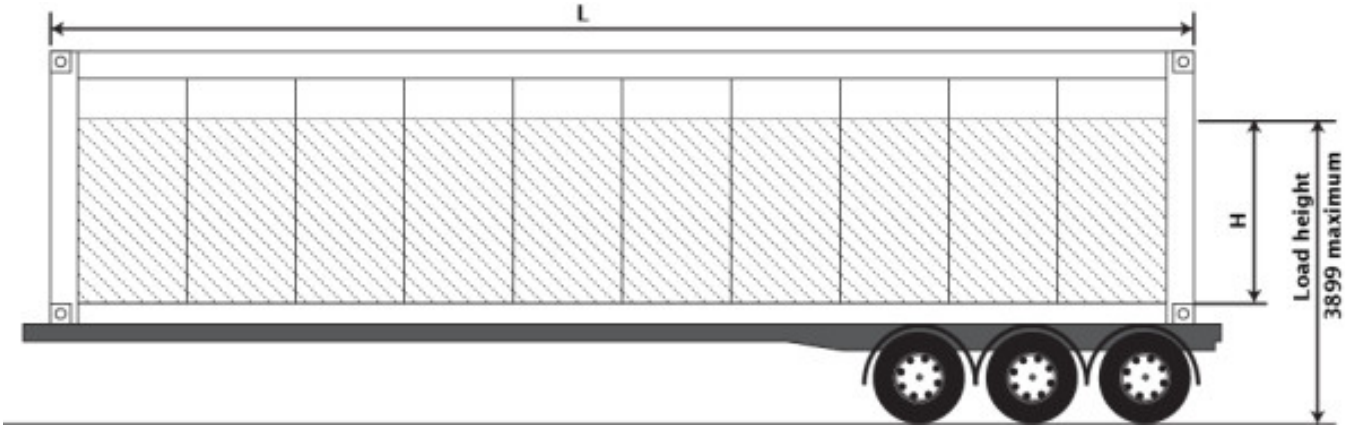
This option can be used where the distance from the road surface to the top of the load in the container is not less than 3.90m (must be 3.90m or more to use this option). This option reflects the fact that most containers have an air gap and are not filled to the roof of the container.

A valid SRT Compliance Certificate for Uniform Density at the permit weights on the trailer and at a minimum load height of 3.90m from the road surface to the top of the load must be completed by an HV Certifier with the HVS2 category and supplied with any permit application form. The SRT Compliance Certificate must be carried on the vehicle and presented to the CVIU on request, together with the standard *evidence bona fide* listed in Section 8.4.4 of the *Transport Agency Overweight Permit Manual*.

SRT Compliance Certificates do not have to be done at 22,000kg, as the maximum allowed for a tri-axle set is 21,780kg, depending on axle spacing, and calculating SRT at a higher weight than the permit will allow could lead to the trailer failing to meet the 0.35g compliance target.

The load height will be a condition of the permit. The CVIU have the legal authority to open any sealed container. Any permit operated outside of its conditions will be revoked under section 4.4 of the VDAM Rule.

3. A Uniform Density SRT overweight permit at an internal load height of less than 3.90m.



This option is for Uniform Density SRT calculated using the weights on the trailer axle set either listed on the Overweight Permit, the Permit Application Form, or at a realistic in-service weight.

This option can be used where the distance from the road surface to the top of the load in the container is less than 3.90m. This option reflects the fact that most containers have an air gap at the top of the load, and are not filled to the roof of the container.

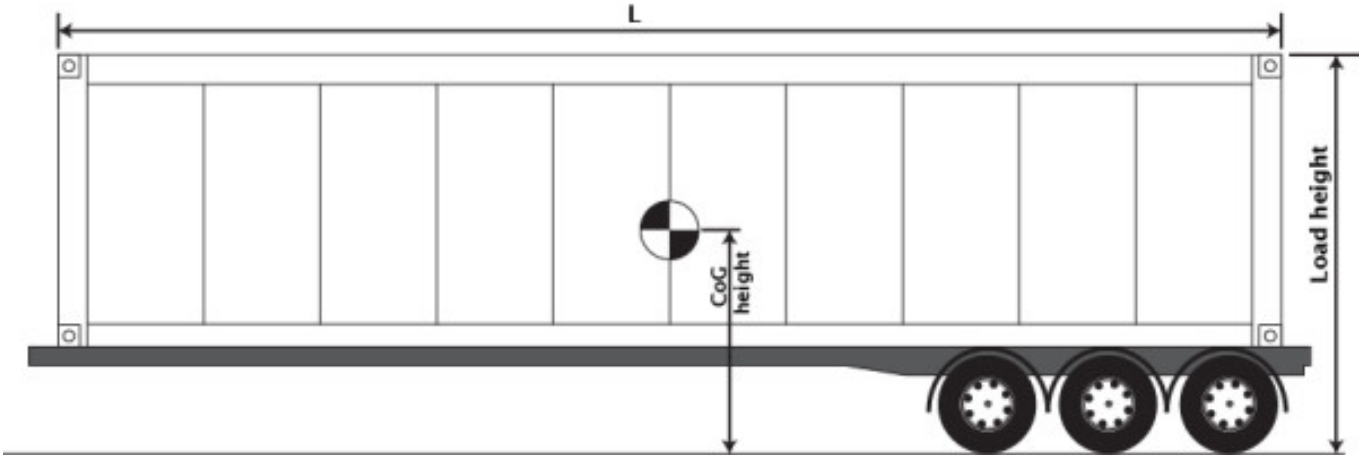
A valid SRT Compliance Certificate for Uniform Density at a load height less than 3.90m from the road surface to the top of the load must be completed by an HV Certifier with the HVS2 category and supplied with any permit application form. The SRT Compliance Certificate must be carried on the vehicle and presented to the CVIU on request, together with the standard *evidence bona fide* listed in Section B3 of the Transport Agency's *Vehicle dimension and mass permitting manual*.

SRT Compliance Certificates do not have to be done at 22,000kg, as the maximum allowed for a tri-axle set is 21,780g depending on axle spacing, and calculating SRT at a higher weight than the permit will allow could lead to the trailer failing to meet 0.35g.

This option also requires permit applicants to supply an accurate drawing (a “load plan”) which shows the height the container is loaded to (H), the mass of the contents, and the load height of the vehicle. This load plan will need to be carried on the vehicle for inspection by the CVIU.

The load height will be a condition of the permit. The CVIU have the legal authority to open any sealed container. Any permit operated outside of its conditions will be revoked under section 4.4 of the VDAM Rule.

4. An ‘Other’ SRT permit for swing lifter/sidelifter trailers (lifting arms not shown).



This option is calculated using the weights on the trailer axle set either listed on the Overweight Permit, the Permit Application Form, or at a realistic in-service weight. The load must be calculated on the basis that the contents are

uniformly dense, and the CoG of the load itself can be nominated using the “Other” method.

A valid SRT Compliance Certificate for ‘Other’ SRT and at a maximum payload CoG height will be required to be completed by an HV Certifier with the HVS2 category and supplied with any permit application form. The SRT Compliance Certificate must be carried on the vehicle and presented to the CVIU on request, along with the standard *evidence bona fide* listed in Section B3 of the Transport Agency's *Vehicle dimension and mass permitting manual*.

SRT Compliance Certificates do not have to be done at 22,000kg, as the maximum allowed for a tri-axle set is 21,780g depending on axle spacing, and calculating SRT at a higher weight than the permit will allow could lead to the trailer failing to meet 0.35g.

The load height and CoG will be a condition of the permit. Any permit operated outside of its conditions will be revoked under section 4.4 of the VDAM Rule.

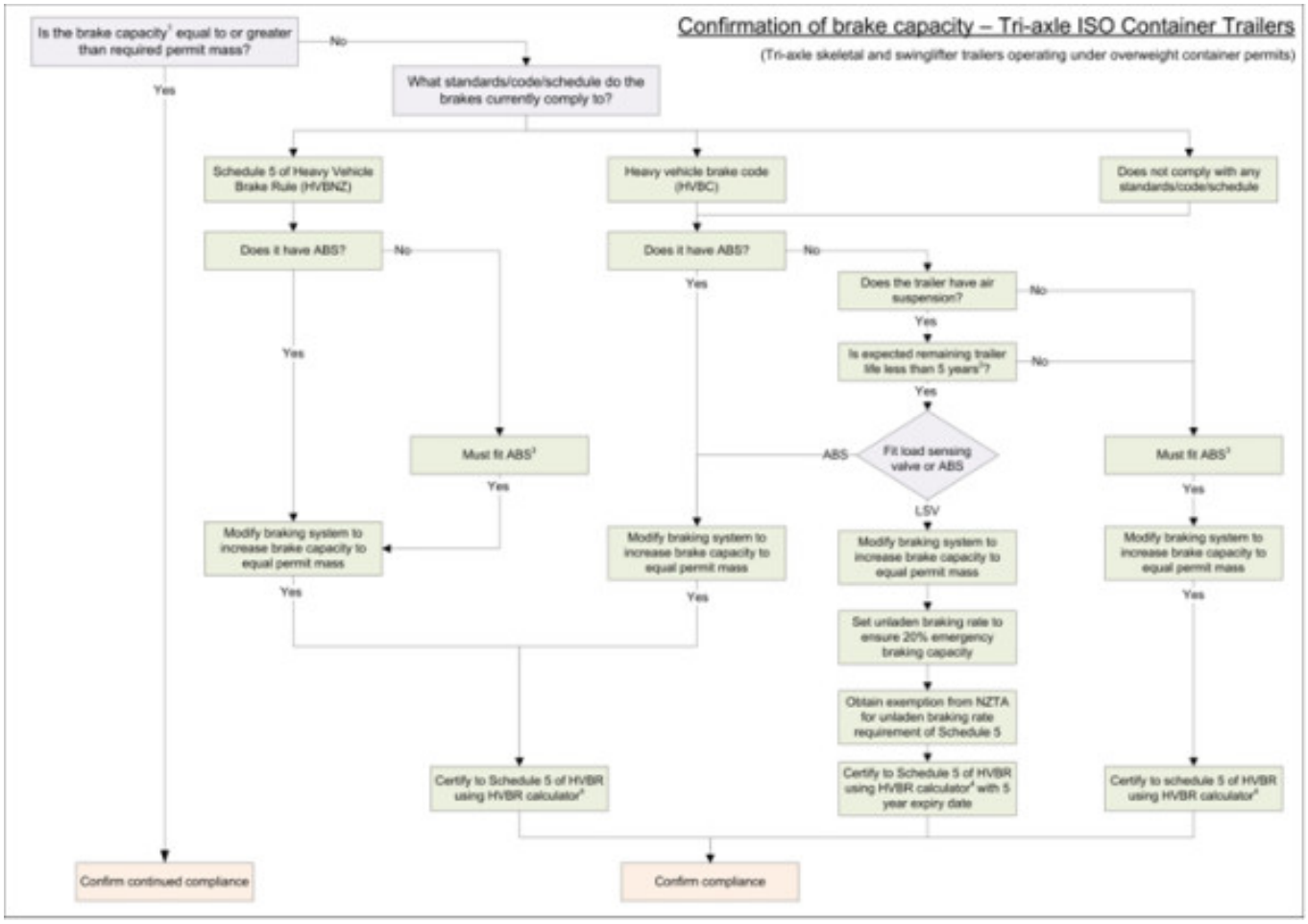
All of Vehicle option

An “all-of vehicle” option is under consideration. The details of this have not been approved or finalised at this time.

Brake Coded Vehicles

To ensure that all vehicles receiving overweight container permits have sufficient brake capacity to match the weight approved on the permit, even if they are Brake Coded, the Agency has agreed to allow operators to prove compliance by having a HVEK Certifier, using the flowchart below, to confirm the braking capacity of a tri-axle semi trailer. This should mean that the majority of tri-axle semi trailers with a VAI of no more than 1.1 will not require major brake upgrades. Quad-axle semi trailers are to be treated on a case by case basis.

The results of this compliance check are to be included in the PDS for the job and reflected on the Attribute Sheet.



- Download **Confirmation of brake capacity flowchart** (PDF)

Notes

1. Brake capacity – either the Brake Code Mass for Brake Coded trailers or the brake calculation mass for a trailer complying to the Heavy-vehicle Brakes Rule, (this should be the axle group mass at the GVM for brake rule compliance).

2. If the expected remaining life of the trailer is less than five years and it is fitted with air suspension a load sensing valve can be fitted – the certification of the braking system in this case will have a non repeatable five year expiry date and an exemption from the unladen braking rate in Schedule 5 of the Heavy-vehicle Brakes Rule will be required. This exemption number is to be recorded on the LT400 and the exemption to be carried with the vehicle

3. Load sensing is also an option however it has been demonstrated that this is only suitable for trailers with a tare weight per axle greater than 2500 kg, otherwise compliance in ALL 3 of the required states, unladen, laden, and the emergency braking requirement (20% brake efficiency) typically cannot be achieved.

4. Using a currently approved NZTA calculator, approved 'proprietary' software or manual calculations, where approved proprietary software is used compliance to schedule 5 must be demonstrated. The HVBC calculator is no longer approved and can NOT be used.

Vehicle attributes sheet (version 5 or later) required for each truck and trailer from 1 August 2013

From 1 August 2013 all new applications for ISO Container Overweight Permits must be accompanied by a completed Vehicle Attributes Sheet (Version 5 or later) for each truck and trailer signed by an appointed heavy vehicle certifier with the HVS2 category, along with the SRT Compliance Certificates (and a load plan for Option 3) as required in this Memo. All container permit applications received from 1 August 2013 that can prove SRT Compliance using one of the four options and accompanied by a Vehicle Attributes Form (Version 5 or later) signed by an appointed HVS2 certifier for each truck and trailer, that demonstrates the vehicle is being operated within safety limits, will be issued with the full twenty-four month (two year) permit.

Requirements on engineers

When preparing an attributes sheet for an import/export container 'O' permit a HVS2 certifier must be engaged to certify the trailer as described in one of the alternatives above and write an LT400. The LT400 is to be added to Landata (IVCERT) but the original SRT values are to be left on the Certificate of Loading. The operator is to be supplied with a copy of the SRT Certificate which must be kept in the cab and produced on request by the NZ Police or NZTA Transport Officers. Such certification is an update and does not replace the original certification.

Where the certifier can verify that the vehicle is unmodified (same dimensions, same axles, same suspension) from its condition when last certified, then the SRT can be updated without physically inspecting the vehicle. Verification can be receipt of a signed declaration from the owner stating that the vehicle is unchanged from its most recent SRT certification. The onus is on the certifier to be satisfied that such a declaration is credible. If it cannot be verified that the vehicle remains unmodified since its last SRT certification then a full inspection and assessment will be required.

When calculating SRT it is important that you use the manufacturer's values as the generic values are more conservative and may result in a failed SRT. However, when calculating SRT for vehicles using Hendrickson axles (models HT230, Intraax and Intraax AANT) the correct roll stiffness figure is 23,162 Nm/degree (1,327,085Nm/rad). Permit officers have been advised to reject permit applications that use other figures for Hendrickson axles

As an additional assistance it has been agreed that the HVS2 certifier, when calculating the SRT using either option 2 or option 3, may include the tare weight of the container as part of the tare weight of the trailer.

Note that where the SRT has been derived from design data it must be verified from ‘as built’ data prior to the issuing of a SRT certificate.

Summary

- From 1 August 2013 all ISO container permit applications must be supplied with a Vehicle Attributes Form (Version 5 or later) signed by an HV Certifier with the HVS2 category for each truck and trailer, along with the SRT compliance certificates (and a load plan for Option 3).
- Permit applications received after 1 August 2013 with a Vehicle Attributes Form (Version 5 or later) signed by an HV Certifier with the HVS2 category for each truck and trailer along with the SRT compliance certificates (and a load plan for Option 3) will receive 24 month permits.
- All temporary ISO container permits successfully renewed with a Vehicle Attributes Form (Version 5 or later) signed by an HV Certifier with the HVS2 category for each truck and trailer, along with the SRT compliance certificates (and a load plan for Option 3) after 1 August 2013, will be extended from the initial date of issue for the full 24 months at no extra cost.
- SRT compliance certificates do not have to be done at 22,000kg, as the maximum allowed for a tri-axle set is 21,780g depending on axle spacing, and calculating SRT at a higher weight than the permit will allow could lead to the trailer failing to meet 0.35g.
- The Transport Agency will consider on a case-by-case basis extensions of up to one month on the 1 August 2013 deadline for those operators who have been unable to get a certifier to complete SRT compliance certificates. Operators will need to apply to their Permit Issuing Officer in writing.

The Transport Agency is taking this action in response to an increased road safety risk and has been working with industry representatives, the NZ Police and affected vehicle operators as a matter of urgency to inform affected parties what is expected of them. We appreciate your patience and time in addressing these important matters.

Page amended **1 February 2017** (see **amendment details**).

9 Attributes sheet for HPMV/’O’ Permit

- Download **High productivity motor vehicle/ISO permit attributes checksheet v5** (MS Word).

10 Welding in the transport industry 2013

> Note that the welder certification standard, AS/NZS 2980:2007, has been superseded by AS/NZS ISO9606: 2017 or AS/NZS 2980:2018, Qualification of welders for fusion welding of steels. Welder certificates to AS/NZS 2980:2007 will not be recognised once they run out and not at all after 1 April 2020.

Memo 72 - 28 February 2013

Introduction

This document is an update of the publication *Welding in the Transport Industry*, Version 2 June 1998 ISBN 0478206607 which was produced by the Land Transport Safety Authority (LTSA) for the use of engineers, fabricators and others involved in heavy motor vehicle construction and repair. It outlined the LTSA’s expectations of these people and their organisations. Copyright is held by the NZ Transport Agency.

This document has been revised and updated by the NZTA with assistance from the HVETIG (formerly the RTCE), including the references and Appendices 1-5 and is published in Memo form as an instruction to all HV certifiers.

A guide to key reference documents is included.

Policy for the use of this document

The information in this document is intended to provide useful guidance on manufacture and fabrication of vehicles and components in the heavy transport industry. It can also be used for guidance when undertaking repairs and modifications where welding to the chassis is indicated, but only in cases where the manufacturer allows welding on the chassis or where the manufacturer's position on welding the chassis is unobtainable. It is NZTA policy that the modifier and repairer must follow the vehicle manufacturer's instructions and standards (eg as outlined in the manufacturer's repair and/or body builder's manual). **If the manufacturer does not permit welding, then welding must not be used for modification or repair purposes.** In such cases modifications and repairs must be done in accordance with the manufacturer's instructions, which may mean such modification or repair **must not** be carried out.

An alternative approach

A chassis can be welded where sound engineering judgement and calculations provide justification even where the OE manufacturer does not support such modification or repair. However, in such cases the HV Certifier takes full responsibility and must be able to support and defend such an approach. At a minimum, substantial reinforcing over the welded section that has been designed to meet the chassis moment of resistance is expected. Such reinforcement would be designed to reduce the cyclic stresses in the weld so that fatigue issue in the welded joint are eliminated. Most manufacturers using a quenched and tempered (QT) chassis provide welding recommendations within their manuals even when their opening statement says that the chassis must not be welded although these welding recommendations are usually supplied as a field repair and assume the affected rail will be replaced at the earliest opportunity. Always look for the manufacturer's welding recommendations in the first instance.

Applicable standards and weld quality

The applicable welding standard is the joint New Zealand and Australian standard, AS/NZS 1554.1:2011, Structural Steel Welding, Part 1, Welding of Steel Structures (minimum yield strength not exceeding 500 MPa). **Superseded standards must not be used.**

Other applicable joint standards are:

- AS/NZS 1554.4:2010, Part 4, Welding of High Strength Quenched and Tempered Steels (minimum yield strength not exceeding 1000 MPa)
- AS/NZS 1554.5:2011, Part 5, Welding of Steel Structures Subject to High Levels of Fatigue (minimum yield strength not exceeding 450 MPa)
- AS/NZS 1554.6:2012, Part 6, Welding of Stainless Steel.
- AS/NZS 1665:2004 Welding of Aluminium Structures

Note that the welder certification standard, NZS 4711, has been superseded by AS/NZS 2980:2007, Qualification of welders for fusion welding of steels, and welder certificates to NZS4711will not be recognised once they run out after 1. April 2011.

Choosing the appropriate standard

The choice of standard will depend on the types of steels above to be welded. There are several additional factors that must also be considered when determining the most appropriate standard to use. For example, if the chassis is made from quenched- and tempered-type high strength steel, use AS/NZS 1554.4 Part 4 2010. (see **Appendix 2**).

For materials which fall outside the range of the standards, follow the manufacturer's recommendations and develop particular weld procedures, or refer to **Appendix 3**: **'Finding out the mechanical properties of the material in the *as welded* condition'**.

Chassis repairs and modifications (general case)

Certifying engineers issuing Design Certificates for chassis or structural manufacture, repairs or modifications have total accountability for fulfilling all statutory and legal obligations concerning such activities. A Design Certificate (Statement of Design Compliance) is a formal declaration that the certifying engineer has fulfilled all such requirements and is accountable for the integrity of the manufacture, repair or modification.

The certifying engineer must:

- Identify the parent metal, and
- Choose the appropriate standards for design and fabrication, and
- Ensure compliance with those standards of all parties encompassed in the certification, and
- Provide evidence of sufficient strength of the welded component.

If the strength of the steel used for the chassis is achieved through the heat treatment of a weldable steel, (eg, some US specification chassis) the certifying engineer must ensure that the design requirements and welding procedure for the modification meet:

1. The original vehicle manufacturer's specifications, or, if this information is not available
2. The design and fabrication engineering practice as described in this document.

The certifying engineer takes responsibility for the modification or repair, and must satisfy the NZTA that the vehicle has been restored to within safe tolerance of its original structural strength. Requirements to be met are contained in **Land Transport Rule: Heavy Vehicles 2004**

If, under Section 6.4 or 7.1(2) of the Heavy Vehicles Rule, the chassis rating has ceased to be appropriate because of the modification or repair, the certifying engineer takes responsibility for the modification or repair and must issue a new chassis rating as specified in HVS Certifier Memo 57a (**Technical bulletin 3**) and subsequent relevant memos.

Chassis modifications for alteration of the chassis rating

When chassis modifications are for the purpose of alteration to the established chassis rating outside the scope of the HV Rule and/or HVS Certifier Memos 57a and 57b (**Technical bulletin 3**) and other relevant instructions, the NZTA will expect, in the first instance, the certifying engineer to obtain approval from the original chassis manufacturer. **The manufacturer should recommend a procedure for modification that will sustain the original specifications.**

If the modification does not fall within the scope of or meet the Rule or relevant Memos or instructions then the NZTA may impose any conditions deemed necessary, including prohibition, and may alter the vehicle ratings according to the information provided by the certifying engineer, vehicle inspector or Transport Officer.

The NZTA may ask the certifying engineer to provide additional information from the manufacturer or other expert sources (eg Industrial Research Ltd (IRL), Heavy Engineering Research Association (HERA), materials testing agencies) to confirm the safety of the modification.

As with any repairs or modifications, failure to observe the relevant Land Transport Rules, regulatory, statutory requirements and standards, may result in the removal of the chassis rating and the withdrawal of the certificate of loading.

Design and Fabrication

Standard AS 1250:1981 is now superseded. It has been incorporated into the revised and reissued AS 3990:1993 Mechanical equipment – Steelwork**. AS 3990-1993 or BS 7608:1993 are the standards to use in all design, fabrication and repair work in the truck/trailer industry.** Section 9.8 of AS 3990-1993 requires that all welds comply with AS 1554 which has been updated to AS/NZS 1554.

Auditing

For the purposes of traceability complete documentation must be available to a NZTA audit so that there is a trail of evidence of compliance.

Penalties and enforcement

Failure to meet the legislative requirements may expose:

- The vehicle's operator to an infringement fee of $150 for operating a vehicle that does not meet the prescribed requirements of **Land Transport Rule: Heavy Vehicles 2004** (Rule 31002), and
- The certifying engineer to sanctions up to and including revocation of their notice of appointment, and
- The certifying engineer and others involved in the modification work, who knowingly fail to meet the prescribed requirements, to criminal charges and/or liability.

The prescribed technical requirements will be enforced by the NZTA and the Police. Any vehicle that does not comply with the prescribed technical requirements may be ordered off the road by the Police.

Reference documents

- Current New Zealand Standards are available for purchase from *Standards New Zealand:* **http://www.standards.co.nz**
- Land Transport Rules are available for free download from the New Zealand Transport Agency (NZTA): **http://www.nzta.govt.nz/resources/rules/about/index.html**
- WTIA Technical Note TN01-06 is available for purchase from *Welding Technology Institute of Australia* (WTIA): **http://www.wtia.com.au/catalog.htm**
- 'NZ Welding Centre Report R8-07 High strength steel: Design and fabrication: Appendices: 1992'. Available for purchase from the *Heavy Engineering Research Association* (HERA): **http://www.hera.org.nz**
- The Welding Technology Institute of Australia (WTIA) was formed in 1989 by the amalgamation of the Australian Welding Institute (AWI) and the Australian Welding Research Association (AWRA). The AWRA document, 'Welding Quenched and Tempered Steels' Technical Note 15 (1985) cited in the 1998 Version of 'Welding in the Transport Industry', was renamed WTIA Technical Note 15 and updated as 'Welding and Fabrication of Quenched and Tempered Steel' (1996). It is available for purchase from *Welding Technology Institute of Australia* (WTIA): **http://www.wtia.com.au/catalog.htm**
- Australian Standards are available for purchase from *SAI Global, Australia*: **http://infostore.saiglobal.com**

Appendices

Appendix 1: Definitions AS/NZS 1554

Appendix 1 provides definitions for the 'Responsible Parties' referred to in the document AS/NZS 1554 when specifically applied to the repair and manufacture of equipment operating in the New Zealand road transport industry.

Certifier

NZTA appointed Specialist Certifier. In the absence of an Inspector, they are responsible to NZTA for ensuring specified work meets the requirements of NZS 1554.

Fabricator

Person or organisation responsible for the welding (may be the workshop owner).

Inspecting Authority

Organisation with the statutory authority to inspect and certify compliance of welding operators, welding procedures and final welds. A Specialist Certifier who holds appropriate qualifications could fulfil this role.

Inspector

Either a Specialist Certifier who meets the qualification requirements of AS/NZS 1554, or an appropriately qualified person employed by the Inspecting Authority.

Principal

This can be NZTA, the vehicle owner, or the manufacturer. A Specialist Certifier acts as the Principal's representative.

Report

The minimum requirement upon which to base a written report must be a visual inspection of all welding to be certified as complying to AS/NZS 1554.

Welder

A person who meets the qualification requirements of AS/NZS 1554 for the position and technique of the welding being performed.

Welding Supervisor

A person employed by the Fabricator who meets the qualification or experience requirements defined in AS/NZS 1554. A Specialist Certifier could be delegated this role by the Fabricator.

Appendix 2: Review AS/NZS 1554.5

Appendix 2 details applications of AS/NZS 1554.1 and AS/NZS 1554.5 regarding welds not exceeding/exceeding 500 MPa yield.

For materials not exceeding 500 MPa yield

This applies for welds subjected to fatigue loadings when the stress in the weld exceeds 80% of Category B of AS 3990 (or exceeds the stress range permitted for detail 112 of AS4100 or NZS 3404.1). AS/NZS 1554.1 should be used for all lower levels of fatigue stress.

Examples

80% Category B

Load condition 4 = 0.8 x 110 = 88 MPa | Range (over 2,000,000 cycles)

Load condition 3 = 96 MPa | Range (500000 – 2,000,000 cycles)

Load condition 2 = 148 MPa | Range (100000 – 500,000 cycles)

Reviewing differences between AS/NZS 1554.1 and AS/NZS 1554.5 for materials not exceeding 500 MPa yield: Generally, there are no differences between the two, except for the level of inspection required and levels of imperfections allowable. In broad terms, AS/NZS 1554.5 only allows levels of imperfections which are 50% of the allowable levels of imperfections in ASS/NZS 1554.1.

Materials exceeding 500 MPa yield

If the materials are High Strength Quenched and Tempered Steels, AS/NZS 1554.4 applies. If the stress in the weld exceeds 80% of category B of AS 3990, then this weld is designated FP (Fatigue Purpose). In this case, higher levels

of inspection are required and lower levels of imperfection apply.

Appendix 3: As welded material properties

Appendix 3 details methods of Finding out the mechanical properties of the material in the as welded condition.

In the first instance, the certifying engineer must obtain material specifications and procedures from the original chassis manufacturer. If this information is not obtainable from the manufacturer, the certifying engineer must undertake the following course of action:

1. **Determine the properties of the unwelded parent metal** through a materials testing agency. It may be necessary to test tensile strength, yield strength, elongation, chemical composition and/or hardness.

2. **Assess the weldability of the steel**, in line with Welding Technology Institute of Australia (WTIA) Technical Note TN1 (2006). Use the weldability group number determined through TN1 when working out possible preheat. HERA recommend that, for practical reasons, only steels with a carbon equivalent of <0.50 (equivalent to Group 5) be considered for welding. If in doubt, seek expert advice (eg HERA, a practising metallurgist etc.).

3. **Choose the welding electrode carefully**. The choice of a matching strength electrode is only of value if the expected loss of strength in the Heat Affected Zone (HAZ) is insignificant. If in doubt, seek expert advice (eg HERA).

4. **Develop and qualify the welding procedure** in accordance with AS/NZS 1554.1. If the material is not pre-qualified, the procedure must be qualified by testing. Such cases can be treated the same as when qualifying non pre-qualified consumables for weld category SP. Obtain approval of the procedure by a suitably qualified person (e.g. HERA). The welder can be qualified to the procedure under AS/NZS 1554.1 or to AS/NZS 2980: 2007.

5. **Determine the mechanical properties of the material in the as welded condition** from the welding procedure test, i.e. tensile, yield, elongation, and (if necessary) impact (charpy) values.

6. **Use the mechanical properties determined for the design calculation.** Please note:

- the weld strength including the heat affected zone (HAZ) for some of the high strength steel (HSS) chassis rails is typically below that obtained for the unwelded parent metal
- the fatigue strength of a welded detail is always considerably below that of the unwelded parent metal and does not depend on the strength of the parent metal
- remember to specify weld category to AS/NZS 1554 and the extent of non-destructive examination required
- refer to HERA NZ Welding Centre Report R8-07: High Strength Steel; Design and Fabrication, and Australian Welding Research Association (AWRA) Technical Note, Issue 15.

Appendix 4: Industry Standard Weld Procedures

Appendix 4 details some methods to obtain qualified weld procedures.

Compliance with AS/NZS 1554 (all parts) requires that all welding procedures used by workshops must be individualised to the workshop by way of a Macro test examination, as a minimum, provided that all other requirements for qualifying the procedure have been met.

Most welding tasks performed within the road transport manufacture and repair industry can be covered by a clearly defined range of welding procedures. This document supports the use of industry developed standard weld procedures which can be tailored for individual workshops and may be used by workshops without the need for further proving.

Such procedures may be developed by relevant industry groups (HERA, HVETIG, TTMF) for use by their members.

Where these procedures are used when HV Certification is required it must be under the supervision of a NZTA appointed Heavy Vehicle Certifier. Unless specified on a SoDC or other approved engineered solution, the certifier

must take responsibility for specifying the procedure to be used and is also responsible for ensuring that the workshop, its equipment and personnel, are capable of meeting the parameters specified in the procedure.

For any tasks that are not clearly covered by available standard procedures a new procedure must be developed and must meet all the requirements of AS/NZS 1554.

Appendix 5: Brittle Fracture Considerations

Appendix 5 is a general discussion on the dangers and affects of brittle fracture.

HVSC's have a responsibility not to lose sight of potential Brittle Fracture problems throughout the complete design and certification process.

Brittle Fracture is not a matter for welder testing to AS/NZS2980 other than using a test procedure compliant with AS/NZS 1554.1. HV Certifiers are required to specify and ensure any job has been completed in compliance with AS/NZS 1554 pt 1-5. Therefore, with respect to welder testing HV Certifiers need to adopt WPS's which have been developed to reduce the size and incidence of defects in welds which are a major cause of brittle failure.

The other aspects of Brittle Fracture fall outside the realms of welding performance being material selection for Design Service Temperature, metallurgy, design and design detailing. All aspects that should be fully considered prior to a weld procedure being chosen.

Generally the shape changes (stress risers) and defects that increase the sensitivity of a structure to fatigue failure, also give rise to brittle fracture in notch sensitive materials.

Structures that are designed for fatigue are generally less prone to brittle fracture under normal loading conditions as the structure will be functioning below the notch sensitive stress levels.

In ductile structures the peak stress at a discontinuity or defect in the material, or in a weld, will result in local deformation and a redistribution of the stress tending to average the stress out. Repeated fluctuated loads will eventually lead to fatigue failure.

In a notch sensitive material, the material will tend to fracture rather than deform giving rise to an even higher level of peak stress at the point of the fracture and an increase in stress due to the reduction in section resulting in total failure.

Structures designed for high fatigue sensitivity, for example AS 3990 Category E load condition 3 (55MPA nominal stress) would be less prone to failure due to brittle fracture than if designed for load Category E condition 1 (140 MPa).

Towing connections with a design life of 10 year would be more prone to brittle fracture, than if designed for for a 20 year life.

Conclusion

Where a component is designed for a minimum fatigue life of 10 years brittle fracture can be considered to be accounted for by the fatigue design. For any reduction in the design life from 10 years the component will need to be designed for brittle fracture with appropriate material selection. All the welding requirements of NZS 1554 appendix B need to be followed.

High Strength Materials. Special attention must be paid to the fracture toughness when using high strength materials, ie yield strengths greater than 350 MPa. These materials may display good fracture toughness and fatigue properties but may be very prone to embrittlement due to poor welding procedures and may become notch sensitive. For these materials specific welding procedures must be applied and the requirements of NZS 1554 Parts 1 and 5 strictly adhered to.

11 Attributes sheet for 50MAX permit

- Download **50MAX vehicle combination attributes sheet** (MS Word, external link).

12 SARN brake data

Category: **HVEK**

Purpose

- This technical bulletin replaces Memo 86.
- This technical bulletin covers the use of brake data derived from the Australian sub assembly registration number (commonly called SARN data).

Issues

Land Transport Rule: Heavy-vehicle brakes 2006: Schedule 5: Section 11: Clauses 11.1 through 11.3 require brake data to be provided by the **axle manufacturer** or **brake manufacturer** and that the data must be based on tests carried out in accordance with one of the standards in **2.5(2) of the Rule**. ADR 38 is not one of the standards in 2.5(2).

However, SARN data derived under ADR 38 is being provided, and by organisations other than axle manufacturers or brake manufacturers, and this data is being used for some brake certifications. Feedback from HVEK Certifiers has increasingly highlighted a problem with the brake factor calculated using SARN data as being unrealistically low. HVEK Certifiers then have to come up with a best-guess brake factor, usually by making a comparison with a similar foundation brake, to complete certifications. To use the SARN data unmodified results in errors of up to 30%, resulting in over-braked axles and premature brake lining wear.

Short term solution

Where axle or brake manufacturer brake data is not available but SARN data to ADR 38 is:

1. Apply for exemption from clauses 11.1, 11.2 and 11.3 as appropriate
2. Derive brake data from a similar (Note 1) foundation brake and use that data
3. Obtain confirmation that the friction material on the axle is equivalent to the friction material of the brake in 2.
4. Enter appropriate comments on the LT400 and an expiry date of six months at which time the vehicle will require re-certification using correctly established brake data.

This short term solution can only be applied to vehicles fitted with an ABS function.

This approach is available to be applied to exemption applications received from the date of issue of this Memo until 30 November 2016. That is, exemptions will not be granted for applications received after 30 November 2016.

This approach does not need to be applied retrospectively to vehicles already certified.

Long term solution

From 1 December 2016 axle and brake manufacturers and retailers must comply with their responsibilities under Clause 10.5 of the Rule.

Note 1

Geometry needs to be the same (s-cam radius, drum radius, location of shoe pivot points, etc).

Page added **24 May 2016** (see **amendment details**)

13 Stock crate certification

It is important that stock crate retention is correctly certified to the appropriate standard. This technical bulletin provides explanations of different types of stock crates (fitted to a vehicle with a GVM of 6000 kg or more) their attachments, how to identify them, and how to identify their certification.

References

- **10-1 Load retention**

Stock crate attachment types

There are three common ways that stock crates are attached to heavy motor vehicles:

- J-hook
- Monocoque
- Deck-mounted.

J-hook

The crate attachment is easy to see as the J-hooks sit on the outside (Figure 13-1-1).

Figure 13-1-1. J-hook stock crate

The stock crate is not a vehicle therefore the actual crate J-hook mountings and J-hooks **cannot be certified with an LT400**. The design can be certified with a design certificate and a plate or label attached to the stock crate.

The design certification for the stock crate anchorage is catered for with an design certificate and the certificate will be held on file by the stock crate manufacturer.

The stock crate identification plate or label needs to have all of the following information:

- Company name

- Serial number
- Date of manufacture
- J-hook capacity load
- J-hook capacity individual
- Number per side.

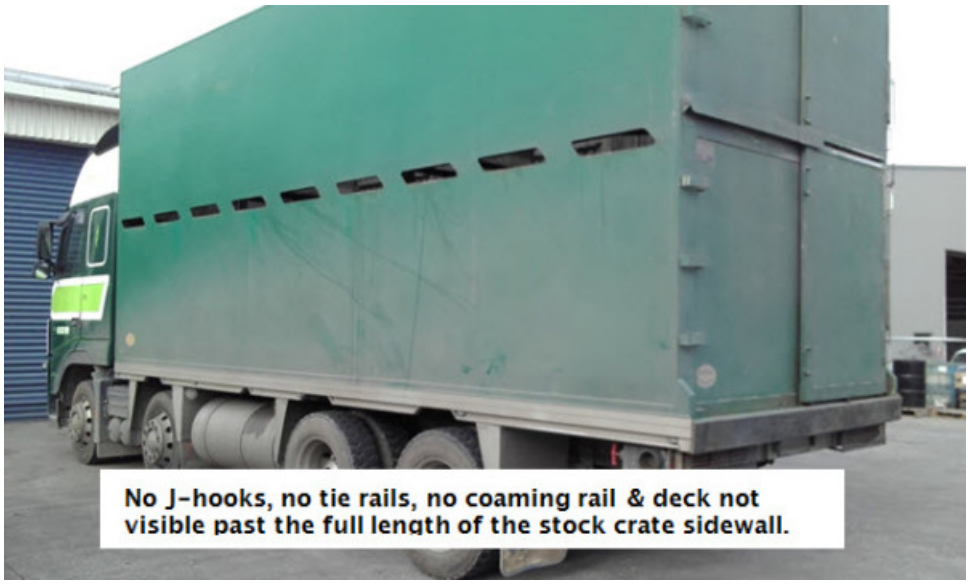
A certificate of fitness inspector can be satisfied in regard to the certification of the stock crate J-hook mountings if a plate or label providing all the information above is attached to the crate and there is a separate load anchorage certification plate fitted to the vehicle to cover the deck mounting points (coaming rail) used to secure the stock crate.

Monocoque

A stock crate and vehicle constructed as one integral assembly, usually without a rigid chassis, with the wheel and axle assemblies , suspension and steer dolly (in the case of a full trailer) attached directly to the crate assembly. The stock crate fits directly to the chassis and there are no coaming rails or tie rails. (Figure 13-1-2).

Figure 13-1-2. Monocoque stock transfer vehicle

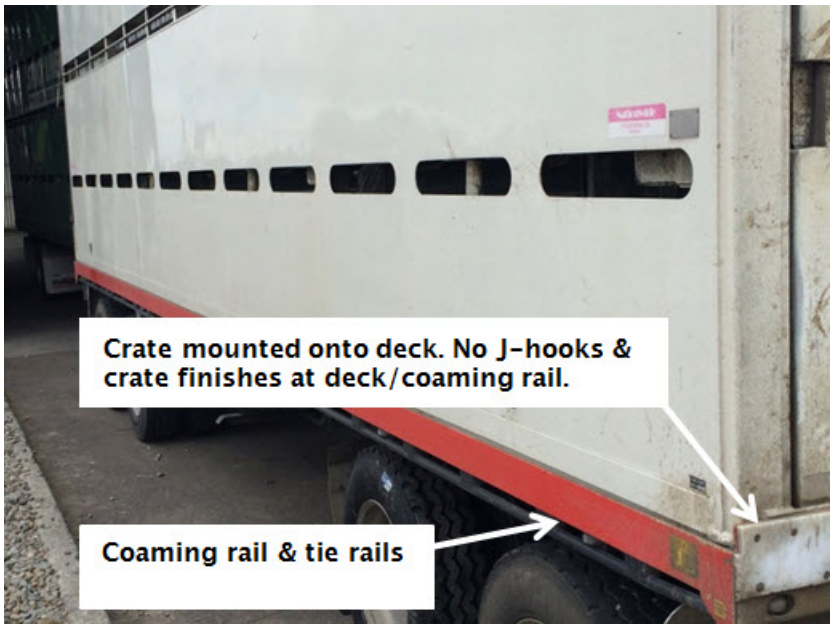
This must be certified to NZS5413.



Deck-mounted

Another common attachment is the deck-mounted stock crate. There are no external attachments and the fitment looks very similar to monocoque except that the crate sits on a deck which is visible with a coaming rail and general fitment of load anchorages and tie rails (Figure 13-1-3).

Figure 13-1-3. Deck-mounted stock crate



Requirements for certification of deck mounted stock crates.

The stock crate is not a vehicle therefore the actual crate bolt mountings and bolts **cannot be certified with an LT400**. The design can be certified with a design certificate and a plate or label attached to the stock crate.

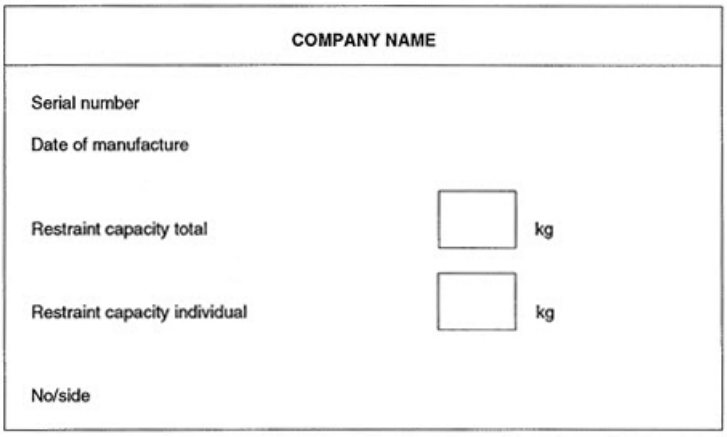
The design certification for the stock crate anchorage is catered for with an engineer's design certificate and the engineers certificate will be held on file by the stock crate manufacturer.

The stock crate identification plate or label needs to have all of the following information:

- Company name
- Serial number
- Date of manufacture
- Restraint capacity load
- Restraint capacity individual
- Number per side

A certificate of fitness inspector can be satisfied in regard to the certification of the stock crate bolted mountings if a plate or label providing all the information above is attached to the crate and there is a separate load anchorage certification plate fitted to the vehicle to cover the deck mounting points used to secure the stock crate.

Sample stock crate plate design



Notes

- Any vehicles inspected after 1/11/2016 that do not meet the requirements but are fit for purpose (inspector has completed a detailed visual inspection and is confident that the anchorage points are in good condition) may be passed for CoF but must have certification completed (in line with this technical bulletin) before next CoF. Notes must be recorded showing the completion of this inspection and actions needed to be taken before next CoF.
- Any vehicles presented for inspection 1 year after 1/11/2016 will not pass for CoF without correct certification.
- All vehicles presented for first time entry compliance must meet these requirements for stock crate/load anchorage immediately.

Page added **14 October 2016** (see **amendment details**).

Page updated 21 May 2019 (see **details**)

14 Lost or illegible identification plates for drawbars, drawbeams and towbars

This technical bulletin replaces memo 25 and memo 51

Standards

- Drawbars and drawbeams fitted heavy vehicles must be certified to NZS 5446:2007
- Towbars fitted to heavy vehicles must be certified to NZS 5467:1993.

Certification to these standards requires that components are identified by means of a prescribed ID plate fitted to the component.

Note: these ID plates are an inspection requirement at CoF and are subject to inspection by appointed NZ Transport Agency Transport Officers and NZ Police.

If an ID plate is damaged or lost, it requires replacement. The operator may request a duplicate of the ID plate and the certifier has two options.

Option one

The original certifier must verify the vehicle identity and the drawbar/drawbeam/towbar specifications with the original certification records. The certifier shall also establish that the component has not been modified or repaired since

original manufacture and certification. When the certifier is satisfied, they then issue a duplicate identification plate with the same expiry date (if required) and ensure that it is attached to the component.

If the HVSC is satisfied that the vehicle identity and the drawbar/drawbeam/towbar can be verified with photographs, it is acceptable to perform this remotely.

Option two

The drawbar/drawbeam/towbar is re-certified by a HVET certifier in accordance with **Re-certification of drawbars & drawbeams of known identity**. Replacement is mandatory when the identity of the component is in doubt or the component has been modified or damaged and repaired with no evidence of subsequent recertification.

Page added **9 April 2018** (see **amendment details**)

15 Documents required for presentation to an IO following HV specialist inspection and certification

This technical bulletin replaces the 31 series of memos.

The tables below set out the minimum requirements for documentation to be presented and retained by CoF and entry inspecting organisations before the first CoF can be issued (following heavy vehicle specialist inspection and certification). Where there is insufficient space on the LT400 to record all the applicable information, the heavy vehicle specialist inspectors or inspecting organisations may issue additional supporting documents.

Certification category	Description	Documentation required by CoF inspecting organisation
HVEC, HMCD	Chassis, suspension, steering	LT400
HVEC, HMCD	PSV roll over strength	LT400
HVEC, HMCD	PSV stability	LT400
HVET, HMTD	Towing connections	LT400
HVEA, HMAD	Load anchorages	LT400
HVEL, HMLD	Log Bolster Attachment Code	LT400
HVEK, HMKD	Brake modifications including the New Zealand Heavy vehicle Brake Specification (Schedule 5)	LT400 and copy of brake data/parameters and calculations as applicable
HVP1	Swept path certification	LT400
HVP2	Performance-based standards	LT400
HVS1, HVS2	Static roll threshold (SRT)	LT400 and SRT compliance certificate

Separate LT400 for each Land Transport Rule section or clause, code or standard

An LT400 can only be used for compliance to one Land Transport Rule, standard, or code. A separate LT400 is required for each Land Transport Rule section or clause, code or standard which is applicable to the vehicle in question. That is, the 'Code/Standard/Rule certified to' box must contain only one section or clause of a Land Transport Rule or refer to only one code or standard.

Examples

- A semi-trailer (first trailer of a B-train) that is fitted with a fifth wheel, king pin/skid plate, load anchorages, and log bolsters requires four separate heavy vehicle specialist certificates as in the table below:

Component	Certification category	Code/standard certified to
Fifth wheel	HVET or HMTD	NZS 5450
King pin	HVET or HMTD	NZS 5451
Load anchorages	HVEA or HMAD	NZS 5444
Log bolsters	HVEL or HMLD	Bolster Attachment Code

- A 4 x 2 truck that has the chassis lengthened, a tag axle fitted, new load anchorages, and a draw beam requires four separate heavy vehicle specialist certificates as in the table below.

Component	Certification category	Code/standard certified to
Chassis or suspension	HVEC or HMCD	Heavy Vehicles Rule (Note 1)
Brakes	HVEK or HMKD	Heavy Vehicle Brakes Rule (Schedule 5)
Load anchorages	HVEA or HMAD	NZS 5444
Drawbeam	HVET or HMTD	NZS 5446

Note 1

Suspension and chassis modifications can only be included on the one LT400 when completed by the same engineer at the same time as part of the same job.

- A bus or coach is manufactured in New Zealand with standards-compliant brakes from the chassis manufacturer, and is fitted with a towbar, passenger seatbelts and a stressed seat with integral seatbelts for the driver then three to five heavy vehicle specialist certifications will be required.

Component	Certification category	Code/standard certified to
Stability or Rollover Strength	HVEC or HMCD	Passenger Service Vehicles Rule (Note 2)
Towbar	HVET or HMTD	NZS5467
Seatbelt anchorages or Seat mounts for seat with integral seatbelt	HVEC or HMCD	Seatbelt and Seatbelt Anchorages Rule (Note 3)

Note 2

Stability and rollover certifications can only be included on the one LT400 when completed by the same engineer at the same time as part of the same job.

Note 3

Seatbelt anchorages or seat mounts for seat with integral seatbelt certifications can only be included on the one LT400 when completed by the same engineer at the same time as part of the same job.

Note 4

Additional certification will be required if the vehicle is fitted with a tow bar, roof rack, a wheelchair hoist, powered ramp or wheelchair/wheelchair occupant restraints.

Page added **9 April 2018** (see **amendment details**)

17 Heavy vehicle power pack upgrades to meet emissions requirements

This technical bulletin replaces memo 59.

A heavy vehicle entering (or re-entering) service may be repowered to meet the requirements of the **Land Transport Rule: Vehicle Exhaust Emissions 2007** by replacing its non-compliant heavy vehicle power pack (Note 1).

Requirements for a repower

- The repower must meet the applicable emissions standard, and
- The repower and its installation must be to the specifications and instructions of the manufacturer of the power pack for the application or be an alternative approved by the vehicle manufacturer, and
- Where final drive or other installation conditions are specified by the manufacturer, they must be met and noted in the final certification, and
- The repower is to be certified by an HVSC with the chassis (HVEC) category, confirming that it meets all the above requirements, and
- Supporting documentation from the power pack or vehicle manufacturer must be available.

Note 1

Power pack means the engine, its radiator/cooling pack, induction and exhaust systems (including layout), and any accessories or emissions control equipment (such as *add blue*) specified by the manufacturer.

Note 2

In-service repowers, whether considered modifications or repairs, are not affected by **Land Transport Rule: Vehicle Exhaust Emissions 2007**.

Note 3

If an engine or power pack is replaced by a unit by the same manufacturer, part number, specification and emission standard then it is considered a repair and not a modification and is not affected by the requirements of the Rule.

Page added **9 April 2018** (see **amendment details**)

18 Rebirthing

This technical bulletin replaces memo 80.

Rebirthing is the practice of issuing a new VIN to an existing vehicle. It often manifests in attempts to give new life to old vehicles or vehicle components. **Rebirthing is illegal and is not approved by the Transport Agency.**

- A VIN remains for the life of a vehicle even if the vehicle goes through a number of iterations. It is essential that the vehicle history is maintained.
- During a vehicle's life, it may have replacement chassis rails, axles, towing connections or even styles of towing connections or number and/or location of axles. These modifications do not create a new vehicle.
- A vehicle cannot be rebirthed with a new VIN. A VIN cannot be altered (including the removal of a VIN).

Recertification after repair/modification

Depending on the level of repair and/or modification, compliance may need new certifications. Required certifications could include brakes, chassis, towing connection and load anchorages, depending on the level of repair/modification and how much of the previous certifications could be carried over.

A full chassis replacement is a significant modification and all certifications would need to be redone. If existing components were reused, any recertification would have to take into account any fatigue life already used. The model (and chassis rating/GVM) must be updated in LANDATA. This is achieved by completing a MR16 form and submitting it to the Transport Agency.

The only situation where a vehicle could be classed as a new vehicle (new VIN) would be if the original vehicle had been scrapped and removed from the register prior to beginning the new vehicle build. In this case a vehicle, to a new design, could be built using components from the previously de-registered and scrapped vehicle. All new certifications to the latest requirements would be necessary although, as previously stated, residual life would have to be considered for any second hand components used.

Deregistering, modifying and reregistering does not meet the test of being a new vehicle. The 'donor' vehicle must be scrapped if components are to be reused in a new vehicle.

Page added **9 April 2018** (see **amendment details**)

19 Tightening or reusing bolt-in tow eyes

This technical bulletin replaces memo 83.

In the case of an incorrectly fitted or maintained bolt-in tow-eye, the large number of stress reversal tension and compression cycles they are subjected to can cause thread pitches to become worn, loosening the coupling shank or nut. This in turn allows the nut to be pulled over the thread on the shank which causes the towing eye to pull out of the drawbar, resulting in the trailer becoming detached.

Failures to bolt-in tow eyes most often occur within days of the tow-eye securing nut being re-tightened.

HVSC requirements

When involved in the repair or recertification of draw bars fitted with bolt-in tow eyes, the HVSC must take the following into account:

- Tightening the nut of a loose bolt-in tow coupling is not acceptable and may increase the potential for earlier catastrophic failure. The complete towing eye and nut must be replaced.
- If there is any sign of it being loose (eg fretting, shiny, rusting, etc) the tow-eye and nut must be replaced – under no circumstances is it to be tightened.
- When the tow-eye and nut is replaced, the nut must be torqued to the manufacturer's recommendation (including a greased thread) and then if necessary taken to the next castellation – in no circumstances backed off.
- Instructions should be given to the operator so that following initial installation; the nut should be re-torqued at the lesser of 5000km or as directed by the manufacturer. If it moves it must be re-torqued (**Note:** this is the only time that re- tightening is permitted).

Inspection requirements

Evidence of looseness of the securing nut, split pin or washer, including wear marks or fretting or evidence that the original nut has been re-tightened are stated as reasons for rejection in this manual and also the **VIRM: In-service certification**.

- See also the Transport Agency's **Safety alert: Bolt-in tow-eye security**

Page added **9 April 2018** (see **amendment details**)

20 Modifications to truck cabs

1. Background

It is common practice to modify the cab of a truck to produce a crawl-through or walk-through between the truck's cab and a custom-made body. Typical examples are motor caravans, truck buses, horse trucks, and other similar special purpose vehicles.

The three critical elements of crashworthiness are the structural integrity of the vehicle (cab), residual space for occupants, and restraint systems. A truck's cab provides fundamental protection to occupants in the event of an accident.

This technical bulletin provides guidance to heavy vehicle specialist certifiers regarding modifications to trucks' cabs to ensure compliance with land transport legislation. It's also expected to serve as a reference for modifiers and importers of modified trucks.

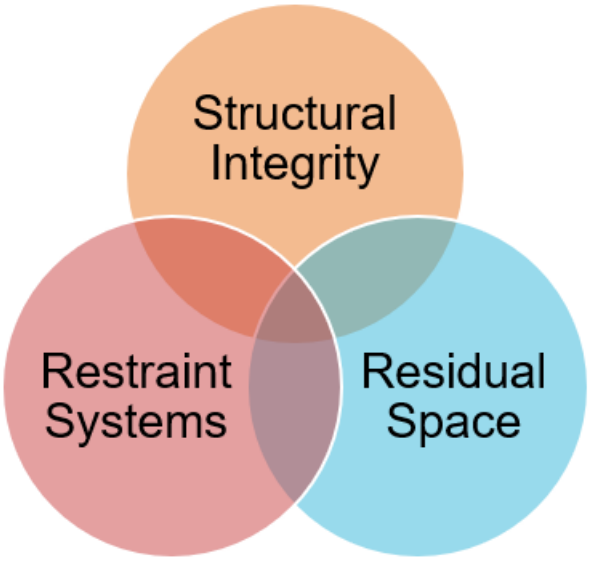


Figure 20-1-1. Three critical elements of crash worthiness

Research and testing have found that even relatively minor modifications to truck cabs can significantly reduce their structural integrity. In the event of a crash, this reduction in structural integrity undermines the survival space for occupants and performance of occupant restraint systems.

In addition to frontal impact protection, modern truck cabs also have inherent structural integrity providing occupant protection from roof loads and side loads (a load applied approximately perpendicular to the longitudinal axis of the vehicle), as to be expected in a truck rollover.

This guidance is primarily aimed at bespoke modifications, not mass-produced variants. Physical testing would result in a damaged cab so is not an option and full engineering analysis of a single modified truck cab can not be done within the financial and time budget restrictions of most conversions.

To that end, common modifications have been reviewed, tested, and recommendations made to produce these general guidelines as a reference for bespoke modifications.

Notwithstanding, the methodology covered here could be applied to series-produced vehicles, where the initial cost of full engineering analysis could be amortised over the series.

2. Legal requirements

The **Land Transport Rule: Vehicle Standards Compliance 2002** requires that a modification to a vehicle must result in that vehicle being safe to be operated, designed and constructed using components and materials that are fit for their purpose, and **within safe tolerance of its state when manufactured** or last certified as a modified vehicle.

Safe tolerance is a defined term and means the tolerance within which the **safe performance** of the vehicle, its structure, systems, components or equipment **is not compromised**, having regard to any manufacturer's operating limits.

The principal that vehicles remain within safe tolerance of their state of manufacture is known as *continued compliance.*

After modification, the demonstration of continued compliance with only one aspect (such as roof loads, for example) does not validate the inherent, as-manufactured performance of the cab under other loads, such as side loads, for example.

In all instances a vehicle modifier should involve a heavy vehicle specialist certifier in a modification project from the beginning of the project. Failure to do so may result in added costs and delays resulting from the certifier's

obligations.

In summary, there are two primary responsibilities of a specialist certifier in respect of cab cut-outs;

1. Inspection of the modifications to ensure they were designed and constructed using components and materials that are fit for their purpose.

   - It is highly recommended that the specialist certifier be provided access to the in-progress vehicle, or other verifiable means of documentation. Otherwise, the trim may be damaged during the course of this mandatory inspection.

1. Demonstration that, after modifications, the safety of the occupants has not been compromised, having regard to the level of safety the occupants had in the as-manufactured, unmodified cab.

Note: manufacturers' body builder's guides commonly feature sections describing where cuts should be made when work is required. While these guides are useful for describing where to (and more importantly, where not to) cut, unless specific guidance for how to reinstate the integrity is described, they must not be considered a replacement for these guidelines. Instead, they should be read in conjunction with these guidelines.

3. Testing overview

To understand how modified cabs performed compared to OEM, the Agency engaged Sandbox Consulting to conduct testing on typical modifications to truck cabs of different GVM ranges. The cabs were tested with the following modifications:

- Modifications to the rear wall only
- Modifications to the rear wall and roof where the structural rings of the cab have been removed

The comparative performance of the cabs demonstrated the relative stiffness of the cabs under loading and the limits at which plastic hinging occurs. After plastic hinging, further loading would continue to deform the cabs, without significant resistance. In the final test of each cab, they were loaded until the cab structure impinged into the approximate residual space of the occupants.

3-1 Modifications to the rear wall only

Figure 20-1-2. Modifications to the rear wall only, Japanese (after testing)

Figure 20-1-3. Modifications to the rear wall only, Japanese (internal, after testing)

3-2 Modifications to the rear wall and roof where the structural rings of the cab have been removed

Figure 20-1-4. Modification to the rear wall and roof, Japanese (during testing)

Figure 20-1-5. Modification to the rear wall and roof, European (during testing)

4. Test results

4-1 Strain energy

The results are reproduced using a load-deflection curve (refer to Hooke's Law). When force is applied to a structure it deforms and stores potential energy. The strain energy is the potential energy stored due to the deflection. Up to the elastic limit, the strain in the structure is also elastic and will be recovered when the load is removed (i.e. the material returns to its original length). However, if the material is loaded beyond the elastic limit, a permanent deformation in the material will take place, this is referred to as plastic strain. The plastic strain of the structure is necessary to achieve energy absorption.

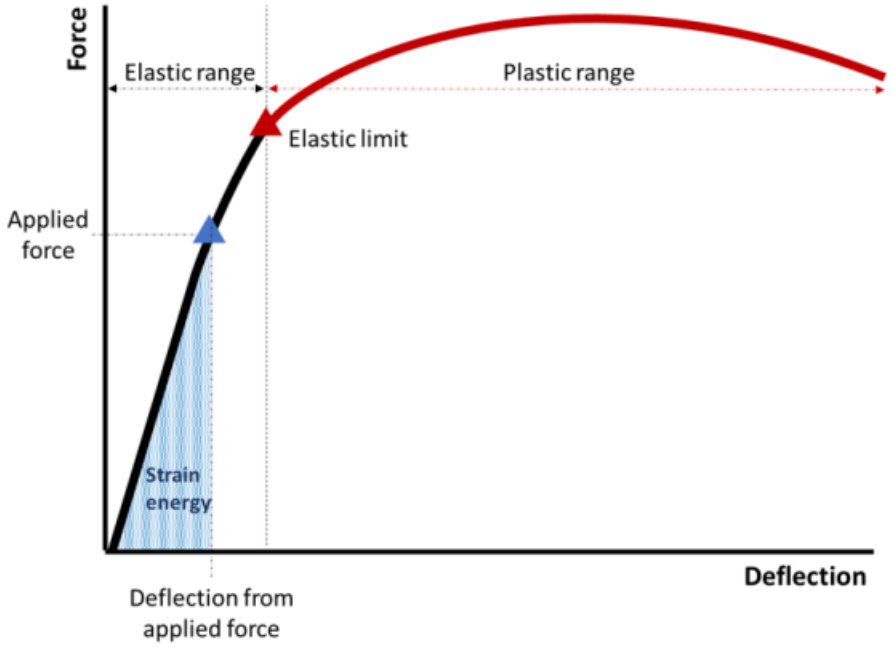


Figure 20-1-6. Load-deflection curve

The area under the curve can be related to the strain energy (work done) and the slope of the curve to the structure's stiffness. The stiffer a structure is, the steeper the force-deflection curve.

4-2 Cab comparison elastic range

Several tests were performed on each cab with the different modifications in the elastic range. The final test loaded the cab structures past the elastic limit and into the plastic range.

The results of all the tests in the elastic range are shown in Figure 20-1-11, including the curve gradients and linear regression values. Linear regression is a statistical method that allows one to summarise and study relationships between two continuous (quantitative) variables. The results show a strong linear (proportional) relationship between force and displacement in the linear elastic range (as expected). The close clustering of data points between tests shows repeatability of the experimental setup. The difference in maximum load capacity between the Japanese and European cabs is primarily due to the size of truck to which they were fitted (i.e. different GVMs).

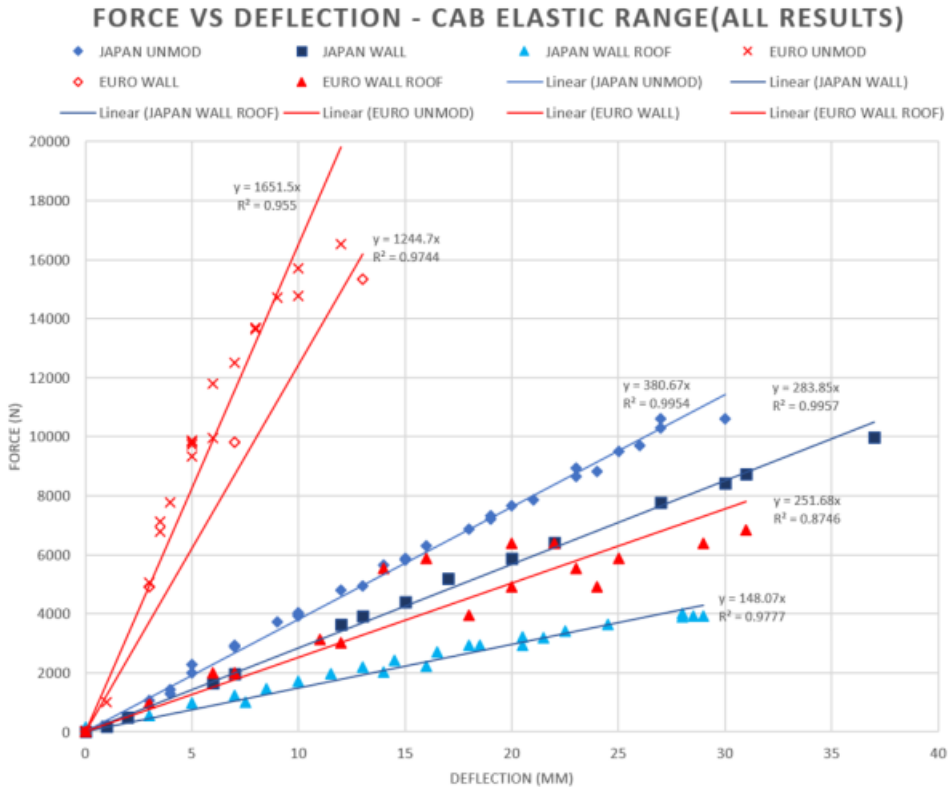


Figure 20-1-7. Force deflection curve elastic range

4-3 Summary of results – elastic range

The results show the cab elastic stiffness is significantly reduced by the modification of the cab structure.

For the Japanese cab, the modification to the rear wall resulted in a stiffness reduction of **26%**, while the combined modification to the rear wall and roof resulted in a **61%** reduction.

For the European cab, the modification to the rear wall resulted in a stiffness reduction of **25%**, while the combined modification to the rear wall and roof resulted in an **85%** reduction.

The large difference between the Japanese cab and European cab after the combined modification to the rear wall and roof is due to the design philosophies used by the manufactures, particularly;

- The style of reinforcement used in the rear wall of the cabs, and
- The height differences between the cab (the European cab was higher), and
- Subfloor reinforcement in the Japanese cab.

Note: the cab test results are not intended to be a statement about the manufacturers or country of origin. The tests were carried out to determine the effect of modification to truck cabs.

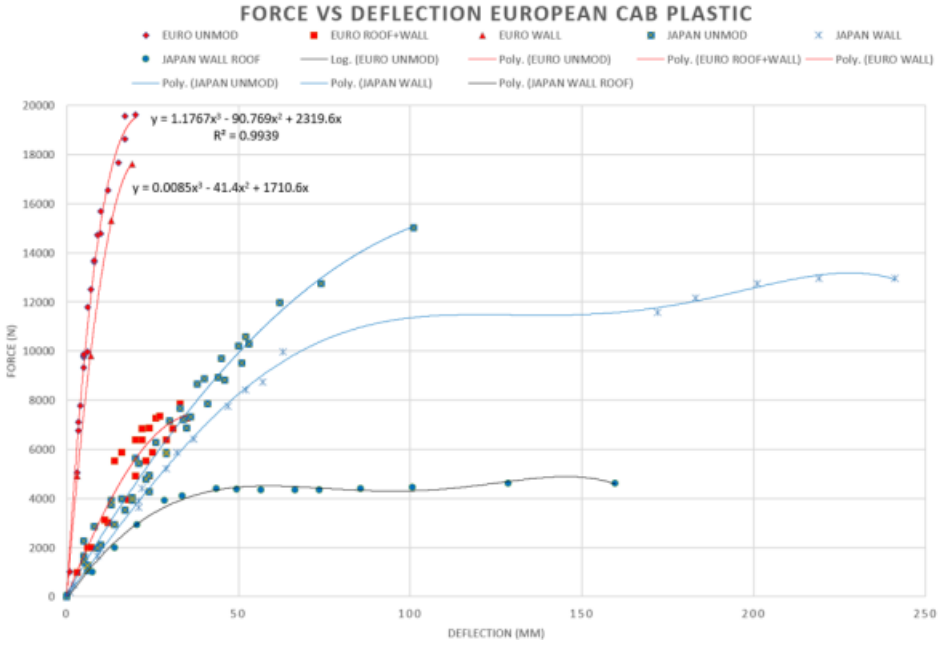


Figure 20-1-8. Force vs deflection Japanese cab - plastic deformation test

4-4 Summary of results - plastic range

In the plastic loading phase of the testing, several more complicated behaviours were observed, these included the failure of welds, tearing of material, and crumpling of the cab side wall (localised buckling).

Due to the limited availability of identical cabs for testing, the unmodified cab was not loaded to the same level as the one modified with the rear wall only or the one with the rear wall and roof modifications. The test was stopped when significant plastic deformation had occurred.

5. Reinforcement types

When considering how to return the level of occupant protection to within safe tolerance of the cab's state of manufacture, there are two main options; integrated reinforcement and an independent protective structure.

5-1 Integrated reinforcement

Integrated reinforcement is where the truck cabin and reinforcing structure are directly connected using permanent fixings, as illustrated below.

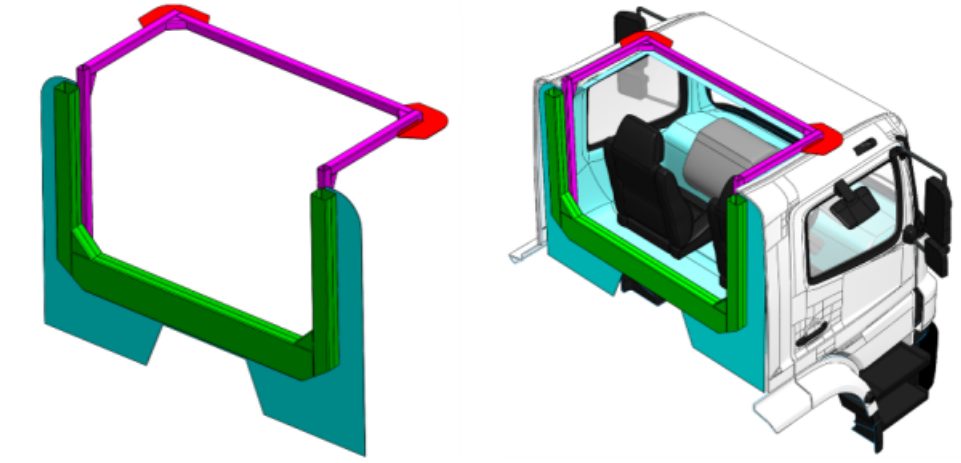


Figure 20-1-9. Example of integrated reinforcement for a rear wall and roof cutout

5-2. Independent protective structure

An independent protective structure is one where the truck's cab is independent of the protective structure (not permanently attached). This configuration is typically found in truck bus conversions where the structural reinforcements in the body necessary for meeting the PSV Rule provide protection for the occupants of the cab.

Figure 20-1-10. Typical New Zealand truck bus

(image courtesy NZ Ski)

In situations where it's appropriate or necessary to make an independent protective structure, it must be shown that:

- The deflection of the body's protective structure provides adequate protection to the truck cab, and
- The structure must be adjacent to the area of modification (rear wall cut out, with protective frame directly behind), and
- The modification only reduces the strength or stiffness of the cab by less than 25% (e.g. modifications such as enlarging the rear window area but not cutting into the main ring frames of the cab structure), and
- The modified cab structure together with the protection provided by the independent protective structure provide protection for occupants of the cab within safe tolerance of the cab alone when new, and
- The body attachment is fit for purpose.

6. Engineering analysis

In all cases, the engineer must ensure the seatbelt anchorages, seat anchorages, safety systems, and frontal impact performance of the cab is not undermined.

6-1 Modification ‘traffic light’

The engineering analysis required depends on the extent of the modifications. The engineering solutions increase dramatically in complexity from left (‘green’) to right (‘red’), below. Only those certifiers with demonstrated expertise in nonlinear finite element analysis should engage in certifications toward the amber and red side.

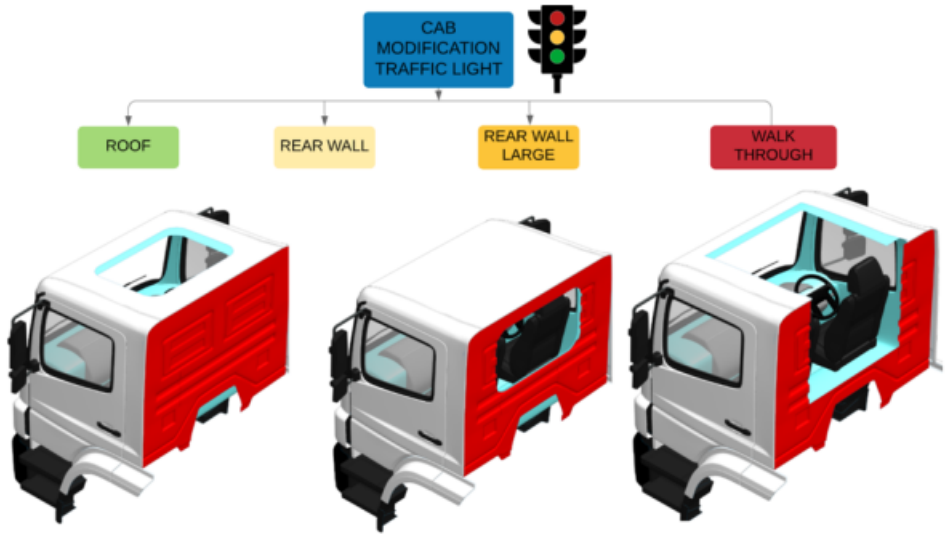


Figure 20-1-11. Cab modification 'traffic light'

Amber and red indicate higher levels of complexity of engineering analysis.

6-2 Cab modification design methodologies

A modern truck cab is designed to absorb and dissipate the ensuing energy of an impact around the body of the cab. Particular attention is required to balance the thickness and stiffness of a reinforcing frame and the parts of the cab to which it is attached. As an energy-absorbing system, overbuilding or over-reinforcing the cab may lead to an unsafe condition.

As noted previously, to demonstrate that a modified cab is returned to within safe tolerance of its original condition, the certifier must show the truck cab performs in a similar way after modification as it did when manufactured to any reasonable load case, including side loads.

6-3 Using UN/ECE Regulation Number 29 (‘R29’) as a benchmark

R29 sets the requirements for occupant safety in the United Nation Economic Commission for Europe (UN/ECE) countries. The standard has become ubiquitous in the truck manufacturing industry both in and outside of Europe. Most truck cabins imported into New Zealand now comply with R29.

To pass R29 a cab may not undergo deformation dangerous to the occupants (penetration into the survival space) when subject to the required test loads. The R29 test uses a pass/fail criterion of survival space large enough for an occupant, so it is the extent of local deformation that is crucial because if any one part of the structure intrudes into this space, the test is failed.

During tests, illustrated below, the components by which the cab is secured to the chassis may be distorted or broken, provided that the cab remains attached to the chassis frame. None of the doors shall open during tests, but the doors shall not be required to open after testing.

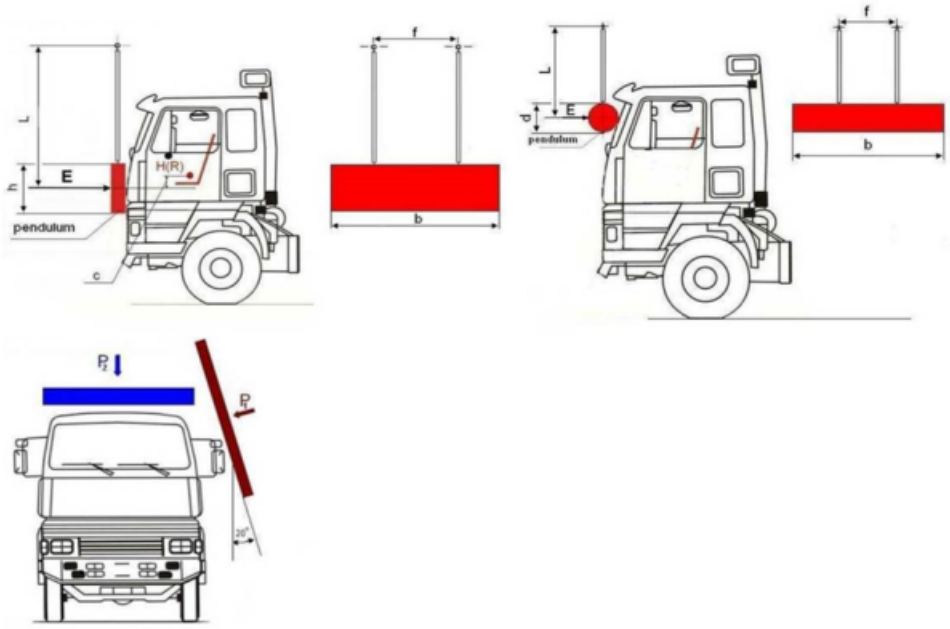


Figure 20-1-12. Impactors from UN/ECE Reg. No. 29 Rev 2.

For industry consistency, either a dynamic load with the R29 impactor, or a quasi-static load using the R29 impactor angles is recommended to use for engineering analysis.

In determining the inherent strength of cabs to side loads, the R29.03 series of amendments are recommended to be used as a benchmark (even if the cab complied with a previous version of the standard which did not include a side-loading test, or another standard).

For the avoidance of doubt, for the comparative analysis, it's not expected that the modified cab will be capable of demonstrating full compliance with the requirements of R29.03. Instead, it's a useful benchmark to compare the relative performance between the unmodified and the modified cab to ensure the modified cab is within safe tolerance of its state of manufacture.

6-4 An iterative approach to solving the problem

Finite element analysis (FEA) should be used to justify the modification to truck cabs. A satisfactory result is reached when it can be shown that the force-deflection curves are within safe tolerance comparing the modified to the unmodified cab. The finite element analysis should be done following best practice and include a mesh sensitivity study. Any geometry simplifications (excluding omission of minor features) of the structure should be noted and justified. The flowchart, below, illustrates an iterative approach that can be employed.

Figure 20-1-13. Process flowchart

There are no appropriate methods available for hand calculation when an **integrated** approach is taken, with the exception of modifications to PSVs which must comply with the PSV rule.

The following recommendations are made for suitable FEA software:

- The computer software and model must be capable of describing the real physical behaviour of the system under load, ie non-linear plastic collapse. Hand calculations won't work.
- The model must be constructed, and assumptions prescribed, in such a way that the calculations give conservative results. The engineer should obtain enough material data to support material assumptions used in calculations or models for the areas where the reinforcement and cab are connected, and which are part of the computer model.
- Shell elements are the most suitable method to represent the structural elements used to construct a cab.
- Only materials of known properties may be used for the construction.
- Non-metallic materials may be used; however, the aggregate strength of the system must be demonstrated using physical testing.
- A mesh sensitivity study should be used to demonstrate convergence. Mesh resolution should be appropriate for areas in large deformation areas and around stress concentrations.
- Connections should be modelled appropriately (e.g. spot-welds, bolts and rivets, etc.).
- Glues may be used but physical testing is required to demonstrate aggregate strength.
- The calculations must include an allowance for deterioration during the expected life of the vehicle where appropriate, having regard to the material of the structure, the specific manufacturing technology, and conditions under which the vehicle is likely to be operated.

7. Welding Standards and Material Data

7-1 Cab body welded connections and material

The material properties for cab panels and their weldability are often difficult to obtain from the manufacturer. Different trucks vary in construction methodology and material choice.

The materials used to construct truck cabs range from mild steel (180 MPa), high strength steel (HSS) to ultra-high-strength steel (UHSS - 1500 MPa). A single cab is often made up of a mixture of different materials.

The use of advanced high-strength steels (AHSS), which are thinner, lighter, stronger and have superior performance absorbing impact energy, is increasing. The use of these materials in truck cabs raises concerns about identification, characteristics, where they are used in the cab and to what extent they can be repaired or modified. If not identified by the manufacturer, it is recommended that a certifier conclusively identifies the material.

7-2 Welding to the cab

Generally, the welding process and material specification of the cab panels falls outside the scope of NZS 1554 and the AS/NZS 2980 and AS/NZS ISO 9606.1 welder qualification.

Due to this, the certifier should use welding processes and consumables specified by the vehicle manufacturer for repair or replacement of body panels where available (panel beaters guide or specifications). In some cases, general provisions are provided; however, care must be taken to ensure these apply to the specific panels affected or part of the welded connection.

Plug weld size and spacing and seam weld length may be referenced to determine the connection of additional reinforcements.

If the material and welding information is not available, the certifier may:

- Obtain material test certificates, from suitability accredited test laboratory, for the parts of the vehicle body used in the welded connections and computer models. The material test should include material properties and information relating to weldability.

The test data from a single cab of the same make and series may be used to support the certification of multiple vehicles. However, the certifier must have records to show the cabs are identical and are common to all models in the same GVM range.

Welding should be performed by welders qualified by a recognised industry qualification used in light vehicle repair such as I-Car.

7-3 Welding of reinforcements

In all cases the certifying engineer must:

- Identify the parent metal, and
- Choose the appropriate standards (**only current versions of the standards may be used)** for design and fabrication, and
- Ensure compliance with those standards of all parties encompassed in the certification, and
- Provide evidence of sufficient strength of the welded component.

The following welding standards may be applicable for the welding/fabrication of the reinforcement structure:

- AS/NZS 1554.1, Structural Steel Welding, Part 1, Welding of Steel Structures (minimum yield strength not exceeding 500 MPa)
- AS/NZS 1554.4, Part 4, Welding of High Strength Quenched and Tempered Steels (minimum yield strength not exceeding 1000 MPa)
- AS/NZS 1554.5, Part 5, Welding of Steel Structures Subject to High Levels of Fatigue (minimum yield strength not exceeding 450 MPa)
- AS/NZS 1554.6, Part 6, Welding of Stainless Steel.
- AS/NZS 1665 Welding of Aluminium Structures
- AS/NZS 1554.7 Structural steel welding of sheet steel structures

7-4 Boron alloyed

The UHSS alloyed with boron is at the higher end of the advanced metals used in truck cab construction.

Parts made from UHSS alloyed with boron should not be straightened or reformed. The steel panels are formed at extremely high temperatures and are prone to work hardening and cracking if damaged or deformed.

Boron UHSS is weldable, and either the GMA (MIG) welding process or squeeze-type resistance spot welding can be used. To maintain the high strength characteristics of the steel, it is important to limit the heat-effected zone.

Information relating to the different issues may be found from industry organisations such as I-Car.

7-5 Material data

The engineer should obtain enough material data to support material assumptions used in calculations or models for the areas where the reinforcement and cab are connected, and which are part of the computer model.

Where the manufacturer specifies a welding process for the area involved in the modification, the material test data may be limited to the tensile test report.

7-6 Alternative materials

Several truck manufacturers use alternative materials for the construction of cab components such as fibre reinforced composites (FCR) or aluminium.

If these components form part of the strength of the cab the engineer must demonstrate any modifications return them to within safe tolerance of their original manufacture, considering the aggregate strength of the materials and connections between components.

7-7 Rivets and bolted connection

The use of rivets and bolts is allowable provided the certifier can show the fasteners have enough bearing area and strength and do not suffer from tear-out. Only structural rated rivets and high tensile bolts should be used. It is recommended that an adhesive system is used in conjunction with bolted and rivet type connections.

7-8 Adhesive joints

The use of adhesives in the connection of reinforcement may be beneficial if not prudent. The use of adhesive in joints provides the following advantages:

- Helps to reduce the stress concentration found in bolded, riveted and welded joints.
- Eliminates sudden changes in stress.
- Shock and impact characteristics of the joint are improved.
- Allows joining of dissimilar materials
- Adhesives can contour and form to complex surfaces.

The engineer, depending on an adhesive joint, must be able to demonstrate:

- A prequalified adhesive system was used, and all requirements in product data sheets were met in the application and use of the product – substrate preparation, adhesive thickness, the temperature and humidity.
- Calculations for the adhesive joints include the expected stress in service and as an occupant protection structure – specifically the orientation, magnitude and frequency of applied loads.
- A test sample is used to validate the connection.
- A suitable factor of safety is used in the design of the adhesive joint considering:
    - Adhesive properties
    - Environmental conditions

- Fatigue
- Appropriate allowance for deterioration during the expected life of the vehicle.

An adhesive system should be used in conjunction with mechanical rivets or spot welding.

8. Additional Considerations

8-1 Steel grain direction

Folded sheet steel subjected to dynamic high-stress loads can tear along folds. Careful attention must be paid to grain or rolling direction when bending high-strength metals, especially when resulting in small inside bend radii. In steel, the ductility in the direction of rolling is almost twice that at right angles to the direction of rolling. When bending high-strength materials, the part should be orientated so that it can be bent against the grain. Bending with the grain may result in cracking or even breaking in the deformation area.

This attention to grain direction should be noted on engineering drawings.

The direction refers to grain fibre following the direction of rolling and parallel to edges of strip or sheets. To bend across the grain is to bend at right angles to the direction of rolling; to bend with the grain is to bend parallel to the direction of rolling.

8-2 Body attachments

In cases where the truck cab to chassis attachments are modified or replaced with rigid attachments, the attachments should be suitable to maintain the cab structure on the vehicle under the specified loads in the design section of this guideline; this is part of the cab’s compliance.

Additional induced loads on the chassis and cab structure due to the rigid mounting must be considered and justified.

8-3 Restraints and airbags

The engineer must demonstrate that the level of modification has not undermined the function of the seatbelts, seatbelt anchorages or airbags.

8-4 Exhaust systems

The certifier must ensure that the vehicle exhaust system gases cannot enter the passenger compartment.

8-5 Corrosion protection

Adequate coating and corrosive protection of the cab after modification must be applied to reduce the likelihood of deterioration of the cab structure.

8-6 Durability considerations

Consideration must be given to the modification’s impact on the durability of the cab and associated components.

Figure 20-1-14. Cracks developing due to insufficient reinforcement after cab modifications

8-7 HV engineer certifiers and HV manufacturer certifiers

Certifying engineers issuing a Statement of Design Compliance (SoDC) for cab/body modification or repairs which affect the occupant protection have total accountability for fulfilling all statutory and legal obligations concerning such activities.

A SoDC is a formal declaration that the certifying engineer has fulfilled all such requirements and is accountable for the integrity of the manufacture, repair or modification.

Refer to **section 11 Local manufacturing** for requirements of HV manufacturing certifiers.

Page added **11 August 2020** (see **amendment details**)