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**Extract taken from:** Heavy vehicle specialist certification > Technical bulletins > Heavy vehicle chassis ratings: modification thresholds to allow a heavy vehicle's GVM to be altered (and its chassis rating to be changed)

## 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](mailto: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 ICRA 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](mailto: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](mailto: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).

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