

INFORMATION SHEET

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LOW
VOLUME
VEHICLE
TECHNICAL
ASSOCIATION Inc



Seatbelt Anchorage Retro-fitment LVV Certification interim documentation

Recent problems relating to seatbelt anchorage certification have highlighted some confusion relating to the different inspection documentation for certifying seatbelt anchorages, and that some points within this documentation need clarification. This Information Sheet is intended to provide some clarification on the subject of documentation and some basic principle rules for certification of retrofitted seatbelt anchorages.

Seatbelt Anchorage documents

There are two distinctly different documents used for the certification of seatbelt anchorage retrofits, and they both apply to specific situations.

- NZHRA Code of Construction

In the case of a scratch-built vehicle, or a vehicle which has had custom anchorages installed in accordance with one of the formulas or systems provided for in section 8.15 of the NZHRA Code (which was developed for specific applications such as roll-bars, lugs or bosses off chassis members etc), the Code of Construction Manual is the appropriate document to use from which to make your certification judgements.

- Specification St 120395

In the case of a modern unitary construction production vehicle that has had seatbelt anchorages installed (typically the vast majority of LVV certifications that are being carried out specifically for seat and seatbelt anchorage retrofits), the ST120395 specification is the appropriate document.

The St120395 specification applies to all vehicles including those manufactured after January 1 1991. Don't be caught out by the Land Transport New Zealand InfoSheet 1.34 (Revised) which states that the St120395 specification can only be applied to pre-January 1st, 1991 vehicles. It must be remembered that InfoSheet 1.34 (written in 1997) was aimed at those people who certified this type of modification prior to the seatbelt anchorage certification role falling within the Low Volume Vehicle Code, so this InfoSheet is now effectively redundant. Under the jurisdiction of the Low Volume Vehicle Code, the Low Volume Vehicle Technical Association can specify any source documents for use in the low volume vehicle inspection and certification process.

The two documents can not be mixed and matched to provide the solution the owner wants to achieve. It must be clear to everyone that each document is to be applied to the type of vehicle for which it was intended. Therefore the St120395 specification is the correct inspection reference document for all modern car and van seatbelt anchorage retrofits.

Requirements of St120395

To follow are some basic and important requirements of the St120395 specification, which need some explanation.

Static lap and diagonals only:

This document was designed for, and allows except where special circumstances exist, static belts only. We acknowledge that retractor systems are vastly superior, however they place a significantly higher load on the upper seatbelt anchorage than a static, and the engineering analysis that went into developing St120395 only provided for static belts. With the addition of a retractor, while the forward loading on an upper anchorage remains about the same as a static belt, the vertical loading on the upper anchorage is more than doubled over a static.

There are only four situations where a retractor system can be retrofitted under St120395:

- When the anchorage is one that is provided by the original vehicle manufacturer. In this case, there must also be provision, incorporated by the original vehicle manufacturer, for a retractor unit to be mounted on the floor or sidewall beneath the upper anchorage.
- When a type test plan exists which shows that a vehicle has been tested and certified by an approved organisation, and the vehicle presented for certification is another derivative of the same make and model, and the positioning and anchorages are identical, and the surrounding area is of exactly the same dimensions and specification, including localised reinforcement. We understand that the only vehicles that have been tested and certified with retractor systems are the 2WD and 4WD Toyota Hiace Super Custom coach, and the Toyota Townace facelift model.

Note that this would only be an LVV situation where there are changes to the tested seating configuration, but the anchorage locations are still appropriate. If the vehicle is exactly as type-tested, it is not a LVV, and would be complied under the St31391 specification which is administered under the Imported Motor Vehicle Dealers Association LTNZ-approved system.

- The only other way that this requirement for static belts can be departed from, is if the installer in question can demonstrate the safety of a retro-fitted retractor system to you, and the only way to do that is through the use of engineer's calculations (to be provided by the owner or installer) to establish that the cant rail can withstand a load of around 2300 kg, depending on variables such as angle of pull. The structural complexities of cant rails makes the calculation process quite complicated and time consuming.
- Other structural areas of a vehicle such as vertical B, C, and D pillars, floors and sidewalls, may be fitted with retractor systems, provided that the doubler plate, fastening, and reinforcement details specified within St120395 are followed.

Window bars:

The St document clearly specifies that when the permitted area for the upper seatbelt anchorage falls within a glazed area, there is only one method of installing the upper anchorage. This is through the use of a window bar that spans across the cant rail and the waist rail, which has been tested and certified by an approved organisation. At this time, the only known bars that meet this requirement are those supplied by the Imported Motor Vehicle Dealers' Association.

There are two reasons for this:

- the cant rails are almost always outside (above) the permitted area of between 560 mm and 700 mm above the top of the seat base cushion that is prescribed by the St120395 specification. This permitted area ensures that the seatbelts are positioned for comfortable operation across your shoulder, whereas positioned in the cant rail the measurement in many cases is between 800 mm and 900 mm. The effect of this is to position the belt across the occupant's neck (obviously dependent on the height of the occupant). A window bar ensures that the upper anchorage is correctly positioned inside the permitted area
- the other reason is that, as explained earlier on in this information sheet, cant rail strength may not be adequate to withstand the loads imposed by a seatbelt anchorage in a crash. The window bar divides the load between the cant rail at the top of the window, and the waist rail below the window. LVVTA is presently carrying out a study aimed at allowing cant rail mountings to be installed in a wider range of van outer seating positions.

Where no window bars are able to be purchased through the IMVDA for the make and model of vehicle in question, if the required measurements are provided to IMVDA, they can supply a kit that will do the job. These should be sourced through an IMVDA seatbelt installer.

Note that these window bars are designed to be used only in conjunction with static seatbelts. Retractor systems may not be used with window bars, except where they are installed by vehicle manufacturers as original equipment.

Doubling anchorages

Where a rearward facing seat is installed directly to the rear of the front row of seats, doubling the new upper seatbelt anchorages onto the existing seatbelt anchorages is not permitted. This is a debatable issue and has been allowed in the past, but for any seatbelt anchorage certifications commenced after the date of this information sheet, separate anchorages must be installed for any additional seatbelts.

Other requirements

The St120395 specification sets out many other requirements to ensure correct installations of seatbelt anchorages. This document should be thoroughly read to ensure that you are fully familiar with such issues as correct doubler plate specification, positioning and attachment, localised reinforcement of surrounding structures, and lots of other minor details.

If you do not have a copy of the St120395 specification, you may obtain one by contacting me by fax on (09) 268 9552.

Documentation required

For the purpose of having your certification documentation accepted by the auditors of the low volume vehicle system, MotorSafe, you will need to make sure that you meet the following requirements. This will ensure smooth processing of your documentation, and issue of a compliance plate.

- Have a copy of both the NZHRA Code of Construction Manual (in particular section 8.15 of the NZHRA Code), and the St120395 Specification; and
- understand both of the above documents, and apply the correct document for the type of certification being carried out; and

- provide a basic drawing within your documentation to show where the anchorages (particularly the upper anchorages) are positioned, and specify the details of the system being used (static or retractor, window bars or droppers, etc); and
- refer to the document used in the appropriate place within the FS001 Statement of Compliance Form ("certified to St120395"), or whatever the case may be.

New LVVTA Low Volume Vehicle Seatbelt Anchorage Standard

At present work is well under way on a new LVV Standard for Seatbelt anchorages, which will replace the St120395 specification. This new standard is designed to cover a wider range of installations in a user-friendly manner. In it, we hope to enable the use of retractor systems through the use of cant rail reinforcement designs, and we are hopeful of having this to you in the next couple of months.

If you have any queries or require any further clarification relating to this Information Sheet, please feel to contact me at the LVVTA office on (09) 268-9550.

Tony Johnson
Technical Officer