

## Installation of aftermarket seat belts in MD category (small) buses

### Background

Increased demand for improved occupant protection in buses and coaches has led to many buses and coaches not originally fitted with seat belts being retro-fitted with seat belts.

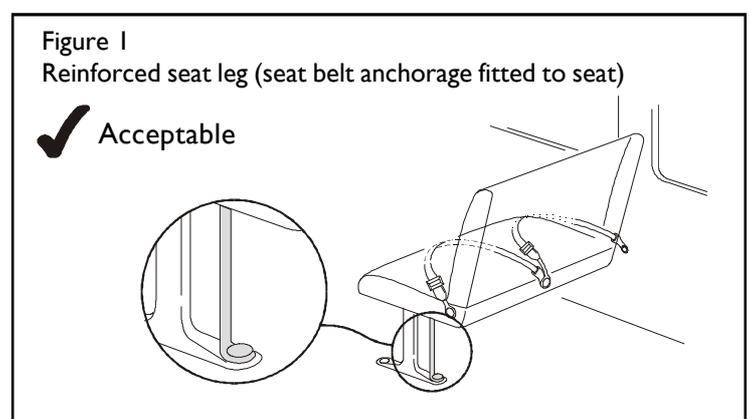
Retro-fitted seat belts are required to be installed in accordance with one of the standards listed below, and to be certified by a recognised engineering signatory:

- Voluntary Modification of Existing Buses & Coaches-Guidelines to Improve Occupant Protection.
- NSW Code Of Practice for Light Vehicle Modifications (for vehicles up to 4.5 tonne GVM).
- Vehicle Standards Bulletin No.6 (VSB6) - National Code of Practice - Heavy Vehicle Modifications (for vehicles over 4.5 tonne GVM).
- Australian Design Rules (ADRs).
- Vehicle Standards Bulletins No's 5A & 5B (VSB5A, VSB5B).

### 1. Acceptable seat belt installations

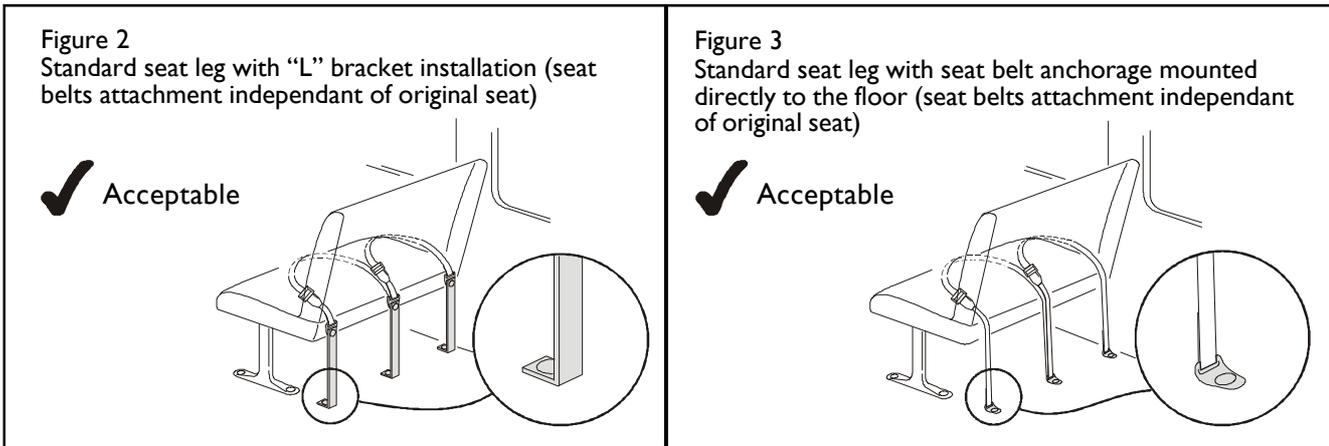
#### 1.1 Installations which have modified the seat, seat leg or wall anchorage by providing additional reinforcement.

These installations are generally considered acceptable, however, an engineer's certificate must certify the fitment of the seat belts. Figure 1 illustrates an acceptable installation of seat belts that are directly attached to the seat, where the seat leg has been reinforced.



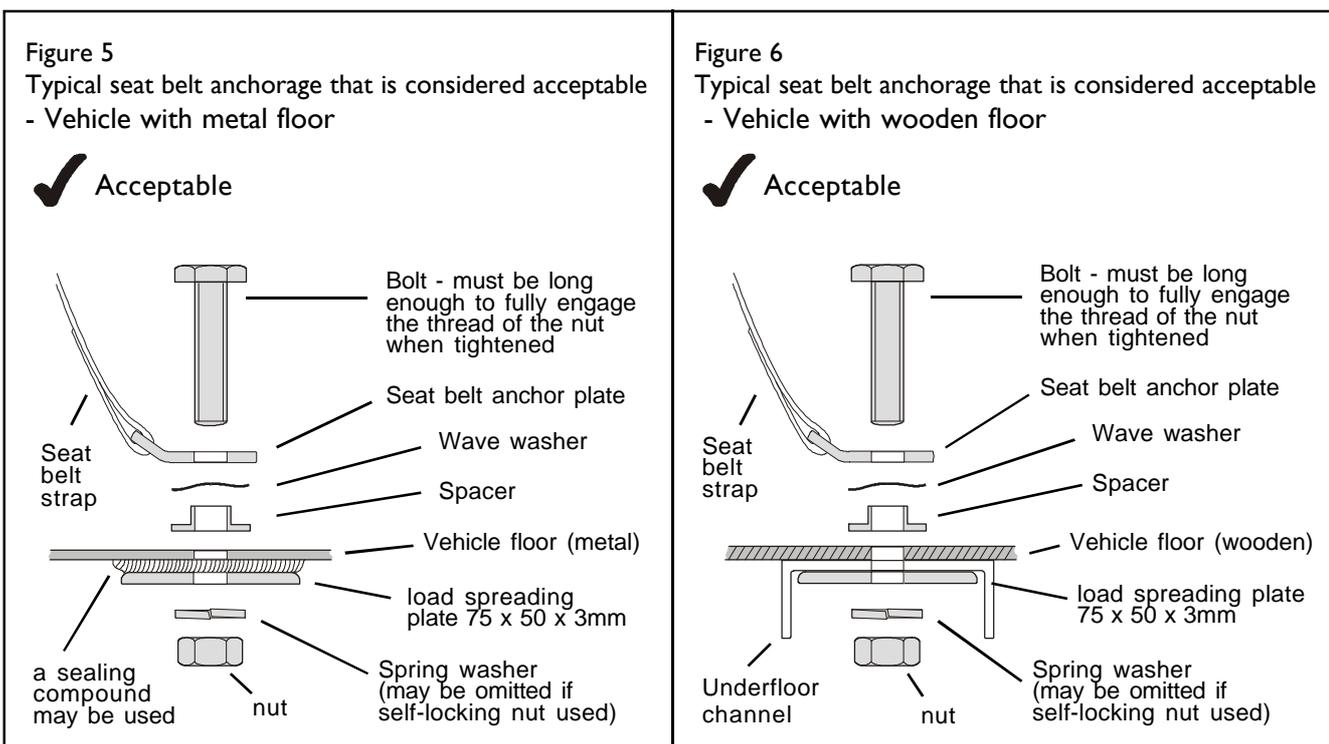
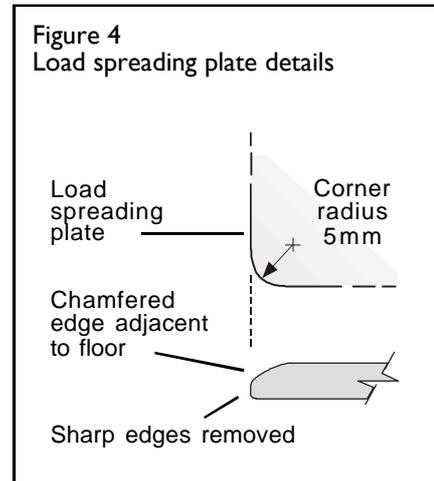
## 1.2 “L” shaped brackets, & floor mountings

The following seat belt modifications which are not directly fitted to the seat are generally considered acceptable. These consist of an “L” bracket (figure 2) or an anchorage mounted directly to the floor (figure 3), and must incorporate a load spreading plate at each location (figure 4). An engineer’s certificate must be provided to certify the correct fitting of these types of seat belt installations.



## 1.3 Load spreading plates

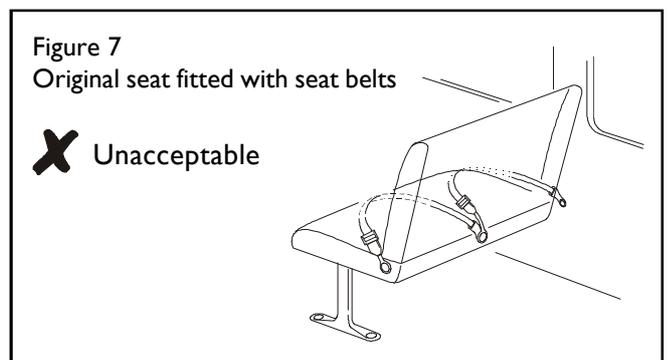
Load spreading plates fitted under the floor of a vehicle to reinforce seat belt installations must be positioned so that the bolt passes centrally through the plate. This is to ensure the plate is loaded evenly. The dimensions of each load spreading plate must allow sufficient surface contact, normally of minimum area 3750mm<sup>2</sup> (75mm x 50mm), however smaller spreading plates may be acceptable if specifically tested and certified. The thickness of the load spreading plates should be no less than 3mm with a minimum corner radii of 5mm. The edges adjacent to the floor should be chamfered, and other sharp edges should be removed (figure 4). Vehicles which have a wooden floor require a load spreading plate to be located inside the underfloor channel. The underfloor channel must be securely welded to at each end to the crossmember. Acceptable seat belt anchorages are illustrated in figures 5 & 6 below.



## 2. Unacceptable seat belt installations

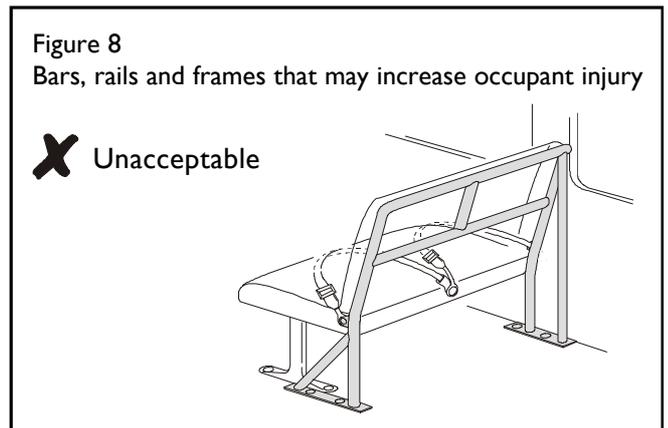
### 2.1 Seat belts fitted directly to original seats

Installation of seat belts fitted directly to the original seats without modification to the seat, seat anchorages or the seat leg are considered insufficient to withstand the loads transmitted through the seat if the vehicle is involved in an accident. Figure 7 illustrates original seats fitted with seat belts.



### 2.2 Installations where fitting may increase likelihood of occupant injury

Occupant injury may occur when vehicles involved in accidents or severe braking conditions cause passengers to be propelled forward and make contact with unyielding surfaces (figure 8). Therefore, in addition to the certification of seat belts to the standards previously described, the installation of bars, rails and frames must be padded in accordance with RTA Technical Specification 148 (which requires a high density padding between 200-300 kg/m<sup>3</sup> with a minimum thickness of 25mm).



## Action

When inspecting this type of vehicle pay particular attention to the items listed under "Reasons for rejection" below. If any unacceptable item is found the owner is to be advised and the vehicle is to be issued with a defect notice instructing the owner to have the unacceptable item/s rectified.

Additionally, details of any vehicle defected for any of these items (including a copy of the defect notice) are to be forwarded to:

Manager, Heavy Vehicle Safety & Standards, Roads & Traffic Authority  
Level 7, 260 Elizabeth Street, Surry Hills, NSW 2010

## Reasons for rejection

1. Seat belt/s anchored directly to a timber floor where the anchorage is not located inside the underfloor channel (figure 6).
2. Seat belt/s fitted directly to the original seats without any modification to the seat, seat anchorages or the seat leg (figure 7).
3. Structures fitted to the vehicle (such as rails and frames without padding) that are likely to increase the risk of occupant injury (figure 8).
4. Load spreading plates fitted and certified prior to August 2002 (date of first issue of this publication) with a surface area less than 1250mm<sup>2</sup> (ie. 50 × 25mm).
5. Load spreading plates fitted and certified after August 2002 (date of first issue of this publication) with a surface area less than 3750mm<sup>2</sup> (ie. 75 × 50mm or similar).
6. Load spreading plate/s have a thickness less than 3mm.
7. Bus presented with retro fitted seat belts without an engineer's certificate.

Note:

1. A seat belt fitted to a standard/original seat is not permitted to be approved by fitment of a VSB5A label.
2. To help determine the mandatory seat belt requirements that the vehicle would have originally been fitted with, and which vehicles have been retro-fitted with seat belts, refer to the seat belt installation reference table on page 4.

# Enforcement

Defect	RTA Inspectors, including HVIS	AIS, HVAIS & AUVIS (Authorised Examiners)
Seat belt installation does not meet the required standard	Defect Notice (up to 28 days to clear)	Issue a rejection certificate (white slip) in the normal manner
Structures fitted (frames & rails) present a safety risk	Defect Notice (up to 28 days to clear)	Issue a rejection certificate (white slip) in the normal manner

## Seat belt installation reference tables

Table 1: Third Edition Design Rules vehicle categories

Date of manufacture	Vehicle category	Number of seating positions	Seating position/s requiring seat belts
From 1 July 1988	MD1	Up to 12	All seating positions
From 1 July 1988	MD2	Over 12	Front row of seats (including driver's seat)
From 1 July 1988	MD3, MD4	—	Driver's seating position
From 1 July 1992	MD2	—	Front seating positions (driver's, outboard passenger & centre) & non-protected seats
	MD3, MD4	—	Driver's & front outboard seating positions, & any non-protected seats
From 1 July 1995	MD3, MD4	17 or more	All seating positions, except: <ul style="list-style-type: none"> <li>• a route service bus*, or</li> <li>• a bus where all passenger seats have a 'reference height' of less than 1.0m**</li> </ul>
		Less than 17	Driver's & front outboard seating position & any non-protected seats
From 1 Jan 2000	MD2	Over 12	All seating positions

\* Seatbelts must be fitted to driver's seating position and to front outboard position.

\*\* Seatbelts must be fitted to driver's seating position, front outboard position, and any non-protected seats.

Buses subject to Third Edition ADRs (i.e. those manufactured since 1<sup>st</sup> July 1988) are grouped into five ADR categories; they are:

- MD1 – Light Omnibus up to 3.5 tonnes 'GVM' and up to 12 seats.
- MD2 – Light Omnibus up to 3.5 tonnes 'GVM' and over 12 seats.
- MD3 – Light Omnibus over 3.5 tonnes and up to 4.5 tonnes 'GVM'.
- MD4 – Light Omnibus over 4.5 tonnes and up to 5 tonnes 'GVM'.

Table 2: Second Edition Design Rules (applicable to buses & coaches manufactured prior to March 1988)

Date of manufacture	GVM (tonnes)	Number of seating positions	Seat belt requirements
Prior to 1 July 1983	N/A	—	Nil
From 1 July 1983	up to 3.5t	—	Front row of seats (including drivers seat)
From 1 Jan 1987	up to 3.5t	up to 12	Front and second row of seats
From 1 Jan 1988	up to 3.5t	up to 12	All seating positions



### Further information:



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Email: tech-enq@rta.nsw.gov.au



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Roads and Traffic Authority