

Safety belts on buses –

Proposals to verify the
standard of fitment and to
introduce new requirements in
relation to the organised
transport of children

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Safety Belts on Buses –A Consultation Document

The Road Safety Authority (RSA) is undertaking a review of the regulation, classification and safety issues associated with the fitting and wearing of safety belts on mini-buses, buses and coaches [buses] carrying children.

We are now consulting individuals, companies, organisations and associations who are interested in the proposals for verifying the standard of fitment of safety belts and introducing a new requirement to have safety belts on all buses carrying children on organised trips.

Before we make recommendations to the Minister for Transport we are seeking your views and comments on the proposals.

This gives you an opportunity to input into the policy relating to safety belts on buses carrying children.

1. SUMMARY

In recent years the Government has taken a number of actions to enhance the safety of buses carrying children. An initial step in this process was the requirement, in January 2007, that all buses used in the School Transport Scheme be fitted with safety belts to a minimum standard.

In June 2006, the Minister for Transport approved certification criteria for assuring the standard of safety belt installations in all buses. This was to be implemented through the compulsory roadworthiness testing scheme for commercial vehicles from September 2008.

This policy required that, as part of their annual roadworthiness inspection, all buses fitted with safety belts would have certificates to show that they would be [or were] able to meet type-approval standards¹.

During 2007, the RSA worked to raise awareness of the new certification requirements. In the course of the RSA's contact with various stakeholders, it became clear that there were a number of significant issues which hindered progress towards the implementation of the certification requirements by September 2008. These issues included cost factors for both commercial and voluntary sector operators and also concerns about the ability of older buses to meet such type-approval standards.

It was decided to review the proposed minimum standard for a retrofitted safety belt installation and also the certification requirements for such installations.

Following completion of that review, it is now proposed that:

1. From 29th October 2010, a verification exercise would be carried out at the buses annual roadworthiness inspection. This verification exercise would require certification of the safety belt installation for any bus fitted with safety belts. Acceptable certification of the safety belt installation would include one of any of the following :
 - type-approval certification / certificate of conformity;
 - certification from the manufacturer confirming that the safety belts and their fitment meet either EC type-approval standards or UK national standards;

¹ See section 2 for an explanation of type-approval standards.

- certification from a competent person that the safety belts and their fitment have been inspected and been passed for the school transport scheme (equivalent to UK visual inspection standard); or
 - certification from the vehicle manufacturer or competent person [or company], confirming the safety belt installation, at a minimum, conforms with certain provisions of Road Traffic (Construction, Equipment and Use of Vehicles) Regulations 1963 (as amended) (the “CE&U Regulations”).
2. From October 2011 approved or certified safety belt installations become a mandatory requirement on all buses used for the organised transport of children.

It is the legal responsibility of the owner and driver of a bus to ensure that, when it is used in a public place, it is in such a condition that danger will not be caused to any person². In cases where safety belts have been fitted to a bus then it is incumbent on the driver/operator of the vehicle to ensure the safety belts and their fitment satisfies an acceptable standard. The verification exercise proposed by the RSA in this document, should provide more certainty on the standard of fitment of safety belts and should assist bus owners and drivers in ensuring that they fulfil their legal obligations in this regard.

² S.I. No. 190 of 1963

2. PROPOSED VERIFICATION OF THE STANDARD OF FITMENT OF SAFETY BELTS

2.1. Safety Belts – the law

It is a key basic road safety requirement that all vehicles on our roads, and all components of those vehicles, conform to a minimum standard of construction.

Whole Vehicle Type Approval (“WVTA”) is the predominant measure used throughout the EU to ensure new vehicles are safe and environmentally acceptable. Type Approval is the assessment of a vehicle, or the component of a vehicle, against a detailed minimum technical standard. If a vehicle, or a component, when tested meets the requirements of the technical standard then it can be type-approved.

WVTA will apply to new buses built in one stage from 29th October 2010 and will be extended to those built in multiple stages [thus applying to all new buses] from 29th October 2011. From those dates, safety belts and their installation will have to obtain type-approval (either EC or national) in order to be registered in Ireland.

Currently in Ireland buses built in volumes greater than 500 must meet the specific requirements set out in European Communities (Mechanically Propelled Vehicle Entry into Service) Regulations 2003 (as amended) (the “Entry into Service Regulations”). The Entry into Service Regulations require buses produced in volumes greater than 500 to meet the EC type approval requirements in respect of safety belts, and their fitment, in order to be registered for use on Irish roads.

For buses outside the scope of Entry into Service requirements and for determining the standards of all vehicles during their in-service life, the CE&U Regulations set out the requirements to which a bus must adhere. The requirements of the CE&U Regulations are more general in nature than the EC requirements. Each vehicle owner must ensure that his or her vehicle complies with the entirety of the CE&U Regulations. Provisions of the CE&U Regulations which apply to buses include:

- every large public service vehicle (including all bodywork, upholstery and fittings) must be properly constructed of suitable material and be of such a design that it is capable of withstanding the loads and stresses likely to be met with in operation [**and be otherwise suitable for the carriage of passengers**] [Regulation 67(1) S.I 190 of 1963];

- every vehicle and trailer, and all parts and equipment of every vehicle and trailer must be maintained in good and efficient working order and be so maintained that no danger is liable to be caused [Regulation 34(1) S.I. 190 of 1963];
- every vehicle while used in a public place shall be such, and so maintained and used, that no danger is likely to be caused to any person. [Regulation 96(1) S.I. 190 of 1963]
- the body of every vehicle must be secure and the floor be strong and in good condition [Regulation 34(2)(h) S.I. 190 of 1963].

The RSA will consider making proposals to the Minister for Transport to strengthen these requirements based on the outcome of this consultation process.

The European Communities (Compulsory Use of Safety Belts and Child Restraint Systems in Motor Vehicles) Regulations 2006 (the “2006 EC Regulations”)³ also set out the requirements for when safety belts must be worn.

2.2 Safety belt fitment on current bus fleet

There are around 10,500 buses on the road in Ireland. It is understood that up to 2,800 of these are owned by Bus Éireann and Dublin Bus. The Dublin Bus fleet and a significant number of Bus Éireann buses are engaged in stage-stop urban services and do not have safety belts. All of the school buses owned by Bus Éireann have safety belts fitted and certified to the type-approval (pull test) standard⁴.

Therefore approximately 7,700 buses in the national fleet are privately owned. Based on surveys conducted by the RSA in 2008, it is estimated that 7,550 or 98% of these buses are fitted with safety belts. It is also estimated that at least 80% of these buses have certification that the safety belts installation meets either:

- EC type approval or UK national standards in the case of buses fitted with safety belts at the time of manufacture; or

³ S.I. No 240 of 2006

⁴ Annex I, (5), European Communities Directive 76/115/EEC (as amended)

- UK visual inspection standard in the case of private sector buses which have been or are in the school transport scheme.

It appears, therefore, that up to 20% of buses with safety belts should, but may not, have certification for their safety belts. It is possible that certification for these vehicles could be obtained from the vehicle manufacturer or, in the case of a retrofit vehicle, from the company which carried out the fitting.

2.3 Verification of Certification at Roadworthiness Inspection

Since 2001, the roadworthiness inspection requires certification to be provided in respect of safety-critical modifications. Retrofitting a bus with safety belts is a safety-critical modification. Therefore, certification should be presented at the roadworthiness inspection of a bus retrofitted with safety belts in order to verify that the fitting of safety belts meets acceptable standards.

The RSA is proposing that a formal verification exercise take place as part of the roadworthiness inspection. At the roadworthiness inspection all buses fitted with safety belts would be required to present certification in respect of the safety belt installation. It is proposed that the verification exercise would commence from 29th October 2010. This should allow sufficient time for those bus owners who need to obtain the certification to do so. Acceptable certification would be:

- I. type approval certificate/certificate of conformity;
- II. certification from the manufacturer confirming that the safety belts and their fitment meet either EC type-approval standards or UK national standards;
- III. certification from a competent person that the safety belts and their fitment have been inspected and been passed for the school transport scheme (equivalent to UK visual inspection standard); or
- IV. certification from a competent person confirming that the safety belt installation conforms with the standards set out in the CE&U Regulations.

Once the authorised tester is satisfied that the certification confirms the safety belts on the vehicle are of the required fitment standard, the bus will have satisfied the roadworthiness test in this regard. In cases where certification is either not presented or is inadequate the bus will fail the roadworthiness test.

It is worth noting that recent changes made to the periodic roadworthiness inspection for heavy commercial vehicles requires each safety belt on a bus to be individually checked. This requirement previously applied only to buses under 3.5 tonnes [DGVW].

3. ACCEPTABLE CERTIFICATION

As set out in 2.3 above, it is proposed that four categories or types of certification would be acceptable to demonstrate the required standard of fitment of safety belts. These are discussed in more detail below.

3.1 Type Approval Certificate / Certificate of Conformity

Buses fitted with safety belts from new may have certification to show they meet the requirements of the relevant EC type-approval directives.

If a bus has EC type-approval, the manufacturer will have provided or be able to provide official certification from a type-approval authority that the safety belts were installed to the requirements of Directives 2005/39/EC on seats, their anchorages and head restraints, 2005/40/EC on safety belts and restraint systems and 2005/41/EC on safety belt anchorages.

Bus owners who bought their vehicles with safety belts fitted from new and who do not already have appropriate certification should contact the homologation department of their vehicle manufacturer or body builder which maintains details of all vehicles manufactured. If the safety belt installations have type-approval then these departments should be able to provide written confirmation of this. This confirmation should include the Vehicle Identification Number (VIN) and / or Body Number of the vehicle and the type-approval reference number.

3.2 Certificate from the manufacturer of compliance with EC Type Approval or UK National standards

Buses which do not have full EC type-approval but were fitted with safety belts at the time of manufacture may have confirmation that the safety belt installation complies with the EC type-approval standard. As buses imported from the UK may be approved to the UK national standard rather than the EC standard, it is proposed that approval to the UK national standard would also be acceptable.

Such certification should confirm the standard to which the safety belts were fitted, the Vehicle Identification Number (VIN) and / or Body Number of the vehicle. As set out in 3.1 above, owners of buses which do not have this certification should check with the homologation department of their vehicle manufacturer/body builder.

3.3 Certificate from a competent person that the safety belts have been inspected and passed under the school transport scheme (equivalent to UK visual inspection standard)

Since 2007, it has been a requirement of the School Transport Scheme that buses participating in the scheme be inspected to verify that the safety belts and their fitment meets the UK visual inspection standard (which is a visual inspection developed to ensure a retrofitted safety belt installation corresponds to the EC type-approval standard). The Department of Education and Science and Bus Eireann have organised for an independent inspection of buses involved in the School Transport Scheme. It is proposed that at the roadworthiness test owners of buses involved in the School Transport Scheme could present certification that the safety belts have been inspected and passed as part of this Scheme.

3.4 Certification from a competent person confirming that the safety belt installation conforms with CE&U standards

Buses which do not meet the requirements of 3.1, 3.2 or 3.3 above may not have any certification (although this should not be the case as it is already a requirement of the roadworthiness test that safety critical modifications must be certified) or may not have certification which meets the minimum requirements proposed in this document.

The RSA is proposing that in cases where either certification is not available or is inadequate, operators would be obliged to obtain certification that the safety belt installation conforms to the requirements of the CE&U Regulations. [The general requirements under the CE&U Regulations have been set out in 2.1 of this document].

In any case, it is proposed that certification would meet the following requirements:

- be provided by a competent person meeting the requirements proposed in this document (see 3.4.1 below);
- be in the format set out in Appendix 1; and
- verify that the vehicle meets the minimum the requirements of the CE&U Regulations.

3.4.1 Competent Persons

Owners/operators of a bus would be required to ensure that the person providing certification of a safety belt installation is competent to do so and is equipped to provide valid certification. Appropriate competent persons could include:

- Approved Test Centres (ATCs); or
- Suitably Qualified Individuals

3.4.1.1 Approved Test Centres (ATCs)

ATCs have been approved by the National Standards Authority of Ireland to carry out national type approval testing of vehicles. They are located across the country and currently use the national minimum technical standard for inspecting new vehicles, including their safety belts installations. Therefore they would not need any further equipment or training to carry out the proposed safety belt certification.

The benefits of a bus owner using an ATC to provide certification are:

- a high level of assurance of the certification as ATCs have NSAI approval;
- ATCs have familiarity with the minimum technical standards for safety belt installations as this is necessary for vehicle type approval; and
- ATCs have the expertise, testing facilities and equipment necessary to undertake a comprehensive vehicle inspection.

3.4.1.2 Suitably Qualified Individuals

For the purposes of licensing a Public Service Vehicle, a Suitably Qualified Individual (SQI) is defined in Road Traffic legislation⁵ as a mechanical or automotive engineer, an automotive assessor or a person with similar qualifications who by reason of his or her competence, experience and independence, is an appropriate person to assess the fitness and safety of a mechanically propelled vehicle.

To ensure that a consistent professional minimum standard is set for the inspection of safety belt installations, certain minimum requirements are proposed for an SQI certifying a safety belt installation. These are as follows:

- An Engineering Qualification (Level 6 or higher accredited courses)⁶, Qualified Vehicle Mechanics Certification or Qualified Vehicle Body Repair Certification⁷;
- a minimum of 5 years experience of working in a suitable technical environment (preferably Automotive or Engineering Environment);
- accreditation with a professional body (e.g. Engineers Ireland, Institute of Automobile Engineer Assessors); and
- access to adequate facilities to carry out a thorough vehicle examination.

It would also be prudent for operators to satisfy themselves that the SQI has appropriate professional indemnity insurance.

As part of the certification procedure the SQI would make a declaration that the safety belt installation conforms to Construction, Equipment and Use standards and that they have the necessary professional requirements. The RSA is proposing that the form of the declaration should be that set out in Appendix 1.

The SQI carrying out a safety belt inspection should have a clear understanding of the technical requirements/considerations of importance when a vehicle is being fitted with safety belts.

⁵ S.I. No. 295 of 1998

⁶ See Engineers Ireland, Accredited Courses

⁷ See FAS, Training and Employment Authority

3.4.2 Assessment of the standard of fitment of safety belts

Where a Competent Person is engaged by the owner to provide certification on the standard of a safety belt installation, they would be required to carry out a comprehensive inspection of the safety belts and how they have been fitted. They would also need to ensure that they have all necessary information to hand when carrying out the inspection.

This information may be in the form of documentation from the vehicle manufacturer, body builder or safety belt installer which sets out the specific standards or considerations that may have been taken into account when fitting the safety belts to the vehicle.

The Competent Person should ensure the assessment comprehensively covers all relevant legal and technical requirements relating to safety belt installations including:

- i. CE&U Regulations;
- ii. Type-approval standards;
- iii. appropriate manufacture's specifications; and
- iv. additional reference material such as the RSA guidelines and checklist contained in Appendix 2 (discussed further in 3.8 below).

The vehicle owner should supply the Competent Person with all relevant information to assist them in determining if the safety belts have been installed correctly.

The report of the safety belt inspection and all other relevant information should be retained on file by the Competent Person. The report should also be furnished to the owner of the vehicle.

3.4.3 RSA guidelines

The RSA has prepared Guidelines (contained in Appendix 2) to assist Competent Persons [/companies] in completing their assessment and inspection. The Guidelines are not an interpretation of the law and are not intended to interpret and/or displace the obligation in law on every owner and driver to ensure that their vehicle is safe and complies with minimum standards.

The RSA intention is that the Guidelines be used in conjunction with, and supplement, the legal requirements [and other information available including general type-approval standards and manufacturers specification as set out in 3.4.4 (i)-(iii) above].

The Guidelines set out, in the view of the RSA, the very minimum requirements to be assessed and considered when inspecting a safety belt installation in respect of seat strength, seat and safety belt anchorages and safety belts and restraint systems.

To ensure that the safety belt installation is acceptable, a minimum standard is highlighted for some safety critical components. In addition to these, specific design features are also given to indicate if a seat and/or safety belt has been correctly installed/modified. Comparison with these minimum standards and design features should assist the Competent Person undertaking the inspection process when determining if a safety belt installation is acceptable.

4. VERIFICATION – PROPOSED COMMENCEMENT DATE

The RSA is proposing that the verification exercise would formally commence on 29 October 2010 as part of the roadworthiness inspection for buses fitted with safety belts.

Buses registered before 29 October 2011 could present one of the four forms of certification proposed in this document. All buses registered after 29 October 2011 will be required to have WVTA (as this will be a requirement for registration after 29 October 2011) and therefore it will not be necessary to present any certification at the roadworthiness test in respect of those buses.

5. PROPOSAL TO REQUIRE BUSES CARRYING CHILDREN ON ORGANISED TRIPS TO HAVE SAFETY BELTS

5.1 Current Requirements in Ireland Regarding Wearing of Safety Belts on Buses

Safety belts provide vehicle occupants with a very high level of protection in the event of a collision.

There is currently no mandatory requirement in Road Traffic legislation for buses to be fitted with safety belts (other than to the front seats of buses under 3.5 tonnes DGVW⁸).

The accepted practice for maximising the safety of a child travelling in the front or rear seat of a bus, minibus or coach is that:

- a child under 3 years of age use an appropriate child restraint;
- a child aged 3-11 and under 1.5 metres in height wear an appropriate child restraint if available, or if not available, an adult safety belt;
- a child aged 12 and 13 and younger children 1.5 metres or more in height wear a safety belt if fitted and available to be used; and
- a child aged 14 years and above must wear a safety belt if one is fitted and available to be used, and are themselves responsible for doing so.

This reflects the approach in other countries. For example, in the UK all buses used to carry children on organised trips were retrofitted with safety belts and legislation was passed to give this effect in 1996. In 2001 all new buses, except those buses with both standing and seated passenger accommodation, were required to be fitted with safety belts.

The 2006 EC Regulations provide that where a safety belt is fitted to a bus:

- every adult and child of 3 years of age or more occupying a seat shall wear a safety belt or use an appropriate child restraint system; and

⁸ Road Traffic (Construction, Equipment and Use of Vehicles) (Amendment) (No. 3) Regulations 1991, S.I. 359 of 1991 (the “1991 CE&U Regulations”).

- a person over 14 who fails to comply commits an offence.

The 2006 EC Regulations also require the owner of a bus to inform passengers that they have to wear a safety belt while seated on a moving bus. Under the 2006 EC Regulations, the driver of a large public service vehicle does not have to carry a passenger who fails to comply with these regulations.

The 1991 CE&U Regulations makes the fitment of safety belts to the front seats of buses under 3.5 tonnes DGVW mandatory. The 1991 CE&U Regulations also require the driver of a bus under 3.5 tonnes DGVW not to permit a person who is under 17 years of age to occupy a forward-facing front seat, unless that person is:

- 4 years of age or upwards and is wearing a safety belt; or
- restrained by an appropriate child restraint.

5.2 Proposed requirement for Safety Belts on Buses Carrying Children on Organised Trips

At present only buses contracted to the Department of Education and Science's School Transport Scheme are required contractually to have safety belts fitted. This requirement does not extend to buses involved in the organised transport of children generally or to privately-operated school bus services.

It is proposed that all buses and minibuses involved in the organised transport of children be required to have a safety belt on every seat. The RSA believes that this is achievable given the apparent high level of safety belt fitment in buses in Ireland. The implementation of this proposal would ensure a minimum level of safety and a common standard for all children. It would apply to all organised transport of a group of more than three children.

While it is not possible to list every trip that would be considered organised transport of children, the key element is that the journey is being undertaken specifically to transport children. Accordingly, it would include school outings, trips by youth/sports clubs and also the transport of children to or from school, or between school premises.

The requirement to have safety belts would apply to organised trips involving children who are aged from 3 to 14 years inclusive and/or are in an approved course in a recognised primary or post-primary school. It would not apply to buses providing a transport service to the general public (e.g. scheduled bus services provided by Dublin Bus).

The provision allowing three children to be counted as two in so far as it still applies would be revoked.

The owner/operator of a bus would be legally responsible for ensuring that a bus transporting children on an organised trip has safety belts fitted.

It is proposed to introduce this requirement from 29 October 2011, by which time all safety belts on buses should have completed the verification exercise. All new buses registered after this date will be required to have WVTA and to be fitted with safety belts.

YOUR COMMENTS

The RSA wishes to hear from all road users, interest groups and others who may have views and suggestions on the proposals contained in this consultation document including the proposed:

- verification of the certification of safety belt installations on existing buses and new buses registered up to 29 October 2011 (for buses registered after this 29 October 2011 all safety belts installations will be type-approved);
- commencement of the verification exercise on 29 October 2010;
- four forms of acceptable certification and, in cases where new certification would be required, the draft certification form in respect of the Construction, Equipment and Use Standards contained in Appendix I;
- minimum requirements of a Suitably Qualified Individual;
- draft Guidelines and checklist in Appendix II;
- requirement for all buses and minibuses carrying children on organised trips to have safety belts from 29 October 2011.

The consultative process commences on Thursday 15th April 2010 and lasts until the 27th May 2010. Comments should be e-mailed to:

safetybeltconsult@rsa.ie

or posted to:

Vehicle Standards Section
Road Safety Authority
Moy Valley Business Park
Primrose Hill
Ballina
Co Mayo

Appendix 1

Construction, Equipment and Use Certification of Safety Belt Installations

This document is to be completed by the individual inspecting and certifying a safety belt installation or the company who installed the safety belts. To complete this certificate you must satisfy yourself that the safety belt installation on this vehicle meets the requirements of the CE&U Regulations. In making your assessment you should consider the appropriate manufacture's specifications, Type Approval standards, and additional reference material (including RSA guidelines), as appropriate, when inspecting and certifying a safety belt installation.

Vehicle Certifier Details

Name _____ Date _____

Business Name _____

Address _____

_____ Telephone _____

Vehicle Owner Details

Name _____ Date _____

Business Name _____

Address _____

_____ Telephone _____

Vehicle Details

Registration Number _____ Make/Model _____

Vehicle Identification Number (VIN) _____

Engine Number _____ Design Gross Vehicle Weight (kgs) _____

Month and Year of Manufacture _____ Number of Seats _____

Safety Belt Installation Details

No. of seats fitted with safety belts ____ No. of seats fitted with two point safety belts ____

No. of seats fitted with three point safety belts ____ Month and Year of Installation ____

Safety Belt Inspection (if applicable)

Date of Inspection _____ Location of Inspection _____

_____ No. of safety belts inspected _____

Additional Information provided to support of safety belt installation Yes/No

If yes please give details _____
(Please attach copy of any additional information provided)

Requirements for Certification

By certifying a safety belt installation you are declaring that each safety belt in the above vehicle satisfies the following requirements of Road Traffic (Construction, Equipment and Use of Vehicles) Regulations, (Statutory Instrument No. 190 of 1963⁹) in respect of safety belts and their installation:

For all buses:

34. (1) Every vehicle and trailer, and all parts and equipment for every vehicle and trailer, shall be maintained in good and efficient working order, and shall be such and so maintained that no danger is liable to be caused thereby.

96. (1) Every vehicle while used in a public place shall be such, and so maintained and used, that no danger is likely to be caused to any person.

67. (1) Every vehicle (including all bodywork, upholstery and fittings) shall be properly constructed of suitable materials and shall be of such a design that it is capable of withstanding the loads and stresses likely to be met with in operation and is otherwise suitable for use for the carriage of passengers.

Declaration

I hereby declare that the above information to be true and correct and that I am in possession of the professional requirements set out in Note 1 below.

_____ Date _____

Signature of Certifier

⁹ S.I. No. 190 of 1963

Note 1 :

This certification must be completed by an Approved Test Centre (ATC) or by a competent person who meets the following minimum requirements:

- Engineering Qualification (Level 6 or higher accredited courses)¹⁰, Qualified Vehicle Mechanics Certification or Qualified Vehicle Body Repair Certification¹¹.
- a minimum of 5 years experience of working in a suitable technical environment (preferably Automotive or Engineering Environment);
- accreditation with a professional body (e.g. Engineers Ireland, Institute of Automobile Engineer Assessors);
- access to adequate facilities to carry out a thorough vehicle examination;

or

- be an authorised representative of the company who installed the safety belts in the vehicle.

¹⁰ See Engineers Ireland, Accredited Courses

¹¹ See FAS, Training and Employment Authority.

Appendix 2

RSA Guidelines for Safety Belt Inspections

1. Introduction

These Guidelines may be used to assist a competent person[/company] in determining whether a safety belt installation meets a sufficient minimum standard to be issued with certification.

The Guidelines set out, in the view of the RSA the very minimum standards to be assessed and considered when inspecting a safety belt installation in respect of seat strength, seat and safety belt anchorages and safety belts and restraints systems.

To ensure that the safety belt installation is acceptable, a minimum standard is highlighted for some safety critical components. In addition to these, specific design features are also given to indicate if a seat and/or safety belt has been correctly installed/modified. Comparison with these minimum standards and design features will assist the inspection process when determining if the safety belt installation is acceptable.

While minimum acceptable standards and design features are outlined for some components, many areas of the safety belt installation are left at the discretion of the tester to determine if appropriate. The subjective nature of the assessment may allow for some variations in certified safety belt installations. However, such variation should not compromise the safety of a safety belt installation and unsafe installations must not be approved.

The inspection and certification of a safety belt installation should be carried out by an individual or company with the appropriate competence and facilities to do so. The RSA advises that the check list at the end of this document should be filled out for each safety belt installation inspected and copies should be retained on file and also given to the owner of the vehicle.

It is likely that the majority of cases where this guidance note is being used to assist in the assessment of the safety belts and their installation, there will be no documentary evidence to show that a safety belt installation complies with a type-approval standard. While it is a matter for each owner / operator to ensure that the vehicle and the safety belts comply with the law and are correctly certified as such, the RSA recommends that the vehicle is thoroughly examined. This examination should ensure that the vehicle, at a minimum, adheres to the guidelines in this document and any other support information being used by the competent person.

The competent person will have to ask the operator to remove seat cushions and to open any access flaps or luggage locker doors, designed to be capable of being readily opened, to allow as much as possible of the safety belt installation to be seen. Some parts of the installation may only be visible with the vehicle on a pit or hoist.

Seat squabs should be removed, to aid the inspection of the condition of the belt and mountings. They must be replaced before the end of the test to allow inspection of the complete belt installation.

2. Seat Strength

Check each forward facing seat is firmly attached to the vehicle structure. Each forward facing seat must be securely attached to the vehicle structure, or other obvious suitable load bearing parts of the vehicle.

Each forward facing seat mounting must be of adequate strength to support the loads likely to be imposed.

The rear parts of the seats must not have rough or sharp edges likely to increase the risk of injury to the occupants.

All head restraints must be securely attached to the seat and a head restraint must not have any roughness or sharp edges likely to increase the risk or severity of injury.

Check the seats to which safety belts are attached for security and for cracks or fracture of the leg and frame.

Where seats that are permanently mounted in the vehicle have been fitted with lap belts or 3 point belts integral to the seat, then, if the seat utilizes tubular frames or tubular "H" pattern legs it must be reinforced. This will include welding metal buttresses, of similar thickness material as the foot, between the foot and the leg (see Diagram 1) and the welding of a diagonal brace, either in compression or tension, between the foot and the seat base attachment of each leg. (Alternatively documentary evidence of compliance with Directive 2005/39/EC can be presented for each type of seat installed).

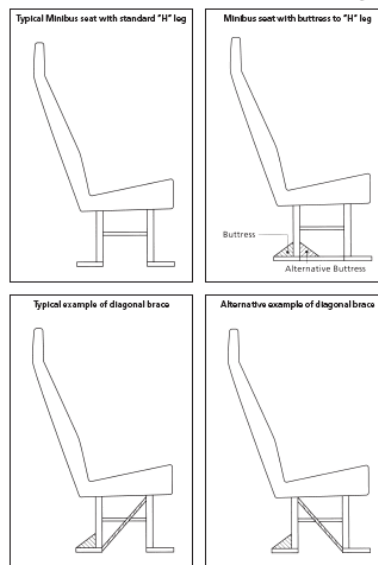


Diagram 1

On seats constructed with a wooden frame it is unacceptable to mount the belts either directly to the frame or to a metal base which is attached to the frame only by wood screws. Unless there are additional reinforcement brackets fitted that provide a direct load path to the seat leg and side mounting the installation would be rejected. This reinforcement could take the form of steel angle sections or plates, alternative materials may be used provided that they are of comparable strength (Diagrams 2 and 3).

Wooden framed seats with a metal base – rear view

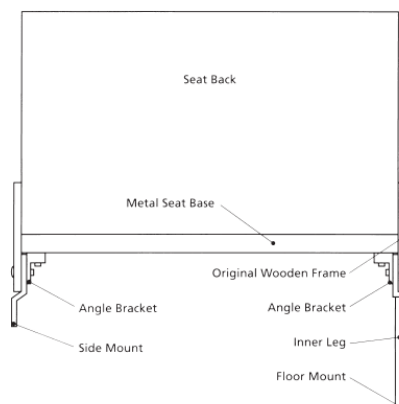


Diagram 2

Wooden framed seats with a metal base – Enlargement of Reinforcement

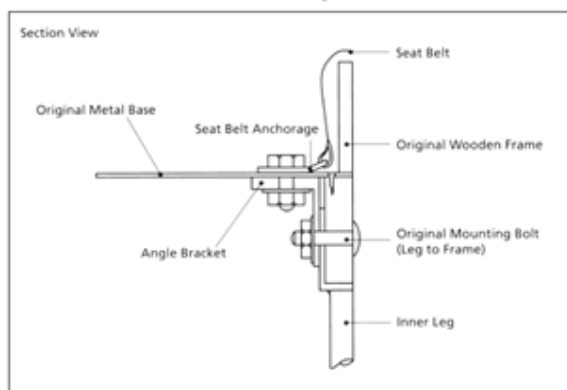


Diagram 3

3. Seat and Safety belt Anchorages

Check that each seating position is fitted with the correct number of anchorage points, and that where there is an anchorage a belt of the correct type is fitted.

Where safety belts are directly mounted (integral safety belts) consideration must be given to the seat mounting as a belt anchorage point and materials and construction methods must be taken into account.

In assessing the strength of all anchorages, it is essential to consider:

- The vehicle structure in the immediate vicinity of the anchorage.
- The parts of the vehicle structure into which the loads from the anchorages will be dissipated.

As far as is practicable without dismantling, check the condition of the vehicle structure around the safety belt anchorage points (i.e. within 300mm (12") of the anchorage). Where a safety belt is mounted to a seat frame this will apply to all seat mounting points. The floor-mounted anchorage points might need to be inspected from underneath the vehicle. Pull each safety belt webbing against its anchorage to see that it is properly secured to the vehicle structure.

Welding should appear neat and of good quality; whilst it is impossible to judge the quality of a weld just by looking at it, messy welding is rarely strong welding.

3.1. Seat Anchorages of Seats with Integral Belt Anchorages

With Pedestal Seats (seats mounted on box or tubular section legs) with Integral Belt Anchorages the seat itself becomes part of the belt anchorage and the loads generated on a belt must be dissipated through the seat frame and into the surrounding vehicle structure. During the anchorage Type Approval test, forces equivalent to approximately 3 tonnes per seating position are applied to the belt anchorages of all forward-facing seating positions. In the case of a double or triple seat, this might mean loads approaching the order of 9 tonnes could be transmitted through the seat pedestals and into the vehicle. In a seat with integral anchorages, this load must travel down the seat back and sides, into the pedestals and then into the floor of the vehicle. The height of the pedestals above the floor then acts as a lever causing the front seat legs to be pushed down into the vehicle floor and the rear seat legs to be pulled upwards out of the floor.

Depending on the pedestal height, the forces being fed into the floor could be considerably larger than the 3 tonnes force applied to the safety belts. On pedestals about 350mm high the upward load on the rear seat legs might well be in the region of 6 tonnes (three tonnes per seat pedestal). In view of the extremely high loads, it is important that a thorough assessment of the load path from each anchorage to the vehicle structure is made. This will begin at each of the belt anchorages and might end some considerable distance away from the attachment of the seat to the vehicle. There are a variety of ways in which a vehicle floor can be designed to cope with the loading from a seat with integral belt anchorages. One commonly used method is to secure the seats to a beam or box section or framework inside the vehicle, running the length of the saloon area. This framework is then attached to the vehicle in a variety of places spread over a large area and located close to strong points under the floor (such as junctions between chassis members). Such systems are difficult to inspect once the vehicle is assembled as the structure is normally concealed under a cosmetic "plywood" floor.

Fixed Single Seats are likely to require (Diagram 4):

- Load spreading plates at least 100 x 100 x 4mm thick.
- Spreader plates fitted between the front legs and the inside of the vehicle floor
- Spreader plates between the rear leg securing nuts and the underside of the vehicle floor.
- Where the rear mounting bolts are located within 50mm of a chassis member, the plate may be folded (not reduced in size) to clear the obstruction and the fold should abut snugly against the chassis member.

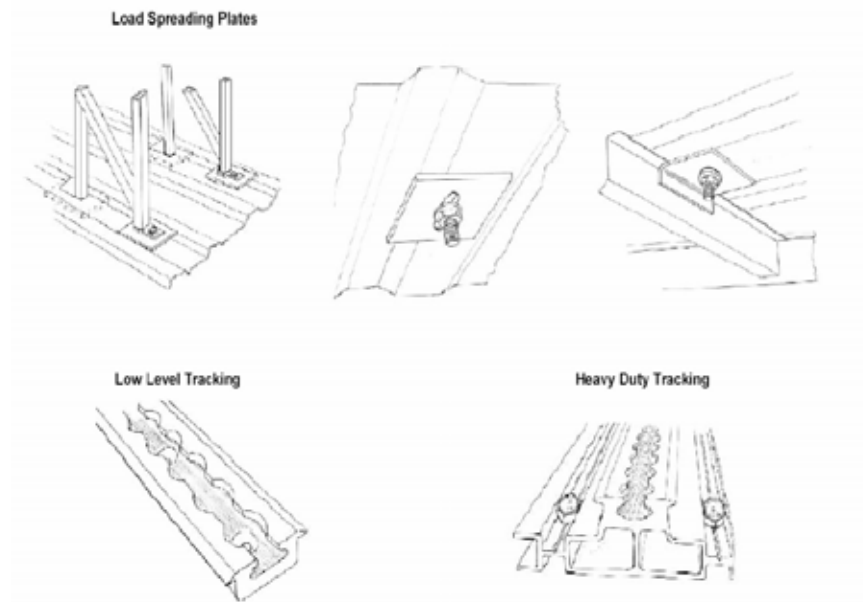


Diagram 4

Double seats fitted with integral three-point belts and two or three pedestals impart significantly higher loads into the vehicle floor than a single seat imparts. As a result, it is extremely difficult to restrain such a seat using simple reinforcements alone. Where a double seat with integral three-point belt anchorages is fitted with four or more pedestals, approximately evenly spaced, a spreader plate extending at least the full width of the seat should be fitted between the front legs and the vehicle floor. Such a plate might typically be in the region of 5mm thick, 150mm long and at least the width of the complete seat (including cushions).

Rear-facing single seats with integral belt anchorages are only required to withstand loads approximately one third of the magnitude of a forward-facing seat. As such, mounting arrangements can be significantly less substantial than those for forward-facing seats. In many cases, rear-facing seats are mounted on a bulkhead rather than free-standing. Often, the bulkhead structure will be impossible to assess due to the presence of trim on both surfaces.

3.2. Safety belt Anchorages

The anchorage and surrounding structure must be of adequate strength to withstand the load likely to be imposed in the event of a vehicle frontal impact. In a severe accident, the seated occupant can exert huge loads upon their safety belts (in the region of 1.5 tonnes for a 75kg person). Safety belt anchorages together must withstand these large loads from the safety belts. These loads in turn must be dissipated by the vehicle structure.

Diagram 5 shows typical methods of attaching safety belts.

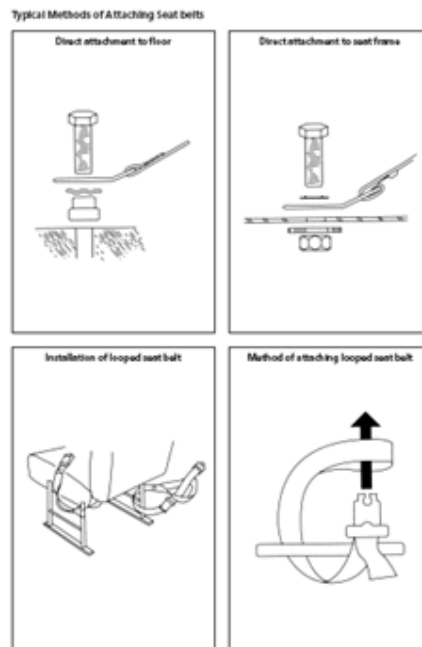


Diagram 5

Where safety belts, other than looped belts, are anchored to the seat frame or the vehicle floor they should be secured with mounting bolts in accordance with the following:

Minimum Acceptable Size and Grade of Bolts for Safety belt Anchorages		
Type of Anchorage	Minibus	Coach or Large Bus
Single Anchorage	M10 Standard Material	M10 Standard Material M8 High Tensile Steel
Double Anchorage	7/16" Standard Material M10 High Tensile Steel	7/16" Standard Material M10 High Tensile Steel

Table 1

Note: Bolt head marks

- Standard Material = P, 4.6 or SAE equivalent
- High Tensile Steel = S, 8.8, or SAE equivalent
- No Markings = Standard Material

If the examiner cannot determine the grade of bolt it must be assumed to be of Standard Grade.

It is paramount that the appropriate sized bolt is used in the safety belt anchorage, i.e. an 8mm bolt should not be used in an 11.5mm diameter hole. The only exception to this is where a “stepped washer” or collar is used to eliminate the excessive clearance and a suitable washer is fitted between the bolt head and the anchorage to prevent the bolt pulling through. The use of smaller bolts, self tapping screws or wood screws is not acceptable.

It is not acceptable to drill tubular seat frames to allow belts to be bolted to the frame except in cases where a manufacturer has approved the installation and the operator presents a certificate issued by the manufacturer or his agent declaring that the installation is satisfactory.

Clamp type brackets are acceptable provided that they are properly secured (Diagram 6).

Example of a typical clamp bracket



Diagram 6

Where safety belts are attached to thin sheet metal seat frames the bolts anchoring the belt must be of the minimum dimensions shown in Table 1 and must be adequately supported by the use of load spreading washers between the frame and the nut. Typically this would be 25mm in diameter and 2mm thick. If two belts are attached at the same point with a single bolt then a larger reinforcement plate 35mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 21 x 46 x 3 mm) must be used. The sizes quoted are for steel reinforcement plates, alternative materials may be used but must provide comparable strength.

Where safety belts are fitted to the rear seats of a vehicle, check the anchorage to ensure that it is not anchored solely to the thin metal sheet which separates the boot area from the passenger compartment. It is essential that safety belt anchorages are secured to a strong cross member connected to the structural members of the vehicle. The connection should be to such a standard that there is confidence that it will be able to transfer the safety belt loads into the structure of the vehicle. This may involve the fabrication of an additional framework at the rear of the vehicle (Diagram 7). An example of typical reinforcement of this area would be by the use of additional square section tubing 40 x 40 x 3 mm, or angle plate 50 x 50 x 4 mm across the full width of the vehicle. The sizes quoted are for steel

reinforcement, alternative materials may be used but must provide comparable strength. A full width reinforcement that is only attached to the thin metal sheet is unacceptable and would be a reason for failure.

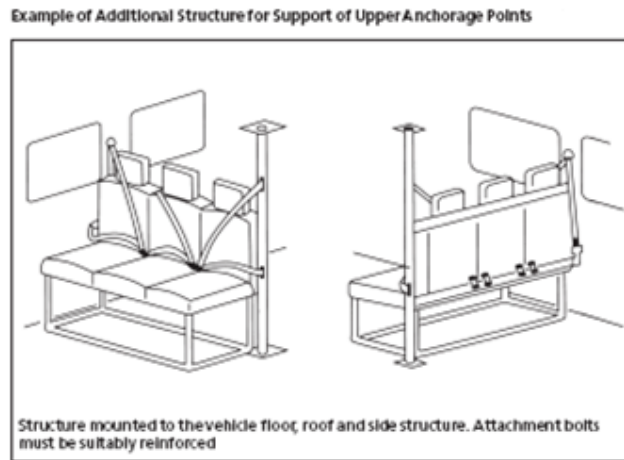


Diagram 7

The upper anchorage point should be at least 475mm above the height of an uncompressed seat cushion. This dimension is to be measured parallel to the backrest. The upper anchorage point should be a minimum of 110mm from the centre line of the seat back to the side of the seat.

Lower anchorages should be at least 320 mm apart. This need not be the distance between the anchorage points of the belt but it can be between two structural parts of the seat that the belt is routed round. If the measurement is between mounting bolts it should be measured between bolt centres. Check that the belt will not raise or significantly compress the seat cushion when subjected to a load. There will always be a small amount of compression which is acceptable.

Where belts are attached directly to a metal floor a load spreading washer must be used between the nut and the floor. The bolts must be at least the sizes specified in Table 1. Typically this would be 25 mm in diameter and 2 mm thick. If two belts are attached at the same point with a single bolt then a larger reinforcement plate of minimum dimensions 35mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 21 x 46 x 3 mm) must be used. The sizes quoted are for a steel reinforcement plates, alternative materials may be used but must provide comparable strength. Reinforcement plates should follow, as far as practicable, any contours in the floor to which they are attached.

Where a belt is attached directly to a wooden floor each anchorage must be reinforced with a plate of minimum dimensions 35mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 21 x 46 x 3 mm). If two belts are attached at the same point with a single bolt then the reinforcement plate must have minimum dimensions of 92mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 65x 100 x 3 mm). If two belts are attached in close proximity to each other, then a single reinforcement plate of minimum dimensions of 92mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 65x 100 x 3 mm) should be used ensuring that the bolt holes are not too close to the plate edge. Alternatively two steel reinforcement plates may be used, but they must be of minimum dimensions 52mm diameter x 3mm thick (or a rectangular plate of minimum

dimensions 46x 46 x 3 mm). The sizes quoted are for a steel reinforcement plates, alternative materials may be used but must provide comparable strength. Reinforcement plates should follow, as far as practicable, any contours in the floor to which they are attached.

4. Safety belts and Restraint Systems

Safety belt and restraints should be “e” / “E” marked.

Check that each safety belt is secured:

- to the vehicle structure or where the belt is integral with the seat to the seat structure
- using a fixing of adequate strength
- such that it can be separated from the anchorage without causing damage to the anchorage.

Check each belt for damage. Check the locked mechanism releases as required. Safety belt components should not be fitted to seats in such a way that they significantly intrude into the gangway space and are likely to cause injury to passengers either by tripping or by hitting the component.

Examine the condition of the attachment fittings and adjusting fitting on each belt. For seats with integral safety belts, it might not be possible to examine the fixing of the safety belt to the seat.

Check each belt operates correctly by fastening each belt locking mechanism (buckle) and trying to pull the locked sections apart. On retracting safety belts, check that, with the mechanism fastened and the seat unoccupied, excess webbing is wound into the retractor unit. Where a lap/diagonal retracting belt is fitted, check the position and operation of the retractor mechanism. A retractor mechanism must be correctly positioned to ensure the correct operation of the belt.

Check that whilst sitting in each seat in turn, and wearing the safety belt, secured and correctly adjusted, that the position of the webbing on the torso and the location of the effective belt anchorage points in relation to the seated body position are correct. A lap belt or the lap section of a 3 point belt must be positioned to lie across the wearer's pelvis and not the stomach. This is to reduce the risk of abdominal injury and to prevent “submarining”. In practice this may result in the belt lying across the top quarter of the thigh.

Check the vehicle structure, fitments and components near each belt for sharp edges likely to cause abrasion or damage to the belt during normal use.

Examine flexible buckle stalks for:

- Signs of corrosion or weakness. Pull the sheaths aside, if this can be done without damage.
- ‘Waggle’ flexible buckle stalks and listen for a clicking noise indicating broken strands of cable.

Examine the condition of all safety belt webbing for cleanliness, cuts or obvious signs of deterioration. Pay particular attention to webbing around anchorages, buckles and loops.

Subsequent cutting or reworking of the webbing will be a reason for failure. It is acceptable for the free end of looped belts or static belts to be reworked to the extent of folding and stitching the webbing so that it cannot pass back through the buckle to prevent the buckle from being dismantled. Any knots in the belt webbing are unacceptable.

A “looped” type safety belt fitting (See Diagram 5) is acceptable provided it is not free to float along any part of the seat structure. Any free movement in excess of 25mm is a reason for failure.

4.1. Important Point to Note

If lap belts are fitted and there is the possibility of passengers hitting their heads on any harsh object such as a grab rail or seat stanchion, padding or other suitable protection must be provided on these objects. The protection does not need to cover the full length of a seat grab rail but should cover a length of at least 300mm directly in front of each passenger. Padding must be compressible and of a depth of at least 50 mm, measured to the surface of the bar and not compress more than 25mm under reasonable thumb pressure, or 25mm thick and not compress more than 5mm. Ordinary seat foam or pipe lagging foam is unlikely to be of sufficient density for this purpose.

5. Check List

Check List		
Vehicle Owner details:		
Vehicle identification (VIN, Reg No. etc)		
Vehicle manufacturer/convertor details		
Record and Attach evidence of compliance with Appropriate Standards/Engineers Reports/Letters from Vehicle Manufacturer or Vehicle Convertor		
Inspection carried out by:		Date:
	Pass	Fail
Safety belt:		
• missing.		
• of an incorrect type.		
• is not a lap or lap and diagonal belt fixed at 3 points		
Anchorages:		
• with excessive corrosion, serious deterioration or a fracture in a load bearing member of the vehicle structure within 300mm (12") of the anchorage. (Where a safety belt is attached to a seat frame this will apply to all seat mounting points).		
• a safety belt not securely fixed to the seat or on the vehicle structure.		
Locking Mechanism, Stalks, Retracting Mechanism and Fittings:		
• locking mechanism of a safety belt does not secure or release as intended.		
• an attachment or adjustment fitting fractured, badly deteriorated or not operating effectively.		
• corrosion or deterioration of a flexible stalk likely to lead to failure under load.		
• broken flexible stalk strands.		
• a retracting mechanism that does not retract the webbing sufficiently to remove all of the slack from the belt with the locking mechanism fastened and the seat unoccupied.		
Condition of Webbing:		
• a cut which causes the fibres to separate.		
• fluffing or fraying sufficient to obstruct correct operation of the belt or which has clearly weakened the webbing.		
• stitching badly frayed, insecure, incomplete or repaired.		
• so dirty that it is likely to soil passengers' clothing.		
Safety belt Fittings:		
• any guide, stalk or pivot with obvious signs of structural weakness such that failure is likely.		
Seat or seats to which safety belts are attached		
• insecure.		

<ul style="list-style-type: none"> • with a cracked or fractured leg or frame. 		
Installation defects		
<ul style="list-style-type: none"> • any obvious installational defect found during the inspection. 		
Installation inspection		
<ul style="list-style-type: none"> • evidence that original webbing has been cut and/or reworked. (e.g. belts knotted, fraying or fluffing removed /sealed by burning etc.) 		
<ul style="list-style-type: none"> • any part of the installation which has a sharp edge which could or is likely to cut or abrade the webbing. 		
<ul style="list-style-type: none"> • a directly attached anchorage not secured by standard safety belt mounting bolts and washers. 		
<ul style="list-style-type: none"> • an anchorage insecure. 		
<ul style="list-style-type: none"> • a tubular seat frame that has been drilled for the purpose of attaching a safety belt. 		
<ul style="list-style-type: none"> • a directly attached anchorage not attached to a load bearing member or without suitable reinforcement. 		
<ul style="list-style-type: none"> • retro-fitted three point belt which is not mounted on a suitable structure. 		
<ul style="list-style-type: none"> • tubular frame legs or tubular "H" pattern legs which have not been reinforced with buttressing and diagonal bracing, or buttressing where a floor mounted belt is fitted close to a seat leg. 		
<ul style="list-style-type: none"> • belt fitted to a seat which has not been suitably reinforced or modified. 		
<ul style="list-style-type: none"> • without suitable padding. 		
<ul style="list-style-type: none"> • lower anchorages less than 320 mm apart. 		
<ul style="list-style-type: none"> • in such a position that loading the belt causes the cushion to be raised or significantly compressed thus allowing the occupant to effectively move forward. 		
<ul style="list-style-type: none"> • an anchorage attached to the floor without reinforcement plates of a suitable size and contour. 		
<ul style="list-style-type: none"> • load spreading washer(s) missing from anchorage bolt. 		
<ul style="list-style-type: none"> • claw type seat mounting with inadequate means of securing claw. 		
<ul style="list-style-type: none"> • on a seat fitted to a flat rail the bolt does not pass through the leg, rail, floor and a suitable structural member or the floor has not been suitably reinforced. 		
<ul style="list-style-type: none"> • tracking for securing seats and wheelchairs insecure. 		
<ul style="list-style-type: none"> • free movement for a looped belt more than 25mm at the anchorage. 		
<ul style="list-style-type: none"> • upper anchorage of three point belt less than 475 mm above uncompressed seat cushion measured parallel to the seat back. 		
<ul style="list-style-type: none"> • upper anchorage of three point belt(s) less than 110 mm from centre line of seat. 		
<ul style="list-style-type: none"> • incorrect positioning of a lap belt or lap section of a three point belt. i.e. the belt lies across the stomach or forward of the top quarter of the thigh. 		
<ul style="list-style-type: none"> • a safety belt component fitted to a seat significantly intrudes into a gangway and is likely to cause injury to a passenger. 		

