

Track-mounted Seat Attachment Systems

Background

Requirements of the LVV Code:

The low volume vehicle standard for seats and seat anchorages (185-00) requires that any seat installation certified under the LVV Code either:

- follows the 'recipes' specified within the LVV standard; or
- is proven to meet the loading requirements specified in the LVV standard by testing; or
- is proven to meet the loading requirements specified in the LVV standard by calculation.

LVVTA has recently become aware that this principle has not been followed in cases where some LVV certifiers are presented with seats mounted into 'track' (otherwise known as 'rail') systems. For this reason, it is necessary to clarify the situation for any future track-mounted seat installations, to ensure that the correct technical requirements are applied at the time of LVV certification.

About floor-mounted track systems:

A number of seat installers have been using floor track systems for mounting aftermarket seats into light vehicles, in particular passenger vans. The track sections are manufactured from extruded aluminium alloy and are either machined or pressed to shape. Ancra, Unwin, NMI, and Q-Straint manufacture the most common track systems in use.

Unwin, NMI, and Q-Straint track systems are specifically designed and marketed for the restraint of wheelchair and seated passengers in motor vehicles. The Ancra system is marketed for use in the aircraft industry but is also used as load restraints and for restraint of wheelchair passengers in motor vehicles.

The track is usually attached directly to the vehicle floor using countersunk screws at regular intervals, with under-floor washers or plates. The rails are fitted in a series of continuous lengths to suit the vehicle layout requirements. The advantage in using these track systems to mount seats is the ease with which the seats can be removed when not required, and the ease with which seating configurations can be changed.

It is believed that these track systems are being used, in many cases, to mount seating configurations that would cause the rail and its mounting assembly to become overloaded. This belief is supported by the fact that, in most cases, the manufacturers of the track systems have no documentation or test certification for their track systems.

In many cases the seats mounted to the track systems have up to three seating positions, and have had 3-point emergency locking retractor seatbelts attached to the seat structure.

Put simply, fully-stressed seating positions will apply substantially more loading in the event of an impact than most track systems were ever designed or intended to withstand.

Technical Requirements for Track-mounted Seats

Unstressed seat mounting:

Unstressed seats may be mounted into a track system in a vehicle provided that the track system is either:

- Ancra aircraft style or heavy duty flange seat rail; or
- Unwin low-profile rail, surface rail, or heavy duty rail; or
- Q-Straint flange, non-flange, or surface track; or
- NMI heavy duty round track, or heavy duty insert track.

Where the information is available, the track must always be mounted in accordance with the manufacturers instructions. This information can be found for the Unwin product on the Unwin website at www.unwin-safety.com, and for the NMI product from Van Extras Ltd on 0800 826 398.

Some installation and attachment requirements for all of the track systems specified above for mounting unstressed seats are as follows:

1. The track must mount directly to the vehicle floor and be attached using 6 mm or 8 mm grade-10.9 metric (grade 8 imperial) steel screws with countersunk heads.
2. The track must be mounted into the vehicle floor at 100 mm intervals along the rails as shown in figure 1.
3. Where possible pre-drilled rail should be used, but if unavailable or impractical, care should be taken in drilling and countersinking holes as the tolerance between the attachment screws is critical.
4. The screws must be fastened using a minimum of a 30 mm heavy-duty plated flat washer under the floor, and a 6 mm or 8 mm nyloc nut.
5. The seat must attach to the rail using a stud or similar assembly supplied by the manufacturer of the track, which is designed specifically for the purpose of seat attachment.
6. The seat attachment assembly must be of the same make as, and be designed to be used in conjunction with, the track being used, in order to avoid misalignment and incorrect fitment issues.
7. All other applicable installation requirements from the LVV Seat and Seat Anchorage Standard 185-00(00) applies.

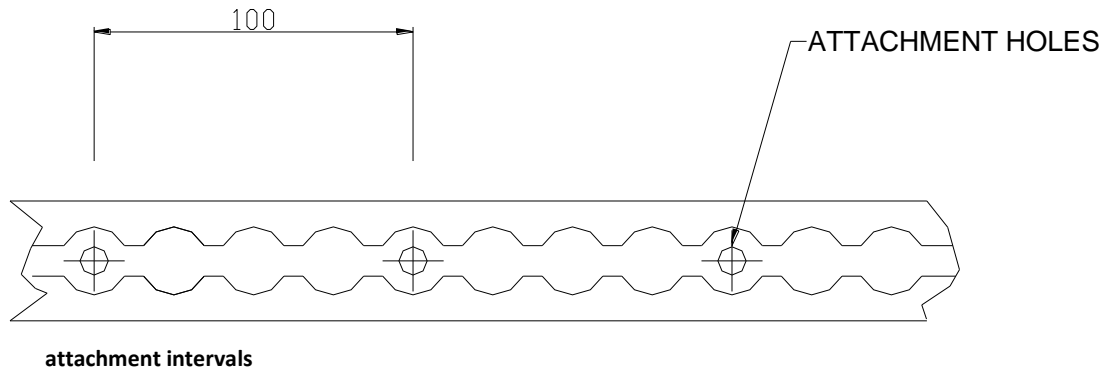


Figure
1 - Rail

Stressed seat mounting:

The only track systems that may be used for mounting stressed seats into a vehicle are either:

- Unwin low-profile rail, or Unwin surface rail, which must always be mounted in accordance with the manufacturers instructions (this can be found on the Unwin website at www.unwin-safety.com); or
- NMI heavy duty round, or heavy duty inset track, which must always be mounted in accordance with the manufacturers instructions (this can be supplied by Van Extras Ltd on 0800 826 398).

To follow are some important installation and attachment requirements for the Unwin or NMI track systems when attaching stressed seats.

1. The track must be purchased pre-drilled by the track manufacturer to accept 8 mm screws.
2. The track must be mounted into the vehicle floor at 100 mm intervals along the rails as shown in figure 1.
3. The track must be mounted using 8 mm grade-10.9 metric (grade-8 imperial) plated steel screws with countersunk heads as supplied by the track manufacturer.
4. The length of rail used must be at least as long as the seat foot and such that no fewer than six mounting screws are used, with at least four toward the rear of the seat leg.
5. An under-floor plate of a size not less than 80 x 50 x 3 mm must be used under each mounting screw, and fastened using 8 mm grade-10.9 metric (grade-8 imperial) plated nyloc nuts, as supplied by the track manufacturer.
6. In the case of a seat being attached to an Unwin system, the seat must be attached to the rail using Unwin Anti-Rattle Lockable Seat Fixtures as shown in Figure 2.

7. In the case of a seat being attached to an NMI system, the seat must use the combination of the NMI track system, and the NMI Millenium Leg as shown in Figure 3.

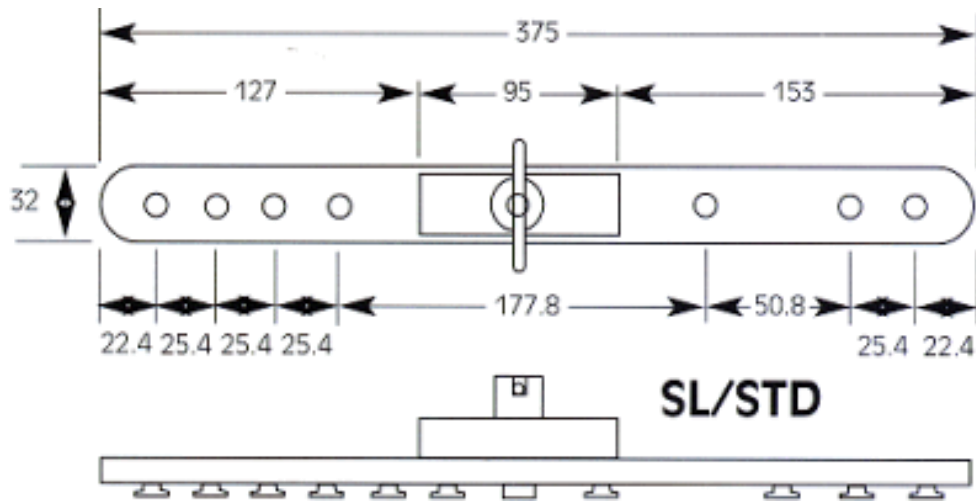


Figure 2 - Unwin Anti-Rattle Lockable Seat Fixture

Unwin systems:

The reason that the specified Unwin system has been approved for use is because testing has been carried out by Unwin on their track systems. Note however that only single seats fitted with integrated lap and diagonal seatbelts mounted to the specified rail and seat fixture products may be accepted. The tests have been carried out dynamically and statically to meet European M1 (passenger car type vehicles) category standards, ie 20g impact loading.

Until further testing is conducted to similar internationally recognized standards, only single stressed seats may be mounted into vehicles using the specified Unwin track system.

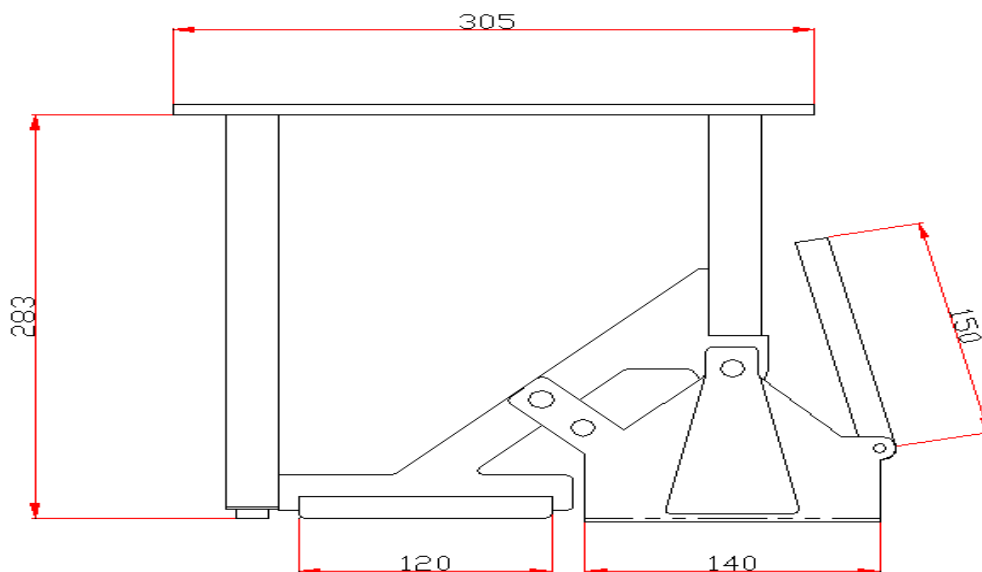


Figure 3 - A typical NMI Millenium Leg

NMI systems:

The reason that the specified NMI system has been approved for use is because testing has been carried out by NMI on their track systems. Note however that only single and double seats fitted with integrated lap and diagonal seatbelts mounted to the specified rail and seat fixture products may be accepted. The tests have been carried out dynamically and statically to meet European M1 (passenger car type vehicles) category standards, ie 20g impact loading.

Until further testing is conducted to similar internationally recognized standards, only single or double stressed seat may be mounted into vehicles using the specified NMI track system.

Other systems:

The use of any other track system to mount stressed seats into light vehicles may be accepted by the LVVTA provided the certifier can provide a test certificate from the track manufacturer which clearly states:

- That a particular seat configuration has been tested to an internationally recognized standard, (eg EEC, ADR, FMVSS); and
- that the testing included the appropriate seatbelt loads (eg: lap or lap and diagonal) transmitted through the seat frame; and
- that the loadings were no less than those expected during a 20g impact; and
- the manufacturer's part numbers of all track and seat attachment items which were tested.

LVV Certification Procedure

Where a track system is used to mount seats into a light vehicle, the LVV certifier must use the requirements of the LVV Standard 185-00(00) and the LVV Form-set FS030, together with the requirements specified in the '*Technical Requirements for Track-mounted Seats*' section of this LVV Information Sheet.

In addition to this, the certifier must clearly state whether the seat is stressed or unstressed. If the seat is a stressed seat and is not mounted using the Unwin or NMI components described in the '*Technical Requirements for Track-mounted Seats*' section of this information sheet, copies of the relevant test certificate and related documentation must be supplied along with clear evidence that the seat mounting being certified closely replicates the seat and seat mounting configuration when tested.

If you have any queries or require any further clarification relating to this Information Sheet, please feel free to contact the technical team at the LVVTA office on (49) 238-4343.