

Main findings of the ANEC accident study of the Performance of Restraints Used by Children Aged Three Years and Under

Children up to four years of age would be better protected if they travelled rearward facing in a suitable child restraint, rather than forward facing as is the current norm in most of Europe. Suitable seats are widely used in the Nordic countries, but are not readily available in the rest of Europe. The law and the supply of seats, together with the information for parents, are in urgent need of revision.

This is the conclusion of a recent study commissioned by ANEC looking at the lessons to be learned from accidents in the UK, US and Sweden.

Background

ANEC, the European consumer voice in standardisation, commissioned a study to contribute to an understanding of how children aged three years or less should best be restrained in cars. The work was carried out by Vehicle Safety Consultancy, UK. There is a mix of current practice, with Nordic countries traditionally keeping their children in rearward facing restraints until three or four years old, whereas the rest of Europe and the US traditionally turn their children forward facing at around one year of age or less. For many years, researchers studying the performance of restraints in the field have found that whilst either form of restraint provides major benefits compared with being unrestrained, rearward facing restraints appear to offer the highest overall levels of protection for younger children.

The current study has been undertaken to examine the hypothesis that keeping children rearward facing until they are four years old would be the best method of improving protection for this age group. This hypothesis is attractive as it could be done quickly, with existing technology that is in normal everyday use in Nordic countries and existing products approved according to R44.

Major findings from this study

The UK, US and Swedish databases all have examples of unexpected poor protection in forward facing child seats. The problems concern neck injury, head injury, chest and abdominal damage resulting in disability or death of the child. In these cases where there are problems, use of well designed rearward facing child restraints would have prevented the injuries seen in most cases. In Scandinavian countries normal practice for the last 20 years has been very different, with children carried rearward facing until they are around four years of age. The statistics illustrate a notable decrease in the severity of injuries to children aged 2 to 4 travelling rearward facing; consequently rearward facing restraints are not only safer, but Swedish experience shows also, that there are no disadvantages associated with this policy.

The literature contains clear information that car bodyshells are getting stiffer in frontal impact, as vehicle manufacturers seek to maximise adult protection in consumer information programmes, such as Euro NCAP, that potentially influence their market share. However,

Children's restraints have not yet evolved in a similar way to optimise child protection in this new and more severe deceleration environment. Use of the larger rearward facing child seats for children up to four years of age would contribute to counteracting this increase in the severity of impacts experienced by restrained children. Without such a change, it seems likely that the incidence of overload for children in forward facing child seats is likely to increase in the future. To maximise the protection for restrained children, it is important that additional loading from luggage is avoided by more rigorous strength and test requirements for rear seat backs.

For the rearward facing child restraints themselves the following points emerged as important in order to maximise their effectiveness:

- The possibilities for misuse must be minimised by design
- The child seat shells need to be large enough to ensure that the larger child's head is well contained during the impact
- Energy absorption within the child seat, in the area where the head will contact is important in ensuring tolerable skull loading and brain deceleration.

Within the car, for rearward facing child seats to deliver their best protection, it is important that:

- All occupants are restrained in order to avoid unfavourable interaction with the restrained child .
- The passenger's frontal protection airbag is switched off reliably or disabled in some way when a rear facing child restraint is placed on the front passenger seat.
- The vehicle designer anticipates that children may be seated in a rearward facing child seat and that countermeasures, such as side curtain airbags, should anticipate a child's head in the appropriate area.
- Space is allowed within the vehicle to accommodate rearward facing child restraints suitable for children up to four years of age.

ANEC conclusions and recommendations

ANEC concludes, in common with all other investigators who have examined this topic, that the rear facing restraints offer advantages over the forward facing restraints at least up to the age of four years.

It is clear that a wide gulf has developed between the conclusions of the technical community, based on accident and test experience, and the guidance provided to consumers via legislation. The technical community appears unanimous that rearward facing restraints offer the best protection until the child is around four years old. However, through the Mass Group classification European legislation implies that it is safe for a child to travel forward facing from 9 kg onwards. For an average child 9 kg represents ten months of age for females and eight months for males. It is clear therefore that the consumer is not receiving

the best technical advice via the current mass group approach within legislation. It is notable that the average four year old weighs around 16.5 kg.

Also, in response to consumer crashworthiness programmes primarily focused on adult protection in the front seats, cars are getting stiffer in frontal impacts. It is now necessary to reconsider the legislative position on child protection.

A fundamental decision needs to be taken; do the legislators wish to insist that all children up to four years old are carried rearward facing and thus having a higher level of safety, or do they wish to simply provide parents with the choice of forward or rearward facing restraints for this age group? The alternative of simply trying to make it easier for parents to obtain either rearward or forward facing restraints for this age group is a clear shortfall of the existing legislation and might have fatal consequences for children. But parents are not aware that this choice may have fatal or life threatening consequences because they expect legislation not to menace children's life. Before more car accidents result in children's death or disability, which could have been actually prevented, ANEC feels that there is urgent need to change the current legislation to ensure a high level of protection. A legal requirement for rear facing restraints for this age group would be the clearest expression of the technical consensus that rear facing restraints provide the best protection. It would give also parents very clear unambiguous information.

Hence, ANEC is urgently calling for a change in the UNECE Regulation 44, which should rapidly phase out approval of forward facing Group 1 seats in R44.04. ANEC further demands that the production and sale of forward facing CRS for a minimum defined age is stopped after five years. ANEC calls for the supply of existing GI rearward facing seats throughout Europe that allows parents to enjoy the benefits currently confined to parents and children in the Scandinavian countries.

ANEC in brief

ANEC is the European consumer voice in standardisation, representing and defending consumer interests in the process of standardisation and certification, also in policy and legislation related to standardisation. Our aim is a high level of consumer protection. ANEC was set up in 1995 as an international non-profit association under Belgian law. We represent consumer organisations from the European Union Member States and EFTA countries. The European Commission and EFTA fund ANEC, while national consumer organisations contribute in kind. The ANEC Secretariat is based in Brussels.

The study is available at:

<http://www.anec.eu/attachments/ANEC-R&T-2008-TRAF-003.pdf>

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