

## GUIDANCE: SEAT INSTALLATION

Motorsport UK has committed to an in-depth review of competitor safety equipment. This review includes initiatives aimed to reduce the burden on competitors of the unnecessary replacement of safety equipment, while ensuring suitably high standards of safety are maintained in the sport.

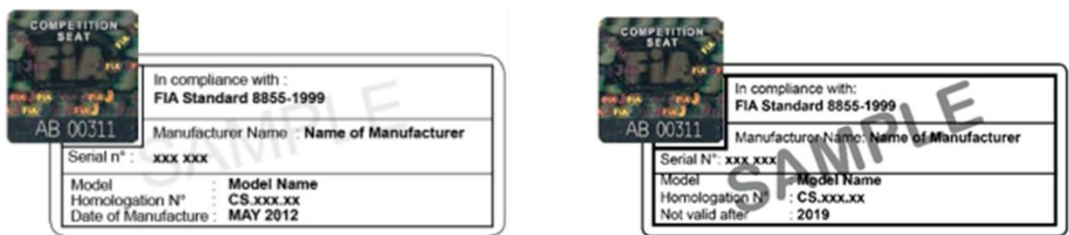
As a result of this review, Motorsport UK will recognise an extended life for certain FIA-homologated seats. In stage rallying, seats homologated to the FIA 8855-1999 standard are granted a two-year extension at the end of their initial five-year life.

A cornerstone of this initiative is to provide greater education for competitors in respect of their own safety and to place more responsibility on the competitor to maintain a level of safety equipment, above a defined Motorsport UK minimum standard.

### How will this affect my seats?

To find out when your seats will be valid until, you will need to look at the FIA homologation label. All seats manufactured since 1 January 2012 will have an FIA homologation label overlapped by the FIA hologram in the top-left corner.

There are two variations of the FIA 8855-1999 homologation label; some will show a manufacture date (month/year) and some will show a 'not valid after' date (year only). Examples of these homologation labels are shown below.



To work out the validity of an 8855-1999 standard seat with a label which shows a manufacture date, add seven years to the year shown on the label. For example, a label that shows a manufacture date of May 2012 will be valid until 31 May 2019. A seat with a manufacture date on the label will always be valid until the end of the month seven years from the date printed.

To work out the validity of an 8855-1999 standard seat with a label which shows a 'not valid after' date, add two years to the year shown on the label. For example, a label that shows a not valid after date of 2018 will be valid until 31 December 2020. A seat with a 'not valid after' date on the label will always be valid until 31 December two years from the date printed on the homologation label.

### Installation

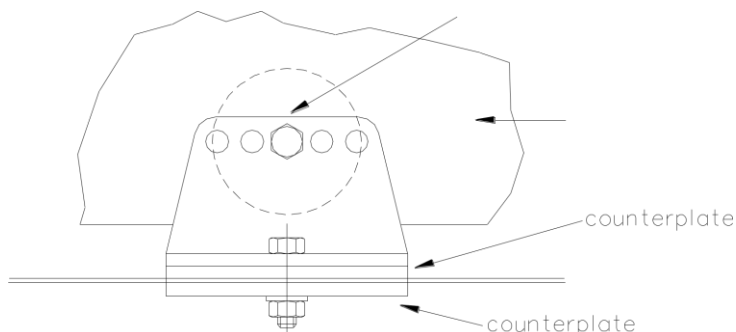
The seat safety system comprises the seat and its mountings; this is one of the most critical safety systems within the vehicle as any failure here will reduce effectiveness of other items such as harnesses and your Frontal Head Restraint (FHR). Accident data and statistics show it is more common for the seat mountings to fail than the seat itself, therefore it is vital that the seat is mounted correctly.

Regulations give a specification for the mounting of the seat directly to the bodyshell/chassis in section K2.2.1 to K2.2.3 of the Motorsport UK Yearbook.

These regulations apply for either a base mounted seat where the seat is bolted directly to the bodyshell/chassis, or a side mounted seat where the seat supports are bolted to the bodyshell/chassis and the seat is bolted to the supports. They require the seat to be attached via a minimum of four mounting points using bolts of at least 8mm diameter.

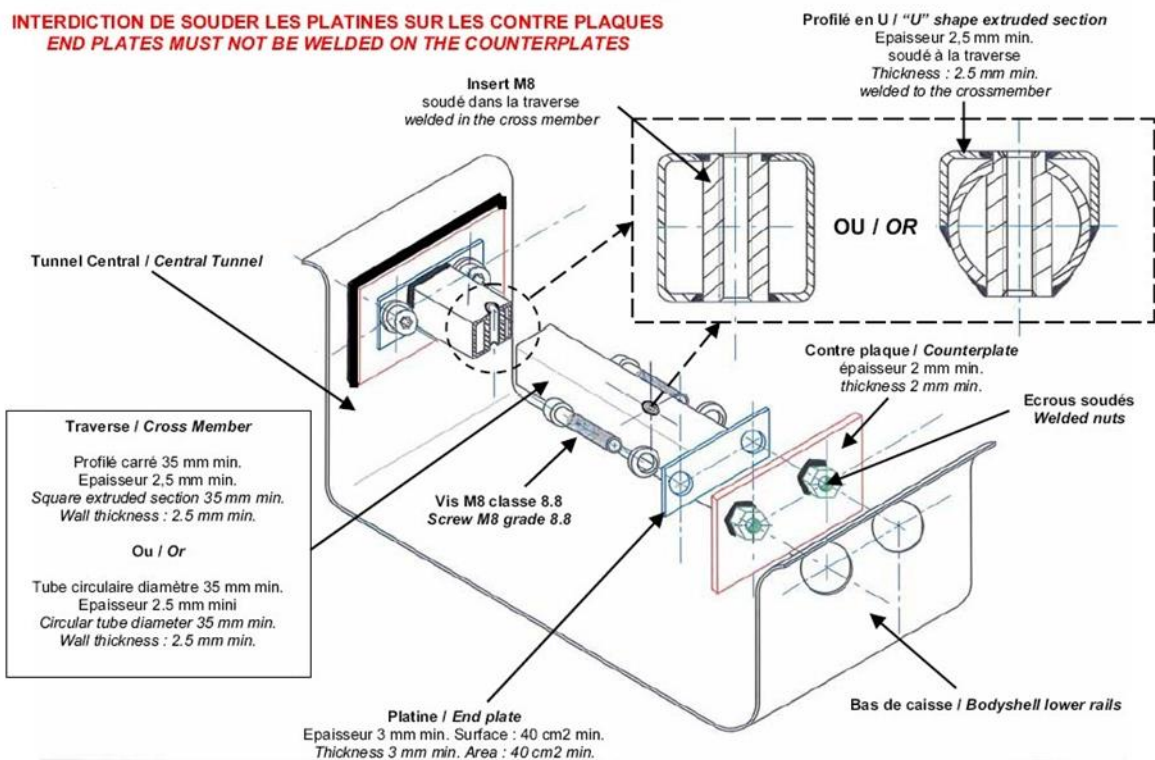
Each of these mounting points is to be reinforced by counter plates above and below the bodyshell/chassis, effectively sandwiching the vehicle structure. This is shown in drawing 32 in Section K in the Motorsport UK Yearbook, reproduced on the right.

These counter plates must be at least 40cm<sup>2</sup> per mounting and must be a minimum thickness of either 3mm for steel or 5mm for light alloy.



There is also an option within FIA Appendix J regulations for mounting seats to a transverse cross member; the drawing below (reproduced from FIA Appendix J) details the requirements for this mounting method. The transverse cross member of either square or tube section with end plates is bolted to a counter plate at each end; the counter plate is welded to the transmission tunnel and the bodyshell outer rails.

The seat supports are then bolted through M8 inserts in the cross member. Note that if a tubular cross member is used then a U-shaped extruded section must be welded to the tube to provide a flat surface for the support to sit on.



In addition to these methods, for vehicles originating as Series Production Cars the manufacturer's original seat mounting points may be used. There is also the ability for manufacturers of FIA-homologated cars to detail a method of mounting within the homologation form as an Option Variant (VO).

## **Supports**

Seat supports are often referred to as mounting plates or side mounts and they are used to connect the seat to the bodyshell/chassis.

For seats homologated to the FIA 8862-2010 standard, the supports are homologated with the seat and these specific homologated supports must be used for the seat homologation to be valid.

For seats homologated to the FIA 8855-1999 standard, the supports do not form part of the seat homologation. The regulations do specify that the minimum material thickness as 3mm for steel or 5mm for light alloy. We recommend that you seek the manufacturer's advice on what supports are compatible with your seat, as universal mounts may not always be compatible.

## **Seat fit**

An important consideration when choosing your seat is to ensure it fits your body size and shape, as seats come in a number of different sizes and fits. If the seat is too big for the occupant, he or she could come out of the seat in an incident, and likewise if the seat is too small the occupant may not be able to be seated securely.

The shoulder harness holes should be aligned with the occupant's shoulders. If the harness holes are below the shoulders, when pulling the harness tight the occupant's spine will be compressed which can lead to serious spinal injuries in an accident. If the harness holes are too high the harness shoulder straps will interact with the seat and not securely restrain the occupant. This will also adversely affect the effectiveness of an FHR device.

The seat padding is an important part of the seat's safety as it ensures the occupant is securely located in the seat and protected in an accident. If the foam is removed to allow a larger person to fit in a smaller seat then the effectiveness of this protection is reduced. Likewise if too much foam is used to accommodate a smaller occupant.

## **Maintenance**

With the extended validity of seat homologation, it is important that as the competitor you take responsibility for the care and maintenance of your equipment. If you have any doubts or concerns over the condition or installation of your seats, please consult the manufacturer.

Seats should only be mounted in accordance with the manufacturer's instructions and Motorsport UK or FIA regulations. Do not modify the seat shell in any way as this will invalidate the homologation; remember this includes the seat supports for those homologated to FIA 8862-2010.

Regular checks and maintenance should be performed during the life of the seat to ensure it remains in good condition.

The seat itself should be checked regularly for damage; a solidly mounted seat with a correctly restrained driver can be subject to some extreme forces during regular stage rally use, for example. Therefore, even if the seat has not been involved in any accidents it could still suffer damage through the normal wear and tear of competition. Stresses in the fabrication of the seat can show as cracks or lighter coloured stress lines in fibreglass or carbon.

Composite shelled seats are often left untrimmed at the rear, so they can be checked easily for cracking and damage; particular attention should be paid to high stressed areas such as the lower part of the back rest and around the support mounting areas. It is also sensible to pull on the shell and look for any excessive flex in the seat and movement in the fixings.

Steel framed seats can be harder to check unless the covers are removable, but any damage visible on the outside of the seat will be an indicator of potentially more serious damage inside.

The seat supports should be checked regularly for security, ensuring the bolts remain tightened to the manufacturer's recommended torque. They should also be checked visually for any cracking, distortion or corrosion. Pay particular attention to ensure the bolt holes have not become ovalised, and for supports with multiple bolt holes/slots for adjustment, check for cracking between the holes.

The mounting points on the bodyshell/chassis should also be regularly checked for any cracking or corrosion.

### **Accidents**

It is important that if your vehicle is involved in an accident you do not simply assume that your seat system will be OK to use again. Even what appears to be a minor impact can put huge loadings through the seat and its mountings.

Following an accident your seat and its mountings should be carefully inspected for damage; the manufacturer should be able to advise you. If there is any damage to the seat or supports, please seek the manufacturer's advice before using the seat again, or else dispose of the equipment.

### **Conclusion**

A seat system is not an 'install and forget' piece of equipment and it is your responsibility to ensure it is installed and maintained correctly. Remember that no matter how good your seat is, it is only going to be effective if it is installed correctly, so as much careful consideration should be given to the mounting points and supports as to the seat itself.

If you have any questions over the use and installation of seats, please contact the Motorsport UK Technical team at [technical@motorsportuk.org](mailto:technical@motorsportuk.org) or on 01753 765000.