



# Safety Cage Structures

## Frequently Asked Questions

A Safety Cage Structure is an integral safety element in motorsport. Its job is to ensure that the integrity of the occupant space within a vehicle is maintained during a motorsport incident.

Motorsport Australia Technical manage the process for the approval of any Safety Cage Structure by Motorsport Australia. Motorsport Australia Technical are here to help with any questions or queries in regard to Safety Cage Structures. This can be to discuss a design alternative, or an issue with a particular build or what the basic requirements are for the car being built. Any issues identified before the build can be easily resolved therefore removing the pressure of approval and changes once a Safety Cage has been fitted to a vehicle.

Contact Motorsport Australia's Technical department for Safety Cage information and approvals.

### **Motorsport Australia Technical**

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1300 883 959

### **References**

Motorsport Australia Manual Schedule J

[motorsport.org.au/regulations/manual/general-requirements](https://motorsport.org.au/regulations/manual/general-requirements)

Motorsport Australia Safety Cage Registration Forms

[motorsport.org.au/regulations/logbooks](https://motorsport.org.au/regulations/logbooks)

## Safety Cage Structure Registration

*For Race, Rally/Road, Off Road, Speed, Autotest*

Safety Cage Structure registration is the process of the approval by Motorsport Australia of a Safety Cage Structure, compliant with Schedule J.

Once approved by Motorsport Australia each Safety Cage is issued with a Motorsport Australia Safety Cage registration label and the completed Motorsport Australia Safety Cage Registration form. The Safety Cage Label is to be fitted to the safety cage on the driver's side of the main hoop or back stay and preferably in a central position where it can be easily viewed (through the vehicle's side window if applicable) or for a Type 1 structure in an easily viewed position for the purposes of scrutineering. The completed registration form is to be kept with the other documents for the vehicle, such as the log book, so that it can be viewed on request by a Scrutineer.

## Approval

To be approved each Safety Cage Structure design and specification must be submitted to Motorsport Australia (Technical) with the following:

1. A current Safety Cage Structure Registration Form, completed in full [motorsport.org.au/regulations/logbooks](http://motorsport.org.au/regulations/logbooks), and
2. The required pictures detailing the design as fitted to the vehicle.

Note: Motorsport Australia Technical may require additional pictures if an area is unclear in the photo's provided.



### Safety Cage Registration Before the Car Build is Complete

A Safety Cage Structure may be registered once the structure is completed in the bodyshell and prior to the completion of the entire build of the vehicle. This is highly recommended so that any identified issues can be addressed prior to any painting of the safety cage and completion of the vehicle for competition. That way should any change be identified this can be actioned without the need to undertake disassembly or removal of other components.

### Safety Cage Structure Certification

Safety Cage Structure Certification by Motorsport Australia is applied in accordance with the requirements for the certification of a Safety Cage Structure by the FIA.

A Certified Safety Cage Structure is required where:

1. The materials used are not compliant with Schedule J (such as the use of chromoly)
2. The design criteria of Schedule J cannot be achieved or requires a variation, and
3. The vehicle is to be used in FIA International Events or may also be required for FIA ASN events (events in other Countries)

Safety Cage Certification requires that each Safety Cage Structure design and material specification is approved by Motorsport Australia prior to the build by the completion of a Safety Cage Certificate Supplementary Dossier (Sup DOS). Each structure will also require specific analysis in accordance with the FIA Homologation Regulations for Safety Cages requirements, with this analysis conducted only by an Engineering company approved to do so (FIA Technical List 35).

Anyone considering Certification of a Safety Cage will need to contact Motorsport Australia Technical in advance of the build. This will ensure that this process is clearly detailed prior to the commencement of the build of the Safety Cage Structure.

## Safety Cage Build Criteria – Motorsport Australia Manual Schedule J

### Compulsory members

Compulsory members are detailed in Schedule J of the Motorsport Australia Manual.

[motorsport.org.au/regulations/manual/general-requirements](http://motorsport.org.au/regulations/manual/general-requirements)

These members include:

1. **Main roll bar:** A transversal and near-vertical (maximum angle +/-10° to the vertical) single piece hoop located across the vehicle and immediately behind the front seat/s
2. **Lateral half roll bar:** (type 3 full safety cage): Also referred to as a 'front leg'. A bar, the shape of which from the Main Roll Bar follows the A pillar to a mounting point on the floor
3. **Transversal member:** A transversal tube joining the roll bars or backstays
4. **Backstay:** A straight and near-longitudinal member located rearward between the top of the main roll bar or off a lateral roll bar, and the bodyshell/chassis
5. **Diagonal member:** A tube between a top corner of the main roll bar, or (in the case of a lateral roll bar) one end of the transversal member, and the lower mounting point of the roll bar on the opposite side or between the upper end of a backstay and the lower mounting point of the other backstay. Please refer to the manual for extra requirements for dual occupants
6. **Door bars:** For Off Road competitions, State Championship and above level Race and Rally competitions (and recommended in other competitions). One or more door bars must be fitted at each side of the vehicle
7. **Roof reinforcement:** For Off Road competitions, National Championship and National Series level Race and Rally competitions (and recommended in other competitions). Please see the manual for the different configurations allowable
8. **Windscreen pillar reinforcement:** For National Championship and National Series level Race, Rally and Off Road competitions (and recommended in other competitions)

### Optional members

The use of optional members are those that are not a compulsory requirement of the Safety Cage Structure.

They may include:

- Front suspension mounting points
- Safety harness mounting bars
- Reinforcement or gussets

### Minimum mounting points

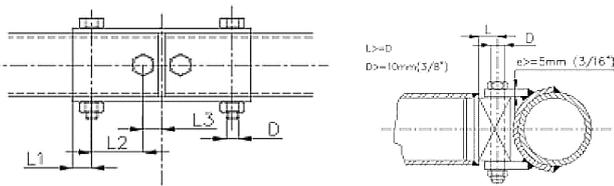
Each mounting point/foot can be either bolted or welded using the specifications listed in article 18 of the manual.

- one for each pillar of the front roll bar
- one for each pillar of the lateral roll bars or lateral half roll bars
- one for each pillar of the main roll bar
- one for each backstay

Each mounting point listed above must be attached directly to the chassis/body of the vehicle.

### Dismountable or removable members

Removable members may be incorporated subject to the use of dismountable joints complying with the Drawings in the Motorsport Australia Manual or a joint Homologated by the FIA or Motorsport Australia or other ASN with the approval of Motorsport Australia. Such joints cannot be welded once assembled.



Examples of joints contained in the Motorsport Australia Manual



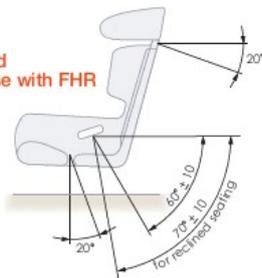
FIA Homologated joint example

## What's New for 2017 and beyond

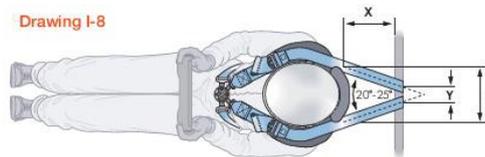
From 1 January 2017 it is permissible to add members to an existing Safety Cage Structure to increase safety in areas such as door intrusion, roof members and safety harness mounting. Safety harnesses used with Frontal Head Restraint (FHR) have a specific angle range for the shoulder belts which may make some structures fall outside of the acceptable range as described in Schedule I

[motorsport.org.au/regulations/manual/general-requirements](http://motorsport.org.au/regulations/manual/general-requirements)

Drawing I-9 Recommended harness placement with use with FHR



Drawing I-8



From 1 January 2017 it is a requirement that intrusion bars when fitted to the driver's side must be replicated on the other side of the vehicle. This does not mean that an existing Safety Cage Structure must be upgraded to comply although it is highly recommended.

## Common Problems

A number of common issues Motorsport Australia Technical see on a regular basis is the attachment of the back stays and spacing of members to specific points such as diagonal bars and A pillar support bars.

**Back stays:** Back stays must be attached to the body shell or chassis. Image 1 demonstrates the wrong orientation of the back stay as it is connected to a cross bar and not directly to its own mounting point on the bodyshell or chassis. Image 2 is the correct orientation and attachment as it is fixed to its own mounting point. Please contact Motorsport Australia Technical if you have any question on your build.



Image 1



Image 2

Note: The yellow lines show the backstay member orientation

The back stay must also be attached to the main roll bar on the upper section of the radius towards the upper horizontal section of the main roll bar. Image 3 shows the backstay on the lower section of the radius which is not correct where Image 4 shows the correct position on the back stay.

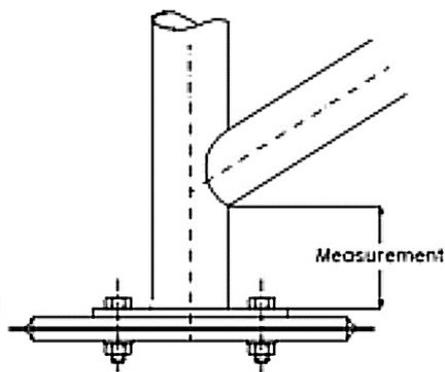


Image 3



Image 4

**Maximum measurements:** The Motorsport Australia Manual also includes maximum measurements for members such as diagonal bars and A pillar support bars. The maximum measurement of 100mm applies to these members as shown in the diagram below.



**A pillar support:** A pillar support bars also have the requirement to be attached at the top and bottom within 100mm of the front leg foot and the transversal member (upper windscreen bar). This support bar can be attached in several pieces through the side intrusion bars as shown in Image 5.



Image 5