

Bolt-in Roll Cage Fitting Instructions

Please read these instructions all the way through before starting, since the order of work is important.

Under no circumstances, should air powered or electric powered nut guns be used. Only use hand tools.

Due to the many differing vehicles to which Safety Devices roll cages are fitted, these instructions are of a general nature and not specific to your vehicle. If you have any issues during installation, please call or email our technical team who can provide advice.

Roll cages must not be fitted to any car with significant rusting of the body shell, especially in areas near where the cage will be bolted down. For the rear cage assembly this usually applies to the rear wheel arches, base of 'B' pillars and adjacent floor or sills and to the floor toe-board or sills near the front door pillars for the front cage. Furthermore, if the vehicle has ever suffered any accident damage, the body shell may be distorted and therefore the roll-over bar or front cage may not fit.

Safety Devices' roll cages are delivered as a finished item, so any alteration to the assembly by welding, repositioning, removal/addition of fittings, drilling/enlarging of holes, incorrect fitment to vehicle or use for something other than its designed purpose will lead to the producer being released from any and all responsibility in the event of performance failure of these goods. If the cage is of a homologated design, any of the above will also void any homologation status on the product.

Section 1 - Saddle brackets, Slipper Tubes and Lap Joints.

Section 2 - Preparation of vehicle prior to installation

Section 3 - Unwrapping and inspection of products

Section 4 - Test installation and mounting point preparation

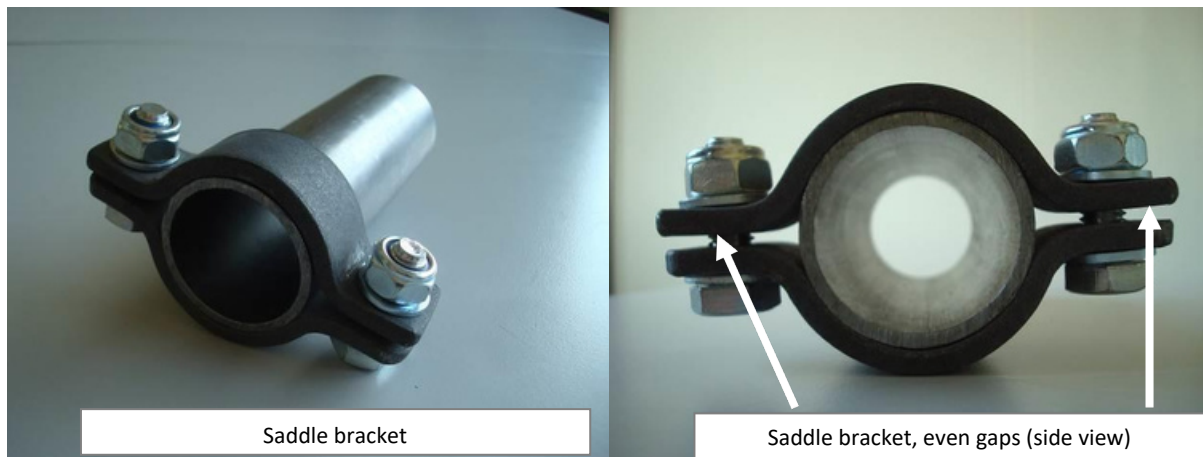
Section 5 - Cage removal and welding of mounting points

Section 6 - Final cage installation and refitting to vehicle

Section 7 - Generic assembly drawing and glossary

Section 1 – Saddle Brackets, Slipper Tubes and Lap Joints Fitting Instructions

1.1 When tightening the saddle bracket joints, it is critical that each side of the saddle bracket is tightened equally to ensure that the gaps on each side are kept even. When fully tightened, the tabs should not be in contact with each other (see picture below). The M10 bolts used in saddle bracket tubes should be torqued to 30Nm.



1.2 Slipper Tubes - These will be found loose in your fitting kit, already cross-drilled. When the cage is test fitted in the next section, the slipper tubes should be slid into position and only drilled once all other brackets have been tightened up. The orientation of the slipper tube should be consistent side to side and sensitive to where the joint is within the cage. The M10 bolts used in the slipper tube joints should be torqued to 45Nm.



1.3 Lap Joints - These should have both holes aligned before shoulder bolts are inserted (as per photos below). Should you have any difficulty in aligning the joints, you can use a Gclamp to pull the sides together. Under no circumstances should a pry bar be used to align the joints as this may damage the threads.



1.4 To bolt together, insert and tighten both bolts part of the way into their threads. Where multiple joints are fitted to a cage, ensure that all bolts have been fitted to all joints partially before you begin to tension any joints up. Warning: the threads are fragile and if damaged may require that section of cage to be replaced.

1.5 A thread lock such as Loctite 243 should be used when the M10 shoulder bolts are torqued to 60Nm.

Section 2 - Preparation of Vehicle Prior to Installation

2.1 If the car is still fully trimmed, remove the following parts from the car:

- The front and rear seats.
- The carpets, under felt and rear wheel arch trim where the rear cage will stand.
- The front seatbelts and, if necessary, the 'B' pillar trim, to allow the rear cage to pass between the 'B' pillars.
- Sunvisors or interior mirrors in around the windscreen may also need removing to clear
- the front cage.
- Some roll cages may require head lining to be removed.
- For cages that penetrate the dash board, the dash board and 'A' pillar trim may need to be removed (and trimmed up on re-installation).
- Some modern roll cages may require all interior trim to be removed.

2.2 Most of our cages will require reinforcement plates to be welded to the floor of the vehicle. For safe welding to take place and to minimise damage to the vehicle the battery should be disconnected. It is also necessary to drain the fuel system and remove the fuel tank, ensuring that any spillages are cleaned up. Doing this work well in advance is always advisable, where possible.

2.3 Please note that the cage must never be fitted on top of carpets or under felt: it must be attached directly to the vehicle body.

Section 3 - Unwrapping and Inspection of Products

3.1 Unwrap the individual cage parts and fitting kits. Use a knife to cut the plastic, taking care not to damage the powder coat.

3.2 You will find that for each mounting point of the cage, you will have a fitting plate (some have more than one) and a selection of fasteners. The plates will usually be unpainted as they are designed to be welded into the car.

3.3 Should you find that any parts are missing, please get in touch with your stockist/dealer first. They will then contact us if required and we may contact you directly to discuss any issues.

Section 4 - Test Installation and Mounting Point Preparation

4.1 The first stage of the installation requires a test fit of the cage to define the correct position at each mounting point. The cage will then be taken out and refitted again at the end of the process.

4.2 Stand the rear cage assembly on its four feet beside the car, with its main hoop towards the front of the car and the backstays towards the rear. If the cage you are fitting has a removable diagonal, this must be fitted in position before installation.

4.3 With the help of an assistant, place the rear roll cage inside the car so that it sits inside on its four feet. It may be necessary to lean the cage forward to allow clearance through the door and it may be easier to remove the vehicle door and/or the steering wheel to improve access.

4.4 The cage is designed to be a tight fit inside the car, the main hoop or backstays may be difficult to get past the 'B' pillar either side. If this is the case you can aid fitting by applying a tourniquet to the bottom of the backstays or base of the hoop and pulling them together just enough to allow clearance.

4.5 Move the rear cage rearwards in an upright position, releasing the tourniquet(s) if applied. The rear cage should sit at rest with the main hoop upright (some cages lean slightly) and the backstay feet on the rear wheel arches or floor between the wheel arches, depending on the model being fitted.

4.6 If only installing a rear cage, please follow the same procedure as below but ignore any reference to a front cage.

4.7 Insert either of the front legs through the corresponding door and locate the upper end onto the saddle bracket or lap joint on the main hoop. Position bolts to hold it in place but do not

tighten at this point. In some instances where the cage is very close fitting, the rear cage may need tilting forward to achieve this. The lower end will sit on the floor.

4.8 Attach the screen rail to the corresponding bracket on the front leg in a similar manner.

4.9 Attach the remaining front leg to the rear cage, and then to the top rail - it may be necessary to temporarily position the legs away from their final positions to achieve this.

4.10 If you have difficulty in installing using the above process, an alternative method is assemble the front legs to the top rail inside the car before attaching the assembly to the rear cage, tilting the rear cage as required.

4.11 If unique doorbars are to be fitted (the main hoop and front legs will have saddle bracket or lap joint mountings welded in to position) the doorbars should be loosely bolted in to position now to ensure correct spacing between the front and rear cages.

4.12 With the cage loosely assembled inside the vehicle the joints should all be tightened using the methods and torque values outlined in Section 1.

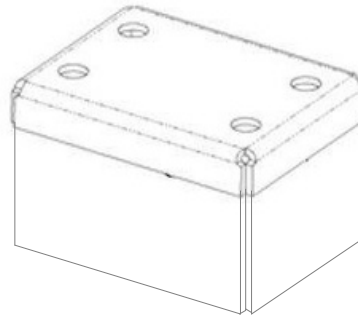
4.13 The cage can now be centralised in the car ensuring that you have even clearances left to right and front to rear. This is normally driven by the rear cage fitting against the floor and onto the rear arches.

4.14 The mounting plates can now be positioned, starting with the rear cage. Depending on which style of plate is being used there are different methods of positioning them.

4.15 Plates without weld nuts should be located into their intended position beneath each cage foot on the inside of the car. Check that the feet fit flush with the reinforcing plates - each should have complete contact with no gaps. The holes can then be marked on the floor and drilled through to the correct size (usually 11mm).

4.16 Plates that are already fitted with weldnuts are designed to fit above hollow sections such as sills where access from beneath is not possible. The method for fitting these is to mark through the holes in the cage footplates and move the cage away temporarily before cutting holes of 25mm diameter using a hole saw to allow the weld nuts to sink into the void.

4.17 Please be aware that some of the mounting plates supplied with historic cages are of a universal design, so it may be necessary to adjust them to perfect the fit. If your cage has box type mounting plates, as illustrated below, it may be necessary to trim the lower edge of the plate to achieve the best fit. Adjustments such as bending slightly in a vice or grinding/filing metal away will help ensure a snug fit.



4.18 More modern cages have specific mounting plates which should not require the same level of attention, although there can sometimes still be varying tolerances between vehicles so slight adjustments to mounting plates may be required.

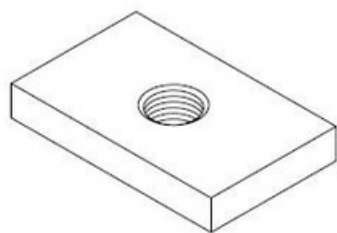
4.19 Once the rear cage plates have all been positioned and the holes drilled, they should be bolted up using the hardware provided in the fitting kit.

4.20 With all the rear plates in position, the fitting process can be repeated for the front leg mounting points.

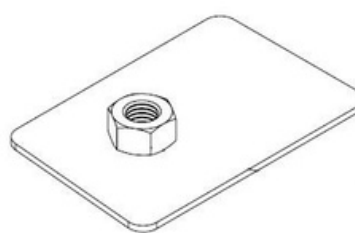
4.21 The areas around the mounting plates should have the paint removed with a file/grinder to provide an earth for welding.

4.22 This section only applies to cages with additional multipoints. Please ignore Section 4.22 if you are just installing a 6 point roll cage. Depending on the roll cage, some multi-point fixings bolt in to existing mounting points on the body shell. If necessary, other multi-point fixings will be supplied in the fitting kit – this kind require tack-welding in to position on the body shell. To tack-weld, hold the fixings in position with a bolt through the multi-points on the cage and make sure they fit snugly to the shell (washers can be used as spacers if required). Some minor dressing of the shell or plates might be required to ensure a really close fit. They may now be tack-welded in position.

Examples of multipoint fixings to be welded to body shell:



Tap Pad



Backing Plate

4.23 With all the roll cage mounting plates in position they can be tack welded to the shell at 3 or 4 locations on each plate.

Section 5 - Cage Removal and Welding of Mounting Points

5.1 Unbolt all mounting points and remove the cage from the car.

5.2 You can now access all of the mounting points and fully weld them to the body of the vehicle.

5.3 At this stage it is recommended to clean up any spatter and wire brush any burnt paint away. The area should be painted with a zinc enriched primer and a top coat applied if required. The RAL code for our black powder coat is RAL9005 (Black Satin).

Section 6 - Final Cage Installation and Refitting to Vehicle

6.1 The cage can now be installed in the vehicle. As before, loosely assemble it in the car ensuring that all joints have hardware installed loosely.

6.2 The bolts mounting the cage to floor should be tightened up first; the torque value for these is 45Nm. **Where a bolt is being installed onto a mounting plate or multi point plate with a weld nut or captive nut, a thread lock such as Loctite 243 should be applied**, along with a flat washer and spring washer. Only then may the bolts joining the cage components together be tightened.

6.3 In some cases it is necessary to reposition the mirror and sun visors as the front cage is obstructing them.

6.4 Finally, replace the seats and interior trim that you removed at the start. Carpets will need to be trimmed to fit around the tube/mounting plates installed in the car. Do not be tempted to install the carpet over the fitting plate and position the cage above the carpet – this is not an acceptable method of installation.

Section 7 - Generic Assembly Drawings

