

# BMW E46 Coupe 3dr MP Bolt in (BMW Race Days Only) Roll Cage (B045) Fitting Instructions

Unwrap the mounting points/ends of the roll cage and unpack the individual fitting kits. Try to leave wrapping on the main lengths of the cage as this will help prevent any damage to the cage caused by the initial fitting process. At this point it is recommended that all the main components are checked against the assembly drawing provided on page 14 of these instructions. Should any parts or fixings be missing at this stage, or during installation, please contact your stockist. Throughout the assembly M10 Bolts will be used; the torque setting for this size is listed below:

M10 - 45Nm

Lap Joint Bolts – 45Nm

During the installation, it will be necessary to cut and drill the vehicle. It is important to primer and paint the exposed areas to prevent rust and corrosion.

During the installation, you will find it beneficial and in some cases essential to have the following tools/consumables:

- A comprehensive socket set with torx/star drives, hex heads and extension bars
- A comprehensive set of ring and open spanners
- A selection of screwdrivers and trim removal tools
- A drill with a variety of drill bit sizes, hole saws and a step drill
- An air saw or equivalent as well as an angle grinder
- Taps make to be a useful tool on tight fitting threads
- Masking tape, a tape measure, marking implements and scissors
- Sealant, copper grease, primer and paint to suit the vehicle
- Safety equipment- goggles, gloves, ear defenders and steel toe capped boots.

Tools required specific to the installation of this cage include:

- 19mm and 32mm hole saw
- 8.5mm drill bit
- 10mm x 1.5 tap and wrench

The assembly process of this roll cage is separated into several different sections:

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## Section 1 – Saddle Bracket Fitting Instructions

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).

**Saddle brackets to be torqued to 30Nm.**



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

## Section 2 – Shell Preparation

- 2.1 Disconnect the battery and ensure that the terminals are covered. Remove the front and rear seats, all of the interior trim and carpets as well as the airbag and steering wheel. Caution must be taken when removing the airbag(s), they are explosive devices so ensure there is no power running to the vehicle prior to any interference with the device.
- 2.2 Remove any components necessary in order to be able to remove the dashboard. Loosen all the bolts which are holding the dashboard in place and then disconnect any accessible connectors that are present connecting the dashboard to the electrics of the vehicle. Once these have been disconnected, remove the loosened bolts that are holding the dashboard assembly in position. Carefully slide the dashboard assembly backwards and disconnect any remaining connectors.
- 2.3 Carefully slide the assembly out of the vehicle through a door aperture and place aside where it will not get damaged.
- 2.4 With the dashboard removed it is now possible to do some small modifications which will allow the front legs to fit correctly. Shown in Figure 2.4 the brackets on the end of the dash bar need to be cut down. As standard there is a folded lip in this area which needs to be trimmed off. This applies to both sides.



Fig 2.4



Fig 2.5

- 2.5 Fig 2.5 shows another modification to the dash bracketry necessary for the correct fit of the LH front leg. Shape the metal to how shown in Fig 2.5 either by grinding or trimming. This is only necessary on the passenger side.



Fig 2.6a



Fig 2.6b

- 2.6 Clean the paint from around the rear suspension turrets (Fig 2.6a) and bolt the rear strut bracket turret brackets in place (Fig 2.6b). Position the strut brace in the car (Fig 2.6c and Fig 2.6d) and mark the lower bolt positions. Using the 32mm hole saw, drill through the floor creating holes for the weld nuts located on the underside of the weld plates.



Fig 2.6c

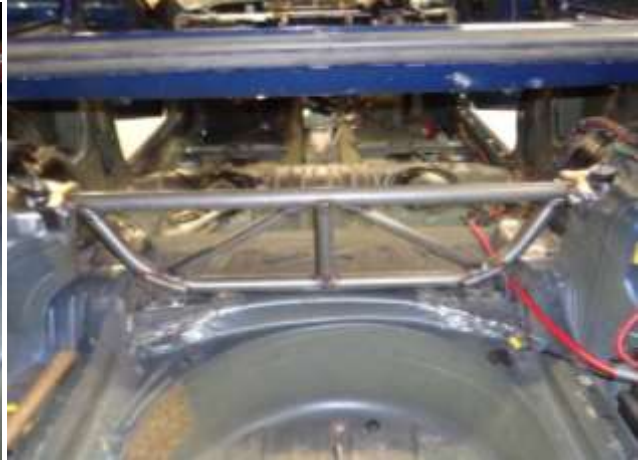


Fig 2.6d

- 2.7 Remove the strut brace and then bolt the weld plates to the strut brace. After removing paint from the weld plate areas reinstall the strut brace into position and lightly tack the weld plates and turret brackets in place. The weld plates should sit nicely against the floor of the car. If satisfied with the fitment and all holes are correctly aligned, remove the strut brace and fully weld all plates and brackets to the car (Fig 2.7a and Fig 2.7b).



Fig 2.7a



Fig 2.7b

- 2.8 Clean paint and sealer from all necessary places. Backstay plate positions can be determined by measuring 684mm from the inside of the boot at the position shown in Fig 2.8a, forwards. This distance is to the rear of the backstay weld plate, as shown in Fig 2.8b



Fig 2.8a



Fig 2.8b



Fig 2.8c

2.9 With the plates in position, mark the hole centres and using the 32mm hole saw, drill through the shell to make room for the weld nuts. TAKE EXTREME CARE ON THE RHS AS THE FUEL FILLER NECK IS UNDERNEATH THE BACKSTAY PLATE LOCATION. After drilling, place the plates back into position but do not tack weld yet.

2.10 Remove the loom mounting points just behind where the B hoop will sit (Fig 2.10a and Fig 2.10b).



Fig 2.10a



Fig 2.10b

2.11 Place the B Hoop weld plates in position and tack weld in place (Fig 2.11a). Position the infill plates as shown in Fig 2.11b (RHS) and 2.11c (LHS) and tack in place. These plates shouldn't require any adjustment for correct alignment due to no bolt holes so they can now be fully welded to completely secure them to the shell of the car (Fig 2.11d and Fig 2.11e).



Fig 2.11a



Fig 2.11b



Fig 2.11c



Fig 2.11d



Fig 2.11e

2.12 Place the front leg plates roughly in position. This will be 325mm forward of the transverse structural member as shown in Fig 2.12a and Fig 2.12b. Do not tack weld yet.



Fig 2.12a



Fig 2.12b

### Section 3 – First Roll Cage Installation

It is strongly recommended that a minimum of two people install the main hoop into the car. Attempting this individually may lead to damage of the cage. It is necessary to remove the handbrake before installing the rear cage. This involves removing two cap head bolts, a hex head bolt and two nuts securing the cables to the assembly.

3.1 Start with the cage as shown in Fig 3.1a. Start feeding the LH B Hoop Leg through the right hand door, rotating the cage as it enters further into the cabin.



Fig 3.1a



Fig 3.1b

Continue feeding the LH leg into the cabin, adjusting to allow the lap joint to clear the B pillar as shown in Fig 3.1c. Lift the hoop so that the top part of the B Hoop is right in the corner of the door as shown in Fig 3.1d – this is necessary to allow the next step to happen without interference. Continue to feed the cage through the car until the LH backstay meets the centre tunnel. At this point the B hoop leg will be trying to exit through the passenger door.



Fig 3.1c



Fig 3.1d

- 3.2 Lift and rotate the rear cage in order for the B hoop leg to pass out the door. It is then possible to continue lifting the rear cage upwards to allow the LH backstay plate to pass over the tunnel. This is the tricky bit so care should be taken. It may be necessary to rotate more in order for the plate to clear the tunnel (Fig 3.2a). With the LH backstay past the tunnel, the rear cage can be passed through the car until it is almost entirely in the cabin. Now is a good time to place it down gently (Fig 3.2b) and reposition for the next steps. It should be centred inside the car therefore both B hoop feet should be just outside of the car.



Fig 3.2a



Fig 3.2b

- 3.3 Start rotating the rear cage clockwise (from right hand side perspective) so that the B hoop begins to sit the right way up. This should be done carefully as space is tight, but it is possible to do this without contacting any parts of the car. The first part of the rotation is the most important as this is when the B hoop foot plates enter the car so rotate slowly to prevent damage to the plates or paintwork.





Fig 3.3a



Fig 3.3b

- 3.4 Continue rotating until it is the right way up as shown in Fig 3.4b. Lift the B hoop until the backstay plates can pass up over the shell and allow the assembly to slide backwards. Take care not to snag any wiring with the plates. Slide it backwards until in position (Fig 3.4d) and then slide the B hoop towers under the foot plates to support it.



Fig 3.4a



Fig 3.4b



Fig 3.4c



Fig 3.4d

- 3.5 Position the B hoop towers onto the weld plates and slide the rear cage as far backwards as possible. Use the 19mm hole saw to make a hole at the bottom of the windscreen pillars, see 3.5a and 3.5b. Put the RH leg into car followed by the LH leg. Don't forget the slipper tube on the roof cross. With both legs inside the vehicle, the lap joint joining the screen rail and LH leg can now be bolted together; the two bolts do not have to be tightened, just threaded enough to secure the

two legs together effectively. Slide the slipper tube over into the correction position, secure with bolts.



Fig 3.5a



Fig 3.5b

- 3.6 Lift the front legs up until it is possible to slide the rear hoop forwards, aligning the lap joints (Fig 3.6a to 3.6d). Insert shoulder bolts into the lap joints securing the front cage to the rear cage. The cage should now be free standing and the foot plates should be in approximately the right location.



Fig 3.6a



Fig 3.6b



Fig 3.6c



Fig 3.6d

- 3.7 Door bars can now be installed. Bolt all plates to the cage and fit tap plates at all positions. Use washers to space the bolts so the end of the bolt is flush with the tap plate. This will allow the tap plates to sit flush against the shell. Insert the two 10mm spacers between the waist height B Hoop brackets and the car, as well as the two 6mm spacers between the car and the brackets on the front legs near the screen rail.
- 3.8 Adjust the position until you are happy with how the cage and plates are sitting. It is now possible to tack weld all plates to the car. Tack weld plates, B hoop towers and tap plates to the car but do not tack the B hoop tower top plates as these will be removed again for final shell preparation.
- 3.9 Remove cage by reversing the procedure. The rear cage can remain in the vehicle if desired but take care not to damage the finish.

## Section 4 – Final Shell Preparation

- 4.1 Remove the B hoop tower top plates to allow access to the inside of the tower. Note that welding is performed inside the tower as well as outside, Fig 4.1a and 4.1b.



Fig 4.1a



Fig 4.1b

- 4.2 Once the inside of the tower is fully welded, refit the tower top plates and use the rear cage for alignment. Weld the tops on and clean up, Fig 4.2a.



Fig 4.2a

- 4.3 Fully weld all other plates then drill 8.5mm holes through all tap plates taking care not to damage the thread, then tap with a 10mm tap.
- 4.4 To prevent any rusting, paint all plates and any bare metal of the shell.
- 4.5 Prior to refitting the cage it is suggested that each thread is tapped to remove any paint which may have got into the threads of plates. This will make installation easier and prevent cross-threading of bolts.

## Section 5 – Completing the Installation

- 5.1 Refit the cage following the same procedure. Remove any wrapping/packing remaining on the cage. Note that all base plates are fitted using 20mm bolts with a spring and plain washer.
- 5.2 Place nut caps over all nuts and bolts to finish.

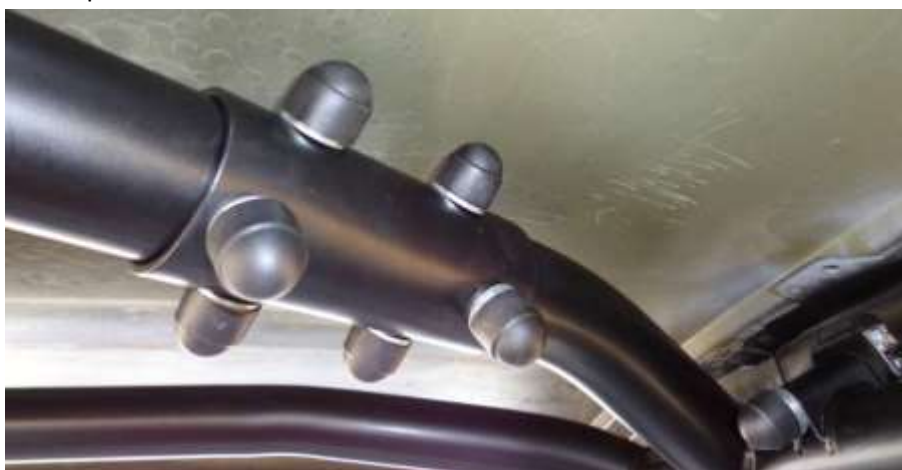


Fig 5.2a

The installation of your Safety Devices Roll Cage is now complete.

Section 6 – Roll Cage Maintenance

The roll cage should be kept clean and the fasteners checked regularly - if this is not carried out then you may find it difficult to remove the roll cage from the vehicle if required at some point. The roll cage should also be inspected for damage if in regular use.

Industrial coatings are no different to the paint on your car – they need cleaning and maintaining. Accumulated dirt may affect the design life of the system, and any mechanical damage almost certainly will. Therefore regular inspections should take place and minor damage must be touched up. The roll cage is powder coated with zinc primer followed by a topcoat so does provide a hardwearing surface. Should you damage the surface and expose bare metal this needs to be repaired to prevent rust spreading under the powder coat.

Damaged areas must be clean and free of grease or rust. Dry sand the area with 600-grade paper until the metal is exposed. The area must be completely free of dust and cleaned with a non-aggressive solvent before proceeding. Spray zinc based primer onto the area and allow it to dry fully. An acrylic or polyurethane topcoat of matching colour (RAL9005 Black Satin) should then be applied and allowed to dry.

Section 7 – Assembly Drawing

