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Land Rover Defender Station Wagon Internal/External Roll Cage (L172) Fitting Instructions

Unwrap the roll cage and unpack the individual fitting kits. At this point it is recommended that all the main components are checked against the assembly drawing provided on page 16 of these instructions. Should any parts or fixings be missing at this stage, or during installation, please contact your stockist.

Throughout the assembly we shall use a variety of different fasteners; the torque setting for each different size is listed below:

M8 - 25Nm M10 - 45Nm M12 - 70Nm M14 - 95Nm 7/16th - 55Nm

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 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.

Fitting Kit – Labelling Matrix

Bag / Box Number	Description	Quantity
RBL1727-FK1	Front Corner Upright (LH &RH) Fitting Kit	1
RBL1727-FK2	B Hoop Fitting Kit	1
RBL1727-FK3	C Hoop Fitting Kit	1
RBL1727-FK4	D Hoop Fitting Kit	1
RBL1727-FK5	Front Leg (LH & RH) Fitting Kit	1
RBL1727-FK6	Rear Corner Upright & Support (LH & RH) Fitting Kit	1

The assembly process of this roll cage is separated into several different sections, each section having its own fitting kit containing all nuts, bolts, washers and fitting plates required:

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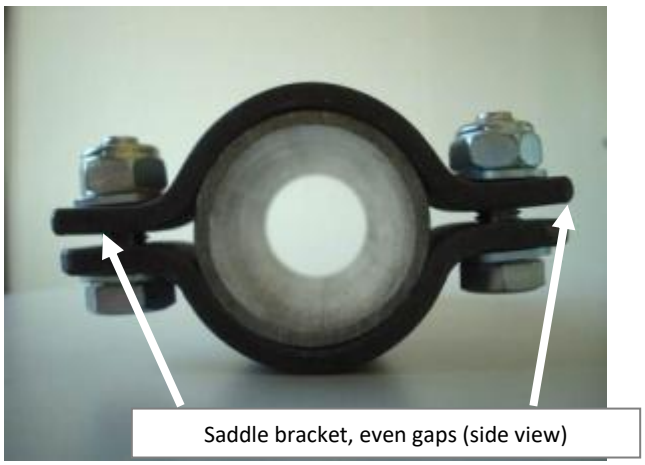
Section 1 –Saddle Bracket Fitting Instructions

If the roll cage has saddle brackets, 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 – Mid & Rear Body Mountings

2.1 Remove the rear interior, side trims, speaker boxes, and steel closing panels from Rear side door shuts if fitted. The first step when installing the roll cage is to prepare all mounting points on the curved section of the body, just below the waist rail.

2.2 Using Drawing A (located at the end of the document) and through locating the slave plate, position masking tape onto the body and mark holes for the C hoop chassis mounts (see Fig 2.2b), and D hoop chassis mounts (see fig 2.2c). Once marked, the four holes can be drilled out to 12mm and the centre cut out – Please note only the centre dimensions of the slave plate should be cut out, not the outer profile. The images below show the process for the rearmost 'D' hoop, though the process is the same for the 'C' hoop. Repeat this process for all 4 holes in the N/S and O/S rear panels (2 on each side).

Fig 2.2 a

Fig 2.2b

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Fig 2.2 c

Fig 2.2 d

Fig 2.2 e

NOTE: Steps 2.3 – 2.5 applies only to Puma (post 2007) vehicles If your vehicle is Pre-2007 then please skip to step 2.5.

2.3 Remove the cover restricting access of installation of C hoop support, shown in Fig 2.3a.

Fig 2.3a

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2.4 Mark cut line approximately 3-4mm from the holes and trim excess material.

Fig 2.4a

Fig 2.4b

2.5 With the holes completed, insert the C hoop support from the inside of the vehicle, removing and rivets causing obstruction. The inner edge which mates against the inside of the body should have sealant (sikaflex 25oz or equivalent) applied before manoeuvring into position. From the outside the gripper/slave plate should be bolted and tightened to hold the mount in place. Care should be taken not to get too much sealer oozing through onto slave plates as you will not be able to get slave plate off later if you do. Reinstall black cover trimmed in Step 2.4 (if necessary).

Fig 2.5a

Fig 2.5b

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2.6 With the C Hoop plate supported in the correct location, the two angle brackets should be positioned as required. They should then be attached and bolted through to the bulkhead and doorframe using the nut plate, washers, nuts and bolts provided in the specific fitting kit (Fig 2.6a).

Note: add packers/spacer as needed to fill the gap between the studs and the two brackets (between blue and red parts highlighted)

Fig 2.6a

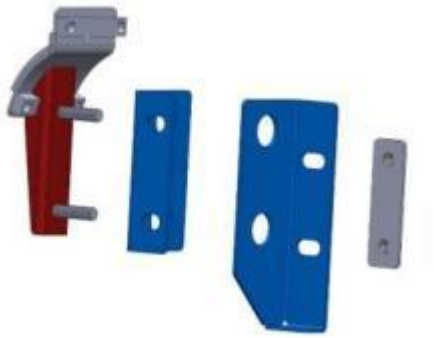

Fig 2.6 b

2.7 Repeat process 2.6 for the D hoop support. The upper part of the upright mounts to the floor. However, due to manufacturing tolerances between vehicles it may be necessary to insert some spacers as shown in Fig 2.7a. The spacers are provided in several different thicknesses as part of the fitting kit. Using the D hoop support as a template, the two holes should be marked and drilled through the floor. This will aid the positioning of the corresponding bracket below the vehicle floor.

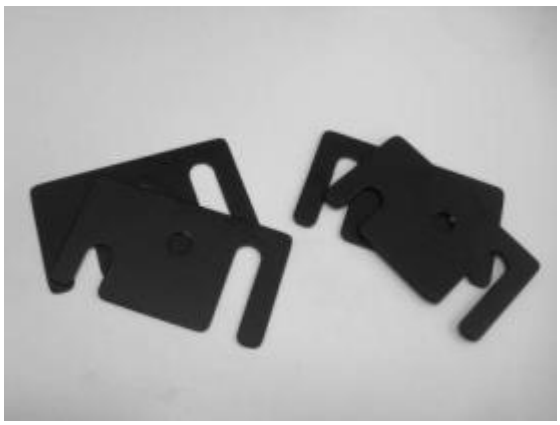

Fig 2.7a

Fig 2.7b

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2.8 Temporarily remove the rear chassis cross member plastic cover to allow access to the upper mounting flange. The upper mounting flange should then be cut vertically alongside the last captive fastening on this plate and along the top as required (marked in yellow in Fig 2.7b).

IMPORTANT NOTE: On later vehicles with forward facing seats in the rear load area, there will be a tubular bracket already mounted in this position which will need to be removed. Our tubular bracket can then be fitted along with the extra bracket shown below (Fig 2.8a) to reinstate the seat belt fixings. If you do not have forward facing seats then the brackets can be discarded.

Fig 2.8a

2.9 The rear cross member bracket can now be located against the chassis and aligned with the holes drilled through the vehicle floor in step 2.7. The spacer tube assembly can be inserted into the end of the chassis and the bolts inserted loosely. As per 2.7, spacers should be used if required.

Fig 2.9a

Fig 2.9b

2.10 The D hoop support bracket and rear cross member brackets should be bolted together and tightened up fully. Only when this assembly has been fully tightened against the floor should the chassis bolts be tightened.

2.11 The plastic cover should then be reinstalled to fit around the lower mounting bracket and fastened into position using original fixings.

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Section 3 – Front Chassis Bulkhead Mountings

3.1 Remove front wing eyebrows and outer skins (split wing)

3.2 Located in the top corner of the outer wing skin is a gusset pop riveted to the wing itself. Drill these pop rivets and remove the gusset.

Fig 3.1a

Fig 3.2a

3.3 Mask the upper rear corner of the front wings. The square hole for the front roll cage leg should be marked using the front leg gripper/slave plate. The upper edge of the mounting plate should be aligned with the edge outer wing skin at the top and should be 5mm forward of the rear edge, with the slot at the bottom.

3.4 Mark all 4 holes in the front wing, then drill to 12mm before removing the centre section, creating a square hole.

Fig 3.4a

Fig 3.4b

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3.5 On the vehicle there is a lower flange that runs rearwards under the doors. The edge of this flange should be cut away completely from just rearward of the hole for the retaining strap, all the way back to the hinge pillar. Leave 6mm (0.25”) on the top of flange, i.e. cut 6mm (0.25”) away from the bend. The corresponding material can now be cut out of the wing flange also.

Fig 3.5a

3.6 With the front wing supported on a work bench, locate the under wing support into position to achieve the best fit, the square mount should protrude through the square hole. Mount and tighten the gripper plate to ensure the support is positioned correctly. Drill a 3mm hole through both the lower part of the rear wing flange and under wing support. This should then be pop riveted to attach the two parts together.

Fig 3.6a

Fig 3.6b

3.7 To allow fitment of the lower chassis outrigger bracket you will first need to remove the long bolt that passes through the outrigger from front to rear. At this point you may find a selection of washers between the outrigger and the bulkhead, or on more recent vehicles a tube welded to the outrigger. If washers are present they should be removed to create sufficient clearance for the bracket. If a welded tube is present then it must be trimmed down to allow the bracket to drop into position.

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3.8 The bolt can now be reinserted loosely. It will be tightened fully when the wing is back in position.

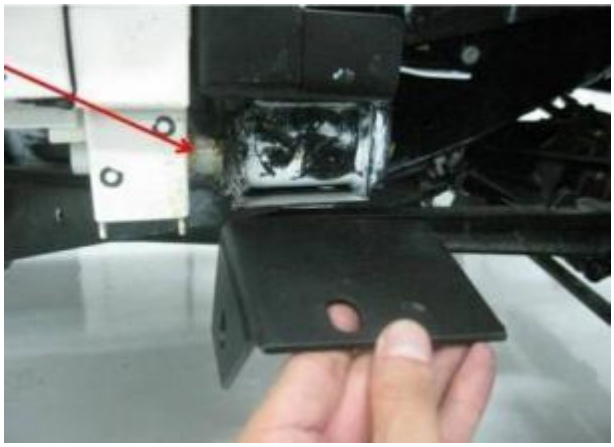

Fig 3.8a

Fig 3.8b

3.9 Replace the spire clips in the front bulkhead ('A' Post) with the 'J' nuts provided in the kit.

Fig 3.9a

3.10 Bolt the wings back onto the vehicle using the existing mounting positions as well as the new chassis mounting on the outrigger. You may find that there is a slight gap between the lower part of the wing bracket and the chassis bracket due to vehicle variances. If so we have supplied several M10 Heavy Penny washers which can be used to fill the gap if required.

3.11 The chassis front outrigger bolt can now be fully tightened.

Section 4 – Internal B Hoop Installation

4.1 Remove both front and centre headlining sections.

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4.2 Remove the driver and front passenger inertia reels and bolts and install the short 7/16" bolts supplied in the fitting kit to seal the holes. (The removed bolts will be used later to bolt the B hoop to the B pillar). Also remove the door check strap mounting brackets and discard as replacements are built in to the B hoop mountings, re-install the original bolts to prevent water ingress. Take great care as with the check straps released the rear doors will damage the body if they are allowed to open too far.

4.3 Position the 'B' hoop into the vehicle using the following images for reference. Ensure all rear trim is removed before attempting B Hoop install.

Fig 4.3a

i. Remove the front passenger seat.

Fig 4.3b

ii. Open rear window or remove rear window if single paned.

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Fig 4.3c

iii. Rotate hoop upside down.

Fig 4.3d

iv. Feed one side of the hoop through the vehicle and out of the rear window.

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Fig 4.3e

v. Feed the top corner into the vehicle.

Fig 4.3f

vi. Work the hoop forwards so that the foot plates on the side that is out of the vehicle can enter through the rear door.

Fig 4.3g

vii. Bring the other foot plate into the vehicle from the window.

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Fig 4.3h

viii. Rotate the hoop.

Fig 4.3i

ix. Position the foot plates.

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Fig 4.3j

4.4 The hoop may need to be pulled in to fit. Locate the two top hat spacers supplied in the B hoop fitting kit. Position the larger side of these spacers into the B pillar trim from where the top seatbelt mounting was removed. Now slot the smaller side of the spacers into the B hoop brackets that attach to the vehicle B pillar at shoulder height and bolt into position using the bolts that were removed from the inertia reel and the penny washers supplied in the fitting kit.

4.5 The lower hoop angled floor brackets should be pushed forward against the rear of drivers' and passengers' seat box of the vehicle. It may be necessary to support the floor brackets in their most forward position. The brackets located on top of the hoop should be parallel with the roof of the vehicle and positioned rearwards of the roof channel as shown. Due to vehicle build tolerances there are spacers supplied to take up any gap at roof and/or floor level. When fitting ensure that the rear doors are closed and B hoop is pushed against B pillar of vehicle and against rear of driver and passenger seat boxes.

4.6 Mark the hole positions through the roof brackets and floor brackets centrally in the slots, and remove the B hoop. All 4 roof hole positions should be drilled to 11mm. All 4 floor hole positions should be drilled to 13mm. It is important that the floor supporting brackets on the chassis outrigger are also drilled through at this time.

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Fig 4.6a

Fig 4.6b

4.7 The B hoop should now be reinstalled and all bolts tightened. Between the floor of the vehicle and the brackets beneath there will be a gap into which the 4 spacers provided should be positioned to ensure the brackets and floor will not be deformed when tightened. Again, due to vehicle tolerances, these spacers made need adjusting to fit.

4.8 The door check strap will need to be relocated onto the fixing provided on the B hoop and secured using the M8 nyloc nut provided. The nut should be tightened sufficiently for the check strap to be held in place whilst still being able to rotate on the thread when the door is opened and closed. The door check strap may need shortening.

Fig 4.8a

4.9 With the B hoop installed the headlining will need to be trimmed to suit - we do not provide specific details as each vehicle will be slightly different. The photos give a general idea as to what the headlining should look like when completed – there are a couple of different methods. This will not be reinstalled until the external sections of the cage have been assembled and all bolts have been fully tightened.

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Fig 4.8a

Fig 4.8b

Fig 4.8c

Section 5 - Cage Installation

5.1 Remove all 6 gripper plates from the front wings, C hoop and D hoop mountings.

5.2 Apply copper slip to all stainless steel bolts (not included).

5.3 Locate the C hoop into position and insert the bolts loosely.

5.4 Locate the left hand front leg onto the wing support and into the front of C hoop. Insert but do not fully tighten bolts.

5.5 Position upper and lower screen rails and the roof connecting rail to front left leg. Insert but do not fully tighten bolts. The roof connecting rail has captive threads that will pass through roof and mate to the internal B hoop. It is important that sufficient sealant (Wurth PU 08901001) is applied around these holes before the bar is finally positioned. The nuts and washers can be installed internally but not fully tightened.

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Fig 5.4a

Fig 5.4b

5.6 Locate right hand front leg onto 'B' hoop, front wing support, upper and lower screen rails and roof connecting rail. Insert but do not fully tighten bolts.

5.7 The D hoop can be positioned onto its mountings and the bolts inserted loosely.

5.8 The roof section of the roll cage has a small rack which should be mounted with the 2 small lamp brackets closest to the C hoop. There are 4 side rails that interconnect the C and D hoops. These side rails are the same so may be fitted in any of the locations. These should all be bolted loosely to hold them in place.

5.9 With all components installed, the next task is to tighten all bolts on the roll cage. Due to vehicle tolerances it is not uncommon for the cage to be sitting slightly to one side or another, so the order in which bolts are tightened is critical in the final cage alignment.
To correct any misalignment on the vehicle the external joints should all be tightened gradually whilst checking the cage is central on the vehicle when viewed from front/rear and from the side. In the side view it is important to ensure that the hoops are upright and that there is sufficient clearance between the cage and the vehicle body at all points.

Section 6 – Seat Belt Installation

6.1 The bolts through the seat belt mountings, B hoop roof and B hoop floor should all be tightened.

6.2 The headlining should be reinstalled.

6.3 The upper seat belt mounting should be located to the new locations on the two B hoop mountings.

6.4 The original inertia reel fixings will be obstructed by the base of the B hoop. As a result, the fixing should be bolted to the lower B hoop angle brackets using the replacement bolt provided.

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6.5 On more recent vehicles the original plastic inertia reel cover may be obstructed by the B hoop base. A replacement surround for the inertia reel is available to prevent damage. The new surround should be assembled around the reel and bolted together. The complete assembly can then be bolted into position.

Fig 6.5a

Fig 6.5b

Fig 6.5c

Fig 6.5d

Section 7 – 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.

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Section 8 - Padding Installation (if purchased)

RBPUPADC16MMBLK – Black 'C' Padding
RBPUPADC16MMGRY – Grey 'C' Padding
RBPUPADO16MMGRY – Grey 'O' Padding

'C' and 'O' Padding is supplied in lengths of approximately 1000mm and some lengths will need to be trimmed to suit your particular ROPS.

It is strongly recommended to use a silicon spray on any saw blades to enable them to pass more easily through the padding member. It is also preferable to use a saw blade where possible with many small teeth such as a metalworking hacksaw. For smaller, more intricate cutting, a long bladed knife should be used to achieve better results rather than a short Stanley knife. Do not inhale the dust that is created in the cutting process. If using a circular saw, ensure that you have tube inserted to within 15mm of the cutting blade to prevent the padding from deforming and causing an uneven cut.

We recommend a trial fitting to the entire cage, ensuring the padding is not under stress and that there are minimal gaps between padding members. Where two lengths of padding meet, ensure that both ends are trimmed to achieve a good fit. It is essential to ensure that any holes or slots that may have been cut to accommodate brackets or tube intersections have rounded corners with a minimum radius of 10mm to prevent splitting. A numbering system can be utilised by writing the number on the inside of the padding member using a permanent marker.

The starting point for padding installation is normally to locate a single length of 'C' padding in the centre of the B hoop upper section (behind the driver/passenger) and then work across and down the hoop in both directions towards the floor. It is important to remember that the 'C' padding should be applied in such a way that the opening along its length is on the outside of the cage so that the inside is entirely covered. Repeat the process with the C hoop (if present).

The X or Y brace (if present) also needs to be padded along its full length using 'O' padding ensuring that the open edges face the centre of the vehicle. It may also be necessary to pad other internal members that are close to the occupants head, such as the side rails and screen rail with 'C' or 'O' padding where appropriate.

The above padding lengths should then be fitted to the roll cage using Sikaflex-252 or a similar strength adhesive. The surface of the tubing and the padding must be wiped clean with a suitable solvent such as 'panel wipe' or white spirit before applying the adhesive. Cable ties should then be wrapped around the padding at regular intervals of 200mm until the glue has dried at which point they should be removed. It is important that these are not too tight as this will lead to permanent marks as well as potential splitting of the padding. Please follow the instructions/see material data sheets on any solvents and adhesive as they may be harmful.

RBPUPADSBCGRY - Grey Saddle Bracket Cover
RBPUPADSBCBLK - Black Saddle Bracket Cover

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Saddle bracket covers should be fitted over any internal tubes joined together using 2 cable ties as shown in the diagram below. Ensure that the padding lengths are fitted as close to the joint as possible before installing the covers - this will ensure maximum protection. It is essential not to over tighten the cable ties as with may cause splitting of the material.

RBPUPADSRBGRY – Grey Single Roof Block
RBPUPADRBGRY – Grey Roof Block

Roof blocks come in both single and double sizes as they are designed to fit two different types of roof mounting brackets that may be found on your roll cage. Both of them attach in the same way utilising a single cable tie through the holes provided and then around the roof bracket itself. Please remove any nut caps (if fitted) before fitting these roof blocks.

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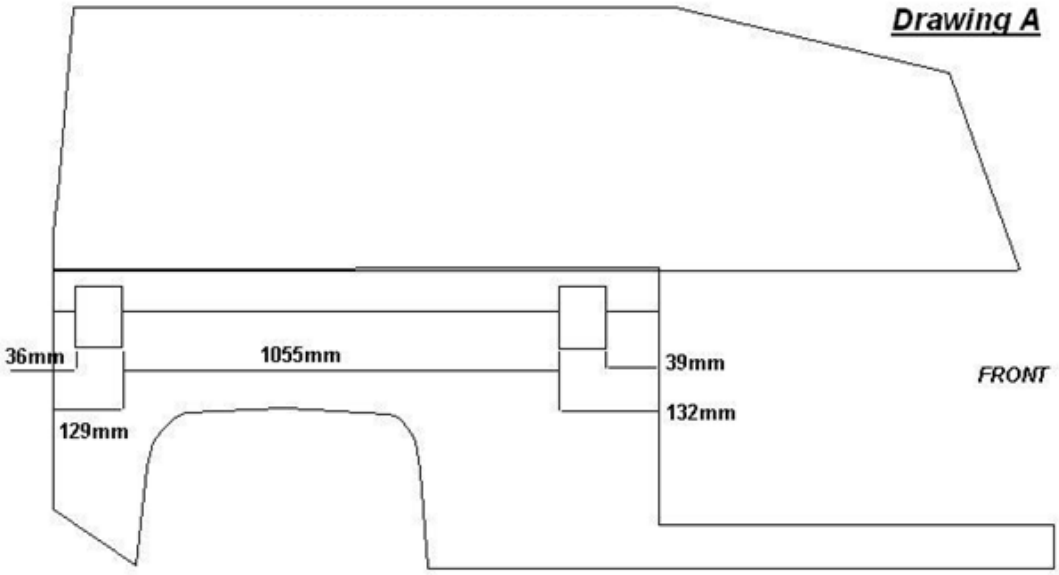
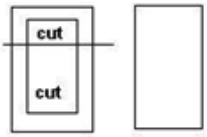
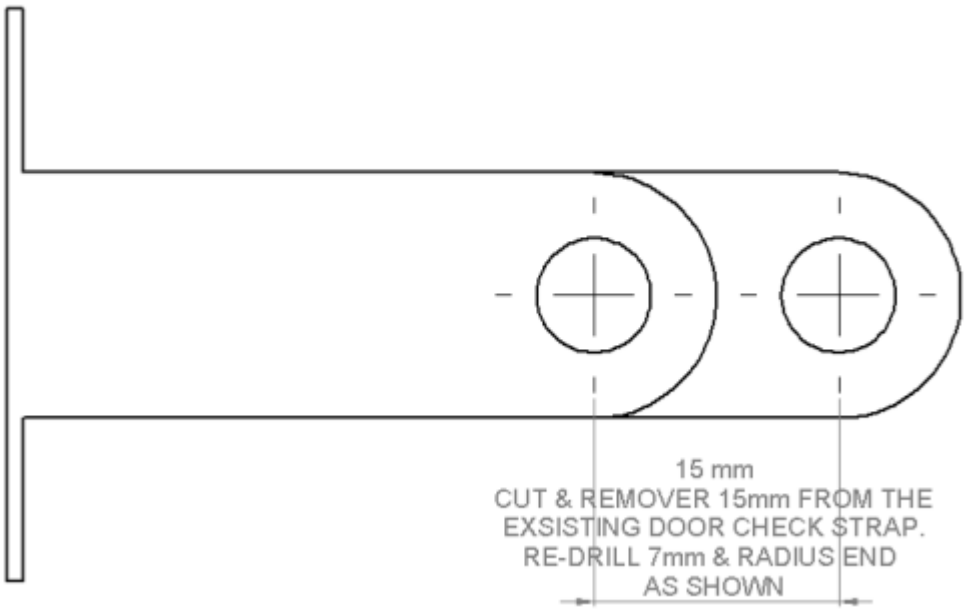
The installation of your Safety Devices roll cage is now complete.





USING MASKING TAPE, TAPE THE BODY AT PLACES WHERE PLATES ARE TO GO, MARK PLATE POSITIONS. POSITION TEMPLATE PLATE ON BODY SIDE AND MARK THE 4 13mm HOLES.
DRILL HOLES TO 12mm THEN CUT OUT CENTRE AS PER SKETCH

IMPORTANT:
IF THIS MODIFICATION IS NOT CARRIED OUT,
BODYWORK DAMAGE WILL OCCUR!



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