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Land Rover Defender 110 Station Wagon External Front-Internal Mid Roll Cage (L148) 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 11 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
RBL148 3SSS-FK	Front Fitting Kit	1
RBL148 5SSS-REAR-FK	Rear Fitting Kit	1

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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:

Section 1 - Saddle Bracket Fitting Instructions	Pg (2)
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Section 3 – Front Cage Installation	Pg (4 - 5)
Section 4 – Finishing Main Internal Hoop	Pg (5 - 6)
Section 5 – Rear Hoop Installation	Pg (6 - 7)
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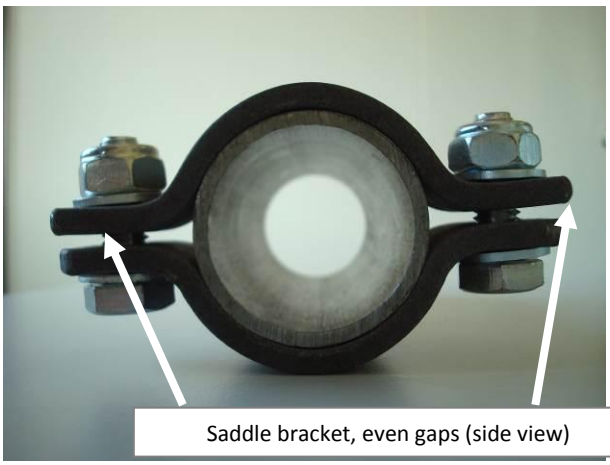
Section 7 – Roll Cage Maintenance	Pg (9)
Section 8 – Padding Installation (if purchased)	Pg (9 - 10)

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.**

Saddle bracket



Saddle bracket, even gaps (side view)

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

Section 2 – Main Internal Hoop

2.1 Remove all rear seats and rear seat belt rails (if fitted).

2.2 Remove rear headlining. Remove rear door check straps from body end only and modify as per Fig 2.2a below. Ensure door and vehicle body do not contact by inserting soft pad such as card or carpet.

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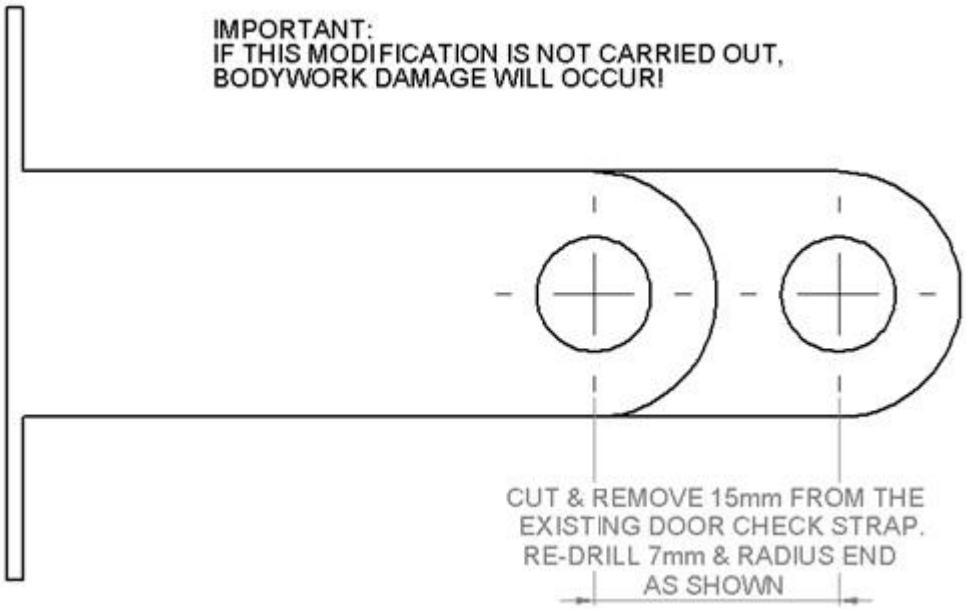

Fig 2.2a

2.3 Remove inertia reel bolts from upper mountings on 'B' posts. Remove reels from mounts, insert 1 x 7/16" bolts and washers supplied into body holes and tighten.

2.4 Remove and discard the check strap angle mounted on the floor and replace and tighten existing bolts and washers.

2.5 Fold front seats forward. Place spacers over 'B' post belt mounting holes and secure with adhesive.

2.6 Put main hoop in through left rear door, right foot first, upright at first, then gradually lean bar forward at the same time move right foot rearwards so that the left foot enters through the door.

2.7 Continue to rotate the hoop so that the right foot is temporarily positioned to the rear of left foot, both being approx. against the inside of the left body side, the hoop now being laid down, with the belt straps downwards against the floor.

2.8 Next lift the rearward part up towards the roof and rotate the right hand side of the hoop forwards, towards the right hand side of the vehicle. Continue gradually raising the top of the hoop towards the roof so that the right hand foot, then the left hand foot, drop into the rear footwell.

2.9 Rotate backwards into position.

2.10 Belt straps should be opposite 'B' post mountings and feet against rear of 'B' post bulkhead in the rear footwell. Put the 1 1/2" x 7/16" bolts and washers supplied through 'B' post belt mounts but do not tighten yet.

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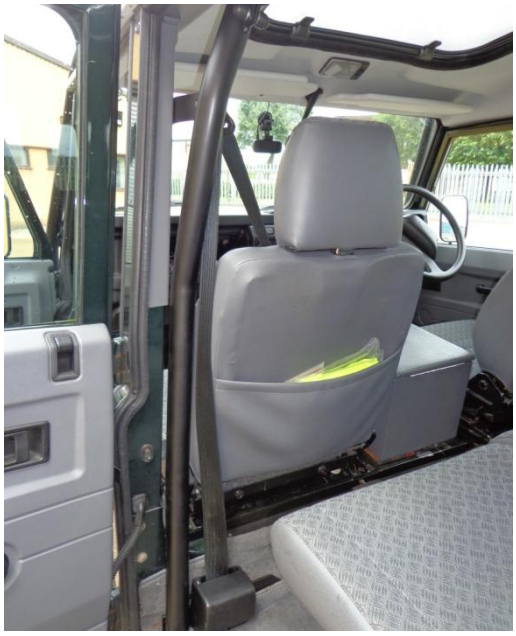
2.11 Assemble modified door check straps to angles on base of hoop using M6 nuts, bolts and washers supplied. If the rear doors are now opened this will pull the base of the hoop outwards, the correct position being where the outer edges of the bar feet are approx 5mm away from the carpet securing 'Z' section.

2.12 Wedge the hoop feet forward against the bulkhead.

2.13 Drill through holes in foot plate, through the floor into the top hat sections beneath floor. These holes should be midway between the top hat centre dimple and the inner face of top hat section.

2.14 Underneath the vehicle, slide the 4 machined aluminium spacers supplied between the floor and top hat sections. Drop bolts with washers through hoop foot plate, floor, top hat section, and attach nuts and washers to bolts but do not fully tighten.



Section 3 – Front Cage Installation

3.1 Remove front wings.

3.2 Remove body mounting bolts from ends of chassis outriggers by the front wing.

3.3 Remove side body trim beneath front doors.

3.4 Fit front cage chassis brackets in position using body bolts.

3.5 If you cannot fit the bracket between the body and the outrigger you may have to cut part of bush off to allow sufficient clearance. Do not tighten bolts at this point.

3.6 Trim wings using template and push on rubber seal to finish off and protect leg.

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Fig 3.6a

3.7 Bolt front cage in position at lower mounting points first. Then insert and bolt lower screen rail together. Do not tighten bolts.

Fig 3.7a

3.8 Drill rear 4 holes through roof at 11mm. Bolt front cage through roof to main hoop inside.

3.9 Drill other 4 holes through roof into roof only.

Section 4 – Finishing Main Internal Hoop

4.1 Remove main hoop from vehicle.

4.2 Enlarge four holes in roof lining to 1” to accept roof spacers. Tighten 4 foremost bolts in roof.

4.3 Replace rear headlining and main hoop as shown in Fig 4.3a.

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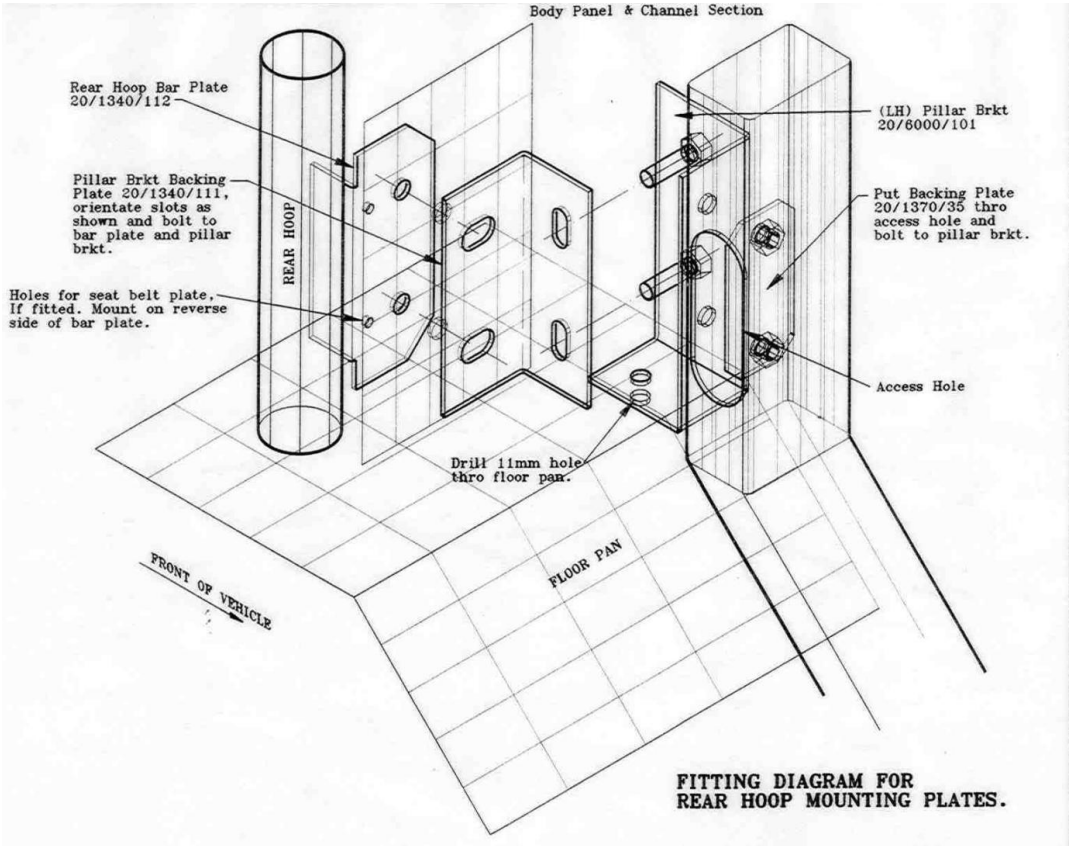
Fig 4.3a

4.4 Check distance through holes in roof lining from top of bar bracket to inside roof. You may have to shorten roof spacers or increase by using washers. Do not tighten bolts yet.

Section 5 – Rear Hoop Installation

5.1 Put rear hoop inside vehicle and locate in position.

5.2 Occasionally, the hoop needs spreading slightly. Use a piece of wood cut to length and wedge in position.



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5.3 The outer face of the hoop tubes should just touch the inner waist rail and the foot plate holes should match the holes in the aluminium body side web. If no holes exist, drill through and note that no holes will be present in pillar either, so position pillar bracket and rill through web holes into pillar.

5.4 Block lower portion of pillar with rag, then insert backing plate 20/1370/035 inside pillar through access hole. Loosely bolt to pillar bracket 20/6000/101, then put plate 20/1340/111 onto bolts of 20/6000/101, fit penny washers and nuts and tighten.

5.5 Bolt through hoop plate 20/1340/112.

5.6 Tighten all nuts and bolts in these plates.

5.7 Drill through bracket 20/6000/101 into wheel arch and bolt through.

5.8 Assemble roof bars and lightly bolt in position.

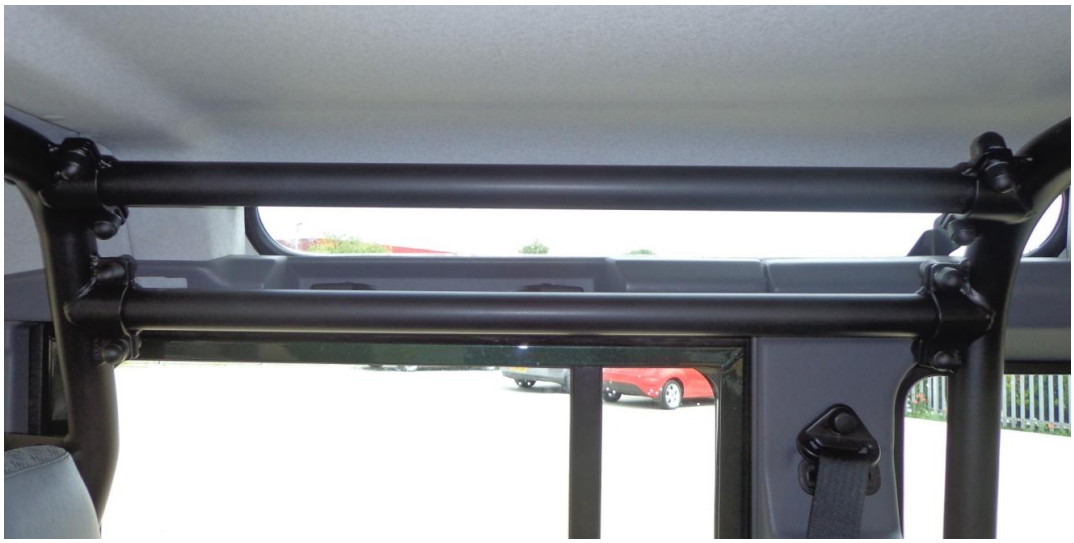
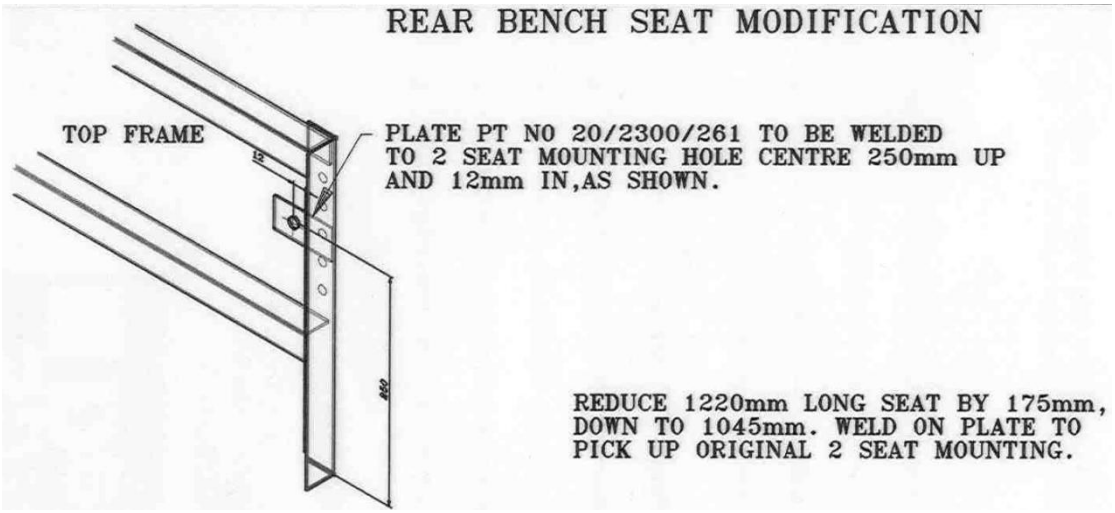


Fig 5.8a

5.9 Tighten all floor mountings and then fully tighten all roof bar connections and front cage.

5.10 Replace seats, belts and trim as required. See Section 6 for seat belt installation.



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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 if not already.

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.

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

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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.

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

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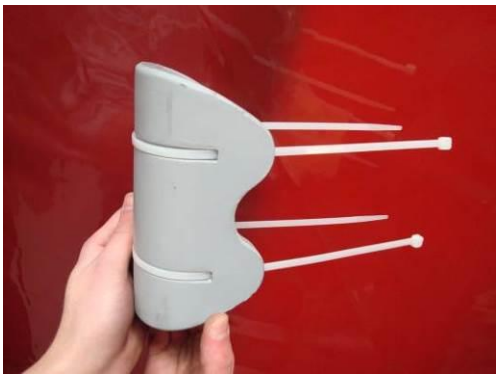
hoop in both directions towards the floor. It is important to remember that the 'C' padding should be applied in such a way that the opening along its length is on the outside of the cage so that the inside is entirely covered. Repeat the process with the C hoop (if present).

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

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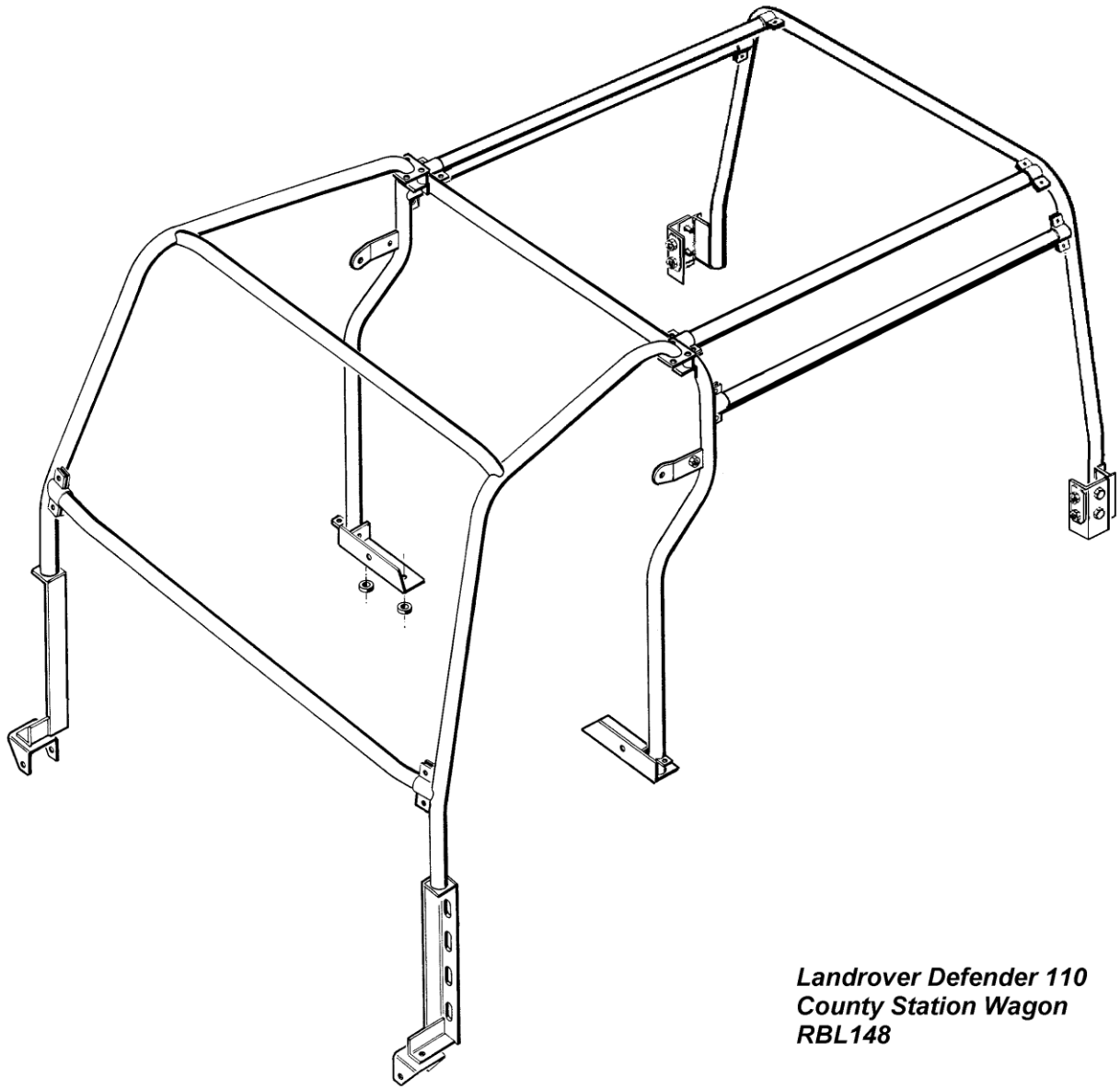
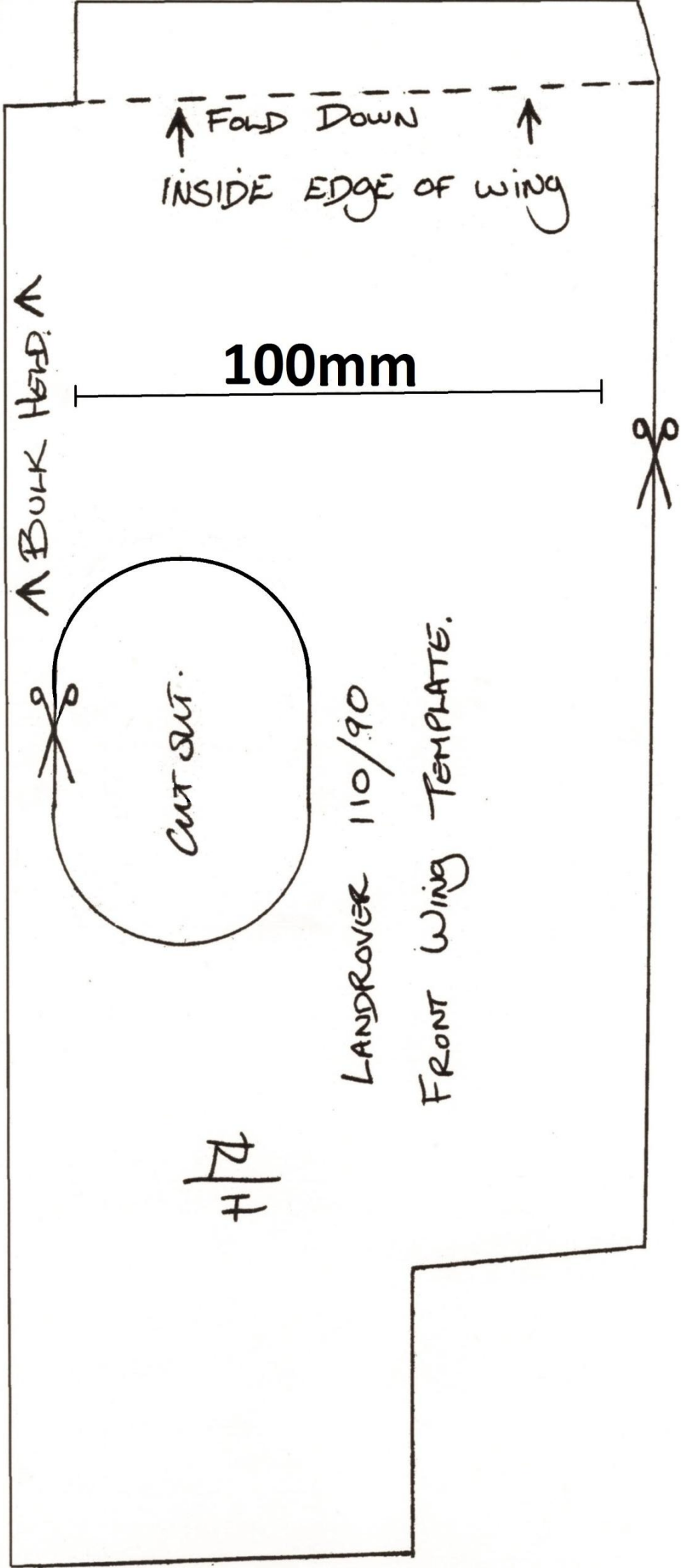
The installation of your Safety Devices roll cage is now complete.



Landrover Defender 110
County Station Wagon
RBL148


FOLD DOWN
INSIDE EDGE OF WING
BULK HEAD
100mm
CUT OUT.
LANDROVER 110/90
FRONT WING TEMPLATE.