

Land Rover Defender 90 Hard Top Internal-External Roll Cage L138-7 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 12 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
- A welder and plasma cutter with a fire blanket/cardboard to protect the vehicle
- 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
RBL138 7SSS-FK	L138 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:

Section 1 – Saddle Bracket Fitting Instructions

Pg (2)

Section 2 – Front Cage

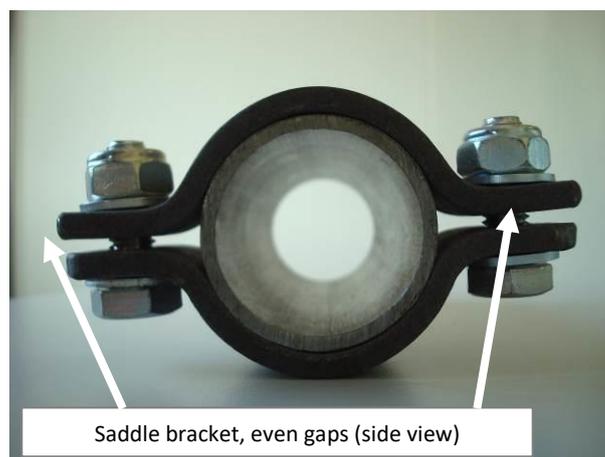
Pg (2 - 5)

Section 3 – ‘B’ Hoop
Section 4 – Rear Seat Supports
Section 5 – Roll Cage Maintenance
Section 6 – Padding Installation

Pg (5)
Pg (6)
Pg (8)
Pg (9 - 11)

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 - Front Cage

2.1 Remove front wing eyebrows and outer skins (split wing).



Fig 2.1a

- 2.2 Inside outer wing skin in top corner there is a gusset pop riveted to the wing itself. Drill these pop rivets out and remove the gusset.



Fig 2.2a

- 2.3 The square hole for the front roll cage leg should be marked using the front leg itself. The edges of the square mounting plate should be in line with the edge of the outer wing skin.



Fig 2.3a

- 2.4 Mark holes in wing, drill out to 12mm and cut between them to create square hole.



Fig 2.4a

- 2.5 With wing on the bench, offer the under wing support up and achieve best fit with the square mount protruding through the hole you have just cut. Mount and tighten gripper plate to ensure the support is positioned correctly.



Fig 2.5a

- 2.6 Drill small hole and pop rivet through the wing to the bracket to attach the 2 parts together.

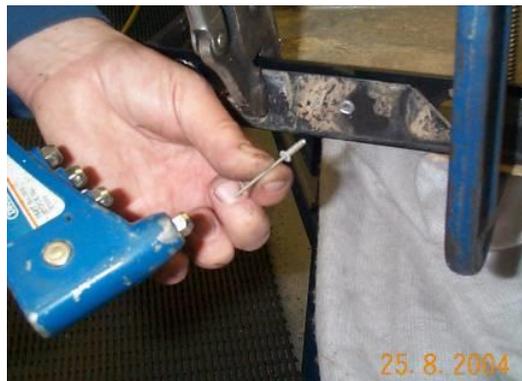


Fig 2.6a

- 2.7 On the vehicle there is a lower flange that runs backwards under the doors. The top edge of this needs completely removing just rearward of the hole for the retaining strap (Fig 2.7a). Cut flange away right back to hinge pillar. Leave 0.25" of the top of flange, i.e. cut 0.25" away from bend on top. Then cut corresponding material out of wing flange (Fig 2.7b). Stand the chassis mount in position on the chassis outrigger (Fig 2.7c).



Fig 2.7a



Fig 2.7b

**Fig 2.7c**

- 2.8 Replace the spire clips in the front bulkhead ('A' Post) with the 'J' nuts provided in the kit.
- 2.9 Bolt the wing back onto the vehicle (complete with under wing mount attached)
- 2.10 The A hoop can then be mounted onto the front of the vehicle and bolted into position on the wing mounts.
- 2.11 The side rails can be inserted into position and marked onto the roof for drilling - please ensure that the hoop is parallel with the windscreen of the car when viewing from the side.
- 2.12 The holes for the side rails can be drilled out.
- 2.13 The internal bracket arrangement can be offered up into position and this can be bolted through the body into the outer side rails.

Section 3 - 'B' Hoop:

- 3.1 Mark and drill the rear bulkhead using Drawing B.
- 3.2 Pass the under-body support under the vehicle from both sides and offer up to bulkhead.
- 3.3 Take internal B hoop inside vehicle and put into position and bolt through to the under-body support underneath. The hoop may need to be pulled in to line up with the holes correctly.
- 3.4 The central bulkhead bar can now be installed into position.
- 3.5 Bolt under body bracket to chassis using brackets provided.
- 3.6 The upper mounts on the body should already be positioned in the correct location and can be bolted to the corresponding brackets on the hoop.
- 3.7 To install the side mounts, it may be necessary to remove the hardtop of the vehicle, the brackets should be mounted as per the photo below.



Fig 3.7

Section 4 – Rear Seat Supports:

- 4.1 Remove rear quarter light covers, seats and seat belt rails (if fitted). If the vehicle is a County, it may be easier if the side trims running below the windows are also removed.
- 4.2 Drill hole in seat box as per Drawing C. Elongate diagonally inwards by about 10mm as indicated.



Fig 4.2a

- 4.3 Cut hole in rubber disc and fit the corner support.
- 4.4 Insert support from above. Place spacer tube assembly into the end of the chassis, insert bolts through chassis, spacer tube assembly and rear upright holes. Do not tighten fully.

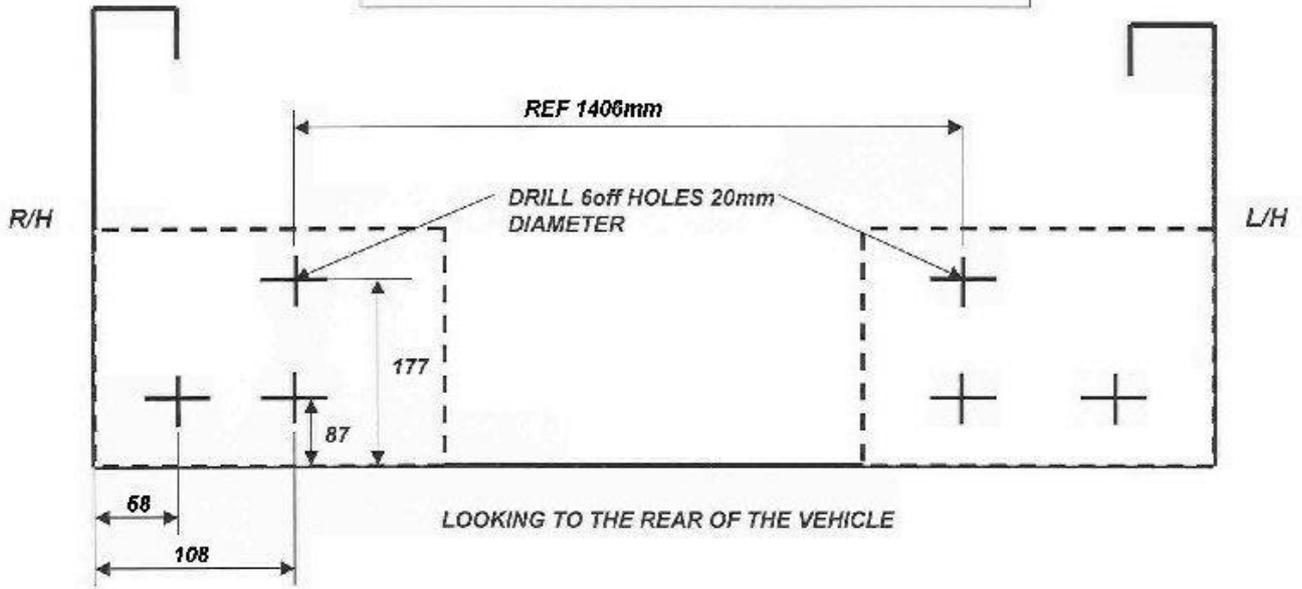


Fig 4.4a

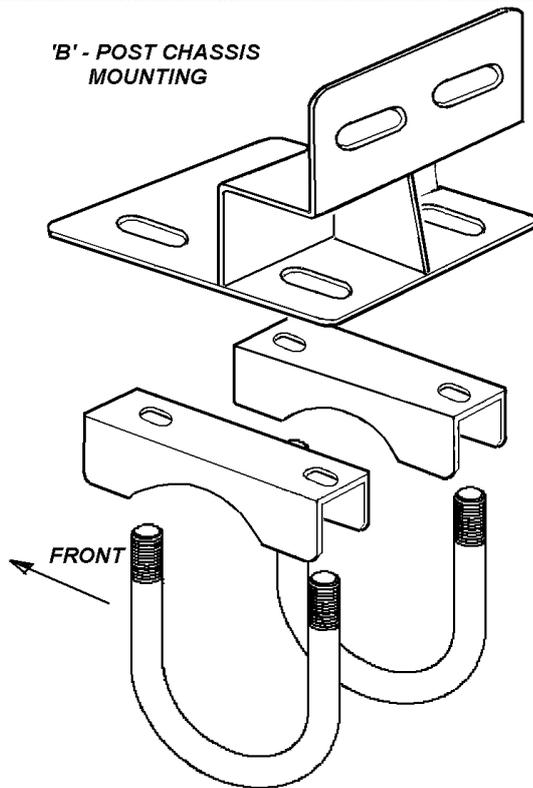
- 4.5 The seat rails can then be attached to the upright and positioned down each side of the car.
- 4.6 The brackets for attaching the rear seat belts can be fixed into position and this will complete installation of these rail.
- 4.7 **Please note: These rear rails do not attach to the B hoop they are mounted separately.**
- 4.8 With all the components installed, you can begin to tighten all of the bolts on the roll cage. The best method is to go around and tighten the bolts small amounts at a time, ensuring the cage is mounted centrally on the vehicle. Trial and error is the only way to ensure the cage is fitted squarely.

Drawing B

BULKHEAD BEHIND DRIVER / PASSENGER SEATS

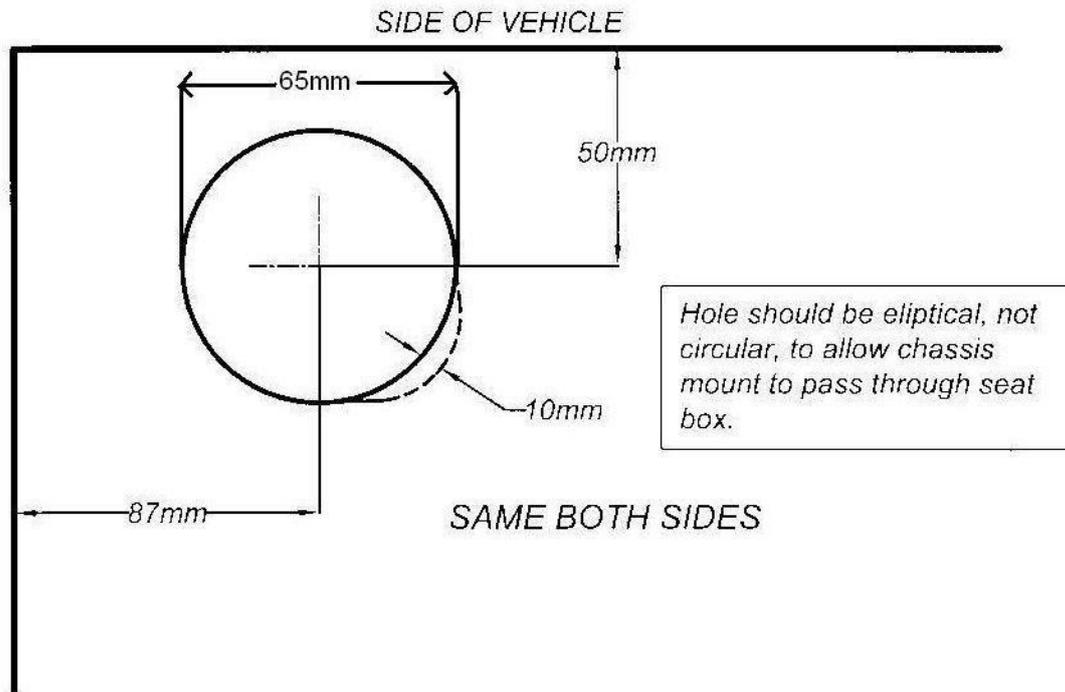


'B' - POST CHASSIS MOUNTING



Drawing C

INTERIOR REAR CORNER (WHEEL BOX) HOLE CUT OUT.



Section 5 – 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 6 - Padding Installation (if purchased)

RBPUADC16MMBLK – Black 'C' Padding
RBPUADC16MMGRY – Grey 'C' Padding
RBPUADO16MMGRY – 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.



RBPUADSBCGRY - Grey Saddle Bracket Cover
RBPUADSBCBLK - 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 this may cause splitting of the material.



RBPUADSRBGRY – Grey Single Roof Block
RBPUADRGRY – 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.



Once installed into position, the cable tie should be tightened fully to one side and then trimmed as shown in the photos below.



With all padding where a cable tie is used, it is important not to over tighten them as this will cause splitting. Remember to cut the ends off as close to the padding as possible once fully tightened.

Please note: Safety Devices are not responsible for the performance of the product that the padding is fitted to, or the way in which it is fitted unless installed by a Safety Devices engineer. Where padding is not supplied with a ROPS it is your responsibility to ensure that it meets your requirements.

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

