Land Rover Defender L663

Predator & Toro Front Bar Fitting Instruction

IMPORTANT! – READ BEFORE INSTALLATION

- **MAXIMUM DRIVING LIGHT HEIGHT IS 200MM. Measured from face of bar. Failure to observe this limit will cause adaptive cruise control malfunctions.**
- When installed in accordance with these instructions, the front protection bar does not affect the operation of the vehicles SRS airbags.
- This product must be installed exactly as per these instructions using only hardware supplied.
- Take a few moments to read instructions thoroughly before beginning work.
- In the event of damage to any bar component please contact OFFROAD ANIMAL to arrange repair/replacement of components.
- Do not use this product for any vehicle make or model other than that specified on these instructions.
- Do not remove labels from this product.
- This product and its fixings must not be modified in any way unless stated in these fitting instructions.
- The installation of this product is recommended for trained personnel.
- These instructions are correct at time of publication. OFFROAD ANIMAL cannot be held responsible for the impact of any changes subsequently made by the vehicle manufacturer. If you find something has changed, please contact us to let us know!
- During installation it is the duty of the installer to check correct operation/clearances of all components.
- If Instructions are to be printed for reference in the workshop, it is recommended that they are printed in color, for best legibility.

  Fitting Difficulty 9/10

  Approx install time 6-8 Hours

GENERAL CARE AND MAINTENANCE

Use caution when cleaning with pressure washers, as they may compromise the product coating's integrity. Exercise care to avoid surface damage.

Only wash the product with a PH neutral car wash to prevent paint damage and discolouration.

Do not use acidic or alkaline based cleaning products.

Plastic parts may be maintained with silicone spray.

It is important to perform regular checks (pre/during/post trip or on an annual basis) on the installed product. More frequent checks may be required in extreme use cases. Checks include:

- Visual inspection for damage (eg. cracks, chips, dents etc.)
- Electrical wiring is not rubbing anything or worn out
- Bolts are torqued to correct specification (see torque guide below)

For touching up small stone chips, Offroad Animal recommends the following paint products:

- Dupli-Color Trim & Bumper Paint Black (TB101)
- VHT Hood, Bumper & Trim Paint Black (SP27)

BOLT TORQUE SETTINGS

Use the following bolt torques on all general fasteners, unless otherwise specified.

GENERAL FASTENERS	
Size	**Torque Nm**
M5	5 Nm
M6	9 Nm
M8	22 Nm
M10	44 Nm
M12	77 Nm

Use the following bolt torques on all structural front bar mount and tow point fasteners, and rear towbar fasteners, unless otherwise specified.

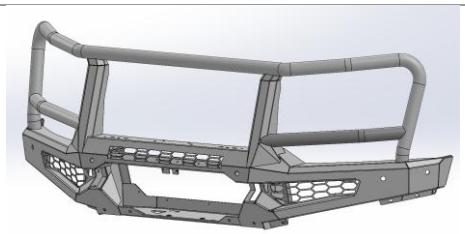
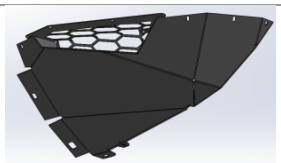
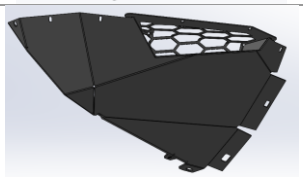
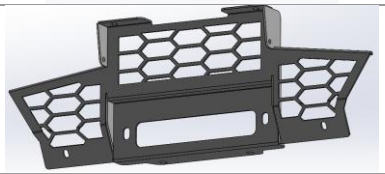
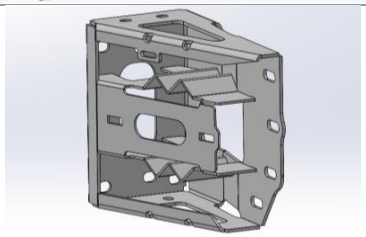
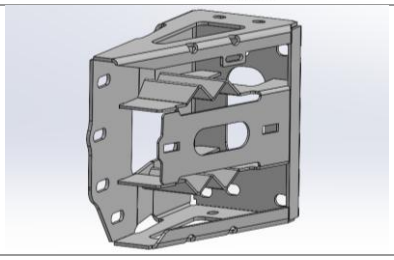
FRONT BAR MOUNTS AND TOW POINTS + REAR TOWBAR	
Size	**Torque Nm**
M10	57 Nm
M12	100 Nm
M14	164 Nm
M16	248 Nm

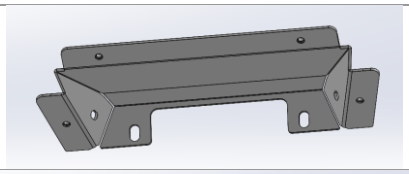
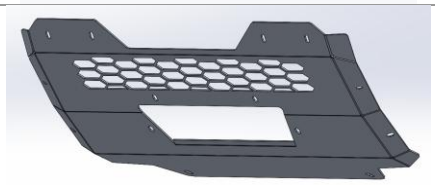
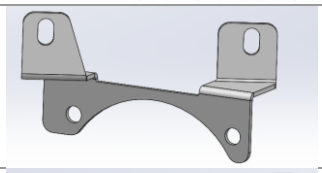
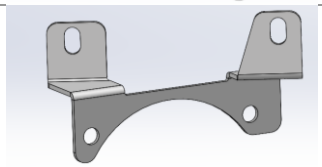
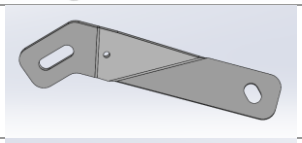
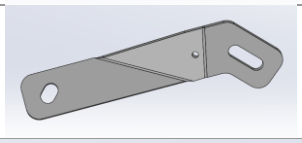
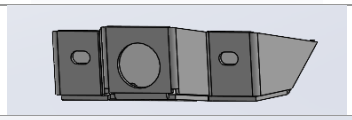
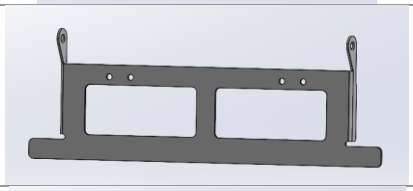
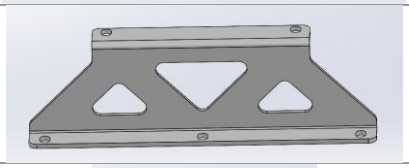
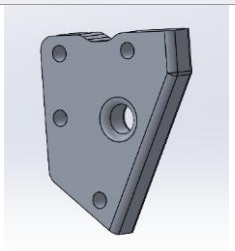
Always use a torque wrench to set correct torque settings. Ensure torque wrench is set to Nm unit of measurement. Otherwise perform conversion to lb-ft.

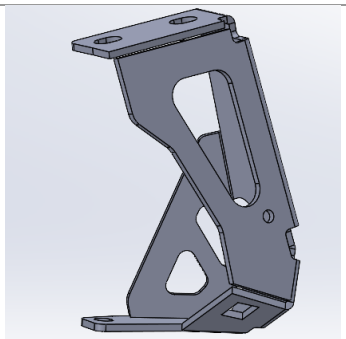
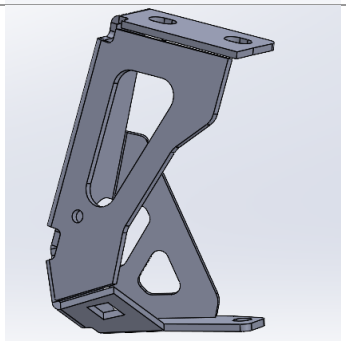
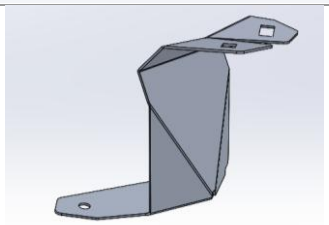
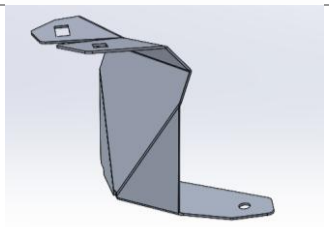
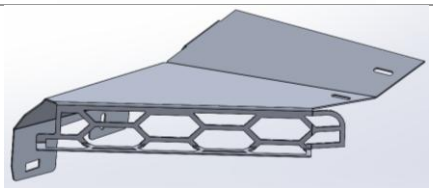
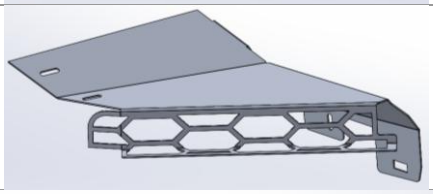
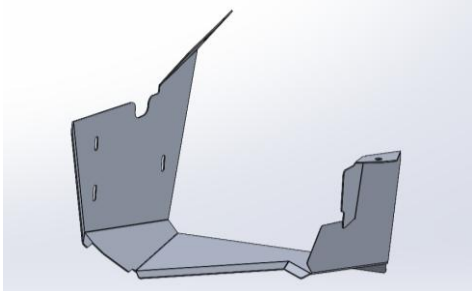
PARTS LISTING

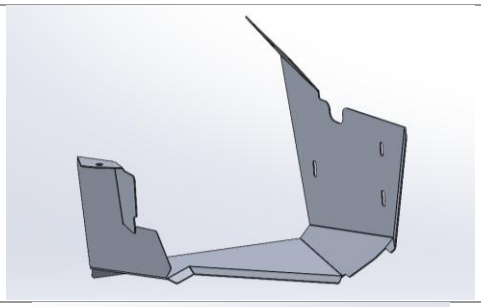
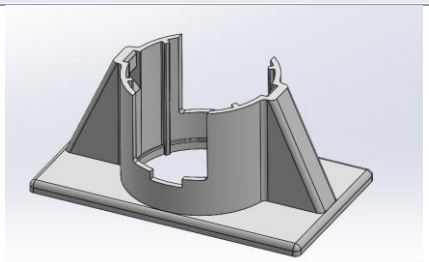
IMPORTANT: Check all parts are present before beginning work! Contact OFFROAD ANIMAL if something is missing.

Main Parts – In the Box

Qty	Part Number	Description	Image
1	FB-LDF-L663-20-PR-ASM1	Land Rover Defender L663 Predator Front Bar Weldment	
		OR	
1	FB-LDF-L663-20-TOR-ASM1	Land Rover Defender L663 Toro Front Bar Weldment	
1	FB-LDF-L663-20-PR-ASM5L	Defender L663 Side Under panel Assy	
1	FB-LDF-L663-20-PR-ASM5R	Defender L663 Side Under panel Assy	
1	FB-LDF-L663-20-PR-ASM4	L663 Defender Mesh Fairlead Assy	
1	FB-LDF-L663-20-PR-ASM2L	Land Rover Defender L663 Impact Assembly	
1	FB-LDF-L663-20-PR-ASM2R	Land Rover Defender L663 Impact Assembly	

1	B-1127	L663 Defender Lower Crossmember Brace Bracket	
1	U-0075	L663 Defender Centre Bash plate	
1	B-1133L	L663 Defender Fog Light Bracket	
1	B-1133R	L663 Defender Fog Light Bracket	
1	B-1134L	L663 Defender Winch Brace Strap	
1	B-1134R	L663 Defender Winch Brace Strap	
1	B-1135	L663 Defender Camera Bracket	
1	B-1157	L663 Defender Number Plate Bracket	
1	B-1158	L663 Defender Pan Brace	
2	P-0353	L663 Defender Aux Tow Plate	

1	B-1132R	L663 Defender Bash Plate Support	
1	B-1132L	L663 Defender Bash Plate Support	
1	B-1269L	L663 Defender Aux Rad Top Outer Air guide	
1	B-1269R	L663 Defender Aux Rad Top Outer Air guide	
1	B-1270L	L663 Defender Aux Rad Top Inner Air guide	
1	B-1270R	L663 Defender Aux Rad Top Inner Air guide	
1	B-1271L	L663 Defender Aux Radiator Lower Air guide	

1	B-1271R	L663 Defender Aux Radiator Lower Air guide	
6	F-0030	Parking Sensor Holder - Universal, Flat	
1	PWS-TOP-1000	Pinch Weld PWS51T - Top Bulb Seal 1000mm	No Image
1	PWS-SIDE-500	Pinch Weld PWS53S - Side Bulb Seal 500mm	No Image
1	TK-FB-THL-N80-15	Tape Kit - 3M 5952, 2x 25x8mm	No Image
1	TK-COM-PSEN-6	Tape Kit - 6 Sensor Universal	No Image
1	FB-LDF-L663-20-PR-ADRCP	ADR Compliance Plate Defender L633	
2	FB-LDF-L663-20-PR-TPWL	Defender L663 TOW POINT LABEL	

Predator Small Parts – Contained in Small Parts Kit Bag

QTY.	PART NO.	DESCRIPTION
39	M6x16 BHCS BLACK ZINC	SCREW, BUTTON HEAD CAP, M6X16X1 GR12.9, ISO4042 ZnNi BLACK PASSIVATED FINISH
55	M6 FLAT WASHER BLACK ZINC	M6 Flat Washer, 12x6.1x1, ISO4042 ZnNi BLACK PASSIVATED FINISH
17	M6 FLANGE NUT	Flange Nut, M6x1 G8.8 ZP
18	M6CN3MM	CAGE NUT M6x2.6-3.5
2	M8 X 16 BHCS BZP	SCREW, BUTTON HEAD CAP, M8X16X1.25 GR12.9, ISO4042 ZnNi BLACK PASSIVATED FINISH
2	M8 FLAT WASHER- BLACK ZINC	M8 FLAT WASHER, 16.5x8.4x1.2, ISO4042 ZnNi BLACK PASSIVATED FINISH
12	M8 HD FLAT WASHER - BZP	M8 FLAT WASHER - High Tensile 19x8x2mm, ISO4042 ZnNi BLACK PASSIVATED FINISH
2	M8 X 20 BHCS BLACK ZINC	SCREW, BUTTON HEAD CAP, M8X20X1.25, ISO4042 ZnNi BLACK PASSIVATED FINISH
8	M8 X 20 HEX	Bolt Hex, M8X20x1.25, GR8.8 ZP
10	M8 FLAT WASHER	M8 FW
8	M10 X 45	Bolt Hex, M10X45X1.5, GR8.8 ZP
8	M10 Flat Washer	M10 FW
16	M10 FLANGE NUT	Flange Nut, M10x1.5 G8.8 ZP
8	M10 x 25	Bolt Hex, M10X25x[1.5], GR8.8 ZP
10	M10 FW LHD	WASHER, FLAT M10X28.5X2.5
2	M5 Flat washer BZP	M5 Flat Washer, 10x5.3x1, ISO4042 ZnNi BLACK PASSIVATED FINISH
2	M5X15 BHCS BZP	SCREW, BUTTON HEAD CAP, M5X15X0.8 GR12.9 ISO4042 ZnNi BLACK PASSIVATED FINISH
2	M8 NYW	Washer, M8, Nylon
2	M8 NYLOC	NYLOC SELF LOCKING NUT, ST STL A2 ISO
8	M12X30	Bolt Hex, M12X30x1.75, GR8.8 ZP
8	M12 FW LHD	M12 FW Large Heavy Duty
8	M12 FLANGE NUT	Flange Nut, M12x1.75 G8.8 ZP
8	M8 FLANGE NUT	Flange Nut, M8x1.25 G8.8 ZP
16	M6x20 BHCS BLACK ZINC	SCREW, BUTTON HEAD CAP, M6X20X1 GR12.9, ISO4042 ZnNi BLACK PASSIVATED FINISH
10	M8 X 30 BHCS BLACK ZINC	SCREW, BUTTON HEAD CAP, M8X30X1.25, ISO4042 ZnNi BLACK PASSIVATED FINISH
8	M6CN2MM	CAGE NUT M6x1.6-2.5
2	M8 Cage nut	NUT, CAGE, M8X1.25 ZINC PLATE
4	M12 FLAT WASHER	M12 FW
4	M12X40	Bolt Hex, M12X40X1.75, GR8.8 ZP
4	NP-COM-M12-40-ASM0	M12 NUT PLATE SHORT, 40MM STEM ROUNDED
2	P-0394	8MM Circular Spacer Suit M12 Bolt
2	M10 X 40	Bolt Hex, M10X40X1.5, GR8.8 ZP

Toro Additional Parts

QTY.	PART NO.	DESCRIPTION
1	B-1177L	L663 Defender Toro Antenna Bracket
1	B-1177R	L663 Defender Toro Antenna Bracket
2	M8 X 20 BHCS BZP	SCREW, BUTTON HEAD CAP, M8X20X1.25 GR12.9, ISO4042 ZnNi BLACK PASSIVATED FINISH
2	M8 FLAT WASHER- BLACK ZINC	M8 FLAT WASHER, 16.5x8.4x1.2, ISO4042 ZnNi BLACK PASSIVATED FINISH

TOOLS REQUIRED

The following tools will be required to install the product.

Hand Tools	Power Tools	Workshop Supplies
Metric Socket Set 8-19mm Socket Extension Bar Socket Universal Joint Metric Spanner Set 10-19mm Hex (Allen) Key Set 4-6mm Torx Key Set Trim Puller Tool Flat Blade Screwdriver set Phillips Head Screwdriver set Utility Knife Side Cutters Pliers Ruler Torque Wrench Square (engineers or combination)	Electric/Air Impact Driver (Optional) Air Hacksaw Or Oscillating Multi Tool Or Angle Grinder Electric Drill + Drill Bit Set	Panel Stand or Soft Blanket Cable Ties Masking Tape Paint Pen Marker Rags Isopropyl Alcohol

WORKSHOP SAFETY

It is the responsibility of the installer to always complete works in a safe manner. Make sure the following safety equipment is available, and precautions are observed whilst fitting this product.

Hearing Protection 	Always wear ear protection when using power tools.
Eye Protection 	Ensure eye protection is always worn when cutting or drilling.
Manual Handling 	Do not attempt to lift bar assemblies or rock sliders on your own. Always use two people to lift or use mechanical Lifting aid such as hydraulic lifting trolley.
Vehicle Support 	Always ensure vehicle is properly supported when working on it. Do not attempt to fit products whilst suspension work is being carried out. Do not work under a vehicle supported only by a jack.

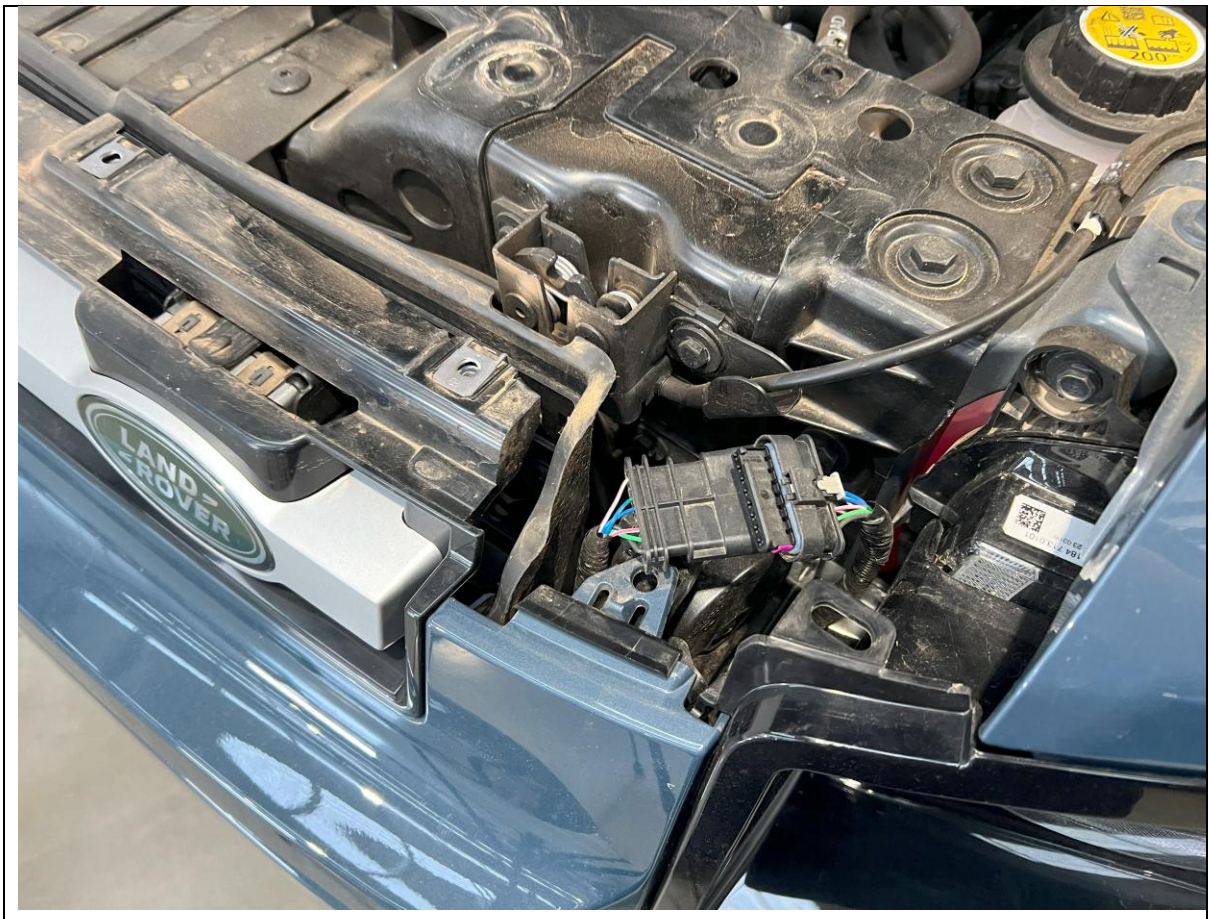
1. If vehicle is equipped with Air Suspension, raise to offroad height to provide more room to work.
2. Open the bonnet.
3. Remove 4x Clips securing the top edge of radiator shroud. Use trim tool to lift the center section. Once the center section is up, remove clip.
4. Remove the 4x T30 Torx screws securing the bottom edge of the radiator shroud.
5. Remove the radiator shroud.
6. Retain all clips and bolts for reassembly.

TOOLS REQUIRED

Trim Tool
T30 Torx Screwdriver

FASTENERS

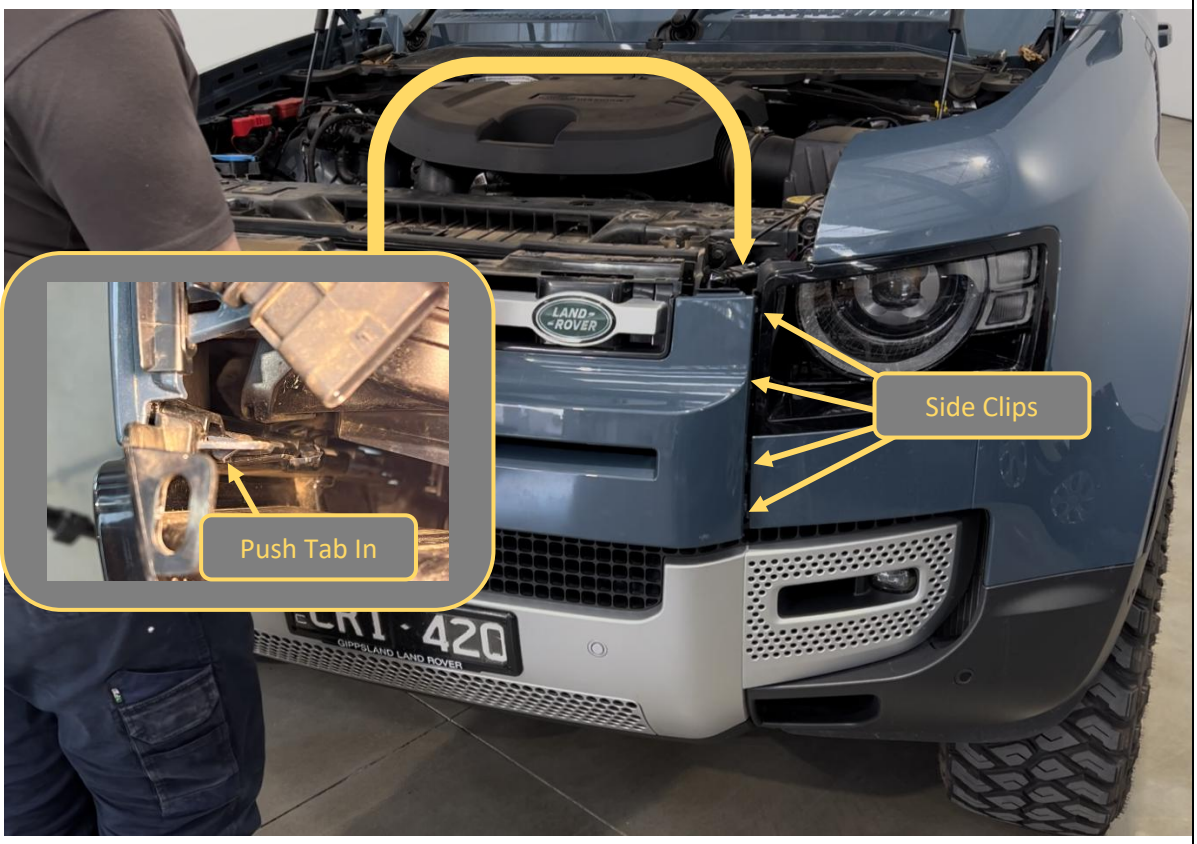
Retain Factory



7. Disconnect the radar electrical harness connector, Located near the top of the LH headlight.

TOOLS REQUIRED

FASTENERS



8. There are 4x clips securing each side of the grille. Working from the top push in the center tab (with a finger or trim tool) whilst pulling the grille away from the car. Alternate LH and RH sides as you release clips.

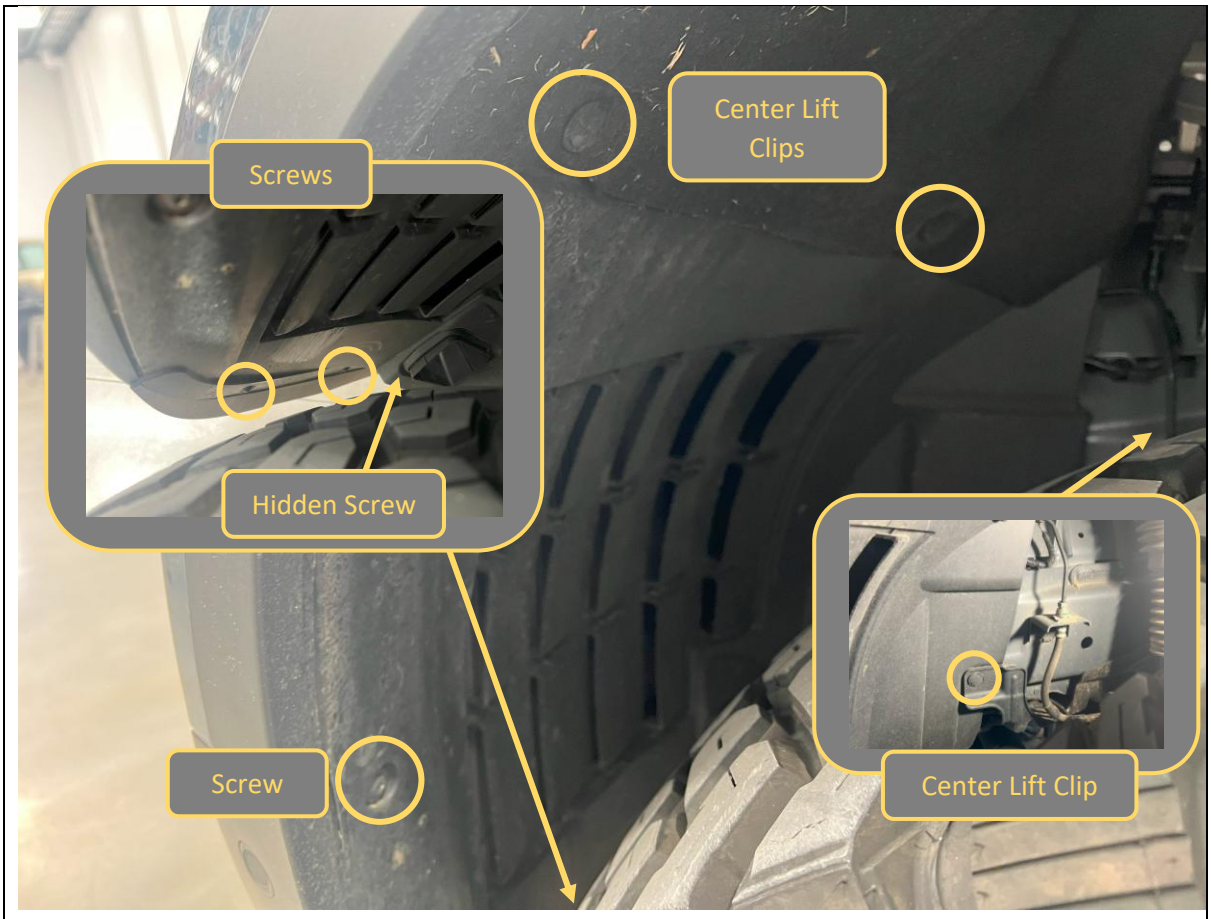
9. There are also clips across the bottom that can be released by prying from underneath with plastic trim tool.

10. Once clips are released, remove grille from car and set aside for re-fitment later.

TOOLS REQUIRED

Plastic Trim Tool

FASTENERS



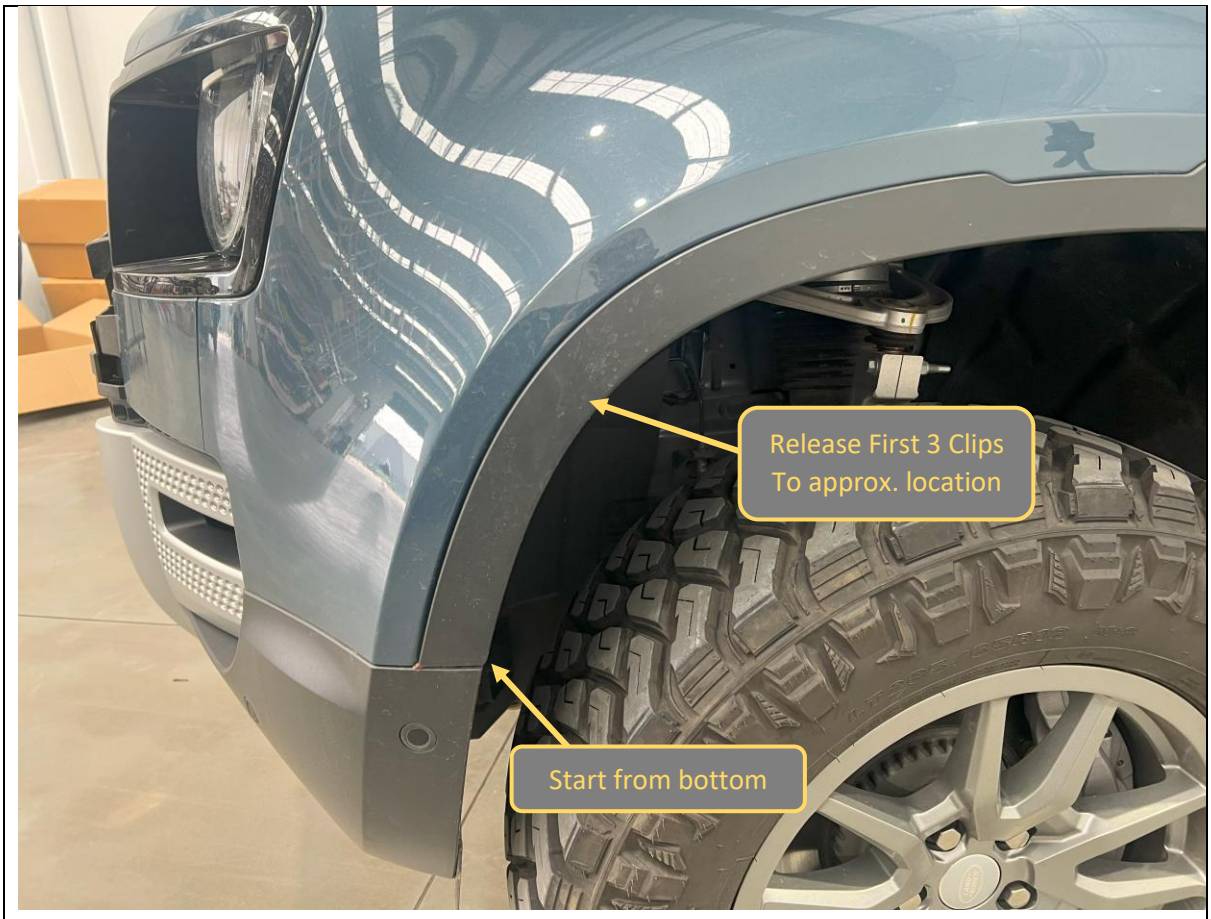
11. Remove the 4 Posidriv (PZ) screws securing the inner wheel arch liner to the bumper
12. Remove 3x center lift clips securing the top and side of the inner arch liner.
13. Remove the inner wheel arch liner from the vehicle.
14. Complete for both sides of the vehicle.

TOOLS REQUIRED

Trim Tool
Posidriv (PZ) Screwdriver

FASTENERS

Factory Screws (Discard)
Factory Clips (Retain)



15. Starting from the bottom edge of the wheel arch flare trim, unclip the first 3 clips securing to the fender by pulling the trim away from the fender.

16. These clips are very easy to break, it can be helpful to pinch the clips from behind with pliers or similar to help release.

17. Repeat on both sides of the vehicle.

TOOLS REQUIRED

Trim Tool
Pliers

FASTENERS

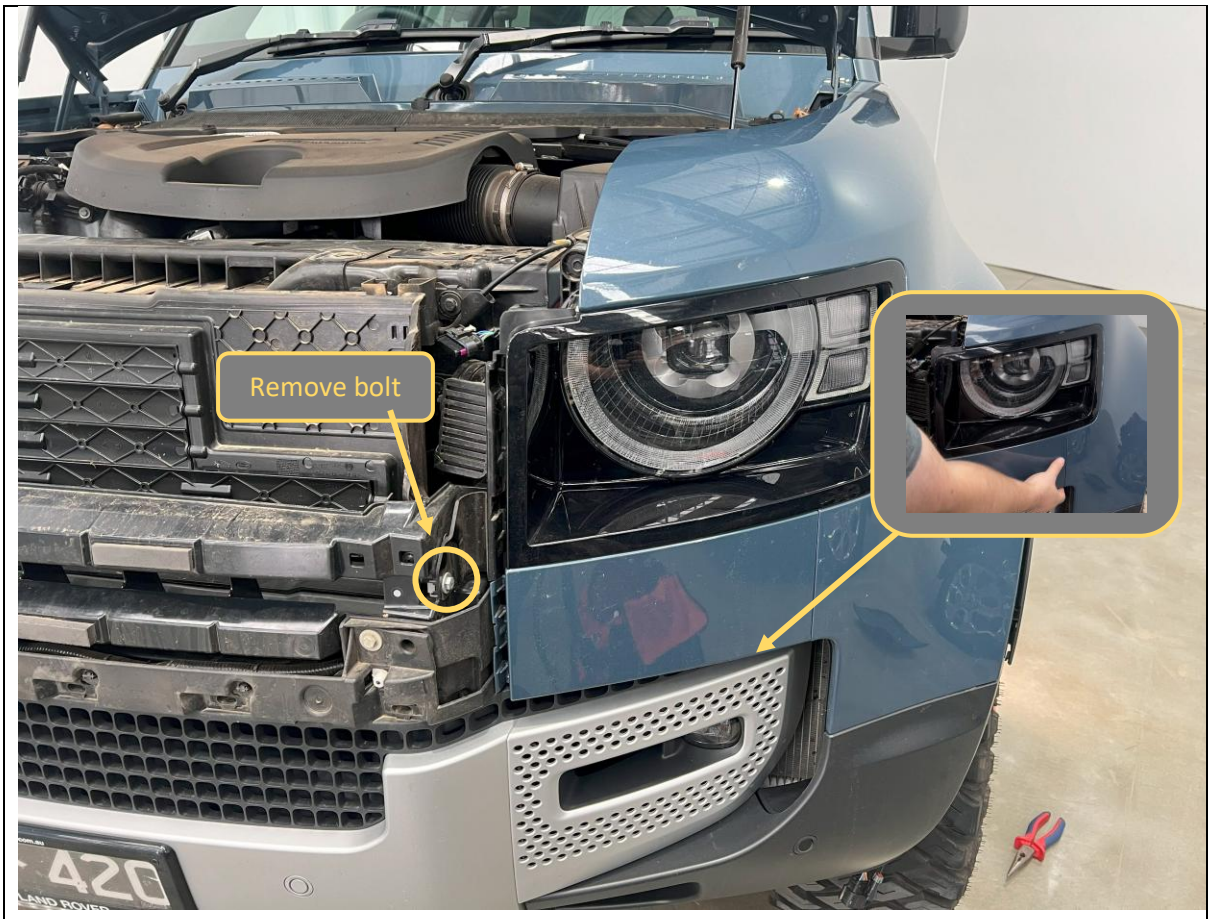
18. Using trim tool, release the main wiring harness from clips securing it to the bumper.

19. Disconnect the main wiring harness and front camera connector. Take care disconnecting the camera, making sure you pull straight, as it is easy to damage the delicate center pin in the mini co-axial connector.

TOOLS REQUIRED

Trim Tool

FASTENERS



20. Remove the 10mm head bolt securing the headlight surround trims to the radiator support panel.

21. Starting from the bottom corner carefully but firmly pull the trim away from the vehicle to release the clips.

22. Work progressively around the panel until all clips are released, then remove the panel.

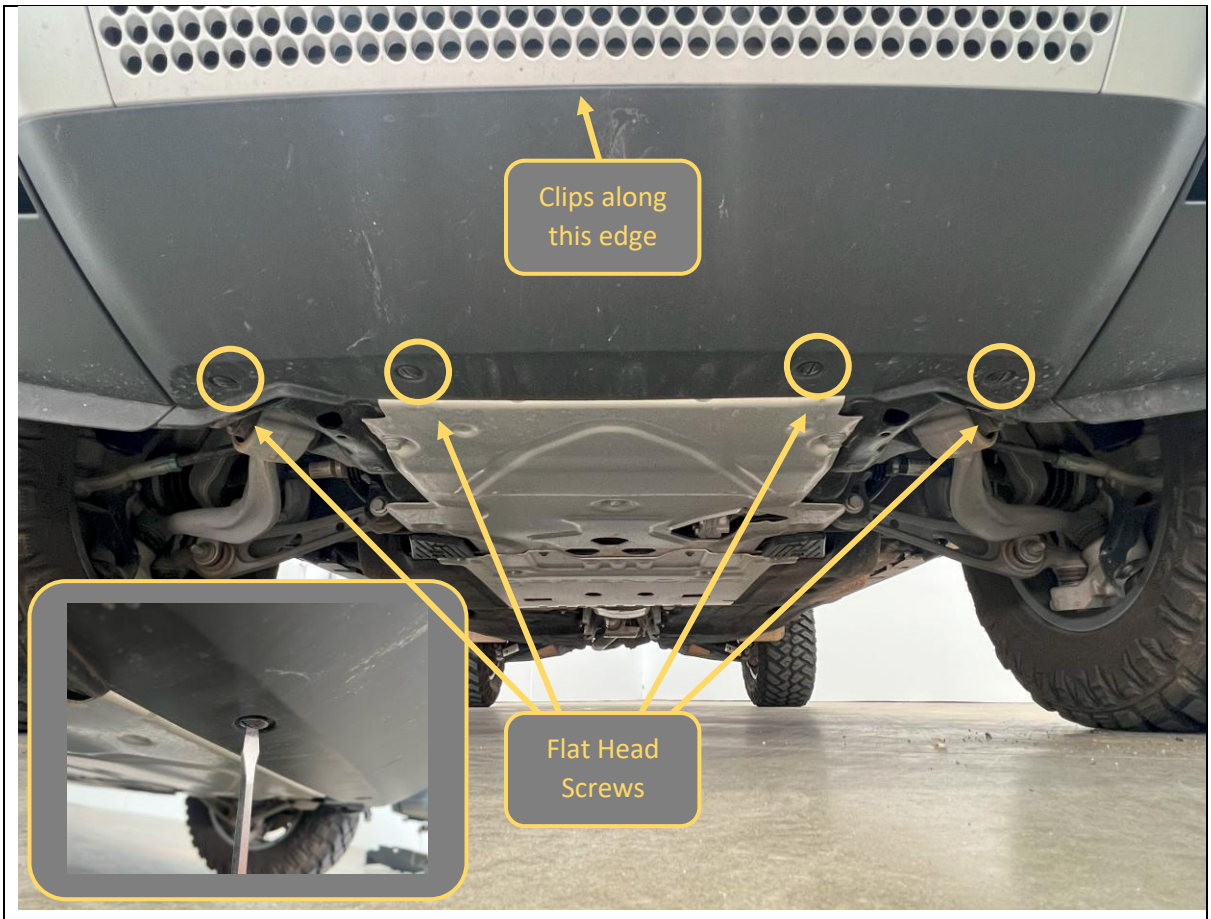
23. Repeat for the other side of the vehicle.

TOOLS REQUIRED

Trim Tool
10mm Socket

FASTENERS

Factory Clips
Factory Bolt - Retain



24. On the underside at the front of the bumper, remove the 4x flat head screws that hold the recovery point cover to the bumper.

25. Firmly but carefully pull the panel forward to release panel from the clips on the front edge.

TOOLS REQUIRED

Flat head screwdriver

FASTENERS

Factory Fasteners - Discard

26. Using T30 Torx Screwdriver, remove the 4x Torx head screws securing the bottom of the bumper to the vehicle.

TOOLS REQUIRED

T30 Torx bit

FASTENERS

27. Remove the 5x 10mm head bolts securing the top edge of the bumper to the vehicle.

    (The bolts have been removed already in this photo)

TOOLS REQUIRED

10mm Socket / Spanner

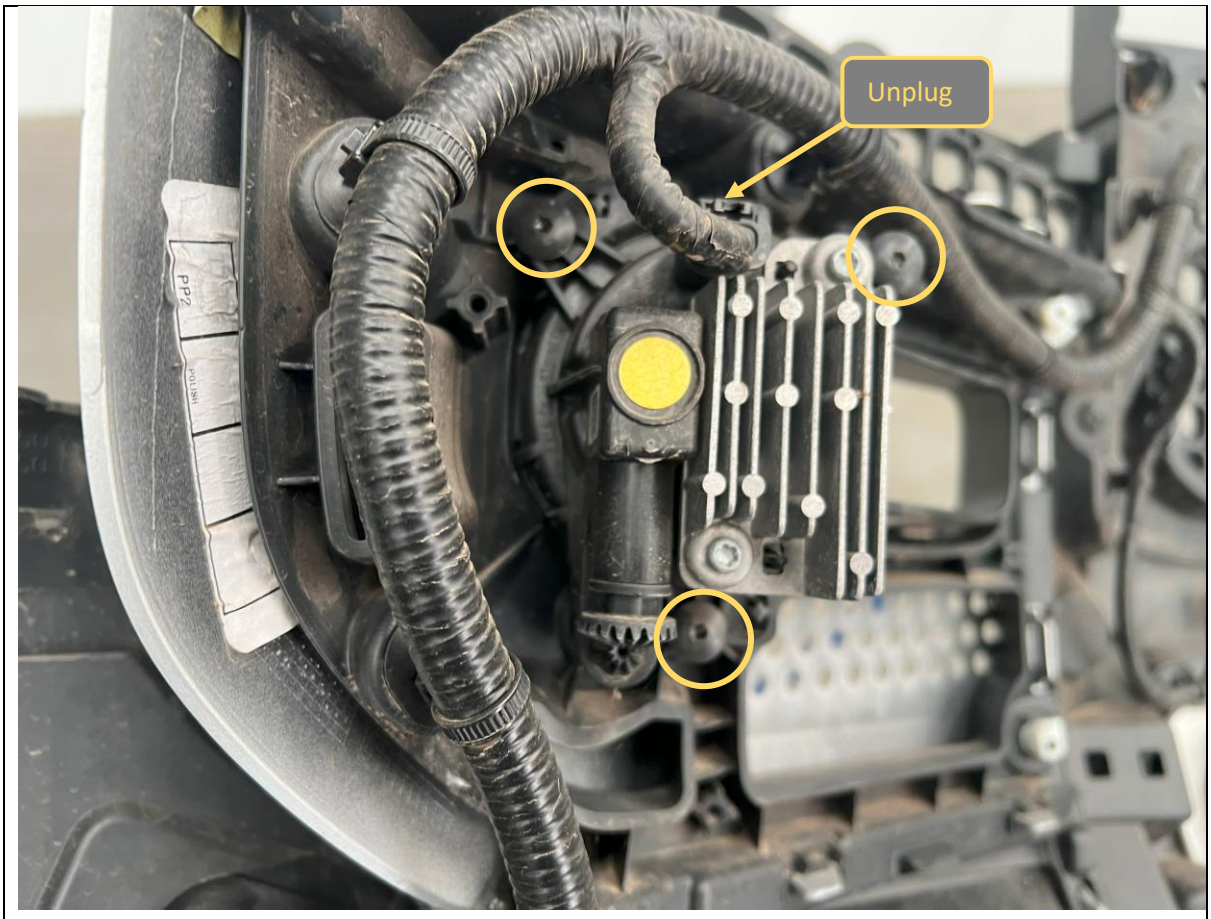
FASTENERS

28. Starting from the wheel arch firmly but carefully pull the bumper away from the retaining clips on the fender.

29. With assistance, complete clip release on both sides simultaneously. Once released, the bumper will be free to remove and set aside.

TOOLS REQUIRED

FASTENERS



30. If equipped, unplug the fog light harness from the fog lights.

31. Remove the fog light, by removing the 3x Torx screws securing it to the bumper.

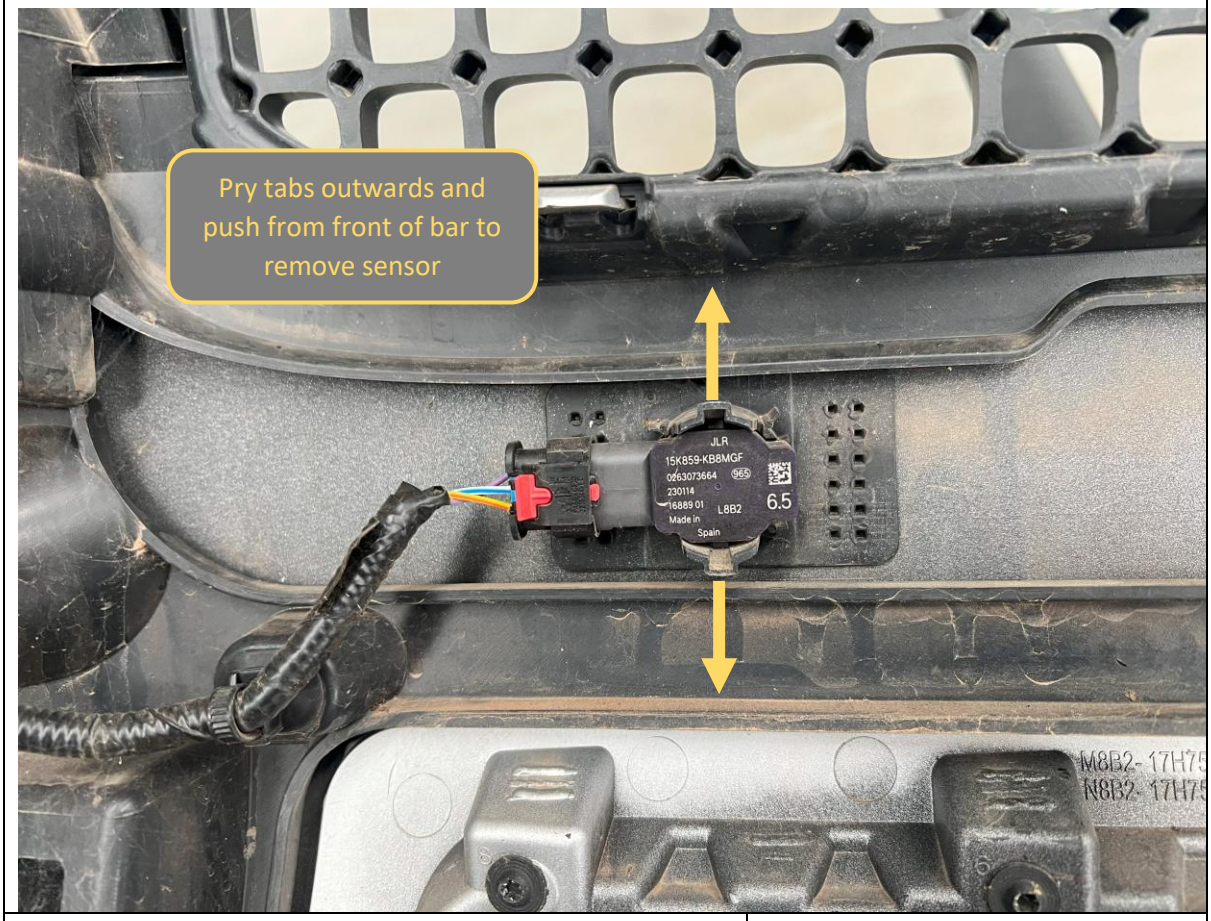
32. Complete for both sides

TOOLS REQUIRED

Torx Screwdriver / Bit

FASTENERS

Factory Screws (Discard)



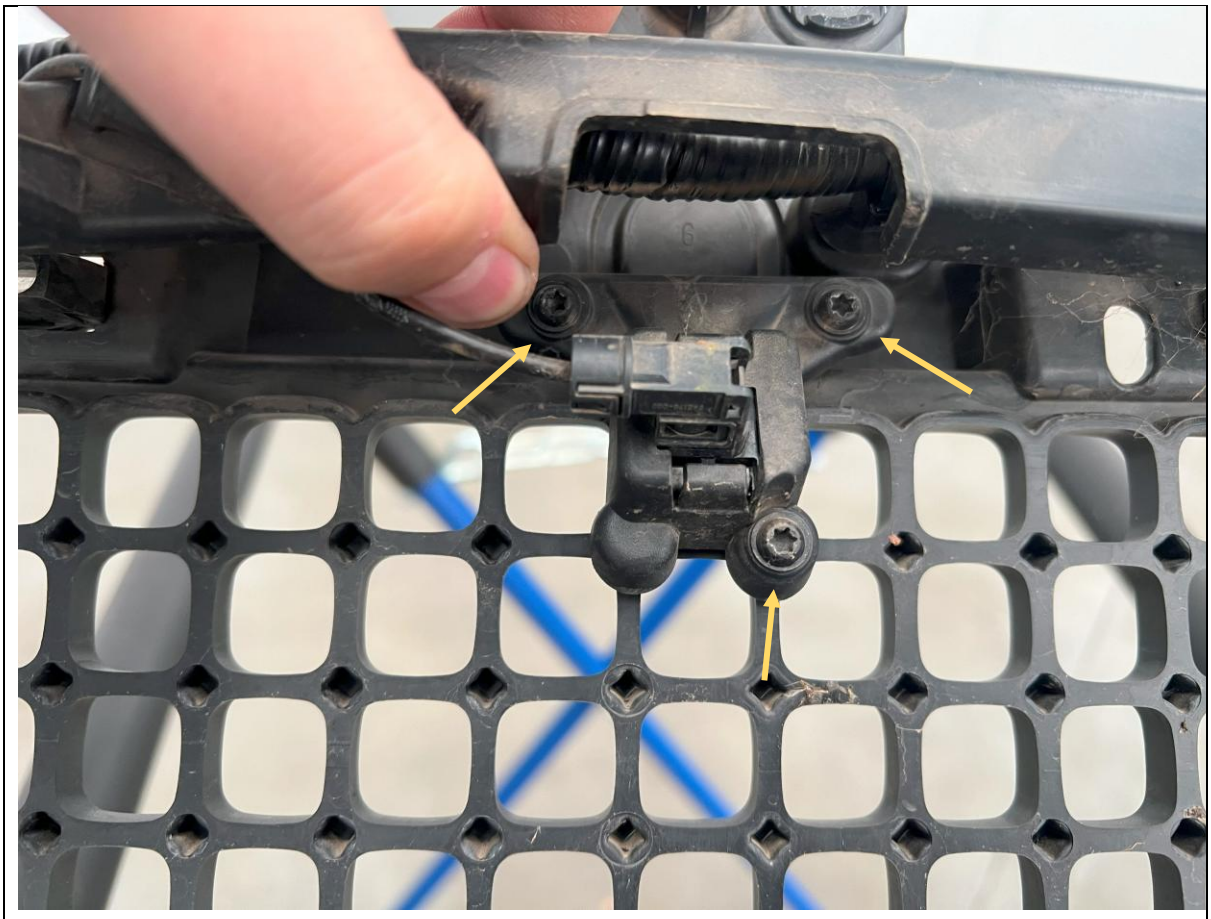
33. Pry the two retaining tabs on the parking sensor housing outwards whilst applying pressure to the face of the sensor from the front side of the bumper. They should be released from the housing. Remove from the rear side of the bumper.

    Take care to ensure the rubber isolation rings remain in place with the sensor

34. Complete for all 6x sensors, leave them attached to the loom at this stage.

TOOLS REQUIRED

FASTENERS



35. Lift the center plastic bar to reveal the 3x Torx screws securing the front camera to the bumper.

36. Remove the 3x Torx screws to release camera.

37. Take note of the correct orientation of the camera. It is helpful to mark this to assist with re-installation to the bar.

38. Carefully disconnect the camera connector, take extra care to ensure you do not twist or bend the connector during removal as it is very easy to damage the delicate center pin on the mini co-axial connector.

39. Place the camera aside in safe place for re-fitment to new front bar.

TOOLS REQUIRED

Torx Screwdriver / Bit
Marker Pen

FASTENERS

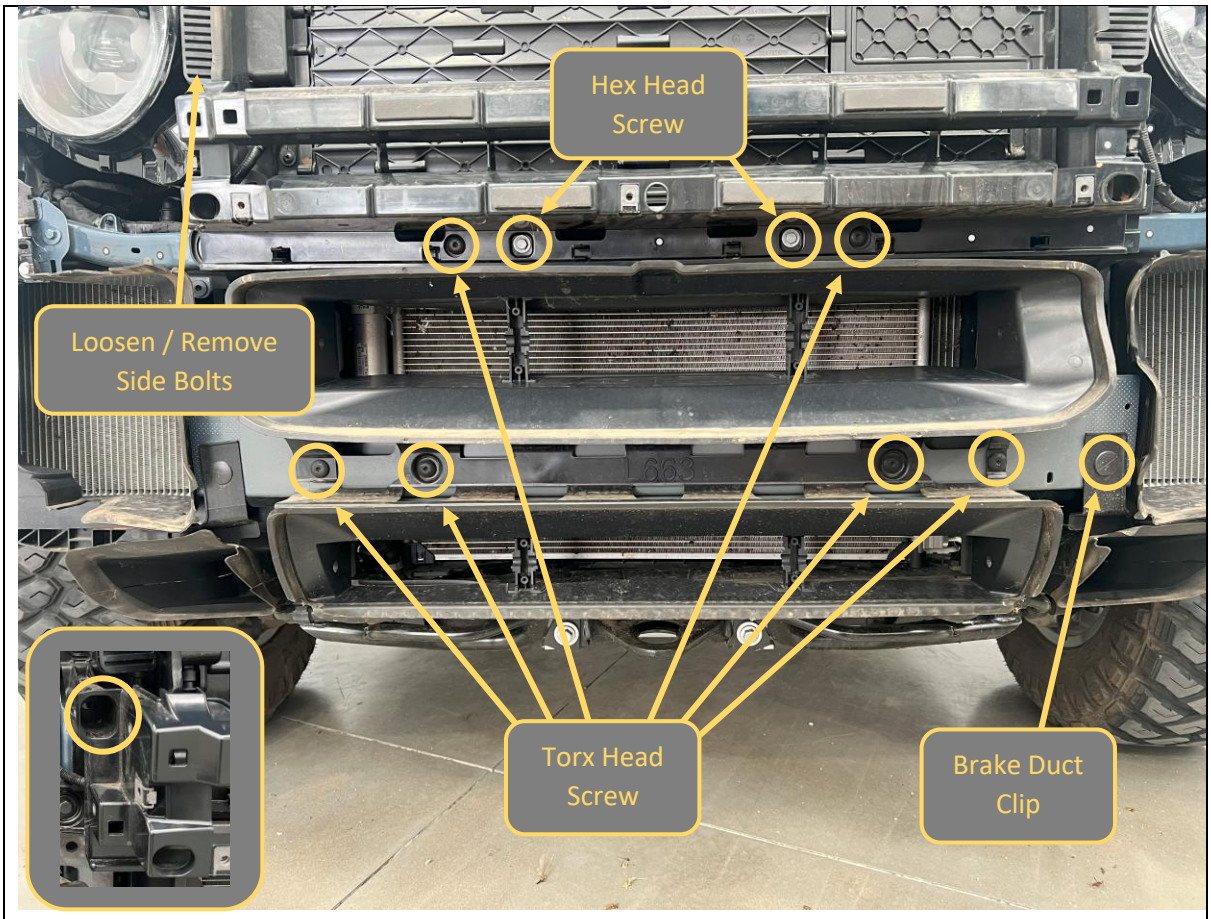
40. Using a trim tool, unclip all the clips securing the wiring harness to the bumper.

41. Remove wiring harness from the bumper and set aside in safe place for re-fitment to the new front bar.

TOOLS REQUIRED

Trim Tool

FASTENERS



42. Undo the 6x Torx Head and 2x 10mm Hex head screws securing the center air guides.

43. Loosen the 2x Bolts (1x Each side) Securing the upper active radiator air guide.

44. If vehicle is fitted with lower active louvers, disconnect electrical harness from louvers and tape back.

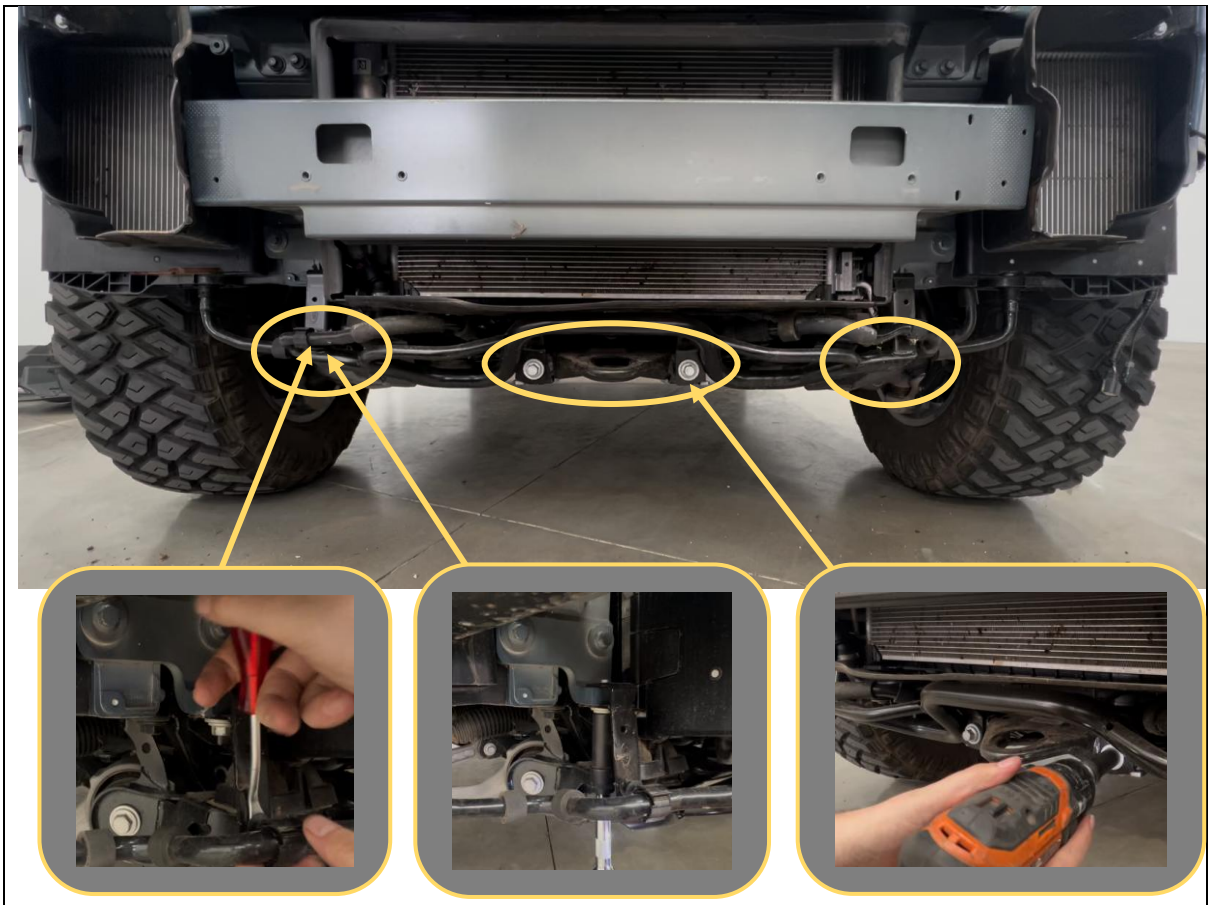
45. Remove the lower air guide (including louvers if fitted). It sits underneath the lip of the upper radiator air guide and will need to be manipulated to remove.

46. Replace the bolts securing the upper active radiator air guide.

TOOLS REQUIRED

Trim Tool
T30 Torx Driver

FASTENERS



47. Release the clips holding the aux radiator coolant hoses to the tubular lower radiator guard.

48. Remove the factory bolts securing the tubular lower radiator guard to the factory impact beam using 13mm socket.

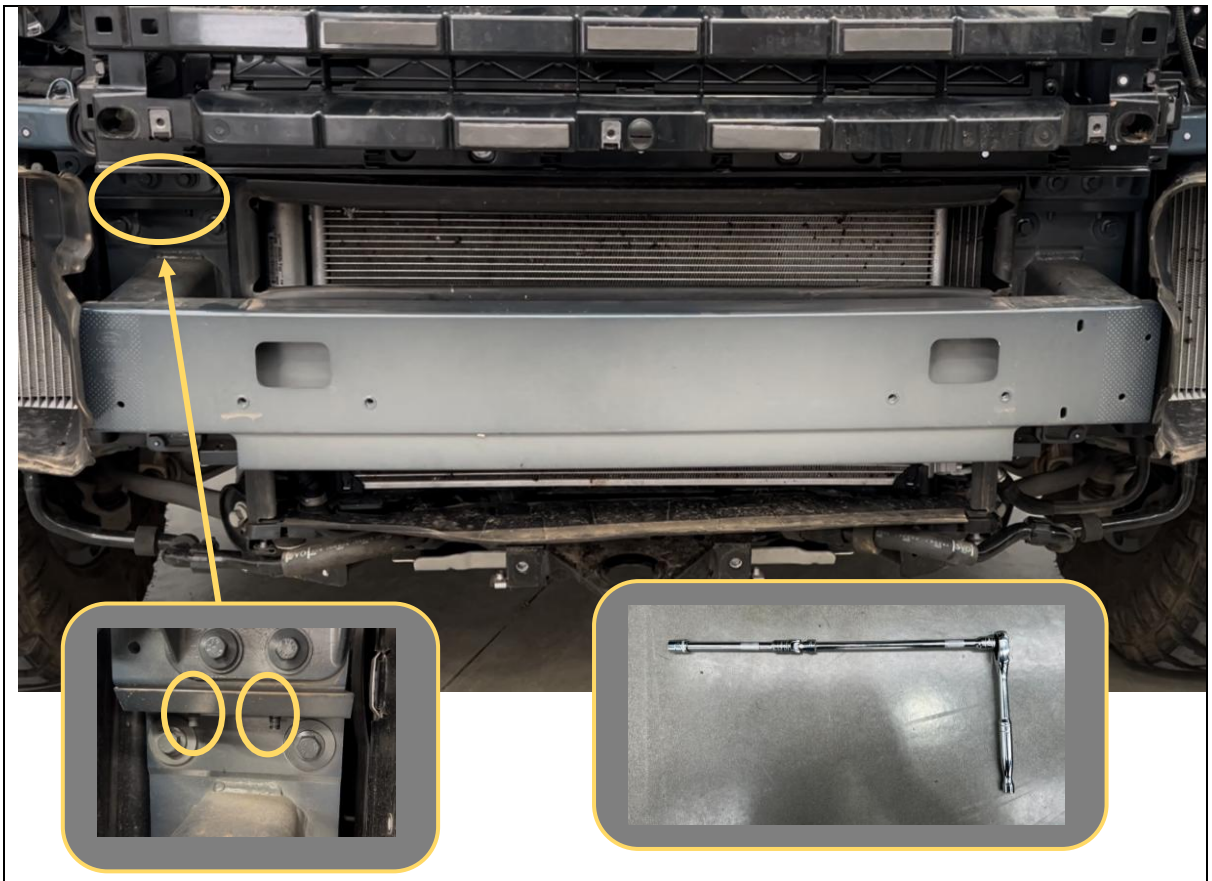
49. Remove the factory bolts securing the tubular lower radiator guard to the cross member using 16mm socket.

TOOLS REQUIRED

13mm Socket
16mm Socket

FASTENERS

Factory 13mm hex bolt (discard)
Factory 16mm hex bolts (Retain for Refitment)



50. It is now time to remove the main impact beam.

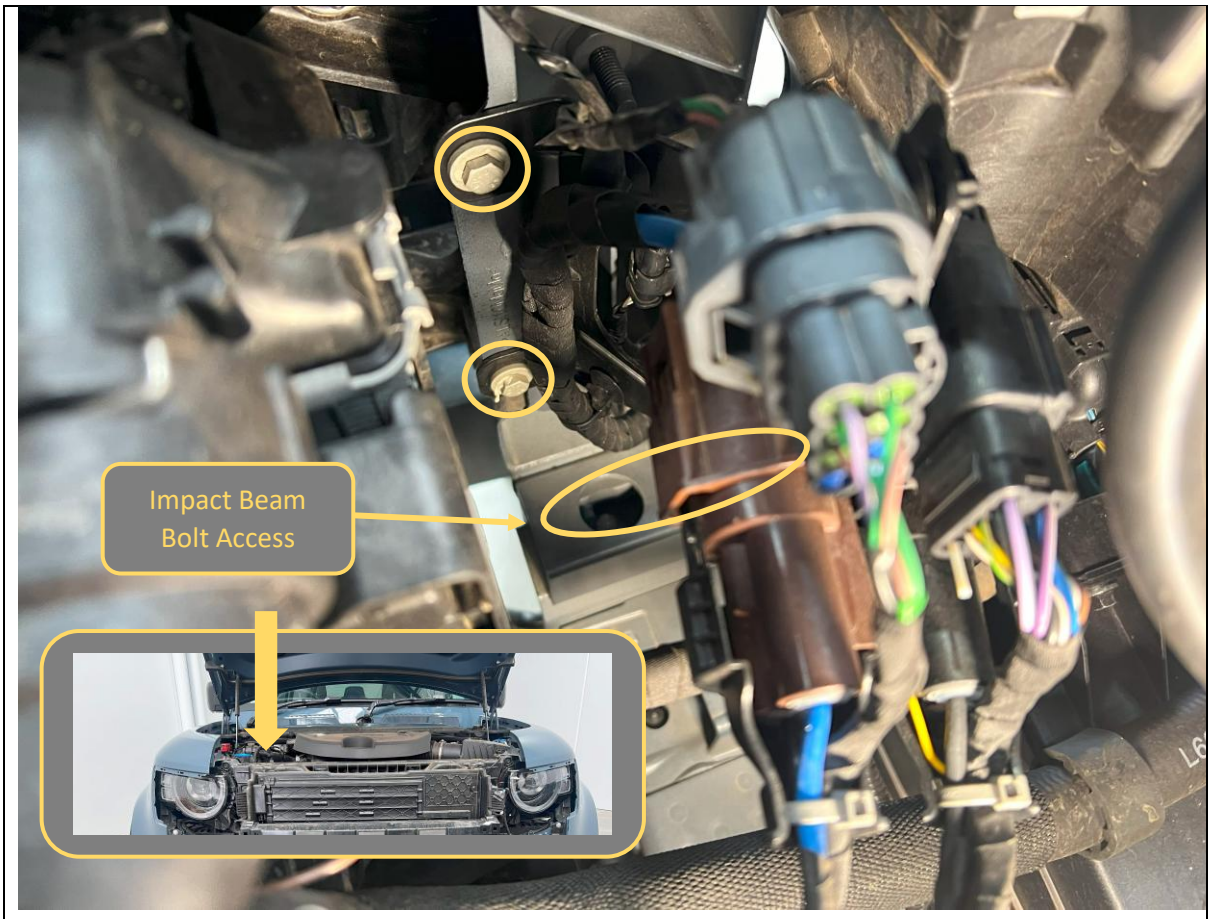
51. This is much more difficult than it first appears due to the vertical bolts securing the top edge of the impact beam to the chassis.

52. Gather the required tools to undo these bolts. You will need 3/8” (1/2” is too large) Ratchet, Universal Joint, a mid (approx. 100mm) and long (approx. 250mm) extension bar, and 10mm socket.

TOOLS REQUIRED

3/8” Drive Ratchet
3/8” Universal Joint
3/8” Medium Extension Bar
3/8” Long Extension Bar
10mm Socket

FASTENERS



53. On the RHS, in the engine bay adjacent to the headlight, locate the wiring harness bracket shown. Below this you will be able to see the bolts that need to be removed to remove the impact bar.

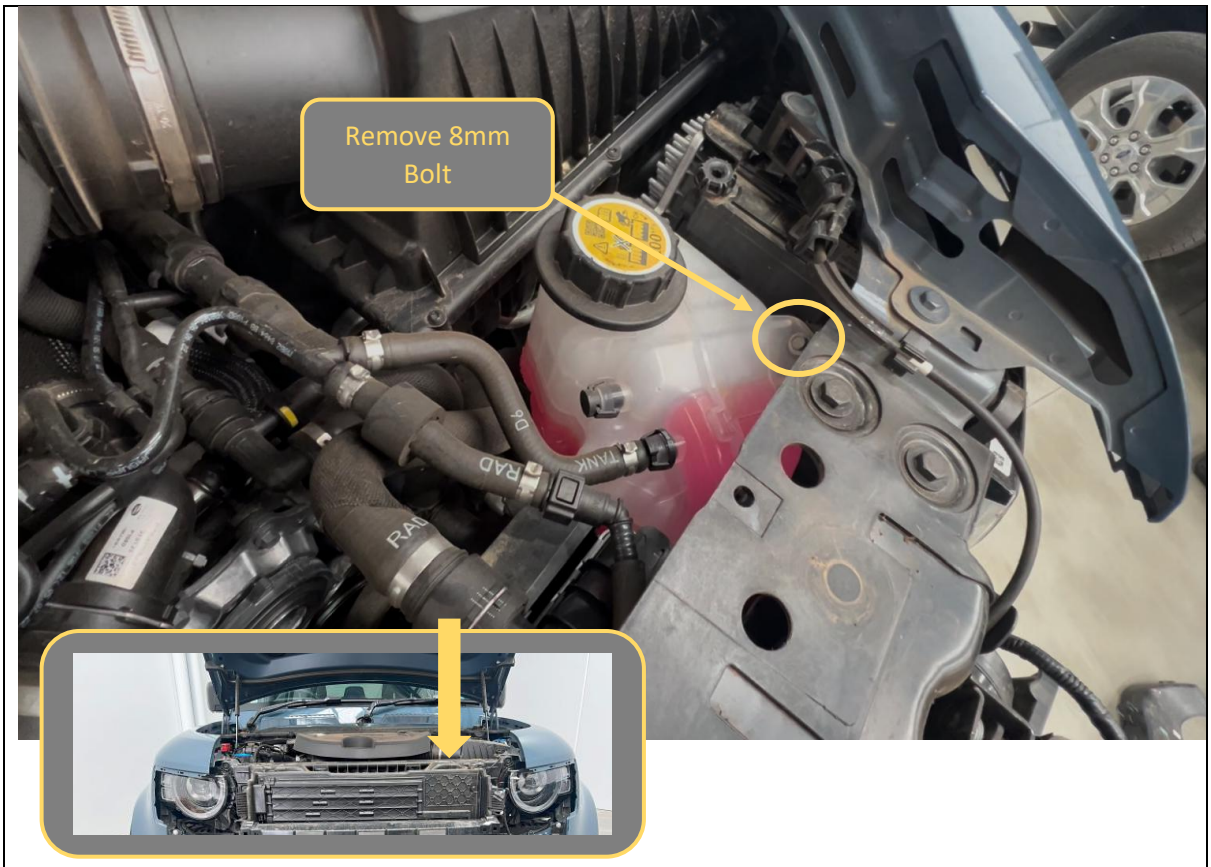
54. Remove the 10mm head screws securing the wiring harness bracket to allow the bracket to be manipulated for better access.

TOOLS REQUIRED

10mm Socket
Extension Bar

FASTENERS

Factory Bolts – Retain



55. On the LHS, the impact beam top bolts are in the same location. This side is obstructed by the coolant overflow tank.

56. Remove the 8mm head screw securing the tank.

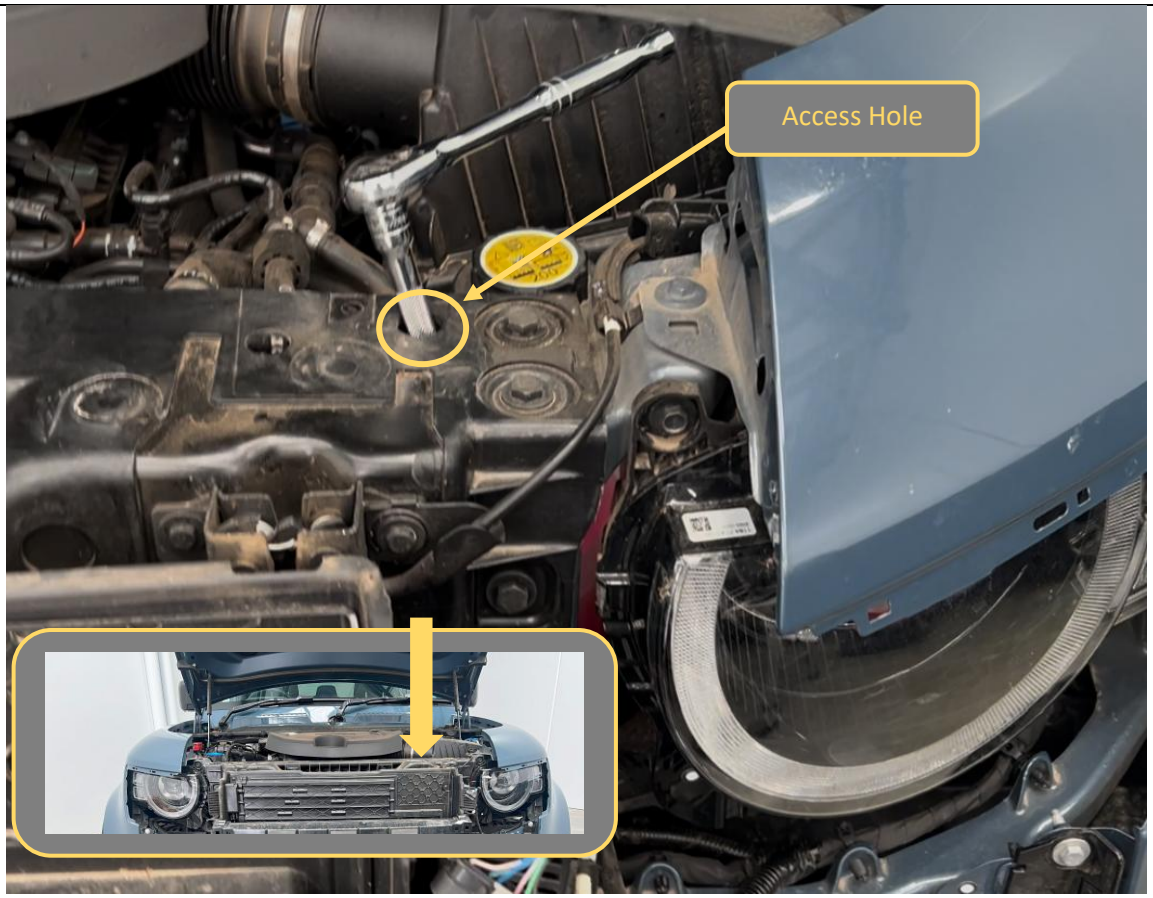
57. The tank sits on locating tabs. Lift tank up then rearwards to lift tank off the tabs. Allow the tank to sit loosely in position. This will provide (albeit very limited) access to the impact beam top bolts.

TOOLS REQUIRED

8mm Socket

FASTENERS

Factory Bolt – Retain



58. Remove the impact beam top bolts.

59. On LHS we found it best to insert the socket through the access holes in the top of the body. Manipulate the tank position as required to get the socket onto the bolts. This is fiddly!

60. Curse out whomever at Land Rover thought this was a good idea…

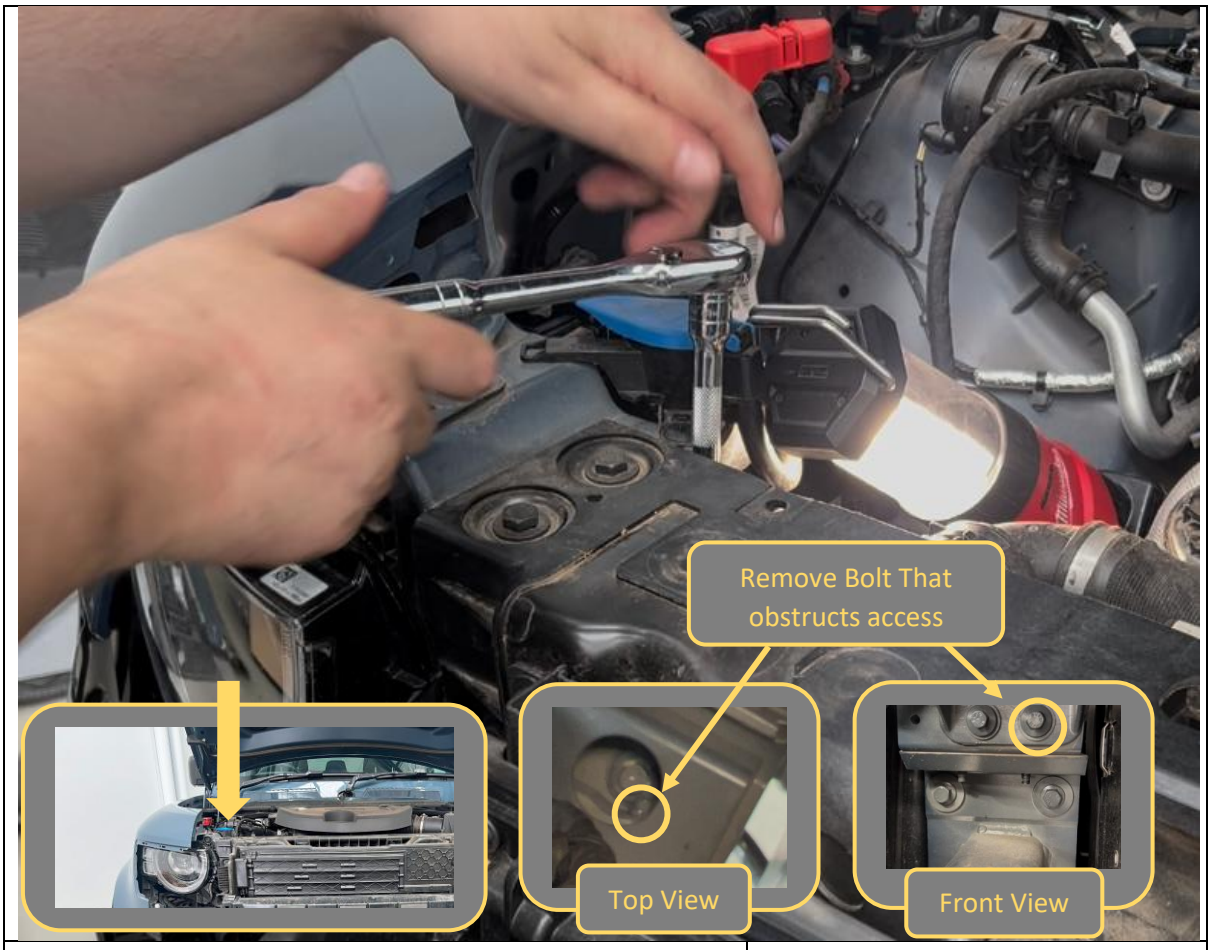
61. Breathe a big sigh of relief when they are finally out! Retrieve the bolts using magnetic pickup tool.

TOOLS REQUIRED

3/8” Extension bar contraption
10mm socket
Magnetic Pickup tool

FASTENERS

Factory Bolts – Retain



62. On RHS there is a bolt that obstructs access to one of the vertical impact beam bolts. Back out the bolt from the front before starting using 10mm socket.

63. On RHS there are no access holes. Manipulate the wiring bracket and the Socket position as required to get the socket onto the bolts. This is fiddly!

64. Again, curse out whomever at Land Rover thought this was a good idea…

65. Breathe a big sigh of relief when they are finally out!

66. Retrieve the bolts using magnetic pickup tool.

TOOLS REQUIRED

3/8” Extension bar contraption
10mm socket
Magnetic Pickup tool

FASTENERS

Factory Bolts – Retain

67. Remove the 8x factory flange bolts (4x per side) securing the impact beam to the chassis, using 13mm socket.

68. Remove set aside the impact beam.

TOOLS REQUIRED

13mm Socket

FASTENERS

69. Next step is to remove the plastic bumper retainer.

70. Remove the 10mm hex bolt securing the aux radiator shroud to the bumper retainer.

71. Remove the 3x 10mm hex bolts securing the bumper retainer to the fender.

72. Remove the retainer from the fender, it is secured by clips on the back of the fender.

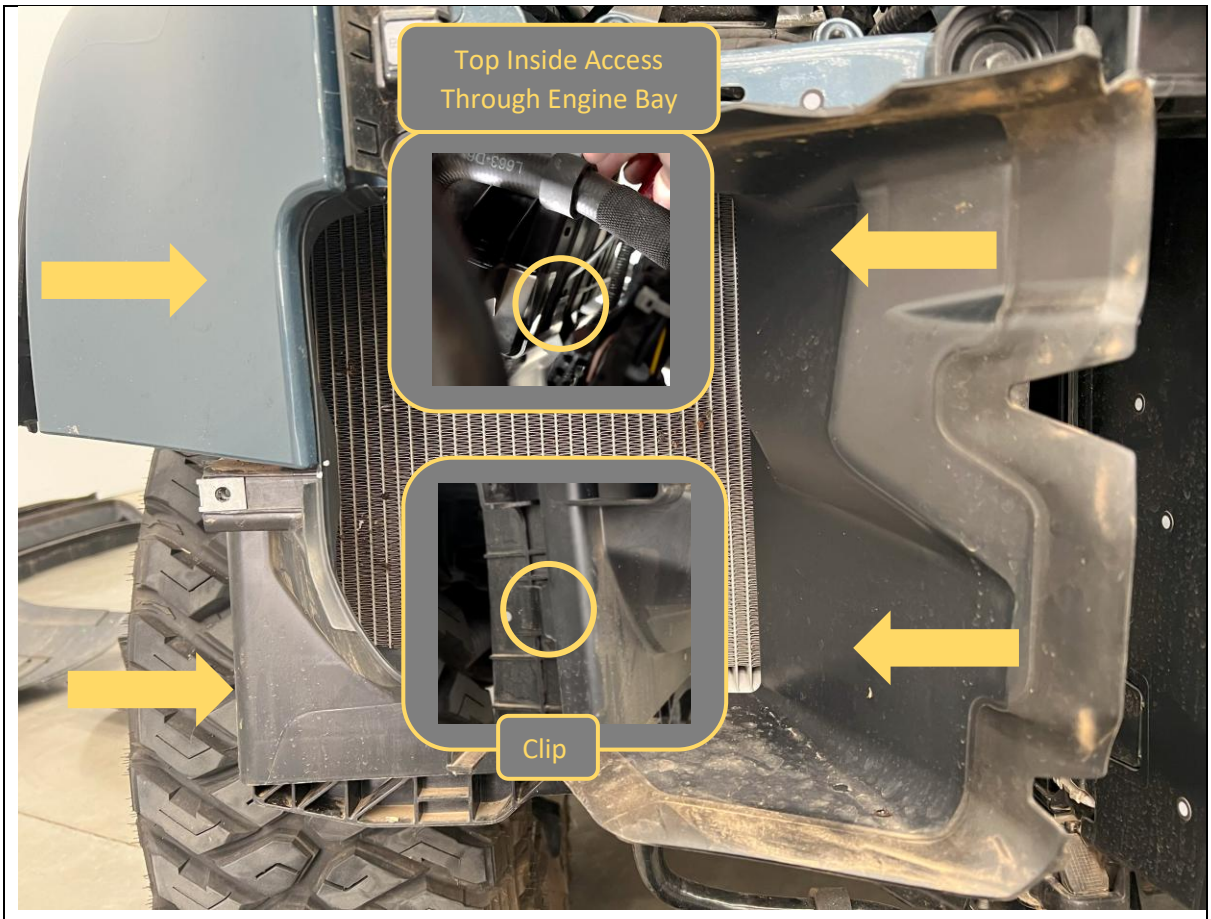
73. Repeat for both sides.

TOOLS REQUIRED

10mm socket / spanner
Trim tool

FASTENERS

Factory 10mm hex bolts - Retain



74. Remove the plastic auxiliary radiator air guides. These are clipped onto the radiator supports in 4x places.

75. Use a trim tool to release the clips. The top inner clip is best accessed through the engine bay.

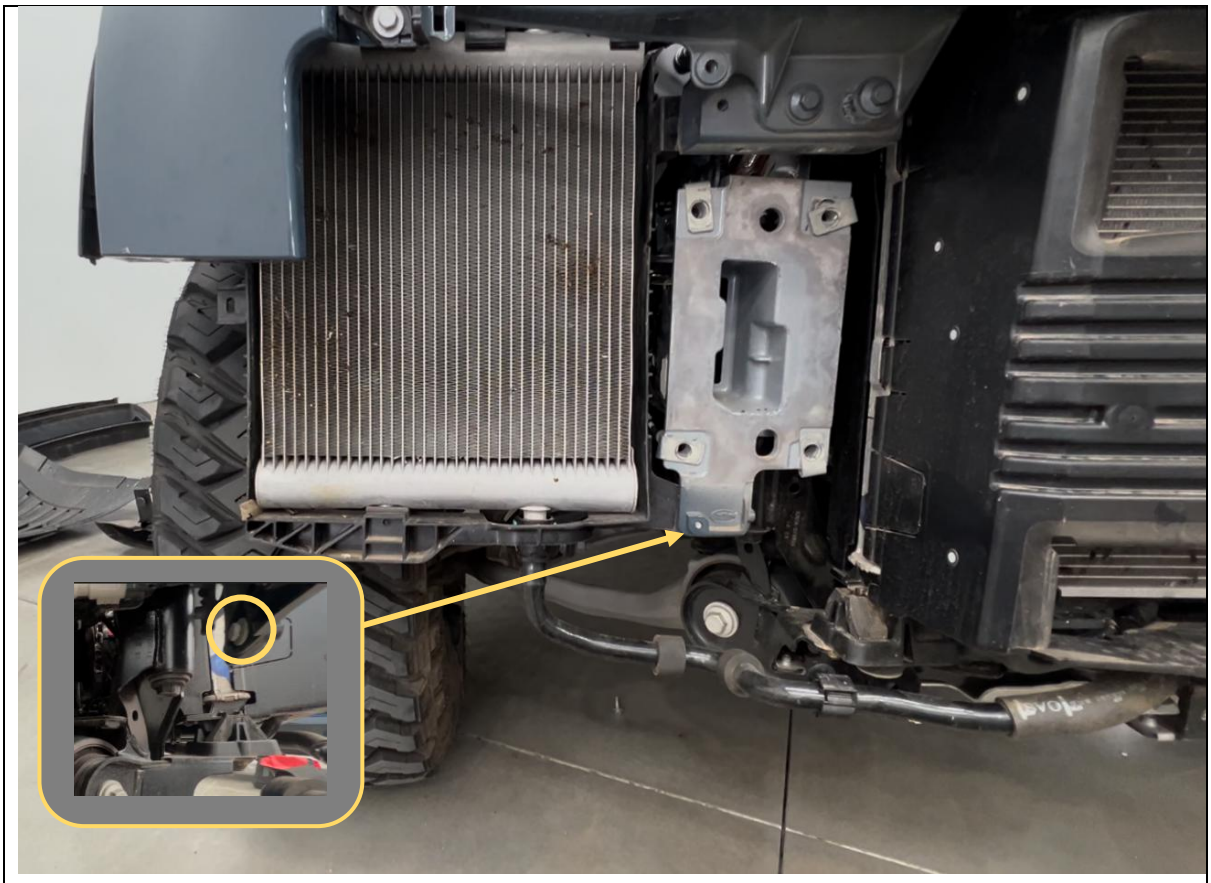
76. Once clips released manipulate the air guide forward and down, past the lip on the fender to remove from the vheicle.

77. Repeat air guide removal for both sides.

TOOLS REQUIRED

Trim tool

FASTENERS



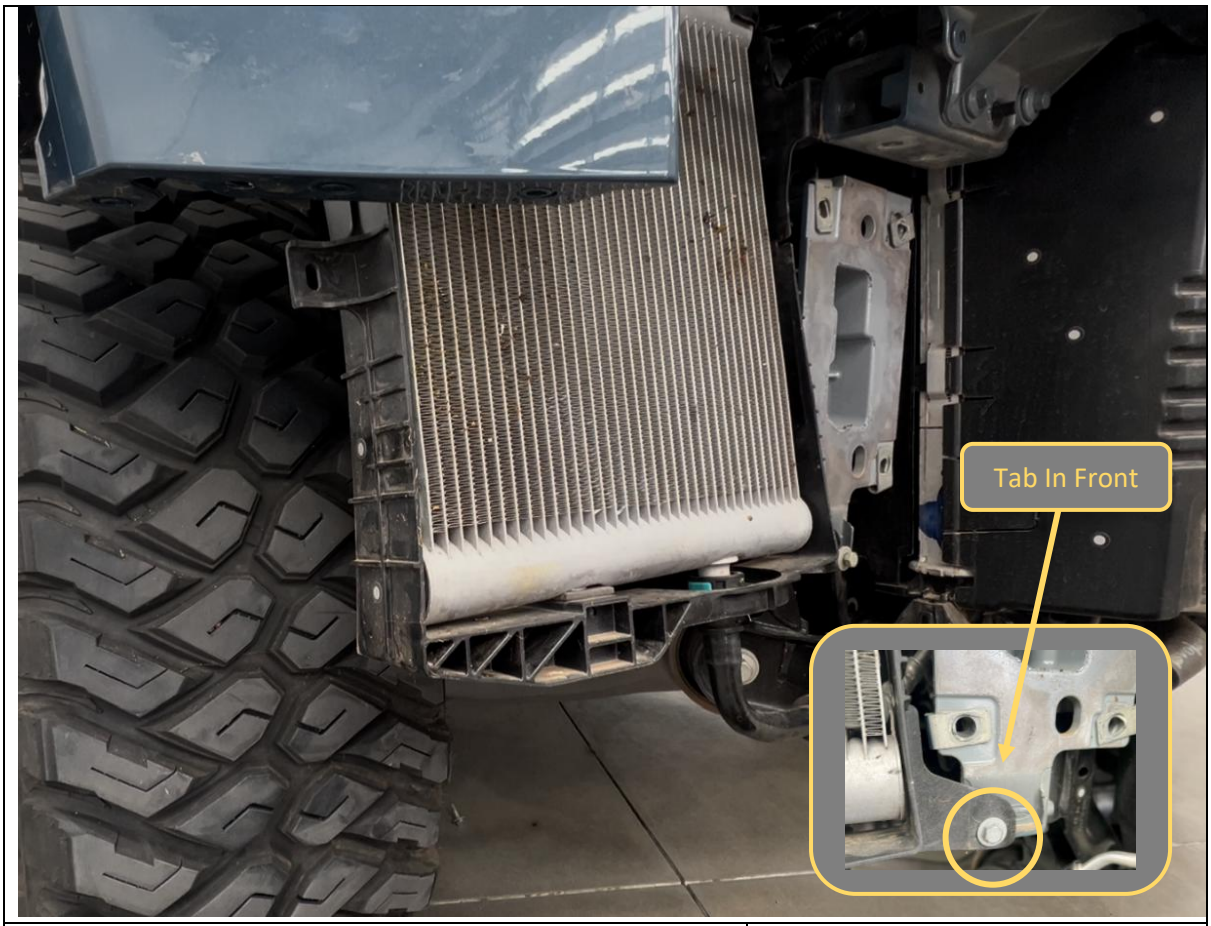
78. Remove the 10mm hex screw securing the bottom of the plastic radiator support to the chassis. This bolt is accessed from behind.

TOOLS REQUIRED

10mm Socket

FASTENERS

Factory 10mm hex bolt - Retain



79. Reposition the plastic radiator support such that the plastic tab sits in front of the chassis horn.

    Use the flex in the plastic to manipulate the tab around the chassis end.

80. Re-secure the radiator support to the chassis ends on the front side, using the same factory bolt.

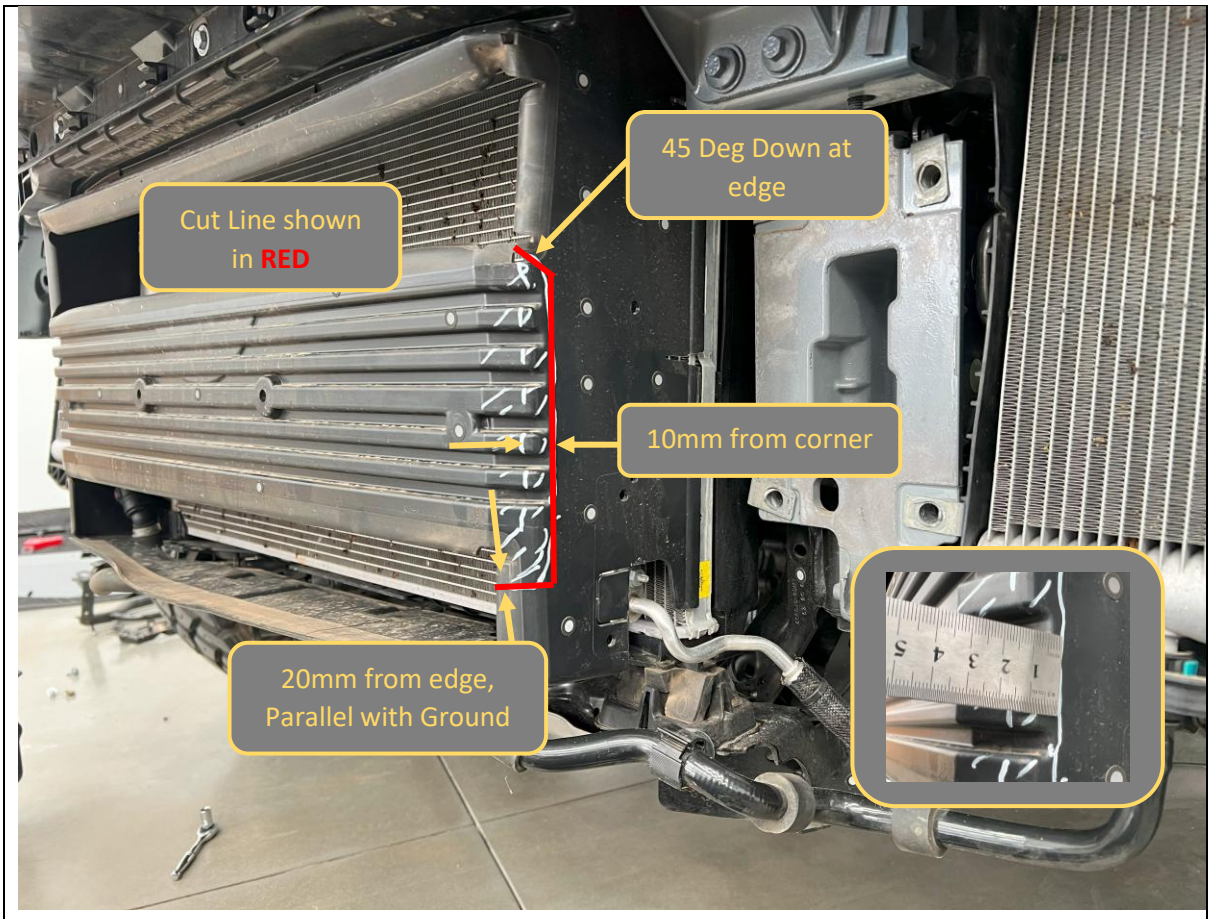
81. Complete for both sides of the vehicle.

TOOLS REQUIRED

10mm Socket

FASTENERS

Factory Flange Bolts

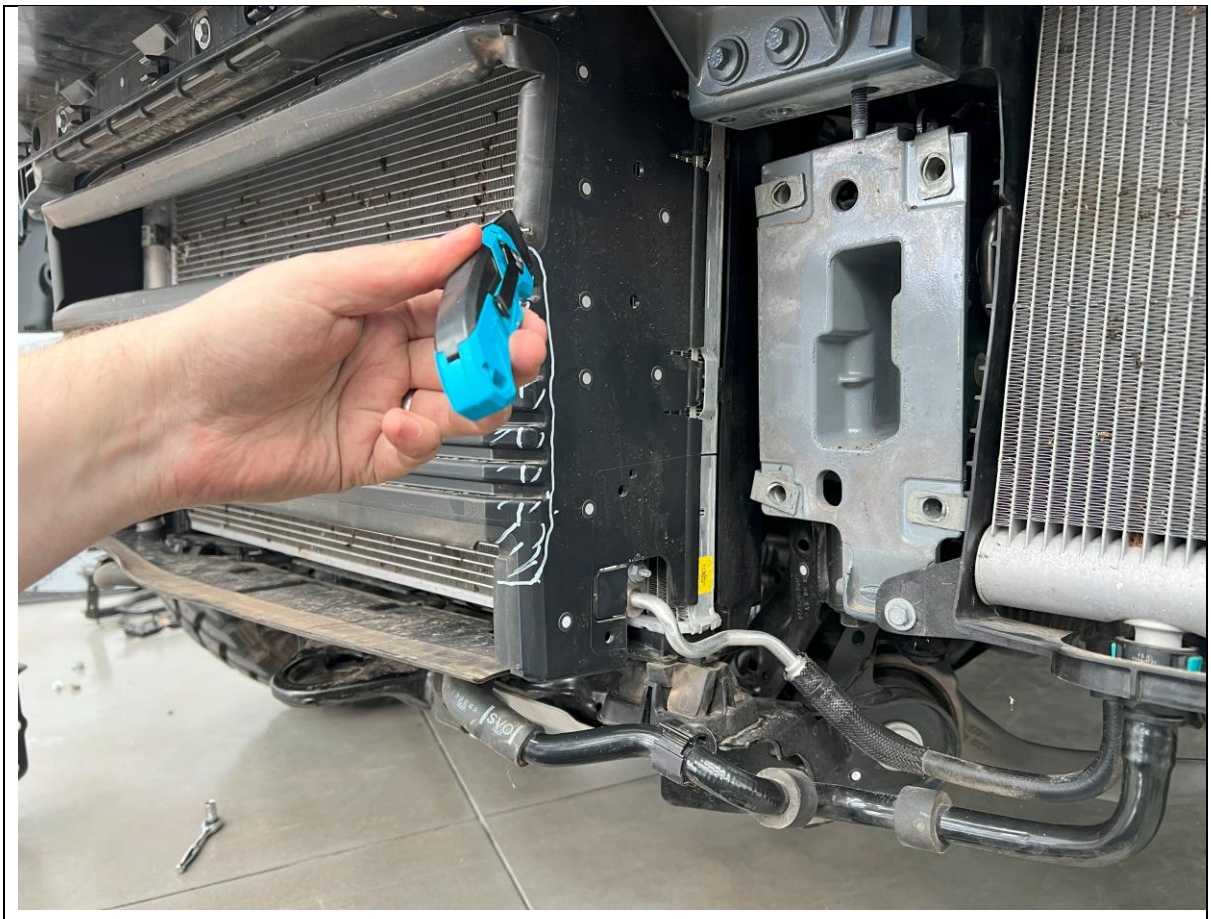


82. Using a ruler and paint marker, mark out the trim for the center radiator air guide as shown in the image above. Mark on both sides of the radiator air guide.

TOOLS REQUIRED

Paint Pen
Ruler

FASTENERS

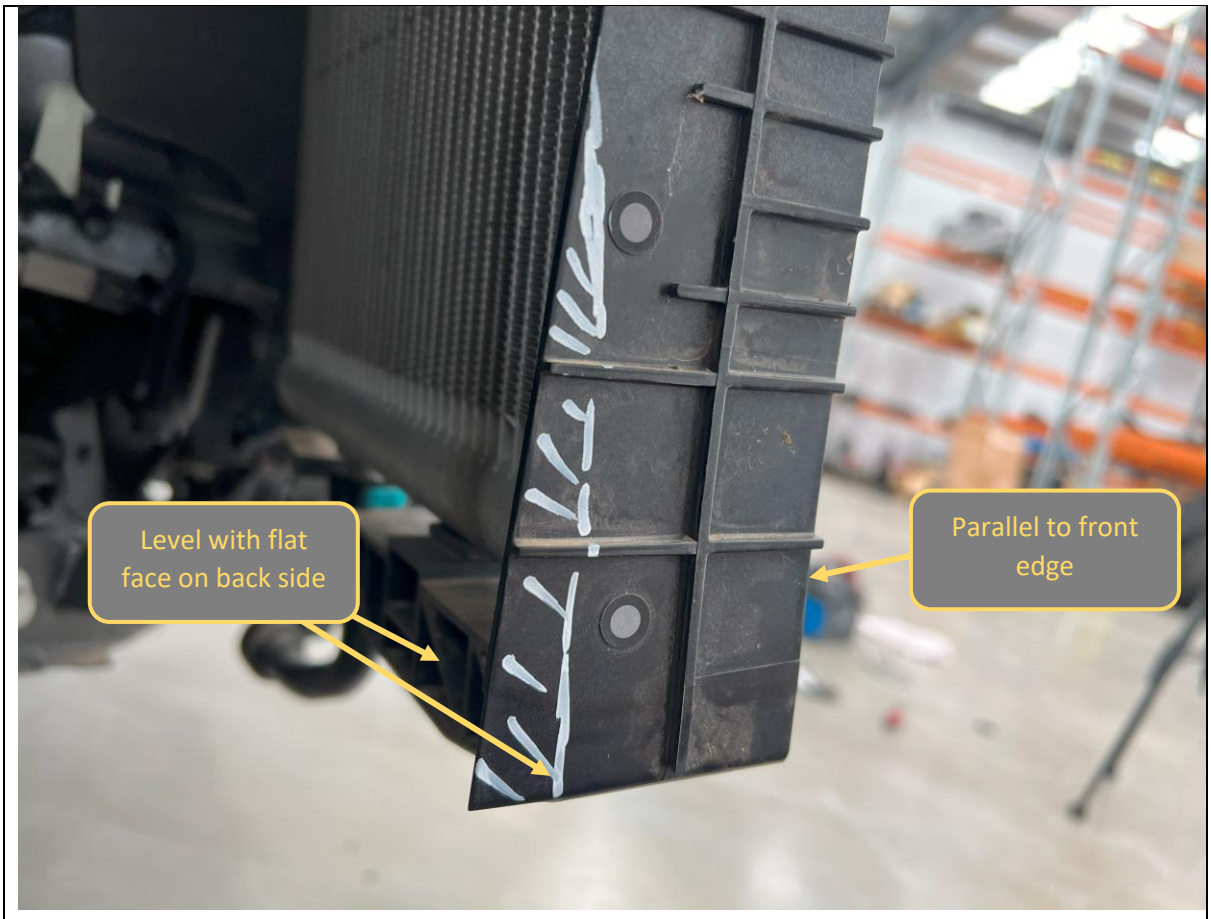


83. Using a sharp utility knife, air hacksaw or oscillating multi tool, carefully cut along marked lines and remove center section of radiator shroud.

TOOLS REQUIRED

Utility Knife
or
Oscillating Multi Tool
or
Air Hacksaw

FASTENERS



84. Mark out the following trim to remove the triangular shaped section of the outer flange on the plastic radiator support.

85. Mark the cut line level with the flat back side face of the radiator support, and roughly parallel to the front edge of the radiator support.

86. Carefully trim off the marked section using a sharp utility knife, air hacksaw or oscillating multi tool.

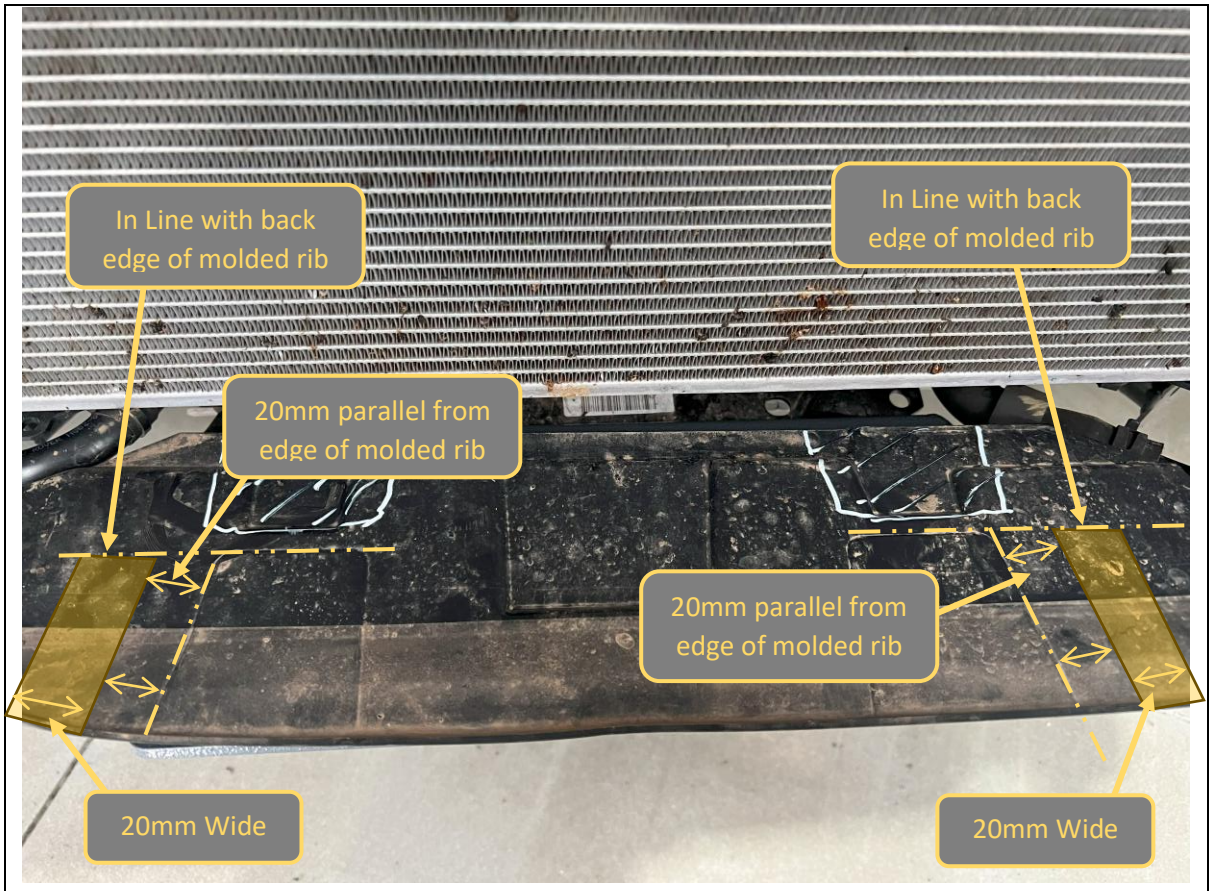
87. Repeat the same trim on other side of the vehicle.

TOOLS REQUIRED

Paint pen

Utility Knife
or
Oscillating Multi Tool
or
Air Hacksaw

FASTENERS



88. Using Paint pen and ruler mark out the following trim in the lower flange of the center radiator air guide panel.

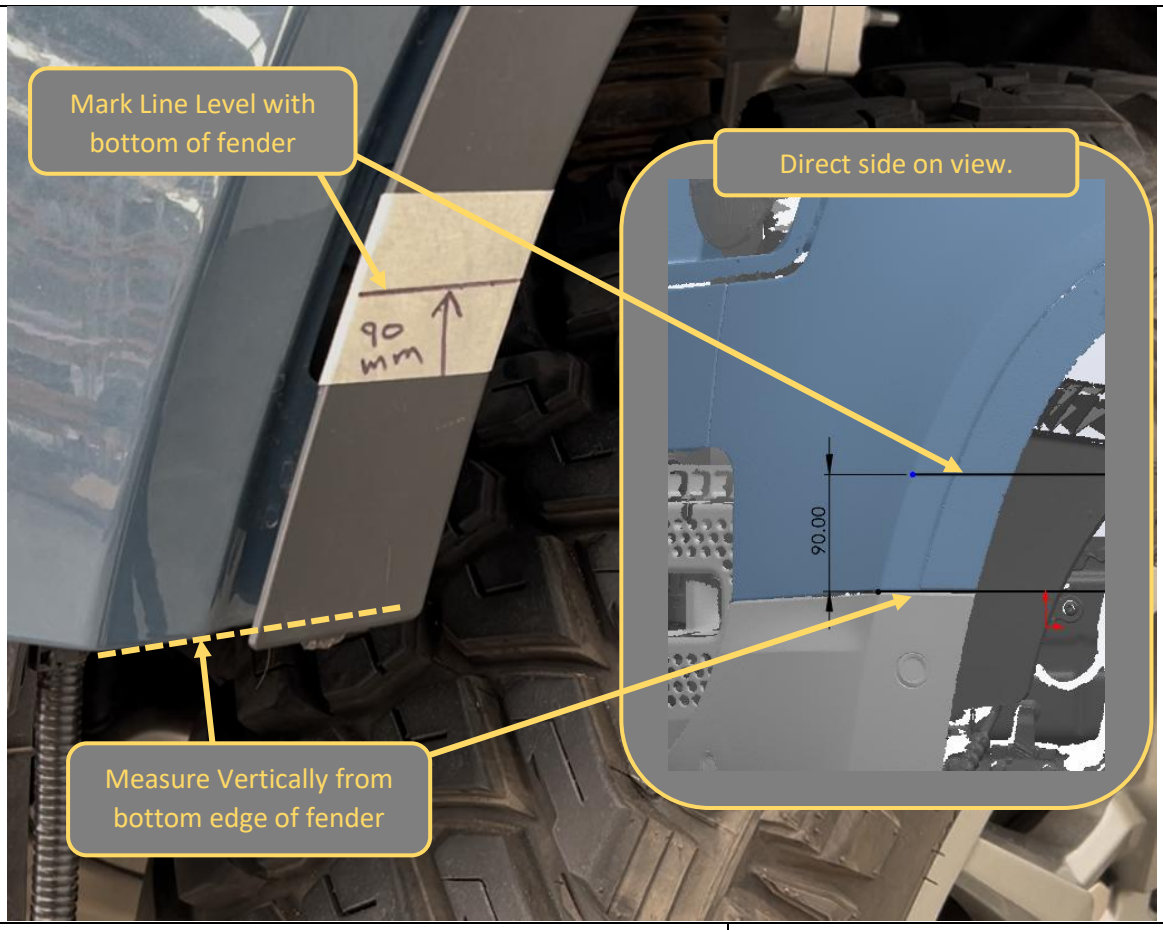
89. Carefully trim off the marked section using a sharp utility knife, air hacksaw or oscillating multi tool.

TOOLS REQUIRED

Paint pen

Utility Knife
Or
Oscillating Multi Tool
Or
Air Hacksaw

FASTENERS



90. Measure approx. 90mm from the bottom of the fender flares and place masking tape across that location.

91. Using a ruler, square and marker, measure and mark a point 90mm perpendicular from the bottom edge of the fender panel.

92. Using the bottom of the fender as reference, mark a line parallel to the bottom of the fender, through the 90mm point just marked.

    This is easiest to do by zeroing a digital level on the bottom of the fender, then matching on the flare. This will account for any rake in vehicle suspension.

93. Ensure the flare is held as close as possible to the fender when making the mark.

TOOLS REQUIRED

Ruler
Marker
Square

Digital level
or
Spirit Level

Masking Tape

FASTENERS

94. Using an Oscillating Multi Tool or Air Hacksaw carefully trim along the line marked, whilst holding the flare away from the fender. Take extra care to ensure this cut is straight and clean.

95. If required the fender flare can be completely removed, by releasing the remaining clips securing it to the fender. This will however increase the time taken and chance of breaking clips.

96. Remove masking tape from cut edge and de-burr if required.

97. Ensure all white clips are present on the back side of the wheel arch flares.

98. Re-clip the wheel arch flare to the fender.

99. Complete steps on both sides.

TOOLS REQUIRED

Oscillating Multi Tool
or
Air Hacksaw

FASTENERS

100. Finally, it's time to start putting some new bits on!

101. First fit the subframe bracket, using the 2x 16mm head factory flange bolts removed from the tubular radiator guard.

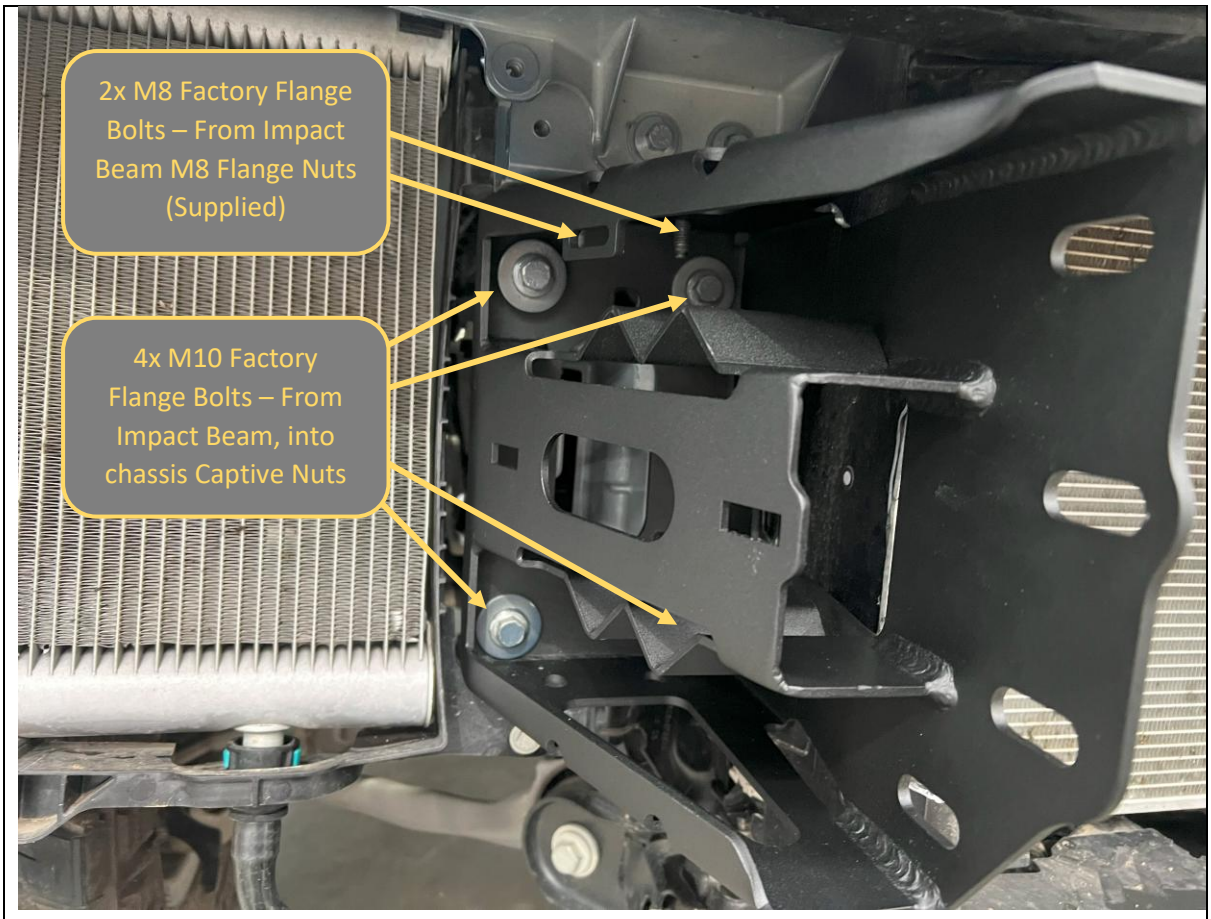
102. Ensure bracket is sitting level, then torque bolts to **90Nm.**

TOOLS REQUIRED

16mm Socket
Torque Wrench

FASTENERS

Factory Flange Bolts (16mm head M12)



103. Fit the impact assemblies to the chassis, using fasteners shown in the image above.

    The (awkward!) top bolts need to be lowered from the top (like how they were removed). This can be quite fiddly and is best achieved using a magnet tool or socket with blu-tack to retain the bolt.

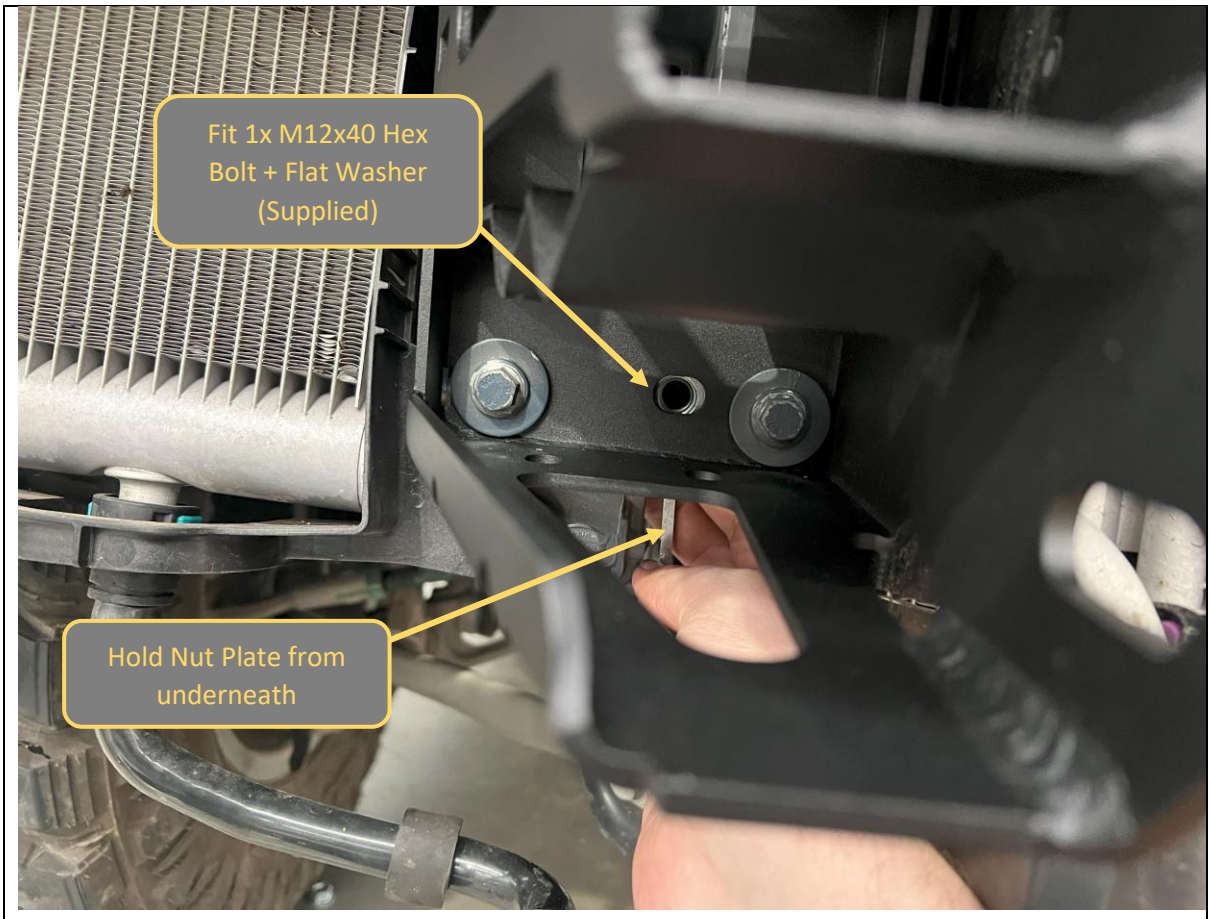
104. Leave all bolts loose at this stage.

TOOLS REQUIRED

3/8” Drive Ratchet
3/8” Universal Joint
3/8” Medium Extension Bar
3/8” Long Extension Bar
10mm Socket
13mm Socket

FASTENERS

Factory Flange Bolts (14mm head M10)
Factory Flange bolts (10mm head M8)



105. Hold one of the M12 short stem nut plates in position behind the bottom of the chassis end. Align with the lower slot in the impact assembly.

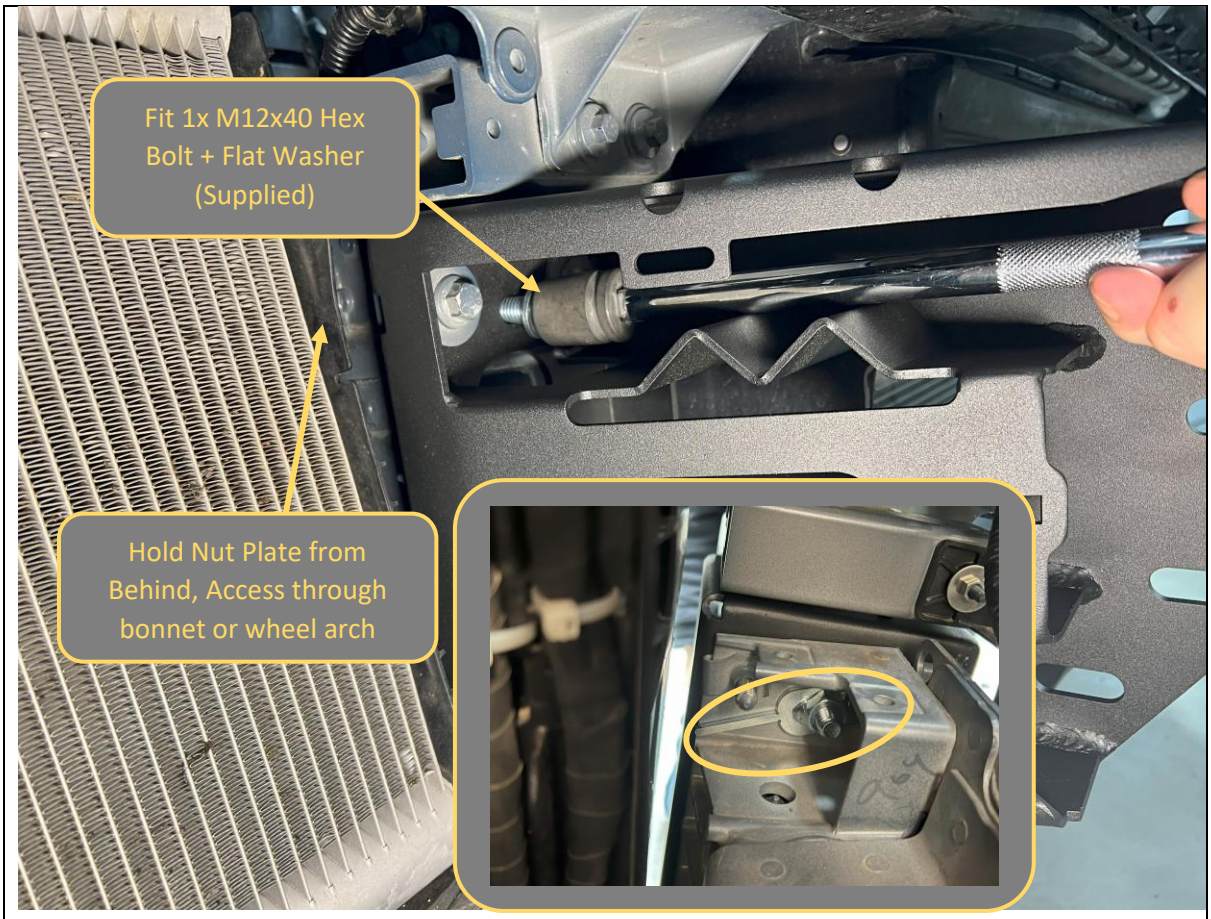
106. Secure with M12x40 Hex Bolt and M12 Flat washer from bolt kit.

107. Leave bolts loose at this stage.

TOOLS REQUIRED

FASTENERS

1x M12x40 Hex Bolt
1x M12 Flat Washer
1x M12 short nut plate



108. With assistance from another person, hold one of the M12 short stem nut plates in position behind the top of the chassis end.

    This can be accessed from the top via the open bonnet (easier on RHS) or via the wheel arch (easier on LHS where radiator overflow tank block view)

109. Secure with M12x40 Hex Bolt and M12 Flat washer from bolt kit. Use Socket and extension bar to assist placing bolt.

110. Leave bolts loose at this stage.

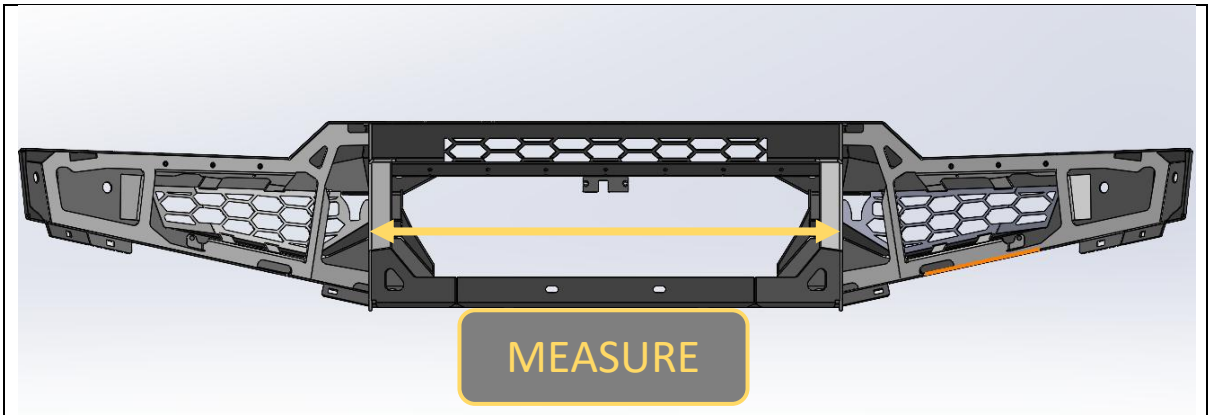
111. Complete fitting of impact assemblies for other side of the vehicle.

TOOLS REQUIRED

18/19mm socket
Extension bar

FASTENERS

1x M12x40 Hex Bolt
1x M12 Flat Washer
1x M12 short nut plate



112. Measure Distance between outside edges uprights on bar using tape measure. Write distance below for reference if required.

    Bar Upright Width = _____mm

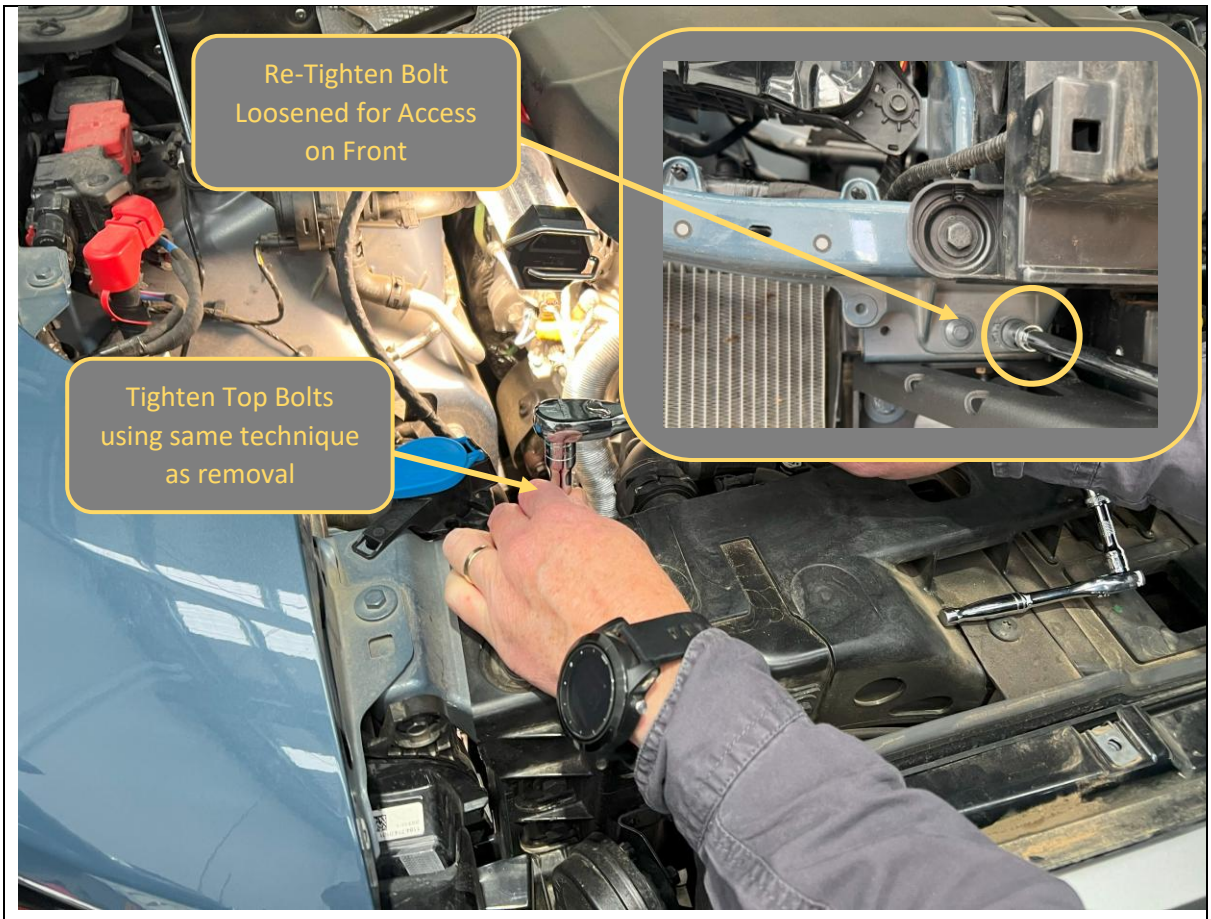
113. Adjust mounts by sliding mounts on slots, such that distance between inside edges of mounts is approximately 1-3mm greater than the bar. Check distance is same top and bottom and centered on the vehicle.

114. Snug the 4x main mounting bolts, such that the impact assemblies are sitting flat on the chassis mounting face and re-check. Readjust as required.

TOOLS REQUIRED

Tape measure
13, 15 & 16mm spanner / socket

FASTENERS



115. Once happy with alignment, with the front face bolts snug, tighten the impact assembly bolts in the following order.

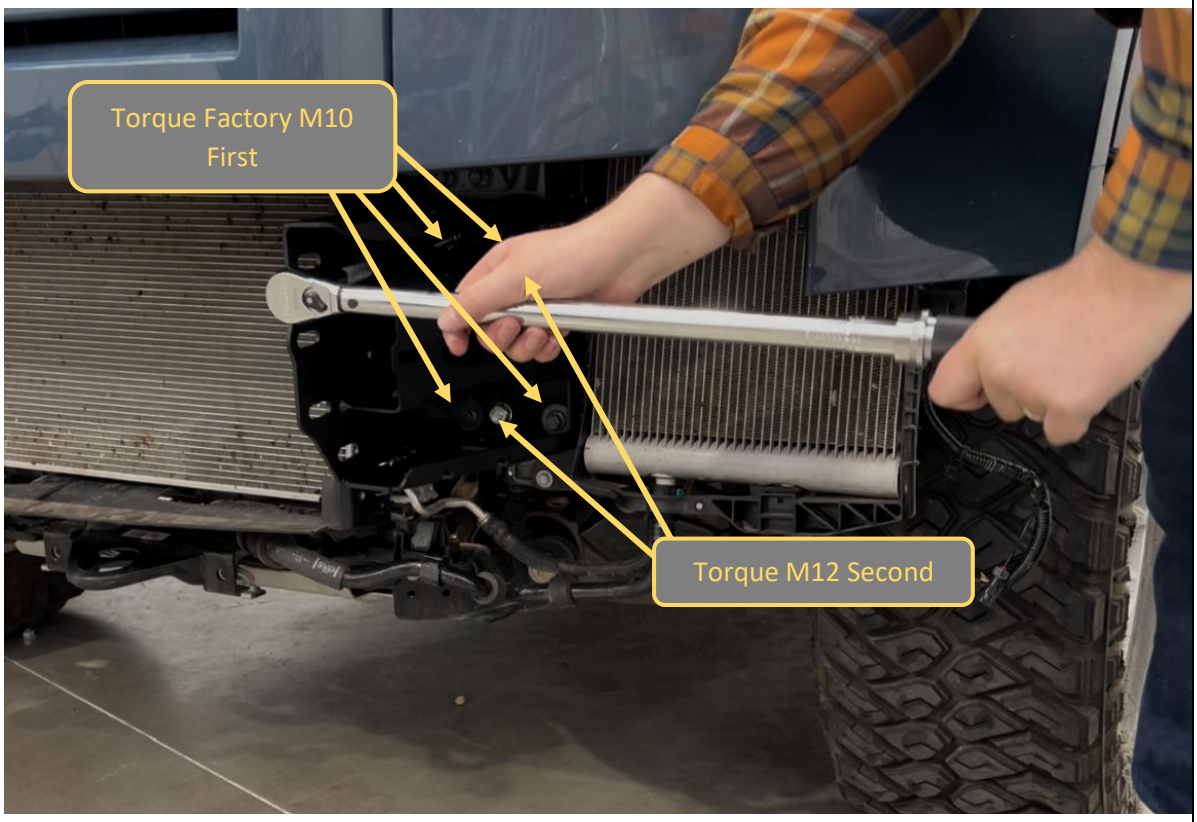
116. First tighten the top bolts, using the same (difficult) access techniques and 3/8” Ratchet /extension bars used to remove them.

117. **IMPORTANT** Re-tighten the bolt on front LHS Front loosened to allow top tool access.

TOOLS REQUIRED

3/8” Drive Ratchet
3/8” Universal Joint
3/8” Medium Extension Bar
3/8” Long Extension Bar
10mm Socket

FASTENERS



118. Next tighten the Factory M10 Flange bolts using a torque wrench and extension bar.

IMPORTANT. THESE BOLTS INTO THE ALUMINIUM CHASSIS END NEED TO BE TIGHTENED TO CORRECT TORQUE – USE A TORQUE WRENCH NOT IMPACT GUN!!!

119. Torque **M10 to 57Nm.**

120. Finally Tighten the M12 bolts, secured into the nut plates, using a torque wrench and extension bar.

121. Torque **M12 to 100Nm.**

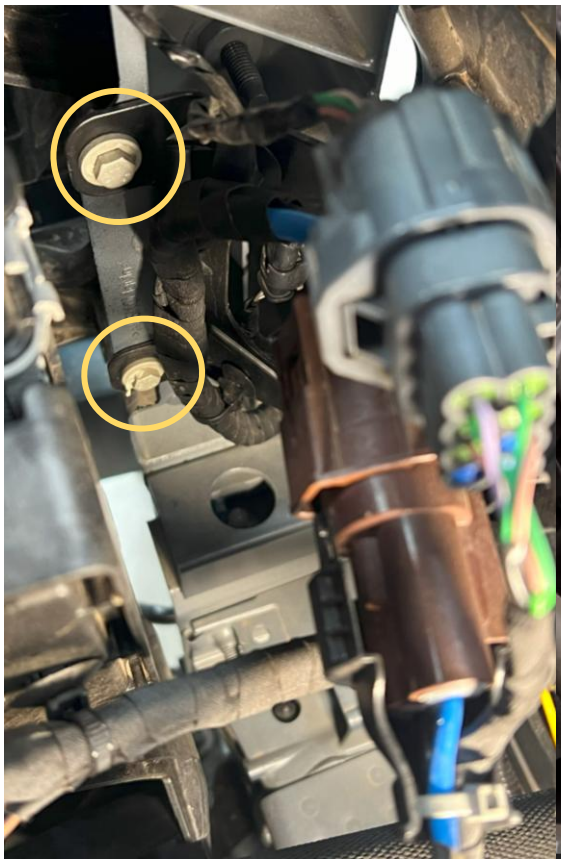
122. Complete tightening sequence on both sides.

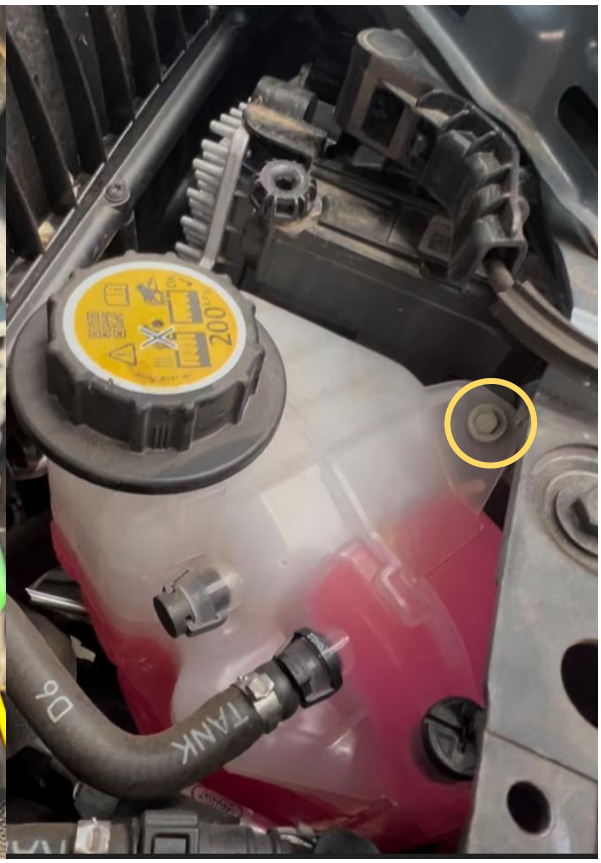
TOOLS REQUIRED

13mm Socket
18/19mm Socket
Extension Bar

Torque Wrench

FASTENERS





123. Re fix the wiring bracket and coolant overflow tank that were loosened for access to the top impact assembly bolts.

124. Ensure the coolant tank is properly re-seated on the support tabs before replacing bolt.

TOOLS REQUIRED

10mm socket
8mm socket

FASTENERS

Re-Fit Factory bolts

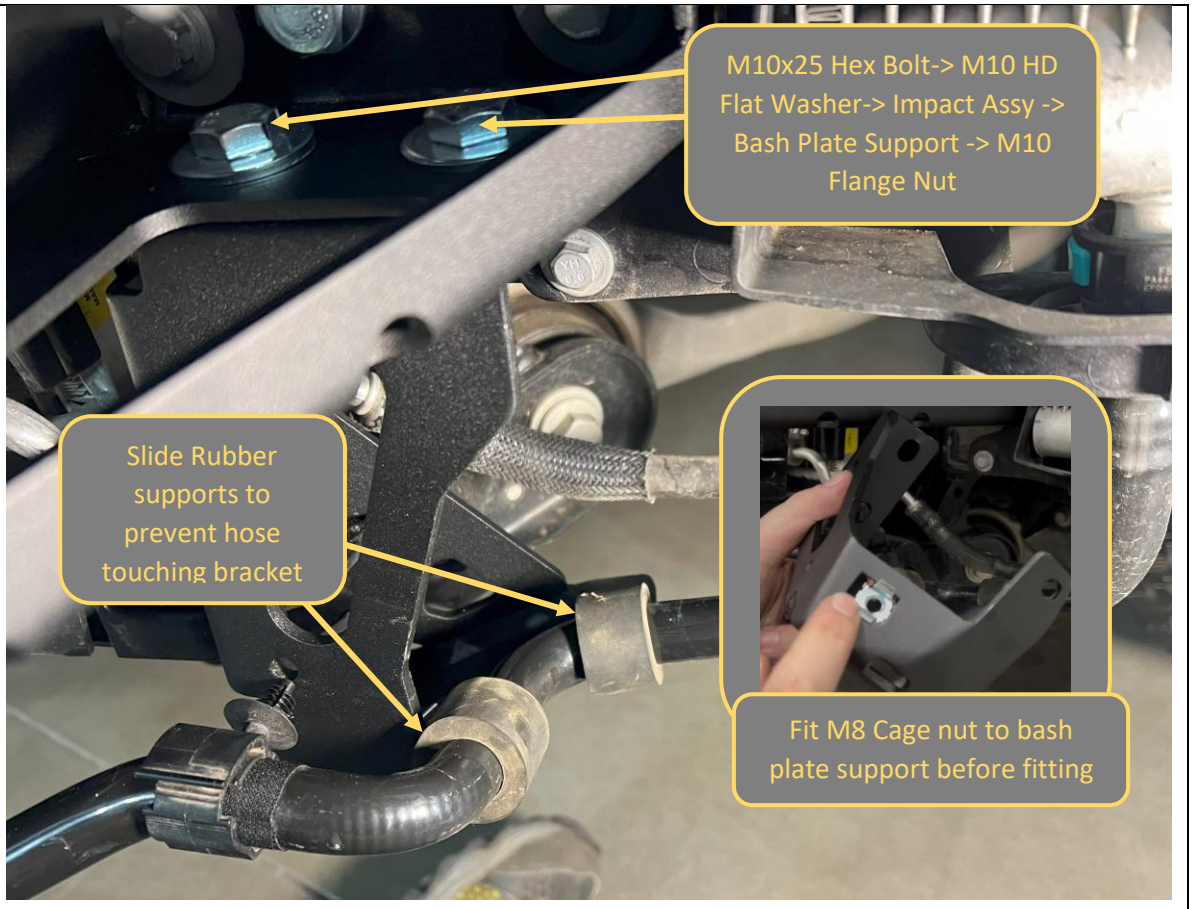
125. For vehicles equipped with front pusher fan, route the fan electrical harness over the top of the impact assembly.

126. Secure harness in position with cable ties, such that the plug sits approximately in line with the recess.

TOOLS REQUIRED

FASTENERS

Cable Ties



127. Fit M8 Cage nuts to the rectangular slot on the bottom of the bash plate support brackets.

128. Next fit the bash plate support brackets to the slots on the bottom of the impact assembly, using supplied M10x25 Hex bolts, HD flat washers and M10 Flange Nuts.

129. Align parallel with the inner edge of the impact assembly, ensure clearance to chassis and tighten in position, using 15&16mm Spanner and Socket.

130. Slide the rubber protection sleeves on the coolant hoses into positions where they will prevent the coolant hoses from contacting the bracket.

131. Complete bash plate support fitment for both sides.

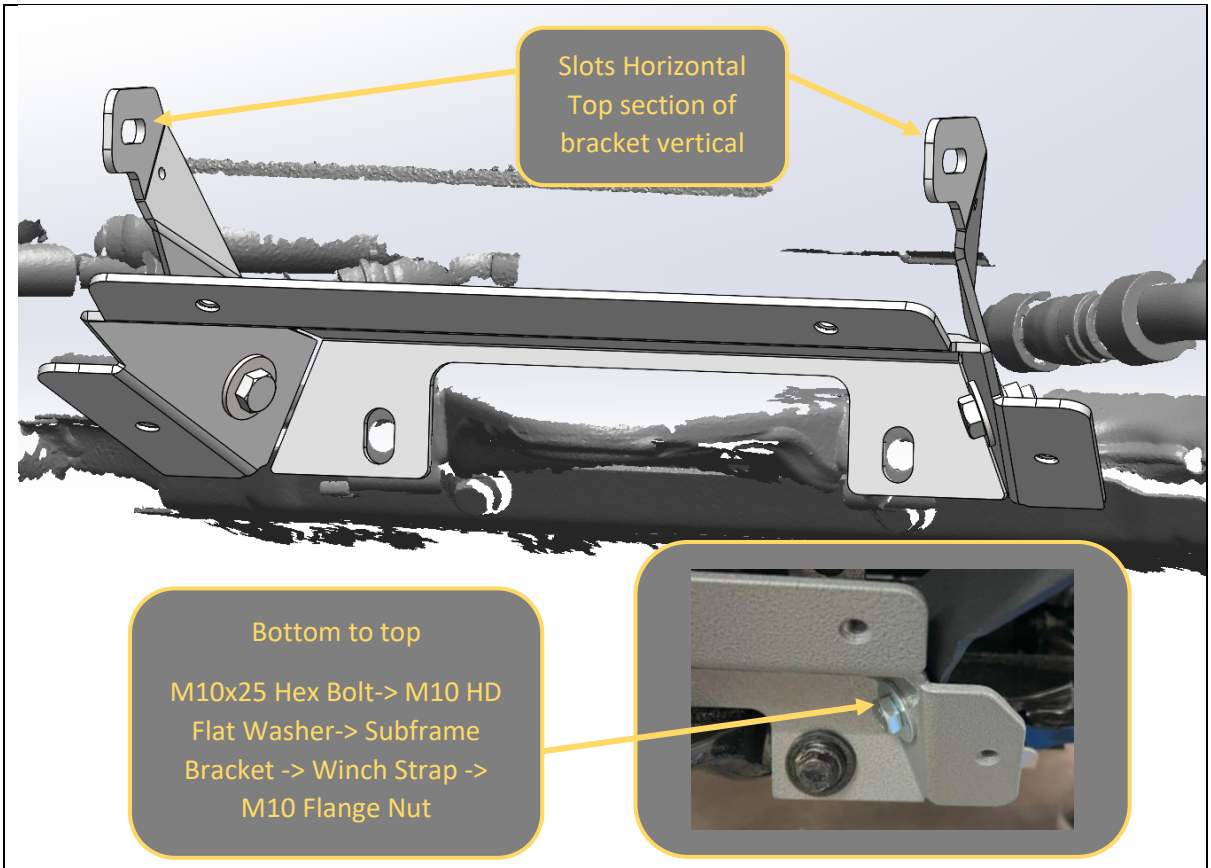
TOOLS REQUIRED

16mm Spanner
15mm Spanner / Socket

FASTENERS

2x M10x25 Hex bolts
2x M10 HD flat washers
2xM10 Flange Nuts

Per side



132. Fit the Winch support straps to the slots on the subframe bracket, using supplied M10x25 Hex bolts, HD flat washers and M10 Flange Nuts.

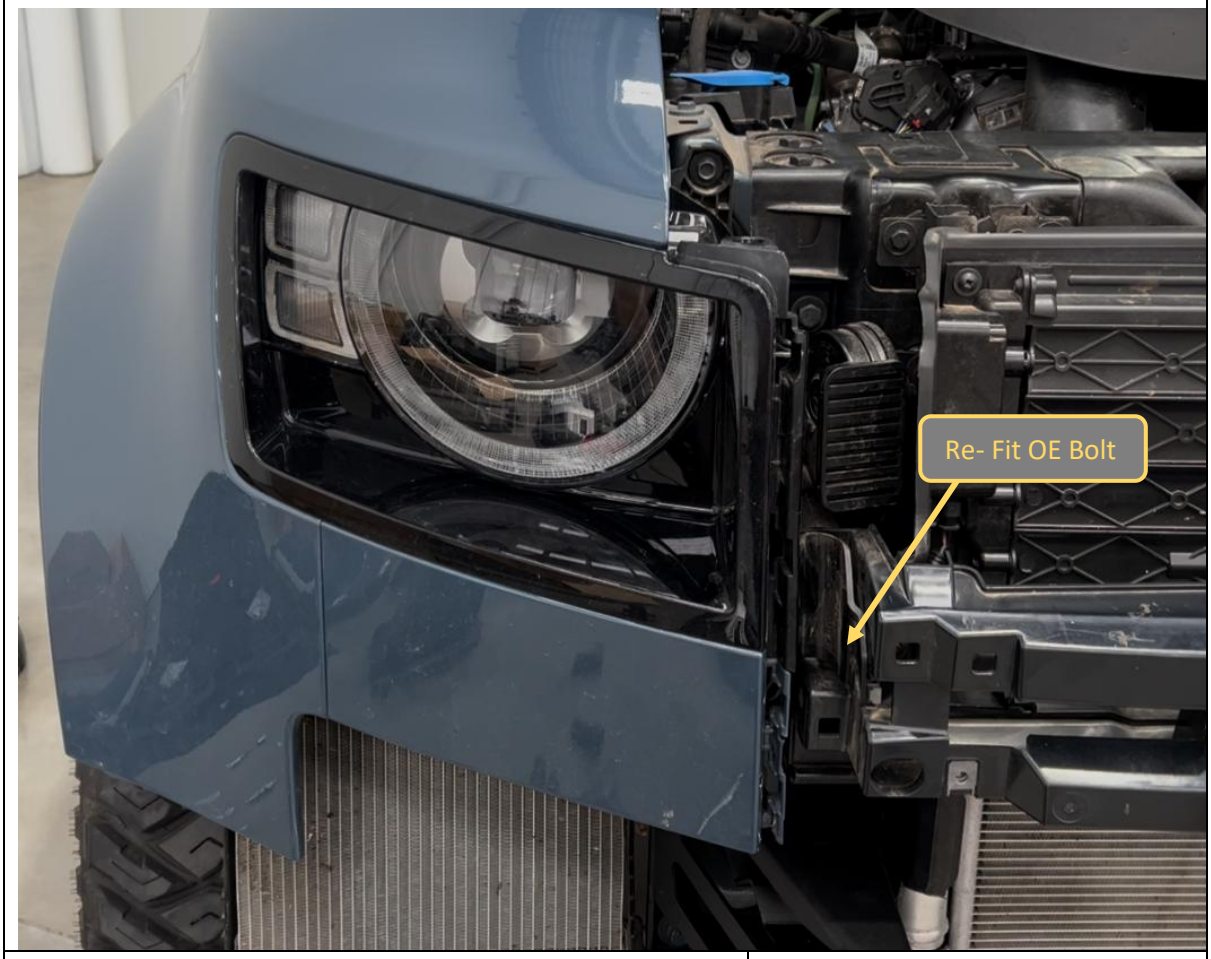
133. Ensure the straps are on the correct side and in the correct orientation. The slots should be horizontal, and top face of the bracket should be vertical.

134. Leave bolts securing straps finger tight at this stage.

TOOLS REQUIRED

FASTENERS

2x M10x25 Hex bolts
2x M10 HD flat washers
2xM10 Flange Nuts



135. Re Fit headlight surround trims.

136. Push into place from the front to secure clips then replace the original 10mm head factory bolt.

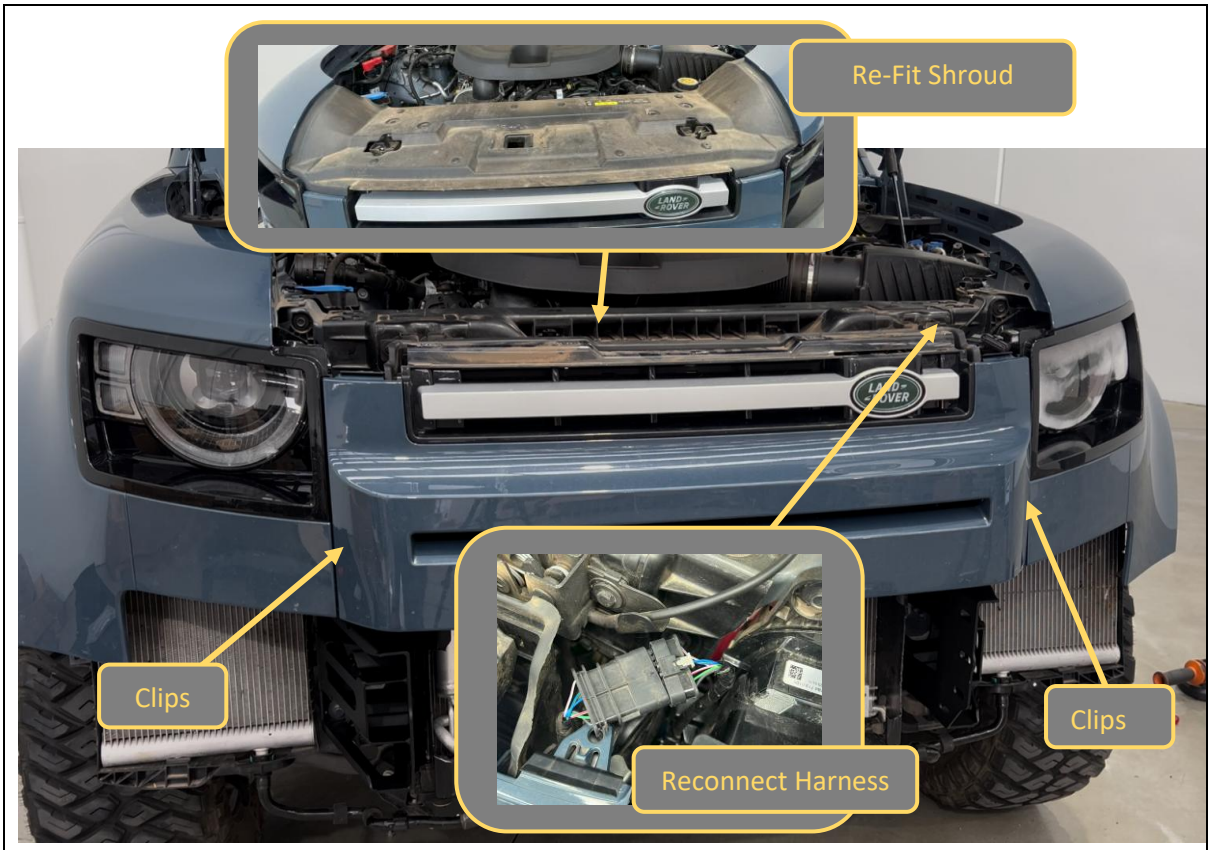
137. Complete for both sides

TOOLS REQUIRED

10mm Socket

FASTENERS

10mm Head Factory Bolt



138. Re Fit Grille, push into position to re-seat clips securing down both sides of the grille.

139. Re-connect the Radar wiring harness connector.

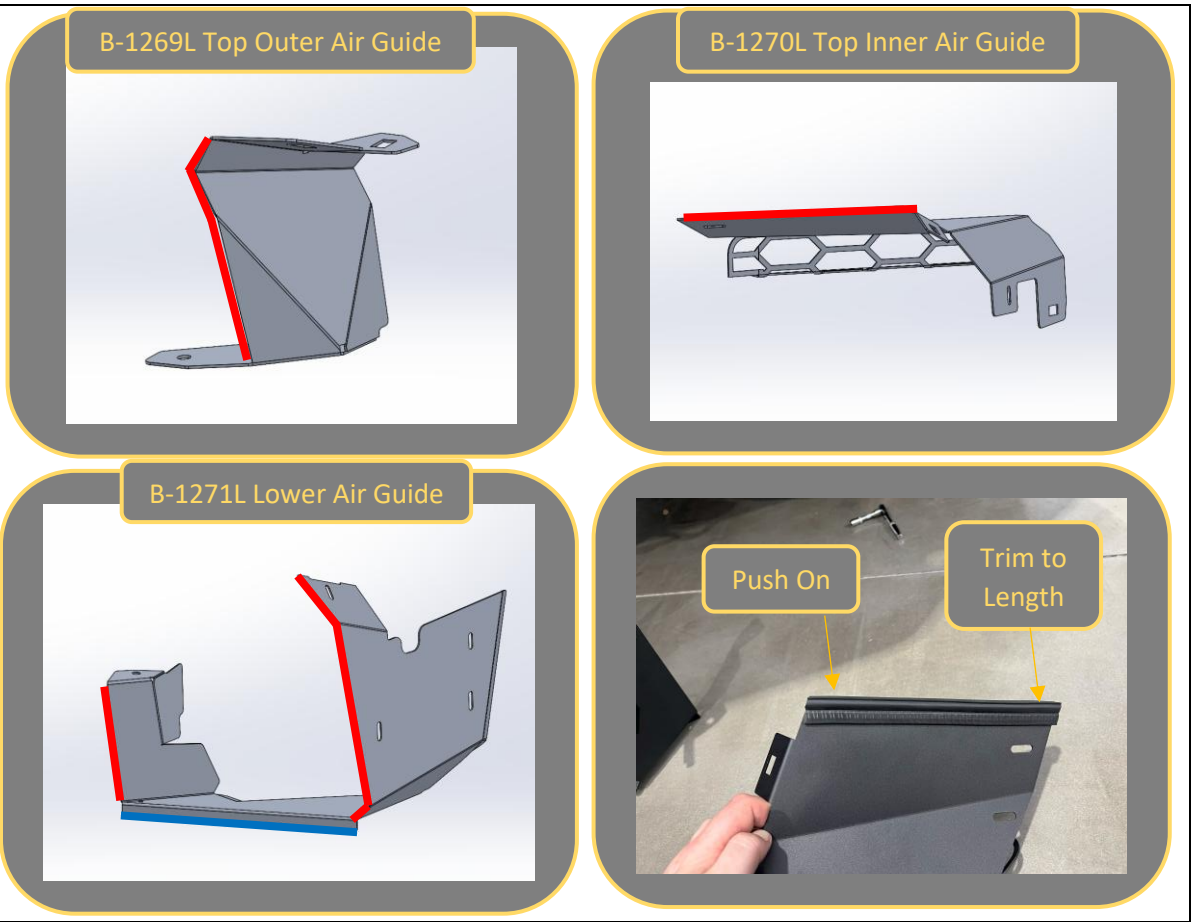
140. Re-fit the radiator shroud panel, re-using the original Center lift clips and T30 Torx Screws.

TOOLS REQUIRED

T30 Torx Screwdriver

FASTENERS

Factory Clips
Factory Torx Screws



141. Unpack and identify the 3x air guide brackets for each side of the vehicle.

142. Fit supplied pinch weld to the back edges indicated in the images above, firmly pressing the pinch weld over the edge, then cutting to length with side cutters.

143. Note the two different types of pinch weld, denoted by the following code. Ensure correct type used in each location

RED – Top Bulb	Blue – Side Bulb
	

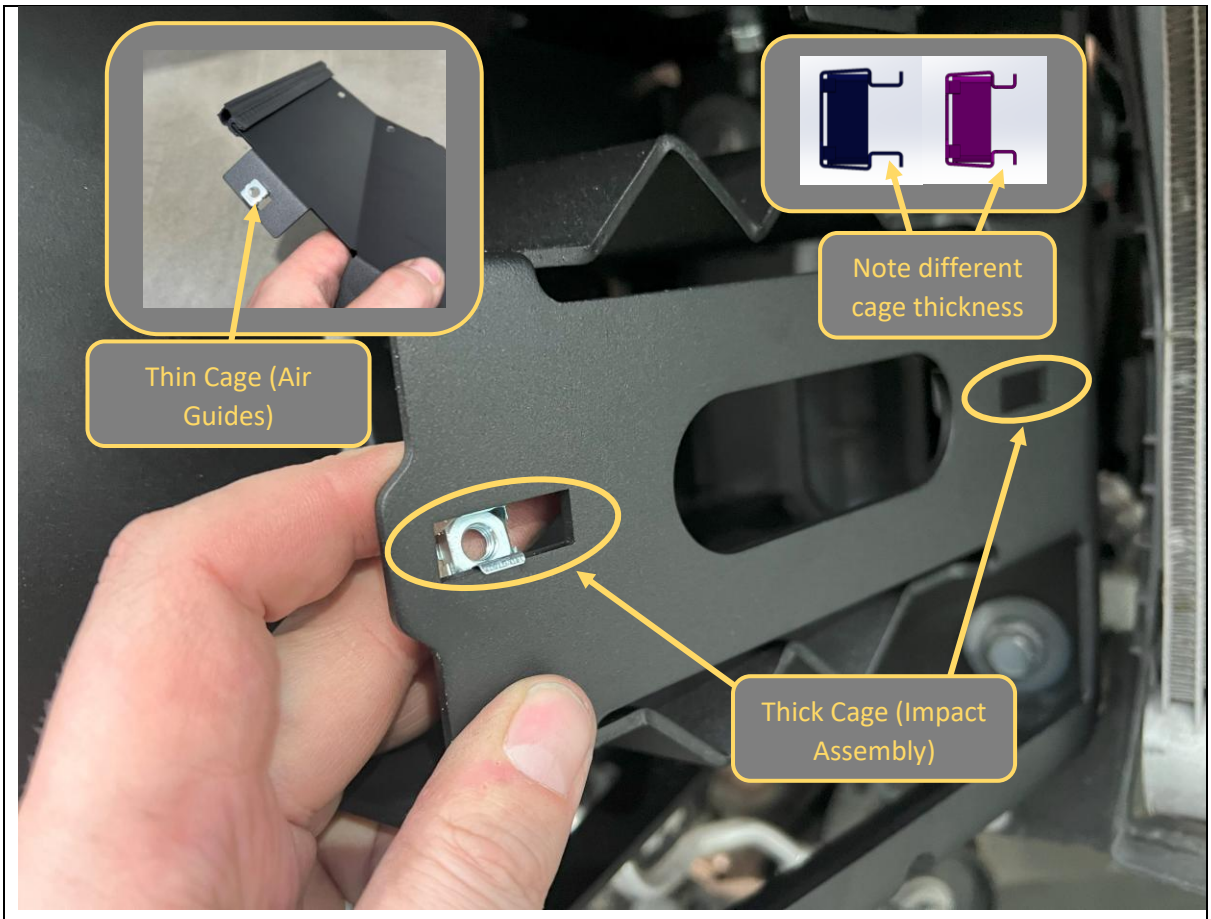
144. Complete pinch weld application for both LH and RH air guide brackets.

TOOLS REQUIRED

Side Cutters

FASTENERS

Pinch Weld Rubber



145. Fit M6x3mm cage (thicker cage) nuts to the 2x rectangular slots in the impact assembly. Place nut behind slot and squeeze into position. A flat bladed screwdriver can be used to assist.

146. Fit M6x2mm cage (thicker cage) nuts to the 4x (2 per bracket) rectangular slots in the upper air guide brackets.

147. Repeat for both LH and RH air guide brackets.

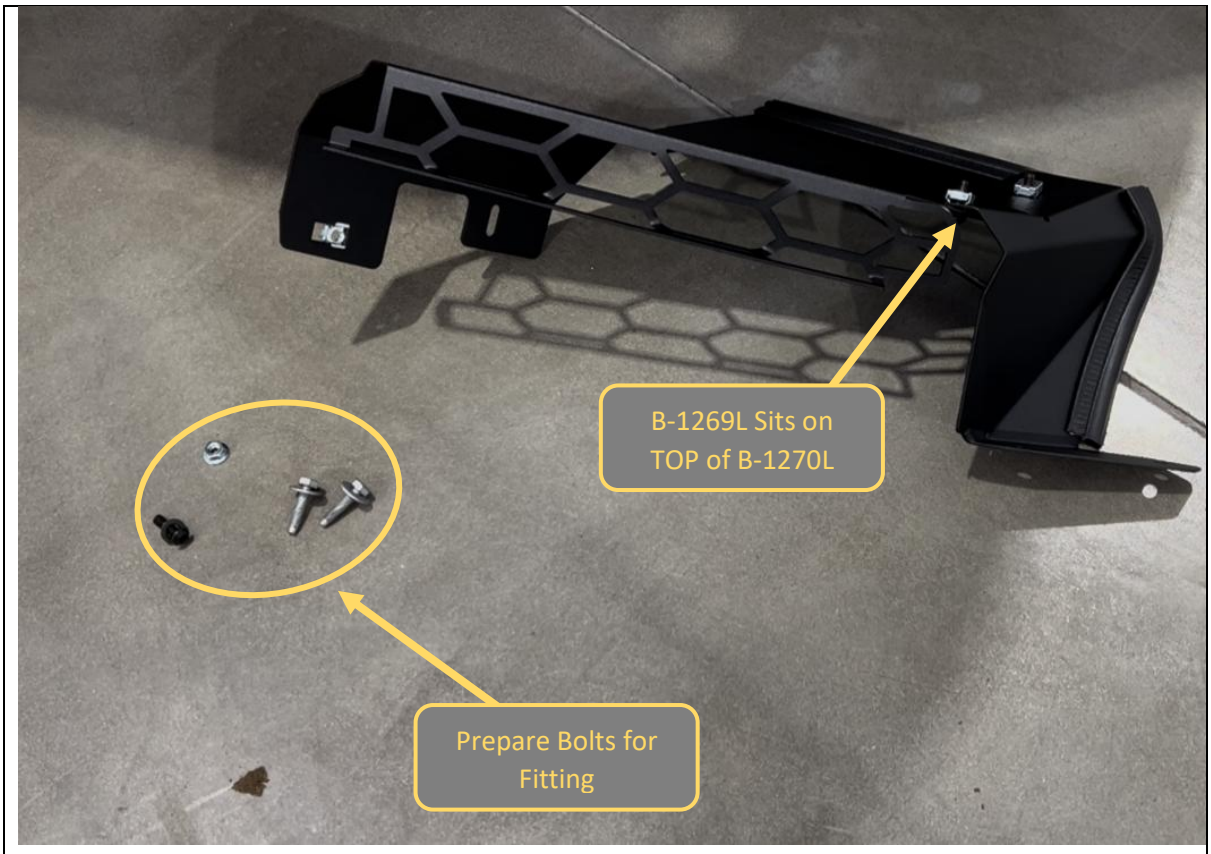
TOOLS REQUIRED

Flat Screwdriver

FASTENERS

2x M6x3mm cage nut
2x M6x2mm cage nut

Per side



148. Pre-Assemble upper air guide, using M6x20 Black Button head screws and Cage nuts into the cage nuts placed in last step. Leave bolts loose at this stage.

149. Ensure the outer guide sits ON TOP of the inner guide.

150. Repeat for both LH and RH air guide brackets.

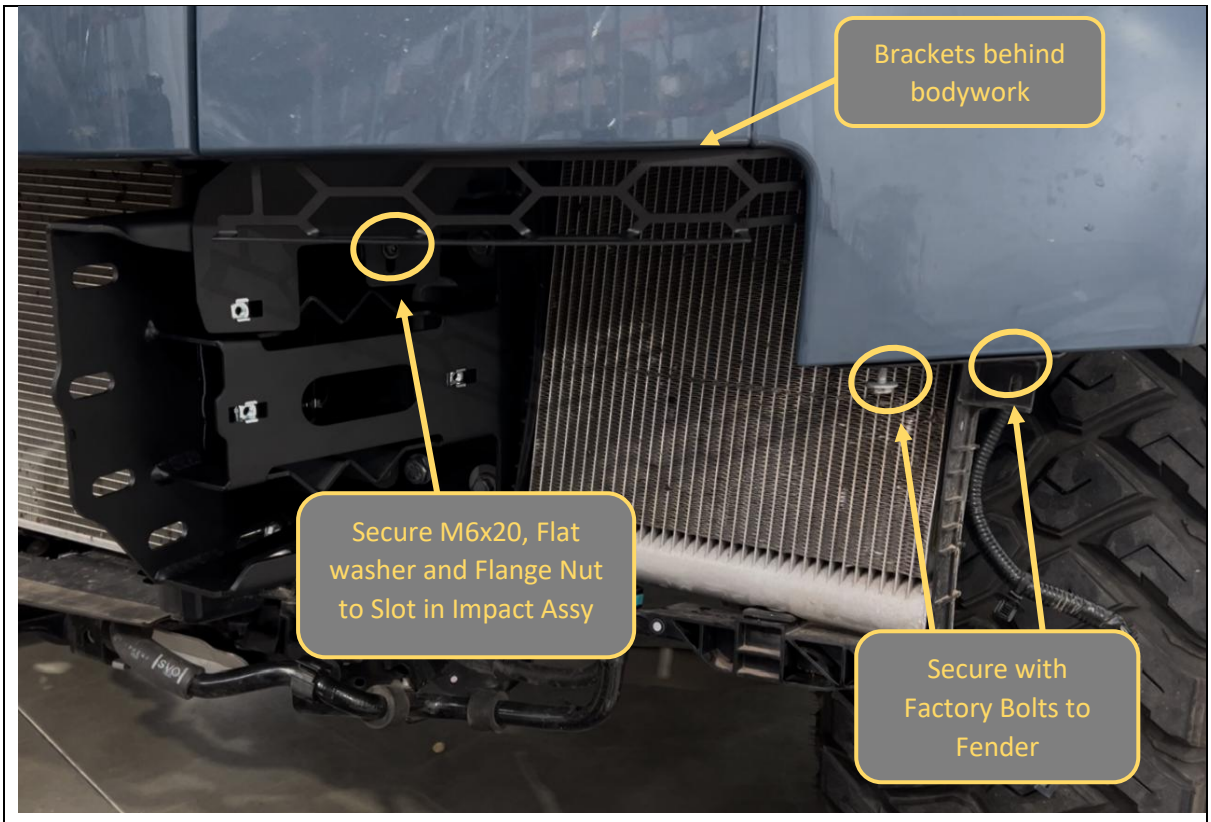
151. Gather the required bolts for fitting so they are at hand. 2x 10mm head Factory Bolts (from bumper clip removal) and 1x M6x20 BH screw, Flat washer and Flange Nut are required.

TOOLS REQUIRED

FASTENERS

2x M6xx20mm Black Button Head
2x M6 Black Flat washer

Per side



152. Fit the pre-assembled upper air guide to the vehicle. Secure to the fender using the factory bolts, and to the slot in the impact assembly using the M6x20 black button head bolt, Flat washer and Flange Nut are required.

153. Manipulate the position of the guides such that they sit level and behind the bodywork. The back edge of the rubber pinch weld should be in contact with the radiator / radiator supports.

154. Once happy with position tighten bolts, first ones securing to vehicle, then ones securing the two pieces of air guide together.

155. Repeat for both LH and RH air guide brackets.

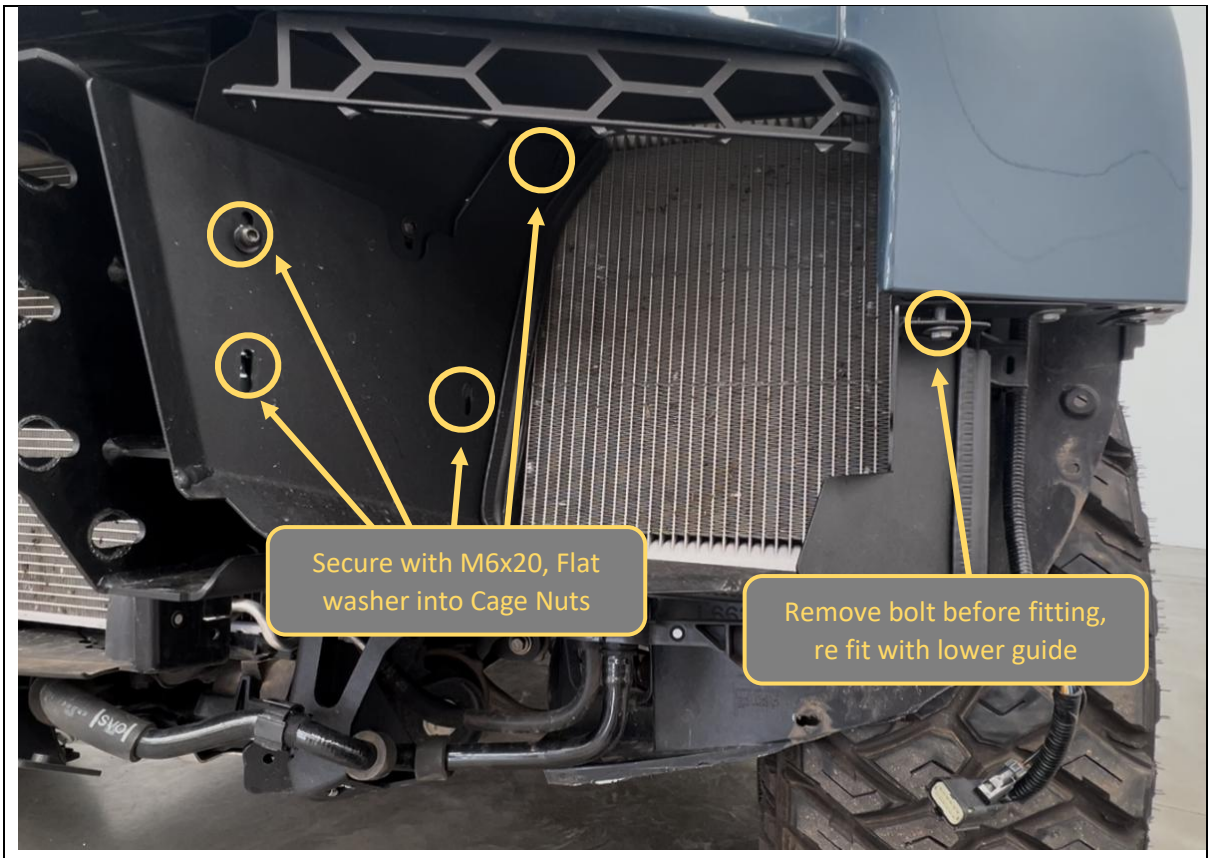
TOOLS REQUIRED

10mm Socket
4mm Hex Key

FASTENERS

2x 10mm head Factory Bolts (from bumper clip removal)
1x M6x20 black button head
1x M6 Flat washer
1x M6 Flange Nut

Per Side



156. Remove the innermost factory bolt from the fender again.

157. Fit the lower air guide to the fender, impact assemblies and upper air guide brackets. Secure with bolts as shown in image above

158. Manipulate the position of the guides such that they sit level. The back edge of the rubber pinch weld should be in contact with the radiator / radiator supports.

159. Once happy with position, tighten bolts, first ones securing to vehicle, then ones securing the air guides together.

160. Repeat for both LH and RH air guide brackets.

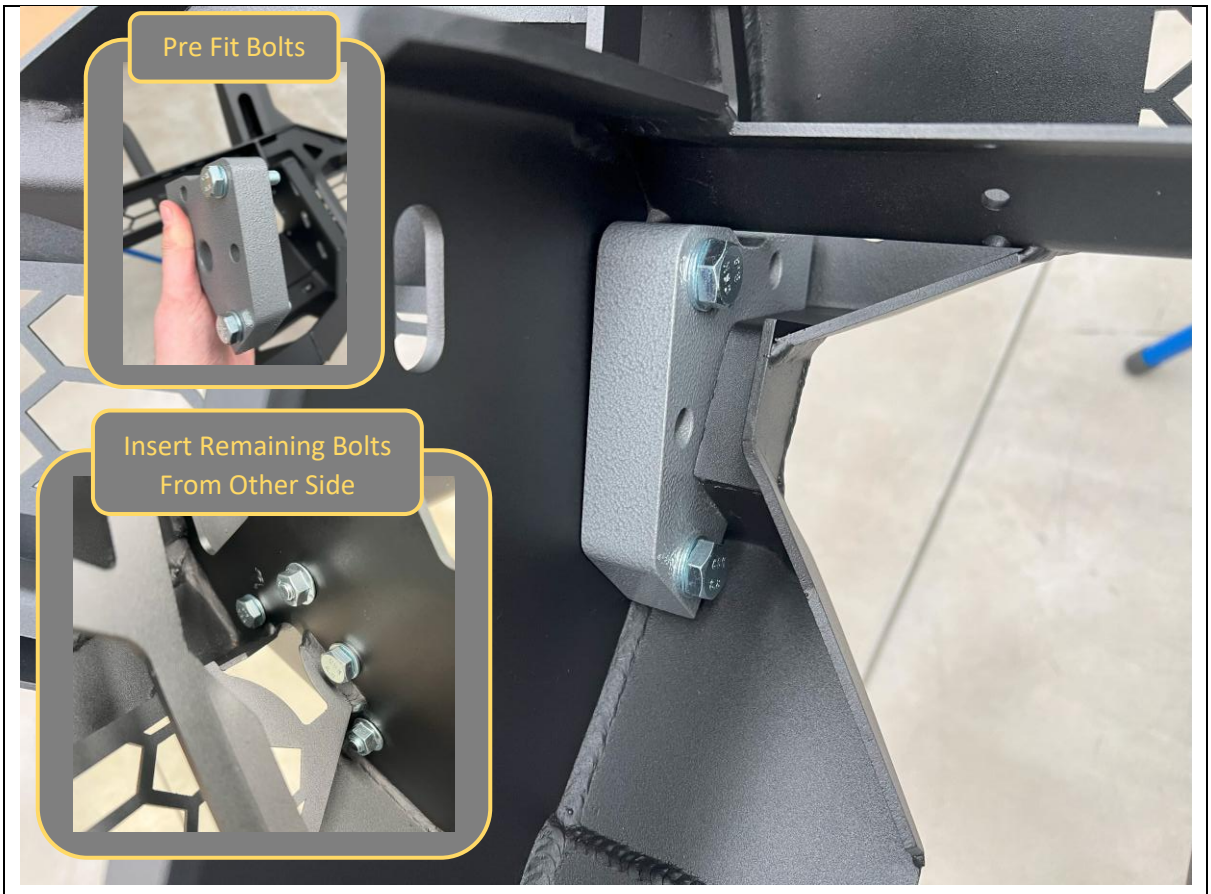
TOOLS REQUIRED

10mm Socket
4mm Hex Key

FASTENERS

4x M6x20 black button head
4x M6 Flat washer

Per Side



161. Prepare bar for fitment. Start Fitting the Auxiliary tow points to the bar.

162. Pre-fit 2x M10X45mm bolts + M10 Flat washers to the tow point as shown in inset image.

163. Fit the Auxiliary tow points to the bar, sliding part into position from behind. Secure with 2x M10 Flange Nuts

164. Insert 2x Remaining M10x45 Bolts from other side of upright, Secure with M10 Flange Nuts.

165. Tighten with 15 & 16/17mm Spanners.

166. Repeat for both sides of bar.

TOOLS REQUIRED

15,16/17mm Spanner

FASTENERS

4x M10x45 Hex
4x M10 Flat Washer
4x M10 Flange Nut

167. Route the Wiring harness through the bar such that all plugs are in the correct location.

    The main harness connector should sit to the OUTSIDE of the mid wing brace on the LH side of the vehicle as shown in the image above.

168. The wiring loom should be routed through the passage above the wing mesh cutout.

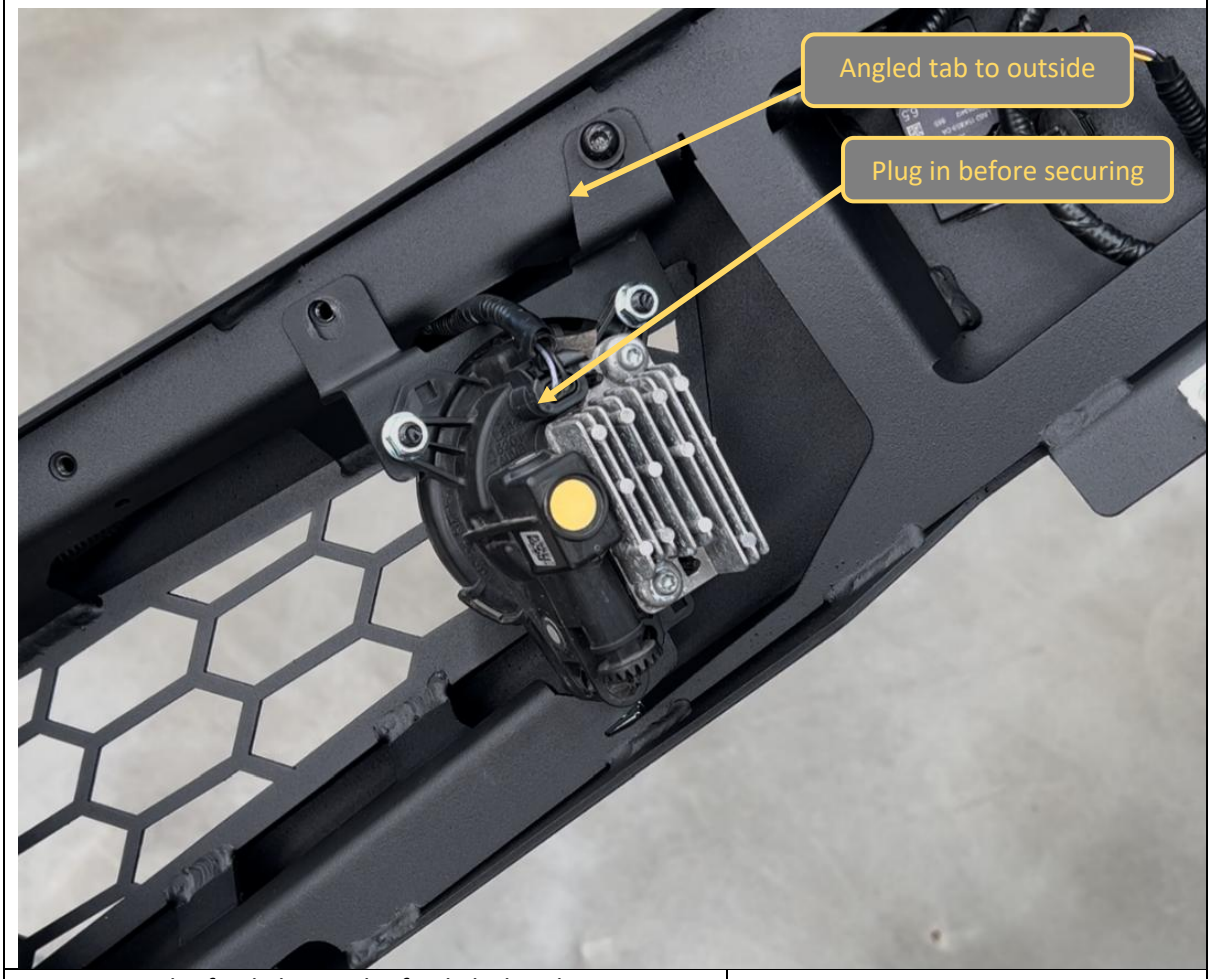
169. It is easier to disconnect the parking sensors from the loom for this step.

    Slide back the red tab and press down on connector to release.

    Take note of correct positions of sensors for re-fitment.

TOOLS REQUIRED

FASTENERS



170. Fit the fog lights to the fog light brackets using supplied M6x16 black button head bolts and flange nuts. Fog lights fit behind the bracket.

171. Fog lights are the same LH and RH. Ensure correct orientation of the brackets by referring to the angled tab, which should be on the outside. Fog lights should face forwards when mounted in the bar.

172. Reconnect the fog light harness before securing bracket to bar. The tail is short and is easier to do before bolting down.

173. Fit Fog light brackets to the bar using M6X16 Button head Bolts, Flat washers, and Flange nuts from the Small Parts Kit.

174. Secure and tighten using 4mm Allen Key and 10mm Spanner

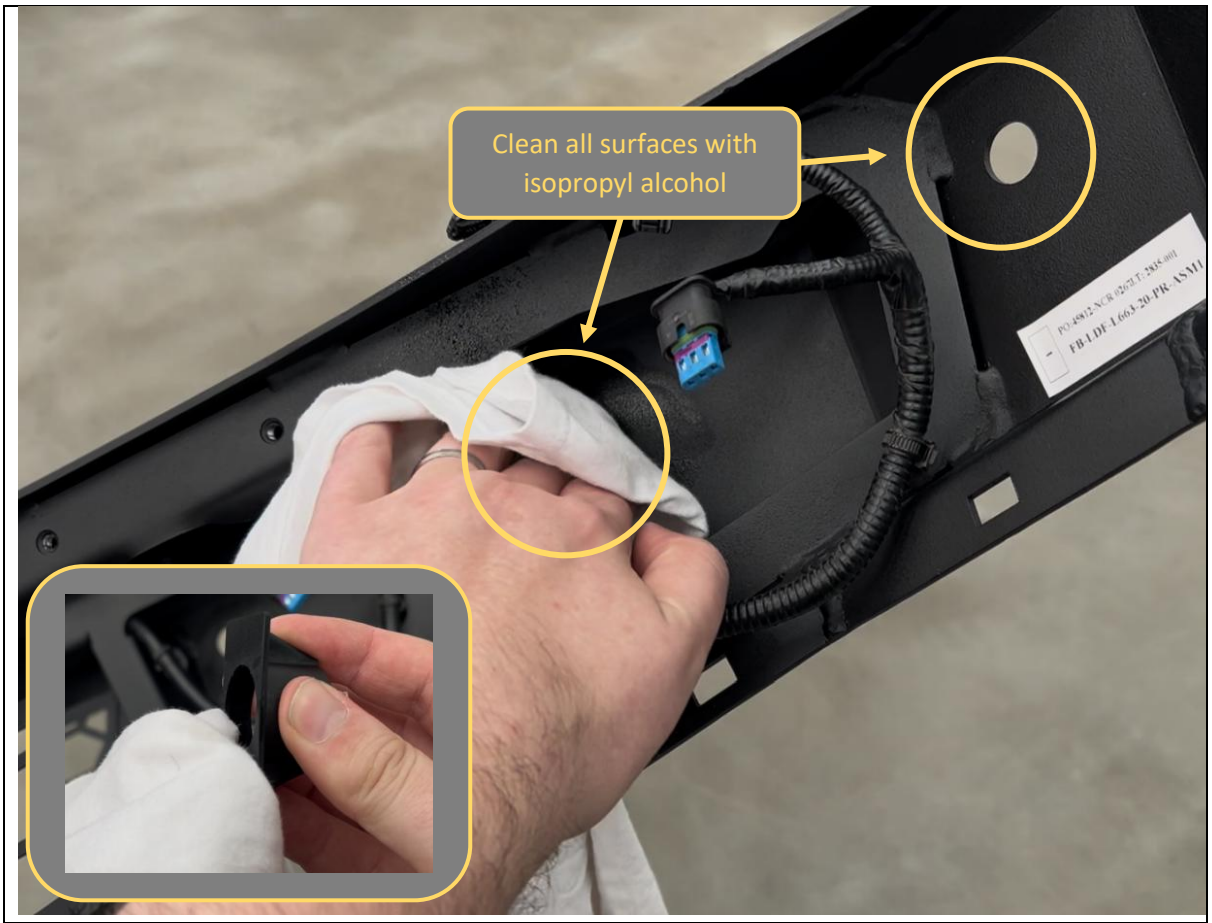
TOOLS REQUIRED

4mm Allen Key
10mm Spanner / Socket

FASTENERS

5x M6x16 BHCS – Black
5x M6 Flat Washer
5x M6 Flange Nut

Per Side



175. Clean area on back side of bar adjacent to parking sensor holes with isopropyl alcohol.

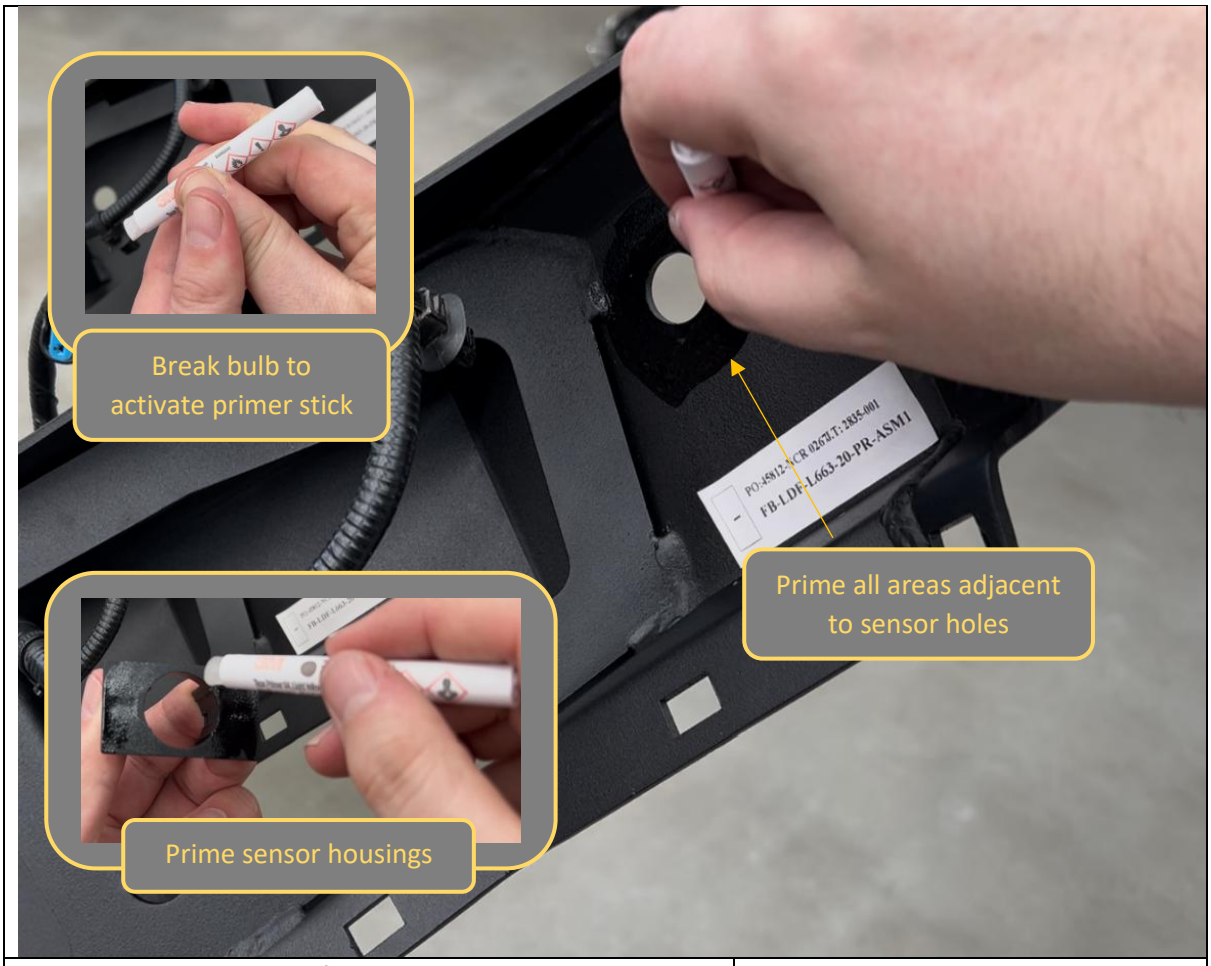
176. Clean area on front of F-0030 parking sensor housings with isopropyl alcohol.

177. Clean for all 6x sensor locations and housings.

TOOLS REQUIRED

Isopropyl Alcohol
Rag

FASTENERS



178. Break the bulb of the supplied Primer 94 ampule to activate the primer dispensing.

179. Apply Primer 94 to all areas adjacent to the parking sensor locations, on both the bar and the sensor housings.

180. Primer needs at least 5 minutes to cure before applying tape.

TOOLS REQUIRED

FASTENERS

Primer 94 Ampule

181. Whist waiting for the adhesion promoter to cure, fit 5x M6 cage nuts from small parts kit to rectangular slots in bottom of wing.

    Use a small flat bladed screwdriver to push the edge of the cage to engage with the slot to aid fitting.

182. Repeat for other side of bar.

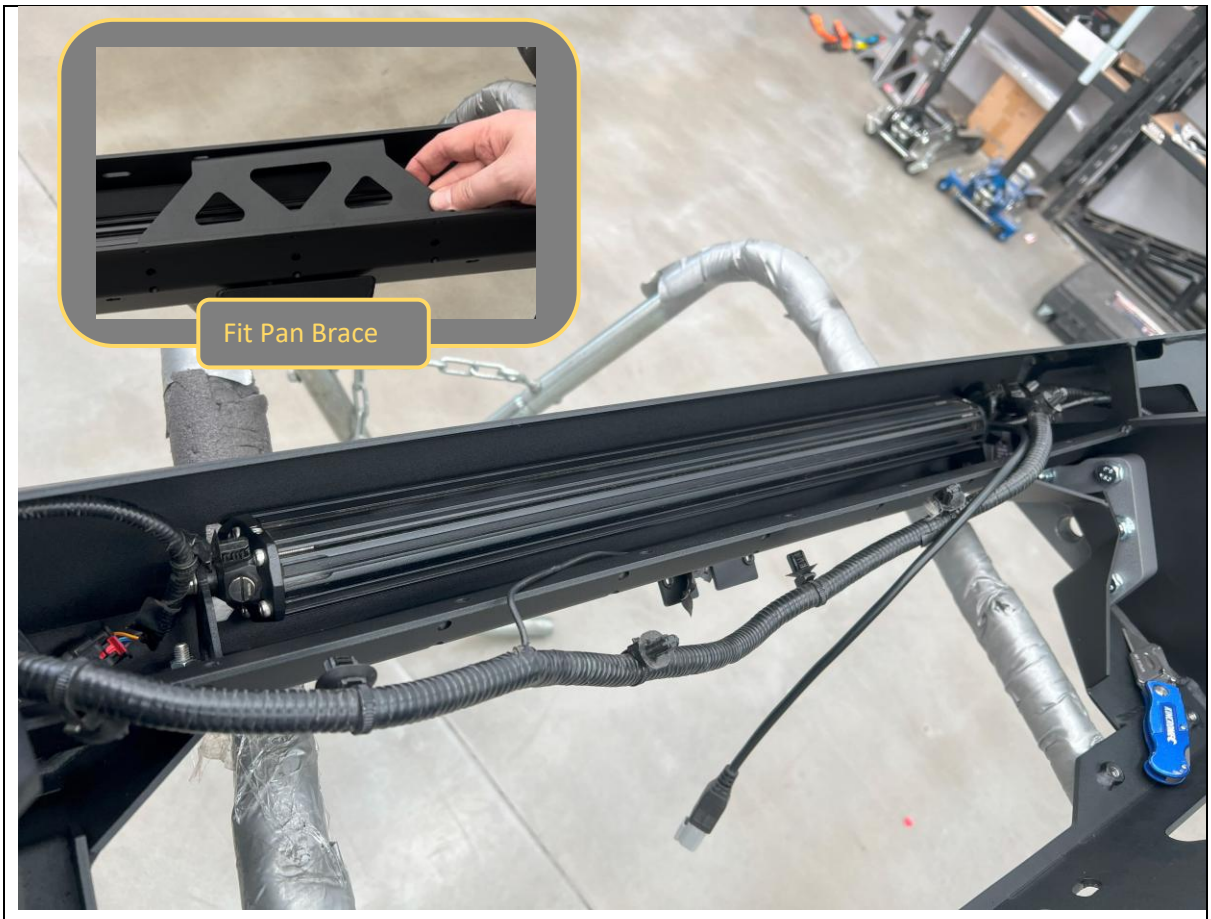
TOOLS REQUIRED

Small Flat Bladed Screwdriver

FASTENERS

5x M6 Cage Nut

Per side



183. If fitting an integrated light bar, do so now.

184. The bar is designed to fit an Offroad Animal 22in light bar. If fitting this light bar, assemble bar with legs out, and it will line up with the slots in the center gusset. Secure with M6 Fasteners supplied with the light bar.

185. The bar can accommodate most other “20-22inch” size light bars.

186. If fitting driving lights, top hoop or Stealth Hoop to the bar, this is also the most convenient time to do so. It is still possible later but is much more difficult.

    MAXIMUM Height of any accessory mounted to the bar is **200MM** from top face. Failure to observe this will cause adaptive cruise control issue.

187. Fit the pan brace, between the gusset and underside of the top face of bar, using supplied M6X16 button head bolts, Flat washers and M6 Flange Nuts.

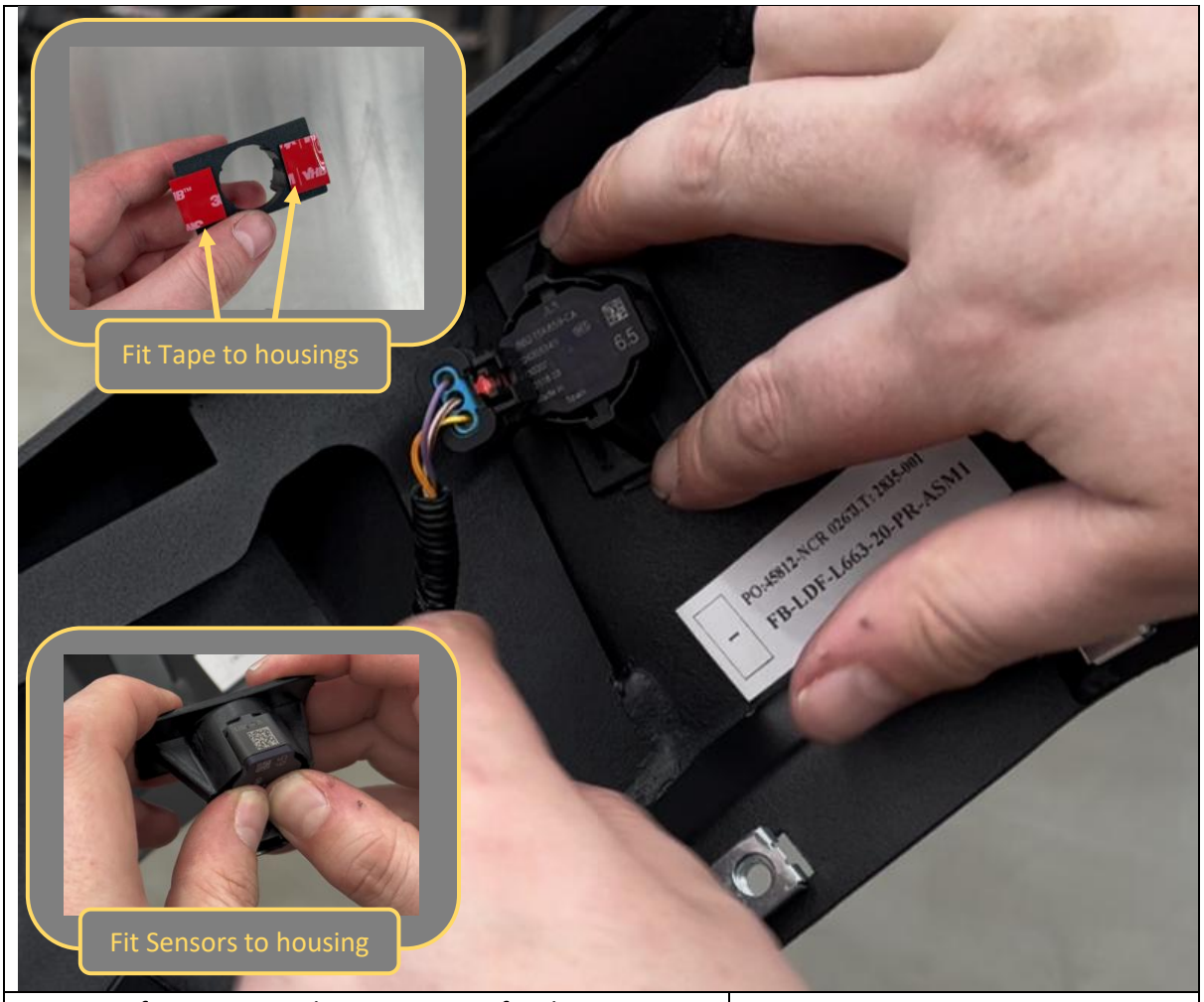
TOOLS REQUIRED

10mm Spanner / Socket
5mm Hex Key

FASTENERS

Light Bar
Supplied with Light Bar

Pan Brace
5xM6X16 Black button head bolts
5xM6 Black Flat washers
5xM6 Flange Nuts



188. After waiting at least 5 minutes for the primer to cure, Fit supplied VHB tape pads to all sensor housings as shown in the inset photo.

189. Fit parking sensors to the sensor housings. Push on sensors to ensure they are fully seated and both sides click into position.

190. Re-connect sensors to wiring loom.

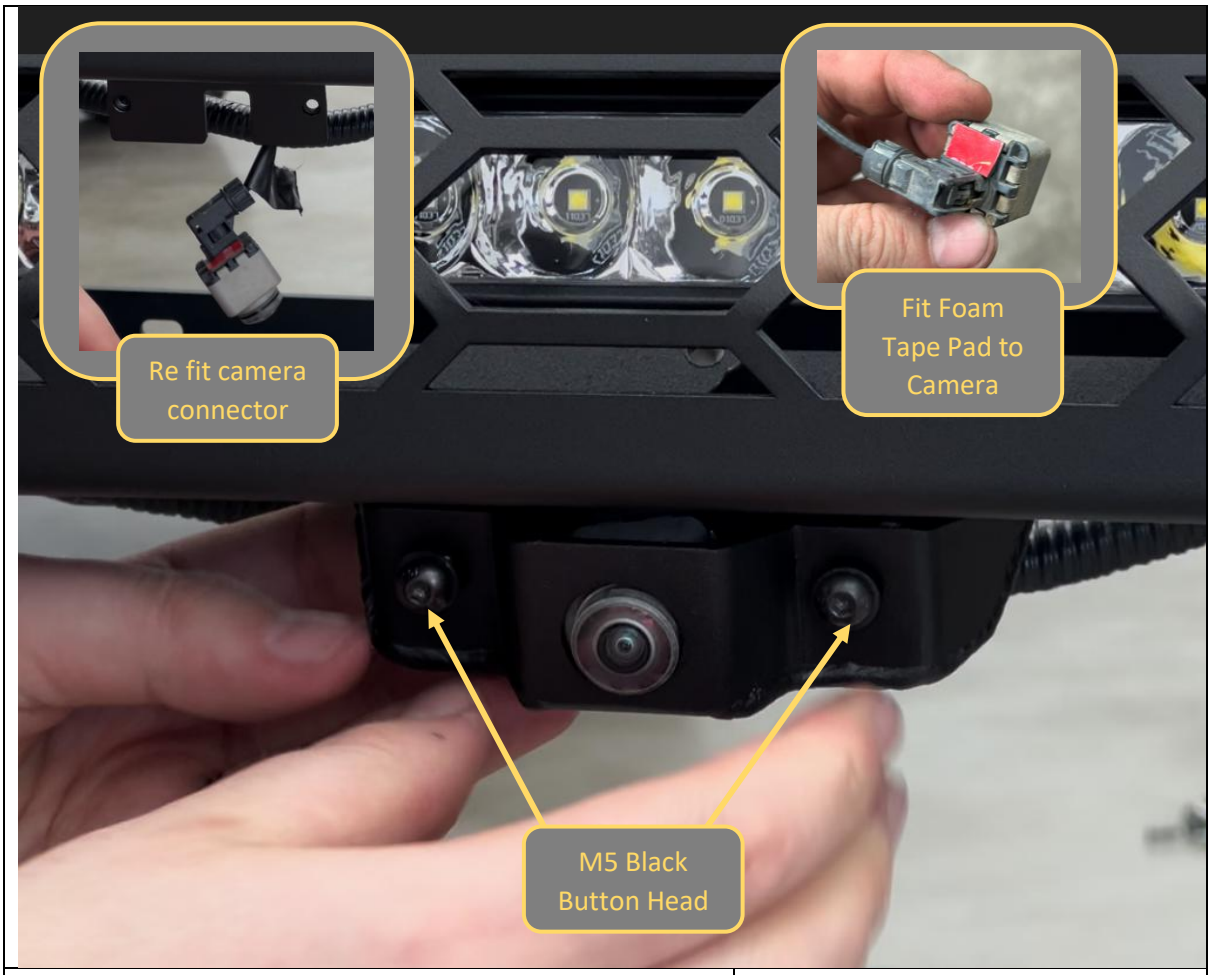
191. Dry fit sensors to bar to check loom position will work.

192. Remove backing and adhere sensors in position in bar. Apply pressure for 10-30sec after positioning for best adhesion.

TOOLS REQUIRED

FASTENERS

VHB Tape pads



193. Ensure the camera loom is correctly routed through the cut out in the gusset.

194. Taking note of the correct orientation, carefully re-connect the camera wiring connector. Ensure the plug is perfectly straight to avoid damaging the delicate center pin.

195. Fit a small pad of foam double side tap to the back side of the camera.

196. Fit the camera support bracket to the bar, the camera should be supported between the bracket and the flange on the bar. Use supplied M5 Black button head bolts and Black M5 Flat Washers.

197. Tighten with 3mm Hex Key.

198. Once complete, tidy up and cable tie looms on bar.

TOOLS REQUIRED

3mm Hex Key

FASTENERS

2x M5 Black Button head bolt
2x M5 Black Flat Washer
Cable Ties

199. With assistance, either from another person, or a lifting trolley, lift the bar onto the mounts on the vehicle.

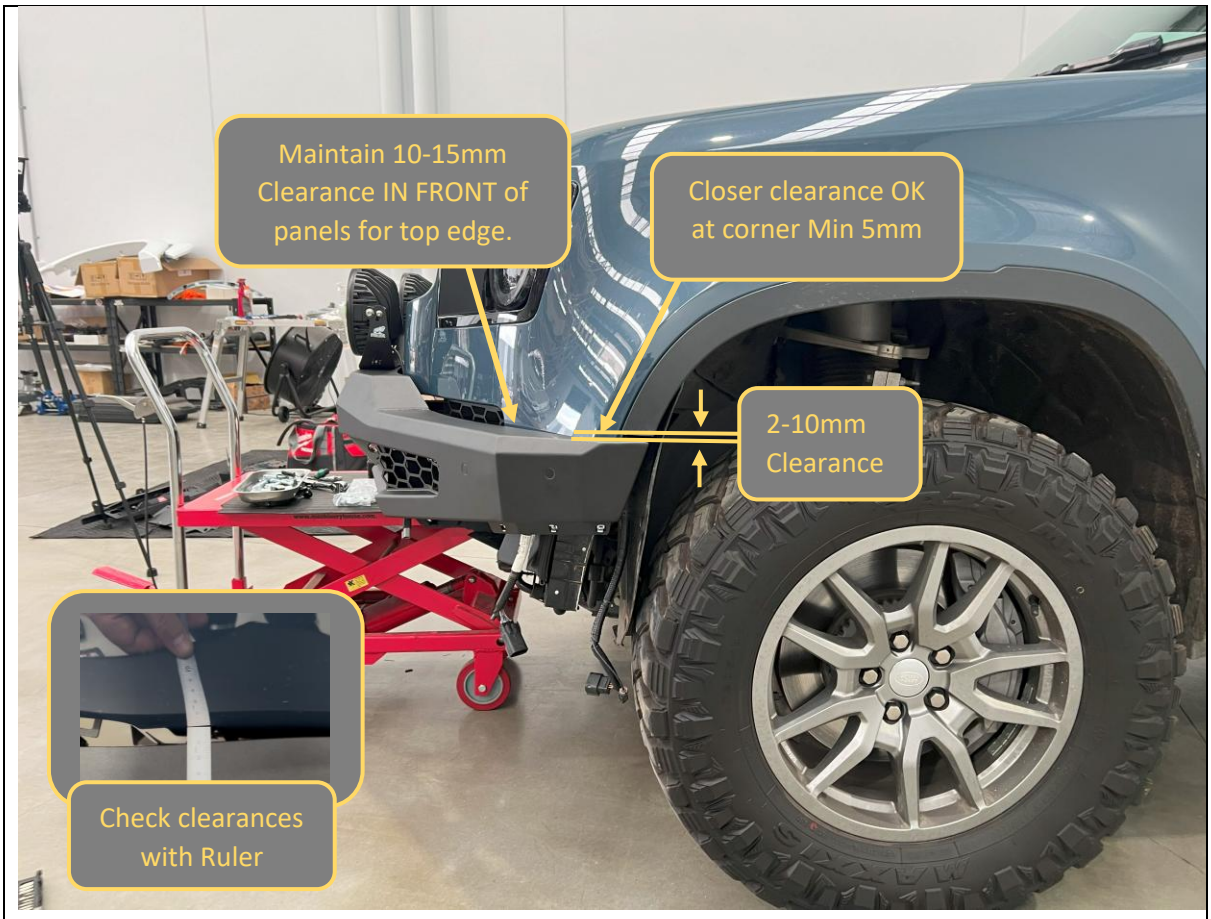
200. Secure with 4x M12x30 Bolts, Heavy Duty washers and M12 Flange Nuts per side, Finger tight at this stage.

TOOLS REQUIRED

Lifting Trolley

FASTENERS

8x M12x30 Bolt
10x M12 Heavy Duty Large Washer
8x M12 Flange Nut



201. With assistance from another person, Align the bar with the edges of the vehicle. Adjust such that the clearances are neat and even side to side.

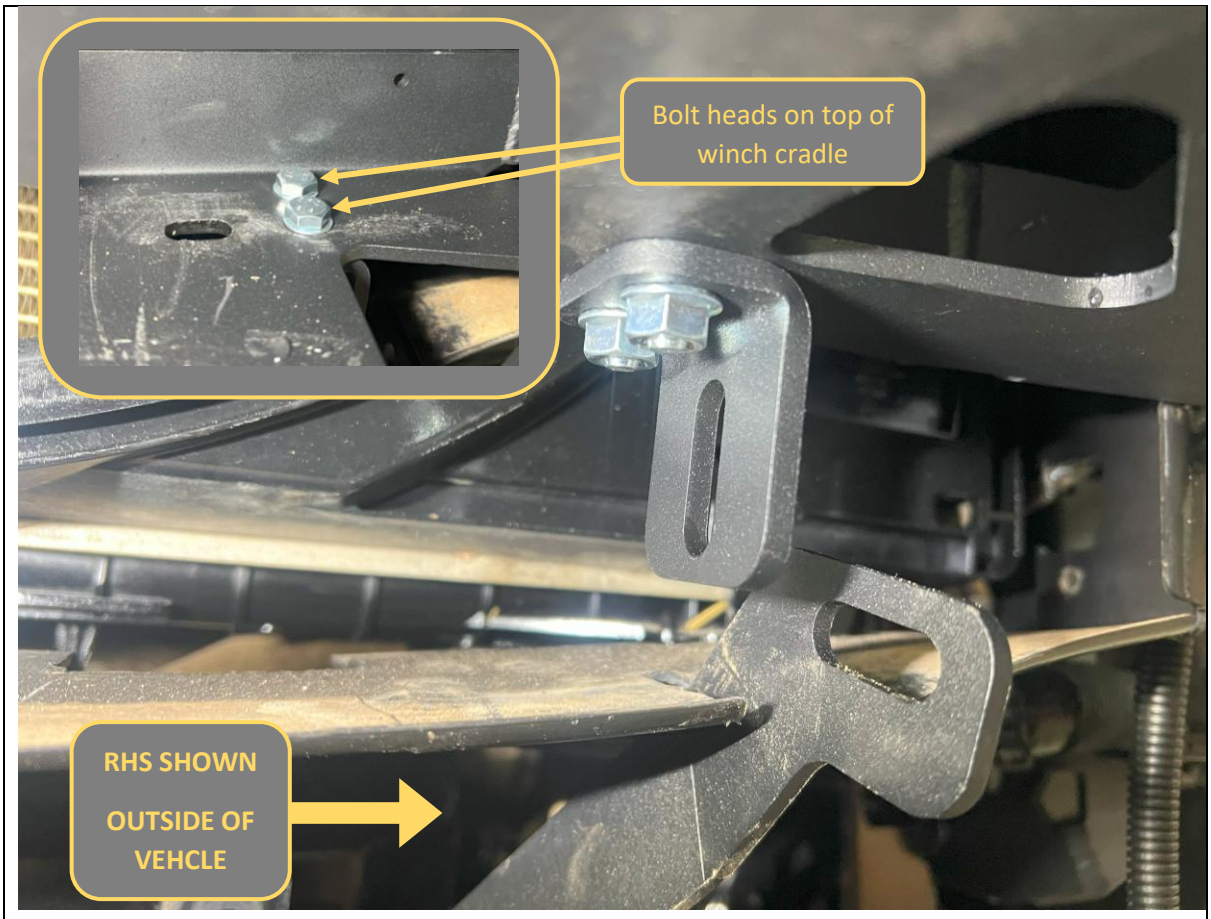
    Acceptable range of clearances shown in image above.

202. Once in position, tighten the M12 Bolts using socket and spanner. An impact driver may be used to speed up this process.

TOOLS REQUIRED

Lifting Trolley
18/19mm Socket and Spanner
Ruler

FASTENERS



203. Once bar is secured in position, Fit the Winch Strap Brackets to the bottom of the winch cradle as shown in the image above.

204. Ensure the bolt heads are sitting on the top of the winch cradle, and the flat face of the bracket is facing the outside of the vehicle.

205. Tighten with 13mm Socket / Spanner

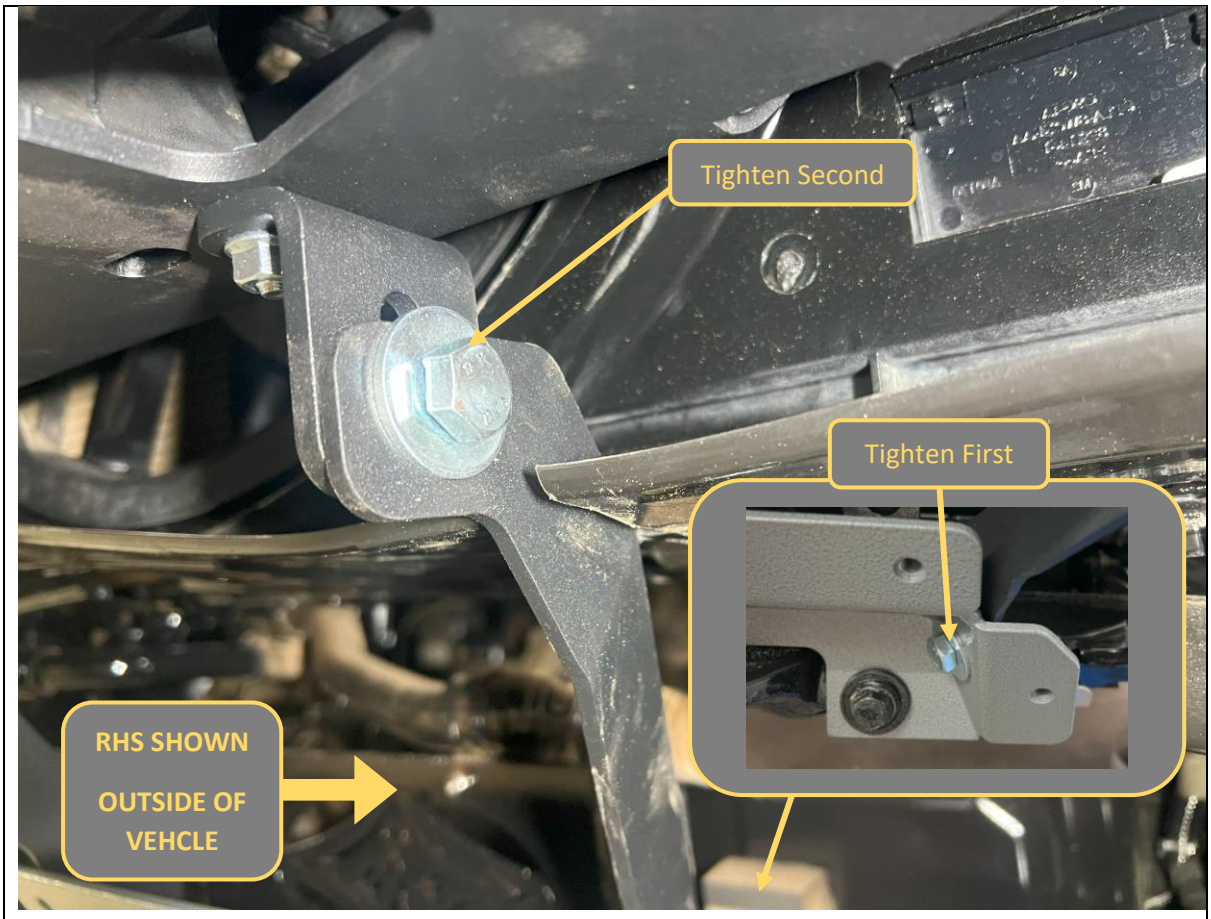
TOOLS REQUIRED

13mm Socket/Spanner

FASTENERS

2xM8x20 Bolt
2xM8 washer
2x M8 Flange Nut

Per Side



206. Fit the winch straps to the winch strap brackets and secure with M10x25 Bolt, HD Flat washer & Flange Nut.

    Ensure the winch strap sits in the cutout made in the radiator shroud earlier. Complete for both sides.

207. First tighten the M10x25 Bolts securing the Winch Strap to the crossmember brackets.

208. Next tighten the M10x25 Bolt Securing the winch strap to the winch strap bracket on the winch cradle.

TOOLS REQUIRED

16/17mm Socket/Spanner

FASTENERS

1xM10x25 Bolt
1xM10 HD washer
1x M10 Flange Nut

Per Side

209. Reconnect the main wiring harness and camera connector. Take care to align and connect the mini co-axial connector for the camrea carefully as it is very easy to bend the center pin.

210. Start the car and confirm the correct operation of the front camera, parking sensor and fog lights.

TOOLS REQUIRED

FASTENERS

211. If fitting a winch, do so now.

212. The bar is designed to fit most low mount winches, in foot down configuration. WARN ZEON 12 is largest winch confirmed to fit.

213. The control box can be mounted on top of the winch. Winches usually come with a bracket to allow this. Refer to winch manufacturer.

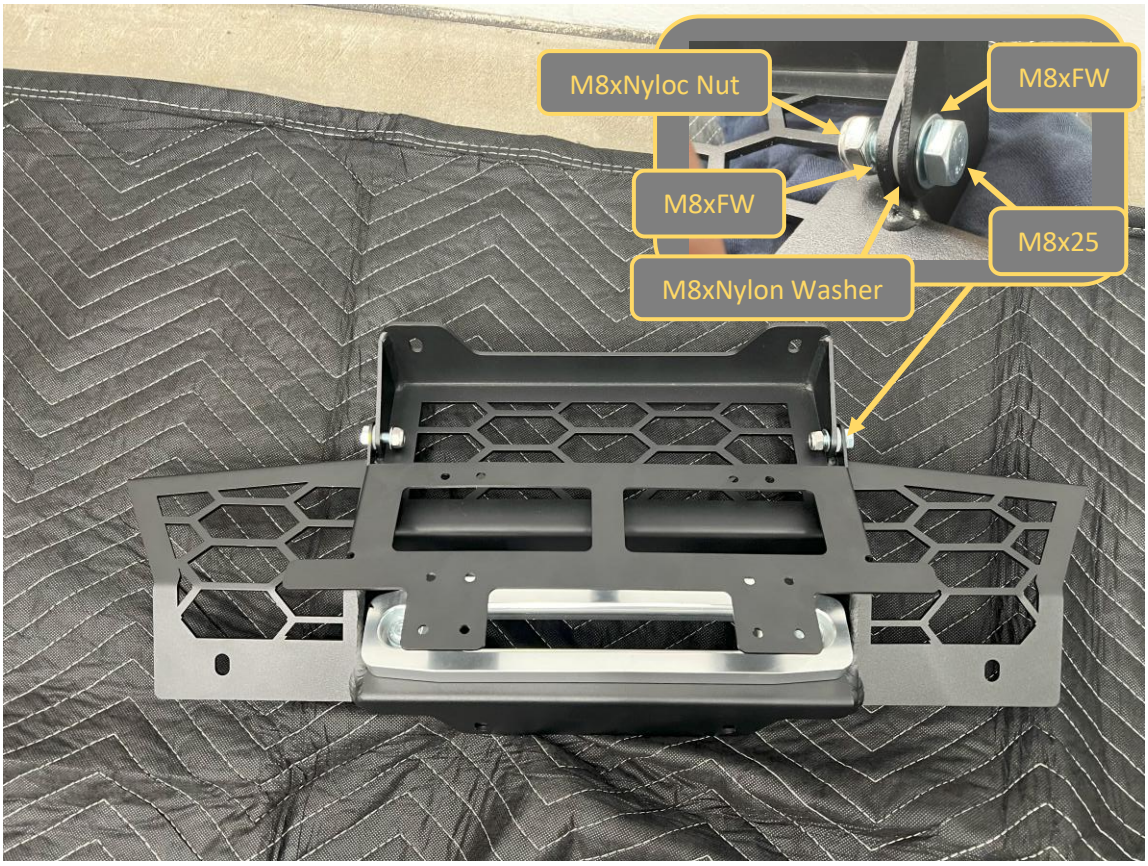
214. Ensure clutch handle will be accessible through access hole in front mesh panel. Refer to winch instructions regarding changing clutch handle location.

TOOLS REQUIRED

Refer to winch fitting instructions

FASTENERS

Supplied with winch



215. If required, fit winch fairlead to Mesh Panel. Use M10 or 3/8” fasteners supplied with winch. The bar is only compatible with low profile hawse type fairleads.

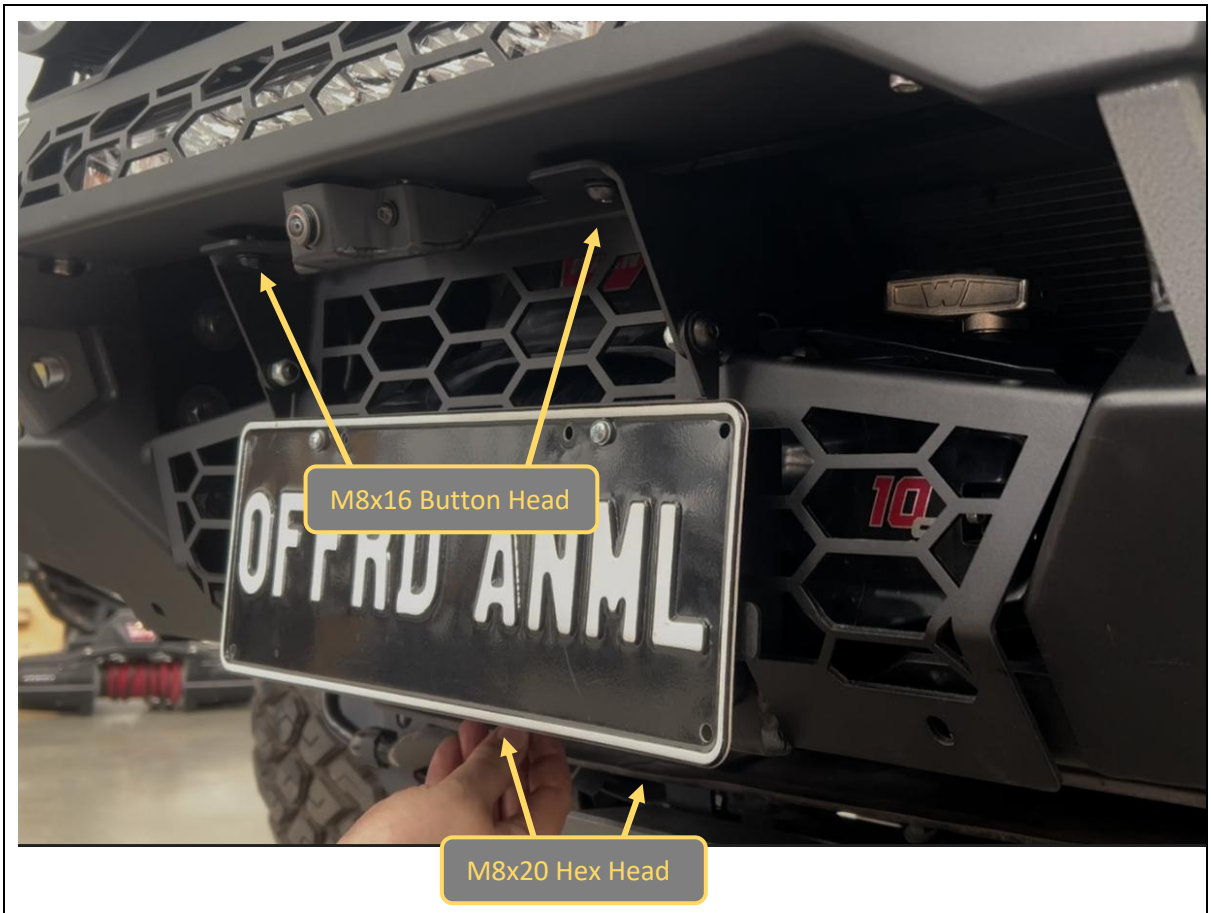
216. Fit number plate flip bracket to fairlead mount, M8x20 Bolt, Flat washer, Nylon washer and Nylon Lock nut. Ensure nylon washer sits between the bracket and fairlead mount.

TOOLS REQUIRED

13mm Spanner
10mm Spanner
4mm Hex Key

FASTENERS

2x M8x20 Hex Head
2x M8 Nyloc Nut
2x M8 Nylon Washer
4x M8 Flat Washer



217. Fit the Mesh Fairlead Mount to the center of the bar, using M8x16 Button head (Top), M8x20 Hex (Bottom) and M8 Flat washers .

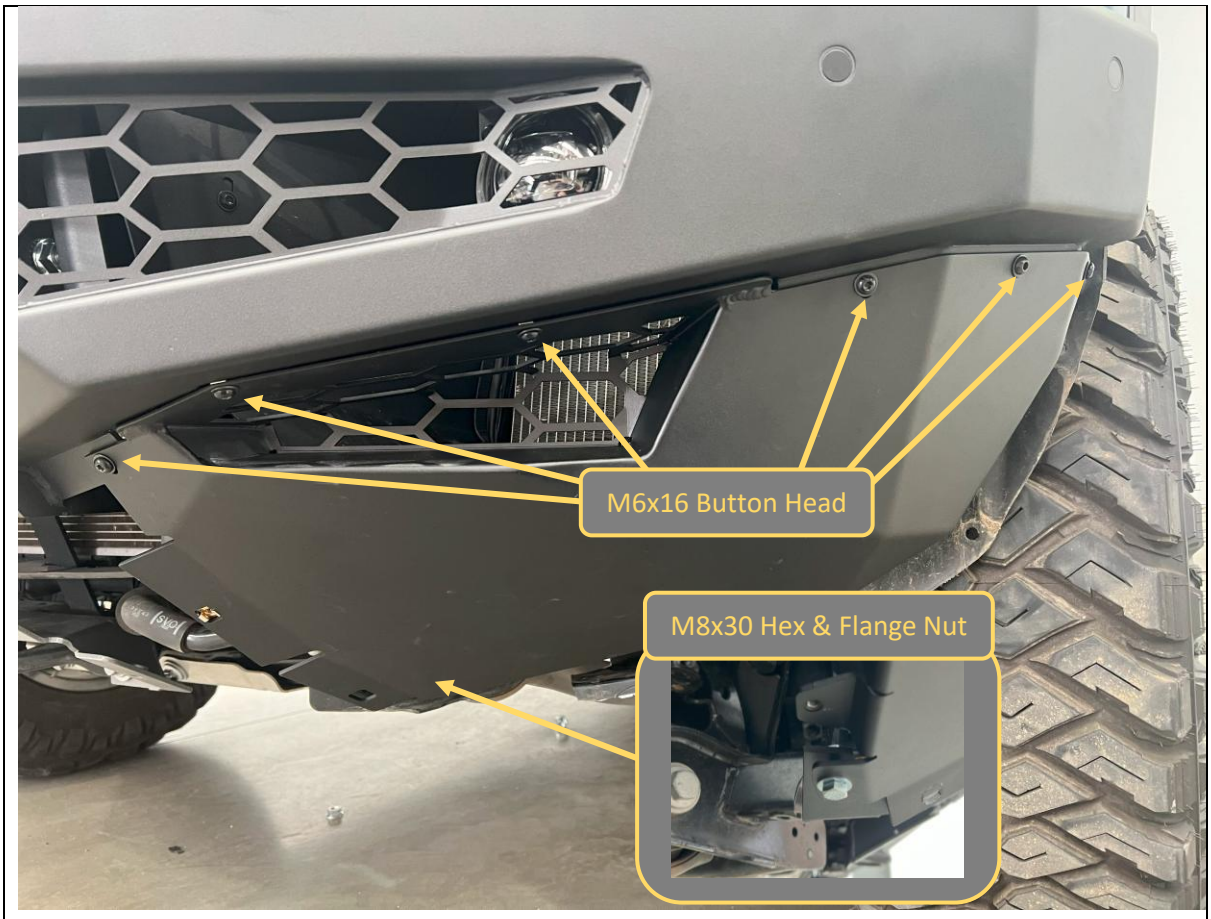
218. Tighten fasteners using 13mm socket / spanner and 5mm Allen Wrench.

TOOLS REQUIRED

13mm Spanner
5mm hex key

FASTENERS

2x M8x16 Button Head
2x M8x20 Hex Head
4xM8 Flat Washer



219. Before fitting the side under panels, insert the M6 Cage nut into the upper rectangular slot on the inside edge.

220. Fit the side under panel to the cage nuts in the bar using Black M6x16 Button head bolts and M6 Flat Washer

221. Fit the bottom corner of the side under panel to the bash plate support bracket with M8x30 Bolt, Flat washer and M8 Flange Nut.

222. Push panel up as far as possible on slots, then tighten M6's starting with vertical bolts, then the horizontal bolts.

223. Tighten the M8 Bolt in the bottom corner.

224. Complete under panel fitment on both sides of the vehicle.

TOOLS REQUIRED

4mm Hex Key
13mm Socket / Spanner

FASTENERS

5x M6x16 Black Button Head
5x M6 Black Flat Washer
1xM8x30 Hex
1xM8 Flat Washer
1x M8 Flange Nut

Per side

225. Screw in 4x M6x16 Button head bolts into the threaded inserts in the back of the side under panels. Leave finger tight.

226. Cover each of the bolt locations with masking tape

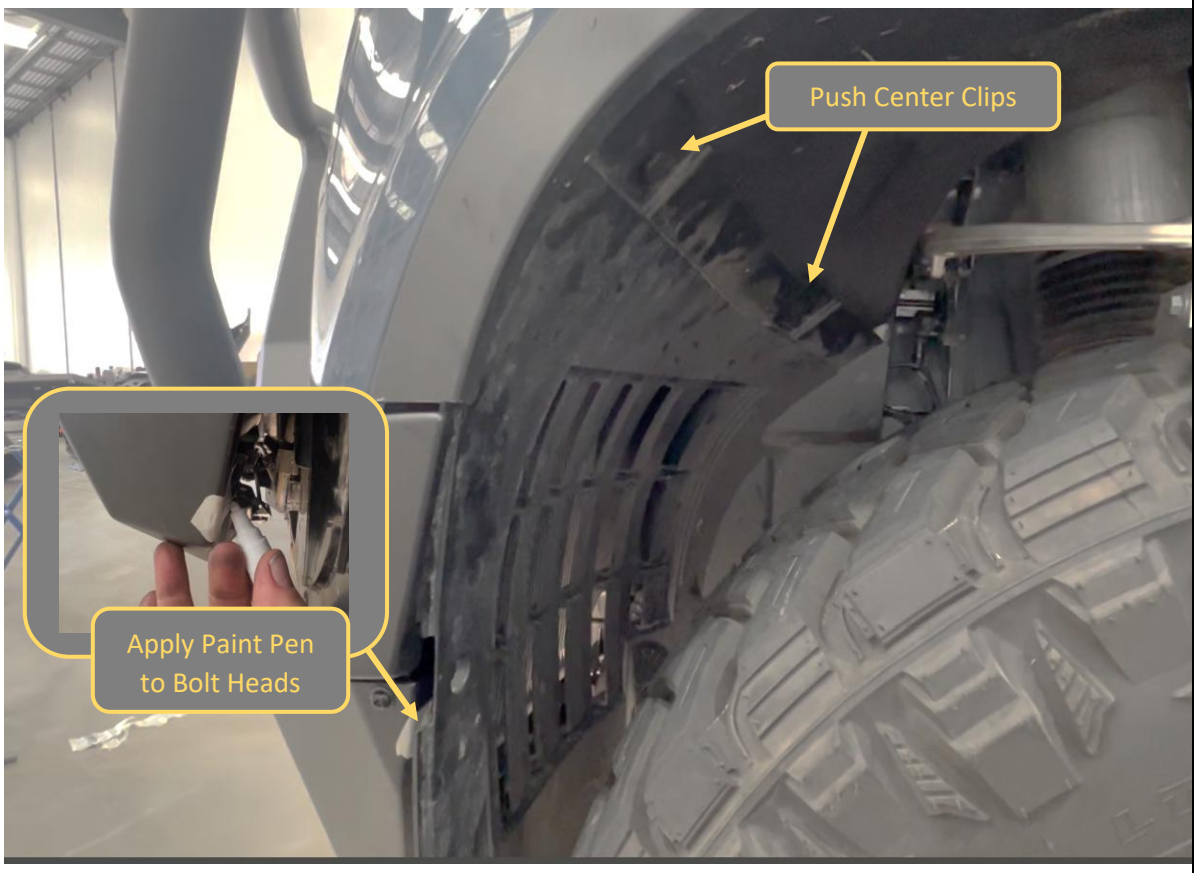
TOOLS REQUIRED

Masking Tape

FASTENERS

4x M6x16 Black Button Head

Per side



227. Re fit the inner wheel arch liner, using the 2x push center clips.

228. Peel back the wheel arch liner and apply paint marker to the protruding tips of all 4x bolts in the side under panel.

TOOLS REQUIRED

Paint Marker

FASTENERS

Push center clips (re-use)

229. Carefully flex the inner wheel arch liner forward to conform with the edge of the under panel. With assistance, complete the following steps whilst holding in this position.

230. Apply pressure at all bolt locations to transfer paint from bolt heads onto wheel arch liner.

231. Mark the intersection of the under panel with a paint pen or marker.

232. Release then remove the inner arch liner.

TOOLS REQUIRED

Paint Marker

FASTENERS

Push center clips (re-use)

233. Drill 8mm holes at the witness mark locations for the bolt heads.

234. Using air hacksaw or oscillating multi tool, Trim just inside intersection line mark.

235. Mark the intersection of the under panel with a paint pen or marker.

236. Re-Fit arch liner to car, secure with Push center clips at top, and using 4x M6x16 Bolts, HD flat washers into the threads on the side under panels.

237. Complete all arch liner trims for both sides of the vehicle.

TOOLS REQUIRED

Electric Drill
8mm Drill bit
Air hacksaw
or
Oscillating multi tool

FASTENERS

5x M6x16 Black Button Head
5x M6 Black Flat Washer
1xM8x30 Hex
1xM8 Flat Washer
1x M8 Flange Nut

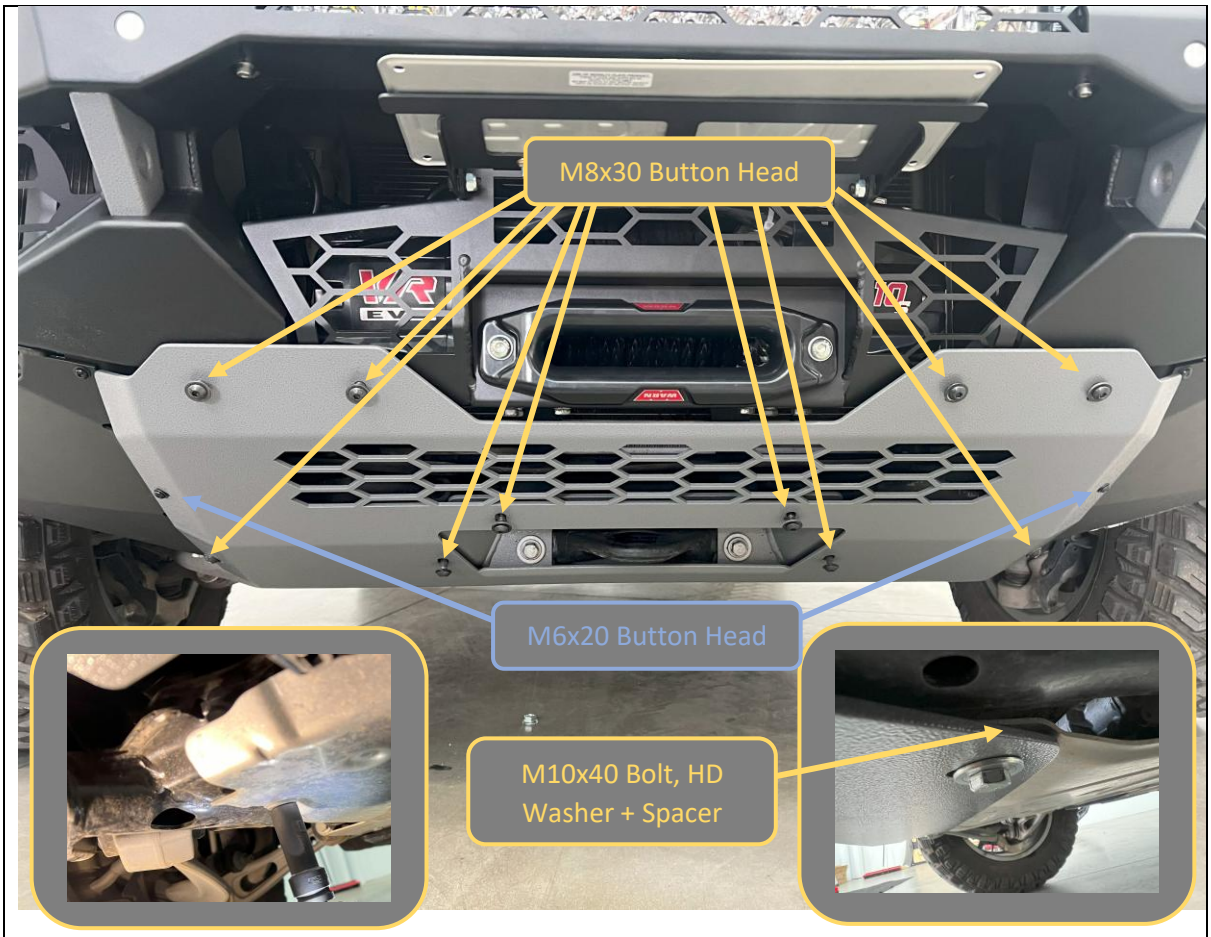
Per side

238. Fit the Compliance Plate to the underside of the winch cradle. Remove the backing paper and secure with the pre applied adhesive. Apply pressure for 10-20 Seconds for a good bond.

239. This location allows the compliance plate to be visible through the bash plate ventilation cutouts.

TOOLS REQUIRED

FASTENERS



240. Remove 2x front outer bash plate bolts before fitting the center bash plate panel, using 14mm socket.

241. Fit the bash plate to the vehicle, using fasteners shown in the notated image above. Leave all fasteners loose at this stage.

242. Secure back of Center Bash Plate using supplied M10x40 Hex head, M10 HD Flat washer, into the factory thread in chassis, with a P-0394 8MM spacer washer between the Offroad Animal bash plate and the factory underbody plate.

243. Progressively tighten the M8 fasteners using 5mm Hex key, to pull the bash plate evenly against the bar and center support.

244. Tighten Bottom fasteners using 16/17MM Socket

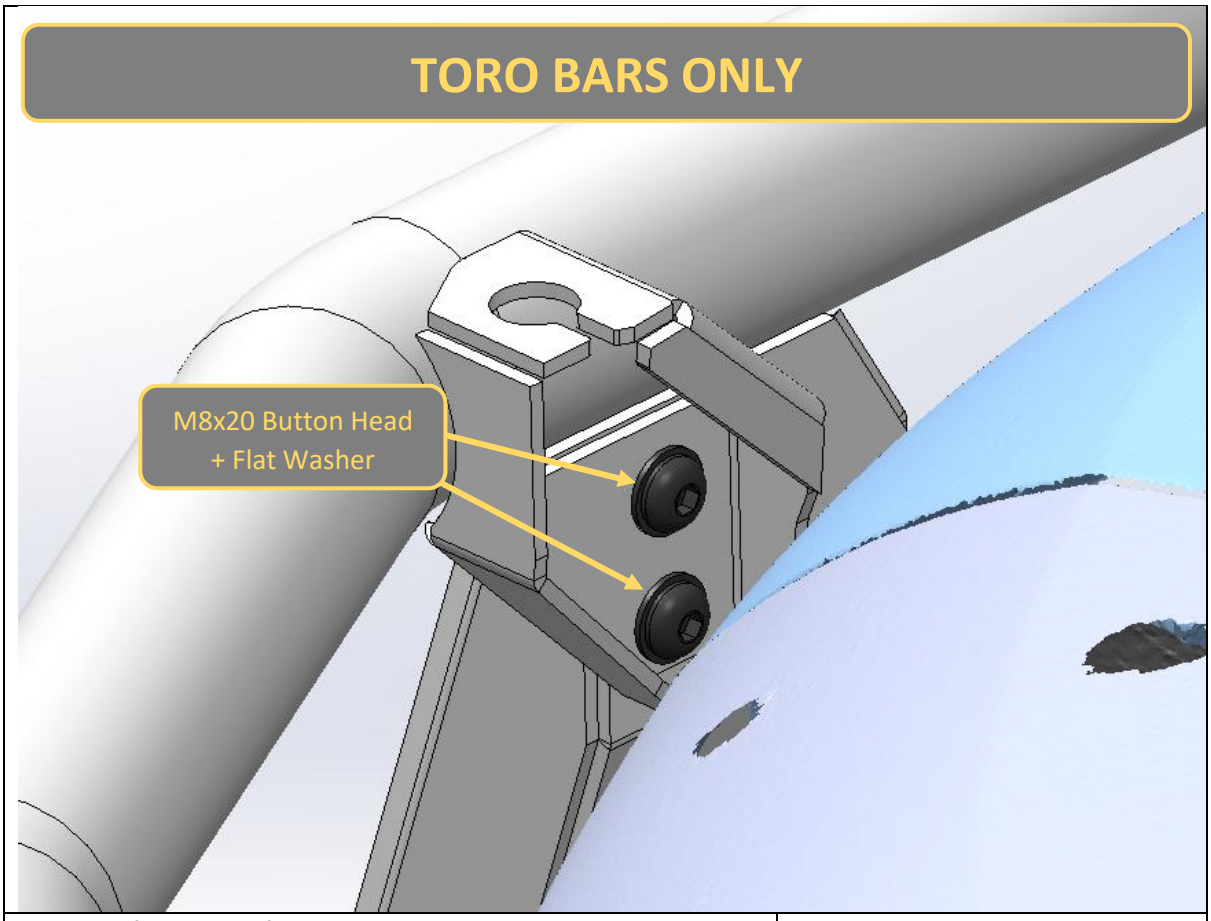
245. Tighten M6 fasteners using 4mm Hex Key

TOOLS REQUIRED

14, 16/17 mm Socket
4 mm Hex Key
5 mm Hex Key

FASTENERS

10x M8x30 Button Head
10x M8 Flat Washer
2x M6x20 Button Head
2x M6 Flat Washer
2x M10x40 Hex Head
2x M10 HD Flat Washer
2x P-0394 8MM spacer



246. If required, fit antenna brackets to the threaded inserts behind bar upright using M8x20 Button Head bolts and Flat Washers.

247. Tighten with 5mm Hex Key

248. Fit Antenna As required.

249. If not fitting antenna brackets retain and supply to customer for future use. Fit M8x20 Button Head bolts and Flat Washers to holes to preserve threads.

TOOLS REQUIRED

5mm Hex Key

FASTENERS

2x M8x20 Button Head Bolt
2xM8 Flat Washer

250. Check all Fasteners are tight.

251. Re-Fit number plate to number plate flip.

252. Head Bush and Enjoy your newly protected Defender!