

Part Number: 3448500

Product DELUXE BULL BAR

Description:

Suited to ISUZU MU-X

vehicle/s:

Optional 3540050 Winch Install Kit

Fitting Kit: 3500600 Hawse Fairlead Spacer Kit

3500610 Zeon Wire Rope Fit Kit

3500620 Zeon Synthetic Rope Fit Kit

W89965 Zeon Control Relocate Kit Short Wiring Kit No Bracket

3500640 ARB AUX Fog Light Adaptor

3500530 ARB AUX Fog Light Loom (non-factory fog lamp vehicles)

3500680 Fog Lamp Housing Clear Lens Kit

3500590 Fog Light Kit (LH&RH Lights)

WARNING

REGARDING VEHICLES EQUIPPED WITH SRS AIRBAG;

When installed in accordance with these instructions, the front protection bar does not affect operation of the SRS airbag.

ALSO, NOTE THE FOLLOWING:

- This product must be installed exactly as per these instructions using only the hardware supplied.
- In the event of damage to any bull bar component, contact your nearest authorised ARB stockist. Repairs or modifications to the impact absorption system must not be attempted.
- ♦ Do not use this product for any vehicle make or model, other than those specified by ARB.
- Do not remove labels from this bull bar.
- This product or its fixing must not be modified in any way.
- The installation of this product may require the use of specialized tools and/or techniques
- It is recommended that this product is only installed by trained personnel
- ♦ These instructions are correct as at the publication date. ARB Corporation Ltd. cannot be held responsible for the impact of any changes subsequently made by the vehicle manufacturer
- During installation, it is the duty of the installer to check correct operation/clearances of all components
- Work safely at all times
- Unless otherwise instructed, tighten fasteners to specified torque

ARB 4x4 ACCESSORIES

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GENERAL CARE AND MAINTENANCE

By choosing an ARB Bar, you have bought a product that is one of the most sought after 4WD products in the world. Your bar is a properly engineered, reliable, quality accessory that represents excellent value. To keep your bar in original condition it is important to care and maintain it following these recommendations:

- Prior to exposure to the weather your bar should be treated to a Carnauba based polish on all
 exposed surfaces. It is recommended that this is performed on a six monthly basis or following
 exposure to salt, mud, sand or other contaminants.
- As part of any Pre Trip Preparation, or on an annual basis, it is recommended that a thorough visual inspection of the bar is carried out, making sure that all bolts and other components are torqued to the correct specification. Also check that all wiring sheaths, connectors, and fittings are free of damage. Replace any components as necessary. This service can be performed by your local authorized ARB Stockist.

Important electrical system information

If the vehicle is fitted with factory fog lights check that the fog lamps are rated at or above 55 watts. If rated below 55 watts to prevent overloading the harness the fog lights must be activated through relays. Relay looms are not provided within this kit to wire these lights. Use 3500530 ARB AUX Fog Light Loom if relays are required.

FITTING REQUIREMENTS

REQUIRED TOOLS FOR FITMENT OF PRODUCT:

BASIC TOOL KIT	ELECTRIC DRILL & Ø4, Ø10, Ø10.5 & Ø13mm BITS
JIG SAW WITH BLADE SUITABLE FOR PLASTIC	RIGHT ANGLE DRILL or 90° FITTING TO CONVERT A STANDARD DRILL
FILE OR SAND PAPER	LOW TACK MASKING TAPE
TAPE MEAURE	UTILITY KNIFE
STEEL RULER	CLAMP
HACK SAW	WHITE FELT MARKER
TOUCH UP PAINT ANTI CORROSION	TORQUE WRENCH

HAVE AVAILABLE THESE SAFETY ITEMS WHEN FITTING PRODUCT:

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Hearing protection



NOTE: 'WARNING' notes in the fitting procedure relate to OHS situations, where to avoid a potentially hazardous situation it is suggested that protective safety gear be worn or a safe work procedure be employed. If these notes and warnings are not heeded, injury may result.



FASTENER TORQUE SETTINGS:

SIZE	Torque Nm	Torque lbft
M6	9Nm	7lbft
M8	22Nm	16lbft
M10	44Nm	32lbft
M12	77Nm	57lbft

NOTE:

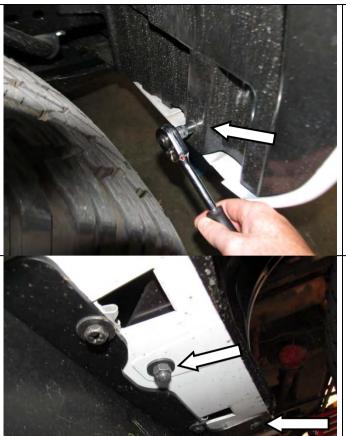
- ♦ REFER FOG LAMP KIT (p/n: 3163082) FOR FOG LAMP PARTS AND FITTING INSTRUCTIONS.
- ARB INTENSITY LIGHTS, UP TO 900 SERIES ROUND OR 800 RECTANGULAR DRIVING OR FOG LAMPS SUIT THIS PRODUCT.

PARTS LISTING					
APPLICATION.	PART NO.	QTY	DESCRIPTION		
PREPARE VEHICLE	3788096	1	TEMPLATE INNER RAIL		
	3788097	1	TEMPLATE OUTER RAIL		
	3789320	1	TEMPLATE BUMPER CUT		
	6191014	2	PINCH WELD 330mm LONG		
MOUNT TO VEHICLE	3759054R	1	BRACKET ASSY RH MOUNT COLORADO		
	3759054L	1	BRACKET ASSY LH MOUNT COLORADO		
	6821279	2	WIRE 1.25mm GALVANISED 500mm LONG		
	3194385	2	PLATE TAPPED COLORADO		
	4581083	8	WASHER FLAT, M10 x 21 x 2 ZP		
	4581048	4	WASHER SPRING M10 x 1/8 x 1/8		
	6151555	4	BOLT M10 x 1.5 x 30 SEMS BLACK		
	6151381	4	BOLT M10 x 1.5 x 80 Gd 8.8 ZP		
	4721558	4	TUBE CRUSH HILUX B/BAR		
	3194384	2	PLATE RECT WASHER COLORADO		
	6151026	4	NUT M10 x 1.5		
	5848393	8	PACKER UPRIGHT COLORADO		
	6151207	4	BOLT M6 x 1.0 x 25 Gd 8.8 ZP		
	6151128	4	NUT FLANGE M6 x 1.0 ZP		
	4581082	4	WASHER FLAT M6 BZ		
DUETEDE INDICATORS	24624700	1 4			
BUFFERS, INDICATORS	3162470R	1	BUFFER RH		
AND FOG LIGHTS TO BAR					
	3162470L	1	BUFFER LH		
	6151128	12	FLANGE NUTS M6		
	6821287	1	LAMP KIT LED INDICATOR CLEARANCE		

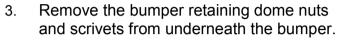
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	6821116	4	NYLON PLUG		
	3163082	1	FOG LIGHT RH & LH KIT		
PARTS LISTING					
AD TO VEHICLE					
BAR TO VEHICLE	4581011	8	WASHER FLAT, M12 x 27 x 4		
	6151340	4	BOLT M12 x 1.75 x 50 Gd 8.8 ZP		
	4581050	4	WASHER SPRING 1/2 x 3/16 x 3/16 ZP		
	6151189	4	NUT M12 x 1.75 ZP		
	4581083	4	WASHER FLAT, M10 x 21 x 2 ZP		
	6151456	4	BOLT M10 x 1.5 x 45 Gd 8.8 ZP		
	6151321	4	NUT FLANGE M10 x 1.5 ZP		
APPLICATION.	PART NO.	QTY	DESCRIPTION		
MOUNT BRACE &		·			
LOWER STONE GUARD	3759055	1	BRACKET BAR BRACE		
LOWER STONE GUARD	4581291	4	WASHER FLAT, M10 BLK ZN		
	6151320	4	BOLT M10 x 1.5 x 25 Gd 8.8 BZ		
	6151321	4	NUT FLANGE M10 x 1.5 ZP		
	6522900	1	PANEL LOWER PAN DMAX 12 ON		
	6151315	3	NUT CAGED M6 0.7-1.6		
	4581082	3	WASHER FLAT, M6 x 19 x 1.6 BZ		
	4581287	3	WASHER SPRING M6 x 2.5 x 1.6 BLK ZN		
	6151213	3	BOLT M6 x 1.0 x 20 Gd 8.8 ZP		
	6151302	5	NUT CAGED M10 1.8-3.2		
	6151555	5	BOLT M10 x 1.5 x 30 SEMS BLACK		
WING STONE GUARDS	6522901R	1	PANEL RH WING DMAX		
	6522901L	<u>'</u> 1	PANEL LH WING DMAX		
	3759106	2	BRACKET PANEL WING DMAX		
		12	WASHER FLAT, M6 x 19 x 1.6 BZ		
	4581082 4581287		WASHER FLAT, MO X 19 X 1.0 BZ WASHER SPRING M6 X 2.5 X 1.6 BLK ZN		
	6151213	8 12	BOLT M6 x 1.0 x 20 Gd 8.8 ZP		
	6151128 6151315	<u>4</u> 8	NUT FLANGE M6 x 1.0 BZ NUT CAGED M6 0.7-1.6		
	0131313	0	NOT CAGED WIG 0.7-1.0		
WINCH COVER PANEL	6522984	1	PANEL WINCH COVER		
(Non-winch bars)	6151256	2	SCREW BTN HD M6 x 16 SS		
	4581304	2	WASHER FLAT, M6 SS		
	6151128	2	NUT FLANGE M6 x 1.0 ZP		
	6191006	1	EXTRUSION COVER 1.5m		
NUMBER PLATE TO BAR	6821189	2	PLASTIC PLUGS		
(NO WINCH FITTED)	6151384	2	SELF TAPPING SCREWS		
(110 MINOLITITED)	0101004		OLLI IAI I IIVO SOILLIVO		
WINCH TO BAR	3540050	1	OPTIONAL WINCH INSTALL KIT		
	EG50	2	RUBBER GROMMET		
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- Read these instructions thoroughly before starting.
- 2. Remove 2 bumper retaining screws at the wheel liner (1 per side).





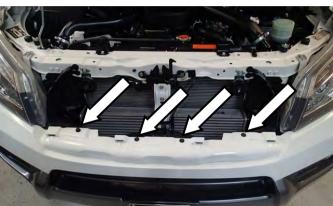
4. Remove and retain the top four scrivets holding the bumper grill.



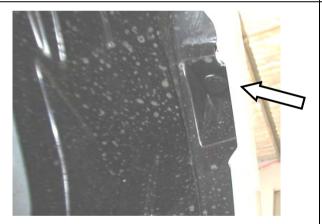
5. Remove and retain the front screw holding the bumper grill in place.



6. Use a flat head screw driver to unclip the vehicle grill from the bumper (4 places). Remove and retain the vehicle grill.



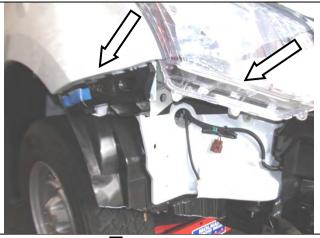
7. Remove and retain the four upper bumper scrivets.



8. Remove and retain the upper rear bumper scrivets (1 per side).



- 9. Remove and retain the number plate from the bumper.
- 10. If the vehicle has fog lights fitted disconnect the right and left hand fog light looms.



11. Carefully remove the bumper from the vehicle by pulling it away from the retaining clips located near the fenders and head lights.



12. Cover the vehicle bumper bar with protective low tack tape in the regions where it is to be trimmed.

Mark up the first cut line, all the way around the bumper, 35mm above the upper external bumper corner as shown on the adjacent image.



13. Cut the A3 paper template along identified cutting line (Part Number 3789320).

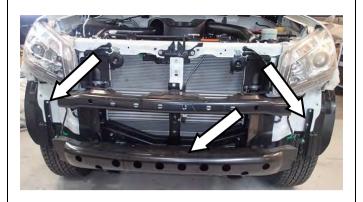
Fasten the template to the RH rear corner of the bumper with tape. Ensure the template is accurately positioned and flush with the upper rear edge of the bumper.

Use a black marker and mark up the second bumper cut line.

Use the same template and mark up the bumper cut lines on the LH rear corner of the bumper.



14. With the aid of an assistant, holding the bumper, trim and remove the lower portion of the bumper with an electric jigsaw.



- 15. Unbolt the RH & LH wheel liner retaining brackets.
- 16. Remove the lower bumper reinforcement beam.
 - 4 hex bolts fastening the beam to the vehicle chassis rails
 - 3 hex bolts fastening the stone guard to the lower bumper reinforcement beam



Unbolt the RH & LH bumper retaining brackets.



- 18. Identify the indicator harness fitted to the head light and remove the clip from the head lamp. Repeat to other side.
- 19. Using the scotch locks provided in the indictor kit, identify the correct wire and attach the indictor harness to the vehicle indicator harness. Repeat for other side.
- 20. Identify the clearance light harness fitted to the head light and remove the clip from the head lamp. Repeat to other side.
- 21. Using the scotch locks provided in the indictor kit, identify the correct wire and attach the clearance light harness to the vehicle clearance light harness. Repeat for other side.



22. Carefully remove the RH and LH plastic bumper retaining brackets. Keep the fastening screws as they will be re-used.



23. Use a white felt tipped pen to mark up the RH plastic bumper retaining bracket: the shaded region is to be cut off.



24. Use a hack saw to cut and remove the shaded portion of the bumper retaining bracket as shown in the adjacent image.
Repeat these two steps for the LH bumper retaining bracket.



25. Loosely refit the LH and RH bumper retaining brackets. It is not necessary to screw them in place yet.

NOTE: The adjacent image displays the LH bumper retaining bracket clipped into the LH vehicle fender.

FITTING PROCEDURE



26. Loosely fit the trimmed vehicle bumper. With the bumper in place, use the trimmed edge of the vehicle bumper to mark the second trim line for the RH & LH bumper retaining brackets with a white marker.





27. Remove the RH & LH bumper retaining brackets from the vehicle. Clearly mark the second cut lines on both sides of the parts as shown.

The adjacent images show the LH bumper retaining bracket.







28. Use a hack saw to cut the RH and LH bumper retaining brackets. Once these cuts have been completed the parts should look like the adjacent images.

NOTE: The LH part is shown here.

FITTING PROCEDURE



29. Use a white marker to mark the upper wheel liner rectangular cut-outs approximately 60mm high x 20mm deep as shown. Next, use a sharp utility knife to cut out these rectangles from the RH and LH wheel liners.



 Remove the bumper and mask the vehicle fenders and headlights. Use a spray can to paint the region immediately below the RH & LH vehicle fenders black.

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31. Refit the RH & LH bumper retaining brackets and secure them properly with the screws previously removed.

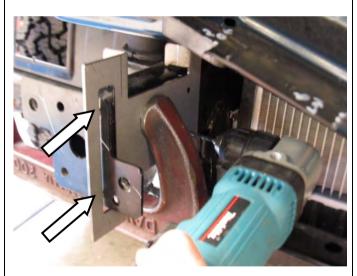
Fix the bumper to the vehicle refitting the previously removed fasteners.

Refit the vehicle grill and secure it using the original fasteners.



32. Fit the pinch weld, 2 off supplied with the bull-bar fitting kit, to the trimmed bumper as shown. Use side cutters to trim any excess pinch weld.

FITTING PROCEDURE







Warning: Drilling operations can result in flying metal debris, safety glasses should be worn.

33. Clamp the inner chassis drilling template, identifiable with an "I" cut through the centre of this part, to the inside face of the RH chassis rail.

ENSURE THE LOCATING DATUMS
CONTACT THE FRONT CHASSIS FLANGE.
ENSURE THE TEMPLATE IS SITTING

CENTRALLY ON THE CHASSIS RAIL, IN THE VERTICAL DIRECTION, BY CHECKING THE CLEARANCE BETWEEN THE UPPER AND LOWER LOCATING TABS AND THE CHASSIS RAIL.

Once the template is positioned accurately on the chassis rail use a right angle drill to drill two Ø4mm pilot holes through the inner wall of the chassis rail.

DO NOT DRILL STRAIGHT THROUGH THE OUTER WALL OF THE CHASSIS RAIL NOW.

NOTE: If you do not have a right angle drill a right angle drill attachment can be bought from a hardware store.







Warning: Drilling operations can result in flying metal debris, safety glasses should be worn.

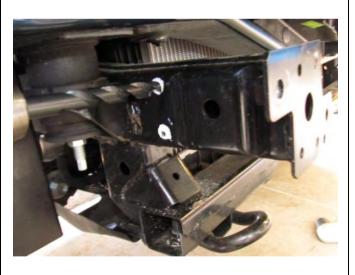
34. Clamp the outer chassis drilling template, identifiable with an "O" cut through the centre of this part, to the outside face of the RH chassis rail.

ENSURE THE LOCATING DATUMS CONTACT THE FRONT CHASSIS FLANGE.

ENSURE THE TEMPLATE IS SITTING CENTRALLY ON THE CHASSIS RAIL, IN THE VERTICAL DIRECTION, BY CHECKING THE CLEARANCE BETWEEN THE UPPER AND LOWER LOCATING TABS AND THE CHASSIS RAIL.

Once the template is positioned accurately on the chassis rail drill the two Ø4mm pilot holes through the outer wall of the chassis rail.

FITTING PROCEDURE



35. Drill two Ø13mm holes through the outer wall of the chassis rail only.

DO NOT DRILL STRAIGHT THROUGH THE INNER WALL OF THE CHASSIS RAIL NOW.





Warning: Drilling operations can result in flying metal debris, safety glasses should be worn.



36. Replace the Ø13mm drill bit with a Ø10.5mm drill bit and pass the drill through the Ø13mm holes.

USE A SECOND PERSON TO WATCH AND ENSURE THE DRILL IS LOCATED CORRECTLY ON THE Ø4mm PILOT HOLES, ON THE INNER WALL OF THE CHASSIS RAIL, DRILLED AT STEP 33.

IT IS CRITICAL THAT THESE HOLES ARE ACCURATELY LOCATED.

Drill two Ø10.5mm holes through the inner wall of the chassis rail.





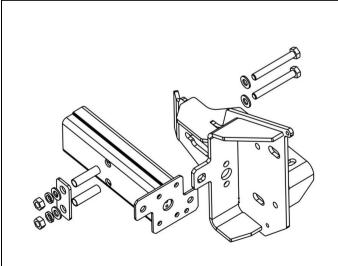
Warning: Drilling operations can result in flying metal debris, safety glasses should be worn.



- 37. Paint all drilled holes with rust inhibiting paint.
- 38. Insert the nut plate, from the bull-bar fitting kit, through the front flange of the chassis rail with the wire attached.

ENSURE THE WIRE REMAINS
ATTACHED TO THE NUT PLATE AND
PROTRUDES FROM THE CHASSIS
RAIL.

FITTING PROCEDURE



39. Loosely fit the right hand bull-bar mount to the chassis rail using the: M10 x 80 bolts (2 off), flat washers (4 off), crush tubes (2 off), rectangular plate (1 off), spring washers (2 off) and hex nuts (2 off) from the bull-bar fitting kit.

Ensure these bolts are orientated as shown in the adjacent image with the head of the bolt on the inside of the chassis rail.



40. Re-use one of the chassis bolts, removed at step 16, to firmly locate the bull-bar mount bracket to the chassis.

> Ensure the mount fits well and in-line with the chassis flange.

NOTE: This bolt will be removed prior to bar fitment



41. Use a punch to mark the two holes in the front of the chassis rail.

> Drill two Ø4mm pilot holes. Next open these holes with a Ø10.5mm drill bit.

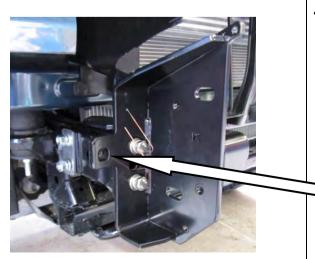
Paint these drilled holes with rust inhibiting paint.





Warning: Drilling operations can result in flying metal debris, safety glasses should be worn.

FITTING PROCEDURE



42. Fasten the two M10 x 30 SEMS bolts to the nut plate inserted in the chassis at step 38. Use the wire, shown in the adjacent image, to correctly position the nut plate.

Tighten the two M10 x 30 hex bolts.



M10 - **44 Nm**.

Tighten the two M10 x 80 hex bolts (fit at step 45).



M10 - **44 Nm.**

Remove the chassis bolt fitted at step 40.

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Note: DO NOT REMOVE THE WIRE USED TO POSITION THE NUT PLATE AS IT MAY BE REQUIRED IN THE FUTURE IF THESE MOUNTS ARE REMOVED.

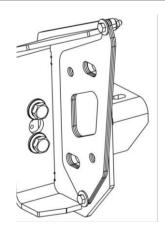
Repeat steps 33 to 42 for the left hand chassis mount.



- 43. Use a tape to measure the distance between the two outer faces of the bull-bar mounts.
 - The nominal design dimension is 722mm. This may differ, however, due to vehicle chassis variation.



- 44. Measure the distance between the bullbar mounting faces.
 - The nominal design dimension is 736mm.

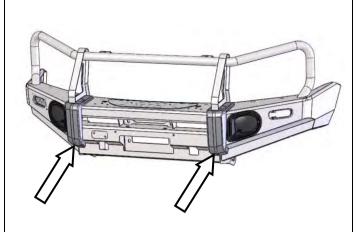


45. Fit an equal number of 2.5mm packers to the RH and LH mounts as required with the M6 x 25 bolts (2 per mount), flat washers and flange nuts.

The total clearance between the bull-bar mounting faces and the mounts should be roughly 1-2mm per side.

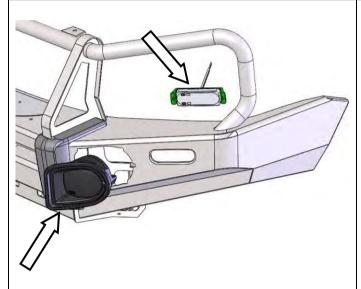
- Assuming the nominal dimensions of 722mm and 736mm were measured at steps 43 & 44, four 2.5mm packers would be used (i.e. 2 per mount)

FITTING PROCEDURE



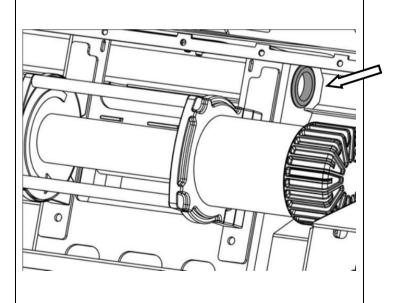
46. Attach the buffers to the bar as shown using twelve M6 flange nuts.

Warning: Do not over tighten these nuts or you risk pulling the studs from the buffers.



- Assemble and install fog lights (p/n 3163082) as per instructions no 3789190 supplied with fitment kit.
- 48. Assemble and install LED indicators (p/n 6821287) as per instructions supplied with fitment kit. Fit nylon plug to indicator surround in the bar prior to installing indicators. Connect the RH and LH indicator looms, to the indicators.

CAUTION: Cable-tie all cables together and keep all cables clear of sharp edges and all moving parts.



- 49. If fitting a winch:
 - install the two rubber grommets, supplied in the bull-bar fitting kit, into the bull-bar winch cradle as shown
 - follow the fitting instructions 3787989 supplied with 3540050 winch install kit

If not fitting a winch proceed to step 50.

FITTING PROCEDURE

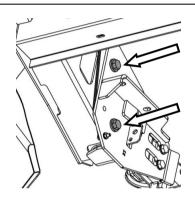


Re-install the cut bumper and grill, refit the scrivits and screw that hold the bumper and grill removed in steps 4 through 8.



51. With the assistance of another person, place the bar on the mount brackets.

> Warning: Due to the weight of the bar and winch if fitted, it is advised that vou use some form of mechanical assistance when lifting the bar onto the vehicle such as an elevating trollev.



52. Use the M12 x 50 hex bolts (2 per mount), flat washers (4 per mount), spring washers (2 per mount) and hex nuts (2 per mount) to secure the bar.



53. Position the bar so that the rear of the wing is parallel with the vehicle fender and lines up with the wheel arch. The nominal distance between the vehicle fender and the bull-bar is 48mm.

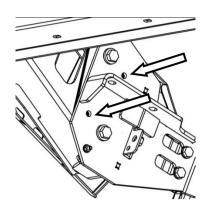
> Once happy with the position of the bar tighten the M12 mounting bolts.



M12 - **77 Nm**.

FITTING PROCEDURE

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Once satisfied with the position of the bar on the vehicle drill the four Ø10mm pinning bolt holes (2 per mount).

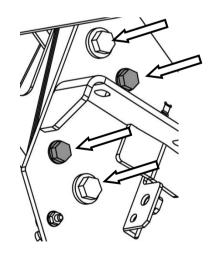




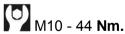
Warning: Drilling operations can result in flying metal debris, safety glasses should be worn.



- Measure the distance from the RH vehicle 55. fender to the outer face of the RH bull-bar wing. Repeat on the LH side to confirm the bar is sitting centrally on the vehicle.
- 56. If not, remove the bar from its mounts and shift the required number of 2.5mm packers installed on the bull-bar mounts, fit at step 45, from one mount to the other. Next re-fit the bar on the mounts lining up the Ø10mm holes drilled at step 52.



57. Once satisfied with the fitment of the bar to the vehicle, fit the M10 x 45 hex bolts to the RH & LH mounts (4 off - 2 per mount), flat washers (4 off) and flange nuts (4 off). Tighten the four M10 x 45 hex bolts.



Tighten the four M12 x 50 hex bolts.



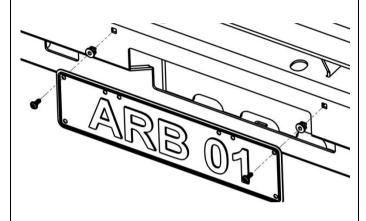
M12 - **77 Nm.**

FITTING PROCEDURE

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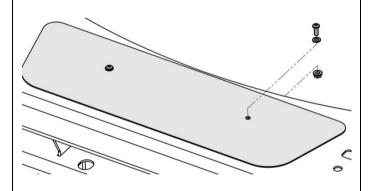
58. If fitting driving lights it is advisable to fit them now.



59. IF NOT FITTING A WINCH

Insert the two plastic plugs into the square holes in the front of the bar. Next, screw the number plate to these grommets.

If fitting a winch, follow the fitting instructions 3787989 supplied with 3540050 winch install kit regarding number plate fitment.



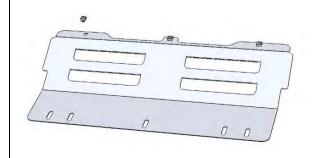
60. IF NOT FITTING A WINCH

Wrap the rubber extrusion around winch cover

Place the winch cover on top of the bar and align the panel bolts holes with mating holes located on the top middle face of the bull-bar.

Bolt winch cover to the bull-bar using the two M6 button head stainless steel screws, stainless steel flat washers and M6 flange nuts.

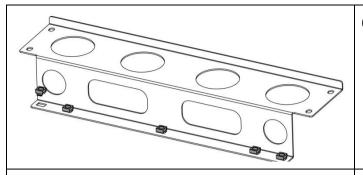




61. Fit three M6 cage nuts to the centre stone guard as shown.

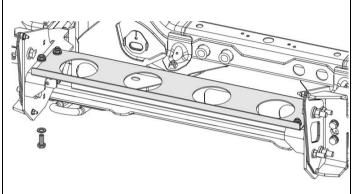
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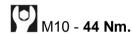
62. Fit five M10 cage nuts to the centre bull-bar brace.

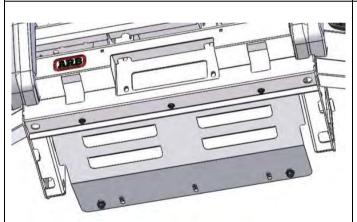
Ensure the cage nuts are inserted with their legs as shown, so they can slide along the rectangular slots.



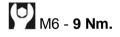
63. Loosely fit the centre bull-bar brace to the bull-bar mounts using four M10 x 25 hex bolts, four flat washers and four flange nuts are shown.

After confirming that the vehicle stone guard bolt holes will fit and line up with the M10 cage nuts in the bull-bar brace tighten the four M10 x 25 hex bolts.

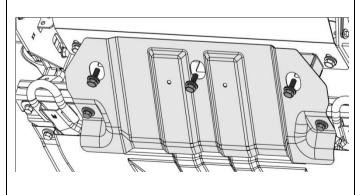




64. Fit the centre stone guard to the bull-bar / vehicle with: three M6 x 20 black hex bolts, spring washers, flat washers and two M10 x 30 black SEMS bolts.



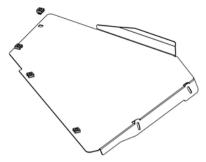
M10 - **44 Nm.**



65. Refit the original vehicle stone guard using two of the original M10 bolts, at the rear of the stone guard, and three M10 x 30 black SEMS bolts at the front.



FITTING PROCEDURE



66. Fit the M6 cage nuts to the two wing stone guards (4 per stone guard).



67. Fit the 2 wing stone retaining brackets to the vehicle chassis using the outer bolts holding the vehicle recovery points.

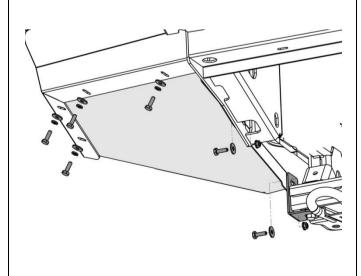


68. Loosely fit the RH and LH wing stone guards to the bull-bar. As shown on the adjacent photo, use a white marker to draw a line on the wheel liner at the lower rear edges of the stone guards.



69. Remove the two wing stone guards and mark a second line 5mm above the first line on the RH and LH wheel liners.

Cut off the lower portion of the wheel liners at the upper line with a utility knife or heavy duty scissors.



- 70. Fit the RH wing stone guard with:
 - four M6 x 20 black hex bolts, four spring washers and four flat washers through the wing
 - two M6 x 20 black hex bolt, two flat washers and two flanges nuts at the bull-bar mount and the stone guard retaining bracket
- 71. Fit the RH wheel liner over the rear lip of the stone guard so it is securely held.
- 72. Repeat steps 68 to 71 for the LH wing stone guard.

M6 - **9 Nm**.

FINAL CHECKS:

- ♦ Check wiring connections to fitted lights and winch.
- ♦ Check operation of winch and all lights.
- ♦ IMPORTANT: Check that all piping and wiring is clear of sharp edges and pinch points. Adjust any piping to clear the bull bar or mounts by a minimum of 15mm.



