

INTRODUCTION

The workshop manual has been written in a format that is designed to meet the needs of technicians worldwide. The objective is to provide descriptions for completing diagnosis and testing, service and repair work with tested and effective techniques, using a common publishing format.

It is structured into **groups** which are specific to vehicle areas, **sections** which are component areas, and **sub sections** which contain lists detailing Specifications, Description and Operation, Diagnosis and Testing, General Procedures, Disassembly and Assembly, Removal and Installation.

HOW TO USE THIS WORKSHOP MANUAL

Appropriate service methods and repair procedures are essential for the safe, reliable operation of all vehicles as well as the personal safety of the individual carrying out the work.

Anyone who does not follow the instructions provided in this manual, must first establish that personal safety or vehicle integrity is not compromised by the choice of method, tools or components.

WARNINGS, CAUTIONS AND NOTES

WARNING:

Warnings indicate hazards that may be present while carrying out the procedure. These hazards may cause personal injury if not followed.

CAUTION:

Cautions indicate that failure to follow the instruction may result in damage to the vehicle or equipment.

NOTE:

Notes provide additional information that is required in the procedure.

General warnings, cautions and notes are included before any procedural steps. These are only used when they apply to each step contained in the procedure.

Step specific warnings, cautions and notes are only assigned to the individual step that they apply to.

POSITIONAL REFERENCES

Vehicle

Positional references of the vehicle are always from the drivers seat looking forward.







HEADLAMP CONTROL MODULE (HCM)

**WARNINGS:**

- A risk assessment must be performed before any work is undertaken. Failure to comply with this instruction may result in personal injury or death.
- All electric vehicle work must be performed by a suitably qualified person. Failure to comply with this instruction may result in personal injury or death.
- Appropriate Personal Protection Equipment (PPE) must be worn when working on or near an electric vehicle high voltage system. Failure to comply with this instruction may result in personal injury or death.
- The hybrid/EV battery pack casing must not be disassembled due to the risk of exposure to hazardous voltage. Failure to comply with this instruction may result in personal injury or death.
- The electric power inverter converter casing must not be disassembled due to the risk of exposure to hazardous voltage. Failure to comply with this instruction may result in personal injury or death.
- If the hybrid/EV battery pack is damaged or overcharged, there is a risk of exposure to hazardous voltage and/or highly corrosive electrolyte mist. If liquid or vapor is observed leaking from the hybrid/EV battery pack, take the following action:
 - Evacuate the area.
 - Notify manager.
 - Do not breathe smoke/vapor.
 - Contain spillage using spill kit.
 - Wash any spillage off body and clothing (remove contaminated clothing).
- If the electric vehicle warning indicator is illuminated, the battery energy control module cannot isolate the high voltage cables. Be aware that live working will be necessary to rectify the fault. Failure to comply with this instruction may result in personal injury or death.
- Be aware that a motor generator can generate a voltage if the wheels are rotated, even if the electric vehicle system has been made safe. Failure to comply with this instruction may result in personal injury or death.

**CAUTION:**

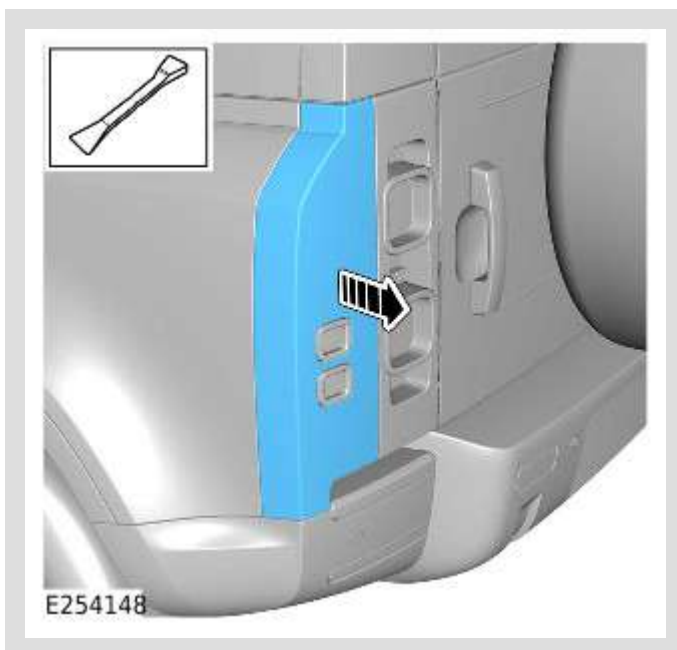
Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
P188A-98	Differential Oil Temperature Too High/Too Low - Component or system over temperature	<div data-bbox="485 170 751 232" style="border: 1px solid black; padding: 2px;">  NOTE: </div> <div data-bbox="485 232 751 295" style="border: 1px solid black; padding: 2px;"> Circuit reference - TEMP SIG+ - </div> <ul style="list-style-type: none"> ■ Electric differential fluid level too low ■ Electric differential fluid specification incorrect ■ Rear differential fluid temperature sensor signal circuit high resistance 	<div data-bbox="807 170 1457 232" style="border: 1px solid black; padding: 2px;">  NOTE: </div> <div data-bbox="807 232 1457 295" style="border: 1px solid black; padding: 2px;"> This DTC may be induced by excessive electric differential clutch operation due to prolonged off road or track driving. </div> <ul style="list-style-type: none"> ■ Refer to the relevant section of the workshop manual and check the electric differential fluid level. Rectify any fluid leaks and add fluid as necessary ■ Check the specification of the electric differential fluid. Rectify as necessary ■ Refer to the electrical circuit diagrams and check the rear differential fluid temperature sensor signal circuit for high resistance. Repair the wiring harness as necessary
P18A4-11	Motion/Position Sensor Power Circuit - Circuit short to ground	<div data-bbox="485 692 751 754" style="border: 1px solid black; padding: 2px;">  NOTE: </div> <div data-bbox="485 754 751 817" style="border: 1px solid black; padding: 2px;"> Circuit reference - HALL_V+ - </div> <ul style="list-style-type: none"> ■ Differential locking motor position sensor power circuit short circuit to ground, open circuit, high resistance ■ Differential locking motor internal failure ■ Rear differential control module internal failure 	<div data-bbox="807 692 1457 754" style="border: 1px solid black; padding: 2px;">  NOTE: </div> <div data-bbox="807 754 1457 880" style="border: 1px solid black; padding: 2px;"> After installing a new rear differential control module, differential locking motor or electric differential, clear the DTCs and calibrate the system by performing routine - On Demand Self Test. </div> <ul style="list-style-type: none"> ■ Refer to the electrical circuit diagrams and check the differential locking motor position sensor power circuit for short circuit to ground, open circuit, high resistance. Repair the wiring harness as necessary ■ Using the Jaguar Land Rover approved diagnostic equipment, clear the DTCs and perform routine - On Demand Self Test. If the fault persists, install a new differential locking motor ■ Using the Jaguar Land Rover approved diagnostic equipment, clear the DTCs and perform routine - On Demand Self Test. If the fault persists, install a new rear differential control module
P18A4-12	Motion/Position Sensor Power Circuit - Circuit short to battery	<div data-bbox="485 1335 751 1397" style="border: 1px solid black; padding: 2px;">  NOTE: </div> <div data-bbox="485 1397 751 1460" style="border: 1px solid black; padding: 2px;"> Circuit reference - HALL_GND - </div> <ul style="list-style-type: none"> ■ Differential locking motor position sensor power circuit short circuit to power, open circuit, high resistance ■ Differential locking motor internal failure ■ Rear differential control module internal failure 	<div data-bbox="807 1335 1457 1397" style="border: 1px solid black; padding: 2px;">  NOTE: </div> <div data-bbox="807 1397 1457 1523" style="border: 1px solid black; padding: 2px;"> After installing a new rear differential control module, differential locking motor or electric differential, clear the DTCs and calibrate the system by performing routine - On Demand Self Test. </div> <ul style="list-style-type: none"> ■ Refer to the electrical circuit diagrams and check the differential locking motor position sensor power circuit for short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary ■ Using the Jaguar Land Rover approved diagnostic equipment, clear the DTCs and perform routine - On Demand Self Test. If the fault persists, install a new differential locking motor ■ Using the Jaguar Land Rover approved diagnostic equipment, clear the DTCs and perform routine - On Demand Self Test. If the fault persists, install a new rear differential control module

23.

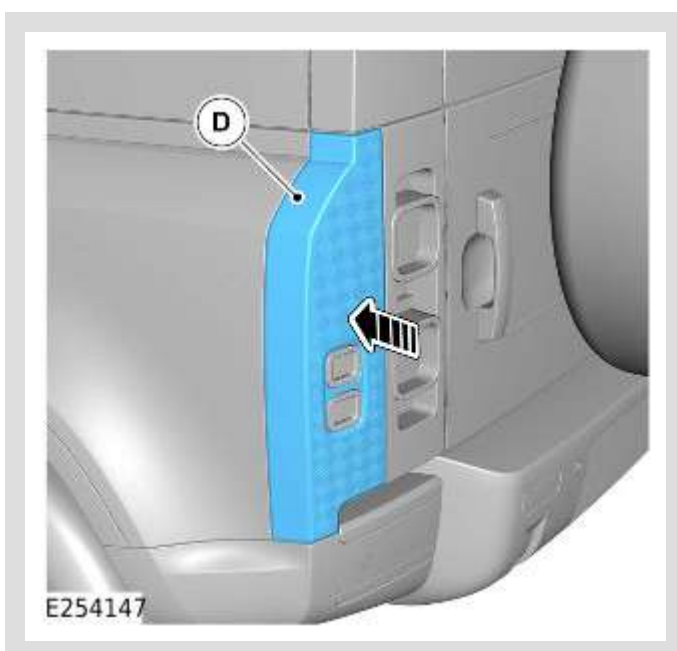
ⓘ CAUTIONS:

- Make sure there are no remaining clips left in the vehicle body.
- Protect the surrounding paintwork and trim to avoid damage.



Remove the tail lamp outer finisher.

24.



Install the tail lamp outer finisher chequer plate.



E258695

JLR-204-838

Ball joint splitter



E269374

JLR-204-838-01



Ball Joint Splitter Adaptor

GENERAL EQUIPMENT

EQUIPMENT NAME
Transmission jack

PART(S)

STEP	PART NAME	QUALIFICATION	QUANTITY
Step 3	Upper control arm retaining nut and bolt	All vehicles	1
Step 4	Front lower arm ball joint to wheel knuckle nut(s)	All vehicles	1
Step 4	Rear lower arm to knuckle nut	All vehicles	1
Step 6	Tie-rod end nut	All vehicles	1

SYMPTOM	POSSIBLE CAUSES	ACTION
	<ul style="list-style-type: none"> ■ Wheel and tire assemblies are non-factory specification ■ Uneven/irregular tire wear ■ Brake binding ■ Steering angle sensor fault ■ Abnormally high friction or excessive wear in the steering or suspension components ■ Wheel alignment is incorrect 	
Vehicle drift	<ul style="list-style-type: none"> ■ Damage to wheel, tires, suspension or steering components ■ Suspension or steering system components are loose ■ Wheel and tire assemblies are non-factory specification ■ Uneven/irregular tire wear ■ Brake binding ■ Steering angle sensor fault ■ Abnormally high friction or excessive wear in the steering or suspension components ■ Wheel alignment is incorrect 	<div style="background-color: #e0f2f7; padding: 5px; border: 1px solid #ccc;">  NOTE: If the steering column is disconnected from the steering gear, do not allow the steering wheel to rotate, as this will damage the steering angle sensor module. </div> <ul style="list-style-type: none"> ■ GO to Pinpoint Test A.
Poor feel, steering light, not connected, requires constant correction	<ul style="list-style-type: none"> ■ Wheel/tire size incorrect ■ Uneven/irregular tire wear ■ Damaged or worn front /rear suspension components ■ Steering angle sensor fault ■ Abnormally high friction in steering ball joints or suspension components 	<div style="background-color: #e0f2f7; padding: 5px; border: 1px solid #ccc;">  NOTE: If the steering column is disconnected from the steering gear, do not allow the steering wheel to rotate, as this will damage the steering angle sensor module. </div> <ul style="list-style-type: none"> ■ Check that the wheels and tires comply with the manufacturer's specification for the vehicle ■ Check the tires for uneven or irregular wear ■ Check the front and rear suspension for damage or wear ■ Using the Jaguar Land Rover approved diagnostic equipment, check the steering angle sensor module for related DTCs and refer to the relevant DTC index

19.

ⓘ CAUTION:

Note the installed position of the component prior to removal.



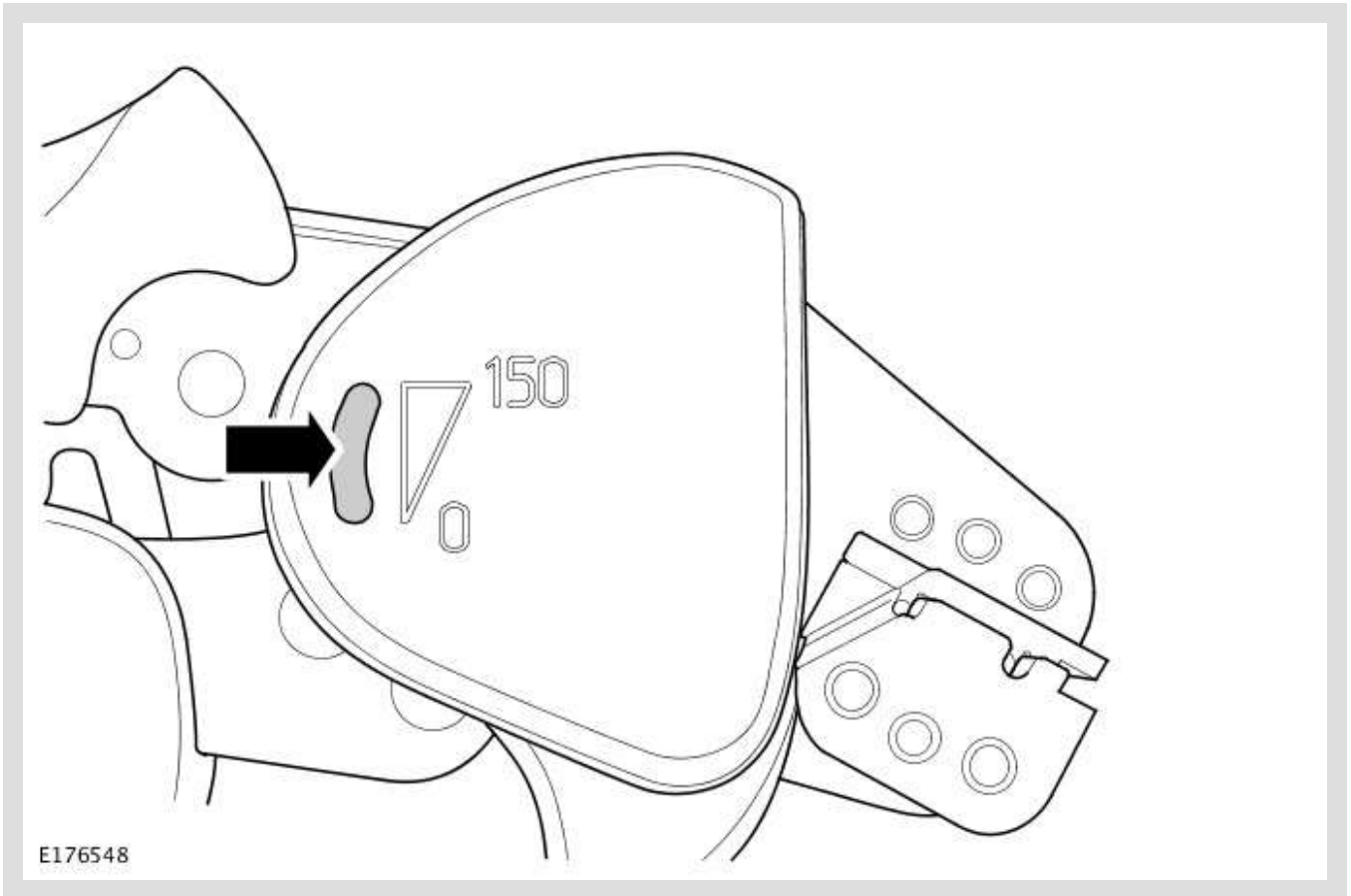
Remove the transfer differential assembly.

20.



Install the special tool.

Install the Special Tool(s): [JLR-308-927](#)



The fiber optic core cutter can be used for approximately 1260 cuts. The indicator line on the remaining cut indicator window only becomes visible when the fiber optic core cutter has 150 cuts or below available.

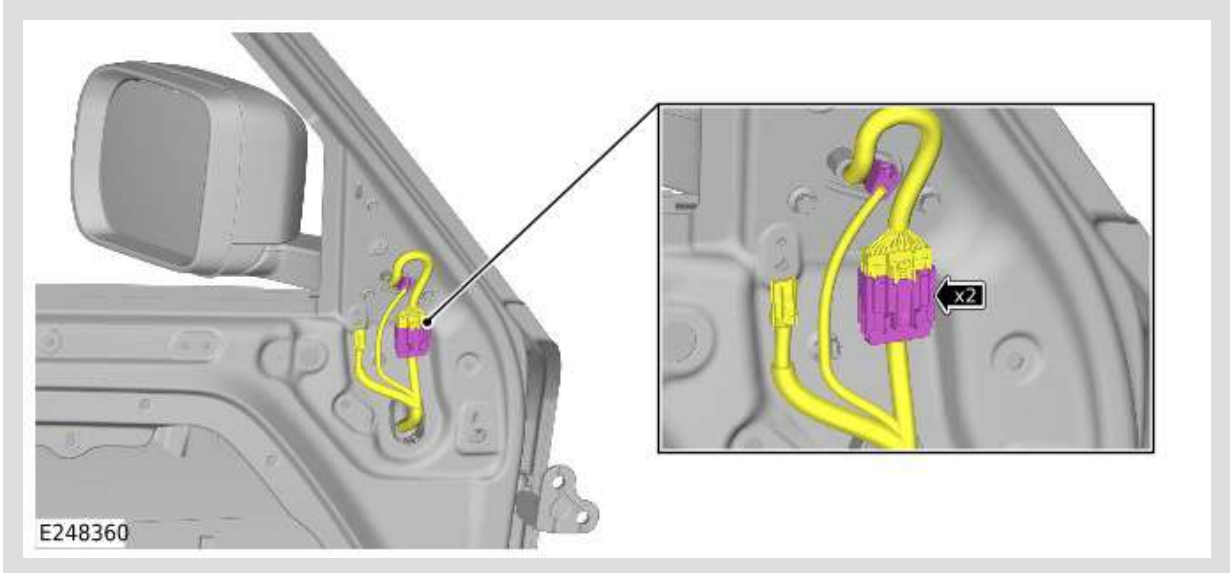
△ NOTE:

When the fiber optic core cutter has reached the maximum allowed cuts, the cutter will become locked and the fiber optic conductor stripper must then be renewed.

Before using the fiber optic conductor core cutter, make sure it has enough cuts remaining to complete the repair process by viewing the remaining cut indicator.

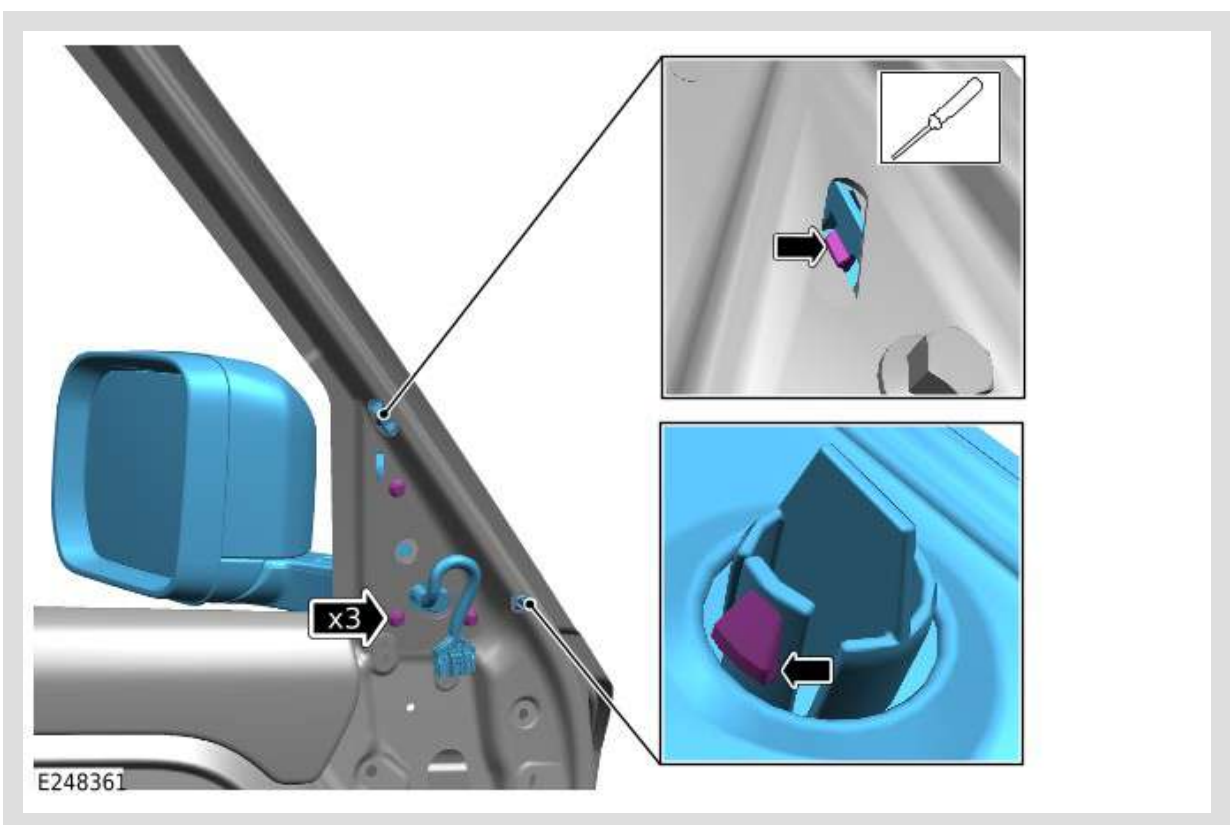
Fiber Optic Conductor Contact Crimping Pliers

4.



Disconnect the 2 electrical connectors.

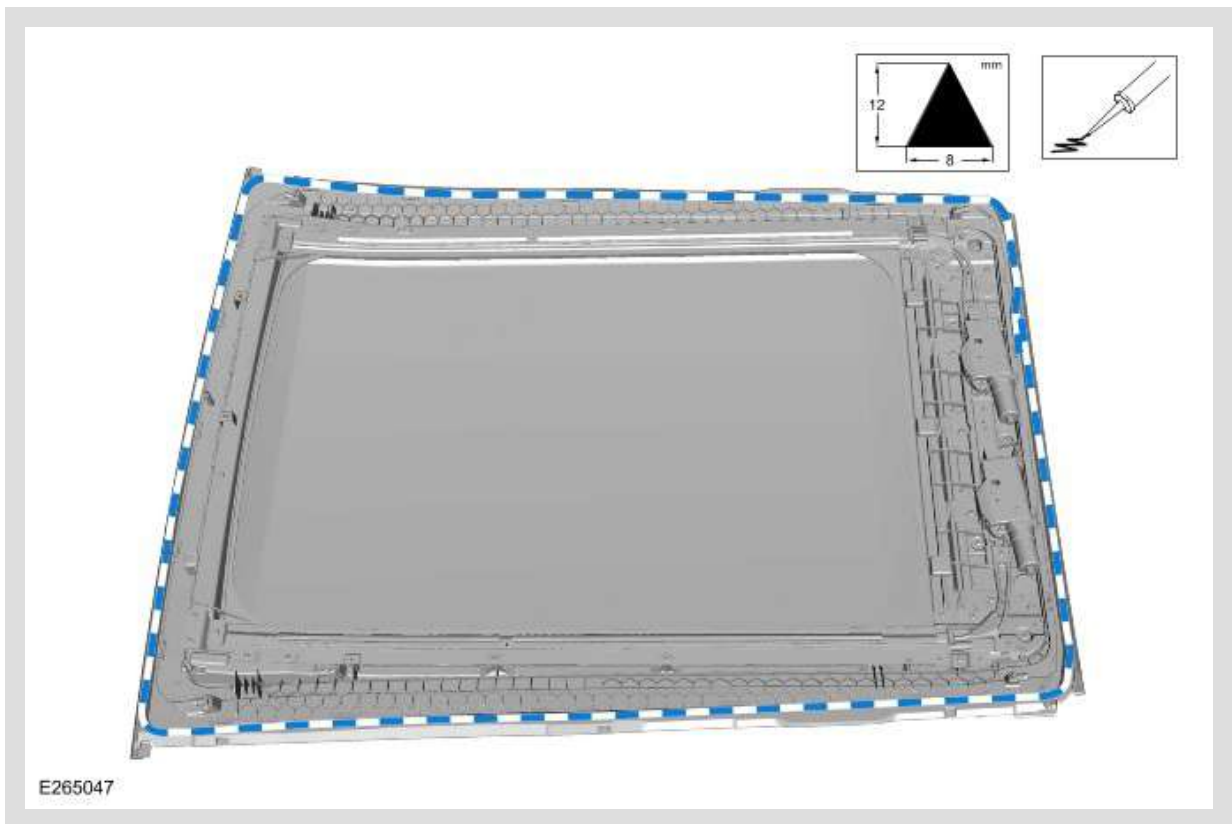
5.



- Remove the 3 bolts.
- Use a suitable tool to release the upper clip.
- Carefully release the lower clip.
- Remove the door mirror.

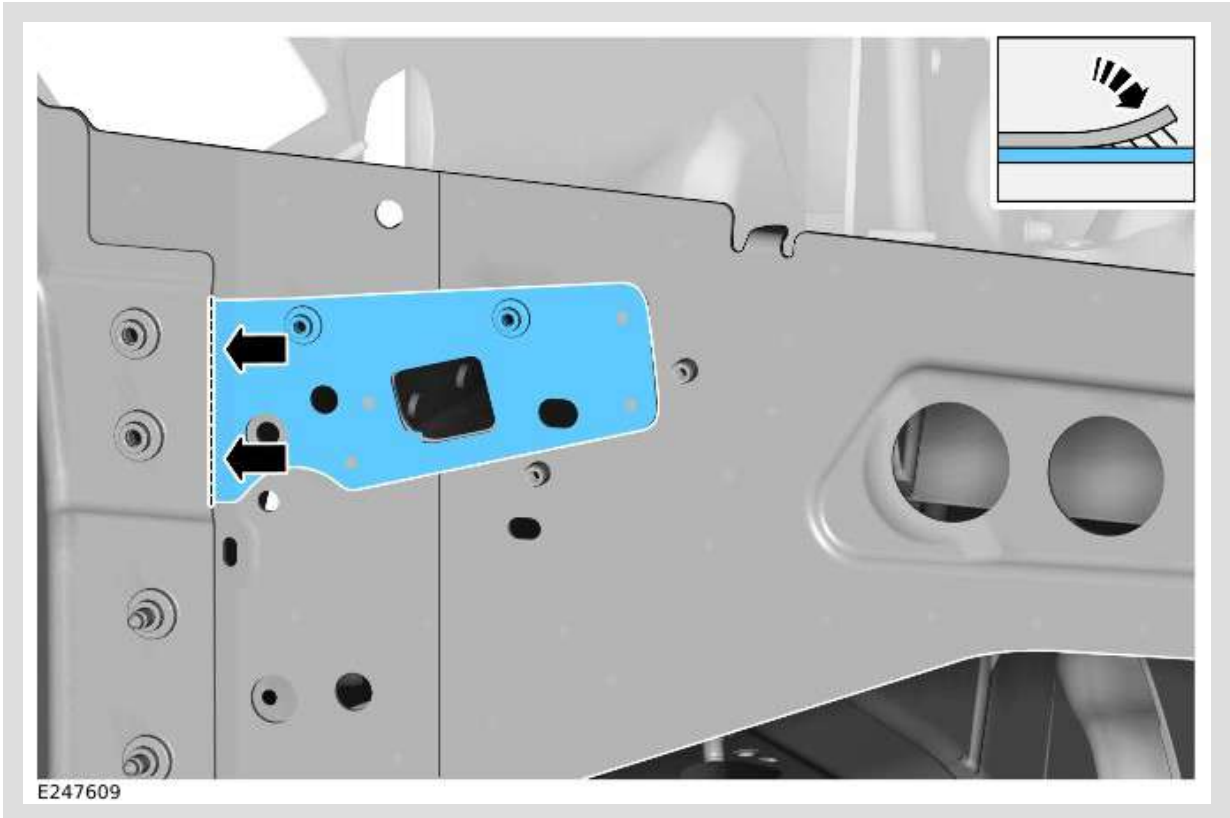
ⓘ CAUTIONS:

- Touching the adhesive surface will impair re-bonding.
- Make sure all mating faces are clean and dry before applying sealant.



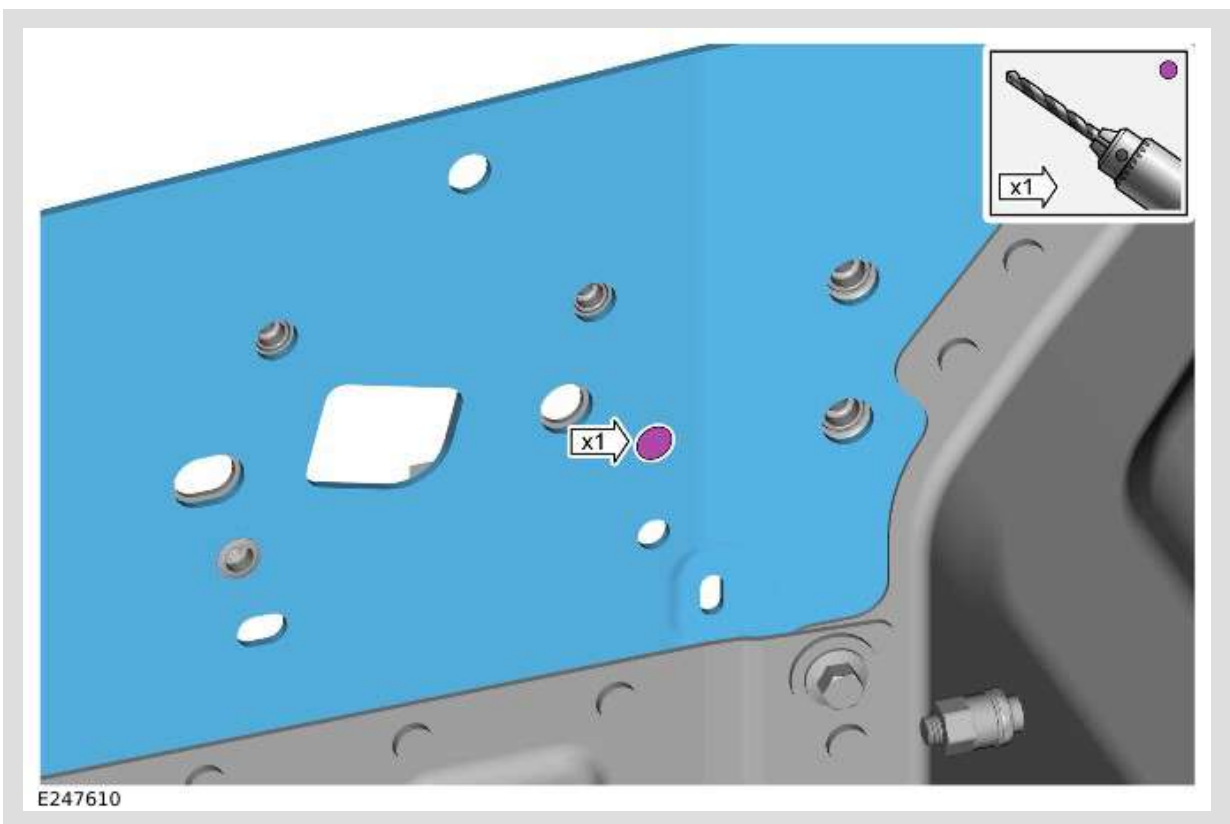
Prepare the canvas roof frame, canvas roof frame flange and trimmed PU adhesive in accordance with the instructions included with the Jaguar Land Rover (JLR) PU adhesive kit.

27.



Close the expansion space as indicated.

28.

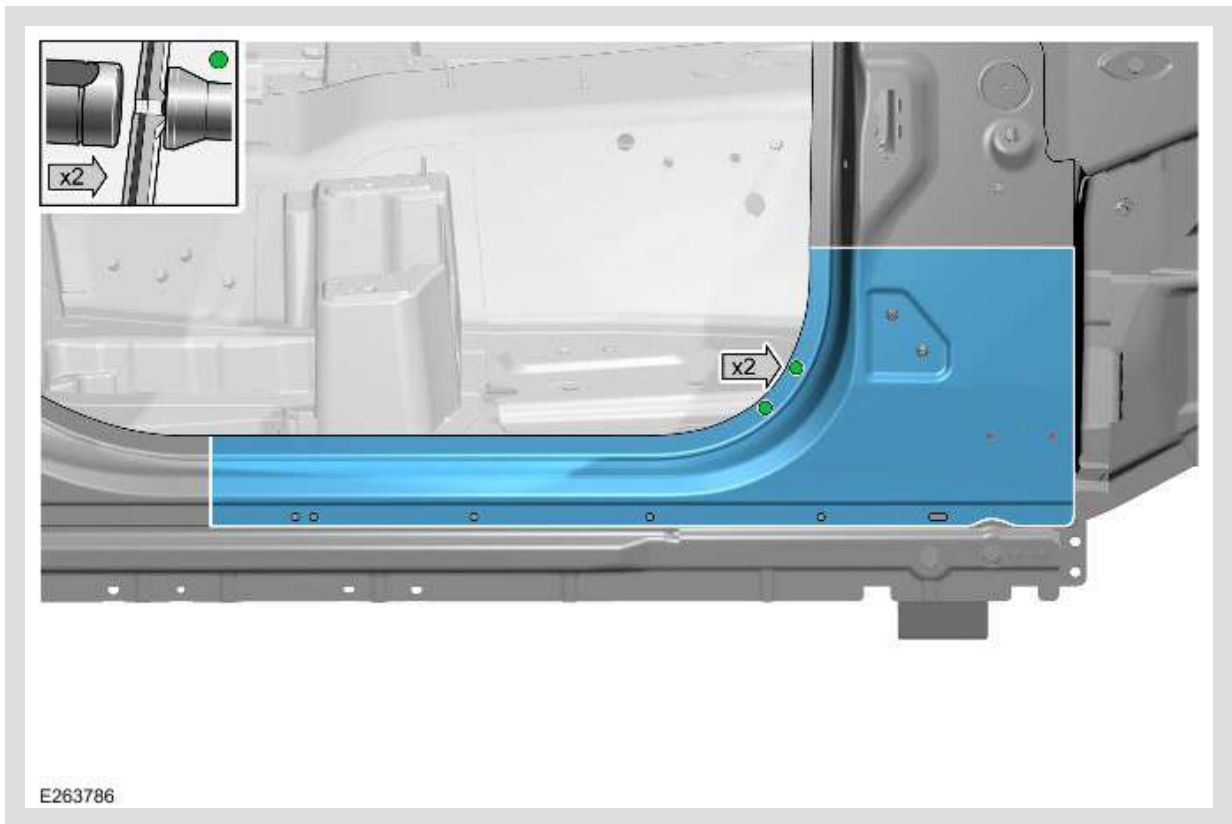


Drill a hole where the rivnut is to be installed as indicated.

17.

NOTE:

Where Flow Form Rivet (FFR) installation is indicated. Make sure that the panel is planished before removal.



Planish the panel as indicated.

18. Carefully separate the joints and remove the A-pillar section.

INSTALLATION

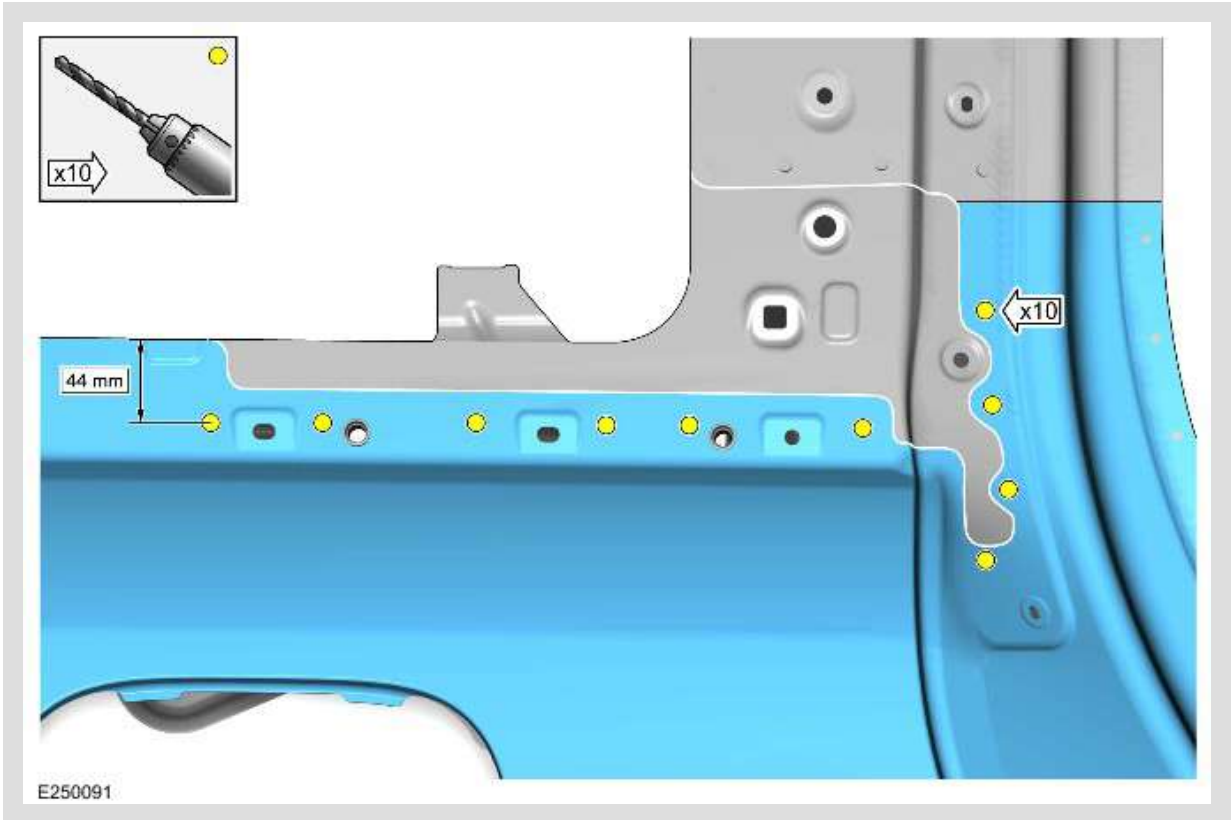
CAUTION:

Where structural adhesive is to be applied between surfaces it is essential compression is applied to the joints during the curing period.

NOTES:

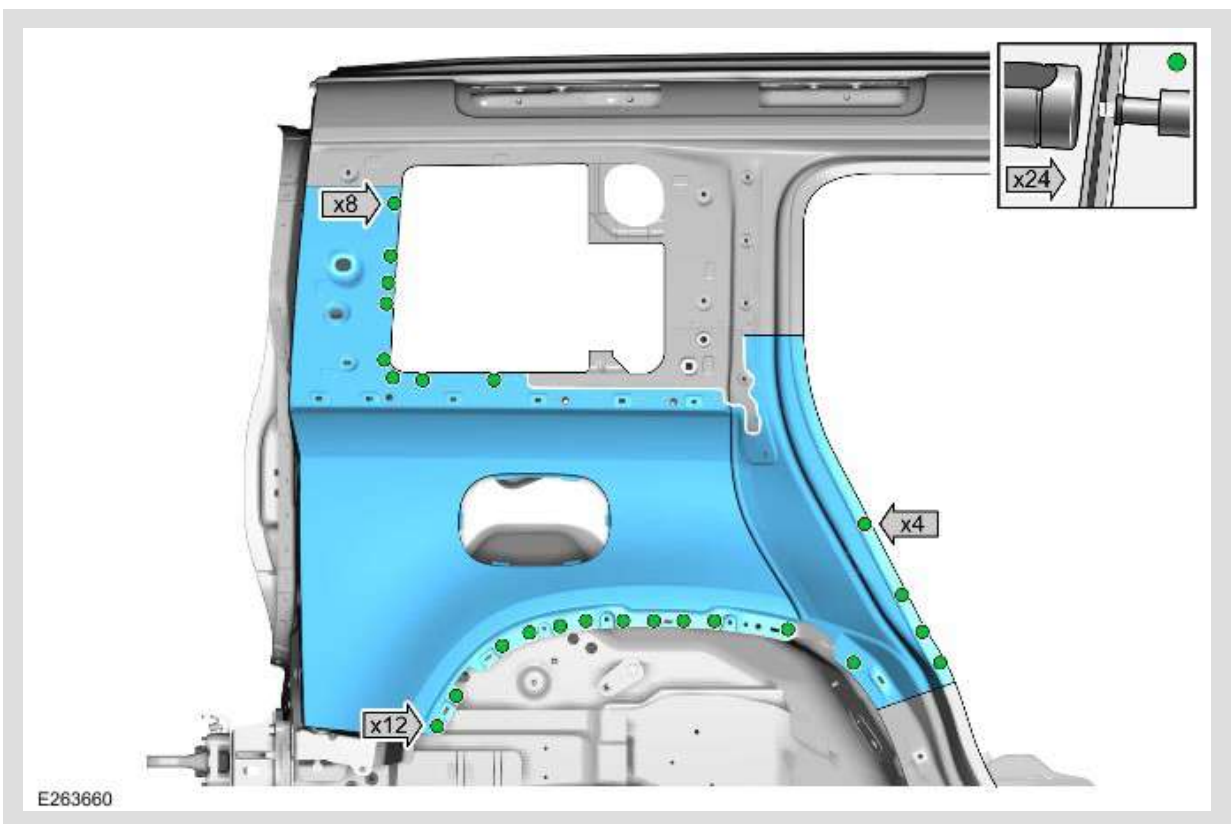
- Breakstem Fastener (BSF) installation involves using the JLR approved BSF installation tool and requires a hole diameter of 6.5 mm.
- Self Piercing Rivet (SPR) installation requires using the JLR approved SPR tool.
- Flow Form Rivet (FFR) installation requires using the JLR approved FFR installation tool.
- Refer to Adhesive, Fixings and Consumables for further information on Flow Form Rivets (FFRs).

5.



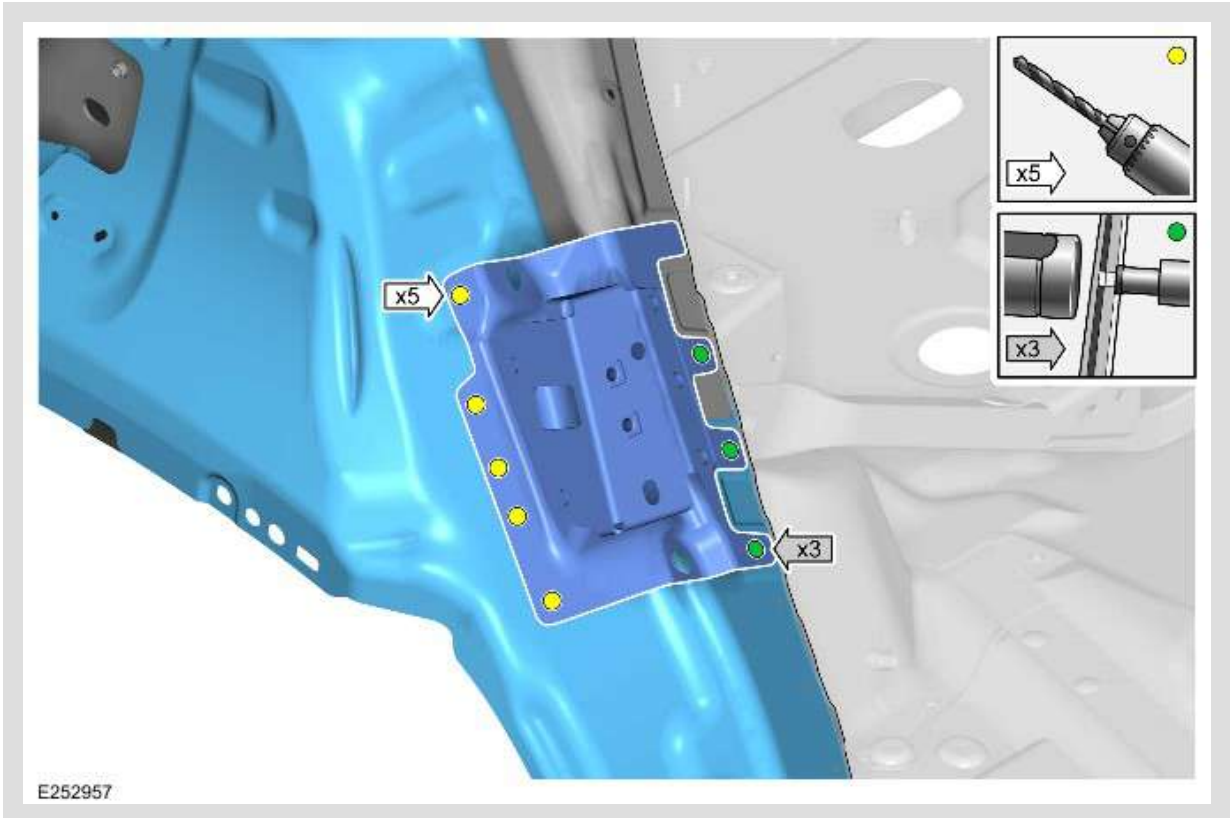
Drill holes where Breakstem Fasteners (BSFs) are to be installed as indicated.

6.



Punch calibrated holes where the Flow Form Rivets (FFRs) are to be installed as indicated.

15.

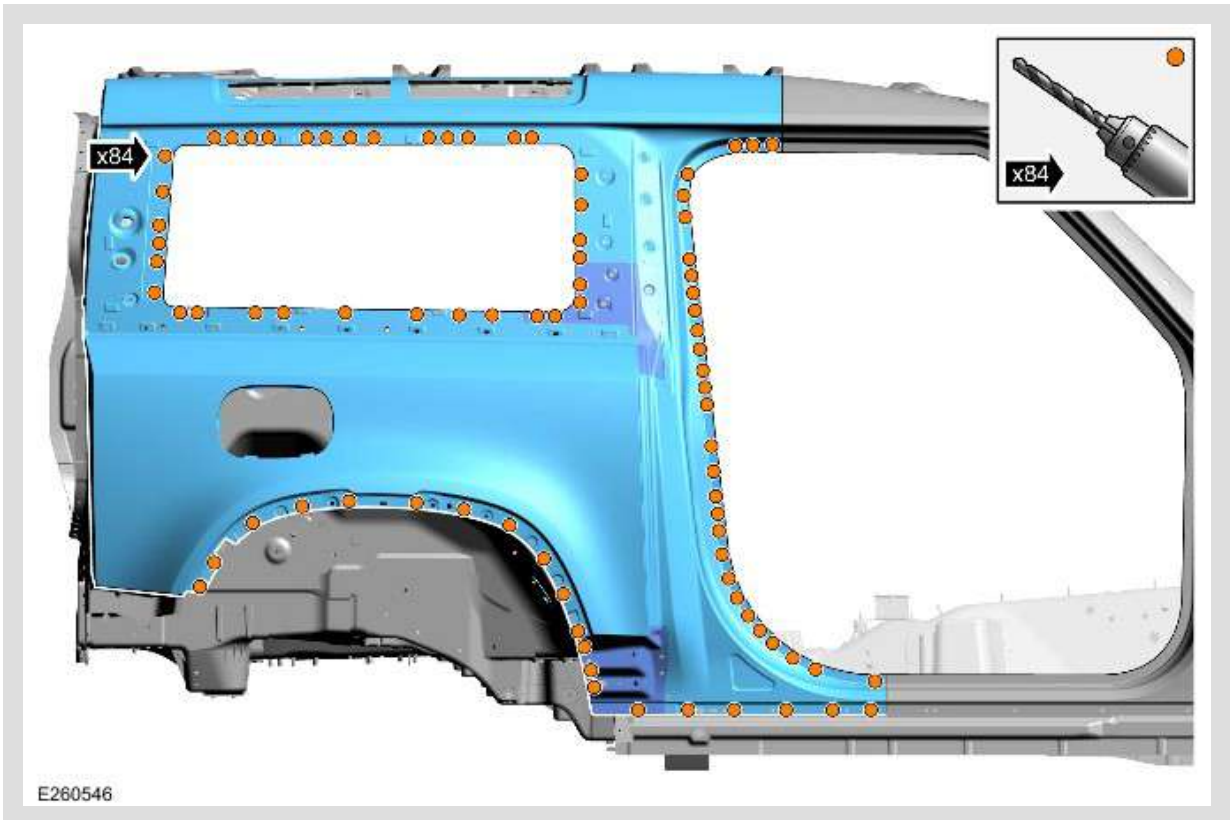


Drill holes where the BSFs are to be installed. Punch calibrated holes where the FFRs are to be installed as indicated.

16. Remove the new quarter panel reinforcement and door striker plate reinforcement.

17. Deburr the drilled holes.

18. Clean and prepare the panel surfaces.



Remove the SPRs as indicated.