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GLASS, FRAMES AND MECHANISMS

FIXED WINDOW GLASS (G2401038)

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PRINCIPLES OF OPERATION

For a detailed description of the Glass, Frames and Mechanisms, refer to the relevant Description and Operation section in the workshop manual. REFER to: [Glass, Frames and Mechanisms](#) (501-11 Glass, Frames and Mechanisms, Description and Operation).

INSPECTION AND VERIFICATION

 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.

 NOTES:

- If a control module or a component is at fault and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval program is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter that has the resolution ability to view 3 decimal places. For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. When testing resistance always take the resistance of the digital multimeter leads into account.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- Refer to Section 100-00 General Information for window glass health and safety precautions.

1. Verify the customer concern
2. Visually inspect for obvious signs of damage and system integrity

Visual Inspection**MECHANICAL**

- Physical damage to the windshield

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step

4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (Diagnostic Trouble Code(s) (DTC)s) and refer to the DTC Index
5. Check JLR claims submission system for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and complete the recommendations as required.

WARRANTY REPAIRS



NOTES:

- The warranty period for the windshield is twelve months with the exception of delamination and electrical faults.
- Warranty repairs should be completed using genuine parts, in accordance with the Warranty Policy and Procedures Manual.

1. Draw a line around the windshield damage using a marker pen.
2. Photograph the entire windshield. If the damage extends behind any trim, remove the trim and take further photographs.
3. Photograph the trademark logo and code to validate the windshield as factory installed.

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Scratches	■ Debris trapped under a wiper blade ■ Foreign object damage ■ Fouling by trim	■ GO to Pinpoint Test A.
Chips	■ Foreign object damage	■ GO to Pinpoint Test B.
Cracks	■ Foreign object damage ■ Impact damage during assembly	■ GO to Pinpoint Test C.
Delamination	■ Manufacturing defect	■ GO to Pinpoint Test D.
Windshield heater element does not defrost	■ Fuse ■ Switch fault ■ Relay fault	 NOTES: ■ Windshield heater should clear within two minutes ■ In the center of the windshield, three wires are removed by design

SYMPTOM	POSSIBLE CAUSES	ACTION
	■ Element fault ■ Circuit fault	■ For each bank of wires: No more than one wire per side (driver or passenger side elements) may be inoperative. In addition, the two wires closest to the 'A'-pillars (one each side) and the two wires closest to the windshield centerline (one each side) may be inoperative ■ GO to Pinpoint Test E. ■ In the event of a claim for either or both banks of wires not working, prior to replacing the part: ■ Check the fuses ■ Check the operation of the heated windshield switch and relay ■ Check the element for continuity ■ Check the windshield heater element connector is securely connected to the wiring harness ■ Refer to the electrical guides and check the heated windshield circuits
Rear window does not defrost	■ Fuse ■ Switch fault ■ Relay fault ■ Element fault ■ Circuit fault	 NOTE: On some rear windows the upper elements are antenna lines, they can be identified as the word "Antenna" is written alongside them. They do not have defrost capability ■ GO to Pinpoint Test F. ■ Check fuse. Check the operation of the heated rear window switch and relay. Check the element for continuity. Check the heated rear window circuit. Refer to the electrical guides
Heated rear window inoperative	■ Climate control system fault ■ Body system fault ■ Heated rear window circuit short circuit to ground, short circuit to power, open circuit, high resistance	■ Using the Jaguar Land Rover approved diagnostic equipment, check the HVAC Control Module for related DTCs and refer to the relevant DTC index ■ Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index ■ Refer to the electrical circuit diagrams and check the heated rear window circuit for short circuit to ground, short circuit to power, open circuit, high resistance
Roof blind (where installed) inoperative	■ Body system fault ■ Roof blind motor power or ground circuit open circuit, high resistance ■ Roof blind motor internal failure ■ Roof blind mechanical failure ■ Roof blind not calibrated	■ Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index ■ Refer to the electrical circuit diagrams and check the roof blind motor power and ground circuits for open circuit, high resistance ■ Check the roof blind cables for: ■ Correct attachment to the roof blind ■ Correct meshing to the roof blind motor ■ Kinks ■ Using the Jaguar Land Rover approved diagnostic equipment, perform routine - Roof Blind Calibration
Roof blind (where installed)	■ Roof blind anti-trap function operating	■ Check the roof blind mechanism for obstructions

SYMPTOM	POSSIBLE CAUSES	ACTION
reverses direction	Roof blind not calibrated	Using the Jaguar Land Rover approved diagnostic equipment, perform routine - Roof Blind Calibration
Roof blind (where installed) noisy operation	- Roof blind motor incorrectly installed or fixings loose - Roof blind motor internal failure	- Refer to the relevant section of the workshop manual and remove the roof blind motor. Inspect for damage. Install a new roof blind motor as necessary - Install a new roof blind motor

PANORAMIC ROOF GLASS DAMAGE INSPECTION PROCEDURE



NOTES:

- Photographic evidence of the origin of the glass damage concern must be retained (and available on request) to support both customer conversations and Warranty claims. For further guidance, refer to section A1.20 of the Global Warranty Manual in relation to Glass.
- Damage from an external influence must not be claimed under Warranty. All Warranty claims are subject to audit.

Where customers present vehicles with damage/cracks in the panoramic roof glass, the following guidance is designed to help retailers/authorized repairers determine if cracks in the panoramic roof glass are the result of a manufacturing defect in the glass substrate or, as is more likely, as a result of impact damage, such as a stone chip. **The procedures outlined below should always be completed whenever a vehicle is presented with reports of damage/cracks in the panoramic roof glass. Regardless of if the repair is to be claimed under Warranty or not, the procedures for gathering and recording evidence of the nature of the cause of the damage should be followed.**

Preparation

Use a suitable glass cleaner to thoroughly clean the inside and outside of the glass panel. Be careful not to apply excess pressure to the glass panel as this may result in further damage.

Equipment Required

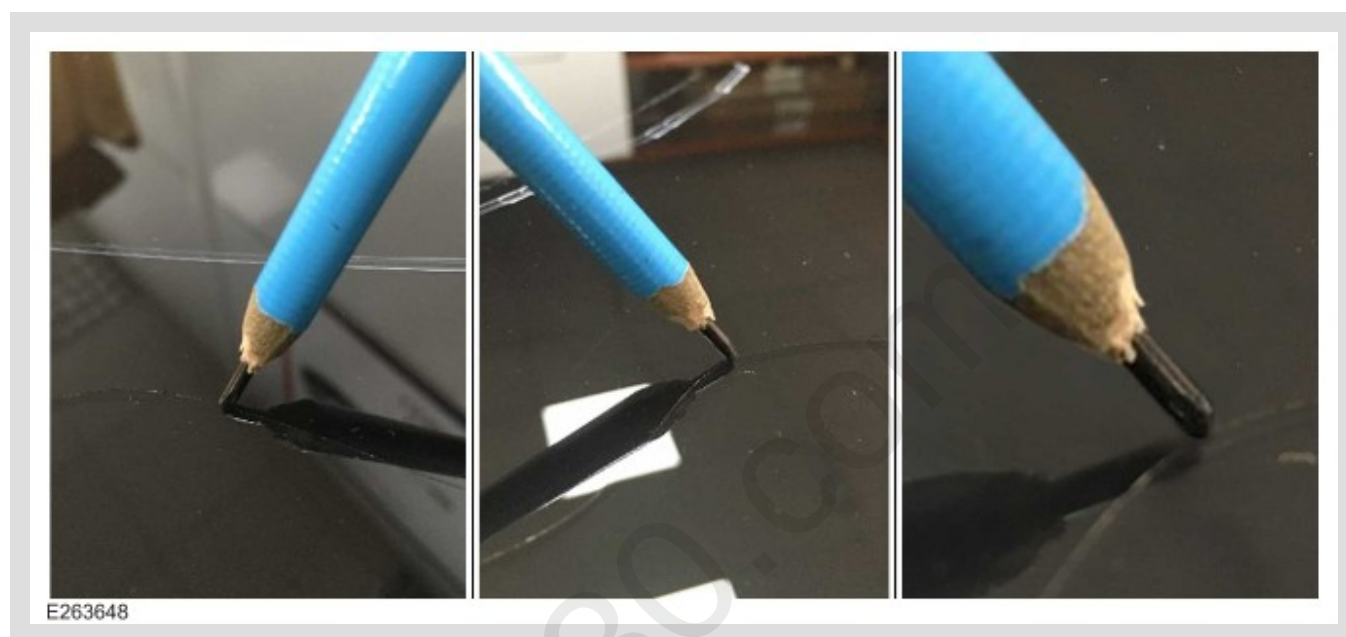
- Paint Marker or China Graph pencil
- Pencil with a sharp point
- Magnifying glass or equivalent

Optimal Viewing Conditions

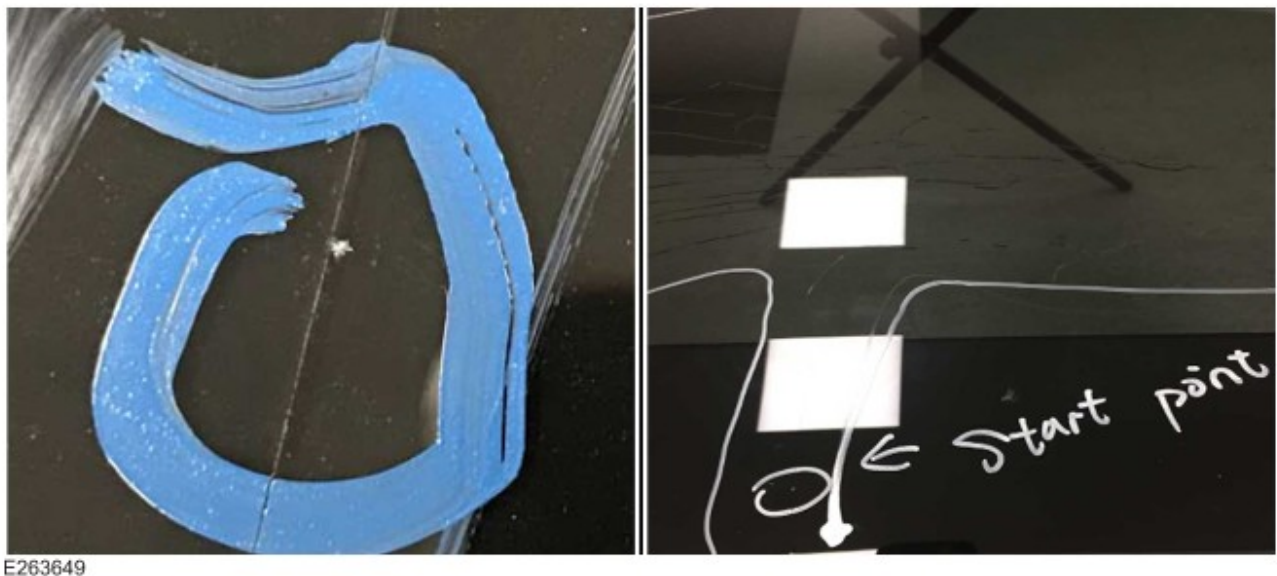
The inspection should ideally be completed in a well-lit workshop, with the vehicle placed so as to minimize any reflections on the roof glass. To confirm the precise location and root cause of the concern, it may be necessary to survey BOTH the interior and exterior surfaces of the panoramic roof glass panel for signs of cracks/damage.

Damage Inspection Procedure

1. As shown below, use the point of a sharpened pencil to feel for the profile of the crack/breach in the glass (as indicated by a step or rough area on the otherwise smooth surface of the glass). **NOTE:** this should be done on both the interior and exterior surfaces of the roof glass.



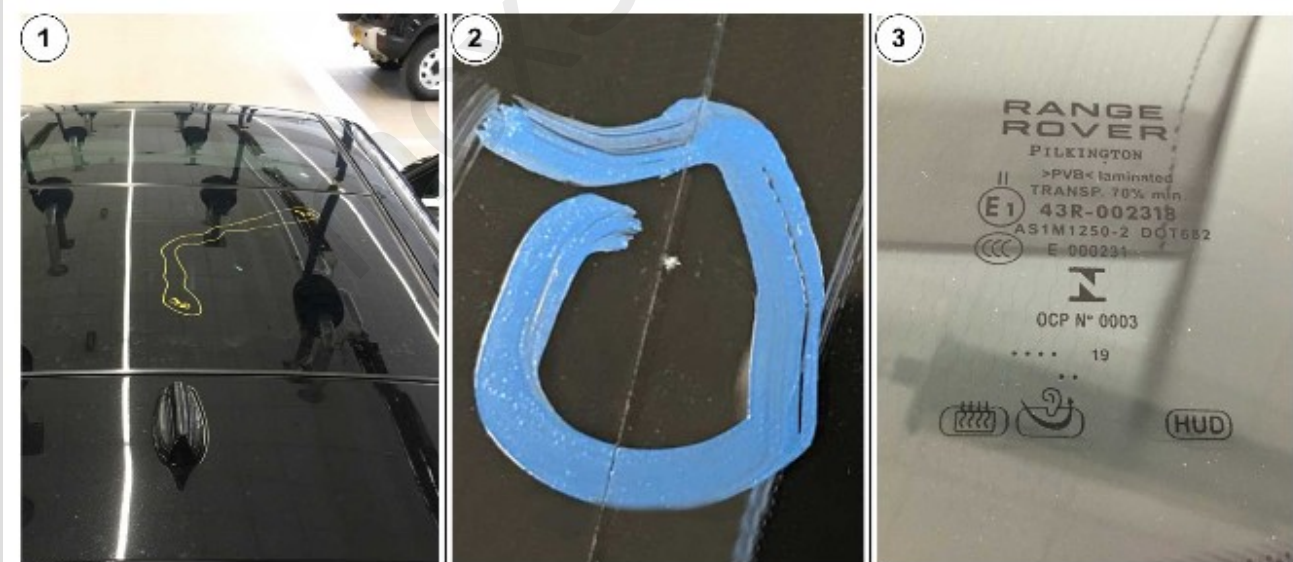
2. Feeling for any step or rough area on the glass, follow the path of the crack with the tip of a sharp pencil. Using a magnifying glass, follow the path of the crack and identify any visual signs of impact damage on the glass surface. If a breach in the glass surface is evident, then the damage to the glass will NOT be covered by the vehicle warranty and the cost of repairs will need to be covered by the customer (or the customer's insurance policy). **NOTE:** not all cracks will necessarily run through the centre of the discernible impact point. See examples of impact points/impact damage shown in the section below.
3. Using a paint marker or chinagraph pencil, circle the origin of the crack/damage identified during the inspection of the glass panel (as shown below). Care should be taken to avoid any further damage when marking-up the glass.



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4. Capture the following set of images (see examples below) as supporting evidence that the faulty glass is still installed on the vehicle. Make sure the images are unobstructed, in focus and plainly show the damage to the glass. If necessary, carefully remove any obstructing trims to gain clear access to the damaged portions of the roof glass before capturing the following images:

1. An image showing an overview of the entire glass panel
2. A close-up image of the root cause (impact point) of the crack/damage
3. A close-up image of the glass ID mark/trademark logo



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These images should be retained in case they are requested for Warranty audit purposes or to facilitate discussions with the customer regarding retail or insurance repairs.

Example Of Damage To Roof Glass

Shown below are examples of cracked/damage roof glass. The top row photos show the original impact points that caused the cracks and other damage to the roof glass. **NOTE:** not all cracks will necessarily run through the centre of the discernible impact point. The bottom row shows the magnified images of the impact points.

△ NOTE:

All of the examples below show damage to the roof glass that has been caused by some foreign objects that have impacted on the glass. Therefore, none of these instances of damage would be suitable for a Warranty claim. Repairs for these kinds of concerns would need to be undertaken as a retail or insurance repair.



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PINPOINT TESTS

PINPOINT TEST A : SCRATCH TESTS

A1: SCRATCH TEST 1

TEST CONDITIONS

DETAILS/RESULTS/ACTIONS

△ NOTE:

A scratch will usually be regular in shape, following the line of the object that caused it.

1 Probe using the tip of a pencil to identify a groove in the windshield surface.

Is there a groove?
Yes
 Windshield scratched. [GO to A2.](#)
No
 Defect not valid.

A2: SCRATCH TEST 2

TEST CONDITIONS

DETAILS/RESULTS/ACTIONS

1 Check for trim, body panels, or foreign objects that may have caused the scratch.

A2: SCRATCH TEST 2	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	Was the scratch caused by a foreign object? Yes The damage is not due to a defect or an assembly error. No Rectify as appropriate.

PINPOINT TEST B : CHIP TESTS	
B1: CHIP TEST 1	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 NOTE: Impact damage may cause a crack to form.	
	1 Assess the damage by probing with the tip of a pencil.
	Is the damaged area rough (indicating a breach of the windshield surface)? Yes Damage caused by the impact of a foreign object. Not a manufacturing defect. No Install a new windshield.

PINPOINT TEST C : CRACK TESTS	
C1: CRACK TEST 1	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 NOTE: A crack will be detectable as a step in the glass.	
	1 Confirm the presence of a crack by probing with the tip of a pencil.
	Is the windshield cracked? Yes Windshield cracked. GO to C2. No Windshield not cracked. GO to Pinpoint Test A.
C2: CRACK TEST 2	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 NOTE: Multiple cracks will radiate out from the source.	
	1 Assess the source of the crack by probing with the tip of a pencil.
	Is there evidence of impact damage being the source of the crack? Yes GO to Pinpoint Test B.

C2: CRACK TEST 2	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	No Install a new windshield.

PINPOINT TEST D : DELAMINATION TESTS	
D1: DELAMINATION TEST 1	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Visually assess the windshield for delamination.
	Have the glass laminates separated? Yes Install a new windshield. No No further action.

PINPOINT TEST E : HEATED WINDSHIELD FAULT DIAGNOSIS	
E1: EVIDENCE FOR HEATED WINDSHIELD FAILURE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 The customer has reported a fault with the heated windshield operation.
	Can evidence be found to support this? Yes GO toE2. No GO toE3.
E2: PERMISSIBLE HEATED WINDSHIELD FAILURES	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 The heated windshield elements must be checked for permissible failures.
	Refer to the "Heated Windshield Permissible Failures" section (found below the pinpoint tests) to determine if a replacement windshield is required. Yes Using the "Heated Windshield Permissible Failures" section a fault was found with the windshield and must be replaced. No Inform the customer that fault was not found or has been deemed permissible based on the evidence. No replacement windshield is offered to the customer. If the customer does not accept these findings, ask the customer to provide evidence of the fault either photographic or through demonstration.

E3: HEATED WINDSHIELD FAULT DIAGNOSIS PROCEDURE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Diagnosing a fault with the heated windshield
	To correctly diagnose a fault with the heated windshield operation the "Heated Windshield Inspection Procedure" must be followed (found below the pinpoint tests) to determine if a replacement windshield is required. Yes The "Heated Windshield Inspection Procedure" was followed and a fault was found, the windshield must be replaced. No The "Heated Windshield Inspection Procedure" was followed and no fault was found or has been deemed permissible based on the evidence. No replacement windshield is offered to the customer. If the customer does not accept these findings, ask the customer to provide evidence of the fault either photographic or through demonstration.

PINPOINT TEST F : HEATED REAR WINDOW FAULT DIAGNOSIS	
F1: EVIDENCE FOR HEATED REAR WINDOW FAILURE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 The customer has reported a fault with the heated rear window operation.
	Can evidence be found to support this?To correctly diagnose a fault with the heated rear window operation the "Heated Rear Window Inspection Procedure" must be followed (found below the pinpoint tests) to determine if a replacement rear window is required. Yes The "Heated Rear Window Inspection Procedure" was followed and a fault was found, the rear window must be replaced. No The "Heated Rear Window Inspection Procedure" was followed and no fault was found or has been deemed permissible based on the evidence. No replacement rear window is offered to the customer. If the customer does not accept these findings,, ask the customer to provide evidence of the fault either photographic or through demonstration.

FIXED WINDOW GLASS WIND NOISE AND WATER LEAKS

GENERAL



NOTE:

If wind noise is evident at varying vehicle speeds, or water ingress is evident, perform the following procedure below.

- If wind noise or water leaks occur after bodywork repairs, the cause can be established using the checks described below. A systematic and logical procedure is required to locate wind noise or water leaks. Before beginning extensive checks, a thorough visual inspection must be completed.
- Visual Inspection
 - The following characteristics may indicate existing water leaks:
 - Check the clearance and accurate fit of ancillary components such as the hood, tailgate, doors, and so on.
 - Check for correct fit and possible damage to sealing elements such as blanking plugs, rubber door weather strips, and so on.

- Check water drain holes for unhindered flow.
- Various tests can be used to provide further information on possible leaks:
 - Water test
 - Washer test
 - Road test
 - Chalk (powder) test

PRACTICAL EXECUTION OF TESTS AND CHECKS

Water test



NOTE:

Never aim a jet of water directly at a door weather strip or rubber seals.

- Complete the water test with a second person present (in the passenger compartment).
- Use variable washer nozzles (concentrated water jet to fine spray mist).
- Start in the lower section and spray the whole area, working upwards in stages.

Washer test

- Further tests can be completed in the washer system.
- Some leaks originate here, or only occur here.
- The relevant passenger compartment should be checked using a flashlight during the wash procedure.

Road test

- If no leaks are located during the tests above, road tests should be completed on wet roads.
- Road tests under various conditions:
 - At various speeds.
 - On various road surfaces (asphalt to cobbles).
 - With loaded or unloaded vehicle.
 - Driving through puddles (splash water).

Chalk test (powder test)

- In this test, the clamping load and the bearing surface of the seal are checked.
- Performing the test:
 - Dust the door seal with powder or coat with chalk.
 - Coat the bearing surface of the seal with a thin film of petroleum jelly.
 - Slowly close the door and open it again.

- Check the width and continuity of the imprint on the door seal.

Other test equipment

- Other equipment such as stethoscopes, ultraviolet (UV) lamps, special mirrors or ultrasound measuring instruments can be used to locate leaks.

RECTIFYING THE LEAK USING RECOMMENDED TOOLS, AUXILIARY EQUIPMENT AND MATERIALS

- Tools and auxiliary equipment:
 - Dry, absorbent cloths
 - Variable washer nozzle
 - Flashlight, fluorescent tube
 - Mirror
 - Compressed air
 - Seal lip installer
 - Wet/dry vacuum cleaner
 - Sealing compound compressor
 - Remover for interior trim
 - Cutter blade or pocket knife
 - Wedge (wood or plastic)
 - Hot air blower
 - Special mirror for concealed leaks
 - Air flow checker
 - Sealing compound (tape and plastic compound)
 - Multi-purpose sticker
 - Clinched flange sealer
 - Window sealing compound
 - Water shield polyvinyl chloride (PVC)
 - Double-sided adhesive tape for water shield
 - Methylated spirit (available from trade outlets)
 - polyurethane (PU) adhesive
 - Silicone remover
 - Tar remover

WATER LEAKS ACCORDING TO MILEAGE OR RUNNING TIME

Increasing mileage has an effect on the problem of leaks in a vehicle. Possible influencing factors are:

- Servicing and maintenance of seals:
 - No maintenance, lack of maintenance or incorrect maintenance
 - Using an incorrect agent
- Damaged seals:
 - As a result of aging, wear or incorrect handling/assembly.
- Heavy soiling of the vehicle:
 - Heavy soiling of a vehicle can seriously impair the function of water drainage channels in particular, and also of rubber seals.
- Age-related factors:
 - Environmental factors
 - UV sunload
 - Extreme climatic conditions
- Corrosion can have a serious impact on bodywork, in particular as a result of:
 - Lightly or heavily rusted seal carriers
 - Rusted body seal welds
 - Perforation corrosion

WIND NOISE OR WATER LEAKS AFTER BODY REPAIRS

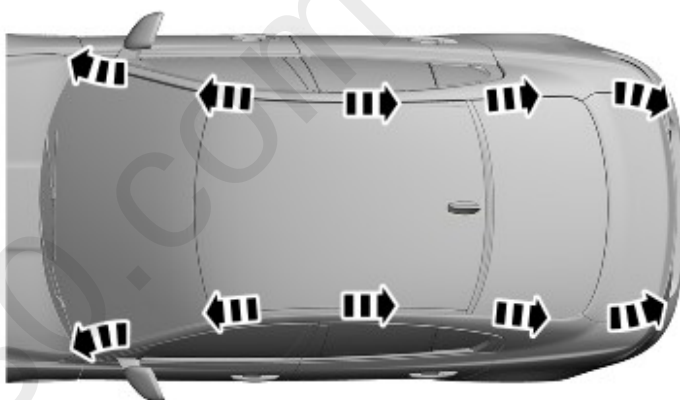
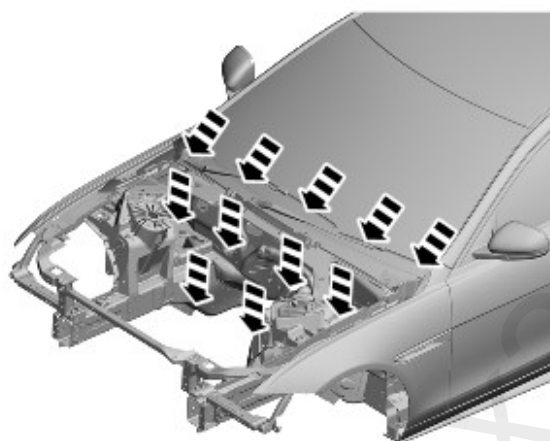
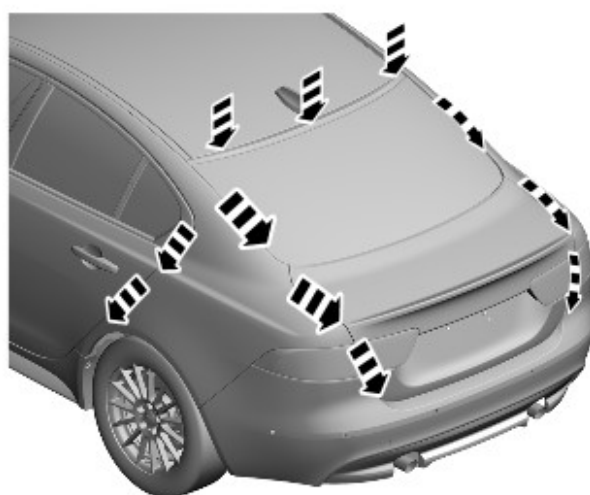
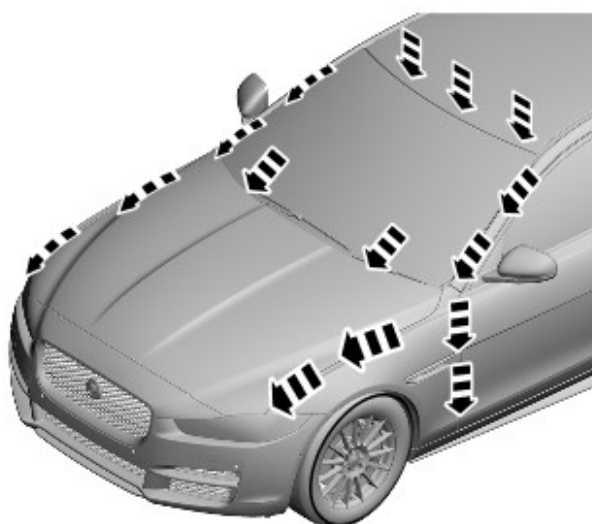
If a vehicle develops wind noise or a water leak after body repairs, the following points must be taken into consideration in particular:

- The correct seating of ancillary components and their seals must be checked.
- The correct alignment of doors/tailgate and tailgate must be checked. The associated seals must not be damaged and must be installed correctly.
- Check that panel seams are correctly sealed.
- The correct seating of rubber grommets must be checked.
- Directly-glazed windows must have correct and complete bonding.

WATER DRAINAGE SYSTEM

If a vehicle develops water leaks, then areas into which water is routed or drained should be checked first.

Water drainage system (illustration for reference only)



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ITEM	DESCRIPTION
1	Water drainage, front
2	Water drainage, side and rear
3	Engine compartment drainage
4	Roof drainage

WIND NOISE OR WATER LEAKS, DIAGNOSIS AND CORRECTIVE ACTION: FRONT PASSENGER COMPARTMENT

Windshield

- Diagnosis:

- Wind noise at varying road speeds and/or ingress of water into A-pillar area or instrument cluster area and rocker panel area.
- Cause:
 - Breaks in adhesive beads.
 - The breaks in adhesive beads can be located from inside by using compressed air. The leak can be identified from outside by the escaping air.
 - The second test method is by means of a water test. The outer trims must be raised carefully using a plastic wedge. The leak should be located from inside by a second assistant.
- Corrective action:
 - Remove the windshield. Remove the existing adhesive bead and reapply using the correct bonding procedure.

Side windows

In the case of side windows, the same problems can arise as for a windshield. The same corrective actions must therefore be used.

Door seal

- Diagnosis:
 - Water ingress in the lower part of the interior door trim or in the rocker panel area.
- Cause:
 - The water shield installed behind the interior door trim exists to drain off water that has entered the door through the drainage holes, either downward or outward. If the water shield seal is damaged or has been installed incorrectly, then water can get into the passenger compartment.
 - In addition to this, the drainage holes can become clogged with leaves, dirt or excess cavity protection agents. Water gathers in the door and ingresses into the passenger compartment.
 - Check water shield for damage or correct fitting.
 - If the water shield needs to be re-bonded, then approved seam sealer should be used.
 - Before the water shield is installed, the drainage holes must be checked for unhindered flow.

Door seals

- Diagnosis:
 - Ingress of water into the rocker panel area
- Cause:
 - Insufficient clamping load between seal and door.
- Corrective action:

When adjusting the clamping load, the profile alignment of the relevant components must always be taken into consideration.

Do not realign the flange too far in the direction of the door, as this can reduce the bearing surface of the seal to the door.

- Check clamping load:
 - The easiest way to check the clamping load of a seal to the respective bearing surface is by means of a paper strip test. This consists of trapping strips of paper at various points between the door and the seal, and fully closing the door. If it is possible to pull out the paper with no great resistance, then the clamping load is too low.
- Adjust the clamping load:
 - The clamping load is normally adjusted using the striker. When doing so, the edge alignment from the door to the side panel, or from the front door to the rear door must be taken into account.
 - Another setting method is to realign the panel flange for the seal mounting. The clamping load is increased by moving the flange towards the door.
- Check the bearing surface:
 - Apply chalk evenly to the surface of the seal. Evenly coat the bearing surface of the door with petroleum jelly.
 - Close the door fully, the lock must engage. Open the door. The imprint of the chalk (bearing surface) can be identified in the film of petroleum jelly.
 - The bearing surface should be at least 5mm across at all points.
- Other causes:
 - The door seal must completely seal the door where it meets the bodywork.
 - Water can ingress directly or indirectly into the interior of the vehicle if the seal is damaged at any point.
- Corrective action:
 - A damaged or worn door seal must always be installed in full.
 - When installing the seal, the following must be taken into account:
 - Always fit the seal first in the area of the narrow radii (corner points).
 - Next, secure the seal to the flange evenly by tapping lightly with a rubber hammer. The installed seal must not be kinked at any point.



NOTE:

The prescribed length of a seal must not be shortened.

- Other cause:
 - The door seal is attached to the welded flange all the way round. If this welded flange is uneven or damaged at any point (usually in areas with small radii) then this point could be subject to leaks.
 - A stretched seal carrier can also cause a leak.
 - In both cases, water gets into the vehicle interior under the seal carrier.
- Corrective action:

- Align the deformed welded flange using a hammer and anvil block, prevent and, if necessary, repair any paint damage.

Roof opening panel - front and rear fixed glass panels

In the case of the roof opening panel - front and rear fixed glass panels, the same problems can arise as for a windshield. The same corrective actions must therefore be used.

Roof opening panel - sliding central glass panel



NOTE:

In the case of the sliding central glass panel, the rubber seals and the lock actuator or latch mechanism must be checked first of all.

- Diagnosis:
 - Wind noise at varying road speeds and/or ingress of water at the roof opening panel.
- Cause:
 - The roof opening panel frame incorporates drain holes in each front corner allowing water to drain through the A-pillars and each rear corner allowing water to drain through the roof panel channels.
 - Damaged, worn, or incorrectly installed seals on the sliding central glass panel.
 - Incorrect alignment of the sliding central glass panel.
 - Damaged, worn, or incorrectly installed seals on the roof opening panel frame.
 - Water drain channels or water drain holes blocked.
- Corrective action:
 - Check the seals on the sliding central glass panel, install as necessary.
 - Check the correct adjustment of the sliding central glass panel, adjust as necessary, replace any worn or damaged components as necessary.
 - Check the internal seal of the roof opening panel frame, realign or install as necessary.
 - Check the water drain channels and holes for blockages, clear blockages as necessary.
 - Check the drainage system for unhindered flow.

Luggage compartment lid

- Diagnosis:
 - Ingress of water into the luggage area.
- Cause:
 - The leak problems of the luggage compartment lid correspond to those of the doors.
 - In addition to this, the area to be sealed is much bigger. The routing holes for cables and hoses must also be sealed.

- The rubber grommets for the routing holes must be checked for damage and correct seating (fully unhooked).
- The grommets around the luggage compartment lid hinges may leak.
- Corrective action:
 - Check the rubber grommets and re-position, reseal or install new, if necessary.

Forced air extraction

- Diagnosis:
 - Ingress of water into side luggage compartment area
- Cause:
 - The forced air extraction for the vehicle interior is located in the quarter panel lower extension.
 - The rubber flap of the forced air extraction must be able to move freely.
- Corrective action:
 - Remove the forced air extraction.
 - Check the seal area between the bodywork and housing, as well as the rubber flap.
 - Install a new seal if necessary.

Rear window

- Diagnosis:
 - Wind noise at varying road speeds and/or ingress of water into the passenger compartment area.
- Cause:
 - Rear window leaking through breaks in the adhesive bead.
 - Check for leaks in the same way as for a leaking windshield.
- Corrective action:
 - In the case of the rear window, the same problems can arise as for a windshield. The same corrective actions must therefore be used.

HEATED WINDSHIELD INSPECTION PROCEDURE



NOTE:

It is possible to repair the rear window silver print heater element without a full screen replacement. The retailer must source 'Electro Connector Repair Paint' (follow the instructions and guidelines supplied by the material provider). Assess the scope for heated screen element repair and action accordingly. Record the findings in the vehicle diagnosis notes

Initial Checks:

- Make sure vehicle battery is sufficiently charged and fusing for heated windshield is correct and present.

- Check that all electrical connections at screen terminals (four of) are in position and connected.

If initial checks are completed and the fault is still present, proceed with the following root cause investigation /troubleshooting steps:

- 1. Consult the workshop manual and select the appropriate removal and installation procedure to remove vehicle interior trim.
- 2. Remove the relevant interior 'A' pillar trim. Both 'A' pillar trims will need to be removed if the issue is reported for the whole screen.
- 3. Vehicle diagnostics (harness, power supply, fusing faults).
 - a) Working on one side of the vehicle at a time, locate the screen terminals (two per heater bank) and disconnect the power feed (upper connection) and ground connection (lower connection).
 - b) Connect a volt meter to the separated vehicle harness connection points.
 - c) Turn the vehicle on and make sure that the 'Heated Windshield' function has been activated.
 - d) Record the voltage observed. If the display reads between 9V - 16V, the vehicle harness, power and fusing are all functioning correctly.
 - e) If the fault has been recorded for the whole full screen, repeat the above checks for the opposite heater bank.
- 4. Component diagnostics (wiggle wire faults)
 - a) Working on one side of the vehicle at a time, locate the screen terminals (two per heater bank) and disconnect the power feed (upper connection) and ground connection (lower connection).
 - b) Connect multi-meter probes to the upper and lower screen terminals.
 - c) Check for continuity and resistance across each heater bank.
 - d) The multi-meter should show continuity across the heating bank and a resistance reading should be displayed.



NOTE:

If there is any visible evidence that there are more than three damaged elements on one heating bank (see visuals for heated windshield permissible failures below), then the windshield can be replaced without following the fault diagnosis procedure

Heated Rear Window Inspection Procedure

Initial checks:

- Make sure vehicle battery is sufficiently charged and fusing for heated windshield is correct and present.
- Check that all electrical connections at screen terminals (two of) are in position and connected.

If initial checks are completed and the fault is still present, proceed with the following root cause investigation /troubleshooting steps:

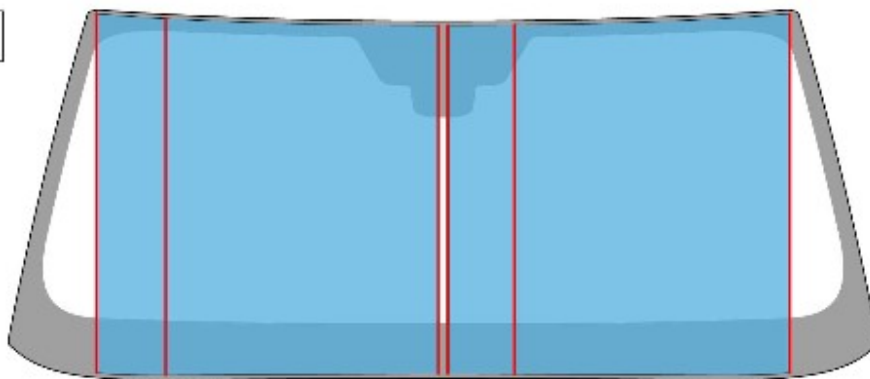
- 1. Consult the workshop manual and select the appropriate removal and installation procedure to remove vehicle interior trim.
- 2. Remove the interior trim from both sides of the vehicle.
- 3. Vehicle diagnostics (harness, power supply, fusing faults).
 - a) Locate the screen terminals (two of) and disconnect the power feed and ground connection.
 - b) Connect a volt meter to the separated vehicle harness connection points.
 - c) Turn the vehicle on and make sure that the 'Heated Rear Screen' function has been activated.
 - d) Record the voltage observed. If the display reads between 9V - 16V, the vehicle harness, power and fusing are all functioning correctly.
- 4. Component diagnostics (silver print faults)
 - a) Locate the screen terminals (two of) and disconnect the power feed and ground connection.
 - b) Connect multi-meter probes to the screen terminals.
 - c) Check for continuity and resistance across the heater bank.
 - d) The multi-meter should show continuity across the heating bank and a resistance reading should be displayed.

**NOTE:**

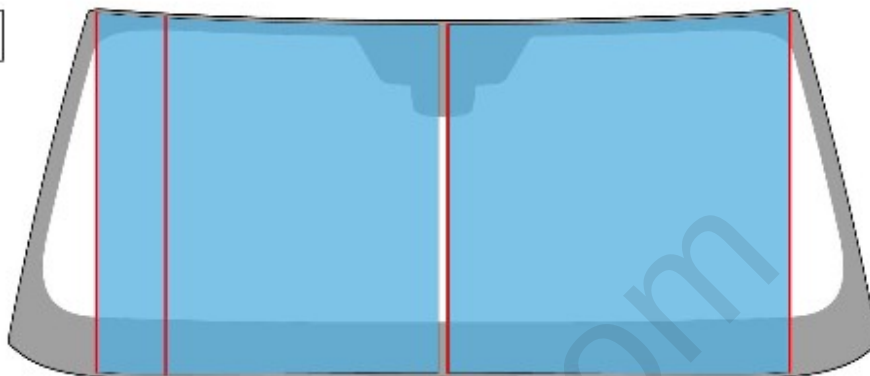
: It is possible to repair the rear window silver print heater element without a full screen replacement. The retailer must source 'Electro Connector Repair Paint' (Follow the instructions and guidelines supplied by the material provider). Assess the scope for heated screen element repair and action accordingly. Record the findings in the vehicle diagnosis notes

Heated Windshield Permissible Failures**Permissible Failures**

A



B



E249897



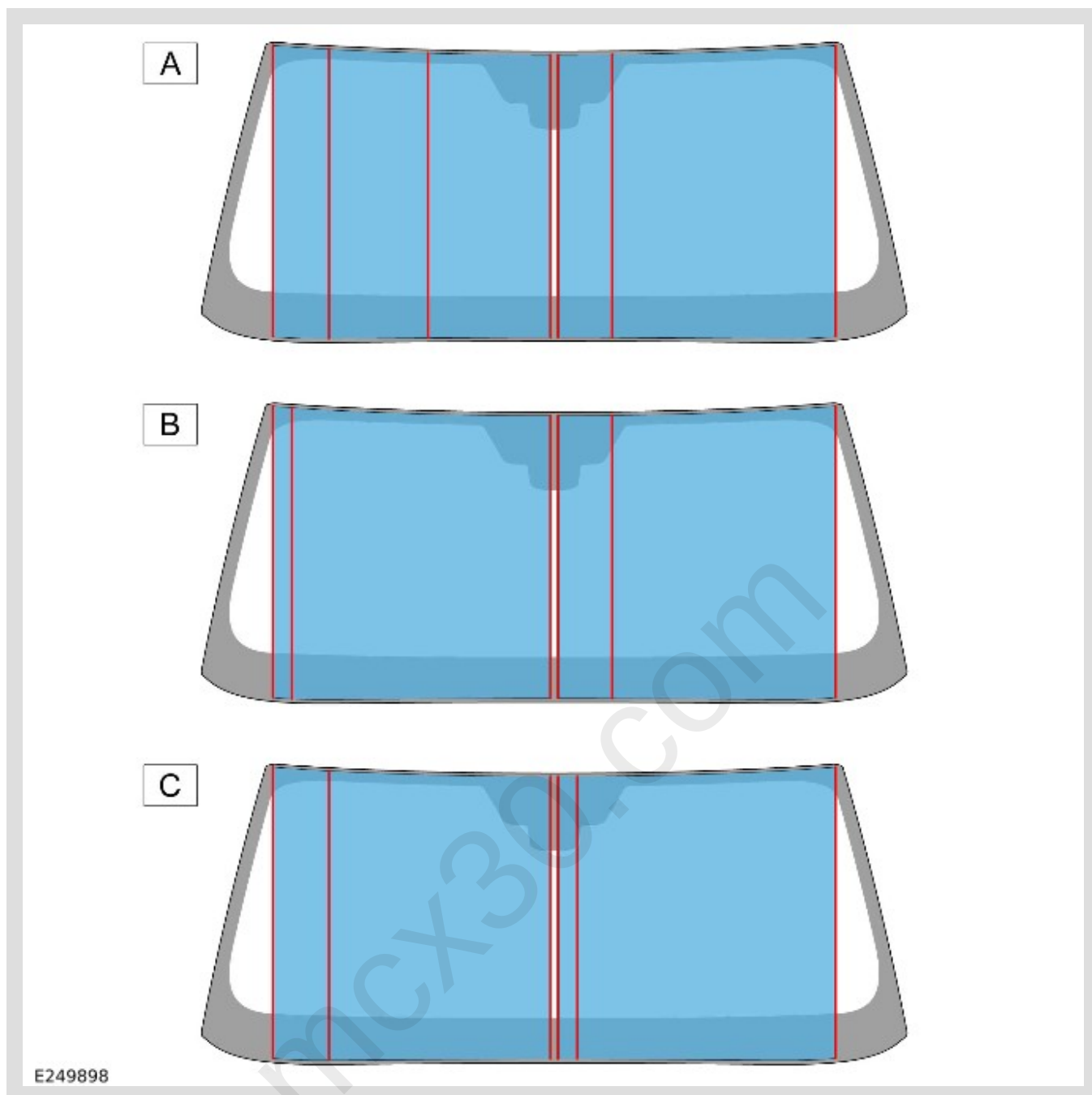
NOTE:

Failed elements shown in red

There can be up to 3 defective elements in each heater bank at any one time:

- a) The element closest to the A pillar
- b) The element closest to the windshield centre-line
- c) AND a single element in the main body of the heater bank

NON Permissible Failures



No more than three elements per heater bank can be defective at any one time.

No more than one defective elements per heater bank (not including A pillar or windshield centre-line elements).

No two adjacent elements in one heater bank can be defective.

ROOF BLIND CALIBRATION

NOTE:

Roof blind calibration will be lost if the battery is disconnected, or the roof blind motor power supply is interrupted when the roof blind is in motion.

Calibrate the roof blind as follows:

1. Start the engine and leave running during the calibration process
2. Make sure that the blind is in the fully closed position - press the close switch to achieve this
3. Press and hold the close switch again and wait for the cables to double click (it should take approximately 30 seconds), and release the switch
4. Within 3 seconds, press and hold the close switch. The roof blind will automatically travel toward the open position and then to the fully closed position. Release the switch when movement is complete

DTC INDEX

For a complete list of all Diagnostic Trouble Codes (DTCs) that could be set on this vehicle, please refer to Section 100-00.

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