TECHNICAL BULLETIN
LTB00168
22 AUG 2008

SECTION: 501-00

Water Ingress into the Cabin Area

AFFECTED VEHICLE RANGE:

Range Rover (LM) - All vehicles fitted with a Roof Opening Panel	VIN:	100003 Onwards

MARKETS:

All

CONDITION SUMMARY:

Situation:

This Technical Bulletin is for information only, to aid Authorized Repairers in diagnosing water ingress into the cabin at any of the following locations:

NOTE: With water ingress via a roof opening panel drain tube, water within the cabin area usually only becomes evident after a few thousand miles due to the small volume of water the drain tubes are designed to disperse.

1. Water ingress through the headliner in the proximity of the drivers or the front passengers head, possibly dripping onto the top of the instrument panel.

2. Water ingress down behind the A-pillar trim, through the facia and possibly into the front footwell. By removing the facia end closing panel, water ingress in this area can usually be identified by rust coloured marks on the instrument panel reinforcement.

3. Water ingress through the headliner around the rear of the roof opening panel.

4. Water ingress into the rear footwell, driver or passenger side.

Cause:
1. Poorly routed, blocked, kinked or twisted front roof opening panel drain tube.
2. Poorly routed, blocked, kinked or twisted front roof opening panel drain tube OR if water ingress is only visible in the footwell area, around the sill finisher and along the bottom of the door casing the probable root cause is a badly fitted front door water shedder.
3. Poorly routed, blocked, kinked or twisted rear roof opening panel drain tube.
4. Poorly routed, blocked, kinked or twisted rear roof opening panel drain tube OR if water ingress is only visible in the footwell area, around the sill finisher and along the bottom of the door casing the probable root cause is a badly fitted rear door water shedder. Suggested Customer Concern Code - R09.

Action: Should a customer express concern, follow the Diagnostic Procedure outlined below.

PARTS:

AKJ760042	Water drain tube - Front	Quantity: 1
AKJ760030	Water drain tube - Rear	Quantity: 1

WARRANTY:

Repair/Claim Coding

CAUSAL PART	AKJ760042 or AKJ760030

CONDITION CODE	02

DIAGNOSTIC PROCEDURE:

NOTE: During the use of sealer and adhesive, the following precautions should be followed, as detailed on Global Technical Reference (GTR), Range Rover (LM), Range Rover Workshop Manual - General Information, Service Information, Solvents, Sealants and Adhesives.

1. If water ingress is only visible in the footwell area, the fitment of the appropriate door water shedder should be inspected as follows, otherwise proceed to step 2.

    1. Water ingress into a front footwell. To allow access to the front door water shedder, remove the appropriate trim casing (see Global Technical Reference GTR Workshop Manual, section 76.34.01, Trim Casing - Front Door) and inspect the door water shedder for signs of poor adhesion to the door frame. If poor adhesion is found, the door water shedder should be replaced (see Global Technical Reference GTR Workshop Manual, section 76.34.18, door water shedder - Front Door (excluding the removal of the trim casing)). If the adhesion of the door water shedder is good, replace the trim casing and proceed to step 2.

    2. Water ingress into a rear footwell. To allow access to the rear door water shedder, remove the appropriate trim casing (see Global Technical Reference GTR Workshop Manual, section 76.34.04, Trim Casing - Rear Door) and inspect the door water shedder for signs of poor adhesion to the door frame. If poor adhesion is found, the door water shedder should be replaced (see Global Technical Reference GTR Workshop Manual, section 76.34.28, door water shredder - Rear Door, step 2 onwards). If the adhesion of the door water shedder is good, replace the trim casing and proceed to step 2.

2. To confirm whether the roof opening drain tubes are the cause of water ingress: Ensure the vehicle is parked on dry level ground, fully open the roof opening panel to gain access to the roof opening panel frame and drain tubes. One corner at a time, carefully pour a small amount of water into the frame, causing water to flow into the drain hole and drain tube. The vehicle may need to be inclined rearward, so that water passes down the rear drain holes due to the restricted access caused by the roof opening panel glass.

3. The drain hoses lead downwards on both sides of the vehicle via the A-pillar and D-pillar. Confirm that water has pooled on the ground at all four points. If there is no water found coming from either the left or right-hand side A-pillar, proceed to step 4. If there is no water found coming from either the left or right-hand side D-pillar, proceed to step 10.

4. No water found pooling on the ground at the right-hand or left-hand A-pillar. Check for twists in the lower section of the appropriate drain tube by releasing the grommet at the bottom of the drain tube from the sill. If the tube is twisted, releasing it will allow it to untwist. Re-fix the drain tube. If the tube was twisted, confirm free-flow of water by repeating step 2, otherwise proceed to step 5.

5. Remove the headlining (see Global Technical Reference GTR Workshop Manual, section 76.64.15) to gain access to the top section of the drain tube. First inspect the tube for signs of kinks or twists. If the tube is kinked or twisted, release the drain tube from the sunroof and re-route; reconnect the drain tube and confirm free-flow of water before replacing the headlining by repeating step 2. If no kinks or twists were found proceed to step 6.

6. Release the drain tube from the sunroof and inspect closely for sign of damage - holes or tears. If damage is found, replace the damaged section of the drain tube as follows, otherwise proceed to step 7.

    1. Cut off the damaged section of the drain tube, ensuring the cross section is flat. Using the damaged part of the drain tube as a template, cut a replacement section from a new drain tube, again ensuring the exposed cross section is flat. Using Loctite 401 (STC50546), bond the replacement section onto the existing tube. Cover the joint with a Polyurethane Sealant, e.g. Betafil (locally sourced), allow to cure and refit the drain tube. Confirm free-flow of water by repeating step 2 before replacing the headlining.

7. Blow out the drain tube with compressed air and re-test for free-flow of water by repeating step 2. If free-flow is achieved replace the headlining, otherwise proceed to step 8.

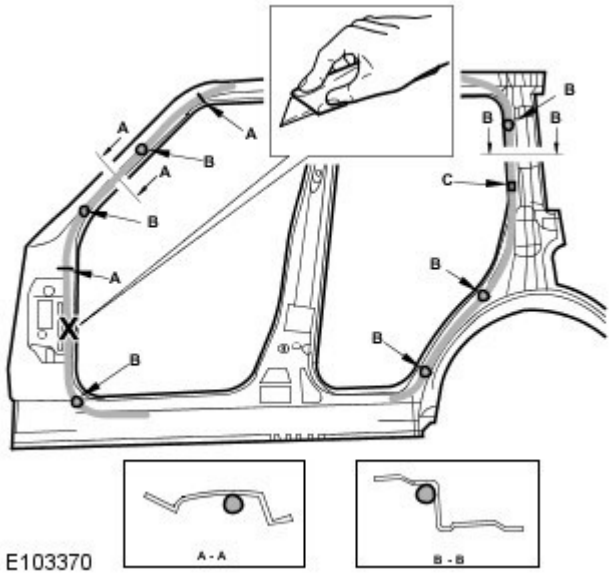
8. If the concern has not been addressed, the drain tube needs to be replaced. To prevent replacement of the complete length of tube, the issue can be traced to either the top or bottom section as follows:

8. CAUTION: Care should be taken when cutting the drain tube as water may

have collected in the tube due to a blockage.

1. Cut drain tube in the location shown in the attached drawing - Body Side Drain Tube Location; the drain tube can be accessed through the body side from inside the vehicle. Carefully pour a small amount of water into the bottom section of the tube. If no water pools on the ground, a blockage exists in the lower section of the drain tube which should be replaced as follows. If the water flowed freely proceed to step 9.

2. Replace the bottom section of the drain tube as follows: Push the plastic drain tube retaining clip into the bottom of the A-pillar as shown in the attached drawing - Body Side Drain Tube Location. Remove the drain tube grommet from the sill and attach a length of welding wiring securely around the top of lower section of drain tube by wrapping the wire around the drain tube and tapping into place. Carefully pull the bottom of the drain tube downwards and outwards to remove it from the vehicle, ensuring the welding wire follows. Stop pulling once the welding wire has taken the place of the drain tube. Leaving the welding wire in position, remove the drain tube from the end of the welding wire. Using the old drain tube as a template, cut a replacement section 10cm longer than the old drain tube. Attach the bottom of the welding wire securely to the top 10cm of the replacement drain tube, by wrapping the wire around the tube and tapping into position. Carefully pull the top of the welding wire upwards, ensuring the new drain tube follows. Once the new drain tube is in the correct location, cut off the additional 10cm of the drain tube and hence the welding wire. Using Loctite 401 (STC50546), bond the replacement section onto the existing tube. Cover the joint with a Polyurethane Sealant, e.g. Betafil (locally sourced), allow to cure and refit the drain tube grommet to the sill. Confirm free-flow of water by repeating step 2 before replacing the headlining.



9. Replace the top section of the drain tube as follows (the existing section of the drain tube will remain encapsulated within the body) Cut off the top visible section of the existing drain tube and the bottom grommet of the new drain tube. Install the top of a new drain tube onto the Sunroof, and run the tube down the inside of the A-pillar, behind the upper A-pillar trim finisher. The tube should then be feed down through the facia to meet the existing lower section of drain tube. Cut of the excess length of the new drain tube and using Loctite 401 (STC50546), bond the replacement section onto the existing tube. Cover the joint with a Polyurethane Sealant, e.g. Betafil (locally sourced), allow to cure and refit the drain tube. Confirm free-flow of water by repeating step 2 before replacing the headlining.

10. No water found pooling on the ground at the right-hand or left-hand D-pillar. Check for twists in the lower section of the appropriate drain tube by releasing the grommet at the bottom of the drain tube from the sill. If the tube is twisted, releasing it will allow it to untwist. Re-fix the drain tube. If the tube was twisted, confirm free-flow of water by repeating step 2, otherwise proceed to step 11.

11. Remove the headlining (see Global Technical Reference GTR Workshop Manual, section 76.64.15) to gain access to the top section of the drain tube. First inspect the tube for signs of kinks or twists. If the tube is kinked or twisted, release the drain tube from the sunroof and re-route; reconnect the drain tube and confirm free-flow of water before replacing the headlining by repeating step 2. If no kinks or twists were found proceed to step 12.

12. Release the drain tube from the sunroof and inspect closely for sign of damage - holes or tears. If damage is found, replace the damaged section of the drain tube as follows, otherwise proceed to step 13.

1. Cut off the damaged section of the drain tube, ensuring the cross section is flat. Using the damaged part of the drain tube as a template, cut a replacement section from a new drain tube, again ensuring the

exposed cross section is flat. Using Loctite 401 (STC50546), bond the replacement section onto the existing tube. Cover the joint with a Polyurethane Sealant, e.g. Betafil (locally sourced), allow to cure and refit the drain tube. Confirm free-flow of water by repeating step 2 before replacing the headlining.

13. Cut off the damaged section of the drain tube, ensuring the cross section is flat. Using the damaged part of the drain tube as a template, cut a replacement section from a new drain tube, again ensuring the exposed cross section is flat. Using Loctite 401 (STC50546), bond the replacement section onto the existing tube. Cover the joint with a Polyurethane Sealant, e.g. Betafil (locally sourced), allow to cure and refit the drain tube. Confirm free-flow of water by repeating step 2 before replacing the headlining.