

## Workshop Manual

Alhambra 1996 ➤ , Alhambra 2001 ➤ ,  
Alhambra 2011 ➤ , Alhambra 2016 ➤ ,  
Altea 2004 ➤ , Altea XL 2007 ➤ ,  
Altea XL Freetrack 2008 ➤ ,  
Arona 2018 ➤ , Arosa 1997 ➤ ,  
Ateca 2017 ➤ , Córdoba 1999 ➤ ,  
Córdoba 2003 ➤ , Córdoba Vario 1999 ➤ ,  
Exeo 2009 ➤ , Exeo ST 2009 ➤ ,  
Ibiza 1999 ➤ , Ibiza 2002 ➤ ,  
Ibiza 2008 ➤ , Ibiza 2016 ➤ ,  
Ibiza 2018 ➤ , Ibiza ST 2010 ➤ ,  
Ibiza ST 2016 ➤ , León 1999 ➤ ,  
León 2006 ➤ , León 2013 ➤ ,  
León ST 2013 ➤ , Mii 2012 ➤ ,  
Tarraco 2019 ➤ , Toledo 1999 ➤ ,  
Toledo 2005 ➤ , Toledo 2013 ➤

**Manual for locating water entries**

Edition 09.2018

## List of Workshop Manual Repair Groups

### Repair Group

00 - Technical data



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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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## 00 – Technical data

### 1 Introduction

(ERL003848; Edition 09.2018)

Nowadays, the bodywork of a vehicle is made from a large amount of sheet metal which is joined together in a variety of different ways. The most common method used is resistance spot welding where the sheet metal retains its mechanical and corrosion resistance properties. Due to the fact that this does not create a continual joint, a sealant is used to compensate for the lack of a continual bond between the joints.

There are also moveable parts, such as doors, tailgates and windows used to secure the vehicle interior. In addition, it is also necessary for air to enter and exit the vehicle, at least for air-conditioning and replacing the air in the vehicle interior.

Due to all these points, ensuring that the vehicle interior is sealed is no easy task, and without considering additional influences, such as torsions transferred to the vehicle body while driving as well as possible accidents where the body is subjected to excessive deformation or distortion, causing e.g. damage to the sealant, misalignment of the moveable parts etc. and thus causing damage to the tightness of the seal.



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## 2 Determining the type of water entry

Correctly determining the type of water entering the vehicle interior is crucial for being able to locate the point of entry.

In general we deal with "External influences"

⇒ ["2.1 External influences", page 2](#) ; however, it is possible

that "Vehicle fluids" are a concern

⇒ ["2.2 Vehicle fluids", page 2](#) .

### 2.1 External influences

External influences refers to fluids from the environment.

These include:

- ◆ Rain water
- ◆ Water from car washes (brush-car wash, car wash with water jets).
- ◆ Snow

### 2.2 Vehicle fluids

Vehicle fluids refers to the fluids used in the vehicle systems.

These include:

- ◆ Coolant (e.g. from the heater core or its pipes).
- ◆ Windscreen washer fluid (e.g. from the rear window washer system).
- ◆ Water of the evaporator (e.g. water drain valve of the evaporator clogged).

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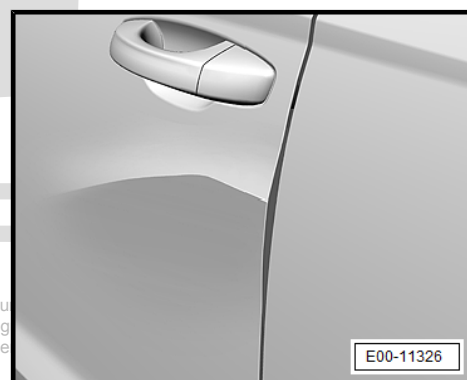
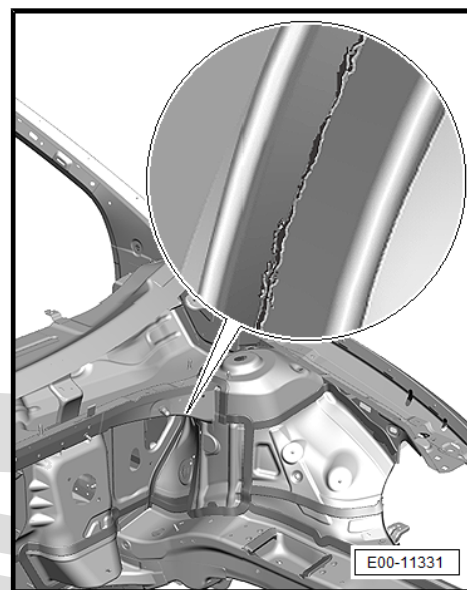
### 3 Reasons for water entry

The reasons for water entry can be quite varied, and because we are dealing with a unit made up of different interconnecting systems and movable parts, locating the point of water entry with multiple possible causes can be difficult. For this reason, the use of appropriate equipment is often required.

In general, in most cases water entry is caused by:

- ◆ an accident
- ◆ cases of extreme vehicle operation
- ◆ ageing of the sealants
- ◆ wear of the seals

Opening the door violently, e.g. by a blast of wind when entering or exiting the vehicle, can misalign the door and be the root cause of water entry; this also applies to the tailgate.



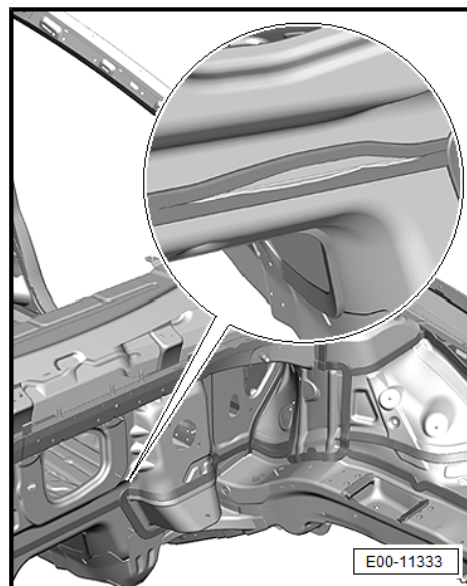
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Parking a vehicle in an overgrown area can lead to the plenum chamber drains to become clogged.

This also applies to cases where the vehicle is parked for extended periods of time.

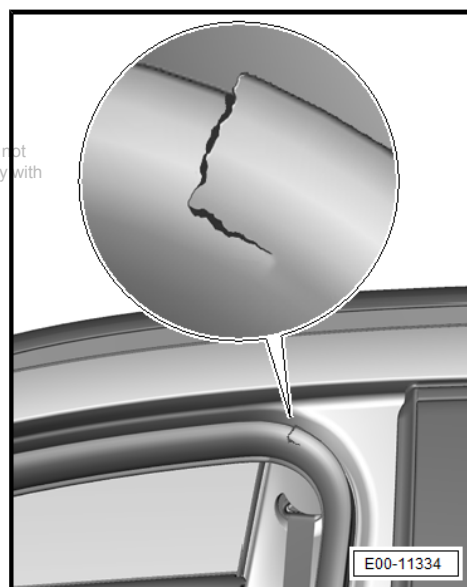


An accident where the vehicle body has been exceptionally deformed may also have damaged the sealant between the sheet metal thus allowing water to enter.

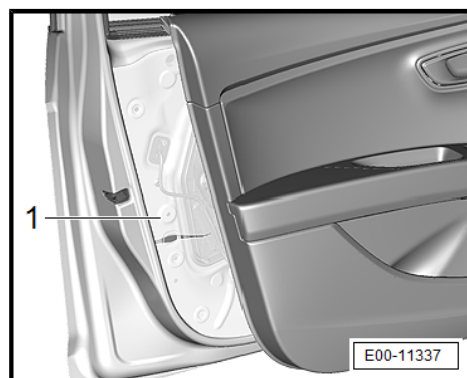


A damaged door seal can also be the cause of water entry.

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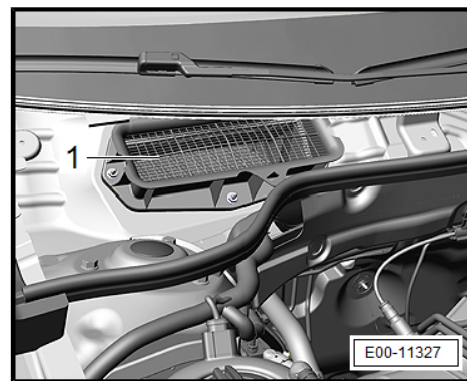


All mechanical or electrical work carried out on the vehicle, as well as work to the vehicle body where a vehicle component has been manipulated may all be causes of water entry. For example, the damage or removal of the protector at the door trim panel -1-.





Heavy rainfall and clogged plenum chamber drains could lead to the possibility of the plenum chamber flooding. An overfilled plenum chamber could then leak water into the vehicle interior through the air conditioner lines -1-.



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## 4 General approach for locating water entries

### 4.1 General procedure

When attempting to locate the point of entry, observe the following steps in their specified sequence:

- ◆ Fill out the ⇒ [“7.1 Checklist”, page 19](#) in order to properly determine the point of water entry according to the customer complaint. Start with the area in which the water entry was located (seen), the circumstances under which the water entered, the water properties and its possible origin.
- ◆ Refer to the TPis (Technical Product Information)
- ◆ Review the test cases

### 4.2 Locating water entries

The process of locating the point of water entry begins in the area where the water appears to be able to determine the water properties, the circumstances under which the water appears as well as the origin.

- ◆ The process when using specialised equipment  
⇒ [page 11](#) .
- ◆ The process without using specialised equipment  
⇒ [page 6](#) .

The basic process for localizing water entry without the use of specialized equipment is to spray down the vehicle with a hose.

With the help of an electric torch a second technician carries out a visual inspection of the possible water entry from within the vehicle.

For locating water entry it is important to differentiate between three key factors:

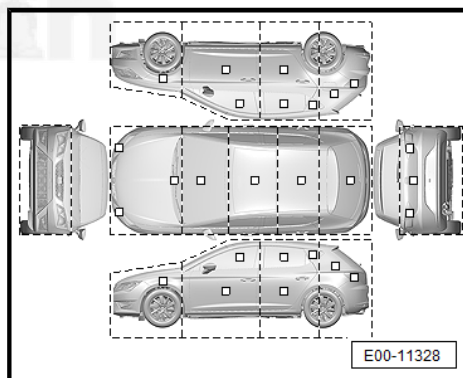
- ◆ the point of entry,
- ◆ the circumstances under which the water enters,
- ◆ the type of fluid.



#### 4.2.1 By localisation (origin)

Once the area in which the driver has detected water has been determined, this area is taken as the starting point from which the search will progress until the point of entry is found.

The chart ⇒ [“7.1 Checklist”, page 19](#) can be used to mark the area or areas in which the customer has noticed water.



#### 4.2.2 According to the circumstances under which water enters.

The circumstances that cause the water entry are determined.

The following circumstances can lead to water entry:

- ◆ Thunderstorms
- ◆ Car washes
- ◆ Using the air conditioner
- ◆ Activating the window washer system
- ◆ Other circumstances

### 4.2.3 According to the type of fluid

In this step the water found in the vehicle interior is tested to determine if it is coolant, rain water, etc.

## 4.3 Checklist

The check list or respectively the report is a practical tool for locating the point of water entry. It is very helpful for data collection, and the technician may begin by filling out the first section of the check list together with the driver usually operating the vehicle. Therefore, with the information from the driver, the conditions under which water enters can be clarified.

### 4.3.1 Notes regarding data collection

In order to efficiently collect the data it is essential that the driver typically operating the vehicle helps to complete the first section of the checklist.

The data collection together with the vehicle driver can be carried out either by the technician or a service consultant. The technician who will carry out the work on the vehicle then completes the checklist.

The technician must openly ask the appropriate questions in order to obtain specific information and allow for a correct diagnosis of the water entry to be determined.

The technician should also explain to the customer the reasons for the questions and then inform them of the measures that will be performed on the vehicle so that they are able to give consent.

Correctly using the check list makes it possible to determine the various operating conditions of the vehicle under which the water enters the interior. The possible history of the vehicle also has to be taken into account, the water properties must be analysed<sup>1)</sup> and a set procedure carried out in order to determine the point of water entry and the cause.

1) See checklist for the various types of water properties  
⇒ [“7.1 Checklist”, page 19](#)

### 4.3.2 Check list description

Print the ⇒ [“7.1 Checklist”, page 19](#) .

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## Check list description, Part I

- A - Vehicle data <sup>2)</sup>
- B - Vehicle inspection <sup>3)</sup> <sup>4)</sup>
- C - Mark the chart in the area where the water was located <sup>5)</sup>
- D - Since when has the water entry been a problem <sup>6)</sup>
- E - Vehicle history <sup>7)</sup>
- F - Conditions under which water entry occurs <sup>8)</sup>

2) Subsequent installations: Whether accessories or parts were installed after vehicle manufacture

3) Vehicle test: Test during which water ingress was able to be reproduced

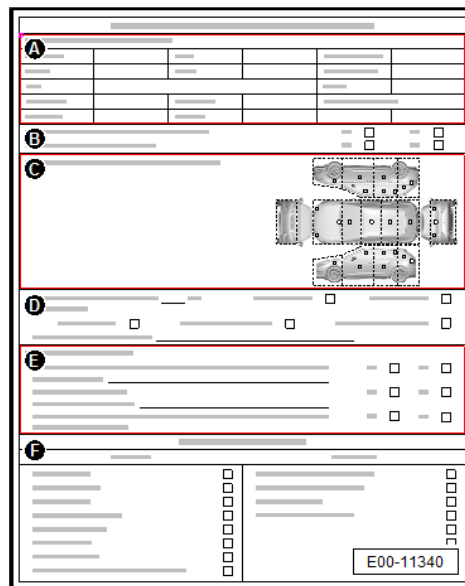
4) Can the customer complaint be confirmed?: The water ingress was visible or it was verified that water ingress did not result from an open door, side window or panoramic tilting sunroof.

5) Localisation graphic: Mark the area(s) where the customer has seen water ingress.

6) Note since when the customer has noticed the water entry. If this occurred after an accident or work on the vehicle show the area affected by the work activities or accident.

7) Reasons that could have lead to possible leaks.

8) Mark the conditions under which water enters. This information makes it easier to locate the point of entry and enables us to simulate the conditions and confirm a solution to the problem.



## Check list description, Part II

- G - In the context of any deviations present <sup>9)</sup>
- H - Amount of water <sup>10)</sup>
- I - Water properties <sup>11)</sup>
- J - The component responsible for the water entry / its origin can be localized <sup>12)</sup>
- K - Comments <sup>13)</sup>

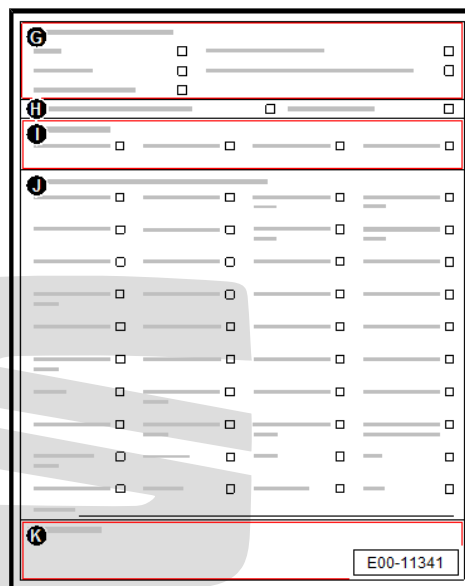
9) Mark the changes on the vehicle that could be connected with the water entry.

10) Indicate whether it is a small amount of water and the floor is just damp or whether large amounts of water enter forming puddles.

11) Describe the type of water entering the vehicle interior.

12) If you know the component responsible for the problem or the source of the water entry, mark the corresponding box or boxes.

13) Information about the customer's or technician's possible comments as well as the measures necessary for the diagnosis.



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## 5 Test cases

### Areas vulnerable to water entry

The area that must remain fundamentally dry, or which water must not reach, is the vehicle interior, where the most potential water entries are concentrated.

Furthermore, there are components outside of the vehicle interior that require a watertight and moisture free environment in order to carry out their function, such as headlights, lamps, fuse boxes, relays, electronic control units, etc.

In this section exemplary cases are presented that can serve as references for locating water entries.

### Headlights

Symptoms	Causes
Water is visible inside the headlight. Fogged headlights. Damage to chrome-plated surfaces. Faulty light projection	Damaged seal Damaged housing Improperly installed or a missing rear cover Accident

### Wing lights

Symptoms	Causes
Water is visible inside the headlight. Fogged headlights.	Improperly screwed down lamp socket. Damaged seal. Seal not properly positioned. Soiled seal.

### Plenum chamber

Symptoms	Causes
Water entry into the vehicle interior. Vehicle interior fogged up. Odour development. Insufficient air supply (air-conditioning)	Drains clogged due to residue collection. The sealant was damaged due to accident. Damaged sealant.

### Windows

Symptoms	Causes
Water entry into the vehicle interior. Vehicle interior fogged up. Odour development. Air entry Whistling noises. Instrument panel moist. Water spots on the pillar lining.	Window seal damaged. Detached from the window Ageing of the sealant. Primer lacking. Improper installation. Improperly applied sealant bead

### Panoramic roof

Symptoms	Causes
Water entry into the vehicle interior. Vehicle interior fogged up. Odour development. Air entry. Whistling noises. Water spots on the seats. Water spots on the roof liner.	Clogged drains. Improperly connected drains. Seal in poor condition. Seals not properly positioned. Extremely soiled ducts. Improperly closed sun roof.

### Doors, tailgate or luggage compartment

Symptoms	Causes
Water entry into the vehicle interior. Vehicle interior fogged up. Odour development. Air entry. Whistling noises. Water spots on the pillar panelling	Wrong settings. Seals in poor condition. Seals not properly positioned. Soiled seals. Door panel's protective cover damaged or missing Clogged drains. Inadequate adjustment of lock.

### Aerial

Symptoms	Causes
Poor radio reception. Water spots on the roof liner. Water spots on the seats. Odour development. Tarnish appearing.	Antenna seal in poor condition. Antenna seal not properly positioned. Antenna seal missing. Inadequate fixing of antenna.

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## 6 SEAT equipment for locating water entries

If dealing with external water entry and in cases where the point of entry cannot be located visually or by hosing down the vehicle, it is advisable to implement more precise methods of locating water entry by using equipment made available by SEAT.

Occasionally these pieces of equipment are used in combination with each other.

### 6.1 Ultrasonic tester - VAG 1842S-

The ultrasonic measuring device - VAG 1842S- is equipped with a transmitter and a receiver. Using both devices allows the exact location of the point of water entry to be pinpointed. This may be done by carrying out a visual inspection using the integrated LEDs or a sound test using the signals emitted.

To locate the point of water entry the device only requires the parts listed below.

#### 6.1.1 Design of the ultrasound measuring device - VAG 1842S-

- ◆ Transport case
- ◆ Receiver that stores the maximum value



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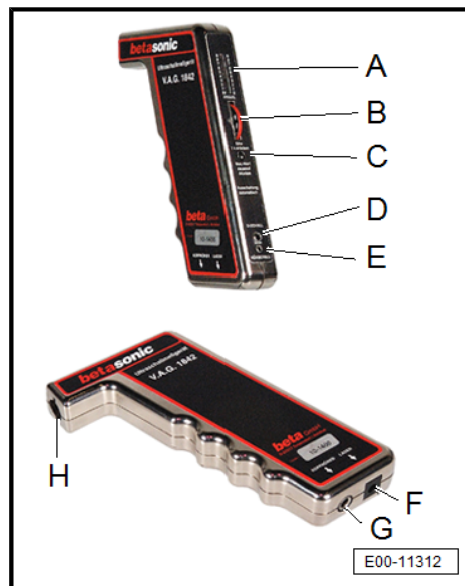
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### Functions of the receiver:

- A - Display LEDs
- B - Potentiometer
- C - Push-button activation
- D - Connector for the ultrasound sensor
- E - Connector for the acoustic sensor
- F - Charging port
- G - Connector for headphones
- H - Ultrasound receiver

The receiver produces sounds in the ultrasonic field and also indicates them visually. The majority of background noises are suppressed.

- In order to activate the receiver press the push-button -C-.
- The lower green LED (Light-Emitting Diode) indicates that the device is ready for use. A flashing LED means the receiver needs to be charged.
- By continually pressing the push-button -C- the LED display saves the maximum value as well as displaying it.
- A potentiometer -B- is located below the LED display to adjust the sensitivity.



### Note

*The device will switch off after 7 minutes – In order to restart push the push-button A.*



### Caution

***Do not use the device or its accessories in explosion-prone areas.***

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◆ Transmitter

A - Indicates the device readiness

B - ON-switch

C - Frequency converter

D - Charging port

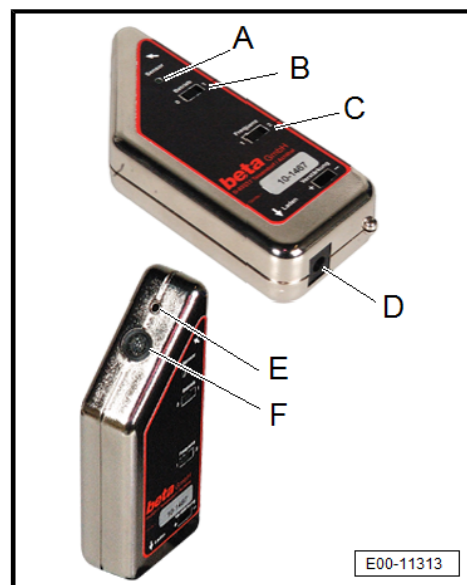
E - Jack socket for external sensors

F - Ultrasound transmitter

In order to activate the transmitter press switch B.

The ultrasound transmitter makes it possible to send signals through vehicle interiors, luggage compartments, etc. In doing so, whistling and other sounds caused by air entering the device can then be located. The sensitivity setting for the frequency modulation can be adjusted for thin-walled components.

The green light-emitting diode (LED) indicates that the device is ready for use. A flashing LED means the device needs to be charged.



**Note**

*The device switches off on its own after 14 minutes – switch it on again.*

◆ Headphones (ear-enclosing)

These headphones insulate the listener from workshop noise and increase the efficiency of the device.



**Note**

*It is recommended to always use this headset (which provides complete covers the ears) as it almost entirely insulates the user from outside noise.*



◆ Unidirectional attachment

The unidirectional attachment is connected to the receiver with a bayonet coupling and is used to suppress background noise enabling noises to be precisely located. As this is a unidirectional probe, this effect is amplified.

◆ Pointed attachment



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#### ◆ Battery charger

The battery charger is equipped with two connecting plugs so that the receiver and transmitter can be charged simultaneously.

Fully charged devices can be used for an entire workday without recharging.

Both devices must then be charged using the supplied battery charger (charging time: about 12 hours from empty battery).

While in use, a green LED will flash on both devices to indicate that the rechargeable batteries are almost drained and need to be recharged. Longer charging times are not crucial.

The battery charger is equipped with two connecting plugs for transmitter and receiver. The charger is equipped with two red LEDs, one for the transmitter and one for the receiver; they will light up when charging.



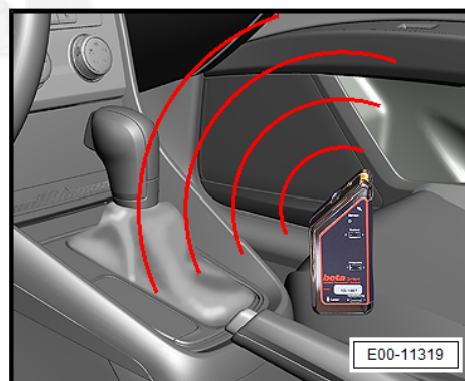
### 6.1.2 Procedure for locating water entries

In order to pinpoint the exact location of water ingress one device in the vehicle interior and the other outside the vehicle, both in close proximity to the point where water was seen. During this procedure, the doors and windows must be completely closed. In addition, device accuracy can be improved by fitting the unidirectional attachment to the receiver.

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If this is not possible due to space reasons, a second mechanic can be called to assist where one holds the transmitter and the other the receiver. The person inside the vehicle traces the same route of the connection being checked as the person on the outside, until the point of water entry can be found.



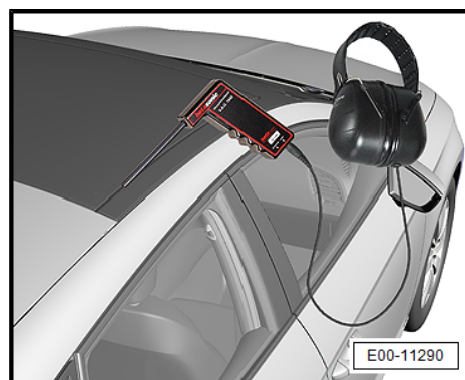
#### Note

*Mounting of the transmitter or receiver on the inside or outside of the vehicle will depend on the type of connection and accessibility of each area to be tested.*



#### WARNING

*It is possible that the ultrasonic device identifies a leaky area while this is not the cause of the water entry.*



## 6.2 Borescope - VAS 6748A-

If the point of water entry is in a confined area that would require disassembly for proper inspection, the endoscope - VAS 6748A- can be used.

This tool is an electronic diagnostic visual display device that makes it possible to locate the point of water entry in vehicles. Images taken with a micro-camera with high magnification and its own lighting, attached to the end of a probe, are displayed on screen.

### 6.2.1 Parts of the borescope - VAS 6748A-

#### ◆ Transport case



#### ◆ Control console

SD card 2 GB

Allows colour pictures and videos to be recorded.



Functions of the control console

A - Playback of recordings (pictures and videos)

B - Mirror mode

C - Zoom

D - Image acquisition

E - Video recording

F - On/off switch

G - Menu mode

H - Brightness reduction

I - Brightness increase

J - FN – Special functions

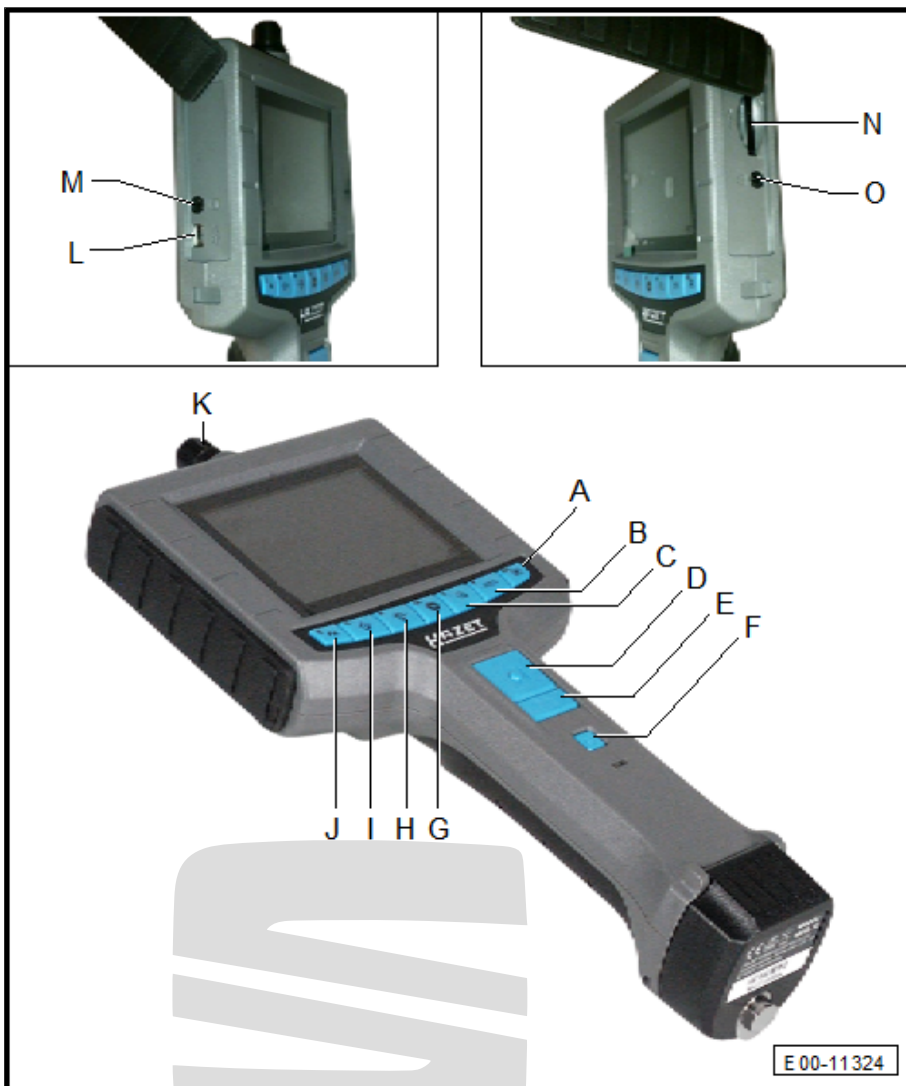
K - Connecting plug for the probe

L - USB

M - Video output (view of probe's camera)

N - SD card input

O - Video output (screen view)



#### ◆ Adapters



#### WARNING

*To avoid damage to the plugs, ensure that the adapter has been installed in the correct position.*

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◆ USB cable (mini)

For downloading audio and video files to the PC.



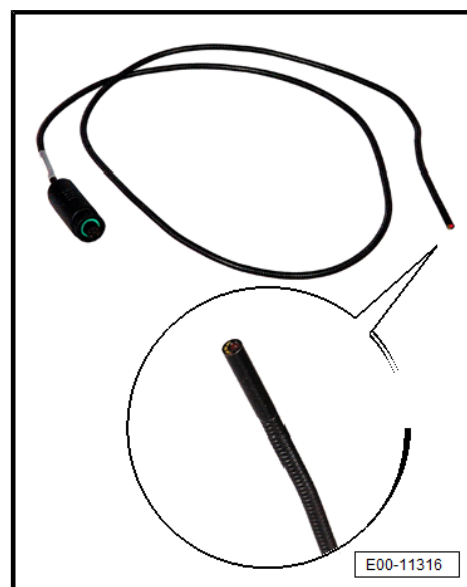
◆ AV cable (cinch)

For viewing the video on an external monitor.



◆ Probe 3.9 mm, guided in straight-line

With front camera.



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- ◆ Probe 3.9 mm with 90° angle

For a 90-degree view in relation to the probe's axis.



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## 6.2.2 Procedure for determining water entries via endoscopy

Endoscopy is used to check and search for additional indicators that would lead to the point of water entry at locations that cannot be viewed with the naked eye without requiring major dismantling of components; it allows viewing various components in the vehicle's interior.

By using both the control console and a probe endoscopy enables:

- ◆ Locating, for example, defective sealants or improperly positioned cover plates in areas that cannot be seen with the naked eye.
- ◆ Following the flow of water through the vehicle body, beginning at the point where the water is visible and following it to the point of leakage.

Using endoscopy for checking:

- Connect the adapter and the suitable probe to the control console.
- Press the ON-switch on the control console.
- Insert the probe in the appropriate entry.
- Move the probe forward and turn it in order to get a complete view of the internal cavity on the monitor.



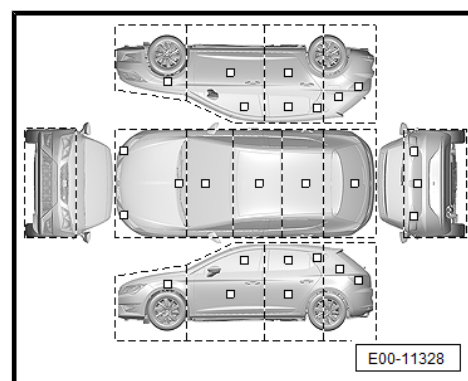


## 7 Annexes

### 7.1 Checklist

Report for locating water entries					
Vehicle details: (fill out together with the vehicle user)					
Item no.:		Brand:		Date of manufacture:	
Date:		Version:		Partner:	
VIN (Vehicle Identification Number)				Model	
Engine type:		Mileage:		Retrofits:	
Gearbox type:		Service technician:			
Has the vehicle been inspected?				YES <input type="checkbox"/>	NO <input type="checkbox"/>
Could the customer complaint be confirmed?				YES <input type="checkbox"/>	NO <input type="checkbox"/>

Highlight the area in the chart where the water was located (viewed).



Since when has water entry been ___ km a problem?		Always <input type="checkbox"/>	Only recently <input type="checkbox"/>
Increasingly <input type="checkbox"/>		Since an accident <input type="checkbox"/>	Since the vehicle was worked on <input type="checkbox"/>
Area of the vehicle affected by the work activities or accident _____			
Vehicle history			
Parts where retrofitted by the repair shop or customer		Yes <input type="checkbox"/>	no <input type="checkbox"/>
Which? _____		s	
The vehicle was involved in an accident		Yes <input type="checkbox"/>	no <input type="checkbox"/>
Which area of the vehicle is affected?		s	
The vehicle is typically parked under trees or other vegetation (leaflets or other types of paper)			
Yes <input type="checkbox"/> No <input type="checkbox"/>			
Conditions in which water entry occurs			
External		Internal	
Heavy rainfall	<input type="checkbox"/>	Switch on the front wipers	<input type="checkbox"/>
Constant rainfall	<input type="checkbox"/>	Switch on the rear wipers	<input type="checkbox"/>
Frequent rainfall	<input type="checkbox"/>	Turn the heater on	<input type="checkbox"/>
Drizzle (light rain)	<input type="checkbox"/>	Turn the air conditioner on	<input type="checkbox"/>

Brush car wash	<input type="checkbox"/>	
Hand car wash	<input type="checkbox"/>	
Rain and speed	<input type="checkbox"/>	
In each of the situations described	<input type="checkbox"/>	
In the context of any deviations present		
Odour development	<input type="checkbox"/>	Fogging up of the windows <input type="checkbox"/>
Whistling noises from air intake	<input type="checkbox"/>	Collection of leaves near the plenum chamber <input type="checkbox"/>
Poor radio reception	<input type="checkbox"/>	
Amount of water	Water puddles on the floor <input type="checkbox"/>	Floor wet <input type="checkbox"/>
Water properties		
Rain water	<input type="checkbox"/>	Tap water (window washer system) <input type="checkbox"/>
	Window washing water	<input type="checkbox"/>
Can the component responsible for the water entry/ the cause of the water entry be located?		
Left front headlight	<input type="checkbox"/>	Right front headlight <input type="checkbox"/>
Plenum chamber	<input type="checkbox"/>	Windscreen <input type="checkbox"/>
Left front door	<input type="checkbox"/>	Right front door <input type="checkbox"/>
Roof aerial:	<input type="checkbox"/>	Back left side door <input type="checkbox"/>
Stationary triangle window left hand side	<input type="checkbox"/>	Stationary triangle window right hand side <input type="checkbox"/>
Interior floor rear left	<input type="checkbox"/>	Interior floor rear right <input type="checkbox"/>
Wheel well rear left	<input type="checkbox"/>	Wheel well rear right <input type="checkbox"/>
Luggage compartment	<input type="checkbox"/>	Heater core <input type="checkbox"/>
Door seal	<input type="checkbox"/>	Window strip <input type="checkbox"/>
Clogged drains	<input type="checkbox"/>	Holes <input type="checkbox"/>
		Tailgate or luggage compartment door <input type="checkbox"/>
		Lights rear left <input type="checkbox"/>
		Lights rear right <input type="checkbox"/>
		Water drainage AC evaporator <input type="checkbox"/>
		Leaking line rear windscreen washer <input type="checkbox"/>
		Sealant <input type="checkbox"/>
		Sealing plug <input type="checkbox"/>
		High-level brake light <input type="checkbox"/>
		Other... <input type="checkbox"/>
Which? _____		
Comments:		