

Technical Knowledge for Volkswagen<sup>®</sup>, Audi<sup>®</sup> and Porsche<sup>®</sup> Service Professionals

# SERVICING THE AUDI Q3 Part 3: Diagnosing Park Assist and Steer Assist

By: Augie Ferron

#### Audi Q3 Service, Part 3

There are times when a concerned owner asks about rear bumper damage and/or observes that the Park/Steer Assist is not offering the values or warnings within the rear camera display. These experiments and tests are with the same Q3 in the service bay (from <u>Part 1</u> and <u>Part 2</u>).

The best option is to scan the vehicle for faults, save, and delete them. Start with a fresh slate and monitor the obstructions using VCDS and move the obstructions around.

With access to open space and with an obstruction triggering the bumper sensors, have the vehicle safely blocked in the Reverse position with the rear camera operational. View the screen with and without an obstruction. At the same time, log into VCDS and view how the obstructions are affecting Park/Steer Assist measured values.

- 1. View Park/Steer Assist Identification and request for any faults and save.
- 2. At address 10 Park/Steer Assist, choose Adv. Meas. Values.

Within that option, scroll the screen until the four sensors are in view and click the boxes on the left to access the set of choices.

The "Two distance tests" image is two tests stitched together. The upper portion indicates an obstruction at the left rear Park Assist sensor. The lower portion indicates that the obstruction was moved towards the right side of the Q3 to trigger three sensors.

Matching the upper portion in the image, line 1 reads 62 cm.

The actual Q3 screen warns the driver with tones increasing in duty cycle as distance of the ultrasonic transmitter/ receiver nears an obstruction at the rear bumper.

The "Screen image 1" image (next page) offers an idea of the

역 VCDS Release 20.4.1: 10 Park/Steer Assist, Open Controller (830-919-475.CLB) 🔀							
Comm Status		V	CDS				
Protocol: UDS	١	Open Controller					
Controller Info							
VAG Number:		919 475 AD	Component:	PARKHILF	PARKHILFE 8K H01 0070 Imp: 770 WSC 00049		
Soft. Coding:	Long Coding		Shop #:	Imp: 770			
Extra:	Extra:						
Extra:	Extra: Geraet 00117						
Basic Functions These are "Safe"			Advanced Functions Refer to Service Manual !				
Fault Code	s - 02	Readiness - 15	Co	ding II - 11	Coding - 07		
Meas. Blocks - 08 Supp. Codes - 18		Advanced ID - 1A	Basic	Settings - 04	Adaptation - 10		
		Adv. Meas. Values	Outp	out Tests - 03	Security Access - 16		
Close Controller, Go Back - 06							

### Park/Steer Assist identification

001	CDS Release 20.4.1: 10-Park/Steer Assist, Advanced Measuring Values	🧙 <- Click for Selection Save/Load	
	Sample Pate: 12		Clear
		Description	Loc.
	Advanced M	Voltage terminal 15	IDE00018
	Auvanceu wie	Vehicle speed	IDE00075
	⊂ Group UDS requests	□ Security Access: Number of invalid k	IDE00323
		Diagnostic mode	IDE00325
	Loc. Description	Time Out Recognition-Control module	IDE00610-MA
	IDE01 Distance of left rear park assist sensor	□ Time Out Recognition-Number of ti	IDE00610-MA
	IDE01 Distance of left rear center park assist sensor:	No. of unscheduled ECU resets	IDE00767
	IDE01 Distance of right rear center park assist sens.	Resulting distance of front sensors	IDE00957
	IDE01 Distance of right rear park assist sensor	Resulting distance of rear sensors	IDE00958
		Outside air temperature	IDE00973
		Outside air temperature internally ca	IDE00974
		□ Parking aid input signal-Reverse gear	IDE01122-MA
		Parking aid input signal-Trailer	IDE01122-MA
		Distance of left rear park assist sensor	IDE01123
		☑ Distance of left rear center park assi	IDE01124
		Distance of right rear center park as	IDE01125
		Distance of right rear park assist se	IDE01126
		Distance sensor for left front park as	IDE01127
		Distance sensor for left front center	IDE01128
	Graph Log	Distance sensor for right front cente	IDE01129
		Distance of right front park assist se	IDE01130

### Park/Steer Assist value check

9	CDS Release 20.4.1: 10-Park/Steer Assist, Advanced Measuring Values	<u>×</u>					
	Sample Rate: 1.2 VCDS Advanced Measuring Values						
	Group UDS requests	Group UDS requests					
	Loc. Description	Actual					
	IDE01 Distance of left rear park assist sensor	62 cm					
	IDE01 Distance of left rear center park assist sensors	infinite					
	IDE01 Distance of right rear center park assist sens	infinite					
	IDE01 Distance of right rear park assist sensor	infinite					
	IDE01 Distance sensor for left front park assist IDE01 Distance sensor for left front center park assist IDE01 Distance sensor for right front center park as IDE01 Distance of right front park assist sensors	69 cm 55 cm 62 cm infinite					
	Graph Log	Save Done, Go Back					

Two distance tests

relationship between VCDS, the Park/ Steer Assist controller, the ultrasonic transmitter/receiver(s), and the rear view camera.

VCDS will also include data from the front ultrasonic transmitter/ receiver(s) if obstructions are encountered in the Drive position. Tones and changing frequencies are similar to the rear sensors. With the Q3 in the Drive position, the closer the obstruction(s), notice the frequency increase with the color of the warning bars turning from white to red.

Note: The steering angle sensor is also integrated with address 10 Park/Steer Assist. The steering angle sensor, if defective, will record faults at multiple controllers.

"Screen image 2" shows the Q3 in the Drive position and quite close to a rolling diagnostic cart in the service bay. Notice the red bars in the image.

### IS THERE ANOTHER WAY TO TEST THE ULTRASONIC TESTERS?

Yes there is, and you can build your own "magic wand."

A hobby kit was found with transmitters and receivers. This is a 40 kHz package.



Screen image 1



Screen image 2

With a plastic "magic wand" tube cut open to fit the receiver, some old twisted CAN pairs, two banana plugs, and corrugated tube, an interesting set of tests was accomplished with an oscilloscope.

## PARTS USED

- 40 kHz transmitter and receiver package (x2)
- White/clear crimp and shrink connector (x2)
- Twisted pair wires approximately 20 inches in length
- Corrugated tubing, tape, and shrink fit
- A plastic vial to accept and hold the receiver within the protective tubing
- BNC-to-banana connector for the oscilloscope



# WHAT SIGNALS CAN THE OSCILLOSCOPE READ?

Review the "Tablet test" images, 01 through 03. These are real time values with the oscilloscope while the Q3 is in the Reverse position, blocked, and measured with a ruler.



Tablet test 01 was approximately 5 cm or 3 inches (33.83 kHz).



Tablet test 02 was approximately 15 cm or 6 inches (95.62 kHz).



Tablet test 03 was approximately 30 cm or 12 inches (107.11 kHz).





Sound Analyzer App 1: 1. Microphone pointed towards the bumper sensor, 2. Microphone pointed away from the bumper sensor, 3. Microphone pointed towards the bumper sensor.

Audi Q3 Service, Part 3



Sound Analyzer App 2: Microphone pointed away from the bumper sensor

Match tests 01 to 03 with the Android tablet and Bluetooth oscilloscope attachment, "Sound Analyzer App" images.

Putting a BlackBerry phone to good use!

With an Android such as the Blackberry or Samsung, the oscilloscope feature works flawlessly to measure/test a possible defective ultrasonic signal(s), front or rear.

The "magic wand" was a successful experiment. The included images allow one or more sensors to be examined and tested individually for the ultrasonic bursts. Consider rear or front bumper damage with simple tools to determine sensor damage.

# ARE THERE OTHER METHODS AND OTHER TESTS WITH SIMPLE EQUIPMENT?

Let's think about the ultrasonic bursts and the test device that was created to include the oscilloscope. Doesn't the average cell phone have an internal microphone?



Sound Analyzer App 3: Microphone pointed towards the bumper sensor for a few moments.

The Android applications (Sound Analyzer App 1-3) were a curiosity.

The beginning rise and wave of this image is with the microphone pointed at the bumper sensor; the drop in sound is moving the cell device up and away, a few inches from the sensor. Moving the cell device in front of the sensor raised the image and wave with the SLM feature.

Side note: This same application was used to measure interior noises when the service bay was quiet. The application was used to measure/test a clicking/ groaning HVAC blend door motor when no vibrations were felt. In that case, three door motors were in close proximity to each other. Always be aware of other noises affecting the application.

The Spectrum Analyzer feature with the Sound Analyzer App, offers a far different view. In the "Sound Analyzer App 3" image, the cell device was a few inches up and away from the sensor. Moving the cell device towards the bumper sensor changed the spectrum analysis.

Read this link for more information: en.wikipedia.org/wiki/Spectrum\_analyzer

What was learned? The experiments were a simplistic way of determining how the system worked, but the thought included a device carried in a pocket. The device has the Bluetooth oscilloscope feature along with a sound analysis application(s).

Can it be put to use for other purposes in this field of study?

Doctors practice on human subjects, the difference is we bring our subjects back to life.

### **FRANKENSTEIN VERSION!**

Past articles presented this application called the "Tricorder" and measured the magnetic wave of a COP ignition coil. The application has access to the built in sensors of an Android device. This time the Acoustic feature (ACO) was used in the same fashion as the previous application to monitor the ultrasonic bursts when the Q3 was ready for front or rear sensor tests.

The application is found at the F-Droid repository: <u>f-droid.org/en/packages/org.hermit.tricorder/</u>

This is by no means accurate compared to the oscilloscope with a 40 kHz receiver, but these ideas offer something quick, noticeable, as well as experimental.

Be aware, outside/intrusion noise(s) will disturb the readings. Intrusions can be cooling/heating fans, air hammers, running or moving vehicles, or the sound of a screaming cat.

No cats were harmed with this experiment!



*derFix* is a publication of Automotive Tech Info, LLC. No part of this newsletter may be reproduced without the express written permission of Automotive Tech Info.

**CAUTION:** VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR OTHERS. INFORMATION CONTAINED IN THIS NEWSLETTER IS INTENDED FOR USE BY TRAINED, PROFESSIONAL AUTO REPAIR TECHNICIANS ONLY. THIS INFORMATION IS PROVIDED TO INFORM THESE TECHNICIANS OF CONDITIONS WHICH MAY OCCUR IN SOME VEHICLES OR TO PROVIDE INFORMATION WHICH COULD ASSIST THEM IN PROPER SERVICING OF THESE VEHICLES. PROPERLY TRAINED TECHNICIANS HAVE THE EQUIPMENT, TOOLS, SAFETY INSTRUCTIONS, AND KNOW-HOW TO PERFORM REPAIRS CORRECTLY AND SAFELY. IF A CONDITION IS DESCRIBED, DO NOT ASSUME THAT A TOPIC COVERED IN THESE PAGES AUTOMATICALLY APPLIES TO YOUR VEHICLE OR THAT YOUR VEHICLE HAS THAT CONDITION. Last but not least, check the sensors for paint, dirt, scrapes, and any damage including to the bumper cover. Damage also includes the hidden harness assembly.

Accuracy is with VCDS and the oscilloscope.



### Tricorder application

Publisher Tamra Ayers Banz | tbanz@derFixTech.com September 2021

**Editorial Director** Dick Moritz | dmoritz@derFixTech.com

**Technical Writers** 

Mike Bavaro, Agostino (Augie) Ferron, Tim Pott, Gary Smith, Frank Walker

#### Creative Director

Christopher M. Ayers III | ayersc3@derFixTech.com

Group Publisher Christopher M. Ayers, Jr. | cayers@derFixTech.com

**Circulation Manager** Joann Turner | jturner@derFixTech.com

**Circulation Offices** derFix<sup>®</sup> | 134B River Rd., Montague, N