



# Technical Service Bulletin

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## 91 MMI3G+ GPS navigation location inaccurate or navigation takes a very long time to acquire location

91 16 81 2040406/7 October 5, 2016. Supersedes Technical Service Bulletin Group 91 number 16-71 dated September 8, 2016 for reasons listed below.

Model(s)	Year	VIN Range	Vehicle-Specific Equipment
A4, A5, A5 Cabriolet, RS 5, RS 5 Cabriolet, Q5, A6, A7, and A8	2013 - 2014	All	MMI3G+
A4	2015	A000001 - A063835 N000001 - N020338	MMI3G+
A5	2015	000001 - 029734	MMI3G+
A5 Cabriolet	2015	000001 - 005135	MMI3G+
RS 5 Cabriolet	2015	900001 - 900262	MMI3G+
Q5	2015	000001 - 066126	MMI3G+
A6	2015	000001 - 031274	MMI3G+
A7	2015	000001 - 031274	MMI3G+
RS 7	2015	900001 - 999999	MMI3G+
A8	2015	000001 - 023803	MMI3G+

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## Condition

REVISION HISTORY		
Revision	Date	Purpose
7	-	Revised <i>Required Parts and Tools</i> (Changed C7 part to suffix "H" part)
6	09/08/2016	Revised <i>Required Parts and Tools</i> (Updated MMI part numbers)
5	07/07/2016	Revised <i>Service</i> (Updated ZUG levels and software numbers) Revised <i>Required Parts and Tools</i> (Updated media part numbers)

- When the vehicle is started, the GPS location or vehicle direction indicated on the MMI navigation map does not match the vehicle's actual location or direction of travel for a long period of time (often as long as 10 minutes):
- The issue occurs in open sky, with no large buildings obstructing the sky view.



Figure 1. No satellite reception.

- The issue is intermittent, but it can occur for long periods of time during a single day. The issue resolves itself intermittently.
  - The issue typically happens on very warm days when the HVAC system blower is at a medium to high setting (auto or manual), with air being directed out of the panel vents.
  - When the issue occurs, the GPS navigation system satellite reception shows 0 satellites. Due to the infrequency of the issue, this might not be verifiable. (To view the number of satellites being received, go to *Nav >> Route >> Select Current Position* (first item in list) and scroll up (Figure 1)).
- No DTCs related to the GPS antenna or MMI system are present.
- The vehicle is an A4 (including S4 and allroad variants), A5 (including Cabriolet, S5, and RS 5 variants), A6 (including S6 variant), A7 (including S7/RS 7 variants), A8 (including long wheelbase, S8, or W12 variants) or Q5 (including SQ5 and hybrid variants). (Q7 and Q3 vehicles are not affected by this condition. See TSB 2030465, *91 MMI3G+ GPS navigation location inaccurate or navigation takes a very long time to acquire location (Q7 or Q3)* for Q7 and Q3 vehicles.)

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**Tip:** If the sky view is blocked because the vehicle is in a parking structure, below ground, or next to large buildings, it is normal for the GPS location or vehicle direction indicated on the MMI navigation map to not match the vehicle's actual location or direction of travel. The blocked sky view prevents the vehicle from receiving a satellite's signal, and the system may be temporarily lost (for example, the system may show the wrong location on the map screen) until four satellite's signal can be received. This behavior can last for several minutes even in clear sky view when the vehicle is exiting a parking structure or underground structure. The MMI can take up to 5-10 minutes to sufficiently get a 3D-GPS fix once the vehicle has clear view of the sky. This is a normal condition, and is not related to the condition described above. Replacing the MMI main unit, replacing the GPS antenna, or updating the MMI software will not change this behavior.

## Technical Background

### For MY 2013 Vehicles:

A potential software failure or internal hardware failure of the MMI main unit can cause the GPS signal to be blocked, even if good reception is available (clear sky with clear view of sky). The failure can happen at start-up or while the vehicle is being driven. The issue typically starts when the vehicle is driven on curvy or circular roads, driven in circles (such as when driven around a parking lot), or driven on or off an expressway.

### For MY 2014-15 Vehicles:

A potential internal hardware failure of the MMI main unit can cause the GPS signal to be blocked, even if good reception is available (clear sky with clear view of sky). The failure can happen at start-up or while the vehicle is being driven. The issue typically starts when the vehicle is driven on curvy or circular roads, driven in circles (such as when driven around a parking lot), or driven on or off an expressway.

### For All Model Years:

Additionally, there is a potential antenna hardware failure that can affect some vehicles. It is important to check the antenna before replacing the MMI main unit. This antenna hardware failure will produce a static condition of no satellite reception, which is the same behavior as the other failure modes.

## Production Solution

- New software was introduced in production starting calendar week 22 of 2013 (start of model year 2014 production).
- New hardware was introduced in production starting with calendar week 45 of 2014 (mid-model year 2015 production).
- New GPS antenna hardware introduced in production starting with calendar week 45 of 2014 (mid-model year 2015 production).



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## Service

Follow one of the repair options below. Note that replacing the MMI hardware in Repair Option 3 is not always necessary. Needless replacement of the MMI hardware without identification of the true root cause can create an unnecessary repeat repair and additional frustration for the customer.

### Repair Option 1 (MY2013):

#### Updating the MMI software for model year 2013 vehicles with a GPS location concern but with good satellite reception at the time of service.

If the vehicle arrives with good satellite reception, shows at least four satellite's signal as being received, and is a model year 2013 vehicle:

- Check the MMI ZUG version in the MMI (*Menu>>Setup MMI>>Software Versions*).
  - If the value shows anything less than K0715 (such as P0566), proceed to step 1 and update the MMI software only.
  - If the software is already updated to K0715 or later (such as K0814), skip steps 1 and 2 below and proceed to "Repair Option 3: Replacing the MMI main unit". The software fix was introduced in P0715/K0715 and updating the MMI software does not apply this scenario. (*K=Kunden or Customer software release" and P = Production software release.*)
- 1. Update the MMI software using ZUG K0942 (see TSB 2030465: *91 MMI 3G+ Various technical Issues (K0942 ZUG update; supersedes K0814 update)*).
- 2. Perform the required SVM feedback according to the instructions in TSB 2030465:
  - A4, A5, Q5 use SVM code **3GPUS942AU3G**
  - A6, A7, A8 use SVM code **3GPUS942AU**

The required SVM code is also included in the ZUG K0942 update medium.

### Repair Option 2 (All Model Years):

#### Checking satellite antenna for all vehicles with static "0" satellite reception at the time of service or verified by the customer.

If the vehicle arrives with a static condition of "0" satellite reception, or was verified by the customer using the MMI, first verify that the antenna is not the root cause of the condition:

1. Move the vehicle outside to a clear view of the sky.

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2. Allow the car to sit with the ignition on for at least five minutes, then use the table below to check Measured Value Blocks 97, 107, and 192 in the information electronics control module 1, J794 (address word 5F).

The “Good Values (*Bad Values*)” column shows the known good values with the known bad values in parentheses. The GPS Status, GPS 3D Fix, and number of Received/Used Satellites will be the most helpful in determining if the MMI is receiving GPS information from the satellites.

Measured Value Block	Name	Good Values ( <i>Bad Values</i> )
MVB 97.1	Received Satellites	4-16 (0)
MVB 97.2	Used Satellites	4-16 (0)
MVB 97.3	Code-locked satellites	4-16 (0)
MVB 97.4	Phase-locked satellites	4-16 (0)
MVB 107.1	GPS Status	Valid ( <i>Not Valid</i> )
MVB 107.3	GPS 3D Fix	4 = 3D Fix (0 or 1 = No GPS data; 2 = No Fix; 3 = 2D Fix, 255 = Not connected)
MVB 192.1	0 Satellite Condition Start Date	This will show the date when the “0” satellite condition started.
MVB 192.2	0 Satellite Condition Start Time of Day	This will show the time of day when the “0” satellite condition started.

3. If it is determined that the antenna is potentially faulty, obtain a known good GPS antenna and coaxial cable to verify that they will fix the issue. Attach the antenna coaxial directly to the back of the MMI main unit using a service repair coaxial cable (see ETKA using part number 000 098 650). There are varying lengths that can be purchased. For instance, part number 000 098 650 = 300mm/1ft and part number 00 098 658 = 7000mm/23ft). Then connect the other end of the coaxial to the test antenna (new service part).



**Tip:** If a C7 or B8 antenna and cable are ordered, they can be used as a test setup for all Audi models with MMI3G+. There is no need to order a different test antenna for each model because the

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internal design is the same for all vehicles for MMI3G+. The only difference is the size and mounting scheme of the different Q5 and A8 antennas.

4. Check the MMI to see how many satellite's signals are received with the new antenna when the car is parked outside with clear view of the sky. To view the number of satellites being received, go to *Nav >> Route >> Select Current Position* (first item in list) and scroll up. If needed, recheck the Measured Value Blocks and verify that the values change to good values.
5. If it is determined the antenna is faulty, replace the GPS antenna using the parts listed in the parts table below. If the coaxial cable is replaced, order the correct cable adapter with the 90 degree bend in the connector (See ETKA).



**Note:**

For A4, A5, A6, and A7 vehicles, do not order the "K" suffix antenna, which ETKA may suggest. The "K" suffix antenna is only used for model year 2016 A6 and A7 vehicles with XM satellite service and will not work with model year 2013 – 2015 A4, A5, A6, and A7 vehicles with Sirius satellite service. The "J" suffix antenna must be ordered for model year 2013 – 2015 A4, A5, A6, and A7 vehicles.

## Repair Option 3 (All Model Years):

### Replacing the MMI main unit for any of the following conditions:

- All vehicles with "0" satellite reception at the time of service and a known good GPS antenna (not resolved by Repair Option 2).
- Model year 2014 – 2015 vehicles with intermittent satellite reception that cannot be verified at the time of service (but customer confirms that the *Condition* applies).
- Model year 2013 vehicles with the latest MMI software and intermittent GPS reception.

Perform the following repair steps for replacing the MMI main unit. Replace the MMI main unit with the part numbers listed in the parts table below. If ETKA suggests different part numbers, ignore the suggestion, and use the part numbers in the table.

1. If the vehicle does not have K0814/P0814, update the MMI software using the latest available ZUG update (as of calendar week 22/16, ZUG K0942 is the latest; see TSB 2030465: *91 MMI 3G+ Various technical Issues (K0942 ZUG update; supersedes K0814 update)*).



**Tip:** This update ensures that the MMI control panel (E380) will be able to communicate with the new MMI main unit (J794). If the update is not performed, the MMI control panel button LED lights will flash constantly to indicate a software incompatibility in the MMI main unit.

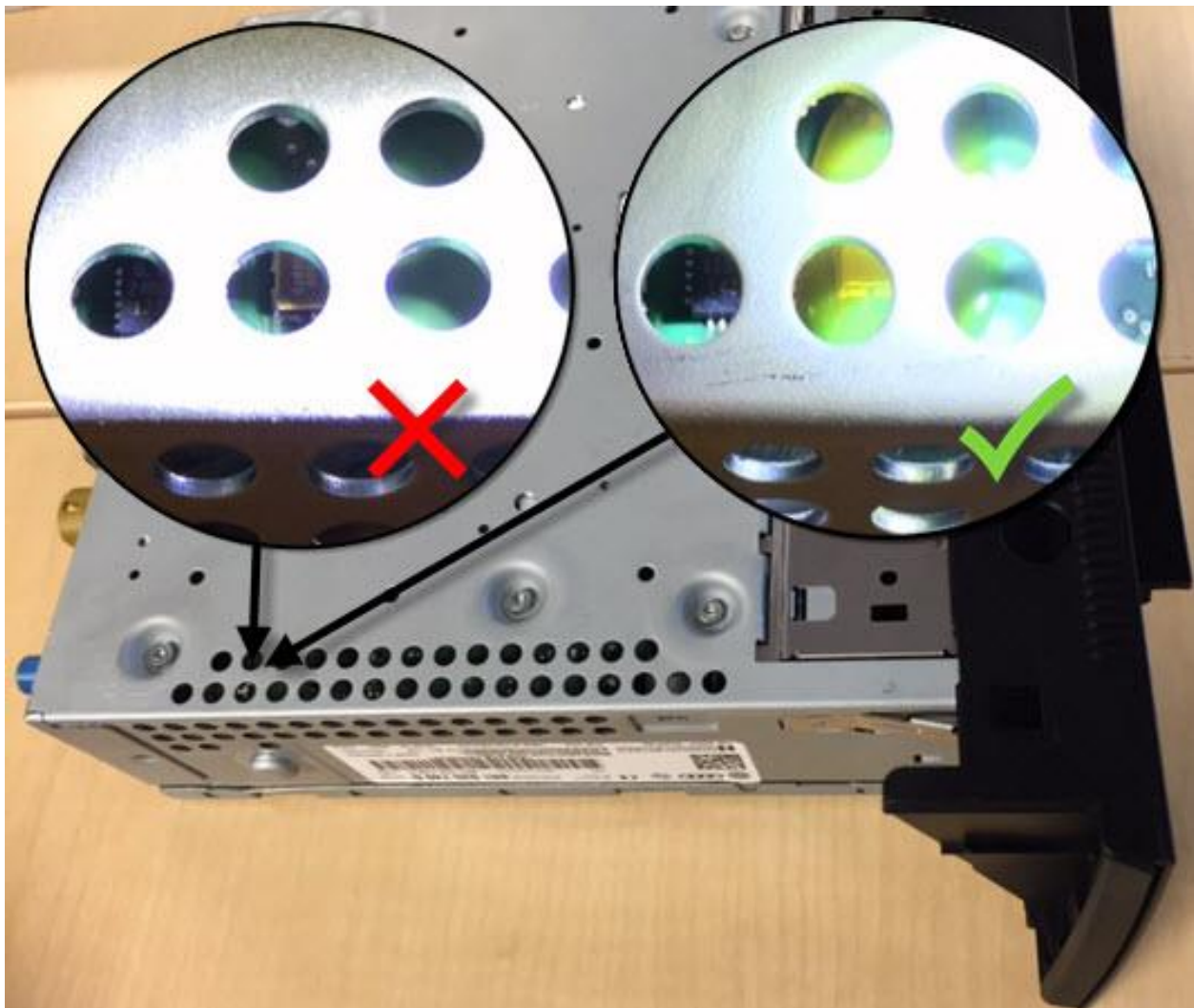
2. Perform the required SVM feedback according to the instructions in TSB 2030465:

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- A4, A5, Q5 use SVM code **3GPUS942AU3G**
- A6, A7, A8 use SVM code **3GPUS942AU**

The required SVM code is also included in the ZUG K0942 update medium.



**Figure 2.** Example of integrated circuit chip without coating (left) and with coating (right). Parts without the coating over the integrated circuit chip are not okay and should be replaced.

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- Order a replacement MMI main unit using the applicable part number listed in the parts table below. There are different variants of main units that have support for a SIM card slot and some variants that do not. Once the new part arrives, check the integrated circuit chip of the GPS oscillator on the internal circuit board. The chip should have a translucent yellow coating (Figure 2).

Some early service parts did not have the coating despite the updated hardware part number (G suffix) and build date. All parts built after November 08, 2014 should have the coating over the integrated circuit chip. If the part does not have the coating over the integrated circuit chip, return the part and order a replacement.

If the parts department has problems getting updated parts with the integrated circuit chip coating, contact TAC. A small amount of specially modified parts are available for shipping directly from Audi of America.

- Check the label (Figure 3) on the side of the new part to verify that it contains software at level 0901 or higher. Install the replacement MMI main unit (information electronics control module 1, J794 (address word 5F)).



Figure 3. Main unit part label.

- If the software level is less than 0901, perform component protection removal, **repeat steps 1 and 2** and then move to step 6.
  - If the software is at 0901 or above (A6, A7, and A8 can have 0902), perform component protection removal and **repeat step 2**, then move to Step 6. Repeating step 2 will allow SVM to accept the new control unit with the updated part number.
- Complete the GFF replacement test plan for the information electronics control module 1, J794 (address word 5F) with only the new MMI main unit installed in the vehicle (the original MMI main unit is not needed).

*ODIS>> Start Diagnosis>>Control Modules>>Right click or long select on 5F - Infotainment control unit 1 >>Guided Functions*

Ensure that the new coding, new parameterization, component protection removal, and the recovery activation (for navigation activation) are all completed successfully before returning the vehicle to the





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customer. If, at any time, an error that cannot be corrected appears, contact the Technical Assistance Center (TAC) for further assistance.

- If the SVM communication fails with a “check hardware” response, and the DTC for “Checking Software Version Management” is in the 5F fault memory, contact TAC. If the lights flash after the repair is complete, try a hard reset by pulling the quad lock connector from the main unit while ignition is on and reconnect. If this doesn’t resolve the concern, contact TAC for further assistance.

## Warranty

For Repair Option 1:			
<b>Claim Type:</b>	<ul style="list-style-type: none"> <li>110 up to 48 Months/50,000 Miles.</li> <li>G10 for CPO Covered Vehicles – Verify Owner.</li> <li>If vehicle is outside any warranty, this Technical Service Bulletin is informational only.</li> </ul>		
<b>Service Number:</b>	9196		
<b>Damage Code:</b>	0040		
<b>Labor Operations:</b>	Update MMI software of original main unit and replacement main unit ( <i>MY13 only</i> )	9196 2699	120 TU
<b>Diagnostic Time:</b>	GFF	0150 0000	Time stated on diagnostic protocol (Max 80 TU)
	Road test prior to service procedure	0121 0002	10 TU
	Road test after service procedure	0121 0004	10 TU
	Technical diagnosis at dealer’s discretion (Refer to Section 2.2.1.2 and Audi Warranty Online for DADP allowance details)		
<b>Claim Comment:</b>	As per TSB #2040406/7		



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For Repair Option 2:			
<b>Claim Type:</b>	<ul style="list-style-type: none"> <li>• 110 up to 48 Months/50,000 Miles.</li> <li>• G10 for CPO Covered Vehicles – Verify Owner.</li> <li>• If vehicle is outside any warranty, this Technical Service Bulletin is informational only.</li> </ul>		
<b>Service Number:</b>	9113		
<b>Damage Code:</b>	0040		
<b>Labor Operations:</b>	ECM information display control head remove+reinstall	9196 1900	See Elsa
	GPS Antenna check	9113 9999	50 TU
	GPS Antenna paint new part	9113 6100	50 TU
	GPS Antenna remove+reinstall	9113 19XX	See Elsa
<b>Diagnostic Time:</b>	GFF	0150 0000	Time stated on diagnostic protocol (Max 80 TU)
	Road test prior to service procedure	0121 0002	10 TU
	Road test after service procedure	0121 0004	10 TU
	Technical diagnosis at dealer's discretion (Refer to Section 2.2.1.2 and Audi Warranty Online for DADP allowance details)		
<b>Claim Comment:</b>	As per TSB #2040406/7		

For Repair Option 3:	
<b>Claim Type:</b>	<ul style="list-style-type: none"> <li>• 110 up to 48 Months/50,000 Miles.</li> <li>• G10 for CPO Covered Vehicles – Verify Owner.</li> </ul>



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	<ul style="list-style-type: none"> <li>If vehicle is outside any warranty, this Technical Service Bulletin is informational only.</li> </ul>		
<b>Service Number:</b>	9196		
<b>Damage Code:</b>	0040		
<b>Labor Operations:</b>	GPS Antenna check	9113 9999	50 TU
	Update MMI software of original MMI main unit	9196 2599	120 TU
	ECM information display control head replace	9196 55XX	See Elsa
	OR		
	GPS Antenna check	9113 9999	50 TU
	Update MMI software of original MMI main unit	9196 2599	120 TU
	ECM information display control head replace	9196 55XX	See Elsa
	Update MMI software of new MMI main unit	9196 2599	80 TU
<b>Diagnostic Time:</b>	GFF	0150 0000	Time stated on diagnostic protocol (Max 80 TU)
	Road test prior to service procedure	0121 0002	10 TU
	Road test after service procedure	0121 0004	10 TU
	Technical diagnosis at dealer's discretion (Refer to Section 2.2.1.2 and Audi Warranty Online for DADP allowance details)		
<b>Claim Comment:</b>	As per TSB #2040406/7		

All warranty claims submitted for payment must be in accordance with the *Audi Warranty Policies and Procedures Manual*. Claims are subject to review or audit by Audi Warranty.



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## Required Parts and Tools

Part Number	Part Description	Quantity
000 098 65X (See ETKA)	Test Coax Cable (Varying lengths)	1
8R0 035 503 G GRU	Roof combination antenna (Q5)	1
4H0 035 503 E GRU	Roof combination antenna (A8)	1
4G0 035 503 J GRU	Roof combination antenna (A4/A5/A6/A7)	1

For vehicles without Audi connect (9W0, 9ZX or 9ZF):		
Vehicle:	MMI main unit (infotainment control unit 1), J794 (5F):	Update medium:
A4, A5, A5 Cab, Q5	8R1.035.664.K	8R0.906.961.ET
A8	4H0.035.664.Q	8R0.906.961.ES

For vehicles with Audi connect (9ZW):		
Vehicle:	MMI main unit (infotainment control unit 1), J794 (5F):	Update medium:
A4, A5, A5 Cab, Q5	8R1.035.746.K	8R0.906.961.ET
A6, A7	4G0.035.746.H	8R0.906.961.ES
A8	4H0.035.746.M	8R0.906.961.ES



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## Additional Information

The following Technical Service Bulletin(s) will be necessary to complete this procedure:

- TSB 2030465, *91 MMI 3G+ Various technical Issues (K0942 ZUG update; supersedes K0814 update)*
- TSB 2028141, *91 Generic instructions for updating MMI 3G / MMI 3G+ software and navigation data*

All parts and service references provided in this TSB (2040406) are subject to change and/or removal. Always check with your Parts Department and service manuals for the latest information.

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