The 2019 Audi A6 Introduction

eSelf-Study Program 990693

Audi Academy
Audi of America, LLC
Service Training
Created in the U.S.A.
Created 06/2018

Course Number 990693

©2018 Audi of America, LLC

All rights reserved. Information contained in this manual is based on the latest information available at the time of printing and is subject to the copyright and other intellectual property rights of Audi of America, LLC., its affiliated companies and its licensors. All rights are reserved to make changes at any time without notice. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, nor may these materials be modified or reposted to other sites without the prior expressed written permission of the publisher.

All requests for permission to copy and redistribute information should be referred to Audi of America, LLC.

Always check Technical Bulletins and the latest electronic service repair literature for information that may supersede any information included in this booklet.
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Presentation</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Body</strong></td>
<td>6</td>
</tr>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>Body assembly</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power units</strong></td>
<td>11</td>
</tr>
<tr>
<td>Gasoline engines</td>
<td>11</td>
</tr>
<tr>
<td>Engine/transmission combinations</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power transmission</strong></td>
<td>14</td>
</tr>
<tr>
<td>Overview</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Running gear</strong></td>
<td>16</td>
</tr>
<tr>
<td>Overview</td>
<td>16</td>
</tr>
<tr>
<td>Axles and wheel alignment</td>
<td>17</td>
</tr>
<tr>
<td>Steering system</td>
<td>19</td>
</tr>
<tr>
<td>Brake system</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electrics and electronics</strong></td>
<td>22</td>
</tr>
<tr>
<td>Introduction</td>
<td>22</td>
</tr>
<tr>
<td>Layout of 12 Volt MHEV</td>
<td>24</td>
</tr>
<tr>
<td>Starter Generator C29</td>
<td>26</td>
</tr>
<tr>
<td>Auxiliary Battery A1</td>
<td>27</td>
</tr>
<tr>
<td>48 Volt MHEV electrical system</td>
<td>30</td>
</tr>
<tr>
<td>Networking</td>
<td>32</td>
</tr>
<tr>
<td>Topology</td>
<td>34</td>
</tr>
<tr>
<td>Exterior lighting</td>
<td>38</td>
</tr>
<tr>
<td>Tail lights</td>
<td>46</td>
</tr>
<tr>
<td>Convenience electronics on Audi A6</td>
<td>48</td>
</tr>
<tr>
<td>Central locking</td>
<td>50</td>
</tr>
<tr>
<td>Interior lighting</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Climate control</strong></td>
<td>54</td>
</tr>
<tr>
<td>Overview</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Safety and driver assist systems</strong></td>
<td>56</td>
</tr>
<tr>
<td>Passive safety</td>
<td>56</td>
</tr>
<tr>
<td>Driver assist systems</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Emergency assist</strong></td>
<td>69</td>
</tr>
<tr>
<td>Function</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Infotainment and Audi connect</strong></td>
<td>72</td>
</tr>
<tr>
<td>Introduction and overview of versions</td>
<td>72</td>
</tr>
<tr>
<td>Sound</td>
<td>74</td>
</tr>
<tr>
<td>Antennas</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inspection and maintenance</strong></td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge assessment</strong></td>
<td>79</td>
</tr>
</tbody>
</table>
The eSelf-Study Program (eSSP) teaches a basic understanding of the design and mode of operation of new models, new automotive components or new technologies. It is not a repair manual! Figures are given for explanatory purposes only and refer to the data valid at the time of preparation of the SSP.

For further information about maintenance and repair work, always refer to the current technical literature.
The new Audi A6 is an impressive mix of elegance, high quality and advanced technology. The vehicle is even more comfortable, convenient and efficient than its predecessor thanks to the use of Mild Hybrid Electric Vehicle (MHEV) technology. All the connect services used in the 2019 A8 and 2019 A7 are included in 2019 A6 to make it into a fully networked vehicle. The Audi A6’s driver assist systems aren’t lagging behind its big sisters either. With its numerous driver assist systems, the Audi A6 is a safe and helpful companion on the road.

In the interior, the Audi A6 has increased legroom and shoulder space.

For the engines, Audi is using a 2.0l TFSI as standard for the Premium and Premium Plus models. The 3.0l V6 will be optional for the Premium and Premium Plus and standard for the Prestige line-up. All in all, a sporty exterior and a progressive interior featuring different equipment versions with something to suit every customer.

Learning objectives of this eSelf-Study Program:

This eSelf-Study Program describes the design and function of the 2019 Audi A6. When completed, you will be able to answer questions on the following topics:

- Engines available at market launch.
- 12/48 Volt electrical system.
- New running gear features.
- New power transmission features.
- New features of the infotainment systems.
Presentation

The introduction of the 2019 Audi A6 marks the completion of the C8 product line. This eSelf-Study Program examines the similarities and differences of the A6 to the A7 and A8. For further information, please refer to the respective eSelf-Study Programs.
Audi A7 Sportback

Audi A6 Avant
(not for the North American Market at this time)
Dimensions

Audi A6 Sedan

64.17 in (1630 mm)
74.25 in (1886 mm)
57.36 in (1457 mm)
63.66 in (1617 mm)
83.07 in (2110 mm)
64.17 in (1630 mm)
74.25 in (1886 mm)
57.36 in (1457 mm)
63.66 in (1617 mm)
83.07 in (2110 mm)

36.22 in (920 mm)
115.11 in (2924 mm)
194.44 in (4939 mm)
38.30 in (973 mm)
43.11 in (1095 mm)

670_003
670_004
670_005
<table>
<thead>
<tr>
<th>Exterior dimensions and weights</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>194.44 in (4939 mm)</td>
</tr>
<tr>
<td>Width (not incl. mirrors)</td>
<td>74.25 in (1886 mm)</td>
</tr>
<tr>
<td>Width (incl. mirrors)</td>
<td>83.07 in (2110 mm)</td>
</tr>
<tr>
<td>Height</td>
<td>57.36 in (1457 mm)</td>
</tr>
<tr>
<td>Front track</td>
<td>64.17 in (1630 mm)</td>
</tr>
<tr>
<td>Rear track</td>
<td>63.66 in (1617 mm)</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>115.11 in (2924 mm)</td>
</tr>
<tr>
<td>Unladen weight</td>
<td>1825</td>
</tr>
<tr>
<td>Max. gross weight</td>
<td>2475</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interior dimensions and other specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front cabin width</td>
<td>60.11 in (1527 mm)&lt;sup&gt;2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Front shoulder width</td>
<td>57.75 in (1467 mm)&lt;sup&gt;3)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Rear cabin width</td>
<td>59.09 in (1501 mm)&lt;sup&gt;2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Rear shoulder width</td>
<td>56.53 in (1436 mm)&lt;sup&gt;3)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Load sill height</td>
<td>26.61 in (676 mm)</td>
</tr>
<tr>
<td>Luggage compartment capacity</td>
<td>18.71 cu ft (530 l)</td>
</tr>
<tr>
<td>Drag coefficient cw</td>
<td>0.24</td>
</tr>
<tr>
<td>Capacity of fuel tank</td>
<td>19.28 gal (73 l)</td>
</tr>
</tbody>
</table>

<sup>1) Maximum headroom  
2) Elbow room width  
3) Shoulder room width</sup>

All dimensions refer to the unladen weight of the vehicle.
Body

Introduction

The body of the 2019 A6 is a composite construction using various materials. It is similar to the composition and construction of the 2019 A7.

Key:

- Sheet aluminum
- Die-cast aluminum
- Aluminum section
- Ultra-high-strength steel (hot-formed)
- Modern high-strength steel
- High-strength steel
- Soft steel
- Composite steel/plastic

On the Audi A6 sedan, the rear roof cross member, the connection to the side roof frame and the D-pillar are fully manufactured from steel.

The rear shelf is made of sheet aluminum.
Reference
For further information on the construction and structure of the body, please refer to eSelf-Study Program 990593 The 2019 Audi A7 Introduction.
Body assembly

On the topic of body assembly, it is also very clear that the 2019 A6 is related to the 2019 A7. For example, the Audi A6 also has semi-electric door locks. The construction of its instrument panel is also practically identical to the one in the Audi A7.

Seats

Eight-way power front seats with driver memory are standard equipment on the 2019 A6. They are heated and feature four-way power lumbar adjustment for the drive. Ordering the Warm Weather Package (Pr. no. PWZ (Premium Plus and Prestige only), provides four-way adjustable lumbar support for the front passenger seat and seat ventilation for both seats.

Heated rear seats are available as part of the Cold Weather Package (Pr. no. PAW).

A contour seat package is also available for Premium Plus and Prestige models.

The A6 is equipped with a three-seat 40:20:40 split-folding rear seat. The backrest can only be released directly at the backrest in the interior of the vehicle. It can also be locked with the vehicle key so the luggage compartment cannot be accessed from the vehicle interior.

Folding and lockable rear seat backrest
Rear lid

There are two rear lid versions for the 2019 A6. The manual rear lid is opened via two mechanical extension springs. A hydraulic damper (left-side) has the task of reducing the speed of opening in the last 45° of the opening procedure.

An optional electric rear lid is available for the A6. With this system, Rear Lid Motor 1 V444 moves the left rear lid hinge via a spindle drive. An extension spring on the right hinge supports the opening process on both the manual and electric systems. However, the spring installation position in the rear of the body will change depending on which system is installed.

Power latching system

The power latching system for the rear lid has also been integrated into the rear lid lock on the 2019 A6. On the previous model, the striker on the lock carrier was moved downwards after the lock was engaged.

However, Rear Lid Closing Aid Motor V382 now pulls the rotary latch of the rear lid lock into its end position after the initial catch has engaged.
Operation of rear lid lock

The rear lid opens when the rear lid lock is actuated by Comfort Systems Central Control Module J393 via Rear Lid Central Locking System Motor V53.

It is possible to release the rear lid manually in the event of an electrical failure.

› The small cover in the rear lid trim in the luggage compartment must first be removed and the lever on the lock pressed upwards.
Power units

Gasoline engines

Torque/power curve of 3.0 ltr. TFSI engine EA839

Engine with code DLZA

Power units

<table>
<thead>
<tr>
<th>Features</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine code</td>
<td>DLZA</td>
</tr>
<tr>
<td>Type</td>
<td>V6 engine with 90° V angle</td>
</tr>
<tr>
<td>Capacity in cm³</td>
<td>2995</td>
</tr>
<tr>
<td>Stroke in mm</td>
<td>89.0</td>
</tr>
<tr>
<td>Bore in mm</td>
<td>84.0</td>
</tr>
<tr>
<td>Number of valves per cylinder</td>
<td>4</td>
</tr>
<tr>
<td>Firing order</td>
<td>1-4-3-6-2-5</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>11.2 : 1</td>
</tr>
<tr>
<td>Power output</td>
<td>340 hp (250 kW) at 5200 - 6400 rpm</td>
</tr>
<tr>
<td>Torque</td>
<td>369 lb ft (500 Nm) at 1370 - 4500</td>
</tr>
<tr>
<td>Fuel</td>
<td>Premium unleaded</td>
</tr>
<tr>
<td>Turbocharging</td>
<td>Turbocharger with wastegate</td>
</tr>
<tr>
<td>Engine management</td>
<td>Bosch MD1 with OBD</td>
</tr>
<tr>
<td>Maximum injection pressure in bar</td>
<td>250</td>
</tr>
<tr>
<td>Emission control</td>
<td>One close-coupled catalytic converter, split into main and secondary catalytic converters, Lambda pr. before &amp; after main cat. conv.</td>
</tr>
<tr>
<td>Emission standard</td>
<td>LEV 3/Tier3</td>
</tr>
<tr>
<td>Concept</td>
<td>Mild hybrid (48V)</td>
</tr>
</tbody>
</table>

Reference
For further information about the engines used, please refer to eSelf-Study Program 920173, The Audi 3.0 l V6 TFSI EA839 Engine and eSelf-Study Program 920163, Audi Third Generation 2.0l Engines. The construction of the fuel tank corresponds to the components of the 2019 Audi A7. For information, refer to eSelf-Study Program 990593, The 2019 Audi A7 Introduction.
### Engine/transmission combinations

<table>
<thead>
<tr>
<th>Gasoline engines</th>
<th>2.0 ltr. TFSI series 888 Gen. 3</th>
<th>3.0 ltr. TFSI series 839</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-speed dual clutch gearbox OCK DL382-7F</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
</tbody>
</table>

Rear final drive 09R HL195.U1 M3) (quattro ultra)
Power transmission

Overview

Two power transmission options are available for the 2019 A6 in the North American Region at market launch. All 2.0l Premium and Premium Plus models will have S-tronic automatic transmissions and front wheel drive. All 3.0l models (Premium, Premium Plus and Prestige) will have S-tronic transmissions with All-wheel-drive.

At market launch, all-wheel-drive models in the North American Region will be equipped with quattro with ultra technology.

quattro with ultra technology

The quattro with ultra technology four-wheel drive system can be used for engine torques of up to 500 Nm.

- 7-speed dual clutch transmission 0CL/0HL
- Four-wheel drive coupling 0CX and rear final drive 09R.

This combination was first used in the 2019 Audi A7.
Overview – Automatic transmission only for NAR

Depending on engine type, the following transmissions are available:

<table>
<thead>
<tr>
<th>PR no.</th>
<th>Manufact. designation</th>
<th>Service designation</th>
<th>Marketing designation</th>
<th>Drive version</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1C</td>
<td>DL382-7F</td>
<td>7-speed dual clutch transmission 0CK</td>
<td>S tronic</td>
<td>Front-wheel drive</td>
</tr>
<tr>
<td>G1D</td>
<td>DL382+ -7A</td>
<td>7-speed dual clutch transmission 0HL</td>
<td>S tronic</td>
<td>quattro with ultra technology</td>
</tr>
</tbody>
</table>

Overview – Rear final drive

The following rear final drive version is available at market launch:

<table>
<thead>
<tr>
<th>PR no.</th>
<th>Production no./equipment</th>
<th>Service designation</th>
<th>Combination with transmission</th>
<th>quattro concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>GH4</td>
<td>HL195.U1 M</td>
<td>Rear final drive 09R</td>
<td>OHL</td>
<td>quattro with ultra technology</td>
</tr>
</tbody>
</table>

1) Production no./equipment

The illustration shows the drive train of the V6 3.0 ltr. TFSI with S tronic and the quattro four-wheel drive system with ultra technology.

Rear final drive 09R
› with dog-clutch
Running gear

Overview

The running gear for the 2019 A6 has been completely redesigned when compared to the previous model. New technology and control systems adapted from the 2019 A8 and 2017 Q7 make it even more comfortable and dynamic. The front and rear axles are based on a high precision lightweight five-link design. Two suspension versions are available depending on model.

Progressive steering, included as standard equipment, reduces the amount of steering effort required.

The generously proportioned brake system offers substantial performance reserves for any corresponding driving situation. The 9th generation ESC system provides high-performance stability control for the vehicle.

The following suspension variants are available for the 2019 A6 at market introduction:

**Running gear with steel suspension and non-variable damping (1BA)**
This is the standard running gear.

**Sport running gear with steel suspension and non-variable damping (1BE)**
This suspension system is optional. The springs, dampers and anti-roll bars are set up for dynamic handling. The ride height is approximately 20 mm lower than version 1BA.
Axles and wheel alignment

Front axle

The front axle is based on the proven design principle of the five-link suspension. A particular emphasis was placed on the lightweight construction. The MLBevo platform is used as the basis. Because the axle loads are similar, the front axle from the 2019 A7 has been used. Springs, dampers and anti-roll bars have been specially adjusted for use in the Audi A6.

Rear axle

The trapezium link rear axle used in the previous model has been replaced by a five-link axle which is largely a new development. The MLBevo platform is used as the basis. The axle for quattro is from the 2019 A7. The springs and dampers have been adapted.

The subframe and hub carrier have been newly developed for the front-wheel drive axle in addition to the concept for connecting the wheel bearing unit to the hub carrier. The wishbones, anti-roll bars and anti-roll bar couplings are from the quattro rear axle. The springs and dampers have been adapted.
Rear axle

On the rear axle for front-wheel drive, the method for securing the wheel bearing unit to the hub carrier has been changed from a bolt to a nut. The stub axle of the subframe now has an external thread.

The hub carrier is geometrically identical to that of the 2018 Q5. The new method of securing the wheel bearing unit will be implemented in the Audi Q5 in the future and the hub carriers of both models will become standard.
Steering system

The steering system has been completely redeveloped compared to the previous model. The electromechanical power steering (EPS), the steering columns, the dynamic steering and the steering wheels are adapted from the 2019 A7.

Reference
For further information about the steering components, refer to eSelf-Study Program 990593, The 2019 Audi A7 Introduction.
Brake system

As with the current MLBevo models, the brakes on the front and rear axles of the 2019 A6 have separate brake circuits and are not diagonally split.

The brakes, brake servo, electromechanical parking brake and ESC are based on those of the 2019 A7.

<table>
<thead>
<tr>
<th>Engine</th>
<th>2.0 ltr. TFSI</th>
<th>3.0 ltr. TFSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum wheel size</td>
<td>17&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Type of brakes</td>
<td>Continental fixed caliper brakes</td>
<td>ATE fixed caliper brakes</td>
</tr>
<tr>
<td>Number of pistons</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Brake disc diameter</td>
<td>13.3 in (338 mm)</td>
<td>14.7 in (375 mm)</td>
</tr>
<tr>
<td>Brake disc thickness</td>
<td>1.2 in (30 mm)</td>
<td>1.4 in (36 mm)</td>
</tr>
</tbody>
</table>

Brake system, front axle

Engine

- **2.0 ltr. TFSI**
- **3.0 ltr. TFSI**

<table>
<thead>
<tr>
<th>Engine</th>
<th>2.0 ltr. TFSI</th>
<th>3.0 ltr. TFSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum wheel size</td>
<td>17&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Type of brakes</td>
<td>TRW PC43HE EPBi Floating caliper brakes</td>
<td>TRW PC43HE EPBi Floating caliper brakes</td>
</tr>
<tr>
<td>Number of pistons</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Brake disc diameter</td>
<td>12.9 in (330 mm)</td>
<td>14.7 in (375 mm)</td>
</tr>
<tr>
<td>Brake disc thickness</td>
<td>0.86 in (22 mm)</td>
<td>1.4 in (36 mm)</td>
</tr>
</tbody>
</table>

Reference

For further information, refer to eSelf-Study Program [990593, The 2019 Audi A7 Introduction].
The 2019 A6 is a Mild Hybrid Electric Vehicle (MHEV). In addition to the traditional battery, it is equipped with a lithium battery and starter-alternator. There are two system variations:

› 12 Volt MHEV electrical system
› 48 Volt MHEV electrical system

The power for the drive train and the electrical energy are generated by the combustion engine. Fully electric driving is not possible with the Audi A6 MHEV.

Vehicles with 4-cylinder engine are 12 Volt MHEVs. Vehicles with 6-cylinder engine are 48 Volt MHEVs and have a 48 Volt main electrical system.

12 Volt pinion starter

12 Volt belt starter-alternator

Relay and fuse carrier SR1 in plenum chamber

Fuse holder SF on instrument panel (left-side)

Relay and fuse carrier SR2 at foot rest (left-side)

Relay and fuse carrier SR3 on lower section of right A-pillar

Audi A6

Auxiliary Battery A1
In plenum chamber (front right)

Wiring junctions TV2 and TV3 with jump-start terminal

Introduction
12 Volt main battery cable

Battery A, 12V in rear right side panel

Relay and fuse carrier SR4 on control module rack in luggage compartment

Reference
For further information about mild hybrid functions, refer to eSelf-Study Program 970293, The 2019 Audi A8 Electrics and Electronics.
Layout of 12 Volt MHEV

A6 models with the 4-cylinder engine are 12 Volt MHEVs. In addition to the usual components, they have a 12 Volt lithium-ion battery and a 12 Volt starter-alternator.

**Starter B**
The starter is a 12 Volt pinion starter. It is used to start the engine at engine oil temperatures of less than 113 °F (45 °C). The pinion starter meshes its pinion with the starter ring gear on the engine flywheel.

**Starter Generator C29**
As the name implies, this component has two functions. When operated as an alternator, it provides the electrical system with electrical energy and charges both batteries. Its electric motor function is used to start the combustion engine when the engine oil temperature is above 113 °F (45 °C) and in start/stop mode. It is also able to support the combustion engine in certain driving situations. Because of the connection via the poly V-belt, an engine start using the starter-alternator is very quiet and almost completely free of vibrations.
Battery A
This battery is a 68Ah/380A AGM battery. It is installed behind the rear right side trim panel of the luggage compartment. Battery Monitoring Control Module J367 is installed on the negative terminal.

Battery Interrupt Igniter N253 is installed on the positive battery cable.

Auxiliary Battery A1
The second battery uses lithium-ion technology and is connected in parallel to the AGM battery. It is activated via an internal relay of the AGM battery. It is installed in the plenum chamber (right-side) and can be accessed via a service flap in the plenum chamber cover. The auxiliary battery is installed in an aluminum housing to protect it from mechanical damage.

Reference
For further information about the dangers of lithium-ion technology, refer to eSelf-Study Program 970293, The 2019 Audi A8 Electrics and Electronics.
For the 12 Volt MHEV, Starter-Generator C29 is an air-cooled 12 Volt belt starter-alternator. In its alternator function, it charges both batteries. The electric motor can be used both as a starter and to assist the engine. It is connected to the Engine Control Module J623 via a LIN data wire. As on any starter-alternator drive system, a special tensioner is used to ensure that the poly V-belt has a large wrap angle around the drive pulley.

Technical data

<table>
<thead>
<tr>
<th>Designation</th>
<th>Starter-Alternator C29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address Word</td>
<td>None/engine control module is master</td>
</tr>
<tr>
<td>Communication</td>
<td>LIN data wire to engine control module</td>
</tr>
<tr>
<td>Terminal designations 12 Volt positive/negative</td>
<td>30 / 31</td>
</tr>
<tr>
<td>Motor speed range</td>
<td>1,500 rpm - 22,000 rpm</td>
</tr>
<tr>
<td>Ratio (starter-alternator - engine)</td>
<td>Approximately 3:1</td>
</tr>
<tr>
<td>Nominal voltage in motor mode</td>
<td>12 Volt</td>
</tr>
<tr>
<td>Nominal voltage in alternator mode</td>
<td>14.3 Volt</td>
</tr>
<tr>
<td>Nominal power in motor mode (supporting engine for maximum 5 seconds)</td>
<td>Approximately 2 kW</td>
</tr>
<tr>
<td>Maximum power in alternator mode (recuperation(^1)) for maximum 30 seconds</td>
<td>Approximately 6 kW</td>
</tr>
<tr>
<td>Maximum continuous nominal power in alternator mode</td>
<td>Approximately 3 kW</td>
</tr>
<tr>
<td>Maximum torque in motor mode</td>
<td>60 Nm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 21 lb (9.5 kg)</td>
</tr>
</tbody>
</table>

\(^1\) Recuperation: Energy recovery. This means that the kinetic energy of the vehicle is converted into electric energy in overrun mode or under braking.
Auxiliary Battery A1

**General description**

Lithium ion Auxiliary Battery A1 houses additional components such as an internal battery control module and a relay. With the assistance of this relay, the positive terminal can be “switched off”.

When the relay is open, there is then no voltage at the terminal. The lithium-ion battery is installed in an aluminum housing to protect it from mechanical damage. The 12 Volt lithium-ion battery is not actively cooled.

**Operation of Auxiliary Battery A1**

Auxiliary Battery A1 is connected in parallel to the AGM battery. Its relay is closed during the start procedure or shortly after. If the ignition is switched off, the relay is opened and A1 is once again disconnected from the electrical system. In certain operating conditions, such as for the duration of the continued operation of the radiator fans or the auxiliary pump, the relay may remain active after Terminal 15 has been deactivated.

If an external battery charger is connected to the vehicle’s electrical system, the relay is closed after approximately 30 seconds (despite Terminal 15 being inactive) so Auxiliary Battery A1 can also be charged. In the event of an accident in which the airbag is triggered, Airbag Control Module J234 sends a signal to the control module in A1 and the relay is opened. A visual check and a classification of Auxiliary Battery A1 must be undertaken before it is removed.

**Technical data**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Auxiliary Battery A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation</td>
<td>0080</td>
</tr>
<tr>
<td>Communication</td>
<td>Hybrid CAN node</td>
</tr>
<tr>
<td>Terminal designations</td>
<td>12 Volt positive/negative</td>
</tr>
<tr>
<td>nominal voltage</td>
<td>30 / 31</td>
</tr>
<tr>
<td>Number of cells</td>
<td>4</td>
</tr>
<tr>
<td>Capacitance</td>
<td>11 Ah</td>
</tr>
<tr>
<td>Usable energy</td>
<td>0.15 kWh</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-22 °F to 149 °F (-30 °C to 65 °C)</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 11.0 lb (5 kg), without protective housing</td>
</tr>
<tr>
<td>Cooling</td>
<td>Air (passive)</td>
</tr>
<tr>
<td>Installation location</td>
<td>Plenum chamber (right-side), in protective housing</td>
</tr>
</tbody>
</table>
Construction of battery

The two halves of the housing are laser welded together. They are also sealed with liquid sealant. There is no provision for replacing battery cells or other individual components inside the battery.

Note
When handling lithium-ion batteries, please observe all the legal requirements as well as all the safety notes and work instructions in the service literature and in the Guided Fault Finding programs in ODIS Service.
48 Volt MHEV electrical system

The 2019 A6 models with 6-cylinder engines are 48 Volt MHEVs. They require a voltage converter in addition to the 48 Volt lithium-ion battery and a 48 Volt starter-alternator. This converts the voltage from 48 Volts to 12 Volts to charge the 12 Volt battery.

The installation locations of the batteries, the voltage converter, the 12 Volt pinion starter and the 48 Volt starter-alternator are, along with their functions and layout, identical to the components in the 2019 Audi A8.
12 Volt main battery cable

Voltage Converter, 48 V/12 V A7

Battery A
in rear right side panel

Relay and fuse carrier SR2
at foot rest (left-side)

Relay and fuse carrier SR4
on control module rack in luggage compartment

Reference
For further information about mild hybrid functions, refer to eSelf-Study Program 970293, The 2019 Audi A8 Electrics and Electronics.
Networking
Installation locations of control modules

Always refer to the current service literature for information about the installation location and service procedures for control modules as well as instructions for installation and removal.

Key:

A1  Auxiliary Battery
A6  Battery, 48 V
A7  Voltage converter (48 V/12V)
A27 Output module 1 for right LED headlight
A31 Output module 1 for left LED headlight
J104  ABS Control Module
J136 Memory Seat/Steering Column Adjustment Control Module
J187 Differential Lock Control Module
J234 Airbag Control Module
J245 Sunroof Control Module
J285 Instrument Cluster Control Module
J386 Driver Door Control Module
J387 Front Passenger Door Control Module
J393 Comfort System Central Control Module
J428 Adaptive Cruise Control Module
J500 Power Steering Control Module
J502 Tire Pressure Monitoring Control Module
J519 Vehicle Electrical System Control Module 1
J521 Front Passenger Memory Seat Control Module
J525 Digital Sound System Control Module
J527 Steering Column Electronics Control Module
J533 Data Bus On Board Diagnostic Interface
J605 Rear Lid Control Module
J623 Engine Control Module
J764 Electronic Steering Column Lock Control Module
J769 Lane Change Assistance Control Module
J770  Lane Change Assistance Control Module 2
J772  Rearview Camera System Control Module
J775  Drivetrain Control Module
J792  Active Steering Control Module
J794  Information Electronics Control Module 1
J853  Night Vision System Control Module
J869  Structure-Borne Sound Control Module
J898  Windshield Projection Head Up Display Control Module
J926  Driver Side Rear Door Control Module
J927  Passenger Side Rear Door Control Module
J949  Control Module for Emergency Call Module and Communication Unit
J1088 Control Module for Left Front Object Detection Radar Sensor
J1089 Control Module for Right Front Object Detection Radar Sensor
J1121 Driver Assistance Systems Control Module
J1122 Laser Distance Regulation Control Module

R7    DVD Player
R86   Cellular Telephone Amplifier
R242  Driver Assistance Systems Front Camera
For presentation reasons, the FlexRay topology does not mirror the actual configuration of the control units. The order of the control units in the MOST ring in this illustration is also not identical to the actual sequence.

1) 48 Volt MHEV only
2) 12 Volt MHEV only
3) Vehicles without an additional lithium-ion battery only
Key:

A1  Auxiliary Battery
A6  Battery, 48 V
A7  Voltage Converter (48 V/12V)
A27 Right LED Headlamp Power Output Module 1
A31 Left LED Headlamp Power Output Module 1
C  Alternator
C29 Starter Generator
E1  Light Switch
E67  Driver Volume Control
E265 Rear A/C Display Control Head
EX22 Switch Module in Instrument Panel, Center
EX23 Center Console Switch Module 1
G65  High Pressure Sensor
G355  Humidity Sensor
G397  Humidity Sensor
G578  Anti-Theft Alarm System Sensor
G935  Exterior Air Quality and Humidity Sensor
H12  Alarm Horn
J104  ABS Control Module
J126  Fresh Air Blower Control Module
J136  Memory Seat/Steering Column Adjustment Control Module
J187  Differential Lock Control Module
J217  Automatic Transmission Control Module
J234  Airbag Control Module
J245  Sunroof Control Module
J285  Instrument Cluster Control Module
J367  Battery Monitoring Control Module
J386  Driver Door Control Module
J387  Front Passenger Door Control Module
J392  Rear Sunroof Control Module
J400  Wiper Motor Control Module
J428 Adaptive Cruise Control Module
J453  Multifunction Steering Wheel Control Module
J492  All Wheel Drive Control Module
J500  Power Steering Control Module
J502  Tire Pressure Monitoring Control Module
J521  Front Passenger Memory Seat Control Module
J525  Digital Sound System Control Module
J527  Steering Column Electronics Control Module
J528  Roof Electronics Control Module
J530  Garage Door Opener Control Module
J587  Selector Lever Sensor System Control Module
J605  Rear Lid Control Module
J623  Engine Control Module
J685  Front Information Display Control Head
J706  Passenger Occupant Detection System Control Module
J764  Electronic Steering Column Lock Control Module
J769  Lane Change Assistance Control Module
J770  Lane Change Assistance Control Module 2
J772  Rearview Camera System Control Module
J775  Drivetrain Control Module
J792  Active Steering Control Module
J844  Automatic High Beam Assist Control Module
J853  Night Vision System Control Module
J854  Left Front Seat Belt Tensioner Control Module
J855  Right Front Seat Belt Tensioner Control Module
J866  Power Adjustable Steering Column Control Module
J869  Structure-Borne Sound Control Module
J897  Ionizer Control Module
J898  Windshield Projection Head Up Display Control Module
J926  Driver Side Rear Door Control Module
J927  Passenger Side Rear Door Control Module
J938  Power Rear Lid Opening Control Module
J949  Control Module for Emergency Call Module and Communication Unit
J1060 Front Information Display Control Head 2
J1088 Control Module for Left Front Object Detection Radar Sensor
J1089 Control Module for Right Front Object Detection Radar Sensor
J1101 Fragrance Diffuser System Control Module
J1122 Laser Distance Regulation Control Module
J1146 Mobile Device Charger 1

MX3  Left Tail Lamp
MX4  Right Tail Lamp
MX5  Left Tail Lamp 2
MX6  Right Tail Lamp 2
Bus systems used in the Audi A6

The bus systems used in the 2019 A6 are the same as the 2019 A8 with the exception of the new Connect CAN. It connects Control Module for Emergency Call Module and Communication Unit J949 to the Gateway.

<table>
<thead>
<tr>
<th>Bus system</th>
<th>Wire color</th>
<th>Configuration</th>
<th>Data transfer rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect CAN</td>
<td></td>
<td>Electrical bus system</td>
<td>500 kbit/s</td>
</tr>
</tbody>
</table>

FlexRay

The FlexRay topology of the Audi A6 is identical to that of the 2019 A8. However, All Wheel Drive Control Module J492 may also be connected at branch 2A.

Key:

J217  Automatic Transmission Control Module
J492  All Wheel Drive Control Module
J500  Power Steering Control Module
J533  On Board Data Bus Diagnostic Interface (Gateway)

Reference

For further information about FlexRay, refer to eSelf-Study Program 970293, The 2019 Audi A8 Electrics and Electronics.
Exterior lighting
Headlights

LED headlights (PR No.: 8IT + 8G1/8G0)

Available as ECE\(^1\) and SAE\(^2\) version.
The illustration shows the left headlight in the ECE\(^1\) version.

Lighting functions

› Daytime running light
› Side light
› Low beam
› High beam
› All-weather light
› Turn signal
› Side marker light (SAE only\(^2\), not illustrated)

Special features of the lighting functions

The daytime running lights (“turn signals during the day”) and the marker light (“turn signals at night) remain active while the turn signals are active. This applies to both the ECE\(^1\) and the SAE\(^2\) versions.

Adjusting headlights for driving on other side of road

It is not necessary to adjust the headlights. The legal requirements are met without additional measures.

\(^1\) ECE = for the European market  
\(^2\) SAE = for the North American market
An LED headlight is available as standard for the Audi A6. With one exception, all lighting functions are performed by LEDs. The turn signal is produced by a 24 W bulb. The LEDs for the low beam and the high beam are installed in a projection module. In the top row, the low beam is generated by 6 LEDs.

In the bottom row, 5 LEDs are used for the high beam function.

Thanks to its comparatively simple construction, the LED headlight is the lightest of the three headlights available for the Audi A6 with a weight of approximately 10 lb (4.5 kg).

**Equipment**

The LED headlights can be combined with the high beam assist as an option. A headlight washer system is also available optionally.

**Service**

The control module installed on the outside of the headlight housing, the bulb module for the turn signal, the LED module, and the headlight range control motor (ECE only) can be replaced in the event of a defect. The LED module and the control motor can only be replaced on the ECE version. In the event of damage to the upper and inner headlight attachments, repair tabs can be attached to the headlight housing.

It is very important to keep the inside of the headlight as clean as possible when replacing components inside of the headlight. It is also recommended to use the ESD anti-static mat VAS 6613 to prevent electrostatic discharge. Wear gloves and avoid touching components to protect the parts of the optical system relevant to lighting. Replacing the LED module is a very delicate procedure and requires precise skill from the Technician.
Smart matrix LED headlights (PR No.: 8IT + 8G4)

Available as ECE\(^1\) and SAE\(^2\) version.
The illustration shows the left headlight in the ECE\(^1\) version.

Lighting functions

› Daytime running light
› Marker light
› Low beam
› Matrix beam high beam
› Turn signal
› All-weather light
› Turning light
› Intersection light (in combination with navigation system)
› Highway light
› Cornering light
› Side marker light (SAE only\(^2\), not illustrated)

Special features of the lighting functions

Turn signals during the day:
On the ECE\(^1\) version, the daytime running light is dimmed to marker light level when the turn signal is activated.
On the SAE\(^2\) version, the daytime running lights are switched off during the turn signal procedure.

Turn signals at night:
On both the ECE\(^1\) and SAE\(^2\) versions, the marker light remains active according to the legal requirements for the North American market.

\(^1\)ECE = for the European market
\(^2\)SAE = for the North American market
The smart matrix LED headlight has a one-row matrix high beam. According to the traffic situation detected, 7 LEDs can be switched off individually to avoid blinding vehicles ahead or oncoming vehicles.

The low beam is generated by 8 LEDs. On this headlight version, all lighting functions are performed by LEDs.

**Headlight range adjustment**

The smart matrix LED headlights are equipped with automatic dynamic headlight range adjustment.

**Service**

The control module is installed to the outside of the headlight housing, the LED module (one assembly group for the low beam and one assembly group for the high beam) and the headlight range control motor can be replaced in the event of a defect. The LED module and the control motor can only be replaced on the ECE version.

In the event of damage to the upper and inner headlight attachments, repair tabs can be attached to the headlight housing.

**Equipment**

The Audi A6 with smart matrix LED headlights is installed with a headlight washer system as standard.

It is very important to keep the inside of the headlight as clean as possible when replacing components in the inside of the headlight. It is also recommended to use the ESD anti-static mat VAS 6613 to prevent electrostatic discharge.

Wear gloves and avoid touching components to protect the parts of the optical system relevant to lighting. Replacing the LED modules is a very delicate procedure and requires precise skill from the Technician.
HD matrix LED headlights (PR No.: 8IT + 8G5)
Available as ECE\(^1\) and SAE\(^2\) version.

The illustration shows the left headlight in the ECE\(^1\) version.

**Lighting functions**

› Dynamic daytime running light
› Dynamic marker light
› Low beam
› Matrix beam high beam
› Dynamic turn signal
› All-weather light
› Turning light
› Highway light
› Cornering light
› Intersection light (in combination with navigation system)
› Side marker light (SAE only\(^2\), not illustrated)

**Special features of the lighting functions**

**Turn signals during the day:**
On the ECE\(^1\) version, the daytime running light is dimmed to marker light level when the turn signal is activated.

On the SAE\(^2\) version, the daytime running lights are switched off during the turn signal procedure.

**Turn signals at night:**
The marker light remains active on both the ECE\(^1\) and SAE\(^2\) versions.

The turn signal is dynamic. The marker light and daytime running light are also dynamic and are activated at different moments as part of the “coming/leaving home” function.

\(^1\)ECE = for the European market
\(^2\)SAE = for the North American market
The Audi designation for the two-row matrix headlights first introduced in the Audi A8 is HD (high definition) matrix LED headlights, or matrix 2.0. In this system, the matrix high beam is generated by two rows of LEDs containing 16 LEDs each. With 64 LEDs in the two headlights, it is therefore possible to achieve a very finely graded reduction in the light to avoid blinding other road users.

Equipment

The Audi A6 with HD matrix LED headlights are installed with a headlight washer system as standard.

Headlight range adjustment

The HD matrix LED headlights are equipped with automatic dynamic headlight range adjustment.

Service

The control module installed on the outside of the headlight housing, the printed circuit board, the fan, and the headlight range control motor can be replaced in the event of a defect.

In the event of damage to the upper and inner headlight attachments, repair tabs can be attached to the headlight housing.

It is very important to keep the inside of the headlight as clean as possible when replacing components in the inside of the headlight. It is also recommended to use the ESD anti-static mat VAS 6613 to prevent electrostatic discharge.

Wear gloves and avoid touching components to protect the parts of the optical system relevant to lighting. Replacing the printed circuit board and the fan is a very delicate procedure and requires precise skill from the Technician.

Because of its complex construction, the HD matrix LED headlight is the heaviest of the three headlight versions available for the Audi A6.
Activation of matrix LED headlights

Illustration for left headlight

Vehicle Electrical System Control Module J519 communicates with Left/Right LED Headlamp Power Output Module 1 A31/A37 via a sub-bus system. These output modules activate all lighting functions, the headlight range control motors and, on the matrix headlights, the fan(s).

The control modules are capable of self-diagnosis and can be accessed via Address Word 00D6/00D7. The illustration shows an example of the communication paths and the components involved. The activation process inside the headlight is not relevant for repairs and therefore not shown specifically.

High beam assist

Together with Driver Assistance Systems Front Camera R242, Driver Assistance Systems Control Module J1121 is responsible for the high beam assist function. If the camera detects oncoming vehicles or vehicles ahead, it passes this information on to Driver Assistance Systems Control Module J1121.

J1121 calculates which LEDs in the matrix headlights need to be switched off to avoid blinding other road users. This information is sent to the output modules via the sub-bus system.

On the LED headlights, only two conditions are possible: “high beams on” or “high beams off”.

2) SAE = for the North American market
Calibrating matrix LED headlights

Calibration of the matrix headlights is always required after the following work:

› Headlight position was changed (removed/installed, securing bolts loosened).
› Headlights were adjusted.
› Drivetrain Control Module J775 was recalibrated or renewed.
› Driver Assistance Systems Control Module J1121 was replaced.
› Left Rear Level Control System Sensor G76, Right Rear Level Control System Sensor G77, Left Front Level Control System Sensor G78 or Right Front Level Control System Sensor G289 has been renewed.
› The event memory contains the entry “No or incorrect basic setting / adaption”.

Aligning reference segment

As with the first generation of the matrix LED headlight used in Europe, reference segment is measured using the headlight adjustment unit VAS 621 001 as the first step of the calibration process.

The deviation value is then sent to Driver Assistance Systems Control Module J1121 with the help of the Scan Tool. The yellow line on the image shows which edge the reference segment is being aligned to. In this example, a horizontal deviation of +26 minutes has been determined.

When the low beams are adjusted, the height of the matrix beam high beam module is also corrected due to the inner layout of the HD matrix LED headlight. When the matrix beam high beams are then calibrated, it is sufficient to determine the horizontal deviation of the reference segment. This means that the calibration procedure for the one-row smart matrix and the two-row HD matrix LED headlight is the same.

The illustration shows the reference segment of the left matrix LED headlight

Note

Up-to-date service literature must be used for all checking, repair and adjustment work.
Tail lights

General description

The 2019 A6 uses 2 taillights on each side of the vehicle. One is located in the quarter panel and one in the outer edge of the trunk lid.

Versions

There are 3 possible versions of the tail lights used in the A6. In the SAE market only two are used.

› LED tail lights (low)
› LED tail lights (mid) with dynamic turn signals
› LED tail lights (high) with dynamic turn signals and dynamic tail lights

PR No. 8SK (ECE\(^1\) only)
PR No: 8SP (ECE\(^1\) and SAE\(^2\))
PR No: 8SQ (ECE\(^1\) and SAE\(^2\))

The illustration shows the 8SQ tail lights in the ECE\(^1\) version.

The tail light versions are geometrically identical. The design varies between the ECE\(^1\) and SAE\(^2\) versions. There are differences in the functions and the activation of the tail lights.

The highest equipment version (PR no. 8SQ) is equipped with dynamic turn signals and dynamic tail lights.

Dynamic tail light means that:
The tail lights are lit gradually when Terminal 15 is activated.
The tail light LEDs are activated as part of the “coming/leaving home” function.

Activation

The tail lights are activated by Comfort System Central Control Module J393.
On the 8SQ version, the tail lights are connected to J393 via a LIN data wire in addition to the discrete wires.

On this tail light version, the dynamic turn signal and dynamic tail light commands are sent via the LIN data wire.

\(^1\)ECE = for the European market
\(^2\)SAE = for the North American market
High-mounted brake lights

The high-mounted brake light is located inside the vehicle behind the rear window. 18 LEDs with a power output of 3.2 W support the brake light function. In the event of a fault, the high-level brake light must be replaced as a complete unit.
Convenience electronics on Audi A6

The 2019 A6 offers various convenience functions. Most were adapted from the 2019 Audi A8. Some of the equipment and features listed are optionally available separately or in a package. Please consult the 2019 A6 ordering guide for the latest and most complete information.

› Interior mirror: auto-dimming interior rear view mirror (frame-less) with compass.
› Rear trunk lid with electric open/close function.
› Locking systems: All vehicles are equipped with radio remote keys.
› Garage door opener with GPS support (when the vehicle nears the stored location, a corresponding message appears to trigger the procedure for sending a signal).
› Seating comfort: Front seats with memory function; Front seat and outer rear seat heating; Seat ventilation and seat massage for front seats only.
› Electric steering column adjustment.
› Analog instrument cluster or optional Audi virtual cockpit.
› Head-up display (as optional equipment).
Two different instrument clusters are used for the Audi A6:

- The standard instrument cluster.
- The optional Audi virtual cockpit.

The driver information system in the analog instrument cluster is a high-resolution 7” color display. The following can be displayed:

- Speed (digital speedometer).
- Time.
- Mileage.
- Outside temperature.
- Fuel level warning with remaining range.
- Gear-change indicator in TIP mode.
- Current radio station or music track.
- Radio and media lists.
- Telephone menu.
- Information from the navigation system and messages from the driver assist systems (if installed).

The information provided by the on-board computer’s short-term and long-term memory includes average and current fuel consumption, remaining range, average speed, driving time and distance covered.

The integrated efficiency program helps the driver to drive economically with overviews of consumption data and economy tips, including the rest recommendation.

The Audi virtual cockpit is an innovative, fully digital instrument cluster with the flexibility to display the relevant information according to the driver’s requirements and as needed. The Audi connect services, for example, can also be displayed.

The VIEW button on the multi-function steering wheel allows the driver to switch between two different-sized versions of the round instruments. The display with small instruments allows large, clear graphics to be displayed by the on-board computer and the MMI.

It is possible to display the navigation map as a 3D terrain model on the high-resolution 12.3” Full HD color display.
Central locking

Audi advanced key

The central locking system in the 2019 A6 is similar to the system in the 2019 A7.

Unlocking the vehicle:

A vehicle key must be within the detection area of the vehicle door. If someone reaches into the door handle, the corresponding exterior door handle contact sensor (for example, Driver Exterior Door Handle Touch Sensor G415) reports this to Comfort System Central Control Module J393.

J393 interrogates the vehicle key. This transmits its data back to the central locking system antenna, which is on the printed circuit board of J393. If the key is detected as an authorized vehicle key, J393 transmits a command to the door control modules to unlock the doors via the convenience CAN bus.

Locking the vehicle:

A coded vehicle key must also be in the detection area when the vehicle is being locked. If the driver presses the locking sensor on the exterior door handle (for example, Driver Exterior Door Handle Touch Sensor G415), this signal is transmitted to J393 via the CAN bus. This queries whether there is actually an authorized key in the detection area. After the key has successfully transmitted its data to J393 via a radio signal, J393 sends the locking command to the corresponding door control modules.

Central locking system diagram

![Central Locking System Diagram](image_url)
As soon as the central locking system is woken by a capacitive proximity sensor, a query signal is transmitted to the remote control key in the low frequency (LF) range. The remote control key decodes the low frequency signal and transmits its coding of the high frequency (HF) signal to the central locking system antenna and on to Comfort System Central Control Module J393.

If the data received are correct/if an authorized vehicle key is detected, J393 gives the unlocking command to the corresponding door control unit.

**Front Access/Start Authorization Antenna R376**

Front Access/Start Authorization Antenna R376 is installed at the front of the front bumper. R376 is needed to ensure that communication in the front area of the vehicle is possible — the key needs to be able to determine its position in relation to the vehicle.

MVs are available for R376 and can be viewed using the VAS Scan Tool.

---

**Key:**

- **G415**: Driver Exterior Door Handle Touch Sensor
- **G417**: Left Rear Exterior Door Handle Touch Sensor
- **G750**: Power Rear Lid Opening Sensor
- **G760**: Power Rear Lid Opening Sensor 2
- **R137**: Access/Start System Antenna in Luggage Compartment
- **R138**: Access/Start System Antenna 1 in Vehicle Interior
- **R200**: Left Access/Start Authorization Antenna
- **R201**: Right Access/Start Authorization Antenna
- **R376**: Front Access/Start Authorization Antenna

---

**Block and schematic diagram of transmission frequencies for central locking system**

- Comfort System Central Control Module J393
- HF signal
- LF signal
- Remote control key
- Exterior door handle sensors

Installation location: in front bumper

**Front Access/Start Authorization Antenna R376**

Comfort System Central Control Module J393

On the Audi A6, J393 is installed in the underbody of the luggage compartment, immediately behind the rear seat backrests.

J393 is installed on control module rack.

As the base carrier, the control module rack comes in two different versions. Depending on the vehicle's equipment, a small base carrier or the larger one shown in the illustration is used.

The components attached include:
- Relay and fuse carrier SR4.
- Comfort System Central Control Module J393.
- A 12 Volt power distributor.
- Control Module for Emergency Call Module and Communication Unit J949.
- Cellular Telephone Amplifier R86.
- Differential Lock Control Module J187.

Installation location

- Relay and fuse carrier SR4
- Towing Recognition Control Module J345 (not for the North American Region) J345
- Control Module for Emergency Call Module and Communication Unit J949
- 12 Volt power distributor
- Comfort System Central Control Module J393
- Differential Lock Control Module J187
- Cellular Telephone Amplifier R86
- Parking Heater Radio Receiver R64 (not for the North American Region) R64
- Windshield Defogger Control Module J505 (not for the North American Region) J505
Interior lighting

There are two interior lighting packages available for the 2019 A6 depending on model:

› Ambient lighting package QQ1.
› Contour ambient lighting package QQ2.

Ambient lighting package QQ1 includes all the important lighting functions:

› Both LED roof modules (front and rear, capacitive lights).
› Make-up lights.
› Entry lights (front and rear).
› Illuminated interior door handles (front and rear).
› Illuminated center console storage compartment.
› Glove box light.
› Footwell lights (front and rear).
› Two luggage compartment lights.
› Ambient door panel lighting for doors (front/rear).
› Surround lighting from exterior door handles (front/rear).
› Ambient lighting in instrument panel.

Vehicles equipped with the QQ2 contour ambient lighting package (which includes most of the QQ1 package) have the following items lit with LEDs featuring six pre-defined color profiles:

› Door pockets (front/rear).
› Door contour lighting (front/rear).
› Ambient door panel lighting for doors (front/rear).
› Ambient lighting for front center console.
› Contour lighting for front center console.
› Contour lighting with illuminated quattro badge or illuminated Audi rings (on front-wheel drive vehicles) in the instrument panel on the passenger side.
› Ambient lighting for instrument panel.

An additional interactive and individual color profile is controlled by the Audi drive select modes. A large number of colors are available with the individual color profile. The color adjustments are made separately for contour and ambient lighting.
Climate control

The new technical features which were introduced with the 2019 Audi A8 are continued in the 2019 Audi A6. Many of the new technical features introduced with the 2019 A8 climate control system are continued with the 2019 A6.

For the North American market, the 2019 A8 will use refrigerant R-1234yf at vehicle introduction.

Overview

Fragrance diffuser system

A fragrance diffuser system with two different fragrances is offered for the 2019 A6. The fragrances are kept in cylindrical vials in Fragrance Diffuser System Functional Unit GX43. A small blower guides the fragrance from the vial into the outer front air outlets. In addition to the fragrance type, four levels of intensity can be selected.

Air ionization system

An air ionization system is used in the Audi A6 to improve the air quality. The air ionization system works by negatively charging a limited number of air particles. They are distributed in the vehicle interior via the side and front air outlets. These anions neutralize the dust and similar very small particles that they attract.

Back massage

A back massage function is offered for the front seats of the 2019 A6 depending on model.

The following seven massage programs can be selected.

› Wave
› Pulse
› Stretch
› Rest
› Shoulder
› Activation
› Revitalization

Climate control operation in front of vehicle

Climate control operation is now implemented via two touch displays communicating with Vehicle Electrical System Control Module 1 J519. A separate Climate Control Module J255 is no longer needed. Communication between the touch screens and J519 is via the LIN bus system.

The main new feature regarding the look and feel of the operation are the two displays. The upper MMI display and the lower touch display are both installed centrally in the instrument panel and the center console. The air conditioner functions in the top MMI display can be accessed via the Car menu.

The MMI display can be used, depending on the optional equipment.

To select the following functions and their settings:

› Ionization
› Perfume
› Steering wheel heating
› Synchronization for driver/passenger side
› Climate control for rear passengers/for rear
› Climate control (A/C MAX, A/C OFF, A/C eco)
Climate control in rear of vehicle

Depending on the equipment version, two different operating units may be available in the rear.

› 3-zone climate control
   Rear operating unit with digital temperature display and buttons for seat heating.

› 4-zone air conditioning
   Rear touch operating unit including air conditioner regulation and seat heating, permanently installed in the center console.

3-zone climate control

Rear A/C Display Control Head E265 is used for controlling the system in the rear of the vehicle.

The seat heating can be set on this operating unit in addition to the temperature and the blower speed.

4-zone climate control

The optional Rear A/C Display Control Head E265 is equipped with a sensory surface. It is operated by touch.

The following settings can be made:

› Temperature  
› Blower speed  
› Air distribution  
› Automatic climate control  
› Climate control on/off  
› Seat heating
Passive safety

The following pages provide an overview of the occupant protection system in the 2019 A6.

Components

- Airbag control module
- Adaptive driver airbag
- Adaptive passenger airbag (two-stage passenger airbag)
- Front side airbags
- Curtain airbags
- Knee airbags
- Crash sensors for front airbags
- Front belt retractors with pyrotechnic belt tensioners
- Front belt retractors with electric belt tensioners
- Front belt retractors with switchable belt force limiters

Airbags in vehicle

- Passenger airbag
- Front side airbag
- Knee airbag (passenger side)

Reference

For further information on the airbag control unit J234 and Audi pre sense, please refer to eSelf-Study Program 990493, The 2019 Audi A8 Introduction.
Note
The images in the “Passive safety” chapter are schematic diagrams and are provided to aid understanding.
The system overview shows components which depend on the market and the vehicle equipment.
Additional equipment

Equipment may vary due to the different demands and legal requirements that are made of vehicle manufacturers in the markets.

Key to diagram on Page 46:

- E24 Driver Seat Belt Switch
- E25 Front Passenger Seat Belt Switch
- F390 Driver Side Second Row Seat Belt Switch
- F391 Center Second Row Seat Belt Switch
- F392 Passenger Side Second Row Seat Belt Switch
- G128 Passenger Seat Occupant Detection Sensor
- G177 Rear seat occupied sensor on driver side
- G178 Rear seat occupied sensor on passenger side
- G179 Driver Thorax Airbag Crash Sensor
- G180 Front Passenger Thorax Airbag Crash Sensor
- G256 Driver Side Rear Thorax Airbag Crash Sensor
- G257 Passenger Side Rear Thorax Airbag Crash Sensor
- G283 Driver Front Airbag Crash Sensor
- G284 Passenger Side Front Airbag Crash Sensor
- G551 Driver Belt Force Limiter
- G552 Front Passenger Belt Force Limiter
- G553 Driver Seat Position Sensor
- G554 Front Passenger Seat Position Sensor
- J234 Airbag Control Module
- J285 Instrument Cluster Control Module
- J519 Vehicle Electrical System Control Module
- J528 Roof Electronics Control Module
- J533 Data Bus on Board Diagnostic Interface
- J706 Passenger Occupant Detection System Control Module
- J854 Left Front Seat Belt Tensioner Control Module
- J855 Right Front Seat Belt Tensioner Control Module
- K19 Seat Belt Indicator Lamp
- K75 Airbag Indicator Lamp
- K145 Front Passenger Airbag -Disabled- Indicator Lamp
- N95 Driver Airbag Igniter
- N131 Front Passenger Airbag Igniter 1
- N132 Front Passenger Airbag Igniter 2
- N153 Driver Seat Belt Tensioner Igniter 1
- N154 Front Passenger Seat Belt Tensioner Igniter 1
- N196 Driver Side Rear Seat Belt Tensioner Igniter
- N197 Passenger Side Rear Seat Belt Tensioner Igniter
- N199 Driver Thorax Airbag Igniter
- N200 Front Passenger Thorax Airbag Igniter
- N201 Driver Side Rear Thorax Airbag Igniter
- N202 Passenger Side Rear Thorax Airbag Igniter
- N251 Driver Head Curtain Airbag Igniter
- N252 Front Passenger Head Curtain Airbag Igniter
- N253 Battery Interrupt Igniter
- N295 Driver Knee Airbag Igniter
- N296 Front Passenger Knee Airbag Igniter
- N297 Driver Seat Belt Tensioner Igniter 2
- N298 Front Passenger Seat Belt Tensioner Igniter 2
- N490 Driver Airbag Release Valve Igniter
- N491 Front Passenger Airbag Release Valve Igniter
- N563 High-Voltage Battery Interrupt Igniter
- N751 Battery Interrupt Igniter, 48 Volt
- T16 Data Link Connector

Wiring colors:
- Orange: Diagnostics CAN
- Yellow: Sub-bus system
- Magenta: FlexRay
- Pink: Instrument panel insert CAN
- Green: Input signal
- Blue: Output signal
- Black: Convenience CAN 2
Driver assist systems

Introduction
This topic begins with short descriptions of the five most important innovations in the 2019 A6. All of these innovations made their début in the 2019 Audi A8.

The innovations concern new hardware which continues to pave the way for autonomous driving, a new and innovative operating concept, and new driver assist systems.

Further information on all the new features can be found on the following pages and more detailed information is available in eSelf-Study Program 990393, The 2019 A8, Driver Assistance System.

Top driver assist system innovations in the Audi A6

Driver Assistance Systems Control Module J1121
J1121 is the first step towards reducing the number of control modules for driver assist systems. With an eye on the major vision of autonomous driving, Audi is gradually moving away from the decentralized approach of individual control modules to one with a powerful central computer. There are four versions of control module J1121. The version installed depends on the assist systems in the vehicle.

Laser Distance Regulation Control Module J1122
The 2019 A6 does not require two long range radar sensors to implement the longitudinal regulation functions of the adaptive cruise assist system. They are replaced with a combination of a radar sensor and a laser scanner. The laser scanner is installed at the front of the vehicle. It has a scanning angle of approximately 145 degrees and can detect objects up to 87 yd (80 m) away. A significant strength of the laser scanner is that its measurement precision is not dependent on how far away an object is.

Profile master for driver assist systems
The profile master is a new operating concept that specifies the activation conditions for the different driver assist systems. A total of eight driver assist systems participate in the profile master system. The customer can choose between three profiles: maximum, individual and basic. The maximum setting switches all participating systems on. With the individual setting, the customer decides which systems to activate and with basic, a maximum of two permanently specified systems are switched on.

Intersection assist
The intersection assist helps the driver to avoid collisions with road users crossing the vehicle’s path. The intersection assist works between speeds of 0 - 19 mph (30 km/h). However, a brake application is only made at speeds of up to 6 mph (10 km/h). The intersection assist is very similar to the rear cross-traffic assist. The main difference is that the intersection assist performs its task in front of and not behind the vehicle.

Lane departure warning and adaptive cruise assist
The two “new” assist systems in the Audi A6 (“lane departure warning” and “adaptive cruise assist”) have been made from the existing Audi adaptive cruise control, Audi active lane assist and traffic jam assist systems. The lane departure warning warns the driver if there is a risk of inadvertently leaving the current lane. However, the adaptive cruise assist offers the customer combined longitudinal and lateral guidance for the vehicle at speeds between 0 - 155 mph (250 km/h).
Driver Assistance Systems Control Module J1121

Introduction

Driver Assistance Systems Control Module J1121 will be standard equipment for 2019 Audi A6 models in the North American Region. This is because Audi Pre sense front, which requires J1121 for its functions, has been specified as standard equipment in these markets.

With the introduction of J1121, Driver Assistance Systems Front Camera R242 is no longer the master module for various driver assist systems. In the 2019 A6, the front camera still captures the area in front of the vehicle. However, images from the camera are processed in J1121. J1121 is now the master module for all driver assist systems for which calculations were previously performed by R242.

These include the following driver assist systems:

› High beam assist.
› Camera-based traffic sign recognition.
› Lateral vehicle guidance (lane departure warning and lane guidance by the adaptive cruise assist).
› Emergency assist.

J1121 remains the master control unit for the following driver assist systems:

› Surround view cameras (there is no longer a separate control module for Peripheral Camera Control Module J928.).
› Intersection assist (introduced in the Audi A8).

Versions of J1121

There are four versions of control module J1121: A0, A, B and C. The version installed in the vehicle depends on the vehicle configuration.

J1121 in the 2019 A6 has the same part numbers as J1121 in the 2019 A8.

4N0.907.107. The control module versions can only be differentiated by the index letters following the part number.
Profile master for driver assist systems

A new operating concept for switching the different driver assist systems on and off was introduced for the first time in the Audi A8: the profile master for driver assist systems. The aim when the concept was under development was not to increase the number of controls, but to reduce it. This is intended to keep the operation of the various driver assist systems simple for the customer, despite the increasing number of systems. The profile master is now being introduced in the Audi A6.

Overview of all driver assist systems participating in the profile master system

› Lane change warning
› Emergency assist
› Rest recommendation
› Exit warning system
› Night vision assist
› Distance warning
› Intersection assist
› Audi pre sense

The three profiles for the profile master for driver assist systems

› Maximum:
  All systems in the vehicle participating in the profile master system are switched on.

› Individual:
  The customer can specify which individual driver assist systems are switched on.

› Basic:
  Only two systems are switched on: Audi pre sense and the emergency assist. If neither system is installed, the “Basic” profile is replaced with the “All off” profile.

Viewing the profile master for driver assist systems

The customer can view the profile master for driver assist systems in two different ways:

› By selecting the basic function “Car” and then “Driver assist systems” after pressing the home button.
› By pressing the profile master button, which is located in a row of buttons in the center console.

The profile master disappears from the display again after five seconds if the second method is used and if no touch input was detected on the upper touch display in that time.

Some of the driver assist systems offered in the Audi A6 can be switched on and off in the profile master for driver assist systems. Other driver assist systems which the driver switches on and off specifically while the vehicle is moving continue to use the classic controls. These include, for example, the parking aid, the park assist and the adaptive cruise assist.
Lane departure warning

Description of function

The lane departure warning on the Audi A6 is an independent system. This function was previously known as Audi active lane assist with the steering input set to “late”. The lane departure warning warns the driver if the vehicle is at risk of leaving its current lane without switching on the corresponding turn signal. If the turn signal is not activated, the system assumes that the driver does not intend to leave the lane.

The lane departure warning can be given in three different ways:

› By steering input from the system towards the middle of the lane.
› By a steering wheel vibration (this warning can be switched off on the MMI).
› By coloring the lane demarcation line red in the function displays.

The lane departure warning is switched on and off via a virtual button on the lower touch display. If the lane departure warning is switched off, this can be seen via a red bar above the function’s symbol. If the lane departure warning is switched off, this only applies for one Terminal 15 cycle. It is active again the next time the ignition is switched on, regardless of whether it was on or off when the ignition was switched off.

Lane departure warning - optical warning

In the two images below, the optical warning “vehicle is at risk of leaving the lane towards the right” is shown.

The image below on the left shows the warning as it can be seen in the driver assist view of the on-board computer; the image on the right shows how it appears in the speedometer.

Master control module

The master control module for the lane departure warning is Driver Assistance Systems Control Module J1121. Version A0 is sufficient for this function.

Note
The steering assist button on the end of the turn signal lever is not relevant to the lane departure warning. It is only used to activate and deactivate the lane guidance system of the Adaptive cruise assist.
Adaptive cruise assist

Description of function

The adaptive cruise assist offers combined longitudinal and lateral guidance at speeds between 0 - 156 mph (0 - 250 km/h). Longitudinal guidance refers to accelerating and braking and lateral guidance refers to steering the vehicle. Because the longitudinal and lateral guidance has been merged with the adaptive cruise assist, the driver assist systems “Audi adaptive cruise control (ACC)” and “Audi active lane assist (AALA)” can no longer be ordered for the Audi A6.

Restructuring of the longitudinal and side regulating systems

Audi has fundamentally restructured the functions of the Audi adaptive cruise control and the Audi active lane assist for the introduction of the new Audi C and D segment models. This has created the lane departure warning and the adaptive cruise assist.

The section of the Audi active lane assist with “early” steering input, the “lane guidance”, has been integrated into the adaptive cruise assist. The section with “late” steering input has become an independent system with the new designation “lane departure warning”.

The lane guidance can be switched off on the adaptive cruise assist so that only longitudinal guidance remains active. If lane guidance is switched off, the vehicle behaves as it would previously have done when driving with adaptive cruise control. However, it is not possible to deactivate longitudinal guidance on the adaptive cruise assist when lane guidance is active at the same time.

The restructuring is shown by the diagram below. It is a comparison of the systems in the 2017 Q7 and 2017 A4/A5 with those in the 2019 A8 and A6.
Displays and operation

There have been changes to the function symbols and displays for the vehicle side guidance systems. If lane guidance is active in the adaptive cruise assist, this is shown by green triangles on the left and right of the vehicle.

If two white triangles appear, lane guidance is switched on but not active. If no triangles are visible, lane guidance is switched off.

The steering assist button on the end of the turn signal lever is only used to switch lane guidance on and off. The lane departure warning has received its own on/off button. This is located in the virtual row of buttons on the lower touch display.

Hardware and sensors

Both a long range radar sensor and a laser scanner are installed on the Audi A6 to implement the longitudinal regulation functions of the adaptive cruise assist.

The steering assist button on the end of the turn signal lever is only used to switch lane guidance on and off. The lane departure warning has received its own on/off button. This is located in the virtual row of buttons on the lower touch display.

Combining the strengths of two types of sensor means that the longitudinal regulation functions perform better than they would if two sensors of the same type were used.

Master control module

The master control module assigned to the entire adaptive cruise assist function is Control Module for Adaptive Cruise Control J428. However, the adaptive cruise assists basic functions (longitudinal and side regulating function) are implemented in different control modules.

The master for longitudinal regulation functions is J428 and the master for side regulation functions is Driver Assistance Systems Control Module J1121.
Laser Distance Regulation Control Module J1122

Laser Distance Regulation Control Module J1122 is located behind the grille on the right side of the Audi rings. It has two washer jets on each side for cleaning.

Control Module for Adaptive Cruise Control J428

Only one radar unit (J428) is installed on the 2019 A6. The laser scanner takes over the functions previously provided by the second radar unit. The fourth-generation system used in the Audi A6 has the same layout and works in the same way as the system in the Audi A8 and A7; it is also serviced in the same manner.

The radar unit is installed on the left-side of the vehicle in the front bumper next to the Audi rings. For design reasons, the sensor unit has been installed with a trim cover which is optically similar to the radome of the laser scanner. J428 also communicates via FlexRay channel B in the Audi A6.

Reference
For further information on the radar sensor and the laser scanner, please refer to eSelf-Study Program 990393, The 2019 Audi A8 Driver Assistance Systems.
New lane guidance features

With the introduction of the adaptive cruise assist, the lane guidance is, for the first time, available to customers right up until the vehicle is stationary. This of course only applies if all the requirements for the lane guidance have been met.

Because of the lowering of the activation speed to 0 mph (0 km/h), Audi found further objects/structures which could also be used to facilitate a lane guidance system. The Audi active lane assist only allowed lane guidance on the basis of road markings.

The system still assumes that the road has two lanes if its width exceeds a defined minimum. If this is assumed, lane guidance can be implemented on the basis of the detected right lane marking and a virtual center line.

Calculating the progression of the virtual center line is the job of Driver Assistance Systems Control Module J1121. As an alternative to the right lane marking, lane guidance can also, at lower speeds, be performed using one of the structures specified above.

New predictive efficiency assist features

The predictive efficiency assist was offered for the first time in 2017 in the Audi Q7. In the Audi Q7, it is a subordinate function to the Audi adaptive cruise control (ACC). It gives the option for the vehicle’s longitudinal guidance not only to regulate to a speed set by the driver, but also to adapt that speed automatically to the speed limits detected by the camera-based traffic sign recognition system. In addition, it is possible to adjust the vehicle’s speed for an upcoming corner as well as to reduce the vehicle’s speed before a roundabout which will then be driven through. The focus of the function is a predictive driving style focused on fuel saving via longitudinal regulation.

On the Audi A6, the predictive efficiency assist can also adjust the speed when the vehicle is approaching an intersection with stop signs and all other requirements for this have been met. In this case, the system automatically reduces the vehicle’s speed to 15 km/h. Continuing to brake the vehicle remains the responsibility of the driver. As with the adaptive cruise assist, the entire predictive efficiency assist function is a driver assist system. The driver alone remains responsible for controlling the vehicle at all times.
Camera-based traffic sign recognition

Description of function

The third generation of the camera based traffic sign recognition is available for the 2019 A6. It now recognizes the signs on the right.

For further information, please refer to eSelf-study Program 990393, The 2019 Audi A8 Driver Assistance Systems.

Master control module

The master control module for the camera-based traffic sign recognition is Driver Assistance Systems Control Module J1121. At least control module version A is required for this system.

<table>
<thead>
<tr>
<th>USA</th>
</tr>
</thead>
</table>

![Speed limit within the confines of road construction.](image)

![Recommended speed limit on freeway entry and exit ramps.](image)

![It is generally permissible to turn right at a red traffic light. If it is not permitted it is indicated to driver by a corresponding sign.](image)
Emergency assist

Function

Emergency assist has been designed for situations in which the driver has incurred an medical emergency and, for this reason, is no longer able to operate the vehicle.

The task of emergency assist in this situation is to take over longitudinal and lateral control of the vehicle and bring it to a controlled stop in its own lane.

During the braking operation the following measures are taken:

› The hazard warning flashers are activated to warn other road users.

› The seat belt is fully tensioned during the final standstill braking operation.

› The windows and the panoramic sunroof close automatically

If emergency assist fails to detect the driver’s hands on the steering wheel for a defined period of time, it assumes than an acute emergency has occurred. A special software algorithm, the “hands-off detector”, has been developed in order to detect this. This is a known feature of Audi active lane assist.

For this purpose, the system takes the following action before and during the braking maneuver:

› Display of text messages in the instrument cluster.

› Acoustic signal output.

› Initiation of brake warnings.

› Initiation of a strong emergency brake warning.

› Brief tightening of the driver’s seat belt.

› Muting of infotainment system.

If the vehicle is traveling at too high a speed as it approaches traffic ahead, braking power is increased to slow the vehicle down. In this way, the system attempts to avoid an impending rear-end collision or to reduce the severity of such a collision.

When emergency assist is active, a series of in-car measures are taken in order to protect the driver and minimize the risk of a collision.

After the vehicle has come to a standstill, the following measures are taken:

› Selector position “P” is engaged.

› The vehicle doors are unlocked.

› The interior light is switched on.

› An emergency call is sent.

To facilitate hand-off detection, the signal from the steering torque sensor is analyzed in an ongoing basis. This characteristic tells the software whether or not the driver’s hands are on the steering wheel. Use of the accelerator and brake pedal is a further criterion for driver inactivity.

Inducing the driver to take control of the vehicle

A second, key function of emergency assist is to alert an inactive driver to take control of the vehicle by taking various measures.

For this purpose, the system takes the following action before and during the braking maneuver:

› Display of text messages in the instrument cluster.

› Acoustic signal output.

› Initiation of brake warnings.

› Initiation of a strong emergency brake warning.

› Brief tightening of the driver’s seat belt.

› Muting of infotainment system.

After all, it is also possible that the driver is distracted and, for this reason, is not concentrating on driving although able to drive.

If the driver is ready to again take control of driving the vehicle, the driver can indicate this through any of the following measures:

› The driver again actively takes over steering the vehicle.

› The driver applies the footbrake.

› The driver presses down on the accelerator.

Emergency assist master control module

The master control module for emergency assist is Driver Assistance Systems Control Module J1121. The basic version A0 is sufficient for emergency assist.

Connectivity to other driver assistance systems is not a mandatory requirement for emergency assist in the Audi A6.

If adaptive cruise assist is not installed on the vehicle, longitudinal control of the vehicle is implemented using Driver Assistance Systems Front Camera R242.

The longitudinal control function is required by emergency assist in order to increase braking power. The idea is, when possible, to avoid a collision with slower vehicles when traveling at a high rate of speed. In this case, R242 normally replaces the front radar sensor required for longitudinal control (J428 Control Module for Adaptive Cruise Control) and Laser Distance Regulation Control Module J1122.
Intersection assist helps the driver to avoid collisions with road users crossing the vehicle's path. These road users can be normal vehicles, buses or lorries, but also cyclists or motorbike riders.

The intersection assist, for example, provides assistance in the following traffic situation:

The red vehicle (equipped with the intersection assist) is standing at an intersection and wishes to drive straight across it. To do so, the driver needs to pay attention to the traffic coming from both the left and right on the main road. On both sides, the crossing traffic consists of a car and a bicycle. If the driver of the red vehicle were now to move off, the intersection assist would activate and would, depending on the current estimation of the danger level, warn the driver or apply the brakes.

Intersection assist operates between speeds of 0 - 19 mph (0 - 30 km/h). However, a brake application is only made at speeds of maximum 6 mph (10 km/h).

The intersection assist is very similar to the rear cross-traffic assist, which was offered for the first time in the 2017 Q7. It corresponds to a front cross-traffic assist, but Audi has decided to call it the intersection assist.

Sensors

Intersection assist operates between speeds of 0 - 19 mph (0 - 30 km/h). However, a brake application is only made at speeds of maximum 6 mph (10 km/h).

In service, they are referred to as:
- Control Module for Left Front Object Detection Radar Sensor J1088.
- Control Module for Right Front Object Detection Radar Sensor J1089.

If a cyclist or motorbike rider is detected by the system, the same warnings are given as with a vehicle.

Master control module

The master control module for the intersection assist is Driver Assistance Systems Control Module J1121. At least control module version B is required if the intersection assist is installed in the vehicle.
Surround view cameras

The surround view cameras are now in their third generation; this generation.

The software for the 3rd generation surround view camera function is now integrated in the Driver Assistance Systems Control Module J1121 along with the software for other driver assist systems. The surround view cameras require version C of J1121.

All four surround view cameras transmit their images to J1121 via screened LVDS wires. J1121 then generates the vehicle view desired by the customer from the camera images. The vehicle view is transmitted to Information Electronics Control Module 1 J794 via two screened LVDS wiring pairs as a Full HD image. The image is shown on the upper touch display.

If the vehicle has both the parking system plus and the surround view cameras as optional equipment, 6th generation ultrasonic sensors are used to meet the requirements of the surround view camera system. The data from these ultrasonic sensors can only be read by J1121 (version C). In this case, J1121 is the master control module for the surround view cameras and also the parking system plus.

If the vehicle has the parking system plus but not the surround view cameras as optional equipment, 5th generation ultrasonic sensors are used. The data from these can only be read by Vehicle Electrical System Control Module J519. In this case, Vehicle Electrical System Control Module J519 is the master control unit for the parking system plus. The customer can also order the park assist in this configuration. On the Audi A6, the master control unit for the park assist is always the Vehicle Electrical System Control Module J519.

<table>
<thead>
<tr>
<th>Assist systems for parking</th>
<th>Ultrasonic sensors</th>
<th>Master control module for systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park assist</td>
<td>Back-up camera</td>
<td>Surround view cameras</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>

Possible combinations of different assist systems for parking at the launch of the Audi A6.

The installation positions of the surround view camera in the exterior mirrors have been changed to extend their range. They are located further outwards in the exterior mirrors and no longer “look” vertically downwards, but are tilted outwards. This allows the side detection area to be enlarged, which allows the area around the vehicle to be detected better.

With the third generation of the surround view cameras, two more two dimensional vehicle views are available:

- Simultaneous view of the front left and front right wheels.
  -and-
- Simultaneous view of the rear left and rear right wheels.

A three dimensional view of the vehicle is available to customers for the first time with the third generation surround view cameras.

The viewing angle of the vehicle is not specified by the system, but can be freely chosen by the customer via the touchscreen. It is still possible to choose between three different preset viewing angles via three virtual buttons in the row of buttons.
The Audi A6 features the MIB2+ version of the modular infotainment matrix infotainment system. Customers can choose between three MMI versions:

- MMI radio plus
- MMI navigation
- MMI navigation plus

All three versions are based on the 2+ High version of the modular infotainment matrix; MIB2+ High for short.

The MMI navigation and MMI navigation plus versions may be equipped with Audi connect, depending on the country. However, they differ regarding the services available.

The license period is three years after the vehicle’s first registration. It can be renewed after this time has elapsed.

Depending on the country, the following Audi connect infotainment services may be available with MMI navigation:

- Navigation data update (4 times per year online or via SD card via myAudi portal).
- Online routing.
- Individual news.
- Online traffic information.
- Twitter.
- Weather.
- Fuel prices.
- Parking information.
- Travel information.
- Destination entry via myAudi app.

MMI navigation plus may, depending on the country, have the following additional Audi connect infotainment services:

- Connected radio (no license period limits, but separate data package required).
- Google Earth.
- Google POI search via speech control.
- 3D city models.
- Messages (text message dictation) and e-mail.
- Traffic sign information.
- Hazard alerts.

If the vehicle is equipped with Audi connect vehicle-related services (IW3), the following services may be available, depending on the country:

- Audi emergency call (license period: 10 years)
- Online roadside assistance (license period: 10 years)
- Audi service request (license period: 10 years)
- Vehicle status report (for example, Mileage, fuel tank level, etc.) (license period: 3 years)
- Remote locking/unlocking (license period: 3 years)
- Parking position (license period: 3 years)

Reference
For further information on MIB2+, please refer to eSelf-Study Program 990293 The 2019 A8 Infotainment and Audi Connect Systems.
## MMI navigation (I8V + 7UG)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.8” touch display</strong></td>
<td>1280 x 720 pixels</td>
</tr>
<tr>
<td>3D navigation system on SSD (7UG)</td>
<td></td>
</tr>
<tr>
<td>7” display in instrument cluster with driver information system (957)</td>
<td>Audi virtual cockpit (958)</td>
</tr>
<tr>
<td>AM/FM radio</td>
<td></td>
</tr>
<tr>
<td>Satellite radio (Sirius) (QV3)</td>
<td></td>
</tr>
<tr>
<td>Audi music interface with 2 USB sockets, 1 SDXC card reader and, depending on country, 1 SIM card reader (UF7)</td>
<td>Audi music interface with 2 USB sockets, 1 SDXC card reader and, depending on country, 1 SIM card reader (UF7)</td>
</tr>
<tr>
<td>Audi Sound System 9VD</td>
<td>Bang and Oulfsen 9VS</td>
</tr>
<tr>
<td>Bluetooth interface (9ZX)</td>
<td></td>
</tr>
<tr>
<td>UMTS/LTE data module (EL3) including Audi connect (IT1/IT3)</td>
<td>UMTS/LTE data module (EL3) including Audi connect (IT1/IT3)</td>
</tr>
<tr>
<td>Emergency call &amp; Audi connect vehicle-related services (IW3)</td>
<td>Emergency call &amp; Audi connect vehicle-related services (IW3)</td>
</tr>
</tbody>
</table>

### Optional equipment

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single DVD drive (7D5) (Optional)</td>
<td>Single DVD drive (7D5) (Optional)</td>
</tr>
<tr>
<td>Audi music interface in rear with 2 USB sockets (UF8)</td>
<td>Audi music interface in rear with 2 USB sockets (UF8)</td>
</tr>
<tr>
<td>Audi smartphone interface (IU1)</td>
<td>Audi smartphone interface (IU1)</td>
</tr>
<tr>
<td>Audi phone box including wireless charging (9ZE)</td>
<td>Audi phone box including wireless charging (9ZE)</td>
</tr>
<tr>
<td>Audi phone box, light (for wireless charging only) (9ZV)</td>
<td>Audi phone box, light (for wireless charging only) (9ZV)</td>
</tr>
<tr>
<td>Audi sound system (9VD)</td>
<td>Bang &amp; Olufsen Premium Sound System with 3D sound (9VS) (Standard)</td>
</tr>
<tr>
<td></td>
<td>Bang &amp; Olufsen Advanced Sound System with 3D sound (8RF) (Optional)</td>
</tr>
</tbody>
</table>

## MMI navigation plus (I8T + 7UG)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10.1” touch display</strong></td>
<td>1540 x 720 pixels</td>
</tr>
<tr>
<td>3D navigation system on SSD (7UG)</td>
<td></td>
</tr>
<tr>
<td>AM/FM radio</td>
<td>AM/FM radio Connected radio (Internet radio)</td>
</tr>
<tr>
<td>Satellite radio (Sirius) (QV3)</td>
<td>Satellite radio (Sirius) (QV3)</td>
</tr>
<tr>
<td>Audi music interface with 2 USB sockets, 1 SDXC card reader and, depending on country, 1 SIM card reader (UF7)</td>
<td>Audi music interface with 2 USB sockets, 1 SDXC card reader and, depending on country, 1 SIM card reader (UF7)</td>
</tr>
<tr>
<td>Bang and Oulfsen 9VS</td>
<td></td>
</tr>
<tr>
<td>Bluetooth interface (9ZX)</td>
<td>Bluetooth interface (9ZX)</td>
</tr>
<tr>
<td>UMTS/LTE data module (EL3) including Audi connect (IT1/IT3)</td>
<td>UMTS/LTE data module (EL3) including Audi connect (IT1/IT3)</td>
</tr>
<tr>
<td>Emergency call &amp; Audi connect vehicle-related services (IW3)</td>
<td>Emergency call &amp; Audi connect vehicle-related services (IW3)</td>
</tr>
</tbody>
</table>

### Optional equipment

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single DVD drive (7D5) (Optional)</td>
<td></td>
</tr>
<tr>
<td>Audi music interface in rear with 2 USB sockets (UF8)</td>
<td>Audi music interface in rear with 2 USB sockets (UF8)</td>
</tr>
<tr>
<td>Audi smartphone interface (IU1)</td>
<td></td>
</tr>
<tr>
<td>Audi phone box including wireless charging (9ZE)</td>
<td>Audi phone box including wireless charging (9ZE)</td>
</tr>
<tr>
<td>Audi phone box, light (for wireless charging only) (9ZV)</td>
<td>Audi phone box, light (for wireless charging only) (9ZV)</td>
</tr>
<tr>
<td>Audi sound system (9VD)</td>
<td>Bang &amp; Olufsen Premium Sound System with 3D sound (9VS) (Standard)</td>
</tr>
<tr>
<td></td>
<td>Bang &amp; Olufsen Advanced Sound System with 3D sound (8RF) (Optional)</td>
</tr>
</tbody>
</table>
Sound

The following sound systems are available for the 2019 A6 depending on the model version:

› Audi sound system (9VD).

› Bang & Olufsen Premium Sound System with 3D sound (9VS).

› Bang & Olufsen Advanced Sound System with 3D sound (8RF). The Bang & Olufsen Premium Sound System (9VS) provides the customer with a 15-channel sound system. It can reach a total power output of 705 W.

The premium sound system requires two loudspeakers to generate the 3D sound. They are installed in the A-pillars.

Bang & Olufsen Advanced Sound System with 3D sound (8RF)

The best sound quality experience for customers is provided by the Bang & Olufsen Advanced Sound System. This system has 19 channels and reaches a total power output of 1820 W.

The Bang & Olufsen Advanced Sound System requires four loudspeakers to generate the 3D sound. Two of these are in the A-pillars and two are in the headliner in front of the handle.

On the Bang & Olufsen Advanced Sound System, the two treble loudspeakers in the instrument panel are retractable.
Antennas

DAB antenna 1

Antenna Amplifier 2
R111

FM2 connection

DAB connection
For further information on the mobile phone antenna in the Audi A6, please refer to eSelf-Study Program 990593 The 2019 Audi A7 Introduction.
<table>
<thead>
<tr>
<th>Maintenance Item</th>
<th>3.0 ltr. TFSI engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine oil change</td>
<td>TBD</td>
</tr>
<tr>
<td>Inspection</td>
<td>TBD</td>
</tr>
<tr>
<td>Pollen filter change interval</td>
<td>TBD</td>
</tr>
<tr>
<td>Air filter change interval</td>
<td>TBD</td>
</tr>
<tr>
<td>Brake fluid change interval</td>
<td>TBD</td>
</tr>
<tr>
<td>Spark plug change interval</td>
<td>TBD</td>
</tr>
<tr>
<td>Fuel filter change interval</td>
<td>–</td>
</tr>
<tr>
<td>Valve gear</td>
<td>Chain (maintenance-free)</td>
</tr>
<tr>
<td>ATF change interval</td>
<td>TBD</td>
</tr>
<tr>
<td>Read out ash deposit mass in diesel particulate filter (in km)</td>
<td>–</td>
</tr>
<tr>
<td>Air ionization system Vials in function unit for Fragrance Diffuser System Functional Unit GX43</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Knowledge assessment

An On-Line Knowledge Assessment (exam) is Available for this eSelf-Study Program.

The Knowledge Assessment is required for Certification credit.

You can find this Knowledge Assessment at: www.accessaudi.com

From the accessaudi.com Homepage:

› Click on the “App Links”

› Click on the “Academy site CRC”

Click on the Course Catalog Search and select “990693 - The 2019 Audi A6 Introduction”

Please submit any questions or inquiries via the Academy CRC Online Support Form which is located under the “Support” tab or the “Contact Us” tab of the Academy CRC.

Thank you for reading this eSelf-Study Program and taking the assessment.