The 2017 Audi Q7 Introduction
For maintenance and repair work, always refer to the current technical literature. It is not a Repair Manual! All values given are intended as a guideline only. For maintenance and repair work, always refer to the current technical literature.
Both technically and in terms of the Audi Q7 design, it embodies the spirit of the Audi quattro. The design of the new Audi Q7 is masculine and resolute. Horizontal lines extend above the wheels. They are a subtle homage to the classic quattro models by Audi.

In a growing segment, the Audi Q7 cuts a confident figure with its impressive exterior, superior build quality and its sporty and efficient engine technology.

The new Audi Q7 is an imposing car. Although it is shorter and narrower than its predecessor, the passenger compartment is longer and offers more headroom. 20 years of experience in lightweight design have gone into the development of the new Audi Q7.

Lightweight construction has been applied in all areas, from the electrical system to the luggage compartment floor. The key is the body structure, a new multi-material design involving the use of aluminum castings, extruded sections and panels in the front and rear ends as well as the superstructure.

The new Audi Q7 welcomes its passengers with an atmosphere of cultivated elegance and spaciousness. The instrument panel is visually separated from the center console, accentuating the sportiness and lightness of the interior.

Two powerful engines will be available at the introduction of the 2017 Q7: a 3.0l V6 TDI and a 3.0l V6 TFSI. A 2.0l TFSI engine will be offered at a later date. Thanks to intensive refinements, the CO₂ emissions of both engines has been reduced.

Smooth, fast, lightweight and efficient. In the new Audi Q7, a newly developed eight-speed Tiptronic transfers the engine’s power to the quattro permanent all-wheel drive system.

Learning objectives of this eSelf Study Program:

This eSelf Study Program describes the design and function of the 2017 Audi Q7. After reading this eSelf-Study Program, you will be able to answer questions on the following topics:

- New features of the multi-material body structure.
- New features of the occupant protection system.
- Engine/transmission combinations.
- New features of the running gear and suspension.
- Modifications to the electronics and the driver assistance systems.
- New features of the electrical system and networking.
- New features of the climate control system.
- Modifications and new features of the Infotainment system.
The new Audi Q7 is a statement of our competence. Its reduced weight and low center of mass make it extremely agile. With a curb weight of only 4398 lb (1995 kg), it weighs 716 lb (325 kg) less than its predecessor.

Although the exterior dimensions are smaller it offers substantially more interior room for passengers and luggage than its predecessor. Its innovative assistance and infotainment systems take the SUV to the front of the pack.

**Engines**
6-cylinder V engines with turbocharger and start-stop system:
- 3.0l TFSI - 330 hp (245 kW)
- 3.0l TDI - 270 hp (200 kW)

**Assistance systems**
The following systems are optionally available:
- Rear cross traffic alert
- ACC stop & go including traffic jam assistant
- Audi active lane assist
- Audi pre sense basic, front, rear and city
- Vehicle exit assist
- Night vision assist
- Collision avoidance assist
- Turn assist

**Headlights**
Depending on trim level, the Q7 comes with either xenon, LED headlights. The daytime running lights of the LED headlights are shaped like a double arrow.

**Climate control**
A three-zone climate control system is standard equipment while a four-zone system is optionally available.
Body
Ultra-high-strength parts made of hot-shaped steel form the backbone of the occupant cell. Aluminum castings, extruded sections and panels are used in the front and rear as well as the super-structure. Other components made entirely of aluminum are the doors, the front fenders, the hood and the rear hatch. A two-piece panoramic glass sunroof is standard.

Power transmission
A newly developed eight-speed Tiptronic transfers the engine’s power to the quattro all-wheel drive system. Besides automatic mode, the driver can also choose to control the Tiptronic using the standard paddles on the steering wheel or using a selector lever. In both cases, the commands are transmitted entirely electrically.

Displays and operation
Displays appear on the central MMI monitor which raises up from the instrument panel when the system is started. The focal point of the operating system is the MMI center with a full touch surface. The main functions can be accessed using the rotary pushbutton and two rocker switches. Depending on trim level, the Audi Q7 features a fully digital instrument cluster - the Audi virtual cockpit.

Chassis
The standard Audi drive select driving dynamics system works together with the adaptive air suspension to offer six modes. The all-wheel steering system with electric drive adjusts the rear wheels by as much as 5 degrees depending on the situation. This increases vehicle agility and reduces the turning radius by up to three feet (one meter).
### Exterior dimensions and weights

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>198.9 in (5052 mm)</td>
</tr>
<tr>
<td>Width (not including exterior mirrors)</td>
<td>77.5 in (1968 mm)</td>
</tr>
<tr>
<td>Width (including exterior mirrors)</td>
<td>87.1 in (2212 mm)</td>
</tr>
<tr>
<td>Height</td>
<td>68.5 in (1741 mm)</td>
</tr>
<tr>
<td>Front track width</td>
<td>66.1 in (1679 mm)</td>
</tr>
<tr>
<td>Rear track width</td>
<td>66.6 in (1691 mm)</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>117.9 in (2994 mm)</td>
</tr>
<tr>
<td>Curb weight</td>
<td>4343 lb (1970 kg)¹</td>
</tr>
<tr>
<td>Gross vehicle weight</td>
<td>6041 lb (2740 kg)²</td>
</tr>
<tr>
<td>Drag coefficient (c_w)</td>
<td>0.32</td>
</tr>
</tbody>
</table>

### Inner dimensions and other specifications

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front cabin width</td>
<td>61.8 in (1571 mm)³</td>
</tr>
<tr>
<td>Front headroom</td>
<td>42.2 in (1071 mm)⁴</td>
</tr>
<tr>
<td>Front shoulder width</td>
<td>59.5 in (1512 mm)³</td>
</tr>
<tr>
<td>Rear headroom (6)</td>
<td>39.9/36.1 in (1016/917 mm)</td>
</tr>
<tr>
<td>Through-loading width</td>
<td>42.7 in (1086 mm)</td>
</tr>
<tr>
<td>Load sill height</td>
<td>31.0 in (788 mm)</td>
</tr>
<tr>
<td>Luggage capacity of 5-seater</td>
<td>31.4/73.3 cu ft (890/2075 l)</td>
</tr>
<tr>
<td>Luggage capacity of 7-seater</td>
<td>27.5/69.0 cu ft (770/1955 l)</td>
</tr>
<tr>
<td>Capacity of fuel tank</td>
<td>22.4 gal (85 l)</td>
</tr>
</tbody>
</table>

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¹ Applicable to 5-seater with 3.0l TFSI engine
² A factory installed tow bar increases the maximum gross weight by 220 lb (100 kg)
³ Elbow room width
⁴ Maximum headroom
⁵ Shoulder room width
⁶ 2nd seat row/3rd seat row
⁷ With second row seat backs folded down (without optional equipment)
⁸ With third row seat backs folded down
⁹ With third row seat backs and second row seat backs folded down

All dimensions refer to the unladen weight of the vehicle.
The Audi Q7 is based on the second generation of MLBevo (Modular Longitudinal Platform Evolution). The lightweight body of multi-material construction represents, with its function and weight optimized design, a further example of a highly advanced modern vehicle body. To meet the requirements of an SUV, the components were deliberately selected according to the principle of using the right material in the right place.

Aluminum components

Aluminum castings, extruded sections and panels are used in the front and rear of the vehicle as well as the super-structure.

They account for 41% of the body structure and are broken down as follows:

- 23% sheet aluminum.
- 15% die-cast aluminum.
- 3% aluminum profile.

The multi-material construction reduces the total weight of the Q7 body by 156 lb (71 kg). The doors (52.9 lb [24 kg] lighter), as well as the front fenders, hood and rear hatch are made entirely of aluminum.

Key:

- Sheet aluminum
- Die-cast aluminum
- Aluminum section
- Ultra-high strength steel (hot-formed)
- Advanced high strength steel
- High strength steel
- Low strength steel

The high quality of the selected materials offers not only reduced weight, but also provides the basis for meeting the most stringent vehicle safety standards.
Ultra-high-strength hot-formed components

The use of ultra-high strength steel materials necessitates, in the event of body repairs, special repair methods adapted to the properties of the materials.

The high heat transfer in the welded areas significantly weakens the strength and structure of the component by altering the microstructure of the material. For this reason, the use of MAG inert gas welding for sectional repair purposes is only permitted on these high quality steels in isolated cases and in precisely defined areas.

Following miscellaneous tests and crash tests, approval was given for two sectional repair areas where MAG welding is allowable in the case of the Audi Q7:

1. Outer top left/right 'A' pillar
2. Inside left/right 'B' pillar

The following ultra-high strength hot-formed components have to be completely replaced if damaged:

3. Inside left/right sill
4. Cross-member of outside left/right bulkhead
5. End section of left/right cross member 2
6. Upper tunnel reinforcement

Joining technology

The key to optimizing the body structure is using "the right materials in the right place". The resulting challenge for the joining technology was to develop, universal and reliable solutions for the large variance in material/thickness combinations in the body.

The body is constructed using the following joining methods:

"Cold" joining methods

- 2125 punch rivets (semi-hollow rivets).
- 108 punch rivets (special semi-hollow rivets).
- 610 flow-drill screws.
- 58 clinching points.
- 479 ft (146 m) of adhesive.
- 14.7 ft (4.5 m) of seaming.

"Hot" joining methods

- 2579 spot welds.
- 105 friction elements.
- 7.5 ft (2.3 m) of TIG weld seams.
- 6.6 ft (2.0 m) of MAG weld seams.
- 30.2 ft (9.2 m) of laser-welded seams.
Joining techniques

Punch riveting

Punch riveting with semi-hollow rivets is a method in which non-prepunched workpieces are joined to form two or more layers. The rivet punches through the upper components and then expands into the basic component. The joining of ultra high strength hot-formed components requires a new special semi hollow rivet for the Audi Q7.

Friction element welding

Friction element welding is used for the first time on the Q7 body. A friction element joins at least two workpieces together. In the case of the Q7, for example, friction elements are used to joint sheet aluminum with ultra-high strength hot-formed sheet steel. The rotating friction element initially penetrates the upper layer of the workpiece (aluminum) and then produces a frictional join with the basic material (ultra-high strength hot-shaped steel) through the application of frictional heat and high axial pressure. The axial contact pressure is also maintained for a short time after welding the components together in order to homogenize the zones in which the microstructure is changed.

Joining techniques in overview

<table>
<thead>
<tr>
<th>Similar types of joints</th>
<th>Mixed design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum / aluminum</td>
<td>Steel / steel</td>
</tr>
<tr>
<td>Aluminum / aluminum</td>
<td>Steel / steel</td>
</tr>
<tr>
<td>Steel / steel</td>
<td>Aluminum / steel with (R_m) up to 800 MPa</td>
</tr>
<tr>
<td>Aluminum / steel with (R_m) of up to 800 MPa</td>
<td></td>
</tr>
<tr>
<td>Aluminum / steel with (R_m) of 800 MPa or higher</td>
<td></td>
</tr>
</tbody>
</table>

- Punch riveting with semi hollow rivets
- Resistance spot welding
- Punch riveting with semi hollow rivets
- Punch riveting with special semi hollow rivets
- Flow-drill screwing
- MAG welding
- Flow-drill screwing
- Friction element welding
- Clinching
- Clinching
- Seaming
- Laser welding
- Seaming
- TIG welding
Unlike in the previous model, the panoramic sunroof on the new Audi Q7 is a two-piece design only. The front glass panel is movable and can be tilted or slid back. The rear glass panel is fixed.

This reduces the gross weight of the panoramic glass sunroof by about 22.0 lb (10 kg) while increasing the headroom in the rear passenger compartment.

Reinforced roof elements at the guide rail and above the third row of seats increase body stiffness to such effect that there is no longer any difference in stiffness compared to an Audi Q7 without a panoramic glass sunroof.

A power operated roller blind for both glass panels provides protection against sunlight if needed.

Note
To ensure proper functioning of the panoramic sunroof after removing/installing/replacing the motor, a Basic Setting Test Plan must be done using the VAS Scan Tool.
Aerodynamics and aeroacoustics

The underbody is almost completely clad and a small spoiler on the rear axle area provides added downforce.

Radiator louver

A radiator louver (shudder) has been installed between the single-frame grille and the upper section of the main radiator. The slats open or close as required to provide better aerodynamic performance. This measure also allows better fuel economy and lowers CO₂ emissions. The closed louver is also beneficial to the thermal management of the engine.

Radiator louver closed

Radiator louver open
Electric rear hatch

The wrap-around rear hatch embracing the sharply inclined “D” pillars - a typical design element of the Audi Q models - is made entirely of aluminum. An electric rear hatch drive is standard equipment.

The power latching system is new. In the Audi Q7 this function is performed by the rear hatch lock; in other Audi models the striker on the rear bumper mount is used.

When the microswitch in the rear hatch lock indicates that the striker is in the prelock position and the Rear Lid Control Module J605 indicates that the rear hatch is in the “closed” position, an eccentrically mounted cam wheel in Rear Lid Closing Assist Motor V382 pulls the catch in the rear hatch lock further into the fully locked position by means of a Bowden cable - in much the same way as the power closing feature of the door locks.

The end position of the cam wheel is monitored by J605, while the position of the catch is monitored by Comfort System Central Control Module J393 via microswitches.
Seat systems

Depending on seat variant, a seat heater, seat ventilation, pneumatic seat backs, pneumatic lumbar support and a pneumatic massage function could be installed.

The second row seating has three seats all with adjustable seat backs. The second row seats can be moved manually fore and aft up to 4.3 in (110 mm). Third row seating is standard.

Folded down, the seat backs are integrated in the load floor and can be electrically raised or lowered. The switches are located in each ‘C’ pillar area and in the luggage compartment.

The seats in the second row have a fold-up function for easier entry and exit from the third seat row. The seat back is folded forward, after which the entire seat can be folded vertically. All seats in the second and third rows have LATCH child seat restraints. This means that customers can secure up to six child seats in the Audi Q7.
Individual contour seating

The contour seating option offers the following functions:

- Electrical seat adjustment.
- Pneumatic side bolsters in the seat base and back.
- Pneumatic lumbar support adjustment.
- Seat heating.
- Seat ventilation.
- Massage functionality.
- Memory function and seat contour customization (each seat contour is assigned to a specific vehicle key).

Seat ventilation is optional for the front seats and for the two outer rear seats in the second row. The seats have an intake system for this purpose.

The front seat ventilation controls communicate with Vehicle Electrical System Control Unit J519 by LIN data bus. The rear seat ventilation controls are connected to Rear A/C Display Control Head E265.
Third row seating

The Audi Q7 is available with a third row of seats. It is a two seat bench with two electric folding backrests.

The head restraints on these seats must fold in when the seats are folded down.

This is done automatically by the kinematic mechanism inside the seat or can be done manually using a pull-tab below the head restraint. After the backrest has been raised, the head restraints must be raised manually. This is done by swivelling them upwards until they lock into place.

Operation

The backrests fold down using the operating buttons in the rear passenger compartment and in the luggage compartment. You must press the buttons until the backrest is completely folded down or unfolded.

An electric motor unlocks and moves each backrest; the end position is monitored by two microswitches. If a backrest has not reached its end position, the backrest warning lamp appears in the DIS and the LEDs in the operating buttons begin to flash.

Operating buttons in the rear passenger compartment

Operating buttons in the luggage compartment
Components

Depending on country version and trim level, the passive occupant protection system in the Audi Q7 may have the following components and systems:

- Airbag Control Module.
- Adaptive driver airbag.
- Adaptive front passenger airbag (front passenger airbag, two-stage version).
- Front side airbags.
- Rear side airbags (equipment option).
- Head airbags.
- Front airbag crash sensors.
- Crash sensors for side impact detection in the doors.
- Crash sensors for side impact detection at the ‘C’ pillars.
- Crash sensor for side and longitudinal impact detection.

- Front inertia-reel safety belts with pyrotechnic belt tensioners.
- Front inertia-reel safety belts with electrical belt tensioners.
- Front inertia-reel safety belts with active belt force limiters.
- Inertia-reel safety belts for second seat row with pyrotechnic belt tensioners, driver and front passenger sides.
- Inertia-reel safety belts for third seat row with pyrotechnic belt tensioners, driver and front passenger sides.
- Front lap belt tensioner.
- Safety belt warning for all seats.
- Safety occupancy sensor in front passenger seat.
- Front passenger airbag OFF and ON warning lamp.
- Driver and front passenger seat position sensors.
- Battery interrupter circuit.
Reference
For further information on the active and passive safety features in the Audi Q7, please refer to eSelf Study Program 970363 The 2017 Audi Q7 Occupant Protection and Infotainment System.
## Engines

### Gasoline Engine

**Torque/power curve of 3.0l V6 TFSI engine**

- **Power output in hp/kW**
- **Torque in lb/Nm**

### Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine code</td>
<td>CREC</td>
</tr>
<tr>
<td>Type</td>
<td>6-cylinder V-engine with 90° V angle</td>
</tr>
<tr>
<td>Displacement</td>
<td>182.7 cu in (2995 cc)</td>
</tr>
<tr>
<td>Stroke</td>
<td>3.5 in (89.0 mm)</td>
</tr>
<tr>
<td>Bore</td>
<td>3.3 in (84.5 mm)</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>10.8 : 1</td>
</tr>
<tr>
<td>Power output</td>
<td>330 hp (245 kW) at 5500-6500 rpm</td>
</tr>
<tr>
<td>Torque in</td>
<td>295 lb ft (440 Nm) at 2900 - 5300 rpm</td>
</tr>
<tr>
<td>Fuel type</td>
<td>Premium unleaded 91 AKI</td>
</tr>
<tr>
<td>Engine management system</td>
<td>Simos</td>
</tr>
<tr>
<td>Supercharging</td>
<td>Clutched supercharger (Roots blower)</td>
</tr>
<tr>
<td>Lambda control</td>
<td>Two sensors upstream of catalytic converter and two sensors downstream of catalytic converter</td>
</tr>
<tr>
<td>Mixture formation</td>
<td>Combined (dual) direct (FSI) and multipoint (MPI) injection</td>
</tr>
<tr>
<td>Emission standard</td>
<td>ULEV125</td>
</tr>
</tbody>
</table>

Reference

For further information about the 3.0l V6 TFSI engine, please refer to eSelf Study Program 920323 The Audi 3.0l V6 TFSI Fourth Generation Engine.
Cooling circuit of 3.0l V6 TFSI engine

Key:
1. Front heater heat exchanger
2. Rear heater heat exchanger
3. Auxiliary heat exchanger
4. Vent screw
5. Flow restrictor
6. ATF cooler
7. Right charge air cooler
8. Cylinder head, bank 1
9. Engine oil cooler
10. Cylinder head, bank 2
11. Left charge air cooler
12. Coolant expansion tank
13. Switchable coolant pump
14. Coolant thermostat
15. Coolant shutoff valve
16. Non-return valve
17. Radiator
18. Auxiliary radiator
19. Front cooler for charge air cooling circuit
20. Left cooler for charge air cooling circuit

G62  Engine Coolant Temperature Sensor
G694  Engine Temperature Control Sensor
J293  Radiator Fan Control Module
J671  Radiator Fan Control Module 2
N279  Heater Coolant Shut-Off Valve
N509  Transmission Fluid Cooling Valve
V50   Coolant Recirculation Pump
V55   Recirculation Pump
V188  Charge Air Cooling Pump

Coolant:
- Blue: Cooled coolant
- Light Blue: Cooled coolant (charge air cooling)
- Red: Hot coolant
- Pink: Hot coolant (charge air cooling)
# Diesel engine

## Torque/power curve of 3.0l V6 TDI engine

<table>
<thead>
<tr>
<th>Power output in hp/kW</th>
<th>Torque in lb ft/Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>270</td>
<td>442</td>
</tr>
<tr>
<td>258</td>
<td>425</td>
</tr>
<tr>
<td>241</td>
<td>408</td>
</tr>
<tr>
<td>215</td>
<td>392</td>
</tr>
<tr>
<td>188</td>
<td>376</td>
</tr>
<tr>
<td>161</td>
<td>360</td>
</tr>
<tr>
<td>134</td>
<td>344</td>
</tr>
<tr>
<td>107</td>
<td>328</td>
</tr>
<tr>
<td>80</td>
<td>312</td>
</tr>
</tbody>
</table>

The engine code is, as seen in the direction of travel, located at the front left below the cylinder head on the protruding edge of the engine block.

## Features

<table>
<thead>
<tr>
<th>Engine code</th>
<th>CRTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>6-cylinder V-engine with 90° V angle</td>
</tr>
<tr>
<td>Displacement</td>
<td>181.0 cu in (2967 cc)</td>
</tr>
<tr>
<td>Stroke</td>
<td>3.9 in (91.4 mm)</td>
</tr>
<tr>
<td>Bore</td>
<td>3.3 in (83.0 mm)</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>16.0 : 1</td>
</tr>
<tr>
<td>Power output</td>
<td>270 hp (200 kW) at 4000 rpm</td>
</tr>
<tr>
<td>Torque</td>
<td>442 lb ft (600 Nm) at 1500 - 3000 rpm</td>
</tr>
<tr>
<td>Fuel type</td>
<td>ULSD (Ultra Low Sulfur Diesel) with a sulfur content of 15 ppm or less; must meet ASTM D975 Grade 2 S15 specifications</td>
</tr>
<tr>
<td>Engine management system</td>
<td>Bosch EDC 17 with start-stop and recuperation</td>
</tr>
<tr>
<td>Maximum injection pressure</td>
<td>29007 psi (2000 bar)</td>
</tr>
<tr>
<td>Fuel injectors</td>
<td>8-port piezo injectors</td>
</tr>
<tr>
<td>Exhaust gas treatment</td>
<td>Oxidizing catalyst, SCR coated diesel particulate filter, particulate sensor, oxygen sensor</td>
</tr>
<tr>
<td>Emission standard</td>
<td>ULEV125</td>
</tr>
</tbody>
</table>
Coolant circuit of 3.0l V6 TDI engine

Key:

1. Front heater heat exchanger
2. Rear heater heat exchanger
3. Auxiliary heat exchanger
4. Vent screw
5. Non-return valve
6. ATF cooler
7. Exhaust turbocharger
8. Exhaust gas recirculation cooler
9. Coolant expansion tank
10. Flow restrictor
11. Cylinder head, bank 1
12. Engine block, bank 1
13. Cylinder head, bank 2
14. Cylinder head, bank 2
15. Engine oil cooler
16. Coolant pump
17. Radiator

- **F265**: Map Controlled Engine Cooling Thermostat
- **G8**: Oil Temperature Sensor
- **G62**: Engine Coolant Temperature Sensor
- **G694**: Engine Temperature Control Sensor
- **G802**: Coolant Temperature Sensor 2
- **J293**: Radiator Fan Control Module
- **J671**: Radiator Fan Control Module 2
- **N279**: Heater Coolant Shut-Off Valve
- **N474**: Reducing Agent Injector
- **N489**: Cylinder Head Coolant Valve (rotary valve)
- **N509**: Transmission Fluid Cooling Valve
- **V50**: Coolant Recirculation Pump
- **V55**: Recirculation Pump

Cooled coolant
Cooled coolant (charge air cooling)
Hot coolant
Hot coolant (charge air cooling)
**SCR system**

**Reducing agent tank**

The reducing agent tank is manufactured from two half-shells as an injection molding (not as a blow-molded tank). This has the advantage of saving weight.

**Equalization chamber**

To accommodate the filling of reducing agent at a high flow rates, there is an equalization chamber in the upper section of the tank and at the filler neck. Since splashing reducing agent would cause the fuel nozzle to shut off, reducing agent is retained and allowed to settle in the equalization chamber.

**Reducing Agent Tank Sensor G684**

The tank sensor is an entirely electronic component and does not require float contact points. An antenna (coil) and the reducing agent (capacitive fluid) form an electrical resonant circuit.

A change in the fluid level alters the impedance of the circuit and shifts the resonance frequency (5 MHz – 12 MHz) proportional to the fluid level.

**Function**

The resonance frequency is determined by a microcontroller by coupling a high frequency signal into the medium and scanning the upper frequency range. It is located at the base of the fluid level sensor. It computes the reducing agent level using a temperature correction function. At the same time, the functioning of the tank heater is checked by determining the temperature.
Reducing Agent Quality Sensor G849

To monitor the quality of the reducing agent, a special quality sensor is integrated in the reducing agent tank. It is located next to the swirl pot on the bottom of the tank.

Function

The sensor determines the density of the reducing agent by deflecting the light beam onto a CMOS cell. An LED emits light within a prism and deflects the light beam through the sight glass filled with reducing agent.

If the reducing agent is in good condition, the light beam travels straight through the sight glass and hits an opposing prism. This light beam impinges on a CMOS line sensor with a resolution of 1024 pixels. The impinging light beam is evaluated and assessed in the electronic evaluation unit. The quality of the reducing agent is determined by reducing and increasing the deflection of the light beam impinging on the CMOS line sensor.

If the reducing agent is degraded, contaminated or diluted with water, the light beam is deflected and impinges on the electronic evaluation unit at a different angle. This sets a DTC in Reducing Agent Metering System Control Module J880 and sends a warning message to the driver via the DIS.
The engine cover also serves as a cover for the air filter. It is a plastic-welded multi-piece construction. The lower section of the cover houses the air filter on the bottom side. It also has attachment points for the Mass Airflow Sensor and oil filler tube.

The air filter housing has two connecting ports on the unfiltered air side. One of the two connecting ports can be sealed with a bypass flap. The bypass flap is vacuum-operated.

The bypass flap is switched by Air Filter Bypass Door Valve N275 (open/close) that is integrated in the air filter. The bypass flap is closed when depressurized. Air filter drainage is through an integrated with multi-outlet water discharge system which allows safe drainage from driving in spray/rain and during off-road operation on inclines within the permissible operating parameters.

Several criteria influence the position of the bypass flap (see table below):

<table>
<thead>
<tr>
<th>Acoustics</th>
<th>To reduce drive-by noise and passenger compartment noise, the bypass flap is closed, reducing the orifice cross-section. Signals for engine speed, engine torque, power demand and vehicle speed are supplied by the ECM.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow</td>
<td>To ensure low snow/snow free air intake, the flap is opened at an ambient temperature of 41 °F (5 °C), resulting in a lower flow rate at the intake. The ambient temperature signal is supplied by the Climatronic Control Module.</td>
</tr>
<tr>
<td>Water spray</td>
<td>To ensure low-spray air intake with no water inlet on the clean air side, the bypass flap is opened as a function of speed, resulting in a lower flow rate at the intake. The signal is supplied by the rain sensor or wiper control unit via the ECM.</td>
</tr>
<tr>
<td>Power</td>
<td>Low pressure loss, power increase, reduction in fuel consumption, reduced charge air temperature. The flap is opened upwards of approximately 3500 rpm as a function of power output, necessitating a lower flow rate (additional air). The engine speed and power demand signals are supplied by engine control unit.</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>Output check diagnosis (can only be checked at idle); visual inspection of flap circuit.</td>
</tr>
</tbody>
</table>

---

**Diagram:**

- Air filter element
- Air filter bottom part
- Main intake
- Air intake from the front end
- Vacuum motor
- Oil filler tube
- Air filter box
- Bypass flap
- Connection for air Mass Airflow Sensor or adaptor

---

632_004
### Engine/transmission combinations

<table>
<thead>
<tr>
<th>Engines</th>
<th>3.0l TFSI engine (CREC)</th>
<th>3.0l TDI engine (CRTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-speed</td>
<td>Automatic gearbox</td>
<td></td>
</tr>
<tr>
<td>ODS</td>
<td>AL552-8A</td>
<td></td>
</tr>
<tr>
<td>Rear axle drive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02D</td>
<td>HL600B</td>
<td></td>
</tr>
</tbody>
</table>

**Breakdown of manufacturer codes:**

For example: AL552-8A

- **M**: Manual transmission
- **A**: Automatic transmission
- **L**: Longitudinal mounting
- **552**: Rated torque capacity
- **8**: Number of speeds
- **F**: Front-wheel drive
- **A**: quattro all-wheel drive
Overview

The quattro drive concept of the Audi Q7 uses the technology of the Modular Longitudinal Platform with full-time all-wheel drive. This is typified by the 8-speed automatic transmission 0D5. It has a front axle drive in front of the torque converter and houses an integrated transfer case.

The transfer case has a self-locking center differential with asymmetrical-dynamic torque split and the rear axle drive through the open differential 0D2.

This drive concept saves weight compared to the predecessor Audi Q7 and increases efficiency.

The software of the 0D5 uses the data from the navigation system to assist the start-stop system and neutral control. The transmission parameters can be selected via Audi drive select. The Transmission Control Module is a participant of the immobilizer system.

The transmission in the Audi Q7 is entirely operated using "shift-by-wire" technology. The selector mechanism and the operating concept are new.

The parking lock is electro-hydraulically actuated and can be released using an emergency release mechanism. The Auto P function provides added operating comfort.

Assembly of the front propeller shaft

The propeller shaft is splined to the transmission.

For more information, please refer to eSelf-Study Program 950103, The 2011 Audi A8 Power Transmission.
Rear axle drive 0D2

The rear axle drive is derived from the previous 0BC rear axle drive. The housing is designed so it can be mounted to the sub-frame by a four-point mounting system.

The front rubber-metal bearing is press-fit to the case and then bolted to the sub-frame. It is supported by an additional bearing which moves in the Z direction. This design provides selective vibration insulation.

Assembly of the rear prop shaft

The special procedure for attaching and tightening the propeller shaft to the rear axle drive (triangular matching) is described in the workshop manual.

For detailed information about triangular matching, please refer to eSelf-Study Program 991803, The 2009 Audi A4 Vehicle Introduction and the Audi Service TV program "Audi A5 Power Transmission / Topic Prop Shaft Assembly Concept" of 23.02.2010.
Eight speed automatic transmission OD5

The OD5 transmission is based on the 0BK transmission first used in the 2011 Audi A8.

It has the internal designation AL-52-8Q. The manufacturer ZF Getriebe GmbH uses the designation 8HP65A. It is rated for up to 516 lb ft (700 Nm) of input torque.

The key new features of the OD5 transmission compared to the 0BK are:

- Twin-damper converter with integrated pendulum-type absorber.
- Reinforced gear set with revised shift elements, the number of brake discs and clutch plates is dependent on engine version, brake B is now activated by a simplex cylinder, the number of discs of brakes A and B is configured for active disc separation using corrugated springs.
- Mechatronics with modified hydraulic interfaces and a vehicle plug connection facing in the direction of travel (refer to page 31).
- Plastic ATF pan with integrated ATF suction filter and an ATF drain plug with bayonet catch in place of a thread (refer to page 33).
- Combined ventilation of the 3 oil systems, the ATF, the transfer case and the front final drive (refer to page 33).
- For the first time in a conventional converter-type automatic transmission, the operating software supports the coasting mode (refer to page 47).
- The neutral control function has been re-configured (refer to page 48).

In addition, as with the 0BK transmission, the software of the OD5 transmission uses data from the navigation system and supports the start-stop system.

Various driving modes can be selected via Audi drive select. The TCM is a participant of the Immobilizer system. ATF system cooling is regulated by the engine’s thermal management system (refer to page 34).

Transfer case

The transfer case of the OD5 transmission can be ordered with a self-locking differential. They are manufactured by either AAM or JTEK.

Both differentials have an asymmetric-dynamic torque split and, depending on traction conditions, distribute up to 70% to the front axle or up to 80% to the rear axle without any deceleration or the need for corrective action by ESC. For more information about torque vectoring, please see eSelf-Study Program 990203, The 2012 Audi A7 Vehicle Introduction.

The mechanical center differential interacts directly with the torque vectoring system, which improves traction and driving dynamics when cornering at high speeds.
Active brake disc separation in brakes A and B

Brakes A and B have corrugated springs between the discs. When the brakes are open, the springs provide a clearance which minimizes drag torque. This helps to save fuel and reduces CO₂ emissions.
The torque converter of the is a twin-damper converter with integrated pendulum-type absorber.

This cannot be seen from the exterior, but if the torque converter is rolled or shaken the very loosely mounted pendulum-type absorbers can produce typical rattling noises. This is not an indication of a damaged or faulty converter. Even at low engine speeds, the pendulum masses produced by the centrifugal force are thrust outwards and no longer generate any noise.

The four pendulum masses complement the conventional working principle of the twin-damper converter by damping engine torsional vibration as a function of engine speed. This is achieved through the interaction of centrifugal force ($F_z$) and the shape of the bearing races. At low engine speed, a low centrifugal force produces more pronounced pendulum movement than a high centrifugal force at high engine speed. The pendulum masses and the shape of the bearing race are adapted to the engine so the pendulum movement counteracts the torsional vibration of the engine.

For more information about the functional principle of pendulum-type absorbers, refer to the Audi Service TV program "Dual mass flywheels with pendulum-type absorbers" of 16.01.2015.

Key:
- The blue-colored sectional edges show the components connected to the internal combustion engine when the converter lockup clutch is open (primary side).
- The magenta-colored sectional edges show the components connected to the transmission input shaft when the converter lockup clutch is open (secondary side).
The Mechatronics module of the 0D5 transmission has the ZF designation E26/29. It is an enhanced version of the module used in the 0BK transmission of the 2011 Audi A8. The key differences between the two modules are the modified hydraulic interfaces for brake B and the ATF cooler which faces in the direction of vehicle travel.

The sensors and actuators as well as the design of the hydraulic parking lock and the hydraulic pulse accumulator (HIS) are identical. This means the shift elements are activated the same way. For further information, see eSelf-Study Program 950103, The 2011 Audi A8 Power Transmission.
The 0D5 transmission of the Audi Q7 has three separate lubrication systems:

- ATF system for the planetary gears and the hydraulic control module (lifetime)
- Oil system for the transfer case (gear oil with STURACO\(^1\), lifetime)
- Oil system for front final drive (gear oil without STURACO\(^1\), lifetime)

The plastic ATF pan saves weight. It forms a unit together with the ATF suction filter and must be replaced when replacing the mechatronics module or the hydraulic pulse accumulator. The ATF pan has reinforcing ribs which offer sufficient stability to allow the transmission to be set down flat on the ATF pan.

The ATF drain plug has a bayonet catch in place of the usual thread. It may not be reused and must be replaced after checking the oil level.

---

\(^1\) STURACO is an oil additive that protects against excessive stresses in the center differential and thus helps to enhance ride comfort. Pay attention to exact assignment of gear oils in accordance with the part numbers in ETKA.
Combined transmission ventilation

The vent pipe leading into the collection chamber is sealed off from the collection chamber by an O-ring. The sealing sleeve prevents the ingress of operating fluids into the converter housing.

The ventilation port in the converter housing provides the necessary pressure equalization after heating or cooling of the transmission. To allow pressure equalization to take place, the ventilation port must be open and unobstructed.

Note
When moving or working on a transmission, the gear oil and ATF may mix via the common gear box vent if the transmission is tilted too far. Always follow the instructions given in the electronic repair information.
**ATF cooling**

The ATF cooling system is integrated with the engine coolant circuit. It is controlled by Transmission Fluid Cooling Valve N509. N509 is actuated by Transmission Control Module J217. J217 receives the command to open or close N509 from the ITM software in the ECM.

If the ATF cooler is leaking, coolant (glycol) will mix with the ATF. Even the smallest quantities of coolant in the ATF can have a detrimental effect on the transmission clutches. A glycol test can done to confirm this condition.

**Integration in the coolant circuit**

The diagram shows a section of the coolant circuit of the 3.0l V6 TDI engine (refer to page 21).
Start phase

When the engine is cold started, N509 is energized closed. The cooling circuit path for the ATF heat exchanger is blocked. This allows the engine to reach operating temperature more quickly. The ITM software of the ECM decides when N509 is to be re-opened. The criteria are: ambient temperature, engine temperature, engine speed and the heat demand of the Climatronic system.

Heating of the ATF

If the engine has reached operating temperature and there is sufficient heat for the passenger compartment, N509 is opened and the ATF is heated. The lower viscosity ATF now used improves efficiency of the transmission.

Normal operation / cooling of the ATF

The coolant temperature of the engine is kept between 176 °F and 190 °F (80 °C - 90 °C). This corresponds to the nominal temperature range of the ATF. During normal operation, N509 is de-energized (open) and the ATF temperature is kept at that range.
Selector mechanism

The Audi Q7 uses a “shift-by-wire” operating concept.

- There is no mechanical connection between the selector lever and the transmission.
- The driver input is registered by the selector mechanism and transmitted electronically to the transmission without the need for a mechanical fail-safe.
- The parking lock is operated electro-hydraulically and activated automatically (Auto P function).
- In the event of a fault, a mechanical emergency release mechanism allows the parking lock to be released to move the vehicle (refer to page 44).

- Only gears R, N, D and S are selected through the automatic gate.
- The parking lock can only be activated manually using the P button. There is no selector lever position for P.
- To operate the Tiptronic function (manual mode M), the selector lever must be moved into the Tiptronic gate (this is only possible if gear position D or S is active).
- The release button Selector Lever Release Button E681 is integrated in the selector lever and configured for redundancy (refer to function diagram).

Parking Lock Button E816, P button

To manually activate the parking lock, the driver must press the P button. For activation, the vehicle must be traveling less than 0.5 mph (0.1 km/h). To help ensure reliability and facilitate fault diagnosis, the P button assembly has three shift elements.

The shift status is indicated to Selector Lever Sensor System Control Module J587 via two interfaces and plug connection E (refer to the diagram). If the P button is defective, a DTC is generated and a message appears in the DIS and the system reverts to the Auto P function when the engine is switched off.
Information flow

The communication path between the selector mechanism and the transmission is: Infotainment CAN > Gateway > FlexRay. The selector lever sensor control module determines the positions of the selector lever as well as the signals of the buttons and transfers the information to the TCM.

The TCM engages the gear corresponding to the driver input and sends this information to the selector lever control module. J587 then activates Shift Lock Solenoid N110, the selector lever position display LEDs and Parking Lock Indicator Lamp K320. When selecting a gear, this information flow causes a short delay until the corresponding gear symbol lights up.

Functional diagram of selector mechanism

![Functional diagram of selector mechanism](image)

Key:

- **E313** Selector Lever (selector mechanism)
- **E681** Selector Lever Release Button
- **E816** Parking Lock Button
- **G727** Selector Lever Position Sensor
- **G868** Transverse Selector Lever Lock Sensor
- **J587** Selector Lever Sensor System Control Module
- **K320** Parking Lock Indicator Lamp
- **N110** Shift Lock Solenoid
- **V577** Transverse Selector Lever Lock Motor
- **Y5** Selector Lever Transmission Range Display

VAS 642 001

The Y adapter VAS 642 001 allows measurements to be taken between Selector Lever E313 and Selector Lever Transmission Range Display Y5.
### Display logic

<table>
<thead>
<tr>
<th>Gear selector</th>
<th>Display in instrument cluster when coasting</th>
<th>Instrument cluster display during use of Tiptronic in D/S</th>
<th>Instrument cluster display</th>
<th>Illumination of Selector Lever Transmission Range Display Y5</th>
</tr>
</thead>
<tbody>
<tr>
<td>R, N, P, D/S</td>
<td>D 1-8</td>
<td>M 1-8</td>
<td>R 1-8</td>
<td>M 1-8</td>
</tr>
<tr>
<td>N</td>
<td>D 1-8</td>
<td>M 1-8</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>S 1-8</td>
<td>M 1-8</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 1-8</td>
<td>M 1-8</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

### Shift diagram

- **Current gear selected**
- **Selectable gear**
- **Selector lever in automatic gate, Tiptronic gate blocked**
- **Selector lever in automatic gate, Tiptronic gate free, D/S shift**
- **Selector lever in Tiptronic gate, Tiptronic function active, manual mode M**
- **Selector lever positions**

### Key to selector lever lock – longitudinal

- **Software lock**: deactivation by pressing the foot brake
- **Mechanical locking effect of Shift Lock Solenoid N110**: deactivation by pressing the Selector Lever Release Button E681
- **Software lock**: deactivation by pressing the Selector Lever Release Button E681

### Speed-dependent transmission protection function

A change in driving direction from D to R and vice versa is only possible at a speed below 5.0 mph (8.0 km/h).

The transmission protection function locks out a change in driving direction shifting (1st gear and into R) at speeds above 5.0 mph (8.0 km/h).

---

1) In the event of a fault, E681 is considered actuated. The red and grey locks are deactivated and a DTC is entered in the control module. The selector can be moved out of positions P and N by pressing the foot brake.
Shift Lock Solenoid N110

The selector lever also serves as an ergonomic hand rest for operating the MMI. To avoid unintentional selector lever operation when operating the MMI, forward movement of the selector lever is blocked in selector positions D and S.

In selector position D/S Shift Lock Solenoid N110 is energized and the locking bolt engages the selector lever locking gate. The selector can now be moved back into position B1 from the basic position in order to shift from D to S or from S to D.

To minimize noise, N110 remains energized after shifting to the Tiptronic gate. The locking effect of the bolt is, however, deactivated because the locking gate swivels away when the selector lever is moved into the Tiptronic gate. The locking effect is reactivated when the selector lever is moved back into the automatic gate.

When the Selector Lever Release Button E681 is pressed, the power supply to N110 is disconnected and the locking effect is deactivated.
Selector lever lock – transverse

To ensure that the selector lever cannot be inadvertently moved into the Tiptronic gate, it is locked transversely in selector positions P, R and N.

Selector position P/R/N – selector lever – transverse, active

The locking cam is positioned in such a way that it engages the locking slot in the crosspiece in which the selector lever is mounted. The selector lever cannot be moved into the Tiptronic gate.
Selector position D/S – selector lever lock – transverse, inactive

The transverse lock is deactivated in selector position D or S. The locking cam is rotated out of the locking slot by the worm gear.

The selector lever can now be moved into the Tiptronic gate.

Resetting the selector lever

If the selector lever is in the Tiptronic gate when the driver shuts off the engine, it is automatically moved back into the automatic gate. Transverse Selector Lever Lock Motor V577 turns the resetting shaft one full turn in the resetting direction. The resetting plate exerts axial lift on the selector lever and moves it back into the automatic gate.

Selector Lever Position Sensor G727 checks whether the selector lever is in the Tiptronic gate or the automatic gate (refer to page 42). If the selector lever has been moved back into the automatic gate, the selector lever lock motor turns the resetting shaft in the locking direction and locks the selector lever in the transverse direction.

Resetting the selector lever in emergency mode

If the transmission enters emergency mode as a result of a fault and can no longer perform the Tiptronic function, the selector lever is moved back into the automatic gate.

If the selector lever is again moved into the Tiptronic gate in such a situation, it will again be moved back to the automatic gate.
Selector Lever Position Sensor G727

Selector Lever Position Sensor G727 tracks the position of the selector lever. G727 has two sensors: one sensor for the automatic gate and one sensor for the Tiptronic gate.

Selector Lever Sensor System Control Module J587 tracks the position of the selector lever based on the signals from these sensors and sends the information to Transmission Control Module J217.

The TCM determines the desired selector lever positions and sends the information back to Selector Lever Sensor System Control Module J587.

Based on this feedback, the system activates the relevant LEDs in Selector Lever Transmission Range Display Y5, Parking Lock Button E816 and Shift Lock Solenoid N110.

How selector lever positions are detected:

The longitudinal and transverse movements of the selector lever are transmitted to a slider with two diamond-shaped sender elements. The sender elements influence the magnetic flow at both sensors according to the movement of the selector lever. Selector Lever Sensor System Control Module J587 generates the following selector lever positions from the sensor signals:

- **Automatic gate:**
  - A2 – A1 – X (basic position) – B1 – B2
- **Tiptronic gate:**
  - T+ – T (basic position) – T-

Refer to the shift schematic on page 26.

**Selector lever in automatic gate**

The movement of the selector lever is limited to one position forwards (T+) and one position back (T-) by the Tiptronic gate track of the locking element (refer to page 39, Fig. 632_118).

**Selector lever in Tiptronic gate**
Activating selector position N (P-OFF position)

To be able to move the vehicle without the parking lock, for example in a car wash, automatic engagement of the parking lock can be prevented. A condition for this is that the selector mechanism, the P button and the transmission are functioning properly. If these conditions are not met, the Auto-P function is activated at "ignition off".

To activate selector position N, first it must be selected when the engine is running and then the engine switched off with the selector in N.

In this case, the parking lock is not engaged (P-OFF position). The Auto-P function is suppressed for a limited period of 30 minutes.

After 29 minutes a message appears in the DIS indicating that the parking lock will shortly be engaged and after 30 minutes the parking lock is engaged.

When selector position N is activated and the door is opened, the following messages appear in the DIS:

- Shift to P, otherwise vehicle can roll away
- Doors do not lock if lever is not in P
- An audible warning is given if one of the doors is opened.

In this situation the vehicle cannot be locked from the outside. The vehicle must be secured to stop it from rolling away while in the P-OFF position.

If it is necessary to hold the parking lock in the P-OFF position for a longer period of time, the parking lock emergency release mechanism must be actuated (refer to page 44).

Rocking the vehicle backwards and forwards

A stuck vehicle can be freed by quickly and skillfully rocking it backwards and forwards.

Shifting from D to R and vice versa is always performed via selector position N. To deactivate the selector lever locks in the longitudinal direction, it is normally necessary to apply the brake and push the release button in order to shift from N to D or from N to R (refer to page 38, Fig. 632_117).

Shifting from D to R and vice versa can, therefore, be performed below a speed of 5.0 mph (8.0 km/h) without applying the brake provided that Selector Lever Release Button E681 is pushed and the vehicle is not stationary for longer than 1 second with the selector in N.

The Auto-P function enables the TCM to engage the transmission parking lock independently and without driver input.

The parking lock is engaged automatically if the following conditions are met:

- Selector position D or R is active.
- The vehicle is stationary (speed less than 0.6 mph [0.1 km/h])
- The engine was shut off by turning the ignition off (terminal 15 = off).

Tip shifting in D/S

Manual gear shifts can be performed at any time by operating the steering wheel Tiptronic in selector position D or S. To this end, the TCM switches to manual mode M (Tiptronic mode) for a limited time.

The D/S symbol is lit in the selector lever position display Y5 and the gear indicator M 1 – 8 appears in the instrument cluster.

If the vehicle is in a normal, constant driving state for a period of about 8 seconds, the transmission shifts back into selector position D or S.

The countdown from about 8 seconds is stopped in the following cases:

- Sporty driving style.
- Cornering.
- Overrun mode.
- Selection of another gear with the steering wheel Tiptronic.

The transmission can be immediately switched from manual mode M back to selector position D or S by pressing Tip+ for a period greater than 1 second.

Tip shifting in D can be activated or deactivated with the diagnostic tester by selective adaptation (refer to page 49).

Shifting in R

A software lock prevents the driver from engaging reverse at speeds of greater than 5.0 mph (8.0 km/h) without applying the brake provided that Selector Lever Release Button E681 is pushed and the vehicle is not stationary for longer than 1 second with the selector in N.

If reverse is selected, an audible signal sounds from the instrument cluster and a large white R appears in the display. Repetitive signalling is suppressed while manoeuvring as long as a forward speed of 5.0 mph (8.0 km/h) is not exceeded.

Diagnostics, actuator test

The electrical components of the selector mechanism can be diagnosed using the VAS Scan Tool under Address Word 81.

Output checks can be done using the VAS Scan Tool for the following components:

- Selector Lever Transmission Range Display Y5.
- Shift Lock Solenoid N110.
- Transverse Selector Lever Lock Motor V577.

---

1) The given values provide a guideline and are not binding. They may deviate depending on model version.
2) If a speed signal is detected (v = greater than 0.6 mph [1.0 km/h]), the time is extended accordingly until either a minimum stationary period of 5 minutes is detected or the vehicle battery is discharged.
Emergency parking lock release

The parking lock is operated and released electro-hydraulically during normal operation. The engine must be running in order to release the parking lock, and a sufficient power supply must be available in order to hold the parking lock in the P-OFF position.

The emergency release mechanism holds the parking lock in the P-OFF position longer in order to release the parking lock and should be operated in the following situations:

- To tow the vehicle.
- If the parking lock cannot be released electro-hydraulically due to a malfunction.
- If the vehicle cannot be maneuvered or moved due to low battery voltage.
- If the engine is not running and it is necessary to move the vehicle.

If it is no longer necessary to hold the parking lock in the P-OFF position, it should be released again and moved back into the P-ON position.

After carrying out assembly work on components of the emergency release mechanism, it must be checked (see note on right).

Emergency releasing the parking lock (P-OFF position)

- Remove cover.
- Insert the emergency release wrench insert into the actuating mechanism as shown under position 1 in Fig. 632_124.
- Turn the socket wrench insert clockwise through 90° (position 2) while pushing it down (position 3 in Fig. 632_126).

When the parking lock emergency release mechanism is actuated, the yellow transmission MIL and the gear selector position indicator N are illuminated in the instrument cluster. The following message is also displayed in the DIS: “Vehicle may roll away! P cannot be selected. Please apply parking brake.”

Locking the parking lock (P-ON position)

- Pull the socket wrench insert upwards out of the actuating mechanism (position 4 in Fig. 632_127).

Note: The wrench insert must not be turned back as this will damage the emergency release mechanism.

- Reinstall the cover.
Reduction of structure-borne noise transmission

A special feature is the positioning of the emergency release Bowden cable in relation to the gear selector lever. A rigid rod and a mushroom-shaped plate are attached to end of the emergency release Bowden cable and contactlessly envelop the gear selector lever. This minimizes structure-borne noise transmission from the transmission to the Bowden cable, and thus into the passenger compartment. The plate and the gear selector lever do not make contact until the emergency release mechanism is actuated.

Quick-release coupling

To simplify removing and installing the transmission, the emergency release Bowden cable consists of two parts interconnected by a quick-release coupling.

Note that when the emergency release mechanism is not actuated, the plate of the Bowden cable must not be in contact with the gear selector lever and there must be sufficient clearance (refer to Fig. 632_146 "Reduction of structure-born noise transmission").

Insulating elements in the quick-release coupling bracket and in the actuating mechanism reduce structure-borne noise transmission.

Note
After removing and installing the transmission or carrying out assembly work on components of the emergency release mechanism, a function test must be performed as described in the repair manual.
Transmission functions

Audi drive select

With Audi drive select, it is possible to select between different vehicle setups. Transmission setups are tailored to the customer’s requirements in a country-specific manner. For this reason, only typical differences between the various modes are shown here.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Transmission setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>offroad</td>
<td>In offroad mode the TCM assists driving in rough terrain by using adapted functions. Gear selection follows a fixed shift program without driver type recognition. The gears are held for long as in selector position S. Selector position S is not available, however manual shifting is possible in Tiptronic mode (manual mode M).</td>
</tr>
<tr>
<td>lift / offroad</td>
<td>In Tiptronic mode, automatic upshifting of the transmission is deactivated. The engine runs up to the speed limiter without shifting up in order to prevent undesirable up-and-down shifting.</td>
</tr>
<tr>
<td></td>
<td>The deactivation of automatic upshifting allows the engine to stop on a hill at full engine speed. Even if brief loss of traction occurs, the gear is held to ensure that full drive torque is available when the wheels regain full traction.</td>
</tr>
<tr>
<td></td>
<td>The deactivation of automatic upshifting allows the full braking effect of the engine to be utilised when driving downhill. To protect the engine against overspeeding, the transmission shifts up before a defined engine speed is reached.</td>
</tr>
<tr>
<td>allroad</td>
<td>The allroad mode does not have any effect on the transmission setup.</td>
</tr>
<tr>
<td>comfort</td>
<td>This setup is especially comfort-oriented with soft gear shifts and low engine speeds. As is the case in auto mode, gear selections are made with the assistance of driver type recognition.</td>
</tr>
<tr>
<td>auto</td>
<td>Driver type recognition in selector positions D and S: In selector positions D and S a driver type recognition is made on the basis of the driver’s driving style. Criteria for driver type recognition include the mode of actuation of the brake and accelerator, the speed of the vehicle as well as transverse and longitudinal acceleration within defined periods. Accordingly, an economical driving style leads to early upshifts and late downshifts. A sporty driving style leads to late upshifts and early downshifts. The driving phases in which the driver adopts an efficient, economical, sporty or manual driving style can be read out using the diagnostic tester.</td>
</tr>
<tr>
<td></td>
<td>Selector position D: Gearshifts are comfort-oriented and shift point selection is adapted to the driver’s driving style with the aid of driver type recognition.</td>
</tr>
<tr>
<td></td>
<td>Selector position S(^{11}): In Sport mode (sport program), the shift points are sporty and adapted to the performance range of the engine. The shift points are configured with the aid of driver type recognition. The shift times and shift points vary from driving in the normal sport program to a handling course setup with short, noticeable shift cycles.</td>
</tr>
<tr>
<td>dynamic</td>
<td>If the dynamic mode is selected, the TCM activates the sport program (selector position S). In dynamic mode, both the Tiptronic functions and selector position D are available. If selector position D is activated before shutting off the engine, selector position (D) is again activated when the engine is subsequently started(^{11}). If the driver wishes to have selector position S, he must select it.</td>
</tr>
<tr>
<td>individual</td>
<td>In individual mode, the driver can freely select the transmission setup irrespective of other vehicle systems.</td>
</tr>
</tbody>
</table>

\(^{11}\) Based on the emission class, the drive programs of selector position D is always selected when the vehicle is restarted.
Navigation-based gear selection

Provided that suitable data is available from the navigation system (optional and market dependent), the 0D5 transmission uses relevant route data for gear selection purposes. The TCM processes information about the route ahead, for example, corner radii or corner length. The TCM also determines whether the vehicle is driving in an urban area or the countryside.

This information reduces shift frequency and makes it easier for the TCM to select or preselect the correct gear. Navigation based gear selection can be activated or deactivated by selective adaptation using the VAS Scan Tool (refer to page 49).
Neutral control

The neutral control system disengages the engine from the transmission when stopping or when the vehicle is stationary. The engine idle torque can be reduced to a minimum because the engine does not have to work against the torque converter.

Neutral control in 1st gear and R

As soon as the ATF pressure supply is ensured after the engine is started, brake A is closed and brake B is moved to the initial friction point. The neutral control system is still not active (selector position P or N) at this point.

The neutral control system is active if the conditions are met, the driver has applied the brake and selector position D or R is selected. If selector position D is selected, clutch C of 1st gear is not initially closed. If selector position R is selected, clutch D of R gear is likewise not initially closed.

As soon as the driver releases the brake, brake B and clutch C are closed in selector position D (in selector position R, brake B and clutch D are closed). Brake B, which is already at the initial friction point, is closed with a steep rise in pressure, while clutches C or D are closed with a gentle rise in pressure. Traction can be comfortably established in this way. The remainder of the start-up operation is performed using the torque converter.

Neutral control when start-stop mode is active

If start-stop mode is active and the command to start the engine is given, the neutral control system is activated to start the engine. To accelerate ATF pressure buildup, the hydraulic pressure accumulator (HIS) assists the closing of brake A and the movement of brake B to the initial friction point.

The remainder of the operation follows the neutral control function described above.

Stopping with the neutral control system

When the vehicle is stopped by applying light pressure to the foot brake, the system normally shifts down from 2nd to 1st gear immediately before the vehicle comes to a stop. As a result, the driver barely notices the 2-1 downshift. To avoid stalling the engine when stopping, the converter lockup clutch is always opened before the transmission input speed reaches the engine idle speed.

With a further reduction in speed, the transmission input speed drops below engine idle speed. The resultant converter slip produces a converter torque which the engine has to compensate by increasing load.

To prevent this converter torque from being produced when converter slip occurs, neutral control is activated in 2nd gear by opening clutch E. If the driver releases the brake when the vehicle is stationary, clutch E is closed for 2nd gear or clutch C for 1st gear depending on the speed of the vehicle.

This helps save fuel and reduces CO₂ emissions. In addition, the engine runs more smoothly and quietly at low idle torque. For this reason, the neutral control system is activated after starting the engine.

Operating conditions

- Full adaptation of the shift elements (brakes, clutches).
- ATF temperature greater than approximately 68 °F (20 °C)¹.
- Gradient less than 4%¹ (the gradient is determined by the longitudinal acceleration sensor of the brake electronics).
- Selector position D or R.
- Accelerator not pressed.
- Foot brake pressed.

Switch-off conditions

- Selector position S² or the Tiptronic mode
- Brake released (unless the vehicle is secured by the electromechanical parking brake or hill start assist is active.)
- Accelerator pressed

Shift matrix

The shift matrix illustrates the activation of the shift elements for gears 1, 2 and R. For further information about the shift schematic and the shift matrix of the ODS transmission, refer to SSP 457, page 28 ff. and 44. The shift operations of transmissions 0BK and 0BL which are identical to those of the ODS transmission are described here.

The neutral control system can be activated or deactivated with the VAS Scan Tool through selective adaptation (refer to page 38).

¹) The given values provide a guideline and are not binding. They may deviate depending on model version.
²) Neutral control is not activated in selector position S in order to allow more direct drive-away. Without neutral control, clutch C or D is immediately closed when selector positions S and R are selected. This is why traction is noticeable on selection of 1st gear or R gear, as is the traction reversal when shifting from 1st gear to R gear (or vice versa). This traction reversal is barely noticeable in selector position D. Reason: when neutral control is active, clutch C or D is opened and traction cannot be established until the brake has been released.
Start-stop system

The system helps save fuel and reduce CO₂ emission. In start/stop mode, the engine is shut off automatically when the vehicle stops, for example, at traffic lights. The ignition remains “off” during this stop phase. The engine is automatically restarted when required.

The requirements for this are a very short starting time and that the vehicle quickly be ready for drive-away. To enable the 0DS transmission to meet these requirements, it is equipped with a hydraulic pulse accumulator (HIS). The function of the pulse accumulator is described in eSelf-Study Program 950103, The 2011 Audi A8 Power Transmission.

Downhill assist

The downhill assist functions aids the driver on downhill gradients. It is activated in selector positions D and S when the foot brake is pressed or after the cruise control system is activated.

The transmission selects a gear appropriate to the gradient. Downhill assist attempts to maintain the reduced speed within the bounds of its physical and drive-related limitations.

It may be necessary to additionally correct the vehicle’s speed with the foot brake. Downhill assist cuts out again as soon as the gradient lessens or the accelerator is pressed. Downhill assist cannot overcome the physical limitations of the vehicle and therefore cannot maintain a speed in all conditions. The driver must always be ready to apply the brakes!

Reason

When the engine is at standstill, the oil pump is not driven and certain parts of the transmission are not lubricated. Failure to observe the towing conditions can lead to serious damage.

Service

Towing

If a vehicle with an OBS transmission needs towing, the usual restrictions apply:

- Emergency release the parking lock.
- Maximum towing speed of 30 mph (50 km/h).
- Maximum towing distance of 30 m (50 km).
- Do not tow the vehicle with the front or rear axle raised off the ground.

Diagnostics, basic setting, adaptations, warnings

Diagnostics

The electrical/electronic components as well as the control operations of the ODS transmission can be diagnosed using the Address Word 02.

Adaptation

The following functions can be activated or deactivated using the adaptation function of the VAS Scan Tool.

- **Individual selector lever position display**: The gear display for selector lever positions D and S can be separately shown or hidden in the instrument cluster by adapting the individual selector lever position display. Selector lever position display is always active in manual mode M (Tiptronic mode).
- **Route data**: Navigation data based gear selection can be activated or deactivated using the adaptation function (refer to page 47).
- **Automatic upshift**: When the automatic upshift function is activated, the transmission shifts to the next higher gear before the engine speed limiter cuts in. If the automatic upshift function is deactivated, the engine runs up to the speed limit without shifting up.
- **Neutral control**: Navigation based gear selection can be activated or deactivated using this adaptation function (refer to page 48).
- **Tiptronic selector**: This adaptation function can be used to activate or deactivate tip shifting in D or S (refer to page 38).

Basic setting

The following adaptation processes can be performed using the basic setting function.

- Quick adaptation when the vehicle is stationary, for example, after changing the ATF, replacing the brakes/clutches or the mechatronics module.
- Reset all programmed values, the adaptation values of the clutches can be read and collectively reset. It is not possible to reset individual adaptation values.

Transmission warning lights

If the yellow transmission warning light appears in the instrument cluster, it is normally possible to continue driving the vehicle. Driver information is displayed telling the driver what to do.

If the red transmission warning light appears in the instrument cluster, the driver is instructed to stop the vehicle.

For detailed and current information, please refer to the vehicle Owner’s Manual.
Suspension

Overall concept

The suspension also features numerous changes. Both the front and rear axles are five-link designs, replacing the double wishbone axles of the previous model. New elastomer bearings and separate springs and dampers at the rear axle enhance responsiveness.

The new electromechanical power steering with servotronic function provides direct steering response - several of the new driver assistance systems would not be possible without it.

Compared with the previous model, the suspension of the new Audi Q7 is over 220.4 lb (100 kg) lighter. The wheel suspension links for example are now made of aluminum and high-strength steel, the front axle drive shafts are hollow and the pivot bearings are aluminum forgings.

Audi also offers the innovative all-wheel steering as an option.

The Audi Q7 already offers excellent comfort even with the standard steel suspension. Rolling is even smoother with the adaptive air suspension, which is managed by a newly developed central vehicle control module that drives all body control systems.

The new controllers developed by Audi for the air suspension and active damping vary the body height and body comfort as a function of the driving situation.

The Audi Q7 comes as standard with 19-inch wheels and 255/55 R19 111H XL all-season tires. Audi offers additional wheels in sizes up to 21 inches as options.

Large, vented brake discs bring the SUV safely to a stop. They are gripped up front by aluminum six-piston calipers. The electromechanical parking brake, updated with convenient hill hold and startup functions, acts on the rear wheels.

New ESC and ACC generations provide the basis for a number of driver assistance systems.

Reference

For further information about the chassis and the ACC system, refer to eSelf Study Program 960163 The 2017 Audi Q7 Running Gear and Suspension System.
### Suspension versions

<table>
<thead>
<tr>
<th>Standard suspension (1BA)</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>The standard suspension comes as standard with steel springs and an unregulated damping system.</td>
<td></td>
</tr>
</tbody>
</table>

| Suspension with air suspension and electronic damper control (adaptive air suspension, 1BK) | This suspension version is optional. |

### Axles and wheel alignment

#### Front axle

The front axle is based on the Modular Longitudinal Platform (MLBevo).

The Audi Q7 adopts the tried and tested five-link axle concept used on other Audi models.

#### Rear axle

The rear axle is also based on the Modular Longitudinal Platform (MLBevo). The Audi Q7 features a newly developed five-link axle.

By paying close attention to lightweight design, the weight of the axle has been reduced by 88.1 lb (40 kg) compared with the previous model.
Air suspension and electronic damper control

The system is based on systems already in use on other Audi models. A key new feature is Drivetrain Control Module J775. This module houses the software for the air suspension and damping systems. The system will, in the future, also include control algorithms for other suspension control systems. The rear end of the vehicle can be lowered in order to simplify loading and unloading.
All-wheel steering

Rear axle steering is being offered optionally on an Audi model for the first time with the Q7. Depending on the speed of the vehicle and the driving situation, the tracking is adjusted dynamically.

The rear axle steering has a beneficial effect on driving dynamics and driving comfort. In general, the control system involves two different steering operations: counter-steering and parallel steering of the front and rear axles.

Counter-steering

One of the key aims for counter-steering the front and rear wheels is to improve handling at low speeds and to reduce the travel envelope of the vehicle. The advantage for the driver is that less steering effort is required given the same curve radius and the same speed. The vehicle is much more maneuverable and agile.

To make full use of the advantages offered by the system, counter-steering is only activated in the low speed range (up to 37.2 mph (60 km/h). The graphic shows the advantage of rear axle steering using the smallest turning circle as an example. Radius R2, which is achieved using rear axle steering, is much smaller than the radius (R1) achievable with traditional steering.
Parallel steering (in same direction)

At higher vehicle speeds, the system responds to the driver’s steering inputs by parallel steering the rear wheels. The resulting yaw torque is much lower than in a vehicle with front-steered wheels only. The immediate buildup of lateral (cornering) force at both axles significantly reduces the transition time from the initial steering input to a steady-state condition - a well-known effect which occurs in purely front-steered vehicles.

The change in the direction of travel is initiated much more harmoniously and comfortably and the danger of yaw oscillation is reduced. In addition, the system also limits the yaw rate when the driver takes sudden evasive action through over-proportional parallel steering of the rear wheels, thus increasing driving stability in critical situations.

Brake system

The Audi Q7 is equipped with a generously dimensioned brake system which offers a high performance reserve. The front axle wheel brakes have lightweight aluminum calipers and lightweight discs. Increased brake caliper rigidity conveys a direct and sporty braking feel. All brake pads already meet the highest environmental standard (copper free), which will not become a statutory requirement until 2021.

The Audi Q7 is now equipped with the electronic parking brake (EPB). The brake pedal assembly and the brake servo are new developments designed with a strong emphasis on weight saving. The Audi Q7 features the new ESC system (ESP 9) by Robert Bosch AG - a high-performance stability control system.
The Audi Q7 now has electro-mechanical steering (EPS). In terms of design and function, it is identical to the systems used in the Audi A6 and A7 models although special steering maps were developed for the Q7.

Steering system

A mechanically adjustable steering column is standard and an electrically adjustable steering column is optional.

A newly designed three-spoke multi-function steering wheel is standard.
Adaptive Cruise Control (ACC)

System overview

The fourth-generation ACC is used for the first time on the Audi Q7. The modified design and extended range of functions provide a significant improvement in driving comfort. System availability has also been increased. For example, a system shut-down due to insufficient sensor vision now takes effect much later than before.

System limitations have been pushed further back by the modified hardware. For example, radar signal reflection (which can lead to misinterpretation when driving through tunnels) has been minimized and is unlikely to cause the system to shut down.

New functions include the system response to stationary vehicles. The measurement data generated by the ACC is an important basis for the following new functions:

- Predictive efficiency assist.
- Collision avoidance assist.
- Turning assist.
- Traffic jam assist.
- Distance indicator.
- Distance warning.

As with previous Audi models, a master/slave concept with two radar units is used on the 2017 Q7. Each unit has its own control module. Data is exchanged via the FlexRay data bus.

Reference
For further information about the function of the ACC, please see Self-Study Program 970263, The 2017 Audi Q7 Driver Assistance Systems.
Wheels and tires

The Audi Q7 comes as standard with 19" wheels. The 20" and 21" wheels are optional. The range of tires for the engine versions available at launch extends from 255/60 R18 to 285/40 R21.

19" and 20" tires with run-flat properties and 20" offroad tires with reinforced sidewalls are standard or optional in certain markets.

The "Tire Mobility System" is standard equipment as well as a tool kit and vehicle jack.

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<table>
<thead>
<tr>
<th>PR Code</th>
<th>Q7 3.0 T</th>
<th>Q7 TDI®</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 8.5&quot; x 19&quot; 5-V-spoke design wheels 255/55 R19 111H XL all-season tires</td>
<td>CH6</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>H79</td>
<td></td>
</tr>
<tr>
<td>B. 9.0&quot; x 20&quot; 10-spoke-star design wheels (Gray/Polished finish) 285/45 R20 112H XL all-season run-flat tires</td>
<td>F06</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>H93</td>
<td></td>
</tr>
<tr>
<td>C. 9.5&quot; x 21&quot; Audi Sport® 5-twin-spoke design wheels 285/40 R21 109Y XL summer performance tires</td>
<td>F50</td>
<td>□</td>
</tr>
<tr>
<td></td>
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<td>□</td>
</tr>
<tr>
<td></td>
<td>H2Q</td>
<td></td>
</tr>
<tr>
<td>D. 255/55 R19 111H XL all-season run-flat tires (not shown)</td>
<td>H92</td>
<td>□</td>
</tr>
</tbody>
</table>

= Standard
= Optional

---

Low tire pressure indicator

The second-generation low tire pressure indicator (RKA+) is standard equipment for the Audi Q7. In terms of design and function, operation and driver information as well as service and diagnosis functions, the system is identical to the systems already in use in other Audi vehicles.

Tire pressure monitoring system

A third-generation direct tire pressure monitoring system is optional for the Audi Q7.
Installation locations of control modules

Some of the control modules shown in the overview are optional and/or country-specific equipment. Notes on the exact locations of the control modules and their removal and installation instructions can be found in the current service literature.

Key:

A27  Right Led Headlamp Power Output Module 1
A31  Left Led Headlamp Power Output Module 1
E87  Front A/C Display Control Head
E265 Rear A/C Display Control Head
E380 Multimedia System Control Head
J104 ABS Control Module
J136 Memory Seat/Steering Column Adjustment Control Module
J234 Airbag Control Module
J245 Power 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 Distance Regulation Control Module
J500 Power Steering Control Module
J519 Vehicle Electrical System Control Module
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
J587  Selector Lever Sensor System Control Module
J605  Rear Lid Control Module
J623  Engine Control Module
J685  Front Information Display Control Head
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
J794  Information Electronics Control Module 1
J844  Automatic High Beam Assist Control Module
J850  Distance Regulation Control Module 2
J853  Night Vision System Control Module
J857  Third Row Seat Adjustment Control Module
J869  Structure Borne Sound Control Module
J880  Reducing Agent Metering System Control Module
J898  Windshield Projection Head Up Display Control Module
J926  Driver Side Rear Door Control Module
J927  Passenger Side Rear Door Control Module
J928  Peripheral Camera Control Module
J1018 Left Light Control Module
J1019 Rear Axle Steering Control Module
J1023 Right Light Control Module
R161  DVD Changer
R242  Driver Assistance Systems Front Camera
Topology

The topology shows all control modules with connectivity to the bus systems.

Some of the control modules shown here are optional or country-specific equipment or are due for rollout at a later date.
For presentation purposes, the FlexRay topology does not mirror the actual configuration of the control modules. This also applies to the control modules on the MOST bus.
Infotainment

The infotainment systems of the Audi Q7 have been completely revised compared to the previous model. The Audi Q7 features a new operating concept first rolled out in the Audi TT.

Overview of versions

Two versions of the MMI are available on the Audi Q7:
- MMI Radio plus.
- MMI Navigation plus.

From a technical point of view, MMI Radio plus is identical to the second-generation MIB Standard.

MMI Navigation plus is a second-generation MIB High system.

### MMI Radio plus (I8E)

- 7.0“ TFT color monitor with 800 x 480 pixel resolution
- Without navigation (7Q0)
- Operating unit (UJ0)
- 7” display in the instrument cluster with driver information system (9S7)
- AM/FM radio with phase diversity
- CD drive (MP3, WMA, AAC)
- 1 SDXC card readers
- Audi music interface with 2 USB ports and AUX-in jack (UE7)
- Audi sound system (9VD)
- Bluetooth interface (9ZX)
- Digital radio SDARS (QV3)

### MMI Navigation plus (I8H)

- 8.3“ TFT color monitor with 1024 x 480 pixel resolution
- 3D SSD navigation system (7UG)
- MMI touch (UJ1)
- 7” display in the instrument cluster with driver information system (9S7)
- AM/FM radio with phase diversity and background tuner
- Jukebox (approx. 11 GB)
- DVD drive (audio/video)
- 2 SDXC card readers
- Audi music interface with 2 USB ports and AUX-in jack (UE7)
- Audi sound system (9VD)
- Bluetooth interface (9ZX)
- UMTS/LTE data module (EL3)
- Audi connect (IW3)
- Digital radio SDARS (QV3)

### Standard equipment

- 7.0“ TFT color monitor with 800 x 480 pixel resolution
- Without navigation (7Q0)
- Operating unit (UJ0)
- 7” display in the instrument cluster with driver information system (9S7)
- AM/FM radio with phase diversity
- CD drive (MP3, WMA, AAC)
- 1 SDXC card readers
- Audi music interface with 2 USB ports and AUX-in jack (UE7)
- Audi sound system (9VD)
- Bluetooth interface (9ZX)
- Digital radio SDARS (QV3)

### Optional equipment

- Provision for Rear Seat Entertainment 9WQ
- Bose Sound System with 3D sound (9VS)
- Bang & Olufsen Advanced Sound System with 3D sound (8RF)
- Audi virtual cockpit (9S8)

For further information about the infotainment system in the Audi Q7, refer to eSelf Study Program 970363 The 2017 Audi Q7 Occupant Protection and Infotainment System.
Climate control

Introduction

The Audi Q7 is equipped as standard with a newly developed three-zone deluxe climate control system. The front control head has two rotary dials for temperature control into which the temperature displays are integrated.

Four-zone deluxe climate control is optional. A display with toggle switches shows the status of selected functions. Touching the toggle switches enlarges the menu for easier legibility and operation.

The front A/C operating and display unit E87 uses fewer buttons and controls, making for intuitive operation of the air conditioning system.

In the four-zone system, the right-hand side of the instrument panel includes an air vent strip which provides indirect and draft-free air flow into the cabin.
Versions

Two climate control versions are available for the Q7: a three-zone system and a deluxe four-zone system.

The front control panel has the component name Front A/C Display Control Head E87 and can be diagnosed using Address Word 08.

The rear A/C control panel is called the Rear A/C Display Control Head E265 and can be diagnosed in four-zone systems under the Address Word 28.

Three-zone deluxe automatic climate control

Three-zone systems come equipped with Rear A/C Display Control Head E265. E265 has only a central temperature display for the rear passenger compartment.

Front A/C control panel

Infrared interior temperature sensor, non-ventilated

Rear A/C control panel
(Three-zone deluxe automatic air conditioning only; no diagnosis possible using Address Word 28)

Rear air distributor housing

Left B-Pillar/Footwell Shut-Off Door Motor V212

Left Rear Upper Body Vent Motor V315

Right B-Pillar/Footwell Shut-Off Door Motor V211

Right Rear Upper Body Vent Motor V316

Rear Fresh Air Blower Control Module J391

Rear Fresh Air Blower V80
Four-zone deluxe automatic air conditioning

Rear A/C Display Control Head E265 with two temperature controls is used for the rear passenger compartment climate control in vehicles with four-zone deluxe automatic air conditioning.

Front A/C control panel

Rear A/C control panel

Infrared interior temperature sensor, (no fan used)

Rear heater and air conditioner housing

Left B-Pillar/Footwell Shut-Off Door Motor V212

Left Rear Temperature Control Door Motor V313

Right Rear Temperature Control Door Motor V314

Rear Recirculation Door Motor V421

Left Rear Upper Body Vent Motor V315

Right B-Pillar/Footwell Shut-Off Door Motor V211

Right Rear Upper Body Vent Motor V316

Rear Fresh Air Blower V80

Rear Fresh Air Blower Control Module J391
Heater and air conditioner housing

The different climate control versions of the Q7 have a different number of control motors. In the four-zone system there are 17 control motors.

If repair work is needed, the following components of the air conditioner can be removed and replaced without removing the instrument panel:

- The control motors.
- The heat exchanger.
- The Auxiliary Heater Heating Element Z35
- The Fresh Air Blower V2 and the Fresh Air Blower Control Module J126.

The control motors are all identical and their function is programmed by auto addressing. When replacing the control motors, the basic setting procedure must be carried out.

If repair work is needed, the cables and plugs leading to the control motors and the cable connections to the temperature sensor must not be interchanged because the components could otherwise be incorrectly addressed. Incorrect addressing can lead to complaints regarding the A/C control system, even if this incorrect addressing may not necessarily be identified as a fault by the system.

Front air conditioner housing

![Diagram of front air conditioner housing with labeled components:](632_033)

- Left Temperature Control Door Motor V158
- Defroster Door Motor V107
- Left Center Vent Motor V110
- Left Side Vent Motor V299
- Left Footwell Temperature Control Door Motor V411
- Rear Temperature Control Door Motor V137
- Coolant pipes to heat exchanger
- Expansion valve
- Left Footwell Vent Temperature Sensor G261
- Right Side Vent Temperature Sensor V300
- Right Center Vent Temperature Sensor V111
- Right Footwell Vent Temperature Sensor G262
- Rear Air Distribution Door Motor V427
- Rear Air Quantity Motor V443
- Right Footwell Door Motor V109
- Right Footwell Temperature Control Door Motor V412

632_033

632_032
Cleaning the evaporator

The evaporator can be cleaned with compressed air using VAG 1538 and the corresponding probe.

A service opening must be drilled for this purpose. On completion of cleaning, the service opening can be re-sealed with a plug (refer to Electronic Parts Catalog).

Removing the dust and pollen filter

It can be accessed through the front passenger footwell. To take out the dust and pollen filter, the insulating mat, lower front passenger side dash panel and the shaft cover must first be removed. The dust and pollen filter can then be pulled out.

To reinstall, the filter must be flexed slightly to adapt it to the shape of the filter shaft.

Note
For the exact procedure for replacing the dust and pollen filter, please refer to the electronic service literature.
Self-Study Programs

For more information about the technology of the Audi Q7, please refer to the following eSelf-Study Programs.

- **SSP 920323**
  The Audi 3.0l V6 TFSI Fourth Generation Engine

- **SSP 970263**
  The 2017 Audi Q7 Driver Assistance Systems

- **SSP 970163**
  The 2017 Audi Q7 Onboard Power Supply and Networking System

- **SSP 970363**
  The 2017 Audi Q7 Occupant Protection and Infotainment System

- **SSP 960163**
  The 2017 Audi Q7 Running Gear and Suspension System
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 “ACADEMY” tab
- Click on the “Academy site” link
- Click on the Course Catalog Search and select “990163 - The 2017 Audi Q7 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.