Self-Study Program 990103

The 2011 Audi A8 Introduction

Audi Academy

Audi of America, LLC
Service Training
Printed in U.S.A.
Printed 4/2010
Course Number 990103

Always check Technical Bulletins and the latest electronic service repair literature for information that may supersede any information included in this booklet.

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Table of Contents

The Self-Study Program provides introductory information regarding the design and function of new models, automotive components or technologies.

The Self-Study Program is not a Repair Manual!
All values given are intended as a guideline only.
Refer to the software version valid at the time of publication of the SSP.

For maintenance and repair work, always refer to the current technical literature.

Reference

Note

Introduction

Audi has launched the next generation A8, a sedan that sets new standards in the luxury class. The 2011 Audi A8 combines prestige, intelligence, dynamics, comfort, and efficiency.

It features an elegant Audi Space Frame (ASF) body that is made of lightweight aluminum. The engine is both powerful and highly efficient, with the power transmission and running gear offering excellent driving dynamics and comfort.

The flagship's interior has luxurious appointments, a newly developed MMI operating system, and handcrafted details. Innovative driver assistance and safety systems improve the entire driving experience.

The new A8 will initially be offered with a 4.2L V8 FSI engine rated at 372 hp (273 kW). Fuel economy has improved by as much as 22% due to intelligent technologies such as new energy recuperation and thermal management systems.

A next generation 8-speed Tiptronic transmission, combined with quattro permanent all-wheel drive, both standard in the 2011 Audi A8, unleash the sport characteristics of the vehicle.

New to the flagship is Audi's modular longitudinal platform design, which features redesigned kinematics and elasto-kinematics, a set-forward front axle, reconfigured front axle components, a new steering position under the center of the front wheel, and upper control arm mounting integrated into the body.

The 2011 Audi A8 offers an updated Multi Media Interface (MMI) that features a touch screen pad, MMI touch. No buttons, no joysticks. Drivers can enter navigation destinations and telephone numbers by simply using their fingertips to write letters and numbers on the pad.

The new Audi A8 also features streamlined CAN data bus technology, and the new FlexRay data bus system. FlexRay is faster and more reliable than CAN and other data bus systems, and offers important system-wide redundancy for safety systems.

The mission of the 2011 Audi A8 is to continue the remarkable success story begun by its predecessor, which surpassed 150,000 unit sales worldwide.

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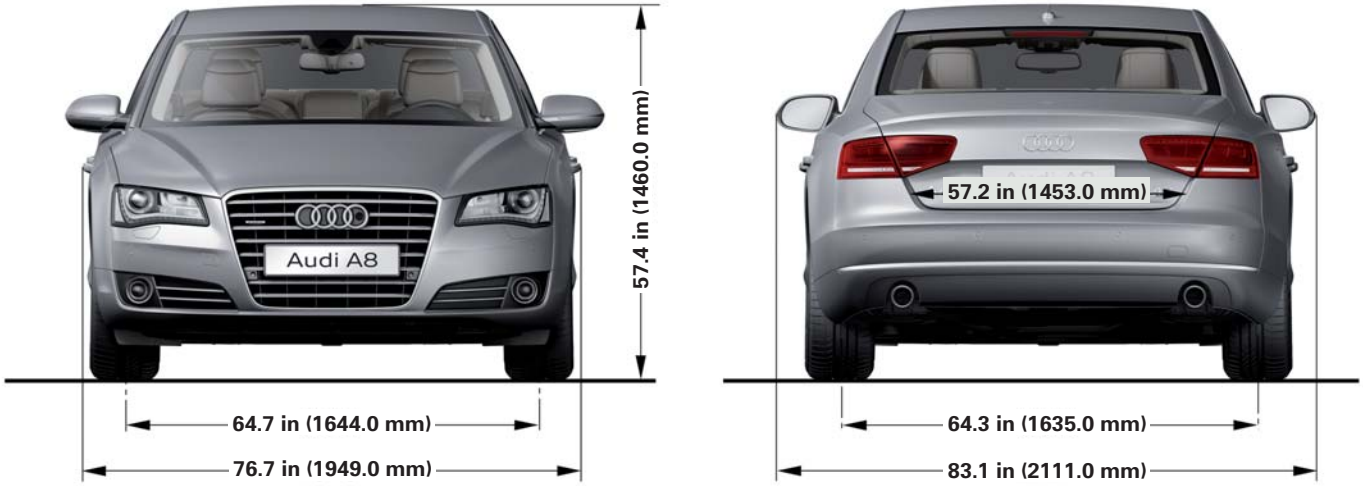
Body

Dimensions



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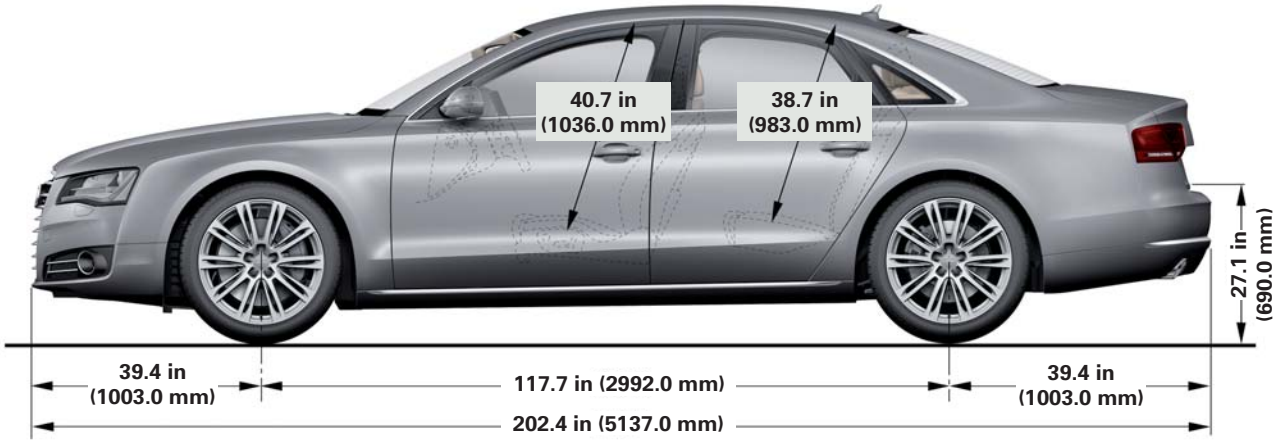

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Length *in/mm*	202.2 in (5137 mm)	Front internal width *in/mm*	59 in (1501 mm)
Width *in/mm*	76.7 in (1949 mm)	Rear internal width *in/mm*	57.6 in (1464 mm)
Height *in/mm*	57.4 in (1460 mm)	Front headroom *in/mm*	40.7 in (1036 mm)
Front track width *in/mm*	64.7 in (1644 mm)	Rear headroom *in/mm*	38.7 in (983 mm)
Rear track width *in/mm*	64.3 in (1635 mm)	Loading width *in/mm*	57.2 in (1453 mm)
Wheelbase *in/mm*	117.7 in (2992 mm)	Load sill height *in/mm*	27.1 in (690 mm)
Towing capacity *lb/kg*	1653.4 lb (750 kg) – 5070.6 lb (2300 kg)	Luggage capacity *cu ft/l*	18 cu ft (510 l)
Curb weight *lb/kg*	4045.4 lb (1835 kg)	Fuel capacity *gal/l*	23.7 gal (90 l)
Maximum allowable gross weight *lb/kg*	5566.6 lb (2525 kg)	Drag coefficient *cw*	0.26

ASF Body

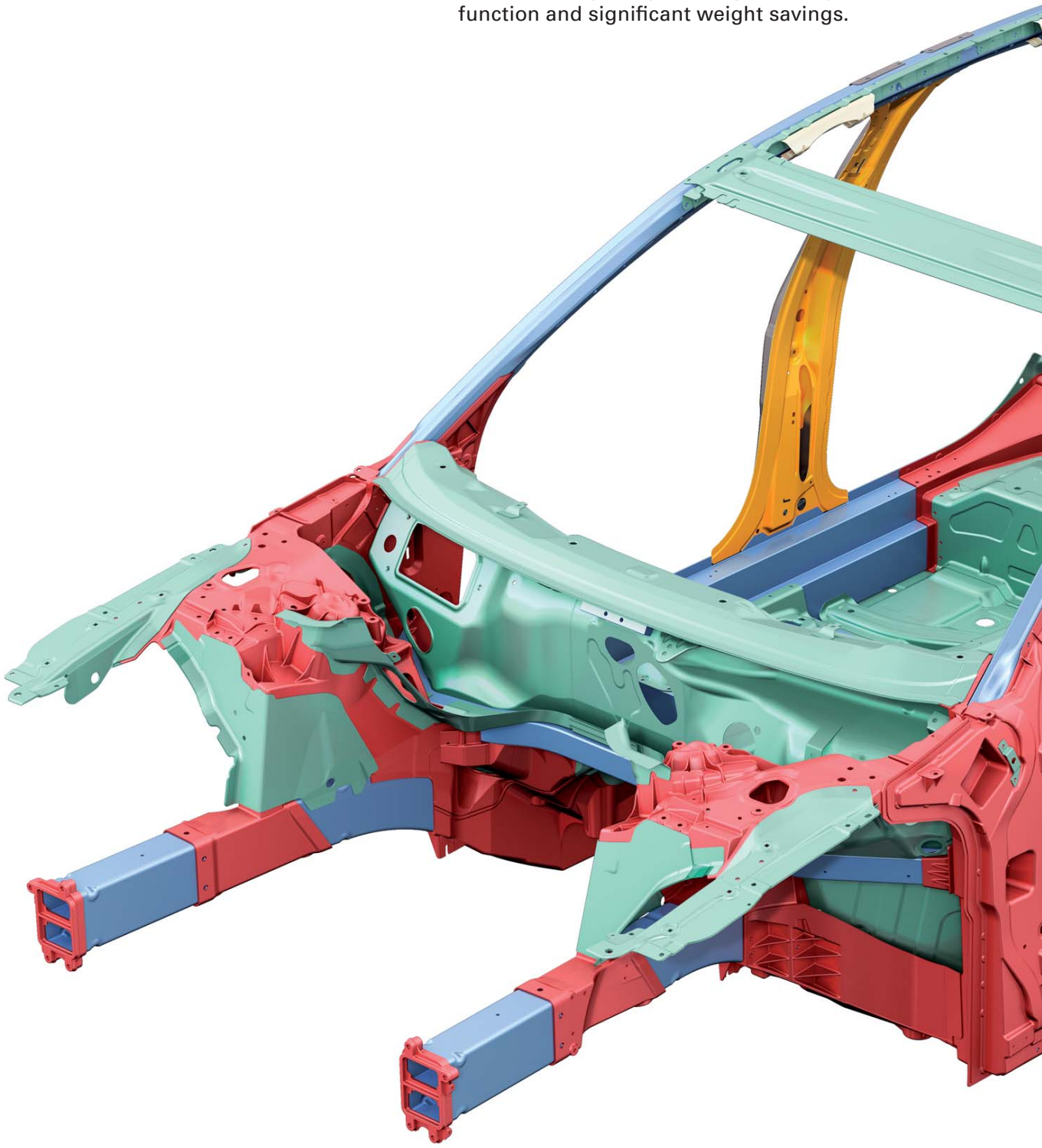
The body of the 2011 Audi A8 employs the proven Aluminum Space Frame (ASF) design. The structure is a composite of aluminum extruded sections, aluminum diecastings, laser welded aluminum blanks, and sheet aluminum components.

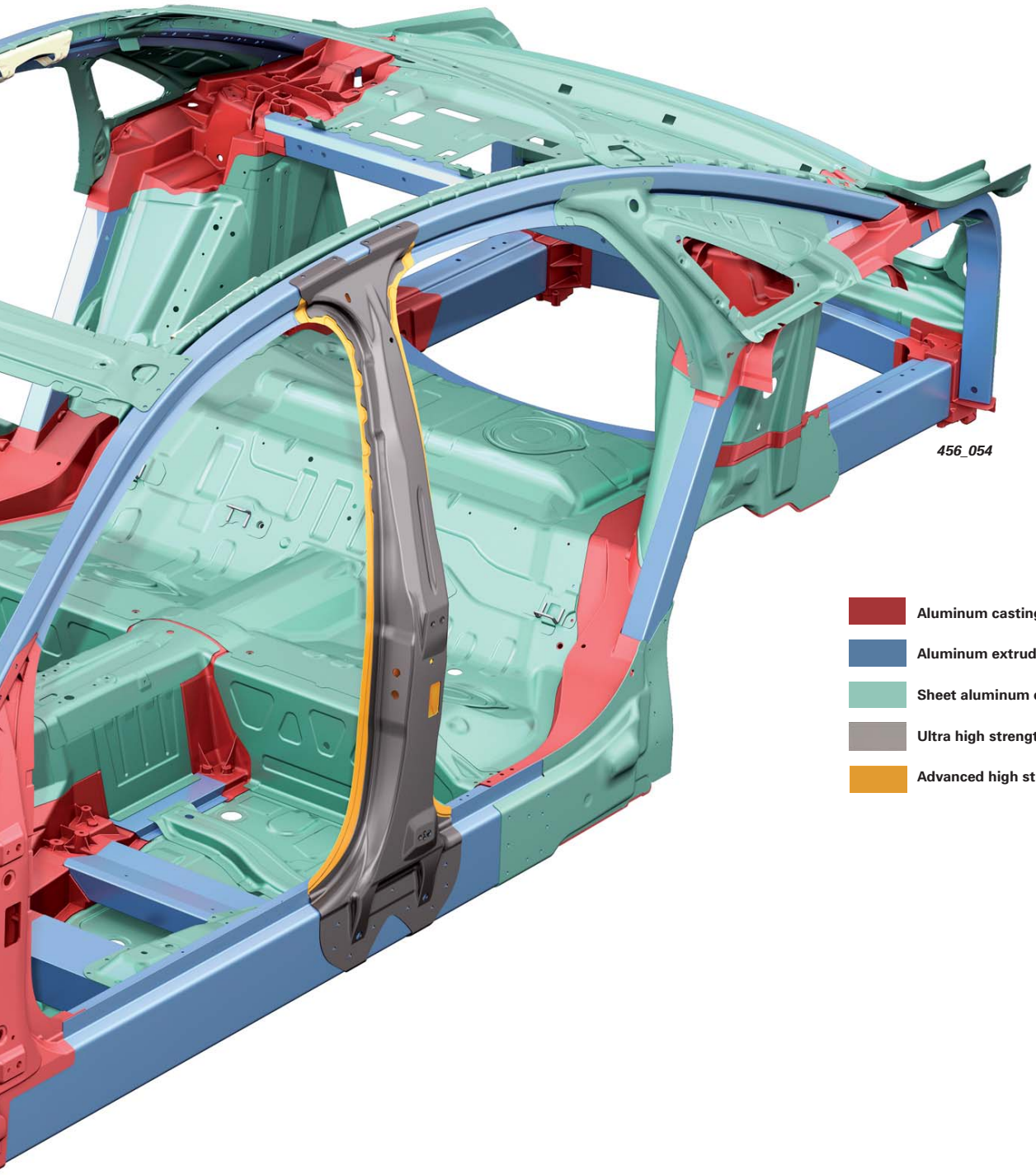
Audi uses 13 different grades of aluminum and several different grades of ultra high strength and advanced high strength steel in the new A8.

The 4.2 FSI V8 weighs in at 4,023.44 lb (1,833.5 kg), considerably less than any of its competitors, despite the added weight of the standard quattro all-wheel drive system.

The new A8 weighs almost 66.14 lb (30 kg) less than the previous generation A8. The ratio of material mass to torsional stiffness is improved by approximately 20%.

All of the body components provide optimal function and significant weight savings.





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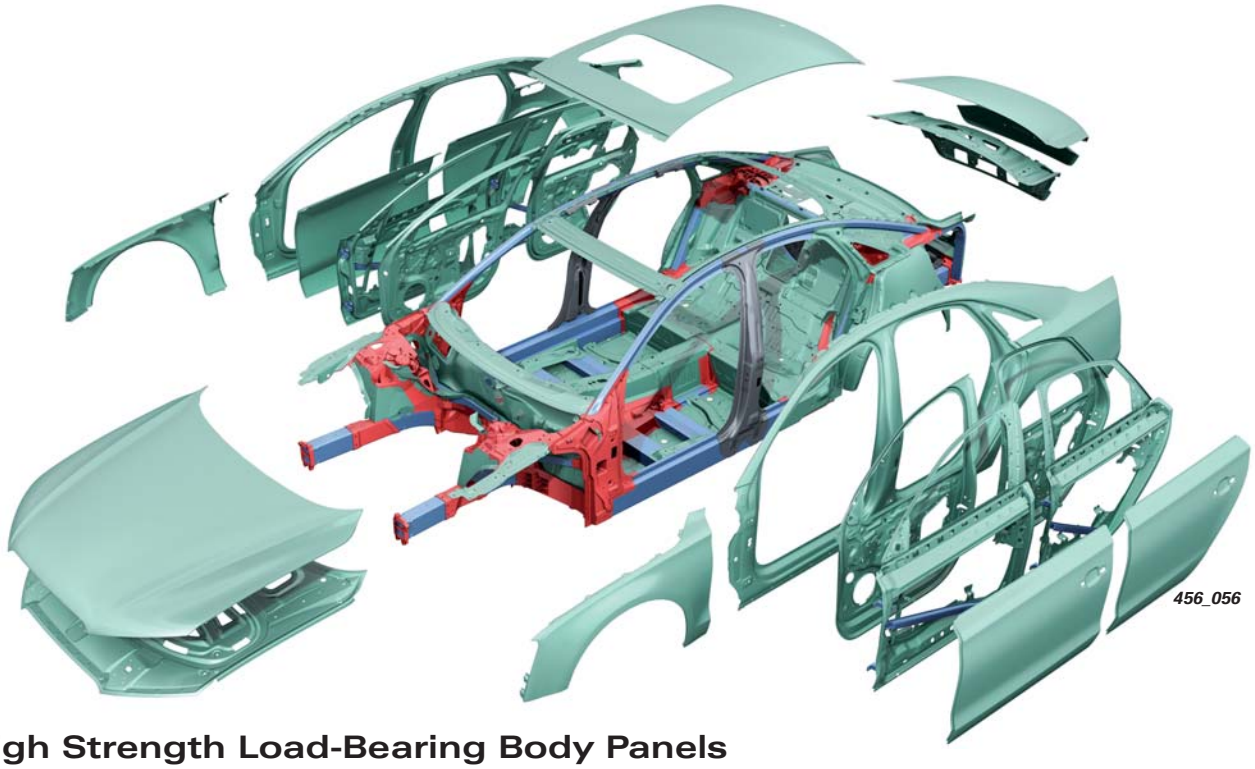
- Aluminum castings
- Aluminum extruded sections
- Sheet aluminum components
- Ultra high strength steel (thermoformed)
- Advanced high strength steel

Body Panels

All body panels are made of aluminum. The door and window frames are a monoblock concave design and are made from sheet aluminum.



High Strength Load-Bearing Body Panels

High strength aluminum alloy sheet panels are used for strategic load-bearing in the body structure. These panels reduce body weight while increasing body strength. In all, 15 component body parts of the 2011 Audi A8 are manufactured from high strength aluminum alloy.

B-Pillar and B-Pillar Striker Panel

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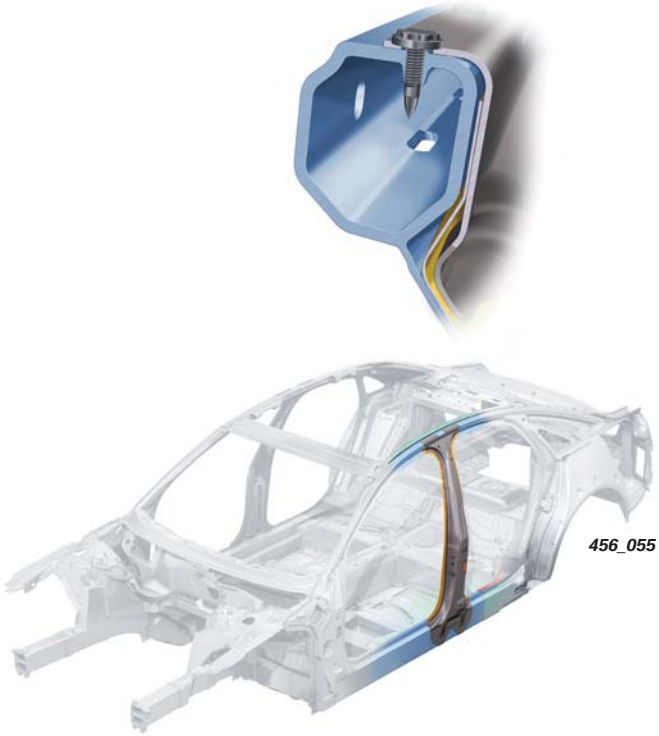
The B-pillar is a welded steel assembly. The pillar is manufactured from ultra high tensile hot-formed steel while the striker panel is made from advanced high strength steel (AHSS).

If repairs to the B-pillar are necessary, the complete welded assembly is available.

Attachment of B-Pillar to Body

The welded B-pillar assembly is attached to the body by flow drill screws. It is also bonded to increase strength, insulate the body, and limit contact corrosion.

The outer skin is attached to the B-pillar by bonding and punch riveting.



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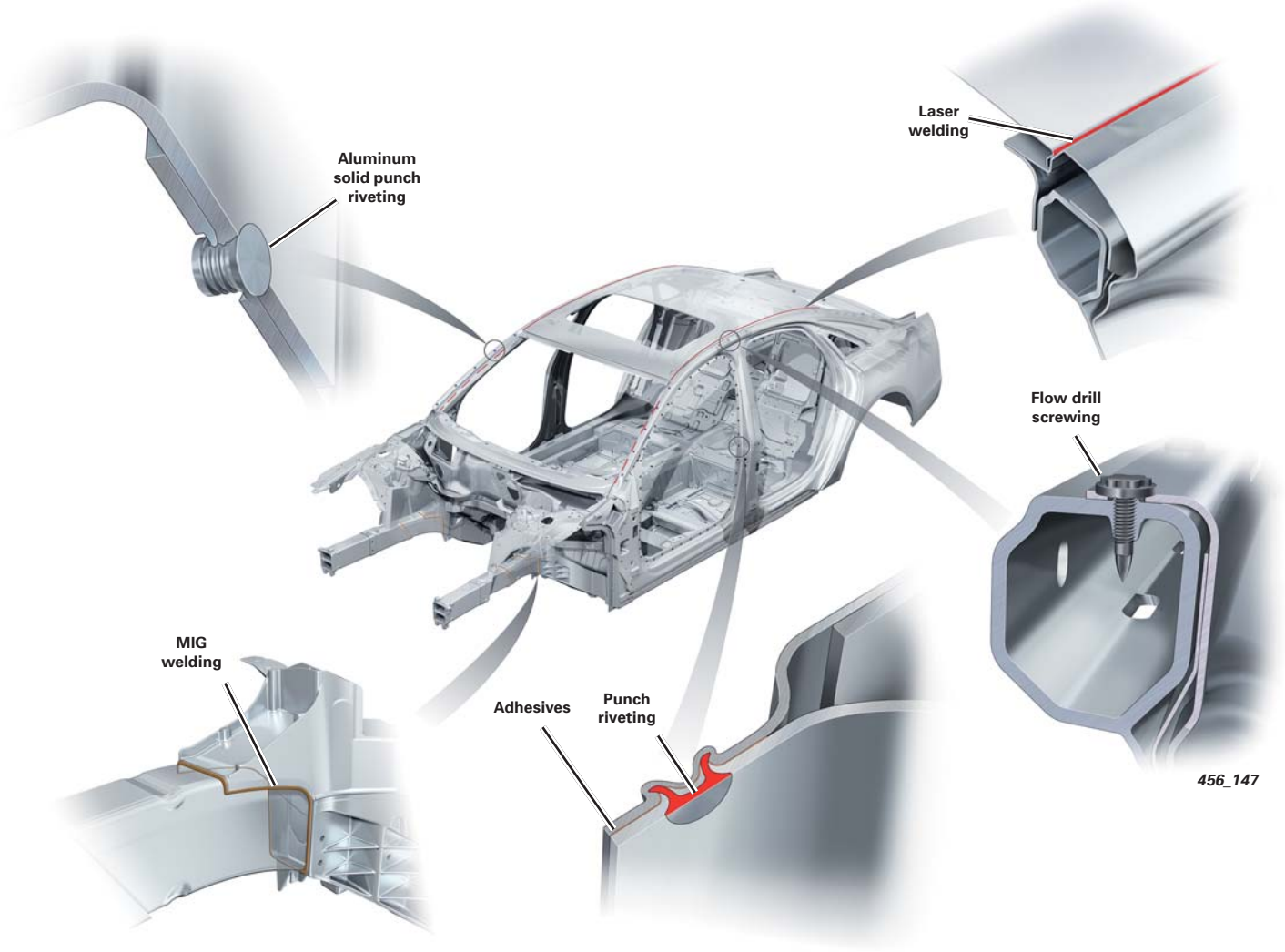
Joining Techniques



A variety of joining techniques are used on the 2011 Audi A8:

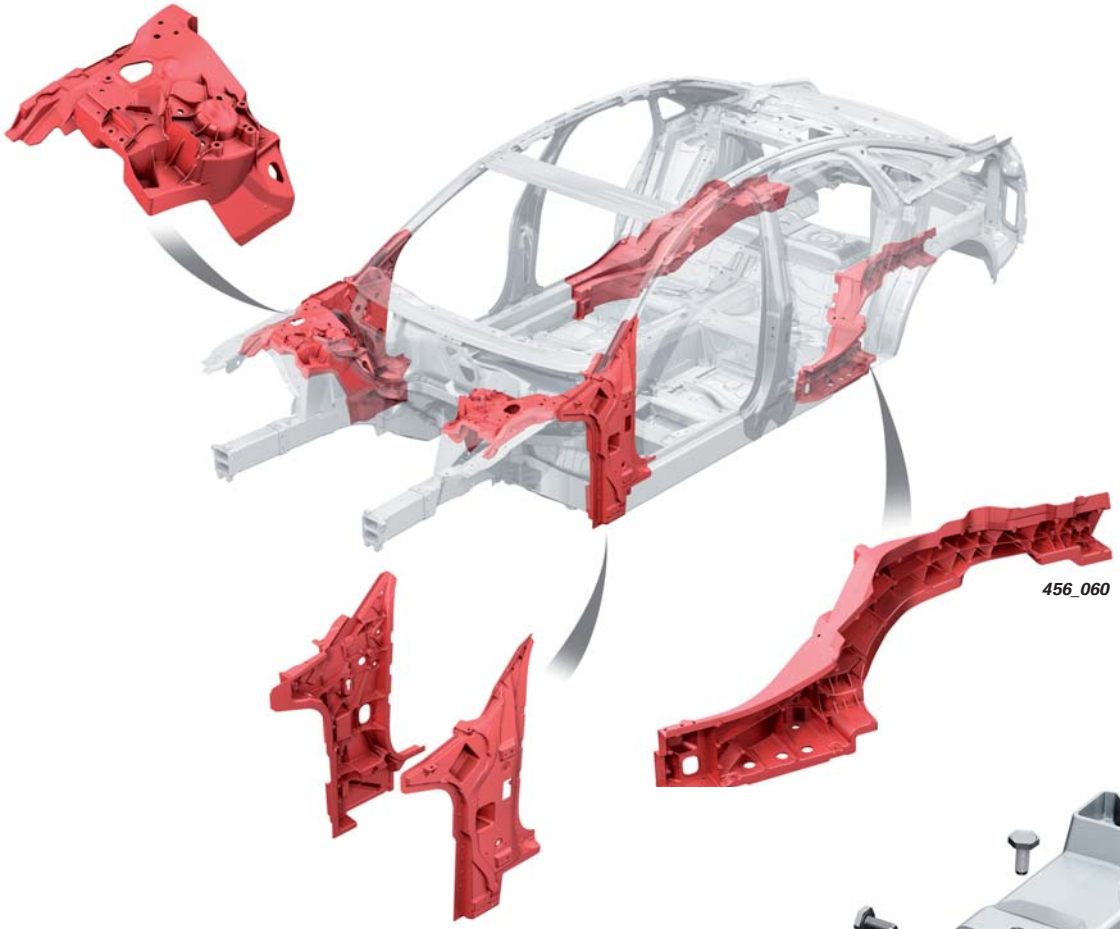
- Metal Inert Gas (MIG) welding
- Laser welding (roof seam)
- Punch riveting (also used for joining the aluminum body panels to the steel B-pillar)
- Flow drill screwing
- Solid punch riveting
- Clinching (attachments only)

Multifunctional Large Castings

Used primarily in high stress areas, multifunctional large castings also offer more freedom for design.

For example, the A-pillar node on the new A8 is a multifunctional casting that fulfills a number of structural tasks. It interconnects all of the following: the longitudinal member, the sill, the windshield crossmember, the roof frame, the suspension strut mount, and the “omega” cross-member.

Most of the 25 castings in the ASF of the new A8 are manufactured using a vacuum pressure diecasting process.



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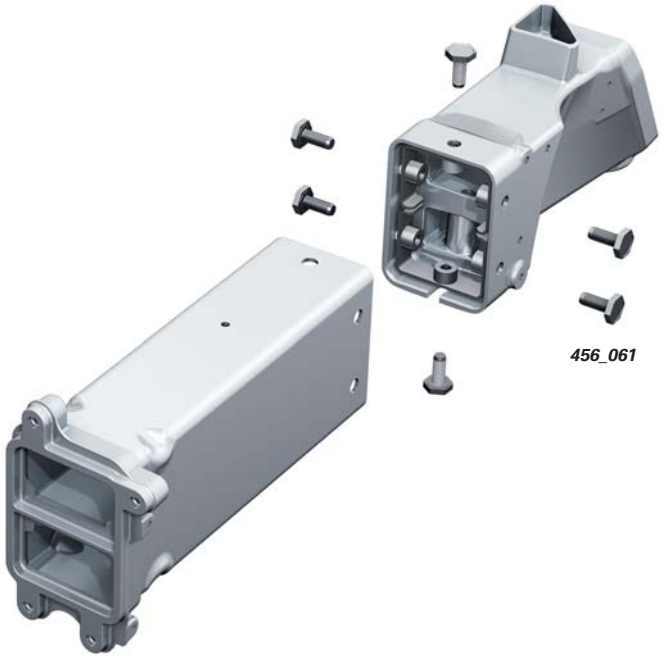
Side Member Mounting

To make repairs more simple and less expensive, the front part of the side member is bolted, as on previous models.



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Passive Safety

Overview

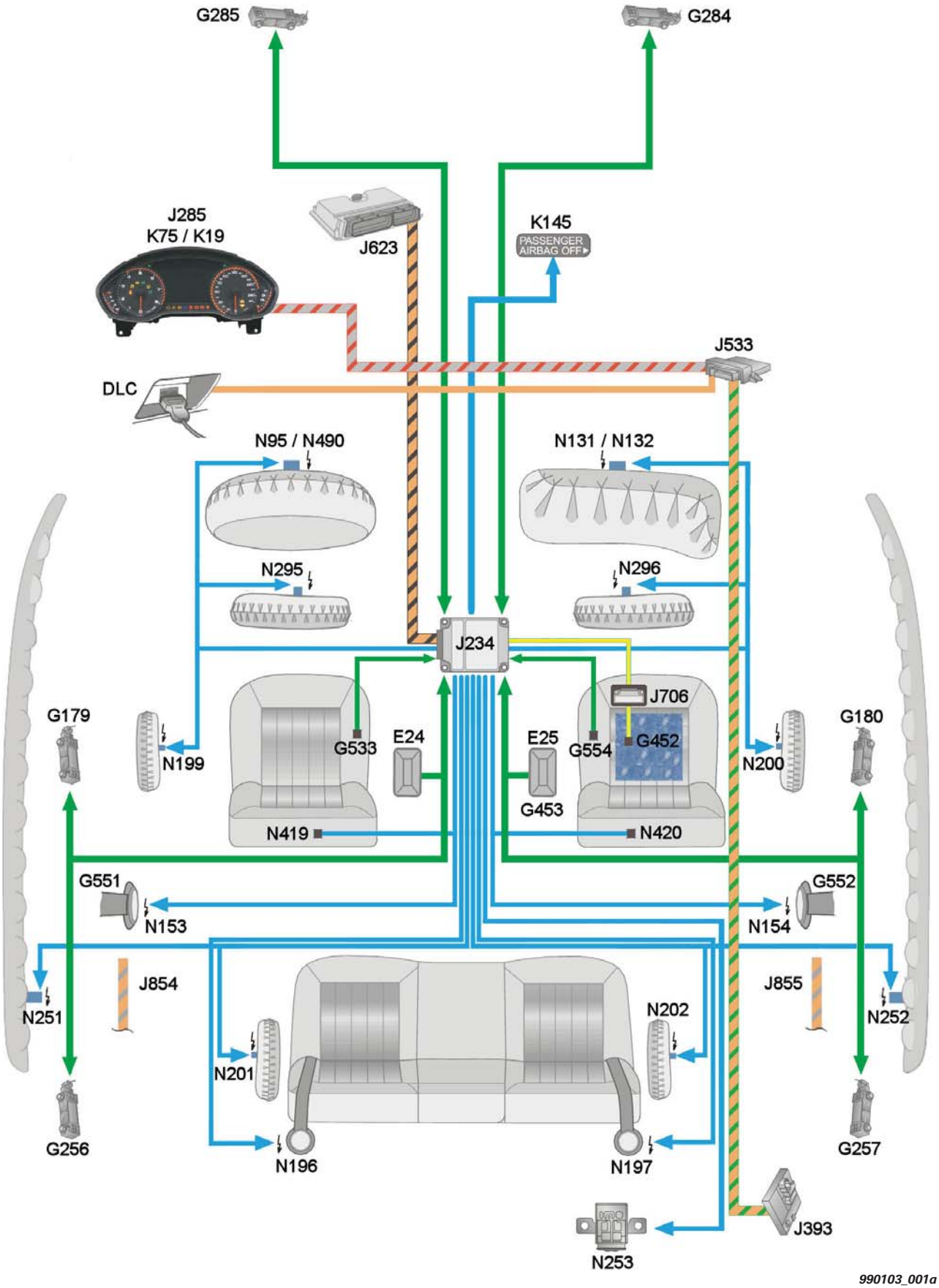
There is close-knit interaction between the driver assistance and passive restraint systems in the 2011 Audi A8.

The occupant protection system has the following features:

- Airbag control module
- Adaptive driver and passenger airbags
- Side airbags, front and rear
- Audi Sideguard (side curtain airbags)
- Up-front crash sensors
- Door-integrated crash sensors for side impact detection
- Crash sensors for side impact detection on the C-pillars
- Front inertia-reel seatbelts with pyrotechnic and electrically reversible belt tensioners and active belt force limiters
- Driver and passenger knee airbags
- Rear inertia reel seatbelts with pyrotechnic belt tensioners
- Battery interrupt igniter
- Seatbelt reminder for driver and front passenger
- Seatbelt switch, driver and front passenger side
- Seat occupied sensor in front passenger seat
- Driver and front passenger seat position sensors

Legend:

E24	Driver's Seat Belt Switch
E25	Front Passenger Seat Belt Switch
G179	Driver Thorax Airbag Crash Sensor
G180	Front Passenger Thorax Airbag Crash Sensor
G256	Left Rear Thorax Airbag Crash Sensor
G257	Right Rear Thorax Airbag Crash Sensor
G283	Driver Front Airbag Crash Sensor
G284	Front Passenger Front Airbag Crash Sensor
G452	Passenger Occupant Detection System Pressure 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	Front Passenger Seat Position Sensor
J533	Data Bus On Board Diagnostic Interface
J623	Engine Control Module
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 Light
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	Left Rear Seat Belt Tensioner Igniter
N197	Right Rear Seat Belt Tensioner Igniter
N199	Driver Thorax Airbag Igniter
N200	Front Passenger Thorax Airbag Igniter
N201	Left Rear Thorax Airbag Igniter
N202	Right Rear Thorax Airbag Igniter
N251	Driver Head Curtain Airbag Igniter
N252	Passenger Head Curtain Airbag Igniter
N253	Battery Interrupt Igniter
N295	Driver Knee Airbag Igniter
N296	Front Passenger Knee Airbag Igniter
N419	Driver Active Head Restraint Solenoid
N420	Front Passenger Aactive Head Restraint Solenoid
N490	Driver Airbag Release Valve Igniter
T16	Data Link Connector


G285
G284
J285
K75 / K19
J623
K145
PASSENGER AIRBAG OFF
J533
DLC
N95 / N490
N131 / N132
N295
N296
J234
J706
G179
N199
G533
E24
E25
G554
G452
N200
G180
G453
N419
N420
G551
N153
G552
N154
J854
J855
N251
N252
N201
N202
G256
N196
N197
G257
J393
N253
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Airbag Control Module J234

The purpose of J234 is to measure and evaluate the vehicle's acceleration and deceleration to determine if a collision has occurred. External sensors, as well as those in the control module are used. J234 can only detect an accident from the information provided by the sensors.

Once all of the sensor information has been evaluated, J234 decides when and which safety components will be activated. Depending on the severity and nature of the impact, the appropriate restraint systems (belt tensioner or belt tensioner and airbag) are activated.

Other vehicle systems are also notified of the collision event.

Through continued development, J234 no longer needs a second crash sensor ("safety switch") for head-on impact detection.

The main tasks of the airbag electronics are:

- Evaluation of all input information
- Continuous monitoring of the overall airbag system
- Collision detection (front, side, rear)
- Defined deployment of the belt tensioners, airbags, and battery isolator
- Defined activation of front airbag adaptivity
- Defined activation of the adaptive belt force limiter
- Independent power supply through a capacitor for a defined period of time (approximately 150 ms)
- Fault indication by the airbag warning lamp
- Storage of fault and crash information
- Notification of a collision event to other system components via the Powertrain CAN
- Activation and deactivation of the seatbelt reminder function

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Rollover Protection System

Two additional sensors for rollover recognition have been integrated into J234. For higher rollover recognition sensitivity, information is also collected from ABS Control Module J104, Active Steering Control Module J792, and Steering Angle Sensor G85.

J234 does not require additional information from these sensors. It is capable of independently identifying a rollover situation. When a rollover is detected, the seatbelt tensioners and Audi Sideguard airbags are activated.

Data Exchange

Airbag Control Module J234 continuously exchanges information with other vehicle systems on the Powertrain CAN, sending the following information:

- Airbag Indicator Lamp K75 ON/OFF
- Status of seatbelt buckles
- Diagnostic data
- Crash signal/crash severity
- Crash information for the actuator test
- Seat position
- Front passenger front airbag status

J234 also evaluates the following information:

- Dimming for the passenger OFF warning lamp
- Vehicle stationary or moving
- Collision prediction*
- Speed relative to objects*

*With Adaptive Cruise Control (ACC) and Audi side assist only

Side Airbags

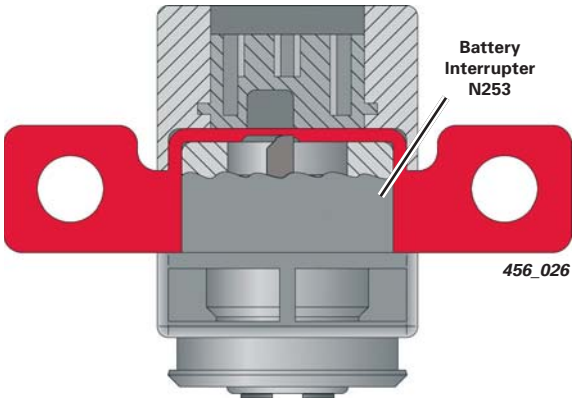
Side airbags are used for all outside seating positions. They are equipped with solid fuel generators.

Audi Sideguard

Side curtain airbags cover almost the entire side window area. The length of the airbag varies according to A8 body shape (long or short wheelbase). These airbags are inflated by hybrid gas generators integrated in the D pillars of the vehicle.

Battery Interrupter

During a collision, Battery Interrupt Igniter N253 is the pyrotechnic battery interrupting component.



Seat Position Sensing

To adapt the function of the belt force limiter and front airbags to the exact requirements of the moment, J234 must know if the seats are in forward or rearward positions. Seat Position Sensors G553 and G554 provide this information for J234.

Belt Tensioners

Rack-type belt tensioners are used on the front seats. Band driven belt tensioners are used on the rear outer seats. These tensioners are integrated into the inertia-reel seatbelts.

Seatbelts

The following functions are integrated into the front inertia-reel seatbelts:

– Reversible belt tensioner with control module
– Pyrotechnic belt tensioner
– Adaptive belt force limiter

Reversible belt tensioners:

– Left Front Seat Belt Tensioner Control Module J854
– Right Front Seat Belt Tensioner Control Module J855

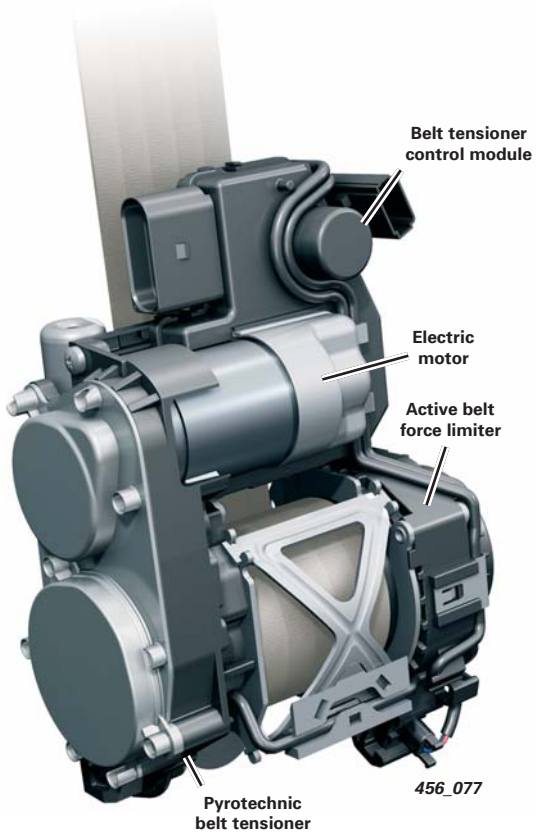
Control modules J854 and J855 communicate via the Extended CAN bus and Data Bus On Board Diagnostic Interface J533. The control modules activate electric motors which vary the tension applied to the belts.

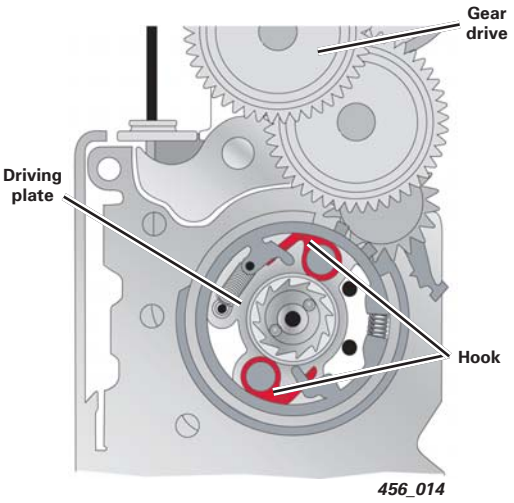
Three different force levels are available:

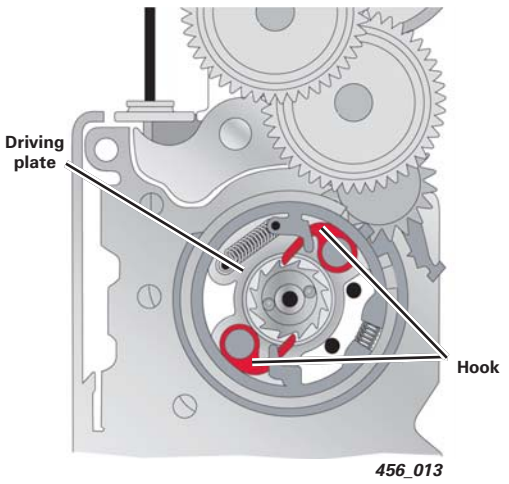
1. Low force = belt slack reduction
2. Medium force = partial tensioning
3. High force = full tensioning

If Airbag Control Module J234 detects a minor head-on collision where the belt tensioners are not needed, a corresponding signal is sent to control modules J854 and J855 to initiate full electrical motor tensioning of the seatbelts.

When the electric motors operate, a driving plate is driven by toothed gearing. Two hooks extend connecting the driving plate to the seatbelt retractor shaft. The seatbelt is retracted. When the motors stop or reverse slightly, the hooks retract, releasing the seatbelt retractor shaft.







Adaptive Belt Force Limiter

The front inertia-reel seatbelts have dual-stage belt force limiters. In a head-on collision where the impact force exceeds a predetermined deployment threshold, the pyrotechnic belt tensioners are ignited first.

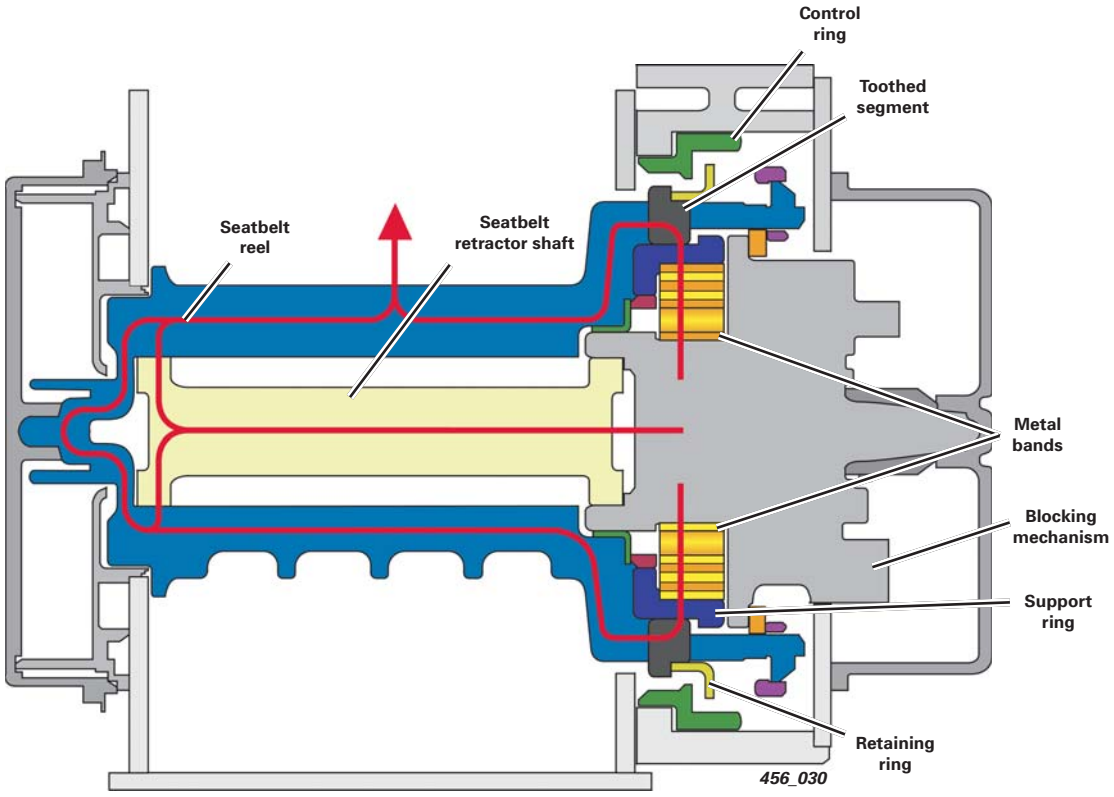
The inertia-reel seatbelt blocking mechanism then blocks the seatbelt retractor shaft, preventing the seatbelt from unwinding. Otherwise, due to the forward motion of the occupants, the seatbelts would attempt to rewind.

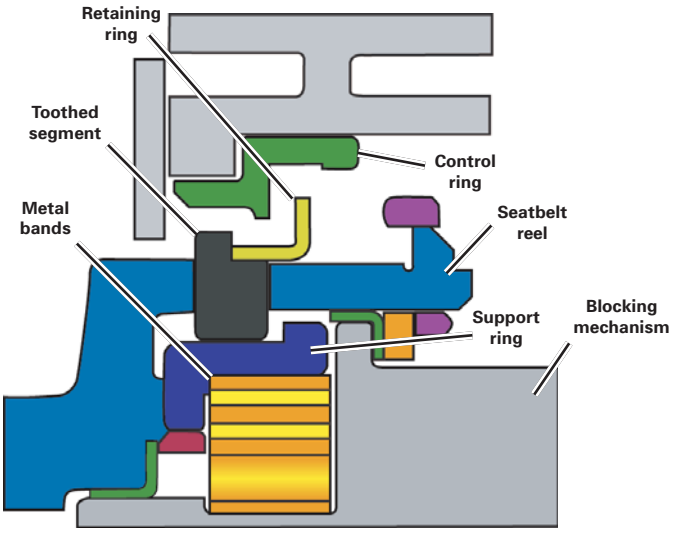
To reduce the load exerted on the occupants by the seatbelt, the seatbelt retractor shaft and a belt winder allow the seatbelt to unwind in a controlled way.

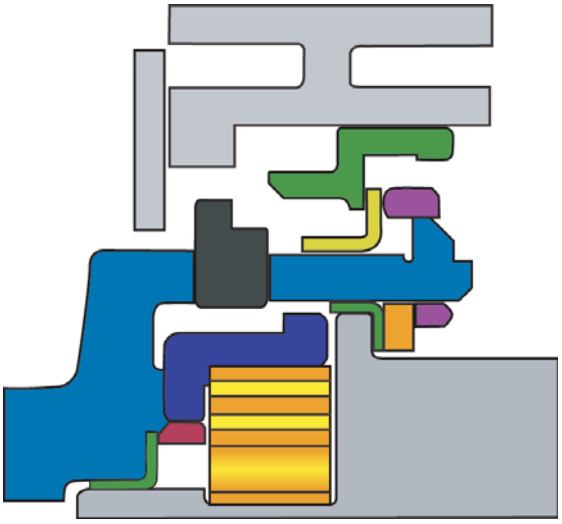
The airbag control module activates the belt force limiter igniter according to the force of impact and the longitudinal position of the seat.

The force counteracting the seatbelt is distributed as follows:

1. From the seatbelt reel to the blocking mechanism via the seatbelt retractor shaft. The seatbelt retractor shaft twists like a torsion bar.
2. From the seatbelt reel to the blocking mechanism via the toothed segments, the support ring, and metal bands. The metal bands are connected to the support ring and blocking mechanism. The metal bands are retracted.







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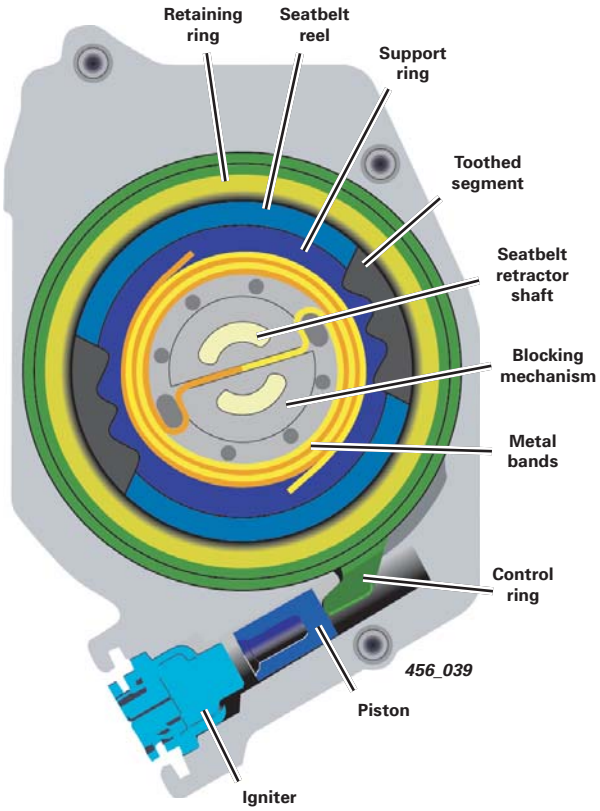


Front Airbags

The 2011 Audi A8 has adaptive driver and front passenger airbags. An airbag module with a single-stage solid fuel generator is located on the driver's side.

A hybrid gas generator is used for the front passenger side airbag. The adaptivity function is similar in both airbag modules.

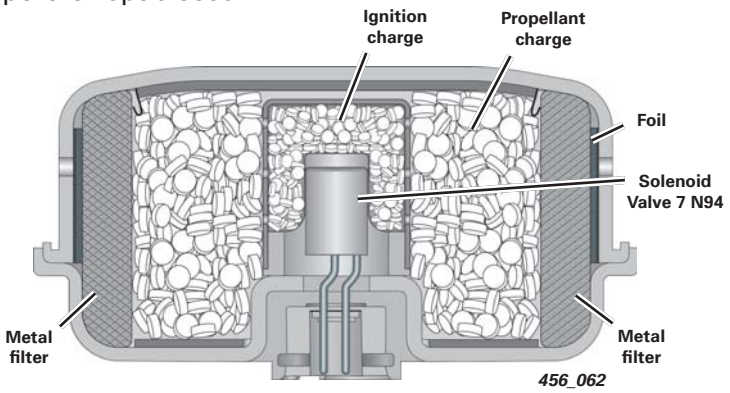
Driver Airbag Operation

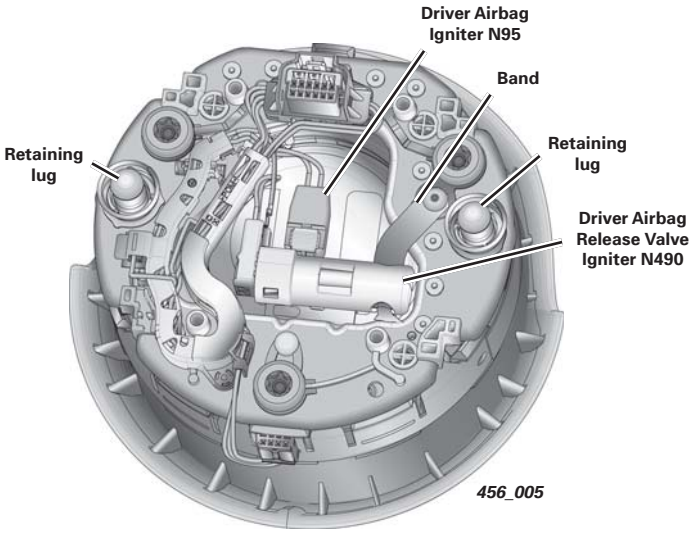
In the event of a collision severe enough to deploy the airbags, Airbag Control Module J234 activates Driver Airbag Igniter N95. The ignition charge then ignites the propellant charge. When the gas pressure produced by combustion of the propellant charge exceeds a predetermined level, a foil opens the discharge ports. This allows gas to flow through the metal filter and into the airbag. The airbag unfolds and is inflated.

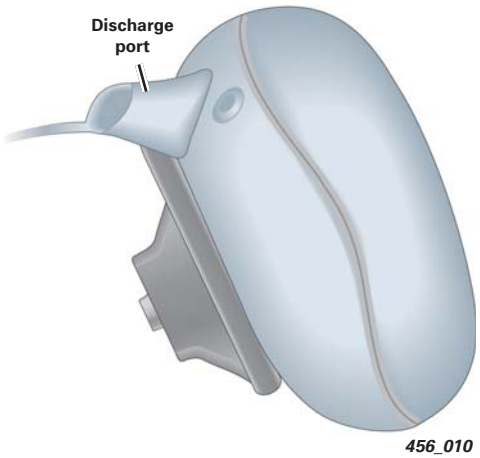
To provide adaptivity, an additional igniter, Driver Airbag Release Valve Igniter N490, and a discharge port are located on the back of the gas generator. This discharge port is kept closed in the airbag by a band.

Depending on the force of impact and the driver's seating position, J234 activates the driver airbag discharge valve igniter, cutting the band and opening the additional discharge port. The airbag is "adapted" to the event seating situation of the occupants.

The gas generator of the driver's airbag is mounted on the steering wheel in a rubber ring, which minimizes vibration.







Note

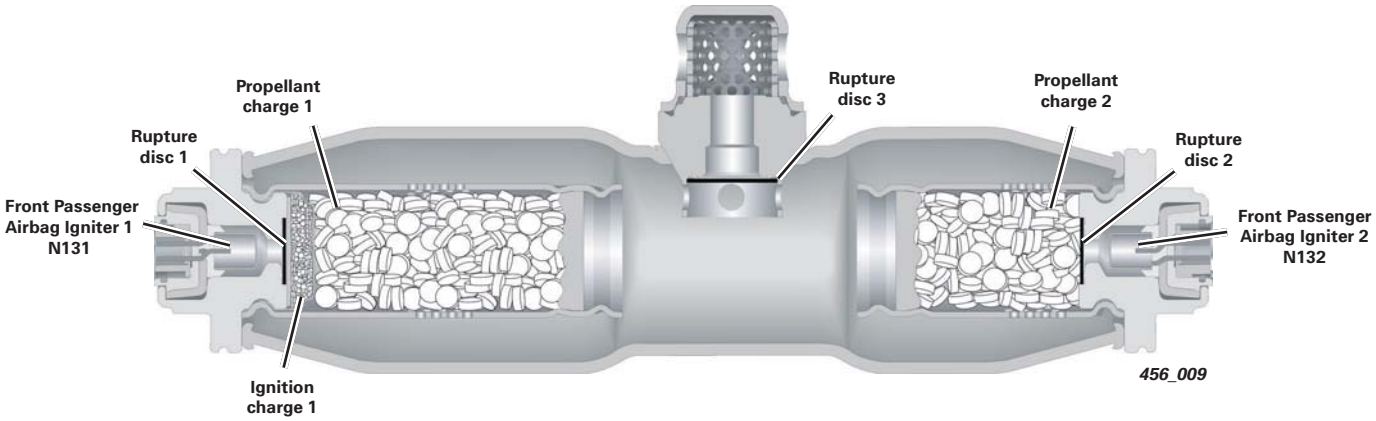
The method for attaching J234 to the steering wheel has changed from previous Audi A8 models. Refer to current service repair literature for complete removal and installation instructions.

Passenger Airbag

The 2011 Audi A8 for the North American market will come equipped with a two-stage adaptive front passenger airbag. It uses a two-stage hybrid gas generator.

Based on accident parameters, Airbag Control Module J234 determines the time interval at which Front Passenger Airbag Igniter 2 N132 is activated after Front Passenger Airbag Igniter 1 N131.

Front passenger two-stage hybrid gas generator



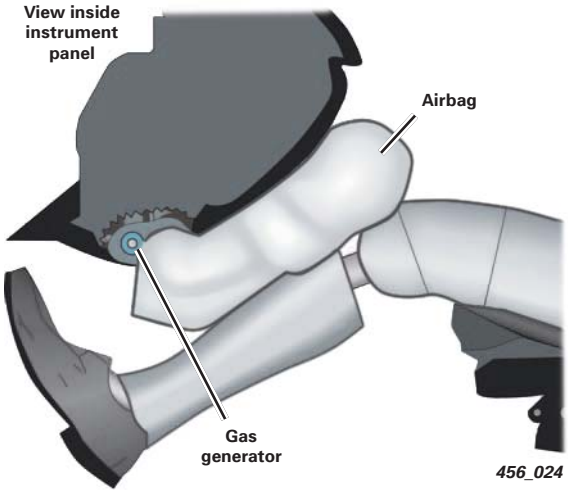
Note

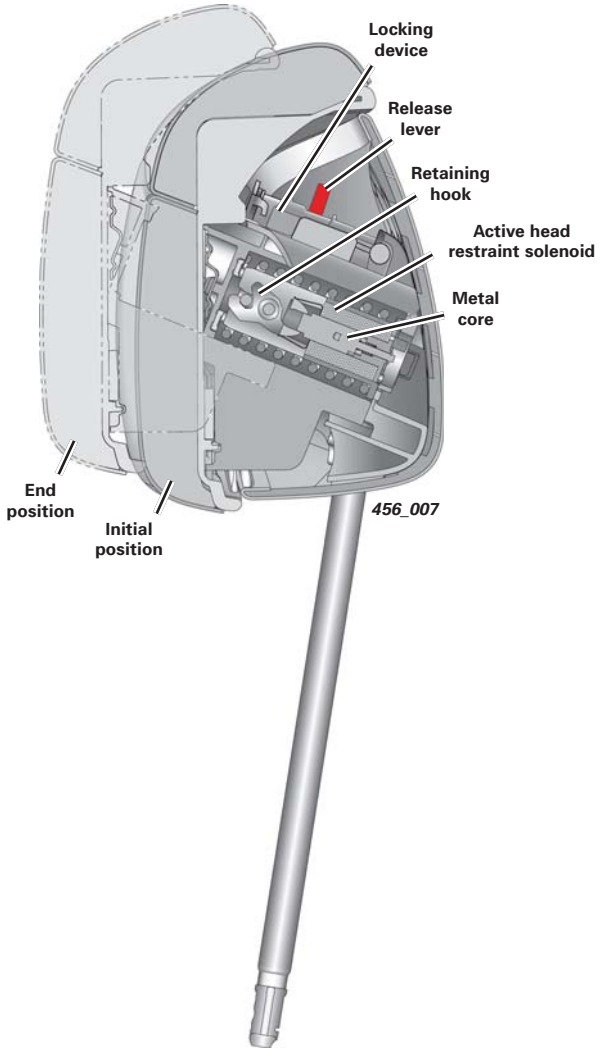
When performing work on the airbag system, it is very important to pay close attention to the Cautions and Warnings given in current service repair literature.

Knee Airbags

Driver Knee Airbag Igniter N295
Front Passenger Knee Airbag Igniter N296

Ignited knee airbags protect occupants earlier in the vehicle deceleration process. On the driver's side, the knee airbag is integrated into the footwell trim below the instrument panel. On the front passenger side, the knee airbag is located behind the glove box lid. Knee airbags are activated in combination with the front airbags. Hybrid gas generators are used.





Active Head Restraints

Driver Active Head Restraint Solenoid N419 and Front Passenger Active Head Restraint Solenoid N420

If Airbag Control Module J234 detects a rear impact where the force exceeds a predetermined deployment threshold, the active head restraints on the front seats are activated in addition to the belt tensioners.

When J234 activates active head restraint solenoids N419 and N420, the metal core is drawn into the magnetic coil. Because the retaining hook no longer rests on the metal core, the front part of the head restraint is released.

The head restraint moves approximately 1.96 in (50 mm) forward and approximately 0.78 in (20 mm) upward. A locking device prevents the front part of the head restraint from returning to its original position.

The active head restraints are reversible. The lock can be released using the release lever, allowing the extended part of the head restraint to be pushed back again.

For the complete procedure, refer to current service repair information.

Active Safety

Audi Pre Sense Safety System

The new Audi pre sense system is available in a basic (standard) version and three expanded (optional) levels: front, rear, and plus.

The Audi pre sense system networks various in-car systems via individual control modules and data bus systems. The associated control modules can evaluate the constant stream of information and take action, as needed.

Audi Pre Sense Basic

This system analyzes information from the Electronic Stability Program (ESP) sensors. When the sensors signal maximum brake application or skidding, the ABS control module intervenes. Depending on the situation, it activates the hazard warning lights, closes the side windows/ sunroof, and tensions the front seatbelts. Electric motors tension the seatbelts. If the situation ends well, the seatbelts are released again.

Audi pre sense tensions the front seatbelts every time the car is started. The seatbelts are tensioned gently, but firmly enough that the driver notices.

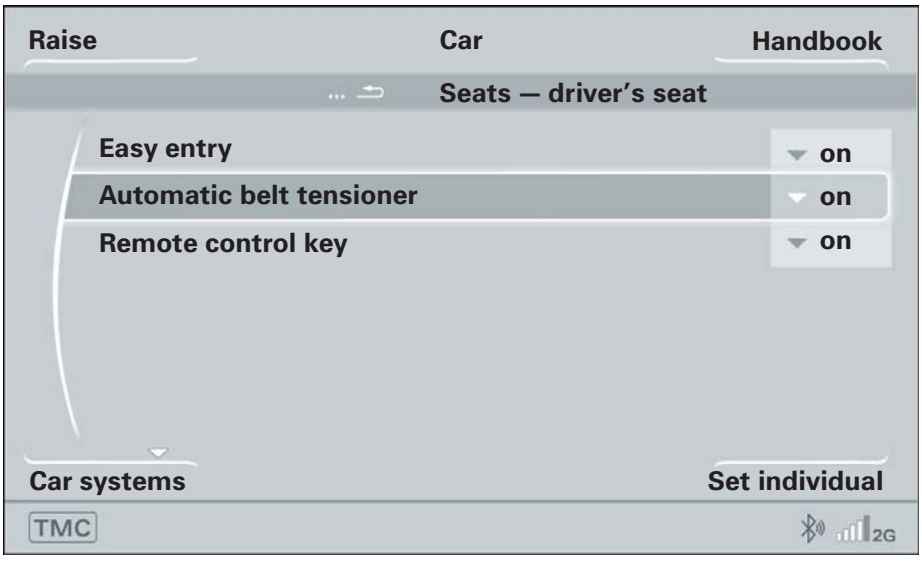
Audi pre sense is unable to prevent accidents. It alerts the driver to hazardous situations and assists where technically feasible. However, drivers are entirely responsible for their driving actions.

Automatic Seatbelt Tensioner

If the front seat occupants are wearing their seatbelts and a vehicle speed of approximately 9.3 mph (15 km/h) is detected (forward travel), Left and Right Front Seat Belt Tensioner Control Modules J854 and J855 will activate the electric motors in the inertia-reels of the seatbelts to reduce belt slack.

If the vehicle is traveling forward at a speed of less than 9.3 mph (15 km/h), belt slack is reduced after approximately 10 seconds. If seatbelts are not being worn, the electric motors in the inertia reels will not be activated.

Occupants can switch the automatic belt tensioner (belt slack reduction) OFF and ON via the MMI.



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Longitudinal Dynamics

If the driver applies heavy braking, Left and Right Front Seat Belt Tensioner Control Modules J854 and J855 will initiate partial seatbelt tensioning once a predetermined braking pressure is exceeded.

If the driver performs an extreme braking maneuver (for example, emergency braking), a sudden increase in brake pressure will occur in the brake system due to pressure on the brake pedal. If this brake pressure reaches a predetermined level within a defined period of time, the seatbelts are fully tensioned by J854 and J855.

ABS Control Module J104 also switches the hazard warning light system ON. Electrical belt tensioning reduces the forward motion of occupants by up to approximately 3.9 in (10.0 cm), depending on the situation.

Transverse Dynamics

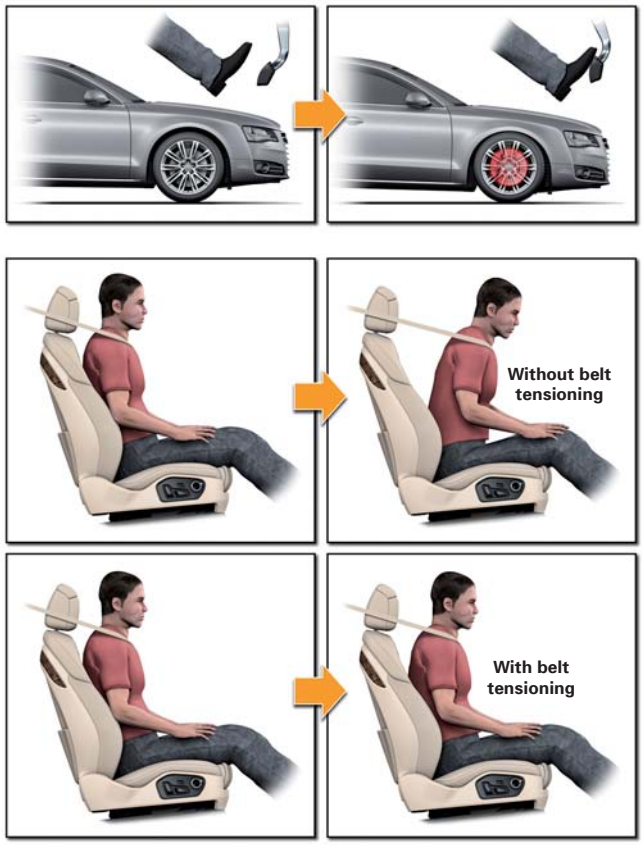
If the vehicle begins to understeer or oversteer, the Electronic Stability Program (ESP) is activated, sending a signal to partially tension the seatbelts. If the vehicle can no longer be stabilized, the seatbelts are fully tensioned. Closing of the side windows/sunroof is initiated.

If an accident does not occur, the seatbelts are again released and the hazard warning lights (if ON) are switched OFF.

Depending on how Audi drive select is configured and whether the Traction Control System (TCS) is switched ON or OFF, the seatbelts are electrically tensioned according to the driving situation.

Due to the short amount of time available, the side windows/sunroof may not fully close.

Closing of the side windows/sunroof can reduce the probability of miscellaneous objects entering the vehicle interior.



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Audi Drive Select		Auto	Comfort	Dynamic
TCS	ON	Partial and full	Partial and full	Full
	OFF	Partial and full under braking	Partial and full under braking	Full under braking

Audi Pre Sense Front

Audi pre sense basic, pre sense front, and pre sense plus are available in conjunction with the optional Adaptive Cruise Control (ACC) system. In addition, Audi braking guard can be ordered in combination with Adaptive Cruise Control.

The radar sensors of the ACC monitor the traffic ahead and send information to Adaptive Cruise Control Control Module J428, which evaluates this data and transfers the information to the data bus.

Other control modules can receive and evaluate these messages, taking appropriate action. Even if ACC is not activated, the radar sensors monitor the traffic ahead and send information.

To implement the Audi pre sense rear system, Audi side assist is required in addition to ACC. Audi side assist also monitors traffic behind the vehicle.

Example

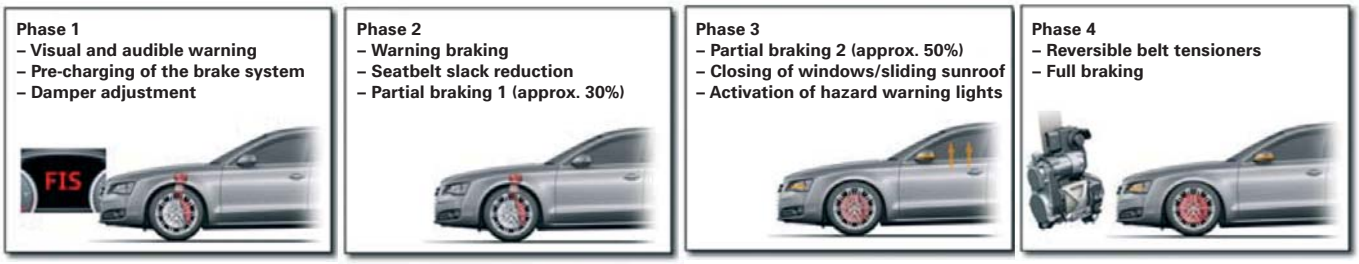
Phase 1:

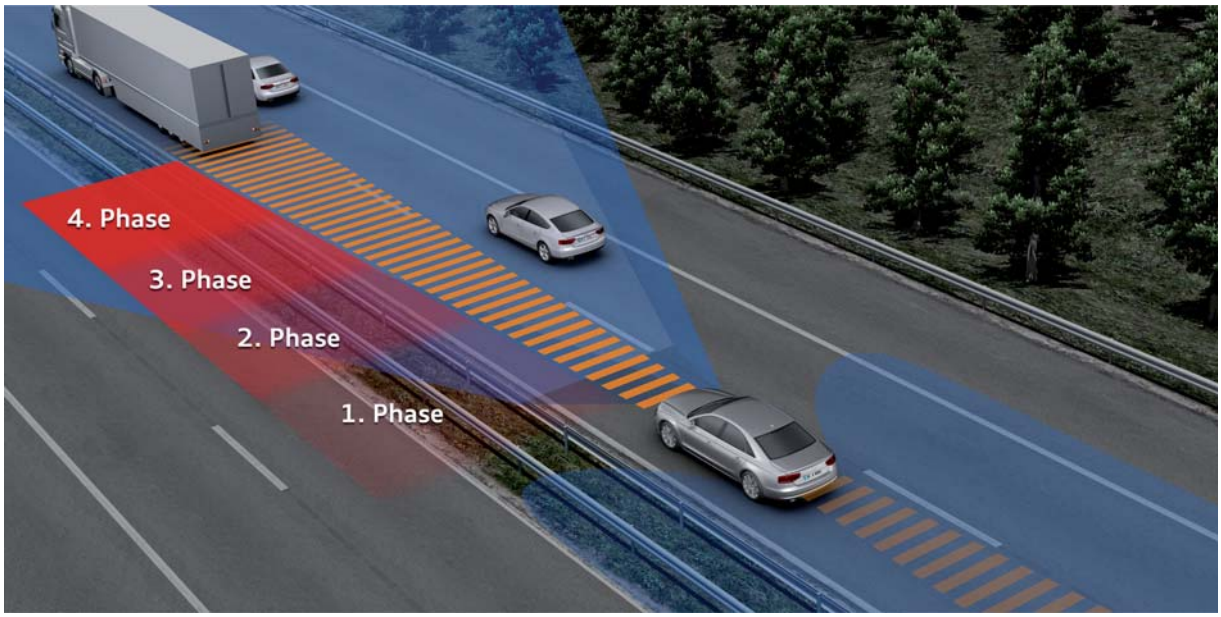
If the driver's vehicle is approaching a hazardous situation, the driver is alerted visually and audibly by Instrument Cluster Control Module J285. At the same time, ABS Control Module J104 precharges the brake system, and Level Control System Control Module J197 sets the damping to "firm".

Phase 2:

If the driver does not react to the warnings from the instrument cluster, or only takes their foot off the accelerator, J104 performs a warning braking application.

The vehicle is then braked again by partial braking "1" (approx. 30% brake pressure). Seatbelt slack is reduced during the warning braking by Left and Right Front Seat Belt Tensioner Control Modules J854 and J855.





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Phase 3: (Audi pre sense plus only)

If the driver still does not apply the brakes, then partial braking “2” (approx. 50% brake pressure) is initiated by J104.

In addition, the hazard warning lights are activated by Distance Regulation Control Module J428, and closing of the side windows/sunroof is initiated by Left Front Seat Belt Tensioner Control Module J854.

Phase 4: (Audi pre sense plus only)

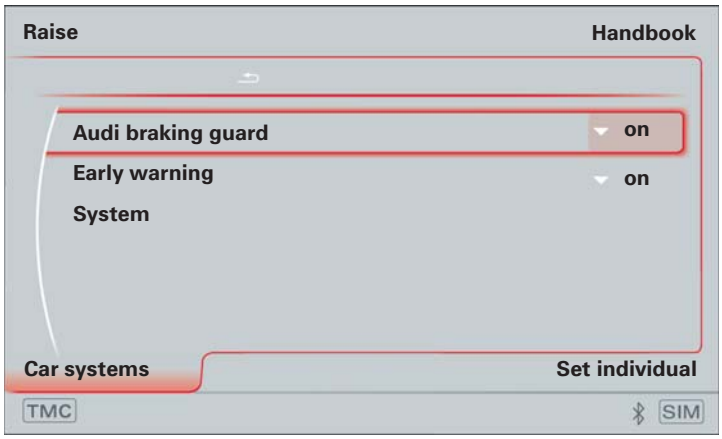
Full braking (approx. 100% brake pressure) is initiated approximately 500 milliseconds before impact. This reduces the severity of the collision. In addition, the front seatbelts are fully tensioned.

At this point, the collision can no longer be prevented by the driver. However, full braking power further reduces vehicle speed by a maximum of 7.4 mph (12 km/h). Even if the driver takes no steps to avoid a collision, Audi braking guard can reduce impact speed by approximately 24.8 mph (40 km/h). The best possible automated steps have been taken to prevent an accident, with the severity of the accident substantially reduced.

If the driver accelerates sharply during phases 2 and 3, despite all of these warnings, then the partial braking operation is aborted after the warning braking. Distance Regulation Control Module J428 does not apply any more braking. If the driver brakes during phase 1, Audi braking guard recognizes that the driver has been alerted and takes no further action.

If the driver enters a hazardous situation during normal vehicle operation and underestimates the risks involved, they will be assisted by Audi pre sense front. If the driver does not apply sufficient brake pressure, Audi braking guard helps by boosting brake pressure.

If the driver decides they do not want the Audi braking guard function, it can be deactivated at the MMI. It is possible to deactivate the visual and audible warnings and/or deactivate the entire Audi braking guard system and the following functions: warning braking, partial braking, full braking, and activation of hazard warning lights.



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Airbag Control Module J234 is also able to react based on the information transmitted to the data bus from Distance Regulation Control Module J428. The “time to collision” and “speed relative to objects ahead” are important information for J234.

Through a predetermined value, J234 knows that a collision is imminent. The electronics in J234 are alerted and are placed in “stand-by”, awaiting further information from the crash sensors.

Reference

For more information about Adaptive Cruise Control and Audi braking guard, refer to Self-Study Program 960103, *The 2011 Audi A8 Running Gear and Suspension Systems.*

Audi Pre Sense Rear

Available with Audi side assist, Audi pre sense rear enables following traffic to be monitored. The radar sensors of Audi side assist provide a continuous flow of information to Lane Change Assistance Control Module J769.

The Audi side assist control module evaluates this information and transfers the data to the data bus. Even if Audi side assist has been switched OFF by the driver, Lane Change Assistance Control Module J769 nevertheless sends data.

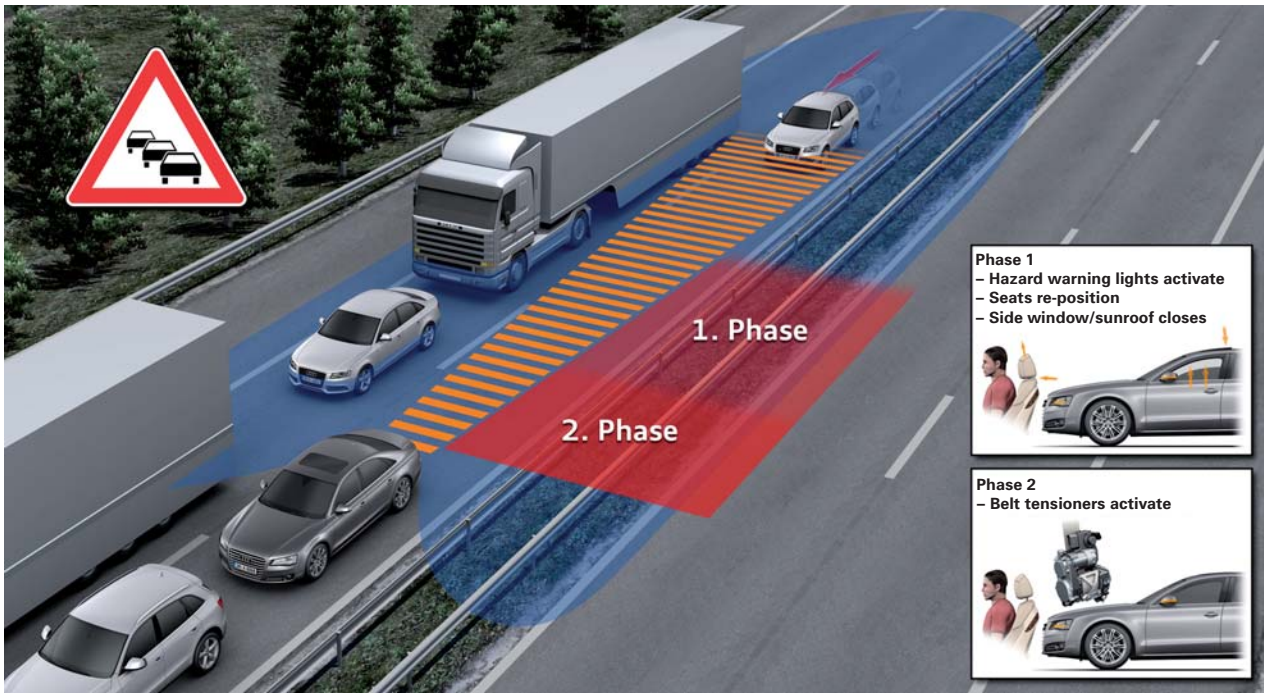
Phase 1:

If a vehicle is approaching from behind and an accident is anticipated. Left Front Seat Belt Tensioner Control Module J854 sends information via data bus. The side windows/ sunroof are closed and the hazard warning lights are turned ON.

If the vehicle has front memory seats, the head restraints move into their upper position. If the vehicle has comfort seats in the front and memory seats in the rear, the head restraints on all seats are moved into their upper position and the upper backrests are electrically inclined forward.

Phase 2:

If the vehicle continues to approach and an accident is probably unavoidable, the front seatbelts are electrically tensioned.



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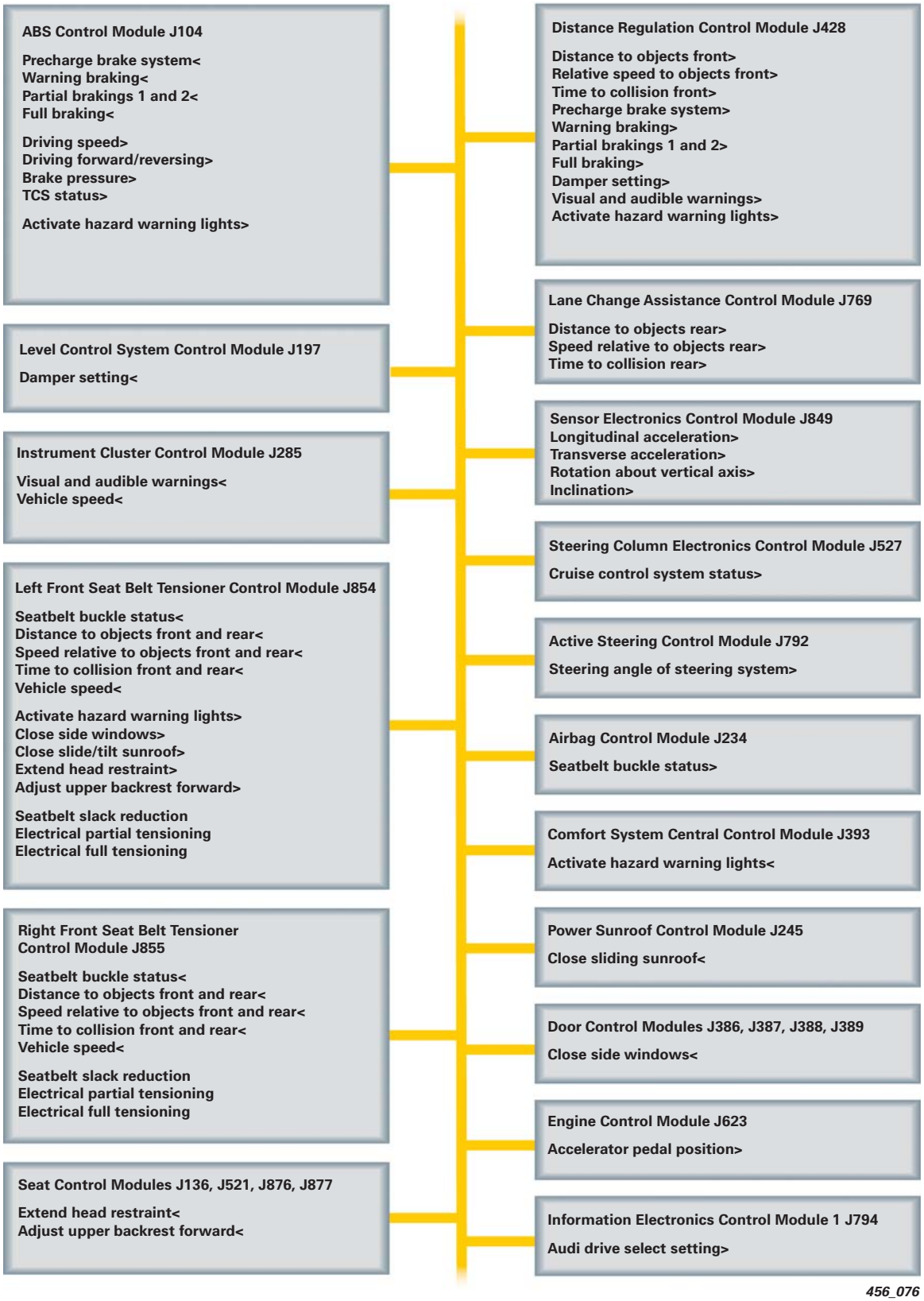
This overview shows information that is exchanged via CAN data bus.

> = sending data < = receiving data without > or < = initiated actions



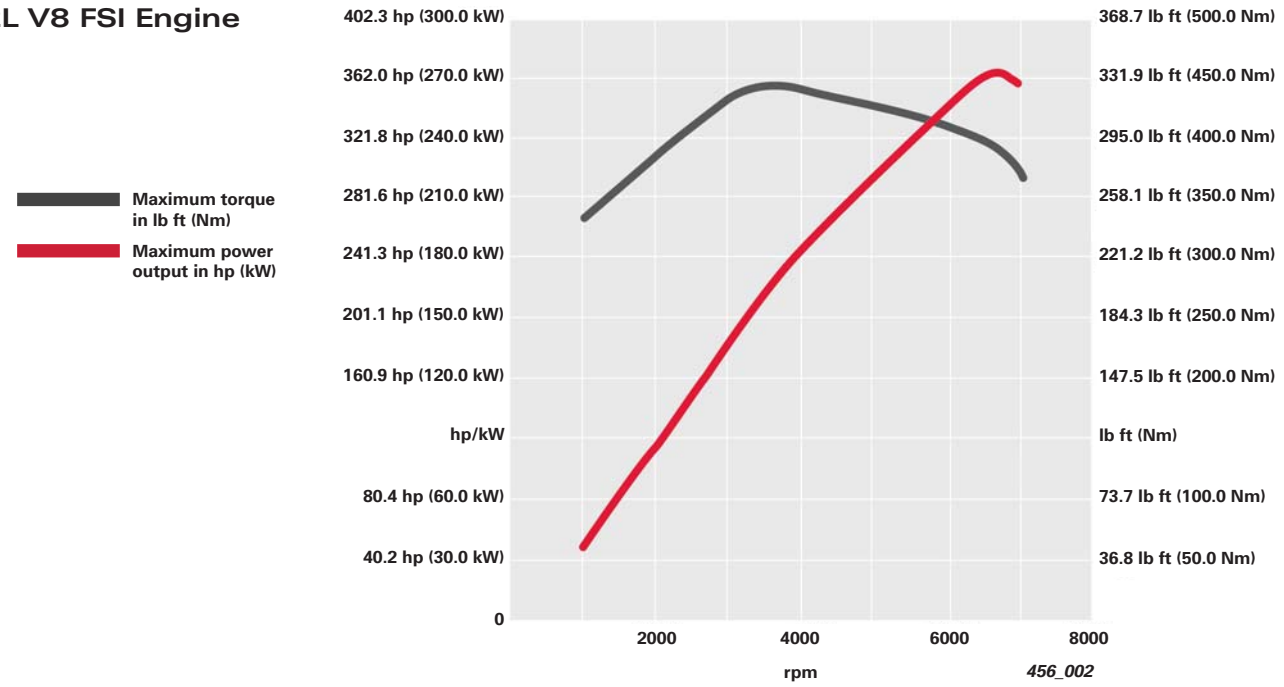
Engine

4.2L V8 FSI

Technical Features

- Tri-oval sprockets on the camshafts
- Reduced friction between pistons and rings due to a change in honing process and improved piston rings
- Supply-on-demand two-stage oil pump
- Dual-flow intake manifold
- Unrestricted fill monitoring system in place of the Mass Airflow Sensor
- Innovative Thermal Management (ITM)
- Energy recuperation

4.2L V8 FSI Engine



Engine Code	CDR
Engine type	V8 engine
Displacement in *cu in (cm^3)*	254.0 cu in (4163.0 cm^3)
Maximum power in *hp (kW)*	366.0 hp (273.0 kW) @ 6800 rpm
Maximum torque in *lb ft (Nm)*	328.2 lb ft (445.0 Nm) @ 3500 rpm
Valves per cylinder	4
Bore in *inches (mm)*	3.32 in (84.5 mm)
Stroke in *inches (mm)*	3.65 in (92.8 mm)
Compression ratio	12.5 : 1
Firing order	1–5–4–8–6–3–7–2
Engine management	Bosch MED 17
Fuel grade	91 AKI
Exhaust emission standard	ULEV2

Volume-Flow Controlled Oil Pump

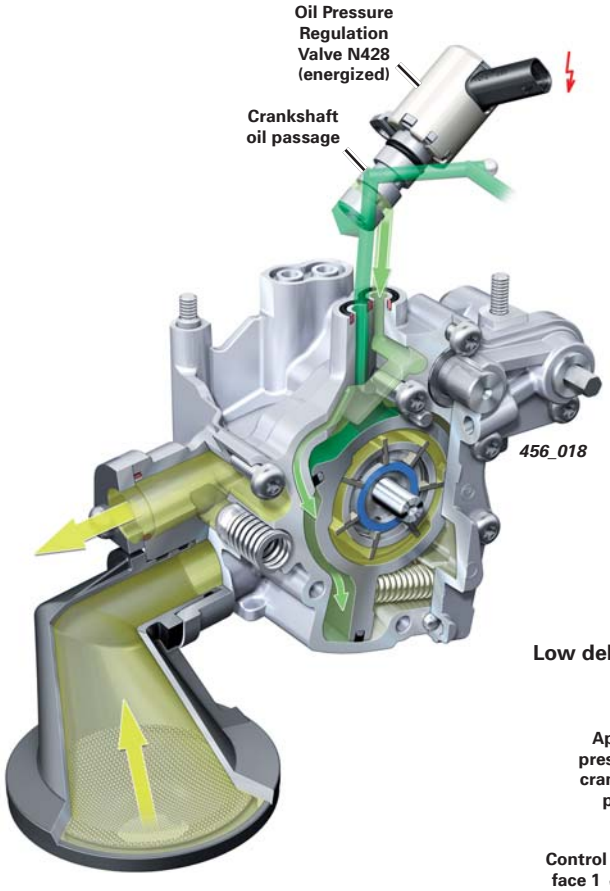
In keeping with the Audi V engine family strategy, the oil pump of the 4.2L V8 FSI engine has a volume-flow control oil pump. This variable delivery rotary vane pump uses less horsepower.

Variable delivery is done by an eccentrically mounted adjusting ring. This adjusting ring can be pressurized with hydraulic fluid across control faces 1 + 2 and swiveled against the pressure of the control spring.

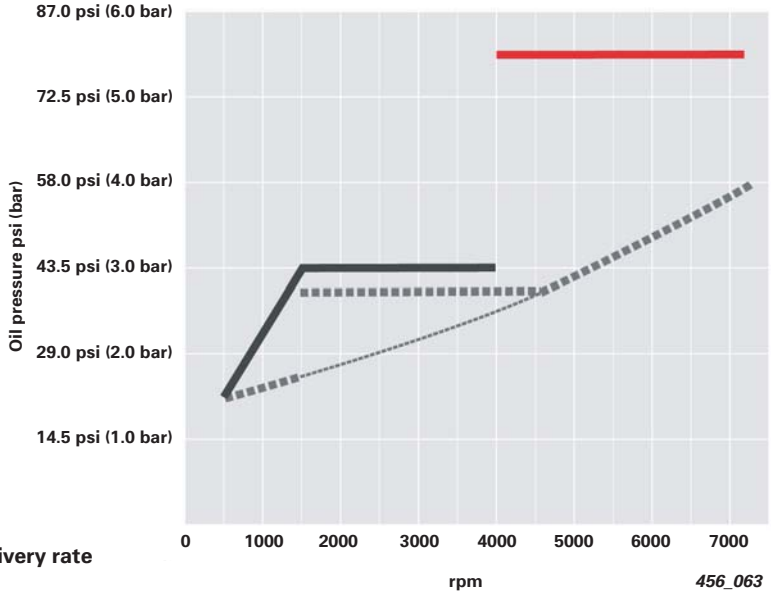
At low engine speeds, the ECM applies ground potential to the energized Oil Pressure Regulation Valve N428 ("terminal 15"). It then opens the oil passage to the second control face of the adjusting ring.

Both oil flows act upon the control faces, applying equal pressure to each. The resulting forces are greater than those exerted by the control springs and swivel the adjusting ring in a counterclockwise direction. The adjusting ring swivels toward the center of the rotary vane pump and reduces the flow space between the vanes.

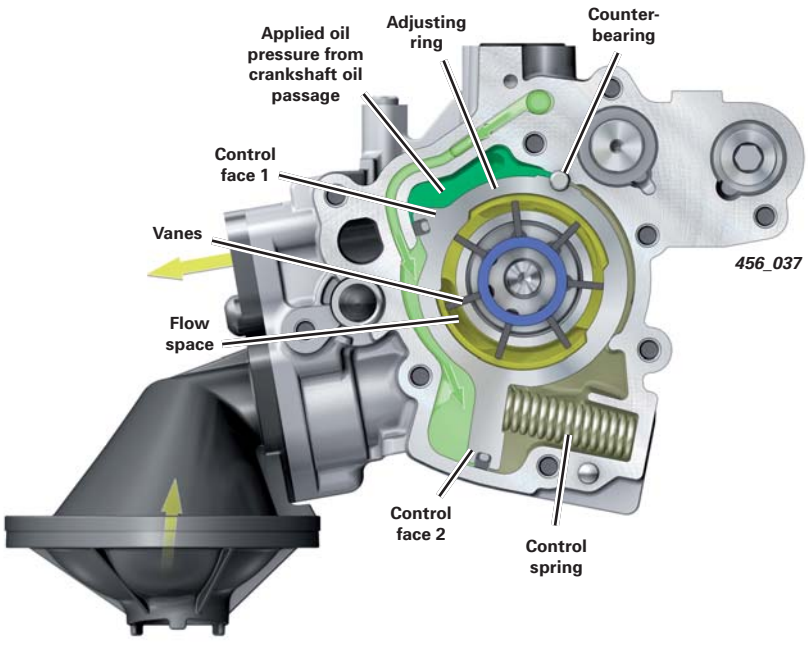
A lower pressure level is activated according to engine load, engine speed, oil temperature, and other operating parameters, all of which reduces the power required to drive the oil pump. This design ensures that there is oil supply to the big-end bearings, and that the pistons are adequately cooled under high load.

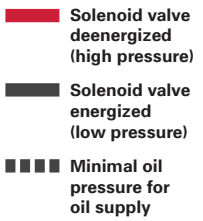


Oil pressure characteristic at 248.0°F (120.0°C) oil temperature



Low delivery rate



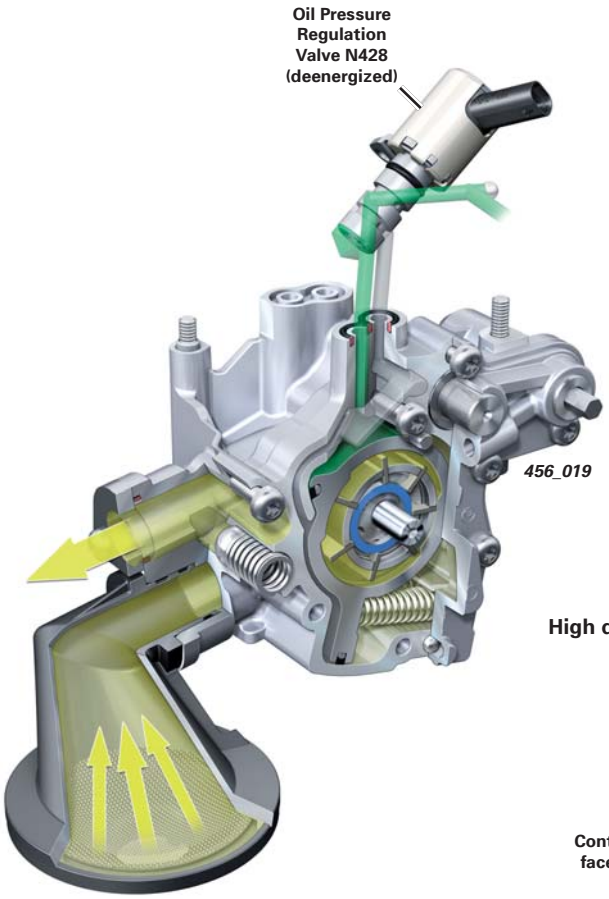


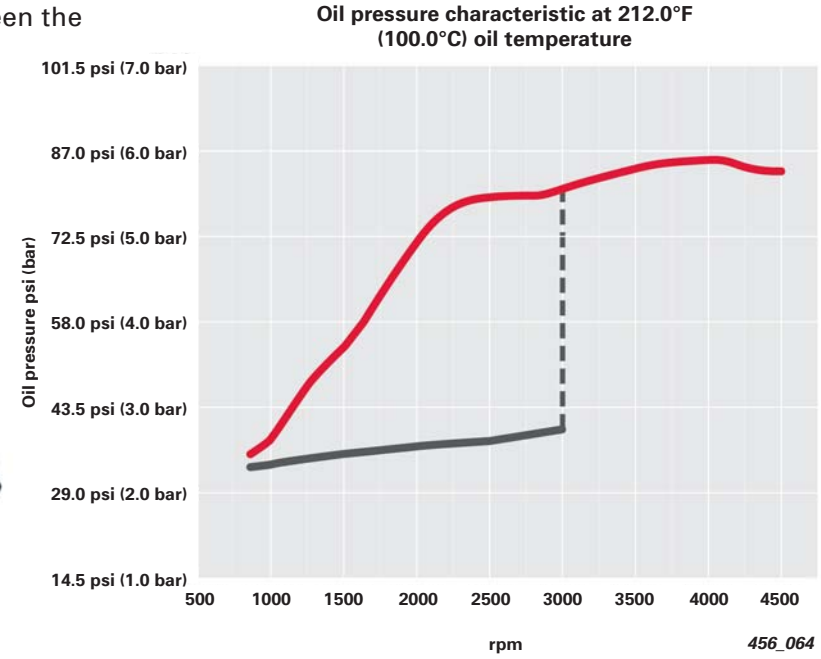
High Delivery Rate

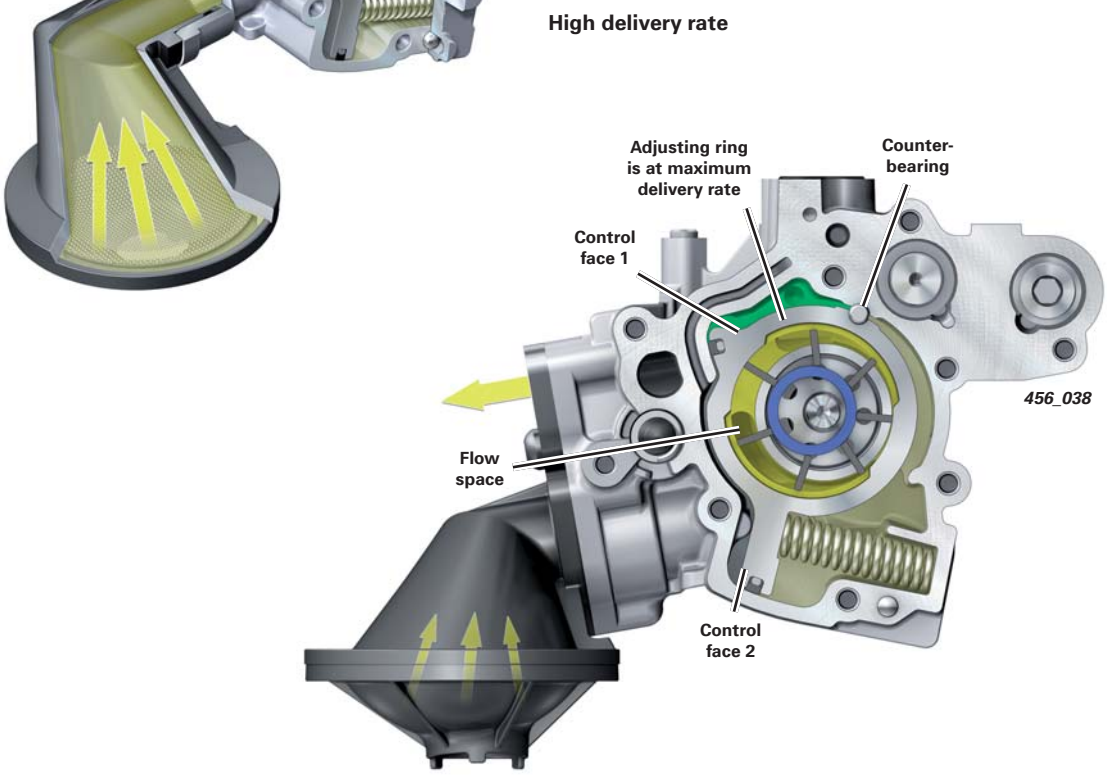
At engine speeds higher than 4000 rpm or at high torque (full throttle acceleration), Oil Pressure Regulation Valve N428 is isolated from ground by the ECM. This closes off the channel from the oil passage to control face 2.

The control spring swivels the adjusting ring clockwise around the counterbearing. The adjusting ring swivels away from the center position, enlarging the flow space between the individual vanes.

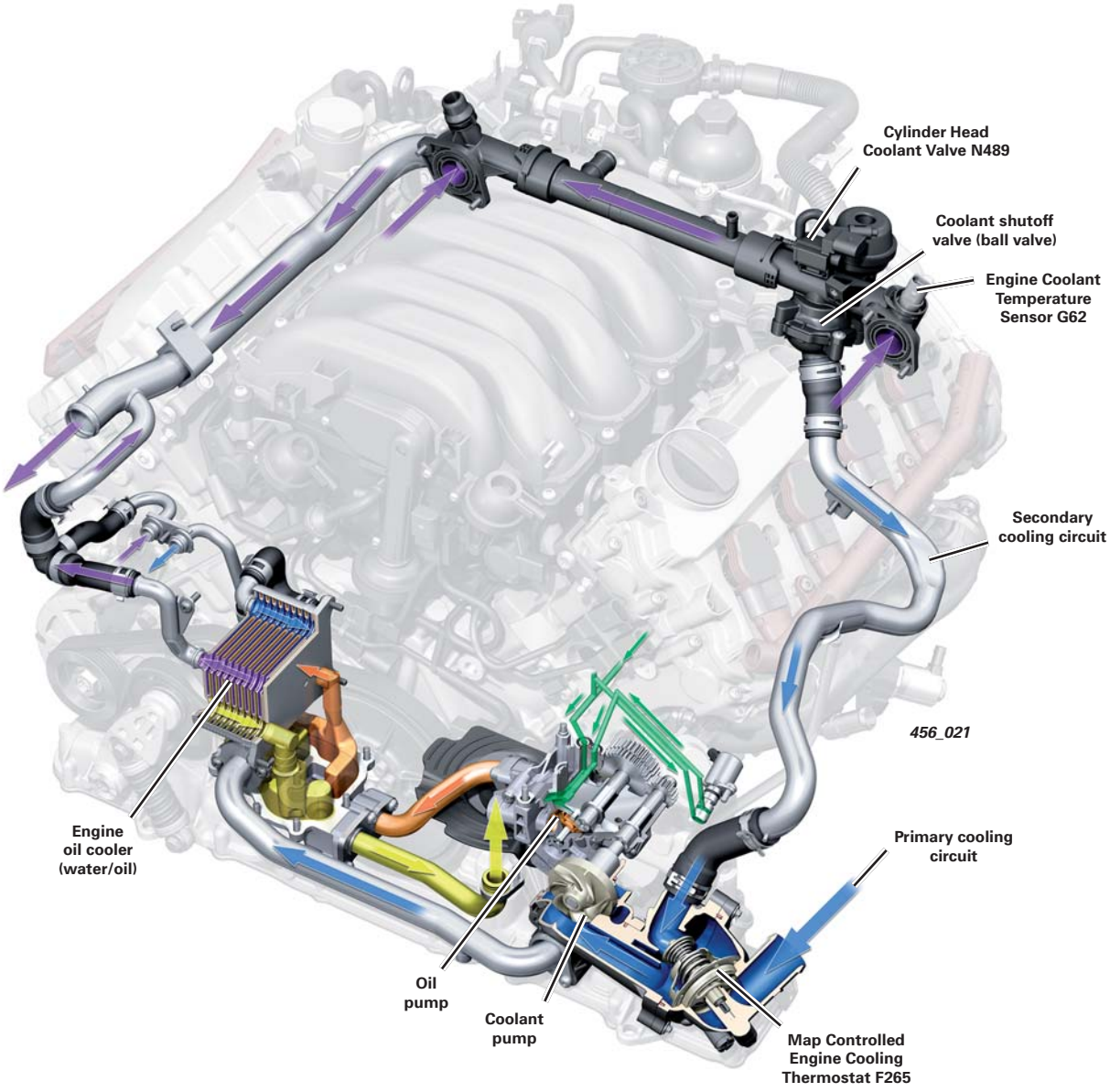
The enlarged spaces between the vanes allow more oil to flow. The higher rate of oil flow through the oil orifices and the crankshaft bearing backlash are counteracted by resistance, causing oil pressure to increase.







Innovative Thermal Management (ITM) in the 4.2L V8 FSI Engine



Innovative Thermal Management is an electronically controlled system designed to optimally distribute engine heat flow. The system is controlled by the Heat Manager, a recently developed software module fully integrated into the engine control module (ECM).

For this purpose, the coolant is distributed on demand between the engine, transmission, and passenger compartment by a system of valves. To ensure maximum comfort, the demands of the heating and climate control systems are factored in at all times.

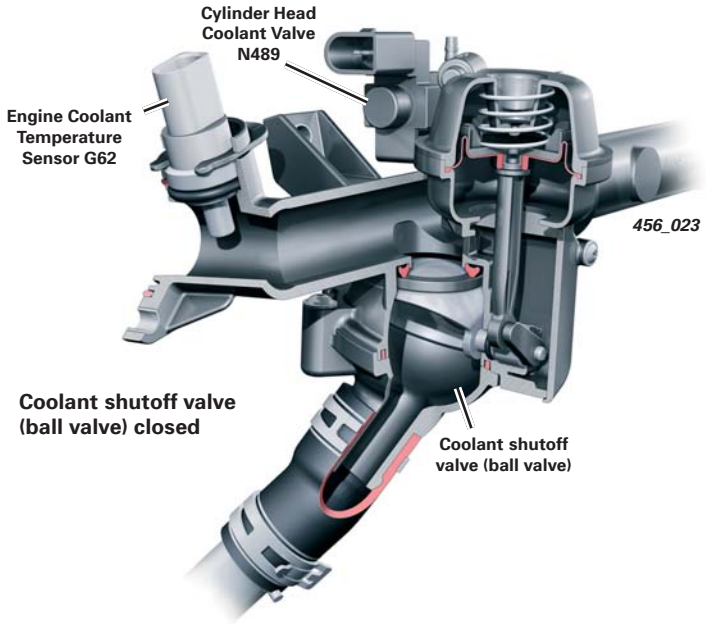
The air conditioning and transmission control modules communicate their heating requirements to the ECM via CAN bus. These heating requirements, together with the engine heating request from the ECM, are then analyzed and prioritized. Innovative Thermal Management components are activated accordingly.

Map Controlled Engine Cooling Thermostat F265 opens at a coolant temperature of approximately 203.0°F (95.0°C), opening radiator inflow. At full throttle, the thermostat is energized and again closes slightly, allowing the coolant temperature to increase to approximately 210.2°F (99.0°C). The warmer oil is conducive to smooth running of the engine.

Stationary Coolant

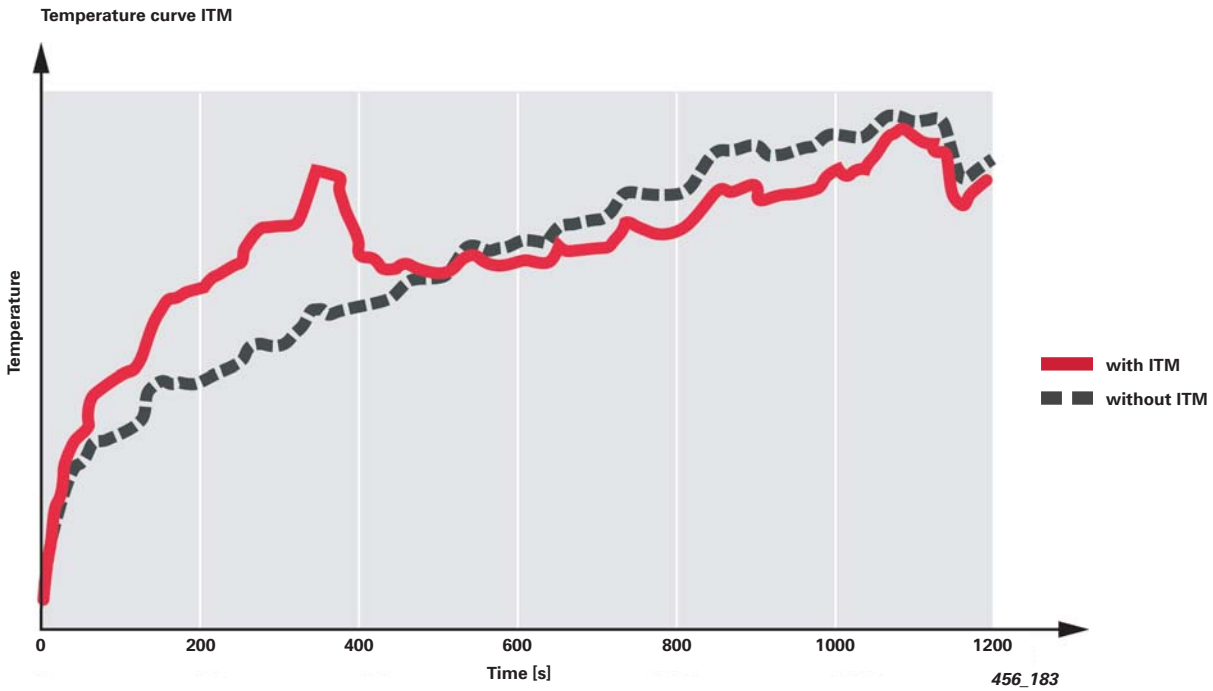
When the engine is cold, the coolant shutoff valve (ball valve) is closed by Cylinder Head Coolant Valve N489 via Engine Control Module J623.

The in-flow from the secondary cooling circuit to the water pump is shut OFF.



Depending on conditions (ambient temperature, air conditioner setting, engine and transmission temperatures), stationary coolant is produced by closing all the valves in the cooling circuit. This allows the engine to reach operating temperature more quickly than in conventional systems.

The stationary coolant phase normally takes approximately 120 seconds. However, there are also exceptional circumstances where stationary coolant is unwanted, for example, when the Defrost button is pressed. Warm coolant flows immediately to the heater in order to prevent the windshield from fogging up.



Circulating Coolant

Coolant Shutoff Valve (Ball Valve) Open

After the stationary coolant phase, the heater is usually first to receive warm coolant. Coolant Shut-Off Valve N82 (ball valve) in the heating circuit opens and quickly provides a comfortable temperature inside the vehicle.

Once the vehicle interior has reached its set temperature, warm coolant can be channeled to the transmission. Transmission Coolant Valve N488 opens and supplies the ATF heat exchanger with warm coolant. As a result, the ATF is heated more quickly, which reduces friction within the transmission and saves fuel.

If the ATF overheats, the transmission oil can still be cooled. In this instance, Transmission Coolant Valve N488 is closed and Transmission Fluid Cooling Valve N509 is opened. Cool coolant is circulated from the radiator to the ATF heat exchanger by After-Run Coolant Pump V51.

If the heater does not need any energy to heat the vehicle interior (at warm ambient temperatures), the air conditioning control module does not send a heating request.

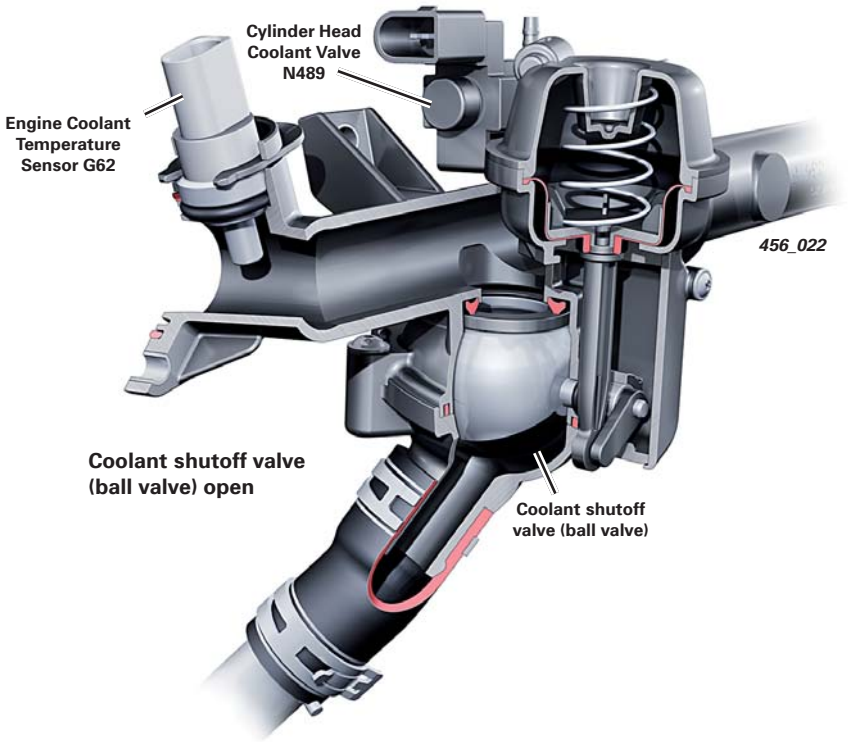
The engine can then run for longer than 120 seconds with stationary coolant, after which the transmission oil is immediately heated.

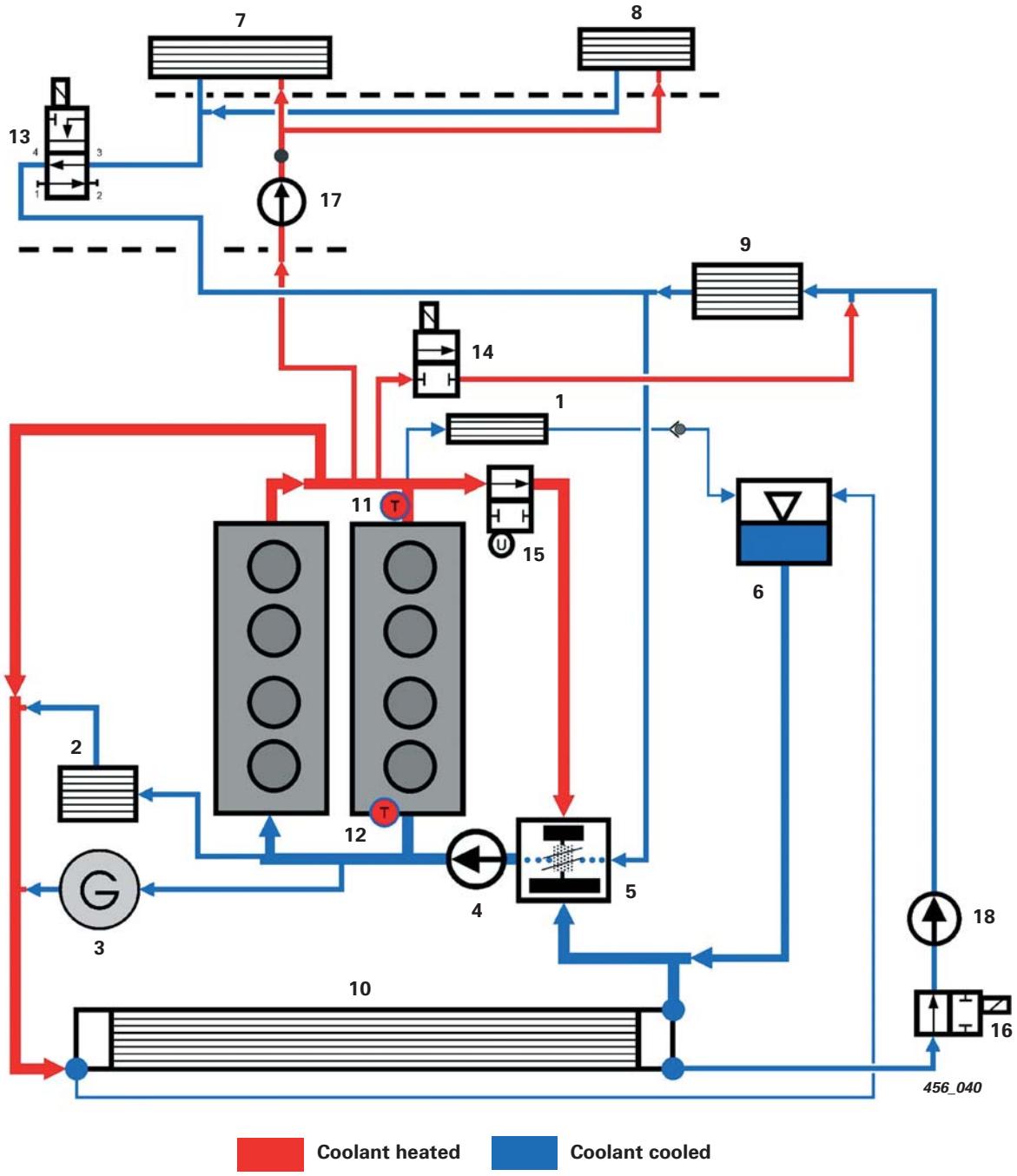
If Engine Temperature Control Temperature Sensor G694 measures a component temperature of approximately 221.0°F (105°C). Cylinder Head Coolant Valve N488 and the coolant shutoff valve are opened.

To monitor critical valve land temperatures and to avoid local overheating during the stationary coolant phase, Engine Temperature Control Temperature Sensor G694 is installed in the cylinder head close to the combustion chamber.

If map-based coolant temperatures are exceeded, the coolant shutoff valve is immediately opened by the ECM, and the secondary cooling circuit to the coolant pump is activated.

The spring-loaded vacuum cell always opens the inlet to the coolant pump when vacuum is low.





Legend:

1 Crankcase breather heater
2 Heat exchanger for engine oil cooling
3 Alternator
4 Coolant pump
5 Map Controlled Engine Cooling Thermostat F265
6 Coolant expansion tank
7 Heater heat exchanger
8 Heater heat exchanger, rear
9 ATF heat exchanger
10 Radiator
11 (T) Engine Coolant Temperature Sensor G62
12 (T) Engine Temperature Control Temperature Sensor G694
13 Coolant Shut-off Valve N82
14 Transmission Coolant Valve N488
15 (U) Cylinder Head Coolant Valve N489 (vacuum operated)
16 Transmission Fluid Cooling Valve N509
17 Coolant Recirculation Pump V50
18 After-Run Coolant Pump V51 (runs during ATF cooling and after-cooling phases)

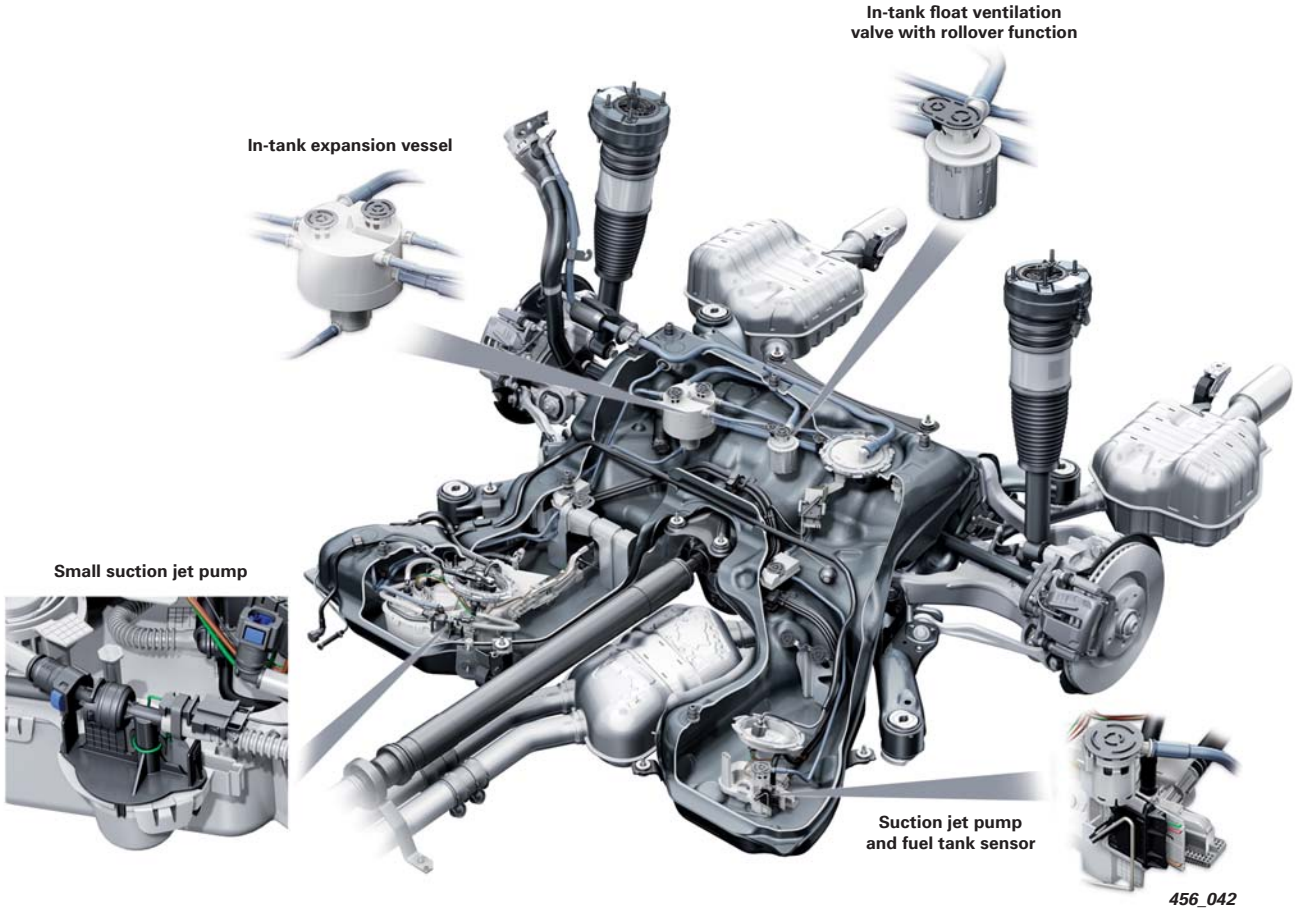
Fuel Tank

The 2011 Audi A8 uses a high-density polyethylene (HDPE) fuel tank manufactured using the Twin Sheet Blow Molding (TSBM) process. The in-tank components are plastic-welded directly on the plastic tank halves only seconds before both tank halves are joined together. This offers significant benefits (for example, lower hydrocarbon emissions) because the tank chamber requires fewer openings for valves and assembly is much simpler.

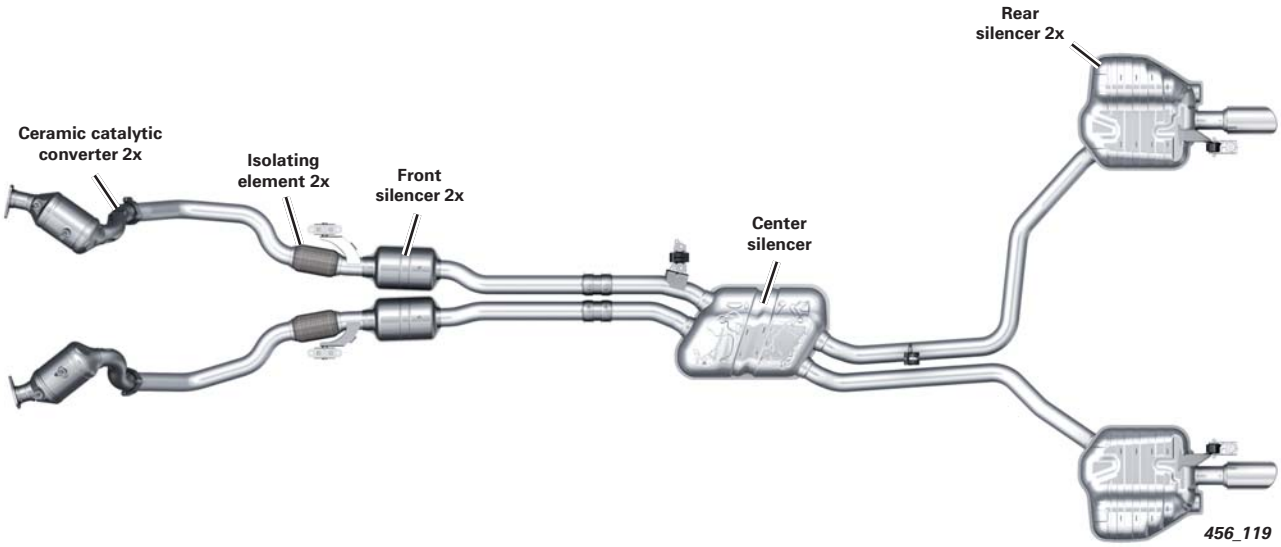
Tank capacity is approximately 23.7 gal (90 L). When the fill volume has been reached during refueling, an in-tank float vent valve (with rollover function) floods, causing the fuel nozzle (and flow) to be cut off.

There are two lever-type sensors in the tank, with one in the upper section of the tank to sense when the tank is full.

An expansion vessel integrated in the fuel tank prevents the discharge of fuel and temperature-related fuel expansion when the vehicle is driven dynamically. This expansion vessel is drained continuously during vehicle operation by a small suction jet pump.



4.2L V8 FSI Engine



Transmission

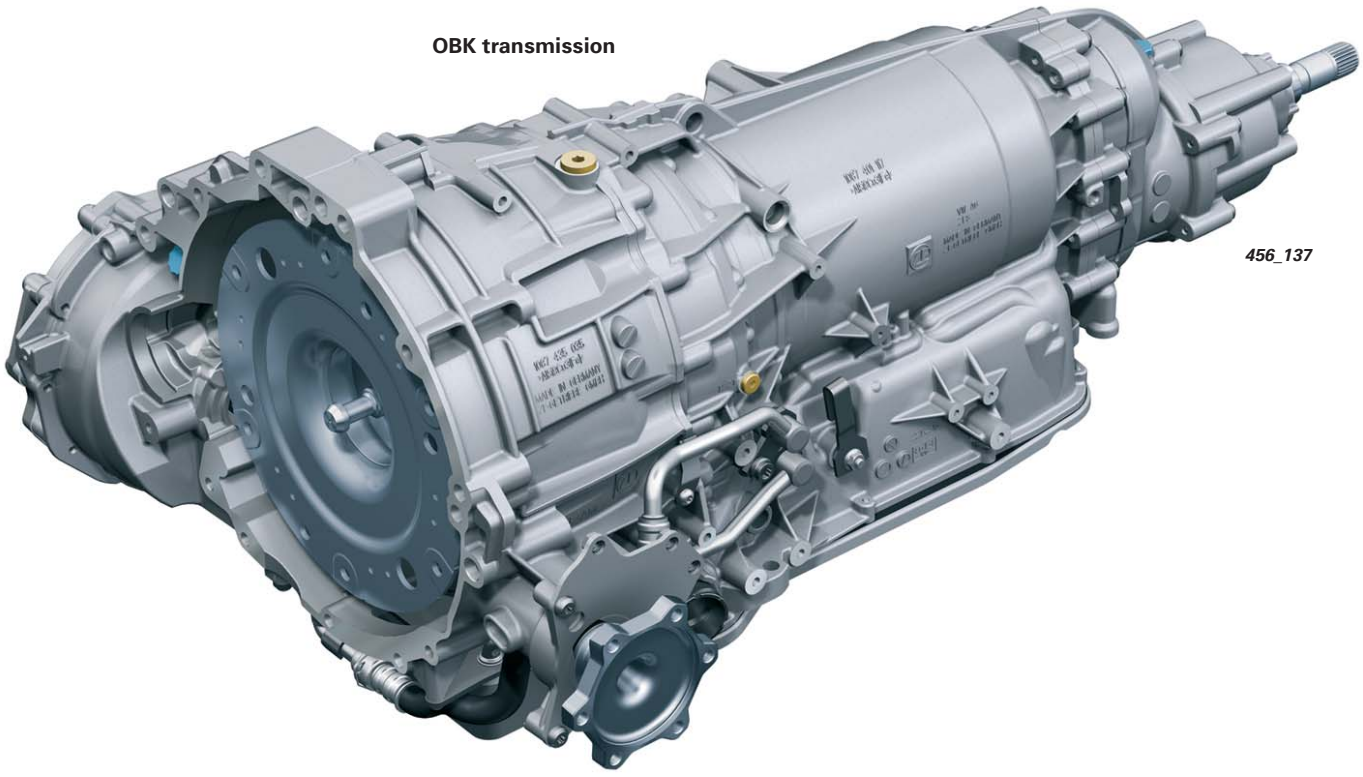
OBK Transmission

The OBK eight-speed Tiptronic transmission is Audi's first eight-speed multi-step automatic transmission.

The OBK transmission features a new "shift-by-wire" control system which eliminates direct linkages to the transmission case.

The transmission reduces fuel consumption by approximately 6% compared to the six-speed Tiptronic. Its eight speeds allow the engine to operate at optimum efficiency, especially in lower gears. Gear changes are almost imperceptible to the driver. They are precise, fast, and very responsive. For instance, downshifting from eighth to fourth gear is effortless.

OBK transmission



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Reference
For more information refer to Self-Study Program 950103, *The 2011 Audi A8 Power Transmission.*

The OBK transmission features:

- Differential in front of the torque converter
- Eight forward gears and reverse are implemented using four planetary gearsets and five shift elements
- Minimized drag losses because three shift elements are closed in every gear
- Mechatronics “shift-by-wire” system with electro-hydraulic parking lock
- Eight gears with a ratio spread of 7.0:1, which enables short gear shifts, a powerful acceleration ratio, and high speed at low engine rpm
- ATF supply via a chain driven vane pump
- Lubrication of the transfer case by its own oil pump
- Shifts into Neutral when the vehicle is stationary and the engine is idling (Neutral Idle Control [NIC])

Splined Propeller Shaft

An innovative new propeller shaft coupling is used. A splined propeller shaft is mated to the transmission output shaft, locked into the slot by a spring sleeve. The connection is axially secured by a clamp. The new connection system provides a weight savings of 1.3 lb (0.6 kg).

This system will be phased in for all Audi transmissions in the future.

Center Differential

The self-locking differential with asymmetrical/dynamic torque split is used in the OBK/OBL transmission. It is similar in design and function to the center differential in the OB2 and OB5 transmissions. The intelligent torque distribution is new.

Suspension System

A fundamental objective for 2011 Audi A8 chassis development was to exceed the high standards set for driving dynamics and ride comfort in the previous model. Proven systems such as the five-link front axle, the trapezoidal link rear axle, and the Adaptive Air Suspension system were systematically enhanced and incorporated into the new luxury class model.

By using the powerful FlexRay bus system, a central control module can now provide information on vehicle movements to relevant systems, such as ESP, Adaptive Air Suspension, dynamic steering, and the sport differential. This has significantly reduced the number of in-vehicle sensors.

The following suspension system versions are available for the 2011 Audi A8. The standard 1BK suspension system (Adaptive Air Suspension) is standard equipment. The 2MA sports suspension (Adaptive Air Suspension — Sport) is optional equipment for customers who prefer a more dynamic driving style. In vehicles with a sport suspension, ride height is 0.39 in (10 mm) lower than with the standard suspension.

456_172

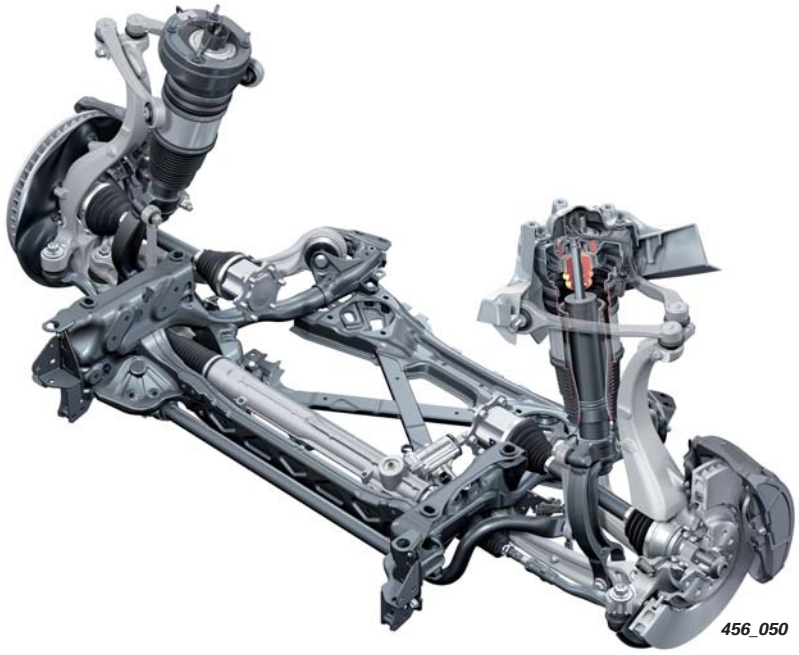
Reference

For more information refer to Self-Study Program 960103, *The 2011 Audi A8 Running Gear and Suspension Systems.*

Front Axle

The five-link front axle was introduced on the Audi A4. A key design benefit is the positioning of the steering gear on the subframe in front of the axle.

The steering gear can be installed with very low tolerances, which means no raised toe measurement is needed for compensation during wheel alignment procedures.



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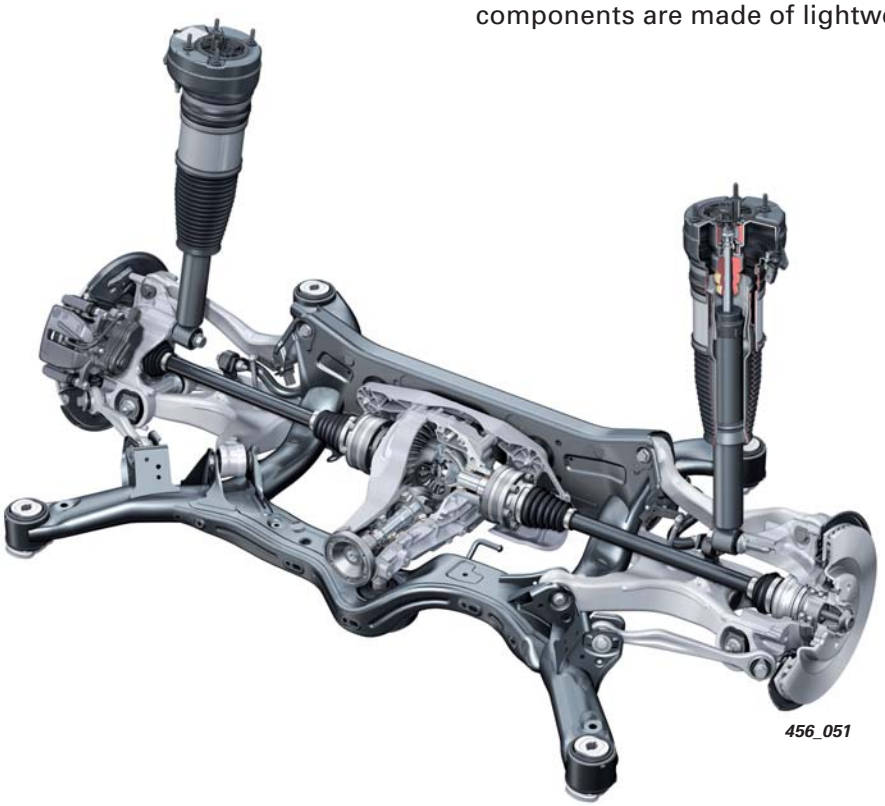
Rear Axle

The self-tracking trapezoidal-link rear axle has been fundamentally revised compared to the previous generation A8. The suspension strut is now supported directly by the wheel carrier.

Damper response is significantly better due to a more direct ratio of 0.9:1 (compared to 0.74:1 in the previous A8). The axle carrier isolates axle components from the body via four large hydraulic bearings. All wheel locating components are made of lightweight aluminum.



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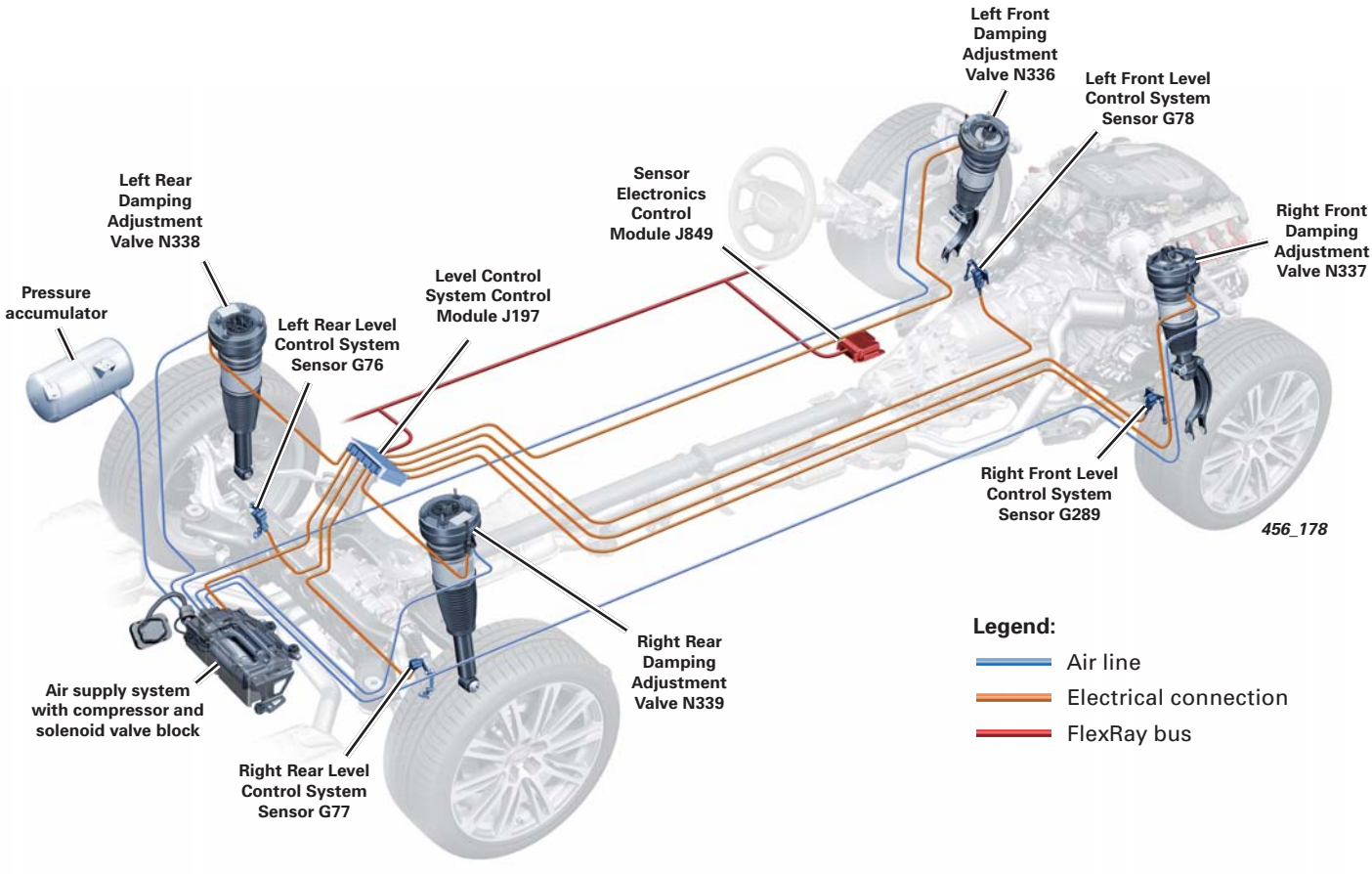
Adaptive Air Suspension (aas)

All key system components have been optimized, including the control logic which is different in both suspension systems.

The body acceleration sensor is now integrated into Sensor Electronics Control Module J849. The Adaptive Air Suspension control module (Level Control System Control Module J197) communicates via the FlexRay data bus. In the 2011 Audi A8, both display and operation have been integrated into Audi drive select.



Brake System

The brake system is a further development of the system used on the 2010 model.

Lightweight construction has substantially reduced the brake system's weight, while also ensuring outstanding braking values in all driving situations.

	Front Axle	Rear Axle
Engine	4.2L V8 FSI	4.2L V8 FSI
Brake type	17 inch 2FNR 42 AL aluminum floating frame caliper	17 inch CII 42 EPB aluminum floating caliper
Number of pistons	2	1
Piston diameter	1.6 in (42.0 mm)	1.69 in (43.0 mm)
Brake disc diameter	14.0 in (356.0 mm)	12.9 in (330.0 mm)

456_174

Brake Discs, Front Axle

For the first time at Audi, stud-type brake discs with aluminum flanges are being used. This brake design is predominantly used in the sport car sector.

The brake disc ring is made of a cast iron material specially developed for this purpose. The friction ring is connected to the aluminum flange by stainless steel studs.

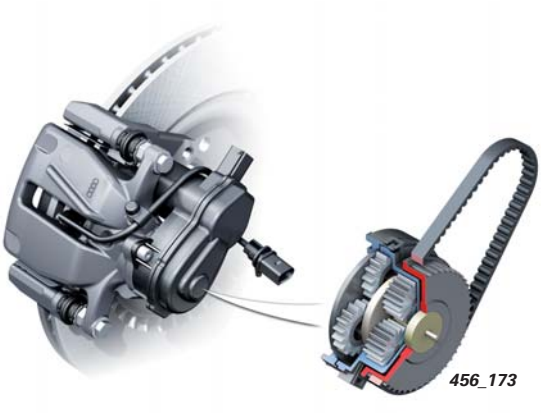
Stud-type brake discs enable a weight reduction of approximately 6.17 lb (2.8 kg) for the 17-inch brake disc.

Brake Assembly, Rear Axle

The Colette II brake caliper from the 2010 Audi A8 is augmented by an increased brake disc diameter.

Electromechanical Parking Brake (EPB)

The parking brake system of the 2011 Audi A8 is also used on Audi A4, A5, and Q5 models. Rear brake pad wear is no longer calculated but instead is measured directly.



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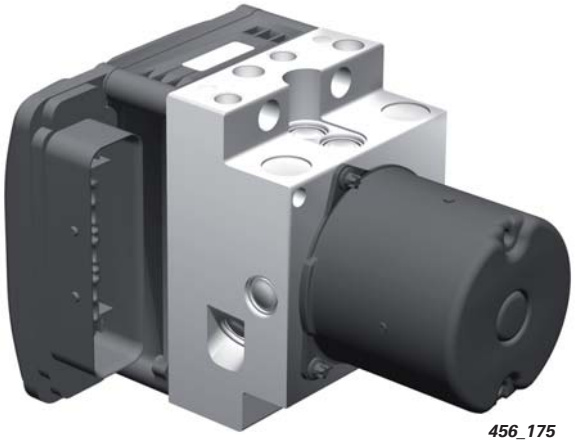
Hydraulic Unit

New to the 2011 Audi A8 is a six-piston pump that improves active pressure build-up dynamics and acoustics. The ESP modules are different in vehicles with and without Adaptive Cruise Control (ACC). Three pressure sensors are integrated into the hydraulic unit for ESP with ACC. Brake pressures at the front right and left wheel brakes are determined in the primary circuit.

Electronic data communication is increased due to the use of the FlexRay data bus and the extensive networking of the many linked control modules.



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Sensor Electronics Control Module J849

The 2011 Audi A8 is the first model to use Sensor Electronics Control Module J849. This control module contains sensors for registering all vehicle movements. By linking it to the FlexRay data bus, other control modules can directly use the measured values.

Complexity has been reduced through the central acquisition of vehicle movements. Data communication via the FlexRay bus ensures a high level of networking and fast data transfer between corresponding control modules.

456_176

Sensor Electronics Control Module J849 has sensors that measure vehicle acceleration in the x-, y-, and z-axes, as well as vehicle rotation around these axes. It replaces ESP Sensor Unit G419 and the body acceleration sensors for the Adaptive Air Suspension system.

Steering System

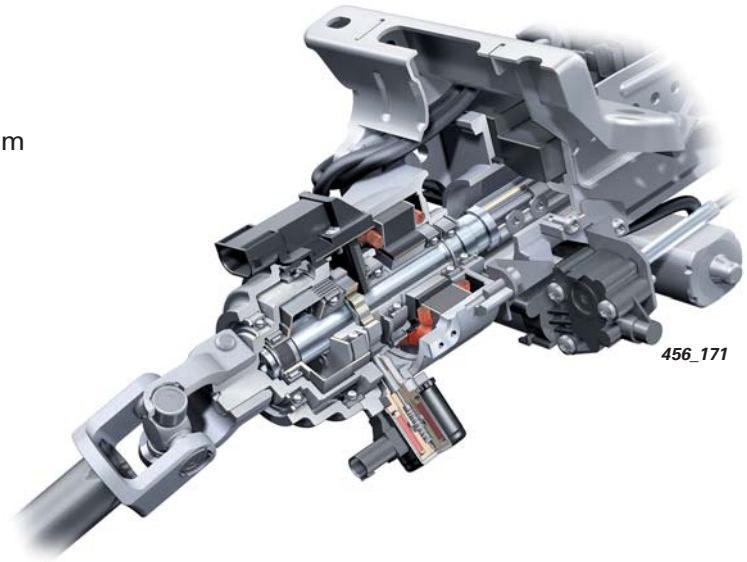
The 2011 Audi A8 uses hydraulic rack and pinion steering with an electrically adjustable steering column. The Servotronic speed dependent system is standard equipment.

The steering gear, steering column, and steering wheel are newly developed components. The main innovation is the arrangement of the steering gear on the subframe ahead of the front axle, which delivers a more direct steering response.

456_170

Dynamic Steering

This steering option is available in the 2011 Audi A8. The design and function of this system corresponds to that in the current Audi A4. Service procedures are also identical.



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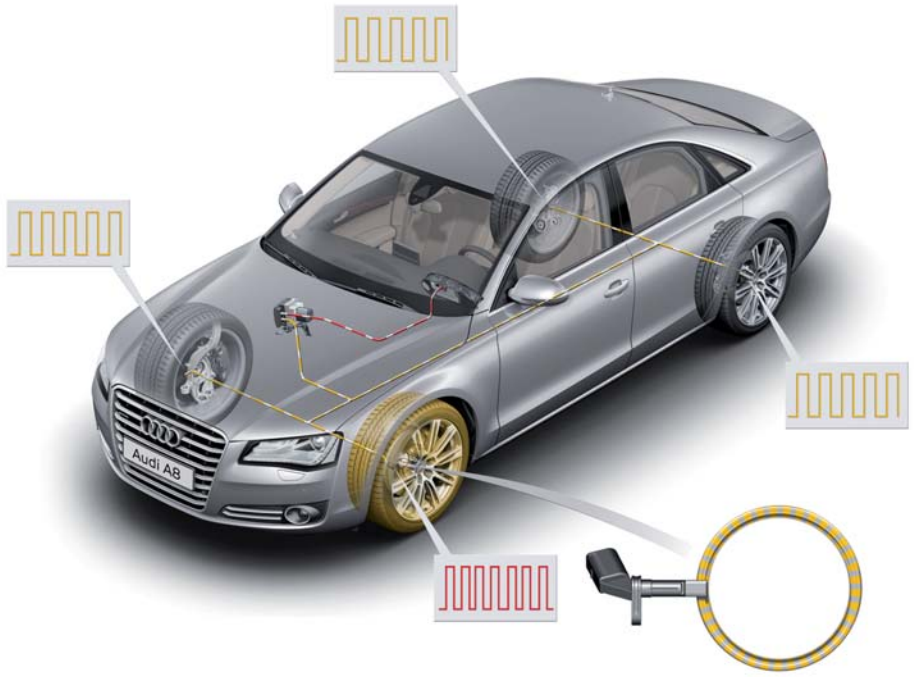
Tire Pressure Monitoring (TPMS)

The 2011 Audi A8 is equipped with the second generation Tire Pressure Monitoring System (TPMS).



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458_097

By evaluating the vibration characteristics of each wheel/tire, the new TPMS system is capable of determining and indicating which tire is experiencing pressure loss.

The system can also detect slow (gradual) pressure loss, as well as simultaneous pressure loss at several wheels.

Reference

You will find detailed information on the second generation Tire Pressure Monitoring System in SSP 990193, *Audi New Technology 2009 – 2010*.

Adaptive Cruise Control (ACC)

As on the 2010 Audi A8, the Adaptive Cruise Control (ACC) system is an option on the new A8, and is available for all engine/transmission configurations.

A new generation of Bosch ACC is used in the 2011 Audi A8. For the first time, two ACC sensors are installed on the front right and left of the vehicle.

With corresponding vehicle equipment, including the video camera for Audi lane assist, rear radar sensors for Audi side assist, and ultrasonic sensors for the Audi Parking System, it is now possible to view vehicles ahead and behind.

Front view of vehicle with ACC sensors

Right Adaptive Cruise Control Sensor G259 and Distance Regulation Control Module J428

Left Adaptive Cruise Control Sensor G258 and Distance Regulation Control Module 2 J450

Introduction

With the increase in sophisticated electronic systems and components, stability and reliability of a vehicle's electrical system are extremely important.

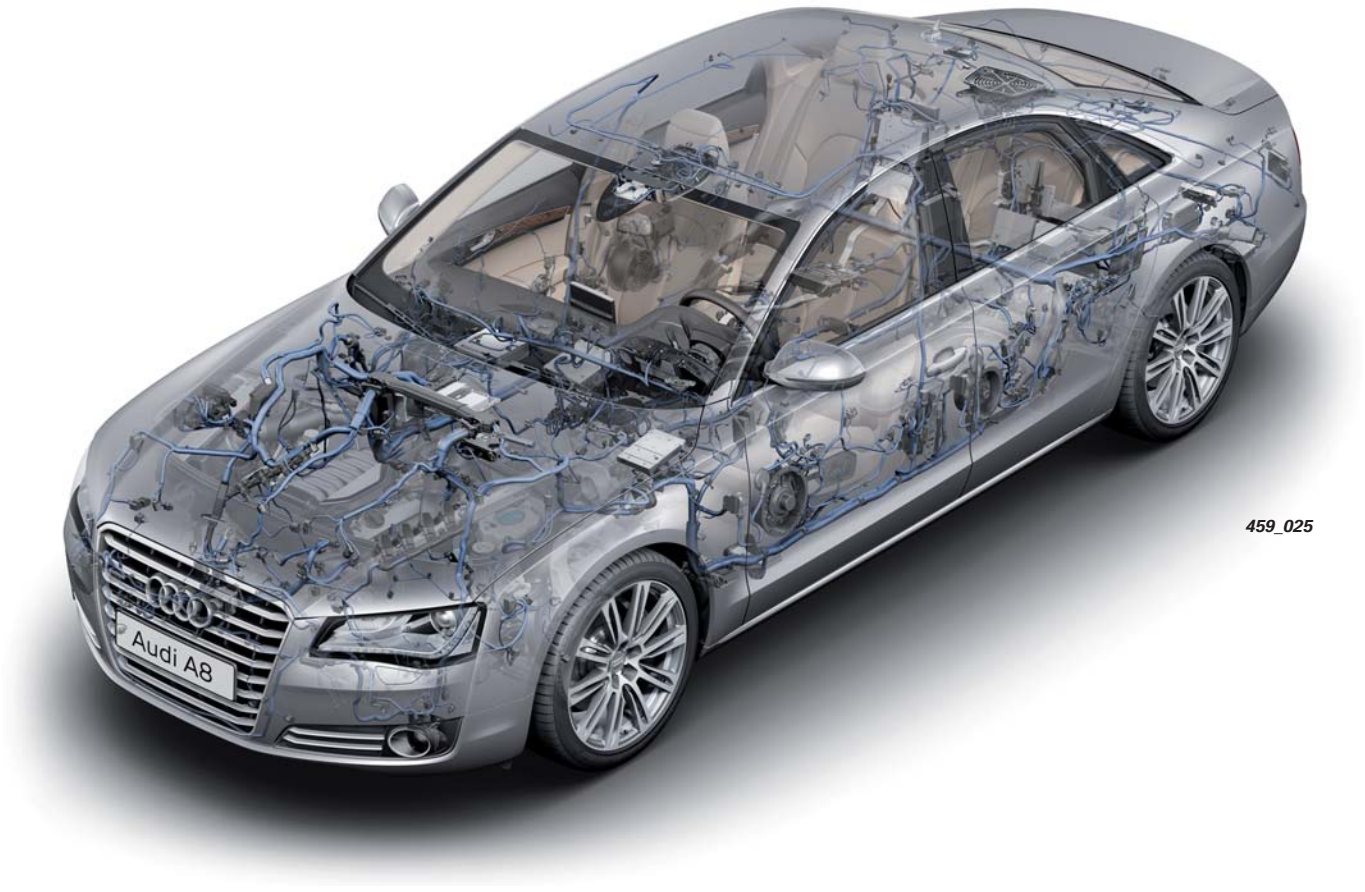
In the 2011 Audi A8, there are over 1,500 individual wires with an average length of 6.5 ft (2.0 m). Numerous terminals, switches, fuse boxes, seals, and wiring ducts make the electrical system one of the heaviest and most expensive components of the vehicle. The weight of the electrical system alone can approach approximately 110 lb (50.0 kg).

Given today's energy and environmental considerations, the development of new and more lightweight electrical system components is extremely important, as weight plays a major factor in fuel consumption and, therefore, CO2 emissions.

Most of today's innovations have only been made possible by the increased performance of electronic systems.

Without this development, many vehicle comfort and convenience features that are now taken for granted would not have been achievable. In comparison with its predecessor, the 2011 Audi A8 electrical system has the following significant differences:

- Number of control modules has increased from 68 to 95
- New bus system, FlexRay, has increased the number of bus systems from six to seven
- Software volumes on the vehicle now exceed 230 MB, almost four times the amount on the previous model



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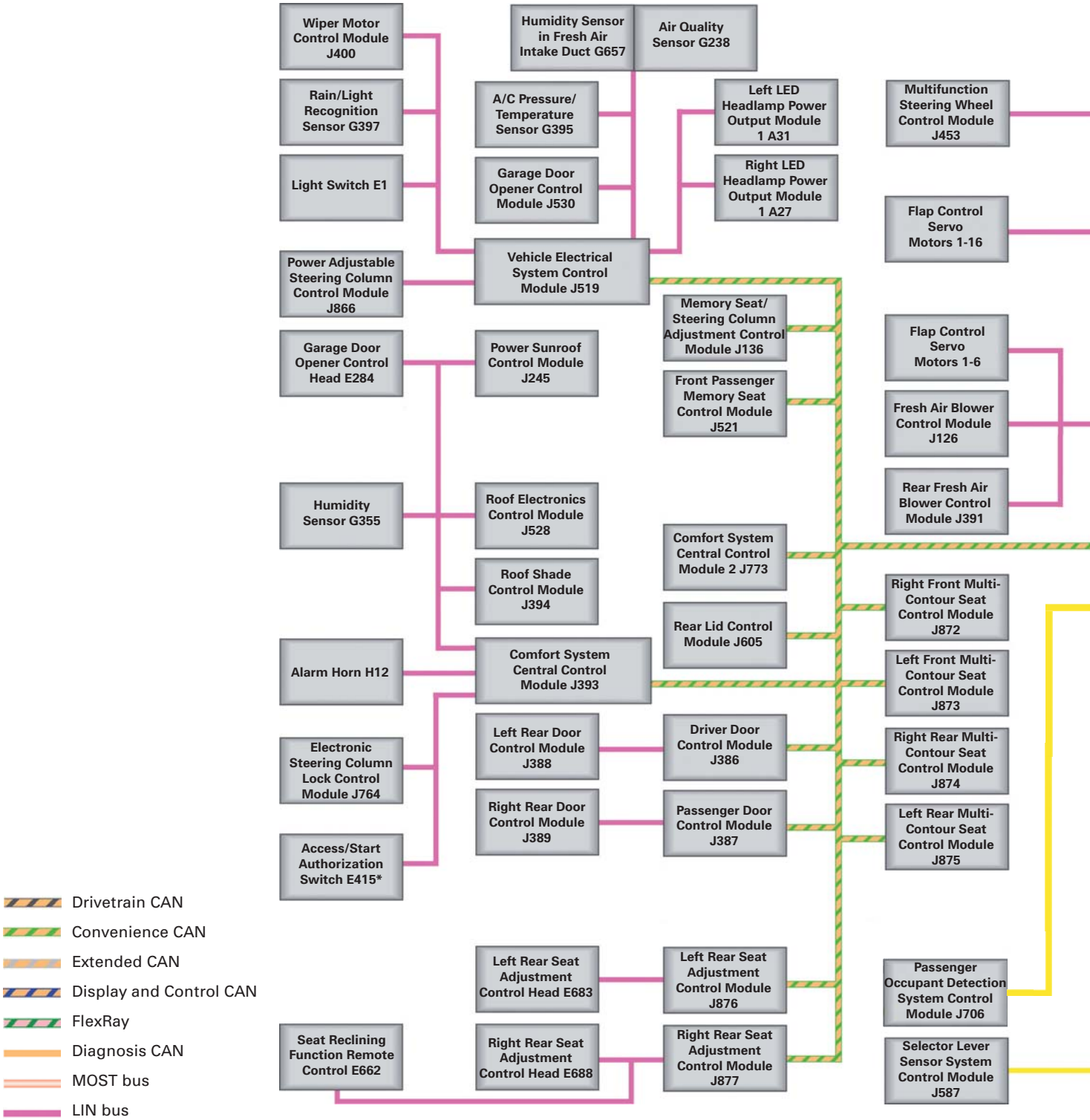
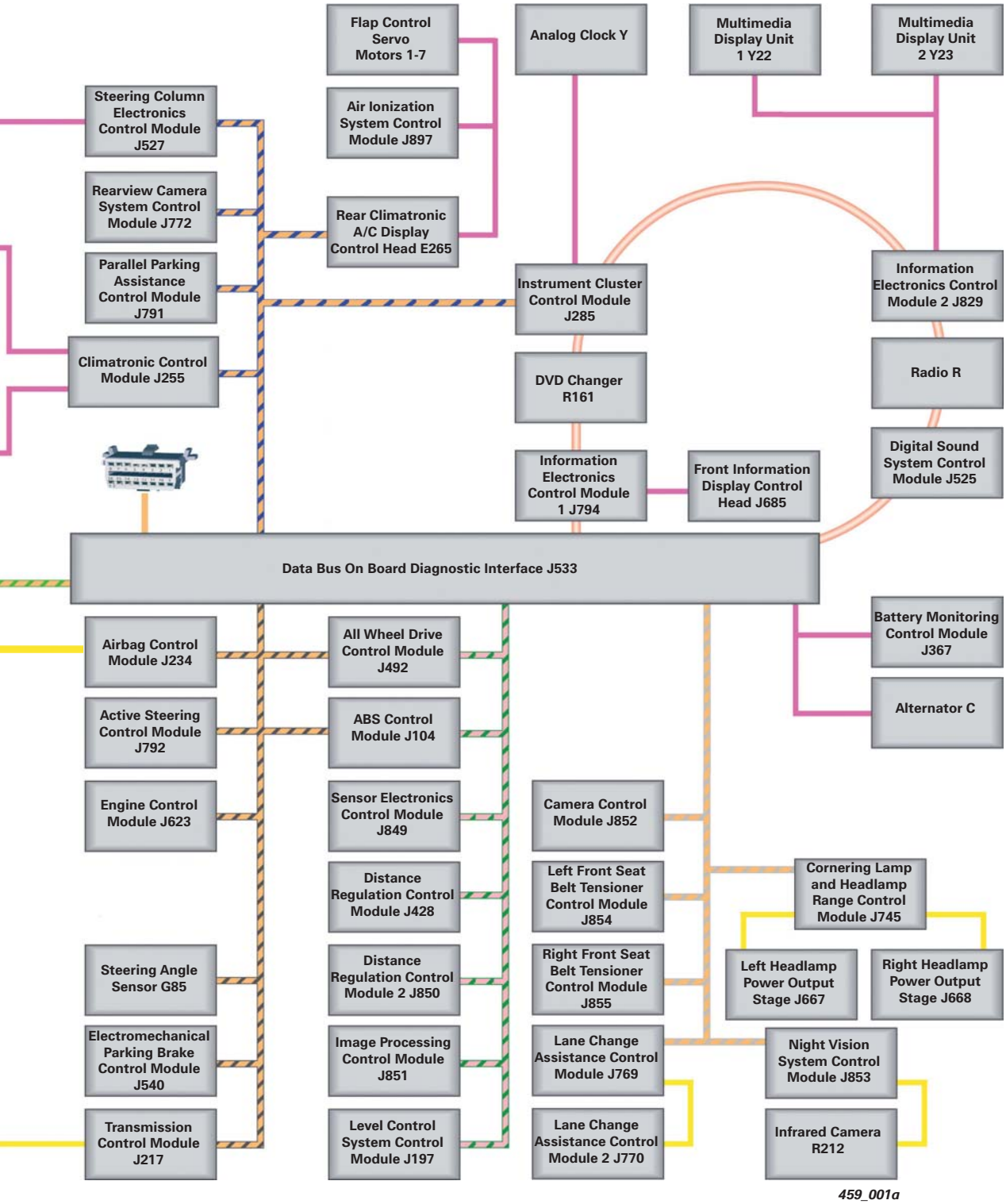
Topology

This diagram shows the network topology for a vehicle with an extensive level of optional equipment.



*Only on early production vehicles. To be removed and replaced with Reader Coil.


Flap Control Servo Motors 1-7
Analog Clock Y
Multimedia Display Unit 1 Y22
Multimedia Display Unit 2 Y23
Steering Column Electronics Control Module J527
Air Ionization System Control Module J897
Rearview Camera System Control Module J772
Rear Climatronic A/C Display Control Head E265
Parallel Parking Assistance Control Module J791
Instrument Cluster Control Module J285
Information Electronics Control Module 2 J829
Climatronic Control Module J255
DVD Changer R161
Radio R
Digital Sound System Control Module J525
Information Electronics Control Module 1 J794
Front Information Display Control Head J685
Data Bus On Board Diagnostic Interface J533
Battery Monitoring Control Module J367
Airbag Control Module J234
All Wheel Drive Control Module J492
Alternator C
Active Steering Control Module J792
ABS Control Module J104
Engine Control Module J623
Sensor Electronics Control Module J849
Camera Control Module J852
Distance Regulation Control Module J428
Left Front Seat Belt Tensioner Control Module J854
Cornering Lamp and Headlamp Range Control Module J745
Steering Angle Sensor G85
Distance Regulation Control Module 2 J850
Right Front Seat Belt Tensioner Control Module J855
Left Headlamp Power Output Stage J667
Right Headlamp Power Output Stage J668
Electromechanical Parking Brake Control Module J540
Image Processing Control Module J851
Lane Change Assistance Control Module J769
Night Vision System Control Module J853
Transmission Control Module J217
Level Control System Control Module J197
Lane Change Assistance Control Module 2 J770
Infrared Camera R212

459_001a

New Bus System Features

The number of control modules and bus systems has increased substantially when compared to the 2010 Audi A8.

Bus Systems Used on the 2011 Audi A8

Bus System	Cable Color	Type	Transmission Rate	Characteristic
Drivetrain CAN		Electrical two-wire bus system	500 kbit/s	Not capable of single-wire operation
Convenience CAN		Electrical two-wire bus system	500 kbit/s	Not capable of single-wire operation
Extended CAN		Electrical two-wire bus system	500 kbit/s	Not capable of single-wire operation
Display and Control CAN		Electrical two-wire bus system	500 kbit/s	Not capable of single-wire operation
Diagnosis CAN		Electrical two-wire bus system	500 kbit/s	Not capable of single-wire operation
FlexRay		Electrical two-wire bus system	10 Mbit/s	Not capable of single-wire operation
MOST bus		Fiber-optic bus system	22.5 Mbit/s	Ring break = failure of complete system
LIN bus		Electrical single wire bus system	20 kbit/s	
Sub bus system		Electrical two-wire bus system	500 kbit/s	

Most Important New Features

- Convenience CAN is a new higher speed bus system
- New FlexRay data bus system is faster and more reliable than CAN and offers system-wide redundancy
- Instrument Cluster Control Module J285 is a bus device in two bus systems — Display and Control CAN and MOST bus
- All Wheel Drive Control Module J492 and ABS Control Module J104 are bus devices in two bus systems — Drivetrain CAN and FlexRay
- Analog clock is a LIN bus component
- Information Electronics Control Module 2 is only installed on vehicles with the Rear Entertainment System
- Control modules for multi-contour seats are only installed on vehicles with the massage seat function

Reference

Basic information on the data bus systems used in Audi vehicles to date can be found in Self-Study Program 971603, *Audi Data Bus Technologies*.

FlexRay

FlexRay makes its debut at Audi on the 2011 Audi A8. FlexRay is a new data bus system developed by a consortium of manufacturers established in 2000. The consortium includes the Volkswagen Group.

The FlexRay data bus system is designed to be faster and more reliable than CAN and other data bus systems. It provides high-speed, pre-determined, distributed control for advanced automotive applications.

FlexRay's dual-channel architecture offers system-wide redundancy that meets the reliability requirements of emerging safety systems, such as brake-by-wire.

With 10 Mbit/s throughput per channel, the FlexRay system can also be employed as a vehicle-wide network backbone, working in conjunction with already well-established systems, such as CAN and LIN. It also drives down costs by reducing the number of parallel CAN networks used to solve bandwidth bottlenecks.

459_006

Benefits of FlexRay

- Simplified vehicle network architectures
- Enhanced control intelligence
- High data transfer rate: 10 Mbit/s maximum
- Reduced wiring requirements
- Reduced weight of networked subsystems
- Distributed computing through a global time clock
- Electromechanical systems (drive-by-wire) replacing hydraulic components
- Time and event triggered data transfer

Example

FlexRay networking works differently from CAN, LIN, and MOST data bus systems.

Think of FlexRay as a cable car station system. The cable car stations represent the bus devices: senders and receivers (control modules). The cable cars themselves represent the message frames, and the passengers the messages.

The time at which a bus device can send messages over the FlexRay is precisely defined. The time at which a sent message reaches the receiver is also precisely known. We can compare it to the scheduled timetable for a cable car service.

Even if a bus device does not send any information at the allotted time, a certain bandwidth is reserved for it. This is like a cable car which travels whether or not there is anyone onboard. This means that prioritization of messages, which occurs on a CAN bus, is not necessary.

On the Audi version of the system, an "empty cable car" is identified as a sender fault, with the control modules always sending data. New information is flagged by an "update bit". If there is no new information to send, the old data is re-sent.

459_031

Comparison Between CAN bus and FlexRay

Characteristic	CAN data bus	FlexRay
Wiring	Electrical, two-wire	Electrical, two-wire
Signal status	“0” — dominant, “1” — recessive	“Idle”, “Data 0”, “Data 1”
Data rate	500 kbit/s	10 Mbit/s
Access principle	Event-controlled	Timer-controlled
Topologies	Passive star coupler, bus	Active star coupler, point-to-point, daisy chain[1]
Arbitration	Higher-priority message sent before lower-priority message	None, data is sent at defined times
Confirmation signal	Receiver confirms receipt of a valid data protocol	Sender gets no confirmation that a data protocol has been correctly transmitted
Fault protocol	A fault can be identified on the network by a fault protocol	Every receiver checks for itself whether the data protocol received is correct
Data protocol length	Maximum eight bytes useful data	Maximum 256 bytes useful data
Usage	– Used when required – Time at which the CAN bus can be used depends on available capacity – CAN bus can potentially be overloaded	– Time at which the data protocol can be used is defined – Duration of usage is defined – Sending slot is reserved even if it is not required
Time of receipt	Unknown	Known

[1]Daisy chain = Taken from the children’s game of threading daisies together to make a string, the inference here refers to a series of control modules connected together in series.

Instrument Cluster

A new instrument cluster has been developed for the 2011 Audi A8 which meets the increased demands on in-car displays and the requirements of various driver assistance systems.

A high-resolution 7" Driver Information System display is located directly within the driver's field of vision. It has an excellent resolution of 800 x 480 pixels.

456_100

The instrument cluster also features a new operating and display design. A taskbar at the top of the display enables a quick call-up of content. The display can be operated using the buttons on the multifunction steering wheel.

Analog Clock

Installed in the center console, the analog clock communicates with the instrument cluster via a LIN bus.

When the ignition is switched ON, the analog clock continuously receives signals from the instrument cluster. When the ignition is switched OFF, the clock continues to operate independently.

456_182

Background Lighting

The 2011 Audi A8 features a completely new interior lighting design. The central interior light in the headliner has been replaced by several optical fibers and lights distributed throughout the vehicle. The new interior lighting ranges from the purely functional to emotional and timeless.

In the optional ambient lighting package, the light bands in the headliner come in two different colors, while the ambient lighting below the shoulder comes in three colors:

Color: Polar White (cool white tone)

Character of light: technical, formal, unemotional, and precise, accentuates high-quality design elements

456_105

Color: Ivory White (warm white tone)

Character of light: warm and inviting, creates a feel-good atmosphere

456_106

Color: Ruby Red (cool white and red tone)

Character of light: sporty and progressive, stark contrast between two different tones

456_107

Audi Night Vision Assist

The Night Vision Assist system provides better illumination of the road, enabling the conditions ahead of the vehicle to be interpreted more quickly and accurately in the dark. Its range greatly exceeds that of high beam headlights. A thermal imaging camera detects heat-emitting objects, such as human beings and larger animals, in difficult light situations.

The system produces a thermal image of the area ahead of the vehicle on the multi-function display. An infrared camera built into the Audi rings on the front grille of the vehicle is used to capture these images.

Human beings and larger animals show up much more brightly in the image than their surroundings, making them easy for the driver to spot on the display. If the system classifies an object as a human being, the object in question is additionally marked in color. The thermal image shows not only living beings, but also the road ahead of the vehicle and the outlines of buildings.

If a danger of collision is computed on the basis of these two predictions, an acoustic warning signal will be given so the driver can react to the situation. However, Night Vision Assist does not itself intervene in road traffic situations.

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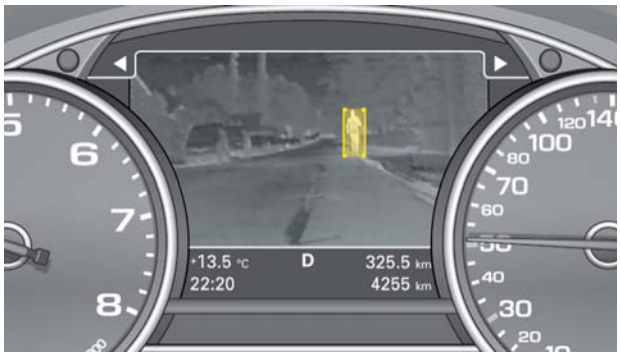

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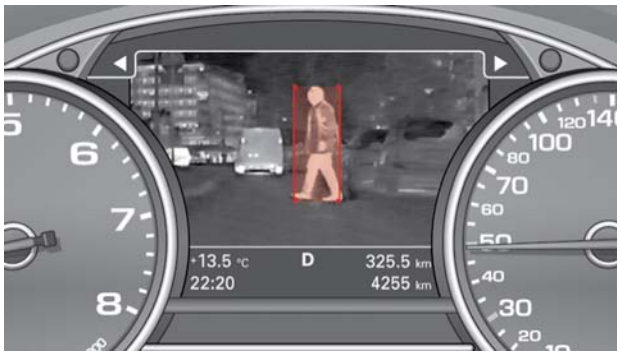

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Reference

For more information on Night Vision Assist and the use of special tool VAS 6430/6 for calibrating the infrared camera, refer to Self-Study Program 970203, *The 2011 Audi A8 Driver Assistance Systems*.

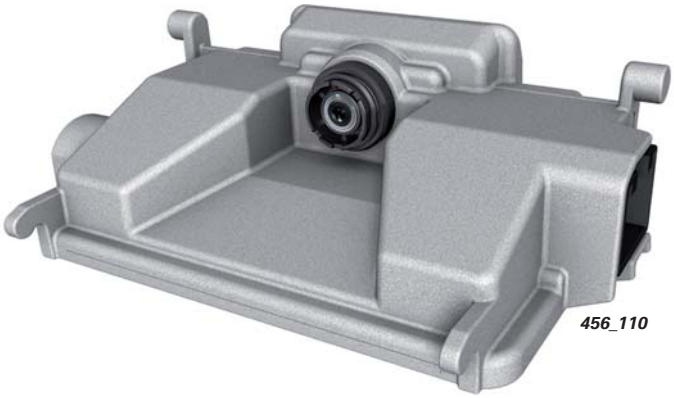
Depending on the equipment level of the 2011 Audi A8, one of two new control modules will be installed:

– Image Processing Control Module J851
– Camera Control Module J852

456_109

Image Processing Control Module J851

J851 is an all-new module. The functions of Adaptive Cruise Control (ACC) Stop and Go are integrated into it. In the future, the Traffic Sign Recognition function will also be integrated into this module.



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Camera Control Module J852

J852 replaces Directional Stabilization Assistance Control Module J759. It has a more powerful CPU and controls the functions of the Audi lane assist system, and the Intelligent Light System.

Audi Drive Select

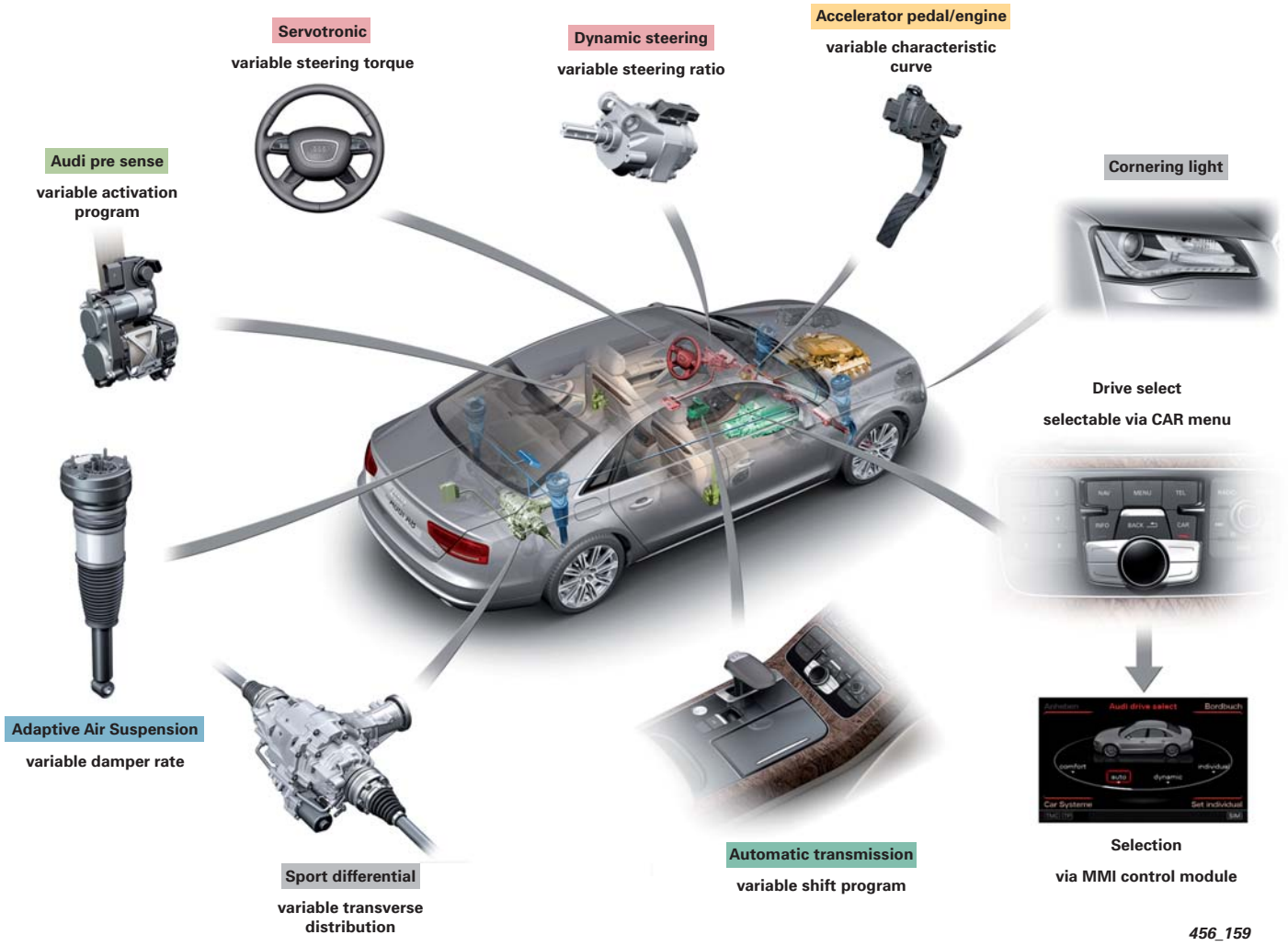
Overview

Audi drive select will now be available on the 2011 Audi A8, enabling the driver to select different vehicle setups via the MMI. There are three modes:

– Comfort
– Auto
– Dynamic

An additional "individual" mode allows the driver to configure the vehicle setup to suit their personal preferences. For example, a sport engine setup can be combined with easy steering action.

The vehicle trim package dictates which systems can be controlled by Audi drive select. The engine, transmission, steering, and Adaptive Air Suspension systems can be controlled. The dynamic steering, sport differential, dynamic cornering light, and belt tensioner systems can be optionally configured via Audi drive select.



Operating Modes

Each mode of Audi drive select is controlled and adapted by relevant vehicle systems, depending upon driving speed and road conditions.

comfort

This mode provides a more comfort-oriented vehicle setup, and is best suited for highway travel or long trips. For example, the engine, automatic transmission, and sport differential respond to accelerator pedal movements with smoother transitions. The steering is more “relaxed”, while the Adaptive Air Suspension is more softly dampened, and the cornering light is also adjusted.

auto

This mode offers a comfortable, balanced, yet dynamic driving feel. This setup is well suited to everyday use.

dynamic

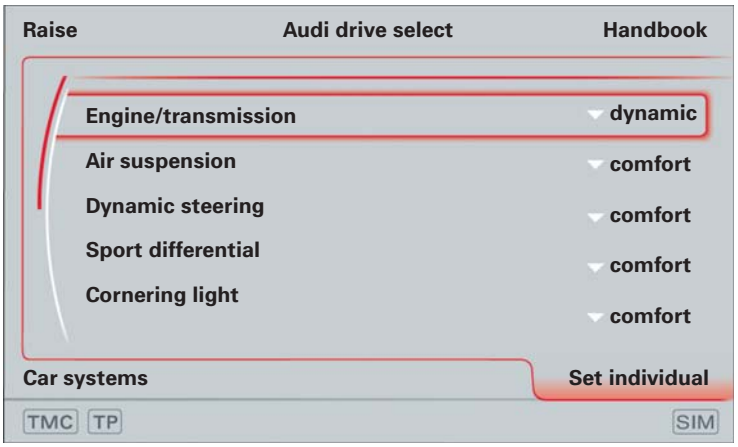
This mode gives the vehicle a sport driving feel. The engine responds immediately to accelerator inputs, and the steering is precise and very responsive. The sport differential is more agile, the Adaptive Air Suspension is firmer, and the transmission adjusts its shift points to higher rpms. The cornering light is also adjusted.

individual

In individual mode, the driver can select their own setup. These settings are saved and assigned to the remote control key in use.

Audi drive select is configured through the MMI. The operating mode can be selected after pressing the “CAR” function key in the MMI menu.

If the driver also presses the “Set individual” control button, the various vehicle systems can be configured individually.



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Characteristics

Depending on driving mode, the engine and transmission respond accordingly to accelerator inputs. The Servotronic power steering also adapts to the setup selected.

The Adaptive Air Suspension ("Air suspension" on the MMI) is an electronically controlled air suspension and damping system. It is configured to the driving mode selected, and to steering inputs, driver braking and acceleration inputs, road surface, vehicle speed, and payload. In vehicles with Adaptive Air Suspension — Sport, the setting is more aggressive.

Ground clearance for the vehicle varies according to mode setting and speed. If the driver goes faster than approximately 74.5 mph (120.0 km/h) for more than 30 seconds in auto or dynamic mode, the ground clearance is automatically adjusted to highway ride height.

If the vehicle is driven at less than approximately 43.4 mph (70.0 km/h) for more than 120 seconds, the ground clearance is automatically increased. In dynamic mode, the activation thresholds of the belt tensioners are modified depending on transverse stresses and stability.

The dynamic steering system adjusts the steering ratio depending on driving speed to minimize steering effort for the driver. At high speeds, for example, a low steering sensitivity is set for better vehicle control.

At low speeds, the steering is more direct to reduce steering effort. For example, when maneuvering in confined spaces. The dynamic steering system provides quick steering response at low and medium speeds. The basic characteristic of the steering ratio can be configured by the driver in Audi drive select.

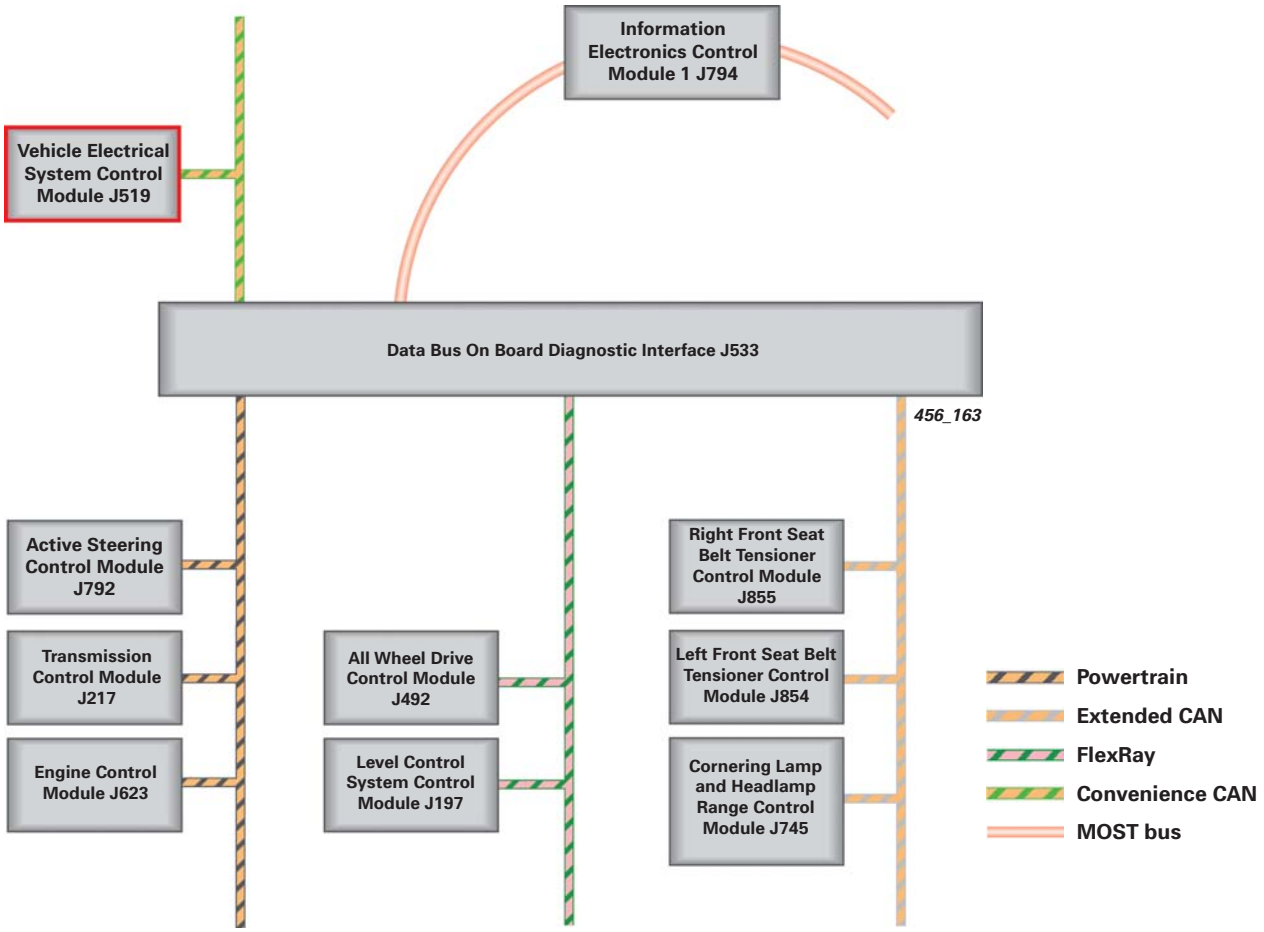
An integral part of the all-wheel drive system (quattro), the sport differential distributes tractive power to the rear axle depending on the situation. Power distribution varies depending upon the mode selected.

A high degree of agility and acceleration are achieved when cornering. The vehicle responds very well to steering inputs. The cornering light adapts to the curve geometry at speeds of between 6.21 mph (10.0 km/h) and 68.4 mph (110.0 km/h). Swivel response and illumination are also adapted to driving mode.

The following table summarizes the characteristics in each mode:

		comfort	auto	dynamic
	Engine/transmission	normal	normal	sporty
	Air suspension	comfortable	normal	sporty
	Steering	comfortable	normal	sporty
	Dynamic steering	comfortable and indirect	normal and direct	sporty and direct
	Sport differential	normal	responsive	sporty
	Cornering light	comfortable	normal	sporty
	Belt tensioners	standard	standard	adapted activation timing

System Integration



Vehicle Electrical System Control Module J519 has a central function in the Audi drive select system. Driver input information is collected by Information Electronics Control Module 1 J794 and is transferred to J519 via the MOST bus, Data Bus On Board Diagnostic Interface J533 (Gateway), and the Convenience CAN bus.

J519 uses this information to generate a suitable activation current for the Servotronic valve. At the same time, corresponding commands are relayed to J533 across the Convenience CAN bus. J533 distributes these commands to the Extended CAN, Powertrain CAN, and the FlexRay for the control modules integrated into Audi drive select.

As soon as all switching conditions have been met, the user system control module confirms the changeover by generating an acknowledgement message, which it sends back to J519 via J533.

In this way, J519 is always informed as to which user system is using which characteristic, ensuring that switching behavior is logical for the driver.

In the 2011 Audi A8, the mode selected by the driver is preserved even after the ignition is switched OFF and the key removed. However, the engine and transmission systems always start in normal mode (corresponding to selector lever position “D”). The previous mode setting and the individual mode settings are saved automatically and assigned to the ignition key.

- A sport shift characteristic is set by selecting dynamic mode. Transmission position “S” is automatically selected.
- In vehicles with dynamic steering, some operating noise can be heard when the engine is switched ON or OFF. This is normal, and is nothing to be concerned about.
- Some models only reach their top speed in the auto and dynamic driving modes.

For further information about the operation of Audi drive select, refer to the Owner’s Manual.

Heating, Ventilation, and Air Conditioning (HVAC)

Overview

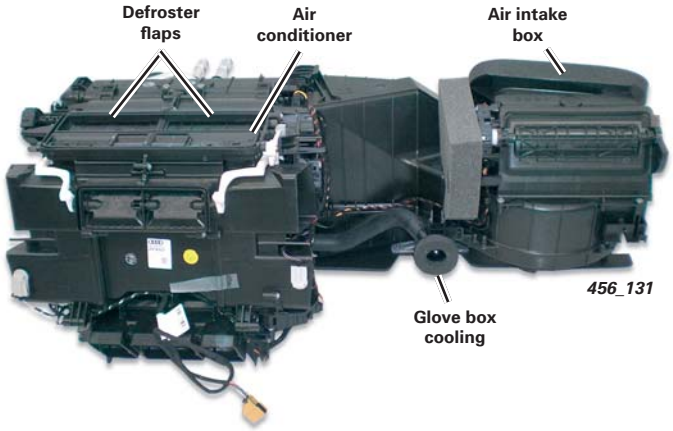
The air conditioning system of the 2011 Audi A8 delivers excellent cooling performance. It is efficient, consumes very little energy, and is unusually lightweight.

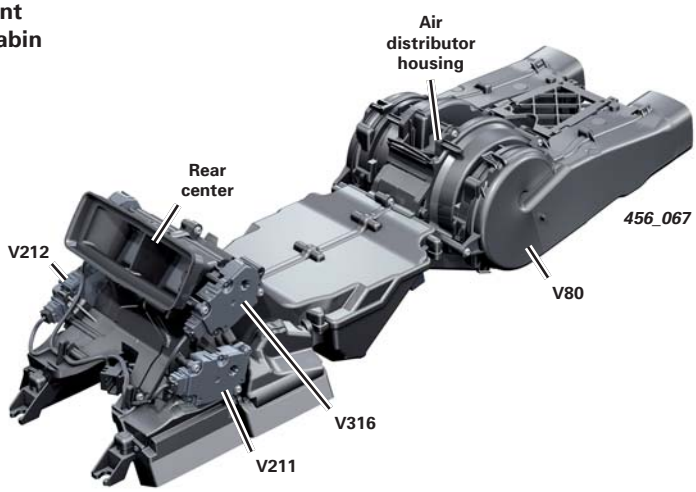
The airflow controlled system is the same basic configuration as the systems used in Audi A5, A4, and Q5 models.

The refrigerant circuit is controlled by an expansion valve. The four-zone deluxe automatic air conditioning system uses two expansion valves.

The rear passenger compartment air conditioning has a twin-flow fresh air blower in the air distributor housing of the center console. The air distributor housing draws in preconditioned air from the front air conditioning unit through ducts in the center console, directing air flow to the rear passengers. This provides excellent air distribution throughout the vehicle interior.

Basic two-zone deluxe automatic air conditioning system: front air conditioning unit and air distributor housing for the rear cabin



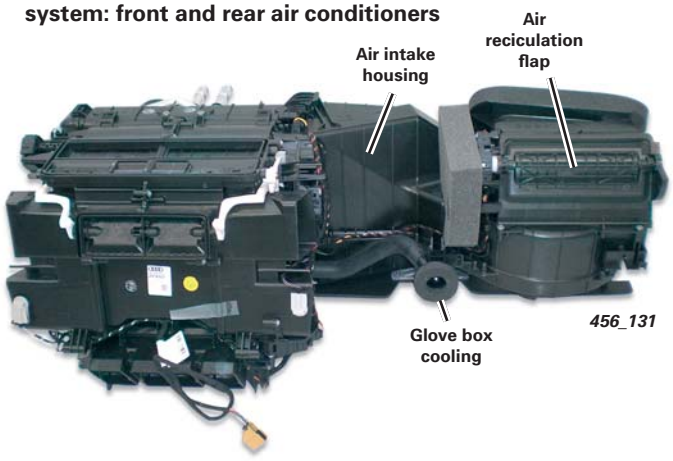


The optional four-zone air conditioning system has its own control system. Rear Climatronic A/C Display Control Head E265 is integrated into the folding center armrest or in the center console of the long wheelbase A8 version.

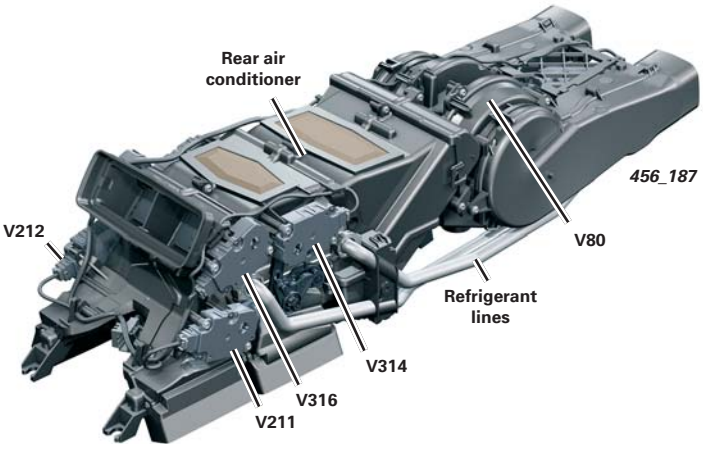
With this second control system, rear seat occupants can configure temperature and air distribution to their individual preferences. They have the same adjustment options as the front passengers.

This four-zone climate control function is made possible by the second air conditioning unit located in the center console. This unit enables individual air temperature control and air distribution.

Four-zone deluxe automatic air conditioning system: front and rear air conditioners



V211/V212 Left/Right B-Pillar/Footwell Shut-Off Door Motors



In addition to automatic control of individual climate zones, occupants have a number of other air conditioning adjustment options to satisfy their personal preferences.

Three different modes can be selected in the AC menu of the MMI:

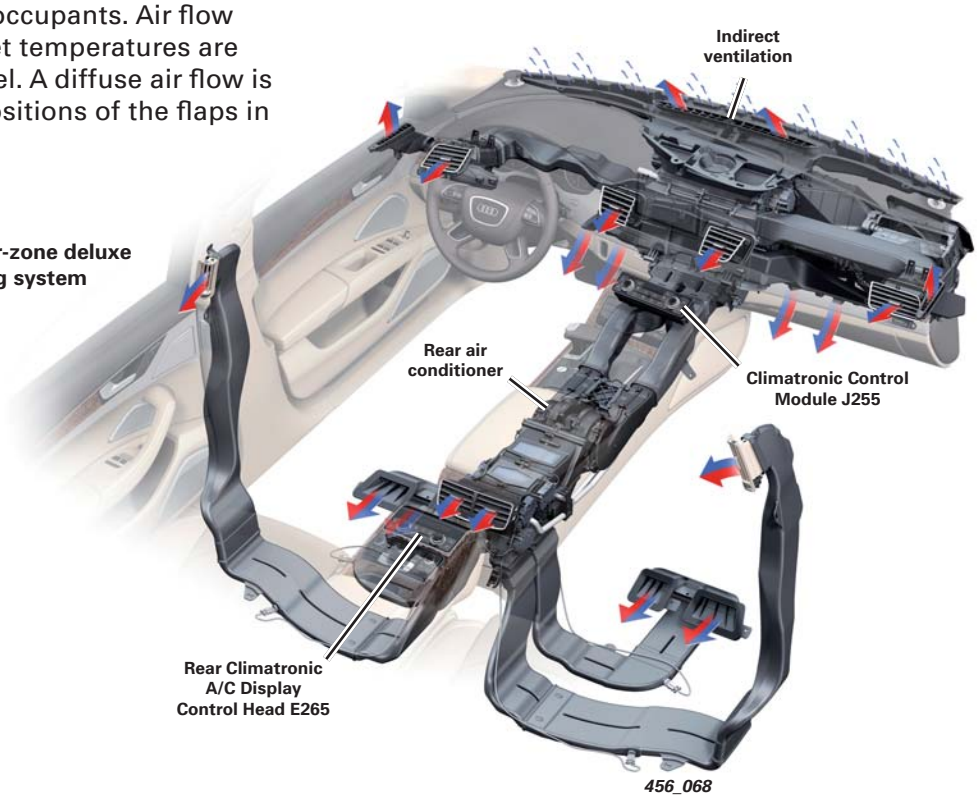
– Soft
– Medium
– Intensive

When the “soft” mode is selected, the air conditioning subtly blends into the background and creates the desired climate in a manner that is barely noticeable to the occupants. Air flow is reduced and the air outlet temperatures are adjusted to a moderate level. A diffuse air flow is created by adjusting the positions of the flaps in the air conditioner.

When the “intensive” mode is selected, air flow to the cabin is noticeably increased and air is distributed more directly to the body. The temperature level is selected to emphasize the air conditioning characteristic. For example, in winter it is slightly warmer than in normal mode, and in summer, slightly cooler.

Footwell temperature can also be adapted at the MMI. This function uses variable temperature stratification to increase or reduce the footwell temperature independently of the other AC settings. This function quickly warms the feet of occupants entering the vehicle in wintery temperatures.

Air distribution in the four-zone deluxe automatic air conditioning system



When the “auto” mode is selected, the flow control system determines individual air requirements for each individual outlet of the air circulation system, setting cooling or heating variables accordingly.

The standard built-in sunlight sensor provides the control module with information on the intensity and angle of direct sunlight on the vehicle. The distribution and conditioning of the air is adapted to provide optimal air flow and temperature comfort for all passengers in the vehicle.

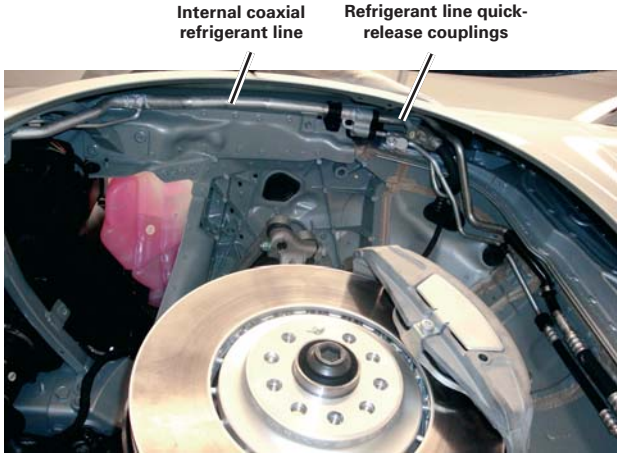
The system also recognizes manual user inputs (such as the manual closing of an air outlet) as control variables and reacts accordingly. Unlike other systems where air is distributed to the remaining open air outlets, the flow control system of the 2011 Audi A8 maintains a constant air flow at each outlet.

To achieve a draft-free, comfortable distribution of air, the new A8 uses a proven indirect ventilation system. A diffuse air flow into the vehicle interior is provided through a grille on the top of the instrument panel. The low flat rate of the air conditioning eliminates drafts, while ensuring fresh air to the head area.

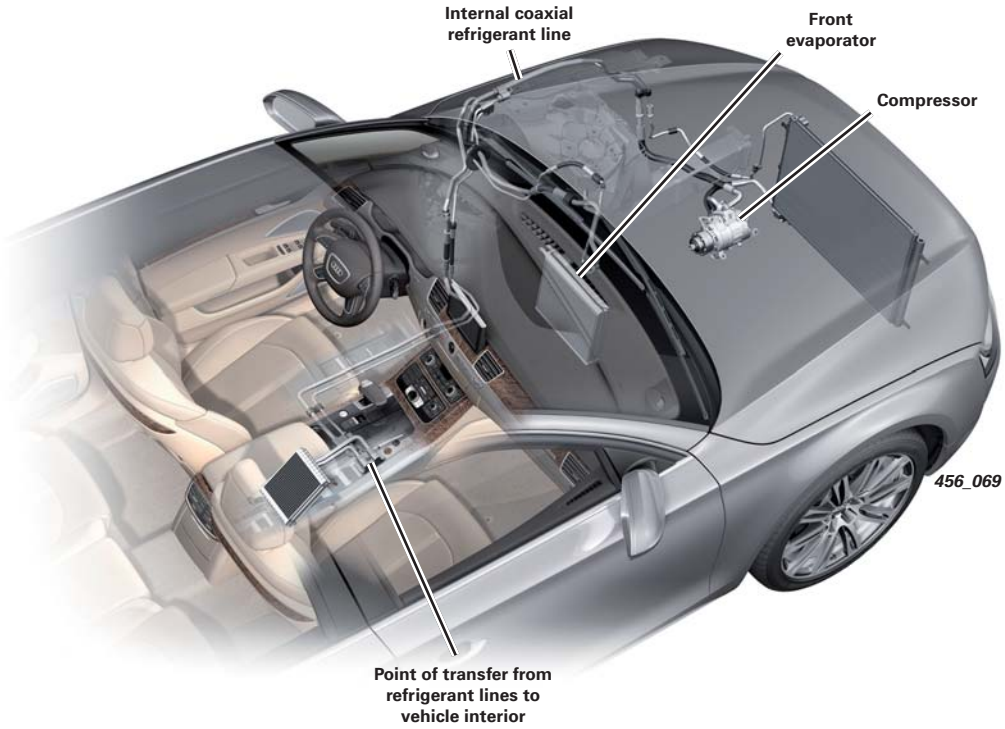
The refrigerant system of the 2011 Audi A8 uses an internal coaxial counter-flow refrigerant line, as used on current Audi A4, A5/S5, and Q5 models.

"Counter-flow" means that a certain amount of heat is transferred from the high pressure side of the refrigerant line to the low pressure side. This reduces the temperature of the refrigerant on the high pressure side at the evaporator inlet, increasing the efficiency of the refrigerant circuit.

Inside left front fender well



456_121



456_069

Location of Internal Coaxial Counter-Flow Refrigerant Line

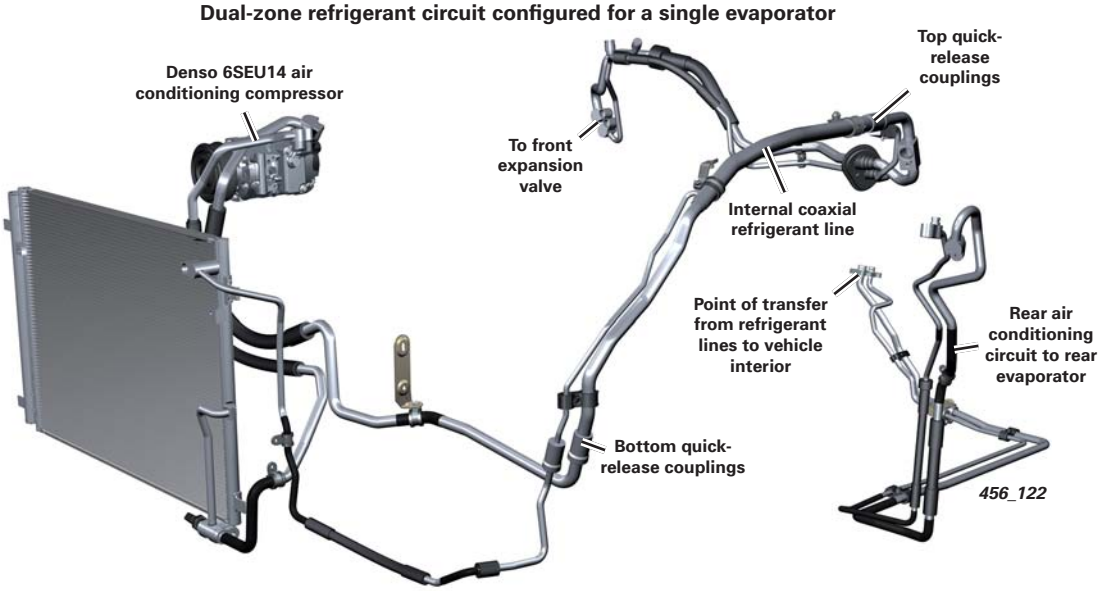
The refrigerant line is located in the upper left front fender well.

Due to its location below the fender brace, a new modified release tool, T40232, must be used to release the couplings.

The refrigerant systems for the dual-zone and four-zone air conditioning systems are different. In both systems, refrigerant flows through the internal coaxial counter-flow refrigerant line. However, the four-zone air conditioning system has two evaporators, two expansion valves, and two air distribution units.

The A/C compressor for both the two-zone and four-zone refrigerant systems is a Denso six-piston compressor with a displacement of 8.5 cu in (140.0 ccm). The compressor is shaft driven.

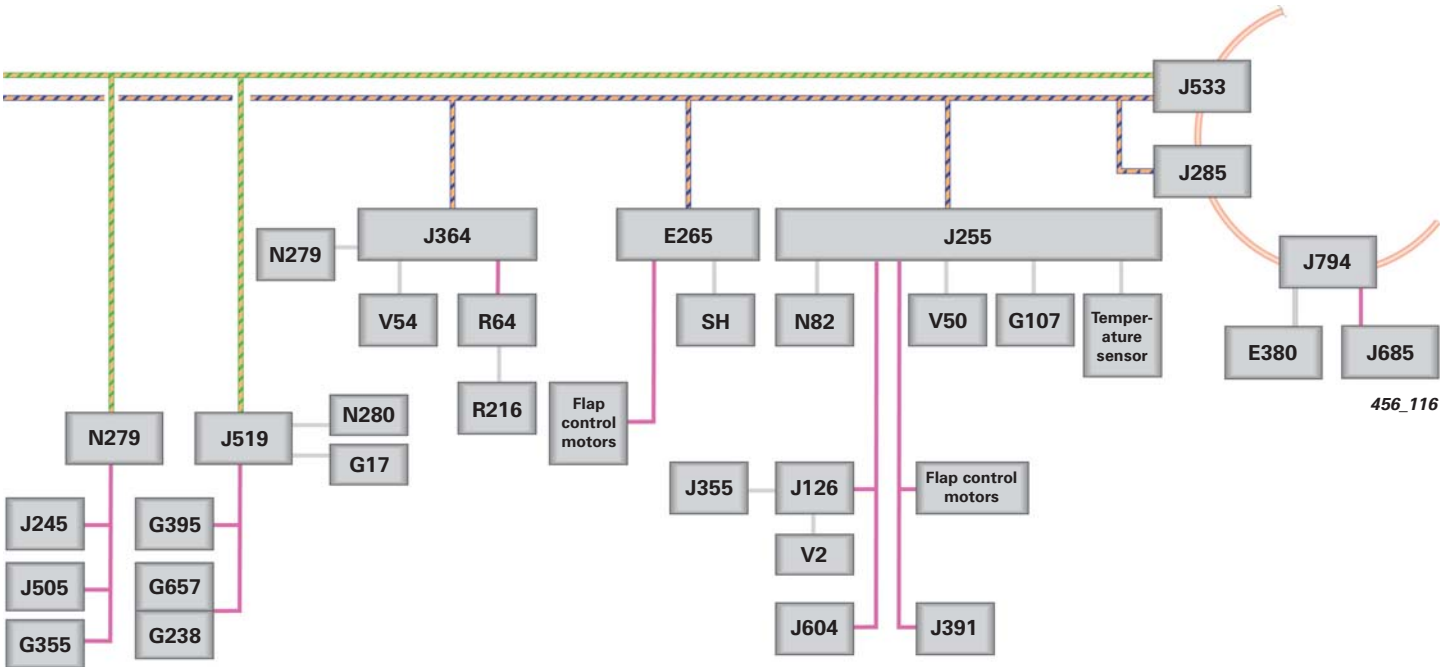
Dual-zone refrigerant circuit configured for a single evaporator



Networking

The control modules of the air conditioning system communicate via two data bus and various LIN bus systems. As in current Audi A4, A5/S5, and Q5 models, information from various sensors is collected by Vehicle Electrical System Control Module J519.

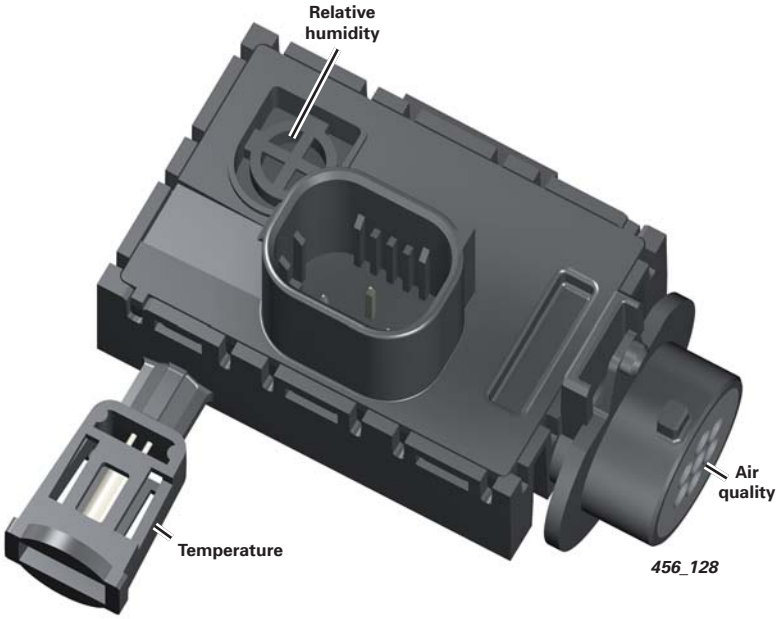
J519 and Comfort System Central Control Module J393 communicate on the Convenience CAN and other data bus systems via Data Bus On Board Diagnostic Interface J533. Information is provided to Climatronic Control Module J255, which is connected to the Display and Control CAN.



Humidity Sensor in Fresh Air Intake Duct G657

G657 is both an air quality sensor and a humidity sensor. The humidity sensor measures the temperature and moisture content of air flow. The measurement data is evaluated by Vehicle Electrical System Control Module J519 and is then sent to the Climatronic control module.

The Climatronic control module then computes the current relative humidity of the fresh air entering the vehicle interior. The computed relative humidity is used to prevent fogging of the vehicle windows from the inside. This is achieved by lowering the evaporator temperature or by adapting the characteristic curve for automatic air recirculation.



Coolant Shut-Off Valve N82

N82 separates the heater heat exchanger from the coolant system. This shortens the engine warm-up phase. It is only activated by Climatronic Control Module J255 after various operating parameters are met.

Front Seat Ventilation and Massage

The comfort sports seat has pneumatic seat and backrest side cushion adjustments, and a lumbar support that is pneumatically adjustable for height and depth. The upper backrest is electrically adjustable and provides shoulder support. Seat depth is electrically adjustable for length.

Both the comfort sports seat and the comfort seat are optionally available with seat heating and a climate control or massage function.

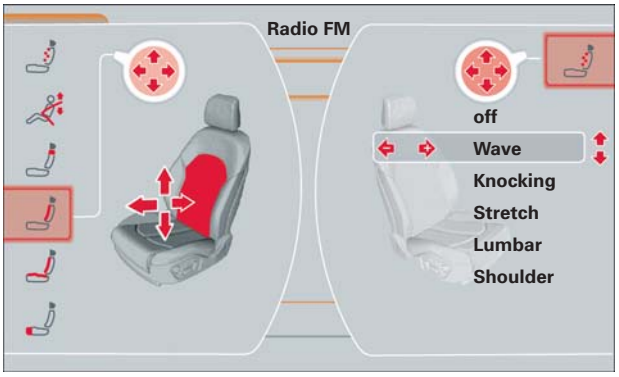
The comfort seat is vibration-isolated and has a pneumatic lumbar adjustment and optional massage functions. The MMI can be used to select five different massage programs, make massage intensity adjustments, and activate the backrest and upper backrest pneumatics. The comfort head restraints have side adjusting elements for relaxation of the neck muscles.

The pneumatics integrated into the seat provide a variety of massage functions which are executed by 10 individually adjustable chambers in the backrest.

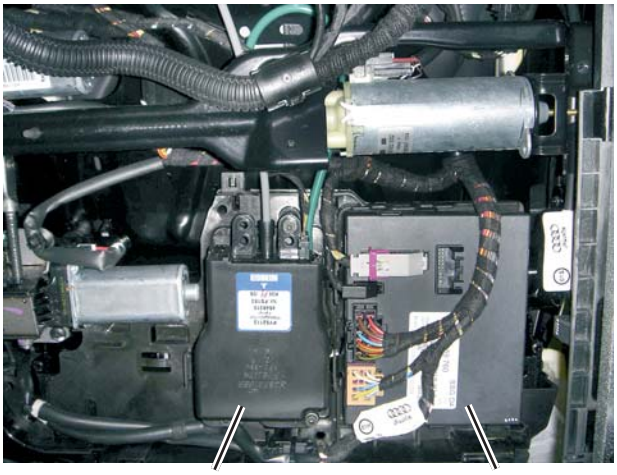
For example, either just the shoulder area or the whole back can be massaged. To accomplish this, a compressor under the seat supplies an intelligent valve block with compressed air. Depending on which program is selected, air is channeled through the valve block to the air cushions.

All seat versions offer lumbar adjustment as standard in the front seats. In the basic seat, an electrically operated mechanical lumbar support is used. The comfort seat and comfort sports seat have a pneumatic lumbar support provided by inflatable cushions in the seat backrest.

Display of various massage settings for driver and front passenger sides



456_144



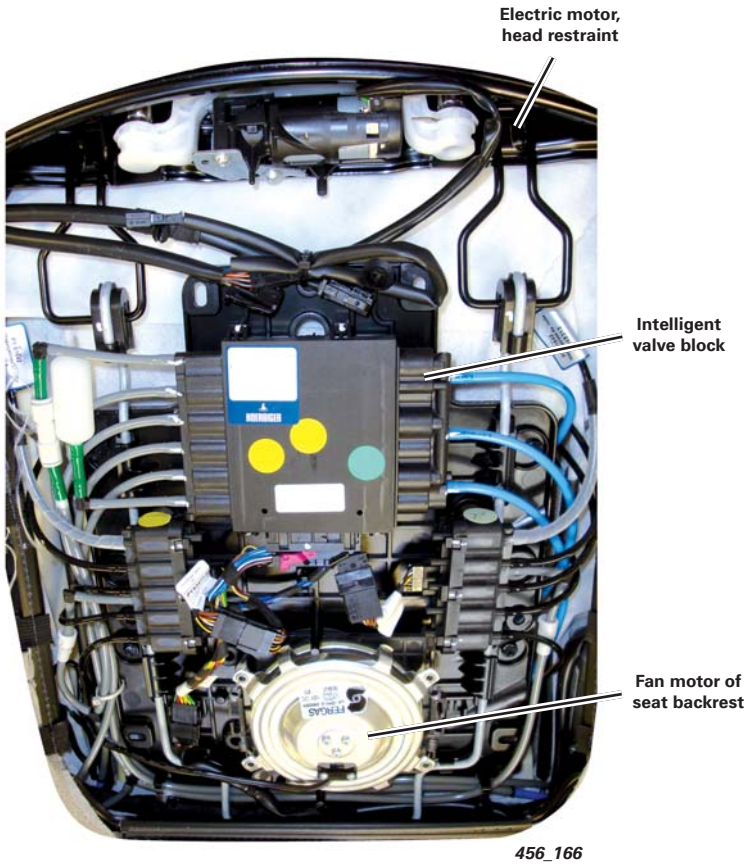
Massage pump, driver compressor, massage seat, driver's side J136

456_146

The 2011 Audi A8 uses a suction-type seat ventilation system which maintains a constant, comfortable seating climate even in hot summer temperatures.

Each seat has a climate control function and two fan motors. One fan is in the seat and one fan is in the backrest. A breathable fabric in the molded foam of the seat provides excellent dispersal of intake air, creating a comfortable, dry seat climate.

The suction-type climate control system wicks moisture away from the seat surface. This means that air conditioning takes effect on the body very quickly.



456_166

Rear Seats

The electrically adjustable rear seat is available as a 2+1 seater and has programmable functions such as backrest angle and seat adjustments. Virtually any desired setting is possible.

Seat climate control, and pneumatic lumbar support and massage functions are optional. All adjustment functions can be activated from the center armrest, which can also be folded up into the backrest to create a third (middle) seat.

Infotainment

Audi Multi Media Interface (MMI)

Making its debut in the 2011 Audi A8 is a new, third generation version of the MMI, which displays its information on an 8-inch head-up LCD monitor (display).

The new MMI combines cutting-edge technology and intuitive operation with an improved user interface and an impressive array of new functions.

456_143

MMI Navigation Plus with MMI Touch

MMI Navigation plus is equipped as standard with a touch pad (MMI touch). It can be used for entering letters and numbers, but also has other functions. MMI Navigation plus includes a Bluetooth interface, which can be used to interface a cell phone or audio player.

MMI Navigation plus also uses the Premium speech dialog “speech command” system. In addition to navigation and telephone operation, this system can be used to control radio and media.

MMI Navigation Plus with MMI Touch

456_080

456_149

Standard Equipment

3D hard drive based navigation system

Navigation data based vehicle assistance

20 GB hard drive for Jukebox

MMI touch control module

8-inch display with 800 x 480 pixel resolution

AM/FM radio with phase diversity and background tuner

New user interface with Car menus: AC display, etc.

Premium speed dialog system

Bose Premium sound system

Single DVD drive

Two SD card readers

Audi music interface

Bluetooth interface

Digital radio (Sirius in North America)

Optional Equipment

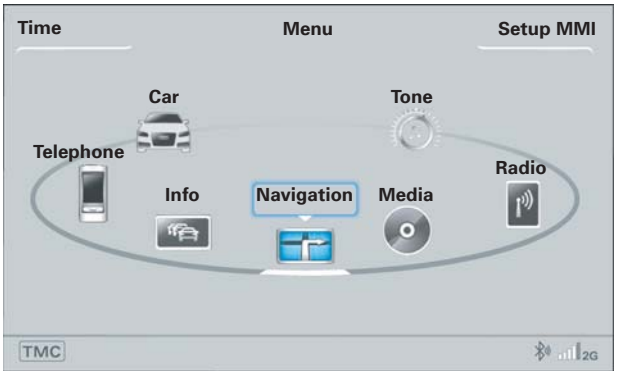
DVD changer

Bang & Olufsen Advanced Sound System

Rear Seat Entertainment

Operation

The MMI debuting on the 2011 A8 is more intuitive. The reduced soft-key graphics and new 8-inch display have created more space for menu graphics. Fresh formatting and vivid colors have created a very user friendly design. The 3D options menu is straightforward and easy to use.

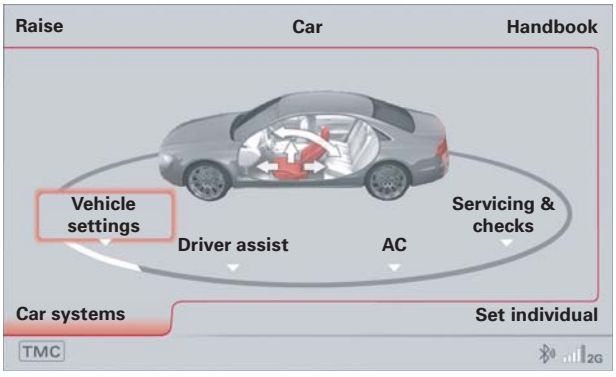


MMI main menu *456_081*

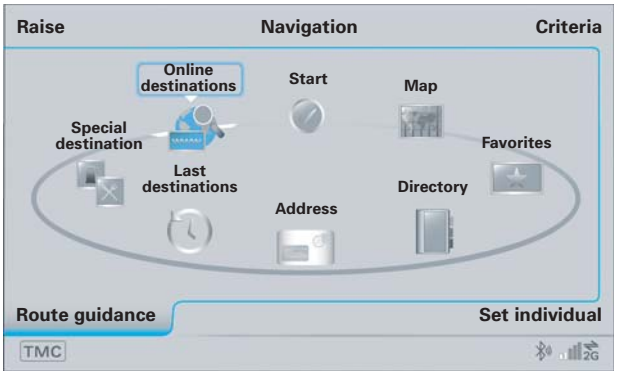
The premium speech dialog system has been enhanced for greater ease of operation. With MMI Navigation plus, media settings can be made by speech command. For example, Jukebox audio files can be selected directly by naming the track.

When selecting audio/video files, the premium speech dialog system recognizes the following languages: German, English, French, Italian, and Spanish, regardless of which menu language option has been selected.

With the improved premium speech dialog system, it is now possible to enter a destination via voice entry, including roads, house/building numbers, and other destination information. This function is also known as “one-shot entry”.



Car menu *456_082*



Navigation menu *456_093*

New Features of MMI Navigation Plus

The Driver Information System display with 800 x 480 pixel resolution in the instrument cluster enables a new, animated route guidance display to be selected as an alternative to the previous directional arrow display.

In addition to lane recommendations, the display shows detailed intersection maps, animated highway exit displays, and useful information about the current route.

456_084

Display in instrument cluster

Information Electronics Control Module 1 J794

J794 is the control module for the MMI Navigation plus system. It has the following functions:

- 60 GB hard drive
  - 40 GB are for navigation (with MMI Navigation plus)
  - 20 GB for Jukebox (with MMI and MMI Navigation plus)
- DVD drive for video file formats (with MMI and MMI Navigation plus)
- Bluetooth interface enhanced for Audi music interface

Information Electronics Control Module 1 J794 in the center console *456_165*

Media Playback

Audio and video files can be played back in all standard formats. The following drives and interfaces can be used for playback:

- DVD drive
- Jukebox
- Memory card readers
- Audi music interface
- DVD changer

Jukebox

The Jukebox has a capacity of 20 GB. Both audio and video files can be imported. Up to 3000 files can be stored.

Tracks can also be imported from an audio CD, with the tracks converted to mp3 format at a rate of 256 kbit/s.

CD Album Cover Display

CD covers, if they are embedded in an audio file, can be displayed in a CD album browser pop-up window alongside other information. Maximum size is 800x800 pixels.

The CD album cover can only be displayed in the CD album browser if it is embedded in the first file on the CD.

Multimedia System Control Head E380

E380 has been dramatically re-designed.

New buttons on the multimedia system control module are:

- TONE — a separate function button for audio settings
- Six-button number pad, as radio station buttons (standard with MMI)
- Touchpad — for direct character input (standard with MMI Navigation plus and optional with MMI)
- MENU — skip to main menu

The following buttons have been deleted:

- SETUP — setups can now be selected directly in any menu
- NAME — the directory can be accessed directly in the Navigation and Telephone menus

456_149

MMI touch control module

Touchpad

The touchpad is a touch-sensitive control panel that is used in place of a six-button number pad. This new touch pad can perform and control the following functions:

- Direct selection of stored radio stations using six displayed station buttons
- Input of letters, numbers, and characters by automatic handwriting recognition
- Browse CD album covers
- Operation of DVD main menu
- Shift navigation map

MMI Reset

To reset the MMI, the following buttons must be pressed simultaneously:

- Turn/push button
- Top right soft key
- TONE

456_148

Button combination for MMI reset

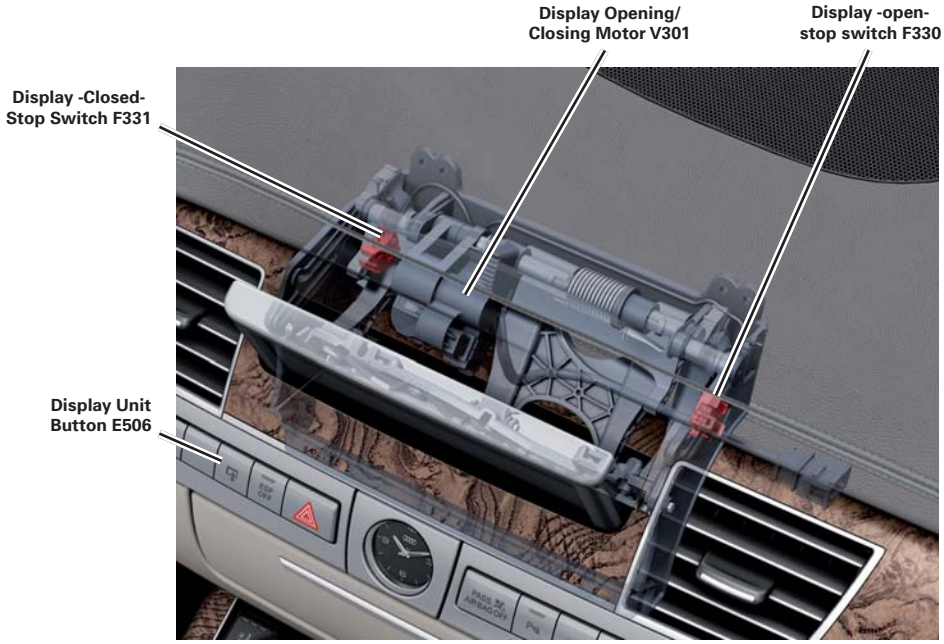
MMI Display Unit
(Front Information Display Control Head J685)

The 8-inch MMI display is based on TFT technology with 800 x 480 pixel resolution. The display unit is connected to Information Electronics Control Module 1 J794 by a 4-pin FAKRA connector. Data is transmitted across a LIN bus line, and video signals are transmitted across two LVDS lines via this connector.

The MMI display unit is powered by the electrically driven swivel mechanism and pops up automatically. This is done after activating the MMI or pressing Display Unit Button E506.

The swivel mechanism can be activated by Multimedia System Control Head E380, which also evaluates both limit switches of the swivel mechanism. One limit switch is responsible for recognizing “display unit popped up”, while the other is responsible for recognizing “display unit retracted”.

456_143



456_114

Swivel mechanism of the MMI display unit

Protective Timeout

If E506 is pressed six times within a minute, the one-minute protective timeout is activated. The MMI display remains in its current end position during this time to protect the swivel mechanism against overloading.

Diagnostics

The diagnostic functions of the MMI display unit, the swivel mechanism, and E506 can be triggered via J794. The MMI display unit can be diagnosed using address word 5F — Information electronics 1.

DVD Changer R161

A DVD changer which holds up to six discs and supports audio CD, mp3 CD/DVD, and video DVD is available as an option. The DVD changer is installed in the glove box.

Address word 0E is assigned to the DVD changer R161. The DVD changer operates exactly like a CD changer. The DVD changer has a component protection function which, if active, interrupts playback at one-second intervals depending on medium.

456_155

DVD changer R161

456_192

Reference
For detailed information about supported media and file formats, refer to the DVD Changer operating instructions.

Audi Music Interface (AMI)

The Audi Music Interface, which is an option on the 2011 Audi A8, connects audio players and serves as a multimedia interface for the following connectivity options via:

– Cable — iPods or USB mass storage devices, such as mp3 player, USB stick, etc.
– Bluetooth — audio players

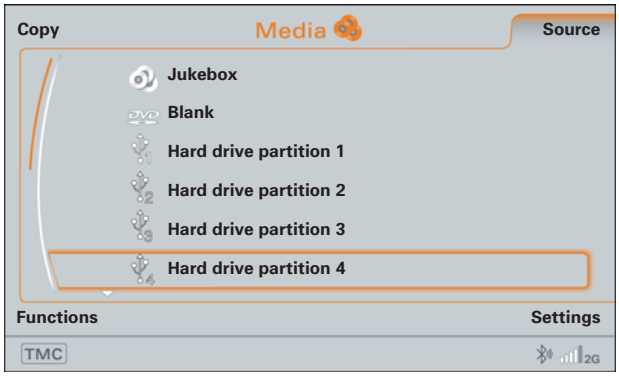
In addition to audio files, videos can be played back through the AMI in supported file formats or directly from a video player.

Media menu *456_087*

Connecting by Cable

MMI adaptors (cables) can connect a USB mass storage device or an audio player to the AMI. The Audi music interface can manage USB mass storage media with up to four partitions. Four virtual USB devices are shown in the Media menu after connecting a USB device.

An AV adaptor cable is available for connecting a video source. It can be used to connect video players with three RSA outputs.

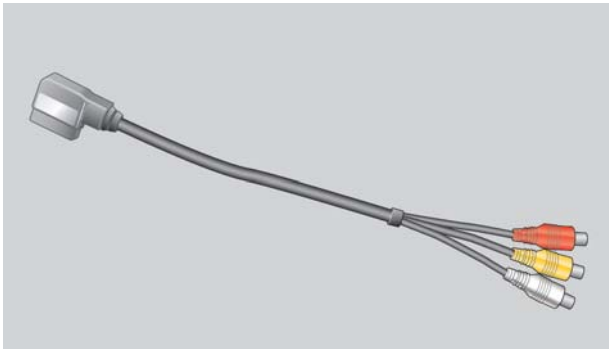


Media menu for connected USB mass storage device *456_089*

Display of CD Album Covers

CD album covers embedded in music files or stored in folders as separate image files are displayed in a pop-up window. To display an album cover stored in a folder as an image file, the image's filename must contain one of the following strings:

– Album
– Cover
– Folder



AV adaptor cable *456_113*

Connecting Via Bluetooth

The Bluetooth interface in the Information Electronics Control Module J794 was previously used only for connecting cell phones. In the 2011 Audi A8, audio players can also be connected to the Audi music interface via a Bluetooth interface.

To transfer music tracks (audio streaming), the connected audio player must support Bluetooth profile A2DP.

- Activate the Telephone menu
- Press the soft key for “Settings”
- Select the menu option “Bluetooth”
- Select the menu option “Bluetooth audio player on”
- Select the menu option “Find Bluetooth devices”
- Read and acknowledge the information field
- Select the Bluetooth device
- Select the connection mode “Audio player”

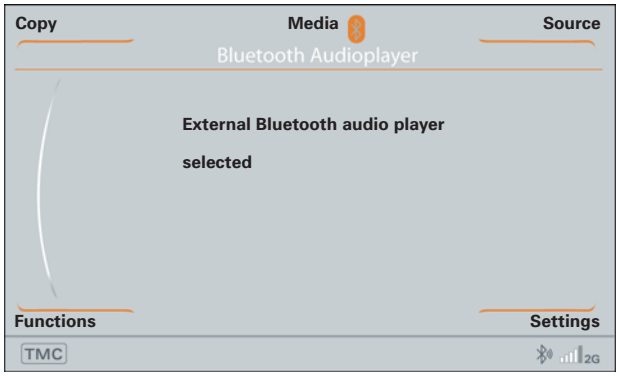
If a device has already been connected, it can be reconnected from the “Bonded devices” list.

Cell phones which support Bluetooth profile A2DP can also be connected via A2DP as audio players. A cell phone can also be interfaced via Handsfree Profile or SIM Access Profile (if supported).

Once the Bluetooth audio player has been selected under “Media”, the information “External Bluetooth audio player selected” is shown on the MMI display. If the audio player supports track information transfer, this information is displayed instead.

456_112

Parallel connection of two terminal devices with J794 via Bluetooth



456_101

Media menu display for active Bluetooth audio player

Bluetooth Audio Player Operation

Tracks in the playlist can only be selected on the audio player itself. With most A2DP players, you can skip between tracks using the arrow buttons on the MMI.

Reference

For more information about approved audio players and control options, refer to the mobile devices database.

Rear Seat Entertainment (RSE) System

This optional system enables rear seat passengers to choose their own entertainment options.

The RSE has the following additional components:

- Information Electronics Control Module 2 J829
- Multimedia Control Head 2 E499
- Multimedia Display Unit 1 Y22 (rear left display)
- Multimedia Display Unit 2 Y23 (right rear display)
- Wireless headphones

To ensure maximum accessibility of all media without interfering with driver functions, a zoning concept has been introduced. The vehicle is now subdivided into a front zone, a rear zone, and a common zone.

The front zone can only be operated by the front seat driver and/or passenger:

- Front internal DVD drive
- Two front SD card readers
- Front Audi music interface
- Front Jukebox

The rear zone, which can only be operated by the rear seat passengers, has the following options:

- Rear internal DVD drive
- Two rear SD card readers
- Rear Audi music interface
- Rear Jukebox

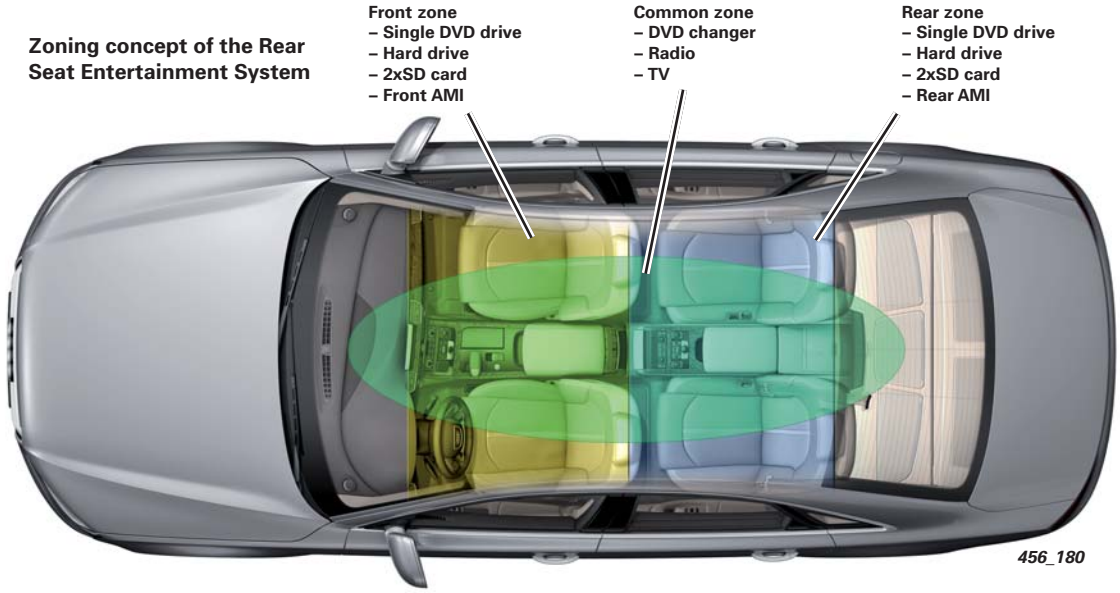
Rear Seat Entertainment System *456_156*

The common zone provides all information and entertainment sources that can be used and operated by both front and rear seat occupants. These are:

- Radio
- DVD changer (optional)
- Navigation system
- Telephone (can be operated by the rear seat passengers using the second optional Bluetooth handset)

To make the common zone as user friendly as possible, Audi adopted a “last wins” approach. Occupants have equal rights to the use of all sources. If a source is already in use, the new user goes to the interface where the previous user left off. If the new user then changes any part of the view, the view also changes for the previous user.

Zoning concept of the Rear Seat Entertainment System



456_180

Information Electronics Control Module 2 J829

J829 is behind the rear center armrest. It has:

– Jukebox with 20 GB capacity
– Two SD card readers
– Single DVD drive
– Audi music interface

J829 does not have a telephone control module.

456_181

Rear Seat Entertainment System operating unit

Multimedia Control Head 2 E499

E499 is connected to J829 by an RS232 serial port. It operates the menu of both rear displays.

It has the following features on both the left and right displays:

– Control buttons for MENU, RADIO, and MEDIA
– A volume control which doubles as an ON/OFF button
– Two arrow buttons which, for example, can be used for fast forward and reverse in CD mode

The central turn/push button with four control buttons positioned around it and a BACK button can be used from either side. The common controls are always active for the side where one of the side-specific buttons was last pushed.

To be able to connect plug-in headphones, a 3.5 mm jack is integrated into each multimedia system operating unit.

456_154

Multimedia system display unit

Multimedia Display Units Y22 and Y23

Two 10-inch TFT displays are available for rear seat occupants. These are mounted on the backs of both front seats.

Each display unit is connected to Information Electronics Control Module 2 J829 via a FAKRA connector.

Diagnostics

J829 uses Address Word 7F — information electronics 2.

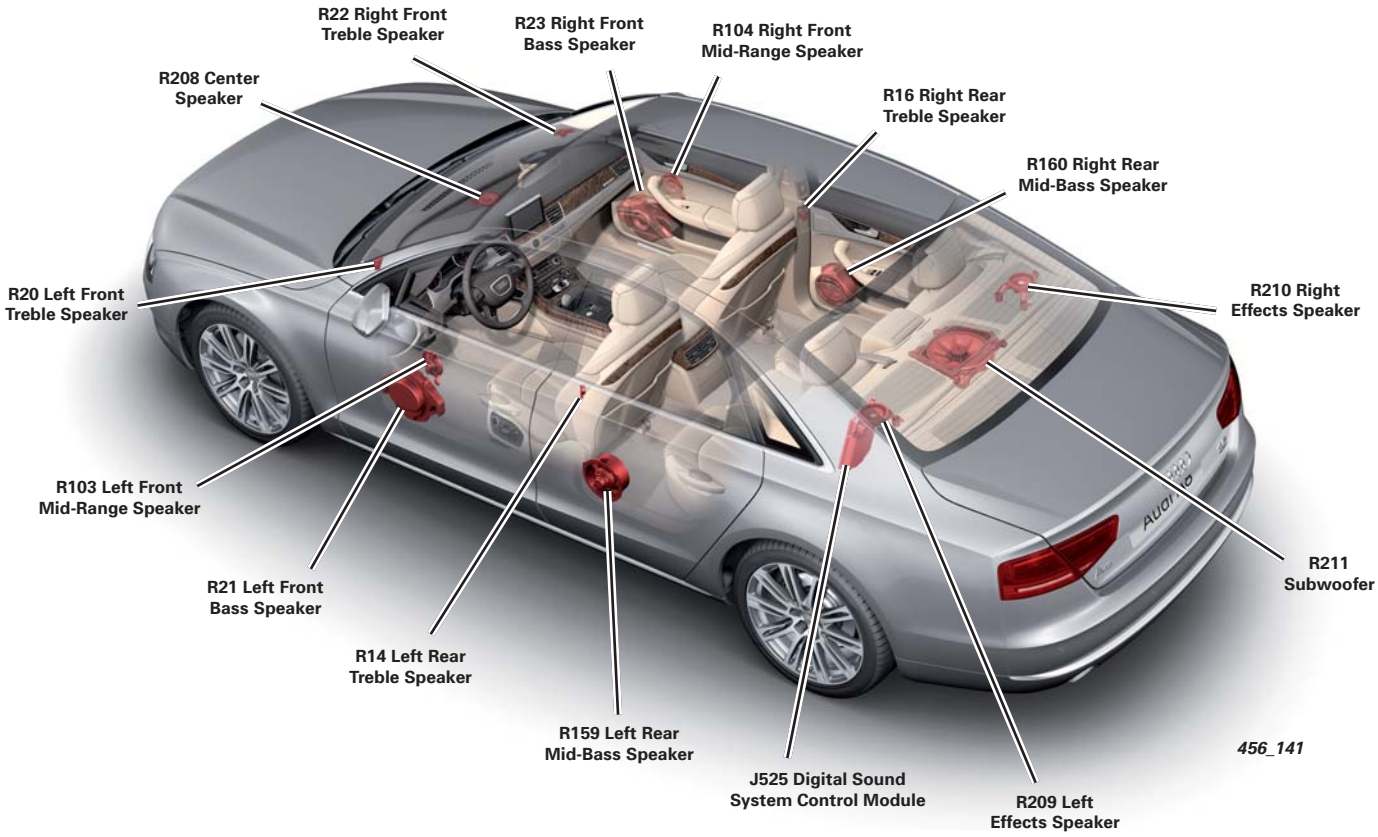
J829 is the diagnostic master for E499, Y22, and Y23, which can also be diagnosed through Address Word 7F.

Sound Systems

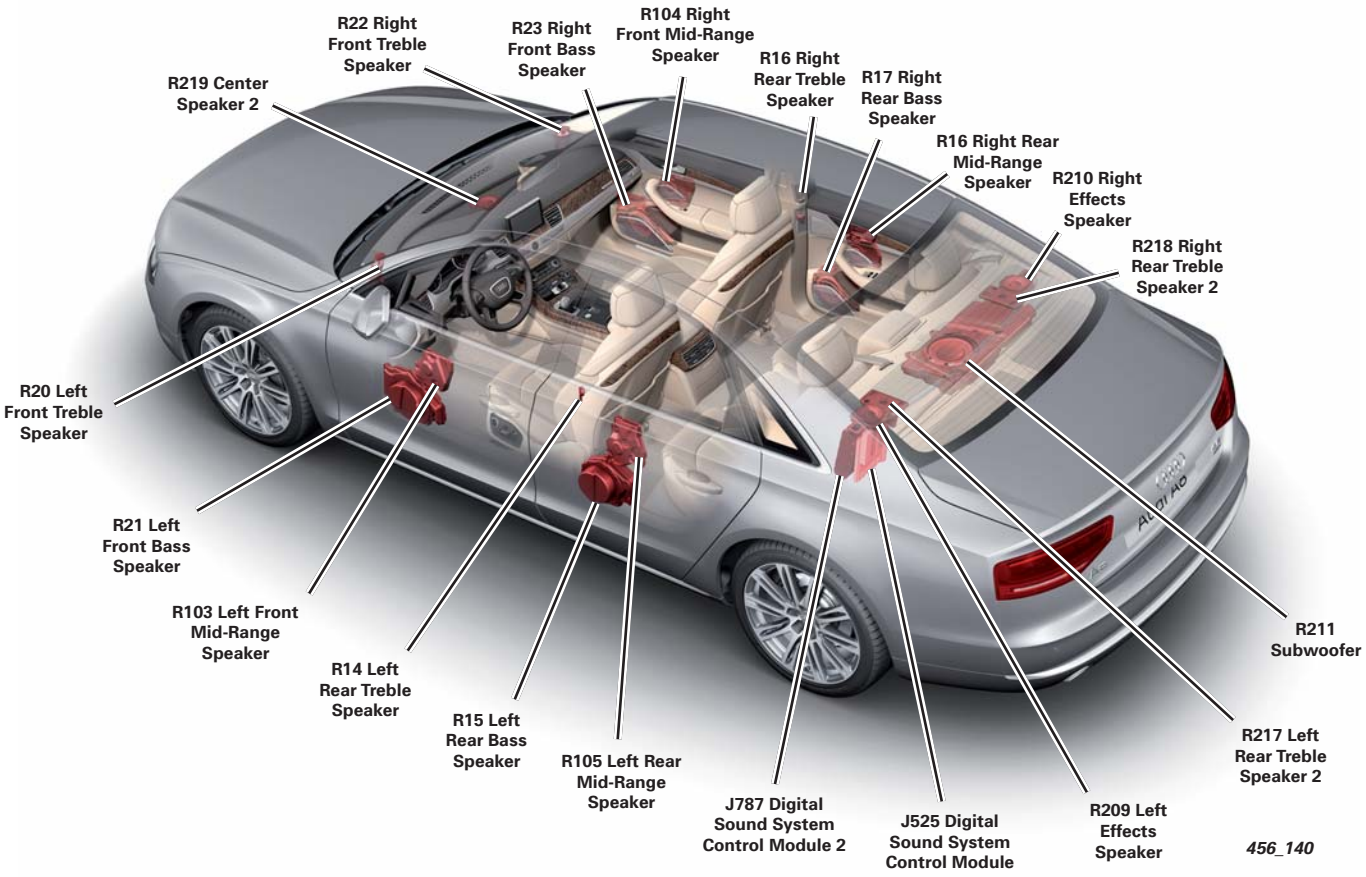
A Bose Premium sound system is standard equipment on the 2011 Audi A8. This surround sound system features a 12-channel amplifier, 14 speakers, and a total output of 630 watts.

A Bang & Olufsen Advanced Sound System is optional. This sound system features a 14-channel amplifier, a 5-channel amplifier, 19 speakers, two pop-out tweeters in the instrument panel, and a total output of more than 1400 watts.

2011 Audi A8 with Bose Premium sound system



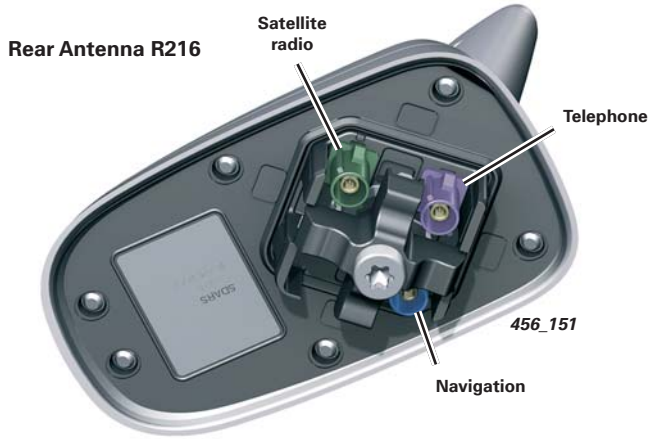
2011 Audi A8 with Bang & Olufsen Advanced Sound System

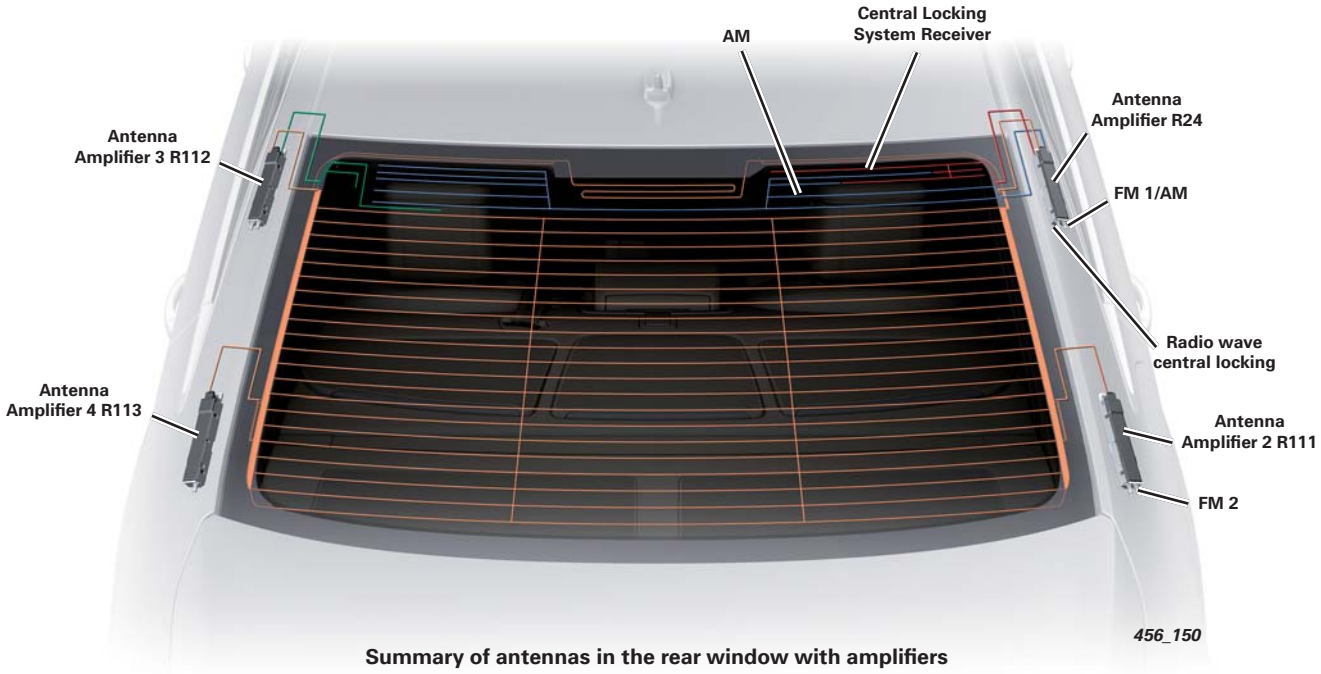


Antenna Systems

Most of the antennas in the 2011 Audi A8 are integrated into the rear window. There is an additional exterior antenna on the roof for the reception of telephone, navigation, and satellite radio (SDARS) signals.

The antenna system is equipped with multiple amplifiers that have in-car terminals adapted to the trim package, with and without tinted glass.





Summary of antennas in the rear window with amplifiers

Advanced Maintenance Display

As with other current Audi models, the 2011 Audi A8 displays maintenance reminders on the MMI. These displays cover various driving profiles, specific conditions of use, mileage driven parameters, and time-based service events.

The following service maintenance work is displayed:

- Mileage-based service events due after a multiple of 20,000 miles (30,000 km)
- Time-based service events due after the expiration of certain defined intervals, for example, the first brake fluid change is due after three years

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Maintenance Intervals Summary

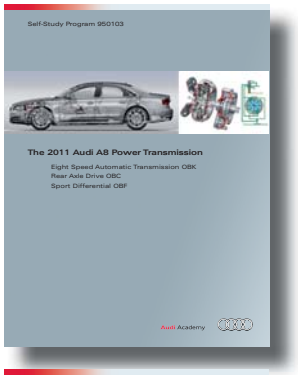
Audi A8 4.2L FSI 273 kW	
Engine oil change	First at 5,000 miles, and every 10,000 thereafter
Service – Mileage-based service events – Time-based service events	Every 20,000 mi (30,000 km) 3, 5, 7 years, etc.
Air filter	60,000 mi (90,000 km)
Spark plugs	60,000 mi (90,000 km)/6 years
Fuel filter	Lifetime
Timing gear chain	Lifetime
Brake fluid	First change due after 3 years (market dependent), subsequently every 2 years

Note
Always refer to current electronic service repair information for the latest specifications.

Self-Study Programs for the 2011 Audi A8

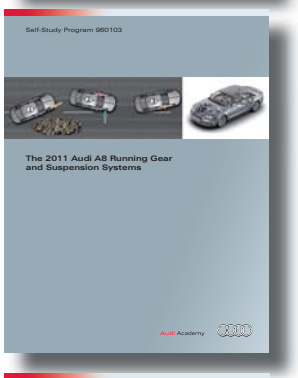
SSP 950103 The 2011 Audi A8 Power Transmission

- Eight-Speed Automatic Transmission OBK
- Shift-by-Wire Control System
- Rear Axle Drive OBC
- Sport Differential OBF



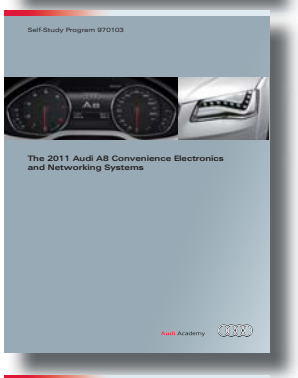
SSP 960103 The 2011 Audi A8 Running Gear and Suspension Systems

- Axle and Wheel Alignment
- Adaptive Air Suspension
- Brake System
- ESP
- Steering System
- Adaptive Cruise Control (ACC)



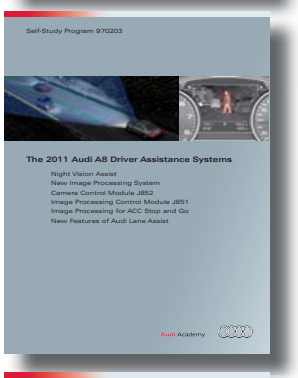
SSP 970103 The 2011 Audi A8 Convenience Electronics and Networking Systems

- Power Supply
- Network System
- FlexRay
- Exterior Lights
- Ambient Lighting



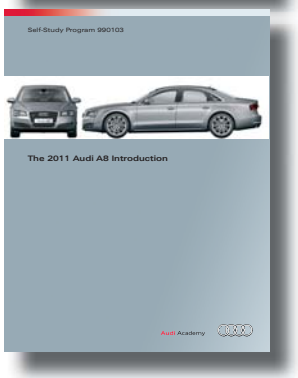
SSP 970203 The 2011 Audi A8 Driver Assistance Systems

- Night Vision Assist
- New Image Processing System
- Image Processing Functions for ACC Stop and Go
- Diagnostic Functions and System Calibration
- New Features of Audi Lane Assist



SSP 990103 The 2011 Audi A8 Introduction

- Body
- Passive and Active Safety
- Powertrain
- Audi Drive Select
- Heating, Ventilation, and Air Conditioning (HVAC)



Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this Self-Study Program.

The Knowledge Assessment is required for Certification.

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 “CRC/Certification” link
- Click on Course Catalog and select “990103 — The 2011 Audi A8 Introduction”

For assistance please call:

Audi Academy

Certification Resource Center (CRC)

1-877-283-4562

(8:00 a.m. to 8:00 p.m. EST)

Or you may send an email to:

audicrchelpdesk@touchstone-group.com

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

Audi
Truth in Engineering

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