Self-Study Program 990613

# The 2012 Audi A6 Vehicle Introduction

Audi Academy

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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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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.**

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

Reference

Note

# Introduction

The lineage of the Audi A6 sedan begins in the late 1960s with the launch of the Audi 100. The impact of the Audi 100 was revolutionary, embodying what was to become a new innovative spirit for the Audi brand.

With its classic, uncluttered design, the Audi 100 formed the cornerstone for many legendary Audi C-platform vehicles that would emerge in the 1970s, ‘80s, and ‘90s, each leaving a lasting mark and forecasting the future.

In the process, the Audi 100 became the Audi A6. Through it all, timeless and innovative Audi design cues and technology redefined automotive elegance and sportiness for each new decade.

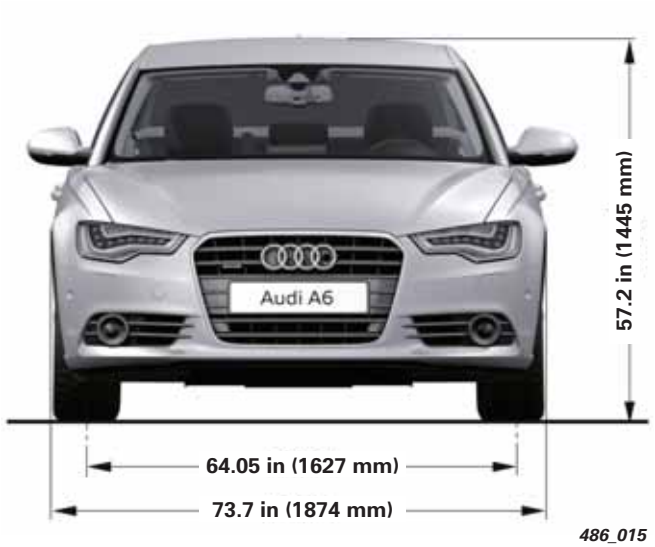
The 2012 Audi A6 continues this tradition. Its Audi internal designation is C7, being the seventh generation of the company’s C-platform. Like its predecessors, the C7 design inspires and creates enthusiasm.

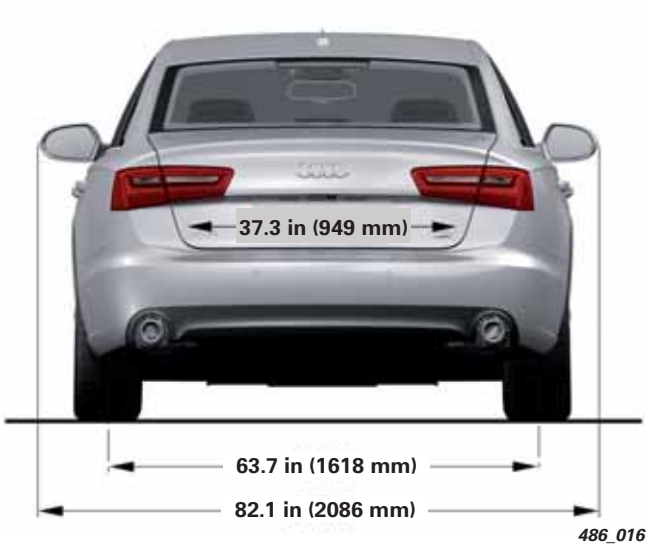
The new Audi A6 is a remarkable sedan that blends comfort and sport characteristics seamlessly. It is both a practical car and a car that excites every time you turn the wheel. Many of the A6’s technology and comfort features have only been available previously in luxury class vehicles.

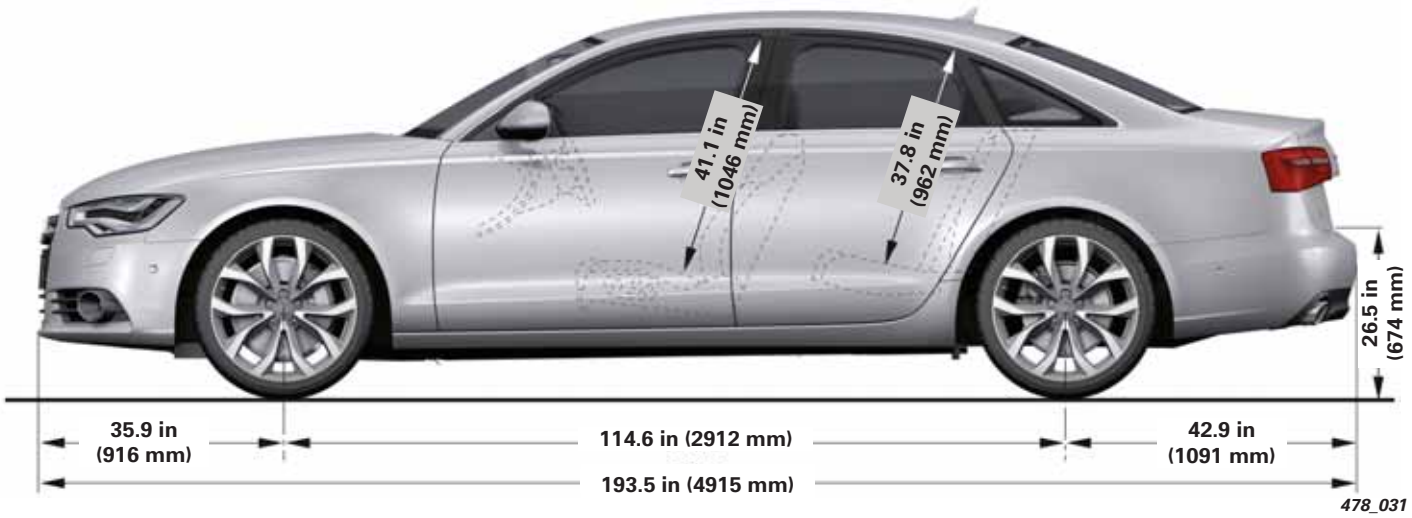
What the Audi 100 began, the new Audi A6 takes to new levels.

# Body

## Exterior Dimensions



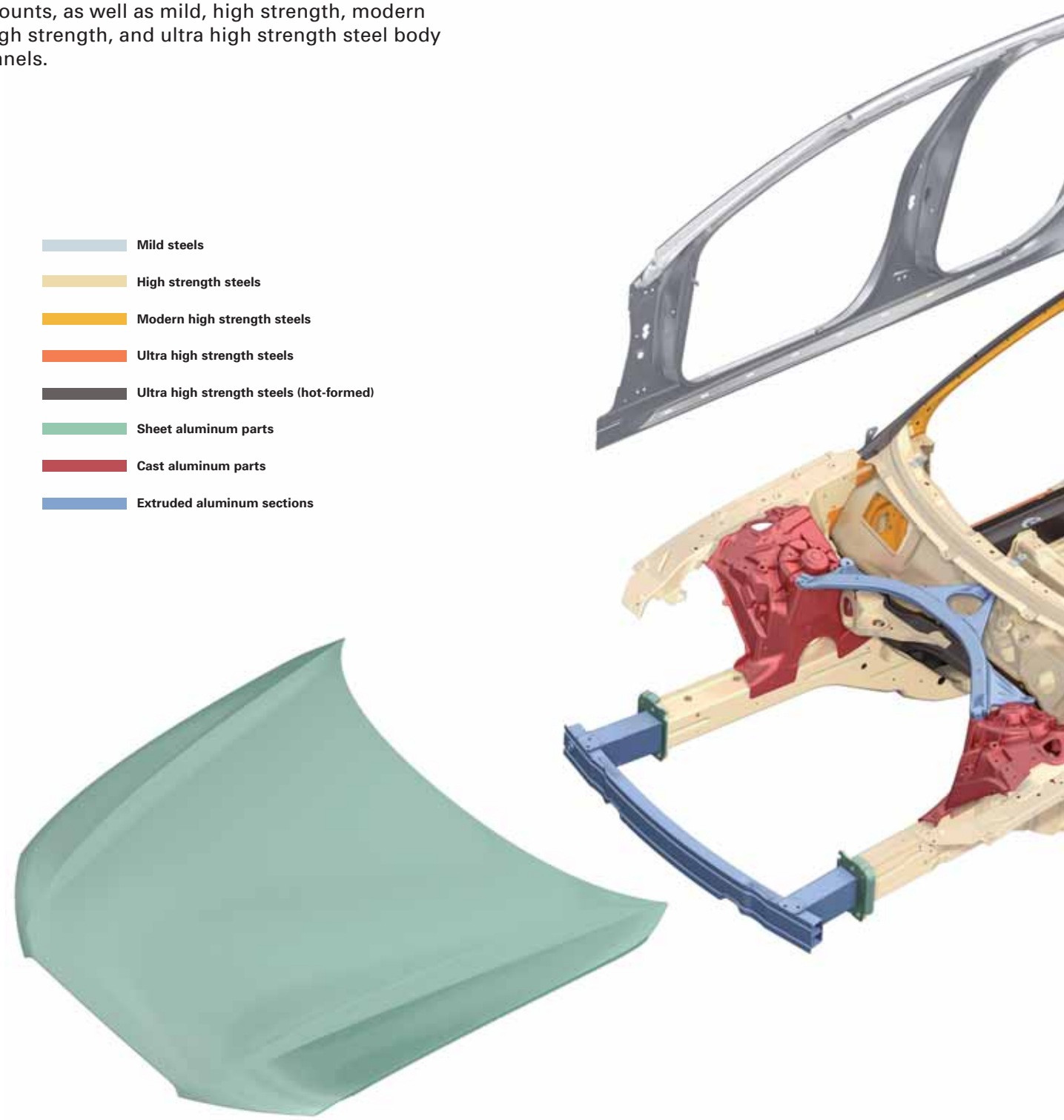



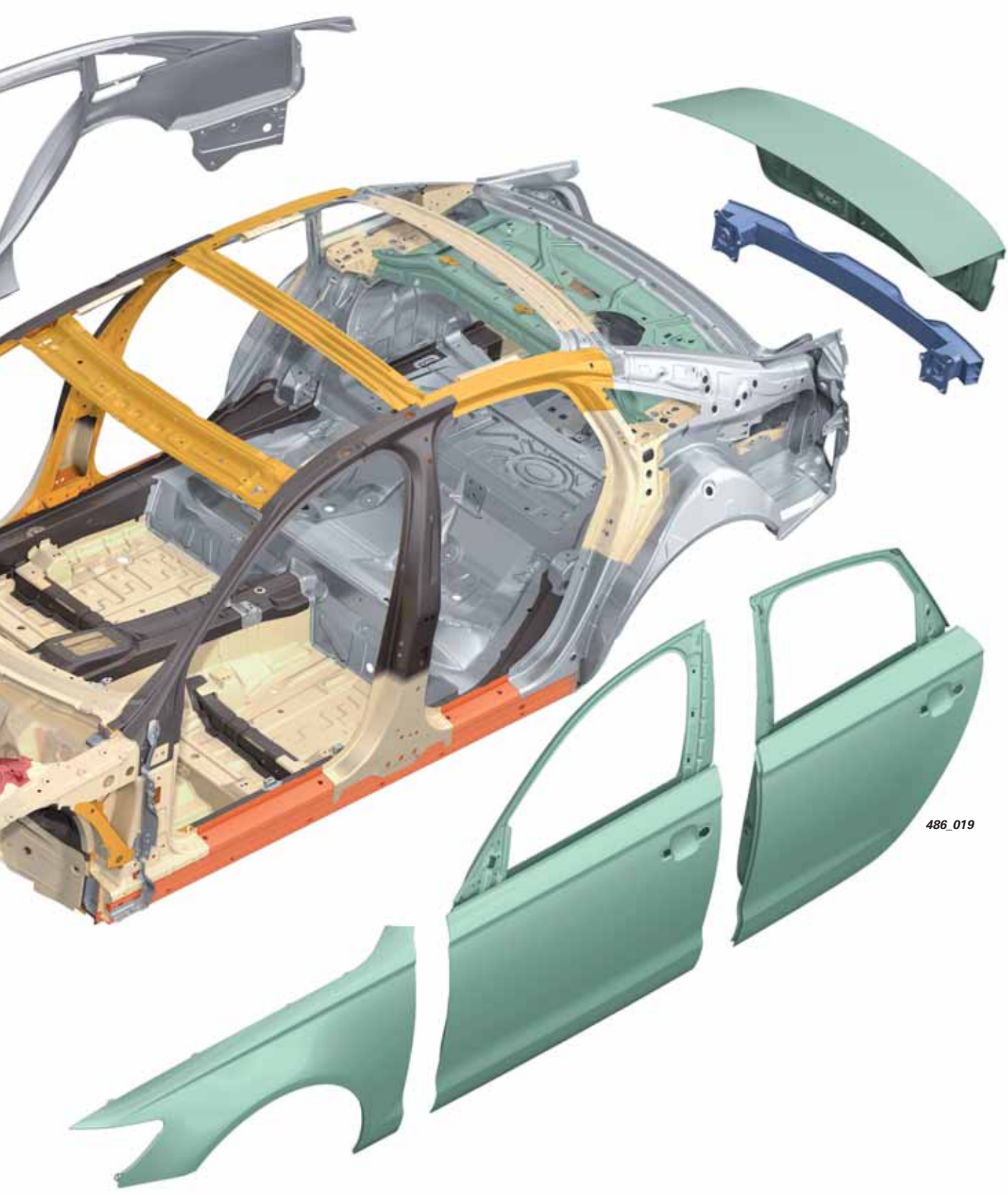




| | | | |
|---|---|---|---|
| Length | 193.5 in (4915 mm) | Front internal width | 57.4 in (1460 mm) |
| Width | 73.7 in (1874 mm) | Rear internal width | 56.2 in (1429 mm) |
| Height | 57.2 in (1455 mm) | Front headroom | 41.1 in (1046 mm) |
| Front track width | 64.05 in (1627 mm) | Rear headroom | 37.8 in (962 mm) |
| Rear track width | 63.7 in (1618 mm) | Loading width | 37.3 in (949 mm) |
| Wheelbase | 114.6 in (2912 mm) | Load sill height | 26.5 in (674 mm) |
| Curb weight | 3472.2 lb (1575 kg) | Trunk capacity | 18.7 cu ft / 35.1 cu ft (530 l / 995 l) |
| Maximum gross weight | 4750.9 lb (2155 kg) | Fuel tank capacity | 19.8 gal (75.0 l) |
| | | Drag coefficient | 0.26 |

## Overview

The body of the 2012 A6 is a hybrid, lightweight design. Aluminum components are used in addition to steel panels. The body-in-white has two aluminum cast components, the front strut mounts, as well as mild, high strength, modern high strength, and ultra high strength steel body panels.





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# Occupant Protection

## Introduction

The occupant protection system in the 2012 A6 is comparable to that of the 2012 Audi A7, with individual components adapted to the A6. A safety belt warning feature for the rear passengers is new.

**Reference**

For more information about the occupant safety system of the 2012 Audi A6, refer to Self-Study Program 920603, *The 2012 Audi A7 Occupant Protection, Infotainment, Climate Control, and Head-Up Display.*


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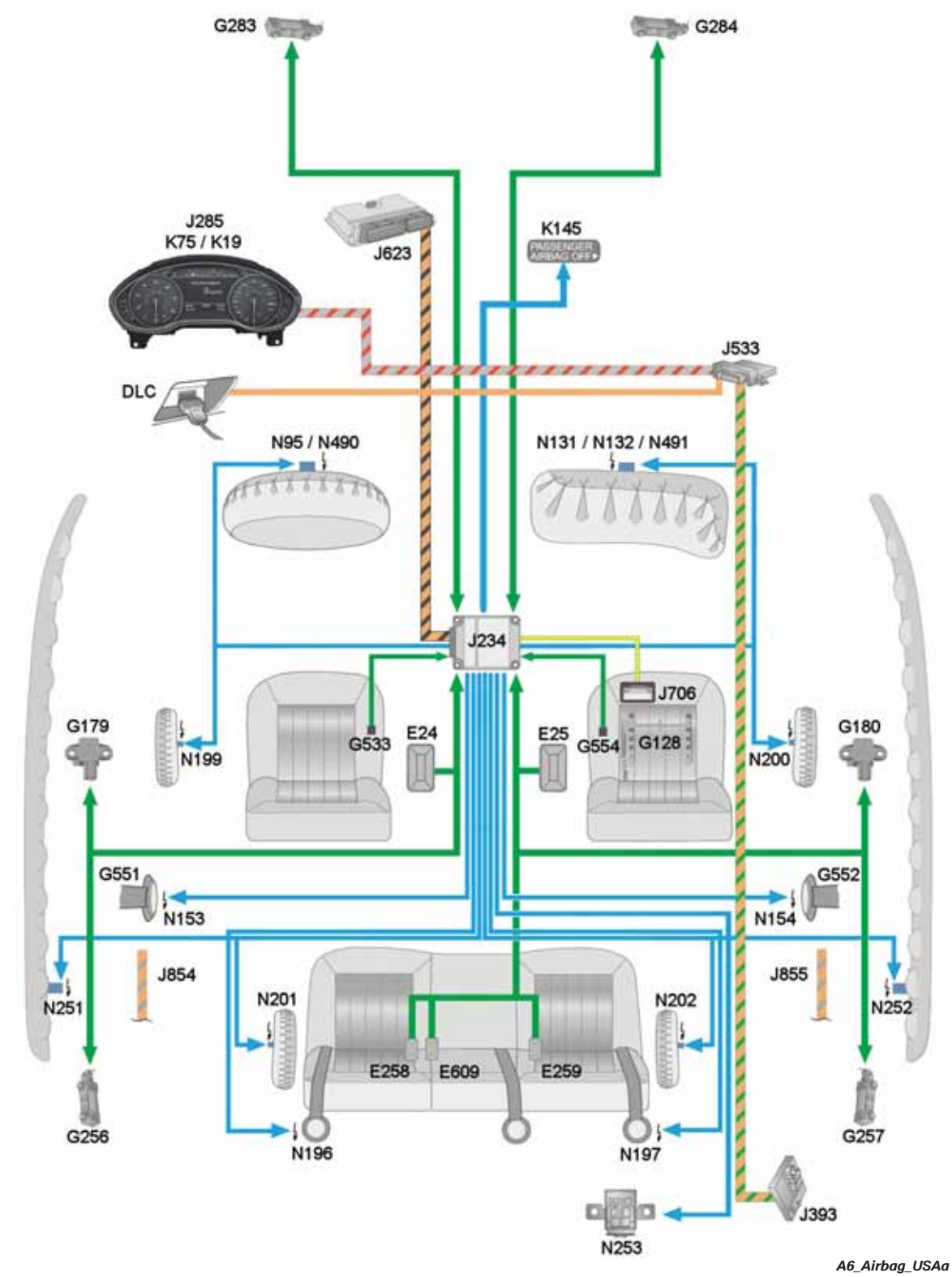
## Components

The following components are used in the 2012 A6 occupant protection system for the North American market:

- Airbag control module
- Adaptive driver and front passenger airbags
- Front side airbags
- Audi Sideguard (side curtain airbags)
- Driver and front passenger knee airbags
- Up-front airbag crash sensors
- Door-integrated pressure type sensors for side impact detection
- Acceleration-type sensors for side impact detection on the C-pillars
- Front inertia-reel safety belts with pyrotechnic and electrically reversible belt tensioners and active belt force limiters
- Battery interrupt igniter
- Safety reminder for driver and front passenger
- Safety belt switch, driver and front passenger
- Seat occupancy sensor in front passenger seat (PODS)
- Driver and front passenger seat position recognition
- Rear passenger safety belt usage warning

**Legend:**

| | |
|---|---|
| E24 | Driver's Seat Belt Switch |
| E25 | Front Passenger Seat Belt Switch |
| E258 | Driver Side Rear Seat Belt Switch |
| E259 | Front Passenger Side Rear Seat Belt Switch |
| E609 | Center Rear Seat Belt Switch |
| G128 | Front Passenger Seat Occupant Sensor |
| G179 | Driver Side Airbag Crash Sensor |
| G180 | Front Passenger Side Airbag Crash Sensor |
| G256 | Driver Side Rear Side Airbag Crash Sensor |
| G257 | Front Passenger Side Rear Side Airbag Crash Sensor |
| G283 | Driver Front Airbag Crash Sensor |
| G284 | Front Passenger Front Airbag Crash Sensor |
| G551 | Driver Belt Force Limiter |
| G552 | Front Passenger Belt Force Limiter |
| G553 | Driver Seat Position Sensor |
| G554 | Front Passenger Seat Position Sensor |
| J234 | Airbag Control Module |
| J285 | Instrument Cluster Control Module |
| 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 |
| N490 | Driver Airbag Release Valve Igniter |
| T16 | Data Link Connector |



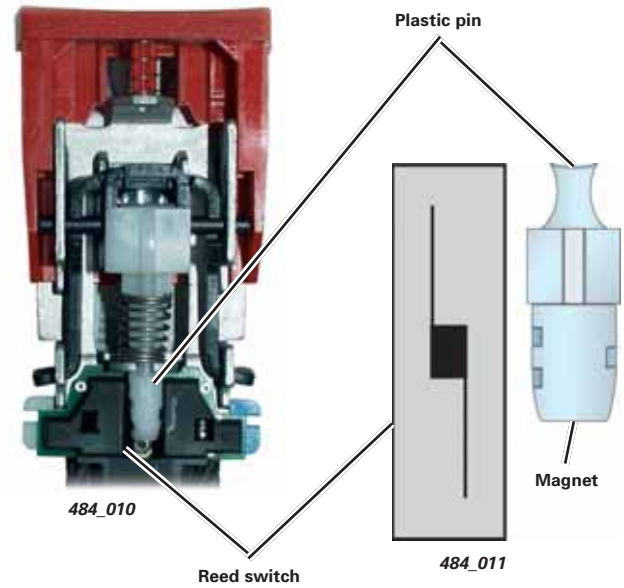

*A6_Airbag_USAa*

## Driver and Front Passenger Seat Belt Switches E24 and E25

E24 and E25 are integrated into the front safety belt buckles. These reed switches are components of the safety belt reminder system.

If the safety belt is not buckled, the reed switch is closed. In this position, a magnet built into the tip of a plastic pin acts on the reed switch.

If the safety belt is buckled, the reed switch is open. The inserted belt tongue lifts the plastic pin. The magnet no longer acts on the reed switch and it opens. Airbag Control Module J234 reads the resistance and determines if the safety belt is buckled or not.

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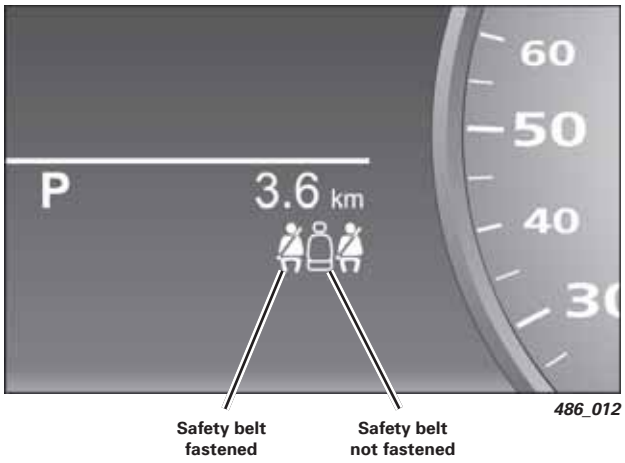
## Rear Safety Belt Reminder

After the ignition is switched ON, a status display for the rear safety belts (fastened/not fastened) appears for approximately 31 seconds in the Driver Information System of the instrument cluster.

At each change in status, a new display appears for approximately 31 seconds. If a rear-seat passenger unfastens the safety belt while the vehicle is moving at a speed above 15.5 mph (25 km/h), an acoustic warning sounds once and the corresponding indicator in the display begins flashing for approximately 31 seconds.

Airbag Control Module J234 receives the information whether the safety belts are fastened through the rear safety belt switches (E258, E259, E609.)

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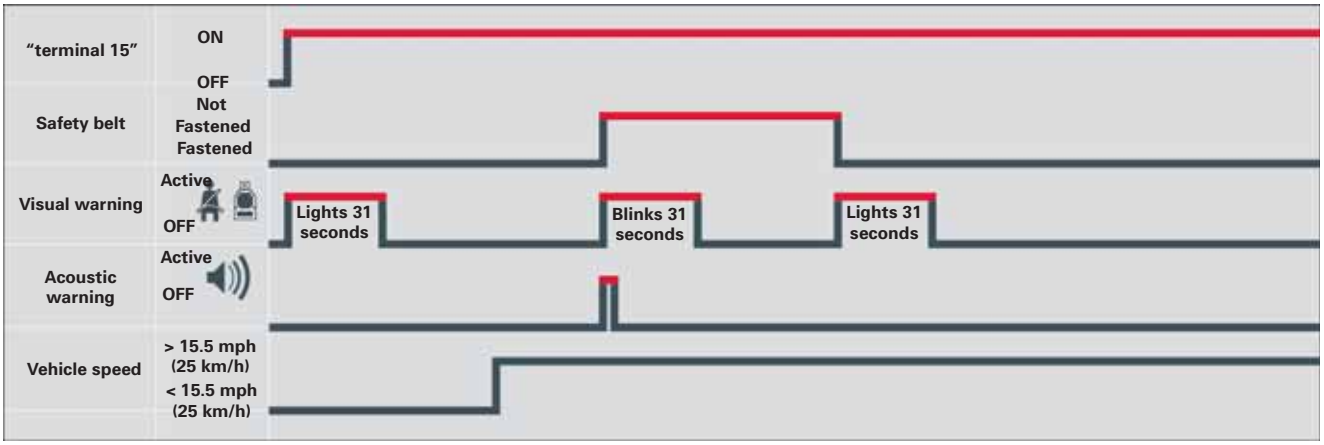
**Rear safety belt not fastened warning**

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# 3.0L V6 TFSI Engine

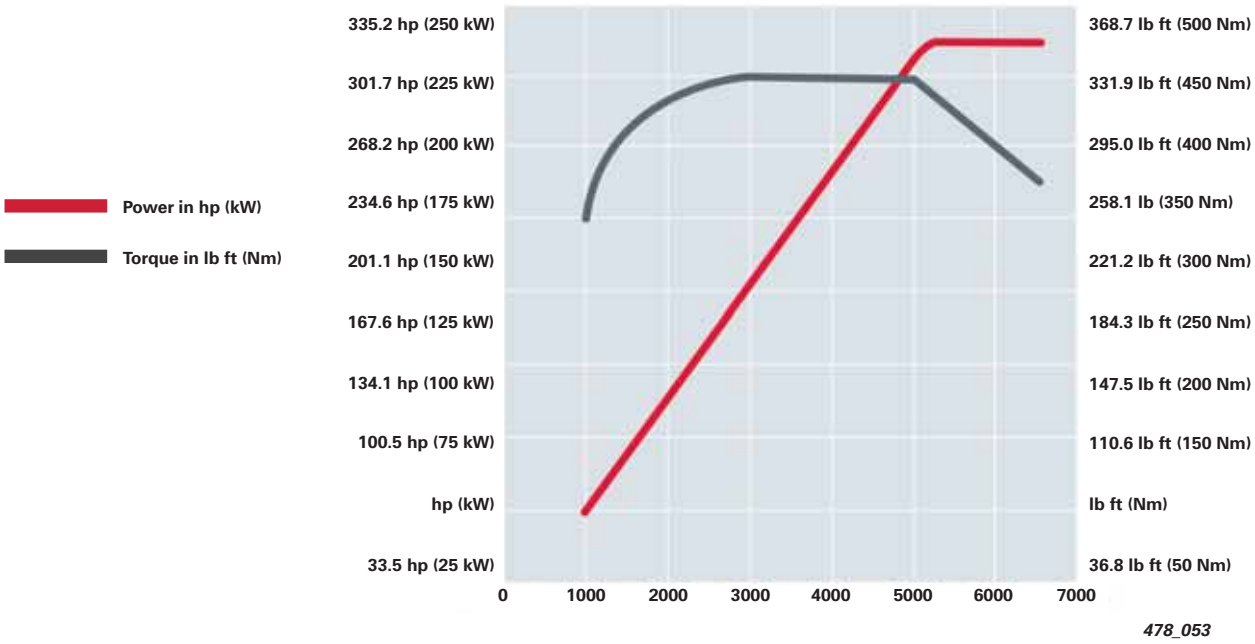
## Technical Features

Adapted belt drive
(without power steering pump)


| Modifications to the 3.0L V6 TFSI Engine for the 2012 A6 | |
|---|---|
| Cylinder block | – New Innovative Thermal Management System (ITM) |
| Cylinders | – Honed to a textured finish to reduce oil consumption and wear<br>– Increased piston installation clearance<br>– Reduced pre-stress on the third piston ring land |
| Main bearing inserts | – Bearing surfaces coated with an additional wear-resistant layer designed to withstand composite friction |
| Chain drive | – Chain tensioners reconfigured and adapted for reduced oil flow |
| Camshafts | – Weight of intake valve camshafts reduced<br>– Cam contour revised<br>– Weight of exhaust valve camshafts reduced<br>– All camshafts are now composite construction |
| Camshaft adjusters | – Enhancements reduce leakage, resulting in reduced oil circuit pressure |
| Valve gear | – Reduced spring forces |
| Oil pump | – Smaller, consumes less power, and generates less friction |
| Spark plugs | – Heat ratings adapted for optimized combustion |

**Reference**
For further information about the design and operation of the 3.0L V6 TFSI engine, refer to Self-Study Program 925803, *The Audi 3.0L V6 TFSI Engine with Roots Blower.*

## Specifications




| Engine Code | CGWB |
|---|---|
| Engine type | Six cylinder V engine with 90° included angle |
| Displacement | 182.7 cu in (2995 cc) |
| Maximum power | 310 hp (220 kW) @ 5500–6500 rpm |
| Maximum torque | 325 lb ft (440 Nm) @ 2900–4500 rpm |
| Valves per cylinder | 4 |
| Bore | 3.32 in (84.5 mm) |
| Stroke | 3.50 in (89.0 mm) |
| Compression ratio | 10.5 : 1 |
| Powertrain | quattro |
| Engine management | Simos 8 |
| Fuel grade | 91 AKI |
| Exhaust emission standard | ULEV 2 |

## Innovative Thermal Management

Innovative Thermal Management (ITM) for the 3.0L V6 TFSI engine is similar to the system designed for the 2011 Audi A8 4.2L V8 TFSI. It 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).

The engine 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 evaluated at all times.

The climate control 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. ITM components are activated accordingly.

During phase one of operation, the engine coolant does not circulate. This results in the stationary coolant temperature increasing faster than if it was circulated, thus reducing frictional losses in the engine.

After the non-circulation phase, engine coolant is used to rapidly heat the ATF via a heat exchanger. The coolant is directed by an electrical control valve actuated by the Transmission Control Module.

A mixing phase is cycled by the ECM to ensure that hot engine coolant is not circulated immediately, which would impair the frictional properties of the engine.

### Passenger Compartment Heating

The stationary coolant phase normally takes approximately 120 seconds. However, there are 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.

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

### Transmission Heating/Cooling

The ATF is heated and cooled as needed, and is only cooled to the temperature level of the engine coolant.

| ITM System Technical Summary |
| --- |
| – Active coolant pump |
| Two sensors:<br>– Engine Temperature Control Temperature Sensor G694<br>– Coolant Temperature Sensor G62 |
| – ATF heating/cooling |
| – Heating cut off |
| – Thermostat opens at 188.6°F (87°C) |

**Reference**

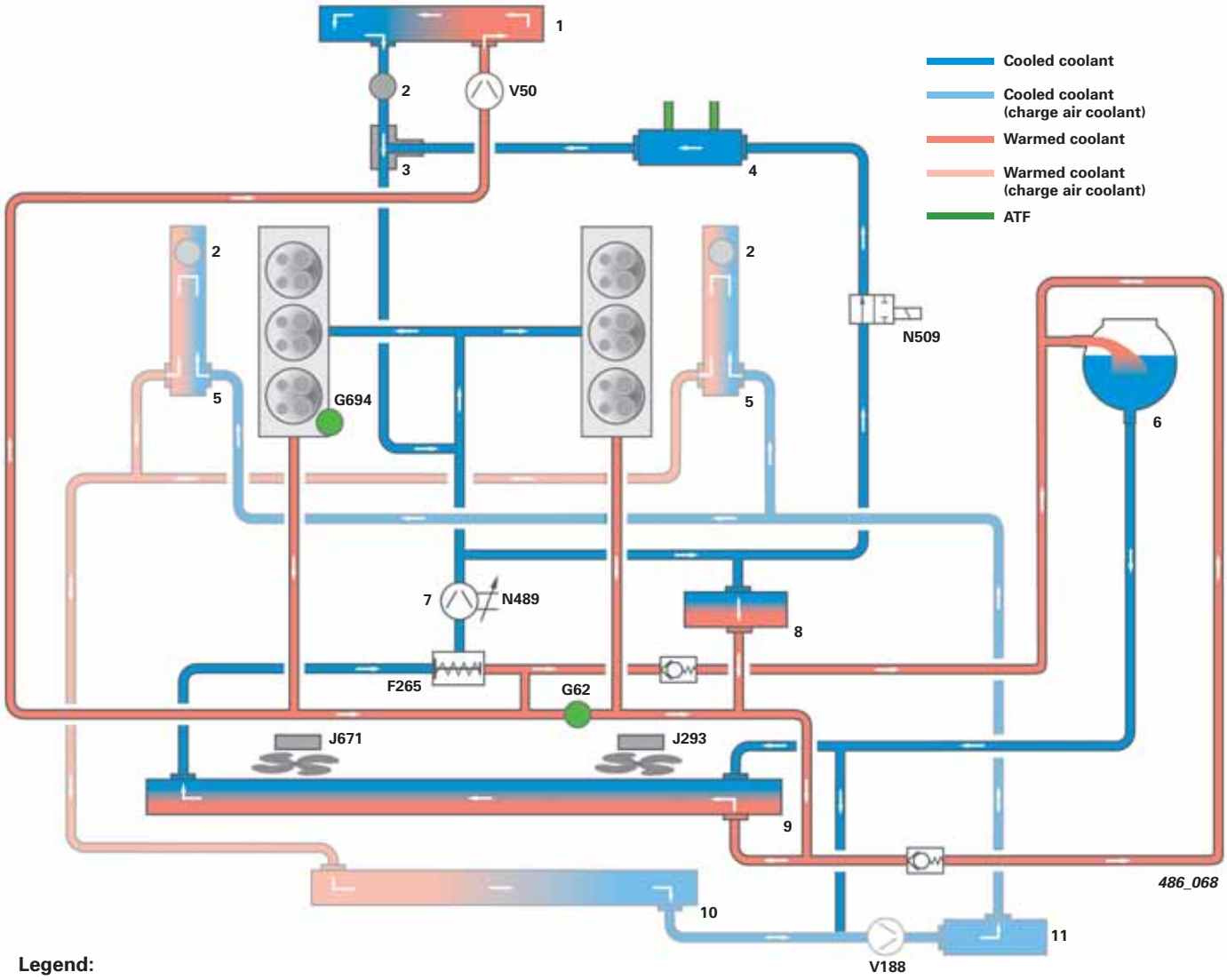
For more information about the Innovative Thermal Management system of the 3.0L V6 TFSI engine, refer to Self-Study Program 990203, *The 2012 Audi A7 Introduction.*

# ATF Heating / Cooling

## Overview

The software for the Innovative Thermal Management (ITM) system is located in the Engine Control Module. It receives information about ATF temperature from Transmission Control Module J217.

ITM controls heating and cooling of the ATF. The ECM gives the TCM the command to open or close the Transmission Fluid Cooling Valve N509.




**Legend:**

| | |
|---|---|
| G62 | Engine Coolant Temperature Sensor |
| G694 | Engine Temperature Control Temperature Sensor |
| J293 | Coolant Fan Control Module[1] |
| J671 | Coolant Fan Control Module 2[1] |
| N489 | Cylinder Head Coolant Valve[1,4] |
| N509 | Transmission Fluid Coolant Valve[2] |
| V50 | Coolant Recirculation Pump[3] |
| V188 | Charge Air Cooling Pump[1] |

[1] Controlled to ECM J623
[2] Controlled by TCM J217
[3] Controlled by Climatronic Control Module J255
[4] Switches the engine coolant pump

| | |
|---|---|
| 1 | Heat exchange (passenger compartment) |
| 2 | Bleeders |
| 3 | Quick connector (black) |
| 4 | ATF heat exchanger |
| 5 | Charge air intercooler |
| 6 | Engine coolant expansion bottle |
| 7 | Active engine coolant pump |
| 8 | Engine oil cooler |
| 9 | Radiator |
| 10 | Low temperature cooler for coolant |
| 11 | Low temperature auxiliary cooler for engine coolant |

## Operation

### 1. Start Phase

When the engine is started cold, ECM J623 commands Transmission Control Valve J217 to close Transmission Fluid Cooling Valve N509. Coolant circulation for the ATF heat exchanger is interrupted. Initially, the variable coolant pump is inactive. Outside temperature, engine temperature, engine speed (rpm), and the heat requirements of Climatronic are criteria for switching to active. The ITM system decides when the coolant pump is switched to active through valve N509.

### 2. Heating the ATF

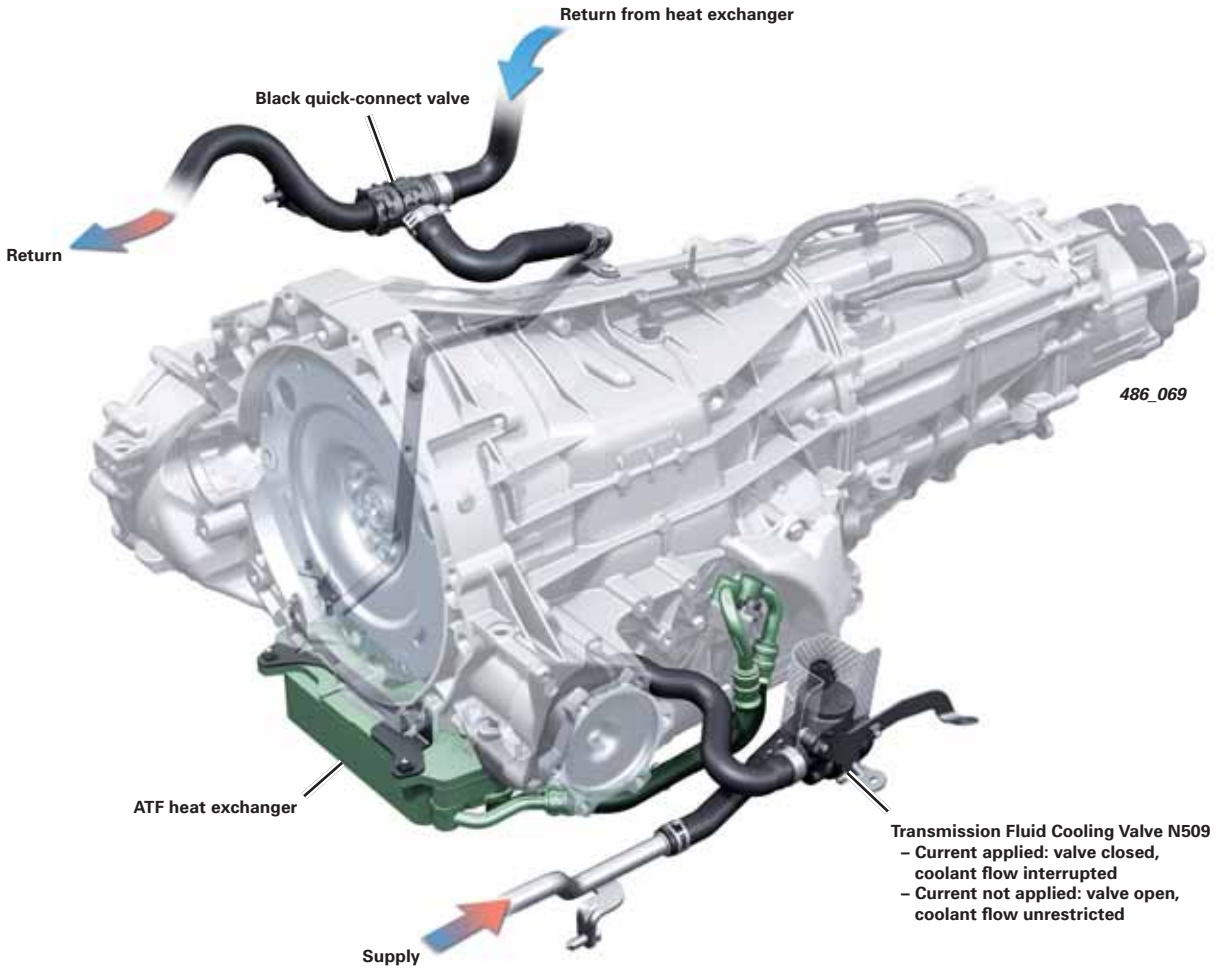
When the coolant pump is switched to active, ITM compares the engine temperature measured Engine Temperature Control Temperature Sensor G694 with the ATF temperature. As soon as ATF temperature is 9°F (5°C) lower than the rising engine temperature, the ECM commands the TCM to open N509. Circulation for the ATF heat exchanger is opened. The ATF is heated.

### 3. Normal Operation

When the TCM reports an ATF temperature of approximately 183.2°F (84°C) to the ECM, the ECM commands the TCM to close N509 again, interrupting coolant circulation for the ATF heat exchanger. The ATF has reached the desired operating temperature and is neither heated nor cooled. This continues up to an ATF temperature of about 221°F (105°C).

### 4. Cooling the ATF

If ATF temperature exceeds 221°F (105°C), the ECM commands the TCM to open N509, which opens circulation for the ATF heat exchanger. The ATF is cooled by the 185°F (85°C) engine coolant. Once ATF temperature has reached about 194°F (90°C), conditions for normal operation are met again. The ECM issues the command to the TCM to close N509 again.



# 2.0L TFSI Engine

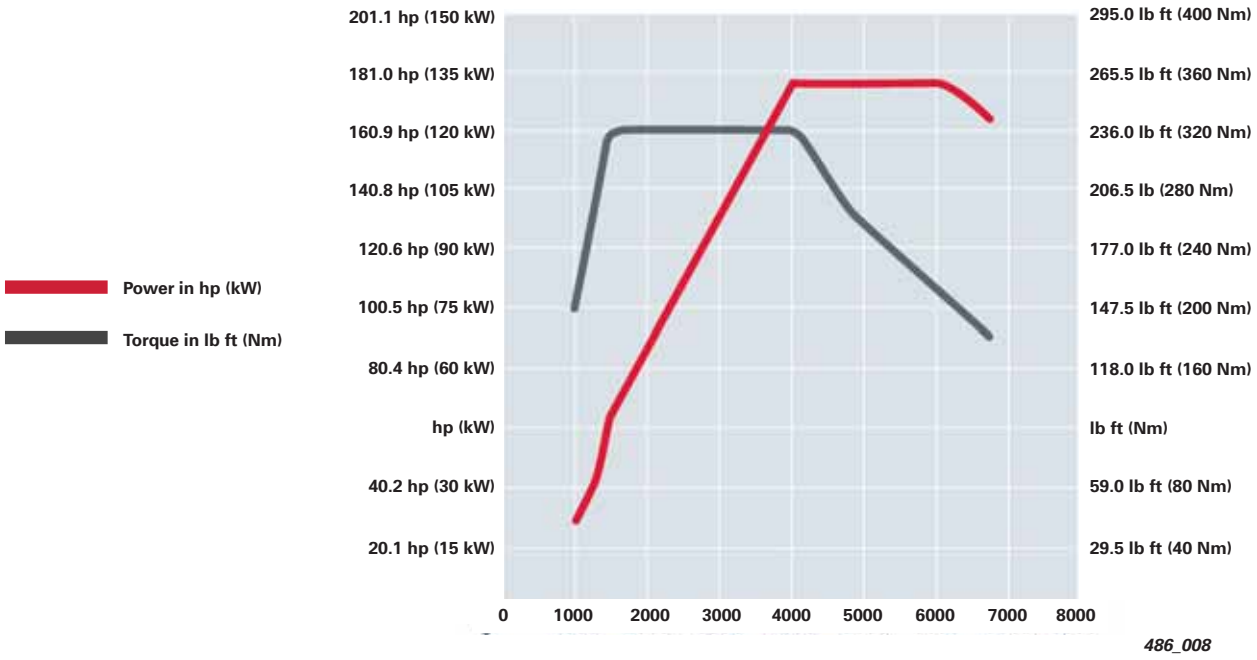
## Technical Features

- Exhaust gas turbocharging
- Four-valve cylinder head with a camshaft adjuster on the intake side and Audi valvelift system on the exhaust side
- Modified belt drive (no power steering pump)
- Chain-driven camshafts
- Dual path intake manifold
- Flow controlled oil pump
- Improved high pressure fuel injectors


**Reference**

For additional information about the design and construction of this engine, refer to Self-Study Program 921703, *The 2.0L Chain-Driven TFSI Engine.*

## Specifications



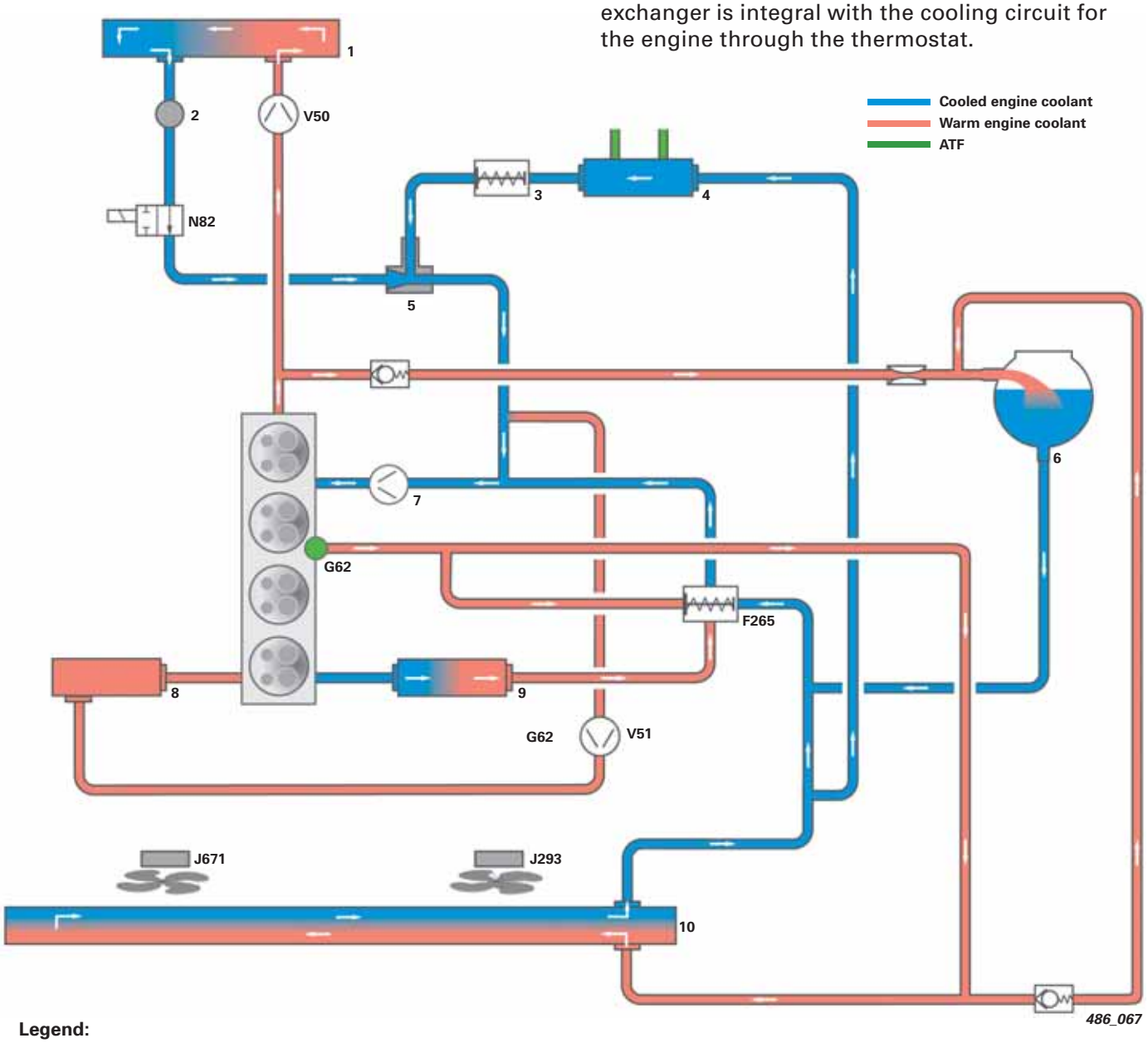

| Engine Code | CDNB |
|---|---|
| Engine type | Four cylinder inline engine |
| Displacement | 121.0 cu in (1984 cc) |
| Maximum power | 211 hp (157 kW) @ 4000–6000 rpm |
| Maximum torque | 250 lb ft (339 Nm) @ 1500–3900 rpm |
| Valves per cylinder | 4 |
| Bore | 3.24 in (82.5 mm) |
| Stroke | 3.65 in (92.8 mm) |
| Compression ratio | 9.6 : 1 |
| Powertrain | Multitronic |
| Engine management | Bosch MED 17.1 |
| Fuel grade | 91 AKI |

# ATF Cooling

## Overview

On vehicles with the 2.0-liter inline 4-cylinder engine, there is no ATF heating.

Above an engine coolant temperature of about 176°F (80°C), the cooling circuit for the ATF heat exchanger is integral with the cooling circuit for the engine through the thermostat.




**Legend:**

| | |
|---|---|
| G62 | Engine Coolant Temperature Sensor |
| F265 | Map Controlled Engine Cooling Thermostat[1] (opening begins at approximately 203°F [95°C]) |
| J293 | Coolant Fan Control Module[1] |
| J671 | Coolant Fan Control Module 2[1] |
| N82 | Coolant Shut-Off Valve[2] |
| V50 | Coolant Recirculation Pump[2] |
| V51 | After-Run Coolant Pump[1] |

[1] Controlled to ECM J623
[2] Controlled by Climatronic Control Module J255

| | |
|---|---|
| 1 | Heat exchange (passenger compartment) |
| 2 | Bleeder |
| 3 | ATF engine coolant regulator (opening begins at approximately 176°F [80°C] |
| 4 | ATF heat exchanger |
| 5 | Quick connector with restrictor, gray |
| 6 | Coolant expansion bottle |
| 7 | Water pump |
| 8 | Turbocharger |
| 9 | Engine oil cooler |
| 10 | Radiator |

## Quick Connector with Restrictor

The quick connect with restrictor (gray) is used in vehicles with the 2.0L, 4-cylinder TFSI engine. A quick connect without restrictor (black) is used on vehicles with the 3.0L V6 TFSI engine.

If the quick connect without restrictor (black) is installed in vehicles with the 2.0L TFSI engine instead of the specified quick connect with restrictor (gray), the cooling performance of the ATF heat exchanger will be reduced. This can cause elevated ATF temperatures.

## ATF Thermostat

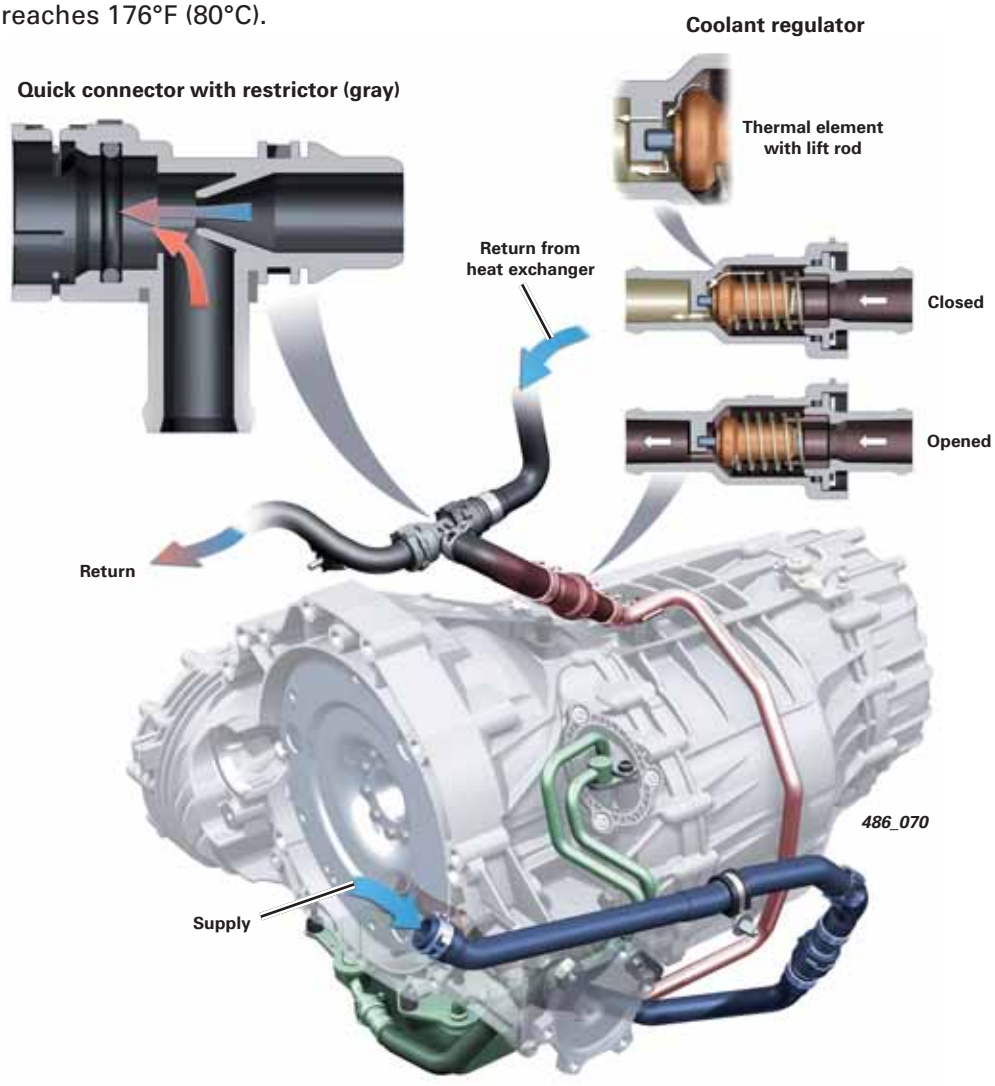
An ATF coolant regulator is installed in the coolant return of the ATF heat exchanger. A groove in the valve seat allows a very small permanent flow of engine coolant. If coolant temperature rises, the wax in the thermal element is heated and expands. As a result, it opens the valve seat through the lift rod and coolant circulation is enabled when the coolant temperature reaches 176°F (80°C).

### Direction of Flow

When installing the ATF coolant regulator, strict attention must be paid to the direction of flow, which is identified by an arrow on the regulator housing.

In the event of incorrect installation, regulation is undesirably affected and ATF cooling is obstructed. If the groove in the valve seat is contaminated, the very small permanent flow of coolant is interrupted, and the thermal element is not properly heated. The valve seat remains closed and the ATF is not cooled.

If there is excessive ATF temperature, then coolant and fluid circulation to the ATF heat exchanger, as well as the coolant regulator, must be checked.

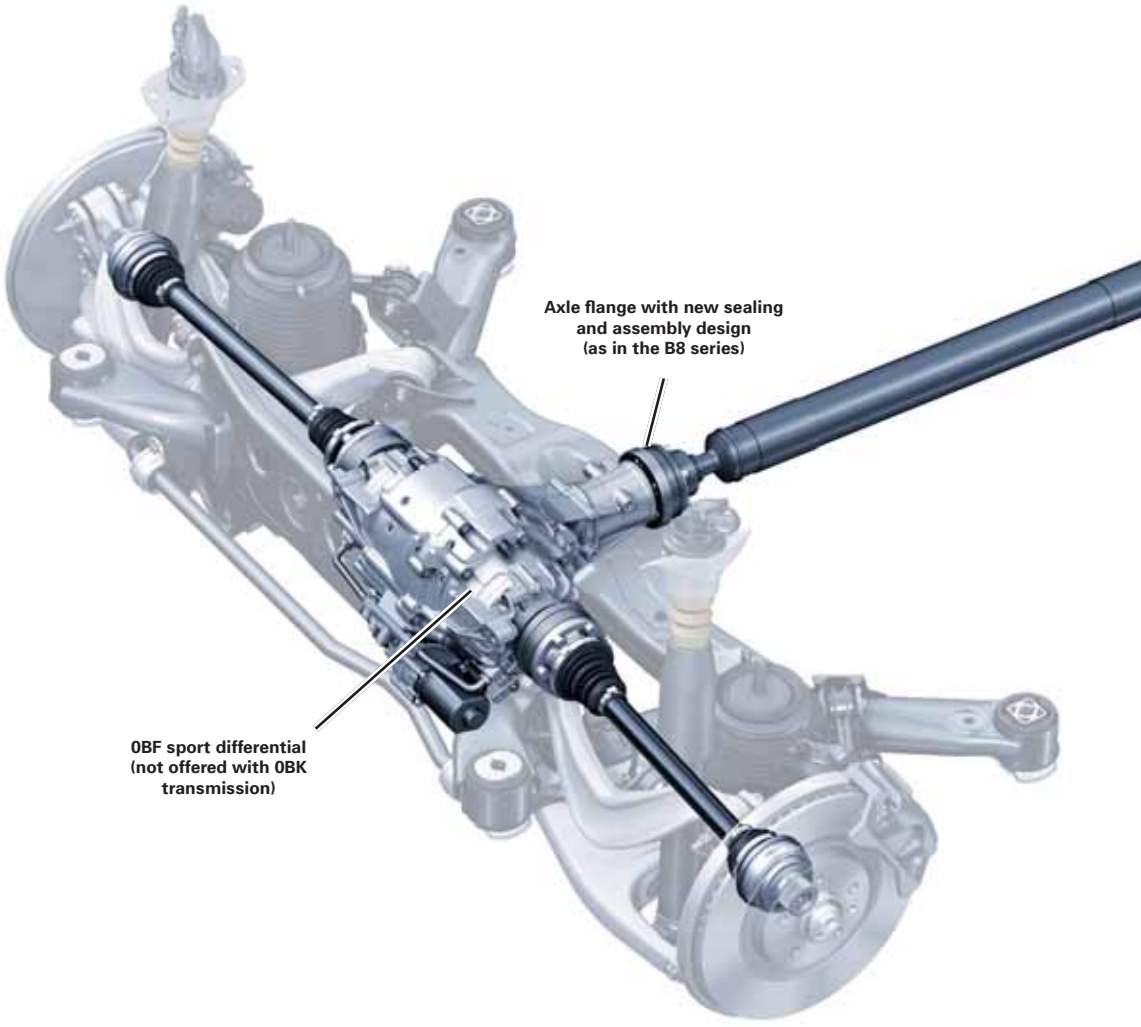


# Power Transmission

## Overview

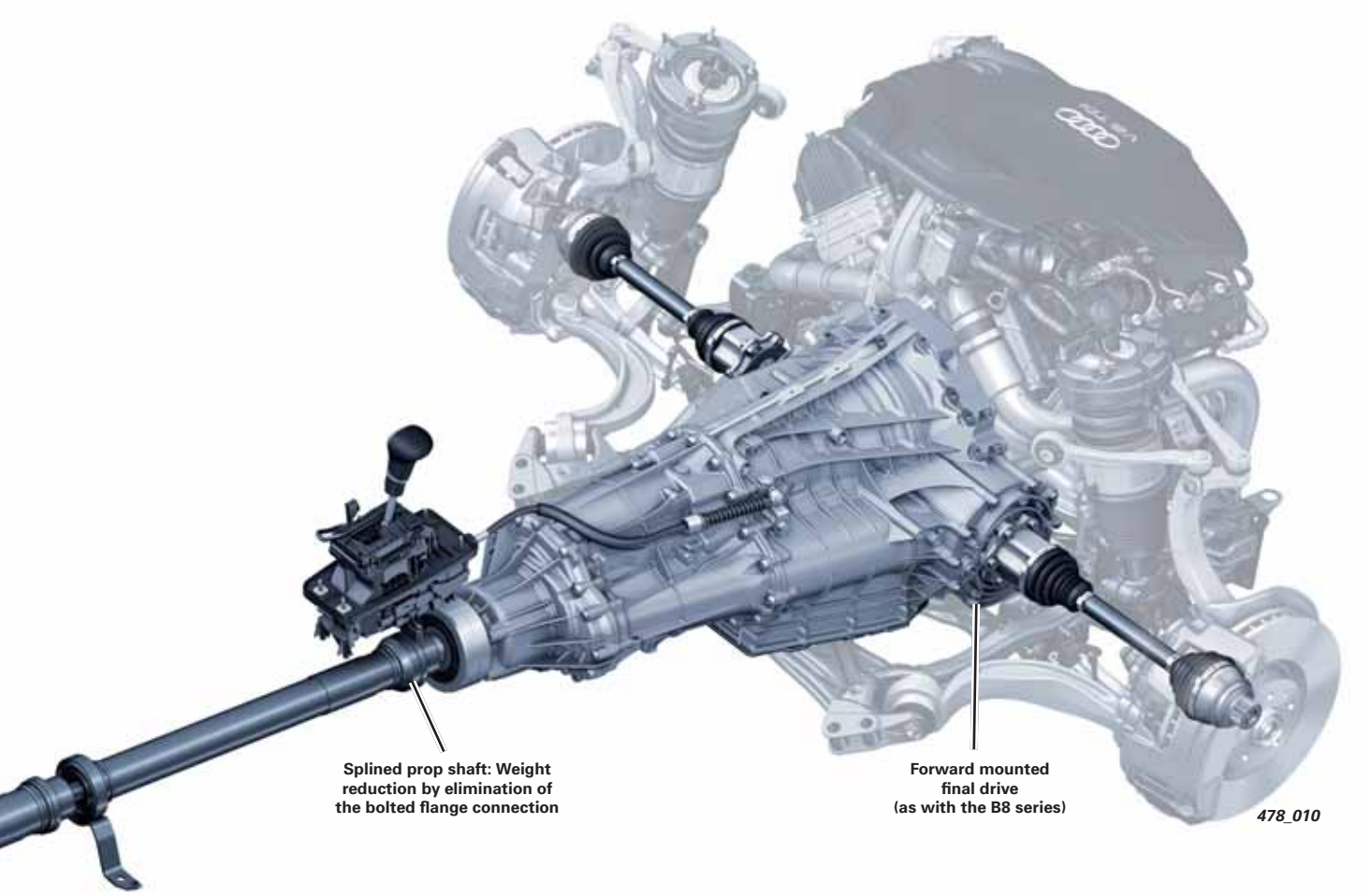
The 2012 A6 is introduced with the 8-speed 0BK automatic transmission. This transmission was designed specifically for the North American market.

It is the same transmission used in the 2011 A8 but does not feature the “shift-by-wire” control system. Instead, it uses a cable operated mechanical selector.




**Reference**

For more details about the mechanical operation of the 0BK transmission, refer to Self-Study Program 950103, *The 2011 Audi A8 Power Transmission.*

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**Multitronic 0AW**

– **Step-less transmission for future front-wheel drive models with engines rated up to 295 lb ft (400 Nm)**

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**0B5 S tronic 7-speed transmission**

– **7-speed dual clutch transmission for future use on quattro models**

# Suspension System

## Overview

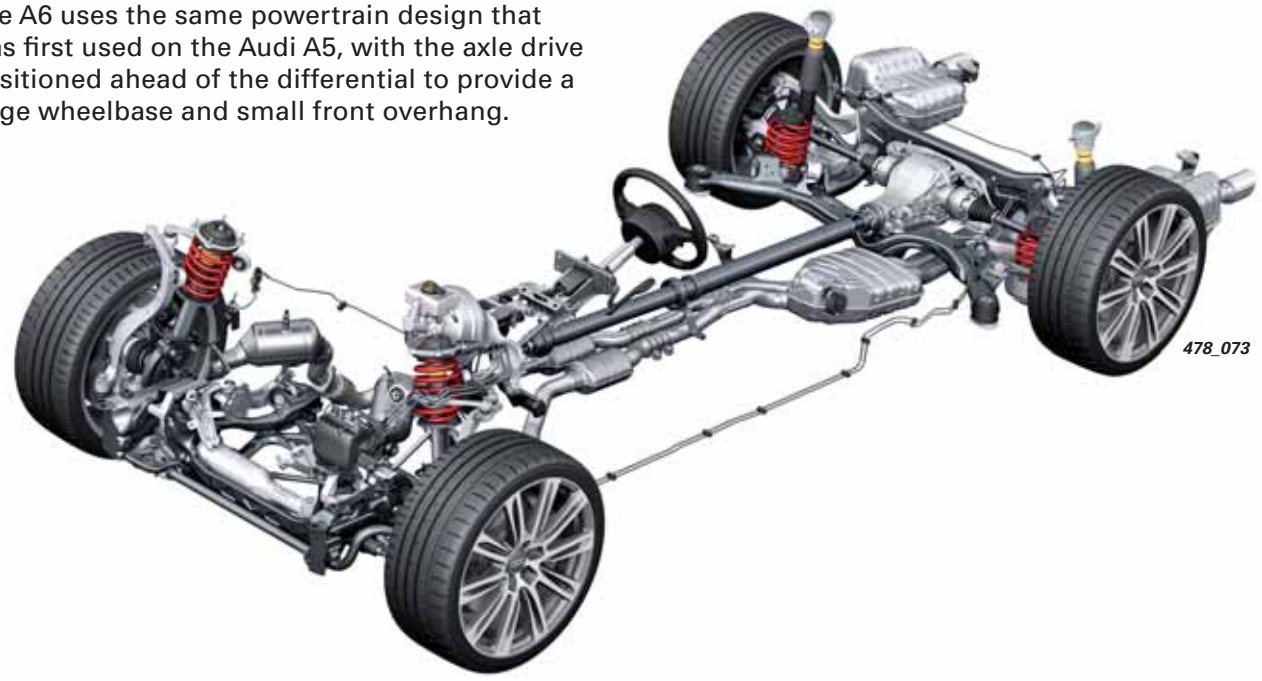
One of the key development goals for the A6 was to provide outstanding agility, driveability and driving enjoyment while also offering a high standard of safety and comfort. This was made possible by adopting the proven design of Audi's five-link front suspension combined with a self-tracking trapezoidal-link rear axle.

A steel-sprung suspension with conventional shock absorbers is standard.

The A6 uses the same powertrain design that was first used on the Audi A5, with the axle drive positioned ahead of the differential to provide a large wheelbase and small front overhang.

Mounting the steering gear on the subframe in front of the front axle provides the necessary, exact steering response and a precise steering feel in every driving situation.

Electro-mechanical steering provides improved fuel economy in addition to allowing more functional options related to handling and control.




| Production Control Number (PR) | Description | Technical Implementation | Offer |
|---|---|---|---|
| 1BA | Standard running gear /suspension | Steel suspension | Series standard |
| 1BE | Sports running gear /suspension | Steel suspension | Option |
| 1BV | Sports running gear /suspension<br>S line (offered from quattro GmbH) | Steel suspension | Option |
| 1BK | Adaptive air suspension<br>(not available at launch) | Air suspension | Option |

**Reference**

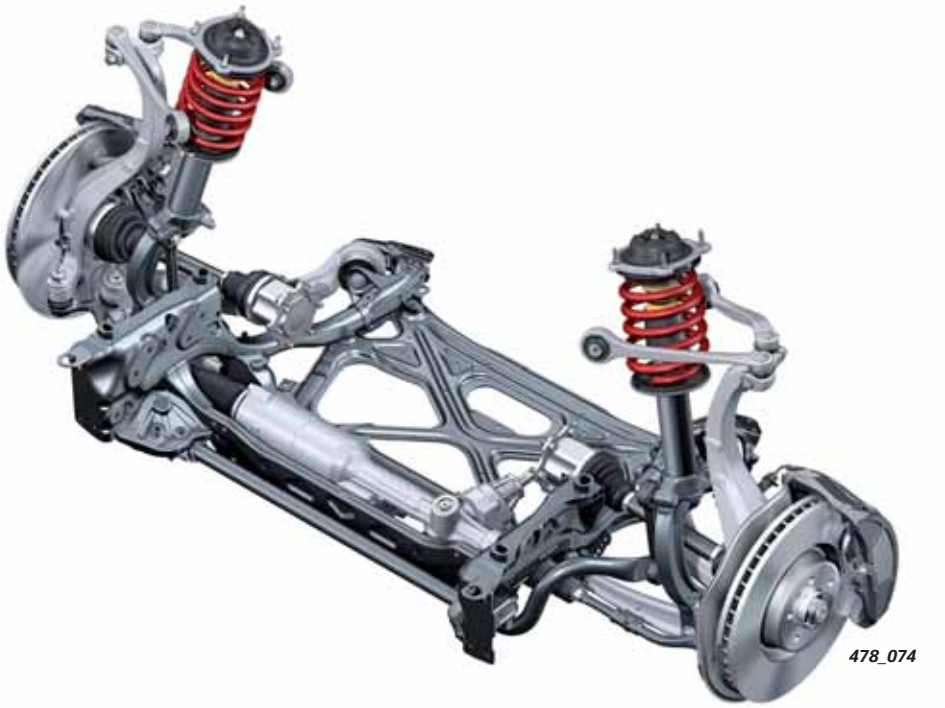
For further information about the suspension system of the 2012 A6, refer to Self-Study Program 990303, *The 2012 Audi A7 Running Gear and Suspension.*

# Axles

## Front Axle

The A6 uses the five-link front suspension of the 2011 A8 as a starting point. The bearing pedestal that supports the upper wishbone has been integrated into the body shell.

In addition to saving weight and increasing rigidity, this also reduces the fitting tolerances of the upper wishbones. Anti-roll bars and shock absorbers have been reconfigured to meet the design objectives of the A6.

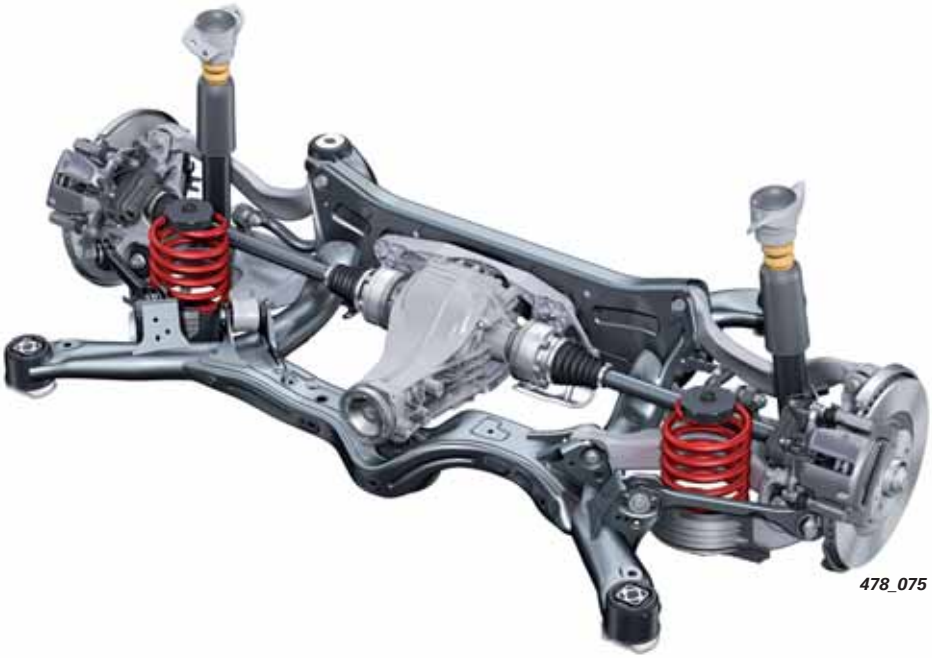


478_074

## Rear Axle

The rear suspension design is based on the trapezoidal link rear axle used on the Audi Q5.

Springs and shock absorbers are separated from one another, providing a large pass-through loading width and a flat load floor.



478_075

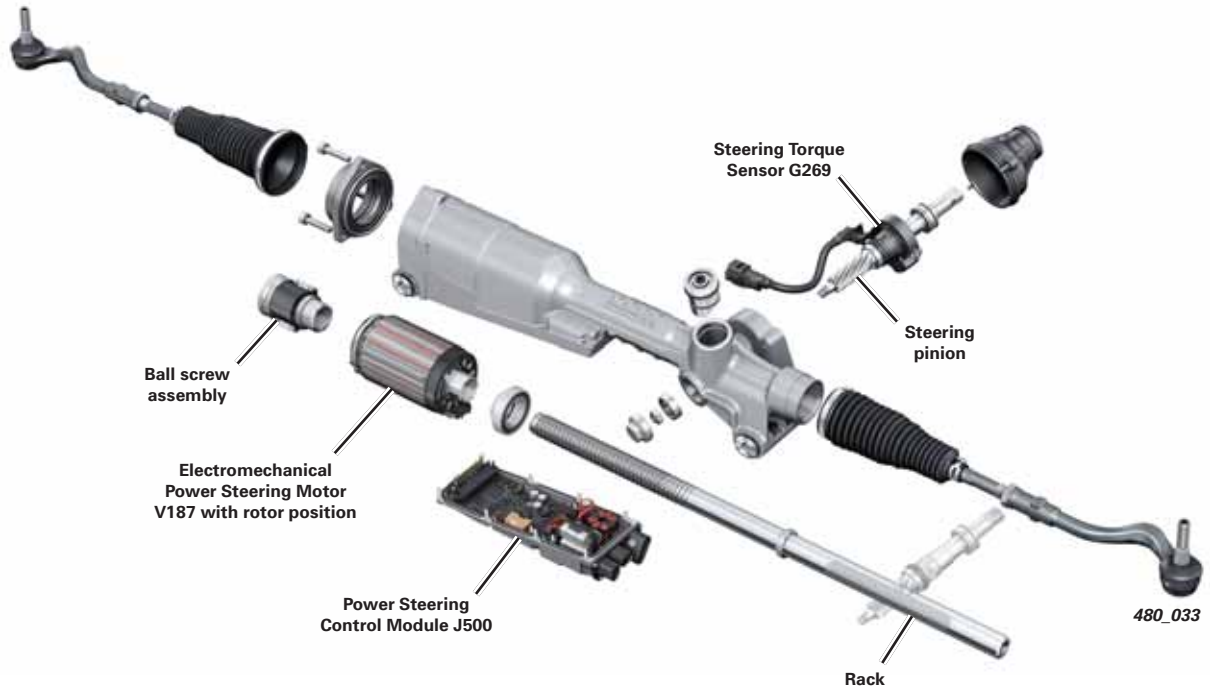
# Electromechanical Steering

## Overview

The new generation of electromechanical power steering used on the 2012 A7 is also used on the 2012 A6. The power assist is accomplished via an electric motor arranged concentrically in relation to the steering rack. This design was selected because it enables high performance capability with relatively small space requirements.

The rack, electric motor, ball screw assembly, control module and necessary sensors are integrated into a compact unit.

This complete steering system is approximately 35.2 lb (16 kg) lighter than earlier versions. The weight reduction means better fuel consumption and increased functionality with other vehicle safety and handling systems.



# Brake System

## Overview

The A6 brake system is similar in design and operation to that of the 2011 A8 and 2012 A7. An electromechanical parking brake is used at the rear.

A high performance ESP by Bosch, which has an extended range of functions, provides a high standard of safety. As on the 2011 A8, Sensor Electronics Control Module J849 supplies information about vehicle dynamics for calculation of desired control operations. The system used in the A6 is identical to that of the A8.




478_072

## ESP

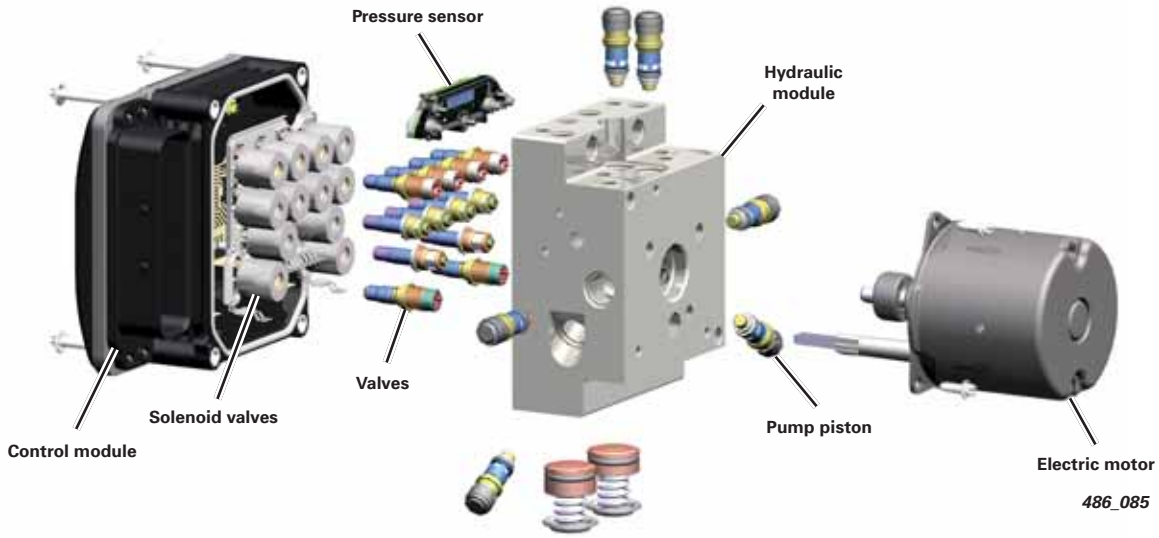
The 2012 A6 uses the 9th generation ESP Premium. The range of functions was expanded for the future use of dynamic steering.

ABS Control Module J104 determines necessary steering intervention to assist vehicle stability. To do this, the values measured by the wheel speed sensors, the steering angle sensor, Sensor Electronics Control Module J794, and the rotor position sensor of the dynamic steering actuator are processed.

When needed, J104 then “instructs” the control unit for Active Steering Control Module J792 to perform a steering correction, irrespective of the steering action by the driver. This feature will not be available during the 2012 model year.

Diagnosis procedures are identical to those for the Audi A7. The innovative functions of wheel-selective torque vectoring (for quattro drive) and the electronic locking differential (for front-wheel drive) are also used in the 2012 A7.

The control module can be removed from the hydraulic unit for service and replaced separately. The installation operations must be performed in an ESD-protected workplace using special service tool VAS 6613.




## Tire Pressure Monitoring

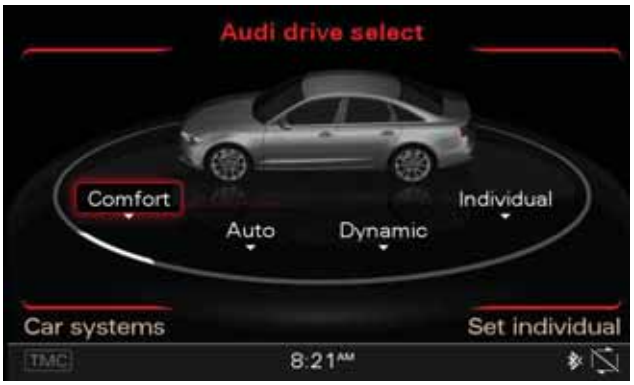
Audi’s familiar second-generation tire pressure monitoring system is also used on the A6. The system is standard on this model worldwide and is identical to those already in use on other Audi models.

## Audi Drive Select

Audi Drive Select will also be offered on the 2012 A6.

There are three modes: **comfort**, **auto**, and **dynamic**. The driver can select these via the MMI control panel and, for example, switch from a sport to a comfort driving mode. The drive can use the individual mode to configure the vehicle.

For instance, a sport engine setup can be combined with light steering action. The model and option level dictates which systems can be configured by Audi drive select. In all cases, the engine, transmission, and steering systems are controlled.




*A6_AudiDriveSelect*

### Mode Characteristics

| | | comfort | auto | dynamic |
|---|---|---|---|---|
|  | Engine/transmission | balanced | balanced | sport |
|  | Air suspension* | comfort | balanced | sport |
|  | Steering | comfort | balanced | sport |
|  | Sport differential* | balanced | responsive | sport |
|  | Reversible belt pretensioners | standard | standard | adapted activation timing |

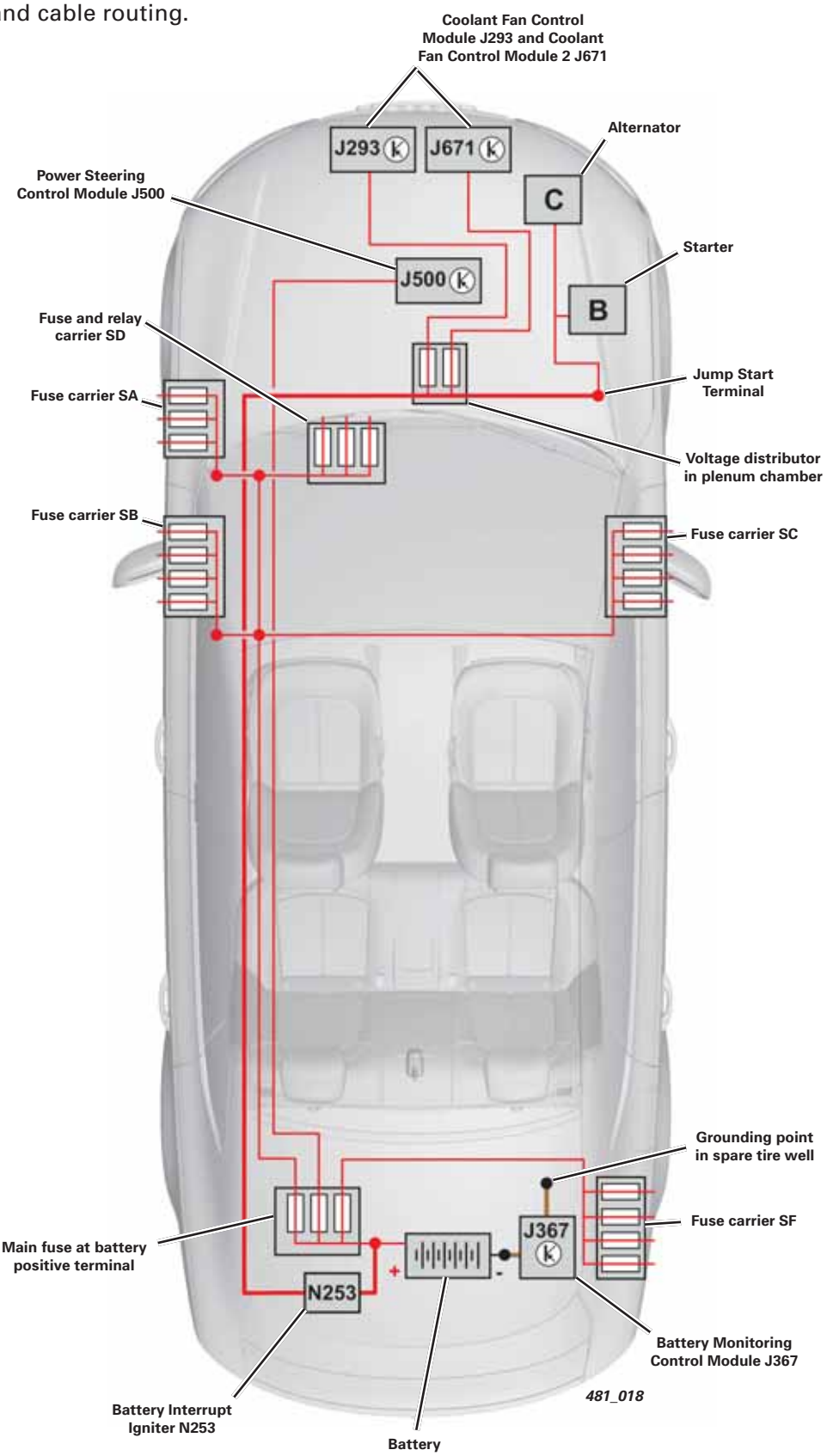
*Not on US models at the introduction of the A6.

**Reference**
For more information about the Audi drive select system and its mode characteristics, refer to Self-Study Program 990203, *The 2012 Audi A7 Vehicle Introduction.*

# Electrical System

## Power Supply Overview

Refer to current technical literature for exact fuse assignments and cable routing.



## Fuses and Relays

**Voltage distributor in plenum chamber**

The coolant fan control modules are supplied power via fuses located at this point. The main battery cable junction point is here.

**Fuse and relay carrier on the right side of the instrument panel**

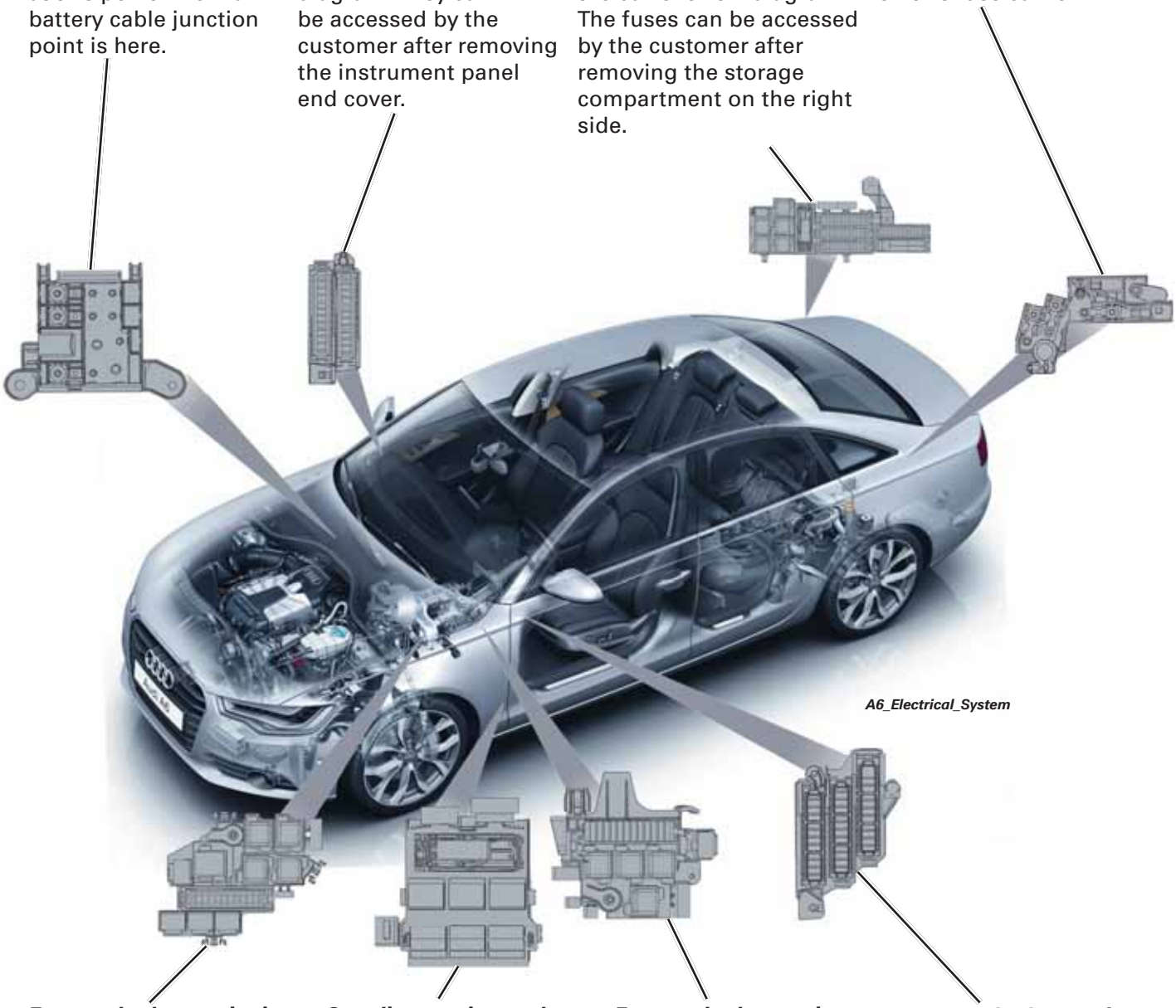
The fuses are labeled SC in the current flow diagram. They can be accessed by the customer after removing the instrument panel end cover.

**Fuse and relay carrier and CAN node connector in luggage compartment, right**

The fuses are labeled SF in the current flow diagram. The fuses can be accessed by the customer after removing the storage compartment on the right side.

**Main fuse carrier at battery positive terminal**

The battery interrupt igniter is also mounted on this fuse carrier.



*A6_Electrical_System*

**Fuse and relay carrier in the E-box in the plenum chamber, driver side**

(under the windshield washer system reservoir)

The E-box lid also serves as a support for the engine control module. The fuses in the E-box are labelled SA in the current flow diagram.

**Coupling station and CAN node connector at the bottom left A-pillar**

**Fuse and relay carrier in the Vehicle Electrical System Control Module area**

(below the instrument panel in the driver footwell)

The fuses are labeled SD in the current flow diagram.

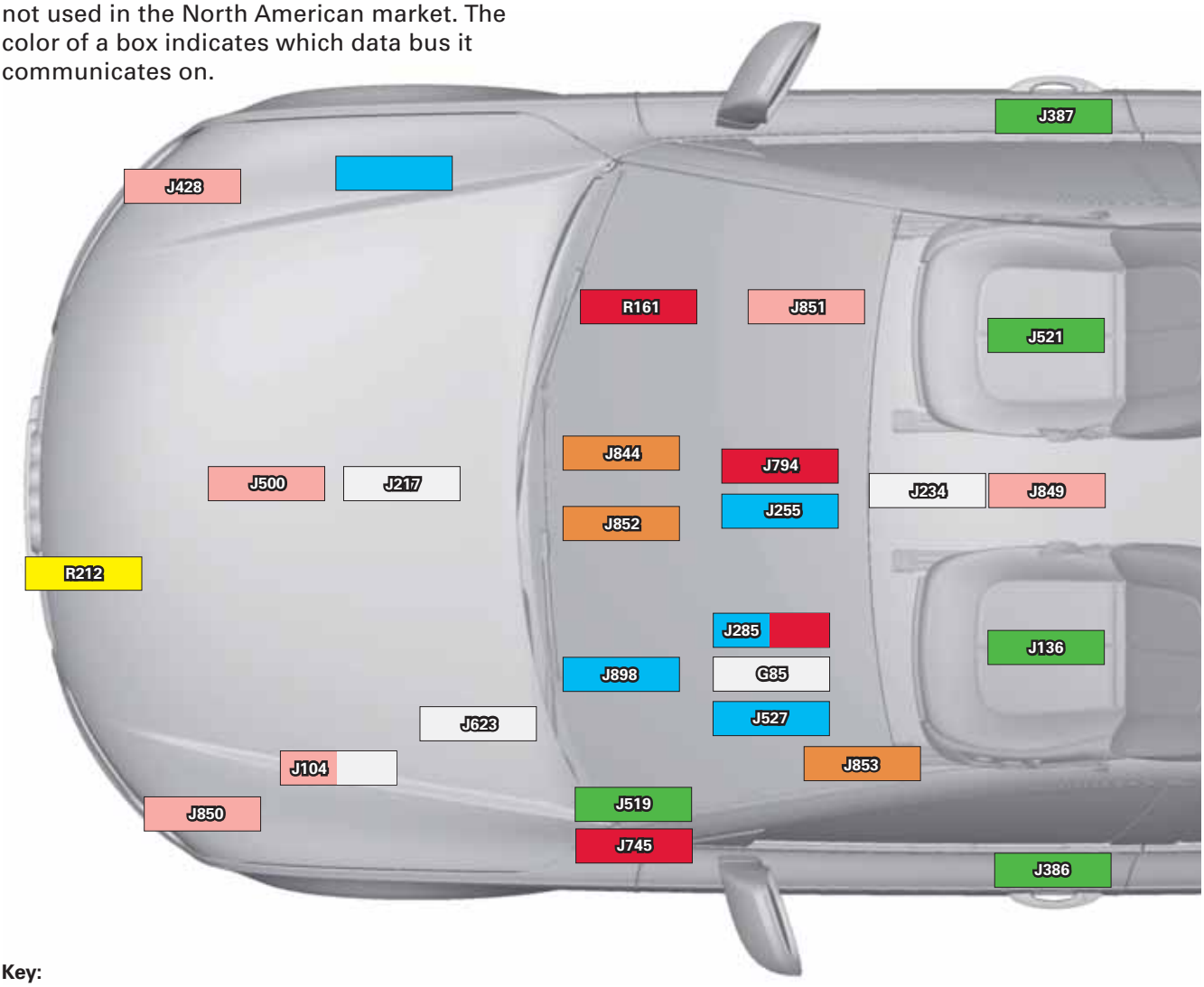
**Fuse and relay carrier on the instrument panel, left**

The fuses are labeled SB in the current flow diagram. They can be accessed by the customer after removing the instrument panel end cover.

# Control Module Locations

Some of the control modules shown in this overview are optional and/or are country-specific equipment. Boxes without numbers in the illustration indicate locations for components not used in the North American market. The color of a box indicates which data bus it communicates on.

Refer to current technical literature for exact installation locations of control modules, as well as for installation and removal instructions.




**Key:**

**Control Modules on the Convenience CAN bus**

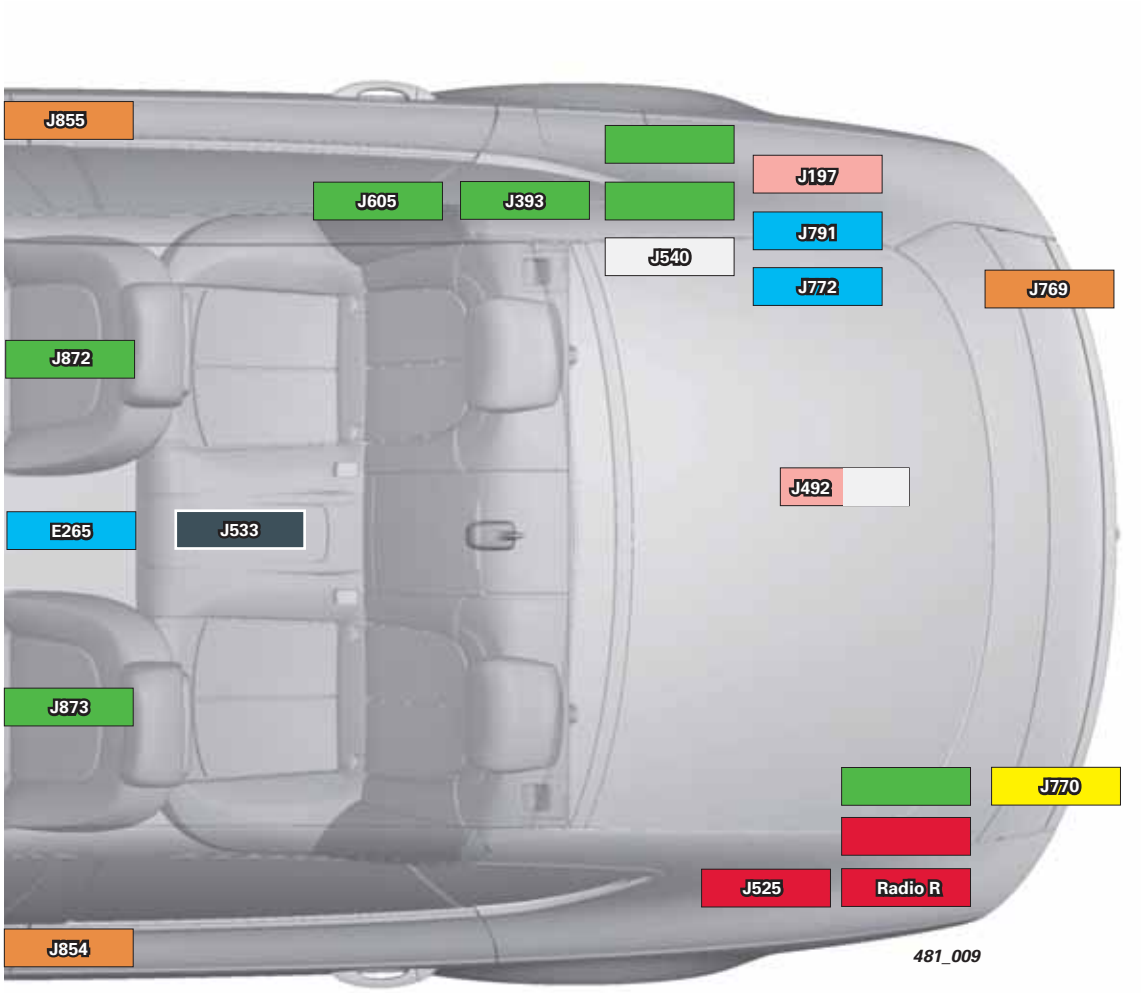
J136 Memory Seat/Steering Column Adjustment CM
J386 Driver Door Control Module
J387 Front Passenger Door Control Module
J393 Comfort System Central Control Module
J519 Vehicle Electrical System Control Module
J521 Front Passenger Memory Seat Control Module
J605 Rear Lid Control Module
J872 Front Passenger Multicontour Seat CM
J873 Driver Multicontour Seat Control Module

**Control Modules on the Display and Control CAN bus**

E265 Rear A/C Display Control Head
J255 Climatronic Control Module
J285 Instrument Cluster Control Module
J527 Steering Column Electronics Control Module
J772 Rear View Camera System Control Module
J791 Parallel Parking Assistance Control Module
J898 Windshield Projection Head-Up Display CM

**Control Modules on the Powertrain CAN bus**

G85 Steering Angle Sensor
J234 Airbag Control Module
J540 Electromechanical Parking Brake Control Module
J623 Engine Control Module
J217 Transmission Control Module




**Control Modules on the Extended CAN bus**

J745 Cornering Lamp and Headlamp Range CM
J769 Lane Change Assistance Control Module
J844 Automatic High Beam Assist Control Module
J852 Camera Control Module
J853 Night Vision System Control Module
J854 Left Front Seat Belt Tensioner Control Module
J855 Right Front Seat Belt Tensioner Control Module

**Control Modules on the MOST bus**

J285 Instrument Cluster Control Module
J525 Digital Sound System Control Module
J794 Information Electronics Control Module 1
R Radio
R161 DVD Changer

**Control Modules on the FlexRay bus**

J104 ABS Control Module
J197 Level Control System Control Module
J428 Distance Regulation Control Module
J492 All Wheel Drive Control Module
J500 Power Steering Control Module
J849 Sensor Electronics Control Module
J850 Distance Regulation Control Module 2
J851 Image Processing Control Module

**Sub-Bus Users**

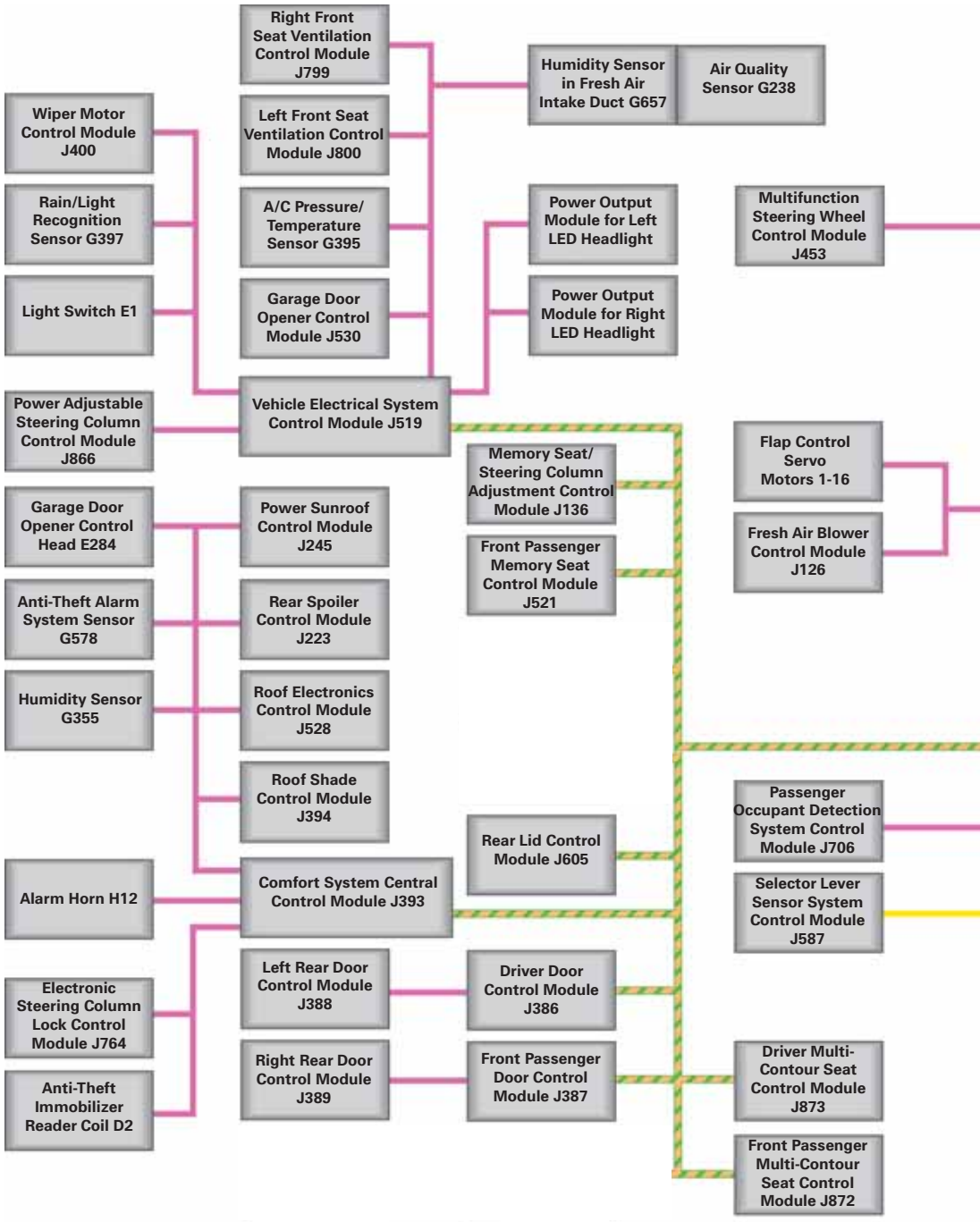
R212 Infrared Camera
J770 Lane Change Assistance Control Module 2

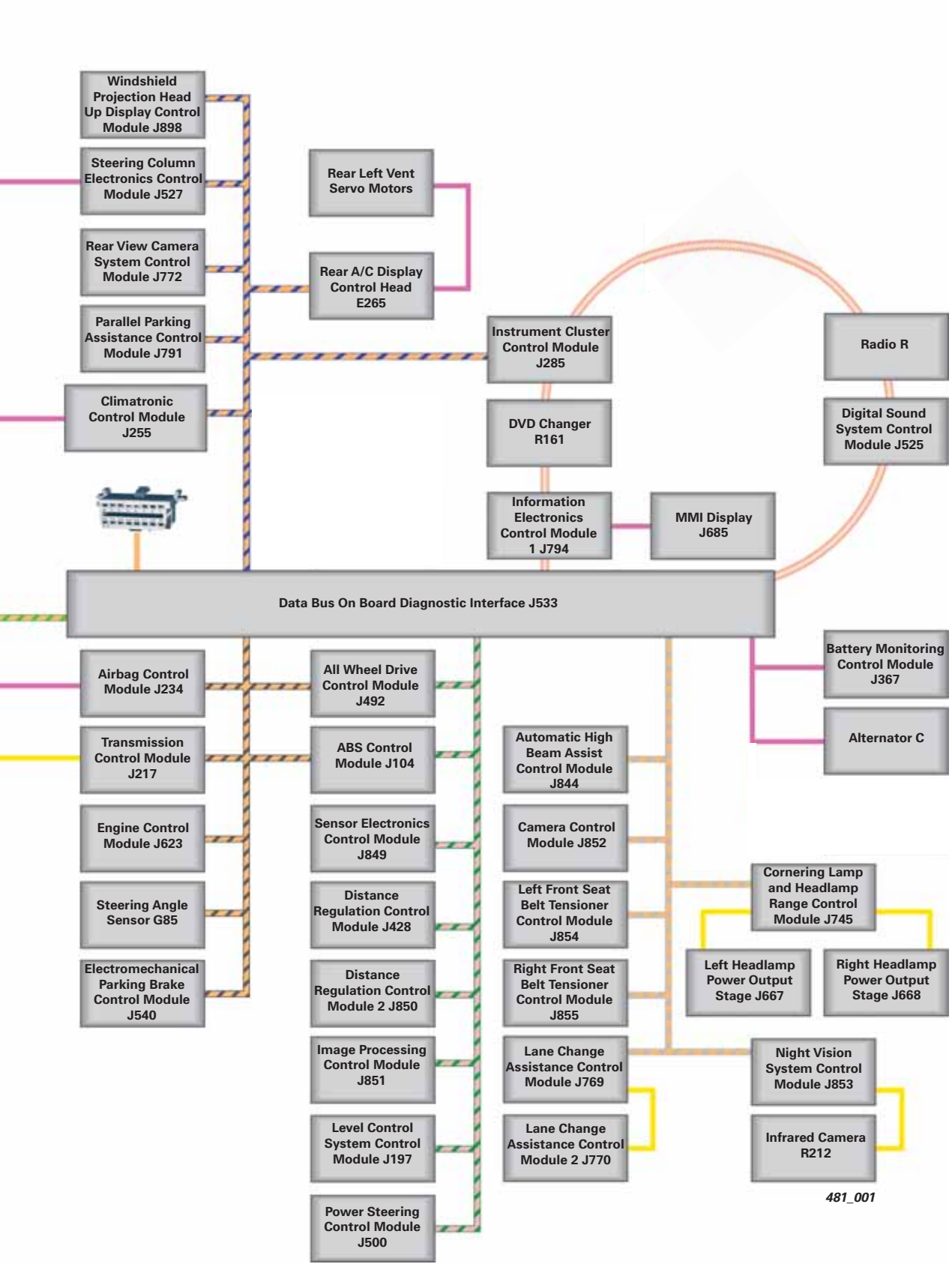
**Users of all Bus Systems (Gateway)**

J533 Data Bus On Board Diagnostic Interface

## Topology

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



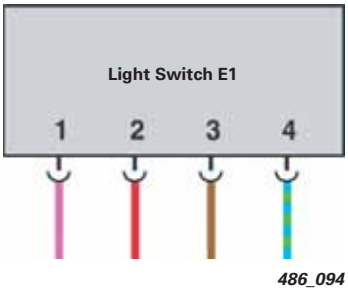

Windshield Projection Head Up Display Control Module J898
Steering Column Electronics Control Module J527
Rear Left Vent Servo Motors
Rear View Camera System Control Module J772
Rear A/C Display Control Head E265
Parallel Parking Assistance Control Module J791
Instrument Cluster Control Module J285
Radio R
Climatronic Control Module J255
DVD Changer R161
Digital Sound System Control Module J525
Information Electronics Control Module 1 J794
MMI Display J685
Data Bus On Board Diagnostic Interface J533
Airbag Control Module J234
All Wheel Drive Control Module J492
Battery Monitoring Control Module J367
Transmission Control Module J217
ABS Control Module J104
Automatic High Beam Assist Control Module J844
Alternator C
Engine Control Module J623
Sensor Electronics Control Module J849
Camera Control Module J852
Steering Angle Sensor G85
Distance Regulation Control Module J428
Left Front Seat Belt Tensioner Control Module J854
Cornering Lamp and Headlamp Range Control Module J745
Electromechanical Parking Brake Control Module J540
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
Image Processing Control Module J851
Lane Change Assistance Control Module J769
Night Vision System Control Module J853
Level Control System Control Module J197
Lane Change Assistance Control Module 2 J770
Infrared Camera R212
Power Steering Control Module J500
481_001

# Exterior Lighting

## Light Switch

| Summary Information | |
|---|---|
| Description | Light Switch E1 |
| Installation Location | Driver's side, instrument panel |
| Functions | Communicates the driver's lighting setting request to the electrical system control module |
| Address Word | None, LIN slave, measured values, and diagnosis through Vehicle Electrical System Control Module J519 (master) |

486_048



486_094

### Function

The rotary knob has four settings:

0 Lights OFF (in some countries, daytime running lights are switched ON automatically at "terminal 15 on")

AUTO Automatic daytime running lights are switched ON and OFF depending on the light sensor

Side light

Low beam

Connections:

Pin 1 LIN to J519
Pin 2 "terminal 30"
Pin 3 "terminal 31"
Pin 4 Redundancy line to J519

486_095

## Button Functions

The switch cluster on the left side of the light switch contains a maximum of three buttons:

– Using the upper button, either the fog lights (vehicles with halogen lights) or the all-weather lights (vehicles with bi-xenon or LED headlights) are activated
– Using the center button, the Night Vision Assist can be activated
– The bottom button is used to switch the rear fog light ON


486_096

Due to different equipment levels and country-specific regulations, the switch clusters differ and not all the buttons are active. Only the button for the rear fog light is used in all 2012 A6 models.

## Light Switch Symbols


Fog lights (only for vehicles with Halogen headlights)


All weather light (only for vehicles with Bi-xenon or LED headlights, not for North American market)


Night Vision Assist


Rear fog light

## Rotary Switch

A maximum of two rotary switches are located on the right side of the light switch:

– E376 Position Control for Head-Up Display (optional)
– E20 Instrument Panel and Switch Illumination Dimmer Switch (always installed)

486_094

## Headlights

Three headlight variants are offered in the 2012 A6:

– Halogen headlights
– Bi-xenon headlights
– LED headlights

The bi-xenon headlights are offered in the following versions:

– Bi-xenon
– Bi-xenon with adaptive light (AFS)

### Halogen Headlights


| Light Function | Bulb Used | Power Output |
|---|---|---|
| Parking light | W5W | 5 watts |
| Daytime running light (DRL) | H15 | 15 watts |
| Turn signal | 3457A-58 | 30 watts |
| Low beam headlight | H7 | 55 watts |
| High beam headlight | H15 | 55 watts |
| Fog light (in bumper, not shown) | H7 | 55 watts |
| Coming home / leaving home | H7 and H15 | 55 and 15 watts |
| Side market lights | 3 LEDs | approx. 2 watts |

On vehicles with halogen headlights, the fog lights are built into the bumper. This precludes equipping these vehicles with Adaptive Cruise Control (ACC) because the space for the ACC sensors is occupied by the fog lights.

For the coming home/leaving home function, daytime running lights and fog lights are activated on vehicles with halogen headlights.

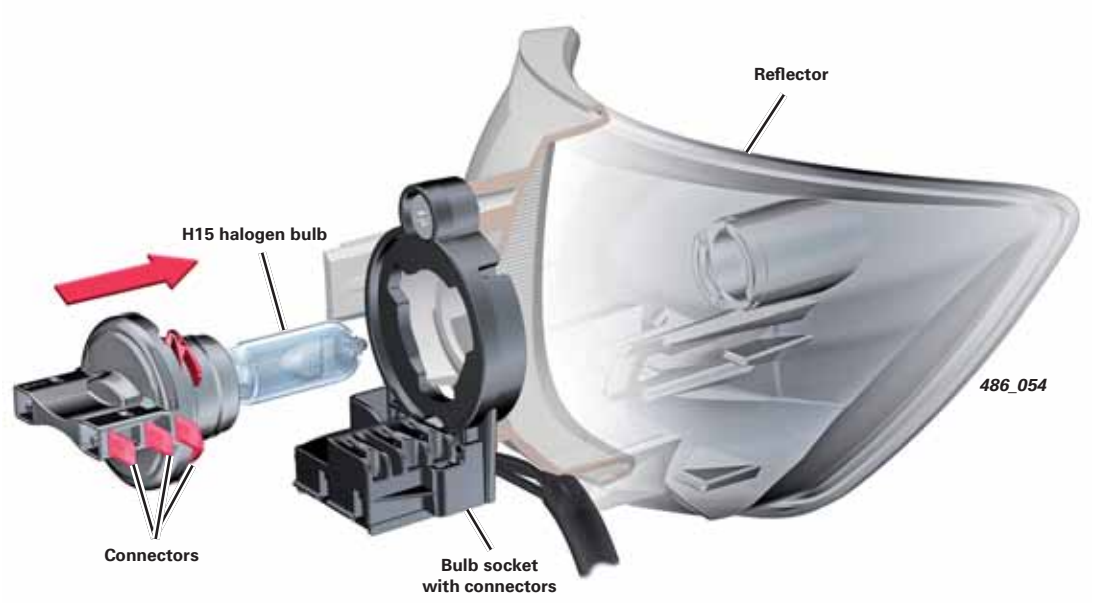
## Halogen Headlight Components

Headlight components such as caps, repair tabs, screws, and ventilation components can be replaced for all headlight variants on the 2012 A6. The individual components shown here can be replaced.

## H15 Halogen Bulb

The halogen headlight uses an H15 bulb for the daytime running lights and high beam functions. It is a dual-filament bulb with a 15-watt filament for DRLs, and a 55-watt filament for high beams.

Three contact tabs project from the base of the H15 bulb. They serve to make the electrical contact but also act as a mechanical stop when the bulb is turned to tighten when installing.




A quarter turn clockwise is sufficient to tighten the H15 bulb and complete the electrical contact. Clamps or bails are not required with the H15 bulb.

The H15 bulb can be installed in a single motion. This facilitates handling in the restricted space of the headlight housing.

## Bi-Xenon Headlights


| Light Function | Bulb Used | Power Output |
|---|---|---|
| Parking light | 2x3 LEDs dimmed (via 2 optical fibers) | not specified |
| Daytime running light (DRL) | 2x3 LEDs (via 2 optical fibers) | not specified |
| Turn signal | PSY24W | not specified |
| Low beam headlight | D3S | 24 watts |
| High beam headlight | D3S | 35 watts |
| Coming home / leaving home | 2x2 LEDs and gas discharge lamp D35 | not specified |
| Side marker light | 3 LEDs | approx. 2 watts |

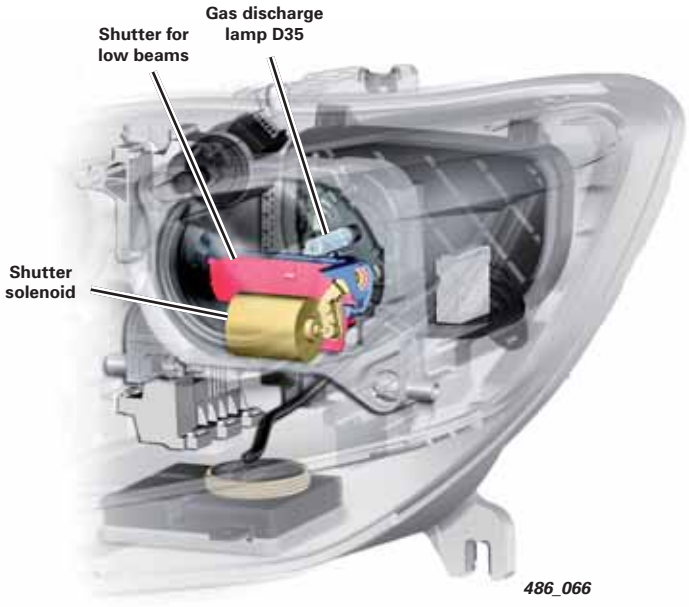
Neither the all-weather light function or fog lights are offered on vehicles with bi-xenon headlights in the North American market. The space for the ACC sensors is vacant on these vehicles, so it is possible to equip them with Adaptive Cruise Control (ACC).

The coming home/leaving home function uses the parking lights in conjunction with the low beams.

### Switching from Low Beams to High Beams

In the bi-xenon headlight, switching between low beams and high beams is done by a solenoid operated shutter.

In its normal position the shutter is raised for the asymmetrical low beams. The solenoid is energized for the high beam function, which lowers the shutter, producing the bi-xenon lamp's symmetrical light.



## Bi-Xenon Headlight Components

The individual components shown here can be replaced on a bi-xenon headlight.

The LEDs and the optical fibers for the parking light/daytime running light functions are not replaceable.


## Actuation

Actuation of the individual lights and of the control module for DRLs and Parking lights is performed separately by Vehicle Electrical System Control Module J519.

Actuation of headlight range control is performed separately by Headlamp Range Control Module J431.