

Service Training



Self Study Program 890113

The all new 2012 Passat



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

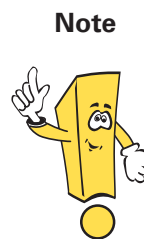
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This Self-Study Program provides information regarding the design and function of new models. This Self-Study Program is not a Repair Manual.

This information will not be updated. For maintenance and repair procedures, always refer to the latest electronic service information.



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The 2012 Passat

The seventh generation Passat has made improvements in design, comfort, quality, efficiency and safety attributes.

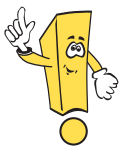
Its straight lines, clearly structured surfaces and dynamic proportions distinguish the design of the new generation sedan.

Highly efficient gasoline and diesel engines supply ample power and fuel efficiency.

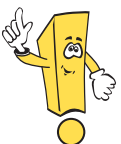
With its high level of quality, the new Passat is another advancement for Volkswagen.



S488_045



The Passat images in this Self-Study Program (SSP) were provided by German media during early production. North American vehicles may differ slightly.

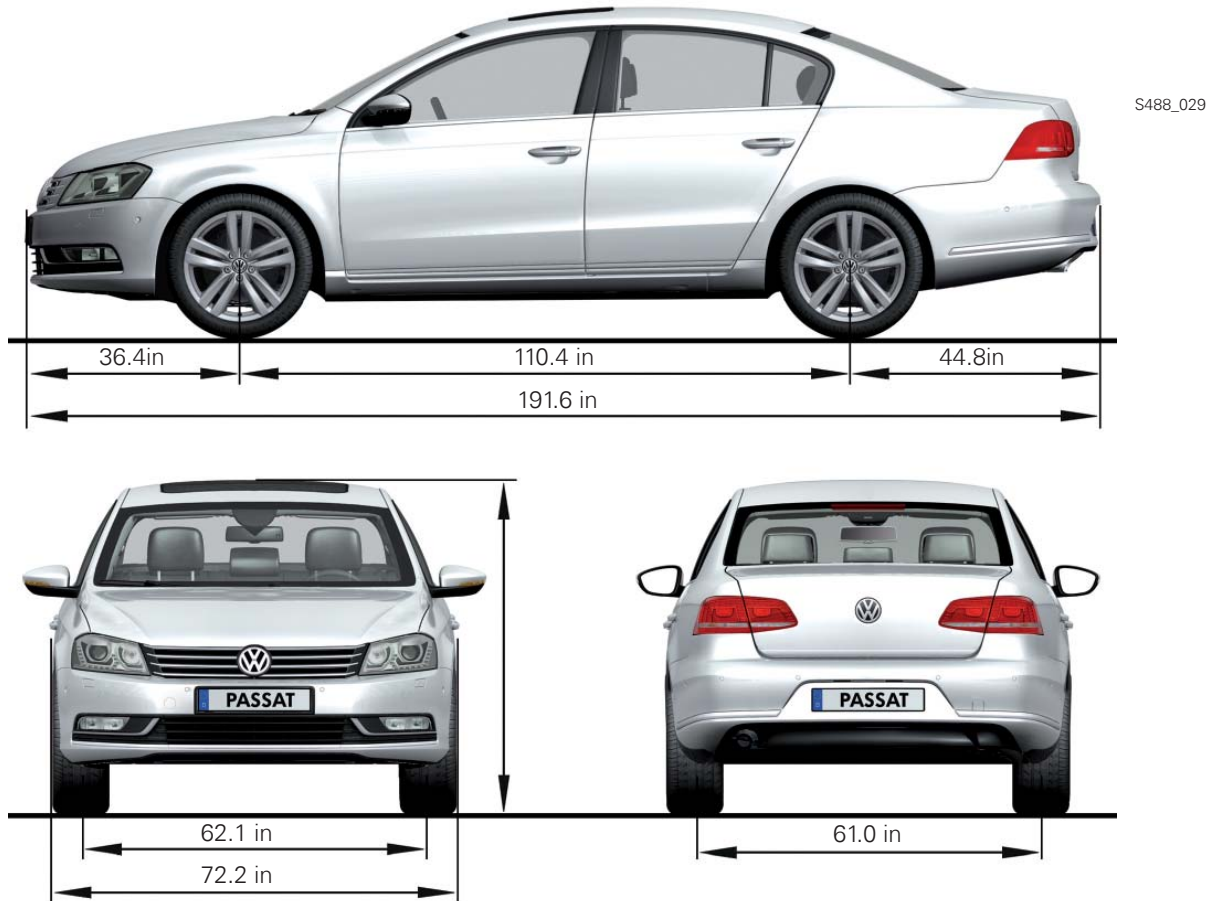


This SSP portrays the design and function of new technologies and its contents will not be updated. For current information and repair instructions, refer to the relevant service literature.

Introduction

Technical Data

Exterior Dimensions and Weights



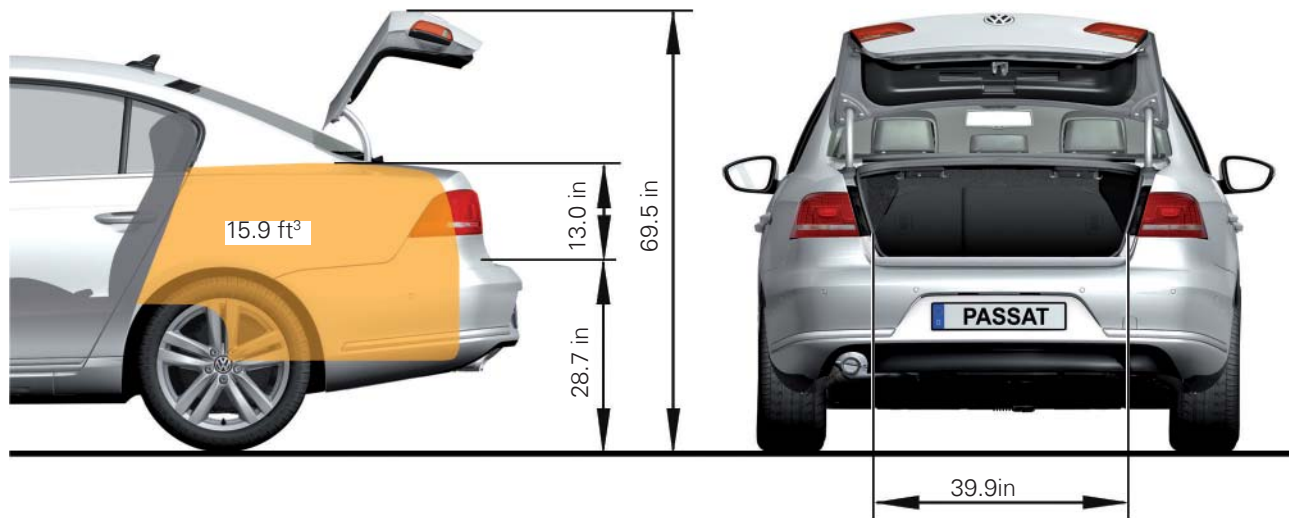
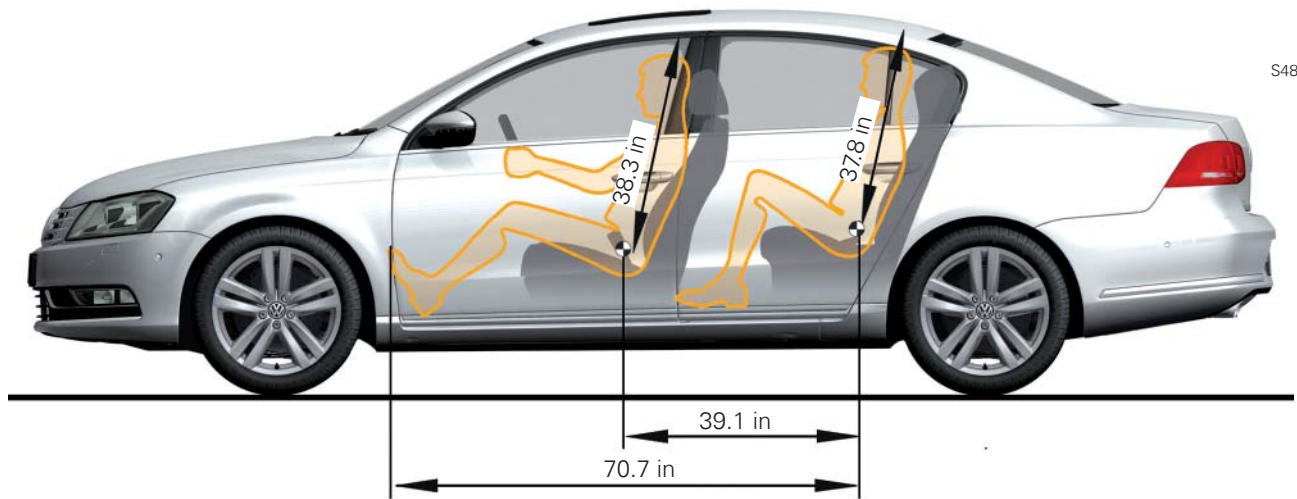
Exterior dimensions

Passat	2006	2012
Length	188.2 in	191.6 in
Width	71.7 in	72.2 in
Height	58 in	58.5 in
Wheelbase	106.7 in	110.4 in
Track width at front	61.1 in	62.1 in
Track width at rear	61.1 in	61.0 in
Turning circle	35.8 ft	36.4 ft

Weights/further details

Passat	2006	2012
Gross vehicle weight	4719 lb	4387 lb
Curb weight	3577 lb	3165 - 3446 lb
Maximum roof load	220 lb	220 lb
Tank capacity	18.5 gal	18.5 gal
Drag coefficient	0.295cd	0.291cd

Interior Dimensions and Volumes



Interior dimensions and volumes

Passat	2006	2012
Luggage compartment volume	14.2 ft ³	15.9ft ³
Height off rear lid (open)	69.1 in	69.5 in
Height off load sill	28.7 in	28.7 in
Cargo area height	13.0 in	13.0 in

Passat	2006	2012
Interior length	70.7 in	70.7 in
Interior length 2nd seat row	37.7 in	39.1 in
Front headroom	38.4 in	38.3 in
Headroom 2nd seat row	37.8 in	37.8 in

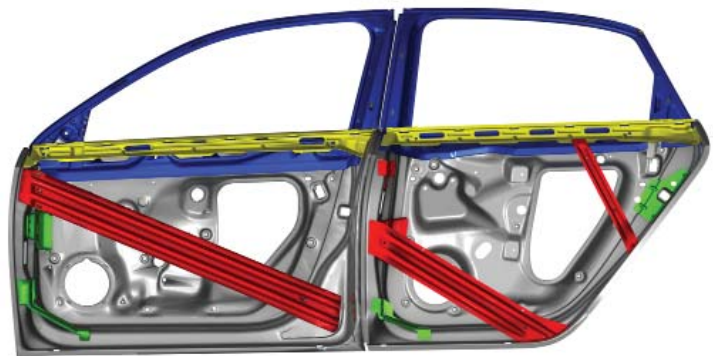
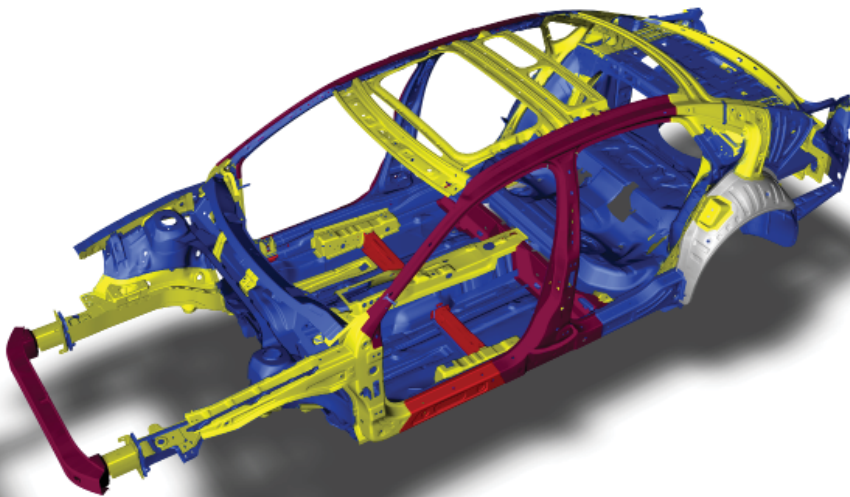
Body

Body Structure

The primary focus of body development increased body strength while reducing weight. This Passat is a completely new development when compared to the previous Passat.

Modifications to Passat Sedan

- Hood
- Rear lid
- Wings
- Door skin
- Side panel
- A-pillar and door frame
- Rear panel



- Up to 220 MPa pressure resistance
- Up to 420 MPa pressure resistance
- Over 1000 MPa pressure resistance

1 Megapascal (MPa) = 145 Pounds per Square Inch (PSI)

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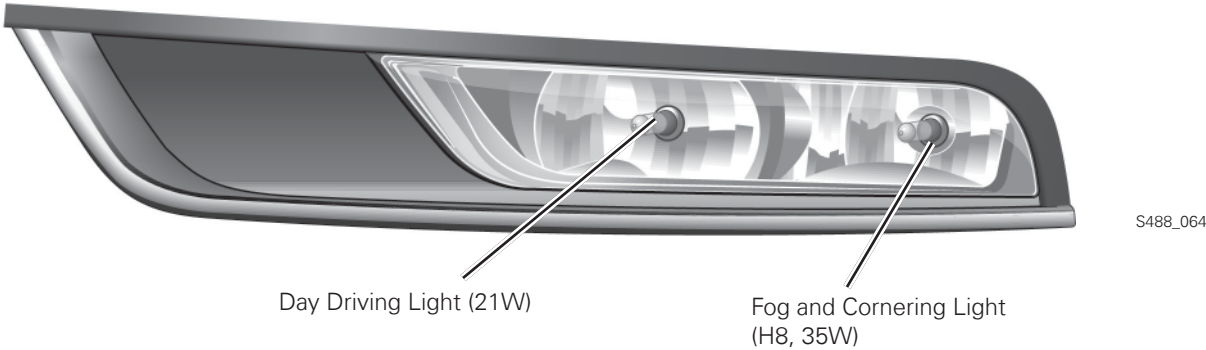


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Body

Halogen Headlights

On this headlight module, the low beam and high beam are designed as separate H7 headlights. The side light is integrated into the low beam headlight.

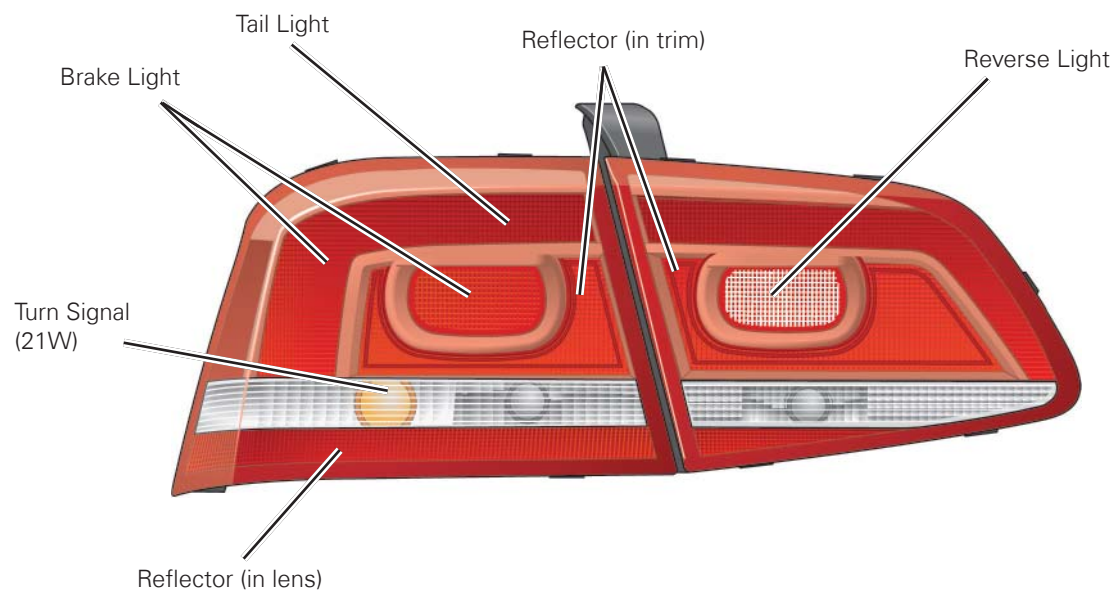


Light Module in Bumper

The cornering, fog and day driving lights have two separate bulbs.

Tail Lights

The tail lights of the 2012 Passat have a two-part design. One segment is attached to the rear fender and the other is attached to the trunk lid.



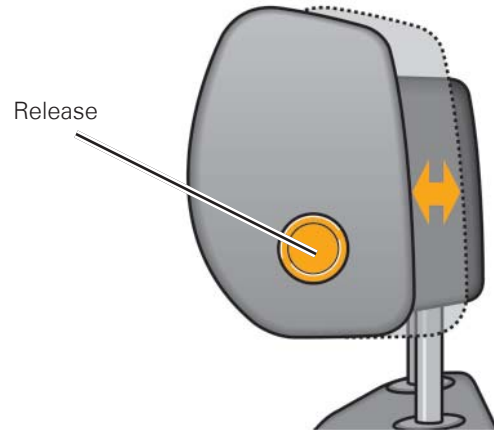
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Body

Interior Equipment

Head Restraints with Adjustment

The head restraint distance to the head can be adjusted using a release mechanism for maximum comfort and safety.



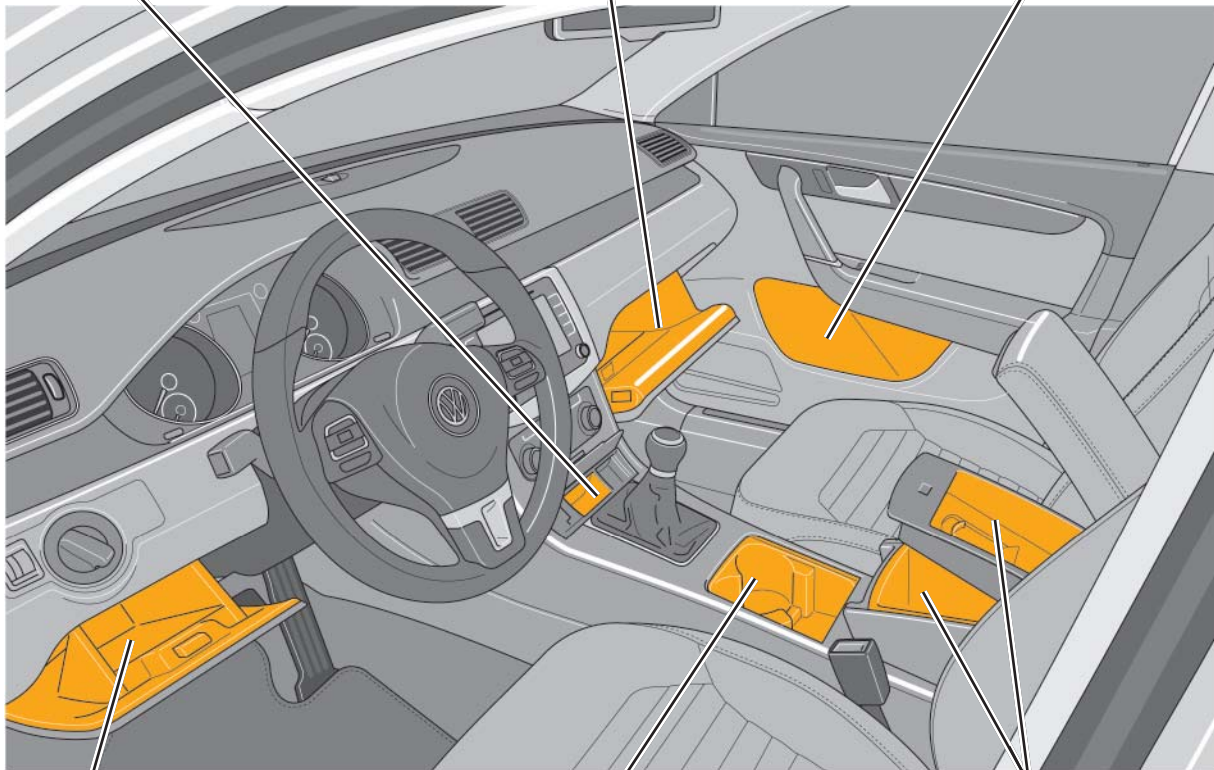
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Front Storage Compartments

Storage Under AC Controls

Glove Compartment

Door Compartment



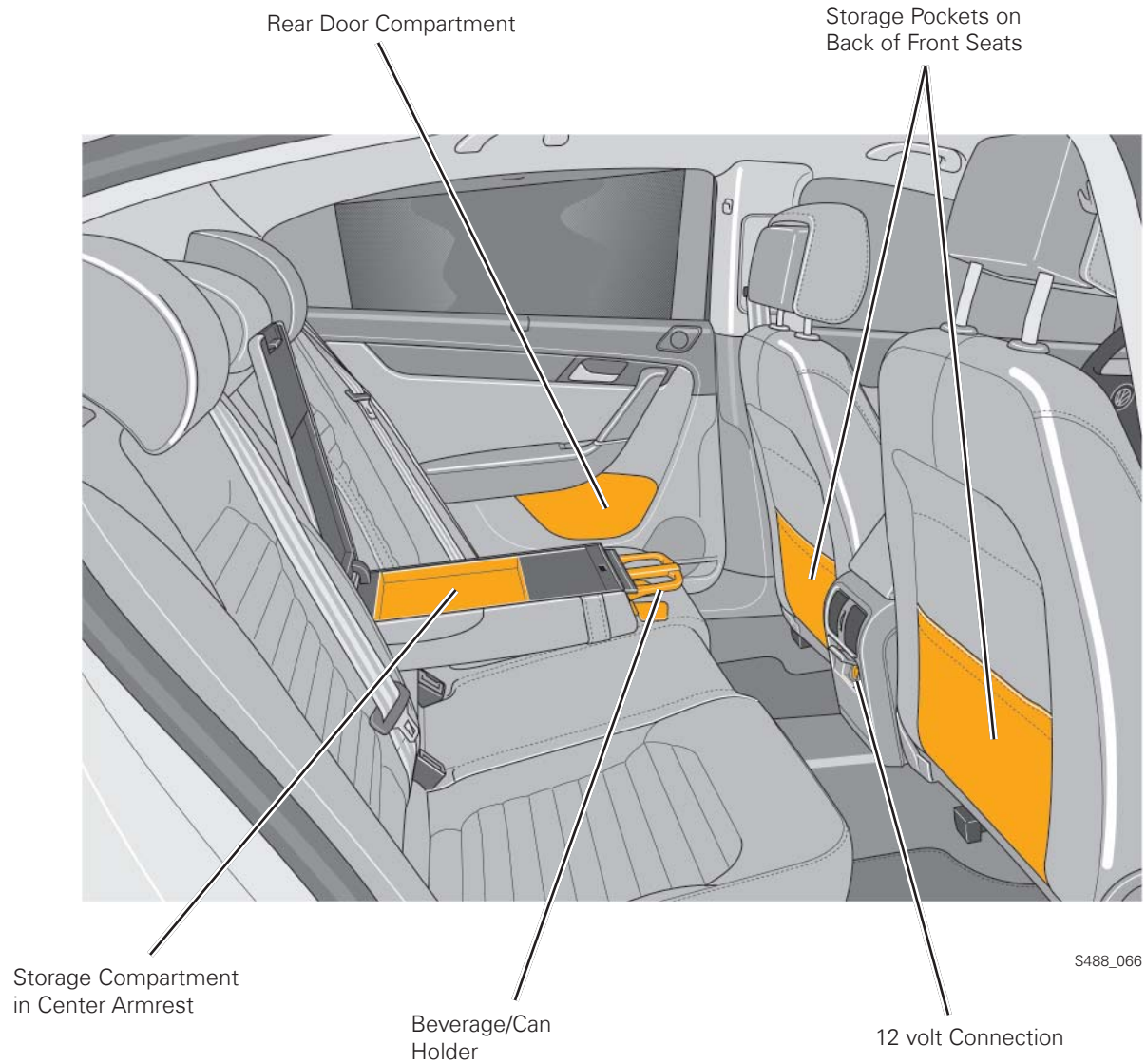
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Small Glove Compartment by Steering Wheel

Storage in Center Console with Beverage/Can Holder

Storage in Center Armrest

Rear Storage Compartments



Occupant Protection

Safety Equipment

The new Passat has six standard airbags as well as pyrotechnic seat belts:

- Driver and front passenger airbag
- Side airbags at front
- Curtain airbags for front and rear passengers
- Front inner and outer seat belt pyrotechnic igniters
- Rear outboard seat pyrotechnic igniters



Side Crash Sensors

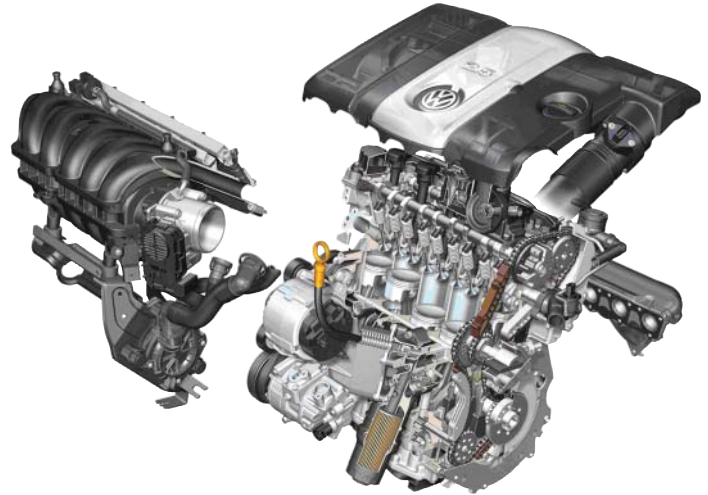
The side crash sensors in the bottom area of the front doors are designed as pressure sensors. Lateral acceleration sensors that detect side impact are located in the C-pillar.

2.5L Engine

The 2.5L engine was first used in the 2005 Jetta. It has been optimized for the 2012 Passat

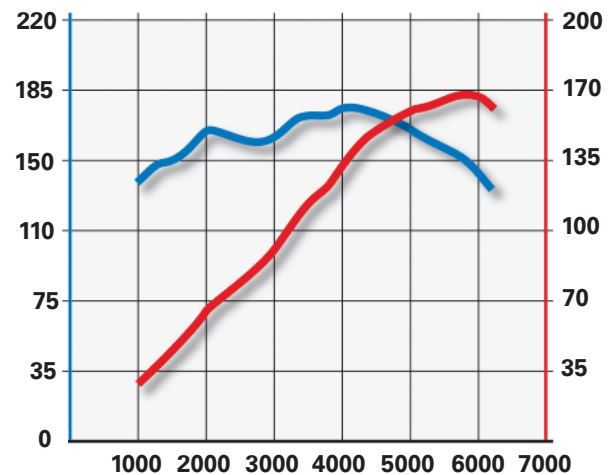
Technical Features:

- Variable oil pump for the lowering of the fuel consumption
- Exhaust manifold redesigned to reduce weight
- Spark plugs switched to Bosch from NGK



S468_020

Engine Configuration	Inline 5-Cylinder
Displacement	2480 cm ³ (151 in ³)
Bore	82.5 mm (3.25 in)
Stroke	92.8 mm (3.7 in)
Valves per Cylinder	4
Compression	9.5:1
Maximum Power	170 hp (125kW) at 5,700 rpm
Maximum Torque	177 lb/ft (240 Nm) at 4,250 rpm
Engine Management	Bosch Motronic ME 17.5
Fuel Requirement	Regular Unleaded
Emission Rating	PZEV



S468_021

Engines

3.6L FSI Engine with 4-Valve Technology

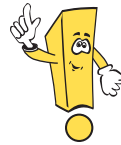
The 3.6L FSI engine with 4-valves per cylinder is based on the VR engine series. Many efficiency technologies are used on this engine.

Technical features

- Oil pump output reduced and oil pressure lowered to 3.6 bar
- Non-engaged chain tensioner
- 89° opening temperature of coolant thermostat
- One-part oil pump chain sprocket
- Exhaust camshaft adjuster with 32° setting range
- Vibration damper secured with 7 bolts



S488_233

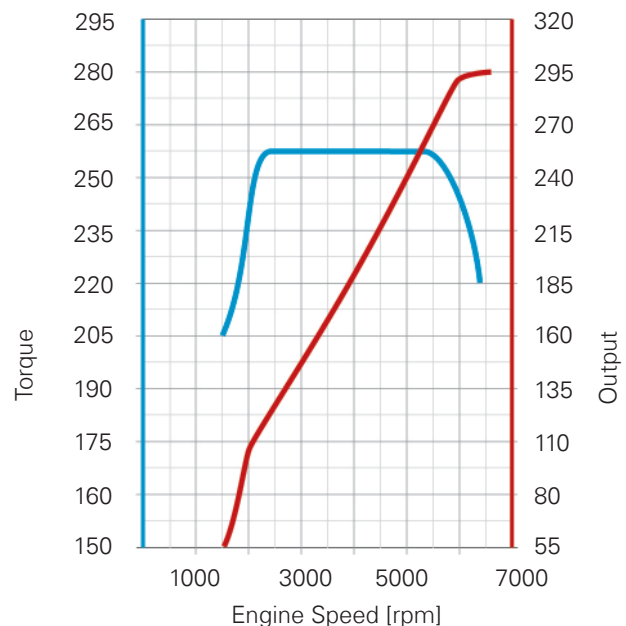


Additional information on this engine is available in SSP 823603, the 3.2L and 3.6L Engines.

Technical data

Engine Code	BWS
Type	6-cylinder in-line engine
Displacement	219.5 in ³ (3597 cm ³)
Bore	3.5 in (89 mm)
Stroke	3.8 in (96.4 mm)
Valves Per Cylinder	4
Compression Ratio	11.4:1
Maximum Output	295 hp (220kW) at 6600 rpm
Maximum Torque	258 lb/ft(350Nm) at 2400 to 5300 rpm
Engine Management	Bosch Motronic MED 17.1
Fuel	Premium unleaded
Exhaust Gas Treatment	Three-way catalytic converter with lambda control
Emissions Standard	ULEV 2

Torque and power diagram



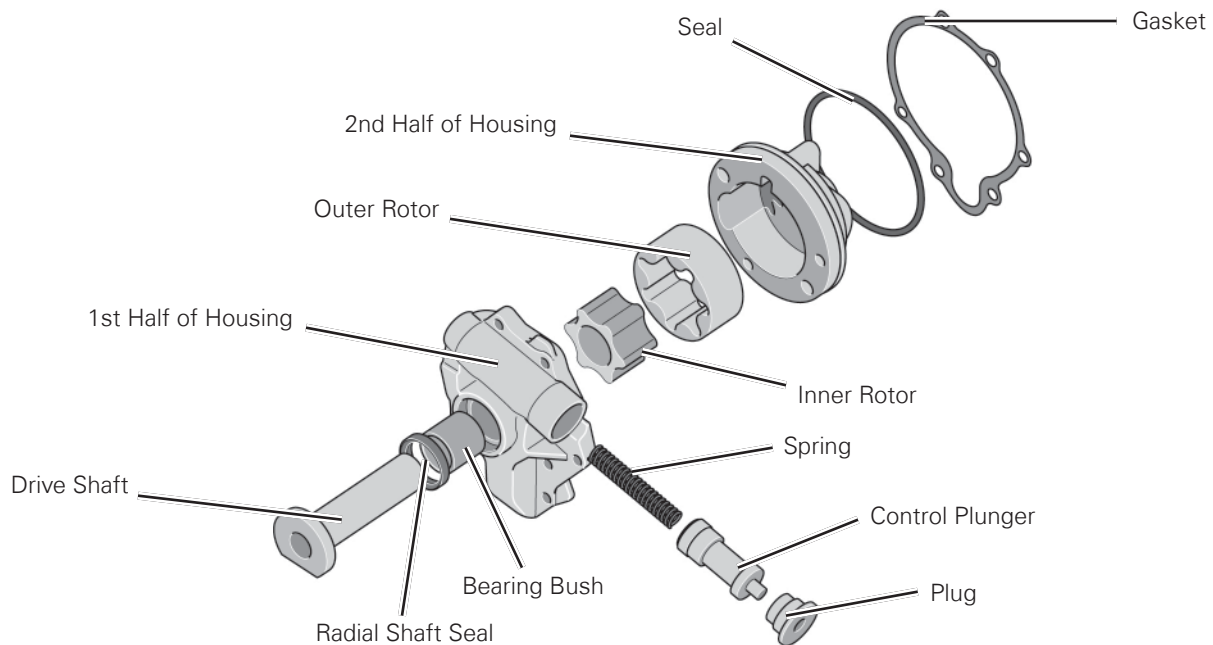
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New Features of 3.6L FSI Engine

Several areas of this engine were improved to reduce fuel consumption and CO₂ emissions.

Duo-Centric Oil Pump

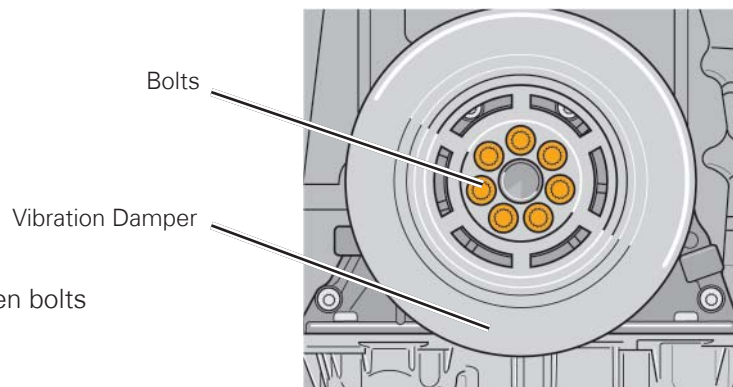
The entire oil circuit of the engine was improved, allowing for the reduction of oil pump output from 5.7 bar to 3.6 bar.



S488_026

Vibration Damper

The vibration damper is secured with seven bolts instead of a single center bolt.



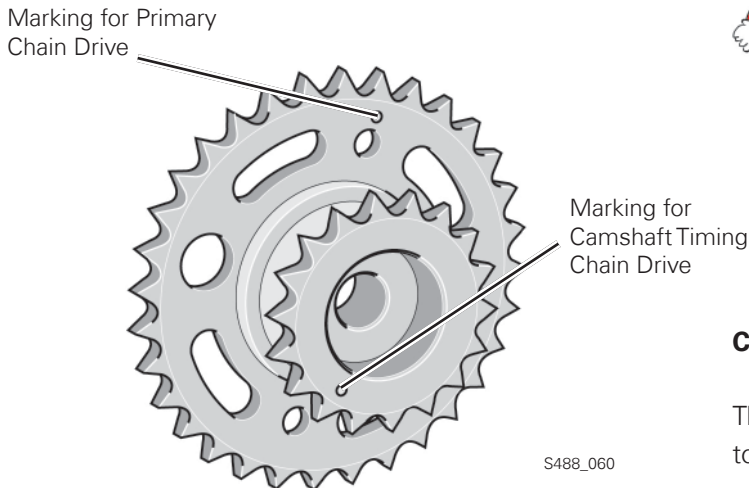
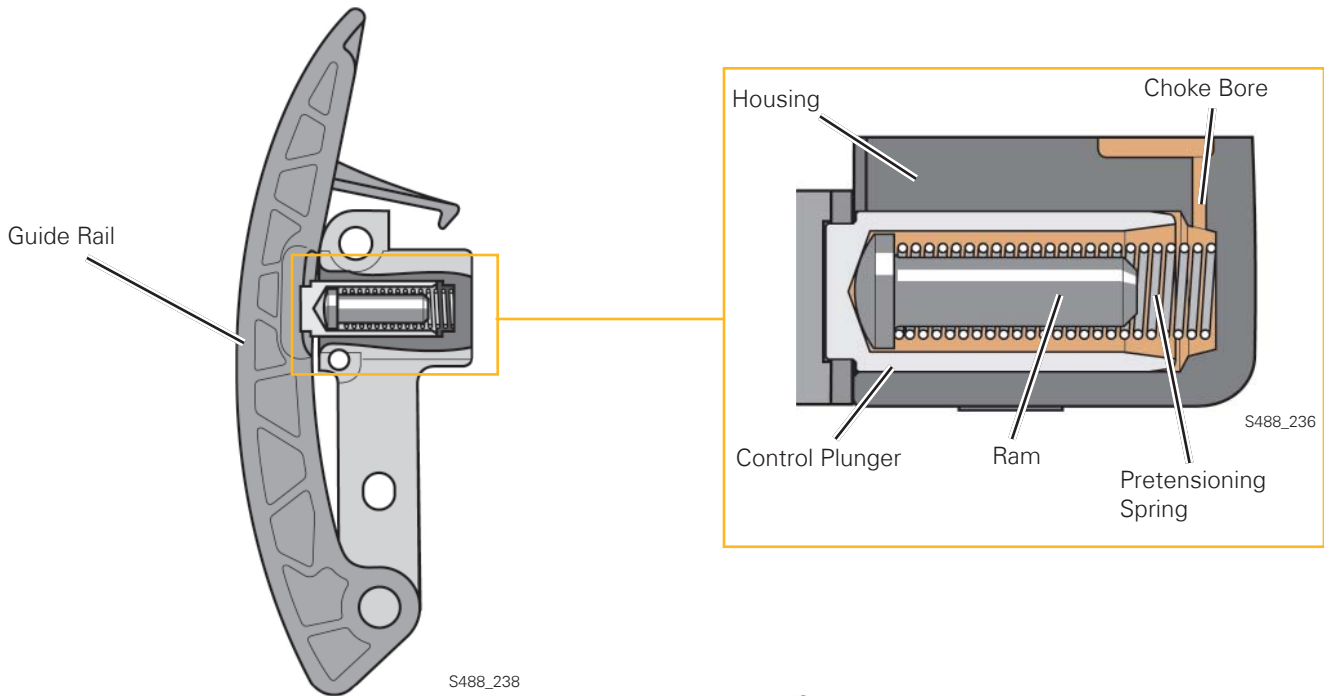
S488_234

Engines

Chain Tensioner

The lower chain tensioner has been redesigned to work without engagement at a lower oil flow rate (originally 0.86l/min, now 0.04l/min). Removing the locking mechanism made it possible to reduce the chain forces. The spring serves to pretension the chain during cold starting. The ram fills the void in the hollow control plunger and gives a faster response from the chain tensioner when oil pressure is building.

Chain tensioner module



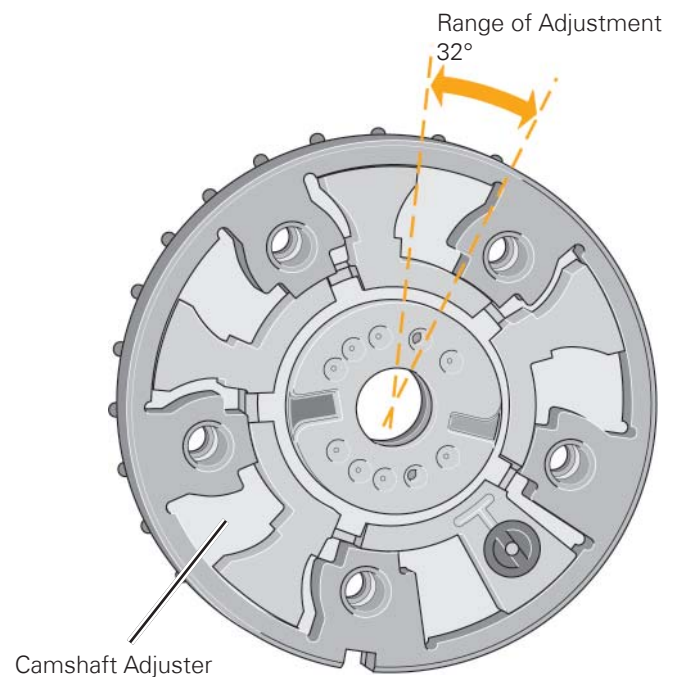
Do not punch through or clean the bore with any kind of tool.

Chain Sprocket

The oil pump chain sprocket has a one-piece design to prevent incorrect installation.

Camshaft Adjuster

The exhaust camshaft adjuster allows for a 32° range of crankshaft adjustment. At idle, less exhaust gas flows back into the inlet port, eliminating residual gas compression. This makes the engine run smoother and reduces consumption at idling speed by 3-5%.

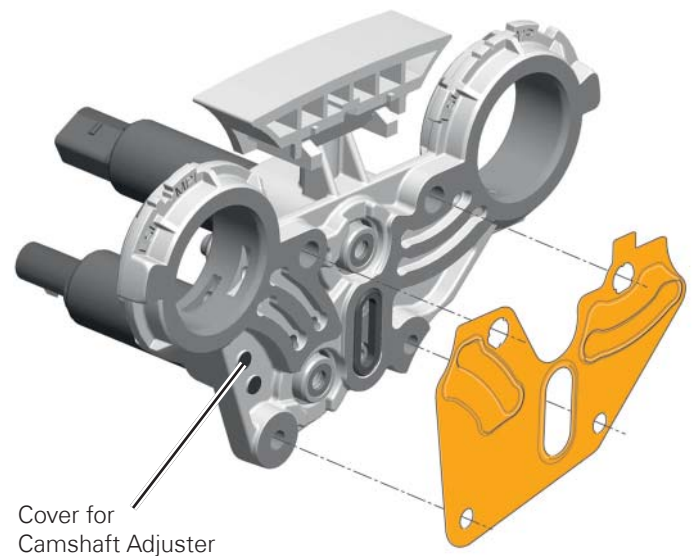


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Camshaft Adjuster Cover

A seal is now located between the camshaft adjuster cover and the cylinder head seal.

This seal optimizes oil supply to the camshaft adjuster, allowing for a faster adjustment speed.



Seal

S488_239

Engines

2.0L TDI CR Engine

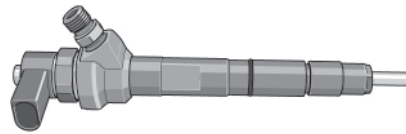
The second generation 2.0l TDI CR engine is used in the 2012 Passat. This engine is revised from the first generation.



S488_207

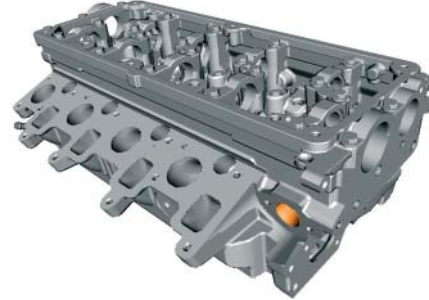
2nd Generation 2.0l TDI CR Engine Features

Common rail fuel injection system with solenoid valve controlled injectors has high injection pressures and can deliver multiple injections per stroke.



S488_206

Cylinder head has a channel that allows for recirculated gas running through cylinder head.



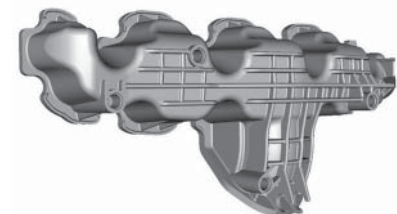
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Exhaust gas recirculation module with Exhaust Gas Recirculation (EGR) valve and EGR cooler.



S488_209

Plastic intake manifold without swirl plate adjustment.

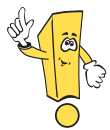
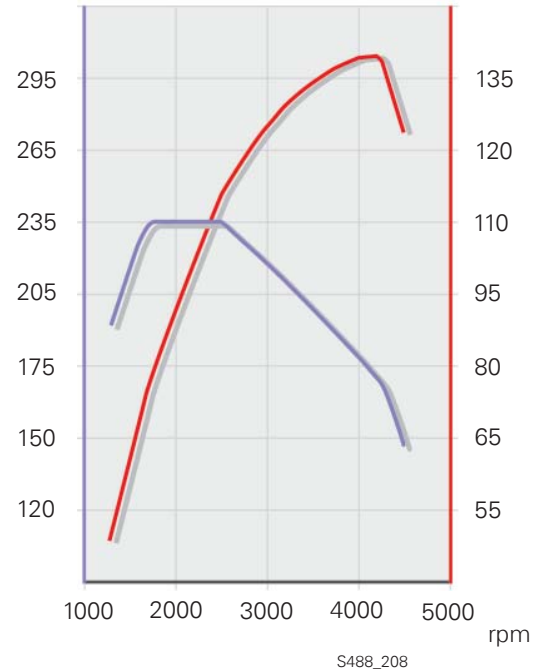


S488_213

Technical data

Engine Code	CFFB
Type	4-cylinder in-line engine
Displacement	120 in ³ (1968 cm ³)
Bore	3.19 in (81 mm)
Stroke	3.75 in (95.5 mm)
Valves per Cylinder	4
Compression Ratio	16.5:1
Maximum Output	140 hp (103 kW) at 4200 rpm
Maximum Torque	236 lb/ft at 1750 to 2500 rpm
Engine Management	Bosch EDC 17
Fuel	Ultra-Low Sulfur Diesel <15ppm Sulfur
Exhaust Gas Treatment	Exhaust gas recirculation, oxidizing catalytic converter, diesel particulate filter
Emission Standard	BIN5/ULEV2

Torque and Power Diagram



Detailed information about the 2.0l TDI CR engine can be found in SSP 826803, The 2.0L TDI Common Rail BIN5 ULEV Engine.

Engines

Fuel System for TDI Engines

The overview shown represents the fuel system of the 2.0 TDI engine.

1 - Transfer Fuel Pump G6

Builds pressure in the fuel supply line.

2 - Fuel Filter

Keeps away diesel fuel impurities from the injection system components. The high precision components such as the high pressure pump and the injectors, can be damaged or their function impaired by even the smallest particles of dirt.

3 - Fuel Temperature Sensor G81

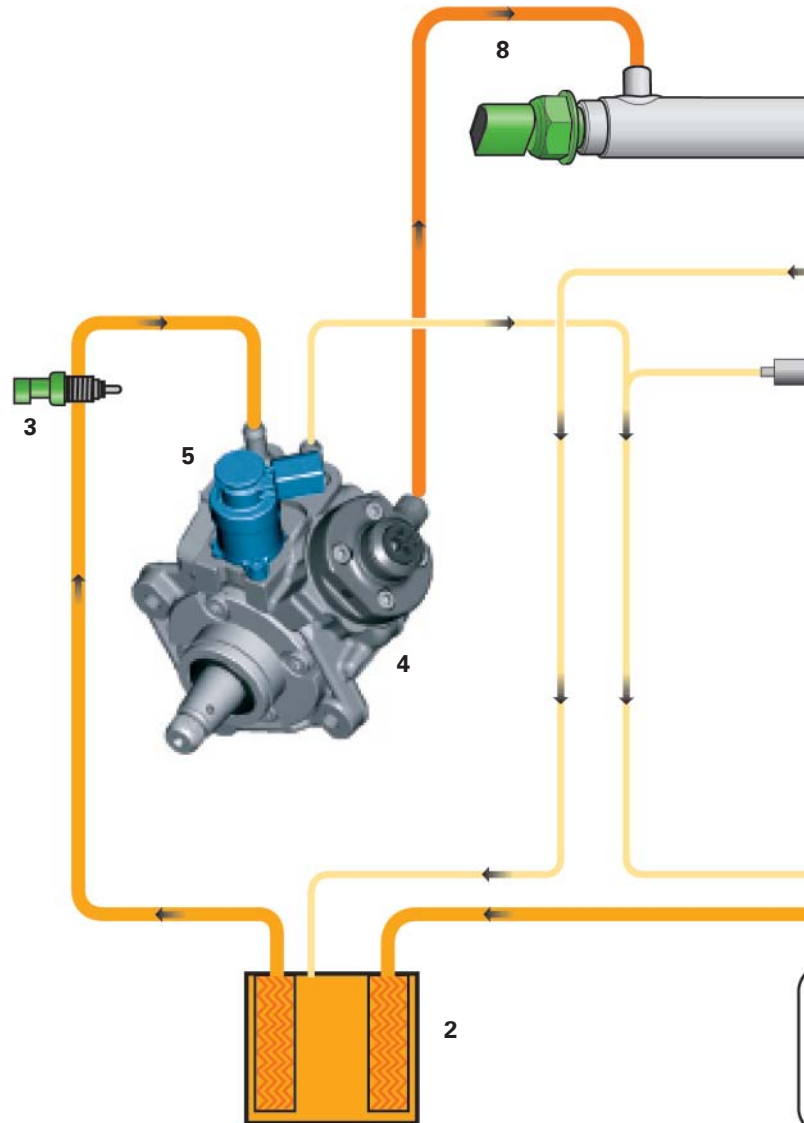
Measures the temperature of the fuel.

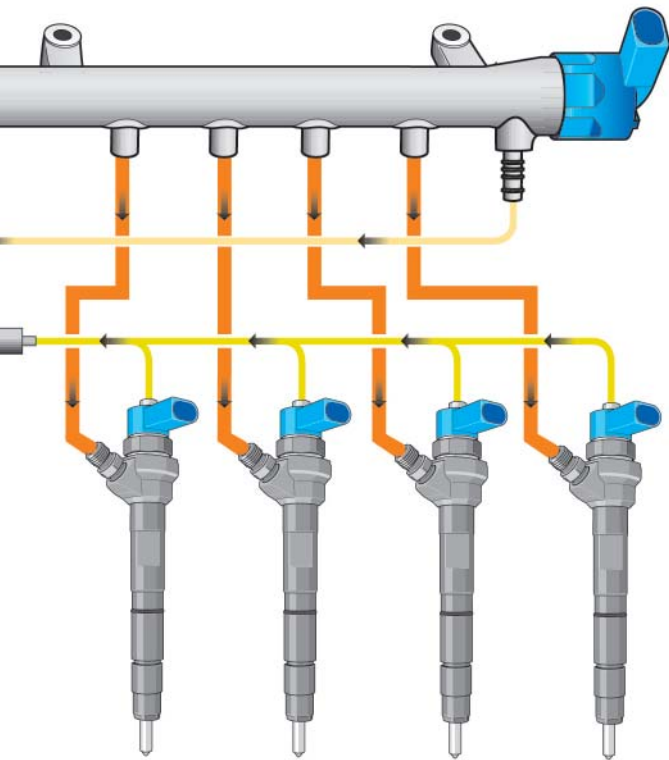
4 - High Pressure Pump

Generates the high pressure required for injection.

5 - Fuel Metering Valve N290

Regulates the quantity of fuel needed with pressure.





6 - Fuel Pressure Regulator Valve N276

Sets the fuel pressure in the high pressure range.

7 - High Pressure Accumulator (rail)

Keeps the fuel required for injection under high pressure for all cylinders.

8 - Fuel Pressure Sensor G247

Determines the current fuel pressure in the high pressure range.

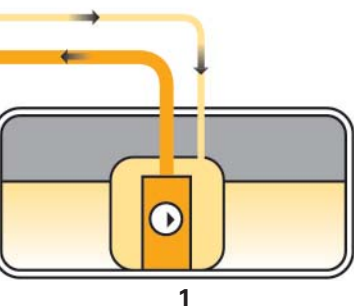
9 - Pressure Retention Valve

Ensures that pressure remains constant in the return flow to the injectors. This reduces or eliminates fluctuations in pressure, allowing for precise control of the injectors.





10 - Cylinders 1,2, 3 and 4 Fuel Injectors N30, N31, N32, N33

Inject fuel into the combustion chambers.

S488_220



Color Coding/Key

	High pressure
	Supply pressure
	Return pressure from injectors
	Return pressure

Engines

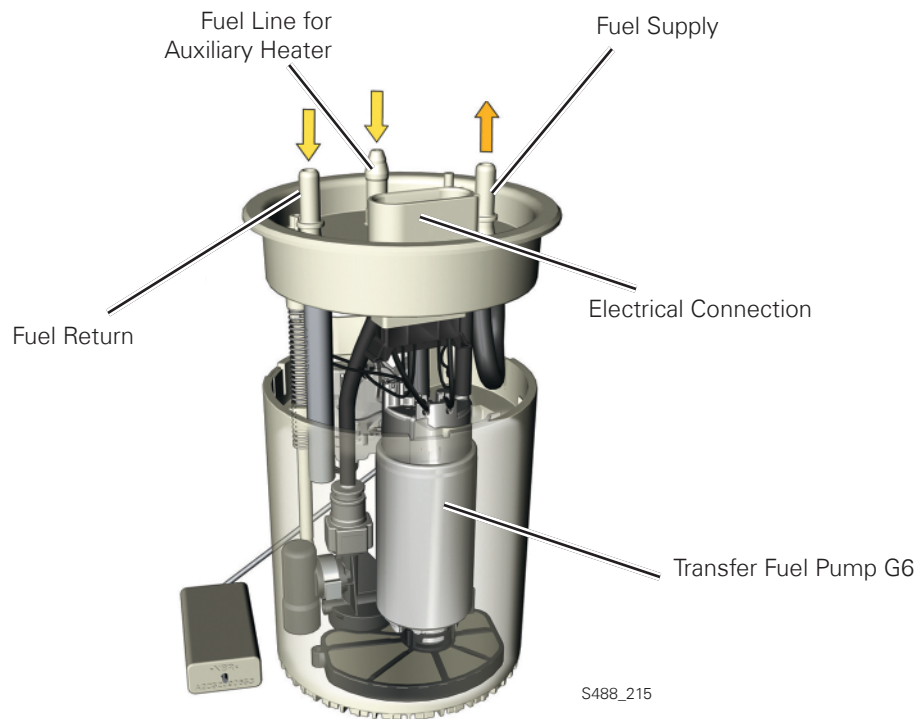
Transfer Fuel Pump G6

The fuel pump G6 now generates enough pressure for the low pressure fuel system from the tank to the engine. This allows for the elimination of the electric pressure pump in the supply line of the low pressure fuel system of the 2.0 ITDI CR engine.

The fuel system pressure pump in the 2012 Passat is an electrically-driven internal gear pump. It is located in the Fuel Delivery Unit GX1. This pump generates a pressure of approx. 6 bar, ensuring that the high pressure pump is supplied with enough fuel in all operating conditions. A valve in the high pressure pump reduces the fuel pressure generated by the fuel system pressure pump in the fuel supply line to approx. 5 bar. This maintains a constant level of pressure in the fuel supply line.

The fuel pump is activated by the ECM by a relay when the engine is started.

Design of Fuel Delivery Unit GX1



Effects in event of failure

If the G6 pump fails, the engine will not run.

Selective Catalyst Reduction

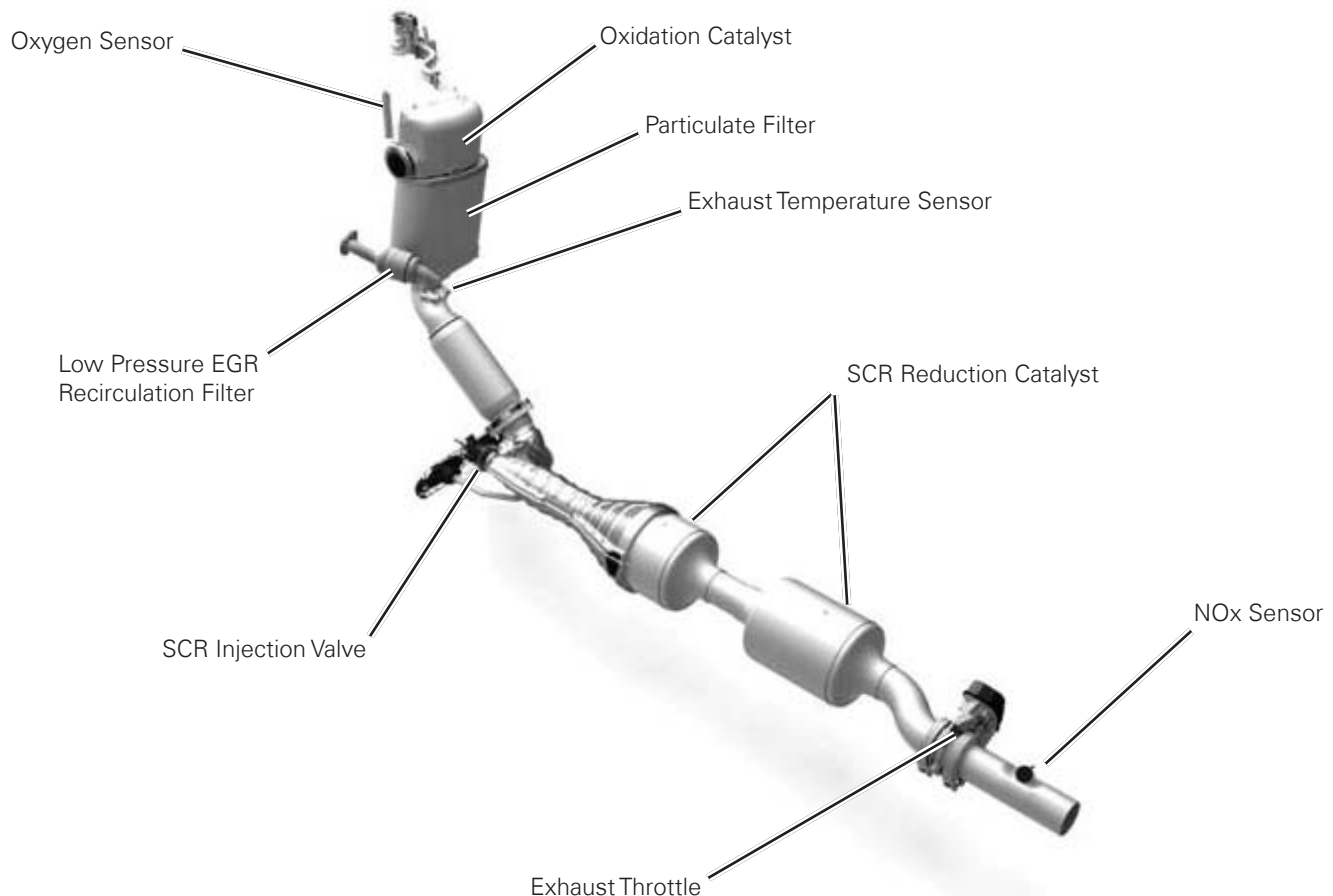
The 2012 Passat uses a Selective Catalyst Reduction (SCR) system for treatment of the exhaust gases. The system is very similar in components and function to the 2011 Touareg 3.0L TDI Engine.

When the exhaust gases exit the engine, they pass through the oxidation catalyst and diesel particulate filter. This component converts gases and traps the soot in the oil. The soot is burned off through regeneration cycles.

After exiting the oxidation catalyst/diesel particulate filter assembly, the gases are sprayed with a reduction agent (urea) using the SCR injection valve. The gases then enter the SCR reduction catalysts where the Nitrogen Oxide (NOx) emissions are reduced substantially.

A NOx sensor downstream of the SCR reduction catalysts monitors the effectiveness of the NOx reduction and is used to influence the amount of reduction agent used.

The exhaust throttle picture is not used for the SCR process. It is used for the low-pressure exhaust gas recirculation process. More information on the operation of the low pressure EGR can be found in the 2.0L CR TDI BIN5 SSP 826803.

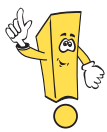
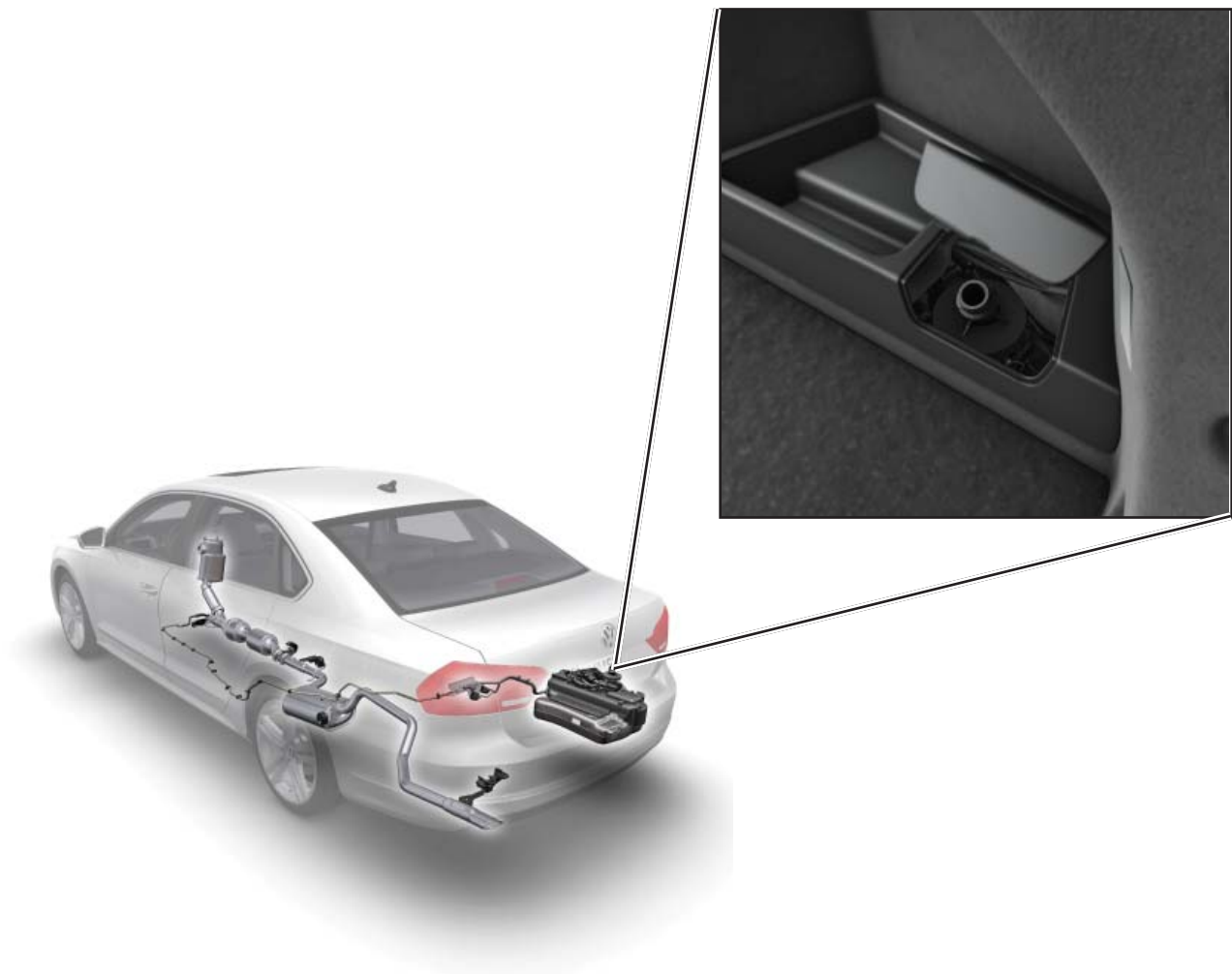


Engines

Selective Catalyst Reduction

A urea solution is injected into the exhaust stream to act as the catalyst for Selective Catalyst Reduction (SCR). This catalyst is stored in 18-liter (4.8 gallon) tank under the vehicle.

The catalyst is refilled by opening a cover located on the right side of the luggage compartment. It has a special adapter so only certain filler bottles or adapters can be used.

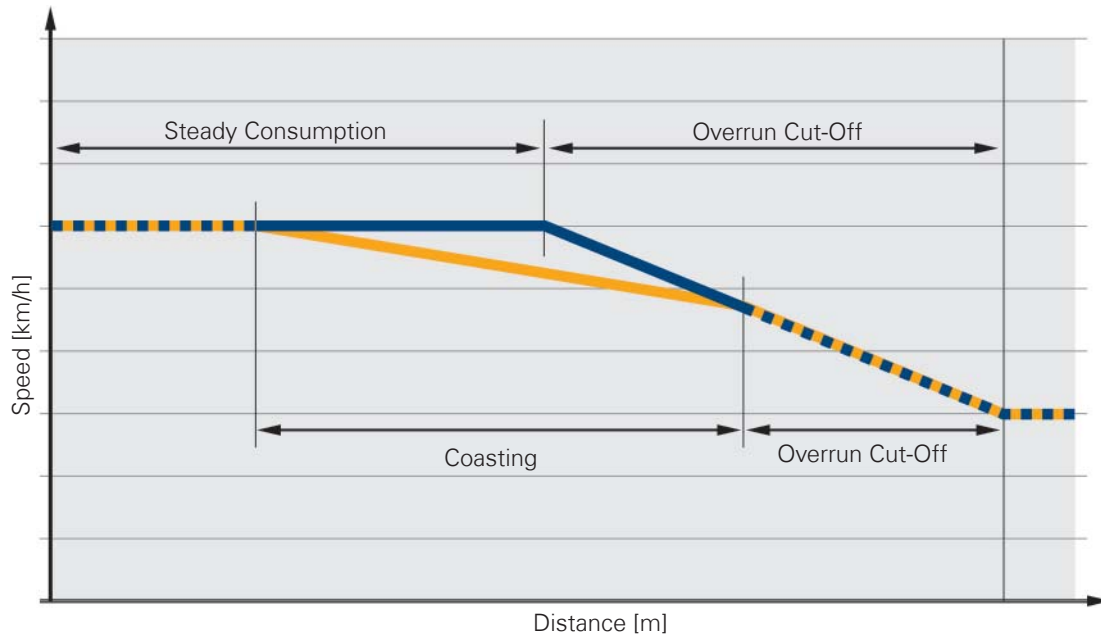


Detailed information about the SCR system can be found in the 3.0L Common-Rail TDI Engine 840193.

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Transmission

Dual Clutch Gearbox with Freewheel Function



S488_240

- Dual clutch transmission without freewheel function
- Dual clutch transmission with freewheel function

The 6-speed dual clutch transmission 02E in the 2012 Passat has a freewheel function.

The purpose of the freewheel function is to isolate the engine from the gearbox in overrun, opening the dual clutch. The engine turns at idling speed and the vehicle coasts without any engine braking effect. This freewheel function promotes fuel savings.

The freewheel function is only possible with the selector lever in the "D" position. If the selector lever is in the "S" position or in the tiptronic gate, or if the driver presses the brake, the freewheel function does not operate. The feature reactivates when the engine is placed under load again.



On dual clutch transmissions with freewheel function, the gear shift points with the selector lever in "S" are only marginally higher than those in the "D" position.

Overview of Transmissions

5-Speed Manual Transmission



- MQ250-5F 02S
- Based on the 0A4
- Longer shafts with additional bearings, additional gear pair, new longer housing lid made from aluminium
- No speedometer sender
- Torque capacity up to 250 Nm

6-Speed Manual Transmission



- MQ350-6F 02Q
- Based on the 02M transmission
- Changes to selector shaft, selector forks with stops in housing, modified bearings
- No speedometer sender
- Torque capacity up to 350 Nm

6-Speed Dual-Clutch Transmission



- DQ250-6F DSG 02E
- The 6-speed dual clutch transmission
- Hydraulic dual clutch
- High level of efficiency as well as sturdiness and sportiness of a manual transmission
- High level of comfort of an automatic gearbox during gear changes.

6-Speed Automatic Transmission



- 09G based on previous 09G/09M automatic transmission
- New Automatic Transmission Fluid (ATF) cannot be mixed with previous 09G/09M automatic transmission fluid. Always reference the correct part number in ETKA
- Redesigned valve body

Running Gear

Overview

The 2012 Passat offers the highest level of driving comfort because of its running gear configuration. The running gear is based on the running gear of the 2006 Passat.

- Lightweight McPherson Strut Front Suspension



- ESP/ABS TRW 450M

Running Gear



- Four-Link Rear Suspension

S488_027

- Tire Pressure Monitoring Using
ABS Signals

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Electrical System Overview

The 2012 Passat is equipped with state-of-the-art technology:

- KESSY with separate ignition and engine start button
- Control Module for Terminal and Engine Start Control System J942

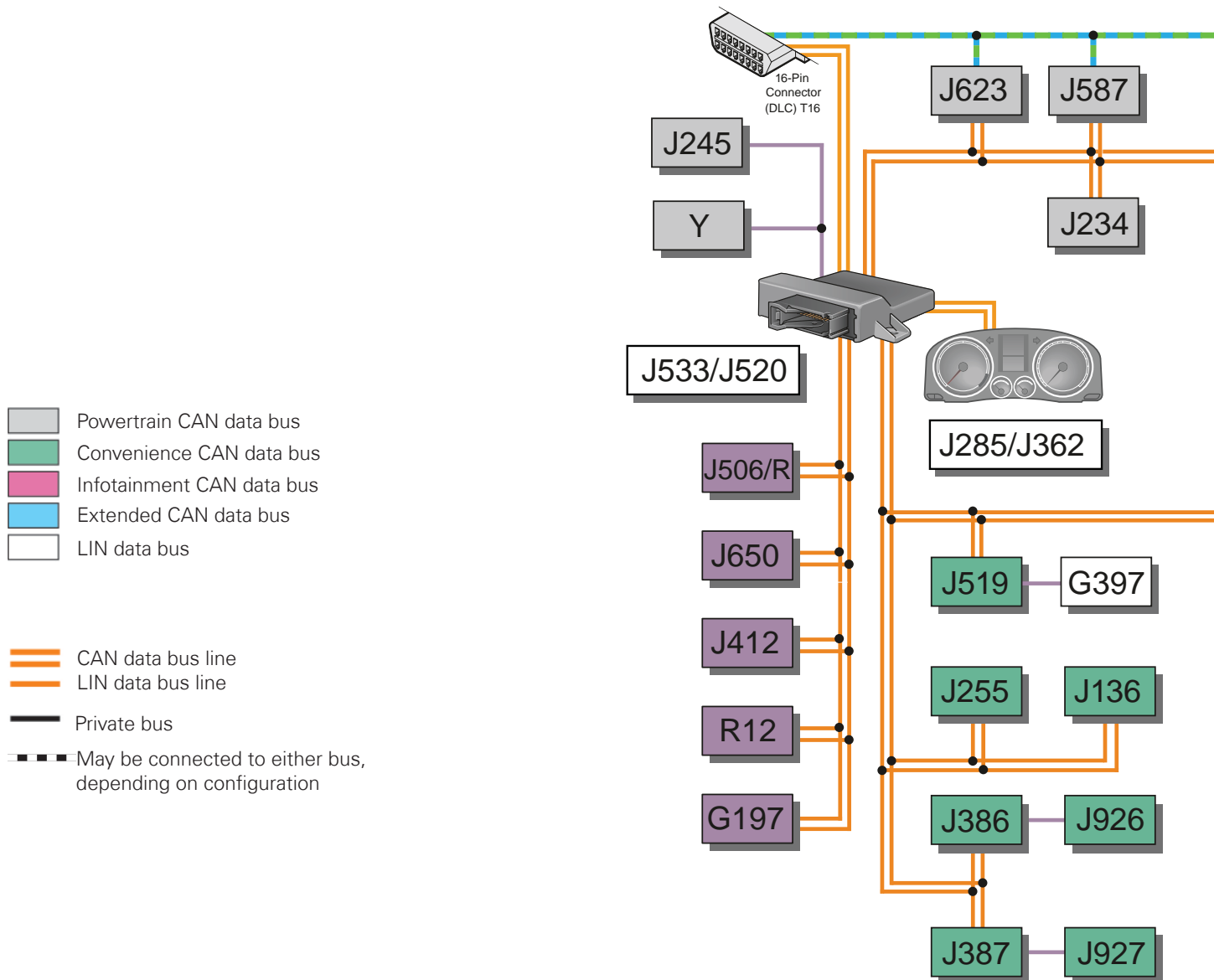


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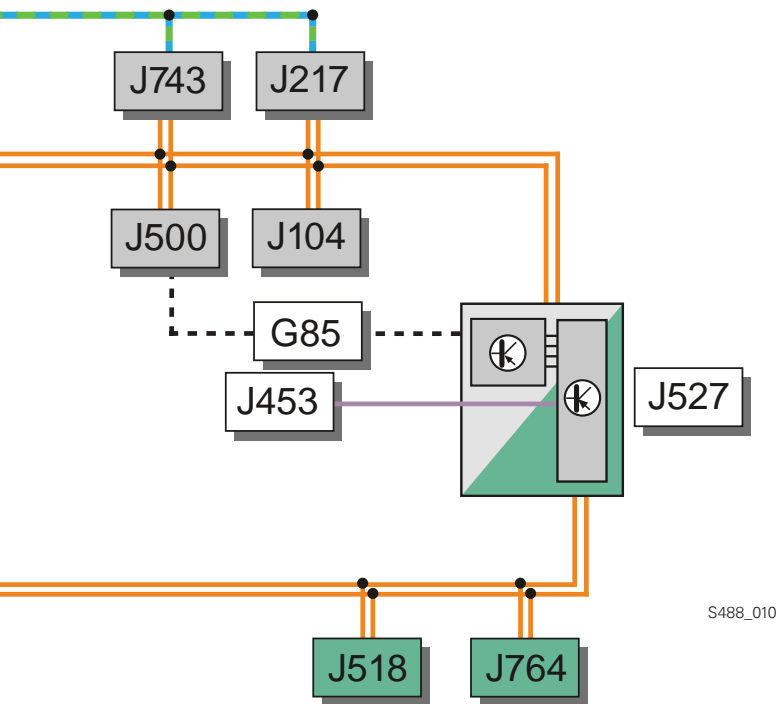
Electrical Systems

System Overview

The following diagram represents a fully-equipped 2012 Passat for the North American region.



Electrical Systems



Key

G85	Steering Angle Sensor
G197	Compass Magnetic Field Sensor
G397	Rain/Light Recognition Sensor
J104	ABS Control Module
J136	Memory Seat/Steering Column Adjustment Control Module
J217	Transmission Control Module
J234	Airbag Control Module
J245	Power Sunroof Control Module
J255	Climatronic Control Module
J285	Instrument Cluster Control Module
J362	Anti-theft Immobilizer System Control Module
J386	Driver Door Control Module
J387	Front Passenger Door Control Module
J412	Cell Phone Operating Electronics Control Module
J431	Headlamp Range Control Module
J453	Multifunction Steering Wheel Control Module
J500	Power Steering Control Module
J506/R	Control Module with TV/Radio/Navigation Display Unit
J518	Access/Start Authorization Control Module
J519	Vehicle Electrical System Control Module
J520	Vehicle Electrical System Control Module 2
J527	Steering Column Electronics Control Module
J533	Data Bus on Board Diagnostic Interface
J587	Selector Lever Sensor System Control Module
J623	Engine Control Module
J650	Multimedia System Control Module
J743	DSG Transmission Mechatronic
J764	Electronic Steering Column Lock Control Module
J926	Drivers Side Rear Door Control Module
J927	Front Passenger Side Rear Door Control Module
R12	Amplifier
Y	Analog Clock



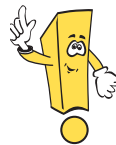
Not all control module combinations are available



Equipment will vary per model.

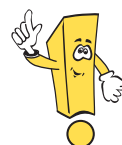
Radio, Navigation and Telephone

RCD 310



The radio capabilities are listed following the radio identification images.

RCD 510/Premium 8



The buttons displayed on these radios may change.

Radio, Navigation and Telephone

RNS 315



RNS 510



Radio, Navigation and Telephone

Feature	RCD 310	Premium 8	RNS 315	RNS 510
Optical Drive Type	CD	CD	CD	DVD
CD Changer Function	N/A	6-Disk Internal	N/A	Hard Drive
Color Display	N/A	6.5" 800 X 480 Pixel	5" 400 X 240 Pixel	6.5" 800 X 480 Pixel
Touch Screen	N/A	√	√	√
Car Menus (Climate Control, Optical Parking System)	N/A	√	√	√
MDI Compatible	√	√	N/A	√
Steering Wheel Control Compatible	√	√	Radio/Media/Phone	Radio/Media/Speech
Cluster Display Compatible	√	√	√	√
Display Vehicle Information (Climatronic, Park Distance Control)	N/A	√	√	√
Connection for Rearview Camera	N/A	√	√	√
Audio/Media	CD-Audio, MP3, WMA	CD-Audio, MP3, WMA	CD-Audio, MP3, WMA	CD-Audio, MP3, WMA
Video/DVD Playback	N/A	N/A	N/A	√
Diversity AM/FM Tuner	√	√	√	√
Sirius SDARS Tuner	Internal/Optional	Internal	Internal	Internal
CD Ripping	N/A	N/A	N/A	N/A
AUX-In	√	√	1 Front Included, 1 Back	√
External Amplifier Interface	√	√	√	√
External Media with No CD Changer	UHV NAR, BT Audio, MDI	UHV NAR+ (late intro), MDI	UHV NAR, BT Audio, MDI	UHV NAR/High+, BT Audio, MDI
Real-Time Traffic	N/A	N/A	N/A	√ Sirius
Home Destination (Direct Route Back to Home)	N/A	N/A	√	√
Map Display	N/A	N/A	2D and 2.5D Map	2D and 2.5D Map
Phone Support	Automatic Mute	Phone Book, Touchdial (late intro)	Handsfree, Touchdial, BT	Handsfree, Touchdial, BT

BT = Bluetooth

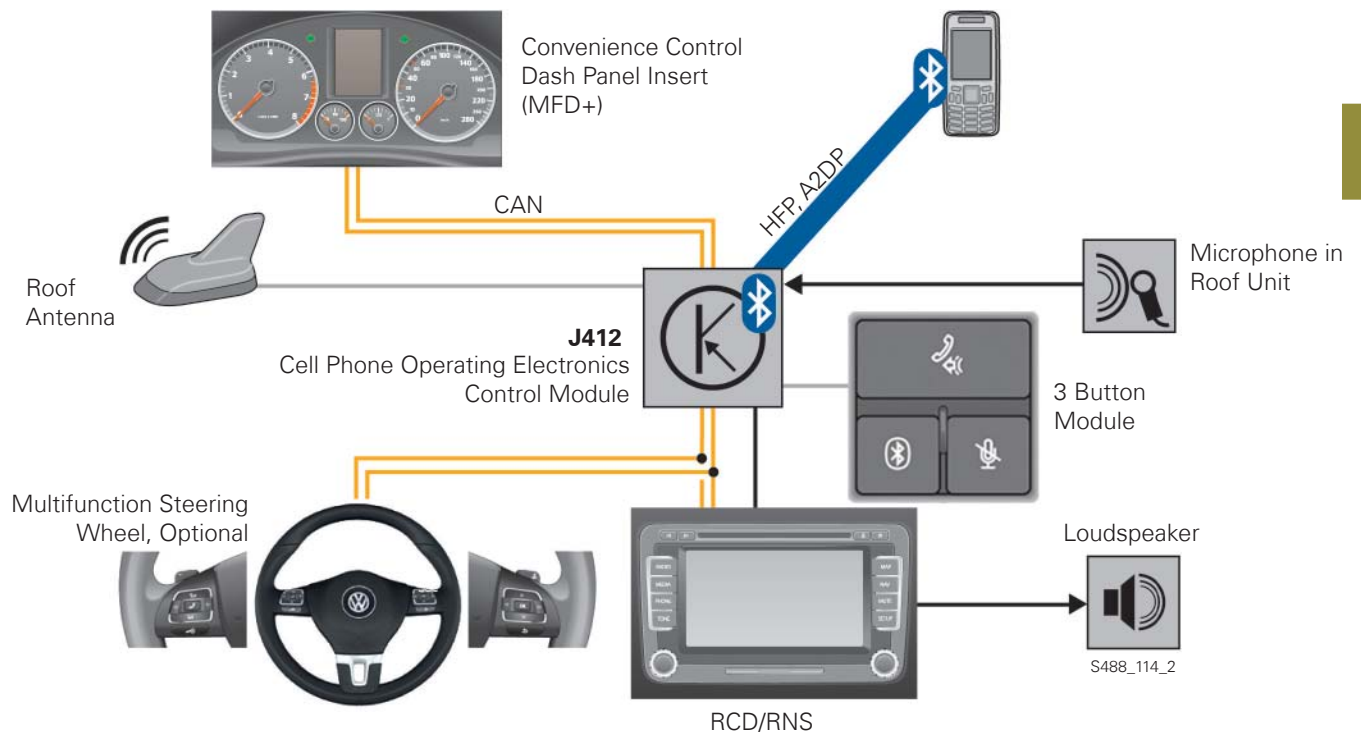
Radio, Navigation and Telephone

Universal Cellphone Preparation 9W7

Every 2012 Passat will be equipped with the 9W7 cellular phone preparation package. This allows for Bluetooth communication between certain Bluetooth-enabled phones and the Cell Phone Operating Electronics Control Module J412.

Function

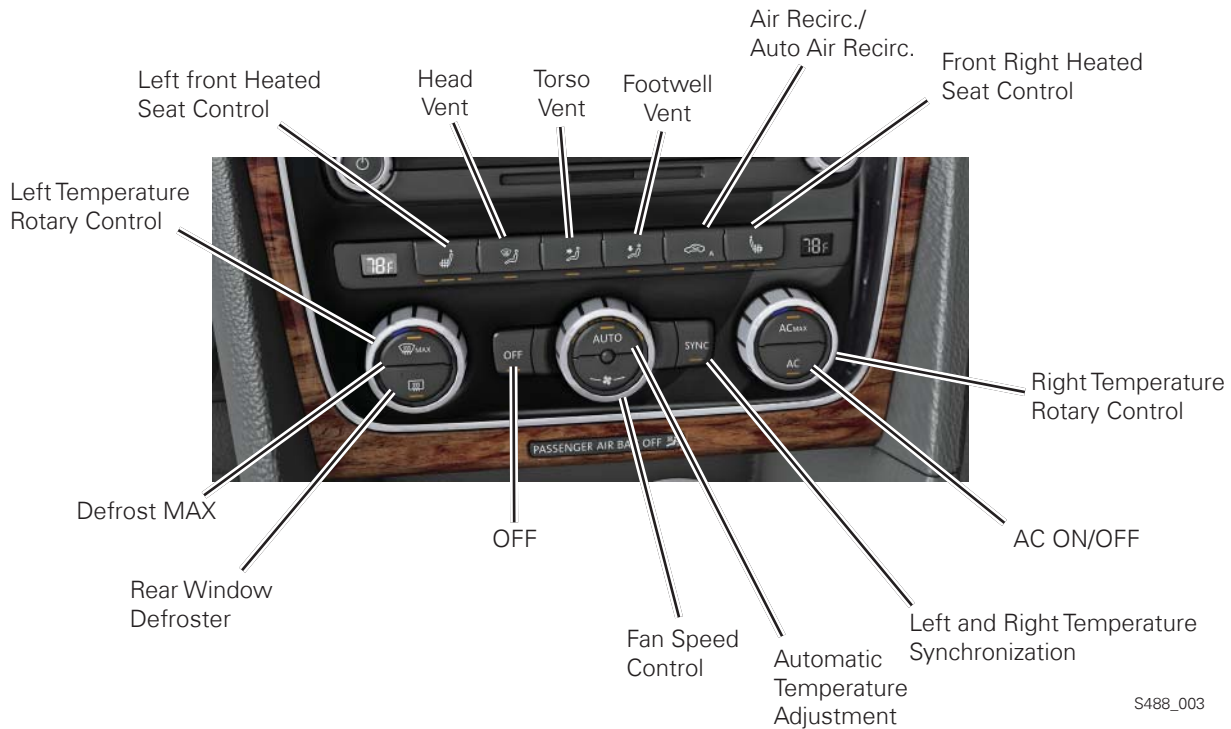
- Mobile phone operation using multifunction steering wheel buttons
- RNS 510, RCD 510 touch-screen control
- Telephone information audio
- Bluetooth integration
- Language muting
- Mobile telephone preparation diagnosis
- SIM data directory in the mobile telephone preparation



Heating and Air Conditioning

2-zone Climatronic

The 2-zone Climatronic features an AC unit with two temperature flaps that can be adjusted independently of each other. This allows the interior temperatures on the driver and front passenger sides to be selected separately.



S488_003

Operating and Display Unit

Depending on the set values and the environmental conditions, such as the outside temperature, the temperature, air quantity and air distribution are regulated automatically by the Climatronic system. Manual operation of the Climatronic system is still possible.

LEDs in the individual function buttons give feedback regarding the current settings of the selected functions. This information can be displayed as a popup in the radio and radio-navigation unit as well.

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Knowledge Assessment

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

The Knowledge Assessment may or may not be required for Certification.

You can find this Knowledge Assessment at:

www.vwwebservice.com

For Assistance, please call:

Volkswagen Academy

Certification Program Headquarters

1-877-791-4838

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

Or, E-mail:

concierge@volkswagenacademy.com



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