

# **The new Jetta**

## **Introduction**



**Self-Study Program**  
**Course Number 891403**



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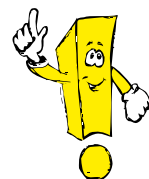
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This Self-Study Program covers the design and operation of the new Jetta!

**This Self-Study Program is not a Repair Manual. This information will not be updated.**

For testing, adjustment and repair procedures, always refer to the latest electronic service information.

**New!**



**Important/Note!**







## Course Introduction

The new Jetta continues its success story of the past 30 years. The new Jetta introduces new features that combine appearance with comfort and modern technology, resulting in a vehicle that provides the ultimate value in its class. Attention to detail, increased horsepower, added safety features and subtle quality improvements set the new Jetta apart from the competition.

The new Jetta is built at Volkswagen's Puebla, Mexico plant. This plant began operation in 1964, manufacturing the old style Beetle. Currently, the Puebla plant employs approximately 14,000 people and also produces the New Beetle, among other vehicles.

New Jetta features include:

- Elegant design
- Superior quality
- Excellent handling dynamics
- Comprehensive safety package
- Innovative drivetrain technology
- Improved economy
- Spacious interior
- Customer focused innovations



Additional self-study programs relating to the new Jetta include:

- SSP 851503: 6-Speed Automatic Transmission 09G/09K/09M
- SSP 851403: The Direct Shift Gearbox 02E
- SSP 892403: The Electro-Mechanical Power-Assisted Steering
- SSP 873403: The new Jetta–Electrical System Design and Function
- SSP 861403: The new Jetta–Steering and Suspension

# Introduction

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## The New Jetta

The new Jetta sets new standards for its class in many areas, including:

- Safety
- Quality
- Design
- Handling
- Roominess
- Drivetrain
- Premium sound system
- Many storage locations such as the overhead console
- Electro-mechanical power steering
- 2.5L 150 HP 5-Cylinder Engine with 4-Valves per Cylinder
- Optional Bi-Xenon headlights
- ABS/ESP MK 60



## Other Features

- Rain sensing windshield wipers
- Optional rear distance warning system



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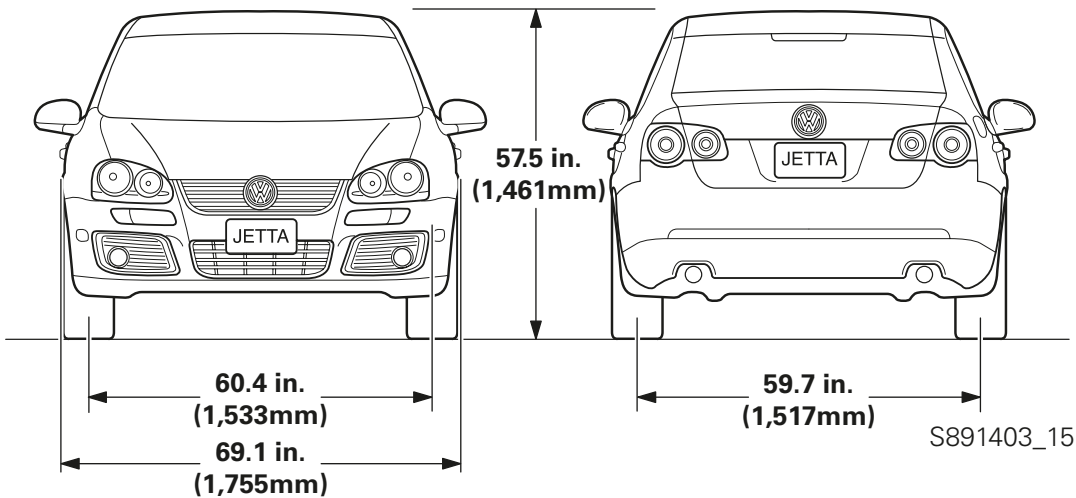
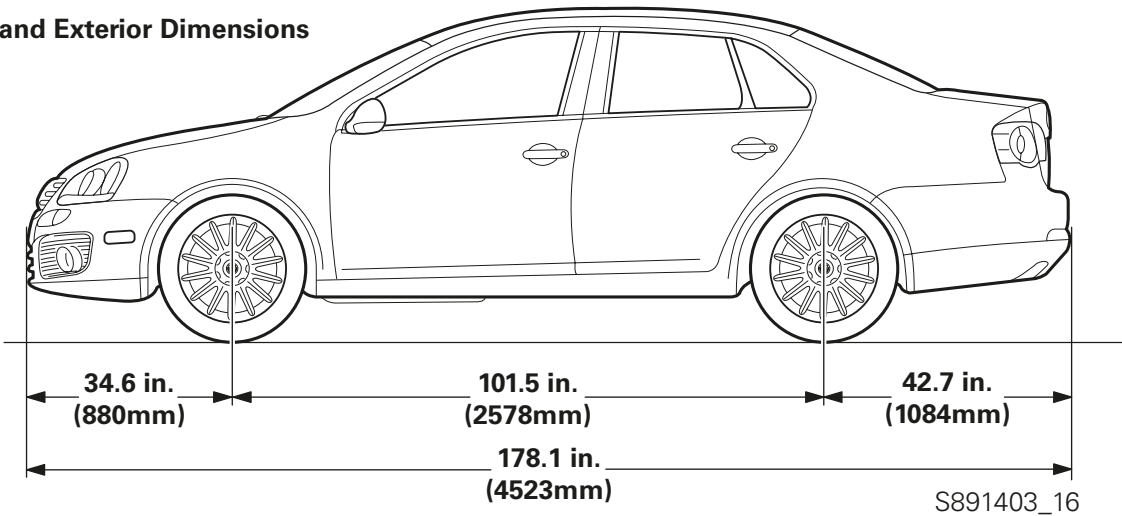
- Dual zone climate control
- Two piece tail light design
- Four link independent suspension
- Customer personalization via the multi-function indicator (MFI) switch lever

# Introduction

## Technical Specifications

The figure shows the dimensions of the front-wheel drive new Jetta.

## Weights and Exterior Dimensions



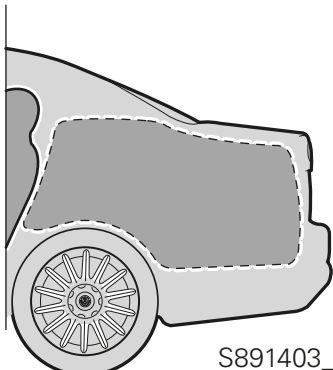
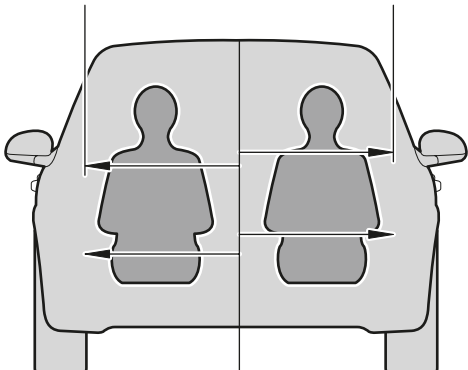
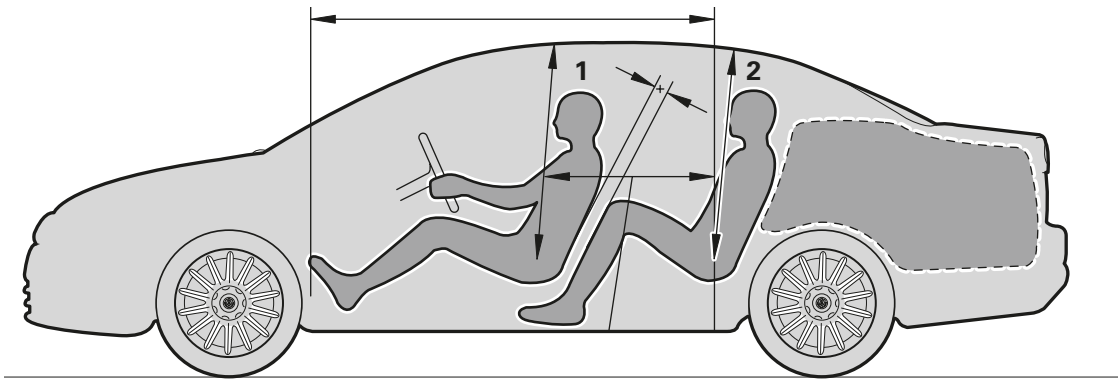
Length	178.1 in. (4,523mm)
Width	69.1 in. (1,755mm)
Height	57.5 in. (1,461mm)
Wheelbase	101.5 in. (2,578mm)

S891403\_01

Front track width	60.4 in. (1,533mm)
Rear track width	59.7 in. (1,517mm)
Maximum weight	4,057 to 4,321 lb.* (1,840 to 1,960 kg)
Empty weight	3,016 to 3,331 lb.* (1,368 to 1,511 kg)

\*varies depending on model  
S891403\_02

## Interior Dimensions



S891403\_12

1 Front seat headroom	37.4 to 38.4 in. (949 to 975mm)
2 Back seat headroom	37.0 to 37.2 in. (941 to 945mm)

\*varies depending on model  
S891403\_03

# Body

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## Chassis Construction

### Static and Dynamic Rigidity

The new Jetta sets new standards for static and dynamic rigidity by the application of lightweight design principles.

Fenders, doors and side panels are all made of high strength steel.

### Laser Weld Technology

The assembly plant in Puebla, Mexico makes extensive use of laser welding technology to produce the new Jetta chassis. The increased use of laser welds has resulted in significant improvements in chassis strength and rigidity.

Laser weld technology not only improves manufacturing efficiency, it also improves the quality of the chassis by increasing the welded surface while reducing the deformation of the sheet metal caused by the necessary heat and pressure of previous welding methods.



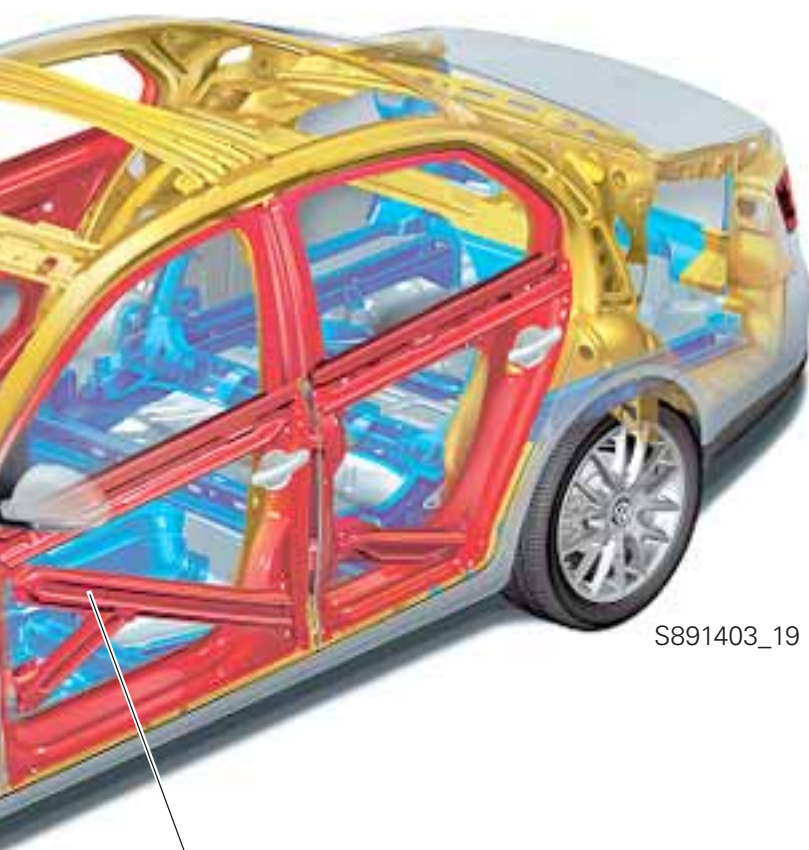
**Key:**

- Red = Side Impact Zone
- Yellow = Occupant Cell
- Blue = Frame Structure



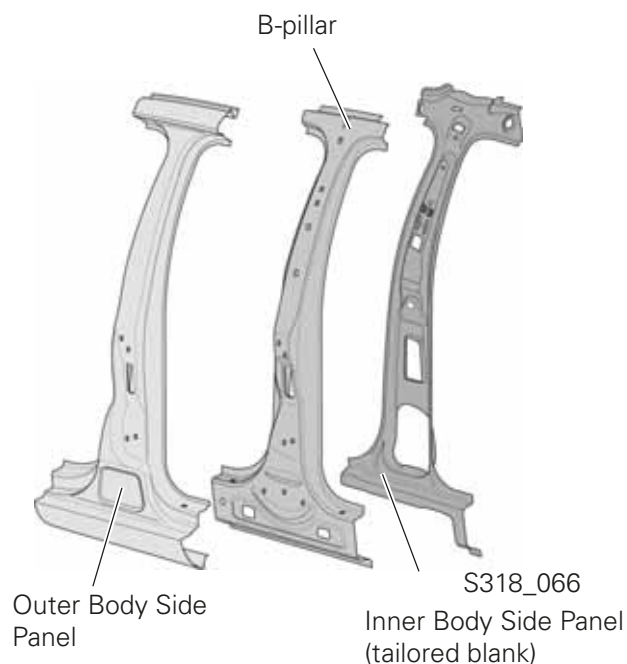
## B-pillar

The new Jetta's B-pillar consists of three hot formed panels that provide improved passenger protection in the event of a side-impact collision.



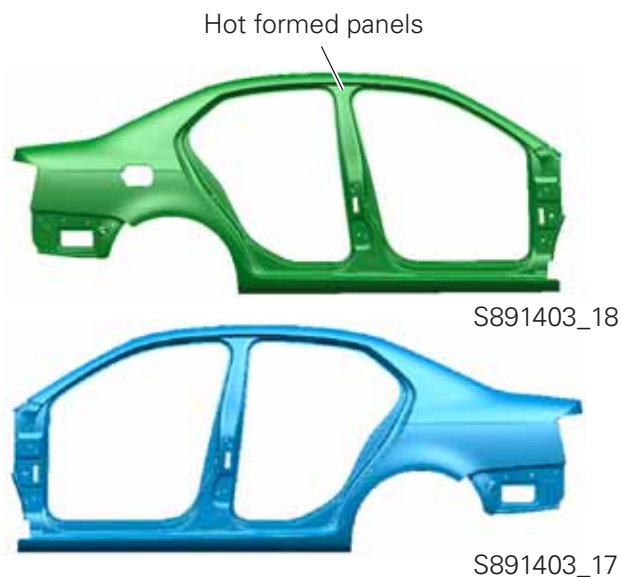
S891403\_19

Additional side impact protection in doors



## Hot Formed Panels

The B-pillar and adjacent portion of the body in the direction of the A-pillar are heat treated during the forming process to increase strength. These hot formed panels are stronger and weigh less than the panels on previous models.

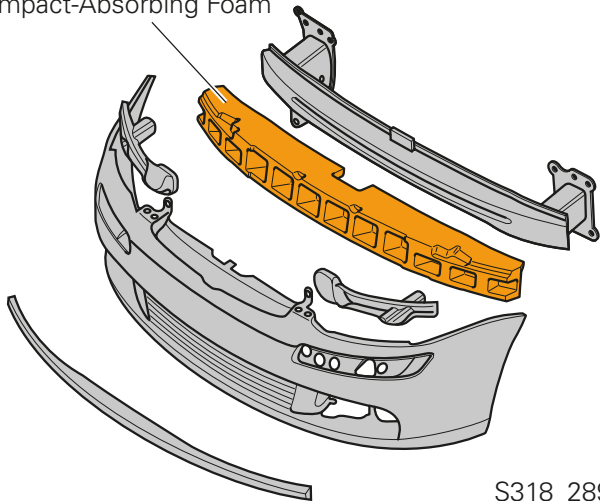


# Body

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## Exterior Parts

Impact-Absorbing Foam



S318\_289

## Front Bumper

By integrating an impact-absorbing foam element into the front bumper behind the front spoiler, the risk of injury to pedestrians is reduced. This deformable foam element allows compression of the front bumper during impact.

## Headlights

The Jetta headlights feature clear plastic. The turn signals are located below the low and high beam headlights to improve their visibility to other drivers.

Bi-Xenon headlights are available as an option on some models.



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## Exterior Rearview Mirrors

Turn signals are integral to the exterior rearview mirrors.



S891403\_117

## Tail Lights

The new Jetta has two-part tail lights.



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# Body

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## Windows

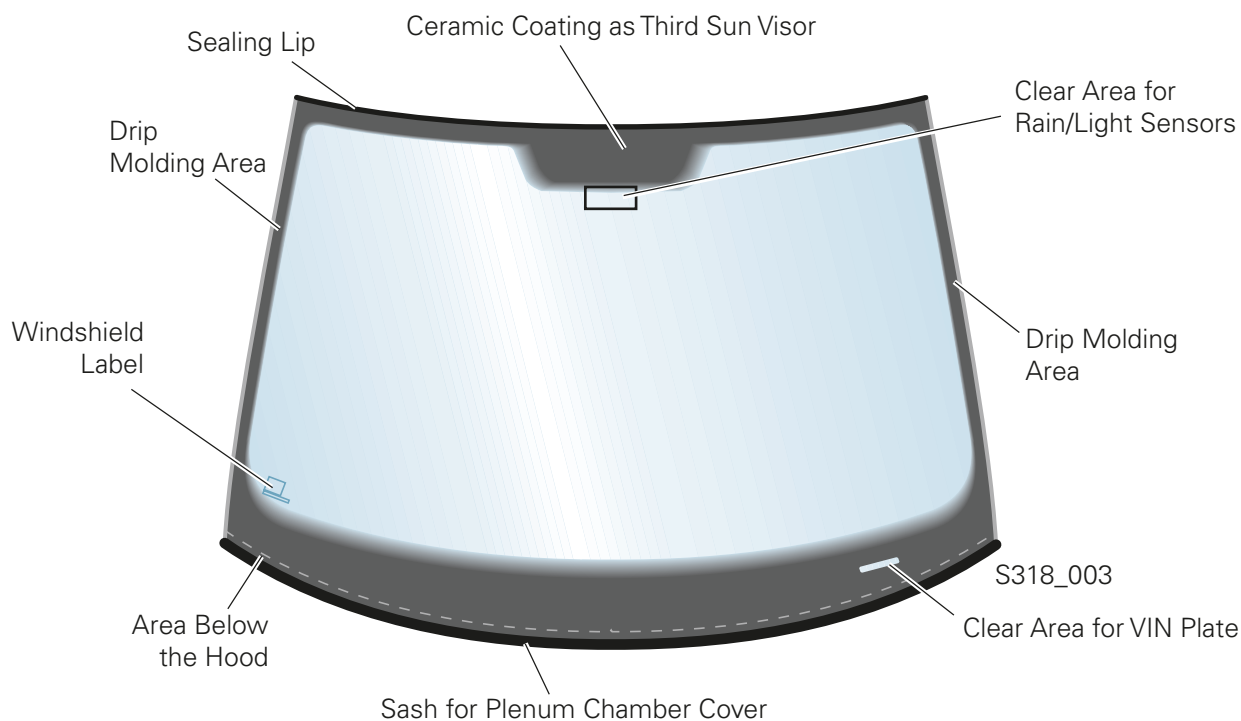
The windows on the new Jetta are green-tinted glass (blue-tinted glass will be available at a later date). The thickness of the window glass depends on its location: the windshield is .17 inches (4.4mm), the front side windows are .14 inches (3.5mm) and all other windows are .12 inches (3.15mm). All fixed windows are bonded to the body.

## Windshield

The windshield is available with an infrared-reflective metal vapor deposition coating. This coating reflects most of the sun's heat generating infrared rays. Conventional reflective glass shields a vehicle's interior from far less solar radiation by absorption.



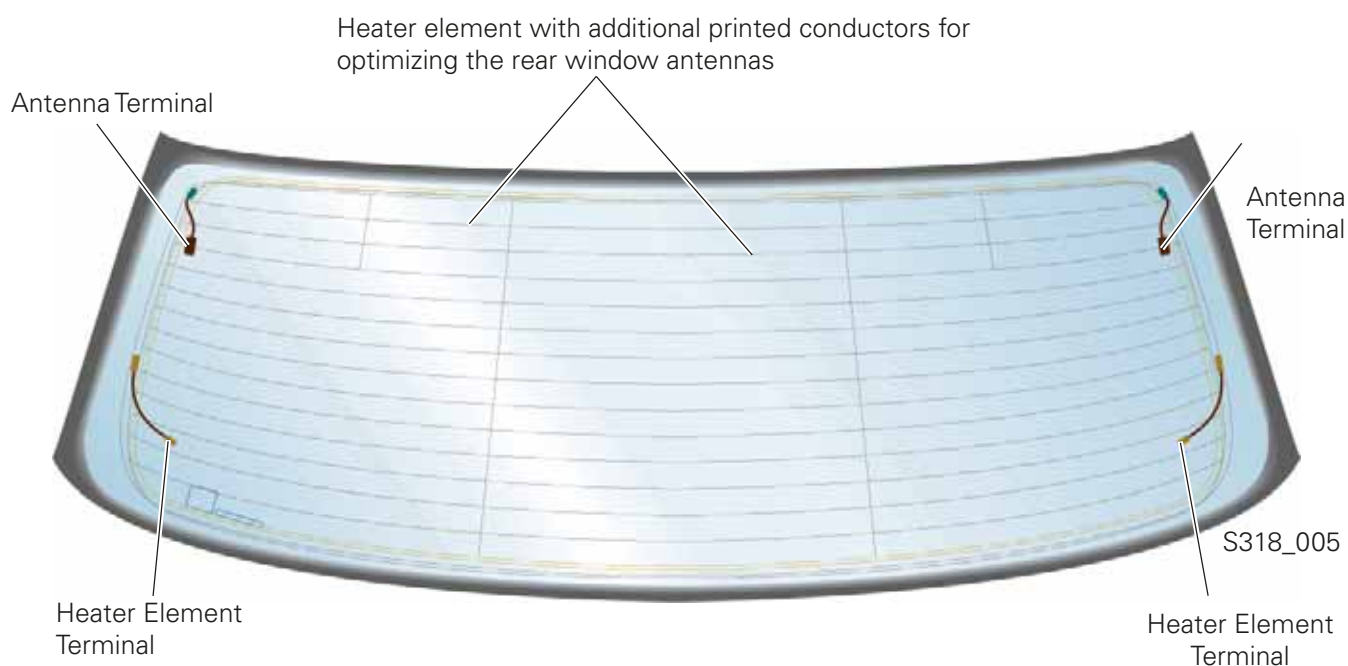
Always set the windshield on its side. Otherwise, the sash at the bottom and/or the sealing lip at the top can become damaged.



## Rear Window

Rear windows are produced with integral diversity antennas. Diversity antennas connect to the diversity switching box by two terminals on the window.

Signals are relayed simultaneously from these terminals to the radio and the diversity switching box. Using both antenna signals significantly reduces interference.



Be sure to order the correct rear window when replacing to assure all electrical terminals are present.

# Body

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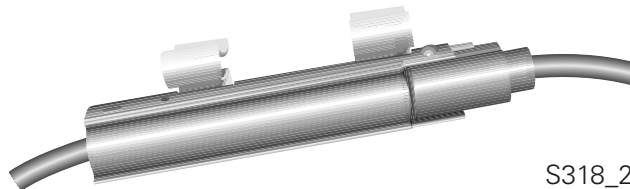
## Hood Latch Cable

The hood latch cable (bowden cable) for releasing the hood latch from inside the passenger compartment is located in a protected area in the engine compartment. The hood latch cable disconnect point is located under the hood behind the driver side headlight assembly. This allows front end service without removing the cable from the vehicles interior.



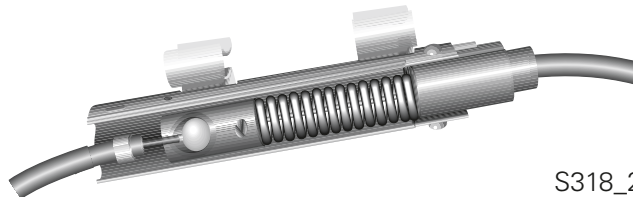
S891403\_47

Disconnect point (closed)



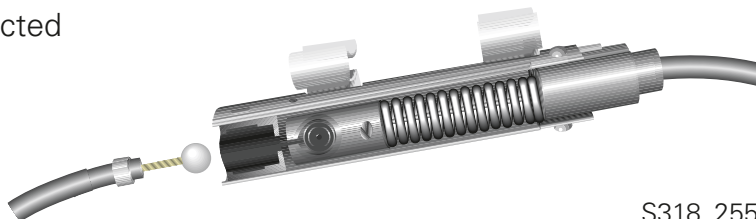
S318\_251

Disconnect point (open)



S318\_253

Bowden cable disconnected



S318\_255

## Emergency Release Mechanism

Removing the interior trunk trim allows access to the locking linkage for emergency release of the trunk.



# Body

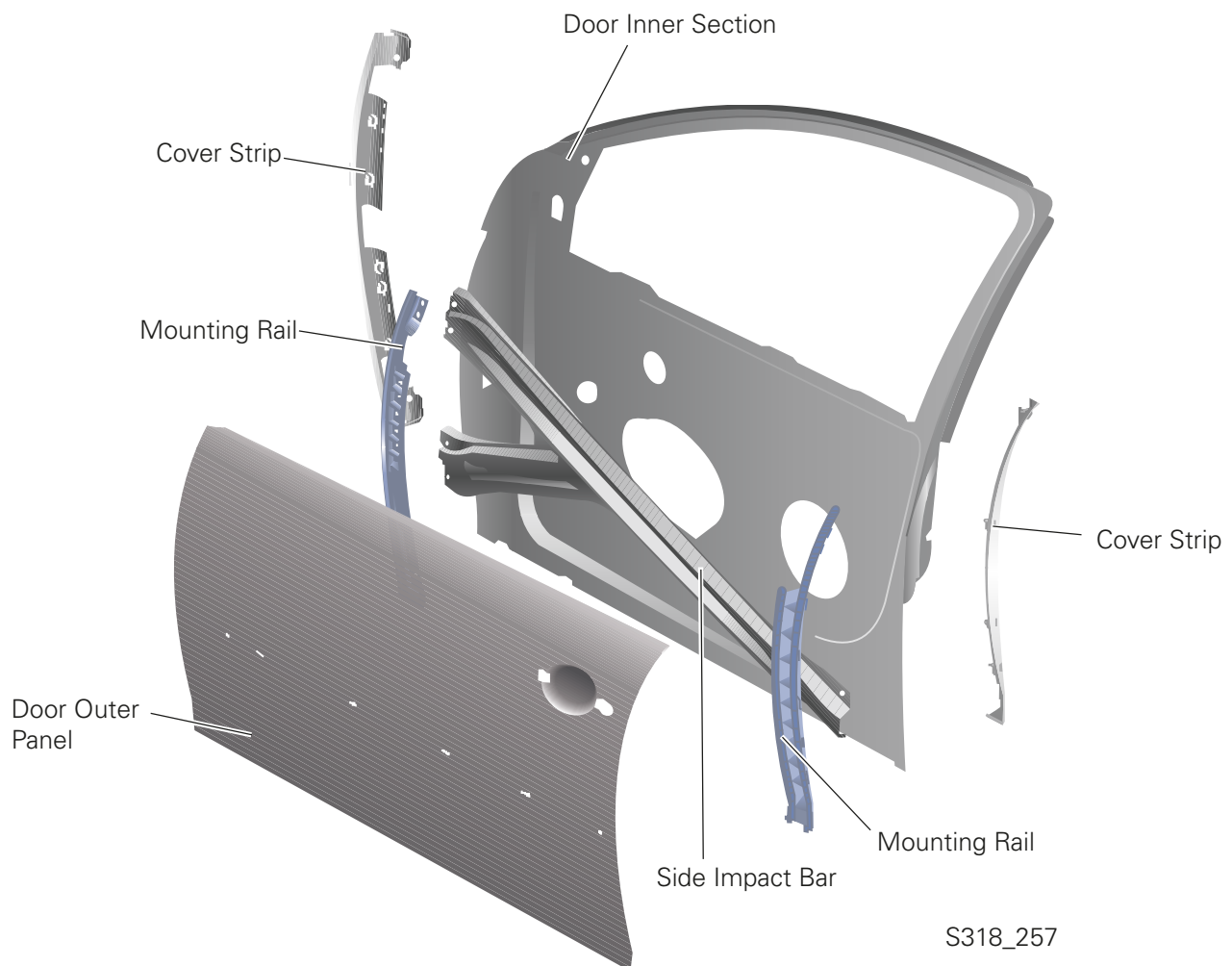
## New Door Design

The doors on the new Jetta consist of an outer panel with two mounting rails and an inner section for mounting hardware. The door's outer panel is bonded to the mounting rails that are bolted to the inner section.

Removal of the outer door panel allows access to some of the door's inner hardware and electronics, the window motor is accessed through the inside. Also, in the event of door damage, the outer panel can be removed for repair or replacement.



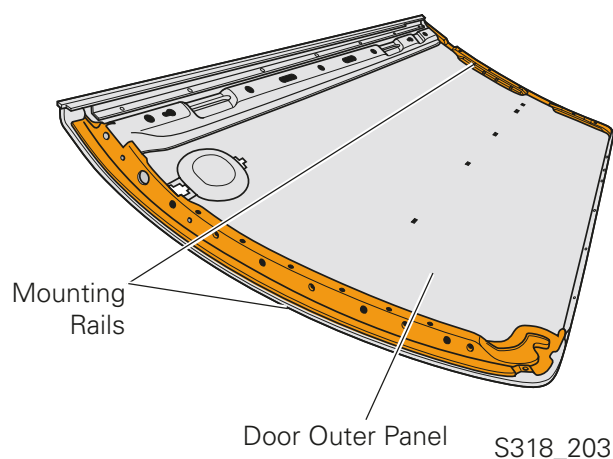
Check the current service repair information for instructions on outer door panel removal.



S318\_257

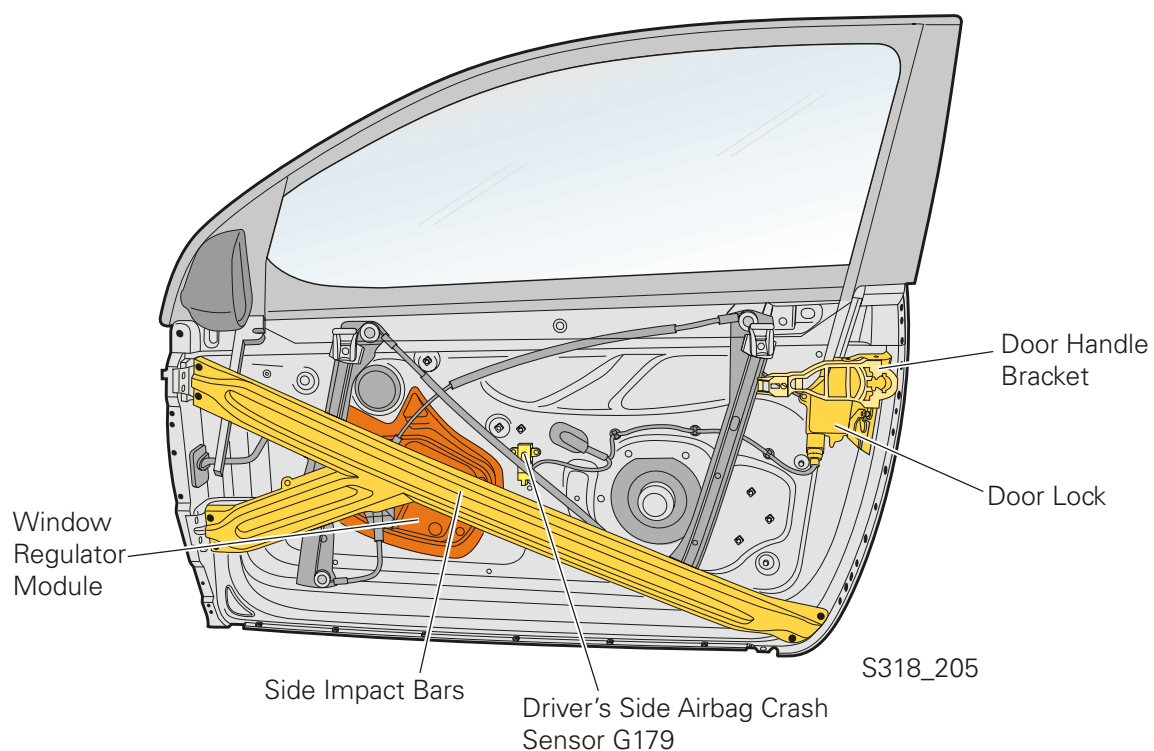
## Mounting Rails

The mounting rails are permanently bonded to the outer panel with adhesive. This ensures an accurate fit when the outer panel is bolted to the door's inner section.



## Internal Door Components

Removing the outer panel allows easy access to the side impact bars, door handle bracket, door lock, side airbag crash sensor and the window regulator module.





# Body

## Seat Design Features

### Front Seats

The front seats on the new Jetta are equipped with an active head restraint system. Options include: a mechanical 2-way lumbar support or an electrical 4-way lumbar support.

The active head restraint system is a mechanical system that moves the driver and passenger head restraints upward and forward in the event of a rear end collision.



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1. Through-Loading Front Passenger Seat
2. Rear Loading Door
3. Active Head Restraints
4. 4-Way Lumbar Support
5. Power Backrest
6. Complete Power Seat, Optional



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Power Backrest      Height Adjustment



S891403\_119

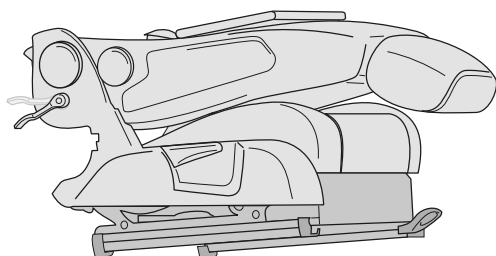
4-Way Lumbar Support



S318\_060



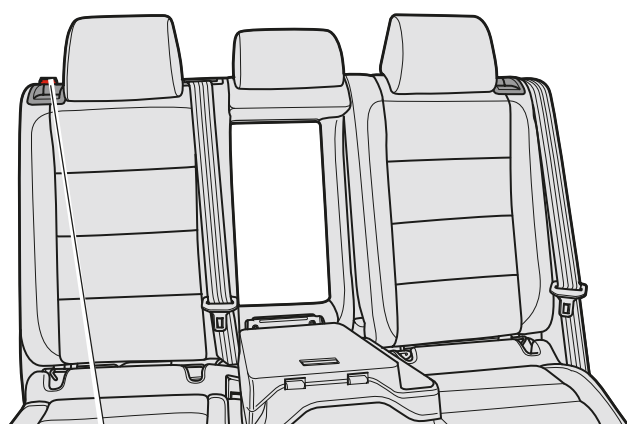
An optional feature of the front passenger seat allows it to be folded flat for loading and hauling of long items by using the full length of the interior.



S318\_101

## Rear Seats

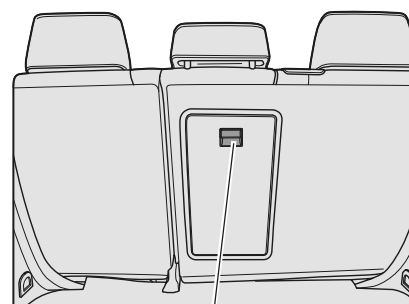
The rear seat cushion extends across the full width of the interior. The backrest is split 60/40 and can be folded down. The backrests lock using a rotary latch. A red indicator shows if the backrests are locked or not.



S318\_207

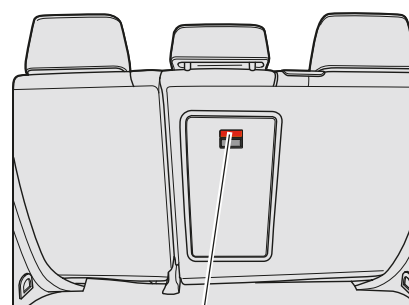
A red indicator showing means that the backrest is not locked in position.

On vehicles equipped with the pass-through option for the rear seat, the armrest and the door located behind it can be folded forward to allow transport of long items such as skis or golf bags.



S318\_209

The pass-through door is locked in position.



S318\_211

A red indicator showing means that the pass-through door is not locked in position.

# Body

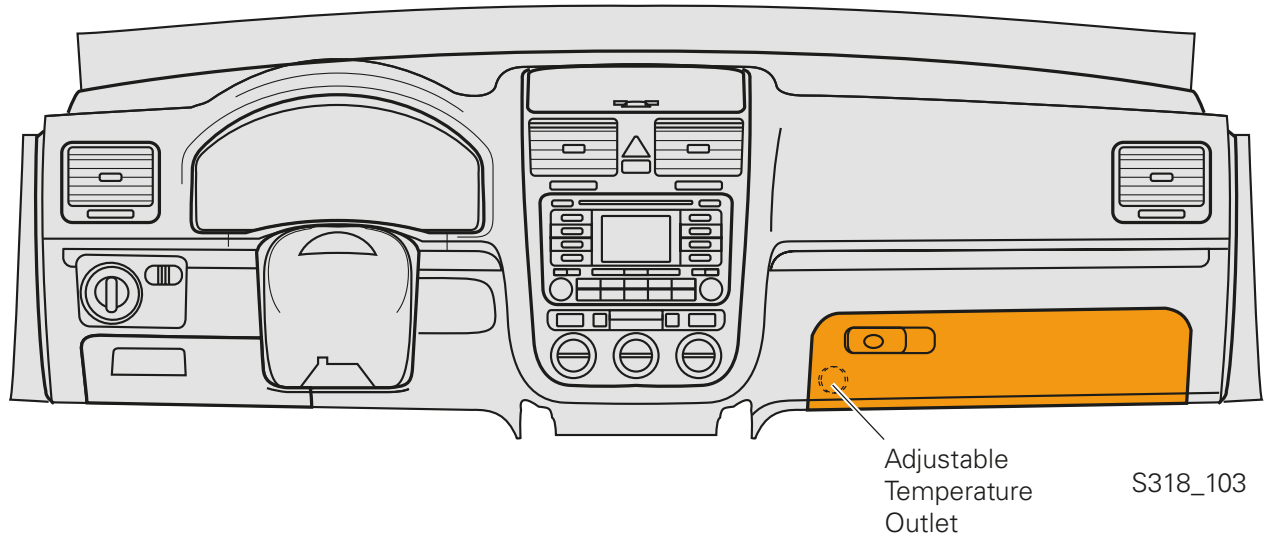
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## Storage Areas

The new Jetta features numerous convenient storage areas.

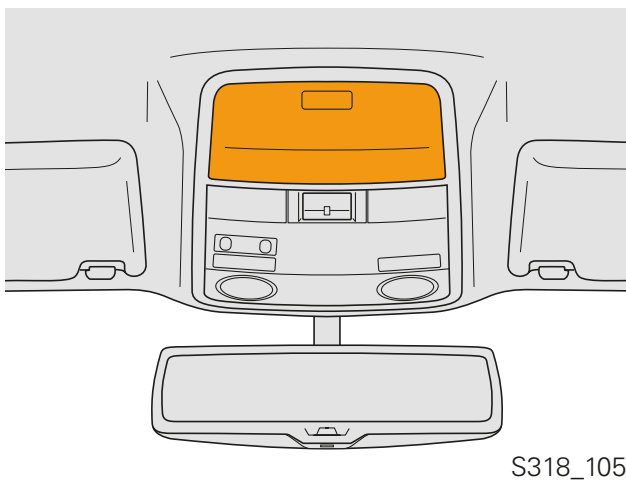
## Front Storage

Vehicles equipped with air conditioning can cool the front passenger side storage compartment.



## Overhead Storage

There is a standard open storage compartment in the overhead console of the new Jetta.



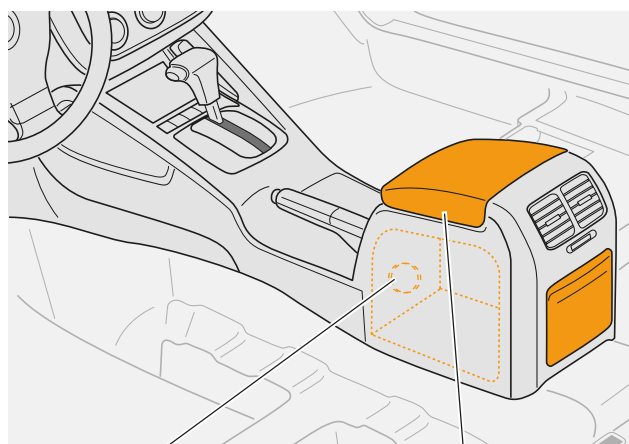
## Door Storage

Storage compartments, and a cup holder for 1.6 quart (1.5 liter) bottles are located in the door panels.



## Center Console Storage

A new Jetta storage option includes an air-conditioned storage compartment in the center console and fold-out cup holders for the rear seats.



Adjustable  
Temperature  
Outlet

Storage  
Compartment  
Door

S318\_081

Rear Vent



S318\_155

Rear Fold-Out  
Cup Holder

## Trunk Storage

A sliding cover provides access to a side compartment for storing small objects. Removal of the sliding cover allows parallel storage of larger items such as a golf bag.



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## Spare Tire Area Storage

The new Jetta is equipped with a full-size emergency spare tire. There are additional storage areas near the spare tire location.

# Passenger Safety

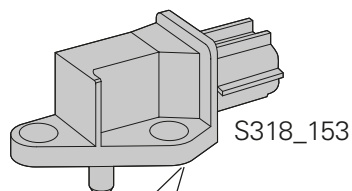
## Overview

The new Jetta provides the following protection systems/devices.

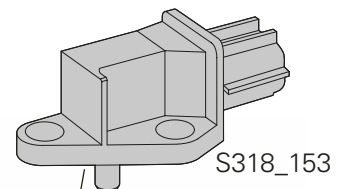
Standard protection equipment includes:

- Driver and front passenger two-stage airbags
- Front seat side airbags
- Front to rear (curtain) airbags
- 3-point seat belts on all seats
- Front seat belt tensioners and belt force limiters
- Front seat active head restraint system.

Two Longitudinal Acceleration Sensors (Early Crash Sensors) G251, located in the front of the vehicle, detect impact and impact intensity.



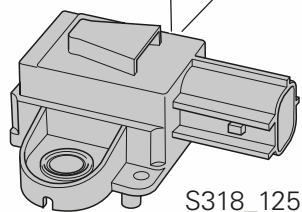
Side Curtain Airbag with Gas Distributor Tube



Lateral acceleration sensors, located in the rear wheel housing, detect side impacts.

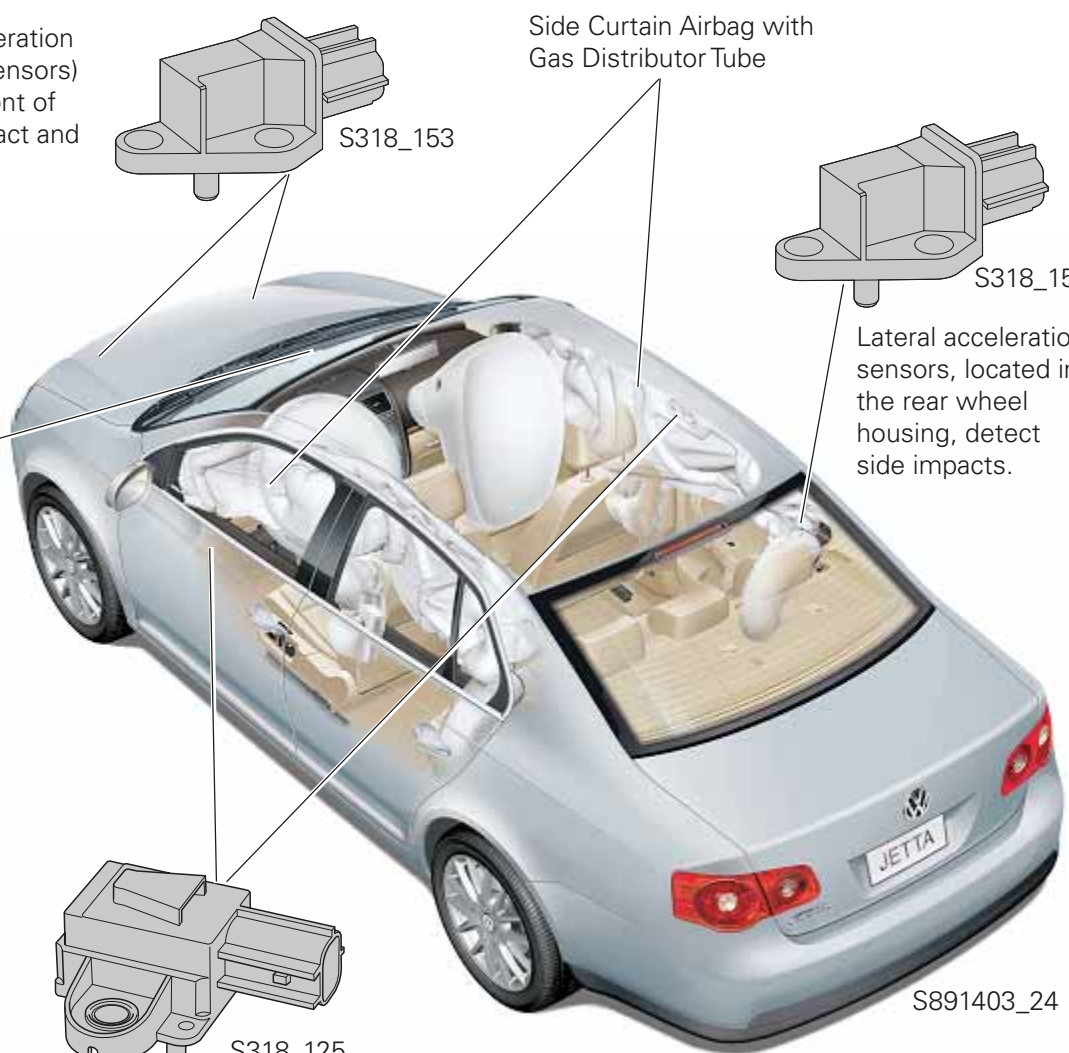
Airbag Control Module J234 receives data from the sensors and controls airbag deployment.

Pressure Sensors G179 and G180 in the front doors detect sudden changes in air pressure during a side impact.



Optional protection equipment includes:

- Rear passenger side airbags in combination with pyrotechnic belt tensioners and belt force limiters on the outer rear seats.



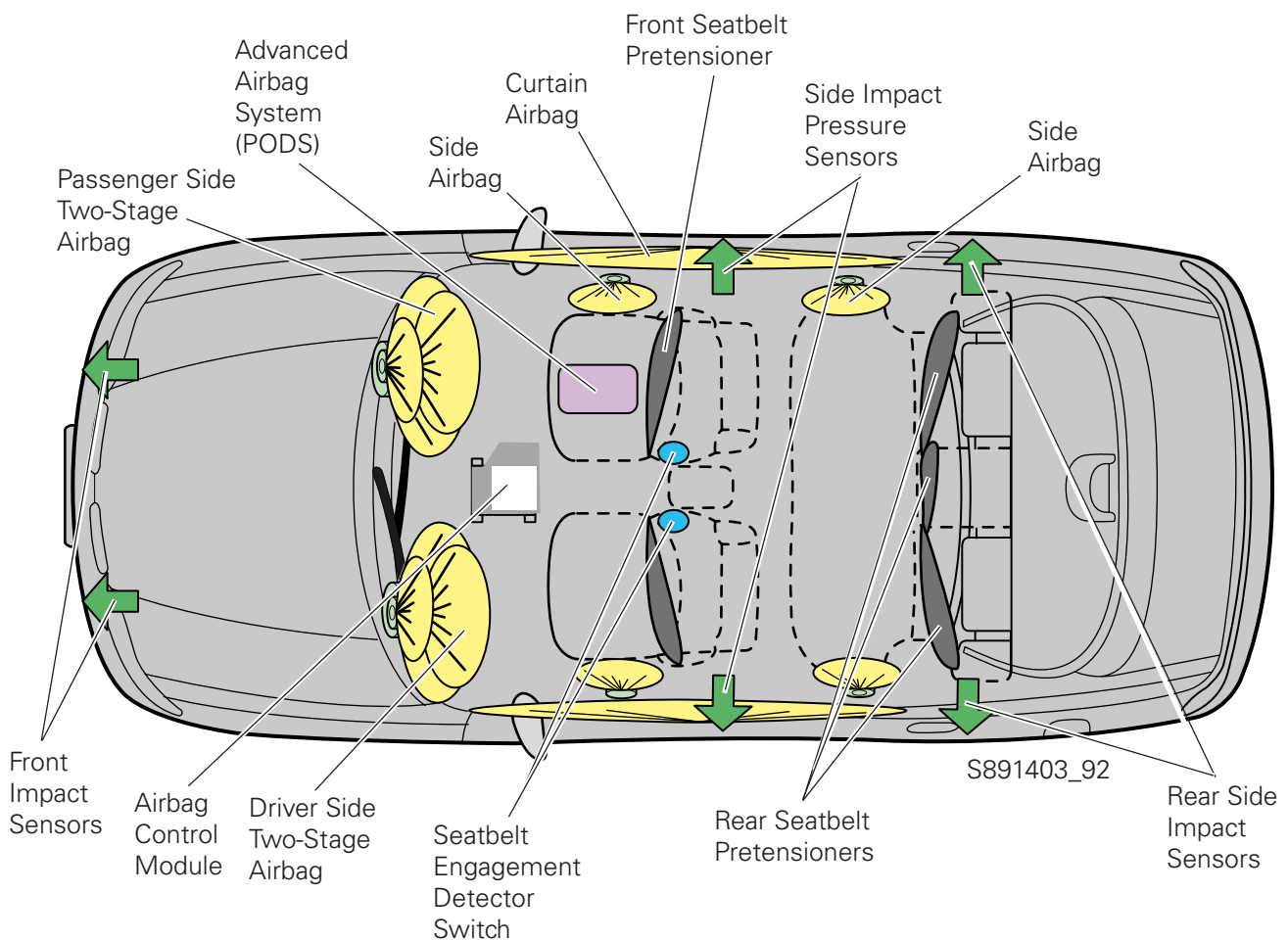
S891403\_24

# Passenger Safety

The driver and passenger airbags provide two-stage deployment. The front passenger airbag is activated or deactivated automatically via the Advanced Airbag System.

Side curtain airbags cover the window area from the A-pillar to the C-pillar. In the event of a crash, a pressurized gas cylinder provides uniform inflation of the curtain airbags.

The rear outer seats are equipped with child seat anchors as standard equipment.



# Passenger Safety

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## Two-Stage Airbags

The airbag system reacts to unique crash conditions by deploying the driver side and passenger side airbags in two stages.



S891403\_95

## Advanced Airbag System (PODS)

The new Jetta is equipped with the Advanced Airbag System. This system is a standard feature for the front passenger seat. Based on occupant weight and seatbelt tension, the system signals the control module to deploy the airbag. In a slow speed collision, the two-stage airbag and the Advanced Airbag System work together. Both stages of the airbag will deploy, but the timing between the deployments may change due to the front passenger weight. This provides the best protection for a small adult. The "Passenger Airbag OFF" light is illuminated when the passenger seat is unoccupied.



S891403\_96

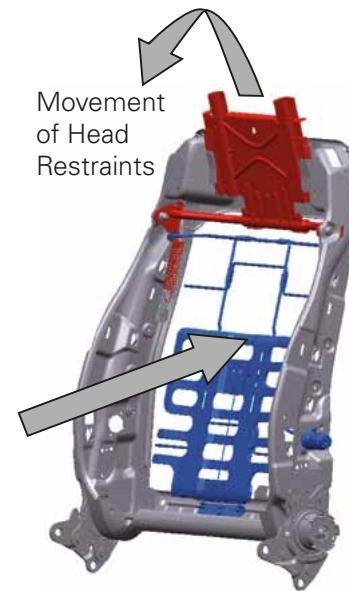
**PASSENGER  
AIR BAG OFF**

S891403\_97



## Active Front Seat Head Restraints

The new Jetta is equipped with active head restraints on the front seats. During a collision, as the occupant is pressed back into the seat, the head restraint is activated and moves forward and down to minimize head and neck injuries. At the same time that the head restraint is activated, the lumbar support moves forward to provide additional protection from injury. This is a completely mechanical system that requires no electronics.



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# Passenger Safety

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## Rear Side (Head) Airbags

These airbags are available as an option for the outer rear seats. They are located in the side bolsters.

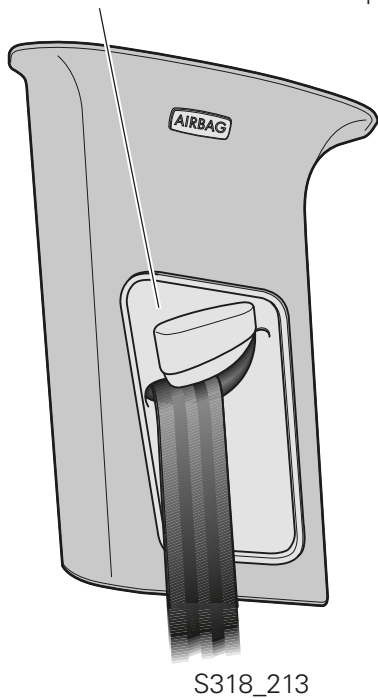
## Seat Belts

The front seatbelts are equipped with pyrotechnic tensioners and belt force limiters. The front seatbelts also have adjustable belt guides to improve passenger comfort.

The rear outer seats on vehicles equipped with rear side airbags also have pyrotechnic belt tensioners and belt force limiters. The retractors are attached to the body to improve passenger shoulder comfort.

The rear center seat has a three-point seatbelt with a retractor integrated in the backrest.

The driver side seatbelt is located in the B-pillar.





## Side Airbag Crash Sensors

The Driver Side Airbag Crash Sensor G179 and the Front Passenger Side Airbag Crash Sensor G180 replace the conventional acceleration sensors for side impact detection.

These new pressure sensors provide faster detection of side impacts in the door area.

### Sensor Function

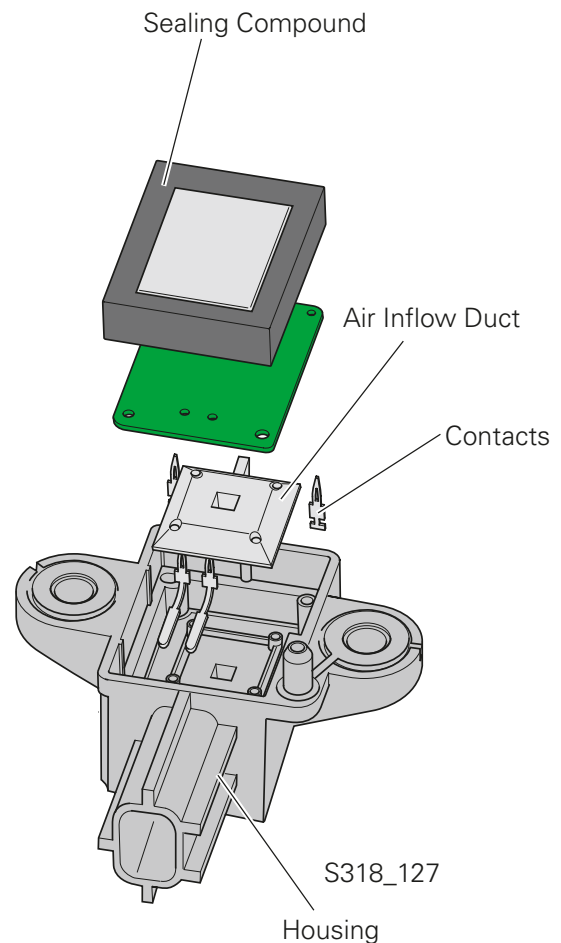
The side airbag crash sensors are located in the front doors between the inner and outer body panels. These sensors react to changes in air pressure in the door cavity. Air is directed via an inflow duct to a plate. The components on the plate react to rapid changes in air pressure that occur during a crash.

### Sensor Signal

The sensor continuously monitors air pressure in the door cavity. If the sensor detects a rise in air pressure above a predetermined value, it sends a signal to the airbag control module.

### Sensor Failure

If the sensor fails, the airbag warning lamp, located in the instrument cluster, will come on.



# Engines

## 2.5L/150 HP 5-Cylinder Engine with 4-Valves per Cylinder

The 2.5L/150 HP engine has 5 cylinders and 4 valves per cylinder driven by DOHC. This engine is all new for the new Jetta and offers high torque, high performance, low fuel consumption, low emissions and low maintenance.

### Special Features:

- Transverse 5-cylinder design
- Dual overhead cams
- Continuously variable intake cam
- Chain driven cams
- Roller rocker fingers
- No hazardous materials used in components

### Technical Data

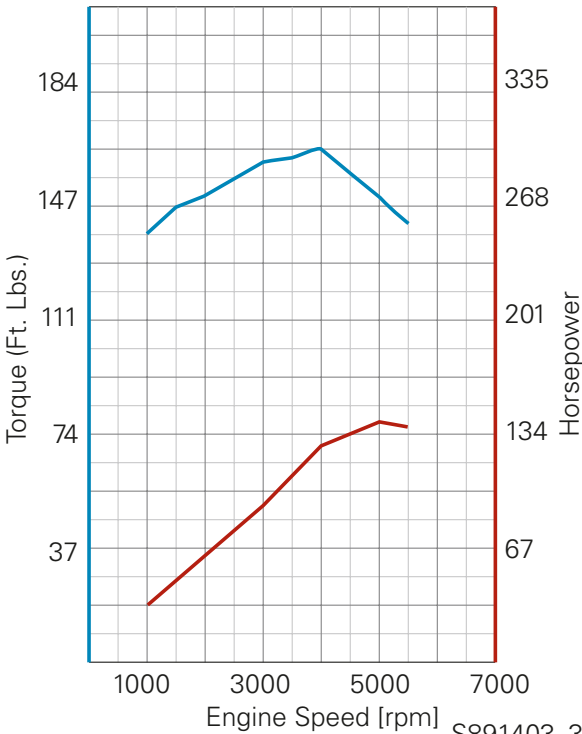
Engine code	BGP
Type	5-cylinder in-line engine
Displacement	151 cu. in. (2480cc)
Firing Order	1-2-4-5-3
Bore	3.25 in. (82.5mm)
Stroke	3.65 in. (92.8mm)
Valves per cylinder	4
Compression ratio	10:1
Max. output	150 HP (110 kW) at 5,000 rpm
Max. torque	168 ft. lb. (228 Nm) at 4,000 rpm
Exhaust gas treatment	Catalytic converter
Emissions standard	SULEV ULEV2

S891403\_31



S891403\_33

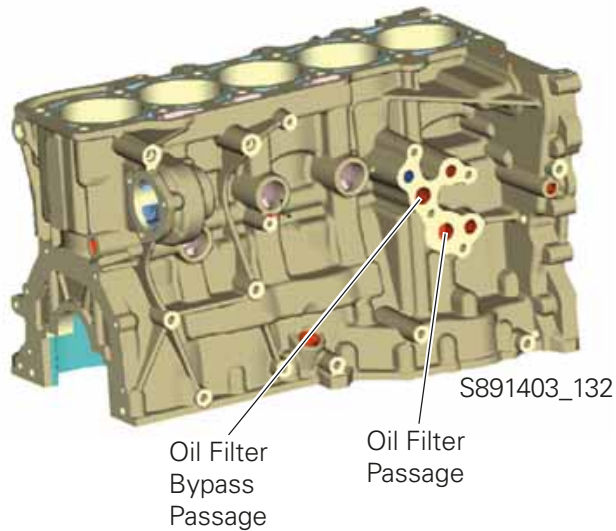
### Torque and Power



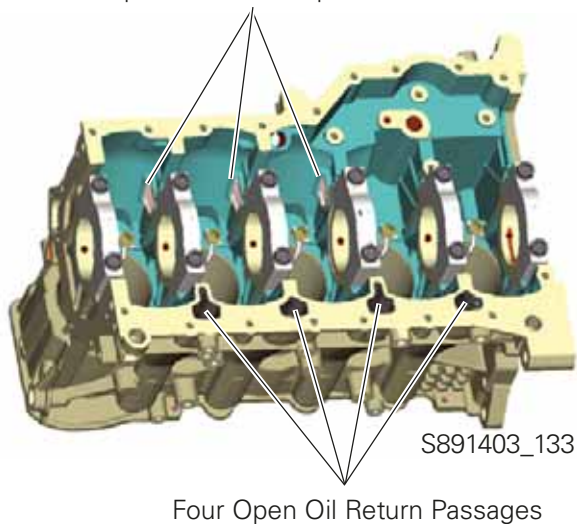
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## Engine Block

The 2.5L engine block design is similar to previous models with an improved lubrication system.

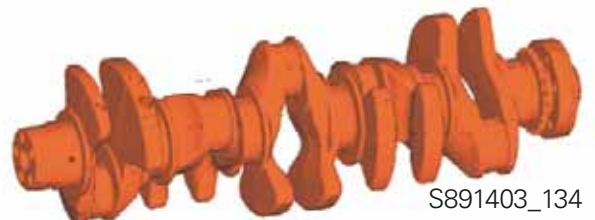


Three Oil Return Check Valves  
(Open Above 43.5 psi)



## Engine Crankshaft

The crankshaft is made of forged steel with bearing and connecting rod surfaces like the 2.0L engine and includes the timing gear. The five connecting rod locations are equally positioned at 72°.

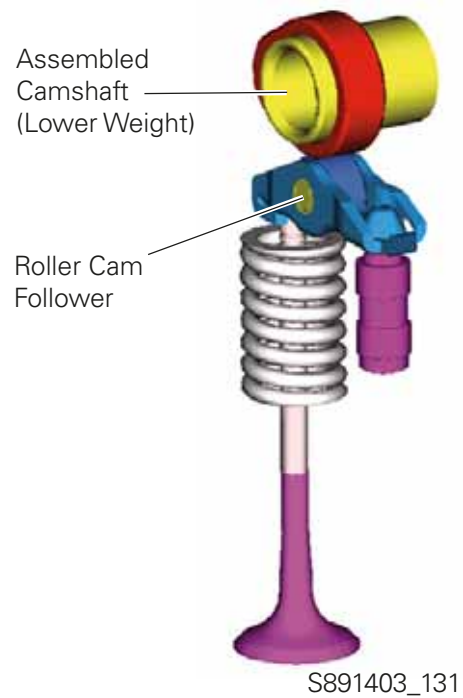
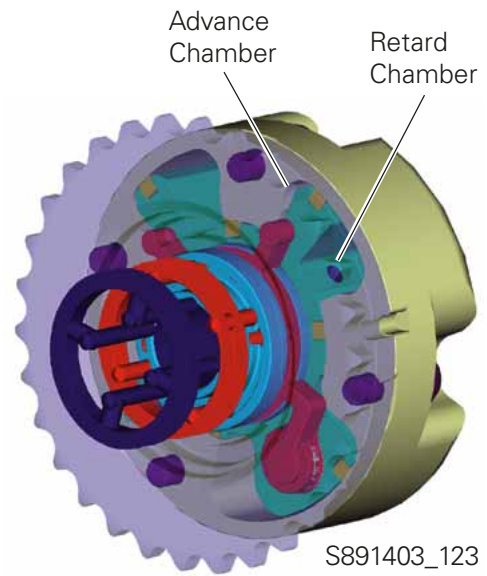
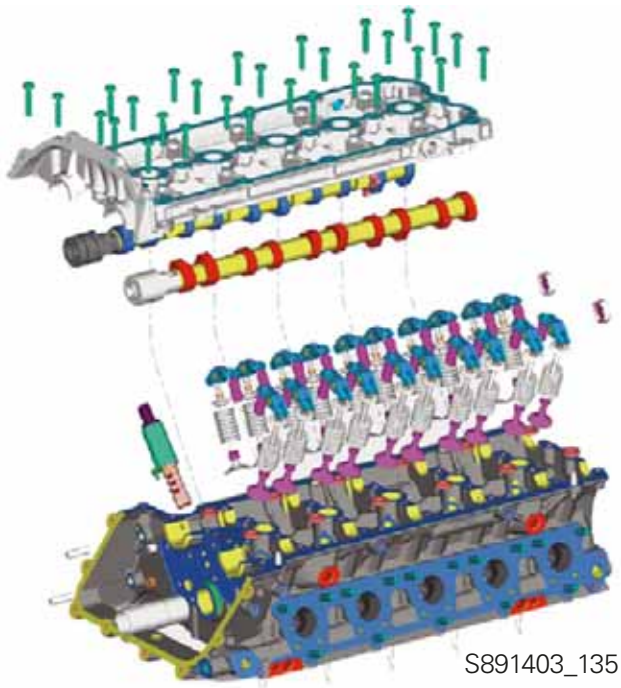


# Engines

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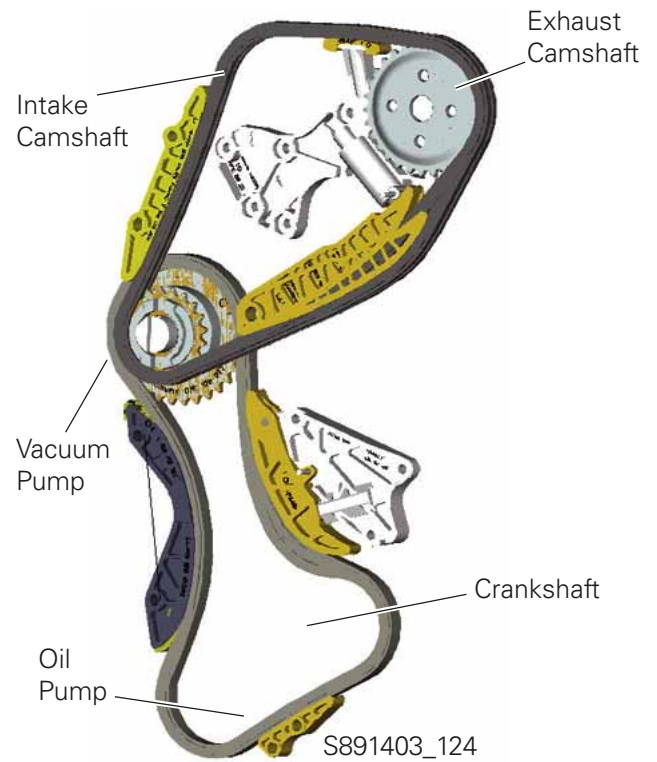
## Dual Overhead Cam Head

The A5 engine has dual overhead camshafts with a continuously adjusting intake cam. The head design is based on the V10 Lamborghini engine.



## Timing Chains

The 2.5L engine uses timing chains to improve durability and extend service periods. The timing chain arrangement also drives the oil pump and the vacuum pump through its intermediate cog wheel.



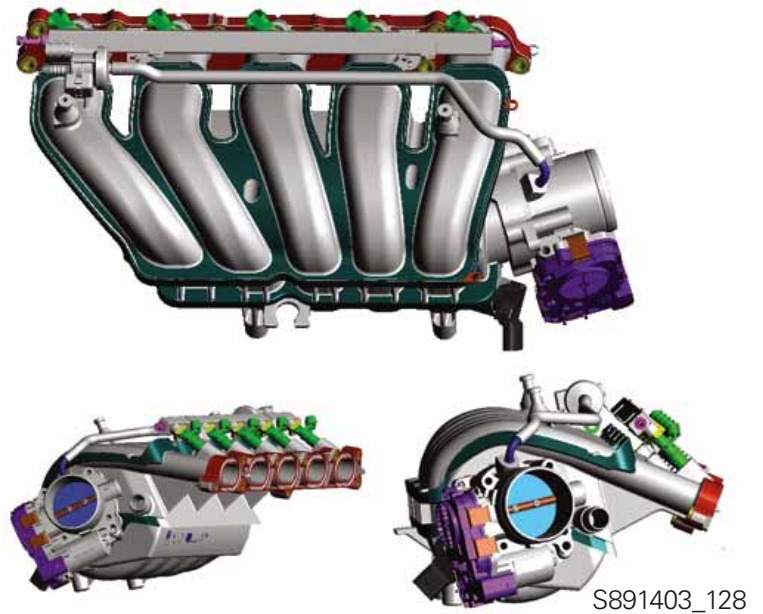


# Engines

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## Intake Manifold

The intake manifold on the 2.5L A5 engine is made of plastic. The intake manifold assembly includes the throttle body, fuel regulator, Evaporative Emission (EVAP) Canister Purge Regulator Valve N80 and the pressure and throttle sensor assembly.



## Exhaust Manifold

A feature of the 2.5L exhaust manifold is its isolated air-flow design. The exhaust manifold features a protective plate that serves as a source for heated intake air.

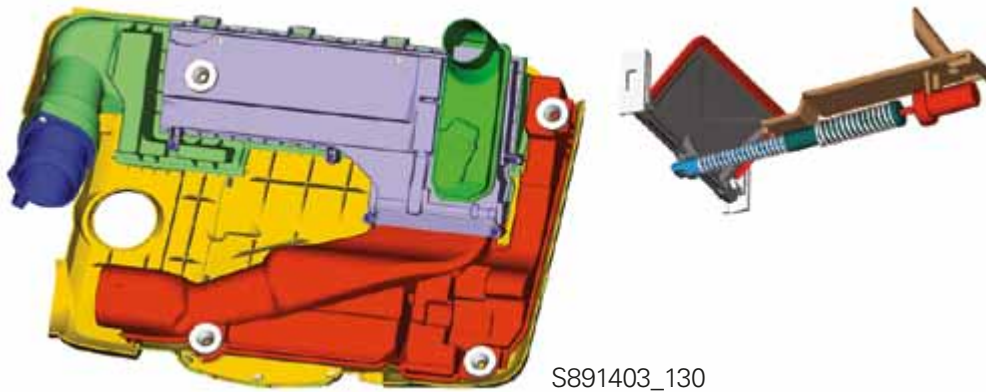


## Engine Cover/Air Filter Housing

The engine cover on the 2.5L engine includes the intake air filter and part of the system that delivers heated intake air to the engine. The engine cover's configuration also lowers engine noise.



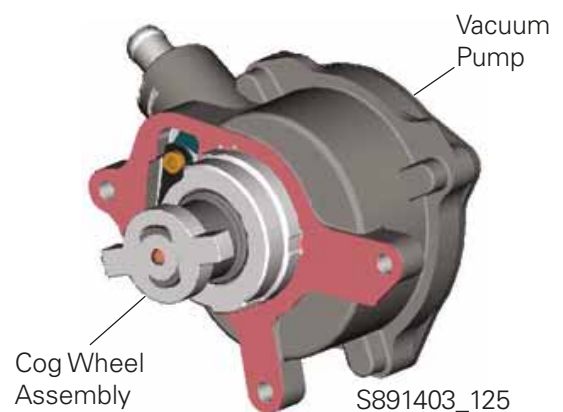
S891403\_129



S891403\_130

## Vacuum Pump

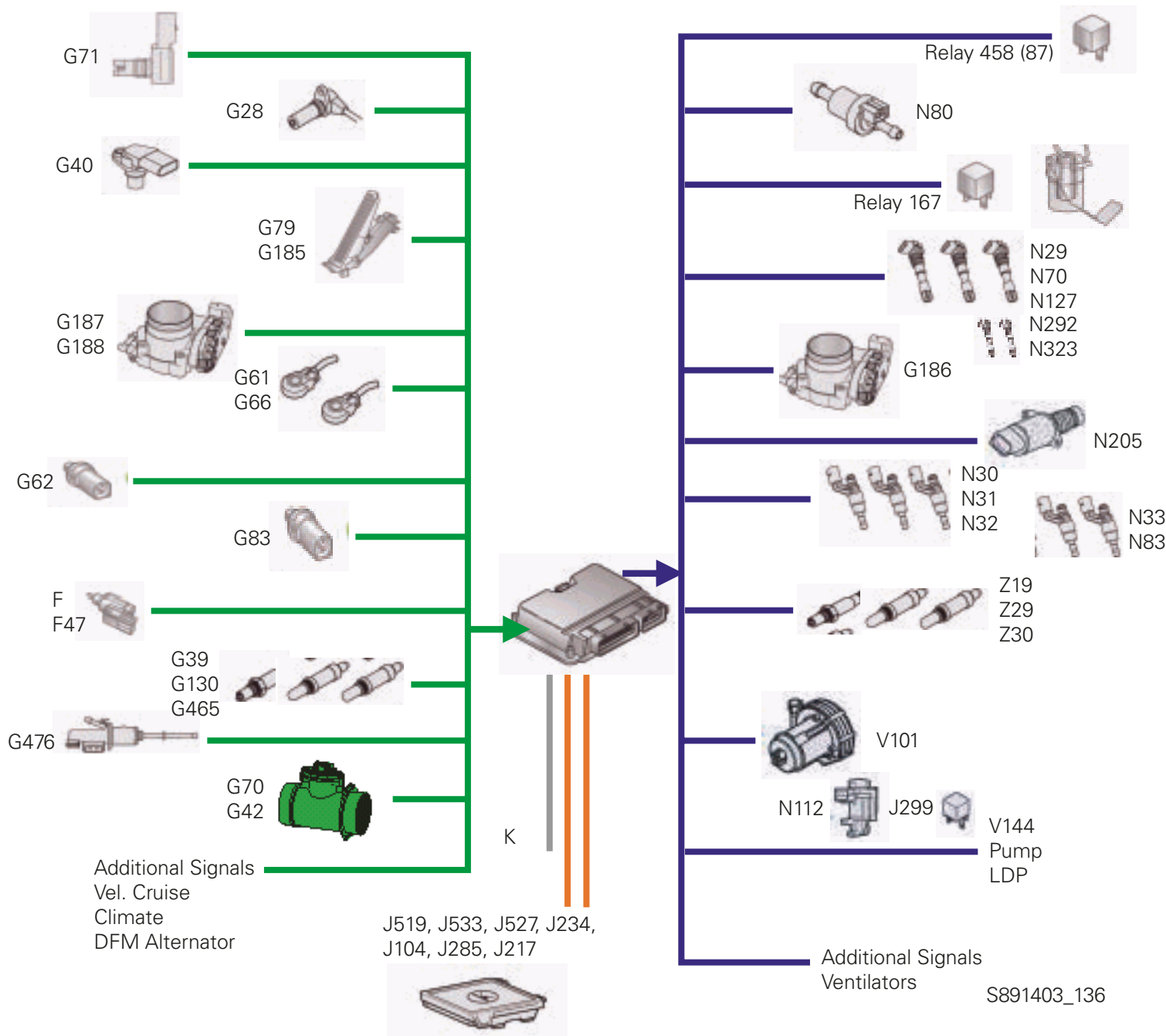
The 2.5L engine's vacuum pump is mechanically driven by the timing chain and provides power assist to the vehicle's brake system. The pump is driven via a cog wheel assembly to the intermediate shaft.



S891403\_125

# Engines

Engine Control System–Input/Output Diagram

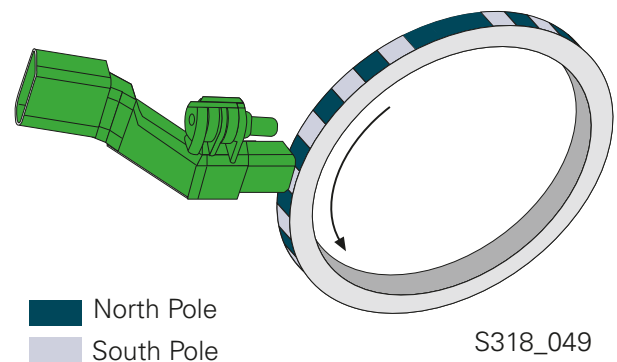
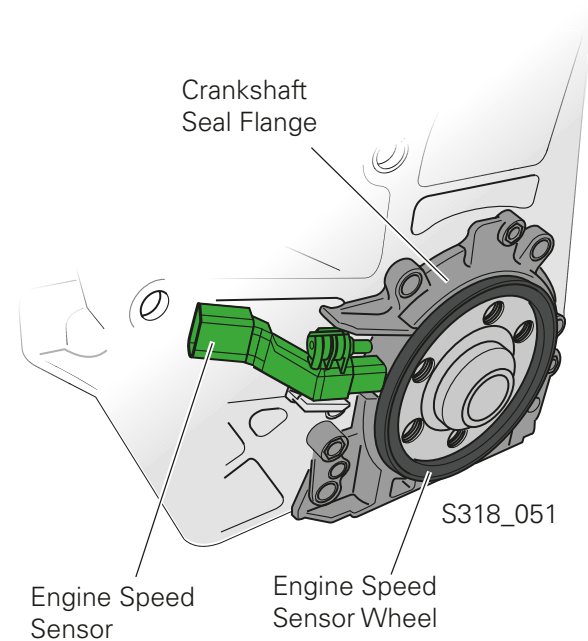




## Crankshaft Seal Flange with Integrated Engine Speed Sensor Wheel

The crankshaft seal flange with integrated engine speed sensor wheel is a new feature. The crankshaft seal flange seals the cylinder block on the flywheel end. The seal is made of heat-resistant and nonwearing polytetrafluoroethylene (PTFE) plastic.

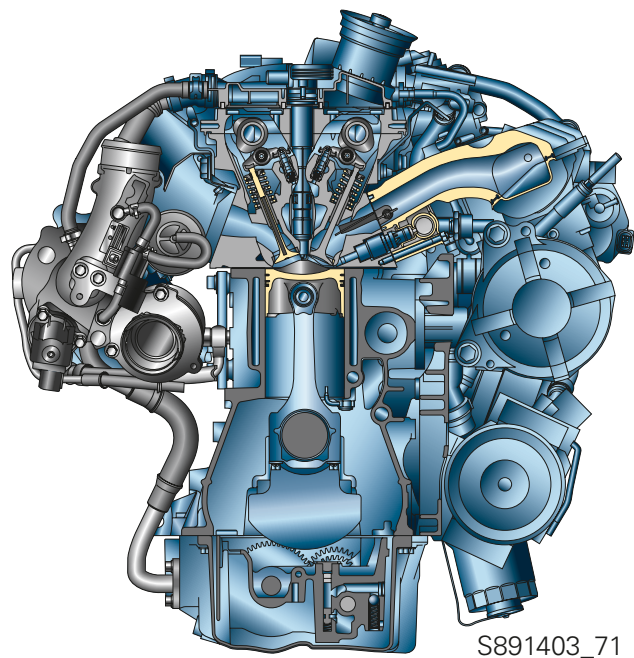
The engine speed sensor is a Hall effect sensor mounted in the crankshaft seal housing and consists of a steel ring mounted in rubber. This rubber material contains embedded magnetized metal chips that have an alternate north and south polarity with a large north pole to serve as a reference for the engine speed sensor. The sensor wheel is precisely press-fit into the crankshaft flange.



# Engines

## 2.0L/200 HP 4-Cylinder Turbo FSI Engine with 4-Valves per Cylinder

The 2.0L turbo FSI engine combines the advantages of direct injection combustion with exhaust turbo charging technology. The result is an extremely responsive engine.



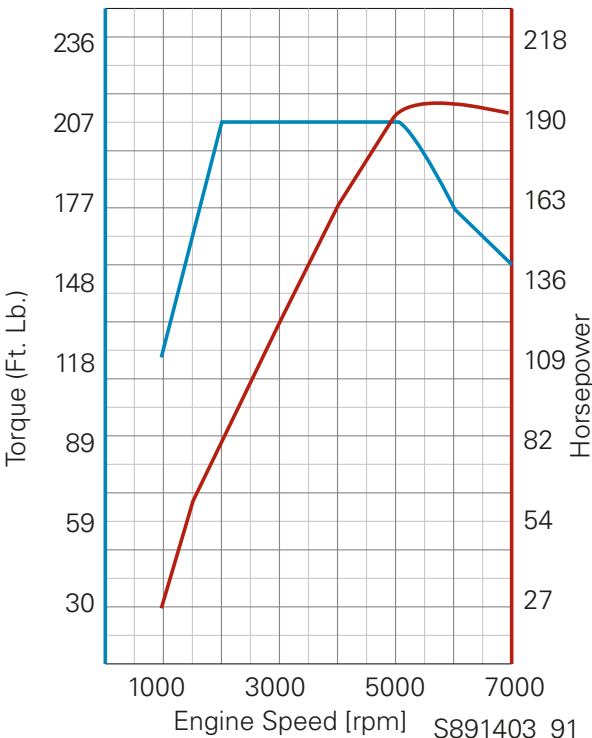
S891403\_71

### Technical Data

Engine code	TBD
Type	4-cylinder in-line engine
Displacement	121 cu. in. (1984cc)
Firing Order	1-3-4-2
Bore	3.25 in. (82.5mm)
Stroke	3.65 in. (92.8mm)
Valves per cylinder	4
Compression ratio	10.5:1
Max. output	200 HP (147 kW) at 5,000 rpm
Max. torque	207 ft. lb. (280 Nm) at 1,800 to 4,700 rpm
Engine management	Bosch Motronic MED 9.1
Fuel	94 octane (98 RON) unleaded fuel, 91 octane (95 RON) unleaded can be used with reduced performance
Exhaust gas recirculation	Inner EGR
Emissions standard	ULEV

S891403\_90

### Torque and Power

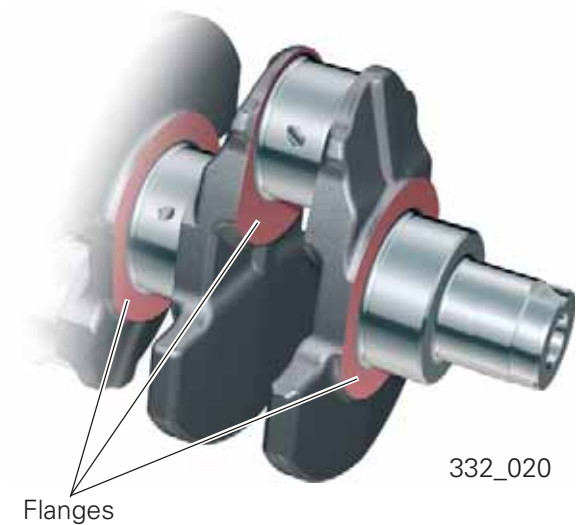


S891403\_91

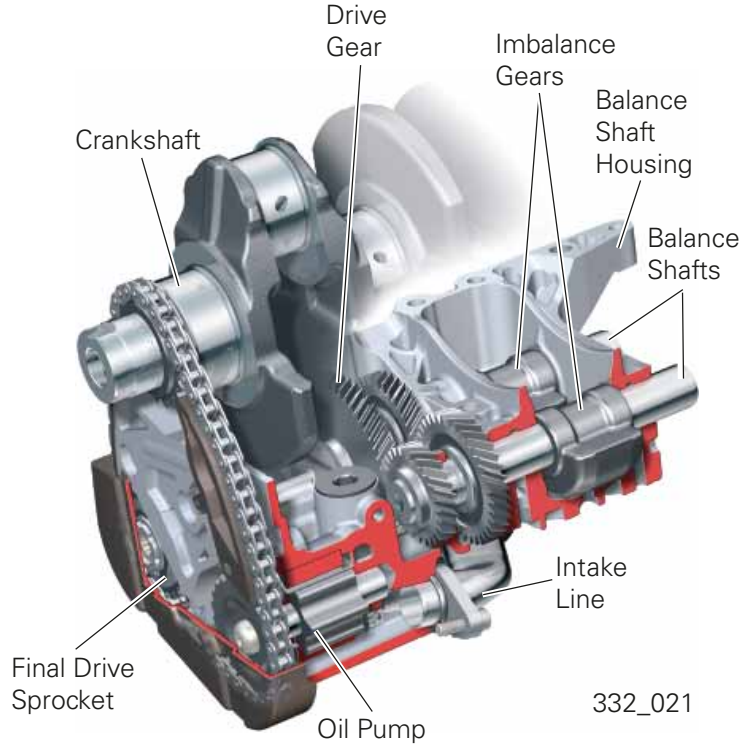
## Crankshaft

The crankshaft has been modified to meet the tougher demands of the turbo FSI engine. This results in higher strength components and less engine noise.

The main bearing flanges and journals have been enlarged for more strength. This meets specifications even with the .25 in. (6.4mm) increase in stroke.



The balance shaft gear used in the engine features the following:



## Final Drive Sprocket

High torsional irregularities from the crankshaft of the turbo engine at low RPMs results in greater chain forces in the balance shaft chain drive. The crank oscillation angle of the turbo engine is  $2^\circ$ . Bow springs have been integrated into the sprocket wheel hub. They decouple the input shaft of the balance shaft module from the crankshaft. This is similar to a dual-mass flywheel.



# Engines

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## Toothed Belt Drive

As with all 4-cylinder in-line engines, the timing gear drives a toothed belt that drives the exhaust camshaft.

The toothed belt tensioning system has been modified to meet the demands placed on the toothed belt drive by the turbo, including:

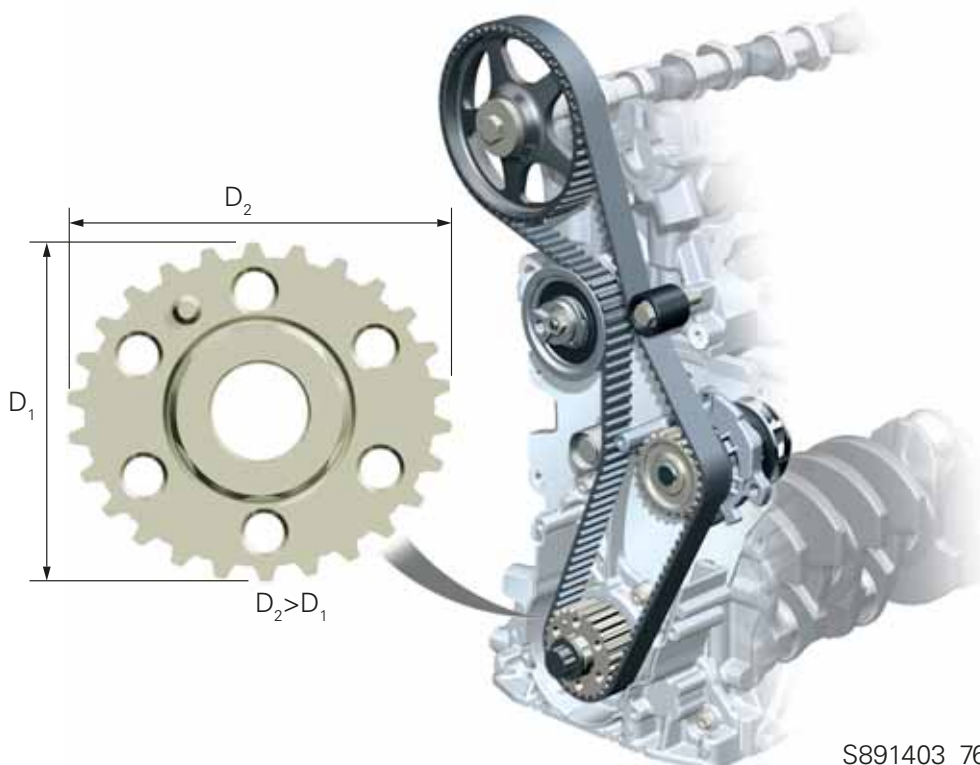
- Higher valve spring pressures
- Turbo-related valve timing associated with the 42° crank angle adjustment range of the continuous variable valve timing on the intake camshaft
- High-pressure oil pump drive from a triple cam on the intake camshaft

The modification is an elliptical toothed belt sprocket on the crankshaft.

The new Crankshaft Torsional Cancellation (CTC) toothed belt sprocket reduces camshaft vibration and the forces acting on the toothed belt.

### Function

The toothed belt sprocket is positioned on the crankshaft at TDC of cylinder 1, as shown below. When the cycle begins, forces acting on the toothed belt are reduced by the elliptical shape of the toothed belt sprocket. The flat side of the sprocket gear allows a slight slackening of the toothed belt.



S891403\_76



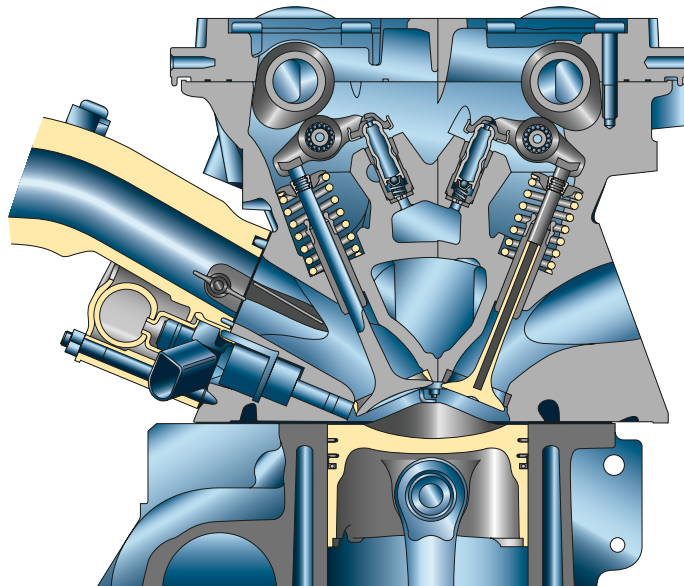
## Cylinder Head

The cylinder head features the following:

- Sodium-filled exhaust valves
- Intake valves with reinforced seats
- Roller rocker fingers strengthened while reducing cam and roller land width
- Identical valve springs are used for both intake and exhaust valves

Intake port geometry is used to enhance the tumble effect, reduce knock and improve running smoothness.

2.0L 4V-TFSI



332\_017

# Engines

## Crankcase Ventilation

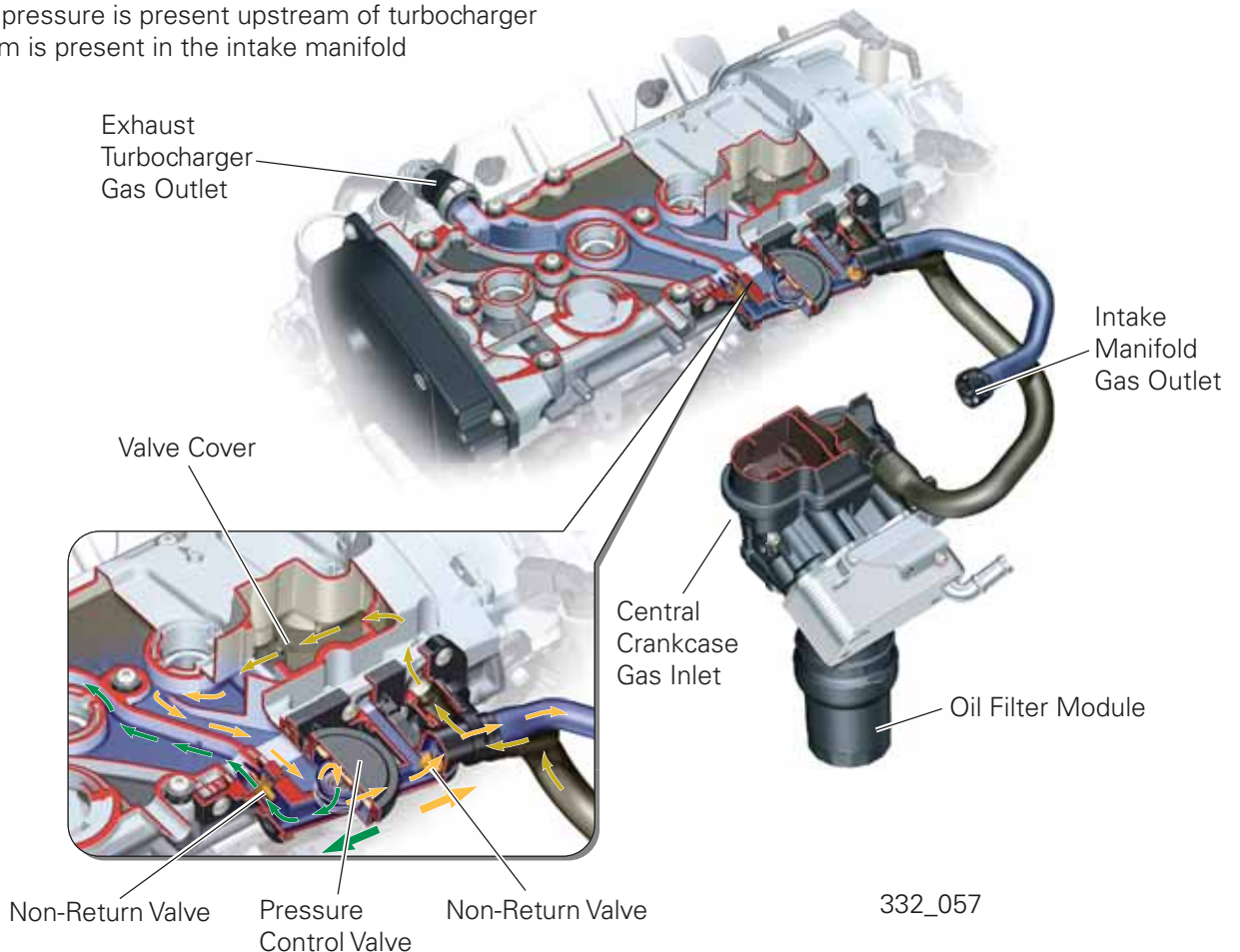
A constant vacuum is maintained in the crankcase through separate ventilation of the crankcase and cylinder head. The crankcase breather is connected to the intake manifold.

The crankcase blow-by gases flow into the cylinder head through the primary oil separator in the oil filter module. Here the blow-by gases mix with the gases from the cylinder head and flow through a second separator to provide additional oil separation.

Since a turbo engine requires a more sophisticated pressure control system, a two-stage pressure control valve is located on the cylinder head cover. If vacuum exist in the intake manifold, blow-by gases flow directly into the intake manifold.

If a boost pressure is present in the intake manifold, a one-way valve in the pressure control valve housing closes and the blow-by gases flow into the cylinder head cover ahead of the turbocharger. The system can detect faulty installation of the pressure control valve. Unmetered air is detected by the reaction of the lambda probe.

- If a boost pressure is present upstream of turbocharger
- If a vacuum is present in the intake manifold

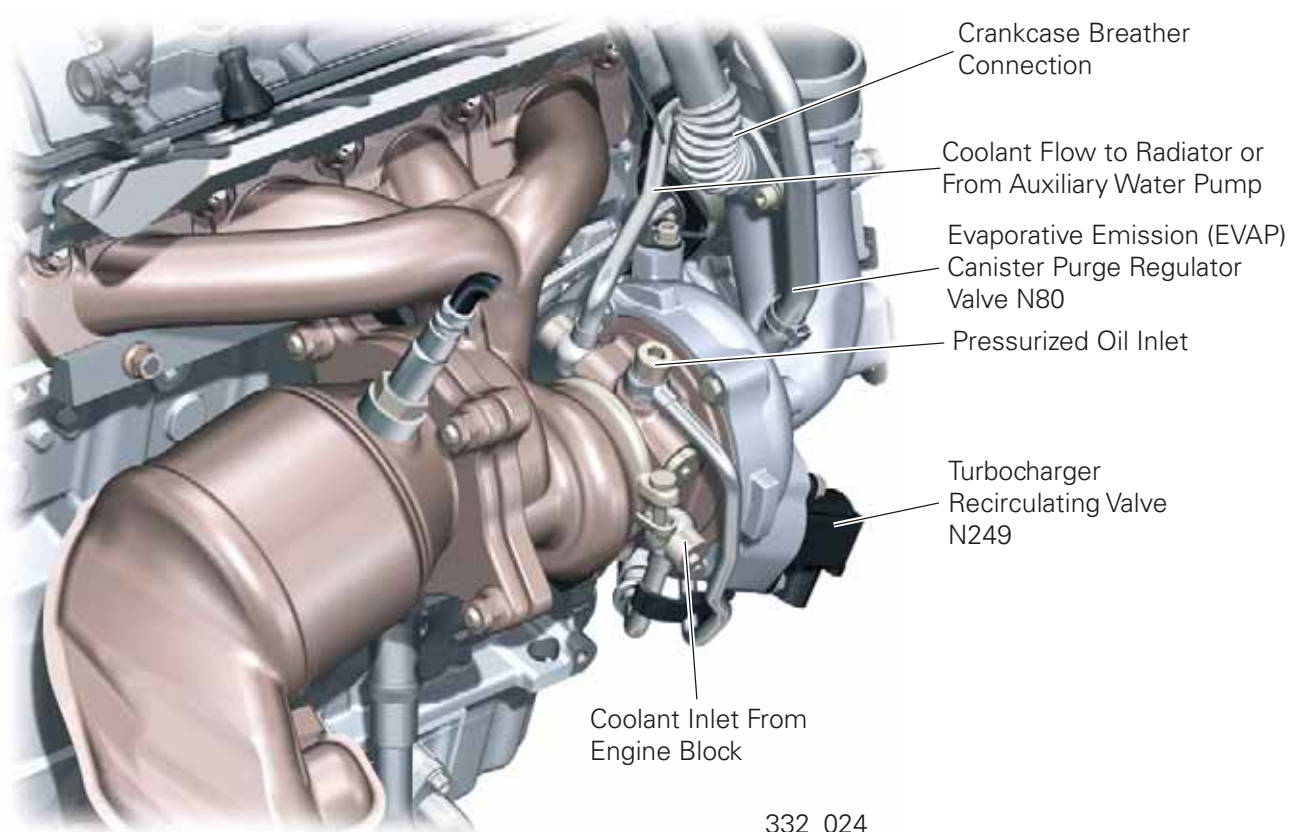


## Exhaust Turbocharger/Manifold Module

To conserve space and improve performance and serviceability, the exhaust manifold and turbine housing have been combined into a single module. Special emphasis was placed on easy removal and installation of the exhaust manifold and the close-coupled catalytic converter.

The turbine shaft mount is integrated into the compressor housing. The air intake includes connections for crankcase and Evaporative Emission (EVAP) Canister Purge Regulator Valve N80. A silencer reduces pressure pulsation noises.

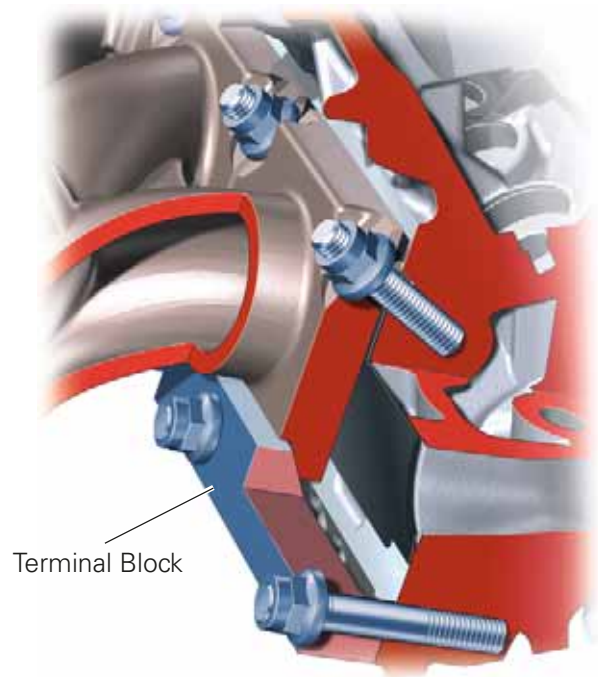
Boost pressure is controlled by a Wastegate Bypass Regulator Valve N75. A Turbocharger Recirculating Valve N249 prevents “overbraking” of the turbine when the engine is in overrun with the throttle valve closed and boost pressure still present. The Wastegate Bypass Regulator Valve N75 and the Turbocharger Recirculating Valve N249 are located on the turbocharger.



# Engines

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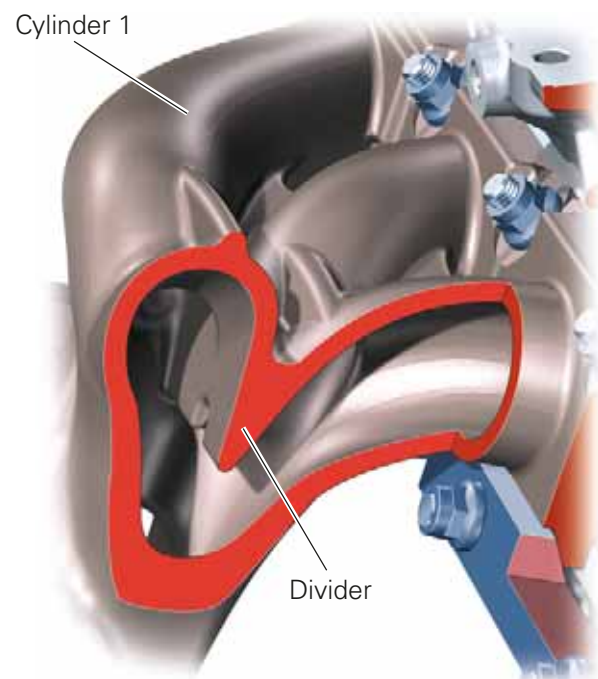
A clamping flange on the cylinder head allows easy removal and installation of the exhaust turbocharger/manifold module. The terminal block does not require removal.



332\_025

The exhaust manifold is split. A divider in the manifold ensures a steady flow of exhaust gases to the turbine. The ports of cylinders 1 and 4 and cylinders 2 and 3 are separated based on the firing order. The divider also prevents the exhaust gas pressure from expanding into the other cylinders.

This maintains turbine speed and optimizes turbocharger response.



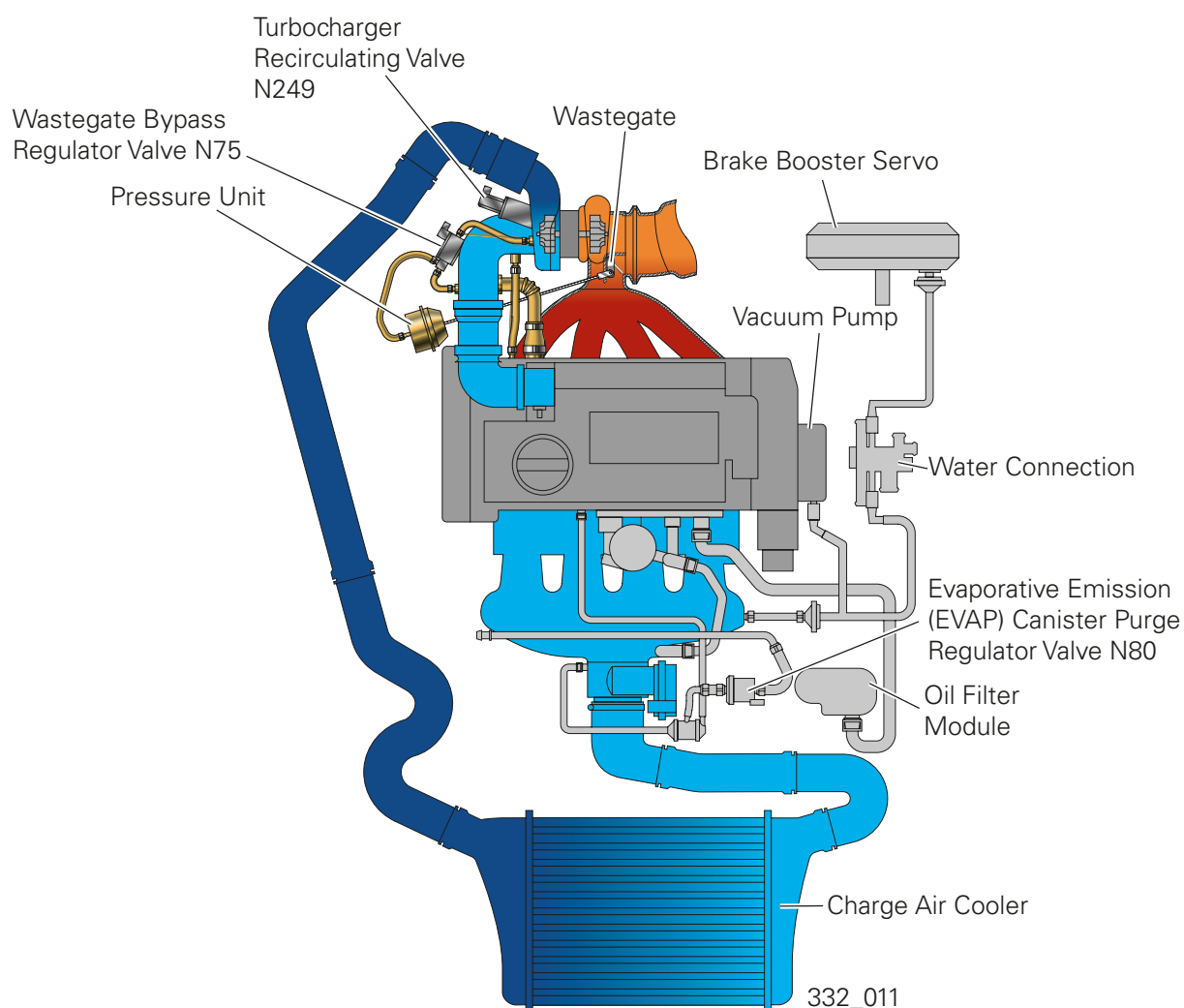
332\_026

## Charge Air Ducting and Boost Pressure Control

The boost pressure and intake pressure are converted to control pressure by the pulse width modulated Wastegate Bypass Regulator Valve N75. Control pressure acts on the pressure unit that actuates the wastegate flap. The wastegate flap opens a bypass and allows some of the exhaust gases to flow past the turbine wheel into the exhaust system. This control system regulates the turbine speed and sets the maximum boost pressure.



If the control system fails, the boost pressure acts directly on the pressure unit. The increased spring pressure reduces maximum boost down to minimum boost.



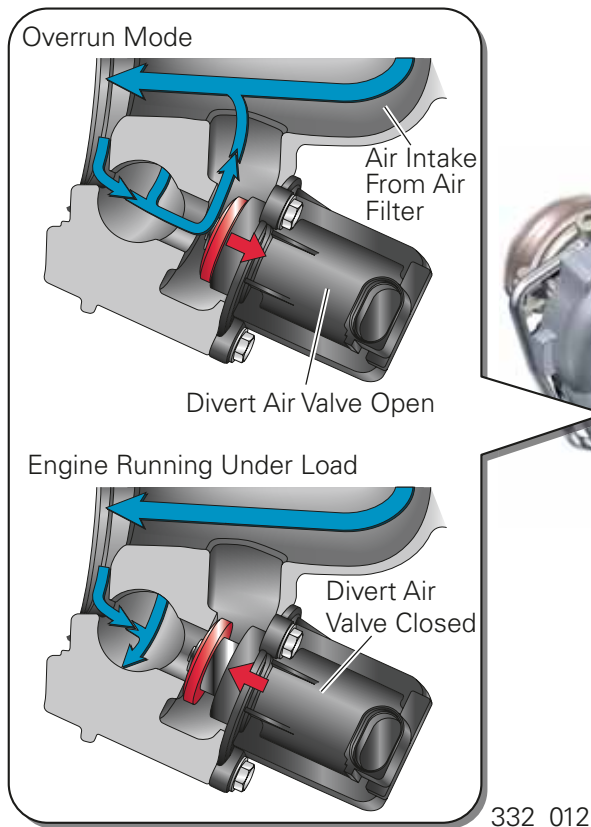


# Engines

## Overrun Air Divert Control

If the throttle valve closes when the engine is in overrun, back pressure develops in the turbo housing. Back pressure reduces the speed of the turbine, which reduces boost pressure and increases turbo lag.

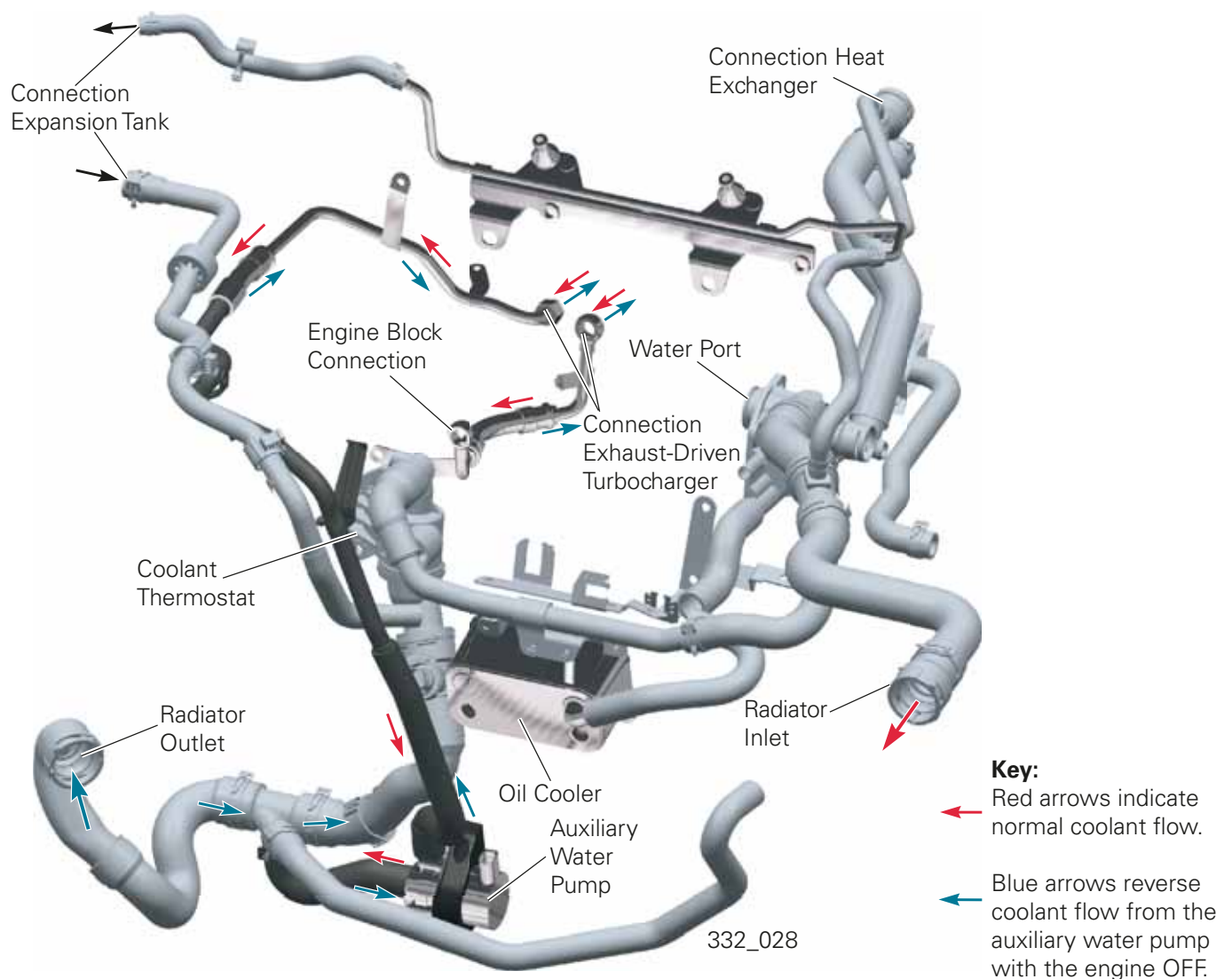
To avoid this, the Turbocharger Recirculating Valve N249 is opened by an electrical actuator. This allows the compressed air to flow back to the intake side of the circuit through the turbine. This maintains turbine speed. The Turbocharger Recirculating Valve N249 closes when the throttle valve opens again and boost pressure is immediately available.





## Cooling System

To prevent carbon build-up on the turbine shaft in the turbocharger, an auxiliary water pump provides additional water circulation for up to 15 minutes after the engine is shut off hot. The pump forces the lower temperature coolant against the normal direction of flow. The coolant flows from the radiator through the turbocharger to the engine block and back to the cooler.



# Engines

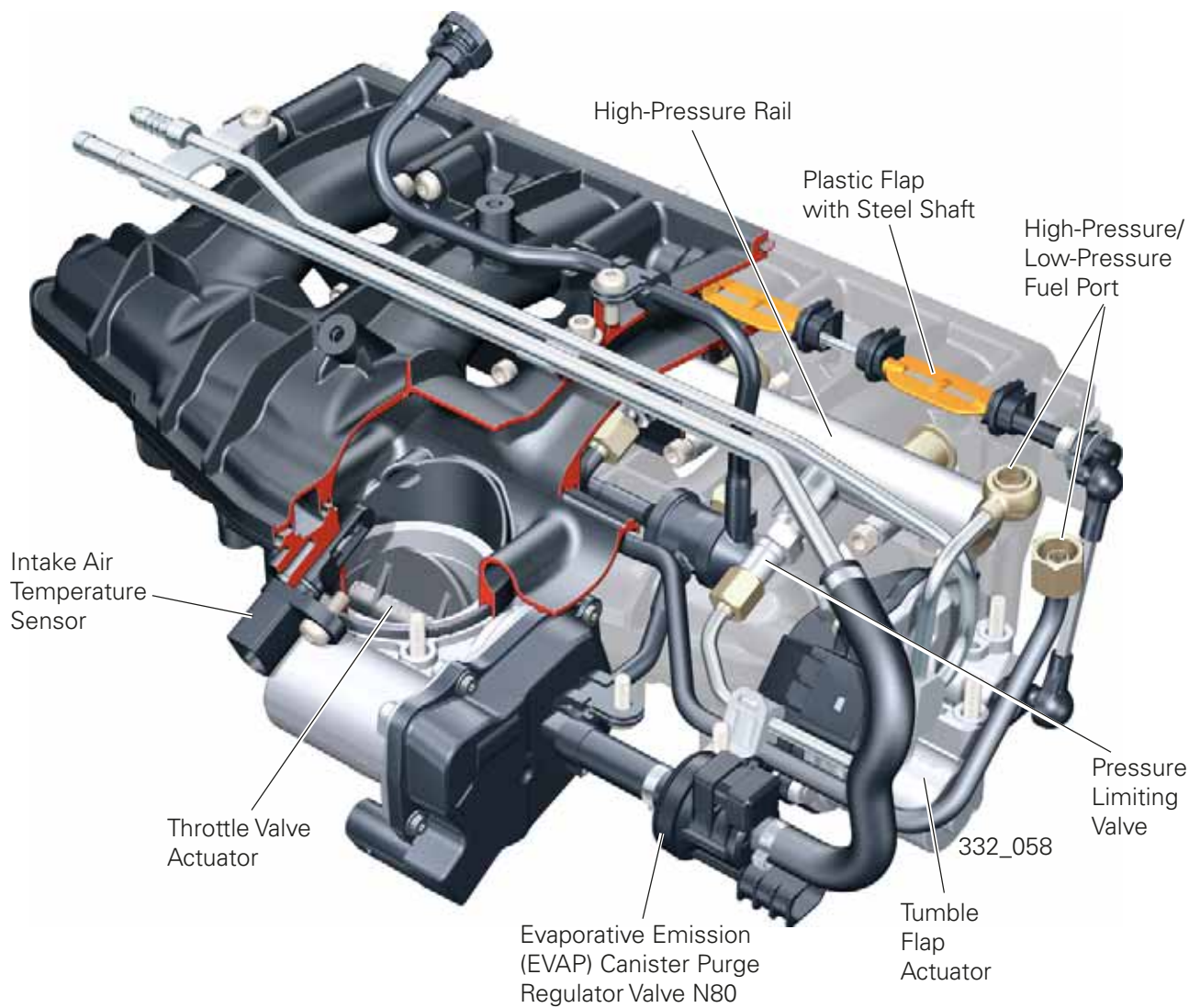
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## Tumble Flaps

At different engine rpms, tumble flaps are activated to enhance the air/fuel mixture.

The tumble flaps are actuated:

- To improve cold engine idling
- To improve charge efficiency at start-up
- In overrun mode

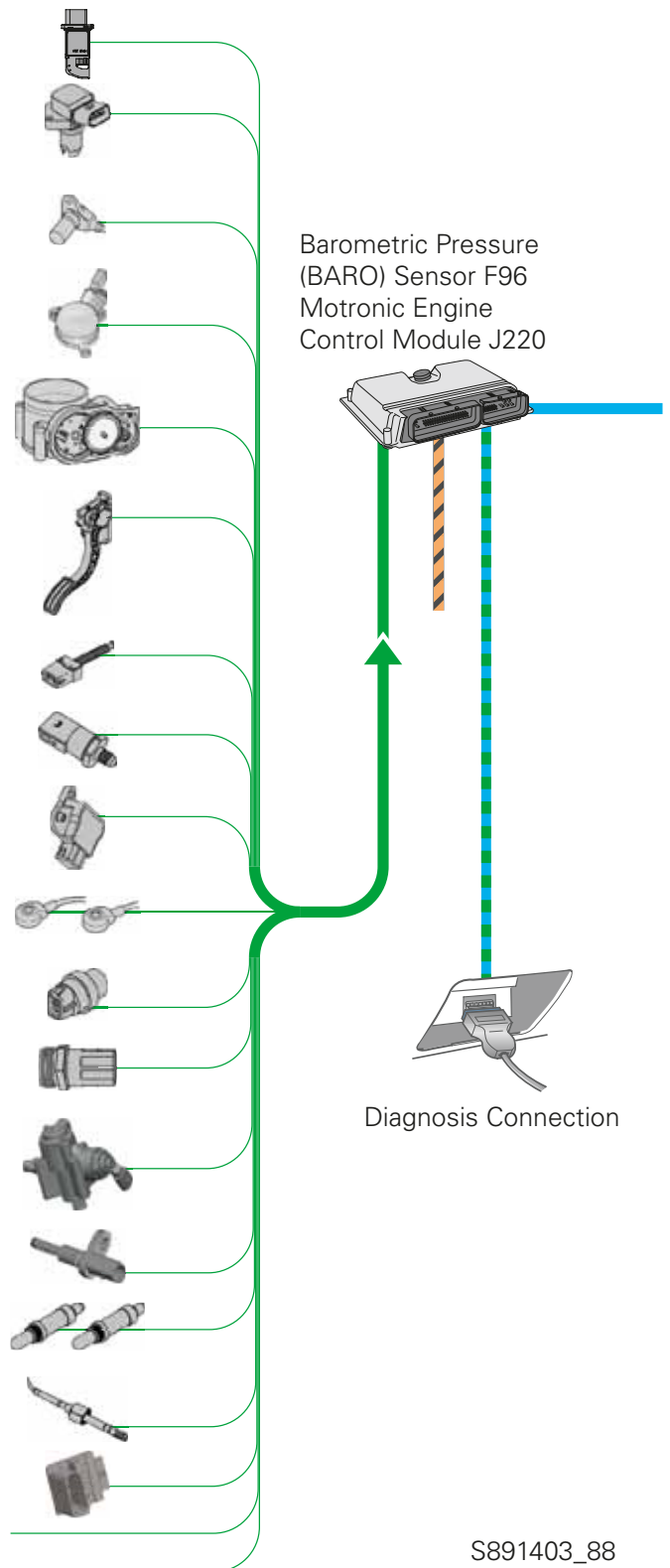




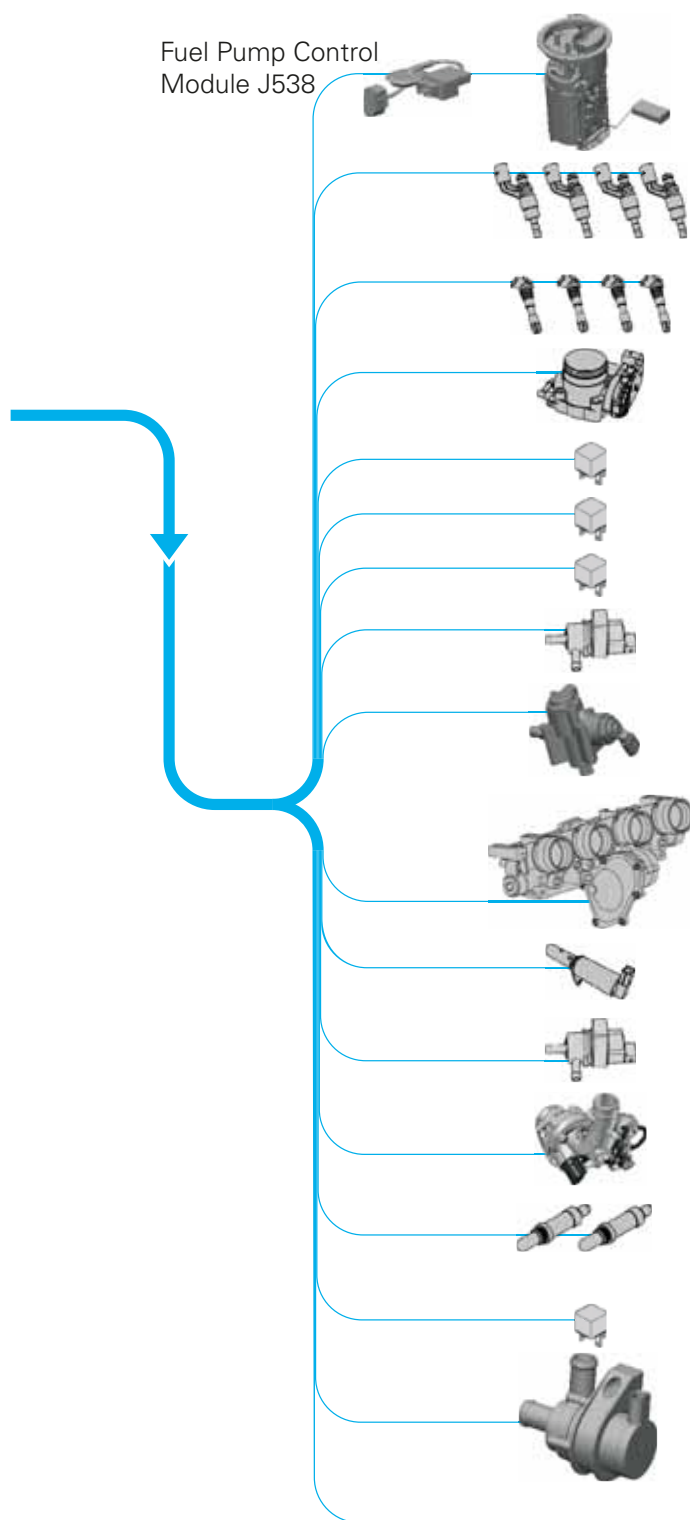
# Engines

## Actuators and Sensor Diagram

Mass Air Flow (MAF) Sensor G70  
Charge Air Pressure Sensor G31  
Manifold Absolute Pressure (MAP) Sensor G71  
Engine Speed (RPM) Sensor G28  
Camshaft Position (CMP) Sensor G40  
Throttle Drive Angle Sensor 1 [for Electronic Power Control (EPC)] G187  
Throttle Drive Angle Sensor 2 [for Electronic Power Control (EPC)] G188  
Throttle Valve Control Module J338  
Throttle Position (TP) Sensor G79  
Accelerator Pedal Position Sensor 2 G185  
Brake Light Switch F  
Brake Light Switch F63  
Fuel Pressure Sensor G247  
Intake Manifold Runner Position Sensor G336  
Knock Sensor (KS) 1 G61  
Knock Sensor (KS) 2 G66  
Engine Coolant Temperature (ECT) Sensor G62  
Engine Coolant Temperature (ECT) Sensor (on Radiator) G83  
Low Fuel Pressure Sensor G410  
Intake Air Temperature (IAT) Sensor G42  
Heated Oxygen Sensor (HO2S) G39  
Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) G130  
Exhaust Gas Temperature (EGT) Sensor 1 G235  
Clutch Position Sensor G476  
Alternator DF



S891403\_88



Fuel Pump Control  
Module J538

Cruise control On/Off

Fuel Level Sensor G

Transfer Fuel Pump (FP) G6

Cylinder 1 Fuel Injector N30

Cylinder 2 Fuel Injector N31

Cylinder 3 Fuel Injector N32

Cylinder 4 Fuel Injector N33

Ignition Coil 1 with Power Output Stage N70

Ignition Coil 2 with Power Output Stage N127

Ignition Coil 3 with Power Output Stage N291

Ignition Coil 4 with Power Output Stage N292

Throttle Valve Control Module J338

Throttle Drive [for Electronic Power Control  
(EPC)] G186

Motronic Engine Control Module (ECM) Power  
Supply Relay J271

Engine Component Power Supply Relay J757

Voltage Supply Terminal 15 (B+) Relay J329

Evaporative Emission (EVAP) Canister Purge  
Regulator Valve N80

Fuel Pressure Regulator Valve N276

Intake Door Motor V157

Camshaft Adjustment Valve 1 N205

Wastegate Bypass Regulator Valve N75

Turbocharger Recirculating Valve N249

Oxygen Sensor (O2S) Heater Z19

Oxygen Sensor (O2S) Heater 1 [behind Three  
Way Catalytic Converter (TWC)] Z29

Coolant Circulation Pump Relay J151

After-Run Coolant Pump V51

Coolant Fan Control (FC) Control Module J293

S891403\_89



# Engines

## 1.9L/105 HP TDI Engine with 2-Valve Technology

### Special Features:

- Switchable EGR cooler
- Crankshaft sealing flange with integrated engine speed sender wheel
- Accelerator pedal module with contactless accelerator pedal position senders
- Contactless clutch pedal switch



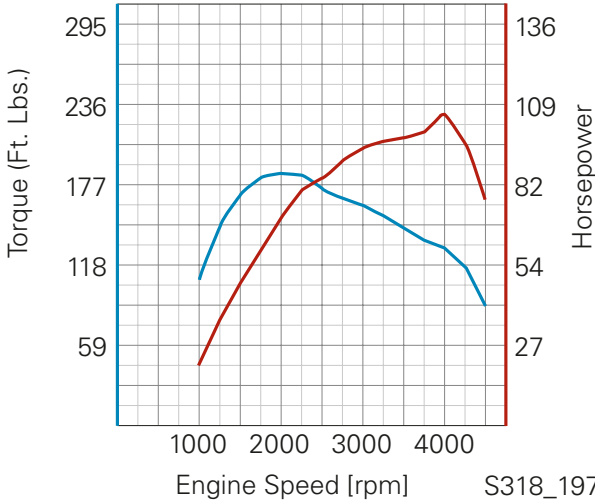
S318\_033

### Technical Data

Engine code	TBD
Type	4-cylinder in-line engine
Displacement	116 cu. in. (1896cc)
Bore	3.1 in. (79.5mm)
Stroke	3.6 in. (95.5mm)
Valves per cylinder	2
Compression ratio	19:1
Max. output	105 HP (77 kW) at 4,000 rpm
Max. torque	184 ft. lb. (250 Nm) at 1,900 rpm
Engine management	Bosch EDC 16
Fuel	Diesel, min. 49 CN
Exhaust gas treatment	Exhaust gas recirculation and oxidizing catalytic converter

S891403\_70

### Torque and Power



S318\_197



## Pedal Assembly

The pedal assembly includes accelerator, brake and clutch control modules.

The brake pedal module housing is made of aluminium and sheet steel.

The accelerator pedal and the clutch pedal module housings are made of plastic. Pedal position sensors recognize the pedal position without making direct contact with pedal sensing components.

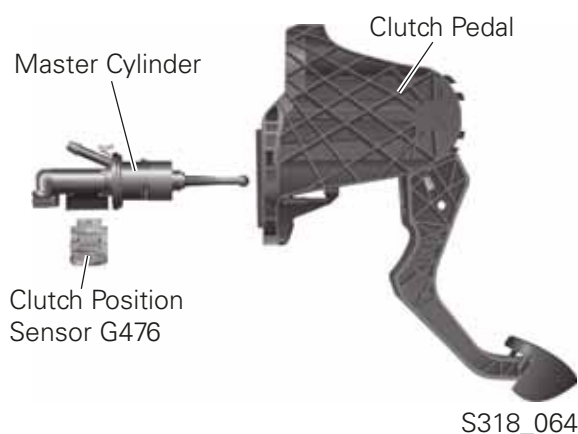


## Clutch Position Sensor G476

The Clutch Position Sensor G476 is a Hall effect device that signals the engine control module that the clutch pedal has moved. This deactivates the cruise control system and briefly reduces fuel to the fuel injectors to prevent engine shudder during the resulting gear change.

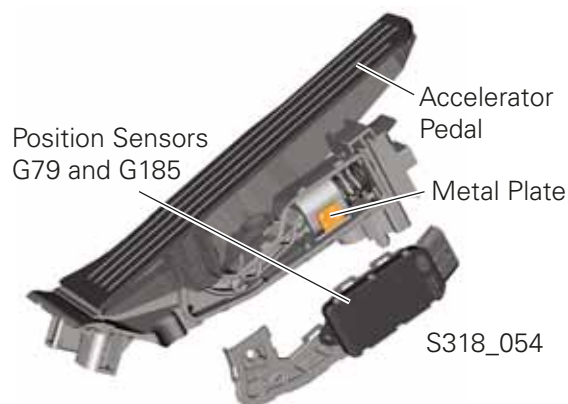


For additional information on the accelerator, brake and clutch pedal assembly please refer to SSP 861403 "The new Jetta Steering and Suspension".



## Accelerator Pedal Position Sensors G79 and G185

The Accelerator Pedal Position Sensors G79 and G185 are located in the accelerator pedal module. Both are inductive sensors that provide the exact position of the accelerator pedal to the engine control module. The engine control module uses this information to control the amount of fuel available to the fuel injectors.



# Automatic Transmission

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## 6-Speed Direct Shift Gearbox (DSG) 02E

The 02E 6-speed gearbox combines the advantages of a manual transmission with those of an automatic transmission:

Manual:

- High efficiency
- Rugged design
- Sporty performance

Automatic:

- Comfort and convenience when changing gears

The 02E meets the high standards of comfort expected by automatic transmission users by using two multi-plate clutches and several automatic shift programs.

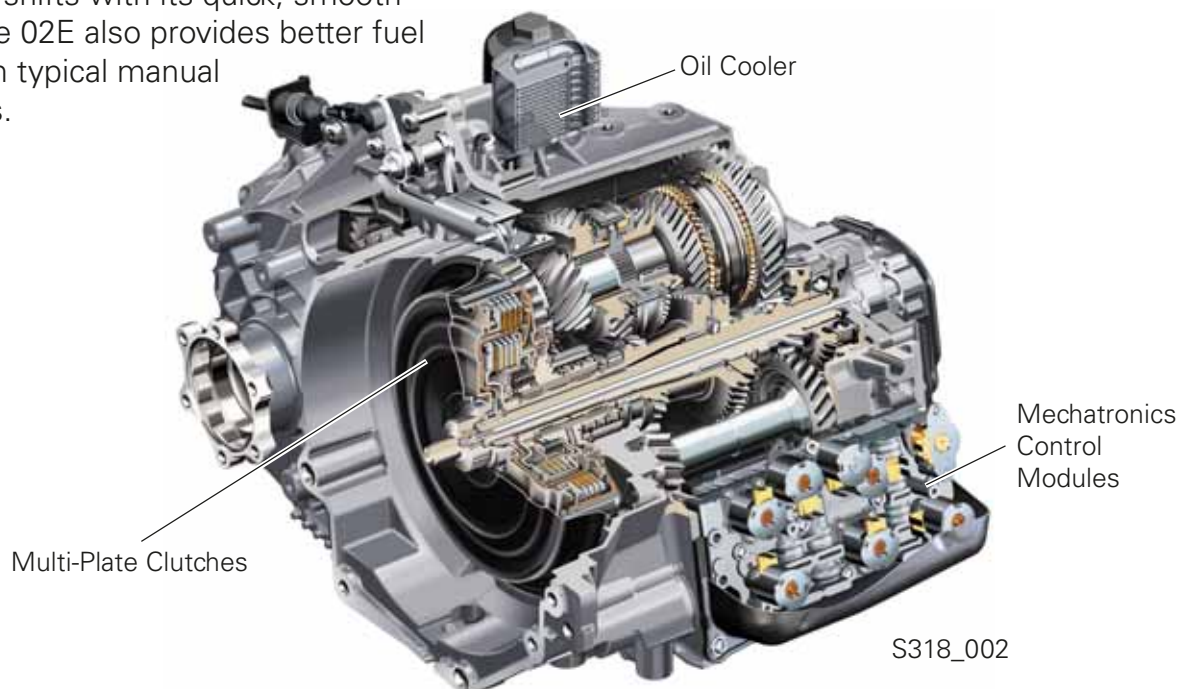
The 02E also provides pure driving enjoyment for manual transmission users by allowing the driver to control the gear selection and shifts with its quick, smooth gearshifts. The 02E also provides better fuel economy than typical manual transmissions.

02E DSG features include:

- Six forward gears and one reverse gear
- Normal shift control program "D" and Sport shift control program "S"
- Tiptronic shift control and steering wheel shift control
- Mechatronics: electronic and hydraulic control modules in a single unit are integral to the transmission
- Oil cooler mounted on the transmission
- Maximum torque 258 ft. lbs. (349 Nm)



For additional information on the DSG, please refer to SSP 841403 "Volkswagen 02E Direct Shift Gearbox".



# Automatic Transmission

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## 6-Speed Automatic Transmission 09G

The 6-speed automatic transmission 09G is transverse mounted, compact, lightweight and electronically controlled.

Features of the 09G include:

- Maximum torque 229 ft. lbs (310 Nm).
- Weight 185 lbs. (84kg)
- Length 13.8 in. (350mm)
- Torque converter with lockup
- Automatic and Tiptronic operation

Forward and reverse gears have simple planetary gear sets with a double Ravigneaux planetary gear set.

Modulating valves are activated by the transmission control module to control pressure build-up in the multi-plate clutches and plate brakes. By allowing a delayed pressure build-up the modulating valves deliver fast response times and smooth shifts.



S318\_024



For additional information on this transmission, please refer to SSP 851503 "The 6-Speed Automatic Transmission 09G".

# Suspension

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## Suspension Features

The suspension of the new Jetta sets the standard in its class. An optimized front axle strut suspension provides state of the art handling characteristics. The new balanced four-link rear axle suspension complements the front suspension with its own superior performance characteristics. Electro-mechanical power steering provides excellent handling assistance while maintaining road feel. This variable assist system also automatically adjusts the level of assist depending on vehicle speed.

- Floor mounted accelerator pedal assembly with redundant position sensors
- Optimized McPherson strut suspension
- Direct 1 to 1 anti-roll bar connection
- Electro-mechanical power steering
- Dual rate brake servo
- Teves MK 60 Electronic stabilization system



# Suspension

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For additional information on the suspension, please refer to SSP 861403, "The new Jetta Steering and Suspension".

- Four-link rear suspension



- Tire pressure monitoring system (delayed introduction)
- Power brakes
- Toe and camber adjustments on rear suspension

S891403\_27



# Electrical System

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## Fuse and Relay Locations

### Mounting Locations

The electrical system on the new Jetta is entirely redesigned. Because the electrical system has been completely reconfigured, the mounting location of fuse and relay centers have changed.

The adjacent diagram shows the various fitting locations.

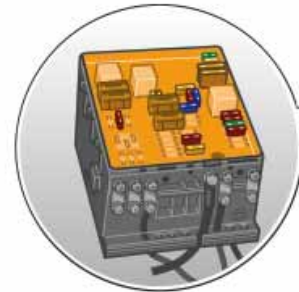


For additional information on the electrical system, please refer to SSP 873403, "The new Jetta Electrical System Design and Function".

Fuse and relay center under the hood on the driver side



Back-up fuse box under the hood on the driver side

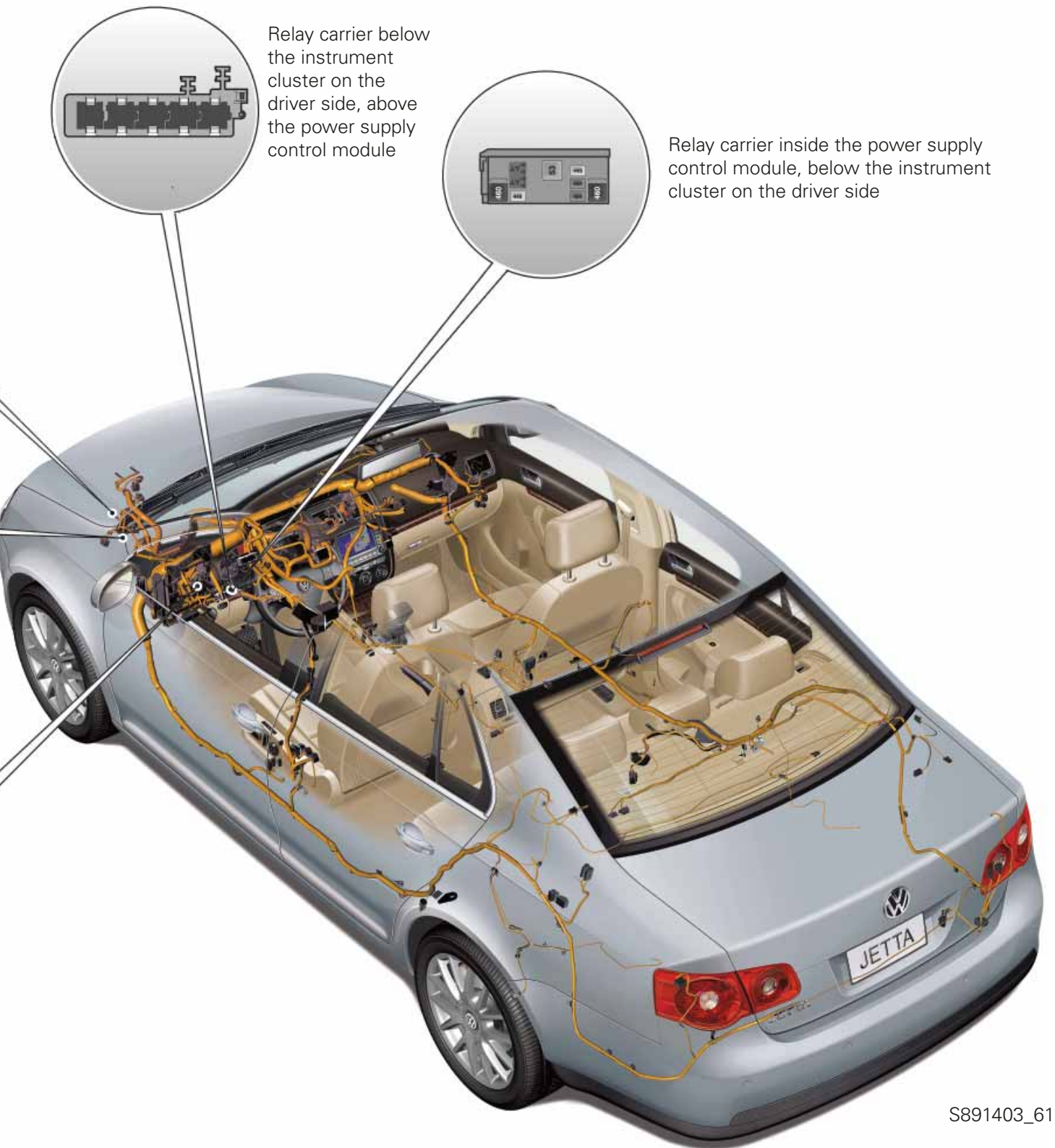


Fuse box behind the instrument cluster on the driver side





# Electrical System



S891403\_61

# Electrical System

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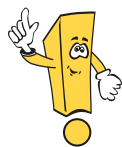
## CAN Networking Concept

### Networked Control Modules

To allow the new Jetta's control modules to communicate, they are connected by various data bus systems.

The Data Bus On Board Diagnostic Interface J533 provides access to the following data bus systems:

- Drivetrain CAN-bus
- Convenience CAN-bus
- Infotainment CAN-bus
- Instrument cluster CAN-bus
- Diagnosis CAN-bus



In addition to the CAN-bus, a number of electric components are networked via the LIN data bus.

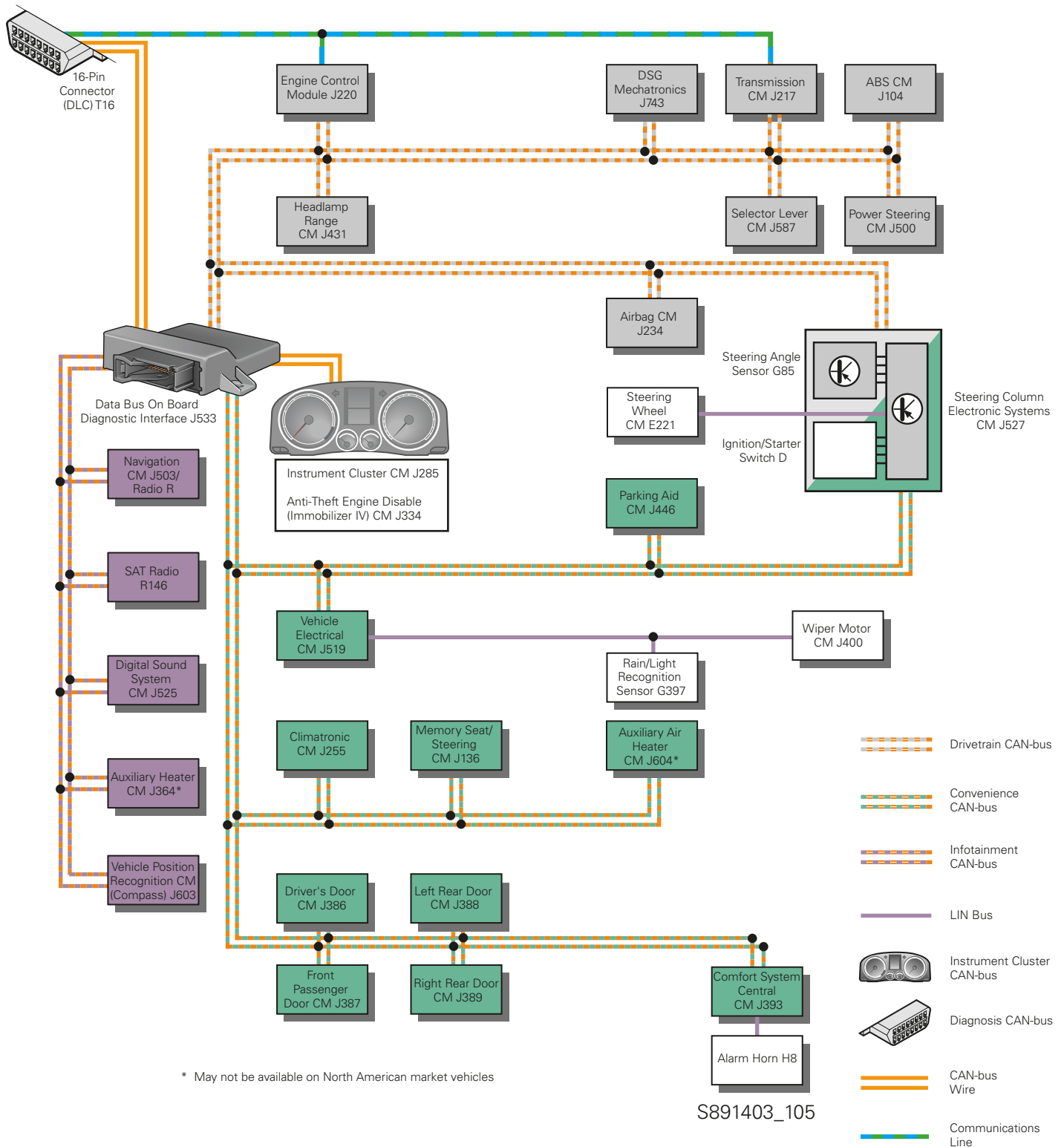


Refer to SSP 873403, "The new Jetta Electrical System Design and Function" for detailed information on CAN-bus communications.

### Key

D	Ignition/Starter Switch
E221	Control Module in Steering Wheel
G85	Steering Angle Sensor
G397	Rain/Light Recognition Sensor
H8	Alarm Horn
J104	ABS Control Module
J136	Memory Seat/Steering Column Adjustment Control Module
J217	Transmission Control Module (TCM)
J220	Motronic Engine Control Module
J234	Airbag Control Module
J255	Climatronic Control Module
J285	Instrument Cluster Control Module
J334	Anti-Theft Engine Disable Control Module
J364	Auxiliary Heater Control Module
J386	Driver's Door Control Module
J387	Front Passenger's Door Control Module
J388	Left Rear Door Control Module
J389	Right Rear Door Control Module
J393	Comfort System Central Control Module
J400	Wiper Motor Control Module
J431	Headlamp Range Control Module
J446	Parking Aid Control Module
J500	Power Steering Control Module
J503	Radio/Navigation Display Control Module
J519	Vehicle Electrical System Control Module
J525	Digital Sound System Control Module
J527	Steering Column Electronic Systems Control Module
J533	Data Bus On Board Diagnostic Interface
J587	Selector Lever Sensor System Control Module*
J603	Vehicle Position Recognition Control Module (Compass)
J604	Auxiliary Air Heater Control Module
J743*	Direct Shift Gearbox (DSG) Mechatronic
R	Radio
R146	SAT Radio
T16	16-Pin Connector (DLC)
*On direct shift gearboxes only	

# Electrical System



\* May not be available on North American market vehicles

S891403\_105

S891403\_122

# Electrical System

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## Air Conditioning Systems

### Dual Zone Climatronic

The new Jetta is equipped with a dual zone air conditioning system. The temperature on the driver's and front passenger's sides can be controlled separately to between 60°F (16°C) and 85°F (29.5°C). Pressing the "Auto" button for longer than two seconds allows the temperatures on both sides to be synchronized to the driver's side.

Two air-conditioning zones are achieved by using two temperature doors within the air conditioner. All air conditioner doors on the Dual Zone Climatronic are actuated by six control motors with integrated potentiometers. The Dual Zone Climatronic can be operated either automatically or manually.

To prevent fogging of the windshield, the Dual Zone Climatronic automatically increases air flow to the windshield if the compressor is off and the windshield wipers are on. The defrost door is also opened wider.

The Dual Zone Climatronic also reduces the fresh air blower speed depending on vehicle speed. This minimizes the airflow noise of the air conditioner. The fresh air blower is automatically adjusted as a function of road speed. This adjustment in blower speed is not noticeable by the vehicle occupants.



S891403\_56

## Climatic System

The Climatic system manages the interior of the vehicle as one climate zone. The Climatic air conditioner has a combined fresh air/recirculating door that, like the temperature control door, is driven by a control motor. The Climatic system uses a flexible shaft to control the position of the air distribution doors. Temperature requests are relayed to the control module by a potentiometer in the rotary switch. The requested temperature setting is achieved by adjusting the position of the temperature door.

## Interface with the Air Conditioner

The various components of the Climatic system and the heating system are divided into two units: an electronic front unit and a mechanical rear unit that is controlled by a flexible shaft. The heater is controlled by a bowden cable. The air conditioner is serviced similarly to other vehicles.



S891403\_57

# Heating and Air Conditioning

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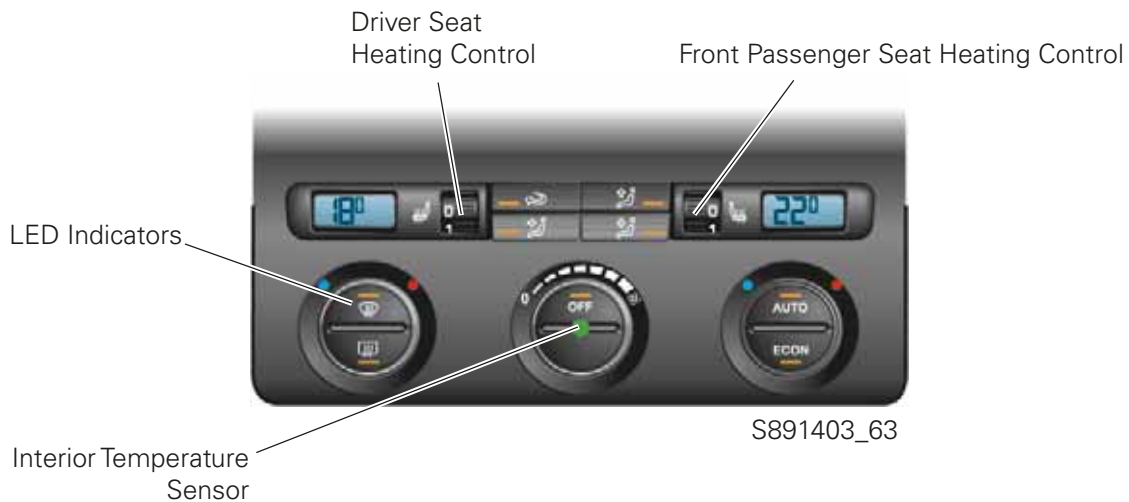
## Introduction

The new Jetta's heating, ventilation and air conditioning systems (HVAC) is available in two versions, depending on the option selected.

- The Dual Zone Climatronic heating and air conditioning system
- The Climatic heating and air conditioning system

All operating controls for the system are located on the control panel. Feedback LEDs on all buttons provide an indication of active functions. The Dual Zone Climatronic and Climatic systems include an interior temperature sensor.

## Dual Zone Climatronic System





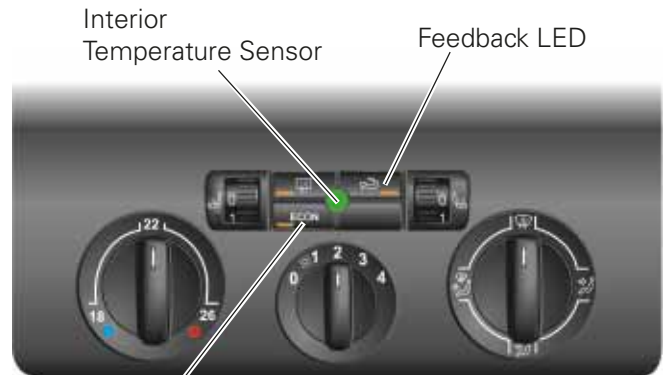
# Heating and Air Conditioning

## Climatic System

The "AC" button on the Climatic system is labelled "ECON."



Air conditioning is deactivated by pressing the "ECON" button.

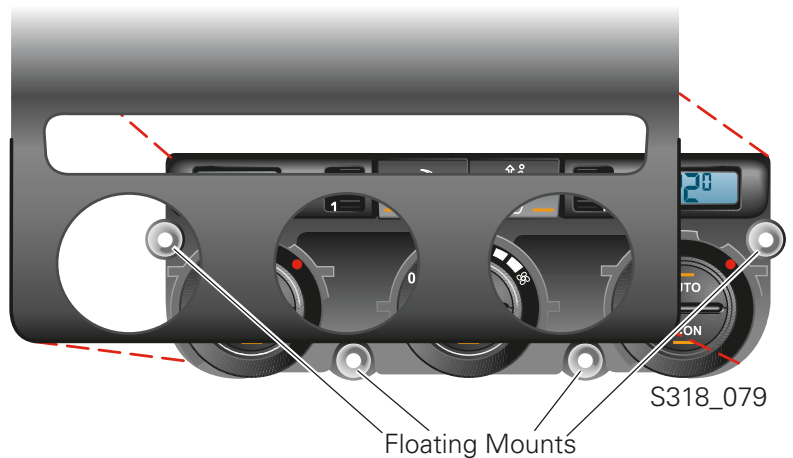


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"AC" is renamed "ECON".

## Floating Mount Installation

To ensure a uniform fit, the system control units are installed using floating mounts. This installation method allows perfect alignment with the trim panel when the panel is installed.



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# Heating and Air Conditioning

## Functions of the Systems in Overview

Components	Dual Zone Climatronic	Climatic
Pollen filter with activated charcoal	Yes	Yes
Air recirculation control	Yes	Yes
Air flow control	Yes	No
Temperature control	Two doors actuated by control motors	One door actuated by a control motor
Central footwell control	Actuated by control motor	Actuated by flexible shaft
Defrost control	Actuated by control motor	Actuated by flexible shaft
Left Vent Temperature Sensor G150 Right Vent Temperature Sensor G151	Left and right	Left
Left Footwell Vent Temperature Sensor G261 Right Footwell Vent Temperature Sensor G262	Left and right	Left
Fresh Air Intake Duct Temperature Sensor G89	Yes	No
Evaporator Vent Temperature Sensor G263	Yes	Yes
High Pressure Sensor G65	Yes	Yes
Fresh Air Blower V2	With electronic control	With series resistor
Sunlight Photosensor 2 G134	Yes	No
Interior temperature sensor	Yes	Yes
Air recirculation mode	By pressing the air recirculation button	
	When driving in reverse	
	In wipe-wash mode	

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# Heating and Air Conditioning

## Air Distribution System

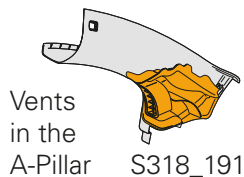
The air distribution system on the new Jetta is similar to the systems on previous Jettas. However, significant improvements to the system have been made, including:

- The cross sectional area of all air ducts has been increased.
- The air duct to the defrost and instrument panel vents runs through the instrument panel.
- The front side windows are now ventilated through new vents in the A-pillar.

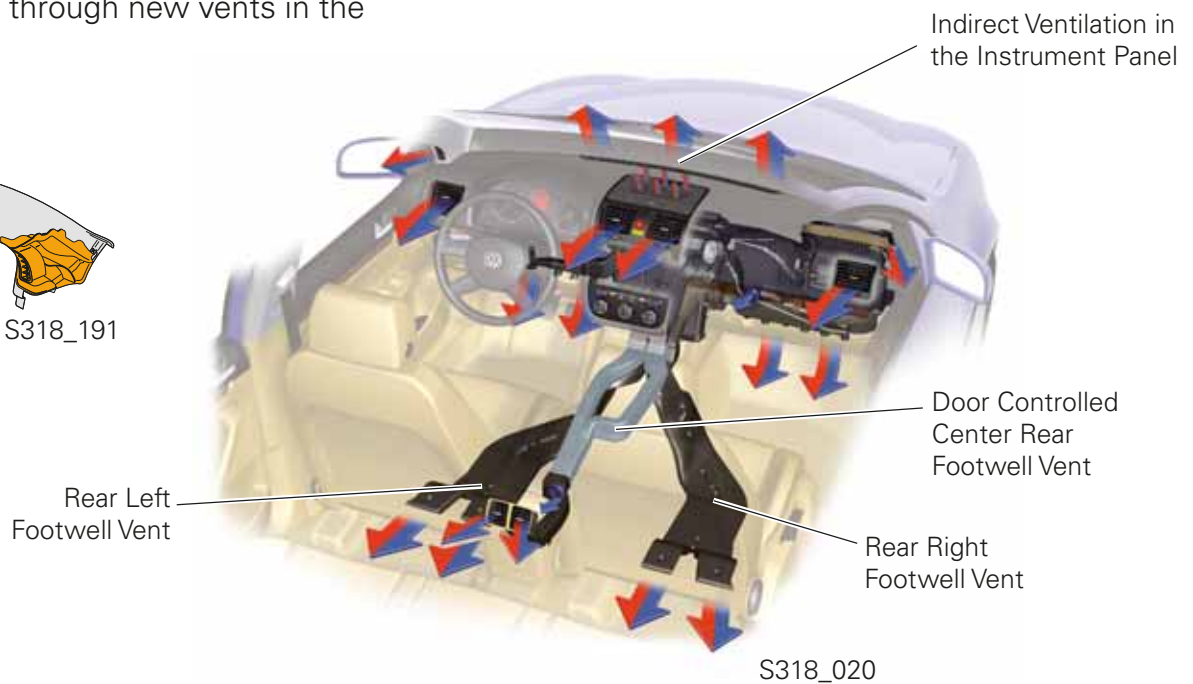
- The rear passenger area is vented by a single air duct leading to the left and right footwells.



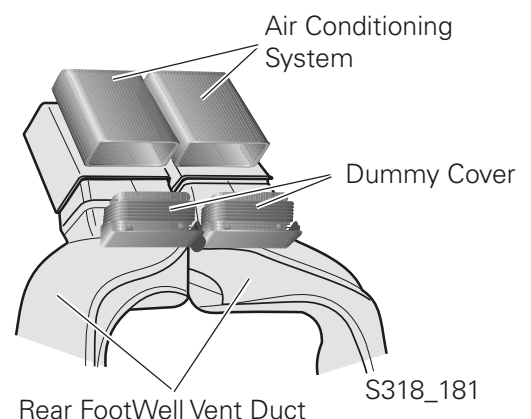
The Dual Zone Climatronic air ducts in the instrument panel provide indirect ventilation through vents in the top of the instrument panel.



Vents in the A-Pillar



A center console vent is available that directs airflow to the center rear vents through a common air duct.



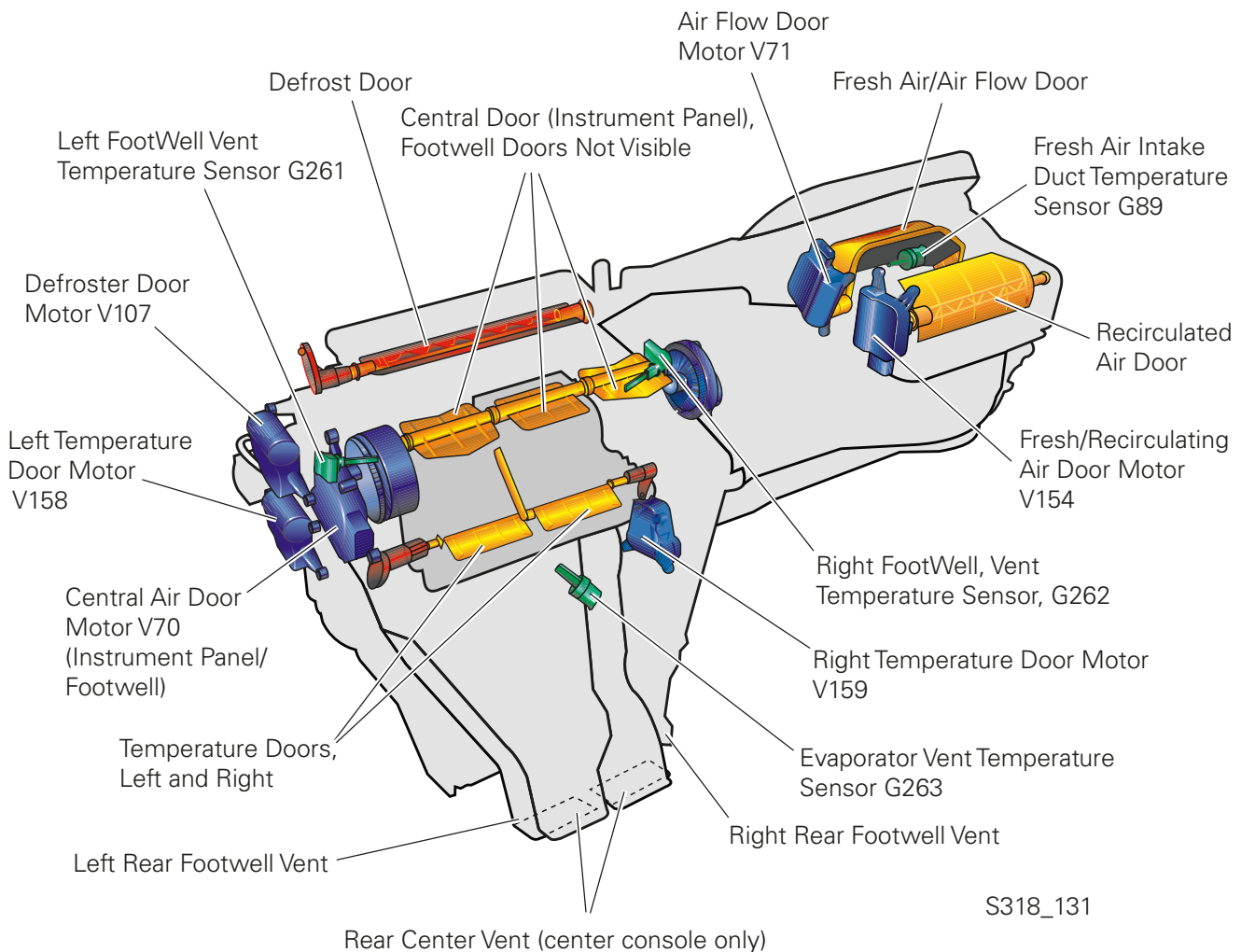
# Heating and Air Conditioning

The main difference between the Climatronic and Climatic systems is the method used to control air distribution. The Dual Zone Climatronic system has an additional fresh air door, which closes at speeds above 60 mph (97 kph). This provides constant fresh air flow at different vehicle speeds.

The figure below shows the air conditioner of the Dual Zone Climatronic system.



The heating/ventilation system and Climatic system use a fresh recirculation door. The Dual Zone Climatronic uses a fresh flow door and a separate air recirculation door.



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# Heating and Air Conditioning

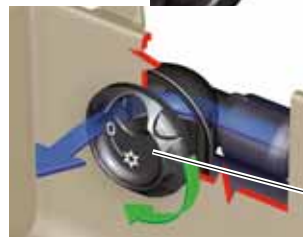
## Storage Box Cooling

All vehicles are equipped with a cooled glovebox storage compartment located in the front passenger side area. The storage compartment is cooled directly by air from the evaporator. The cooling level is adjusted manually by turning an adjustable nozzle.

The center console also has an adjustable vent for temperature control. Cooled air is directed from the center console air duct to the storage compartment. This cooled air supply can also be adjusted manually by turning an adjustable nozzle.

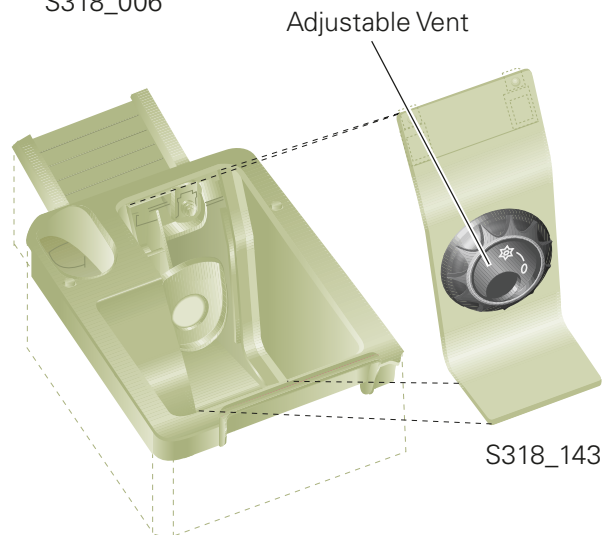


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S318\_006

Adjustable Vent



S318\_143

# Heating and Air Conditioning

## Overview of the Dual Zone Climatronic/Climatic System

Fresh Air Intake Duct Temperature Sensor G89\*

Left Footwell Vent Temperature Sensor G261

Right Footwell Vent Temperature Sensor G262\*

Left Vent Temperature Sensor G150

Right Vent Temperature Sensor G151\*

High Pressure Sensor G65

Evaporator Vent Temperature Sensor G263

Sunlight Photosensor 2 G134\*

Defroster Door Control Motor Position Sensor G135\*

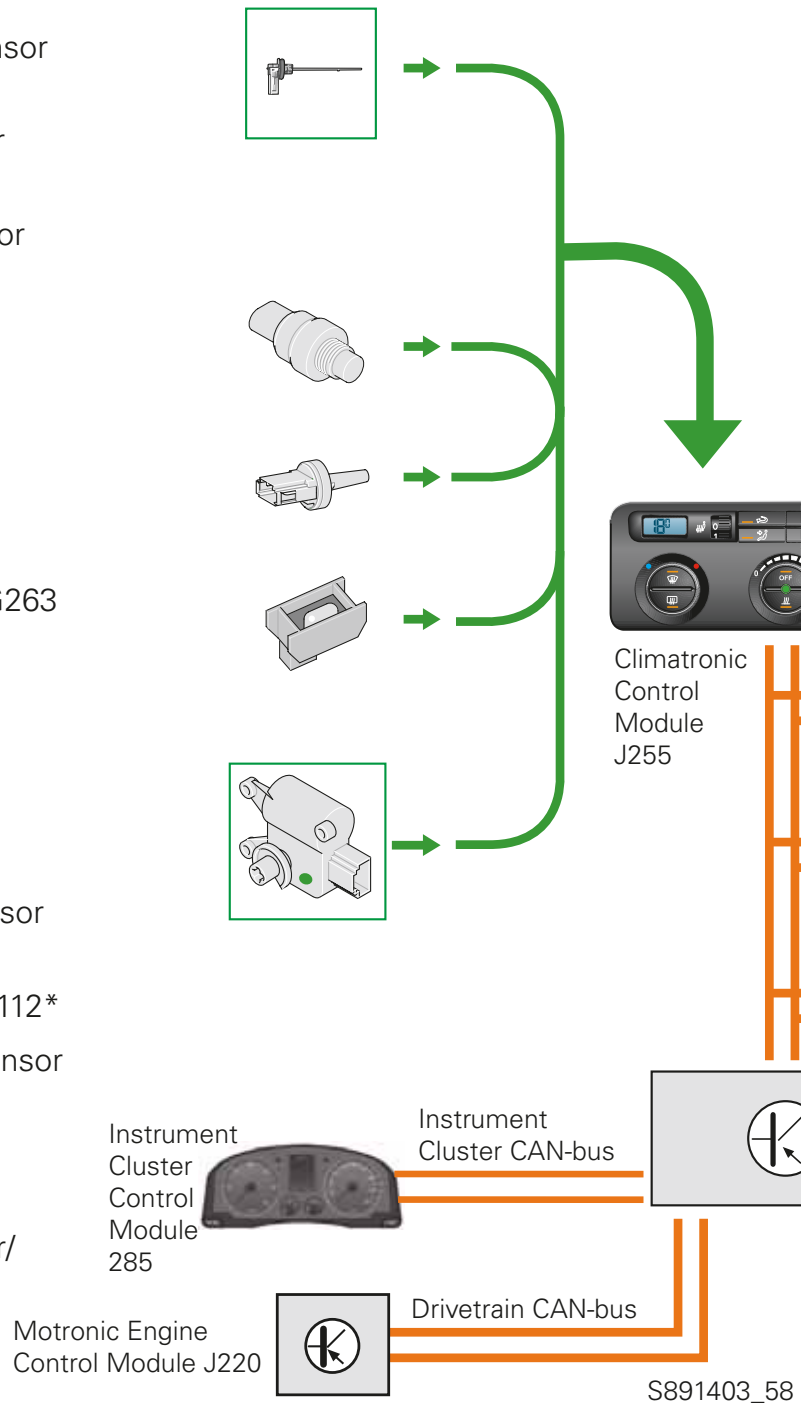
Recirculation Door Motor Position Sensor G143

Central Door Motor Position Sensor G112\*

Back Pressure Door Motor Position Sensor G113\*

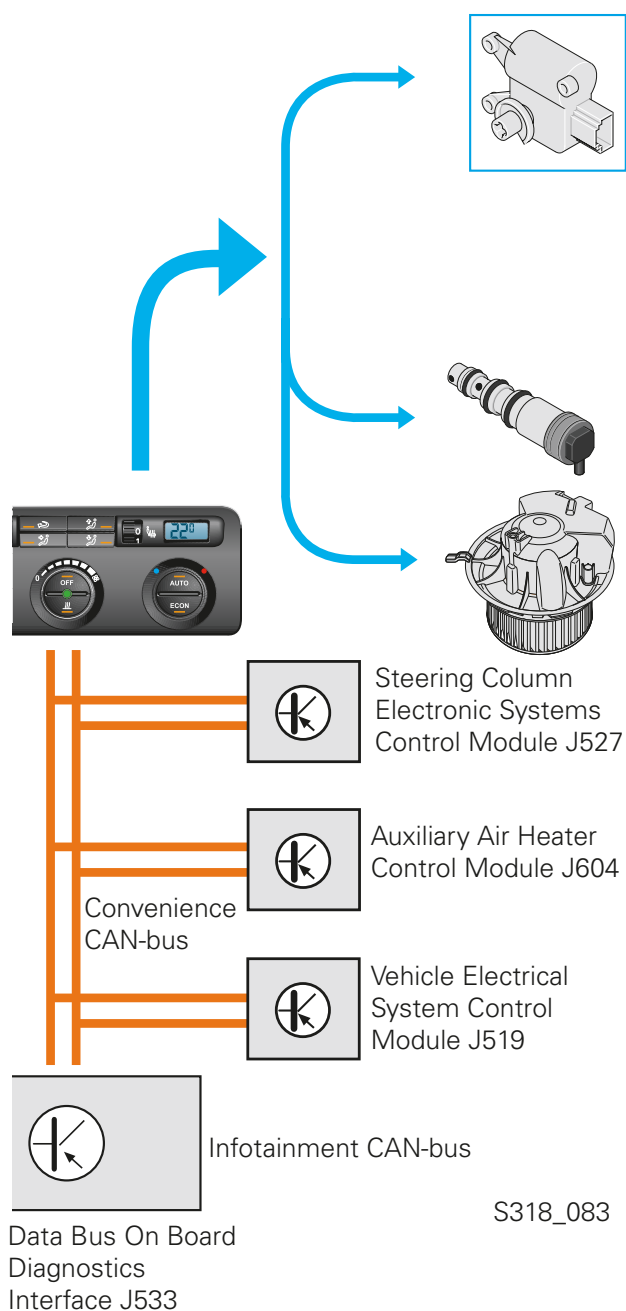
Left Temperature Door Potentiometer/Actuator G220

Right Temperature Door Potentiometer/Actuator G221\*





# Heating and Air Conditioning



Defrost Door Motor V107\*

Fresh/Recirculating Air Door Motor V154

Left Temperature Door Motor V158

Right Temperature Door Motor V159\*

Central Air Door Motor V70\*

Air Flow Door Motor V71\*

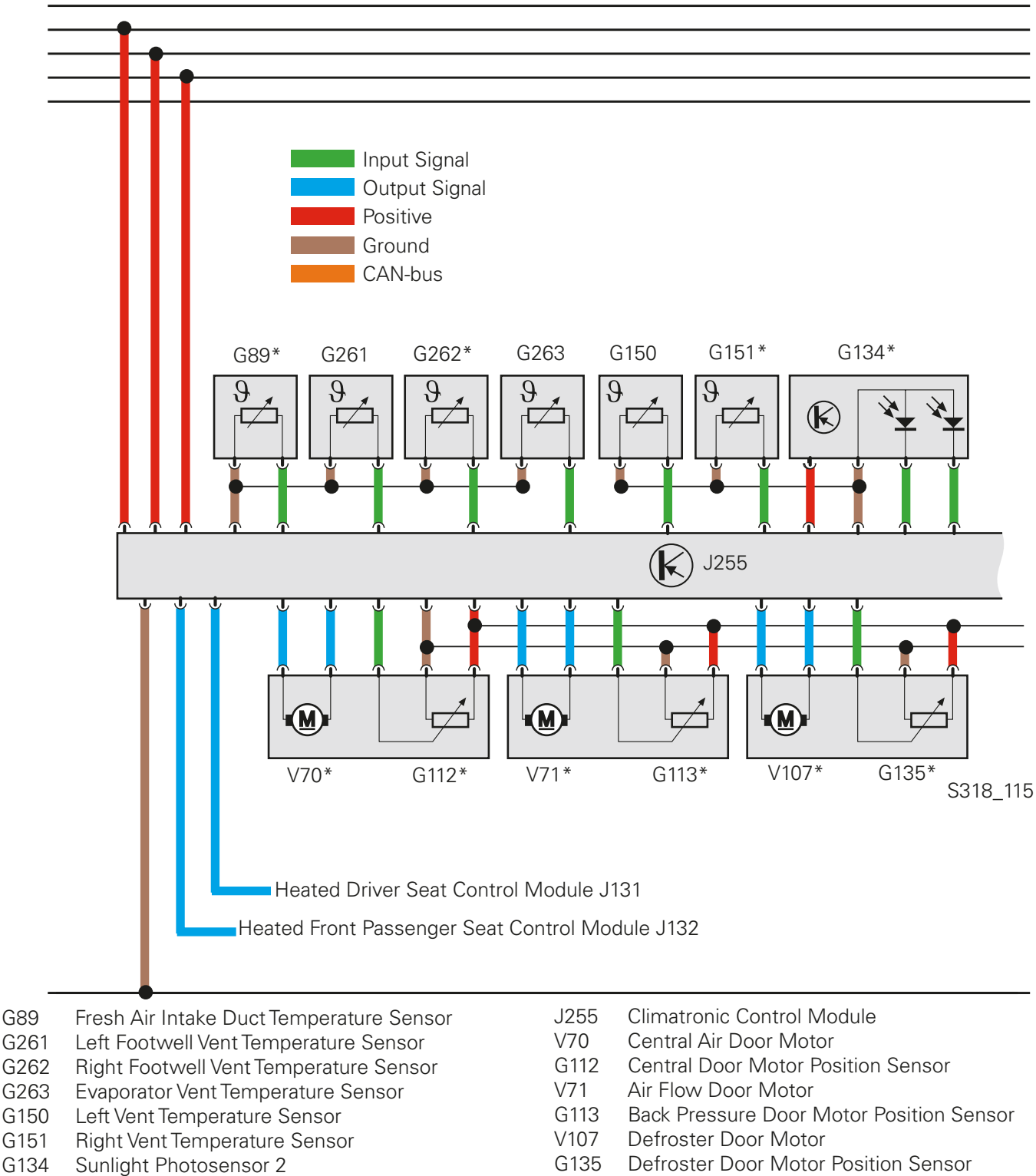
A/C Compressor Regulator Valve N280

Fresh Air Blower V2 with integrated fresh air blower controller. (In the Climatic system, air flow is not controlled electronically, but through series resistors.)

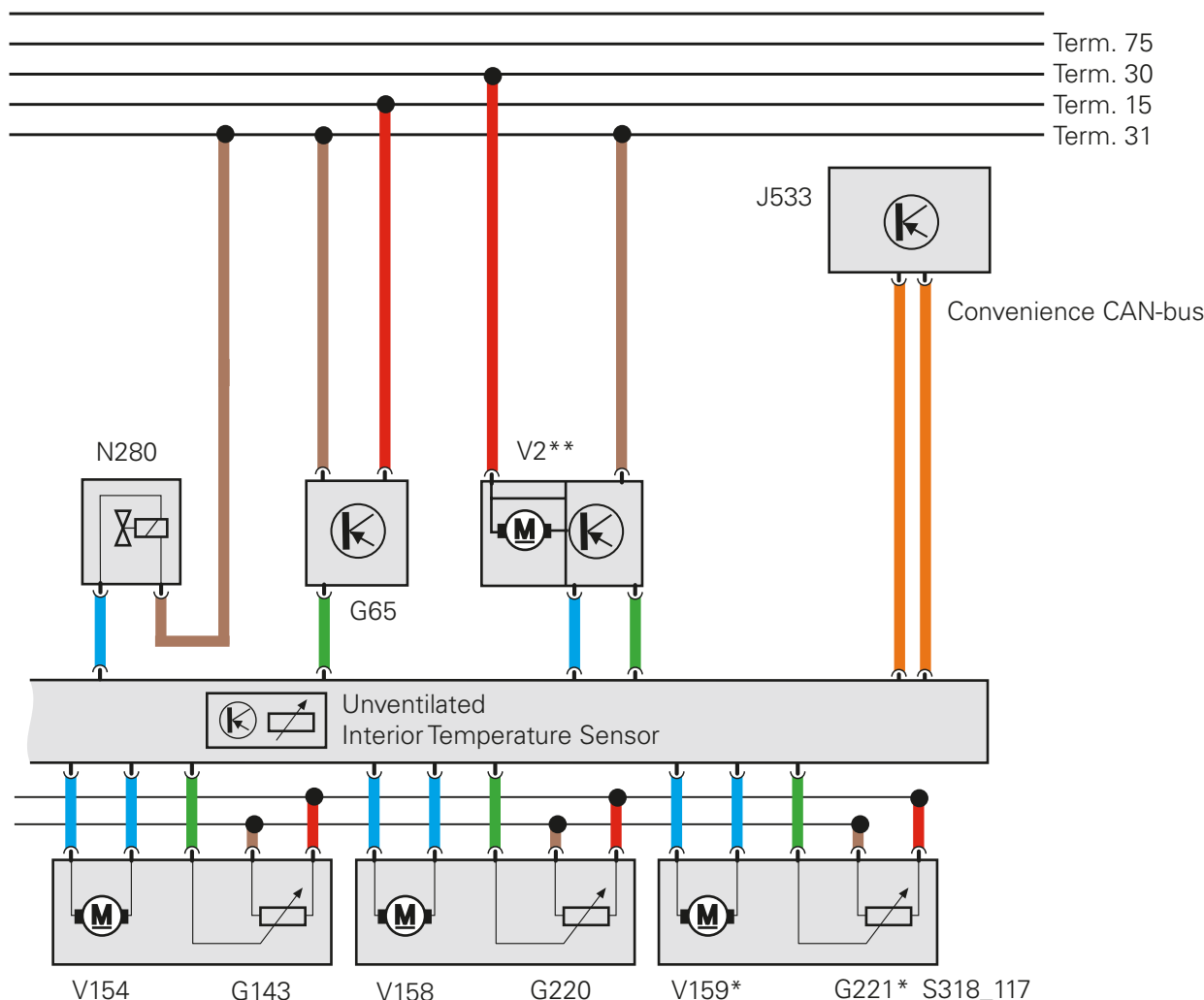
\* Only in combination with Dual Zone Climatronic

# Heating and Air Conditioning

Function Diagram - Air Conditioning Systems



# Heating and Air Conditioning



\* Used with Dual Zone Climatronic system only

\*\* The V2 Fresh Air Blower motor used with Dual Zone Climatronic only. Climatic and the heater are controlled by series resistors.



The Climatic sensors and actuators use different designations. For additional information, please refer to current service repair information.

N280 A/C Compressor Regulator Valve  
G65 High Pressure Sensor  
V2 Fresh Air Blower  
J533 Data Bus On Board Diagnostic Interface  
V154 Fresh/Recirculating Air Door Motor  
G143 Recirculation Door Control Motor Position Sensor

V158 Left Temperature Door Motor  
G220 Left Temperature Door Potentiometer/Actuator  
V159 Right Temperature Door Motor  
G221 Right Temperature Door Potentiometer/Actuator

# Heating and Air Conditioning

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## Sensors

### Interior Temperature Sensor

#### Function

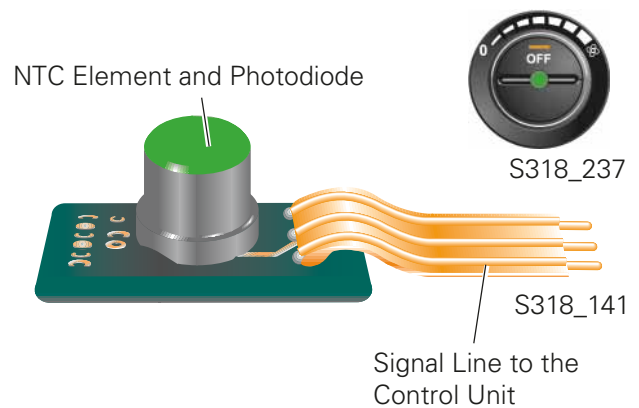
The interior temperature sensor replaces the Instrument Panel Interior Temperature Sensor G56 with ventilation motor. It is an integral part of the control unit.

The new sensor measures:

- Surface temperature
- Unit temperature
- Sunlight penetration

Its advantages over the previous sensor include:

- The sensor housing is protected, making it less susceptible to obstructions that could interfere with temperature regulation
- No moving parts to wear and fail
- No openings in the trim provide a design advantage



# Heating and Air Conditioning

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## Construction

The interior temperature sensor is not vented and consists of an integrated thermo-optical sensor, an NTC element in combination with a photodiode.

The NTC element measures the temperature and intensity of solar radiation on its surface. This allows the sensor to measure the air temperature in the vehicle's interior even if the sensor's surface is heated. The sensor signals are transmitted to the Climatic or Dual Zone Climatronic. Software then evaluates the sensor signals and regulates the temperature of the vehicle's interior.



For additional information please refer to the following:

SSP 881203 "HVAC Theory and Operation"

SSP 894303 "The Phaeton Heating and Air Conditioning System"

SSP 899303 "The Touareg Heating/Air Conditioning System"

# Heating and Air Conditioning

## Actuators

### Fresh Air Blower and Integrated Fresh Air Blower Controller V2

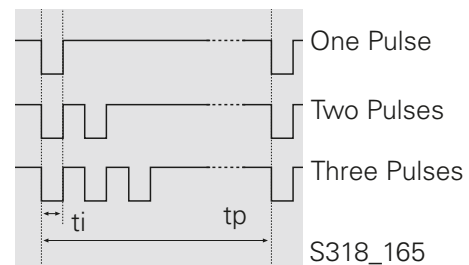
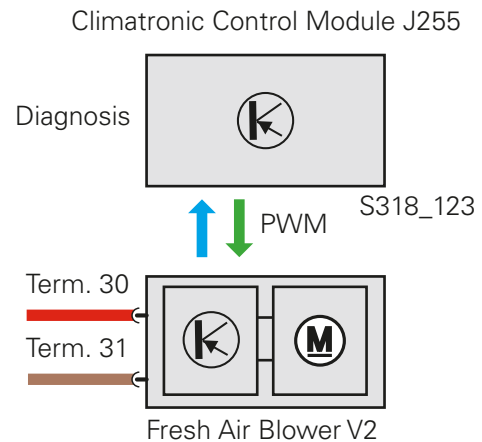
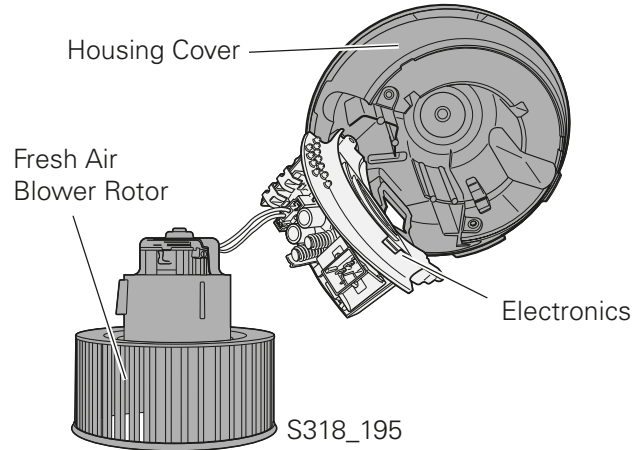
The Dual Zone Climatronic system has a fresh air blower with an integrated controller. The fresh air blower is accessible from the front passenger footwell.

#### Fresh Air Blower Controller Activation

The Fresh Air Blower V2 with integrated electronic fresh air blower controller is controlled by the air conditioner control module via a pulse-width modulated signal (PWM) and can also send back a diagnostic feedback signal.

A single pulse transmitted in the diagnostic feedback signal indicates “no fault” to the air conditioner control module.

However, two pulses indicate that the current is limited; three pulses indicate that the temperature is too high and may cause the fresh air blower to slow or shutdown.



ti = time segment of one pulse  
tp = time segment of one period



# Radio and Navigation

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## Radio and Navigation Systems

### Low Entry Radio

The Low Entry radio is a standard radio system. It has the following features:

- Single CD player in dash
- CD changer ability
- External CD changer (optional)
- MP3 compatible
- CD-R compatible
- 1 tuner



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### Premium 7 Radio

The Premium 7 radio in the new Jetta has the following features:

- CDC 6 disc in dash
- CD changer ability
- External CD changer (optional)
- MP3 compatible
- CD-R compatible
- Satellite Radio (optional)
- 2 tuners



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# Radio and Navigation

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## Premium 7 Radio (With Satellite Radio)

The Premium 7 radio (with satellite radio) has the following features:

- CDC 6 disc in dash
- CD changer ability
- External CD changer (optional)
- MP3 compatible
- CD-R compatible
- Amplifier
- Satellite Radio (optional)
- 2 tuners



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## Radio with DVD-Based Navigation

The radio with DVD-based navigation operates similarly to the radio navigation system in the Touareg. Features include:

- CD changer ability
- External CD changer
- Amplifier (optional)
- Satellite Radio (optional)
- 2 tuners



To remove and install a radio, remove the cover to access the mounting screws.



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## Special Tools

Alignment bracket set VAS 6240 and supplementary set VAS 6240/2 are required service tools for new Jetta frame and chassis alignment and straightening.

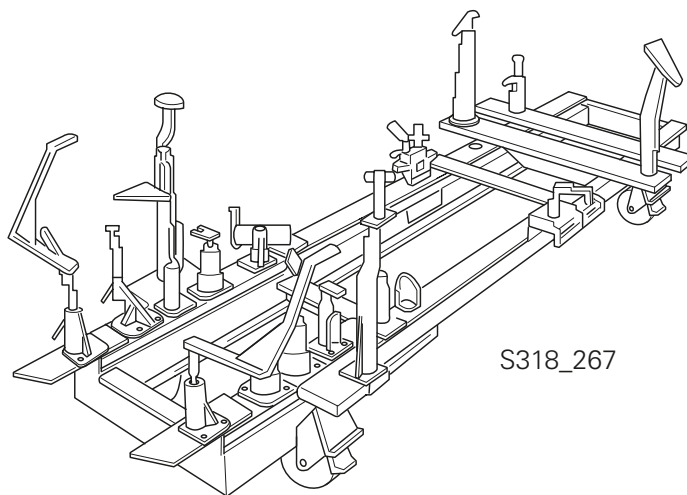


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New required equipment:



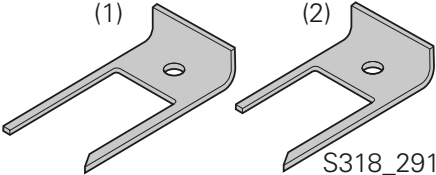
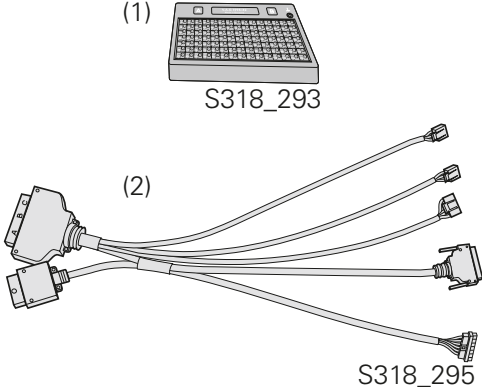
- Alignment bracket set VAS 6240
- Supplementary set VAS 6240/2
- Portal gauge supplement VAS 5007/18

Straightening Bracket Set VAS 6240



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New Special Tools

Tool Number	Diagram	Application
T10237	 S318_269	Door setting tool
T10236	 S318_265	Rear door removal tool
T10238 (1) T10240 (2)	 S318_291	Accelerator pedal module release tool (1) Left-hand drive (2) Right-hand drive
V.A.G. 1598 (1) V.A.G. 1598/47 (2)	 S318_293 S318_295	Dual Zone Climatronic, Climatic and heating and ventilation systems troubleshooting tools (1) Test box (2) Test adapters

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# Knowledge Assessment

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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.vwwebsource.com](http://www.vwwebsource.com)**

From the vwwebsource.com Homepage:

- Click on the Certification tab
- Type the course number in the Search box
- Click "Go!" and wait until the screen refreshes
- Click "Start" to begin the Assessment

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