

**Service Training**



**Self-study Programme 891143C**

**The Golf 2014**



The material in this Self Study Program (SSP) may contain technical information or reference vehicle systems and configurations which are not available in the Canadian market.

Please ensure you reference ElsaPro for the most current technical information and repair procedures.

## The new Golf

The Golf 2013 is the first vehicle to be launched by the Volkswagen brand which is based on a new concept used for all platforms, the “Modular Transverse Matrix” (MQB). Many of the mechanical units, subassemblies and systems have been completely re-developed within the scope of the MQB.

This makes the seventh generation of the Golf a completely new release, and one which is accompanied by many innovations. The Golf 2013 sets new standards in its vehicle class when it comes to convenience, quality and safety features, as well as the assistance systems available for the vehicle.

This Self-study Programme will provide an overview of the design and function of the new Golf and help explain many of the technical innovations it boasts.

The individual chapters contain references to further Self-study Programmes which provide more detailed information on the way the individual vehicle components are designed and constructed.



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**The self-study programme presents the design and function of new developments!  
The content will not be updated.**

Current testing, setting and repair instructions can be found in the provided service literature.



**Important  
note**

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# Introduction



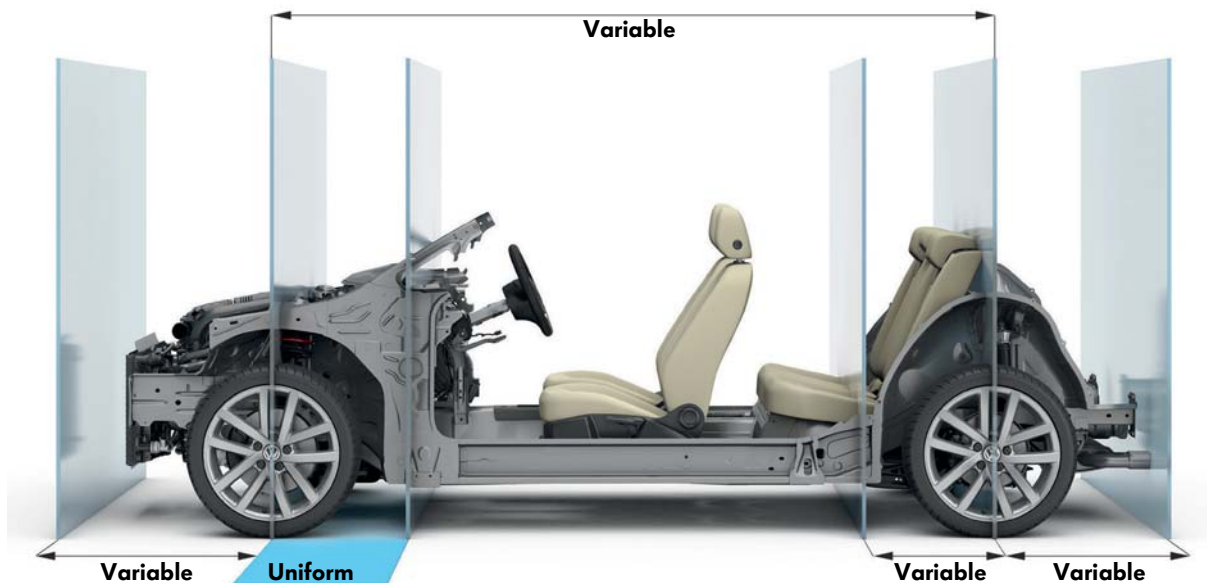
## The Modular Transverse Matrix (MQB)

The modular transverse matrix, or MQB for short, is the new modular strategy introduced by the Volkswagen Group. Under the direction of the Volkswagen brand, this modular transverse matrix will be launched for the Volkswagen, Audi, SKODA and SEAT brands. The models Polo, Beetle, Scirocco, Jetta, Tiguan, Touran, Sharan, Passat, Volkswagen CC and, as the first vehicle model of them all, the Golf 2013 are being assembled using the MQB as a basis.

### Vehicle architecture

The integral feature of the modular transverse matrix is a flexible vehicle architecture. This has been divided into five principle vehicle sections. The central dimension is the area between the pedal cluster and wheel centre.

This dimension is uniform in all vehicles and is based on a standard engine installation position which is transverse to the direction of travel. Other dimensions which characterise the concept, such as wheelbases, track widths, wheel sizes and seat positions, have been standardised across the Group while remaining variable.



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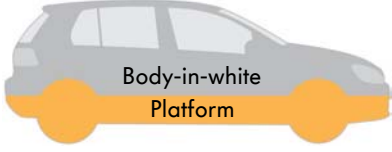
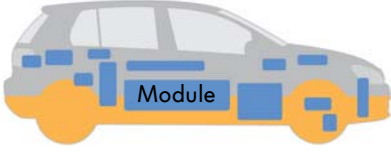
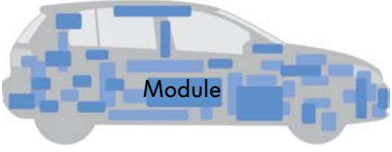
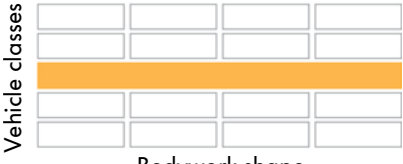
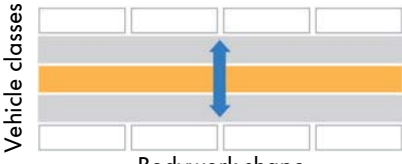
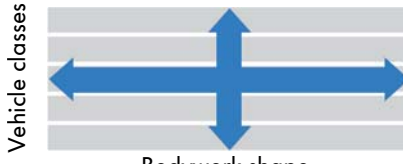
### Module families

The modular strategy characterising the MQB is based on the following standardised module families:

- Electrics/electronics
- Drive
- Running gear
- Vehicle design (vehicle body, air conditioning system, seat system, airbags)



## From the platform to the modular matrix

Platform strategy	Module strategy	Modular matrix strategy
 <p>Body-in-white Platform</p> <p>s513_070</p>	 <p>Module</p> <p>s513_072</p>	 <p>Module</p> <p>s513_074</p>
Synergies within just one vehicle class	Synergies partly shared among vehicle classes	Synergies shared among all vehicle classes
 <p>Vehicle classes</p> <p>Bodywork shape</p> <p>s513_076</p>	 <p>Vehicle classes</p> <p>Bodywork shape</p> <p>s513_078</p>	 <p>Vehicle classes</p> <p>Bodywork shape</p> <p>s513_080</p>
<p>Since the early 1990s, a number of different models have been produced on a shared platform. This strategy involves dividing the vehicle into the body-in-white and the platform. The technical features of the platform components are virtually identical.</p>	<p>In the year 2000, this strategy was supplemented with the launch of the module strategy. Modules with basic technical functions and designs which are identical were introduced to a variety of vehicles.</p>	<p>Since 2007, the use of modules has been extended to the entire vehicle, and has been introduced across all vehicle classes as well. From 2012 on, the same modules will be used across the entire Group within the modular strategy.</p>

## Standardisation across all brands

Some of the advantages provided by standardisation across all brands include:

- VW production will become faster, simpler, more cost-effective and more flexible through standardisation across the brands. It will simplify development, creating synergies right across all brands and vehicle series.
- The modular matrix strategy will allow the number of versions, and their complexity, to be reduced significantly.
- Standardised production processes are made possible by employing uniform joining sequences in body construction, a uniform assembly sequence and uniform installation concepts.
- It is now possible to produce models based on the MQB architecture, even when they are made by different brands, together on one and the same production line.



# Introduction



## The production sites

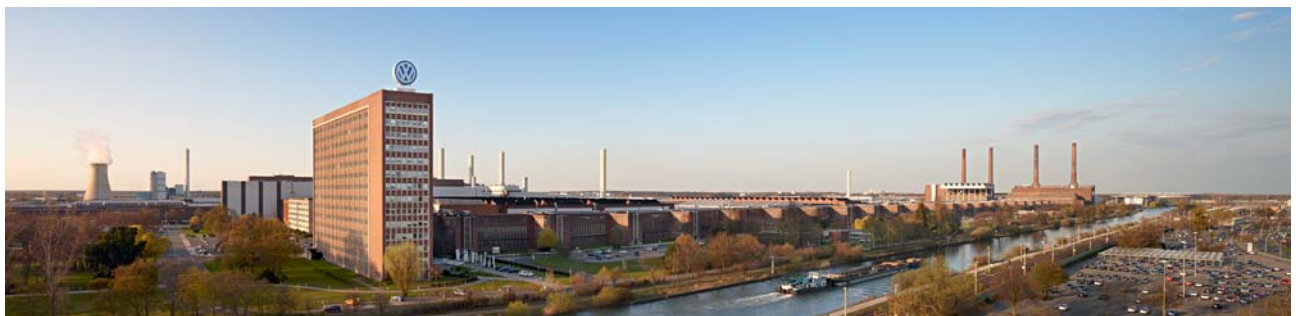
The Golf 2013 will be produced in the Volkswagen factory in Wolfsburg, as well as in the Volkswagen factory in Zwickau.

### The Wolfsburg production site

The production plant in Wolfsburg, which was built in 1938/1939, is now headquarters of the Volkswagen Group and the largest continuous automobile factory in the world.

The factory grounds, which are located next to the Mittelland Canal, encompass an area covering more than six square kilometres.

Over 51,000 staff are currently employed there. They are not only involved in the production of the Golf, but also the Volkswagen models Golf Plus, Touran and Tiguan. In 2011, a total of 805,000 vehicles left this factory's production halls. Altogether, around 40 million vehicles have been produced at the Wolfsburg plant to date.



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### The Zwickau production site

The Volkswagen plant in Zwickau is an automobile factory located in Saxony, founded in 1990 in what is now the Mosel district of Zwickau, and which forms Volkswagen-Sachsen GmbH, with headquarters in Zwickau, together with the engine factory in Chemnitz. The factory grounds cover an area approximately 1.8 square kilometres in size. The Golf and Passat models as well as bodies for Bentley and Phaeton are produced at the production plant. A combined number of around 8,100 employees work in Zwickau and Chemnitz.



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## The Golf innovations

The main contribution made by all vehicle subassemblies is the weight saved, this being up to 100 kg compared to the previous models. This also saves a significant amount of fuel for all engine and gearbox combinations, at the same time as reducing the CO<sub>2</sub> emissions by the same proportion.

This focus on innovations allowed numerous new technologies to be implemented in this vehicle class, such as:

- A new series of engines
- Modular Infotainment System (MIB)
- Active Cylinder Management (ACT)
- ergoActive seat design
- Multicollision brake
- Electromechanical parking brake with AutoHold
- Panorama sliding/tilting sunroof
- Xenon headlight versions
- Proactive occupant protection
- Driving mode selection



For the first time, many new systems and numerous driver assist systems are being utilised in the Golf 2013, all of which were otherwise only available for higher-level vehicle classes, such as:

- Traffic sign recognition (TSR)
- Driver Alert System
- Dynamic Light Assist (DLA)
- Main beam assist (FLA)
- Lane departure warning system "Lane Assist"
- Speed limiter
- Adaptive Cruise Control (ACC)
- FrontAssist with City Emergency Brake and distance warning
- Optical parking system (OPS)
- Park Assist Steering 2.0 (PLA)



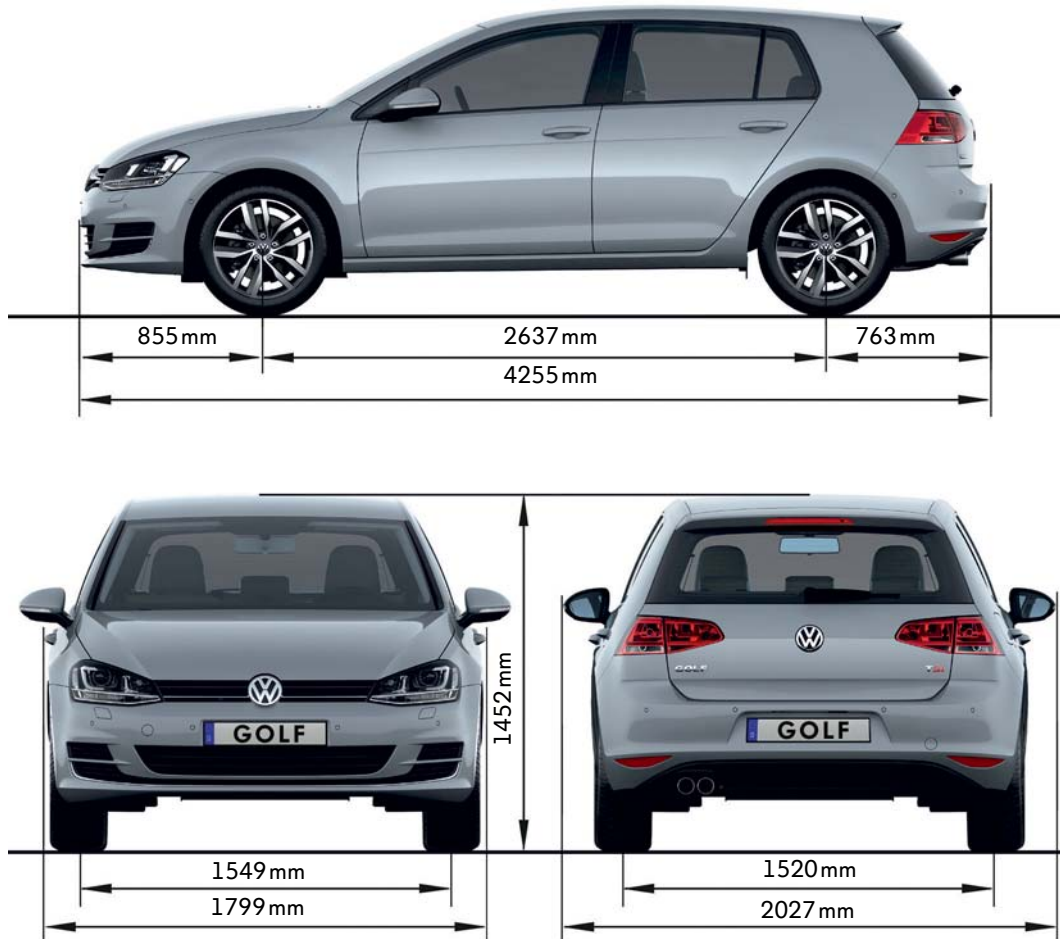


# Introduction



## Technical data

### Exterior dimensions and weights



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#### Exterior dimensions

	Golf 2009	Golf 2013
Length	4199 mm	4255 mm
Width	1786 mm	1799 mm
Height	1480 mm	1452 mm
Wheelbase	2578 mm	2637 mm
Track width at front	1541 mm	1549 mm
Track width at rear	1514 mm	1520 mm

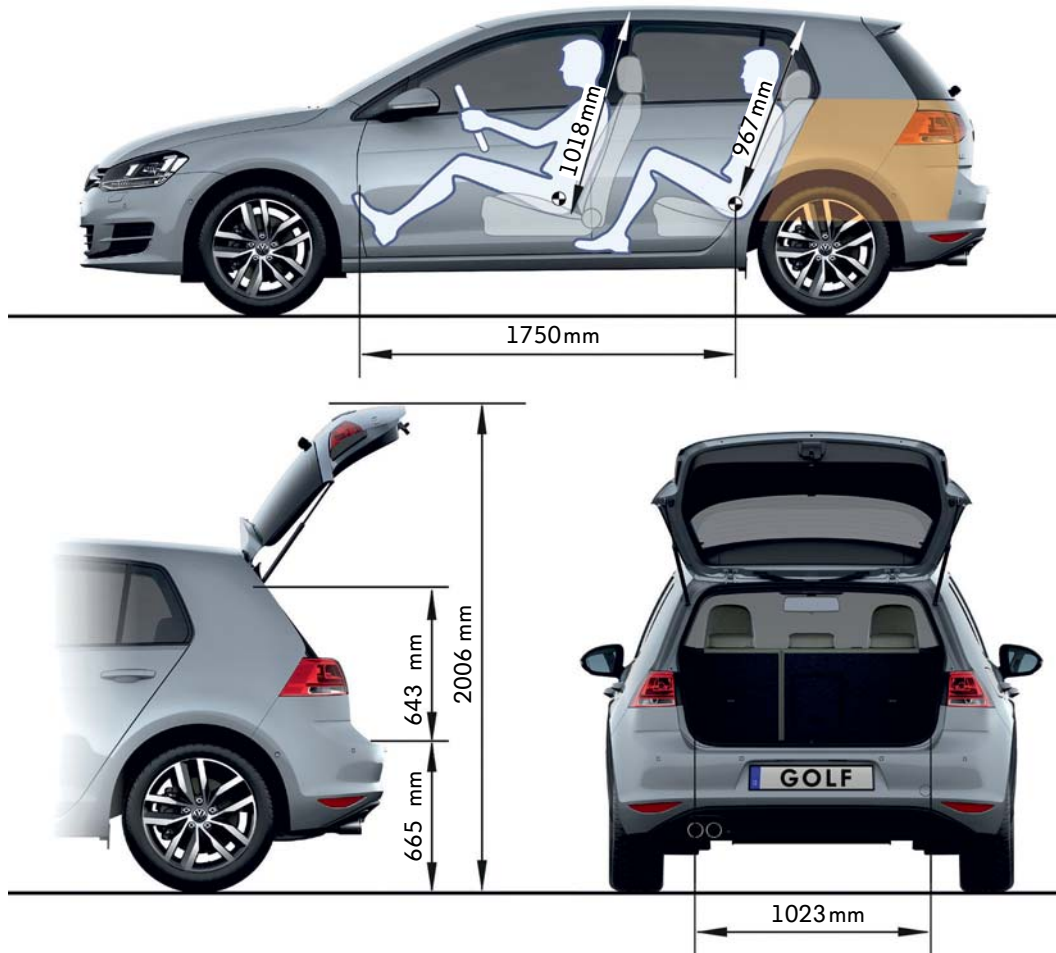
#### Weights/further data

	Golf 2009	Golf 2013
Gross vehicle weight rating	1780 kg*	1720 kg*
Kerb weight	1154 kg*	1130 kg*
Max. roof load	75 kg	75 kg
Turning circle	10.9 m	10.9 m
Tank capacity	55 litres	50 litres
Drag coefficient	0.312 $c_w$	0.287 $c_w$ *

\* This data refers to the two vehicles, without driver, when equipped with a 1.2 | 63 kW TSI engine, 5-speed manual gearbox MQ200 and 195/65 R15 tyres, as well as BMT (BlueMotion technology) for the Golf 2013 and without BMT for the Golf 2009.



## Interior dimensions and volumes



s513\_019

## Interior dimensions and volumes

	<b>Golf 2009</b>	<b>Golf 2013</b>
Length of vehicle interior	1736 mm	1750 mm
Luggage compartment volume	350 litres	380 litres
Luggage compartment volume with rear seat backrest folded down	1305 litres	1270 litres
Height of luggage compartment aperture	659 mm	643 mm
Width of luggage compartment aperture	976 mm	1023 mm

	<b>Golf 2009</b>	<b>Golf 2013</b>
Through-load width between wheel housings	1006 mm	1003 mm
Max. front headroom	1033 mm	1018 mm
Rear headroom	979 mm	967 mm
Knee room – 2nd seat row	29 mm	44 mm

# Body

## Body structure

The key focus during development of the body structure was combining high crash safety with a low body weight. This is why a high proportion of ultra-high tensile (thermoformed) sheet metal parts have been used for the Golf 2013. Furthermore, innovative production technologies, such as the “tailored rolled blank technique”, and new joining technologies, such as the “wobble seams” in the side area, have been used. This has allowed the stability of the passenger compartment to be increased.



## Wobble seams

For the first time, wobble seams (the name refers to their shape) have been used in the Golf 2013. This joining technology produces a longer laser weld joint over the same area. It can be subjected to a load 3 to 4 times greater than individual spot welds.



Wobble seam



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### Strengths of steel sheets

- <160MPa
- <220MPa
- <420MPa
- <1000MPa
- ultra-high tensile (thermoformed) >1000 MPa

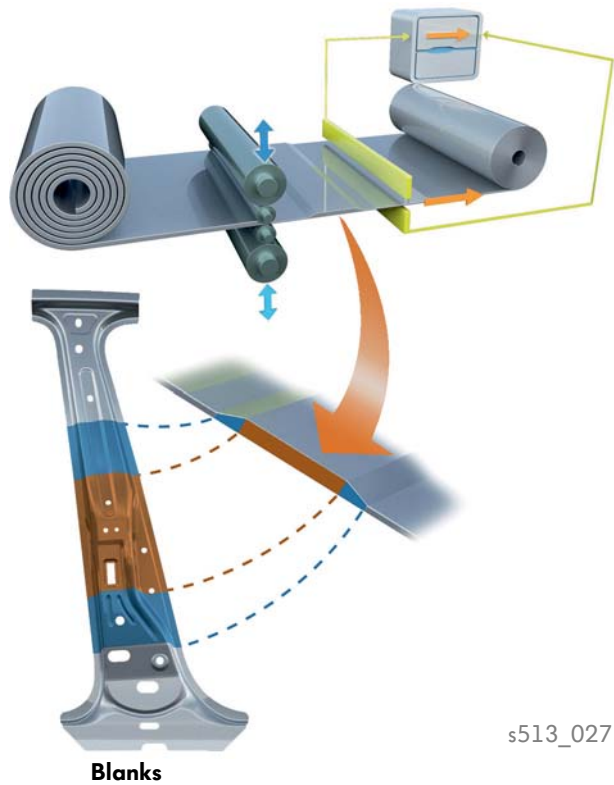


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## Tailor rolled blank technology

The B-pillar has been produced by employing “tailor rolled blank technology”. This involves only shaping those areas of a component where the loads exerted require a larger wall thickness. A so-called tailor rolled blank plate is produced. Tailored blank (meaning custom-made blank).

### Manufacturing process



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You can find further information on the body in the Self-study Programme no. 520 “The Golf 2013 – Body and Occupant Protection”.



# Occupant safety

## Safety equipment

The Golf 2013 features the following safety equipment:

- Single-stage driver airbag
- Single-stage, disengagable front passenger's airbag
- Side airbags at front
- Side airbags at rear as an option
- Head-protection airbags
- Knee airbag on driver's side
- Three-point automatic seat belt with tensioner at front
- Three-point automatic seat belt at rear
- Reversible belt tensioner at front as an option
- Belt force limiter at front
- Top tether



## Seat belt reminder

As an option, the 4-door Golf can be equipped with side airbags at the rear in combination with a seat belt reminder. The seat belt reminder informs the driver of whether the passengers in the rear compartment have fastened their seatbelts, indicating this in the multifunction display in the dash panel insert.

## Crash sensors

The following crash sensors are installed:

- Crash sensor for front airbag
- Crash sensors in the doors for side crash detection (pressure sensors)
- Crash sensors in the C-pillars for side crash detection (acceleration sensors)



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## Proactive occupant protection system

For the very first time in this vehicle class, the Golf features the option of being equipped with the proactive occupant protection system.

This system takes action if one of the following criteria is met:

- Emergency braking (very fast brake pedal actuation)
- Hazard braking (fast increase in the brake pedal pressure when braking)
- Unstable vehicle conditions, such as e.g. excessive vehicle under or oversteering

If a potential accident situation is identified, then the occupants and vehicle are prepared for a possible accident. Tensioning of the seat belts by means of electric motors keeps the driver and front passenger securely in their seats, allowing the airbag and the seat belt system to provide the highest possible level of protection.

In the event of excessive vehicle under or oversteering, the panoramic sliding roof and the side windows are also closed until only a residual gap remains.

Once the driver has regained control of the vehicle and it has been returned to a stable dynamic handling condition, the seat belts are relaxed again.





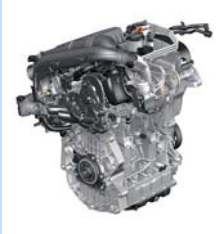









You can find further information on the body in Self-study Programme no. 520 “The Golf 2013 – Body and Occupant Protection”.



# Power units

## Engine and gearbox combinations





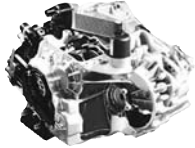

### Petrol engines

	1.2l 63 kW TSI engine CJZB	1.2l 77 kW TSI engine CJZA	1.4l 90 kW TSI engine CMBA	1.4l 103 kW TSI engine CHPA/CPTA**
				
5-speed Manual gearbox MQ200-5F* 0AH				
6-speed Manual gearbox MQ200-6F* 0AJ				
6-speed Manual gearbox MQ250-6F* 02S				
7-speed Dual-clutch gearbox DQ200-7F* 0CW				

\* 5F = 5-speed front-wheel drive, 6F = 6-speed front-wheel drive, 7F = 7-speed front-wheel drive

\*\* engine with active cylinder management (ACT)

## Diesel engines

	1.6l 77 kW TDI engine CLHA	2.0l 110 kW TDI engine CRBC
5-speed Manual gearbox MQ250-5F* 0A4		
6-speed Manual gearbox MQ350-6F/6A* 02Q		
6-speed Dual-clutch gearbox DQ250-6F* 0D9		
7-speed Dual-clutch gearbox DQ200-7F* 0CW		

\* 5F = 5-speed front-wheel drive, 6F = 6-speed front-wheel drive, 6A = 6-speed four-wheel drive, 7F = 7-speed front-wheel drive



With the launch of the modular transverse matrix, the installation position of the dual clutch gearbox has been changed, along with the communication between the mechatronic unit and the data bus system. This has led to a change in the designations used for the dual clutch gearboxes. The dual clutch gearbox 0AM has become the 0CW, and the 02E has become the 0D9.



# Power units

## 1.2l 63/77 kW TSI engine with turbocharger

The 1.2 l TSI engine in the new EA211 series of petrol engines is available in two different power versions. The two different power versions are realised by the software.

### Technical features

- Cylinder head with integrated exhaust manifold
- Toothed belt drive
- Coolant distributor housing forms a unit with the coolant pump
- Coolant pump driven by a toothed belt from the exhaust camshaft
- Exhaust gas turbocharger with electric charge pressure controller
- Inlet camshaft adjustment
- Crankshaft oil pump

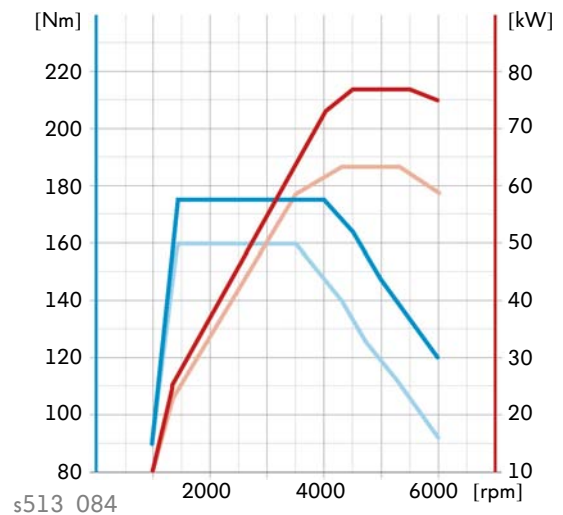


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### Technical data

Engine code	CJZB/CJZA
Design	4-cylinder inline engine
Displacement	1197 cm <sup>3</sup>
Bore	71 mm
Stroke	75.6 mm
Valves per cylinder	4
Compression ratio	10.5:1
Max. output	63 kW at 4300 - 5300 rpm 77 kW at 4500 - 5500 rpm
Max. torque	160 Nm at 1400 - 3500 rpm 175 Nm at 1400 - 4000 rpm
Engine management	Bosch Motronic MED 17.5.21
Fuel	Super unleaded RON 95
Exhaust gas aftertreatment	Three-way catalytic converter with one upstream broadband Lambda probe and one step-type Lambda probe downstream of the catalytic converter
Emissions standard	EU5

### Torque and performance diagram



CJZB, 63 kW

CJZA, 77 kW

## 1.4 | 90 kW TSI engine with turbocharger

The 1.4 | 90 kW TSI engine is another engine from the new EA211 series of petrol engines.

### Technical features

- Cylinder head with integrated exhaust manifold
- Toothed belt drive
- Coolant distributor housing forms a unit with the coolant pump
- Coolant pump driven by a toothed belt from the exhaust camshaft
- Exhaust gas turbocharger with electric charge pressure controller
- Inlet camshaft adjustment
- External gear wheel oil pump with two-stage oil pressure regulation

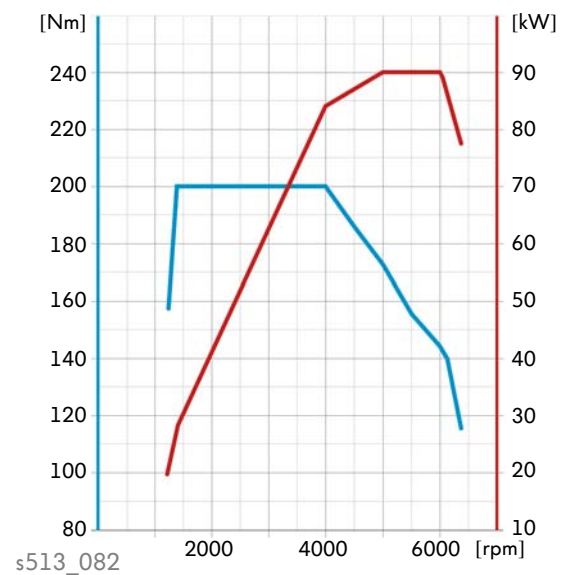


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### Technical data

Engine code	CMBA
Design	4-cylinder inline engine
Displacement	1395 cm <sup>3</sup>
Bore	74.5 mm
Stroke	80 mm
Valves per cylinder	4
Compression ratio	10.0:1
Max. output	90 kW at 5000 - 6000 rpm
Max. torque	200 Nm at 1400 - 4000 rpm
Engine management	Bosch Motronic MED 17.5.20
Fuel	Super unleaded RON 95
Exhaust gas aftertreatment	Three-way catalytic converter with one upstream broadband Lambda probe and one step-type Lambda probe downstream of the catalytic converter
Emissions standard	EU5

### Torque and performance diagram



s513\_082

# Power units

## 1.4 I 103 kW TSI engine with turbocharger

The 1.4 I 103 kW TSI engine is the basic engine in the new EA211 series of petrol engines.

### Technical features

- Cylinder head with integrated exhaust manifold
- Toothed belt drive
- Coolant distributor housing forms a unit with the coolant pump
- Coolant pump driven by a toothed belt from the exhaust camshaft
- Exhaust gas turbocharger with electric charge pressure controller
- Inlet and exhaust camshaft adjustment
- External gear wheel oil pump with two-stage oil pressure regulation

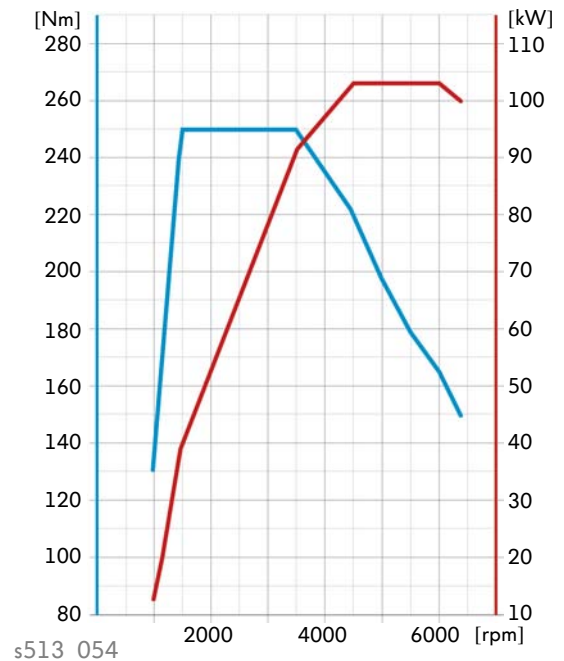


s513\_011

### Technical data

Engine code	CHPA
Design type	4-cylinder inline engine
Displacement	1395 cm <sup>3</sup>
Bore	74.5 mm
Stroke	80 mm
Valves per cylinder	4
Compression ratio	10.0:1
Max. output	103 kW at 4500 - 6000 rpm
Max. torque	250 Nm at 1500 - 3500 rpm
Engine management	Bosch Motronic MED 17/05/2021
Fuel	Super unleaded RON 95
Exhaust gas aftertreatment	Three-way catalytic converter with one upstream broadband Lambda probe and one step-type Lambda probe downstream of the catalytic converter
Emissions standard	EU5

### Torque and performance diagram



s513\_054

# 1.4 | 103 kW TSI engine with Active Cylinder Management (ACT)

The main difference between this engine and the 1.4 | 103 kW TSI engine is the Active Cylinder Management (ACT).

### Technical features

- Active Cylinder Management (ACT)
- For further technical features, read about the 1.4 | 103 kW TSI engine with turbocharger.



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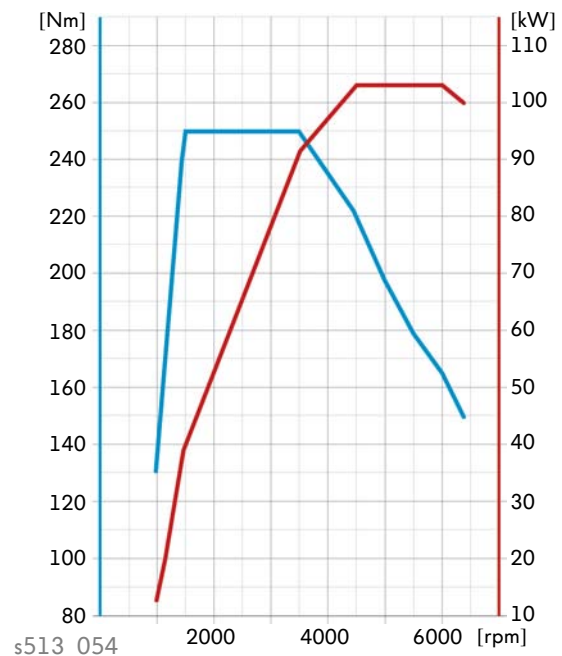


More information on active cylinder management can be found in Self-study Programme no. 510 “Active Cylinder Management (ACT) in the 1.4 | 103 kW TSI engine”.

### Technical data

Engine code	CPTA
Design	4-cylinder inline engine
Displacement	1395cm <sup>3</sup>
Bore	74.5mm
Stroke	80mm
Valves per cylinder	4
Compression ratio	10.0:1
Max. output	103kW at 4500 - 6000 rpm
Max. torque	250Nm at 1500 - 3500 rpm
Engine management	Bosch Motronic MED 17/05/2021
Fuel	Super unleaded RON 95
Exhaust gas aftertreatment	Three-way catalytic converter with one upstream broadband Lambda probe and one step-type Lambda probe downstream of the catalytic converter
Emissions standard	EU6

### Torque and performance diagram



s513\_054



You can find further information on the petrol engines in Self-study Programme no. 511 “The New EA211 Petrol Engine Series”.





# Power units

## The 1.6 l 77 kW TDI engine

The 1.6 l 77 kW TDI engine is the basic engine in the new EA288 series of diesel engines.

### Technical features

- Camshaft bearings in camshaft housing (modular design)
- Oil pump and vacuum pump in one housing with a shared drive shaft
- Thermomanagement with switchable coolant pump
- Intake manifold with water-cooled charge air cooler
- Exhaust purification module with integrated oxidizing catalytic converter and diesel particulate filter
- Low pressure exhaust gas recirculation

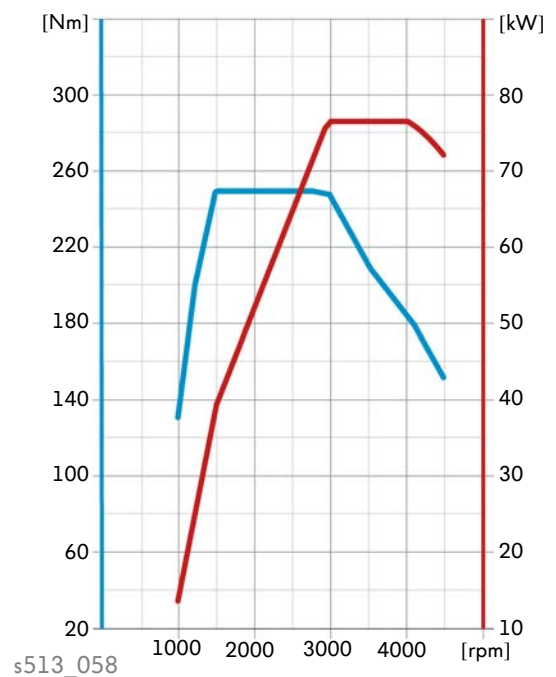


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### Technical data

Engine code	CLHA
Design	4-cylinder inline engine
Displacement	1598 cm <sup>3</sup>
Bore	79.5 mm
Stroke	80.5 mm
Valves per cylinder	4
Compression ratio	16.2:1
Max. output	77 kW at 3000 - 4000 rpm
Max. torque	250 Nm at 1500 - 2750 rpm
Engine management	Bosch EDC 17
Fuel	Diesel as per EN 590
Exhaust gas aftertreatment	Exhaust gas recirculation, oxidising catalytic converter, diesel particulate filter
Emissions standard	EU5

### Torque and performance diagram



s513\_058

# The 2.0l 110 kW TDI engine

The 2.0l 110 kW TDI engine is the more powerful version in the new EA288 series of diesel engines.

## Technical features

- Camshaft bearings in camshaft housing (modular design)
- Oil pump and vacuum pump in one housing with a shared drive shaft
- Thermomanagement with switchable coolant pump
- Intake manifold with water-cooled charge air cooler
- Exhaust purification module with integrated oxidizing catalytic converter and diesel particulate filter
- Low pressure exhaust gas recirculation
- Balancer shaft integrated in the cylinder block



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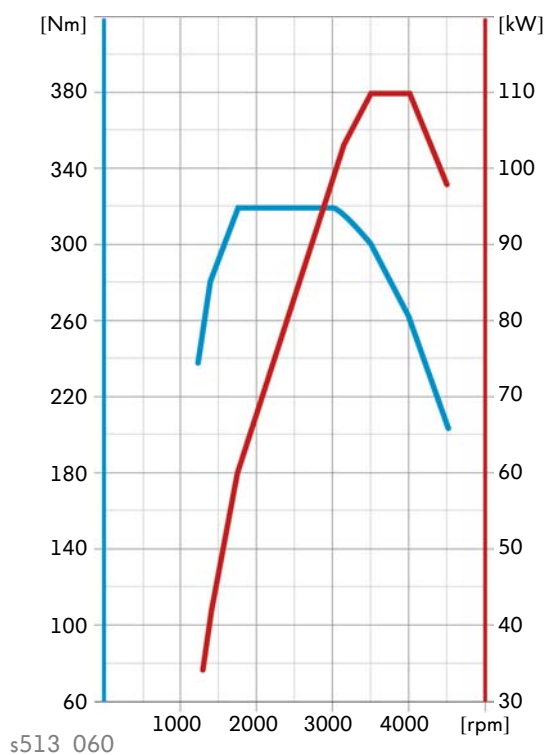


You can find further information on the TDI engines in Self-study Programme no. 514 “The New EA288 Diesel Engine Series”.

## Technical data

Engine code	CRBC
Design	4-cylinder inline engine
Displacement	1968 cm <sup>3</sup>
Bore	81.0mm
Stroke	95.5mm
Valves per cylinder	4
Compression ratio	16.2:1
Max. output	110kW at 3500 - 4000 rpm
Max. torque	320Nm at 1750 - 3000 rpm
Engine management	Bosch EDC 17
Fuel	Diesel as per EN 590
Exhaust gas aftertreatment	Exhaust gas recirculation, oxidising catalytic converter, diesel particulate filter
Emissions standard	EU5

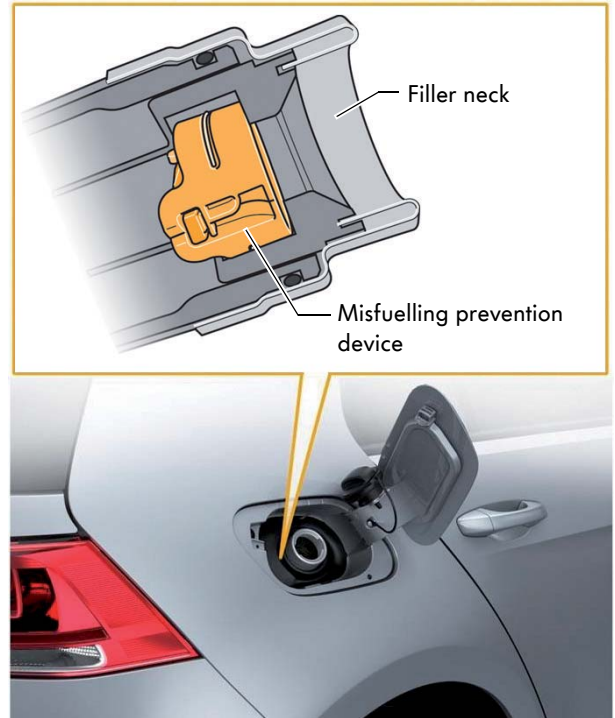
## Torque and performance diagram



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## The misfuelling prevention device for vehicles with a diesel engine

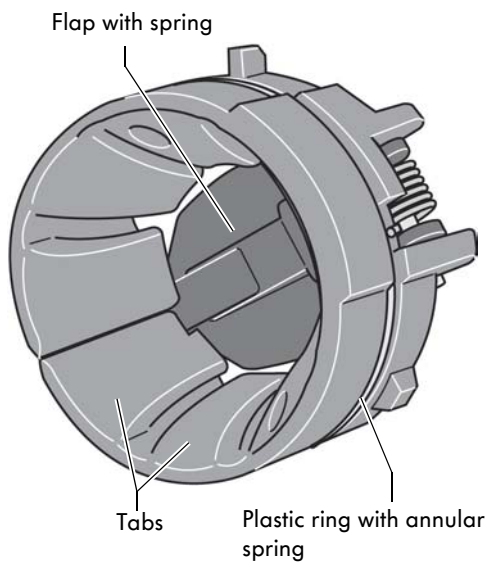
On vehicles with a diesel engine, there is an insert with a mechanically locking flap on the filler neck for the fuel tank. The flap prevents the incorrect fuel nozzle from being inserted, allowing the diesel vehicle to be protected from being filled with the wrong type of fuel.



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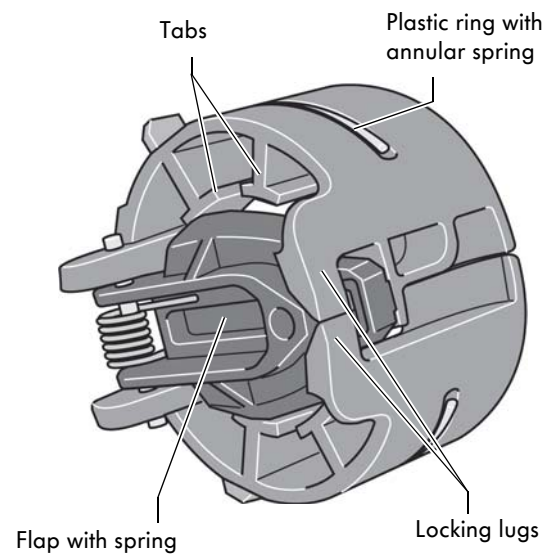
## Design

View from front

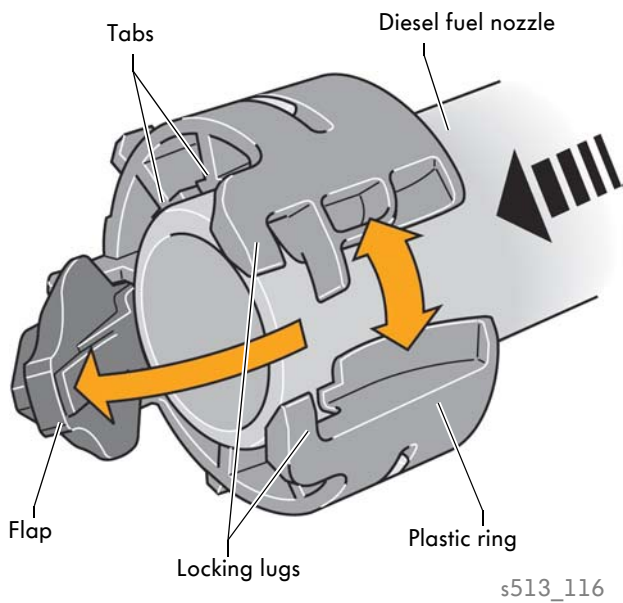


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View from rear



s513\_094



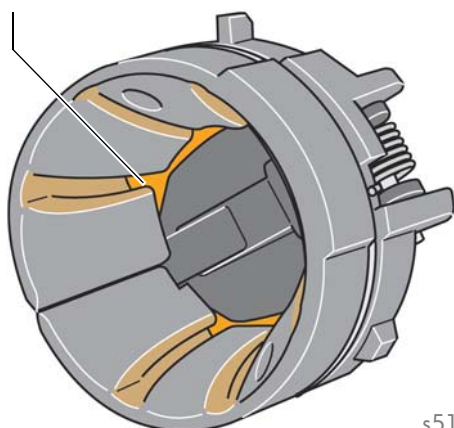
## Function

If a diesel fuel nozzle is inserted into the filler neck of the fuel tank, the fuel nozzle pushes all the tabs in the misfuelling prevention device to the side. The plastic ring is splayed and the locking lugs are forced apart. The force of the fuel nozzle during insertion opens the flap. The diesel fuel nozzle can now be fully inserted into the filler neck and the vehicle can be refilled with diesel fuel.

When the diesel fuel nozzle is pulled out of the misfuelling prevention device, the flap is closed by the force of the springs, with the force of the annular springs contracting the plastic ring and the flap being locked by the locking lugs.

The diameter of a petrol fuel nozzle is too small to force all the tabs in the plastic ring apart. The plastic ring is not splayed and the locking lugs cannot release the flap. This prevents the insertion of the incorrect fuel nozzle.

Space between the tabs and the flap



## Filling with reserve canister

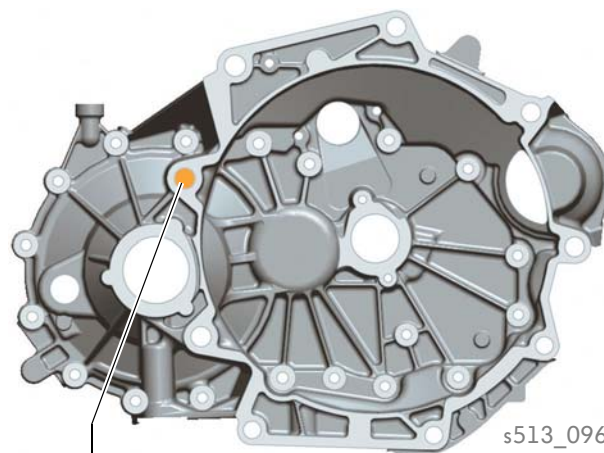
If the fuel tank needs to be filled using a reserve canister and filler neck, the flap does not open. In this case, it is only possible to fill the tank using the gap left between the tabs and flap. The diesel fuel should then be filled in very small amounts and very slowly.



# Power transmission

## The engine-gearbox connection

With the introduction of the modular transverse matrix, the connection between the engine and the gearbox has been changed, and a new engine bolt point has been added.



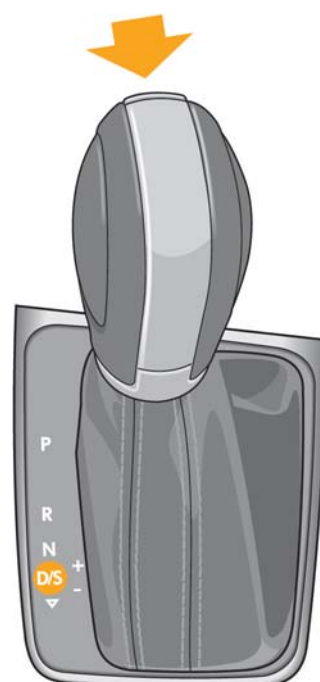
Additional engine bolt point

s513\_096



## The selector lever

The selector lever features a new option for changing from selector position “D” to “S” and vice-versa. The change is made by tapping it backwards once. The selector lever then springs back into the D/S position.



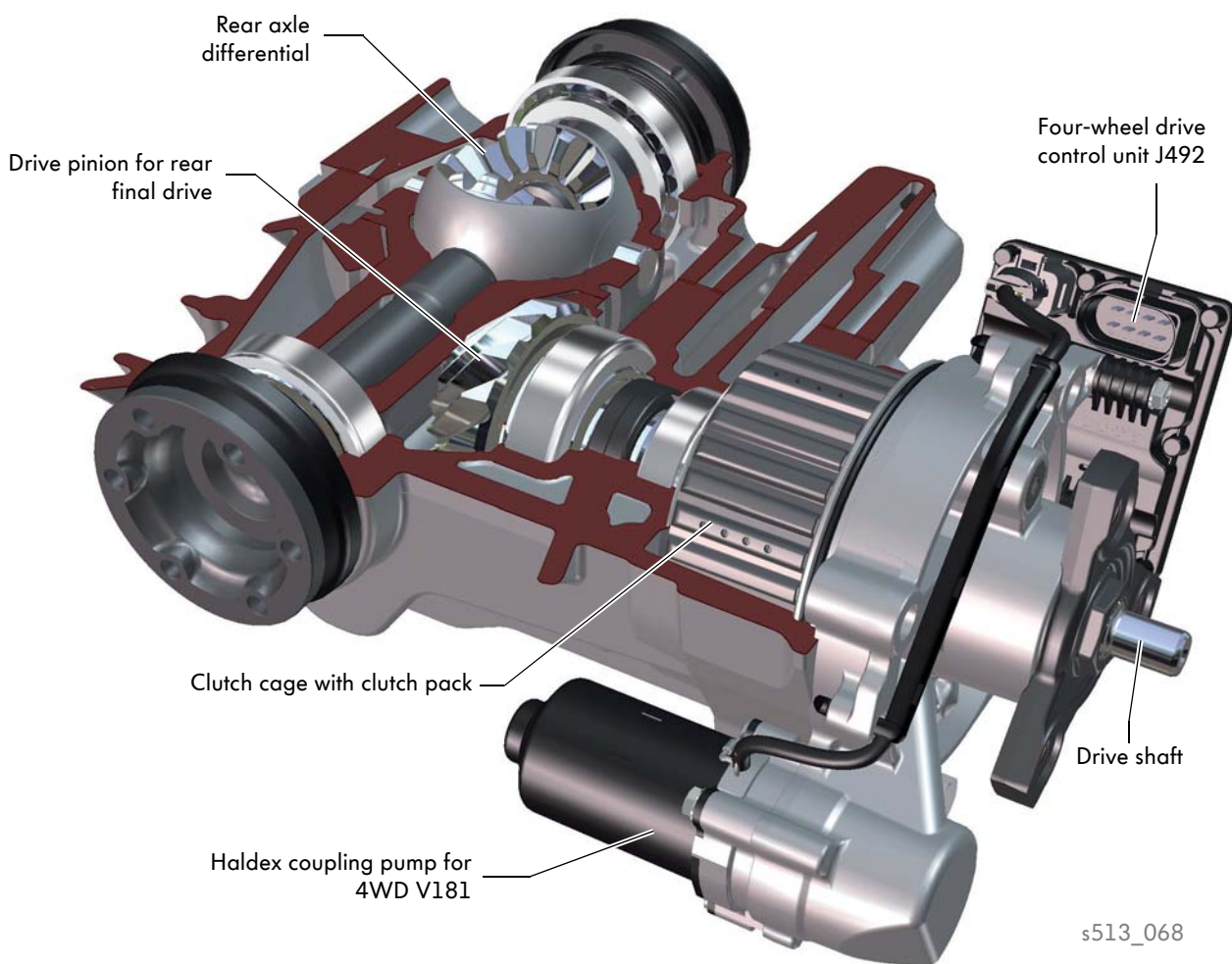
s513\_098



## Four-wheel drive clutch

With the Golf 2013, the 5th generation of four-wheel drive clutch is being launched. The control logic for the various driving situations has been adopted from the 4th generation four-wheel drive clutch. The pressure control in the 5th generation is now generated by a piston pump with an integrated centrifugal governor (Haldex coupling pump for 4WD V181).

The regulated pressure acts on the working piston and compresses the clutch pack within the clutch cage, allowing the required torque to be transferred to the rear axle.



You will find more information on the 5th Generation four-wheel drive clutch in Self-study Programme no. 515 “The Golf 2013 – Running Gear and Four-wheel Drive Concept”.



# Running gear

## Overview of the running gear and the driver assist systems

This overview presents the most important series-standard and optional running gear equipment and driver assist systems available for the Golf 2013. The Golf can be equipped with a standard running gear, a sports running gear, a heavy-duty running gear or an adaptive chassis control (DCC).

### Running gear:

- McPherson strut front suspension
- Four-link rear axle or a torsion-beam rear axle (depending on the engine).
- Electromechanical parking brake (EPB) with AutoHold
- Electromechanical power steering
- ABS/ESP Continental MK 100
- 4MOTION drive





## Driver assist systems:

- Automatic distance control system (ACC) with city emergency braking function (CNB)
- Area monitoring system (Front Assist)
- Distance warning
- Multicollision brake
- Front camera
- Lane departure warning (Lane Assist)
- Park Assist Steering 2.0 (PLA)
- Tyre pressure monitoring (TMD)
- Driver Alert System (MKE)
- Cruise control system (CCS)
- Speed limiter
- Park distance control (PDC)



s513\_031



You will find further information on the running gear and the driver assist systems in Self-study Programme no. 515 “The 2013 Golf Running Gear and Four-wheel Drive Concept” and no. 516 “The Golf 2013 Driver Assist Systems”.

# Heating and air conditioning

## The different climate control versions

There are three different versions of the climate control system available for the Golf 2013:

- The heating and ventilation system
- The manual electric air conditioning system
- 2-zone Climatronic

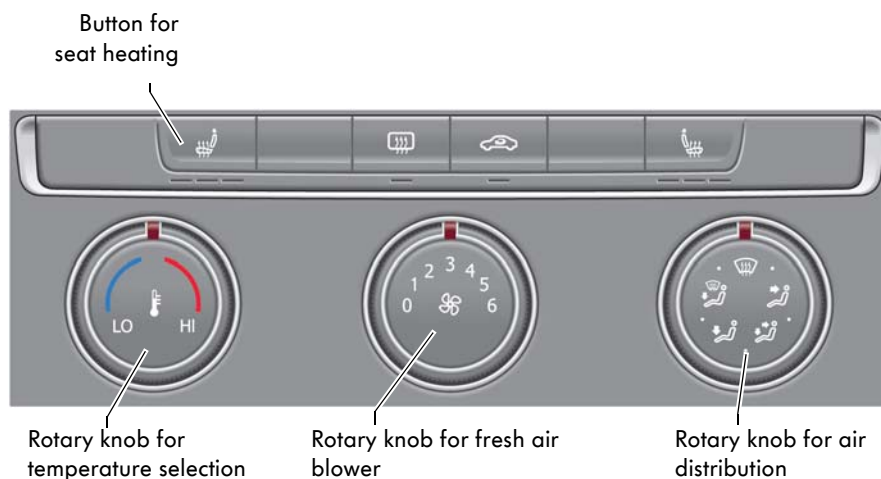
Each version has a self-contained operating unit.

As an option, all three versions can be equipped with a button for controlling the seat heating. Furthermore, the two air conditioning systems may also feature an optional button for controlling the auxiliary heating.

The seat heating features three levels. The heating level chosen is indicated by an LED in the respective button. The auxiliary heater can be switched on and off using the immediate heat button in the respective operating unit.

All three versions of the climate control are diagnostically-compatible and can be accessed using the address word 08.

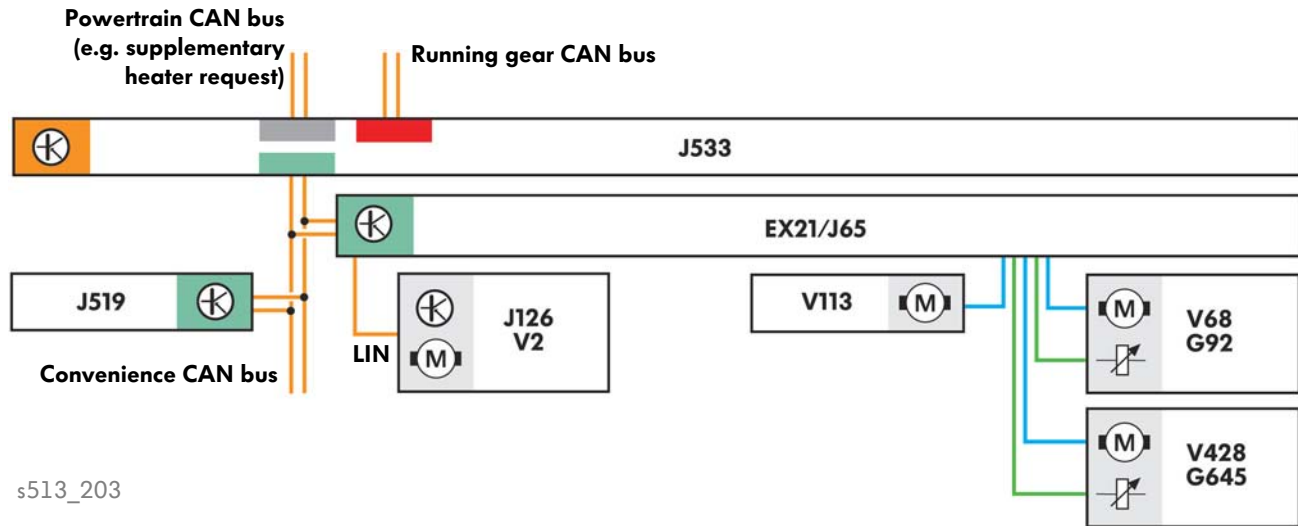
## The heating and ventilation system



The operating and control unit for the heating and ventilation system is a completely new development. It is a manual electric system, meaning the temperature flap and the air flaps can be adjusted with the aid of control motors.

The fresh air blower now features 6 different speeds. The various fresh air blower speeds are now controlled by the fresh air blower control unit J126.

## Heating and ventilation network plan



### Legend

EX21 Heater/air conditioner operating unit

G92 Potentiometer for temperature flap control motor

G645 Potentiometer for air distribution

J65 Heater control unit

J126 Fresh air blower control unit

J519 On-board power supply control unit

J533 Data bus diagnostic interface

V2 Fresh air blower

V68 Control motor for temperature flap

V113 Control motor for air recirculation flap

V428 Control motor for front air distribution flap

Powertrain CAN bus

Running gear CAN bus

Convenience CAN bus

CAN data bus line

LIN data bus line

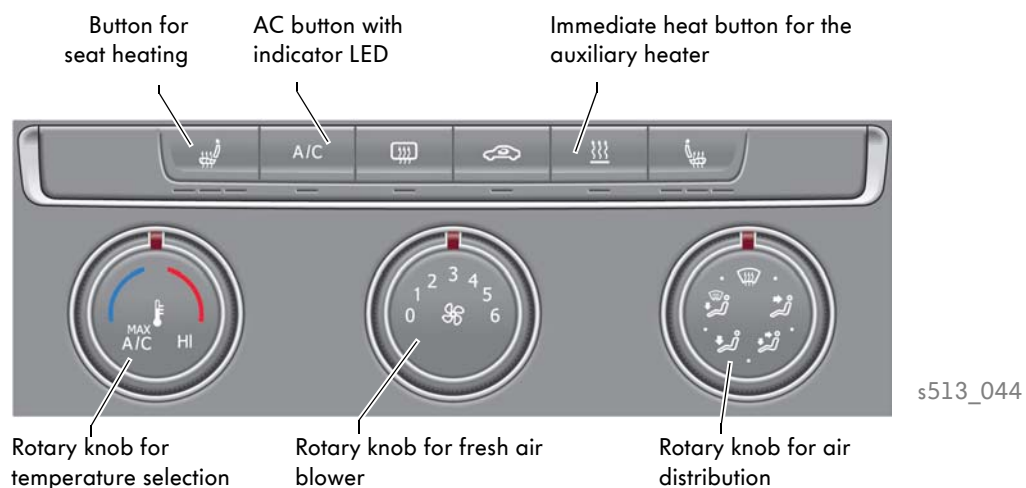
Sensor line

Actuator line



# Heating and air conditioning

## The manual electric air conditioning system

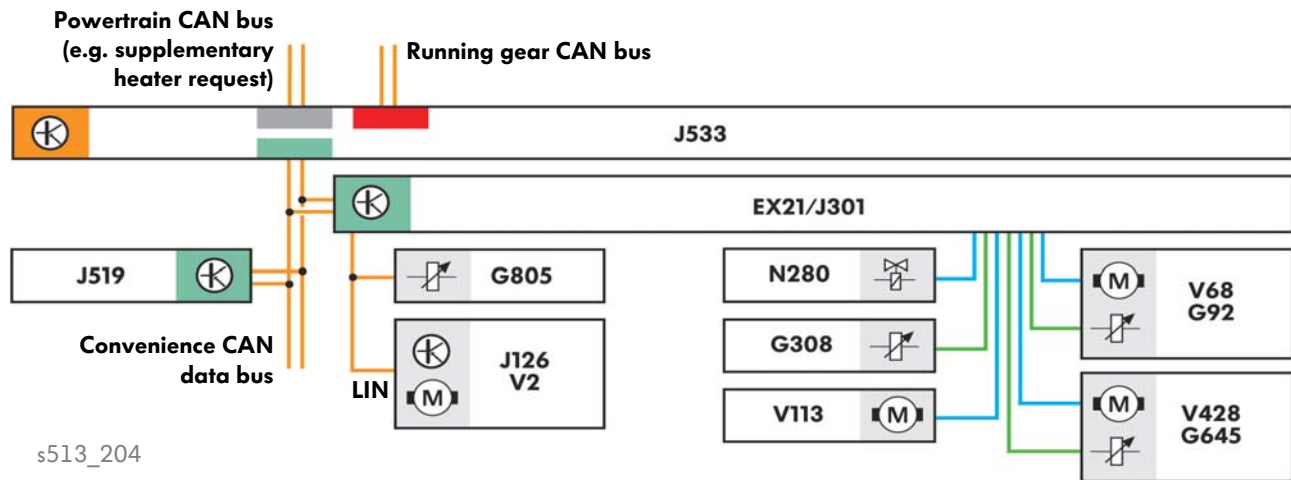


The operating and control unit for the manual electric air conditioning system is also a completely new development. The system operates on an electrical/manual basis. In this case, the temperature flap and the air flaps are also adjusted using control motors.

Just like the heating and ventilation system, the fresh air blower is now a 6-speed one. The various fresh air blower speeds are also controlled by the fresh air blower control unit J126.

There is no automatic regulation. All settings must be activated and adjusted manually, when required.

## The manual electric air conditioning system network plan



### Legend

- EX21 Heater/air conditioner operating unit
- G92 Potentiometer for temperature flap control motor
- G308 Evaporator temperature sender
- G645 Potentiometer for air distribution
- G805 Pressure sender for refrigerant circuit
- J126 Fresh air blower control unit
- J301 Air conditioning system control unit
- J519 On-board power supply control unit
- J533 Data bus diagnostic interface
- N280 Air conditioner compressor regulating valve
- V2 Fresh air blower
- V68 Control motor for temperature flap
- V113 Control motor for air recirculation flap
- V428 Control motor for front air distribution flap

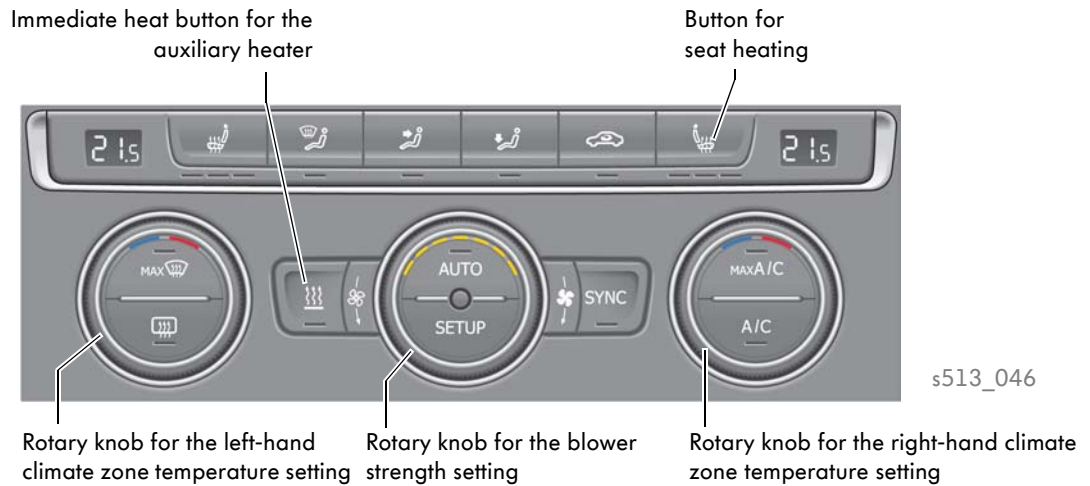
- Powertrain CAN bus
- Running gear CAN bus
- Convenience CAN data bus
- CAN data bus line
- LIN data bus line
- Sensor line
- Actuator line





# Heating and air conditioning

## The 2-zone Climatronic



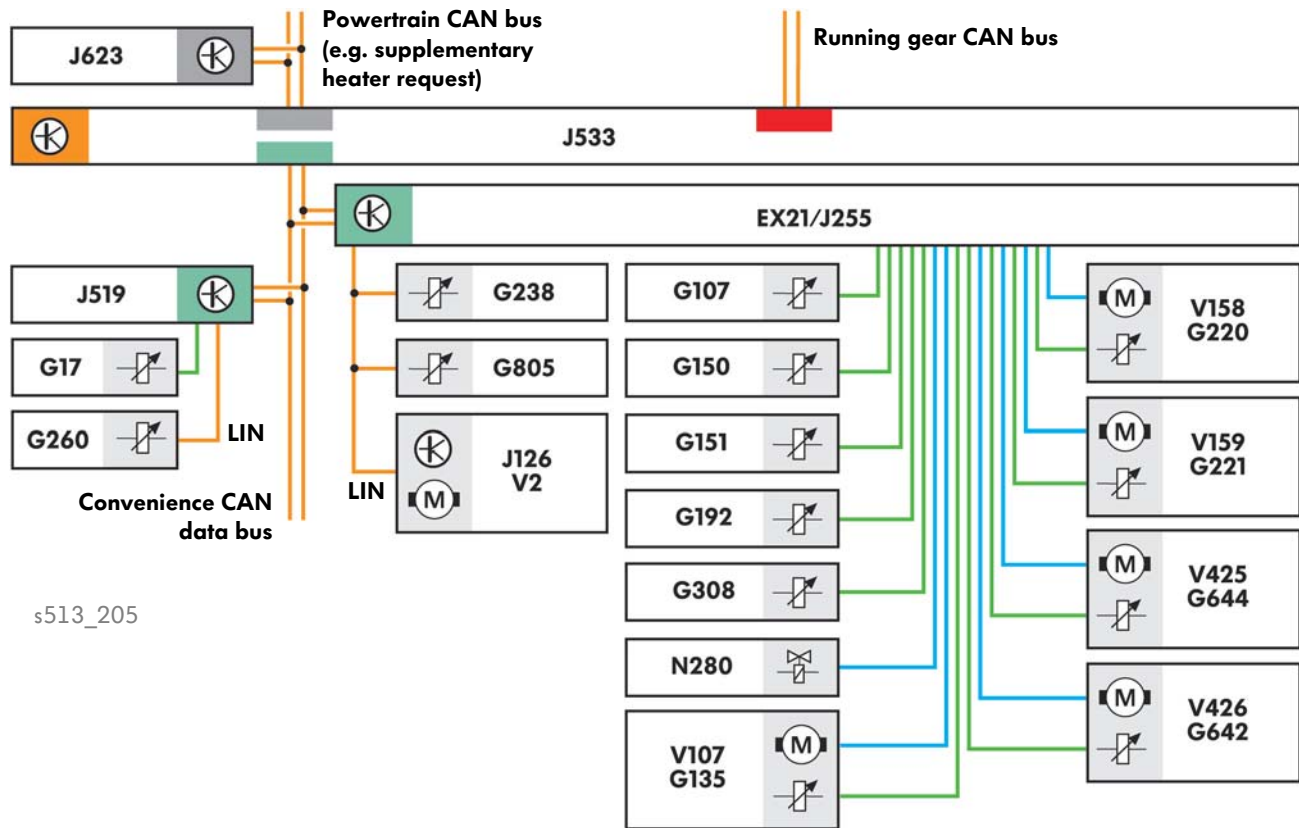
The operating and control unit for the 2-zone Climatronic is also a completely new development. Temperature settings ranging from 16°C to 29.5°C can be set individually for the driver's side and the passenger side.

The illustration shows the control and operating unit for Climatronic J255 for the highest equipment level.

It is operated using the following buttons:

- **SETUP:** Opens the climate menu in the operating and display unit for the Infotainment system, allowing the climate profile, AUTO air recirculation and auxiliary heating programming to be set.
- **AUTO:** Automatic regulation of blowers, temperature and air distribution in accordance with the intensity of the sun, outside and inside temperature and humidity.
- **MAX Defrost:** Maximum blower power, air distribution is guided towards the windows.
- **SYNC:** Synchronises the climate zones with the driver's value.
- **MAX A/C:** Temperature setting to "LO", maximum blower power, air distribution to the occupant vents.

## 2-zone Climatronic network plan



s513\_205

### Legend

EX21	Heater/air conditioner operating unit	J533	Data bus diagnostic interface
G17	Exterior temperature sensor	J623	Engine control unit
G107	Sunlight penetration photosensor	N280	Air conditioner compressor regulating valve
G135	Potentiometer control motor for defroster flap	V2	Fresh air blower
G150	Left vent temperature sender	V107	Defroster flap control motor
G151	Right vent temperature sender	V158	Control motor for left temperature flap
G192	Footwell vent temperature sender	V159	Control motor for right temperature flap
G220	Potentiometer for left temperature flap control motor	V425	Control motor for fresh air and air recirculation flap and air flow flap
G221	Potentiometer for right temperature flap control motor	V426	Control motor for air distribution
G238	Air quality sensor		
G260	Humidity sender for air conditioning system		
G308	Evaporator temperature sensor		
G642	Potentiometer for air distribution		
G644	Potentiometer for fresh air/air recirculation air flow flap		
G805	Pressure sender for refrigerant circuit		
J126	Fresh air blower control unit		
J255	Climatronic control unit		
J519	On-board power supply control unit		

	Powertrain CAN bus
	Running gear CAN bus
	Convenience CAN data bus
	CAN data bus line
	LIN data bus line
	Sensor line
	Actuator line



# Heating and air conditioning

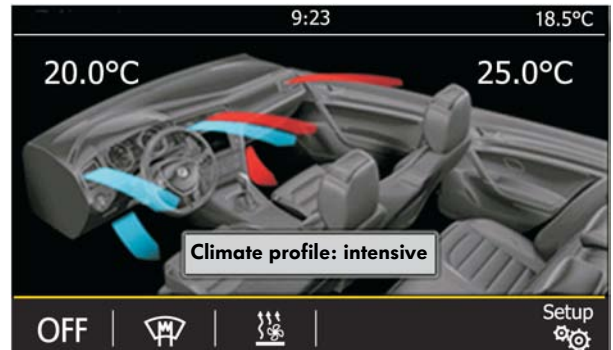
## Climate profiles

The climate profile is set using the operating and display unit for the Infotainment system. The following three climate profiles are available for selection:

- Gentle
- Average
- Intensive

A characteristic map has been stored for each individual climate profile in the Climatronic control unit. Depending on the climate profile selected, the airflow is regulated using the fresh air blower speed.

The time needed to respond to disturbances varies between the climate profiles. For example, the climate profile intensive gives the information an even stronger weighting when processing it. Furthermore, this profile also factors in the signals from the sunlight sensor.



s513\_022

## Air conditioning system sensors

### Ambient temperature sensor G17

#### Installation location

The ambient temperature sensor G17 is installed behind the front bumper.

#### Function

The temperature is measured by NTC thermistors.

#### Effects of failure

The air conditioning system control unit J255 will assume a defined temperature value of 0°C in this case. The air conditioning system will continue to operate using this value.

#### Signal analysis

The signal is transmitted to the onboard supply control unit J519. This transmits it to the air conditioning system control unit J255 via the convenience CAN bus.

Using the „Guided Functions” in the vehicle diagnostic tester, the current outside temperature can be stored in the air conditioning system control unit. This function is useful when working on the air conditioning system in the workshop when the vehicle was exposed to temperatures of less than 0°C beforehand and the air conditioning system control unit needs to be renewed.

## Pressure sender for refrigerant circuit G805



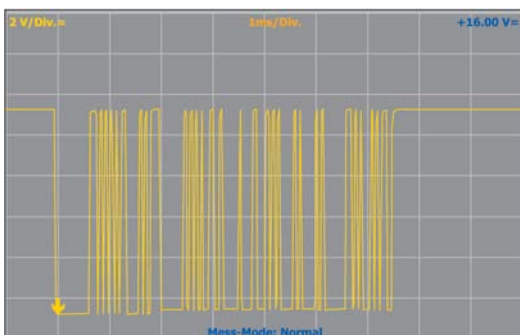
s513\_110

### Installation location

The pressure sender for the refrigerant circuit G805 replaces the high-pressure sender G65. It is screwed into place in the high-pressure line between the condenser and the expansion valve. The pressure sender for the refrigerant circuit G805 is connected directly to the air conditioning system control unit via the LIN bus.

### Signal utilisation

The actual refrigerant pressure in the refrigerant circuit, and therefore the required engine load, is calculated using the signals.

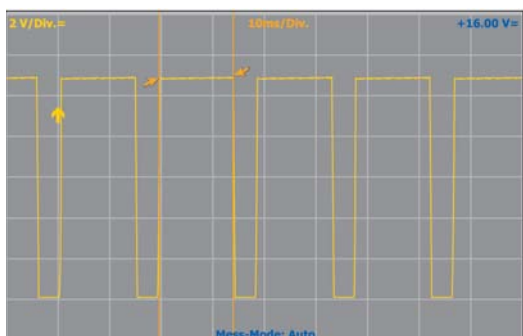


s513\_112

Signal curve of the new sender for the refrigerant circuit G805.

### Signal curve

The display of the signal curve during diagnosis differs considerably from the signal curve of the PWM signal issued by the sender previously used, G65.



s513\_114

For comparison: PWM signal curve of the old high-pressure sender G65

### Effects of failure

If the pressure signal fails, the cooling function is deactivated.

# Heating and air conditioning

## Humidity sender for air conditioning system G260

### Installation location

The humidity sender for the air conditioning system G260 is only installed with the Climatronic unit. It is installed in the base of the interior mirror together with the rain/light sensor.

### Design and functional principle

The humidity and the temperature at the windscreen are measured using a capacitive thin-layer sensor. The sender functions in a similar manner to a plate capacitor; measurement of the capacity reveals the degree of humidity.

### Signal utilisation

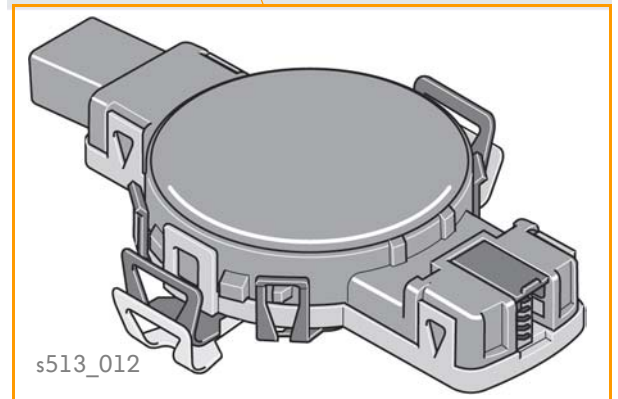
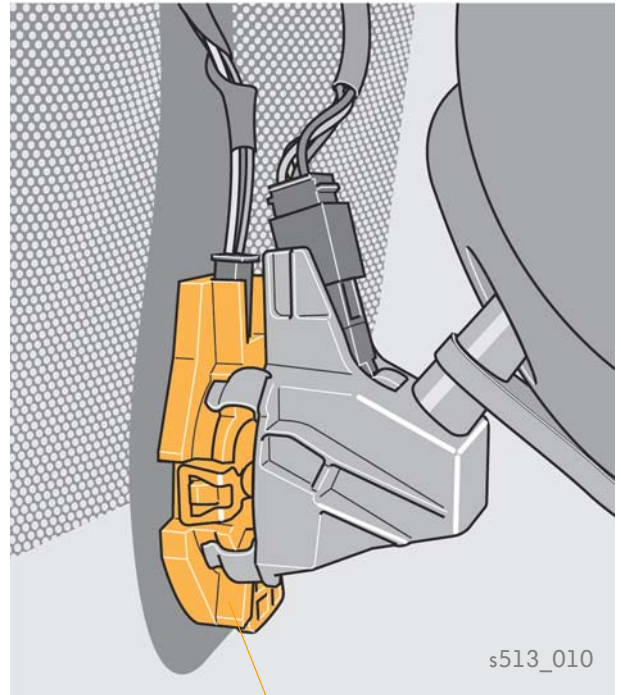
The sender determines:

- The inside windscreen temperature
- The inside relative humidity

The signals are transmitted to the onboard supply control unit and are forwarded to the Climatronic control unit via the convenience CAN bus. This uses the signals to calculate the inside dew point and the inside dew point distance.

To reduce the fogging of the windscreen, the Climatronic ensures that conditions in the passenger compartment are optimal and initiates the following measures:

- Compressor on/off
- Defroster flaps open/closed
- Air quantity regulation by changing the fresh air blower speed
- Evaporator temperature change
- Air recirculation flap in the recirculation/fresh air position



### Effects of failure

Without the sensor's signal, the control unit is no longer able to calculate the point in time from which moisture settles on the windows. The automatic defrost function fails.



# Climate control components

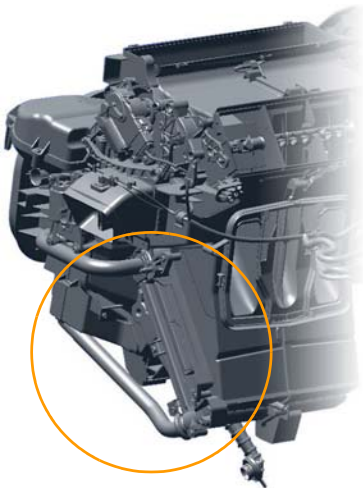
## Heater and air conditioning units

Three different versions have been used in the Golf 2013:

- The 1-zone heater and air conditioning unit for the heating and ventilation system
- The 1-zone heater and air conditioning unit for the manual electric air conditioning system
- The 2-zone heater and air conditioning unit for the 2-zone Climatronic

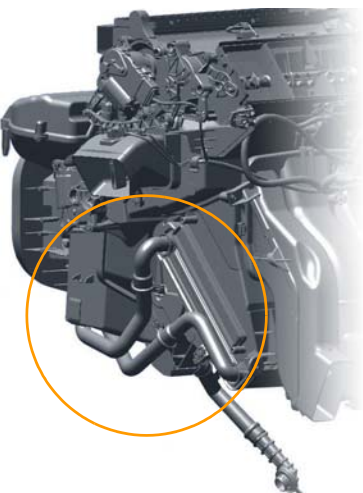
The horizontal installation position of the dust and pollen filter in the heater and air conditioning units is a new feature.

The dust and pollen filter is replaced through the glove compartment, which involves placing the glove compartment cover in a “service position”.



s513\_201

Denso heating pipe connection



s513\_202

Valeo heating pipe connection

### Manufacturer versions

Heater and air conditioning units made by the Denso company and by the Valeo company are installed in the Golf. When installed, the heater and air conditioning unit which a vehicle has can only be identified by the heater pipe connections on the heat exchanger for heater. Because the control motors for actuating the individual air flaps are different for Denso and Valeo, these must be ordered according to manufacturer.

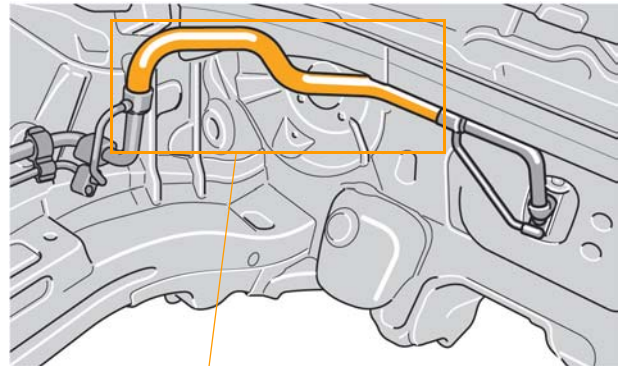


To expose the pipe connections, the front left trim of the centre console must be removed.

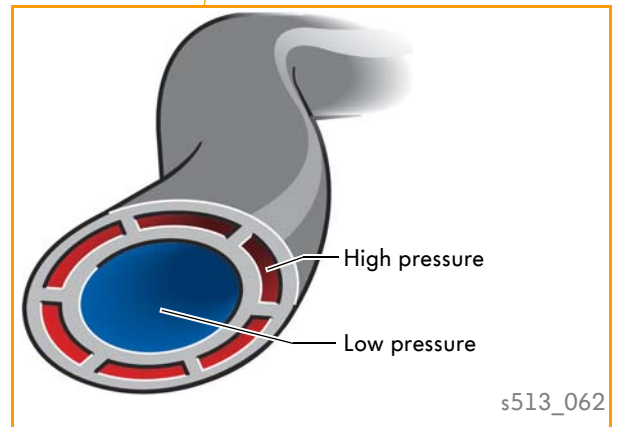
# Heating and air conditioning

## Internal heat exchanger

A new feature in the Golf is the so-called “Internal heat exchanger” (IWT), which was used for the first time in the Volkswagen Touareg. This is a refrigerant line that forms a “pipe-in-pipe system”. This refrigerant line features a low-pressure line which is guided through a separate space in the high-pressure line. The refrigerant flows through the outer line to the expansion valve (high pressure), and flows back from the expansion valve through the inner line towards the air conditioner compressor (low pressure). This design increases the efficiency of the system and contributes to reducing the fuel consumption.



s513\_008



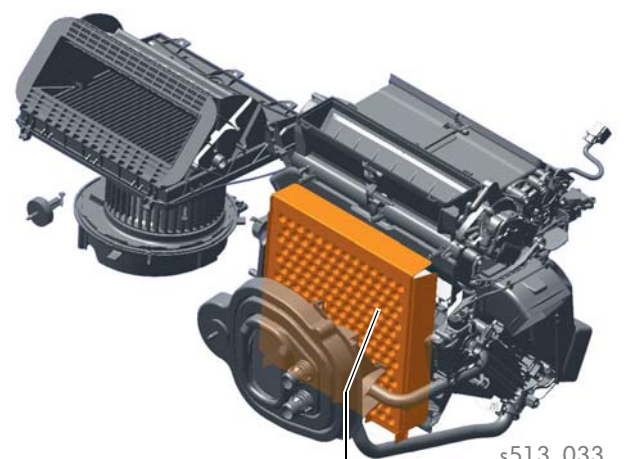
s513\_062



## The airflow limiter

On vehicles with a heater and air conditioning system, the same fresh air blower V2 and control unit J126 is installed as in vehicles with an air conditioning system. However, in this case there is no evaporator to reduce the air flow.

An air flow limiter has therefore been installed in the heater unit in these vehicles. This guarantees that the heater and blower power operates optimally.



s513\_033

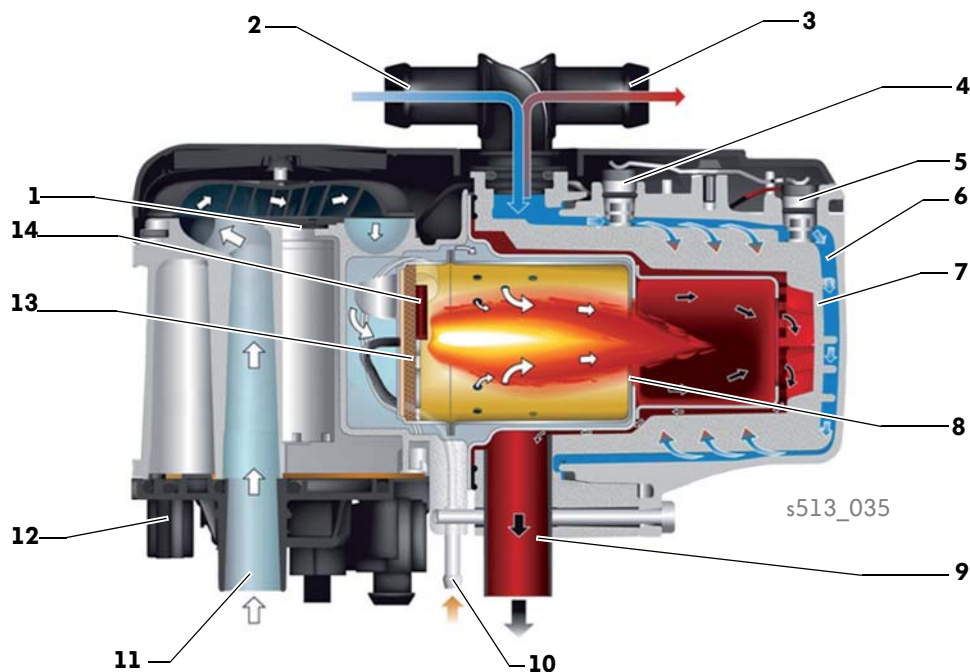
Air flow limiter

## “Thermo Top Evo” auxiliary coolant heating

The auxiliary coolant heating “Thermo Top Evo” is available as an optional extra for the new Golf. It is installed at the front right, behind the bumper, as in the Golf 2009. The “Thermo Top Evo” is offered both as a petrol and diesel version. The auxiliary heater is used as a fuel-operated auxiliary heater for petrol and diesel engines. It is activated via the air conditioning system control unit.

### Design

The heater unit is largely identical to the “Thermo Top Fleece”, which has been installed in the passenger vehicle models with diesel engines since October 2010.



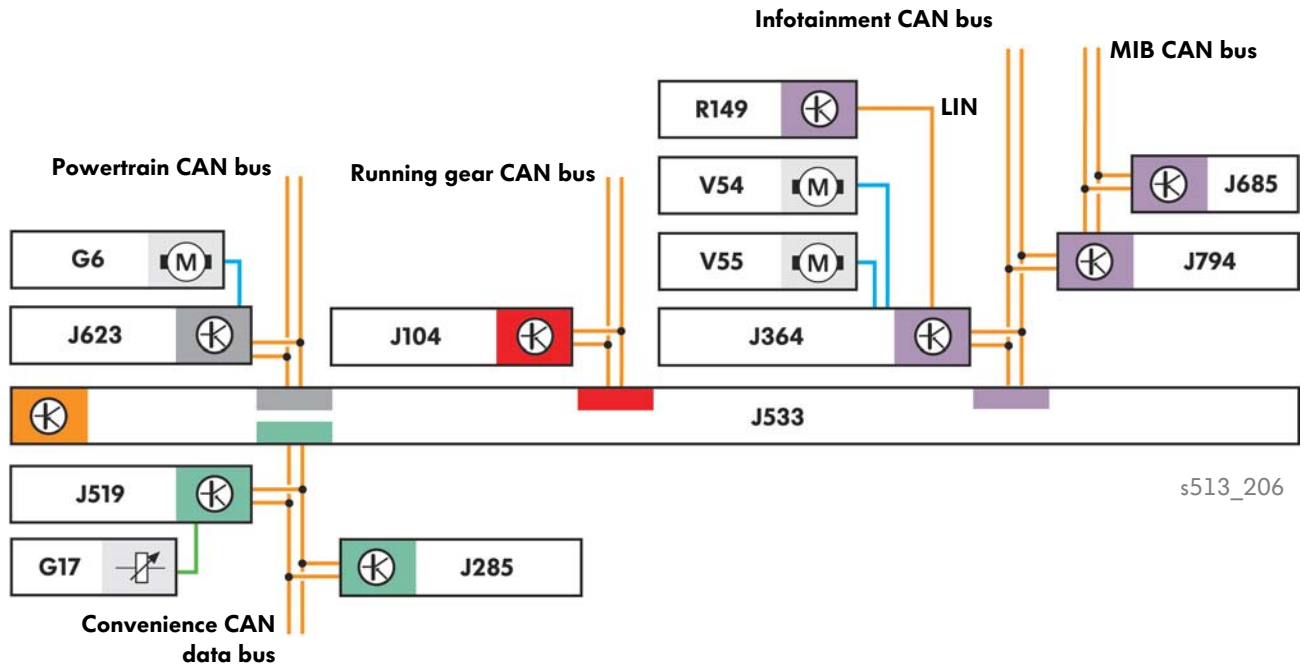
#### Legend

- |   |                                   |    |  |
|---|-----------------------------------|----|--|
| 1 | Combustion air blower (fan wheel) | 8  | Burner with combustion chamber and combustion tube |
| 2 | Coolant inlet                     | 9  | Exhaust outlet                                     |
| 3 | Coolant outlet                    | 10 | Fuel line  |
| 4 | Temperature sensor G18            | 11 | Combustion air inlet                               |
| 5 | Overheating sensor G189           | 12 | Control unit J364                                  |
| 6 | Cooling jacket                    | 13 | Metal fleece                                       |
| 7 | Heat exchanger with fins          | 14 | Glow plug with flame monitor Q8                    |



# Heating and air conditioning

## Auxiliary coolant heating network plan



### Legend

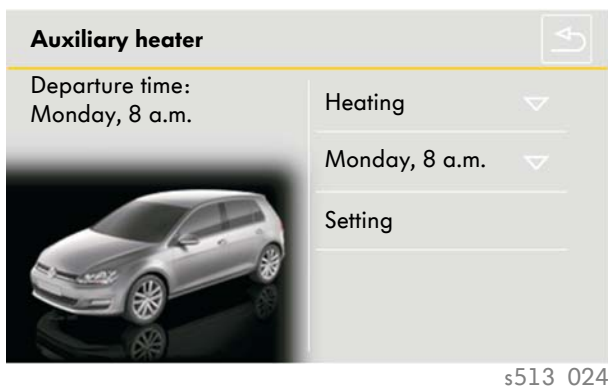
- G6 Fuel system pressurisation pump
- G17 Exterior temperature sensor
- J104 ABS control unit
- J285 Control unit in dash panel insert
- J364 Supplementary heating system control unit
- J519 On-board power supply control unit
- J533 Data bus diagnostic interface
- J623 Engine control unit
- J685 Display unit for front information display and operating unit control unit
- J794 Control unit 1 for information electronics
- R149 Remote control receiver for auxiliary coolant heater
- V54 Metering pump
- V55 Recirculating pump

- Powertrain CAN bus
- Running gear CAN bus
- Convenience CAN data bus
- Infotainment CAN bus
- CAN bus line
- LIN data bus line
- Sensor line
- Actuator line

## Function

The only differences to the “Thermo Top Fleece” are found in the activation and the functions which have been integrated into the auxiliary heater control unit J364. This means the programming for the timer is now stored in the vehicle, for example, with the heating now switching “On” or “Off”.

The auxiliary heater and auxiliary ventilation functions, as well as supplementary heater operation, are still available. The T91R is used as a remote control.



“Auxiliary heater” menu when a Climatronic is installed

The auxiliary heating can still be started in one of three different ways, by:

- the immediate heat button in the heating/air conditioner operating unit
- the remote control
- programming the “auxiliary heating” menu in the operating and display unit of the Infotainment system.

A new feature is that the “Auxiliary heating” menu in the operating and display unit of the Infotainment system can be used to set the departure time in vehicles in which an air conditioning system is installed. This means that the vehicle should already be warmed up at this preset time. The control unit for the air conditioning system determines the starting time for the auxiliary heater automatically.

The current battery charge capacity is factored into the calculation of the auxiliary heating run time.

The auxiliary heating function can be activated or deactivated in the “Air conditioning system settings” menu.





# Electrical system

## Overview of the electrical system and driver assist systems

This overview presents the most important series-standard and optional features of the electrical system available for the Golf 2013.

### Electrical systems:

- Transmission speed of the CAN bus systems is 500 kBit/s
- The multifunction steering wheel is available in three different versions:
  - Normal multifunction steering wheel
  - Multifunction steering wheel with cruise control system (GRA)
  - Multifunction steering wheel with adaptive cruise control (ACC)
- The dash panel insert is available in three different versions:
  - Dash panel insert with multi-function display (MFD)
  - Dash panel insert with MFD Plus
  - Dash panel insert with MFD Premium
- Immobilizer V (fifth generation)
- Component protection
- Front camera for driver assist systems
- Reversing camera
- Modular Infotainment System (MIB)





s513\_013

## Driver assist systems:

- Traffic sign recognition (TSR)
- Dynamic Light Assist (DLA)
- Main beam assist (FLA)
- Optical parking system (OPS)
- Driving mode selection (FPA)



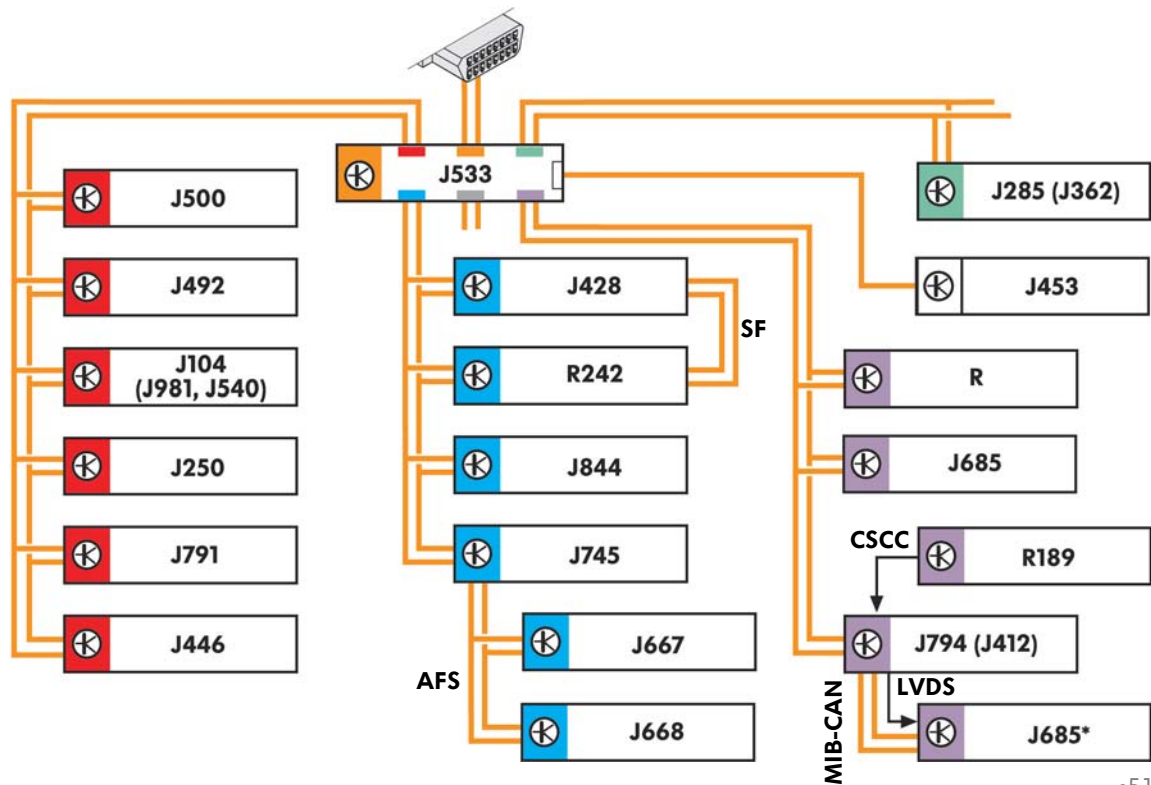
You can find further information on the electrical system and on the driver assist systems listed above in Self-study Programme no. 517 “The Golf 2013 Electrical System”.

# Electrical system

## Network design

The following diagram shows the new features of the control unit network in the Golf 2013. All CAN bus systems in the Golf 2013 have a transmission speed of 500 kBit/s.

For the first time, the Golf 2013 also features a running gear CAN bus and an extended CAN bus, along with the familiar CAN data buses.



s513\_036

### Legend

- |      |   |       |  |
|------|---|-------|--|
| J104 | ABS control unit                                    | J667  | Output module for left headlight   |
| J250 | Electronically controlled damping control unit      | J668  | Output module for right headlight  |
| J285 | Control unit in dash panel insert                   | J685  | Display unit for front information display and operating unit control unit, front information display (connected to R and J685 on MIB CAN) |
| J362 | Immobilizer control unit                            | J685* | Display unit for front information display and operating unit control unit, front information display (on MIB CAN)                         |
| J412 | Mobile telephone operating electronics control unit | J745  | Cornering light and headlight range control unit   |
| J428 | Adaptive cruise control unit                        | J844  | Main beam assist control unit  |
| J446 | Parking aid control unit (connected to J791)        | J981  | Electronic stabilisation control unit (ESP)  |
| J453 | Multifunction steering wheel control unit           | J791  | Park Assist control unit (connected to J446)   |

The diagnostic interface for data bus J533 connects the individual CAN data bus systems. It is also the master in the energy management LIN network and for the multifunction steering wheel control unit (J453).









For the very first time, the control unit for the dash panel insert J285 is connected to the convenience CAN bus in the Golf.

The control units for the driver assist systems are connected to the extended CAN bus. These, in turn, feature two sub-CAN data bus systems:

- Sensor Fusion (SF) CAN bus between the adaptive cruise control unit J428 and the front camera for driver assist systems R424.
- Cornering light CAN bus (Advanced Frontlighting System, AFS) between the cornering light and headlight range control unit J745 and the output modules for the headlights J667 and J668.

In the infotainment CAN bus, the display unit for front information display and operating control unit J685 is connected to the control unit for information electronics J794 by a new, subordinate data bus system, the MIB CAN bus and a low voltage differential signalling (LVDS) line (depending on equipment version).

J794	Control unit for information electronics (connected to R and series display J685 on the infotainment CAN bus)
R	Radio (connected to J794 and series display J685 on the infotainment CAN bus)
R189	Reversing camera
R242	Front camera for driver assist systems (connected to J844)
T16	16-pin connector
CSCC	Colour video blanking sync signal; "Colour TV line"
LVDS	Low voltage differential signalling; standard interface for high speed data transmission
AFS	Cornering light CAN data bus
SF	Sensor fusion CAN bus

	Powertrain CAN bus
	Running gear CAN bus
	Extended CAN bus
	Convenience CAN data bus
	Infotainment CAN bus
	LIN data bus
	CAN bus line
	LIN data bus line



# Electrical system

## Fuse boxes and relay locations in the electrical system

- The battery is located on the left in the engine compartment.

The following batteries are available with equipment versions **without** StartStop:

- Lead-acid battery 44Ah/220A (H4 format)
- Lead-acid battery 51Ah/280A (H4 format)
- Lead-acid battery 60Ah/280A (H5 format)
- Lead-acid battery 61Ah/330A (H5 format)
- Lead-acid battery 72Ah/380A (H6 format)

The following batteries are available with equipment versions **with** StartStop:

- EFB 59Ah/320A (H5 format)
- EFB 69Ah/360A (H6 format)
- AGM battery 68Ah/380A (H6 format)

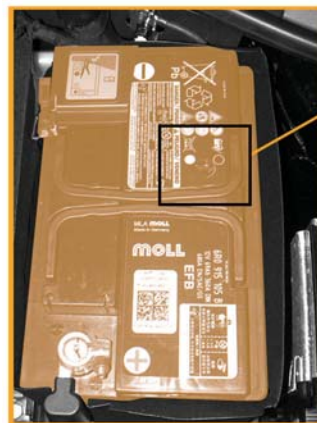
The AGM battery 68Ah/380A (H6 format) is always installed in vehicles which feature auxiliary heating.

All lead-acid batteries and EFB feature an acid level indicator.

Acid level indicator



Battery



You can find further information on the different types of batteries in the Self-study Programme no. 517 "The Golf 2013 Electrical System".

- The alternator is at the right hand side of the engine compartment.  
Depending on the equipment installed, alternators with an output of 110A, 140A and 180A are fitted.

### Legend

EFB Enhanced Flooded Battery  
AGM Absorbent Glass Mat Battery



Generator



**Fuse box in the passenger compartment.**



**On-board supply control unit**



- Fuse box is on the left hand side of the passenger compartment. The onboard supply control unit J519 is located at the side of the fuse carrier.



s513\_021



**Multifuse**

- Fuse box in the engine compartment in front of the battery, with Multifuse



**Fuse box in the engine compartment**



## Modular Infotainment System (MIB)

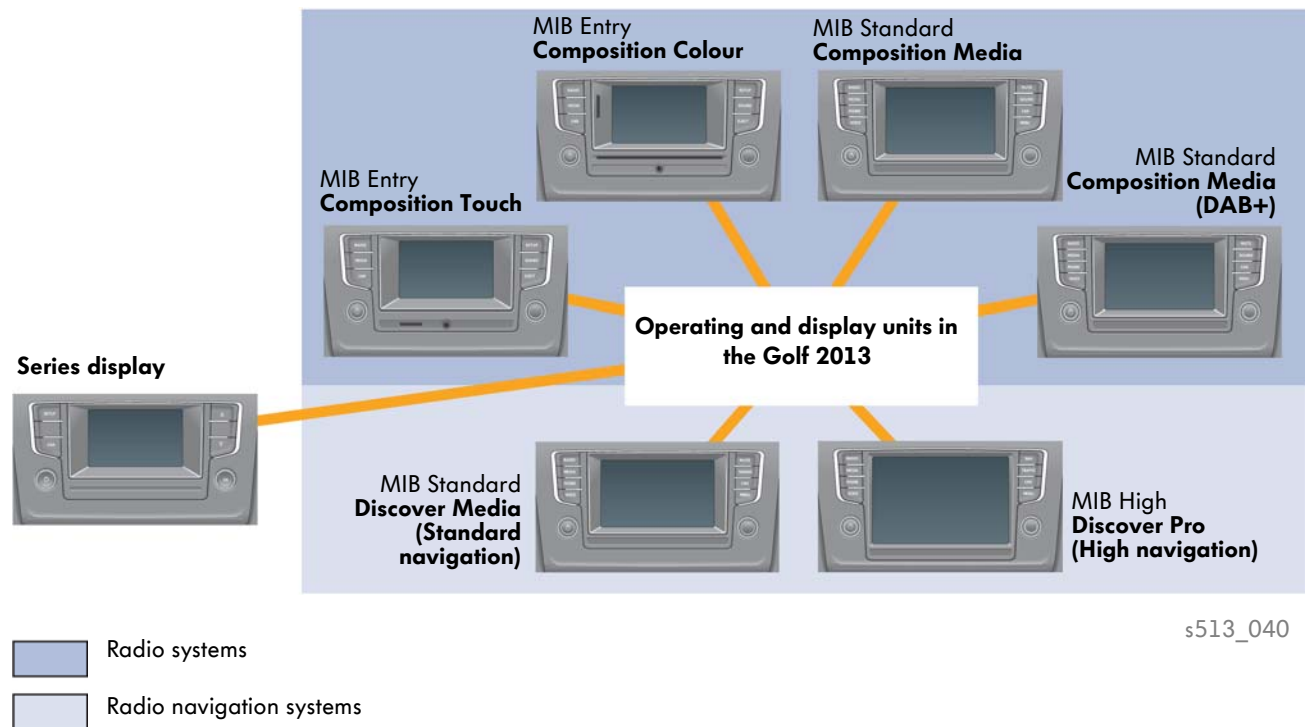
The new Infotainment concept, the Modular Infotainment System (MIB), is being installed in the Golf 2013 for the very first time. The Modular Infotainment System is a component of the modular transverse matrix (MQB).

The central element of the MIB in its Standard and High versions is a central computer, with the same one being used Group-wide (control unit 1 for information electronics, J794), with a performance and capacity which is scalable with a constant installation space.

The MIB is always connected to the infotainment CAN bus.

The MIB features three configuration levels with the following operating and display units:

- MIB Entry
  - Composition Touch
  - Composition Colour
- MIB Standard
  - Composition Media
  - Composition Media (DAB+)
  - Discover Media (Standard navigation)
- MIB High
  - Discover Pro (High navigation)



s513\_040



You can find further information on the Modular Infotainment System (MIB) in Self-study Programme no. 518 "The Golf 2013 – Infotainment, Part 1".

# Driving mode selection

The optional driving modes allow a variety of wide-ranging settings to be made in the vehicle according to the driver's preferences. The driving mode selection provides the driver with the option of choosing between the following driving profiles:

- Convenience (in combination with DCC)
- Normal (standard setting)
- Eco
- Sport
- Individual

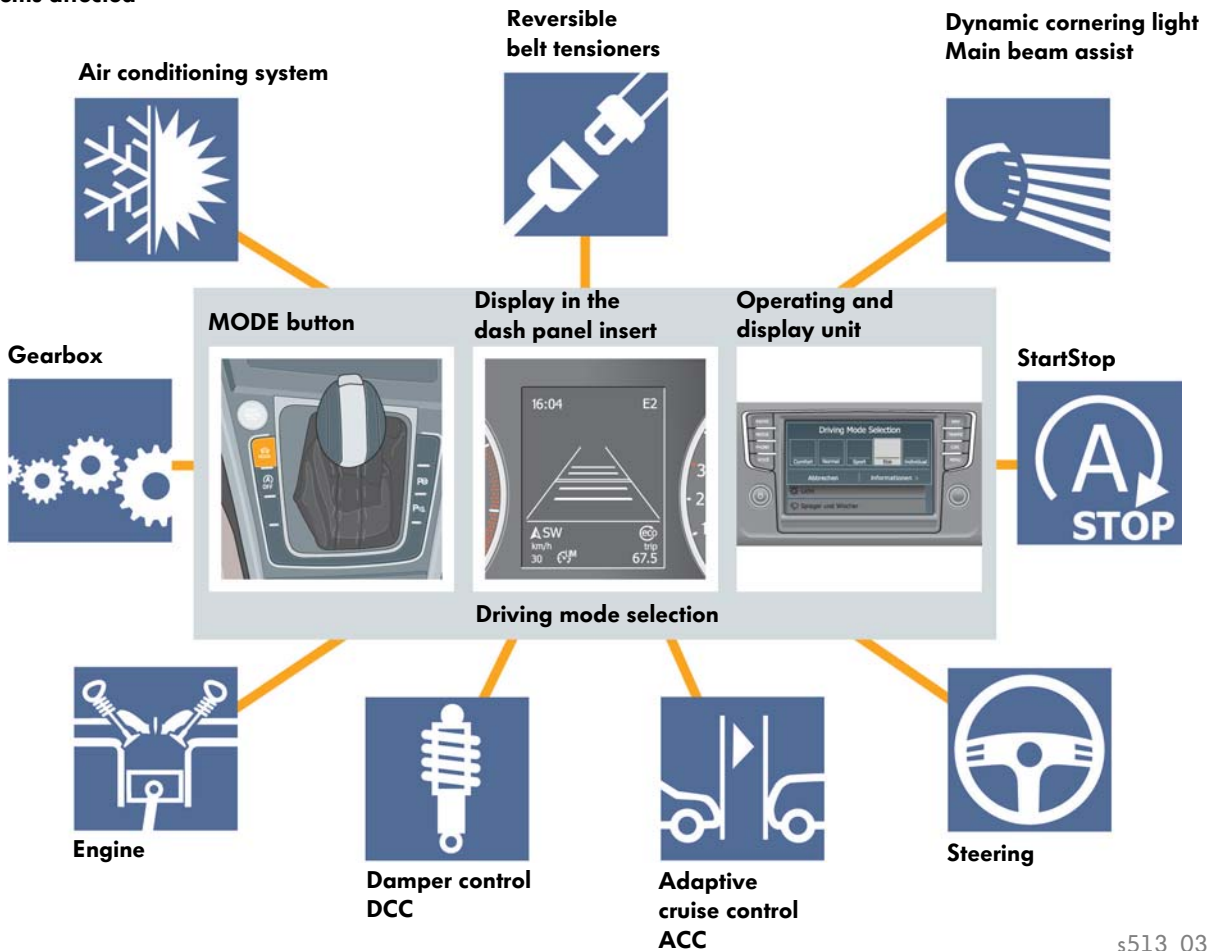
The driving mode selection is activated using the MODE button in the centre console, and the driving profile is selected using the touchscreen in the operating and display units. It communicates with the driver using the display in the respective operating and display unit.

Depending on the driving profile selected and the vehicle equipment, different systems will be affected.



You can find further information on the driving mode selection in Self-study Programme no. 518 "The Golf 2013 – Infotainment, Part 1".

## Systems affected



s513\_038

## The service concept from model year 2013 on

The **cross-brand** service concept is being launched with the Golf 2013. The following information describes the most important changes.

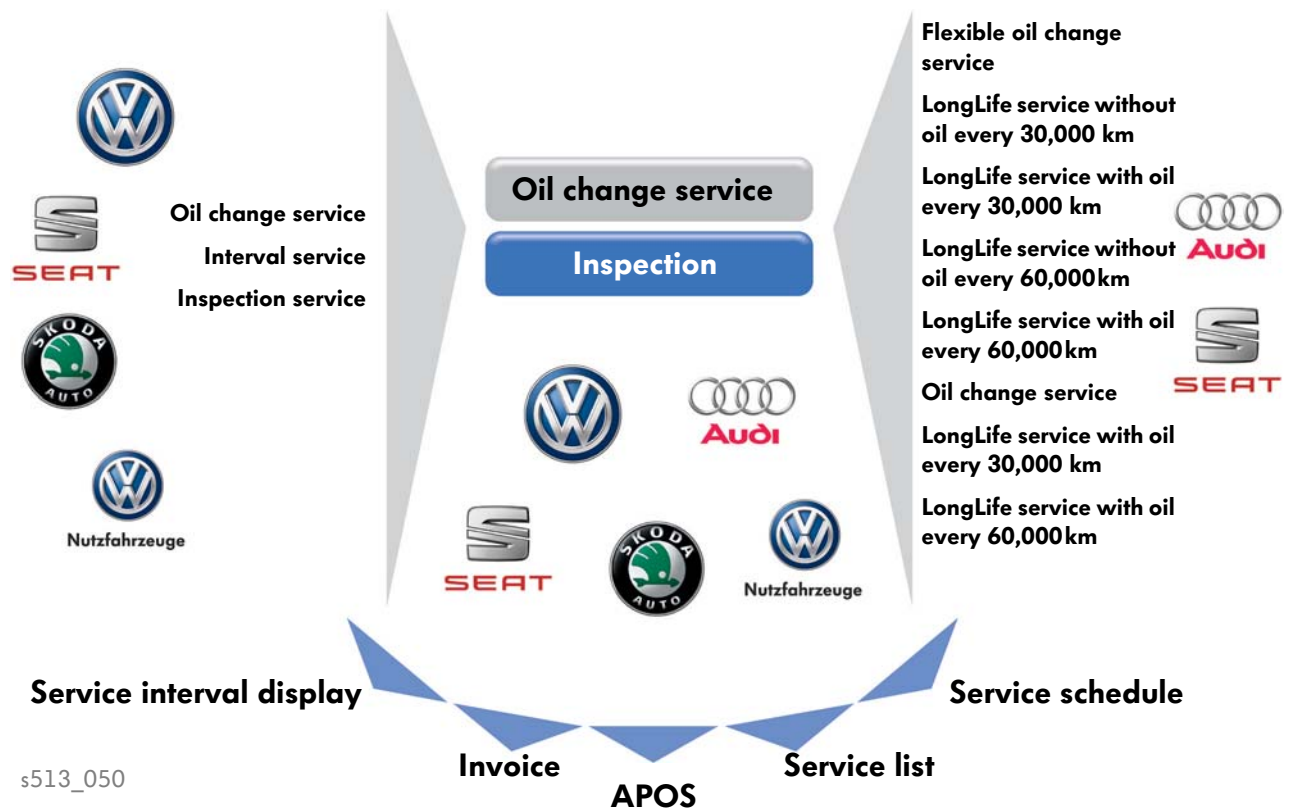
### Core terms

The cross-brand service concept involves standardising the terms used to describe the individual service intervals at the Group brands. Consequently, the following core terms are being introduced at all brands:

- **Oil change service**
- **Inspection**

In service, these terms will be used for communication throughout the Group, for example:

- using the service interval display in the dash panel insert
- in the service lists
- in APOS
- in the service schedule
- as well as in the invoice.



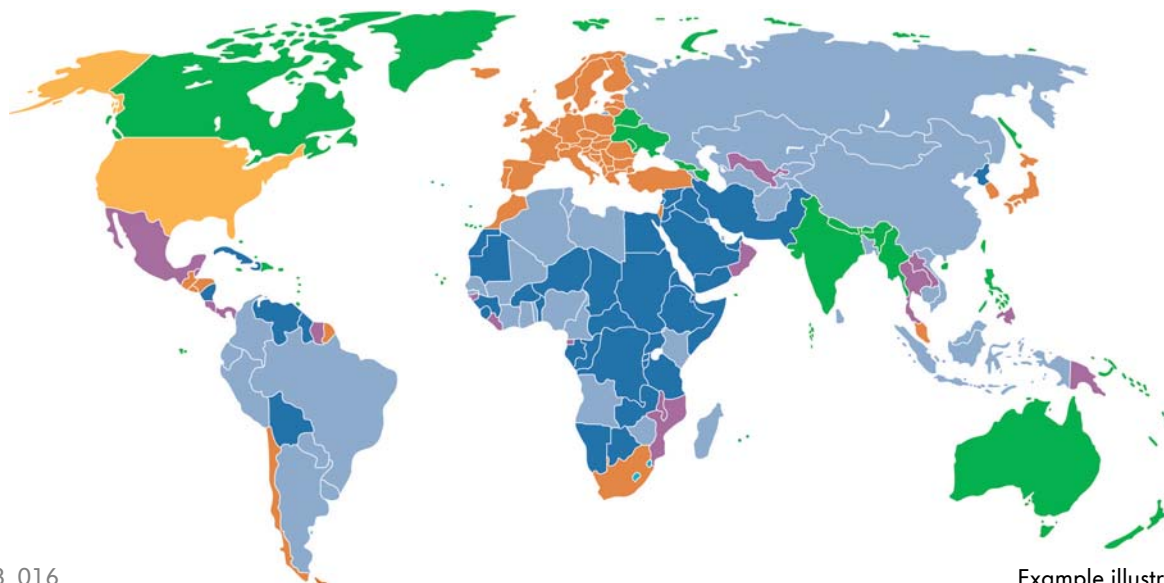
s513\_050



The term "interval service" is no longer being used with the Golf 2013.

## QI PR numbers

Every vehicle that leaves the production site is marked with a fixed PR number referring to the oil change service. The world map shows which oil change intervals are necessary in various regions. The following, cross-brand QI PR numbers determine the engine oil change intervals all over the world.



### Legend

QI 1	Service interval display 5,000 km or 1 year (fixed)
QI 2	Service interval display 7,500 km or 1 year (fixed)
QI 3	Service interval display 10,000 km or 1 year (fixed)
QI 4	Service interval display 15,000 km or 1 year (fixed)

QI 5	For Volkswagen Commercial Vehicles only (fixed)
QI 6	Service interval display 30,000 km or 2 years (flexible)
QI 7	Service interval display 10,000 miles or 1 year (fixed)
QI 8	For Volkswagen Commercial Vehicles only (flexible)

## Two service channels

In the past, it was only possible to inform customers of any service events due at the same time as the oil change using the service interval display. All other service events were listed on the service sticker. The Golf 2013 has been given a second service channel to ensure that service events which are not linked to an oil change can be displayed.

This guarantees a clearly displayed service due date. This reduces the risk of exceeding any service events which are due, as the customer's attention is drawn to them directly by the display in the dash panel insert.

Filling in the service sticker is no longer necessary.

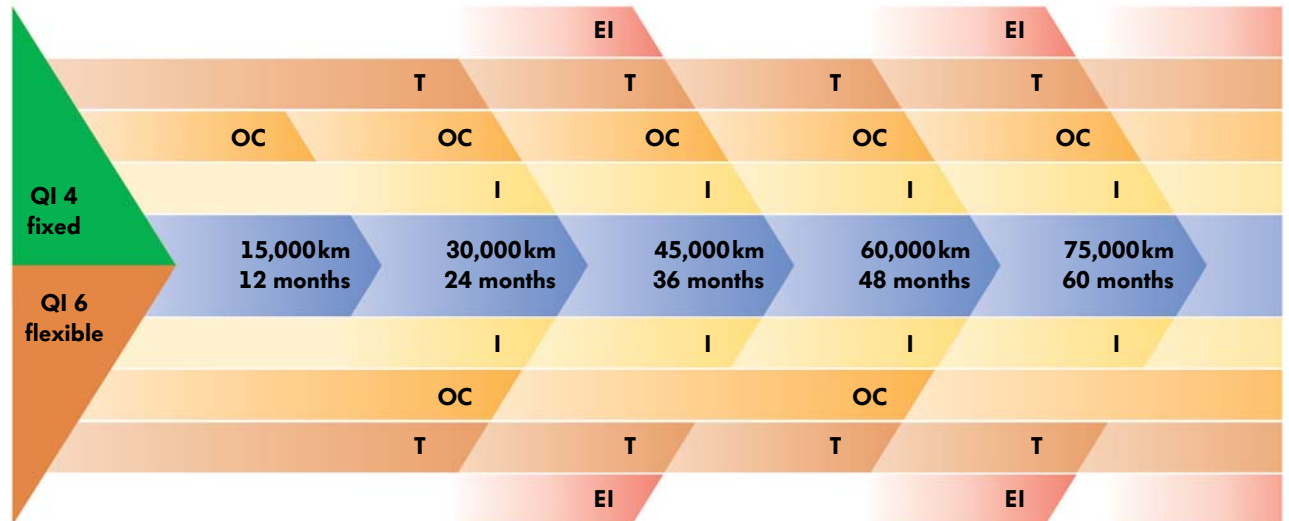


# Service

## Service intervals for the Golf 2013

The following overview shows the service intervals for the Golf with fixed intervals (QI 4) and flexible intervals (QI 6).

**Mileage 15,000 km/year; fixed interval: maximum 15,000 km/year**



**Mileage 15,000 km/year; ESI\*: maximum 30,000 km/2 years**

s513\_052

\* ESI = Extended Servicing Interval

### Legend

<b>EI</b>	Extended Inspection scope: first inspection after 60,000 km/3 years, followed by every 60,000 km/2 years
<b>AT</b>	Additional tasks, e.g. brake fluid/air and fuel filter/dust and pollen filter/spark plugs*
<b>OC</b>	Oil change service
<b>I</b>	First inspection after 30,000 km/2 years, followed by every 30,000 km/1 year

\* The additional tasks are listed according to mileage or running time. The corresponding intervals for the additional tasks are described in the service literature.



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## Service schedule

The following is new in the service schedule from model year 2013:

- **Explanation of the QI PR numbers for identifying the respective type of service**  
The explanation of the QI PR number and the information about the servicing the vehicle requires indicates the respective type of service (fixed/flexible) and is described in the service schedule.
- **Documentation of the body inspection**  
The verification field is used for documenting any vehicle damage needing examination within the scope of the inspection.
- **Discontinuation of the detailed list of all service scopes**  
There may be technical changes during the period over which the printed service plan applies. This prevents any information in the service schedule from contradicting the content found in ELSA.  
This allows a service schedule to be used worldwide.

## Service list

The order of the service items is no longer structured according to subassemblies, but rather based on events.





# Notes

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