

Self Study Program 890373

# The 2018 Tiguan Introduction

Tablet Format



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# Introduction

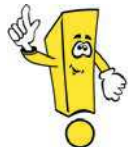
## 2018 Tiguan Product Features

The 2018 Tiguan is a larger version of the previous Tiguan, helping Volkswagen to expand its role in the SUV market. It is designed to be an all-around vehicle, with front-wheel drive and 4MOTION options to cover almost any terrain.

This SSP will introduce you to the highlights of the 2018 Tiguan.



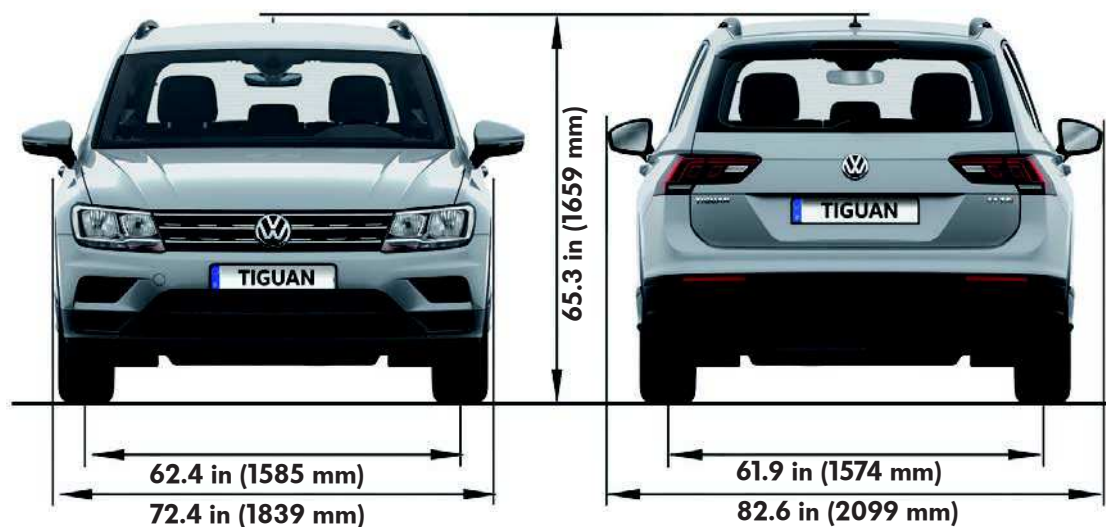
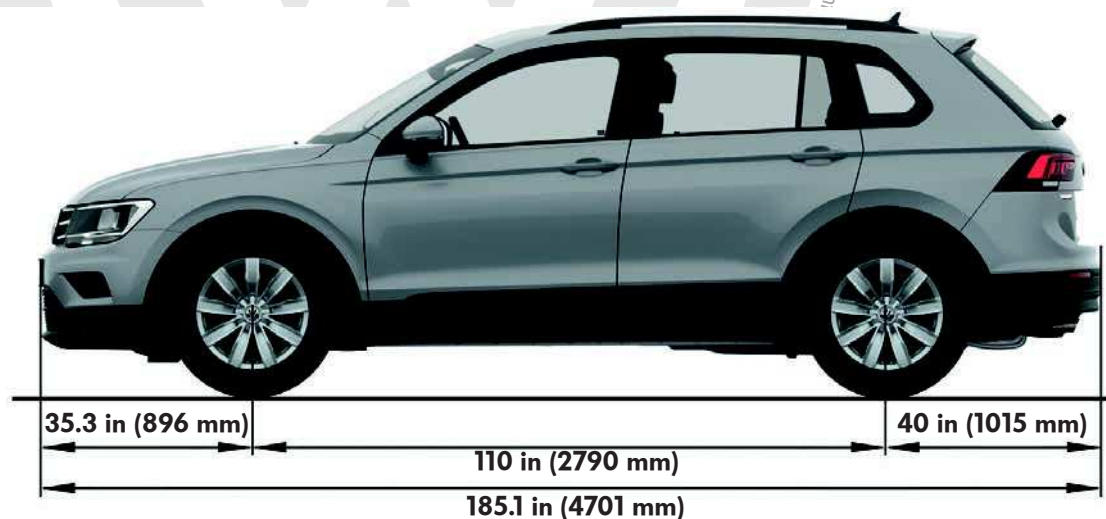
Not all features listed are standard equipment.



# Body

## Technical Data

### Exterior Dimensions and Weights



#### Exterior Dimensions

Length	185.1 in (4701 mm)
Width	72.4 in (1839 mm)
Height	65.3 in (1659 mm)
Wheelbase	110 in (2790 mm)
Overall width	72.4 in (1839 mm)
Track width at front	62.4 in (1585 mm)
Track width at rear	61.9 in (1574 mm)

#### Weights/Details

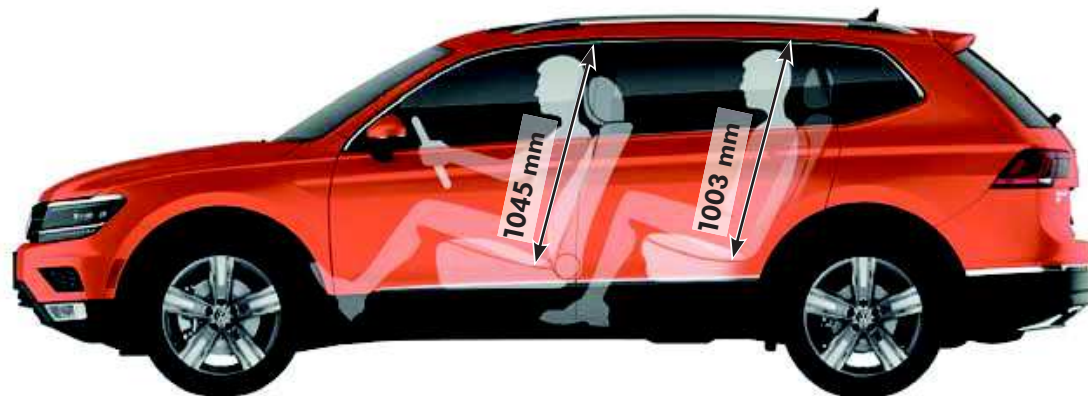
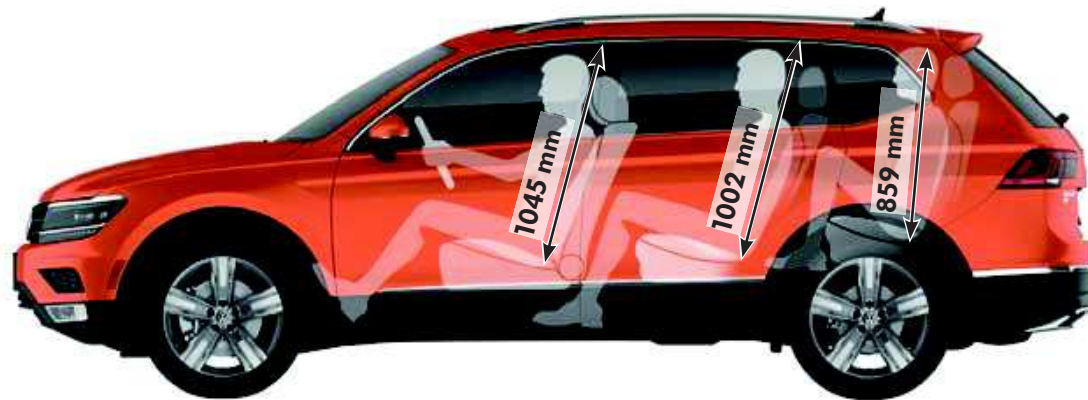
Curb weight	3780 - 3944 lb
Maximum roof load	165 lb



# Body

## Technical Data

### Interior Dimensions and Volumes



#### Interior Dimensions (7-Seater)

Front headroom	41.1 in (1045 mm)
Middle headroom	39.1 in (993 mm)
Rear Headroom	33.8 in (859 mm)
Luggage compartment with third row raised	12 ft <sup>3</sup>
Luggage compartment with third row folded	33 ft <sup>3</sup>
Luggage compartment with second and third rows folded	65.7 ft <sup>3</sup>

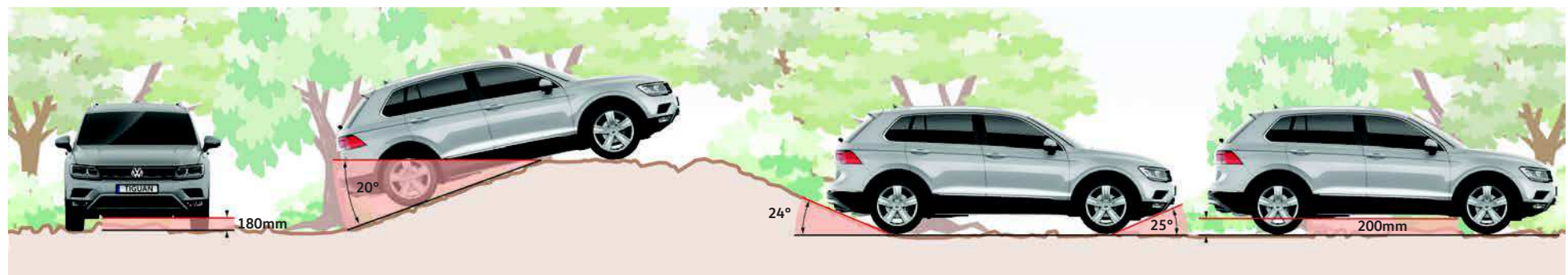
#### Interior Dimensions (5-Seater)

Front headroom	41.1 in (1045 mm)
Middle headroom	39.1 in (993 mm)
Luggage compartment with second row raised	37.6 ft <sup>3</sup>
Luggage compartment with second row folded	73.5 ft <sup>3</sup>

# Body

## Ground Clearance

The Tiguan's ground clearance supports maneuverability in both on-road and off-road situations. The maximum ground clearances are displayed below. The Tiguan R-Line ground clearances are not yet available and will be different due to redesigned components.



Ground Clearance Underneath the Axles

Breakover Angle

Ramp Angle

Ground Clearance Between the Axles

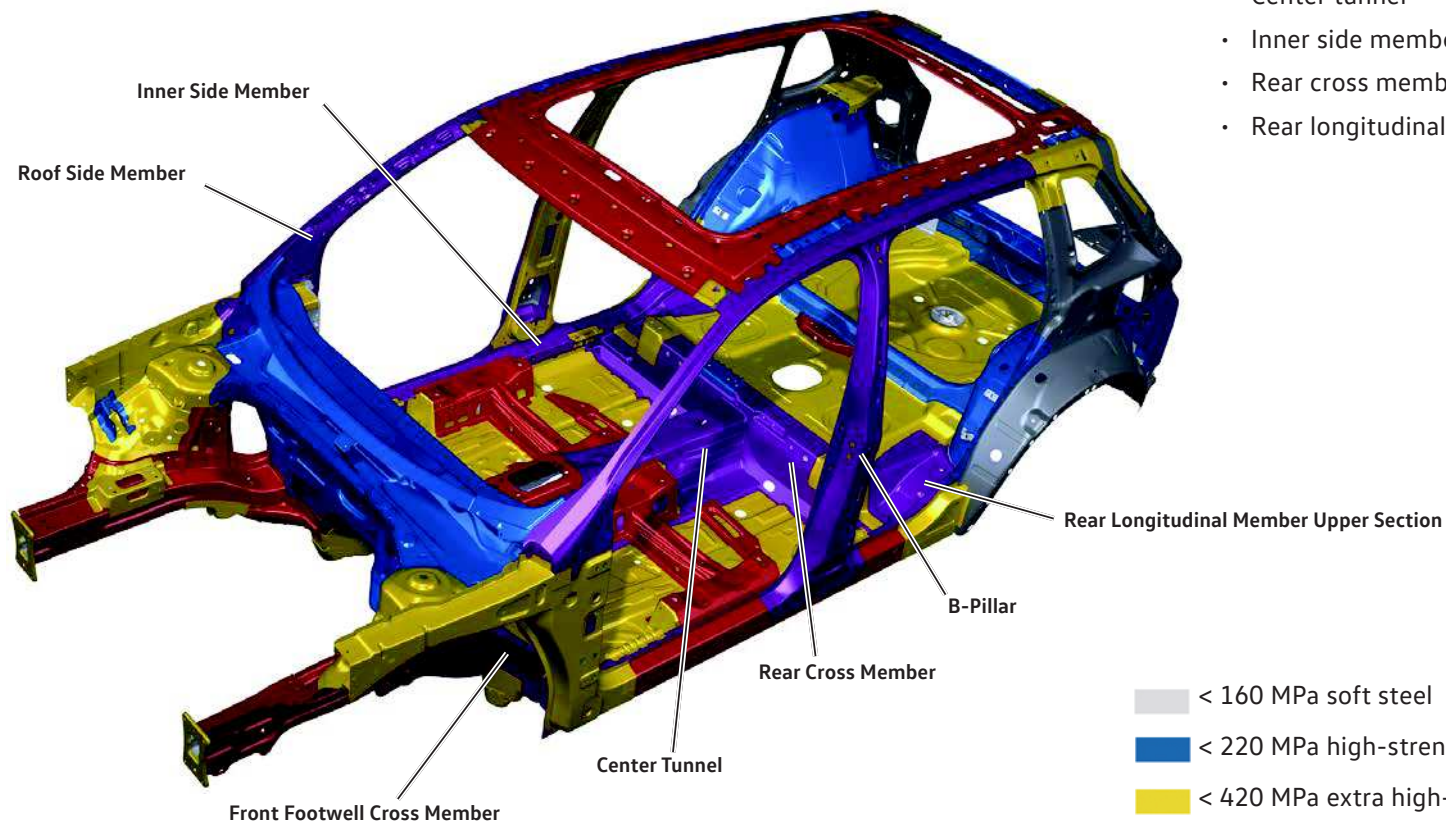
# Body

## Body Structure

The body is based on the MQB platform, and ultra-high-strength hot-formed steels are used just like in the other MQB vehicles. These steels are stronger than conventional steel with a similar weight. Using these steel sheets has made the body 26 lb (12 kg) lighter compared with the previous model, but still considerably stronger and safer.

The following components are made from ultra-high strength hot-formed steel:

- B-pillars
- Roof side members
- Front footwell cross member
- Center tunnel
- Inner side members
- Rear cross member
- Rear longitudinal member upper sections



- < 160 MPa soft steel
- < 220 MPa high-strength steel
- < 420 MPa extra high-strength steel
- < 1,000 MPa ultra-high-strength steel
- > 1,000 MPa ultra-high-strength hot-formed steel



# Body

## Panoramic Sunroof

The optional Panoramic Tilting/Sliding Sunroof is a two-piece large glass opening system that is approximately 4.46 ft. (1360 mm) long and 2.85 ft (870 mm) wide. The front glass element will tilt and open, and the rear glass is stationary.

An electronically-controlled sunshade helps to control light and heat from the sun.



## Ambient Lighting

The Tiguan has a light strip on each side of the panoramic sliding sunroof for ambient lighting.



# Body

## Electrically Operated Tailgate

The Tiguan is available with an electrically operated tailgate. The drive uses two spindle drives. They are installed in place of the gas struts.

It is opened and closed with:

- A button on the tailgate
- A button in the door trim
- A button on the remote control key

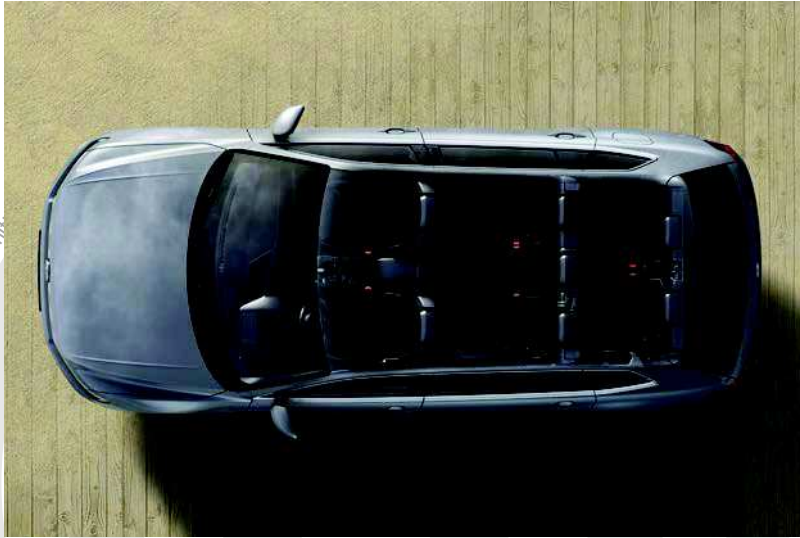


## Programming

The opening height can be programmed for ease of use and to avoid contact with low garage ceilings or carports. To program the opening height, stop the tailgate in the required position with the button on the tailgate. Then hold down the button until you hear an acoustic signal.

# Body

## Seating Configuration



# Body

## Center Row Seats

The center row of seats:

- Can be moved separately forward and backward
- Has backrest tilt angles that can be adjusted
- Are electrically heated in some equipment levels





# Body

## Luggage Compartment Floor System

The luggage compartment floor can be set to two positions:

### Floor in upper position:

This position creates a flat loading area. In addition, it matches the same height of the third row of seats when they are folded down, creating a larger flat loading surface.



### Changing the position:

Lift the rear part of the loading floor and place the front part in the lower position.



### Floor in lower position:

In this position, the customer can make use of the maximum luggage compartment volume.



# Body

## Occupant Protection

The following occupant protection systems can be equipped:

- Single-stage driver airbag
- Single-stage front passenger airbag
- Side airbags in the front seats
- Side airbags in the outer rear seats
- Front and rear curtain airbags
- Three-point seat belts with belt tensioners and force limiters on front seats
- Three-point seat belts with belt tensioners and force limiters on outer rear seats
- Three-point seat belt on center rear seat
- Top tether system on outer rear seats
- ISOFIX child seat retaining rings on the outer rear seats
- Belt status display



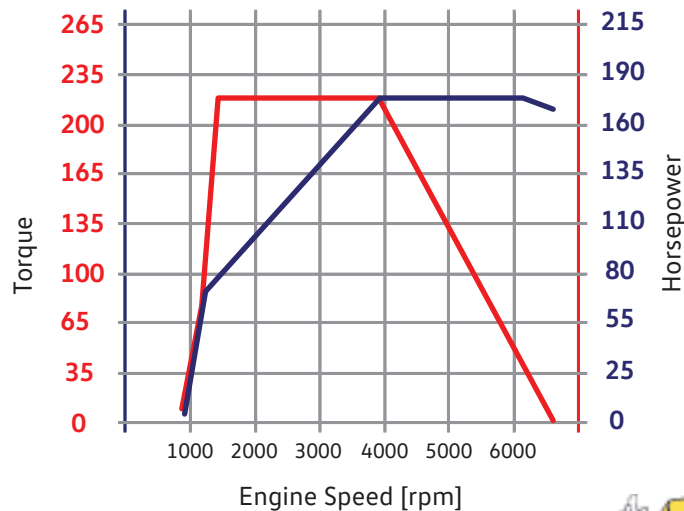
# Engines and Transmissions

## 2.0L TSI Engine

The 2.0L TSI engine in the Tiguan is an EA888 engine, Generation III B.

### Technical Features

- Valvelift system on the intake side
- Injection pressure increased to 250 bar
- Mass Airflow Sensor G70 between the turbocharger and air filter housing
- Engine Control Module with quad core processor
- Intake camshaft and exhaust camshaft adjustment
- Innovative thermal management with rotary valve regulation
- On-demand piston cooling jets
- Intake manifold flaps



Displacement	1984 cm <sup>3</sup>
Bore	82.5 mm
Stroke	92.8 mm
Valves Per Cylinder	4
Compression Ratio	11.6:1
Horsepower	184 hp (137 kW) from 3940 to 6000 rpm
Torque	221 lb/ft (300 Nm) from 1500 to 3940 rpm
Engine Management	Bosch MG1
Fuel	87 Octane
Emission Treatment	Three-way catalytic converter, one upstream broadband lambda probe of the turbocharger and one step-type lambda probe downstream of the catalytic converter



For more information about the EA888 engine used in the Tiguan, refer to SSP 820173, The EA888 2.0L TSI Engine Generation III B.

# Engines and Transmissions

Transmission Type	Technical Data
<b>8-Speed Automatic Transmission 09P</b>	<p>The 09P (AQ450) 8-speed automatic transmission is the only transmission used in the Tiguan. It is available as both a two- and four-wheel drive configuration. This transmission is based on the Aisin 09G transmission, but incorporates a different design and components, such as:</p> <ul style="list-style-type: none"><li>• Additional planetary gearsets</li><li>• Additional hold and drive components</li><li>• A different valve body</li><li>• An Electro-Magnetic Oil Pump (EMOP) solenoid to keep the 1st gear C1 clutch engaged during Start-Stop operation, ensuring a smooth transition from a stopped engine to takeoff</li></ul> <p>Both the FWD and AWD transmissions have the same drive ratios per gear. Also, this transmission has the same final drive ratio as the 09G/M transmission.</p>





# Engines and Transmissions

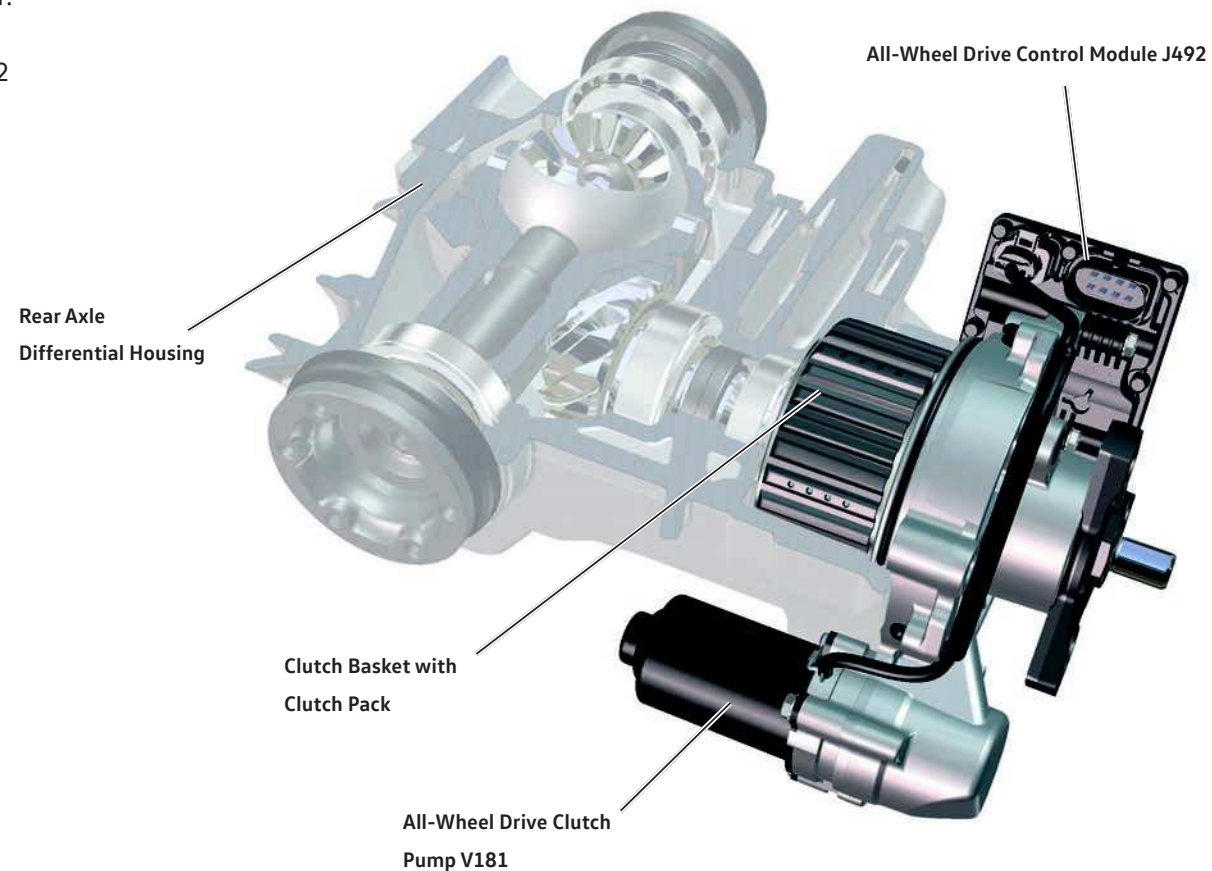
## Fifth Generation of All-Wheel Drive Coupling

The familiar fifth generation of the all-wheel drive coupling is used in the MK VII Golf, the Alltrack and the Atlas.

The all-wheel drive coupling is located in the rear axle differential housing. It transfers the required drive torque to the rear wheels and is operated electro-hydraulically.

The all-wheel drive coupling consists of:

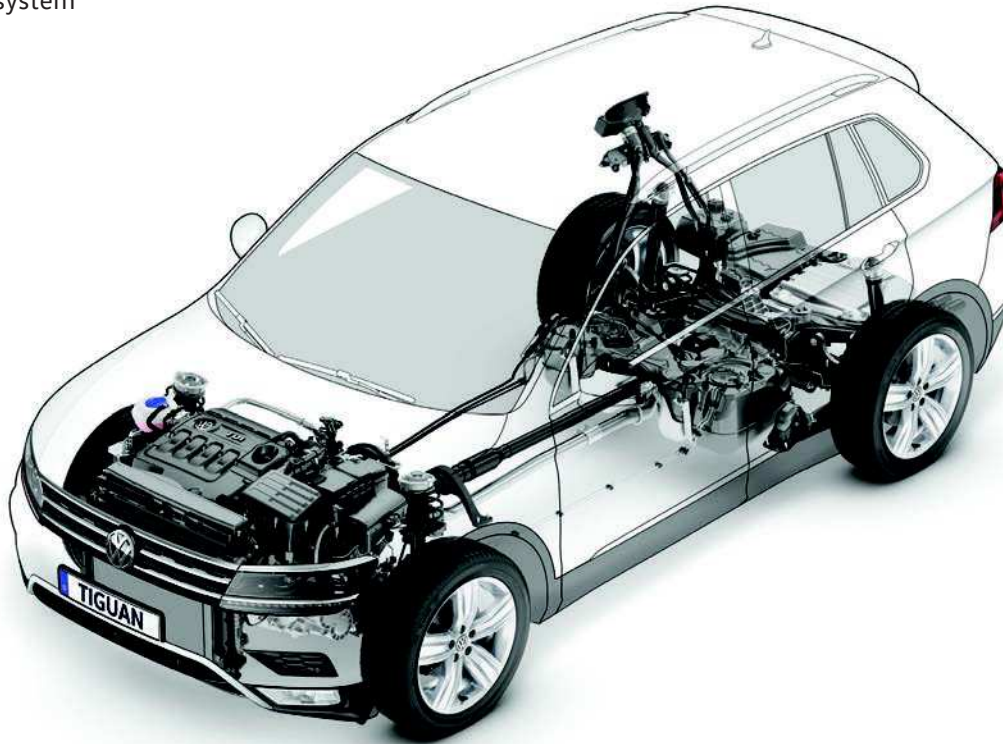
- All-Wheel Drive Control Module J492
- All-Wheel Drive Clutch Pump V181
- Clutch basket with clutch pack



# Running Gear

## Running Gear:

- McPherson strut front suspension
- Four-link rear axle
- Electromechanical parking brake (EMPB) with Auto Hold function
- Electromechanical power steering (EMPS) with integrated steering angle sensor
- Continental MK 100 ABS/ESC anti-lock brake system



## Driver Assistance Systems:

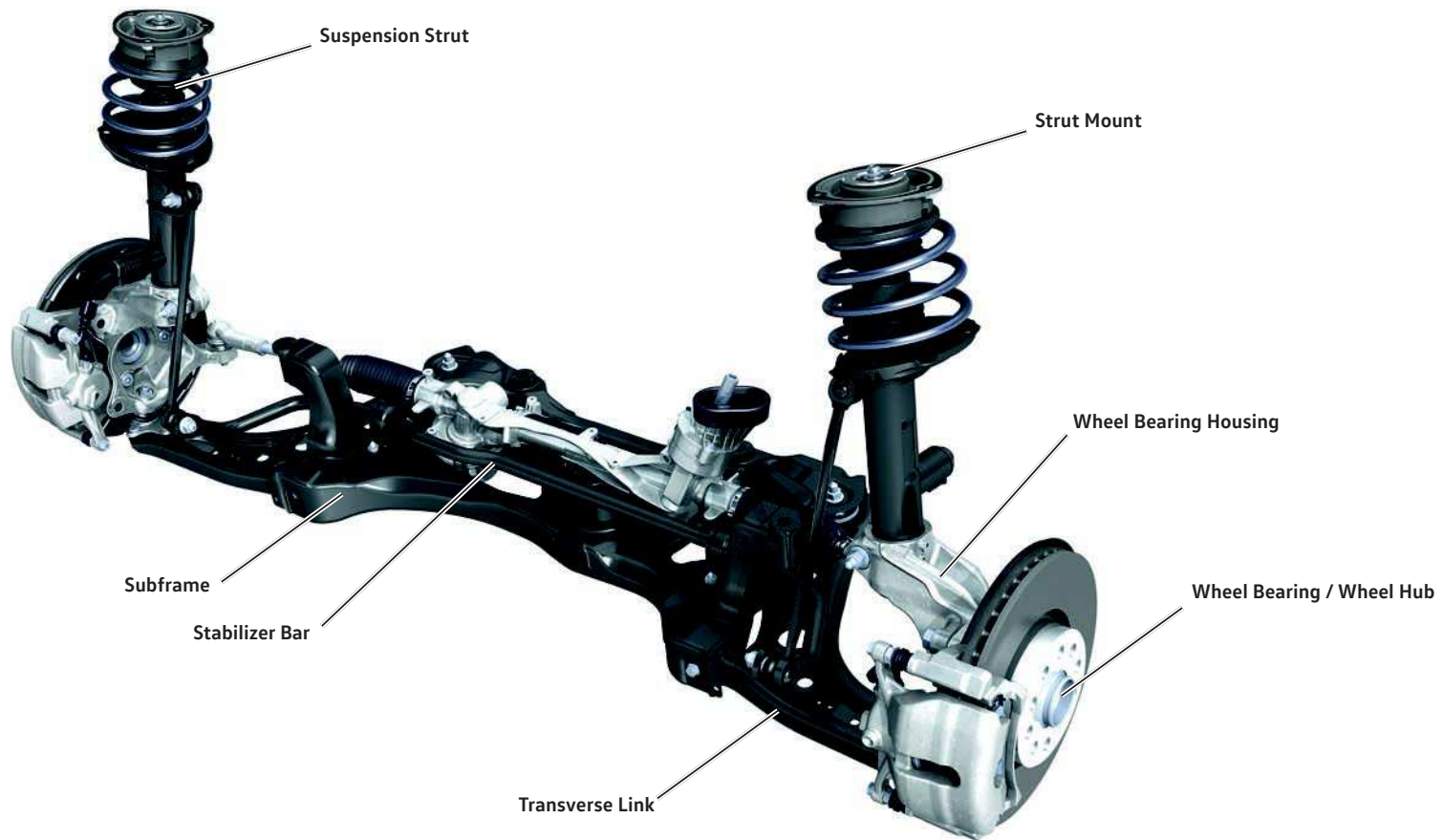
- Front assist (area monitoring system) with:
  - City Emergency Braking System
  - Pedestrian Detection
- Adaptive Cruise Control (ACC)
- Lane Assist (lane departure warning system) with:
  - Emergency Assist
  - Traffic Jam Assist
- Side Assist (lane change assistant) with:
  - Rear Traffic Alert
- Park assist steering, PLA 3.0 (Park Assist) and parking aid, PDC with:
  - Maneuver braking
- Rear View (reverse camera)
- Tire Pressure Loss Indicator, TPLI+
- Tire Pressure Monitoring System, TPMS
- Multi-collision brake (Automatic Post-Collision Braking System)
- Driver Alert System
- Area View (overhead)

# Running Gear

## Front Axle

The Tiguan has a McPherson front axle with two pivoted suspension struts and lower transverse links.

The subframe, which is made of steel, is bolted to the body. The weight of the front axle has been reduced compared to the previous Tiguan. However, the axle loads have been increased.



# Running Gear

## Rear Axle

The four-link rear axle comes in two variants:

- The four-link rear axle for vehicles with front-wheel drive
- The four-link rear axle for vehicles with 4MOTION drive

### Four-link axle for front-wheel drive

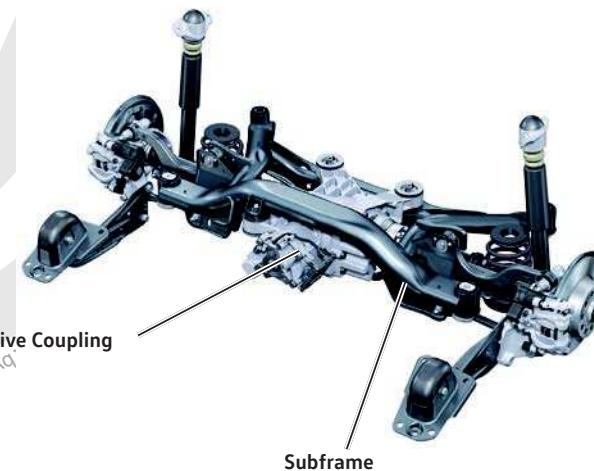
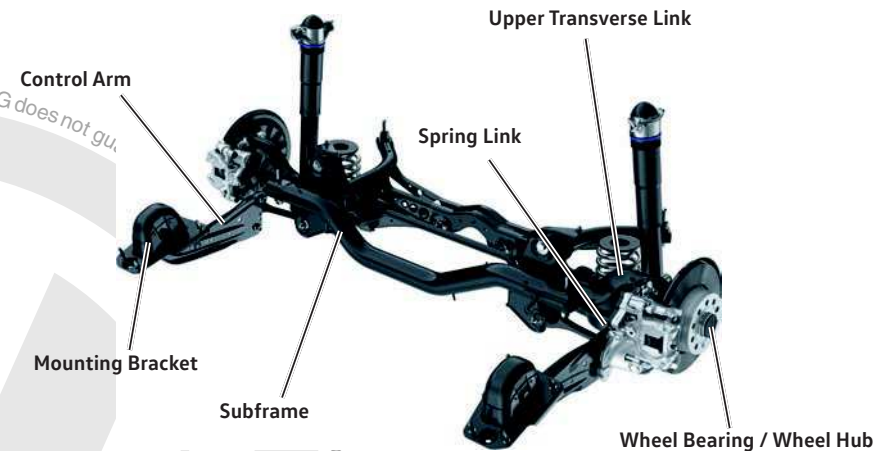
The four-link axle has been specifically enhanced and adapted to the axle loads and driving dynamics of the Tiguan, e.g.:

- Weight-optimized axle parts
- Improvement in driving dynamics/ride comfort
- Acoustic optimization

### Four-link axle for 4MOTION drive

The four-link axle for 4MOTION drive is distinguished by the following points:

- 0.8 inch (20 mm) longer control arm
- Modified subframe
- Wheel bearings adapted to the axle load and the driving dynamics



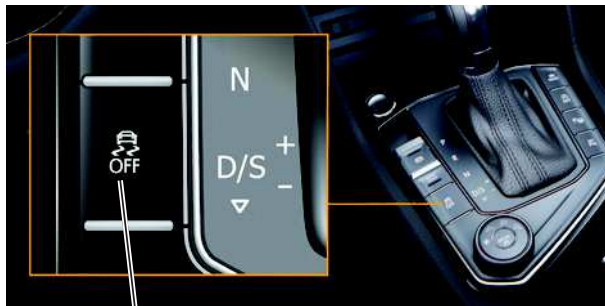


# Running Gear

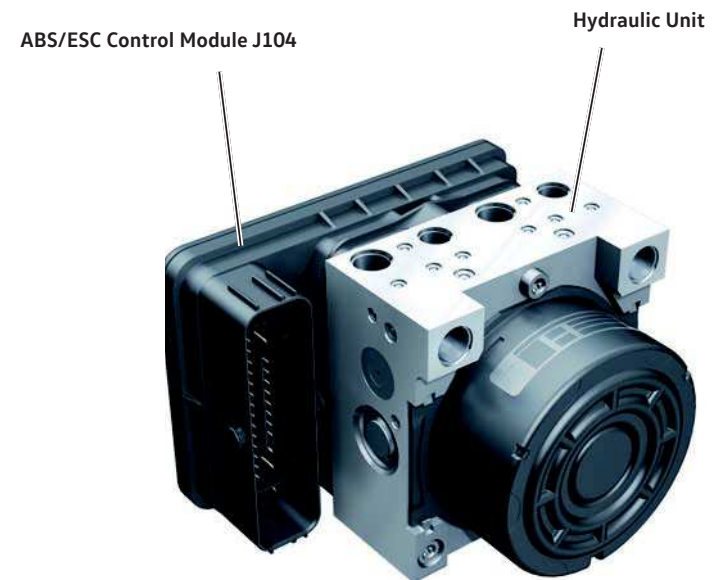
## Continental MK 100 ABS/ESC Anti-Lock Brake System

The MK 100 from Continental is used as the ABS/ESC unit. This unit is also used in the Golf, Passat and Atlas.

The Traction Control System (TCS) and Electronic Stabilization Control (ESC) can be activated and deactivated using the ASR/ESC Button E256 in the center console.



ASR/ESC Button E256

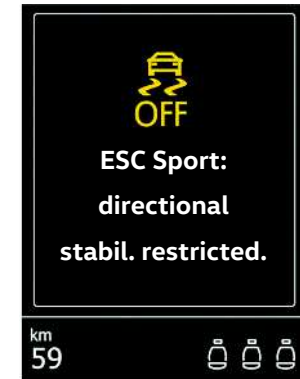


# Running Gear

For vehicles with Front-Wheel drive, the TCS can be deactivated using the button.



For All-Wheel Drive vehicles, the ESC system can be restricted using the button.



Mode	Press E256	Activation/Deactivation/Restriction
On-road and Off-road	< 3 seconds	TCS is deactivated
On-Road	> 10 seconds	ESC Sport Mode is active
Off-Road	> 10 seconds	ESC is restricted, however becomes active when pressing the brake pedal

# Running Gear

## Driving Profile Selection Control Head E881

The vehicle's drive, running gear and brake system can be adapted using the Driving Profile Selection Control Head. The switch is in the center console below the selector lever. The MODE button is integrated into the Infotainment screen menu.

The driver can choose between the driving profiles "Normal", "Snow", "Offroad" and "Offroad Individual" by turning the button on the operating unit. These profiles are described on this page and the next pages.

### Normal

In the "Normal" driving profile, the driving behavior is adapted to regular roads. In the on-road position, the driving profile selection menu opens on the infotainment system display when you press the MODE button.

The driver can select the driving profiles by pressing the MODE button.

- Eco
- Normal
- Sport
- Individual



Press

# Running Gear

## Snow

Snow is the ideal profile for snow-covered or icy roads. It provides:

- Traction Control System (TCS) adapts for more traction in straight line conditions
- Traction control system (TCS) adapts for better tracking when cornering
- Flatter accelerator characteristic curve
- Early upshift points



## Off-road

Off-road is the ideal profile for terrain away from normal roads. It is characterized by:

- Downhill driving assistant active, holds speed < 30km/h when driving downhill and on downhill gradients > 10%
- Hill Start Assist active, start assist on uphill gradients, max. 2 s
- Anti-lock brake system (ABS), chock effect on loose surfaces
- Electronic Differential Lock (EDL), greater locking ratio, max. speed 80km/h
- Later intervention of Electronic Stability Control (ESC) and the Traction Control System (TCS)
- Flatter accelerator characteristic curve
- Late upshift points
- No forced upshifts in the Tiptronic gate



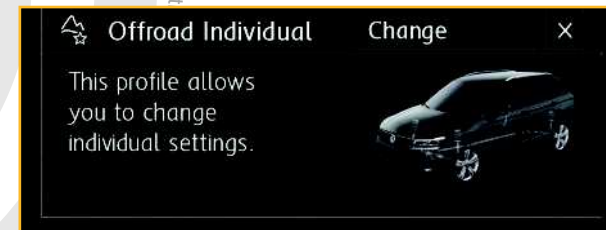


# Running Gear

## Off-road Individual

Off-road Individual allows for the driver to select individual off-road functions.

- Downhill driving assistant can be activated/ deactivated
- Hill Start Assist can be activated/deactivated
- Electronic Differential Lock (EDL) can switch between on-road/off-road mode



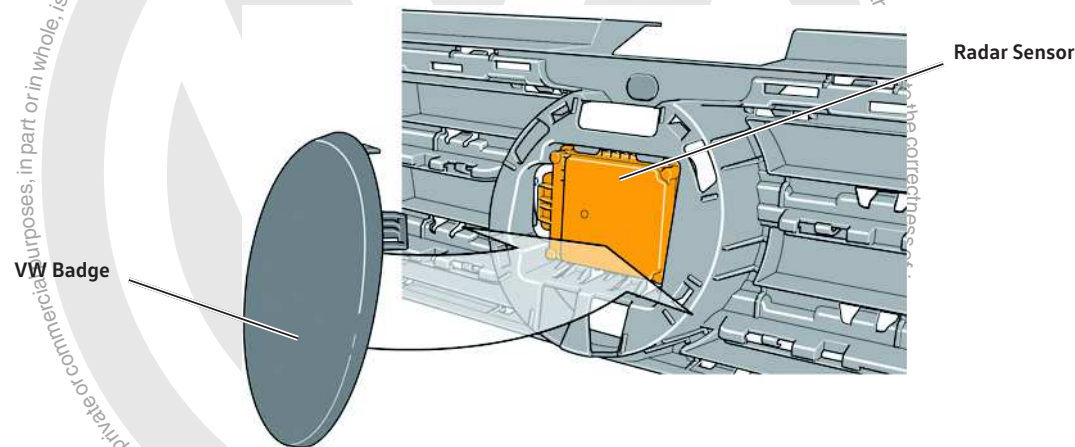
# Running Gear

## Distance Regulation Control Module J428 – Adaptive Cruise Control Radar Sensor

The Distance Regulation Control Module is a combination of the control module and radar sensor. A new radar sensor for ACC, Front Assist, Pedestrian Detection and Emergency Assist is being used for the first time. This sensor is now capable of detecting pedestrians by exclusively using radar.

It is clipped directly into the radiator grille. A Volkswagen badge, which is suitable for radar usage thanks to a special coating, is then clipped on top.

The badge has a vapor-deposited indium coating. Indium (In) is a chemical element. This silvery-white, soft, heavy metal is often processed to form indium tin oxide and used as a transparent conductor.



### Technical data

- Manufacturer: Continental
- Range: approx. 460 feet (140 meters)
- Frequency range: 76–77 GHz (used bandwidth 55 MHz)
- No heating

### Advantages

- Greater radar angle
- Emergency brake assist integrated into the radar sensor
- Pedestrian Detection on radar basis only, without front camera

# Running Gear

## Calibration

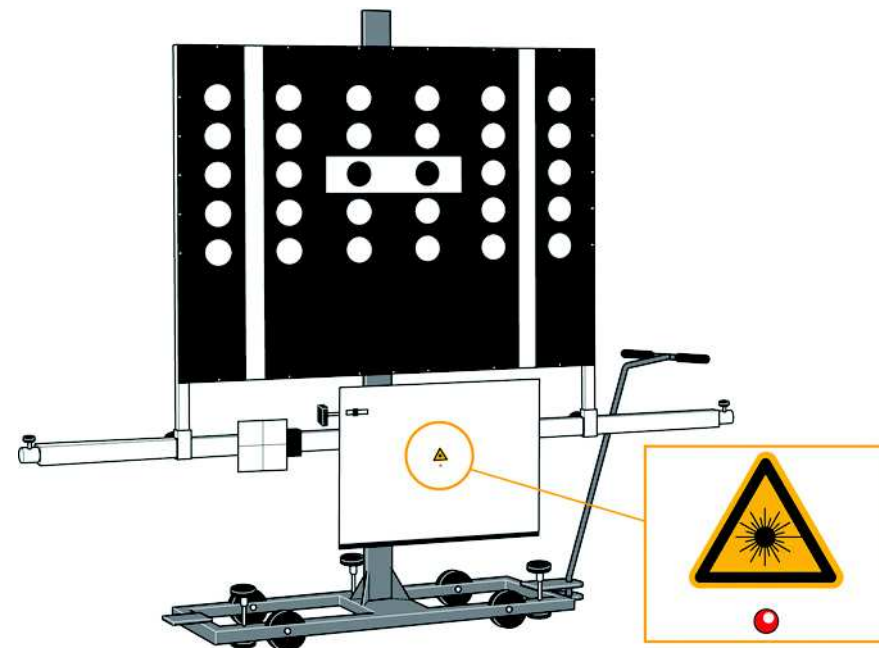
Static calibration for the radar sensor uses the calibration board VAS 6430/10 and the manufacturer's instructions.

### Static calibration

During static calibration, the front radar calibrates its sensors using a calibration board that is aligned with the driving axis. The calibration process is activated through the scan tool. Mechanical adjustment with adjuster screws is no longer possible or necessary.

The radar sensor needs to be calibrated when:

- The Distance Regulation Control Module J428 has been replaced
- The radiator support has been replaced, moved into service position, or has been removed and installed
- The rear axle track has been adjusted



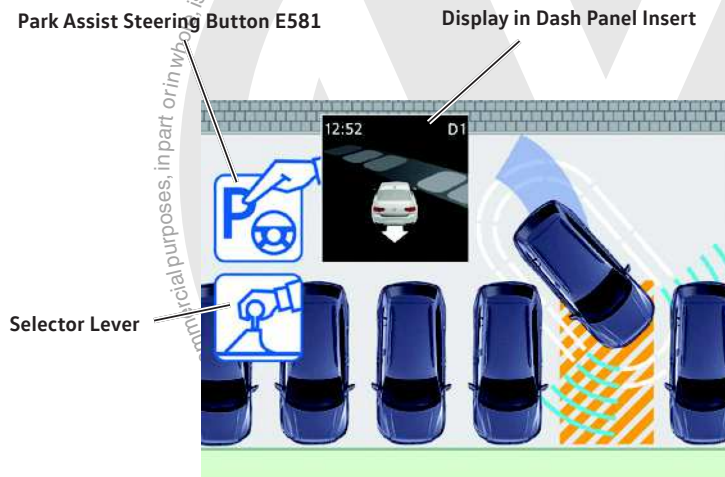
VAS 6430/10 Calibration Board

# Running Gear

## Park Assist steering (PLA 3.0)

Park assist steering helps you park in parallel and perpendicular spaces by automatically steering the car.

The system uses the Park Distance Control (PDC) sensors to detect possible parking scenarios (parallel and perpendicular parking spaces). The driver can select a suitable parking scenario with the Parallel Parking Assistance Button E581.



Example of Driving Forward into a Parking Space

## Parking Aid (PDC) with maneuver braking

The parking aid system now includes a braking function.

This function works independently of the Park Assist steering and uses only the PDC sensors (8- and 12-channel system). It is designed to brake the vehicle automatically to reduce collisions with static obstacles.

The parking aid ultrasonic sensors are used for this function. The system activates when Reverse gear is selected. If the vehicle is about to impact a static obstacle, the brakes will automatically apply.





# Running Gear

## Function Conditions

PDC braking can be activated or deactivated using the Infotainment screen menus.

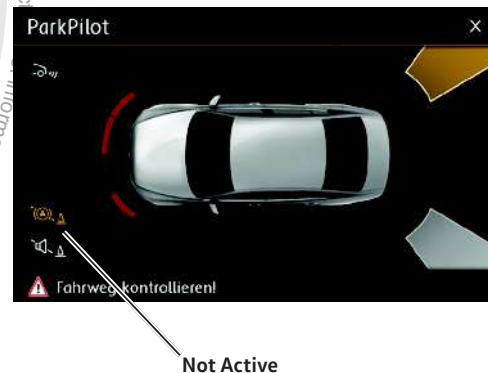
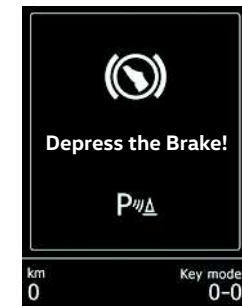
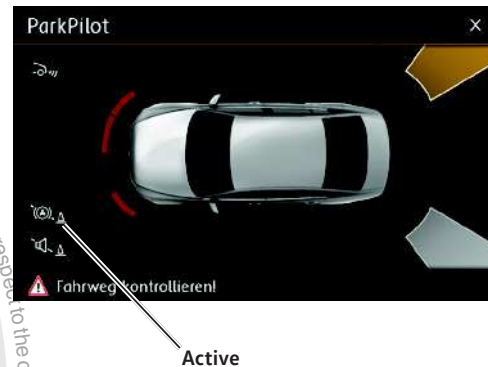


### PDC braking is active when:

- Speed is between 1-6 mph (1.5-10 km/h)
- Parking Aid (PDC) is activated
- PDC braking is activated
- Objects are detected directly by the rear sensors
- A collision is unavoidable

### PDC braking is not active when:

- PDC braking is not activated
- Parking Aid (PDC) is not activated
- A door/tailgate is open
- Transport mode or single-axle roller dynamometer mode is activated
- PDC sensors fail
- The ABS control module reports a fault



# Climate Control

## Air Conditioning

The Tiguan uses air conditioning components from the MQB platform. A manual/electric air conditioning system standard. A Climatronic system is optional.

### Climatronic

A Climatronic system with a third climate zone in the rear is available in the Tiguan. The three-zone Climatronic system allows the driver, front passenger and the rear passengers to independently set their own preferred temperature between 61 - 85 °F (16 - 29.5°C). Temperature regulation is fully automatic.

### Front Operating and Display Unit

All Climatronic functions can be selected through the front operating and display unit. Some functions are also available through the Infotainment display.

### Rear Operating and Display Unit

The rear operating and display unit is located in the center console. It allows temperature adjustment for the rear seats (third climate zone). The temperature setting is shown on the display.



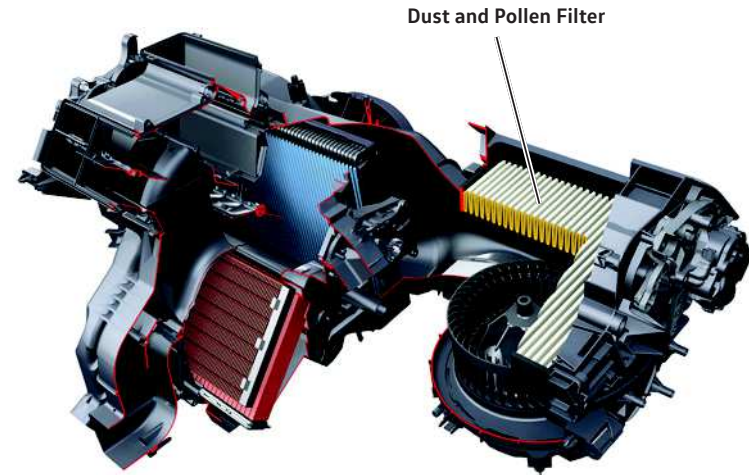
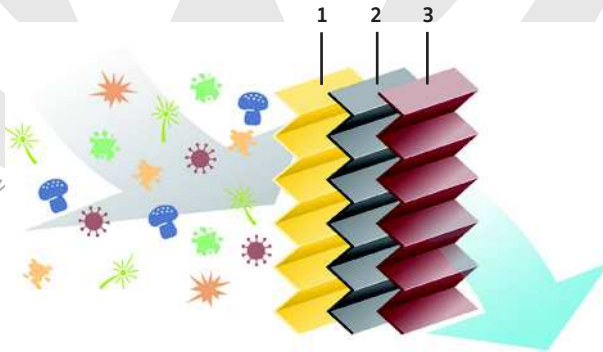
# Climate Control

## Pure Air Climatronic (dust and pollen filter)

A polyphenol coating has been added to the dust and pollen filter. This coating is a natural product that has anti-inflammatory properties and occurs in many plants. It absorbs allergens and renders them harmless. The yellow coating makes the filter easy to distinguish from conventional dust and pollen filters.

An Air Quality Sensor G238 is located in the plenum chamber detects and pollutants in the ambient air. The air conditioning compressor will activate or switch to recirculation mode depending on:

- The pollution of the ambient air
- The inside and outside temperature
- The interior humidity



### Key

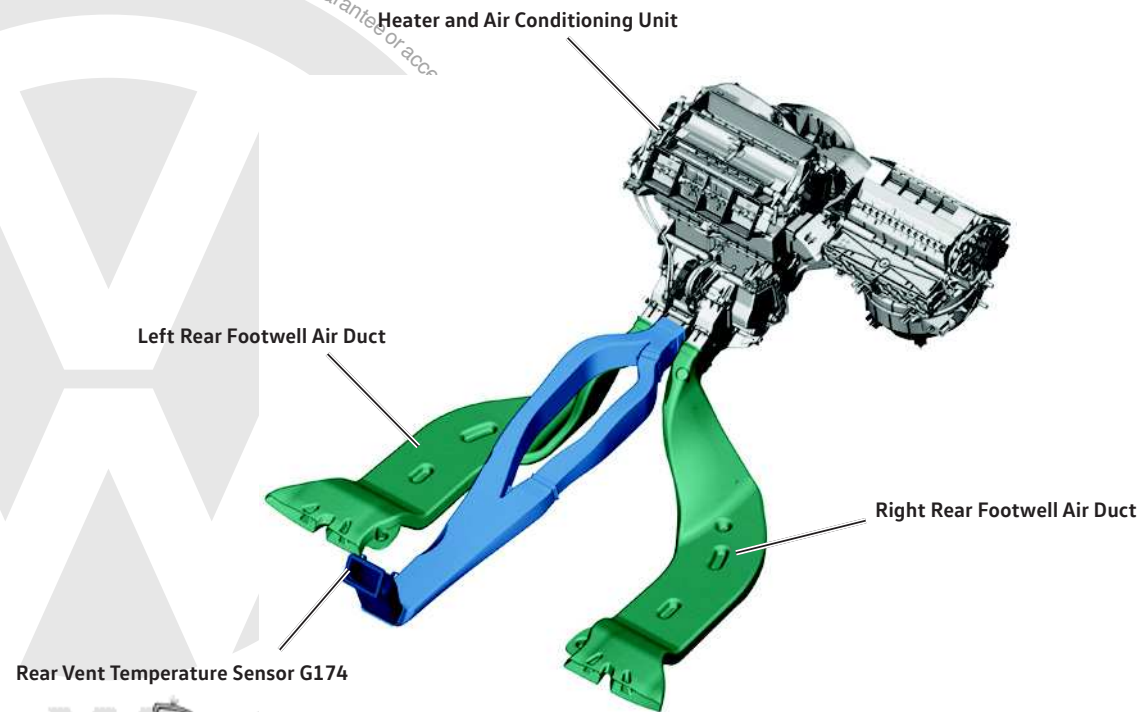
1. Fleece layer with antibacterial and antiallergenic polyphenol coating
2. Activated charcoal layer to filter out odors and gasses
3. Fleece layer to filter out pollen and dust

# Climate Control

## Rear Air Distribution

The three climate zones are heated or cooled by a heater and air conditioning in the front of the vehicle. The new Rear Vent Temperature Sensor G174 measures the air temperature at the vent.

The air distribution in the rear is controlled by the front operating unit.

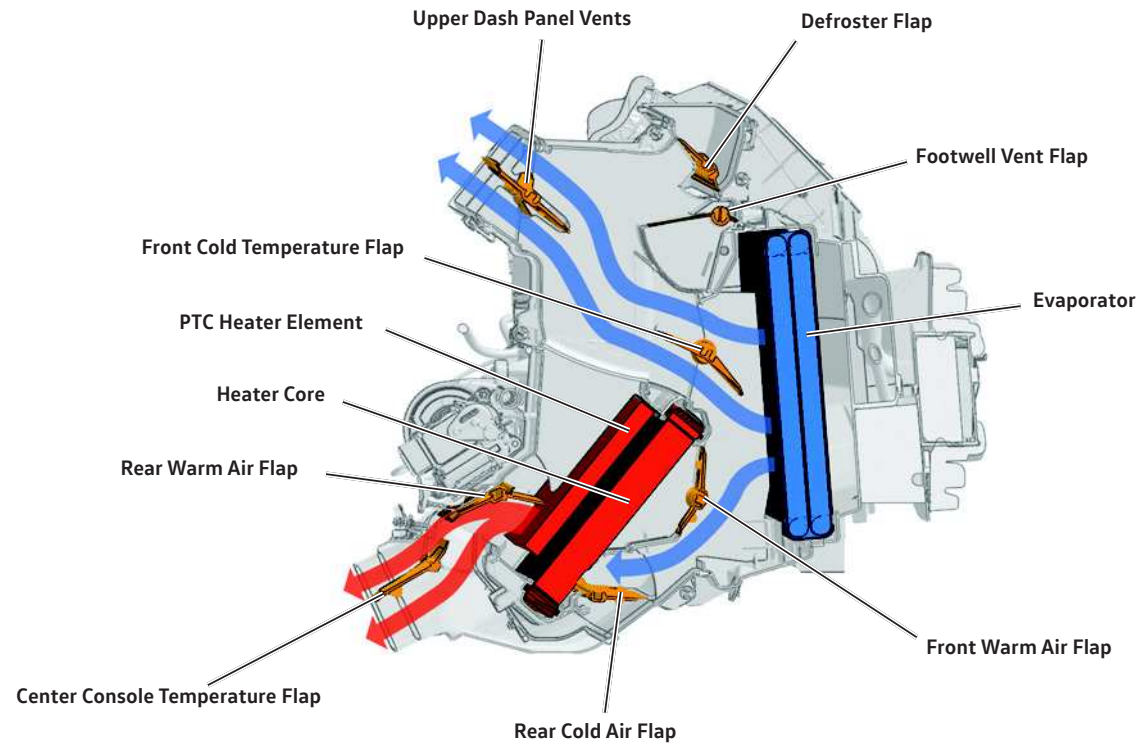




# Climate Control

## Rear Air Distribution Cross-Section

This cross-section shows the flow of air when the front is set to a cool temperature and the rear is set to a warmer temperature.



# Climate Control

## R-1234yf Refrigerant

R-1234yf refrigerant will be used in the Tiguan. The mechanical setup of the air conditioning system using R-1234yf is identical to that of the R-134a air conditioning systems.

### Vapor pressure curve

The following graph provides a comparison of the vapor pressure curves for the refrigerants R-1234yf and R-134a. Both curves are very similar. It was not necessary to modify any components (compressor, evaporator, condenser, sensors, actuators and refrigerant lines) because the refrigerants have similar properties.

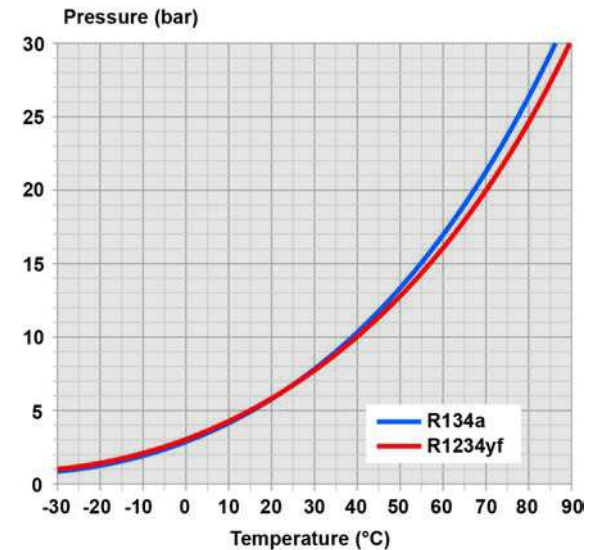
Only the software in the air conditioning control module differs depending on the refrigerant used.

### Global warming potential

The Global Warming Potential (GWP) is the potential contribution of the substance to the warming of the atmosphere, i.e. the greenhouse effect. The lower the GWP value, the lower the potential effect on global warming and the associated environmental impact.

CO<sub>2</sub> with a GWP = 1 is used as a reference refrigerant. R-1234yf has a GWP of 4 with a time horizon of 100 years. This means that one kilogram of R-1234yf contributes four times as much as one kilogram of CO<sub>2</sub> to the greenhouse effect within the first 100 years after release into the atmosphere.

The cause of the very low GWP is due to the life of the R-1234yf refrigerant in the atmosphere.



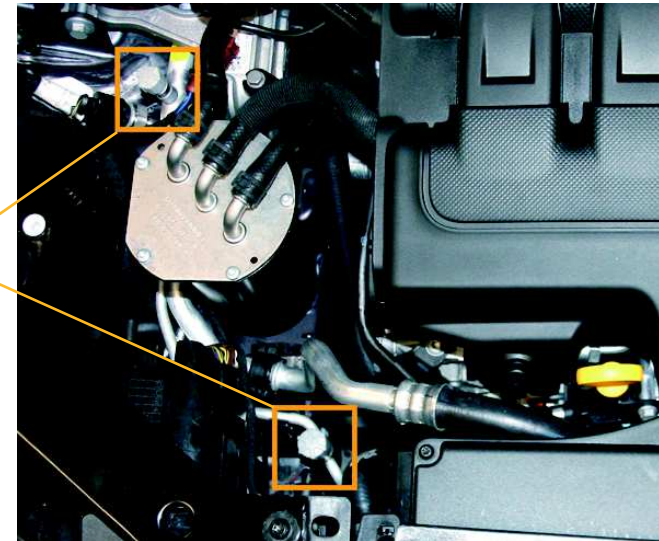
Refrigerant	GWP
CO <sup>2</sup> (R-744)	1
R-1234yf	4
R-134a	1,430
R-22	1,810
R-12	10,900

# Climate Control

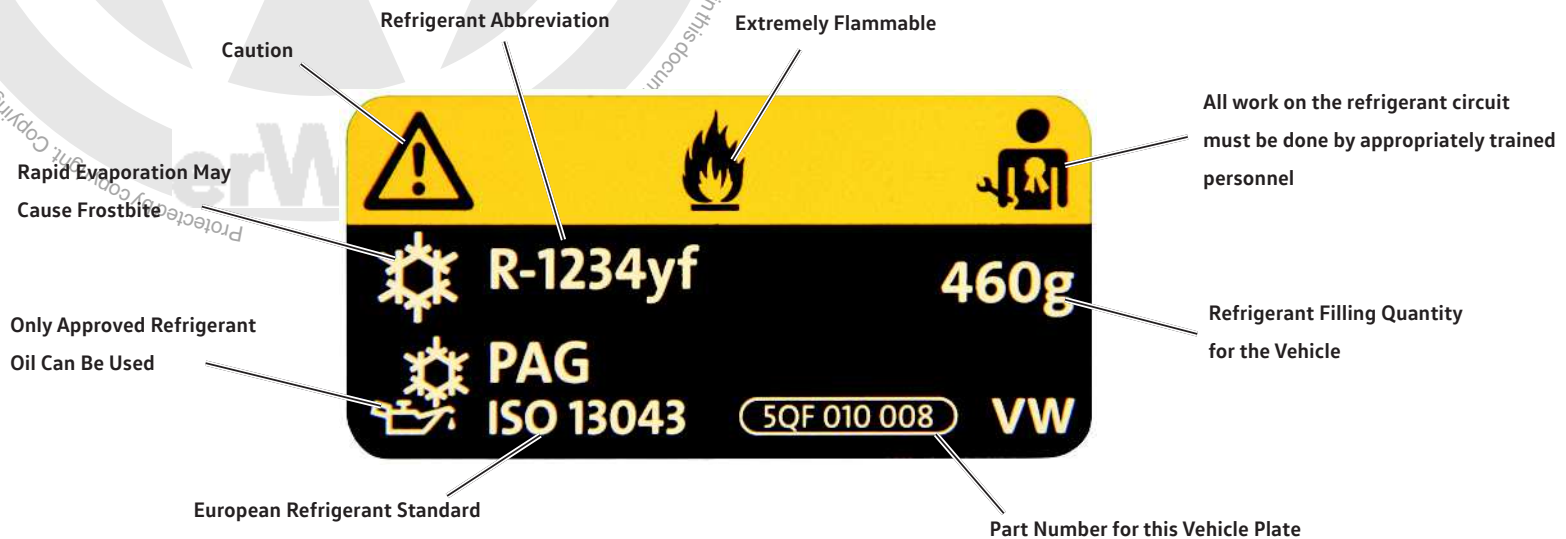
## Identifying Features on the Vehicle

The following identifying features show that the air conditioning system is filled with the refrigerant R-1234yf:

- Gray caps on the evacuating and charging valves
- Information label on the lock carrier



Gray Caps



# Climate Control

## VAS Air Conditioning Service Station

A new air conditioning service station (VAS 581 005) must be used for R-1234yf refrigerant. The connections are mechanically coded to ensure that the R-134a charging connectors on the air conditioning service stations cannot be connected to the R-1234yf evacuating and charging valves. This will prevent mix-ups or accidental charging of the R-1234yf system with R-134a and vice versa.

A qualification certificate for work on air conditioning systems is required (identical to the R-134a refrigerant air conditioning system). Please also comply with health and safety requirements and wear the following when performing work on the air conditioning system:

- Safety goggles
- Safety gloves
- Apron

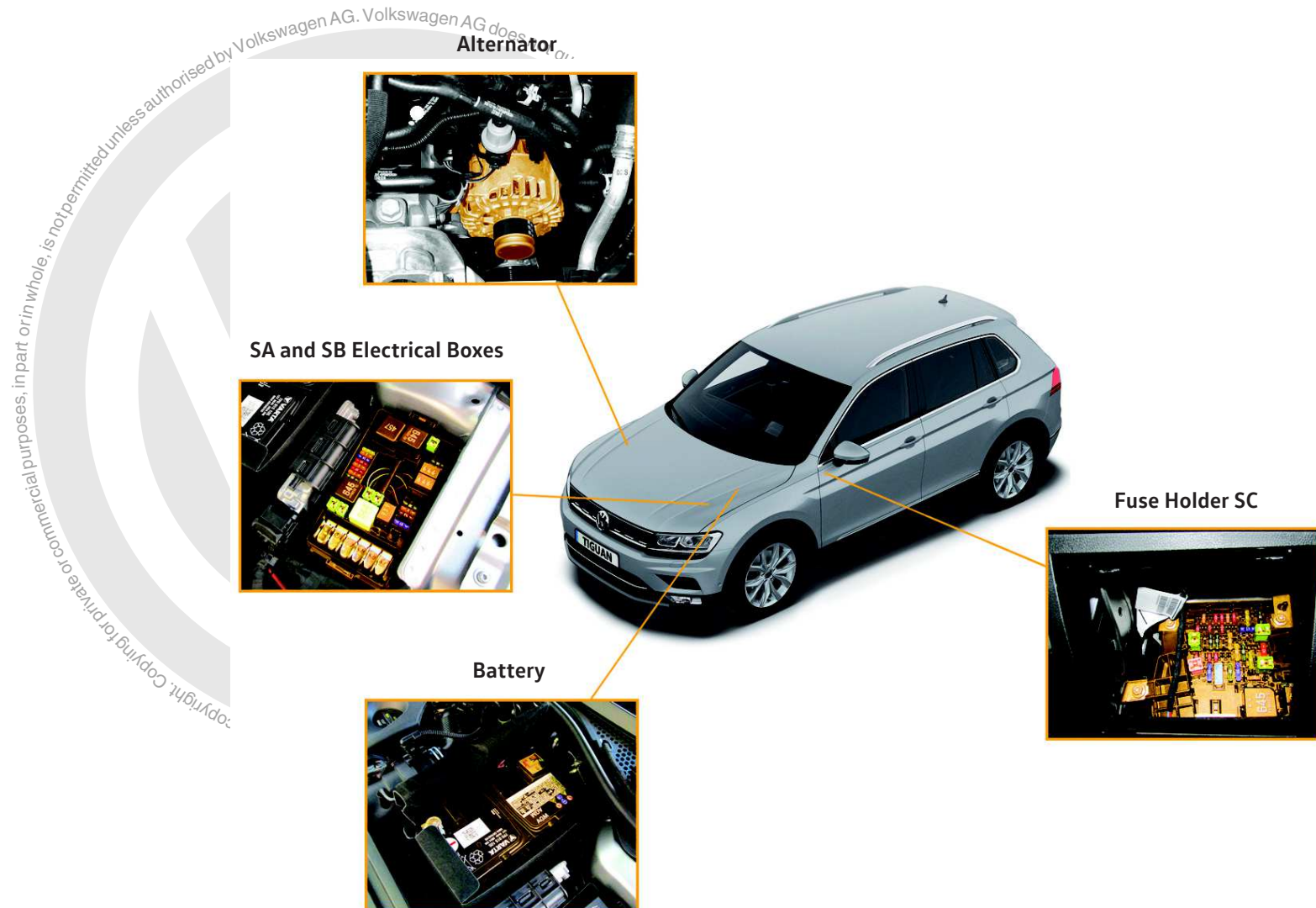


**VAS 581 005**

# Electrical Systems

## Electrical Components

An alternator with an output of 110 A, 140 A or 180 A is used, depending on the vehicle equipment. Also, various batteries with capacities between 44 and 72 Ah are used, depending on vehicle equipment.



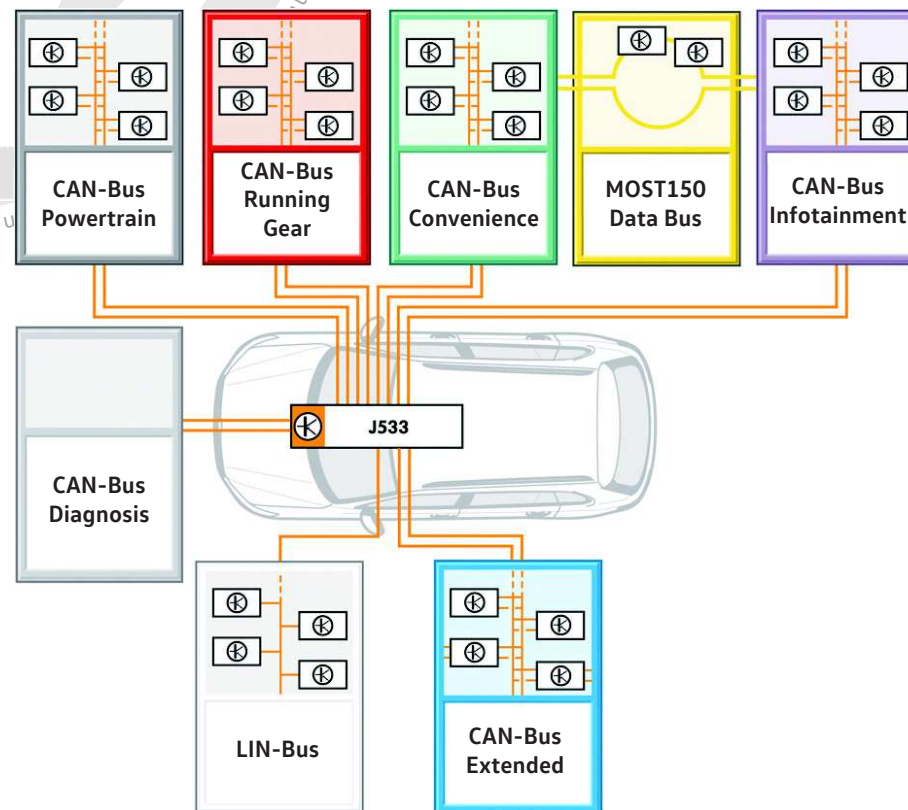


# Electrical Systems

## Network Design

The network has been expanded compared with the previous model.

- All CAN-Bus systems have a transmission speed of 500 kbit/s.
- The LIN bus rate is 19.2 kbit/s.
- The MOST150 data bus, which uses fiber-optic technology and has a transfer speed of 150 Mbit/s, is new for the Tiguan.
- The Data Bus Onboard Diagnostic Interface J533 (Gateway) contains the control system for several LIN data buses and forms the link between the individual CAN-Busses.
- Additional LIN buses are used and connected to individual control modules.



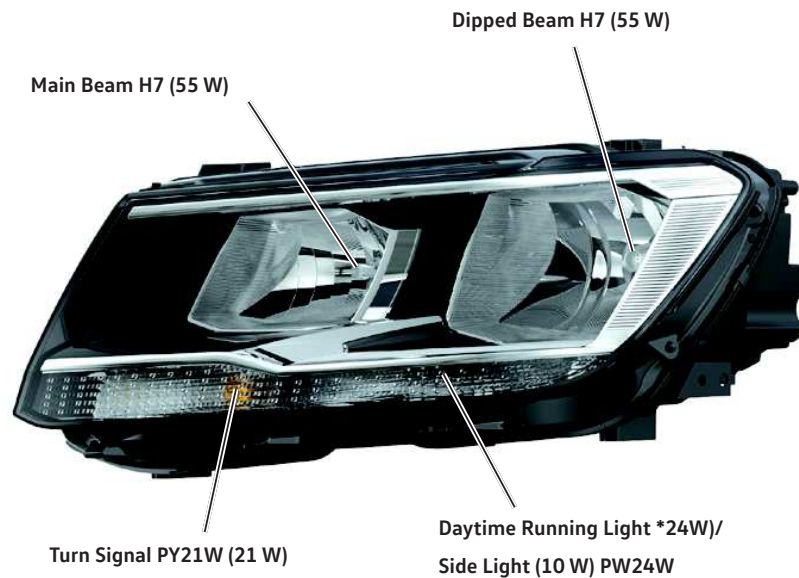
# Electrical Systems

## Headlights

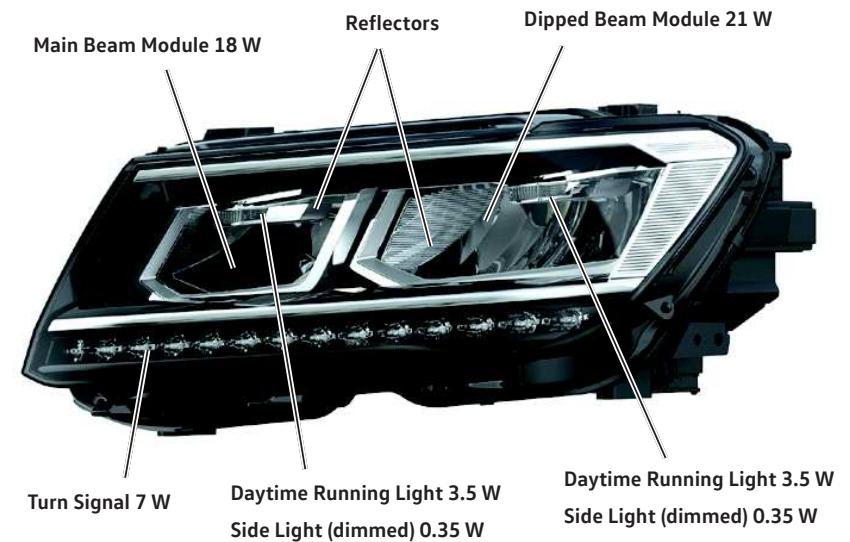
Three different versions of headlights are available:

- Halogen headlight
- "Basic" LED headlights
- "Mid" LED headlights with Dynamic Light Assist - Use of the Dynamic Light Assist varies according to market.

**Halogen Headlight**



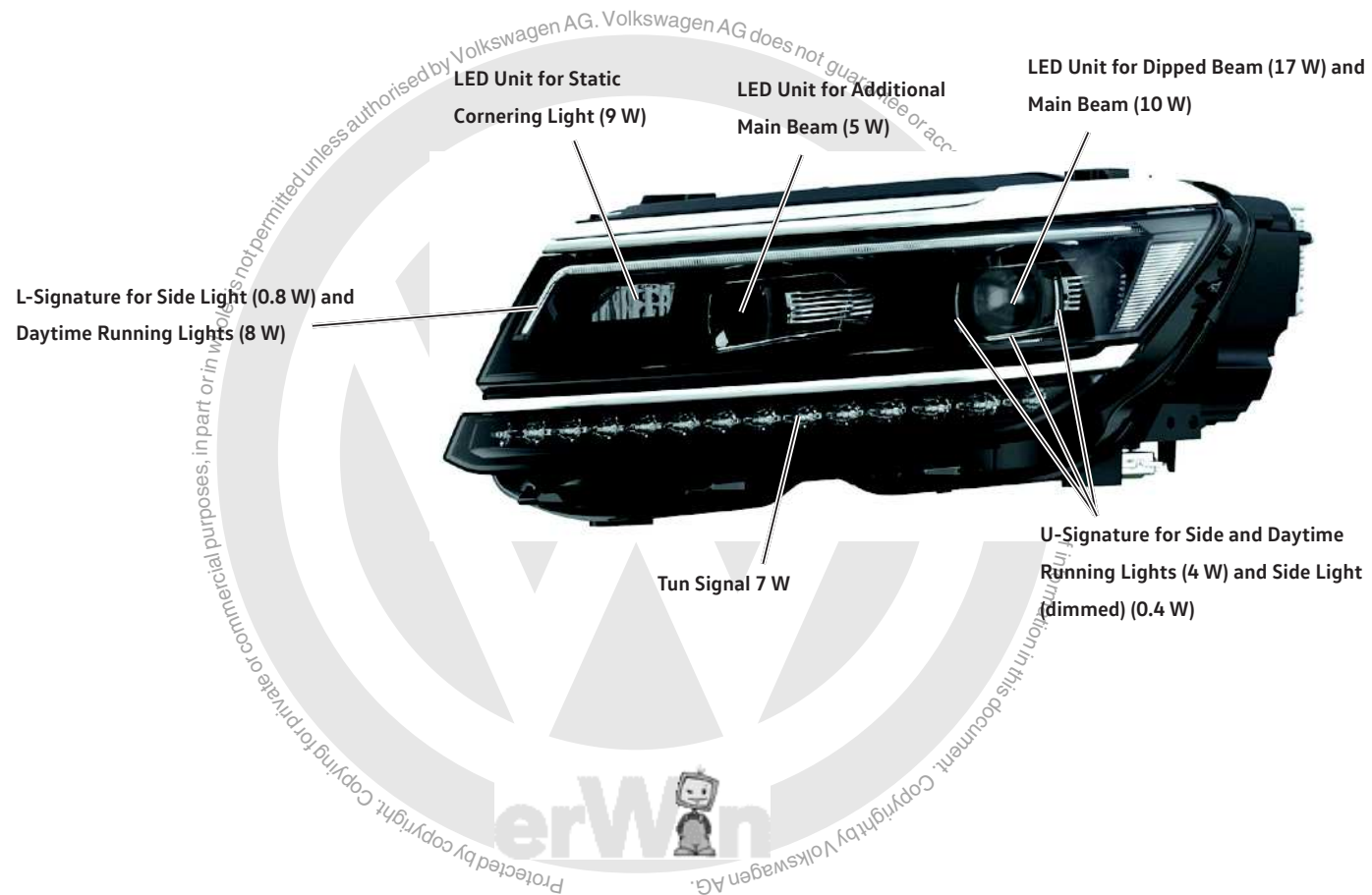
**"Basic" LED Headlight**



# Electrical Systems

## Headlights continued...

### "Mid" LED Headlight



# Electrical Systems

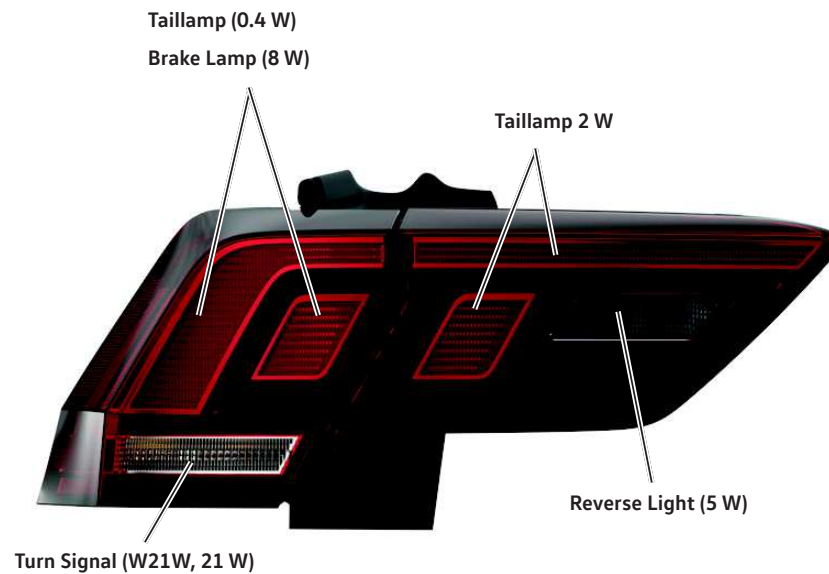
## Taillamp clusters

The taillamp clusters use exclusively LED technology. There are two versions: "Basic" and "High".

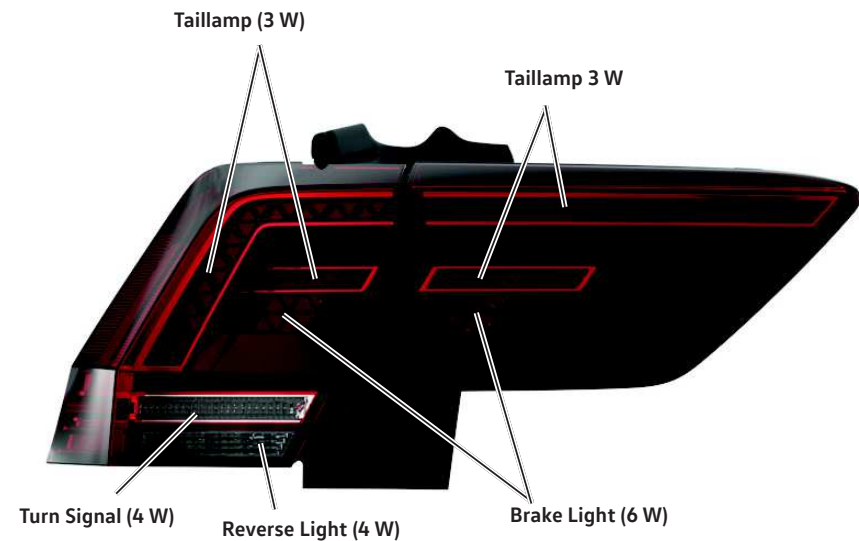
Both cluster consist of one part mounted to the body and the other part mounted to the tailgate.



Basic Taillamp



"High" Taillamps



# Electrical Systems

## Dash panel insert

Three dash panel inserts are available:

### Medium Dash Panel Insert Functions and Characteristics

- Black and white TFT center display with a resolution of 320 X 240 pixels
- Analog gauges for tachometer, speedometer, coolant temperature and fuel
- Multifunction display with vehicle information



### Color Dash Panel Insert Functions and Characteristics

The same functions as the Medium plus:

- Color TFT center display
- Screen transitions with animations





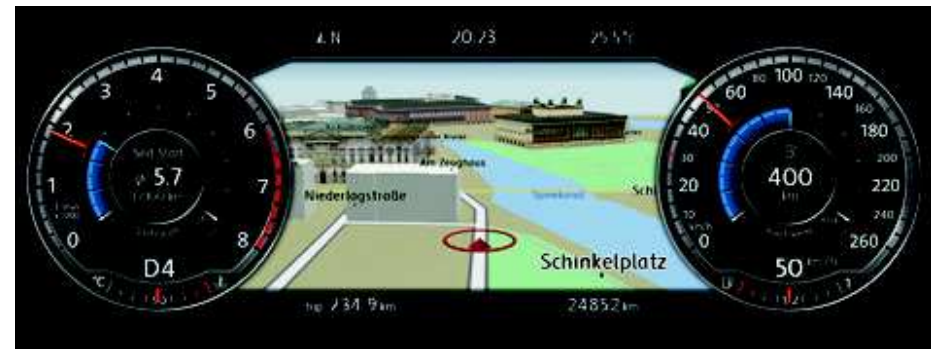
# Electrical Systems

## Virtual Cluster Dash Panel Insert

The Virtual Cluster shows gauges on a screen virtually. The driver information display can be customized to show additional data for the driving, navigation and driver assist functions in the middle areas of the speedometer and tachometer.

### Functions and characteristics

- 12.3" TFT display with a resolution of 1,440 X 540 pixels
- Features all basic functions
- Different displays can be selected
- Automatically changing displays depending on the active function
- Display of 2D and 3D graphics
- Navigation and media display



Additional off-road displays are provided in the Tiguan:

- Steering angle
- Compass
- Downhill driving assistant



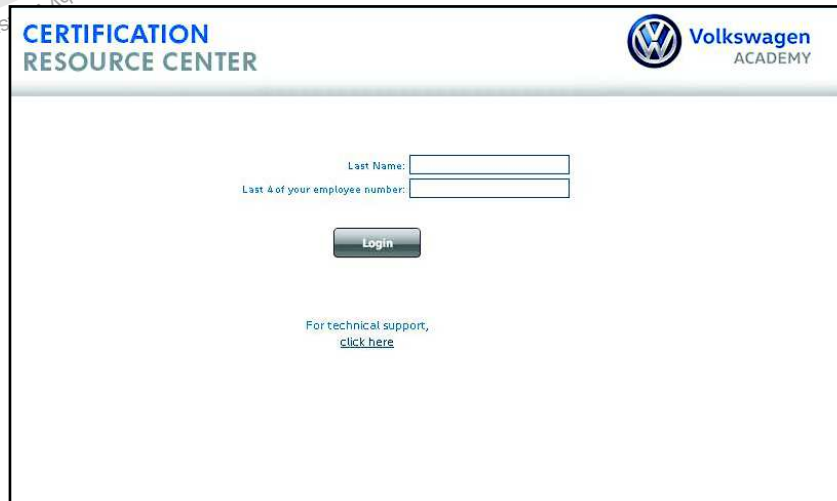
# Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this Self-Study Program. The Knowledge Assessment may or may not be required for Certification.

You can find this Knowledge Assessment at: [www.vwwebservice.com](http://www.vwwebservice.com)

For Assistance, please call: **Volkswagen Academy, Certification Program Headquarters 1-877-791-4838 (8:00 a.m. to 8:00 p.m. EST)**

Or, E-mail: [concierge@volkswagenacademy.com](mailto:concierge@volkswagenacademy.com)



The screenshot shows the login interface for the Volkswagen Certification Resource Center. At the top, the text "CERTIFICATION RESOURCE CENTER" is displayed in blue and green, alongside the Volkswagen logo and "Volkswagen ACADEMY". Below this, there are two input fields: "Last Name:" and "Last 4 of your employee number:". A "Login" button is positioned below these fields. At the bottom, a link for technical support is provided: "For technical support, click here".

[https://www.datarunners.net/vw\\_crc/default.asp?pageid=home](https://www.datarunners.net/vw_crc/default.asp?pageid=home)

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Volkswagen Group of America  
2200 Ferdinand Porsche Drive  
Herndon, VA 20171  
June 2017



# Cautions & Warnings

**Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.**

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the VAG 1551 Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.

# Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.



## Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the VAG 1551 Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

**I have read and I understand these Cautions and Warnings.**

