



## Audi TT Coupé '07 - Suspension System

Self-Study Programme 381

The new TT by Audi is a thoroughbred sports car. The suspension system is one of the features key to meeting this high standard. The basic TT has a conventional steel-sprung suspension - the so-called "dynamic suspension system". The new Audi magnetic ride system is optional. It is a semi-active suspension system with magneto-rheologically controlled dampers.

Sport or comfort damper settings can be selected at the touch of a button. The S-line suspension by quattro-GmbH has been developed to meet the growing customer demand for vehicle customisation. This suspension is sportier than the dynamic suspension and reduces vehicle ride height by 10 mm.



# Contents

## Axles

Front axle .....	4
Rear axle .....	9

## Brake system

Overview .....	12
System components .....	15

## ESP

System components .....	18
Operation and displays .....	20

## Steering system

Electromechanical steering system EPS .....	21
Steering column .....	22
Steering wheel .....	22

## Audi magnetic ride

Overview .....	23
Functional principle .....	24
System components .....	25
Special functions .....	28
Function diagram .....	30
CAN data exchange .....	31
Scope of service .....	32

## Wheels/tyres


Overview .....	34
Self Supporting Tires (SST) .....	35
Low tyre pressure indicator 36	
Tyre pressure monitoring system (US spec) .....	44

The self-study programme teaches the design and function of new vehicle models, new automotive components or new technologies.

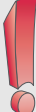
**The self-study programme is not a repair manual!**  
All values given are intended as a guideline only and refer to the software version valid at the time of preparation of the SSP.

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

Reference



Note

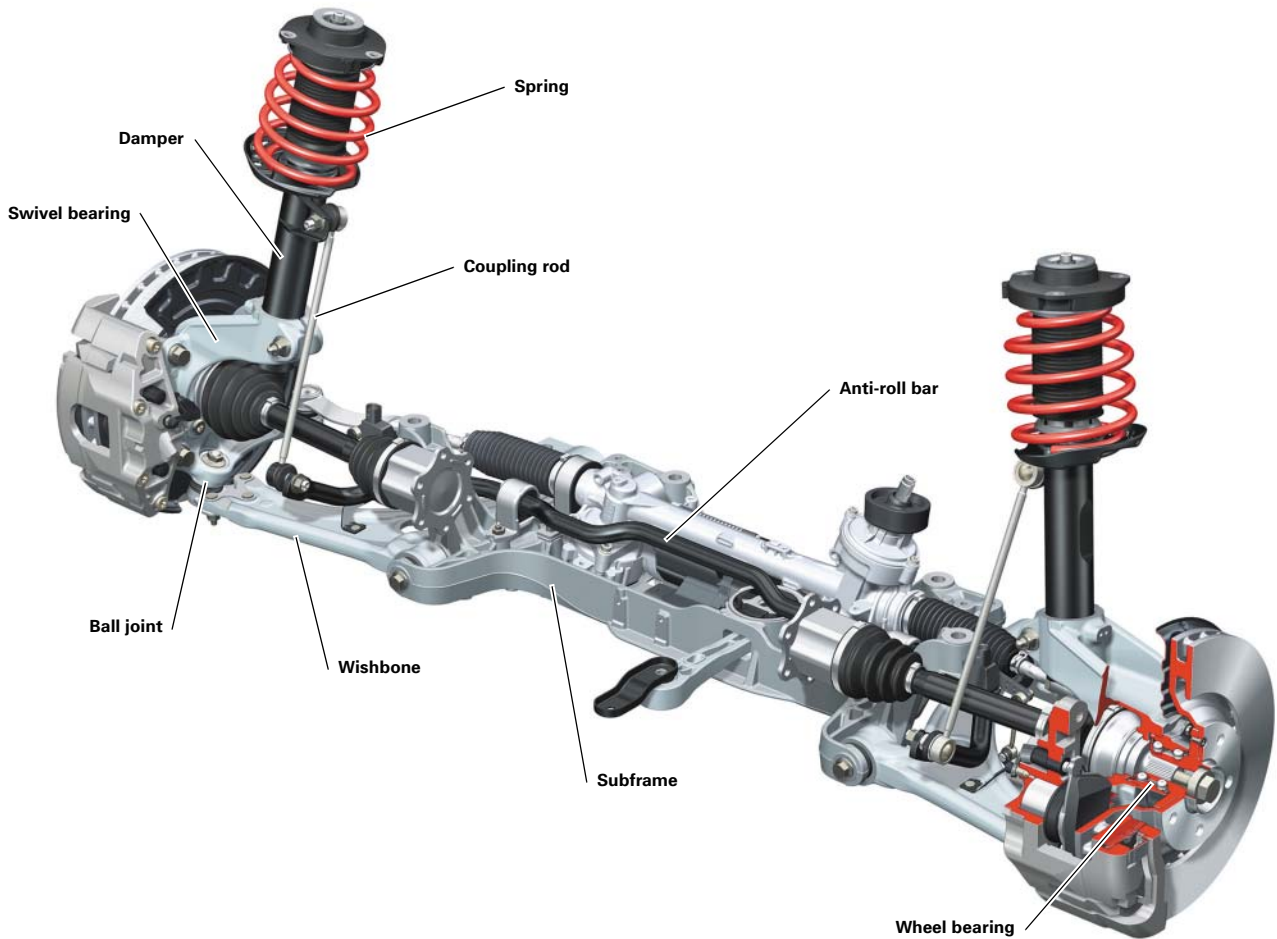


## Front axle

### Overview

An improved version of the McPherson suspension is employed. The design of the front axle is identical to that of the Audi A3. Track width is 13 mm wider on each side than the Audi A3.

Detail modifications have been made to reflect the particularly sporty character of the Audi TT. In addition to the tuning parts (springs, dampers and anti-roll bars), the same axle components are used in all TT suspension variants.



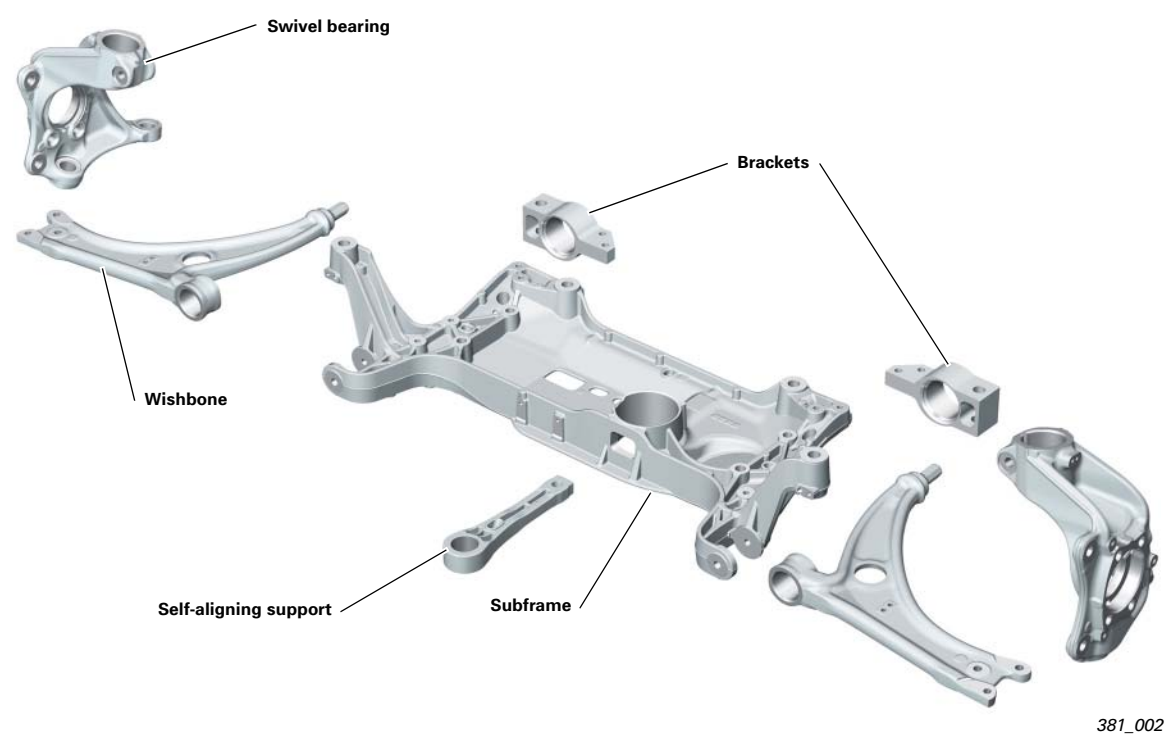
381\_001

**System components**

**Subframe**

The aluminium subframe bears the wishbones, the anti-roll bar and the steering gear of the electromechanical steering system. The two brackets for mounting the wishbones are now common parts.

The Audi TT is living proof that sportiness and light-weight design go hand in hand. The illustration shows the aluminium components of the front axle.

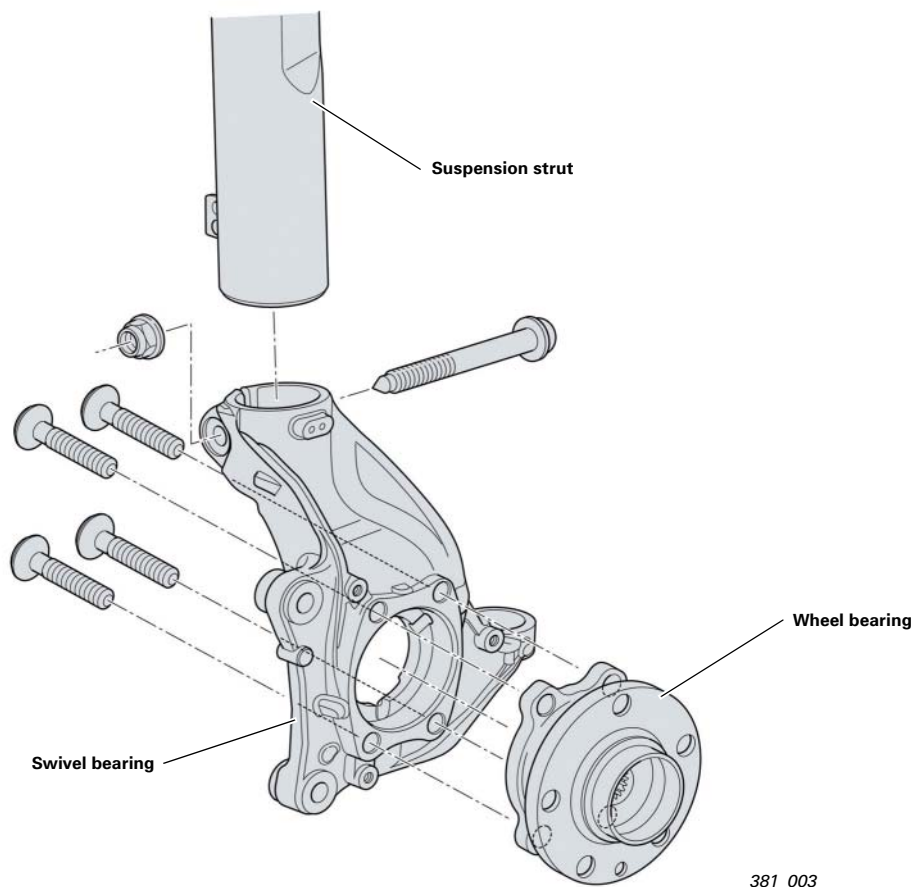


# Axles

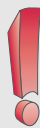
## Swivel bearing, wheel bearing

The aluminium swivel bearing manufactured using Cobapress technology\* is a new part. Its geometric design allows a wider track width to be achieved. Steel bushes are press fitted into the swivel bearing at the track rod and ball joint mounting points. The third generation wheel bearing is bolted to the swivel bearing.

The wheel bearings are carry-over parts from the Audi A3. The screws are now coated with a chromium-6 free material to protect the environment. The suspension strut is connected to the swivel bearing by a clamp coupling.



### Note



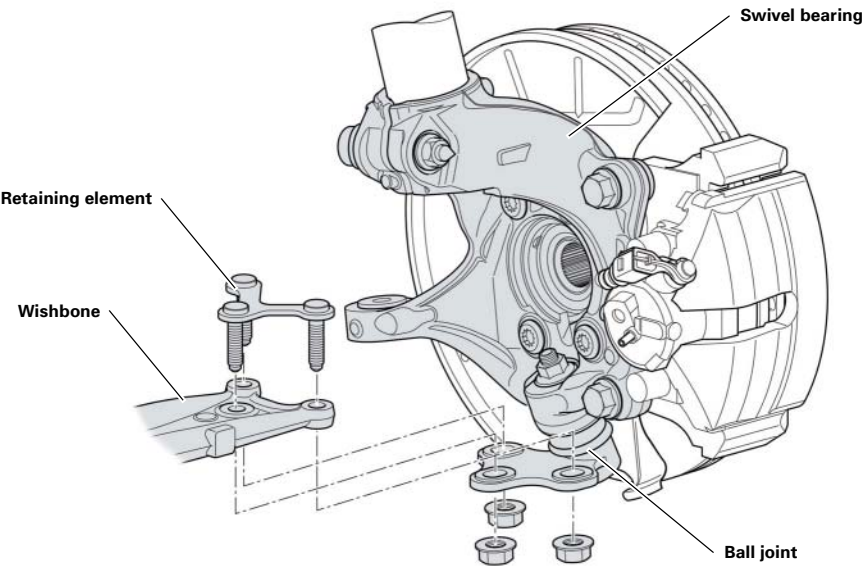
Note: Special tool 3424 must always be used to widen the clamp when installing and removing the damper!

\*: The Cobapress process is a casting process in which the component subsequently undergoes a forging process. The result is high strength and toughness.

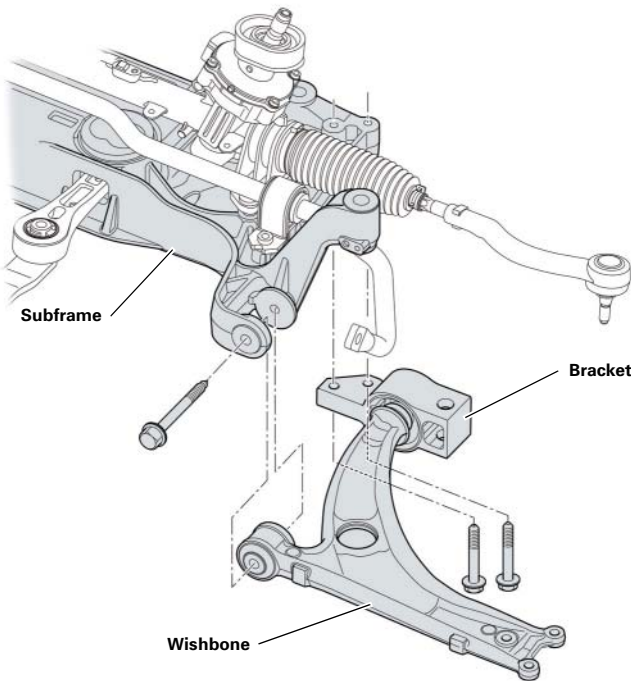
Wishbones, ball joint and bracket

The ball joint is connected to the wishbone at three bolting points. Compared to the Audi A3, the fastening bolts are integral parts of a separate retaining element. The bolts and retaining element are inserted from above through the wishbone and ball joint.

The wishbone is attached directly to the subframe at the inside front and to the body at the inside rear by means of an aluminium bracket.

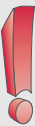


381\_004



381\_005

Note



Note: after undoing the threaded connection between the ball joint and wishbone, always replace the retaining element.

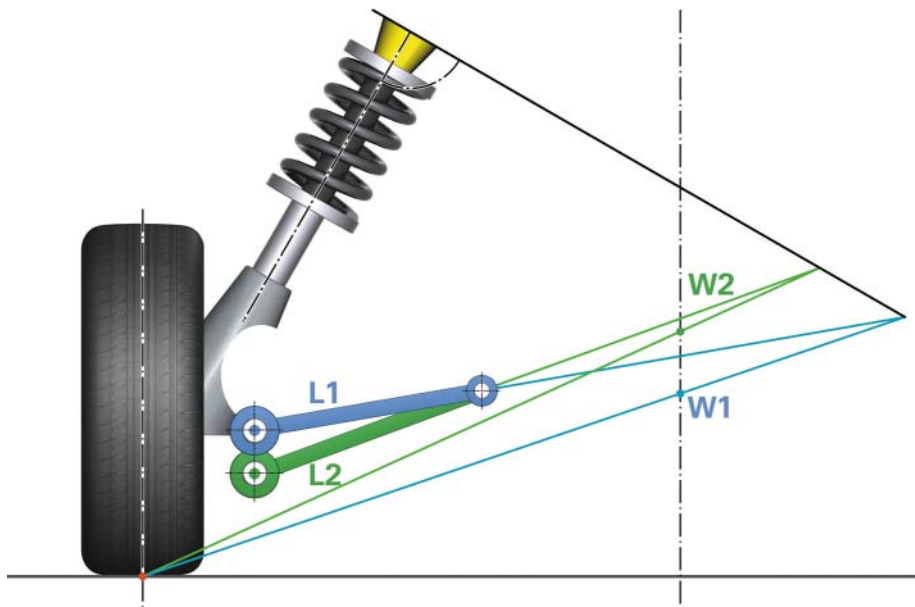


# Axles

## Wishbones, ball joint and bracket

The ball joint is in a lower position than on the Audi A3. The result is a higher centre of roll. This improves roll stabilisation and gives particularly sporty handling.

The centre of roll is the level with the front axle in the centre of the vehicle about which the body pivots when subjected to lateral forces, e.g. when cornering.



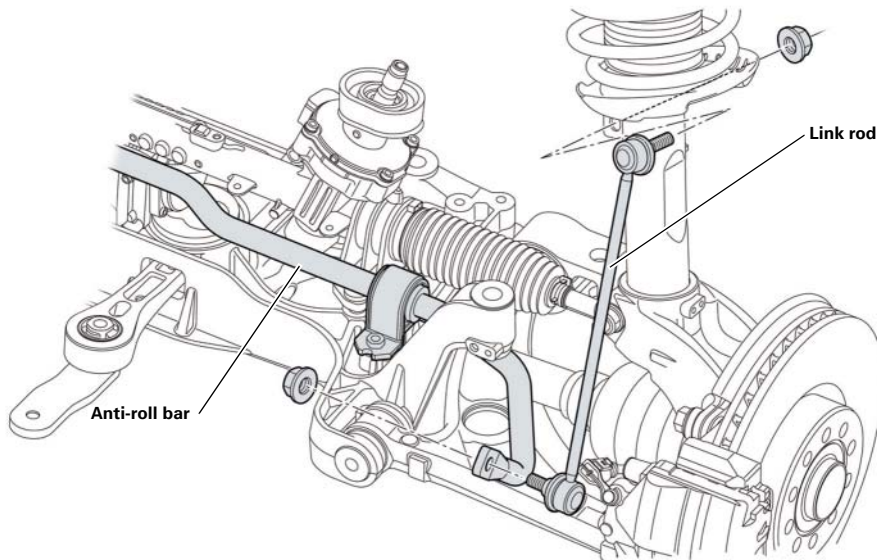
- L1** = position of the ball joint in the Audi A3
- L2** = lower position of the ball joint in the Audi TT
- W1** = position of the centre of roll in the Audi A3
- W2** = higher position of the centre of roll in the Audi TT

381\_006

## Anti-roll bar

A tubular anti-roll bar is used on models with front-wheel drive, while a solid bar is used on quattro models.

The link rod is a carry-over part from the Audi A3.



381\_007



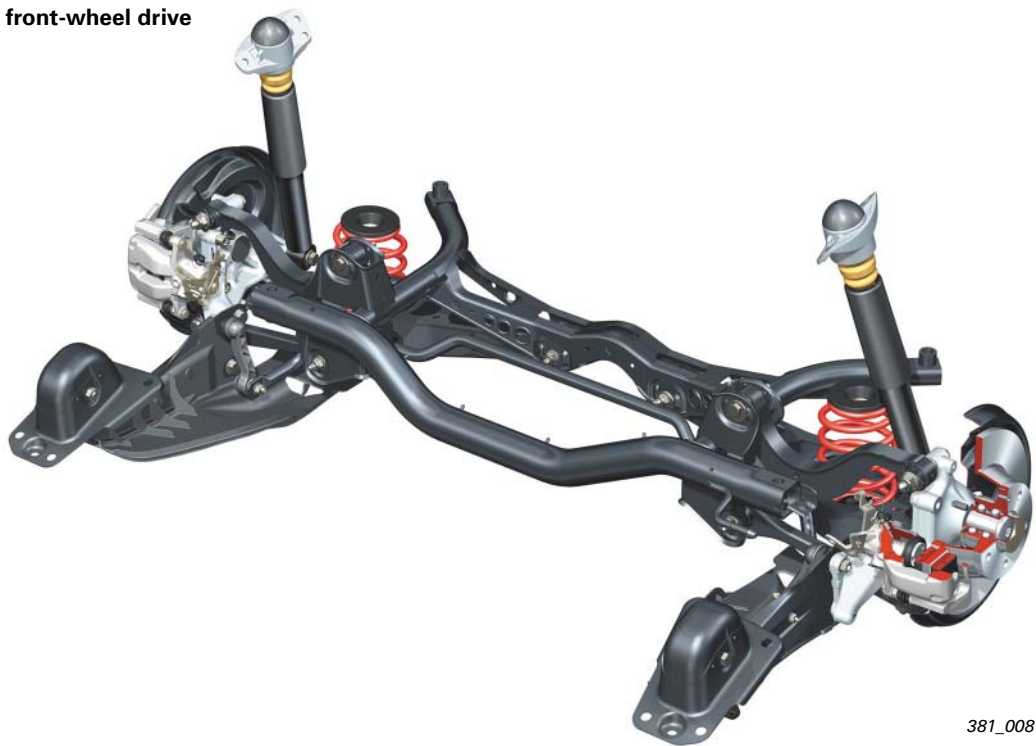
# Rear axle

## Overview

The rear axle of the Audi TT is basically identical in design and function to the rear axle on the Audi A3 . The wheel carriers, damper bearings and wheel bearings are modified versions of the components used in the Audi A3. Track width has been increased by 15 mm on each side over the Audi A3.

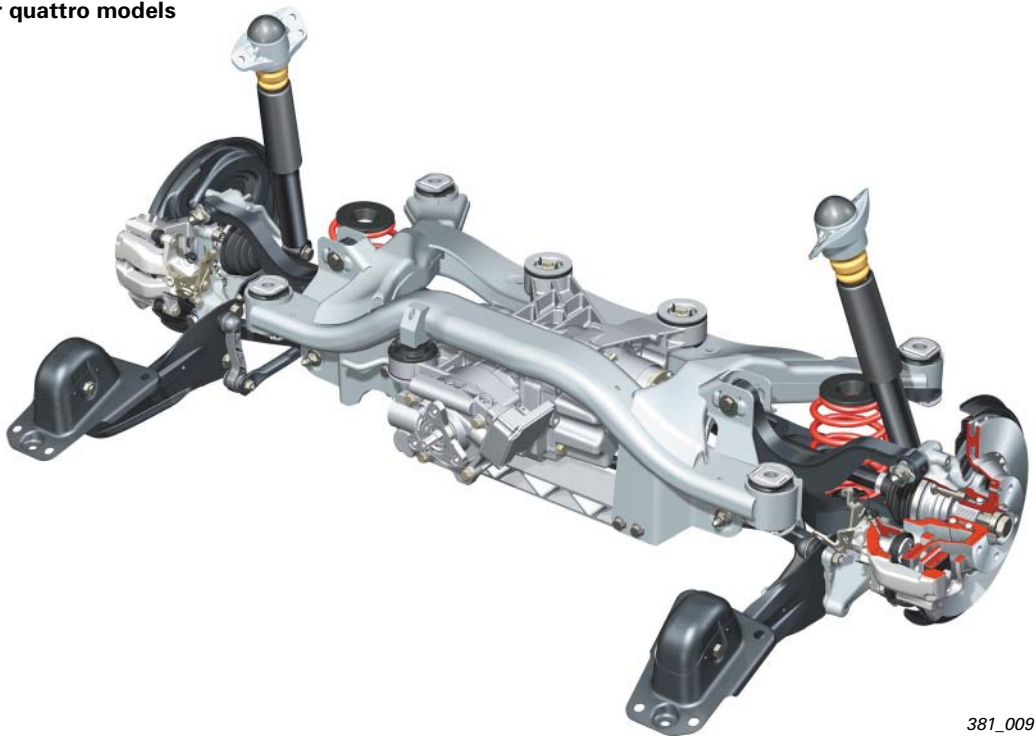
The suspension and damping components (springs, dampers and anti-roll bars) have been adapted to the specific requirements of the Audi TT. Additional stone chip protection is provided for certain markets. The trailing arms on these models are protected by plastic claddings.

### Rear axle for front-wheel drive



381\_008

### Rear axle for quattro models



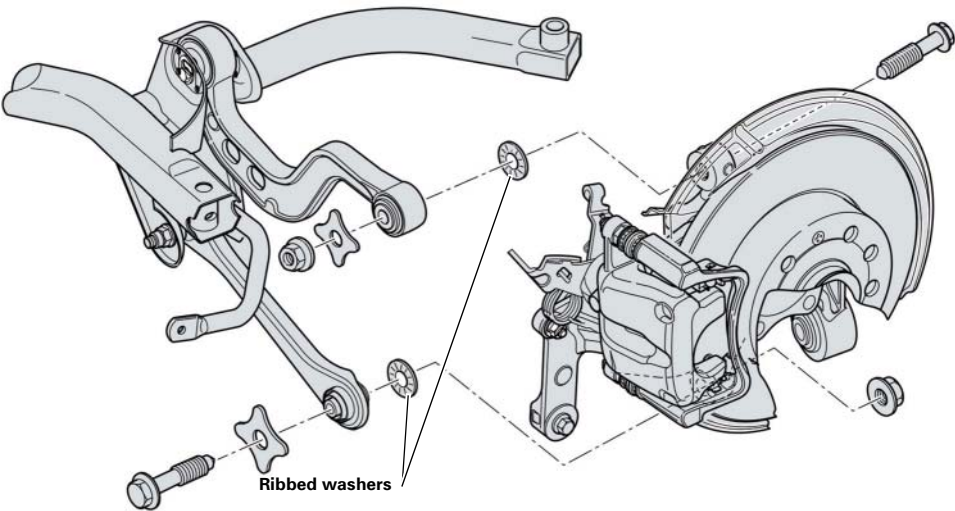
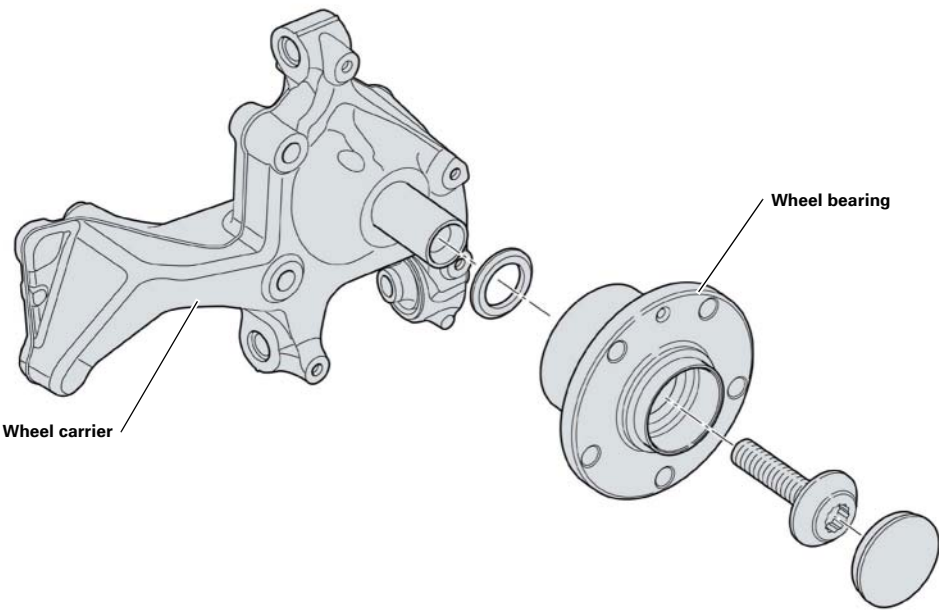
381\_009

## System components

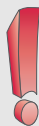
### Wheel carrier, wheel bearing

The wheel carrier has been modified geometrically in order to increase track width. Front-wheel-drive models use a second-generation wheel bearing which is larger than the bearing on the Audi A3. The diameter of the wheel carrier bearing journal has been adapted to match the internal diameter of the wheel bearing.

Ribbed washers are used for attaching the track link, upper wishbones and damper to the wheel carrier. These washers are required to achieve the necessary surface pressures.



### Note



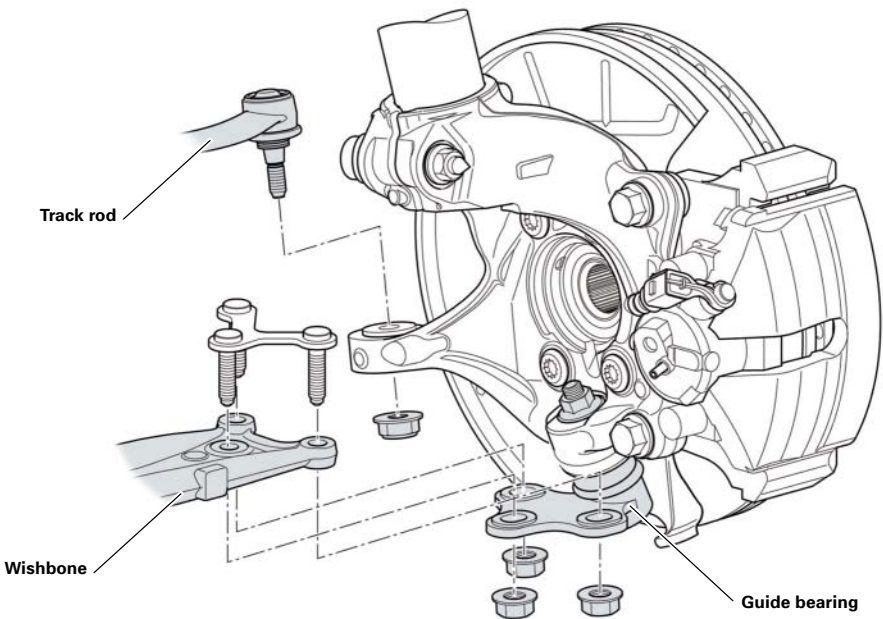
Note: Always replace the ribbed washers during removal and installation of parts in the service workshop.

**Wheel alignment**

**Front axle**

Toe and camber can be adjusted at the front axle. The toe-out values are adjusted at the track rods. Unlike on the Audi A3, left and right camber can be adjusted separately.

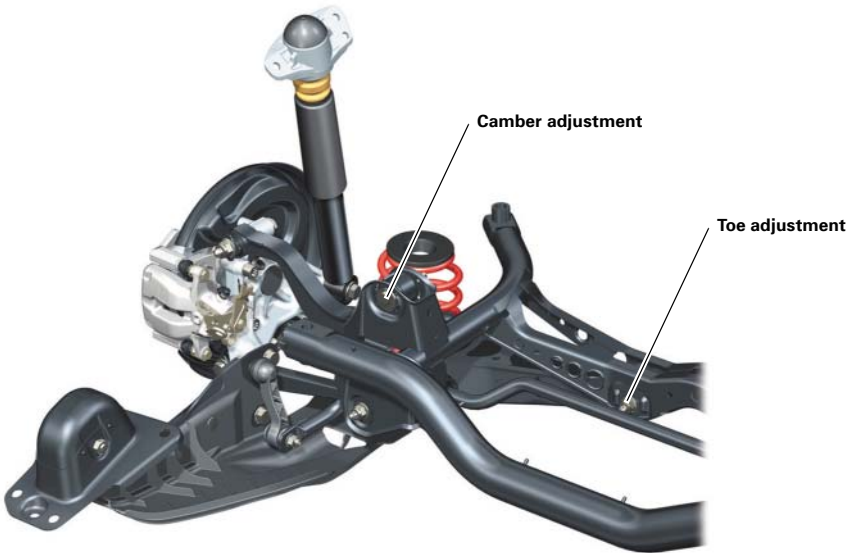
The camber is adjusted at the connection between the wishbone and the guide bearing. For this purpose, the holes in the guide bearing are oblong in shape.



381\_012

**Rear axle**

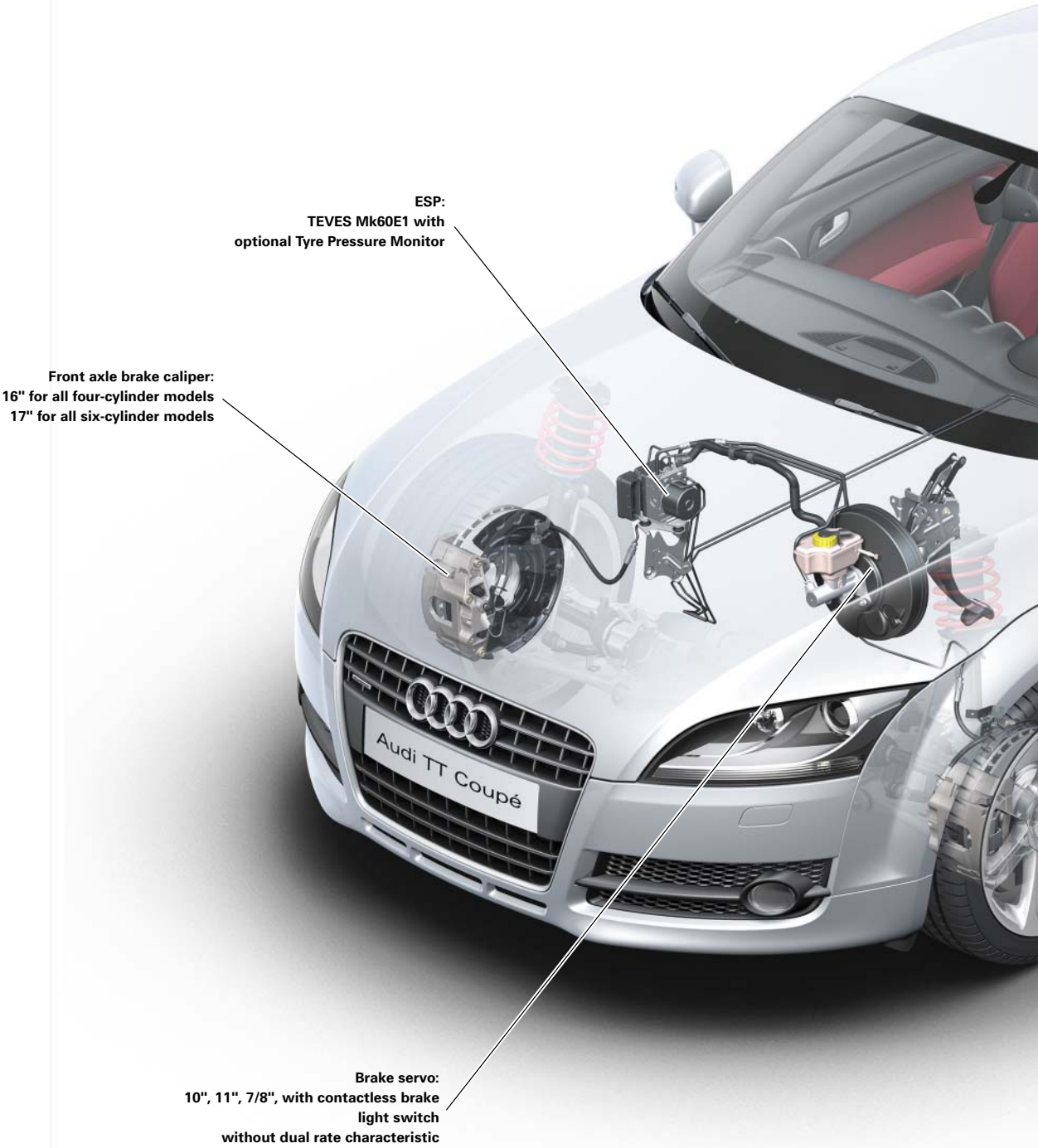
The camber and toe can be adjusted at the rear axle. The adjustment procedure is the same as for the Audi A3.



381\_013

# Brake system

## Overview







Rear axle brake caliper:  
16" for all four-cylinder models  
17" for all six-cylinder models

# Brake system

## Front axle

Engine	R4-4V 2.0I TFSI	VR6 3.2I MPI
Minimum wheel size	16"	17"
Brake type	FN3	FNR-G
Number of pistons	1	1
Piston diameter (mm)	54	57
Brake disc diameter (mm)	312	340

## Rear axle

Engine	R4-4V 2.0I TFSI	VR6 3.2I MPI
Minimum wheel size	16"	17"
Brake type	CII 38	CII 41
Number of pistons	1	1
Piston diameter (mm)	38	41
Brake disc diameter (mm)	286	310



# System components

## Front axle wheel brake

The brake calipers are identical in design and principle of operation to the brake calipers on the Audi A3. A zinc-nickel coating is now applied. Brake calipers are optionally available in a grey finish. The brake discs for the 16" system have been adopted from the Audi A3. The brake discs for the 17" system are a modified version of the discs used on the Audi A3. This change was necessary due to the modified rim geometry of the SST wheels. The Audi TT has new brake hoses with modified holders on the swivel bearing compared to the Audi A3. The 16" and 17" splash plates have been adopted from the Audi A3. Break pad wear is measured in a conventional fashion on the interior lining of the left wheel brake. The 17" system is equipped with a vibration damper. The damper is attached to the brake caliper by the lower fastening bolt.



381\_015

16" wheel brake



381\_016

17" wheel brake

# Brake system

## Rear axle wheel brake

The brake calipers are identical in design and principle of operation to those on the Audi A3. The brake carriers have been modified since the Audi TT has wider rims than the Audi A3 and, because of this, the requisite clearance for the handbrake cable would not have been assured had the A3 brake carrier been adopted unchanged.



16" wheel brake

Compared to the Audi A3, the brake calipers have been shifted 10 mm further inwards. Two new 16" and 17" splash plates are used. The brake hoses have been modified. In the Audi TT the transition point from brake hose to brake line is located on the side member (it is located on the subframe in the Audi A3) .



17" wheel brake

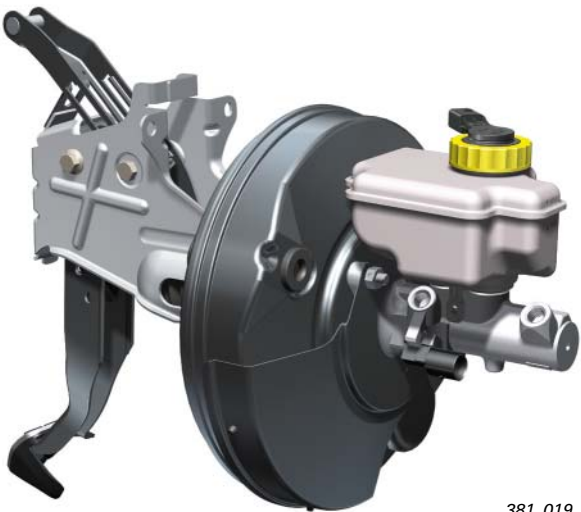
**Power brake unit / brake servo**

In the case of the 16" systems, 10" single brake servos are used on left-hand-drive models and 7/8" tandem brake servos on right-hand drive models.

Vehicles with 17" systems are equipped with 11" single brake servos for left-hand-drive models and with 7/8" tandem brake servos for right-hand drive models.

For the Audi TT, no dual rate characteristic\* was applied to the brake servo.

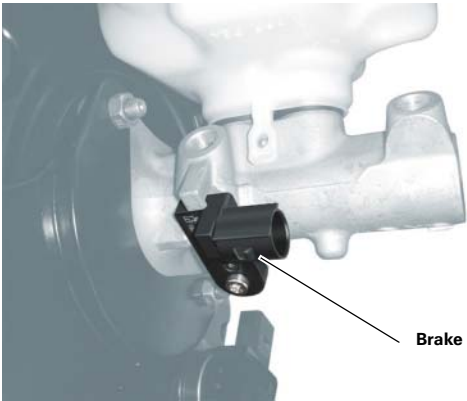
The OHB-V function known from the Audi A3 \* was implemented on vehicles with 3.2l VR6 engine and dual-clutch gearbox.



381\_019

\* dual rate and OHB-V are described in SSP 313

Like in Audi A3 models after November 2005, the contactless brake light sensor is used on the Audi TT. Brake light and brake test switches are no longer required on the brake pedal. The pedal assembly has been adopted from the Audi A3.



Brake light sensor

381\_020

System components

ESP unit

The Audi TT features a new ESP generation by Continental-Teves with the designation Mk60E1.

As with the Mk25E1 in the current Audi Q7, the Mk60E1 has analogised switch valves (4 intake valves and 2 block valves) and an integrated pressure sensor. In the case of analogised switch valves, the port cross-section is determined by the activation current. Unlike systems with conventional switch valves with the valve positions open and closed, more precise brake control is possible.

In the ESP control unit has the same integrated functions as in the Mk60 control unit on the Audi A3, however these functions have been adapted to the Audi TT. The hill hold assist (hha) and driver steering recommendation (dsr) functions will be implemented at a later date. The Audi A3 system has been modified with regard to the operation of the ESP Off key.

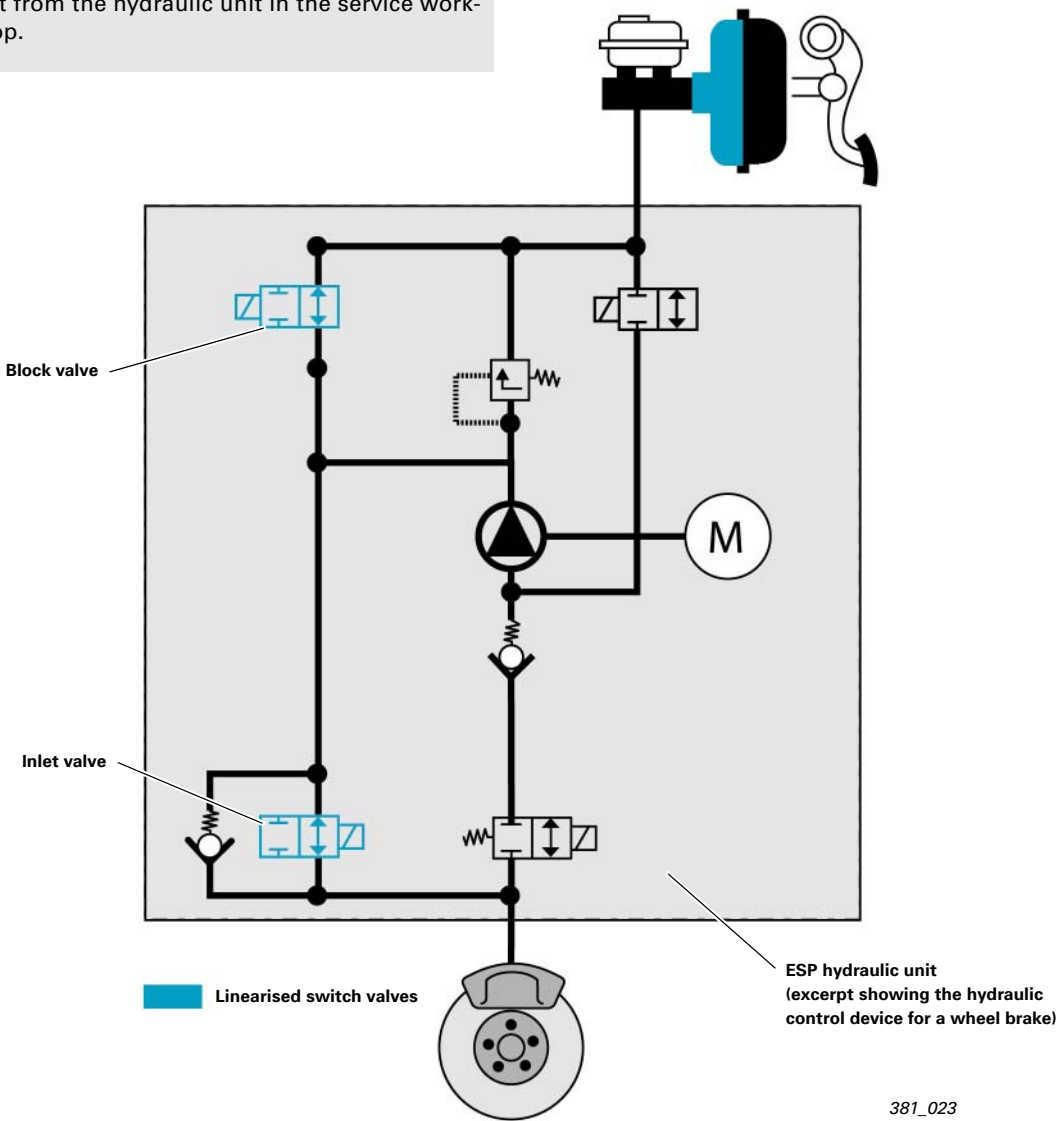


381\_022

Note



Due to the use of linearised switch valves, it is no longer possible to disconnect the control unit from the hydraulic unit in the service workshop.



381\_023

### **Sensor unit G419**

The sensor unit comprises senders G200 (lateral acceleration sender), G202 (yaw rate sender) and, on models with quattro four-wheel drive, G251 (longitudinal acceleration sender) . The sensor unit has been adopted from the Audi A3. The service procedures for calibrating the sensors are the same as for the Audi A3.



381\_024

### **Wheel speed sensors G44 - G47**

The wheel speed sensors for wheel speed measurement have been adopted from the Audi A3.

### **Steering angle sender G85**

The steering angle sender is identical in design and function to the sender on the Audi A3.



381\_026

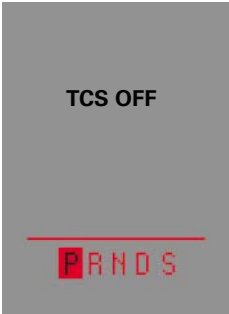
Operation and displays

The functions of button E256 for ESP and TCS were extended as follows:



381\_025

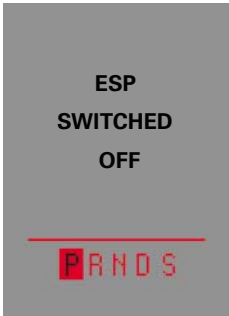
Briefly pressing the button (<3 s) deactivates only the TCS function. TCS OFF improves traction when starting from a stop on loose surfaces (e.g. on snow or sand). TCS OFF is active up to a road speed of 70 kph. TCS is switched on automatically when this speed is exceeded. In all-wheel-drive models, TCS is automatically switched off again when the vehicle's road speed drops below 70 kph. In front-wheel-drive models, TCS is not automatically switched off when the vehicle's road speed drops below this threshold.



381\_027

If the button is pressed for longer than 3 s, the ESP function is switched off.

When the brake is applied, TCS and ESP are switched on again for the duration of the braking manoeuvre and remain active until a stable driving condition is restored.



381\_027a

The ESP function is activated automatically if faults are diagnosed in the magnetic ride system or when actuating the rear spoiler.

If the button is pressed for longer than 10 s, the ESP function is switched on again and cannot be switched off again until the ignition has been turned off and on again.

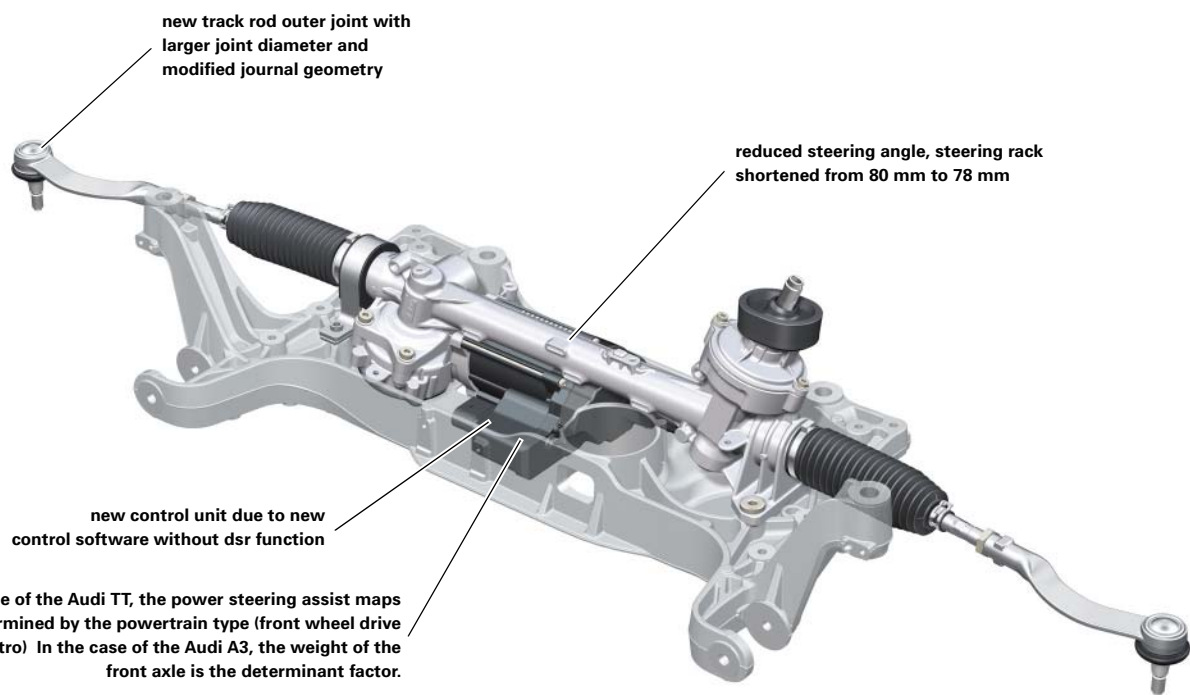


381\_027b



Electromechanical steering system EPS

The electromechanical steering system EPS which has proved successful in the Audi A3 is also featured in the new Audi TT. The following modifications have been made compared to the Audi A3:



In the case of the Audi TT, the power steering assist maps are determined by the powertrain type (front wheel drive or quattro) In the case of the Audi A3, the weight of the front axle is the determinant factor.

381\_028

Reference

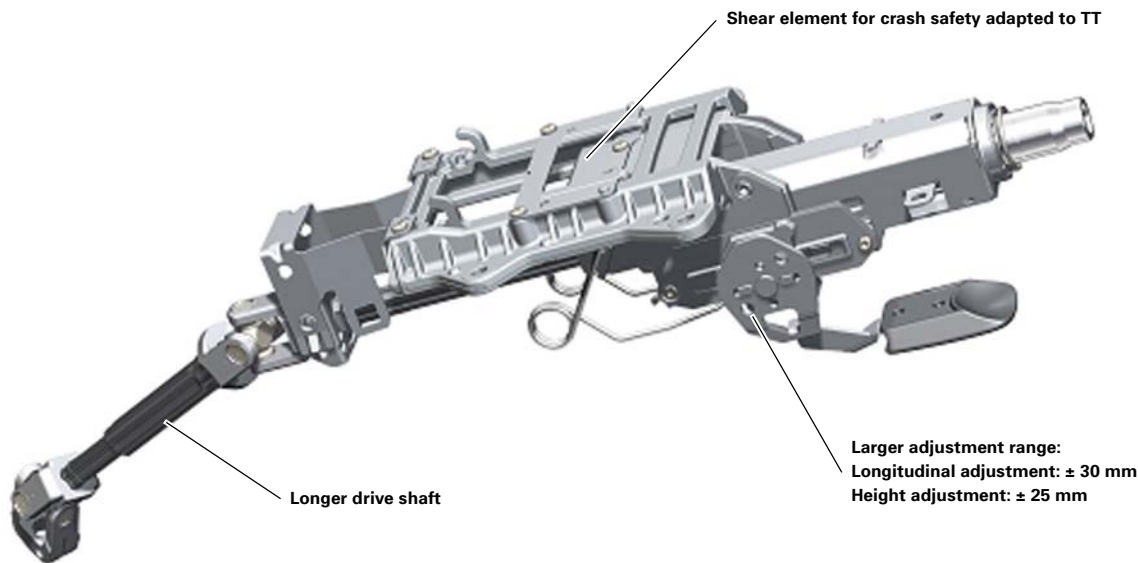


For detailed information on the design and function of the EPS system, refer to SSP 313.

# Steering system

## Steering column

A mechanical steering column is used in the Audi TT. The steering column is basically identical in design and function to the steering column in the Audi A3. The following modifications have been made compared to the Audi A3:



381\_029

## Steering wheel

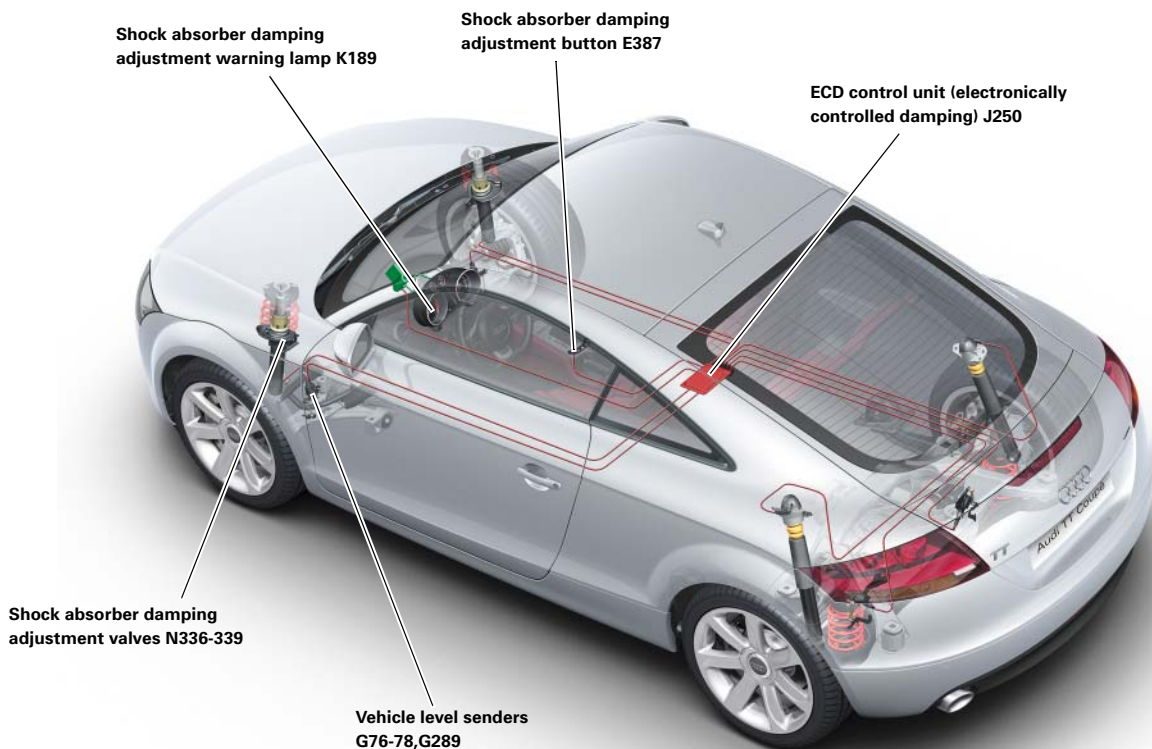
A redesigned steering wheel is used in the Audi TT. All models are fitted with three-spoke leather-bound steering wheels with integrated two-stage airbag module. In addition to the standard version, combinations are also available of multifunction, Tiptronic and leather stitching in various colours. The skeleton is made of magnesium. The diameter of the steering wheel rim is 5 mm less than on the Audi A3. As in the Audi A3, the airbag unit is bolted. A new feature is the use of cage nuts for tolerance compensation. The airbag module is centred in the steering wheel with two locating pins.



381\_030

## Overview

The Audi TT is the first Audi to feature Audi magnetic ride - a new semi-active suspension system with magneto-rheologically controlled dampers. Sport or comfort damper settings can be selected at the touch of a button.



381\_031

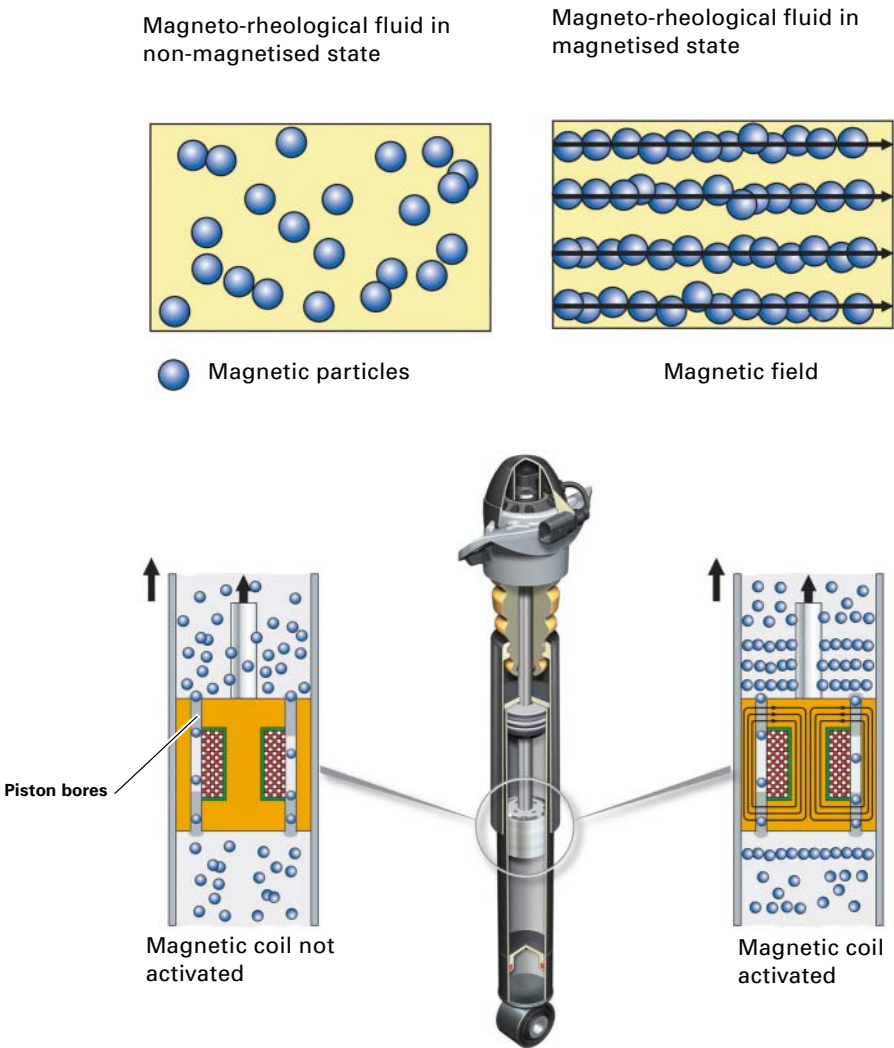
Audi magnetic ride improves **driving dynamics** and **driving comfort** for the following reasons:

- reduced body movement (pitch and roll)
- optimised vibration behaviour
- improved road-holding
- improved handling

## Operating principle

The damping function is based on the magneto-rheological effect. The prerequisite for this is the use of a special damping fluid. This magneto-rheological fluid is a suspension consisting of a hydrocarbon-based synthetic oil in which soft magnetic particles with a diameter of 3-10 µm are held in suspension.

To stabilise the fluid, various additives are added. Applying a magnetic field changes the properties of the magneto-rheological fluid. The magnetic particles are aligned in the direction of the magnetic field lines. This alters the flux voltage of the fluid.



When the magnetic coils are not activated electrically, the magnetic particles are arranged irregularly in the damper oil. During the piston stroke, the individual particles are forced with the fluid through the piston bores. The particle-laden suspension damping fluid has a low resistance to the movement of the piston. As a result the damping force is low.

When the magnetic coil is activated electrically, the magnetic particles are aligned with the magnetic field lines. Thus, long particle chains form in the vicinity of the piston.

These particle chains are aligned cross-wise before the fluid enters the piston bores. During the piston stroke, individual particles break up and are forced with the fluid through the piston bores. To "break up" these chains, force must be applied, i.e. work must be done. The resistance which the piston must overcome is greater than in the case of a non-energised magnetic coil, and is dependent on the amount of electrical current and the strength of the magnetic field.

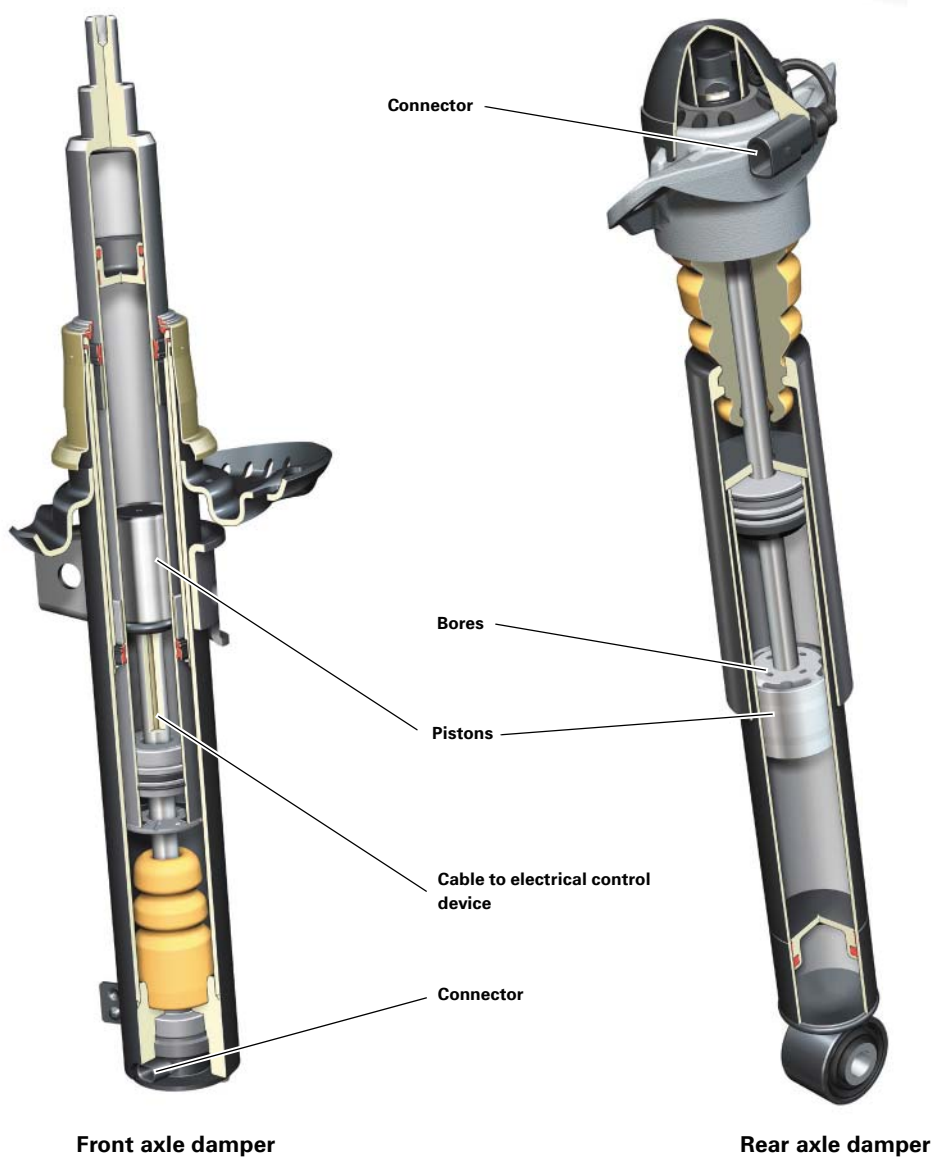
This allows greater damping forces to be achieved.

# System components

## Damper

The magneto-rheological dampers are much simpler in design than conventional dampers. The complex conventional damping valves are no longer required. These have been replaced by bores in the piston through which the fluid is displaced. In addition, single-tube dampers are used. The magnetic coils are integrated in the pistons.

Power is supplied through the hollow piston rods along discrete lines from control unit J250. Depending on engine type (4 cylinder or 6 cylinder engines), different front axle dampers are used. A single damper is used for all engine types on the rear axle.



381\_034

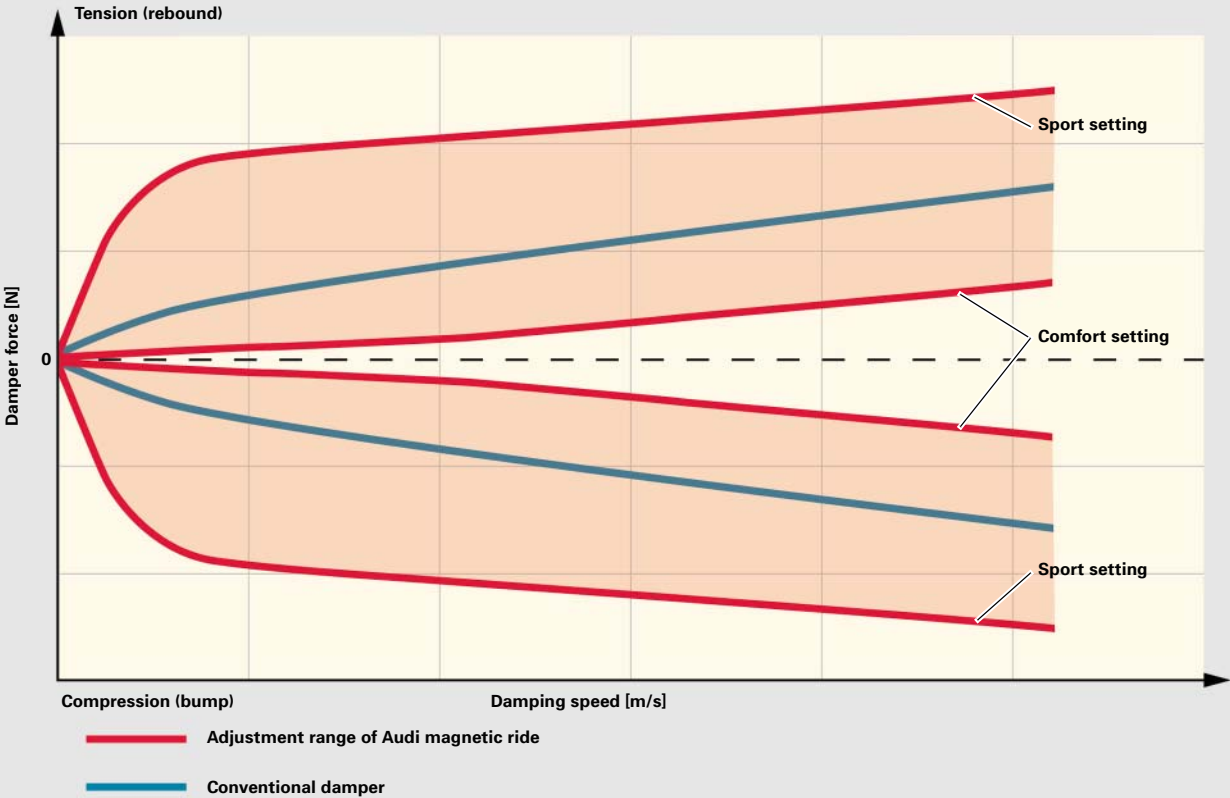
# Audi magnetic ride

## Damper

Variable activation of the solenoid valve allows the shock absorber damping force to be adjusted over a wide range.

Damping force adjustments are made within milliseconds. This allows the damping force to be adapted to requirements during the bump and rebound cycles.

Comparison of the damping force characteristics of Audi magnetic ride and conventional dampers



381\_035

## ECD control unit (electronically controlled damping) J250

The control unit receives the measured data from the vehicle level sender, as well as information on the current driving condition from the ESP. The control unit processes the data and thus determines the momentary activation currents for the dampers. Each damper is activated individually. The dampers are not activated when the vehicle is stationary. The control unit is located under the front passenger seat.



381\_036



**Vehicle level senders G76-78, G289**

The vehicle level senders are identical in design and function to those used in the Audi A6 and Audi A8. The sampling rate is 800 Hz. Design and function are described in detail in SSP 343. Measured data is read in by control unit J250 across discrete lines, processed and relayed to the headlight range control, control unit via the CAN bus.



381\_037

**Shock absorber damping adjustment button E387**

**Warning lamp K189**

The button is used to select a damper setting. In standard operation the dampers are configured for comfort. A sport damping characteristic can be activated pressing the button. The LED indicator integrated in the button indicates that the sport setting is active. Depending on dash panel variant, an additional text message may appear. The signal from the button is read in by the control unit across a discrete line.



381\_038

**Warning lamp**

System faults are indicated by a warning lamp in the dash panel insert. The warning lamp is checked whenever the ignition is turned on. The warning lamp also comes on if the dash panel insert has been coded incorrectly.



381\_039

## Special functions

### Temperature model

The suspension damping becomes softer with increasing magneto-rheological fluid temperature. A software module for temperature compensation is integrated in the control unit. The rising temperature is compensated by increasing the magnetic coil activation current. Likewise, the activation current is reduced at low ambient temperatures. Temperature is determined indirectly by measuring the resistance of the magnetic coil. A current of 3A is applied to the coil for the duration of 40 ms.

The required voltage is determined and the resistance is calculated. The basic value is the resistance measured in a vehicle which has been shut off for at least 6 hours. The following measurements are correlated with the basic value. Based on the change in resistance, the control unit determines the actual temperature in the shock absorber damper. In addition, the temperature of the control unit is calculated. This is done by evaluating the electrical currents provided by the control unit to activate the coils.

### Temperature shut-off

The magnetic coil activation current must be increased in order to compensate for the effect of temperature increase in the dampers. However, increasing the electrical current causes further heating of the magnetic coil. Upwards of a defined threshold temperature of (90°C), therefore, it is no longer possible for the driver to select 'Sport' mode.

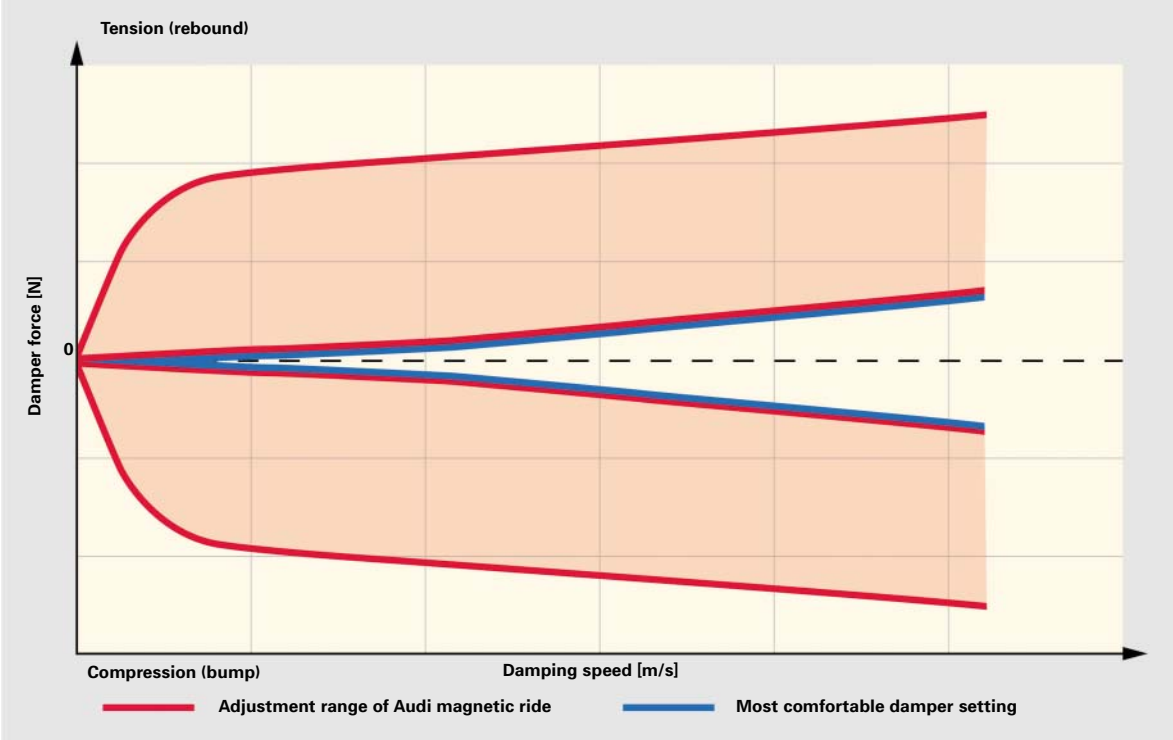
In 'Sport' mode, higher damping forces are produced by increasing the magnetic coil activation current. Activating the 'Sport' mode would, therefore, cause a further increase in the already high temperature in the suspension damper. The control unit is shut down when its temperature exceeds 110°C.

### Emergency operation in case of failure in electrical activation of the magnetic coil

In case of failure in electrical activation of multiple magnetic coils, the magnetic coils of all suspension dampers are no longer activated.

In this case, the most comfortable suspension damping characteristic is set.

Suspension damper force characteristic of Audi magnetic ride



**Shock absorber test**

When the button is pressed for longer than 5 s, the magnetic coils are activated by the application of a constant electrical current. In this state, the shock absorbers can be tested on the test bench.

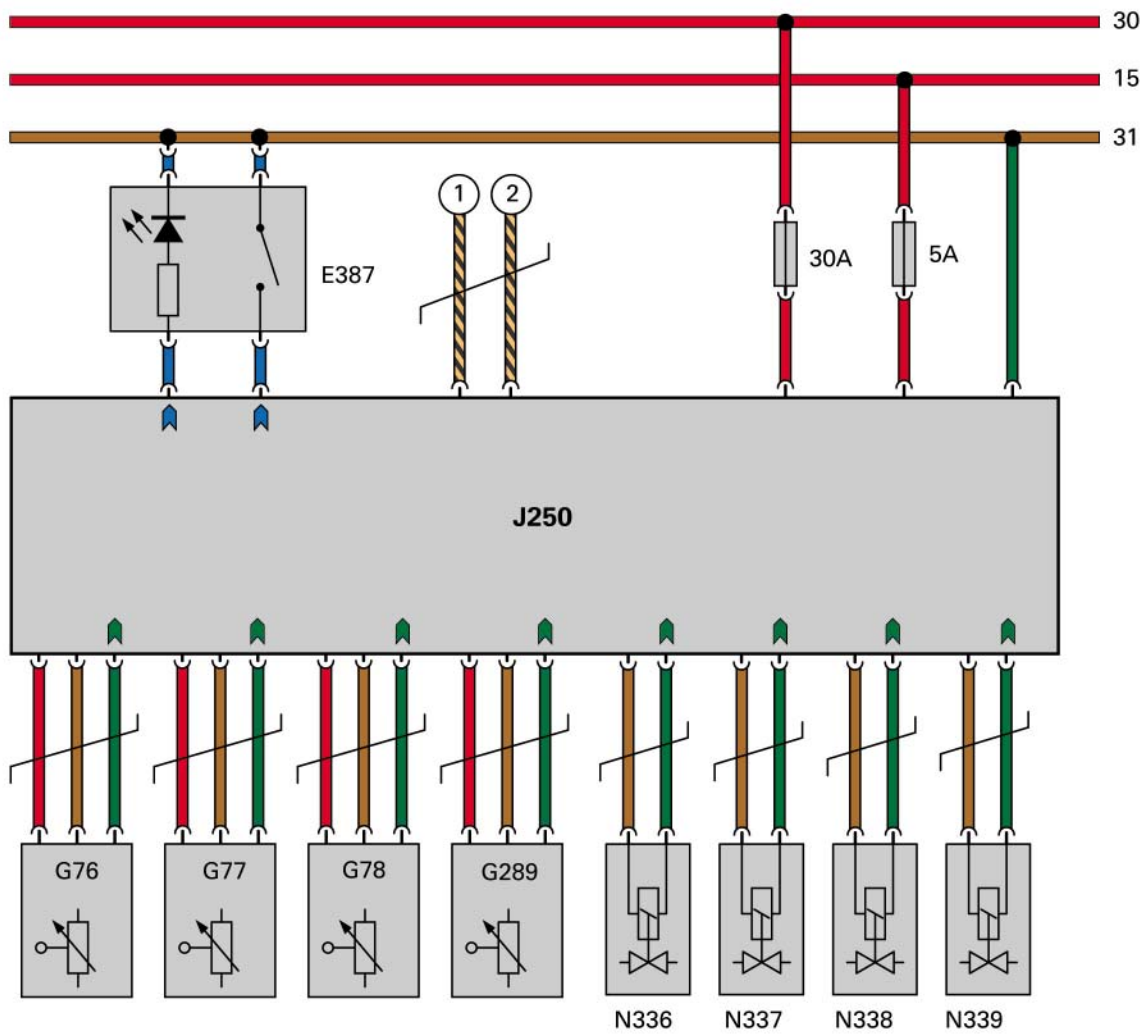
The indicator LED in the button flashes when the "shock absorber test" mode is active. The system exists the mode automatically when the button is pressed again, after ignition on/off or when driving at a speed of at least 10 kph.








381\_041

# Audi magnetic ride

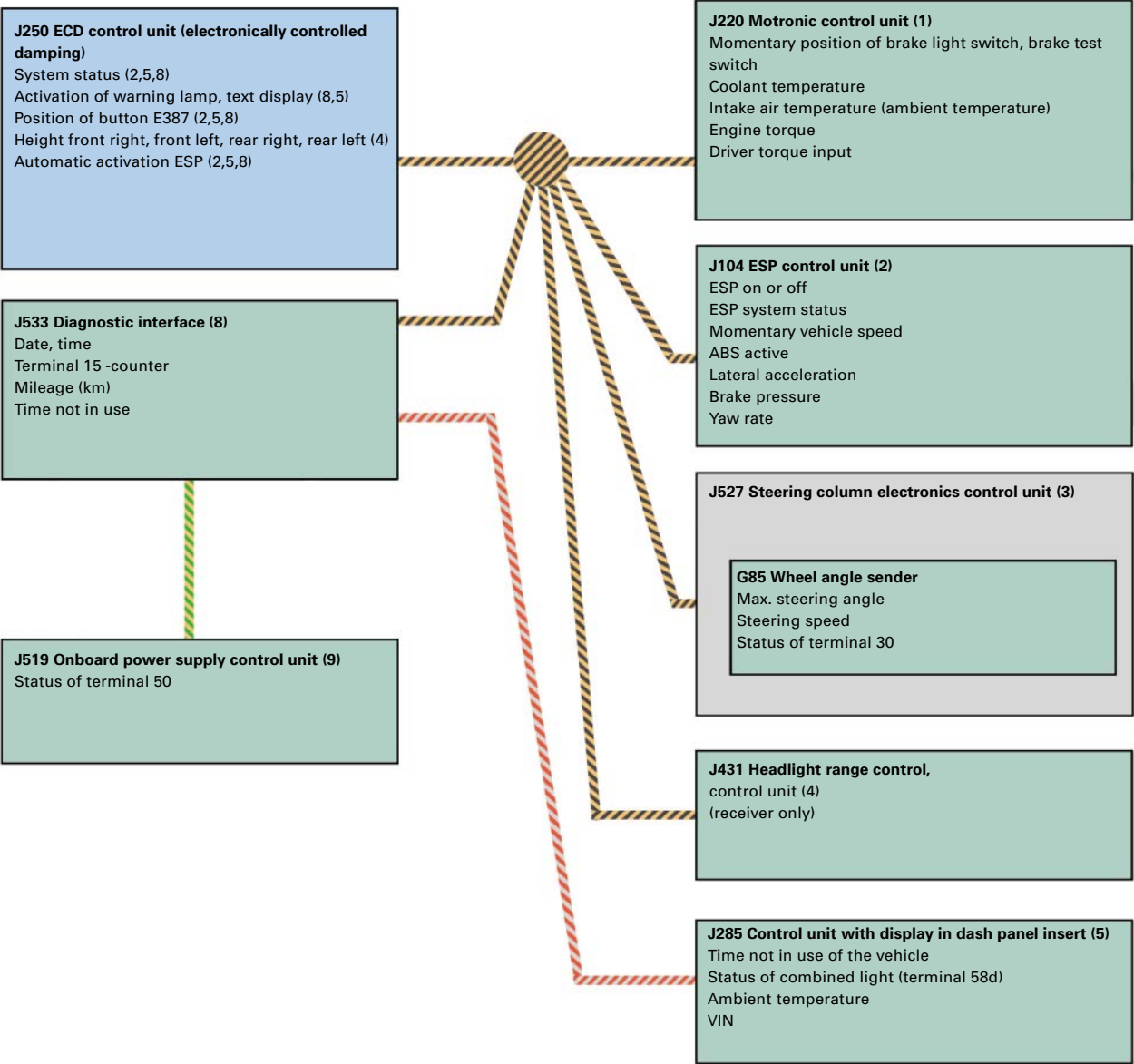
## Function diagram



381\_042

- |   |                    |              |  |
|---|--------------------|--------------|--|
|  | Positive           | J250         | ECD control unit (electronically controlled damping) |
|  | Earth              | G76-78, G289 | Vehicle level senders                                |
|  | Powertrain CAN bus | N336-339     | Damper adjustment valves                             |
|  | Input signal       | E387         | Shock absorber damping adjustment button             |
|  | Output signal      |              |  |

# CAN data exchange



381\_043

# Audi magnetic ride

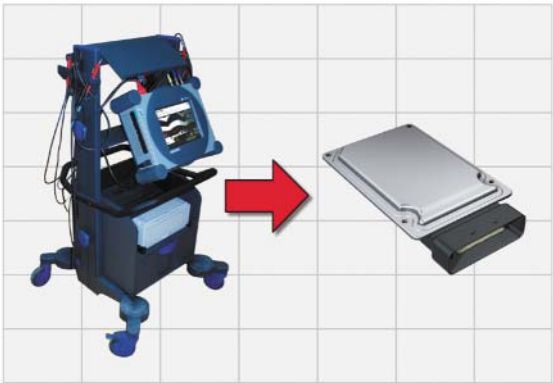
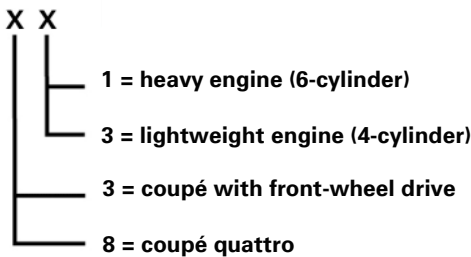
## Service work

### Address

The system can be addressed in the diagnostic tester under the address: **14 Wheel damping**.

### Coding

The coding tells the control unit the powertrain type and engine type of the vehicle. The control unit accepts the new coding after ignition on/off.



381\_046

### System initialisation - teaching in the new standard position

The system initialisation must be performed when the control unit J250 and/or one or more vehicle level senders is replaced. The characteristic curves of the vehicle level sender are stored in the control unit

During the system initialisation procedure, the control unit is informed which vehicle ride heights at the wheel positions match the actual measured values generated by the vehicle level sender. If these assignments are known to the control unit, then all measured values generated subsequently by the vehicle level sender can be converted to vehicle ride heights. The basic system initialisation procedure is identical to the procedure for initialising the aas systems in the A6 and A8. The system initialisation can only be performed when the code control unit is coded.



381\_045



### **Final control diagnostics**

The shock absorber dampers can be activated selectively in the final control diagnostics.

The shock absorber dampers are activated by applying a current of 2A.

### **Data blocks**

The data blocks are used to check key system status information. The temperature values calculated for the dampers and control unit, for example, are represented in data block 28.

### **Cold starting**

When control unit J250 or shock absorber dampers are replaced, the control unit must determine the electrical resistance values of the damper coils at ambient temperature. The control unit saves these values as "standard values" for purposes of temperature compensation (refer to "Special functions - temperature model").

This function is activated automatically after ignition on, provided the vehicle has been out of use for at least 3 hours (e.g. even after a cold start in the morning). During this time not in use, the temperatures of the dampers have adjusted to the ambient temperature. If the mechanic has fitted shock absorber dampers which are already at ambient temperature (e.g. parts sourced directly from the spare parts warehouse), the resistance measurement function can be started immediately by activating the "Cold start" function with the diagnostic tester.

### **Flashing**

The control unit software can be flashed by an external data carrier (CD, online interface).

# Wheels and tyres

## Overview



Engine	Basic wheels	Optional wheels			Winter wheels	
4-cylinder	7.5J x 16 ET 45 (1) Cast aluminium wheel painted 225/55 R 16	8J x 17 ET 47 (3) Cast aluminium wheel painted 225/50 R 17	9J x 18 ET 52 (5) Cast aluminium wheel polished, bicolor 225/50 R 17		7J x 16 ET 47 (7) Cast aluminium wheel painted 225/50 R 17	9J x 18 ET 52 (9) Cast aluminium wheel painted 245/40 R 18
6-cylinder	8.5J x 17 ET 50 (2) Forged aluminium wheel painted 245/45 R 17	9J x 18 ET 52 (4) Cast aluminium wheel painted 245/40 R 18	9J x 18 ET 52 (6) Cast aluminium wheel painted 245/50 R 18		7J x 17 ET 47 (8) Forged aluminium wheel painted 225/50 R 17	

● also available optionally as SST wheel

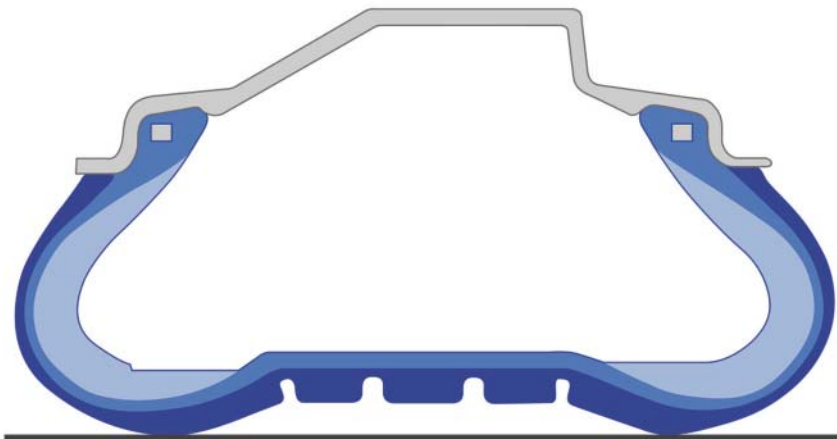
381\_047

# Self Supporting Tires (SST)

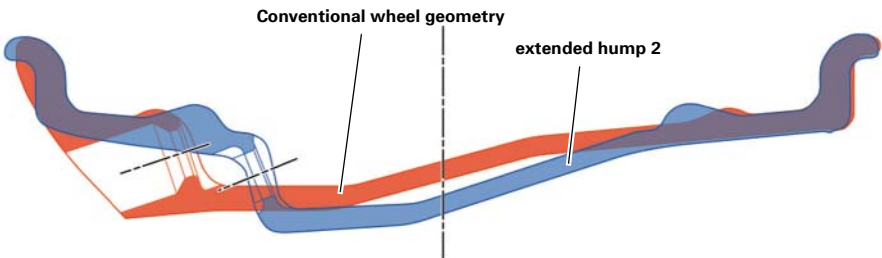
SST tyres have run-flat capability because of their modified design compared to conventional tyres. Much stiffer tyre sidewalls enable the vehicle to drive on for up to 50 km at a maximum speed of 80 kph even after a total loss of pressure.

Due to their modified tyre geometry, special wheels with the designation EH2 (extended hump 2) are used for SST tyres. To prevent inward displacement of the tyre beads in case of loss of tyre pressure, the bead seating has been modified substantially in comparison with conventional wheels. The bead is seated in a recess which supports the tyre towards the inside of the rim.

The special 17" wheels on the Audi TT can be used both for conventional tyres and for SST tyres. In the case of the 18" wheels, conventional tyres are available in combination with conventional rims. SST tyres are always combined with the low tyre pressure indicator.



381\_048



381\_049

## Note



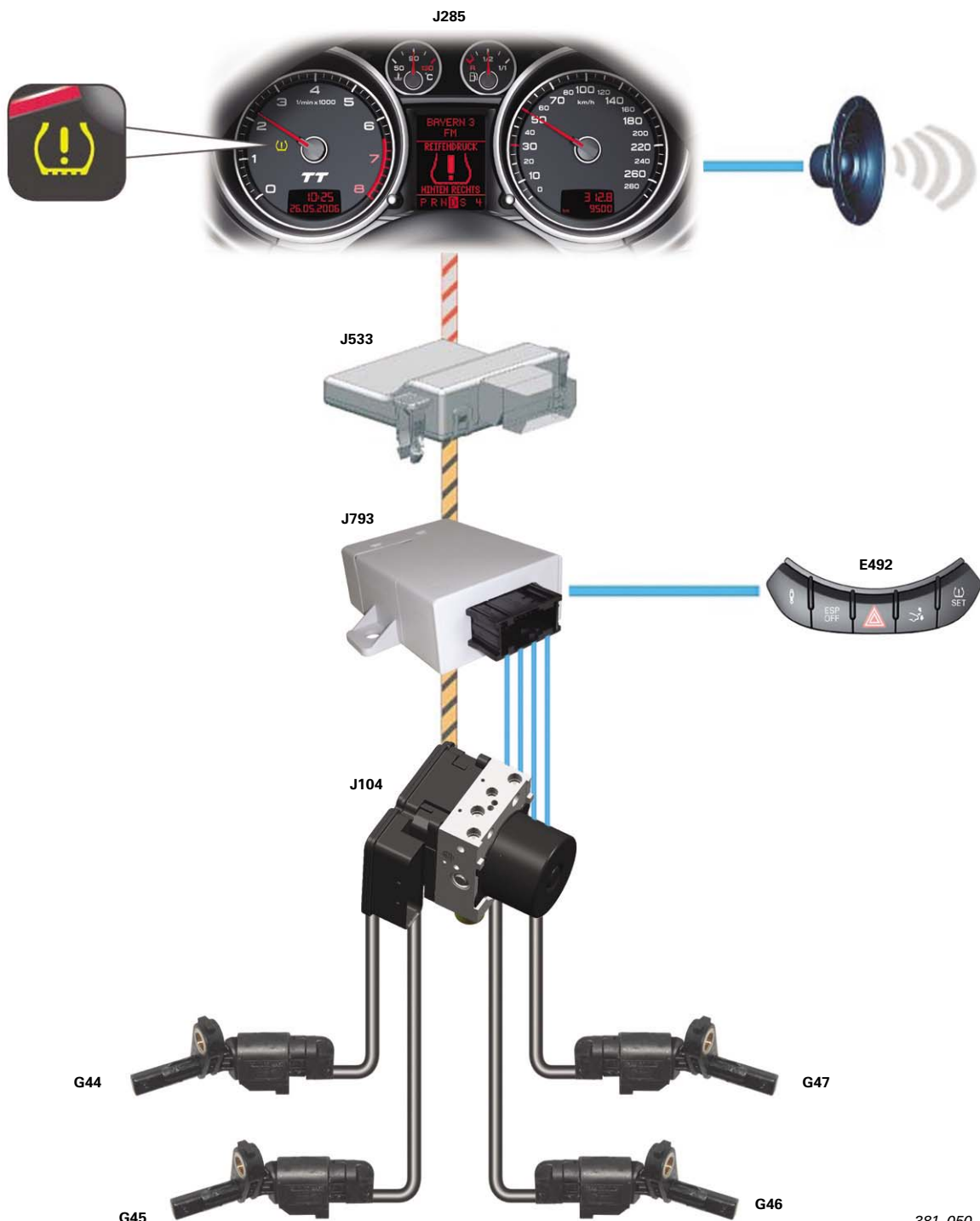
Tyres run in "limp home" mode must always be replaced!  
Special tools must be used to fit and remove SST tyres. For detailed information, refer to the "Workshop Equipment" catalogue

Low tyre pressure indicator


Overview

In all markets except North America the Audi TT features a newly developed low tyre pressure indicator.

Being an indirect measuring system, no tyre pressure sensors are installed in the wheels.



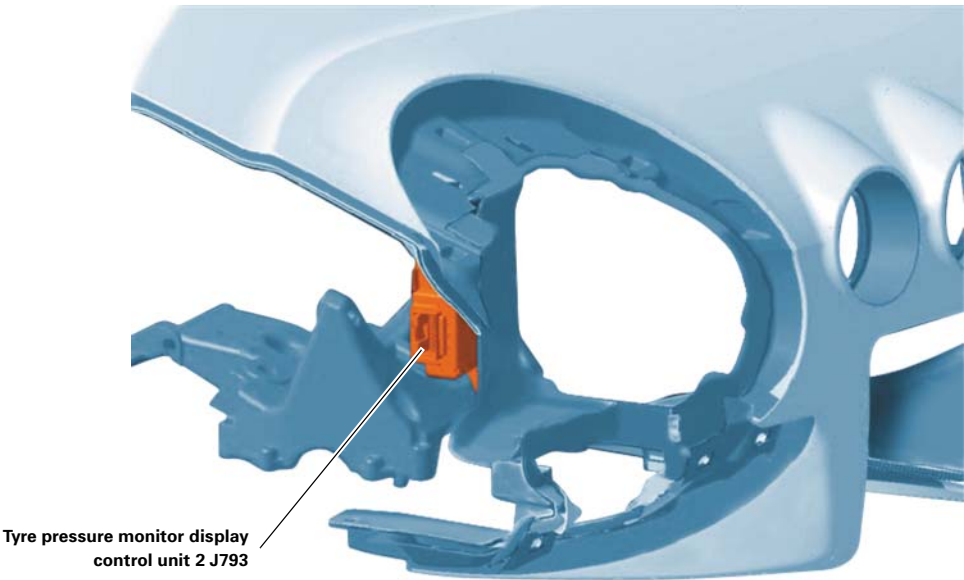
- J285 Control unit with display in dash panel insert
- J533 Data bus diagnostic interface
- J793 Tyre pressure monitor control unit 2
- E492 Tyre pressure monitor display button
- J104 ESP control unit
- G44-47 Wheel speed sensor

-  Dash panel insert CAN bus
-  Powertrain CAN bus

381\_050

**Design and function**

Data processing in the Audi TT is performed by control unit J793, and is no longer an integral part of the ESP control unit. The control unit is located behind the dash panel insert.



381\_051

## Design and function

Using a new evaluation method, it is now possible to detect simultaneous pressure loss to at multiple wheels. Tyre pressures are monitored simultaneously using two different concepts.

### 1. Tyre circumference monitoring

- Tyre circumference decreases as a function of loss of pressure. As a result the wheel must rotate more quickly to cover the same distance as a fully inflated tyre. Wheel speeds are transmitted to control unit J793 by the ESP control unit. In the current Audi A3, the wheel speeds of the diagonal wheels are added and both diagonal sums are correlated with one another. In this way, allowance is made for different wheel speeds when cornering. In the Audi TT, the tyre circumferences are compared axle by axle and side by side. Allowance is made for yaw rate and steering angle when cornering.

### 2. Tyre vibration monitoring

- Torsional vibration is excited in each tyre while rolling, due to road surface unevenness. These vibrations can be determined by evaluating the wheel speed signals. When the tyre pressure decreases, the vibration characteristics change. This monitoring concept, which is an additional feature compared to the Audi A3, it is now possible to reliably detect simultaneous loss of pressure at multiple wheels, as for example occurs over time at all four wheels due to diffusion.



### Operation and displays

Tyre pressure monitoring is activated with the SET key. This function must always be activated when tire pressures are changed or different wheels/tyres are fitted to the vehicle. This can only be done when the ignition is on and the vehicle stationary. The SET key must be pressed for at least 5 seconds in order to activate the tyre pressure monitoring function.



381\_061



381\_054

Warnings are always indicated by the warning lamp in the dash panel insert.

For this purpose, the warning lamp is activated in two colours.

### The following displays are possible:

- In the event of a rapid loss of pressure at a single wheel (tyre damage), the red warning lamp is activated. If the vehicle has a driver information system, an additional text display appears indicating the position of the wheel affected.
- In case of slow loss of pressure, which occurs gradually at multiple wheels due to diffusion, the red warning lamp is also activated. In this case, the optional text display appears but no positional information is given. The displays are activated when the tyre pressure drops below a coded minimum value.
- When system faults are detected, the yellow warning lamp is activated.

# Wheels and tyres

## Operation and displays

The teach-in process is performed once after the SET key is pressed for the low tyre pressure indicator. During the next trip, the control unit saves the measured wheel speeds and the vibration characteristics of the wheels in various vehicle operating states. The vehicle operating states are basically defined by the following parameters: vehicle speed, steering angle, transverse acceleration and yaw velocity. These teach-in values subsequently make up the target data which is used for monitoring. After approximately 10 minutes of driving, it is already possible to detect a breakdown (rapid loss of pressure) . Approximately 60 minutes of driving are required to detect diffusion loss (slow loss of pressure).



381\_061

## Service work

### Address

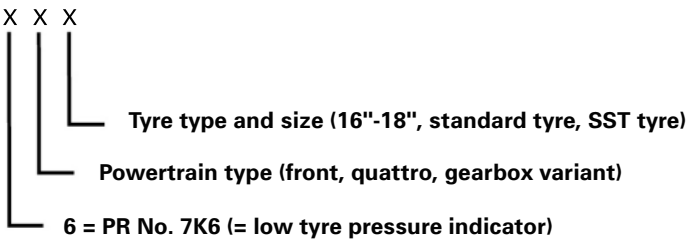
The system can be addressed in the diagnostic tester under the address:  
**4C Tyre pressure monitor II.**

Vehicle self-diagnostics	4C - Tyre pressure monitor II
	8J0907274 8J0907274
	J793 TPM+ H03 --- 0100
Select diagnostic function	Coding 614100
	Dealership number 98765
Display all diagnostic functions	
02 - Query fault memory	
05 - Clear fault memory	
06 - End of output	
07 - Encode control unit	
Encoding the subbus system	
08 - Read data block	
16 - Access authorisation	
Read out Challenge immobiliser IV	
Activate immobiliser IV	
Identification services	
	Goto Print ? ⚠

381\_056

**Coding**

The coding tells the control unit the system variant, powertrain type, gearbox type, wheel size and type of tyre used on the vehicle. The control unit accepts the new coding after ignition on/off.

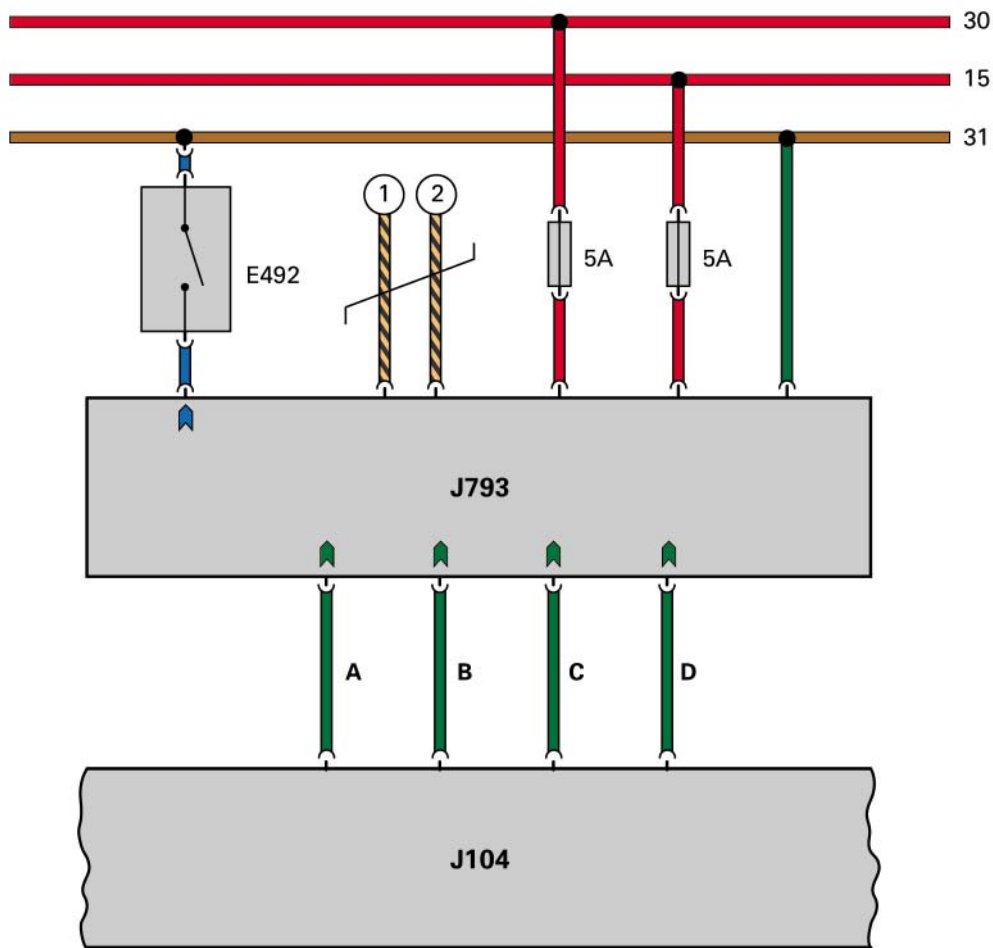


**Data blocks**






The data blocks are used to check key system status information.

# Wheels and tyres

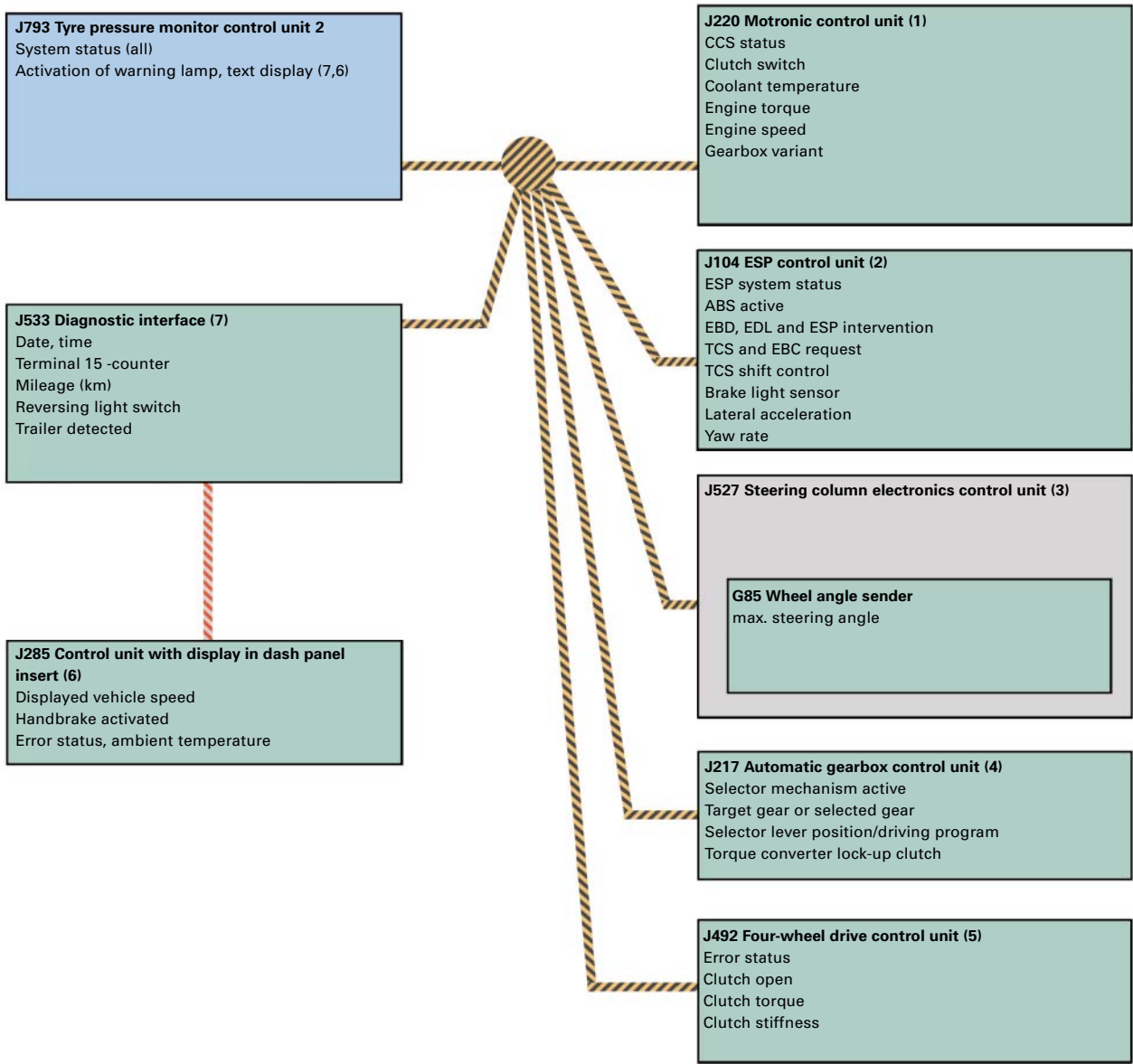
Function diagram



381\_057

	Positive	J793	Tyre pressure monitor control unit 2
	Earth	J104	ESP control unit
	Powertrain CAN bus	E492	Tyre pressure monitor display button
	Input signal	A	Signal from wheel speed sensor, rear right
	Output signal	B	Signal from wheel speed sensor, rear left
		C	Signal from wheel speed sensor, front right
		D	Signal from wheel speed sensor, front left

CAN data exchange



381\_058



Information sent by control unit J793



Powertrain CAN bus



Information received and evaluated by control unit J793



Dash panel insert CAN bus



Tyre pressure monitoring system (US spec)

Overview

The Audi TT for the North American market uses an improved version of the tyre pressure monitoring system as featured previously in the Audi A6 (USA). It is a direct measuring system with tyre pressure sensors in the wheels.



- J285 Control unit with display in dash panel insert
- J533 Data bus diagnostic interface
- J502 Tyre pressure monitor control unit
- E492 Tyre pressure monitor display button
- G222-225 Tyre pressure sensors

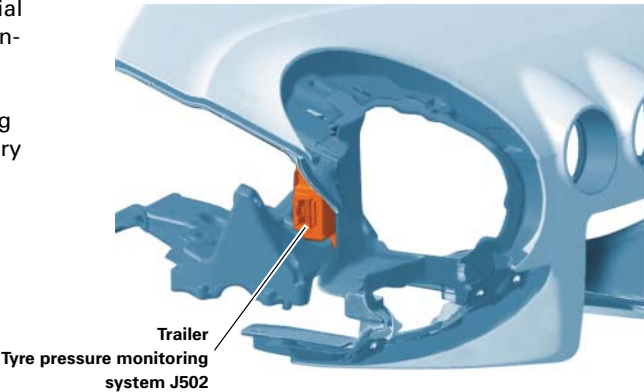
-  Dash panel insert CAN
-  Powertrain CAN bus

381\_059



**Design and function**

In the Audi TT the rear tyre pressure monitor aerial R96 is integrated in the tyre pressure monitor control unit J502. The control unit is fitted in the low tyre pressure indicator behind the dash panel insert. In the case of the tyre pressure monitoring system, communication with the vehicle periphery via the convenience CAN bus.



381\_051a

The aerial receives the radio signals from tyre pressure sensors G222-G226. The sensors operate at a radio frequency of 315MHz. The sensors are identical in design and function to those on the Audi A6. A new feature is the use of the valve body as a transmitter antenna. The valve body and sensor can no longer be separated. As with the current models A4, A6 and Q7, the sensors do not start to transmit until the wheels being to turn. To meet the country-specific statutory requirements, the battery service life is 10 years. The tyre pressure of the spare wheel is not monitored. When the customer orders a full-size spare wheel, the sensor is already installed in the wheel if the vehicle is equipped with a tyre pressure monitoring system.



381\_060

The E492 button used in the tyre pressure monitoring system is identical to the button used by the low tyre pressure indicator. Pressing the button displays the actual tyre pressures as new target pressures. As with the low tyre pressure indicator, the button is connected to the control unit by discrete lines.



381\_061

# Wheels and tyres

## Design and function

Tyre pressure warnings are indicated by the yellow warning lamp in the dash panel insert. No position-related warning is given. Warnings are indicated in accordance with country-specific statutory requirements at a residual tyre pressure of 75% or less. Tyre pressures are determined taking into account the tyre air temperature.



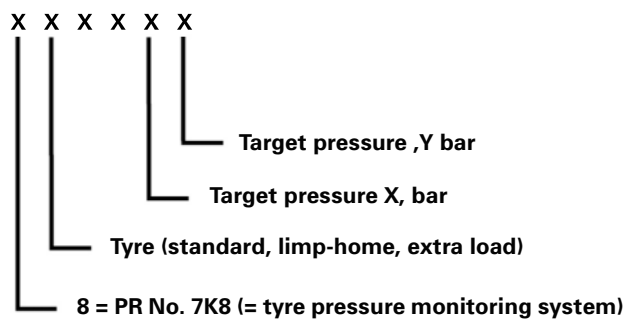
381\_054

**Service work**

The main changes to the service work on the low tyre pressure indicator are listed in the following.

**Coding**

The coding tells the control unit the system variant, powertrain type, gearbox type, wheel size and type of tyre used on the vehicle. The control unit accepts the new coding after ignition on/off.

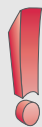


**Adaption**

The control unit learns the new tyre pressure sensors automatically when the ignition is turned on after the vehicle has been shut off for at least 20 minutes. When new tyre pressure sensor identification numbers are recognised, the fault indicator lamp is activated. The driver enable monitoring of the actual tyre pressures by pressing the SET key. The system is now ready for operation again.

The tyre pressure sensor identification numbers can be transmitted manually to the control unit using the function "10 Adaption". This bypasses the waiting period. Each identification number is indicated on the tyre pressure sensor housing.

**Note**



The handheld transmitters for the tyre pressure monitoring system VAS 6287 cannot be used on the tyre pressure monitoring system of the Audi TT.

All rights reserved.  
Technical specifications  
subject to change without  
notice.

Copyright  
AUDI AG  
I/VK-35  
[Service.training@audi.de](mailto:Service.training@audi.de)  
Fax +49-841/89-36367

AUDI AG  
D-85045 Ingolstadt  
Technical status: 05/06

Printed in Germany  
A06.5S00.26.20