Service Training



The Audi Q7 Running Gear

Self-Study Program 992603

Audi of America, Inc.
Service Training
Printed in U.S.A.
Printed 02/2006
Course Number 992603

©2006 Audi of America, Inc.

All rights reserved. All information contained in this manual is based on the latest information available at the time of printing and is subject to the copyright and other intellectual property rights of Audi of America, Inc., its affiliated companies and its licensors. All rights are reserved to make changes at any time without notice. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, nor may these materials be modified or reposted to other sites without the prior expressed written permission of the publisher.

All requests for permission to copy and redistribute information should be referred to Audi of America, Inc.

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

Trademarks: All brand names and product names used in this manual are trade names, service marks, trademarks, or registered trademarks; and are the property of their respective owners.

Table of Contents

Introduction

Overview 1

Front Axle

Overview 3

Rear Axle

Overview 4

Brake System

Overview 5
Foot-Operated Parking Brake 6
The Active Brake Booster 10

ESP

Overview 15
Summary of Functions/New Functions 16
System Components 22
Service 24

Steering/Wheel and Tires

Overview 25
Wheels Overview/Tire Pressure Monitoring System 26

Adaptive Air Suspension (AAS)

Overview 27
System Components 30
Vehicle Ride Heights/Modes 30
Control Characteristics 36
Operation and Displays 39
Service 40

Self-Study Programs for the Audi Q7 47

The self-study program provides introductory information regarding the design and function of new models, automotive components or technologies.

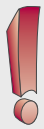
The self-study program is not a Repair Manual!
All values given are intended as a guideline only and refer to the software version valid at the time of publication of the SSP.

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

Reference



Note



With the Audi Q7, Audi offers a vehicle that defines new superlatives in the Sport Utility Vehicle (SUV) market. The Audi Q7 combines sportiness and versatility, advanced technology and sophisticated luxury. On the road, it shines with the performance and dynamics of a sports car. Off-road, it re-defines the potential of this vehicle segment. The all-round qualities of the chassis are simply outstanding.

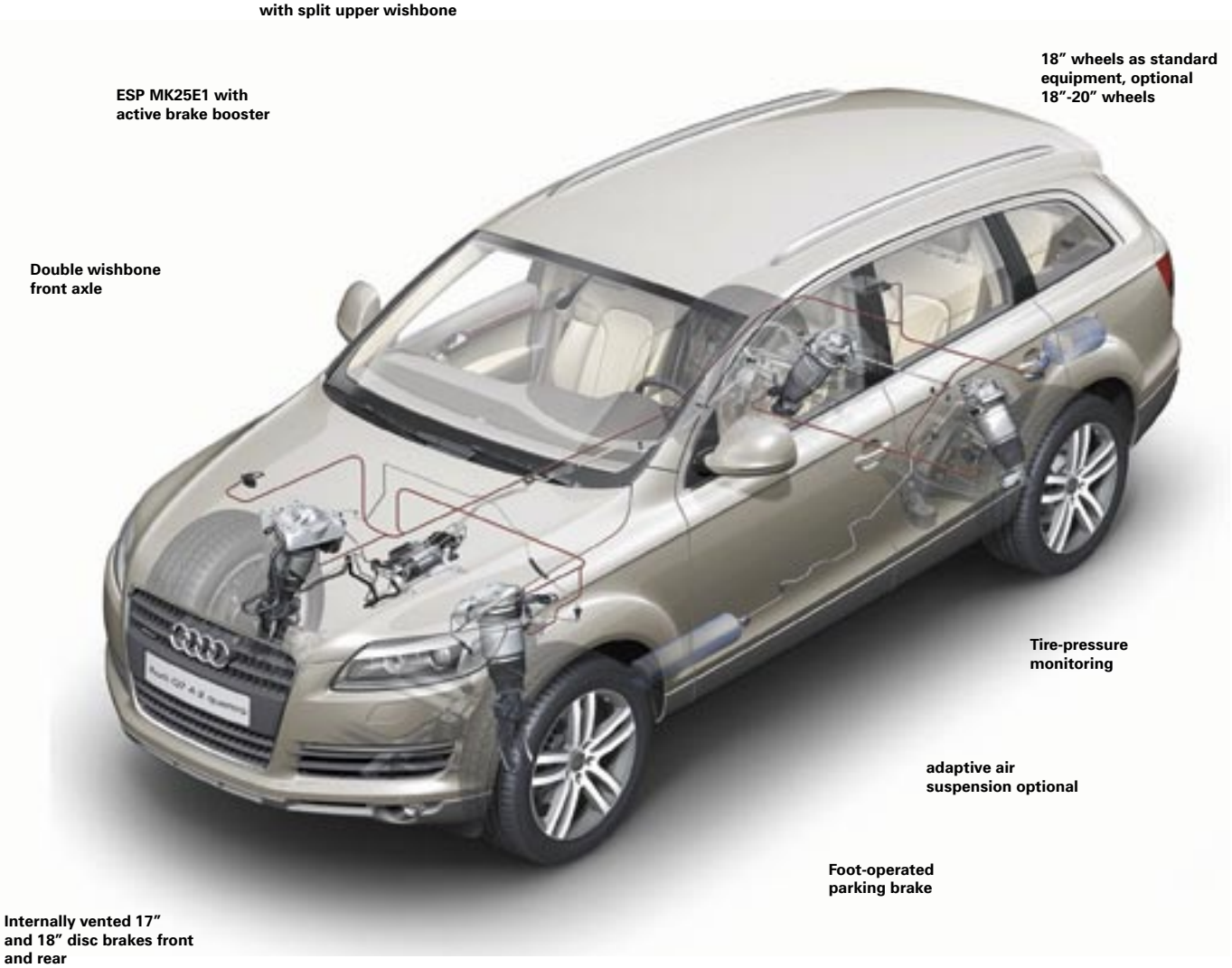
Steel springs suspension and twin-tube shock absorbers are tuned for sporty driving qualities and supreme comfort, even when off-road. The optionally available adaptive air suspension, with its electronically controlled damper system, represents the perfect synthesis of deliberately sporty handling characteristics and maximum suspension comfort.



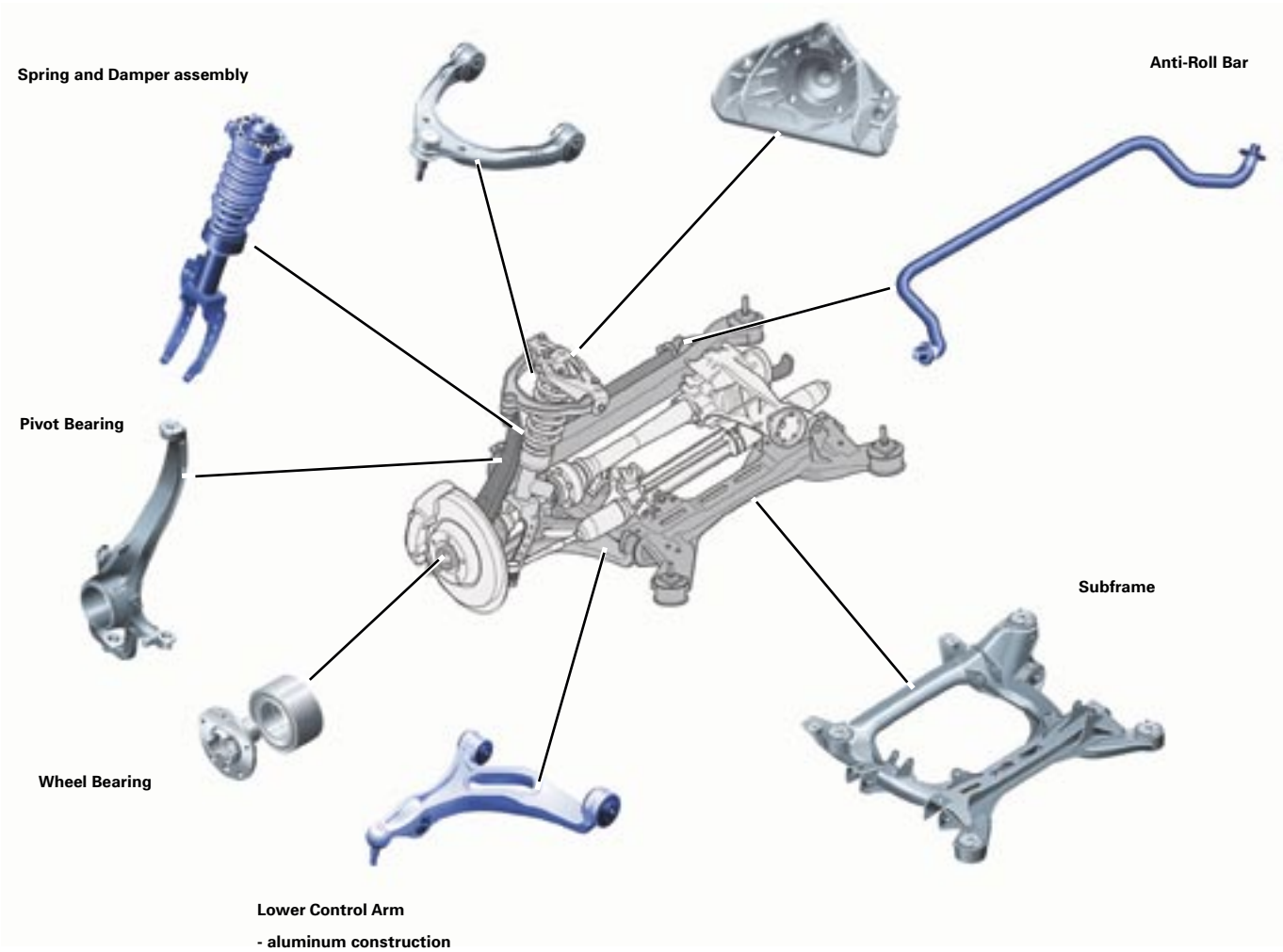
362_076

Overview

The Audi Q7 is offered with conventional steel spring suspension and Adaptive Air Suspension.

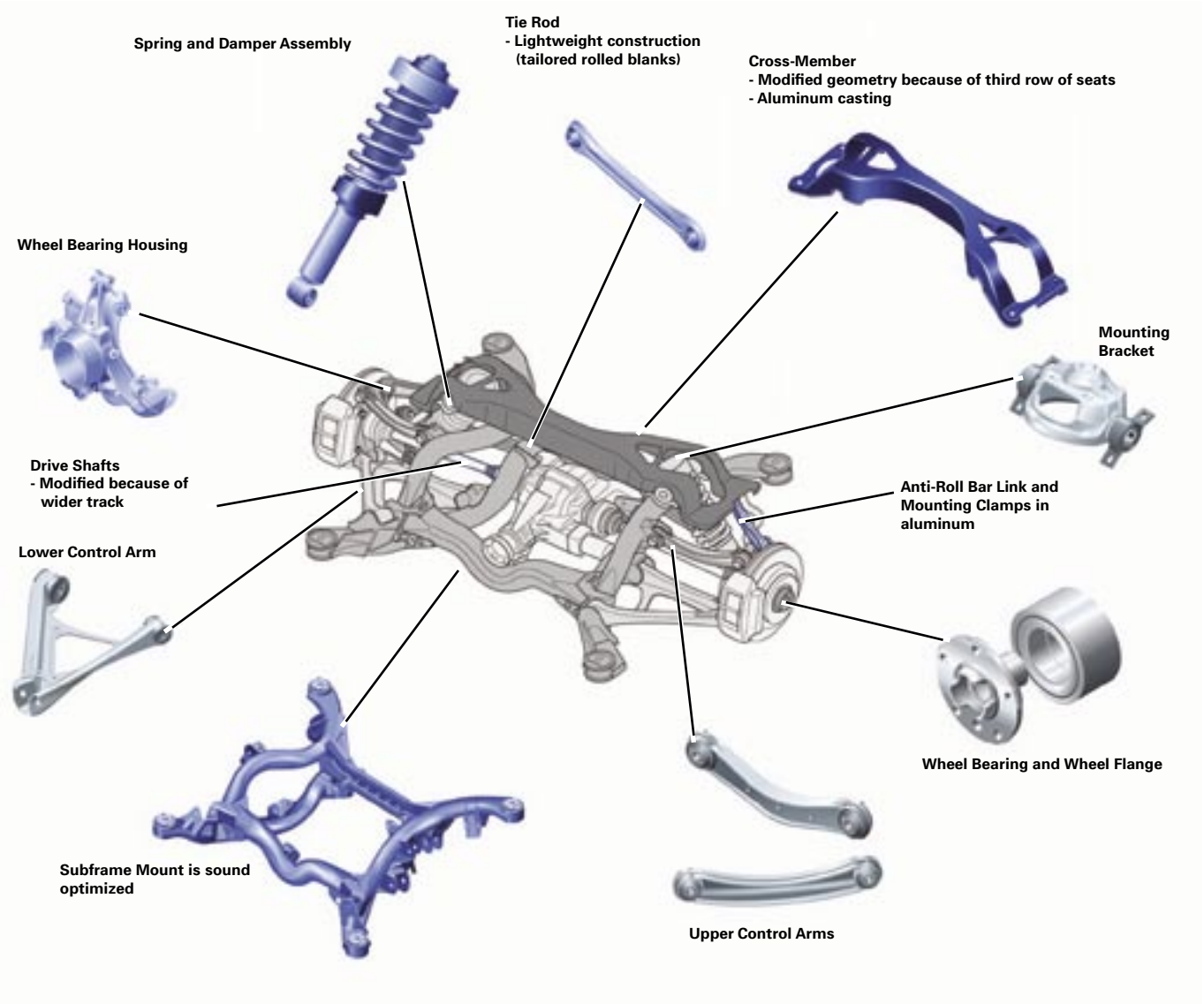


Overview



362_072

Overview



362_071

Overview

	Front axle		Rear axle	
Engine	V-8 gasoline engine, V6 FSI		V-8 gasoline engine	V6 FSI
Brake type	Brembo aluminum fixed caliper		Brembo aluminum fixed caliper	Brembo aluminum fixed caliper
Number of brake pistons	6		4	4
Brake piston diameter in inches (mm)	1.18/1.34/1.5 (30/34/38)		1.10/1.26 (28/32)	1.10/1.18 (28/30)
Brake rotor diameter in inches (mm)	13.78 (350)		14.1 (358)	12.99 (330)

Front Brakes

Internally vented brake rotors are used. The brake pads are equipped with pad wear measurement. The aluminum brake calipers are of a monobloc design.



362_036

Rear Brakes

Internally vented brake rotors are used. Pad wear is monitored at the rear axle as well. A servo-drum brake is used for the parking brake.

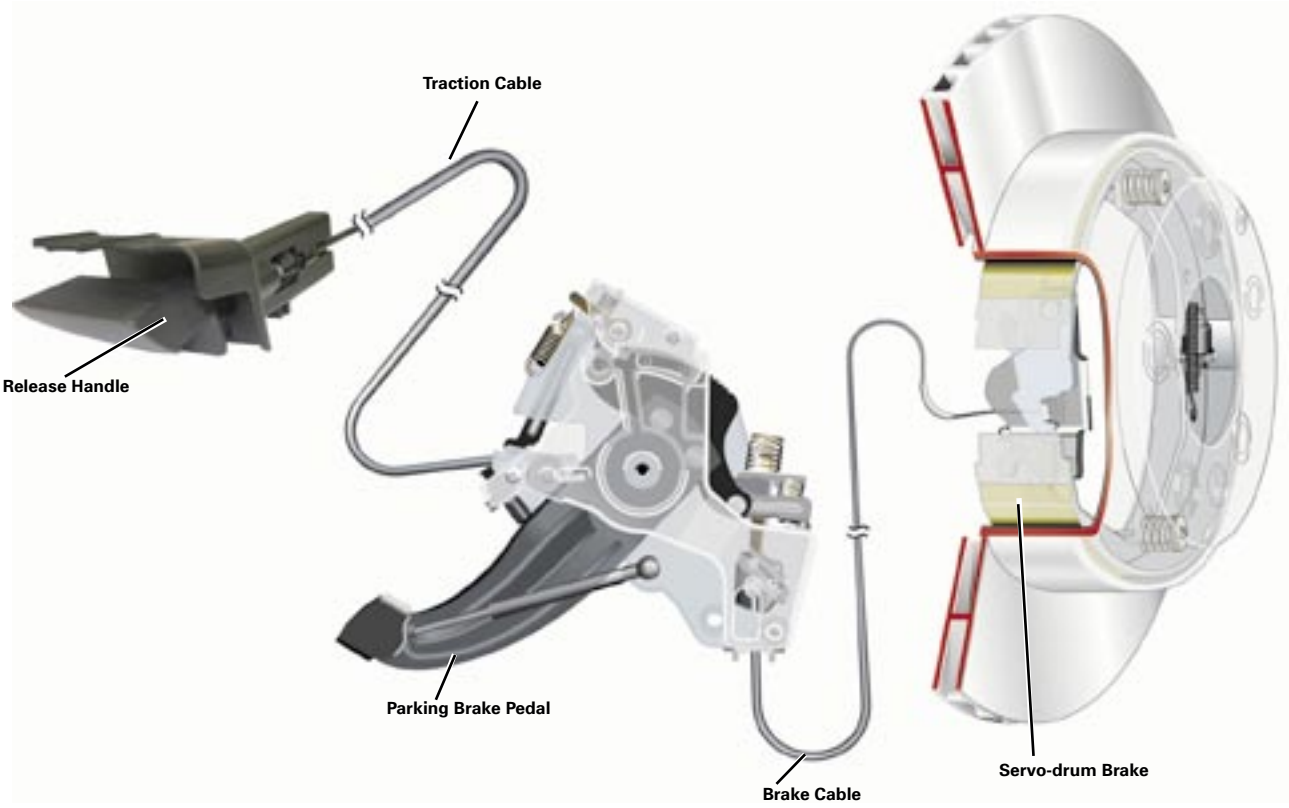


362_037

Foot-Operated Parking Brake

Overview

A foot-operated parking brake is used for the first time in an Audi.



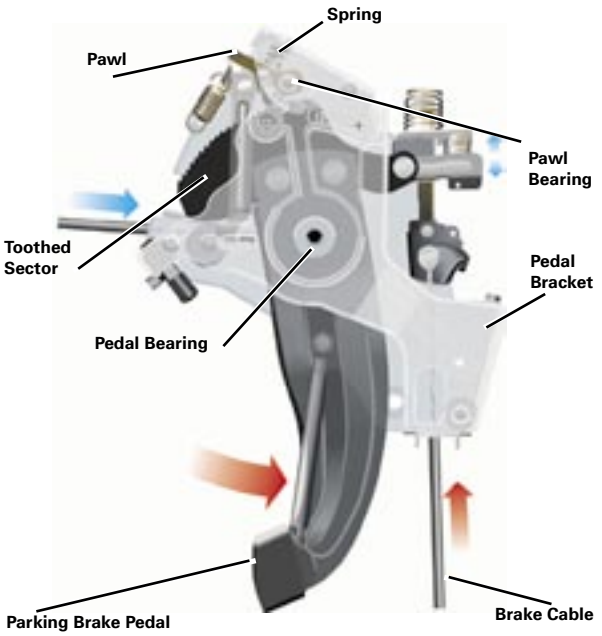
362_038

Foot-Operated Parking Brake

Brake Operation

The brake cable is actuated when the pedal is depressed. In the actuated position, the pedal is locked by a pawl which engages the toothed sector attached to the pedal.

The pawl is mounted so that it can rotate in the pedal bracket. A spring pushes the pawl against the toothed sector. The brake cable remains actuated and the vehicle is held.

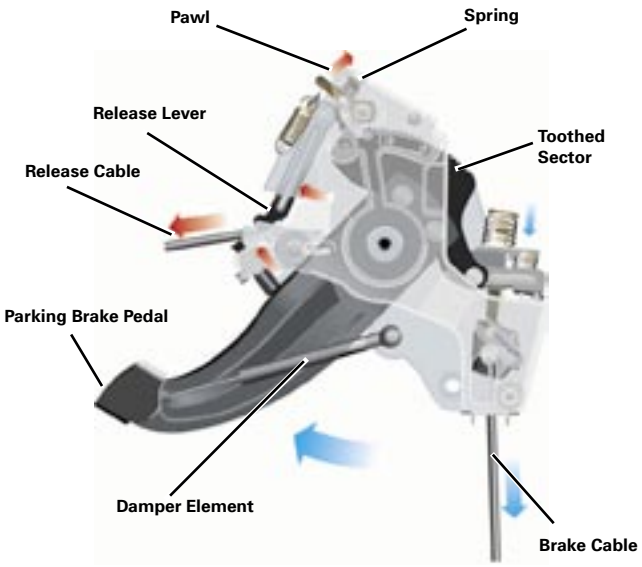


362_039

Releasing the Applied Brake

By actuating the release handle, the locking pawl is lifted by the release lever against the spring force. It is lifted out of the toothed sector and the pedal is unlocked.

The pedal slowly moves back to its initial position against the damping force of the damper element. The brake cable is moved in the opposite direction and releases the parking brake.



362_040

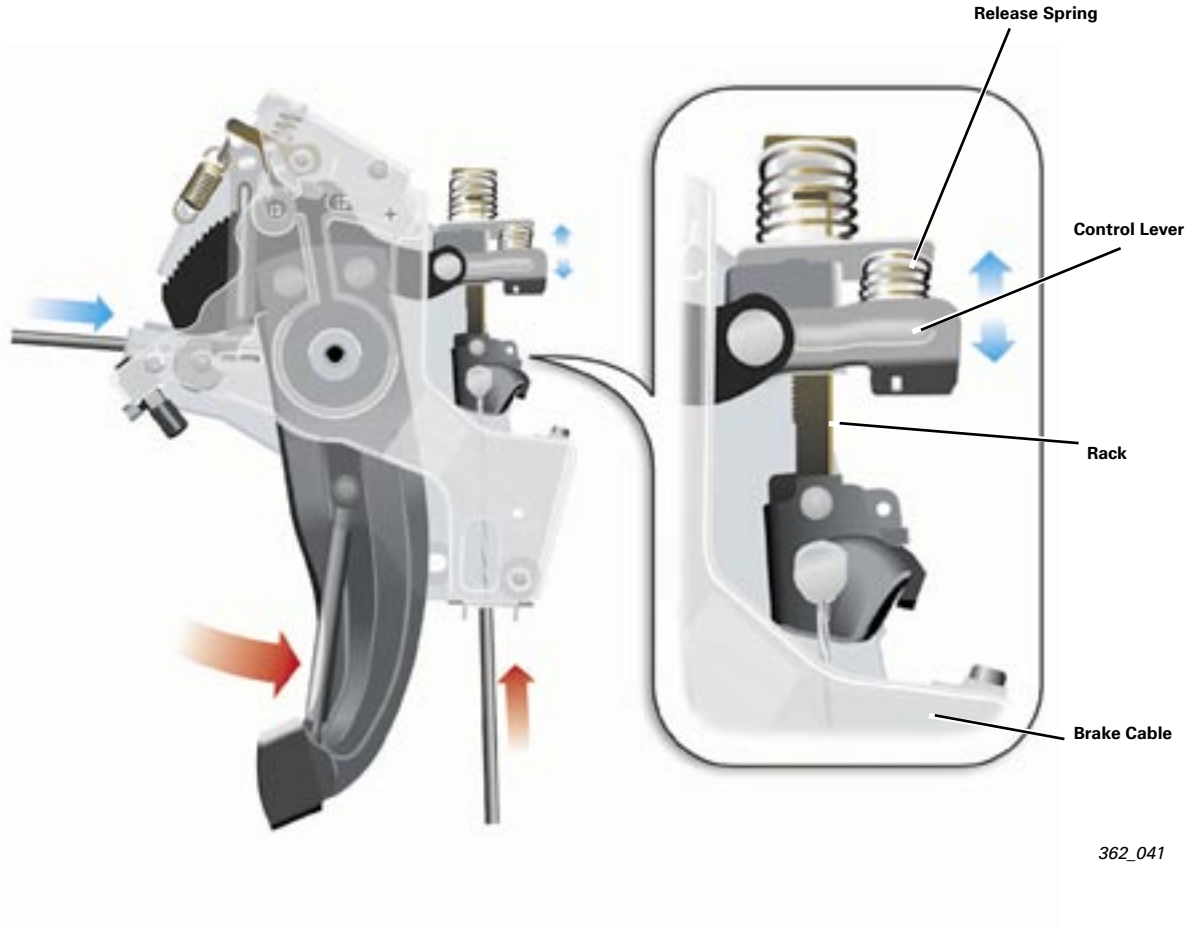
Foot-Operated Parking Brake

Automatic Adjustment

Stretching of the cable and settling of the bearing points lead to increasing backlash in the operating mechanism. The brake must be adjusted in order to operate correctly. Adjustment is performed automatically in the Audi Q7. The adjusting mechanism is mounted on the parking brake pedal. It is located between the pedal and the cable.

Configuration with the Parking Brake Actuated

The parking brake pedal and the cable are connected by means of a rack. The rack is rigidly connected on one side to the cable. The rack is carried in a control lever. This control lever is connected to the toothed segment so that it can rotate. The control lever is pressed against the rack by the release spring and locks it to the parking brake pedal. This produces a rigid connection between the pedal and the brake cable.

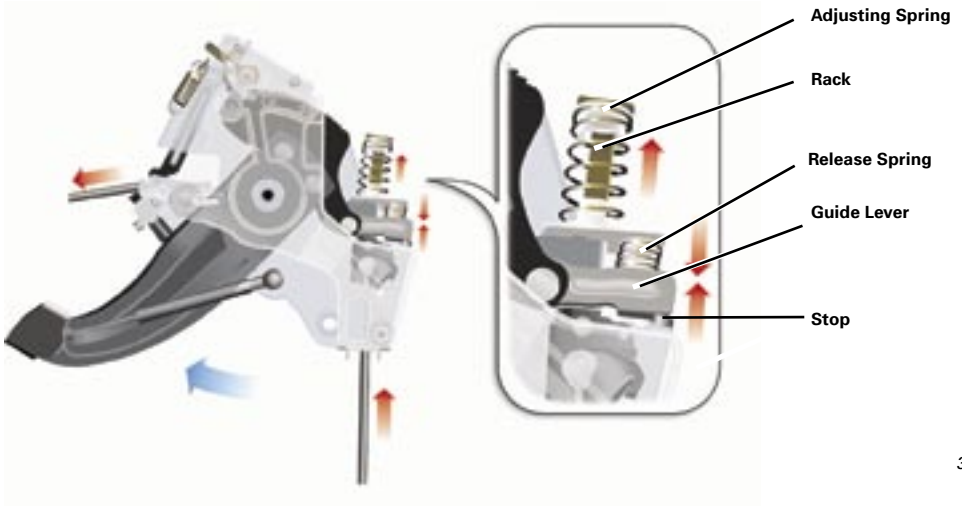


Foot-Operated Parking Brake

Operation of the Self-Adjustment Mechanism

When the release lever is actuated, the foot brake pedal returns to its original position. The control lever comes to rest against the stop. The control lever is pushed upward against the force of the release spring as it continues to move, releasing the rack.

The adjusting spring pulls the rack upward until the backlash is compensated for. The next time the parking brake pedal is actuated, the control lever is pushed against the rack again by the release spring and locks the rack in position.

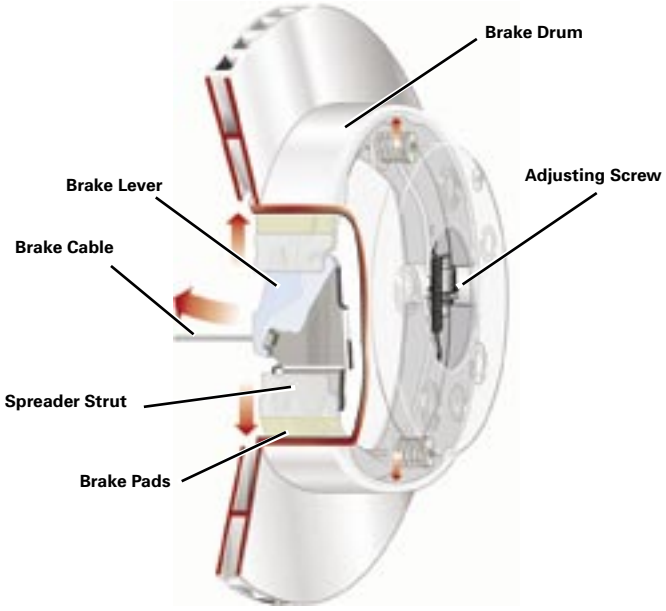


362_042

Servo Drum Brake

By pulling on the brake cable, both brake pads are simultaneously pressed against the brake drum by the spreader strut.

Basic adjustment of the parking brake is performed through a star-wheel adjuster.

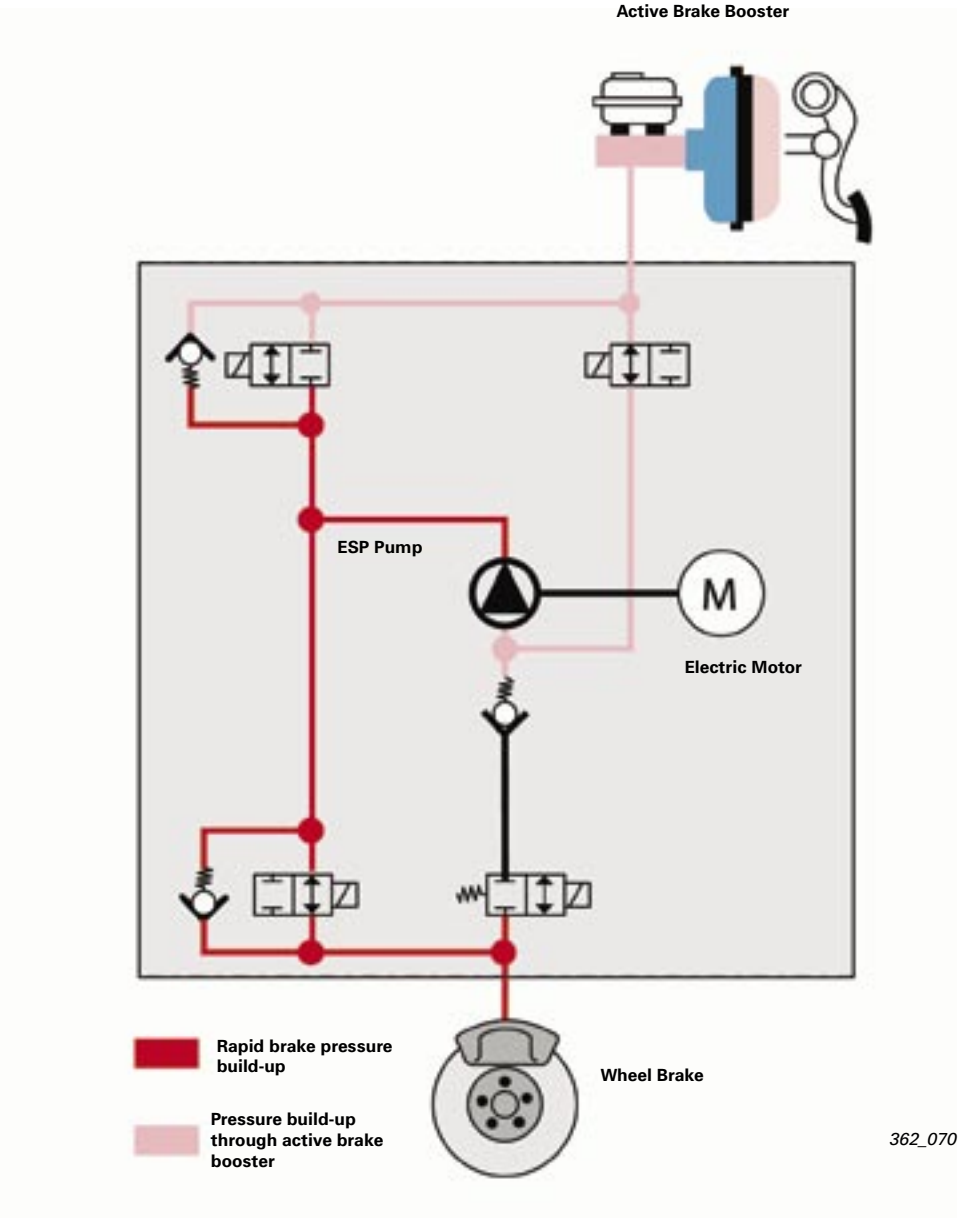


362_043

The Active Brake Booster

The purpose of the active brake booster is to build up brake pressure without the driver touching the brake pedal. This is required for certain ESP control functions. Extremely rapid pressure build-up is required specifically for roll-over stabilization and for ESP intervention when the vehicle is oversteering.

To this end, pressure is built up by activating the active brake booster on the vacuum side of the ESP pump. The ESP pump throughput increases and pressure build-up can be achieved more quickly.

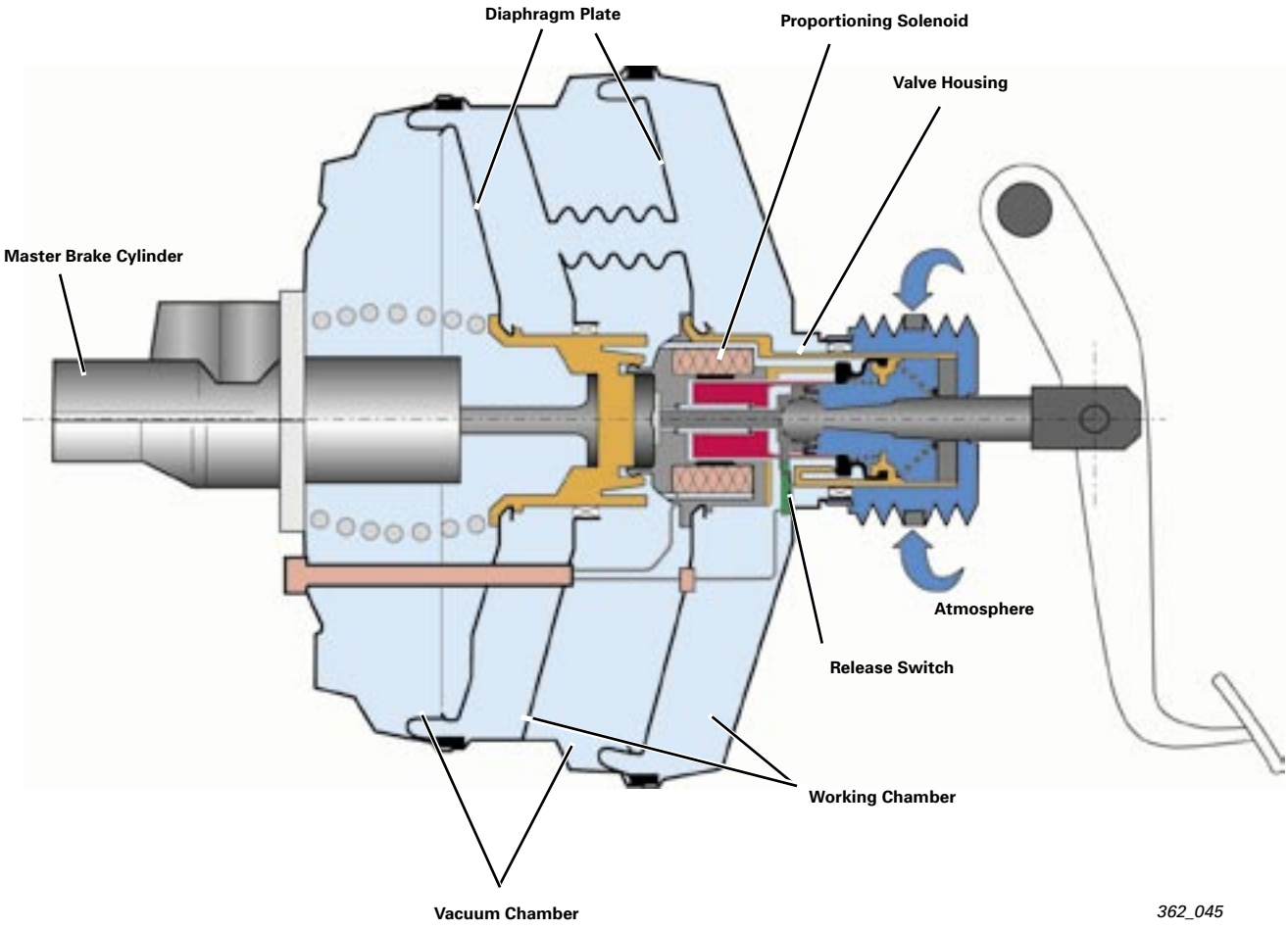


The Active Brake Booster

Design

In contrast to a conventional passive brake booster, an electromagnetically operated valve is integrated into the active brake booster. A proportional solenoid (infinitely adjustable proportionally to the field current) is used for the valve actuation.

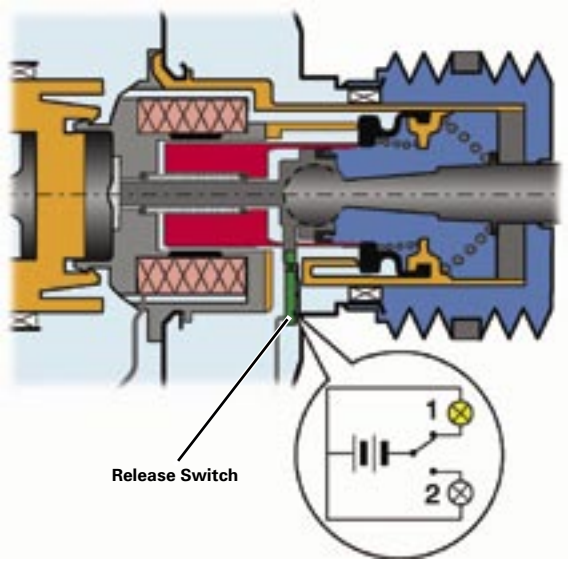
The ESP Control Module activates the solenoid. A release switch in the active brake booster detects whether the driver has applied or released the brake. The release switch is a two-way switch (NO and NC switch).



The Active Brake Booster

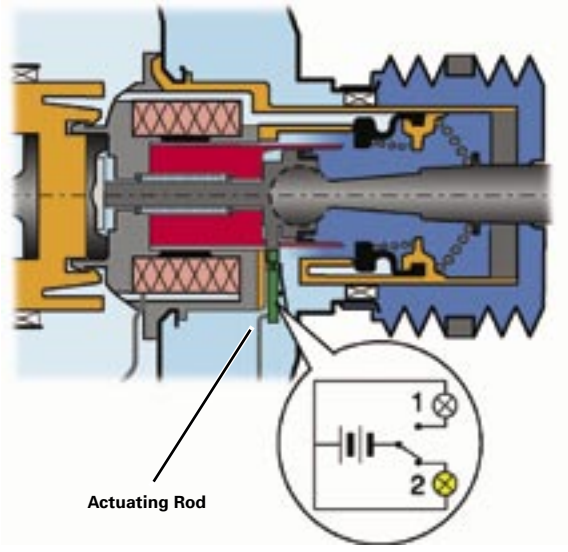
Function of the Release Switch

In the rest position or when the brake booster is electrically activated, the Release Switch contacts the active brake booster housing and closes the electrical circuit 1.



362_046

When the driver depresses the brake pedal, the Actuating Rod is moved. The Release Switch lifts off the active brake booster housing. The electrical circuit 1 is opened, and the electrical circuit 2 is closed.



362_047

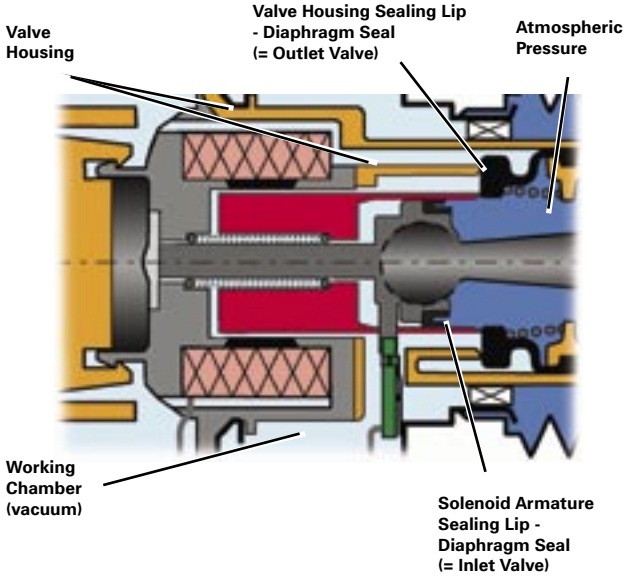
The Active Brake Booster

Active Brake Booster Operation

Non-activated state

No current is applied to the proportional solenoid, the brake pedal is not depressed. Operation of the Active Brake Booster is determined by the sealing edges which function as valves and by the diaphragm seal. Depending on the position of the valve sealing lip, a specific pressure builds up in the Working Chamber of the Active Brake Booster.

In the non-activated position shown, both valves are closed by the sealing lips lying against the diaphragm seal. Vacuum provided by the vacuum source (intake manifold or pump) is applied in the Working Chamber.

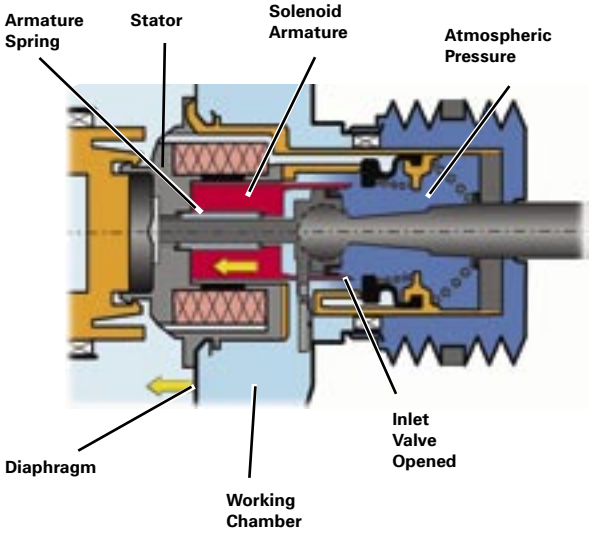


362_048

Pressure build-up

Current is applied to the proportional solenoid by the ESP Control Module. The Solenoid Armature is moved by magnetic force acting against the Armature Spring in the direction of the arrow until it stops against the stator. The sealing lip of the Solenoid Armature lifts from the Diaphragm Seal and the Inlet Valve opens. Air at atmospheric pressure flows into the Working Chamber.

As a result of the pressure differential now present between the vacuum chamber and the Working Chamber, the diaphragms are moved toward the master brake cylinder (direction of the arrow) and brake pressure is built up.



362_049

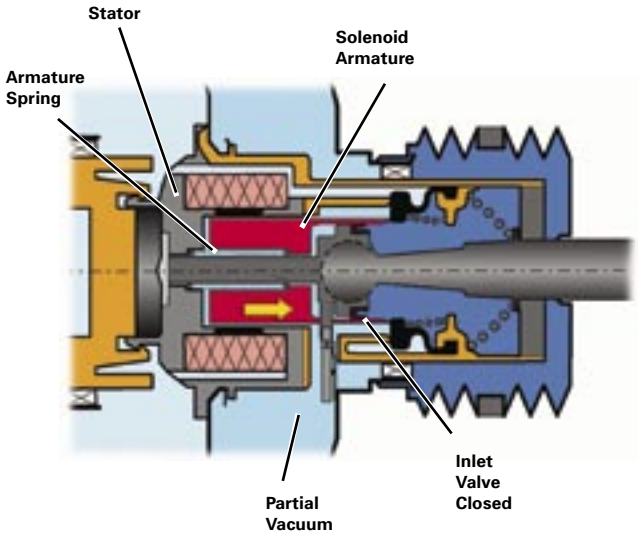
The Active Brake Booster

Active Brake Booster Operation

Maintaining pressure

The solenoid coil current is reduced. The Armature Spring pushes the Solenoid Armature away from the Stator (direction of arrow).

The sealing lip of the Solenoid Armature comes to rest again on the spring plate and the Inlet Valve is closed. The partial vacuum in the working chambers remains constant, as does the brake pressure.

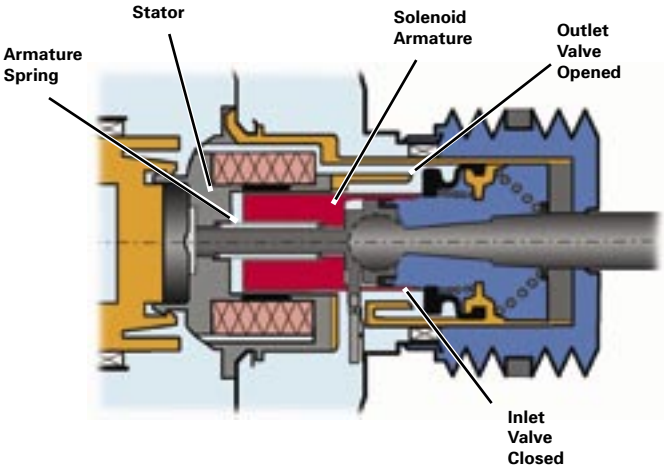


362_050

Pressure reduction

When the solenoid coil is de-energized, the Armature Spring pushes the Solenoid Armature and the Stator further apart. The Solenoid Armature pushes the spring plate back over the sealing lip of the Inlet Valve. The Outlet Valve is opened.

The connection between the working chambers and the vacuum chambers is completed. Air flows from the working chambers into the vacuum chambers until pressure is equalized between the chambers.



362_051

Overview

A new ESP system from Continental Teves designated Mk25E1 is being used in the Audi Q7.

The differences of the Mk25E1 with the Mk60S which is used in the current Audi A3, are as follows:

- Expanded range of functions
- Larger size hydraulic pump
- More powerful electric motor
- Larger internal storage chambers
- Active engine rpm sensors with forward / reverse detection and installation location recognition



362_052

Meaning of the Mk25E1 designation:

Mk25	=	Series designation
E	=	Use of linearized switching valves* as reversing valves (2x) and inlet valves (4x)
1	=	Use of an integrated pressure sensor

Reference

For more information on the operation, please refer to Chassis Systems SSP, 997303 for the Audi A8L.

Functions Overview

Known functions integrated in existing Teves ESP systems

- ABS (Anti-lock Brake System)
- EBD (Electronic Brake pressure Distribution)
- ASR (Anti Slip Regulation)
- EDL (Electronic Differential Lock)
- EBC (Engine Braking Control)
- HBA (Hydraulic Brake Assist)

New Functions

- Braking Guard (only in vehicles with Adaptive Cruise Control)
- Roll-over Stabilization
- Fading Brake Support (FBS)
- Brake Rotor Wiper
- Emergency Brake Signal
- Off-road Mode

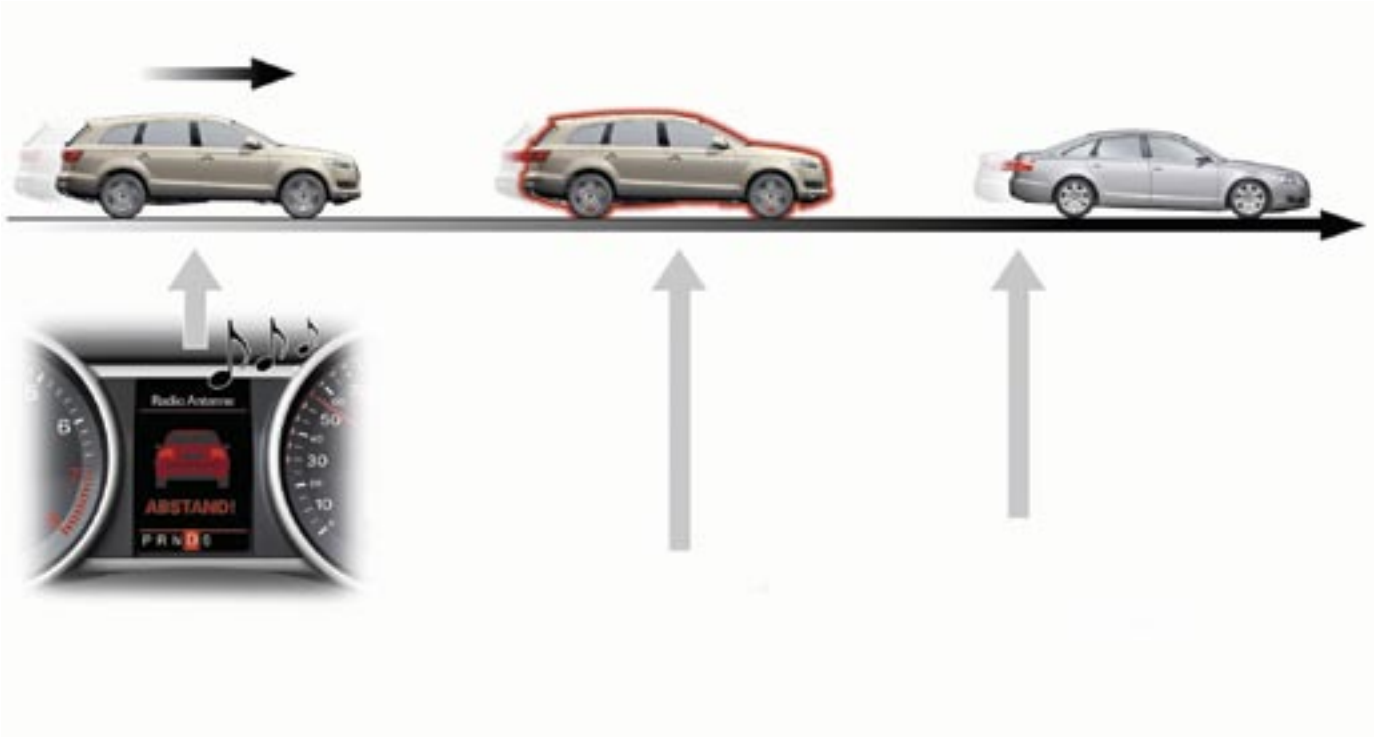
New Functions

Braking Guard

This function actively warns the driver of an imminent collision with a vehicle ahead. The vehicle must be equipped with Adaptive Cruise Control for this feature to be available. The ACC radar sensors evaluate the distance to a vehicle ahead and its speed. The ACC Control Module processes these readings and detects a risk of collision. The warning is issued in two stages:

1. An initial warning is given by simultaneously activating a visual and audible signal.
2. A brief build-up of brake pressure follows. The ACC Control Module sends a CAN message to the ESP Control Module with the request for braking. Then, the ESP Control Module activates the return flow pump and briefly brakes the front axle.

Even if ACC is not activated, Braking Guard is active.



Pre-warning

Acute warning, brake pressure

Vehicle ahead is decelerating sharply – for example, at the end of a line of traffic

362_053

New Functions

Roll-over Stabilization

If the vehicle is in danger of rolling-over, it is stabilized by reducing the lateral acceleration. This is done by a massive corrective braking at the front axle. In addition, the engine torque is reduced. The driver may notice this even though he has not registered yet any critical driving situation (starting at about 0.6 g of lateral acceleration). The ESP warning lamp flashes during the corrective braking action.

The brake pressure build-up is achieved by activating the Active Brake Booster and through active pressure build-up by the ESP. The Active Brake Booster generates a rapid build-up of pressure on the vacuum side of the ESP return flow pump. This results in a very rapid increase in brake pressure through the ESP.

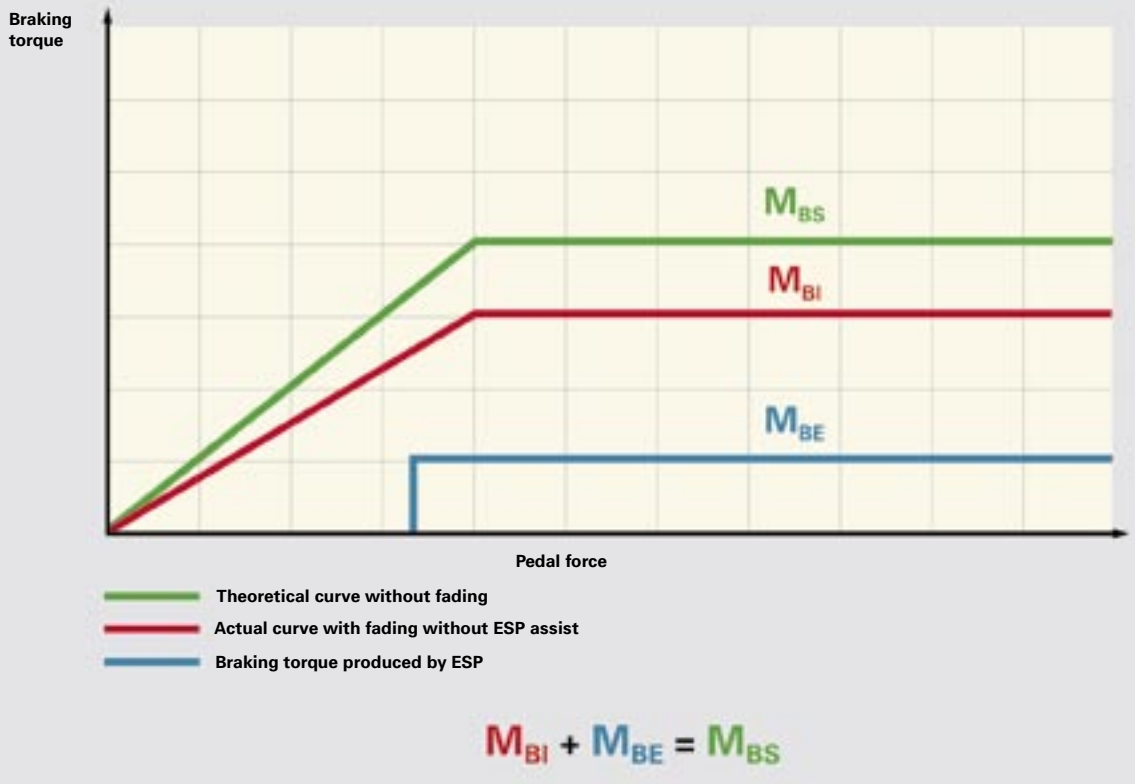
Emergency Brake Signal

When braking with extremely high deceleration or braking in the ABS operation range, the emergency flashers are activated.

Fading Brake Support (FBS)

When braking performance decreases as the result of lower friction values between the brake pad and the brake rotor, the ESP pump builds up additional pressure to compensate the loss of braking efficiency.

This is the case when high brake pressure is measured and there is no braking control at the wheels. As soon as the brake pressure is substantially reduced by the driver, the function is switched off. There is no display.



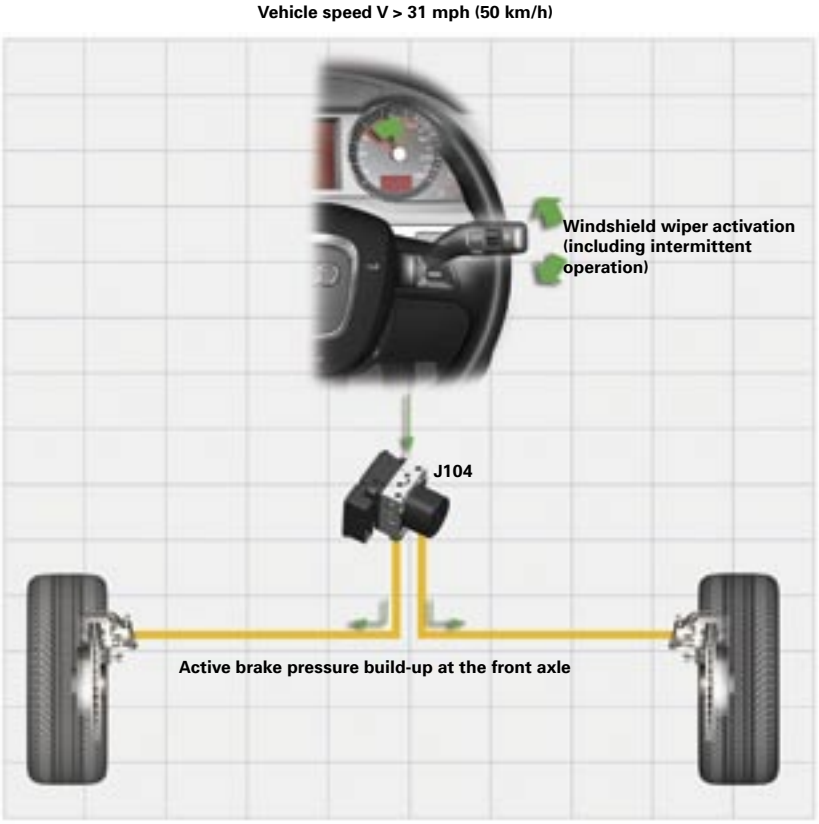
362_055

New Functions

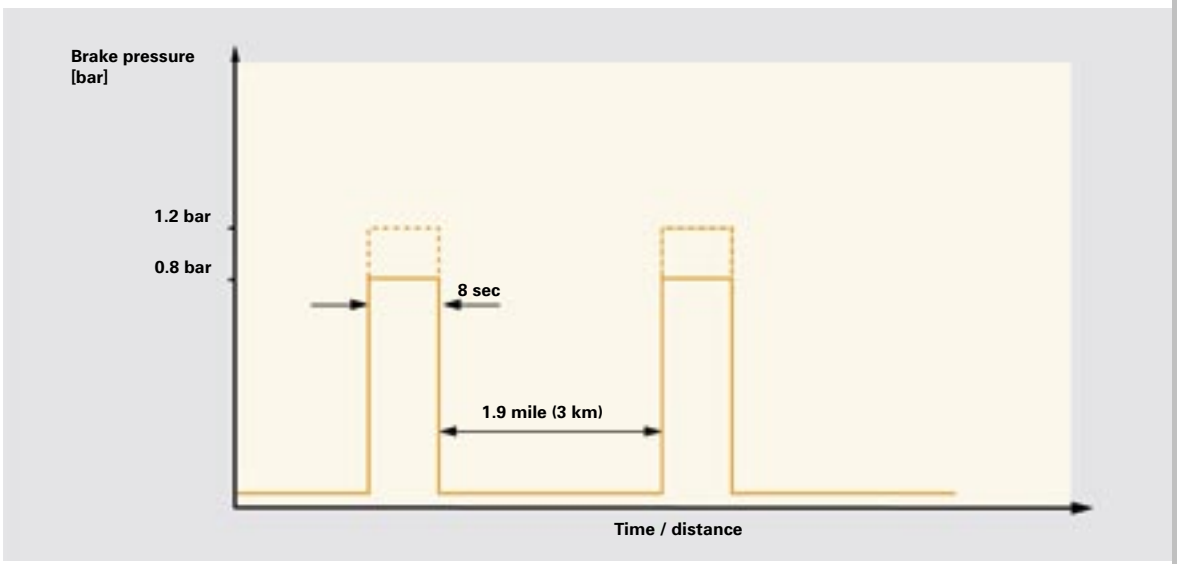
Brake Rotor Wiper

With a speed signal greater than 31 mph (50 km/h) and a windshield wiper command (including intermittent operation) active on the CAN bus, the front brake pads are applied about every 1.9 miles (3 km) by an ESP pump pressure of about 11-17 psi (0.8-1.2 bar) for a duration of approximately 8 seconds, in order to remove any water film from the brake rotors.

The function is not indicated to the driver. The function interval is reset every time the brake is applied.



362_056



362_066

New Functions

Off-road Mode

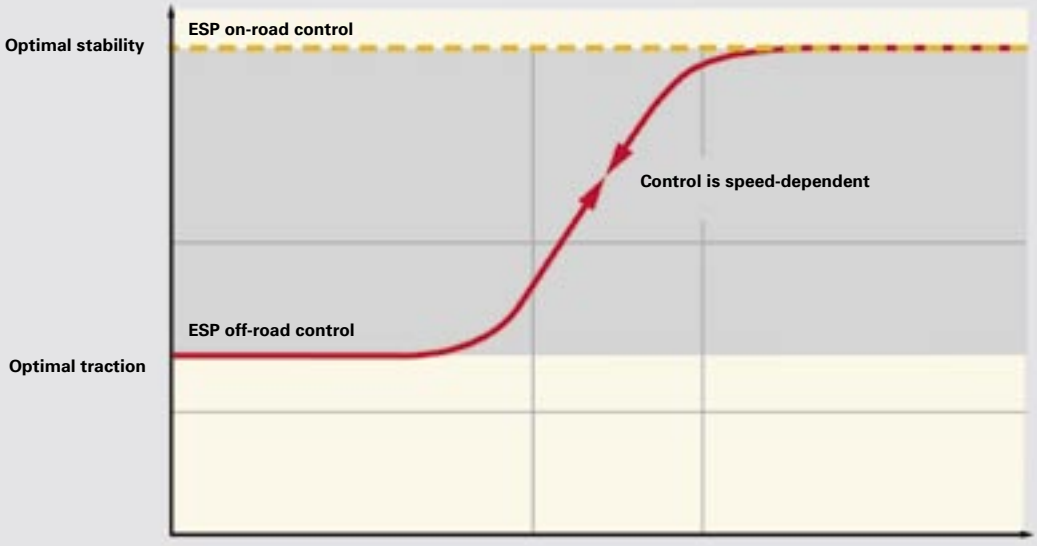
The basic function of this mode is to optimize ESP/ASR/EDL and ABS interventions with respect to traction and braking performance on a loose surface (off-road). The thresholds for activating ESP/ASR and ABS interventions vary according to the vehicle speed.

Greater wheel slip values are allowed until one of the control systems is activated.

The EDL function is activated at low differences in speed.



362_058



362_057

Activation:

This mode is activated by pressing the ESP button for more than 3 seconds.



362_059

Display:

The message “offroad” is displayed the Driver Information System, the yellow ESP warning light is activated.

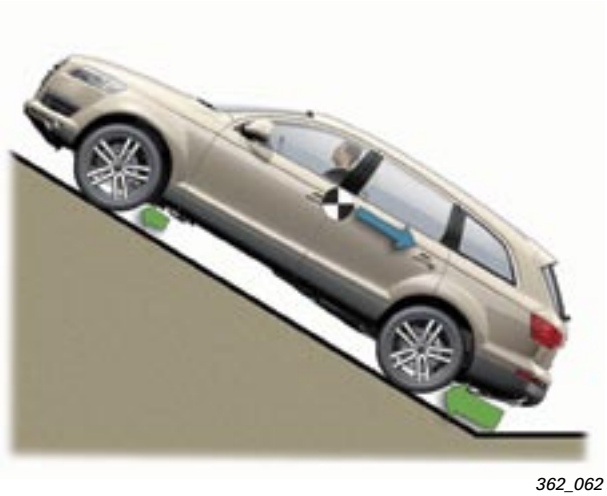


362_060

New Functions

– Activation of “ABS while reversing”

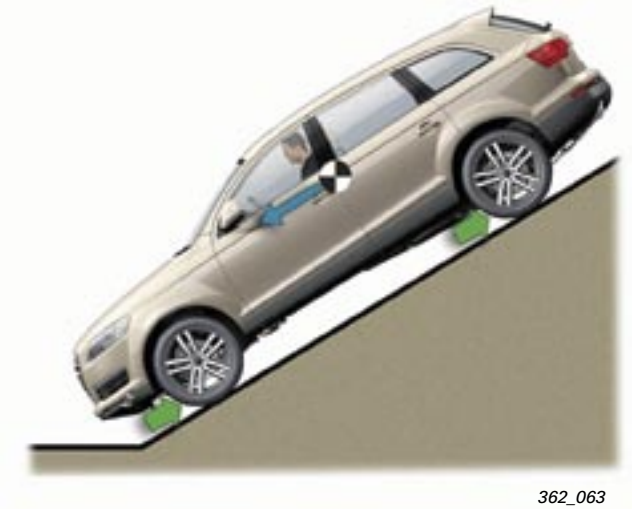
  If the vehicle rolls backwards on a slope, the rear axle would be braked less than the front axle as a result of EBD function. When reversing, the rear axle is treated as a front axle from a braking standpoint and brakes are applied more strongly on it.



362_062

– Activation of “hill descent assist”

  The hill descent assist helps the driver through brake activation on steeply sloping ground with grade angles of 10-15% at speeds up to 12 mph (20 km/h). The function is activated when different wheel speeds occur while driving down hill because of partially slippery ground or wheels lifting because of axle articulation on uneven ground. The goal is for the vehicle to descend the downhill stretch at a constant speed without driver intervention.



362_063

Note

It is not possible to switch off ESP in the Off-road mode by pressing the ESP button.

System components

Hydraulic Unit and Control Module

A larger size hydraulic pump is used for the hydraulic unit compared to the Mk 60. In conjunction with a more powerful electric motor, greater amounts of hydraulic fluid can be transferred in the same time. This is necessary because the brake calipers in the Audi Q7 have a much higher volume capacity.

The internal storage chambers are also increased in size compared to the Mk 60. The Control Module is, as usual, bolted to the hydraulic unit. The connector pinout is the same as that of the Mk 60 series.



362_052

Wheel Speed Sensors

Active speed sensors are used in the Audi Q7.

The benefit of these sensors is that they can detect forward/reverse motion as well as their installation position. These sensors operate based on the Hall effect principle.



362_080

Reference

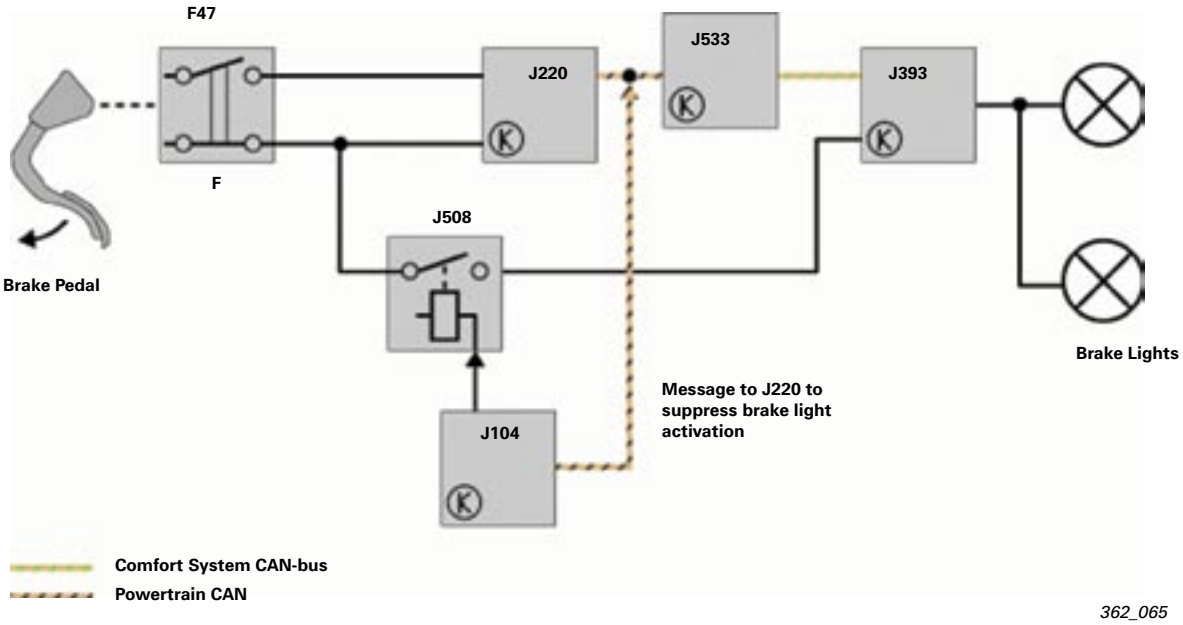
For more information on the design and operation, please refer to Chassis Systems SSP, 997303 for the Audi A8L

System Components

Brake Light Disable Relay

Activation of the Active Brake Booster solenoid produces minor movements of the Brake Pedal without action by the driver. This causes the Brake Light Switch to be actuated. The operation of the Brake Light Switch is read in by the Engine Control Module. The Engine Control Module requests the Comfort System Central Control Module J393 to activate the Brake Lights. In parallel, J393 receives the signal from the brake light switch on a discrete line.

The Comfort System Central Control Module J393 activates the Brake Lights if the CAN message and/or the discrete signal are present. The Brake Booster is also activated during corrective brake operation in which the brake light is not supposed to be activated. In these instances, the relay suppresses transmission of the discrete signal. The ESP Control Module switches the relay for this purpose and also communicates to the Engine Control Module that the Brake Lights should not be activated.



J220 Motronic Engine Control Module
J104 ABS Control Module
J533 Data Bus On Board Diagnostic Interface
J393 Comfort System Central Control Module
J508 Brake Light Disable Relay (ESP)
F47 Brake Pedal Switch
F Brake Light Switch

Note

The brake light suppression relay is not included in the system diagnosis.

Service Components

Service includes the following new procedures:

Control Module Encoding

The following information is encoded:

- Brake equipment
- Running gear version (Adaptive Air Suspension or conventional steel spring suspension)
- Engine version
- Trailer equipment (not available in the U.S.)

Final Control Diagnostic

In the last procedure of the Output Check Diagnosis, all the valves required for the EDL function and the ESP pump are activated. Brakes must be properly applied onto all the wheels of the vehicle when the system operates correctly.

Measured Value Blocks

The following readings have been implemented in addition to those from the Audi A6:

- Brake Pressure Release Solenoid F84 status (instead of brake light switch signal)
- Parking Brake status (foot-operated parking brake)

The Audi Q7 also checks the coding of the ESP Control Module by comparing the coding information with information stored in the Airbag Control Module. The information for the powertrain type and brake equipment are compared at each initialization (terminal 15 on).

Overview

Steering System

The steering system is a conventional system using a vane pump, rotary slide valve and rack and pinion steering gear. Depending on the engine installed, the steering pumps have different fluid volumes (11 cm^3/revolution for V6 engines, 14 cm^3/revolution for V8 engines).

Servotronic is standard. The Servotronic II system from the current Audi A8L is used. The Servotronic solenoid valve is actuated by the Vehicle Electrical System Control Module –2- J520.

Steering Column

An electrically adjustable steering column is used on the Audi Q7. The electrical drives are carried over from the Audi A8L.

The steering columns on the Audi Q7 are equipped with electric steering column locks.

The design and function of the steering column lock are identical to those of the steering column used in the Audi A6. For purposes of anti-theft protection, the entire structural unit on the Audi Q7 is mounted in such a way that it cannot be separated from the steering column.



362_034a

Wheels



Engines	Base wheels	Optional 18" wheels	Optional 19" wheels	Optional 20" wheels	Winter wheels
6-cylinder	7.5J x ET 53 (1) Aluminum forged wheel painted 235/60 R 18	8J x 18 ET 56 (3) Aluminum forged wheel polished 255/55 R 18	8.5J x 19 ET 62 (5) Aluminum cast wheel painted 265/50 R 19	9J x 20 ET 60 (6) Aluminum cast wheel polished bicolor 275/45 R 20	7.5 J x 18 ET 53 (1) Aluminum cast wheel painted 235/60 R 18
8-cylinder	8.5 x 18 ET 56 (2) Aluminum forged wheel painted 255/55 R 18 (available as extra equipment for 6-cylinder)	8.5 J 18 ET 58 (4) Aluminum cast wheel painted 255/55 R 18			

Not all wheel and tire combinations will be available in the North American market. Please check the ordering guides for the latest information.

362_035

Tire Pressure Monitoring System

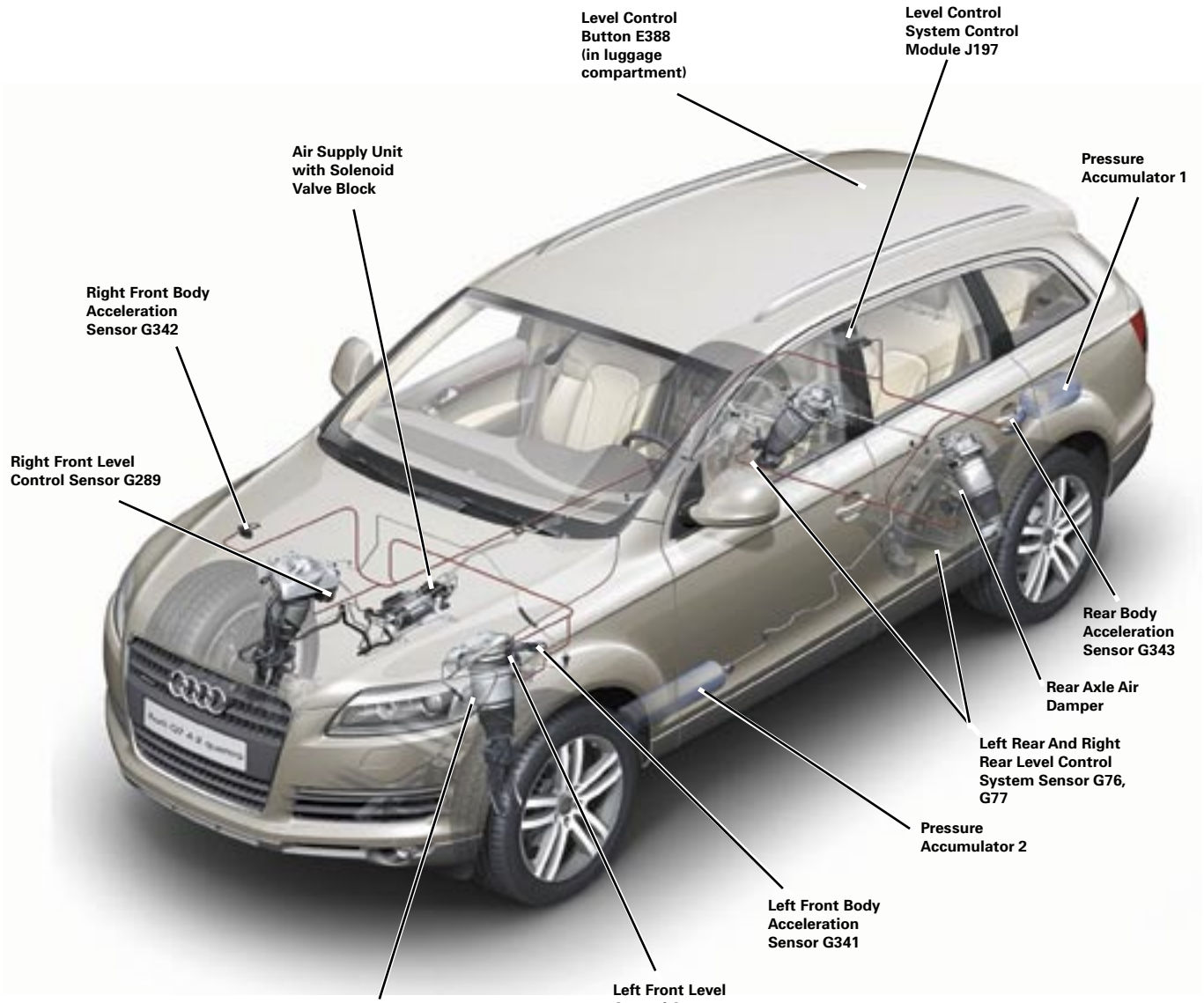
A Tire Pressure Monitoring system is available as an option for the Audi Q7. Its design and function are similar to those of the system used in the 2005 Audi A6.

Reference

For more information about the Tire Pressure Monitoring System used on the Audi Q7, please refer to Self-Study Program 993403, The 2005 Audi A6 Running Gear, pages 45 through 47.

Overview

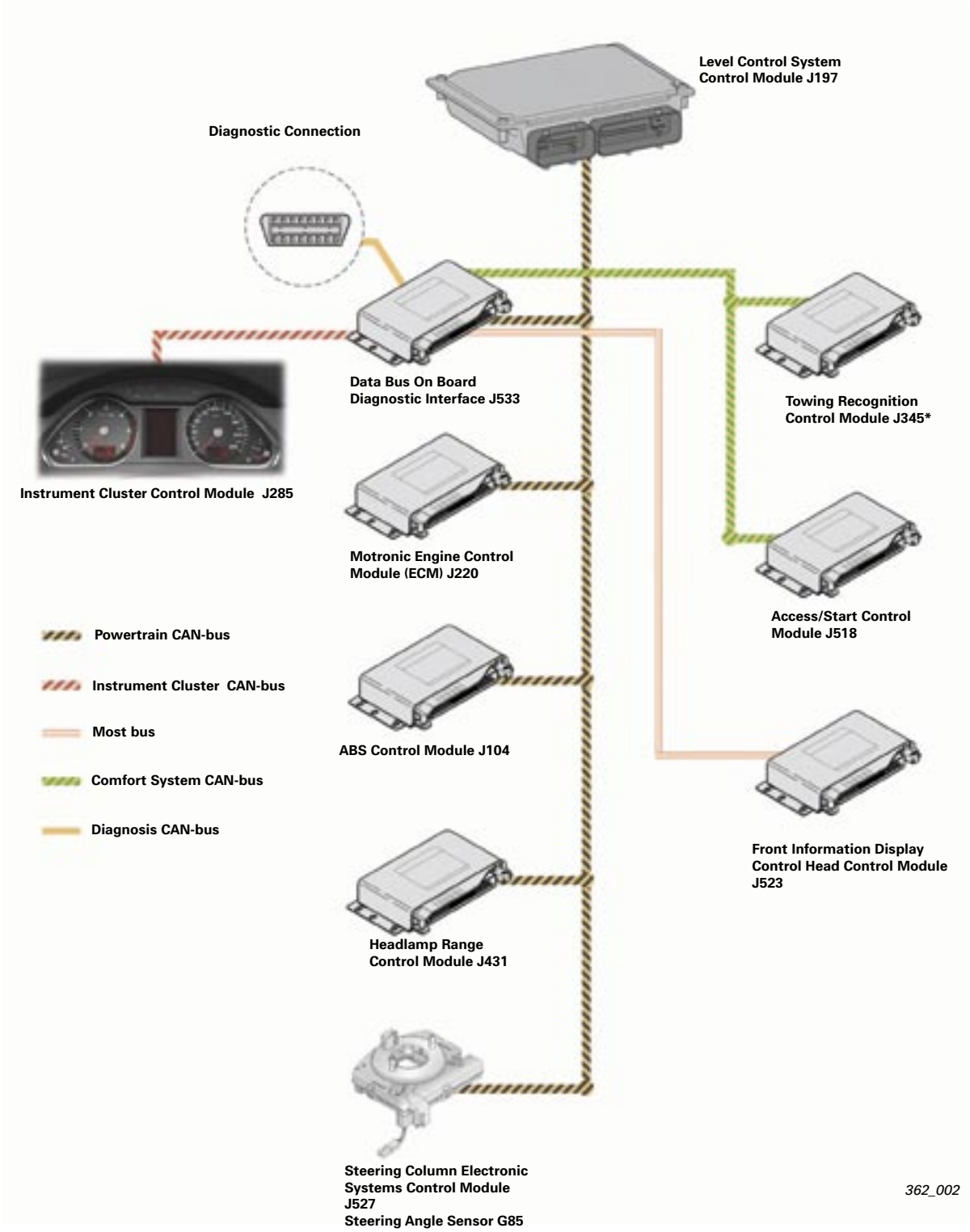
With the exception of the springs and dampers, the axle components are the same as those of the steel spring suspension. The PR number for the AAS is BK.



362_001

Overview

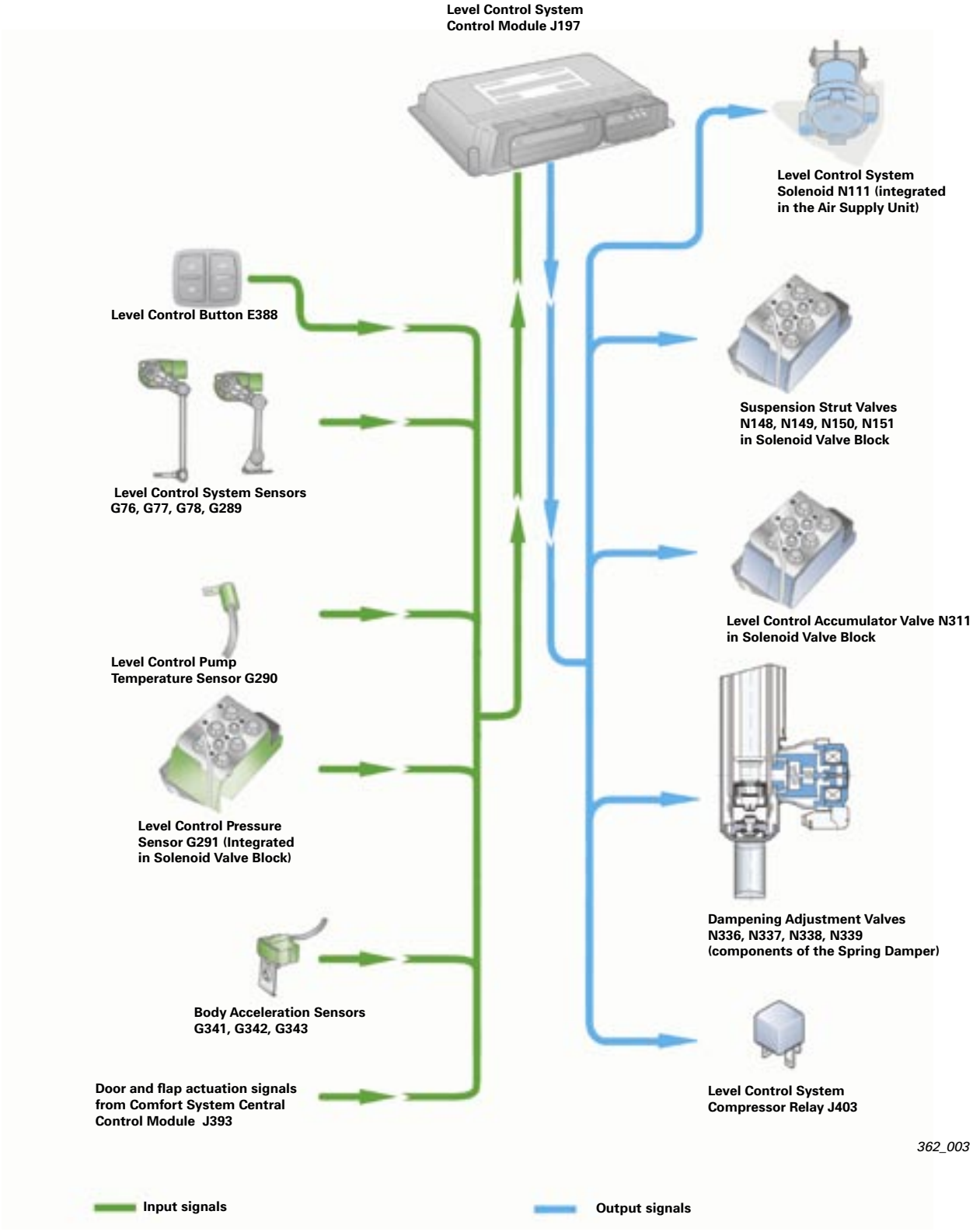
System Overview of Networked Components



*Trailer towing equipment information was not available at the time of publication. Please consult the appropriate repair manual for the latest information.

Overview

System Overview of Non-Networked Components



Overview

Design differences vs. the Adaptive Air Suspension system of the Audi A6

- Two pressure accumulators are used instead of one
- The air supply lines have a larger cross-section (Ø8mm instead of Ø6mm)
- All air lines are molded parts and are not routed in the wiring harness
- The design of the system components is partially modified (due to a different supplier)

Operational Differences vs. the Adaptive Air Suspension system of the Audi A6

- Additional “off-road” mode
- Additional lowering of the rear axle by 1.77 in (45 mm) below normal level for easier loading
- Modified control strategy
- Modified operational and display elements

System Components

Level Control System Control Module J197

The Control Module is located in the rack on the right side of the luggage compartment. From the input signals, the Control Module determines the signals required to activate the damper valves, the compressor, the pneumatic switching valves and the driver information displays.

The geometry and design of the Control Module are identical to those of the Control Module used in the Audi A6.

An additional signal, compared to those of the Audi A6 and A8L, is the signal coming from the Level Control Button E388 in the luggage compartment for lowering the rear of the vehicle in the loading mode.



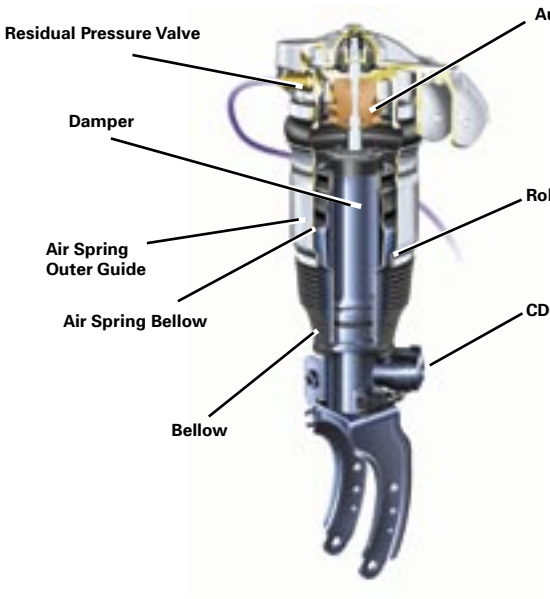
362_004

System Components

Air Spring Dampers

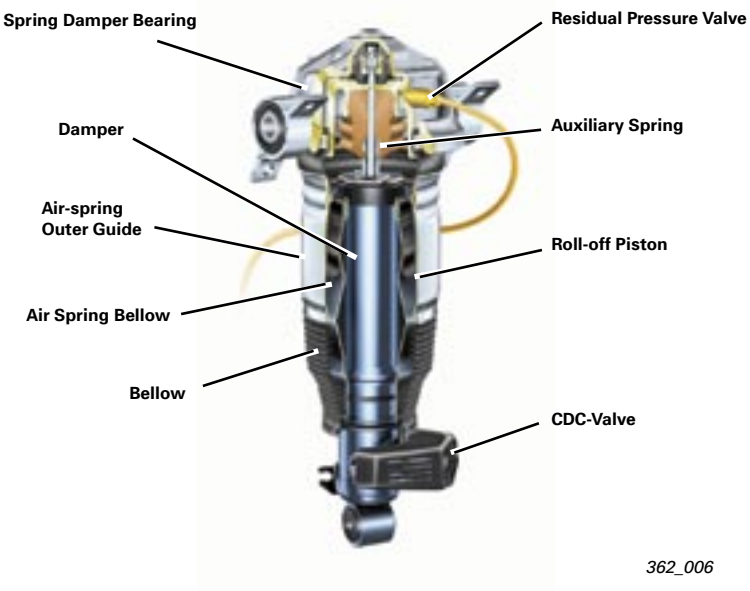
Air spring dampers are used on the front and rear axles of the Audi Q7. There is no separate spring-damper arrangement as on the Audi A6. The roll-off piston geometry and the damper settings were modified for use in the Audi Q7.

The Residual Pressure Valves ensures that a minimum pressure of about 50 psi (3.5 bar) is maintained in the air springs even if there is a serious leak in the system.



362_005

Rear Axle Air-Spring Damper



362_006

System Components

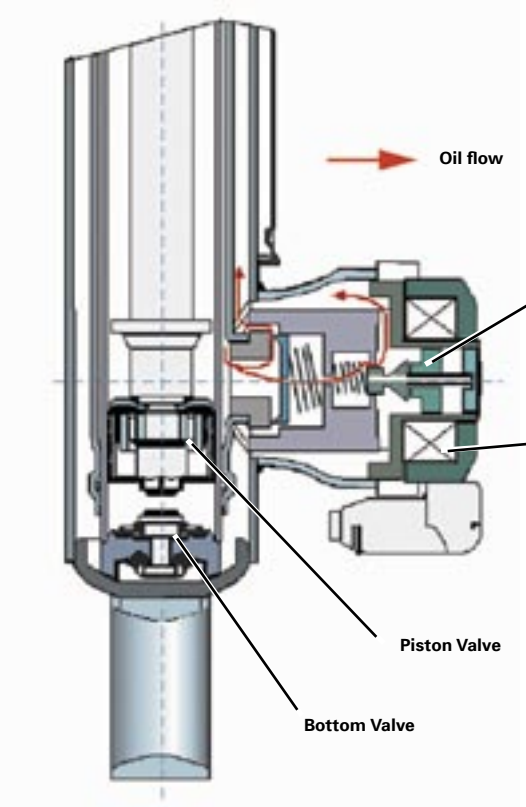
Air Spring Damper CDC Valve

Damping is controlled by a CDC valve (Continuous Damping Control). The valve is mounted externally on the damper tube.

Operation

If the CDC valve is not energized, the slide valve and the cylinder are locked by spring forces in the illustrated position. In this position, damper oil can flow through a defined cross-sectional port from the piston chamber into the compensating chamber (=medium damping force).

The Armature is shifted by applying current to the Magnetic Coil. This changes the opening cross-sections for the damper oil. Large cross sections with therefore low damping forces are achieved with low activation currents (starting at 600 mA). When higher activation currents are applied (from about 1000 mA to about 2000 mA) higher damping forces are applied.



362_008

Note

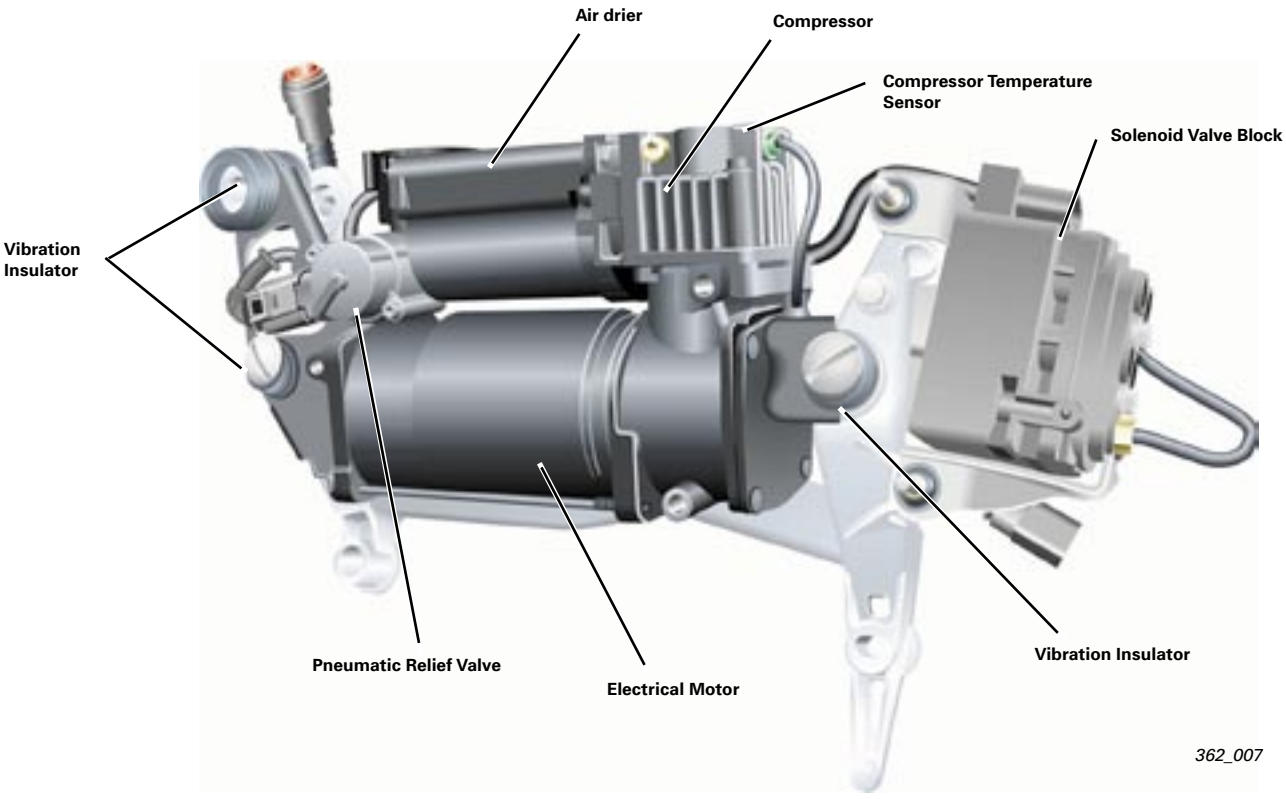
In the event of a system failure, the valve is de-energized. As a result, the dampers are set to medium settings and the vehicle remains stable.

System Components

Air Supply

The air supply unit is installed together with the Solenoid Valve Block on a common bracket, on the vehicle floor, on the right front side of the vehicle.

The maximum system pressure is 240 psi (16.5 bar). The maximum Compressor operating time is determined by its temperature, which is monitored constantly by a sensor as in the Audi A6 and A8L.

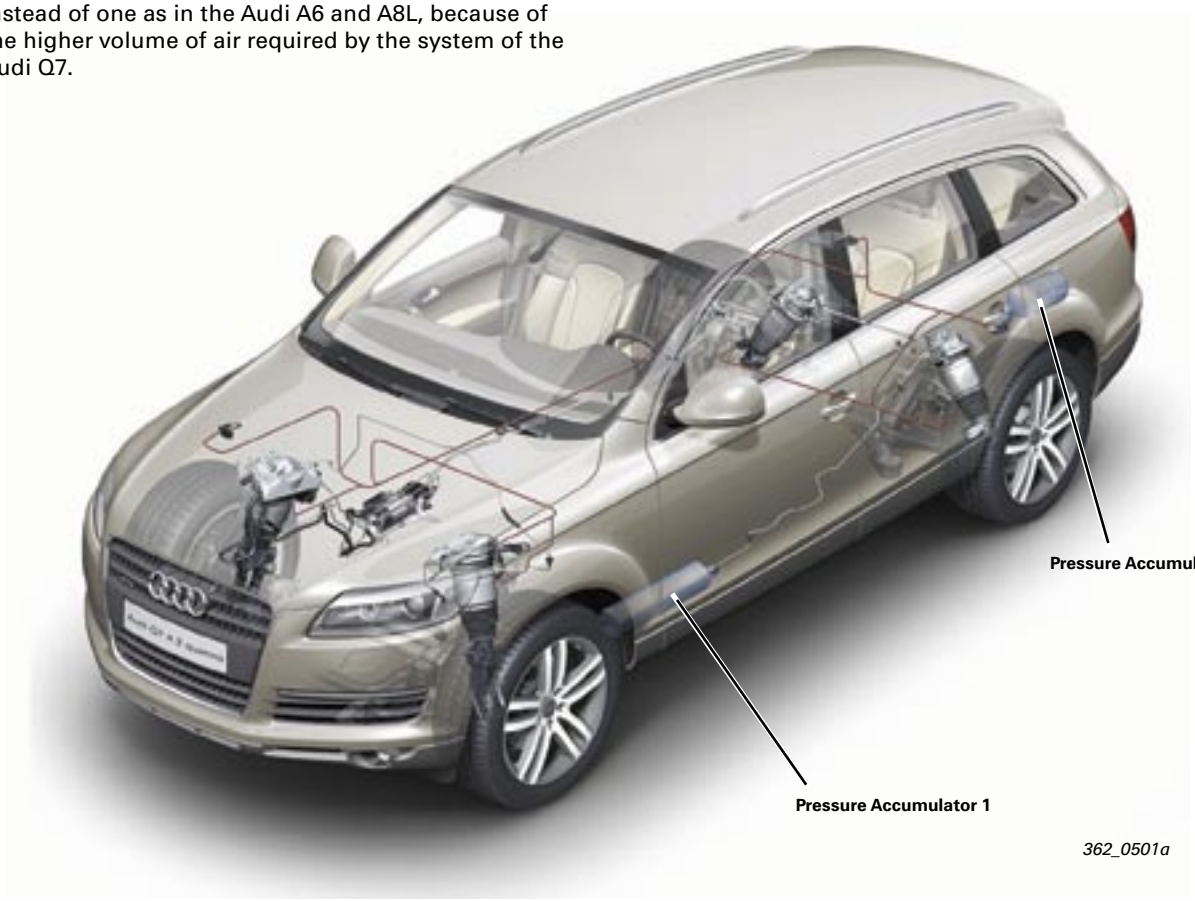


System Components

Pressure Accumulators

The Pressure Accumulators have the following functions:

- Implementation of the vehicle controls (raising the vehicle level) without activating the compressor, thereby reducing the internal noise level, reducing the compressor temperature, and therefore, increasing the availability of the compressor.
- Correction of the vehicle level after occupants exit the vehicle, after 2, 5 and 10 hours as required.
- In the Audi Q7, two pressure accumulators are used instead of one as in the Audi A6 and A8L, because of the higher volume of air required by the system of the Audi Q7.



The pressure accumulators are made of aluminum. The volumes of the front and rear accumulators are 5.2 liters and 4.8 liters respectively. In order to perform a level control with the accumulators, the air pressure in the accumulators must be 43 psi (3 bar) higher than the air pressure in the associated air spring.

The compressor will start and fill the accumulators under the following conditions:

- accumulator pressure drops to approximately 178 psi (12.3 bar) while the system is active and the engine is running and the vehicle speed is higher than 22 mph (35 km/h.)

System Components

Sensors

The vehicle level and the acceleration of the unsprung masses are measured by the vehicle level sensors, as in the Audi A6 and A8L.

Four of these sensors are used on the Audi Q7. They can be monitored through the Measuring Value Blocks using the VAS Scan Tools.



362_079

The acceleration of the vehicle body (acceleration of the sprung masses), is measured by the body acceleration sensors, like in the Audi A6 and A8L.

Two sensors are installed at the front of the vehicle. One in each front wheel housing. A third sensor is located in the rear of the vehicle, in the luggage compartment, on the left side of the spare tire well.



362_077

Vehicle Ride Heights

"Automatic" Mode

In this mode, the vehicle is at its basic height. The damper setting is a compromise between comfortable and sporty and is therefore an optimum setting for most driving situations on paved roads.

"Comfort" Mode

The vehicle is at its basic height, the damper setting is comfort oriented.



362_015

"Lift" Mode

The vehicle is 2.36 in (60 mm) higher than in "automatic" mode, with the same spring and damper settings as in the "automatic" mode.

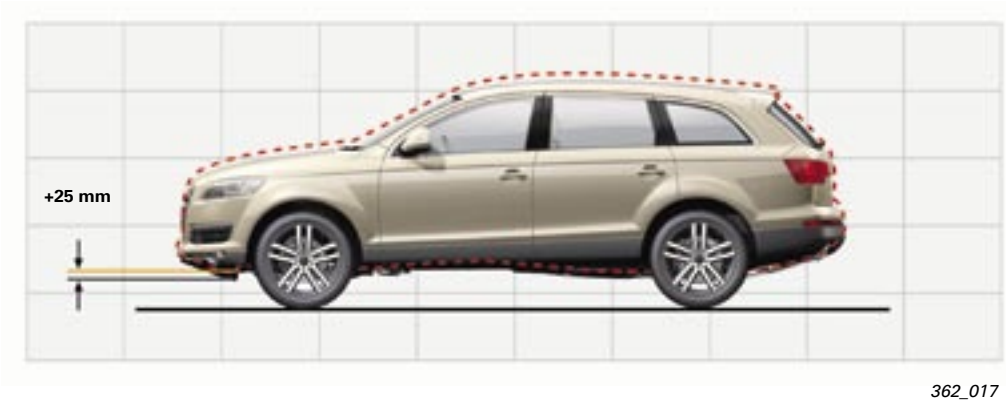


362_016

Vehicle Ride Heights

“Off-road” Mode

The vehicle is 1 in (25 mm) higher than in “automatic” mode. Numerous ESP functions for improving traction (refer to ESP) are automatically activated. This mode was developed especially for off-road operation.



362_017

“Dynamic” Mode

The vehicle is .6 in (15 mm) lower than in “automatic” mode. The damper control is set to sporty driving.



362_018

“Loading” Mode

In order to improve the vehicle’s ergonomic loading characteristics, the vehicle rear end is lowered by 1.77 in (45 mm) at the rear axle. It is not possible to drive the vehicle in this mode.



362_019

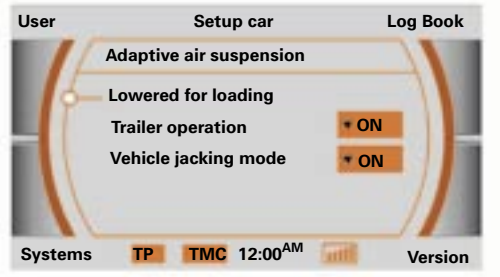
Vehicle Levels - Modes

“Loading” Mode

The “loading” mode allows the rear of the vehicle to be lowered to make loading of objects into the luggage compartment easier. The “loading” mode can be activated with the MMI or the button at the rear of the vehicle.

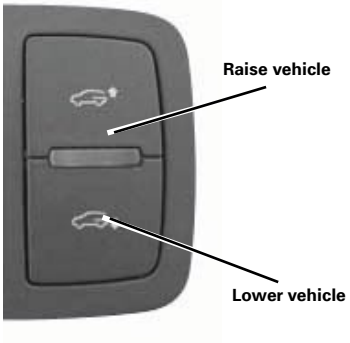
This function:

– Can only be activated with the MMI if all the doors are closed.



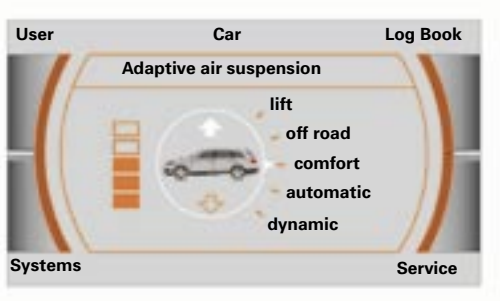
362_020

– Can only be activated by the button on the right hand side of the luggage compartment when all the vehicle doors are closed and the tailgate is open.



362_021

In order to clearly identify when the vehicle is in an active loading mode, the vehicle symbol (illustration on the right) is replaced by the illustration shown below.



362_027

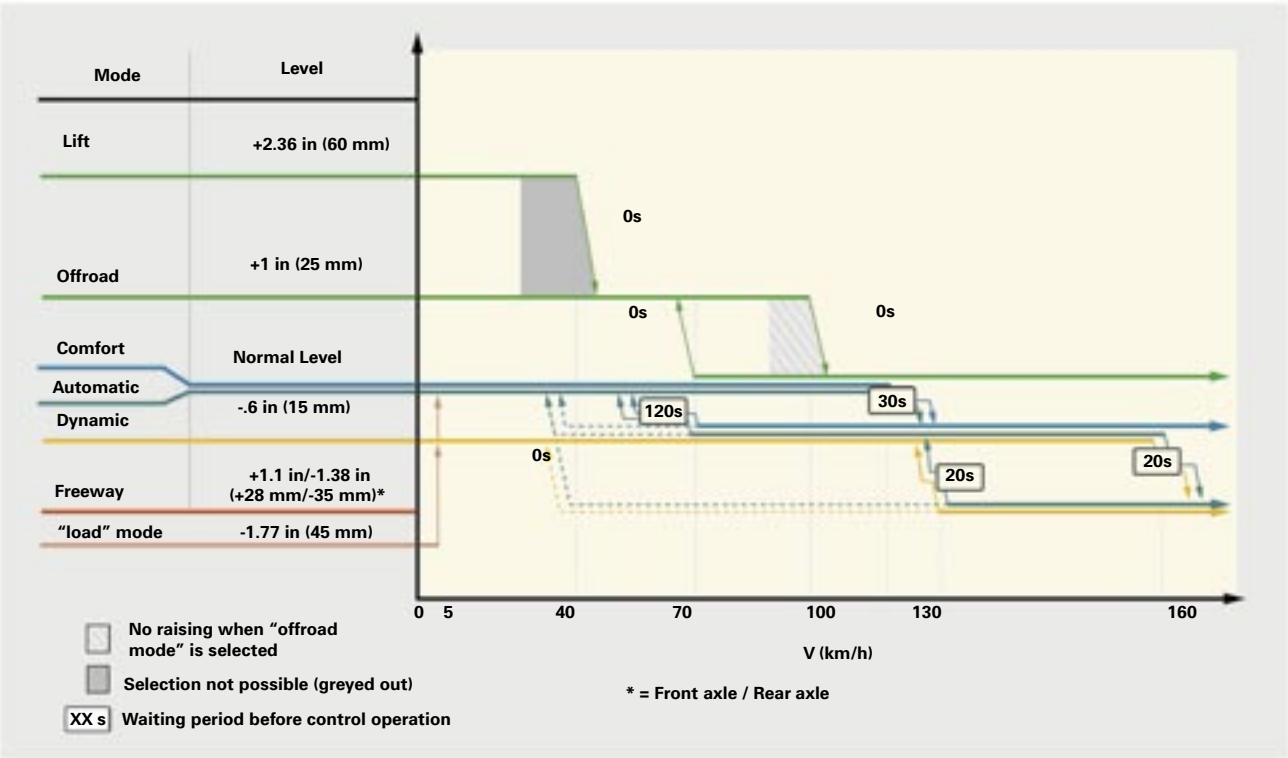
No bars are displayed since the loading level is below the level for vehicle operation.



362_023

Control Characteristics

Control Characteristics without trailer



362_024

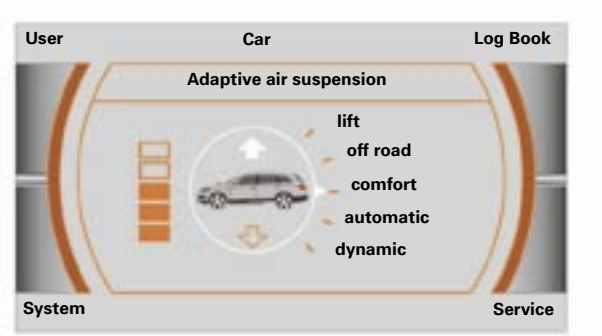
Operation and Displays

Like in the A8L, the Adaptive Air Suspension is operated using the CAR and SETUP buttons and the MMI control knob.



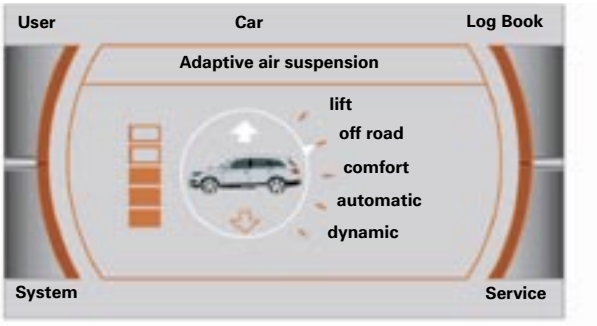
362_026

A new component of the display in the MMI is the additional indicator bar at the left of the vehicle icon. It shows the current vehicle level.



Display in vehicle equipped with MMI

362_027



362_028

Operation and Displays

A new feature is the temporary display in the center of the instrument panel insert.

The activations of the indicator bar, the target marker and the control arrow are similar to those on the MMI display.

This display can be selected manually with the Reset button on the windshield wiper lever.



Display in vehicle equipped with highline instrument cluster

362_029

The display is shown automatically when:

- the Off-road mode is selected
- the Lift mode is selected\

Note

The lift mode is exited automatically when the speed threshold is exceeded.

Like in the Audi A6 and A8L, there are two warning lights in the instrument panel insert. They indicate the following conditions:

Yellow warning light (continuous):

- in load mode
- in vehicle jacking mode (level control switched off)
- in the event of system faults
- vehicle is extremely high (when the vehicle is more than 3.15 in (80 mm) above normal level, the warning light flashes)
- during final control test and basic adjustment in service workshop

Green light:

- loading level activated
- dynamic driving mode was selected (display duration about 15 secs.)
- under extreme vehicle load, more than 1 in (25 mm) below normal level (except in “dynamic” mode)

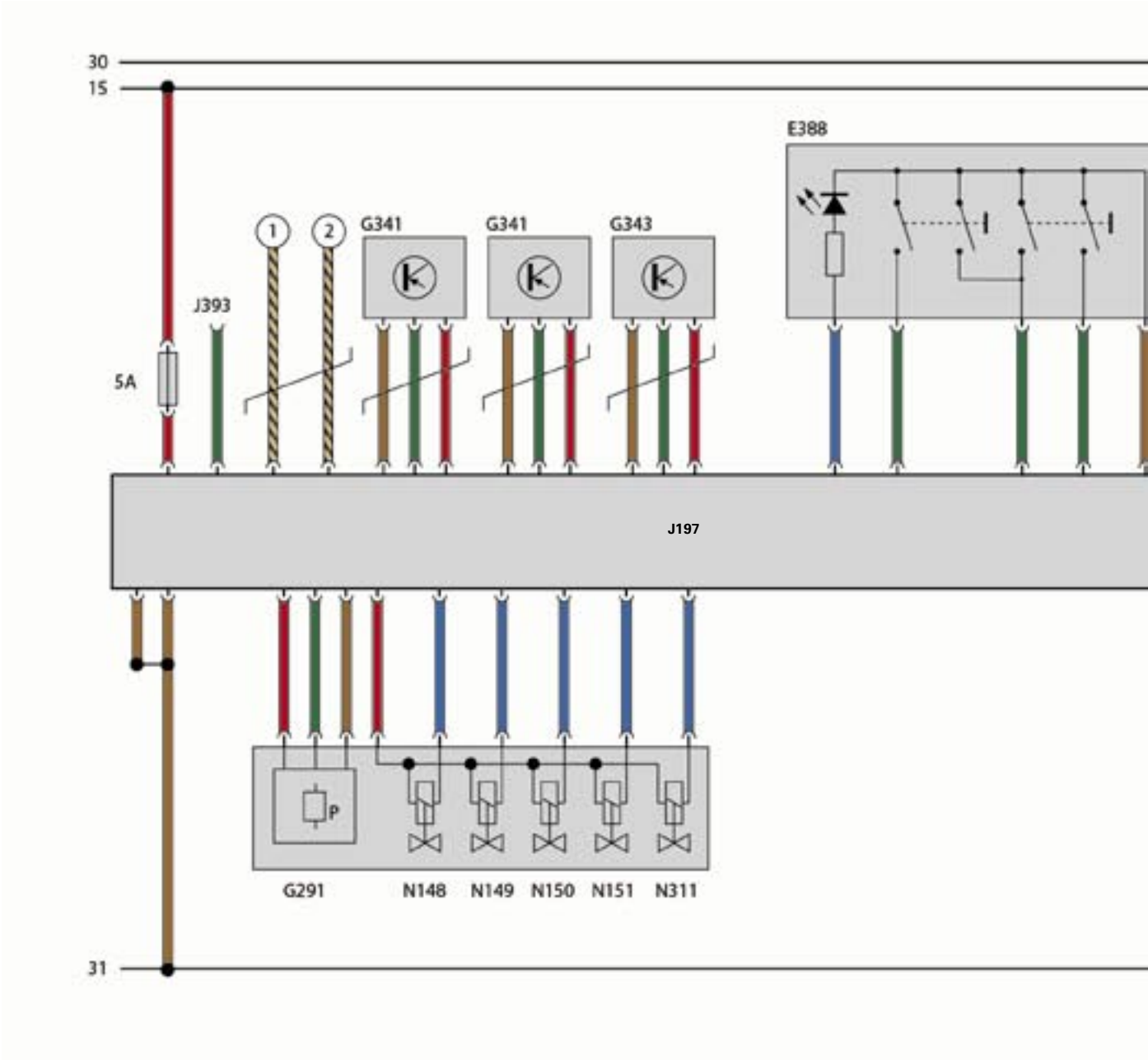
Both lamps (flashing):

- vehicle extremely heavily loaded (more than 2.56 in (65 mm) below normal level)



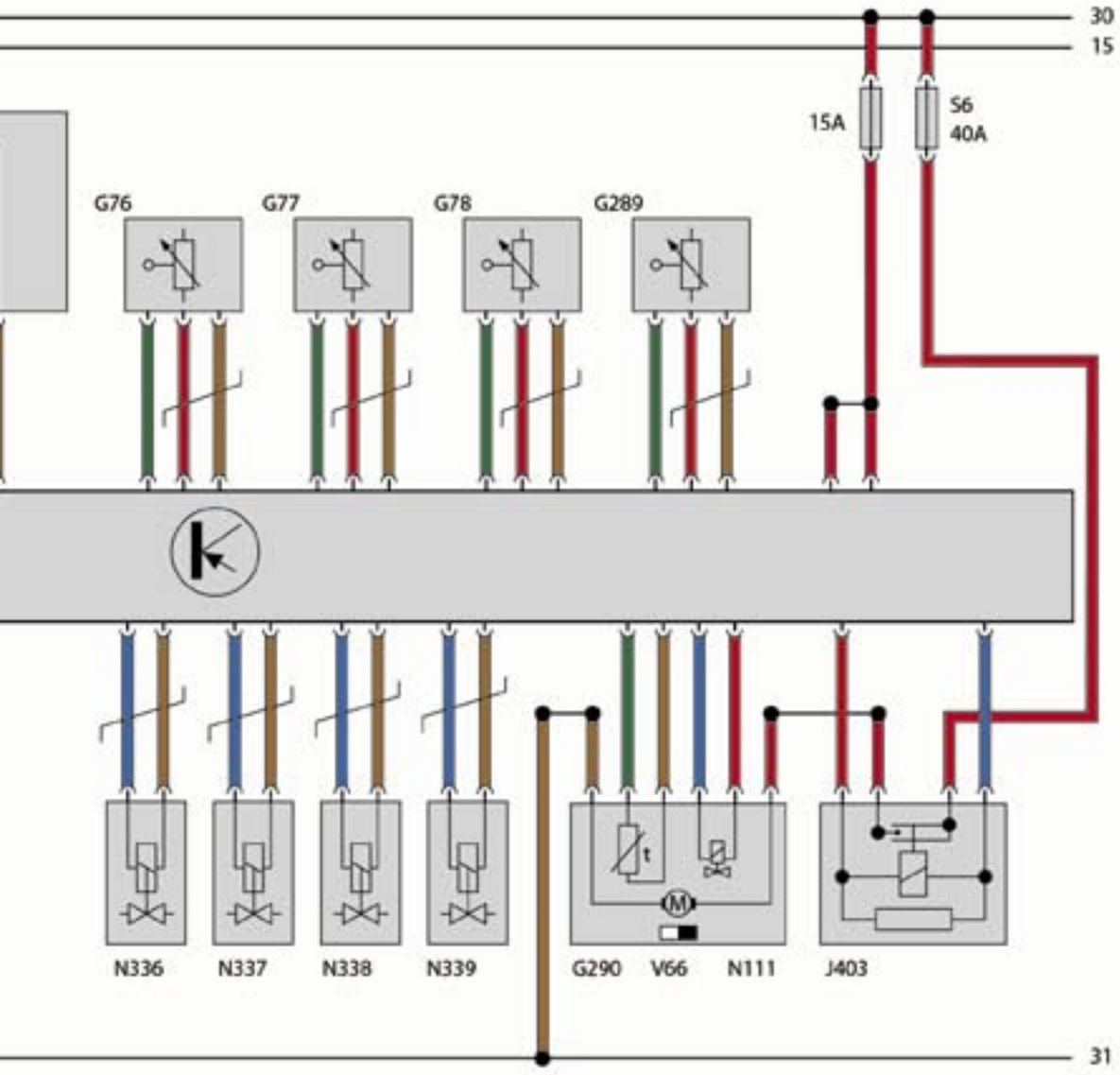
362_031

Function diagram



J197 Level Control System Control Module
G76 Left Rear Level Control System Sensor
G77 Right Rear Level Control System Sensor
G78 Left Front Level Control System Sensor
G289 Right Front Level Control Sensor
G290 Level Control Pump Temperature Sensor
G291 Level Control Pressure Sensor
J393 Comfort System Central Control Module
G341 Left Front Body Acceleration Sensor
G342 Right Front Body Acceleration Sensor
G343 Rear Body Acceleration Sensor
J403 Level Control System Compressor Relay

N111 Level Control System Solenoid
N148 Left Front Suspension Strut Valve
N149 Right Front Suspension Strut Valve
N150 Left Rear Suspension Strut Valve
N151 Right Rear Suspension Strut Valve
N311 Level Control Accumulator Valve
N336 Left Front Dampening Adjustment Valve
N337 Right Front Dampening Adjustment Valve
N338 Left Rear Dampening Adjustment Valve
N339 Right Rear Dampening Adjustment Valve
V66 Level Control System Compressor Motor
E388 Level Control Button

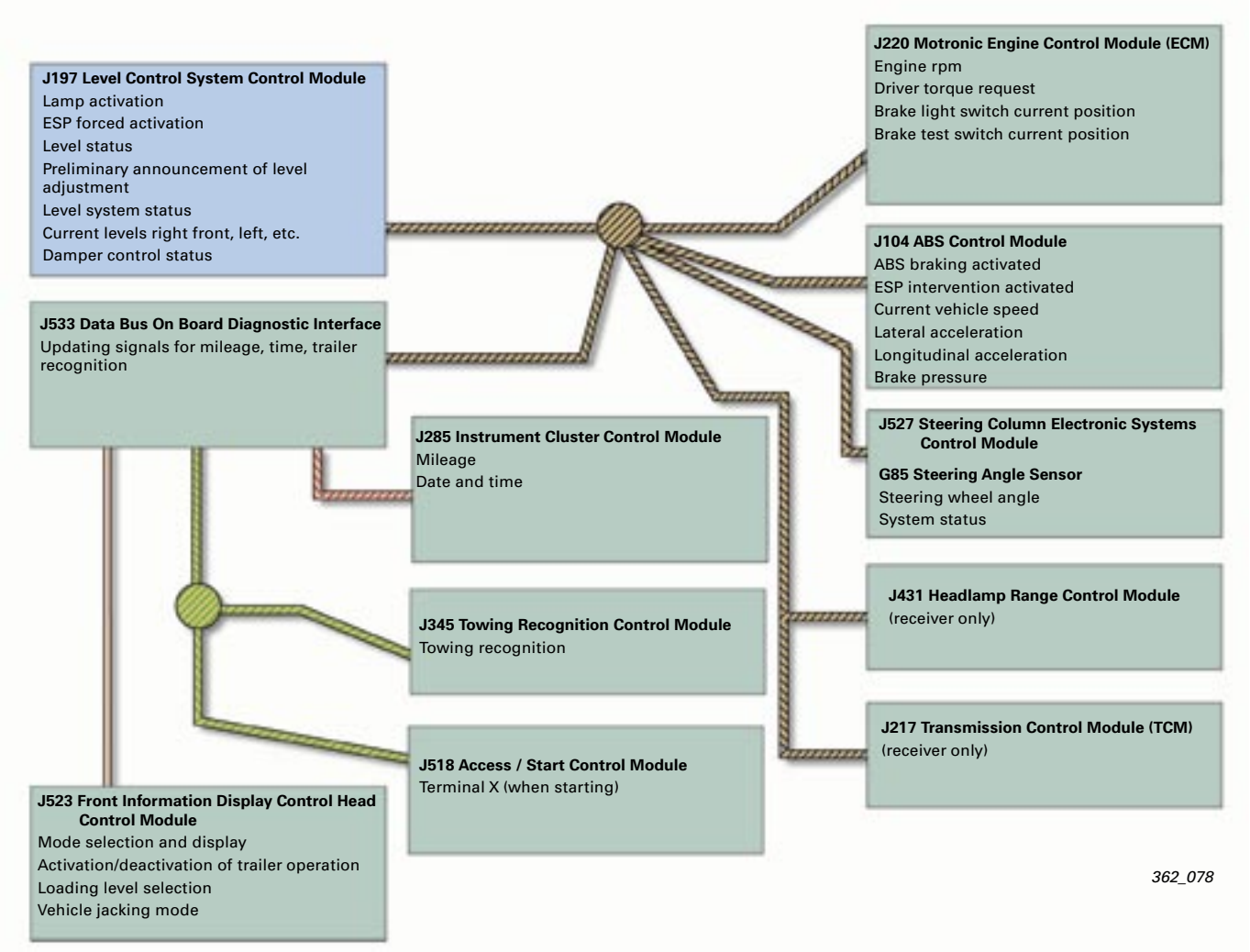


362_033

Color Coding

- Input Signal
- Output Signal
- + Power Supply
- Ground
- CAN bus
- (1) CAN-high
- (2) CAN low

CAN Information Exchange



Powertrain CAN-bus

Instrument Cluster CAN-bus

Comfort System CAN-bus

Most bus

Information sent by J197

Information received by J197

Service Procedures

The following are new service procedures:

1. Level Control System Control Module J197 encoding

When exchanging or flashing a control module, it must be encoded before a system initialization can be performed.



362_068

2. Output Check Diagnosis:

The pressure accumulator test is now performed with a display of temperature and pressure readings.

The warning lights are no longer activated.

3. System initialization:

The learning of vehicle heights is now performed in a modified procedure.



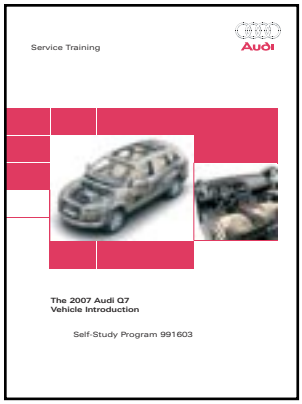
362_067

Notes

The following Self Study Programs are applicable to the Audi Q7:

– SSP 991603 The Audi Q7 Vehicle Introduction
– SSP 992603 The Audi Q7 Running Gear
– SSP 993603 The Audi Q7 Power Transmission
– SSP 994603 The Audi Q7 Electrical System
– SSP 996603 Driver Assistance Systems

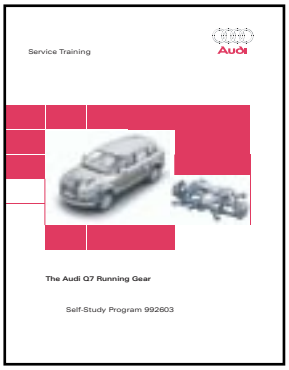
SSP 991603 The Audi Q7 Vehicle Introduction



– Body
– Passenger protection
– Engine
– Running Gear
– Electrical
– Air conditioning
– Infotainment

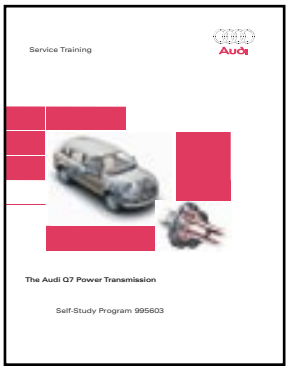
Order number: A04.5S00.14.00

SSP 992603 The Audi Q7 Running Gear



– Front axle
– Rear axle
– ESP braking system
– Steering systems

Order number: A05.5S00.15.00



SSP 993603 The Audi Q7 Power Transmission

– Automatic transmission
– Manual transmission
– Torsen differential
– Rear wheel drive

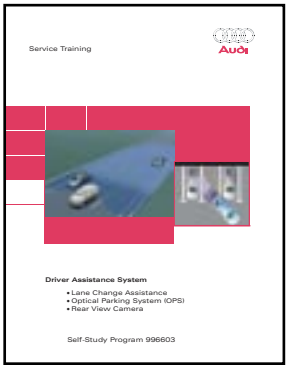
Order number: A05.5S00.16.00

SSP 994603 The Audi Q7 Electrical System



– Networking
– Bus topologies
– Comfort electrical system
– Infotainment

Order number: A04.5S00.09.00



SSP 996603 Driver Assistance Systems

– Lane change assistance (SWA)
– Optical Parking System (OPS)
– Rear View Camera

Order number: A05.5S00.21.00

Notes

Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this SSP.

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

You can find this Knowledge Assessment at:

www.accessaudi.com

From the accessaudi.com homepage:

- Click on the “ACADEMY” Tab
- Click on the “Academy Site” Link
- Click on the ”CRC Certification” Link

For assistance, please call:

Audi Academy

Learning Management Center Headquarters

1-877-AUDI-LMC (283-4562)

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

Vorsprung durch Technik www.audiusa.com

992603

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

Audi of America, Inc.
3800 Hamlin Road
Auburn Hills, Michigan 48326