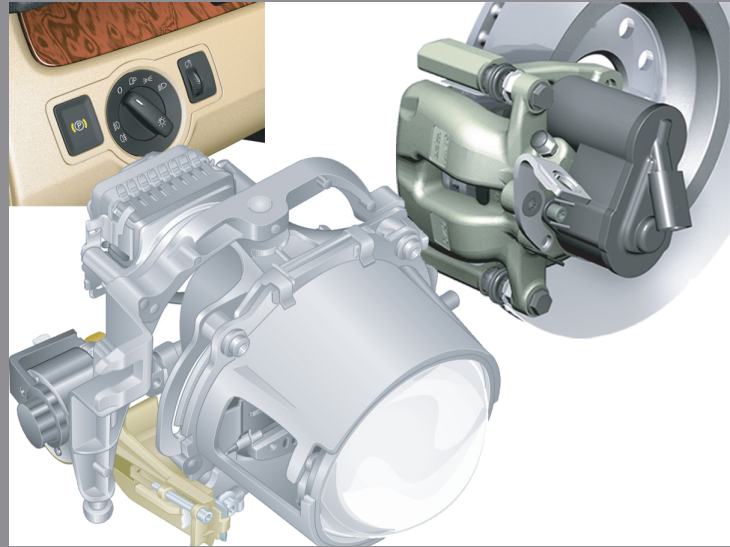


2005 Volkswagen New Technologies



**Self-Study Program
Course Number 801503**



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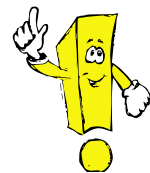
Always check Technical Bulletins and the latest electronic repair information for information that may supersede any information included in this booklet.

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New!



Important/Note!



This Self-Study Program covers some systems of the 2006 Passat.

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

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

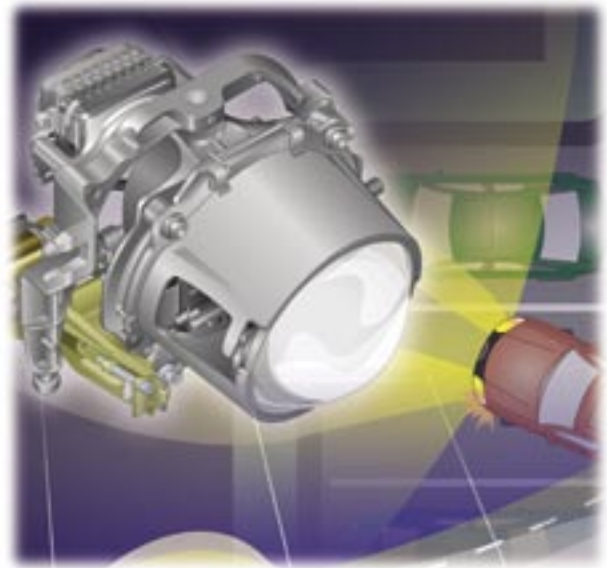
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New Technologies

This Self-Study Program focuses on new features found on the 2006 Passat.

These new features include:

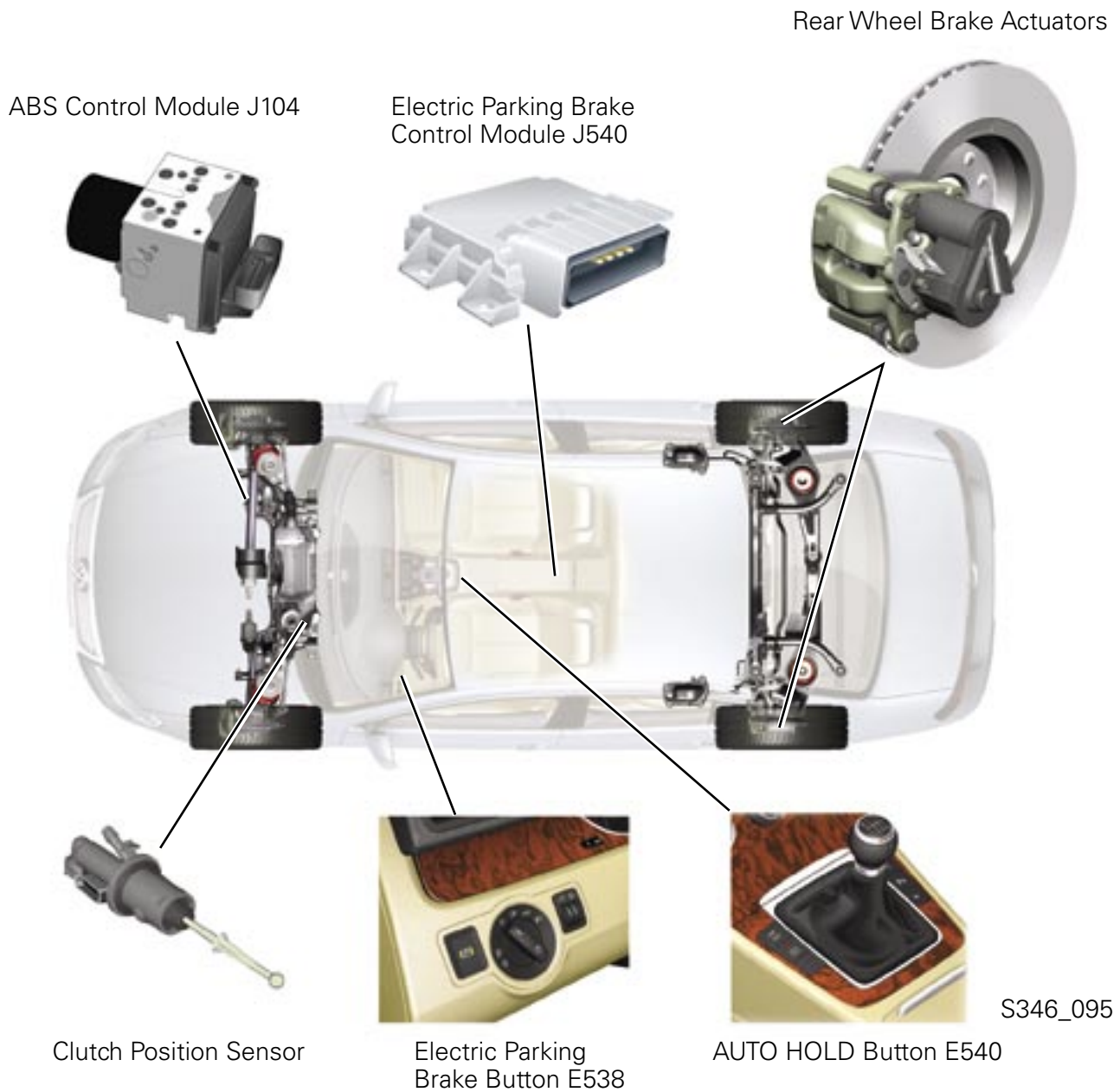
- Electric Parking Brake
- Adaptive Front Lighting System



Electric Parking Brake Overview

Introduction

This section provides detailed information on the electric parking brake. Topics covered include: system overview, components, operation, special features, CAN networking, and operational diagram.



Electric Parking Brake Overview

Electric Parking Brake Features

The electric parking brake offers many advantages over the mechanical hand parking brake. Significant advantages include:

- **Greater interior design freedom**
The hand brake lever is replaced by a button. This allows greater freedom when designing the interior, the center console and the footwell area
- **More customer features**
Through the use of electronic controls and CAN networking, the electric parking brake can integrate with the AUTO HOLD function
- **Production advantages**
The elimination of the hand brake lever and hand brake cables allow simplification of the production and assembly process
- **Self-diagnosis capability**
The electric parking brake system can be monitored constantly

A Comparison of a Hand Parking Brake and the Electric Parking Brake

	Hand Parking Brake	Electric Parking Brake
Setting	Pull hand brake lever	Press button
Releasing	Release hand brake lever	Apply brake pedal and press button
Stop and Go	Continuous setting and releasing the parking brake or continuous operation of the foot brake	When AUTO HOLD is selected, the vehicle is automatically held at each stop.

Electric Parking Brake Operation

Electric Parking Brake Operation

The electric parking brake system provides the following modes of operation:

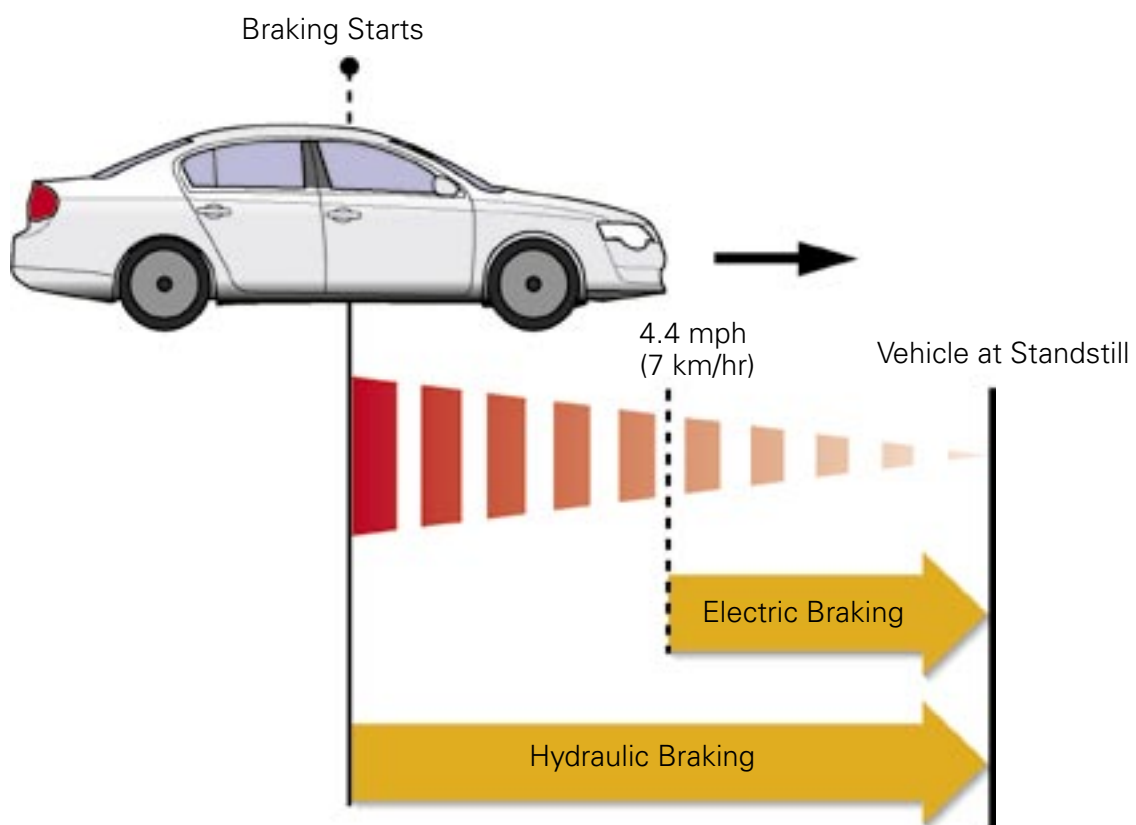
- Parking brake
- Emergency brake
- AUTO HOLD

Depending on vehicle speed when the brakes are applied, a distinction is made between static braking (vehicle speed less than 4.4 mph [7 km/hr]) and dynamic braking (vehicle speed greater than 4.4 mph [7 km/hr]).

Static braking applies and releases the parking brake electrically.

Dynamic braking slows the vehicle via ABS/ESP, meaning the brakes are applied hydraulically.

The electric parking brake's modes of operation are explained in greater detail on the following pages.



S346_088

Electric Parking Brake Operation

Parking Brake Operation

The electric parking brake provides safe parking on grades of up to 30 percent. The electric parking brake is applied by pressing the Parking Brake button. The electric parking brake is released by pressing the brake pedal, holding it, then pressing the Parking Brake button.

Apply

The electric parking brake can be applied at any time even when the ignition is OFF.

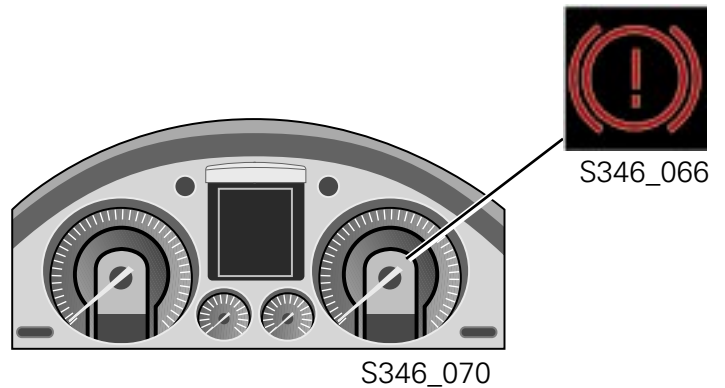
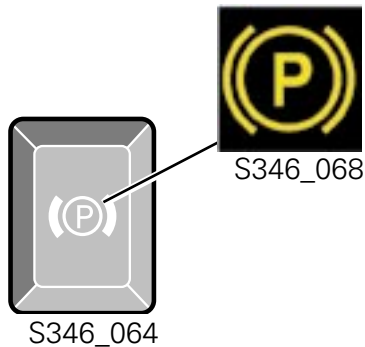
When the parking brake is applied with the ignition ON, the indicator light in the electric parking brake button and the indicator light for the brake light both come ON.

If the electric parking brake is applied with the ignition OFF, both indicator lights come ON for 30 seconds and then go OFF.

Release

The electric parking brake can only be released with the ignition ON.

The electric parking brake releases when the brake pedal and the electric parking brake button are pressed at the same time.



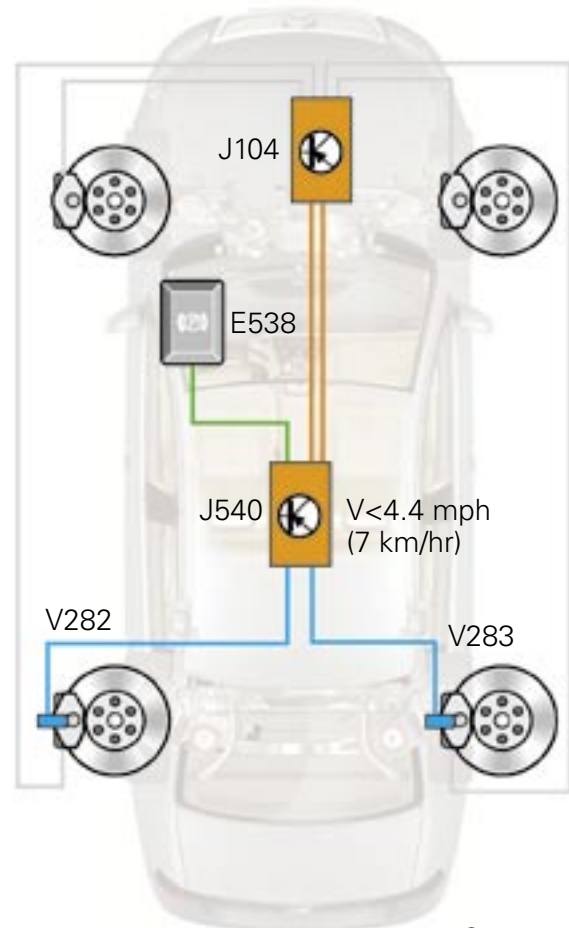
If the brake pads and rotors cool after the vehicle sets for a while, the electric parking brake automatically tightens if necessary. This is a calculated function.

Electric Parking Brake Operation

Using the Electric Parking Brake

The Electric Parking Brake operates as follows:

1. The driver presses the Electric Parking Brake Button E538.
2. The Electric Parking Brake Control Module J540 communicates with the ABS Control Module J104 through the dedicated CAN-bus and determines that the vehicle speed is less than 4.4 mph (7 km/hr).
3. The Electric Parking Brake Control Module activates the two locking motors on the rear wheel brakes. The brake is applied automatically.
4. If the driver presses the electric parking brake button again while pressing the foot brake, the rear wheel parking brakes will release.



S346_090

E538	Electric Parking Brake Button
J104	ABS Control Module
J540	Electric Parking Brake Control Module
V282	Left Parking Brake Motor
V283	Right Parking Brake Motor

Electric Parking Brake Operation

Emergency Brake Operation

If the brake pedal fails or is blocked, the vehicle can be stopped using the emergency brake.

Apply

Pressing and holding the electric parking brake button causes a moving vehicle to be braked at a rate of approximately 6m/s_2 .

A warning sounds and the brake lights turn ON.

At a vehicle speed greater than 4.4 mph (7 km/hr), the emergency brake applies by increasing hydraulic brake pressure at all 4 wheels. Depending on the situation, the braking may be regulated by the ABS/ESP system to maintain vehicle stability.

If the button is pressed at a vehicle speed less than 4.4 mph (7 km/hr), the parking brake is applied.

Release

If the vehicle speed is greater than 4.4 mph (7 km/hr) after emergency braking has occurred, the brake releases when the electric parking brake button is released or the accelerator pedal is pressed.

If the vehicle has stopped, the parking brake will engage.



When the electric parking brake button is pressed, the engine goes to idle and related features such as cruise control, automatic cruise control or AUTO HOLD are turned off.



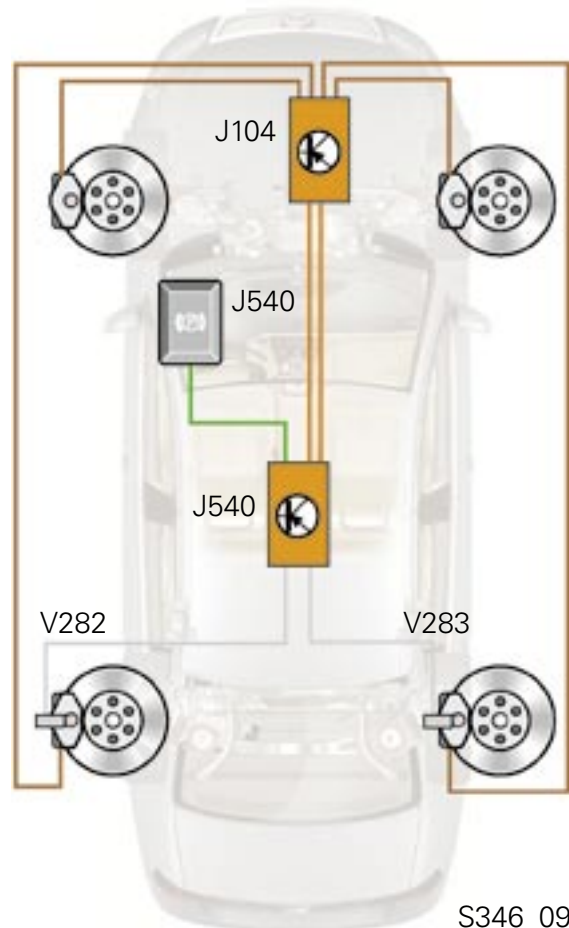
The emergency braking will function with the ignition OFF.

Electric Parking Brake Operation

Using the Emergency Brake Feature

1. The driver presses and holds the Electric Parking Brake Button E538.
2. The Electric Parking Brake Control Module J540 communicates with the ABS Control Module J104 via the CAN-bus to determine if the vehicle speed is greater than 4.4 mph (7 km/hr).
3. If the vehicle speed is greater than 4.4 mph (7 km/hr), the ABS Control Module J104 activates the hydraulic pump, builds up brake pressure and applies the brakes to all four wheels.
4. If J538 is released or the accelerator pedal is pressed and J540 determines that the vehicle speed is still greater than 4.4 mph (7km/hr), the brakes are released.

If the vehicle has stopped, the parking brake will be engaged.



E538	Electric Parking Brake Button
J104	ABS Control Module
J540	Electric Parking Brake Control Module
V282	Left Parking Brake Motor
V283	Right Parking Brake Motor

Electric Parking Brake Operation

AUTO HOLD Operation

AUTO HOLD assists the driver when the vehicle is standing still and in starting off events (forward or reverse travel).

Activation

AUTO HOLD activation can only occur if the:

- Driver-side door is closed
- Safety belt is buckled
- Engine is running

Whenever the vehicle is restarted, the AUTO HOLD feature must be reactivated by pressing the AUTO HOLD button.

To activate AUTO HOLD, press the AUTO HOLD button in the center console. The indicator light in the button lights showing that the AUTO HOLD system is active.

Deactivation

If any one of the Activation conditions change, the AUTO HOLD feature turns OFF.

To deactivate AUTO HOLD, press the AUTO HOLD button again. The indicator light in the button goes off showing that the AUTO HOLD system is inactive.

The AUTO HOLD function also includes the following assistance features:

Stop and Go Assistance

Less effort is required during stop-and-go driving because it is no longer necessary to use the brake pedal to hold the vehicle still.



S346_086



S346_082

Electric Parking Brake Operation

Start-off Assistance

When AUTO HOLD is activated, start-off assistance automatically holds the vehicle in a parked position on a grade until the accelerator pedal is pressed.



S346_084

Automatic Parking Brake Application

When the vehicle is stopped with the AUTO HOLD feature activated, and the driver-side door is open, the safety belt is unbuckled or the ignition is OFF, the parking brake will automatically apply.



S346_080

Hydraulic AUTO HOLD

When the AUTO HOLD feature is first activated, the vehicle is held in place hydraulically by the four wheel brakes.

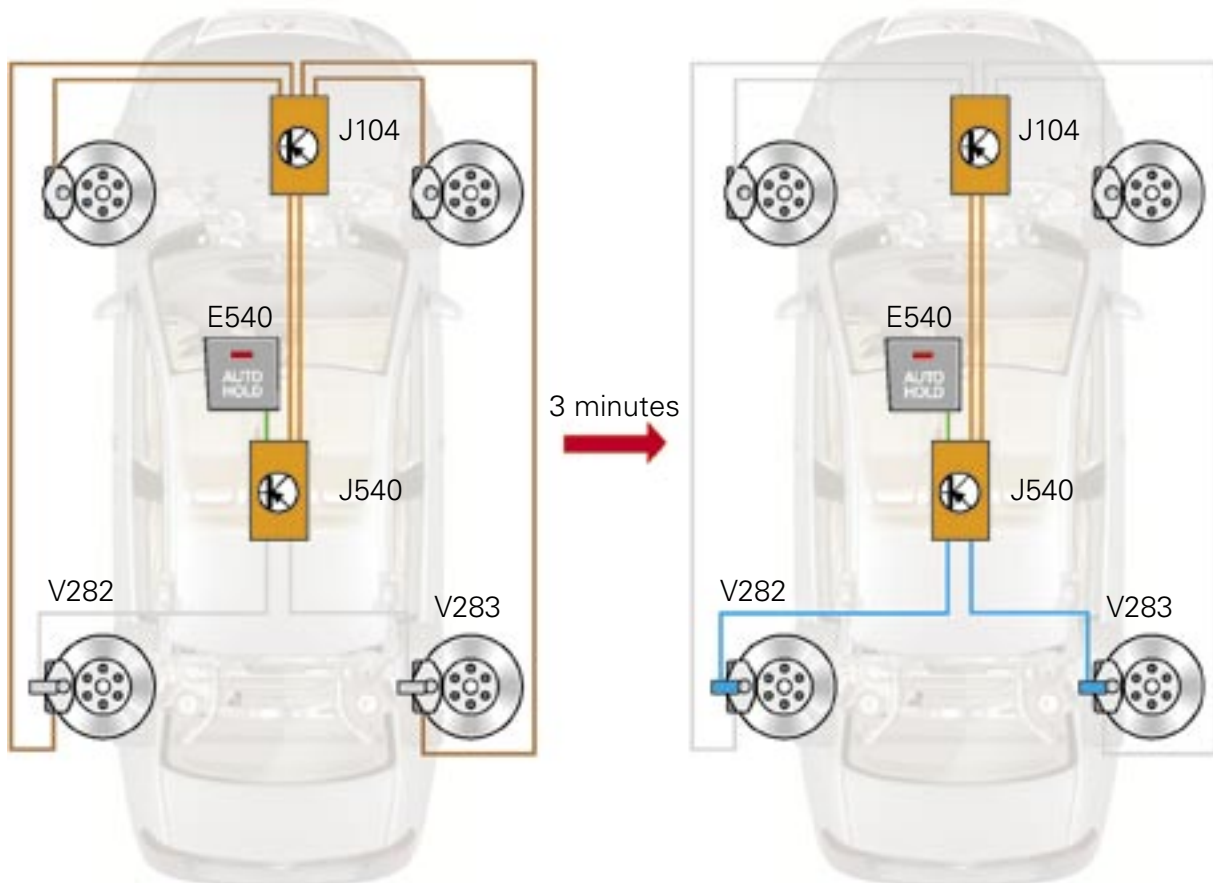
When the driver applies the brakes by pressing the brake pedal, pressure is held by blocking the valves in the ABS unit. The driver is no longer required to press the brake pedal to hold the vehicle in place.

If the driver does not press the brake pedal and the vehicle starts to move after a detected stop, ESP is activated and brake pressure is applied by the ABS pump.

After the vehicle is held for three minutes, a switch from ESP hydraulic to the electric parking brake is made. The vehicle will move away seamlessly when the accelerator pedal is pressed.

Electric Parking Brake Operation

AUTO HOLD Modes



S346_116

1. Initially AUTO HOLD prevents vehicle movement by hydraulically applying the four wheel brakes. This is set, monitored, and adjusted by the ABS Control Module J105 depending on the grade the vehicle is on.
2. After 3 minutes, the electric parking brake takes over. J104 communicates the torque required to hold the vehicle to the Electric Parking Brake Control Module J540.
3. J540 activates the left and right locking parking brake motors V282 and V283 on the rear wheel brakes. The brakes are now set electrically and the hydraulic brake pressure is reduced by J105.

E540	AUTO HOLD Button
J104	ABS Control Module
J540	Electric Parking Brake Control Module
V282	Left Parking Brake Motor
V283	Right Parking Brake Motor

Electric Parking Brake Components

Sensors

Clutch Position Sensor G476



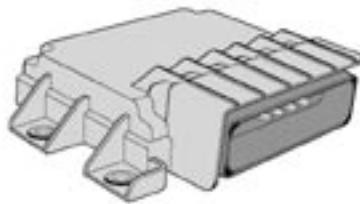
Electric Parking Brake Button E538



AUTO HOLD Button E540



Electric Parking Brake Control Module J540

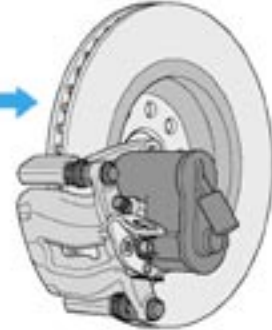


ABS Control Module J104



Actuators

Left Parking Brake Motor V282



Right Parking Brake Motor V283



Electric Parking Brake Indicator Lamp K213



Brake System Warning Lamp K118



Electric Park/Handbrake Malfunction Indicator Lamp K214



AUTO HOLD Indicator Lamp K237

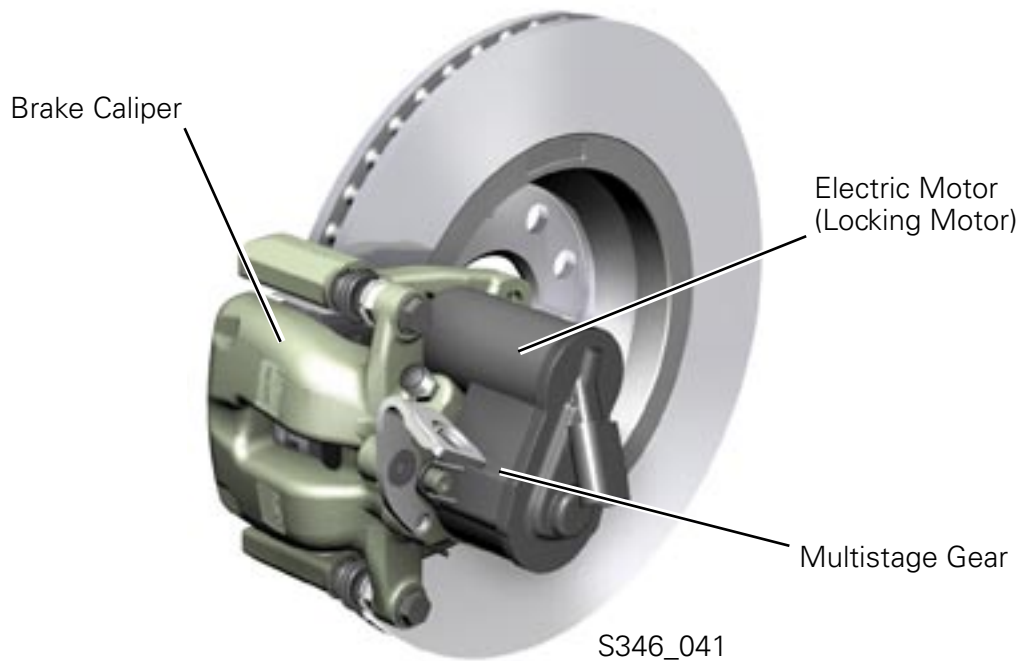


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Electric Parking Brake Components

Rear Wheel Brake Actuators

The electric rear brake actuator is an integral part of the rear wheel brake caliper. The electric motor, the multistage gear and the spindle drive convert the "Activate Parking Brake" command into a specified force that applies the rear brakes.



Electric Parking Brake Components

Parking Brake Unit

Only slight movement of the brake piston is required to set the parking brake. The rotational motion of the electric motor is converted into a linear motion in three stages with an overall ratio of 1:150 (150 revolutions of the electric motor for each revolution of the spindle drive).

1st stage—toothed belt drive

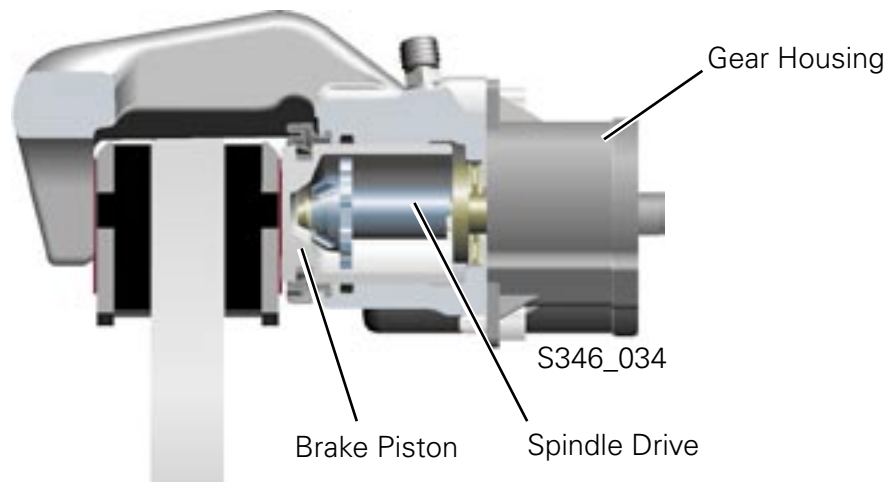
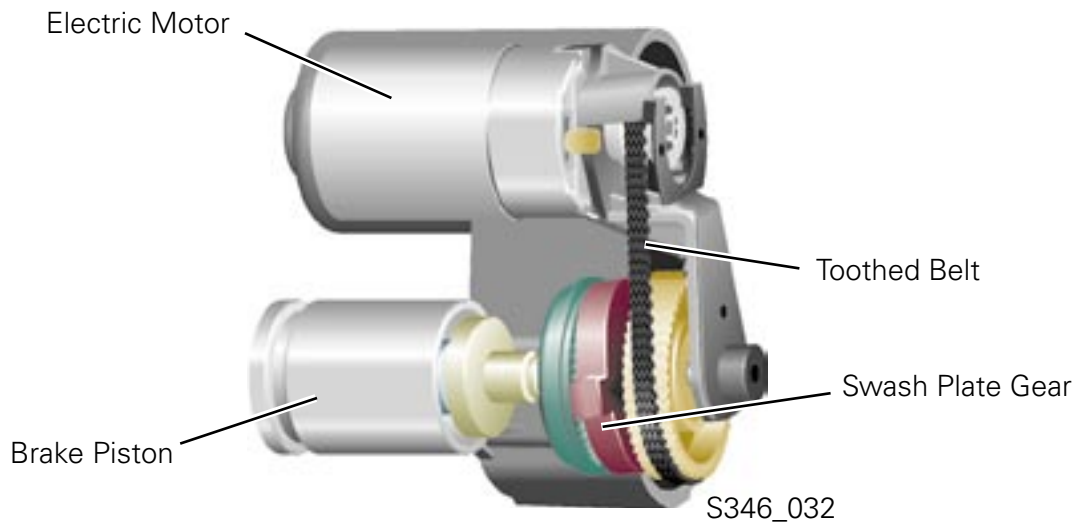
The first stage (ratio of 1:3) is from the electric motor to the swash plate gear input.

2nd stage—swash plate gear

The second stage (ratio of 1:50) is produced by the swash plate gear.

3rd stage—spindle drive

The spindle drive converts the rotational motion into linear motion.



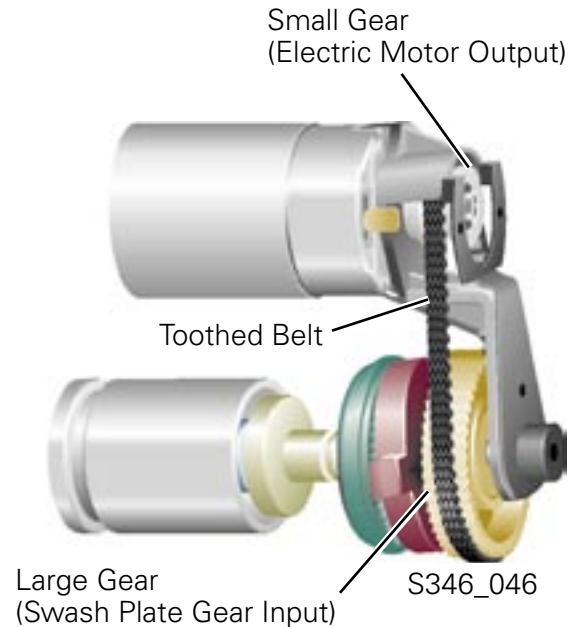
Electric Parking Brake Components

Toothed Belt Drive

In the first stage (1:3), the toothed belt transmits power from the electric motor to the swash plate gear. The toothed belt drive consists of:

- A small gear attached to the electric motor
- A large gear attached to the swash plate
- A toothed belt that connects the small and large gears

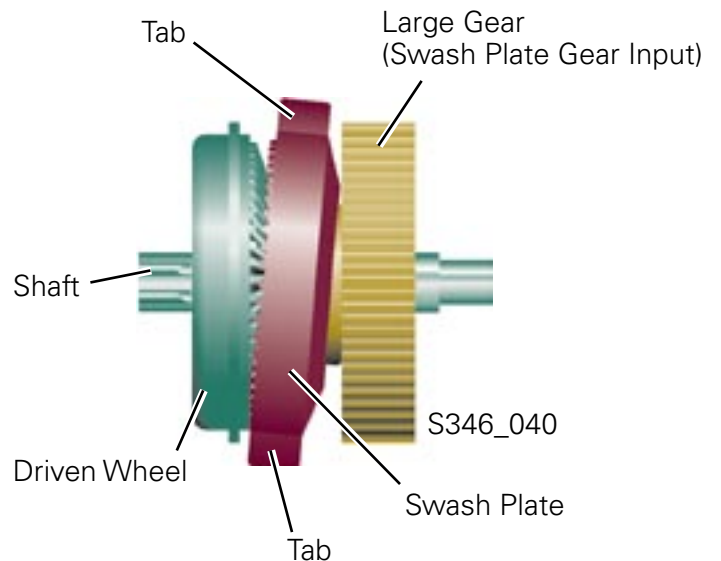
The ratio is determined by the gear sizes.



Swash Plate Gear Assembly

The swash plate gear assembly provides the second stage ratio change (1:50) and consists of a large gear, the swash plate, and the driven wheel.

The swash plate is prevented from rotating in the housing by two tabs that allow only a rocking motion.

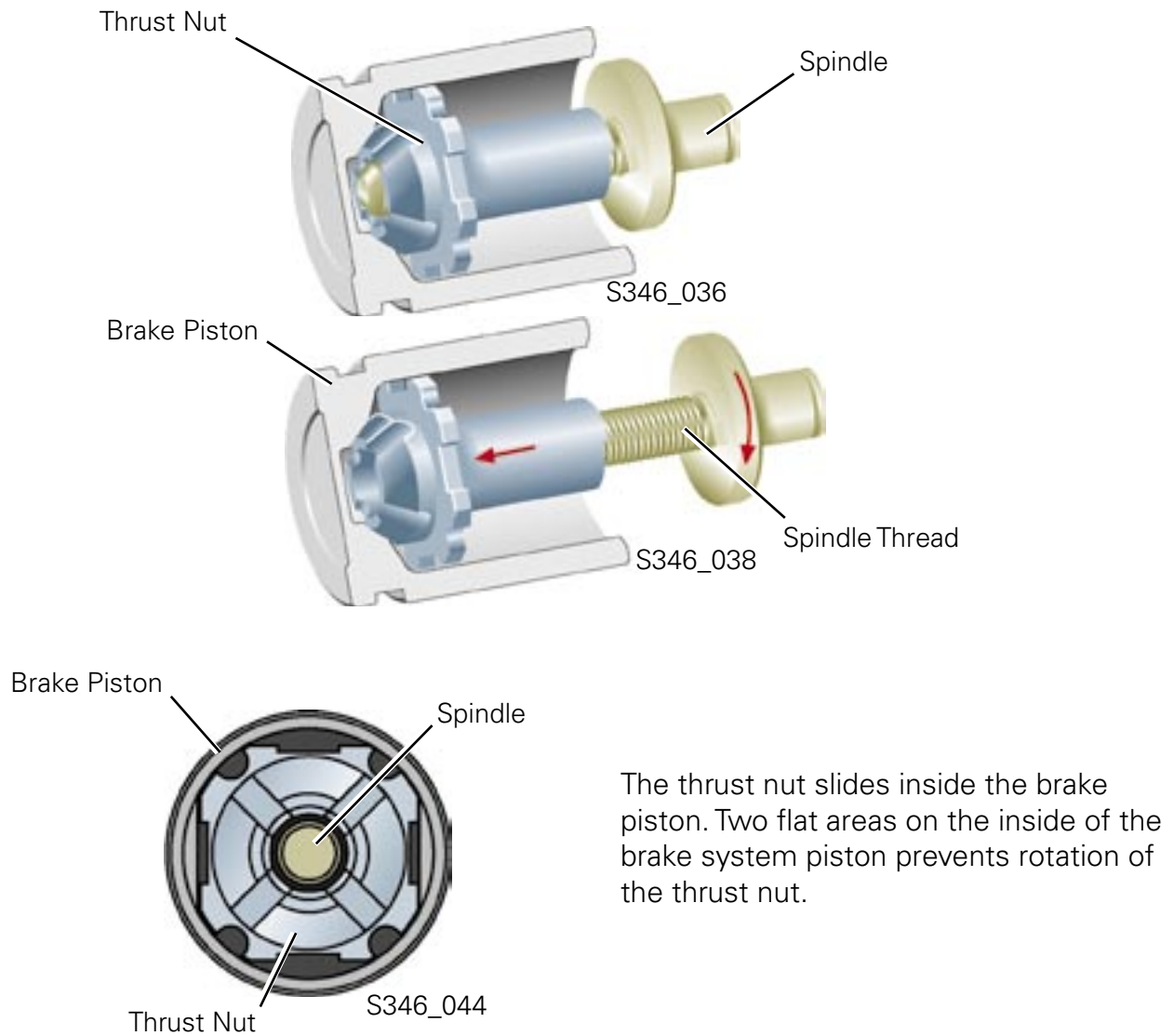


Electric Parking Brake Components

Spindle Drive

The spindle drive converts the rotational movement of the gears into a linear motion. The spindle is driven by the swash plate gear. The spindle's direction of rotation determines the thrust nut direction of movement on the spindle drive.

The spindle assembly is self-locking. After the electric parking brake is set, the system remains locked even when the power is OFF.

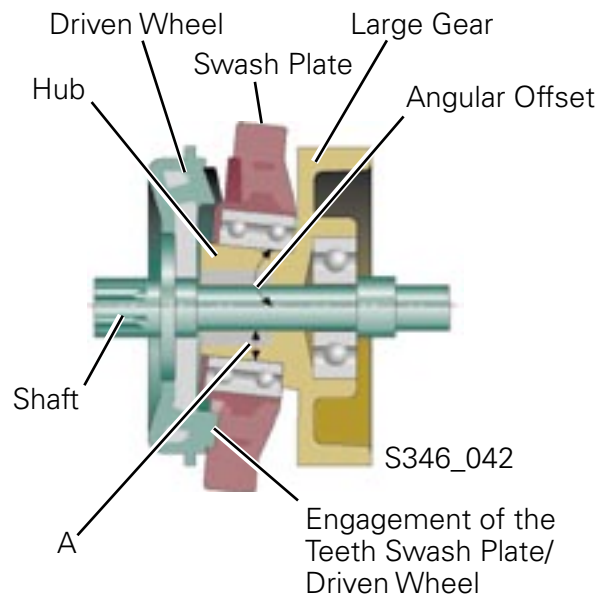


Electric Parking Brake Components

Swash Plate Operation

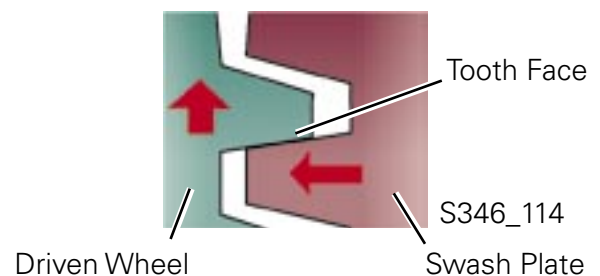
The shaft is pressed into the driven wheel. The large gear with bearing turns freely on this shaft. The swash plate is attached to the hub of the large gear. This hub is bored at an angle and causes the rocking motion of the swash plate.

The driven wheel and swash plate are always engaged at the place where the large gear hub has the least thickness (A).



The swash plate has 51 gear teeth and the driven wheel has 50. Because of this, one tooth never fits exactly into a tooth space and one tooth of the swash plate is always engaging one tooth face of the driven wheel. This engagement forces the driven wheel to rotate slightly.

This moves the driven wheel one tooth width for each revolution of the large gear. Because the driven wheel has 50 teeth, the large gear rotates 50 times for each revolution of the driven wheel. The ratio is 1:50.



Electric Parking Brake Components

Rear Wheel Brake Actuators

Electric Operation

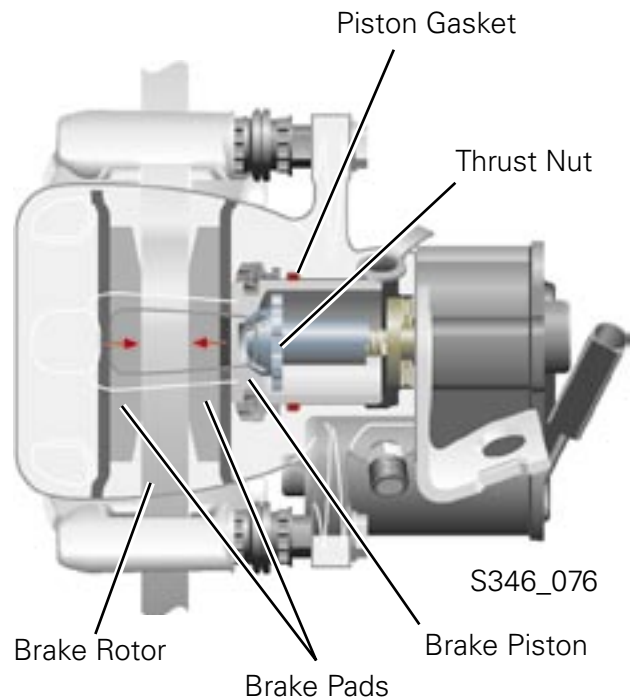
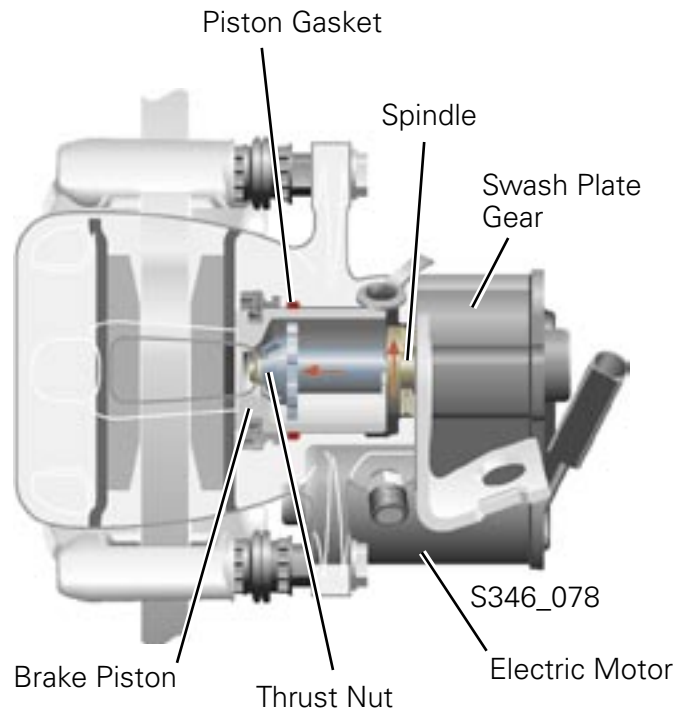
To set the parking brake, the Electric Parking Brake Control Module J540 activates the electric motor.

The spindle, driven by the electric motor via the belt and swash plate gear, moves the thrust nut forward on the spindle thread. The thrust nut contacts the brake piston and forces the brake pads against the brake rotor.

When the parking brake is set, the piston gasket is stretched towards the brake pads. The pressure, in combination with the pressure created on the brake pads, increases the electric motor's power consumption.

When the command to set the parking brake is given, J540 measures the power consumption of the electric motor during the action. If the power consumption exceeds a specific value, J540 senses that the pads have reached the correct application pressure and turns off power to the electric motor.

When the parking brake is released, the thrust nut rotates back on the spindle, relieving pressure on the brake piston. The piston gasket returning to its original shape and any imbalance of the brake rotor moves the brake piston back, allowing the brake pads to release the brake rotor.



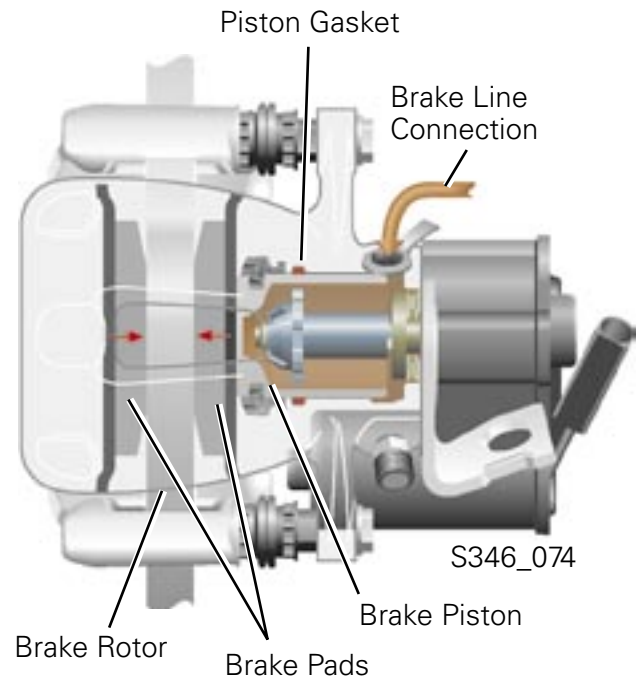
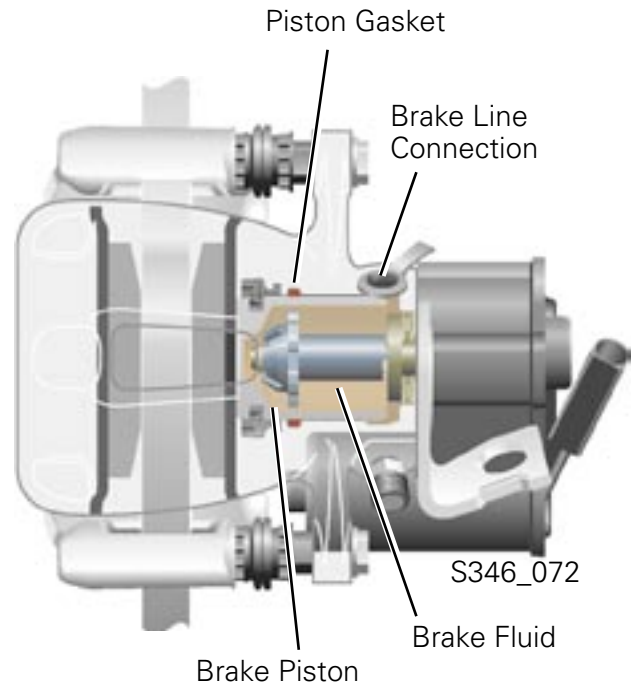
Electric Parking Brake Components

Hydraulic Operation

In an emergency braking event, pressing the button for the electric parking brake while the vehicle is moving causes the ABS Control Module J104 to activate, increasing hydraulic brake pressure and forcing the brake pads against the rotors.

Releasing the button ends the braking event. After the braking event has ended, the brake fluid pressure drops and brake pads release the brake rotors.

Holding the button until the vehicle stops applies the parking brake.



Electric Parking Brake Components

Clutch Position Sensor G476

The Clutch Position Sensor G476 is attached to the sensor cylinder. It detects when the clutch pedal is pressed.

The G476 signal is used for:

- Engine starting
- Turning off cruise control
- Briefly limiting fuel injection during shifting to prevent engine surge
- Calculating best AUTO HOLD release time

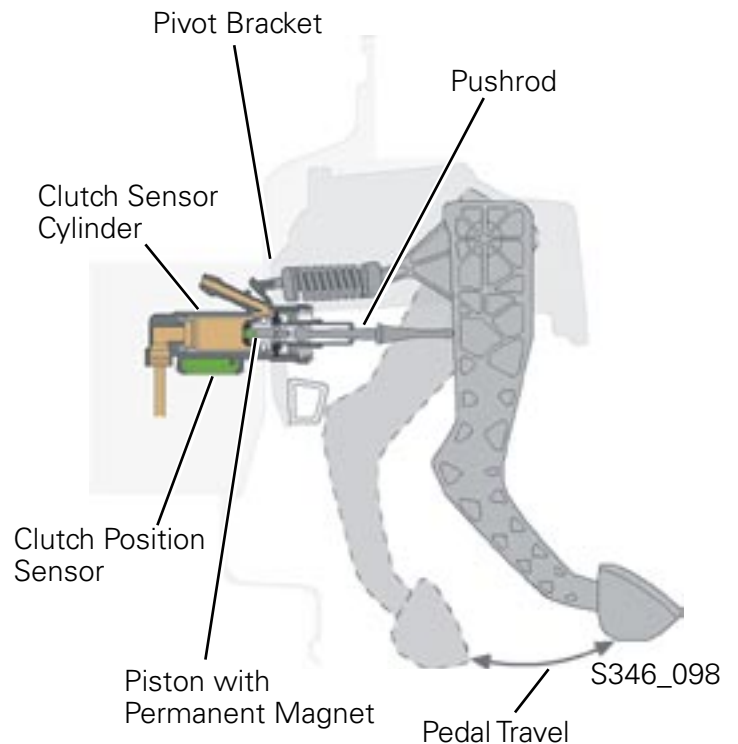


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Clutch Pedal with Clutch Position Sensor

Construction

The sensor cylinder attaches to the pivot bracket with a bayonet connector and pushrod.



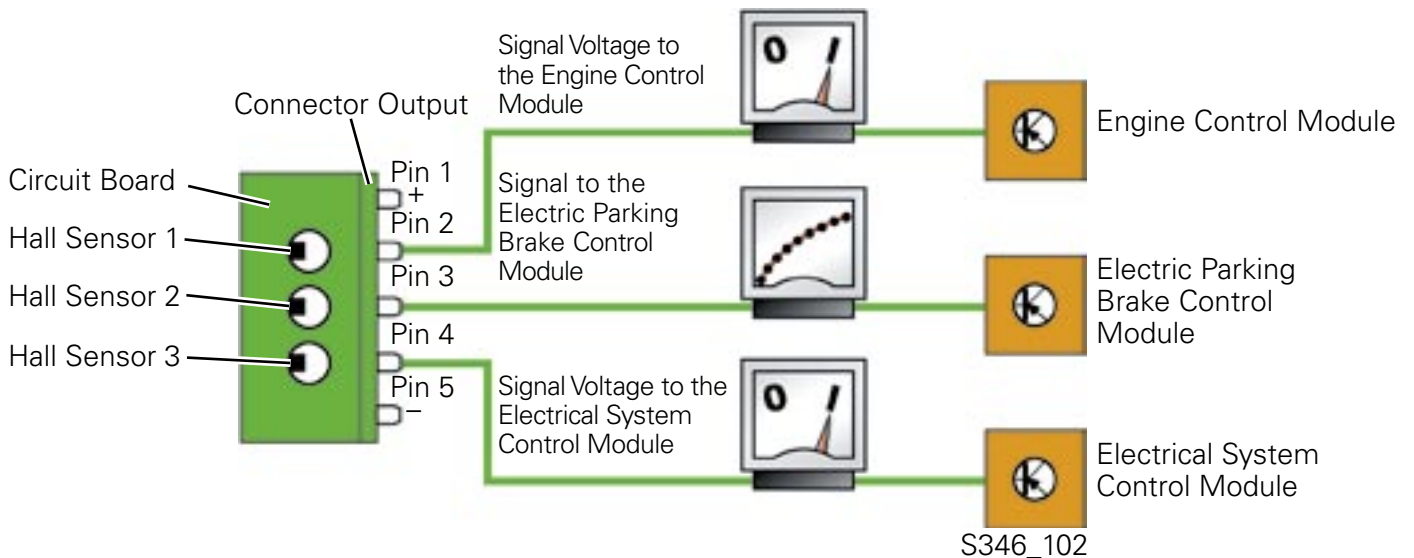
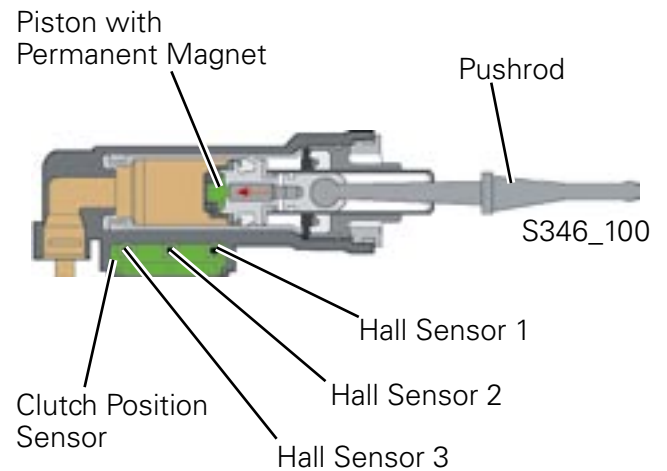
S346_098

Electric Parking Brake Components

Operation

When the clutch pedal is pressed, the pushrod and the piston move toward the clutch position sensor. A permanent magnet is attached to the front of the piston. Three Hall sensors are mounted on the clutch position sensor circuit board.

As the permanent magnet moves past the Hall sensors, a signal is sent to the specified control modules.



Hall sensor 1 is a digital sensor that sends a voltage signal to the engine control module. This turns the cruise control off.

Hall sensor 2 is an analog sensor that sends a pulse-width modulated signal (PWM signal) to the electric parking brake control module. The exact position of the clutch pedal is detected allowing the control module to calculate the best release time when using the AUTO HOLD function.

Hall sensor 3 is a digital sensor that sends a voltage signal to the electrical system control module.

The module then detects that the clutch is disengaged allowing the engine to start. Only if the clutch is disengaged can the engine be started (interlock function).

Electric Parking Brake Components

Electric Parking Brake Button E538

The Electric Parking Brake Button E538 activates and deactivates the electric parking brake. E538 is located to the left of the rotary light switch.



S801503_06

Electric Parking Brake Button

AUTO HOLD Button E540

The AUTO HOLD Button E540 switches the AUTO HOLD function ON and OFF. E540 is located to the left of the shift lever in the center console.

The AUTO HOLD function is OFF every time the vehicle is started or the ignition is cycled. It must be enabled by pressing the button.



S801503_05

AUTO HOLD Button

Electric Parking Brake Components

Indicator Lights

The Electric Parking Brake indicator lights are located in the Instrument Panel and the MFI.

Electric Parking Brake Indicator Lamp K213

The Electric Parking Brake Indicator Lamp K213 is located in the electric parking brake button. When the button is pressed, activating the parking brake, this indicator lights.



S346_054

Electric Parking Brake Indicator Lamp K213

Brake System Warning Lamp K118

The Brake System Warning Lamp K118 is located in the Instrument Cluster. When the parking brake is activated, this indicator lights.



S346_056

Brake System Warning Lamp K118

Electric Park/Handbrake Malfunction Indicator Lamp K214

The Electric Park/Handbrake Malfunction Indicator Lamp K214 is located in the control panel. If the brake system malfunctions, this malfunction indicator lights. The vehicle should be serviced immediately.



S346_058

Electric Park/Handbrake Malfunction Indicator Lamp K214

AUTO HOLD Indicator Lamp K237

The AUTO HOLD Indicator Lamp K237 is located in the AUTO HOLD button. When the button is pressed activating the AUTO HOLD, this indicator lights.



S346_060

AUTO HOLD Indicator Lamp K237

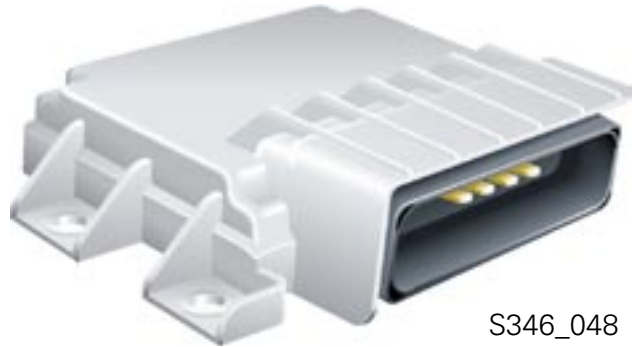
Electric Parking Brake Components

Electric Parking Brake Control Module J540

The Electric Parking Brake Control Module J540 is located in the center console. All activation and diagnostic functions of the electric parking brake are controlled by J540.

J540 has two processors and is networked to the ABS Control Module J104 through a dedicated CAN-bus.

A sensor cluster in J540 includes the transverse acceleration sensor, the longitudinal acceleration sensor and the yaw rate sensor. Signals from the sensor cluster are analyzed for both electric parking brake and ESP control functions. The inclination angle is derived from the longitudinal acceleration sensor's signal.



S346_048

Electric Parking Brake Communication

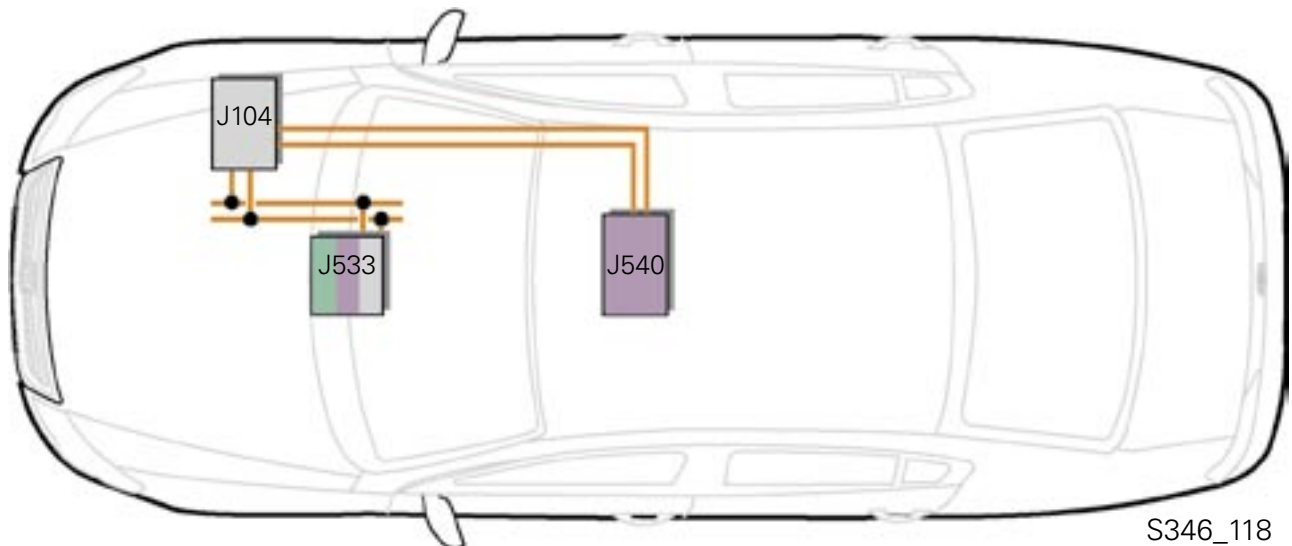
Electric Parking Brake CAN-Bus

The Electric Parking Brake Control Module J540 is connected to the ABS Control Module J104 via a private CAN-bus.

The data transfer rate is 500 kbit/s. The data is transferred through the CAN high wire and the CAN low wire. To ensure reliable communication without conflict or interference, the CAN wires are twisted together.

The CAN-bus for the electric parking brake cannot transfer data over a single wire. If a failure occurs with either wire, no communication occurs.

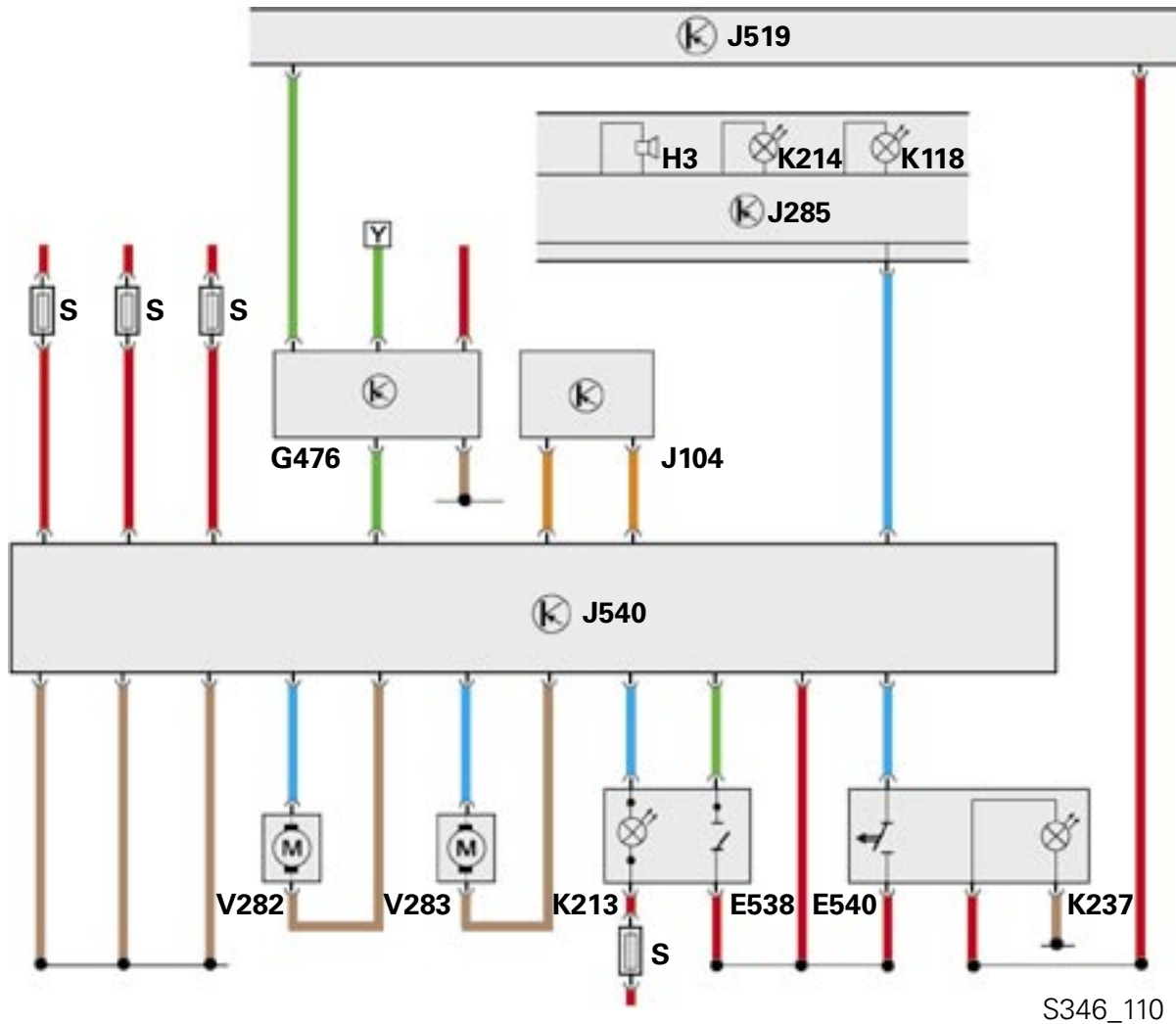
Control Units in the CAN-Bus for the Electric Parking Brake



- J104 ABS Control Module
- J533 Data Bus On Board Diagnostic Interface
- J540 Electric Parking Brake Control Module

Electric Parking Brake Communication

Electric Parking Brake Control Circuit



- E538 Electric Parking Brake Button
- E540 AUTO HOLD Button
- G476 Clutch Position Sensor
- H3 Warning Buzzer
- J104 ABS Control Module
- J285 Instrument Cluster Control Module
- J519 Vehicle Electrical System Control Module
- J540 Electric Parking Brake Control Module
- K118 Brake System Warning Lamp
- K213 Electric Parking Brake Indicator Lamp
- K214 Electric Park/Handbrake Malfunction Indicator Lamp
- K237 AUTO HOLD Indicator Lamp
- S Fuse
- V282 Left Parking Brake Motor
- V283 Right Parking Brake Motor

S346_110

Key

- Input Signal
- Output Signal
- Positive
- Ground
- CAN-Bus

y to Engine Control Module J623

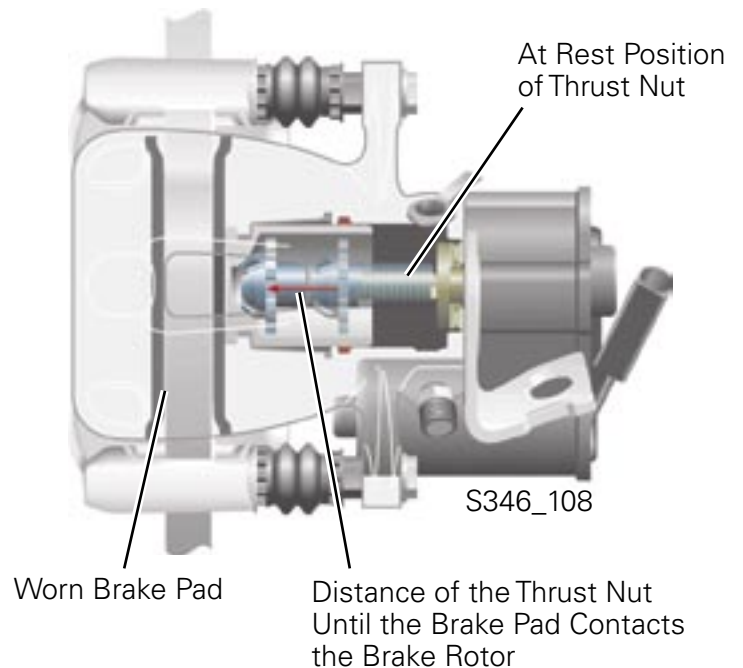
Electric Parking Brake Special Features

Automatic Brake Pad Clearance Adjustment

The brake pad adjustment occurs periodically with the vehicle parked. If the electric parking brake has not been set within 620 miles (1,000 km), the clearance is adjusted automatically.

To perform the adjustment, the brake pad moves toward the brake rotor from its resting position.

The Electric Parking Brake Control Module J540 determines the distance traveled from the power consumption of the electric motor and adjusts to compensate for any brake wear.



The brake pad wear adjustment occurs with the vehicle parked, the ignition in the locked position and the parking brake not applied.



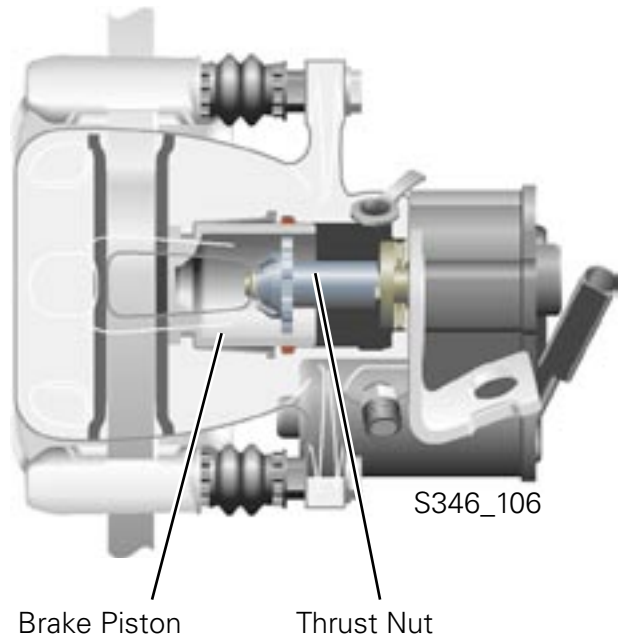
A customer may comment that their vehicle makes a strange noise. Ask them to set the parking brake and listen for the same noise. If it is the same noise, it's normal.

Electric Parking Brake Special Features

Brake Pad Replacement Mode

The brake pads are replaced with the electric parking brake not activated. Using the VAS Scan Tool, the electric parking brake is completely released by moving the thrust nut on the spindle all the way back.

After the new brake pads have been installed, the electric parking brake is adjusted using the VAS Scan Tool. The new position of the new brake pads is learned automatically.



Please reference the current service information for brake pad replacement procedures.

AFS Overview

Volkswagen's Adaptive Front Lighting System (AFS) consists of two independent lighting systems:

- Moving front lights
- Stationary front lights

The two lighting systems combine to provide improved nighttime visibility when cornering or turning.

This section provides an overview of the Adaptive Front Lighting System features and operation.



S801503_03

AFS Overview

Components and Locations

The following graphic shows the locations of the Adaptive Front Lighting System control modules and components. For the Passat, the Adaptive Front Lighting System (AFS) is available only as a package with High-Intensity Discharge Xenon Lamps.

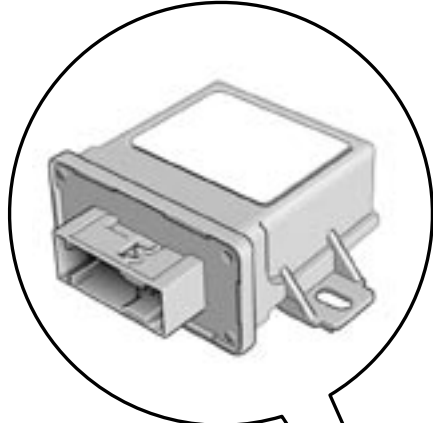
Right Headlamp Power Output Stage J668



Left Headlamp Power Output Stage J667



Headlamp Range/Cornering Lamp Control Module J745

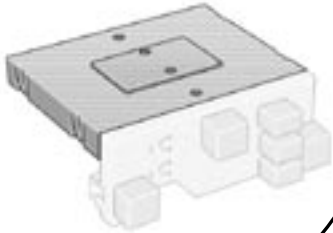
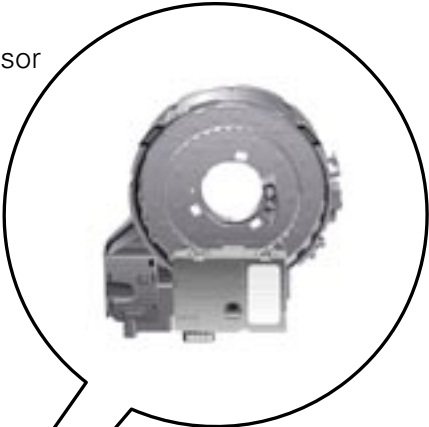


AFS Overview

Adaptive Lighting System features include:

- Moving low beam headlights that swivel horizontally at highway speeds, based on steering wheel position, to improve nighttime visibility around curves
- Stationary lights, located in the headlight, provide side lighting when turning at slower speeds

Steering Angle Sensor G85, built into the steering column



Vehicle Electrical System Control Module J519, behind the fuse box



ABS Control Module J104, mounted in engine compartment

S335_009

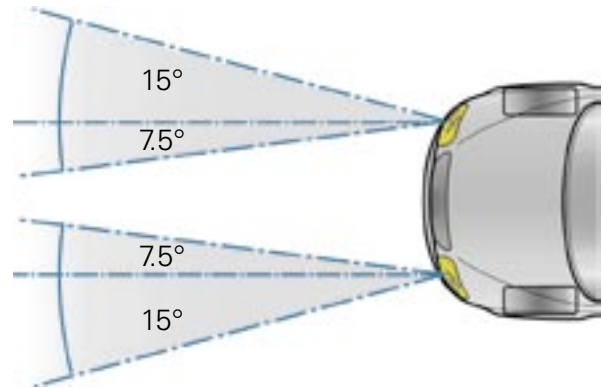
AFS Moving Front Lights

Moving Front Light Operation

The low beam headlight unit swivels horizontally, driven by an integrated electric motor.

Swivel Angle

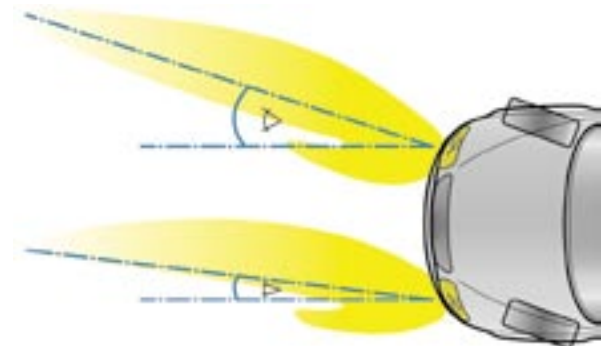
The swivel angle on the inside curve headlight is approximately 15° and approximately 7.5° on the outside curve headlight.



S335_019

Road Illumination

The different swivel angles provide the best possible illumination in curves because the headlight on the inside moves twice as far as the one on the outside of the curve.



S335_012



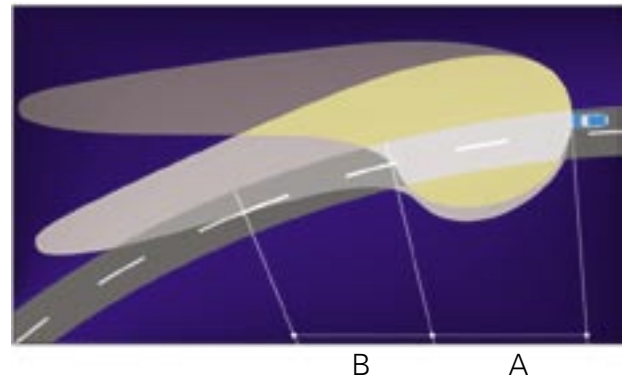
The headlights do not swivel at speeds below 6 mph (10 km/hr). Above 6 mph (10 km/hr), the swivel angle depends on the sharpness of the curve. This complies with the regulations that prohibit both headlights from swiveling when the vehicle is not in motion.

AFS Moving Front Lights

Illuminated Areas

The moving front lights provide improved illumination on curves. The darker area shows illumination with a conventional low beam headlight. It illuminates area "A" of the road surface and a lot of the area off the road.

The lighter area shows the illumination on the same curve with the moving front lights in use. It illuminates more of the road surface as shown in area B.



S335_008

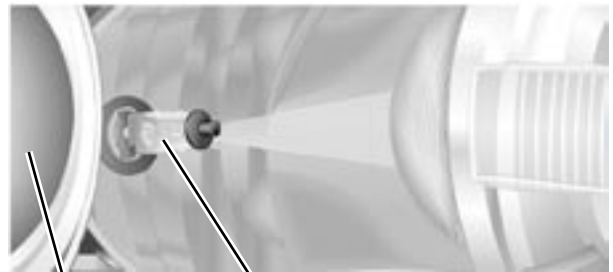
Operating Requirements

Status	ON Requirements	OFF Conditions
Adaptive Front Lights–Moving Front Lights set to low beams	<ul style="list-style-type: none"> - Terminal 15 ON AND - Low beam ON AND - Vehicle speed greater than 6 mph AND - Steering wheel turning gradually into a curve AND - Vehicle travelling forward 	<ul style="list-style-type: none"> - No ON requirement met

AFS Stationary Front Lights

Stationary Front Light Operation

Stationary front lights provide improved visibility during nighttime turning at intersections. When activated, the stationary front lights, with integrated reflectors, illuminate the area to the right or left side of the vehicle depending on the position of the steering wheel.



S335_023

Low Beam Stationary Front Light

The top graphic shows road illumination when turning with conventional low beam headlights. The bottom graphic shows the additional illumination provided by the stationary front lights.

The stationary front lights only work when the low beams are activated.

Conventional Low Beam Lighting



S335_014

Adaptive Stationary Low Beam Side Lighting



S335_015

AFS Stationary Front Lights

The Halogen bulbs in the stationary front light are activated, depending on conditions less than 31 mph (50 km/hr). They help the driver detect other road users or obstacles. The static cornering light is switched on and off by dimming.

Additional side illumination provides earlier visibility to the driver while turning at an intersection.

Illuminated Area



S335_028

Operating Requirements

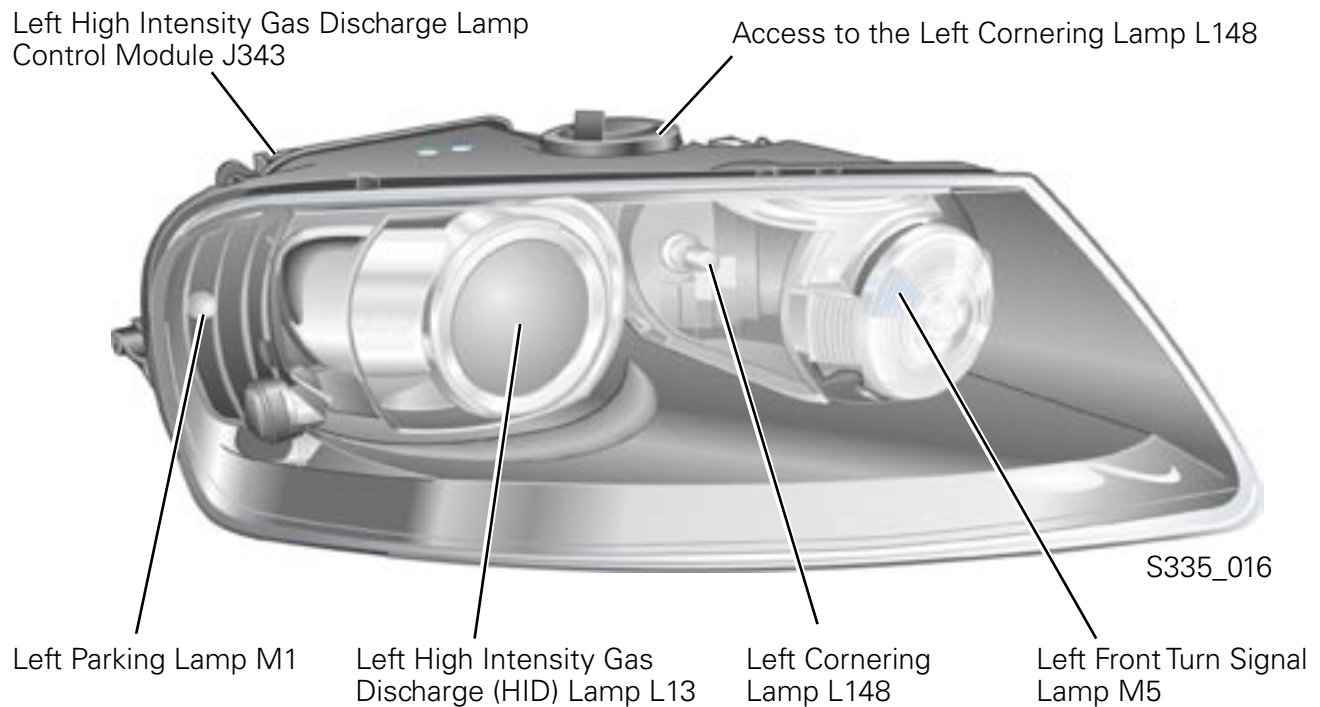
Status	ON Requirements	OFF Conditions
- Adaptive Front Lights– Stationary Front Lights set to low beams	- Terminal 15 ON AND - Low beam ON AND - Vehicle speed less than 31 mph AND - Steering wheel turning sharply in an intersection	- No ON requirement met

AFS Design

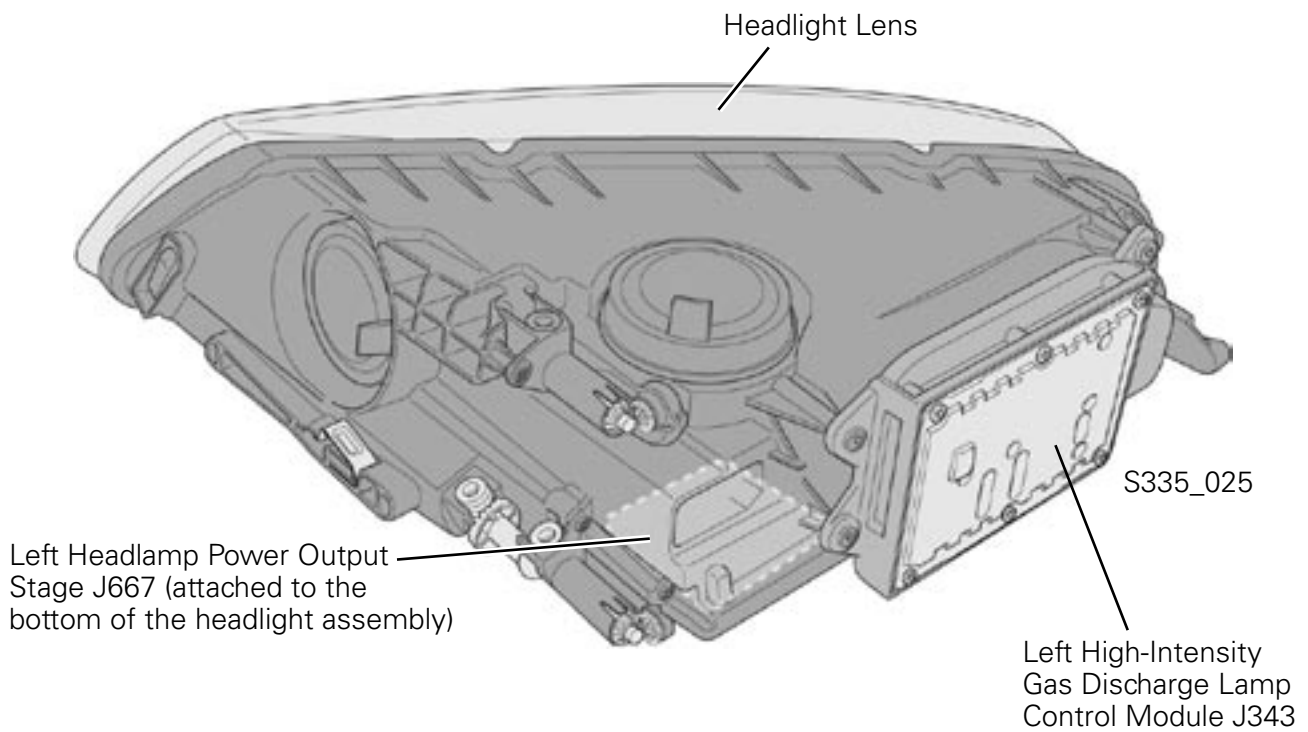
Adaptive Front Headlight Assembly

Each Adaptive Front Headlight Assembly includes four bulbs:

- The Xenon bulb (for low beam, high beam, and moving front lights)
- The bulb for the stationary front light
- The turn signal bulb
- The parking light bulb



The power output modules for the left J667 and right J668 headlights are located on the bottom of the headlight modules.

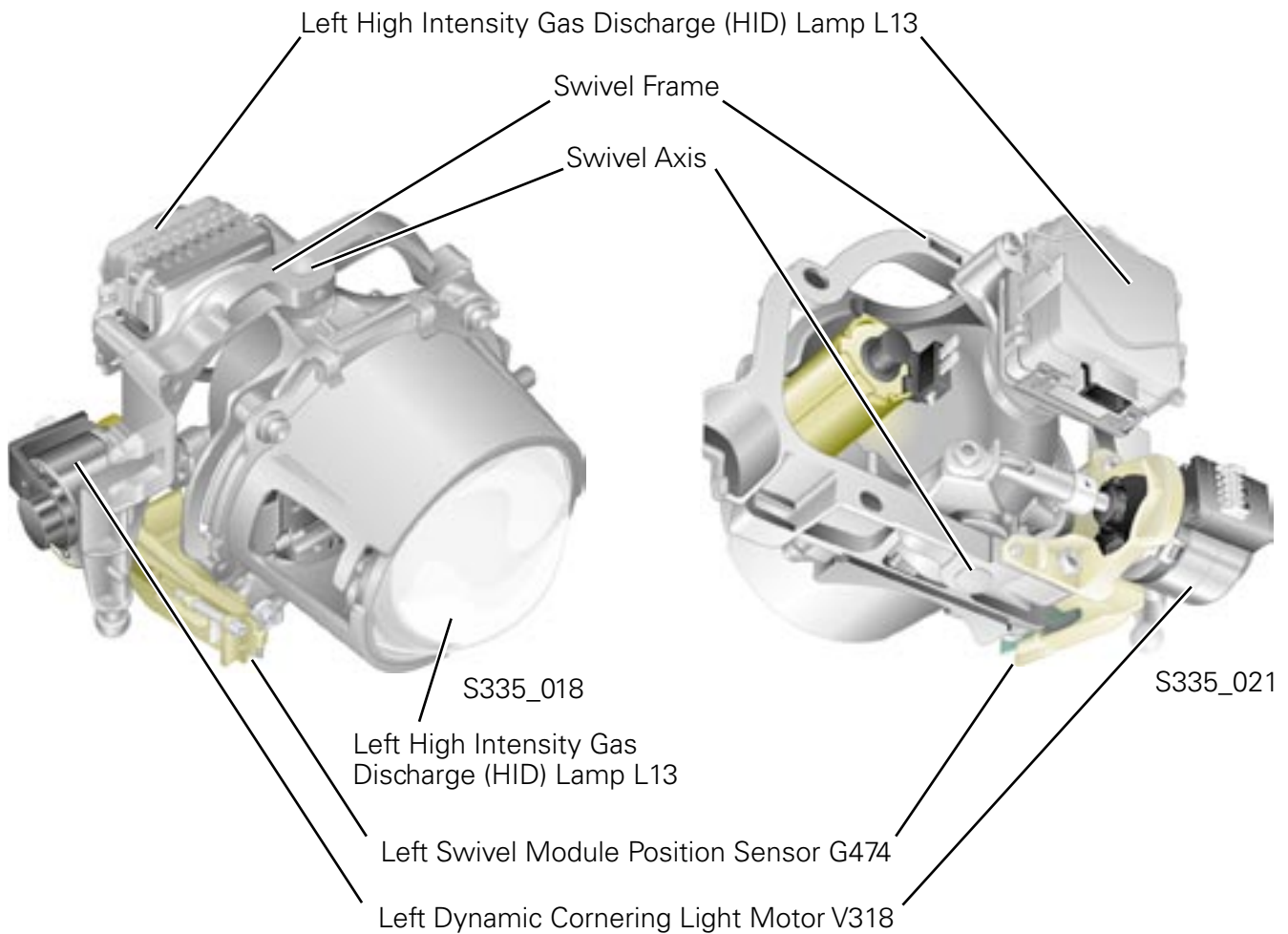


AFS Design

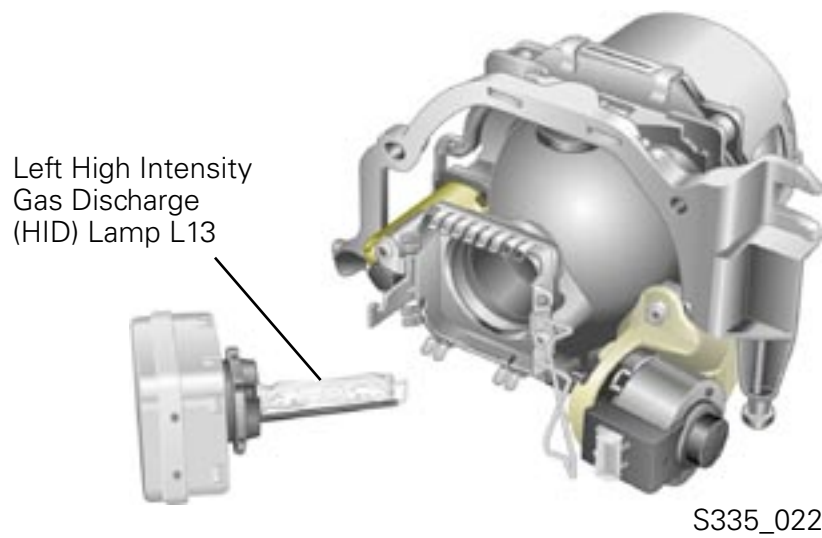
Moving Front Light Assembly

The light module for the moving front lights is similar to a conventional Bi-Xenon module. The low and high beam light is located in the lamp module. The module is mounted on bearings in a swivel frame to allow horizontal movement.

The module is equipped with a control motor and sensor for controlled movement. The sensor recognizes and communicates the position of the assembly.



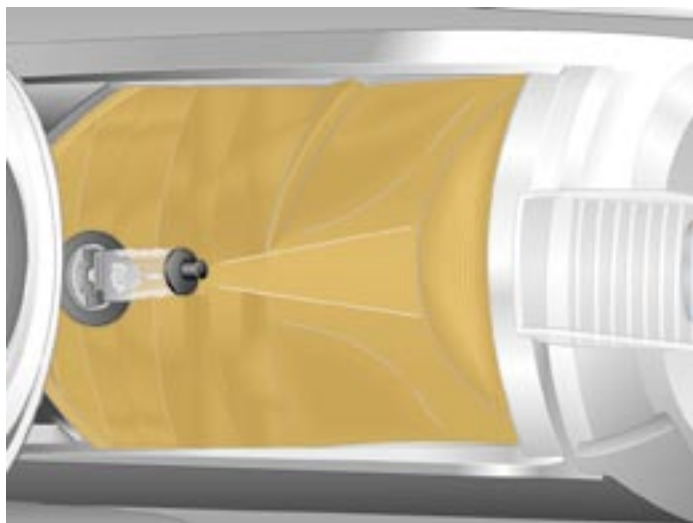
The gas discharge bulb is located in a holder at the back of the moving front light assembly. The gas discharge bulb can be accessed by opening the bulb holder door.



AFS Design

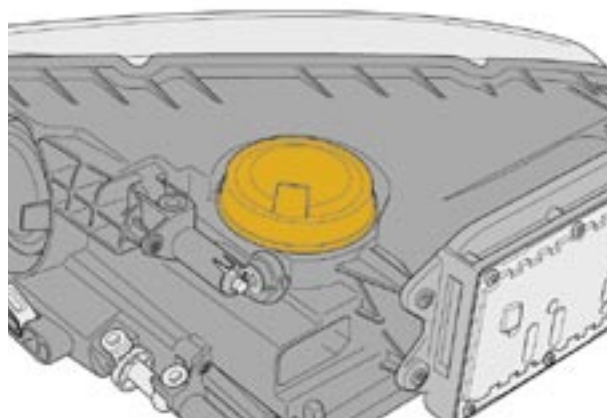
Stationary Front Light Assembly

The stationary front light projects light off a reflector located behind the turn signal to illuminate the side area at the front of the vehicle.



S335_017

The bulb in the stationary front light is accessed through an opening in the headlight module housing.



S335_026

Fault Indicator

The warning light in the instrument cluster flashes when the Adaptive Front Lighting System detects a fault in the system. The fault is stored in the fault memory of the Headlamp Range/Cornering Lamp Control Module J745.

If the low beam headlight fails on one side, the Adaptive Front Lighting System is disabled and low beam assemblies will no longer swivel during cornering. The stationary front lights are also disabled.



S335_024

AFS Communication

Sensors

G474 Left Swivel Module Position Sensor
(type depends on manufacturer)

G76 Left Rear Level Control System Sensor
G78 Left Front Level Control System Sensor

G475 Right Swivel Module Position Sensor
(type depends on manufacturer)

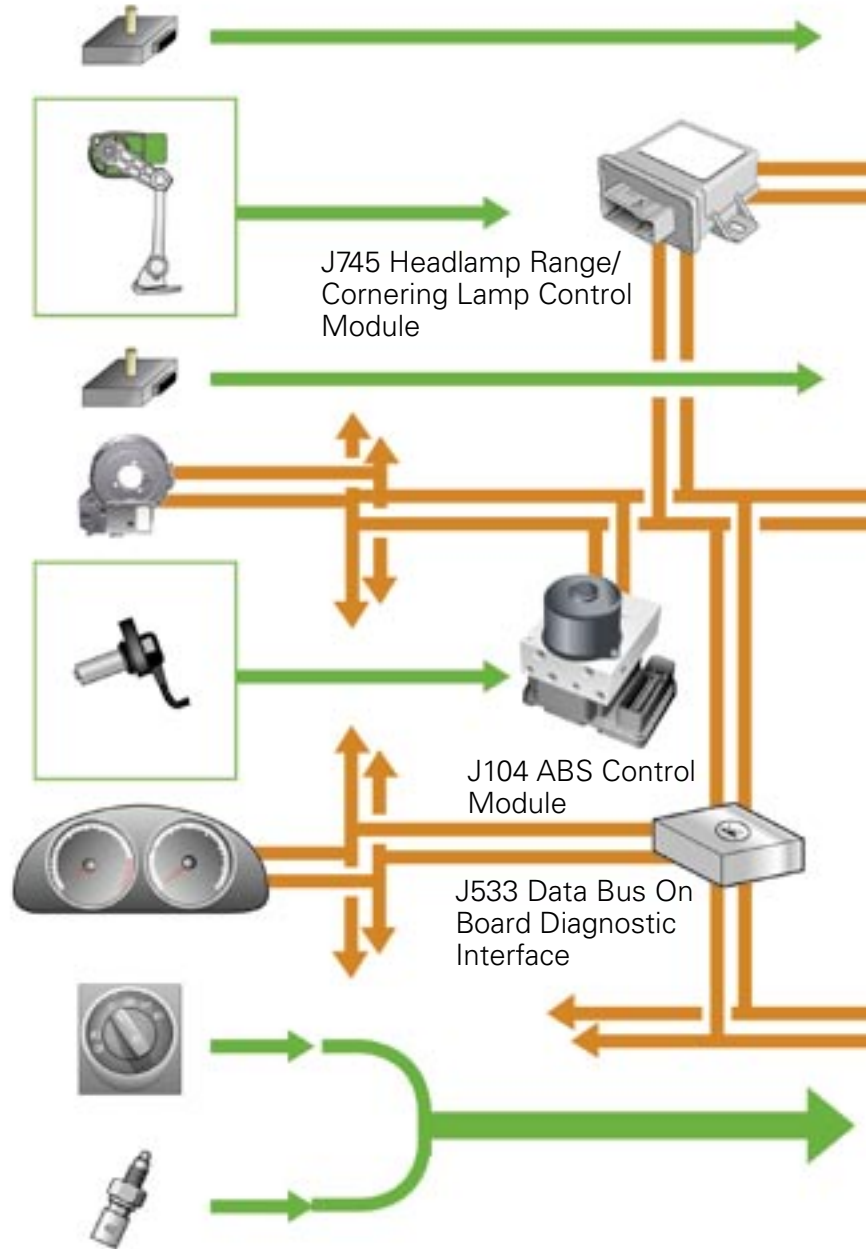
G85 Steering Angle Sensor

G44 Right Rear ABS Wheel Speed Sensor
G45 Right Front ABS Wheel Speed Sensor
G46 Left Rear ABS Wheel Speed Sensor
G47 Left Front ABS Wheel Speed Sensor

J285 Instrument Cluster Control Module

E1 Light Switch

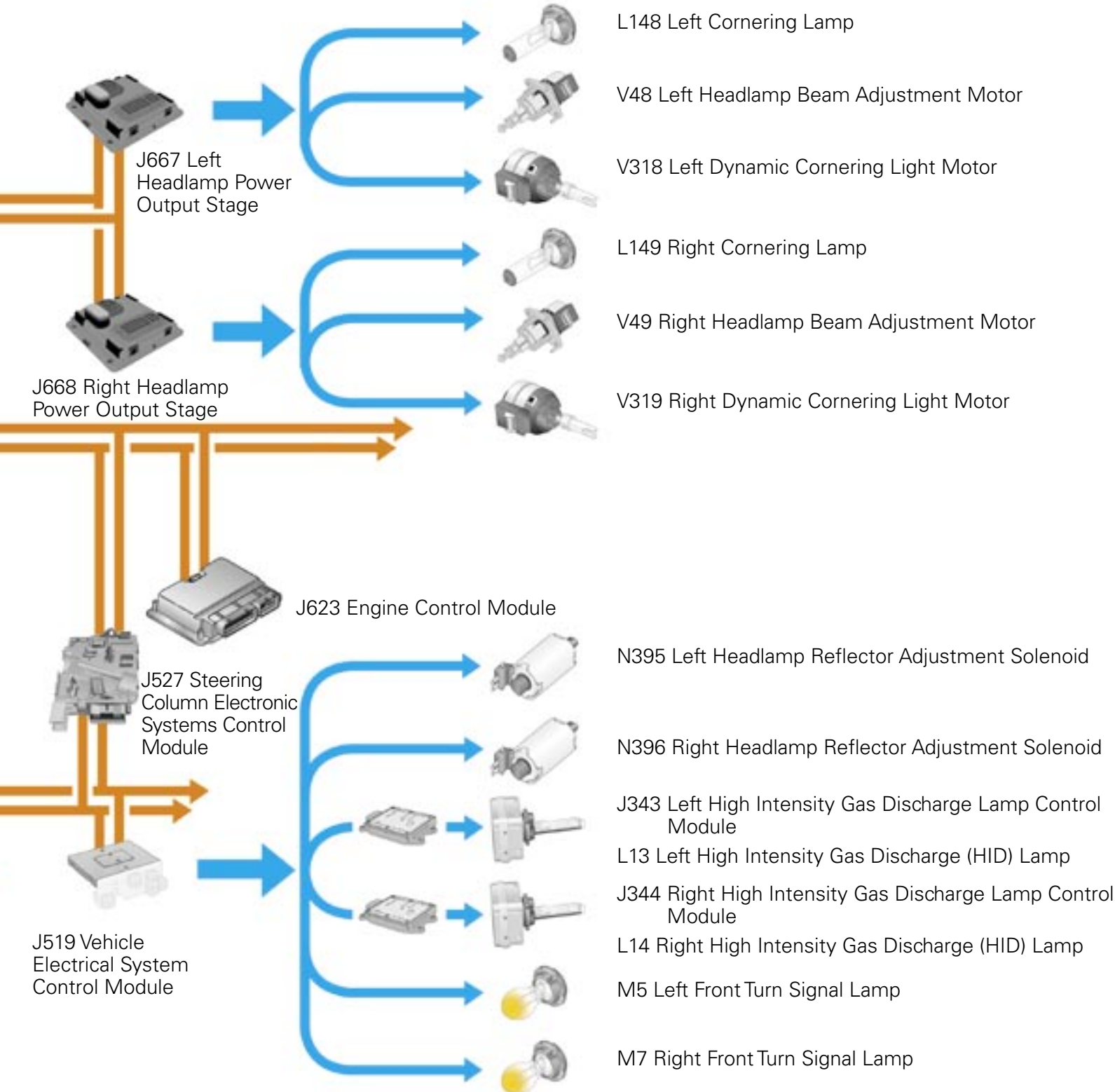
F4 Back-Up Light Switch



Vehicles equipped with air leveling suspension provide information via the drivetrain CAN-bus. This information is then accessed by the Headlamp Range/Cornering Lamp Control Module J745. On vehicles without air suspension, J745 receives the information from the vehicle level sensors.

AFS Communication

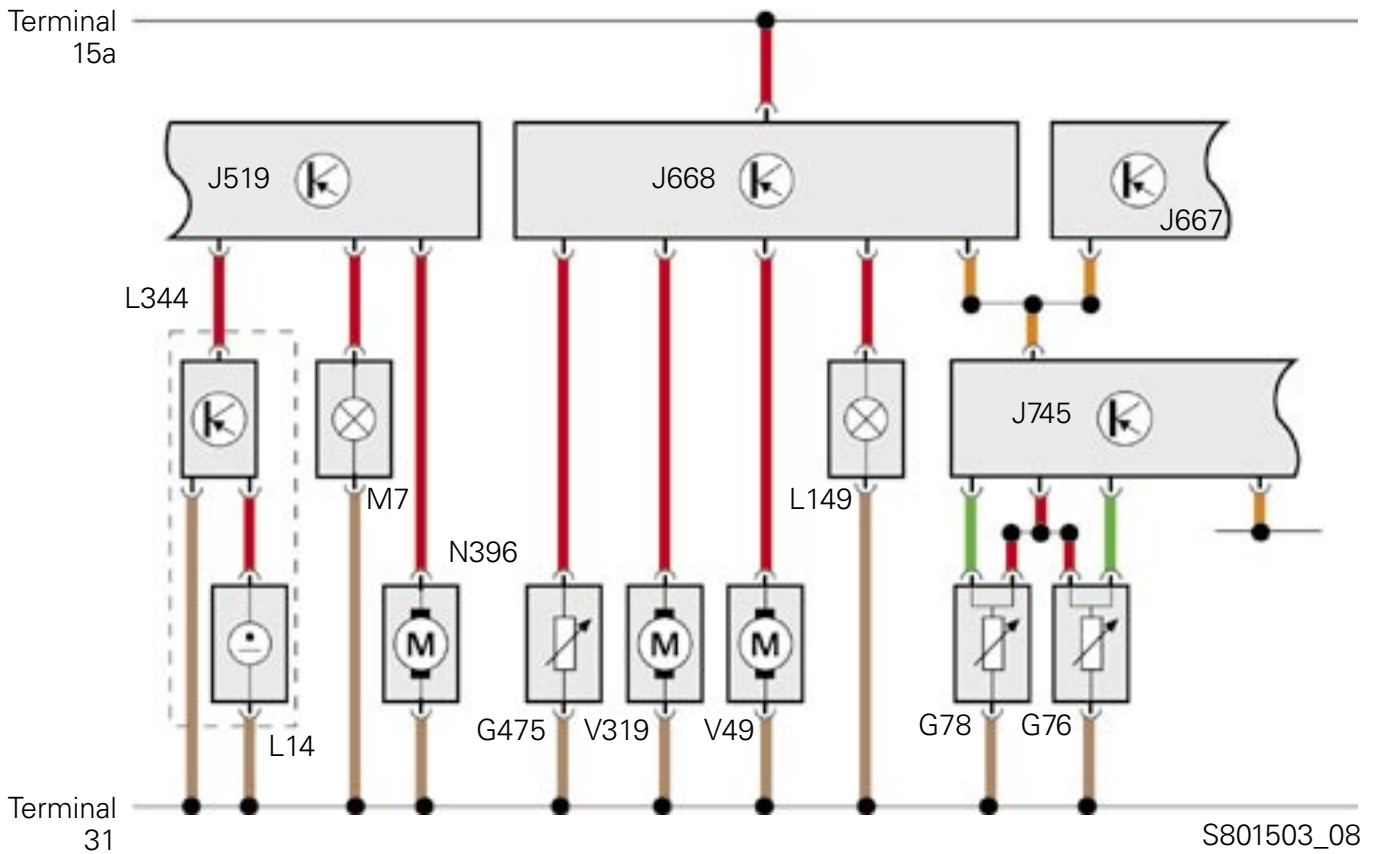
Controlled Components



S801503_07

AFS Communication

Right Side AFS Control Circuit



- N396 Right Headlamp Reflector Adjustment Solenoid
- G76 Left Rear Level Control System Sensor
- G78 Left Front Level Control System Sensor
- G475 Right Swivel Module Position Sensor
- J344 Right High Intensity Gas Discharge Lamp Control Module
- J519 Vehicle Electrical System Control Module
- J667 Left Headlamp Power Output Stage
- J668 Right Headlamp Power Output Stage
- J745 Headlamp Range/Cornering Lamp Control Module

- V319 Right Dynamic Cornering Light Motor
- V49 Right Headlamp Beam Adjustment Motor
- L14 Right High Intensity Gas Discharge (HID) Lamp
- L149 Right Cornering Lamp
- M7 Right Front Turn Signal Lamp

Key

- Positive
- Ground
- Input Signal
- CAN-Bus



Power for the stationary front side lights is controlled by Power Output Modules J667 and J668. All other headlights are powered by the Vehicle Electrical System Control Module J519.

Control Module Network

The control modules that control the Adaptive Front Lighting System functions and its CAN-bus network are shown on page 46. Data is exchanged between J745 and the power output modules in the left J667 and right J668 headlights via the 500 kBaud CAN-bus. This light CAN-bus is a separate CAN-bus and is not connected to the 500 kBaud Drivetrain CAN-bus. The Adaptive Front Lighting System CAN-bus also does not run via the Data Bus On Board Diagnostic Interface.

The following inputs are used by J431 to control adaptive front light functions:

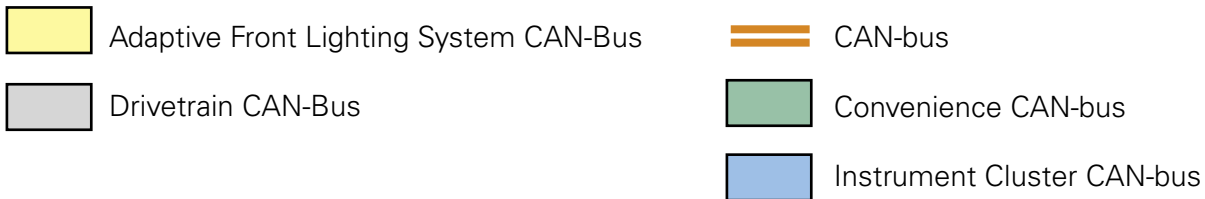
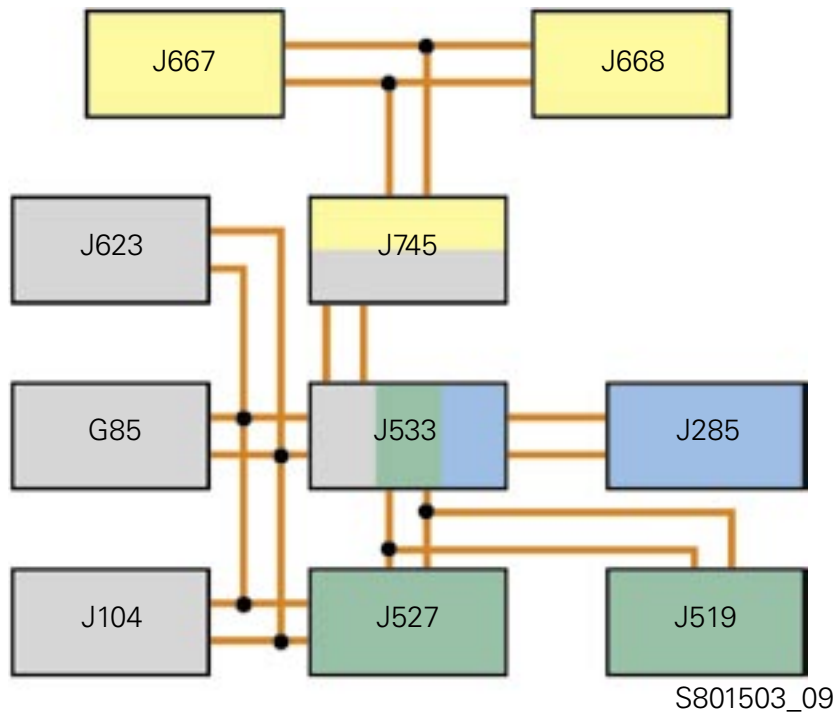
- Steering wheel angle (Steering Angle Sensor G85)
- Steering wheel speed (Steering Angle Sensor G85)
- Wheel speed (ABS Control Module J104)
- Direction of travel (Vehicle Electrical System Control Module J519/Back-Up Light Switch F4)
- Yaw velocity (ABS Control Module J104)
- Low beam headlights (Vehicle Electrical System Control Module J519)



For additional information on the CAN-bus, please reference SSP 871503 "The 2006 Passat Electrical System Design and Function".

AFS Communication

CAN Communication



- G85 Steering Angle Sensor
- J104 ABS Control Module
- J285 Instrument Cluster Control Module
- J519 Vehicle Electrical System Control Module
- J527 Steering Column Electronic Systems Control Module
- J533 Data Bus On Board Diagnostic Interface
- J623 Engine Control Module
- J667 Left Headlamp Power Output Stage
- J668 Right Headlamp Power Output Stage
- J745 Headlamp Range/Cornering Lamp Control Module

Knowledge Assessment

An on-line Knowledge Assessment (exam) is available for this
Self-Study Program

You can find this Knowledge Assessment on your
Certification Resource Center

at:

www.vwwebservice.com

From the vwwebservice.com homepage, do the following:

1. Click on the Certification tab
2. Click on "My Certification" tab
3. Click the Fulfill link next to this SSP
4. Click "Launch Assessment"

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