MODEL 230.4 (except 230.470)
except CODE (P99) Special model "AMG Black Series"
as of Model Year 2009
/CY 08 model refinement package

General function requirements

- Circuit 61 ON (Sensotronic Brake Control (SBC) and Electronic Stability Program (ESP) active)

i When the interior CAN is active, the SBC functions are available regardless of the status of circuit 61.

SBC, general

SBC assists the driver in dangerous situations which occur suddenly and thus serves active safety.
SBC is an electrohydraulic brake system which controls the braking requests for each wheel individually.
The following components are involved:

- SBC hydraulic unit (A7/3) with SBC control unit (A7/3n1)
- ESP, SPS [PML] and BAS control unit ()N47-5
- Steering angle sensor (N49) and steering column tube module (N80)
- Yaw rate and lateral acceleration sensor (B24/15)
- SBC pedal value sensor (B37/1)
- Left front rpm sensor (/)L6/1
- Right front rpm sensor (/)L6/2
- Left rear rpm sensor (/)L6/3
- Right rear rpm sensor (/)L6/4

The system is made up of the following component functions:

- **SBC function**
- **ESP function**

SBC function

The SBC control unit evaluates the basic information (initial pressure and pedal travel) to determine the driver's braking request and transmits this information to the ESP control unit via the electrohydraulic brake CAN.
Based on these values, the ESP control unit calculates the specific target pressure in the SBC hydraulic unit.
The brake pressure, which is individually calculated for each wheel based on the control algorithms, is sent to the SBC control unit by the ESP control unit via the electrohydraulic brake CAN.
The pressure regulators in the SBC hydraulic unit adjust the pressure in the corresponding brake circuits to the required brake pressure individually for each wheel.
In the event of failure of the ESP control unit or of the electrohydraulic brake CAN or in the event of communication faults between the control units, the SBC hydraulic unit provides a basic braking function without the functionality of the ESP control unit.

The SBC function is comprised of the following subfunctions:

- **SBC system activation function sequence**
- **SBC system deactivation function sequence**
- **SBC operational states**
- **SBC function scope**
- **SBC additional support functions function sequence**

SBC system activation function sequence

The SBC function can be activated by various wake-up events:

- Circuit 15 On
- Brake light switch (S9/1) actuated
- Parking brake indicator switch (S12) actuated
- Opening a vehicle door
- Locking the vehicle via the central locking (CL [ZV])

The SBC control unit performs a self-test straight after it is activated.

During the initialization period which is required to initialize the system (e.g. for sensor adjustment), the system is not fully operational. When the system is woken up via the brake light switch, an increased pedal travel is therefore adjusted during the first pedal operation. The pedal can pulsate when it is subsequently released. The next time the brake pedal is actuated, the pedal travel is normal. If there are no system errors, the system becomes operational and starts carrying out its functions.
The ESP control unit and the SBC control unit perform further partial tests at regular intervals.
The corresponding fallback level is actuated depending on the faults detected and a fault message is displayed in the instrument cluster (A1).

SBC system deactivation function sequence

SBC is deactivated after:

- t = 20 s, after global vehicle locking
- t = 2 min, e.g. after circuit 15R OFF
- t = 4 min, e.g. after service brake is released with circuit 15R OFF

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i The system is not deactivated as long as the vehicle is rolling or the service brake is operated.

SBC operational states

- SBC system is fully active including ESP
- SBC system is capable of operating to a limited extent, with emergency ABS, without ESP and without ASR
- SBC system provides a basic braking function (without ESP, ASR, BAS, ABS and ETS) i.e. only the brake booster function is active (preliminary and run-on phase with shutoff of the above-specified subfunctions)
- SBC system is in a fallback level (reduced or no brake booster function) i.e. brake pressure is only built up via foot force at the front wheels without brake boosting

SBC function scope

- Brake boosting during driving
- Brake boosting during preliminary and run-on phase

- Individual pressure regulation for each wheel

- Safety software

The safety software monitors the following electrical components and their inputs and outputs:
- Rpm sensors, accelerator pedal sensor (B37) and SBC pedal value sensor
- Valve paths
- Pump motor path
- Supply path
- Hardware of ESP control unit and SBC control unit

In addition, the safety software monitors the plausibility of the signals of the following components:
- Accelerator pedal sensor and SBC pedal value sensor
- Reservoir monitoring
- Modulator monitoring
  Plausibility of pressure request relative to actual pressure at individual wheel = inference of valve fault)

The safety software also performs active tests during initialization (PreDrive Check) and while driving (DriveCheck) (check of pressure sensors and valves).

SBC additional support functions function sequence

The additional support functions of the SBC system consist of the following sub functions:
- *SBC Hold function sequence (not with code (494) USA version and code (460) Canada version)*
- *Precharging function sequence*
- *Dry braking function sequence*

SBC Hold function sequence

SBC Hold is a convenience function which further reduces the stress on the driver.

i On vehicles with code (494) USA version and code (460) Canada version, the SBC Hold function is deactivated via the country coding.

SBC Hold makes life easier for the driver upon request:
- When starting off, particularly on mountain roads
- When maneuvering on mountain roads
- When waiting in traffic

When the vehicle is stationary, the driver can activate the SBC Hold function by pressing the brake pedal. The vehicle is then held in position without any further actuation of the brake pedal. When the vehicle starts off, the braking effect is canceled by actuation of the accelerator pedal.

SBC Hold can be activated when:
- The vehicle is stationary with the brake pedal actuated
- The driver door and the engine hood are closed
- The parking brake is disengaged
- The engine is running (circuit 61 ON)
- The electronic selector lever module control unit (N15/5) is not in the P position

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i The status of the driver door is recorded via the left door contact switch (S17/3) by the rear SAM control unit (N10/8).
The status of the engine hood is recorded by the passenger-side SAM via the left ATA engine hood switch (S62) and the right ATA engine hood switch (S62/1).
The signals are transmitted over the interior CAN.

SBC Hold is activated when the brake pedal is depressed far enough that the "SBC H" indicator appears on the left multifunction display (A1p13). The brake pedal can then be released. The vehicle is held in position automatically.

SBC Hold is deactivated automatically when:
- The accelerator pedal is actuated
- The electronic selector lever module control unit is shifted to position P
- The brake pedal is actuated again until the "SBC H" indicator disappears from the left multifunction display

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The ESP control unit must be fully initialized for the SBC Hold function to be activated. When the vehicle is stationary and the SBC Hold function has been activated, a corresponding signal is placed on the electrohydraulic brake CAN. The passenger-side SAM control unit (N10/11) is informed of the successful activation via a separate line. Furthermore, all the specified pressures requested by the ESP control unit are monitored by the SBC control unit so that the pressure control function can be taken over by the SBC control unit at any time if necessary.
If no specified pressures can be transmitted by the ESP control unit to the SBC control unit in this state, the last specified pressures are used and maintained (electrohydraulic brake CAN inactive or faulty). The last specified pressures are also maintained in the event of a fault in the ESP control unit.
This is signaled to the SBC control unit via a fault bit. Faults in the ESP control unit whereby specified pressures can still be transmitted to the SBC control unit (e.g. yaw rate, lateral and longitudinal acceleration sensor defective) are handled by the additional support function module.

With circuit 15 OFF, holding of the brake pressure is finished when the driver secures the vehicle after circuit 15 OFF. The status of circuit 15 is placed on the engine compartment CAN by the EZS control unit (N73).
This either takes place when the electronic selector lever module control unit is moved to the P position or via the service brake when the brake pedal is actuated with sufficient pressure.
As soon as the P position is detected after SBC Hold was active, the SBC hydraulic unit is deenergized after approx. t = 2 s. This causes a rapid pressure reduction.
The SBC hydraulic unit is then in hydraulic backup mode until it is woken up by a new wake-up event.

If there is a fault in the ESP control unit, the signal "Selector lever position P" is also transmitted via the electrohydraulic brake CAN to reduce the pressure.
If however it can no longer be transmitted, deactivation is then only possible via the service brake.

When the circuit status changes from circuit 15 OFF to circuit 15 ON during pressure holding, the pressures are communicated back to the ESP control unit as follows.

In order to force deactivation of SBC Hold by the driver before he/she leaves the vehicle, visual and acoustic warning messages are

After initialization of the ESP control unit when the signal "SBC hydraulic unit holding pressure" is set, the SBC Hold function is automatically activated in the ESP control unit.
The SBC hydraulic unit recognizes the automatic activation based on the pressure specifications of the ESP control unit and the additional support function status bit on the electrohydraulic brake CAN. Monitoring of the specified pressures is then performed in the same way as described above in case of a further event resulting in pressure holding.

Faults in the SBC hydraulic unit that are relevant to the run-on period (faults whereby the SBC hydraulic unit cannot adjust pressures in the run-on period) result in immediate pressure reduction after circuit 15 OFF. To counteract this, the SBC control unit transmits a signal to the ESP control unit to prevent activation of SBC Hold.

SBC Hold on-board electrical system control:
If SBC Hold is active with circuit 15 OFF, the power supply for maintaining SBC Hold must be ensured. The starter battery (G1/4) may be used for this purpose under certain circumstances.
The driver-side SAM control unit transmits a corresponding signal defining the active status of SBC Hold on the interior CAN regardless of the status of circuit 15.
A precondition for general activation of SBC Hold is a corresponding signal which contains the status "Battery control active". The vehicle power supply control unit (N82/1) transmits this signal on the interior CAN after initialization . The central gateway control unit (N93) receives the signal and transmits it to the ESP control unit via the engine compartment CAN. The status signal is withdrawn in the event of general faults of the vehicle power supply control unit or in the event of faults which prevent power supply via the starter battery.

Plausibility checking of the status of the left door contact switch is used to determine faults in the signal path from the left door contact switch to the instrument cluster.

To reduce the response time during emergency braking, the air gap of the wheel brake system is closed as soon as the accelerator pedal is released and the brake linings are applied with a pressure of p ≤3 bar.
If the driver subsequently depresses the brake pedal, a spontaneous braking effect is achieved and thus the stopping distance is reduced.
The accelerator pedal release gradient is used in the process to evaluate the requirement for rapid braking. The precharging process is terminated after a short time if the driver does not apply the brake.

The precharging function is implemented by the ESP control unit and is subdivided into two functions:
- Continuous detection of triggering threshold for brake precharging
- Precharging of brake system

Precharging is not active in the case of:
- ESP faults (system passive)
- Speed v > 200 km/h
- Initialization of ESP control unit not yet complete

output in various stages.
- Stage 1 (circuit 15 ON and door open)
  The instruction "Move selector lever to position P" is displayed on the right multifunction display (A1p15).
- Stage 2 (circuit 15 OFF and door is or was open)
  In addition to stage 1, the left fanfare horn (H2) and right fanfare horn (H2/1) (horns sounded to attract attention) are actuated by the passenger-side SAM control unit.
- Stage 3 and 4
  The horns are actuated more vigorously to attract attention according to further events.

The horns stop always stop sounding as soon as the driver has deactivated SBC Hold.

i The interior CAN is kept awake by the driver-side SAM control unit (N10/10) as long as SBC Hold is active.

The status of the left door contact switch is read in by the rear SAM control unit and placed on the interior CAN.
If as a result of an electrical or mechanical fault "driver door closed" or "driver door open" is detected erroneously although this is not the case, this is detected by the plausibility logic in the instrument cluster and a corresponding fault is entered in the instrument cluster.
The driver can no longer activate the SBC Hold function or a warning message is issued in instrument cluster if SBC Hold is already active.
In the event of an attempt to activate SBC Hold, a fault is entered in the ESP control unit.

Precharging function sequence
The precharging function is constantly active and improves the braking power by applying pressure to the brake linings (precharging), when the driver switches quickly from the accelerator pedal to the brake pedal.
As a result, the response time of the brake is reduced and the stopping distance reduced during emergency stops.

Continuous detection of triggering threshold:
If the boundary conditions are met, the associated release gradient is determined each time the accelerator pedal is released completely.
The triggering threshold does not change up to a defined value.
If the release gradient exceeds this range, the triggering threshold is also adjusted (it becomes less sensitive).
The aim of this procedure is to obtain a driver-specific triggering threshold.

Precharging of brake system:
The actual precharging function starts once the triggering threshold is exceeded. The strength of the function depends on the vehicle speed and the release gradient.

The following applies within specified thresholds:
The higher the vehicle speed or the quicker the accelerator pedal is released, the stronger the precharging function is performed. However, this is limited to a maximum value so that the driver is not irritated.

However, if the driver brakes before 600 wipe cycles are reached, the counter is set back by 200 cycles per second.
Dry braking is performed for t = 3 s with a brake pressure of p = 1.5 bar only on the front axle with the pressure built up and reduced in a

- Control interventions (ABS, ESP, ASR)
- ME-SFI [ME] control unit (N3/10) faults
- CAN fault
- Selector lever position N
- Standstill or filling pulse performed for t = 800 ms

Dry braking function sequence
This function is continuously active and improves braking performance in wet conditions. The response time of the brake is reduced by cyclical dry braking of the brake disks.

To control the dry braking function, the ESP control unit reads in the position of the windshield wipers via the "Windshield wiper outside park position" contact (circuit 31b).
The dry braking function is triggered after 600 wipe cycles i.e. every t = 7 to 14 min depending on the wiper stage.

If there are no system errors, the ESP becomes operational and starts carrying out its functions.
During operation, the ESP control unit continuously performs system tests.
Any faults are stored in the fault memory.

The ESP control unit processes the following measured quantities to determine the vehicle behavior:
- Yaw rate and
  lateral acceleration recorded by yaw rate and lateral acceleration sensor
- Steering wheel angle recorded by steering angle sensor, made available by steering column tube module
- Brake pressure, made available by SBC control unit
- Engine torque
- Transmission shift stage, made available by ETC control unit (N15/3) (with transmission 722.6) or by
  fully integrated transmission control unit (VGS) (Y3/8n4) (with transmission 722.9)

Intervention in the case of oversteer:
If the vehicle begins to oversteer, brake pressure is built up at the outer front wheel. The resulting reduction in lateral force at the outer front wheel generates a yawing moment which counteracts the tendency of the vehicle to rotate inward. The vehicle speed decreases as a result of the brake force at the front wheel, which also enhances stability.

Intervention in the case of understeer:
If the vehicle understeers, the maximum possible lateral force at the front axle has been exceeded. This means that the vehicle pushes itself over the front axle and toward the outer edge of the corner. If at this point the driver depresses the accelerator pedal, the drive torque is first of all reduced.

To achieve this, the ESP control unit transmits a signal via engine compartment CAN to the ETC control unit (with transmission 722.6) or to the fully integrated transmission control unit (VGS) (with transmission 722.9). The ETC control unit or fully integrated transmission control unit (VGS) then suppresses any upcoming shift operations.

ESP is made up of the following subfunctions:
- **Antilock brake system (ABS) function sequence**
- **Acceleration Slip Regulation (ASR) and Electronic Traction System (ETS) function sequence**
- **Brake Assist (BAS) function sequence**
- **Hill Start Assist function sequence**
- **Passive ASR and ESP switching function sequence**

ramp-shaped pattern.
When 600 wipe cycles are reached, dry braking is only performed if the lateral acceleration is a < 1 m/s, the vehicle speed is between v = 30 and 200 km/h and the pedal value of the accelerator pedal sensor is > 5 %.

ESP function
ESP prevents breakaway when the vehicle oversteers or understeers. Within physical limits it ensures that the vehicle does not deviate from the course specified by the driver. Brake forces are produced selectively at the individual wheels to correct any deviations. Furthermore, reduction of the drive torque takes place in order to increase directional stability and road adhesion.
The ESP control unit immediately carries out a self-test upon circuit 15 ON.

The side-slip angle (angle between vehicle longitudinal axis and direction of movement of the vehicle's center of gravity) is calculated using the yaw rate (speed of vehicle rotation about vertical axis of vehicle).
The yaw rate, the lateral acceleration and the turning angle of the front wheels (calculated from the steering wheel angle) can be used to determine the lateral forces on the wheels. The longitudinal forces on the wheels are calculated using the engine torque, transmission stage and brake pressure at each wheel.
If the yaw angle velocity measured does not match the specified value or if the determined side-slip angle is too large, the ESP control unit generates a signal for brake force build-up or reduction for the relevant wheel. The resulting forces stabilize the vehicle.
A distinction is made between understeering and oversteering vehicle behavior.

If this is not enough or the accelerator pedal is not depressed, the incipient instability is prevented by brake application at up to three wheels:
Stage 1: Brake pressure reduction at inner rear wheel
Stage 2: Stage 1 plus brake pressure buildup at outer rear wheel
Stage 3: Stage 2 plus brake pressure buildup at inner front wheel
Depending on the brake force, a torque is generated which causes the vehicle to rotate inward with a simultaneous reduction in speed. This has a stabilizing effect.
The ESP control unit transmits via engine compartment CAN a signal for drive torque reduction to the ME-SFI [ME] control unit, which reduces the engine output accordingly.
A pending shift operation is suppressed for the duration of control intervention.

ABS function sequence
ABS prevents the wheels from locking up when braking and as a result maintains the steerability and directional stability and road adhesion during vehicle deceleration. If a locking wheel is detected by the ESP control unit on the basis of the signals from the rpm sensors, the brake pressure is reduced at the appropriate brake cylinder until the wheel begins to turn again.

ASR/ETS function sequence
ASR/ETS prevents the driven wheels from spinning when the vehicle is being driven. In addition it causes an improved directional stability and road adhesion with an increased traction potential over the entire vehicle speed range.The ESP control unit records the spinning of the drive wheels via the signals from the rpm sensors. Wheel spinning is

- **Exhaust test/roller dynamometer mode function sequence**
- **System fault display function sequence**

The ESP control unit transmits via engine compartment CAN a signal for drive torque reduction to the ME-SFI [ME] control unit, which then reduces the engine output accordingly.
The system constantly checks whether the drive torque specified by the driver via the accelerator pedal sensor can be allowed again e.g. due to improved road adhesion. The drive torque is transmitted to the opposite, stable drive wheel by means of intervention by the brake system on the spinning wheel.

BAS function sequence
BAS detects emergency braking situations from rapid actuation of the brake pedal and, if necessary, increases the brake pressure in order to achieve maximum possible deceleration. The ESP control unit evaluates the increase in pressure in the brake system and initiates an emergency stop if a certain triggering threshold is exceeded.

The ESP control unit transmits it to the SBC control unit via the electrohydraulic brake CAN.
The brake pressure applied by the driver is maintained in the brake calipers by the SBC hydraulic unit. Once the brake pedal is released, the brake pressure is modulated based on the balance of torques (downward torque due to slope, braking torque and drive torque). When the torque is sufficient to move off, the Hill Start Assist function is deactivated and the vehicle starts off.
However, if the driver does not actuate the accelerator pedal, the pressure in the brake calipers is reduced to zero after t = 0.7 s.

Passive ASR and ESP switching function sequence
The ASR and ESP functions can be switched passive via the ESP OFF button (N72s14) in the lower control panel control unit (N72). The status of the ESP OFF button is read in by the lower control panel control unit and transmitted on the interior CAN.

System fault display function sequence
The driver is informed of the system status and any system faults by means of the following:
- ABS indicator lamp
- ESP and ABS warning lamp
- Message in instrument cluster

countered by reduction of the drive torque.

Hill Start Assist function sequence
Hill Start Assist prevents the vehicle from rolling back contrary to the direction of the gear range engaged when starting off during the time it takes for the driver to move his/her foot from the brake pedal to the accelerator pedal.
The function is automatically triggered when the yaw rate and lateral acceleration sensor detects an incline of $\alpha > 5°$ which would cause the vehicle to roll back contrary to the direction of the gear range engaged with the vehicle at standstill and the brake pedal actuated. The signals from the yaw rate and lateral acceleration sensor are read in by the ESP control unit over the vehicle dynamics CAN. The SBC control unit reads in the status of the brake light switch and transmits this to the ESP control unit via the electrohydraulic brake CAN.
The status of the parking brake indicator switch is read in by the driver-side SAM control unit and placed on the interior CAN. The central gateway control unit forwards this over the engine compartment CAN to the ESP control unit.

The central gateway control unit forwards this over the engine compartment CAN to the ESP control unit.
If the functions are switched passive, the ESP and ABS warning lamp (A1e41) lights up in the instrument cluster. The control thresholds are raised when the functions are switched passive. ABS cannot be deactivated. ESP is always active during a brake application.

Exhaust test/roller dynamometer mode function sequence
For vehicle test purposes, ESP can be set to roller dynamometer mode if the workshop menu is activated via the instrument cluster and the engine is then started. ESP, ABS and ASR are then switched passive. The ESP and ABS warning lamp and the ABS indicator lamp (A1e17) light up in the instrument cluster.
In addition, a corresponding message is displayed in the multifunction display of the instrument cluster.
Roller dynamometer mode can also be activated via diagnosis.

Status	ESP and ABS warning lamp
No control intervention	Off
ABS control	Flashes
ESP control	Flashes
Slip limit reached in ESP passive mode	Flashes
ESP passive	Lights up
Engine OFF and circuit 15 ON	Lights up

SBC status	Lamp	Left multifunction display	Right multifunction display
System OK			
Engine OFF and circuit 15 ON or parking brake actuated and vehicle at standstill	((!))		

Parking brake actuated while driving	((!))	((P))	Release parking brake/brake!
SBC fault (with function limitation) and engine running or SBC control unit in diagnosis mode	((!))	((!))	Info 1: Reduced braking effect/ Visit workshop! Info 2: Longer Stopping Distance/ Service Required!
SBC defective and circuit 15 ON or SBC control unit in diagnosis mode or starter battery defective	((!))	"Stop"	Brake Malfunction!/Stop Vehicle!
SBC defective in preliminary and run-on stage or undervoltage with engine off	((!))	((!))	Info 1: Reduced braking effect/ Start engine! Info 2: Longer Stopping Distance/ Start engine!
SBC brake system is very hot due to extreme usage		((!))	Brakes Overheated!/ Drive with caution!
Brake fluid below minimum	((!))	((!))	Brake fluid/ Visit workshop!

ESP control unit status	**Lamp**	**Left multifunction display**	**Right multifunction display**
System OK			
ESP fault (e.g. yaw rate and lateral acceleration sensor)		ESP	defective!/ Visit workshop!
ESP shut off because steering angle sensor not initialized (e.g. starter battery replaced)	((!))	ESP	Not available!/ See operator's manual!
ABS/ESP/BAS shutoff due to fault (e.g. rpm sensor)	((ABS))	ESP ABS	Info 1: defective!/ Visit workshop! Info 2: defective!/ Visit workshop!
CAN communication to instrument cluster faulty	((ABS))	ESP ABS	Info 1: Display Malfunction/ Visit workshop! Info 2: Display Malfunction/ Visit workshop!
ESP control unit in diagnosis or exhaust test mode	((ABS))	ESP ABS	Info 1: Not available!/ Diag./test bench mode! Info 2: Not available!/ Diag./test bench mode!

SBC Hold display concept:
The display concept and plausibility checking of the signal path of the left door contact switch are implemented in the instrument cluster

Function-related messages (e.g. SBC H OFF) are only actuated by the ESP control unit.

Warning messages are actuated independently by the ESP control unit or instrument cluster depending on the event.

The driver is informed about the system status or faults in accordance with the following table.

Message no.	**Meaning**	**Left multifunction display**	**Right multifunction display**	**Attributes**
1	SBC Hold has been deactivated	SBC H	SBC Hold Off	Text color: white Sound: Gong (1x)
2	SBC Hold has been activated	SBC H		Text color: white
3	Warning message 1	((!))	Brake immediately	Text color: red Sound: Continuous beep
4	SBC Hold fault	SBC H	SBC Hold not available refer to Operating instructions	Text color: white Sound: Beep (1x)
5	Warning message 2	P	Gear selector lever to P	Text color: red Sound: Continuous beep

6	SBC Hold cannot be activated	SBC H	SBC Hold not activatable!	Text color: white

	Sensotronic Brake Control (SBC), location of components		GF42.46-P-0001-01RI
☞PE	Electrical function schematic for Sensotronic Brake Control (SBC)		PE42.46-P-2050-97KA
☞PE	Electrical function diagram for Sensotronic Brake Control Hold (SBC H)		PE42.46-P-2052-97KA
	Sensotronic Brake Control (SBC), block diagram		GF42.46-P-0001-05RI
	Sensotronic Brake Control Hold (SBC H), block diagram		GF42.46-P-0001-06RI
	Instrument cluster, component description	A1	GF54.30-P-6000RI
	SBC hydraulic unit, component description	A7/3	GF42.50-P-5119RI
	Yaw rate, lateral and longitudinal acceleration sensor, component description	B24/15	GF42.45-P-4810RI
	ME-SFI [ME] control unit, component description	N3/10 Engine 272 Engine 273 Engine 275	GF07.61-P-6000MIR GF07.61-P-6000MLR GF07.61-P-6000MOR
	Rear SAM control unit with fuse and relay module, component description	N10/8	GF54.21-P-6030RI
	Driver-side SAM control unit with fuse and relay module, component description	N10/10	GF54.21-P-6010RI
	Passenger-side SAM control unit with fuse and relay module component description	N10/11	GF54.21-P-6020RI
	Electronic transmission-control control unit, component description	N15/3 With transmission 722.6	GF27.60-P-5164ACM
	Electronic selector lever module control unit, component description	N15/5 Transmission 722.6 Transmission 722.9	GF27.60-P-5163ACM GF27.60-P-5163AHM
	ESP control unit, component description	N47-5	GF42.45-P-5118RI
	Lower control panel control unit, component description	N72	GF54.21-P-6060RI
	Component description for the EIS [EZS] control unit	N73	GF80.57-P-6003RI
	Steering column tube module, component description	N80	GF54.21-P-6050RI
	Vehicle power supply control unit, component description	N82/1	GF54.21-P-4126RI
	Central gateway control unit, component description	N93	GF54.21-P-4170RI
	Fully integrated transmission control unit, component description	Y3/8n4 With transmission 722.9	GF27.60-P-5165AHM
	Accelerator pedal sensor, component description	B37	GF30.20-P-2010RI
	SBC pedal value sensor, component description	B37/1	GF42.46-P-5133RI
	Fanfare horns component description	H2, H2/1	GF54.35-P-3010RI
	Component description for the rpm sensor	L6/1, L6/2, L6/3, L6/4	GF42.30-P-4552RI
	Steering angle sensor, component description	N49	GF42.45-P-5107RI
	Brake light switch, component description	S9/1	GF42.10-P-2010RI
	Parking brake indicator switch, component description	S12	GF42.20-P-5002RI
	Door contact switch, component description	S17/3	GF80.20-P-4125RI
	ATA hood switch, component description	S62, S62/1	GF80.50-P-6040RI