MODEL 166
up to model year 2016

A1 Instrument cluster
A1p13 Multifunction display
A76 Left front reversible emergency tensioning retractor
A76/1 Right front reversible emergency tensioning retractor
A90 COLLISION PREVENTION ASSIST controller unit (with CODE 252 (COLLISION PREVENTION ASSIST))
A98 Panoramic sliding sunroof control module (with CODE 413 (Panoramic glass sunroof with top sliding sunroof))
A98n1 Panoramic sliding sunroof control unit (with CODE 413 (Panoramic glass sunroof with top sliding sunroof))
A98/1 Sliding roof control module (with CODE 414 (Power glass tilting/sliding roof))
N2/10 Supplemental restraint system control unit
N3/9 CDi control unit (diesel engine)
N3/10 ME-SFI [ME] control unit (gasoline engine)
N10 SAM control unit
N30/4 Electronic Stability Program control unit
N32/2 Front passenger seat control unit (with CODE P64 (Memory package))
N32/29 Driver multicontour seat control unit (with CODE 399 (Front multicontour seats with massage function))

Function requirements, general
- Terminal 15 ON
- "Engine running" or "Drive train operational" signal set (except with seat belt adjustment function)
- No overvoltage or undervoltage

- Function sequence for sensing the vehicle status
- Function sequence for reversible tensioning retraction
- Function sequence for seat belt adaptation
- Function sequence for positioning the front passenger seat (with CODE P64 (Memory package))
The electronic ignition lock control unit sends the status of circuit 15 via chassis CAN 1 to the Electronic Stability Program control unit and to the reversible emergency tensioning retractors. The signal "Engine running" or "Drivertrain operational" is sent by the CDI control unit or ME-SFI (ME) control unit via chassis CAN 1 to the Electronic Stability Program control unit.

**PRE-SAFE®, general**

The preventive occupant protection system PRE-SAFE® can recognize critical driving situations in advance and as a precautionary measure can, if necessary, activate systems that reduce the risk of injury to the vehicle occupants. To do so, PRE-SAFE® permanently evaluates the data from systems such as the Electronic Stability Program (ESP®) and the Brake Assist System PLUS (BAS PLUS) (with CODE 233 (DISTRONIC PLUS)), which then enables it, e.g. to recognize excessive understeer or oversteer and emergency braking. If a critical driving situation is recognized, corresponding measures can be started within fractions of a second. These measures allow the seat belts and airbags to provide their full protective effect in the event of a collision.

The PRE-SAFE® function is controlled by the Electronic Stability Program control unit. The PRE-SAFE function® includes the following subfunctions:

**Function sequence for sensing the vehicle status**

The current vehicle status is defined by the Electronic Stability Program control unit by evaluating the following variables:

- Wheel speed
- Natural dynamics of the vehicle (yaw speed, lateral acceleration and longitudinal acceleration)
- Steering angle

Detailed information about acquisition of these variables can be found in the separate function description "ADAPTIVE BRAKE function".

The Electronic Stability Program control unit also evaluates the following signals from different driver assistance systems:

- "Autonomous brake application": The video and radar sensor system control unit (with CODE 233 (DISTRONIC PLUS), CODE 237 (Active Blind Spot Assist) and CODE 238 (Active Lane Keeping Assist)) sends the "Autonomous brake application" signal via chassis CAN 1 to the Electronic Stability Program control unit.
- "Collision-critical warning": The COLLISION PREVENTION ASSIST controller unit (with CODE 252 (COLLISION PREVENTION ASSIST)) sends the "Collision-critical warning" status via chassis CAN 1 to the Electronic Stability Program control unit.

The Electronic Stability Program control unit differentiates between the following critical driving statuses:

- Emergency braking: Fast brake-pedal operation, which indicates a startled response by the driver.
- Panic braking: The driver's deceleration request is significantly higher than the physically possible vehicle deceleration on a slippery road (e.g. aquaplaning, ice or snow). Strong interventions of the anti-lock braking system (ABS).
- Strong oversteer: Swerving of rear end combined with strong ESP® stabilization interventions.
- Strong understeer: Vehicle pushes for a certain time over the front wheels. Strong ESP® stabilization interventions.
- Critical steering movements: Rapid steering movements at high speeds (v > 140 km/h) that indicate a startled reaction from the driver, making it highly likely that the driver will not be able to cope with this situation.
- Strong braking support by BAS PLUS (with CODE 233 (DISTRONIC PLUS)): Strong support of brake application initiated by the driver in response to recognized threat of collision in longitudinal traffic based on a radar-supported assessment of the surroundings.
- Autonomous braking by PRE-SAFE® brake (with CODE 233 (DISTRONIC PLUS)): Deceleration of the vehicle in response to recognized threat of collision in longitudinal traffic based on a radar-supported assessment of the surroundings.
- Autonomous course correction through Active Blind Spot Assist (with CODE 237 (Active Blind Spot Assist)): Pronounced, course-correcting brake intervention with registered risk of a side collision with vehicles in blind spot based on a radar-supported assessment of the surroundings.
- Autonomous course correction through Active Blind Spot Assist: Detection of an imminent frontal impact (under certain conditions) based on a radar-supported assessment of the surroundings.
- Autonomous braking by PRE-SAFE® brake (with CODE 233 (DISTRONIC PLUS)): Deceleration of the vehicle in response to recognized threat of collision in longitudinal traffic based on a radar-supported assessment of the surroundings.

Function sequence for closing side windows

Function sequence for closing of sliding roof (with CODE 414 (Power glass tilting/sliding roof)) or of panoramic sliding sunroof (with CODE 413 (Panoramic glass sunroof with top sliding sunroof))

Function sequence for display of fault messages

Function sequence for terminating PRE-SAFE® functions

Additional function requirements, reversible emergency tensioning retraction

- Seat belt applied

The supplemental restraint system control unit reads in the status of the respective belt buckle restraint system switch directly and sends this via chassis CAN 1 to the reversible emergency tensioning retractors.

Additional function requirements for seat belt adjustment

- Function activated in instrument cluster

Function sequence for adjustment of seat contour (as of 01.07.2012 with CODE 399 (Front multicontour seats with massage function))

Function sequence for closing side windows

Function sequence for closing of sliding roof (with CODE 414 (Power glass tilting/sliding roof)) or of panoramic sliding sunroof (with CODE 413 (Panoramic glass sunroof with top sliding sunroof))

Function sequence for display of fault messages

Function sequence for terminating PRE-SAFE® functions

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Additional function requirements for positioning of the front passenger seat (with CODE P64 (Memory package))

- Front passenger seat occupied
- Seat adjustment normalized

The supplemental restraint system control unit sends the status of the front passenger seat occupied recognition via chassis CAN 1, electronic ignition lock control unit and interior CAN to the front passenger seat control unit.

Function sequence for positioning the front passenger seat (with CODE P64 (Memory package))

In order to optimize the protective effect of the conventional restraint equipment, the front passenger seat is moved into a position that is favorable from a safety point of view before a potential accident. The Electronic Stability Program control unit sends information about the PRE-SAFE® status and the request for PRE-SAFE® adjustment over the chassis CAN 1, electronic ignition lock control unit and interior CAN to the front passenger seat control unit. Any memory or manual setting that may be active is aborted.

Depending on the current seat position, the following adjustments are made:
- Seat fore/aft position
- Seat height

Additional function requirements for adjustment of the seat contour (as of 01.07.2012 with CODE 399 (Front multicontour seats with massage function))

- Seat belt applied

The supplemental restraint system control system reads in the status of the respective belt buckle restraint system switch directly and sends this via chassis CAN 1, electronic ignition lock control unit and interior CAN to the multicontour seat control units.

Function sequence for adjustment of seat contour (as of 01.07.2012 with CODE 399 (Front multicontour seats with massage function))

In order to optimize the protective effect of the conventional restraint equipment, the seat contour of the driver and front passenger seat is adjusted by PRE-SAFE® before a potential accident. The Electronic Stability Program control unit sends information about the PRE-SAFE® status and the request for PRE-SAFE® adjustment via chassis CAN 1, electronic ignition lock control unit and interior CAN to the multicontour seat control units. Any memory or manual setting that may be active is aborted.

The following settings are made:
- Inflating the side inserts (the driver and the front passenger are held in a central position in the seat)
- Deflating the air cushions in the lumbar area (driver and front passenger sit lower down in their seats)

Additional function requirements for closing the side windows

- Power windows normalized

Function sequence for closing side windows

Closing the side windows apart from a small gap is intended to ensure that no objects can penetrate into the vehicle interior and no body parts (e.g. arms) of the occupants can protrude from the vehicle in the event of a potential accident. This also allows the smoke particles generated by the pyrotechnical restraint equipment to disperse quickly.

The Electronic Stability Program control unit sends information about the PRE-SAFE® status and the request for PRE-SAFE® adjustment over the chassis CAN 1, electronic ignition lock control unit and interior CAN to the following control units:
- Left front door control unit
- Right front door control unit
- Left rear door control unit
- Right rear door control unit

The closing of the respective side window by PRE-SAFE® can be interrupted at any time by manual adjustment requests. Following the PRE-SAFE® situation, the side windows must be manually moved back into the desired position.

Detailed information about controlling the side windows can be found in the separate function description "Power windows (EFH), function".

- Seat inclination
- Backrest inclination

The PRE-SAFE® setting continues until:
- The target position is reached (front passenger seat in optimum position)
- The impact occurs
- End of PRE-SAFE® situation

Detailed information about adjusting the front passenger seat can be found in the separate "Electrical seats, function" function description in the "Electrical seat adjustment (ESE), function" subfunction.

- Deflating the air cushions in the lumbar area (driver and front passenger sit lower down in their seats)

The PRE-SAFE® setting continues until:
- Specified pressure reached in the side inserts
- The impact occurs
- End of PRE-SAFE® situation

Detailed information on adjusting the seat contour is available in the separate function description "Electrical seats, function" in the "Multicontour seat (MKS), function" subfunction.
Additional function requirements for closing of sliding roof (with CODE 414 (Power glass tilting/sliding roof)) or the panoramic sliding sunroof (with CODE 413 (Panoramic glass sunroof with top sliding sunroof))

- Sliding roof NORMALIZED

Function sequence for closing of sliding roof (with CODE 414 (Power glass tilting/sliding roof)) or the panoramic sliding sunroof (with CODE 413 (Panoramic glass sunroof with top sliding sunroof))

Closing the sliding roof apart from a small gap ensures that no objects can penetrate into the vehicle interior and no body parts (e.g. arms) of the occupants can protrude from the vehicle in the event of a potential accident. This also allows the smoke particles generated by the pyrotechnical restraint equipment to disperse quickly.

The Electronic Stability Program control unit sends information about the PRE-SAFE® status and the request for PRE-SAFE® adjustment via chassis CAN 1, electronic ignition lock control unit and interior CAN to the panoramic sliding sunroof control unit in the panoramic sliding sunroof control module or to the sliding roof control module.

If closing is activated by PRE-SAFE® during a manual adjustment, the manual adjustment is completed first and then closing by PRE-SAFE® is carried out. If closing is activated by PRE-SAFE® during an automatic operation, the automatic operation is aborted and closing is carried out by PRE-SAFE®. When closing the sliding sunroof through PRE-SAFE®, the automatic reversing function is active.

Function sequence for display of fault messages

If the reversible emergency tensioning retractors detect faults, these are displayed in the multifunction display of the instrument cluster. Faults in other components that are involved in the PRE-SAFE® system are not displayed as PRE-SAFE® faults. The reversible emergency tensioning retractors send the request to display the fault message via chassis CAN 1, electronic ignition lock control unit and chassis CAN 2 to the instrument cluster.

Function sequence for terminating PRE-SAFE® functions

The PRE-SAFE® function is deactivated as soon as the current situation is deemed to be no longer critical. For this purpose, the Electronic Stability Program control unit obtains the information about the PRE-SAFE® status from the chassis CAN 1.

The PRE-SAFE® setting continues until:
- The sliding roof reaches the PRE-SAFE® position
- The impact occurs
- The closing of the sliding roof by PRE-SAFE® can be interrupted at any time by manual adjustment requests. Following completion of the PRE-SAFE® situation, the sliding roof must be manually moved back into the desired position.

Detailed information about controlling the sliding roof can be found in the separate function descriptions "Power sliding roof (SD), function" or "Electric panoramic sliding roof, function".

| Electrical function schematic, pre-safe | PE91.40-P-2051-97NAA |
| Overview of PRE-SAFE system components | GF91.40-P-9997GR |