

# G30 Driver Assistance Systems

## 21. Cruise Control

| Symbols   | Explanation  |
|---|--|
| <br>TE15-0974  | <p>Distance control (ranging) active:<br/>ACC Stop&amp;Go adjusts to the set distance (distance 2).<br/>The speedometer mark for the Active Cruise Control with Stop&amp;Go function also lights up green in the speed reading.</p>  |
| <br>TE15-0975  | <p>Distance control (ranging) active:<br/>ACC Stop&amp;Go adjusts to the set distance (distance 3).<br/>The speedometer mark for the Active Cruise Control with Stop&amp;Go function also lights up green in the speed reading.<br/>Distance 3 is approximately half the value of the speed indicator in metres and is pre-set automatically when the system is first switched on.</p> |
| <br>TE15-0976 | <p>Distance control (ranging) active:<br/>ACC Stop&amp;Go adjusts to the set distance (distance 4).<br/>The speedometer mark for the Active Cruise Control with Stop&amp;Go function also lights up green in the speed reading.</p>  |

# G30 Driver Assistance Systems

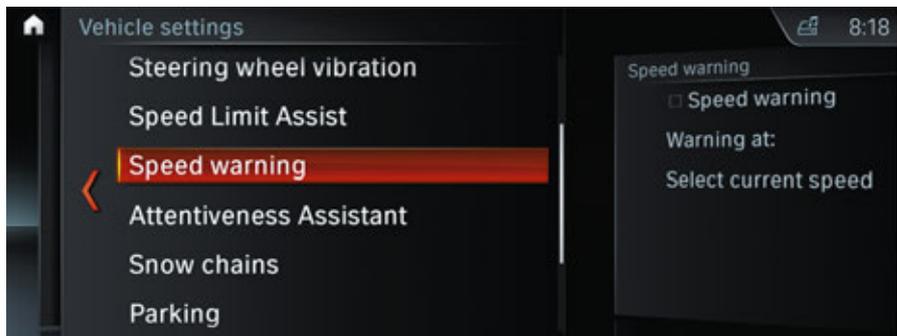
## 22. Speed Limit Warning

The driver has the option of setting a speed at which a warning is issued when the system is activated and the preset speed is exceeded.

### 22.1. Operation

The speed limit warning can be switched on and off in the iDrive menu, as well as the speed setting at which the warning should be issued, by making the following selection via the controller:

- "My Vehicle"
- "Vehicle settings"
- "Speed warning"
- "Warning at:"
- Turn controller until the desired speed is displayed
- Press controller
- Speed limit warning is saved



G30 Speed limit warning display on the CID

# G30 Driver Assistance Systems

## 23. Lateral Guidance Assistants

The Active Lane Keeping Assistant with Side Collision Avoidance were introduced for the first time in the G12.

Further innovative systems are introduced with the launch of the G30. The driver of a new BMW 5 Series now also has Evasion Aid at his disposal.

### 23.1. Launch timeline

The graphic below shows when the lateral guidance systems were introduced:



Overview of lateral guidance assistance

# G30 Driver Assistance Systems

## 23. Lateral Guidance Assistants

| Index | System   | Functional characteristics of the systems  |
|-------|--|--|
| 1     | Second generation Traffic Jam Assistant (from 2015 with launch of G12)                     | <ul style="list-style-type: none"> <li>• 0 – 43 mph (0 – 70 km/h)</li> <li>• Traffic jam following distance control with lane center guidance</li> <li>• No road-type restrictions</li> </ul>  |
| 1     | Active Lane Keeping Assistant (from 2015 with launch of G12)                               | <ul style="list-style-type: none"> <li>• 43 – 130 mph (70 – 210 km/h)</li> <li>• Lane center guidance</li> <li>• No road-type restrictions</li> </ul>  |
| 2     | Active Lane Keeping Assistant with Side Collision Avoidance (from 2015 with launch of G12) | <ul style="list-style-type: none"> <li>• 18 – 43 mph (30 – 70 km/h) (warning in form of single steering wheel pulse)</li> <li>• 43 – 130 mph (70– 210 km/h) (corrective steering interventions)</li> <li>• Active steering interventions in situations where a collision is imminent</li> <li>• No road-type restrictions</li> </ul> |
| 3     | Second generation Traffic Jam Assistant  | <ul style="list-style-type: none"> <li>• 0 – 43 mph (0 – 70 km/h)</li> <li>• Traffic jam following distance control with lane center guidance</li> <li>• No road-type restrictions</li> </ul>  |
| 3     | Active Lane Keeping Assistant  | <ul style="list-style-type: none"> <li>• 43 – 130 mph (70 – 210 km/h)</li> <li>• Lane center guidance</li> <li>• No road-type restrictions</li> </ul>  |
| 4     | Active Lane Keeping Assistant with Side Collision Avoidance                                | <ul style="list-style-type: none"> <li>• 18 – 43 mph (30 – 70 km/h) (warning in form of single steering wheel pulse)</li> <li>• 43 – 130 mph (70– 210 km/h) (corrective steering interventions)</li> <li>• Active steering interventions in situations where a collision is imminent</li> <li>• No road-type restrictions</li> </ul> |
| 4     | Evasion Aid (from 2016 with the launch of the G30)   | <ul style="list-style-type: none"> <li>• 25 – 100 mph (40 – 160 km/h)</li> <li>• Supporting steering intervention after warning from the collision warning system and previously initiated avoidance maneuver</li> </ul>   |

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants

What drivers wish for most while driving is relief from monotonous situations such as sitting in a jam or slow moving traffic. In addition to Active Cruise Control with Stop&Go function, drivers are now also supported by Active Lane Keeping Assistant. The Active Lane Keeping Assistant was first introduced in the G12.

The Active Lane Keeping Assistant and Traffic Jam Assistant are part of the Active Driving Assistant Plus, optional equipment (OE 5AT).

The system assists the driver in keeping the vehicle in lane by initiating corrective steering interventions if required.



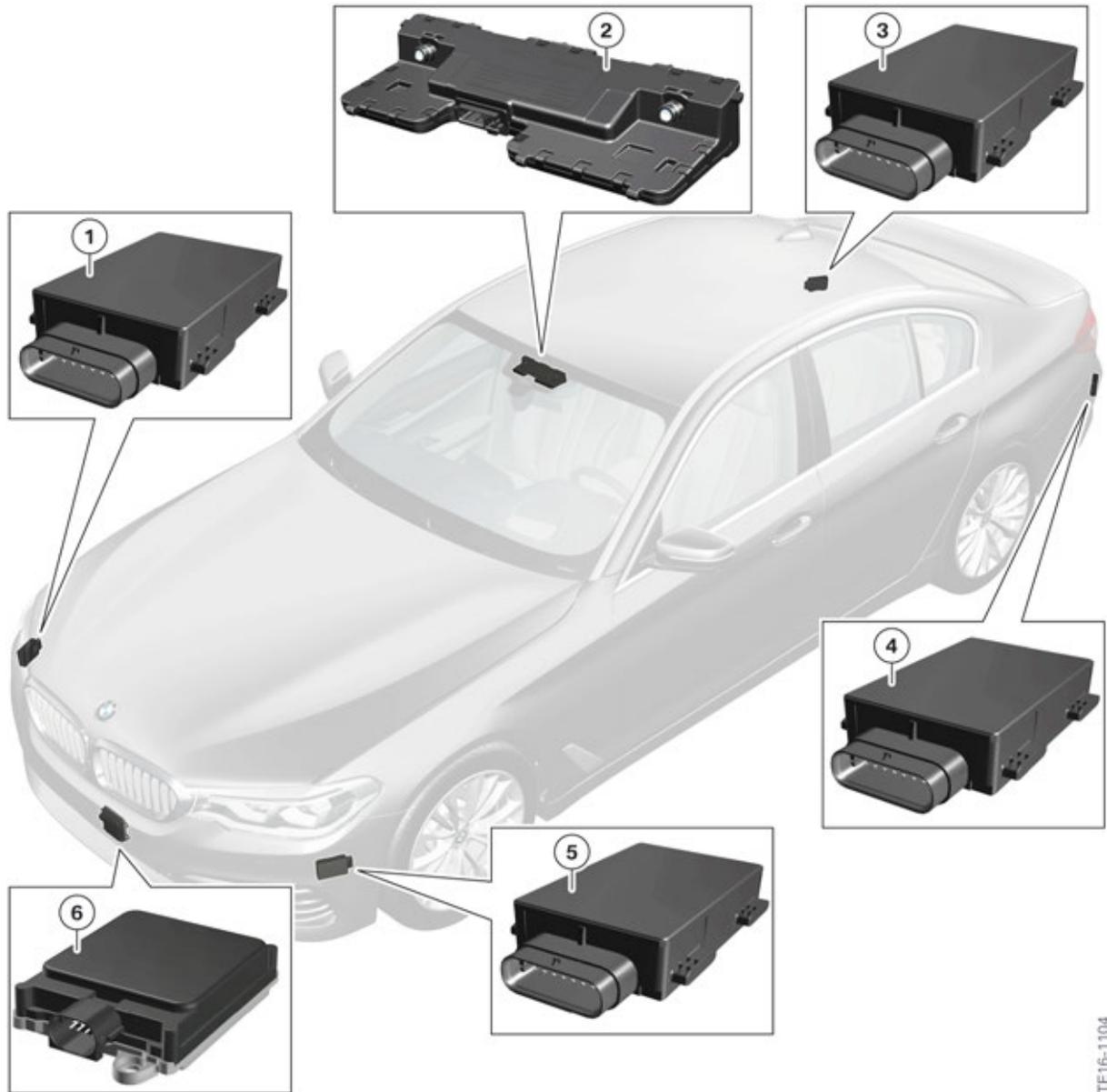
G30 Active steering intervention

### 24.1. Functional principle

Depending on the speed, the system is guided by the lane edges or vehicles driving ahead. The position of the lane edges and the vehicle driving ahead is determined with the help of five radar sensors and the KAFAS stereo camera.

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants



G30 Installation locations of radar sensors and KAFAS stereo camera

TE16-1104

| Index | Explanation                                |
|-------|--|
| 1     | Control unit for radar sensor, right (RSR) |
| 2     | KAFAS stereo camera                        |
| 3     | Blind Spot Detection (primary)             |
| 4     | Blind Spot Detection (secondary)           |
| 5     | Control unit for radar sensor, left (RSL)  |
| 6     | Active Cruise Control (ACC)                |

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants

The system has two subfunctions: the Traffic Jam Assistant (second generation) and the Active Lane Keeping Assistant.

The Traffic Jam Assistant is available for speeds up to approximately 43 mph (70 km/h), the Active Lane Keeping Assistant from approximately 43 mph (70 km/h) to approximately 130 mph (210 km/h).

The table below shows an overview of the differences between the two subfunctions:

| <b>Traffic Jam Assistant</b>  | <b>Active Lane Keeping Assistant</b>   |
|---|--|
| Speed range 0 – 43 mph (0 – 70 km/h)  | Speed range from 43 – 130 mph (70 – 210 km/h)  |
| Corrective steering interventions in the direction of the vehicle driving ahead | Corrective steering interventions in the direction of the center of the lane           |
| Detected lane markings taken into consideration                                 | Gaps in lane markings can be bridged for a limited time by aligning with vehicle ahead |

If the Traffic Jam and Active Lane Keeping Assistants are activated, the Side Collision Avoidance is also interlinked.

### 24.1.1. Hands-off-Detection

To ensure the driver is alert and able to react, he is urged to always have both hands on the steering wheel when the Active Lane Keeping Assistant and Traffic Jam Assistant are activated (established in the German road traffic regulations). If the driver takes both hands off the steering wheel rim, control is stopped after a few seconds during active control and the driver is requested to take over steering.

Additional information about Hands-off-Detection may be found in the “G12 Driver Assistance Systems” reference manual (section 23.1.1).

### 24.1.2. Functional prerequisites

The following prerequisites must be met in order for the Active Lane Keeping Assistant and Traffic Jam Assistant to be used:

- Speed must be below 130 mph (210 km/h).
- Above 43 mph (70 km/h): both lane edges must be detected.
- Below 43 mph (70 km/h): both lane edges or a vehicle driving ahead must be detected.
- The lane width must be sufficient.
- The vehicle should be positioned as centrally as possible in the lane.
- There must be a sufficient curve radius.
- At least one hand must be on the steering wheel rim.
- The turn indicator must not be activated.
- The camera calibration process must be completed immediately after vehicle delivery.

The active lateral control function with data evaluation of the KAFAS stereo camera is implemented with the assistance of the lane markings identified on the left and right.

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants

In order for the system to be activated, two lane boundary lines must be detected. Below a speed of approximately 43 mph (70 km/h) a vehicle driving ahead in the same lane is sufficient to activate the system.

The system is put in Standby mode if the marginal conditions are not satisfied (e.g. hands not on steering wheel, lane too narrow or dazzling of KAFAS stereo camera). Once all marginal conditions have been met, the system is re-enabled automatically.

To activate the system, the speed of the vehicle is another input quantity that is evaluated. The system uses these values to decide which function will be enabled. As mentioned above, the threshold values are set as follows:

- The Traffic Jam Assistant can be enabled within a speed range of 0 to approximately 43 mph (70 km/h).
- The Active Lane Keeping Assistant can be enabled within a speed range from approximately 43 to approximately 130 mph (70 to approximately 210 km/h).

### 24.1.3. Lane change

For a lane change to be as comfortable as possible, the Active Lane Keeping Assistant and Traffic Jam Assistant are put silently into Standby mode when the turn indicator is activated and reactivates itself automatically once the turn indicator is back in its initial position and a lane change has occurred.

### 24.1.4. Function logic

The main function logic of the lateral guidance is implemented in the Optional Equipment System (SAS) control unit.

The majority of the data for the function is provided by the KAFAS stereo camera, where algorithms for the lane and object detection run.

Vehicle dynamics data, such as the driving speed, wheel speeds, yaw rate, steering angle, lateral acceleration, longitudinal acceleration, etc., is provided by the rest of the vehicle network via a FlexRay or CAN connection.

A target trajectory (also known as a path curve) is calculated in the Optional Equipment System (SAS) control unit. This is used to determine whether a steering correction is required.

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants

### 24.1.5. Steering interventions

If the current course of the vehicle deviates too much from the target trajectory (path curve), a steering correction is initiated.

The steering intervention is a corrective measure. This means the driver is not relieved of his duty to steer the vehicle. As the corrective steering interventions are limited to approximately  $1.5 \text{ m/s}^2$  based on the lateral acceleration, the system cannot navigate curves above the respective speed-dependent curve radius without the driver's assistance. The driver must therefore steer the vehicle at the same time in order to stay on the roadway.

The target trajectory and required steering corrections are calculated based on the driving speed as follows:

#### Speed range 0 to 43 mph (0 to 70 km/h):

- The position and previous movements of the vehicle driving ahead are given priority when determining the appropriate steering corrections.
- Detected lane markings are taken into account to avoid unwanted steering corrections that would result in leaving the lane.
- Corrective steering interventions in the direction of the center of the lane are initiated if the vehicle detects there is not a vehicle driving ahead.

#### Speed range 43 to 80 mph (70 km/h to 130 km/h):

- Corrective steering interventions in the direction of the center of the lane are initiated.
- It is possible to bridge the gap for a limited time where lane markings are not detected by estimating the course of the lane based on the vehicle driving ahead.

#### Speed range 80 to 130 mph (130 km/h to 210 km/h):

- Corrective steering interventions in the direction of the center of the lane are initiated.
- For safety reasons above a driving speed of approximately 80 mph (130 km/h) the course of the lane is **not** estimated using the vehicle driving ahead.

The vehicle driving ahead is given priority as the "correction target" at speeds up to approximately 43 mph (70 km/h) due to the limited detection of lane markings.

In traffic jams or slow-moving traffic following distances are often extremely small ( $< 30 \text{ ft}$  ( $< 10 \text{ m}$ )) due to tailgating and lanes ahead are often partially covered due to staggered driving.

This means the KAFAS stereo camera is unable to correctly interpret the lane markings in some cases.

When classifying the object driving ahead, vehicles such as motorbikes are not used as the "correction target".

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants

### Steering momentum

The driving dynamics function software in the Dynamic Stability Control (DSC) control unit calculates a target steering torque based on the curve nominal value. The target steering torque is then converted to an engine torque by the Electronic Power Steering (EPS), which finally results in a steering wheel movement at the wheels.

The maximum steering torque has been set in such a way that it can always be overruled by the driver and therefore steering past the maximum steering torque is possible.

### 24.1.6. Operation

The system is switched on via the Traffic Jam Assistant button on the multifunction steering wheel (MFL).



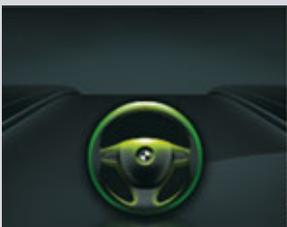
G30 buttons for ACC Stop&Go with Active Driving Assistant Plus optional equipment (OE 5AT)

| Index | Explanation   |
|-------|---|
| 1     | Button for activating or deactivating the Active Lane Keeping Assistant and Traffic Jam Assistant |
| 2     | Button for activating or deactivating ACC Stop&Go   |
| 3     | Rocker switch for changing the set speed  |
| 4     | “SET” button for setting the speed of cruise control  |
| 5     | Button for adjusting the distance of the driver's vehicle to the vehicle driving ahead            |
| 6     | Button for calling up a saved set speed/temporarily switching off the cruise control              |

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants

### Displays

| Symbols   | Explanation  |
|---|--|
|  A steering wheel icon in a grey color, centered on a dark background. A vertical label 'TE15-0966' is on the right side of the image.   | <p>Grey steering wheel symbol:</p> <ul style="list-style-type: none"><li>The system has been interrupted and will not make any further steering wheel movements. The system is in Standby mode.</li><li>Once the system conditions are met, the system reactivates itself automatically.</li></ul> |
|  A steering wheel icon in a green color, centered on a dark background. Lane edges are visible as thin green lines on either side of the road. A vertical label 'TE15-0962' is on the right side of the image. | <p>Green steering wheel symbol and lane edges:</p> <ul style="list-style-type: none"><li>The system assists in keeping the vehicle in the lane.</li></ul>  |
|  A steering wheel icon in a green color, centered on a dark background. Lane edges are visible as thin grey lines on either side of the road. A vertical label 'TE15-0963' is on the right side of the image. | <p>Green steering wheel symbol, grey lane edges:</p> <ul style="list-style-type: none"><li>No lane edges detected. The vehicle follows the vehicle driving ahead.</li></ul>  |
|  A steering wheel icon in a yellow color, centered on a dark background. A vertical label 'TE15-0984' is on the right side of the image.   | <p>Yellow steering wheel symbol:</p> <ul style="list-style-type: none"><li>Request for driver to place hands back on the steering wheel (grasp steering wheel). System continues to be active.</li></ul>   |
|  A steering wheel icon in a red color, centered on a dark background. A vertical label 'TE15-0965' is on the right side of the image.  | <p>Red steering wheel symbol and acoustic signal sounds:</p> <ul style="list-style-type: none"><li>The system has been interrupted. It will not make any further steering wheel movements.</li></ul>   |

### Configuration options

The driver can change the system settings in the Intelligent Safety configuration menu.

# G30 Driver Assistance Systems

## 24. Lane Keeping & Traffic Jam Assistants

### 24.1.7. Deactivation criteria

The Active Lane Keeping Assistant and Traffic Jam Assistant is deactivated automatically in the following situations:

- If the vehicle departs from the detected lane or the lane width does not meet the requirements.
- If the lane edges of the current lane are not detected by the KAFAS stereo camera.
- If no vehicle driving ahead is detected.
- The vehicle is travelling at a speed greater than 130 mph (210 km/h).
- If the Hands-off-Detection cannot detect the hands (at least one hand) on the steering wheel rim. The system is switched off once a defined time threshold (several seconds) has elapsed.
- Due to the radius of the bend in the road, the inner lane edge is no longer detected due to the camera aperture angle.
- Pedestrian protection assumes the operating condition "Fault exists".
- If the turn indicator is on.
- The driver intervenes actively in the steering.
- If over a certain time period no lane edges are detected and there is not a vehicle driving ahead.
- If the driver manually deactivates the DSC (DSC off).
- If there is an intervention from the preventative pedestrian protection.
- After Dynamic Brake Control braking (brake assistant).

### 24.1.8. Limits of the system

When driving in narrow lanes, e.g. when driving through construction zones or when emergency lanes are formed, the system cannot be activated or used meaningfully.



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Due to the limited detection capacity of the KAFAS stereo camera, the driver must remain alert and observant in order to be able to actively intervene at any time so as to avoid the risk of an accident. The system does not relieve the driver of personal responsibility for correctly judging the traffic situation. The driver is solely responsible for the vehicle.

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# G30 Driver Assistance Systems

## 25. Active Lane Keeping Assistant

The Active Lane Keeping Assistant with Side Collision Avoidance is part of the Active Driving Assistant Plus, optional equipment (OE 5AT).

By making corrective steering interventions, the system, already familiar from the G12 helps the driver to keep the vehicle in lane at speeds from approximately 43 mph (70 km/h) to approximately 130 mph (210 km/h) and to actively avoid potential side collisions. The system endeavors to orient the vehicle in its lane according to the situation and within the framework of the system limits.

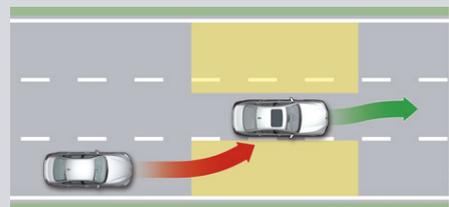
The system consists of the following four subfunctions:

- Side Collision Avoidance
- Reduced Side Collision Avoidance
- Lane Departure Warning
- Blind Spot Detection

### 25.1. Side Collision Avoidance

The table below shows an overview of the functional characteristics of the "Side Collision Avoidance" subfunction:

| Speed range                  | Warning functions  | Corrective steering intervention   |
|------------------------------|--|--|
| 43 – 130 mph (70 – 210 km/h) | <ul style="list-style-type: none"> <li>• Issued if the vehicle detects that it is getting critically close to another vehicle to the side</li> <li>• Haptic warning in the form of vibration in the steering wheel using an unbalanced actuator</li> <li>• Visual warning in exterior mirror in the form of the corresponding warning light</li> </ul> | <ul style="list-style-type: none"> <li>• Corrective steering intervention in the direction of the available space on the roadway</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>• Detected lanes</li> <li>• Sufficient available space on the roadway</li> </ul> |



#### 25.1.1. Reduced Side Collision Avoidance

The Reduced Side Collision Avoidance comes into play if it is not possible to adequately monitor the available space on the roadway or there is no available space on the roadway.

The Reduced Side Collision Avoidance is interlinked with the Active Lane Keeping Assistant and Traffic Jam Assistant functions.

# G30 Driver Assistance Systems

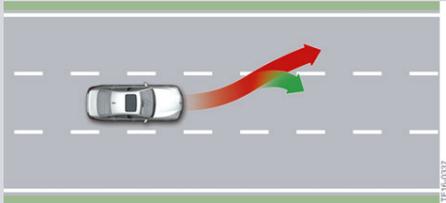
## 25. Active Lane Keeping Assistant

The table below shows an overview of the functional characteristics of the "Reduced Side Collision Avoidance" subfunction:

| Speed range                     | Warning functions  | Corrective steering intervention  |
|---------------------------------|--|---|
| 18 – 130 mph<br>(30 – 210 km/h) | <ul style="list-style-type: none"> <li>Issued if the vehicle detects that it is getting critically close to another vehicle to the side</li> <li>Haptic warning in the form of vibration in the steering wheel using an unbalanced actuator</li> <li>Visual warning in exterior mirror in the form of the corresponding warning light</li> <li>18 – 46 mph (30 – 75 km/h) additional warning in form of single steering wheel pulse</li> </ul> | <ul style="list-style-type: none"> <li>A corrective steering intervention is <b>not</b> initiated; instead only a single steering wheel pulse warning is issued in the opposite direction to the detected object the vehicle could collide with.</li> </ul> |

### 25.2. Lane Departure Warning

The table below shows an overview of the functional characteristics of the "Lane Departure Warning" subfunction:

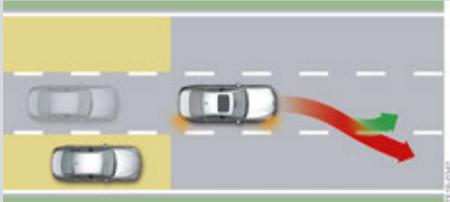
| Speed range                     | Warning functions   | Corrective steering intervention  |
|---------------------------------|---|---|
| 43 – 130 mph<br>(70 – 210 km/h) | <ul style="list-style-type: none"> <li>Triggered if a lane departure is detected by the Lane Departure Warning function. The associated haptic warning in the form of a vibration in the steering wheel using an unbalanced actuator is issued and visual warning in the exterior mirror in the form of the corresponding warning light.</li> </ul> | <ul style="list-style-type: none"> <li>Corrective steering intervention in the direction of the original lane if vehicle moves towards neighboring lane</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>Detected lanes</li> </ul>  |

# G30 Driver Assistance Systems

## 25. Active Lane Keeping Assistant

### 25.3. Blind Spot Detection

The table below shows an overview of the functional characteristics of the "Blind Spot Detection" subfunction:

| Speed range                     | Warning functions   | Corrective steering intervention  |
|---------------------------------|---|---|
| 43 – 130 mph<br>(70 – 210 km/h) | <ul style="list-style-type: none"> <li>Triggered if a lane change that could result in a collision is detected by the Blind Spot Detection function. The associated haptic warning in the form of a vibration in the steering wheel using an unbalanced actuator is issued and visual warning in the exterior mirror in the form of the corresponding warning light.</li> </ul> | <ul style="list-style-type: none"> <li>Corrective steering intervention in the direction of the available space on the roadway when lane change intention is made and neighboring lane is obstructed</li> </ul> <p>Prerequisites:</p> <ul style="list-style-type: none"> <li>Detected lanes</li> <li>Sufficient available space on the roadway</li> </ul>  |

Further information can be found in the system descriptions of the respective subfunctions (see section 8–10).



The Active Lane Keeping Assistant with Side Collision Avoidance does not relieve the driver of his overall responsibility for driving the vehicle. Due to the system limits be attentive in order to be able to actively intervene at any time. Otherwise, there is a risk of an accident.

# G30 Driver Assistance Systems

## 26. Evasion Aid

Often a collision with another vehicle (at the end of a traffic jam for example) or obstacle can only be prevented by an avoidance maneuver. Since the driver's response time plays a decisive role in an avoidance maneuver just as in a braking maneuver, Evasion Aid is able to make a considerable contribution to avoiding an impending collision.

Evasion Aid supports the driver in such critical driving situations with a focused steering intervention if the driver needs to avoid an obstacle. The system also help keep the vehicle stable during and after the avoidance maneuver.

This is achieved by an interaction between the Dynamic Stability Control (DSC), the Electronic Power Steering (EPS) and the analysis of data from the assistance sensors.



G30 Evasion Aid: interaction of Dynamic Stability Control( DSC) and Electronic Power Steering (EPS)

Evasion Aid is a function of the Active Driving Assistant Plus, optional equipment (OE 5AT), and is fitted in the G30 for the first time.

### 26.1. Functional principle

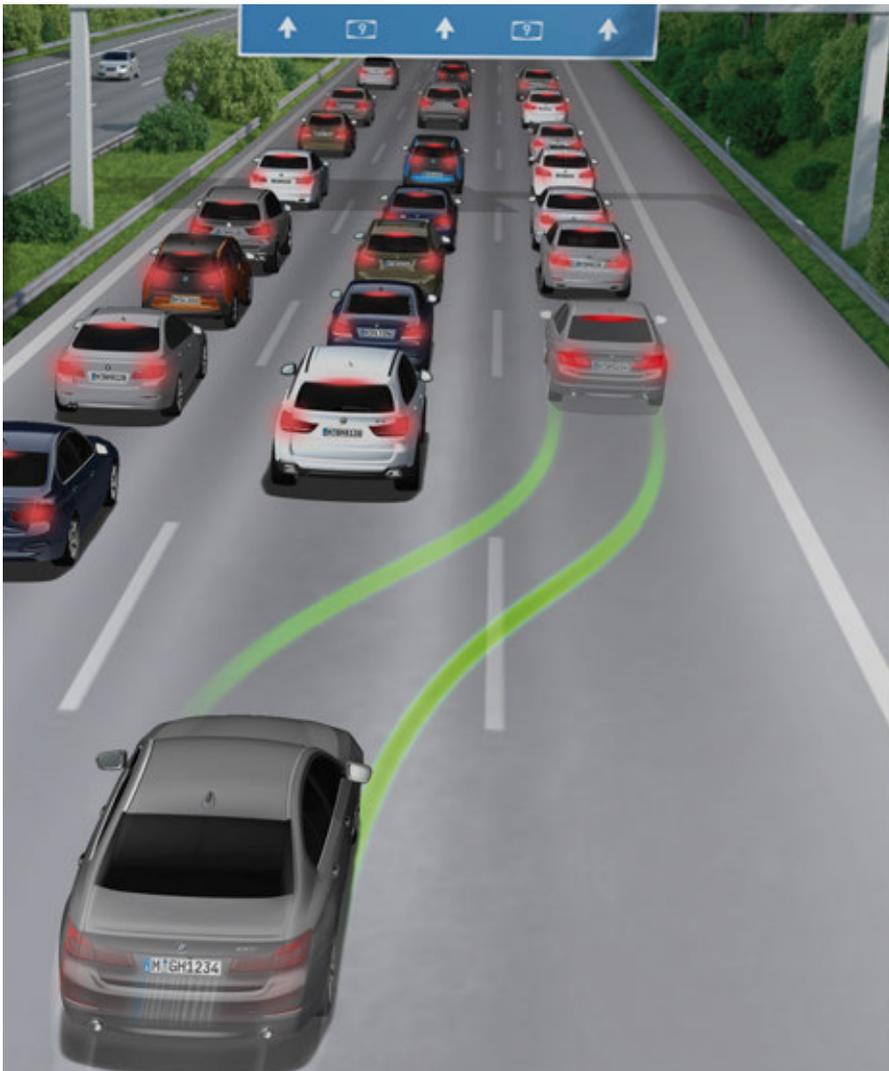
An emergency avoidance maneuver takes place when a suddenly occurring obstacle is detected in front of the vehicle and the driver has to avoid this obstacle quickly and without “significant” braking.

Evasion Aid supports the driver in avoidance maneuvers in emergency situations and calculates an optimum “escape track” past the obstacle.

The “escape track” is calculated within the physical limits of the particular vehicle. The calculated “escape track” is designed to minimize transverse dynamics.

# G30 Driver Assistance Systems

## 26. Evasion Aid



G30 Evasion Aid

The vehicle is preconditioned before an anticipated avoidance maneuver.

Here all functions that contribute to stabilize the vehicle are adapted in their configuration for the maximum support of the driver. This can reduce the risk of unstable vehicle behavior or overloading the driver in an acute avoidance maneuver.

Evasion Aid checks the current vehicle inclination and the driver's steering wheel actions and compares the information with the computed "escape track". Should the system detect discrepancies, an appropriate steering intervention is applied to steer the vehicle to the previously estimated "escape track".

The design objective for the system was that the driver's selected steering is not bypassed, but instead the feel of the steering wheel use is modified. The driver is supported by an additional support torque in the Electronic Power Steering (EPS) for the avoidance maneuver.

If a collision-threatening situation is detected and an acute warning has been issued, Evasion Aid evaluates the traffic situation.

# G30 Driver Assistance Systems

## 26. Evasion Aid

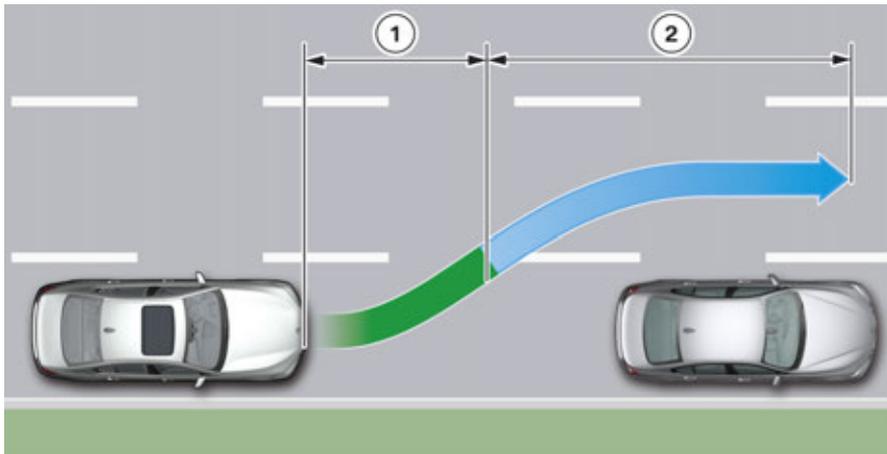
The possible free space for an avoidance maneuver is analyzed on the basis of this critical situation. Radar sensors and the KAFAS stereo camera monitor the vehicle's surroundings. The system can intervene to provide support if an avoidance opportunity next to the vehicle in front is available and if no collision object has been detected to the side of the own vehicle.

The system assists the driver in the speed range from 25 – 100 mph (40 to 160 km/h).

The driver initiates the avoidance maneuver by turning the steering wheel rapidly, at the same time determining the avoiding direction. Any brake intervention initiated by the acute warning is aborted or suppressed as appropriate. The Electronic Power Steering (EPS) implements a supporting steering intervention.

The vehicle is made “more agile” by the system as it steers around the obstacle and then stabilized again when it reaches the escape lane.

Rapid and effective avoidance is possible thanks to the vehicle's improved response to steering commands, without endangering the general driving stability.



G30 Evasion Aid: make agile/stabilize

| Index | Explanation |
|-------|-------------|
| 1     | Make agile  |
| 2     | Stabilize   |

The hard shoulder may be used as the escape lane, in addition to a normal lane.



The supporting steering intervention by the system is not performed until after the driver has actively initiated the avoidance maneuver. An avoidance maneuver by Evasion Aid alone is thus **not** performed. The driver must likewise determine the direction of the avoidance.

# G30 Driver Assistance Systems

## 26. Evasion Aid

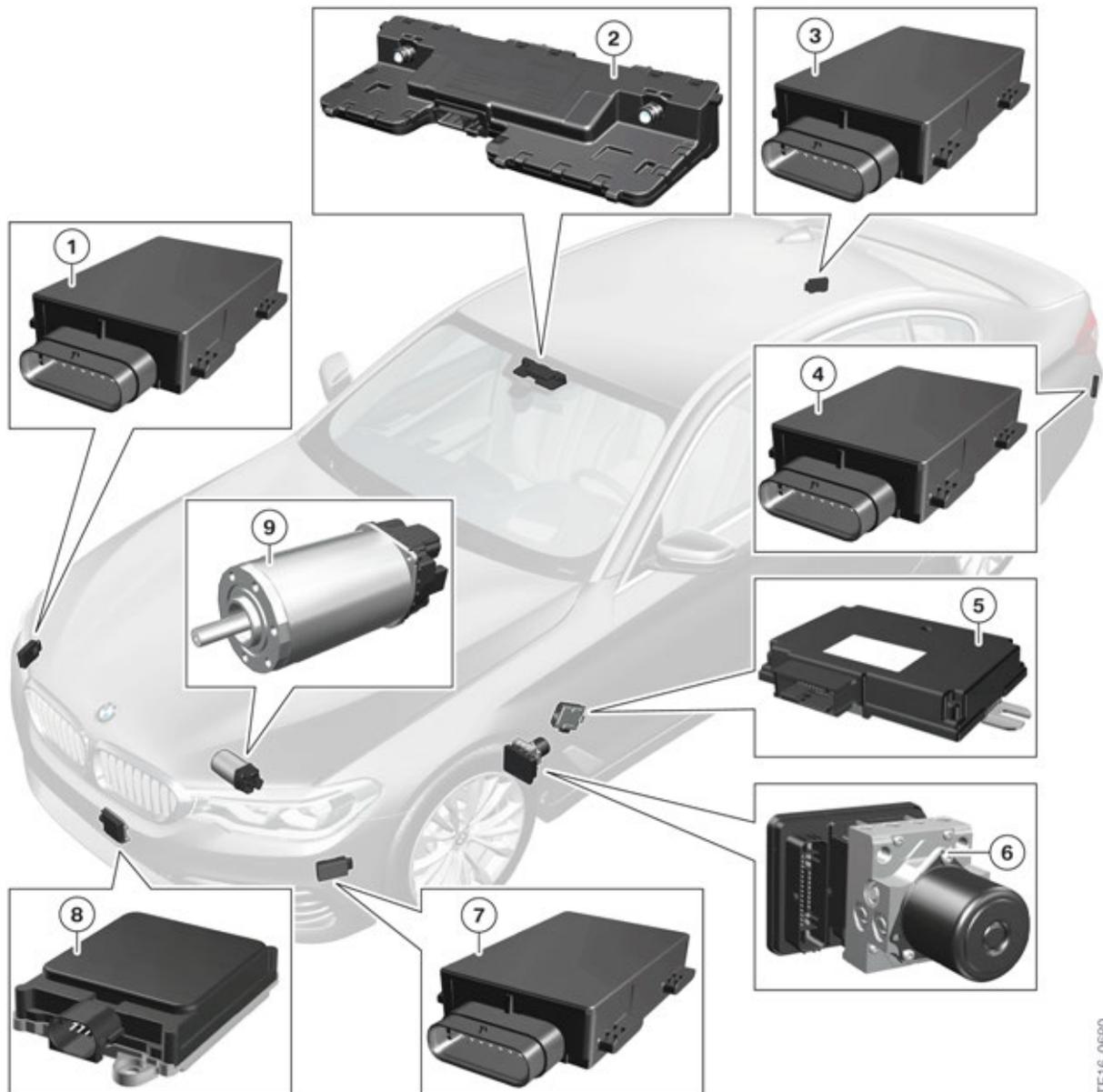
### 26.2. System overview

Below we describe which main components or sensors are relevant to Evasion Aid.

- Object or obstacles are detected by means of the KAFAS stereo camera and the ACC Stop&Go front radar sensor.
- The four side radar sensors monitor the area around the vehicle. The data from the KAFAS stereo camera is also analyzed and in this way a possible free space for an avoidance maneuver can be identified.
- A target trajectory (also known as a path curve), that is the “escape track” itself, is calculated in the Optional Equipment System (SAS) control unit.
- The driving dynamics function software in the Dynamic Stability Control (DSC) control unit calculates a target steering torque based on the “escape track”.
- The target steering torque is converted to an engine torque by the Electronic Power Steering (EPS), which finally results in a supporting steering intervention, if necessary. The maximum steering torque has been set in such a way that it can always be overruled by the driver and therefore steering past the maximum steering torque is possible.

# G30 Driver Assistance Systems

## 26. Evasion Aid



G30 Evasion Aid system overview

TE16-0680

| Index | Explanation                                |
|-------|--|
| 1     | Control unit for radar sensor, right (RSR) |
| 2     | KAFAS stereo camera                        |
| 3     | Blind Spot Detection, right (primary)      |
| 4     | Blind Spot Detection, left (secondary)     |
| 5     | Optional Equipment System (SAS)            |

# G30 Driver Assistance Systems

## 26. Evasion Aid

| Index | Explanation  |
|-------|--|
| 6     | Dynamic Stability Control (DSC)                                    |
| 7     | Control unit for radar sensor, left (RSL)                          |
| 8     | Active Cruise Control (ACC)  |
| 9     | Electronic Power Steering (electromechanical power steering) (EPS) |

### 26.3. Operation

A special precondition such as the individual configuration capability for the system or deactivation of this function only is not possible.

Evasion Aid can only be deactivated by switching off all Intelligent Safety systems (ALL OFF).



The system does not relieve the driver of personal responsibility for correctly judging the traffic situation. The driver is solely responsible for the vehicle.

### 26.4. Functional prerequisites

Evasion Aid is not linked to a particular road type.

The following parameters are the prerequisites for the availability of Evasion Aid:

- The vehicle's speed must not be below approximately 25 mph (40 km/h) and be no higher than approximately 100 (160 km/h).
- The system must have identified a free space for an avoidance maneuver.

Evasion Aid is generally **not** available in the following cases:

- The vehicle's speed is below approximately 25 mph (40 km/h) or higher than approximately 100 mph (160 km/h).
- During a dynamic overtaking maneuver initiated by the driver.
- If the Dynamic Stability Control has been switched off by the driver, or there is a fault in the DSC.
- When all Intelligent Safety systems are switched off.
- In the event of systemic limitations of the radar sensors or the KAFAS stereo camera.

# G30 Driver Assistance Systems

## 26. Evasion Aid

### 26.5. Limits of the system

The collision warning has a limited capacity for detection. As a result, incorrect or delayed warnings may occur and consequently Evasion Aid is limited in its operation. It is also possible that the following vehicles are not detected:

- A slow vehicle when driving off at high speed.
- Vehicles that suddenly swerve or decelerate rapidly.
- Vehicles with an unusual rear view or with insufficiently visible rear lights.
- Partially concealed vehicles.
- Two-wheeled vehicles travelling ahead.

The function of the KAFAS stereo camera and the radar sensors, and thus the function of Evasion Aid may be impaired in the following situations:

- Heavy fog, rain, spray or snow.
- Insufficient light.
- Strong light in the camera lens.
- If the field of view of the KAFAS stereo camera or the windscreen is dirty.
- On sharp bends.
- Up to 10 seconds after engine start via the START-STOP button.
- On restriction or deactivation of the driving dynamics systems, for example DSC OFF.
- During the calibration process for the KAFAS stereo camera immediately after vehicle delivery or a camera change.



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Evasion Aid does not release the driver from his comprehensive responsibility as the driver. There can be functional limitations because of system restrictions.

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