

FUNCTION : EXTERIOR LIGHTING - SIGNALLING (AEE2010 R3 ECONOMY MULTIPLEXED ARCHITECTURE)

N.B. : (*) According to version.

1. Lighting and signalling management

Operations managed by the exterior lighting and the signalling :

- 2Front sidelamps
- 4Rear sidelamps
- 2Dipped headlamps
- 2Main beam headlamps
- 2Front dedicated daytime lamps
- 8Direction indicators (Front, rear and side direction indicators)
- 4Brake lamps
- 2Number plate lamps
- 1Additional brake lamp
- 2Reversing lamps
- 2Rear foglamps
- 2Front foglamps
- 1Low note horn
- 1High note horn
- 2Approach lamps in the exterior rear view mirrors (*)

Units associated with the exterior and signalling lighting functions :

- Steering wheel control (Lighting stalk)
- Instrument panel (Area of lighting and signalling warning lamps)
- Rain and brightness sensor
- Built-in systems interface
- Engine fuse and relay box
- High frequency remote control or hands-free identifier
- Exterior rear view mirrors
- Generic trailer relay unit (*)
- Front headlamps beam corrector switch (*)
- Dynamic headlamp beam height adjuster unit (*)

Headlamps are switched on and off in the following ways :

- Manual switching on of the headlamps : The user actions a control from the controls under the steering wheel
- Automatic lighting of headlamps : When the automatic mode is selected, the dipped headlamps are switched on and off according to the ambient brightness and in rain (*)

N.B. : The manual controls of the headlamp illumination system systematically take priority over automatic illumination.

The request to switch the lights on or off is received by the built-in systems interface which controls the lighting components, either directly or via the engine fuse and relay unit .

Components controlled by the built-in systems interface :

- Rear sidelamps / Number plate lamps
- Front sidelamps
- Front, rear and side direction indicators
- Dipped headlamps
- Exterior rear view mirrors with signalling repeaters

- Rear foglamp
- Reversing lamps
- Brake lamps
- Additional brake lamp
- Daytime running lamps
- Horn
- Approach lamps in the exterior rear view mirrors (*)
- Front foglamps

Components controlled via the engine fuse and relay box : Main beam headlamps.

2. Sidelamps

Functional description	
Stages	Details
A	Driver's action on the lighting stalk to the sidelamps position
B	Acquisition and filtering of the position of the lighting stalk by the controls under the steering wheel
	Transmission of the position of the lighting stalk to the built-in systems interface via the passenger compartment CAN
C	Control of the front sidelamps by the built-in systems interface
	Control of the rear sidelamps and number plate lamps by the built-in systems interface
D	Control of the lighting of the sidelamps indicator on the instrument panel by the built-in systems interface via the INFO DIV CAN

3. Dipped headlamps

Functional description	
Stages	Details
A	Moving of the lighting stalk to the dipped beam headlamps position by the driver
B	Acquisition and filtering of the position of the lighting stalk by the controls under the steering wheel
	Transmission of the position of the lighting stalk to the built-in systems interface via the passenger compartment CAN
C	Control of the dipped beams by the built-in systems interface
D	Control of the lighting of the dipped haadlamps indicator on the instrument panel by the built-in systems interface via the INFO DIV CAN

4. Automatic switching on of the dipped headlamps (*)

The automatic switching on of the dipped headlamps is active when the engine is running.

The determining of the automatic lighting is managed internally by the rain and brightness sensor.

The rain and brightness sensor transmits the request for lighting of the dipped headlamps to the built-in systems interface according to the environment and the ambient brightness via the LIN.

The vehicle speed and distance information is transmitted by the electronic stability program ECU via the HS CAN 1 to the built-in systems interface, which transmits the information to the rain and brightness sensor over the LIN.

The rain and brightness sensor deduces a reference value for the switching on of the dipped headlamps.

The built-in systems interface manages the switching on of the dipped headlamps and sidelamps in relation to the reference value received if the conditions of authorisation are present.

Conditions of switching on in relation to the windscreen wipers :

- If the windscreen wipers have been operating at high speed for 2 seconds
- Or operation of the windscreen wipers at low speed for 10 seconds
- Or intermittent operation of the windscreen wipers (5 wiping cycles in 40 seconds)

Switching off conditions :

- If system has not operated for 15 s
- If the ignition is switched off

There is no headlamp illumination setting linked to the windscreen wash wipe function :

- If wiping is requested in single cycles
- If it involves a wash cycle

N.B. : The system does not request headlamp illumination for a bridge or a temporary shaded area.

Resuming manual control cancels the current timed duration of lighting periods determined in the automatic operation strategy.

5. Main beam headlamps

5.1. Functional description

Stages	Details
A	Driver's action on the lighting stalk to the main beam headlamps position
B	Acquisition and filtering of the position of the lighting stalk by the controls under the steering wheel
	Transmission of the position of the lighting stalk to the built-in systems interface via the passenger compartment CAN
C	Control of the main beam headlamps at the engine fuse and relay box , by the built-in systems interface via the wired network
D	Control of the main beams by the engine relay fusebox
E	Control of the lighting of the main beam headlamps indicator on the instrument panel by the built-in systems interface via the INFO DIV CAN

The main beams come on provided the dipped beams are on.

As soon as the dipped beam headlamps are turned off, the main beam headlamps are no longer controlled.

When the automatic switching on of the dipped headlamps function is activated, the switching on of the main beam headlamps can be deactivated if the conditions for switching off the dipped headlamps are met.

5.2. Headlamp flash function

A single short press of the lighting switch in the direction of the driver is sufficient to switch on the main beam headlamps (dipped beam headlamps on or not).

6. Daytime running lamps

The daytime running lamps function permanently controls the lighting of the daytime running lamps in the following conditions :

- Lighting stalk (In "0" position)
- Ignition in the "ignition positive" position
- Engine running

N.B. : The sidelamps also come on (*).

The daytime running lamps switch off when the ignition is switched off.

7. Intersection lighting

The built-in systems interface controls the front foglamps according to the angle of turning of the steering wheel or the activation of the direction indicators when the vehicle speed is below 40 km/h.

Lighting conditions :

- Vehicle speed 40 km/h or below
- The steering wheel rotates more than 60°

- The direction indicators are activated for at least 1 second
- The front foglamps are deactivated

Switching off conditions :

- The vehicle speed exceeds 40 km/h
- The steering wheel returns to its initial position and the angle of rotation becomes less than 30°
- The direction indicators are deactivated
- Reverse gear is engaged
- The front foglamps are on

N.B. : The switching on of the intersection lighting by activating the direction indicator takes priority over activation by rotation of the steering wheel.

8. Brake lamps

Functional description	
Stages	Details
A	The driver presses the brake pedal and so closes the brake switch
B	The brake lamps are controlled directly by the built-in systems interface
C	The built-in systems interface checks the presence of the "ignition positive"
	The built-in systems interface checks for a brake lamps fault

9. Reversing lamps (Manual gearbox) (*)

Functional description	
Stages	Details
A	Engaging of reverse gear
B	Acquisition of the status of the reverse gear switch by the built-in systems interface
C	The built-in systems interface controls the switching on of the reversing lamps

10. Reversing lamps (Automatic gearbox) (*)

Functional description	
Stages	Details
A	Engaging of reverse gear
B	Acquisition of the reverse gear engaged information by the built-in systems interface via the HS CAN 1
C	The built-in systems interface controls the switching on of the reversing lamps

11. Front foglamps (*)

11.1. Functional description

Stages	Details
A	Driver action on the lighting stalk press forwards on the front foglamps control ring
B	Acquisition and filtering of the position of the lighting stalk by the controls under the steering wheel
	Transmission of the position of the lighting stalk to the built-in systems interface via the passenger compartment CAN
C	The built-in systems interface controls the front foglamps control relay in the engine fuse and relay box

D	Control of the front foglamps by the engine relay fusebox
E	Control of the lighting of the front foglamps indicator on the instrument panel by the built-in systems interface via the INFO DIV CAN

N.B. : When the ignition is turned off, the memorisation of the front foglamp request is lost.

11.2. Switching on and off conditions

Lighting conditions :

- Ignition on
- Sidelamps on
- Driver's action on the one-touch control switching of the front foglamps

Switching off conditions :

- Further press of the front foglamps control switch
- Request to switch off the sidelamps
- The ignition has cut out

12. Rear foglamps

Functional description	
Stages	Details
A	Driver action on the lighting stalk press rearwards on the rear foglamps control ring
B	Acquisition and filtering of the position of the lighting stalk by the controls under the steering wheel
	Transmission of the position of the lighting stalk to the built-in systems interface via the passenger compartment CAN
C	Control of the rear foglamps by the built-in systems interface
D	Control of the lighting of the rear foglamps indicator on the instrument panel by the built-in systems interface via the INFO DIV CAN

N.B. : The switching on of the foglamps takes priority over the automatic switching on of the dipped headlamp function.

13. Switching on of the lamps on unlocking the vehicle

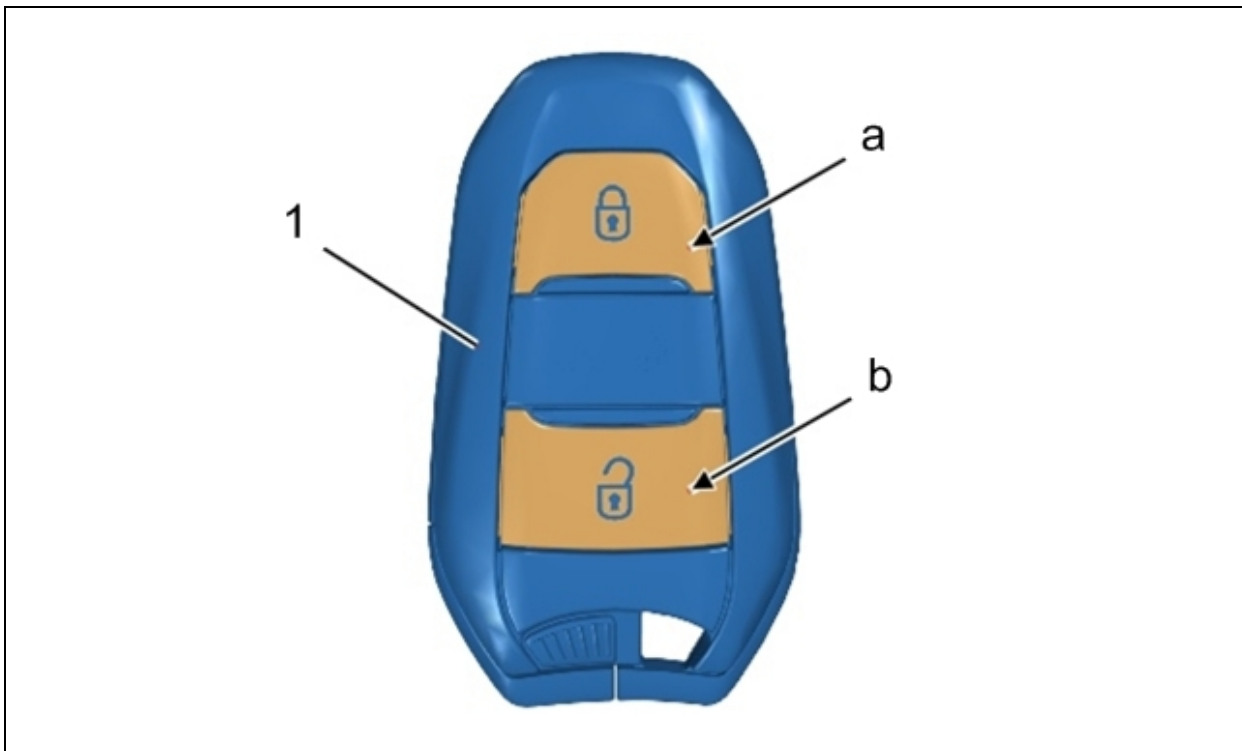


Figure : D4EA4YGD

(1) High frequency remote control or hands-free identifier.

"a" Locking control.

"b" Unlocking control.

13.1. Switching on of the lamps on locking

Locking of the vehicle is signalled by fixed lighting of the direction indicators for 2 seconds.

13.2. Switching on of the lamps on unlocking

Unlocking is confirmed by the flashing (5 Hz) of the direction indicators for 2 seconds.

If a low level of light is detected, pressing the vehicle unlocking button activates the following functions :

- Welcome lighting
- Dipped headlamps
- Sidelamps
- Number plate lamps
- Approach lighting in the exterior mirrors (*)

The lights switched on by the unlocking of the vehicle switch off in one of the following conditions :

- Ignition on
- Locking of the vehicle
- End of the timed period defined in the vehicle configuration

N.B. : The duration of the welcome lighting is associated with and identical to the duration of the automatic guide me-home lighting parameter.

14. Vehicle locating by hands-free identifier or hands-free remote control

When the locking control is pressed (After locking for more than 5 seconds) :

- The rapid flashing (10 seconds) of the direction indicators signals up the presence of the vehicle
- The courtesy lamp comes on
- The vehicle remains locked
- The approach lighting in the exterior mirrors comes on (*)

15. Guide-me-home lighting (Guide-me-home)

With the ignition off, the guide-me-home lighting controls the illumination of the following components :

- Sidelamps
- Dipped headlamps
- Number plate lamps
- Approach lighting in the exterior mirrors (*)

15.1. Manual guide-me-home lighting

The manual guide-me-home lighting is activated, with the ignition off, by pulling the lights stalk towards the user (headlamp flash).

Manual guide-me-home lighting is deactivated :

- If the headlamp flash is operated again before the end of the timing
- If there is a vehicle unlocking request

15.2. Automatic guide-me-home lighting (*)

The automatic guide-me-home lighting is valid for vehicles fitted with automatic headlamp illumination and the configuration menu.

The automatic guide-me-home lighting is activated in the following conditions :

- When the automatic headlamp illumination is activated
- If the guide-me-home lighting is activated (Parameter setting menus or control under the steering wheel in AUTO position)

The automatic guide-me-home lighting is deactivated by :

- The headlamp flash being operated again before the end of the timing
- A vehicle unlocking request

N.B. : [The manual guide-me-home lighting can be activated whatever the status of the automatic guide-me-home lighting.](#)

16. Parking lamps

When the vehicle has been parked and the ignition turned off, the user has 60 seconds to switch on the parking lamps by operating the direction indicators control for the traffic side.

The activation of the parking lamps is indicated by brief lighting of the direction indicators indicator lamp and the activation of a buzzer.

Switching on the parking lamps signals the presence of the vehicle and the fact that the driver is getting out to the other vehicles.

Lighting conditions :

- The ignition is switched off
- The direction indicators switch is activated

Switching off conditions :

- The direction indicators switch returns to the neutral position
- The ignition is on

17. Direction indicators and hazard warning lamps function

17.1. Direction indicators function

Functional description	
Stages	Details

Functional description	
A	Driver's action on the lighting stalk placing it in the "left" or "right" direction indicator position
B	Acquisition and filtering of the position of the lighting stalk by the controls under the steering wheel Transmission of the position of the lighting stalk to the built-in systems interface via the passenger compartment CAN
C	Control of the front and rear direction indicators and side repeaters by the built-in systems interface
D	Control of the lighting of the direction indicators indicator lamp by the built-in systems interface via the INFO DIV CAN Control of the buzzer at the steering wheel control by the built-in systems interface via the Passenger Compartment CAN

N.B. : If the lighting switch is flicked, the built-in systems interface controls 3 flashes of the direction indicators.

17.2. Hazard warning lamps function

Functional description	
Stages	Details
A	Driver's action on the hazard warning lamps switch
B	Acquisition of the status of the hazard warning lamps switch by the built-in systems interface
C	Control of the front and rear direction indicators and side repeaters by the built-in systems interface
D	Control of the switching on of the hazard warning lamps indicator lamp by the built-in systems interface via the INFO DIV CAN Control of the buzzer at the steering wheel control by the built-in systems interface via the Passenger Compartment CAN

17.3. Automatic switching on of the hazard warning lamps

The automatic activation of the hazard warning lamps function improves safety by automatically indicating sharp deceleration or accidents.

Automatic illumination conditions :

- If the brake pedal is pressed
- And deceleration greater than or equal to 7 m/s²
- And the initial speed is above 40 km/h

Switching off conditions :

- If the hazard warning lamps button is pressed
- Or the accelerator pedal is pressed (for automatic triggering due to a sudden deceleration)

Functional description of the illumination of the hazard warning lamps	
Stages	Details
A	Acquisition by the built-in systems interface of the vehicle speed and longitudinal acceleration information transmitted by the electronic stability program ECU on the HS CAN 1
B	The built-in systems interface determines the need to automatically activate the hazard warning lamps
C	Control of the rear direction indicators by the built-in systems interface Control of the front direction indicators and repeaters by the built-in systems interface
D	Control of the lighting of the hazard warning lamps indicator lamp by the built-in systems interface Control of the buzzer at the steering wheel control by the built-in systems interface via the Passenger Compartment CAN

N.B. : On emergency braking, the automatic switching on of the hazard warning lamps is activated by sending o the "sharp deceleration" information by the dynamic stability control ECU.

18. Number plate lighting

The number plate lamps are switched on and off by the side lamps being switched on and off via the lighting control stalk under the steering wheel.

For as long as lamps are on, the number plate lamps operate (activation via the built-in systems interface).

19. Lighting of the trailer lamps (*)

If a trailer is connected, the generic fuse box 1 (trailer) manages the operation of the trailer lamps.

The generic fuse box 1 (trailer) relays the lamp controls generated by the built-in systems interface.

The generic fuse box (trailer) manages the lighting of the following trailer lamps :

- Rear sidelamp
- Number plate lamps
- Direction indicators
- Foglamp on trailer (1 lamp or 2 lamps depending on the trailer)
- Reversing lamp on trailer (1 lamp or 2 lamps depending on the trailer)
- Brake lamps

20. Manual headlamp height adjustment (*)

The manual headlamp height adjustment is used to compensate for the weight at the rear of the vehicle.

The adjustment is carried out by means of a dedicated dial.

The manual headlamp height adjustment is active in the following cases :

- Ignition positive present
- Dipped beam headlamps on

The adjustment goes from 0 to 3 (Counting the intermediate positions, there are 7 possible positions of the dial).

Engraving	Position	Adjustment angle	Representative load
0	0	-1 %	1 or 2 occupants in the front
-	1	-1,25 %	Intermediate setting
1	2	-1,5 %	Maximum authorised load plus 5 people
-	3	-1,75 %	Intermediate setting
2	4	-2 %	Maximum authorised load plus driver
-	5	-2,25 %	Intermediate setting
3	6	-2,5 %	Maximum load authorised in the boot plus 5 persons

Composition of the manual headlamp height adjustment system :

- One direct current motor per headlamp
- One headlamp height adjustment dial

The angular movement for the load adjustment is 3°.

N.B. : The presence of this function is compulsory on vehicles which are not fitted with automatic headlamp height adjustment.

21. Dynamic lighting

21.1. Dynamic automatic height adjustment

The dynamic automatic height adjustment is corrected after receiving the vehicle ride height either via :

- 4 body height sensors in the presence of variable damping suspension
- 2 body height sensors in the absence of variable damping suspension

After receiving the vehicle ride height, the dynamic headlamp adjustment unit controls the actuators in order to adapt

the height of the headlamps in relation to the vehicle load.

The actuators are controlled between a minimum value and a maximum value, The value is centred in relation to the initial mechanical adjustment of the vehicle (Factory setting).

N.B. : The dynamic automatic height adjustment is carried out continuously during driving without any input from the driver. The vehicle ride height is between -3° and 3° .

21.2. Dynamic cornering lighting

The dynamic cornering lighting function angles the main luminous flux of the dipped headlamps or the main luminous flux of the main beam headlamps.

The dynamic cornering lighting function continuously receives the steering wheel angle to adapt the azimuth angle of the headlamps on a bend.

The directional headlamps move in relation to the following parameters :

- Direction and angle of rotation of the steering wheel
- The steering wheel angle sensor activation status (activated or faulty)
- The vehicle speed from the dynamic stability control ECU
- Dipped beam headlamps turned on
- Engaging of reverse gear
- Engine running information

The dynamic directional headlamp adjustment unit angles the headlamps in relation to their nominal axis (centreline of the vehicle).

The directional headlamps are directed simultaneously to the same side of the vehicle but along different angles.

A position sensor incorporated in the directional headlamps allows the directional headlamps ECU to control the directional headlamps to the position required.

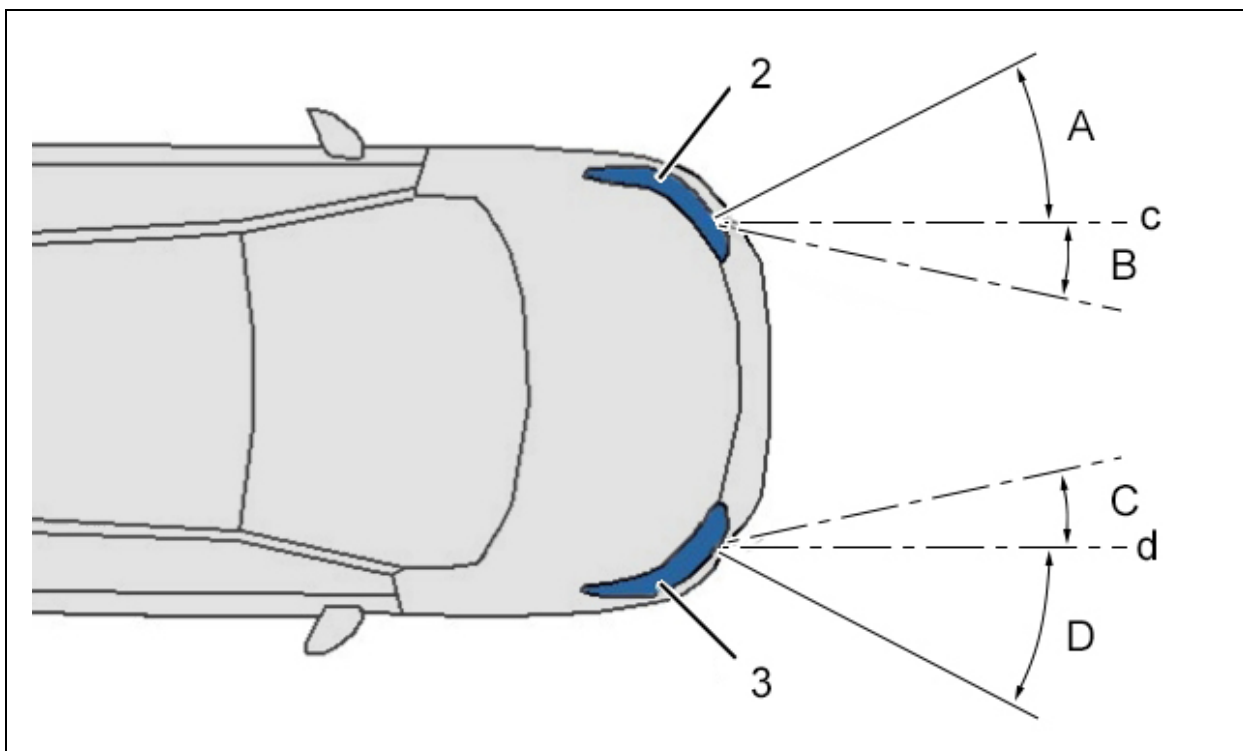


Figure : D4EAEMOD

(2) Left-hand headlamp.

(3) Right-hand headlamp.

The maximum rotation of the directional headlamps towards the interior is about 7.5° ("B" and "C").

The maximum rotation of the directional headlamps towards the exterior is about 15° ("A" and "D").

Turning of the steering wheel to the left :

- "c" Nominal centreline of the left directional headlamp
- "A" Maximum rotation of the left directional headlamp to the left
- "C" Maximum rotation of the right directional headlamp to the left

Turning of the steering wheel to the right :

- "d" Nominal centreline of the right directional headlamp
- "B" Maximum rotation of the left directional headlamp to the right
- "D" Maximum rotation of the right directional headlamp to the right

Example (Vehicle viewed from above) :

- When the steering wheel is turned to the left, the left directional headlamp (2) is directed to the left by an angle ("A")
- At the same time, the right hand directional headlamp (3) is also directed to the left by an angle ("C") ; Smaller than angle ("A")

The same occurs on the right when the steering wheel is turned to the right.

When reverse gear is engaged and when the vehicle is stationary, the directional headlamps return to the nominal centreline of the vehicle.

22. Welcome function

The welcome functions are animations created using 3 rotating modules per headlamp when "ignition positive" is absent.

The angle of rotation of these 3 rotating modules is 180°.

23. Adaptive lighting

23.1. Town function

Town lighting gives the driver better visibility on the road in an urban driving situation.

Town lighting is active at a vehicle speed below 50 km/h.

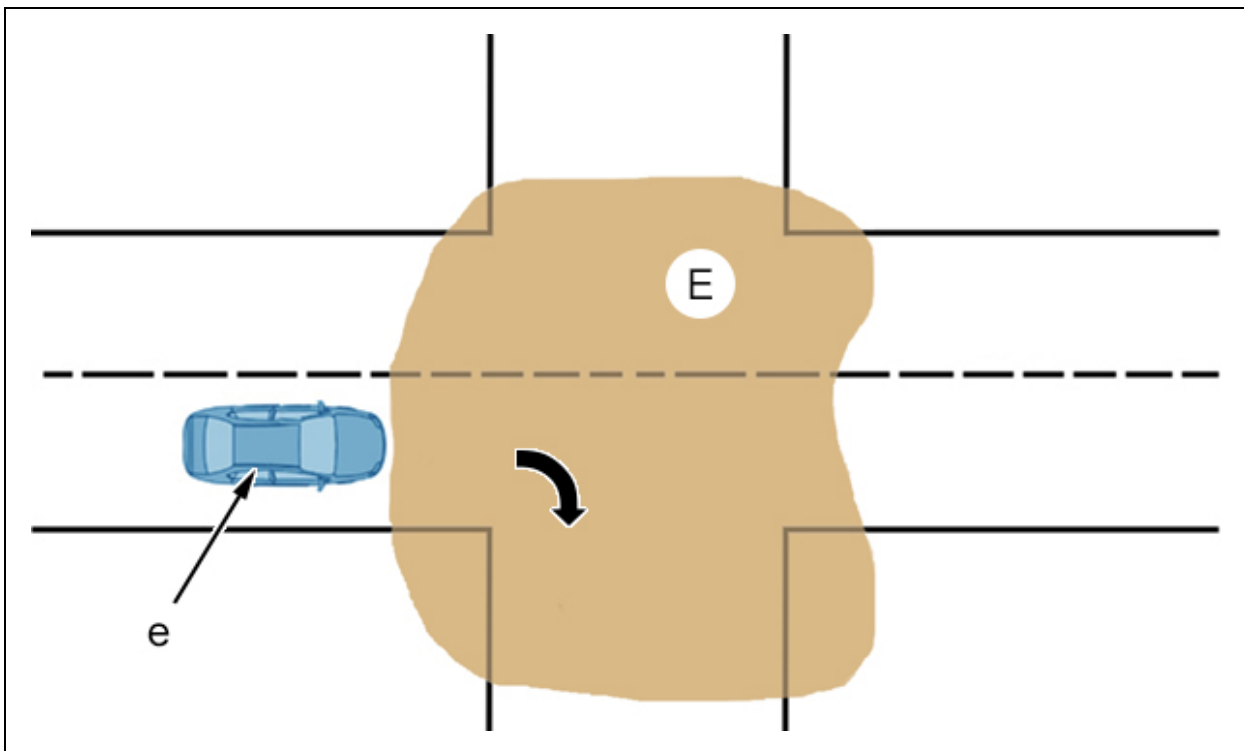


Figure : D4EAEMPD

"E" Lit area of the town function.

"e" Vehicle fitted with the adaptive lighting function.

23.2. Dipped beam function

The dipped headlamp function gives the driver better visibility on the road when driving.

The dipped headlamp function is active at a vehicle speed between 50 and 110 km/h.

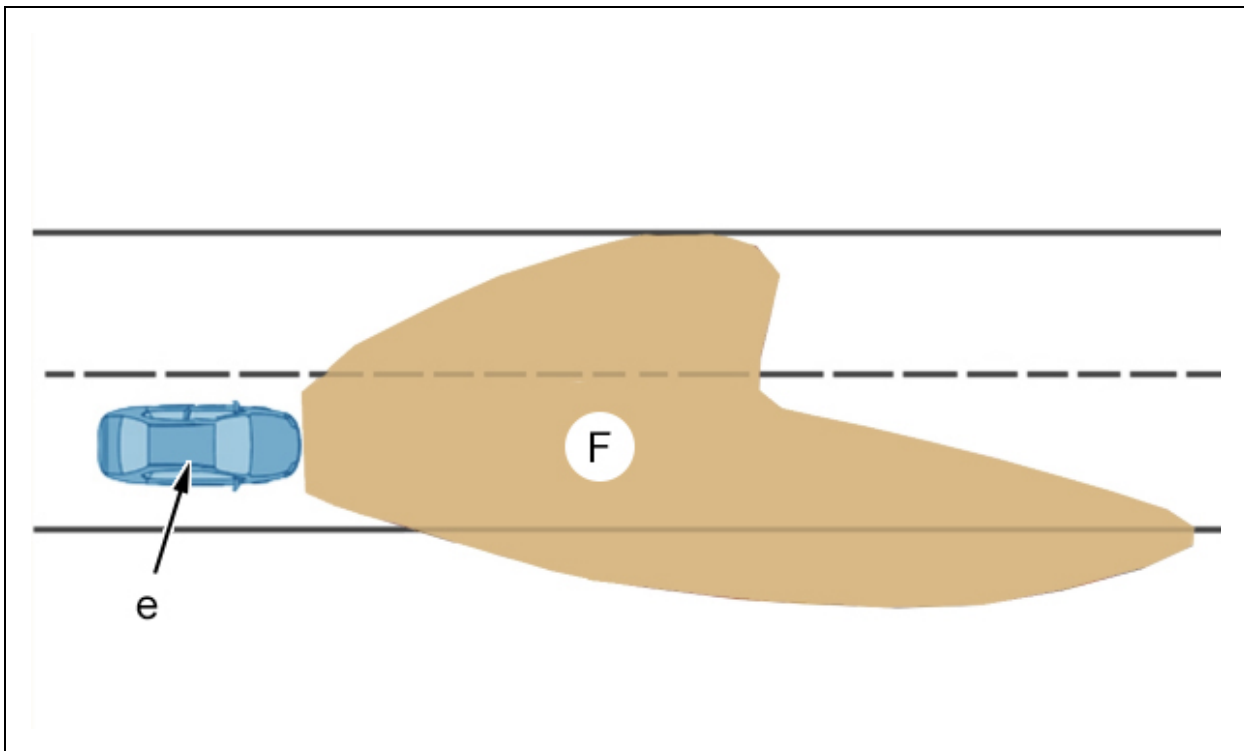


Figure : D4EAEMQD

"F" Lit area of the dipped headlamp function.

"e" Vehicle fitted with the adaptive lighting function.

23.3. Motorway function

The motorway function is additional to the dynamic automatic height adjustment. This function is active on fast road and can be disabled by the driver.

The motorway function is activated when the vehicle is being driven on fast roads at a speed greater than 110 km/h

The motorway function is deactivated when the vehicle speed drops below 100 km/h.

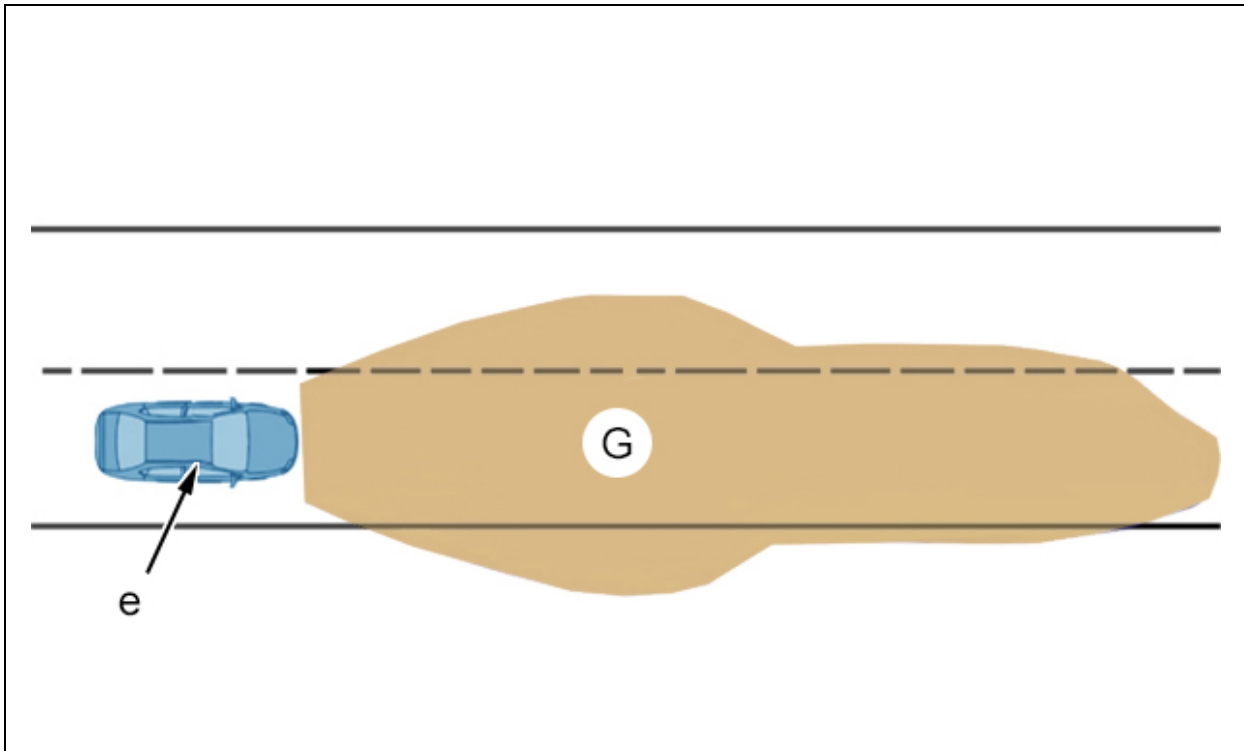


Figure : D4EAEMRD

"G" Lit area of the motorway function.

"e" Vehicle fitted with the adaptive lighting function.

23.4. Main beam headlamps function

The main beam headlamp function improves visibility in the main beam headlamp position, without dazzling vehicle coming from the opposite direction.

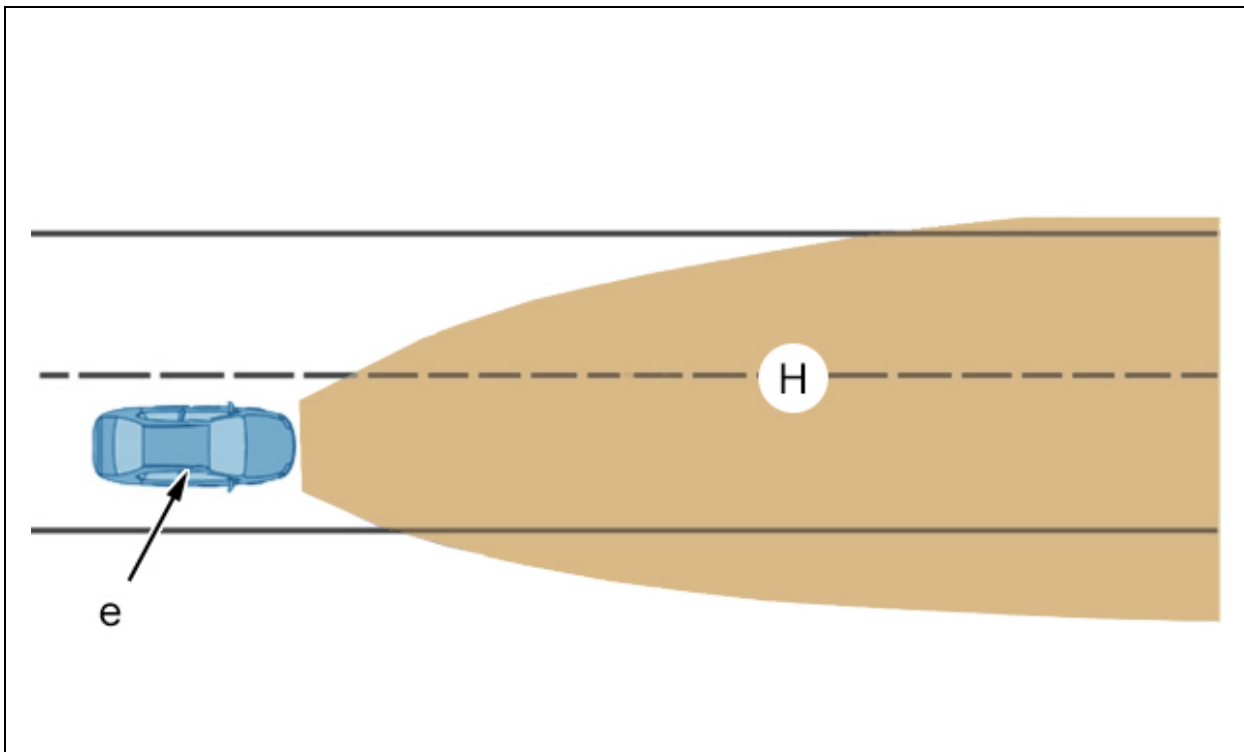


Figure : D4EAEMSD

"H" Lit area of the main beam headlamp function.

"e" Vehicle fitted with the adaptive lighting function.

23.5. Rain function

The rain function lighting gives the driver better visibility on the road in poor weather conditions.

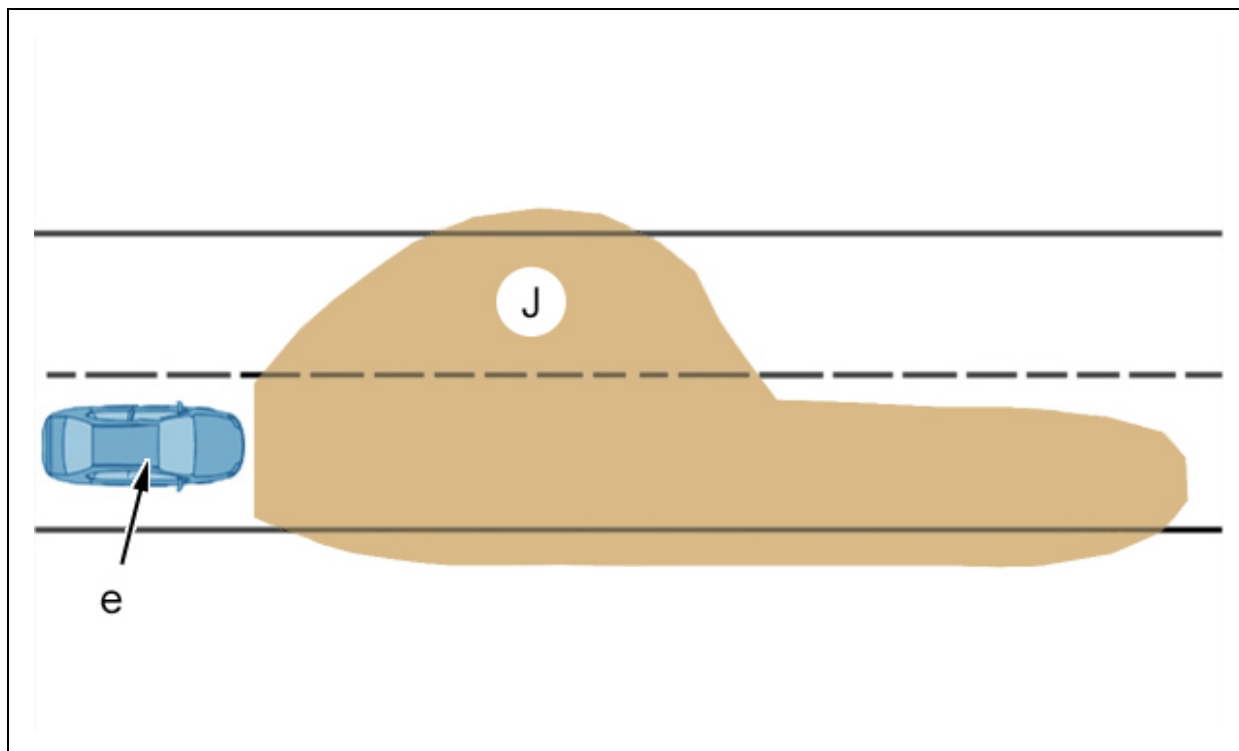


Figure : D4EAEMTD

"J" Lit area of the rain function.

"e" Vehicle fitted with the adaptive lighting function.

23.6. Dynamic cornering function

The dynamic cornering lighting function gives the driver better visibility on the road on bends.

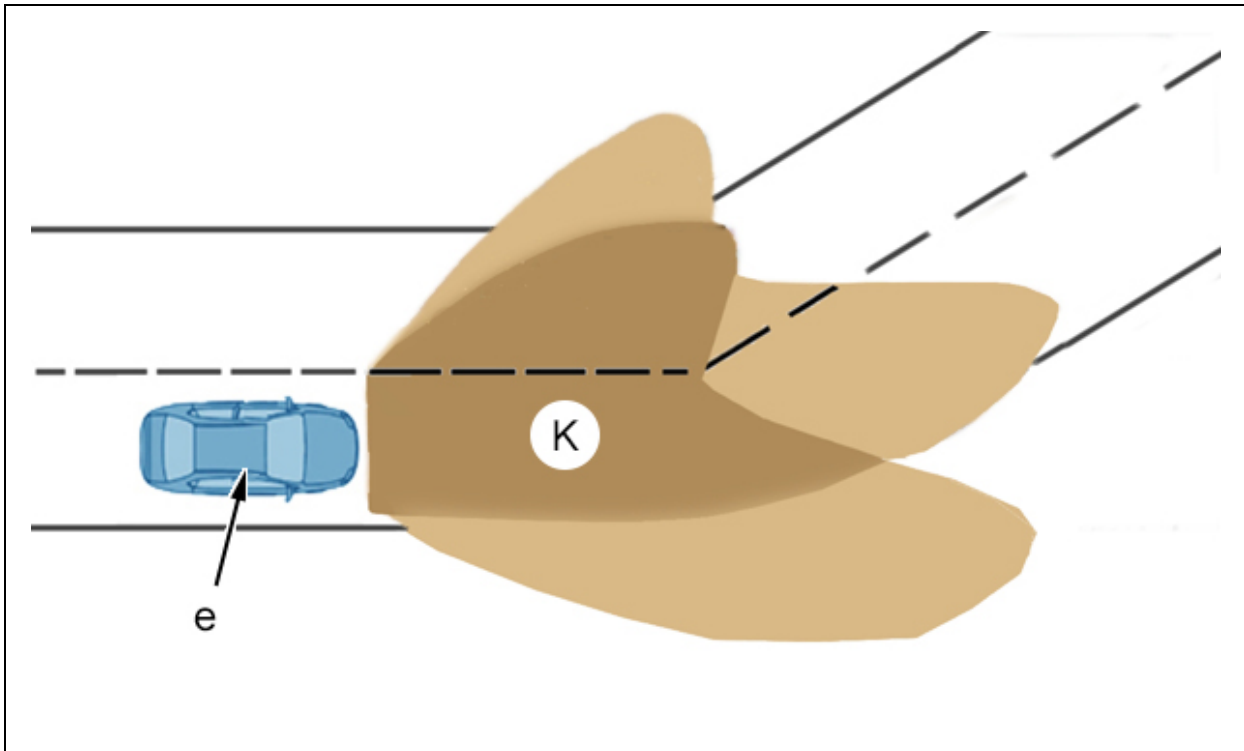


Figure : D4EAEMUD

"K" Lit area of the dynamic cornering function.

"e" Vehicle fitted with the adaptive lighting function.

24. Lamps left on buzzer

24.1. Functional description

Stages	Details
A	The built-in systems interface acquires the status of the driver's door opening switch, of the position of the ignition switch or of the engine starting switch and of the position of the lighting stalk
B	The built-in systems interface determines whether the conditions of activation of the buzzer are met
C	If the conditions for activating the buzzer are met, the built-in systems interface controls the buzzer at the steering wheel controls via the passenger compartment CAN

24.2. Conditions of activation of the lamps left on buzzer

Buzzer activation conditions :

- If the ignition is switched off
- The driver's door is open
- The sidelamps are switched on

The buzzer emits a sound for 10 seconds.

N.B. : With the ignition off, if the dipped headlamps remain on, they go off automatically when the battery reaches the threshold for entering energy economy mode.

24.3. Direction indicators

The direction indicators left on alert is triggered after a direction indicators request has been present for 20 seconds

The alert volume intensifies once the speed of the vehicle goes above 60 km/h.

The warning is stopped as soon as the direction indicators are switched off.

N.B. : This warning applies to the right-hand and left-hand direction indicators and the hazard warning lamps.

25. Horn

Functional description	
Stages	Details
A	Action of the driver on one of the switches of the horn
B	Acquisition and filtering of the status of the horn switch by the steering wheel control
	Transmission of the status of the horn switch to the built-in systems interface via the passenger compartment CAN
C	Control of the horn by the built-in systems interface

N.B. : The built-in systems interface carries out horn diagnostics.