

PUBLISHED: 10-JAN-2020
2020.0 DEFENDER (LE), 413-13

PARKING AID (G2342532)

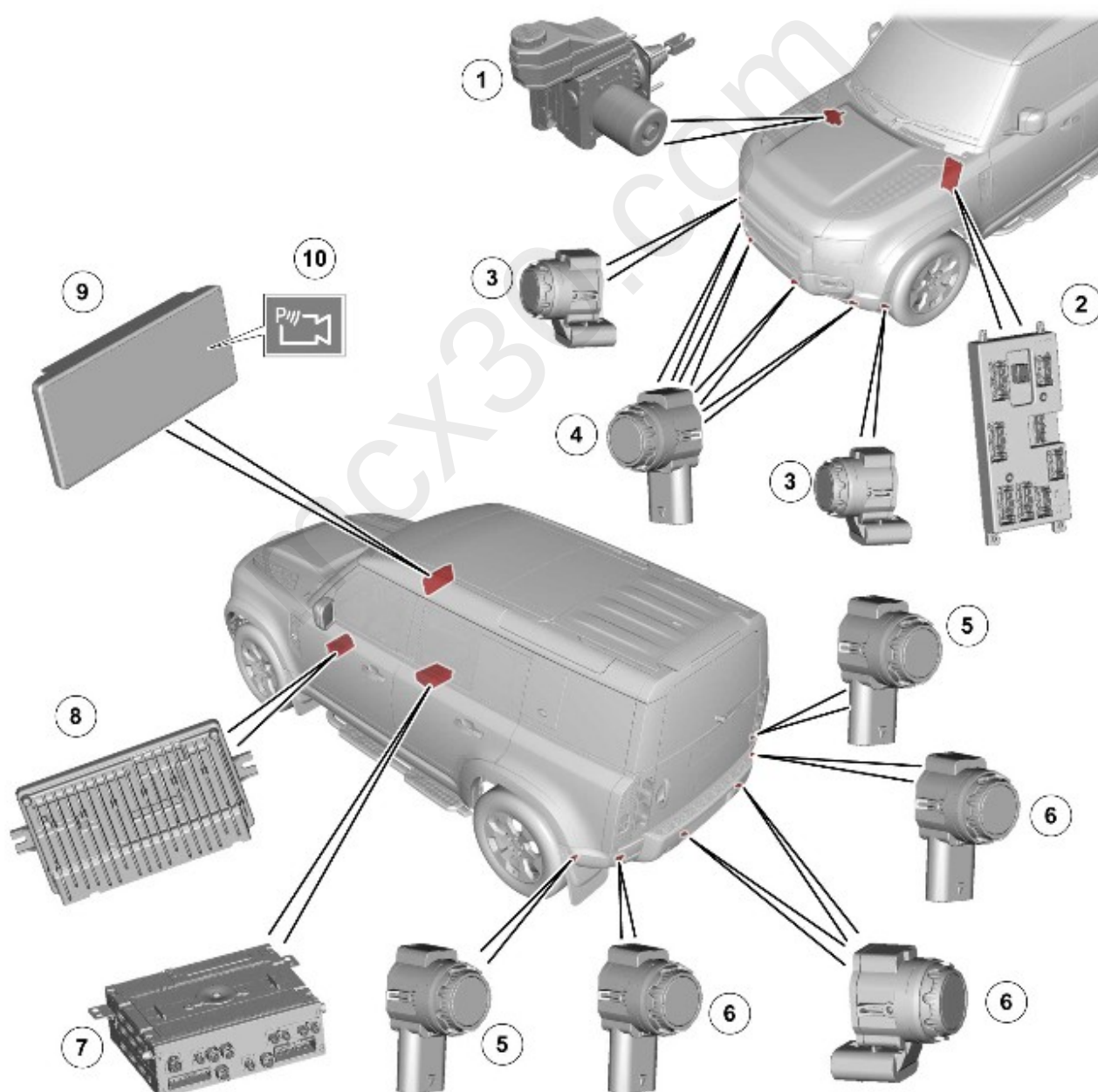
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COMPONENT LOCATION

COMPONENT LOCATION - 1 OF 3 - PARKING AID - 360°

 NOTES:

- Right Hand Drive (RHD) vehicle is shown, Left Hand Drive (LHD) vehicle is similar.
- Vehicle with 5 doors is shown, vehicle with 3 doors is similar.



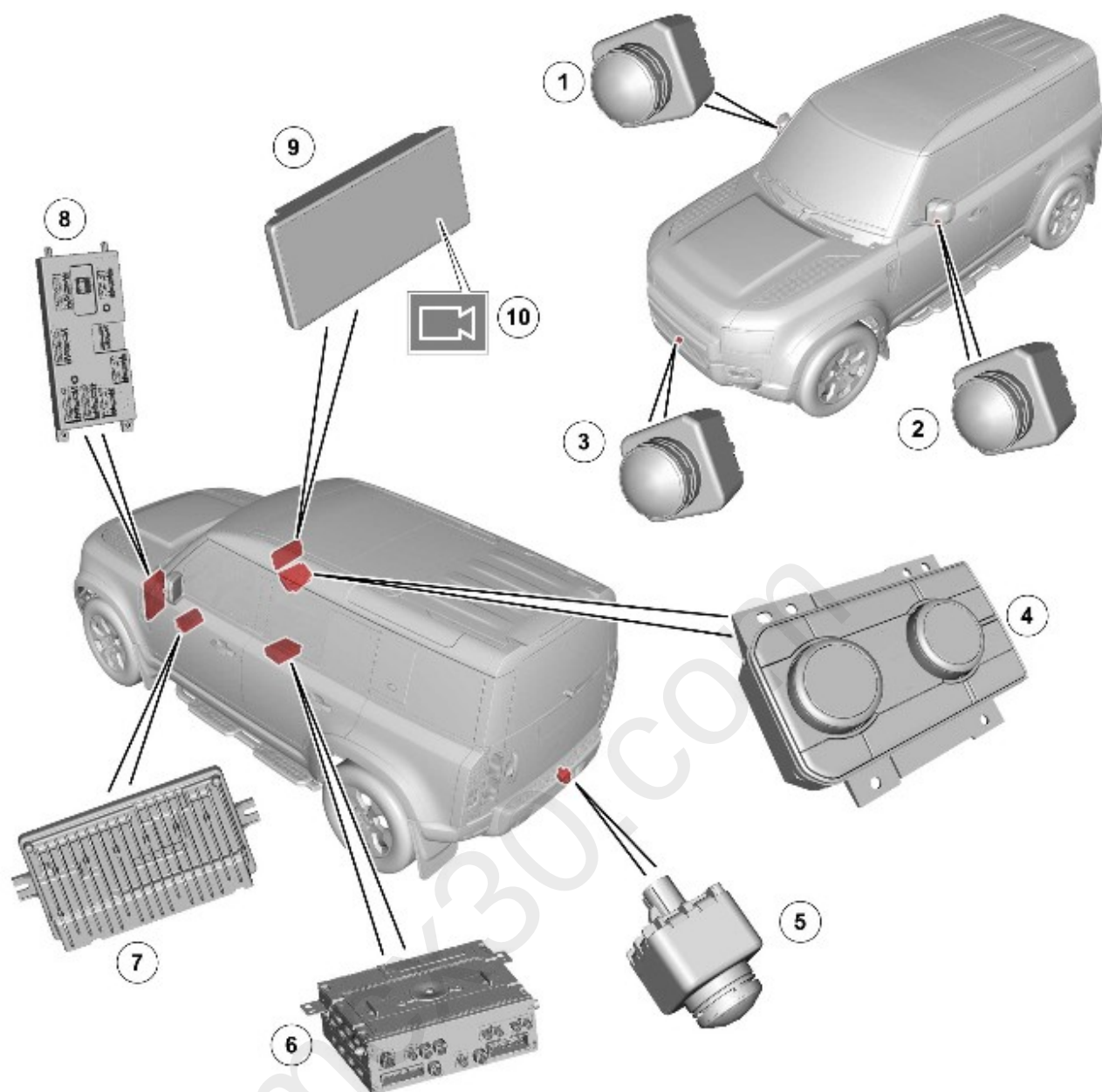
ITEM	DESCRIPTION
1	Anti-Lock Brake System Control Module (ABS) - Integrated with the Integrated Power Brake
2	Body Control Module (BCM)/ Gateway Control Module (GWM)
3	Park Assist sensor - Front (quantity 2)
4	Parking Aid sensor - Front (quantity 4)
5	Park Assist sensor - Rear (quantity 2)
6	Parking Aid sensor - Rear (quantity 4)
7	Front Infotainment Control Module (IGM / ICCM)
8	Near Field Sensing Module (NFSM)
9	Touchscreen (TS)
10	Parking Aid switch

COMPONENT LOCATION - 2 OF 3 - PROXIMITY CAMERA SYSTEM



NOTES:

- RHD vehicle is shown, LHD vehicle is similar.
- Vehicle with 5 doors is shown, vehicle with 3 doors is similar.



E249817

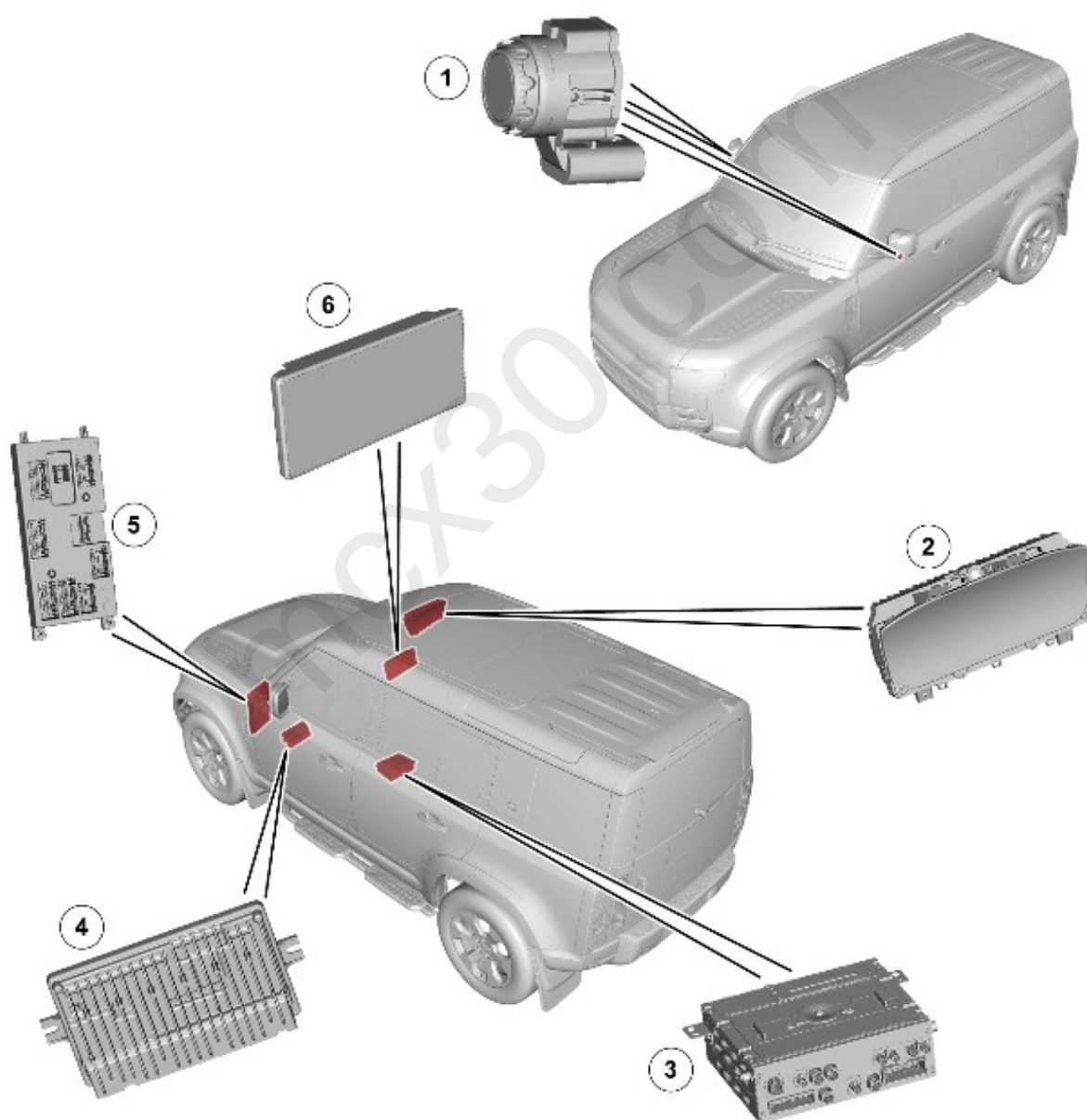
ITEM	DESCRIPTION
1	Right door mirror proximity camera
2	Left door mirror proximity camera
3	Front proximity camera
4	Integrated Control Panel (FCIM)
5	Rear proximity camera
6	IGM / ICCM
7	NFSM
8	BCM/ GWM

ITEM	DESCRIPTION
9	TS
10	Proximity camera switch

COMPONENT LOCATION - 3 OF 3 - WADE SENSING SYSTEM

NOTES:

- RHD vehicle is shown, LHD vehicle is similar.
- Vehicle with 5 doors is shown, vehicle with 3 doors is similar.



E249818

ITEM	DESCRIPTION
1	Door mirror wade sensor (quantity 2)
2	Instrument Panel Cluster (IPC)
3	IGM / ICCM
4	NFSM
5	BCM/ GWM
6	TS

OVERVIEW

PARKING AID

⚠ CAUTION:

When you wash the vehicle, do not aim high pressure water jets directly at the Parking Aid sensors. Do not use abrasive materials or hard/sharp objects to clean the Parking Aid sensors. Only use approved vehicle cleaning products. Water jets and hard/sharp objects can cause damage to the Parking Aid sensors and paintwork. Failure to follow these guidelines may result in damage to the system or cause a system fault.

The Parking Aid system provides an audible warning to the driver when the vehicle is approaching any obstacles during forward or reverse parking maneuvers. The Parking Aid system works in conjunction with the camera system. The system assists the driver while maneuvering the vehicle at low speed in confined spaces.

A 360° vehicle plan view displays detected objects along the front, rear and sides of the vehicle when the Parking Aid system is active. Object tracking is also used along the sides of the vehicle to monitor the vehicle blind spots. When a detected object is calculated to be a collision threat, it is displayed as a colored line over a black background on the TS

During low speeds, the NFSM uses the ultrasonic sensors to monitor the area around the vehicle. When an object is detected within a monitored area, the NFSM then outputs a warning using the audio system speakers. A threat is an obstacle inside the detection zone of the vehicle, to which the vehicle either drives to, or has intent to drive to. The Parking Aid sensors can detect solid objects such as posts, walls and other vehicles. Objects very close to the ground may not be detected, but because of their low height, may not cause damage to the vehicle.

When the Parking Aid system is activated, the Parking Aid switch on the TS illuminates. The system only reports with graphical and audible warnings when a threat is identified.

The distance from a collision threat is color coded yellow to amber to red, with red being the closest. Other detected objects that are not a collision threat are displayed as gray lines.

WADE SENSING SYSTEM

The wade sensing feature is designed to aid the driver to calculate the current depth while driving through water. The TS displays the current detected water level and the vehicle maximum wading depth.

The NFSM hosts software to deliver the wade sensing functionality using 2 downward facing ultrasonic sensors installed in the door mirrors. The sensors connect to the NFSM and measure the distance to the water surface. From this measurement, the NFSM can calculate the depth of the water through which the vehicle is traveling.

PROXIMITY CAMERA SYSTEM

CAUTION:

The proximity camera system remains the driver responsibility to detect obstacles and estimate the vehicle distance from them when reversing.

The proximity camera system provides the driver with a visual aid when maneuvering the vehicle at low speeds. The NFSM captures camera data from the proximity cameras and displays the images on the TS. The images provide the driver with a 360° view around the vehicle. The system is also supported by various driving aid features where graphical information and warnings are superimposed onto the images displayed on the TS.

FORWARD VEHICLE GUIDANCE

The forward vehicle guidance activates when the plan view or front proximity camera is selected from the camera screen. The projected vehicle path and object detection displays on the TS.

ADVANCE TOW ASSIST

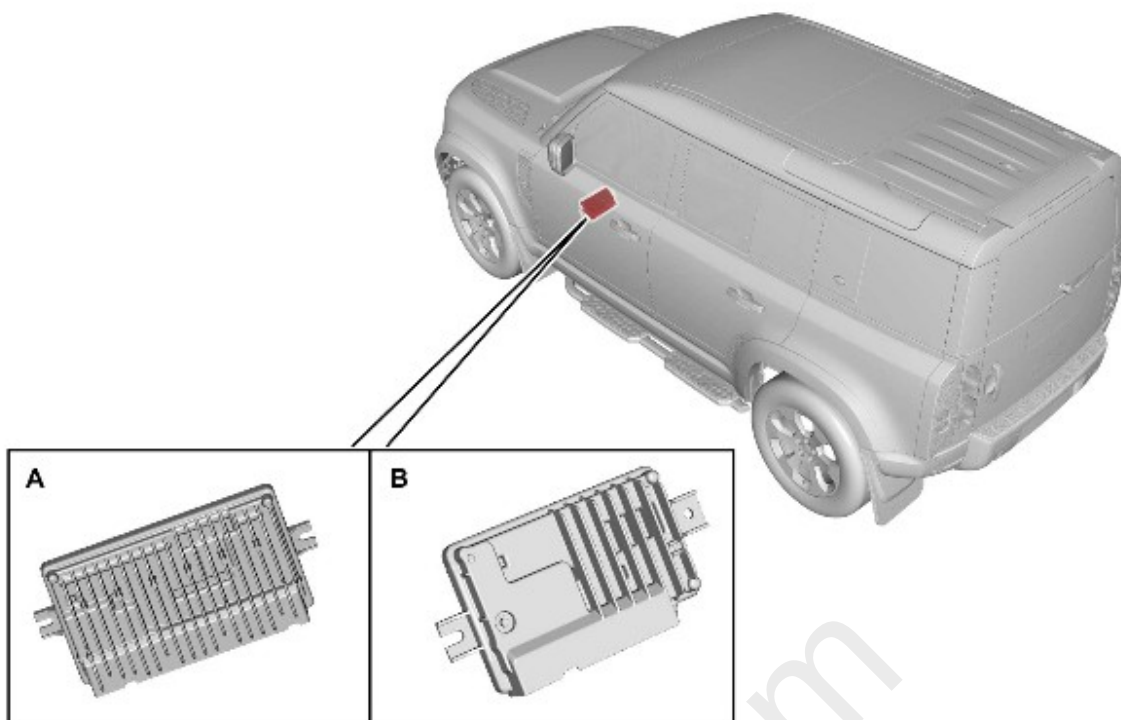
The advanced tow assist automatically steers the vehicle when the vehicle is in REVERSE and a trailer is attached. The projected path is displayed on the TS. The direction can be overridden by the driver by taking control of the steering.

DESCRIPTION

NEAR FIELD SENSING MODULE

NOTES:

- RHD vehicle is shown, LHD vehicle is similar.
- Vehicle with 5 doors is shown, vehicle with 3 doors is similar.
- The Near Field Sensing Module 'B' (NFSMB) is not available on L663 20MY.



E249819

ITEM	DESCRIPTION
A	NFSM
B	NFSMB

The NFSM is located below the instrument panel.

The NFSM has connections for the following:

- Power
- Ground
- FlexRay
- Parking Aid sensor - Front (quantity 4)
- Parking Aid sensor - Rear (quantity 4)
- Park Assist sensor - Front (quantity 2)
- Park Assist sensor - Rear (quantity 2)
- Door mirror wade sensor (quantity 2)
- Proximity camera (quantity 4)
- IGM / ICCM.

The FlexRay connections provide for the receipt of the following information from the BCM/ GWM:

- ABS - Vehicle speed signal
- Transmission Control Module (TCM) - REVERSE engaged signal.

The NFSM gathers the camera images and analyses and alters them by adjusting perspectives and applying corrections. The resulting processed images are then relayed to the TS through the IGM / ICCM on the Automotive Pixel Link 2 (APIX2).

The NFSM also adds guidance and warning overlays to the camera images to create the various driving aid features supported by the proximity camera system. For example, visual direction is made available when reversing the vehicle.

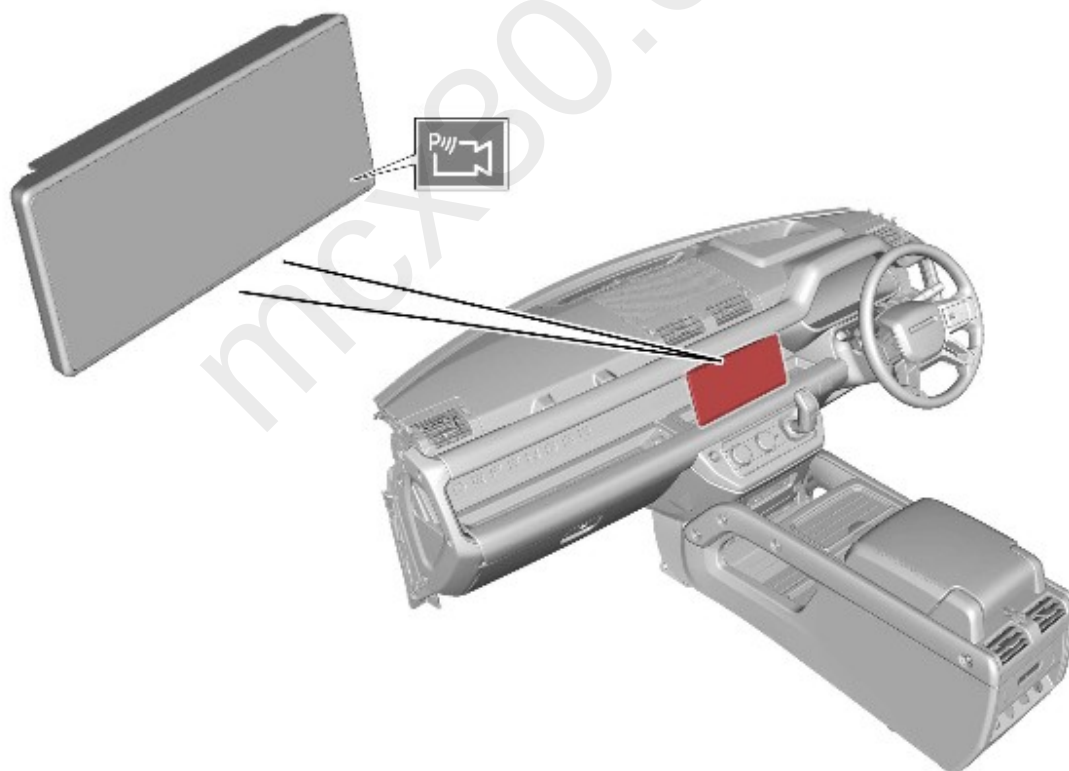
In addition to the data lines, the camera receives a power supply and a ground wire from the NFSM. Use caution when you remove, install, disconnect and reconnect the camera harnesses.

PARKING AID SWITCH



NOTE:

RHD vehicle is shown, LHD vehicle is similar.



E249820

The Parking Aid switch is a soft key on the TS.

The Parking Aid switch allows the driver to select the Parking Aid system ON or OFF.

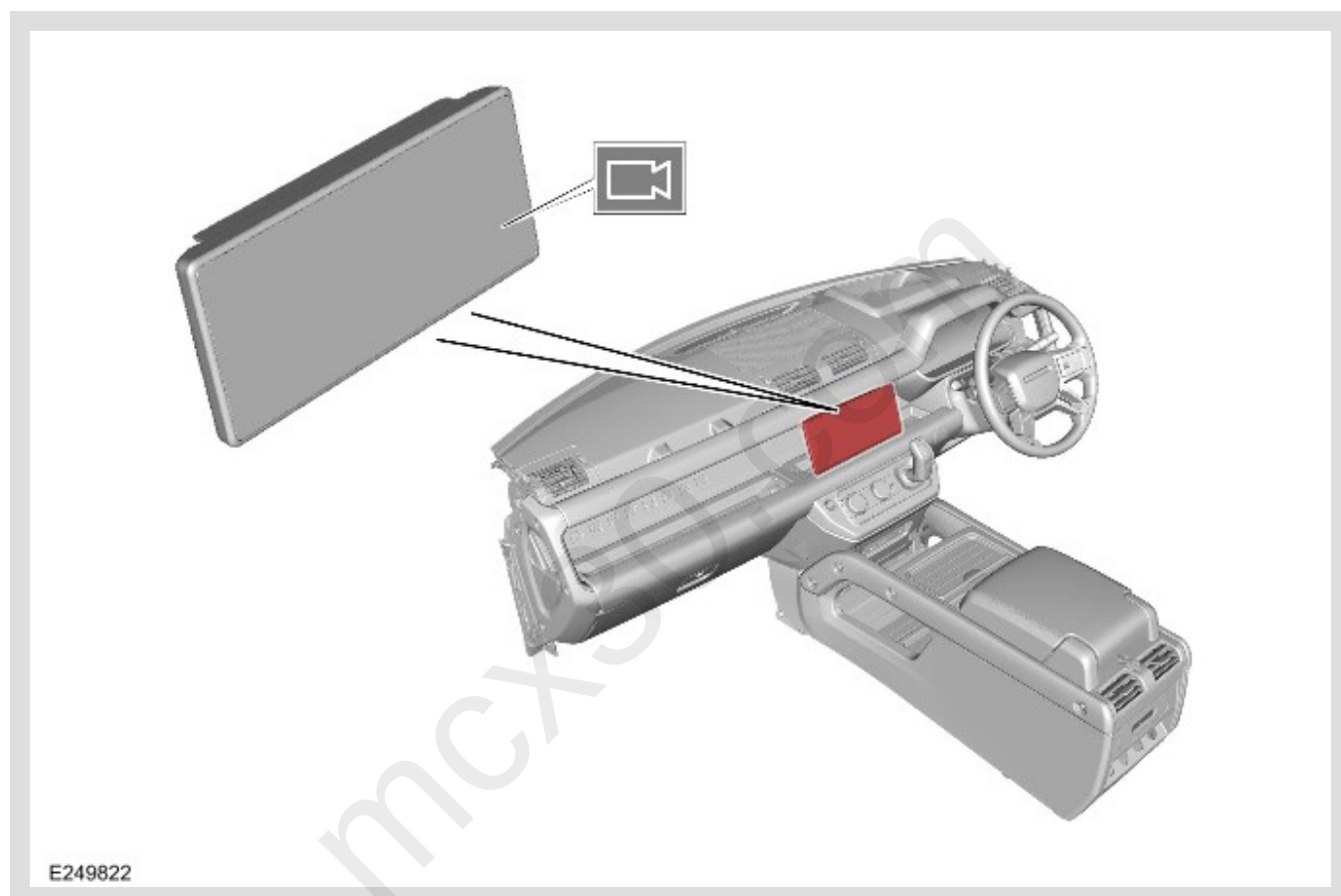
The Parking Aid system remains OFF until REVERSE is selected, or the system is manually switched back ON again. There is an indicator in the switch to indicate when the system is active.

The vehicle is equipped with automatic Parking Aid activation which can be configured through the Parking Aid settings to ON or OFF state. To access the settings, press the setting soft key on the Parking Aid plan view.

PROXIMITY CAMERA SWITCH

NOTE:

RHD vehicle is shown, LHD vehicle is similar.



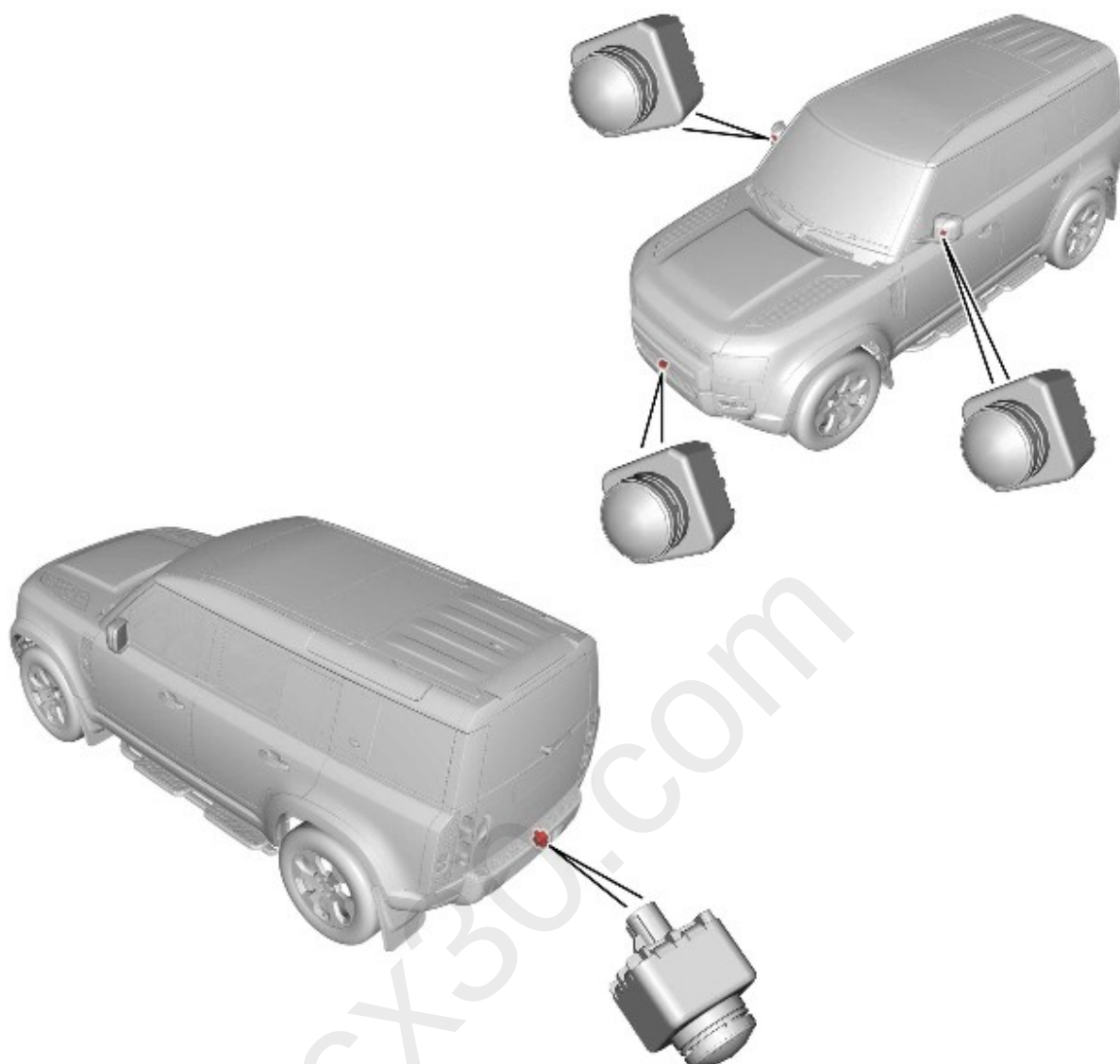
The proximity camera switch is a soft key on the TS.

Operation of the camera system allows the user to select appropriate views. There is an indicator in the switch to indicate when the system is active.

CAMERAS

NOTE:

Vehicle with 5 doors is shown, vehicle with 3 doors is similar.



E249823

The camera system uses Video Graphic Array (VGA) resolution cameras. The cameras are permanently powered whenever the vehicle is in Power Mode 6 (ignition ON) or Power Mode 7 (engine running).

On the proximity camera system, the cameras are installed in the following locations:

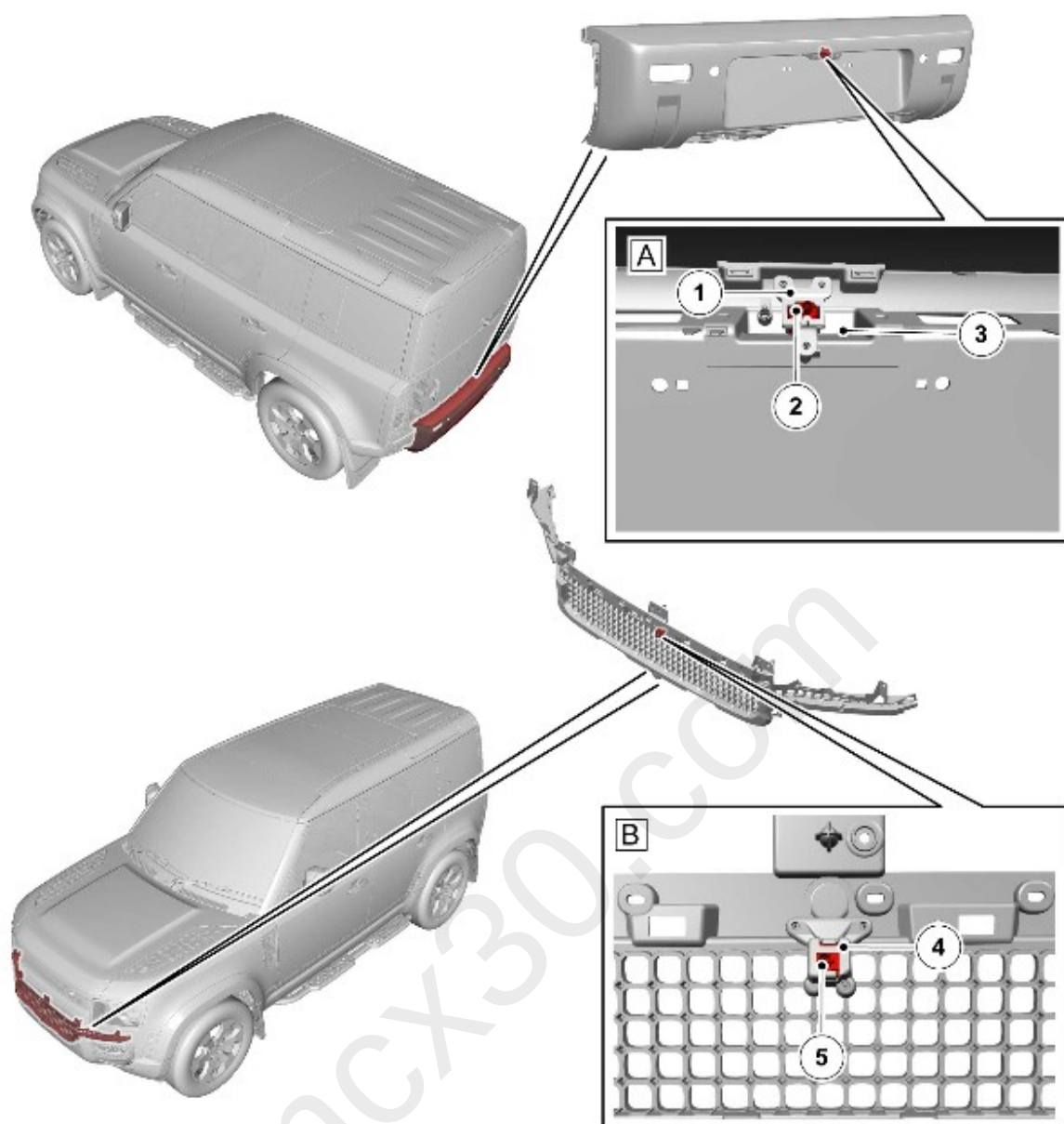
- Front lower grille
- Each door mirror
- Rear bumper, above the license plate.

CAMERA MOUNTING



NOTE:

Vehicle with 5 doors is shown, vehicle with 3 doors is similar.



E249824

ITEM	DESCRIPTION
A	Rear proximity camera mounting
B	Front proximity camera mounting
1	Rear proximity camera bracket
2	Rear proximity camera
3	Exterior tailgate
4	Front proximity camera bracket
5	Front proximity camera

To reduce the cost of accident repair, the mounting of the front proximity cameras features a 'snap free' bracket. On impact, the bracket releases the proximity camera and prevents damage to the proximity camera itself. Depending on the severity of the accident, it may also be possible to reuse the brackets as they are manufactured from a memory type plastic.

The positioning accuracy of all the cameras is crucial for the successful operation of the proximity camera system. The camera housings are manufactured using metal to maintain structural stability in high-ambient temperatures. Without this stability, a loss of image focus would be possible. Use caution when installing the cameras to make sure that they sit correctly into their locations. Secure mounting of the cameras provides an initial 'build up' tolerance accurate to 2 mm. The cameras calibrate themselves automatically.

OPERATION

PARKING AID SYSTEM – 360°



WARNINGS:

- The Parking Aid sensors may not detect moving objects, such as children and animals, until the objects are dangerously close. The driver is responsible for driving with due care and attention during low speed manoeuvres.
- Parking Aid is a driving aid only. The driver must maintain full control of the accelerator and brake pedals throughout low speed manoeuvres.
- All sensors must be kept clean and free from debris or obstructions. For example, leaves, mud, snow, ice, frost, or insects. Failure to keep the sensors clean may result in sensor miscalculation or false indications.
- Parking Aid must not be used when a sensor is damaged, or the bumper is damaged sufficiently enough to affect a sensor mounting point. Failing to follow these guidelines may result in sensor miscalculation or false indications.
- Parking Aid must not be used when a sensor is obstructed by items attached to the vehicle. For example, bumper covers, a bicycle rack, or stickers. Failing to follow these guidelines may result in sensor miscalculations or false indications.
- Make sure the relevant safety warnings and cautions have been read and understood before operating the TS.



CAUTIONS:

- The Parking Aid sensors may also be externally influenced by noise generated from air brakes, emergency vehicles, motorbikes, pneumatic drills, and high wind. The driver is responsible for driving with due care and attention during low speed manoeuvres.
- The Parking Aid sensors may not detect some obstructions. For example, narrow posts or small objects close to the ground. Objects above sensor level may not be detected, when approaching a flatbed truck, the protruding part of the flatbed may not be detected. Additionally, the Parking Aid system operation may be limited, when maneuvering the vehicle near wooden objects. For example, a wooden post.

- Do not aim a high pressure water jet directly at any of the sensors when washing the vehicle. Only use approved vehicle shampoo. Do not use abrasive materials, or hard or sharp objects, to clean the sensors. Failure to follow these guidelines may result in damage to the system or cause a system fault.
- Particular care must be taken when using the Parking Aid system when accessories are installed to the front or rear of the vehicle. For example, a bicycle rack installed in a position where it obstructs the operation of the parking sensor(s). When the affected sensor(s) is obstructed, the sensor(s) only indicates the distance from the bumper to the bicycle rack. Any obstacle beyond the detected accessory may not be indicated on the TS display.
- At vehicle start-up, the front sensors may not detect low objects, even if the objects were detected during the original parking maneuver.

The Parking Aid system - 360° is automatically activated when:

- REVERSE is selected.
- NEUTRAL is selected.

When the Parking Aid system is active and a forward gear is selected, the sensors remain active. When the vehicle speed reaches 16 km/h (10 mph) the system is disabled.

The Parking Aid system - 360° can be configured to activate automatically when:

- The vehicle speed is less than 10 km/h (6 mph).
- DRIVE is selected.

Automatic Parking Aid activation can be configured through the Parking Aid settings to ON or OFF. To access the settings press the 'settings' icon on the Parking Aid plan view to access 'Automatic collision alert'. The Parking Aid system activates automatically when the automatic collision alert soft key is displayed on the passenger side bar of the TS. When a collision threat is detected, the TS automatically displays a 360° vehicle plan view. A warning tone also sounds.

The automatic collision alerts default state of the Parking Aid system is ON. To switch OFF the automatic collision alerts:

- 1 Touch the settings soft key from any screen.
- 2 Select 'Vehicle'.
- 3 Select 'Driver Assistance'.
- 4 Select 'Low speed maneuvering'.
- 5 Touch 'automatic collision alert' to switch ON or OFF.

To activate the Parking Aid system manually, touch the camera soft key. The selection is retained in all Power Modes.

The Parking Aid system - 360° are not available under the following conditions:

- Vehicle speed is greater than 16 km/h (10 mph).
- PARK is selected.
- All Terrain Progress Control (ATPC) is active (if equipped).
- When wade sensing is active (if equipped).
- When there is a system fault.

The Parking Aid system - 360° may be selected ON or OFF by pressing the Parking Aid switch. An indicator in the switch indicates when the system is active.

Audible warnings



NOTE:

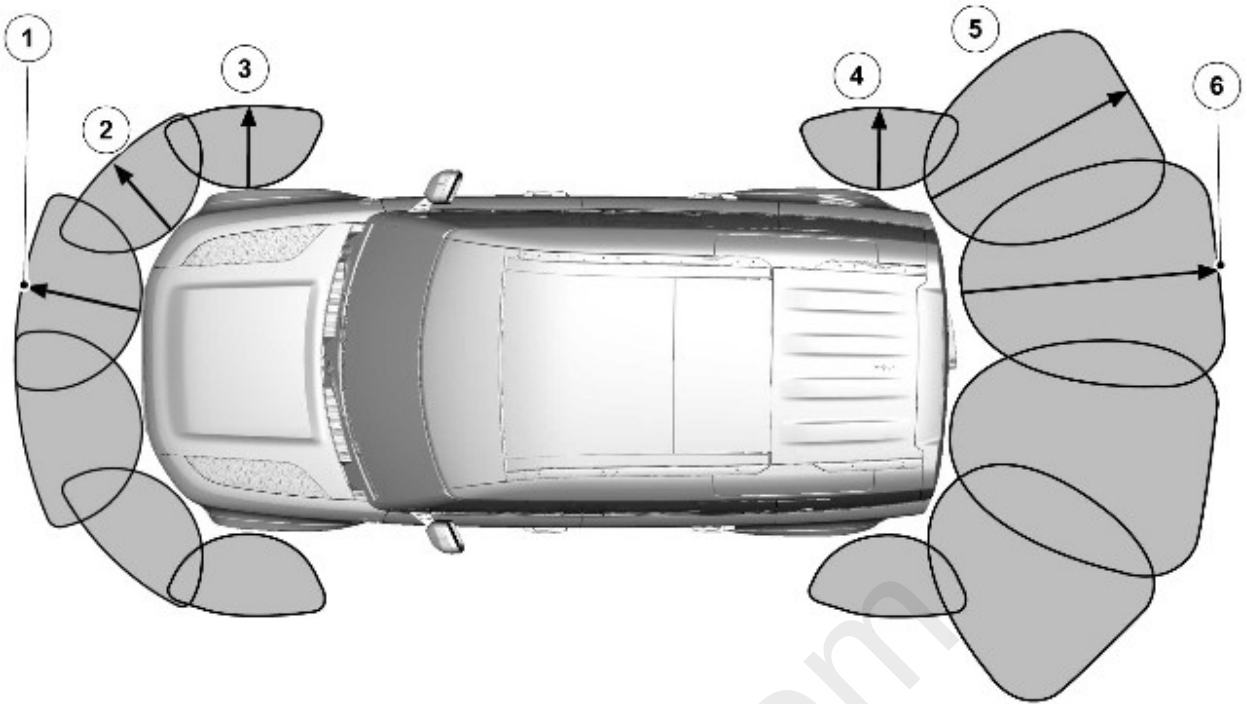
When the Parking Aid system is active, the system only provides warning tones when a threat is detected.

The NFSM module processes the distance readings from the Parking Aid sensors to determine when the objects are within the detection areas. When no objects are detected, there are no audible warnings. When an object is detected, repeated audible warnings are emitted through the audio system speakers. The time delay between the audible warnings decreases as the distance between the detected object and the vehicle decreases. Eventually a continuous tone is emitted from the audio system speakers.

To adjust the volume of the Parking Aid warning tones, rotate the media volume control switch on the FCIM while the tones are active. Touch the speaker soft key on the 360° vehicle plan view of the TS to mute the warning tones for maneuver only. The Parking Aid system warning tones do not sound when:

- Low range mode is selected.
- Any of the following driving programs is selected:
 - Sand.
 - Mud ruts.
 - Rock crawl.
 - Wade.
 - The 'OFF ROAD' camera view is displayed.

Audible warnings detection ranges



E249825

FRONT INNER	SENSOR LOCATION	MAXIMUM DETECTION RANGE AUDIO TONE	CONTINUOUS AUDIO TONE
1	Front bumper inner	Approximately 1,200 mm (47 inches)	Approximately 200 mm (8 inches)
2	Front bumper outer	Approximately 1,200 mm (47 inches)	Approximately 200 mm (8 inches)
3	Front bumper side	Approximately 1,200 mm (47 inches)	Approximately 200 mm (8 inches)
4	Rear bumper side	Approximately 1,200 mm (47 inches)	Approximately 200 mm (8 inches)
5	Rear bumper outer	Approximately 1,800 mm (71 inches)	Approximately 200 mm (8 inches)
6	Rear bumper inner	Approximately 1,800 mm (71 inches)	Approximately 200 mm (8 inches)

Detection calculation

In the combined mode, the Parking Aid sensors emit a series of ultrasonic impulses. The Parking Aid sensors then switch to receiver mode to receive the echo reflected by an obstacle within the detection range. The received echo signals are amplified and converted from an analog signal to a digital signal by the Parking Aid sensor. The NFSM receives this data through the signal wire from the Parking Aid sensor. The NFSM then calculates the distance from the object using the elapsed time between the transmitted and received impulse. The impulse duration is determined by the NFSM, with the Parking Aid sensor controlling the frequency of the impulse output.

When in REVERSE mode, all the Parking Aid sensors are active. When in a forward gear, only the Parking Aid sensors - Front are active.

In receiver mode, the Parking Aid sensor receives impulses that were emitted by adjacent Parking Aid sensors. The NFSM uses this information to precisely determine the position and distance of the object.

When no objects are detected, there are no further audible warnings. When an object is detected, repeated audible warnings are emitted from either the front or rear audio speakers as appropriate. The time delay between the audible warnings decreases as the distance between the object and the vehicle decreases. At approximately 200 mm (8 inches), the audible warnings becomes continuous.

While the vehicle is passing an object within its sensor range, the vehicle integrated systems calculate its steering trajectory. The TS displays the trajectory lines on the 360° vehicle plan view and the camera main screen. The steering trajectory lines indicate the projected path of the vehicle, based on the current steering wheel position.

When approaching several objects within detection range, the NFSM recognizes the distance from the vehicle to the nearest object.

The NFSM uses the threat based concept. An object is identified as a threat when it lies in the vehicle trajectory. Also when the vehicle is either moving towards the threat or the vehicle has the intent to move towards the threat.

The intent is determined by the gear selected.

The NFSM receives a signal on the FlexRay through the BCM/ GWM when a trailer is attached. When this signal is detected, the NFSM suspends operation of the Parking Aid sensor - Rear. The ignition needs to be cycled when the trailer has been disconnected to activate the Parking Aid sensor - Rear.

Diagnostics

When the NFSM identifies a fault, a red border displays on the 360° vehicle plan view and the NFSM stores a Diagnostic Trouble Code(s) (DTC).

The NFSM has a diagnostic connection through the ethernet to enable faults to be retrieved using Jaguar Land Rover (JLR) approved diagnostic equipment.

WADE SENSING SYSTEM



WARNINGS:

- Do not assume that using the wade sensing system reduces the risks of wading. The wade sensing system only detects the immediate level of water that touches the vehicle. The wade sensing system cannot detect or predict the depth of water around the vehicle, or rapid increases in water levels about to occur. The wade sensing system cannot predict if it is safe to continue driving. The driver is responsible to assess the safety of the driving conditions, potential hazards and current driving direction to avoid vehicle damage or personal injury.
- Do not wade through flowing or rough water. This action can cause injury or death.
- Do not wade through water when a layer of ice or snow exists on the water surface. The wade sensing system cannot detect the true level of the water, which can cause injury or death.
- Rapid increases in water depth cannot be detected in time to deliver a warning message to the driver. This can cause injury or death.

 CAUTION:

The wade sensors and the area below the wade sensors must be kept clean and free from snow, ice, mud and other debris. Failure to keep the wade sensors clean may result in sensor miscalculation.

The door mirrors must be in the normal (unfolded) position when using the wade sensing system. When the door mirrors are in the fold position, wade sensing operates, but gives false readings.

 NOTE:

Wade sensing needs to be calibrated when the vehicle is equipped with deployable side steps, fixed side steps, or side protection tubes.

The NFSM incorporates software which is able to provide the wade sensing functionality. There are 2 ultrasonic sensors located on the underside of the door mirrors. The ultrasonic sensors are hardwired to the NFSM. The NFSM supplies the sensors with an ignition voltage and an earth lead connection. The sensors return a signal voltage, proportional to the measured reflection from the water. The water depth calculation is based on the reflection from the water surface, which is measured by the sensors, and:

- +/- offset from suspension height adjustment from the Chassis Control Module (CHCM).
- +/- depth effect of road gradient.

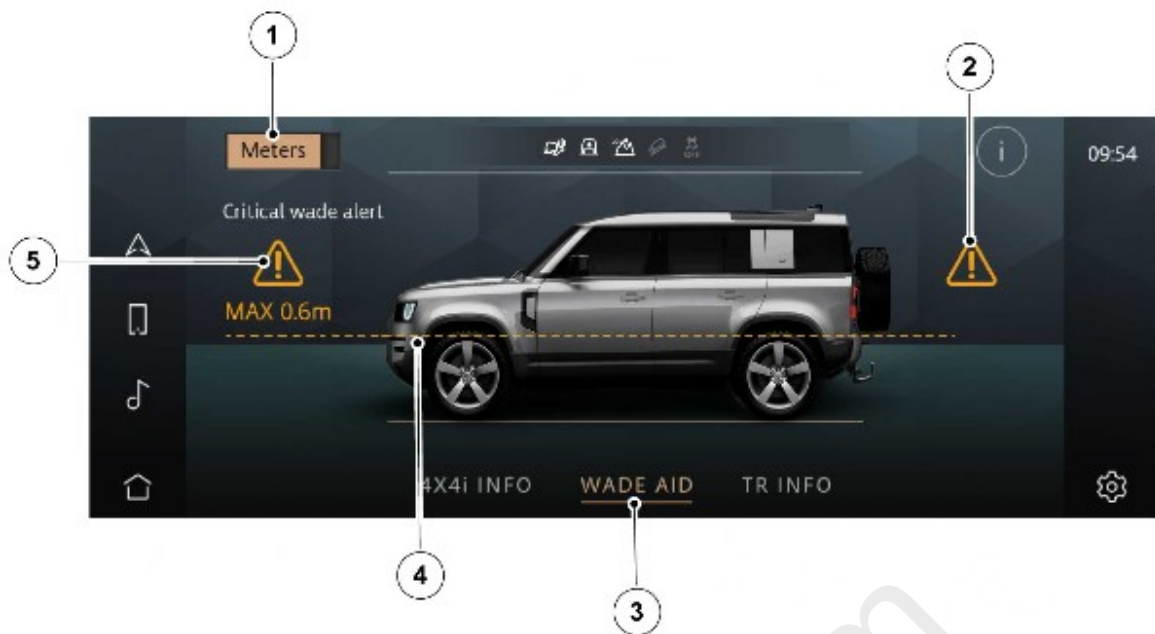
The NFSM uses these inputs when the vehicle moves through water to provide the driver audible and visual information about:

- The depth of water.
- The gradient of the vehicle compared to the water level.

The wade sensing system can display the water depth information on the IPC message center and on the TS.

The wade sensing screen can be selected from the TS '4X4i' or 'Extra Features' menus.

The TS can display the current and maximum water depths. The system warns the driver as the maximum depth for wading approaches.



E256827

ITEM	DESCRIPTION
1	Units
2	Warning
3	Wade sensing soft key
4	Depth indication line
5	Maximum depth indication numeral

The TS provides the driver with the following information:

- Initial wading advice.
- Maximum vehicle wade depth.
- Advice to select 'OFF ROAD' suspension height to support the maximum wade depth.
- Ice wade warning, to prevent potential damage to the vehicle.
- Near max wade depth.
- Max wade depth reached.
- Max wade depth exceeded.
- Road Gradient - Level, nose down, nose up and laterally uneven.

**NOTE:**

Wading performance is improved when the vehicle suspension is set to 'OFF ROAD' height. Wade sensing does not operate correctly when the door mirrors are in the fold position. Parking Aid and stop/start systems are all disabled when wade sensing operates.

The wade sensing system warns the driver through the TS, IPC and audible tones, when the maximum depth approaches. When the wade sensing system limitations are exceeded, the TS views gray out. Wade sensing is suspended when the vehicle speed is greater than 10 km/h (6 mph). Wade sensing automatically reactivates when the vehicle speed decreases to 10 km/h (6 mph). When the vehicle speed is greater than 30 km/h (19 mph) for 30 seconds, wade sensing automatically switches OFF.

CAMERA SYSTEM

There are a number of systems that use of word systems.

FORWARD VEHICLE GUIDANCE

The forward vehicle guidance uses the front camera to display a view of the area in front of the vehicle not visible to the driver. The images are displayed on the TS.

The forward vehicle guidance is turned ON or OFF using the camera settings soft key on the camera menu page.

The forward vehicle guidance displays an image from the front camera. The image may have overlays of the projected vehicle path based on the steering angle from the Steering Wheel Module (SWM). When the Parking Aid sensors are - Front active, object detection displays on the image.

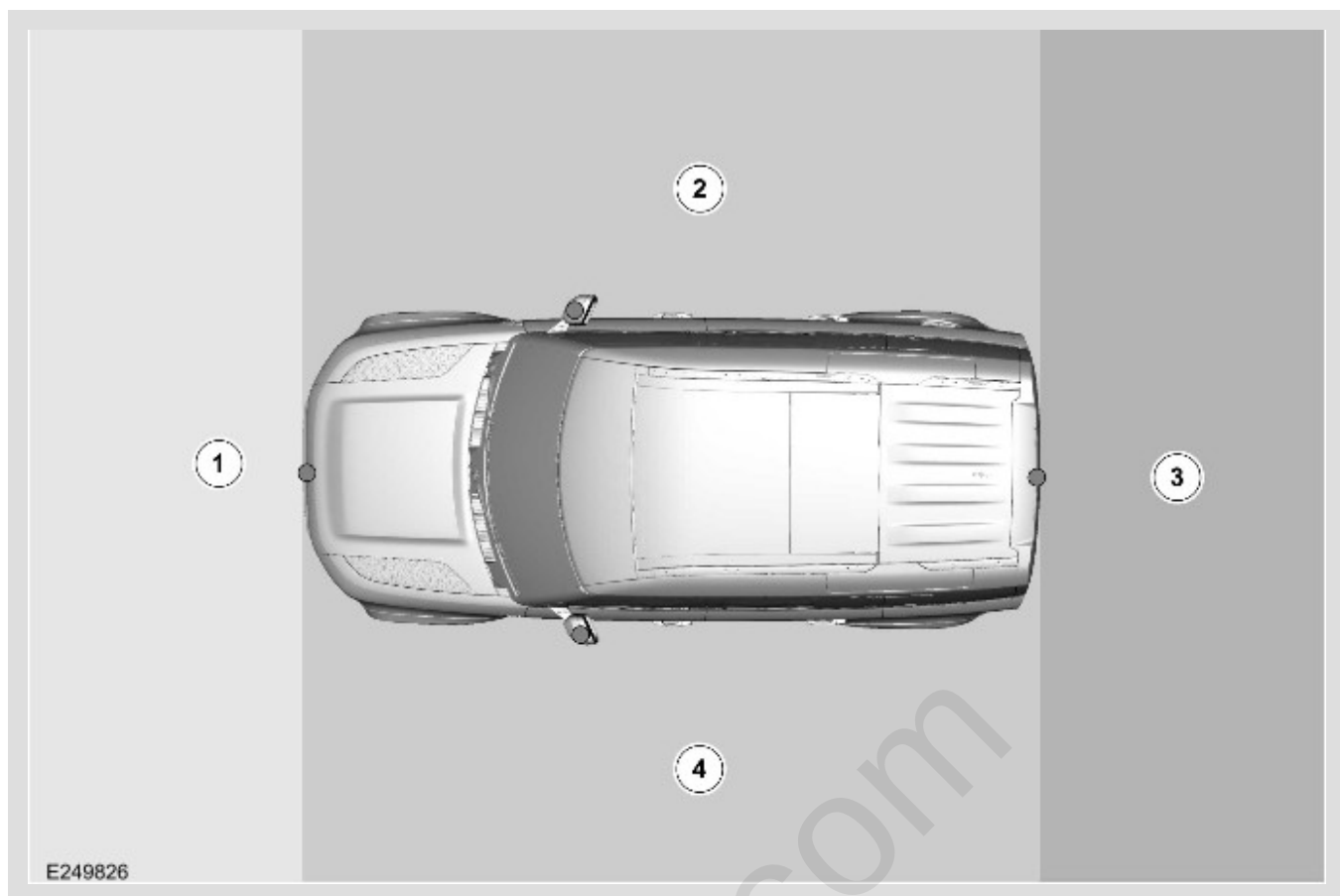
The forward vehicle guidance activates when the plan view or forward camera is selected on the camera menu page on the TS.

The forward vehicle guidance operates when:

- A forward gear or NEUTRAL is selected.
- The vehicle speed is less than 16 km/h (10 mph).

PROXIMITY CAMERA SYSTEM

The proximity camera system provides the driver with a visual aid when maneuvering the vehicle at low speeds. The proximity camera system uses the NFSM to capture the camera data. The images are displayed on the TS, providing the driver with a 360° view around the vehicle. The system is also supported by various driving aid features where graphical information and warnings are superimposed onto the images displayed on the TS.



E249826

ITEM	DESCRIPTION
1	Proximity camera - Front coverage zone
2	Door mirror proximity camera - Right coverage zone
3	Proximity camera - Rear coverage zone
4	Door mirror proximity camera - Left coverage zone

Camera activation and deactivation

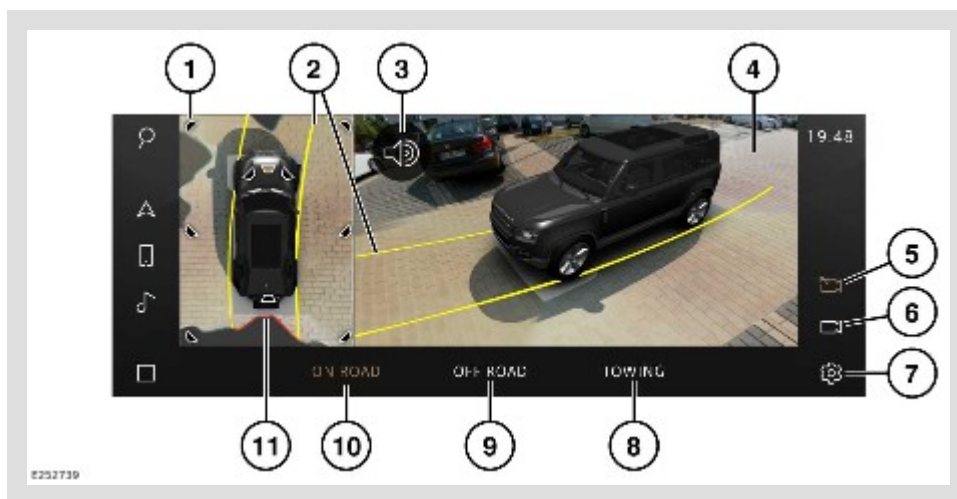
Camera views can be activated in 2 ways, automatically or manually.

Automatic views are initiated either by engaging REVERSE or engaging DRIVE after selecting semi-auto view ON in the 'Camera Settings' menu. This is not available in all vehicles, depending on the market and vehicle specifications.

When semi-auto view is set to ON and a proximity threat is within the driving path of the vehicle, the front camera view displays. Both automatic camera views are deactivated at 16 km/h (10 mph).

All camera views activated using soft key presses on the TS are classed as manual and remain on the TS. The camera views are deactivated at 30 km/h (18 mph).

Selecting views



ITEM	DESCRIPTION
1	Volume soft key
2	Camera view soft key
3	Vehicle steering trajectory lines
4	Clear sight soft key
5	Main camera screen
6	Parking Aid soft key
7	Camera soft key
8	Setting soft key
9	Towing mode
10	'OFF ROAD' mode
11	'ON ROAD' mode
12	Parking aid object detection threats

The TS displays real time images transmitted from each of the 4 cameras.

The proximity camera view images are overlaid with:

- Solid lines representing the predicted trajectory of the vehicle, calculated from the steering wheel angle sensor.
- Colored bars represent the amount of distance between the vehicle and the object being approached. Working in conjunction with the Parking Aid, this adds a visual representation to the existing audible warning.

The reversing aid graphics can be disabled in the settings menu or by touching the TS when REVERSE is selected and the camera view displayed.

The camera system is available in 3 modes:

- 'ON ROAD' mode
- 'OFF ROAD' mode
- Towing mode.

'ON ROAD' mode

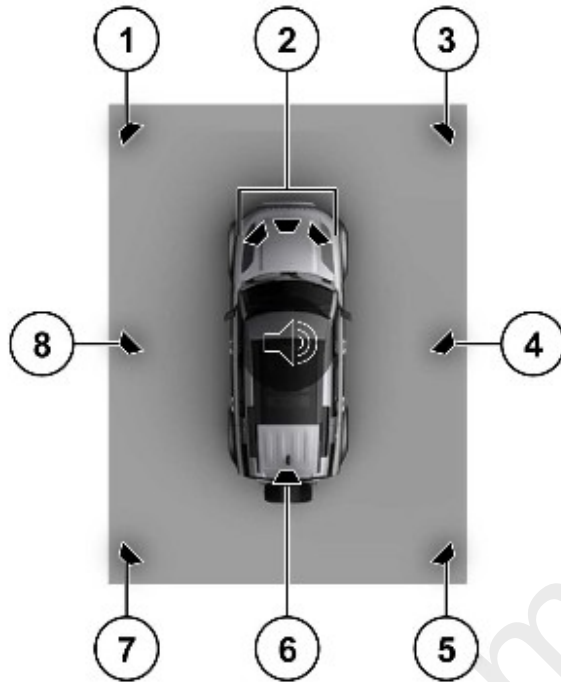
The 'ON ROAD' mode activates automatically when:

- REVERSE is selected.
- The vehicle starts to roll backward.
- An automatic collision threat is detected by the Parking Aid system.

When the 'ON ROAD' mode is active, the camera views may automatically switch under the following conditions:

- A rear proximity camera view displays when REVERSE is selected.
- A rear proximity camera view displays when the vehicle rolls backward.
- A forward camera view displays when DRIVE is selected.

Touch the camera view soft keys from the Parking Aid plan view to select the relative camera views depending on the driver requirement.



E256828

ITEM	DESCRIPTION
1	Front left camera soft key - Touches to display a front left perspective camera view
2	Front toggle camera soft key - Touches to display a front camera view, touches again to display a front junction camera view
3	Front right camera soft key - Touches to display a front right perspective camera view
4	Right curbside camera soft key - Touches to display a right curbside perspective camera view
5	Rear right camera soft key - Touches to display a rear right perspective camera view
6	Rear toggle camera soft key - Touches to display a rear proximity camera view, touches again to display a rear junction camera view
7	Rear left camera soft key - Touches to display a rear left perspective camera view
8	Left curbside camera soft key - Touches to display a left curbside perspective camera view

The selected camera view soft key illuminates on the Parking Aid plan view and the image displays on the main camera screen. Touch the left or right arrows displayed or swipe the main camera screen left or right to display an alternative camera view.

NOTES:

- When manually activating the camera system, the default camera view display is dependant on the

selected gear.

- The previously selected camera view is displayed when the camera system has been re-enabled.

To activate the 'ON ROAD' mode manually through the TS:

- Touch the Parking Aid soft key or the camera soft key from the home screen.
- Select 'ON ROAD'.

'OFF ROAD' mode

The 'OFF ROAD' mode uses the proximity cameras to display 'OFF ROAD' camera views, to assist the driver during 'OFF ROAD' driving.

To activate the 'OFF ROAD' mode through the TS:

- Touch the Parking Aid soft key or the camera soft key from the home screen.
- Select 'OFF ROAD'.

The 'OFF ROAD' mode can also be activated through the '4x4i' screen.

The 'OFF ROAD' mode displays the following:

- The drive assist mode
- The clear sight ground view mode.

Towing mode

The towing mode consists of the following camera views:

- Hitch assist
- Tow assist.

When REVERSE is selected, the rear proximity camera automatically displays a wide-angle color image onto the TS. The rear proximity camera provides additional information to the driver when hitching a trailer to the vehicle.

Within the settings menu the driver can activate the hitch guidance and the auto towbar zoom features.

- Hitch guidance - The hitch guidance provides a trajectory line indicating the path of the towbar in relation to the steering angle applied to the vehicle.
- Auto towbar zoom - Initiates an automatic image zoom when the trailer is within 0.6 m (2 feet) of the towbar. This allows more accurate alignment of vehicle to trailer.

 NOTE:

The auto towbar zoom feature is not available in the North American Specification (NAS) market

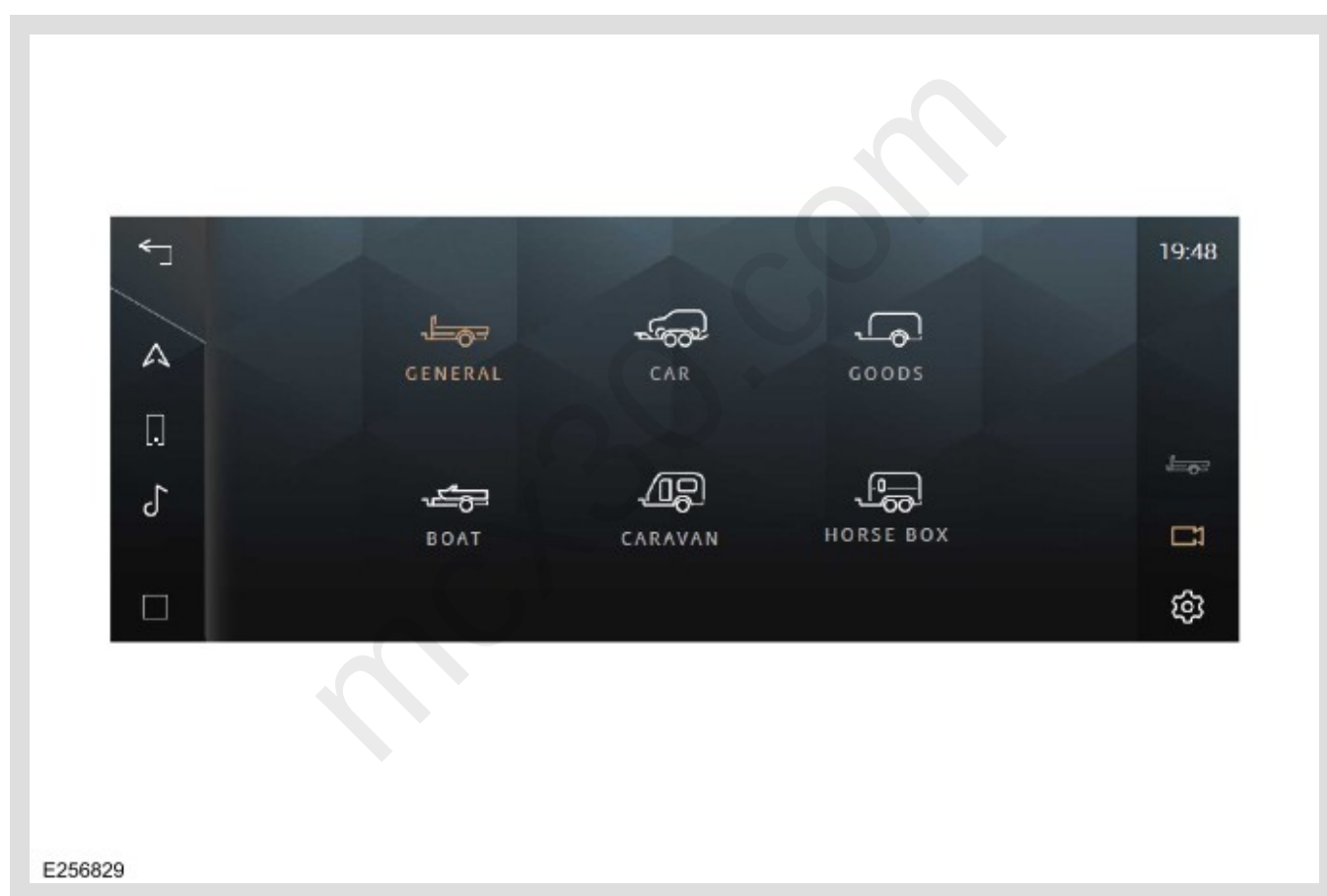
The tow assist feature uses the camera views to monitor the position of a connected trailer. Trajectory lines are overlaid onto the images when reversing a trailer. Different camera views can be selected through the TS.

 NOTE:

The tow assist only operates when the connected trailer has had a profile created and has been calibrated.

On first use, the setup screens guide the user through a series of configuration options for the connected trailer.

Trailer Setup - Step 1 of 5



- Choose from the list of generic trailer descriptive icons for the trailer attached.

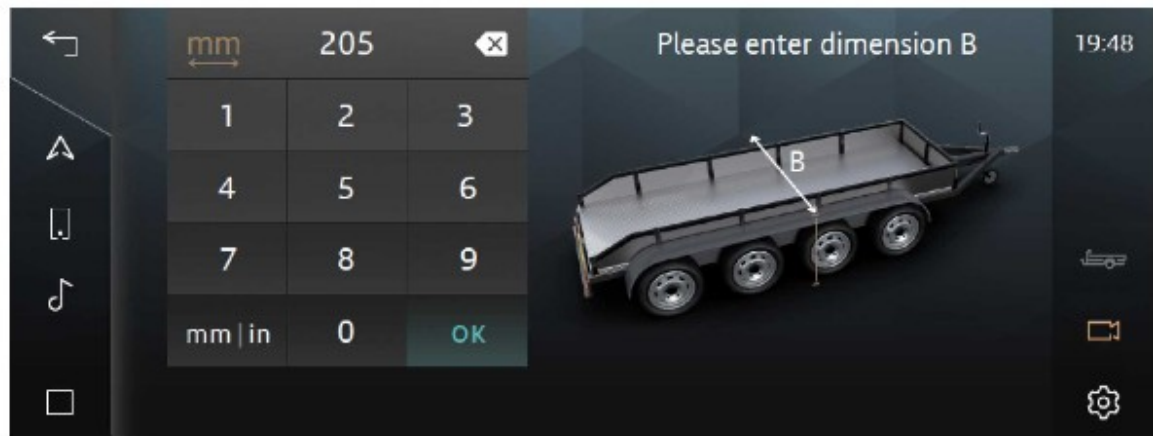
Trailer Setup - Step 2 of 5



E256830

- Select the number of axles from the screen.

Trailer Setup - Step 3 of 5



- Enter the dimensions of the trailer, then select 'OK'.

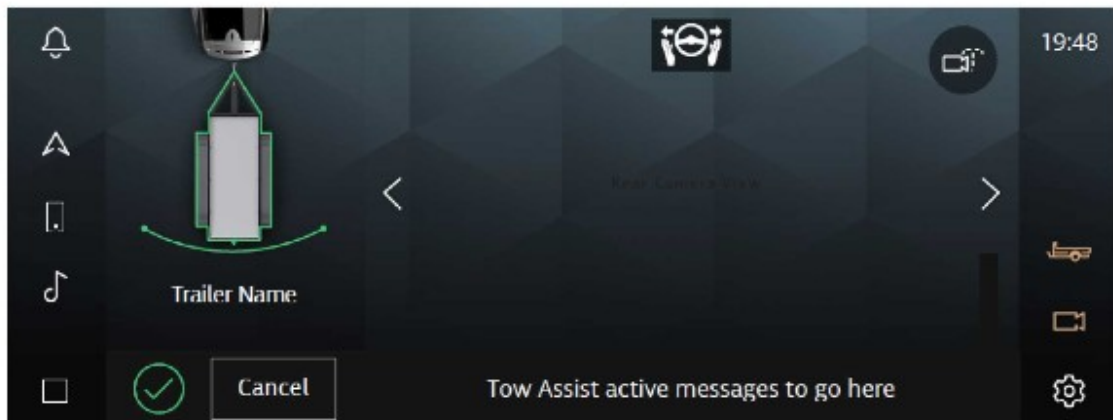
Trailer Setup - Step 4 of 5



E256832

- Position the trailer straight behind the vehicle, then select 'OK'.

Trailer Setup - Step 5 of 5



E256833

- To learn the central position of the trailer, drive the vehicle forward:
 - At less than 24 km/h (15 mph).
 - With the steering wheel in the straight ahead position.
- As the tracking feature learns the central position, a progress bar appears to show the progress.

Finally, highlight the trailer that has been memorized, and select 'OK'.

The tow assist feature is now ready to use.

Advanced tow assist

The advanced tow assist is selected on the camera screen of the TS by selecting the advanced tow assist soft key. The soft key is only available when a previously saved trailer is connected to the vehicle.

The advanced tow assist reverses a vehicle with a previously saved trailer. The trajectory path is displayed and adjusted using the FCIM and the rotary control on the driver side of the FCIM.

Colored lines indicate when the trailer is going straight, turning or turning at too great an angle:

- Green line - Trailer is straight.
- Magenta line - Trailer is turning.
- Red line - Trailer is turning at too great an angle.

The driver controls the angle by operating the rotary control on the driver side of the FCIM. The driver controls the vehicle speed using the accelerator pedal and the brake pedal.

The maximum vehicle speed for advanced tow assist is 9 km/h (5.6 mph).

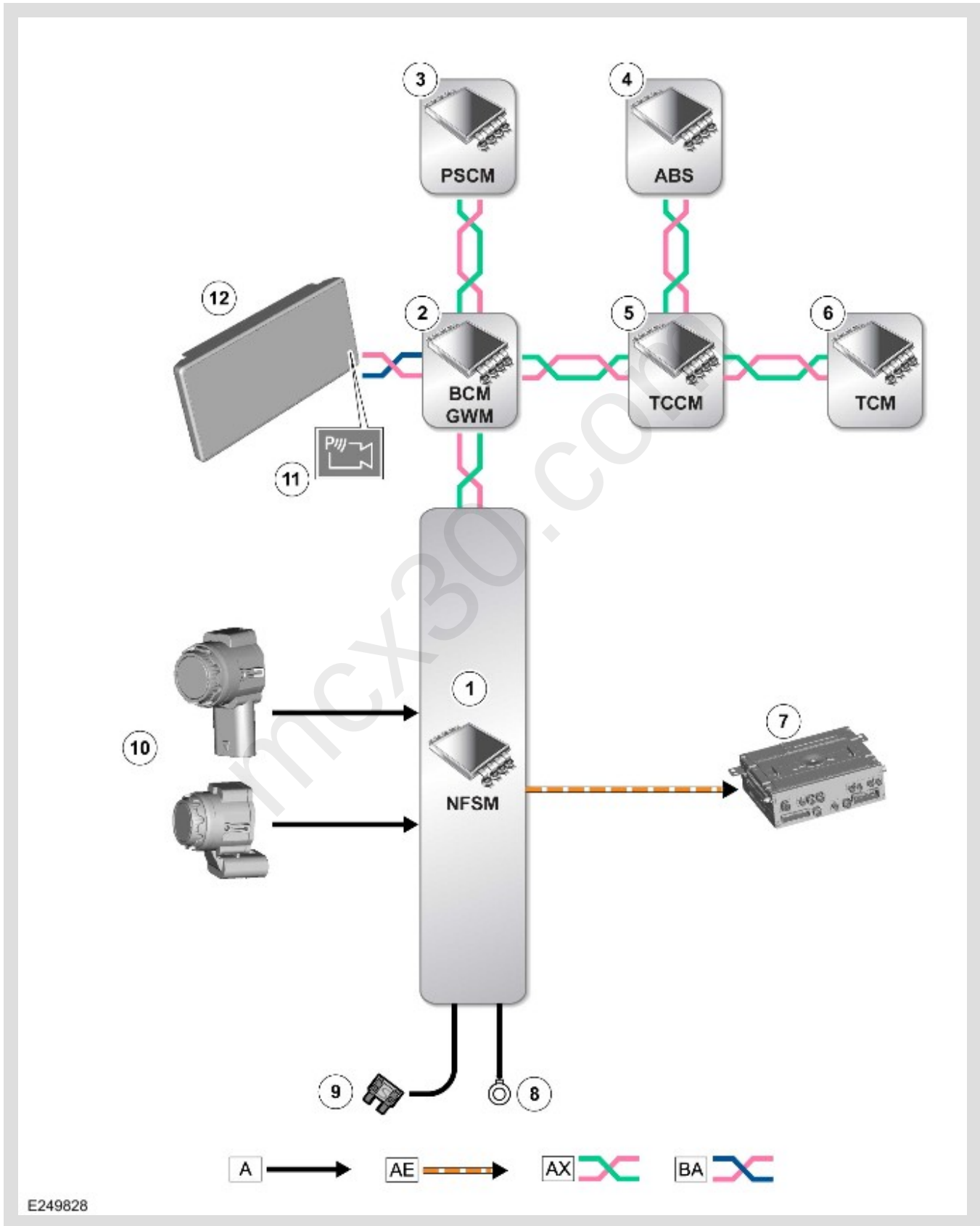
DIAGNOSTICS

The NFSM records any DTCs and related data. Read the DTCs and related data with the JLR approved diagnostic equipment.

The JLR approved diagnostic equipment can read live data and activate certain components.

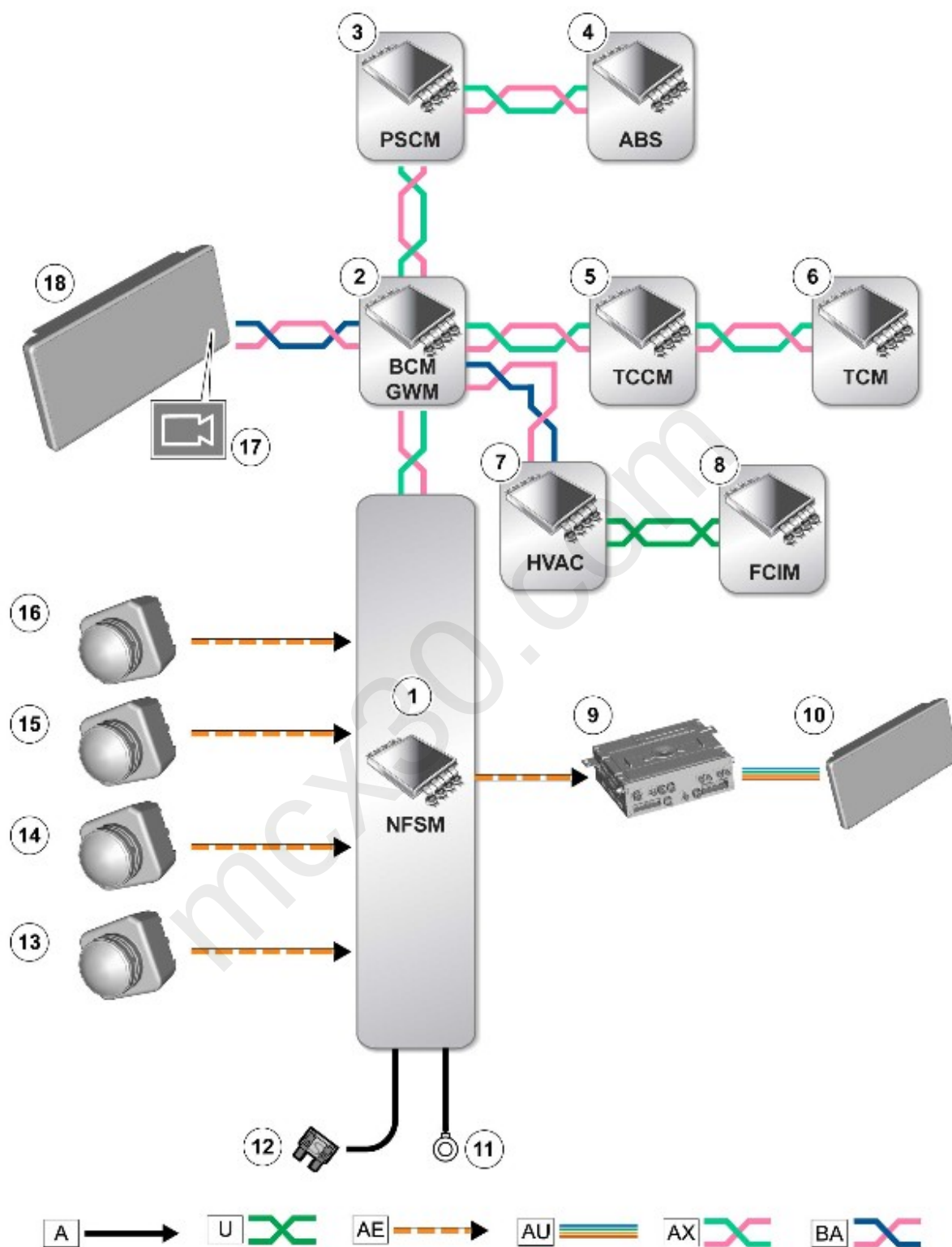
mcx30.com

CONTROL DIAGRAM – 1 OF 3 – PARKING AID – 360°



A = HARDWIRED: AE = LOW-VOLTAGE DIFFERENTIAL SIGNALLING (LVDS): AX = FLEXRAY: BA = HIGH SPEED (HS) CONTROLLER AREA NETWORK (CAN) HUMAN MACHINE INTERFACE (HMI) SYSTEMS BUS.

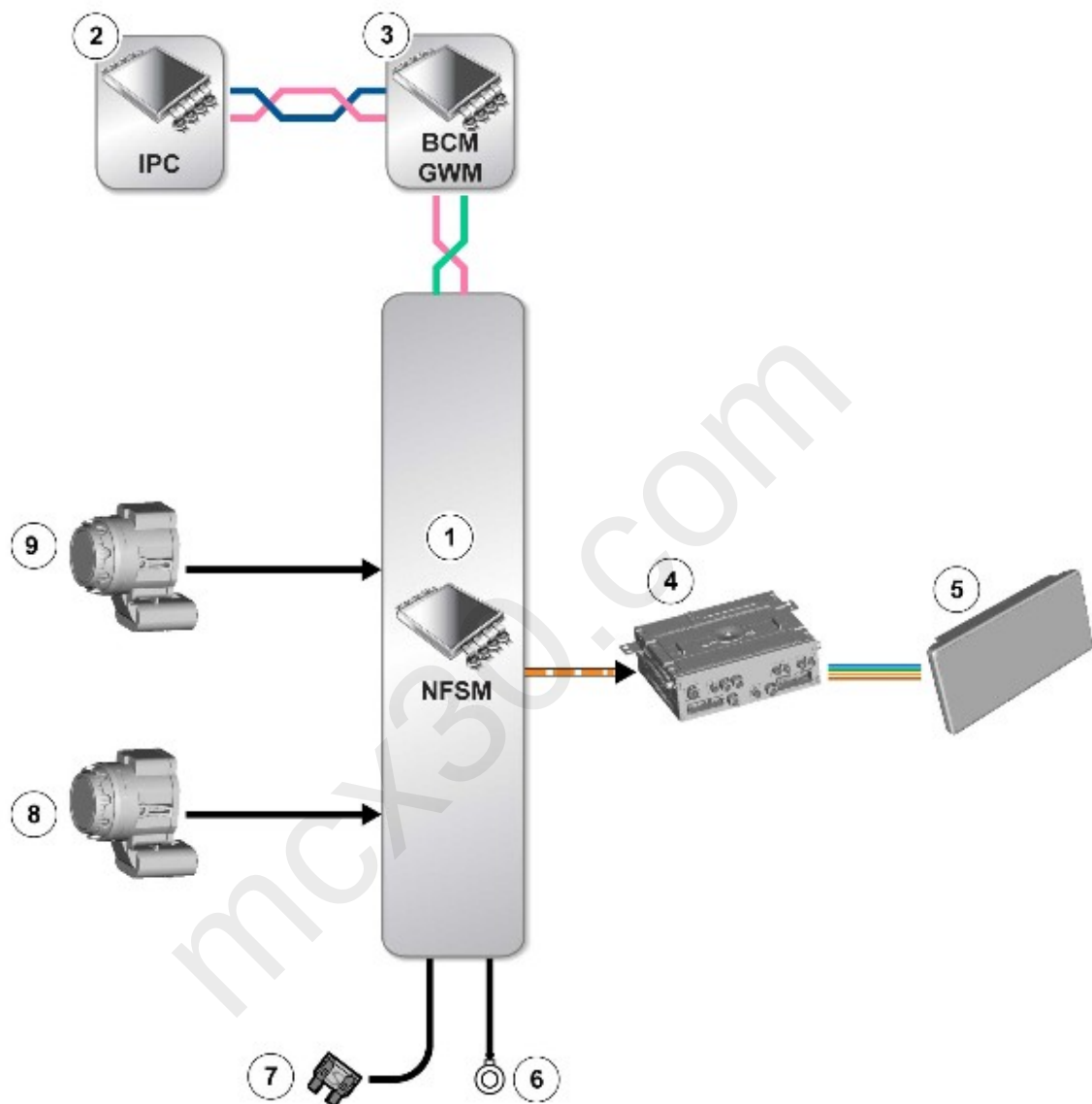
ITEM	DESCRIPTION
1	NFSM
2	BCM/ GWM
3	Power Steering Control Module (PSCM)
4	ABS
5	Transfer Case Control Module (TCCM)
6	TCM
7	IGM / ICCM
8	Ground
9	Power supply
10	Parking Aid and Park Assist sensor (quantity 12)
11	Parking Aid switch
12	TS



A = HARDWIRED: U = PRIVATE CAN BUS: AE = LVDS: AU = APIX2: AX = FLEXRAY: BA = HS CAN HMI SYSTEMS BUS.

ITEM	DESCRIPTION
1	NFSM
2	BCM/ GWM
3	PSCM
4	ABS
5	TCCM
6	TCM
7	Heating, ventilation, and air conditioning (HVAC) control module
8	FCIM
9	IGM / ICCM
10	TS
11	Ground
12	Power supply
13	Front proximity camera
14	Left door mirror proximity camera
15	Right door mirror proximity camera
16	Rear proximity camera
17	Proximity camera switch
18	TS

CONTROL DIAGRAM - 3 OF 3 - WADE SENSING SYSTEM



E249832

A = HARDWIRED: AE = LVDS: AU = APIX2: AX = FLEXRAY: BA = HS CAN HMI SYSTEMS BUS.

ITEM	DESCRIPTION
1	NFSM
2	IPC
3	BCM/ GWM
4	IGM / ICCM
5	TS
6	Ground
7	Power supply
8	Right door mirror wade sensor
9	Left door mirror wade sensor

cmIjaGFyZG1vbnRvbjsyMDIwLTA5LTE4VDA2OjQ0OjE4LjQwMFo7OTAuMTk5LjEyMS4xMTc7