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INFORMATION AND ENTERTAINMENT SYSTEM

TELEMATICS (G2401470)

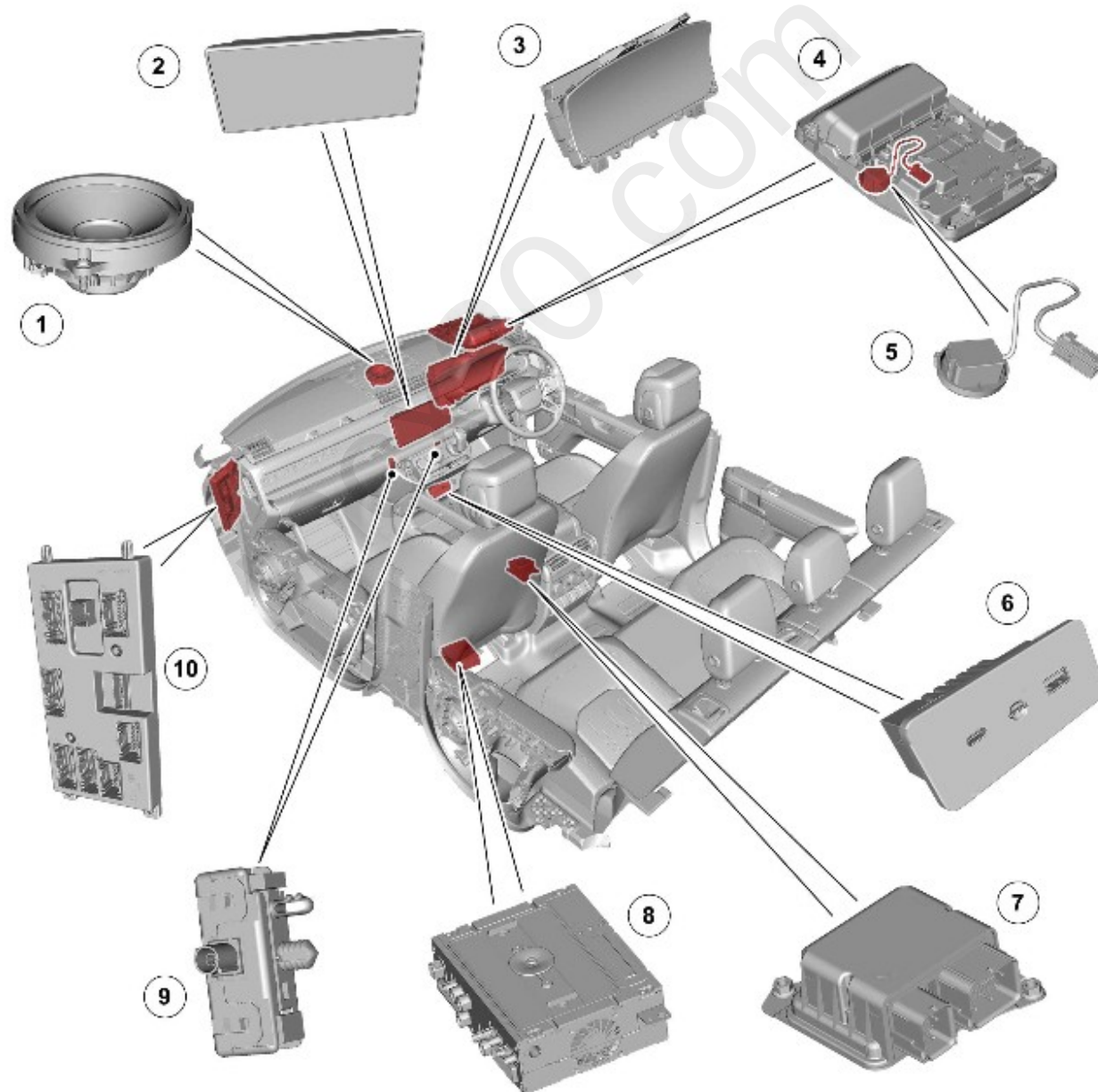
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COMPONENT LOCATION

COMPONENT LOCATION - 1 OF 2

 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.



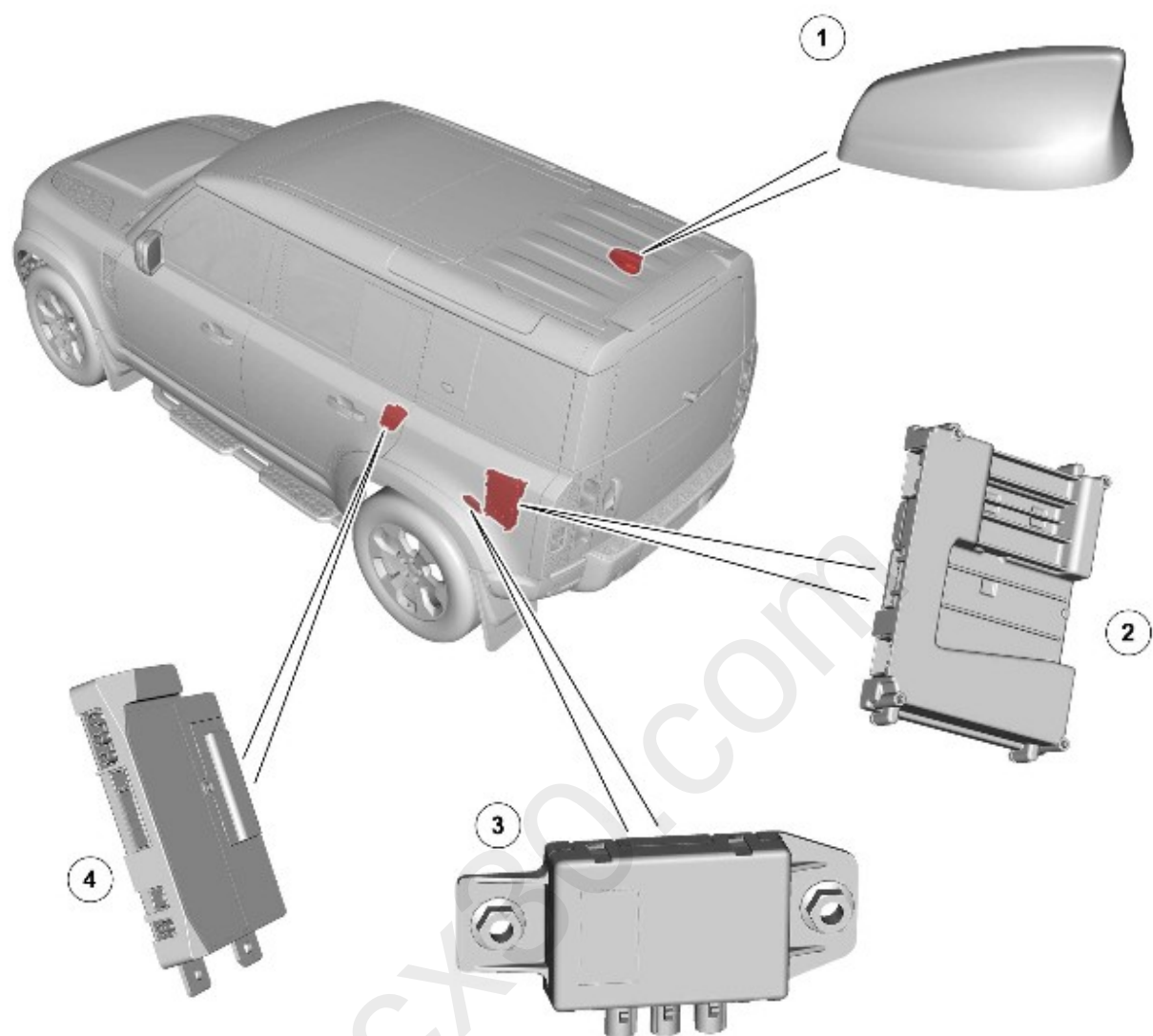
ITEM	DESCRIPTION
1	Speaker - Telematics
2	Touchscreen (TS)
3	Instrument Panel Cluster (IPC)
4	Front overhead console
5	Microphone - Telematics
6	Front portable media interface panel
7	Restraints Control Module (RCM)
8	Front Infotainment Control Module (IGM / ICCM)
9	Bluetooth®/WiFi antenna (quantity 2)
10	Body Control Module (BCM)/ Gateway Control Module (GWM)

COMPONENT LOCATION - 2 OF 2



NOTE:

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



E249001

ITEM	DESCRIPTION
1	Roof pod
2	Audio Amplifier Control Module (AAM)
3	Global Navigation Satellite System (GNSS) signal splitter
4	Telematics Control Module (TCU)

Telematics is a system of devices and features which communicate with other devices or users. The telematics system is a combination of built-in mobile connectivity, global satellite location information and vehicle network communications. The telematics features are often branded under the name InControl.

The system is controlled by the TCU. The TCU is integrated into the High Speed (HS) Controller Area Network (CAN) isolated systems bus. The TCU communicates with the vehicle infotainment system through the BCM/ GWM.

The telematics system provides features so the driver can remotely connect to the vehicle through the mobile communications network. The driver can view information from the vehicle and can send instructions to the vehicle.

The system also provides:

- The InControl remote smartphone application
 - The application features allow the user to remotely find information about the vehicle health and status on the smartphone. The smartphone application also displays vehicle information that includes the fuel level, range and the odometer value.
- The emergency Call (eCall)
 - When the vehicle is involved in an accident and the airbags deploy, the SOS eCall sends information to the emergency services. The information includes the users location. At the same time, the emergency services connect to the user by phone.
- The breakdown call (bCall)
 - When the vehicle breaks down, the user can make a direct call to the Jaguar Land Rover (JLR) assistance team by pressing the bCall button located in the front overhead console.
- The Secure Tracker
 - The function provides a stolen vehicle tracking service. In the event that the vehicle has been tampered with or moved without the owners consent, the owner is contacted by the InControl stolen vehicle tracking call centre.
 - 'Secure Tracker' is known as 'Stolen Vehicle Locator' in North American Specification (NAS) markets. The Secure Tracker is part of the remote feature with limited functionality.
- The Secure Tracker Pro (if equipped)
 - The function provides an enhanced level of security by integrating a secondary authentication between the smart key and the vehicle.
- WiFi hotspot.
 - The function provides in-vehicle access to cellular internet. The function enables wireless devices to be used in the vehicle.
 - For the WiFi hotspot to work, the user provided nano Subscriber Identification Module (SIM) card must be inserted into the front portable media interface panel. The front portable media interface panel is located in the front console.

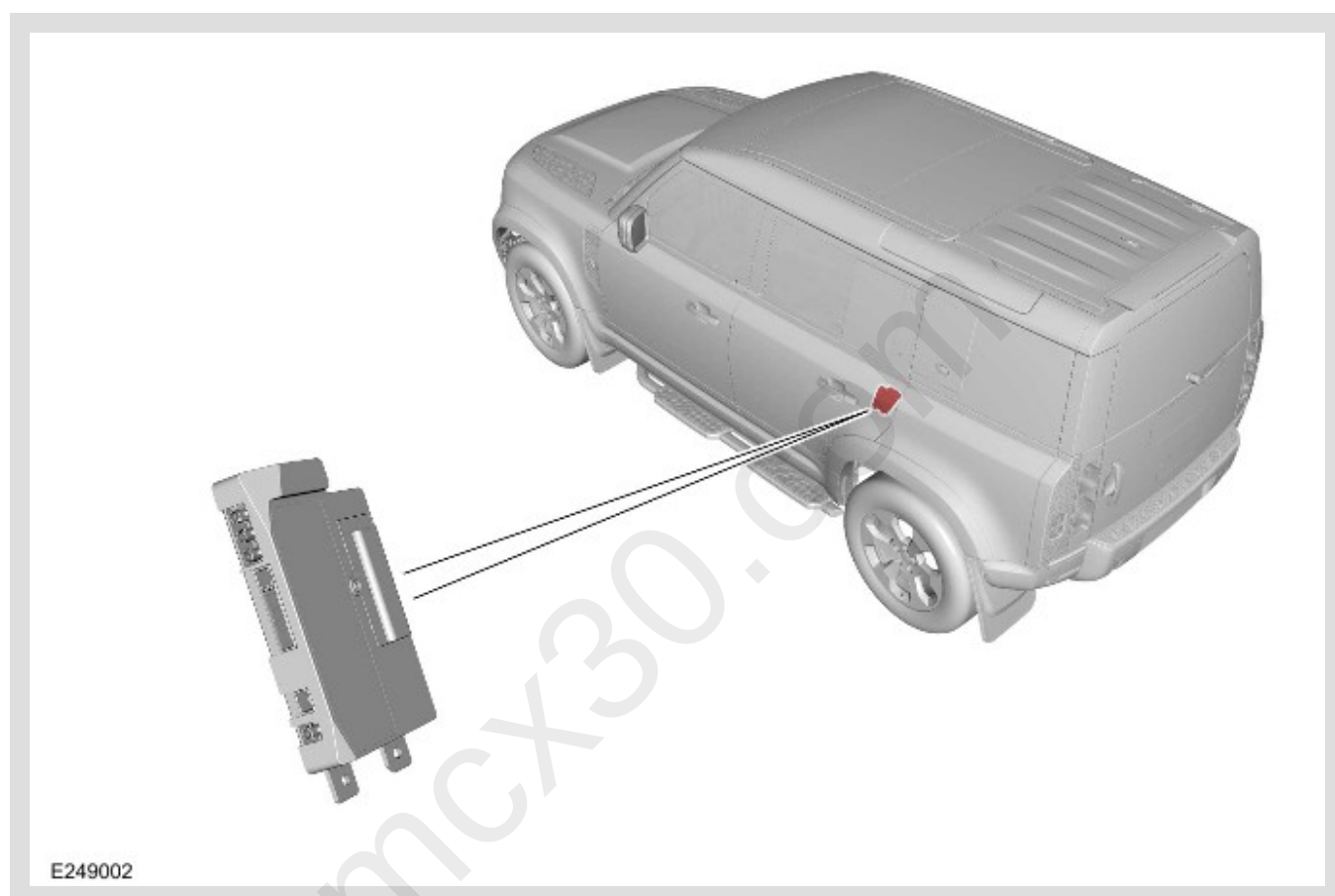
DESCRIPTION

TELEMATICS CONTROL MODULE



NOTE:

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



The TCU is located behind the rear left trim panel in the loadspace compartment.

The TCU receives a permanent power supply from the Battery Junction Box (BJB) through a fuse in the Passenger Junction Box (PJB).

The TCU controls the telematics system by communicating with the vehicle systems. The TCU uses the HS CAN isolated systems bus or HS CAN powertrain systems bus through the BCM/ GWM.

The system transmits and receives signals through the GNSS and the Global System for Mobile communications (GSM).

Depending on vehicle specification, the TCU also transmits and receives signals from the roof pod through a co-axial connection for WiFi services.

The TCU has an integral embedded SIM chip. The embedded SIM chip is part of the module circuitry and cannot be removed. The embedded SIM chip is configured to enable the network to retrieve and pass information to the Telematics Service Provider (TSP). The SIM chip enables the TSP to call back the TCU. Use of the embedded SIM chip overrides the user provided SIM card data transmissions. The function results in loss of WiFi during the call and call back.

The embedded SIM chip is used in the following circumstances:

- During an eCall
- During a bCall
- During a Secure Tracker operation.

The RCM is connected directly to the TCU. The connection provides an instant crash signal communication from the RCM in the event of an accident of a severity to activate the airbags. When the TCU receives the crash signal, an automatic eCall is initiated.

TELEMATICS CONTROL MODULE BATTERY

The TCU battery is integrated into the TCU. The TCU battery is located below a cover which is retained by a screw. The TCU battery contains a single cell that is fully rechargeable.

The TCU battery enables continued operation in the event of a vehicle main power source disconnection. For example:

- In a major accident.
- In the case of deliberate action of a thief as part of a vehicle theft attempt.
- When the startup battery becomes depleted then 'Secure Tracker' is triggered.

The TCU battery only activates during an eCall, bCall or Secure Tracker in which the vehicle power supply is disabled. The TCU battery is also required for the JLR logistics tracking system when the vehicle is in transit mode. The TCU battery enables the TCU to reliably deliver this data. The TCU is in a pre-activated state when in transit mode.

During the vehicle Pre-Delivery Inspection (PDI) process the TCU is removed from transit mode and switched ON to an activated state. When the TCU is removed from transit mode, the telematics system on the vehicle becomes fully active.

The TCU charges the battery when in Power Mode 7 (engine running). The charging function is controlled and regulated by the TCU software.

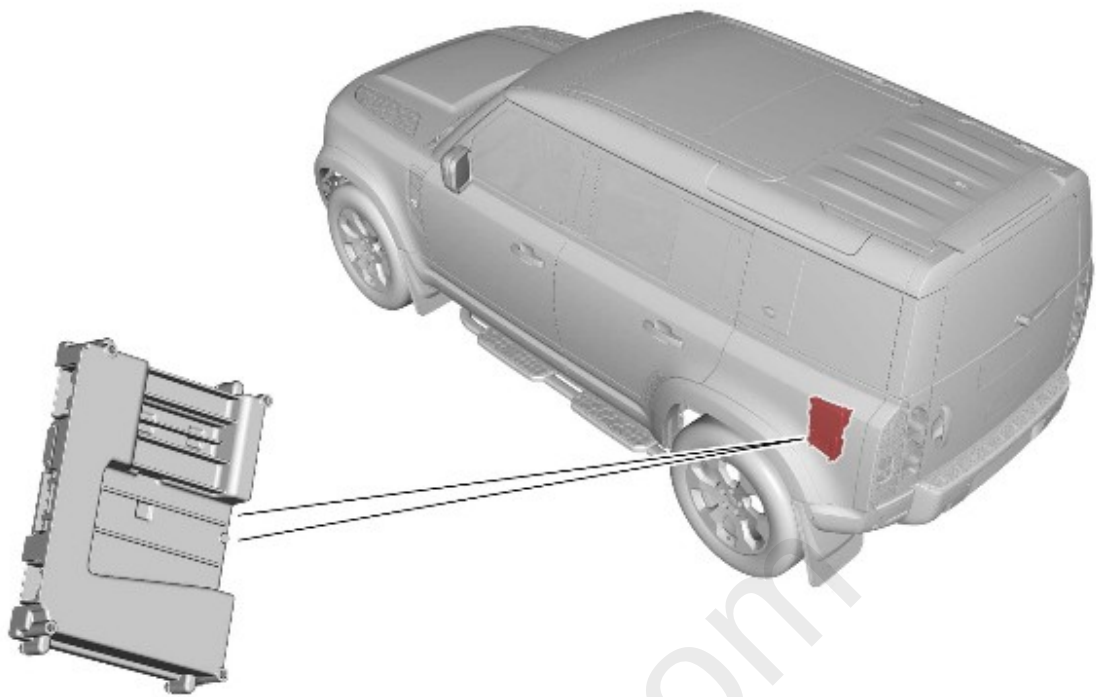
When the backup battery has been replaced, the system must be reset, setting the backup battery level back to 100%, using the JLR approved diagnostic equipment.

AUDIO AMPLIFIER CONTROL MODUL



NOTE:

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



E249003

The AAM is located behind the rear left trim panel in the loadspace compartment.

The AAM receives a power supply from BJB through a fuse in the rear junction box.

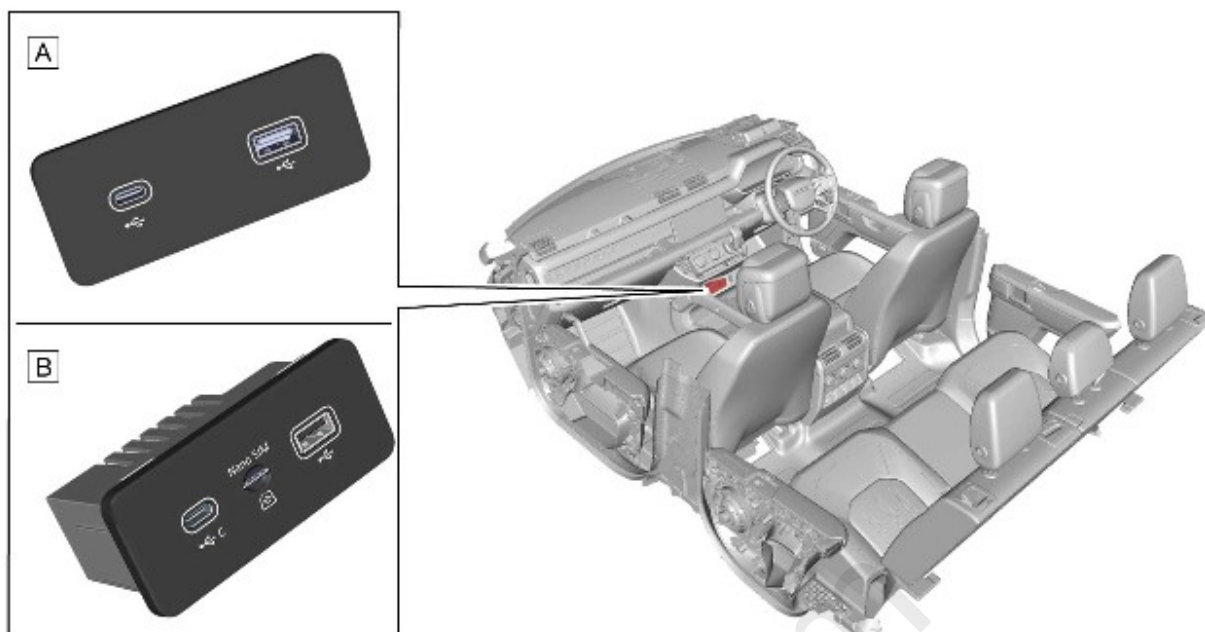
The AAM is connected to the TCU for transfer data to the mid-range speaker located in the instrument panel. The AAM processes the data received from the TCU and passes it to the mid-range speaker. The connection between the 2 modules is used during an eCall or bCall. The connection allows the driver to communicate with the TSP.

FRONT PORTABLE MEDIA INTERFACE PANEL



NOTES:

- RHD vehicle is shown, LHD vehicle is similar.
- Vehicle with 5 doors is shown. Vehicle with 3 doors is similar.
- Vehicle with nano SIM is described. The function of the embedded SIM is similar.
- When the SIM card has a Personal Identification Number (PIN), the PIN must be disabled before use in the vehicle.
- The embedded SIM cannot be removed from the device.



E249004

ITEM	DESCRIPTION
A	Front portable media interface panel - Vehicle with embedded SIM
B	Front portable media interface panel - Vehicle with nano SIM

The nano SIM card is located in the SIM card reader in the front portable media interface panel. The front portable media interface panel is located in the front console.

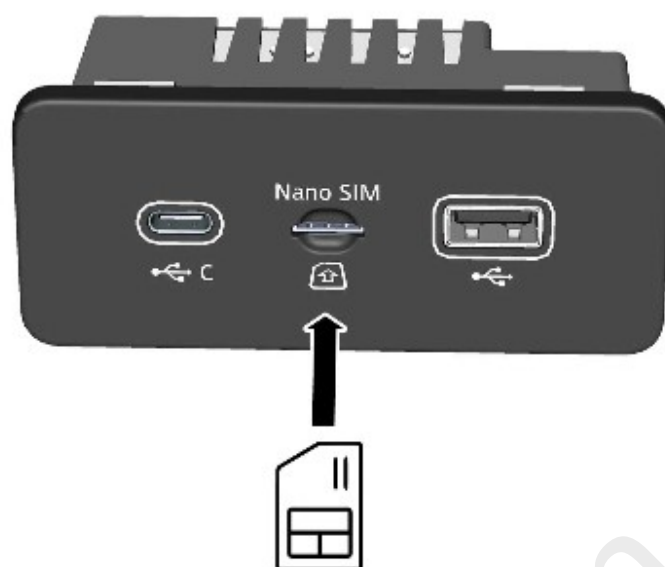
The SIM card is used to establish the InControl WiFi hotspot feature. The SIM card reader contains the SIM card which enables the system to vent to a network of personal choice.

The SIM card reader is connected directly to the IGM / ICCM through the Universal Serial Bus (USB). The SIM card reader is used to establish the InControl Pro Services feature.

To install a SIM card, insert the SIM card into the SIM card reader in the front portable media interface panel.

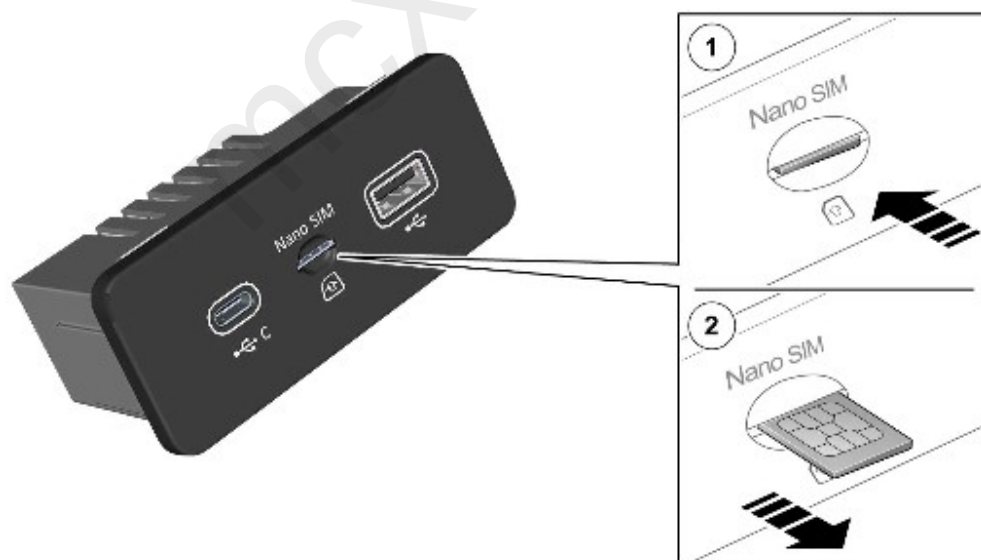
The SIM card must be inserted with the contacts facing up and the shortest end facing outwards. The graphic on the portable media interface panel shows the correct orientation. The SIM card should not be protruding when correctly inserted. Make sure that the SIM card is located correctly in the SIM card reader. Failure to do so may damage the SIM card or SIM card reader. To remove the SIM card, gently push in and release.

Nano SIM Card Insertion



E249005

Nano SIM Card Removal

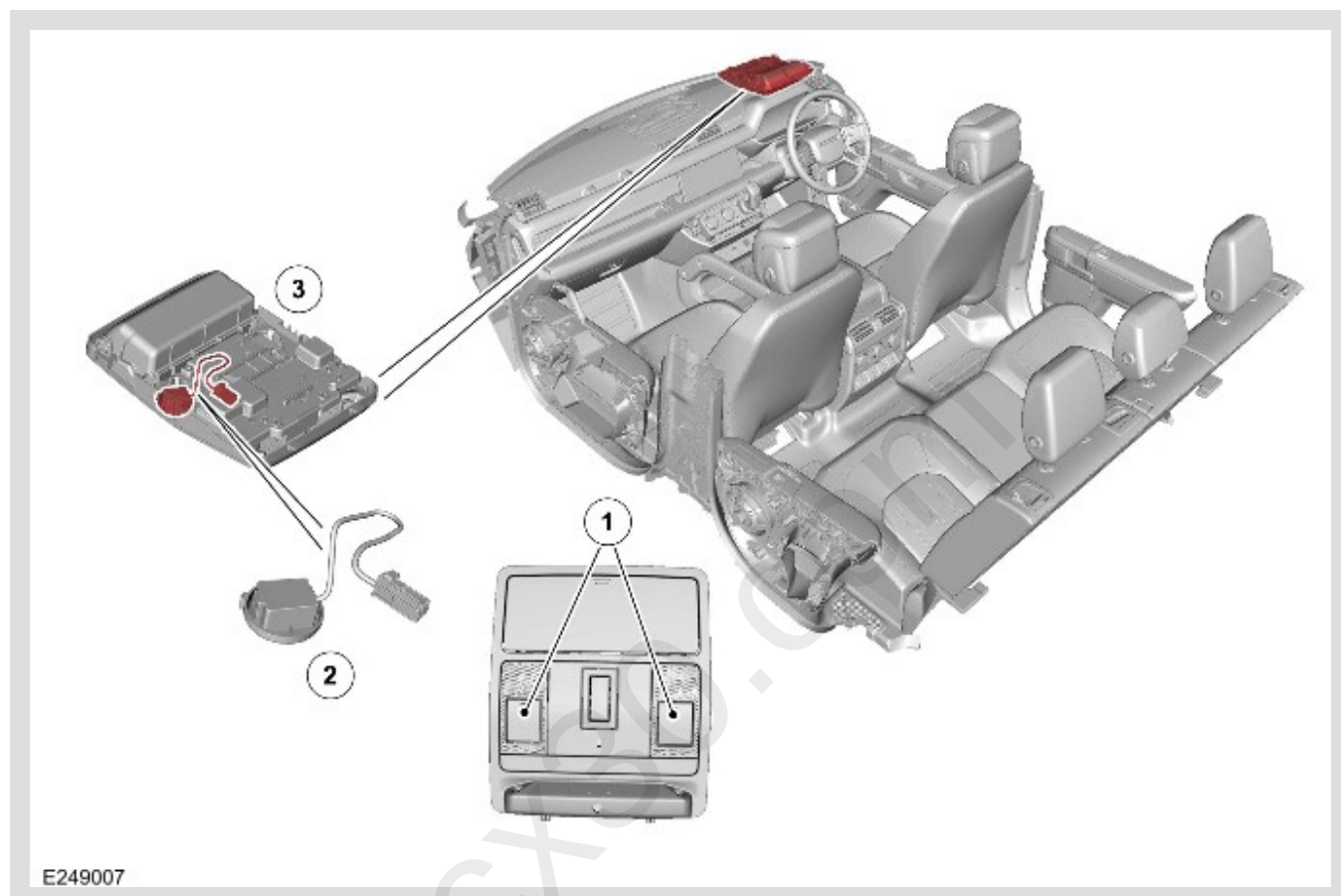


E249006

FRONT OVERHEAD CONSOLE

NOTES:

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



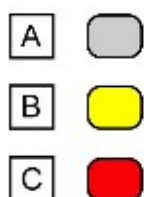
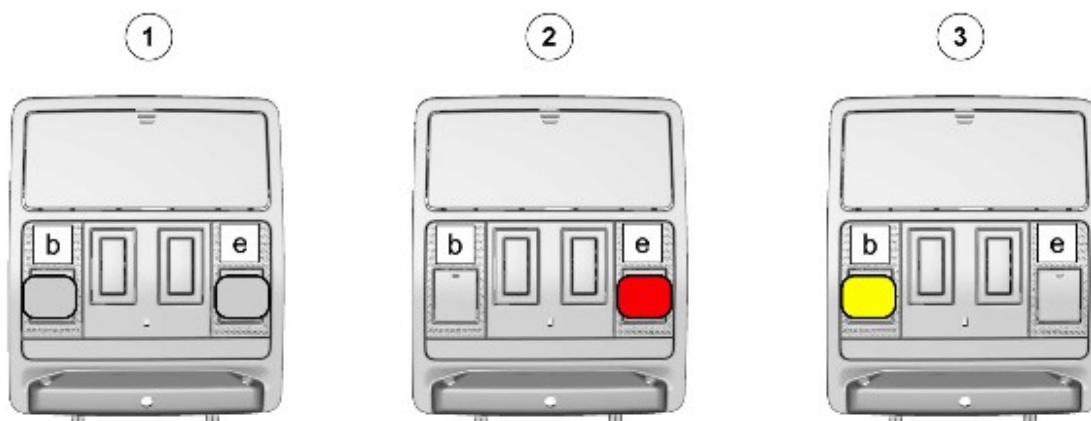
ITEM	DESCRIPTION
1	eCall/bCall switches
2	Microphone - Telematics
3	Front overhead console

The front overhead console contains the eCall switch, bCall switch and the microphone. The functions of the eCall switch and bCall switch are controlled by the TCU.

Microphone

The microphone is connected directly to the TCU. The TCU uses this connection during an eCall or bCall, enabling the driver to verbally communicate with the TSP.

The eCall and bCall Switch



E258945

ITEM	DESCRIPTION
A	Light Emitting Diode (LED) indicator OFF
B	bCall - LED indicator illuminated - Yellow color
C	eCall - LED indicator illuminated - Red color
b	bCall switch
e	eCall switch
1	State 1
2	State 2
3	State 3

The LED indicators, integrated into the eCall and bCall switches, provide switch illumination. The LEDs also indicate the status of the call operation. The LED indicator sequences of the eCall and bCall switches can identify the current activation status of the system.

NOTE:

For China only, after a PDI the eCall switch is not illuminated until activation is completed.

The LED indicator sequences denote the activation status:

State 1

- The CAN bus is awake or in Power Mode 7 (engine running).
- Neither of the LED lamps are illuminated.

State 2

- The CAN bus is awake or in Power Mode 7 (engine running).
- The eCall switch is illuminated (red).
- The bCall switch is not illuminated.

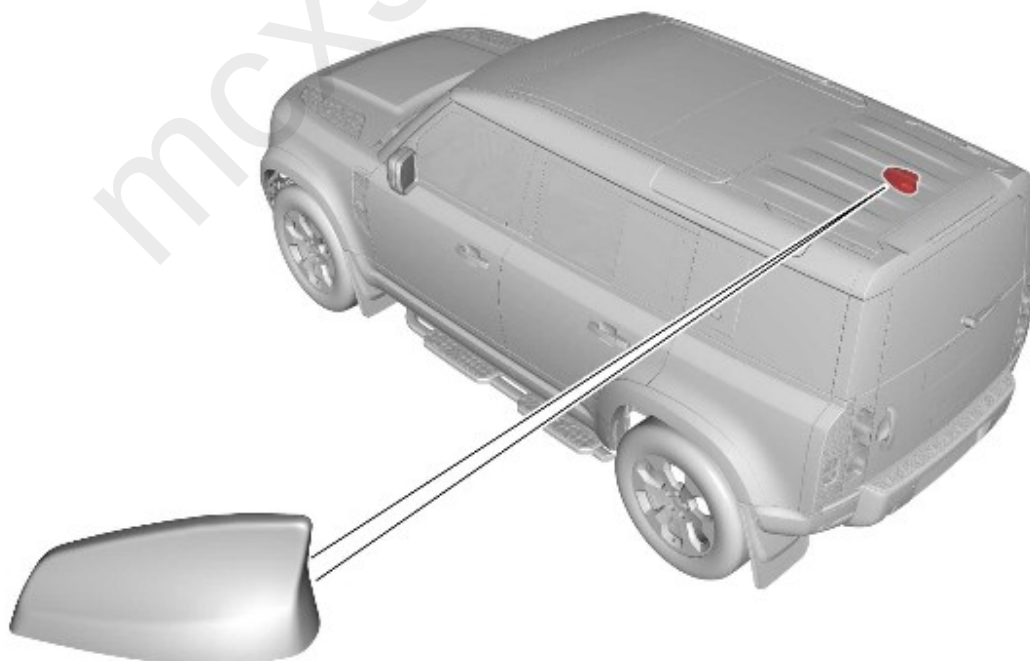
State 3

- The CAN bus is awake or in Power Mode 7 (engine running).
- The bCall switch is illuminated (yellow).
- The eCall switch is not illuminated.

ROOF POD

NOTE:

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



E249008

The roof pod is located towards the rear of the roof panel.

The roof pod on vehicles with the telematics system contains antennas for the reception of:

- The GNSS signals
- The GSM signals
- The external WiFi signals (if equipped).

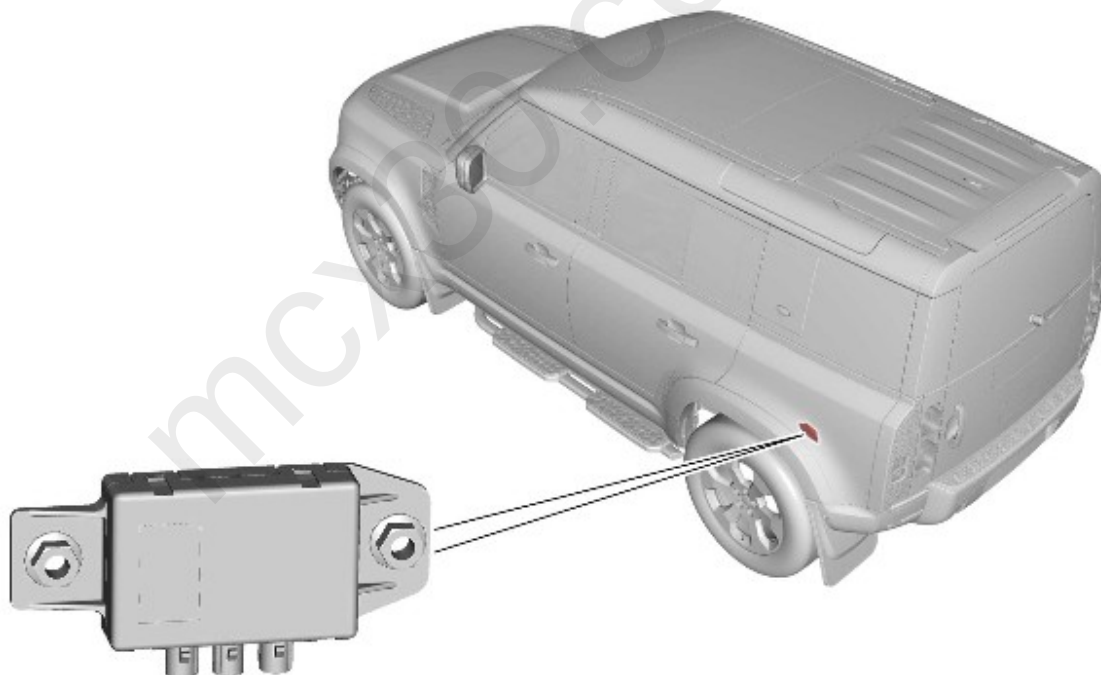
Depending on vehicle specifications, the roof pod can also contain an antenna for Satellite Digital Audio Radio Service (SDARS).

For additional information, refer to: [Antenna](#) (415-01 Information and Entertainment System, Description and Operation).

GLOBAL NAVIGATION SATELLITE SYSTEM SIGNAL SPLITTER

NOTE:

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



E249009

The GNSS signal splitter is located behind the left trim panel in the loadspace compartment. The GNSS signal splitter attaches to 2 studs on the left inner quarter panel with 2 nuts.

The GNSS signal splitter shares the GNSS signal from the roof pod antenna with:

- The TCU

- The IGM / ICCM.

For additional information, refer to: [Antenna](#) (415-01 Information and Entertainment System, Description and Operation).

BLUETOOTH®/WIFI ANTENNA

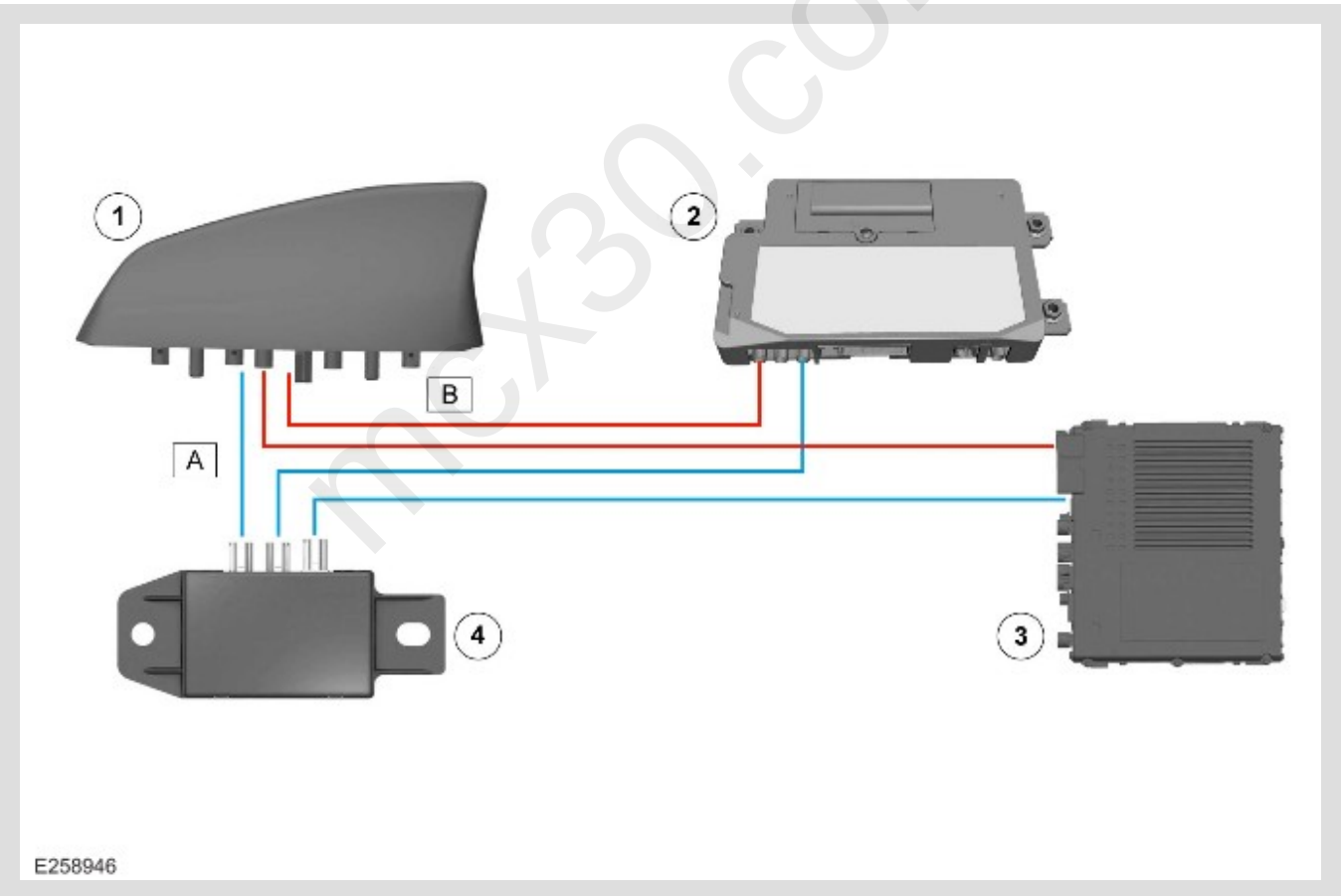
For further information on the Bluetooth®/WiFi antenna.

For additional information, refer to: [Antenna](#) (415-01 Information and Entertainment System, Description and Operation).

OPERATION

ANTENNA SIGNALS

The TCU receives the GSM and GNSS signals. Signal reception is through the roof pod which contains the GSM and GNSS antennas.



ITEM	DESCRIPTION
A	GNSS signal
B	GSM signal

ITEM	DESCRIPTION
1	Roof pod - GNSS/GSM antenna
2	TCU
3	IGM / ICCM
4	GNSS signal splitter

The signal from the GNSS antenna is passed to the GNSS signal splitter by a co-axial cable. The GNSS signal from the GNSS signal splitter is sent to:

- The TCU for telematics system use.
- The IGM / ICCM for navigation use.

The roof pod has 2 GSM antennas. An antenna is connected with the TCU, and the other is connected with the IGM / ICCM.

The GSM signal, provided by the network operator, enables the TCU to communicate with the TSP. The TSP provides secure mobile data connection and ordinarates the sending and receiving of vehicle data and control commands.

The InControl system provides 2 main services:

- Telematics
- Connectivity.

Telematics services include:

- The eCall
- The bCall
- The InControl remote smartphone application
- The Secure Tracker.

The InControl system includes the following connectivity services:

- Pro Services
- WiFi hotspot.

Several TSPs are integral to the InControl system. In each market emergency response, roadside assistance and Secure Track suppliers are integrated with InControl to provide the appropriate services.

The InControl remote mobile phone application and website are available to provide an intuitive and secure interface for InControl users. An administration website is available for retailers to set up and manage customer accounts with the 'InControl Admin Website'.

The TCU receives the following inputs:

- Hardwired and the CAN crash signal from the RCM - Automatic eCall activation.
- Hardwired eCall and bCall switch activation signals.
- Hardwired audio speaker signal from the AAM.
- The GSM and the GNSS signals from the roof pod.

The TCU communicates with the other vehicle systems through the BCM/ GWM. The BCM/ GWM provides the connection to the other vehicle systems to enable remote vehicle feature functions.

TELEMATICS SYSTEM MESSAGES

When there is any fault with the telematics system, the following messages are displayed on the IPC:

- **'SOS System Limited'** displayed when a call is possible but with limited service. For example, when there is any fault with the microphone or the speaker (Diagnostic Trouble Code(s) (DTC) present). The TCU battery may be depleted but the call can be placed and vehicle data transmitted.
- **'SOS System Not Available'** displayed when TCU is unable to attempt a call. For example, when no network available or TCU has no CAN network connectivity.

A DTC is set in the TCU in the event of 'SOS System Limited' warning.

SOS System Limited

This message is driven by DTC, relating to hardware issues:

- External GSM antenna connection failure.
- External GNSS antenna connection failure.
- The eCall switch connection failure.
- Hardwired connection failure with the RCM.
- The microphone connection failure.
- The GNSS receiver failure, internal failure.
- Speaker connection failure.
- The TCU backup battery depleted.

SOS System Not Available

The message is driven by 4 possible scenarios:

- The TCU is disconnected or unresponsive.
- Failed eCall due to no network coverage.

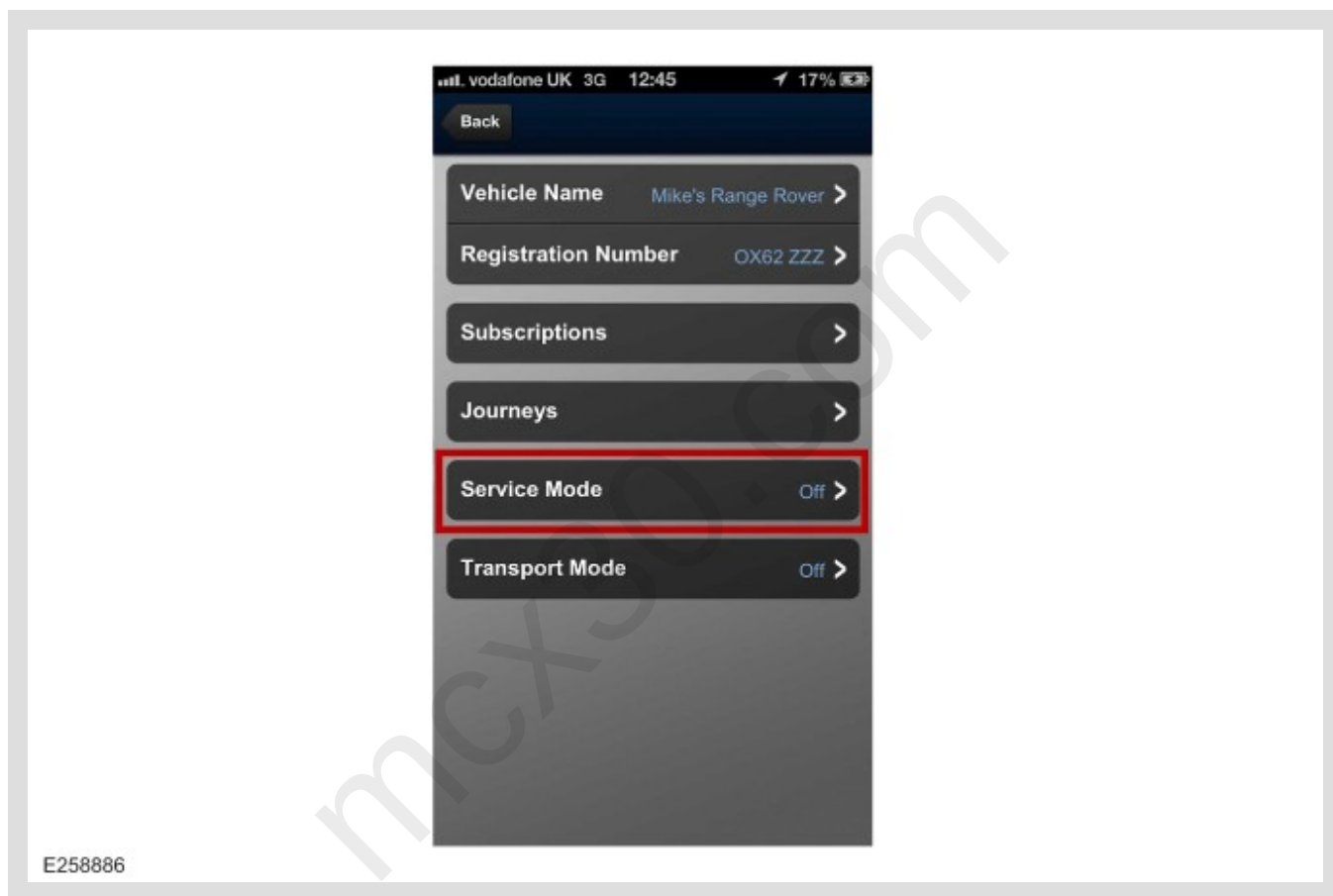
- Failed eCall due to no eCall number provided.
- Modem failure.

SERVICE MODE

NOTE:

The service mode is only on vehicles with Secure Tracker feature.

Before disconnecting power to the TCU, the vehicle owner must place the TCU into '**Service Mode**'. This must be done for example, before disconnecting the startup battery to do maintenance repairs.



When the disconnection procedure is not performed, the system sends a theft alert to the following:

- The user through the InControl remote smartphone application.
- The TSP.

Then the system enters 'Theft Notification' or 'Stolen Vehicle Tracking' mode during which time the charge in the TCU battery is used. The emergency services may be falsely alerted that the vehicle has been stolen.

For security purposes 'Service Mode' is the sole responsibility of the vehicle owner. This is because it requires a PIN code that has been defined by the customer.

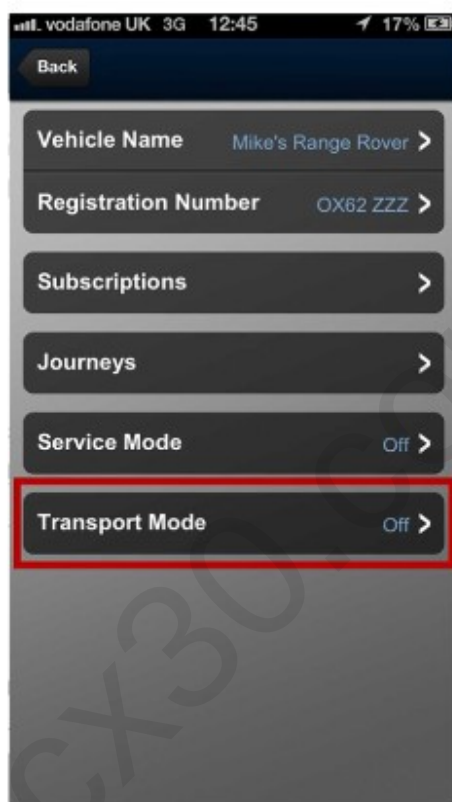
When the startup battery is disconnected for a period of time, the vehicle owner can define the time it is to be disconnected for. When the time is exceeded, the vehicle owner must re-activate the 'Service Mode'. To re-activate the 'Service Mode' the vehicle owner is required to use 'InControl Remote' smartphone application.

TRANSPORT MODE



NOTE:

Only on vehicles with Secure Tracker feature.



E258887

The TCU contains a motion sensor which is used for vehicle movement detection as part of the stolen vehicle tracking system. Prior to transporting the vehicle, for example, a ferry journey, the vehicle owner must place the TCU into **'Transport Mode'** to disable the motion sensor. This is because on a ferry, the GPS location of the vehicle moves, but the wheels do not turn.

The 'Theft Notification' function is activated when vehicle movement is detected when:

- The motion sensor is not disabled.
- In Power Mode 4 (accessory (vehicle unlocked and smart key present)).
- In Power Mode 0 (vehicle locked and armed).

As with 'Service Mode', 'Transport Mode' is the sole responsibility of the vehicle owner for security reasons.

The motion sensor is capable of detecting slow movement, for example, jacking the vehicle to remove a road wheel, or winching onto a transporter.

Triggering of the sensor does not immediately generate a 'Theft Notification', but it activates the GNSS receiver. The sensor measures the vehicle movement. When the vehicle moves more than a predefined distance (approximately 200 meters (0.12 miles)) the TCU sends a theft alert to the TSP.

The TSP contacts the vehicle owner to determine if a genuine theft has taken place. When a vehicle theft is confirmed, the TSP initiates full GNSS tracking of the vehicle.

'Transport Mode' disables the movement assessment by the GNSS that follows a motion detection, therefore no 'Theft Notification' is sent to the service provider. Should transporting the vehicle exceed the time defined by the vehicle owner, it is the responsibility of the vehicle owner to reset 'Transport Mode'. The reset avoid a false theft notification being generated.

When in Power Mode 0 (vehicle locked and armed) and the vehicle network buses are 'asleep', the TCU is still active. The TCU enables movement detection to identify if there is an illegal attempt to move the vehicle. The TCU has a permanent battery feed to enable this function. The drain on the startup battery is minimal and the vehicle remains well within its quiescent drain target.

There is an internal antenna in the TCU when the GSM antenna is disconnected or fails. The internal antenna is used as a backup GSM antenna. The backup GSM antenna is used to re-establish communication with the TSP.

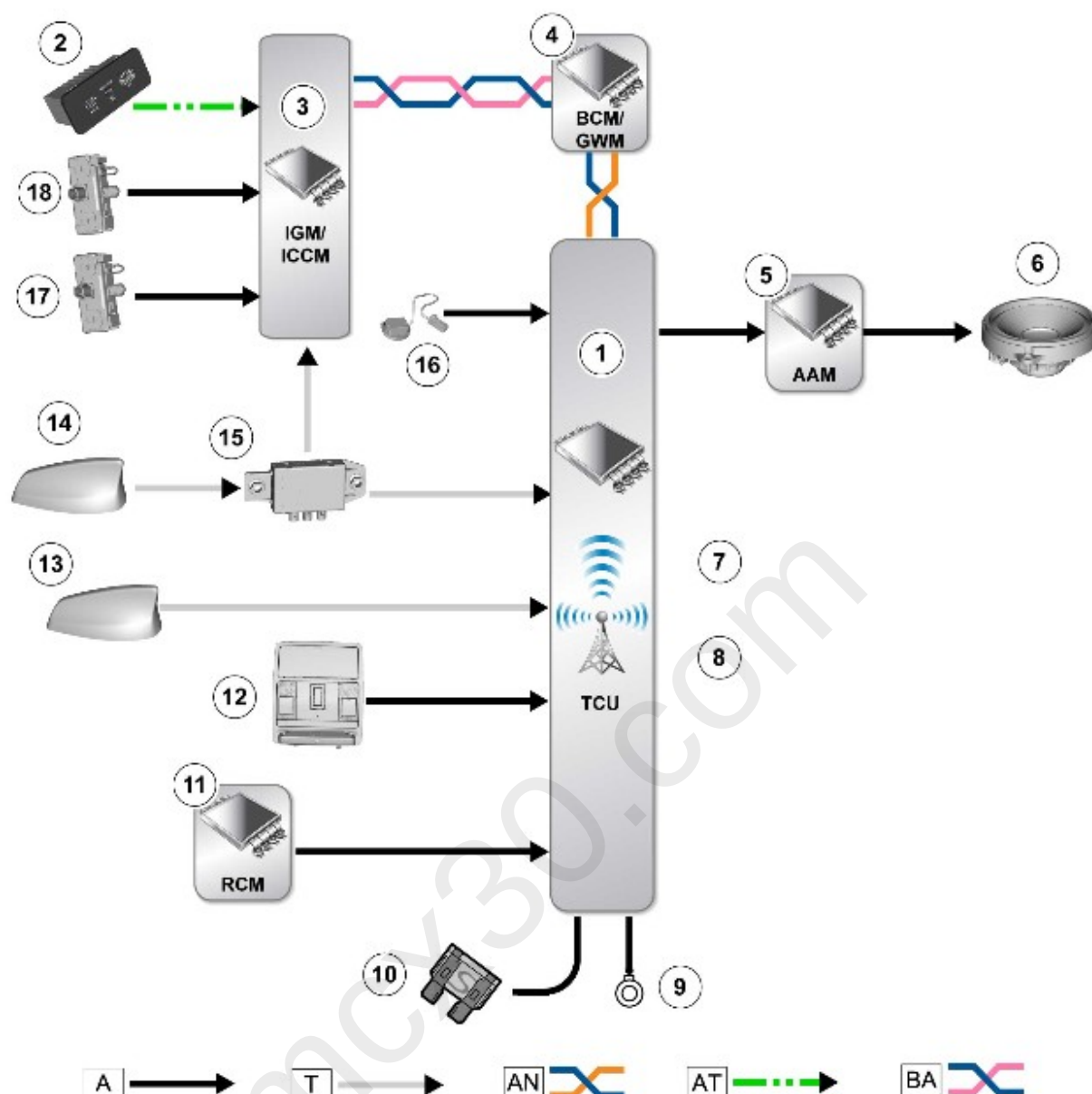
CONTROL DIAGRAM

CONTROL DIAGRAM - 1 OF 1



NOTES:

- Vehicle with 5 doors is shown. Vehicle with 3 doors is similar.
- Vehicle with 5 doors uses the HS CAN powertrain systems bus. Vehicle with 3 doors uses the HS CAN isolated systems bus.



E249010

A = HARDWIRED: T = CO-AXIAL: AN = HS CAN POERETRAIN SYSTEMS BUS: AT = UNIVERSAL SERIAL BUS (USB): BA = HS CAN HUMAN MACHINE INTERFACE (HMI) SYSTEMS BUS.

ITEM	DESCRIPTION
1	TCU
2	Front portable media interface panel
3	IGM / ICCM
4	BCM/ GWM
5	AAM
6	Mid-range speaker - Instrument panel

ITEM	DESCRIPTION
7	WiFi signal - TCU internal antenna
8	Global System for Mobile communications (GSM) back-up signal - TCU internal antenna
9	Ground
10	Supply
11	RCM
12	bCall and eCall switches signal
13	Roof pod (GSM antenna)
14	Roof pod (GNSS antenna)
15	GNSS signal splitter
16	Microphone - Front overhead console
17	Bluetooth®/WiFi antenna
18	Bluetooth®/WiFi antenna

cmIjaGFyZG1vbnRvbjsyMDIwLTA5LTE4VDEwOjA0OjUyLjc5M1o7OTIuNDAuMTg5LjUzOw==