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ANTI-THEFT - PASSIVE (G1255025)

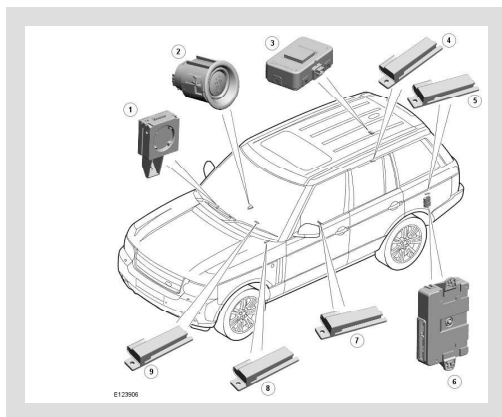
DESCRIPTION AND OPERATION

COMPONENT LOCATIONS



NOTE:

RHD installation shown, LHD installation similar



ITEM	DESCRIPTION
1	Immobilizer Antenna Unit (IAU)
2	Stop/Start switch
3	Radio Frequency (RF) receiver
4	Interior Antenna right-hand (RH) luggage compartment
5	Interior Antenna left-hand (LH) luggage compartment
6	Keyless Vehicle Module (KVM)
7	Interior antenna - rear compartment
8	Interior antenna - front compartment
9	Interior antenna - front compartment

OVERVIEW

The passive anti-theft system provides a secure interface between the central junction box (CJB) and the engine control module (ECM), to prevent unauthorized starting of the vehicle. Unauthorized starting prevention is achieved by immobilization of the engine crank system and the fuel system.

The passive anti-theft system is a function of the 'Passive Start' system. The system uses the following components:

- Smart key
- Low Frequency (LF) antennas (5 off)
- Radio Frequency (RF) receiver
- Keyless Vehicle Module (KVM)
- Immobilizer Antenna Unit (IAU)
- CJB
- ECM.

The system is automatic and requires no input from the driver other than to press the brake pedal and the start/stop button. The engine management system will only allow engine crank and fuelling when an authorization data message is received from the CJB.

Engine starting is prevented by inhibiting the fuel, engine (spark, injectors and crank) and ignition systems from operating. This is achieved by using a uniquely coded Smart Key and an encoded data exchange between multiple control modules.

The engine start system is initiated when the encoded data between the Smart Key and KVM and CJB and ECM is verified. The engine can then be started when the drive selector is in the 'Park' position, and the start/stop button and the brake pedal are pressed simultaneously.

SYSTEM OPERATION

PASSIVE START SYSTEM

At the request of the CJB, the KVM prompts each of the LF antennas to output a signal. When the Smart Key is in the vehicle cabin, it detects the LF signals and responds with a RF data-identification signal back to the KVM via the RF receiver.

If the data received matches that stored in the KVM it continues the passive start process by communicating a 'Smart Key valid' signal to the CJB via the medium speed controller area network (CAN) bus.

Once the CJB receives the authorization and confirms the response with an internal calculation, it passes coded data to the ECM on the high speed CAN bus. Upon confirmation from the ECM the ignition is enabled.

Before the CJB sends a mobilization signal to the ECM it will exchange encrypted data with the electric steering lock and the instrument cluster to authorize unlocking of the steering column. The instrument cluster only provides a ground for the steering lock motor.

The CJB will enable the fuel pump relay which, on diesel vehicles operates the fuel pump and on gasoline vehicles sends a battery voltage supply to the fuel pump driver module (FPDM) to operate the fuel pump in conjunction with the ECM.

If the transmission selector is in the park position and the driver presses the brake pedal and simultaneously presses the start/stop button, the CJB interprets this as an engine crank request. Before the engine crank request is allowed, the CJB compares a brake pressure signal received from the anti-lock brake system (ABS) module. If the signal is greater than the stored threshold value, a crank request signal is sent to the ECM on the high speed CAN bus.



NOTE:

If the KVM fails to locate the Smart Key, a message 'SMART KEY NOT FOUND REFER TO HANDBOOK' will appear in the instrument cluster message center and the keyless start back-up process will have to be used to mobilize and start the vehicle.

KEYLESS START BACK-UP

If the vehicle has been unlocked using the emergency key blade or the Smart Key is not detected by the vehicle, it will be necessary to use the keyless start back-up system to disarm the alarm and start the engine. The following process must be followed in this event:

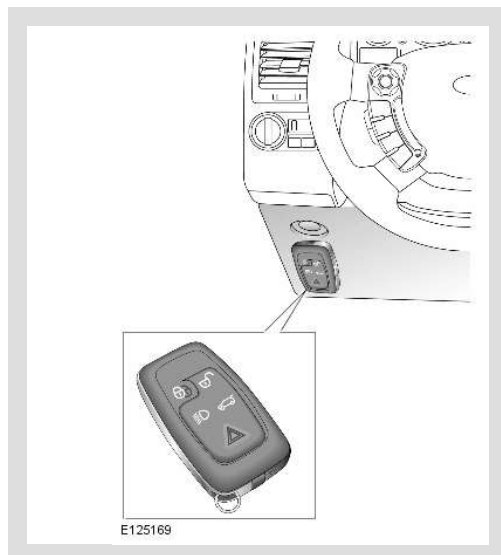
- Position the Smart Key against the underside of the instrument panel, on the outboard side of the steering column, with the buttons facing downwards. This is the location of the IAU.
- Holding the Smart Key in position and with the brake pedal depressed, press the start/stop button to start the engine.

Position of Smart Key on instrument panel.



NOTE:

left-hand drive (LHD) shown right-hand drive (RHD) similar.



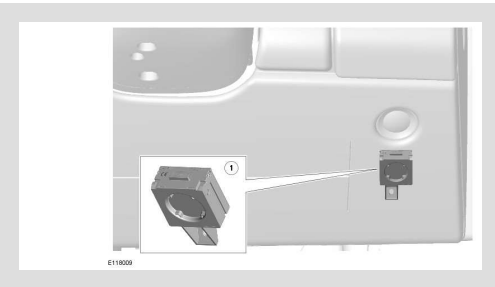
This process bypasses the data exchange between the KVM and the CJB. A transponder within the Smart Key is detected by the IAU. The IAU confirms the code output from the transponder and communicates this code confirmation with the CJB via a local interconnect network (LIN) bus connection. The CJB then initiates the vehicle start process in the normal manner.

COMPONENT DESCRIPTION

IMMOBILIZER ANTENNA UNIT (IAU)

NOTE:

RHD shown LHD similar.

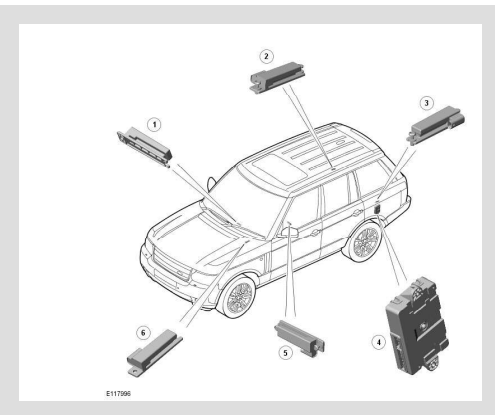


ITEM	DESCRIPTION
1	IAU

The IAU is located on the underside of the instrument panel, outboard of the steering column, below the footwell lamp. The IAU cannot be seen as it is located behind the trim panel. The IAU is used if the KVM is unable to authorize the Smart Key. The driver will be alerted to this by a chime and a message in the instrument cluster message center 'SMART KEY NOT FOUND REFER TO HANDBOOK'.

If the KVM is unable to identify the Smart Key, for example if the Smart Key battery voltage is low or there is local RF interference, the transponder within the Smart Key can be read by holding the smart key against then instrument panel in the position shown in the illustration.

LOW FREQUENCY (LF) ANTENNAS



ITEM	DESCRIPTION
1	Interior antenna - front compartment
2	Interior antenna RH - luggage compartment
3	Interior antenna LH - luggage compartment
4	Keyless Vehicle Module (KVM)
5	Interior antenna - rear compartment
6	Interior antenna - front compartment

Five Low Frequency (LF) antennas for the passive start system are positioned in specific locations within the vehicle.

The KVM transmits an LF signal via the antennas which is received by the Smart Key. The Smart Key then responds by transmitting a RF signal which is received by the RF receiver and passed to the KVM for authorization.

KEYLESS VEHICLE MODULE (KVM)

The KVM is located in the LH side of the luggage compartment, behind the trim panel and receives a power supply from the CJB. A serial communication line from the KVM to the RF receiver (which is located behind the headlining, rearward of the sunroof), transmits coded data from the Smart Key to the KVM for vehicle locking and unlocking using the Smart Key buttons.

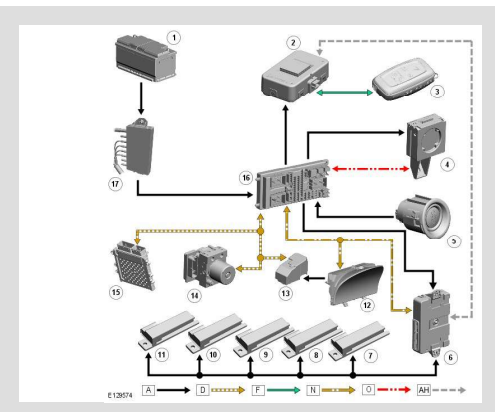
The KVM controls LF signal transmissions to and from the Smart Key and provides authorization to allow the vehicle to be started. The module has a medium speed CAN bus connection to the CJB for authorizing vehicle starting.

CONTROL DIAGRAM



NOTE:

A = Hardwired; **D** = High speed CAN bus; **F** = RF transmission; **N** = Medium speed CAN bus; **O** = LIN bus;
AH = Serial communication line



ITEM	DESCRIPTION
1	Battery
2	RF receiver
3	Smart Key
4	IAU
5	Stop/Start switch
6	KVM
7	Interior antenna
8	Interior antenna
9	Interior antenna
10	Interior antenna
11	Interior antenna
12	Instrument cluster
13	Electric steering column lock
14	ABS module
15	ECM
16	CJB
17	battery junction box (BJB)