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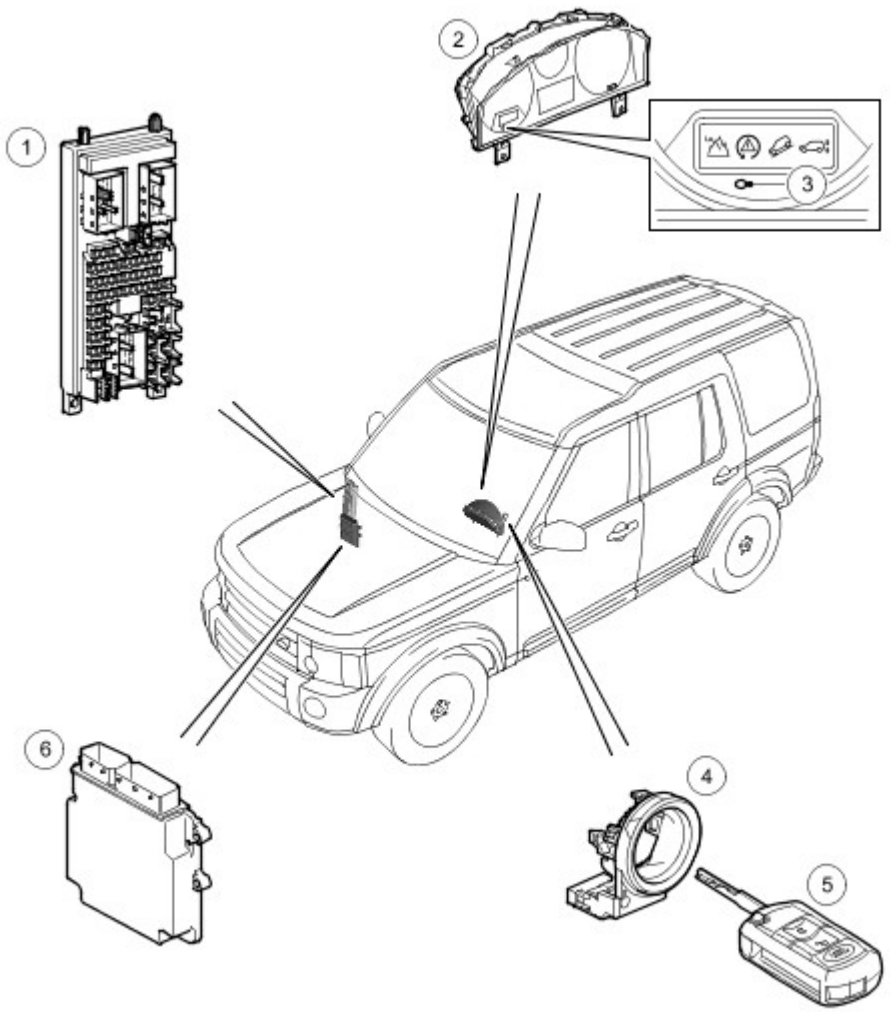
Anti-Theft - Passive

COMPONENT LOCATIONS

NOTE :

LHD installation shown, RHD installation similar



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Item	Part Number	Description
1	-	Central Junction Box (CJB)
2	-	Instrument cluster
3	-	Alarm indicator
4	-	Transponder coil
5	-	Ignition key with transponder
6	-	Engine Control Module (ECM)

GENERAL

The engine immobilization system provides a secure interface, between the ignition key and the Engine Control Module

(ECM), to prevents unauthorized starting of the vehicle. The same engine immobilization system is installed for all engine variants. Each system consists of the following:

- A transponder in the head of each ignition key.
- A transponder coil around the ignition switch.
- An immobilization control system in the Central Junction Box (CJB).

The engine immobilization system also uses:

- The alarm indicator, to show the engine immobilization status.
- The instrument cluster, as a gateway for communications with the ECM.

Operation of the engine immobilization system is automatic and requires no input from the driver. The engine management system will only crank and run the engine when a valid key is in the ignition switch.

When it senses a key in the ignition switch the CJB energizes the transponder coil, which activates the transponder. The transponder transmits identification and rolling code data to the CJB. The CJB checks the data from the transponder against stored data to validate the key. When the ignition switch is turned to position II (ignition), the ECM sends a start authorization request to the CJB. If the key is valid the CJB grants the request and the ECM will subsequently crank and run the engine. If the key is invalid, the CJB refuses the request and the ECM will not crank the engine.

TRANSPONDER

The transponder is an integral part of the Printed Circuit Board (PCB) located within the head of the ignition key. For additional information, refer to Handles, Locks, Latches and Entry Systems (501-14 Handles, Locks, Latches and Entry Systems)

The transponder is powered by a rechargeable battery and is contained within the processor on the PCB, which also controls the remote operation of the Central Locking System (CLS). A separate coil on the PCB is used by the transponder to receive the signals from the transponder coil on the ignition switch. The coil is also used to generate the current required to recharge the battery.

The transponder has a 256 byte Electronic Erasable Programmable Read Only Memory (EEPROM), which is programmed with vehicle identification data and a unique identification code. This information is stored in one of 30 key 'slots' within the CJB. When energized, the transponder emits the coded information which is received by the CJB. The CJB checks that the key is valid by confirming the received data before granting permission to start the engine. The information programmed into the transponder cannot be overwritten. If a key is lost or is no longer required, T4 can be used to disable the key to prevent it being used on the vehicle.

TRANSPONDER COIL

The transponder coil is located in a plastic housing which surrounds the ignition switch barrel. The transponder coil is connected via two wires to the CJB. The CJB emits electrical energy to the transponder coil which transmits data at a frequency of 125 kHz. This electrical energy excites the transponder in the ignition key when it is within 20 mm (0.78 in) of the transponder coil.

CJB

The CJB is the main component in the immobilization system. The CJB contains a processor and software which controls the immobilization system. The CJB is connected to the medium speed Controller Area Network (CAN) bus, which it uses to communicate with the ECM via the instrument cluster and the high speed CAN bus.

When the ignition key is placed in the ignition switch key barrel, the immobilization system wakes up. The transponder coil is activated causing the transponder to transmit its coded data. The CJB validates the data and transmits another request for the data. When this is received for a second time, the CJB confirms the key as valid.

Replacement CJB's are not stock items and can only be installed on the vehicle for which they were ordered. After replacement of a CJB:

- Car configuration information from the instrument cluster is automatically transferred to the new CJB.
- T4 must be used to ensure that only those ignition keys currently in use with the vehicle are enabled in the CJB.

ALARM INDICATOR

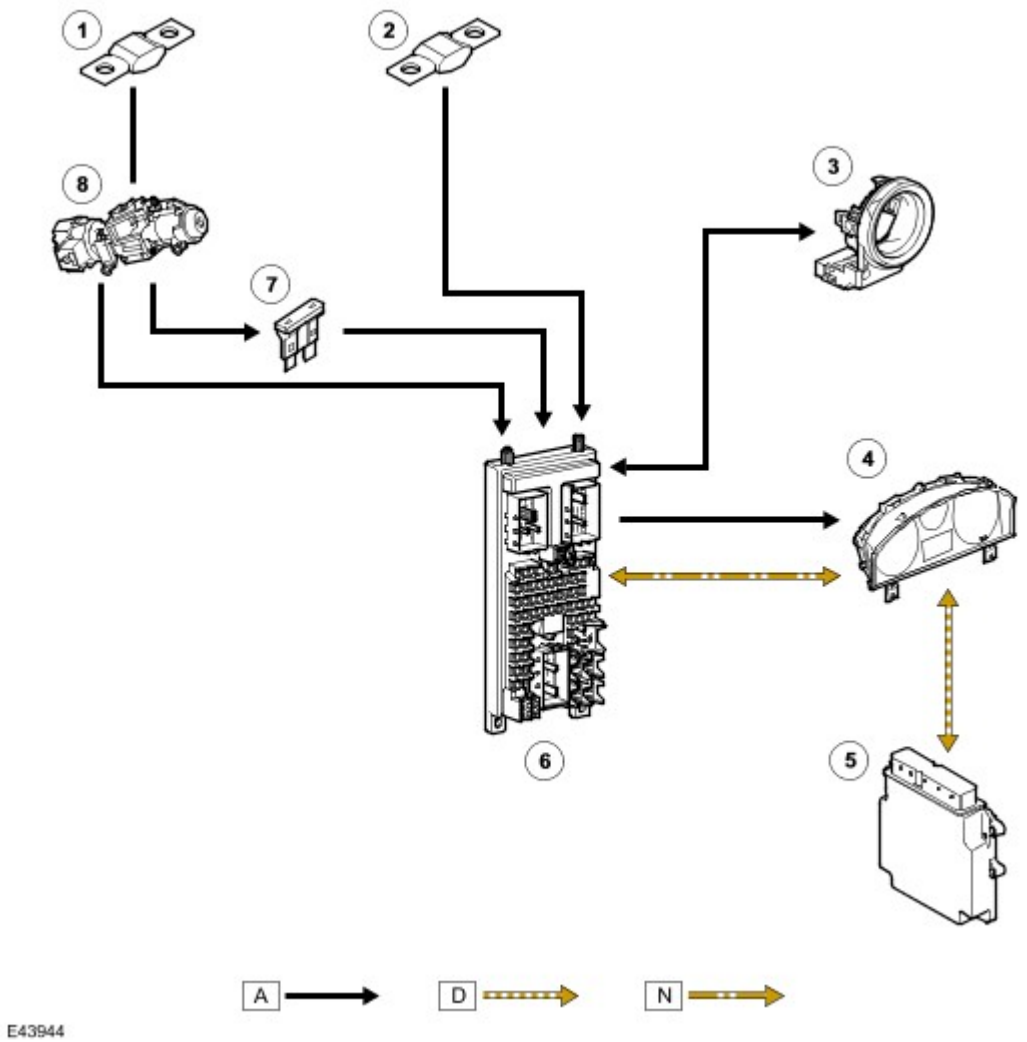
The alarm indicator is located in the instrument cluster, below the tachometer. The alarm indicator provides information about the status of the alarm and immobilization system. Operation of the alarm indicator is controlled by the CJB using a hardwired connection with the instrument cluster.

For immobilization system status, when the alarm system is disarmed and the vehicle is immobilized (key out of ignition switch), the alarm indicator flashes once every 2 seconds. When the alarm system is disarmed and the vehicle is mobilized, the alarm indicator performs a 1 second confirmation flash (when the ECM confirms to the CJB that it is in the mobilized state) and then remains off.

CONTROL DIAGRAM

NOTE :

A= Hardwired connection; D = High speed CAN bus; N = Medium speed CAN bus



Item	Part Number	Description
1	-	Fusible link 11E, Battery Junction Box (BJB)
2	-	Fusible link 16E, BJB
3	-	Transponder coil
4	-	Instrument cluster (alarm indicator)

5	-	ECM
6	-	CJB
7	-	Fuse 40P, CJB (key in signal)
8	-	Ignition switch