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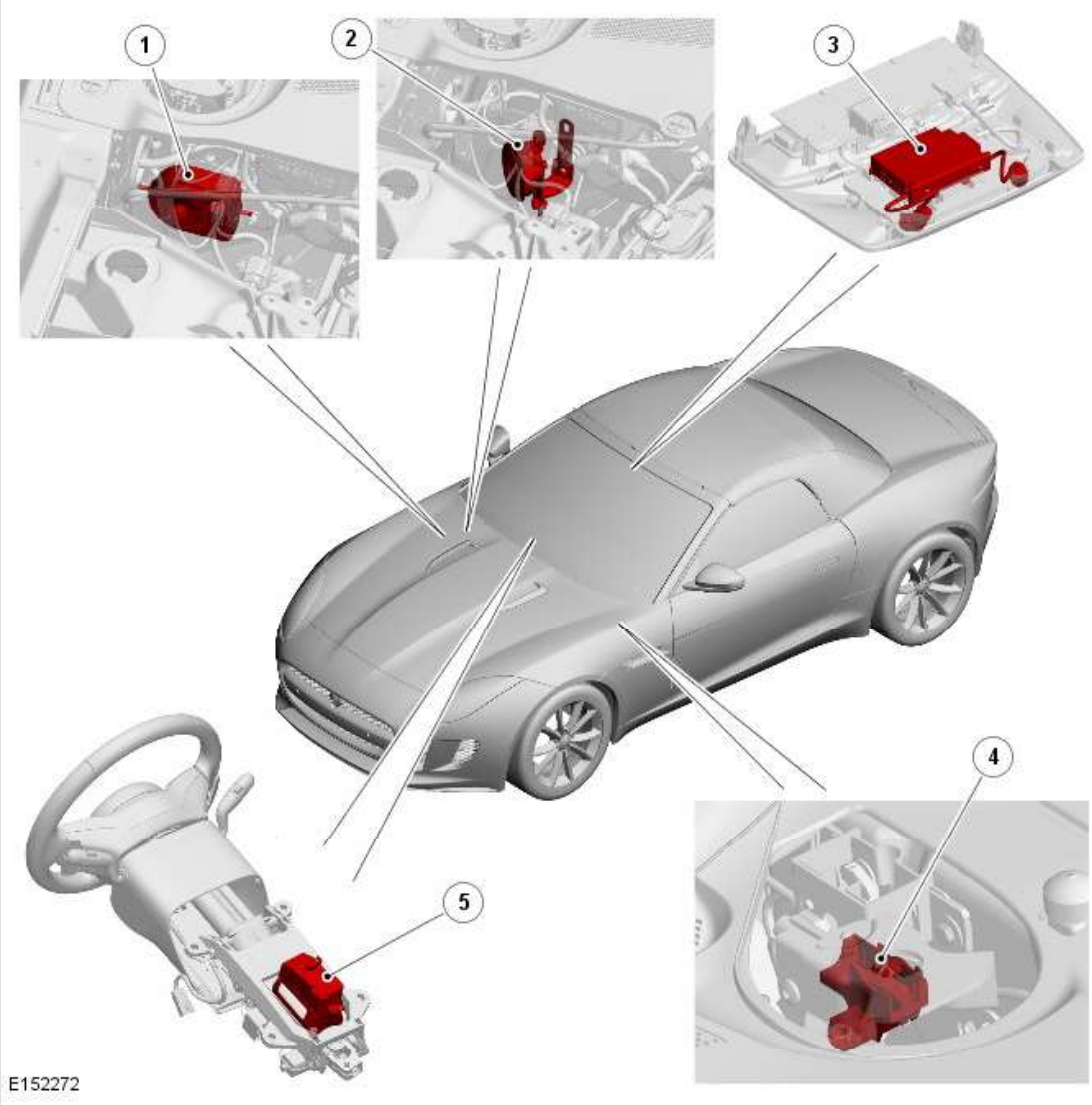
ANTI-THEFT - ACTIVE

COMPONENT LOCATION



ITEM	DESCRIPTION
1	Battery back-up sounder (where fitted)
2	Passive sounder (where fitted)
3	Volumetric sensor (where fitted)
4	Hood switch
5	Electric steering column lock (where fitted)

OVERVIEW

The active anti-theft system monitors the hinged panels for unauthorized opening. In some markets the system also incorporates:

- Monitoring of the vehicle interior and vehicle tilt sensing
- Control of the electric steering column lock (where fitted).

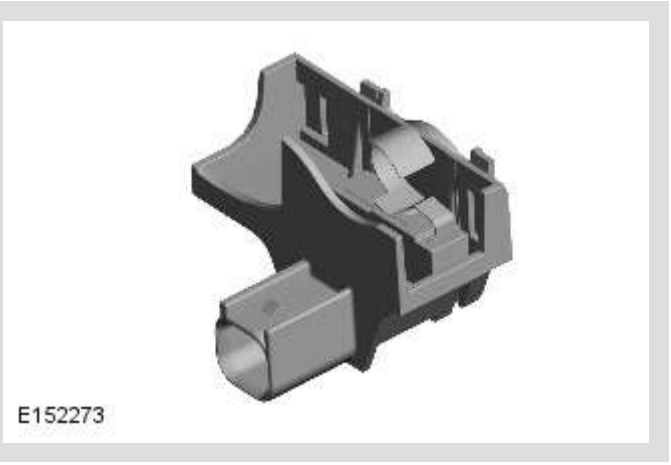
The CJB (central junction box) is the main controller of the system. The CJB monitors the hinged panels using inputs from the:

- Hood switch.
- Ajar switches in the door latches and the luggage compartment lid latch of the CDL (central door locking) system.
  For additional information, refer to: Handles, Locks, Latches and Entry Systems (501-14, Description and Operation).

A volumetric sensor is used to monitor the vehicle interior. To sound an alarm, the system incorporates either a BBUS (battery back-up sounder) or a passive sounder, depending on market. Where a BBUS is fitted, it also includes an inclination sensor, which is used to monitor for vehicle tilt sensing.

DESCRIPTION

HOOD SWITCH



The hood switch is attached to the underside of the left hood latch and operated by movement of the latch mechanism. When the latch opens, the switch closes and connects a ground to the CJB .

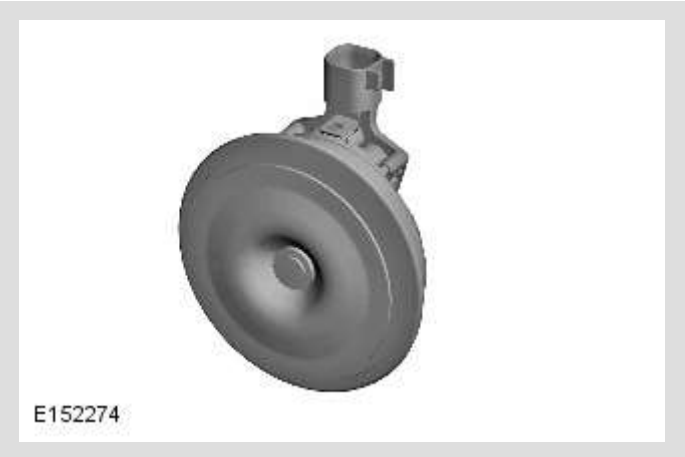
VOLUMETRIC SENSOR (WHERE FITTED)

The volumetric sensor comprises two sensors which allow the interior of the vehicle to be monitored. The module is located in a central position in the front overhead console.

The CJB provides a permanent power feed to the volumetric sensor and communicates with the sensor on a LIN (local interconnect network) bus connection.

The volumetric sensor is activated with the volumetric mode which in turn is enabled when the vehicle is double locked. The vehicle can be locked and alarmed with the module deactivated if a pet is to be left in the vehicle for example, by single locking the active anti-theft system.

PASSIVE SOUNDER (WHERE FITTED)



The passive sounder is located in the rear right corner of the engine compartment and attached to a bracket on the bulkhead panel. The passive sounder is connected directly to the CJB , which connects a power feed to the passive sounder when the alarm is triggered.

BATTERY BACK-UP SOUNDER (WHERE FITTED)

The BBUS is located in the rear right corner of the engine compartment and attached to a bracket on the bulkhead panel.

The BBUS also incorporates a tilt sensor. The CJB monitors the tilt sensor and can detect if the vehicle is being moved, towed or raised, and activate the alarm system.

Operation of the sounder is controlled by the CJB on a LIN bus. The BBUS is also connected to a permanent battery supply from the CJB . An integral, rechargeable battery powers the sounder in the BBUS if the battery power supply from the CJB is interrupted.

ELECTRIC STEERING COLUMN LOCK (WHERE FITTED)

The ESCL (electric steering column lock) is attached to the upper steering column. The lock engages with a locking sleeve on the shaft of the upper column to lock the steering. A tolerance ring is installed between the locking sleeve and the shaft. The tolerance ring allows the shaft to turn in the locking sleeve if a high torque is applied to the steering wheel when the lock is engaged. This prevents the locking bolt from being sheared by someone forcibly turning the steering wheel while the steering lock is engaged, while still effectively locking the steering.

The electric steering column lock is supplied with a power feed from the CJB . The instrument cluster provides a ground for the steering lock motor.

OPERATION

The CJB automatically arms and disarms the active anti-theft system when it operates the CDL system. The CJB also locks and unlocks the ESCL (where fitted) when it operates the CDL system.

On vehicles without a volumetric sensor, only the perimeter mode of operation is available to monitor the hinged panels. When perimeter mode is active, the CJB monitors the hinged panels using the hardwired inputs from the hood switch, and the ajar switches in the door and luggage compartment lid latches.

On vehicles fitted with a volumetric sensor, the system has two modes of operation; perimeter mode and volumetric mode. Volumetric mode monitors the vehicle interior for intrusion. If a BBUS is fitted, the volumetric mode also monitors vehicle attitude. When volumetric mode is active, the CJB monitors the vehicle interior and vehicle attitude using the LIN bus signals from the volumetric sensor and the tilt sensor in the BBUS.

ARMING

PERIMETER MODE

The active anti-theft system is armed in the perimeter mode when the vehicle is locked or double locked using the lock switch on the smart key or, on vehicles with the passive entry system, the lock /unlock switch on one of the exterior door handles.

Smart key switch selection is relayed to the CJB by the KVM (keyless vehicle module) on the medium speed CAN (controller area network) bus. Lock/Unlock switch selection on the exterior door handles is relayed to the CJB by the related door module, also on the medium speed CAN bus.
For additional information, refer to: Handles, Locks, Latches and Entry Systems (501-14, Description and Operation).

VOLUMETRIC MODE

Volumetric mode is activated by a second press of the lock switch on the smart key or, on vehicles with the passive entry system, the lock/unlock switch on one of the exterior door handles. The second press of the switch must occur within 3 seconds of the first press.

The CJB arms the active anti-theft system when it locks or double locks the vehicle providing the following conditions are met:

- The doors, luggage compartment lid and hood are closed
- The smart key is not sensed inside the vehicle
- The CJB is not in transit mode.

Smart key detection inside the vehicle is provided by the KVM, which supplies the information to the CJB on the medium speed CAN bus.
For additional information, refer to: Anti-Theft - Passive (419-01B, Description and Operation).

ARMING SEQUENCE

When the CJB arms the active anti-theft system, it first enables perimeter mode and monitors the status of the hinged panels. If the vehicle is double locked and the vehicle is fitted with a BBUS, an arming signal is sent from the CJB on the LIN bus to enable the sounder. If the vehicle is fitted with a volumetric sensor, the CJB then sends an arming signal on the LIN bus to the volumetric sensor and the BBUS tilt sensor. The CJB ignores the signals from the volumetric sensor for the first 30 seconds to allow time for the vehicle interior to settle and prevent false alarm activation.

When the vehicle has successfully completed its locking routine, confirmation will be given by a long single flash of the turn signal indicators to indicate the locked condition. If double locking is activated then confirmation will be given by a double flash of the turn signal indicators, one flash for locked and one long flash for double locked. In certain markets an audible warning is emitted to confirm arming or double locking.

MISLOCK

If any door, luggage compartment lid or hood is open when a lock or double lock request is received, the anti-theft system remains disarmed and the CJB generates a short mislock sound on the BBUS or passive sounder and the turn signal indicators will not flash. Each attempt to lock will be confirmed by two audible chimes being emitted.

DISARMING

The CJB will disarm the active anti-theft system when it receives an unlock request from the smart key or, on vehicles with passive entry, the lock/unlock switch on one of the exterior door handles is pressed with a smart key present.

The CJB can selectively disarm parts of the active anti-theft system to prevent false alarm activation under certain conditions as follows:

- On vehicles fitted with a volumetric sensor, if the folding top is down and the vehicle is double locked (armed in volumetric mode) the CJB will not arm the volumetric sensor. The CJB determines the position of the folding top from high speed CAN bus messages broadcast by the folding top control modules.
- When the vehicle active anti-theft system is armed in volumetric mode, and the luggage compartment lid is opened with the smart key or, on vehicles with passive entry, the exterior release switch with a smart key present. The luggage compartment lid can be opened without triggering the alarm. When the luggage compartment lid is subsequently closed, the active anti-theft system will be re-armed.
- When the vehicle active anti-theft system is armed in volumetric mode, if the vehicle battery voltage decreases to less than 9 V, the CJB will disable the volumetric mode and remain in the perimeter mode only. This prevents false alarm activation because the volumetric sensor does not operate below 9 volts.
- On vehicles fitted with a BBUS, if the vehicle battery voltage decreases from 9.5 to 9 V in more than a 30 minute period, the CJB de-activates the BBUS and if required, will use the vehicle horns to sound an audible alarm trigger warning. This prevents false alarm activation. At voltages below 9 volts, the CJB will not generate the 'heartbeat' signal to the BBUS. If the sounder fails to receive the 'heartbeat' signal, it interprets this as tampering with the CJB and the sounder self activates. If the battery voltage subsequently rises above 9.5 V, the CJB will re-arm the BBUS.

- If the vehicle is unlocked and, within 45 seconds, a hinged panel is not opened, the CJB automatically re-locks the vehicle and re-arms the active anti-theft system (if the auto re-lock feature is enabled). This prevents leaving the vehicle unlocked and disarmed by accidental operation of the smart key unlock switch.

ALARM

When the alarm is triggered, the CJB activates audible and visual warnings. The audible warning is produced using the passive sounder or the BBUS, whichever is fitted. The visual warning is produced using the turn signal indicators.

The CJB cycles the warnings on for 30 seconds and off for 5 seconds. At the end of the off period, if the alarm trigger is still present the CJB repeats the warning cycle. The CJB activates a maximum of 10 warning cycles (3 in some markets) for any one arming period. The CJB deactivates the alarm if the maximum number of warning cycles have been completed and the alarm trigger is still present, or if it receives a disarm signal.

NOTE:

If the BBUS is triggered due to tamper detection, the visual warning using the turn signal indicators is not activated.

The alarm can be triggered if any of the hinged panels are opened, the volumetric sensor detects movement inside the vehicle, the tilt sensor detects vehicle movement, the CJB is disconnected or an ignition tamper is detected (invalid smart key).

BATTERY BACK-UP SOUNDER

When the CJB arms the active anti-theft system, in either the perimeter mode or the volumetric mode, it sends an arming signal to the BBUS on the LIN bus. When the system is armed in the volumetric mode, the CJB also sends an arming signal to the tilt sensor.

On receipt of the arming signals, the BBUS and the tilt sensor respond with status signals. If the CJB does not receive the status signals within 12 seconds, it assumes there is a fault and responds with a disarm signal to the BBUS and/or the tilt sensor and stores a related fault code. If the BBUS is disarmed when the active anti-theft system is armed and the system is subsequently triggered, the CJB energizes the horn relay in the right EJB (engine junction box) and uses the vehicle horns to sound the audio warning in place of the BBUS.

When the BBUS is armed, the CJB sends a periodic (heartbeat) signal to the BBUS, which prompts the BBUS to monitor the vehicle battery supply and the LIN bus link with the CJB . The BBUS sounder will operate if:

- It receives an alarm signal from the CJB or the tilt sensor
- The power supply or the LIN bus link from the CJB is disrupted.

The tilt sensor measures the longitudinal and lateral angle of the vehicle over a range of ±16° from the horizontal. When the active anti-theft system is armed in the volumetric mode, the tilt sensor stores the current vehicle angles in its memory and monitors the tilt sensor readings. If the vehicle angle changes in either direction by more than the alarm limit, the tilt sensor activates the BBUS.

If the alarm system is active and the battery or BBUS is disconnected, the BBUS will operate, but there will be no visual warning.

PANIC ALARM

A panic alarm feature allows the vehicle alarm system to be activated using the smart key. The panic alarm switch, identified by a triangle symbol, can be pressed three times or pressed and held for more than 3 seconds to activate the vehicle alarm.
For additional information, refer to: Handles, Locks, Latches and Entry Systems (501-14, Description and Operation).

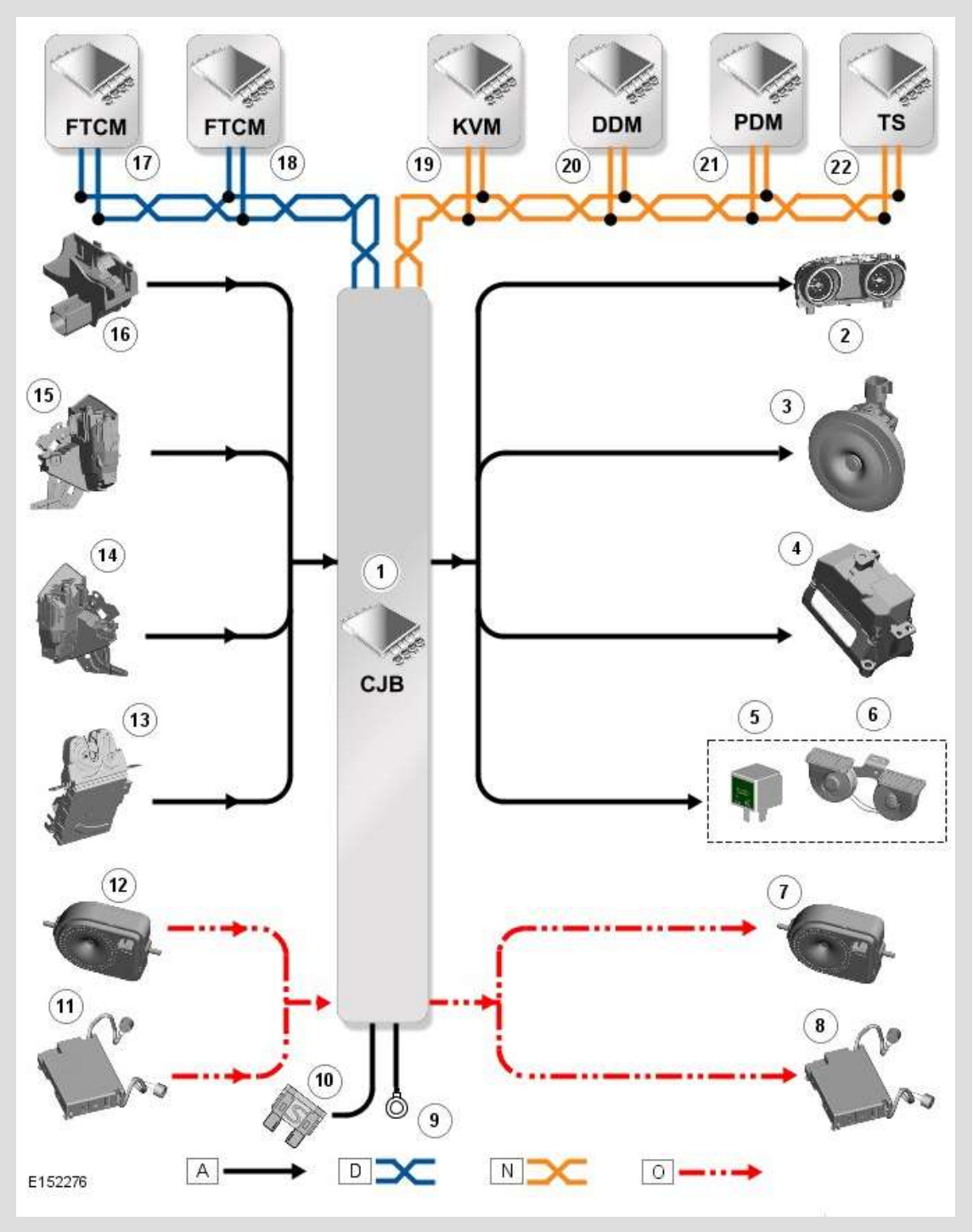
To cancel the panic alarm feature, press the panic alarm switch three times, press and hold the panic switch for three seconds or press the start/stop switch. To prevent accidental cancellation, the panic alarm cannot be cancelled within 5 seconds of being activated.

ALARM WARNING INDICATOR

The alarm warning indicator is a red LED (light emitting diode) located in the instrument cluster, operated by a hardwired connection from the CJB . When the ignition is off, the indicator gives a visual indication of the status of the active anti-theft system.

ANTI-THEFT SYSTEM STATUS	ALARM WARNING INDICATOR STATUS
Disarmed	No flash
Arming - with perimeter alarm	Indicator will flash twice quickly with a long interval between and is repeated 10 times. Slow 'armed' flash then follows.
Arming - with volumetric alarm	Indicator will flash three times quickly with a long interval in between and is repeated 10 times. Slow 'armed' flash then follows.
Armed	Slow flash once alarm is armed at a frequency of 100 ms on and 200 ms off.
Alarm activated	Indicator will flash rapidly until the CJB receives an accessory power signal.

INPUT/OUTPUT DIAGRAM



A = HARDWIRED CONNECTION; D = HIGH SPEED CAN BUS; N = MEDIUM SPEED CAN BUS; O = LIN BUS.

ITEM	DESCRIPTION
1	Central junction box
2	Instrument cluster (alarm warning indicator)
3	Passive sounder (where fitted)
4	Electric steering column lock (where fitted)

5	Horn relay
6	Horns
7	Battery back-up sounder (where fitted)
8	Volumetric sensor (where fitted)
9	Ground
10	Permanent power supply
11	Volumetric sensor
12	Battery back-up sounder
13	Luggage compartment lid latch - ajar switch
14	Right door latch - ajar switch
15	Left door latch - ajar switch
16	Hood switch
17	Left folding top control module
18	Right folding top control module
19	Keyless vehicle module
20	Driver door module
21	Passenger door module
22	Touch screen