

## Instrument Cluster -

Description	Specification
Illumination bulb.	3.0 Watt

# Instrument Cluster - Instrument Cluster - Component Location

Description and Operation

COMPONENT LOCATION



E93401

Item	Description
1	Speedometer
2	Message Center
3	Tachometer

# Instrument Cluster - Instrument Cluster - Overview

Description and Operation

## OVERVIEW

The primary task of the instrument cluster is to display current vehicle status through a series of analogue gauges, indicator lamps, and a [LCD \(liquid crystal display\)](#) message center. In addition to this, the instrument cluster:

- Acts as a gateway between the medium speed and high speed [CAN \(controller area network\)](#) bus networks
- Is connected by the [LIN \(local interconnect network\)](#) bus to the start control unit and the steering wheel clockspring
- Controls operation of the steering column adjust feature  
Refer to: [Steering Column](#) (211-04 Steering Column, Description and Operation).
- Acts as an interface for the passive anti-theft system.  
Refer to: [Anti-Theft - Active](#) (419-01A Anti-Theft - Active, Description and Operation).

Two analogue gauges are located in the instrument cluster; the speedometer and the tachometer. The speedometer is located on the [LH \(left-hand\)](#) side of the instrument cluster. The tachometer is located on the [RH \(right-hand\)](#) side of the instrument cluster

and displays engine speeds up to 7000 Revolutions Per Minute (RPM) for the supercharged engine, 8000 RPM for the naturally aspirated engines and 6000 RPM for diesel variants.

The message center is a [LCD](#) located in a central position in the cluster. The message center displays system status information including fuel quantity remaining.

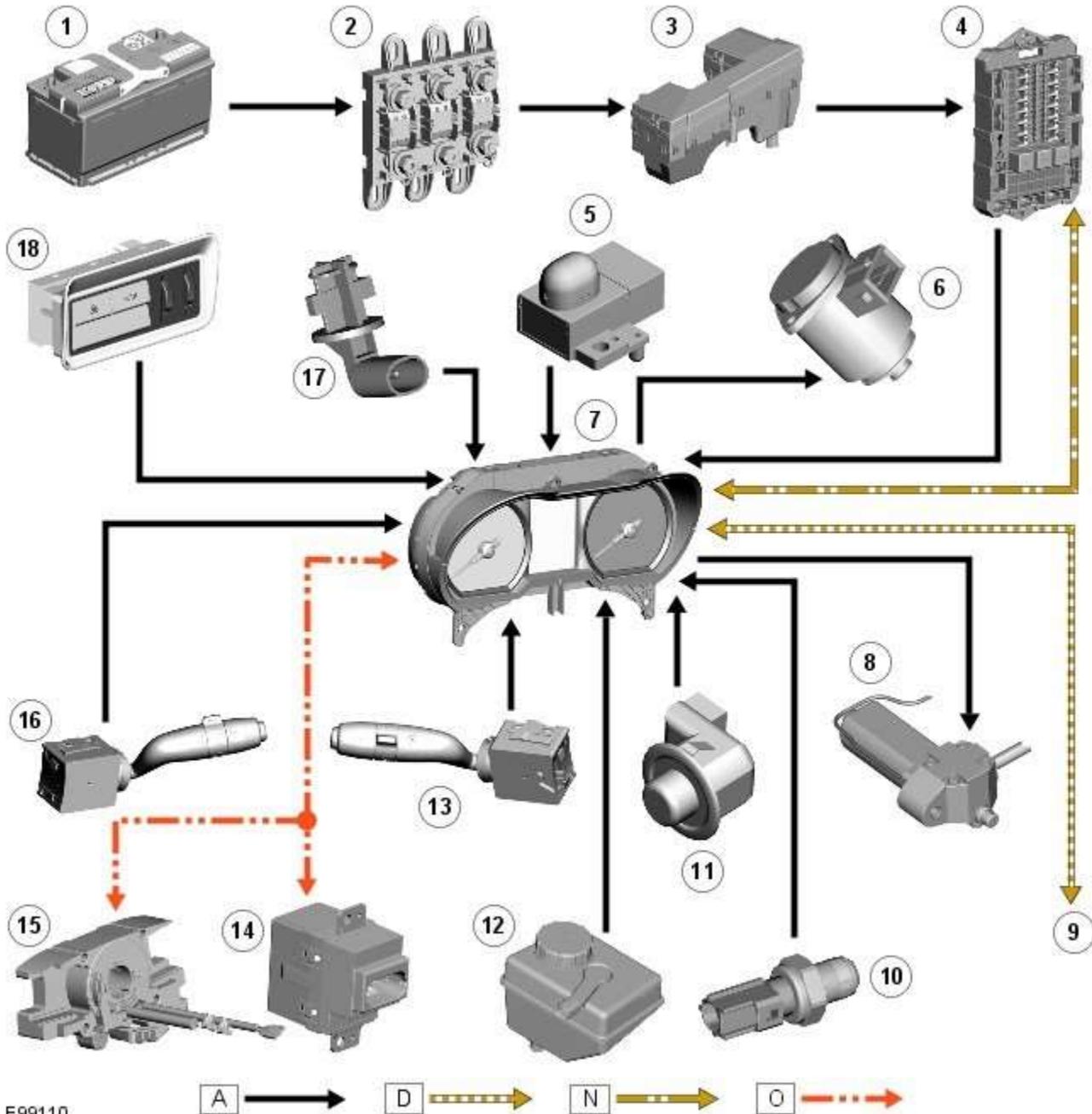
# Instrument Cluster - Instrument Cluster - System Operation and Component Description

Description and Operation

## Control Diagram



NOTE: **A** = Hardwired; **D** = High speed CAN (controller area network) bus; **N** = Medium speed CAN bus; **O** = LIN (local interconnect network) bus



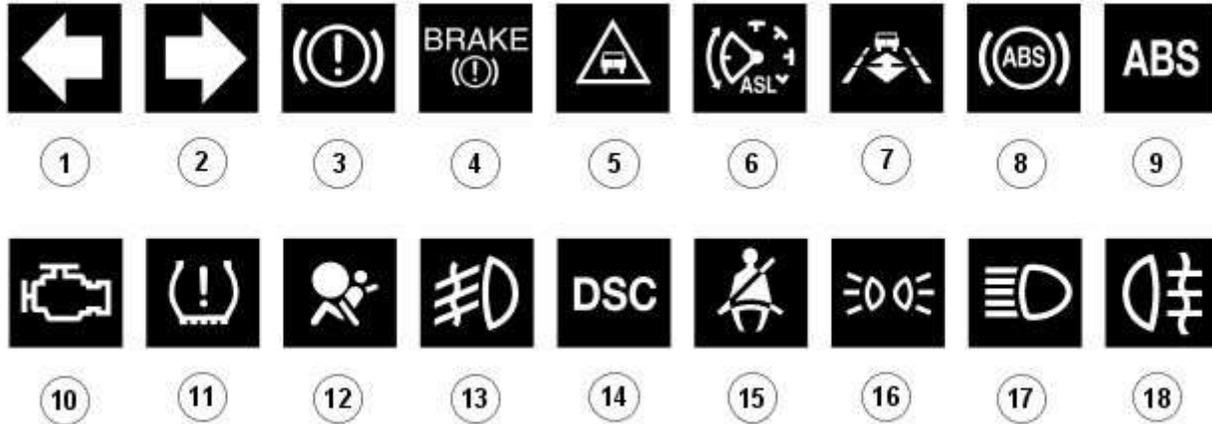
E99110

Item	Description
1	Battery
2	BJB (battery junction box)
3	EJB (engine junction box)
4	CJB (central junction box)
5	Sun load sensor (alarm LED (light emitting diode))

6	Servotronic valve
7	Instrument cluster
8	Steering column motor
9	High speed <a href="#">CAN</a> bus connection to other vehicle systems
10	Engine oil pressure switch
11	Steering column adjustment switch
12	Brake fluid level switch
13	<a href="#">LH (left-hand)</a> steering column multifunction switch
14	Start control module
15	Clockspring
16	<a href="#">RH (right-hand)</a> steering column multifunction switch
17	Engine coolant level sensor
18	Auxiliary lighting switch

## System Operation

### WARNING INDICATOR FUNCTIONALITY



E99113

Item	Description
1	<a href="#">LH</a> turn signal
2	<a href="#">RH</a> turn signal
3	Brake warning
4	Brake warning (NAS)
5	Forward alert
6	Automatic Speed Limiter (ASL)
7	Adaptive speed control
8	<a href="#">ABS (anti-lock brake system)</a> warning
9	<a href="#">ABS</a> warning (NAS)
10	Malfunction Indicator Lamp (MIL)
11	Tire Pressure Monitoring System (TPMS)
12	Airbag warning
13	Front fog lamps
14	Dynamic Stability Control (DSC) warning
15	Seat belt warning
16	Side lamps
17	High beam
18	Rear fog lamps

The functionality for each of the above warning indicators is described in the following sections:

## 1 and 2. Turn Signal Indicators

The turn signal indicators are controlled by the [CJB](#) on receipt of medium speed [CAN](#) bus signals from the instrument cluster.

The instrument cluster outputs a voltage to the turn signal indicator switch. The switch contains resistors of different values. When the switch is operated in either the [LH](#) or [RH](#) direction, the voltage is passed to a ground connection in the instrument cluster which detects the reduced voltage supplied via the resistors. When the turn signal indicator switch is operated in the [LH](#) or [RH](#) direction, the instrument cluster detects the ground voltage and determines whether a [LH](#) or [RH](#) selection is made.

The instrument cluster transmits a medium speed [CAN](#) message to the [CJB](#) for operation of the applicable turn signal indicators. The message can contain a number of states for each possible switch position and also an out of range low and high state for circuit faults and an initial value for the switch neutral position. The turn signal indicators are not subject to the 3 second indicator check when the ignition is switched on.

The [RJB](#) (rear junction box) software controls the flash rate of the warning indicator which sends 'ON' and 'OFF' signals to the instrument cluster which flashes the indicators in a green color. During normal operation, the warning indicator flashes slowly, accompanied simultaneously by a sound from the instrument cluster sounder. If a fault exists, the [RJB](#) transmits a message to the instrument cluster which responds by displaying an appropriate message in the message center.

The hazard warning indicators are controlled by the [CJB](#) on receipt of a completed ground path from the hazard warning indicator switch. The [CJB](#) outputs a medium speed [CAN](#) message to the instrument cluster which operates both the [LH](#) and [RH](#) turn signal indicators simultaneously. The hazard warning indicators can operate with the ignition switched off, therefore the [CAN](#) message from the [CJB](#) will also carry a 'wake-up' message for the instrument cluster.

## 3. Brake Warning Indicator

This warning indicator is displayed in a red or amber color (dependant on market) as a brake symbol in all markets except United States of America (USA) which have the word 'BRAKE' in place of the symbol. The indicator is controlled by high speed [CAN](#) messages from the [ABS](#) module and the parking brake control module. The indicator is illuminated in a red color for a 3 second indicator check when the ignition is switched on.

The instrument cluster monitors the fluid level in the brake fluid reservoir using a hardwired level switch. If the fluid level falls to below a determined level, the switch contact is broken and the [ABS](#) module detects the low fluid level condition. The instrument cluster illuminates the warning indicator and simultaneously displays a 'BRAKE FLUID LOW' message in the message center.



**NOTE:** If both the brake warning indicator and the [ABS](#) warning indicator illuminate simultaneously, a major fault in the brake system will have occurred.

The warning indicator also displays parking brake status. When the parking brake is applied, the warning indicator will be illuminated by the instrument cluster and, if the vehicle is moving, the message 'PARK BRAKE APPLIED' will be also displayed in the message center in response to a [CAN](#) message from the parking brake control module.

If a condition exists where the parking brake cannot be applied, the parking brake control module issues a [CAN](#) message to the instrument cluster which flashes the warning lamp on and off and is accompanied with a message 'CANNOT APPLY PARK BRAKE'. If a fault occurs in the parking brake system, the parking brake control module issues a [CAN](#) message to the instrument cluster which illuminates the warning indicator and displays the message 'PARK BRAKE FAULT' in the message center.

## 4. Forward Alert Indicator

The forward alert system uses the components of the adaptive speed control system to alert the driver of the presence of a vehicle ahead. The system can be turned on and off using a switch located in the auxiliary lighting switch when the adaptive speed control system is off. The indicator is illuminated in an amber color for a 3 second indicator check when the ignition is switched on.

The forward alert system is controlled by the adaptive speed control module. When the switch is pressed, the forward alert system is activated and the adaptive speed control module issues a forward alert active message on the high speed [CAN](#) bus to the instrument cluster. The forward alert icon in the instrument cluster will illuminate in an amber color and a 'FORWARD ALERT' message will be displayed in the message center. When the button is pressed a second time, the module issues a forward alert off [CAN](#) message. The forward alert system will be deactivated, the forward alert icon will go off and a message 'FORWARD ALERT OFF' will be displayed in the message center.

## 5. Automatic Speed Limiter (ASL) Indicator

The ASL is controlled by the [ECM](#) (engine control module). An ASL switch is located in the floor console, adjacent to the gear selector lever. When the ASL switch is pressed, this is sensed by the [ECM](#) which issues a high speed [CAN](#) message to the instrument cluster. The instrument cluster illuminates the ASL warning indicator in an amber color to show the driver that ASL is active. The driver sets the required speed using the speed control SET +/- switches on the steering wheel. The selected speed is shown by the message 'LIMITER SET XXX MPH / K/MH' in the message center. The indicator is illuminated in an amber color for a 3 second indicator check when the ignition is switched on. ASL can be deselected by pressing the ASL switch, by depressing the throttle pedal initiating kick-down or by pressing the 'cancel' switch on the steering wheel. The ASL indicator will go off and the message center will display the message 'limiter cancelled' for 4 seconds. If a fault occurs in the ASL system, the [ECM](#) will send a message to the instrument cluster to illuminate the ASL indicator and display the message 'LIMITER NOT AVAILABLE'.

## 6. Adaptive Speed Control Indicator

The adaptive speed control system is controlled by the adaptive speed control module. Operation of the SET +/- switches on the steering wheel will activate the system. Operation of the switches is detected by the adaptive speed control module. The module issues a high speed [CAN](#) message to the instrument cluster which illuminates the adaptive speed control indicator, when the system is in 'follow mode', in an amber color and displays a 'SETSPEED XXX MPH / KM/H' message in the message center. The indicator is illuminated in an amber color for a 3 second indicator check when the ignition is switched on.

## 7. Anti-lock Braking System (ABS) Warning Indicator

The [ABS](#) warning indicator is controlled by the [ABS](#) module. If a fault in the [ABS](#) system is detected by the [ABS](#) module, the module issues a high speed CAN message to the instrument cluster to illuminate the [ABS](#) warning indicator in an amber color and display the message 'ABS FAULT' in the instrument cluster. The indicator is illuminated in an amber color for a 3 second indicator check when the ignition is switched on. If a fault is present when the ignition is on, the bulb will remain illuminated after the 3 second indicator check period.

### NOTES:



The 'ABS FAULT' message is not displayed in NAS markets).



If both the [ABS](#) warning indicator and the brake warning indicator illuminate simultaneously, a major fault in the brake system will have occurred.

On NAS vehicles, the [ABS](#) warning indicator is also used for parking brake operation. The NAS warning indicator does not have 'ABS' on the icon and will function as described previously for the parking brake operation of the brake warning indicator.

## 8. Engine Malfunction Indicator Lamp (MIL)

The MIL warning indicator is controlled by the [ECM](#) and illuminated by the instrument cluster on receipt of a message on the high speed [CAN](#) bus from the [ECM](#). The indicator is illuminated in an amber color for a 3 second indicator check when the ignition is switched on.

If the MIL remains illuminated after the engine is started or illuminates when driving, a fault is present and must be investigated at the earliest opportunity. Illumination of the MIL warning indicator alerts the driver to an [OBD \(on-board diagnostic\)](#) fault which will cause excessive emissions output. This may relate to either an engine management system fault or a transmission.

## 9. Tire Pressure Monitoring System (TPMS) Warning Indicator

The TPMS warning indicator is illuminated by the instrument cluster on receipt of a medium speed [CAN](#) message from the TPMS module. The indicator is illuminated in an amber color for a 3 second indicator check when the ignition is switched on.

If the indicator illuminates and is accompanied by the message 'TYRE PRESSURE SYSTEM FAULT' in the message center, then a TPMS fault has occurred. If the indicator illuminates and accompanied by a different message, then a low tire pressure has been detected, a spare wheel has been fitted or a TPMS sensor has failed.

## 10. Airbag Warning Indicator

The airbag warning indicator is controlled by the instrument cluster. The indicator is illuminated in an amber color for the 3 second indicator check when the ignition is switched on. The indicator remains illuminated after the 3 second period has expired until the instrument cluster receives a turn off message on the high speed [CAN](#) bus from the [RCM \(restraints control module\)](#).

## 11. Front Fog Lamp Indicator

The green colored front fog lamp indicator is controlled by the [CJB](#) and illuminated by the instrument cluster on receipt of a front fog lamp on message on the medium speed [CAN](#) bus from the [CJB](#). The indicator is illuminated for as long as the front fog lamps are active. The front fog lamp indicator is not subject to the 3 second indicator check when the ignition is switched on.

## 12. Dynamic Stability Control (DSC) Indicator

The DSC warning lamp is controlled by the [ABS](#) module and illuminated by the instrument cluster in response to messages received on the high speed [CAN](#) bus. The indicator is illuminated in an amber color for the 3 second indicator check when the ignition is switched on. The [DSC](#) warning indicator, are permanently illuminated in an amber color if the instrument cluster receives a high speed [CAN](#) message from the [ABS](#) module relating to one of the following faults:

- Traction control fault
- Yaw control fault
- Engine drag torque control fault
- Panic Brake Assist (PBA) fault
- Signal missing relating to either traction control active, yaw control active or DSC switch input.

The above faults will also generate an applicable DSC and ABS warning message in the message center. The DSC warning indicator will flash at 2 Hz for if the traction control or yaw control is active when the DSC system is enabled. If the DSC system is switched off, the warning indicator will be permanently illuminated until the DSC system is subsequently re-activated.

## 13. Safety Belt Warning Indicator

The safety belt warning indicator operates for both the driver and passenger safety belts. The warning indicator is controlled by

the [RCM](#) and illuminated by the instrument cluster on receipt of high speed [CAN](#) bus messages. The safety belt warning indicator is not subject to the 3 second indicator check when the ignition is switched on.

The operation of the passenger seat buckle switch is as described below with the exception that the instrument cluster must receive a hardwired signal from the belt minder control module to indicate that a passenger is occupying the seat.

The safety belt warning indicator is subject to a timer. The warning indicator is activated when the following conditions exist:

- Ignition is switched on
- One of the front seat belts is unbuckled
- USA market only - 75 seconds has elapsed after ignition on mode is selected
- Vehicle is not in reverse gear
- Vehicle speed is more than 8 km/h (5 mph).

Once the above parameters are met, the instrument cluster flashes the warning indicator at 2 Hz for 10 seconds accompanied by a simultaneous chime. After 10 seconds the chime ceases and the warning indicator is permanently illuminated for 20 seconds. This sequence is repeated every 30 seconds until one of the following events occurs:

- 300 seconds has elapsed
- The safety belt of the occupied front seats is fastened
- The ignition is switched to off mode
- The vehicle speed decreases to below 5 km/h (3 mph).



**NOTE:** On USA market vehicles, the warning indicator is not permanently illuminated.

The safety belt minder function cannot be disabled. The seat belt minder function can be disabled. Refer to: [Safety Belt System](#) (501-20A Safety Belt System, Description and Operation).

#### **14. Side Lamp Indicator**

The instrument cluster controls the green colored side lamp indicator on receipt of a side lamp status message on the medium speed [CAN](#) bus from the [CJB](#) and the auxiliary junction box. The lighting switch on the [LH](#) steering column multifunction switch is connected to the instrument cluster. Selections using this switch are detected by the cluster which requests the side or headlamp operation via a message to the [CJB](#) and the [RJB](#). The [CJB](#) and the [RJB](#) responds with a side lamp active message and the cluster illuminates the side lamp indicator. The side lamp indicator is not subject to the 3 second indicator check when the ignition is switched on.

#### **15. High Beam Indicator**

The instrument cluster controls the blue colored high beam indicator on receipt of a high beam status message on the medium speed [CAN](#) bus from the [CJB](#). The lighting switch on the [LH](#) steering column multifunction switch is connected to the instrument cluster. High beam or flash selections using this switch are detected by the cluster which requests the light operation via a [CAN](#) message to the [CJB](#). The [CJB](#) responds with a high beam active message and the cluster illuminates the high beam indicator. The high beam indicator is not subject to the 3 second indicator check when the ignition is switched on.

#### **16. Rear Fog Lamp Indicator**

The amber colored rear fog lamp indicator is controlled by the auxiliary junction box and illuminated by the instrument cluster on receipt of a rear fog lamp on message on the medium speed [CAN](#) bus from the [RJB](#). The indicator is illuminated for as long as the rear fog lamps are active. The rear fog lamp indicator is not subject to the 3 second indicator check when the ignition is switched on.

### **SPEEDOMETER**

The speedometer is driven by high speed [CAN](#) signals transmitted by the [ABS](#) module. The wheel speeds are measured by sensors reading the rotational speed of the rear wheels from toothed targets on the hubs. An average of the two wheel speeds are passed from the sensors to the [ABS](#) module in the form of pulsed signals. The [ABS](#) module converts these signals into a speed output on the high speed [CAN](#) to the instrument cluster. The same speed outputs from the wheel speed sensors are also used to calculate the distance the vehicle has travelled.

### **TACHOMETER**

The tachometer is driven by an engine speed signal transmitted on the high speed [CAN](#) from the [ECM](#). The signal is derived from the [CKP \(crankshaft position\)](#) sensor. The signal is received by the instrument cluster microprocessor and the output from the microprocessor drives the tachometer.

### **FUEL GAGE**

The fuel gage is controlled by [CAN](#) messages from the [RJB](#). The [RJB](#) reads the values output by the fuel level sensors every 131 ms and transmits a fuel tank contents value, corrected for battery voltage, in a [CAN](#) message to the instrument cluster. A fuel pump symbol is displayed to the left of the linear gage. An arrow above the symbol shows the driver on which side of the vehicle the fuel filler cap is located. Above the linear fuel gage, is a [LCD \(liquid crystal display\)](#) area which displays odometer and trip readouts. When a trip computer function is selected, these are replaced by a trip computer display for the trip function selected.

### **LIQUID CRYSTAL DISPLAY**

In the area above and below the message center is a [LCD](#) display. The area below the message center displays a linear fuel

gauge, odometer, trip distance and trip computer readouts. The trip distance and trip computer information is derived from information supplied on the high speed [CAN](#) bus to the instrument cluster from the [ABS](#) module and the [ECM](#).

The area above the message center displays the transmission gear position information and speed control related information. The transmission information is supplied on the high speed [CAN](#) bus from the [TCM \(transmission control module\)](#).



**NOTE:** There is no engine coolant temperature gauge displayed. If the engine coolant temperature increases to above a predetermined threshold, a warning message is displayed in the message center. The message is sent from the [ECM](#) in a high speed [CAN](#) message to the instrument cluster.

## TRANSMISSION GEAR SELECTION POSITION

The gear position display shows JaguarDrive selector position or selected gear when using the Jaguar Sequential Shift. The gear selector module transmits a [CAN](#) message to the instrument cluster for gear selector lever position. The module also outputs a 'not in park' signal to the instrument cluster. The [TCM](#) transmits a high speed [CAN](#) message to the instrument cluster with data containing the selected gear when in Jaguar Sequential Shift mode.

### Component Description

## INSTRUMENT CLUSTER - WARNING INDICATOR LOCATIONS



**NOTE:** Other market variants of instrument cluster are similar.

EUROPEAN MARKET - DIESEL INSTRUMENT CLUSTER



Item	Description
1	Speedometer
2	<a href="#">ABS</a> indicator
3	Adaptive speed control indicator
4	Glow plug indicator
5	Malfunction Indicator Lamp (MIL)
6	Tire Pressure Monitoring System (TPMS) indicator
7	Airbag warning indicator
8	Front fog lamp indicator
9	Tachometer
10	<a href="#">RH</a> turn signal indicator
11	Rear fog lamp indicator
12	Dynamic Stability Control (DSC) indicator
13	High beam indicator
14	Side lamp indicator
15	Seat belt warning indicator

16	Message center
17	Automatic Speed Limiter (ASL) indicator
18	Forward alert indicator
19	Brake warning indicator
20	LH turn signal indicator

NAS MARKET - V8 NORMALLY ASPIRATED INSTRUMENT CLUSTER



E99112

Item	Description
1	Speedometer
2	ABS indicator (NAS)
3	ABS indicator (ROW)
4	Adaptive speed control indicator
5	Tachometer
6	Malfunction Indicator Lamp (MIL)
7	Tire Pressure Monitoring System (TPMS) indicator
8	Airbag warning indicator
9	Front fog lamp indicator
10	RH turn signal indicator
11	Rear fog lamp indicator
12	Dynamic Stability Control (DSC) indicator
13	High beam indicator
14	Seat belt warning indicator
15	Side lamp indicator
16	Message center
17	Automatic Speed Limiter (ASL) indicator
18	Forward alert indicator
19	Brake warning indicator (NAS)
20	Brake warning indicator (ROW)
21	LH turn signal indicator

The warning indicators are located in various positions in the instrument cluster. The indicators can be split into two groups; instrument cluster controlled and externally controlled.

Instrument cluster controlled warning indicators are dependent on software logic within the instrument cluster for activation. The cluster software controls the indicator illumination check at ignition on (power mode 6).

Externally controlled indicators are supplied with current from another vehicle system control module or illuminated by the instrument cluster software on receipt of a bus message from another vehicle sub-system. The indicator illumination check at ignition on (powermode 6) is also controlled by the sub-system module for these indicators.

## MESSAGE CENTER

The message center is a [LCD](#) located in a central position in the cluster. The message center displays system status information.

Refer to: [Information and Message Center](#) (413-08 Information and Message Center, Description and Operation).

## ANALOGUE GAGES

### Speedometer

The analogue speedometer is located on the [LH](#) side of the instrument cluster and is available in 4 market variants:

- Major scale Miles Per Hour (MPH), minor scale kilometers per hour (km/h) (ROW)
- Major scale MPH, minor scale km/h (NAS)
- Major scale km/h, minor scale MPH
- Major scale km/h only.

### Tachometer

The analogue tachometer is located on the [RH](#) side of the instrument cluster. The tachometer has different Revolutions Per Minute (RPM) scales depending on the engine variant fitted to the vehicle as follows:

- 4.2L V8 Naturally aspirated 8000 RPM (NAS Only)
- 5.0L V8 Naturally aspirated 8000 RPM
- 5.0L V8 Supercharger 8000 RPM
- 3.0L V6 Naturally aspirated 8000 RPM
- 3.0 V6 Diesel 6000 RPM.

## ELECTRONIC GAGES

### Fuel Gage

The linear fuel gage has a colored bar which moves left or right depending on the tank contents. As the bar moves to the left the fuel tank contents displayed is decreasing. A warning message is displayed in the message center when the fuel tank contents fall to below the reserve level.

### Transmission Gear Position Display

The gear position display shows the JaguarDrive selector position or the selected gear when using the Jaguar Sequential Shift.

The applicable drive letter is highlighted to show that a selection has been made using the JaguarDrive selector.

When Jaguar Sequential Shift is selected, the letters change to numbers; 1 - 6, and the selected gear is highlighted to emphasize the selection to the driver.

# Instrument Cluster - Instrument Cluster

Diagnosis and Testing

## Principles of Operation

For a detailed description of the Instrument Cluster, refer to the relevant Description and Operation sections in the workshop manual. REFER to: (413-01 Instrument Cluster)

[Instrument Cluster](#) (Description and Operation),

[Instrument Cluster](#) (Description and Operation),

[Instrument Cluster](#) (Description and Operation).

## Inspection and Verification



**CAUTION:** Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage and system integrity.

### Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> <li>• Fluid level(s)</li> <li>• Accessory installations</li> </ul>	<ul style="list-style-type: none"> <li>• Fuse(s)</li> <li>• Wiring harness</li> <li>• Electrical connector(s)</li> <li>• Instrument cluster</li> <li>• Central Junction Box (CJB)</li> <li>• Engine Junction Box (EJB)</li> <li>• Driver Door Module (DDM)</li> <li>• Engine Control Module (ECM)</li> </ul>

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart.

## Symptom Chart

The instrument cluster contains a self-diagnostic mode known as engineering test mode (ETM). This can be used to show the status of the instrument cluster inputs as well as a number of other useful features.

When in the ETM, the Message Centre displays internal data that can be cycled through. All functions except the message centre display will continue to operate normally unless otherwise noted.

This document is to be used in conjunction with the instrument cluster ETM (see relevant section within this document) and the Integrated Diagnostic System (IDS) facility; this does not supersede or replace the IDS facility.

Go directly to the 'Area of Concern/Symptom' that indicates the customer concern(s) and perform the actions described within the relevant section(s):

Area of Concern/Symptom	Diagnostic Ref. No.	Actions	Notes
Warning lights	A-1	Perform instrument cluster Self-Diagnostic Mode/ETM test 3.	When this test is ended the warning lamps currently required to be 'ON' will remain illuminated.
Multiple warning lights 'ON'	B-1	Check with IDS for DTCs related to identified vehicle system(s).	.
.	B-2	Check instrument cluster battery and ignition wiring - refer to circuit diagrams.	Specifically check continuity of Standard Corporate Protocol (SCP) and Controller Area Network (CAN) lines.
.	B-3	Check instrument cluster grounds.	.
.	B-4	Check fuses in battery junction box.	.
.	B-5	Check for harness traps in fascia.	.
.	B-6	Perform instrument cluster Self-Diagnostic Mode/ETM test 3.	Frost/ice warning illuminated in mixed red and amber; therefore colour differs from other warning lamps. When this test is ended, warning lamps currently required to be 'ON' will remain illuminated.
.	B-7	Check for open circuit/shorts in wiring to related warning lamp trigger (module, sensor, switch).	.

Area of Concern/Symptom	Diagnostic Ref. No.	Actions	Notes
Specific warning lamp 'ON'	C-1	Check with IDS for DTCs related to identified vehicle system.	
	C-2	Check for open circuit/shorts in wiring related to warning lamp circuit (module, sensor, switch) where appropriate.	
	C-3	Perform cluster Self-Diagnostic Mode/ETM test 3.	Frost/ice warning illuminated in mixed red and amber; therefore colour differs from other warning lamps. When this test is ended, warning lamps currently required to be 'ON' will remain illuminated.
	C-4	Check the specific vehicle system indicated by the warning lamp illuminated?	What is the warning lamp telling me? Does this check out with the DTC logged by the system indicating the fault?
Fuel gauge operation	D-1	Perform Self-Diagnostic Mode/ETM test 21 to establish if fuel level input to cluster is out of range or invalid.	0 - 9 = short circuit; gauge will show empty. 10 - 254 = normal range. 255 = open circuit; gauge will show empty. --- = missing signal; gauge will show empty.
	D-2	Check gauge function versus Self-Diagnostic Mode/ETM test 21.	0 = empty, 254 = full. 255 = invalid; gauge will show empty.
	D-3	Check for open circuit/shorts in wiring between the Fuel Delivery Module, Jet Pump Module and Rear Electronic Module (REM).	
Fuel gauge reading	E-1	Check gauge position versus Self-Diagnostic Mode/ETM test 21.	0 = empty to 254 = full (255 invalid; gauge will show empty). Other values percentage of above range e.g. 127 = half.
	E-2	Calculate percentage fuel level from figure obtained from Self-Diagnostic Mode/ETM test 21 and compare to IDS vehicle fuel percentage test.	Self-Diagnostic Mode fuel level percentage can be calculated as follows: Value from Self-Diagnostic Mode test 26 ÷ 254 x 100 = % shown on gauge.
	E-3	Monitor value of Self-Diagnostic Mode test/ETM test 21 (during test drive) to establish if input drops out of range.	0 - 9 = short circuit; gauge will show empty. 10 - 254 = normal range. 255 = open circuit; gauge will show empty. --- = missing signal; gauge will show empty.
	E-4	Monitor 'FUEL LEVEL' in IDS data logger (during test drive) to correlate gauge position to vehicle reported fuel level.	Gauge function is damped so will not follow rapidly changing Fuel Delivery Module values.
Speedometer operation	H-1	Monitor Self-Diagnostic Mode/ETM test 19 (during test drive) check to establish if vehicle speed input to cluster is out of range or invalid.	Display speed input in 1/10 mile/h, no decimal point shown, and is compensated for tire size etc. Displays ---- or INV if message is not received or if received data is invalid.
Speedometer reading	I-1	During test drive compare speedometer position to Self-Diagnostic Mode/ETM test 19, displayed value.	Self-Diagnostic Mode displayed speed figure will be approx 3% higher than speed indicated by speedometer. Allowed tolerance - minus nothing/+ 10% + 2.5 mile/h.
	I-2	Monitor Self-Diagnostic Mode/ETM test 19 (during test drive) to establish if vehicle speed input to cluster drops out of range or is invalid.	Displays ---- if message is not received or if received data is invalid for two seconds or more.
	I-3	Check that installed wheels and tires are standard Jaguar fitment. Confirm wheel size in IDS, 'ADD REMOVE ACCESSORY' section.	Non standard wheels and tires may lead to speed indication inaccuracies. Incorrectly set wheel size will result in speed indication inaccuracies. Trip and odometer distance accumulation will also be incorrect.
Tachometer operation	J-1	Perform Self-Diagnostic Mode/ETM test 20 to establish if vehicle rpm input to cluster out of range or invalid.	Displays ---- or INV if message is not received or if received data is invalid.
Tachometer reading	K-1	Check tachometer position versus Self-Diagnostic Mode/ETM test 20, displayed value.	Tachometer accuracy +/- 100 rpm.
	K-2	Monitor 'ENGINE RPM' in IDS data logger at constant engine rpm to compare tachometer indicated engine rpm to engine rpm reported by Engine Control Module (ECM).	Tachometer accuracy +/- 100 rpm.
	K-3	Monitor Self-Diagnostic Mode test/ETM test 20, (during test drive) to establish if input to cluster drops out of range or is invalid.	Displays ---- or INV if message is not received or if received data is invalid.
Gauge judder	L-1	Perform Self-Diagnostic Mode test/ETM test 2, to prove out smooth gauge operation.	
Gauge noise	M-1	Perform vehicle road test. Gauges should not be audible during operation in drive cycle.	

Area of Concern/Symptom	Diagnostic Ref. No.	Actions	Notes
	M-2	Benchmark noise against non-complaint vehicle.	
Trip (fuel) computer	N-1	Check for consistent display (during test drive) of valid 'Rolling Odometer' count in Self-Diagnostic Mode/ETM test 24.	Displays ---- , INV or 255 if message is not received, or if received data is invalid.
	N-2	Check that installed wheels and tires are standard Jaguar fit. Confirm fitted wheel size in IDS, 'ADD REMOVE ACCESSORY' section.	Non standard wheels and tires or incorrectly set wheel size may lead to Odometer increment inaccuracies. This will impact the distance accumulators, which in turn affects the rolling average, fuel economy and range values. Trip distance accumulation will also be incorrect.
	N-3	Consider noting odometer value and resetting fuel computer system. Advise customer to conduct brim-to-brim fuel tank test. Use collected information to determine if system accurate.	
Column adjust	O-1	Check with IDS for DTCs related to powered column system.	
	O-2	Check cluster battery supply voltage and ground resistance. Check for loose connections.	
	O-3	Check power column motors supply voltage.	
	O-4	Check power column switch for physical damage.	
Passive Anti-Theft System (PATS) indicator	P-1	Check for three second prove out when vehicle start button is pressed.	
	P-2	Check for loose connections/wiring continuity.	
	P-3	Check ignition switch for physical damage.	
Cluster illumination	Q-1	Check for loose connections/wiring continuity.	
	Q-2	Check dimmer switch operation.	
Cluster backlight operation	R-1	Is the backlight on other components inoperative.	
	R-2	Check dimmer switch operation.	
	R-3	Check for loose connections/wiring continuity.	
Chime/tone operation	S-1	Check vehicle configuration.	
	S-2	Utilize lights ON, ignition OFF, door open warning to verify chime operation.	
	S-3	Check appropriate sensing circuit.	
Continuous chime/tone	T-1	Check appropriate sensing circuit.	
Unexpected chime operation	U-1	Check vehicle configuration.	
Message centre display illumination	V-1	Is the backlight 'ON' and other components dim?	
	V-2	Does the lighting level of other components change when dimmer adjusted?	
Message centre display issue	W-1	Perform Self-Diagnostic Mode test/ETM tests 5 to 9, to prove out LCD display function.	
Message centre missing lines	X-1	Perform Self-Diagnostic Mode test/ETM tests 5 to 9, to prove out LCD display function.	
Message centre incorrect message	Y-1	What is the message?	
	Y-2	Check for open circuit/shorts in wiring to related warning light trigger (module, sensor, switch).	
Cluster/connectivity	Z-1	Check cluster battery and ignition wiring.	
	Z-2	Check cluster grounds.	
	Z-3	Disconnect/reconnect cluster.	
	Z-4	Attempt to enter Self-Diagnostic Mode/ETM to prove cluster response to inputs.	
No crank	AA-1	Check with IDS for presence of related DTCs.	
	AA-2	Is there a Passive Anti-Theft System (PATS) flash code?	
	AA-3	Does the vehicle crank with the other passive key?	

Area of Concern/Symptom	Diagnostic Ref. No.	Actions	Notes
	AA-4	Ensure only one key is in the vehicle, try both keys in the Starter Control Unit (SCU).	If this test starts the vehicle this tends to indicate an issue with the keyless vehicle module.
	AA-5	Tried new key?	
	AA-6	Check battery voltage.	
	AA-7	Diagnose non-start condition with IDS.	
	AA-8	Attempt PATS key erase and re-learn.	Ensure keys are erased from current cluster if replacing cluster.
Crank but no-start	AB-1	Diagnose non-start condition with IDS.	Not usually caused by cluster issue.
Incorrect configuration	AC-1	Attempt to configure cluster.	
	AC-2	Ensure battery voltage is maintained above 12.5 volts if cluster re-configured.	

1. If the cause is not visually evident, verify the symptom and refer to the Self-Diagnostic Mode

## Self-Diagnostic Mode

To place the cluster in engineering test mode (ETM) carry out the following steps

- Press and hold the stalk trip cycle button, for more than five seconds but less than eight seconds, whilst briefly pressing the vehicle START button. There is no initial display indication that the instrument cluster has entered ETM. If ETM has successfully been entered then 'ENGINEERING TEST MODE' will be displayed in the Message Centre when the stalk trip button is released.
- To navigate forward through the instrument cluster Self-Diagnostic Mode tests, press the stalk trip cycle button.
- Each push of the stalk trip cycle button will advance one step through the ETM sequence. It is not possible to move backward through the test sequence.
- To exit the Self-Diagnostic Mode press and hold the stalk trip cycle button for more than three seconds.
- The Self-Diagnostic Mode is also deactivated when the ignition switch is turned to the 'OFF' position or low battery voltage is detected.
- If the Self-Diagnostic Mode cannot be accessed repeat the above paying particular care to the sequence timing.
- The ETM text is not language configurable and will be displayed in English.

ETM Test/no.	Message Center Display	Gauge/Indicator/Display Tested.	Range	Description
1 - Self-diagnostic entry.	ENGINEERING TEST MODE.		Not Applicable (N/A).	Establishes Self - Diagnostic mode.
2 - Gauge sweep.	GAUGE SWEEP.	Tachometer and speedometer. Gauges display current values after test.	(N/A).	All gauges go through a full up and down pointer sweep smoothness check.
3 - Warning lamp LED's.	TELL TALE TEST.	All internally controlled lamps/LED's regardless of software configuration.	(N/A).	Illuminates all the LED warning indicators that are controlled by the instrument cluster. When this test is exited current vehicle warning lamps will remain illuminated.
4 - Version information.	PROGRAM VERSION. <ul style="list-style-type: none"> <li>• ROM: XXXX</li> <li>• NVM: XXXX</li> <li>• REV: XXXX</li> <li>• DATE: XXXX</li> </ul>	Software Read only memory (ROM) and Non volatile memory (NVM) version and date.	(N/A).	Display's the instrument cluster ROM and NVM level version and date or indication of ROM checksum fault.
5 - Message Center display.	LCD display in WHITE.	Message center LCD display.	(N/A).	Activates all pixels of LCD display in White.
6 - Message Center display.	LCD display in DARK GREY.	Message center LCD display.	(N/A).	Activates all pixels of LCD display in Dark Grey.
7 - Message Center display.	LCD display in LIGHT GREY.	Message center LCD display.	(N/A).	Activates all pixels of LCD display in Light Grey.
8 - Message Center display.	LCD display in four bands black to white, top to bottom.	Message center LCD display.	(N/A).	Activates all pixels of LCD in four bands from black to white, from top to bottom.
9 - Message Center display.	LCD display in four bands dark to light left to right.	Message center LCD display.	(N/A).	Activates all pixels of LCD in four bands from dark to light, from left to right.
10 - Digital I/O.	DIGITAL I/O. <ul style="list-style-type: none"> <li>• A: XXXX</li> <li>• E: XXXX</li> <li>• B: XXXX</li> <li>• F: XXXX</li> </ul>	Cluster configuration settings.	(N/A).	Display Hex coding of cluster configuration settings ports A to H. Not defined for diagnostic purpose.

ETM Test/no.	Message Center Display	Gauge/Indicator/Display Tested.	Range	Description
	<ul style="list-style-type: none"> <li>• C: XXXX</li> <li>• G: XXXX</li> <li>• D: XXXX</li> <li>• H: XXXX</li> </ul>			
11 - Analogue Inputs.	ANALOG INPUTS. <ul style="list-style-type: none"> <li>• #: RAW - RATIO</li> <li>• 0: XXX - XXXX</li> <li>• 1: XXX - XXXX</li> <li>• 2: XXX - XXXX</li> <li>• 3: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 0 - 3. <ul style="list-style-type: none"> <li>•               <ul style="list-style-type: none"> <li>• 0 - Main beam / FTP 1</li> <li>• - Master light switch</li> <li>• 2 - Power column joystick switch</li> <li>• 3 - DI / Hazard</li> </ul> </li> </ul>
12 - Analogue Inputs.	ANALOG INPUTS. <ul style="list-style-type: none"> <li>• #: RAW - RATIO</li> <li>• 4: XXX - XXXX</li> <li>• 5: XXX - XXXX</li> <li>• 6: XXX - XXXX</li> <li>• 7: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 4 - 7. <ul style="list-style-type: none"> <li>•               <ul style="list-style-type: none"> <li>• 4 - Auto lamp sensor</li> <li>• 5 - battery in</li> <li>• 6 - Pedal position</li> <li>• 7 - Display temperature</li> </ul> </li> </ul>
13 - Analogue Inputs.	ANALOG INPUTS. <ul style="list-style-type: none"> <li>• #: RAW - RATIO</li> <li>• 8: XXX - XXXX</li> <li>• 9: XXX - XXXX</li> <li>• 10: XXX - XXXX</li> <li>• 11: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 8 - 11. <ul style="list-style-type: none"> <li>•               <ul style="list-style-type: none"> <li>• 8 - Power column Rake position</li> <li>• 9 - Power column Reach position</li> <li>• 10 - Auxiliary switch</li> <li>• 11 - Power column mode switch</li> </ul> </li> </ul>
14 - Analogue Inputs.	ANALOG INPUTS. <ul style="list-style-type: none"> <li>• #: RAW - RATIO</li> <li>• 12: XXX - XXXX</li> <li>• 13: XXX - XXXX</li> <li>• 14: XXX - XXXX</li> <li>• 15: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 12 - 15. <ul style="list-style-type: none"> <li>•               <ul style="list-style-type: none"> <li>• 12 - Not used</li> <li>• 13 - Airbag LED monitor</li> <li>• 14 - Battery voltage</li> <li>• 15 - Low brake fluid</li> </ul> </li> </ul>
15 - Analogue Inputs.	ANALOG INPUTS. <ul style="list-style-type: none"> <li>• #: RAW - RATIO</li> <li>• 16: XXX - XXXX</li> <li>• 17: XXX - XXXX</li> <li>• 18: XXX - XXXX</li> <li>• 19: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 16-19. <ul style="list-style-type: none"> <li>•               <ul style="list-style-type: none"> <li>• 16 - Fog light switch</li> <li>• 17 - Flick wipe switch</li> <li>• 18 - Int. wipe switch</li> <li>• 19 - Exit delay switch</li> </ul> </li> </ul>
16 - Analogue Inputs.	ANALOG INPUTS. <ul style="list-style-type: none"> <li>• #: RAW - Ratio</li> <li>• 20: XXX - XXXX</li> <li>• 21: XXX - XXXX</li> <li>• 22: XXX - XXXX</li> <li>• 23: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 20 - 23. <ul style="list-style-type: none"> <li>•               <ul style="list-style-type: none"> <li>• 20 - Wash wipe switch</li> <li>• 21 - Trip cycle switch</li> <li>• 22 - dimmer level</li> <li>• 23 - Master wipe switch</li> </ul> </li> </ul>
17 - Analogue Inputs.	ANALOG INPUTS. <ul style="list-style-type: none"> <li>• #: RAW - Ratio</li> <li>• 24: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 24 - 27. <ul style="list-style-type: none"> <li>•               <ul style="list-style-type: none"> <li>• 24 - Brake pad wear</li> </ul> </li> </ul>

ETM Test/no.	Message Center Display	Gauge/Indicator/Display Tested.	Range	Description
	<ul style="list-style-type: none"> <li>• 25: XXX - XXXX</li> <li>• 26: XXX - XXXX</li> <li>• 27: XXX - XXXX</li> </ul>			<ul style="list-style-type: none"> <li>• 25 - Passenger seat belt</li> <li>• 26 - Not used</li> <li>• 27 - On-board temp ref</li> </ul>
18 - Analogue Inputs.	<ul style="list-style-type: none"> <li>• ANALOG INPUTS.</li> <li>• #: RAW - Ratio</li> <li>• 28: XXX - XXXX</li> <li>• 29: XXX - XXXX</li> <li>• 30: XXX - XXXX</li> <li>• 31: XXX - XXXX</li> </ul>	Cluster inputs.	TDB.	Displays Hex coding of inputs 28 - 31. <ul style="list-style-type: none"> <li>• 28 - On-board temp</li> <li>• 29 - Not used</li> <li>• 30 - Not used</li> <li>• 31 - Not used</li> </ul>
19 - Speedometer.	SPEEDOMETER. <ul style="list-style-type: none"> <li>• RAW:</li> <li>• MPH:</li> <li>• KMH:</li> <li>• DRIVER:</li> </ul>	Speedometer inputs.		<ul style="list-style-type: none"> <li>• Displays present .</li> <li>• Speedometer inputs values;</li> <li>• Speedometer will indicate present road speed.</li> </ul>
20 - Tachometer.	TACHOMETER. <ul style="list-style-type: none"> <li>• RAW:</li> <li>• ACTUAL:</li> <li>• DRIVER:</li> </ul>	Tachometer inputs.		Displays present received Tachometer input values, tachometer will indicate present engine RPM.
21 - Fuel system.	FUEL SYSTEM. <ul style="list-style-type: none"> <li>• (A) (B)</li> <li>• RAW: X X</li> <li>• FILT: X X</li> <li>• PERCENT: X X</li> </ul>	Fuel indication system.		Displays present received fuel level A/D inputs in decimal, fuel gauge will indicate present filtered level.
22 - Battery voltage.	BATTERY VOLTAGE. <ul style="list-style-type: none"> <li>• LOCAL:</li> <li>• VEHICLE:</li> <li>• RAW:</li> <li>• A/D:</li> </ul>	Battery voltage.		Displays present received battery input voltage values. If message not received or invalid display will be ' _ _ _ '.
23 - Rolling counts.	ROLLING COUNTS. <ul style="list-style-type: none"> <li>• ODO:</li> <li>• FUEL:</li> </ul>	Odometer and fuel gauge.	0 - 255.	Displays present received odometer and fuel level input values in decimal, value is a rolling count. If either message not received or invalid respective display will be ' _ _ _ '.
24 - VAPS.	VAPS. <ul style="list-style-type: none"> <li>• CURRENT:</li> <li>• COMMAND:</li> <li>• STATUS:</li> </ul>	Variable assistance power steering (VAPS) status.		CURRENT is displayed in mA. COMMAND is last command sent to VAPS chip. STATUS is last status returned from VAPS chip.
25 - Module status.	MODULE STATUS. <ul style="list-style-type: none"> <li>• IGN</li> <li>• DSC</li> <li>• ACC</li> <li>• ADCM</li> </ul>	Provides status of; Ignition (IGN), Dynamic Stability Control (DSC), Adaptive Cruise Control (ACC) and Adaptive damping control module (ADCM) modules.	<ul style="list-style-type: none"> <li>• CONNECTED</li> <li>• WAITING</li> <li>• MISSING</li> <li>• FAULTY.</li> </ul>	<ul style="list-style-type: none"> <li>• Communication (Coms) ok</li> <li>• Coms not received, not an issue</li> <li>• Coms never received</li> <li>• Coms error .</li> </ul>
26 - Module status.	MODULE STATUS. <ul style="list-style-type: none"> <li>• EPB</li> <li>• PIE</li> <li>• RCM</li> <li>• TCM</li> </ul>	Provides status of; Electronic park brake (EPB), Pedestrian Impact ECU (PIE), Restraints control module (RCM) and Traction control module (TCM), modules..	<ul style="list-style-type: none"> <li>• CONNECTED</li> <li>• WAITING</li> <li>• MISSING</li> <li>• FAULTY.</li> </ul>	<ul style="list-style-type: none"> <li>• Communication (Coms) ok</li> <li>• Coms not received, not an issue</li> <li>• Coms never received</li> <li>• Coms error .</li> </ul>
27 - Module status.	MODULE STATUS. <ul style="list-style-type: none"> <li>• ECM</li> <li>• RCC</li> </ul>	Provides status of; Engine control module (ECM), Rear Climate Control (RCC), Driver Door Control (DDC) and	<ul style="list-style-type: none"> <li>• CONNECTED</li> <li>• WAITING</li> <li>• MISSING</li> </ul>	<ul style="list-style-type: none"> <li>• Communication (Coms) ok</li> <li>• Coms not received, not an issue</li> </ul>

ETM Test/no.	Message Center Display	Gauge/Indicator/Display Tested.	Range	Description
	<ul style="list-style-type: none"> <li>• DDC</li> <li>• PDC</li> </ul>	Passenger Door Control (PDC) modules..	<ul style="list-style-type: none"> <li>• FAULTY.</li> </ul>	<ul style="list-style-type: none"> <li>• Coms never received</li> <li>• Coms error .</li> </ul>
28 - Module status.	MODULE STATUS. <ul style="list-style-type: none"> <li>• KVM</li> <li>• DSM</li> <li>• ICM</li> <li>• ICP</li> </ul>	Provides status of; Keyless vehicle module (KVM), Drivers seat module (DSM), Infotainment control module (ICM) and Integrated control panel (ICP) modules..	<ul style="list-style-type: none"> <li>• CONNECTED</li> <li>• WAITING</li> <li>• MISSING</li> <li>• FAULTY.</li> </ul>	<ul style="list-style-type: none"> <li>• Communication (Coms) ok</li> <li>• Coms not received, not an issue</li> <li>• Coms never received</li> <li>• Coms error .</li> </ul>
29 - Module status.	MODULE STATUS. <ul style="list-style-type: none"> <li>• FSJB</li> <li>• RSJB</li> <li>• TPMS</li> <li>• AFLS</li> </ul>	Provides status of; Front smart junction box (FSJB), Rear smart junction box (RSJB), Tyre pressure monitoring system (TPMS) and Adaptive front lighting system (AFLS) modules.	<ul style="list-style-type: none"> <li>• CONNECTED</li> <li>• WAITING</li> <li>• MISSING</li> <li>• FAULTY.</li> </ul>	<ul style="list-style-type: none"> <li>• Communication (Coms) ok</li> <li>• Coms not received, not an issue</li> <li>• Coms never received</li> <li>• Coms error .</li> </ul>
30 - Module status.	MODULE STATUS. <ul style="list-style-type: none"> <li>• PATS</li> <li>• BSM</li> <li>• GSM</li> <li>• SCU</li> </ul>	Provides status of; Passive anti-theft system (PATS), Blind Spot Monitoring (BSM), Gear shift module (GSM) and Starter Control Unit (SCU) modules.	<ul style="list-style-type: none"> <li>• CONNECTED</li> <li>• WAITING</li> <li>• MISSING</li> <li>• FAULTY.</li> </ul>	<ul style="list-style-type: none"> <li>• Communication (Coms) ok</li> <li>• Coms not received, not an issue</li> <li>• Coms never received</li> <li>• Coms error .</li> </ul>
31- Back to test 2.	GAUGE SWEEP.	Tachometer and speedometer.	N/A.	Repeats display cycle from test 2.

1. If the cause is not visually evident, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

## DTC Index



**CAUTION:** When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

### NOTES:



If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.



Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give extra information read by the manufacturer-approved diagnostic system).



When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.



Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.



If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action
B100811	Wiper Mode Switch	<ul style="list-style-type: none"> <li>• Master wiper switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check master wiper switch circuit for short to ground
B100815	Wiper Mode Switch	<ul style="list-style-type: none"> <li>• Master wiper switch circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check master wiper switch circuit for short to power, open circuit
B100951	Ignition Authorisation	<ul style="list-style-type: none"> <li>• Instrument cluster power and ground supply circuits - short, open circuit</li> <li>• Target SID synchronization error following re-programming</li> <li>• CAN fault</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check instrument cluster power and ground supply circuits for short, open circuit. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system. Check CAN communications between instrument cluster and tester

<b>DTC</b>	<b>Description</b>	<b>Possible Cause</b>	<b>Action</b>
B100962	Ignition Authorisation	<ul style="list-style-type: none"> <li>• LS CAN fault</li> <li>• CJB ignition, power and ground supply circuits - short, open circuit</li> <li>• Instrument cluster power and ground supply circuits - short, open circuit</li> <li>• Incorrect CJB or instrument cluster installed</li> <li>• Target SID synchronization error following re-programming</li> <li>• Noise/EMC related error</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communications between CJB and instrument cluster. Refer to the electrical circuit diagrams and check CJB ignition, power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check correct CJB and instrument cluster installed. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system. Check CAN network for interference/EMC related issues
B100987	Ignition Authorisation	<ul style="list-style-type: none"> <li>• CJB ignition, power and ground supply circuits - short, open circuit</li> <li>• LS CAN fault</li> <li>• Instrument cluster power and ground supply circuits - short, open circuit</li> <li>• Low battery voltage &lt;9 volts</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check CJB ignition, power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check CAN communications between CJB and instrument cluster. Check battery is in serviceable condition and fully charged
B100A62	Fuel Pump Authorisation	<ul style="list-style-type: none"> <li>• LS CAN fault</li> <li>• RJB power and ground supply circuits - short, open circuit</li> <li>• Instrument cluster power and ground supply circuits - short, open circuit</li> <li>• Incorrect RJB or instrument cluster installed</li> <li>• Target SID synchronization error following re-programming</li> <li>• Noise/EMC related error</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communications between RJB and instrument cluster. Refer to the electrical circuit diagrams and check RJB power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check correct RJB and instrument cluster installed. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system. Check CAN network for interference/EMC related issues
B100A64	Fuel Pump Authorisation	<ul style="list-style-type: none"> <li>• Target SID synchronization error following re-programming</li> <li>• RJB power and ground supply circuits - short, open circuit</li> <li>• LS CAN fault</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check RJB power and ground supply circuits for short, open circuit. Check CAN communications between RJB and instrument cluster
B100A87	Fuel Pump Authorisation	<ul style="list-style-type: none"> <li>• RJB power and ground supply circuits - short, open circuit</li> <li>• LS CAN fault</li> <li>• Instrument cluster power and ground supply circuits - short, open circuit</li> <li>• Low battery voltage &lt;9 volts</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check RJB power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check CAN communications between RJB and instrument cluster. Check battery is in serviceable condition and fully charged
B100B67	Column Lock Ground Authorisation	<ul style="list-style-type: none"> <li>• Algorithm based failure-signal is incorrect after the event</li> <li>• Instrument cluster power and ground supply circuits - short, open circuit</li> <li>• LS CAN fault</li> <li>• RJB power and ground supply circuits - short, open circuit</li> <li>• Vehicle speed present when attempting to power ESCL</li> <li>• Engine speed present when attempting to power ESCL</li> <li>• PowerMode status &gt; 4 when attempting to perform lock action</li> </ul>	If a non start issue has not been identified, clear the DTC and check vehicle starts correctly. If a non start issue has been identified run the manufacturers approved diagnostic system Start Authorisation Application. Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check RJB power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check CAN communications between RJB and instrument cluster. Check for invalid vehicle speed signal from ABS/instrument cluster gateway. Check for invalid engine speed signal from ECM/instrument cluster gateway. Check for invalid signal from CJB
B100B87	Column Lock Ground Authorisation	<ul style="list-style-type: none"> <li>• Instrument cluster power and ground supply circuits - short, open circuit</li> <li>• LS CAN fault</li> <li>• RJB power and ground supply circuits - short, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check RJB power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check CAN communications between RJB and instrument cluster

DTC	Description	Possible Cause	Action
B100C67	Column Lock Supply Authorisation	<ul style="list-style-type: none"> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>LS CAN fault</li> <li>CJB power and ground supply circuits - short, open circuit</li> <li>Vehicle speed present when attempting to power ESCL</li> <li>Engine speed present when attempting to power ESCL</li> <li>PowerMode status &gt; 4 when attempting to perform lock action</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check CJB power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check CAN communications between CJB and instrument cluster. Check for invalid vehicle speed signal from ABS/instrument cluster gateway. Check for invalid engine speed signal from ECM/instrument cluster gateway. Check for invalid signal from CJB
B100C87	Column Lock Supply Authorisation	<ul style="list-style-type: none"> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>LS CAN fault</li> <li>CJB power and ground supply circuits - short, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check CJB power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check CAN communications between CJB and instrument cluster
B100D62	Column Lock Authorisation	<ul style="list-style-type: none"> <li>CAN fault</li> <li>ESCL power and ground supply circuits - short, open circuit</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Incorrect ESCL or instrument cluster installed</li> <li>Target SID synchronization error following re-programming</li> <li>Noise/EMC related error</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communication between Electronic Steering Column Lock and instrument cluster. Refer to the electrical circuit diagrams and check Electronic Steering Column Lock power and ground supply circuits for short, open circuit and Instrument cluster power and ground supply circuits for short, open circuit. Check correct Electronic Steering Column Lock and instrument cluster installed. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system. Check CAN network for interference/EMC related issues
B100D64	Column Lock Authorisation	<ul style="list-style-type: none"> <li>Algorithm based failure-signal plausibility failure</li> <li>CAN fault</li> <li>ESCL power and ground supply circuits - short, open circuit</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> </ul>	If the customer has not reported a non start issue, clear the DTC and check vehicle starts correctly. If a non start issue has been reported run the manufacturers approved diagnostic system Start Authorisation Application and follow the actions required for this DTC. Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communication between Electronic Steering Column Lock and instrument cluster (check transmission out speed, vehicle speed, engine speed, gear position and powermode signals to Electronic Steering Column Lock). Refer to the electrical circuit diagrams and check Electronic Steering Column Lock power and ground supply circuits for short, open circuit and Instrument cluster power and ground supply circuits for short, open circuit.
B100D87	Column Lock Authorisation - Missing message	<ul style="list-style-type: none"> <li>Missing message</li> <li>CAN fault</li> <li>No response from electric steering column lock control module, instrument cluster, central junction box Battery</li> <li>voltage at electric steering column lock control module too low</li> <li>Electric steering column lock control module, instrument cluster, central junction box fault</li> </ul>	<ul style="list-style-type: none"> <li>Clear DTC, repeatedly lock and unlock car using the key fob and retest. Check for related DTCs and refer to the relevant DTC index</li> <li>If the fault is cleared, notify the customer that the steering column lock may fail to unlock if the vehicle is parked with a high steering angle or with the road wheel against a curb. If the column lock is failing to disengage, the customer may be able to rectify this by rotating the steering wheel while pressing the engine start button</li> <li>If fault persists, complete a CAN network integrity test using the manufacturers approved diagnostic system. Alternatively, refer to the electrical circuit diagrams and check CAN circuits between the central junction box, the instrument cluster and the electronic steering column lock. Refer to the electrical circuit diagrams and check the central junction box, the instrument cluster and the electronic steering column lock power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance. Repair circuit(s) as required. Clear DTC, perform an on demand self-test and retest</li> <li>If fault persists, check that the vehicle battery supply voltage is between 9-16 volts. Rectify as required</li> </ul>

DTC	Description	Possible Cause	Action
B100D96	Column Lock Authorisation - Component internal failure	<ul style="list-style-type: none"> <li>Battery voltage at electric steering column lock control module too low</li> <li>Torque load on steering column</li> <li>CAN fault</li> <li>Electric steering column lock control module - Internal failure</li> </ul>	<ul style="list-style-type: none"> <li>Clear DTC, repeatedly lock and unlock car using the key fob and retest</li> <li>If fault persists, check that the vehicle battery supply voltage is between 9-16 volts. Rectify as required</li> <li>Ensure the column lock bolt movement is not obstructed or restricted (the parked position of the road wheels may be exerting a turning force through the steering column, preventing the lock from releasing. The steering wheel may need to be held against the force to allow the column lock to release). Clear DTC, repeatedly lock and unlock car using the key fob and retest</li> <li>If fault persists, complete a CAN network integrity test using the manufacturers approved diagnostic system. Alternatively, refer to the electrical circuit diagrams and check CAN circuits between the central junction box, the instrument cluster and the electronic steering column lock. Refer to the electrical circuit diagrams and check the central junction box, the instrument cluster and the electronic steering column lock power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance. Repair circuit(s) as required. Clear DTC, perform an on demand self-test and retest</li> <li>If fault persists, check and install a new electric steering column lock control module as required</li> </ul>
B102487	Start Control Unit	<ul style="list-style-type: none"> <li>Smart card docking station failure - slave node not responding</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check the smart card docking station LIN circuit for short, open circuit. Suspect the smart card docking station, check and install a new docking station as required, refer to the new module/component installation note at the top of the DTC Index
B104611	Front Fog Lamp Control Switch	<ul style="list-style-type: none"> <li>Fog lamp switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check fog lamp switch circuit for short to ground
B104615	Front Fog Lamp Control Switch	<ul style="list-style-type: none"> <li>Fog lamp switch circuit - short to power, open circuit</li> </ul>	Refer to the electrical circuit diagrams and check fog lamp switch circuit for short to power, open circuit
B104811	Brake Fluid Level Switch	<ul style="list-style-type: none"> <li>Brake fluid level switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check brake fluid level switch circuit for short to ground
B10A011	Wiper/ Washer Switch	<ul style="list-style-type: none"> <li>Wash/wipe circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check wash/wipe circuit for short to ground
B10A015	Wiper/ Washer Switch	<ul style="list-style-type: none"> <li>Wash/wipe circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check wash/wipe circuit for short to power, open circuit
B10A611	Main Light Switch	<ul style="list-style-type: none"> <li>Master lighting switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check master lighting switch circuit for short to ground
B10A615	Main Light Switch	<ul style="list-style-type: none"> <li>Master lighting switch circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check master lighting switch circuit for short to power, open circuit
B112B87	Steering Wheel Module	<ul style="list-style-type: none"> <li>Steering wheel module failure - slave node not responding</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check the clockspring LIN circuit for short, open circuit. Suspect the clockspring, check and install a new clockspring as required, refer to the new module/component installation note at the top of the DTC Index
B115C7A	Transfer Fuel Pump	<ul style="list-style-type: none"> <li>Fuel pump system fault</li> </ul>	Check for fuel system jet pump or jet pump fuel level sensor fault
B1A8515	Ambient Light Sensor	<ul style="list-style-type: none"> <li>Autolamp sensor circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check autolamp sensor circuit for short to power, open circuit

<b>DTC</b>	<b>Description</b>	<b>Possible Cause</b>	<b>Action</b>
B1B0100	Key Transponder	<ul style="list-style-type: none"> <li>Operator only cycles one key</li> <li>During transponder key programming the instrument cluster, smartcard docking station or key loses power/circuit failure</li> <li>Faulty key during key programming</li> <li>Unable to program transponder key due to noise/EMC related error</li> </ul>	Ensure all keys to be programmed are available. Refer to electrical circuit diagrams and check power and ground supply circuits to all relevant modules. Replace faulty key and repeat key programming. Check CAN network for interference/EMC related issues
B1B0105	Key Transponder	<ul style="list-style-type: none"> <li>Error following SCU replacement</li> <li>Smartcard docking station power and ground supply circuits - short, open circuit</li> <li>LIN fault</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check smartcard docking station power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check LIN communications between smartcard docking station and instrument cluster
B1B0151	Key Transponder	<ul style="list-style-type: none"> <li>LIN fault</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Key fault</li> <li>Smartcard docking station power and ground supply circuits - short, open circuit</li> <li>Attempted to program a non default key</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check LIN communications between smartcard docking station and instrument cluster. Refer to the electrical circuit diagrams and check smartcard docking station power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Confirm transponder key operation. Ensure new keys are from a known source
B1B0155	Key Transponder	<ul style="list-style-type: none"> <li>Un-programmed key inserted in SCU2</li> <li>A non default key inserted during key programming</li> </ul>	Confirm the correct keys are used
B1B0162	Key Transponder	<ul style="list-style-type: none"> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Smartcard docking station power and ground supply circuits - short, open circuit</li> <li>Incorrect instrument cluster or smartcard docking station installed</li> <li>Error during or following the Write Target SID routine</li> <li>Noise/EMC related error</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check smartcard docking station power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check correct instrument cluster and smartcard docking station are installed. Perform the Immobilisation application from the Set-Up menu using the manufacturer approved diagnostic system. Check CAN network for interference/EMC related issues
B1B0164	Key Transponder	<ul style="list-style-type: none"> <li>LIN fault</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Transponder key fault</li> <li>Smartcard docking station power and ground supply circuits - short, open circuit</li> <li>Error occurred during transponder key programming</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check LIN communications between smartcard docking station and instrument cluster. Refer to the electrical circuit diagrams and check smartcard docking station power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Confirm transponder key operation. Repeat transponder key programming
B1B0167	Key Transponder	<ul style="list-style-type: none"> <li>LIN fault</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Transponder key fault</li> <li>Smartcard docking station power and ground supply circuits - short, open circuit</li> <li>Another key in close proximity</li> <li>Instrument cluster in incorrect</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check LIN communications between smartcard docking station and instrument cluster. Refer to the electrical circuit diagrams and check smartcard docking station power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Confirm transponder key operation. Confirm single key operation. Ensure instrument cluster in correct mode i.e. Auto Enable, Key erase etc. Ensure new keys are from a known source. Check for intermittent power and ground to

DTC	Description	Possible Cause	Action
		<ul style="list-style-type: none"> <li>programming state</li> <li>Attempted to program a non default key</li> <li>Instrument cluster Cold init whilst in Ignition On state, without key being present in the SCU</li> <li>Race condition caused by closing driver door and pressing the start button within a small time window</li> <li>Passive Key search function from last door closed and key inserted in the SCU</li> </ul>	instrument cluster. Design condition - advise customer of starting sequence. Design condition - determine customer transponder key usage
B1B0187	Key Transponder	<ul style="list-style-type: none"> <li>LIN fault</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Smartcard docking station power and ground supply circuits - short, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check LIN communications between smartcard docking station and instrument cluster. Refer to the electrical circuit diagrams and check smartcard docking station power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit
B1B3305	Target I.D. Transfer	<ul style="list-style-type: none"> <li>CAN fault</li> <li>ECM ignition, power and ground supply circuits - short, open circuit</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>ECM or instrument cluster incorrectly configured</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communications between ECM and instrument cluster. Refer to electrical circuit diagrams and check ECM ignition, power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system
B1B3362	Target I.D. Transfer	<ul style="list-style-type: none"> <li>CAN fault</li> <li>ECM ignition, power and ground supply circuits - short, open circuit</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Incorrect ECM or instrument cluster installed</li> <li>Synchronisation error following re-programming</li> <li>Noise/EMC related error</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communications between ECM and instrument cluster. Refer to electrical circuit diagrams and check ECM ignition, power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check correct ECM and instrument cluster installed. Perform the Immobilisation application from the Set-up menu using the manufacturer approved diagnostic system. Check CAN network for interference/EMC related issues
B1B3364	Target identification transfer	<ul style="list-style-type: none"> <li>Algorithm based failure - signal plausibility failure</li> <li>CAN fault</li> <li>ECM ignition, power and ground supply circuits - short, open circuit</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>electronic steering column lock status incomplete</li> <li>Race condition caused by closing driver door and pressing the start button within a small time window</li> </ul>	If the customer has not reported a non start issue, clear the DTC and check vehicle starts correctly. If a non start has been reported run the manufacturers approved diagnostic system Start Authorisation Application and follow the actions required for this DTC. Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communications between ECM and instrument cluster. Refer to electrical circuit diagrams and check ECM ignition, power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check electronic steering column lock operation. Advise customer of starting sequence and to allow time to elapse between closing door and pressing start button.
B1B3387	Target I.D. Transfer	<ul style="list-style-type: none"> <li>CAN fault</li> <li>ECM ignition, power and ground supply circuits - short, open circuit</li> <li>Instrument cluster power and ground supply circuits - short, open circuit</li> <li>Low battery voltage</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CAN communications between ECM and instrument cluster. Refer to electrical circuit diagrams and check ECM ignition, power and ground supply circuits for short, open circuit and instrument cluster power and ground supply circuits for short, open circuit. Check battery is in serviceable condition and is fully charged, check terminals etc

<b>DTC</b>	<b>Description</b>	<b>Possible Cause</b>	<b>Action</b>
B1C3277	Steering Column Tilt Solenoid	<ul style="list-style-type: none"> <li>TILT axis fails to move minimum distance within allotted time period. Motion may have been prohibited due to motor jamming, stalling or solenoid pin not engaging</li> </ul>	Check for restricted/jammed steering column motor mechanism. Refer to the electrical circuit diagrams and check steering column motor UP/IN, DOWN/OUT circuit for short, open circuit
B1C3294	Steering Column Tilt Solenoid	<ul style="list-style-type: none"> <li>TELE axis moves when it has not been commanded to. Motion may have occurred due to solenoid pin not disengaging or mechanism has been jammed on, whilst REACH axis has been commanded to move</li> </ul>	Check for stuck/jammed solenoid/switch. Refer to the electrical circuit diagrams and check steering column motor UP/IN, DOWN/OUT circuit for short, open circuit
B1C3312	Steering Column Tilt Feedback Signal	<ul style="list-style-type: none"> <li>Steering column tilt feedback signal circuit - short to power</li> </ul>	Refer to the electrical circuit diagrams and check steering column tilt feedback signal circuit for short to power
B1C3314	Steering Column Tilt Feedback Signal	<ul style="list-style-type: none"> <li>Steering column tilt feedback signal circuit - short to ground, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check steering column tilt feedback signal circuit for short to ground, open circuit
B1C3477	Steering Column Telescope Solenoid	<ul style="list-style-type: none"> <li>REACH axis fails to move minimum distance within allotted time period. Motion may have been prohibited due to motor jamming, stalling or solenoid pin not engaging</li> </ul>	Check for restricted/jammed steering column motor mechanism. Refer to the electrical circuit diagrams and check steering column motor UP/IN, DOWN/OUT circuit for short, open circuit
B1C3494	Steering Column Telescope Solenoid	<ul style="list-style-type: none"> <li>REACH axis moves when it has not been commanded to. Motion may have occurred due to solenoid pin not disengaging or mechanism has been jammed on, whilst TILT axis has been commanded to move</li> </ul>	Check for stuck/jammed solenoid/switch. Refer to the electrical circuit diagrams and check steering column motor UP/IN, DOWN/OUT circuit for short, open circuit
B1C3512	Steering Column Telescope Feedback Signal	<ul style="list-style-type: none"> <li>Steering column TELE feedback signal circuit - short to power</li> </ul>	Refer to the electrical circuit diagrams and check steering column TELE feedback signal circuit for short to power
B1C3514	Steering Column Telescope Feedback Signal	<ul style="list-style-type: none"> <li>Steering column TELE feedback signal circuit - short to ground, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check steering column TELE feedback signal circuit for short to ground, open circuit
B1C3611	Steering Column Tilt/Telescope Switch	<ul style="list-style-type: none"> <li>Steering column adjust switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check steering column adjust switch circuit for short to ground
B1C4811	Flash to Pass Switch	<ul style="list-style-type: none"> <li>Main beam flash switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check main beam flash switch circuit for short to ground
B1C4815	Flash to Pass Switch	<ul style="list-style-type: none"> <li>Main beam flash switch circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check main beam flash switch circuit for short to power, open circuit
B1C5311	Front Wiper Intermittent Data	<ul style="list-style-type: none"> <li>Intermittent wipe switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check intermittent wipe switch circuit for short to ground
B1C5315	Front Wiper Intermittent Data	<ul style="list-style-type: none"> <li>Intermittent wipe switch circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check intermittent wipe switch circuit for short to power, open circuit
B1D3611	Turn Indicator Switch	<ul style="list-style-type: none"> <li>Direction indicator switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check direction indicator switch circuit for short to ground

<b>DTC</b>	<b>Description</b>	<b>Possible Cause</b>	<b>Action</b>
B1D3615	Turn Indicator Switch	<ul style="list-style-type: none"> <li>Direction indicator switch circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check direction indicator switch circuit for short to power, open circuit
B1D3711	Wiper Switch Connection Circuit	<ul style="list-style-type: none"> <li>Flick wipe switch circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check flick wipe switch circuit for short to ground
B1D3715	Wiper Switch Connection Circuit	<ul style="list-style-type: none"> <li>Flick wipe switch circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check flick wipe switch circuit for short to power, open circuit
C111064	Power steering Calibration Data	<ul style="list-style-type: none"> <li>Invalid VAPS curve loaded</li> </ul>	Re-configure the instrument cluster as new to download VAPS curve data
P063511	Power Steering Control Circuit	<ul style="list-style-type: none"> <li>VAPS ignition supply circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check VAPS ignition supply circuit for short to ground
P063512	Power Steering Control Circuit	<ul style="list-style-type: none"> <li>VAPS ignition supply circuit - short to power</li> </ul>	Refer to the electrical circuit diagrams and check VAPS ignition supply circuit for short to power
P063513	Power Steering Control Circuit	<ul style="list-style-type: none"> <li>VAPS ignition supply circuit - open circuit</li> </ul>	Refer to the electrical circuit diagrams and check VAPS ignition supply circuit for open circuit
P063522	Power Steering Control Circuit	<ul style="list-style-type: none"> <li>First valid received speed value above threshold</li> </ul>	Check ABS module for DTCs and refer to relevant DTC Index
P063544	Power Steering Control Circuit	<ul style="list-style-type: none"> <li>Data memory failure</li> </ul>	Re-configure the instrument cluster as new to download VAPS curve data
U000188	High Speed CAN Communication Bus	<ul style="list-style-type: none"> <li>Bus Off</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Carry out CAN network integrity test using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check HS CAN network to instrument cluster
U001088	Medium Speed CAN Communication Bus	<ul style="list-style-type: none"> <li>Bus Off</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Carry out CAN network integrity test using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check MS CAN network to instrument cluster
U010000	Lost Communication With ECM/PCM "A"	<ul style="list-style-type: none"> <li>Loss of CAN communication with ECM</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check ECM for DTCs and refer to the relevant DTC Index
U010100	Lost Communication with TCM	<ul style="list-style-type: none"> <li>Loss of CAN communication with TCM</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check TCM for DTCs and refer to the relevant DTC Index
U010300	Lost Communication With Gear Shift Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with transmission shift module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check transmission shift module for DTCs and refer to the relevant DTC Index
U010400	Lost Communication With Cruise Control Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with speed control module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check speed control module for DTCs and refer to the relevant DTC Index
U012100	Lost Communication With Anti-Lock Brake System (ABS) Control Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with ABS module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check ABS module for DTCs and refer to the relevant DTC Index
U012700	Lost Communication With Tire Pressure Monitor Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with tire pressure monitoring module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check tire pressure monitoring module for DTCs and refer to the relevant DTC Index
U012800	Lost Communication With Park Brake Control Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with parking brake module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check parking brake module for DTCs and refer to the relevant DTC Index

<b>DTC</b>	<b>Description</b>	<b>Possible Cause</b>	<b>Action</b>
U013900	Lost Communication with Suspension Control Module 'B'	<ul style="list-style-type: none"> <li>Loss of CAN communication with adaptive damping module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check adaptive damping module for DTCs and refer to the relevant DTC Index
U014000	Lost Communication With Body Control Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with CJB</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CJB for DTCs and refer to the relevant DTC Index
U014200	Lost Communication With Body Control Module "B"	<ul style="list-style-type: none"> <li>Loss of CAN communication with RJB</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check RJB for DTCs and refer to the relevant DTC Index
U015100	Lost Communication With Restraints Control Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with RCM</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check RCM for DTCs and refer to the relevant DTC Index
U015600	Lost Communication with Information Centre 'A'	<ul style="list-style-type: none"> <li>Loss of CAN communication with information and entertainment control module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check information and entertainment control module for DTCs and refer to the relevant DTC Index
U016400	Lost Communication with HVAC Control Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with climate control module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check climate control module for DTCs and refer to the relevant DTC Index
U019900	Lost Communication with Door Control Module 'A'	<ul style="list-style-type: none"> <li>Loss of CAN communication with driver door module (DDM)</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check DDM for DTCs and refer to the relevant DTC Index
U020000	Lost Communication with Door Control Module 'B'	<ul style="list-style-type: none"> <li>Loss of CAN communication with passenger door module (PDM)</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check PDM for DTCs and refer to the relevant DTC Index
U020800	Lost Communication with Seat Control Module 'A'	<ul style="list-style-type: none"> <li>Loss of CAN communication with driver seat module (DSM)</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check DSM for DTCs and refer to the relevant DTC Index
U021400	Lost Communication with Remote Function Actuation	<ul style="list-style-type: none"> <li>Loss of CAN communication with keyless vehicle module (KVM)</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check KVM for DTCs and refer to the relevant DTC Index
U024100	Lost Communication with Headlamp Control Module 'A'	<ul style="list-style-type: none"> <li>Loss of CAN communication with headlamp control module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check headlamp control module for DTCs and refer to the relevant DTC Index
U025000	Lost Communication with Impact Classification System Module	<ul style="list-style-type: none"> <li>Loss of CAN communication with pedestrian protection module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check pedestrian protection module for DTCs and refer to the relevant DTC Index
U025600	Lost Communication with Front Controls Interface Module 'A'	<ul style="list-style-type: none"> <li>Loss of CAN communication with integrated control panel</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check integrated control panel for DTCs and refer to the relevant DTC Index
U030000	Internal Control Module Software Incompatibility	<ul style="list-style-type: none"> <li>Invalid configuration message is received</li> </ul>	Re-configure the RJB using the manufacturer approved diagnostic system. Clear the DTC and retest. If the DTC is still logged suspect the instrument cluster; refer to the new module/component installation note at the top of the DTC Index
U040268	Invalid data received from TCM	<ul style="list-style-type: none"> <li>Algorithm based failures - events information</li> </ul>	Check TCM for DTCs and refer to the relevant DTC Index
U200411	Auxiliary Switch Pack	<ul style="list-style-type: none"> <li>Auxiliary switch signal circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check auxiliary switch signal circuit for short to ground
U200415	Auxiliary Switch Pack	<ul style="list-style-type: none"> <li>Auxiliary switch signal circuit - short to power, open circuit</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check auxiliary switch signal circuit for short to power, open circuit

<b>DTC</b>	<b>Description</b>	<b>Possible Cause</b>	<b>Action</b>
U300046	Control Module	<ul style="list-style-type: none"> <li>• Calibration/parameter memory failure</li> </ul>	Suspect the instrument cluster, check and install a new instrument cluster as required, refer to the new module/component installation note at the top of the DTC Index
U300049	Control Module	<ul style="list-style-type: none"> <li>• Internal electronic failure</li> </ul>	Suspect the instrument cluster, check and install a new instrument cluster as required, refer to the new module/component installation note at the top of the DTC Index
U300055	Control Module	<ul style="list-style-type: none"> <li>• Incorrect car configuration data received</li> </ul>	Re-configure the RJB using the manufacturer approved diagnostic system. Clear DTC and re-test. If the DTC remains suspect the instrument cluster. Check and install a new instrument cluster as required, refer to the new module/component installation note at the top of the DTC Index
U300087	Control Module	<ul style="list-style-type: none"> <li>• Missing message</li> </ul>	Re-configure the RJB using the manufacturer approved diagnostic system. Check instrument cluster for additional DTCs and refer to the DTC Index. Carry out CAN network integrity tests using the manufacturer approved diagnostic system. If DTC remains suspect the instrument cluster. Check and install a new instrument cluster as required, refer to the new module/component installation note at the top of the DTC Index
U300281	Vehicle Identification Number	<ul style="list-style-type: none"> <li>• Vehicle/component mis-match. Corrupt VIN data being transmitted, instrument cluster previously installed to other vehicle</li> </ul>	Check and install original/new instrument cluster as required, refer to the new module/component installation note at the top of the DTC Index
U300316	Battery Voltage	<ul style="list-style-type: none"> <li>• Instrument cluster logic power supply circuit - voltage below threshold</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check instrument cluster logic power supply circuit for short to ground, open circuit
U300317	Battery Voltage	<ul style="list-style-type: none"> <li>• Instrument cluster logic power supply circuit - circuit voltage above threshold</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check charging system for over charging condition
U300362	Battery Voltage	<ul style="list-style-type: none"> <li>• Mis-match in battery voltage, of 2 volts or more, between instrument cluster and RJB</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check instrument cluster logic power supply circuit for short, open circuit

# Instrument Cluster - Instrument Cluster

Removal and Installation

## Removal



**CAUTION:** If a new instrument cluster is to be installed, the diagnostic tool must be connected prior to removal, the data must then be downloaded from it and the keys (remote control handsets) set into default mode. Failure to follow this instruction will result in permanent damage to the keys.

NOTES:



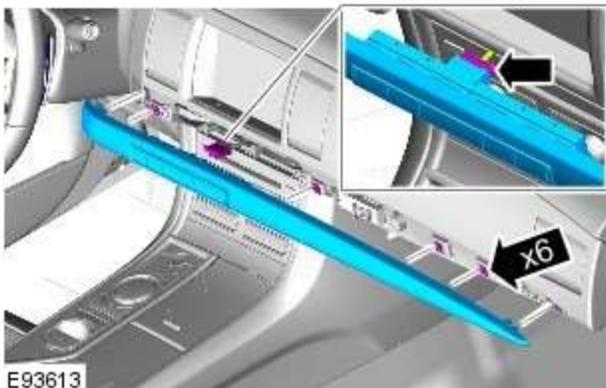
If a new instrument cluster is to be installed, make sure that all keys (remote control handsets) are present.



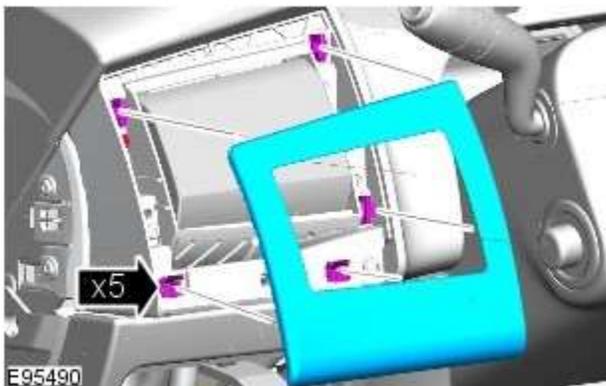
Removal steps in this procedure may contain installation details.

1. Fully extend and lower the steering column for access.
2. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

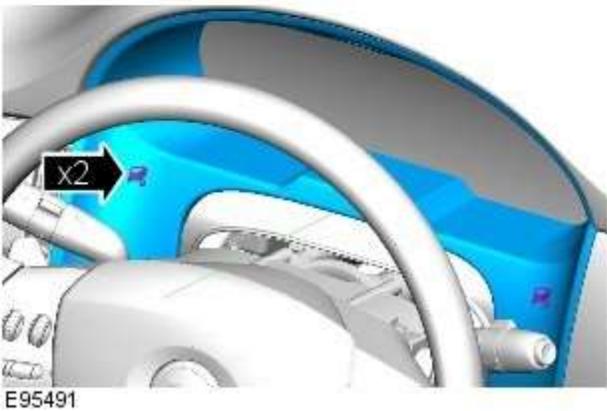
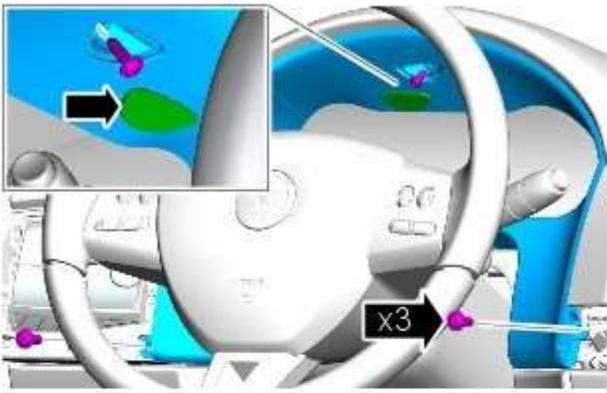
3.



4.

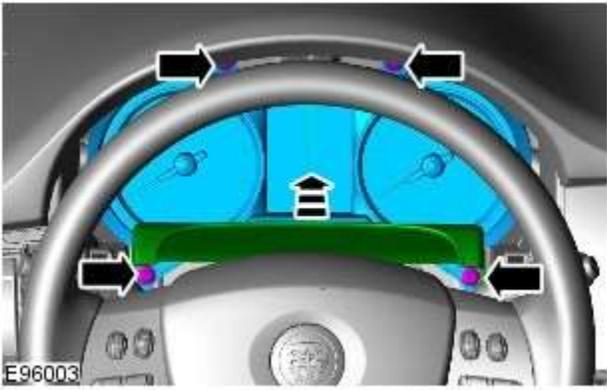


5.



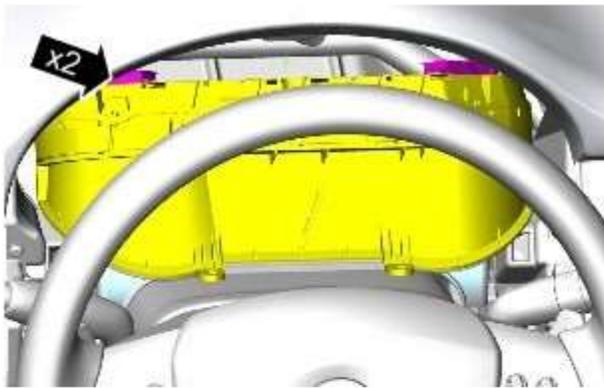
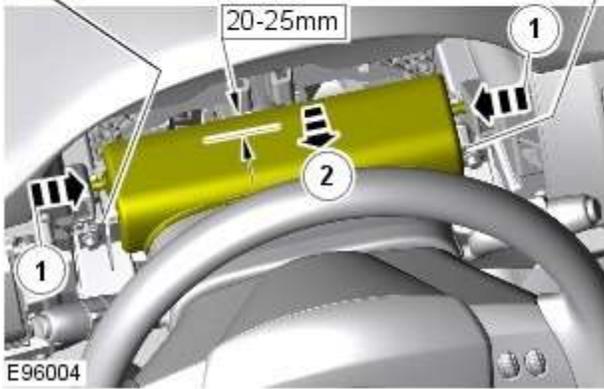
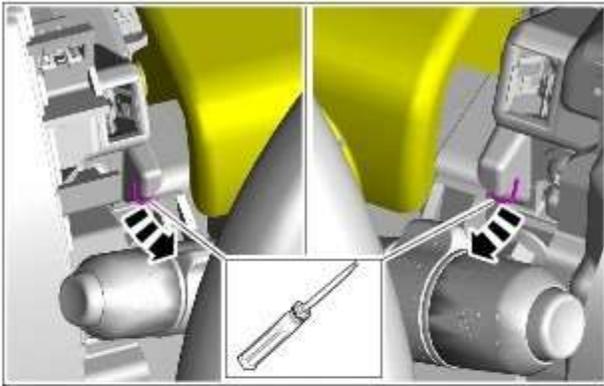
E95491

6.



E96003

7.



E96005

8.  CAUTION: Take extra care not to damage the instrument cluster face.

## **Installation**

1. To install, reverse the removal procedure.
2. Configure the instrument cluster and ignition keys using the diagnostic tool.

# Instrument Cluster - Instrument Cluster Lens

Removal and Installation

## Removal

1. Fully extend the steering column for access.

2. Disconnect the battery ground cable.

Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

3. Refer to: [Instrument Cluster](#) (413-01 Instrument Cluster, Removal and Installation).



E142894



4. **CAUTION:** To prevent static damage to the circuits, place the instrument cluster inside the electro static discharge bag and use the gloves provided during this procedure.

5.



E145564

6.



E145565



7.  CAUTION: Take care not to damage the dials.



E145566

## Installation

1. NOTE: Take care not to leave finger prints inside the new lens.



E145567

2. Refer to: [Instrument Cluster](#) (413-01 Instrument Cluster, Removal and Installation).

3. Disconnect the battery ground cable.

Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

**Horn -**

Description	Nm	lb-ft	lb-in
Vehicle horn retaining bolt	25	18	-

## Horn - Horn

Removal and Installation

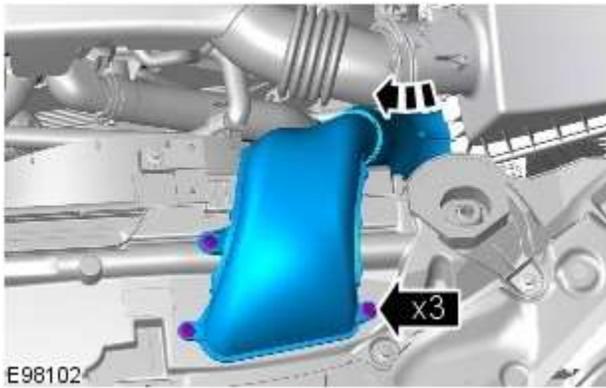
### Removal



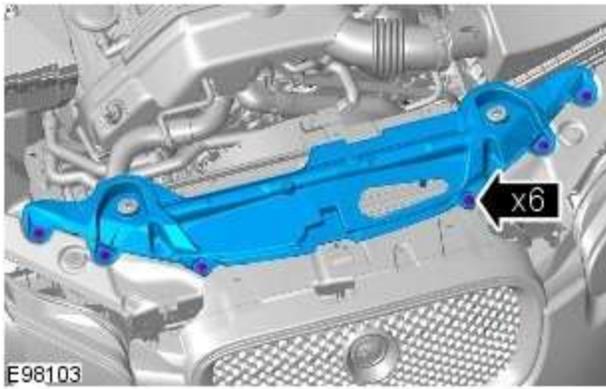
NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

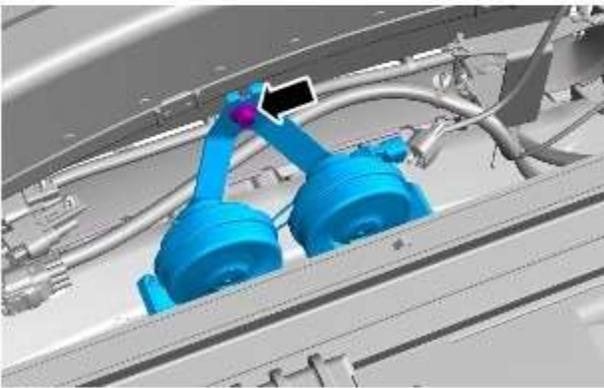
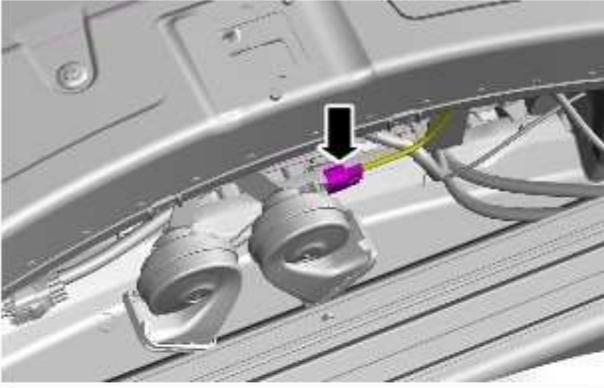
2. *Torque: 7 Nm*



3. *Torque: 7 Nm*



4. *Torque:* 25 Nm



E99894

## Installation

1. To install, reverse the removal procedure.

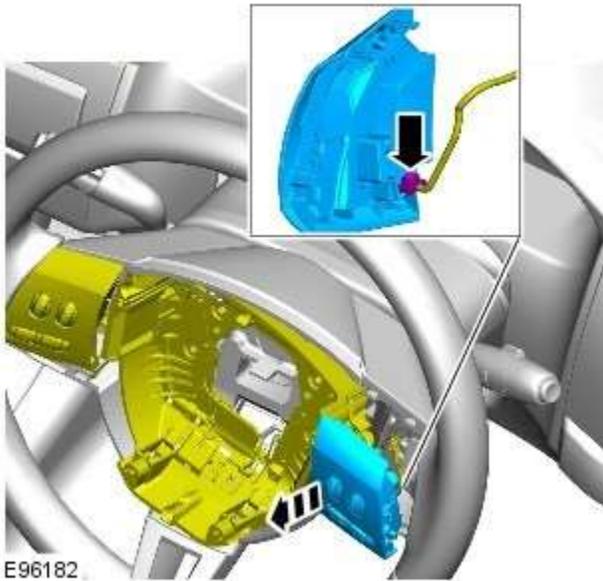
## Horn - Horn Switch

Removal and Installation

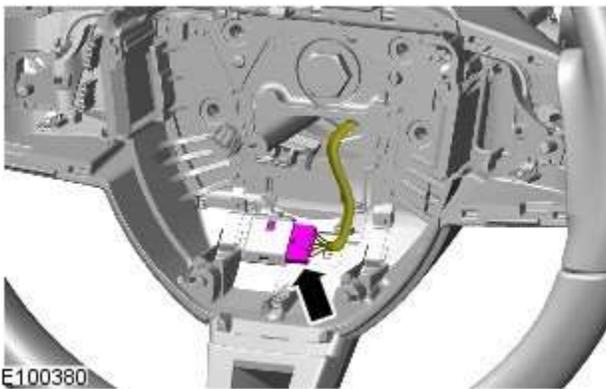
### Removal

1. Refer to: [Standard Workshop Practices](#) (100-00 General Information, Description and Operation).
2. Refer to: [Steering Wheel Audio Controls](#) (415-01A Information and Entertainment System, Removal and Installation).

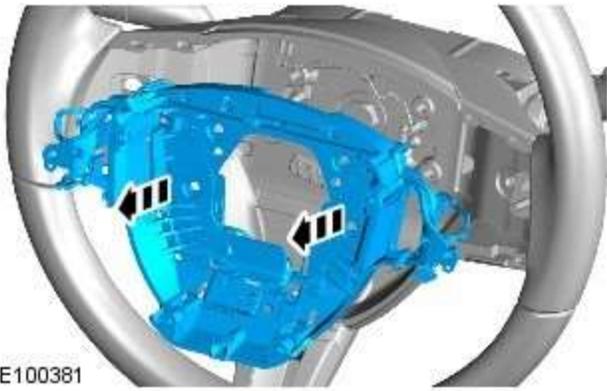
3.



4.



5.



E100381

## Installation

1. To install, reverse the removal procedure.

# Information and Message Center - Information and Message Center - Component Location

Description and Operation

## COMPONENT LOCATION



E93390

Item	Description
1	Message center

# Information and Message Center - Information and Message Center -

## Overview

Description and Operation

### OVERVIEW

The message center is a [LCD \(liquid crystal display\)](#) located in a central position in the instrument cluster. The message center receives [CAN \(controller area network\)](#) bus, [LIN \(local interconnect network\)](#) bus, and hardwired signals from other vehicle system control modules to display current vehicle status information. Depending on message importance, the message center will be backlit in white, amber or red.

The message center will display:

- Fuel level
- Trip computer information
- Gear selected
- Speed control information
- Vehicle map
- Clock
- Turn by turn satellite navigation
- Voice control text
- JaguarDrive Control system messages.

Operation of the message center is controlled by software within the instrument cluster.  
Refer to: [Instrument Cluster](#) (413-01 Instrument Cluster, Description and Operation).

# Information and Message Center - Information and Message Center - System Operation and Component Description

Description and Operation

## System Operation

### SERVICE INTERVAL INDICATOR - 3.0L V6 DIESEL, 5.0L V8 SUPERCHARGER AND 5.0L V8 NATURALLY ASPIRATED ENGINES ONLY

If the vehicle is within 3,200 kilometers (1,988 miles) of a service, the message center will display 'SERVICE REQUIRED IN XXXX km or MILES'. The display reduces the 'service required in' readout by increments every 50 kilometers (30 miles). If this distance drops below 1 km (0.6 miles), the message center will display 'SERVICE REQUIRED'.

These messages are displayed every time the vehicle enters power mode 6, for 4 seconds after the instrument cluster bulb check routine has finished.



**NOTE:** The message center will display distance to next service in miles on an instrument cluster fitted with a Miles Per Hour (MPH) speedometer unless the driver has changed the display units on the Touch Screen Display (TSD).

#### Reset Procedure

To re-set the service interval indicator, the following process switch presses must each be carried out within 3 seconds:

- With the vehicle in power mode 0, (ignition off) press and hold the rear fog lamp switch
- Allow the vehicle to enter power mode 6 (Press the start button without a foot on the brake)
- Immediately release the rear fog lamp switch
- Press and hold the trip computer cycle switch
- Press and hold the rear fog lamp switch
- Continue to hold the trip computer and rear fog lamp switches
- If the process has been successful, the message center will display 'RESETTING SERVICE MODE' and then display 'SERVICE MODE RESET' after 10 seconds
- Release both switches and return the vehicle ignition to off, power mode 0.

## Component Description

### MESSAGE CENTER

The message center [LCD \(liquid crystal display\)](#) display has a viewable area of 126 pixels horizontal and 174 pixels vertical. It is divided into six information display zones as follows, starting from the top:

- Set speed
- Transmission position
- Warning /message display
- JaguarDrive Optimization icon
- Odometer/Trip computer information
- Fuel level.

The message center is active at all times when the ignition is on and can also be active when the ignition is off, dependant on the information to be displayed. The message center [LCD](#) illumination is controlled by the sun load light sensor located on the instrument panel. In bright conditions, the illumination is set to maximum brightness. As the ambient light levels drop, the illumination dims. When the lights are switched on or activated by the 'AUTO' function, the illumination operates in the same way until a defined ambient light threshold is reached, at this point the setting of the panel illumination dimmer in the auxiliary light switch will control the brightness.

If more than one message is active, each message is displayed for 4 seconds in the order of priority. Once all messages have been displayed, they are again displayed in turn for 2 seconds each. Warning messages can be displayed when the ignition is in accessory power mode 4 which is the initial ignition state when a door is opened.

#### Message Priority

Messages are assigned priorities which are defined by the effect on driving safety and functional ability of the vehicle. When new messages are displayed they may be accompanied by a chime from the instrument cluster sounder. A new message will be displayed immediately, providing the currently displayed message (if there is one) has been displayed for at least 4 seconds. A warning indicator will be activated simultaneously with the message being displayed. If more than one fault warning message is being displayed, the messages will cycle, in priority order, with each message being displayed for 2 seconds.

### INFORMATION DISPLAY

The transmission display is located in the upper section of the [LCD](#). The transmission position information is sent from the [TCM \(transmission control module\)](#) in a high speed [CAN \(controller area network\)](#) message to the instrument cluster. The transmission has three modes of operation:

- Conventional automatic operation (JaguarDrive selector in 'D' position)
- Sport automatic operation (JaguarDrive selector in 'S' position)
- Manual gear operation - Jaguar Sequential Shift.

The following table shows the JaguarDrive selector position and the highlighted indication displayed in the transmission display.

JaguarDrive Selector Position	Transmission Display
P - Park	P
R - Reverse	R
N - Neutral	N
D - Drive	D
S - Sport	S

The following table shows the Jaguar Sequential Shift display. Selections are made using the steering wheel mounted paddle switches.

Jaguar Sequential Shift Gear Selection	Transmission Display
First	1
Second	2
Third	3
Fourth	4
Fifth	5
Sixth	6

The transmission may inhibit a requested up or down shift if the requested gear is outside the normal engine speed operating range. If this occurs, the transmission display will briefly display the gear requested by the driver but will then change to display the actual gear selection.

### Speed Control and Set Speed Displays

The following table shows the possible messages which can be displayed, other visual or audible warnings and a description of the message.

Message	Other Warnings	Reason	Action
OVERLIMIT XXX MPH (km/h)	<ul style="list-style-type: none"> <li>Amber ASL warning indicator illuminated at +4.8 km/h (+3 mph) above limit</li> <li>Amber ASL warning indicator flashing at +24 km/h (+15 mph) above limit</li> <li>Amber ASL warning indicator flashing and chime emitted at +24 km/h (+15 mph) for a certain time period</li> </ul>	Displayed when vehicle speed exceeds the ASL set speed	Reduce vehicle speed to ASL set limit
LIMITER CANCELLED	None	Displayed for 4 seconds when driver deselects ASL	None
LIMITER SET XXX MPH (km/h)	None	Displays new speed setting for the ASL	None
LIMITER STANDBY	None	Displayed when ASL is activated and speed control is selected	None
LIMITER NOT AVAILABLE	None	Displayed when ECM (engine control module) has detected a fault	Use an approved Jaguar Diagnostic System to diagnose fault.
TOO FAST TO RESUME	None	Displayed when 'Resume' switch is pressed but vehicle speed is 30 km/h (18 mph) above the set speed.	Reduce vehicle speed to set speed then press 'Resume' switch.
CRUISE CANCELLED	None	Driver has cancelled speed control or the brake pedal has been pressed.	None
CRUISE OVERRIDE	None	Driver has pressed the accelerator pedal, overriding the speed control system. Message will go off when accelerator pedal is released and speed control is active.	<b>WARNING: Adaptive cruise braking will be disabled when this message is displayed.</b>
GAP 1 / 2 / 3 / 4	None	Displays the current set or default adaptive speed control distance. Displayed along with a vehicle graphic in the LCD. Chevrons (>) denote gap figure selected.	If required, adjust distance using the steering wheel switches.
SETSPEED XXX MPH (km/h)	None	Displays the new speed input for the speed control	None
DRIVER INTERVENE	None	Immediate action required by the driver to apply the brakes if required.	<ul style="list-style-type: none"> <li>Apply brakes if required.</li> <li>May also be displayed if speed control system loses CAN messages when active.</li> </ul>

Message	Other Warnings	Reason	Action
CRUISE NOT AVAILABLE	None	Speed control cannot be engaged.	A fault has occurred in the speed control system. Diagnose fault using an approved Jaguar Diagnostic System.
RADAR SENSOR BLOCKED	None	The adaptive speed control radar sensor has become dirty or obstructed.	Remove obstruction or clean the radar sensor.
FORWARD ALERT OFF	None	Forward alert has been switched off. No warning will be given for objects in the vehicles forward direction.	None
FORWARD ALERT	None	Forward alert has been switched on or the gap settings have changed.	None
FORWARD ALERT UNAVAILABLE	None	Forward Alert and Emergency Brake Assist are not available.	Use an approved Jaguar Diagnostic System to diagnose fault..

### Warning/Message Display

Warning and information messages are displayed in the central area of the [LCD](#). When no messages are required, an analogue clock is present on the display. The message display language can be changed by the driver using a selection menu on the Touch Screen Display (TSD). The following table shows the possible messages which can be displayed, other visual or audible warnings and a description of the message.

Message	Other Warnings	Reason	Action
DSC ON	DSC warning indicator flashes for a short time.	Displayed for a short time when the DSC switch is operated to activate the DSC system.	None
DSC OFF	DSC warning indicator illuminated.	Displayed for a short time when the DSC switch is operated to de-activate the DSC system.	None
TRAC DSC	DSC warning indicator illuminated.	Displayed for a short time when the DSC switch is operated to activate the TRAC DSC system.	None
DSC NOT AVAILABLE	DSC warning indicator illuminated.	A fault is present in the DSC system.	A fault has occurred in the DSC system. Interrogate <a href="#">ABS (anti-lock brake system)</a> module for faults and diagnose fault using an approved Jaguar Diagnostic System.
BRAKE FLUID LOW	<ul style="list-style-type: none"> <li>Brake warning indicator illuminated.</li> <li>Red warning triangle illuminated in <a href="#">LCD</a>.</li> </ul>	Brake fluid level has become low and activated low level switch.	Investigate fluid loss and check brake system for leaks. Repair system as required and replenish brake fluid reservoir.
ABS FAULT	<ul style="list-style-type: none"> <li><a href="#">ABS</a> warning indicator illuminated.</li> <li>Amber warning triangle illuminated in <a href="#">LCD</a>.</li> </ul>	A fault is present in the <a href="#">ABS</a> system. Braking system will operate but <a href="#">ABS</a> will not be available.	A fault has occurred in the <a href="#">ABS</a> system. Interrogate <a href="#">ABS</a> module for faults and diagnose fault using an approved Jaguar Diagnostic System.
BRAKE ASSIST FAULT	Amber warning triangle illuminated in <a href="#">LCD</a> .	A fault is present in the braking system preventing brake assist operation. Braking system will operate but brake assist will not be available and increased effort on the brake pedal may be required.	A fault has occurred in the brake assist system. Interrogate <a href="#">ABS</a> module for faults and diagnose fault using an approved Jaguar Diagnostic System.
EBD FAULT	Red warning triangle illuminated in <a href="#">LCD</a> .	A fault is present in the braking system preventing EBD operation. Braking system will operate but EBD will not be available.	A fault has occurred in the EBD system. Interrogate <a href="#">ABS</a> module for faults and diagnose fault using an approved Jaguar Diagnostic System.
ADAPTIVE DYNAMICS FAULT	Amber warning triangle illuminated in <a href="#">LCD</a> .	A fault is present in the Computer Active Technology Suspension (CATS) or the Adaptive Dynamic Suspension system. Suspension will default to the 'hard' setting.	A fault has occurred in the CATS system. Interrogate the CATS or adaptive damping module for faults and diagnose using an approved Jaguar Diagnostic System.
PARK BRAKE APPLIED	None	Parking brake has been applied when the vehicle moving at a speed 5 km/h (3 mph) or above.	None
PARK BRAKE FAULT	<ul style="list-style-type: none"> <li>Brake warning indicator illuminated.</li> <li>Red warning triangle illuminated in <a href="#">LCD</a>.</li> </ul>	A fault is present in the parking brake system.	A fault has occurred in the parking brake system. Interrogate the parking brake module for faults and diagnose using an approved Jaguar Diagnostic System.

Message	Other Warnings	Reason	Action
APPLY FOOT AND PARK BRAKE	Amber warning triangle illuminated in <a href="#">LCD</a> .	The battery has been disconnected or power supply interrupted to the parking brake module.	Apply foot brake and parking brake to reset the parking brake module.
CANNOT APPLY PARK BRAKE	<ul style="list-style-type: none"> <li>• Brake warning indicator flashing.</li> <li>• Red warning triangle illuminated in <a href="#">LCD</a>.</li> <li>• <b>NOTE: In certain markets the brake warning indicator does not flash.</b></li> </ul>	A fault is present in the parking brake system and the parking brake cannot be applied.	A fault has occurred in the parking brake system. Interrogate the parking brake module for faults and diagnose using an approved Jaguar Diagnostic System.
CHECK TYRE PRESSURE	<ul style="list-style-type: none"> <li>• Tire Pressure Monitoring System (TPMS) warning indicator illuminated.</li> <li>• Vehicle graphic displaying tire location.</li> </ul>	A tire pressure has decreased to below the warning threshold.	Check tires for punctures and re-inflate to correct pressures.
TYRE NOT MONITORED	<ul style="list-style-type: none"> <li>• Tire Pressure Monitoring System (TPMS) warning indicator illuminated.</li> <li>• Vehicle graphic displaying tire location.</li> </ul>	<ul style="list-style-type: none"> <li>• One or more tire pressure sensors have developed a fault.</li> <li>• A temporary spare wheel or a wheel without a sensor has been fitted at the displayed position.</li> <li>• An unapproved accessory may be interfering with the TPMS.</li> </ul>	<ul style="list-style-type: none"> <li>• Check for local RF interference.</li> <li>• A wheel has been fitted without a TPMS sensor fitted (space saver spare wheel).</li> <li>• TPMS sensor has developed a fault or the battery voltage is low.</li> <li>• A fault has occurred in the TPMS. Interrogate the TPMS module for faults and diagnose using an approved Jaguar Diagnostic System.</li> </ul>
CHECK ALL TYRE PRESSURES	<ul style="list-style-type: none"> <li>• Tire Pressure Monitoring System (TPMS) warning indicator illuminated.</li> <li>• Amber warning triangle illuminated in <a href="#">LCD</a>.</li> <li>• Vehicle graphic displaying tire location.</li> </ul>	One or more tire pressures have decreased to below the warning threshold.	<ul style="list-style-type: none"> <li>• Check tires for punctures and re-inflate to correct pressures.</li> <li>• Message may be displayed when TPMS is learning position of a new sensor.</li> </ul>
TYRE PRESSURE SYSTEM FAULT	<ul style="list-style-type: none"> <li>• Tire Pressure Monitoring System (TPMS) warning indicator illuminated.</li> <li>• Amber warning triangle illuminated in <a href="#">LCD</a>.</li> </ul>	<ul style="list-style-type: none"> <li>• Wheels and tires without sensors have been fitted to the vehicle.</li> <li>• TPMS sensors have become defective.</li> <li>• An unapproved accessory may be interfering with the TPMS.</li> <li>• A fault is present in the TPMS system and the tire pressures cannot be monitored.</li> </ul>	A fault has occurred in the TPMS. Interrogate the TPMS module for faults and diagnose using an approved Jaguar Diagnostic System.
TYRE PRESSURE LOW FOR SPEED	<ul style="list-style-type: none"> <li>• Tire Pressure Monitoring System (TPMS) warning indicator illuminated.</li> <li>• Amber warning triangle illuminated in <a href="#">LCD</a>.</li> </ul>	TPMS has detected current tire pressures are too low for sustained high speed driving	Check tire pressures and inflate to the correct pressures if necessary.
TYRE PRESSURE SYSTEM FAULT	<ul style="list-style-type: none"> <li>• Tire Pressure Monitoring System (TPMS) warning indicator illuminated.</li> <li>• Amber warning triangle illuminated</li> </ul>	<ul style="list-style-type: none"> <li>• Wheels and tires without sensors have been fitted to the vehicle.</li> <li>• TPMS sensors have become defective.</li> <li>• An unapproved accessory may be interfering with the TPMS.</li> <li>• A fault is present in the TPMS</li> </ul>	A fault has occurred in the TPMS. Interrogate the TPMS module for faults and diagnose using an approved Jaguar Diagnostic System.

Message	Other Warnings	Reason	Action
	in <a href="#">LCD</a> .	system and the tire pressures cannot be monitored.	
ENGINE TEMPERATURE HIGH	Amber warning triangle illuminated in <a href="#">LCD</a> at temperatures of between 118.0°C (244.4°F) and 119.3°C (246.8°F).	Engine coolant temperature has exceeded threshold for normal operation.	<ul style="list-style-type: none"> <li>Stop vehicle and allow engine to idle for 5 minutes. Switch off engine and allow to stand for not less than 10 minutes. Check coolant level.</li> <li>If message re-appears, investigate coolant system for leakage.</li> </ul>
ENGINE OVERHEATING	Red warning triangle illuminated in <a href="#">LCD</a> at temperatures of 119.4°C (247°F) or above.	Engine coolant temperature has exceeded threshold for normal engine operation.	<ul style="list-style-type: none"> <li>Stop vehicle and allow engine to idle for 5 minutes. Switch off engine and allow to stand for not less than 10 minutes. Check coolant level.</li> <li>If message re-appears, investigate coolant system for leakage.</li> </ul>
ENGINE OIL PRESSURE LOW	Red warning triangle illuminated in <a href="#">LCD</a> .	Engine oil pressure has fallen below the threshold for normal operation.	Stop the engine immediately. Check engine oil level. If oil level correct, do not restart engine until oil pressure loss has been identified and corrected.
RESTRICTED PERFORMANCE	Red or Amber warning triangle illuminated in <a href="#">LCD</a> depending on nature of power loss.	A fault has occurred which has reduced engine power output.	Investigate cause of engine power loss. Interrogate control modules for faults and diagnose using an approved Jaguar Diagnostic System.
ENGINE SYSTEMS FAULT	<ul style="list-style-type: none"> <li><a href="#">MIL (malfunction indicator lamp)</a> illuminated for certain faults.</li> <li>Red or Amber warning triangle illuminated in <a href="#">LCD</a>.</li> </ul>	<ul style="list-style-type: none"> <li>A fault has occurred in the engine management system or, if the <a href="#">MIL</a> is illuminated, an emissions related fault is present which has been detected by the On-Board Diagnostic systems in the <a href="#">ECM</a> and <a href="#">TCM</a>.</li> <li>A fault has occurred with the start/stop switch.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate cause of fault. Interrogate <a href="#">ECM</a> and <a href="#">TCM</a> for faults and diagnose using an approved Jaguar Diagnostic System.</li> <li>Check start/stop switch for correct operation or short circuits.</li> </ul>
CHECK FUEL FILLER CAP	<ul style="list-style-type: none"> <li>(NAS Vehicles Only)</li> <li>Red warning triangle illuminated in <a href="#">LCD</a>.</li> </ul>	The Diagnostic Monitoring Tank Leakage (DMTL) system has detected fuel filler cap has not been correctly installed or the system has a leak.	Check fuel filler cap to ensure it is correctly installed and secure or check the fuel system for leakage.
ENGINE TEMPERATURE INDICATION FAULT	Red warning triangle illuminated <a href="#">LCD</a> .	A fault has occurred in the engine management system and the engine temperature signal is no longer being received.	Investigate cause of engine temperature failure. Interrogate <a href="#">ECM</a> for faults and diagnose using an approved Jaguar Diagnostic System.
PLEASE WAIT COLD START IN PROGRESS	Amber warning triangle illuminated <a href="#">LCD</a> .	Message appears after start/stop switch is pressed. Glow plugs are warming up, message will appear for up to 12 seconds dependant on ambient temperature. Engine will crank once message is switched off.	None
GEARBOX FAULT	Battery symbol and amber warning triangle illuminated in <a href="#">LCD</a> .	<a href="#">TCM</a> has detected a fault in the transmission. Transmission may default to 'limp home' mode and only allow limited operation of forward gears and reverse.	Investigate transmission fault. Interrogate <a href="#">TCM</a> and diagnose fault using an approved Jaguar Diagnostic System.
BATTERY NOT CHARGING	Red warning triangle illuminated in <a href="#">LCD</a> .	Charge output from generator not detected by <a href="#">ECM</a> .	Investigate cause of generator failure.
OVER 120 km/h	<ul style="list-style-type: none"> <li>(GULF States Only)</li> <li>Red text illuminated in <a href="#">LCD</a>.</li> </ul>	Vehicle has exceeded the preset 120 km/h speed value.	Reduce vehicle speed.
DPF FULL SEE HANDBOOK	Amber or Red warning triangle illuminated <a href="#">LCD</a> .	<a href="#">ECM</a> has detected diesel particulate filter is becoming blocked or has become blocked.	Drive the vehicle as described in the owners handbook or the workshop manual to clean the filter.
COOLANT LEVEL LOW	Red warning triangle illuminated in <a href="#">LCD</a> .	Coolant level in expansion tank has fallen below minimum level.	<ul style="list-style-type: none"> <li>Stop vehicle and allow engine to idle for 5 minutes. Switch off engine and allow to stand for not less than 10 minutes. Check coolant level and replenish</li> </ul>

Message	Other Warnings	Reason	Action
			expansion tank to maximum level. • If message re-appears, investigate coolant system for leakage.
BLIND SPOT MONITOR NOT AVAILABLE	Amber warning triangle illuminated <a href="#">LCD</a> .	Blind spot monitoring system has a fault or vehicle speed is below threshold for system operation.	Drive vehicle above threshold speed or investigate cause of fault.
BLIND SPOT MONITOR SENSOR BLOCKED	Amber warning triangle illuminated <a href="#">LCD</a> .	A blind spot monitoring sensor has become dirty or obstructed.	Remove obstruction or clean the radar sensor.
BRAKE PADS LOW	Amber warning triangle illuminated <a href="#">LCD</a> .	Brake pads have reached the service limit.	Replace brake pads.
SERVICE REQUIRED IN XXXX MILES/km	Amber warning triangle illuminated <a href="#">LCD</a> .	If the vehicle is within 3,200 kilometers (1,988 miles) of a service, the message center will display this message. The displayed distance will decrease in increments of 50 km (31 miles).	None
SERVICE REQUIRED	Amber warning triangle illuminated <a href="#">LCD</a> .	This is displayed if the distance to next service drops below 1 km (0.6 miles).	Vehicle requires service.
RESETTING SERVICE MODE	Amber warning triangle illuminated <a href="#">LCD</a> .	Displayed during the service reset procedure.	None
SERVICE MODE RESET	Amber warning triangle illuminated <a href="#">LCD</a> .	Displayed when the service reset procedure has been successful.	None
WINTER MODE CONFIRMED	Snow mode symbol illuminated <a href="#">LCD</a> .	Displayed when snow mode has been selected.	None
DYNAMIC MODE CONFIRMED	Dynamic mode symbol illuminated <a href="#">LCD</a> .	Displayed when dynamic mode has been selected.	None
MODE CHANGE IN PROGRESS	None or Snow mode symbol illuminated or Dynamic mode symbol illuminated <a href="#">LCD</a> <a href="#">LCD</a>	Displayed when the driver has selected an alternative JaguarDrive mode.	None
RECOMMEND WINTER MODE FOR CONDITIONS	None or Dynamic mode symbol illuminated <a href="#">LCD</a>	Displayed when the JaguarDrive senses excessive wheel slip.	Select winter mode.
WINTER MODE OFF	None	Confirmation that winter mode has been deselected.	None
DYNAMIC MODE OFF	None	Confirmation that dynamic mode has been deselected.	None
WINTER MODE FAULT	Amber warning triangle illuminated <a href="#">LCD</a> .	A sub-system fault is present and the driver attempts to select a different JaguarDrive Control mode. The message 'WINTER MODE FAULT' can also in very rare circumstances be generated by a fault in the JaguarDrive Control module.	Investigate cause of message. Interrogate sub-system control modules for faults and diagnose using an approved Jaguar Diagnostic System. If no sub-system fault is found, investigate JaguarDrive Control module.
DYNAMIC MODE FAULT	Amber warning triangle illuminated <a href="#">LCD</a> .	A sub-system fault is present and the driver attempts to select a different JaguarDrive Control mode. The message 'DYNAMIC MODE FAULT' can also, in very rare circumstances, be generated by a fault in the JaguarDrive Control module.	Investigate cause of message. Interrogate sub-system control modules for faults and diagnose using an approved Jaguar Diagnostic System. If no sub-system fault is found, investigate JaguarDrive Control module.
SPECIAL MODES NOT AVAILABLE	Amber warning triangle illuminated <a href="#">LCD</a> .	A sub-system fault is present and the driver attempts to select a different JaguarDrive Control mode. The message 'SPECIAL MODES NOT AVAILABLE' can also in very rare circumstances be generated by a fault in the JaguarDrive Control module.	Investigate cause of message. Interrogate sub-system control modules for faults and diagnose using an approved Jaguar Diagnostic System. If no sub-system fault is found, investigate JaguarDrive Control module.
LISTENING	Tone emitted from the instrument cluster.	The voice button has been pressed and the Jaguar voice system is active and awaiting a voice command.	None
VOICE NOT READY	None	If the Voice button on the steering wheel is pressed before the system is ready to receive a command, VOICE NOT READY will be displayed	Press button a second time after a short delay.
INSERT MAP DISC	None	Navigation disc not loaded.	Load navigation disc in the navigation computer.
NOT AVAILABLE PHONE IN USE	None	Voice button has been pressed during a telephone call.	None
COMMAND NOT RECOGNISED	None	Jaguar Voice system has not recognised the command.	Repeat the command speaking clearly.

Message	Other Warnings	Reason	Action
NO SPEECH DETECTED	None	Jaguar Voice system is expecting a voice command .	Repeat required voice command.
STORING	None	Jaguar Voice system is storing input telephone information.	None
COMMAND CANCELLED	None	Jaguar Voice button has been pressed and held.	Previous command cancelled.
SEARCHING	None	Jaguar Voice system is searching for requested information from phone book.	None
HOLD BUTTON TO CANCEL	None	Jaguar Voice system has requested a command to be cancelled.	None
FUEL LEVEL LOW	Amber warning triangle illuminated <a href="#">LCD</a> .	Fuel level in fuel tank has fallen below low fuel warning limit.	Replenish fuel tank.
FUEL PUMP SYSTEM FAULT	Amber warning triangle illuminated <a href="#">LCD</a> .	Fuel pump or FPDM fault has occurred.	Investigate cause of fault. Interrogate <a href="#">ECM</a> for faults and diagnose using an approved Jaguar Diagnostic System.
WASHER FLUID LOW	Amber warning triangle illuminated <a href="#">LCD</a> .	Fluid level has fallen below low level switch in windshield washer reservoir.	Replenish reservoir.
DOOR OPEN	Red text is illuminated in <a href="#">LCD</a> and vehicle view showing open luggage compartment lid is displayed.	Door is open or incorrectly closed.	Close open door.
BOOT OPEN	Red text is illuminated in <a href="#">LCD</a> and vehicle view showing open door location is displayed.	Luggage compartment lid is open or incorrectly closed.	Close open luggage compartment lid.
COLUMN ADJUST	None	Manual column adjust has been selected on steering column adjustment switch.	None
COLUMN ADJUST AUTO	None	Automatic column adjust has been selected on steering column adjustment switch.	None
MEMORY 1 / 2 / 3 / 4 SETTINGS RECALLED	None	Memory button has been pressed to recall memory positions for seat, steering column and mirrors.	None
MEMORY 1 / 2 / 3 / 4 SETTINGS SAVED	None	Memory has been saved for one of the memory button positions.	None
SEAT BELT MINDER	None	Engine has been started and driver and/or front passenger seat belt has not been fastened.	Fasten seat belt(s).
CHECK PEDESTRIAN SYSTEM	Red warning triangle illuminated in <a href="#">LCD</a> .	A fault has occurred with the pedestrian protection system.	Investigate cause of fault. Interrogate pedestrian protection system control module for faults and diagnose using an approved Jaguar Diagnostic System.
INERTIA SWITCH TRIPPED	Amber warning triangle illuminated <a href="#">LCD</a> .	Message appears when the crash status signal from the <a href="#">RCM (restraints control module)</a> changes to crash detected or a fault in the restraints system prevents the message from being transmitted.	<a href="#">RCM</a> can be rest with an ignition on/off cycle. If fault has occurred, then investigate cause of fault and interrogate the <a href="#">RCM</a> for faults and diagnose using an approved Jaguar Diagnostic System.
VALET MODE	None	Confirmation that valet mode has been entered.	None
VEHICLE ARMED	None	Confirmation that alarm and immobilization has been achieved.	None
SMART KEY NOT FOUND PLEASE INSERT IN SLOT	Red warning triangle illuminated in <a href="#">LCD</a> .	Smart key has not been detected by the passive system inside the vehicle.	Smart key not present in vehicle. May be caused by a flat smart key battery. Replace internal battery in smart key. May also be due to a communications problem.
CHECK SMART KEY	None	The smart key detected is not the correct smart key for the vehicle.	Use the correct smart key coded to the vehicle.
REMOVE SMART KEY	None	Smart key is in the start control module and has been recognized by the passive start system.	Remove smart key from the start control module.
SMART KEY BATTERY LOW	None	Battery voltage in smart key is becoming low, resulting in a decrease in effective range of the smart key transmitter.	Replace smart key internal battery.
PRESS BRAKE WHEN STARTING	None	The stop/start button has been pressed without the brake pedal depressed. This will turn on the ignition power mode 6.	To start engine, press brake pedal, then press stop/start button.
GEARBOX NOT IN PARK	None	The transmission is not in the 'park' position. Engine starting will be prohibited until 'park' is selected.	Put transmission in the park position.

Message	Other Warnings	Reason	Action
STEERING COLUMN LOCKED	Red warning triangle illuminated in <a href="#">LCD</a> .	Fault has occurred preventing the steering column lock from unlocking. This will also prevent the engine from starting.	Press the stop/start button to return to accessory mode 4. If steering column is still locked, investigate cause of fault and interrogate the <a href="#">CJB (central junction box)</a> for faults and diagnose using an approved Jaguar Diagnostic System.
IGNITION ON	Red warning triangle illuminated in <a href="#">LCD</a> .	Stop/start button has been pressed without the brake pedal depressed. Ignition is now in power mode 6.	None
ENGINE STOP BUTTON PRESSED	Red warning triangle illuminated in <a href="#">LCD</a> .	Engine stop button has been pressed when the vehicle is moving. Engine will not be switched off until button is pressed quickly for a second time.	Do not stop engine when vehicle is moving unless necessary.
LIGHTS ON	Amber warning triangle illuminated in <a href="#">LCD</a> .	Side lamps or headlamps are on and the driver's door has been opened.	Switch off headlamps to avoid excessive drain on battery.
AUTOLAMP DELAY OFF	None	Autolamp delay feature has been deactivated by moving light control switch from the auto position.	None
AUTOLAMP DELAY XX:XX	None	Lighting control switch has been moved to one of the 4 autolamp delay positions. Message displays delay timer period selected.	None
AUTOLAMP DELAY	None	Autolamp delay is selected on the light control switch and the driver has switched off ignition and opened driver's door initiating the autolamp delay.	None. Message will extinguish once the selected delay timer has switched off the headlamps.
TAIL LAMP FAILURE	None	The tail lamp <a href="#">LED (light emitting diode)</a> 's are not functioning correctly. Location shown on vehicle image.	Correct fault in rear lamp assembly, <a href="#">RJB (rear junction box)</a> or wiring.
BRAKE LAMP FAILURE	None	The brake lamp <a href="#">LED</a> 's are not functioning correctly. Location shown on displayed vehicle image.	Correct fault in rear lamp assembly, <a href="#">RJB</a> or wiring.
INDICATOR LAMP FAILURE	None	A turn signal indicator bulb has failed. Location is shown on displayed vehicle image.	Replace failed turn signal indicator bulb.
E-DIFF NOT AVAILABLE	Amber warning triangle illuminated in <a href="#">LCD</a> accompanied with a single chime	Differential temperature has reached the overheat threshold. System deactivated until temperature returns within limits.	Allow differential to cool.
E-DIFF FAULT	Amber warning triangle illuminated in <a href="#">LCD</a> accompanied with a single chime	Fault has occurred with electronic differential. System deactivated until fault rectified.	Investigate cause of fault and interrogate the system for faults and diagnose using an approved Jaguar Diagnostic System.
ENGINE OIL LOW	Amber warning triangle illuminated in <a href="#">LCD</a> accompanied with a single chime	The oil is at the minimum level for safe operation.	Top-up with 1 liter (1.8 pints) of oil.
ENGINE OIL HIGH	Amber warning triangle illuminated in <a href="#">LCD</a> accompanied with a single chime	This warning is displayed when the engine is started, if the oil is above the maximum level for safe operation.	Stop the vehicle as soon as safety permits and have the engine oil drained to correct level, before driving the vehicle.
ENGINE OIL CRITICALLY LOW	Red warning triangle illuminated <a href="#">LCD</a> accompanied with a single chime	The oil is below the minimum level for safe operation.	Stop the vehicle as soon as safety permits and top-up with 1.5 liters (2.6 pints) of oil. Wait for 10 minutes, re-check the oil level reading and top-up again if necessary.
ENGINE OIL LEVEL MONITOR SYSTEM FAULT	Amber warning triangle illuminated in <a href="#">LCD</a> accompanied with a single chime	A fault with the oil level monitoring system is indicated.	Investigate cause of fault and interrogate the <a href="#">ECM</a> for faults and diagnose using an approved Jaguar Diagnostic System.
WATER IN FUEL	Amber warning triangle illuminated in <a href="#">LCD</a> accompanied with a single chime	The water in fuel sensor in the fuel filter has detected water in the fuel system.	Drain fuel filter to remove collected water.

### Odometer Display

The odometer displays the total distance which the vehicle has traveled. This is calculated by the instrument cluster using wheel speed signals from the [ABS](#) module.

The odometer can show 6 characters and distances up to 999,999 miles or kilometers. The total distance travelled is stored in a [EEPROM \(electrically erasable programmable read only memory\)](#) and the [RAM \(random access memory\)](#). This ensures that the total distance is not lost if the battery is disconnected.

The odometer value is passed to other vehicle system modules on the medium speed and high speed [CAN](#) bus. This is used to record the total vehicle mileage for diagnostic purposes and when storing [DTC \(diagnostic trouble code\)](#)'s.

## Trip computer Information Display

The instrument cluster contains software which controls the trip computer. The computer allows the driver to access information for current fuel usage, current journey length, average speed and estimated vehicle range of fuel remaining.

The information is calculated from [CAN](#) messages from other vehicle systems, for example wheel speed signals from the [ABS](#) module and fuel injector operating data from the [ECM](#).

A 'Trip' button is located on the end of the [LH \(left-hand\)](#) multifunction switch and allows the driver to access, in sequence, the available trip information by repeatedly pressing the button. The trip information is displayed in the following order:

- Trip distance – The trip distance since the last reset is displayed
- Average speed – The average speed since the last reset is displayed
- Average fuel consumption – The average fuel consumption since the last reset is displayed
- Range – The range is displayed showing the distance which can be travelled until the fuel gage reads empty. If the range display shows dashes (-), this indicates a failure with one or both of the fuel level sensors.

The trip computer has three independent memories: A, B and Auto. Memories A and B can be set independently. The Auto memory is reset after each ignition cycle and therefore only contains information relating the current journey.

The trip information can also be accessed from the TSD located in the center console. The TSD allows the same information available with the trip button on the multifunction switch to be displayed on the TSD, with the addition of the option to reset the values in the A and B memories.

If the battery is disconnected, all trip data in memories A, B and Auto are erased.

## Fuel Level Display

The fuel level display is a linear [LCD](#) display to show the usable fuel tank contents. The level display is active at all times when the ignition is on. Low fuel level is displayed as a LOW FUEL LEVEL message and an amber warning triangle in the message center.

The fuel level is obtained by fuel level sensors in the fuel tank. These are monitored by the [RJB](#) software and their output resistance values, corresponding fuel quantity, are transmitted to the instrument cluster on the medium speed [CAN](#) bus. The instrument cluster uses the two level sensor signals to calculate the fuel tank contents. This calculation takes into account fuel movement in the tank to display a steady fuel quantity in the [LCD](#).

The fuel level information is transmitted on the medium speed and high speed [CAN](#) bus for use by other vehicle system modules.

## AUDIBLE WARNINGS

The instrument cluster can generate audible warnings to alert the driver to a displayed message and change of vehicle operating condition. The audible warning is generated by a sounder located within the instrument cluster. The audible warnings can be generated for the warnings below and are listed in order of priority, with the first being the highest priority:

- Seatbelt reminder
- EPB (High Pitch)
- ACC Driver Intervene 1
- Airbag fault
- Key in ignition switch
- ASL overspeed
- ACC Driver Intervene 2
- EPB (Low Pitch)
- Vehicle armed (entry delay)
- JaguarDrive selector not in park
- Valet mode
- Lights on reminder
- Hood operation
- Passive Entry / Passive Start (PEPS)
- Memory set
- Turn signal indicators
- Seat Belt Minder.

The audible warnings can take the form of a single chime, a number of chimes or a continuous chime. The audible warnings are initiated by a CAN message request from the requesting sub-system control module or by the instrument cluster software.

## **Information and Message Center - Information and Message Center**

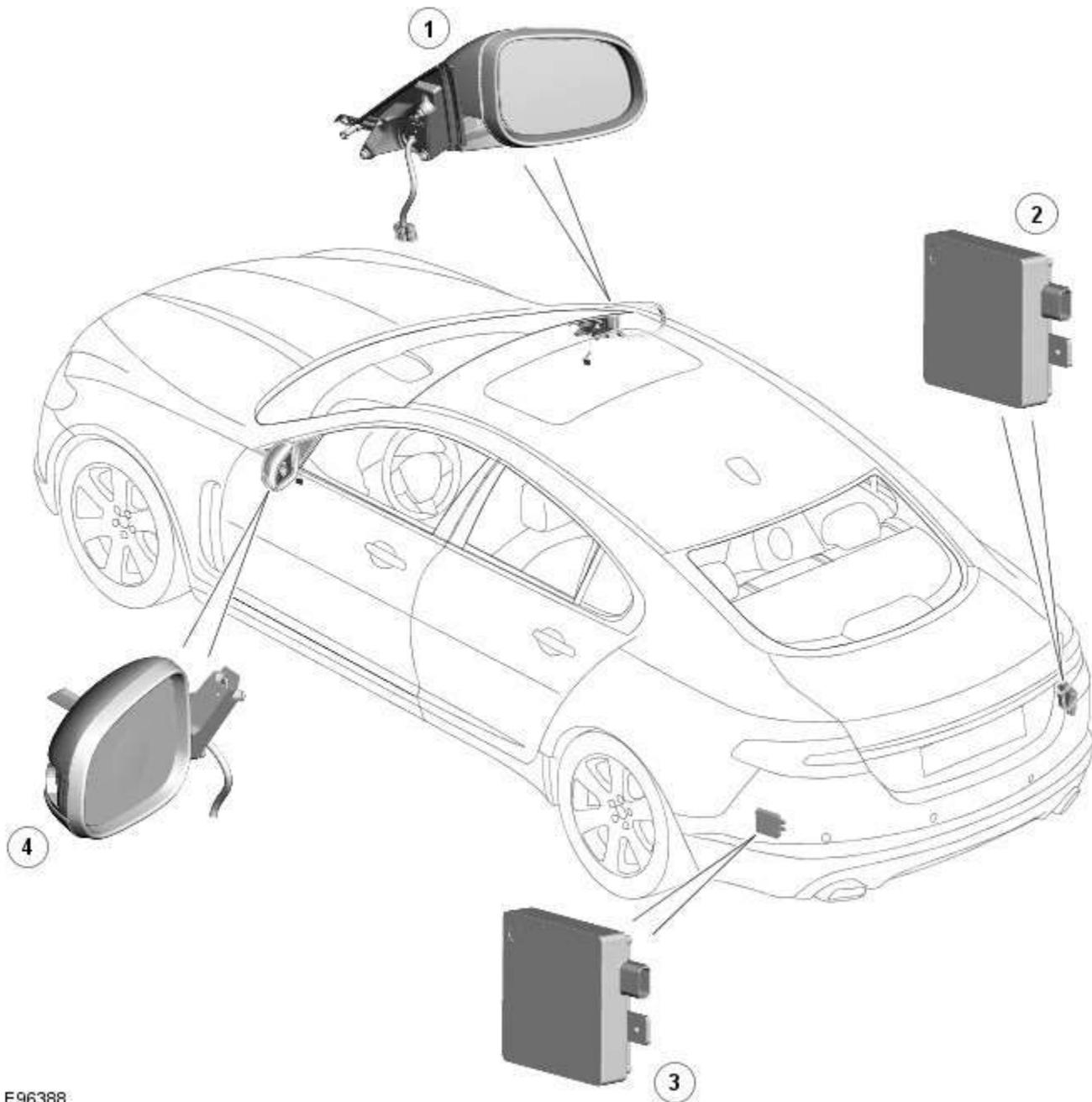
Diagnosis and Testing

For additional information.

REFER to: [Instrument Cluster](#) (413-01 Instrument Cluster, Diagnosis and Testing).

# Warning Devices - Blindspot Monitoring System - Component Location

Description and Operation



E96388

Item	Description
1	RH (right-hand) door mirror
2	RH blind spot monitoring module
3	LH (left-hand) blind spot monitoring module
4	LH door mirror

# Warning Devices - Blindspot Monitoring System - Overview

Description and Operation

## OVERVIEW

Eliminating blind spots is a major element in vehicle body design, but because of the structural requirements of B, C and D posts, blind spots cannot be entirely eliminated. Statistics show that some accidents are directly attributable to drivers moving across into the path of overtaking vehicles that have not been seen in conventional mirrors. New mirror designs have improved the situation, but by remotely covering areas that cannot be seen either directly or by the vehicle mirrors, have led to the introduction of a radar-based blind spot monitoring system.

The blind spot monitoring system comprises:

- [LH \(left-hand\)](#) Blind spot monitoring sensor
- [RH \(right-hand\)](#) Blind spot monitoring sensor
- [LH](#) door mirror
- [RH](#) door mirror

The system uses two radar modules operating at a frequency of 24 GHz and each combining the radar face and electronic module in a single unit. The modules are located behind the rear bumper surface, symmetrically, one on each side of the car behind the rear wheels. They are side facing and inclined rearwards at an angle of 16 degrees, which is dictated by the shape at the rear of the vehicle. Each module is calibrated to detect a vehicle in the **driver's** blind spot. Once a vehicle is detected the module illuminates an amber warning 'alert icon' [LED \(light emitting diode\)](#) in the relevant exterior door mirror. If there is a fault or blockage with the blind spot monitoring system an amber warning indicator dot [LED](#) is displayed in the exterior mirror and the message '**blind** spot monitoring not **available**' is displayed in the instrument cluster message center.

When the system initiates, it performs a self-check, during which the warning icons in the mirrors illuminate alternately for a short period of time. Each module does a left/right determination check when the ignition is switched on. Each mirror has a different circuit configuration so that the modules can determine which mirror they are connected to. If a module detects the wrong mirror it will go into a fault condition.

The blind spot monitoring modules receive vehicle speed on the medium speed [CAN \(controller area network\)](#) and are inactive until the vehicle reaches 16kph (10mph). Each blind spot monitor module emits a radar field greater than the blind spot area.

Each Blind Spot Monitor module emits a radar field greater than the blind spot area. The actual blind spot area is calibrated into the module during its manufacture.

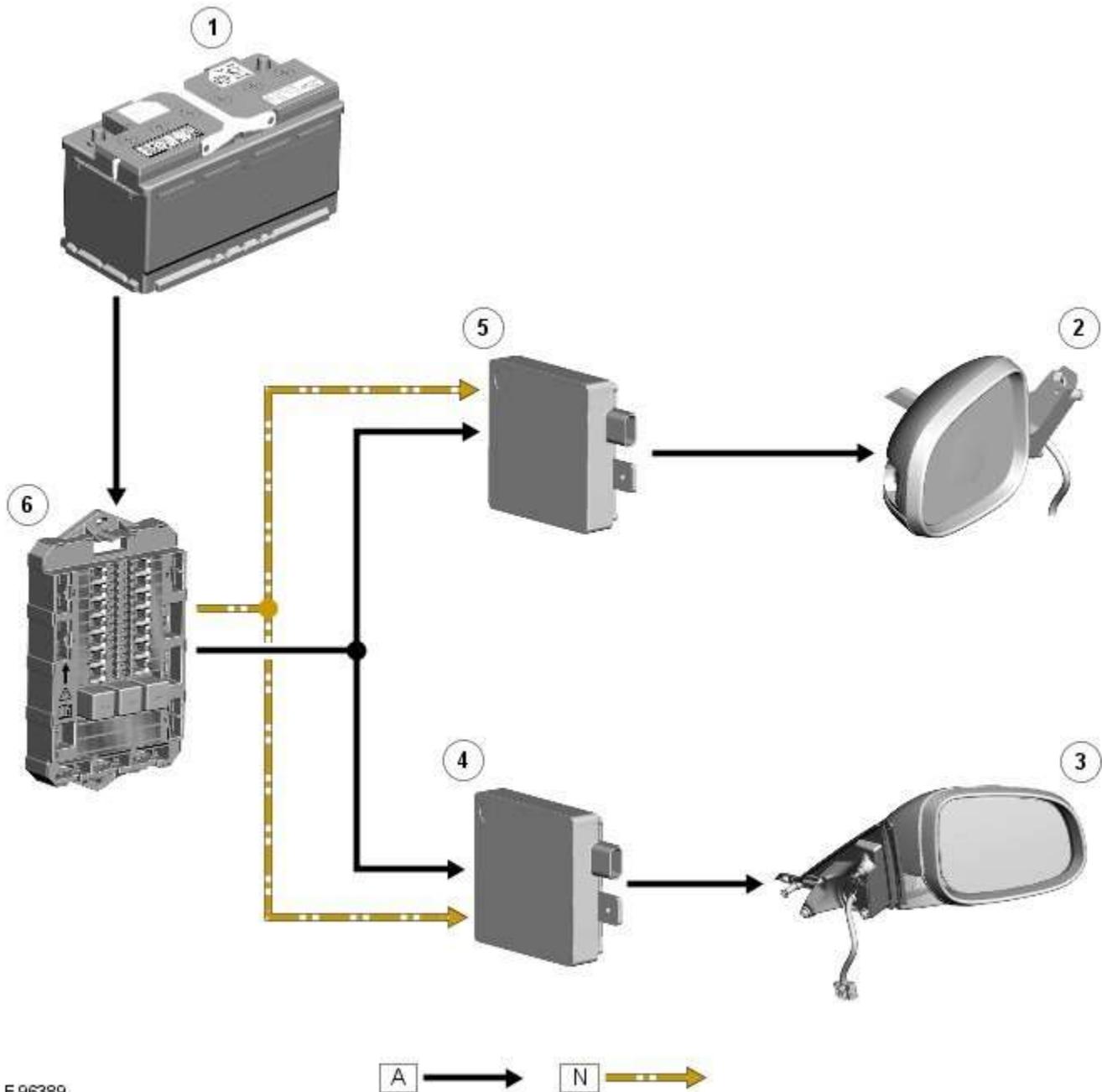


**CAUTION:** The blind spot monitoring system is designed as a driver aid not a safety device. The driver should always exercise due care and attention whilst driving.

# Warning Devices - Blindspot Monitoring System - System Operation and Component Description

Description and Operation

## Control Diagram



E 96389

Item	Description
1	Battery
2	LH (left-hand) door mirror
3	RH (right-hand) door mirror
4	RH blind spot monitoring module
5	LH blind spot monitoring module
6	RJB (rear junction box)

## System Operation

### Blind Spot Monitoring

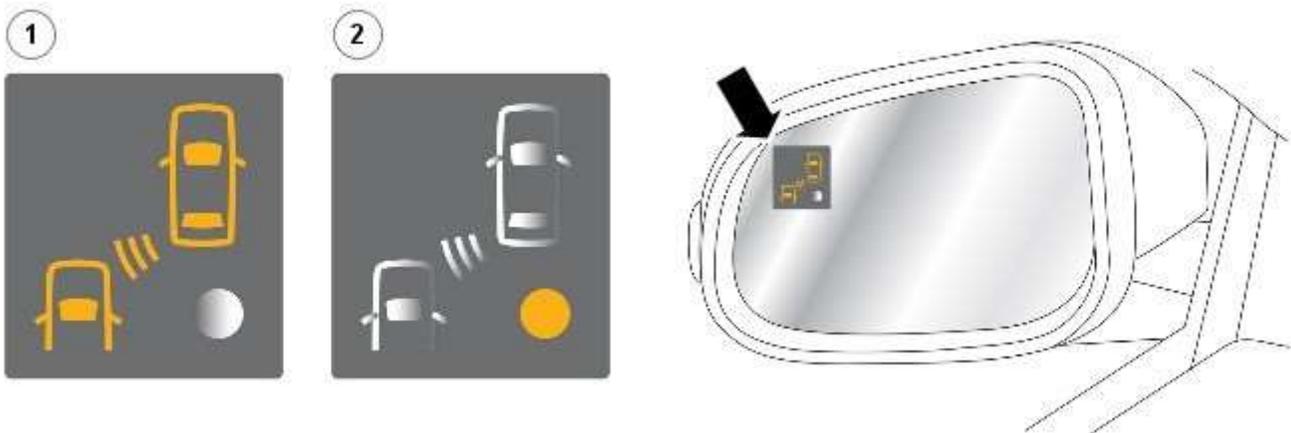
The purpose of the blind spot monitoring system is to detect an object moving with a positive velocity relative to the radar module, on either side of the vehicle, at a distance of up to 2.5 meters laterally and in an area from the door mirror up to 7.0 meters behind the module. These criteria identify an overtaking vehicle within the blind-spot area and within a typical carriageway lane width, while eliminating other objects that are not relevant, either because of their position, they are stationary, traveling in the opposite direction, or being overtaken. A vehicle is classed as a heavy goods vehicle, car or motorcycle. A motorcycle is defined as a minimum size of 2.0m long, 0.8m wide (widest point) and 1.1m high. The system is not affected by the mass of the overtaking vehicle providing all identification criteria, including relative velocity of (16km/h - 10mph) or above, is met.

The system emits radar pulses and analyses the reflections, identifying anything that moves into the blind spot zone. Having detected another vehicle in the defined blind spot zone it alerts the driver by illuminating the amber alert icon located in the appropriate exterior mirror.



**NOTE:** If an overtaking vehicle is detected on both sides of the vehicle simultaneously, the warning alert icons in both mirrors will illuminate.

The light lens is shaped so as to minimize the visibility to other drivers. The **LED (light emitting diode)**'s are located towards the outside extremity of the mirror face, within the peripheral view of the driver but not in any area of the mirror where they could obscure or distract from the image.



E97753

Item	Description
1	Warning <b>alert</b> icon
2	System <b>status</b> warning indicator

The **LED** lighting sequence is as follows:

- Amber alert **LED** icon permanently lit - system operational, vehicle detected in blind spot area
- No **LED**'s lit - system active no vehicle detected in blind spot area
- Amber status **LED** permanently lit - system not active or faulty

The system has operating limitations and is automatically turned off under certain operating conditions. During these operating conditions the amber status **LED** is permanently lit.

The system operating limitations are as follows:

- The area surrounding the radar face of the module must be clear of metallic items
- The system is inactive until vehicle speed is greater than 16km/h - 10mph (amber status **LED** permanently lit)
- The system is inactive if an approved trailer is connected to the vehicle (amber status **LED** permanently lit)
- The system is inactive when reverse gear or park is selected (amber status **LED** permanently lit)

If either of the radar signals are blocked or distorted, for example by water, the radar face of the module is covered in mud, sleet or snow the system may detect this and be disabled with the amber status **LED** permanently lit together with a '**blind spot monitoring blocked**' message displayed in the instrument cluster message center. The system is disabled until the blockage is cleared.

If there is a fault in the system the amber status **LED** is permanently lit and a '**blind spot monitoring not available**' message displayed in the instrument cluster message center. The system is disabled until the fault is rectified.

System fault and blockage warnings are as follows:

- The system is disabled when the radar module signal is blocked (amber status [LED](#) permanently lit and instrument cluster message)
- The system is disabled by a fault (amber status [LED](#) permanently lit and instrument cluster message)

If there is a failure in the communication network and the warning [LED's](#) cannot be displayed in the mirror, a failure message will be displayed in the instrument cluster message center.

When any faults are present in the system [DTC \(diagnostic trouble code\)](#)'s are stored in both blind spot monitoring modules appropriate to each module. Replacement of modules requires the right hand module to be configured using the Jaguar approved diagnostic equipment. Due to the fact that all modules are supplied as left hand modules the replacement left hand modules do not require configuring.

Calibration of the modules using the Jaguar approved diagnostic equipment enables updates to be downloaded as new technology becomes available or any fault concerns require software updates.

# Warning Devices - Warning Devices

Diagnosis and Testing

## Principles of Operation

For a detailed description of the Blindspot Monitoring system, refer to the relevant Description and Operation sections in the workshop manual. REFER to: (413-09 Warning Devices)

[Blindspot Monitoring System](#) (Description and Operation),  
[Blindspot Monitoring System](#) (Description and Operation),  
[Blindspot Monitoring System](#) (Description and Operation).

## Inspection and Verification



**CAUTION:** Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage and system integrity.



**NOTE:** Particular attention should be paid to the following items where DTCs may not be logged:

- Check for contamination (e.g. dirt, grime, frosting, ice) around the blindspot monitoring sensors and clear.

### Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> <li>• Exterior rear view mirror glass</li> <li>• Mud or sleet contamination around rear bumper area</li> <li>• Blindspot Monitoring Modules</li> </ul>	<ul style="list-style-type: none"> <li>• Fuse(s)</li> <li>• Relay(s)</li> <li>• Wiring Harness</li> <li>• Electrical connector(s)</li> <li>• Blindspot Monitoring Modules</li> </ul>

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

## Symptom Chart

Symptom	Possible Causes	Action
<ul style="list-style-type: none"> <li>• The instrument cluster displays 'BSM System Fault'</li> <li>• DTC B11C915 is logged within the left hand Blind Spot Monitoring module</li> <li>• The Left Alert icon is constantly illuminated</li> </ul>	<ul style="list-style-type: none"> <li>• Left driver display alert LED circuit - short to power</li> </ul>	Refer to the electrical circuit diagrams and check left driver display alert LED circuit for short to power
<ul style="list-style-type: none"> <li>• The instrument cluster displays 'BSM System Fault'</li> <li>• DTC B11C915 is logged within the left hand Blind Spot Monitoring module</li> <li>• No short to power or open circuit fault on the driver display status LED circuit</li> </ul>	<ul style="list-style-type: none"> <li>• Left mirror ground circuit - open circuit</li> </ul>	Refer to the electrical circuit diagrams and check the left mirror ground circuit for open circuit
<ul style="list-style-type: none"> <li>• The instrument cluster displays 'BSM System Fault'</li> <li>• DTC B11C915 is logged within the right hand Blind Spot Monitoring module</li> <li>• No short to power or open circuit fault on the driver display status LED circuit</li> </ul>	<ul style="list-style-type: none"> <li>• Right mirror ground circuit - open circuit</li> </ul>	Refer to the electrical circuit diagrams and check the right mirror ground circuit for open circuit

Symptom	Possible Causes	Action
<ul style="list-style-type: none"> <li>The instrument cluster displays 'BSM System Fault'</li> <li>DTC U023200 is logged within the right hand Blind Spot Monitoring module</li> <li>The left driver display status LED does not illuminate when the vehicle is stationary, in Park and the ignition is on</li> </ul>	<ul style="list-style-type: none"> <li>Left driver display status LED circuit - short to ground</li> <li>Harness fault between left side mirror and left side module</li> <li>Suspect left hand module failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check left driver display status LED circuit for short to ground. Clear DTC and re-test. If DTC remains suspect the left hand Blindspot Monitoring module</li> <li>Refer to the electrical circuit diagrams and check the left side harness between the left side mirror and left hand module</li> <li>Check and install a new left hand Blindspot Monitoring module only, refer to the new module/component installation note at the top of the DTC Index</li> </ul>
<ul style="list-style-type: none"> <li>The instrument cluster displays 'BSM System Fault'</li> <li>DTC U023200 is logged within the right hand Blind Spot Monitoring module</li> <li>When the system is powered up the left driver display alert LED does not illuminate during the bulb self-checks</li> </ul>	<ul style="list-style-type: none"> <li>Left driver display alert LED - short to ground, open circuit</li> <li>Harness fault between left side mirror and left side module</li> <li>Suspect left hand module failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check left driver display alert LED circuit for short to ground, open circuit. Clear DTC and re-test. If DTC remains suspect the left hand Blindspot Monitoring module</li> <li>Refer to the electrical circuit diagrams and check the left side harness between the left side mirror and left hand module</li> <li>Check and install a new left hand Blindspot Monitoring module only, refer to the new module/component installation note at the top of the DTC Index</li> </ul>
<ul style="list-style-type: none"> <li>The instrument cluster displays 'BSM System Fault'</li> <li>DTC U023300 is logged within the left hand Blind Spot Monitoring module</li> <li>The right driver display status LED is constantly illuminated</li> </ul>	<ul style="list-style-type: none"> <li>Right driver display status LED - short to power</li> <li>Harness fault between right side mirror and right side module</li> <li>Suspect right hand module failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check right driver display status LED circuit for short to power. Clear DTC and re-test. If DTC remains suspect the right hand Blindspot Monitoring module</li> <li>Refer to the electrical circuit diagrams and check the right side harness between the right side mirror and right hand module</li> <li>Check and install a new right hand Blindspot Monitoring module only, refer to the new module/component installation note at the top of the DTC Index</li> </ul>
<ul style="list-style-type: none"> <li>The instrument cluster displays 'BSM System Fault'</li> <li>DTC U023300 is logged within the left hand Blind Spot Monitoring module</li> <li>When the system is powered up the right driver display status LED does not illuminate during the bulb self-checks</li> </ul>	<ul style="list-style-type: none"> <li>Right driver display status LED - open circuit</li> <li>Harness fault between right side mirror and right side module</li> <li>Suspect right hand module failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check right driver display status LED circuit for open circuit. Clear DTC and re-test. If DTC remains suspect the right hand Blindspot Monitoring module</li> <li>Refer to the electrical circuit diagrams and check the right side harness between the right side mirror and right hand module</li> <li>Check and install a new right hand Blindspot Monitoring module only, refer to the new module/component installation note at the top of the DTC Index</li> </ul>
<ul style="list-style-type: none"> <li>The instrument cluster displays 'BSM System Fault'</li> <li>DTC U023300 is logged within the left hand Blind Spot Monitoring module</li> <li>When the system is powered up both the right driver display LEDs do not illuminate during the bulb self-checks</li> </ul>	<ul style="list-style-type: none"> <li>Right mirror ground circuit - open circuit</li> <li>Harness fault between right side mirror and right side module</li> <li>Suspect right hand module failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check the right mirror ground circuit for open circuit. Clear DTC and re-test. If DTC remains suspect the left hand Blindspot Monitoring module</li> <li>Refer to the electrical circuit diagrams and check the right side harness between the right side mirror and right hand module</li> <li>Check and install a new right hand Blindspot Monitoring module only, refer to the new module/component installation note at the top of the DTC Index</li> </ul>

## DTC Index



**CAUTION:** When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

### NOTES:



If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.



Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system).



When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.



Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.



Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.



If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.



When carrying out repair/diagnosis of the system, on removal of the front or rear bumper inspect the sensor connectors to ensure they were correctly latched and check fly leads for signs of chaffing or trapped wires.



Check DDW for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and carry out the recommendations as required

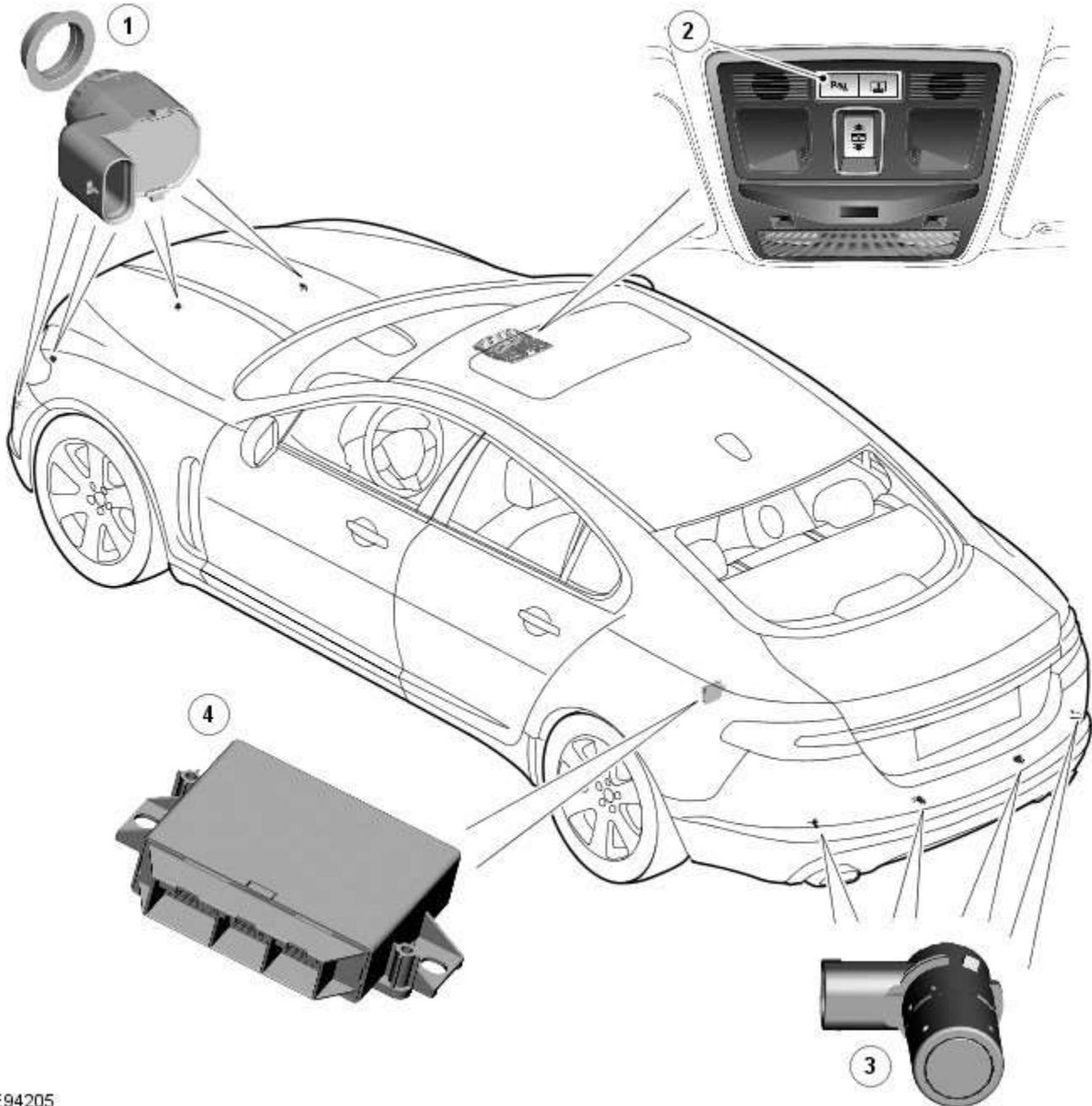
DTC	Description	Possible Causes	Action
B11C911	Driver Display Status LED	<ul style="list-style-type: none"> <li>Driver Display Status LED circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check driver display status LED circuit for short to ground
B11C915	Driver Display Status LED	<ul style="list-style-type: none"> <li>Driver Display Status LED circuit - short to power, open circuit</li> </ul>	Refer to the electrical circuit diagrams and check driver display status LED circuit for short to power, open circuit
B11D611	Driver Display Alert LED	<ul style="list-style-type: none"> <li>Driver Display Alert LED circuit - short to ground</li> </ul>	Refer to the electrical circuit diagrams and check driver display alert LED circuit for short to ground
B11D615	Driver Display Alert LED	<ul style="list-style-type: none"> <li>Driver Display Alert LED circuit - short to power, open circuit</li> </ul>	Refer to the electrical circuit diagrams and check driver display alert LED circuit for short to power, open circuit
U001000	Medium Speed CAN Communication Bus	<ul style="list-style-type: none"> <li>No sub type information</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check MS CAN bus state, carry out CAN network integrity tests using the manufacturer approved diagnostic system
U014000	Lost Communication With Body Control Module	<ul style="list-style-type: none"> <li>Lost communication with CJB</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check CJB for related DTCs and correct function, refer to the relevant DTC Index
U014200	Lost Communication With Body Control Module "B"	<ul style="list-style-type: none"> <li>Lost communication with RJB</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check RJB for related DTCs and correct function, refer to the relevant DTC Index
U014600	Lost Communication With Gateway "A"	<ul style="list-style-type: none"> <li>Lost communication with information and entertainment module</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check information and entertainment module for related DTCs and correct function, refer to the relevant DTC Index
U015500	Lost Communication With Instrument Panel Cluster (IPC) Control Module	<ul style="list-style-type: none"> <li>Lost communication with instrument cluster</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check instrument cluster for related DTCs and correct function, refer to the relevant DTC Index
U023200	Lost Communication With Side Obstacle Detection Control Module - Left	<ul style="list-style-type: none"> <li>CAN bus circuit fault</li> <li>Harness fault between left side mirror and left side module</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the left Blind Spot Monitoring System Module and the right Blind Spot Monitoring System Module</li> </ul>

DTC	Description	Possible Causes	Action
			<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check the left side harness between the left side mirror and left hand module</li> </ul>
U023300	Lost Communication With Side Obstacle Detection Control Module - Right	<ul style="list-style-type: none"> <li>CAN bus circuit fault</li> <li>Harness fault between right side mirror and right side module</li> </ul>	<ul style="list-style-type: none"> <li>Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the left Blind Spot Monitoring System Module and the right Blind Spot Monitoring System Module</li> <li>Refer to the electrical circuit diagrams and check the right side harness between the right side mirror and right hand module</li> </ul>
U030000	Internal Control Module Software Incompatibility	<ul style="list-style-type: none"> <li>RJB car configuration data is not compatible with the Blindspot Monitoring module</li> </ul>	Check RJB for related DTCs and refer to the relevant DTC Index. Clear DTCs and re-test. If DTC still logged, re-configure the RJB using the manufacturer approved diagnostic system. Clear DTCs and re-test. If DTC still logged, re-configure the Blindspot Monitoring module using the manufacturer approved diagnostic system. Clear DTC and re-test, if still logged suspect the Blindspot Monitoring module. Check and install a new module as required, refer to the new module/component installation note at the top of the DTC Index
U041568	Invalid Data Received From Anti-Lock Brake System Control Module	<ul style="list-style-type: none"> <li>Event information</li> </ul>	Check ABS module for related DTCs and correct function, refer to the relevant DTC Index
U042268	Invalid Data Received From Body Control Module	<ul style="list-style-type: none"> <li>Event information</li> </ul>	Check CJB for related DTCs and correct function, refer to the relevant DTC Index
U042368	Invalid Data Received From Instrument Panel Control Module	<ul style="list-style-type: none"> <li>Event information</li> </ul>	Check instrument cluster for related DTCs and correct function, refer to the relevant DTC Index
U210000	Initial Configuration Not Complete	<ul style="list-style-type: none"> <li>No configuration has been previously set</li> </ul>	Check RJB for related DTCs and refer to the relevant DTC Index
U210100	Control Module Configuration Incompatible	<ul style="list-style-type: none"> <li>Data sent from RJB is invalid</li> </ul>	Check RJB for related DTCs and refer to the relevant DTC Index. Check/amend Car Configuration File using the manufacturer approved diagnostic system
U300044	Control Module	<ul style="list-style-type: none"> <li>Data memory failure</li> </ul>	Cycle the ignition and check if the DTC is still logged. If DTC remains suspect the module, refer to the new module/component installation note at the top of the DTC Index
U300047	Control Module	<ul style="list-style-type: none"> <li>Watchdog/safety Micro controller failure</li> </ul>	Cycle the ignition and check if the DTC is still logged. If DTC remains suspect the module, refer to the new module/component installation note at the top of the DTC Index
U300049	Control Module	<ul style="list-style-type: none"> <li>Internal electronic failure</li> </ul>	Clear DTC, cycle ignition and retest. If fault persists, check and install a new Blindspot Monitoring module as required, refer to the new module/component installation note at the top of the DTC Index
U300281	Vehicle Identification Number	<ul style="list-style-type: none"> <li>Vehicle/component mismatch. Corrupt VIN data being transmitted, suspect module previously installed to other vehicle</li> </ul>	Check RJB has not been previously installed to other vehicle. Install original/new module as required, refer to the new module/component installation note at the top of the DTC Index. Check RJB for DTCs and refer to the relevant DTC Index
U300362	Battery Voltage	<ul style="list-style-type: none"> <li>Mis-match in battery voltage, of 2 volts or more, between Blindspot Monitoring module and RJB</li> </ul>	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

# Parking Aid - Parking Aid - Component Location

Description and Operation

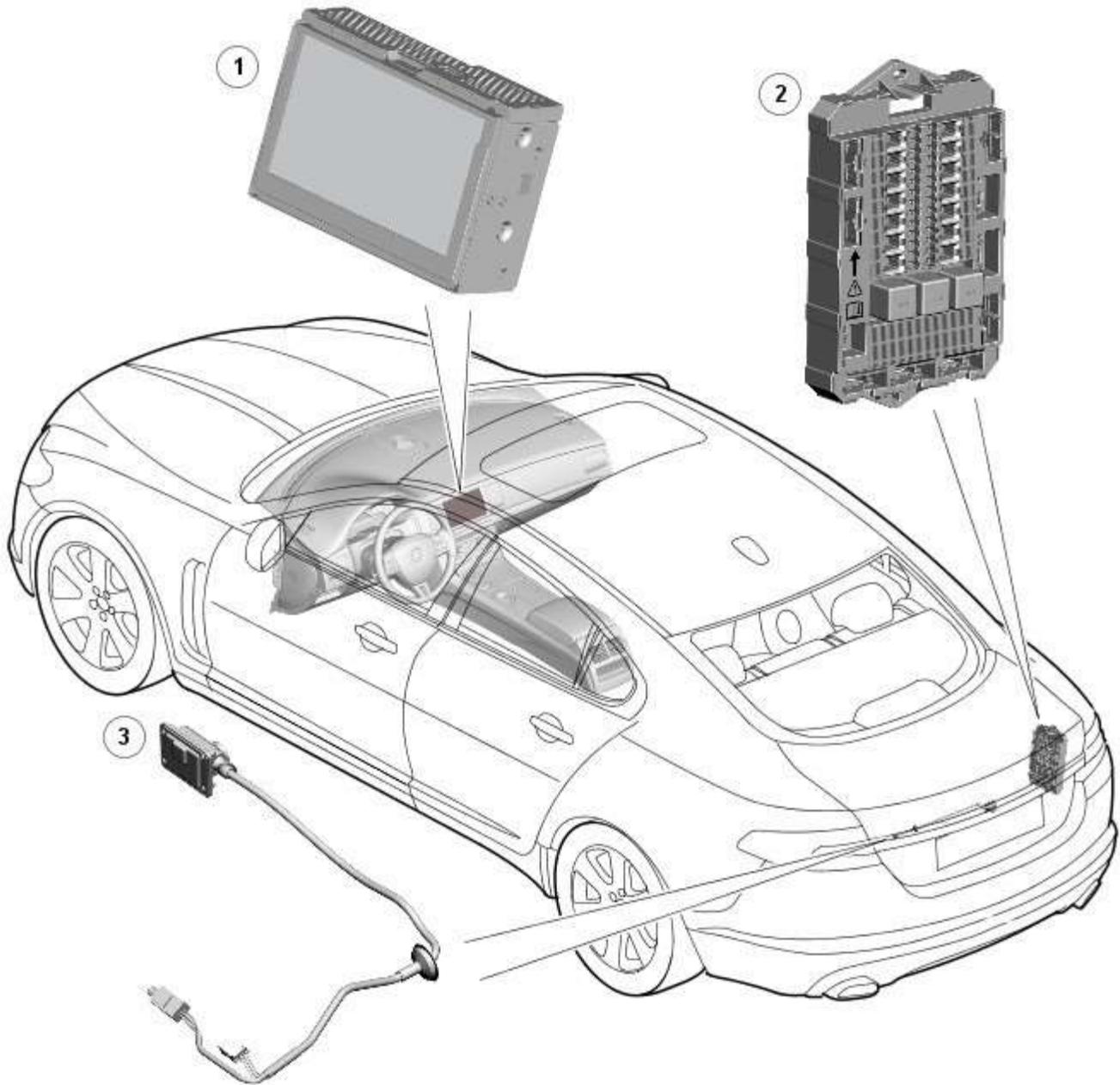
COMPONENT LOCATION - PARKING AID



E94205

Item	Description
1	Front parking aid sensors (4 off)
2	Parking aid switch
3	Rear parking aid sensors (4 off)
4	Parking aid module

COMPONENT LOCATION - PARKING AID CAMERA



E94206

Item	Description
1	Touch Screen Display (TSD)
2	<a href="#">RJB (rear junction box)</a>
3	Parking aid camera

## Parking Aid - Parking Aid - Overview

Description and Operation

### OVERVIEW

The parking aid system provides an audible warning to the driver when any obstacles are in the path of the vehicle during a forward (if front sensors are fitted) or reversing manoeuvre. The purpose of the system is to assist the driver when parking or manoeuvring in a restricted space. It is not designed as a crash avoidance system or a replacement for visual interpretation by the driver.

All vehicles are fitted with rear parking aid sensors. Higher specification vehicles may also be fitted with front parking aid sensors.

A roof console mounted parking aid switch allows the driver to deactivate the parking aid system if operation is not required.



**NOTE:** The switch is only fitted to vehicles with front parking aid sensors.

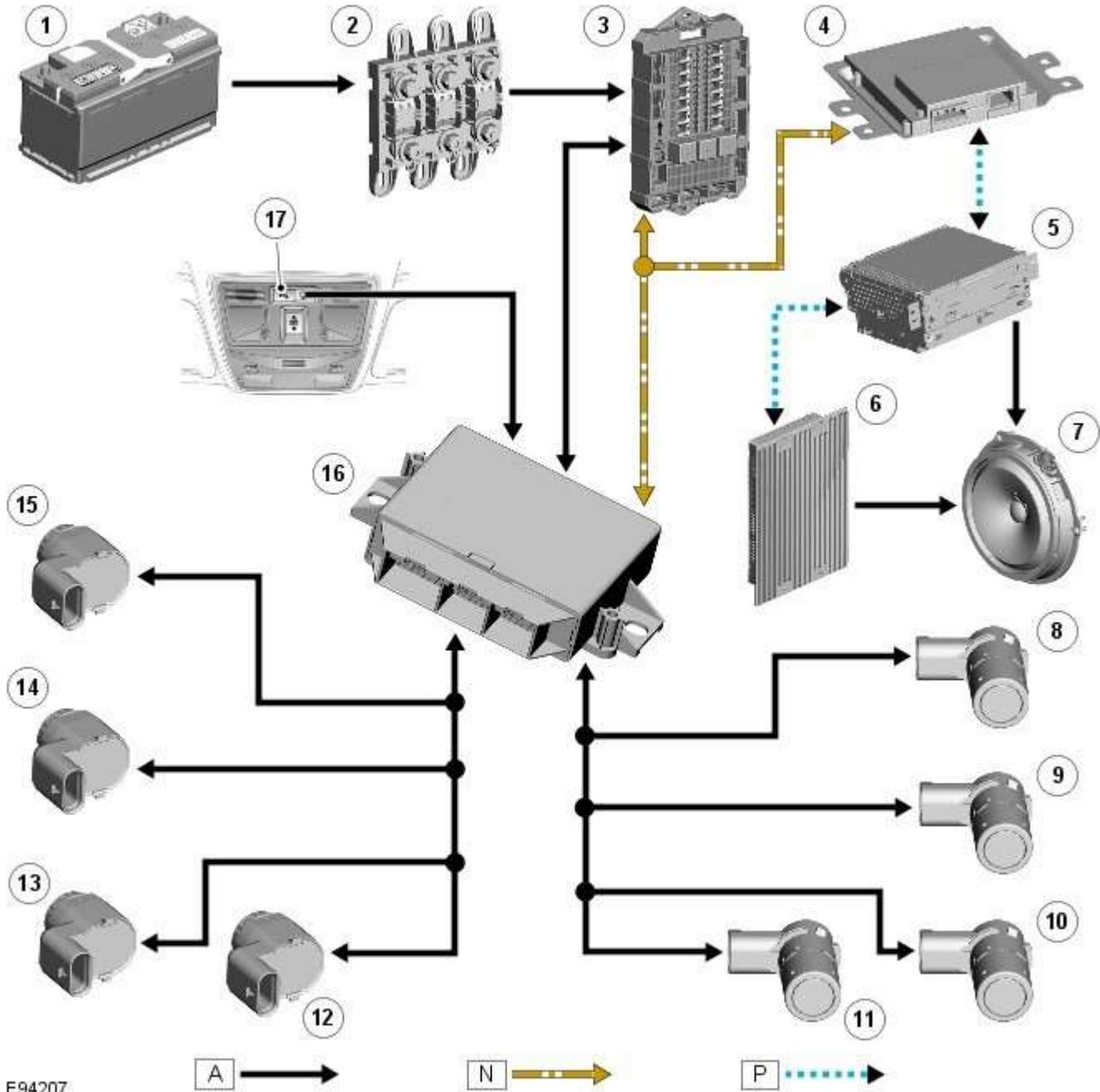
A parking aid camera is a standard fitment on some models and optional on others. The parking aid camera supplements the information provided by the parking aid system by providing the driver with a visual display of the area directly behind the vehicle.

# Parking Aid - Parking Aid - System Operation and Component Description

Description and Operation

## Control Diagram

CONTROL DIAGRAM - PARKING AID



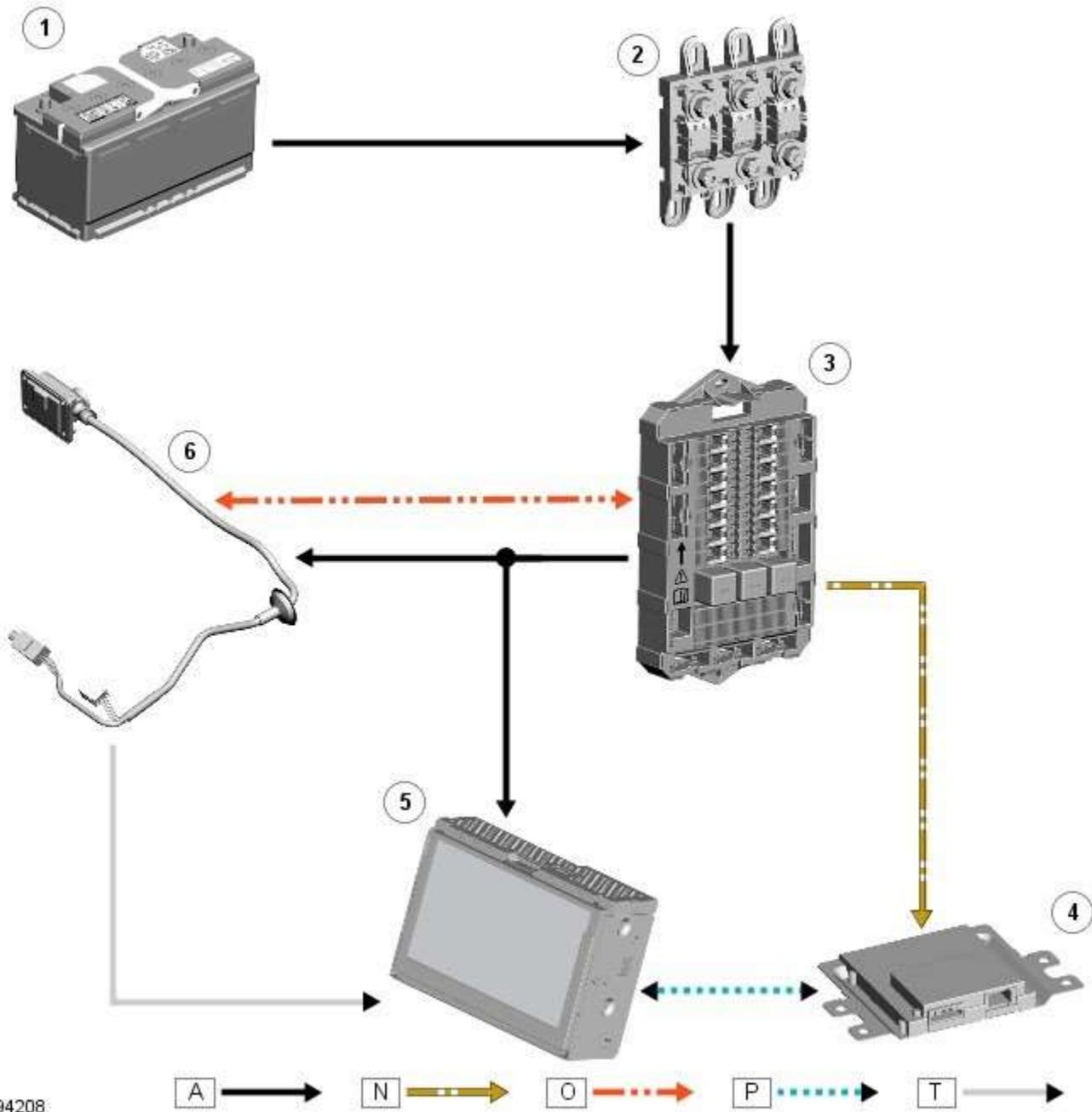
E94207

**A = Hardwired; N = Medium speed CAN bus; P = MOST ring**

Item	Description
1	Battery
2	Megafuses
3	RJB (rear junction box)
4	Entertainment system control module
5	Integrated audio module
6	Audio amplifier
7	Audio system speakers

8	RH (right-hand) outer rear sensor
9	RH inner rear sensor
10	LH (left-hand) inner rear sensor
11	LH outer rear sensor
12	LH outer front sensor
13	LH inner front sensor
14	RH inner front sensor
15	RH outer front sensor
16	Parking aid module
17	Parking aid switch

CONTROL DIAGRAM - PARKING AID CAMERA



**A = Hardwired; N = Medium speed CAN bus; O = LIN bus; P = MOST ring; T = Co-axial cable**

Item	Description
1	Battery

2	Megafuses
3	RJB
4	Entertainment system control module
5	Touch Screen Display (TSD)
6	Parking aid camera

## System Operation

### PARKING AID

Two levels of parking aid system can be fitted; a rear only system or a front and rear system.

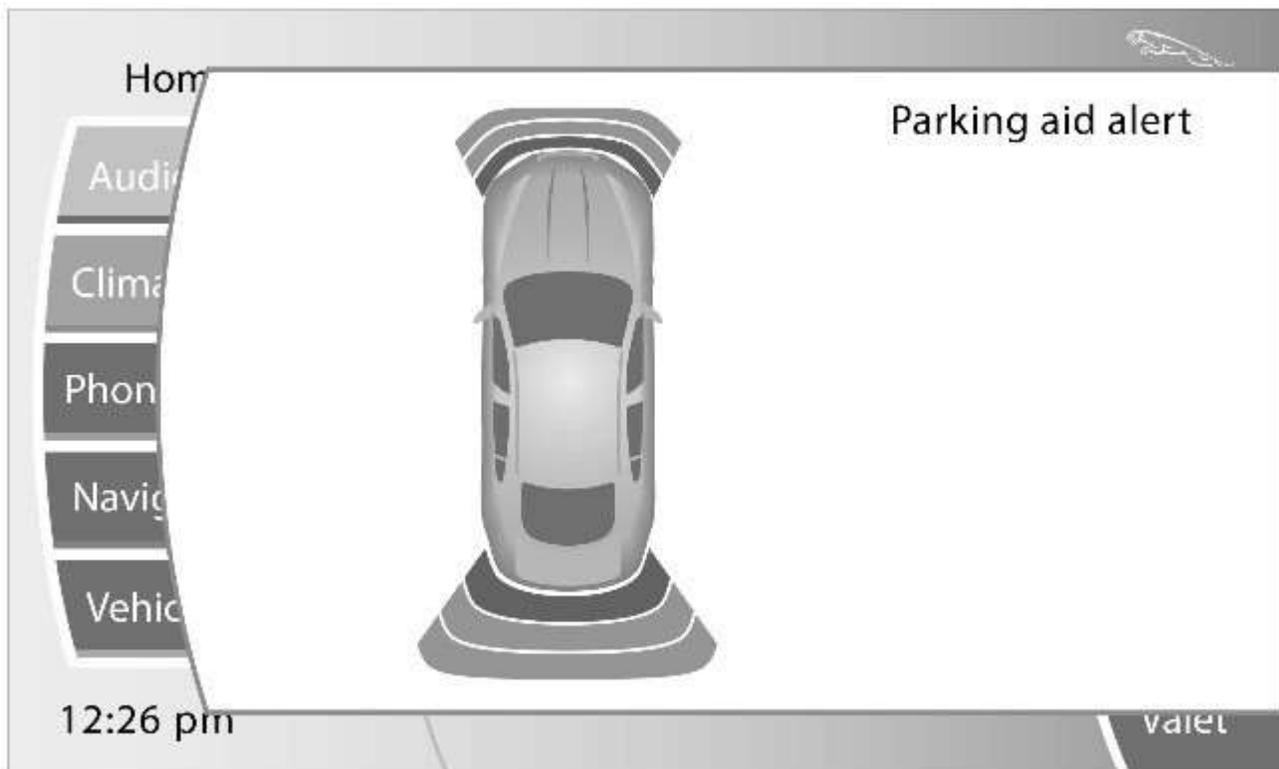
The parking aid module receives and ignition power mode 6 supply from the [RJB](#).

The parking aid module is connected to the entertainment system control module by the medium speed [CAN \(controller area network\)](#) bus and the Media Orientated System Transport (MOST). The entertainment system is used by the parking aid system to provide the driver with an audible warning. If an obstacle is sensed by the rear parking aid sensors, the rear audio system speakers will sound. If an obstacle is sensed by the front parking aid sensors (if fitted), the front audio system speakers will sound.

The parking aid system operates using ultrasonic signals which are transmitted by the sensors. The reflected echo from this output is received by the sensors and used by the parking aid module to calculate the distance from an object.

When the parking aid module activates the system, the switch [LED \(light emitting diode\)](#) is illuminated to indicate that the system is operating. The parking aid module then processes signals received from the sensors to determine if there is an object with the detection range of the sensors. A parking aid screen is automatically displayed in the Touch Screen Display. If the vehicle has a parking aid camera fitted, the camera display is automatically displayed in the TSD in preference to the parking aid alert display. To view the parking aid sensor display, a single touch of the TSD screen will remove the camera image display and show the parking aid alert display.

Parking Aid Alert Display



E99384

A visual interpretation of the detection areas is given in the TSD.

The visual interpretation dynamically updates as the sensors detect an objects within the set parameters. This feature can also be used as a diagnostic aid.

In the combined mode, the sensors emit a series of ultrasonic impulses and 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 analogue

signal to a digital signal by the sensor. The digital signal is passed to the parking aid module and compared with pre-programmed data stored in an [EEPROM \(electrically erasable programmable read only memory\)](#) within the module. The module receives this data via the signal line from the sensor and calculates the distance from the object using the elapsed time between the transmitted and received impulse. The duration of the impulse duration is determined by the module, with the sensor controlling the frequency of the impulse output.

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

If no objects are detected there are no further warning tones. If an object is detected, repeated audible tones are emitted from either the front or rear audio speakers as appropriate. The time delay between the tones decreases as the distance between the object and the vehicle decreases, until at approximately 300 mm (12 inches), the audible tone becomes continuous.

After the initial detection of an object, if there is no decrease in the distance between an object and the central sensors, the time delay between the audible warnings remains constant. If an object is detected by one of the corner sensors only, the audible warnings stop after approximately 5 seconds if there is no change in the distance between an object and the corner sensor.

When approaching several objects within detection range, the control module recognises the distance from the vehicle to the nearest object.

The PDC module will prioritise the objects detected, the nearest object detected will take priority and the corresponding audio outputs will be emitted. For example if 2 objects are detected (one front one rear) the nearest detected object will take priority and relevant audible tone will be heard.

If two objects are detected at equal distance (one front one rear) the audible tones will alternate between the front and rear speakers.

If reverse (R) is the first gear selected after the ignition is switched on, both the front (if fitted) and rear parking aid sensors will become operational. If a forward drive gear is subsequently selected, the front and rear parking aid sensors will remain operational until vehicle speed increases above 16 km/h (10 mph), park (P) is selected or the PDC control switch is pressed.

If drive (D) is the first gear selected after the ignition is switched on the parking aid system will have to be activated by pressing the PDC control switch.



**NOTE:** The PDC system can not be activated whilst the vehicle is in park (P).

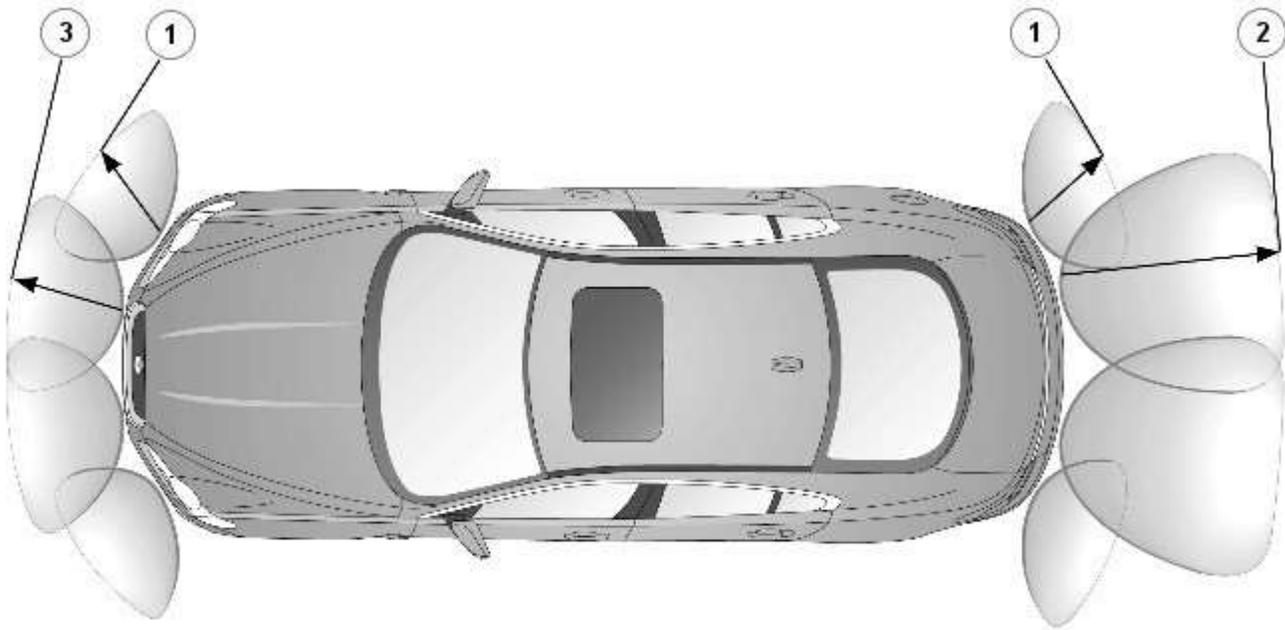
The volume output of the parking aid audible tones can be adjusted by selecting the 'Vehicle Settings' menu and selecting 'Parking' from the menu on the TSD. The volume can be adjusted using the + or - selections on the TSD.

The system can detect when a trailer is connected to the vehicle by a message output on the medium speed [CAN](#) bus from the trailer module. When the parking aid module detects that a trailer is connected to the vehicle, the rear sensors are disabled to prevent constant warnings due to the close proximity of the trailer.



**NOTE:** The ignition needs to be cycled once the trailer has been disconnected to activate the rear parking aid system.

## Distance Calculation



E99385

The detection ranges of the sensors are shown in the table below.

Item Number	Sensor Location	Maximum Detection Range	Audio Tone	Continuous Audio Tone
1	Rear/Front Outer	Approximately 600 mm (24 inches)		Approximately 300 mm (12 inches)
2	Rear Inner	Approximately 1800 mm (71 inches)		Approximately 300 mm (12 inches)
3	Front Inner	Approximately 800 mm (31 inches)		Approximately 300 mm (12 inches)

## PARKING AID CAMERA

The parking aid camera receives an ignition power mode 6 power supply from the [RJB](#). It also has a [LIN \(local interconnect network\)](#) bus connection from the [RJB](#) which is not used at the moment but installed for a later enhancement of the parking aid camera.

A shielded co-axial cable connection between the camera and the Touch Screen Display (TSD) is used for the video image transmission.

The camera receives power at all times when the ignition is in power mode 6. When reverse gear is selected, the [RJB](#) transmits a reverse selected signal on the medium speed [CAN](#) bus message to the entertainment system control module. This message is transferred on the MOST to the TSD which displays the parking aid camera video input from the camera in preference to the parking aid alert screen.

If the driver does not require the camera image in the TSD, a single touch on the screen will revert the display to the parking aid alert screen. The camera view can be reselected by pressing the 'Rear Camera' softkey on the TSD.

When reverse gear is deselected, the camera image remains on the TSD for 10 seconds after the transmission has been put into drive 'D'. This is to prevent the TSD switching between screens if the vehicle is being manoeuvred into a parking space. If the vehicle forward speed exceeds 16 km/h (10 mph) within the 10 second period, the camera image is removed from the TSD.

If the TSD display is switched off, the camera image will be automatically displayed when reverse gear is selected. When reverse gear is deselected and the 10 second period has expired, the TSD will revert back to its switched off state.

## Component Description

### PARKING AID

#### Parking Aid Module

The parking aid module is located on the [LH](#) side of the luggage compartment.

The parking aid module has three connectors which provide for power, ground and [CAN](#) bus connections, front parking aid sensors and rear parking aid sensors. The medium speed [CAN](#) bus connections provide for the receipt of the following

information from other systems:

- [ABS \(anti-lock brake system\)](#) module - Road speed signal
- [TCM \(transmission control module\)](#) - Reverse gear engaged signal
- Trailer module - Trailer attached to vehicle

The module also outputs messages on the medium speed [CAN](#) bus which are received by the integrated audio module. The integrated audio module processes these messages and converts them into Media Orientated System Transport (MOST) signals which are passed to the audio system power amplifier. These signals are then used by the power amplifier to emit the applicable warning tones from the front or rear audio speakers when an object is detected by the front or rear parking aid sensors. A warning tone can also be emitted to alert the driver to a fault in the parking aid system.

The control module has a diagnostic connection via the medium speed CAN bus to enable faults to be retrieved using the Jaguar approved diagnostic equipment. Additionally an on-board diagnostic routine within the control module constantly monitors the system and alerts the driver to a system fault by emitting a 3 second continuous tone through the rear audio system speakers when the ignition is switched on. If front parking aid sensors are fitted, the control switch LED will also flash 6 times.

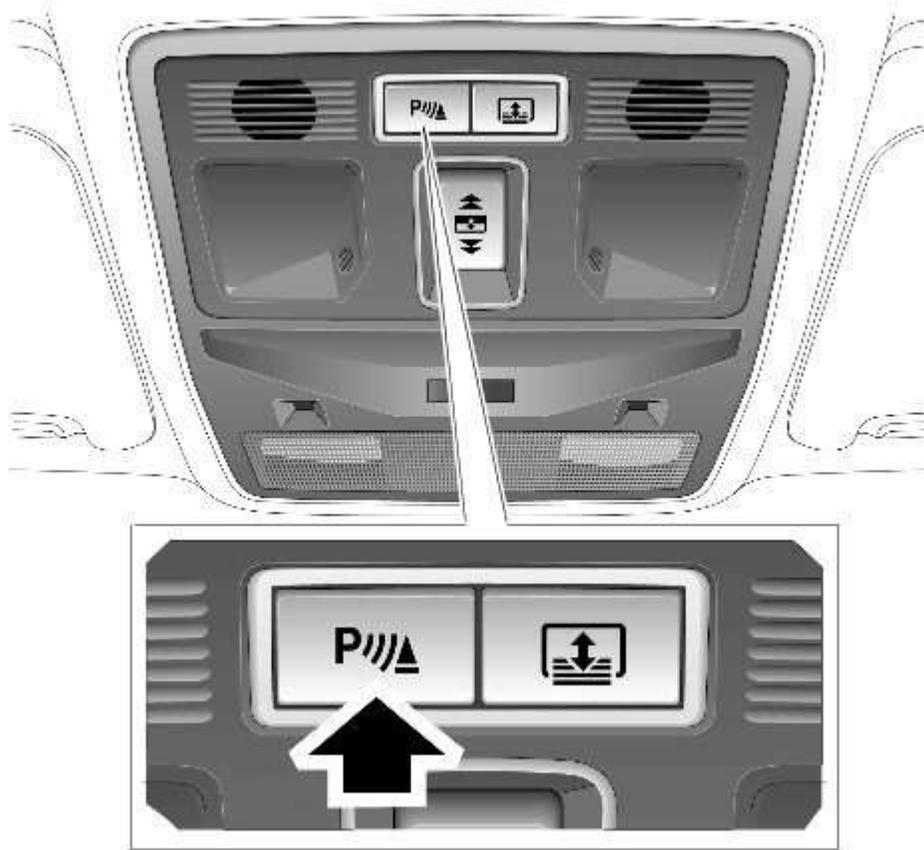
### Parking Aid Sensors

Four ultrasonic sensors are located in the front (if fitted) and rear bumpers.

Each sensor has a three pin connector which mates with a bumper harness, which in turn is connected to the main body harness. Three pins provide for power supply, ground and signal lines to and from the parking aid module.

The parking aid module controls the operation of each sensor using a digital output on the signal line. The module controls the sensor in one of two modes; combined transmitter and receiver mode or receiver mode only.

### Parking Aid Switch



E99386

The parking aid switch is located in the instrument panel switch pack, above the touch screen. The switch is the [LH](#) switch with an integral [LED](#).

The switch is a non-latching push switch which allows the driver to select the parking aid system on or off. When pressed, the switch momentarily connects a ground to the parking aid module.

The [LED](#) indicates when the parking aid system is active. The [LED](#) is controlled by the parking aid module.



**NOTE:** The control switch allows the driver to activate/deactivate the parking aid system if operation is required or not required.

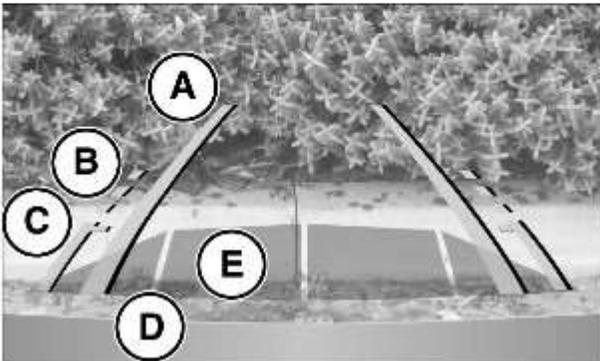
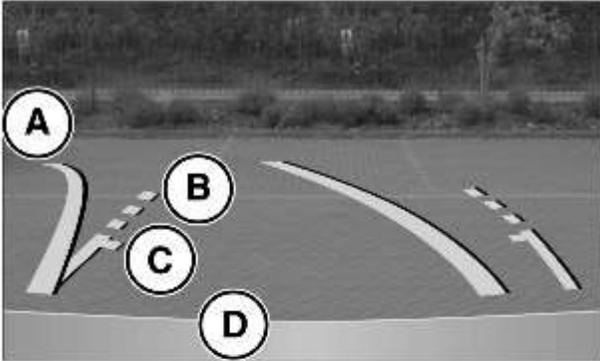
## PARKING AID CAMERA

The parking aid camera receives an ignition power mode 6 power supply from the [RJB](#). It also has a [LIN](#) bus connection with the [RJB](#), which is used as a gateway.

A shielded co-axial cable connection between the camera and the TSD is used for the video image transmission.

The camera receives power at all times when the ignition is in power mode 6. When reverse gear is selected, the [RJB](#) transmits a reverse selected message on the medium speed [CAN](#) bus. The information and entertainment module transfers the message on the MOST ring to the TSD, which displays the video input from the parking aid camera in preference to the parking aid alert screen.

The display from the camera incorporates graphic overlays, indicating vehicle direction, width and proximity to surrounding objects.



E137441

Item	Description
A	Solid line: The projected wheel trajectory
B	Dotted line: The safe working width of the vehicle (including exterior mirrors)
C	Luggage compartment access guideline: Do not reverse beyond this point if luggage compartment access is required
D	Bumper inclusion
E	Parking sensor activation: A colored area appears, to indicate which rear sensors have been activated

A single touch on the screen will revert the display to the parking aid alert screen. The camera view can be reselected by pressing the Rear Camera soft key on the TSD.



**NOTE:** This can only be activated when reverse gear is selected.

When reverse gear is deselected, the camera image remains on the TSD for 2 seconds after the transmission has been put into D (drive). If the vehicle forward speed in D exceeds 16 km/h (10 mph) the camera image is removed from the TSD.

If the TSD is switched off, the camera image will be automatically displayed when reverse gear is selected. When reverse gear is deselected, after 10 seconds the TSD will revert back to its switched off state.

# Parking Aid - Parking Aid

Diagnosis and Testing

## Principles of Operation

For a detailed description of the parking aid system, characteristics and limitations refer to the relevant description and operation section in the workshop manual.

REFER to: [Parking Aid](#) (413-13 Parking Aid, Description and Operation).

## Parking Aid System On-Board Self-Test

As part of the strategy of the system if any DTCs are detected, a long high-pitched tone approx 3 seconds will sound and the parking aid switch (where fitted) indicator LED will flash 6 times at ignition on

- If a fault is present when the parking aid system is activated then the parking aid switch (where fitted) status LED will flash 6 times indicating an issue with front or rear parking aid sensors, wiring switch, parking aid control module or hard wired sounders
- The rear parking aid sounder/rear audio system will emit an error tone for approx 3 seconds at ignition on if a fault is detected with the front or rear sensors, the switch, or if there is a controller area network (CAN) bus error
- (Only applicable to vehicles fitted with front parking aid and a hard wired rear parking aid sounder). If there is a fault with the rear parking aid sounder the error tone will come from the front parking aid sounder unit (integral with the instrument cluster)

### Audible and Visual Warnings when Parking Aid System is in Error State

Rear Parking Aid System Fitted and No Parking Aid System Switch Fitted	Rear Parking Aid System Fitted and Parking Aid System Switch Fitted	Front and Rear Parking Aid System Fitted with Parking Aid System Switch Fitted
A long high-pitched error tone will sound at Ignition On for approx 3 seconds	<ul style="list-style-type: none"> <li>• A long high-pitched error tone will sound at ignition on for approx 3 seconds and the parking aid switch indicator LED will flash 6 times at ignition on. Every time the parking aid system is activated within the same ignition cycle, parking aid switch indicator LED will flash 6 times</li> </ul>	<ul style="list-style-type: none"> <li>• A long high-pitched error tone will sound at ignition on for approximately 3 seconds and the parking aid switch indicator LED will flash 6 times at ignition on. Every time the parking aid system is activated within the same ignition cycle the parking aid switch indicator LED will flash 6 times</li> </ul>

## Inspection and Verification

### CAUTIONS:



If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the warranty policy and procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.



Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle



Do not apply any grease based products to any parking aid system connector or pins



NOTE: Check DDW for open campaigns. Refer to the corresponding bulletins and SSMS which may be valid for the specific customer complaint and carry out the recommendations as required.

1. Verify the customer concern
2. Visually inspect for obvious signs of mechanical or electrical damage
3. Ensure that the parking aid sensor face is clear of contamination that could affect the performance of the sensor

### Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> <li>• Parking aid sensor condition/damaged</li> <li>• Parking aid sensor installation and holder</li> <li>• Parking aid sensor alignment</li> <li>• Parking aid sensor contamination</li> <li>• Bumper cover(s)</li> <li>• Vehicle ride height</li> <li>• Non standard/non manufacturer approved accessories fitted</li> </ul>	<ul style="list-style-type: none"> <li>• Battery</li> <li>• Fuse(s)</li> <li>• Relays</li> <li>• Wiring harness</li> <li>• Electrical connector(s)</li> <li>• Front parking aid sensor(s)</li> <li>• Rear parking aid sensor(s)</li> <li>• Parking aid switch and LED</li> </ul>

Mechanical	Electrical
	<ul style="list-style-type: none"> <li>• Parking aid control module</li> <li>• Parking aid sounder</li> <li>• Audio system</li> </ul>

- If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step
- If the cause is not visually evident, check for diagnostic trouble codes (DTCs) and refer to the DTC index

**Symptom Chart**



CAUTION: Do not apply any grease based products to any parking aid system connector or pins

NOTES:



Please note if this diagnosis is being carried out on a vehicle without a hard wired parking aid speaker, ensure the in car infotainment system is fully functional and configured correctly



Parking aid sensors that are painted incorrectly and not to the manufacturer standards, will not be considered in any warranty claim

Symptom	Possible Causes	Action
NOTE: Permanent/Intermittent fault Parking aid system not functioning correctly. (No DTCs displayed)	<ul style="list-style-type: none"> <li>• Front or rear parking aid sensors dirty</li> <li>• Front or rear parking aid sensor position incorrect</li> <li>• Front or rear parking aid sensor incorrectly installed</li> <li>• Front or rear parking aid sensor coupling rings not installed/incorrectly installed</li> <li>• Parking aid control module or parking aid sensor connector not fully latched</li> <li>• Parking aid sensors painted without being removed from the bumper assembly or not painted to the manufacturer specification</li> </ul>	<ul style="list-style-type: none"> <li>• Clean front or rear parking aid sensors</li> <li>• Check the front or parking aid rear sensor position</li> <li>• Check the front or rear parking aid sensor are correctly installed</li> <li>• Check front or rear parking aid sensor coupling rings are installed/installed correctly</li> <li>• Ensure all parking aid system connectors are correctly latched</li> <li>• Remove parking aid sensor and ensure correctly painted parking aid sensor is installed               <ul style="list-style-type: none"> <li>- Parking aid sensors that are painted incorrectly and not to the manufacturer standards, will not be considered in any warranty claim</li> </ul> </li> </ul>
NOTE: Permanent/Intermittent fault Parking aid system not functioning correctly. (No DTCs displayed). System characteristics or environmental effects	<ul style="list-style-type: none"> <li>• Parking aid sensors incorrectly mounted</li> <li>• Incorrect vehicle ride height</li> <li>• Dirty parking aid sensor face. Ice/snow covered sensor. Debris trapped between parking aid sensor and parking aid sensor body. Heavy rain or water splash from the ground</li> <li>• Non standard, bumper, exhausts/tailpipes, tow bar or external spare wheel mounting</li> <li>• Area around vehicle is not clear of obstacles such as channels, gutters or other items on the ground</li> <li>• Exhaust gas and warm air clouds creating ghost echoes</li> <li>• Vehicle not on level ground or next to a gradient</li> <li>• Parking aid sensors painted without being removed from the bumper assembly or not painted to the manufacturer specification</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the sensors are a tight fit in the holder and locked. Ensure the sensors are central in the holder and bumper and at the correct angle</li> <li>• Ensure vehicle ride height is within the specified limits. Rectify as required</li> <li>• Clean the sensor face as required. Defrost the sensor and dry as required. Clear any debris from the sensor and holder as required. Water flowing over the sensor is a system limitation. (no action required)</li> <li>• Check for non standard, bumper, exhausts/tailpipe, tow bar or external spare wheel mounting that may be being detected by the parking aid system. Rectify as required</li> <li>• Ensure the area around the vehicle is clear of any obstacles, move the vehicle to a suitable area before continuing diagnosis</li> <li>• Ensure no exhaust gas or warm area clouds are in the area around the parking aid sensor detection range</li> <li>• Ensure the vehicle is on level ground and clear of any ramps, potholes or speed bumps, move the vehicle to a suitable area before continuing diagnosis</li> <li>• Remove parking aid sensor and ensure correctly painted parking aid sensor is installed               <ul style="list-style-type: none"> <li>- Parking aid sensors that are painted incorrectly and not to the manufacturer standards, will not be considered in any warranty claim</li> </ul> </li> </ul>

Symptom	Possible Causes	Action
Parking aid sensors are being returned with no faults found or signs of water ingress/corrosion	Possible issue with sensor connectors not latched correctly	<ul style="list-style-type: none"> <li>• When either no/intermittent operation has been reported the following action should be taken</li> <li>• 1. Using Datalogger, identify the position of the suspect parking aid sensor within the bumper</li> <li>• 2. Visually locate the position of the suspect parking aid sensor. Inspect and provide details in claim if the sensor has any sign of physical damage</li> <li>• 3. Remove the bumper. Disconnect the wiring at the main harness connector. Inspect the main harness connectors and terminals for signs of damage, backed out pins, corrosion and water ingress, or damage to the seals. Provide details in claim if any of the above symptoms are present</li> <li>• 4. Attempt to remove the harness connector from the suspect parking aid sensor without using the connector latch i.e. lightly pull back on <b>ALL</b> wires together, ensuring the harness is held close to the back of the connector, not elsewhere on the wiring harness. <b>DO NOT</b> apply excessive force. If the connector can be removed without using the latch, provide details in claim if connector is loose. If the connector is fully latched, disconnect it from the sensor</li> <li>• 5. Inspect and provide details in claim if the suspect sensor harness connector has any sign of water ingress/corrosion</li> <li>• 6. Inspect and provide details in claim if the suspect parking aid sensor harness connector shows any sign that the terminals have backed-out of the connector or for any damage to the terminal seals. Replace/repair the harness as required and proceed</li> <li>• 7. Remove the suspect parking aid sensor from the bumper. Inspect the parking aid sensor connector for signs of water ingress/corrosion. Provide details in claim if corrosion/water ingress is present</li> <li>• 8. Exchange the suspect parking aid sensor with another parking aid sensor within the bumper that is performing correctly. Reconnect all sensors and reconnect the bumper main harness connector. Repeat step 1. Confirm if the original fault now appears at the new position of the suspect parking aid sensor, if so, proceed to step 10</li> <li>• 9. If not, carry out the appropriate open circuit and short circuit checks between the original suspect parking aid sensor harness connector and the parking aid control module</li> <li>• 10. Refit the parking aid sensors to their original position in the bumper</li> <li>• 11. Reconnect the parking aid sensor to the bumper harness connector. Reconnect main harness connector and refit the bumper</li> <li>• 12. Repeat Step 1. If fault is still present, <b>replace only the faulty sensor</b></li> </ul>

PINPOINT TEST A : PARKING AID SYSTEM NOT FUNCTIONING CORRECTLY WITH NO DTCS LOGGED	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>A1: PERMANENT FAULT</b>	
	<p><b>1</b> When the parking aid system is activated, there is a vibration on the parking aid sensor membrane. This can be verified by touching the parking aid sensor face with a hard item such as a pencil, ball-pen, small screwdriver, or fingernail. <b>Ensure no damage is caused to sensor painted surface</b></p>
	<p>Are the parking aid sensor(s) vibrating?  <b>Yes</b>  <a href="#">GO to A2.</a>  <b>No</b>  <a href="#">GO to A5.</a></p>
<b>A2: SENSORS VIBRATING WITH PARKING AID FAULT</b>	
	<p><b>1</b> Clean the parking aid sensor face</p>
	<p>Parking aid system functioning correctly?  <b>Yes</b>            No further action required  <b>No</b></p>

	<a href="#">GO to A3.</a>
<b>A3: SENSORS VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Check parking aid sensors correctly mounted. Parking aid sensor holder correctly mounted. Parking aid sensor decoupler ring fitted or fitted correctly. Parking aid sensor positioning correct. Parking aid sensor painted without being removed from the bumper assembly or not painted to manufacturer specification. Rectify as required
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to A4.</a>
<b>A4: SENSORS VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Carry out speaker test. Only applicable to vehicles with rear hard wired parking aid speakers. Check the parking aid speaker wiring circuit and connector. Rectify as required. Check and install a new parking aid speaker as required. Vehicles with audio parking aid system. Confirm audio system is functioning correctly. Refer to the relevant section of the workshop manual
	Parking aid system functioning correctly <b>Yes</b> No further action required
<b>A5: SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Isolate the fault to front or rear parking aid sensors
	Are all rear parking aid sensors vibrating? <b>Yes</b> <a href="#">GO to A6.</a> <b>No</b> <a href="#">GO to A10.</a>
<b>A6: FRONT SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Check the parking aid control module is correctly configured. Check and update the car configuration file as required
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to A7.</a>
<b>A7: FRONT SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Check the correct parking aid control module is installed to the vehicle
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to A8.</a>
<b>A8: FRONT SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	If all 4 front parking aid sensors are not vibrating, carry out harness test on common ground, power supply. Check main parking aid harness connector to bumper harness connector. Rectify as required
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to A9.</a>
<b>A9: FRONT SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Check and install a new parking aid control module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component
	Parking aid system functioning correctly <b>Yes</b> No further action required
<b>A10: REAR SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Check the parking aid control module is correctly configured. Check and update the car configuration file as required
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to A11.</a>
<b>A11: REAR SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	If all 4 rear parking aid sensors are not vibrating, carry out harness test on common ground, power supply. Check main parking aid harness connector to bumper harness connector. Rectify as required
	Parking aid system functioning correctly <b>Yes</b> No further action required <b>No</b> <a href="#">GO to A12.</a>
<b>A12: REAR SENSORS NOT VIBRATING WITH PARKING AID FAULT</b>	
<b>1</b>	Check and install a new parking aid control module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component

	Parking aid system functioning correctly <b>Yes</b> No further action required
--	--

### PINPOINT TEST B : PARKING AID SYSTEM NOT FUNCTIONING CORRECTLY WITH NO DTCS LOGGED

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>B1: PARKING AID SYSTEM GIVES WARNING SIGNAL WITHOUT OBSTACLE</b>	
	<b>1</b> Clean the parking aid sensor face. Check for any damage to the parking aid sensor face. Rectify as required. Snow, water or ice on sensor face. Parking aid sensor face has been repainted to the incorrect thickness. Rectify as required
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to B2.</a>
<b>B2: PARKING AID SYSTEM GIVES WARNING SIGNAL WITHOUT OBSTACLE</b>	
	<b>1</b> Ensure the vehicle ride height is within manufacturer specified limits. Rectify as required
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to B3.</a>
<b>B3: PARKING AID SYSTEM GIVES WARNING SIGNAL WITHOUT OBSTACLE</b>	
	<b>1</b> Check for any non standard accessories are not fitted, such as tow bar, bike rack, body kit, modified exhaust, lighting or licence plate holder
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> <a href="#">GO to B4.</a>
<b>B4: PARKING AID SYSTEM GIVES WARNING SIGNAL WITHOUT OBSTACLE</b>	
	<b>1</b> Limitations or characteristics of the parking aid system such as vehicle on a gradient, exhaust gas vapour, signal reflection
	Parking aid system functioning correctly? <b>Yes</b> No further action required <b>No</b> For a detailed description of the parking aid system, refer to the relevant description and operation section in the workshop manual. REFER to: <a href="#">Parking Aid</a> (413-13 Parking Aid, Description and Operation).

### DTC Index



**CAUTION:** Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

#### NOTES:



If the control module is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module.



Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system).



When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.



Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.



Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.



If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.



Check DDW for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and carry out the recommendations as required.



When carrying out repair/diagnosis of the system, on removal of the front or rear bumper inspect the sensor connectors to ensure they were correctly latched and check fly leads for signs of chaffing or trapped wires



Physical damage to the sensor (impact damage or scratched sensor surface) must NOT be changed under warranty.

<b>DTC</b>	<b>Description</b>	<b>Possible Causes</b>	<b>Action</b>
B1B36-01	Front Right Outer Sensor - General electrical failure	<ul style="list-style-type: none"> <li>Wiring harness fault</li> <li>Front Right Outer Sensor - Component internal failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to electrical wiring diagrams and check the front bumper harness for damage/corrosion. Check sensor circuit for short circuit to ground, short circuit to power, open circuit. Repair or replace any wiring harness as required</li> <li>Check the connector for integrity and damage, then re-connect sensor to confirm connection</li> <li>Using the manufacturers approved diagnostic system clear the DTC and run the on demand self test</li> <li>If the problem persists remove the suspect sensor from the bumper. Inspect the sensor connector for signs of water ingress/corrosion. Exchange the suspect sensor with another sensor within the bumper that is not reporting a fault. Clear the DTC and run the on demand self test to confirm if the fault code now appears for the new position of the suspect sensor. Renew the faulty sensor</li> </ul>
B1B36-12	Front Right Outer Sensor - Circuit short to battery	<ul style="list-style-type: none"> <li>Wiring harness fault</li> </ul>	<ul style="list-style-type: none"> <li>Refer to electrical wiring diagrams and check the front bumper harness for damage. Check sensor circuit for short circuit to power. Repair or replace any wiring harness as required</li> <li>Check the connector for integrity and damage, then re-connect sensor to confirm connection</li> <li>Using the manufacturers approved diagnostic system clear the DTC and run the on demand self test</li> </ul>
B1B36-96	Front Right Outer Sensor - Component internal failure	<ul style="list-style-type: none"> <li>Wiring harness fault</li> <li>Front Right Outer Sensor - Component internal failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to electrical wiring diagrams and check the front bumper harness for damage/corrosion. Check sensor circuit for short circuit to ground, short circuit to power, open circuit. Repair or replace any wiring harness as required</li> <li>Check the connector for integrity and damage, then re-connect sensor to confirm connection</li> <li>Using the manufacturers approved diagnostic system clear the DTC and run the on demand self test</li> <li>If the problem persists remove the suspect sensor from the bumper. Inspect the sensor connector for signs of water ingress/corrosion. Exchange the suspect sensor with another sensor within the bumper that is not reporting a fault. Clear the DTC and run the on demand self test to confirm if the fault code now appears for the new position of the suspect sensor. Renew the faulty sensor</li> </ul>
B1B38-01	Front Right Inner Sensor - General electrical failure	<ul style="list-style-type: none"> <li>Wiring harness fault</li> <li>Front Right Inner Sensor - Component internal failure</li> </ul>	<ul style="list-style-type: none"> <li>Refer to electrical wiring diagrams and check the front bumper harness for damage/corrosion. Check sensor circuit for short circuit to ground, short circuit to power, open circuit. Repair or replace any wiring harness as required</li> <li>Check the connector for integrity and damage, then re-connect sensor to confirm connection</li> <li>Using the manufacturers approved diagnostic system clear the DTC and run the on demand self test</li> <li>If the problem persists remove the suspect sensor from the bumper. Inspect the sensor connector for signs of water ingress/corrosion. Exchange the suspect sensor with another sensor within the bumper that is not reporting a fault. Clear the DTC and run the on demand self test to confirm if the fault code now appears for the new position of the suspect sensor. Renew the faulty sensor</li> </ul>

# Parking Aid - Proximity Camera

Diagnosis and Testing

## Principles of Operation

For a detailed description of the rear view camera system, refer to the relevant Description and Operation section of the workshop manual.

## Inspection and Verification



**CAUTION:** Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

NOTES:



If a control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component.



When performing voltage or resistance tests, always use a digital multimeter accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the digital multimeter leads into account.



Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern
2. Visually inspect for obvious signs of damage and system integrity

### Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> <li>• Touch screen</li> <li>• Rear view camera</li> </ul>	<ul style="list-style-type: none"> <li>• Fuses</li> <li>• Wiring harnesses and connectors</li> <li>• Touch screen</li> <li>• Rear view camera</li> </ul>

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index
5. Check DDW for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and carry out the recommendations as required

## Symptom Chart

Symptom	Possible Cause	Action
Rear view camera image slow to react	<ul style="list-style-type: none"> <li>• System operation within specification</li> </ul>	 <p>NOTE: After selecting reverse, it may take up to 20 seconds for the image to be displayed.</p> <ul style="list-style-type: none"> <li>• No further action necessary</li> </ul>
Blank screen	<ul style="list-style-type: none"> <li>• Rear view camera not functioning</li> </ul>	<ul style="list-style-type: none"> <li>• GO to Pinpoint Test <a href="#">A.</a></li> </ul>
Blue screen	<ul style="list-style-type: none"> <li>• Video in signal absent</li> </ul>	<ul style="list-style-type: none"> <li>• GO to Pinpoint Test <a href="#">B.</a></li> </ul>
No tracking lines	<ul style="list-style-type: none"> <li>• Missing/invalid reverse gear signal</li> <li>• LIN fault</li> </ul>	<ul style="list-style-type: none"> <li>• Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index</li> <li>• GO to Pinpoint Test <a href="#">C.</a></li> </ul>

Symptom	Possible Cause	Action
Frozen tracking lines	<ul style="list-style-type: none"> <li>LIN data gateway fault</li> </ul>	<ul style="list-style-type: none"> <li>GO to Pinpoint Test <a href="#">D</a>.</li> </ul>

## Pinpoint Tests

### PINPOINT TEST A : PERMANENT BLANK SCREEN TESTS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>A1: PERMANENT BLANK SCREEN TEST 1</b>	
 NOTE: A blank screen is the default display when the rear view camera is not transmitting an image.	
	<b>1</b> Refer to the electrical circuit diagrams and check the power and ground connections to the rear view camera
	Are the power and ground circuits within specification? <b>Yes</b> <a href="#">GO to A2</a> . <b>No</b> Repair power or ground circuit as necessary
<b>A2: PERMANENT BLANK SCREEN TEST 2</b>	
 CAUTION: Do not probe the coaxial cable connectors as they are prone to damage.	
 NOTE: A DC resistance measurement is not a reliable test method as the system operates at low voltage and high frequency.	
	<b>1</b> Check the integrity of the rear view camera coaxial cable connectors (at rear view camera, the touch screen and in-line connectors)
	<b>2</b> Check the coaxial cable for excessive bending, clamping and insulation damage
	Is the rear view camera coaxial cable disconnected or damaged? <b>Yes</b> Reconnect or install a new coaxial cable as necessary <b>No</b> Install a new rear view camera

### PINPOINT TEST B : BLUE SCREEN TESTS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>B1: BLUE SCREEN TEST 1</b>	
 NOTE: A blue screen is the default display when the video in signal is absent.	
	<b>1</b> Select reverse gear and observe the touch screen
	Is the touch screen blue? <b>Yes</b> Check the integrity of the rear view camera coaxial cable connectors (at rear view camera, the touch screen and in-line connectors), and retest <b>No</b> GO to Pinpoint Test <a href="#">A</a> .

### PINPOINT TEST C : ABSENT TRACKING LINES TESTS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>C1: ABSENT TRACKING LINES TEST 1</b>	
	<b>1</b> Refer to the electrical circuit diagrams and check the rear view camera LIN bus circuit for short circuit to ground, short circuit to power, open circuit, high resistance
	Is a LIN bus circuit fault present? <b>Yes</b> Repair the LIN bus circuit as necessary <b>No</b> Install a new rear view camera

### PINPOINT TEST D : FROZEN TRACKING LINES TESTS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>D1: FROZEN TRACKING LINES TEST 1</b>	



NOTE: The vehicle may take 30 seconds (or 100m) to learn the steering centre position after starting the engine. This is normal.

	<b>1</b>	Start the engine
	<b>2</b>	Wait at least 30 seconds
	<b>3</b>	Select reverse gear
	<b>4</b>	Turn the steering wheel and observe the touch screen
		Do the tracking lines react to steering input?
	<b>Yes</b>	No fault present
	<b>No</b>	Potential LIN data gateway fault

## DTC Index

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00.

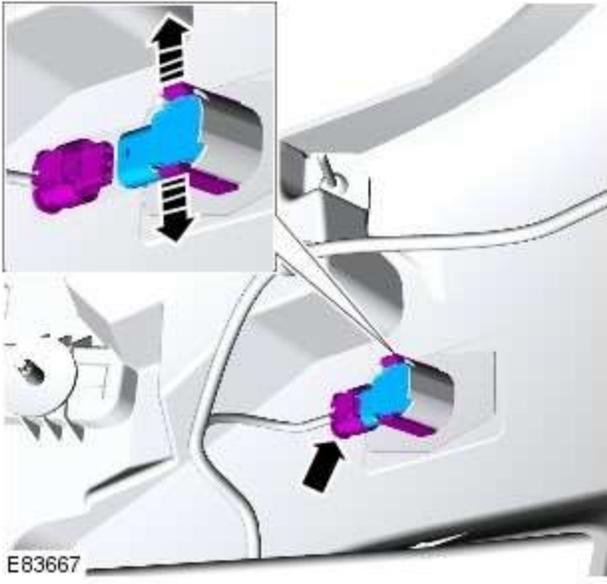
## Parking Aid - Front Inner Parking Aid Sensor

Removal and Installation

### Removal

1. Refer to: [Front Bumper Cover](#) (501-19 Bumpers, Removal and Installation).

2.

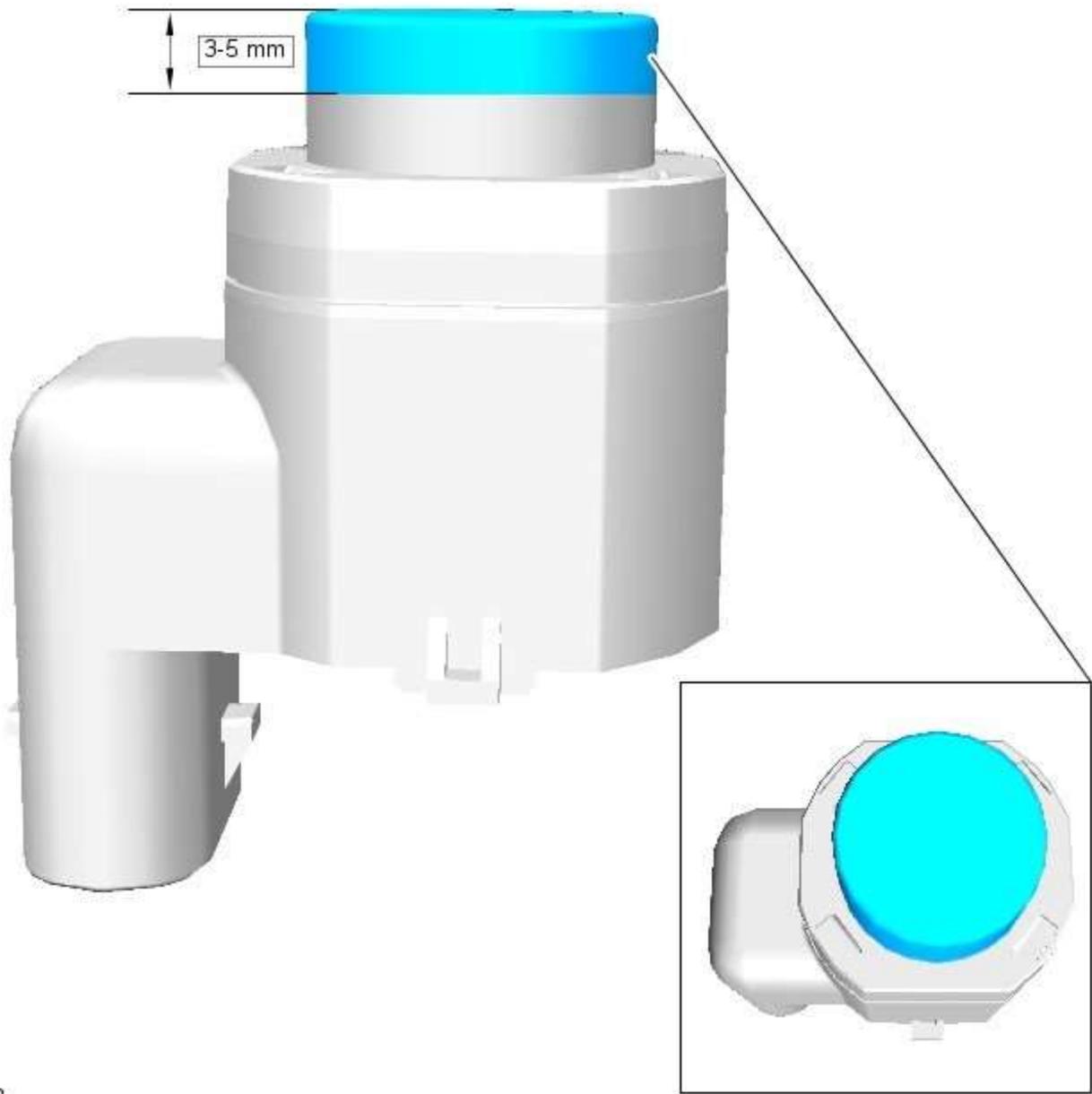


### Installation

1.  CAUTION: If a new sensor is installed, make sure that the area illustrated is the **only** area painted. Failure to follow this instruction may result in the component malfunctioning.



NOTE: On vehicles that are equipped with black or unpainted bumpers, the sensor(s) do not require painting.



E153132

2. To install, reverse the removal procedure.

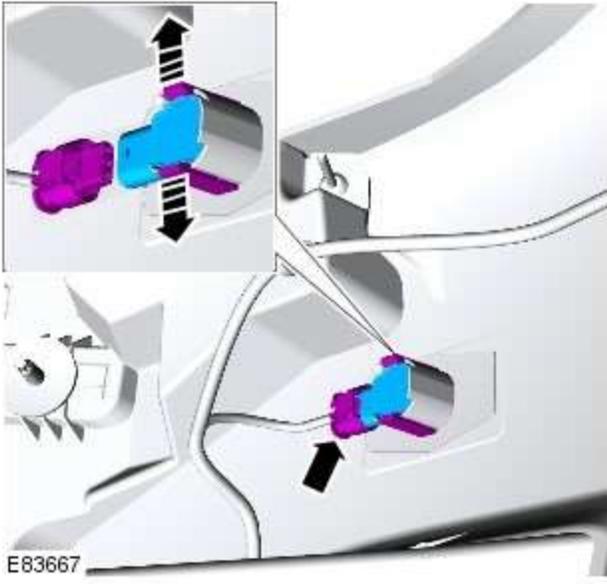
# Parking Aid - Front Outer Parking Aid Sensor

Removal and Installation

## Removal

1. Refer to: [Front Bumper Cover](#) (501-19 Bumpers, Removal and Installation).

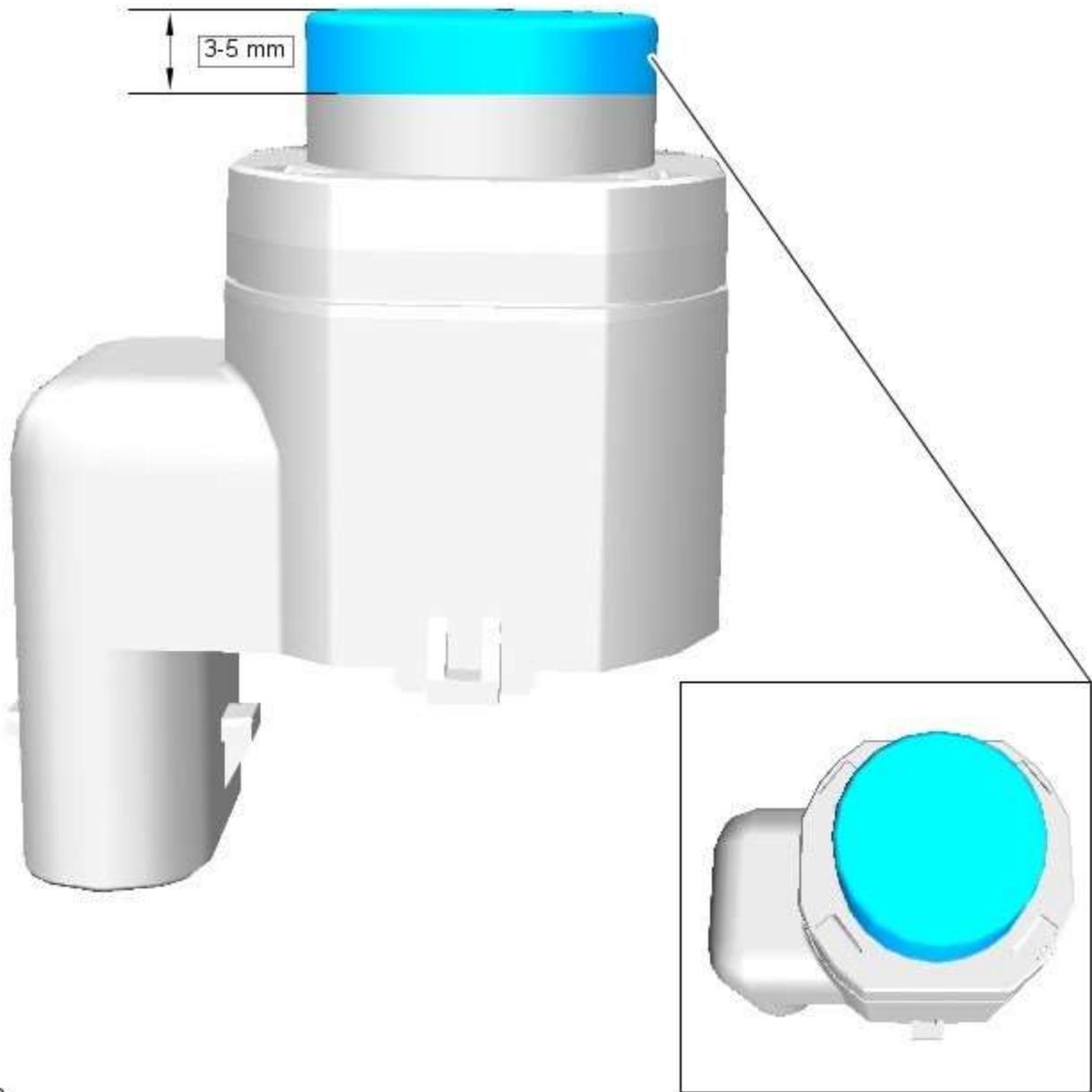
2.



## Installation

1.  CAUTION: If a new sensor is installed, make sure that the area illustrated is the **only** area painted. Failure to follow this instruction may result in the component malfunctioning.

 NOTE: On vehicles that are equipped with black or unpainted bumpers, the sensor(s) do not require painting.



E153132

2. To install, reverse the removal procedure.

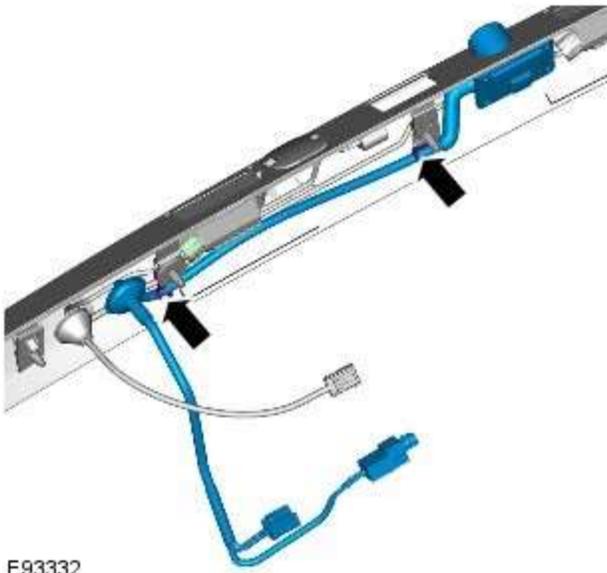
## Parking Aid - Parking Aid Camera

Removal and Installation

### Removal

1. Refer to: [Luggage Compartment Lid Moulding](#) (501-08 Exterior Trim and Ornamentation, Removal and Installation).

2.



### Installation

1. To install, reverse the removal procedure.

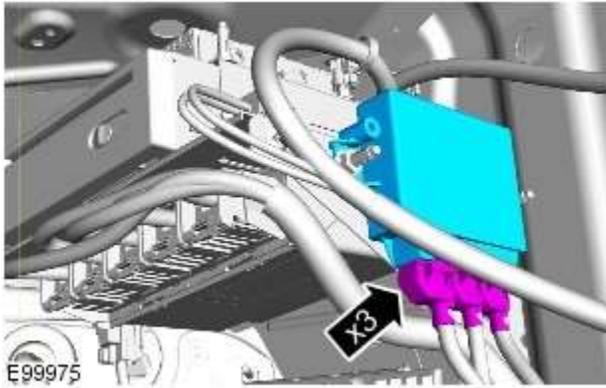
## Parking Aid - Parking Aid Module

Removal and Installation

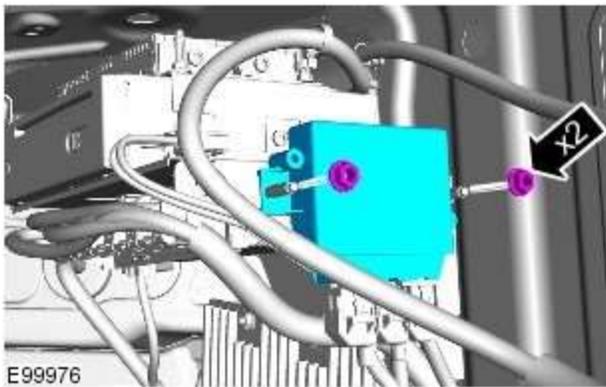
### Removal

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Refer to: [Loadspace Trim Panel LH](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

3.



4.



### Installation

1. To install, reverse the removal procedure.
2. If a new component has been installed, configure using Jaguar approved diagnostic equipment.

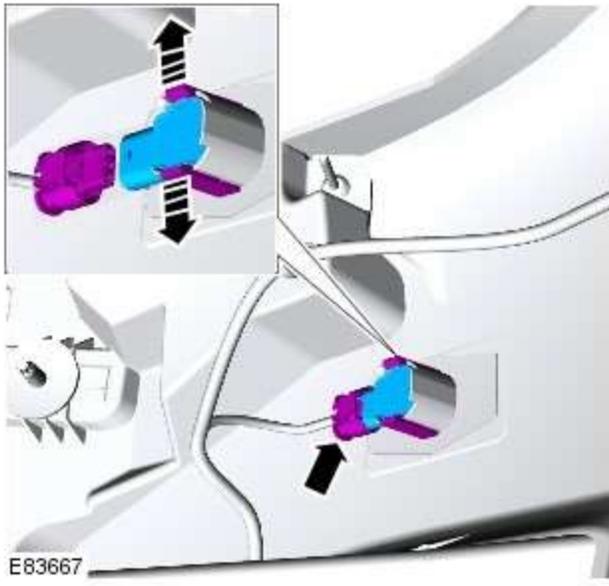
## Parking Aid - Rear Parking Aid Sensor

Removal and Installation

### Removal

1. Refer to: [Rear Bumper Cover](#) (501-19 Bumpers, Removal and Installation).

2.



### Installation

1. To install, reverse the removal procedure.