Электрооборудование — Освещение

Land Rover Discovery Sport (L550) · Руководство по ремонту
Источник: lrdisc.com · разделов: 34

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31. Stoplamps
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34. Передний Turn Signal фонарь Bulb снятие и установка

Lighting

Lighting

- Autolamps

- Fog Lamps
- Headlamp Leveling
- Headlamps
- Parking, Rear and License Plate Lamps
- Reversing Lamps
- Stoplamps
- Trailer Lamps
- Turn Signal and Hazard Lamps
- Front Turn Signal Lamp Bulb (G1785540) Removal and Installation

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Warning Devices / Diagnosis and TestingAutolamps

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Autolamps

Autolamps

PRINCIPLES OF OPERATION

For a detailed description of the Autolamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
▪ Lighting control switch ▪ Wipers and washers control switch ▪ Rain/light sensor	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Side, tail and headlamp inoperative when the lighting control switch is set to auto	▪ Body system fault ▪ Lighting control switch fault	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch

SYMPTOM:

Side, tail and headlamp inoperative when the lighting control switch is set to auto

POSSIBLE CAUSES:

- Body system fault
- Lighting control switch fault

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (100-00 General Information, Description and Operation).

- Daytime Running Lamps / Description and Operation

- Daytime Running Lamps / Diagnosis and Testing
- Interior Lighting / Description and Operation
- Front Interior and Reading Lamps - Overhead Console
- Vanity Mirror Illumination Lamp
- Interior Lighting
- Interior Lighting / Diagnosis and Testing

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LightingDaytime Running Lamps / Description and Operation

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Daytime Running фонари / описание и работа

Daytime Running Lamps / Description and Operation

OVERVIEW

The Daytime Running Lamps (DRL) and side lamps are incorporated into the headlamp assemblies.

For additional information, refer to: Exterior Lighting (417-01, Description and Operation).

On Rest Of World (ROW) vehicles with halogen headlamps, the DRL use the same lamp as the main beam lamp.

On North American Specification (NAS) vehicles with halogen headlamps, the DRL use the same Light Emitting Diodes (LEDs) as the dip beam lamp.

On vehicles with xenon headlamps, the 'signature' side lamp LEDs are used for the DRL function, but are illuminated at a higher intensity for DRL operation than for side lamp operation.

On Japan market vehicles, the DRL function is inoperative.

DESCRIPTION

For additional information, refer to: Exterior Lighting (417-01, Description and Operation).

OPERATION

REST OF THE WORLD (ROW)

The DRL are switched on when the following conditions are met:

- Ignition is in power mode 7 - engine running
- Lighting control switch is in the off position or in the 'AUTO' position (rain/light sensor not requesting exterior lighting operation).

The DRL remain off if:

- Park is still selected (automatic transmission only)
- Neutral is still selected and the park brake is applied (manual transmission only)
- The vehicle has not moved since the engine was manually started (not started using stop/start sequence - only applies to vehicles with the stop/start system).

The DRL are illuminated at a higher intensity than the side lamp operation.

Depending on market, the DRL will be dimmed to the intensity of the side lamp or switched off when the turn signal indicator on that side is active. For example, if the left turn signal indicator is active, the left the

DRL is dimmed or switched off until the turn signal indicator becomes inactive. The opposite headlamp DRL will remain on at full intensity.

If the hazard warning lamps become active, the DRL are dimmed to the intensity of the side lamps on both headlamps until the hazard warning lamps are deactivated.

The DRL are switched off when the following conditions occur:

- Ignition state is changed to power mode 4 (accessory) or power mode 0 (locked and alarmed)
- Lighting control switch is moved from off to side lamps or headlamps position
- Lighting control switch is in the 'AUTO' position and the rain/light sensor requests exterior lighting on

The DRL are not switched off when the headlamp flash function is operated.

NORTH AMERICAN SPECIFICATION (NAS)

The DRL are switched on when the following conditions are met:

- Ignition is in power mode 7 - engine running
- Lighting control switch is in the off position or in the 'AUTO' position (rain/light sensor not requesting exterior lighting operation).

The DRL remain off if:

- Park is still selected (automatic transmission only)
- Neutral is still selected and the park brake is applied (manual transmission)
- The vehicle has not moved since the engine was manually started (not started using stop/start sequence - only applies to vehicles with the stop/start system).

The DRL are illuminated at a higher intensity than the side lamp operation.

The DRL will be switched off when the turn signal indicator on that side is active. For example, if the left turn signal indicator is active, the left DRL will be switched off until the turn signal indicator becomes inactive. The opposite headlamp DRL will remain on at full intensity.

If the hazard warning lamps become active, the DRL are switched off until the hazard warning lamps are deactivated.

The DRL are switched off when the following conditions occur:

- Park is selected (automatic transmission vehicles)
- Neutral is selected and the park brake is applied (manual transmission vehicles)
- Ignition state is changed to power mode 4 (accessory) or power mode 0 (locked and alarmed)
- Lighting control switch is moved from off to side lamps or headlamps position
- Lighting control switch is in the 'AUTO' position and the rain/light sensor requests exterior lighting on.

The DRL will not be switched off when the headlamp flash function is operated.

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AutolampsDaytime Running Lamps / Diagnosis and Testing

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Daytime Running фонари / диагностика и проверка

Daytime Running Lamps / Diagnosis and Testing

PRINCIPLES OF OPERATION

For a detailed description of the Daytime Running Lamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Daytime Running Lamps (417-04 Daytime Running Lamps, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
▪ Headlamps	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Daytime running lamps inoperative	▪ Daytime running lamps working as specified or within system limitations ▪ Car configuration file mismatch with vehicle specification ▪ Daytime running lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Headlamp internal failure	**NOTE:** After updating the car configuration file, set the ignition to on and wait 30 seconds before clearing the DTCs. ▪ For a detailed description of the daytime running lamps, refer to the relevant Description and Operation section in the workshop manual. ▪ Using the Jaguar Land Rover approved diagnostic equipment, check and up-date the car configuration file as necessary. Clear the DTCs and retest ▪ Refer to the electrical circuit diagrams and check the daytime running lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp as necessary

SYMPTOM:

Daytime running lamps inoperative

POSSIBLE CAUSES:

- Daytime running lamps working as specified or within system limitations
- Car configuration file mismatch with vehicle specification
- Daytime running lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance
- Headlamp internal failure

ACTION:

NOTE:

After updating the car configuration file, set the ignition to on and wait 30 seconds before clearing the DTCs.

- For a detailed description of the daytime running lamps, refer to the relevant Description and Operation section in the workshop manual.
- Using the Jaguar Land Rover approved diagnostic equipment, check and up-date the car configuration file as necessary. Clear the DTCs and retest
- Refer to the electrical circuit diagrams and check the daytime running lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp as necessary

DTC INDEX

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

Interior Lighting Rear Interior Lamp (G1815479) Removal and Installation

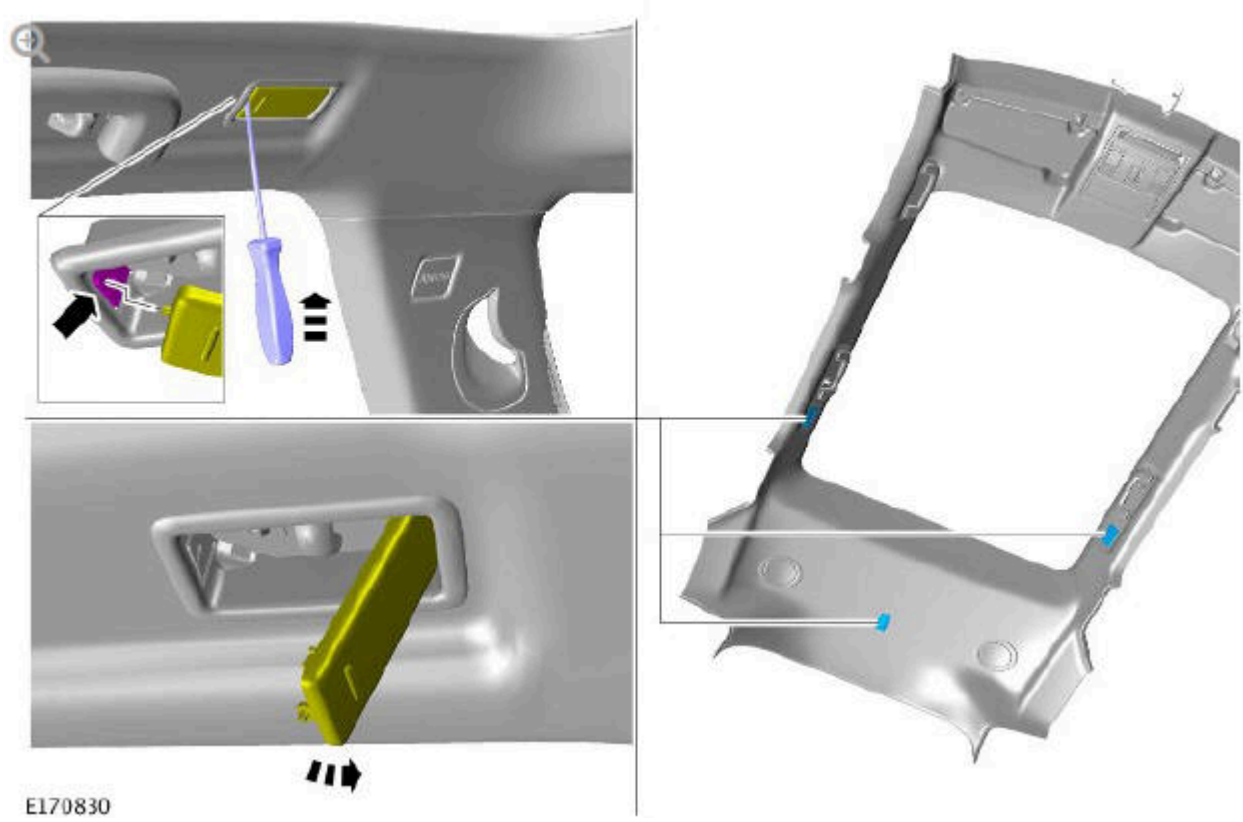
REMOVAL

NOTE:

Removal steps in this procedure may contain installation details.

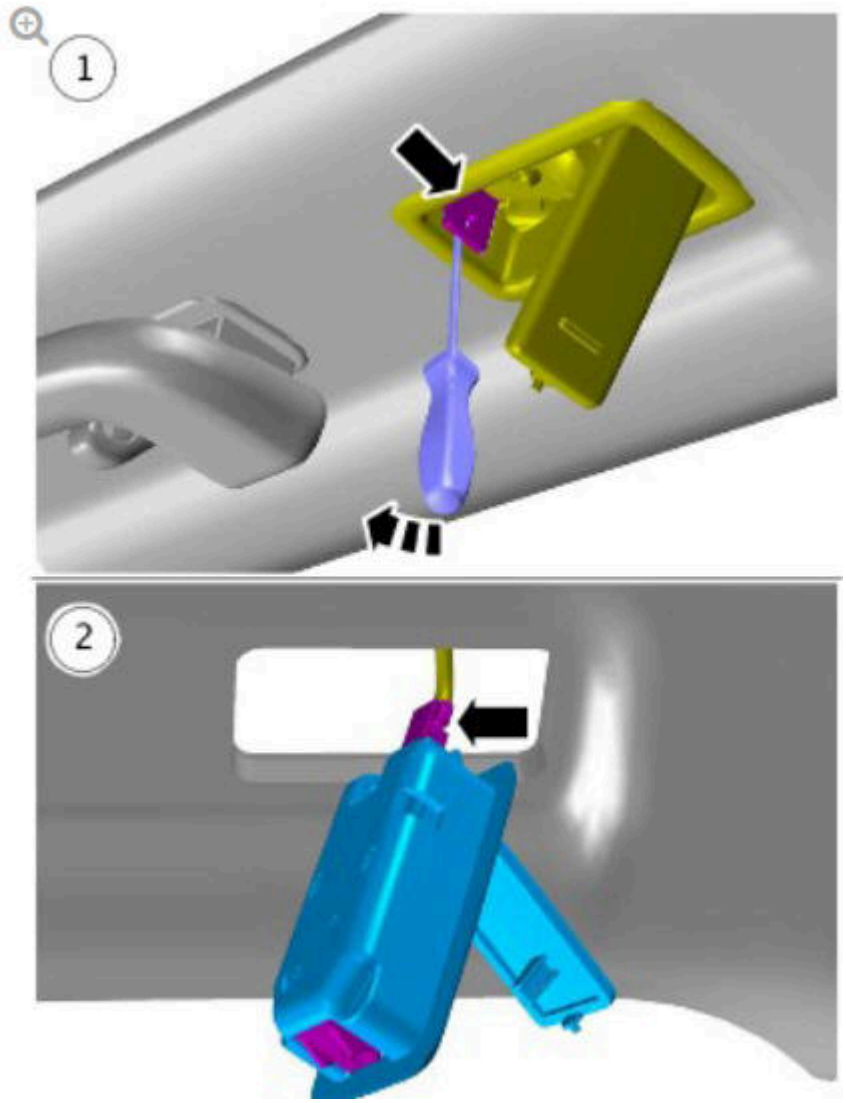
CAUTION:

Use a suitable trim tool.



CAUTION:

Use a suitable trim tool.



INSTALLATION

1. To install, reverse the removal procedure.

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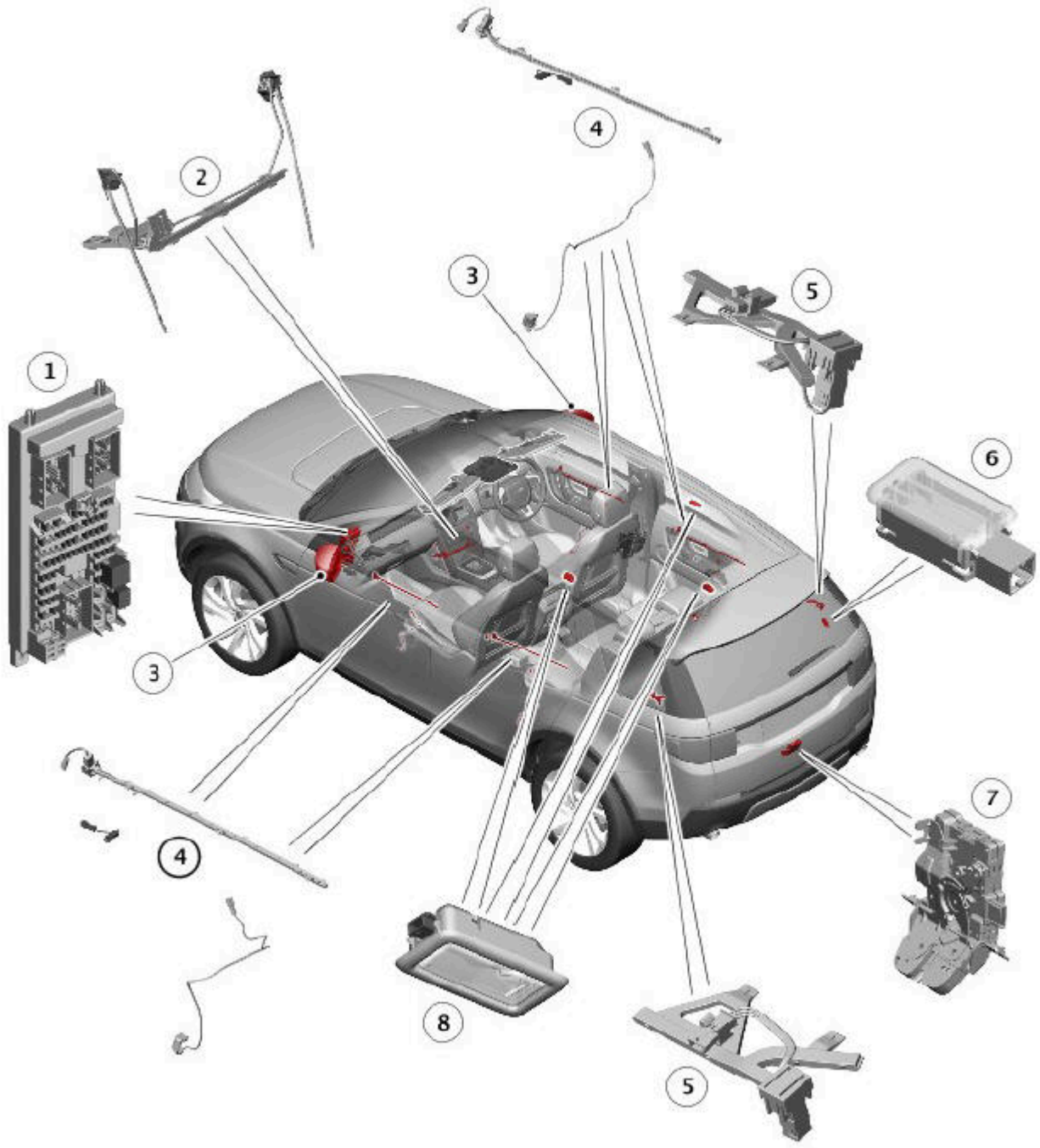
Daytime Running Lamps / Description and OperationInterior Lighting / Description and Operation

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Освещение салона / описание и работа

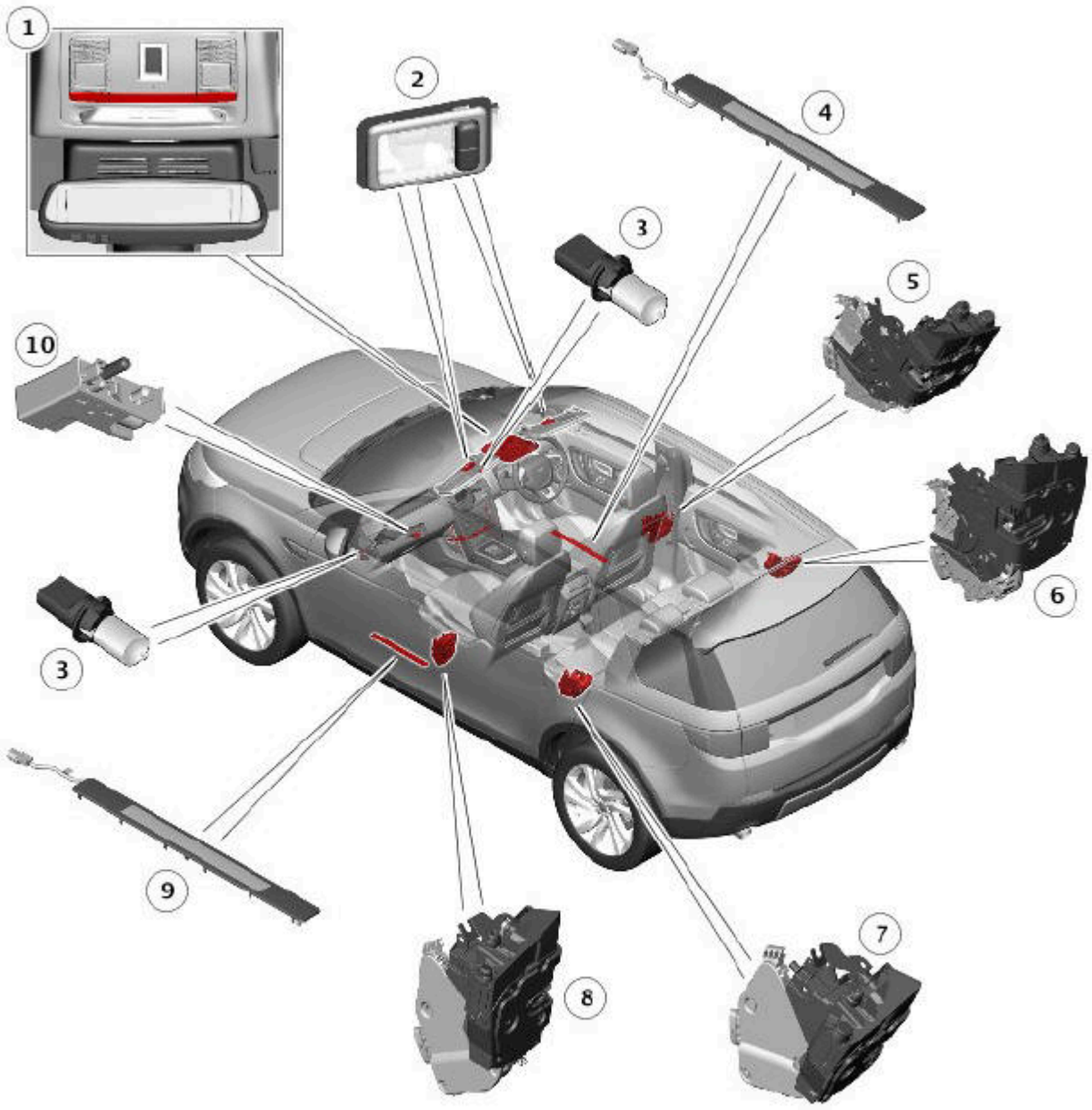
Interior Lighting / Description and Operation

COMPONENT LOCATION - SHEET 1 OF 2



1. Central Junction Box (CJB)
2. Instrument panel illumination
3. Approach lamp - door mirror
4. Door ambience lighting Light Emitting Diodes (LEDs)
5. Luggage compartment ambience lighting LEDs
6. Luggage compartment lamp
7. Tailgate latch - ajar switch
8. Rear interior lamps

COMPONENT LOCATION - SHEET 2 OF 2



1. Interior lamp and reading lamps
2. Vanity mirror illumination
3. Footwell lamps
4. Right treadplate LEDs
5. Driver door latch - ajar switch
6. Right rear door latch - ajar switch
7. Left rear door latch - ajar switch
8. Passenger door latch - ajar switch
9. Left treadplate LEDs
10. Glovebox switch and lamp assembly

OVERVIEW

The interior lighting system includes:

- An approach lamp in each door mirror

- Two footwell lamp for the passenger and driver
- A glovebox lamp and switch
- An interior lamp and two reading lamps in the overhead console
- Two vanity mirror lamps in the headliner
- Ambience lighting Light Emitting Diodes (LEDs) in the center console
- Ambience lighting LEDs on each door
- Ambience LED's in the luggage compartment
- Three interior lamps in the rear
- One luggage compartment lamp and a tailgate latch switch.

All of the interior lamps are controlled by the Central Junction Box (CJB).

The approach lamps, interior lamp, footwell lamps and rear interior lamps provide courtesy lighting, which operates automatically. The CJB operates these lamps simultaneously when the vehicle is locked and unlocked, the doors open and close, the start/stop switch is pressed and the interior lamp is selected on and off.

The CJB operates the load space lamps automatically when the tailgate is opened and closed.

The ambience lighting LED's in the center console, on each door and in the luggage compartment operate with the courtesy lighting and with selection of the side lamps and headlamps. There are two variants of ambient lighting depending on market and model specification:

- Phosphor blue only
- Configurable, from phosphor blue, pale blue, white, coral or red, which, if not already selected, changes to red when the vehicle is in the dynamic mode.

The glovebox illumination lamp operates automatically when the glovebox door is opened or closed. The side lamps or headlamps do not need to be selected for the glovebox illumination lamp to operate.

The approach lamps are selected on and off by their related door module, in response to a medium speed Controller Area Network (CAN) body systems bus signal from the CJB.

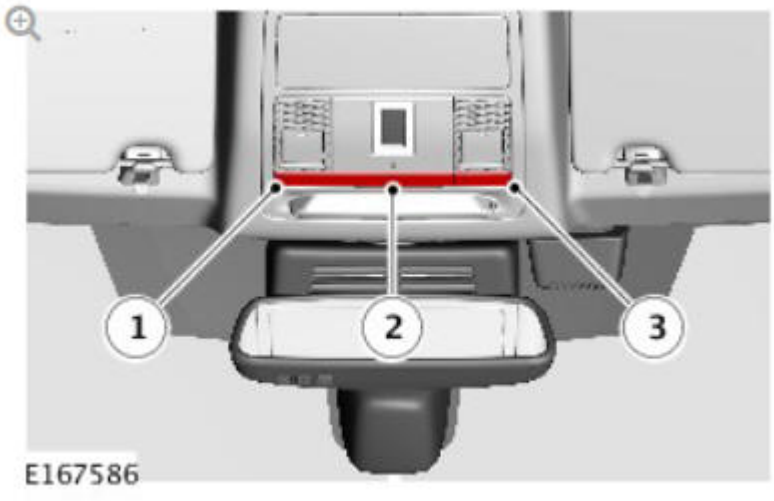
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Daytime Running Lamps / Diagnosis and TestingFront Interior and Reading Lamps - Overhead Console

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Передний салон и Reading фонари - Overhead консоль

Front Interior and Reading Lamps - Overhead Console



1. Left reading lamp
2. Interior lamp
3. Right reading lamp

The front interior and reading lamps are LED's located on the PCB in the overhead console. The lamps are manually controlled by a proximity sensing system or automatically controlled by the CJB.

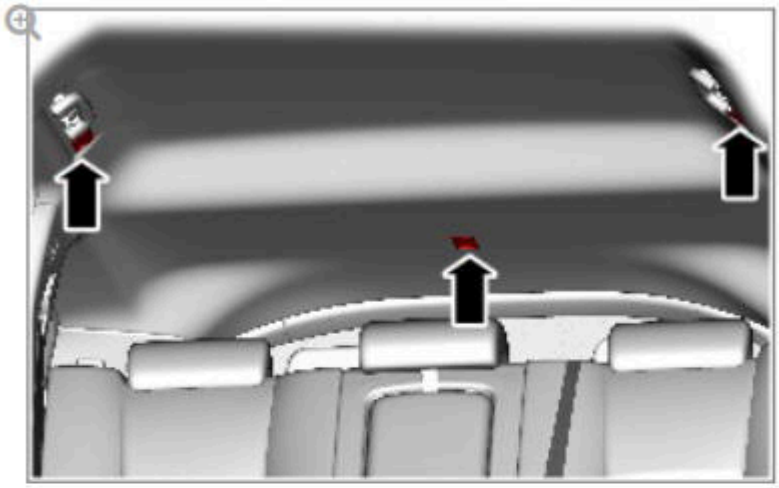
The front interior lamp is switched on manually by placing a finger close to or touching the lamp lens to switch the lamp on or off.

The front interior lamp also has automatic operation controlled by the CJB.

When the doors are unlocked all of the interior lamps are illuminated. The lamps are extinguished 60 seconds after all doors are closed, when the engine is started or the vehicle is locked. The automatic illumination can be deactivated by touching the front interior lamp lens for 2 seconds. The automatic illumination is reactivated by touching the front interior lamp lens again for 2 seconds. The CJB controls the interior lamp operation using a Pulse Width Modulation (PWM) output to fade the interior lamps on and off.

The reading lamps are switched on manually by placing a finger close to or touching the lamp lens to switch the lamp on or off. The reading lamps are provided a voltage feed from the power saver relay within the CJB. The reading lamps are provided with a power supply until the power saver relay contacts are opened. This prevents excessive primary battery drain if one or both reading lamps are inadvertently left on.

REAR INTERIOR LAMPS



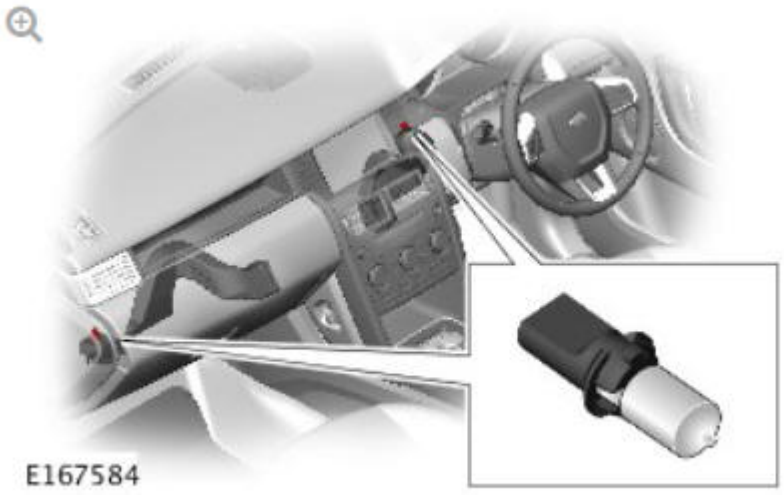


The rear interior lamps provide illumination via the automatic interior lighting controlled by the CJB.

Each lamp can be manually switched on or off by pressing the lamp lens which operates a switch internal to the lamp assembly. The rear interior lamps are provided a voltage feed from the power saver relay within the CJB. The lamps are provided with a power supply until the power saver relay contacts are opened. This prevents excessive primary battery drain if a door is inadvertently left open.

Two rear interior lamps are installed in the headliner adjacent to the rear grab handles. On 7-seat vehicles with third row seats, an additional rear interior lamp is installed in a central position above the third row seats

FOOTWELL LAMPS



A footwell lamp is located in each front footwell. The driver side footwell lamp is located in a bracket which is integral with the climate control system driver side floor duct. The passenger side footwell lamp is located in a bracket which is attached to the rear of the glovebox.

Each lamp comprises a halogen bulb installed in a bulb holder integrated into the vehicle instrument panel wiring harness. The footwell lamps are operated by a Pulse Width Modulation (PWM) output from the CJB to fade the footwell lamps on and off with the interior lamps. If the automatic illumination function has been disabled, the footwell lamps are also disabled.

APPROACH LAMPS



An approach lamp is installed in the underside of each door mirror.

Each approach lamp is powered by a fused permanent power supply to the Driver Door Module (DDM) and the Passenger Door Module (PDM) from the Engine Junction Box (EJB) and the CJB.

Each door module receives a signal from the CJB on the medium speed Controller Area Network (CAN) body systems bus to illuminate or extinguish the approach lamp. The approach lamps are active when the vehicle is unlocked or the engine is switched off and a front door opened.

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Interior Lighting / Description and OperationVanity Mirror Illumination Lamp

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Vanity зеркало Illumination фонарь

Vanity Mirror Illumination Lamp

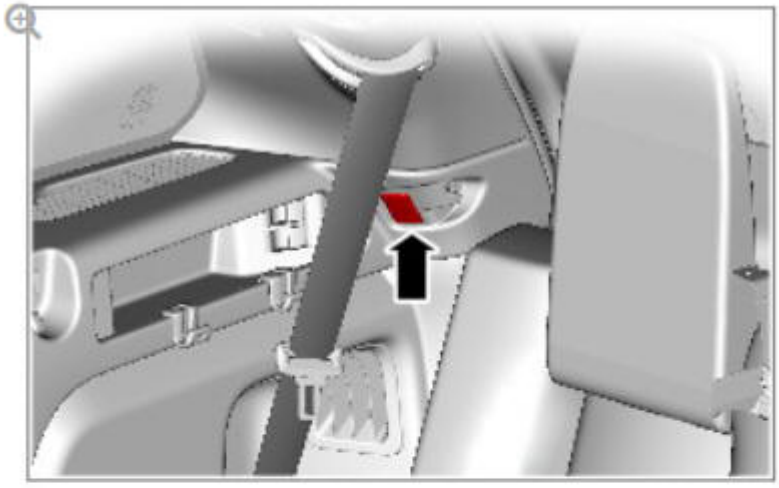


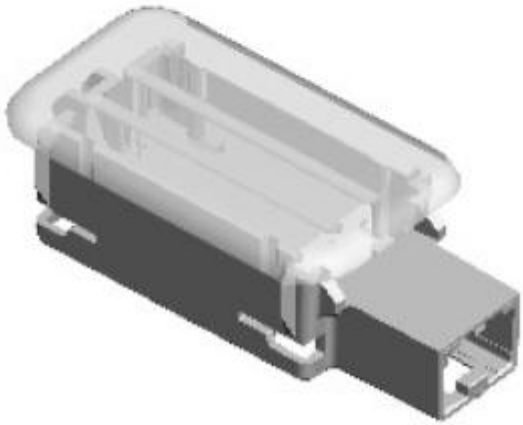


A vanity mirror lamp is located in the headliner above each sun visor. Each vanity mirror lamp has an on/off control switch. The vanity mirror lamps are not connected to the CJB automatic interior lamp function.

The vanity mirror lamps are provided a voltage feed from the power saver relay within the CJB. The lamps are provided with a power supply until the power saver relay contacts are opened. This prevents excessive primary battery drain if the vanity mirror lamps are inadvertently left on.

LUGGAGE COMPARTMENT LAMP





A single luggage compartment lamp is located in the right 'C' pillar trim in the luggage compartment.

Power is supplied to illuminate the luggage compartment lamps when the tailgate is opened and the tailgate latch ajar switch is operated. The switch supplies a ground signal to the CJB, which then illuminates the luggage compartment lamps. When the tailgate is closed the ground signal is removed and the luggage compartment lamps are turned off. The luggage compartment lamps are provided a voltage feed from the power saver relay within the CJB. The lamps are provided with a power supply until the power saver relay contacts are opened. This prevents excessive primary battery drain if the tailgate is left open for a period of time.

TREADPLATE ILLUMINATION LIGHT EMITTING DIODES (LEDS)

The front door rocker panels are fitted with illuminated treadplates. The illumination is provided by LEDs. When the LEDs are active they illuminate a 'Discovery' graphic within the treadplate.

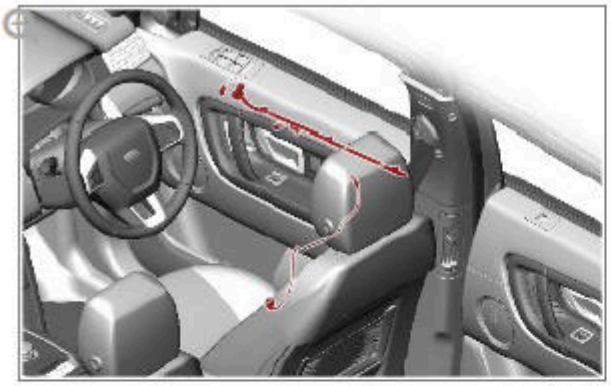
The treadplate LEDs are operated via the automatic interior lighting controlled by the CJB. When the doors are unlocked all of the treadplate LEDs are illuminated along with the interior lamps. The treadplate LEDs are operated by a Pulse Width Modulation (PWM) output from the CJB to fade the LEDs on and off with the interior lamps. If the automatic illumination function has been disabled, the treadplate LEDs are also disabled.

AMBIENCE LIGHTING LIGHT EMITTING DIODES (LEDS)

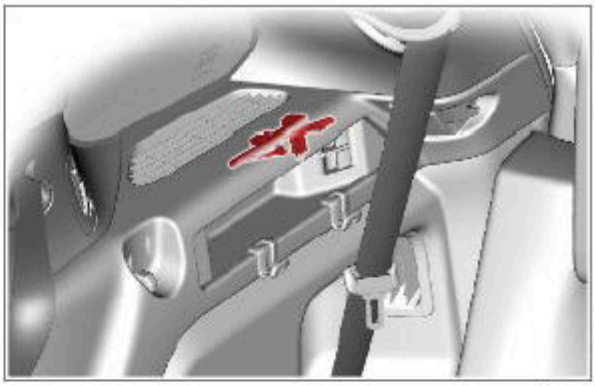




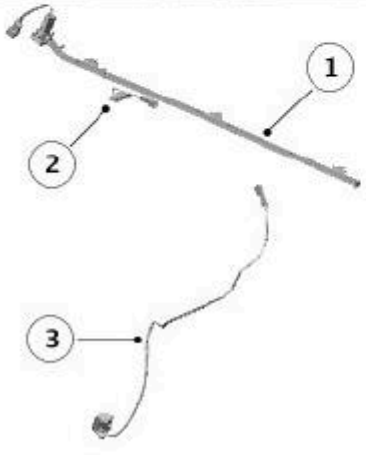
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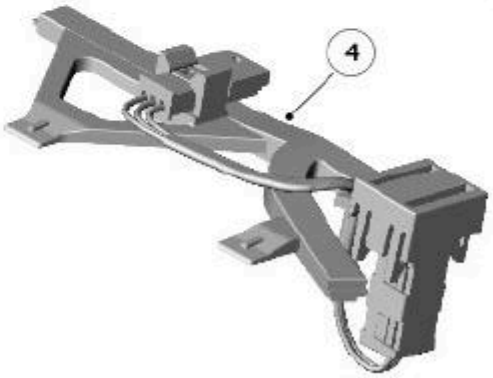


x4



x2





E167589

Ambience lighting LEDs are installed in the following locations:

- Instrument panel
- Driver and passenger doors - red/blue
- Driver and passenger doors - door pocket
- Driver and passenger doors - interior door handle
- Rear doors - red/blue
- Rear doors - door pocket
- Rear doors - interior door handle
- Luggage compartment - left/right side trim panels.

Each ambience lighting LED comprises three parts:

- LED light source
- A light guide
- A light guide carrier.

Ambience lighting operates with the courtesy lighting and with selection of the side lamps and headlamps.

OPERATION

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Front Interior and Reading Lamps - Overhead ConsoleInterior Lighting

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Освещение салона

Interior Lighting

The interior lamp operation is activated by any of the following input signals:

- Front and rear door latches - door ajar switch contacts
- Tailgate latch assembly - tailgate ajar switch contacts
- Power Mode 4 - accessory/vehicle unlocked
- Central Door Locking (CDL) - lock request
- Central Door Locking CDL - smart key unlock request
- Crash sensor input from Restraints Control Module (RCM)
- Front interior lamp switch.

The luggage compartment lamp is not switched on with the interior lamps.

This lamp is only activated when the tailgate is opened. When the tailgate is opened, the interior lamps, in addition to the luggage compartment lamps, are switched on and are subject to the CJB timers. The tailgate open signal to the CJB is provided by a tailgate ajar switch in the tailgate latch assembly.

AUTOMATIC CONTROL

The automatic control of the interior lamps has several switch on and off conditions as follows:

- The interior lamps are switched on when one or more doors are opened.

  When all the doors are closed, the interior lamps are switched off after a delay of 60 seconds. If the vehicle is locked after closing the doors, within the 60 second period, the lamps go off immediately.

- When the interior lamps are on and the ignition is in power mode 0 or 6, the lamps go off immediately after all doors have been closed.
- In power mode 0, the interior lamps are switched on for 60 seconds. This timer is overridden if a door is subsequently opened.
- When the vehicle is unlocked and the doors are closed, the interior lamps can be activated for a further 60 second period by pressing the 'unlock' button on the smart key.
- When the vehicle is unlocked from a locked condition, the interior lamps are activated for a 60 second period. This timer is overridden if a door is subsequently opened.
- If a door is left open, the interior lamps will remain on for 16 minutes.

  After this period, the CJB timer switches opens the contacts of the power saver relay and the interior lamps are switched to off to prevent excessive primary battery drain.

The CJB uses a Pulse Width Modulation (PWM) operation of the interior lamps for the on/off conditions. The lamps are switched on increasing to full intensity after a period of 1.3 seconds. The lamps are switched off with a decreasing intensity over a period of 2.6 seconds. The fade on/off operation is controlled by the CJB.

MANUAL CONTROL

The interior lamps can be switched on or off using the manual switch for the front interior lamp. The front interior lamp switch will switch all front and rear interior lamps on or off. If the interior lamps are on when the switch is pressed, all interior lamps will go off. The on and off automatic switching conditions remain effective even when the manual switch is used.

In power mode 4 or 6 and the front interior lamp switch is used to switch the interior lamps on, the lamps will remain on continuously. If the ignition is put into power mode 0, the interior lamps will be subject to the 16 minute CJB timer. The interior lamp is immediately switched off when the vehicle is locked. After a locking procedure, the interior lamp automatic control is reinstated.

CONTINUOUS OFF

To prevent drain on the primary battery if the doors are to remain open for some time, the interior lamps can be turned off permanently. This is stored in the CJB and is also activated following a system power down or a reset of the CJB To enter the continuous off condition, the front interior lamp switch must be pressed and held for more than 2 seconds. The continuous off function can only be exited by pressing the front interior lamp switch for a further 2 seconds, after which, full automatic control is resumed. When continuous off is active, the rear interior lamp switches can still be used to switch the rear interior lamps only on or off.

CRASH SIGNAL OPERATION

The CJB receives a crash signal on a hardwired connection from the Restraints Control Module (RCM) in the event of a crash of a severity to activate the airbags. On receipt of this signal, the CJB activates the interior lamps which are on permanently and not subject to the CJB timer.

The crash operation of the interior lamps can only be cancelled by operating the switch on the front interior lamp or by locking and unlocking the vehicle.

AMBIENCE LIGHTING

The ambience lighting system has variable colour options which can be adjusted by the customer using a menu option in the Touch Screen (TS).

The ambience lighting system uses phosphor blue and red LED's which are combined together to make a range of five different colours from pure blue, through purple, to pure red. In addition to the colour of the ambient lighting, customers can also vary the brightness.

Automatic colour changes are also activated when the driver selects dynamic mode; the ambience lighting automatically changes from the default blue colour to red (this colour change is also repeated in the

instrument cluster graphics).

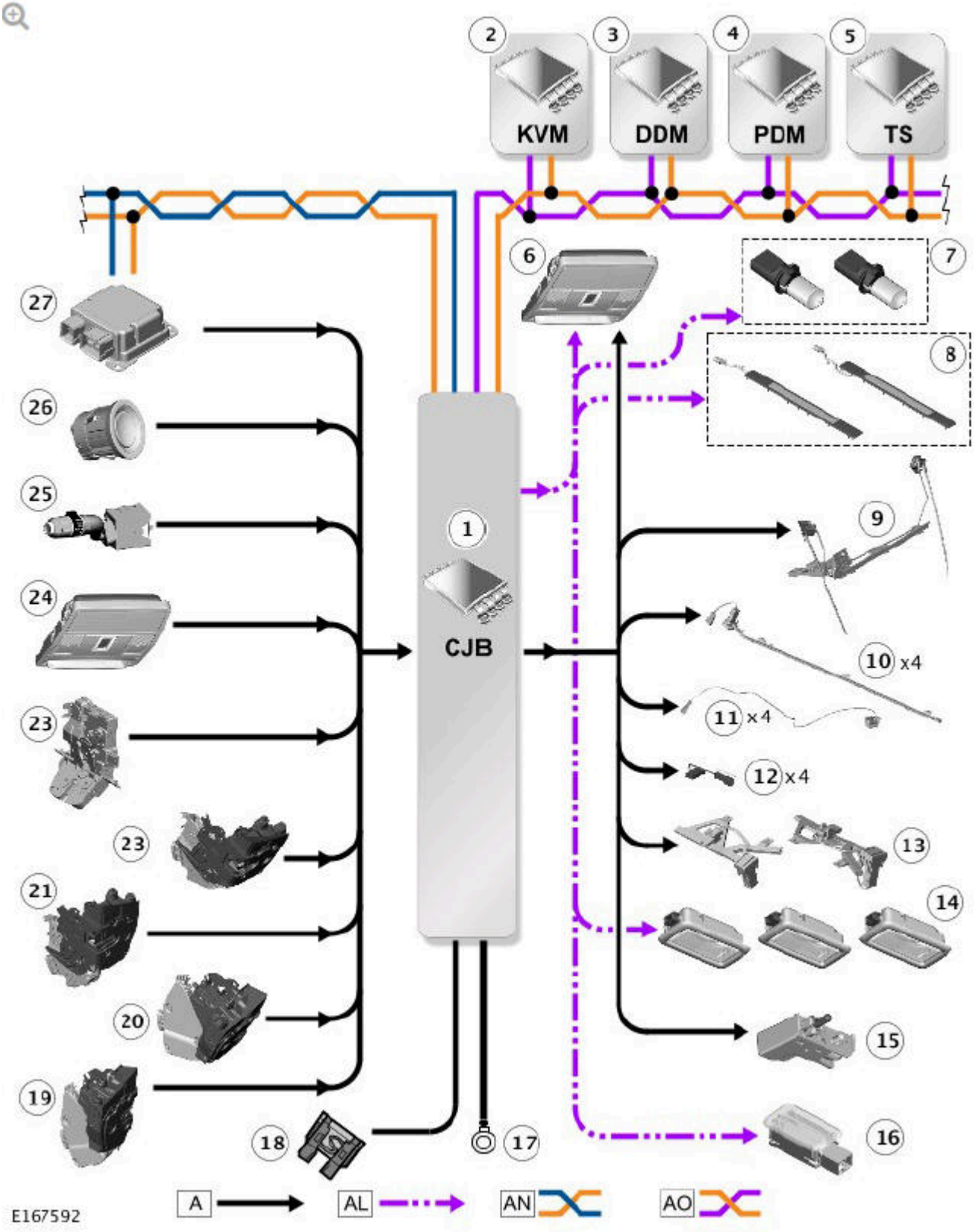
DIAGNOSTICS

Diagnostics for the interior lamps is limited to a check of the function of the front interior lamp switch. The CJB can be interrogated using a Land Rover approved diagnostic system to establish the correct operation of the front interior lamp switch, the door ajar switches and the tailgate ajar switch.

CONTROL DIAGRAM

NOTE:

A = Hardwired; AL = Pulse Width Modulation (PWM); AN = high speed CAN powertrain systems bus; AO = high speed CAN body systems bus;



1. Central Junction Box (CJB)
2. Keyless Vehicle Module (KVM)
3. Driver Door Module (DDM)
4. Passenger Door Module (PDM)
5. Touch Screen (TS)
6. Interior lamp and reading lamps
7. Footwell lamps

8. Treadplate Light Emitting Diodes (LEDs)
9. Instrument panel ambience lighting
10. Door ambience lighting LEDs (4 off)
11. Door pocket ambience lighting LED (4 off)
12. Door handle ambience lighting LED (4 off)
13. Luggage compartment ambience lighting LEDs
14. Rear interior lamps
15. Glovebox switch and lamp assembly
16. Luggage compartment lamp
17. Ground
18. Power supply from Battery Junction Box (BJB)
19. Passenger door latch - ajar switch
20. Left rear door latch - ajar switch
21. Right rear door latch - ajar switch
22. Driver door latch - ajar switch
23. Tailgate latch - ajar switch
24. Front interior lamp and reading lamps - overhead console
25. Lighting control switch
26. Stop/start switch
27. Restraints Control Module (RCM) - crash signal

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Vanity Mirror Illumination LampInterior Lighting / Diagnosis and Testing

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Освещение салона / диагностика и проверка

Interior Lighting / Diagnosis and Testing

PRINCIPLES OF OPERATION

For a detailed description of the Interior Lighting, refer to the relevant Description and Operation section in the workshop manual. REFER to: Interior Lighting (417-02 Interior Lighting, 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.

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-todate 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
▪ Interior lamps ▪ Map reading lamps ▪ Vanity mirror lamps ▪ Glove compartment lamp ▪ Footwell lamps ▪ Door mirror approach lamps ▪ Puddle lamps ▪ Luggage compartment lamp ▪ Ambience lighting	▪ Fuses ▪ Wiring harnesses and connectors ▪ Interior lamps ▪ Map reading lamps ▪ Vanity mirror lamps ▪ Glove compartment lamp ▪ Footwell lamps ▪ Door mirror approach lamps ▪ Puddle lamps ▪ Luggage compartment lamp ▪ Ambience lighting

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

Front/rear interior lamp inoperative	▪ Automatic mode switched off ▪ Front/rear interior lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ GO to Pinpoint Test A.
Ambience lighting inoperative	▪ Ambience lighting circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the ambience lighting circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new ambience lighting LED as necessary
Map reading lamp(s) inoperative	▪ Map reading lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the map reading lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new map reading lamp bulb as necessary
Vanity mirror lamp(s)	▪ Vanity mirror lamps circuit short	▪ Refer to the electrical circuit diagrams and check the vanity mirror lamps circuit for short

inoperative	circuit to ground, short circuit to power, open circuit, high resistance	circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new vanity mirror lamp bulb as necessary
Glovebox lamp inoperative	▪ Glovebox lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the glovebox lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new glovebox lamp as necessary
Footwell lamp(s) inoperative	▪ Footwell lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the footwell lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new footwell lamp bulb as necessary
Approach lamp(s) inoperative	▪ Approach lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the approach lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new approach lamp as necessary
Puddle lamp(s) inoperative	▪ Puddle lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the puddle lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new puddle lamp bulb as necessary
Luggage compartment lamp inoperative	▪ Luggage compartment lamp circuit short circuit to ground, short circuit to power, open	▪ Refer to the electrical circuit diagrams and check the luggage compartment lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new luggage compartment lamp bulb as necessary

	circuit, high resistance	

SYMPTOM:

Front/rear interior lamp inoperative

POSSIBLE CAUSE:

- Automatic mode switched off
- Front/rear interior lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

GO to Pinpoint Test A.

SYMPTOM:

Ambience lighting inoperative

POSSIBLE CAUSE:

- Ambience lighting circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the ambience lighting circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new ambience lighting LED as necessary

SYMPTOM:

Map reading lamp(s) inoperative

POSSIBLE CAUSE:

- Map reading lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the map reading lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new map reading lamp bulb as necessary

SYMPTOM:

Vanity mirror lamp(s) inoperative

POSSIBLE CAUSE:

- Vanity mirror lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the vanity mirror lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new vanity mirror lamp bulb as necessary

SYMPTOM:

Glovebox lamp inoperative

POSSIBLE CAUSE:

- Glovebox lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the glovebox lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new glovebox lamp as necessary

SYMPTOM:

Footwell lamp(s) inoperative

POSSIBLE CAUSE:

- Footwell lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the footwell lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new footwell lamp bulb as necessary

SYMPTOM:

Approach lamp(s) inoperative

POSSIBLE CAUSE:

- Approach lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the approach lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new approach lamp as necessary

SYMPTOM:

Puddle lamp(s) inoperative

POSSIBLE CAUSE:

- Puddle lamps circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the puddle lamps circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new puddle lamp bulb as necessary

SYMPTOM:

Luggage compartment lamp inoperative

POSSIBLE CAUSE:

- Luggage compartment lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the luggage compartment lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new luggage compartment lamp bulb as necessary

PINPOINT TESTS

NOTE:

The interior lamps should extinguish 20 seconds after the vehicle was unlocked if a door was not opened.

NOTE:

The vehicle will lock 30 seconds after it was unlocked if a door was not opened. If this has occurred, unlock the vehicle using the smart key unlock switch and wait until the interior lamps extinguish before continuing.

NOTE:

Steps 2 to 4 should be completed within 20 seconds.

PINPOINT TEST A : INTERIOR LAMP FUNCTION TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: INTERIOR LAMP FUNCTION TEST 1	
	1 Lock the vehicle
	2 Unlock the vehicle using the smart key unlock switch
	3 Visually check the front and rear interior lamps
	Are any of the interior lamps illuminated? **Yes** Test passed. GO to A2. **No** Test failed. GO to Pinpoint Test B.
A2: INTERIOR LAMP FUNCTION TEST 2	

	1 Visually check the front and rear interior lamps
	Is the front interior lamp illuminated? **Yes** Test passed. **GO to A3.** **No** Test failed. GO to Pinpoint Test **E.**

A3: INTERIOR LAMP FUNCTION TEST 3

	1 Visually check the front and rear interior lamps
	Is the rear left interior lamp illuminated? **Yes** Test passed. **GO to A4.** **No** Test failed. GO to Pinpoint Test **F.**

A4: INTERIOR LAMP FUNCTION TEST 4

	1 Visually check the front and rear interior lamps
	Is the rear right interior lamp illuminated? **Yes** Test passed. **GO to A5.** **No** Test failed. GO to Pinpoint Test **G.**

A5: INTERIOR LAMP FUNCTION TEST 5

	1 Wait for the interior lamps to extinguish
	2 Visually check the front and rear interior lamps
	Have the front and rear interior lamps extinguished? **Yes** Test passed. **GO to A6.** **No** Test failed. Check the instrument cluster for a message indicating that a door is open when it is closed

A6: INTERIOR LAMP FUNCTION TEST 6

	1 Open a door
	2 Visually check the front and rear interior lamps

	Are the front and rear interior lamps illuminated? **Yes** Test passed. **GO to A7**. **No** Test failed. Check the instrument cluster for an absence of door open message when a door is open
A7: INTERIOR LAMP FUNCTION TEST 7	

	1 Enter the vehicle
	2 Close the door
	3 Start the engine
	4 Visually check the front and rear interior lamps
	Have the front and rear interior lamps extinguished? **Yes** Test passed. **GO to A8.** **No** Test failed. Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index

A8: INTERIOR LAMP FUNCTION TEST 8

	1 Briefly touch the front interior lamp lens
	2 Visually check the front and rear interior lamps
	Are the front and rear interior lamps illuminated? **Yes** Test passed. **GO to A9.** **No** Test failed. GO to Pinpoint Test **D.**

A9: INTERIOR LAMP FUNCTION TEST 9

	1 Briefly touch the front interior lamp lens
	2 Visually check the front and rear interior lamps
	Have the front and rear interior lamps extinguished? **Yes** Test passed. **GO to A10.** **No** Test failed. GO to Pinpoint Test **D.**

A10: INTERIOR LAMP FUNCTION TEST 10

	1 Stop the engine
	2 Visually check the front and rear interior lamps
	Are the front and rear interior lamps illuminated?

	Yes Test passed. GO to A11. **No** Test failed. Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index

A11: INTERIOR LAMP FUNCTION TEST 11	
	1 Exit the vehicle
	2 Close the door
	3 Lock the vehicle
	4 Visually check the front and rear interior lamps
	Have the front and rear interior lamps extinguished? **Yes** Tests complete **No** Test failed. Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index

NOTE:

Interior lamps auto mode off is also known as Hunting mode.

PINPOINT TEST B : AUTO MODE FUNCTION TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	B1: AUTO MODE FUNCTION TEST 1
	1 Set the ignition to on
	2 Touch the front interior lamp lens for 5 seconds (or until the interior lamp flashes)
	3 Check the touch screen for a message
	Was "Auto function on" displayed on the touch screen? **Yes** Test passed. **GO to B2.** **No** Test failed. **GO to B3.**
	B2: AUTO MODE FUNCTION TEST 2
	1 Open a door
	2 Close the door
	3 Visually check the front and rear interior lamps
	Are the front and rear interior lamps illuminated? **Yes**

	Tests complete **No** Test failed. GO to Pinpoint Test **C.**
B3: AUTO MODE FUNCTION TEST 3	
	1 Touch the front interior lamp lens for 5 seconds (or until the interior lamp flashes)
	2 Check the touch screen for a message
	Was "Auto function on" displayed on the touch screen? **Yes** Auto mode now set to on. GO to Pinpoint Test **C.** **No** Test failed. GO to Pinpoint Test **D.**

NOTE:

Interior lamp operation is inhibited if the battery state of charge is below threshold

PINPOINT TEST C : BATTERY AND CHARGING SYSTEM TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
C1: BATTERY AND CHARGING SYSTEM TEST 1	
	1 Refer to the relevant section of the workshop manual and test the battery and charging system
	Are the battery and charging system operating within specification? **Yes** Test passed. GO to Pinpoint Test **E.** **No** Refer to the relevant section of the workshop manual and repair the battery and charging system as necessary

NOTE:

In step 1, do not disconnect the electrical connector(s). The lamp is removed for access only.

PINPOINT TEST D : INTERIOR LAMP SIGNAL TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	D1: INTERIOR LAMP SIGNAL TEST 1
	1 Using the manufacturer approved diagnostic system, check datalogger signal - Master Interior Light Switch (0xD902)
	2 Briefly touch the front interior lamp lens and check for a change in the signal
	Did the signal change? **Yes** Tests inconclusive. GO to Pinpoint Test **A.** **No** Test failed. **GO to D2.**
	D2: INTERIOR LAMP SIGNAL TEST 2
	1 Refer to the relevant section of the workshop manual and remove the front interior lamp
	2 Set a multimeter to measure voltage
	3 Connect the multimeter to terminals 19 (WH-OG) and 10 (BK-YE)
	Does the multimeter display battery voltage? **Yes** Test passed. **GO to D3.** **No** Test failed. **GO to D4.**
	D3: INTERIOR LAMP SIGNAL TEST 3
	1 Connect the multimeter to terminals 19 (WH-OG) and 10 (BK-YE)
	2 Briefly touch the front interior lamp lens and check for a change in the voltage
	Did the multimeter measure 0V? **Yes** Tests inconclusive. GO to Pinpoint Test **A.** **No** Install a new front interior lamp
	D4: INTERIOR LAMP SIGNAL TEST 4

D4: INTERIOR LAMP SIGNAL TEST 4

	1 Connect the multimeter to terminal 10 (BK-YE) and earth
	Did the multimeter measure 0V? **Yes** Refer to the electrical circuit diagrams and check the front interior lamp switch signal circuit for open circuit, high resistance **No**
	Refer to the electrical circuit diagrams and check the front interior lamp earth circuit for open circuit, high resistance

NOTE:

In step 1, do not disconnect the electrical connector(s). The lamp is removed for access only.

PINPOINT TEST E : FRONT INTERIOR LAMP TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	E1: FRONT INTERIOR LAMP TEST 1
	1 Refer to the relevant section of the workshop manual and remove the front interior lamp
	2 Open a door
	3 Set a multimeter to measure voltage
	4 Connect the multimeter to front interior lamp terminals 18 (GY-VT) and 10 (BK-YE)
	Does the multimeter display battery voltage? **Yes** Install a new front interior lamp. To continue with interior lamp function test GO to Pinpoint Test **A.** **No** Test failed. **GO to E2.**
	E2: FRONT INTERIOR LAMP TEST 2
	1 Open a door
	2 Connect the multimeter to front interior lamp terminal 10 (BK-YE) and earth
	Did the multimeter measure 0V? **Yes** Refer to the electrical circuit diagrams and check the front interior lamp supply circuit for open circuit, high resistance **No** Refer to the electrical circuit diagrams and check the front interior lamp earth circuit for open circuit, high resistance

NOTE:

In step 1, do not disconnect the electrical connector(s). The lamp is removed for access only.

PINPOINT TEST F : REAR LEFT INTERIOR LAMP TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	F1: REAR LEFT INTERIOR LAMP TEST 1
	1 Refer to the relevant section of the workshop manual and remove the rear left interior lamp
	2 Open a door
	3 Set a multimeter to measure voltage
	4 Connect the multimeter to rear left interior lamp terminals 2 (GY-VT) and 3 (BK-YE)
	Does the multimeter display battery voltage? **Yes** Install a new rear left interior lamp. To continue with interior lamp function test GO to Pinpoint Test **A.** **No** Test failed. **GO to F2.**
	F2: REAR LEFT INTERIOR LAMP TEST 2
	1 Open a door
	2 Connect the multimeter to rear left interior lamp terminal 3 (BK-YE) and earth
	Did the multimeter measure 0V? **Yes** Refer to the electrical circuit diagrams and check the rear left interior lamp supply circuit for open circuit, high resistance **No** Refer to the electrical circuit diagrams and check the rear left interior lamp earth circuit for open circuit, high resistance

NOTE:

In step 1, do not disconnect the electrical connector(s). The lamp is removed for access only.

PINPOINT TEST G : REAR RIGHT INTERIOR LAMP TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	G1: REAR RIGHT INTERIOR LAMP TEST 1
	1 Refer to the relevant section of the workshop manual and remove the rear right interior lamp
	2 Open a door
	3 Set a multimeter to measure voltage
	4 Connect the multimeter to rear right interior lamp terminals 2 (GY-VT) and 3 (BK-YE)
	Does the multimeter display battery voltage? **Yes** Install a new rear right interior lamp. To continue with interior lamp function test GO to Pinpoint Test **A.** **No** Test failed. **GO to G2.**
	G2: REAR RIGHT INTERIOR LAMP TEST 2
	1 Open a door
	2 Connect the multimeter to rear right interior lamp terminal 3 (BK-YE) and earth
	Did the multimeter measure 0V? **Yes** Refer to the electrical circuit diagrams and check the rear right interior lamp supply circuit for open circuit, high resistance **No** Refer to the electrical circuit diagrams and check the rear right interior lamp earth circuit for open circuit, high resistance

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (100-00 General Information, Description and Operation).

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Interior LightingFog Lamps

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Fog Lamps

PRINCIPLES OF OPERATION

For a detailed description of the Fog Lamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01, 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.

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-todate 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
▪ Lighting control switch ▪ Fog lamps	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Front fog lamp(s) inoperative	▪ Body system fault ▪ Lighting control switch fault ▪ Front fog lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Front fog lamp LED failed	▪ Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the front fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance ▪ Install a new front fog lamp
Rear fog lamp(s) inoperative	▪ Body system fault ▪ Lighting control switch fault ▪ Rear fog lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Rear fog lamp LED failed	▪ Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the rear fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance ▪ Install a new rear fog lamp
Front fog lamp(s) dim	▪ Body system fault ▪ Front fog lamp circuit high resistance ▪ Front fog lamp LED failed	▪ Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the front fog lamp circuit for high resistance ▪ Install a new front fog lamp
Rear fog lamp(s) dim	▪ Body system fault ▪ Rear fog lamp circuit high resistance	▪ Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index

	▪ Rear fog lamp bulb incorrect specification ▪ Rear fog lamp LED failed	▪ Refer to the electrical circuit diagrams and check the rear fog lamp circuit for high resistance ▪ Install a new rear fog lamp bulb ▪ Install a new rear fog lamp
Warning indicator(s) inoperative	▪ Body system fault ▪ Instrument cluster fault ▪ Lighting control switch fault	▪ Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Using the manufacturer approved diagnostic system, check the instrument cluster for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch

SYMPTOM:

Front fog lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Front fog lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance
- Front fog lamp LED failed

ACTION:

- Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the front fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance
- Install a new front fog lamp

SYMPTOM:

Rear fog lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Rear fog lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance
- Rear fog lamp LED failed

ACTION:

- Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the rear fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance
- Install a new rear fog lamp

SYMPTOM:

Front fog lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Rear fog lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance
- Rear fog lamp LED failed

ACTION:

- Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the rear fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance
- Install a new rear fog lamp

SYMPTOM:

Front fog lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Front fog lamp circuit high resistance
- Front fog lamp LED failed

ACTION:

- Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the front fog lamp circuit for high resistance
- Install a new front fog lamp

SYMPTOM:

Rear fog lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Rear fog lamp circuit high resistance
- Rear fog lamp bulb incorrect specification
- Rear fog lamp LED failed

ACTION:

- Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the rear fog lamp circuit for high resistance
- Install a new rear fog lamp bulb
- Install a new rear fog lamp

SYMPTOM:

Warning indicator(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Instrument cluster fault
- Lighting control switch fault

ACTION:

- Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index
- Using the manufacturer approved diagnostic system, check the instrument cluster for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code (DTC) Index - DTC: Central Junction Box (CJB) (100-00, Description and Operation).

- Exterior Lighting Front Fog Lamp Adjustment
- Front Fog Lamp (G1785314) Removal and Installation

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Interior Lighting / Diagnosis and TestingExterior Lighting Front Fog Lamp Adjustment

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Наружное освещение передний противотуманная фара регулировка

Exterior Lighting Front Fog Lamp Adjustment

NOTES:

- *Some variation in the illustrations may occur, but the essential information is always correct.*
- *Left illustration shown, Right is similar.*

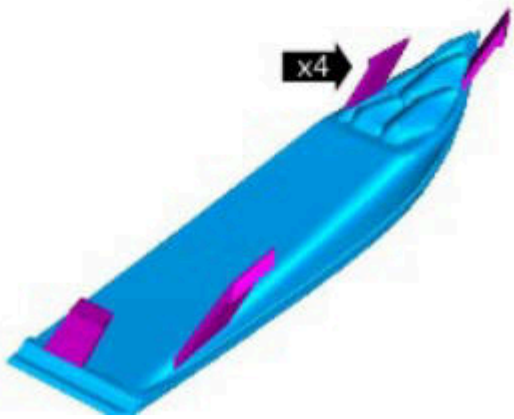
NOTE:

The fog lamp beam should be set at 2% below the horizontal and parallel.

Check the fog lamp beam alignment.

Align the beam setting equipment to one fog lamp.




x4


E167863

Adjust the fog lamp.

To adjust the second fog lamp, repeat the above procedure.

ne

Fog LampsFront Fog Lamp (G1785314) Removal and Installation

ne

Передний противотуманная фара снятие и установка

Front Fog Lamp (G1785314) Removal and Installation

REMOVAL

NOTES:

- *Removal steps in this procedure may contain installation details.*
- *Left illustration shown, Right is similar.*

Disconnect the battery ground cable.

Refer to: Specifications (414-01 Battery, Mounting and Cables, Specifications).

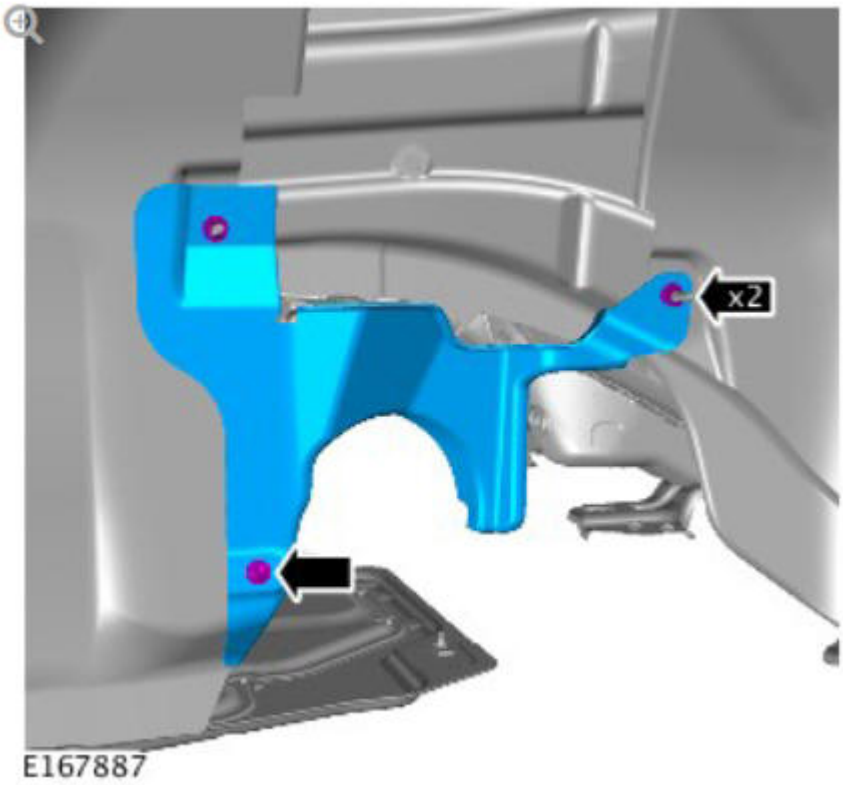
WARNING:

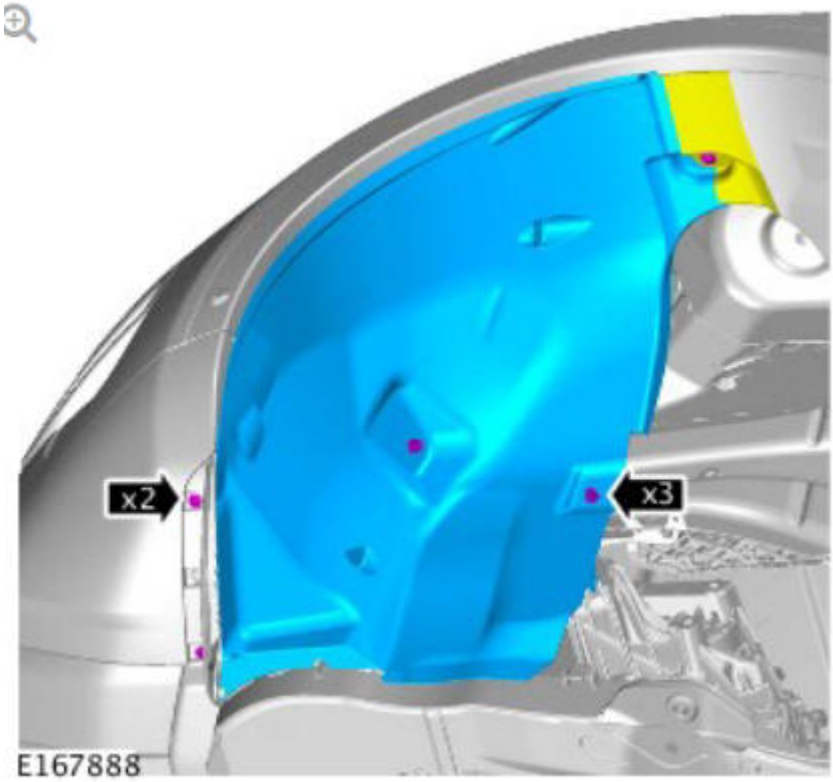
Make sure to support the vehicle with axle stands.

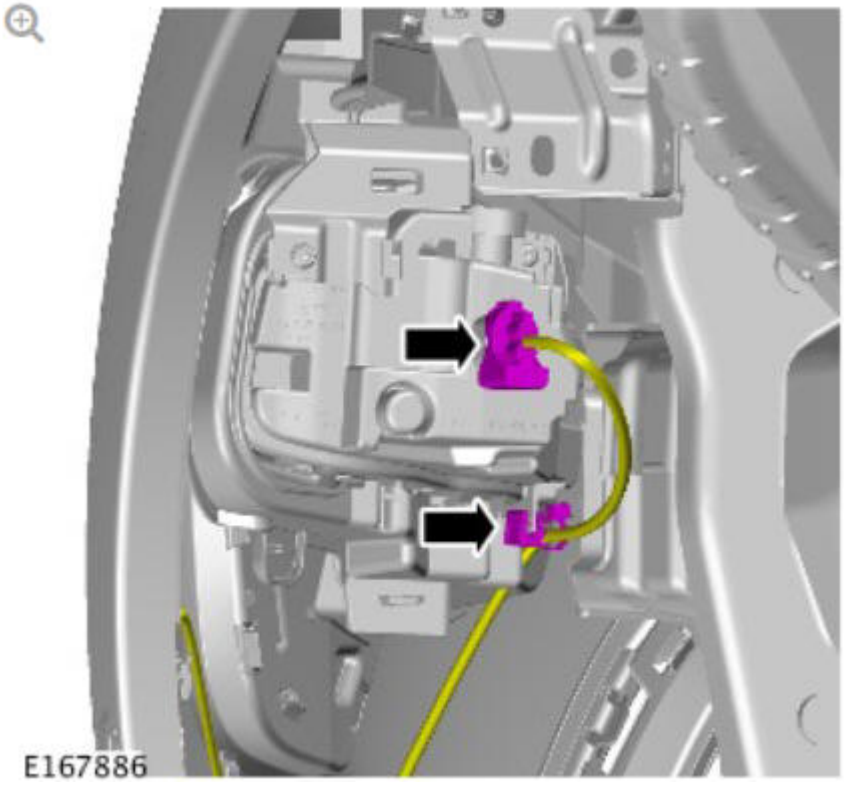
Raise and support the vehicle.

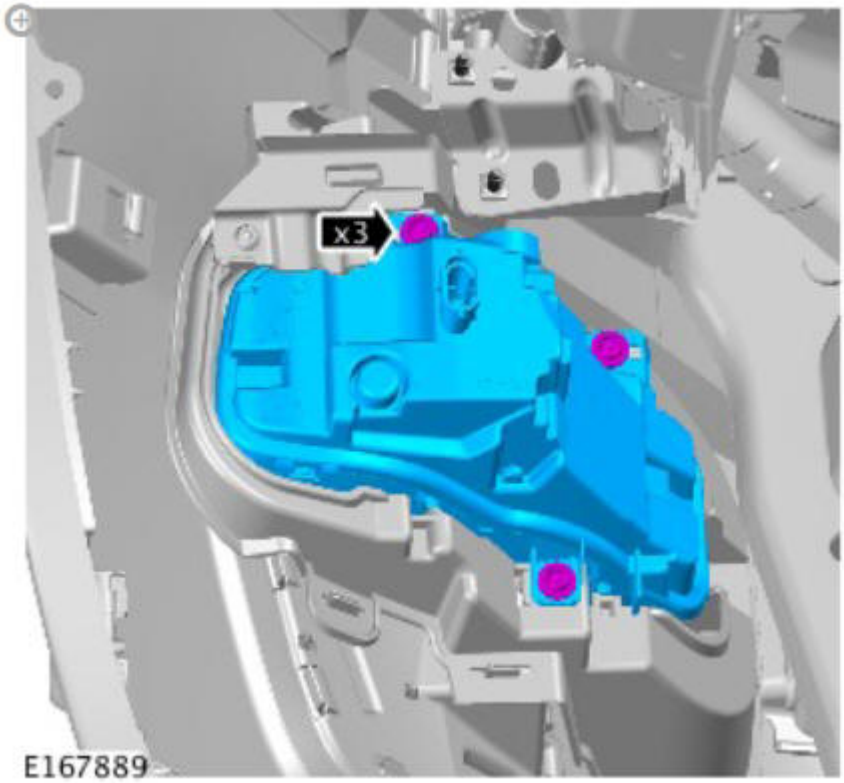
Remove the left front wheel and tire.

Refer to: Wheel and Tire (204-04, Removal and Installation).




x2
x3
E167888


E167886



Torque: 2 Nm

INSTALLATION

1. To install, reverse the removal procedure.
2. Check the fog lamp beam alignment.

   Refer to: Front Fog Lamp Adjustment (417-01, General Procedures).

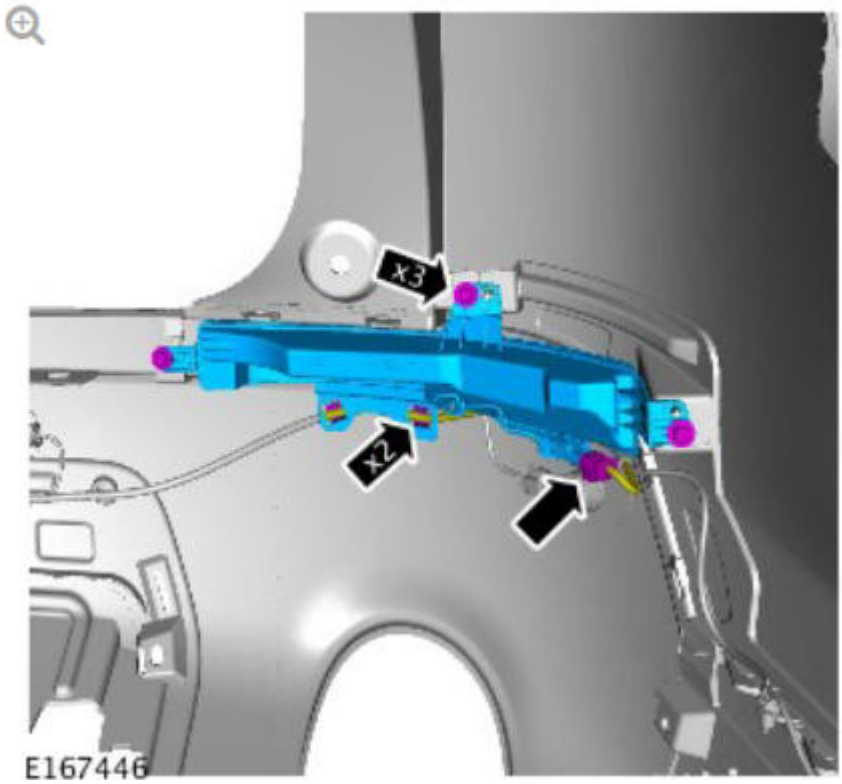
Rear Fog Lamp (G1781467) Removal and Installation

REMOVAL

NOTE:

Removal steps in this procedure may contain installation details.

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



Torque: 4.5 Nm

INSTALLATION

1. To install, reverse the removal procedure.

ne

Exterior Lighting Front Fog Lamp AdjustmentHeadlamp Leveling

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Фара Leveling

Headlamp Leveling

PRINCIPLES OF OPERATION

For a detailed description of the Headlamp Leveling system, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
▪ Lighting control switch ▪ Headlamps	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box ▪ Headlamp leveling control module ▪ Suspension control module ▪ Height sensors

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 CAUSES	ACTION
Headlamp leveling system inoperative	▪ Adaptive front lighting system fault ▪ Body system fault ▪ Adaptive damping system fault ▪ Headlamp internal failure - Leveling motor/linkage	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the headlamp leveling control module for related DTCs and refer to the relevant DTC index ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the suspension control module for related DTCs and refer to the relevant DTC index ▪ Install a new headlamp
Headlamp alignment incorrect	▪ Adaptive front lighting system fault ▪ Body system fault ▪ Adaptive damping system fault ▪ Headlamp internal failure - Leveling motor/linkage	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the headlamp leveling control module for related DTCs and refer to the relevant DTC index ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the suspension control module for related DTCs and refer to the relevant DTC index ▪ Install a new headlamp

SYMPTOM:

Headlamp leveling system inoperative

POSSIBLE CAUSE:

- Adaptive front lighting system fault
- Body system fault
- Adaptive damping system fault
- Headlamp internal failure - Leveling motor/linkage

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the headlamp leveling control module for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the suspension control module for related DTCs and refer to the relevant DTC index
- Install a new headlamp

SYMPTOM:

Headlamp alignment incorrect

POSSIBLE CAUSE:

- Adaptive front lighting system fault
- Body system fault
- Adaptive damping system fault
- Headlamp internal failure - Leveling motor/linkage

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the headlamp leveling control module for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the suspension control module for related DTCs and refer to the relevant DTC index
- Install a new headlamp

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: (100-00 General Information) Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (Description and Operation), Diagnostic Trouble Code Index - DTC: Headlamp Leveling Control Module (HLCM) (Description and Operation).

Headlamp Levelling Control Module (G1785272) Removal and Installation

REMOVAL

CAUTION:

Protect the surrounding components.

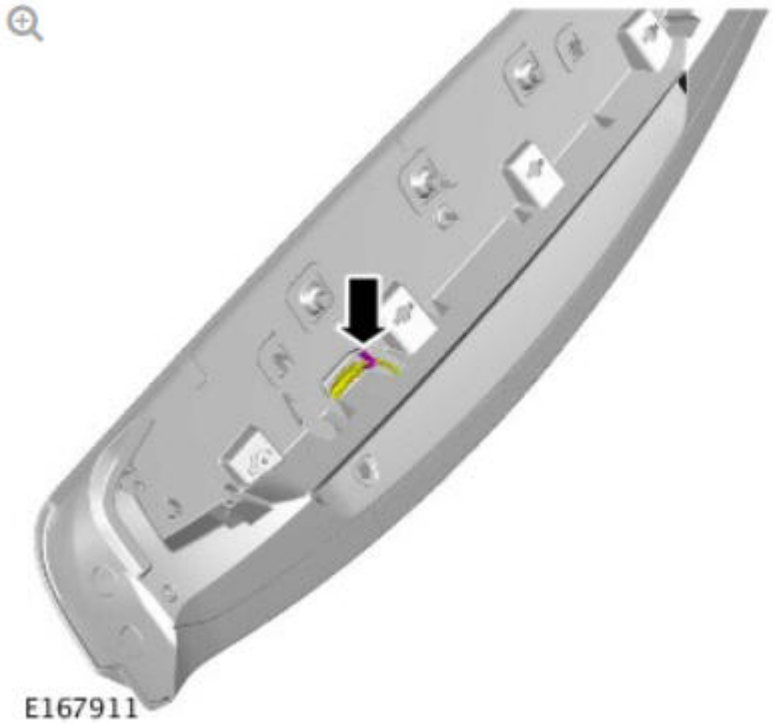
NOTES:

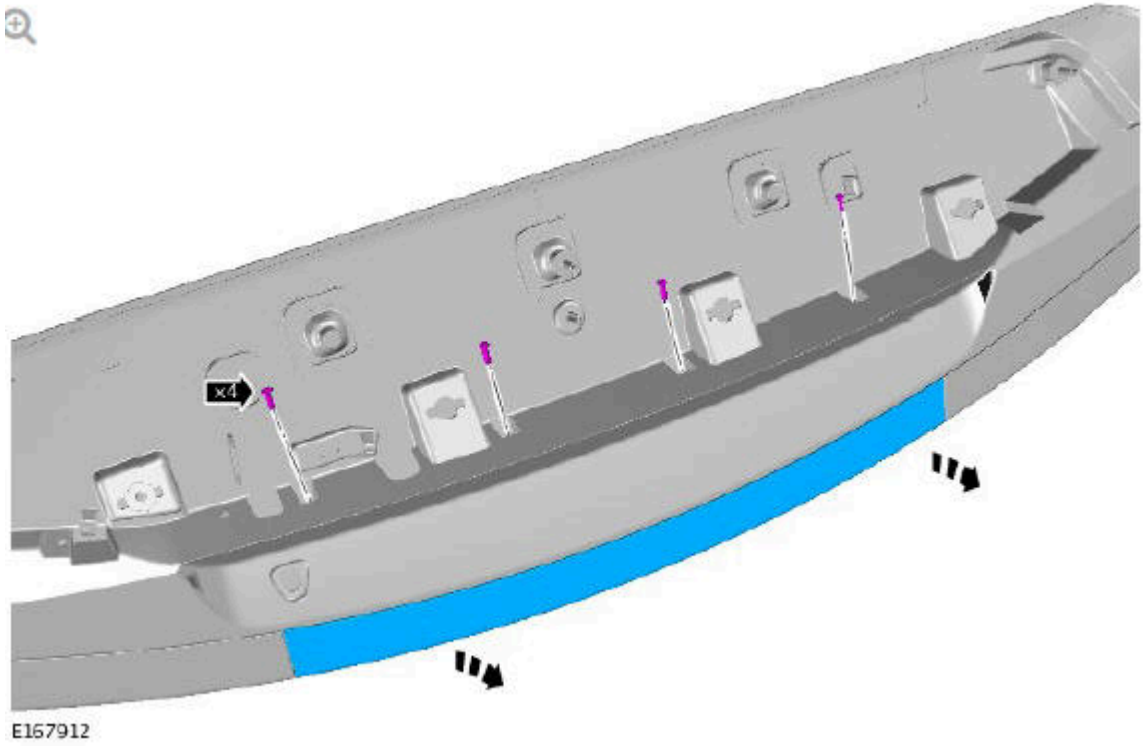
- *Removal steps in this procedure may contain installation details.*
- *Some variation in the illustrations may occur, but the essential information is always correct.*

Disconnect the battery ground cable.

Refer to: Specifications (414-01 Battery, Mounting and Cables, Specifications).

Refer to: Rear Spoiler (501-08 Exterior Trim and Ornamentation, Removal and Installation).





Torque: 2 Nm

INSTALLATION

1. To install reverse the removal procedure.

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Front Fog Lamp (G1785314) Removal and InstallationHeadlamps

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Headlamps

Headlamps

PRINCIPLES OF OPERATION

For a detailed description of the Headlamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, Description and Operation).

SAFETY INFORMATION

WARNING:

The xenon headlamp system generates up to 28,000 volts. Make sure that the headlamps are switched off before working on the system.

Failure to follow this instruction may result in personal injury.

The following safety precautions must be followed when working on the xenon headlamp system:

1. DO NOT attempt any procedures on the xenon headlamps when the lights are switched on.
2. Handling of the xenon bulb must be performed using suitable protective equipment, e.g. gloves and goggles. The glass part of the bulb must not be touched.
3. Xenon bulbs must be disposed of as hazardous waste.
4. Only operate the lamp in a mounted condition in the reflector.

There are comprehensive instructions on the correct procedures for xenon headlamp system repairs in the manual, refer to section 100-00 - General Information, Standard Workshop Procedures of the workshop manual.

REFER to: Standard Workshop Practices (100-00 General Information, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
■ Lighting control switch/Steering wheel module and installation ■ Headlamps condition & Installation	■ Fuses ■ Wiring harnesses and connectors ■ Height sensors ■ Central junction box ■ Integrated suspension control module ■ Steering angle sensor module ■ Image processing module ■ Rain/light sensor

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 CAUSES	ACTION
Headlamp(s) inoperative	▪ Body system fault ▪ Headlamp bulb failed ▪ Lighting control switch fault ▪ Headlamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new headlamp bulb ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the headlamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp bulb as necessary
Headlamp(s) dim	▪ Body system fault ▪ Headlamp bulb failed ▪ Headlamp bulb incorrect specification ▪ Headlamp circuit high resistance ▪ Low voltage	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new headlamp bulb ▪ Install a new headlamp bulb ▪ Refer to the electrical circuit diagrams and check the headlamp circuit for high resistance. Repair the wiring harness or install a new headlamp bulb as necessary
Headlamp(s) stuck on	▪ Body system fault ▪ Lighting control	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the

	switch fault ▪ Headlamp circuit short circuit to power	relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the headlamp circuit for short circuit to power. Repair the wiring harness as necessary
Headlamp low/high beam switching function inoperative	▪ Body system fault ▪ Lighting control switch fault ▪ Headlamp shutter circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Headlamp internal failure - Shutter mechanism	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the headlamp shutter circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp as necessary ▪ Install a new headlamp
Warning indicator(s) inoperative	▪ Body system fault ▪ Instrument cluster fault ▪ Lighting control switch fault	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the instrument cluster for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch

SYMPTOM:

Headlamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Headlamp bulb failed
- Lighting control switch fault
- Headlamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new headlamp bulb
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the headlamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp bulb as necessary

SYMPTOM:

Headlamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Headlamp bulb failed
- Headlamp bulb incorrect specification
- Headlamp circuit high resistance
- Low voltage

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new headlamp bulb
- Install a new headlamp bulb
- Refer to the electrical circuit diagrams and check the headlamp circuit for high resistance.

  Repair the wiring harness or install a new headlamp bulb as necessary

SYMPTOM:

Headlamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Headlamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the headlamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Headlamp low/high beam switching function inoperative

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault

- Headlamp shutter circuit short circuit to ground, short circuit to power, open circuit, high resistance
- Headlamp internal failure - Shutter mechanism

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the headlamp shutter circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp as necessary
- Install a new headlamp

SYMPTOM:

Warning indicator(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Instrument cluster fault
- Lighting control switch fault

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the instrument cluster for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch

- Front and Rear Lamp Condensation
- Exterior Lighting / Description and Operation
- Headlamp Assemblies/ Description
- Halogen / Xenon Headlamp
- Adaptive Front Lighting System (AFS)
- Tail Lamp Assemblies
- Left Steering Column Multifunction Switch
- Front Fog Lamps
- Hazard Warning Lamps
- Central Junction Box
- Headlamp Assembly (G1785269) / Removal and Installation
- Headlamp Bulb (G1785270) / Removal and Installation

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Headlamp LevelingFront and Rear Lamp Condensation

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Передний и задний фонарь Condensation

Front and Rear Lamp Condensation

Some customers may complain of condensation/mist inside exterior lamps.

Condensation/mist is a natural phenomenon which can occur when there is a temperature difference between the inside and outside of the lamp unit.

This condensation is considered to be as a result of normal atmospheric conditions and replacing the light unit will not correct this symptom. With the introduction of clear lenses condensation is likely to be more noticeable but does not affect the performance of the lamp. Condensation will clear when the lights have been on for some length of time and in warmer ambient temperatures A lamp that exhibits condensation should be evaluated after a drying time where all the functions have been operated for a minimum of 30 minutes. If the condensation has started to clear during this time it indicates that the lamp sealing has NOT been breached and will eventually clear. The lamp must NOT be replaced

CAUTION:

Make sure that bulb covers are correctly installed and make sure that all breathers (tubes or membrane patches) are free from dirt and debris and are fitted correctly as these can all lead to the formation of condensation. If any of these are determined to be the cause of the condensation, measures should be taken to dry out the lamps and to make sure that the bulb covers are installed correctly

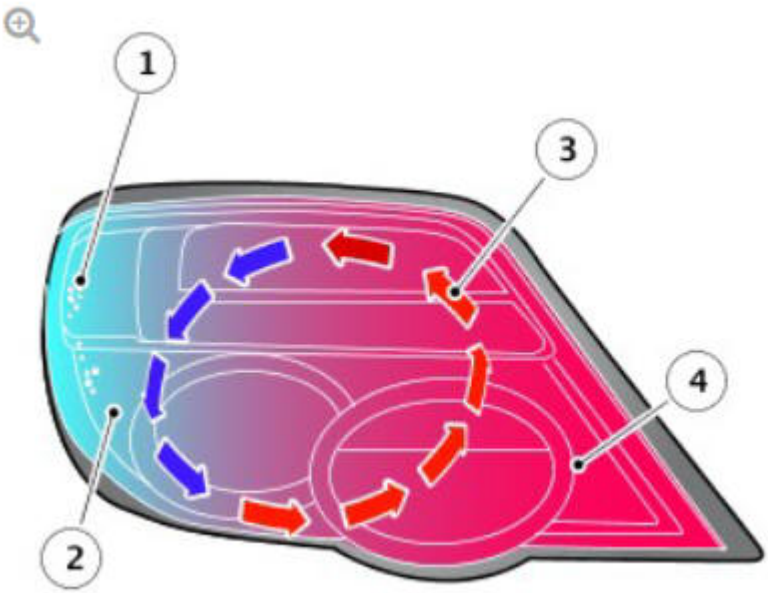
NOTES:

- *The Owner's handbook clearly states that condensation may form on the inside of lamp lenses and is caused by atmospheric conditions. That it is not detrimental to lamp performance and will clear during normal usage*
- *Pools of water and high levels of condensation would indicate that the lamps sealing has been compromised. Check for damage and inspect the condition of caps and breathers*
- *Differing layout on the opposing sides of the vehicle can lead to different levels of condensation inside the lamps from side to side.*

  As a result of this the rate at which condensation clears may also differ from side to side

- *Photographic evidence of the condensation levels prior to and after drying time should be provided with every returned part. Failure to do so may result in the claim being rejected*
- *This information bulletin contains examples of normal condensation generated from atmospheric conditions. A thin mist can form on the interior of clear plastic lenses, this is not detrimental to the lamp's performance. This thin mist will eventually clear through normal use, exiting through the lamp's venting system*

Condensation or moisture can be more noticeable during the months of spring and autumn when there is a likelihood of a higher moisture content in the air. It can occur when there is a temperature difference on either side of the lens surface. This can often be seen in the evening and morning sunshine or when cold water makes contact with a warm lamp lens. When a lamp is warmed unevenly by the sunshine the surface area in direct sunlight will be approximately 10ºC higher than the remainder of the lamp. When warm air circulates within the lamp and makes contact with the colder surfaces moisture can appear on the lens as water condenses out of the warmer air. Condensation may occur when washing a vehicle with cold water on a warm day or when the lamps are warm and vice versa. This is the same phenomena as with the formation of dew on the surface of a glass window pane The following illustration demonstrates the process:



1. Moisture formation
2. Cool surfaces
3. Air circulation (convection)
4. Warm surfaces

Shown below are examples of normal exterior lamp condensation. This would NOT be covered by warranty and the lamp(s) should not be replaced

In the photographs shown below, there are no visible streaks, drip marks or droplets in the condensation mist



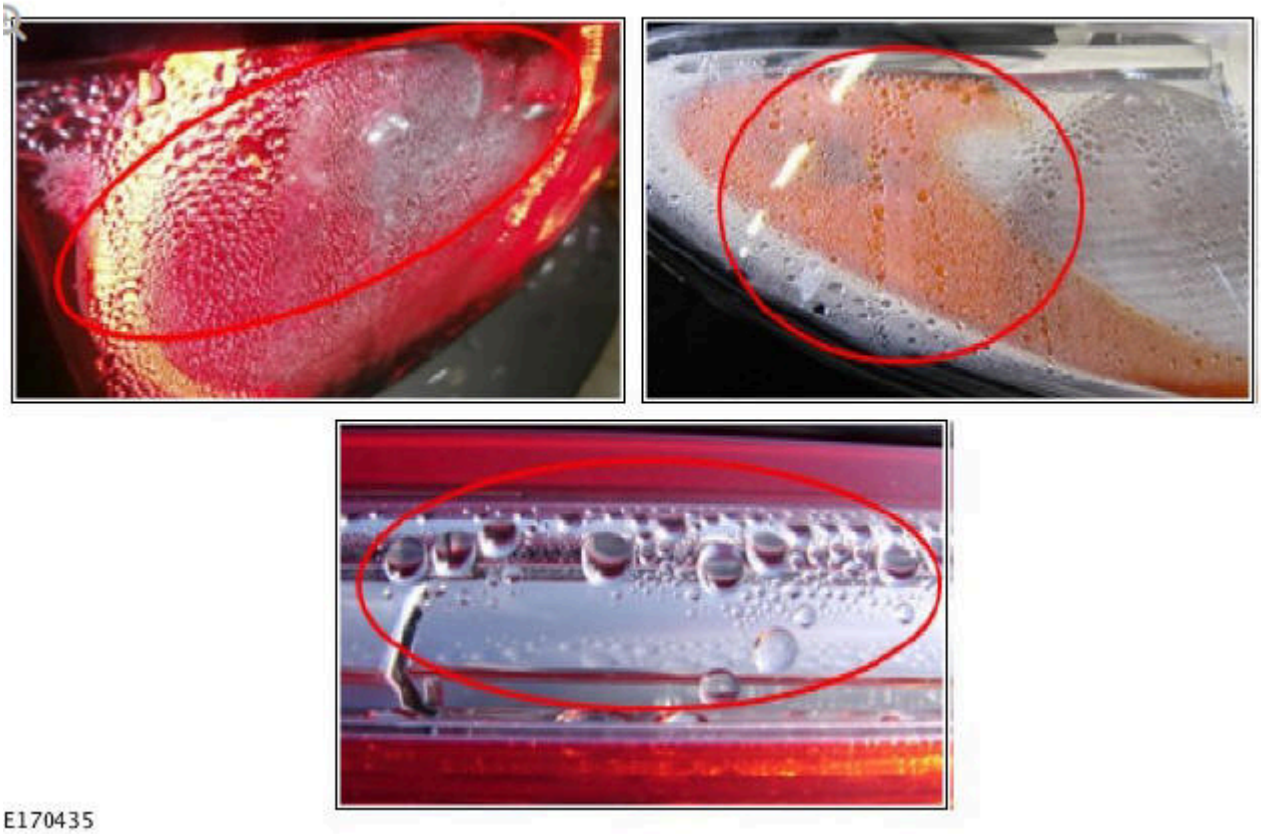
In the photographs shown below, the condensation mist does not obstruct the view of the lamp interior



E170434

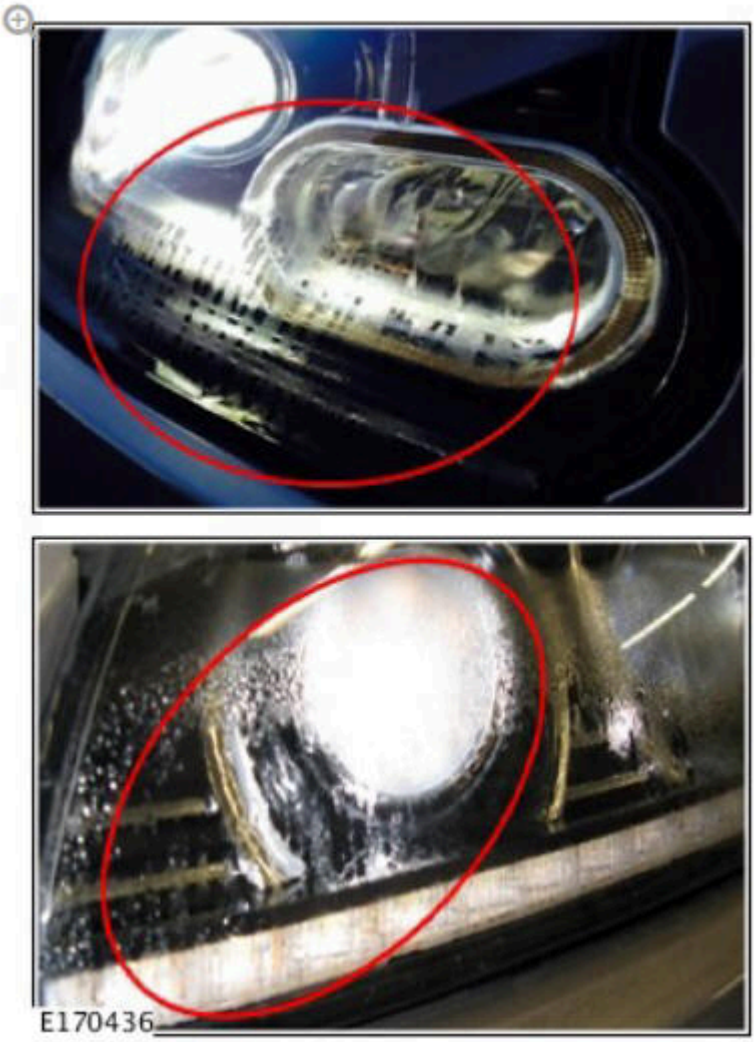
Shown below are examples of abnormal exterior lamp condensation that may be covered by warranty. Warranty may be accepted providing the lamp does not exhibit any visible signs of external damage

In the photographs shown below, note the large water droplets



E170435

In the photographs shown below, note the drip marks or streaks in the condensation



In the photograph shown below, note the standing water within the lamp



In the photograph shown below, note the thick mist covering the lens with water droplets



DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (100-00 General Information, Description and Operation).

Exterior Lighting Headlamp Adjustment

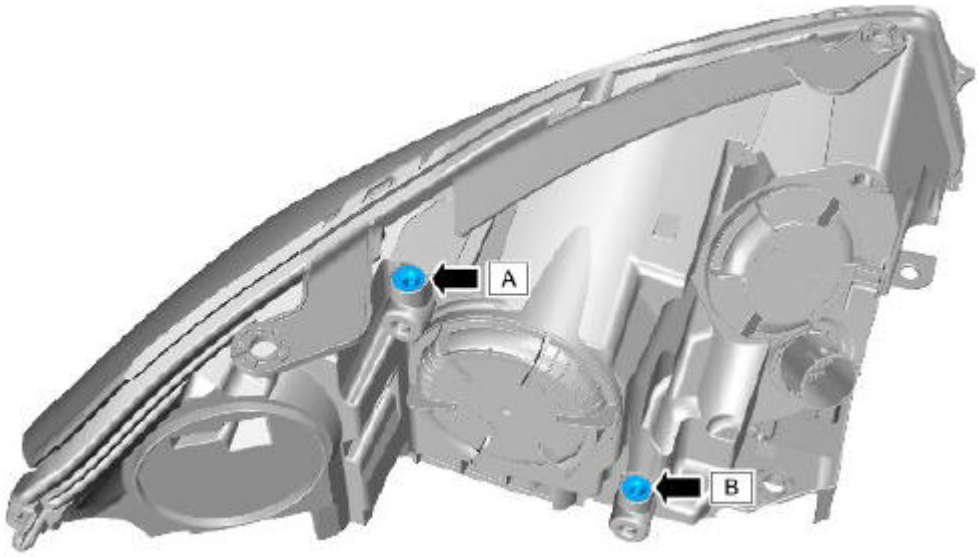
NOTES:

- *The headlamp setting is 1.2 % below horizontal and parallel.*
- *Left illustration shown, Right is similar.*

1. Align the headlamp beam setting equipment to one headlamp.
2. Switch the headlamps on and to dipped beam.

NOTE:

NAS vehicles have vertical adjustment only.



- Adjust the headlamps with an Allen Key.
- Rotate the adjuster 'A' for horizontal alignment.
- Rotate the adjuster 'B' for vertical alignment.

To adjust the second headlamp, repeat the above procedure.

ne

HeadlampsExterior Lighting / Description and Operation

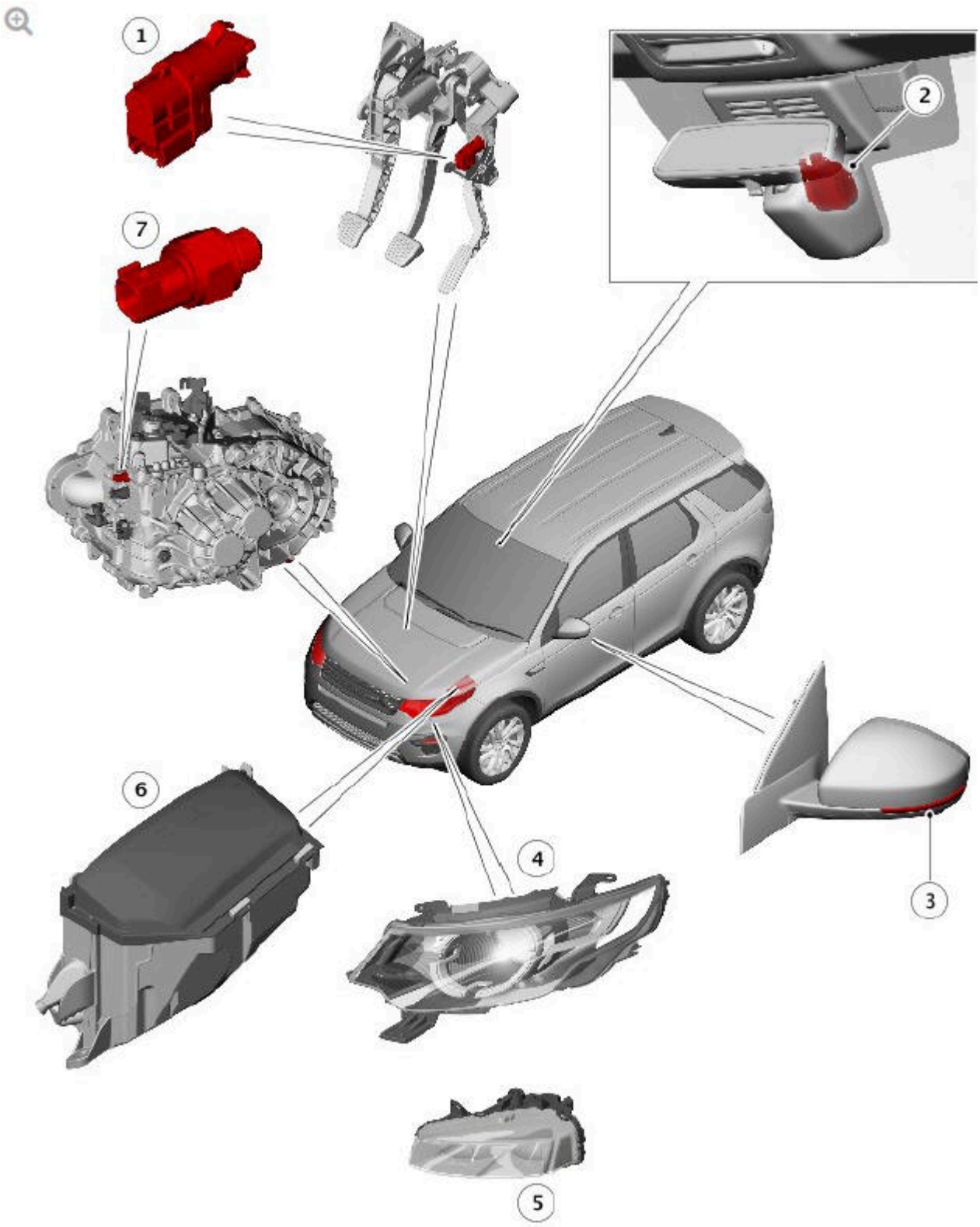
ne

Наружное освещение / описание и работа

Exterior Lighting / Description and Operation

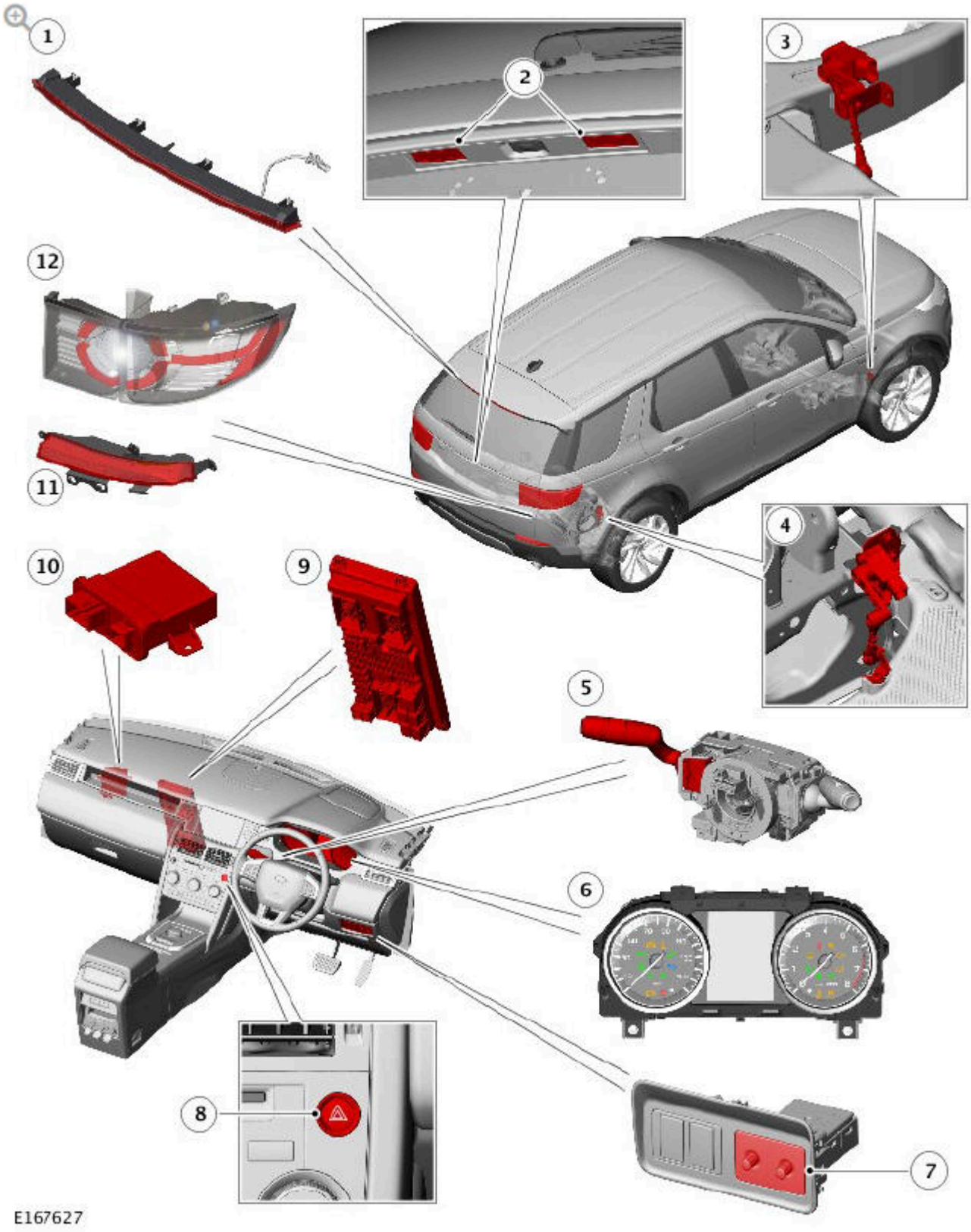
COMPONENT LOCATION

Graphic: 1 off 2.



1. Stop lamp switch
2. Rain/Light sensor
3. Side turn signal indicator lamp
4. Headlamp
5. Front fog lamp
6. Battery Junction Box (BJB)
7. Reverse lamp switch

Graphic: 2 off 2.



1. High Mounted Stop Lamp (HMSL)
2. License plate lamp
3. Front height sensor (Xenon headlamps only)
4. Rear height sensor (Xenon headlamps only)
5. Left steering column multifunction switch
6. Instrument Cluster (IC)
7. Auxiliary lighting switch

8. Hazard warning lamp switch
9. Central Junction Box (CJB)
10. Headlamp Levelling Control Module (HLCM)
11. Rear fog lamp
12. Tail lamp unit

OVERVIEW

Exterior lighting

The exterior lighting consists of:

1. Two headlight assemblies, each containing a:

- Headlamp
- Static bending lamp
- Turn signal indicator lamp
- Combined daytime running lamp and side lamp
- Side marker lamp and reflector (NAS only).

2. Two tail lamp assemblies, each containing a:

- Turn signal indicator lamp
- Tail lamp unit
- Stop lamp
- Rear side markers
- Reverse lamps

3. lighting control switch and steering column multifunction switch.
4. Central Junction Box (CJB).
5. Two front fog lamps
6. Two rear fog lamps.
7. A High Mounted Stop Lamp (HMSL).
8. Two license plate lamps.
9. Two side repeater lamps.
10. A Headlamp Levelling Control Module (HLCM).
11. Two front and rear height sensors (Xenon headlamps only).
12. An auto high beam camera (model/market dependant).
13. Auxiliary lighting switch.
14. A Stop lamp switch.
15. Reverse lamp switch.
16. Stop lamp switch.
17. A rear fog lamp switch.
18. A hazard warning lamp switch.
19. Warning indicators.
20. Rain/Light sensor.
21. Battery Junction Box..

The exterior lighting is controlled by the CJB as follows:

- Control and monitoring of the exterior lamps including the turn signal indicators and hazard warning lamp functionality.
- Monitoring and evaluation of control inputs from other system control modules and output of applicable messages in the instrument cluster message centre.

The CJB is connected to the Medium Speed (MS) and High Speed (HS) Controller Area Network (CAN) buses. The CJB contains a microprocessor which performs the control, monitoring and evaluation of functions.

The headlamp Levelling control module provides signals to control headlamp Levelling and, where fitted, the Adaptive Front lighting System (AFS) headlamps.

Driver lighting selections are made using the lighting control switch and left steering column multifunction switch, the rear fog lamp switch and the hazard warning lamp switch. The CJB operates the brake lamps using the inputs from the Stop lamp switch.

Depending on model and market specification, the lighting system may have:

- An auto high beam function, where the headlamps are automatically switched between low and high beam in response to signals from the auto high beam camera.
- An autolamps function, where the exterior lights are automatically turned on or off in response to signals from the rain/light sensor used for automatic wiper operation.

  For additional information, refer to: Wipers and Washers (501-16 Wipers and Washers, Description and Operation).

All headlamps have their signalling functions controlled by LED (light emitting diode)'s within the headlamp assemblies.

Driver lighting selections using the left steering column multifunction switch are passed to the CJB via the clockspring on a Local Interconnect Network (LIN) bus. The auxiliary lighting switch is hardwired directly to the CJB and is only used for manual headlamp Levelling on vehicles with halogen headlamps. The CJB provides circuit protection for all exterior lighting circuits.

The lighting system has an 'auto' lights function which is controlled by the CJB on receipt of signals from the rain/light sensor located at the top of the windshield. The exterior lights are turned on or off in response to ambient light signals from the rain/light sensor on a LIN bus connection to the CJB .

The auto lights can also be activated when the windshield wipers are activated by signals from the rain sensor, or when the driver activates the wipers in the continuous wipe position for more than 20 seconds.

Three levels of headlamp specification are available:

- halogen,
- xenon,
- xenon with Adaptive Front lighting System (AFS).

In certain markets the headlamps feature a static bending lamp which illuminates the area at the side of the vehicle when turning into driveways for example. Only the D3S xenon bulb and the xenon ballast resistor are serviceable, no other headlamp components are available individually.

Failure of any Light Emitting Diode (LED) requires replacement of the complete lamp assembly.

The tail lamps comprise a single lamp assembly on each side of the vehicle.

The turn signal indicator, tail and stop lamps, side marker lamps and reverse lamps are located in each tail lamp assembly. Rear fog lamps are mounted in the rear bumper. The rear lamp assemblies require removal for bulb replacement.

All versions of the headlamps have impact resistant polycarbonate lenses.

Removable covers at the rear of the headlamps allow for bulb replacement.

The headlamps require removal for bulb replacement.

The headlamps use a projector unit. The xenon headlamps use a D3S xenon bulb which operates in both low and high beam. Halogen projector headlamps use a HB3 halogen bulb which also operates in both low and

high .

Headlamp washer jets are a standard fitment on xenon headlamps.

Headlamp washer jets are a standard fitment on xenon headlamps.

Static dynamic Levelling is standard on all xenon headlamps. The static dynamic system uses height sensors fitted to the front and rear suspension and a Headlamp Levelling Control Module (HLCM) which process the height sensor signals and adjust the headlamp vertical alignment accordingly.

Manual headlamp Levelling is used only on vehicles fitted with halogen projector lamps. A rotary Levelling thumbwheel is located in the auxiliary lighting switch in the instrument panel, adjacent to the steering column.

Turn signal indicators and high and low beam functions are controlled from the left steering column multifunction switch. The turn signal indicators have a lane change feature. A single press and release of the multifunction switch in either direction will operate the selected turn signal indicators for 3 cycles.

An Image Processing Control Module (IPCM) system may also be fitted as an optional feature which automatically controls the high beam headlamps.

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Front and Rear Lamp CondensationHeadlamp Assemblies/ Description

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Фара Assemblies / описание

Headlamp Assemblies/ Description

HEADLAMP ASSEMBLIES

Three headlamp variants are available depending on model specification:

- halogen,
- xenon,
- xenon with Adaptive Front lighting System (AFS).

The headlamps are sealed units, with scratch resistant polycarbonate lenses bonded to the headlamp body. One sealed access cover and a sealed bulb holder provide a watertight environment for the headlamp internal components. To prevent fogging of the lens and to allow the headlamp unit to 'breath' in response to internal temperature changes, a vent is located at the outer rear face of the headlamp body. The vent is covered by a Gortex waterproof membrane. This allows ventilation of the headlamp while preventing the ingress of water.

Each headlamp has one access cover at the rear and a turn signal indicator bulb holder. Access to the cover and/or bulb holder requires removal of the grille and headlamp screws. A release lever at the rear of the headlamp allows the headlamp assembly to be released from its guide slots in the headlamp mounting bracket and moved forwards to allow access to the cover and the turn signal indicator bulb. The cover is removed by rotating clockwise to allow access to the xenon or halogen bulb.

On NAS vehicles, the side marker lamp LED is coloured orange. The side marker lamp lens is designed so that light from the LED also illuminates the orange coloured side marker reflector area at the side of the lamp without the need for an additional bulb.

Headlamp Levelling

Headlamp Levelling provides for the adjustment of the vertical aim of the headlamps to minimize glare to other road users when the vehicle attitude changes due to vehicle loading.

Two types of headlamp Levelling are available dependent on the type of headlamps fitted to the vehicle:

- Manual headlamp Levelling - Halogen headlamps only
- Automatic headlamp Levelling - Xenon headlamps only.

Manual Headlamp Levelling - Halogen Headlamps Only

The manual system comprises the following components:

NOTE:

NOTE: Headlamp leveling is not available on NAS vehicles with halogen headlamps.

- Two headlamp Levelling motors
- Headlamp Levelling rheostat rotary control.

A rotary thumbwheel controller is located adjacent to the instrument panel dimmer control in the auxiliary lighting switch. The rotary thumbwheel controller is connected to a rheostat which gives a variable output to the headlamp Levelling stepper motors. The motors respond to the output and move to adjust the headlamp vertical alignment as required.

In power mode 6 or above the motors in the lamps are driven from the extended ignition relay in the CJB, via a fuse to each lamp motor.

Movement of the Levelling rotary control produces a variable voltage output (hardwire connection). The motors react to the supplied voltage and move the headlamp to the requested position which relates to the supplied voltage from the Levelling rotary control. The headlamps can be lowered from their unladen position to compensate for changes in vehicle attitude due to loading.

The control has four defined positions to compensate for a drop in height at the rear of the vehicle and avoid dazzle to oncoming drivers. The positions are defined as follows:

ROTARY CONTROL ROTATION	VEHICLE LOAD
0	Driver only or Driver and front seat passenger
1	Driver and pass
2	Maximum gross vehicle weight
3	Maximum rear axle load

Headlamp Delay

The CJB controls a headlamp delay function which illuminates after the occupants leave the vehicle. The headlamp delay will operate on low beam headlamps only when the lighting control switch is in the AUTO position and the ignition is off (power mode 0) or in accessory power mode 4.

The headlamp delay is activated when the lighting control switch is in the AUTO position and the engine is switched off. The message centre displays a 'HEADLIGHT DELAY' message and the low beam headlamps will be activated for a period of approximately 30, 60 or 120 seconds. After the delay period, the CJB

automatically switches off the delay function, extinguishing the headlamps. The delay period can be adjusted using the instrument cluster 'Vehicle Settings' menu. The feature can also be disabled using this menu.

The headlamp delay feature can also be switched on when approaching the vehicle or switched off by pressing the headlamp switch on the smart key.

Automatic Headlamp Levelling - Xenon Headlamps Only

Automatic headlamp Levelling is only available on vehicles with xenon headlamps. The system is not a Dynamic headlamp Levelling system and changes in vehicle inclination due to positive and negative acceleration are not compensated.

Automatic headlamp Levelling provides for the static, periodic adjustment of the vertical aim of the headlamps to minimize glare to other road users when the vehicle attitude changes due to loading.

Automatic headlamp Levelling is controlled by the Headlamp Levelling Control Module (HLCM). The HLCM is a dual function control module which can process and control the headlamp Levelling and the Adaptive Front lighting System (AFS) if fitted.

The headlamp Levelling system comprises the following components and information from other vehicle systems:

- Front and rear vehicle height sensors
- Two headlamp Levelling, vertical adjustment motors
- HLCM
- Ignition in power mode 6 or above.

When the ignition is in power mode 6 or above, power is supplied, via the extended ignition relay in the CJB, to the lighting control switch, the headlamp Levelling motors (or AFS motors if fitted) and to the HLCM.

When the lighting control switch is moved to the side lamp or headlamp position, a LIN bus message is passed from the clockspring to the CJB for the selected function. The CJB then issues a 'lights on' message on the High Speed CAN Powertrain bus CAN bus to the HLCM.

The HLCM uses signals from the front and rear height sensors to periodically re-align the vertical aim of the headlamps to their optimum position.

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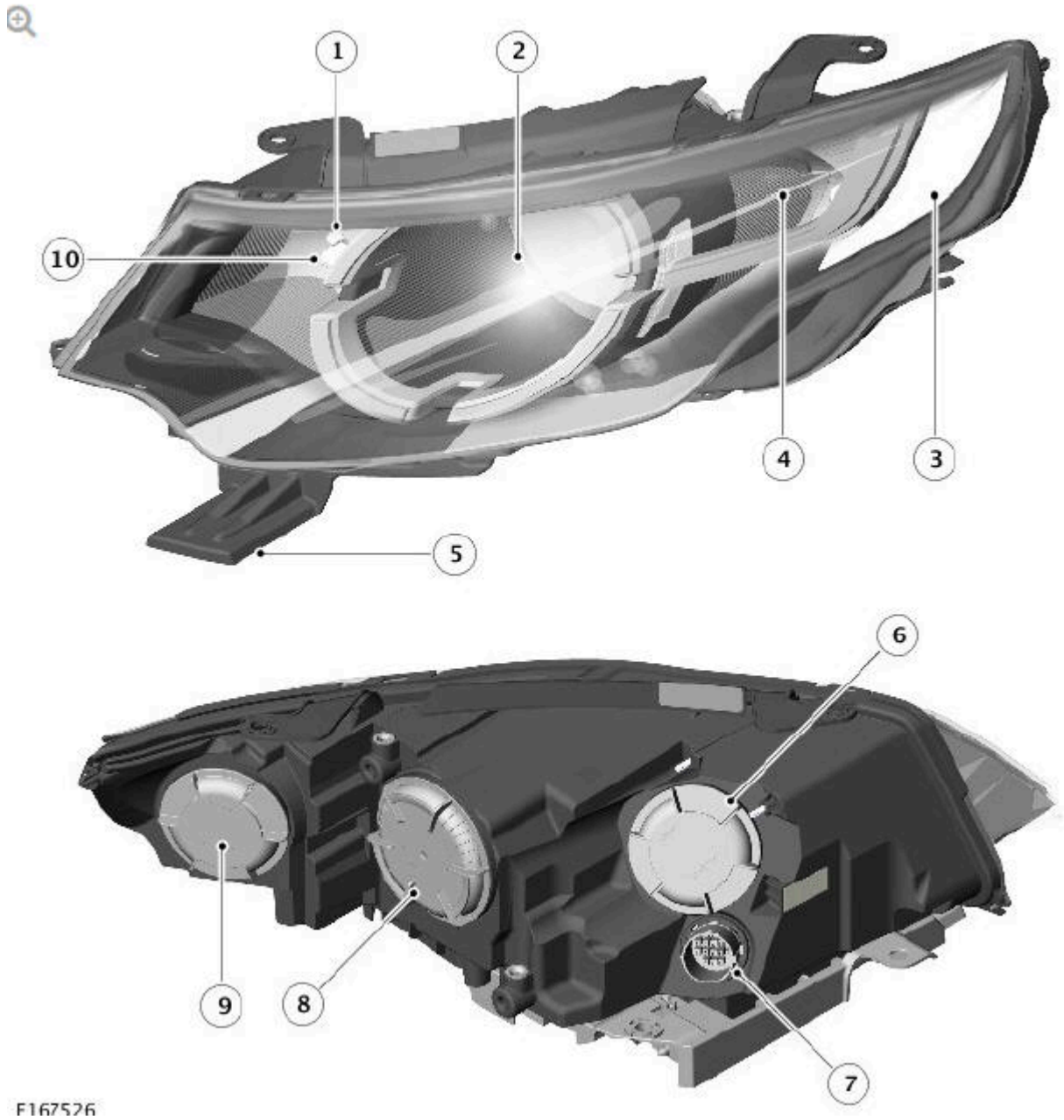
Exterior Lighting / Description and OperationHalogen / Xenon Headlamp

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Halogen / Xenon фара

Halogen / Xenon Headlamp

Halogen Headlamp



1. Projector module - low/high beam headlamp
2. Daytime Running Lamp (DRL) LED
3. Turn signal indicator
4. Side marker lamp LED (NAS only)
5. Amber side reflector (NAS only)
6. Headlamp mounting bracket
7. Halogen bulb access cover
8. Release lever
9. Electrical connector
10. Side marker lamp bulb holder

The halogen headlamp uses a projector module which comprises an ellipsoidal lens with a solenoid controlled shutter to change the beam output from low to high beam.

The halogen headlamp is a self contained unit located within the headlamp assembly. The unit comprises a reflector, an adaptor ring, the lens, a shutter controller and the halogen bulb, which together forms an

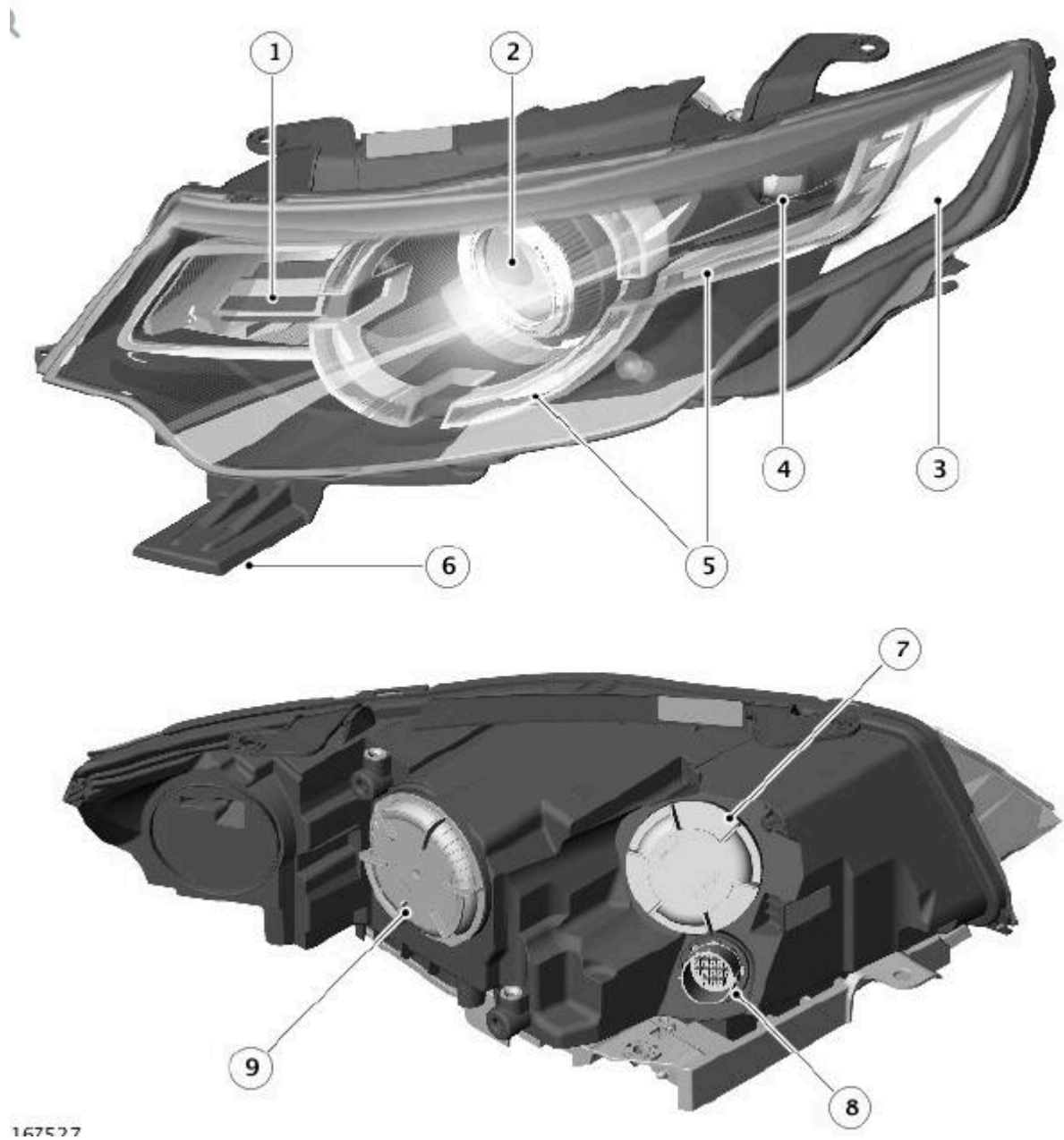
assembly known as the projector module. The reflector is curved and provides the mounting point for the xenon bulb.

The HB3 bulb is located in an integral holder which locates in a keyway to ensure the correct alignment in the reflector and is secured by rotating to the locked position. The shutter controller is a solenoid which operates the shutter mechanism via a lever. The shutter is used to change the beam projection from low beam to high beam and vice versa.

Xenon Headlamp

WARNINGS:

- ***The xenon system generates up to 28000 volts and contact with this voltage could lead to fatality. Make sure that the headlamps are switched off before working on the system.***
- ***The following safety precautions must be followed when working on a xenon headlamp system:***
  - ***DO NOT attempt any procedures on the xenon headlamps when the lights are switched on.***
  - ***Handling of the xenon bulb must be performed using suitable protective equipment, for example gloves and goggles. The glass part of the bulb must not be touched.***
  - ***Xenon bulbs must be disposed of as hazardous waste.***
  - ***Only operate the lamp in a mounted condition in the reflector.***



1. Projector module - low/high beam headlamp
2. Static bending lamp (Not NAS)
3. Turn signal indicator
4. Side marker lamp LED (NAS only)
5. Amber side reflector (NAS only)
6. Headlamp mounting bracket
7. Xenon Bulb Control Module (XBCM)
8. Xenon bulb access cover
9. Side lamp / Daytime Running Lamp (DRL) LED
10. Release lever
11. Electrical connector
12. Turn signal indicator bulb holder

The xenon headlamp operates as both a low and high beam unit. The unit comprises a reflector, an adaptor ring, the lens, a shutter controller and the xenon bulb, which together is an assembly known as the projector module.

The projector module is installed in a carrier frame that allows the module to tilt for vertical movement of the headlamp beam. Vertical movement is controlled by an actuator, connected between the carrier frame and the projector module, operated by the headlamp Levelling control module for automatic headlamp Levelling.

The reflector is curved and provides the mounting for the xenon bulb. The bulb locates in a keyway to ensure correct alignment in the reflector and is secured by a plastic mounting ring. The bulb is an integral part of the xenon bulb igniter. The shutter controller is a solenoid which operates the shutter mechanism via a lever. The shutter is used to change the beam projection between low and high beam.

The xenon headlamps are controlled by the CJB using a xenon bulb control module and a xenon bulb igniter for each headlamp. These provide the regulated power supply required to illuminate the xenon bulbs through their start-up phases of operation.

The xenon bulbs illuminate when an arc of electrical current is established between 2 electrodes within the bulb. The xenon gas sealed in the bulb reacts to the electrical excitation and the heat generated by the current flow produces the characteristic blue/white light.

To operate at full efficiency, the xenon bulb goes through 3 stages of operation before the output for continuous operation is achieved. The 3 phases are; start-up phase, warm-up phase and continuous phase.

In the start-up phase, the bulb requires an initial high voltage starting pulse of up to 28000 volts in order to establish the arc. This high voltage starting pulse is produced by the igniter and, once the arc is established, the warmup phase begins. During the warm-up phase, the xenon bulb control module regulates the supply to the bulb to 2.6A which gives a lamp output of 75W. While in this phase, the xenon gas begins to illuminate brightly and the environment within the bulb stabilizes, ensuring a continual current flow between the electrodes. Once the warm-up phase is complete, the xenon bulb control module changes to continuous phase. The supply voltage to the bulb is reduced and the operating power required for continual operation is reduced to 35W. The process from start-up to continuous phase is completed in a very short time.

The xenon bulb control modules (one per headlamp) receive an operating voltage from the CJB when the headlamps are switched on. The modules regulate the power supply required through the phases of start-up.

The xenon bulb igniters (one per headlamp) generate the initial high voltage required to establish the arc. The igniters have integral coils which generate the high voltage pulses required for start-up. Once the xenon bulbs are operating, the igniters provide a closed circuit for the regulated power supply from the xenon bulb control modules.

Static Bending Lamps (Xenon Only)

The LED static bending lamps are designed to illuminate the direction of travel when cornering at low speeds. The static bending lamp functionality, which is controlled by the CJB and the HLCM, operates using inputs from the steering angle sensor and vehicle speed information from the ABS control module. The static bending lamp is incorporated into the headlamp assembly. The design of the lens projects a spread of light from the vehicle at approximately 45 degrees to the vehicle axis. The static bending lamp uses LEDs located in the headlamp housing.

NOTE:

The static bending lamps are not fitted to NAS vehicles.

The static bending lamps operate with a steering angle sensor CAN bus signal which is received by the CJB. The CJB monitors this signal and vehicle speed and activates the static bending lamp LED. When the operation parameters of the lamp are reached, the CJB snaps the static bending lamp LED on. When the lamp is switched off, the CJB fades the LED off by decreasing the Pulse Width Modulation (PWM) voltage in a

linear manner over a period of 1 second. The static bending lamps can only be active for a maximum of 3 minutes at any given time.

NOTE:

NOTE: Static bending lamps only operate when the transmission is in DRIVE or in SPORT - and the low beam is active.

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Headlamp Assemblies/ DescriptionAdaptive Front Lighting System (AFS)

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Адаптивная система головного освещения (AFS) (AFS)

Adaptive Front Lighting System (AFS)

The Adaptive Front lighting System (AFS) headlamp assembly contains an additional carrier frame which provides a location for the horizontal actuator. The projector module has a central pivot point which allows the module to move horizontally in response to operation of the horizontal actuator.

The AFS actuators are bi-polar (2 phase) dc stepper motors which are driven by a power output from the AFS power module located in the headlamp assembly. Each stepper motor receives its position information from the headlamp Levelling control module via the applicable AFS power module.

When the actuators are powered to their requested positions, a holding current is applied to maintain the actuator position.

The actuators do not supply a positional feedback signal to the headlamp Levelling control module. Each stepper motor requires referencing each time the AFS system becomes active. When the AFS system is active, each vertical actuator is driven to the low beam position and each horizontal actuator is driven to an inboard position until a mechanical stop in the actuator is reached. Once the stop is reached a step counter in the headlamp Levelling control module is set to zero and the actuator is then powered to the operating position as determined by the AFS software.

The AFS is controlled by a Headlamp Levelling Control Module (HLCM). The HLCM is a dual function control module which can process and control the headlamp Levelling and the AFS headlamp systems. The same module is used on vehicles without AFS but fitted with xenon headlamps.

The system operates by the HLCM receiving inputs from the Engine Control Module (ECM) for engine running signal, the Anti-lock Brake System (ABS) control module for steering angle and vehicle speed and a reverse gear input from the transmission.

The HLCM processes these signals and provides an output to the headlamp Levelling motors to adjust the headlamp horizontal aim according to vehicle speed and steering angle.

NOTE:

NOTE: In markets with DRL, the AFS system will not operate when the DRL are active.

The HLCM is connected on the High Speed (HS) Controller Area Network (CAN) bus to receive information from other vehicle systems. The HLCM is connected to the AFS headlamps on a dedicated LIN bus. The HLCM calculates, using input data from other systems, the required position of the horizontal adjustment of the projector modules. The position information is then output on the LIN bus to the AFS Headlamps. The

HLCM outputs the appropriate signals to drive the AFS stepper motors in the headlamp to the appropriate position.

The horizontal position of the projector modules is dependent on a number of input variables. The position is determined by vehicle speed and steering angle. When reverse gear is selected, the projector modules are moved to the straight ahead position to avoid glare to other road users.

The angles of each projector module differ to give the correct spread of light, for example, when turning left, the left hand projector module will have a greater swivelling angle than the right hand projector module.

AFS Operation

When the HLCM receives an ignition on signal, the control module performs the initialization procedure which ensures that the headlamps are correctly aligned on both their vertical and horizontal axes.

The AFS swivel initialization starts less than 1 second after the headlamp Levelling initialization is activated to ensure that the headlamps are at or below the 0 degree position in the vertical axis, thus preventing glare to oncoming vehicles. The AFS swivel initialization is completed in less than 2.5 seconds. The left and right AFS actuator motors are powered from the 0 degree position to a small movement to the inboard position, then another small movement to the outboard position and then back to the 0 degree position.

Failure Mode

In the event of a failure of the AFS system, a warning indicator in the Instrument Cluster (IC) is illuminated to warn the driver. The AFS warning indicator illuminates when the ignition is in power mode 6 (ignition on) or greater and will flash continuously until the fault is rectified. The AFS warning indicator will also be illuminated if a failure of the steering angle sensor or the vehicle speed signal is detected.

Illumination of the AFS warning indicator does not necessarily mean that there is a fault with the AFS system. The fault may be caused by a failure of another system such as steering angle sensor or the vehicle speed signal missing, preventing the AFS system operating correctly.

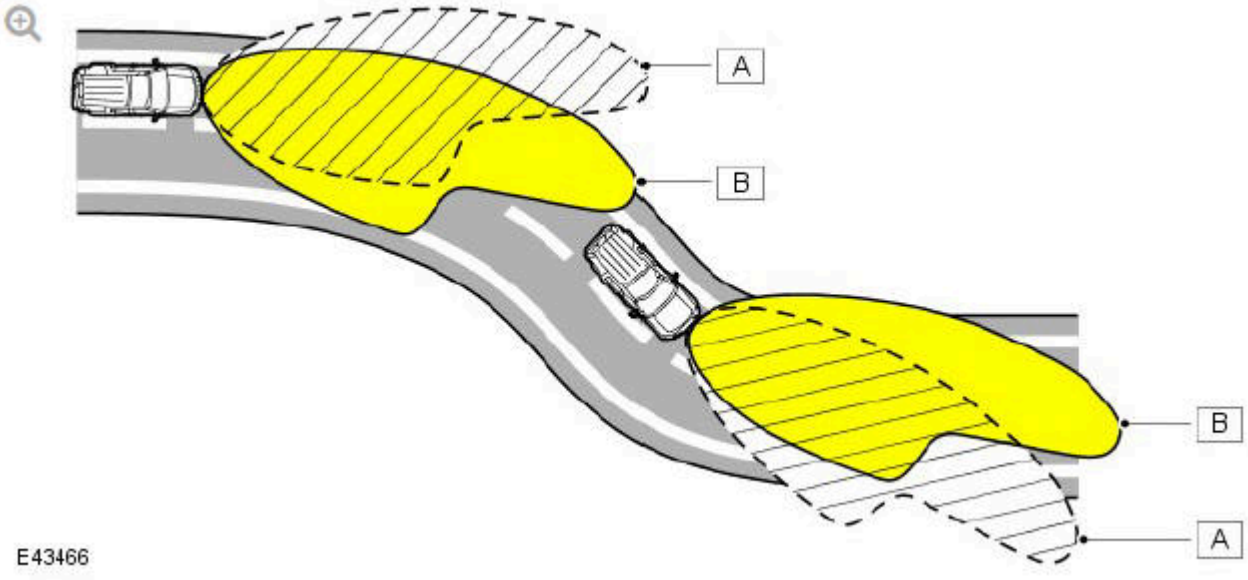
The HLCM performs a diagnostic routine every time AFS is requested. If any fault is found, the HLCM will suspend the operation of the AFS function.

If the AFS Levelling system has failed with the xenon projector module in a position other than the correct straight ahead position, the HLCM will attempt to drive the projector module to a position a small amount lower than the standard position. If the swivel function has failed, the HLCM will lower the projector module using the Levelling actuator motors to a position much lower than standard to prevent excess glare to oncoming vehicles.

The HLCM software can detect an internal failure of the HLCM control circuits. The HLCM will power the projector modules to the zero position and prevent further operation.

Faults can be investigated by interrogating the HLCM using a Land Rover approved diagnostic tool to check for fault codes.

Headlamp Beam Diagram



A. Conventional headlamp beam distribution
B. AFS swivel headlamp beam distribution

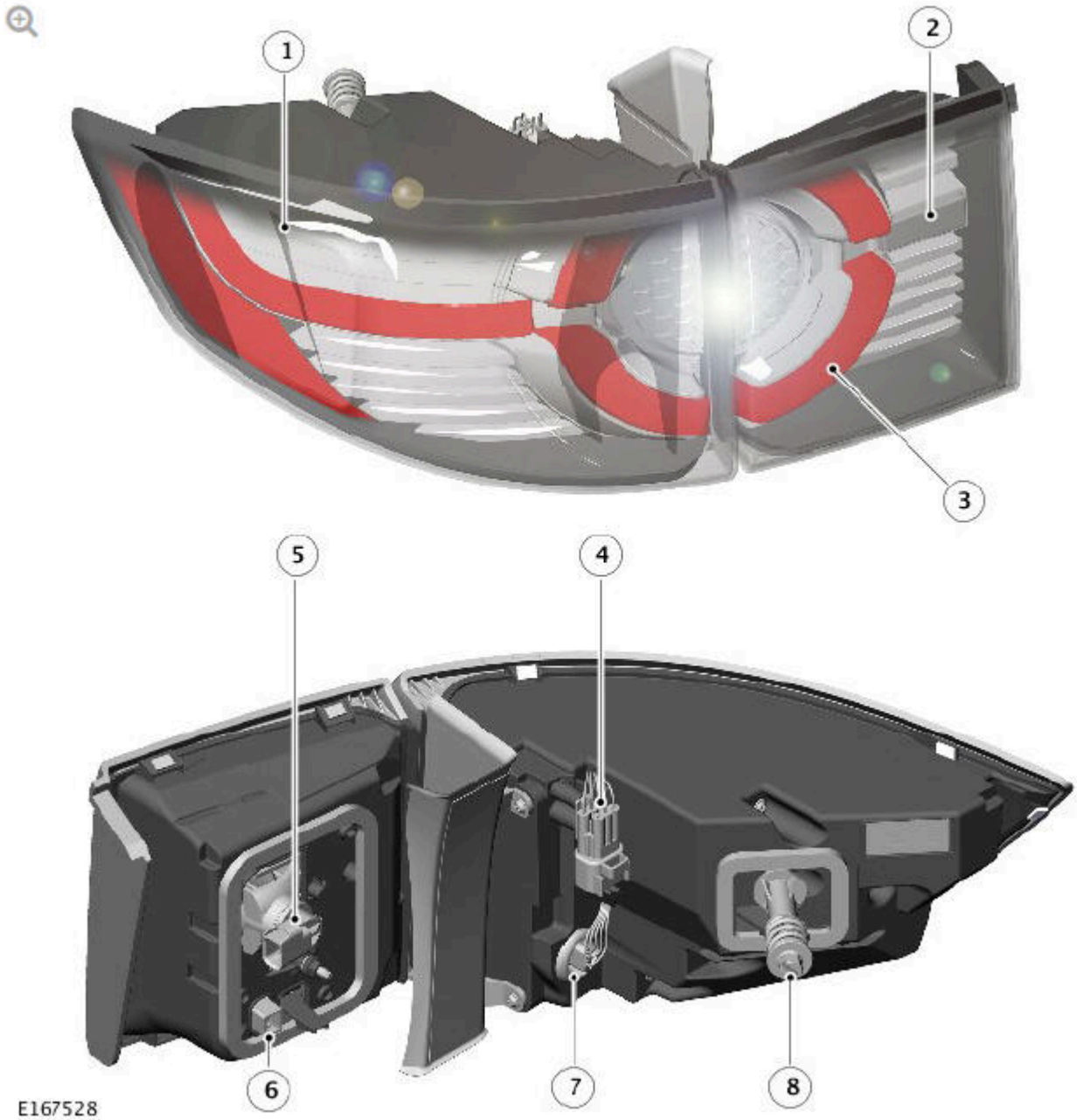
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Halogen / Xenon HeadlampTail Lamp Assemblies

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Задний фонарь Assemblies

Tail Lamp Assemblies



1. Side marker
2. Turn signal indicator
3. Reverse lamp
4. Stop/Tail lamps
5. Reverse lamp bulb
6. Electrical connector
7. Turn signal indicator bulb

The tail lamp assembly is a one piece unit which contains a stop/tail lamp, a turn signal indicator and a reverse lamp.

The tail lamp assembly is located in a recess in the vehicle body. One stud on the outer edge of the lamp housing locates in a plastic clip on the vehicle body. The lamp is secured with two screws which are located on the inner edge of the lamp housing, near the tailgate aperture. In order to access the screws, removal of a small cover in the lamp housing is required.

Rear Stop/Tail Lamps

The upper lamp is a combined LED matrix for stop and tail lamp. The stop lamp is activated when the ignition is in ignition power mode 6 or above and the stop lamp switch is active (by depressing the brake pedal). The HMSL will also be activated when the brake pedal is pressed. The stop lamps can also be activated by the ABS when Hill Descent Control (HDC) is active (if fitted). The ABS module sends a High Speed CAN Powertrain bus CAN bus message to the CJB which supplies power to the stop lamps and HMSL.

The side lamps are operated by selecting side lamps or headlamps on the lighting control switch. The side lamps can be switched on at all times and are not dependent on power mode. The side lamps will also be illuminated when the lighting control switch is in the 'AUTO' position and a 'lights on' signal is received by the CJB from the rain/light sensor.

Turn Signal Indicator

The turn signal indicator is located next to the stop/tail lamp and uses a Silvervision 24W bulb.

The turn signal indicators are operated by the left steering column multifunction switch or by the hazard warning lamp switch. The left steering column multifunction switch is only active with the ignition in power mode 6, the hazard warning lamp switch is active at all times. When active, the turn signal indicators will flash at a frequency cycle of 400ms on 400ms off.

If a bulb fails, the remaining turn signal indicator bulb on that side of the vehicle flashes at normal speed. The applicable turn signal indicator in the Instrument Cluster (IC) will flash at double speed with the audible alert at twice the normal rate as well to alert the driver to the bulb failure.

Reverse Lamp

The reverse lamp is located adjacent to the turn signal indicator and uses a 16W bayonet fitting bulb.

The reverse lamp is active in power mode 6 and the CJB receives a reverse selected signal on the HS CAN bus. The automatic and manual transmissions have a reverse switch which senses when reverse is selected and sends the state out on the High Speed CAN Powertrain to the CJB.

Side Marker Lamp

The side marker lamp is located in the outer part of the tail lamp assembly, adjacent to rear fog lamp and uses LED.

The side marker lamp is active at all times when the side lamps are selected on using the lighting control switch. The side marker lamps will also be illuminated when the lighting control switch rotary switch is in the 'AUTO' position and a 'lights on' signal is received by the CJB from the light sensor.

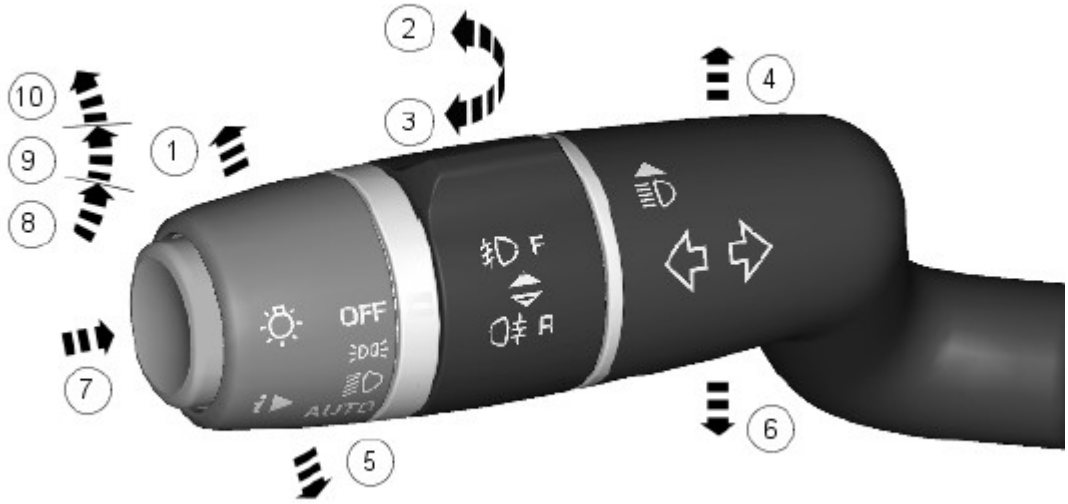
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Adaptive Front Lighting System (AFS)Left Steering Column Multifunction Switch

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Левый рулевая колонка Multifunction выключатель

Left Steering Column Multifunction Switch



1. High beam
2. Front fog lamp
3. Rear fog lamp
4. Right turn signal indicator
5. Headlamp high beam flash
6. Left turn signal indicator
7. Trip computer information
8. Side lamp
9. Low beam
10. Autolamps on

The left steering column multifunction switch allows the following selections:

- All exterior lamps off
- Side lamps on
- Low beam headlamps on
- Autolamps activation
- Headlamp low/high beam
- Headlamp high beam flash
- Left/right turn signal indicators
- Front/rear fog lamps
- Trip computer functions.

The multifunction switch positions are all connected via a resistive ladder.

The output from the resistive ladder is connected to the clockspring which converts the switch operation to LIN bus signals. The signals are received by the CJB which operates the required exterior lighting selection.

Fog Lamps

The fog lamps are controlled by a rotary, non-latching switch on the left steering column multifunction switch. The switch is a momentary switch in both positions for front and rear fog lamps. The front and rear fog lamps can be selected individually. Movement of the switch in either direction will activate or deactivate the selected fog lamps. When active, the fog lamps will remain on until deselected using the fog lamp switch or the headlamps are switched off or when the ignition is in auxiliary power mode 4 or lower.

The applicable Instrument Cluster (IC) warning indicators will illuminate when the fog lamps are active.

Autolamps

The (AUTO) autolamp function is a driver assistance system. The driver can override the system operation by selection of side lamp or low beam headlamp on.

The automatic headlamp system uses a rain/light sensor which is connected to the CJB via a LIN bus. The CJB reacts to the signals from the rain/light sensor and activates the exterior lamps as required.

The light sensor is incorporated in the rain/light sensor located on the inside of the windshield, below the rear view mirror. The wiper system also uses the rain/light sensor for automatic wiper operation.

For additional information, refer to: Wipers and Washers (501-16 Wipers and Washers, Description and Operation).

The light sensor measures the ambient light around the vehicle in a vertical direction and also the angular light level from the front of the vehicle. The rain/light sensor uses vehicle speed signals, wiper switch position and the park position of the front wipers to control the system.

- Twilight
- Darkness
- Rain
- Tunnels
- Underground or multistoried car parks.

Operation of the autolamps requires the ignition to be on (power mode 6 or above), the left steering column multifunction switch to be in the 'AUTO' position and a lights on request signal from the light sensor. When the 'AUTO' system is active, the side lamp warning indicator in the Instrument Cluster (IC) will be illuminated.

High Beam On and Flash Functions

The high beam is operated by pushing the left steering column multifunction switch towards the instrument panel. The switch will latch in the high beam position. When the high beam headlamps are active, the high beam warning indicator will illuminate in the IC.

The high beam flash function is operated by pulling the left steering column multifunction switch away from the instrument panel. The non-latching switch will operate the high beam headlamps for as long as the switch is held. The switch will return to the high beam off position when released.

The high beam warning indicator will illuminate when the high beam headlamps are active.

High beam can also be automatically operated by the Image Processing Control Module (IPCM) system (when fitted), see below.

Turn Signal Indicators

The left and right turn signal indicators are operated by moving the left steering column multifunction switch up or down to select right or left turn signal indicators respectively. The switch will latch in each position.

The switch has a turn signal indicator lane change function which is configurable by the dealer. If the switch is gently pushed, but not latched, to either turn signal indicator position and then released, the applicable turn signal indicators will flash 3 times and then will be automatically cancelled.

If a turn signal indicator fails, the green turn signal warning indicator in the Instrument Cluster (IC) will flash at twice the normal rate and the audible ticking from the IC sounder will also be at twice the normal rate.

Side Lamps and Headlamps

The side lamps and headlamps are selected by a rotary switch on the left steering column multifunction switch.

Rotating the switch from the off position to the side lamps position illuminates the front side lamps, the tail lamps, the license plate lamps and the instrument panel illumination.

Rotating the switch to the headlamps position, switches on the headlamps in addition to the lamps illuminated by the side lamp position.

Autolamps

Autolamps is selected by rotating a rotary switch on the left steering column multifunction switch to the 'AUTO' position. When the lighting control switch is in the 'AUTO' position, a reference voltage from the CJB flows through 4 resistors in the lighting control switch. The returned signal voltage is detected by the CJB which activates the auto headlamp function to activate the headlamps and front and rear side/tail lamps.

The rain/light sensor receives a battery voltage output from the ignition relay in the CJB. The rain/light sensor continually outputs a LIN bus message to the CJB with information regarding the ambient light levels.

When the ambient light level reaches a predetermined value, the CJB activates the Autolamps feature. The CJB can also activate the Autolamps when it receives information regarding rain fall from the rain/light sensor which subsequently activates the auto wipers function.

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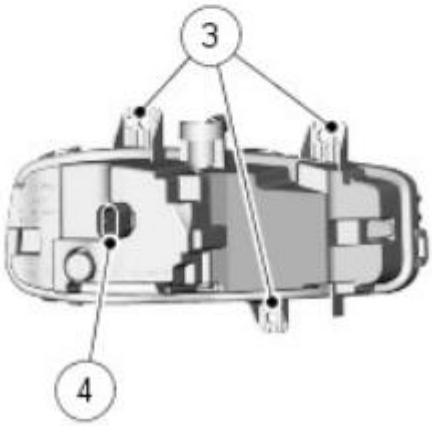
Tail Lamp AssembliesFront Fog Lamps

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Передний противотуманная фара s

Front Fog Lamps





1. LED light source
2. Lens
3. Attachment holes
4. Electrical connector

The two front fog lamps are available as an option or standard fitment on vehicles fitted with xenon headlamps and headlamp washer jets.

The front fog lamps are located in apertures in the front bumper. Each lamp is secured in the bumper with Torx screws which are covered with a removable finisher. Each fog lamp has an adjuster which is used to set the fog lamp to the correct alignment.

The fog lamp uses an LED light source.

The front fog lamps are controlled by the CJB. When the ignition is in ignition power mode 6 or above and the lighting control switch is in the side lamp or headlamp position or AUTO position (and Rain/Light Sensor is requesting low beam), the fog lamp switch can be rotated to activate the front fog lamps. A front fog lamp warning indicator is illuminated in the Instrument Cluster (IC) when the front fog lamps are active.

Front Fog Lamp Functionality (NAS and Canadian Markets Only)

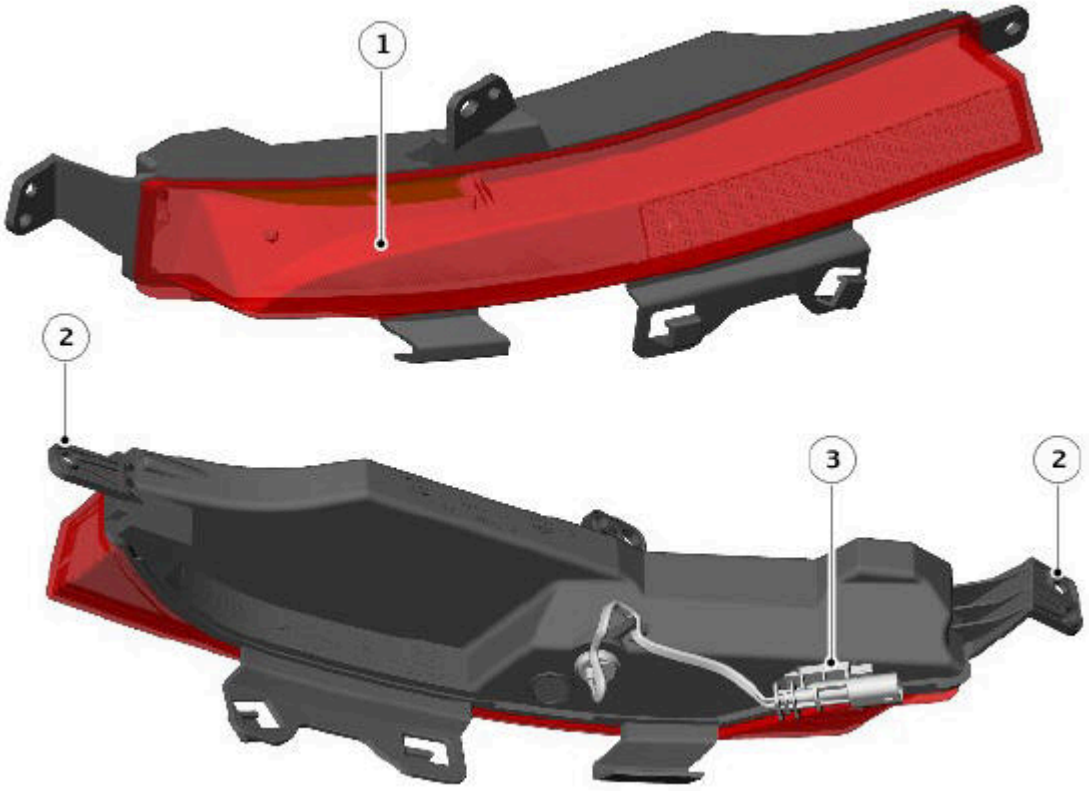
The front fog lamps operate as described previously but with the following differences which cover local laws governing lamp usage.

If the low beam headlamps and the front fog lamps are on at the same time, when the high beam headlamps are switched on, the front fog lamps will be automatically switched off. When the high beam headlamps are subsequently switched off, the front fog lamps will be switched on automatically.

NOTE:

NOTE: The front fog lamps will also be switched off if the high beam 'flash' function is operated.

REAR FOG LAMP



57529

1. Rear fog lamp bulb holder
2. Rear fog lamp bulb
3. Attachment holes
4. Attachment

The rear fog lamp is located in the bumper and uses a bayonet fitting bulb.

The rear fog lamp is controlled by CJB. When the ignition switch is in power mode 6 or greater and the lighting control switch is in the side lamp or headlamp position, the rear fog lamp switch on the left steering column multifunction switch can be operated to activate the rear fog lamps. A rear fog lamp warning indicator is illuminated in the Instrument Cluster (IC) when the rear fog lamps are active.

HIGH MOUNTED STOP LAMP



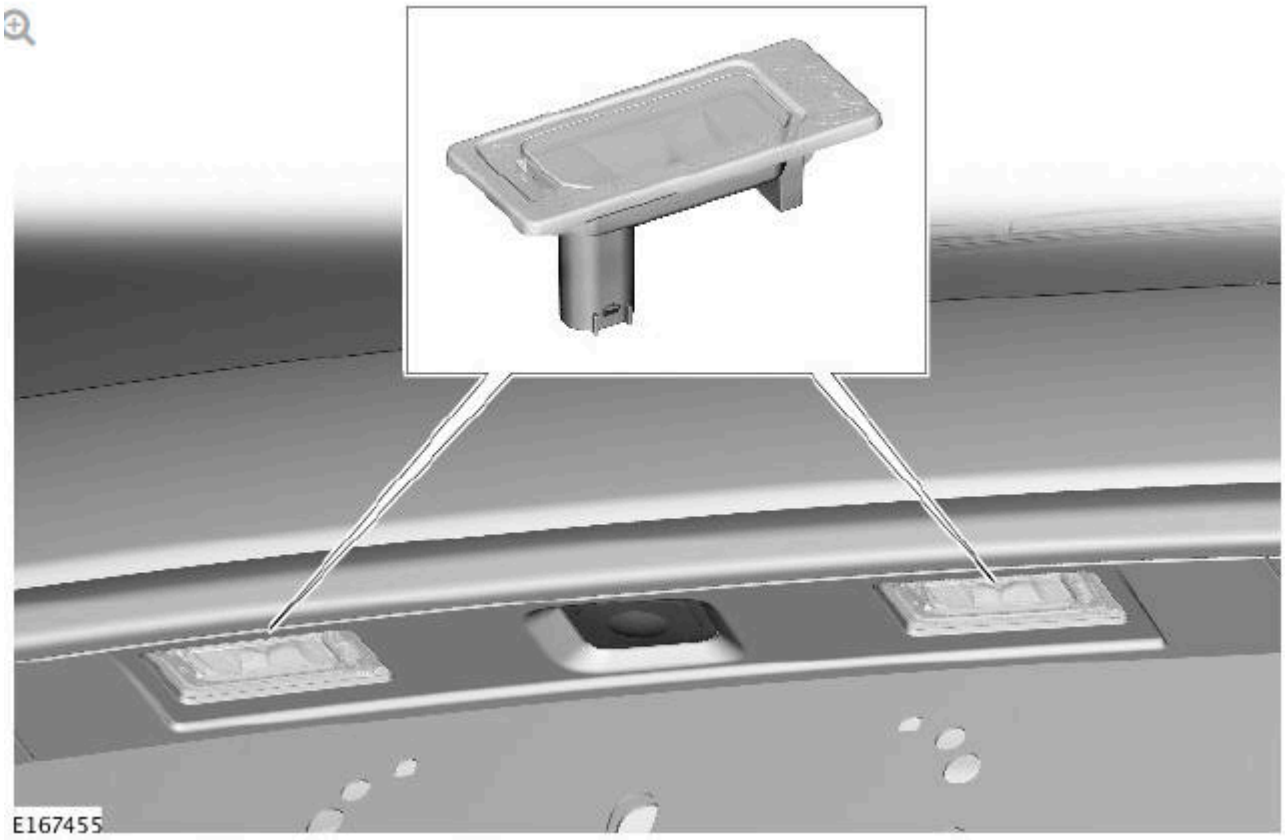
The HMSL is located in the tailgate. Access to the lamp is by removal of the upper tailgate interior trim panel. After releasing the lamp retaining clips, the lamp can be removed from outside the vehicle.

The lamp comprises a plastic housing with a red coloured lens. The lamp is illuminated by LEDs.

The HMSL is activated, along with the tail lamp stop lamps, when the ignition is in power mode 6 or above and the stop lamp switch is active (by pressing the brake pedal).

The HMSL and the stop lamps can also be activated by the ABS when HDC is active (if fitted). A signal on the HS CAN bus from the ABS control module is passed to the CJB which supplies power to the stop lamps.

LICENSE PLATE LAMPS



Two license plate lamps are fitted in the tailgate handle, above the license plate in the upper tailgate. Each lamp uses LEDs.

The lamps are secured in the upper tailgate handle with integral clips. The lamps can be released from the handle using a small, flat blade screwdriver.

The license plate lamps are active at all times when the side lamps are switched on.

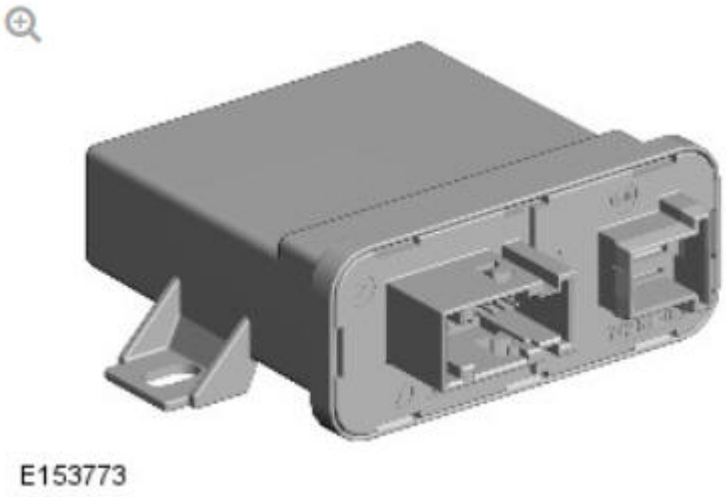
SIDE REPEATER LAMPS



The side repeater lamps are located in the external rear view mirrors.

The side repeater lamps use LEDs. The side repeater lamps have the same functionality as the front and rear turn signal indicator lamps and are operated by the left steering column multifunction switch or by the hazard warning lamp switch. The steering column multifunction switch is only active with power mode 6, the hazard warning lamp switch is active at all times, regardless of the power mode. When active, the side repeater lamps will flash at a frequency cycle of 400ms on and 400ms off. If a side repeater lamp fails, the turn signal indicator lamps continue to flash at the normal rate.

HEADLAMP LEVELLING CONTROL MODULE

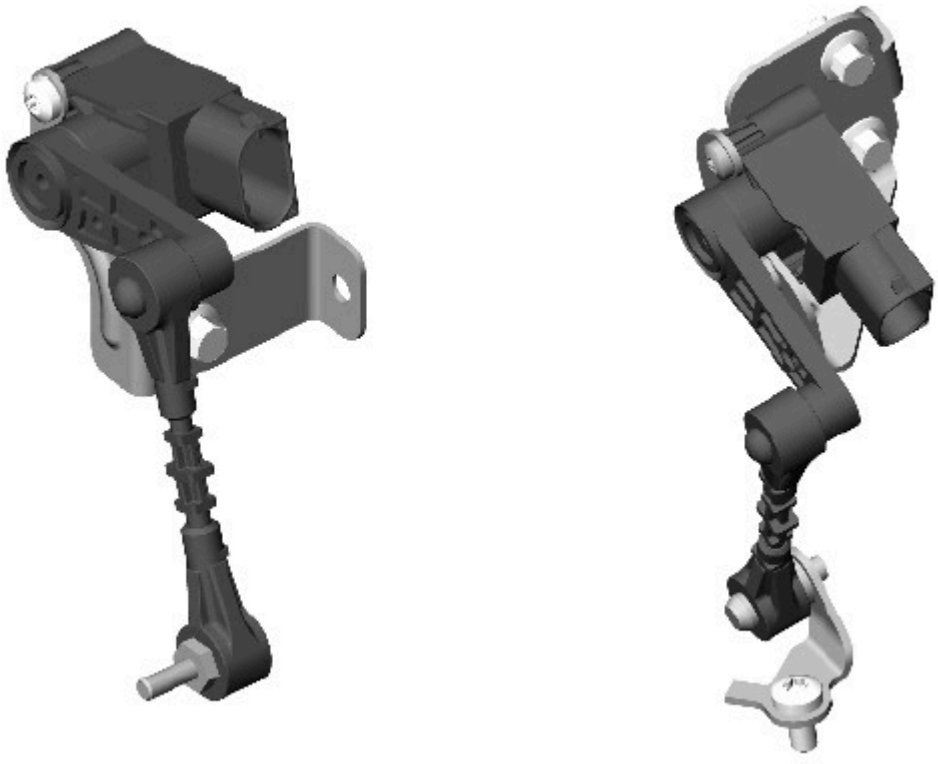


The HLCM is located on the bulkhead panel, adjacent to the right pillar. The HLCM controls headlamp LEVELLING and, where fitted, the AFS headlamps and the static bending lamps. The HLCM is connected to the HS CAN and receives inputs from other vehicle inputs from the other vehicle systems on the status of the parameters that follow:

- Height sensors
- Steering angle
- Vehicle speed
- Headlamp status
- Engine running
- Reverse gear selected.

The HLCM is connected to each AFS on a private LIN bus.

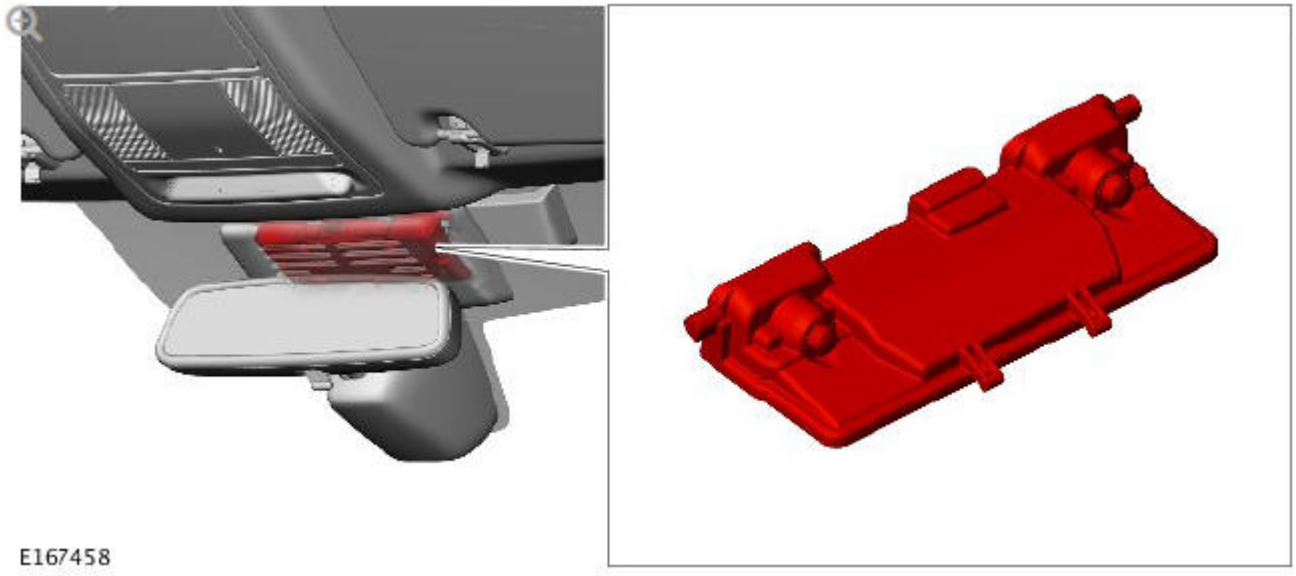
FRONT AND REAR HEIGHT SENSORS



The height sensors used by the headlamp LEVELLING system are both located on the right side of the vehicle.

Each sensor has three connections with the Integrated Suspension Control Module (ISCM); power, ground and signal.

IMAGE PROCESSING CONTROL MODULE (IPCM) CAMERA



Vehicles with the Image Processing Control Module (IPCM) feature have an IPCM camera installed in the covers of the rear view mirror support, with the lens directed through the windshield. The camera is connected to the IPCM, integrated into the body of the rear view mirror.

The camera is a low resolution image sensor that detects headlamps and tail lamps of the vehicles ahead. The IPCM evaluates the image data, checking for light intensity and location. Depending on the image data,

the control module then sends a low or high beam request message to the CJB via the Medium Speed CAN bus. The CJB then controls the shutter in the Xenon projector module accordingly.

STOP LAMP SWITCH



The stop lamp switch is a two pole switch mounted in the brake pedal bracket and operated by the brake pedal. The output connections of the two poles are hardwired to the CJB. The input connection of one pole is a hardwired signal feed from the CJB. The input connection of the second pole is hardwired to ground. The CJB compares the signals from the two poles to confirm the status of the stop lamp switch, which it uses to operate the stop lamps.

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Left Steering Column Multifunction SwitchHazard Warning Lamps

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Hazard контрольные лампы

Hazard Warning Lamps

The hazard warning lamps are controlled by a non-latching switch in the centre of the instrument panel. The hazard warning lamps operate at all times when selected and are not dependent on the ignition power mode.

When the hazard warning lamps are selected on, all of the turn signal indicators operate as previously described and both left and right turn signal indicators in the Instrument Cluster (IC) also flash. The hazard warning lamps flash at a rate of 400ms on and 400ms off. When the hazard warning lamps are active, they override any request for turn signal indicator operation.

If a trailer is fitted, the trailer turn signal indicators will flash at the same frequency as the vehicle turn signal indicators. The trailer warning indicator in the IC will also flash. If a trailer turn signal indicator bulb is defective, the trailer warning indicator will not flash.

The hazard warning lamps can also be activated by a crash signal from the Restraints Control Module (RCM). This is received by the CJB which activates the hazard warning lamps. The hazard warning lamps can be cancelled when crash mode is cancelled by the RCM.

TRAILER LIGHTING

Several different types of trailer socket can be fitted to the vehicle depending on market specifications. Refer to the Electrical Reference Library for specific socket details.

The CJB monitors the turn signal indicators and can detect if more than two lamps are fitted. When a trailer is detected, the trailer warning indicator in the IC will flash in synchronization with the turn signal indicator.

If one or more of the turn signal indicators on the vehicle or the trailer are defective, the trailer warning indicator will not flash to alert the driver to the bulb failure.

DAYTIME RUNNING LAMPS (DRL)

Daytime Running Lamps (DRL) are a market requirement in certain countries.

For market information and DRL functionality refer to the DRL section.

For additional information, refer to: Daytime Running Lamps (417-04 Daytime Running Lamps, Description and Operation).

Halogen Headlamps

The DRL and Side lamps use the same string of LED's. The DRL operate at a higher intensity than the side lamp illumination.

Xenon Headlamps

The DRL's and Side lamps use the same string of LED's. The DRL operate at a higher intensity output than the side lamp illumination.

TRIP COMPUTER

For details of the trip computer function refer to Information and Message Centre.

For additional information, refer to: Information and Message Center (413- 08 Information and Message Center, Description and Operation).

INSTRUMENT PANEL DIMMER CONTROL



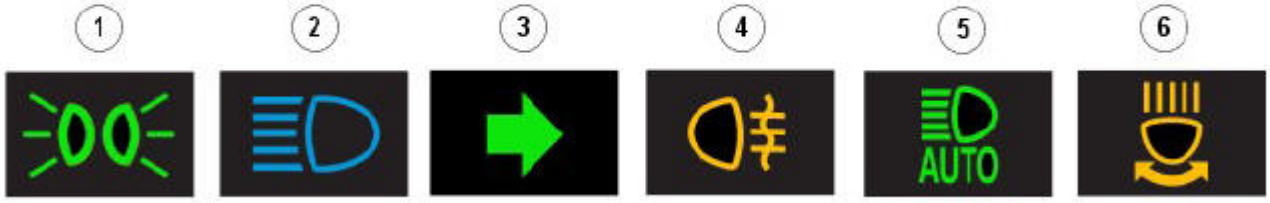
The dimmer rotary thumbwheel controller is located adjacent to the headlamp LEVELLING control (when fitted) in the auxiliary lighting switch.

The dimmer control provides a PWM output to control the illumination brightness of the Instrument Cluster (IC), switches and other instrument panel illumination.

The dimmer rotary thumbwheel is connected to a rheostat and a high side switch. The rheostat is a variable resistor which provides a high or low resistance according to its set position. This output is passed to a switchable capacitor or a high side switch. The high side switch uses the output from the rheostat to

determine the switching frequency of the capacitor which provides the PWM output of between 8 and 12V to determine the brightness of the illumination.

WARNING INDICATORS

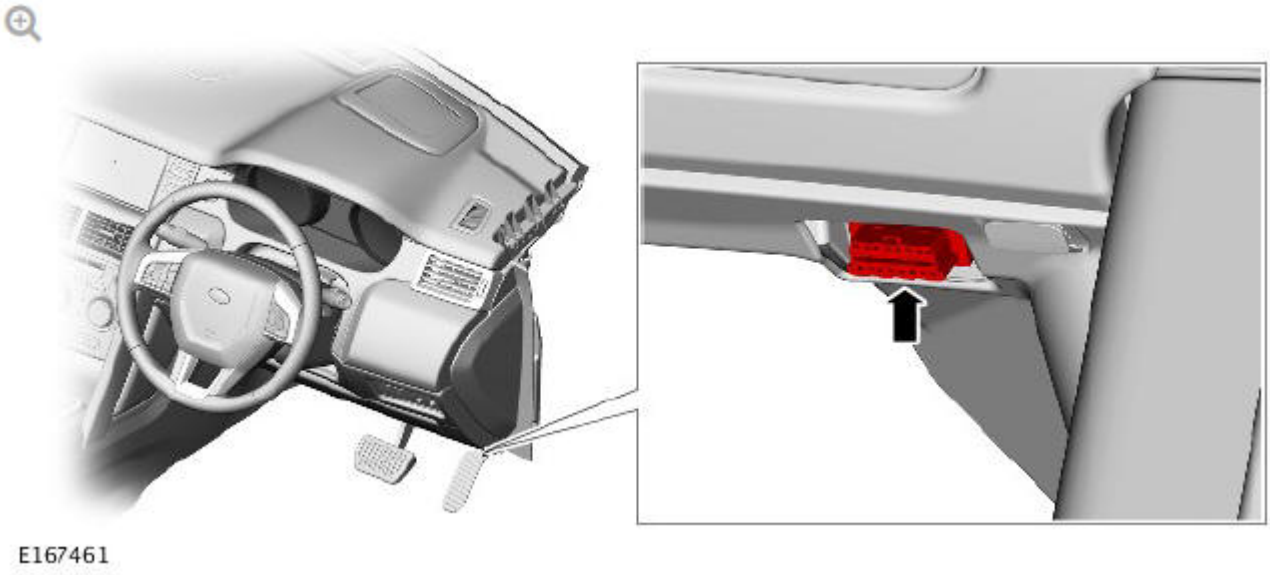


1. Side lamps
2. Headlamp high beam
3. Turn signal indicators
4. Rear fog lamps
5. Auto high beam
6. Adaptive front lighting system

The AFS warning indicator is activated by a high speed CAN bus message from the headlamp LEVELLING control module to the instrument cluster.

The remainder of the exterior lighting warning indicators are activated by the CJB using medium speed CAN bus messages to the instrument cluster.

DIAGNOSTIC SOCKET



The diagnostic socket is located in the lower instrument panel closing panel, on the driver side, below the steering column. Various lighting system functions are monitored by different systems which can store fault information. This can be retrieved using a Land Rover approved diagnostic system.

OPERATION

Центральный Junction Box

Central Junction Box

The CJB controls the exterior lighting system through interconnections as follow:

- Left steering column multifunction switch
- Side lamp position
- Low beam position
- Automatic ('AUTO') position (if fitted)
- Front fog lamp switch (if fitted)
- Rear fog lamp switch
- Turn signal indicators
- High beam switch
- Headlamp flash
- Stop lamp switch
- Manual headlamp LEVELLING control switch (halogen only)
- Hazard warning lamp switch
- Rain/light sensor (LIN signal).

CIRCUIT PROTECTION

Two 60 Amp fusible links in the BJB protect the power feed to the CJB, left and right lighting circuits respectively. All exterior lighting circuits are protected by Field Effect Transistors (FETs), located in the CJB, which can detect overloads and short circuits.

The FETs respond to heat generated by increased current flow caused by a short circuit. On a normal circuit this would cause the fuse to blow. The FETs respond to the heat increase and disconnect the supply to the affected circuit. When the fault is rectified or the FET has cooled, the FET will reset and operate the circuit normally. If the fault persists the FET will cycle, disconnecting and reconnecting the power supply. The CJB stores fault codes which can be retrieved using a Land Rover approved diagnostic system. The fault code will identify that there is a fault on a particular output which assist in fault detection.

ALARM INDICATIONS

The exterior lighting system is used for arm and disarm requests. When the driver locks or unlocks the vehicle, a visual indication of a successful lock or unlock request is displayed to the driver by the hazard flashers.

For additional information, refer to: Anti-Theft - Active (419-01A Anti-Theft - Active, Description and Operation).

LIGHTS-ON WARNING CHIME

When the ignition is in the off (power mode 0) or auxiliary (power mode 4) mode and the left steering column multifunction switch is in the side lamp or Low beam position, a warning chime will sound if the driver door is opened. This indicates to the driver that the exterior lights have been left on. The chime is generated from Instrument Cluster (IC) sounder on receipt of a lights-on signal, a door open signal and an ignition off signal from the CJB on the HS CAN bus.

CRASH SIGNAL ACTIVATION

In the event of an accident of a severity to activate and deploy the airbags, the Restraints Control Module (RCM) sends a request to the CJB via the HS CAN bus to activate the hazard warning lamps. The hazard warning lamps will continue to operate until the ignition mode is changed to the auxiliary power mode 4, or the off power mode 0, or the RCM no longer transmits the crash signal.

HEADLAMP DELAY TIMER

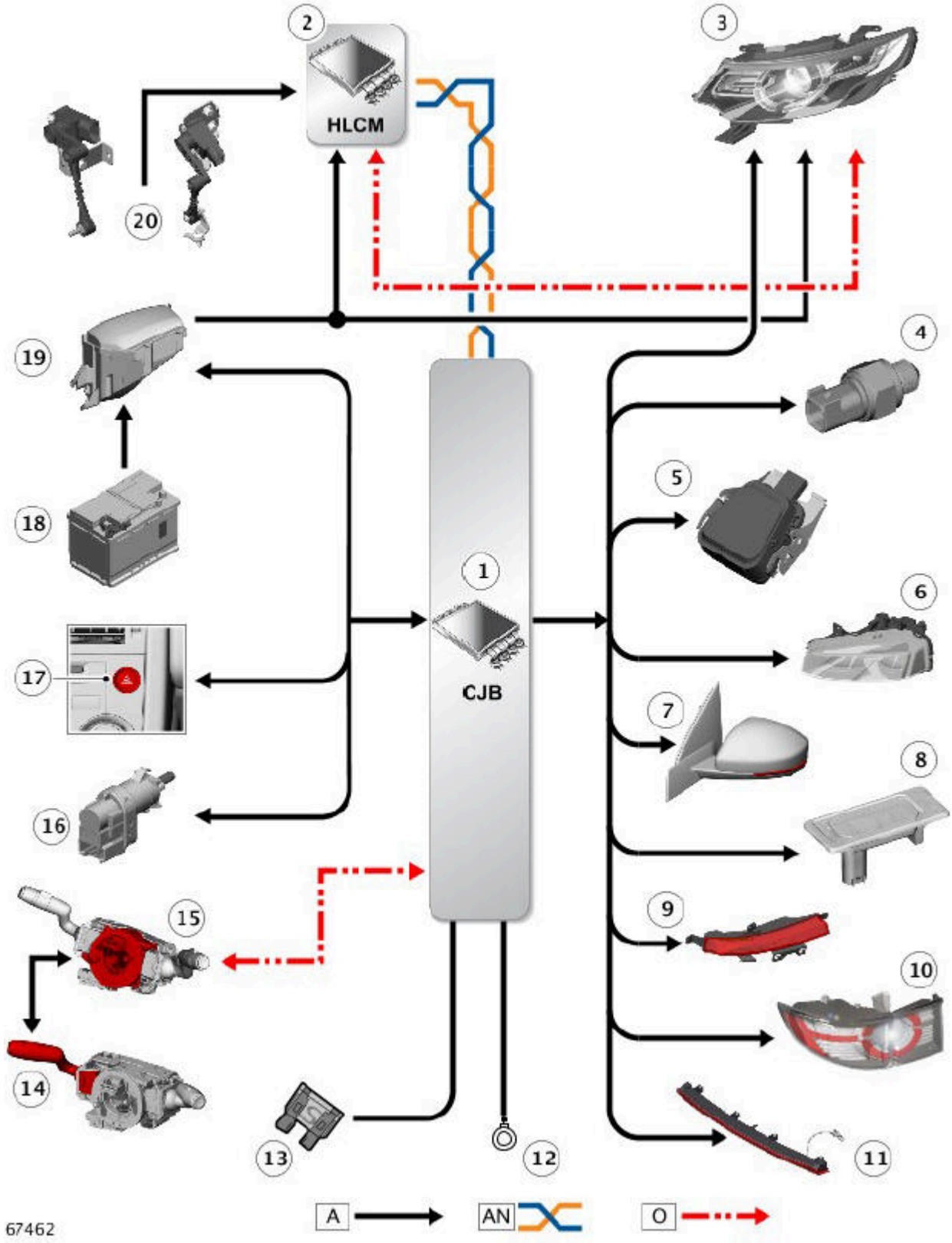
The CJB controls a headlamp delay function which illuminates the driveway after leaving the vehicle. The CJB activates the low beam headlamps for the required delay period. The delay timer is set within the IC 'Vehicle Set-up Menu'. The default timing is 30s, but the timing can be changed to between 0s (OFF), 30s (default), 60s, 120s and 240s.

For additional information, refer to: Information and Message Center (413- 08 Information and Message Center, Description and Operation).

INPUT/ OUTPUT DIAGRAM

NOTE:

NOTE: A = Hardwired; AN = High Speed (HS) Controller Area Network (CAN) Powertrain bus; O = Local Interconnect Network (LIN) bus.



1. Central Junction Box (CJB)
2. Headlamp LEVELLING Control Module (HLCM)
3. Headlamp assemblies
4. Reverse lamp switch
5. Rain/light sensor
6. Front fog lamps
7. Side repeater lamps in door mirrors

8. License plate lamp
9. Rear fog lamps
10. Tail lamp assemblies
11. HMSL
12. Ground
13. Fuse
14. Left steering column multifunction switch
15. Clockspring
16. Stop lamp switch
17. Hazard warning lamp switch
18. Battery
19. Battery Junction Box (BJB)
20. Height sensors

Exterior Lighting Specifications

Torque Specifications

ITEM	NM	LB-FT	LB-IN
Front fog lamp Torx bolts	2	-	17
Headlamp assembly retaining bolts	4.1	-	36
Rear lamp assembly retaining screws	1	-	9
High mounted stoplamp retaining nuts	1.5	-	13
Headlamp leveling module retaining nuts	7	-	61

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Hazard Warning LampsHeadlamp Assembly (G1785269) / Removal and Installation

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Фара в сборе / снятие и установка

Headlamp Assembly (G1785269) / Removal and Installation

REMOVAL

CAUTION:

Protect the surrounding paintwork to avoid damage.

NOTES:

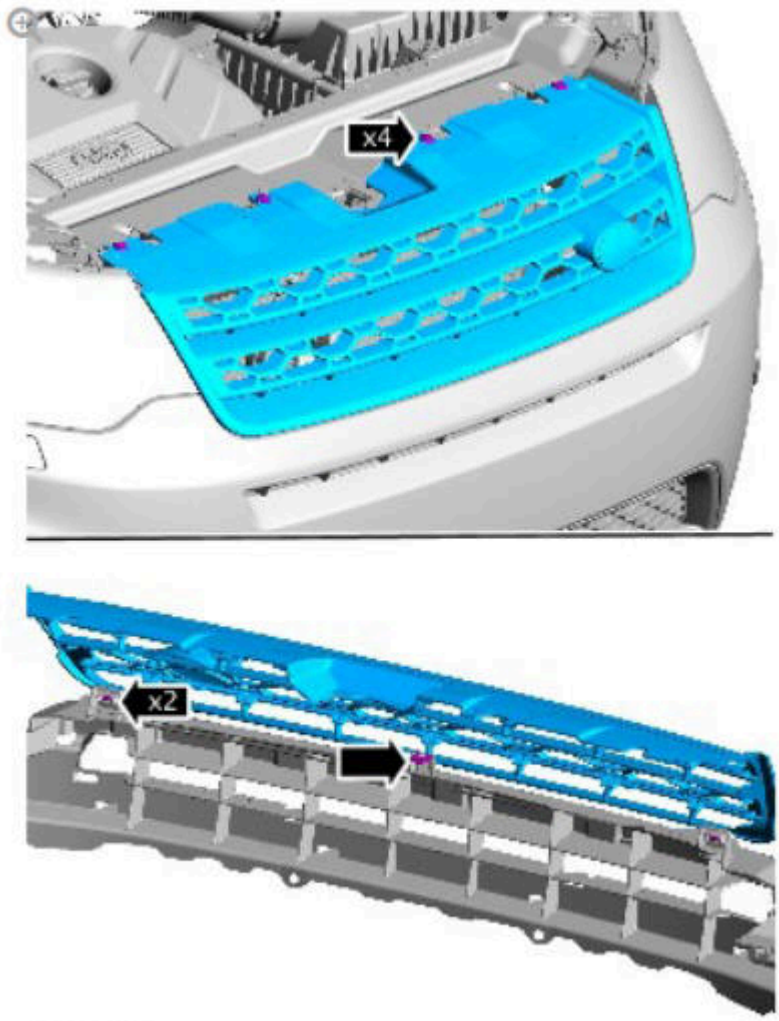
- *Removal steps in this procedure may contain installation details.*
- *Right illustration shown, left is similar*

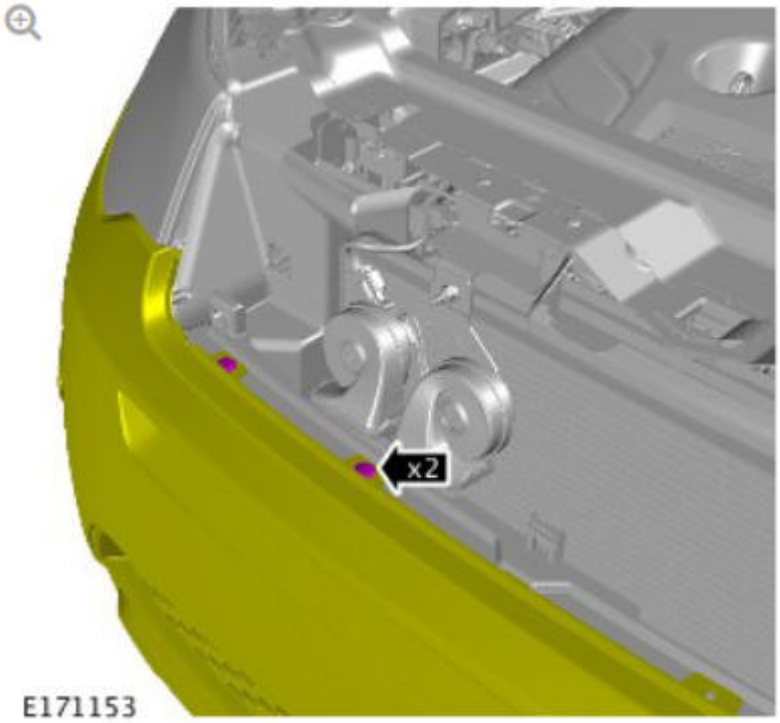
WARNING:

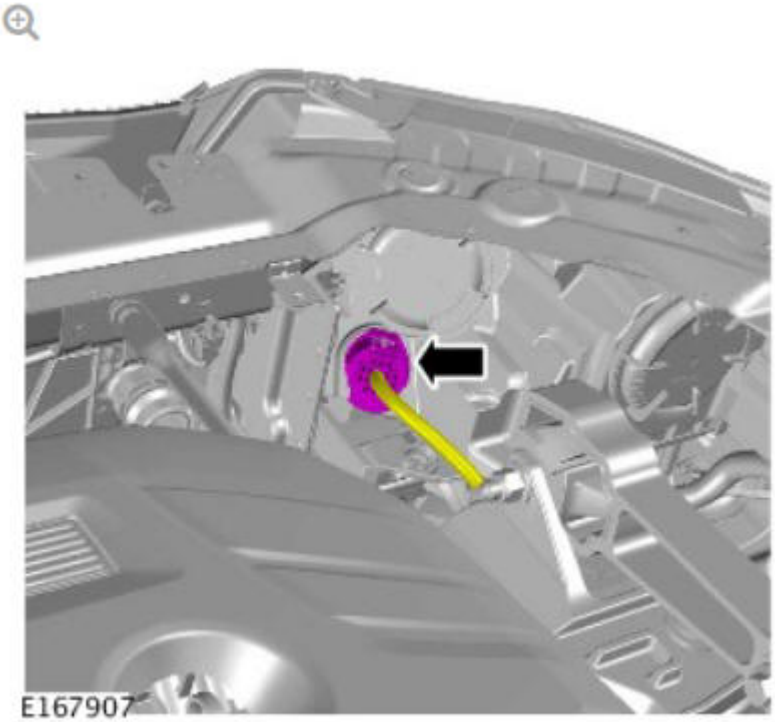
<u>Make sure to support the vehicle with axle stands.</u>

Raise and support the vehicle.

Refer to: Wheel and Tire (204-04, Removal and Installation).

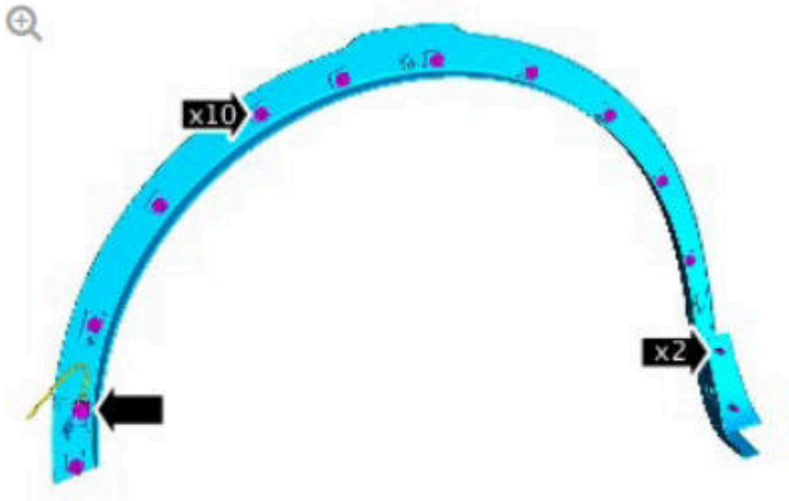


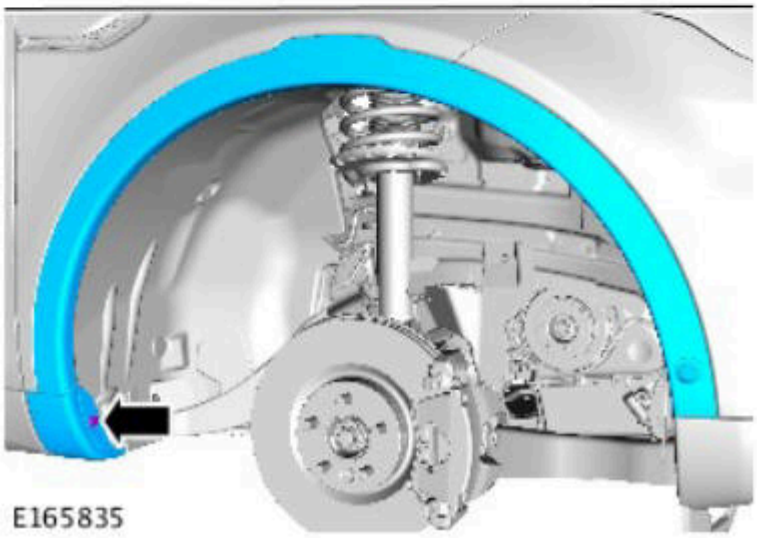




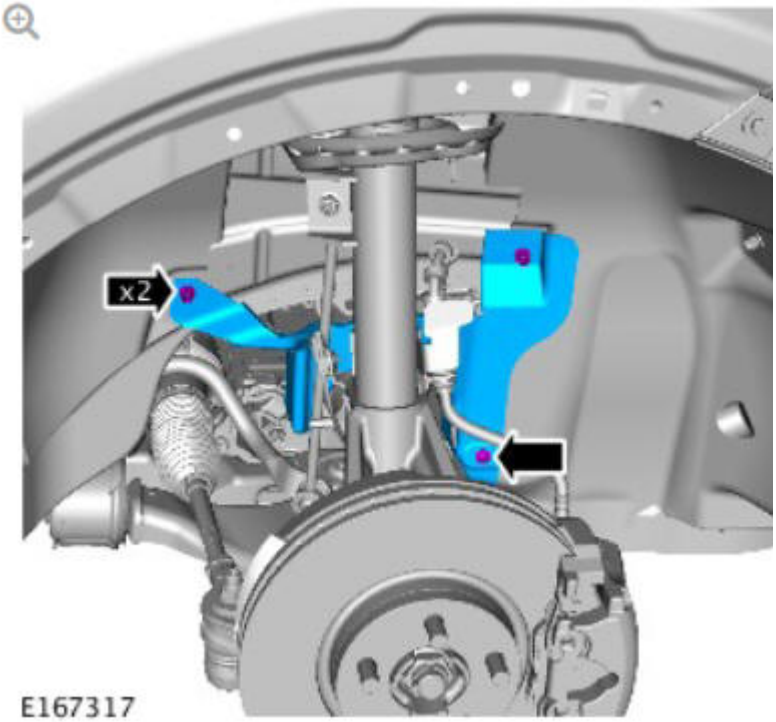
CAUTION:

Take extra care not to damage the component.

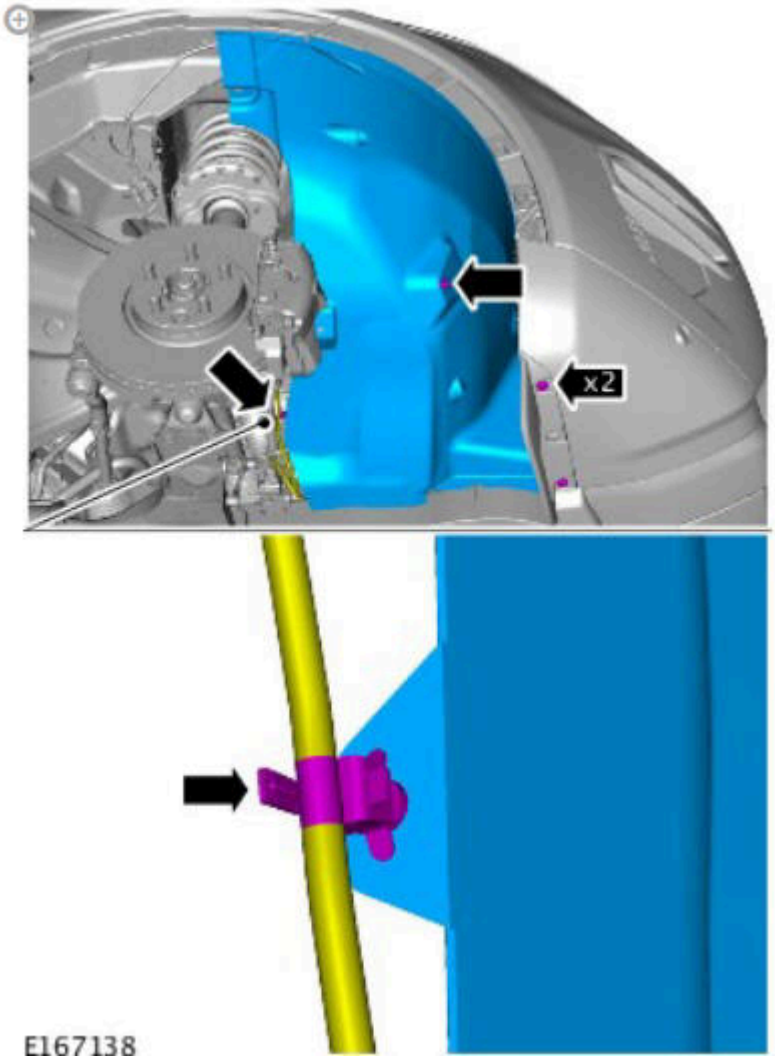




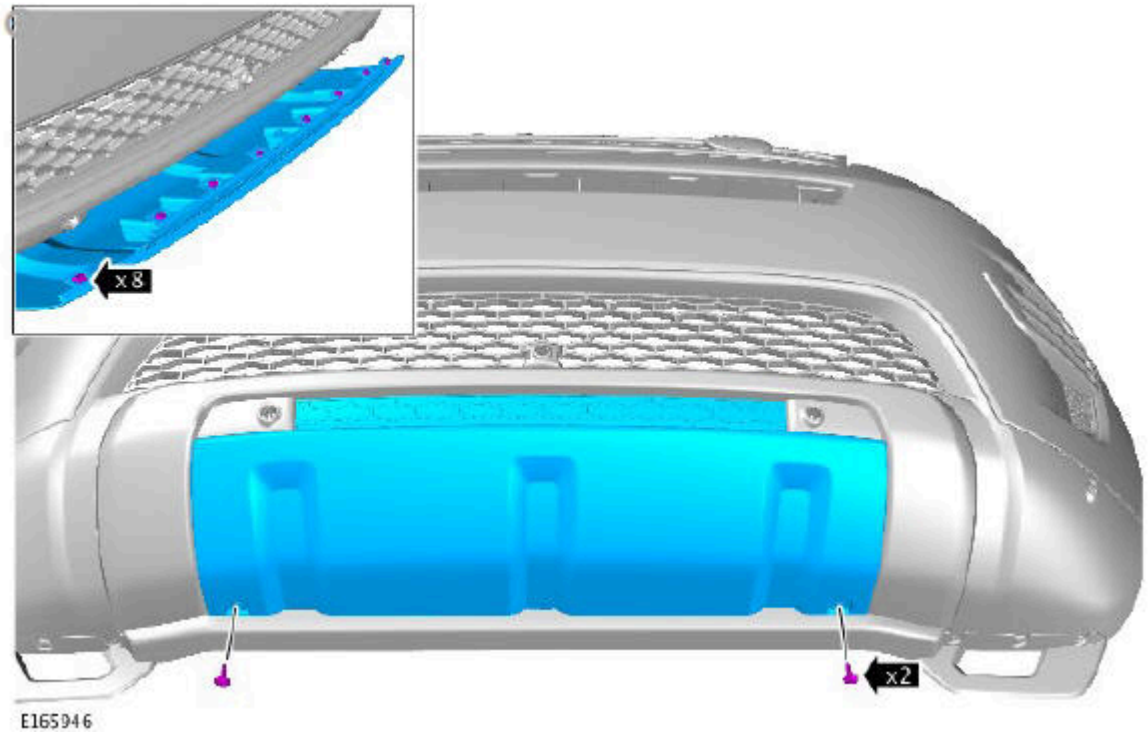
E165835



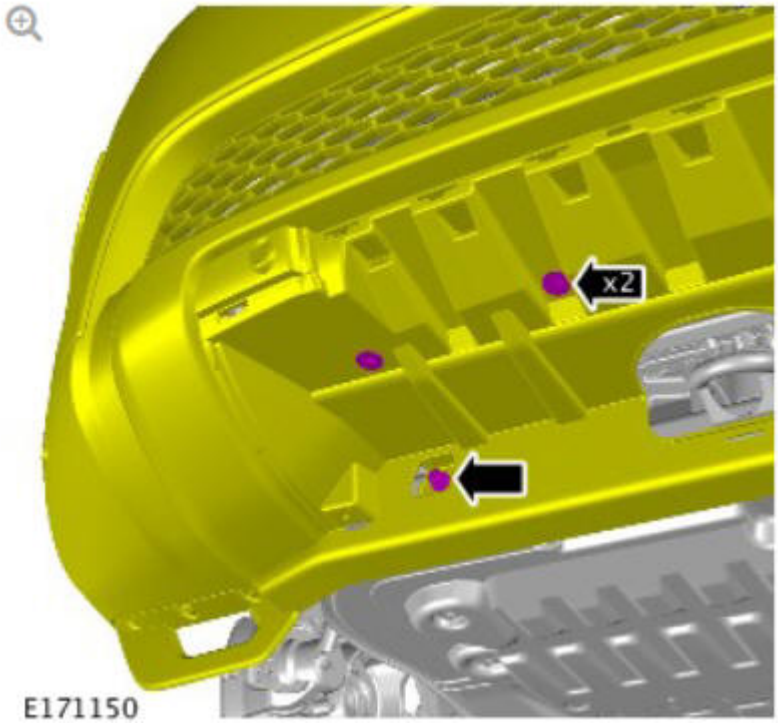
E167317



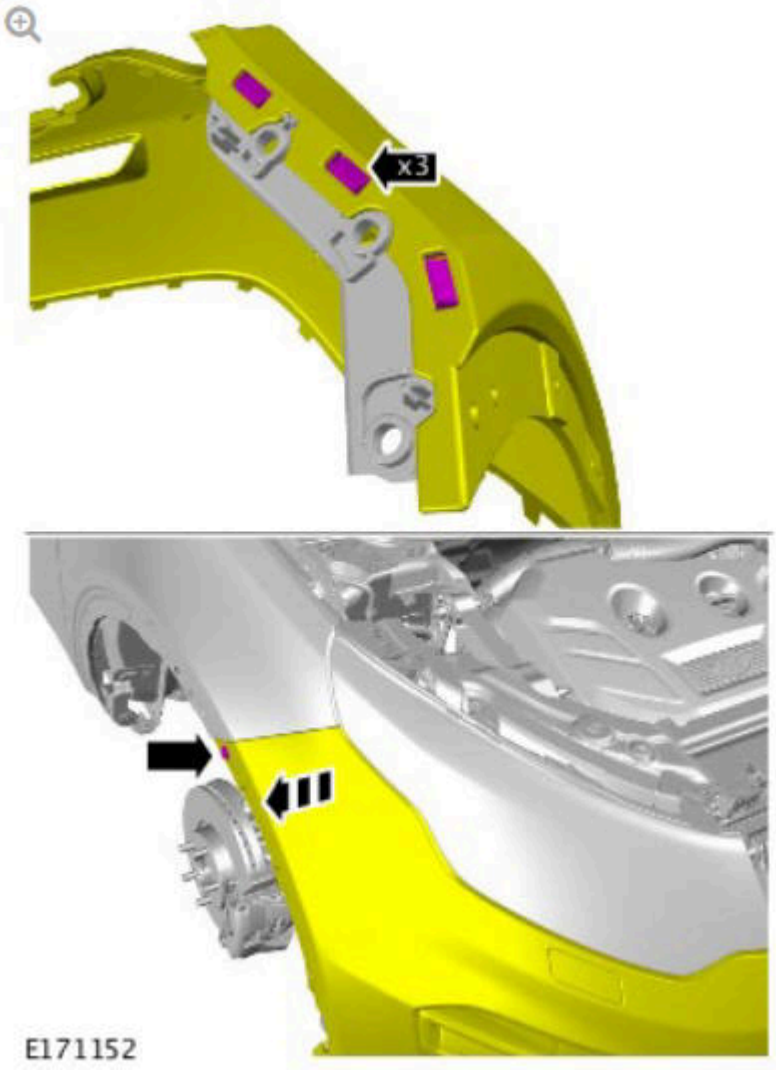
E167138



E165946

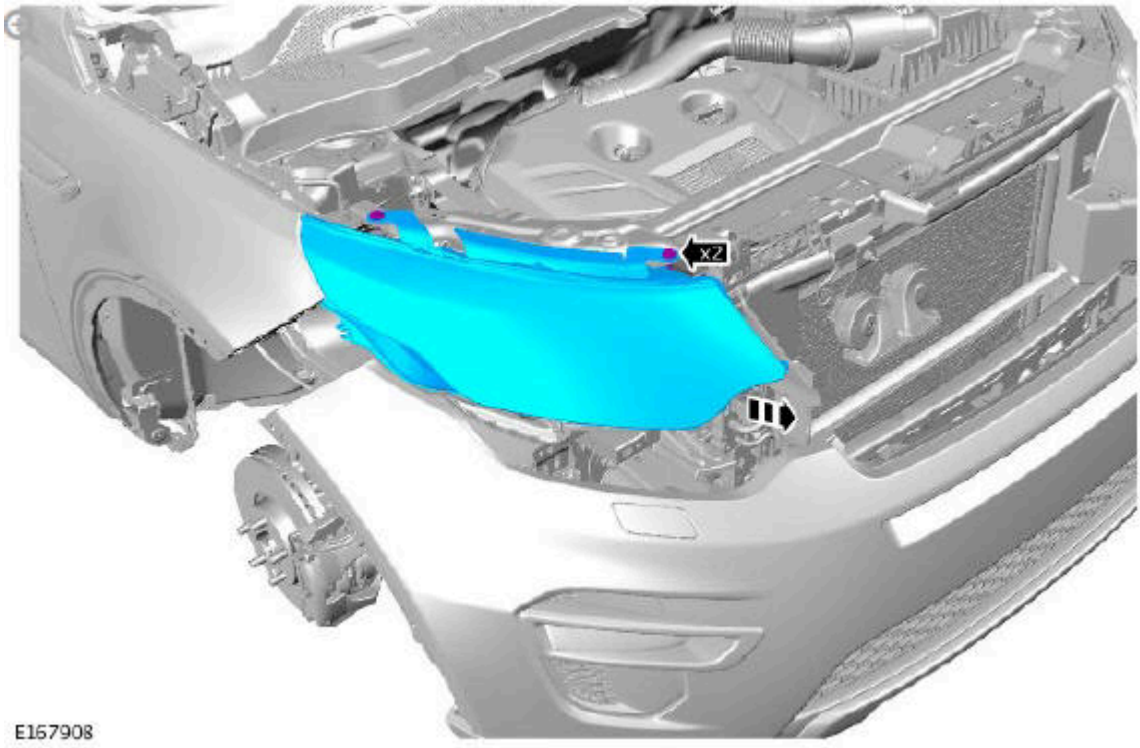


Torque: 4.5 Nm



Torque: 4.5 Nm





Torque: 4 Nm

INSTALLATION

1. To install, reverse the removal procedure.
2. Check the headlamp alignment and adjust if necessary.

   Refer to: Headlamp Adjustment (417-01, General Procedures).

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Central Junction BoxHeadlamp Bulb (G1785270) / Removal and Installation

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Фара Bulb / снятие и установка

Headlamp Bulb (G1785270) / Removal and Installation

REMOVAL

WARNING:

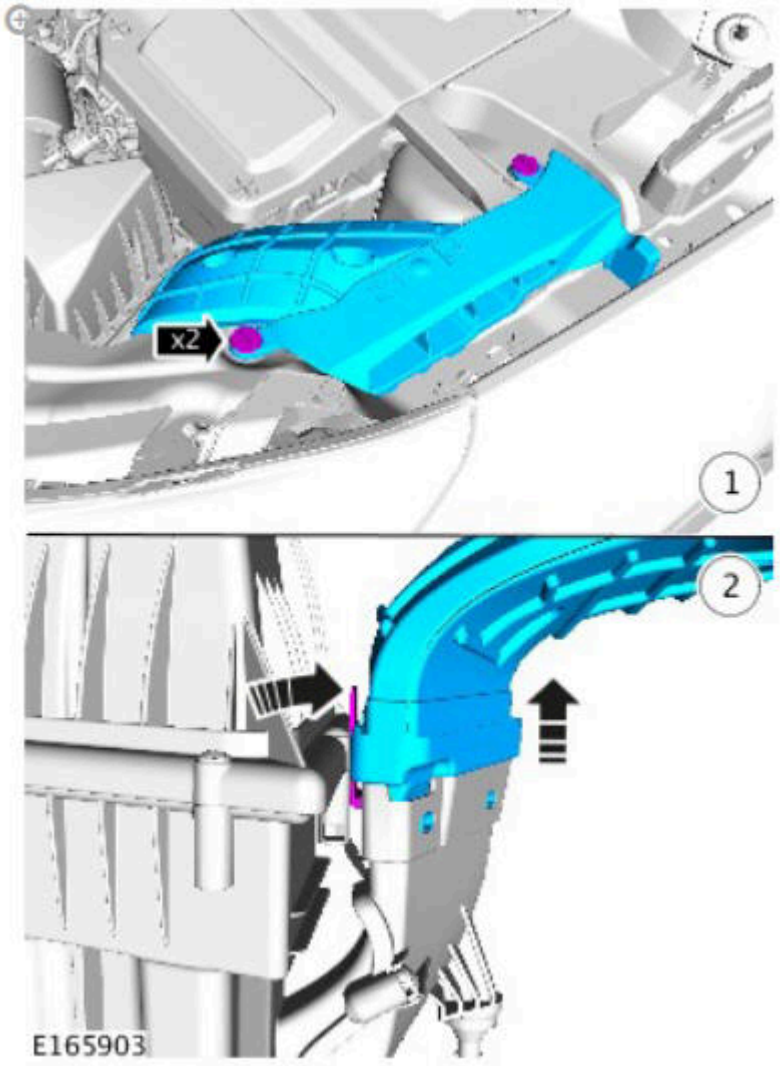
Vehicles fitted with Xenon headlamps, the following precautions must be observed. Failure to comply may result in exposure to ultra violet rays, severe electric shock, burns or the risk of explosion. Ensure the headlamps are switched off at all times. Eye and hand protection must be worn. Never switch on the lamps or test the bulbs with the lamp holder released from the headlamp.

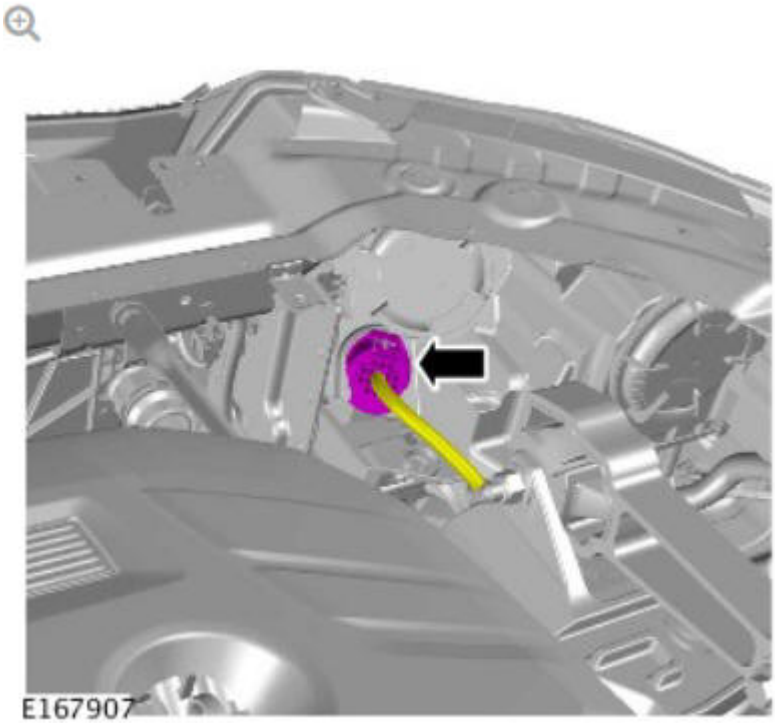
NOTES:

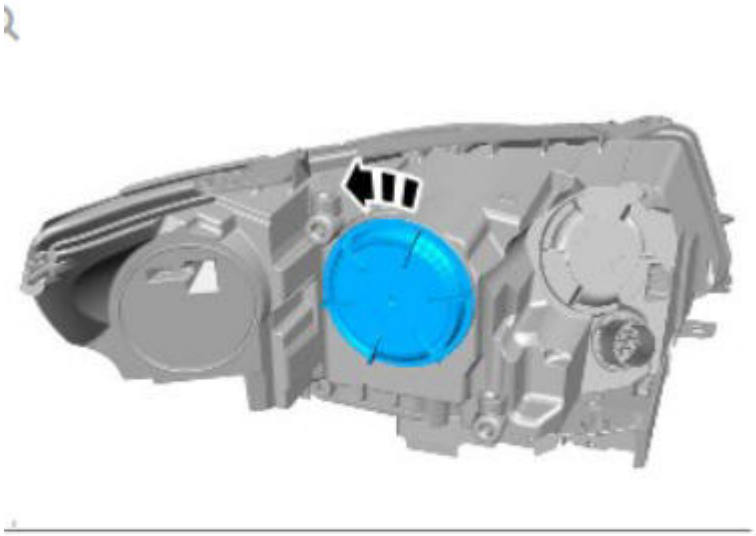
- *Left illustration shown, Right is similar.*
- *Removal steps in this procedure may contain installation details.*
- *Some variation in the illustrations may occur, but the essential information is always correct.*

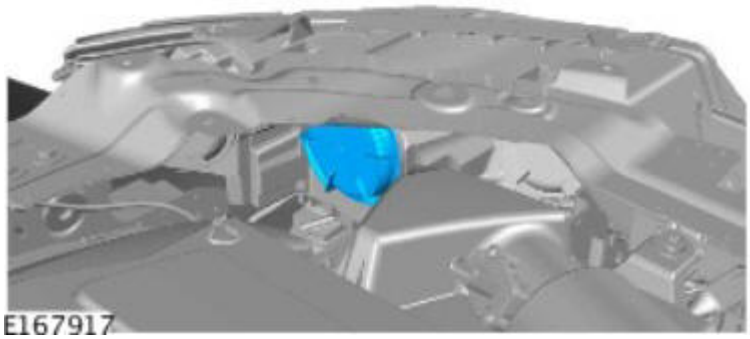
Disconnect the battery ground cable.

Refer to: Specifications (414-01, Specifications).



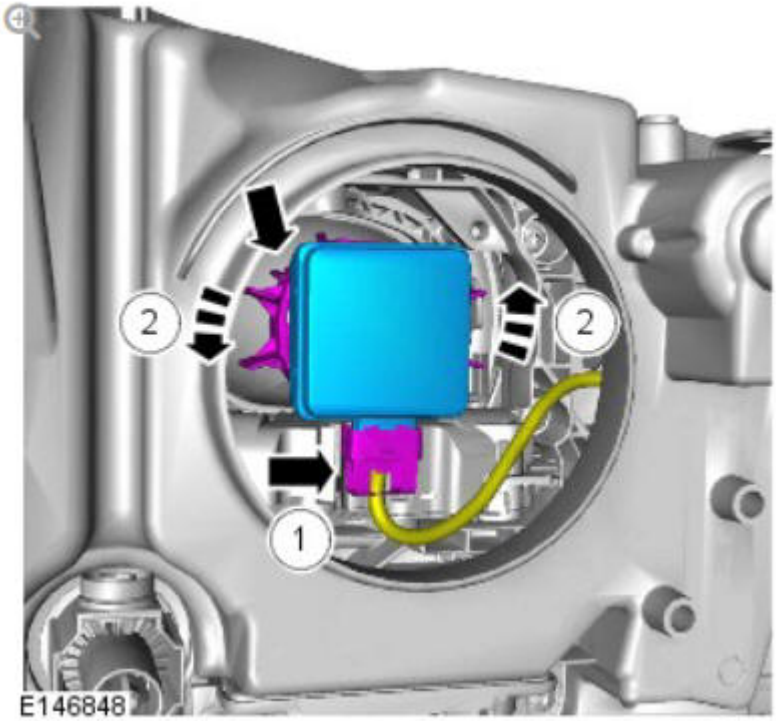




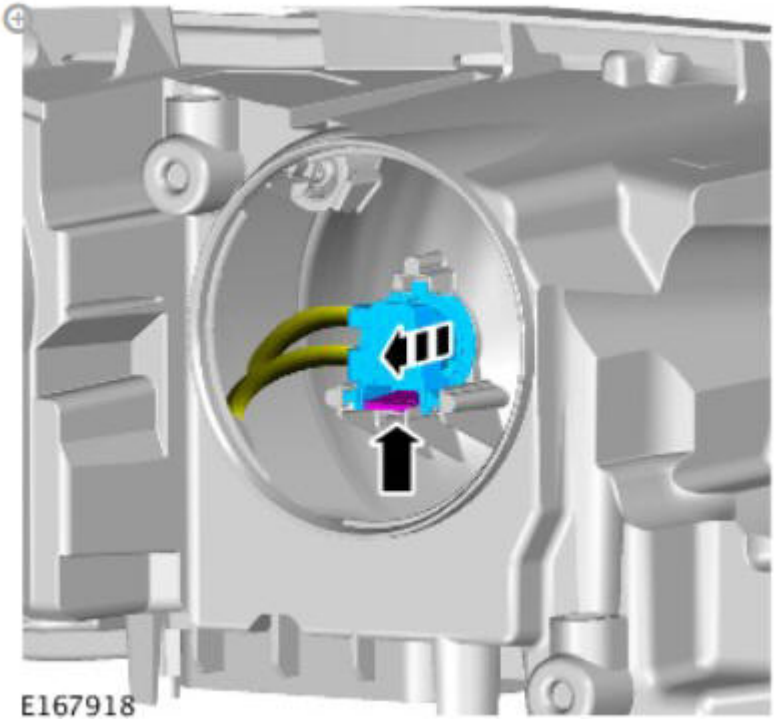


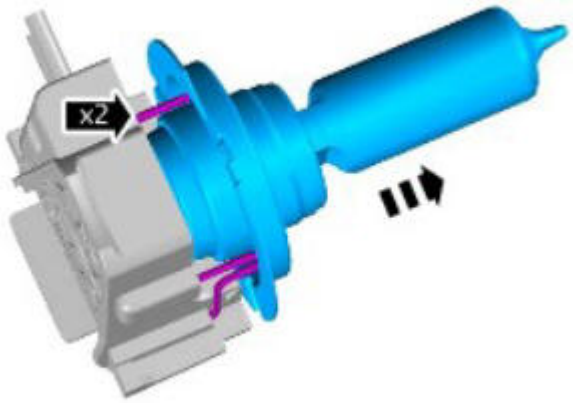
NOTE:

If equipped.



E146848


E167918



INSTALLATION

1. To install, reverse the removal procedure.

High Mounted Stoplamp (G1785271) Removal and Installation

REMOVAL

CAUTION:

Protect the surrounding components.

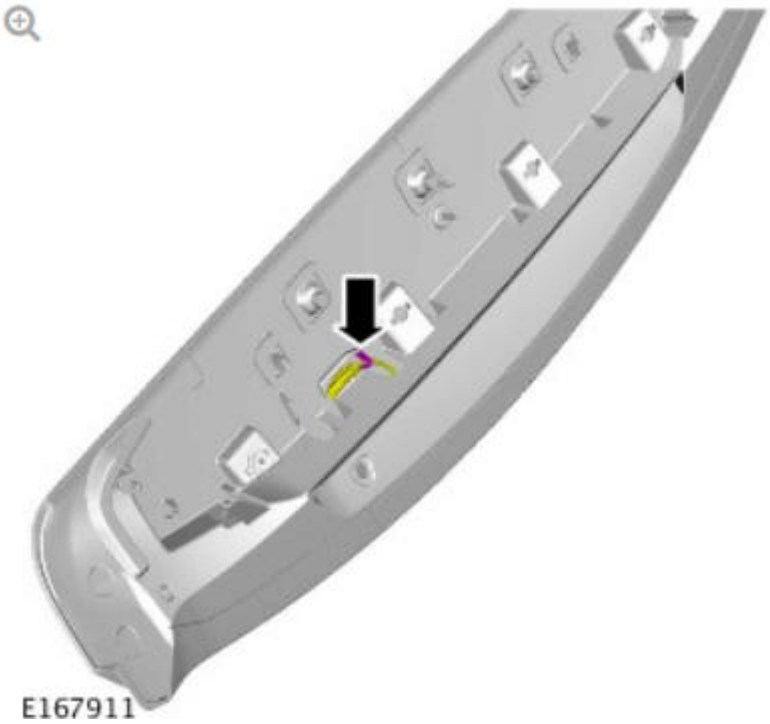
NOTES:

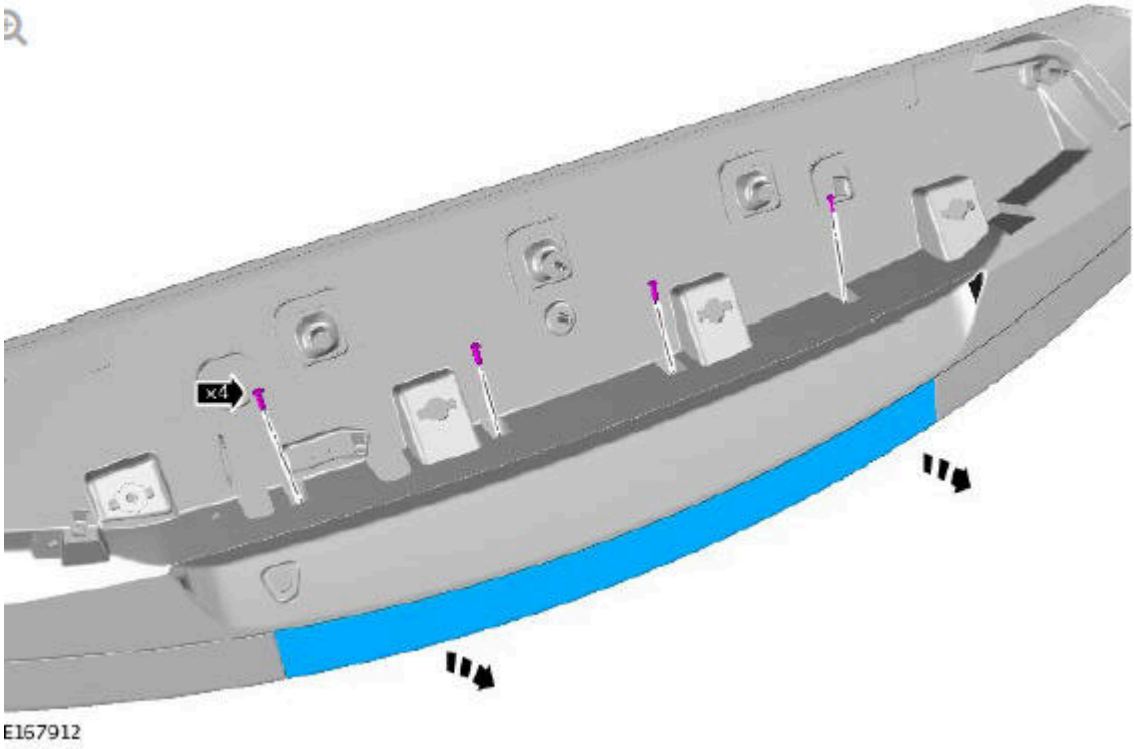
- *Removal steps in this procedure may contain installation details.*
- *Some variation in the illustrations may occur, but the essential information is always correct.*

1. Disconnect the battery ground cable.

   Refer to: Specifications (414-01 Battery, Mounting and Cables, Specifications).

2. Refer to: Rear Spoiler (501-08 Exterior Trim and Ornamentation, Removal and Installation).





Torque: 2 Nm

INSTALLATION

1. To install reverse the removal procedure.

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Headlamp Assembly (G1785269) / Removal and InstallationParking, Rear and License Plate Lamps

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Парковка, задний и License пластина фонари

Parking, Rear and License Plate Lamps

PRINCIPLES OF OPERATION

For a detailed description of the Parking, Rear and License Plate Lamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
▪ Lighting control switch ▪ Side lamps ▪ Tail lamps ▪ License plate lamps	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Side lamp(s) inoperative	▪ Body system fault ▪ Lighting control switch fault ▪ Side lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the side lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp as necessary
Tail lamp(s) inoperative	▪ Body system fault ▪ Lighting control switch fault ▪ Tail / license plate lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary
License plate lamp(s) inoperative	▪ Body system fault ▪ Lighting control switch fault ▪ Tail / license plate lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new license plate lamp as necessary
Side lamp(s)	▪ Body system fault	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction

dim	▪ Side lamp circuit high resistance	box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the side lamp circuit for high resistance. Repair the wiring harness or install a new headlamp as necessary
Tail lamp(s) dim	▪ Body system fault ▪ Tail / license plate lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary
License plate lamp(s) dim	▪ Body system fault ▪ Tail / license plate lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for high resistance. Repair the wiring harness or install a new license plate lamp as necessary
Side lamp(s) stuck on	▪ Body system fault ▪ Lighting control switch fault ▪ Side lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the side lamp circuit for short circuit to power. Repair the wiring harness as necessary
Tail / license plate lamp(s) stuck on	▪ Body system fault ▪ Lighting control switch fault ▪ Tail / license plate	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index

	lamp circuit short circuit to power	▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Side lamp(s) inoperative

POSSIBLE CAUSES:

- Body system fault
- Lighting control switch fault
- Side lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the side lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new headlamp as necessary

SYMPTOM:

Tail lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Tail / license plate lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary

SYMPTOM:

License plate lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Tail / license plate lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new license plate lamp as necessary

SYMPTOM:

Side lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Side lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the side lamp circuit for high resistance. Repair the wiring harness or install a new headlamp as necessary

SYMPTOM:

Tail lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Tail / license plate lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary

SYMPTOM:

License plate lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Tail / license plate lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for high resistance. Repair the wiring harness or install a new license plate lamp as necessary

SYMPTOM:

Side lamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Side lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the side lamp circuit for short circuit to power.

  Repair the wiring harness as necessary

SYMPTOM:

Tail / license plate lamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Tail / license plate lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the tail / license plate lamp circuit for short circuit to power. Repair the wiring harness as necessary
- Inner Tail Lamp Assembly (G1818088) / Removal and Installation
- Outer Tail lamp Assembly (G1817630) / Removal and Installation

ne

Headlamp Bulb (G1785270) / Removal and InstallationInner Tail Lamp Assembly (G1818088) / Removal and Installation

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Внутренний задний фонарь в сборе / снятие и установка

Inner Tail Lamp Assembly (G1818088) / Removal and Installation

REMOVAL

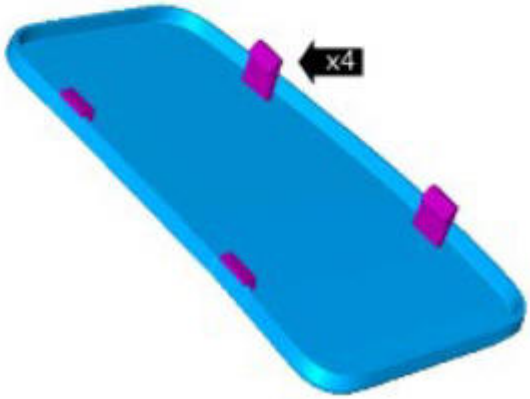
CAUTION:

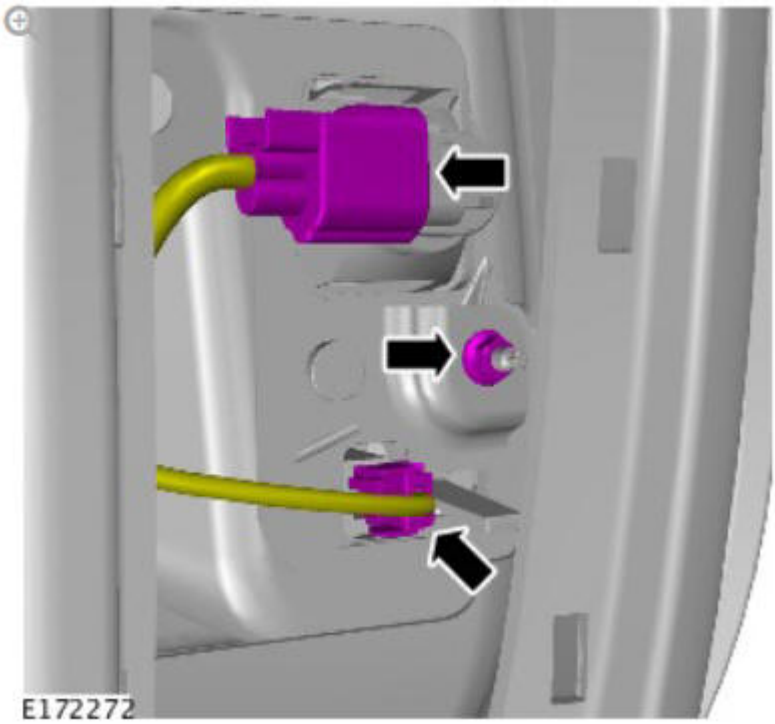
Take extra care not to damage the surrounding components.

NOTES:

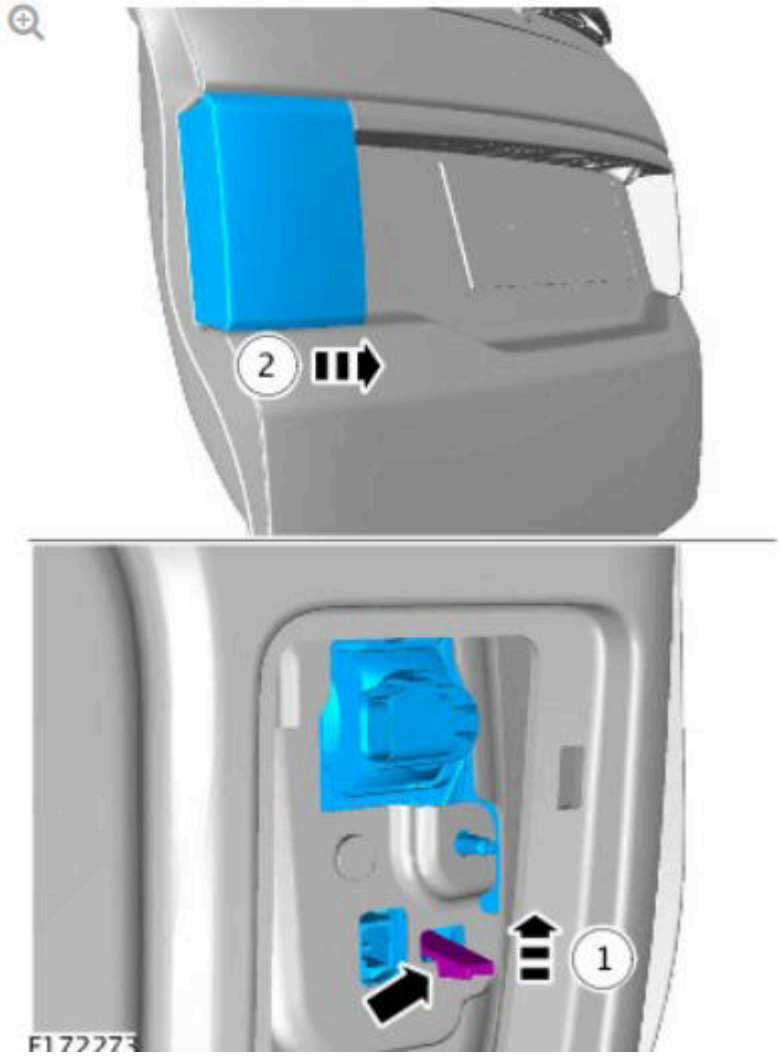
- *Removal steps in this procedure may contain installation details.*
- *Left illustration shown, right is similar.*







Torque: 2.5 Nm



INSTALLATION

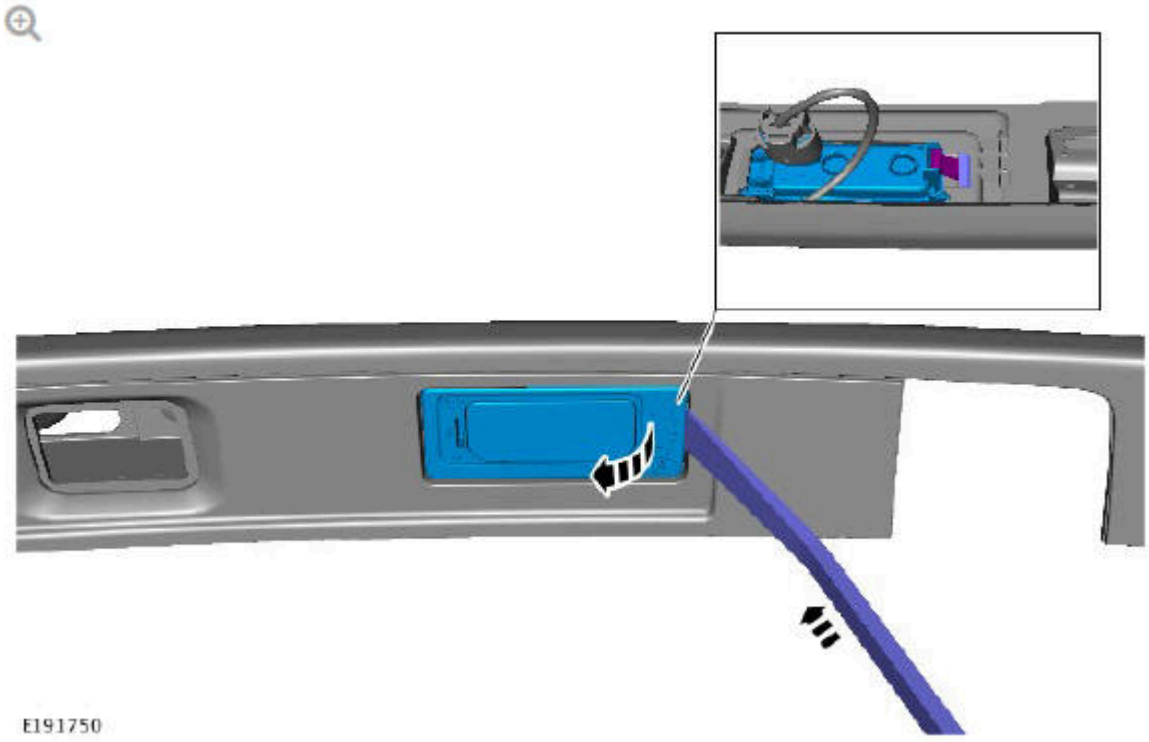
1. To install, reverse the removal procedure.

License Plate Lamp (G1982981) Removal and Installation

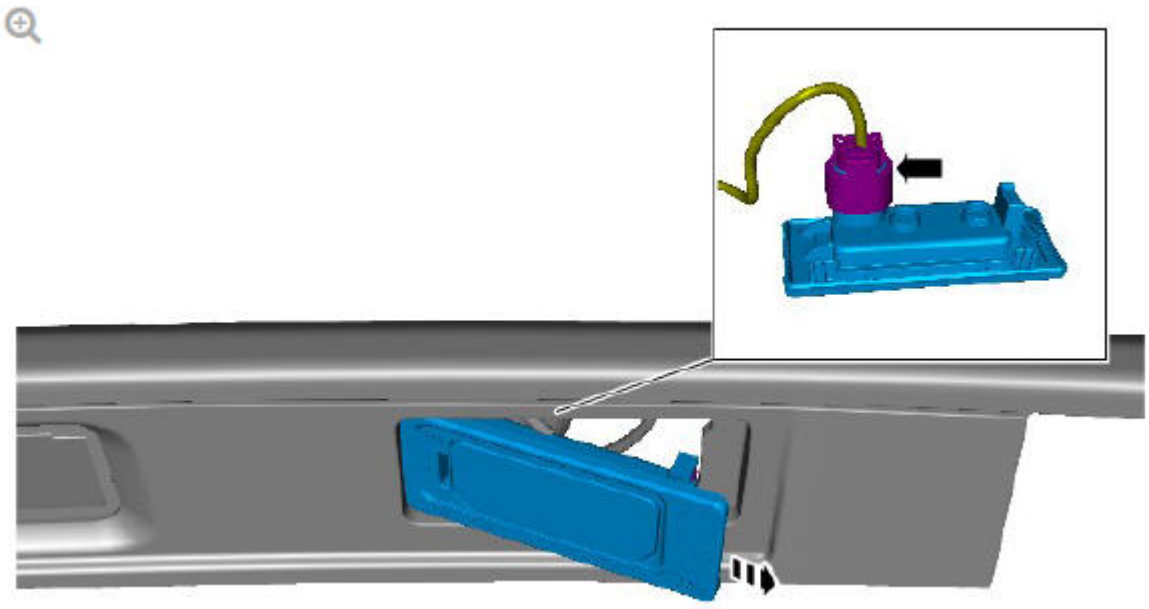
REMOVAL

CAUTION:

Take extra care not to damage the surrounding components.



Using a suitable plastic trim tool, release the lamp.



Disconnect the electrical connector.

INSTALLATION

1. To install, reverse the removal procedure.

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Parking, Rear and License Plate LampsOuter Tail lamp Assembly (G1817630) / Removal and Installation

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Наружный задний фонарь в сборе / снятие и установка

Outer Tail lamp Assembly (G1817630) / Removal and Installation

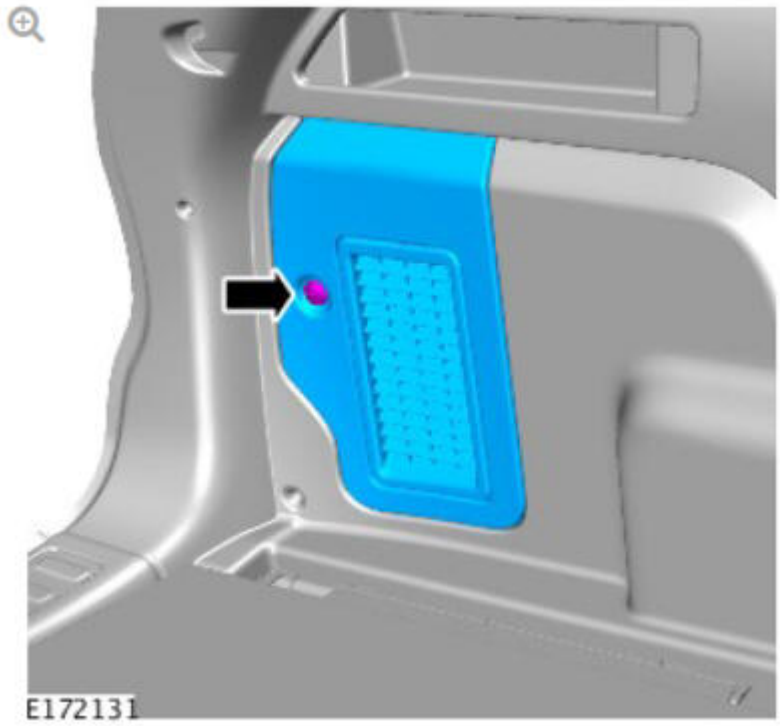
REMOVAL

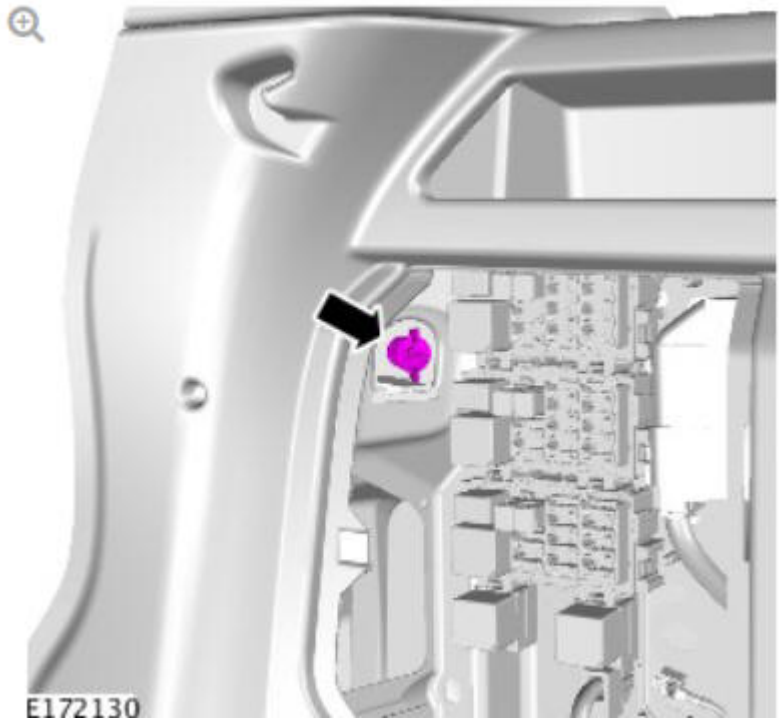
CAUTION:

Take extra care not to damage the surrounding components.

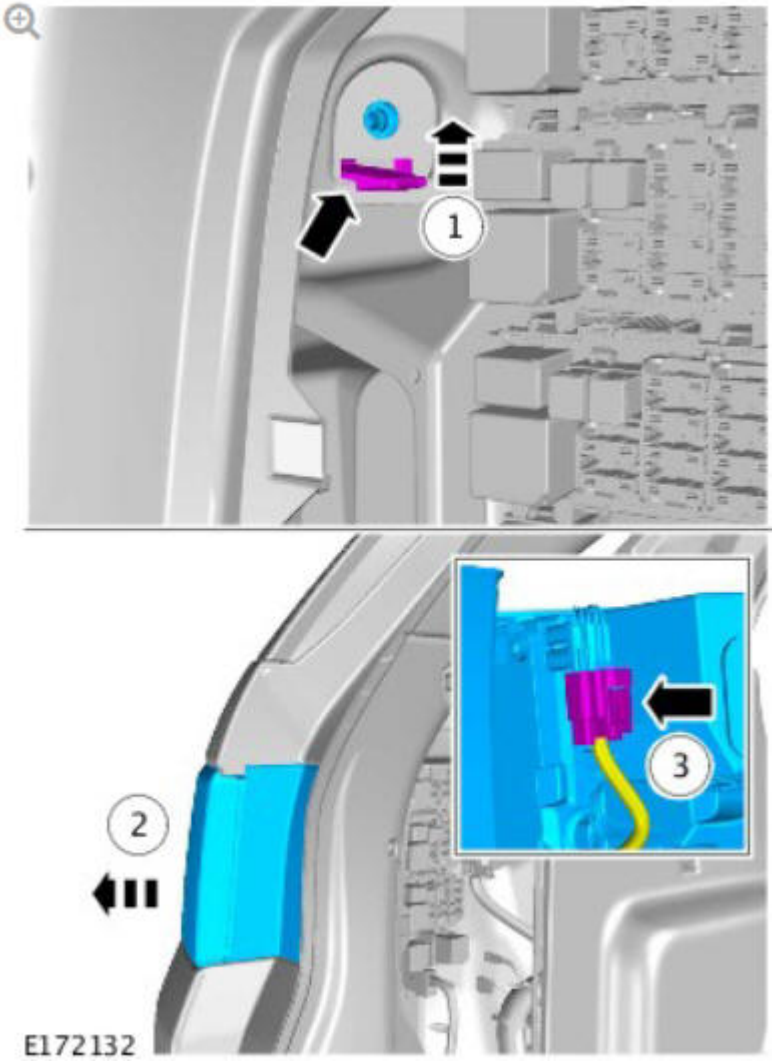
NOTES:

- *Removal steps in this procedure may contain installation details.*
- *Left illustration shown, right is similar.*



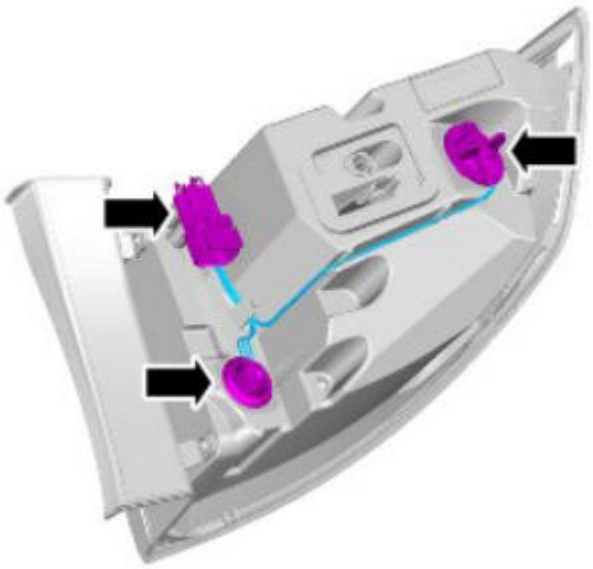


Torque: 2.5 Nm



NOTE:

Do not disassemble further if the component is removed for access only.



INSTALLATION

1. To install, reverse the removal procedure.

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Inner Tail Lamp Assembly (G1818088) / Removal and InstallationReversing Lamps

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Reversing фонари

Reversing Lamps

PRINCIPLES OF OPERATION

For a detailed description of the Reverse Lamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
▪ Reverse lamps	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Reverse lamps(s) inoperative	■ Body system fault ■ Reverse gear switch signal circuit short circuit to power, open circuit, high resistance (manual transmission) ■ Transmission system fault (automatic transmission) ■ Reverse lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	■ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ■ Manual transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index. Refer to the electrical circuit diagrams and check the reverse gear switch signal circuit for short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new reverse gear switch as necessary ■ Automatic transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the transmission control module for related DTCs and refer to the relevant DTC index ■ Refer to the electrical circuit diagrams and check the rear fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new reverse lamp bulb as necessary
Reverse lamps(s) dim	■ Body system fault ■ Reverse lamp bulb incorrect specification ■ Reverse lamp circuit high resistance	■ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ■ Install a new reverse lamp bulb ■ Refer to the electrical circuit diagrams and check the reverse lamp circuit for high resistance. Repair the wiring harness or install a new reverse lamp bulb as necessary

Reverse lamps(s) stuck on	▪ Body system fault ▪ Reverse gear switch signal circuit short circuit to ground (manual transmission) ▪ Transmission system fault (automatic transmission) ▪ Reverse lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Manual transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index. Refer to the electrical circuit diagrams and check the reverse gear switch signal circuit for short circuit to ground. Repair the wiring harness or install a new reverse gear switch as necessary ▪ Automatic transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the transmission control module for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the reverse lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Reverse lamps(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Reverse gear switch signal circuit short circuit to power, open circuit, high resistance (manual transmission)
- Transmission system fault (automatic transmission)
- Reverse lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Manual transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index. Refer to the electrical circuit diagrams and check the reverse gear switch signal circuit for short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new reverse gear switch as necessary
- Automatic transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the transmission control module for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the rear fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new reverse lamp bulb as necessary

SYMPTOM:

Reverse lamps(s) dim

POSSIBLE CAUSE:

- Body system fault
- Reverse lamp bulb incorrect specification
- Reverse lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new reverse lamp bulb
- Refer to the electrical circuit diagrams and check the reverse lamp circuit for high resistance. Repair the wiring harness or install a new reverse lamp bulb as necessary

SYMPTOM:

Reverse lamps(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Reverse gear switch signal circuit short circuit to ground (manual transmission)
- Transmission system fault (automatic transmission)
- Reverse lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Manual transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index. Refer to the electrical circuit diagrams and check the reverse gear switch signal circuit for short circuit to ground. Repair the wiring harness or install a new reverse gear switch as necessary
- Automatic transmission: Using the Jaguar Land Rover approved diagnostic equipment, check the transmission control module for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the reverse lamp circuit for short circuit to power. Repair the wiring harness as necessary

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (100-00 General Information, Description and Operation).

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Outer Tail lamp Assembly (G1817630) / Removal and InstallationStoplamps

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Stoplamps

PRINCIPLES OF OPERATION

For a detailed description of the Stop Lamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
▪ Brake pedal switch ▪ Stop lamps	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Stop lamp(s) inoperative	▪ Body system fault ▪ Brake pedal switch incorrectly installed ▪ Stop lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Check the installation of the brake pedal switch ▪ Refer to the electrical circuit diagrams and check the stop lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary
Stop lamp(s) dim	▪ Body system fault ▪ Stop lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the stop lamp circuit for high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary
Stop lamp(s) stuck on	▪ Body system fault ▪ Brake pedal switch incorrectly installed ▪ Stop lamp circuit short circuit to power ▪ Hill descent control system fault	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Check the installation of the brake pedal switch ▪ Refer to the electrical circuit diagrams and check the stop lamp circuit for short circuit to power. Repair the wiring harness as necessary ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the anti-lock brake system control module for related DTCs and refer to the relevant DTC index

SYMPTOM:

Stop lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Brake pedal switch incorrectly installed
- Stop lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Check the installation of the brake pedal switch
- Refer to the electrical circuit diagrams and check the stop lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary

SYMPTOM:

Stop lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Stop lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the stop lamp circuit for high resistance. Repair the wiring harness or install a new stop/tail lamp as necessary

SYMPTOM:

Stop lamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Brake pedal switch incorrectly installed
- Stop lamp circuit short circuit to power
- Hill descent control system fault

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Check the installation of the brake pedal switch
- Refer to the electrical circuit diagrams and check the stop lamp circuit for short circuit to power.

  Repair the wiring harness as necessary
- Using the Jaguar Land Rover approved diagnostic equipment, check the anti-lock brake system control module for related DTCs and refer to the relevant DTC index

DTC INDEX

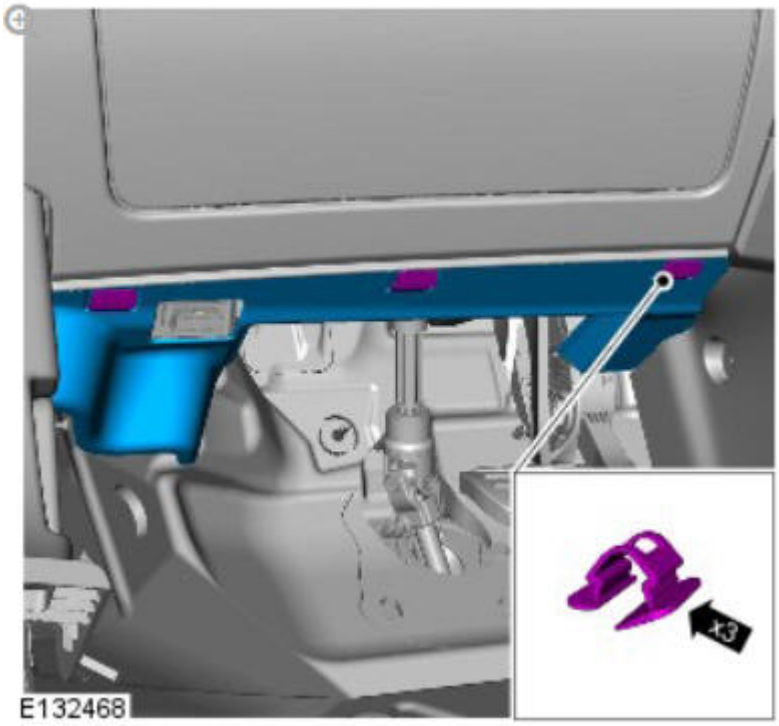
For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (100-00 General Information, Description and Operation).

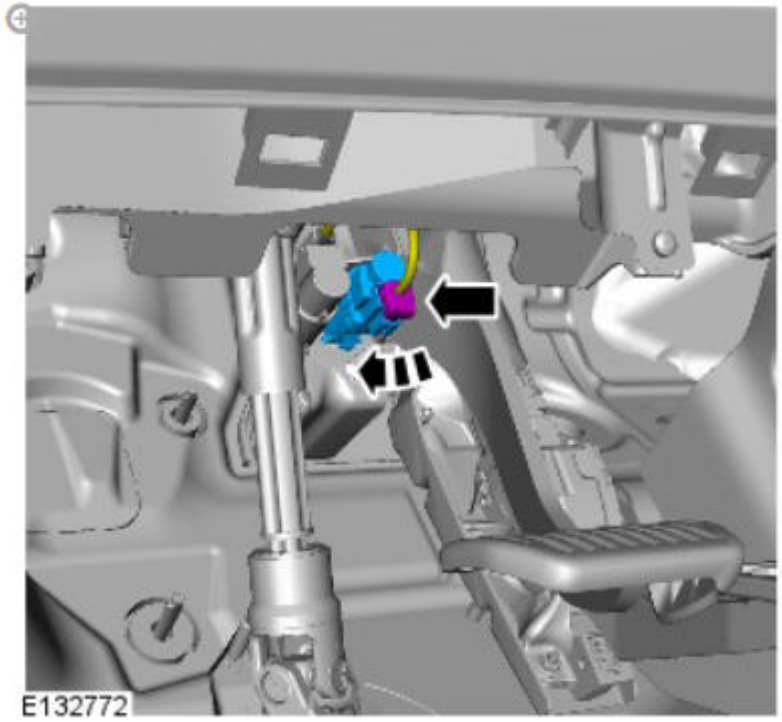
Stoplamp Switch (G1347951) Removal and Installation

REMOVAL

NOTES:

- *Removal steps in this procedure may contain installation details.*
- *LHD illustration shown, RHD is similar.*





INSTALLATION

1. To install, reverse the removal procedure.

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Trailer фонари

Trailer Lamps

PRINCIPLES OF OPERATION

For a detailed description of the Trailer Lamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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

ELECTRICAL
▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Trailer stop lamp(s) inoperative	▪ Body system fault ▪ Trailer stop lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer stop lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary
Trailer stop lamp(s) dim	▪ Body system fault ▪ Trailer stop lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer stop lamp circuit for high resistance. Repair the wiring harness as necessary
Trailer stop lamp(s) stuck on	▪ Body system fault ▪ Trailer stop lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer stop lamp circuit for short circuit to power. Repair the wiring harness as necessary
Trailer fog lamp(s) inoperative	▪ Body system fault ▪ Trailer fog lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring

		harness as necessary
Trailer fog lamp(s) dim	▪ Body system fault ▪ Trailer fog lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer fog lamp circuit for high resistance. Repair the wiring harness as necessary
Trailer fog lamp(s) stuck on	▪ Body system fault ▪ Trailer fog lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer fog lamp circuit for short circuit to power. Repair the wiring harness as necessary
Trailer tail / license plate lamp(s) inoperative	▪ Body system fault ▪ Trailer tail / license plate lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer tail / license plate lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary
Trailer tail / license plate lamp(s) dim	▪ Body system fault ▪ Trailer tail / license plate lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer tail / license plate lamp circuit for high resistance. Repair the wiring harness as necessary

Trailer tail / license plate lamp(s) stuck on	▪ Body system fault ▪ Trailer tail / license plate lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer tail / license plate lamp circuit for short circuit to power. Repair the

		wiring harness as necessary
Trailer turn signal indicator lamp(s) inoperative	▪ Body system fault ▪ Trailer turn signal indicator lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer turn signal indicator lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary
Trailer turn signal indicator lamp(s) dim	▪ Body system fault ▪ Trailer turn signal indicator lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer turn signal indicator lamp circuit for high resistance. Repair the wiring harness as necessary
Trailer turn signal indicator lamps stuck on	▪ Body system fault ▪ Trailer turn signal indicator lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer turn signal indicator lamp circuit for short circuit to power. Repair the wiring harness as necessary
Trailer reverse lamp(s) inoperative	▪ Body system fault ▪ Trailer reverse lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer reverse lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary

Trailer reverse lamp(s) dim	▪ Body system fault ▪ Trailer reverse lamp circuit high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer reverse lamp circuit for high

		resistance. Repair the wiring harness as necessary
Trailer reverse lamp(s) stuck on	▪ Body system fault ▪ Trailer reverse lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the trailer reverse lamp circuit for short circuit to power. Repair the wiring harness as necessary
Warning indicator(s) inoperative	▪ Body system fault ▪ Instrument cluster fault	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the instrument cluster for related DTCs and refer to the relevant DTC index
Trailer connector power (battery) circuit inoperative	▪ Trailer connector power (battery) circuit short circuit to ground, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the trailer connector power (battery) circuit for short circuit to ground, open circuit, high resistance. Repair the wiring harness as necessary
Trailer connector power (ignition) circuit inoperative	▪ Trailer connector power (ignition) circuit short circuit to ground, open circuit, high resistance	▪ Refer to the electrical circuit diagrams and check the trailer connector power (ignition) circuit for short circuit to ground, open circuit, high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer stop lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault

- Trailer stop lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer stop lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer stop lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Trailer stop lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer stop lamp circuit for high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer stop lamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Trailer stop lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer stop lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Trailer fog lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Trailer fog lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer fog lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer fog lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Trailer fog lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer fog lamp circuit for high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer fog lamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Trailer fog lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer fog lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Trailer tail / license plate lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Trailer tail / license plate lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer tail / license plate lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance.

  Repair the wiring harness as necessary

SYMPTOM:

Trailer tail / license plate lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Trailer tail / license plate lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index

- Refer to the electrical circuit diagrams and check the trailer tail / license plate lamp circuit for high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer tail / license plate lamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Trailer tail / license plate lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer tail / license plate lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Trailer turn signal indicator lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Trailer turn signal indicator lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer turn signal indicator lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance.

  Repair the wiring harness as necessary

SYMPTOM:

Trailer turn signal indicator lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Trailer turn signal indicator lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer turn signal indicator lamp circuit for high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer turn signal indicator lamps stuck on

POSSIBLE CAUSE:

- Body system fault
- Trailer turn signal indicator lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer turn signal indicator lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Trailer reverse lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Trailer reverse lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer reverse lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer reverse lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Trailer reverse lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer reverse lamp circuit for high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer reverse lamp(s) stuck on

POSSIBLE CAUSE:

- Body system fault
- Trailer reverse lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the trailer reverse lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Warning indicator(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Instrument cluster fault

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the instrument cluster for related DTCs and refer to the relevant DTC index

SYMPTOM:

Trailer connector power (battery) circuit inoperative

POSSIBLE CAUSE:

- Trailer connector power (battery) circuit short circuit to ground, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the trailer connector power (battery) circuit for short circuit to ground, open circuit, high resistance. Repair the wiring harness as necessary

SYMPTOM:

Trailer connector power (ignition) circuit inoperative

POSSIBLE CAUSE:

- Trailer connector power (ignition) circuit short circuit to ground, open circuit, high resistance

ACTION:

- Refer to the electrical circuit diagrams and check the trailer connector power (ignition) circuit for short circuit to ground, open circuit, high resistance. Repair the wiring harness as necessary

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (100-00 General Information, Description and Operation).

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Turn Signal и Hazard фонари

Turn Signal and Hazard Lamps

PRINCIPLES OF OPERATION

For a detailed description of the Turn Signal and Hazard Lamps, refer to the relevant Description and Operation section in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, 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.

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 that has the resolution ability to view 3 decimal places.*

  For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. 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
▪ Lighting control switch ▪ Turn signal indicator lamps ▪ Side repeater lamps	▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box

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 CAUSES	ACTION
Turn signal indicator lamp(s) inoperative	▪ Body system fault ▪ Lighting control switch fault ▪ Turn signal indicator lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new turn signal indicator lamp bulb as necessary
Hazard warning lamps inoperative	▪ Body system fault ▪ Turn signal indicator lamp bulb incorrect specification ▪ Hazard warning lamp switch fault ▪ Turn signal indicator lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new turn signal indicator lamp bulb ▪ Install a new hazard warning lamp switch ▪ Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new turn signal indicator lamp bulb as necessary
Turn signal indicator / hazard warning lamp(s) dim	▪ Body system fault ▪ Turn signal indicator lamp bulb incorrect specification ▪ Turn signal indicator lamp circuit high	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new turn signal indicator lamp bulb ▪ Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for high resistance. Repair the wiring harness or install a

	resistance	new turn signal indicator lamp bulb as necessary
Turn signal indicator lamps stuck on	▪ Body system fault ▪ Lighting control switch fault ▪ Turn signal indicator lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Install a new lighting control switch ▪ Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for short circuit to power. Repair the wiring harness as necessary
Hazard warning lamps stuck on	▪ Body system fault ▪ Hazard warning lamp switch signal circuit short circuit to ground ▪ Hazard warning lamp circuit short circuit to power	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Refer to the electrical circuit diagrams and check the hazard warning lamp switch signal circuit for short circuit to ground. Repair the wiring harness or install a new hazard warning lamp switch as necessary ▪ Refer to the electrical circuit diagrams and check the hazard warning lamp circuit for short circuit to power. Repair the wiring harness as necessary
Warning indicator(s) inoperative	▪ Body system fault ▪ Instrument cluster fault ▪ Hazard warning lamp switch fault ▪ Lighting control switch fault	▪ Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index ▪ Using the Jaguar Land Rover approved diagnostic equipment, check the instrument cluster for related DTCs and refer to the relevant DTC index ▪ Install a new hazard warning lamp switch ▪ Install a new lighting control switch

SYMPTOM:

Turn signal indicator lamp(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Turn signal indicator lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new turn signal indicator lamp bulb as necessary

SYMPTOM:

Hazard warning lamps inoperative

POSSIBLE CAUSE:

- Body system fault
- Turn signal indicator lamp bulb incorrect specification
- Hazard warning lamp switch fault
- Turn signal indicator lamp circuit short circuit to ground, short circuit to power, open circuit, high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new turn signal indicator lamp bulb
- Install a new hazard warning lamp switch
- Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new turn signal indicator lamp bulb as necessary

SYMPTOM:

Turn signal indicator / hazard warning lamp(s) dim

POSSIBLE CAUSE:

- Body system fault
- Turn signal indicator lamp bulb incorrect specification
- Turn signal indicator lamp circuit high resistance

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new turn signal indicator lamp bulb
- Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for high resistance. Repair the wiring harness or install a new turn signal indicator lamp bulb as necessary

SYMPTOM:

Turn signal indicator lamps stuck on

POSSIBLE CAUSE:

- Body system fault
- Lighting control switch fault
- Turn signal indicator lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Install a new lighting control switch
- Refer to the electrical circuit diagrams and check the turn signal indicator lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Hazard warning lamps stuck on

POSSIBLE CAUSE:

- Body system fault
- Hazard warning lamp switch signal circuit short circuit to ground
- Hazard warning lamp circuit short circuit to power

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Refer to the electrical circuit diagrams and check the hazard warning lamp switch signal circuit for short circuit to ground. Repair the wiring harness or install a new hazard warning lamp switch as necessary
- Refer to the electrical circuit diagrams and check the hazard warning lamp circuit for short circuit to power. Repair the wiring harness as necessary

SYMPTOM:

Warning indicator(s) inoperative

POSSIBLE CAUSE:

- Body system fault
- Instrument cluster fault
- Hazard warning lamp switch fault
- Lighting control switch fault

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the central junction box for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the instrument cluster for related DTCs and refer to the relevant DTC index
- Install a new hazard warning lamp switch
- Install a new lighting control switch

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (100-00 General Information, Description and Operation).

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Trailer LampsFront Turn Signal Lamp Bulb (G1785540) Removal and Installation

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Передний Turn Signal фонарь Bulb снятие и установка

Front Turn Signal Lamp Bulb (G1785540) Removal and Installation

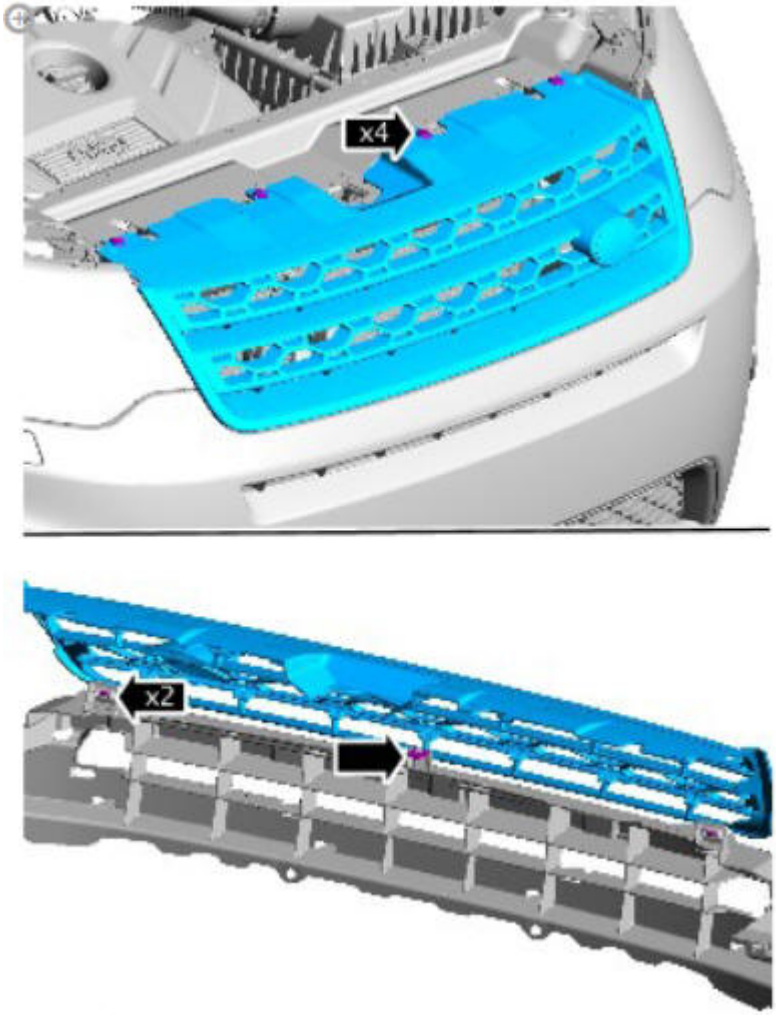
REMOVAL

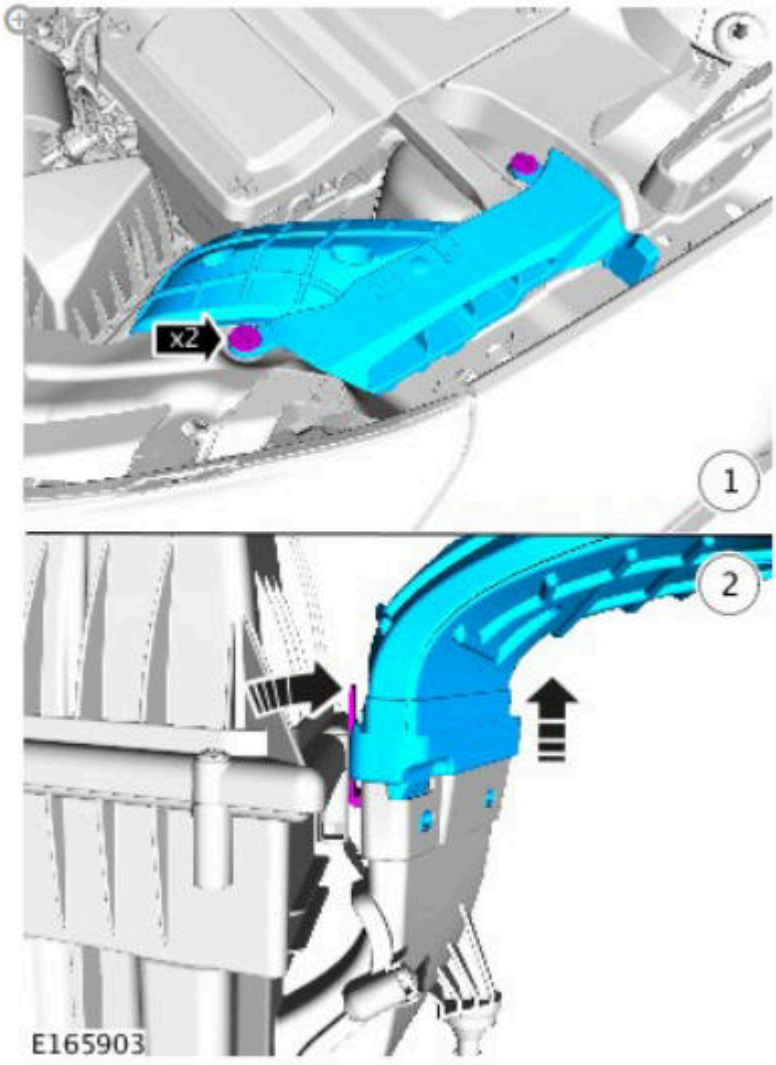
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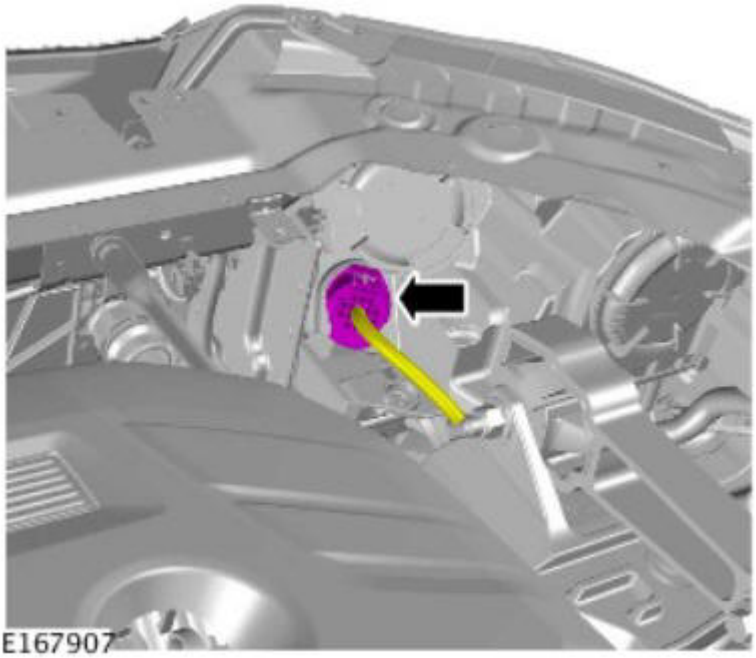
- *Removal steps in this procedure may contain installation details.*
- *Some variation in the illustrations may occur, but the essential information is always correct.*
- *Left illustration shown, right is similar.*

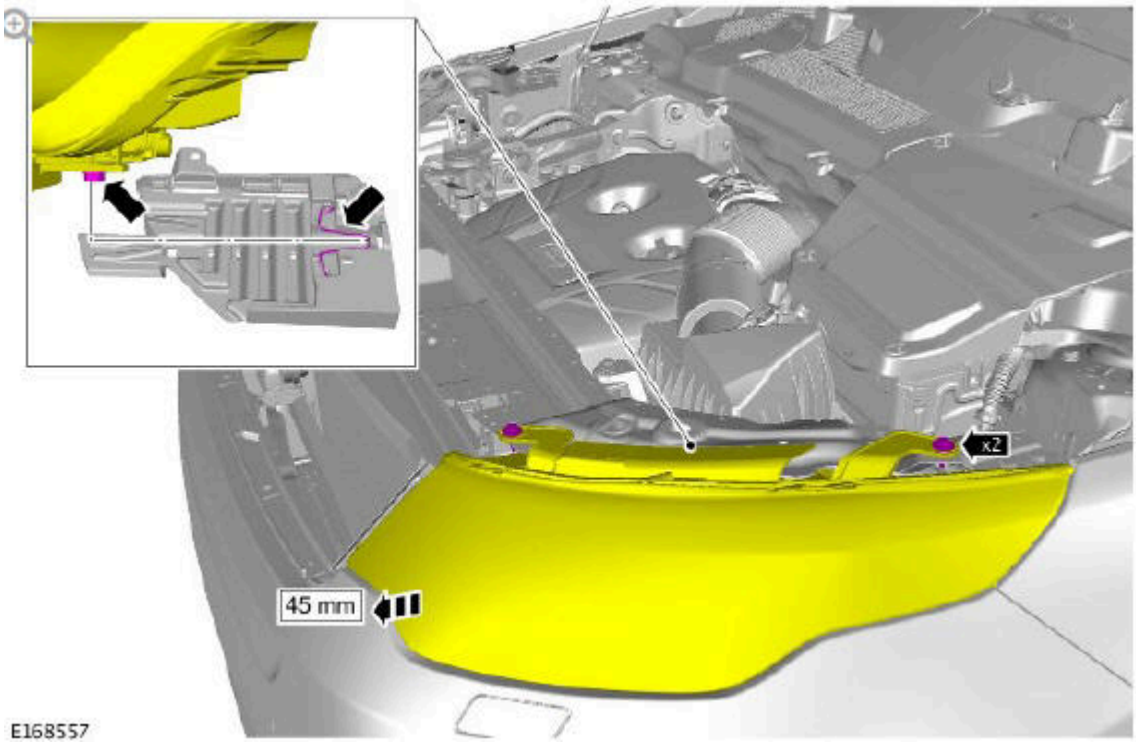
Disconnect the battery ground cable.

Refer to: Specifications (414-01, Specifications).




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2
E165903

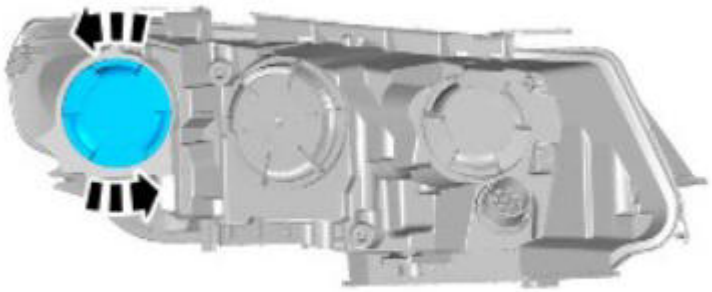

E167907

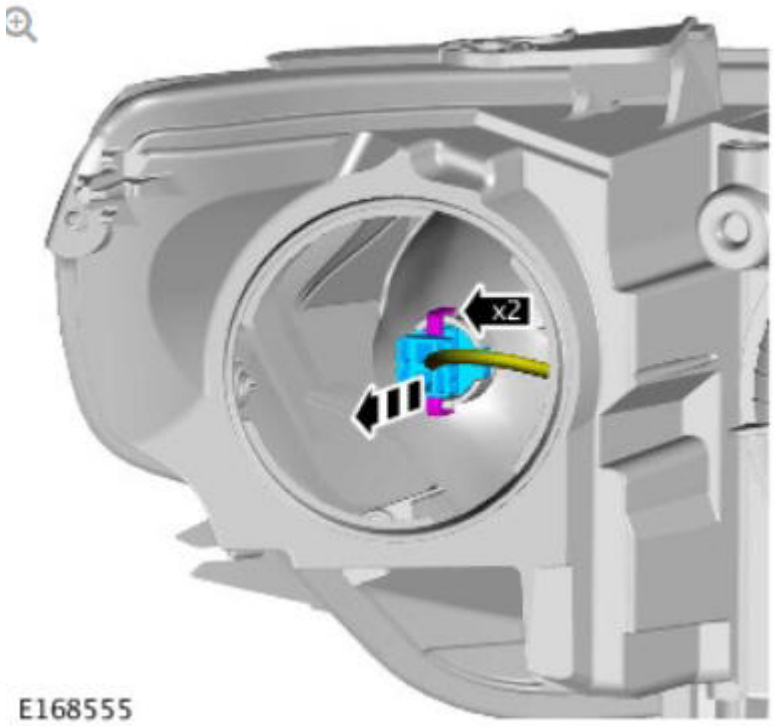


Torque: 4 Nm

NOTE:

Component shown removed for clarity.





INSTALLATION

1. To install, reverse the removal procedure.

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Turn Signal and Hazard LampsPowertrain

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