

Exterior Lighting -

Bulbs

Lamp	Bulb Type
Number plate lamp	W5WL
Reverse lamp	LED (non-serviceable)
Side repeater indicator	WY5W
Headlamp unit:	
Cornering lamp	H8
Dip and main beam projector unit	D1S35W
Direction indicator	PY21W
Side lamp	W5W
Side marker	WY5W
Rear lamp unit:	
Direction indicator	PY21W Silver Vision
Side marker	W5W
Stop and tail	P21/5W
Tail lamp	W5W
Fog lamps:	
Front fog lamp	H11 55W
Rear fog lamp	LED (non-serviceable)

Adjustment

Item	Adjustment Setting
Headlamp aim (ROW)	-1% +/- 0.1%
Headlamp aim (NAS)	-0.7%
Fog lamp aim	-2% +/- 0.5%

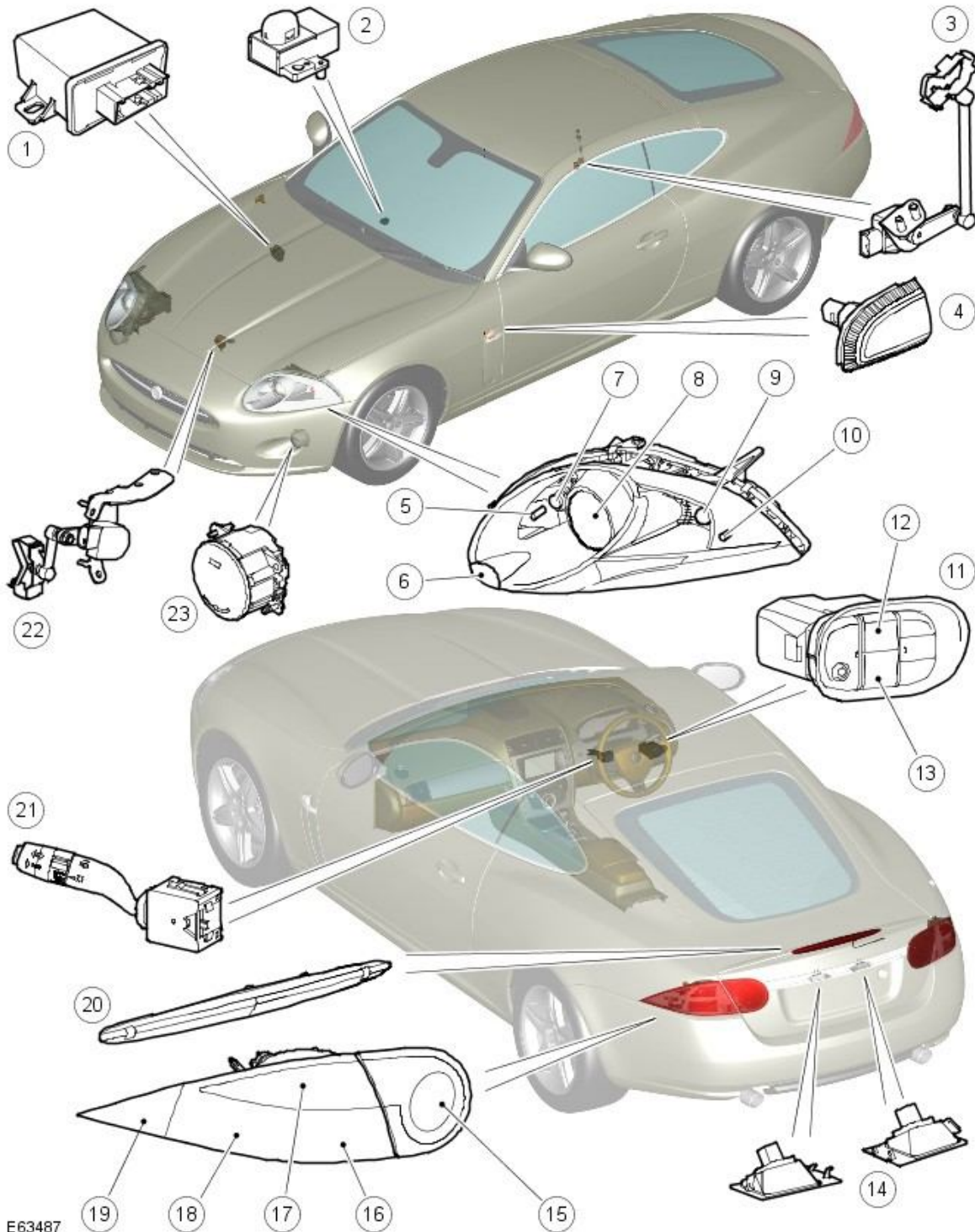
Torque Specifications

Item	Nm	lb-ft	lb-in
Headlamp assembly - bolt	6	4	53
Headlamp leveling, front sensor - bolt	20	15	-
Headlamp leveling module - bolt	4	3	35
Headlamp leveling, rear sensor - bolt	20	15	-
High-mounted stop lamp - screw	2	-	18
Rear lamp assembly to gate/lid - nut	2.5	-	22
Rear lamp assembly to fender - nut	2	-	18

Exterior Lighting - Exterior Lighting

Description and Operation

COMPONENT LOCATION



E63487

Item	Part Number	Description
1	-	Headlamp leveling/AFS control module
2	-	Light sensor
	3	Rear height sensor
4	-	Turn signal indicator repeater lamp (2 off)
5	-	Cornering lamp
6	-	Headlamp power washer
7	-	Front side lamp
8	-	Xenon headlamp module
9	-	Front turn signal indicator
10	-	Side marker lamp
11	-	Auxiliary lighting switch
12	-	Front fog lamp switch
13	-	Rear fog lamp switch
14	-	License plate lamps
15	-	Reverse or rear fog lamp
16	-	Side lamp
17	-	Rear turn signal indicator
18	-	Side lamp/Stop lamp
19	-	Rear side marker lamp
20	-	High mounted stop lamp
21	-	Lighting switch
22	-	Front height sensor
23	-	Front fog lamp (2 off)

INTRODUCTION

The lighting systems are controlled by the Auxiliary Junction Box (AJB) and the central junction box (CJB). The two boxes contain fuses, relays and microprocessors to control the power supply and functionality of the lighting systems.

Driver lighting selections using the left-hand (LH) steering column multifunction switch or the auxiliary lighting switch are passed to the CJB via the instrument cluster.

The lighting system has an 'auto' lights function which is controlled by the CJB on receipt of signals from the light sensor. The exterior lights are turned on or off in response to ambient light signals from the light sensor via the instrument cluster.

Two levels of headlamp are available; Bi-xenon or Bi-xenon with Adaptive Front lighting System (AFS). The AFS headlamp has a swiveling projector module which moves the headlamp beam in the direction of travel. The AFS headlamp also features a cornering/static bending lamp which illuminates the area at the side of the vehicle when turning into driveways for example.

The tail lamp is in two parts. The turn signal indicator, side and stop lamps are located in each rear fender. The reverse and rear fog lamps are located in separate units attached to the liftgate. The locations of the fog and reverse lamps changes depending if the vehicle is left-hand drive (LHD) or right-hand drive (RHD). The turn signal indicator, side and stop lamps use conventional glass filament bulbs. The rear fog and reverse lamp use colored light emitting diode (LED).

EXTERIOR BULB TYPE/RATING

The following table shows the bulbs used for the exterior lighting system and their type and specification.

Bulb	Type	Rating
Xenon Headlamps - Low/High beam	Xenon D1S	35W
Front fog lamps - Naturally aspirated	Halogen H11	55W
Front fog lamps - Supercharged	Halogen H3	55W
Rear fog lamp	LED	Not applicable
Turn signal indicator lamps - Front - Rest of World (ROW)	Bayonet PY21W	21W
Turn signal indicator lamps - Front - North American Specification (NAS)	Wedge S8W 3457K	27/7W
Turn signal indicator repeater lamps	Capless W5W	5W
Turn signal indicator lamps - Rear	Bayonet PY21W	21W
Side lamps - Front	Wedge W5W	5W
Stop / Side lamps	Bayonet - Twin filament - P21/5	21W/5W
High mounted stop lamp	LED	Not applicable
License plate lamps	Capless W5W	5W
Reverse lamp	LED	Not applicable
Cornering lamp	Halogen H8	35W
Side marker lamps (front/rear)	Capless W3W	3W

CENTRAL JUNCTION BOX AND AUXILIARY JUNCTION BOX

The CJB is an integrated unit located in the passenger compartment LH side on the 'A' pillar.

The Auxiliary Junction Box (AJB) is located in a central position, behind the rear seat.

CJB Control

The CJB receives inputs from the following switches via the instrument cluster and the medium speed controller area network (CAN) bus:

- LH steering column multifunction switch
- Side lamp position
- Headlamp position
- Automatic (AUTO) position
- Timer delay positions
- Turn signal indicators
- Headlamp flash and high beam
- Stop lamp switch
- Hazard flasher switch
- Sunload/Light sensor.

The following lamps are controlled by the CJB:

- Front side lamps
- Front side marker lamps
- Headlamps
- Cornering lamps
- Front fog lamps.

AJB Control

The following lamps are controlled by the AJB:

- Rear fog lamp
- Reverse lamp
- Stop lamps
- High mounted stop lamp
- Rear side lamps
- Rear side marker lamps
- Licence plate lamps
- Front and rear turn signal indicators and side repeaters

The AJB is also connected via a hardwired connection to the hazard flasher switch.

Circuit Protection

The AJB and the CJB provide circuit protection for all exterior lighting circuits. The exterior lighting circuits are protected by Field Effect Transistors (FETs). Operation of the exterior lighting circuits is protected by the FETs 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 power 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 and the AJB store fault codes which can be retrieved using a Jaguar approved diagnostic system. The fault code will identify that there is a fault on a particular output which will assist with fault detection.

Alarm Indications

The exterior lighting system is used for alarm arm and disarm requests.

When the driver locks and arms the vehicle, a visual indication of a successful lock and arm request is displayed to the driver by a single flash of the hazard flashers. If the vehicle is superlocked then the hazard flashers will flash a second time (200ms off and 200ms on) to confirm the superlock request.

When the driver unlocks the vehicle, a visual indication of a successful lock and disarm request is displayed to the driver by the hazard flashers operating twice (200ms off and 200ms on).

If the alarm is triggered, the hazard flashers are operated for ten 30 second cycles of 200ms on and 200ms off with a 10 second delay between each cycle.

NOTE: On NAS vehicles the delay between cycle when the alarm is triggered is 60 seconds.

The alarm triggered hazard flasher operation varies depending on market.

Lights on Warning Chime

When the ignition is in the off mode or accessory mode conditions and the lighting switch is in the side lamp or headlamp position, a warning chime will sound if the driver's door is opened. This indicates to the driver that the exterior lights have been left switched on.

The chime is generated from the instrument cluster sounder on receipt of a lights on signal, a driver's door open signal and an ignition off or accessory mode signal via a medium speed CAN bus signal from the CJB.

Crash Signal Activation

When a crash signal is transmitted from the restraints control module, the AJB activates the hazard flashers. The hazard flashers continue to operate until the ignition is in the off or accessory modes and then returned to the ignition on mode. Once this condition has occurred, the restraints control module will cease transmission of the crash signal.

Headlamp Timer

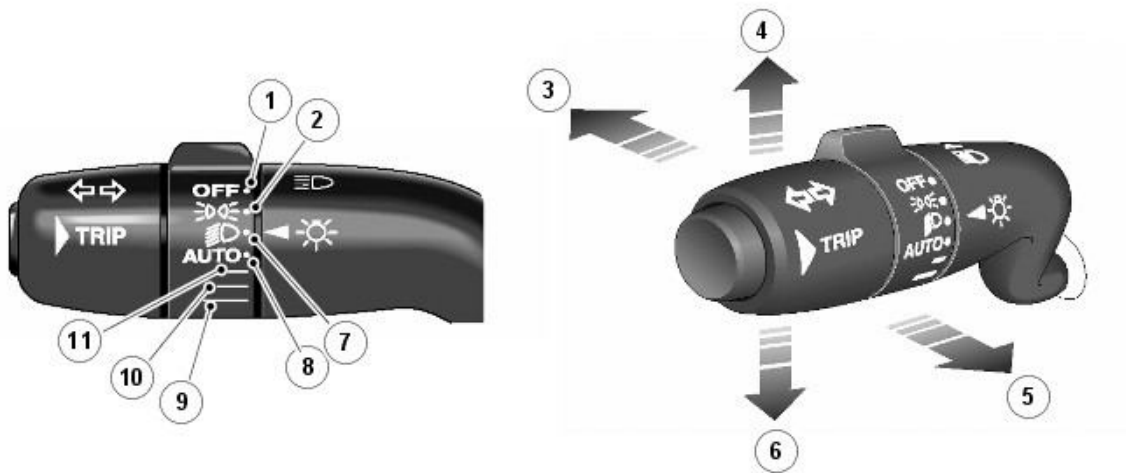
The AJB controls a headlamp timer function which allows the headlamps to remain on for a period of time after leaving the vehicle. This is a driver convenience feature which illuminates the driveway after leaving the vehicle.

To select this feature, the lighting control switch on the steering column multifunction switch must be in one of the three headlamp timer positions when the ignition mode is changed from ignition on mode to off mode. The timer function will then be initiated and the low beam headlamps will be illuminated for the selected timer period.

NOTE: If the lighting switch is in the AUTO position, the headlamp timer will not function when the ignition mode is changed to off.

The timer period can be adjusted using one of the 3 positions on the lighting control switch on the LH steering column multifunction switch. The 3 switch positions correspond to timer values of 30, 60 and 120 seconds.

LIGHTING CONTROL SWITCH



Item	Part Number	Description
1	-	Off position
2	-	Side lamp position
3	-	High beam position
4	-	right-hand (RH) turn signal indicator position
5	-	Headlamp flash/high beam off position
6	-	LH turn signal indicator position
7	-	Headlamp position
8	-	AUTO headlamp position
9	-	Headlamp timer 120 second delay position
10	-	Headlamp timer 60 second position
11	-	Headlamp timer 30 second position

The lighting control switch is located on the LH steering column multifunction switch. The switch is a rotary control with positions for the following lighting selections:

- Off
- Side lamps
- Headlamps
- AUTO headlamps
- Headlamp timer (3 time period selections).

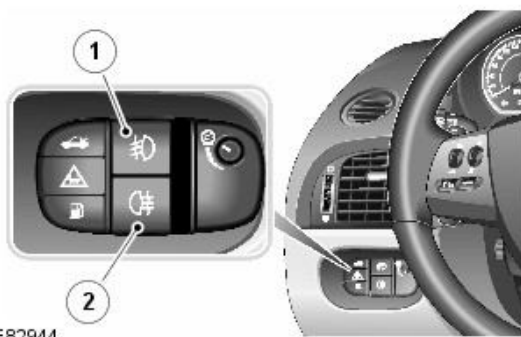
The steering column multifunction switch also provides for the selection of low and high beam headlamps and also the headlamp flash function.

The steering column multifunction switch is connected to the instrument cluster by 3 wires. Two wires supply a signal voltage to the lighting switch and the headlamp timer positions. The third wire is a common ground. Each switch position is connected to the ground return via resistors which vary the return voltage to the instrument cluster. The instrument cluster senses the voltage returning and determines the switch position selected. The instrument cluster then generates an applicable message which is sent to the AJB and the CJB on the medium speed CAN bus for activation of the selected exterior lamps.

The steering column multifunction switch also provides the control for the turn signal indicators. The switch can be pushed down to select the LH turn signal indicators or pushed up to select the RH turn signal indicators. The switch has 2 positions. If the switch is pushed up or down gently and held, the turn signal indicators will operate until the switch is released, if the switch is pushed past a detent, the switch can be released and the selected position will automatically be cancelled when the manoeuvre is completed. If a turn signal indicator bulb fails, the green turn signal indicator warning indicator in the instrument cluster will flash at twice the normal rate and the audible ticking will also be at twice the normal rate.

The steering column multifunction switch also has a lane change function. If the switch is gently pushed to either turn signal indicator direction and then released, the turn signal indicators will flash 3 times and then automatically cancel.

AUXILIARY LIGHTING SWITCH



E82944

Item	Part Number	Description
1	-	Front fog lamp switch
2	-	Rear fog lamp switch

The auxiliary lighting switch is located in the instrument panel, adjacent to the steering column. The switch has 2 buttons which select the front and rear fog lamps. The buttons are non-latching momentary switches.

The auxiliary lighting switch is connected to the instrument cluster by 3 wires. Two wires supply a signal voltage to the each fog lamp switch. The third wire is a common ground. Each switch position is connected to the ground return via a series of resistors which vary the supply voltage from the instrument cluster. The instrument cluster senses the voltage and determines the switch position selected. The instrument cluster then generates an applicable message which is sent to the

AJB and the CJB on the medium speed CAN bus for activation of the selected fog lamps.

The front fog lamps can only be activated when the ignition is in the ignition power mode and side lamps or headlamps are active. The rear fog lamps can only be activated if the low beam headlamps are on or if the sidelamps and front fog lamps are on. A second press of each fog lamp button will switch of the selected fog lamps. If the lighting control switch or the ignition is changed to the off mode, then both fog lamps will be switched off and will need to be re-selected if required.

HEADLAMP ASSEMBLY

Two types of headlamp are available; Bi-Xenon and Adaptive Front lighting System (AFS). The headlamps are located with a locating dowel through the upper front bumper bracket and secured with 3 bolts to the front body structure. Bulb replacement requires the removal of the complete headlamp assembly.

The rear of the headlamp unit has removable access panels which allow access to the bulbs for replacement. A large cover, which is rotated anti-clockwise to remove allows access to the Xenon D1S bulb. Another removable cover provides access to the cornering lamp bulb and the side lamp bulb, which is retained with a spring clip. A smaller cover can be rotated anti-clockwise to provide access to the turn signal indicator bulb and the side marker lamp bulb.

The headlamps have two adjustment screws on the rear which allow for the manual setting of the vertical and horizontal alignment.

On NAS vehicles the headlamp is regarded as 'Visual Optically Left' aiming. The adjustment screws have to be turned equal amounts to maintain the correlation in the vertical axis only. There is no horizontal adjustment. Refer to the Service Repair Procedures manual for headlamp alignment data and procedures.

Each headlamp has an integral 16 pin connector which provides inputs and outputs for the various functions of the headlamp assembly.

The low beam headlamps are switched on when the ignition is in the ignition mode and:

- the lighting control switch is in the headlamp position
- the lighting control switch is in the AUTO position and a 'lights on' signal is received by the CJB from a 'lights on' message generated by the AJB.

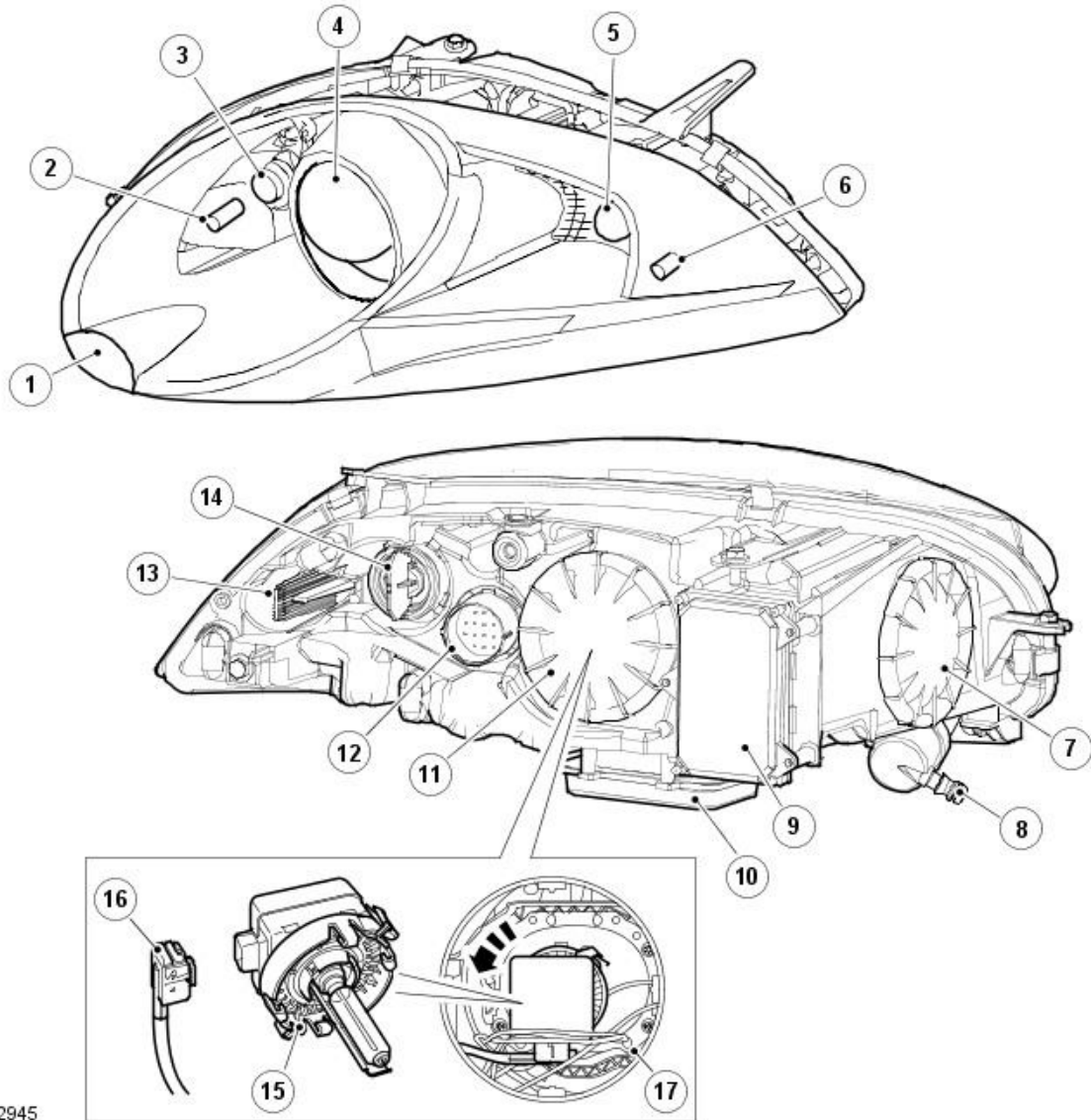
The low beam headlamps can also be operated by the headlamp timer function.

The high beam headlamps are switched on when the ignition is in the ignition mode and:

- The low beam headlamps are selected on or activated via the AUTO feature and the LH steering column multifunction switch is pushed forward, away from the driver

The high beam lamps will be switched off when:

- The LH steering column multifunction switch is moved rearwards, towards the driver.
- The low beam headlamps are switched off
- The ignition mode is changed to accessory or off mode.



E82945

Item	Part Number	Description
1	-	Headlamp power washer jet
2	-	Side lamp bulb
3	-	Cornering lamp (if fitted)
4	-	Xenon projector module
5	-	Turn signal indicator bulb
6	-	Side marker lamp bulb
7	-	Cover - Side lamp and cornering lamp
8	-	Powerwash hose connection
9	-	AFS power module (if fitted)
10	-	Xenon control module
11	-	Cover - Xenon bulb
12	-	Electrical connector
13	-	Side marker lamp bulb and holder
14	-	Turn signal indicator bulb and holder
15	-	Igniter electrical connector
16	-	Igniter unit and bulb
17	-	Mounting collar

 **WARNING:** 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 the Xenon headlamp system:

- **DO NOT** attempt any procedures on the Xenon headlamps when the lights are switched on.
- Handling of the D1S 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.

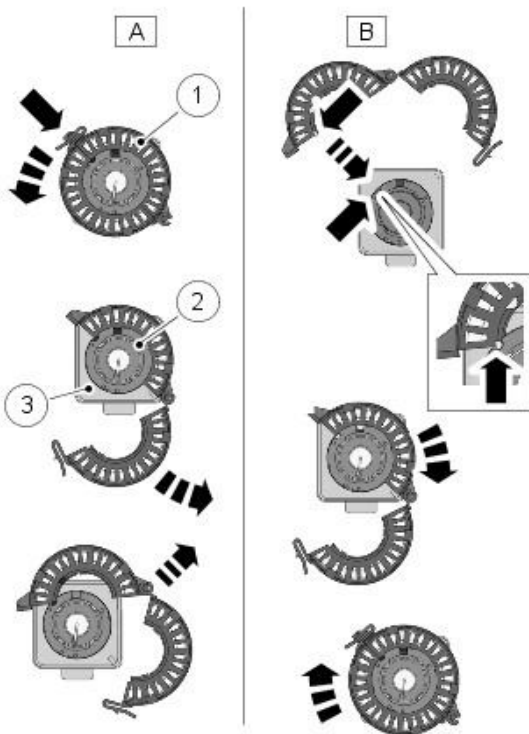
The Xenon headlamp is known as Bi-Xenon because it operates as both a low and high beam unit. The Xenon lamp or High Intensity Discharge (HID) lamp as they are sometimes called, comprise an ellipsoidal lens with a solenoid controlled shutter to change the beam output from low to high beam.

NOTE: If the lighting control switch is in the OFF position, the Xenon lamps operate when the high beam 'flash' function is operated.

The Xenon headlamp system is controlled by the CJB using a control module for each headlamp and an igniter. The control modules and the igniters provide the regulated power supply required to illuminate the Xenon bulbs through their start-up phases of operation.

Xenon Headlamp Construction

Xenon Bulb Replacement



E60561

Item	Part Number	Description
A	-	Locking Ring Removal
B	-	Locking Ring Replacement
1	-	Mounting ring
2	-	Xenon bulb
3	-	Igniter

The Xenon 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 xenon bulb, which together is an assembly known as the projector module.

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 igniter and is electrically connected by a connector located in the igniter unit.

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 visa versa.

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 to produce the characteristic blue/white light.

To operate at full efficiency, the Xenon bulb goes through 3 full stages of operation before full 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 30000 volts to establish the arc. This is produced by the igniter. The warm-up phase begins once the arc is established. The Xenon control module regulates the supply to the bulb to 2.6A which gives a lamp output of 75W. During this phase, the Xenon gas begins to illuminate brightly and the environment within the bulb stabilizes, ensuring a continual current flow between the electrodes. When the warm-up phase is complete, the Xenon 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 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 igniters (one per headlamp) generate the initial high voltage required to establish the arc. The igniters have integral coils which generate 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 control modules.

Turn Signal Indicator Lamp

The turn signal indicator lamp is incorporated into the outer part of the headlamp assembly, outboard of the projector module. The turn signal indicator lamp uses a PY21W bayonet orange colored bulb in Rest Of World (ROW) markets. A S8W 27/7W wedge bulb is used in NAS markets.

The bulb is fitted into a holder which connects with contacts in the headlamp housing. The holder is fitted into an aperture in the headlamp housing and is rotated to lock in position. Access to the turn signal indicator bulb requires removal of the headlamp assembly.

The turn signal indicator lamps are operated by the LH steering column multifunction switch or by the hazard flasher switch. The steering column multifunction switch is only active when the ignition is the ignition mode. The hazard flasher switch is active at all times. When active, the turn signal indicator lamps flash at a frequency cycle of 400 ms on and 400 ms off.

If a bulb fails, the remaining turn signal indicator lamps continue to flash at the normal speed. The applicable turn signal indicator in the instrument cluster will flash at double speed to indicate the failure to the driver.

Side Lamp

The side lamp is incorporated into the outer part of the headlamp assembly, above the cornering lamp. The side lamp shares the same housing and reflector as the cornering lamp.

The side lamp uses a W5W wedge fitting, orange colored bulb which is fitted in a holder and connected by wires to the main headlamp connector. The holder is a push fit into a receptacle in the headlamp housing. The bulb is accessible by removal of the cover on the side of the headlamp. Access to the bulb and the cover requires removal of the headlamp assembly.

The side lamps are operated by selecting side lamps or headlamps on the lighting control switch. The side lamps are operational at all times and are not dependant on the ignition 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 a 'lights on' message generated by the AJB.

Side Marker Lamp

The side marker lamp is located on the outer part of the headlamp, adjacent to the turn signal indicator bulb. The side marker lamp uses an orange colored W3W wedge fitting bulb, which is fitted in a holder which connects with contacts in the headlamp housing. The holder is fitted into an aperture in the headlamp housing and is rotated to lock in position. Access to the side marker bulb requires removal of the headlamp assembly.

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 is in the 'AUTO' position and a 'lights on' signal is received by the CJB from a 'lights on' message generated by the AJB.

Cornering Lamp - Vehicles without AFS

The cornering lamp functionality differs between vehicles with or without the AFS system. The cornering lamps are designed to illuminate the direction of travel when cornering at low speeds. The design of the lens projects a spread of light from the vehicle at approximately 45 degrees to the vehicle axis.

The cornering lamp is incorporated into the inner part of the headlamp assembly, below the side lamp. The cornering lamp uses a 35W Halogen H8 bulb which is permanently fitted in an integral holder which is located in the headlamp housing. The holder is connected by a removable harness connector and the holder can be removed from the housing by rotating to unlock. The bulb is accessible by removal of a cover on the side of the headlamp. Access to the bulb and cover requires removal of the headlamp assembly.

The cornering lamps are controlled by the LH steering column multifunction switch, when the lighting control switch is in the headlamps position and the ignition is in the ignition on mode. The cornering lamps are controlled by the CJB which uses turn signal indicator active and vehicle speed to operate the cornering lamps. The cornering lamps are deactivated if the vehicle speed exceeds 25 mph (40 km/h) with the turn signal indicators selected on or if the headlamp high beam is active.

Only one cornering lamp will illuminate at any one time. If the LH turn signal indicators are active, the LH cornering lamp will be illuminated and visa versa, providing the vehicle speed and the lighting control switch positions are correct.

Cornering Lamp - Vehicles with AFS

The cornering lamps fitted to vehicles with the AFS system functions differently to those fitted to vehicle with non AFS headlamps. The construction and light distribution of the cornering lamp with AFS is as described previously for cornering lamp without AFS.

The cornering lamps operate using high speed CAN signals from the steering angle sensor which are received by the CJB and the AFS control module. The AFS control module transmits a cornering lamp on request to the CJB which, if all operating conditions are correct, activates the cornering lamp.

When the operating parameters of the cornering lamp is achieved, the CJB fades the cornering lamp on using a pulse width modulation (PWM) voltage over a period of approximately 2 seconds. When the lamp is switched off, the CJB fades the bulb off by decreasing the PWM voltage in a linear manner depending on vehicle speed and steering angle.

ADAPTIVE FRONT LIGHTING SYSTEM (AFS)

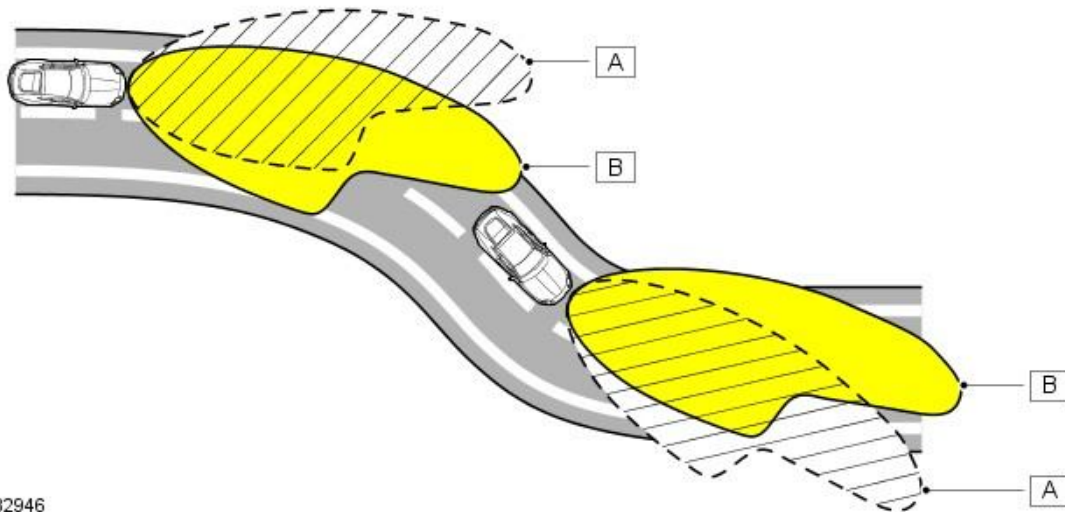
The AFS headlamp is similar in its construction to the Xenon, non-AFS headlamp. The projector module is constructed and functions as described for the Xenon headlamp but with the addition of the AFS system which allows the projector module to be moved vertically and horizontally. The AFS system is controlled by a AFS control module which is integral with the headlamp levelling module.

The AFS headlamp assembly contains an additional carrier frame which provides location for the AFS actuators. The remaining lamps are as described previously. The carrier frame is attached to the AFS vertical actuator. The projector module has a central pivot point which allows the module to move horizontally in response to operation of the AFS 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 on the rear of the headlamp assembly. Each stepper motor receives its position information from the AFS 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 AFS 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 AFS control module is set to zero and the actuator is then powered to the operating position as determined by the AFS control module software.

The AFS control module receives front and rear vehicle height data from the height sensors to provide headlamp levelling adjustment via the vertical actuator motor. The AFS control module also receives vehicle speed signals from the ABS module to adjust the projector module vertically to increase the beam range as the vehicle speed increases.



E82946

Item	Part Number	Description
A	-	Conventional headlamp beam distribution
B	-	AFS swivel headlamp beam distribution

AFS Control Module

The AFS control module is located on the bulkhead, at the bottom of the RH 'A' pillar. The AFS control module is a dual functionality unit which also incorporates software to control the headlamp leveling. The AFS control module is connected to the high speed CAN bus and receives inputs from other vehicle systems on the status of the following parameters:

- Steering angle
- Vehicle speed
- Headlamp status
- Engine running
- Reverse gear selected
- AUTO lights on.

The AFS will only operate when the AFS control module receives an engine running signal on the high speed CAN bus from the engine control module (ECM). When the engine running signal is received the AFS control module performs its initialisation routine.

The AFS will also function when the lighting control switch is in the AUTO position and the AFS control module receives a lights on signal from the light sensor and an engine running signal.

The AFS control module then monitors the inputs from the other vehicle systems to control the AFS functionality according to cornering angles and vehicle speed.

The AFS control module is connected to each AFS power module on a private Local Interconnect Network (LIN) bus. The power modules read operating values supplied from the AFS control module and control the output drivers for the stepper motor actuators inside the headlamp assembly.

AFS Operation

The AFS controls the swiveling angle of each projector module using speed and steering angle signals. The angles of each projector module differ to give the correct spread of light, for example, when turning left, the LH projector module will have a greater swiveling angle than the RH projector module.

Initialisation Procedure

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

The headlamp leveling motors are powered from their current position, which can be either the upper or lower limit or somewhere in between, to their lower position and then back to the 0 degrees position.

The AFS swivel initialisation starts less than 1 second after the headlamp leveling initialisation 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 initialisation is completed in less than 2.5 seconds. The LH and RH AFS actuator motors are powered from the 0 degree position to their fully inboard position, then to their fully 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 is illuminated to warn the driver. The AFS warning indicator illuminates when the ignition is in the ignition on mode 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 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 preventing the AFS system from operating correctly.

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

If the AFS leveling system has failed with the projector module in a position other than the correct straight ahead position, the AFS control module 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 AFS control module will lower the projector module using the leveling actuator to a position much lower than standard to prevent excess glare to oncoming vehicles.

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

Faults can be investigated by interrogating the AFS control module using an approved Jaguar diagnostic system to check for fault codes.

AUTOMATIC HEADLAMP OPERATION

The automatic headlamp function is a driver assistance system. The driver can override the system operation by selection of side lamp or headlamp on if the ambient light conditions require front and rear lighting to be active. The automatic headlamp system uses a light sensor and the AJB, which is connected to the instrument cluster, via the medium speed CAN bus, to control 'AUTO' headlamp functionality.

The light sensor is located in the centre of the instrument panel upper surface. The sensor has three functions; houses the alarm system LED, auto lamp function for AUTO headlamps and sun load sensor for the air conditioning (A/C) system.

The sensor is hardwired to the instrument cluster which supplies a 5V current via a pull-up resistor to 2 photodiode light sensors within the sensor housing. The ambient light signals are returned to the instrument cluster by the light sensor varying the current drawn from the 5V output, hence varying the voltage at the 'pull-up' resistor. The instrument cluster then outputs a message relating to the ambient light level on the medium speed CAN bus. The AJB receives the message and determines if AUTO lamps are required to be activated.

Operation of the 'AUTO' headlamps requires the ignition to be in the ignition mode and the lighting control switch must be in the AUTO position. The AJB will only activate the AUTO headlamps on receipt of a valid ambient light signal on the medium speed CAN bus from the instrument cluster.

HEADLAMP LEVELING

Headlamp leveling provides for the automatic adjustment of the vertical aim of the headlamps. The leveling system is required to minimise glare to other road users when the vehicle attitude changes due to braking or acceleration.

Headlamp leveling is controlled by a headlamp leveling module which is located on the bulkhead, at the bottom of the RH 'A' pillar.

NOTE: On vehicles with the AFS system, the headlamp leveling software is incorporated into the AFS control module and the module is known as the AFS control module.

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

- Front and rear vehicle height sensors
- Two headlamp leveling, vertical adjustment motors
- Headlamp leveling module (or AFS control module if vehicle is fitted with AFS)
- Ignition in on mode
- Vehicle speed information from anti-lock brake system (ABS) module.

When the ignition is in the ignition power mode, power is supplied via the ignition relay in the battery junction box to the headlamp leveling module (or AFS control module if vehicle is fitted with AFS).

NOTE: When the headlamp leveling module receives a power supply from the ignition relay, the module performs an initialization procedure to correctly align the vertical aim of the headlamps and to determine if the leveling motors are functioning correctly.

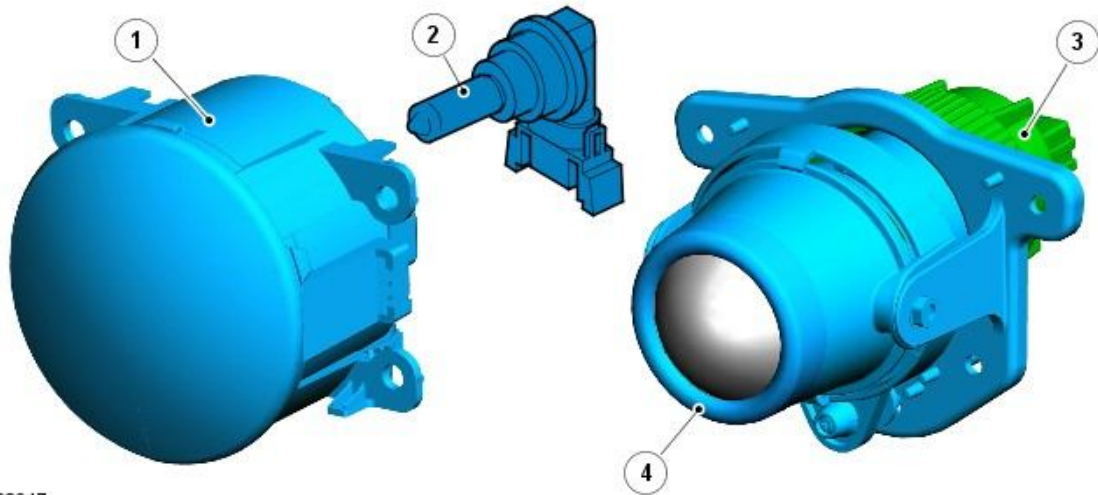
The headlamp leveling module receives information relating to vehicle attitude from the front and rear height sensors. The headlamp leveling module processes these signal and provides an output to the headlamp leveling motors to adjust the headlamp vertical aim according to vehicle speed and attitude.

DAYTIME RUNNING LAMPS

Refer to the daytime running lamps (DRL) section for details.

For additional information, refer to: [Daytime Running Lamps \(DRL\)](#) (417-04 Daytime Running Lamps (DRL), Description and Operation).

FRONT FOG LAMP



E82947

Item	Part Number	Description
1	-	Fog lamp - Naturally aspirated vehicles
2	-	Bulb H11
3	-	Bulb H3
4	-	Fog lamp - Supercharged vehicles

Two front fog lamps are located in apertures in the front bumper. The fog lamps are different in design between the naturally aspirated and supercharged vehicles.

Front Fog Lamp - Naturally Aspirated Vehicles

The front fog lamp is a conventional design with a clear lens and smooth surface reflector. An H11 55W halogen bulb is located at the rear of the fog lamp. The bulb has an integral holder and can be removed by rotating counter clockwise to remove from the lamp housing.

Fog lamp beam adjustment is provided by a rotary adjuster located on the underside of the lamp and is accessible from the rear of the bumper.

The front fog lamps are controlled by the auxiliary lighting switch and the CJB. Refer to the Auxiliary Lighting Switch section for switch operation.

Front Fog Lamp - Supercharged Vehicles

The front fog lamp is projector module, similar in design to the projector module used in the Xenon headlamp. A halogen H3 bulb is located in the rear of the lamp and secured with a spring clip. The bulb has a power lead which is secured to the rear of the lamp connector socket.

Fog lamp beam adjustment is provided by a screw at the top of the lamp. The screw is accessible from the front of the lamp.

Front fog lamp control and operation is as described for 'Front Fog Lamp - Naturally Aspirated Vehicles.

Front Fog Lamp Functionality (NAS and Canadian Markets Only)

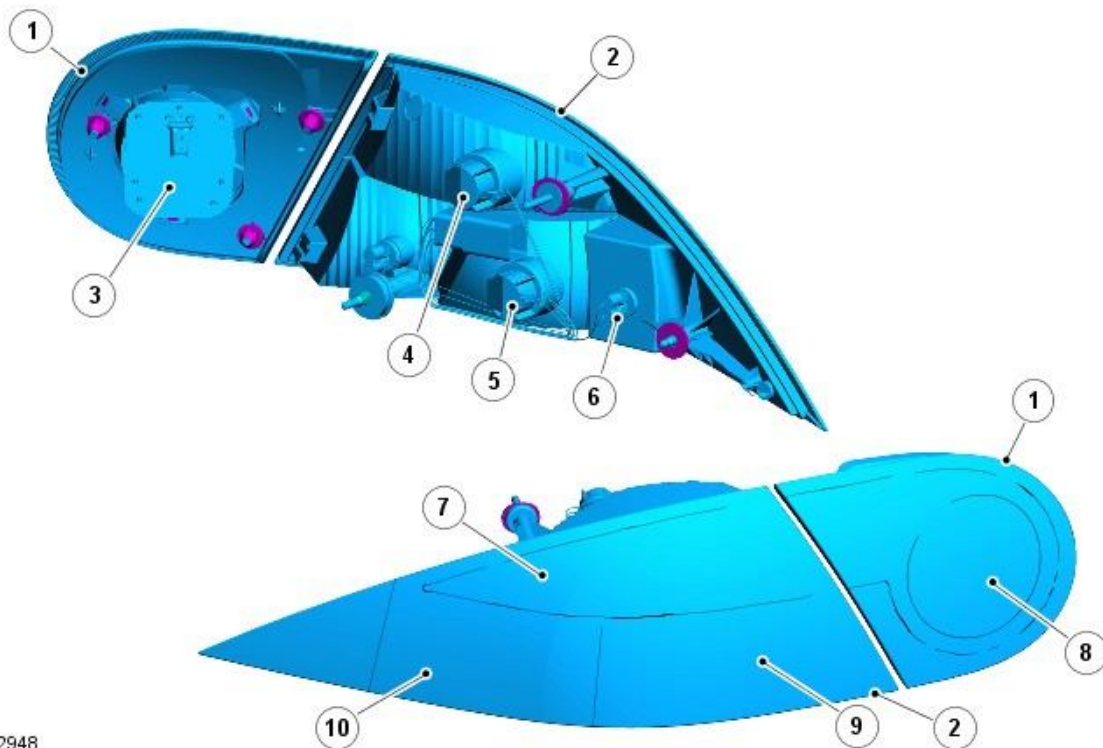
The front fog lamps operate as described previously but with the following differences which cover local laws governing lamp usage.

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

REAR LAMP ASSEMBLY

The rear lamp assembly is a 2 piece unit, with one part being located in the rear quarter panel and the second part being attached to the liftgate. The outer rear lamp assembly is located in a recess in the vehicle body and is secured with 2 nuts which screw onto studs in the lamp assembly. The inner rear lamp assembly is located in a recess in the liftgate and is secured with 3 nuts.



E82948

Item	Part Number	Description
1	-	Inner rear lamp assembly
2	-	Outer rear lamp assembly
3	-	Rear fog lamp or reverse lamp LED (market dependant)
4	-	Turn signal indicator bulb and holder
5	-	Stop lamp and Tail lamp bulb and holder
6	-	Side marker bulb and holder
7	-	Turn signal indicator
8	-	Rear fog lamp or reverse lamp (market dependant)
9	-	Stop lamp and tail lamp
10	-	Side marker lamp

Rear Stop and Side Lamp

The stop and side lamp are located in the lower section of the outer rear lamp assembly. A combined, twin filament 21W/5W bayonet fitting bulb is used. The stop lamp uses the 21W bulb filament and the side lamp uses the 5W bulb filament. The bulb is located in a holder which connects with contacts in the rear lamp housing. The holder can be released by rotating and pulling from the aperture.

The stop lamps are active when the ignition is in the ignition mode and the stop lamp switch is activated by pressing the brake pedal. The high mounted stop lamp will also be activated when the brake pedal is pressed. Operation of the stop lamp switch is sensed by the CJB which sends a message on the high speed CAN bus to the AJB which activates the stop lamps.

The stop lamps can also be activated by the adaptive speed control system. A signal from the adaptive speed control module is sent via the high speed CAN bus to the AJB which activates the stop lamps until an off message is received.

The side lamps are operated by selecting side lamps or headlamps on the lighting control switch. The side lamps are operational at all times and are not dependant on the ignition 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 light sensor.

Turn Signal Indicator Lamp

The turn signal indicator lamp is located in the upper section of the outer rear lamp assembly and uses a PY21W bayonet fitting bulb. The bulb is located in a holder which connects with contacts in the rear lamp housing. The holder can be released by rotating and pulling from the aperture.

The turn signal indicator lamps are operated by the LH steering column multifunction switch or by the hazard flasher switch. The steering column multifunction switch is only active when the ignition is the ignition mode. The hazard flasher switch is active at all times. When active, the turn signal indicator lamps flash at a frequency cycle of 400 ms on and 400 ms off.

If a bulb fails, the remaining turn signal indicator lamps continue to flash at the normal speed. The applicable turn signal indicator in the instrument cluster will flash at double speed to indicate the failure to the driver.

Reversing Lamp

The reversing lamp is located in the inner rear lamp assembly. The reversing lamp uses 3 LED. Only one reversing lamp is fitted and is located in the LH inner lamp assembly on RHD vehicles and in the RH inner lamp assembly on LHD vehicles.

The reversing lamp is activated on receipt of reverse selected message sent on the medium speed CAN signal from the transmission control module (TCM) to the AJB.

Rear Fog Lamp

The rear fog lamp is located in the inner rear lamp assembly. The fog lamp uses 3 LED's. Only one fog lamp is fitted and is located in the RH inner lamp assembly on RHD vehicles and in the LH inner lamp assembly on LHD vehicles.

The rear fog lamp is controlled by the auxiliary lighting switch and the CJB. The rear fog lamp switch receives a power supply from the instrument cluster. When the rear fog lamp switch is pressed, a ground path is completed through a resistor. The current flow is monitored by the instrument cluster which determines that the switch has been pressed. The instrument cluster transmits a rear fog lamp on request message on the medium speed CAN bus to the AJB which activates the power supplies to the fog lamp provided the lighting switch is in the correct position and the ignition mode is correct.

When the ignition is in ignition on mode and the lighting control switch is in the side lamp or headlamp position and the front fog lamps are on, pressing the rear fog lamp switch on the auxiliary lighting switch will activate the rear fog lamp. Pressing the rear fog lamp switch for a second time will switch the rear fog lamp off. The rear fog lamp will also be deactivated if the lighting control switch is moved to the off position or the ignition mode is changed to off mode.

LICENCE PLATE LAMPS

Two licence plate lamps are located in the underside of the liftgate (hardtop) or luggage compartment lid (convertible) exterior trim finisher. Each lamp uses a W5W capless bulb which is located in a holder at the rear of the lamp.

The lamp can be removed from the finisher by using a wide flat blade screwdriver or similar tool, inserting it in the slot between the lamp lens and the finisher and gently levering the lamp from the surround. The bulb is pushed into a holder which in turn is a press fit in the lamp housing.

The licence plate lamps are illuminated at all times when the side lamps are active.

HIGH MOUNTED STOP LAMP

The high mounted stop lamp is located in the rear spoiler on the upper edge of the liftgate or luggage compartment lid. The lamp comprises 24 separate LED's which illuminate through a red colored lens. The high mounted stop lamp functionality is

the same as that described for the stop lamps.

TURN SIGNAL INDICATOR REPEATER LAMP

The turn signal indicator repeater lamps are located in each front fender and can be removed by sliding the lamp assembly rearwards and releasing the front edge from the fender. The lamps use a 5W capless bulb which is located in a holder in the rear of the lamp housing.

The repeater lamps have the same functionality as described for the turn signal indicators and the hazard flashers.

HAZARD FLASHERS

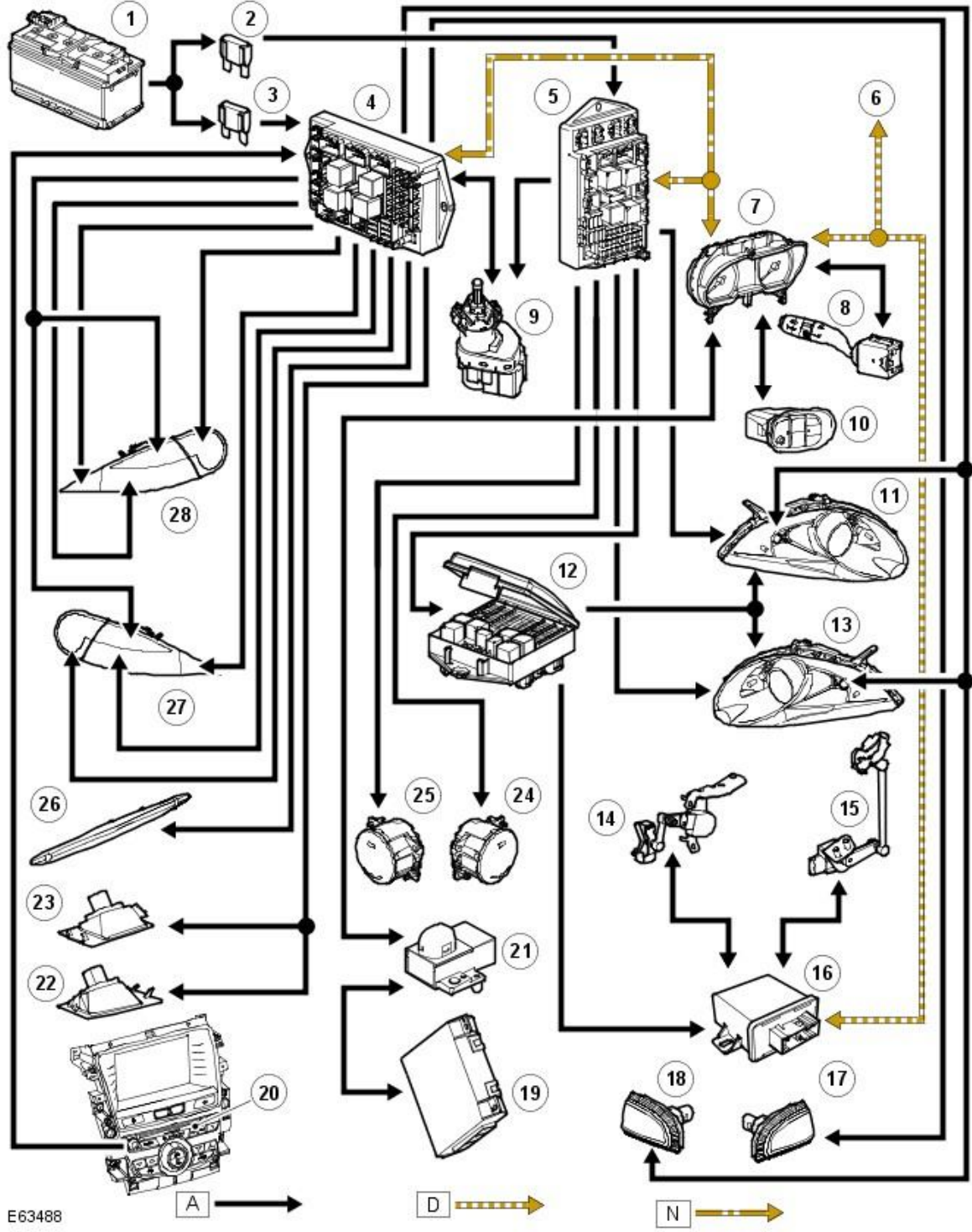
The hazard flashers are controlled by a non-latching switch located in the centre of the instrument panel. The hazard flashers operate at all times when selected and are not dependant on an ignition mode to be selected.

When the hazard flashers are selected on by the driver, a ground path is momentarily completed to the AJB which activates the front and rear and side repeater turn signal indicators. A second press of the switch is again sensed by the AJB and the hazard flasher will be deactivated. When the hazard flasher are active, they override any request for turn signal indicator operation.

The hazard flashers can also be activated by a crash signal from the restraints control module (RCM). The signal is received on the medium speed CAN bus from the instrument cluster by the AJB which activates the hazard flashers. The hazard flasher can be cancelled by changing the ignition mode to accessory or off mode and then changing it to ignition on mode or the crash mode signal is removed by the RCM.

CONTROL DIAGRAM

NOTE: **A** = Hardwired; **D** = High speed CAN bus



E63488

Item	Part Number	Description
1	-	Battery
2	-	Megafuse (175A)
3	-	Megafuse (175A)
4	-	Auxiliary Junction Box (AJB)
5	-	CJB
6	-	High speed CAN bus to other vehicle systems

7			Instrument cluster
	8	-	LH steering column multifunction switch
9		-	Stop lamp switch
10		-	Auxiliary lighting switch
11		-	LH headlamp
12		-	Power distribution box
13		-	RH headlamp
14		-	Rear height sensor
15		-	Front height sensor
16		-	Headlamp leveling/AFS control module
17		-	LH side repeater
18		-	RH side repeater
19		-	A/C control module
20		-	Hazard warning switch
21		-	Light sensor
22		-	LH license plate lamp
23		-	RH license plate lamp
24		-	LH front fog lamp
25		-	RH front fog lamp
26		-	High mounted stop lamp
27		-	RH tail lamp assembly
28		-	LH tail lamp assembly

Exterior Lighting - Headlamps

Diagnosis and Testing

Principles of Operation

For a detailed description of the exterior lighting system, refer to the Description and Operation section 417-00 - Exterior Lighting of the workshop manual.

Safety Information

WARNINGS:



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 lead to fatality.



The following safety precautions must be followed when working on the Xenon Headlamp System:

- DO NOT attempt any procedures on the Xenon Headlamps or circuits when the system is energized.
- 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.
- Only operate the lamp in a mounted condition in the reflector.
- All safety procedures and precautions must be followed to prevent personal injury.



CAUTION: Xenon bulbs must be disposed of as hazardous waste.

There are instructions on the correct procedures for Xenon Headlamp System repairs in the manual, refer to section 100-00 - General Information, Standard Workshop Practices of the workshop manual.

Inspection and Verification



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

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

Visual Inspection

Electrical
<ul style="list-style-type: none"> • Headlamp Leveling Module (HLM) • Bulb(s) • Photocell(s) • Ballast • Wiring harness/electrical connectors • Fuse(s)

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, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

Symptom Chart

Symptom	Possible Causes	Action
Low beam lamp(s) inoperative	<ul style="list-style-type: none"> • Bulb failure • Fuse(s) blown • Circuit fault • Lighting control switch 	Check the bulb and fuse condition (see visual inspection). Check the headlamp circuits. Check the lighting control switch function. Check the left-hand steering column multifunction switch operation. Refer to the electrical guides. Check for DTCs indicating a headlamp or

High beam lamp(s) inoperative	<ul style="list-style-type: none"> ● fault ● Left-hand steering column multifunction switch fault 	related circuit fault.
Low beam lamp(s) dim	<ul style="list-style-type: none"> ● Incorrect bulb rating ● Tourist lever set in the wrong position <ul style="list-style-type: none"> ● Circuit fault ● Lighting control switch fault ● Left-hand steering column multifunction switch fault 	Check the bulb condition and rating. Check the tourist lever is set correctly. Check the headlamp circuits. Check the lighting control switch function. Check the left-hand steering column multifunction switch function. Refer to the electrical guides.
High beam lamp(s) dim		
Low beam lamp(s) stuck on	<ul style="list-style-type: none"> ● Circuit fault ● Lighting control switch fault ● Left-hand steering column multifunction switch fault ● Headlamp timer function fault 	Check the headlamp circuits. Check the lighting control switch function. Check the left-hand steering column multifunction switch operation. Check the headlamp timer function. Refer to the electrical guides. Check for DTCs indicating a headlamp circuit fault
High beam lamp(s) stuck on		
Headlamp low/high beam switching function inoperative	<ul style="list-style-type: none"> ● Circuit fault ● Left-hand steering column multifunction switch fault ● Xenon lamp shutter mechanism fault 	Check the headlamp circuits. Check the left-hand steering column multifunction switch operation. Check the xenon lamp shutter mechanism operation. Refer to the electrical guides. Check for DTCs indicating a headlamp circuit fault
Warning lamp(s) inoperative	<ul style="list-style-type: none"> ● Fuse(s) blown ● Lighting control switch fault ● Left-hand steering column multifunction switch inoperative <ul style="list-style-type: none"> ● Circuit fault ● Instrument cluster fault 	Check the fuse(s) (see visual inspection). Check the lighting control switch function. Check the left-hand steering column multifunction switch function. Check the warning lamp circuits. Refer to the electrical guides. Check for DTCs indicating an instrument cluster or CAN system fault.
Headlamp Wet - Internal	<ul style="list-style-type: none"> ● Condensation ● Water Ingress 	Check for outstanding Technical Service Bulletins (TSBs) relating to 'Headlamp Internal Condensation'. Carry out the instructions in the service bulletin to determine if the fault is related to condensation or water ingress.

DTC Index



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

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

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

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

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

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

NOTE: Prior to installation/replacement of the Headlamp assembly carry out all relevant internal visual and mechanical checks for correct cable location and termination including: checks for corroded, bent or backed out pins or terminals, incorrectly inserted connectors and harness damage due to chaffing or incorrect routing.

NOTE: If the control module has been removed and reinstalled, carry out a DTC code clear, cycle the ignition state to off, then on. This will erase any DTCs that have been logged during the module installation procedure.

Headlamp Leveling Module (HLM)

DTC	Description	Possible Cause	Action
B1A59-11	Front or Rear Height Sensors - Circuit short to ground	<ul style="list-style-type: none"> Front or Rear Height Sensors 5 volt supply short to ground 	Refer to the electrical circuit diagrams, and check Front and Rear Height Sensors 5 volt supply circuit for short to ground
B1A59-12	Front or Rear Height Sensors - Circuit short to power	<ul style="list-style-type: none"> Front or Rear Height Sensors 5 volt supply short to power 	Refer to the electrical circuit diagrams, and check Front and Rear Height Sensor 5 volt supply circuit for short to power
C1A04-11	Front Right Height Sensor - Circuit short to ground	<ul style="list-style-type: none"> Front Right Height Sensor signal circuit short to ground 	Refer to the electrical circuit diagrams, and check Front Right Height Sensor signal circuit for short to ground
C1A04-15	Front Right Height Sensor - Circuit short to power or open circuit	<ul style="list-style-type: none"> Front Right Height Sensor signal circuit short to power or open circuit 	Refer to the electrical circuit diagrams, and check Front Right Height Sensor signal circuit for short to power or open circuit
C1A04-64	Front Right Height Sensor - Signal plausibility failure	<ul style="list-style-type: none"> Sensor (PWM) Signal out of range 	<p>NOTE: This DTC may be logged if the vehicles wheels have been raised from the floor</p> <p>Check the location, security and mechanical operation of the Height Sensor. Refer to the electrical circuit diagrams, and check Front Right Height Sensor signal circuit for fault</p>
C1A06-11	Rear Right Height Sensor - Circuit short to ground	<ul style="list-style-type: none"> Rear right Height Sensor signal circuit short to ground 	Refer to the electrical circuit diagrams, and check Rear Right Height Sensor signal circuit for short to ground
C1A06-15	Rear Right Height Sensor - Circuit short to power or open circuit	<ul style="list-style-type: none"> Rear right Height Sensor signal circuit short to power or open circuit 	Refer to the electrical circuit diagrams, and check Rear Right Height Sensor signal circuit for short to power or open circuit
C1A06-64	Rear Right Height Sensor - Signal plausibility failure	<ul style="list-style-type: none"> Sensor (PWM) Signal out of range 	<p>NOTE: This DTC may be logged if the vehicles wheels have been raised from the floor</p> <p>Check the location, security and mechanical operation of the Height Sensor. Refer to the electrical circuit diagrams, and check Rear Right Height Sensor signal circuit for fault</p>
B1A57-01	Left Headlamp Leveling Motor - General Electrical Failure	<ul style="list-style-type: none"> Internal Headlamp Motor Fault Internal Headlamp Circuit Fault 	Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the swiveling feedback sensor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1A58-01	Right Headlamp Leveling Motor - General Electrical Failure	<ul style="list-style-type: none"> Internal Headlamp Motor Fault Internal Headlamp Circuit Fault 	Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the swiveling feedback sensor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
U0121-00	Lost communication with Anti-lock Brake System (ABS) Control Module - No sub type information	<ul style="list-style-type: none"> Lost communication with the Anti-lock Brake System Module CAN network fault 	Check the Anti-lock Brake System Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Leveling Module and the Anti-lock Brake System Module
U0121-86	Lost communication with Anti-lock Brake System (ABS) Control Module - Signal invalid	<ul style="list-style-type: none"> Invalid signal from the Anti-lock Brake System Module CAN network fault 	Check the Anti-lock Brake System Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Leveling Module and the Anti-lock Brake System Module
U0100-00	Lost communication with ECM - No sub type information	<ul style="list-style-type: none"> Lost communication with the Engine Control Module 	Check the Engine Control Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical

		<ul style="list-style-type: none"> ● CAN network fault 	circuit diagrams and check the CAN network between the Headlamp Leveling Module and the Engine Control Module
U0101-00	Lost communication with TCM - No sub type information	<ul style="list-style-type: none"> ● Lost communication with the Transmission Control Module ● CAN network fault 	Check the Transmission Control Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Leveling Module and the Transmission Control Module
U0443-00	Invalid data from Body Control Module B - No sub type information	<ul style="list-style-type: none"> ● Invalid signal from the Auxiliary Junction Box ● Auxiliary Junction Box fault 	Check the Auxiliary Junction Box for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Leveling Module and the Auxiliary Junction Box
U0001-49	High speed CAN communication Bus - Internal electronic failure	<ul style="list-style-type: none"> ● Adaptive Front Lighting System (AFS) Control Module internal electronic failure 	Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network to the Headlamp Leveling Module. If no CAN Bus circuit faults are evident suspect Headlamp Leveling Module internal fault. Refer to the new module/component installation note at the top of the DTC Index
U0300-62	Internal Control Module software incompatibility - Signal Compare Failure.	<ul style="list-style-type: none"> ● Configuration data received over the CAN BUS is different from the stored configuration data 	Check the correct Headlamp Leveling Module is installed to vehicle specification. Refit original or replace the module as required. Refer to the new module/component installation note at the top of the DTC Index
U0001-88	High Speed CAN Communication Bus - Bus off	<ul style="list-style-type: none"> ● CAN Bus Off ● CAN Bus Circuit fault 	Check other modules for stored DTCs. Carry out the CAN Network Integrity test using the manufacturer approved diagnostic system
U3002-81	Vehicle Identification Number (VIN) - Invalid Serial Data received	<ul style="list-style-type: none"> ● The stored Vehicle Identification Number is not the same as the Central Broadcast Vehicle Identification Number ● The Headlamp Leveling Module has previously been installed to another vehicle 	Check the correct Headlamp Leveling Module is installed to vehicle specification. Refit original or replace the module as required. Refer to the new module/component installation note at the top of the DTC Index
U3000-54	Control Module - Missing Calibration	<ul style="list-style-type: none"> ● Height Sensors not calibrated to vehicle 	<p>NOTE: Sensor calibration routine must be carried out with the vehicle unladen</p> <p>Calibrate the Headlamp Leveling sensors using the manufacturer approved diagnostic system, carry the out routine 'Headlamp and Axle Sensor Calibration' from the 'Module programming and configuration - Setup and Configuration - Lighting'</p>
U3000-49	Control Module - Internal electronic failure	<ul style="list-style-type: none"> ● Internal electronic failure 	Install a new Headlamp Leveling Module, refer to the new module installation note at the top of the DTC Index
U3000-55	Control Module - Not Configured	<ul style="list-style-type: none"> ● Incorrect Car Configuration File (CCF) data received 	<p>NOTE: The Car Configuration File (CCF) parameters required are (Vehicle type)(Headlamp type)(Gearbox type) and (Dayrunning light)</p> <p>Re-configure the Car Configuration File (CCF) File (CCF) as required using the manufacturer approved diagnostic system. Clear DTC and re-test. If the DTC remains suspect the Headlamp Leveling Module, refer to the new module installation note at the top of the DTC Index</p>
U3003-17	Battery voltage	<ul style="list-style-type: none"> ● The power supply to the Module has been above 16 Volts for more than 1000 milliseconds 	Suspect Charging fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section
U3003-16	Battery voltage	<ul style="list-style-type: none"> ● The power supply to the Module has been below 9 Volts for more than 1000 milliseconds 	Suspect Battery or Charging fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section. Clear the DTC, cycle ignition state to off then on, if DTC returns refer to the electrical circuit diagrams and check power and ground circuit to the Headlamp Leveling Module

DTC Index



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

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

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

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

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

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

NOTE: Prior to installation/replacement of the Headlamp assembly carry out all relevant internal visual and mechanical checks for correct cable location and termination including: checks for corroded, bent or backed out pins or terminals, incorrectly inserted connectors and harness damage due to chaffing or incorrect routing.

NOTE: If the control module has been removed and reinstalled, carry out a DTC code clear, cycle the ignition state to off, then on. This will erase any DTCs that have been logged during the module installation procedure

NOTE: The **Headlamp Power Module** is referenced as the **AFS ECU + Motors** in the circuit diagrams.

Adaptive Front Lighting System (AFS) Control Module

DTC	Description	Possible Cause	Action
B1A59-11	Front or Rear Height Sensors - Circuit short to ground	<ul style="list-style-type: none"> Front or Rear Height Sensors 5 volt supply short to ground 	Refer to the electrical circuit diagrams, and check Front and Rear Height Sensors 5 volt supply circuit for short to ground
B1A59-12	Front or Rear Height Sensors - Circuit short to power	<ul style="list-style-type: none"> Front or Rear Height Sensors 5 volt supply short to power 	Refer to the electrical circuit diagrams, and check Front and Rear Height Sensor 5 volt supply circuit for short to power
C1A04-11	Front Right Height Sensor - Circuit short to ground	<ul style="list-style-type: none"> Front Right Height Sensor signal circuit short to ground 	Refer to the electrical circuit diagrams, and check Front Right Height Sensor signal circuit for short to ground
C1A04-15	Front Right Height Sensor - Circuit short to power or open circuit	<ul style="list-style-type: none"> Front Right Height Sensor signal circuit short to power or open circuit 	Refer to the electrical circuit diagrams, and check Front Right Height Sensor signal circuit for short to power or open circuit
C1A04-64	Front Right Height Sensor - Signal plausibility failure	<ul style="list-style-type: none"> Sensor (PWM) Signal out of range 	<p>NOTE: This DTC may be logged if the vehicles wheels have been raised from the floor</p> <p>Check the location, security and mechanical operation of the Height Sensor. Refer to the electrical circuit diagrams, and check Front Right Height Sensor signal circuit for fault</p>
C1A06-11	Rear Right Height Sensor - Circuit short to ground	<ul style="list-style-type: none"> Rear Right Height Sensor signal circuit short to ground 	Refer to the electrical circuit diagrams, and check Rear Right Height Sensor signal circuit for short to ground
C1A06-15	Rear Right Height Sensor - Circuit short to power or open circuit	<ul style="list-style-type: none"> Rear Right Height Sensor signal circuit short to power or open circuit 	Refer to the electrical circuit diagrams, and check Rear Right Height Sensor signal circuit for short to power or open circuit
C1A06-64	Rear Right Height Sensor - Signal plausibility failure	<ul style="list-style-type: none"> Sensor (PWM) Signal out of range 	<p>NOTE: This DTC may be logged if the vehicles wheels have been raised from the floor</p> <p>Check the location, security and mechanical operation of the Height Sensor. Refer to the electrical circuit diagrams, and check Rear Right Height Sensor signal circuit for fault</p>
B1D66-00	Left Headlamp Power Module - No sub type	<ul style="list-style-type: none"> Headlamp Power Module internal fault 	NOTE: The power module is a service item

	information	<ul style="list-style-type: none"> Headlamp Power Module circuit fault 	<p>This DTC is logged if the Headlamp Power Module supply voltage is above 16 volts / below 9.5 volts or the module suffers an internal failure. Record then clear the stored DTC, cycle the ignition state and check headlamp operation, if the DTC returns refer to the electrical circuit diagrams and check the power, ground and signal circuit of the Power Module for circuit fault. If no circuit faults are evident suspect the Headlamp Power Module has an internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
B1D67-00	Right Headlamp Power Module - No sub type information	<ul style="list-style-type: none"> Headlamp Power Module internal fault Headlamp Power Module circuit fault 	<p>NOTE: The power module is a service item</p> <p>This DTC is logged if the Headlamp Power Module supply voltage is above 16 volts / below 9.5 volts or the module suffers an internal failure. Record then clear the stored DTC, cycle the ignition state and check headlamp operation, if the DTC returns refer to the electrical circuit diagrams and check the power, ground and signal circuit of the Power Module for circuit fault. If no circuit faults are evident suspect the Headlamp Power Module has an internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
B1D66-46	Left Headlamp Power Module - Calibration/parameter memory failure	<ul style="list-style-type: none"> The parameter set of the power module does not match the Adaptive Front Lighting System (AFS) Control Module parameter set 	<p>NOTE: The power module is a service item</p> <p>Clear the DTC. Turn the Headlamp Switch on, cycle the ignition state to start the engine, check for stored DTCs, if DTC returns suspect the Headlamp Power Module has an internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
B1D67-46	Right Headlamp Power Module - Calibration/parameter memory failure	<ul style="list-style-type: none"> The parameter set of the power module does not match the Adaptive Front Lighting System (AFS) Control Module parameter set 	<p>NOTE: The power module is a service item</p> <p>Clear the DTC. Turn the Headlamp Switch on, cycle the ignition state to start the engine, check for stored DTCs, if DTC returns suspect the Headlamp Power Module has an internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
B1D68-01	Left Headlamp Swiveling Feedback Sensor circuit - General Electrical Failure	<ul style="list-style-type: none"> Internal Headlamp Sensor Fault Internal Headlamp Circuit Fault 	<p>Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Headlamp Swiveling Feedback Sensor. If no mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
B1D69-01	Right Headlamp Swiveling Feedback Sensor circuit - General Electrical Failure	<ul style="list-style-type: none"> Internal Headlamp Sensor Fault Internal Headlamp Circuit Fault 	<p>Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Headlamp Swiveling Feedback Sensor. If no mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
B1D64-01	Left Headlamp Swiveling Motor circuit - General Electrical Failure	<ul style="list-style-type: none"> Internal Headlamp Motor Fault Internal Headlamp Circuit Fault 	<p>Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Headlamp Swiveling Motor. If no</p>

			mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1D65-01	Right Headlamp Swiveling Motor circuit - General Electrical Failure	<ul style="list-style-type: none"> ● Internal Headlamp Motor Fault ● Internal Headlamp Circuit Fault 	Turn the Headlamp Switch on, cycle the ignition state to start the engine, and check headlamp operation, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Headlamp Swiveling Motor. If no mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B10A3-71	Left Headlamp Swivel Actuator - Actuator stuck	<ul style="list-style-type: none"> ● Internal Headlamp Actuator Fault ● Internal Headlamp Circuit Fault 	Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Swiveling Feedback Actuator. If no mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B10A4-71	Right Headlamp Swivel Actuator - Actuator stuck	<ul style="list-style-type: none"> ● Internal Headlamp Actuator Fault ● Internal Headlamp Circuit Fault 	Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Swiveling Feedback Actuator. If no mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1A57-01	Left Headlamp Leveling motor - General Electrical Failure	<ul style="list-style-type: none"> ● Internal Headlamp Motor Fault ● Internal Headlamp Circuit Fault 	Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Leveling motor. If no mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1A58-01	Right Headlamp Leveling motor - General Electrical Failure	<ul style="list-style-type: none"> ● Internal Headlamp Motor Fault ● Internal Headlamp Circuit Fault 	Turn the Headlamp Switch on, cycle the ignition state to start the engine, look for any errors in the Headlamp Beam movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). If no faults are evident refer to the electrical circuit diagrams and check for circuit fault between the Headlamp Power Module and the Leveling motor. If no mechanical or circuit faults are evident suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1C98-11	Left Corner Lamp circuit defect - Circuit short to ground	<ul style="list-style-type: none"> ● Left Corner Lamp circuit short to ground 	<p>NOTE: On Adaptive Front Lighting System (AFS) equipped vehicles the power feed to the Corner Lamp is supplied via the Headlamp Power Module</p> <p>Refer to the electrical circuit diagrams, and check Left Corner Lamp circuit for short to ground</p>
B1C98-13	Left Corner Lamp circuit defect - Circuit open	<ul style="list-style-type: none"> ● Left Corner Lamp circuit open 	<p>NOTE: On Adaptive Front Lighting System (AFS) equipped vehicles the power feed to the Corner Lamp is supplied via the Headlamp Power Module</p>

			Refer to the electrical circuit diagrams, and check Left corner lamp circuit for open circuit
B1C99-11	Right Corner Lamp circuit defect - Circuit short to ground	<ul style="list-style-type: none"> Right Corner Lamp circuit short to ground 	<p>NOTE: On Adaptive Front Lighting System (AFS) equipped vehicles the power feed to the Corner Lamp is supplied via the Headlamp Power Module</p> <p>Refer to the electrical circuit diagrams, and check Right corner lamp circuit for short to ground</p>
B1C99-13	Right Corner Lamp circuit defect - Circuit open	<ul style="list-style-type: none"> Right Corner Lamp circuit open 	<p>NOTE: On Adaptive Front Lighting System (AFS) equipped vehicles the power feed to the Corner Lamp is supplied via the Headlamp Power Module</p> <p>Refer to the electrical circuit diagrams, and check Right corner lamp circuit for open circuit</p>
U1A39-00	Lost communication with Right Headlamp Power Module - No sub type information	<ul style="list-style-type: none"> Communication Circuit fault Headlamp Power Module internal fault Headlamp Power Module Power or Ground supply fault 	<p>NOTE: This circuit uses shielded cable</p> <p>NOTE: The power module is a service item</p> <p>Refer to the electrical circuit diagrams, and check the power/ground supply and Communication circuit to the Headlamp Power Module. Using the manufacturer approved diagnostic system, clear stored DTCs in the Adaptive Front Lighting System (AFS) Control Module. Cycle the ignition state to off, then return to on and check for stored DTCs. If DTCs U1A39-00 and U1A38-00 return suspect Adaptive Front Lighting System (AFS) Control Module internal fault, If only DTC U1A39-00 returns suspect Headlamp Power Module internal fault. Replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
U1A38-00	Lost communication with Left Headlamp Power Module - No sub type information	<ul style="list-style-type: none"> Communication Circuit fault Headlamp Power Module internal fault Headlamp Power Module Power or Ground supply fault 	<p>NOTE: This circuit uses shielded cable</p> <p>NOTE: The power module is a service item</p> <p>Refer to the electrical circuit diagrams, and check the power/ground supply and Communication circuit to the Headlamp Power Module. Using the manufacturer approved diagnostic system, clear stored DTCs in the Adaptive Front Lighting System (AFS) Control Module. Cycle the ignition state to off, then return to on and check for stored DTCs. If DTCs U1A39-00 and U1A38-00 return suspect Adaptive Front Lighting System (AFS) Control Module internal fault, If only DTC U1A38-00 returns suspect Headlamp Power Module internal fault. Replace as required. Refer to the new module/component installation note at the top of the DTC Index</p>
U0126-00	Lost communication with Steering Angle Sensor Module - No sub type information	<ul style="list-style-type: none"> Lost communication with the Steering Angle Sensor Module CAN network fault 	Check the Steering Angle Sensor Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Steering Angle Sensor Module
U0126-86	Lost communication with Steering Angle Sensor Module - Invalid signal	<ul style="list-style-type: none"> Invalid signal from the Steering Angle Sensor Module CAN network fault 	Check the Steering Angle Sensor Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Steering Angle Sensor Module
U0121-00	Lost communication with Anti-lock Brake System (ABS) Control Module - No sub type information	<ul style="list-style-type: none"> Lost communication with the Anti-lock Brake System Module CAN network fault 	Check the Anti-lock Brake System Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Anti-lock Brake System Module
U0121-	Lost communication with	<ul style="list-style-type: none"> Invalid signal from 	Check the Anti-lock Brake System Module for stored

86	Anti-lock Brake System (ABS) Control Module - Signal invalid	<ul style="list-style-type: none"> the Anti-lock Brake System Module ● CAN network fault 	DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Anti-lock Brake System Module
U0100-00	Lost communication with ECM - No sub type information	<ul style="list-style-type: none"> ● Lost communication with the Engine Control Module ● CAN network fault 	Check the Engine Control Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Engine Control Module
U0101-00	Lost communication with TCM - No sub type information	<ul style="list-style-type: none"> ● Lost communication with the Transmission Control Module ● CAN network fault 	Check the Transmission Control Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Transmission Control Module
U0443-00	Invalid data from Body Control Module B - no sub type information	<ul style="list-style-type: none"> ● Invalid signal from the Auxiliary Junction Box ● Auxiliary Junction Box fault 	Check the Auxiliary Junction Box for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Auxiliary Junction Box
U0001-49	High speed CAN communication Bus - Internal electronic failure	<ul style="list-style-type: none"> ● CAN network fault ● Adaptive Front Lighting System (AFS) Control Module internal electronic failure 	Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network to the Headlamp Leveling Module. If no CAN Bus circuit faults are evident suspect Adaptive Front Lighting System (AFS) Control Module internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
U0300-62	Internal Control Module software incompatibility - Signal Compare Failure.	<ul style="list-style-type: none"> ● Configuration data received over the CAN BUS is different from the stored configuration data ● The Headlamp Leveling Module has previously been installed to another vehicle 	Check the correct Adaptive Front Lighting System (AFS) Control Module is installed to vehicle specification. Refit original or replace the module as required. Refer to the new module/component installation note at the top of the DTC Index
U0001-88	High Speed CAN Communication Bus - Bus off	<ul style="list-style-type: none"> ● CAN Bus Off ● CAN Bus Circuit fault 	Carry out the CAN Network Integrity test using the manufacturer approved diagnostic system
U3002-81	Vehicle Identification Number (VIN) - Invalid Serial Data received	<ul style="list-style-type: none"> ● The stored Vehicle Identification Number is not the same as the Central Broadcast Vehicle Identification Number ● The Adaptive Front Lighting System (AFS) Control Module has previously been installed to another vehicle 	Check the correct Adaptive Front Lighting System (AFS) Control Module is installed to vehicle specification. Refit original or replace the module as required. Refer to the new module/component installation note at the top of the DTC Index
U3000-54	Control Module - Missing Calibration	<ul style="list-style-type: none"> ● Height sensors not calibrated to vehicle 	<p>NOTE: Sensor calibration routine must be carried out with the vehicle unladen</p> <p>Calibrate the Headlamp Leveling sensors using the manufacturer approved diagnostic system, carry the out routine 'Headlamp and Axle Sensor Calibration' from the 'Module programming and configuration - Setup and Configuration - Lighting'</p>
U3000-49	Control Module - Internal electronic failure	<ul style="list-style-type: none"> ● Internal electronic failure 	Suspect an internal fault, replace the Adaptive Front Lighting System (AFS) Control Module as required, refer to the new module installation note at the top of the DTC Index
U3000-55	Control Module - Not Configured	<ul style="list-style-type: none"> ● Incorrect Car Configuration File 	NOTE: The Car Configuration File (CCF) parameters required are (Vehicle type)(Headlamp type)(Gearbox

		(CCF) data received	type) and (Dayrunning light)
			Re-configure the Car Configuration File (CCF) as required using the manufacturer approved diagnostic system. Clear DTC and re-test. If the DTC remains suspect the Adaptive Front Lighting System (AFS) Control Module, replace as required. Refer to the new module installation note at the top of the DTC Index
U3003-17	Battery voltage	<ul style="list-style-type: none"> The power supply to the Module has been above 16 Volts for more than 1000 milliseconds 	Suspect Charging fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section
U3003-16	Battery voltage	<ul style="list-style-type: none"> The power supply to the Module has been below 9 Volts for more than 1000 milliseconds 	Suspect Battery or Charging fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section. Clear the DTC, cycle ignition state to off then on, if DTC returns refer to the electrical circuit diagrams and check power and ground circuit to the Adaptive Front Lighting System (AFS) Control Module

Exterior Lighting - Front Fog Lamp Adjustment

General Procedures

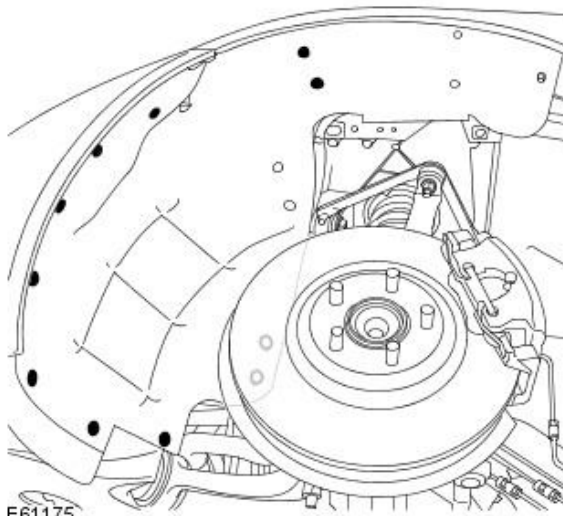
1. Align the beam setting equipment to one fog lamp.
2. **NOTE:** The fog lamp beam should be set at 1.2% below the horizontal and parallel.

Check the fog lamp beam alignment.

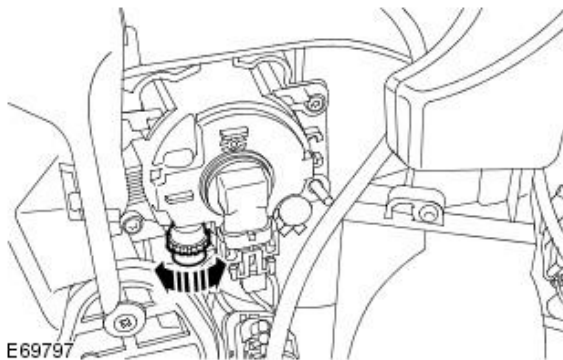
3. Turn the steering on to full lock for access.
4. **NOTE:** Wheel shown removed for clarity.

Release the front of the fender splash shield.

- Remove the 7 Torx bolts.
- Tie the splash shield aside.



5. Adjust the fog lamp using the thumb wheel.



6. Install the fender splash shield.
 - Tighten the Torx bolts.
7. To adjust the second fog lamp, repeat the above procedure.

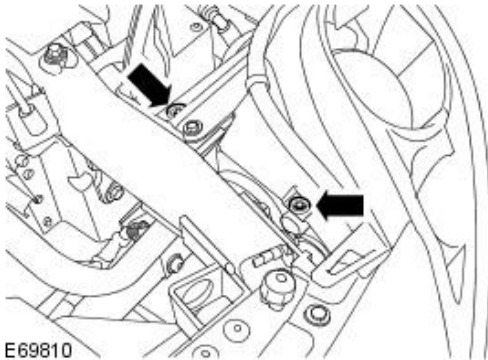
Exterior Lighting - Headlamp Adjustment

General Procedures

1. Align the headlamp beam setting equipment to one headlamp.
2. **NOTE:** The headlamp setting is 1.2 % below horizontal and parallel.

Check the headlamp beam alignment.

3. Open the hood.
 4. Adjust the headlamps with an Allen Key.



E69810

5. To adjust the second headlamp, repeat the above procedure.

Exterior Lighting - Approach Lamp

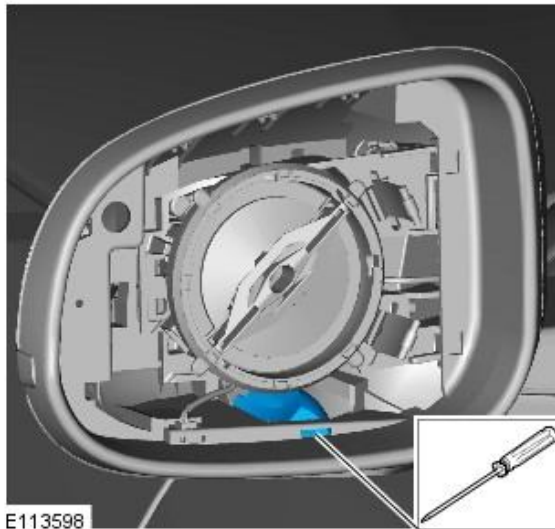
Removal and Installation

Removal

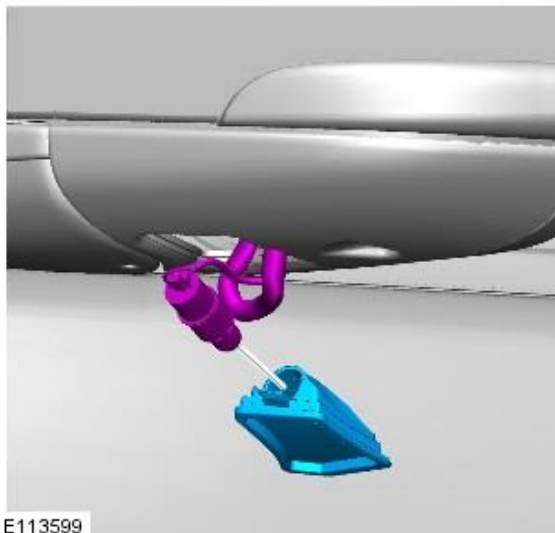
NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Exterior Mirror Glass](#) (501-09 Rear View Mirrors, Removal and Installation).

2.



3.



Installation


1. To install, reverse the removal procedure.

Exterior Lighting - Front Fog Lamp

Removal and Installation

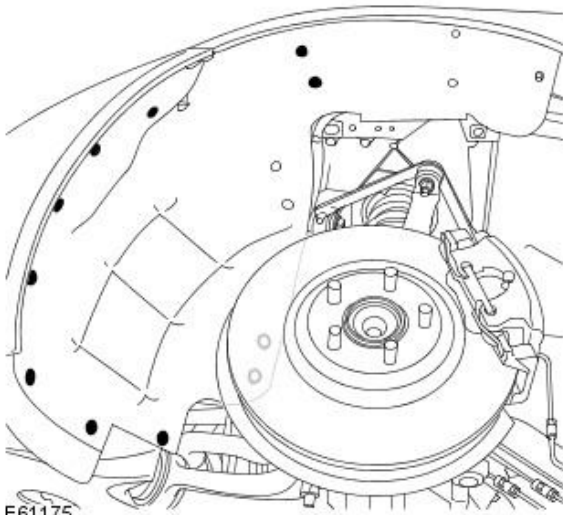
Removal

NOTE: Left-hand shown, right-hand similar.

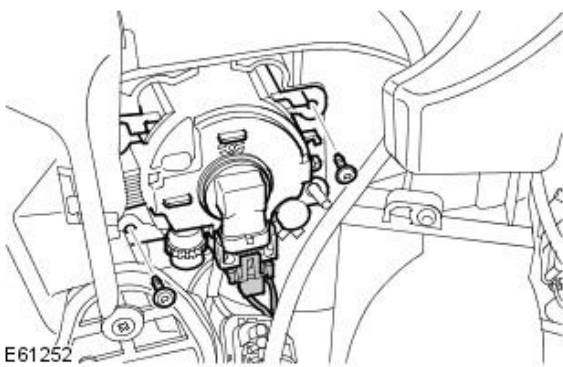
1. Disconnect the battery ground cable.
For additional information, refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

3. Remove the front wheel and tire.
For additional information, refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).
4. Release the front of the fender splash shield.
 - Remove the 11 Torx bolts.
 - Tie the splash shield aside.



5. Remove the front fog lamp.
 - Disconnect the electrical connector.
 - Remove the 2 Torx screws.



Installation

1. Install the front fog lamp.
 - Tighten the Torx screws.
 - Connect and secure the electrical connector.
2. Install the fender splash shield.
 - Tighten the Torx bolts.
3. Install the wheel and tire.
For additional information, refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).


4. Connect the battery ground cable.
For additional information, refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
5. **NOTE: The fog lamp beam should be set at 1.2% below the horizontal and parallel.**


Check the fog lamp beam alignment.

Exterior Lighting - Headlamp Assembly

Removal and Installation

Removal

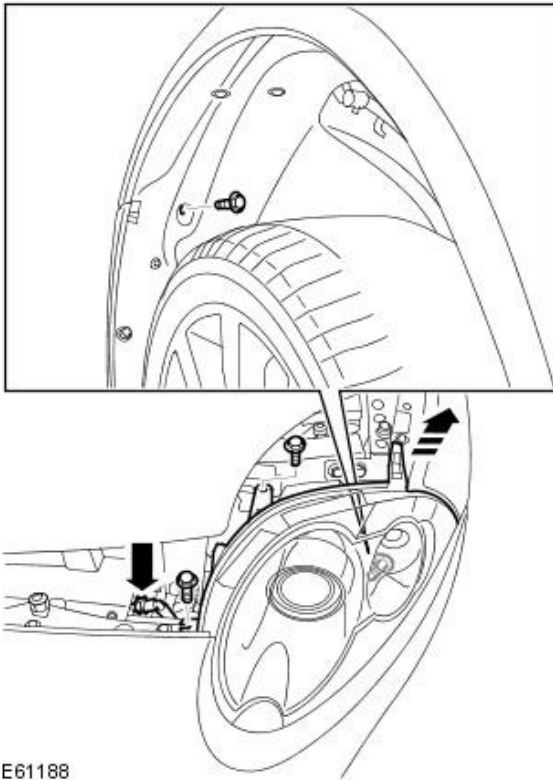
 **WARNING:** Vehicles fitted with Xenon headlamps, the following precautions must be observed. Failure to comply may result in exposure to ultra violet rays, severe electric shock, burns or the risk of explosion. Ensure the headlamps are switched off at all times. Eye and hand protection must be worn.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

1. Disconnect the battery ground cable.
2. Open the hood.
3.  **CAUTION:** Always protect paintwork and glass when removing exterior components.

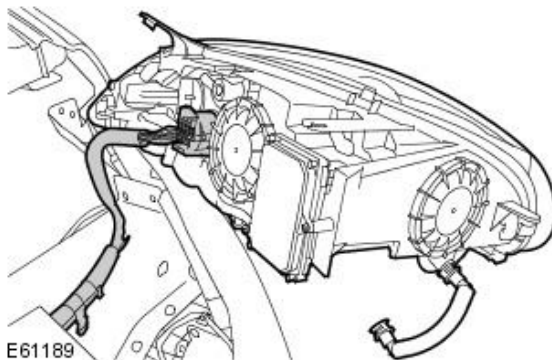
Release the headlamp assembly.

- Remove the 3 bolts.
- Release the locating pegs.

4. Disconnect the washer jet hose.

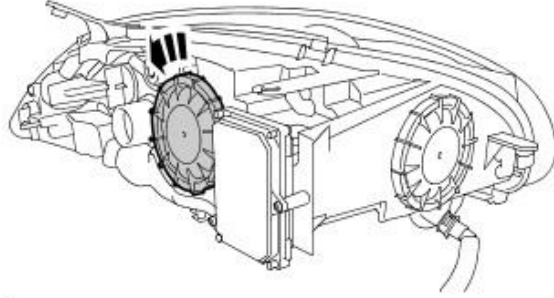


E61188

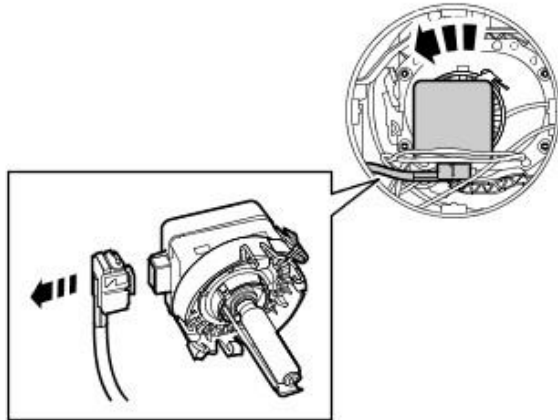


E61189

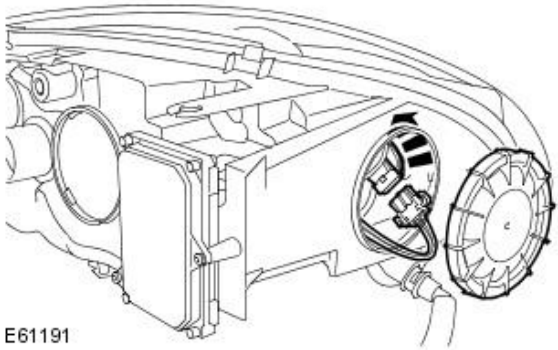
5. Remove the LH headlamp assembly.
 - Disconnect the electrical connector.



6. Remove the headlamp bulb.
 - Remove the cover.
 - Disconnect the electrical connector.
 - Release the clip.

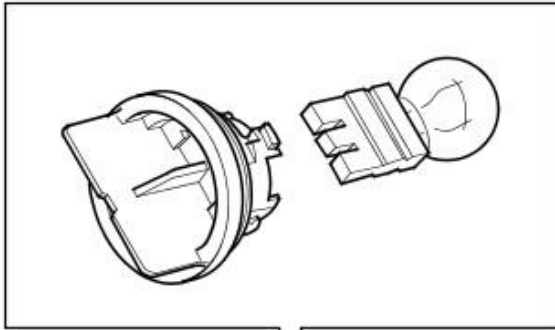


E61190

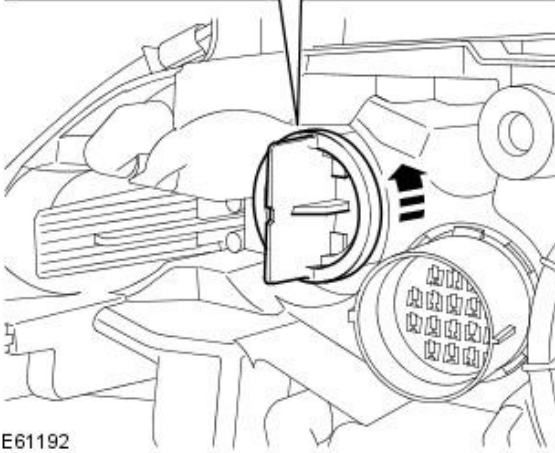


7. Remove the headlamp inner bulb.
 - Remove the cover.
 - Disconnect the electrical connector.
 - Release the clip.

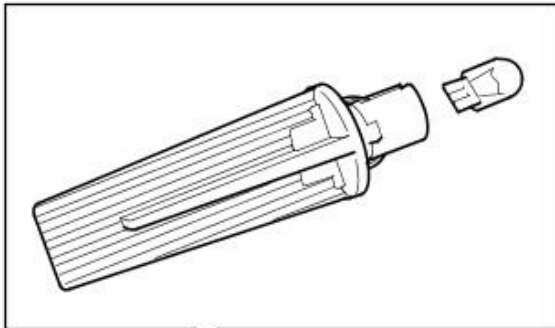
E61191



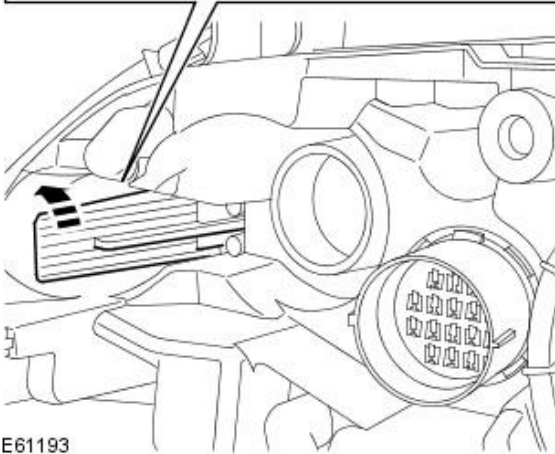
8. Remove the turn signal indicator bulb.
 - Release the bulb holder.



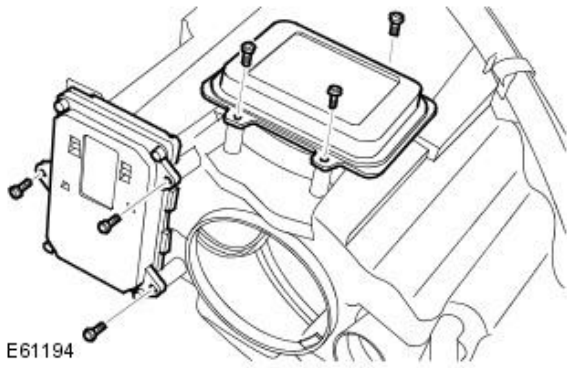
E61192



9. Remove the side marker bulb.
 - Release the bulb holder.

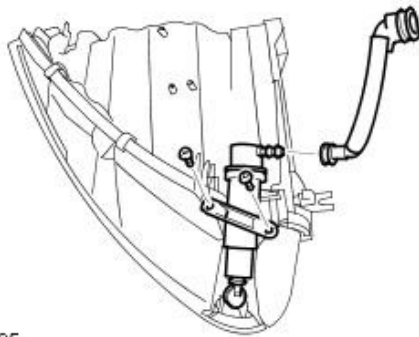


E61193



E61194

10. Remove the gas discharge modules.
 - Remove the 6 Torx screws.



E61195

11. Remove the headlamp washer jet.
 - Disconnect the washer jet hose.
 - Remove the 2 Torx screws.

Installation

1. Install the headlamp washer jet.
 - Tighten the Torx screws.
 - Connect the washer jet hose.
2. Install the gas discharge modules.
 - Tighten the Torx screws.
3. Install the side marker bulb.
 - Install the bulb holder.
4. Install the turn signal indicator bulb.
 - Install the bulb holder.
5. Install the headlamp inner bulb.
 - Connect and secure the electrical connector.
 - Install the cover.
6. Install the headlamp bulb.
 - Connect and secure the electrical connector.
 - Install the cover.
7. Install the headlamp assembly.
 - Connect and secure the electrical connector.
 - Position the locating pegs.
8. Connect the washer jet hose.
9. Secure the headlamp assembly.
 - Tighten the bolts.
10. Close the hood.
11. Connect the battery ground cable.

Exterior Lighting - Headlamp Bulb Vehicles With: High Intensity Discharge Headlamps

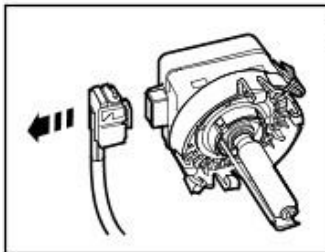
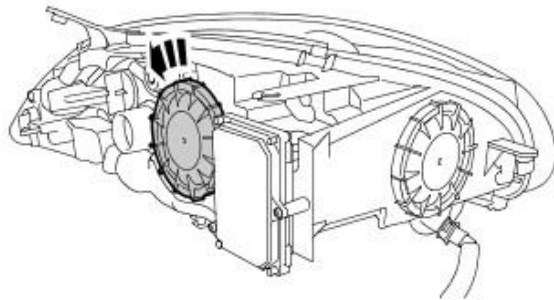
Removal and Installation

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.

1. Disconnect the battery ground cable.
2. Remove the headlamp assembly.
For additional information, refer to: [Headlamp Assembly](#) (417-01 Exterior Lighting, Removal and Installation).
3. Remove the headlamp bulb.
 - Remove the cover.
 - Release the clip.
 - Disconnect the electrical connector.



E61190



4. Remove the headlamp bulb retainer.
 - Release the clip.



E60953

Installation

1. Attach the headlamp bulb retainer.
2. Install the headlamp bulb.
 - Connect the electrical connector.
 - Secure with the clip.
 - Install the cover.
3. Install the headlamp assembly.
For additional information, refer to: [Headlamp Assembly](#) (417-01 Exterior Lighting, Removal and Installation).
4. Connect the battery ground cable.

Exterior Lighting - Headlamp Leveling Module

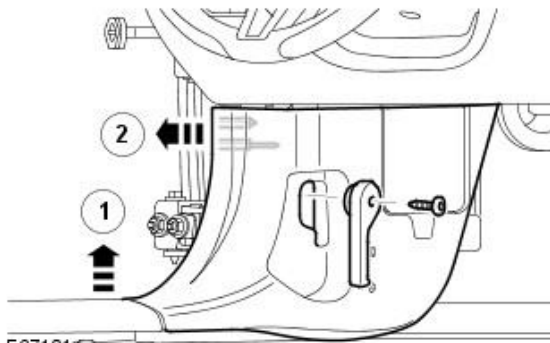
Removal and Installation

Removal

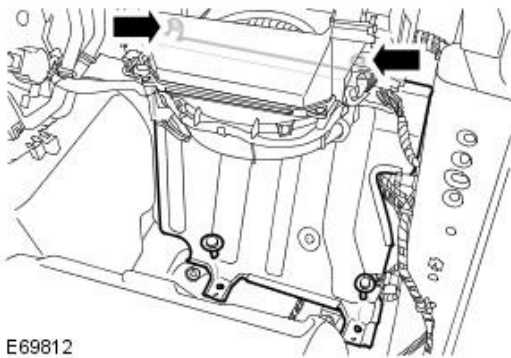
1. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-01 Battery, Mounting and Cables, Specifications).
2. Remove the blower motor.
For additional information, refer to: [Blower Motor](#) (412-02 Heating and Ventilation, Removal and Installation).

3. **NOTE:** LH illustration shown, RH is similar.

Remove the RH cowl side trim panel.

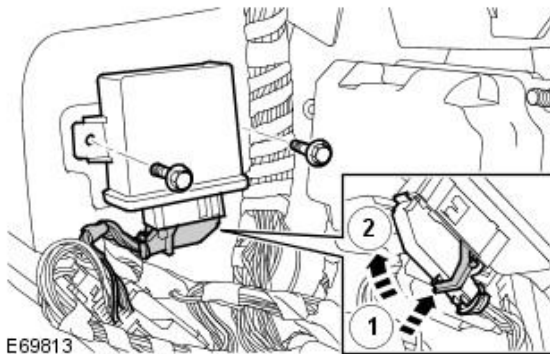


E67101



E69812

4. Remove the subwoofer cover.
 - Reposition the carpet for access.
 - Remove the 4 bolts.



E69813

5. Remove the headlamp leveling module.
 - Remove the 2 bolts.
 - Disconnect the electrical connector.

Installation

1. To install, reverse the removal procedure.
2. Install the headlamp leveling module.
 - Tighten the bolts to 3 Nm (2 lb.ft).
3. Install the subwoofer cover.
 - Tighten the bolts to 10 Nm (7 lb.ft).

Exterior Lighting - Headlamp Leveling Front Sensor

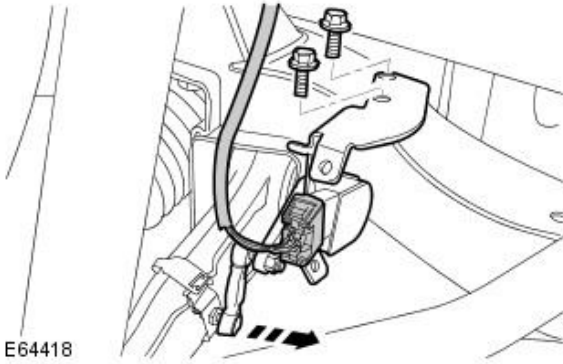
Removal and Installation

Removal

1.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

2. Remove the LH front wheel and tire.
For additional information, refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).



E64418

3. Remove the headlamp levelling sensor.
 - Disconnect the height sensor link.
 - Disconnect the electrical connector.
 - Remove the 2 bolts.

4. **NOTE:** Do not disassemble further if the component is removed for access only.

Remove the height sensor link.

5. **NOTE:** Note the fitted position.

Remove the bracket.

- Remove the 2 Allen bolts.



E64419

Installation

1. **NOTE:** Align to the position noted on removal.

Install the bracket.

- Tighten the Allen bolts to 5 Nm (4 lb.ft).

2. Install the height sensor link.

3. Install the headlamp levelling sensor.

- Tighten the bolts to 25 Nm (18 lb.ft).
- Connect and secure the electrical connector.
- Connect the height sensor link.

4. Install the wheel and tire.

For additional information, refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

Exterior Lighting - Headlamp Leveling Rear Sensor

Removal and Installation

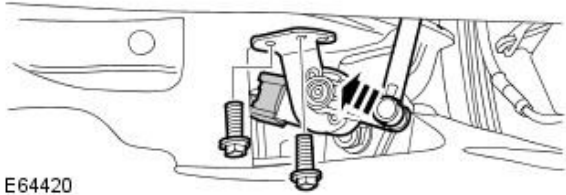
Removal

1.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.



2. Remove the headlamp levelling sensor.
 - Disconnect the height sensor link.
 - Disconnect the electrical connector.
 - Remove the 2 bolts.



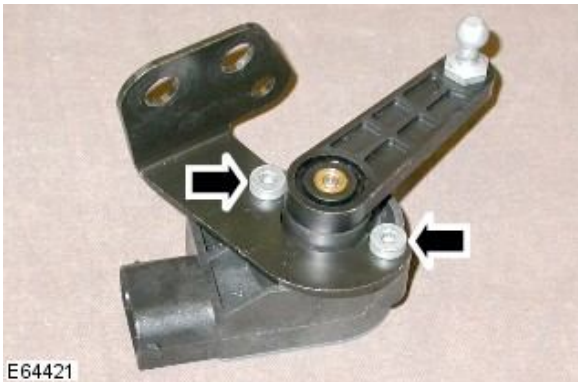
E64420

3. **NOTE:** Do not disassemble further if the component is removed for access only.

NOTE: Note the fitted position.

Remove the bracket.

- Remove the 2 Allen bolts.



E64421

Installation

1. **NOTE:** Align to the position noted on removal.

Install the bracket.

- Tighten the Allen bolts to 5 Nm (4 lb.ft).

2. Install the headlamp levelling sensor.
 - Tighten the bolts to 25 Nm (18 lb.ft).
 - Connect and secure the electrical connector.
 - Install the height sensor link.

Exterior Lighting - High Mounted Stoplamp

Removal and Installation

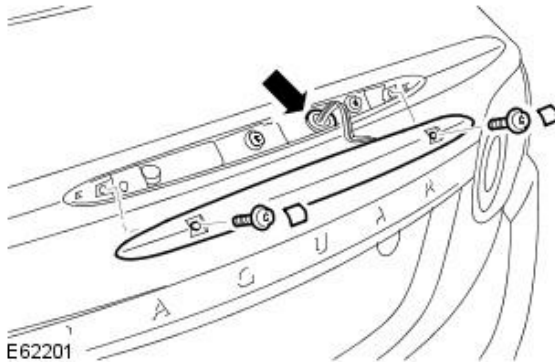
Removal

1. Remove the liftgate lower trim panel.
For additional information, refer to: [Liftgate Lower Trim Panel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).



2. Disconnect the high mounted stoplamp electrical connector.

3. Remove the high mounted stoplamp.
 - Carefully release the Torx bolt covers.
 - Remove the 2 Torx bolts.



Installation

1. Install the high mounted stoplamp.
 - Tighten the Torx bolts to 6 Nm (4 lb.ft).
 - Install the Torx bolt covers.
2. Connect the high mounted stoplamp electrical connector.
3. Install the liftgate lower trim panel.
For additional information, refer to: [Liftgate Lower Trim Panel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

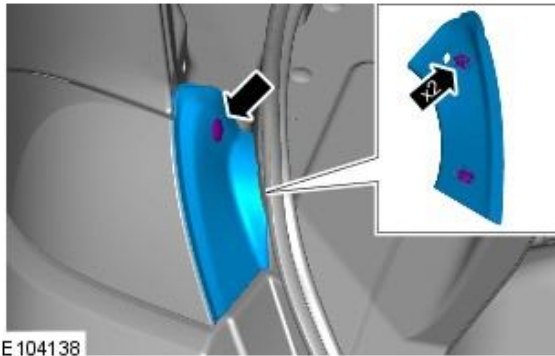
Exterior Lighting - Rear Lamp Assembly V8 5.0L Petrol/V8 S/C 5.0L Petrol

Removal and Installation

Removal

All vehicles

1.



Vehicles without convertible top

2. Refer to: [Loadspace Trim Panel - 2-Door](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

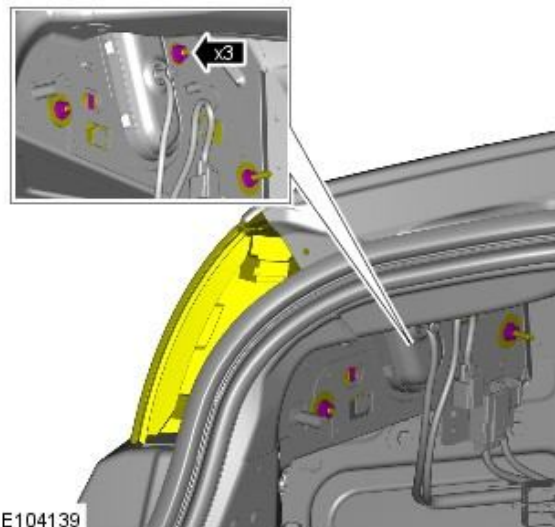
Vehicles with convertible top

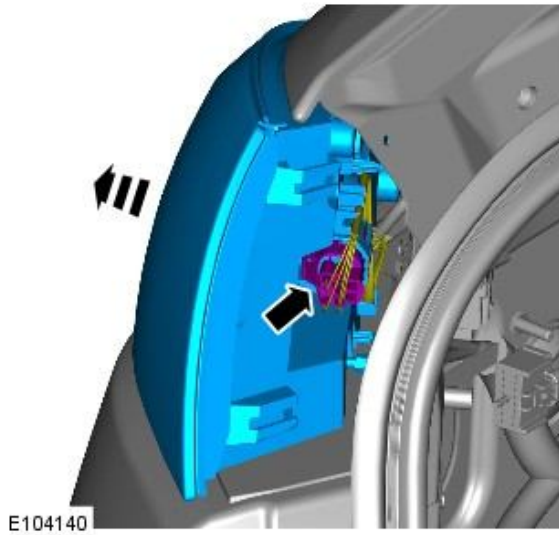
3. Refer to: [Loadspace Trim Panel - Convertible](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).


All vehicles

4.

- Torque: 2 Nm





5.  CAUTION: Take great care when removing the rear lamp assembly as the forward point of the lens can be easily damaged.

Installation

1. To install, reverse the removal procedure.

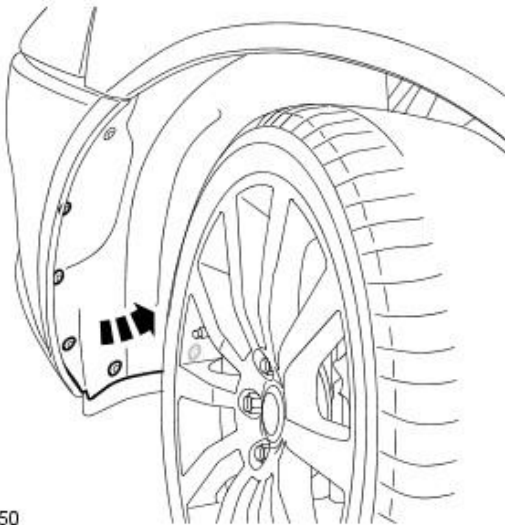
Exterior Lighting - Fog Lamp Bulb

Removal and Installation

Removal

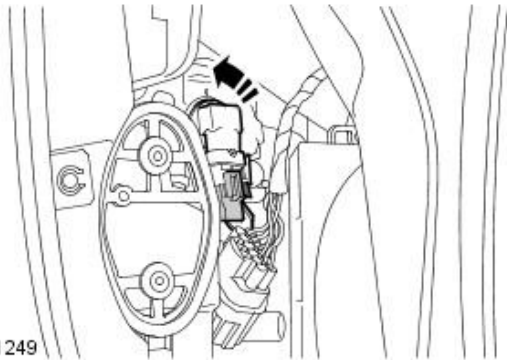
NOTE: Left-hand shown, right-hand similar.

1. Disconnect the battery ground cable.
For additional information, refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Turn the steering on to full lock for access.
3. Release the front of the fender splash shield.
 - Remove the 5 Torx bolts.
 - Tie the splash shield aside.



E61250

4. Remove the front fog lamp bulb.
 - Release and disconnect the electrical connector.



E61249

Installation

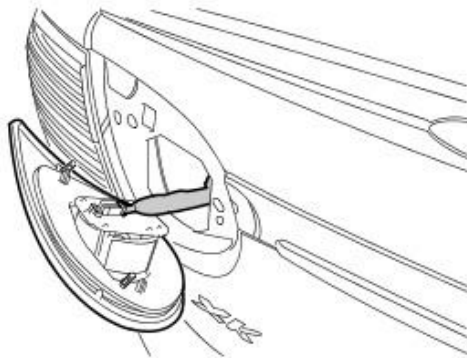
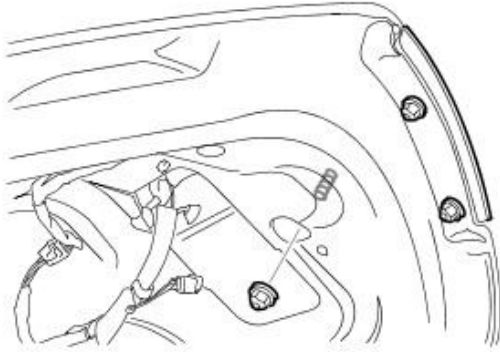
1. Install the fog lamp bulb.
 - Connect and secure the electrical connector.
2. Install the fender splash shield.
 - Tighten the Torx bolts.
3. Connect the battery ground cable.
For additional information, refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

Exterior Lighting - Rear Fog and Reversing Lamp 2-Door

Removal and Installation

Removal

1. Remove the liftgate lower trim panel.
For additional information, refer to: [Liftgate Lower Trim Panel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).
2. Remove the fog and reversing lamp.
 - Remove the 3 plastic nuts.
 - Disconnect the electrical connector.



E63144

Installation

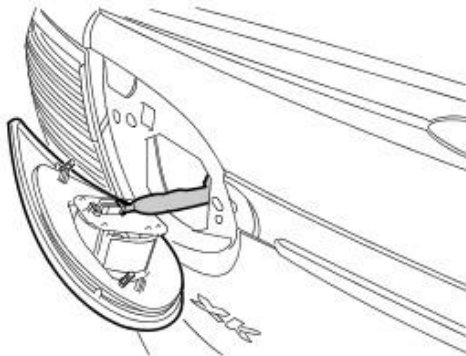
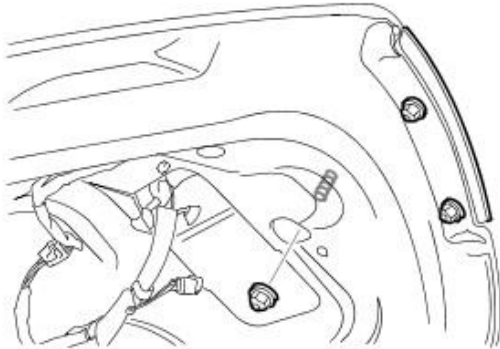
1. Install the fog and reversing lamp.
 - Connect the electrical connector.
 - Install the plastic nuts.
2. Install the liftgate lower trim panel.
For additional information, refer to: [Liftgate Lower Trim Panel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

Exterior Lighting - Rear Fog and Reversing Lamp Convertible

Removal and Installation

Removal

1. Remove the luggage compartment lid trim panel.
For additional information, refer to: Luggage Compartment Lid Trim Panel (501-05, Removal and Installation).
2. Remove the reverse/fog lamp.
 - Remove the 3 plastic nuts.
 - Disconnect the electrical connector.



E63144

Installation

1. Install the reverse/fog lamp.
 - Connect the electrical connector.
 - Install the plastic nuts.
2. Install the luggage compartment lid trim panel.
For additional information, refer to: Luggage Compartment Lid Trim Panel (501-05, Removal and Installation).

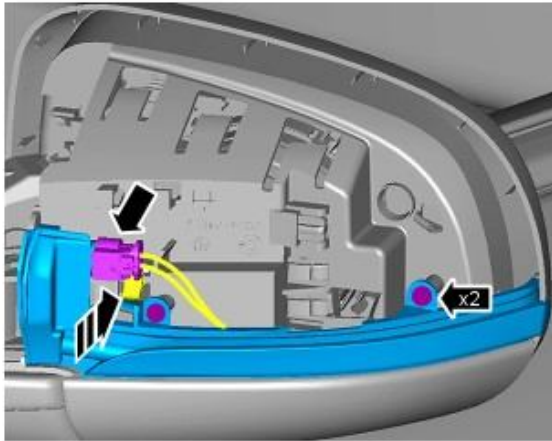
Exterior Lighting - Side Turn Signal Lamp

Removal and Installation

Removal

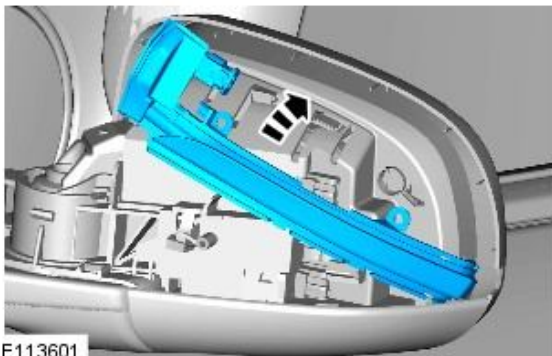
NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Exterior Mirror Cover](#) (501-09 Rear View Mirrors, Removal and Installation).
- 2.



E113600

- 3.



E113601

Installation

1. To install, reverse the removal procedure.