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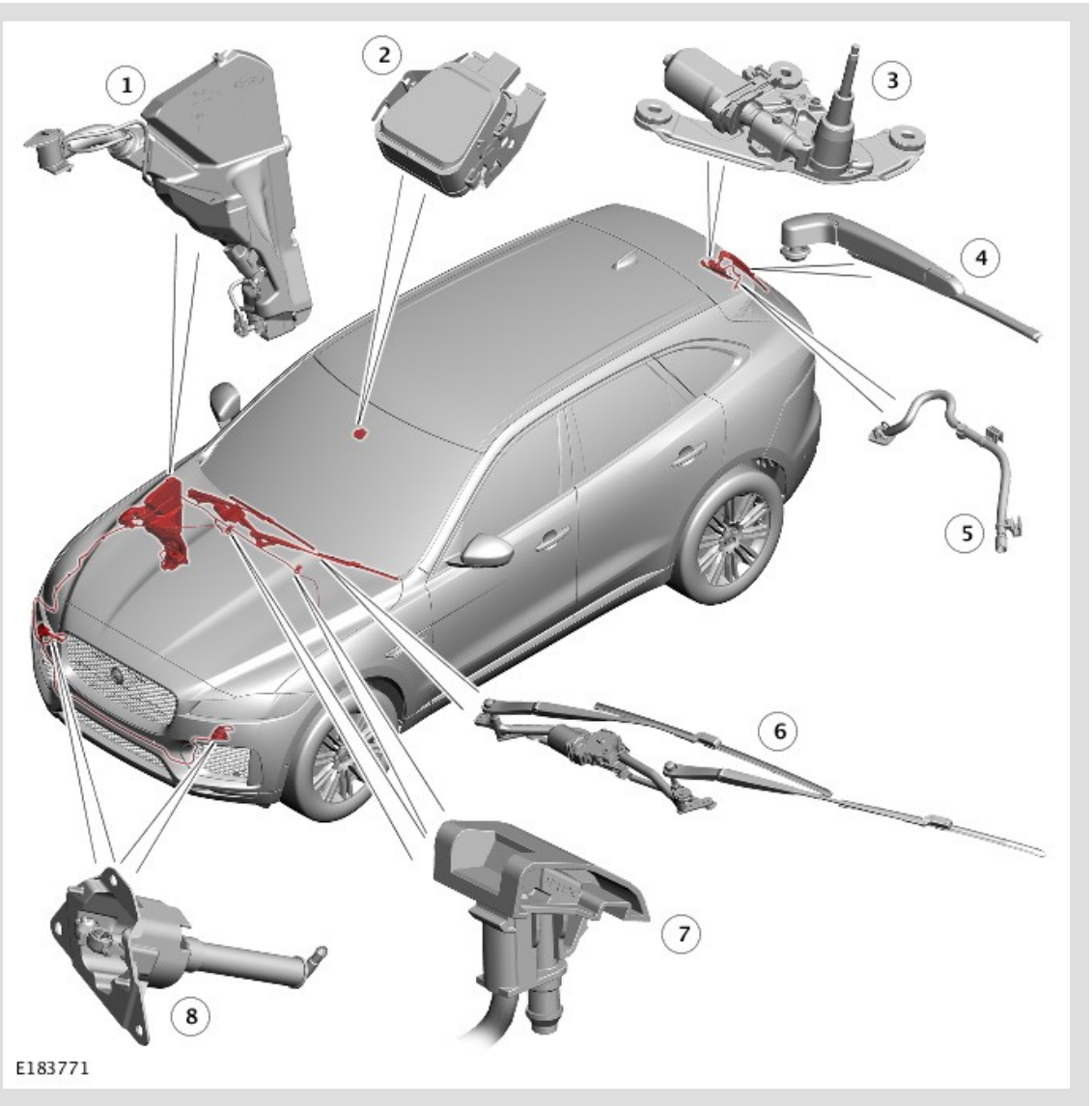
WIPERS AND WASHERS

DESCRIPTION AND OPERATION

COMPONENT LOCATION

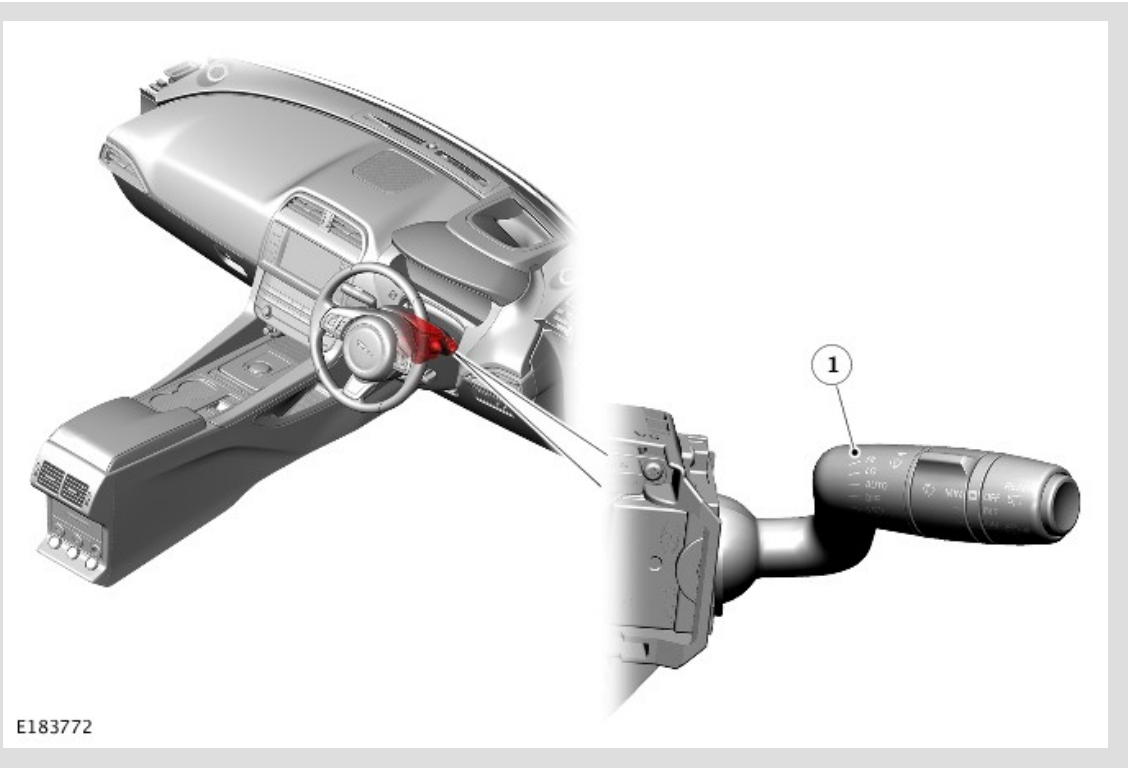
COMPONENT LOCATION - SHEET 1 OF 2 - WIPERS AND WASHERS COMPONENTS



ITEM	DESCRIPTION
1	Windshield and rear window washer reservoir - front/rear
2	Rain/light sensor
3	Rear window wiper motor
4	Rear window wiper arm

5	Rear window washer jet
6	Windshield wiper motor and linkage assembly
7	Windshield washer jet (2 off)
8	Headlamp washer jet (2 off) where fitted

COMPONENT LOCATION - SHEET 2 OF 2 - WIPERS AND WASHERS CONTROL



ITEM	DESCRIPTION
1	Right steering wheel module switchpack - Wipers and washers control switch

OVERVIEW

Windshield wiper, rear window wiper and washer operation is controlled by the Body Control Module /Gateway Module (BCM/GWM) assembly in response to driver inputs and if fitted, signals from the rain /light sensor.

The wiper and washer system comprises:

- Windshield wiper motor and linkage assembly
- Two windshield wiper arms and blades
- Windshield washer reservoir
- Two windshield washer jets - located in the cowl panel
- Two headlamp washer jets (if fitted)
- The wipers and washers control switch
- Rain/light sensor (if fitted).

- Rear window wiper motor and arm
- Rear window washer jet - located in the rear spoiler

The windshield wipers have five operational states:

- Intermittent wipers - vehicles without rain/light sensor
- Automatic wipers - vehicles with rain/light sensor - automatic wipers can be disabled to operate as intermittent via the Instrument Cluster (IC) menu.
- Flick wipe
- Windshield wash and wipe
- Slow wipe
- Fast wipe.

The rear window wiper has two operational states:

- Intermittent (related to road speed)
- Slow wipe

A windshield washer reservoir contains washer fluid which is used by both the windshield washer, the rear window washer and the headlamp washer (if fitted). The headlamp washer (if fitted) uses a dedicated headlamp washer pump located in the reservoir.

On vehicles with a rain/light sensor, the wipers have an 'Auto' function. The 'Auto' function uses an output from the rain/light sensor to the BCM/GWM assembly on a Local Interconnect Network (LIN) bus to provide automatic operation of the windshield wipers. The rain/light sensor is mounted on the inner surface of the windshield and transmits infra-red light to determine the amount of water on the outer surface of the windshield.

The rear window wiper system operates independently of the windshield wiper system and is controlled by the BCM/GWM on receipt of LIN bus messages from the wipers and washers control switch.

NOTE:

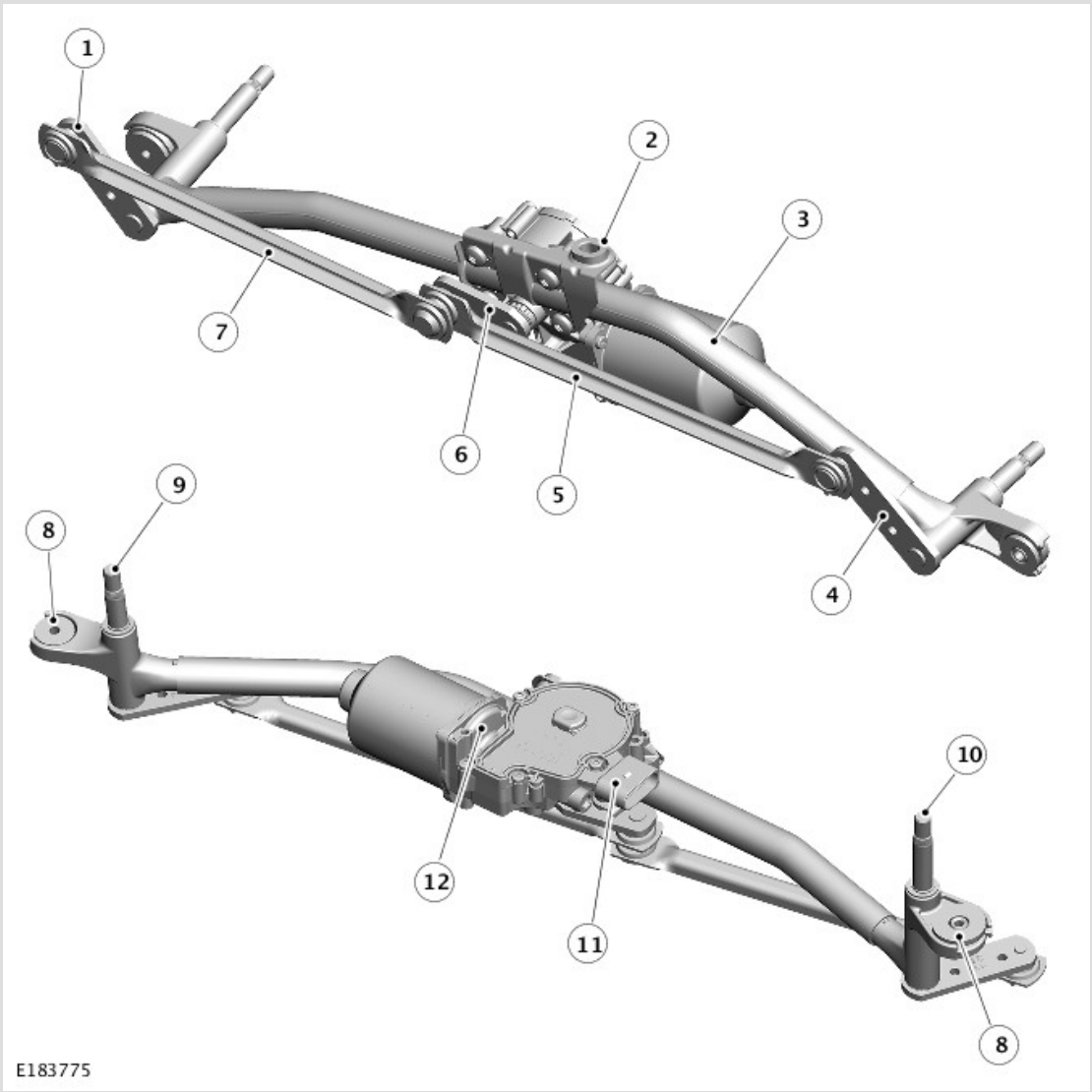
The windshield and rear window washers utilize the same pump meaning only 1 wash function, either front or rear, can be performed at any one time.

DESCRIPTION

WINDSHIELD WIPER MOTOR AND LINKAGE ASSEMBLY

NOTE:

Right Hand Drive (RHD) wiper assembly shown, Left Hand Drive (LHD) wiper assembly is similar.



ITEM	DESCRIPTION
1	Pivot crank - left windshield wiper arm
2	Rubber locating grommet
3	Main tube
4	Pivot crank - right windshield wiper arm
5	Link rod
6	Motor crank
7	Link rod
8	Rubber mounting (2 off)
9	Pivot - right windshield wiper arm
10	Pivot - left windshield wiper arm
11	Electrical connection
12	Windshield wiper motor

The windshield wiper motor and linkage assembly differs between Right Hand Drive (RHD) and Left Hand Drive (LHD) models. The wiper linkage and motor assembly are not available as separate service components.

The windshield wiper motor and linkage assembly is attached to the vehicle body with screws and washers at each end. The screws are located in rubber bushes in the wiper linkage assembly which isolate the assembly from the vehicle body. A rubber locating grommet is located behind the motor and engages on a spigot on the vehicle body to locate the linkage assembly.

The windshield wiper motor comprises a 12V Direct Current (DC) motor and gear wheel and worm drive, contained in an integral housing, and attached to the wiper linkage with three screws.

The windshield wiper motor drives an integral gear wheel via a worm drive attached to the motor spindle. The gear wheel has a central spigot which provides the attachment point for the motor crank. The windshield wiper motor and linkage assembly are a single component and cannot be replaced separately.

The motor assembly is connected to the vehicle harness by a four pin electrical connector. The electrical connector provides two battery voltage feeds from the fast/slow wiper relay, located in the left Engine Junction Box (EJB), a ground path for the motor assembly and a wiper park feed for theBody Control Module/Gateway Module (BCM/GWM) assembly.

The wiper motor is prevented from operating when the hood is open. If the vehicle speed is more than 1.9 Miles mph (3 km/h) the BCM/GWM assembly considers the hood closed and the wiper motor will operate.

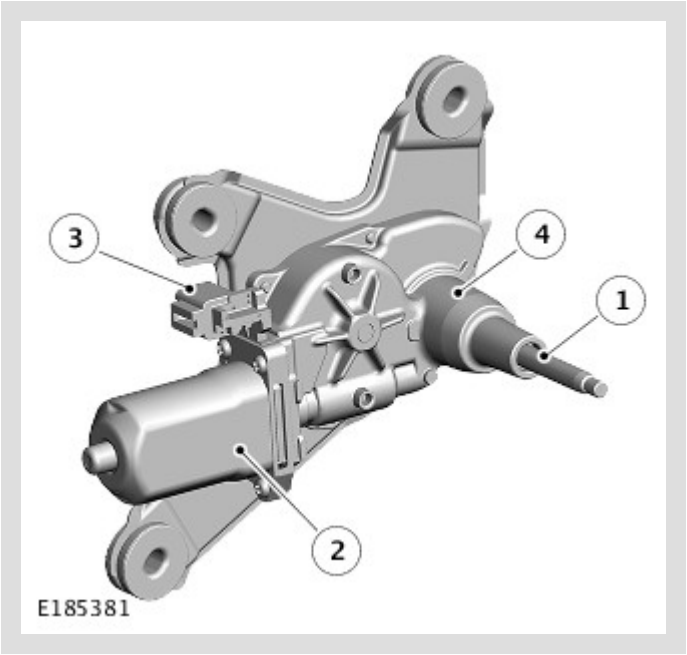
The motor contains a park switch which is connected to the BCM/GWM assembly. When the motor is switched off, the BCM/GWM assembly detects the park switch opening and stops the windshield wiper motor in the park position.

If the windshield wipers or the linkage become obstructed, the BCM/GWM assembly will remove power to the windscreen wiper motor if the park signal does not change state within 6 seconds. The wiper motor will remain disabled until the obstruction is cleared or an alternative active wiper mode is selected. Three disable events are allowed until a 180 second disable period is activated, or until the next ignition cycle when the event counter will be reset to zero.

The windshield wiper motor and linkage assembly comprises a main tube with a pivot housing assembly located at each end. The motor assembly is attached to the tube by four screws. Two link rods are attached to the motor crank to provide the connection between the motor crank and the two pivots.

The motor crank converts rotary motion from the motor output shaft into linear movement of the link rods. The cranks connected to each pivot, convert the linear motion of the link rods back to rotary motion of the pivots. This rotary motion is passed to the wiper arms and blades causing the blades to wipe a reciprocating arc on the windshield.

REAR WINDOW WIPER MOTOR



ITEM	DESCRIPTION
1	Spindle
2	Motor
3	Electrical connector
4	Clutch

The single speed rear window wiper motor is mounted on the inner surface of the tailgate. It is secured by three bolts. The interior trim panel covers all the electrical components that are installed in the tailgate. Rubber bushes isolate the motor assembly from the body to help reduce the transmission of motor operating noise to the tailgate. The motor is located on a worm drive mechanism, which converts the rotary motion of the motor output spindle into the required arc for the rear wiper blade. The rear wiper motor contains a clutch mechanism. This disengages the wiper arm and blade if there is an obstruction to prevent damage to the motor. To reset the clutch, remove the obstruction and switch the rear wiper off and on again.

If the rear wiper or the linkage become obstructed, the Body Control Module/Gateway Module (BCM /GWM) assembly removes power to the rear wiper motor if the park signal does not change state within 6 seconds. The rear wiper motor remains disabled until the obstruction is cleared, or an alternative active wiper mode is selected. Three disable events are allowed until a 180 second disable period is activated, or until the next ignition cycle when the event counter is reset to zero.

A three pin electrical connector is used to connect the rear window wiper motor to the vehicle harness. The electrical connector provides a power feed to the motor from the Rear Junction Box (RJB), a wiper park feed from the BCM/GWM, and a ground path.

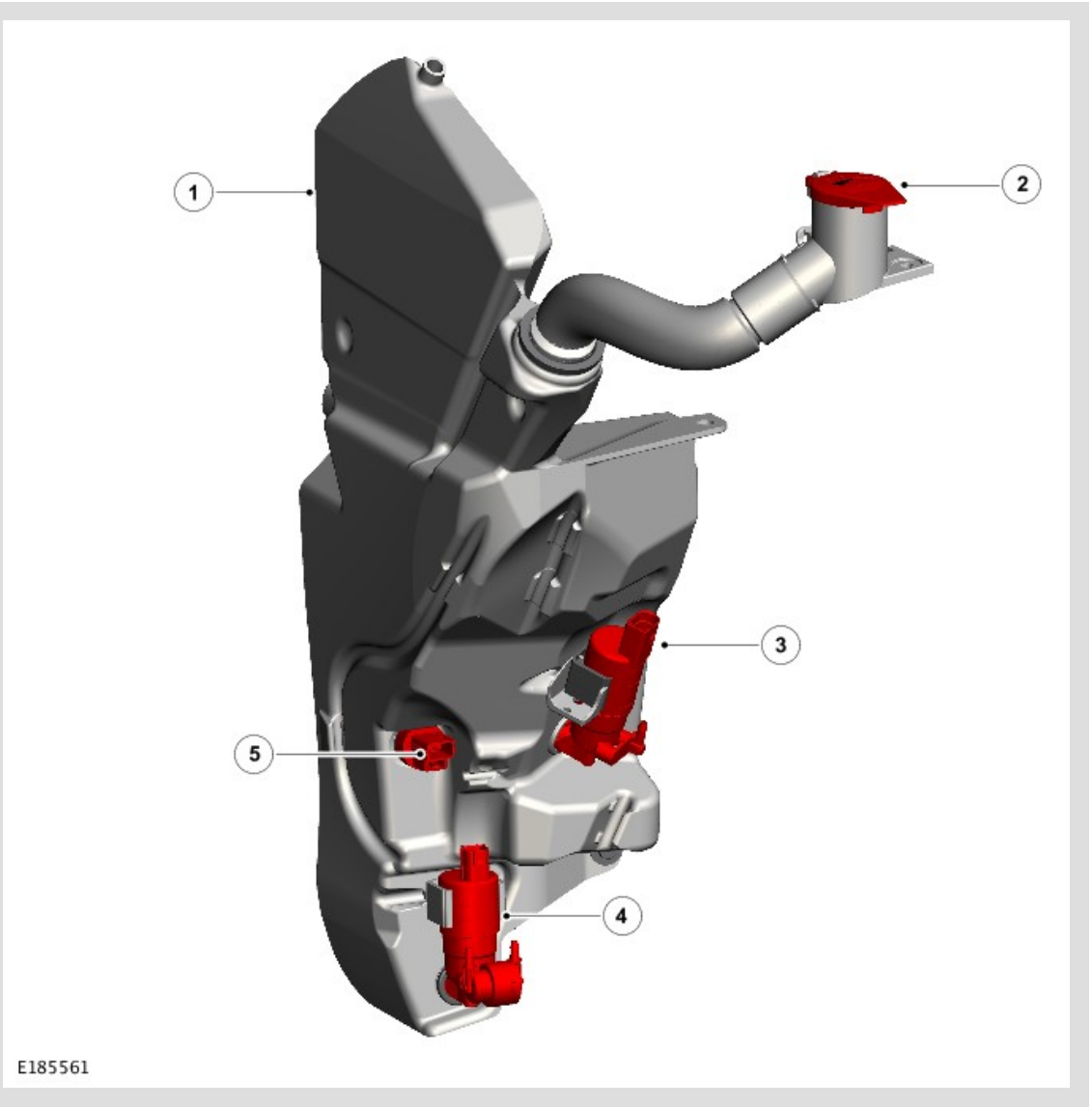
The RJB contains the rear window wiper relay. The operation of the relay is controlled by the BCM /GWM, which provides feed and ground paths according to logic contained within its software.

WINDSHIELD AND REAR WIPER ARMS AND BLADES

Each wiper arm is located on a taper spline on the respective pivot. A nut is screwed on the end of the pivot shaft and positively secures the wiper arm on the taper spline.

The wiper blades are attached to the wiper arms with quick release fittings. The wiper arms are spring loaded to maintain a constant wiper blade pressure on the windshield. The wiper blades are a flat blade type with two spines, which provides an even pressure along the length of the wiper blade and allows the wiper blade to curve and match the windshield profile throughout their arc.

WINDSHIELD, AND REAR WINDOW WASHER RESERVOIR AND WASHER PUMPS



ITEM	DESCRIPTION
1	Washer fluid reservoir
2	Washer fluid reservoir filler neck and cap
3	Headlamp washer pump (where fitted)
4	Windshield and rear window washer pump
5	Washer fluid level sensor (where fitted)

The windshield washer reservoir is located behind the front right wheel, behind the wheel arch liner. The windshield washer reservoir is a plastic molding and is secured in the wheel arch to the body with two screws.

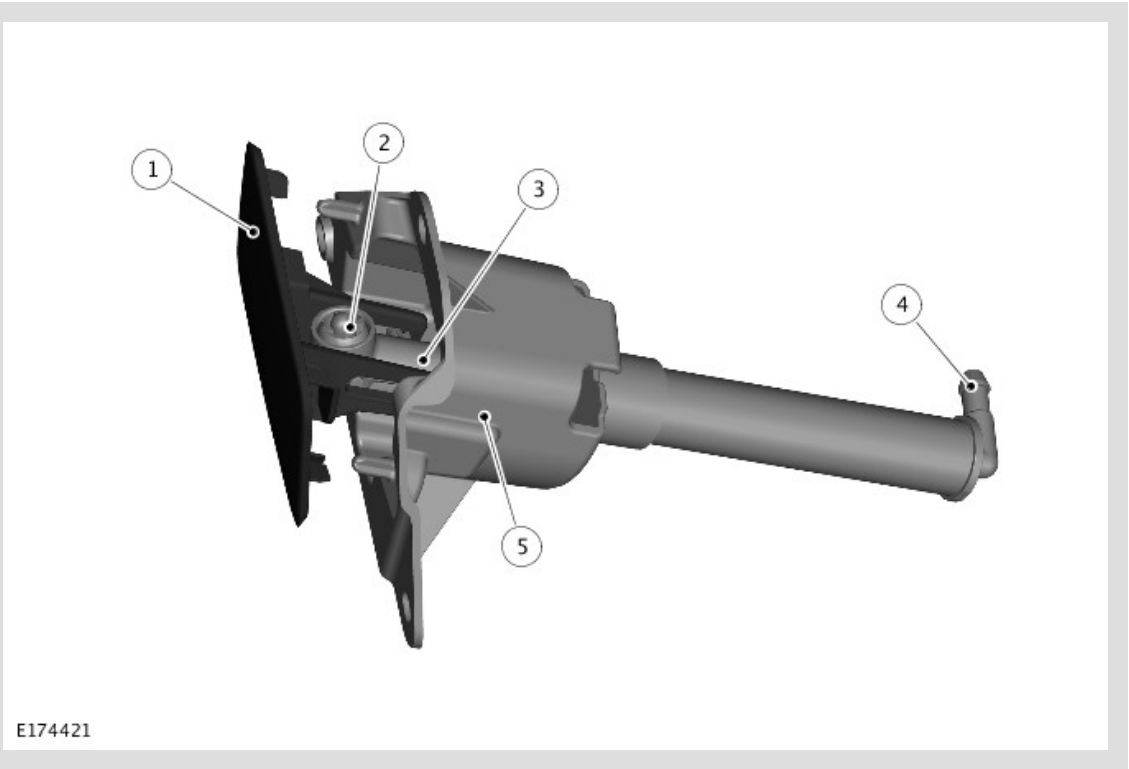
A level sensor (where fitted) is located in the windshield washer reservoir and is connected to the Body Control Module/Gateway Module (BCM/GWM) assembly via a hardwired connection. A combined windshield washer and rear window washer pump is installed at the base of the reservoir. The headlamp wash pump (where fitted) is located one side of the reservoir. The windshield washer pump supplies washer fluid to the windshield washer jets or the rear window washer jet. The headlamp washer pump supplies fluid to the left and right headlamp washer jets.

A filler cap is located at the top of the windshield washer reservoir and is accessible from the engine compartment.

The washer pumps are located in rubber sealing grommets in holes in the windshield washer reservoir and secured with clips. The washer fluid hoses have quick release connectors at the end of the hoses which are not connected to the pumps. The fluid level sensor is a push fit into a sealing grommet in one side of the windshield washer reservoir body.

The windshield washer jets are located in the cowl panel, below the windshield. The windshield washer jets can be heated on some models. Power for the heating elements in the jets is supplied from the BCM/GWM assembly. The heater elements are active at all times when the engine is running.

HEADLAMP WASHERS (IF FITTED)



ITEM	DESCRIPTION
1	Washer jet trim panel
2	Washer jet
3	Telescopic arm
4	Washer fluid supply hose connection
5	Washer jet housing

NOTE:

The headlamp washers will only operate if the vehicle headlamps are on, the ignition is on and the low level sensor is not closed.

The front bumper is fitted with two headlamp washers. The headlamp washers are located in the bumper, below the headlamp assembly. The headlamp washer is located in an aperture at the front of the bumper and secured with three self-tapping screws to a bracket moulded into the bumper structure.

The headlamp washers are telescopic units which extend forward from the bumper under washer fluid pressure supplied by the headlamp washer pump. When the washer fluid pressure decreases the headlamp washer is automatically retracted back into the housing. The outer end of the headlamp washer is fitted with a trim which blends the headlamp washer into the bumper when it is not operating. Each headlamp washer has a washer jet which directs washer fluid under pressure onto the headlamp lens when the headlamp washer is extended.

RAIN/LIGHT SENSOR (IF FITTED)

The rain/light sensor is located at the upper edge of the windshield, behind the rear view mirror trim panel. Contact between the rain/light sensor and windscreen is provided via a silicon pad which is compressed during the assembly process by two locking retaining clips either side of the sensor.

The rain/light sensor unit attaches to the windshield via a retaining clamp, which latches onto formed tags on the windshield bracket.

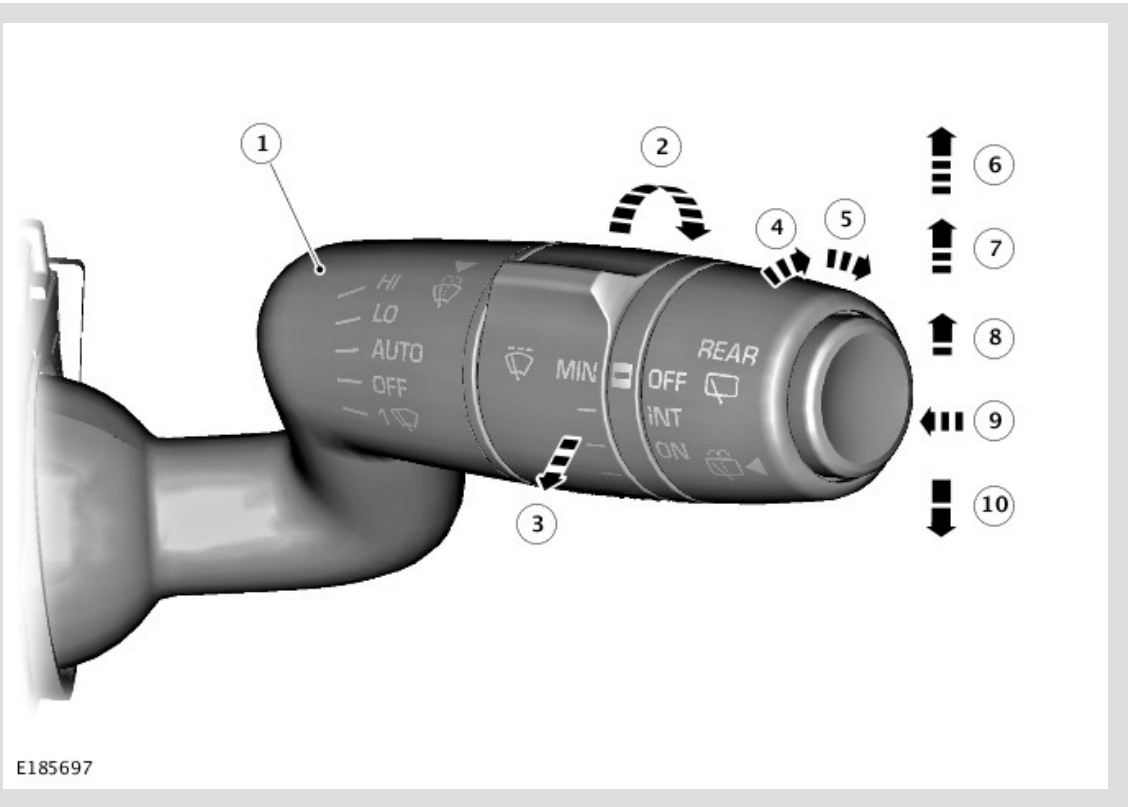
The rain/light sensor provides information to the Body Control Module/Gateway Module (BCM/GWM) assembly via a Local Interconnect Network (LIN) bus connection for the optimum windshield wiper operation for the prevailing conditions to maintain the windshield in a clear condition at all times. The rain/light sensor is an optical unit, which operates on an infrared waveband. It uses the principle of the laws of reflection on interfacing surfaces between materials with differing refraction properties. The light is directed at an angle so that the light is reflected 100% on the outside surface of the screen and is transmitted back into the optical unit. To receive a 100% reflection, the outer screen surface must be clean and dry.

The light is reflected 4 times from when it leaves the transmitter diodes to when it is picked up by the receiver diodes. If the windshield is wet or dirty in the area of the optical unit, the clean conditions for 100% reflection means that some of the light reflected is lost. As the screen becomes dirtier or wetter, the received light is evaluated by the rain/light sensor and translated into a signal value. A micro-controller within the sensor monitors the change in signal and initiates the appropriate wipe cycle via LIN bus signals to the BCM/GWM assembly.

The software can compensate for the long-term effects of scratches and stone chips in the area of the optical unit and the short term effects of dirt or smears caused by worn wiper blades. A heater element is also contained within the rain/light sensor and uses ambient air temperature LIN bus signals from the BCM/GWM assembly to keep the optical unit clear of condensation.

The sensor receives a power supply from the BCM/GWM assembly. The 'Auto' wipers are activated when the wipers and washers control switch is moved to the 'Auto' position. The sensitivity of the rain /light sensor can be adjusted by rotating the windshield wiper intermittent switch on the wipers and washers control switch in a clockwise or counterclockwise direction. Clockwise rotation will increase sensitivity, while counterclockwise adjustment will decrease sensitivity. An increase in sensitivity adjustment results in a single wipe of the wiper motor.

WIPERS AND WASHERS CONTROL SWITCH



ITEM	DESCRIPTION
1	Wipers and washers control switch
2	Intermittent delay rotary control or rain/light sensor sensitivity adjustment
3	Windshield wash/wipe
4	Rear window wiper intermittent delay position
5	Rear window wiper normal wipe position
6	Fast wipe position

7	Slow wipe position
8	Intermittent wipe position or Auto rain/light sensor position
9	Rear window wash position
10	Flick wipe position

The windshield wiper functions are controlled by the driver using the wipers and washers control switch. The control switch is part of the steering wheel module located on the steering column.

The outputs from the switches are converted to LIN bus signals by the steering wheel module and transmitted to the BCM/GWM assembly. The BCM/GWM assembly processes the LIN bus signals and activates the selected function directly, or via relays located in the left and right Engine Junction Box (EJB).

WIPER SERVICE POSITION

The wiper service position allows the windshield wipers to be parked in a position to allow easy access to the wiper blades for replacement.

NOTE:

The smart key must remain in the vehicle when the windshield wipers are in the service position.

Perform the following steps to set the windshield wipers service position:

- Make sure the ignition is switched off
- Switch the ignition on and then switch it off again
- Immediately move the wipers and washers control switch down to the flick wipe position and switch the ignition on again
- The windshield wipers will move to the service position.

To return the windshield wipers to the normal park position perform the following steps:

- Switch the ignition off
- The windshield wipers will return to the park position.

WINDSHIELD WIPER LIMP HOME MODE

If a Local Interconnect Network (LIN) bus failure occurs between the Body Control Module/Gateway Module (BCM/GWM) assembly and the wipers and washers control switch during the operation of the windshield wiper, the BCM/GWM assembly will initiate limp home mode. The BCM/GWM assembly will operate the windshield wipers continuously at slow speed whilst an active wiper mode is selected.

OPERATION

WINDSHIELD WIPER SLOW/FAST/FLICK WIPE

Slow Wipe

When the driver moves the wipers and washers control switch to the slow wipe position, the Body Control Module/Gateway Module (BCM/GWM) assembly detects a LIN bus message and energizes the wiper on/off relay in the left Engine Junction Box (EJB). The relay supplies power to the windshield wiper motor via a resistor in the motor. The motor will operate at slow speed until fast speed is selected or the wiper on/off relay is de-energized, removing the power to the windshield wiper motor.

Fast Wipe

When the driver moves the wipers and washers control switch to the fast wipe position, the BCM/GWM assembly detects a LIN bus message and energizes the slow/fast wiper relay in the left EJB. The fast /slow wiper relay contacts supplies the power directly to the windshield wiper motor, bypassing the resistor used for the slow wipe. The windshield wiper motor will operate at fast speed until slow speed is selected or the relays are de-energized, removing the power to the windshield wiper motor.

Flick Wipe

When the driver moves the wipers and washers control switch to the single wipe position, the BCM /GWM assembly detects a LIN bus message and energizes the wiper on/off relay in the left EJB. The motor will operate at slow speed until the wipers and washers control switch is released from the flick wipe position. The on/off relay is de-energized, removing the power to the windshield wiper motor.

WINDSHIELD WIPER PARK

The windshield wiper park switch is integral with the windshield wiper motor. The park switch ensures the windshield wipers return to the park position when the windshield wipers are switched off.

The park switch is part of the windshield wiper motor gear wheel. When the windshield wipers move from the park position, the park switch contacts are open. When the windshield wiper becomes near to the park position the park switch contacts are closed and a ground path to the BCM/GWM assembly is completed.

When the BCM/GWM assembly receives a LIN bus signal from the wipers and washers control switch that a wiper operation is selected, the park switch status is continually monitored by the BCM/GWM assembly. If the wipers and washers control switch is moved to the off position, when the BCM/GWM assembly next senses the ground signal from the park switch, it will remove the power supplies via the wiper on/off relay, stopping the windshield wipers in the park position.

WINDSHIELD WIPER INTERMITTENT FUNCTION

NOTE:

On vehicles without rain/light sensor, only the intermittent function is available. Rain/light sensor equipped vehicles the intermittent function can be selected using the IC (Instrument Cluster) menu to disable the automatic wipers function.

When the driver moves the wipers and washers control switch to the intermittent wipe position, the BCM/GWM assembly detects a LIN bus message and energizes the wiper on/off relay in the left EJB. The windshield wiper motor will operate at slow speed until the wiper on/off relay is de-energized, removing the power to the windshield wiper motor.

The BCM/GWM assembly monitors the LIN bus signal from the windshield wiper intermittent switch simultaneously. Depending on the intermittent switch position, the BCM/GWM assembly will operate the windshield wipers for one single wipe. After a time period relating to the adjustment switch position, the BCM/GWM assembly will repeat the process until the driver selects wipers off on the wipers and washers control switch or a different windshield wiper selection is made.

DELAY TIMERS

The delay periods in seconds relating to the switch positions are as follows:

- 21 seconds
- 15 seconds
- 11 seconds
- 7 seconds
- 4 seconds
- 2 second.

REAR WINDOW WIPER

> **NOTE:**
>
> The rear wiper will not operate when the tailgate is open.

On receiving a request for rear window wiper operation the BCM/GWM will energize the rear wiper relay in the Rear Junction Box (RJB). When energized, the relay provides a feed to the rear window wiper motor. The rear window wiper operates intermittently, with a delay between wipes depending on speed of the vehicle. It also has a continuous operating mode if selected on the windshield wiper control switch. The BCM/GWM controls operation of the relay, and thus the operation of the rear window wiper motor.

The BCM/GWM provides voltage to the rear window wiper motor park switch. The park switch is integral with the rear window wiper motor and ensures the wiper returns to the park position if the rear wiper request is cancelled mid-stroke. The park switch contacts are closed when the rear wiper is in any position except the park position. This allows the BCM/GWM to return the rear wiper to the park position when the relay is de-energized.

The BCM/GWM also powers the rear window wiper motor if reverse gear is selected while the windshield wiper function is active. On vehicles fitted with an automatic transmission, the reverse gear signal originates in the Transmission Control Module (TCM). The TCM broadcasts a reverse gear signal over the High Speed (HS) Controller Area Network (CAN) bus to the BCM/GWM, which responds by operating the rear wiper.

On vehicles fitted with a manual transmission, the reverse gear signal originates at the reverse gear switch. The reverse gear switch is hardwired to the BCM/GWM.

WINDSHIELD WASHERS

When the windshield wiper is switched off and the driver moves the wipers and washers control switch to the windshield wash position, the BCM/GWM assembly energizes the windshield washer pump. The BCM/GWM assembly will delay windshield wiper operation for 250 ms after the driver has operated the wipers and washers control switch in the windshield wash position.

When the windshield wiper is operating in either position, and the driver moves the wipers and washers control switch to the windshield wash position, the BCM/GWM assembly energizes the windshield washer pump, but the wiper sequence will not change.

If the driver operates the windshield washer for less than 250 ms, the BCM/GWM assembly will operate the windshield washer only.

If the driver operates the windshield washer between 250 ms and 1.2 seconds, the BCM/GWM will operate the windshield washer pump for 1.2 seconds and the windshield wipers (with a 250 ms delay) for three full wipes.

If the driver operates the windshield washer for longer than 1.2 seconds, the BCM/GWM assembly will operate the windshield wipers for as long as the driver operates the wipers and washer control switch in the windshield washer position. The washer pump will only be powered for a maximum of 10 seconds. After the washer pump stops, the BCM/GWM assembly will operate the wipers to complete the current wipe cycle, and two further full cycles before park. After a 4 second delay, the BCM/GWM assembly will operate the windshield wipers for one full cycle to remove any residual washer fluid from the windshield.

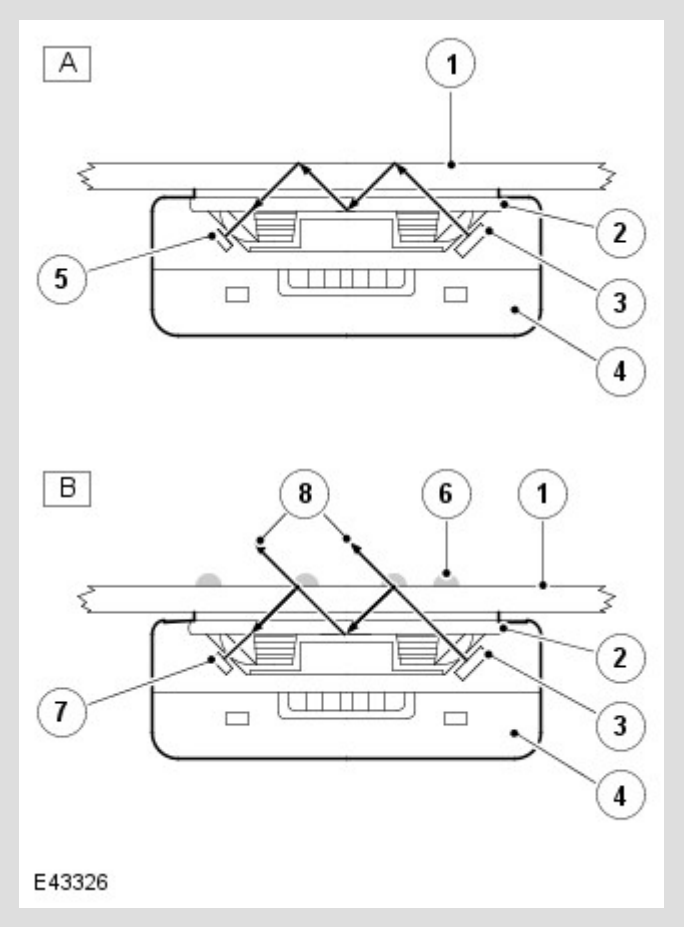
REAR WINDOW WASHER

The rear window washer jet is incorporated into the rear spoiler. When it receives a request for rear window washer operation, the BCM/GWM energizes the windshield washer pump in the opposite direction to the windshield washers operation. The BCM/GWM assembly supplies the voltage and the ground for the rear window washer motor. Reversing the polarity of the pump (see 'Windshield Washers' above) allows washer fluid to be directed to the rear window washer jet rather than the windshield washer jets.

The rear window washer will operate for up to 10 seconds if continuously requested. When rear window washer operation is requested, the rear window wiper will operate continuously until the switch is released. After this period when the button is released, the rear window wiper continues for 3 more cycles followed, after a delay, by a single dry wipe. After this period washing is inhibited, the wiper continues for 3 more cycles followed, after a delay, by a single dry wipe. This is to remove any residual washer fluid from the rear window. Reactivating the switch will start the wash/wipe cycle again.

RAIN/LIGHT SENSOR

The rain/light sensor contains a number of transmitter and receiver diodes which emit and receive infrared light. By comparing the received light signal against the known transmitted light signal, the rain/light sensor can determine the amount of water on the outer surface of the windshield.



A = CLEAN AND DRY WINDSHIELD; B = WET AND DIRTY WINDSHIELD.

ITEM	DESCRIPTION
1	Windshield outer surface
2	Optical element
3	Transmitter diodes (100% light transmitted)
4	Rain/light sensor assembly
5	Receiver diodes (100% light received)
6	Water droplets or water film
7	Receiver diodes (less than 100% light received)
8	Lost light

When the driver moves the wipers and washer control switch to the 'Auto' position, the BCM/GWM assembly detects a LIN bus message and monitors LIN bus messages received from the rain/light sensor. The rain/light sensor provides LIN bus messages with values ranging from 0 to 7. A signal value of 0 is interpreted by the BCM/GWM assembly as there being no water on the windshield.

A signal value from 1 to 5 is interpreted by the BCM/GWM assembly as there being a small amount of water hitting the windshield. In this instance, the BCM/GWM assembly initiates a slow wipe routine as detailed in the 'Windshield Wiper Slow Wipe' section above.

A signal value from 6 is interpreted by the BCM/GWM assembly as there being a large amount of water hitting the windshield. In this instance, the BCM/GWM assembly initiates a fast wipe routine as detailed in the 'Windshield Wiper Fast Wipe' section above.

Rain/Light sensor sensitivity can be adjusted by turning the windshield wiper intermittent switch on the wipers and washers control switch to the required position. Six different sensitivity settings are available, which are broadcast over the LIN bus to the BCM/GWM assembly.

NOTE:

The BCM/GWM assembly will only change from fast wipe to slow wipe if the rain/light sensor value is lower than 6.

HEADLAMP WASHERS (WHERE FITTED)

When the engine is running and the BCM/GWM has received a headlamps 'ON' LIN bus message from the lighting control switch, when the driver operates the wipers and washers control switch in the windshield wash position, the BCM/GWM assembly will initiate the headlamp washer sequence.

The number of headlamp washer operations in given period is limited to preserve the washer fluid in the washer reservoir. The BCM/GWM assembly then suspends headlamp wash activation for the next 10 minutes and 3 operations of the wash/wipe switch, with the headlamp power washers activated on the fourth operation of the switch and after the 10 minute period has expired.

If more than three windshield wash operations are requested by the driver within the 10 minutes inhibit period, the BCM/GWM assembly will activate the headlamp washer on the next windshield washer sequence following the 10 minute period has expired.

The timer and event counter is cleared following an ignition cycle or moving the lighting control switch to 'OFF' then back to 'ON'.

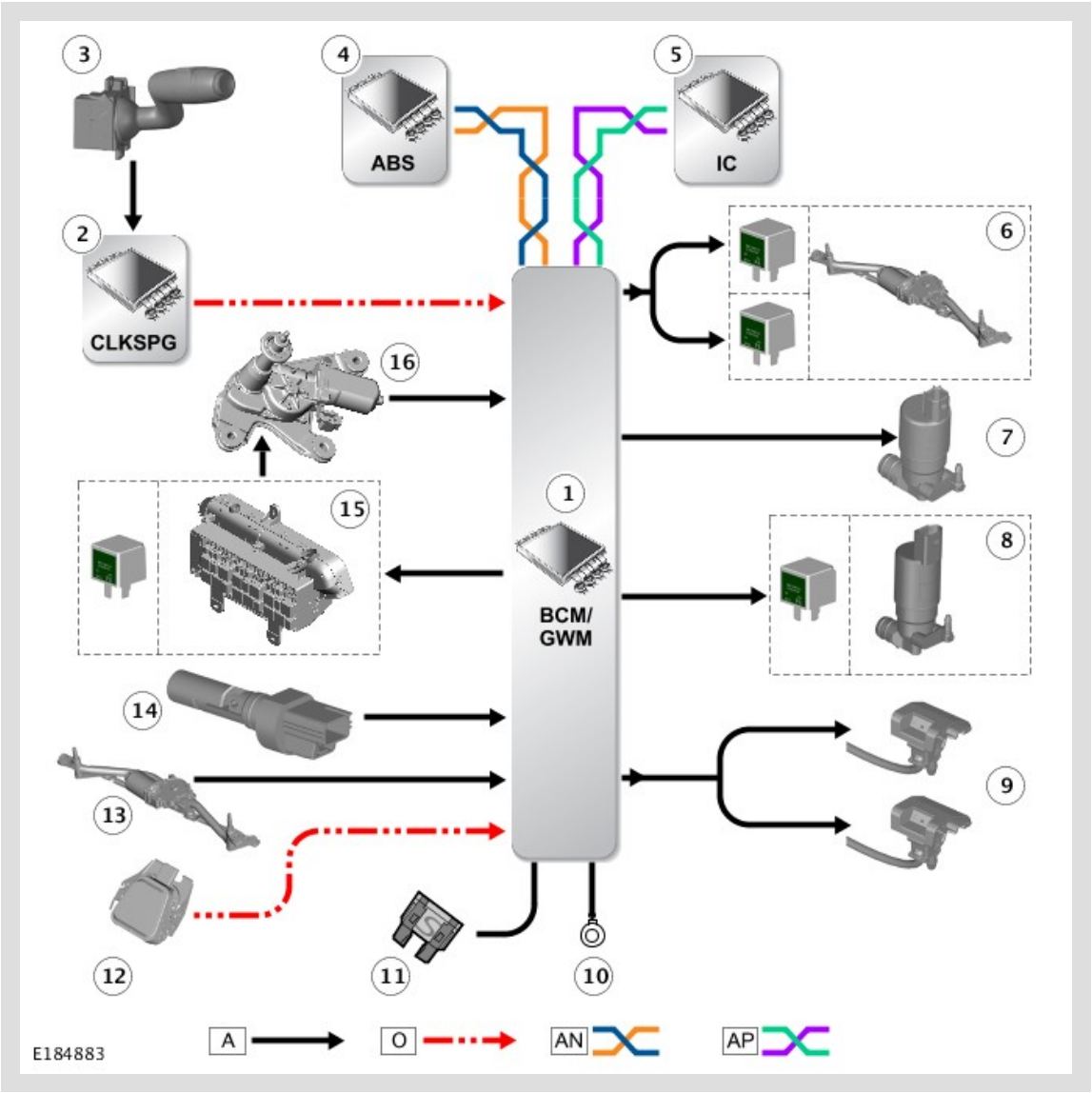
When the driver moves the wipers and washers control switch to the windshield wash position and the headlamps are 'ON', the BCM/GWM assembly provides a ground for the headlamp washer relay in the right EJB which supplies power to the headlamp washer motor.

If the washer fluid level becomes low, the BCM/GWM assembly suspends headlamp washer operation to preserve the remaining washer fluid.

WASHER FLUID LEVEL SENSOR (WHERE FITTED)

The washer fluid level sensor has a float with integral magnet which is connected to the BCM/GWM assembly via hardwired connection. The sensor has a contact, which is normally open when the windshield washer reservoir is full. When the washer fluid level reduces to approximately 1 liter, the magnetic float pivots down, and closes the switch contacts. The BCM/GWM assembly then sends a message to the IC (Instrument Cluster) via the MS CAN comfort systems bus, then the 'WASHER FLUID LOW' message is displayed in the IC message center.

CONTROL DIAGRAM



A = HARDWIRED; O = LOCAL INTERCONNECT NETWORK (LIN) BUS; AN = HIGH SPEED (HS) CONTROLLER AREA NETWORK (CAN) POWERTRAIN SYSTEMS BUS; AP = MEDIUM SPEED (MS) CAN COMFORT SYSTEMS BUS.

ITEM	DESCRIPTION
1	Body Control Module / Gateway Module (BCM/GWM) assembly
2	Steering wheel module
3	Wipers and washers control switch
4	Anti-lock Brake System (ABS) control module
5	Instrument Cluster (IC)
6	Windshield wiper motor
7	Windshield and rear window washer pump
8	Headlamp washer pump
9	Heated washer jets (where fitted)
10	Ground
11	Power feed - Passenger Junction Box (PJB)

12	Rain/light sensor
13	Windshield wiper motor-park signal
14	Washer fluid level sensor
15	Rear junction box (RJB)
16	Rear window wiper motor