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2020.0 DEFENDER (LE), 501-17

ROOF OPENING PANEL (G2342582)

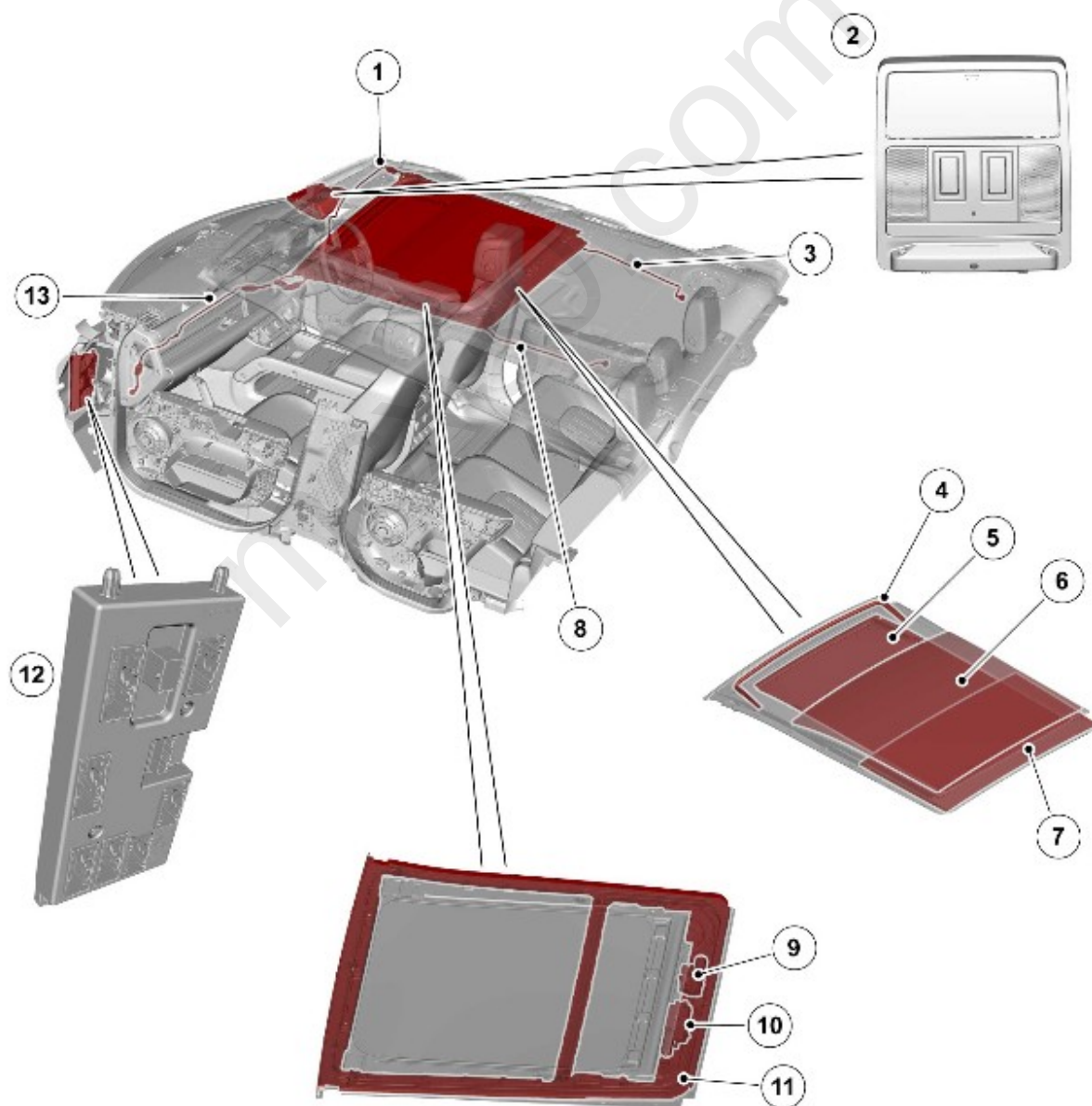
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COMPONENT LOCATION

COMPONENT LOCATION - 1 OF 2 - VEHICLE WITH SLIDING GLASS ROOF OPENING PANEL

 NOTES:

- Vehicle with 5 doors is shown, vehicle with 3 doors is similar.
- Right Hand Drive (RHD) is shown, Left Hand Drive (LHD) is similar.



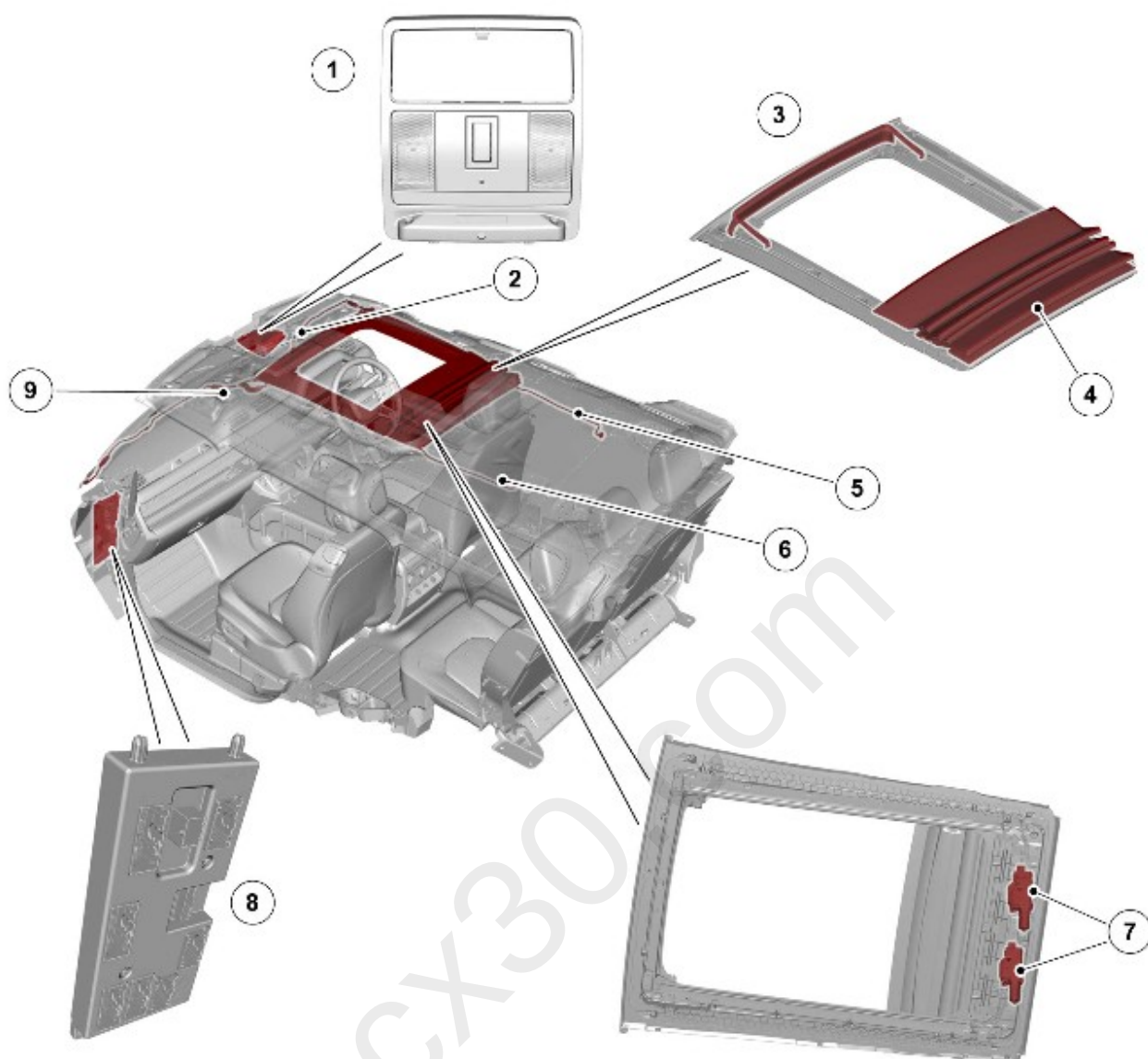
ITEM	DESCRIPTION
1	Roof opening panel drain hose - Front right
2	Front overhead console
3	Roof opening panel drain hose - Rear right
4	Roof opening panel air deflector
5	Roof opening panel blind
6	Roof opening panel glass - Front
7	Roof opening panel glass - Rear
8	Roof opening panel drain hose - Rear left
9	Motor - Roof opening panel glass
10	Motor - Roof opening panel blind
11	Roof opening panel frame
12	Body Control Module (BCM)/ Gateway Control Module (GWM)
13	Roof opening panel drain hose - Front left

COMPONENT LOCATION - 2 OF 2 - VEHICLE WITH SLIDING CANVAS ROOF OPENING PANEL



NOTES:

- RHD is shown, LHD is similar.
- The sliding canvas roof opening panel is only available on the 3 door vehicle.



E255142

ITEM	DESCRIPTION
1	Front overhead console
2	Roof opening panel drain hose - Front right
3	Roof opening panel air deflector
4	Roof opening panel - Canvas
5	Roof opening panel drain hose - Rear right
6	Roof opening panel drain hose - Rear left
7	Motor - Roof opening panel - Canvas (quantity 2)
8	BCM/ GWM

ITEM	DESCRIPTION
9	Roof opening panel drain hose - Front left

OVERVIEW

There are 2 options of roof opening panel:

- The sliding glass roof opening panel
- The sliding canvas roof opening panel.

When the vehicle is equipped with a sliding glass roof opening panel, the roof opening panel glass and roof opening panel blind are controlled by 2 switches. The 2 switches are located in the front overhead console. When the vehicle is equipped with a sliding canvas roof opening panel, the roof opening panel canvas is controlled by a single switch. The switch is located in the front overhead console.

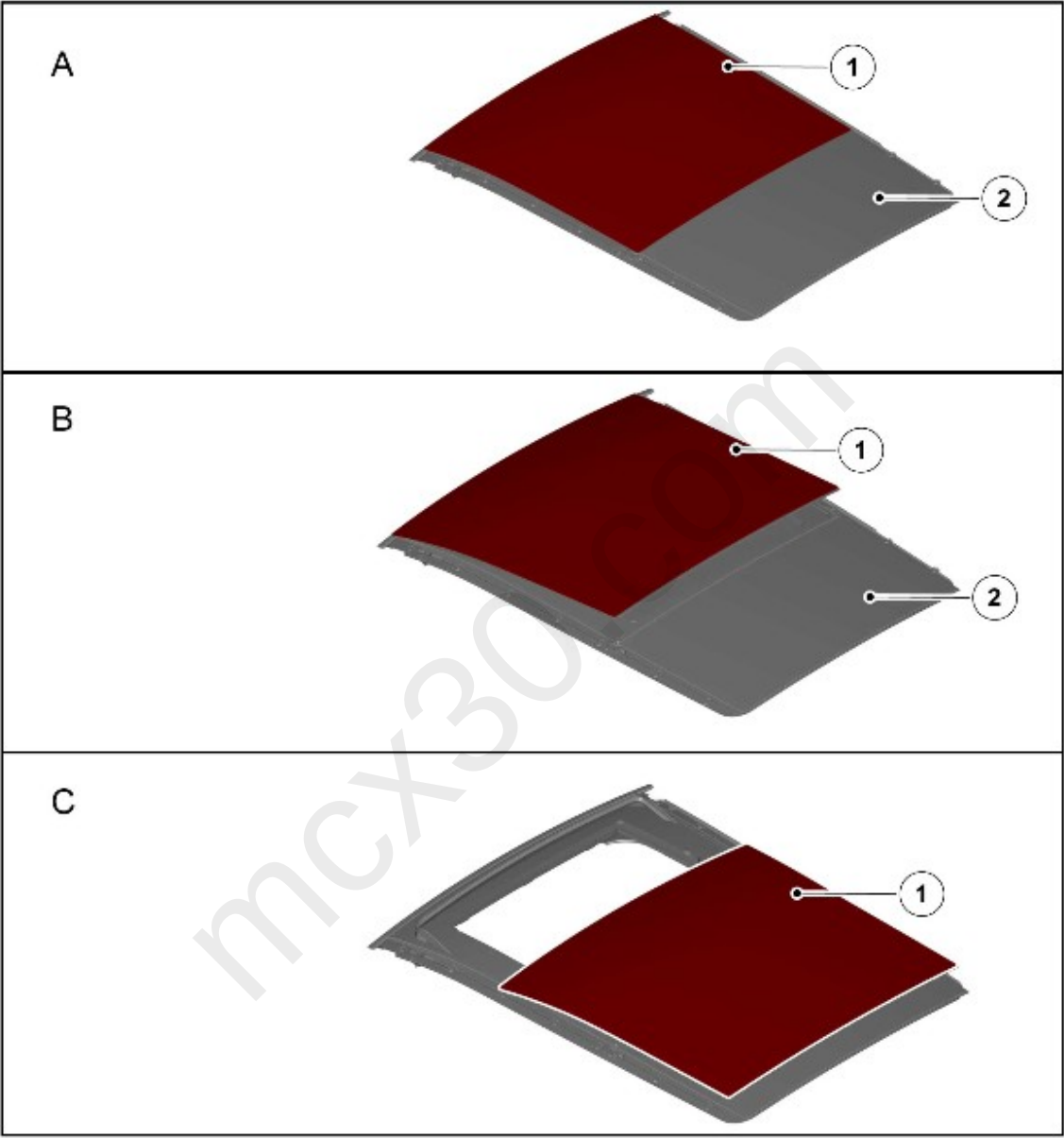
Electric motors are used to operate the roof opening panel glass, roof opening panel canvas and the roof opening panel blind.

A drain pipe is connected to each corner of the roof opening panel frame.

A roof opening panel air deflector is deployed when the roof opening panel glass or the canvas is open.

DESCRIPTION

ROOF OPENING PANEL - VEHICLE WITH SLIDING GLASS ROOF OPENING PANEL



E255143

ITEM	DESCRIPTION
A	Closed position
B	Tilted position
C	Open position
1	Roof opening panel glass - Front

ITEM	DESCRIPTION
2	Roof opening panel glass - Rear

The external surface of the roof opening panel comprises the following 2 elements:

- Roof opening panel glass - Front
- Roof opening panel glass - Rear.

The front roof opening panel glass and the rear roof opening panel glass are manufactured in a tinted laminated glass. Should the glass break it will remain attached to the plastic membrane, although small pieces of glass may enter the passenger compartment. The tinted glass provides a high degree of sunload protection allowing only 6.5% heat transmission into the vehicle and <1% ultraviolet light.

The roof opening panel features an electrically powered tilt and slide mechanism. On opening, the rear of the front roof opening panel glass tilts upwards before moving rearward.

Anti-trap mechanism

WARNING:

Before closing the roof opening panel, make sure that no occupants have any body part in a position where it could be trapped. Even with an anti-trap system, death or serious injury could occur.

NOTE:

Vehicle with a sliding canvas sunroof does not have an anti-trap system.

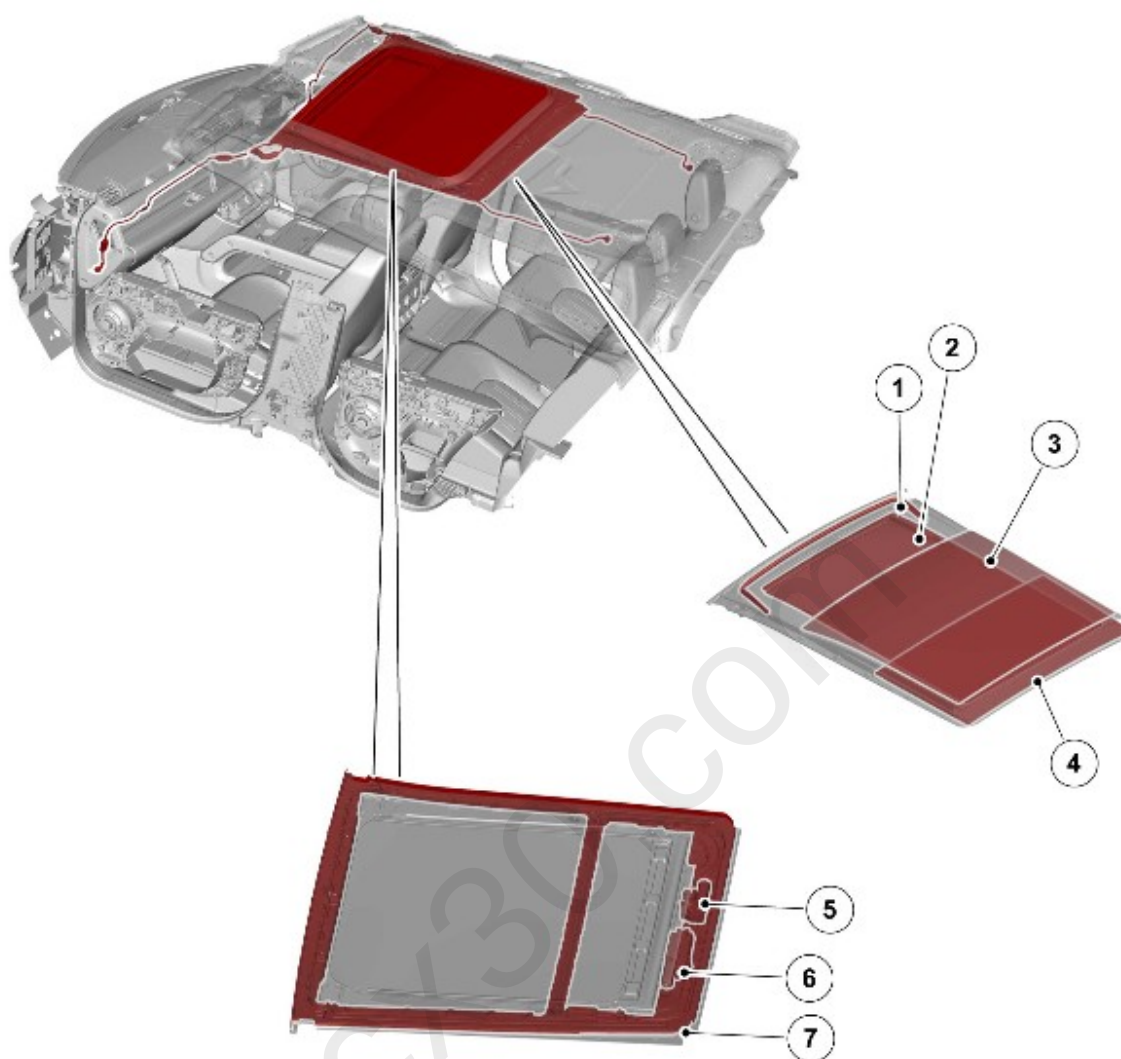
The roof opening panel glass and the roof opening panel blind have an anti-trap protection function which stops the panel closing when an obstruction is sensed. When an obstruction is sensed, the motor automatically retract the panel as far as possible to prevent serious injury or damage to the mechanism. When the obstruction is removed, you can close the panel by using the normal method. The anti-trap mechanism can be overridden to allow the roof to be closed when movement is restricted by dirt. To override the anti-trap, remove the dirt first then press and hold the front of the switch until the roof reaches the closed position.

ROOF OPENING PANEL ASSEMBLIES

Roof Opening Panel Assembly - Vehicle With Sliding Glass Roof Opening Panel

NOTES:

- Vehicle with 5 doors is shown, vehicle with 3 doors is similar.
- RHD is shown, LHD is similar.



E255144

ITEM	DESCRIPTION
1	Roof opening panel air deflector
2	Roof opening panel blind
3	Roof opening panel glass - Front
4	Roof opening panel glass - Rear
5	Motor - Roof opening panel glass
6	Motor - Roof opening panel blind
7	Roof opening panel frame

Vehicle with sliding glass has a master motor with control unit and a slave motor without control unit. The two motors are controlled by the switches located in the front overhead console. The master motor receives a power supply from the Passenger Junction Box (PJB) and communicates with the BCM/ GWM through Local Interconnect Network (LIN). The slave motor communicates with the master motor on hardwired connection. The roof opening panel glass and the roof opening panel blind are controlled by separated motors. The 2 motors can run at the same time depending on what function the roof is performing.

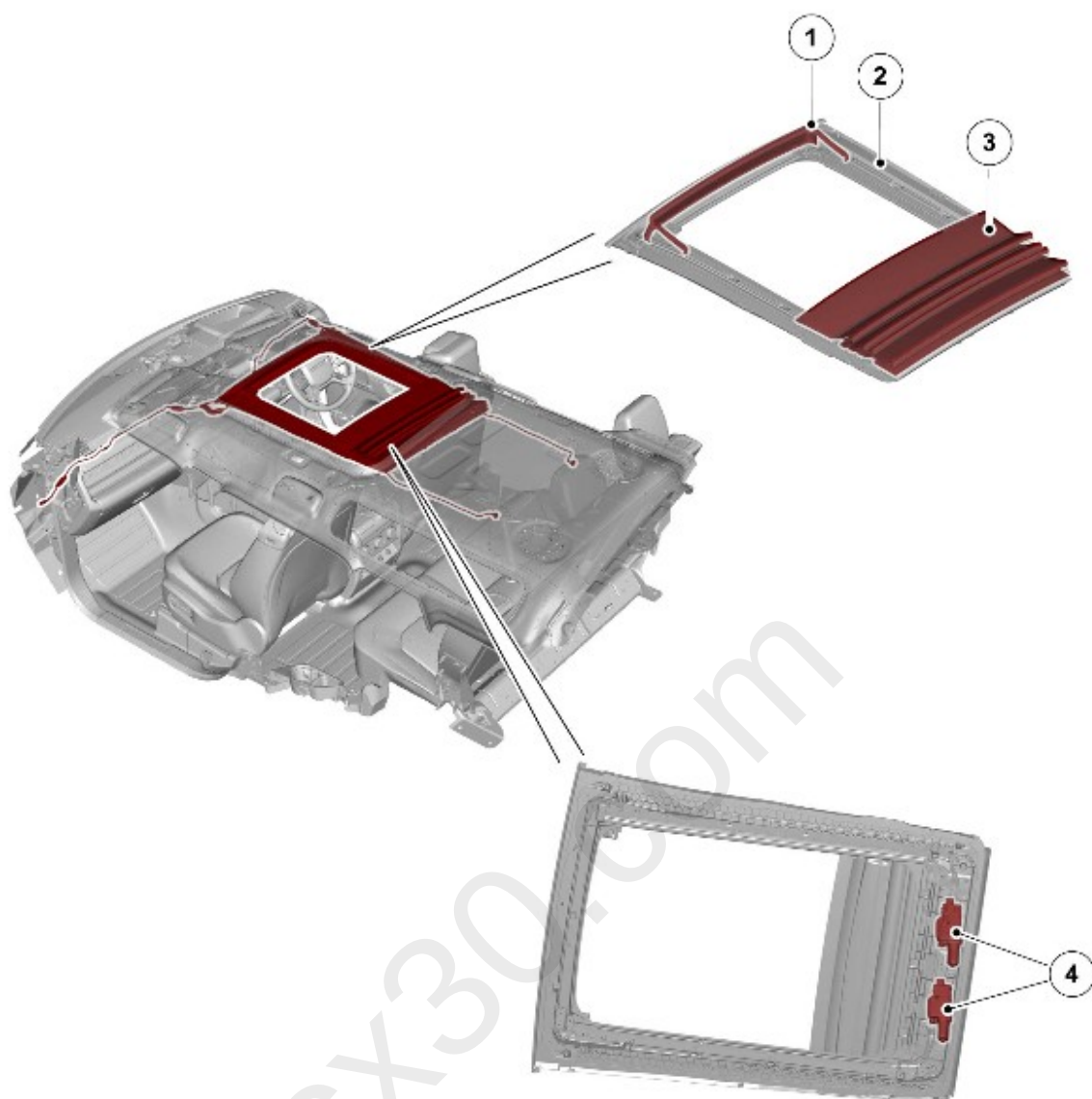
The motors have a thermal protection device manufactured into the control module software to protect them from overheating. The thermal protection is based on total operation time to calculate temperature through an algorithm. The motor thermal protection inhibits the motor function after a number of cycles, functionality returns in some minutes.

Roof Opening Panel Assembly - Vehicle With Sliding Canvas Roof Opening Panel



NOTES:

- RHD is shown, LHD is similar.
- Vehicle with a sliding canvas sunroof does not have an anti-trap system.
- The sliding canvas roof opening panel is only available on the 3 door vehicle.



E255145

ITEM	DESCRIPTION
1	Roof opening panel air deflector
2	Roof opening panel frame
3	Roof opening panel - Canvas
4	Motor - Roof opening panel - Canvas (quantity 2)

Vehicles with a sliding canvas roof have 2 electric motors. The 2 electric motors operate at the same time to open or close the sliding canvas roof mechanism. The 2 electric motors are controlled by a single switch located in the front overhead console. The 2 motors drive the same cables at the same time. If one of the motors is broken, the other one cannot drive the canvas roof by itself.

The 2 electric motors each receive a power supply from the PJB. The 2 electric motors communicate with the BCM/GWM through LIN.

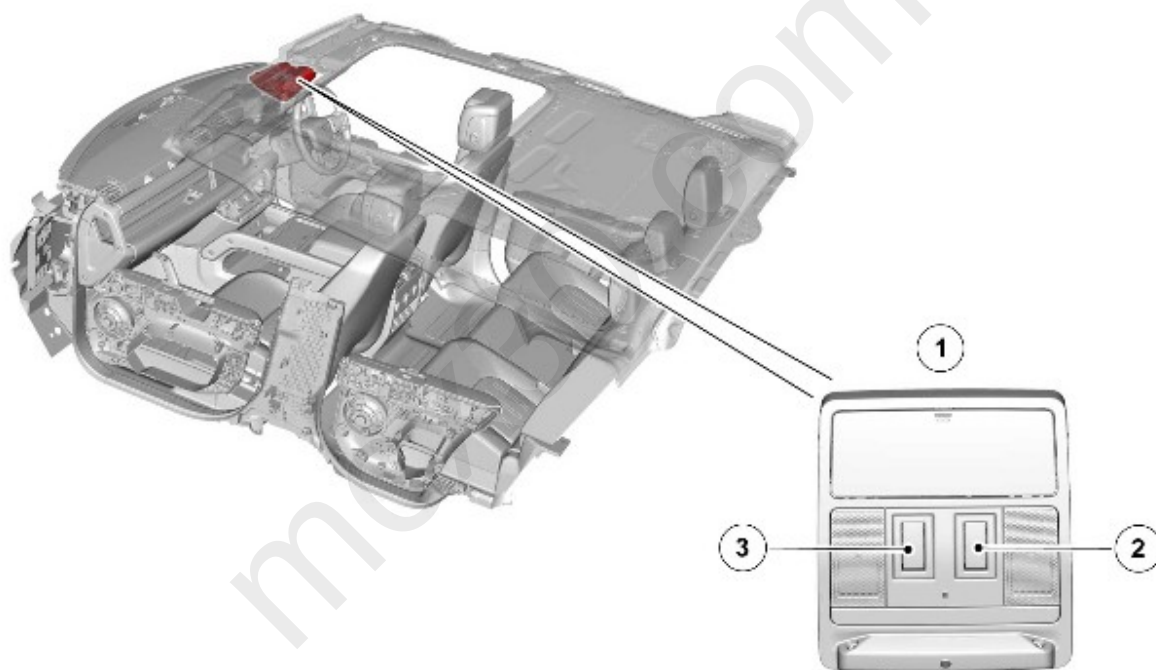
The 2 electric motors have a thermal protection device manufactured into the control module software to protect them from overheating. The thermal protection is based on total operation time to calculate temperature through an algorithm. The motor thermal protection inhibits the motor function after a number of cycles, functionality returns in some minutes.

CONTROL SWITCHES

Control Switches - Vehicle With Sliding Glass Roof Opening Panel

NOTES:

- Vehicle with 5 doors is shown, vehicle with 3 doors is similar.
- RHD is shown, LHD is similar.



E255146

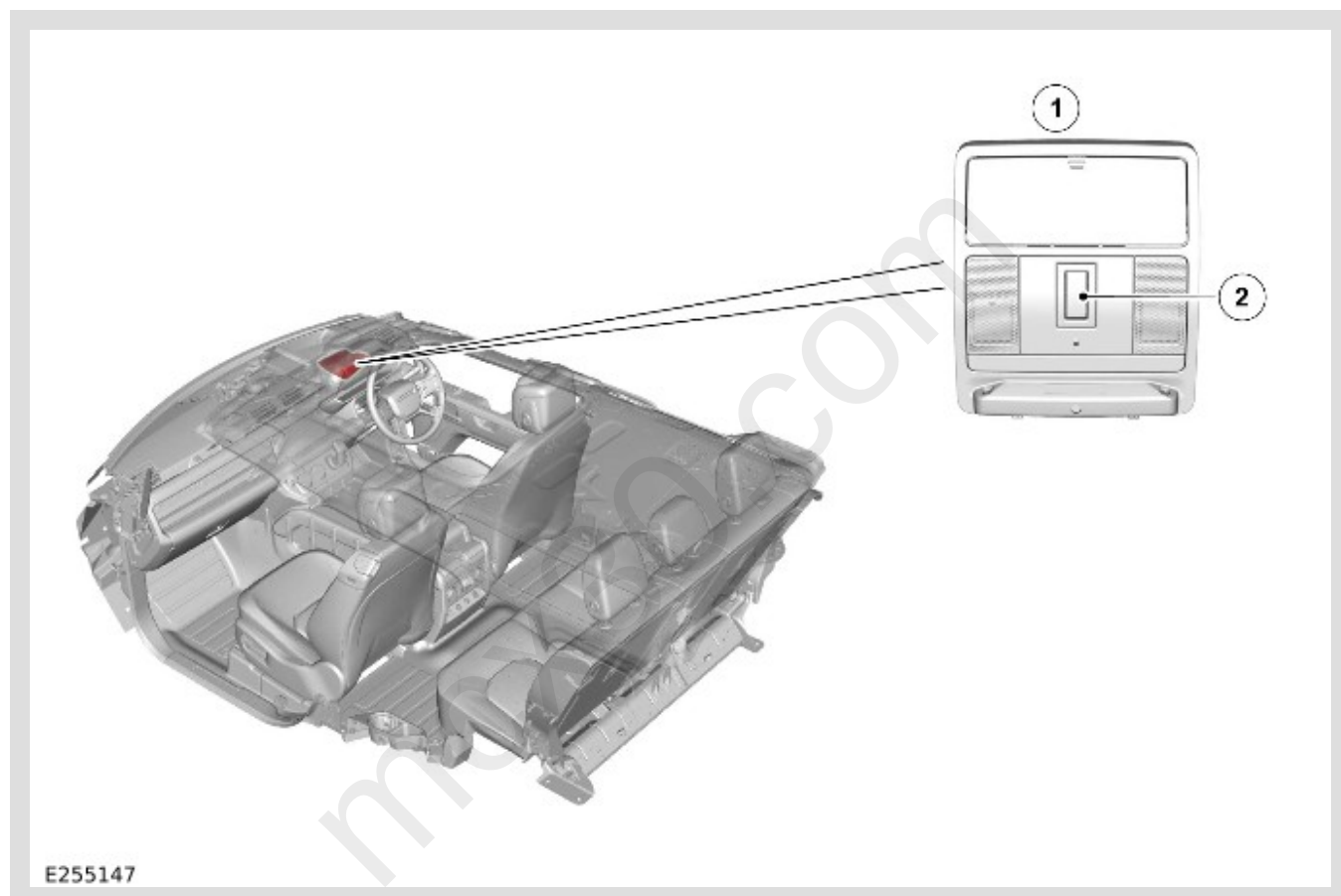
ITEM	DESCRIPTION
1	Front overhead console
2	Switch - Roof opening panel blind
3	Switch - Roof opening panel glass

The roof opening panel glass and the roof opening panel blind are operated through the separate 2-way rocker switch. The switches are located in the front overhead console. The switches receive a power supply from the BCM/ GWM. The switches transmit the signal to the motor on a hardwired connection.

Control Switch - Vehicle With Sliding Canvas Roof Opening Panel

NOTES:

- RHD is shown, LHD is similar.
- Vehicle with a sliding canvas sunroof does not have an anti-trap system.
- The sliding canvas roof opening panel is only available on the 3 door vehicle.



ITEM	DESCRIPTION
1	Front overhead console
2	Switch - Roof opening panel - Canvas

The roof opening panel canvas is operated through the 2-way rocker switch. The switch is located in the front overhead console. The switch receives a power supply from the BCM/ GWM. The switch transmits the signals to the motors on a hardwired connection.

RAISING AND OPENING THE ROOF OPENING PANEL GLASS – VEHICLES WITH SLIDING GLASS ROOF OPENING PANEL**NOTES:**

- The user can stop the roof opening panel glass from raising or opening at any point by pressing the switch again.
- When the roof opening panel blind is closed, pressing the roof opening panel glass switch also opens the blind when you open the roof opening panel glass.

Press and release the rear of the roof opening panel glass rocker switch to fully tilt the opening glass panel. Press and release the rear of the rocker switch again to fully open the roof opening panel glass. To tilt or open the panel to a particular position press and hold the rear of the switch. When the desired position is reached release the switch.

Alternatively, press fully and then release the rear of the rocker switch. This operation opens and tilts the roof opening panel glass to the fully raised position automatically. Press and then release the rear of the rocker switch again to move the roof opening panel glass to the fully open position.

LOWERING AND CLOSING THE ROOF OPENING PANEL GLASS – VEHICLE WITH SLIDING GLASS ROOF OPENING PANEL**NOTE:**

The user can stop the roof opening panel glass from lowering or closing at any point by pressing the switch again.

Lightly press and hold the front of the roof opening panel rocker switch to lower or close the roof panel to the desired position. Press and hold the rear of the switch again to partially or fully close the roof opening panel glass.

Alternatively, press fully and then release the front of the rocker switch. This operation lowers the roof opening panel glass to the fully lowered position automatically. Press and then release the front of the rocker switch again to move the roof opening panel glass to the fully closed position.

OPENING AND CLOSING THE ROOF OPENING PANEL BLIND – VEHICLE WITH SLIDING GLASS ROOF OPENING PANEL

A blind is integrated into the roof opening panel blind support bracket. The roof opening panel blind operates when the roof opening panel glass is in either the tilted, open or closed position. When the roof opening panel glass opens (slides rearward) the blind automatically slides rearward. The roof blind cannot be moved forward until the roof glass is moved forward.

The operating switch for the roof opening panel blind operates in the same way as the switch for the roof opening panel glass.

When the roof opening panel glass is partially closed, then the blind only partially closes to the same position as the panel.

When the blind encounters a resistance when closing, it stops and then (depending on its current position) it either partially or fully opens. This allows you to remove the obstruction to either prevent personal injury or damage to the mechanism. Press or hold the front of the switch, within 10 seconds of the partial or full opening, to override.

ROOF OPENING PANEL GLASS RESETTING – VEHICLE WITH SLIDING GLASS ROOF OPENING PANEL

The roof opening panel control module has a non-volatile memory. When the power supply to the module is lost, the roof opening panel glass and roof opening panel blind positions are retained and the one-touch feature does not require re-initializing. However, due to the software condition, when the power supply to the control module is interrupted while the ignition is ON, the one-touch feature must be re-initialized.

When the power supply is restored, reset the roof mechanism as follows:

- 1** Switch the ignition ON.
- 2** Make sure that the roof opening panel glass is in the fully closed position.
- 3** Press the front of the roof opening panel glass switch and hold it for 10 seconds. Do not release the switch during the calibration sequence.
- 4** The calibration sequence starts after 10 seconds in the following order:
 - The roof opening panel blind moves to the fully open position.
 - The roof opening panel glass moves to the fully open position, then moves back to fully closed.
 - The roof opening panel blind moves to the fully closed position.
- 5** Release the switch.
- 6** The roof opening panel blind and the roof opening panel glass can now be operated as normal.

The open/close cycle during the calibration sequence takes about 30 - 40 seconds.

AUTOMATIC ROOF BLIND

The automatic roof blind feature automatically closes the roof blind at the end of a journey, when the vehicle is locked. This improves customer comfort and reduces energy usage of the Air Conditioning (A/C) system as it lowers the passenger compartment temperature.

The operation of the automatic roof blind can be enabled or disabled through the Touch Screen (FCDIM). When the operation is set to 'Manual', the automatic roof blind operation is disabled and can only be operated by the roof blind switch.

When 'Auto' is selected on the FCDIM, the roof blind automatically closes when the vehicle is locked. At next ignition cycle the roof blind reverts to the previously set position when the driver starts the engine. Operation of the roof blind switch automatically cancels the automatic roof blind function. If the roof blind is already closed when the vehicle is locked, it will not open automatically at the next ignition cycle.

OPENING AND CLOSING THE SLIDING CANVAS



NOTES:

- The sliding canvas roof opening panel is only available on the 3 door vehicle.

- Operation of the sliding canvas roof is not recommended in temperatures below -10°C. Damage may occur when the canvas roof is operated below -10°C.

With the sliding canvas roof closed, press the rear of the switch to partially or fully open the sliding canvas roof. Lightly press and hold to manually operate to the required position. Alternatively, press fully and release for one-touch operation. One-touch operation can be halted at any time by pressing the switch again.

With the sliding canvas roof open, press the front of the switch to partially close the sliding canvas roof. Press and hold the front of the switch to fully close the sliding canvas roof. The one-touch operation does not fully close the sliding canvas roof. The canvas roof stops 150-200mm away from the final closing position during one-touch operation. The final travel is done by keeping the switch pushed continuously until the canvas roof reached the fully closed position.

ROOF OPENING PANEL MOTOR

The roof opening panel motor has a worm drive which drives a gear in the cast housing attached to the end of the motor. The gear has a small pinion gear attached to the outer part of its spindle. The pinion engages with 2 cables to form a rack and pinion drive. Rotation of the motor turns the pinion which in turn drives the cables in the required direction.

The 2 cables are attached either side of the pinion. One end of each cable is attached to the guide. The opposite end of each cable is held in position on the pinion by a metal insert in the frame. The cables run in channels in the panel frame to the guides. As the panel is closed the cables are pushed through channels in the front of the frame. The displaced cable is guided into a further 2 channels in the frame, which protect the cable and prevent it from snagging. The cables are manufactured from rigid spring steel, which can pull as well as push the panel along the guides.

The roof opening panel motor contains a microswitch and hall effect sensor. Signals received from these components enable the control module to calculate the exact position of the roof opening panel. The hall effect sensor is also responsible for the operation of the anti-trap protection function.



NOTE:

Vehicle with a sliding canvas sunroof does not have an anti-trap system.

When the anti-trap protection feature is activated while the roof opening panel is closing, the panel is reversed for 200 mm or as far as possible. The hall effect sensor, located in the motor, monitors the speed of the motor. When the speed decreases below a set threshold, indicating an obstruction, the power feed to the motor is reversed so the panel goes back. In an emergency the anti-trap protection function can be overridden by holding the switch in the closed position.

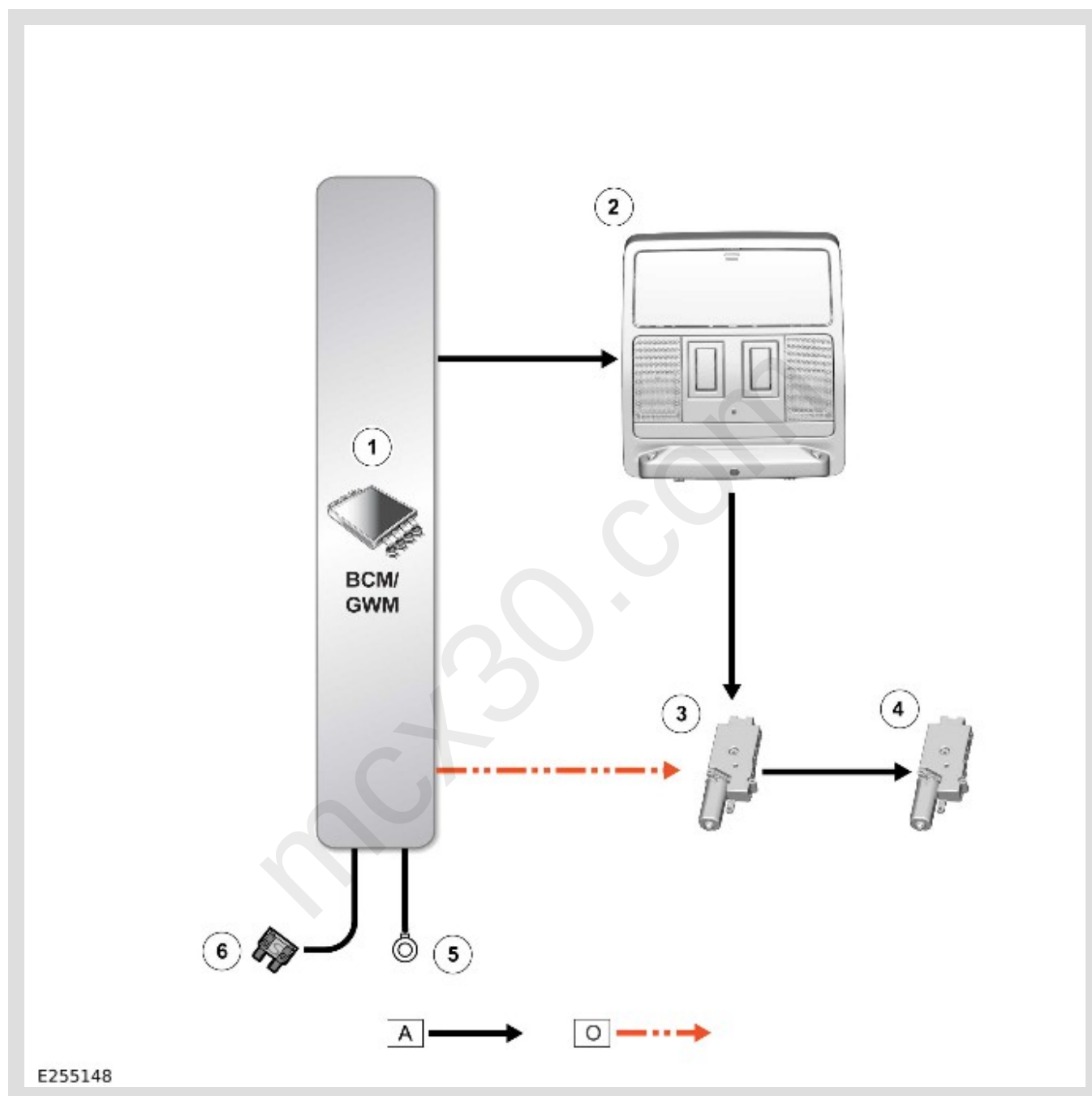
DIAGNOSTICS

The BCM/ GWM records any Diagnostic Trouble Code(s) (DTC) and related data. Read the DTC and related data with the Jaguar Land Rover (JLR) approved diagnostic equipment.

The JLR approved diagnostic equipment can read live data and activate certain components.

CONTROL DIAGRAM

CONTROL DIAGRAM - 1 OF 2 - VEHICLES WITH SLIDING GLASS ROOF OPENING PANEL

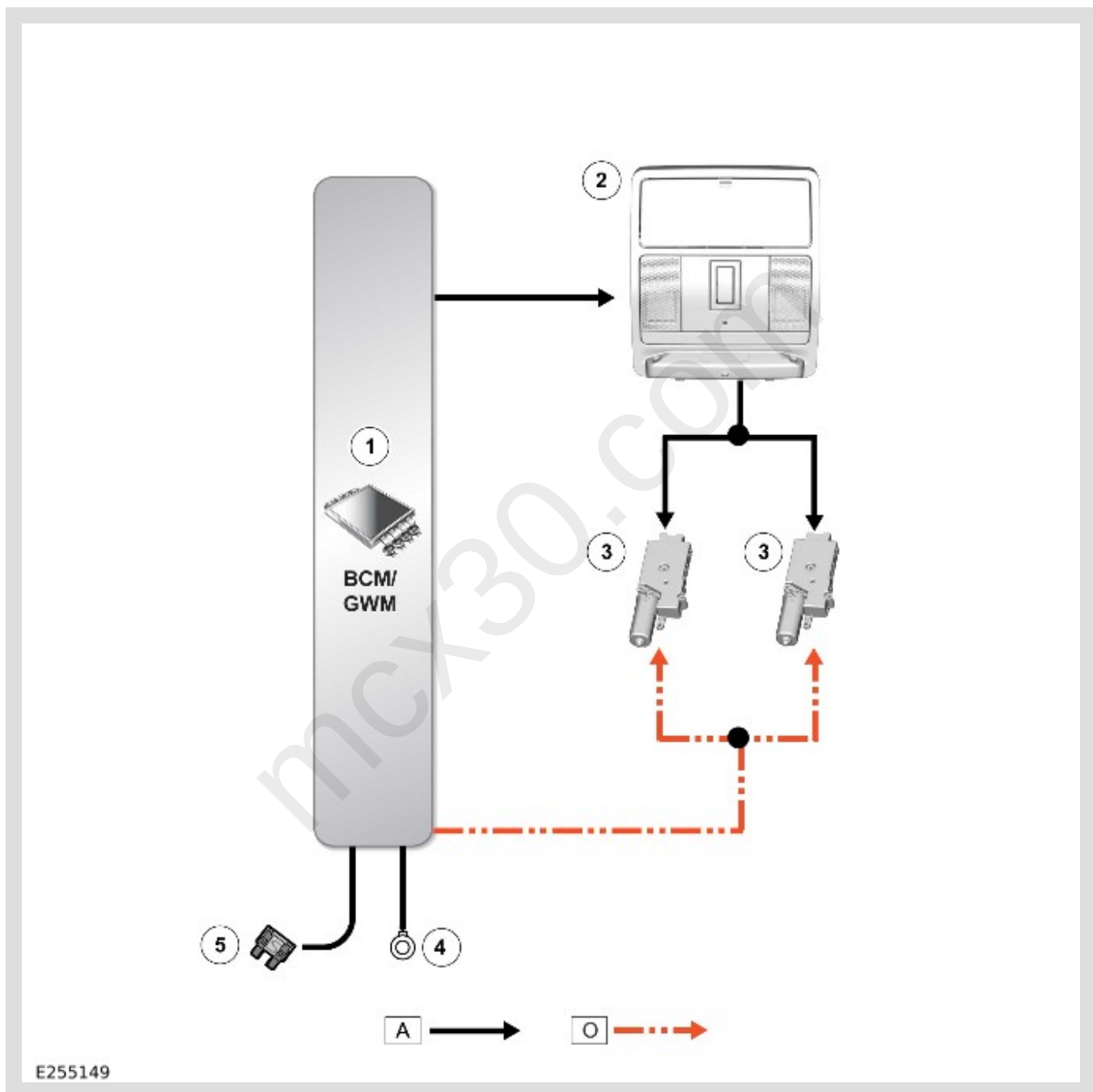


A = HARDWIRE: O = LIN.

ITEM	DESCRIPTION
1	BCM/ GWM
2	Switches - Front overhead console
3	Master motor

ITEM	DESCRIPTION
4	Slave motor
5	Ground
6	Power supply

CONTROL DIAGRAM - 2 OF 2 - VEHICLE WITH SLIDING CANVAS ROOF OPENING PANEL



A = HARDWIRE: O = LIN.

ITEM	DESCRIPTION
1	BCM/ GWM

ITEM	DESCRIPTION
2	Switch - Front overhead console
3	Motor - Roof opening panel - Canvas (quantity 2)
4	Ground
5	Power supply

cmjjaGFyZG1vcnRvbjsyMDIwLTASLTc4VDEzOjIzOjI3LjEEXOfOTAuMTk5LjEyMS4xMTc7

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