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2020.0 DEFENDER (LE), 501-20A

# SEATBELT SYSTEM (G2342583)

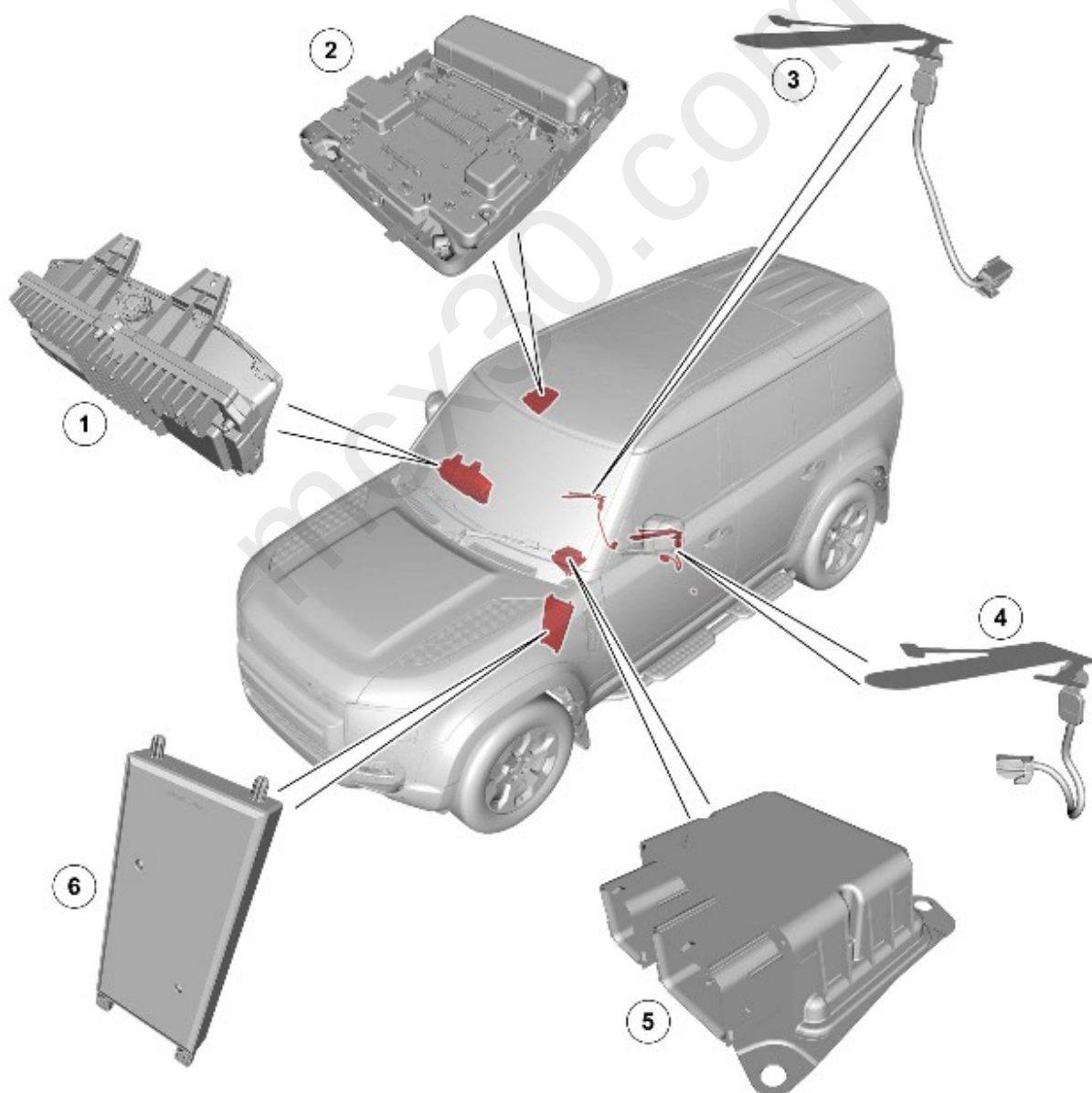
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## COMPONENT LOCATION

## COMPONENT LOCATION - 1 OF 7 - ALL MARKET EXCEPT NORTH AMERICAN SPECIFICATION VEHICLES

 NOTES:

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



| ITEM | DESCRIPTION                                             |
|------|---------------------------------------------------------|
| 1    | Instrument Panel Cluster (IPC)                          |
| 2    | Front overhead console                                  |
| 3    | Front row occupant detection sensor - Center            |
| 4    | Front row occupant detection sensor - Passenger         |
| 5    | Restraints Control Module (RCM)                         |
| 6    | Body Control Module (BCM)/ Gateway Control Module (GWM) |

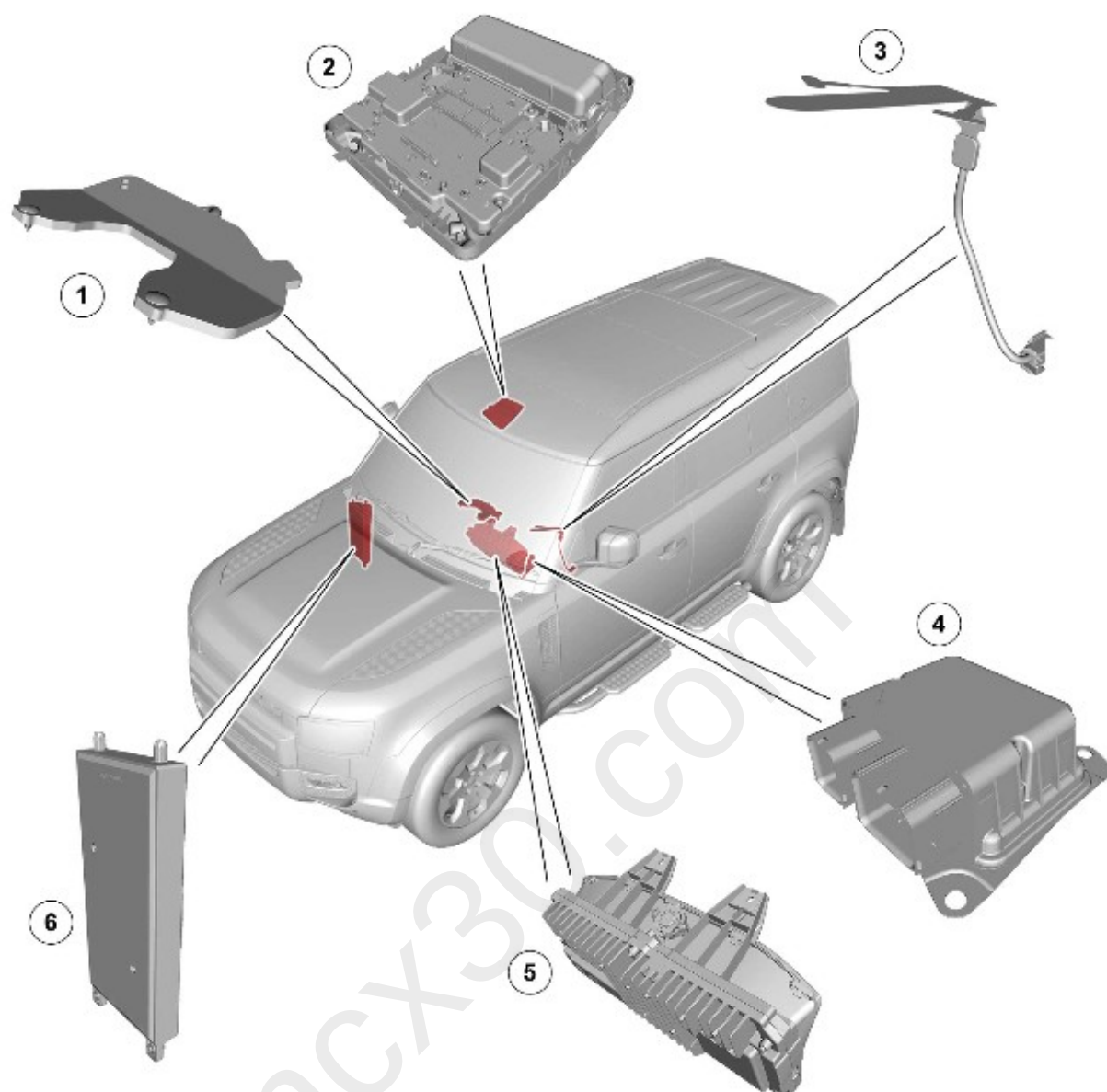
#### COMPONENT LOCATION - 2 OF 7 - NORTH AMERICAN SPECIFICATION VEHICLES ONLY



#### NOTE:

Vehicle with 5 doors is shown, vehicle with 3 doors is similar.

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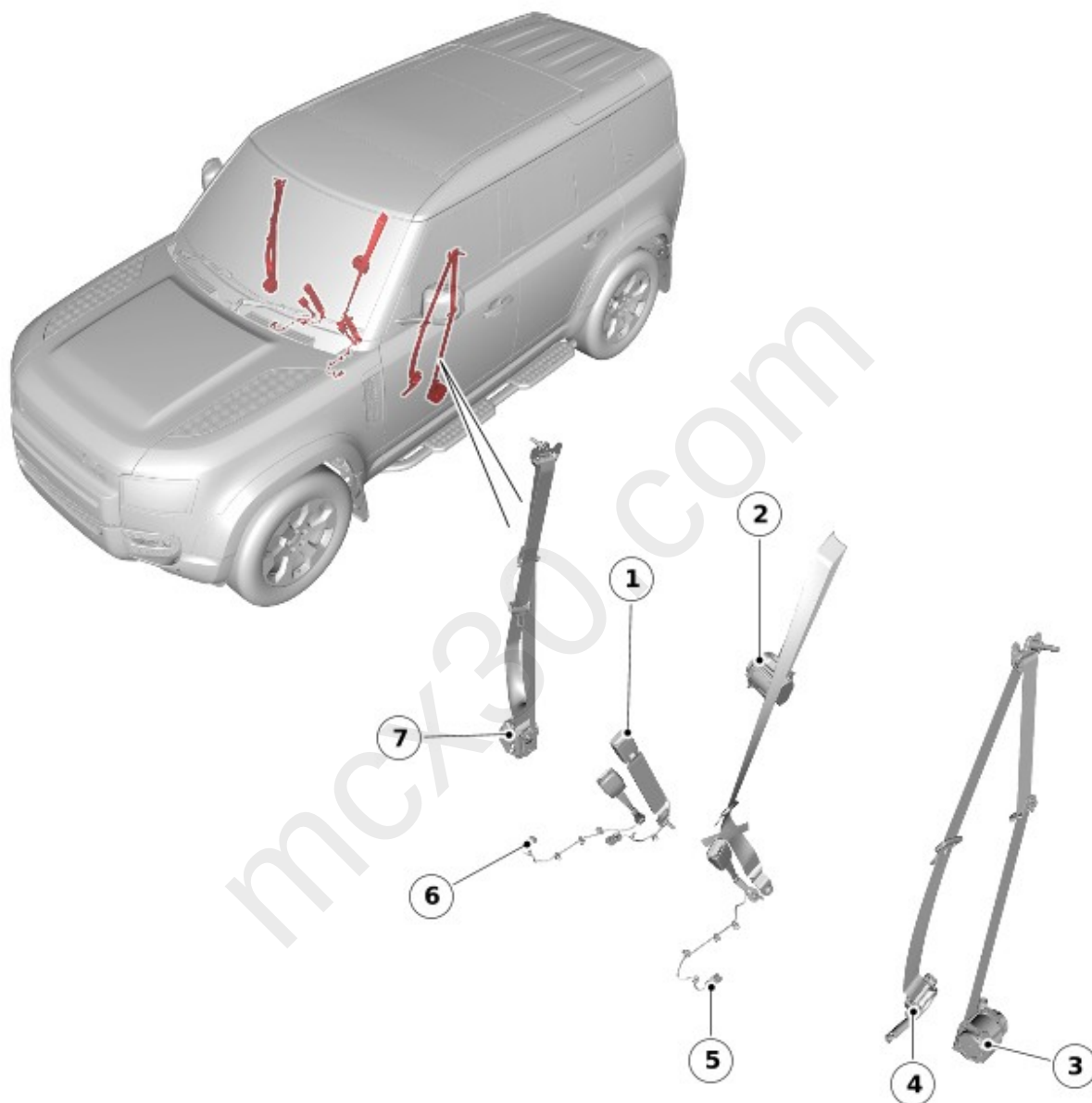
E251747

| ITEM | DESCRIPTION                                                                                            |
|------|--------------------------------------------------------------------------------------------------------|
| 1    | Occupant Classification Sensor Control Module (OCS) - North American Specification (NAS) vehicles only |
| 2    | Front overhead console                                                                                 |
| 3    | Front row occupant detection sensor - Center                                                           |
| 4    | RCM                                                                                                    |
| 5    | IPC                                                                                                    |
| 6    | BCM/ GWM                                                                                               |

## COMPONENT LOCATION - 3 OF 7 - THE FRONT ROW SEATBELTS

### NOTE:

Vehicle with 5 doors is shown, vehicle with 3 doors is similar.

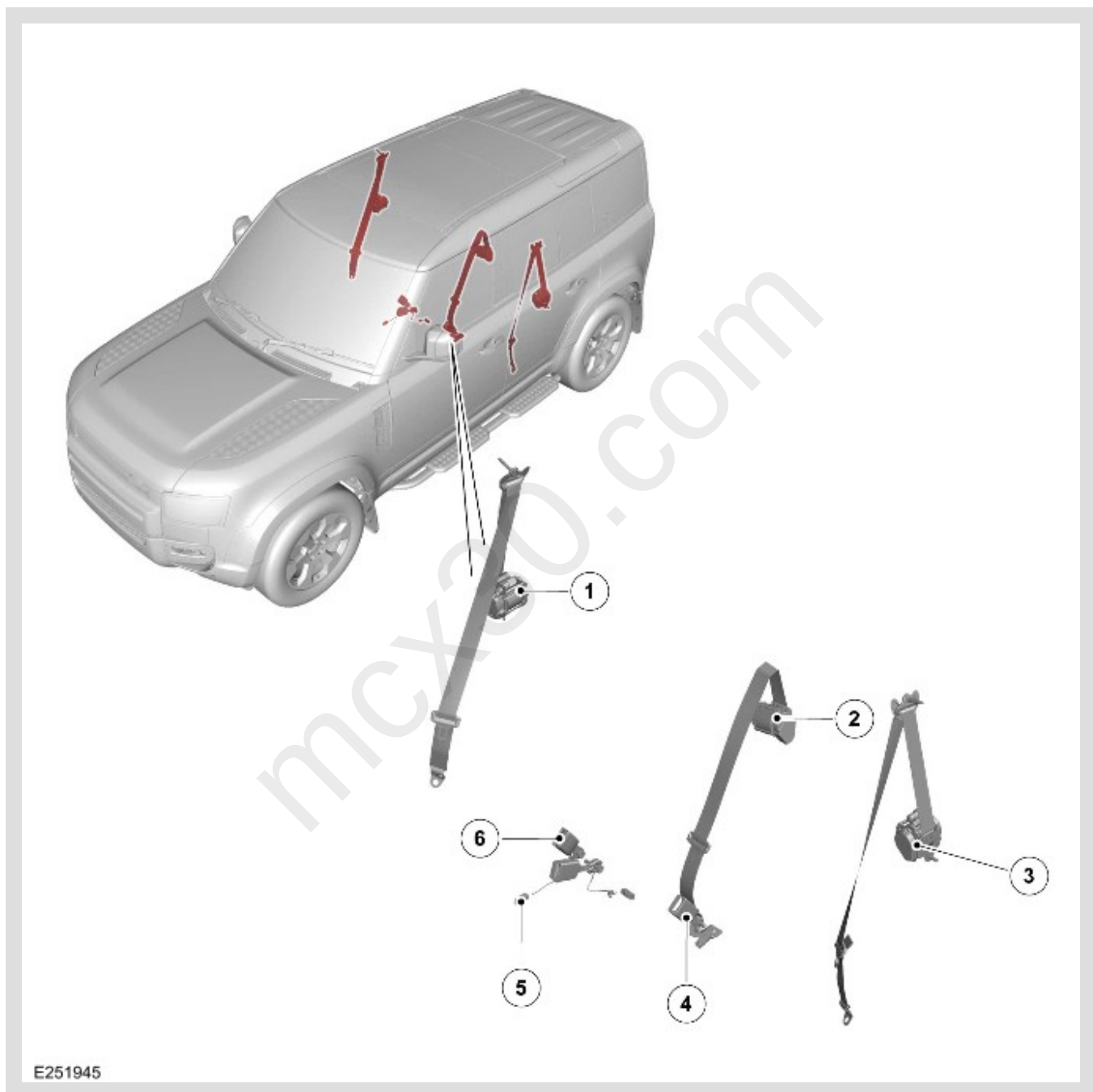


E251748

| ITEM | DESCRIPTION                                        |
|------|----------------------------------------------------|
| 1    | Front row seatbelt buckle - Center                 |
| 2    | Front row seatbelt retractor pretensioner - Center |
| 3    | Front row seatbelt retractor pretensioner - Left   |
| 4    | Seatbelt pretensioner - Left - NAS only            |

| ITEM | DESCRIPTION                                       |
|------|---------------------------------------------------|
| 5    | Front row seatbelt buckle - Left                  |
| 6    | Front row seatbelt buckle - Right                 |
| 7    | Front row seatbelt retractor pretensioner - Right |

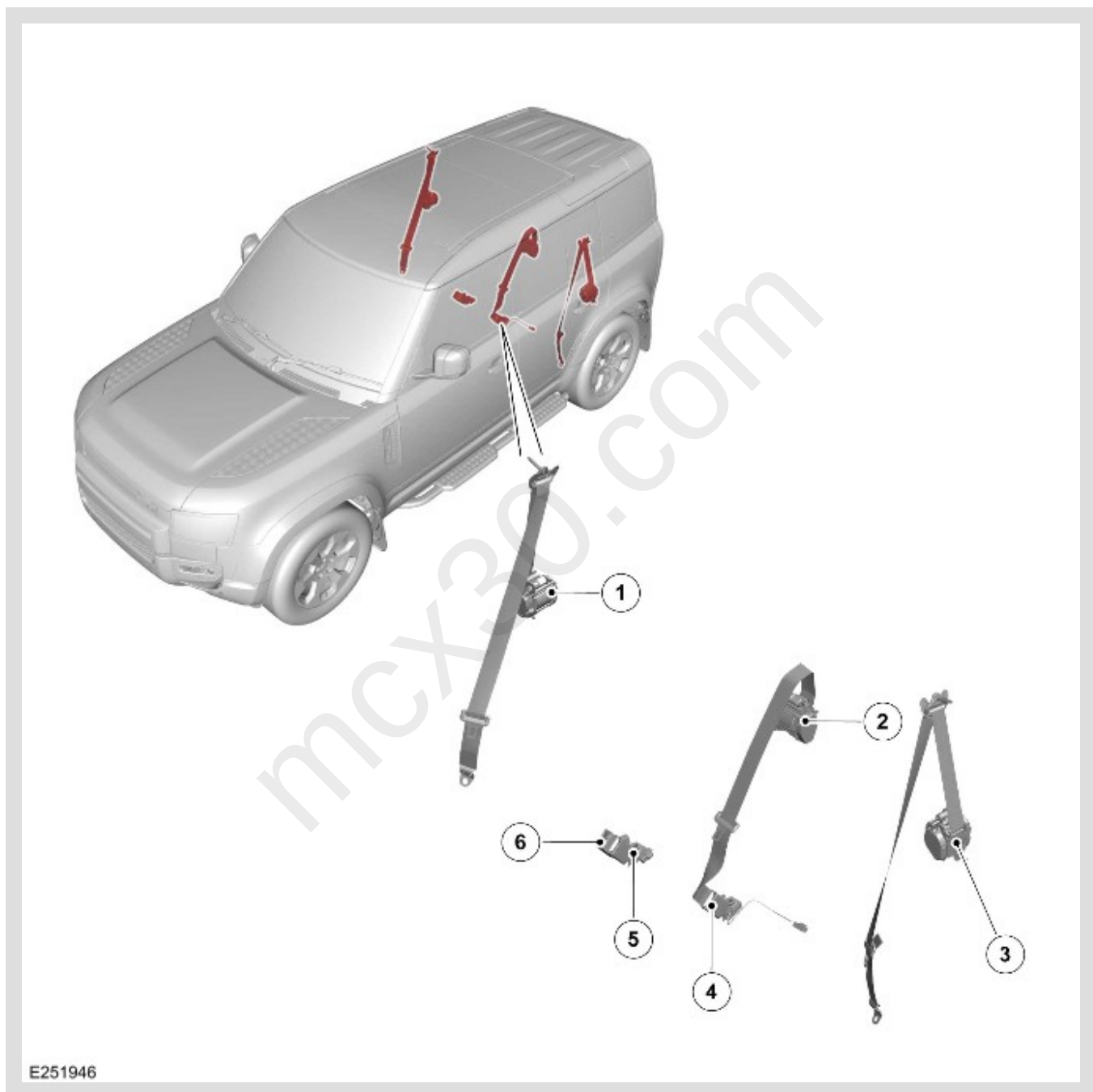
#### COMPONENT LOCATION - 4 OF 7 - THE SECOND ROW MOVEABLE SEAT WITH 5 DOORS



| ITEM | DESCRIPTION                                        |
|------|----------------------------------------------------|
| 1    | Second row seatbelt retractor pretensioner - Right |
| 2    | Second row seatbelt retractor - Center             |
| 3    | Second row seatbelt retractor pretensioner - Left  |

| ITEM | DESCRIPTION                         |
|------|-------------------------------------|
| 4    | Second row seatbelt buckle - Left   |
| 5    | Second row seatbelt buckle - Center |
| 6    | Second row seatbelt buckle - Right  |

**COMPONENT LOCATION - 5 OF 7 - SEATBELTS OF THE SECOND ROW FIXED SEAT WITH 5 DOORS - 6 SEAT**

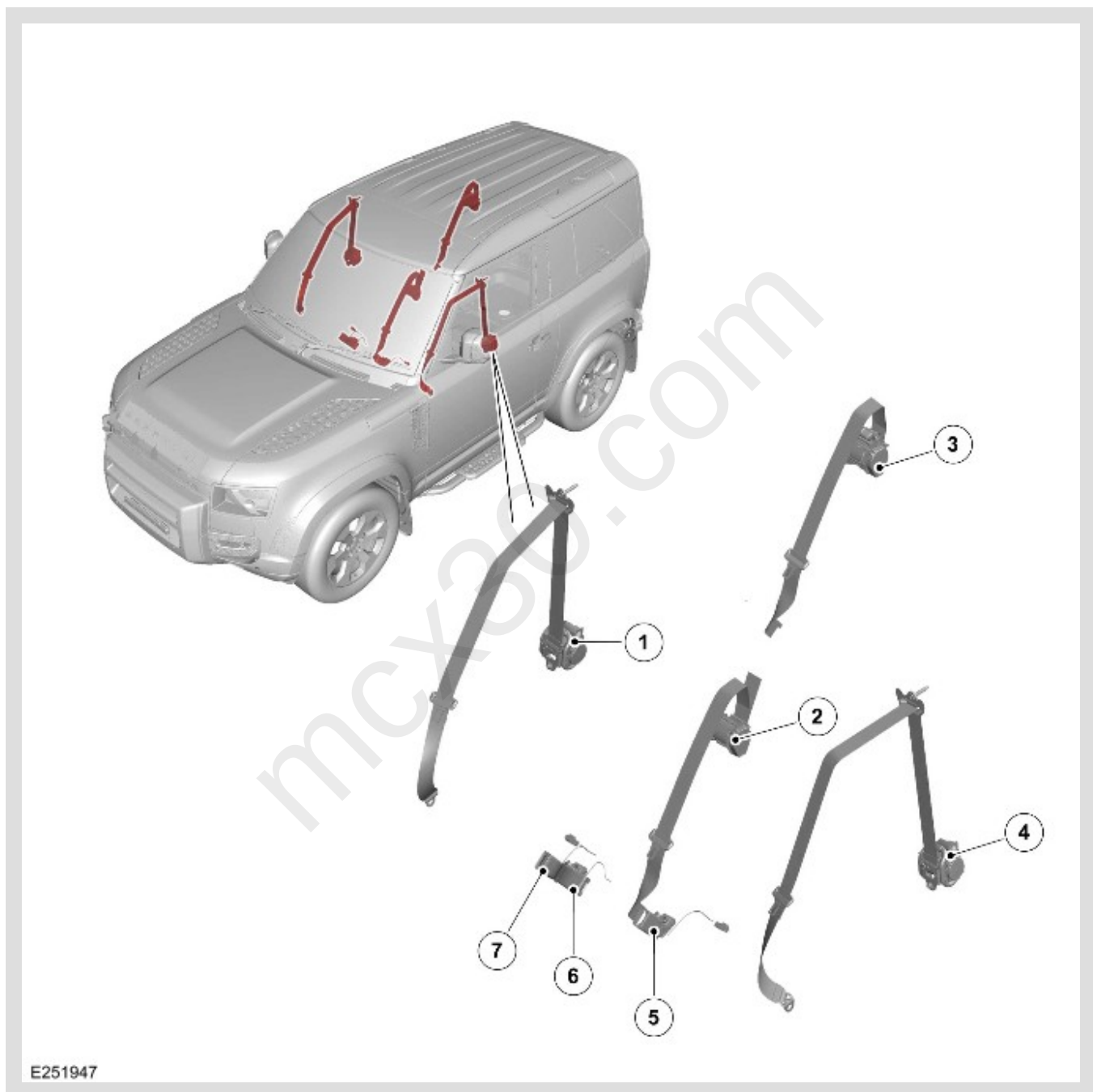


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| ITEM | DESCRIPTION                                        |
|------|----------------------------------------------------|
| 1    | Second row seatbelt retractor pretensioner - Right |
| 2    | Second row seatbelt retractor - Center             |
| 3    | Second row seatbelt retractor pretensioner - Left  |

| ITEM | DESCRIPTION                         |
|------|-------------------------------------|
| 4    | Second row seatbelt buckle - Left   |
| 5    | Second row seatbelt buckle - Center |
| 6    | Second row seatbelt buckle - Right  |

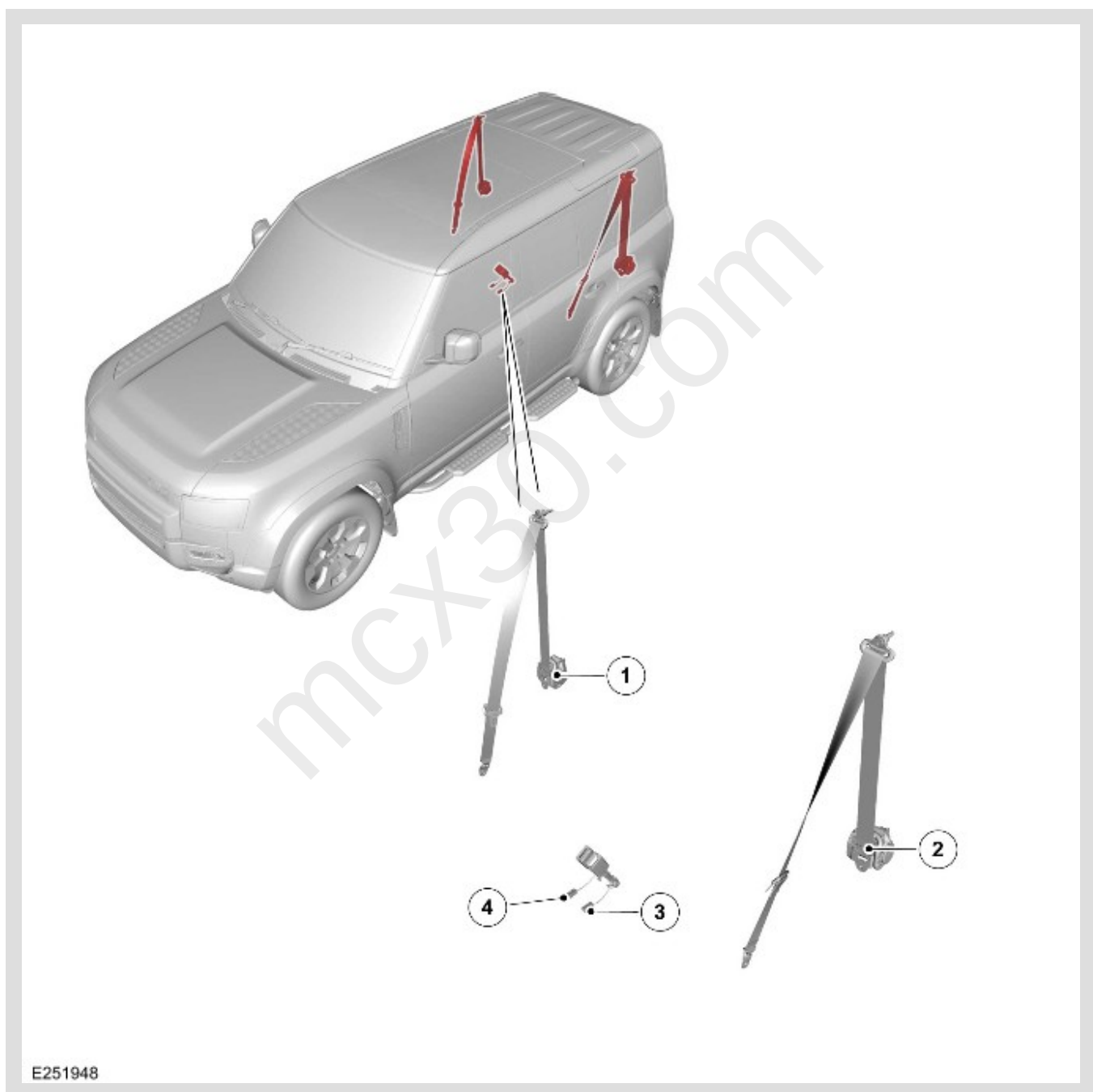
#### COMPONENT LOCATION - 6 OF 7 - SEATBELTS OF THE SECOND ROW FIXED SEAT WITH 3 DOORS



| ITEM | DESCRIPTION                                                  |
|------|--------------------------------------------------------------|
| 1    | Second row seatbelt retractor pretensioner - Right           |
| 2    | Second row seatbelt retractor without pretensioner - Center  |
| 3    | Second row seatbelt retractor pretensioner - Center (6 seat) |

| ITEM | DESCRIPTION                                       |
|------|---------------------------------------------------|
| 4    | Second row seatbelt retractor pretensioner - Left |
| 5    | Second row seatbelt buckle - Left                 |
| 6    | Second row seatbelt buckle - Center               |
| 7    | Second row seatbelt buckle - Right                |

#### COMPONENT LOCATION - 7 OF 7 - THIRD ROW SEATBELTS



| ITEM | DESCRIPTION                                       |
|------|---------------------------------------------------|
| 1    | Third row seatbelt retractor pretensioner - Right |
| 2    | Third row seatbelt retractor pretensioner - Left  |

| ITEM | DESCRIPTION                       |
|------|-----------------------------------|
| 3    | Third row seatbelt buckle - Left  |
| 4    | Third row seatbelt buckle - Right |

## OVERVIEW

There is a 3 point seatbelt installed at each seat position. Each seatbelt has an emergency locking retractor functionality.

The emergency locking retractor function incorporates a lift shaft locking system with webbing sensor and vehicle sensing activating mechanisms. The webbing sensor activates the locking mechanism when the webbing is subjected to a sharp pull. The webbing sensor activates the locking system when the vehicle is subjected to sudden deceleration or severe tilt angle.

A pretensioner is incorporated into the retractors of the front row seatbelts, the outer second row seatbelts and the third row seatbelts (if equipped). The pretensioners are pyrotechnic devices that are controlled by the RCM in the Supplementary Restraint System (SRS).

- For additional information, refer to: [Airbag and Safety Belt Pretensioner Supplemental Restraint System - \[+\] Vehicles with 2nd / 3rd Row Seats](#) (501-20B Supplementary Restraint System, Description and Operation).
- For additional information, refer to: [Airbag and Safety Belt Pretensioner Supplemental Restraint System - \[+\] Front Row Seats Only](#) (501-20B Supplementary Restraint System, Description and Operation).

There are 2 types of occupant monitoring:

- In all markets except NAS market, vehicles have an occupant detection sensor.
- In NAS markets, vehicles have an OCS and passenger seat include an occupant detection sensor.

Depending on vehicle specification and market, the seatbelts may also have:

- An automatic locking retractor equipped to all passenger seats (NAS market vehicles).
- A seatbelt pretensioner assembly incorporated into the anchor of the driver seatbelt (NAS and Europe market vehicles).
- A pretensioner incorporated into the anchor of the passenger seatbelt (NAS market vehicles).
- A load limiter actuator incorporated into the retractor of the second row seatbelt and third row seatbelt (if equipped).

A seatbelt reminder system warns the driver when 1 of the following occurs:

- The seatbelt of an occupied front row seat is not fastened.
- A front or rear seatbelt is unfastened during the trip.

## North American Specification Market Vehicles

In NAS market, vehicles are equipped with the occupant classification sensor system.

Where an automatic locking retractor is activated, no further webbing can be drawn from the seatbelt retractor, prior to disengagement of the automatic locking. The feature can be mistaken as a jammed seatbelt retractor.

- For additional information, refer to: [Airbag and Safety Belt Pretensioner Supplemental Restraint System - \[+\] Vehicles with 2nd / 3rd Row Seats](#) (501-20B Supplementary Restraint System, Description and Operation).
- For additional information, refer to: [Airbag and Safety Belt Pretensioner Supplemental Restraint System - \[+\] Front Row Seats Only](#) (501-20B Supplementary Restraint System, Description and Operation).

## DESCRIPTION

### FRONT ROW SEATBELTS

The outer of the front seatbelt retractors are attached to the vehicle body on the lower B-pillar. The webbing runs from the retractor, through the seatbelt D-loop which is installed on the upper B-pillar, to an anchor point. The anchor point is located at the base of the seat frame.

The center of front row seatbelt retractor is installed in the center seat frame. The webbing runs from the retractor over the seat. The anchor is installed through the retention trim. The anchor point is located at the base of the seat frame.

### SECOND ROW SEATBELTS

The retractor of each side second row seatbelt is attached to the body immediately behind the C-pillar lower. The webbing runs from the retractor, through a D-loop located on the upper C-pillar. The anchor point is located on the rear floor at the front of related wheel arch.

The retractor for the center second row seatbelt is installed in the top of the seat backrest. The webbing runs from the retractor, over the top of the seat. An anchor point is located at the base of the seat frame.

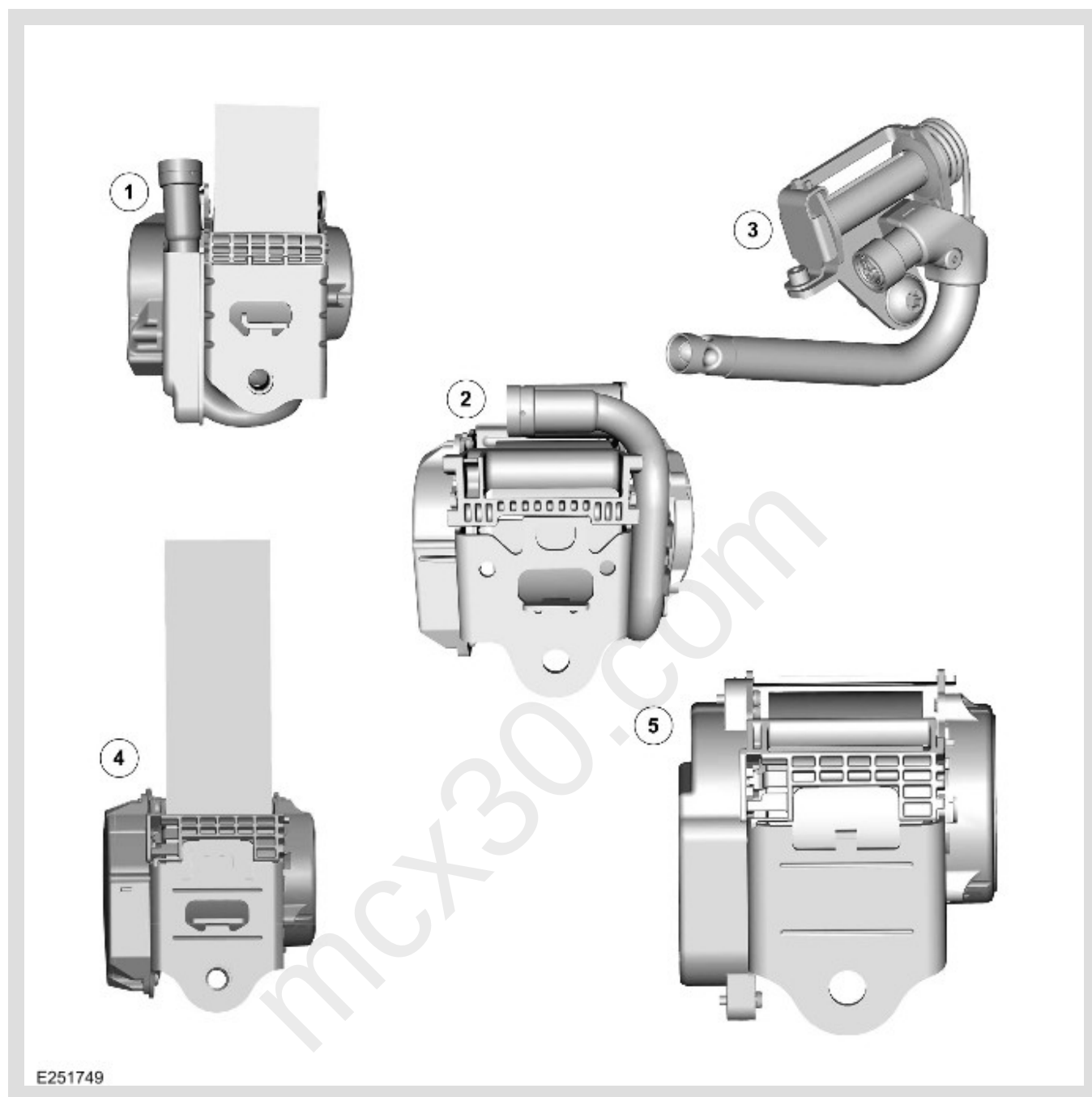
The seatbelt buckles for the second row seatbelts are attached to the seat frame.

### THIRD ROW SEATBELTS

The retractor of each third row seatbelt is attached to the body on the D-pillar lower. The webbing runs from the retractor, through an exposed D-loop on the D-pillar, to an anchor point on the rear floor.

The buckles for the third row seatbelts are attached to the middle of third row seat frame.

## SEATBELT RETRACTOR PRETENSIONERS



| ITEM | DESCRIPTION                                                                                                 |
|------|-------------------------------------------------------------------------------------------------------------|
| 1    | Retractor pretensioner - Front row outer                                                                    |
| 2    | Retractor pretensioner - Front row center, second row outer, second row center and third row outer - 7 seat |
| 3    | Seatbelt pretensioner - NAS only                                                                            |
| 4    | Retractor pretensioner - Second row bench central - 5 seat                                                  |
| 5    | Retractor pretensioner - Second row bench central - 7 seat                                                  |

All of the seatbelt retractor pretensioners incorporate an emergency locking function and a load limiter function. On NAS vehicles, the retractors of the front passenger and rear seatbelts also incorporate an automatic locking function.

The emergency locking function locks the retractor when the seatbelt is pulled out of the retractor too quickly. The emergency locking function also locks when the vehicle is subjected to a sudden deceleration or severe tilt angle.

The automatic locking function allows the seatbelt to be tightened and locked, for the installation of a child seat.

## **LOAD LIMITER**

On NAS vehicles, the retractor of the front passenger seatbelt incorporates an adaptive load limiter.

The load limiter has 2 different load limits:

- The standard load limit
- The lower load limit.

The lower load limit is designed to reduce the seatbelt chest loading on smaller seat occupants during an impact. The load limiter changes from the standard limit to the lower limit when the load limiter actuator is fired by the RCM.

The load limiter function progressively releases an amount of seatbelt when the belt tension exceeds a certain level. The load limiter also limits the chest loading of an occupant during an impact.

## **SEATBELT BUCKLE**

The buckle of each seatbelt incorporates a switch to provide a seatbelt status signal. The status signal is used for operation of the seatbelt reminder and belt minder systems, and for the firing strategy of the SRS.

- For additional information, refer to: [Airbag and Safety Belt Pretensioner Supplemental Restraint System - \[+\] Vehicles with 2nd / 3rd Row Seats](#) (501-20B Supplementary Restraint System, Description and Operation).
- For additional information, refer to: [Airbag and Safety Belt Pretensioner Supplemental Restraint System - \[+\] Front Row Seats Only](#) (501-20B Supplementary Restraint System, Description and Operation).

The switches of the front row seatbelts (except front row seatbelt center) have signal and ground connections with the RCM. The switches of the rear seatbelts have connections to a vehicle ground point and to the BCM/ GWM. The RCM broadcasts on FlexRay and the BCM/ GWM broadcasts on High Speed (HS) Controller Area Network (CAN) body system bus.

## SEATBELT WARNING INDICATOR



A seatbelt warning indicator is installed in and controlled by the IPC. The IPC receives seat buckle and first row occupancy information from the HS CAN Human Machine Interface (HMI) systems bus. The signals are transferred from the FlexRay and HS CAN body system bus through the BCM/ GWM.

### OPERATION

#### SEATBELT REMINDER



#### NOTE:

The warning indicator is displayed each time there is a status change. For example, a seatbelt is unfastened or a door is opened and then closed.

The seatbelt warning indicator and a warning chime come on when the driver seatbelt, or the seatbelt of an occupied passenger seat, is not fastened. The indicator goes off when the unfastened seatbelt is fastened.

The RCM provides driver and passenger buckle status signals on FlexRay which are provided to the IPC through the BCM/ GWM. The BCM/ GWM provides the first row middle seat buckle status (If equipped) on HS CAN body system bus which are provided to the IPC through the BCM/ GWM.

**NOTE:**

For front row middle seat provides the BCM/ GWM with the occupancy using an Occupant Detection Sensor .

The front outer passenger seat occupancy status is provide by:

- A hardwired input from the occupant detection sensor, except NAS vehicles.
- A Local Interconnect Network (LIN) systems bus message from the OCS to the RCM on NAS vehicles only.

**BELTMINDER SYSTEM****NOTES:**

- Although not advisable, it is possible to disable the belt minder system using Jaguar Land Rover (JLR) approved diagnostic equipment.
- When a heavy object is placed on a passenger seat, it may activates the belt minder feature. The feature recommends that any objects placed on that seat are secured using the seatbelt.

Where equipped, the belt minder system augments the seatbelt reminder. At vehicle speeds above 20 km/h (12 mph), if the seatbelt has not been fastened, the belt minder system activates an intermittent warning chime. At the same time the belt minder system flashes the seatbelt warning indicator and displays a warning message indicating which second row seatbelt triggered the warning.

When the belt minder is triggered, the IPC generates the following warnings repeated for 10 seconds:

- Flashes the seatbelt warning indicator at 2 Hz
- Triggers the audible chime.

After 10 seconds the seatbelt warning indicator changes from flashing to continuously illuminated for 10 seconds.

While the trigger conditions still exist, the warnings are repeated every 20 seconds until one of the following occurs:

- 190 seconds has elapsed from when the warnings were first triggered.
- The seatbelt of each occupied front row seat is fastened.
- In Power Mode 0 (ignition OFF)
- In REVERSE.

**NOTE:**

On NAS market vehicles when the driver seatbelt is not fastened, the warning indicator and audible chime triggers for 6 seconds. After the 6 seconds, the warning indicator remains visible for 60 seconds.

When stationary a single audible warning indicates that the second row seatbelt is not fastened.

Above 20 km/h (12 mph) the audible warning is triggered for 10 seconds, then switches off for 10 seconds. This cycle is repeated for 60 seconds. The audible warning will cease when a rear door is opened when stationary (or front door in 3 seat vehicle) if:

- The vehicle is put in REVERSE
- A rear belt is buckled
- In Power Mode 0 (ignition OFF).

#### VISUAL BELTMINDER



| ITEM | DESCRIPTION            |
|------|------------------------|
| A    | Indicator - Second row |

| ITEM | DESCRIPTION           |
|------|-----------------------|
| B    | Indicator - Third row |

A graphic in the IPC indicates which of the second row and third row seatbelts are fastened at the start of a journey. The graphic indicates when a seatbelt is fastened or unfastened during a journey. Each seating position is represented by a passenger icon.

The color of passenger icon indicates the seatbelt status:

- No color - Seatbelt not fastened.
- Green - Seatbelt fastened.
- Red - Seatbelt status changed from fastened to unfastened.

When the seatbelt of an occupied seat is not fastened or is unfastened during a trip, an audible warning sounds.

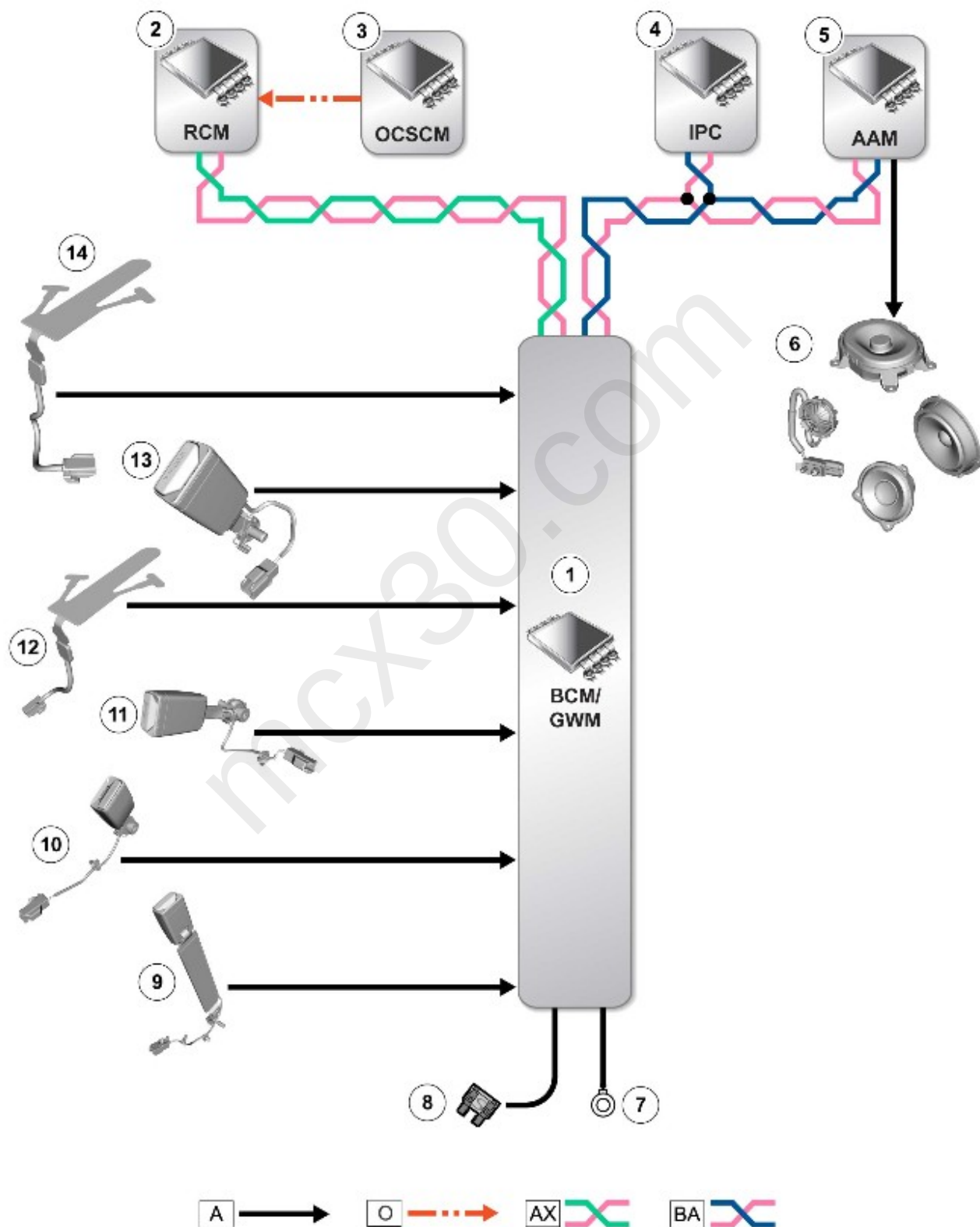
For additional information, refer to: [Message Center](#) (413-08 Message Center, Description and Operation).

#### DIAGNOSTICS

The RCM records any Diagnostic Trouble Code (DTC)s and related data. Read the DTCs and related data with the JLR approved diagnostic equipment.

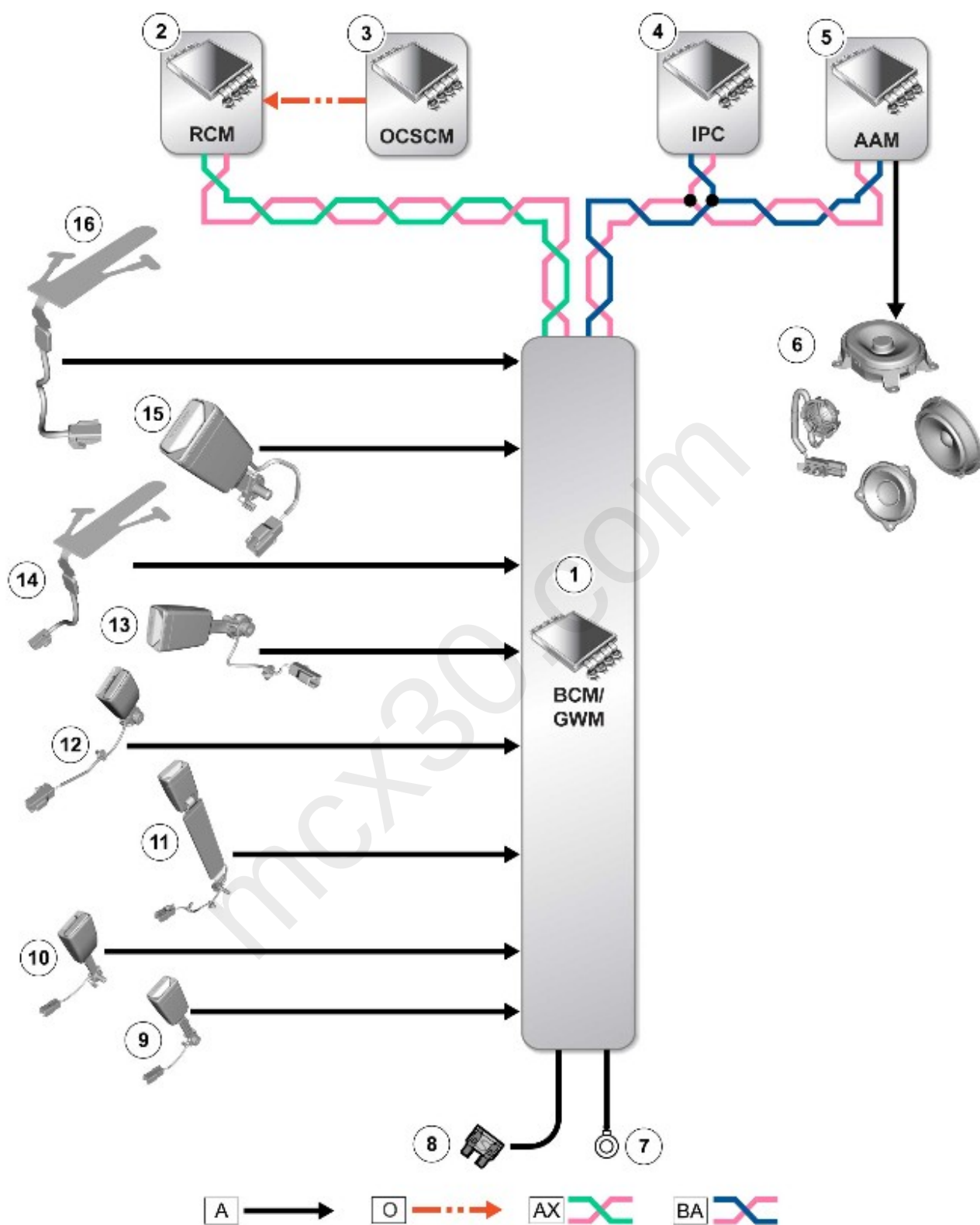
The JLR approved diagnostic equipment enables certain components to be activated and also live data to be read.

CONTROL DIAGRAM - 1 OF 4 - SEATBELT REMINDER WITH 3 DOORS VEHICLE



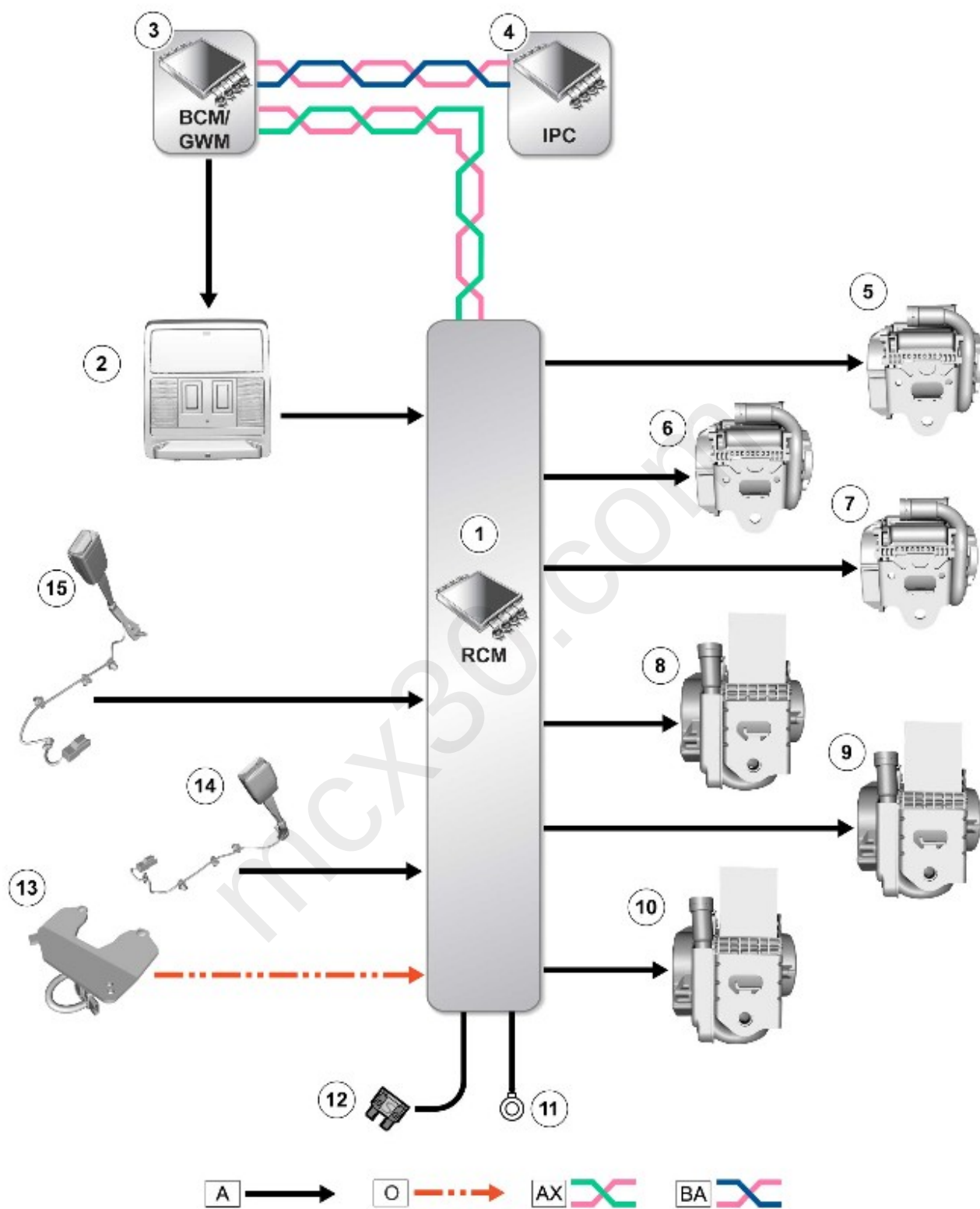
A = HARDWIRED: O = LIN BUS: AX = FLEXRAY: BA = HS CAN HMI SYSTEM BUS.

| ITEM | DESCRIPTION                                     |
|------|-------------------------------------------------|
| 1    | BCM/ GWM                                        |
| 2    | RCM                                             |
| 3    | OCS - NAS vehicles only                         |
| 4    | IPC                                             |
| 5    | Audio Amplifier Control Module (AAM)            |
| 6    | Vehicle speakers                                |
| 7    | Ground                                          |
| 8    | Power supply                                    |
| 9    | Front row seatbelt buckle - Center              |
| 10   | Second row seatbelt buckle - Right              |
| 11   | Second row seatbelt buckle - Center             |
| 12   | Front row occupant detection sensor - Center    |
| 13   | Second row seatbelt buckle - Left               |
| 14   | Front row occupant detection sensor - Passenger |



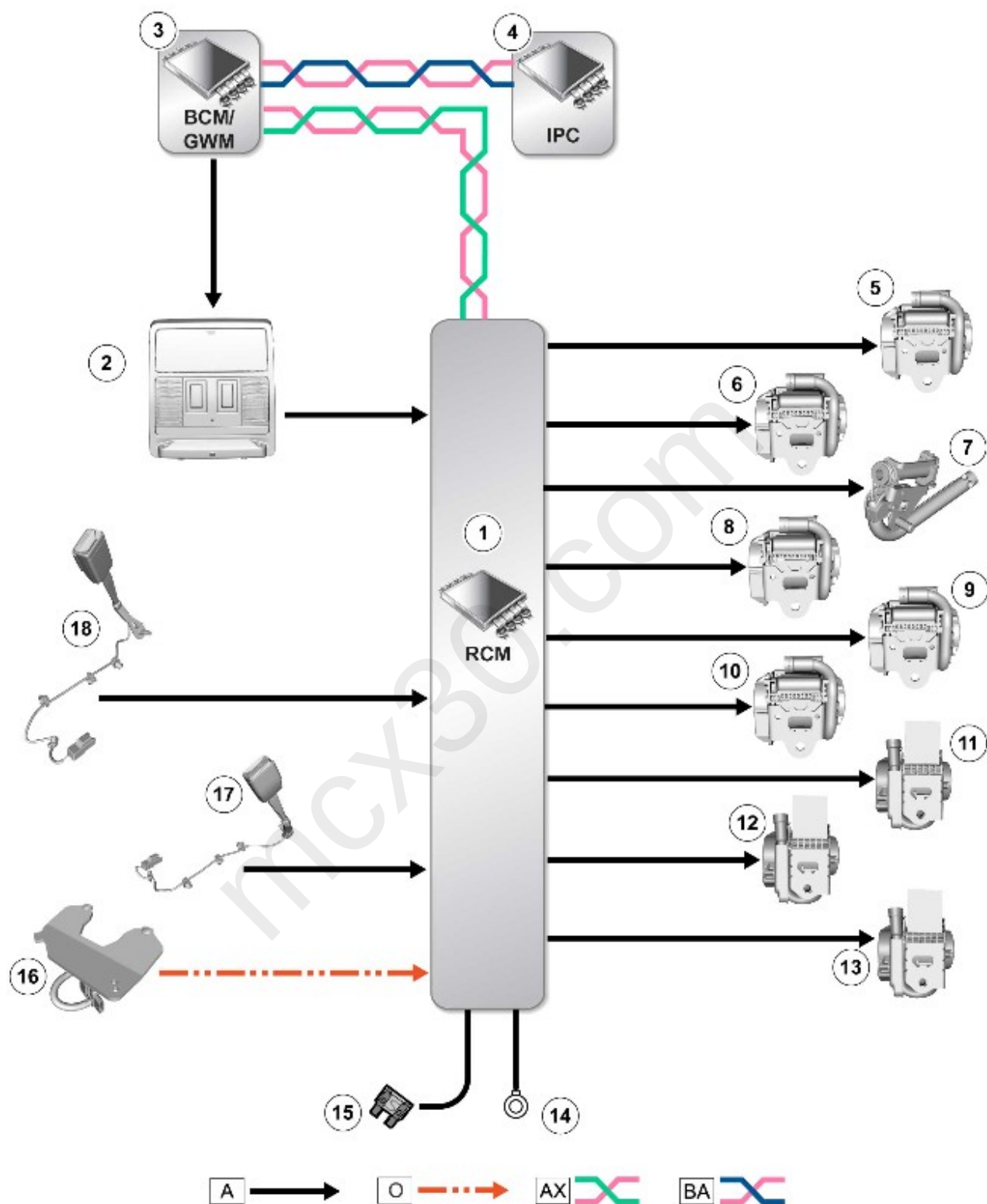
A = HARDWIRED: O = LIN BUS: AX = FLEXRAY: BA = HS CAN HMI SYSTEM BUS.

| ITEM | DESCRIPTION                                     |
|------|-------------------------------------------------|
| 1    | BCM/ GWM                                        |
| 2    | RCM                                             |
| 3    | OCS - NAS vehicles only                         |
| 4    | IPC                                             |
| 5    | AAM                                             |
| 6    | Vehicle speakers                                |
| 7    | Ground                                          |
| 8    | Power supply                                    |
| 9    | Third row seatbelt buckle - Right               |
| 10   | Third row seatbelt buckle - Left                |
| 11   | Front row seatbelt buckle - Center              |
| 12   | Second row seatbelt buckle - Right              |
| 13   | Second row seatbelt buckle - Center             |
| 14   | Front row occupant detection sensor - Center    |
| 15   | Second row seatbelt buckle - Left               |
| 16   | Front row occupant detection sensor - Passenger |



A = HARDWIRED: O = LIN BUS: AX = FLEXRAY: BA = HS CAN HMI SYSTEM BUS.

| ITEM | DESCRIPTION                                         |
|------|-----------------------------------------------------|
| 1    | RCM                                                 |
| 2    | Front overhead console                              |
| 3    | BCM/ GWM                                            |
| 4    | IPC                                                 |
| 5    | Front row seatbelt retractor pretensioner - Right   |
| 6    | Front row seatbelt retractor pretensioner - Center  |
| 7    | Front row seatbelt retractor pretensioner - Left    |
| 8    | Second row seatbelt retractor pretensioner - Right  |
| 9    | Second row seatbelt retractor pretensioner - Center |
| 10   | Second row seatbelt retractor pretensioner - Left   |
| 11   | Ground                                              |
| 12   | Power supply                                        |
| 13   | OCS - NAS vehicles only                             |
| 14   | Front row seatbelt buckle - Right                   |
| 15   | Front row seatbelt buckle - Left                    |



A = HARDWIRED: O = LIN BUS: AX = FLEXRAY: BA = HS CAN HMI SYSTEM BUS.

| ITEM | DESCRIPTION                                         |
|------|-----------------------------------------------------|
| 1    | RCM                                                 |
| 2    | Front overhead console                              |
| 3    | BCM/ GWM                                            |
| 4    | IPC                                                 |
| 5    | Third row seatbelt retractor pretensioner - Right   |
| 6    | Third row seatbelt retractor pretensioner - Left    |
| 7    | Front row seatbelt pretensioner - NAS only          |
| 8    | Front row seatbelt retractor pretensioner - Right   |
| 9    | Front row seatbelt retractor pretensioner - Center  |
| 10   | Front row seatbelt retractor pretensioner - Left    |
| 11   | Second row seatbelt retractor pretensioner - Right  |
| 12   | Second row seatbelt retractor pretensioner - Center |
| 13   | Second row seatbelt retractor pretensioner - Left   |
| 14   | Ground                                              |
| 15   | Power supply                                        |
| 16   | OCS - NAS only                                      |
| 17   | Front row seatbelt buckle - Left                    |
| 18   | Front row seatbelt buckle - Right                   |