Cellular Phone

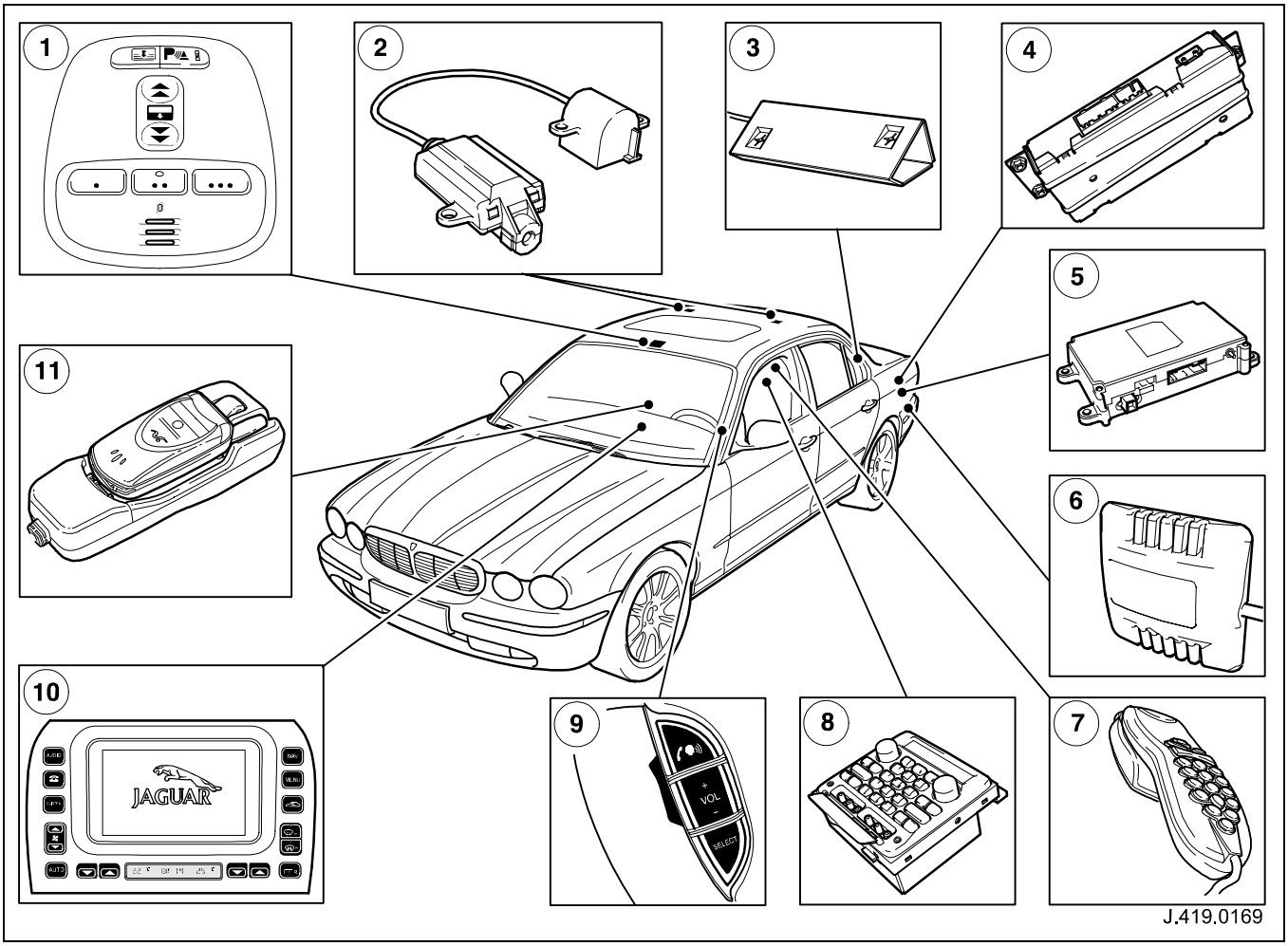

Fig. 132 Cellular phone system component location

1. Front microphone (option)
2. Rear microphone (option)
3. Cellular phone antenna (NAS)
4. Voice activation module (option)
5. Cellular phone control module
6. Cellular phone antenna (GSM)
7. Cellular phone handset and cradle (GSM)
8. Passenger entertainment control panel (option)
9. Steering wheel telematics controls
10. Telematics display module (option)
11. Cellular phone handset (NAS)

The cellular phone system is market dependent and comprises the following:

- Cellular phone control module.
- Cellular phone antenna.
- Cellular phone handset and cradle.
- Steering wheel telematics controls.
- Remote keypad.

NOTE: The remote keypad for the cellular phone is dependent on the vehicle specification; it is selectable from the telematics display module (where installed) or integral to the audio unit (non-telematics version); refer to **Audio Unit** for details.

Hands-free operation of the phone is possible by the addition of a microphone (part of the overhead console) and the voice activation module (VAM); refer to **Voice Activated Control System**.

Cellular Phone Control Module

The CPCM is market dependent and:

- located in the luggage compartment to the left-hand side;
- fixed to a bracket which also supports (where applicable) other multimedia modules;
- has one electrical connector, one optical connector;
- has one antenna connector (GSM only).

NOTE: The NAS antenna connects directly to the hang-up cup.

Steering Wheel Telematics Controls

To ensure minimum disruption to concentration when driving, limited control of audio, telephone and voice activation systems is possible using the steering wheel telematics controls.

The controls provide the following phone functionality:

- Answer phone call/end hands-free calls.
- Increase or decrease volume.
- Selection of phone ready mode.
- Cycle through phone memory.

Rear Cellular Phone

The rear cellular phone facility is a dealer-installed option, subject to market and vehicle specification.

- Vehicles installed with twin rear seats and rear floor console have the phone fitted to the rear console lid.
- Vehicles installed with the fold-down armrest have the phone installed within the armrest.

To facilitate conference calls, hands-free operation of the phone is possible by the addition of multizone voice option, which comprises two microphones (located in the headliner, one above each of the rear passenger seat positions), the voice activation module (VAM); refer to **Voice Activated Control System** and the passenger entertainment control panel; refer to **Rear Multimedia System**.

The appropriate microphone is selected by pressing the left or right-hand 'TALK' button on the passenger entertainment control panel during a call. The active microphone is indicated by the illumination of the tell-tale LED in the 'TALK' button.

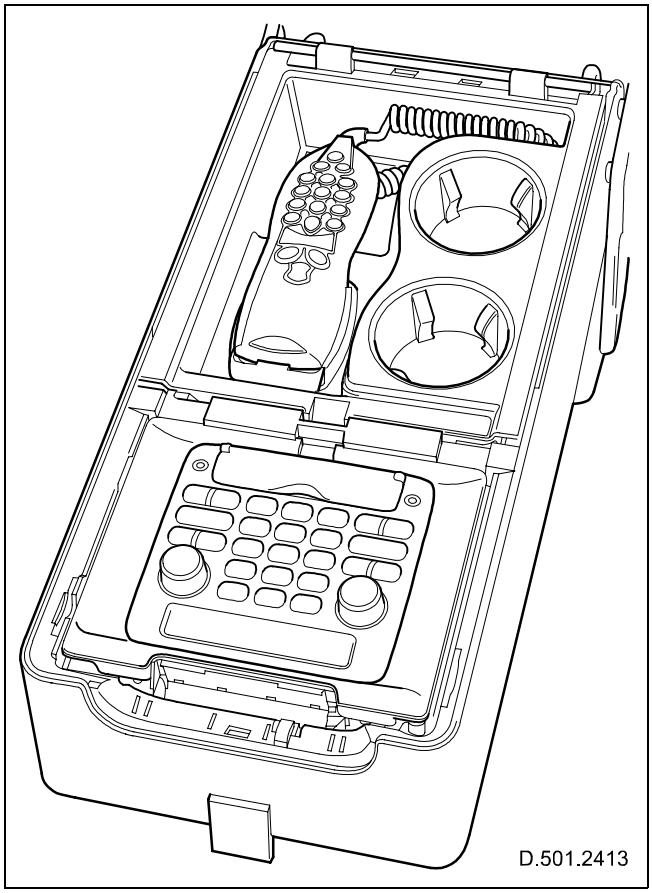

Fig. 133 Rear armrest (without covers)

Multifunction Electronic Control Modules

Front Electronic Module

The front electronic module (FEM) is located at the base of the left-hand side A-post.

There are five electrical connectors each with unique keyways.

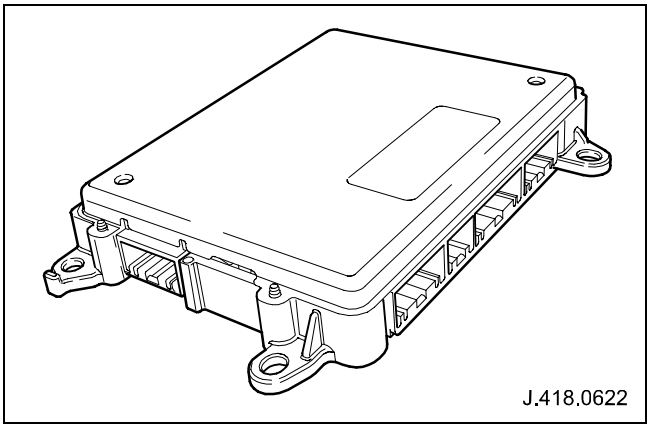

Fig. 134 Front electronic module

The FEM communicates via the SCP network, is configured for market options and where appropriate controls or provides an interface for the following major functions:

- Easy entry-easy exit lighting.
- Courtesy / demand lighting.
- Front exterior lighting.
- Turn signals and hazard warning lamps.
- Daytime running lamps.
- Battery saver (interior lights).
- Adjustable pedals.
- Fluid and pressure metrics (low washer fluid, low oil pressure).
- Memory functions.
- Front heated seats.
- Security; refer to **Anti-Theft**.

Rear Electronic Module

The rear electronic module (REM) is located to the right-hand side of the luggage compartment, behind a trim panel.

The REM communicates via the SCP network, is configured for market options and where appropriate controls or provides an interface for the following major functions:

- Inertia switch operation (disables fuel pump driver and triggers door unlock command).
- Fuel pump driver circuit and fuel level indication.
- Exterior rear lamps, park, fog, stop, turn, hazard, reversing lamps.
- Rear heated seats.
- Luggage compartment lid release.
- Trailer functionality.
- Electrochromic mirror operation (reverse).
- Security; refer to **Anti-Theft**.

Driver Door Module

The driver door module (DDM) is matched to the operating frequency of the appropriate market and located in the driver's door.

The DDM communicates via the SCP network, is configured for market options and where appropriate controls or provides an interface for the following functions:

- RF decoder for remote keyless entry; refer to **Anti-Theft**.
- Three personality configurations linked to the memory feature.
- Power windows.
- Driver mirror.
- Exterior mirror movement
- Power locks/automatic door locks
- Easy entry/exit
- Horn chirp

Body Construction

The body is a monocoque structure, designed from aluminum to provide the following benefits:

- Reduce the weight of the vehicle bodyshell by approximately 40%.
- Improve fuel economy and vehicle performance.
- Provide enhanced corrosion protection.

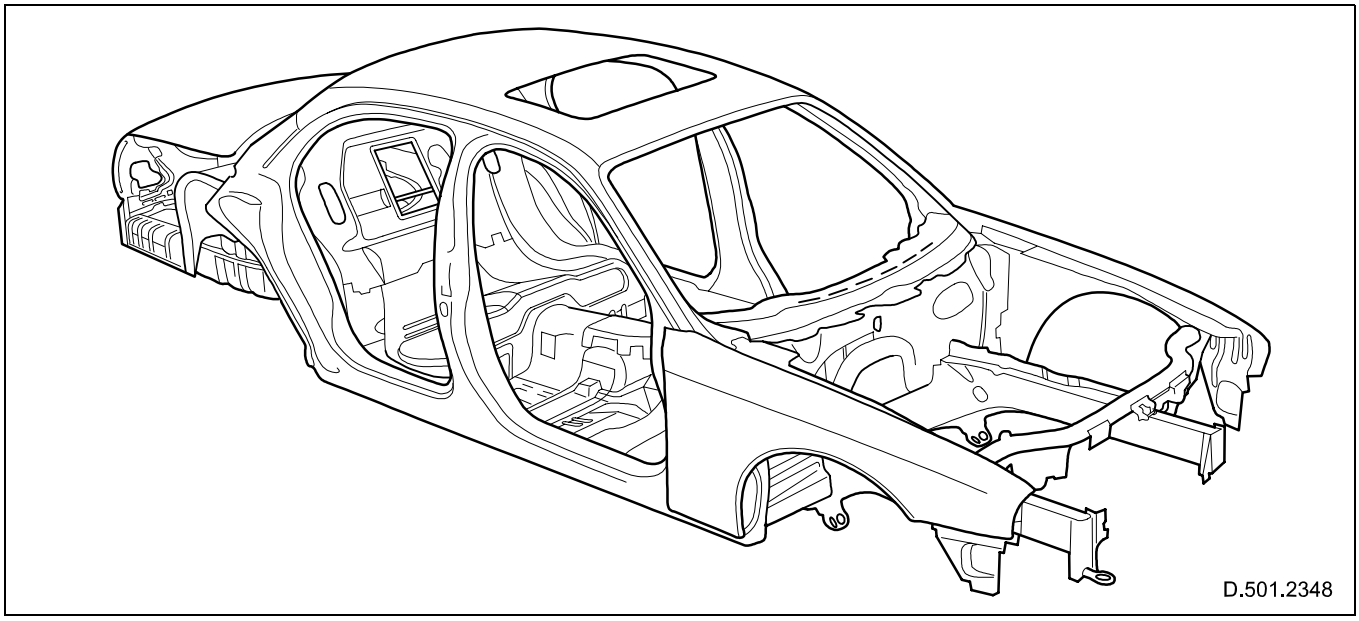

Fig. 135 Body shell

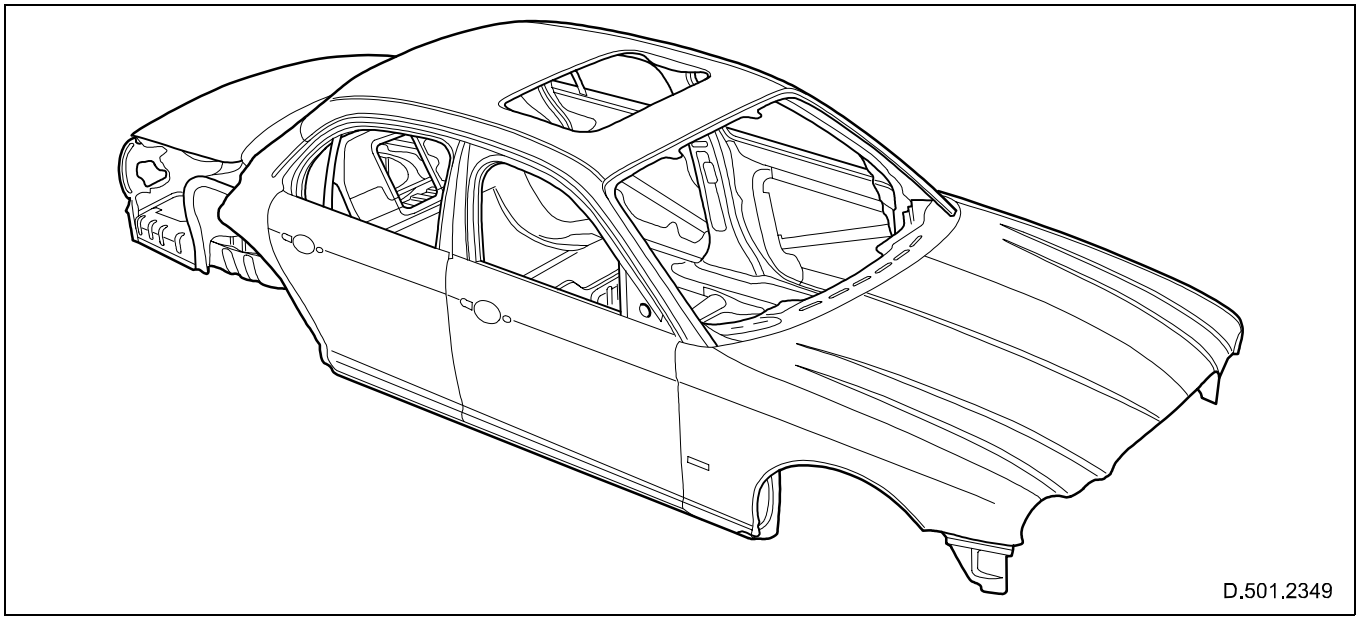

Fig. 136 Body shell with closures

Body Repair Technology

Repairs to aluminum requires different tools and techniques to those used for steel. Repairs should only be undertaken by trained Body and Paint Repair technicians; refer to **New XJ Range Body and Paint Repair Supplement** for detailed information.

Aluminum

Background Facts

- The most abundant metallic element and the third most abundant element in the Earth's crust (only oxygen and silicon are present in larger quantities).
- Discovered and named in 1808 by British scientist, Sir Humphry Davy.
- First isolated as a metal by Danish scientist, Hans Christian Oersted in 1925.
- Naturally exists in very stable combinations with other materials and is therefore not readily accessible.
- Most commonly produced from bauxite ore using the Bayer Process which refines the ore into alumina (aluminum oxide). The final part of the process produces primary aluminum using electrolysis (Hall-Heroult Process).
- More aluminum is now produced than the combined total of all other non-ferrous metals.

Alloying Elements

Aluminum is not used in its purest form, it is alloyed with other elements to enhance its properties. Selected quantities of certain alloys (copper, manganese, silicon, magnesium, zinc, lithium and others) are added to produce the required physical properties or characteristics.

Products

There are three broad classes of aluminum products:

- Ingots
  - cast from furnaces and the source material from which both wrought products and castings are manufactured.
- Wrought products
  - extrusions, tube, rod, plate and foil are mechanically deformed during production to suit defined uses.
- Castings
  - allows the production of shapes in which mechanical properties are determined by alloying elements and thermal treatments after casting.

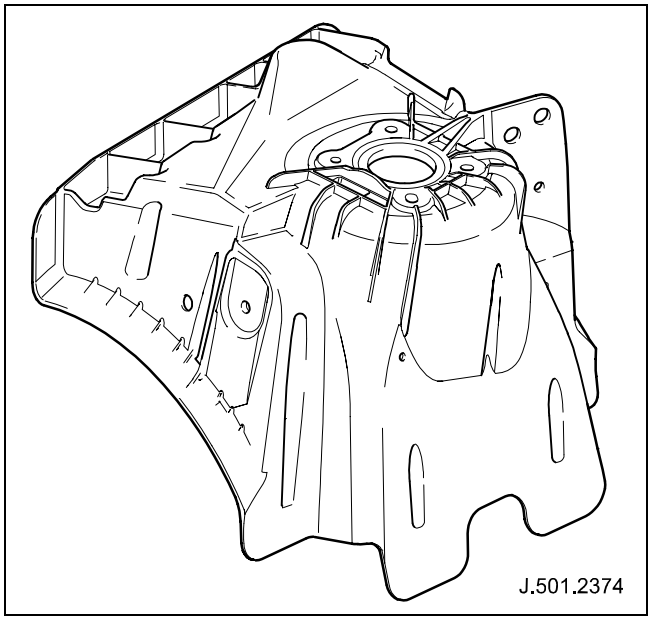

Fig. 137 Typical casting (448 alloy)

The aluminum industry uses a standardized numbering system to distinguish one alloy from another: wrought alloys are designated a four-digit number; cast alloys are designated a three-digit number. The first digit is used to represent the principal alloy, for example: 5 for magnesium; 6 for magnesium and silicon.

Properties and Characteristics

- Silver/grey in appearance.
- Light - one third of the mass of mild steel.
- Strong - double the strength-to-weight ratio of steel.
- Corrosion resistant; refer to **Corrosion**.
- Good thermal conductor.
- Good electrical conductor.

Corrosion

Under normal environmental conditions, aluminum is protected by an oxide-layer that forms and naturally inhibits the onset of corrosion.

NOTE: Under certain circumstances the oxide-layer can break down and rapid corrosion can result due to the chemically reactive nature of aluminum alloys.

The two principle types of corrosion are crevice and galvanic:

- Crevice corrosion occurs in environments where atmospheric oxygen is excluded and an electrolyte, such as salt water, is present.

NOTE: Such conditions could occur where road debris and mud is allowed to accumulate.

- Galvanic corrosion occurs when aluminum is placed in direct contact with a more noble metal or carbon in the presence of an electrolyte.

NOTE: A moist environment can act as an electrolyte.

CAUTION:

- **Avoid using components that could damage the paint system, such as, self-tapping screws, spring-steel clips or paint-clearing screws.**
- **To ensure anti-corrosion integrity is maintained, use only genuine Jaguar fasteners; refer to JTIS.**
- **Always reinstate the paintwork to its condition prior to commencing the repair; refer to New XJ Range Body and Paint Repair Supplement for detailed information.**

Material Incompatibility

Materials that are incompatible with aluminum include:

- All copper alloys (brasses, aluminum and silicon bronzes, cupro-nickels and gun metals such as phosphor and tin bronzes).

NOTE: Copper and its alloys should not be used unless suitably coated or isolated.

- Noble metals such as gold, silver and its alloys (including some hard solders), platinum and rhodium. These metals should not be placed in contact with aluminum even with an intervening paint layer.

NOTE: A noble metal is defined as one that resists chemical action, does not corrode or tarnish in air or water, and is not easily attacked by acids.

Materials containing carbon black should not be used, examples include certain rubber compounds and some black (paint) finishes. Similarly, plastics and composites containing carbon (graphite) fibers should not be used in direct contact with aluminum.

Material Compatibility

Materials that are generally compatible with aluminum include: all plastics, magnesium, zinc and suitably protected steel.

NOTE: Suitable protection for steel includes organic finishes such as electrocoat and powder coat. Sacrificial coatings such as passivated zinc, zinc alloy platings and proprietary 'organic' finishes are all generally suitable.

Stainless steel is generally compatible with aluminum although under certain conditions the protective oxide films on both metals could break down resulting in rapid galvanic corrosion. Anodically protected steel such as zinc coating is generally preferable.

Benefits

The high-strength and low-weight characteristics of aluminum, potentially lead to benefits in the following areas:

Weight

Vehicle sizes can be maintained while reducing overall weight.

Fuel

The reduction in weight leads to improved fuel economy and therefore reduced vehicle exhaust emissions.

Recycling

Recycling is readily achieved and provides significant environmental benefits. Recycling requires far less energy and produces far less emissions when compared with the primary production of aluminum.

Jaguar Usage

- Outer-surface panels including closures, roof and fenders are manufactured from 6111 alloy, which gains its property of high dent resistance whilst going through the electrocoating and paint-bake cycles.
- The chassis and support structure is constructed using various gauges of 5754 alloy. 5754 has a low magnesium content (less than a nominal 3%) which produces a combination of long-term stability, good formability and strength to provide good crash performance.
- Cast elements of the body allow strong, accurate, lightweight construction for areas like the suspension mounting points but are not considered repairable.
- High strength and rigid joints are achieved using a combination of adhesive and self-piercing rivets.

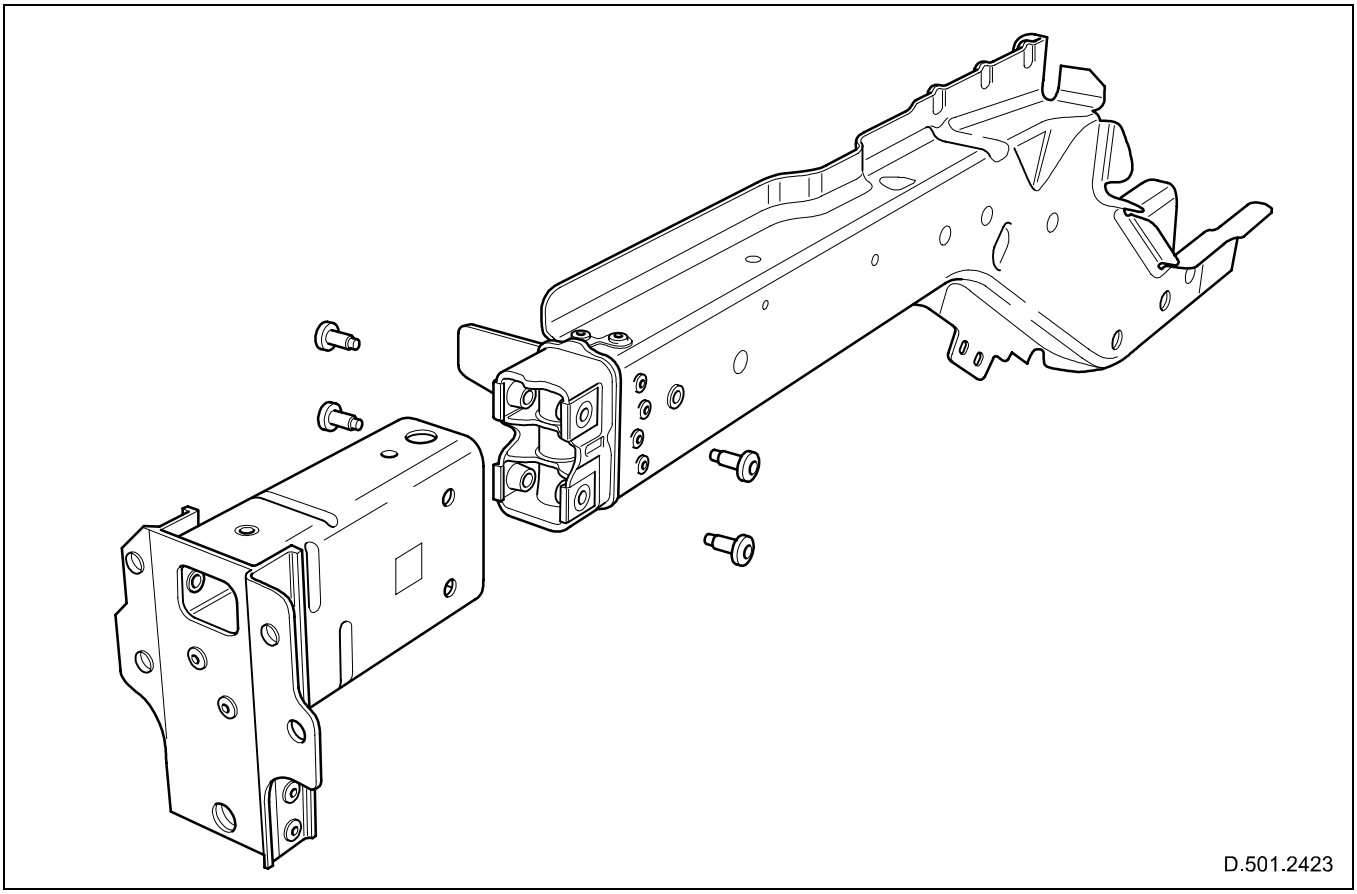

Fig. 138 Bolt-on crush-can

Secondary Bulkhead

A secondary bulkhead, which is attached to the main bulkhead, has been introduced to reduce noise and eliminate fume ingress into the passenger compartment.

NOTE: To simplify access for service, two panels on the driver's side of the secondary bulkhead are removable; refer to **JTIS**.

The pollen-filter intake-bucket, located on the passenger side of all vehicles, performs a similar function to the secondary bulkhead. The bucket has improved water-management capabilities, to minimize moisture around the engine control module (ECM) connector, which is located directly underneath.

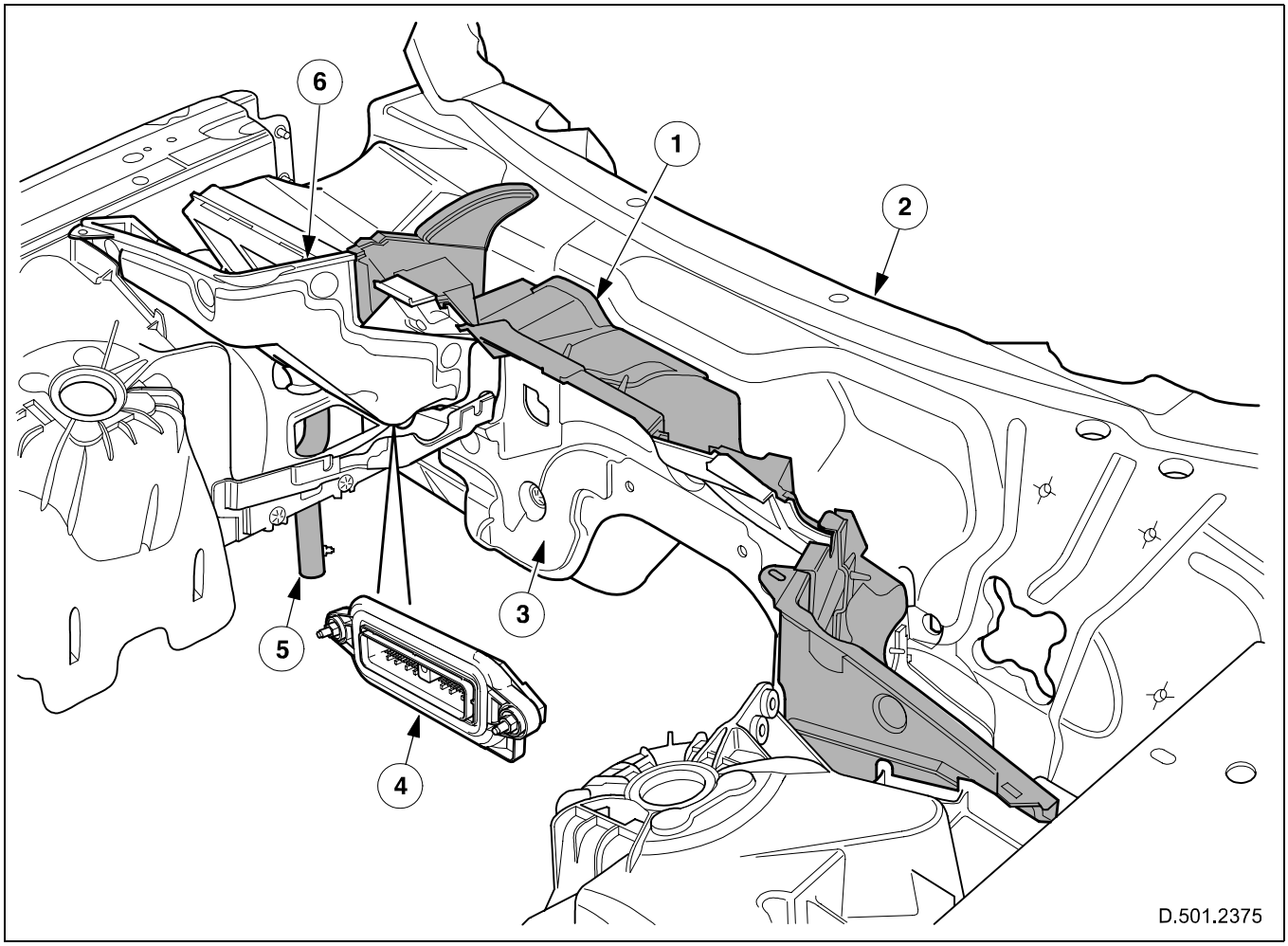

Fig. 139 Secondary bulkhead location

1. Secondary bulkhead
2. Bulkhead
3. Sound proofing
4. ECM electrical connector
5. Drain tube
6. Air intake bucket

Seats

Front Seats

WARNING: Prior to seat removal and before disconnecting the seat harness (which includes air bag connectors), the vehicle battery should be disconnected and a period of at least one minute allowed to elapse. The same amount of care should be taken when handling and storing these seats, as would be taken when handling and storing vehicle air bags in isolation.

NOTE: Refer to **JTIS** for detailed Removal and Installation instructions.

All front seats are fitted with the following features as standard:

- Integral side air bags; refer to **Occupant Safety, Air Bag Modules**.
- Head restraints.
- Safety belt buckle/pretensioner; refer to **Occupant Safety, Safety Belts**.
- Anti-whiplash mechanism; refer to **Occupant Safety, Anti-whiplash System**.

The driver and passenger seats, although almost identical, have some unique components fitted: the driver's seat has a seat track position sensor and the passenger's seat has an occupant weight-sensing system. In both instances the components form an integral part of the occupant safety system; refer to **Occupant Safety, Occupancy and Position Sensing**.

NOTE: Individual components of the passenger seat weight-sensing system, which includes the seat cushion assembly, are not serviceable and must be replaced as a complete unit; refer to **JTIS**.

Driver Seat

Depending on specification, the vehicle may be installed with heated cushions and backrest. In addition to the standard electrical seat functionality, the following features may also be adjusted electrically:

- Head restraint.
- Extendible seat cushion.
- Lumbar support.

Driver seat module

The driver seat module (DSM) is located under the driver seat. In addition to supporting standard seat functionality the module also supports the electrically-adjustable head restraint and extendible seat-cushion; refer to **New XJ Range Electrical Guide** for detailed connection information.

Up to three personality configurations in relation to seat positions, are possible using the seat memory switch. The positions are stored and retrieved from the driver door module (DDM).

NOTE: Lumbar positions cannot be saved using the memory feature.

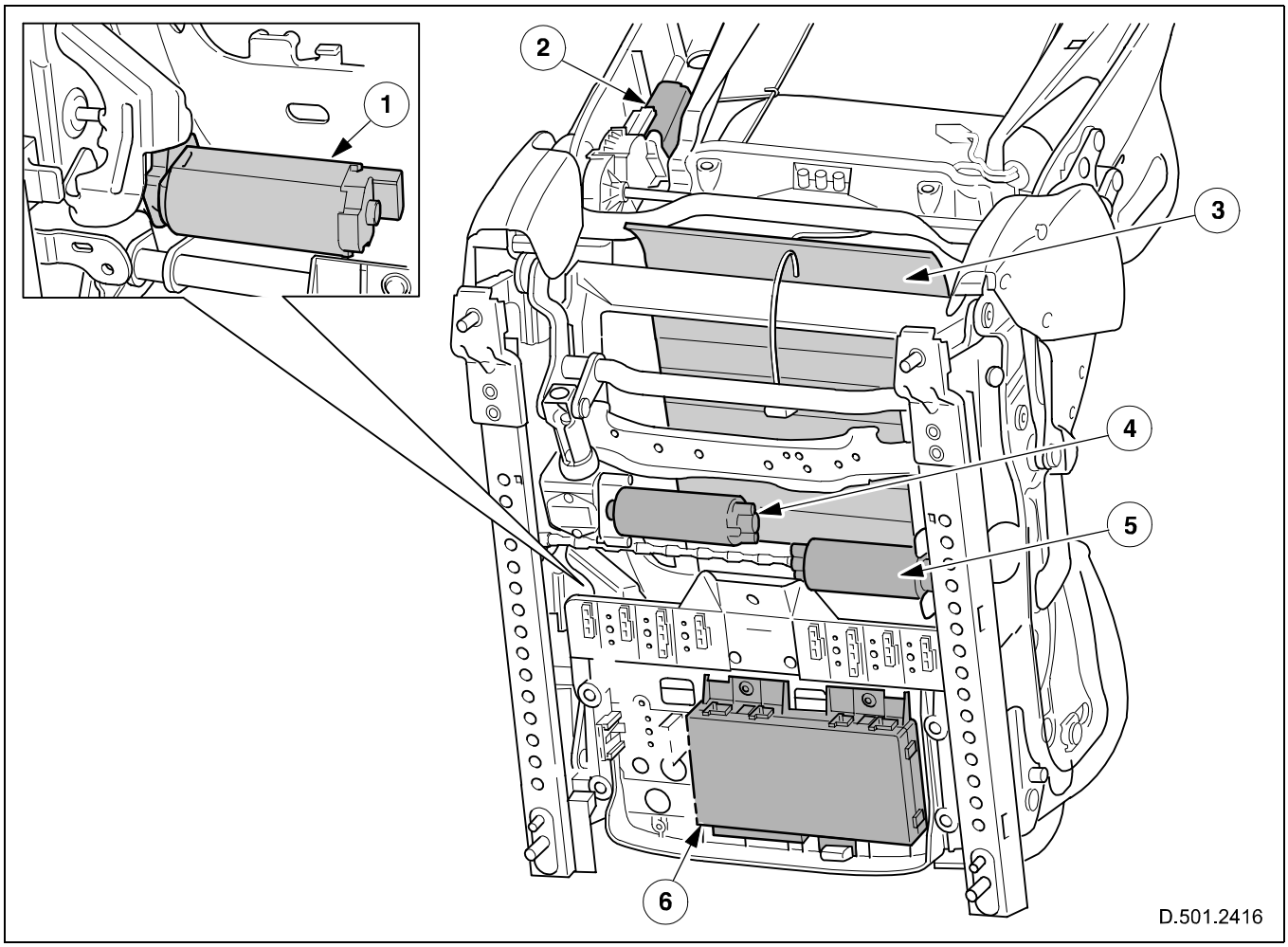

Fig. 140 Driver power-seat - component locations

1. Rake adjustment motor (front)
2. Recline adjustment motor
3. Seat cushion heater
4. Height-adjustment motor
5. Fore/aft adjustment motor
6. Driver seat module

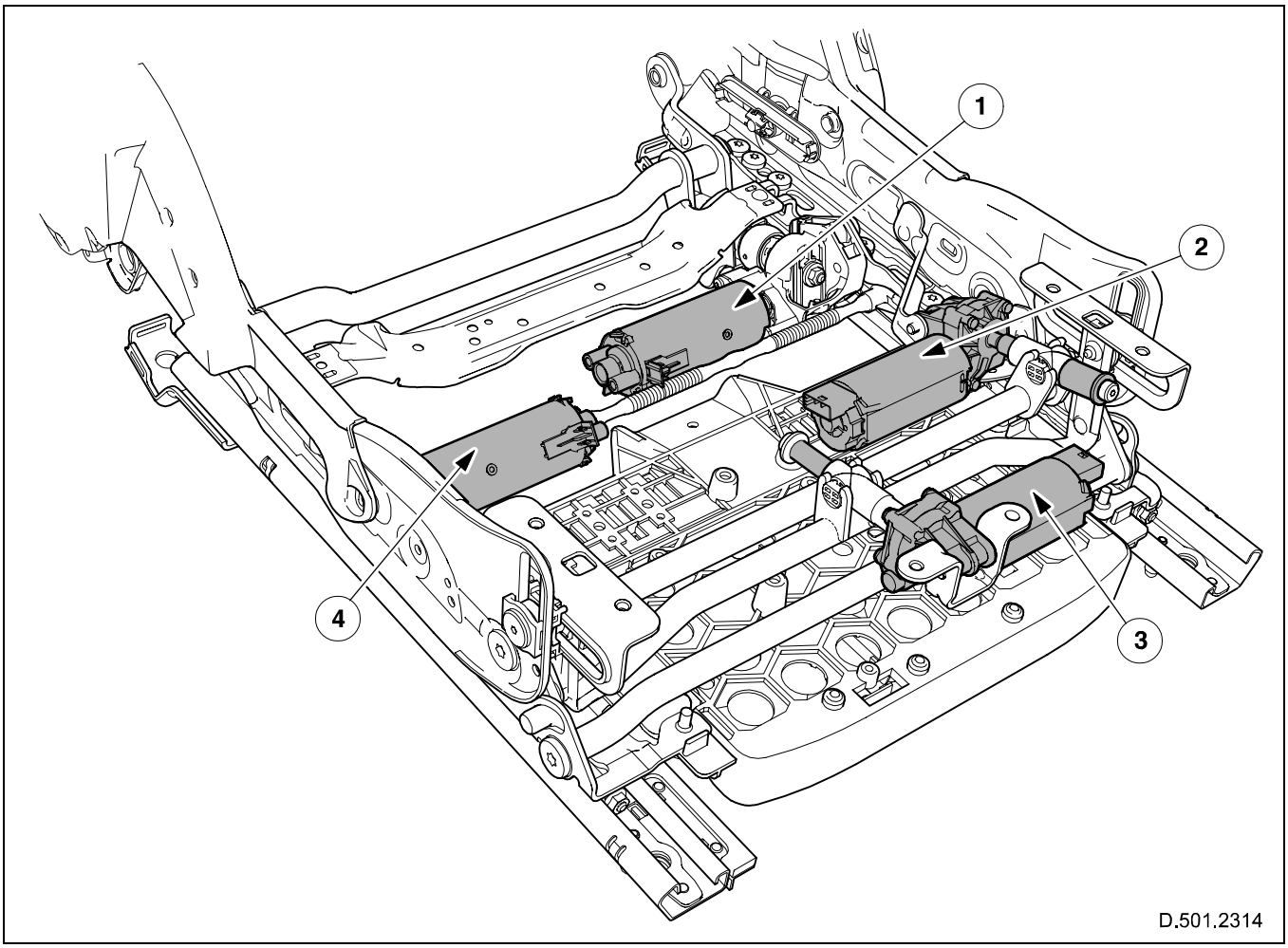

Fig. 141 Power seat with extendible cushion

1. Height-adjustment motor
2. Rake adjustment motor (front)
3. Cushion-extend motor
4. Fore/aft adjustment motor

Passenger Seat

The switches for electrically adjusting the passenger seat are wired directly to the appropriate motor; refer to **New XJ Range Electrical Guide** for detailed electrical connection information.

NOTE: Rear seats with electrical functionality, have a switch installed (where specified) that will allow adjustment of the front passenger seat, recline and fore/aft positions, by the rear occupant seated directly behind.

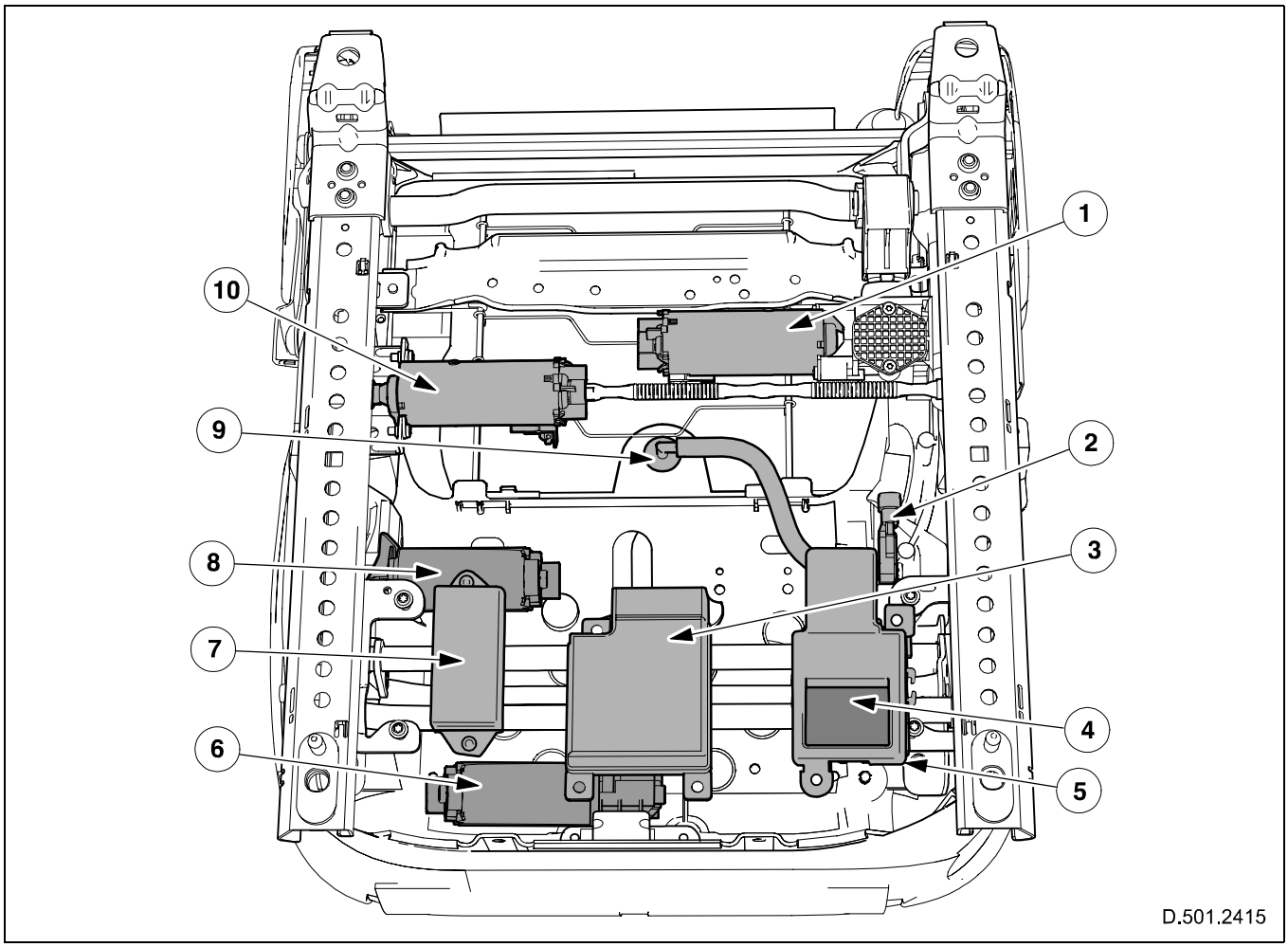

Fig. 142 Passenger power-seat - component locations (mounting tray removed)

1. Height-adjustment motor
2. Pressure sensor
3. Occupancy sensing module
4. Seat weight-sensing module
5. Seat weight-sensing module cover
6. Cushion-extend motor
7. Passenger rear-adjust relay module
8. Rake adjustment motor (front)
9. Silicon bladder connector and pipe
10. Fore/aft adjustment motor

Electrically-Operated Head Restraint

The electrically-operated head restraint (where applicable) is occupant-controlled from the seat-mounted switch. The driver seat module (DSM) responds to the switch position chosen, by providing an output to the respective drive motor; refer to **New XJ Range Electrical Guide** for detailed connection information.

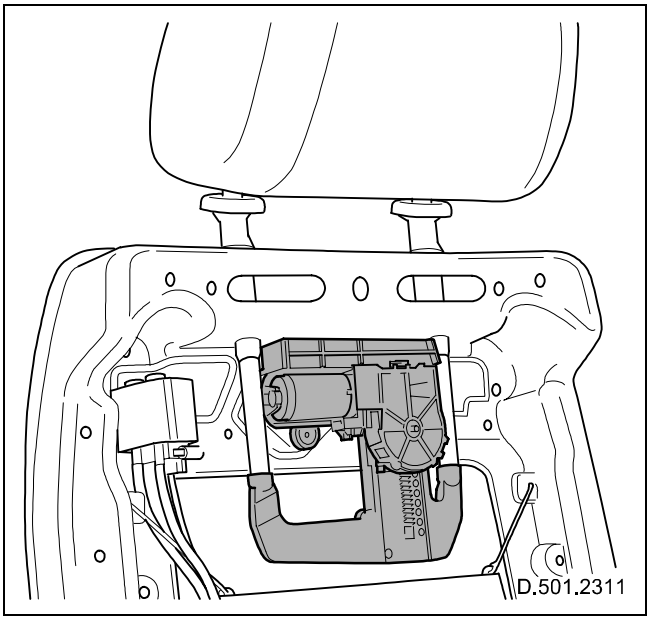

Fig. 143 Electrically operated head restraint

Power Lumbar

The 4-position power lumbar (where installed) comprises a single motor-driven pump, which inflates or deflates air cells as required to provide upper and lower lumbar support. The degree of support is determined by the operation of the seat-mounted switch. Depending on the switch-direction chosen, one of four solenoids housed within the solenoid pack is connected to the pump, which provides lumbar support by adjusting the amount of air in the appropriate cell. Vehicles fitted with the basic power-lumbar, utilize the lower air-cell only; refer to **New XJ Range Electrical Guide** for detailed connection information.

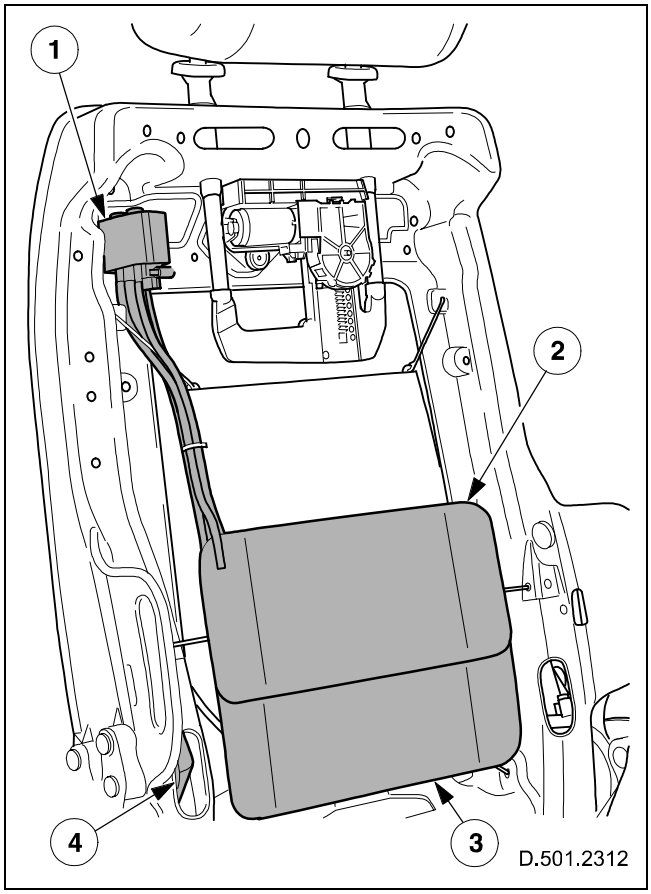

Fig. 144 Power lumbar

1. Solenoid pack
2. Upper air-cell
3. Lower air-cell
4. Motor-driven pump

Heated Seats

The heated seat system which offers a choice of three settings, comprises:

- Heated seat switches.
- Heated seat status LEDs.
- Backrest heater element.
- Cushion heater element and thermostat.
- Front electronic module.

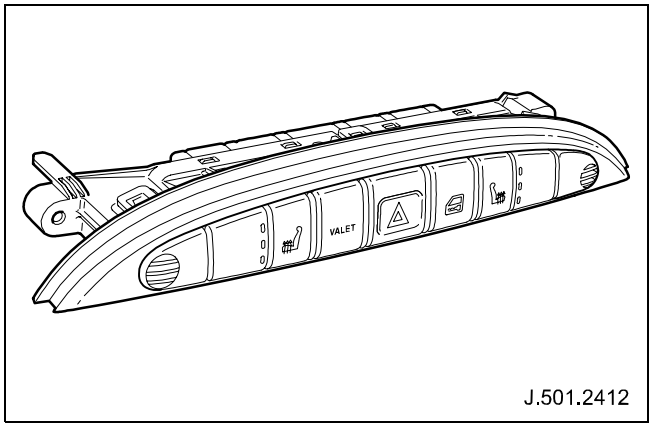

Fig. 145 Heated seat switches

As one of its many functions, the front electronic module (FEM) controls the seat heating feature by providing the appropriate response depending on the status of the heated seat switches; refer to **New XJ Range Electrical Guide** for detailed connection information.

Heater functionality is constantly monitored by the electrical load management system (ELMS); refer to **Electrical Load Management System**. The ELMS dictates that in circumstances where the generated electrical power is less than the electrical consumption, selected systems may be inhibited or operated using reduced power for as long as is necessary.

NOTE: Tell-tale LEDs remain illuminated so that any corrective action is not apparent to the driver.

The heated seat function (when selected) permits the electrical heating of the backrest and cushion. The heating system for each seat is activated by separate switches. The switches complete with status LEDs are located in the center console switch assembly.

NOTE: Where applicable, the heated steering wheel function is automatically activated concurrent with the driver's heated seat switch; refer to **Heated Steering Wheel**.

Provided the engine is 'running', pressing a heated seat switch, will select the maximum heat setting for the chosen seat, as confirmed by three illuminated red LEDs. A second press selects the mid-setting (two LEDs) and a third press selects the lowest heat setting (one LED). A fourth press deactivates the seat heater.

Once the heated seat function has been activated, it will persist until one of the following conditions have been satisfied:

- The function is deactivated by pressing the switch for a fourth time.
- The ignition key is turned to position 'I'.
- A malfunction is detected by the front electronic module (FEM).

NOTE: The seat heaters are designed to operate at temperatures below a predetermined limit and therefore operation may be inhibited due to: storing the vehicle in a heated garage, body heat or warm ambient temperatures.

Rear Seats

Depending on market and vehicle specification, the rear seats will be one of the following:

- Fixed bench style with armrest.
- Electrically-adjustable, twin-back and bench cushion style (complete with armrest).
- Electrically-adjustable twin seats.

NOTE: Vehicles fitted with twin seats have a Rear Floor Console installed; refer to **Rear Floor Console**.

Depending on vehicle specification, heaters may be integral to the cushions and backrest; refer to **Rear Heated Seats**.

The following features are electrically adjustable (where applicable):

- Head restraint.
- Lumbar support.
- Backrest.

Electrically-Adjustable Backrest

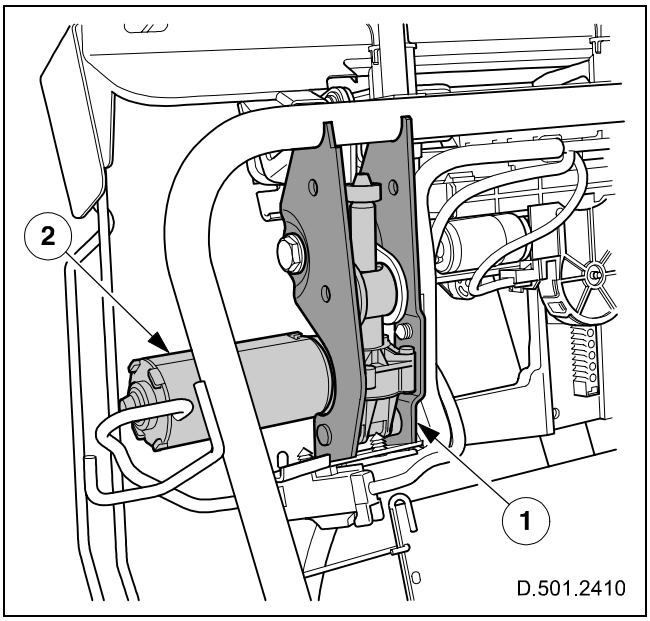

Fig. 146 Electrically-adjustable backrest

1. Backrest recline mechanism
2. Backrest recline adjustment motor

The electrically-adjustable backrest (where applicable) is occupant-controlled from the seat-mounted switch. The rear memory module (RMM) responds to the switch position chosen, by providing an output to the drive motor; refer to **New XJ Range Electrical Guide** for detailed connection information.

Electrically-Adjustable Head Restraint

The electrically-adjustable head restraint (where applicable) is occupant-controlled from the seat-mounted switch. The rear memory module (RMM) responds to the switch position chosen, by providing an output to the drive motor; refer to **New XJ Range Electrical Guide** for detailed connection information.

Power Lumbar

The 4-position power lumbar (where installed) comprises a single motor-driven pump, which inflates or deflates air cells as required to provide upper and lower lumbar support. The degree of support is determined by the operation of the seat-mounted switch. Depending on the switch-direction chosen, one of four solenoids housed within the solenoid pack is connected to the pump, which provides lumbar support by adjusting the amount of air in the appropriate cell; refer to **New XJ Range Electrical Guide** for detailed connection information.

Front Passenger Seat Adjustment

Depending on vehicle specification, the rear seats may have switch installed that will allow adjustment of the front passenger seat, recline and fore/aft positions, by the rear occupant seated directly behind. The relevant front passenger seat motors are activated by the passenger rear-adjust relay module (item 7, **Fig. 142**) in response to the switch position selected; refer to **New XJ Range Electrical Guide** for detailed connection information.

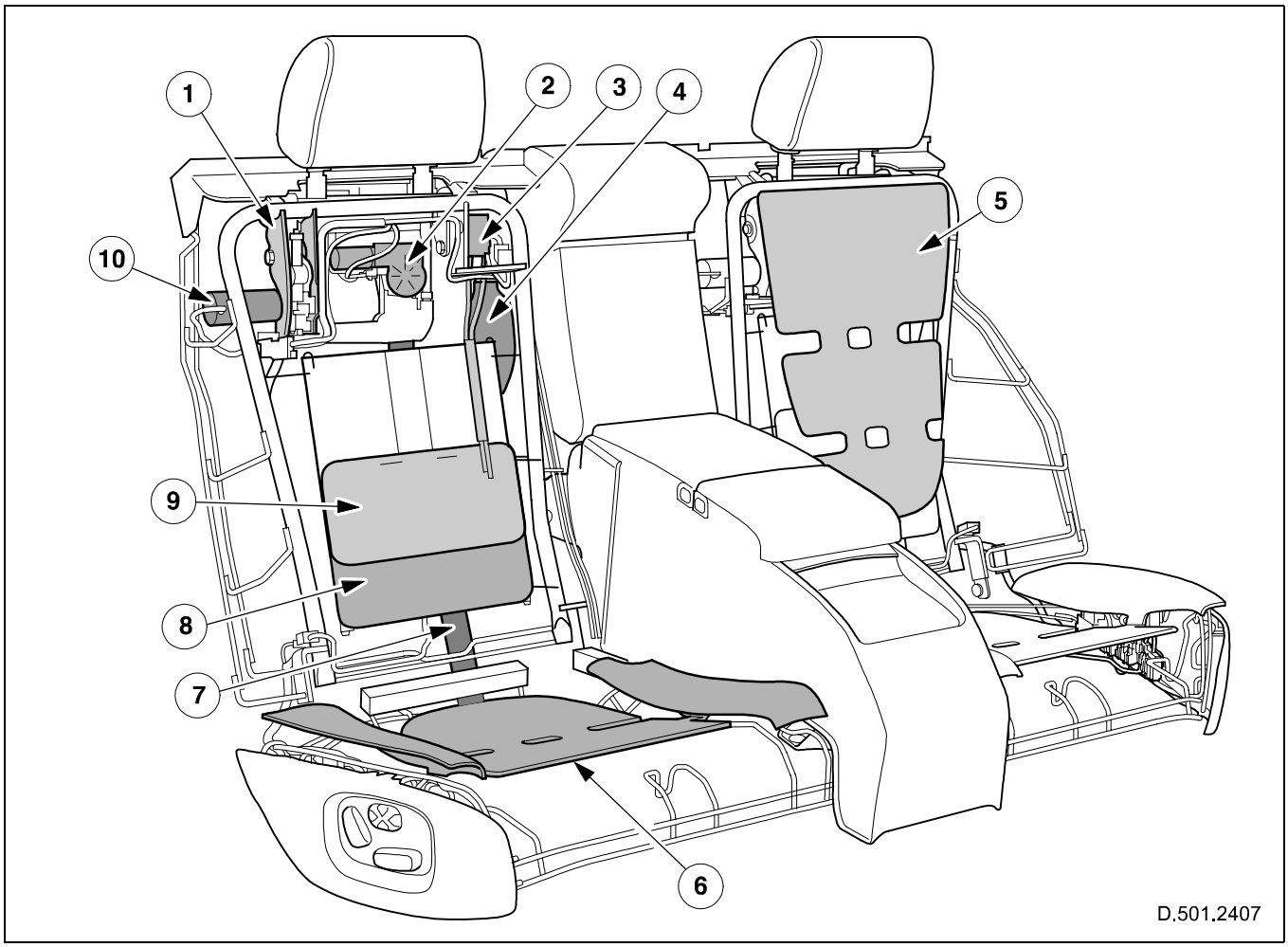

Fig. 147 Electrically-adjustable twin rear seats

1. Backrest recline mechanism
2. Head restraint mechanism
3. Lumbar solenoid pack
4. Motor-driven lumbar pump
5. Heater (backrest)
6. Heater (cushion)
7. Release strap
8. Lower air-cell
9. Upper air-cell
10. Backrest recline adjustment motor

NOTE: For clarity, the right-hand seat position is illustrated with the backrest heater removed.

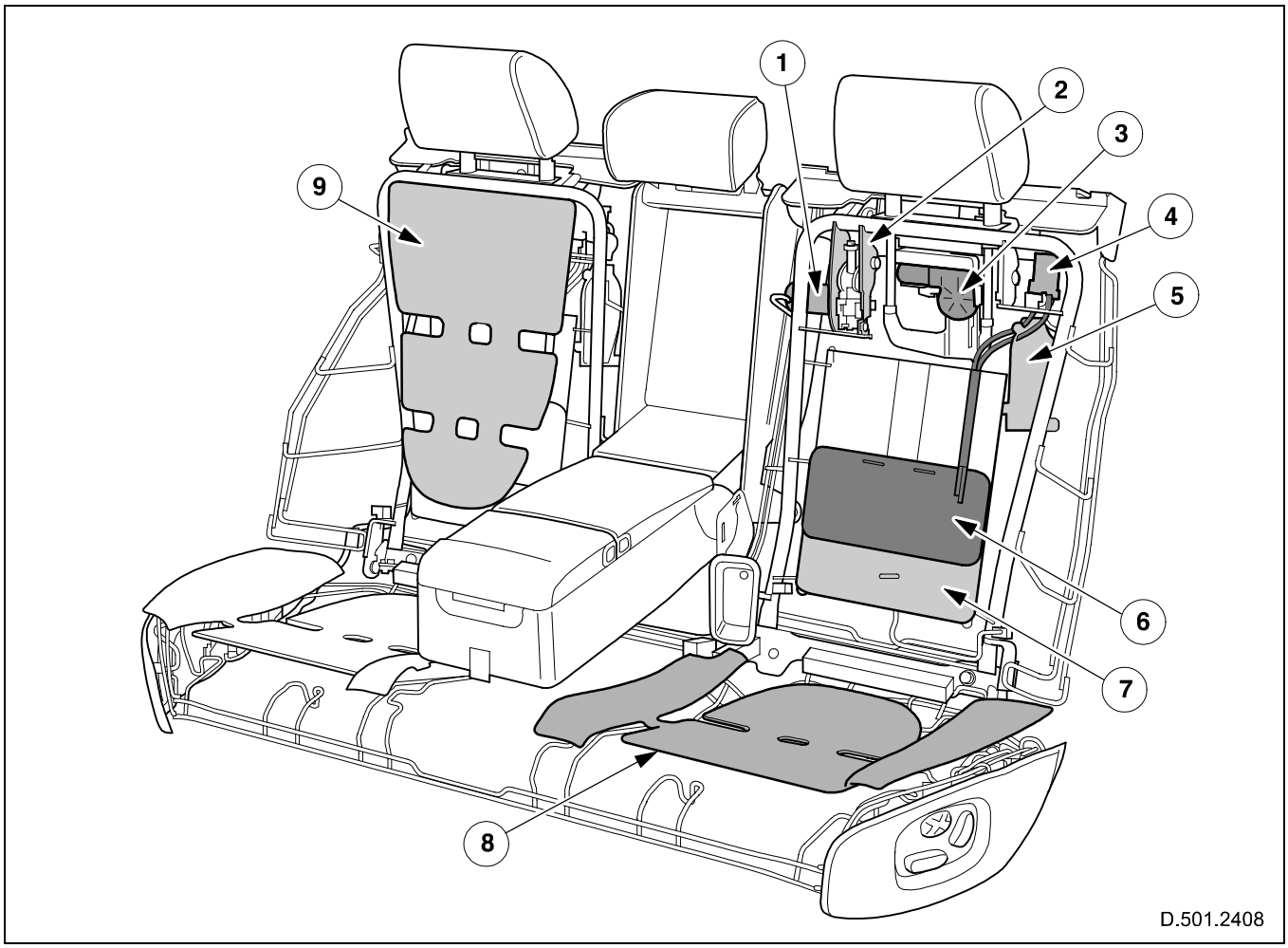

Fig. 148 Electrically-adjustable rear bench seat with armrest

1. Recline adjustment motor
2. Recline mechanism
3. Head restraint mechanism
4. Lumbar solenoid pack
5. Motor-driven lumbar pump
6. Upper air-cell
7. Lower air-cell
8. Heater (cushion)
9. Heater (backrest)

NOTE: For clarity, the left-hand seat position is illustrated with the backrest heater removed.

Backrest Release Mechanism

Access for service purposes is achieved by unlatching the backrest using the release strap, which is accessible once the seat cushion has been removed.

CAUTION: Make sure the backrest is in its most rearward position before removal; refer to JTIS for detailed Removal and Installation instructions.

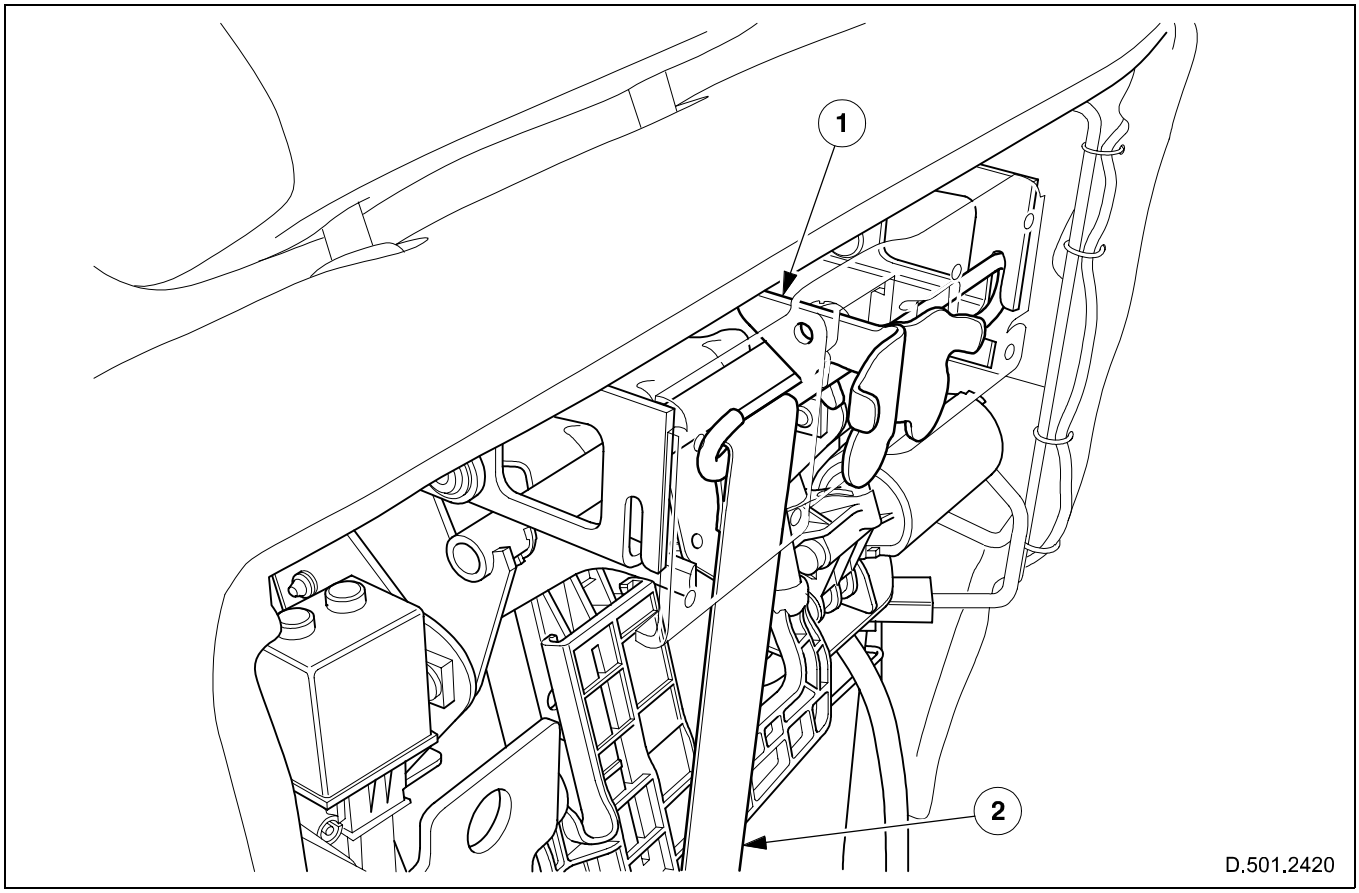

Fig. 149 Backrest release mechanism

1. Latch (secured to body panel)
2. Release strap

Rear memory module

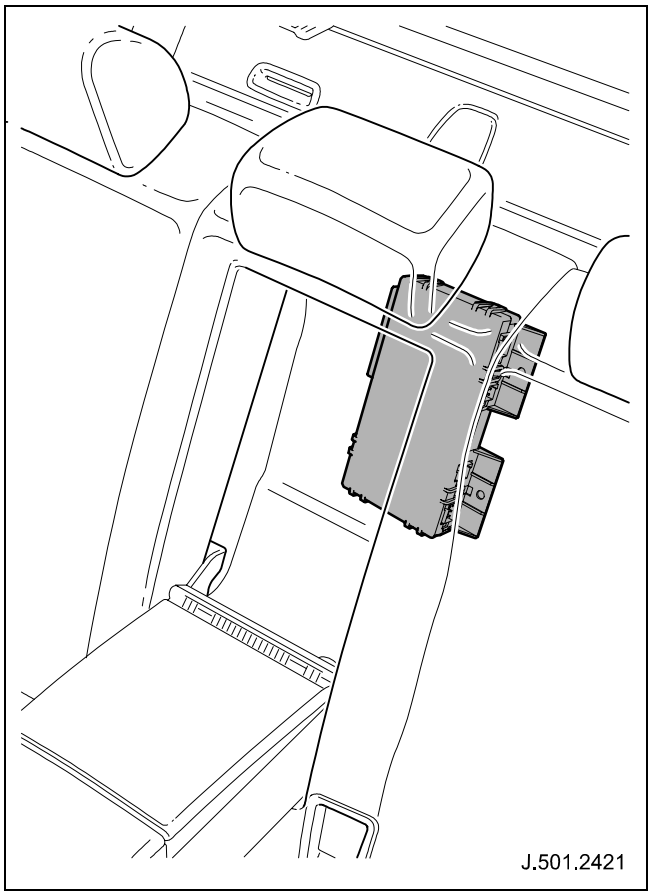

Fig. 150 Rear memory module

The rear memory module (RMM) is attached to the body-in-white behind the seat or to the ski-hatch blanking plate if the Rear Multimedia System is installed.

The RMM interfaces with the seat memory switches and the seat-mounted switchpack to control the rear seat electrical functionality. In response to selections made by the rear seat occupants, output signals are sent to the motors that control the:

- rake of the backrest;
- head restraint.

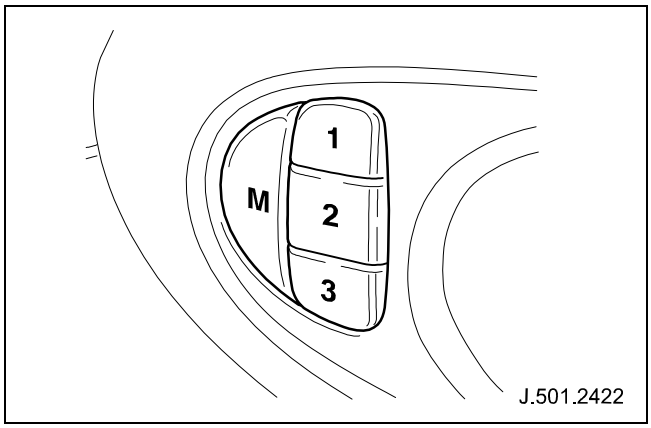

Fig. 151 Memory switch

Up to three personality configurations in relation to seat positions, are possible using the seat memory switch. The positions are stored and retrieved from the rear memory module (RMM).

NOTE: Lumbar positions cannot be saved using the memory feature.

Refer to **New XJ Range Electrical Guide** for detailed connection information.

Rear Heated Seats

Where applicable, the heated seat system comprises:

- Heated seat switches.
- Backrest heater element.
- Cushion (inner and outer) heater element and thermostat.
- Rear electronic module (REM).

As one of its many functions, the rear electronic module (REM) controls the seat heating feature by providing the appropriate response depending on the status of the heated seat switches; refer to **New XJ Range Electrical Guide** for detailed connection information.

The heated seats is one of the areas monitored by the electrical load management system (ELMS); refer to **Electrical Load Management System**. The ELMS dictates that in circumstances where the generated electrical power is less than the electrical consumption, selected systems may be inhibited or operated using reduced power for as long as is necessary.

NOTE: The tell-tale LED will remain illuminated so that the action is not apparent to the driver.

The heated seat function (when selected) permits the electrical heating of the backrest and cushion. The heating system for each seat is activated by separate switches, located in the floor console.

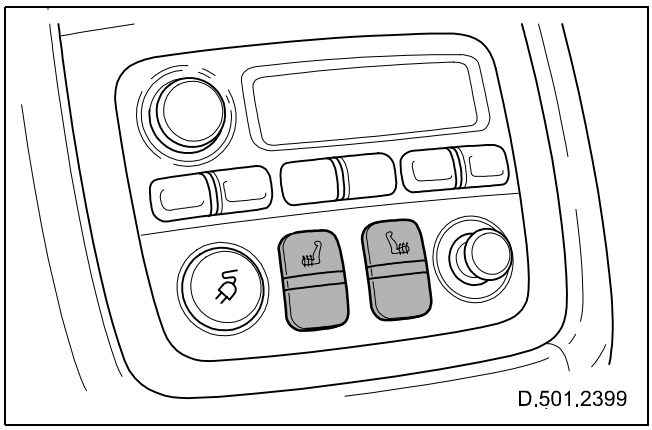

Fig. 152 Heated seat switches (4–zone console)

Provided the engine is 'running', pressing a heated seat switch, will select the maximum heat setting for the chosen seat, as confirmed by three illuminated red LEDs. A second press selects the mid-setting (two LEDs) and a third press selects the lowest heat setting (one LED). A fourth press deactivates the seat heater.

Once the heated seat function has been activated, it will persist until one of the following conditions have been satisfied:

- The function is deactivated by pressing the switch for a fourth time.
- The ignition key is turned to position 'I'.
- A malfunction is detected by the REM.

NOTE: The seat heaters are designed to operate at temperatures below a predetermined limit and therefore operation may be inhibited due to: storing the vehicle in a heated garage, body heat or warm ambient temperatures.

Armrest

The fold-down armrest has integral cup holders and depending on market and vehicle specification may also be fitted with passenger entertainment control panel; refer to **Passenger Entertainment Control Panel**.

NOTE: The cellular phone is a dealer installed option for certain markets; refer to **Cellular Phone**.

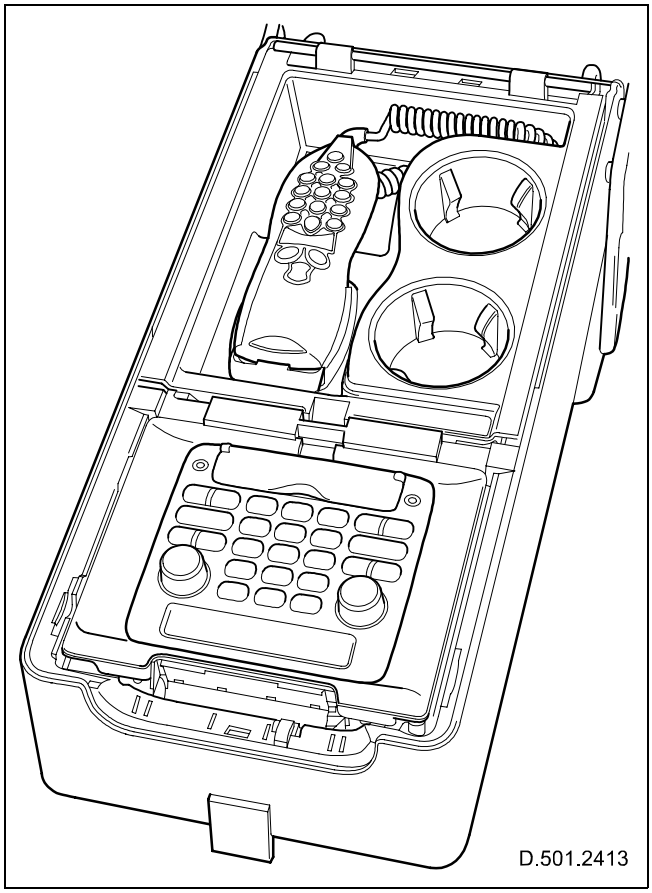

Fig. 153 Armrest (without covers)

Instrument Panel And Consoles

Instrument Panel

The instrument panel is built around a magnesium cross-car beam. The magnesium casting provides benefits in terms of both weight and accuracy of alignment.

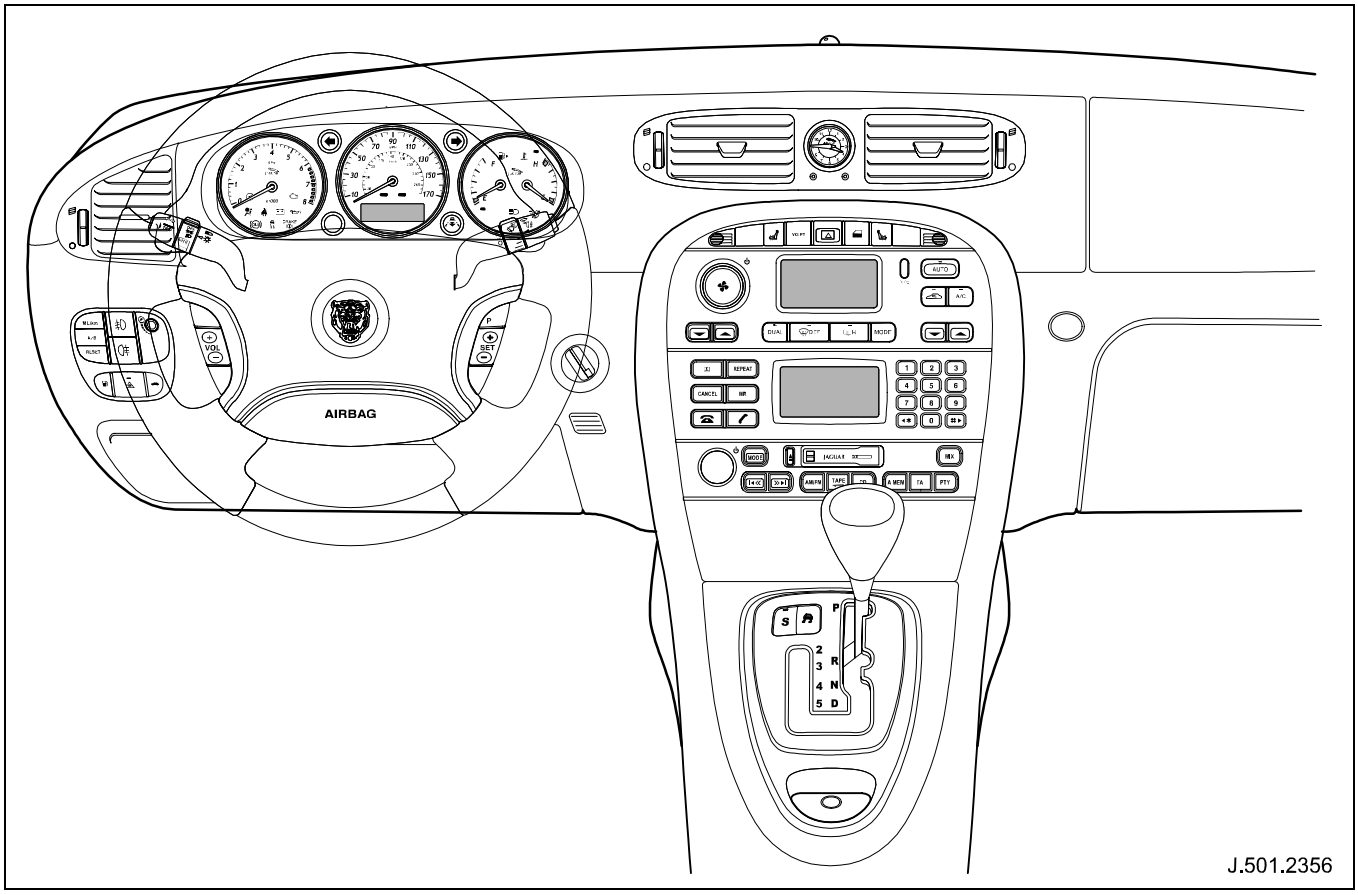

Fig. 154 Instrument panel

The following components are fitted to, or installed within the instrument panel:

- instrument cluster;
- passenger air bag module;
- glove compartment;
- air distribution registers;
- air distribution ducting;
- auxiliary lighting switch;
- in-vehicle temperature sensor;
- sunload/autolamp sensor;
- ignition switch;
- driver's stowage compartment;
- driver's knee-bolster;
- hood release-lever;
- driver's switch assembly (fuel filler-flap / forward alert switch / luggage compartment lid release);
- glove compartment release switch.
- clock

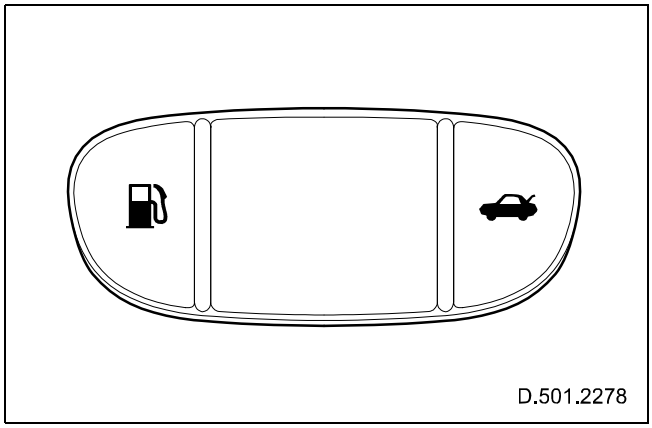

Fig. 155 Fuel filler-flap/luggage compartment lid release

The center console of the instrument panel houses the following:

- center console switch assembly;
- climate control panel or telematics display module; refer to **Climate Control System**;
- audio unit; refer to **In-vehicle Entertainment Systems**.

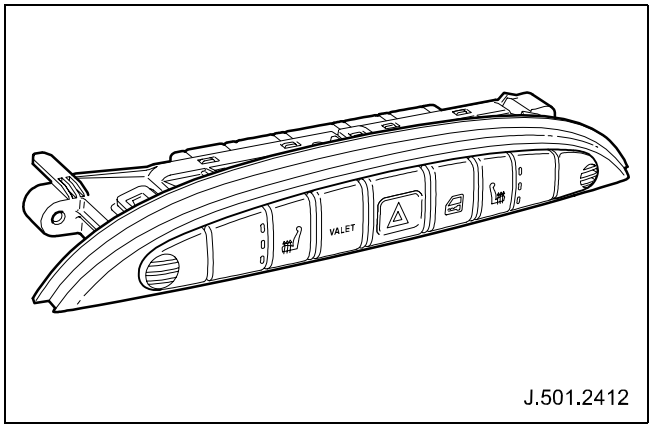

Fig. 156 Center console switch assembly

Depending on vehicle specification, the center console switch assembly comprises:

- heated-seat switches;
- master lock switch;
- hazard warning switch;
- valet mode switch;
- occupancy sensor (one of four); refer to **Occupancy Sensors**.

NOTE: The sensor is installed adjacent to the passenger side of the assembly. To maintain symmetry, the opposite end of the assembly has only the sensor housing installed.

Glove Compartment

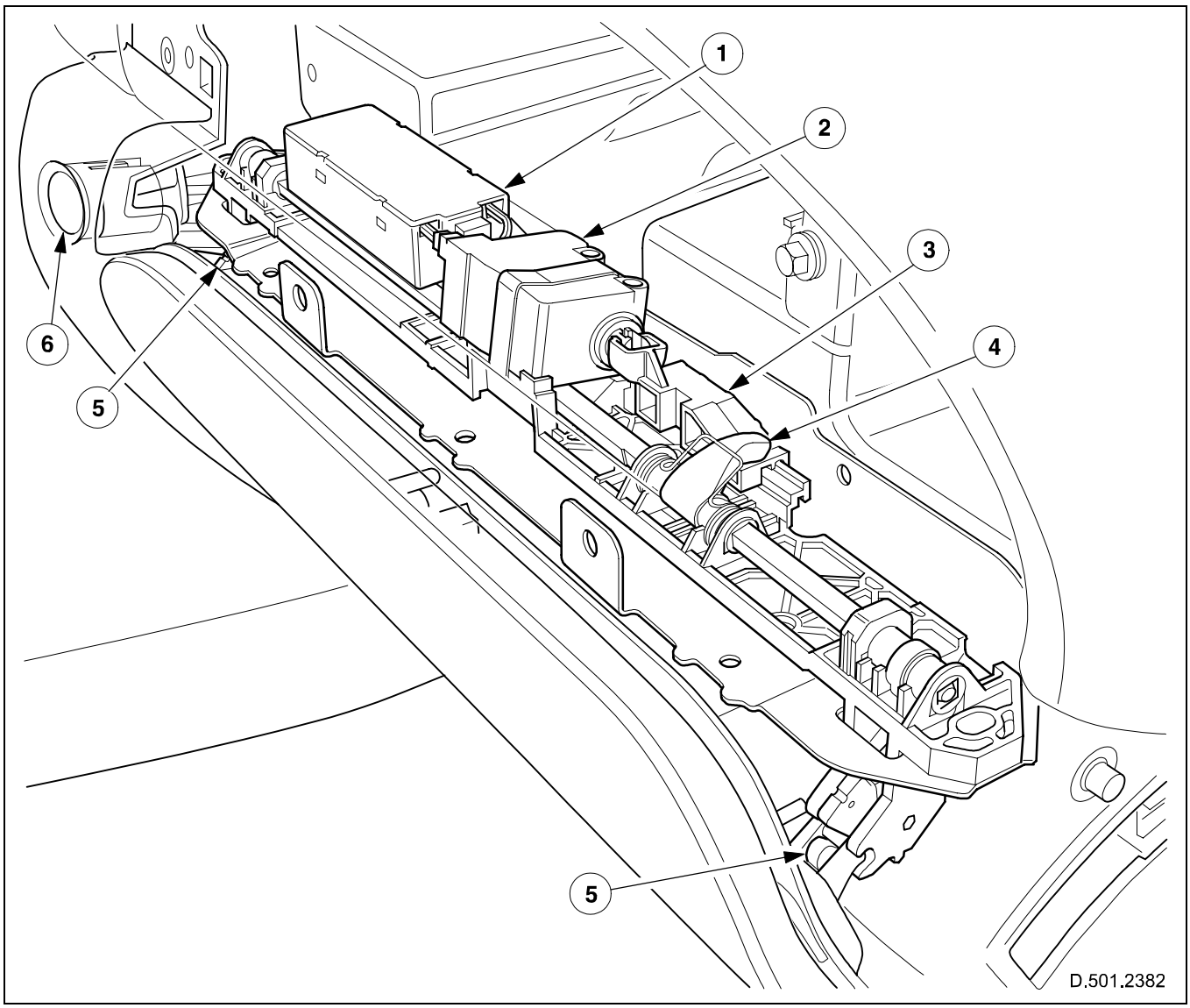

Fig. 157 Glove compartment door release mechanism

1. Control-electronics
2. Motor
3. Actuating slide
4. Release lever
5. Latch
6. Switch

The glove compartment door is electrically secured and can only be released by operating the switch.

NOTE: Should it prove necessary, removal of the end closing panel, from the passenger side of the instrument panel will permit access so that technicians can manually release the mechanism; refer to **JTIS**.

The door is a component part of the anti-theft strategy and therefore cannot be opened when:

- the anti-theft system is actively or passively armed;
- the vehicle is in valet mode;
- the vehicle is centrally or super-locked from the door key-barrel or integrated key transmitter.
- the auto-relocking function has been activated.

NOTE: Access is not inhibited by drive-away door-locking or activation of the master-locking switch or internal door locking/unlocking mechanism.

Providing the mechanism has not been inhibited by a security feature, when the switch is pressed, the front electronic module (FEM) responds by sending a control signal to the motor, via the control-electronics. When activated, the motor causes the actuating-slide to operate the release lever. The lever releases the two latches mounted either side of the door, allowing the door to lower to its fully-open position.

NOTE: If the switch is operated more that 15 times within a 20 second period, the opening function is inhibited. The opening function is reactivated after 20 seconds have elapsed.

An accessory power socket is mounted, outboard, inside the glove compartment.

Floor Console

The 4–zone floor console (where installed) is designed to accommodate the rear climate control system; refer to **Rear Climate Control System**. Actual features vary according to vehicle specification.

NOTE: The j-gate support casting is made from magnesium and secured to the cross-car beam to minimize variation between the instrument cluster and the floor console.

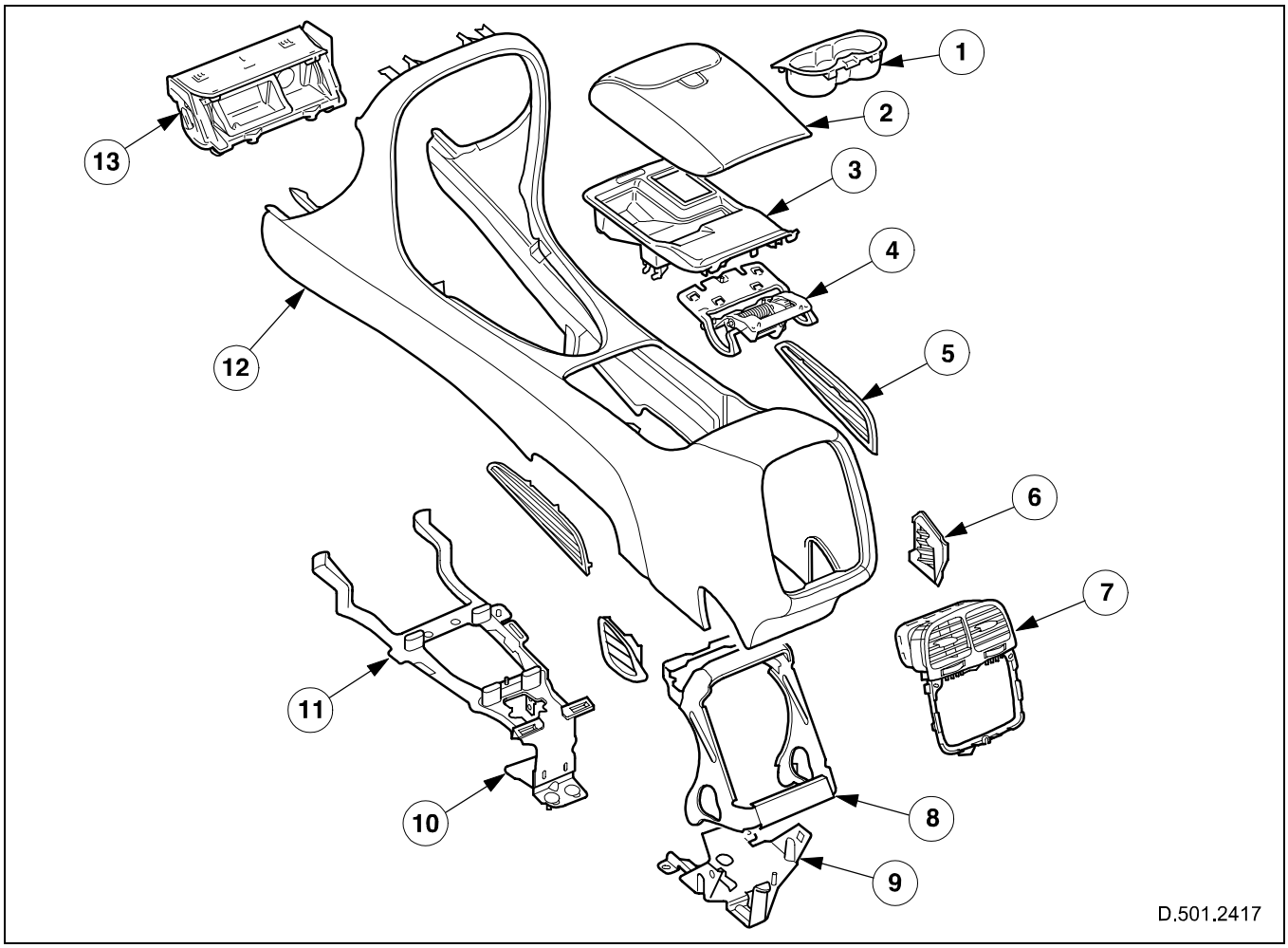

Fig. 158 Floor console assembly (4–zone)

1. Cupholder
2. Armrest
3. Phone (where applicable) stowage area
4. Armrest hinge assembly
5. Climate control input register
6. Climate control floor register
7. Climate control face ducting and registers
8. Console bracket
9. Console to floor mounting bracket
10. Yaw rate sensor bracket
11. J-gate support casting
12. Console
13. Ashtray

The 2–zone floor console, depending upon vehicle specification, consists of the accessory power-socket, ashtray, cigar lighter, heated seat switches and sliding armrest. The center section of the console carries a stowage box complete with a clip-in secondary cup holder. The cellular phone (where installed) is located on the underside of the armrest.

NOTE: The 2–zone floor console is the standard installation and is not designed to accommodate the rear climate control system.

Rear Floor Console

The rear floor console is installed for vehicles fitted with rear twin seats. Depending upon market and vehicle specification, the following features are integral to the console:

- twin cupholders;
- stowage box;
- cellular phone (dealer installation); refer to **Cellular Phone**;
- passenger entertainment control panel; refer to **Passenger Entertainment Control Panel**.

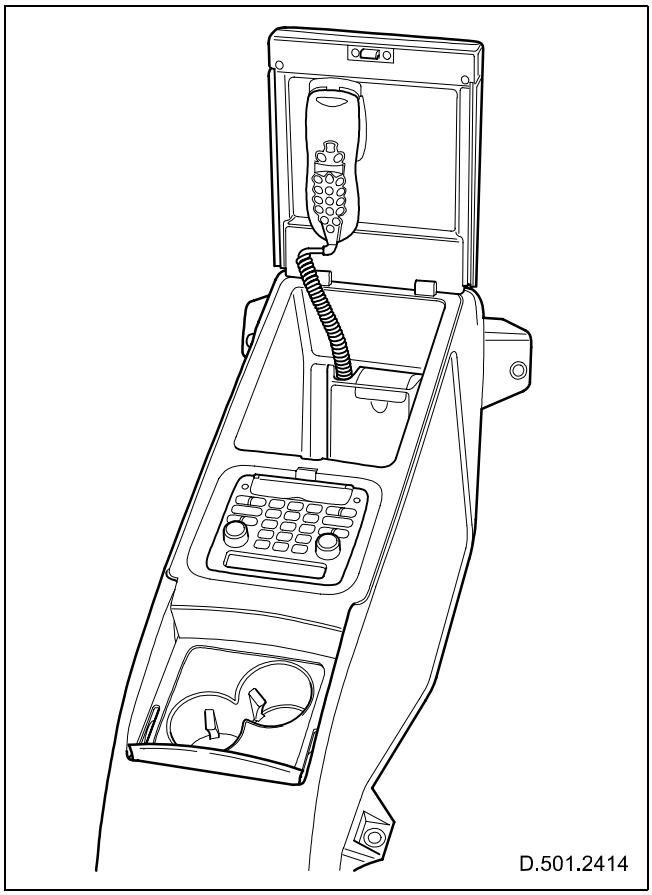

Fig. 159 Rear floor console (with front armrest removed)

Overhead Console

The overhead console, depending on market and vehicle specification, incorporates the following:

- sunblind switch;
- front parking aid deactivation switch;
- courtesy lamp;
- reading/map lamps;
- remote convenience buttons (garage door opener);
- roof opening panel switch;
- microphone;
- intrusion sensors;
- mood lamp.

All switches have backlight illumination and tell-tale lamps where applicable. The console has an integral sunglasses bin with sprung and damped opening.

The mood lamp provides 'soft' illumination of the floor console and cup-holder area. The lamp is part of the backlight illumination circuit and therefore illuminates in synchronization with the side lamps. The level of back-lighting is determined by the dimmer control mounted within the auxiliary lighting switch; refer to **Instrument Cluster and Panel Illumination**.

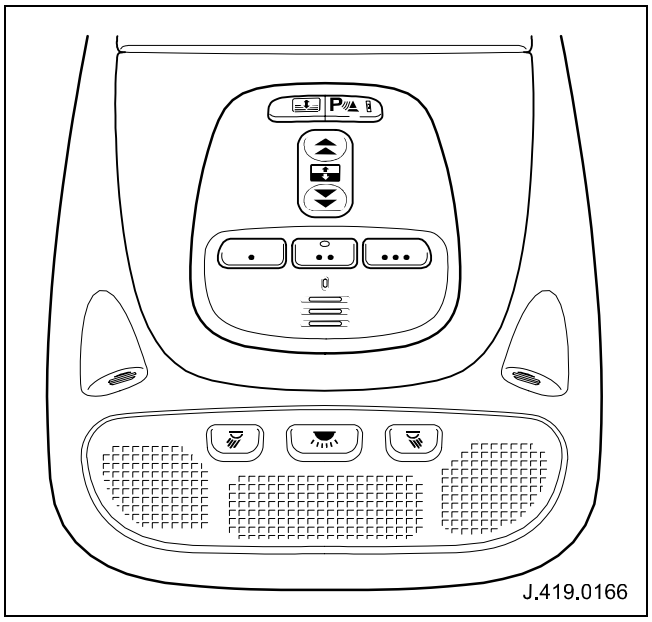

Fig. 160 Overhead console

The remote convenience transceiver, (where fitted), can be programmed to transmit up to three different radio frequencies, to activate garage doors, gates, home lighting, security systems or other radio frequency operated equipment.

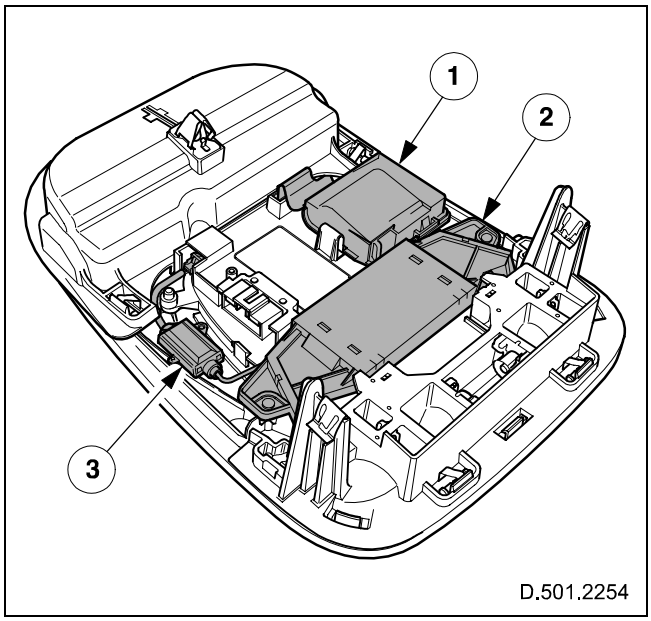

Fig. 161 Overhead console components

1. Remote convenience transceiver (garage door opener)
2. Intrusion sensors
3. Microphone amplifier

NOTE: Principal components of the overhead console are 'heat-staked' for robustness and consequently cannot be serviced separately; refer to **JTIS** for details.

Advanced Restraints System

Introduction

The continued development of the 'Advanced Restraint System' provides an improved overall level of crash protection for vehicle occupants. The system analyzes the occupancy scenario and crash severity before activating the appropriate safety devices to help better protect a range of occupants in a variety of crash situations. Benefits of the system include:

- Optimization of the deployment restraint devices and the reduction in potential for air bag induced injuries.
- The significant reduction in passenger air bag deployments (particularly when passenger seats are unoccupied) and a general reduction in all air bag deployments.

Some typical passenger position scenarios are illustrated in **Fig. 162**.

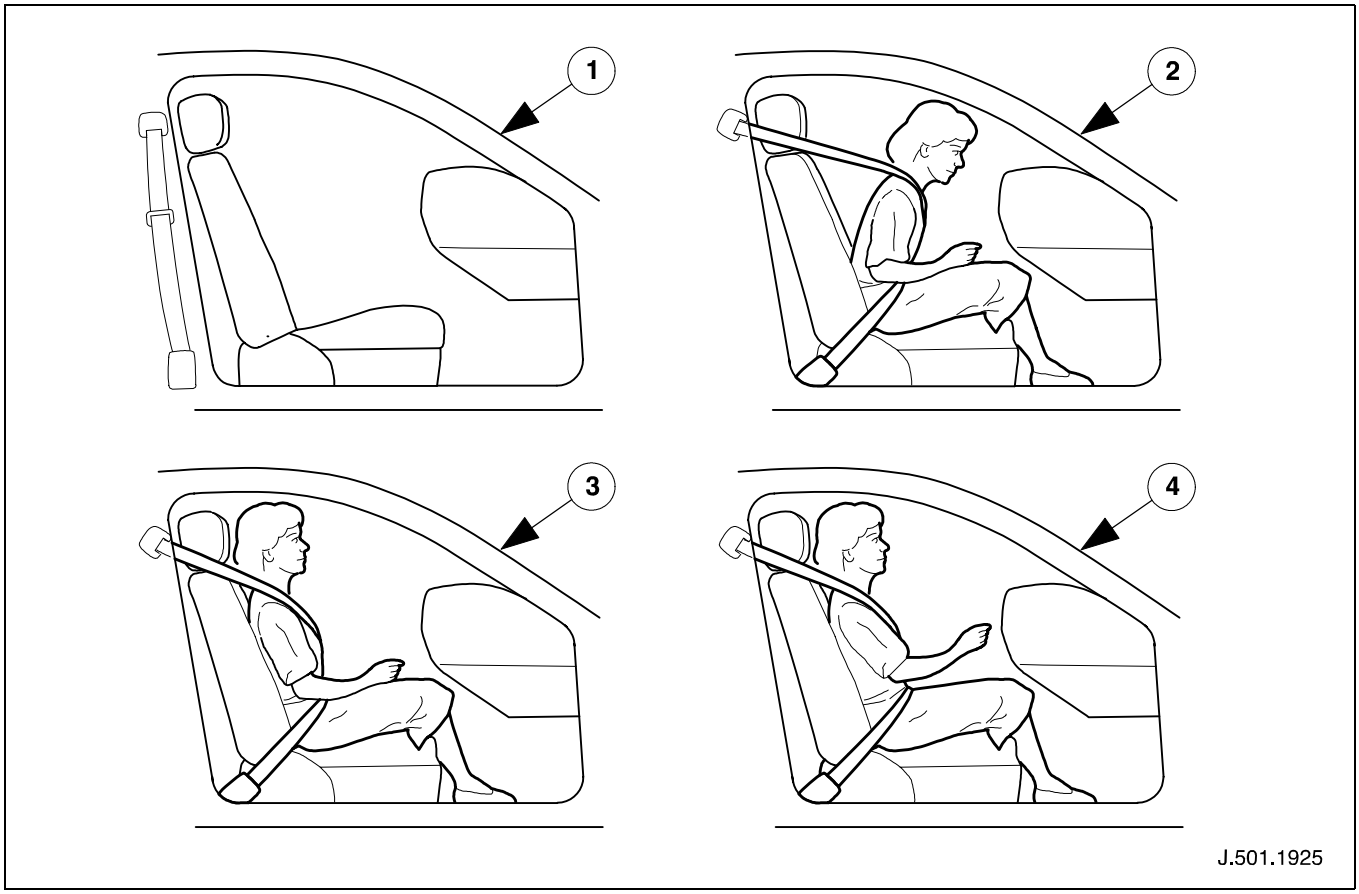

Fig. 162 Basic occupancy scenarios (passenger side)

1. Empty seat - No deploy
2. Out of position- No deploy
3. In position- Deploy
4. Extremities - No effect on deployment decision

In order to support the advanced restraint system requirements, a restraint control architecture has been introduced comprising the following systems or components:

- Passenger occupancy-sensing system
- All-electronic crash sensing with including frontal crash severity sensing and advanced restraints management.
- Driver air bag with twin stage inflator.
- Passenger air bag with twin stage inflator.
- Child seat lower ISOfix anchors for rear seats.
- Safety belt system including: front belt use detection, load limiting retractors and pre-tensioners.
- Rear safety belts with pre-tensioners.
- Front seats including: driver seat-track position sensor and passenger seat weight-sensing system.
- Lower steering column.
- Front seat-mounted side air bags.
- Side curtain air bags.

The systems diagram **Fig. 163** provides an indication of how the electrical component parts interact with each other; refer to **New XJ Range Electrical Guide** for detailed information.

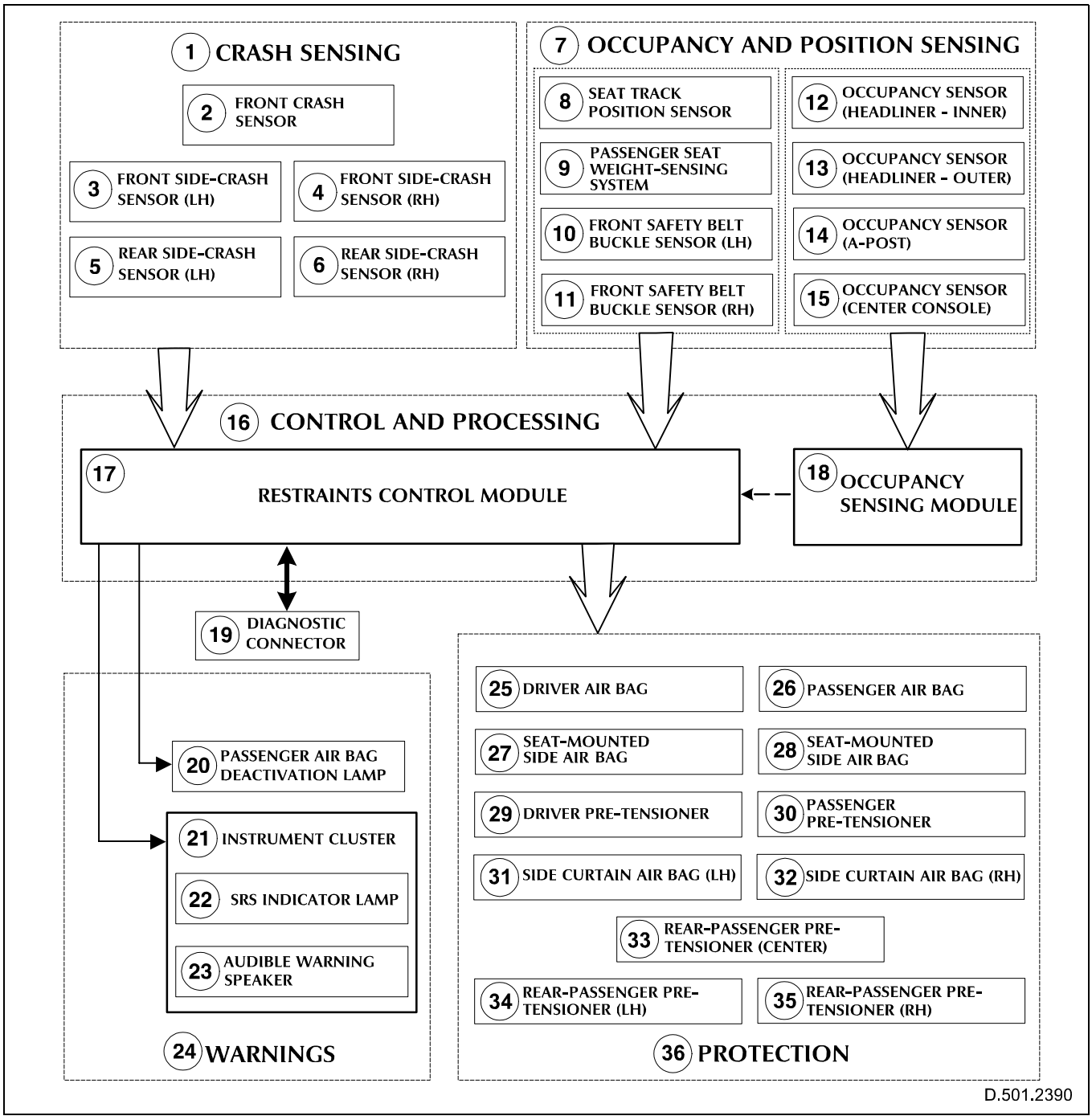

Fig. 163 Advanced restraints system diagram

Key to Fig. 163

1. Crash sensing
2. Front crash sensor
3. Front side-crash sensor (LH)
4. Front side-crash sensor (RH)
5. Rear side-crash sensor (LH)
6. Rear side-crash sensor (RH)
7. Occupancy and position sensing
8. Seat-track position sensor
9. Passenger seat weight-sensing system
10. Front safety belt buckle sensor (LH)
11. Front safety belt buckle sensor (RH)
12. Occupancy sensor (headliner - inner)
13. Occupancy sensor (headliner - outer)
14. Occupancy sensor (headliner - A-post)
15. Occupancy sensor (center console)
16. Control and processing
17. Restraints control module
18. Occupancy sensing module
19. Diagnostic connector
20. Passenger air bag deactivation lamp
21. Instrument cluster
22. SRS indicator lamp
23. Audible warning speaker
24. Warnings
25. Driver air bag
26. Passenger air bag
27. Seat-mounted side air bag
28. Seat-mounted side air bag
29. Driver pre-tensioner
30. Passenger pre-tensioner
31. Side-curtain air bag (LH)
32. Side-curtain air bag (RH)
33. Rear passenger pre-tensioner (center)
34. Rear passenger pre-tensioner (LH)
35. Rear passenger pre-tensioner (RH)
36. Protection

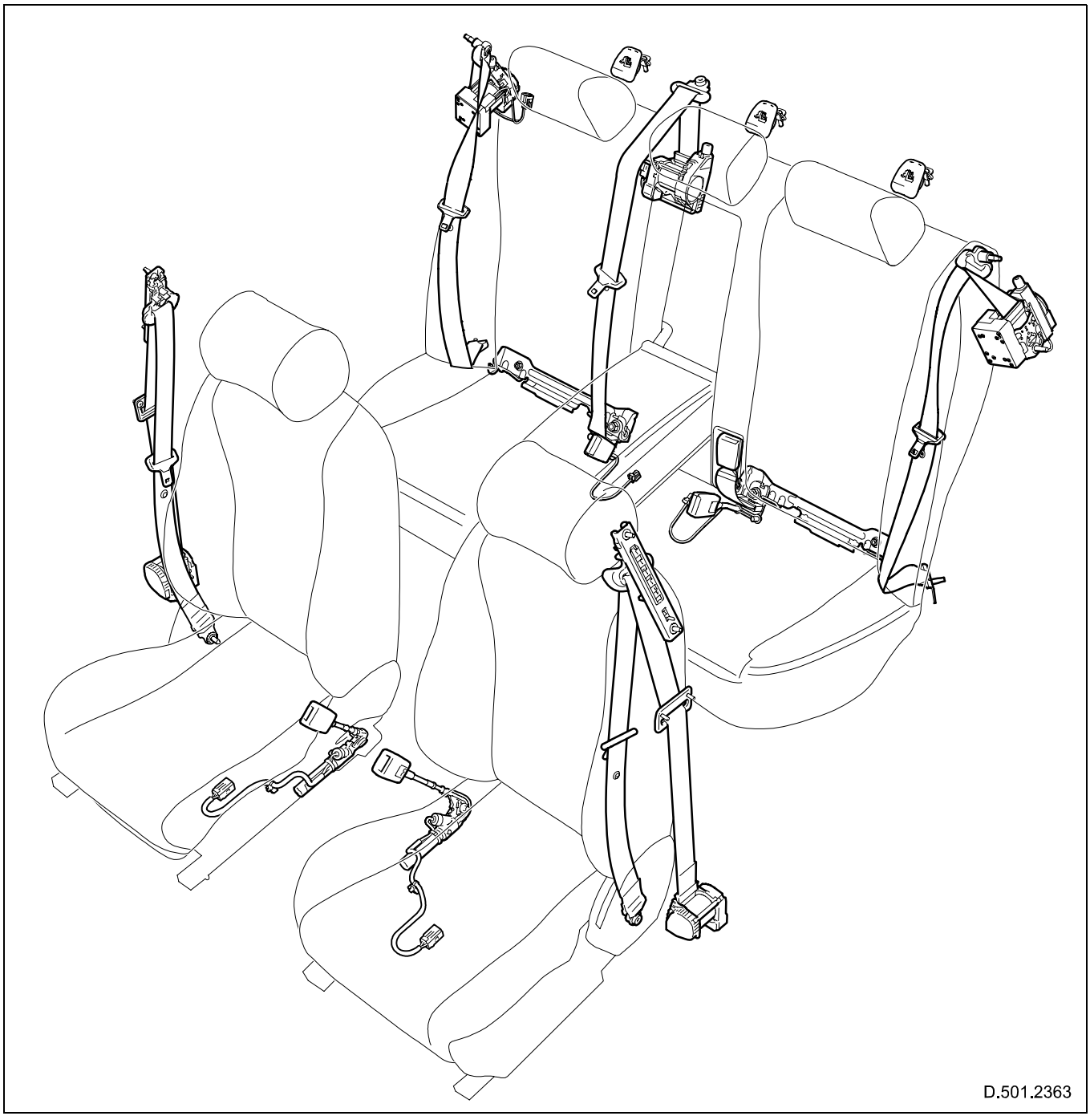

Fig. 164 Occupant restraints - location of active components

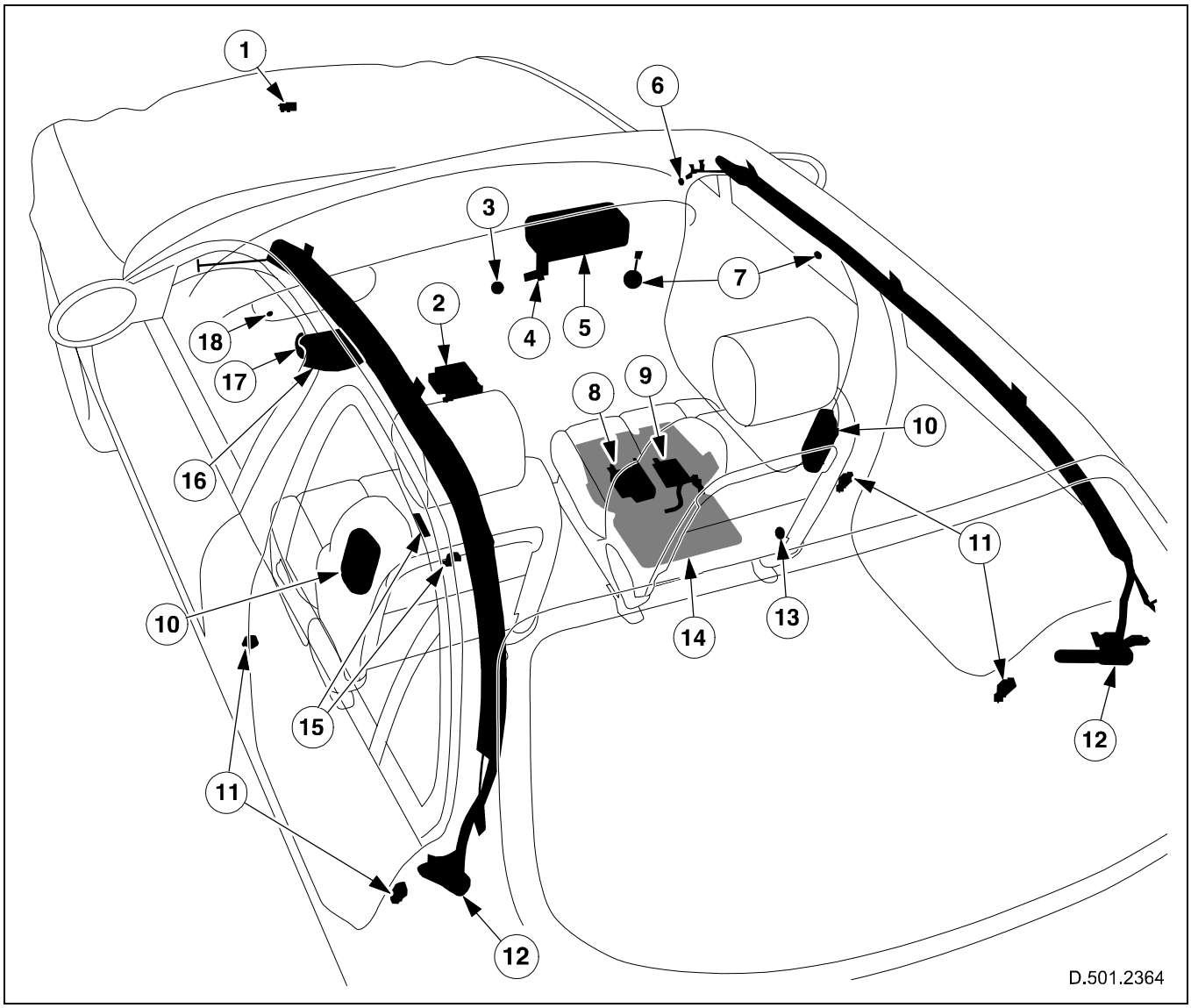

Fig. 165 Occupant restraints - location of passive components

1. Front crash sensor
2. Restraint control module
3. Occupancy sensor - center console
4. Passenger air bag deactivation indicator lamp
5. Passenger air bag module
6. Occupancy sensor - A-post
7. Occupancy sensors - headliner
8. Occupancy sensing module
9. Passenger seat weight-sensing module
10. Seat-mounted side air bag module
11. Side-crash sensor
12. Side-curtain air bag
13. Belt tension sensor (where applicable)
14. Passenger seat weight-sensing bladder
15. Seat-track position sensor
16. Driver air bag module
17. Clockspring
18. SRS indicator lamp

Crash Sensing

WARNING: Before commencing work on any part of the restraint system, the vehicle battery should be disconnected and a period of at least one minute allowed to elapse.

- The sensors do not contain any serviceable parts.
- Serial numbers of new parts should be logged against VIN for traceability.

Front Crash Scenario

The restraints control module (RCM), controls air bag deployment decisions by using signals from its internal accelerometer and the following sensors:

- Front crash sensor.
- Seat-track position sensor.
- Safety belt buckle sensor.
- Passenger seat weight-sensing system.
- Occupancy sensors.

Front Crash Sensor

The front crash sensor:

- is mounted on a bracket which is located in the center of the upper mounting crossmember;
- collects acceleration data from the front of the vehicle and sends it back to the RCM as an analogue signal;
- provides the main source of data that enables the RCM to gauge the severity of a frontal impact.

Side Crash Scenario

Data from the side crash sensors are used by the restraints control module (RCM), in conjunction with acceleration data from the RCM's internal accelerometer to make a deployment decision. The RCM processes the acceleration data and subject to an impact being of high enough severity, decides whether the seat-mounted side air bag should be deployed. The decision is forwarded to the deployment handler (within the RCM) which responds appropriately; for example: in the case that the data received indicates that the passenger seat is empty, or occupied by a small person, the passenger side air bag will be disabled.

NOTE: The appropriate side curtain air bag will still deploy to afford protection for any corresponding rear occupant.

Side Crash Sensors

The side crash sensors:

- Comprise accelerometer and processing circuits but do not make deployment decisions.
- The front side-crash sensor is mounted behind the B-post trim close to the safety belt retractor fixing.
- The rear side-crash sensor is mounted directly to the vehicle body at a rear mid-wheel location, close to the rear lower safety belt anchor.

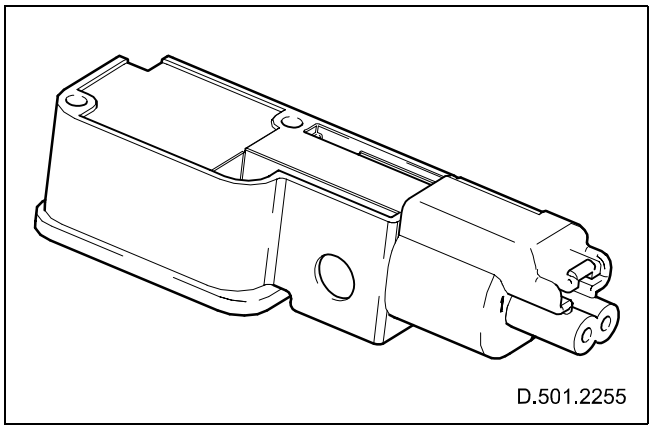

Fig. 166 Crash sensor

Occupancy and Position Sensing

Seat-track Position Sensor

The seat-track position sensor, a 'Hall effect' type, is fitted to the underside of the driver's seat. The sensor is actuated by the magnet that is attached to the seat slide; refer to **Fig. 167**. The magnetic field disturbance caused when the magnet passes the sensor, creates an output signal for the RCM. On receipt of this signal, which indicates when the seat is forward of a defined point in its travel, the RCM disables the second stage output of the driver air bag. Malfunction of the sensor or associated circuits will cause the SRS indicator lamp to illuminate. Diagnosis must be undertaken using WDS.

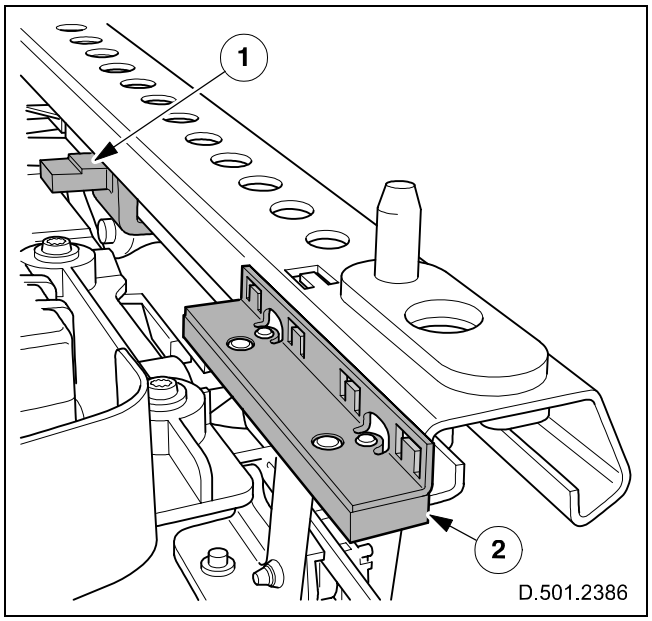

Fig. 167 Seat-track position sensor

1. Hall effect sensor
2. Magnet

Safety Belt Buckle Sensor

The safety belt buckle sensor is a 'Hall effect' type, which provides an output signal in response to the magnetic field disturbance caused by the insertion of the safety belt tongue into the buckle. The output signal from the sensor is used by the RCM to determine whether the front seat occupants are correctly restrained. Malfunction of the sensor or associated circuits will cause the SRS indicator lamp to illuminate. Diagnosis should be undertaken using WDS.

The Hall effect sensor is used in conjunction with the other components of the advanced restraint system to ensure that air bag and safety belt deployment only occurs where necessary.

Passenger Seat Weight-Sensing System

The seat weight-sensing system forms part of a strategy to control passenger air bag deployment depending on the occupancy scenario. The strategy also takes into account the data received from the occupancy sensors; refer to **Occupancy Sensors**.

NOTE: The seat weight-sensing system does not comprise any serviceable items.

The following components are combined and calibrated during manufacture to form the seat weight-sensing system:

- Passenger seat cushion.
- Silicone-filled bladder (integrated into the passenger seat cushion).
- Seat weight-sensing module (mounted under the seat).
- Pressure sensor (attached to the bladder and mounted under the seat).

NOTE: In some markets, the belt tension sensor (an integral part of the front passenger safety belt seat-anchor) has been introduced; refer to **Belt tension sensor**.

Locations for the seat weight-sensing components are shown in **Body, Seats, Fig. 142**.

The silicone-filled bladder responds to weight changes on the passenger seat. The pressure sensor responds to these pressure changes and provides an appropriate signal to the seat weight-sensing module. In addition, the belt tension sensor (where applicable), provides a separate input to the seat weight-sensing module; refer to **Belt tension sensor**. The module processes the input signals received from the sensors and forwards an appropriate signal to the restraints control module (RCM) via the local CAN. In addition, the module performs self-diagnostic functions on the system, with any malfunctions being notified to the RCM accordingly. Malfunction of the sensing system or associated circuits will cause the SRS indicator lamp to illuminate. Diagnosis of the system can only be undertaken using WDS; refer to **JTIS** for further information.

The seat weight-sensing system responds to the occupancy of the front passenger seat in accordance with **Table 9**. The advanced restraints system via the RCM, monitors and processes the data from the seat weight-sensing system and several other sensors, before making a deployment decision; refer to the advanced restraints system diagram **Fig. 163**. The system is designed to take account of several variables in addition to weight, including: inclination of the vehicle; exact position and structure of the weight on the seat.

NOTE: The seat weight-sensing system cannot discriminate between a passenger and an object.

Passenger seat status	Passenger air bag status	Passenger air bag deactivation lamp status
Empty	OFF	OFF
Occupied (small occupant)	OFF	ON
Occupied (large occupant)	ON	OFF

Table 9 Passenger seat weight-sensing system

Service Kit

Individual components of the seat weight-sensing system are not serviceable; the system must be replaced as a complete unit. Due to the sophistication of the weight-sensing system, each replacement system requires calibration. To avoid the need to provide each dealer with calibration equipment, a pre-calibrated service kit assembly is available. The kit has two fixed connectors and a single connector to interface with the vehicle harness. After installation, the system will require initialization by WDS; refer to **JTIS** for further information.

Belt tension sensor

The belt tension sensor (BTS) is a strain-gauge type, encapsulated within the passenger safety belt anchor. The sensor converts the force applied to the belt into an electrical signal. In the event that a child-seat is installed onto the front passenger seat (not recommended), the force applied to the passenger safety belt is reflected by the output signal from the sensor, which provides data to supplement that received from the silicon bladder. The passenger seat weight-sensing module processes the input data and makes it available to the restraints control module (RCM), which then makes the necessary adjustments in respect of passenger air bag deployment.

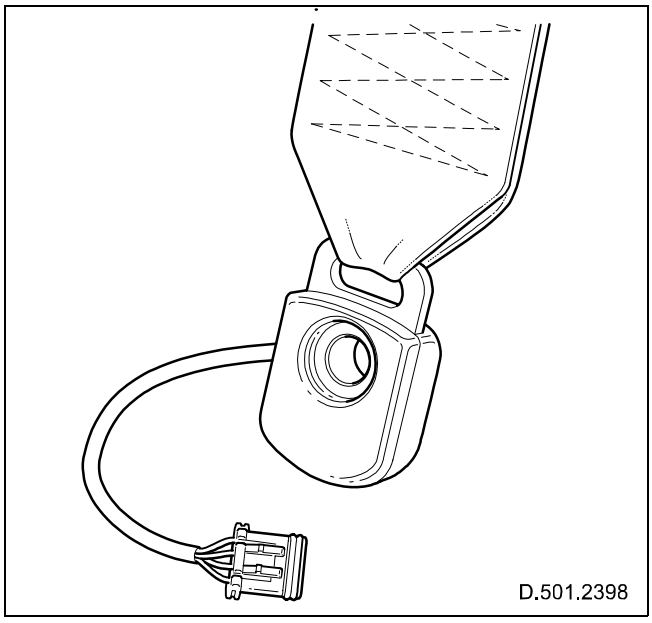

Fig. 168 Belt tension sensor

Occupancy Sensors

The occupancy sensors form part of a strategy to control passenger air bag deployment, depending on the occupancy scenario; refer to **Fig. 162**. The strategy also takes into account the data received from the seat weight-sensing system; refer to **Passenger Seat Weight-Sensing System**.

The occupancy sensor system uses ultrasound at an operating frequency of 40 kHz to monitor passenger seat occupancy.

NOTE: Medical studies have shown that frequencies within this range do not present any danger or discomfort.

The advanced restraints system uses four ultrasonic sensors, one at the passenger-side A-post, one in the center console and two in the headliner assembly; refer to **Fig. 165**.

The sensors:

- are strategically placed to detect the presence and movement of the front passenger seat occupant;
- determine the presence and position of the front seat occupant with respect to the passenger air bag deployment door;
- determine air bag deployment decisions by classifying occupants as either 'in position''or 'out of position';
- are part of a system that is sophisticated enough to be unaffected by body extremities; refer to **Fig. 162**.

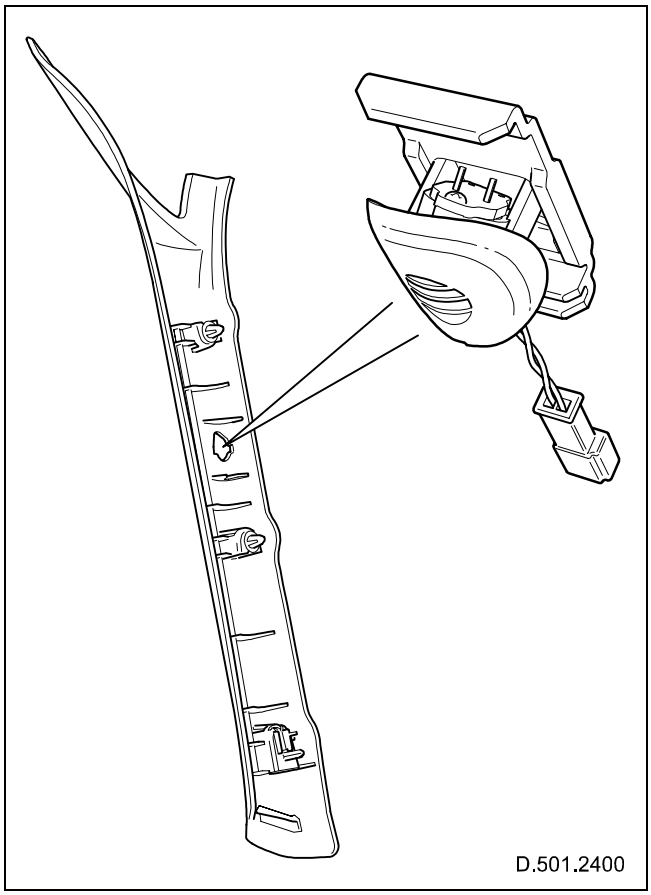

Fig. 169 Occupancy sensor - A-post

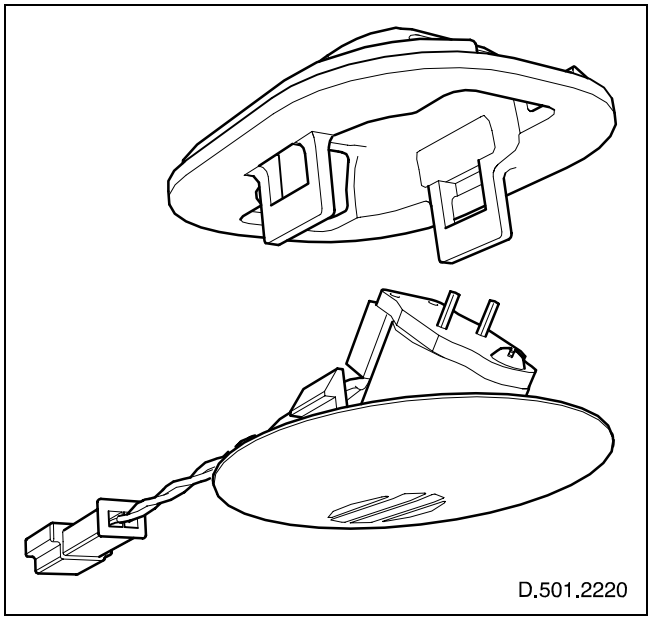

Fig. 170 Occupancy sensor - headliner

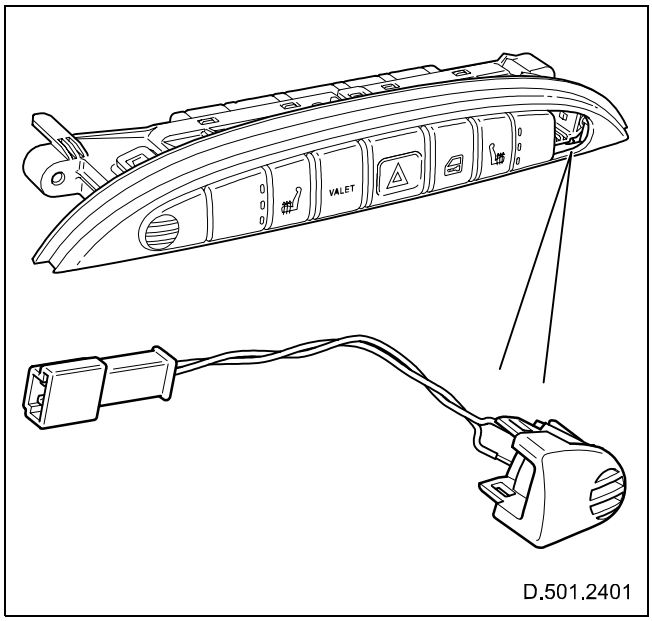

Fig. 171 Occupancy sensor - center console

The occupancy sensing module constantly monitors and processes the signals received from the occupancy sensors; refer to **Occupancy Sensing Module**. Data from the sensors is correlated by the occupancy sensing module and used to decide when the front passenger seat occupant has leaned into an area in front of the passenger air bag door, known as the 'keep-out zone'.

NOTE: The system is designed to ignore body extremities (hands, feet) and respond only to head or body movements. When the passenger leans forward into the zone, the system will disable the passenger air bag and provide visual confirmation by illuminating the passenger air bag deactivation lamp; refer to **Passenger Air Bag Module**.

The RCM uses the data received from the occupancy sensing module, in conjunction with data from other sensors in the system (refer to **Fig. 163**), to make deployment decisions; refer to **Restraints Control Module**.

Refer to **JTIS** for sensor servicing information and to **New XJ Range Electrical Guide** for connection information.

Control and Processing

Restraints Control Module

Internally, the restraints control module (RCM) has two areas that determine which elements of the restraint system are to be deployed:

Area 1 - Crash severity evaluation

The first area evaluates crash severity by using data from the RCM's internal accelerometer, the front crash sensor and the safety-belt buckle sensor. Based on this data, the RCM decides which level of air bag deployment is required and forwards the information to the second area, the deployment handler.

Area 2 - Deployment handler

The status of the seat-track position sensor, occupancy sensors, seat weight-sensing system and safety-belt buckle sensors are examined before a decision is made about which restraints should finally be deployed. For instance, if the occupancy sensing and seat weight-sensing system indicates that the passenger seat is empty, then no restraint deployment will take place on the passenger side, even if full deployment takes place for the driver.

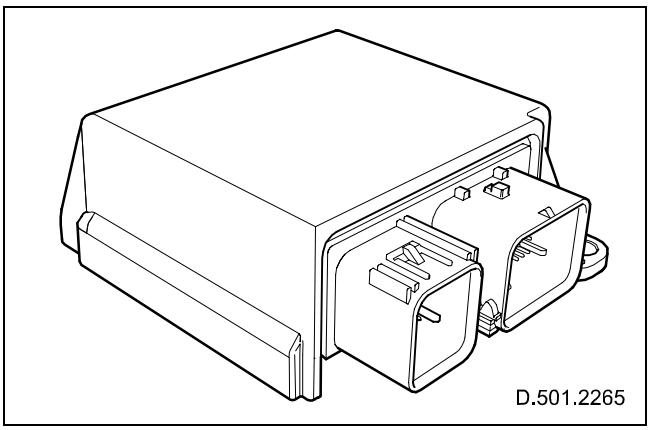

Fig. 172 Restraints control module

The restraints control module:

- Is fixed to the top of the driveshaft tunnel below the center console.

NOTE: Due to the importance of the module being securely fixed to the vehicle body, the ground connection is made via the fixings and is monitored by the diagnostic system. A bad connection causes a diagnostic trouble code (DTC) to be generated. Refer to **JTIS** for the correct torque figures.

- Identifies severity and direction of impact and makes decision on deployment of air bags and pre-tensioners.
- Provides firing signals to all air bags and pre-tensioners.
- Performs on-board testing of the air bag and pre-tensioner firing circuits, warning indicator circuits and module status (the front and side-crash sensors perform basic self-tests).
- Stores DTCs.
- Drives the SRS indicator lamp on the instrument cluster: if the warning lamp fails and there is an additional malfunction within the system (DTC recorded) a secondary-warning audible tone is emitted.
- In the event of a crash, sends a signal to the vehicle emergency message system (VEMS) and the ECM to indicate that a crash has occurred.
- Is connected to the diagnostic connector via the ISO data bus to enable communication with WDS or scan-tool.
- In the event of loss of battery supply in crash conditions, provides a temporary back-up power supply (100ms after the RCM loses its supply) to operate the front air bag modules and pre-tensioners.
- In the event of a crash, records certain data for subsequent access via the diagnostic connector. This data includes deceleration information, firing delay and DTCs.

NOTE: Diagnosis of any malfunctions relating to the adaptive restraints system must always be undertaken using WDS.

Occupancy Sensing Module

The module:

- is located beneath the front passenger seat;
- processes signals received from the occupancy sensors; refer to **Occupancy Sensors**;
- processes signals received from the seat weight-sensing system; refer to **Passenger Seat Weight-Sensing System**;
- makes data available to the RCM via a local CAN.

Safety Belts

In appropriate markets, all passenger safety belts (not the driver's) have an integral automatic locking retractor (ALR), providing a 'static reel mode' for use with child seats. When activated, the static reel mode prevents further extraction of the belt and locks the child seat firmly in position.

The static reel mode is activated by pulling the belt to its full extension to engage the ratchet mechanism. After ensuring the child seat is in the required position the belt tongue should be inserted into the buckle and the belt allowed to slowly retract back onto the reel (a ratchet operation may be felt as the belt retracts) until it fits snugly around the child seat.

Unbuckling the belt and allowing the webbing to fully retract will disengage the ALR feature.

NOTE: Safety belts are not serviceable items. As with all electronically monitored, occupant safety components, the SRS indicator lamp will illuminate if a DTC has been stored. Diagnosis must be undertaken using WDS.

WARNING: Prior to the removal of safety belts and before disconnecting safety belt electrical connectors, the vehicle battery should be disconnected and a period of at least one minute allowed to elapse. The same amount of care should be taken when handling and storing safety belts, as would be taken when handling and storing air bag modules.

The front safety belt retractors incorporate a load limiting device, that allows progressive 'payout' of additional safety belt webbing when the force exerted exceeds a predetermined limit.

NOTE: Each front safety belt buckle assembly incorporates a 'Hall effect' sensor; refer to **Safety Belt Buckle Sensor**. In some markets, a belt tension sensor is incorporated into the front passenger, lower safety belt anchor; refer to **Belt tension sensor**.

Front Safety Belt Warning Reminder

NOTE: To suit market legislation, the feature can be activated or disabled as appropriate.

- When the front passenger seat is unoccupied, the reminder will pertain only to the driver's safety belt and will cease when the belt is buckled.
- When the front passenger seat is occupied, the reminder will pertain to both safety belts and will cease only when **both** belts are buckled.

NOTE: The presence of a front seat passenger is detected by the **Passenger Seat Weight-Sensing System**.

Provided the reminder feature is activated, detection of an unfastened front safety belt is indicated by the illumination of the safety belt warning lamp and an audible warning.

NAS functionality

For the first 60 seconds after the ignition key has been turned to position 'II'/'III':

- If the driver's safety belt is unfastened, the safety belt warning lamp will remain illuminated and be accompanied by a single six-second audible warning.
- Fastening the driver's safety belt will cause the warnings to cease.
- Failure to fasten the driver's safety belt will cause the audible warning to cease after 6 seconds and the warning lamp to extinguish after 60 seconds.
- After 75 seconds have elapsed, the reminder feature will operate as described for rest-of-world functionality.

Rest-of-world functionality

An intermittent audible warning will start/resume and the safety belt warning lamp will flash under the following conditions:

- a front seat occupant is present and their safety belt is unfastened;
- the vehicle is travelling at a speed greater than 10 mile/h (16 km/h).

The warning will remain active for a 5 minute period, every 30 seconds during this period, the intermittent audible warning and flashing lamp will be evident for 10 seconds. These incremental warnings will cease when either of the following conditions are satisfied:

- front seat occupants fasten their safety belts;
- the vehicle is halted.

Disabling the reminder

The front passenger seat must be unoccupied and the following steps completed within 60 seconds:

1. Turn the ignition key to position 'II' (do not start the engine).
2. Repeat the following actions, nine times:
   – fasten the driver safety belt buckle, check the safety belt warning lamp extinguishes and then unfasten the driver safety belt buckle, check the safety belt warning lamp illuminates.

   NOTE: After completion of step 2, a single chime confirms that the reminder feature has been disabled.

Enabling the reminder

The procedure for enabling the reminder is identical to the disabling procedure.

Pyrotechnic pre-tensioners

The pre-tensioner will only be activated when the restraints control module (RCM) sends an appropriate firing signal; refer to **Control and Processing**.

The pre-tensioners are:

- designed to remove excess webbing from the safety belt in the event of a crash;
- deploy very quickly and early on in the crash before the occupant starts loading the safety belt.

WARNING: In the event that a pre-tensioner deploys, the complete safety belt system (front and rear) must be replaced; refer to JTIS.

The front safety belts employ buckle-type pre-tensioners; refer to **Fig. 173**.

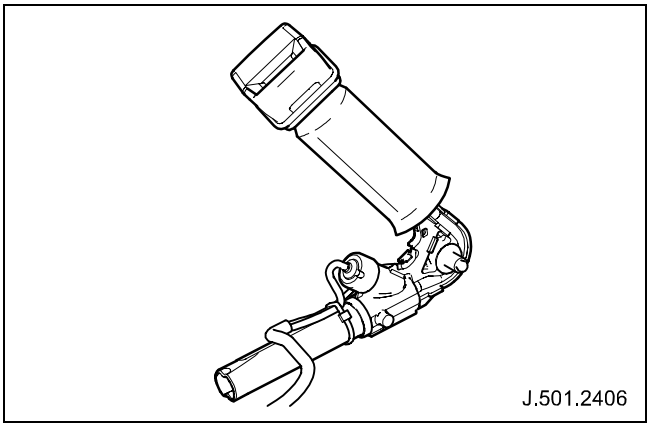

Fig. 173 Buckle-type pre-tensioner

The rear safety belts employ retractor-type pre-tensioners; refer to **Fig. 174** and **Fig. 175**.

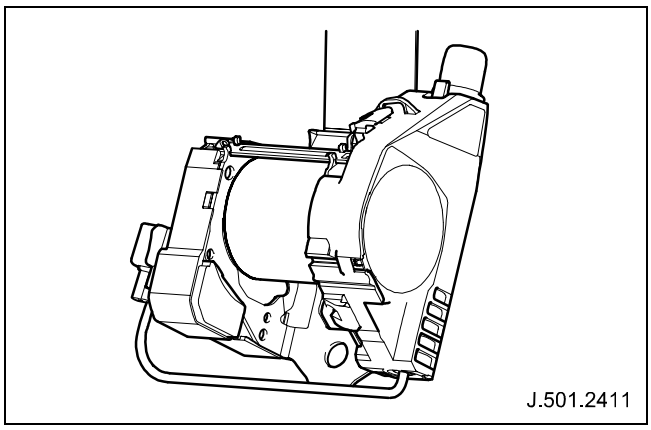

Fig. 174 Retractor-type pre-tensioner (rear center)

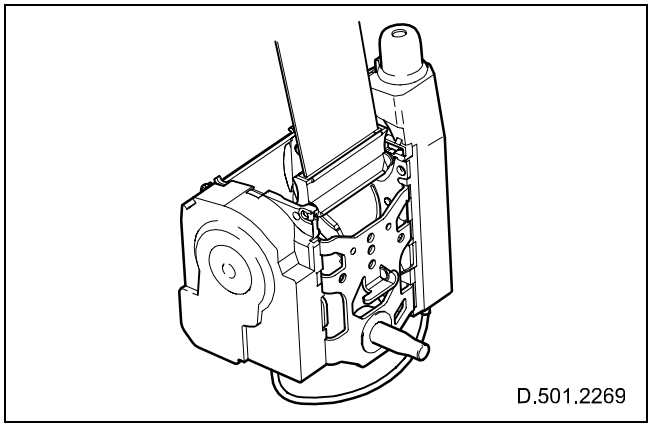

Fig. 175 Retractor-type pre-tensioner (rear left-hand)

Rear Safety Belt Comfort System

NOTE: The following applies only to vehicles fitted with electrically adjustable rear seats.

The rear safety belts for the outboard positions have an integral comfort solenoid, designed to be activated when the belts are fastened. During the period that a belt remains fastened, the solenoid switches operation from the retraction spring to a comfort spring, which reduces the force exerted on the occupant by the safety belt webbing. When the belt is unfastened, the comfort solenoid disengages the comfort spring, re-engages the retraction spring and causes the force on the webbing to immediately revert to the standard retraction mode.

Anti-whiplash System

In order to reduce the incidence of whiplash injuries, two anti-whiplash mechanisms (one either side) are incorporated into each front seat. The mechanisms are designed to respond to rear impacts at low speeds, by controlling the rearward motion of the backrest to reduce the likelihood of neck injuries.

Depending on the weight of the seat occupant and the severity of the collision, the mechanisms begin to operate at collision speeds between approximately 8.7 and 11.2 mile/h (14 and 18 km/h).

Immediately after a rear impact, the seat forces the backrest against the occupant (**Fig. 176A**). At this point the mechanism is activated and progresses through a controlled phase of movement:

1. the backrest moves rearwards (but in an upright position) for a distance of approximately 50mm (**Fig. 176B**);
2. the backrest tilts rearwards (**Fig. 176C**) but is limited to an angle of approximately 15 degrees.

The combined effects of movements 1 and 2, absorb impact energy, reducing the relative acceleration of the head and body.

NOTE: The positioning of items behind the front seats will prevent the activation of the mechanism (**Fig. 176D**).

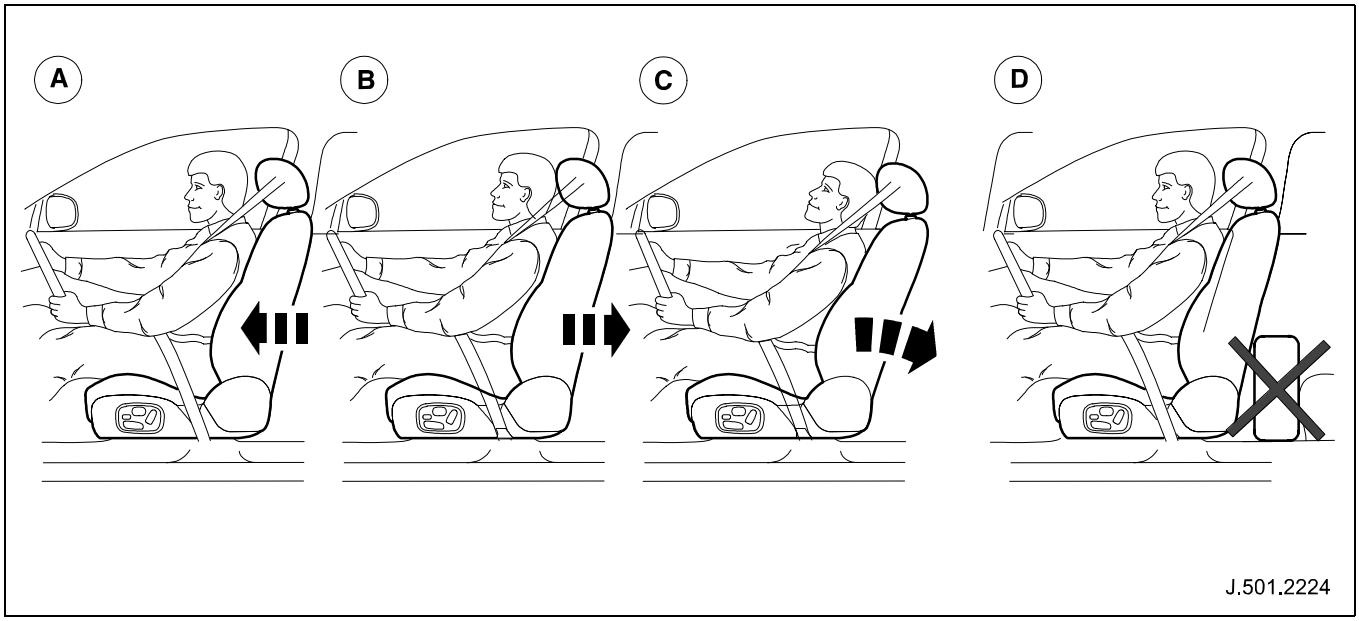

Fig. 176 Anti-whiplash feature

With reference to **Fig. 177**, the mechanism has been engineered so that during a rear impact collision, the movement of the recliner plate (7) and backrest, is controlled. This is achieved by constraining the movement of the guide-pin (4) within the window (3) of the outer side-plate (1).

NOTE: The displacement of the guide-pin in the window, will vary depending on occupant weight, occupant posture and the impact severity.

The tilting movement of the backrest is determined by the design parameters of the deformation link (5) which collapses (**Fig. 177C**) to provide gentle braking.

NOTE: The shape of the window, the angle between the two links (**Fig. 177B**) and the return spring (2), prevents the mechanism from being activated during normal driving.

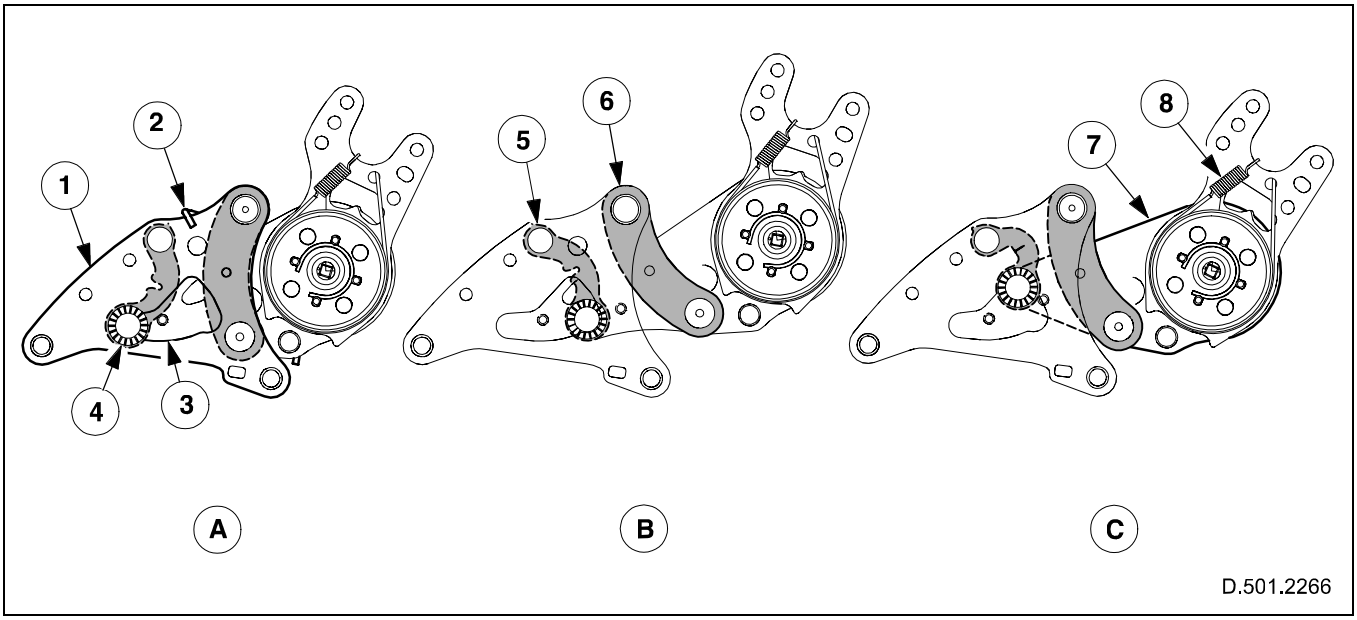

Fig. 177 Anti-whiplash mechanism (left-hand side)

A. Installed condition
B. Fully rearwards condition
C. Fully deployed condition
1. Outer side-plate
2. Return spring
3. Window
4. Guide-pin
5. Deformation link
6. Rear link
7. Recliner plate
8. Brake spring

NOTE: The anti-whiplash mechanism has no serviceable components. In the case of a minor collision, even though the protective system has been activated, there may be no apparent change to the seat. The seat must always be inspected after a rear collision; refer to **JTIS**.

Air Bag Modules

Driver Air Bag Module

The driver air bag module is controlled by the restraints control module (RCM), which chooses between first or second stage deployment, depending on driver seat buckle usage, the seat position and crash severity.

NOTE: Variation in driver air bag deployment is determined by the timing of the first and second stage ignition signals. This facilitates adaptation of the stiffness and timing of the air bag to optimize occupant protection.

The module comprises:

- A twin stage inflator as opposed to the single stage inflator.
- Separate chambers for the two inflation stages, each independently activated by the RCM.
- Two air bag connectors, that have foolproof mechanical keying and are color coded to the respective plug on the inflator.
- A non-azide propellant that reduces particulates and effluents.

The air bag deploys radially, to reduce the risk of air bag induced injury to a driver that is positioned close to the steering wheel.

NOTE: Disposal of twin stage air bags is different to single stage air bags; refer to **JTIS**.

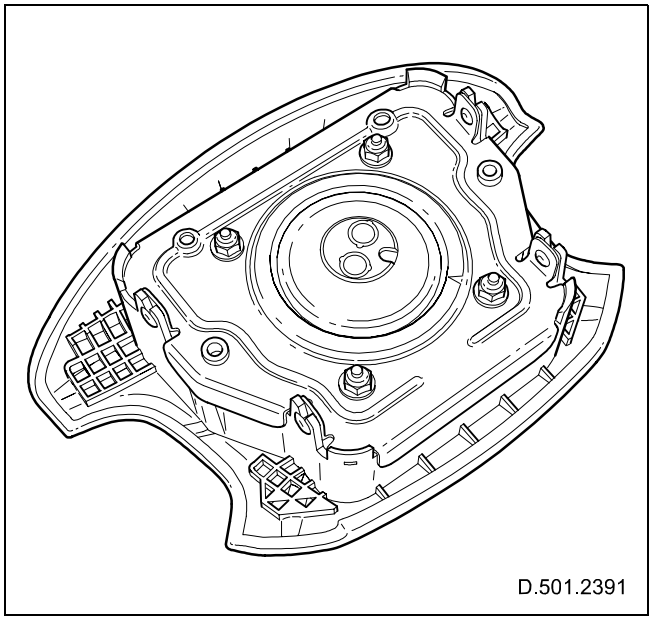

Fig. 178 Driver air bag module

Passenger Air Bag Module

The module is attached to a mounting bracket which is in-turn attached to the cross-car beam; refer to JTIS.

The module comprises:

- A twin-stage inflator as opposed to the single-stage inflator.
- Two air bag connectors to accommodate the twin-stage inflation.

The heated gas inflator:

- Comprises a high-pressure mix of clean air and hydrogen gas, triggered by two separate igniters.
- Produces a controlled generation of clean gas to rapidly fill the air bag.
- Is classified as a stored flammable gas (not as an explosive) and as such, has less restrictive storage and transportation requirements.
- Produces a very clean burn and almost no particulates.
- Is almost free of any toxins, making disposal or recycling much easier.

NOTE: Disposal of twin-stage air bags is different to single-stage air bags; refer to **JTIS**.

The passenger air bag module is controlled by the restraints control module (RCM), which chooses between first or second-stage deployment, depending on occupant status and crash severity.

NOTE: Variation in passenger air bag deployment is determined by the timing of the first and second-stage ignition signals. This facilitates adaptation of the stiffness and timing of the air bag to optimize occupant protection.

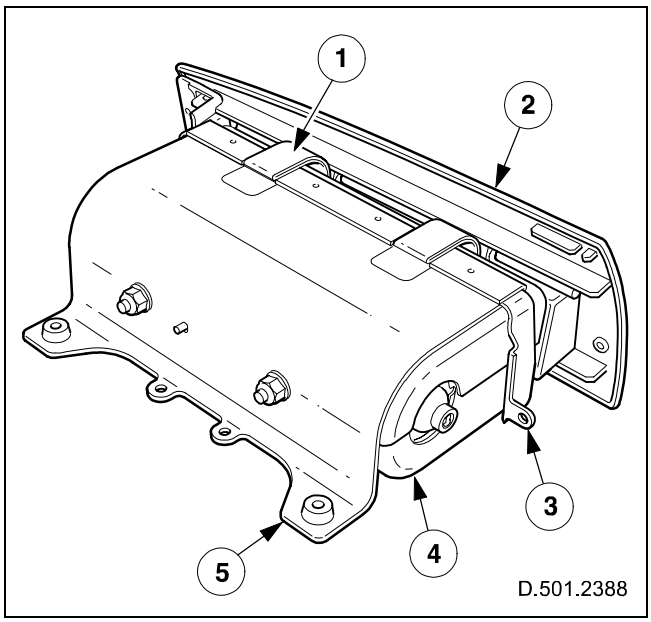

Fig. 179 Passenger twin-stage air bag module

1. Webbing straps
2. Air bag deployment door
3. Tether bar
4. Passenger air bag module
5. Mounting bracket

Passenger Air Bag Deployment Door

The passenger air bag deployment door is clipped into the instrument panel and tethered to the mounting bracket via webbing straps.

NOTE: Removal of the door complete with webbing straps and tether bar can only be achieved after removing the passenger air bag module; refer to **JTIS**.

The passenger air bag deployment door incorporates a lens that displays the air-bag deactivated symbol.

NOTE: In some markets, the symbol may be replaced by the phrase 'PASS AIRBAG OFF'.

The lens is backlit by the air-bag deactivation indicator lamp, which is mounted in a separate housing attached to the instrument panel. The illumination of the lens is designed to inform the front seat occupants whether or not the passenger air bag has been deactivated; refer to **Occupancy and Position Sensing**.

NOTE: The lamp is not a serviceable item; the complete housing must be changed; refer to **JTIS**.

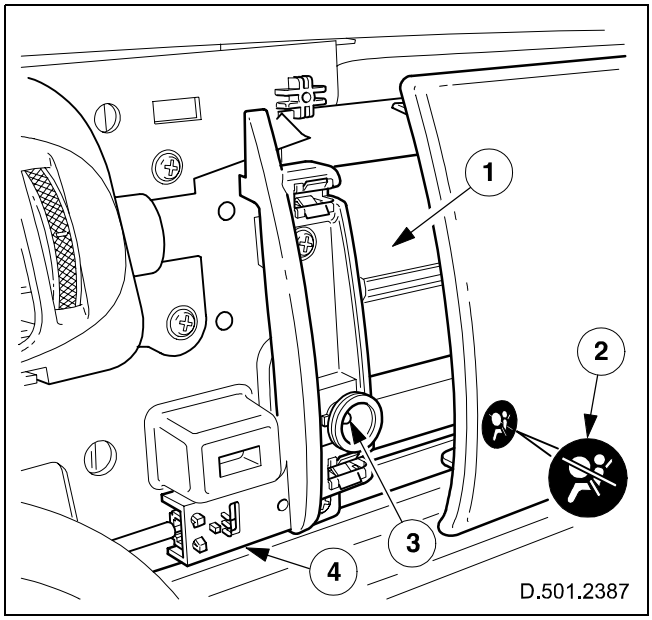

Fig. 180 Passenger air bag deactivation

1. Air bag module
2. Air bag deactivation indicator lens
3. Air bag deactivation indicator lamp
4. Air bag deactivation indicator lamp housing

Seat-Mounted Side Air Bag Module

The seat-mounted side air bag module is designed to provide protection for the thorax (the part of the torso between the neck and the abdomen). The module:

- is mounted in the outboard bolster of each front seat;
- is standard fit and specification in all markets;
- does not require routine maintenance;
- has no serviceable parts;
- uses compressed argon to inflate the bag.

NOTE: As with all occupant safety components, the SRS indicator lamp will illuminate if a DTC has been stored. Diagnosis must be undertaken using WDS.

In an air bag deployment situation, the air bag deploys through the stitched seam in the side bolster. A chute has been designed into the inside of the trim cover to ensure the air bag always emerges at the same point.

WARNING: In a service situation, the module must be correctly located in the chute. Failure to follow the service procedure could result in incorrect air bag deployment; refer to JTIS.

NOTE: In the event of a side impact that is sufficient to deploy the bag, it will be necessary to replace the complete seat.

Side-Curtain Air Bag

The side-curtain air bag comprises:

- Attachment brackets (p-clips).
- Fill tube.
- Air bag.
- Housing.
- Inflator.
- Front/rear tethers.

The side-curtain air bag:

- is standard fit and specification in all markets;
- is located under the headliner and stabilized at the A-post and C-post by tethers;
- does not require routine maintenance;
- has no serviceable parts;
- uses compressed argon to inflate the air bag;
- deploys to coincide with seat-mounted side air bag deployment.

NOTE: If the passenger air bag is deactivated, the corresponding seat-mounted side air bag is also deactivated, however the side-curtain air bag will still deploy to afford protection to any corresponding rear occupant.

- After deployment, the side-curtain air bag extends down to approximately shoulder height providing head protection for both the front and rear occupants.

The inflator:

- generates the gas needed to fill the air bag;
- consists of a high strength steel casing filled with a solid propellant charge, an electrically activated igniter and a cold gas bottle containing pressurized gas.

When appropriate, the restraints control module (RCM) sends a signal to the igniter causing the following sequence of events:

- the propellant is ignited;
- the burning propellant opens the membrane of the cold gas bottle and heats the pressurized gas;
- the expanding gas is directed into the fill tube by the inflator housing assembly;
- the gas emerges through holes in the fill tube and enters the front and rear side-curtain air bag chambers.

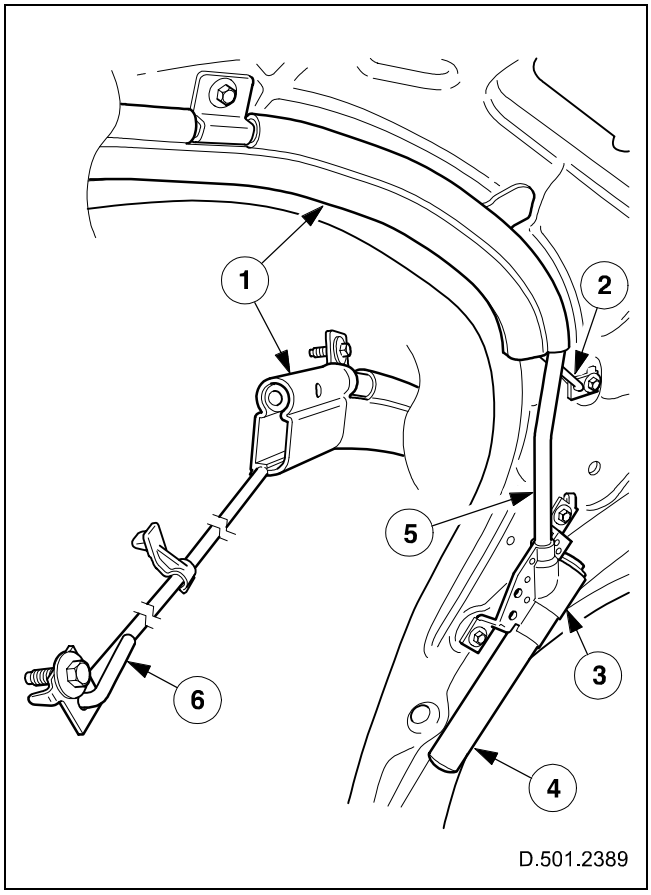

Fig. 181 Side curtain air bag

1. Housing
2. Rear tether
3. Inflator housing assembly
4. Inflator
5. Fill tube
6. Front tether

Steering Column

The steering column is an integral part of the occupant safety system; refer to **Chassis, Steering System, Steering Column**.

Clockspring

The clockspring provides a flexible coupling for electrical connection of components that are attached to the steering wheel, including:

- horn;
- speed control buttons;
- telematics control buttons;
- driver air bag module.

NOTE: The clockspring has two electrical connectors that interface between the twin-stage driver air bag module and the restraints control module (RCM); refer to **Driver Air Bag Module**.

Vehicles installed with the heated steering wheel option have an additional power coupling; refer to **Climate Control System**, **Heated Steering Wheel**.

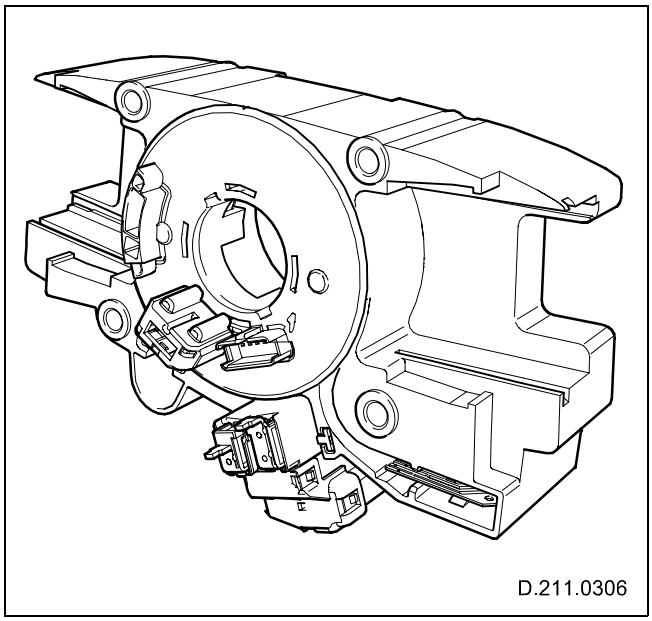

Fig. 182 Clockspring

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