

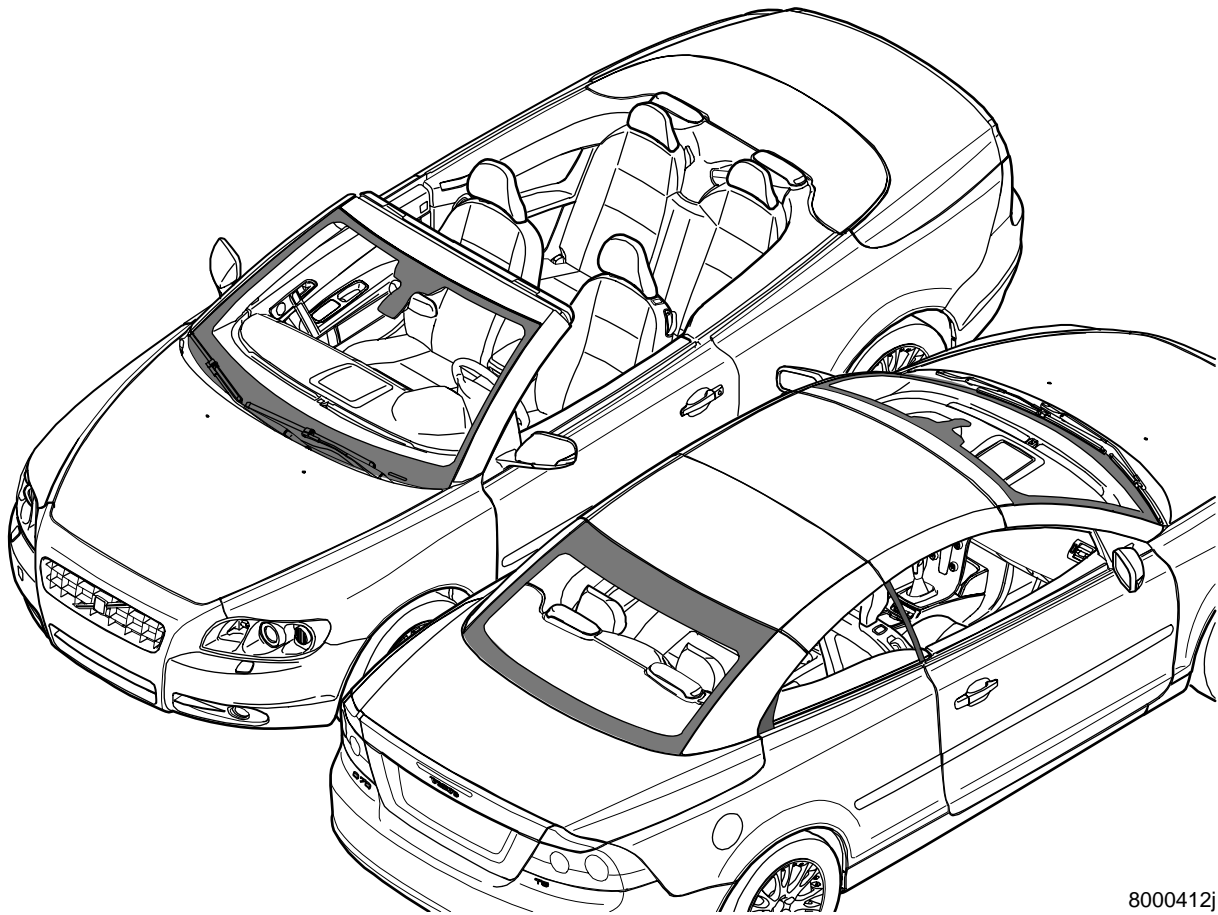
Table of contents

Section 0	4
Introduction C70	4
New C70.....	4
Dimensions	5
Section 2	6
Overview	6
Section 3	7
Electrical system, design	7
Network	7
Control modules in the CAN network.....	8
MOST	9
Audio system, specifications	10
Special functions	11
Alarm.....	12
Central locking system	14
Function.....	14
Section 4	17
Gearbox	17
Section 5	18
DSTC function	18
General	18
Section 7	19
Rear axle	19
Wheels	19
Section 8	20
Body	20
General	20
Lifting points, body	21
Deformation zones.....	22
Steel materials	23
Miscellaneous materials	24
Windows.....	24
RHT (Retractable Hard Top)	26
General	26
Operating the roof	28
Operating, opening/closing.....	28
Link system	32
Roof	32
Boot lid	34
General	34
Latch bolt motor	35
Support points	36
Open position.....	37
Movement limiter, roof stored in cargo compartment.....	38
Closed position	40
Cover panel	42

Loading assistance	44
Cargo divider and loading assistance	44
Hydraulics	46
Components.....	46
Hydraulic unit.....	47
Overview	49
Hydraulic cylinders	50
Locking the roof and boot lid	52
Hall sensors/Position sensors	54
Hall sensors	56
Position sensor.....	56
Hall sensors, location.....	57
Position sensors	61
Input and output signals	62
Input signals, directly connected	63
Output signals, directly connected.....	63
Input signals via CAN	63
Output signals via CAN.....	63
Functions, miscellaneous.....	64
Manual roof operation	67
Closing the roof	67
Opening the roof.....	67
Sequences, opening and closing the roof, opening.....	68
Explanation.....	69
1. Unlocking boot lid front edge.....	69
2. Opening the boot lid, unlocking the roof's front lock and unlocking the roof's rear lock	69
3. Extending the cover panel	71
4. Unlocking the front/centre roof section and the centre/rear roof section and opening the front roof section.....	71
5. Opening the front, centre and rear roof sections.....	71
6. Finishing the opening	73
7. Closing the boot lid upper section and locking in the roof.....	73
8. Locking the boot lid upper section	73
Sequences, opening and closing the roof, closing.....	74
1. Unlocking boot lid front edge.....	75
2. Opening the boot lid upper section and unlocking the roof.....	75
3. Closing the roof	75
4. Closing the roof, continued	77
5. Continued roof closing and locking of front/centre roof section and centre/rear roof section	77
6. Retracting the cover panel	77
7. Closing the boot lid upper section and locking the front and rear roof sections.	79
8. Locking the boot lid upper section	79
Loading assistance	80
General	81
1. Opening the boot lid ("manually" at the rear edge).....	81
2. Unlocking the roof.....	81
3. Raising the roof	81
4. Lowering the roof.....	83
5. Locking the roof	83

Hydraulics	84
Hydraulic diagram	84
Opening the roof.....	86
Closing the roof	88
Loading assistance.....	90
Parameters, position sensor S2 and S17	92
Signals, position sensor S2 and S17	94
Front roof section	96
Centre roof section	96
Rear roof section.....	96
Rubber strips/seals, front roof section	97
Rubber strips/seals, centre roof section	97
Rubber strips/seals, rear roof section.....	98
Roof trim	100
General	101
Front roof trim	101
Centre roof trim	102
Rear roof trim/panels	102
Wires, roof trim	104
General	104
Wire units	105
Fixed and sliding points.....	105
Interior, front passenger compartment	108
Interior, rear passenger compartment	109
Front seats, PSL/PSR	110
Function.....	110
Climate control	113
Controlling the passenger compartment climate	113
Safety systems	114
Components/Component location (Excluding USA/CDN).....	114
Signal descriptions (Excluding USA/CDN)	117
Components/Component location, USA/CDN	118
Front seatbelts, USA/CDN	119
Signal descriptions, USA/CDN	120
Activating the safety systems	121
Accessories	122
iPod “Plug and Play” Adapter	122
General	122
iPod adapter.....	122
Operation	123
Function.....	123
Hands Free with Bluetooth	124
General	124
Components.....	125
Operation	125
Function.....	126

Section 0



8000412j

Section 0

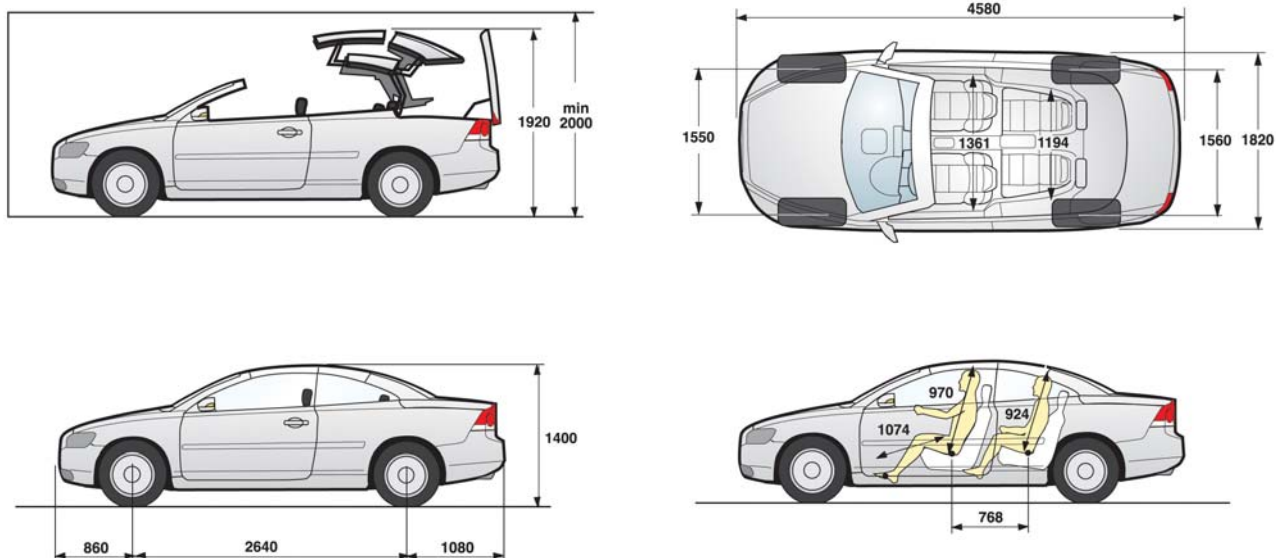
Introduction C70

New C70

- The new C70 is a new coupé/convertible that replaces the previous C70 models
- The C70 has a new design, the car is based on the S40/V50 and at the same time has many of the characteristics and functions found in these cars.
- The C70 has a lot of new technology but much of the technology is in principle the same as in the S40/V50.

The launch

- The C70 was exhibited at the motor show in Frankfurt (Germany) at the start of September 2005. The date when the cars are available for the customer varies depending on market.
For precise information on dates, contact your own sales department.



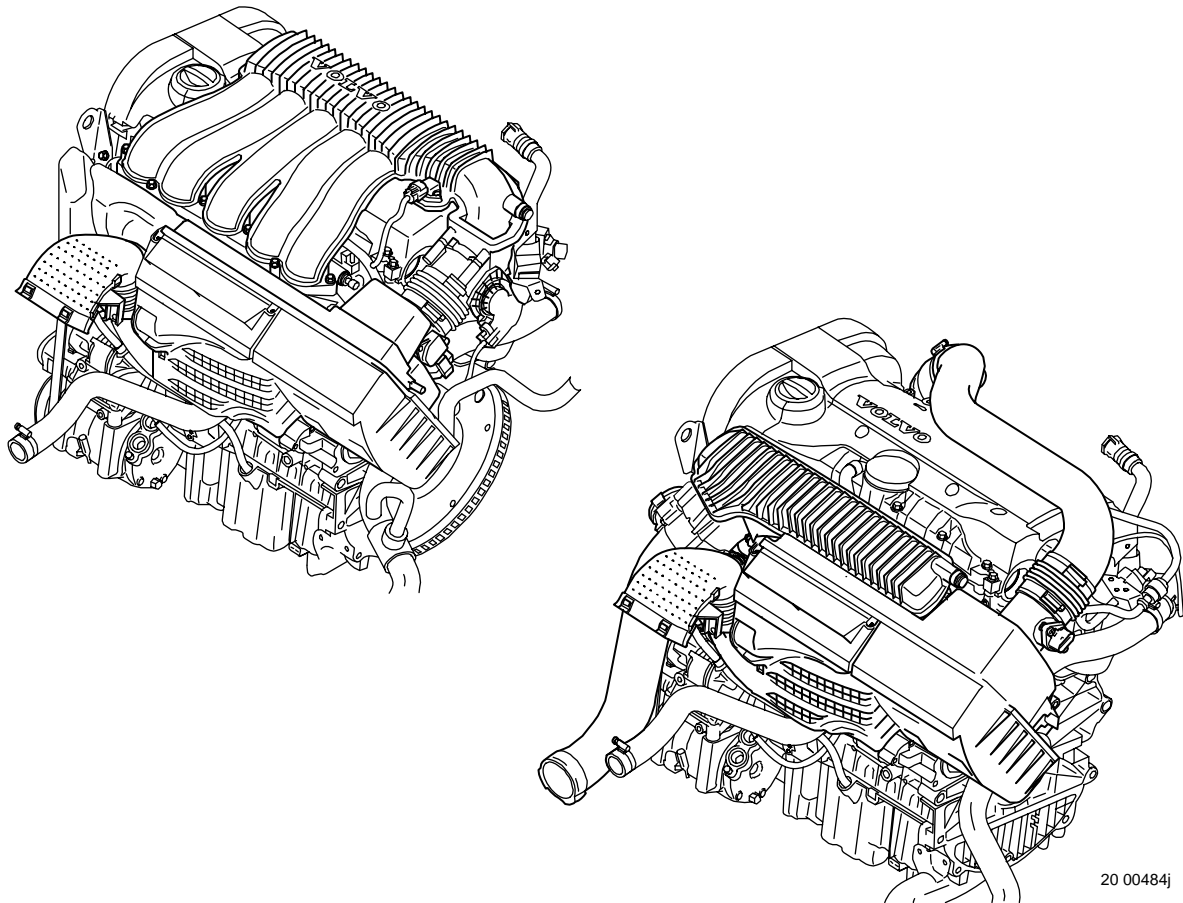
Dimensions

Compared with the old C70 the new C70 is shorter, wider and lower. The interior of the car is slightly lower in terms of height, the front section of the interior is slightly narrower, and the rear section is wider

Dimensions	C70	The new C70 compared with the "old" C70
Length ¹⁾	4580 mm	- 136 mm
Width	1820 mm	+ 3 mm
Height	1400 mm	-29 mm
Wheelbase	2640 mm	-24 mm
Track, front ²⁾	1550 mm	+ 29 mm
Track, rear ²⁾	1560 mm	+ 42 mm

Notes:

1)	The new C70 is shorter than the "old" C70.
2)	The wheel offset is unique to the C70, which means that it has unique wheels



20 00484j

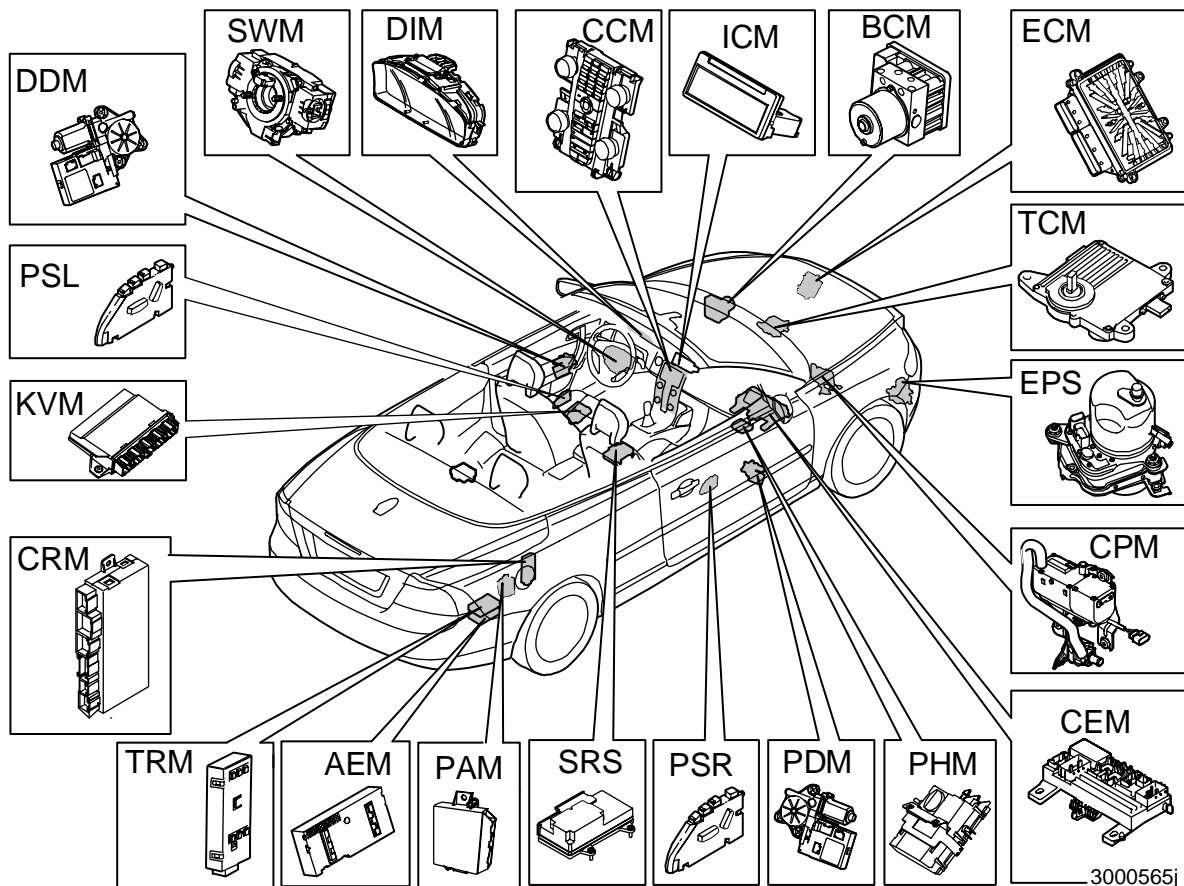
Section 2

Overview

The C70 is equipped with two different naturally aspirated engines and one turbocharged engine.

Engine	B5244S5 (2.4)	B5244S4 (2.4i)	B5244T3 (T5)
<i>Top speed:</i>			
Manual gearbox	205 km/h	220 km/h	240 km/h
Automatic gearbox	200 km/h	215 km/h	235 km/h
<i>Acceleration</i>			
<i>0-100 km/h:</i>			
Manual gearbox	11.0 seconds	9.1 seconds	7.6 seconds
Automatic gearbox	11.8 seconds	10.0 seconds	8.0 seconds
<i>Maximum torque</i>	220 Nm @ 4000 rpm	230 Nm @ 4400 rpm	320 Nm between 1500-4800 rpm
<i>Maximum output</i>	103 kW (140 hp) @ 5000 rpm	125 kW (170 hp) @ 6000 rpm	162 kW (220 hp) @ 5000 rpm

For further information see "New Car Features 0338-0347", "New Car Features 0420" and "New Car Features 0446", S40/V50, Section 2 Engine.



Section 3

Electrical system, design

Network

The network in the C70 is based on the same principle as the S40/V50:

- CAN-HS (High Speed), 500 kbps
- CAN-LS (Low Speed), 125 kbps
- MOST (Media Oriented System Transport), audio system 24.8 Mbps
- LIN (Local Interconnect Network), serial communication 9.6 kbps

To prevent electrical interference in the CAN network there are termination resistors that bridge over CAN HS and CAN LS. One in each endpoint on both the high and low speed side of the network. Each termination resistor has a resistance of 120 Ω .

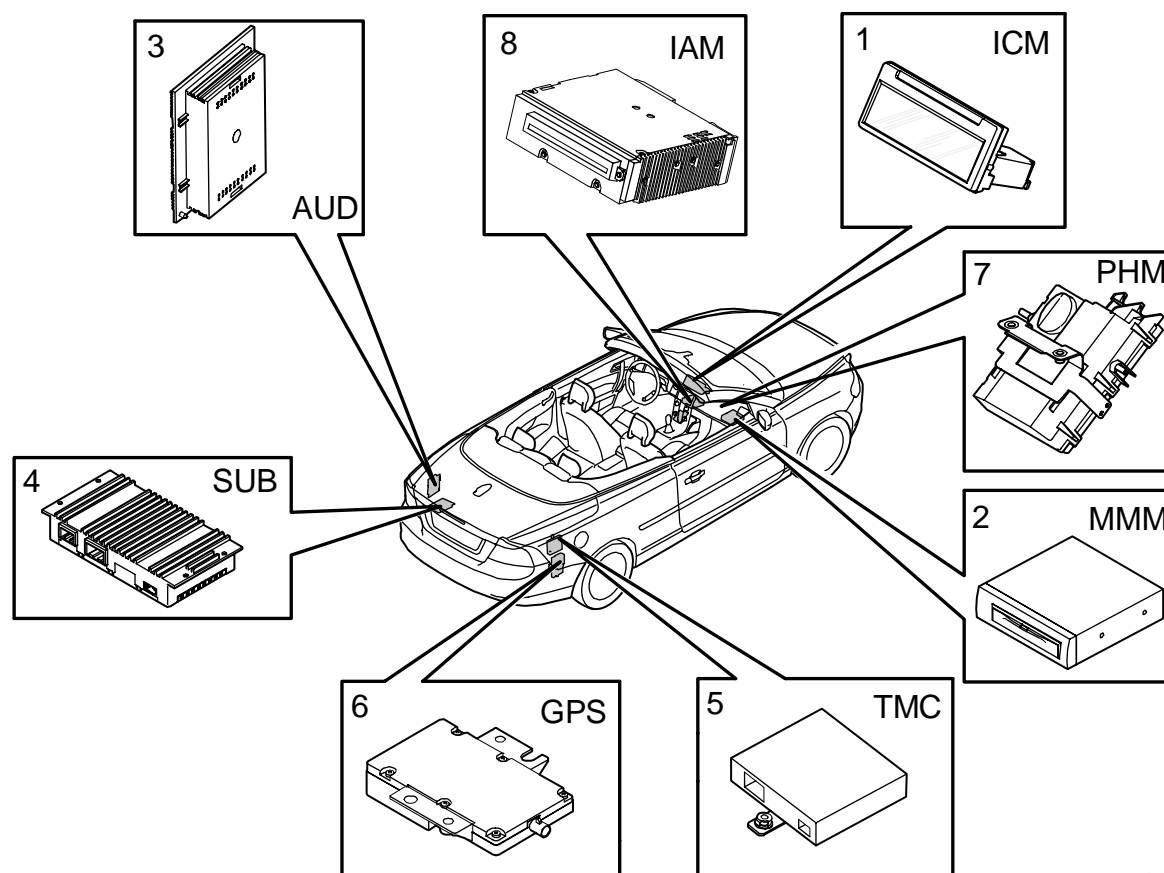
For CAN HS there are termination resistors located in the Steering Wheel Module (SWM) and in the Engine Control Module (ECM). For CAN LS there are termination resistors located in the Driver Information Module (DIM) and in the Supplemental Restraint System Module (SRS).

Both termination resistors create a parallel circuit. If the CAN network is complete then the resistance in each side of the network is approx. 60 Ω .

Control modules in the CAN network

Control module	Description	Network	
AEM	Accessory Electronic Module	CAN LS	Accessories
BCM	Brake Control Module	CAN HS	Has Body Sensor Cluster (BSC) as stability sensor slave control module.
CCM	Climate Control Module	CAN LS	
CEM	Central Electronic Module	CAN HS/ CAN LS	
CPM	Combustion Pre-heater Module	CAN LS	Accessory/option. Market dependent.
CRM	Convertible Roof Module	CAN LS	
DDM	Driver Door Module	CAN LS	
DIM	Driver Information Module	CAN LS	
ECM	Engine Control Module	CAN HS	Different versions depending on engine alternative.
EPS	Electronic Power Steering module	CAN HS	
ICM	Infotainment Control Module	CAN LS/ MOST	
KVM	Keyless Vehicle Module	CAN LS	Option
PAM	Parking Assistance Module	CAN LS	Option/accessory
PDM	Passenger Door Module	CAN LS	
PHM TEM	Phone Head Module Telematics Module	CAN LS/ MOST	Option/accessory
PSL	Power Seat Left	CAN LS	Option in C70. Note: The Power Seat Left (PSL) does not control seat heating and SIPS bag function.
PSR	Power Seat Right	CAN LS	Option in C70. Note: The Power Seat Right (PSR) does not control seat heating and SIPS bag function.
SRS	Supplemental Restraint System	CAN LS	Has OWS (Occupant Weight Sensor) as slave control module, to check whether anyone is sitting in the passenger seat, (market dependent)
SWM	Steering Wheel Module	CAN HS	
TCM	Transmission Control Module	CAN HS	Only cars with automatic gearbox.
TRM	Trailer Module	CAN LS	Option Only on vehicles with towbar.

MOST



3905617j

The MOST network can consist of up to eight different control modules.

When the vehicle is equipped with Subwoofer Module (SUB), in addition to Infotainment Control Module (ICM), the Audio Control Module (AUD) is also included as standard in the MOST network.

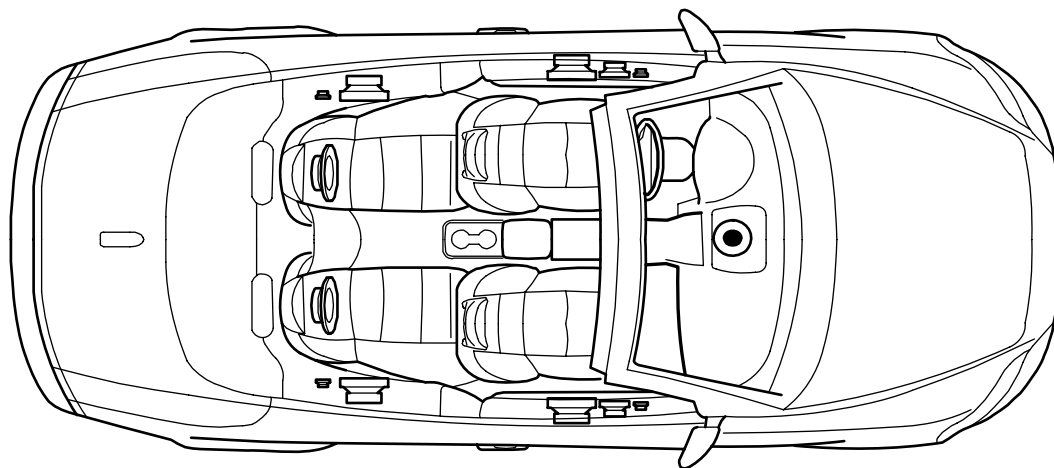
Performance is the simplest variant of the audio system. The vehicle is then only equipped with Integrated Audio Module (IAM) as well as Infotainment Control Module (ICM).

Control modules in the MOST network

1	ICM	Included in the standard set-up of the MOST network.
2	MMM	Option
3	AUD 2 AUD 5	Included with High Performance option. Included with Premium Sound option
4	SUB	Option for High Performance and Premium Sound
5	TMC	Included with Multimedia Module (MMM) option for EU
6	GPS	Included with Multimedia Module (MMM) option and/or Telematics module (TEM)
7	PHM	Option (with or without Volvo On Call)
8	IAM	Is standard in the MOST network.

For further information on MOST, see "New Car Features 0338-0347, S40/V50".

Audio system, specifications



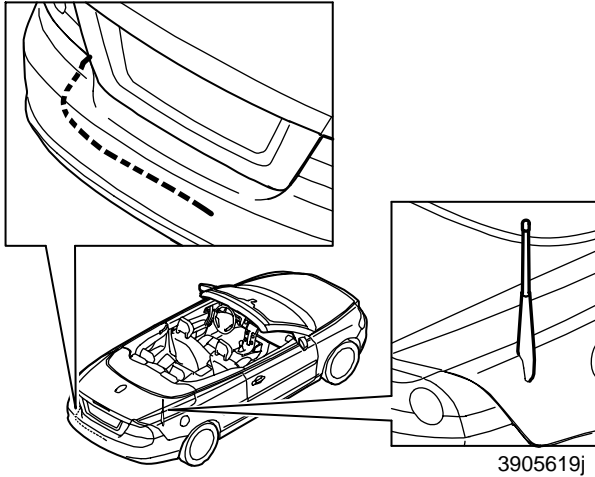
3905618j

	Performance	High Performance	Premium Sound
Radio/Amplifier	4x20W	4x40W	4x130W+1x130W
Surround System	No	No	Dolby Pro Logic II
Standard CD player	1 CD	1 CD	1 CD
Option, CD player	No	6 CD changer	6 CD changer
Speakers	Harman/Becker	Harman/Becker	Dynaudio
Dashboard	No	No	3" Bass/mid-range + 1" treble
Front doors	6.5" Full range + 1" treble	6.5" Bass + 1" treble	8" Bass + 4" mid-range + 1.5" treble
Rear seat side panel	6.5" Full range	6.5" Bass + 1" treble	6.5" Bass + 1.5" treble
Subwoofer	No	2x8", Amplifier 2x130W	2x8", Amplifier 2x130W

Special functions

The audio system adapts and adjusts volume, bass and treble depending on whether the roof is open or closed. The Infotainment Control Module (ICM) receives information on roof status from the Convertible Roof Module (CRM) and adjustment takes place automatically.

In addition, if the roof is unlocked and speed is > 2 km/h then the Infotainment Control Module (ICM) plays a warning sound in the speakers via the Audio Control Module (AUD). At the same time a text message is shown in the Driver Information Module (DIM).

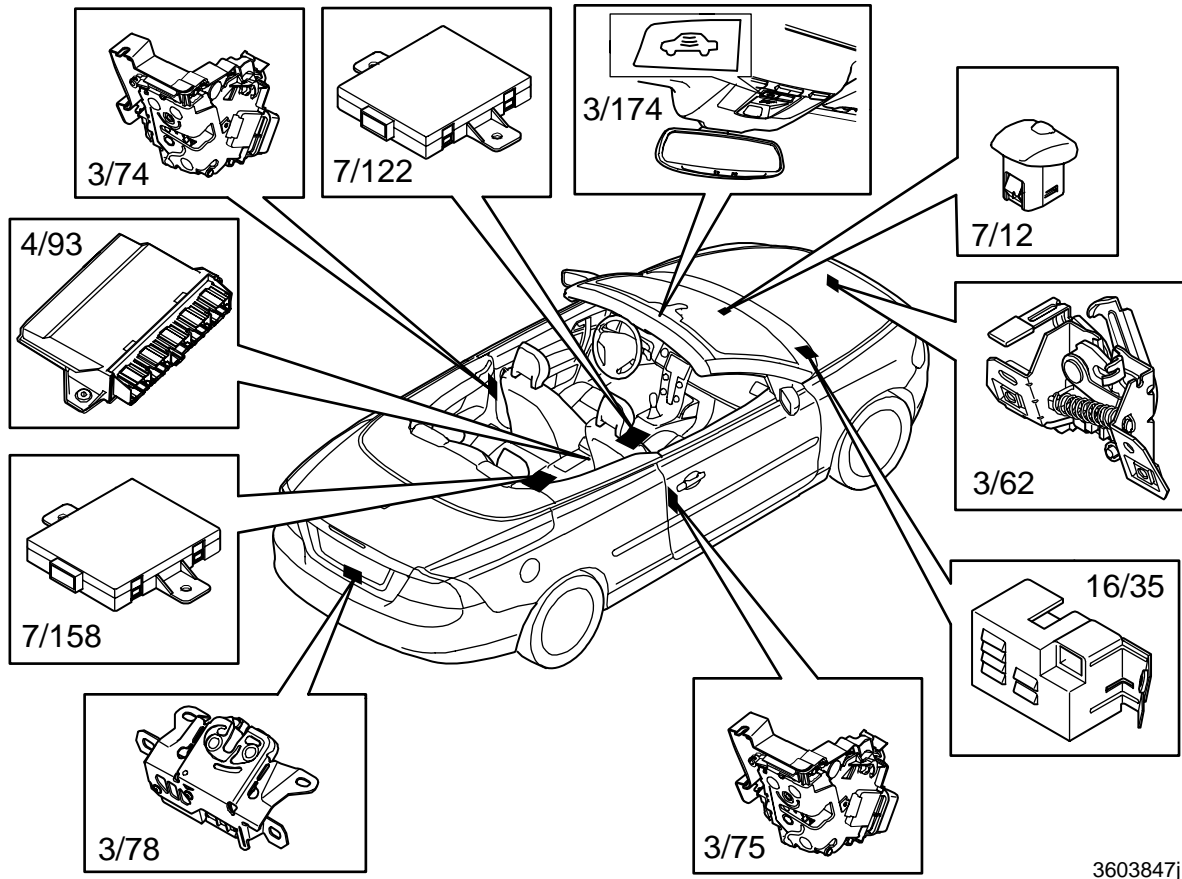


Antennas

The antenna system consists of a main antenna for AM/FM and a sub-antenna for FM in the bumper. The antennas are connected to two antenna amplifiers.

Both antenna amplifiers are connected to the Integrated Audio Module (IAM) with a coaxial cable.

The "Shark fin antenna", that is fitted on top of the boot lid, consists of two separate antennas. One is used as the GPS antenna for the RTI system and the other is used as the telephone antenna.



3603847j

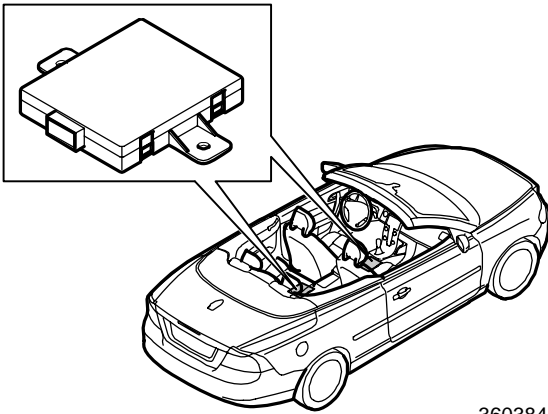
Alarm

3/62	Unclosed position sensor, bonnet	4/93	KVM
3/74	Unclosed position sensor, driver's door	7/12	Alarm indicator, status
3/75	Unclosed position sensor, passenger door	7/122	MMS front
3/78	Unclosed position sensor, boot lid	7/158	MMS rear
3/174	Switch, reduced alarm	16/35	SCM

Configurations

- Level 1. Perimeter protection. This configuration includes unclosed position sensors in the lock motors, alarm LED and Siren Control Module (SCM) without vehicle tilt sensor.
- Level 2. Everything included in Level 1 plus Mass Movement Sensor Module (MMS).
- Level 3. Everything included in Level 2 plus Siren Control Module (SCM) with vehicle tilt sensor.

For further information, see "New Car Features 0338-0347" and "New Car Features 0420", S40/V50.



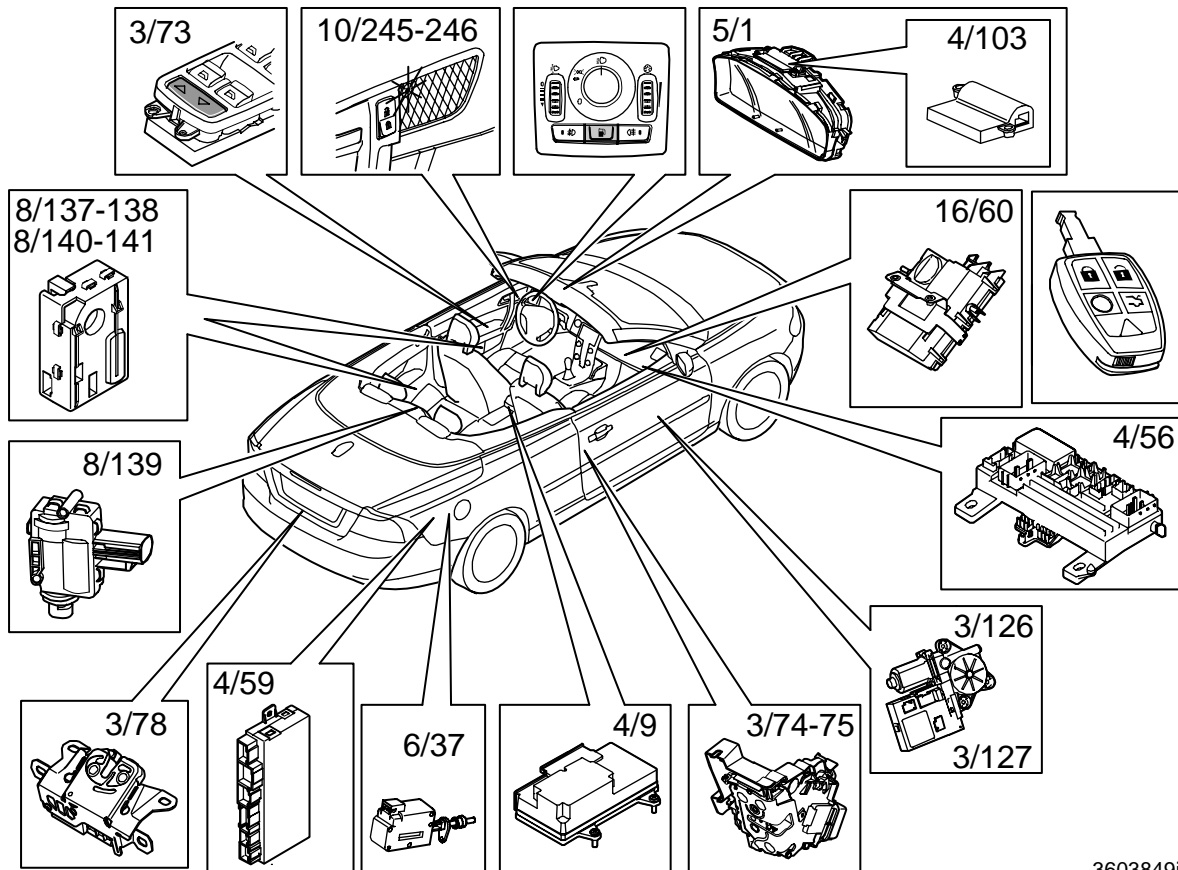
3603848j

MMS

There are two Mass Movement Sensor Modules (MMS). One is located under the cup holder in the tunnel console and the other centrally under the rear seat.

The Mass Movement Sensor Module (MMS) works equally as well whether the roof is open or closed. The alarm system uses microwaves which provides a robust system.

The microwaves are not affected by air temperature variations in a vehicle standing in the sun.



3603849j

Central locking system

3/73	Central locking switch	4/103	Receiver, remote control signal
3/74-3/75	Unclosed position sensor, driver's door/passenger door	5/1	Driver information module (DIM)
3/78	Lock motor, boot lid	6/37	Lock motor, fuel filler flap
3/126-3/127	Lock motor, driver's door/passenger door	8/137-8/138	Lock motor, storage compartment, driver's door/passenger door
		8/140-8/141	Lock motor, storage compartment, side panel, left-hand rear/right-hand rear
4/9	Supplemental Restraint System Module (SRS)	8/139	Lock motor, centre cushion, rear seat
4/56	CEM	10/245-10/246	LEDs, lock status (locked/unlocked)
4/59	CRM	16-60	PHM

Function

The central locking system functions in the same way as in the S40/V50. For further information, see "New Car Features 0338-0347, S40/V50".

Function, standard locking

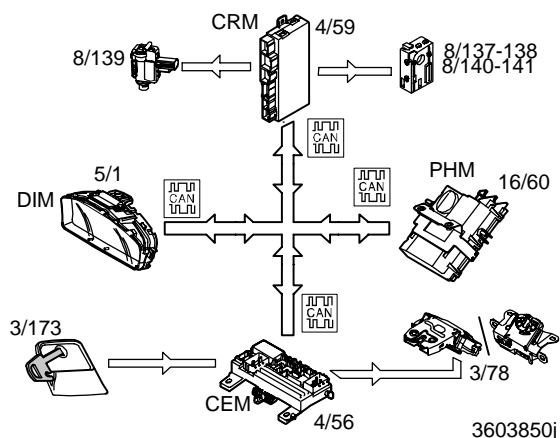
The standard locking function locks/unlocks the doors and deactivates/activates the lock button in the boot lid so that it can be opened. The function also locks/unlocks the storage compartments as well as the lock for the rear seat centre cushion.

The glovebox lock is not connected to the central locking function, i.e. the glovebox can only be locked or unlocked using the key blade.

Unlocking with the key

The doors can be unlocked and locked using the detachable key blade in the remote control.

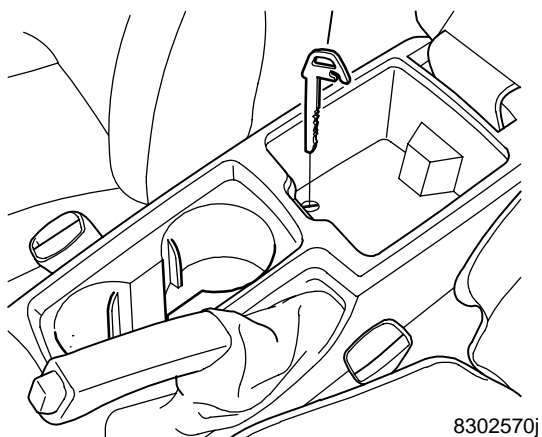
The alarm is triggered when the doors are unlocked with the key blade. The alarm is deactivated with the "unlock" button on the remote control or using the ignition key in ignition switch position II.



Private locking mode

Glovebox, cargo compartment, storage compartments and the lock for the rear seat centre cushion can be locked in a "private" mode. This function is used to prevent access to these areas if the vehicle is parked with open roof for example or is handed over for valet parking.

Private locking mode is activated when the key blade is turned 180° clockwise in the glovebox lock. The remote control key can then only be used to unlock the doors and to drive the car.



Unlocking the boot lid

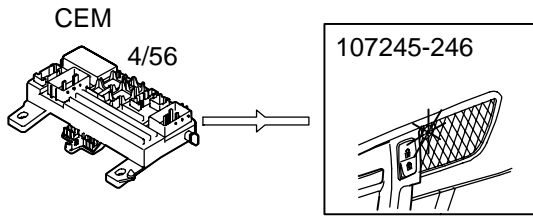
The boot lid opening handle is activated at the same time as the doors if an unlock command is received from the remote control. The boot lid button can also be activated separately using a special button on the remote control.

The boot lid opening handle is directly connected to the Keyless Vehicle Module (KVM) and to the Central Electronic Module (CEM). The lock motor is directly connected to the Central Electronic Module (CEM).

Mechanical unlocking/opening of the boot lid

To open the boot lid when the power in the vehicle is disconnected for example, there is a lock cylinder under the storage compartment in the tunnel console which is mechanically connected to the boot lid lock.

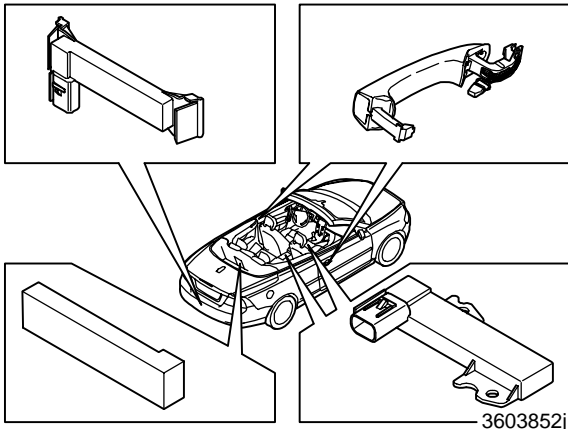
The lock cylinder is covered. This covering must first be removed in order to expose the lock cylinder.



3603851j

Lock status, indication

Normally there are lock buttons in the doors, but these are not in the C70. Instead the vehicle is equipped with LEDs that indicate whether or not the vehicle is locked. The LEDs come on for approx. 5 minutes after the vehicle has been locked. The LEDs are located on each respective door and are directly connected to the Central Electronic Module (CEM).



3603852j

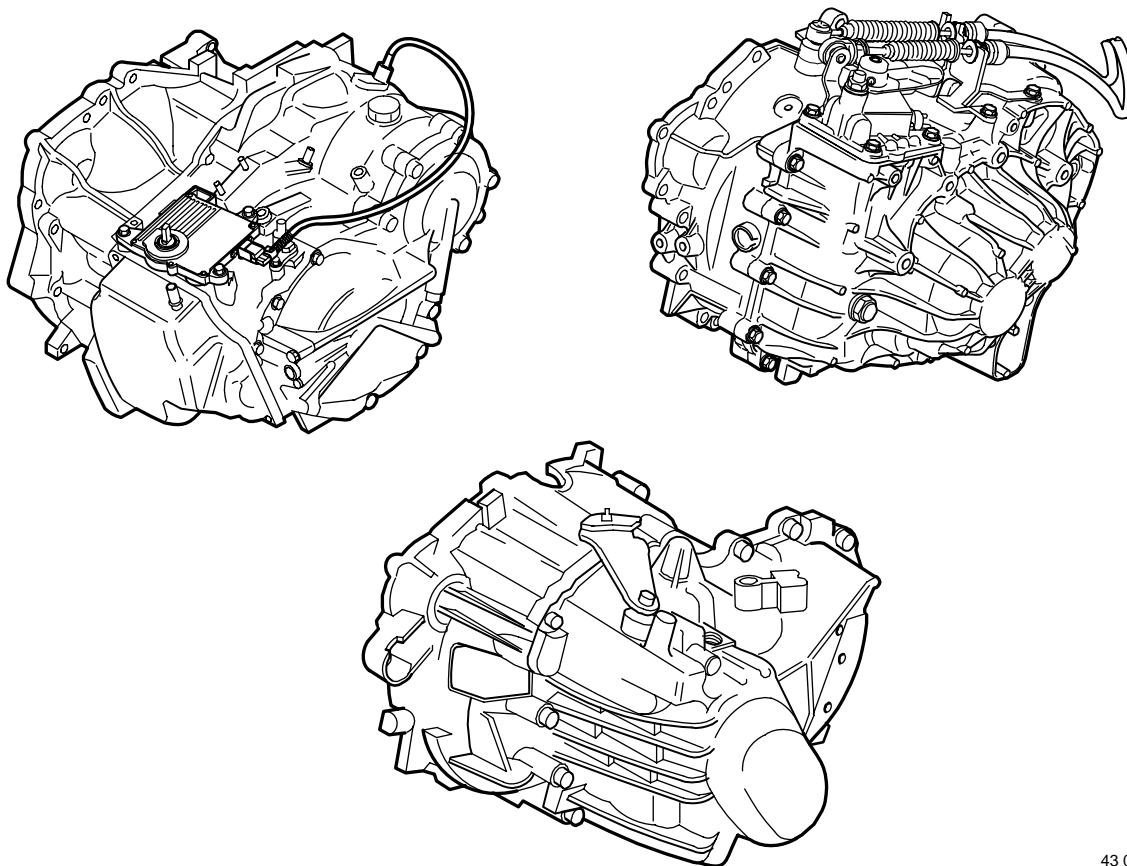
KVM (Keyless Vehicle Module)

Keyless Vehicle Module (KVM) operates according to the same principle as in the S40/V50.

There are three further antennas (one in each door handle and one in the rear bumper).

There are three internal antennas which are located under the carpet between the front seats, under the carpet on top of the tunnel console in front of the rear seat, and in the cargo compartment.

For further information, see "New Car Features 0420, S40/V50, KVM".



43 04165j

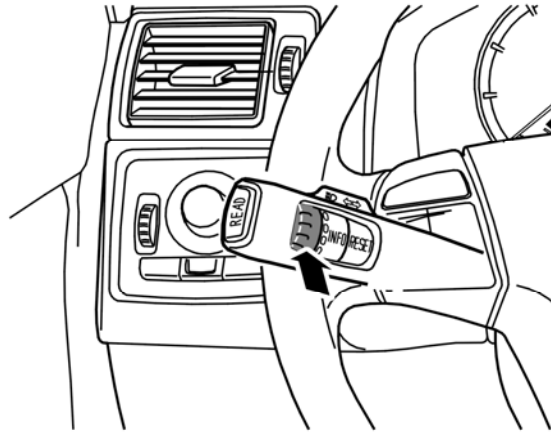
Section 4

Gearbox

Combinations, engines/gearboxes:

Engine	Gearbox	Final drive
B5244S5	M56L	4,00:1
	AW55/51	2,44:1
B5244S4	M56H	4,25:1
	AW55/51	2,44:1
B5254T3	M66W	3,77:1
	AW55/51	2,27:1

For further information on gearboxes, see "New Car Features 0338-0347, S40/V50, Section 4".



Section 5

DSTC function

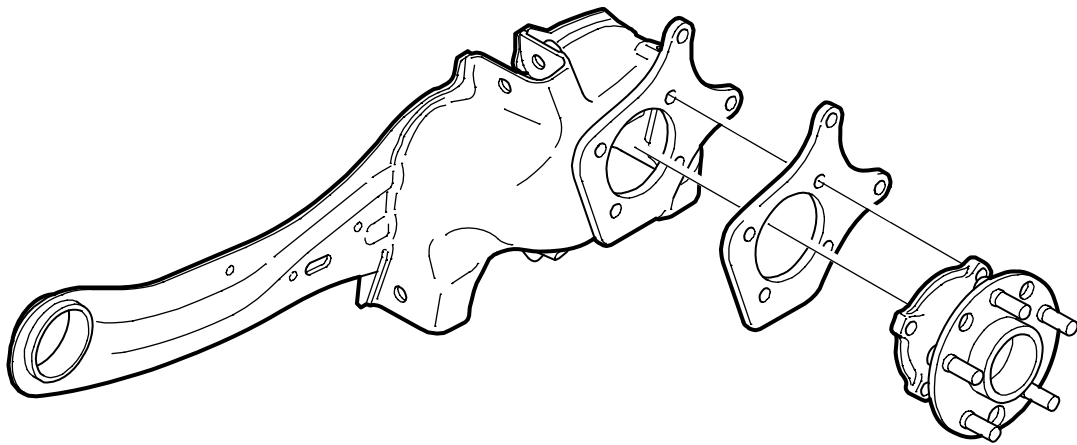
General

DSTC is always activated when the ignition switched on. The different menu functions in the trip computer display can be shown by turning the function selector located on the direction indicator stalk switch.

The DSTC On/Off function is activated using the "RESET" button. Activation/deactivation of the DSTC is confirmed by means of a message in the trip computer display.

In the event of diagnostic trouble codes (DTC) in the Brake Control Module (BCM) a message is shown in the Driver Information Module (DIM).

For further information on DSTC/Brakes, see "NCF 0338/0347, S40/V50", Section 5, Brakes.



46 00591j

Section 7

Rear axle

In order to obtain the required track there is a 7 mm spacer plate fitted between the link arm and wheel hub on each side. This increases the track by 14 mm.

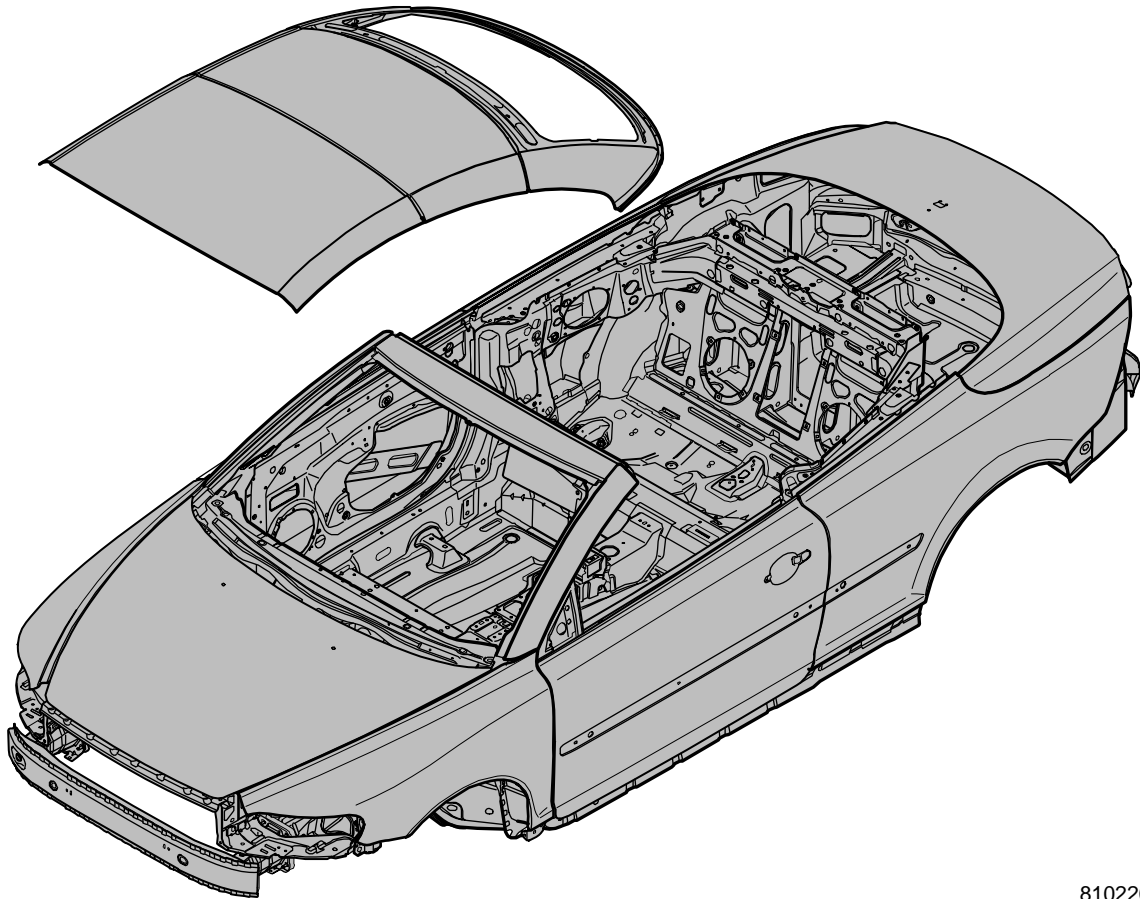
The rear axle is the multilink type. The design provides a certain "co-steering effect" which contributes to fast and stable steering reaction when cornering.

Wheels

The new C70 is equipped with wheels with a unique offset of 45 mm. This means that only wheels designed for the car can be used.

The following wheels are available:

- CASTULA (silver painted), 7.5" x 16" with tyre dimension 215/55-16".
- SADIRA and SYRMA (silver painted or polished), 7.5" x 17" with tyre dimensions 215/50-17" or 235/45-17".
- DRACO and MIRZAN (silver painted), 8.0" x 18" with tyre dimension 235/40-18".



8102206j

Section 8

Body

General

The new Volvo C70 is one of the safest convertibles on the market in a collision. Amongst other things this is achieved by using high-strength steel of varying tensile yield limits. This also contributes to the body having high torsional strength.

Further contributing factors to the high torsional strength are the laser welded bottom rails, and two diagonal struts that run between the rear suspension frame and the bottom rails.

The body has twice the torsional strength compared with the previous C70. The torsional strength increases by a further 10-15 % with the roof closed.

The high torsional strength makes the car stable and contributes to very good driving characteristics.

The body is based on the platform from the new S40/V50. The patented front member structure is the same as in the new S40/V50.

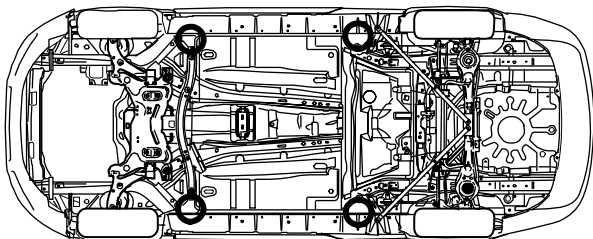
The strength requirement on the A-pillars is considerable. This means that the A-pillars are designed to withstand major forces in the event of a collision and/or if the car overturns.

The car's A-pillars are manufactured from high-strength steel with an advanced production method called hydroforming. A hydroformed profile can be designed in a single piece with a varied shape and thickness. The pillar has no welded joints and the material thickness varies from 3.2 mm to 5.7 mm.

Internally the doors have diagonally fitted steel profiles. The upper sections of the doors are reinforced with hydroformed longitudinal aluminium members.

The front wings are unique compared with the S40/V50.

The rear passenger compartment is surrounded at the top edge by a horseshoe shaped member. There is a double wall between the passenger and cargo compartment. Reinforcements are located between both wall plates. Amongst other things this is to minimise the risk of encroachment from behind in the passenger compartment.



Lifting points, body

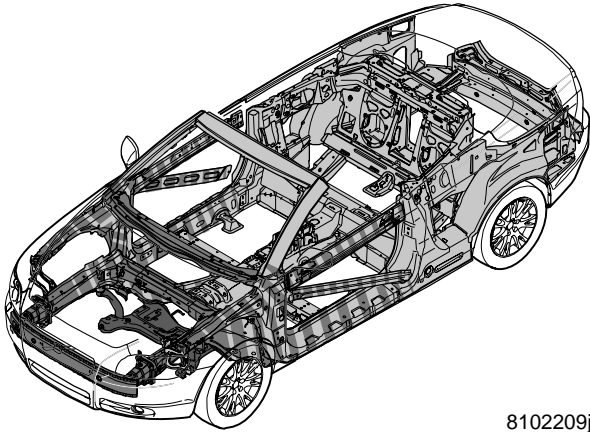
Only the designated lifting points may be used when raising the vehicle.

The lifting plate must be rubber coated to avoid damaging the vehicle.

NOTE: The roof must not be operated when the vehicle is raised.

8102215j

Deformation zones

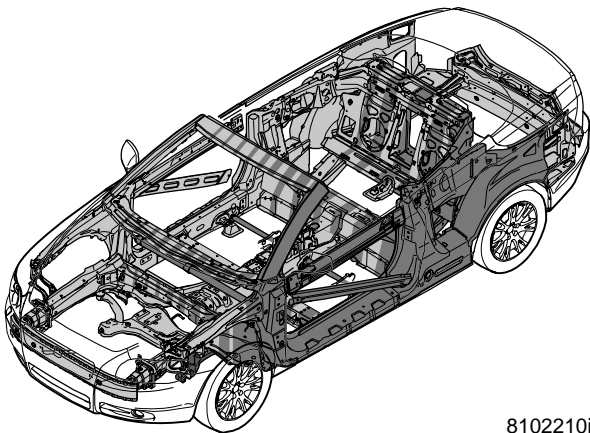


8102209j

Front

The route of frontal collision force is via the following zones:

- bumper member with crashbox
- front side members
- upper front side members
- crossmembers, bulkhead
- subframe
- A-pillars - door members
- A-pillars - bottom rails

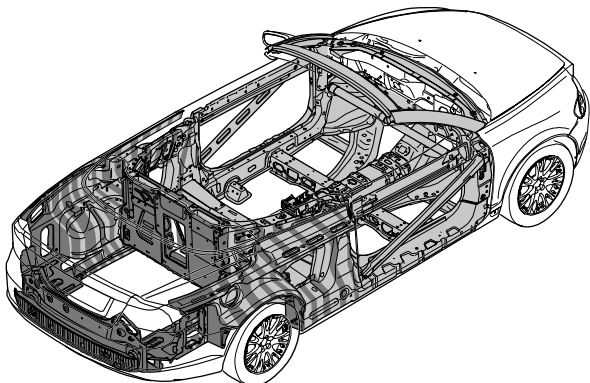


8102210j

Side

The route of lateral collision force is directed via the following zones:

- doors, door members
- bottom rails
- crossmembers on floor plate
- crossmember, rear floor
- A-pillars
- B-pillars
- crossmember, bulkhead
- seat support, rear
- SIPS box
- transverse tube, dashboard
- seat frames



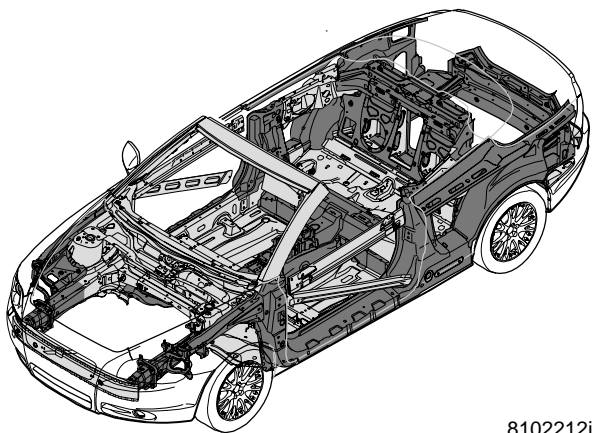
8102211j

Rear

The route of rear collision force is via the following zones:

- bumper rail, rear
- rear section
- rear side members
- roof sections if the roof is open
- double wall between cargo/passenger compartment
- U-formation in front of cargo compartment
- crossmember, rear floor
- bottom rails

Steel materials



8102212j

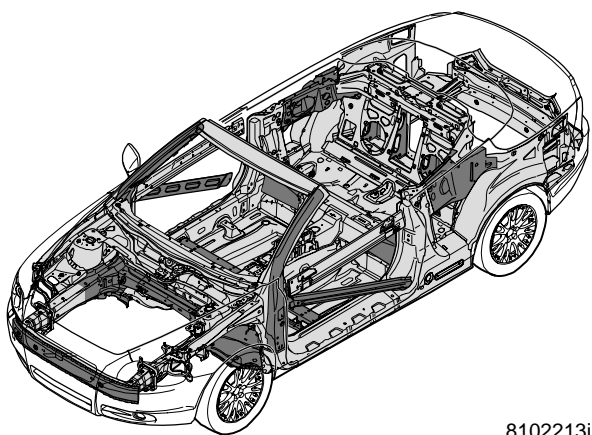
HSS (High Strength Steel)

Blue paint is used to indicate the HSS material.

The material is marked grey on the illustration.

The tensile yield limit on the marked sections of the body is:

$\geq 180 < 400$ Mpa.



8102213j

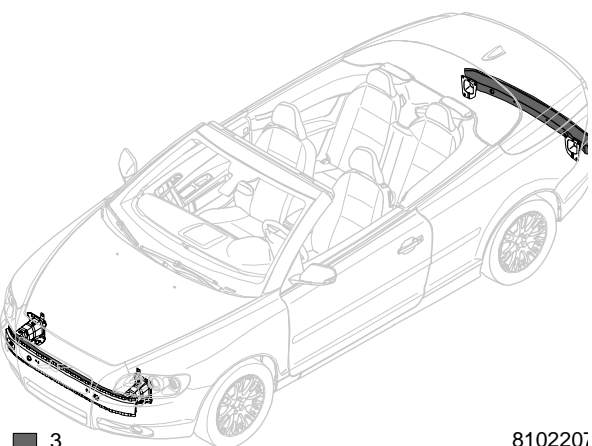
EHSS (Extra High Strength Steel)

Yellow paint is used to indicate the EHSS material.

The material is marked grey on the illustration.

The tensile yield limit on the marked sections of the body is:

$\geq 400 < 800$ Mpa.



■ 3

8102207

***UHSS (Ultra High Strength Steel)
(boron steel)***

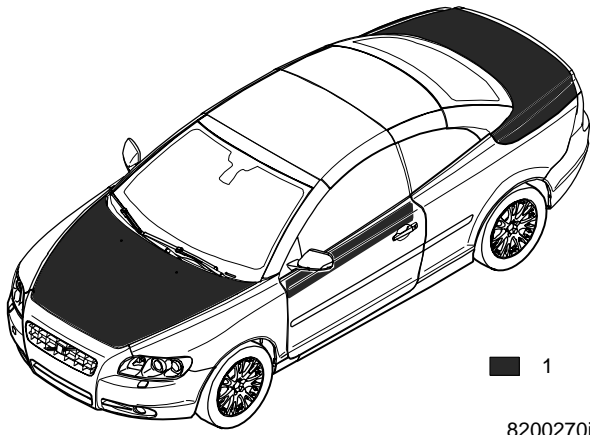
Red paint is used to indicate the UHSS material.

The material is marked grey on the illustration.

The tensile yield limit on the marked sections is:

≥ 800 Mpa.

Miscellaneous materials

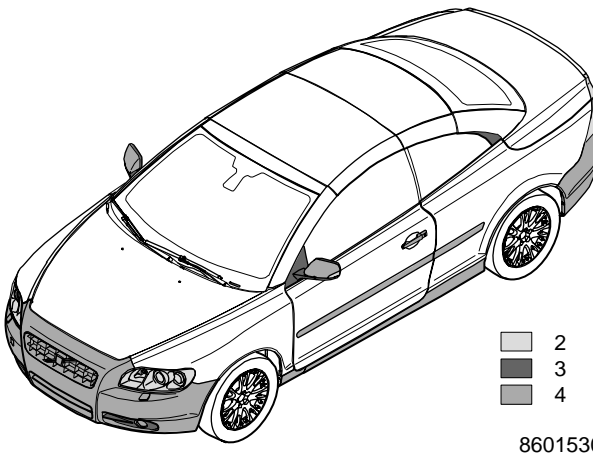


Aluminium components in the body

The following components are manufactured in aluminium:

- bonnet.
- the hydroformed members in the upper edge of the doors.
- boot lid top del.

1. Aluminium components	3. Unpainted plastic components
2. Transparent plastic	4. Painted plastic components



Plastic materials, exterior

The following components are manufactured in different plastics:

- bumper covers with grilles, PP+EPDM.
- bottom rail covering and lower trim mouldings on doors, PP+EPDM T8.
- intermediate trim mouldings, PP+EPDM M26.
- rearview mirror casings, ABS.
- rearview mirror base, ASA.
- door handles, PA66 GF30.
- the transparent headlamp lenses are unique to the new C70.

Windows

The windows are faintly tinted green.

Windscreen

Laminated glass, thickness 4.46 mm.

Available in two variants, with and without rain sensor.

Door windows

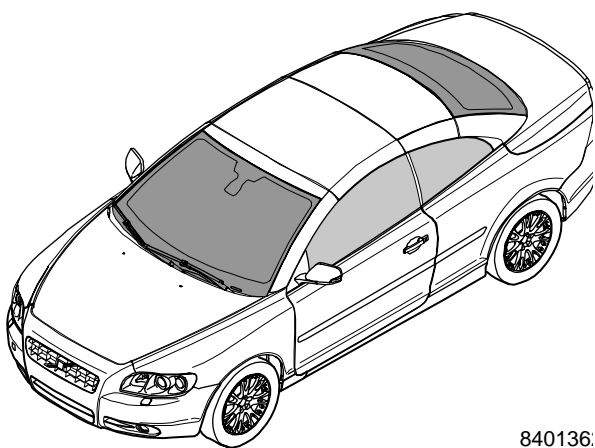
Hardened glass, thickness 4.85 mm.

Side windows

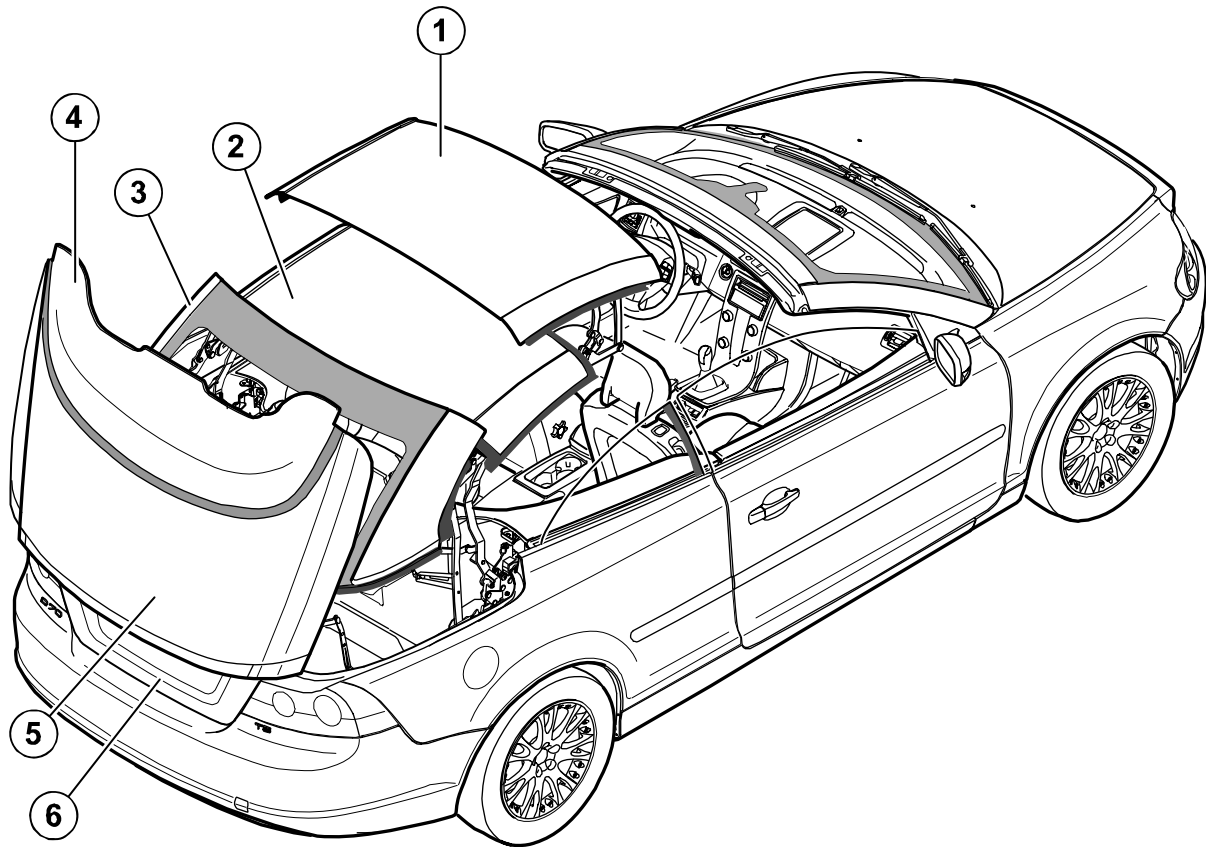
Hardened glass, thickness 4.85 mm.

Rear window

Hardened glass.



Notes



8000413j

1	Front roof section	4	Cover panel
2	Centre roof section	5	Upper section, boot lid
3	Rear roof section	6	Lower section, boot lid

RHT (Retractable Hard Top)

General

The Volvo C70 is a coupé with a triple-section steel plate roof. By pressing a button the sections of the roof are folded together and stored in the cargo compartment at which point the car is transformed into a convertible. The time for the opening/closing sequence is approx. 30 seconds.

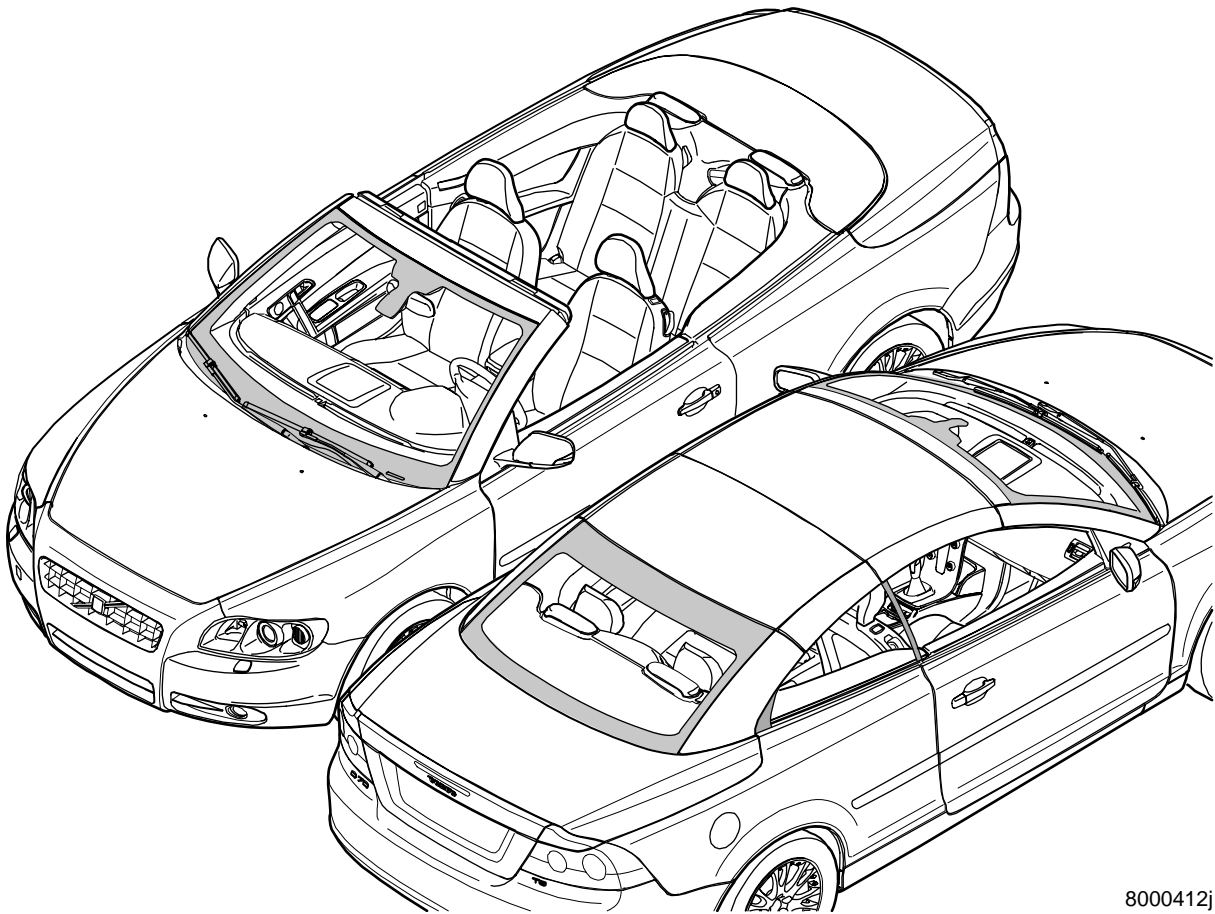
The roof consists of a front, centre and rear roof section.

The boot lid consists of two sections, an upper and a lower section. When the roof is opened and closed the upper section opens at the front edge. Approx. 40 % of the total cargo volume remains when the roof is stored in the cargo compartment.

When the roof is open (i.e. when the roof is stored in the cargo compartment) the space between boot lid and passenger compartment is covered by a moving cover panel.

When the roof is closed the cover panel is retracted and stored under the upper section of the boot lid.

The operation and control of roof, cover panel and boot lid is mainly by means of mechanical links, arms and catches, i.e. a link system. In turn, the link system is actuated by a total of eleven hydraulic cylinders.



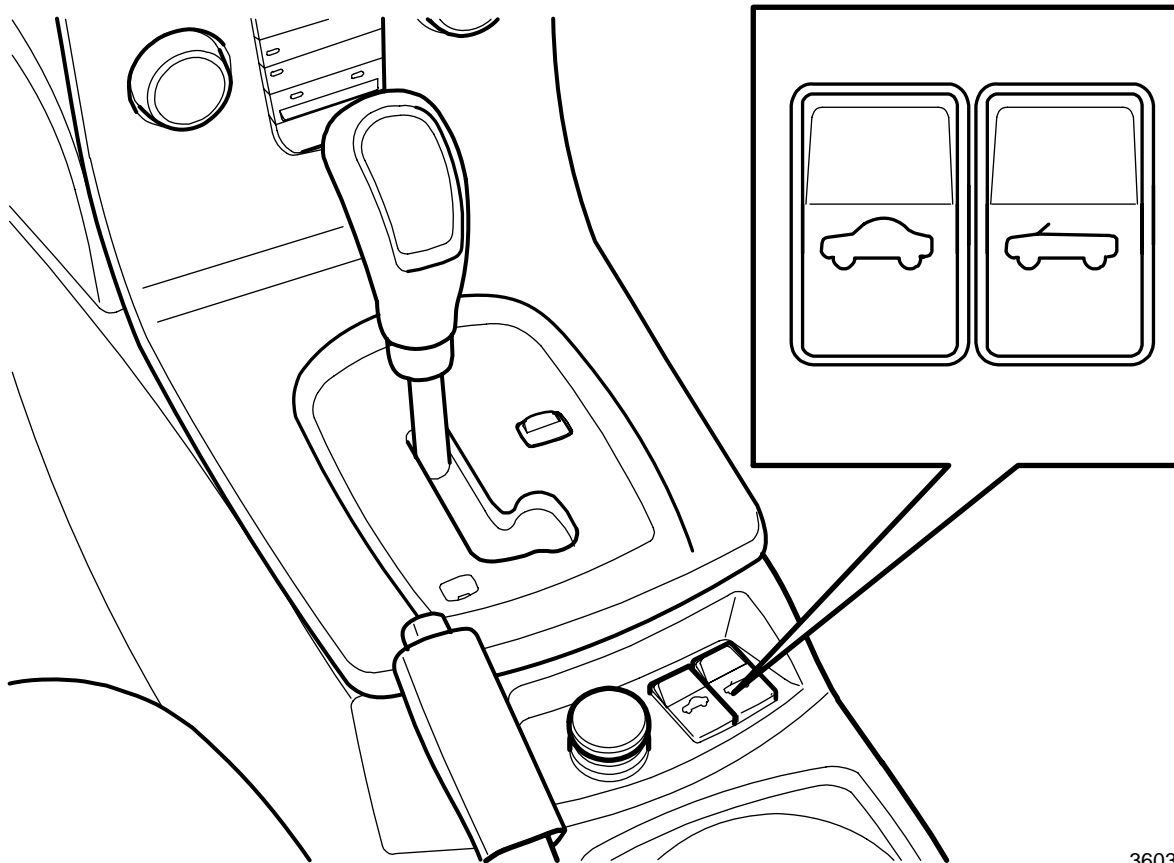
8000412j

Hydraulic cylinders open, close and lock the roof, open and close the upper section of the boot lid and move the cover panel from its extended or retracted position.

An electric latch bolt motor locks the upper section of the boot lid to the boot lid hinges (links) using cables. The Convertible Roof Module (CRM) electrically controls the hydraulic system and the electric latch bolt motor.

By means of a number of input signals the Convertible Roof Module (CRM) receives information including:

- whether the roof should be opened or closed.
- the current position for the roof sections, the position for the upper section of the boot lid and the position for the cover panel.
- whether the different locks are in locked or unlocked mode.



3603883j

Operating the roof

Operating, opening/closing

General

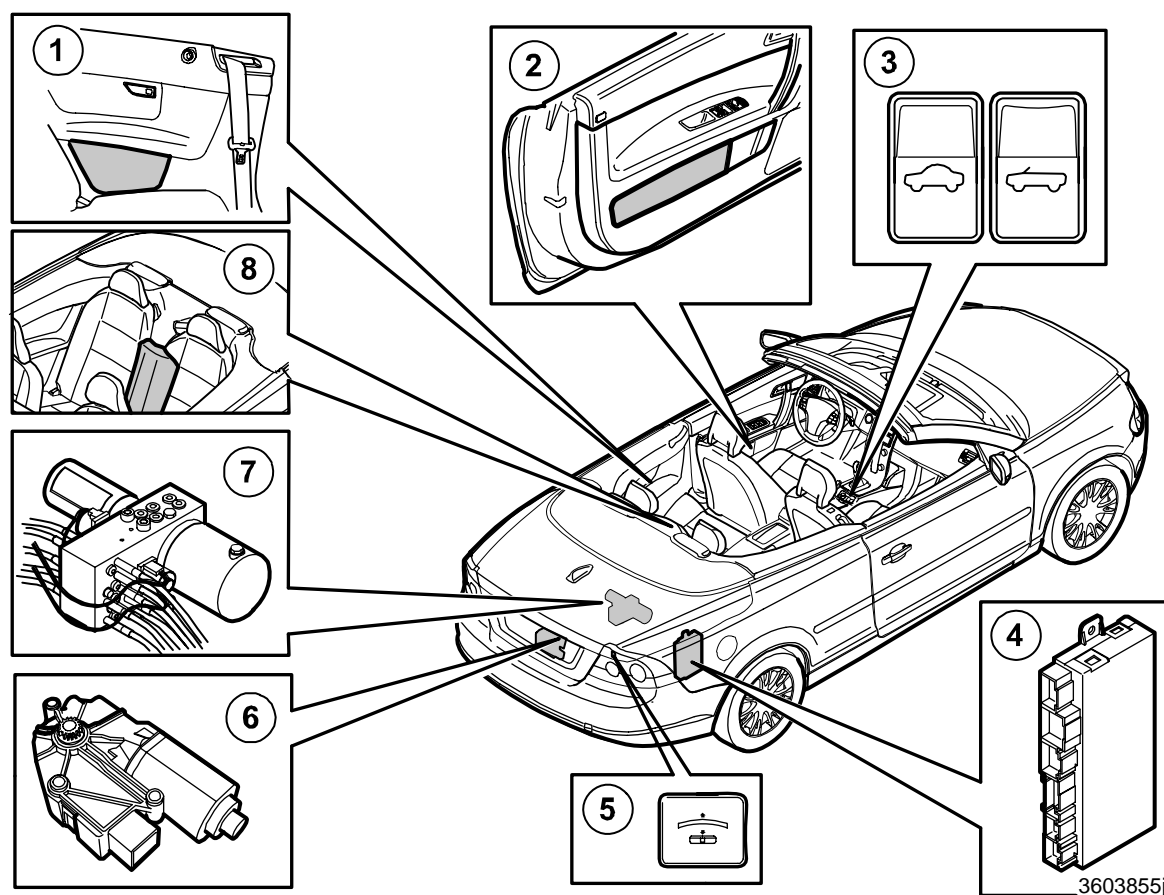
Roof operation takes place by means of two switches, one for opening and one for closing. The switches are directly connected to the Convertible Roof Module (CRM).

When opening/closing the switch must be held depressed during the whole opening/closing process and the brake pedal must be depressed. For information see the Owner's Manual.

During opening/closing, the Convertible Roof Module (CRM) continuously transmits the current position of the roof as a message on the CAN network.

Amongst other things, the signal is used by:

- The Driver Information Module (DIM), to advise the status of the roof by means of text messages and an audio signal in the combined instrument panel "buzzer".
- The Central Electronic Module (CEM), to adapt the locking function for the boot lid.
- The Infotainment Control Module (ICM), to adapt the audio system's settings depending on whether the roof is opened or closed.



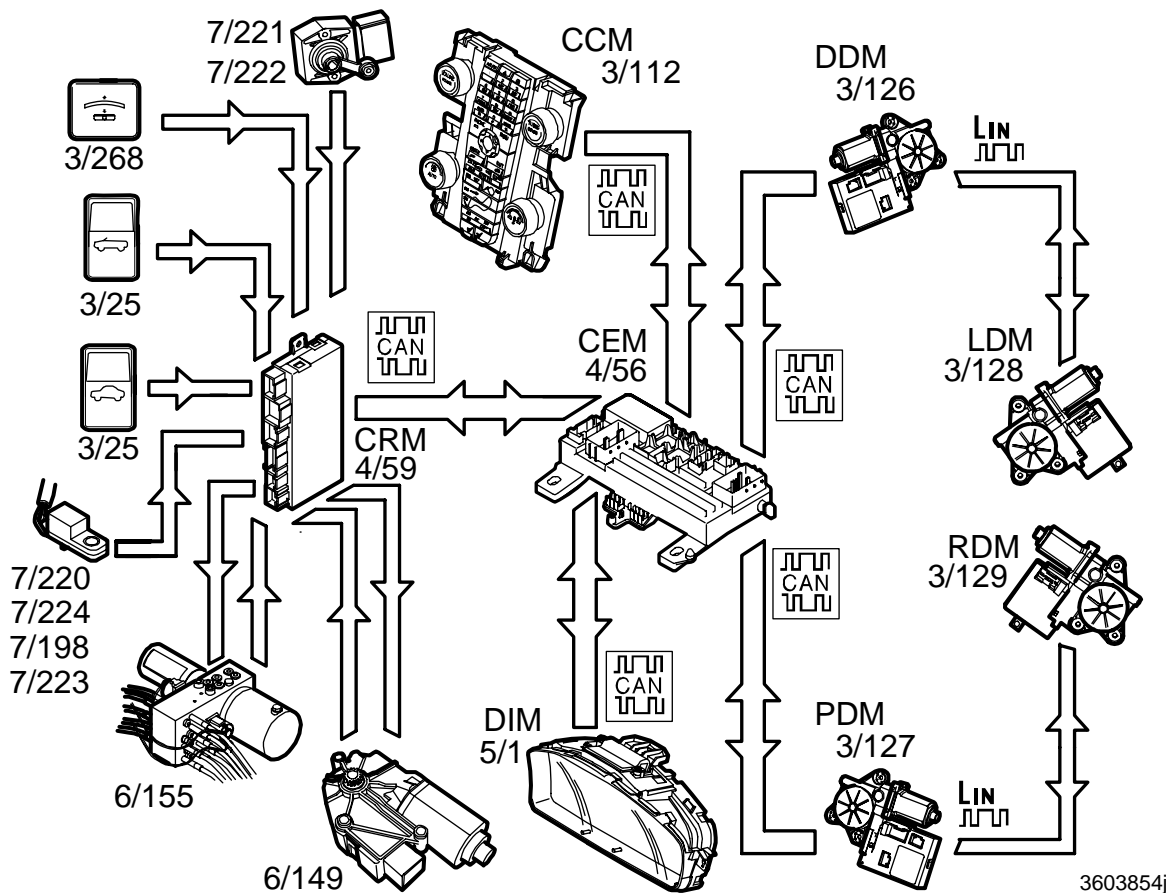
1	Storage compartment, rear	5	Switch, loading assistance
2	Storage compartment, doors	6	Electric latch bolt motor
3	Switch, closing and opening the roof	7	Unit, hydraulic pump
4	Convertible Roof Module (CRM)	8	Centre cushion, rear seat

Function, overview

In order to control the hydraulic operation of roof sections, cover panel and boot lid an electrical system is required that reads/registers the movement/position of the roof sections during opening and closing. The Convertible Roof Module (CRM), controls when/how the hydraulic unit's electrically controlled hydraulic valves should be activated. The position of the hydraulic valves in turn affects the movement of the hydraulic cylinders.

In addition to directly controlling the function of the roof sections, boot lid and cover panel as well as the loading assistance function, the Convertible Roof Module (CRM) also controls:

- the electric motors for the locks for the four storage compartments (rear, **1**, and front, **2**).
- the locking function for the upper section of the boot lid which takes place by means of the electric latch bolt motor, **6**.
- the electric motor for the lock for the rear seat's centre cushion, **8**.



Function, side windows

When one of the switches for opening or closing is activated the Convertible Roof Module (CRM) initiates a number of actions:

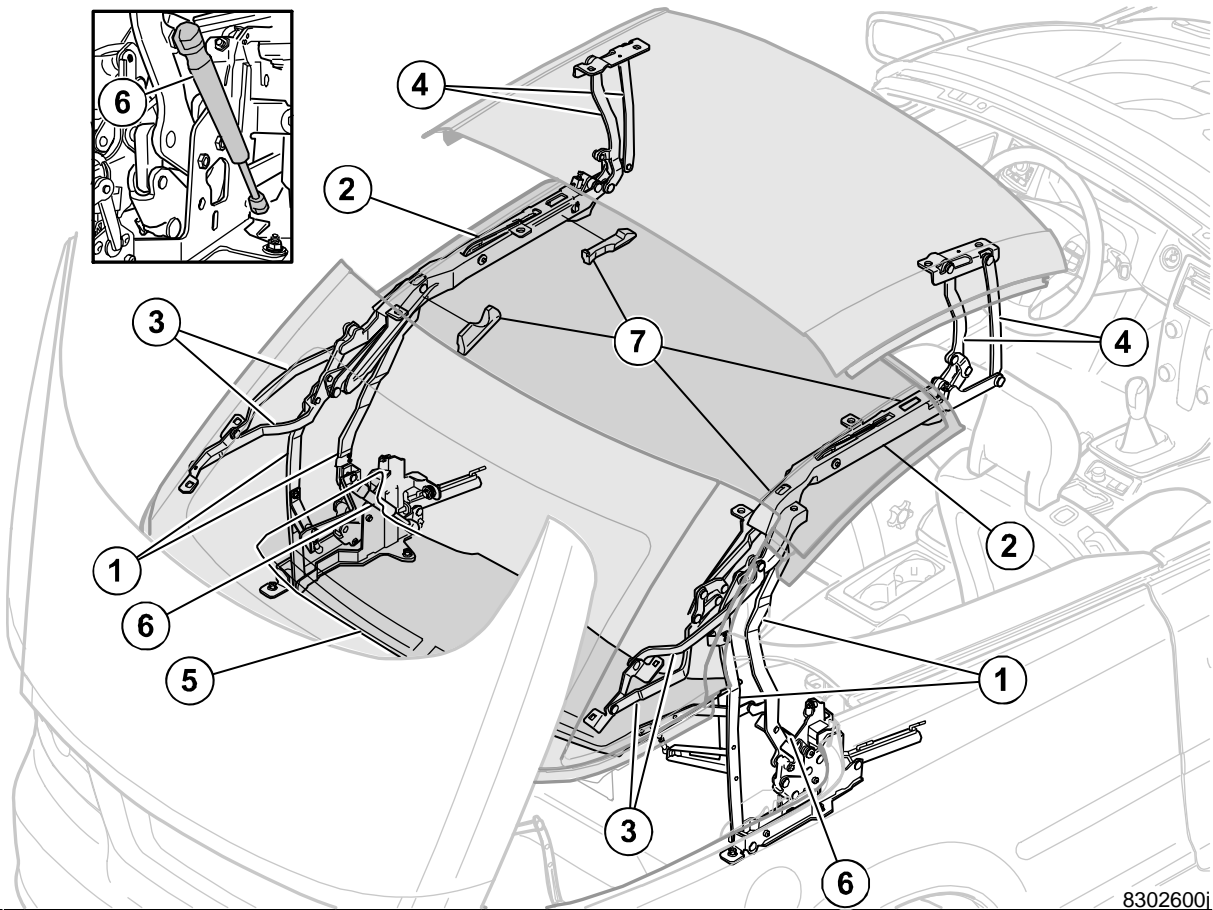
- The Convertible Roof Module (CRM) sends a signal to the Driver Door Module (DDM) and Passenger Door Module (PDM) to lower the side windows approx. 80 mm. The request is sent through the CAN LS.
- In turn the Driver Door Module (DDM) and Passenger Door Module (PDM) send the request to the Left Rear Door Module (LDM) and Right Rear Door Module (RDM) to lower the rear side windows approx. 80 mm. Takes place through the LIN.
- By means of lowering the side windows, friction between windows and roof when the roof is opened/closed is eliminated. The function is called "Short drop".
- The side windows cannot be raised or lowered during the opening/closing sequence.
- When the sequence is complete, both opening and closing, the side windows are raised to their end positions. The takes place irrespective of the position before the opening/closing sequence.

Opening/closing

- The Convertible Roof Module (CRM) activates the electric latch bolt motor, 6/149, the electric motor for the hydraulic pump and the electrically controlled hydraulic valves, 6/155. The hydraulic cylinders start to work and the roof starts to move.
- The roof is opened or closed in accordance with a procedure programmed into the Convertible Roof Module (CRM). 14 hall sensors divided into groups 7/220, 7/224, 7/198 and 7/223 as well as two position sensors 7/221 and 7/222, provide feedback to the Convertible Roof Module (CRM) on whether the movement of the roof is correct.
- When one of the processes of opening/closing is complete a signal sounds and a text message is shown in the Driver Information Module (DIM). See the Owner's Manual for the text messages that appear.

The boot lid must be closed in order to allow the roof to be opened/closed. When roof operation is initiated the Central Electronic Module (CEM) locks based on the signal from the Convertible Roof Module (CRM) boot lid lock.

If the boot lid lock is unlocked with the roof in an incomplete position (not fully open or closed) then no further operation is permitted before the boot lid is closed again (and is immediately locked "automatically").



8302600i

1	Main link arms	5	Parcel shelf
2	Mounting plates	6	Gas strut
3	Link arms, rear roof section	7	Impact protection
4	Link arms, front roof section		

Link system

Roof

The three roof sections are secured on a link system. The link system consists of a right and left-hand section respectively.

The main link arms, **1**, are attached to the body at the rear edge.

The centre roof section is fitted on the mounting plates **2**, which are secured the main link arms.

The rear roof section is fitted on the link arms, **3**.

These link arms are in turn secured to the main link arms **1**.

The front roof section is fitted on the link arms, **4**, secured on the mounting plates **2**.

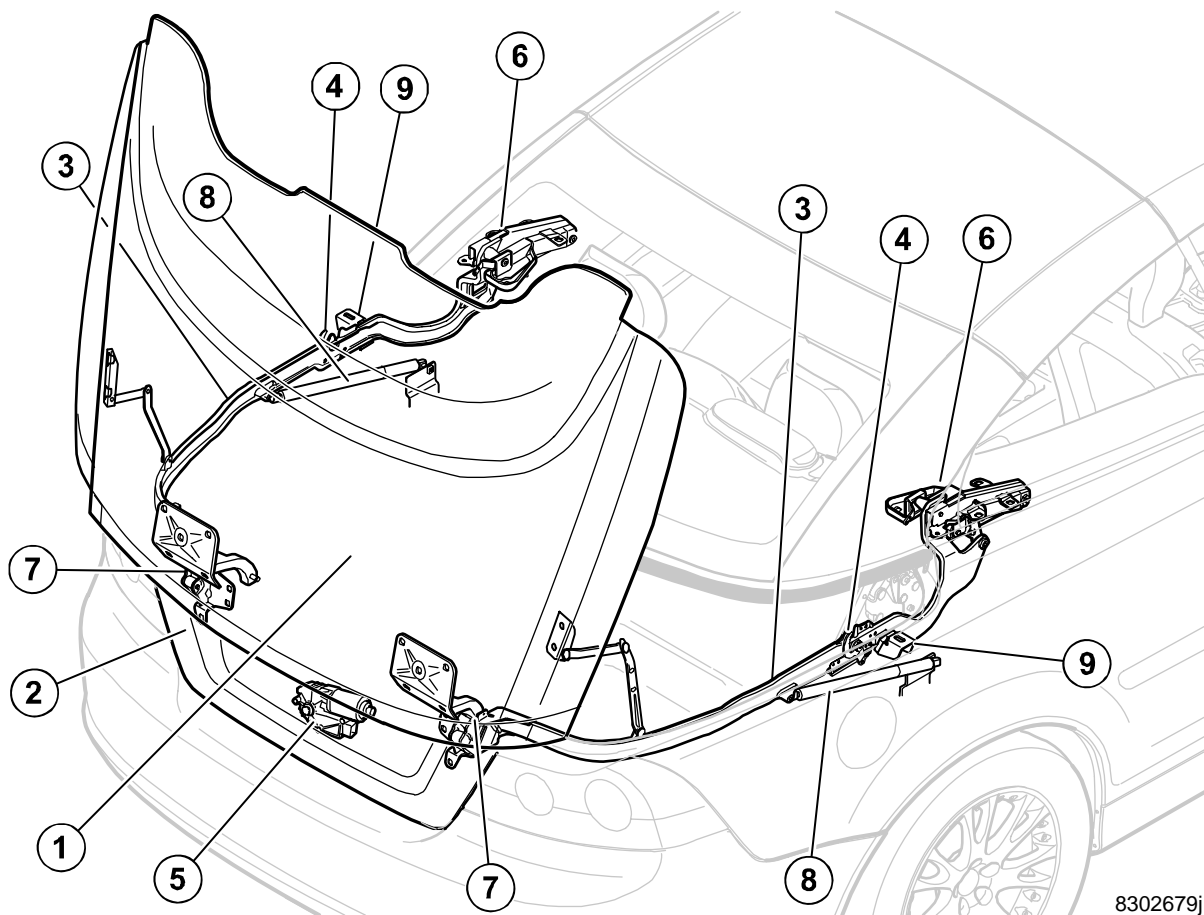
The movement of the centre roof section and rear roof section is created by means of the main link arms being acted on by two hydraulic cylinders called the "Master cylinders".

The movement of the front roof section is actuated by two further hydraulic cylinders called "Roof cylinders, front roof".

Parcel shelf, **5**, is secured to the main link arms by means of link arms. Parcel shelf movement is actuated by means of the reciprocal "ratio" of the link arms. When the roof sections are stored in the cargo compartment the parcel shelf is located at the bottom.

Two gas struts, **6**, help to provide a controlled movement for the link system.

There is protection, **7**, fitted on the left and right-hand sections of the link system. The protection is designed to minimise the risk of injury to passengers in the event of impact.



8302679j

1	Boot lid, upper section	6	Hinge/joint (boot lid opening)
2	Boot lid, lower section	7	Rear hinge, boot lid upper section (during roof operation)
3	Hinge (links), boot lid	8	Gas strut
4	Catches, boot lid upper section	9	Console
5	Electric latch bolt motor		

Boot lid

General

The boot lid consists of two sections, an upper section and a lower section. The sections are fitted on the left and right-hand hinges (hinges=links).

When the boot lid is opened in a conventional way, it moves at the articulated points **6**.

When the roof is opened/closed the boot lid's upper section opens at the front edge.

Opening and closing of the boot lid upper section takes place by means of two hydraulic cylinders.

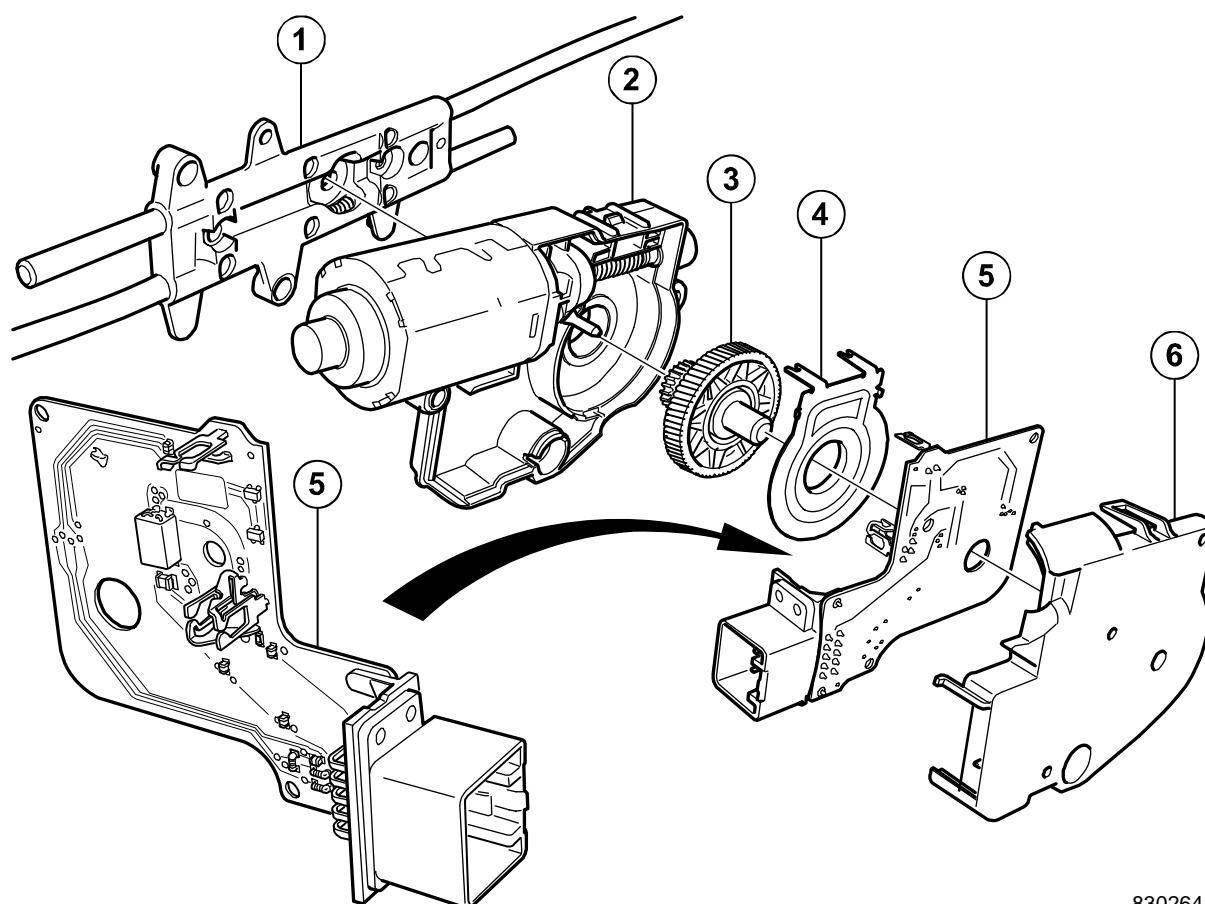
The hydraulic cylinders are located on the lower section of the boot lid.

When the boot lid upper section is in closed position (i.e. the boot lid is one unit) the upper section is locked to the hinges (links) by an electric latch bolt motor.

The latch bolt motor acts on the two latch bolts by means of two cables (one each on the right and left-hand side respectively) which locks the upper section into the hinges (links).

The consoles **9** fixes the boot lid sideways.

When the boot lid is open at the rear edge then two gas struts hold the boot lid in open position.



8302641j

1	Housing, cables	4	Cover
2	Latch bolt motor	5	Circuit board
3	Shaft with large and small gear	6	Cover

Latch bolt motor

The electric latch bolt motor is located on the lower section of the boot lid.

A direct current motor drives the shaft's large gear by means of a worm gear.

The shaft's small gear in turn drives two latch bolts by means of two cables.

There is a recess in the outer end of the shaft for a hexagon socket which means that the electric motor can be turned manually. By this means there is the option to adjust the latch bolts to the correct position, for example when replacing the latch bolt motor.

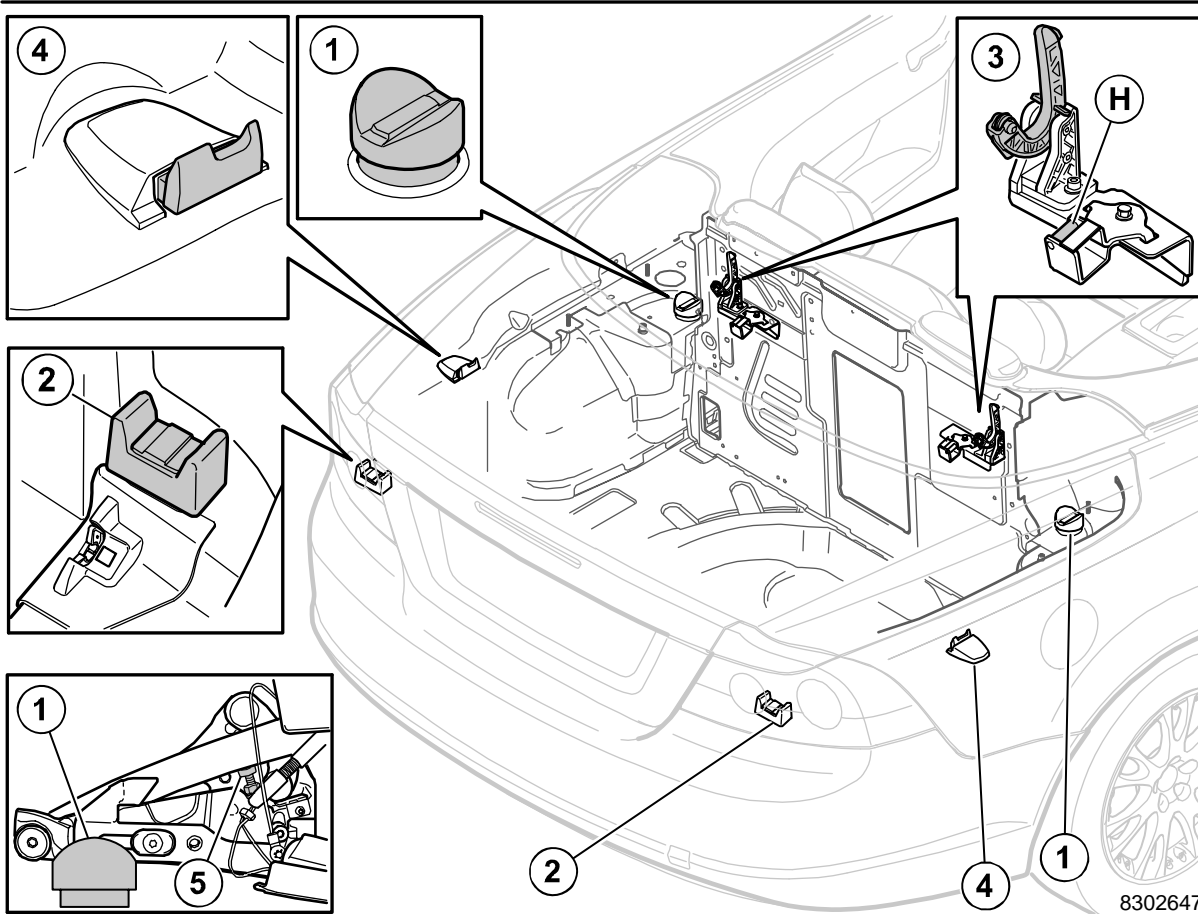
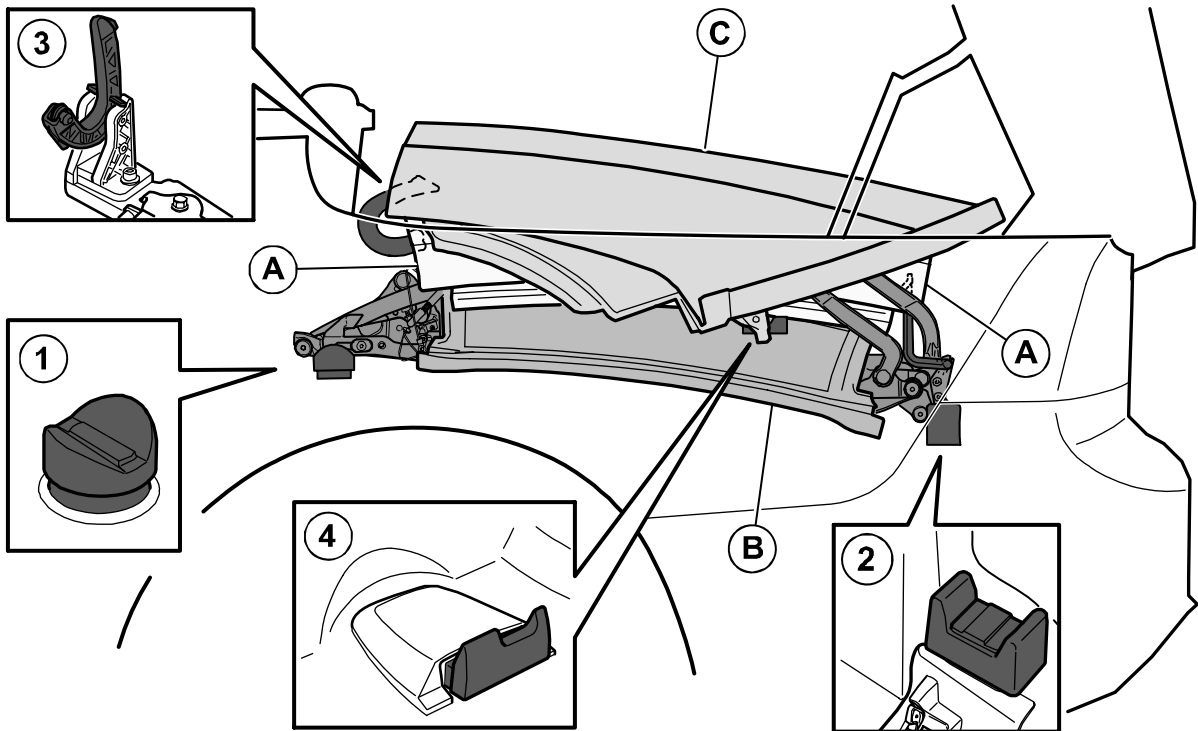
In order that the Convertible Roof Module (CRM) can determine the number of turns for which the electric motor rotates, it is equipped with a hall sensor.

The hall sensor is acted on by a magnet located on the rotor shaft. The hall sensor sends a pulsed signal to the Convertible Roof Module (CRM).

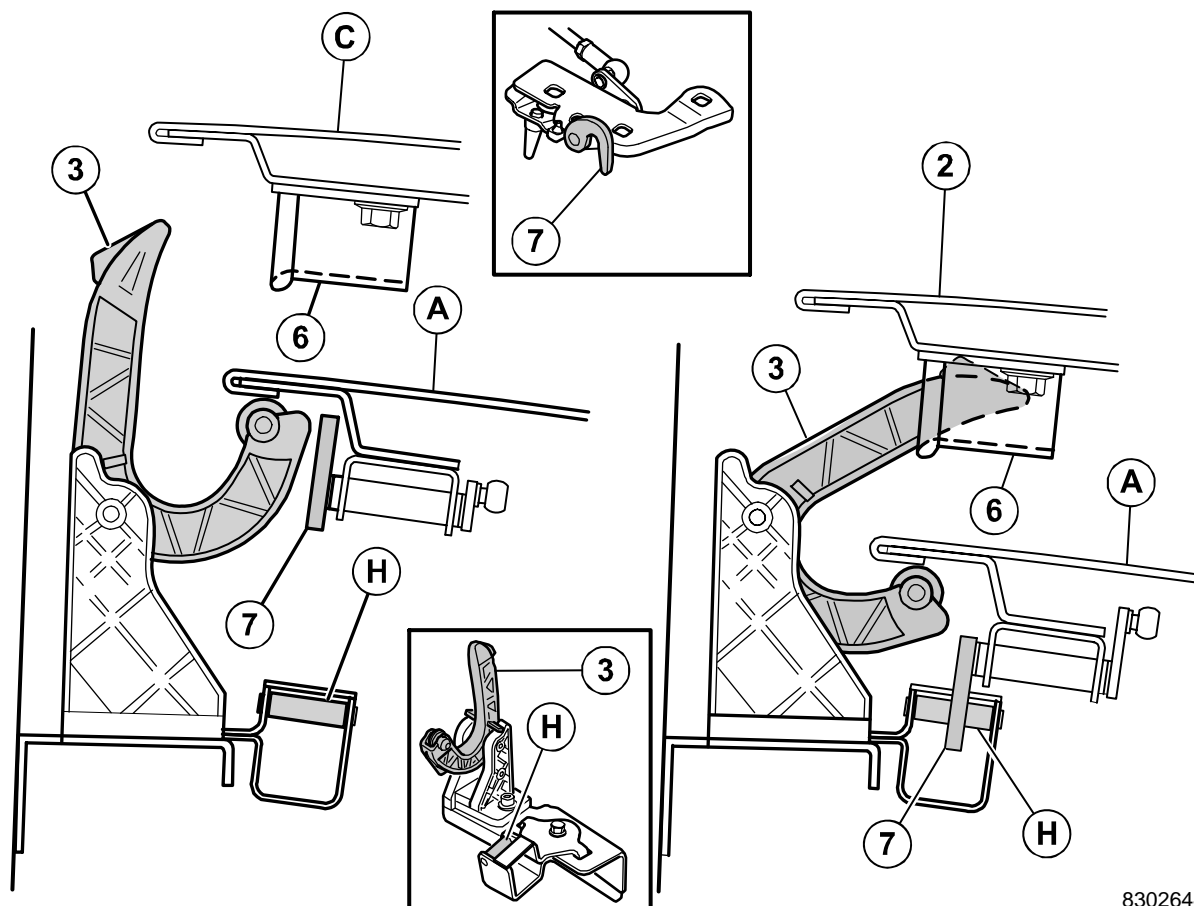
Based on this signal the Convertible Roof Module (CRM) can determine the number of turns for which the electric motor has rotated.

The Convertible Roof Module (CRM) can determine whether the latch bolts are in locked or unlocked position by comparing the number of turns for which the electric motor has rotated using the signal from hall sensor S7 (at the left-hand latch bolt for the boot lid upper section).

Support points



8302647j



8302644j

Open position

When the roof is stored in the cargo compartment the sections of the roof rest on different support points.

Centre roof section

The centre roof section, **B**, stored at the bottom. The roof section link arms rest on support points **1** and **2**.

Front roof section

The front roof section, **A**, is stored in the centre. The adjustable stop point, **5**, determines the final position of the roof section when the roof is folded.

When the whole roof unit is lowered the front section presses on the clamp, **3**, which is rotated.

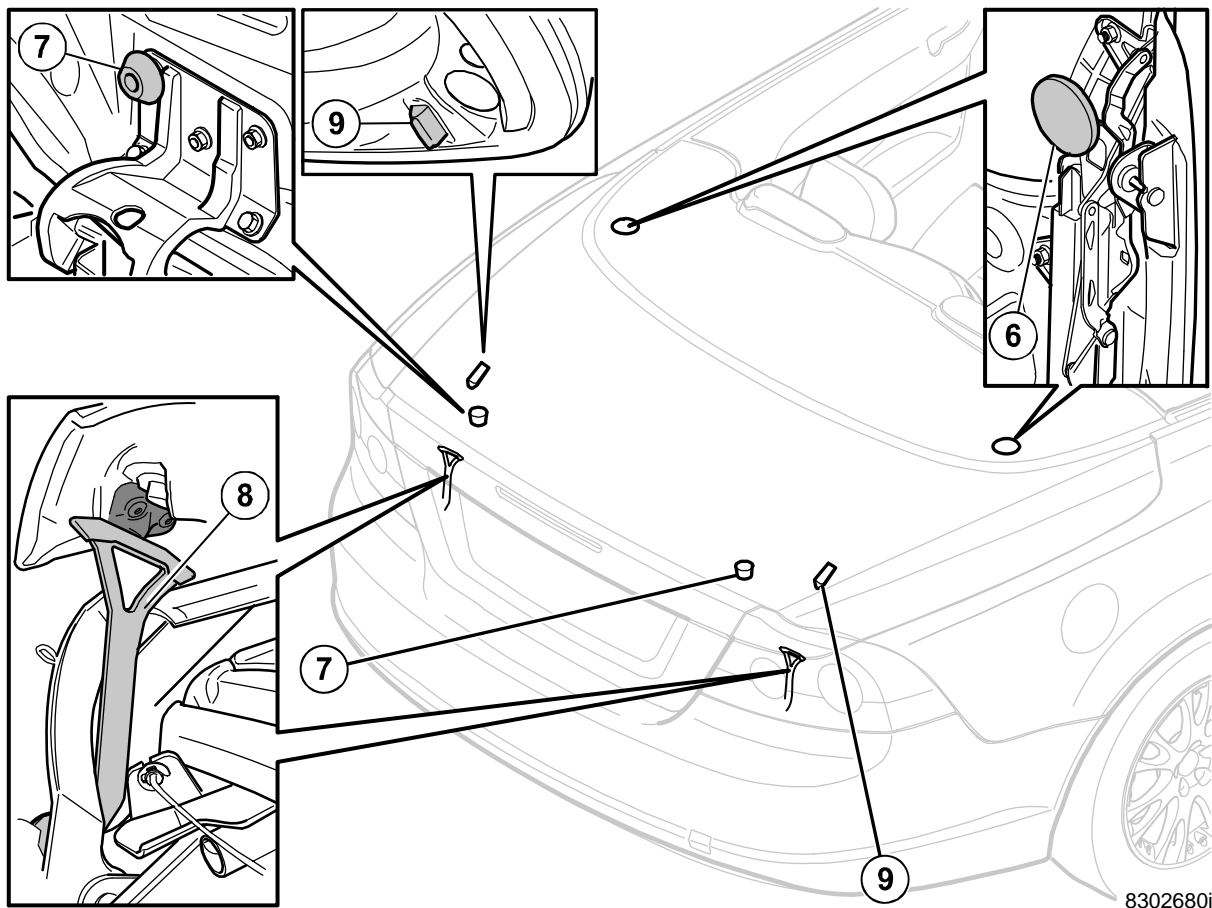
In turn, the clamp is guided against the rear roof section's lock housing, **6**.

Finally, the front roof section is locked against the latch pins, **H**, of the two latch bolts **7** (two). (The latch bolts are the same that lock the front roof section to the windscreen).

Rear roof section

The rear roof section, **C**, is located at the top. On each side a bracket rests against the support points, **4**.

The clamp, **3**, secures the roof section's front edge when the roof unit is stored in the cargo compartment.



Movement limiter, roof stored in cargo compartment.

There are a number of components fitted that limit the movement of the roof sections in order to prevent them from bumping into each other or colliding with another object.

There are two rubber pads **6** and **7** fitted on the boot lid upper section.

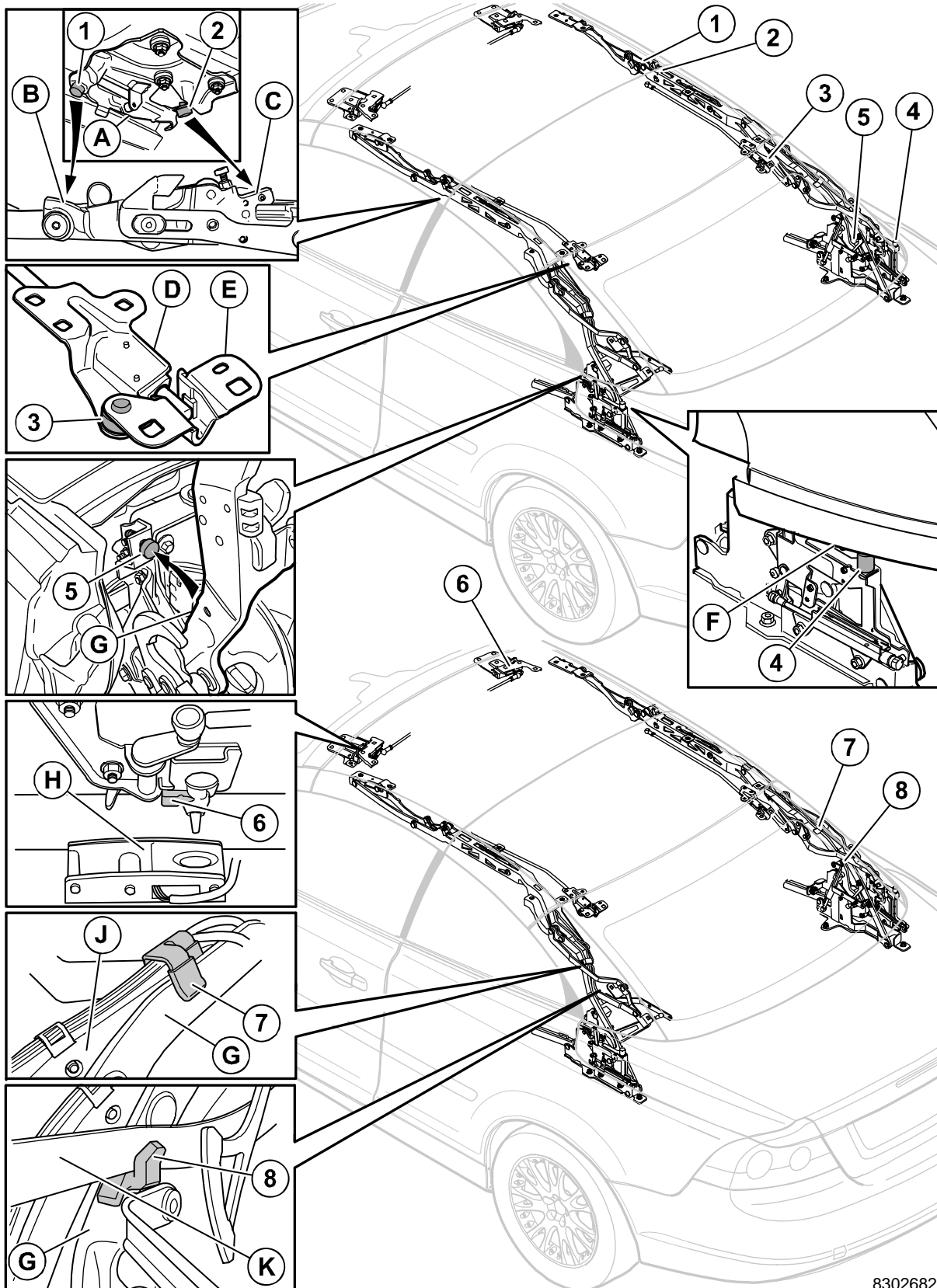
These limit the movement of the rear roof section and prevent the rear roof section from colliding with the different sections of the boot lid.

There are two arms, **8**, located on the link system. The arms prevent the front roof section from colliding with the centre roof section when the roof sections are stored in the cargo compartment.

There are two rubber pads, **9**, fitted on the rear roof section. The pads prevent the rear roof section from colliding with the front roof section (which is located directly underneath).

Notes

Closed position



8302682j

Front roof section

The roof is locked against the windscreen at the front edge. The rubber pads, **6**, rests against the strikers **H** attached to the windscreen frame.

The brackets, **A**, are located on the right and left-hand sides at the rear edge. The rubber pads **1** and **2** fitted onto the brackets abut against the link system stop points **B** and **C**.

Centre roof section

The roof section is fitted onto mounting plates which are secured on the link system's main link arms. The front roof section and rear roof section move towards/from the rear roof section.

There are brackets, **D**, located in the rear edge on the right and left-hand sides. The brackets function partly as guides for the connecting rods (which lock the centre roof section to the rear roof section) and partly as stop points for the rear roof section.

Rear roof section

There are brackets, **E**, located in the front edge on the right and left-hand sides. The rubber pads **3** fitted onto the brackets abut against the stop points on the brackets **D** (i.e. the centre roof section).

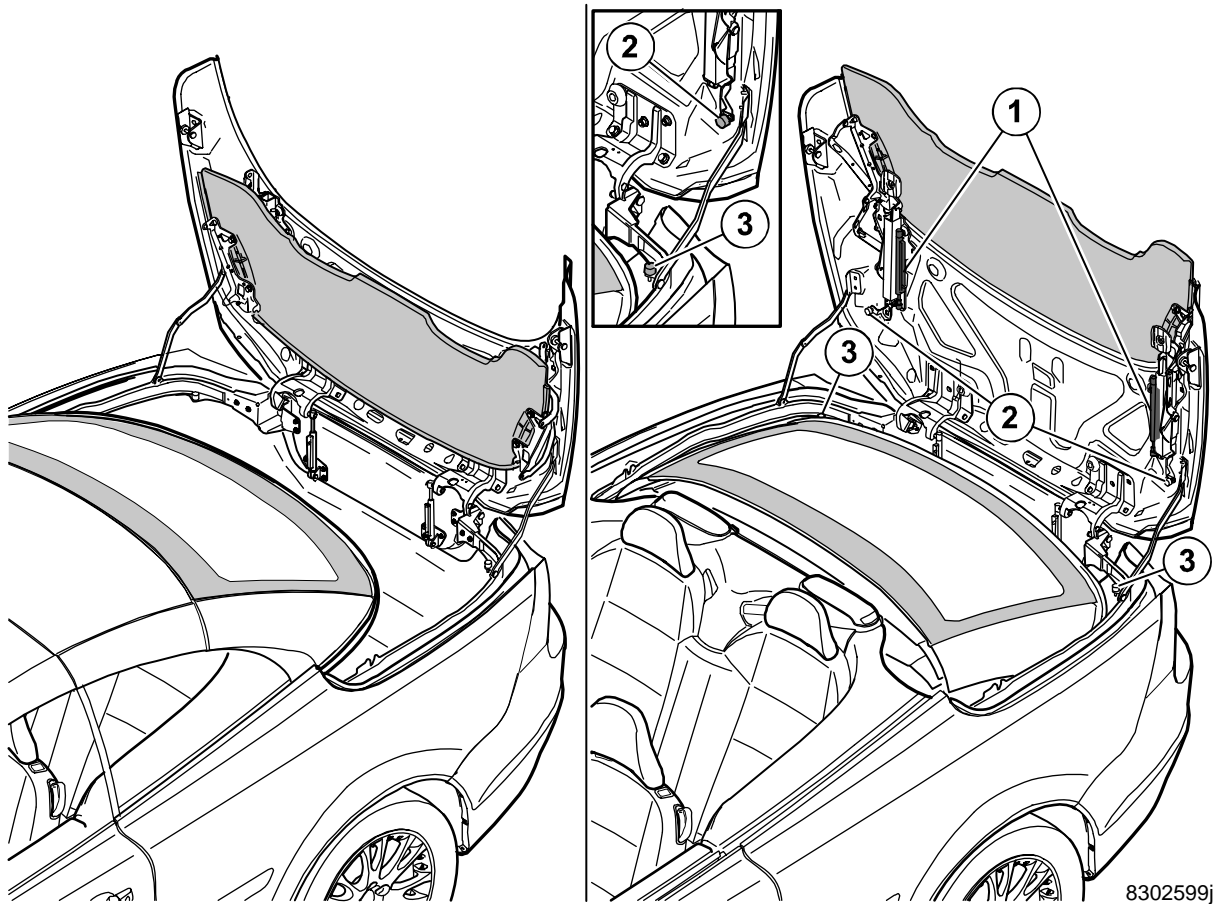
The roof section is locked to the body at the rear edge, **F**, and abuts against the stop points (rubber pads) **4**.

Link system.

When the roof is closed, the front main link arms, **G**, abut against the stop points (rubber pads) **5**.

The supports **7**, attached to the rear main link arms **J**, fixes the rear main link arms to the front main link arms **G**.

The supports **8** fixes the rear (lowest) links of the rear roof section, **K**, to the front main link arms **G**.



8302599j

Cover panel

When the roof is stored in the cargo compartment the cover panel covers the area between the boot lid upper section and the passenger compartment. This takes place by means of the cover panel adopting its extended position.

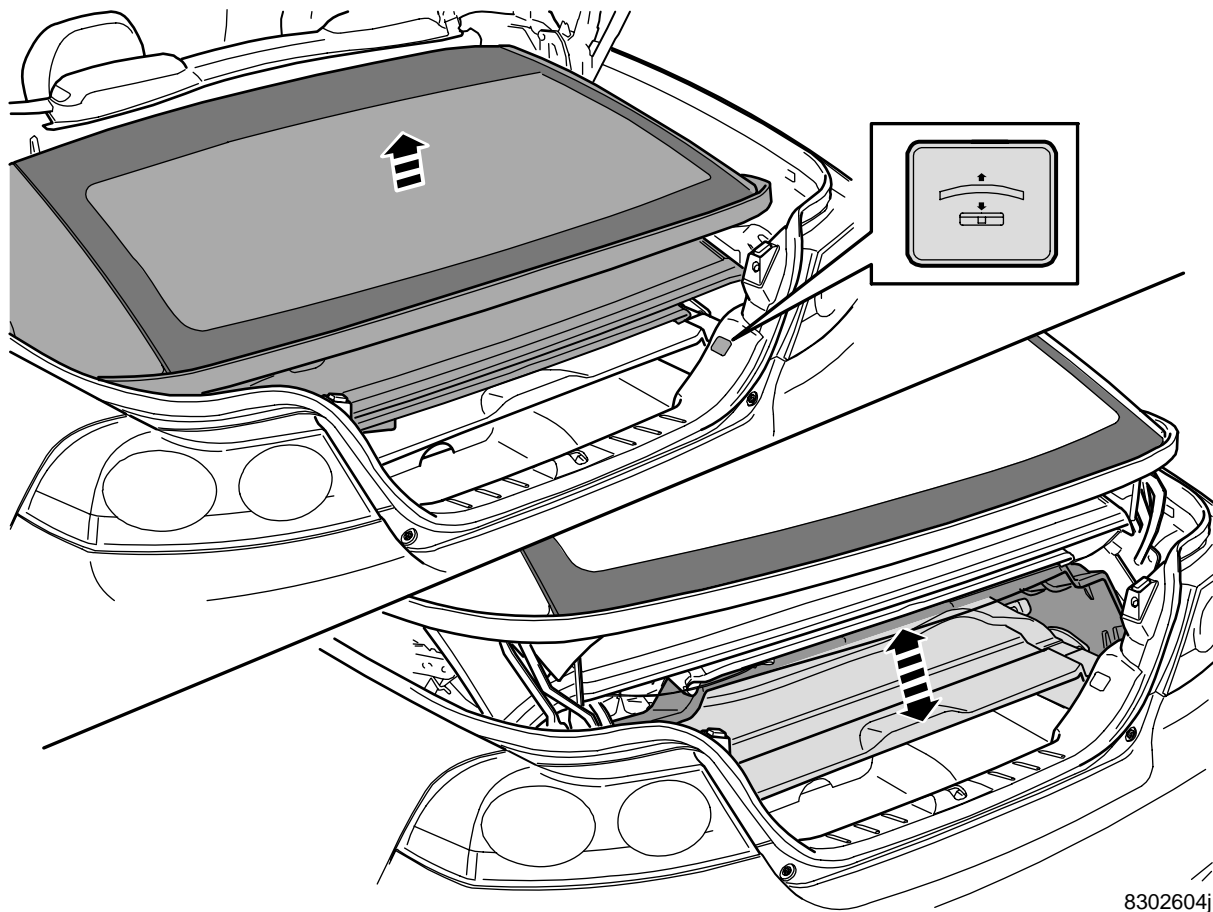
When the roof is closed the cover panel is in its retracted position and is located under the upper section of the boot lid.

The cover panel is in its extended position during roof operation.

The movement of the cover panel is actuated by means of a link system that is acted on by two hydraulic cylinders called "Cylinders, cover panel", **1**.

The cover panel rests against support points **2** and **3** in its retracted position.

Notes



8302604j

Loading assistance

Cargo divider and loading assistance

The cargo compartment is divided into two sections by means of a moveable cargo divider. The upper area is designed for the roof sections and the lower area for luggage.

There is a loading assistance function available in order to facilitate loading with the roof open (i.e. when the roof is located in the cargo compartment).

Lifting the sections of the roof enables an increase in cargo compartment height of up to 300 mm during loading. This function is initiated by means of a switch in the cargo compartment.

Only one press of a button (one impulse) is required for the roof to move from the lower end position to the upper end position, or from the upper end position to the lower end position.

A larger cargo opening is obtained by means of lifting the cargo divider when the roof is at the upper limit position, and this provides improved accessibility for loading and unloading.

The position of the roof is guided/controlled by the Convertible Roof Module (CRM) based on the signal from position sensor S2.

The cargo divider must be in its lower end position for roof operation to be permitted.

The position is registered by hall sensor S10 whose signal is sent to the Convertible Roof Module (CRM).

The following applies if more than one press of a button takes place after initiation.
When the roof is moving from its lower position to its upper position:

- A second press means that the movement is stopped.
- The next press means that the roof is lowered.
- The next press means that the movement is stopped again.
- The next press means that the roof is raised again.

Continued pressing follows the schedule above, i.e. the movement of the roof is stopped-lowered-stopped-raised and so on.

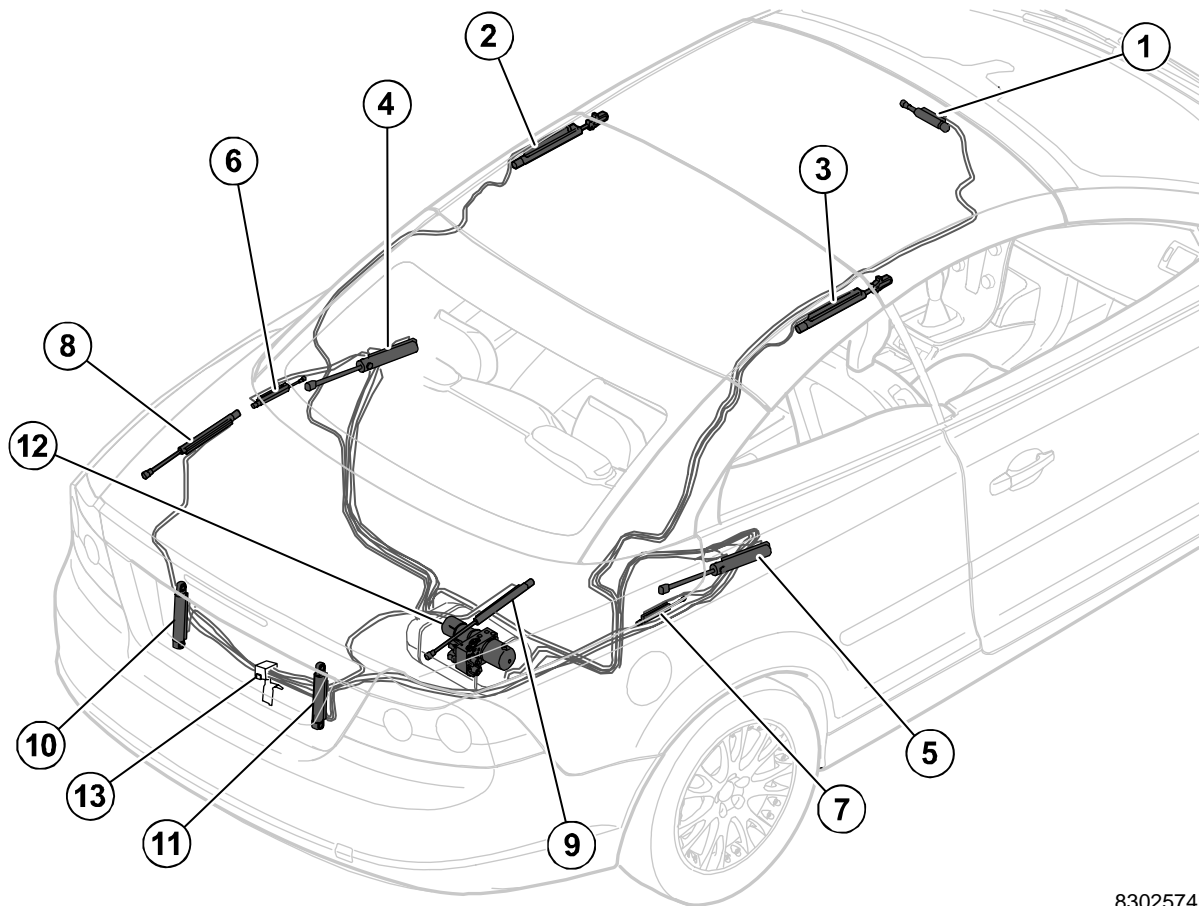
The following applies if more than one press of a button takes place after initiation.
When the roof is moving from its upper position to its lower position:

- A second press means that the movement is stopped.
- The next press means that the roof is raised.
- The next press means that the movement is stopped again.
- The next press means that the roof is lowered again.

Continued pressing follows the schedule above, i.e. the movement of the roof is stopped-raised-stopped-lowered and so on.

The upper end position of the roof is a pre-programmed position stored in the Convertible Roof Module (CRM). The Convertible Roof Module (CRM) can determine when the correct position has been reached based on the signal from position sensor S2.

The loading assistance switch is directly connected to the Convertible Roof Module (CRM).

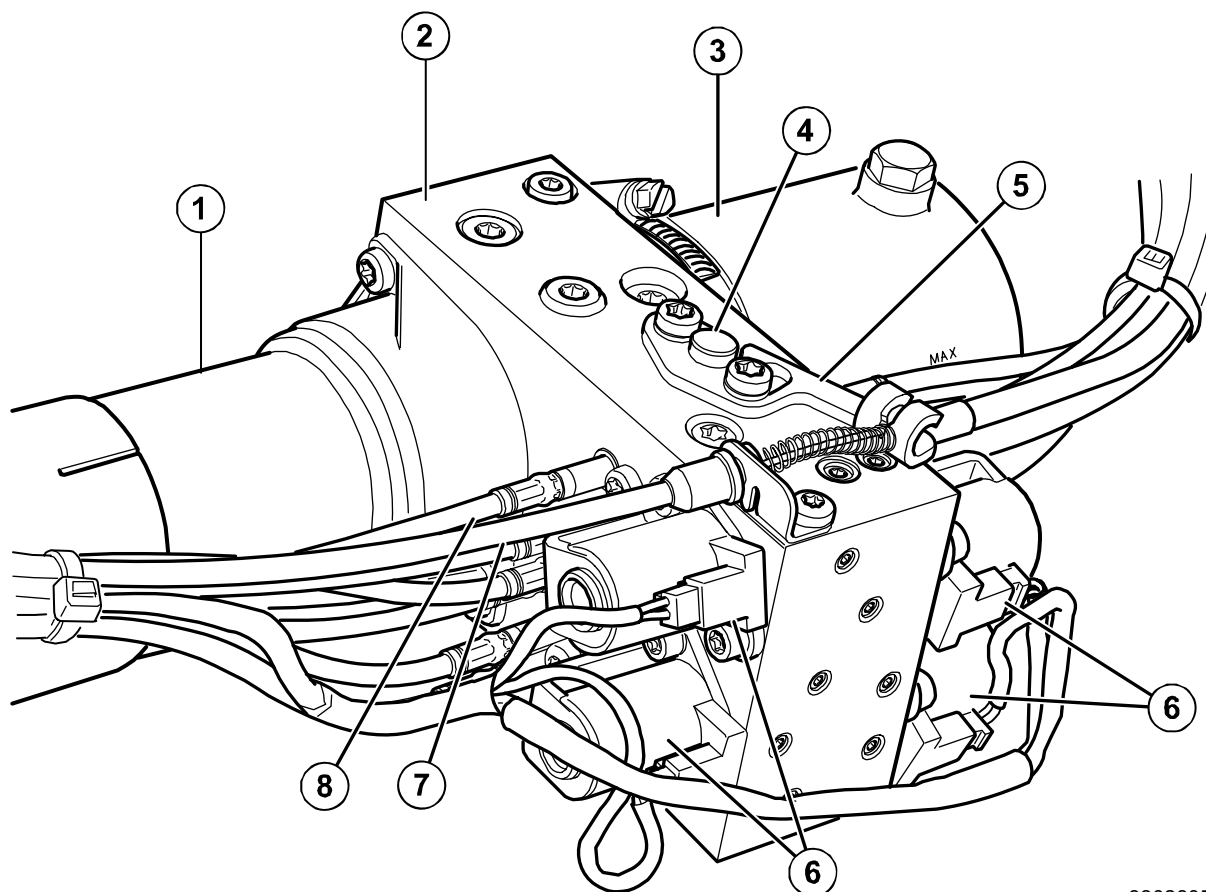


8302574j

Hydraulics

Components

1	Lock cylinder, front roof	8	Cylinder, cover panel, left
2	Roof cylinder, left	9	Cylinder, cover panel, right
3	Roof cylinder, right	10	Cylinder, boot lid, left
4	Master cylinder, left	11	Cylinder, boot lid, right
5	Master cylinder, right	12	Unit, hydraulic pump
6	Lock cylinder, rear roof, left	13	Distribution box
7	Lock cylinder, rear roof, right		

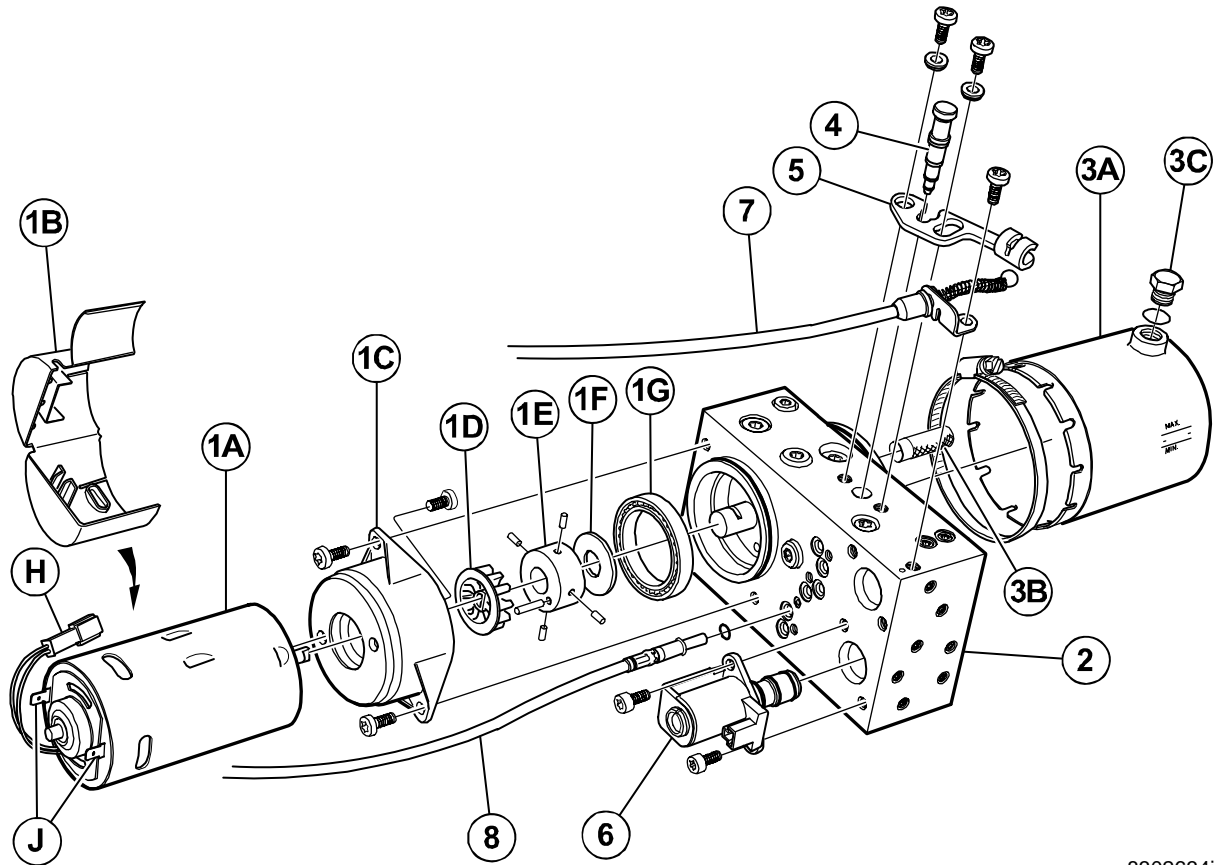


8302605j

1	Electric motor that drives the hydraulic pump	5	Lever for locking relief valve
2	Housing	6	Electrically controlled hydraulic valves, x 4
3	Oil reservoir	7	Cable for releasing the relief valve
4	Relief valve	8	Hydraulic hoses

Hydraulic unit

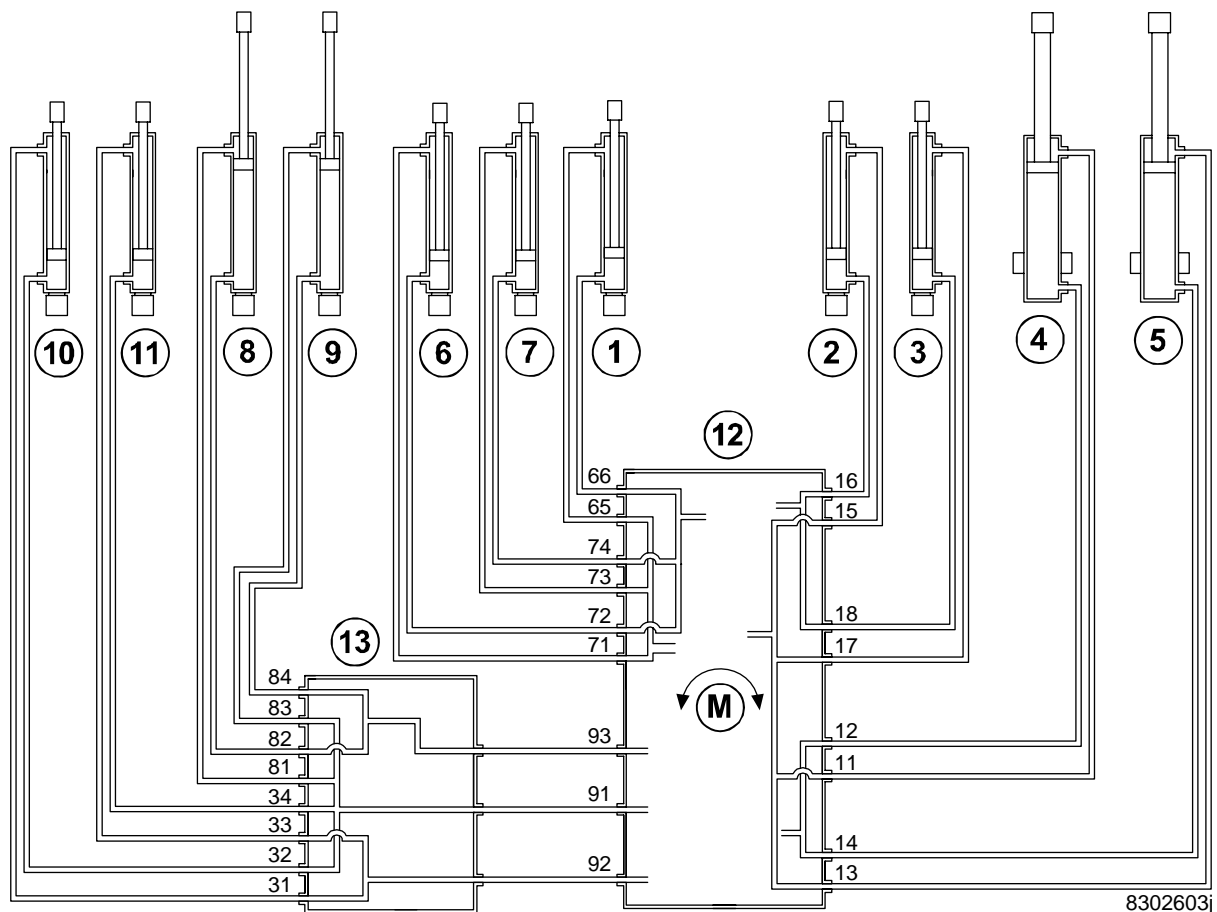
- The Convertible Roof Module (CRM) controls the electric motor which drives the hydraulic pump clockwise or anticlockwise. The direction of rotation depends on the sequence/position of the roof during opening/closing.
The hydraulic system has a maximum working pressure of 140 bar.
- There is a temperature sensor in the electric motor. The sensor is directly connected to the Convertible Roof Module (CRM). At high temperatures the Convertible Roof Module (CRM) limits the functionality of the hydraulic pump in order to avoid damage to the system.
- There are ducts in the housing through which the oil passes to/from the hydraulic pump, to/from the four electrically controlled hydraulic valves, to/from the hydraulic cylinders and to/from the oil reservoir.



8302634j

1A	Electric motor	3B	Filter
1B	Cover	3C	Filling
1C	Cover	4	Relief valve
1D	Driver	5	Lever for locking relief valve
1E	Pump	6	Electrically controlled hydraulic valve
1F	Axial washer	7	Cable, lever
1G	Bearing	8	Hydraulic hose
2	Housing	H	Connector, temperature sensor
3A	Oil reservoir	J	Connection, electric motor

- The hydraulic valves are controlled electrically by the Convertible Roof Module (CRM). The different hydraulic cylinders' positions (and thereby also the roof sections' positions) are controlled by opening/closing the valves in different patterns.
- There is a relief valve, **4**, for releasing the pressure in the system when required. The pressure in the system is released when the valve is lifted. The ducts containing pressure are then connected with the return ducts, at which point the pressure in the system decreases. In order to be able to lift the valve the lever must first release the valve. This is done by pulling the cable, the handle for which is located under the rear seat cushion.
- The hydraulic hoses are "inserted" in the housing with O-rings as seals. The hoses are secured with screws.
- The hoses and housing have corresponding numbering for easy identification.



Overview

1. Lock cylinder, front roof. Locks the front section of the roof to the windscreen frame.

2 and 3. Roof cylinders, left and right. Have several functions:

- They move the front section of the roof during opening and closing.
- They lock the roof's front section rear edge to its centre section front edge.
- They lock the roof's centre section rear edge to its rear section front edge.

4 and 5. Master cylinders, left and right. They move the centre roof section and the rear roof section during the opening and closing of the roof.

6 and 7. Lock cylinders rear roof section, left and right. They lock the roof (i.e. the roof's rear section) into the body.

8 and 9. Cylinders, cover panel, left and right. They move the cover panel to extended or retracted position.

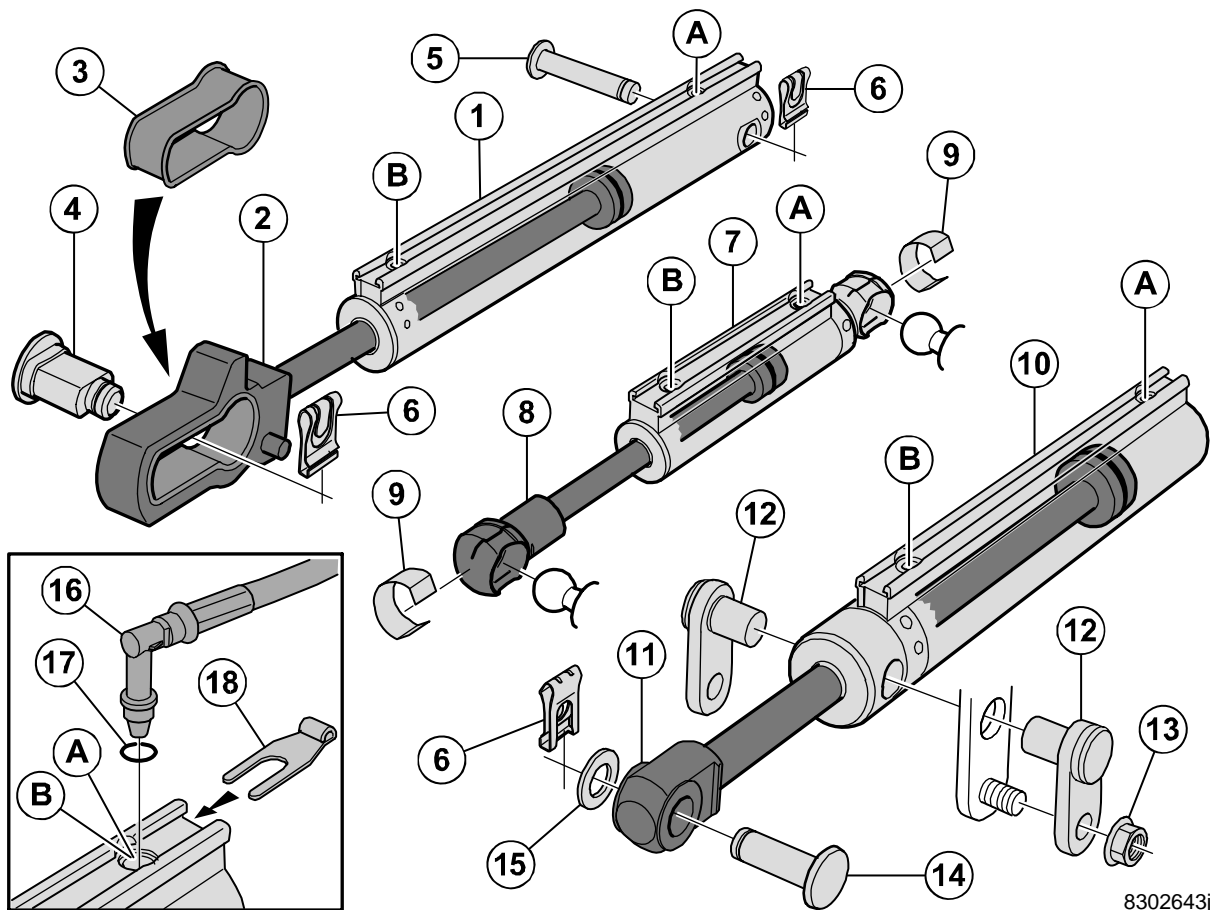
10 and 11. Cylinders, boot lid, left and right. They open and close the upper section of the boot lid.

12. Hydraulic unit. Amongst other things, this contains electric motor driven hydraulic pump, four electrically controlled hydraulic valves and connections for hydraulic cylinders and distribution box.

13. Distribution box. Distributes hydraulic oil to the boot lid and cover panel hydraulic cylinders.

The illustration shows the position of the hydraulic cylinders with closed roof.

NOTE. Only use hydraulic oil intended for this hydraulic system. See the service information for the correct part number.



8302643j

Hydraulic cylinders

1	Roof cylinder	11	Piston
2	Piston	12	Jointed suspension
3	Bushing	13	Nut
4	Bolt	14	Bolt
5	Bolt	15	Washer
6	Catch	16	Hydraulic hose
7	Lock cylinder	17	O-ring
8	Piston	18	Catch
9	Catch	A	Connection, hydraulic hose
10	Master cylinder	B	Connection, hydraulic hose

Hydraulic cylinders

All hydraulic cylinders are double acting cylinders with single-sided piston rod. Amongst other things, the piston/cylinder diameter, hose length and suspension differ depending on function.

Roof cylinders

The two roof cylinders open/close the front roof section. In addition, the roof cylinders lock the front roof section with the centre roof section and the centre roof section with the rear roof section.

The locking sequence is implemented after the roof has been closed and accordingly the unlocking sequence before the roof is opened.

Locking takes place by means of the lug on the hydraulic piston engaging a recess on the lock mechanism's plate. This means that the latch bolt follows the movement of the piston, at which the front roof section is locked against the centre roof section.

A ball joint is secured on the plate, opposite the latch bolt. A connecting rod is fitted onto the ball joint. When the lock mechanism plate moves, the connecting rod also moves (as does the latch bolt). In turn, the connecting rod grips the lamp housing for the rear roof section, at which the centre roof section is locked against the rear roof section.

During unlocking, the sequence takes place in reverse order, i.e. the roof's sections are first released and then the front roof section is opened.

Lock cylinder for front roof section, lock cylinders and cover panel cylinders

These cylinders are moveably mounted at both cylinder and piston by means of ball joints. This design is enabled by means of the load on these cylinders being relatively small.

Master cylinders

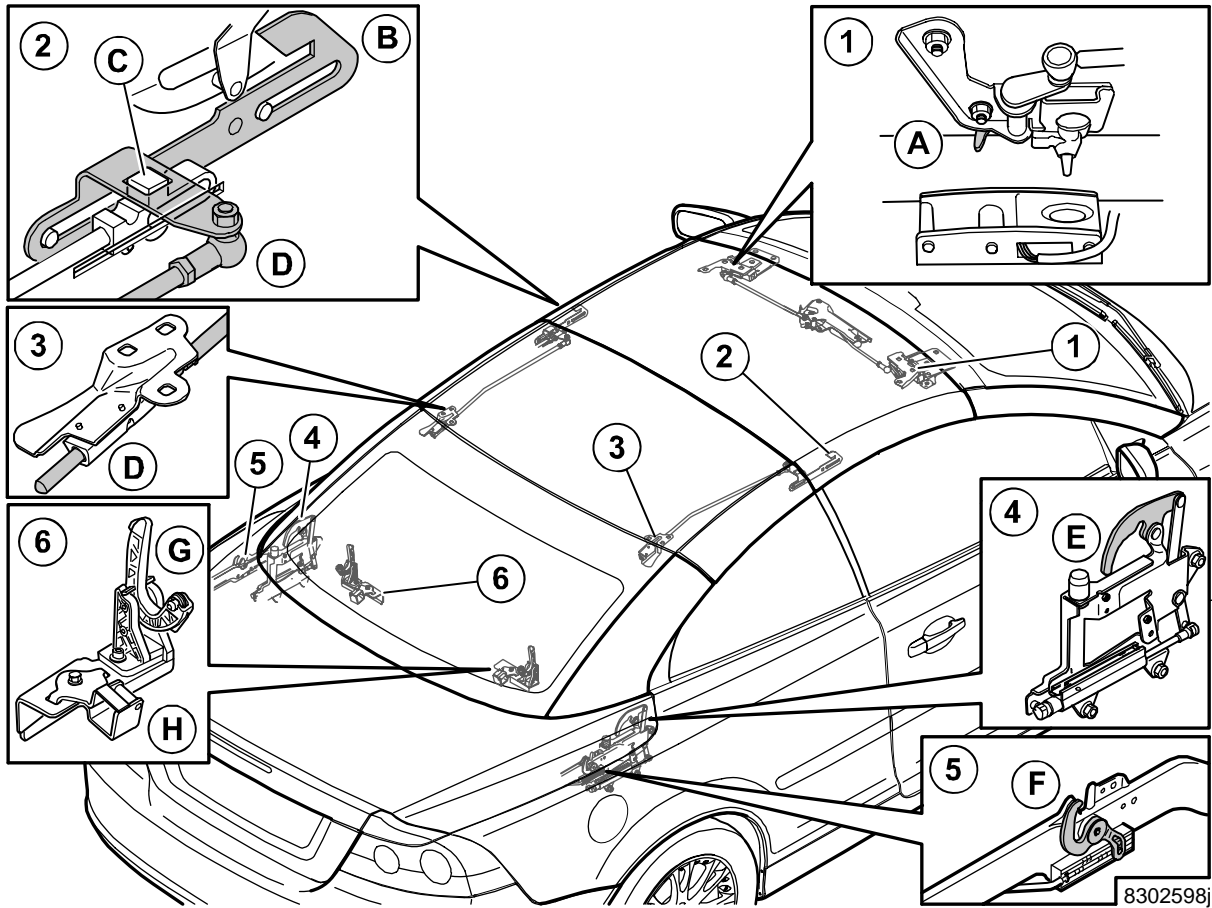
The master cylinders close/open the centre roof section directly by means of the main link arms, and the rear roof section indirectly by means of these link arms.

The movement and geometry of the link system for opening and closing means that the master cylinder pistons have an elliptical movement.

The master cylinders have joint suspension in order to avoid failure and stresses.

Cylinders, boot lid

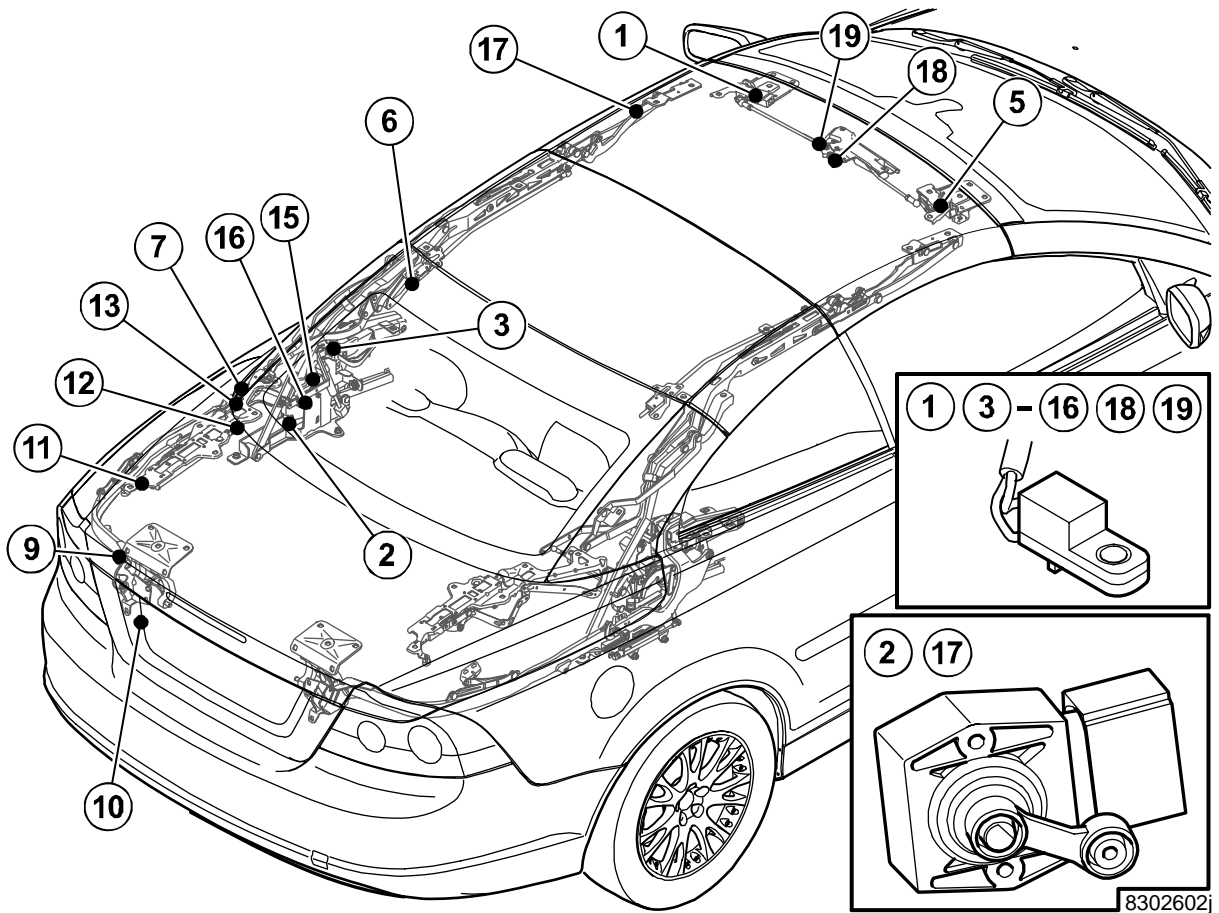
The boot lid cylinders are exposed to relatively large forces and for this reason are robustly dimensioned. The cylinders are moveably mounted by means of bolts at both piston and cylinder.



Locking the roof and boot lid

1. Two latch bolts, **A**, lock the front roof section to the windscreen frame. Takes place by means of the lock cylinder for the front roof section.
 2. Two latch bolts, **B**, lock the roof's front section rear edge to its centre section front edge. Takes place by means of the two roof cylinders **C**.
 3. Two connecting rods, **D**, lock the roof's centre section rear edge to its rear section front edge. Takes place by means of the roof cylinders **C**.
 4. Two latch bolts, **E**, lock the roof's rear section rear edge to the body. Takes place by means of the two lock cylinders for the rear roof section.
 5. Two latch bolts, **F**, lock the boot lid's upper section front edge to the boot lid hinges (links). Takes place by means of the electric latch bolt motor via cables.
 6. When the roof is located in the cargo compartment the rear section of the roof is secured by means of the moving clamp **G**.
- When the roof has reached the correct "rest position" the roof's front section lock cylinder locks the front latch bolts, **A**, around the latch pins **H**.

Notes



Hall sensors/Position sensors

Position	Hall sensor/ position sensor	Location	Comments
1	Hall sensor S1	Windscreen frame, left.	Registers whether the roof is locked to the windscreen frame.
2	Position sensor S2	By the left-hand main link arm in the cargo compartment.	Provides information for the Convertible Roof Module (CRM) on the roof's movement sequences (centre and rear roof section).
3	Hall sensor S3	By the link system/frame for the boot lid.	Registers whether the boot lid is fully open before the loading assistance function is permitted.
5	Hall sensor S5	Windscreen frame, right.	Registers whether the roof is locked to the windscreen frame.
6	Hall sensor S6	Rear roof section, left front.	Registers whether the centre roof section is locked to the rear roof section.
7	Hall sensor S7	By the lock mechanism for the upper section of the boot lid.	Registers whether the upper section of the boot lid is locked to the boot lid frame.

9	Hall sensor S9	By the left-hand rear hinge for the upper section of the boot lid.	Registers whether the upper section of the boot lid has been opened before roof opening/closing is permitted.
10	Hall sensor S10	By the cargo divider's left-hand rear attachment point to the cargo compartment floor.	Registers whether the cargo divider is secured in its lower end position.
11	Hall sensor S11	By the link system for the cover panel.	Registers whether the cover panel is in its fully retracted position.
12	Hall sensor S12	By the link system for the cover panel.	Registers whether the cover panel is in its fully extended position.
13	Hall sensor S13	By the stop plate for the upper section of the boot lid.	Registers whether the upper section of the boot lid is closed before it is locked.
15	Hall sensor S15	By the lock mechanism for the rear roof section to the body, left-hand side.	Registers whether the rear roof section is locked to the body.
16	Hall sensor S16	By the lock mechanism for the rear roof section to the body, left-hand side.	Registers whether the rear roof section is unlocked from the body.
17	Position sensor S17	By the link system for the front roof section.	Provides information for the Convertible Roof Module (CRM) on the roof's movement sequences (front roof section).
18	Hall sensor S18	By the link system for the front roof section's lock cylinder.	Registers whether the lock cylinder is in its open position, i.e. roof unlocked from the windscreen frame.
19	Hall sensor S19	By the link system for the front roof section's lock cylinder.	Detects whether the lock cylinder is in its closed position, i.e. roof locked to the windscreen frame.

Hall sensors

The hall sensors have their own electronics and send a continuous current/voltage signal to the Convertible Roof Module (CRM).

The signals are used by the Convertible Roof Module (CRM) to be able to determine the particular phase the roof is in.

The signal from the sensors is either active or passive. Activation takes place when a metal object such as a latch bolt passes the sensor body itself. This applies to all hall sensors apart from S13 which is activated by a magnet. The magnet is located on the left-hand front edge of the boot lid upper section.

The sensors have an output signal to the Convertible Roof Module (CRM) which is approx. 3.6 volts when passive and approx. 0.8 volts when active.

The sensors are connected in groups with one power supply cable per group in accordance with the following:

- S1 and S5
- S10
- S3, S7, S9, S11, S12 and S13
- S6 and S18
- S15, S16 and S19

Each sensor has a supply voltage of 12 volts, i.e. the car's system voltage.

Position sensor

The position sensors function in accordance with the hall principle. They also have their own electronics and send a current/voltage signal to the Convertible Roof Module (CRM). The signals are used by the Convertible Roof Module (CRM) to be able to determine the angle of the roof's link arms during operation.

The position sensors have reversed signal characteristics during roof movement.

Position sensor S2 (main link arms) has a high voltage, approx. 4.5 volts, when the roof is fully closed. The voltage decreases gradually to approx. 0.5 volts when the roof is fully open.

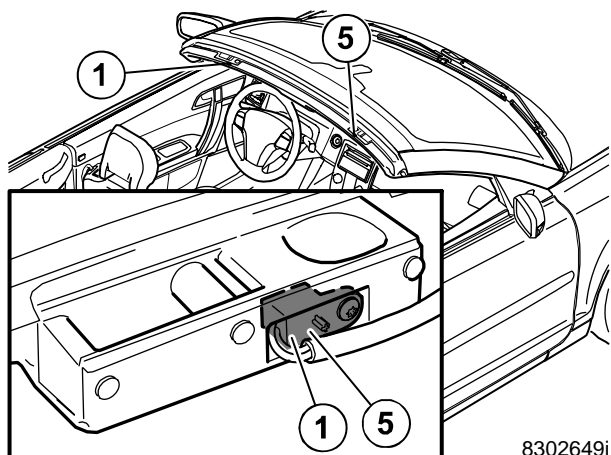
Position sensor S17 (front roof section) has a low voltage, approx. 0.5 volts, when the roof is fully closed. Following which, the voltage increases gradually to approx. 4.5 volts when the roof is fully open.

The position sensors have a supply voltage equivalent to approx. 5 volts.

The position sensors must be calibrated through VIDA after replacement.

Hall sensors, location

By means of the signals from the hall sensors the Convertible Roof Module (CRM) can determine the phase that the roof is in by registering which sensor has been activated.

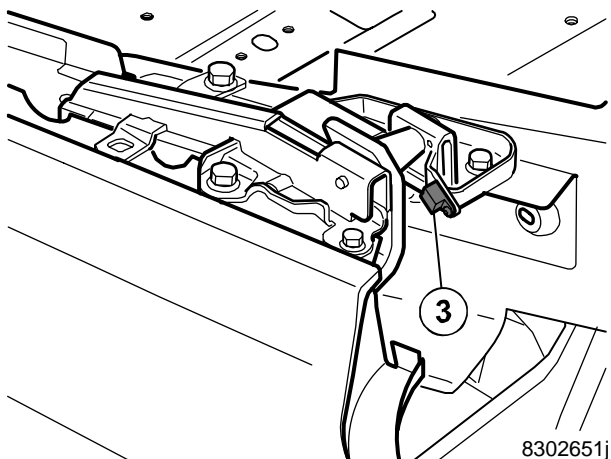


Hall sensors S1 and S5

Two sensors (S1=left, S5=right) are located in the windscreen's stop plates (active locks). This is in order to read the status on the left and right-hand latch bolts respectively, i.e. whether or not the roof is locked to the windscreen.

Signal with locked roof is approx. 0.8 volts, i.e. the sensor is active.

Signal with unlocked roof is approx. 3.6 volts, i.e. the sensor is passive.

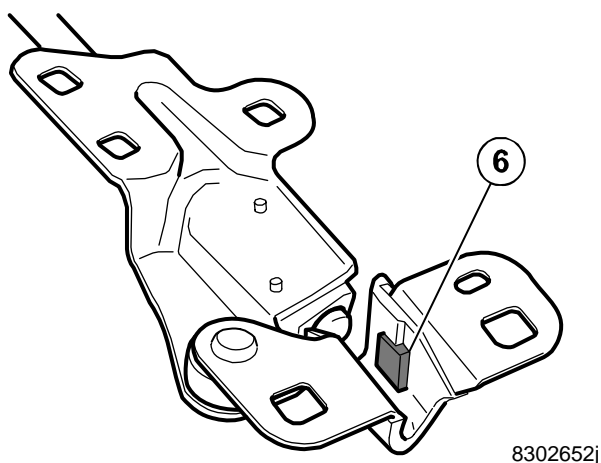


Hall sensor S3

One sensor is located on the boot lid's hinge. The sensor registers whether the boot lid is fully open. The signal is used to determine whether the loading assistance function should be permitted.

Signal with open boot lid is approx. 0.8 volts, i.e. the sensor is active.

Signal with closed boot lid is approx. 3.6 volts, i.e. the sensor is passive.

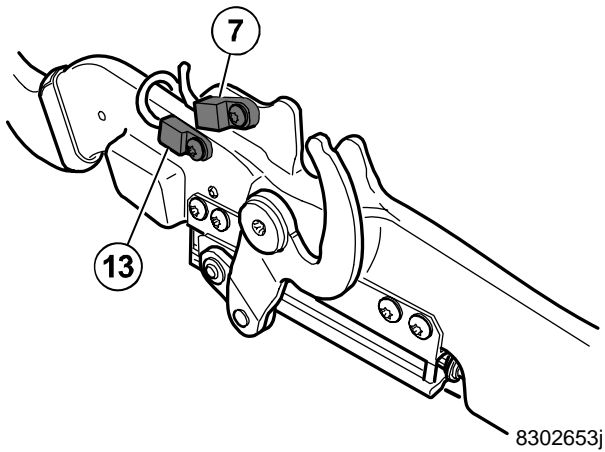


Hall sensor S6

A sensor is located by the rear roof section's front left-hand catch. The sensor registers whether the connecting rod has locked the centre roof section with the rear roof section.

Signal with locked roof is approx. 0.8 volts, i.e. the sensor is active.

Signal with unlocked roof is approx. 3.6 volts, i.e. the sensor is passive.



8302653j

Hall sensors S7 and S13

Sensor S7 registers that the upper section of the boot lid is locked.

Locked signal is approx. 0.8 volts, i.e. the sensor is active.

Unlocked signal is approx. 3.6 volts, i.e. the sensor is passive.

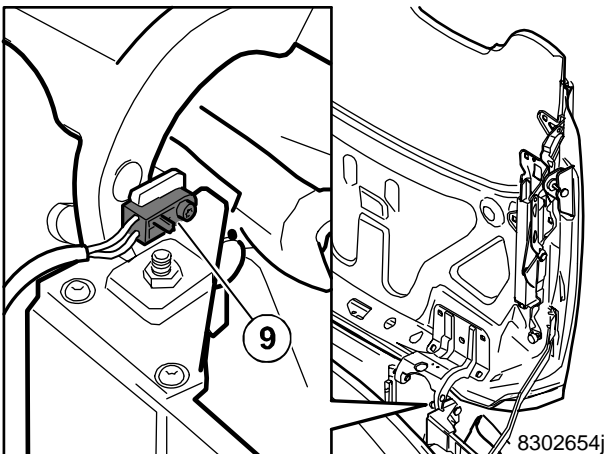
The signal is activated by the lock's left-hand latch bolt.

Sensor S13 registers whether the upper section of the boot lid is closed (at the front edge). (The boot lid must be closed before locking its upper section is permitted.)

Closed signal is approx. 0.8 volts, i.e. the sensor is active.

Open signal is approx. 3.6 volts, i.e. the sensor is passive.

The sensor is activated by a magnet. The magnet is located on the left-hand front edge of the boot lid upper section.



8302654j

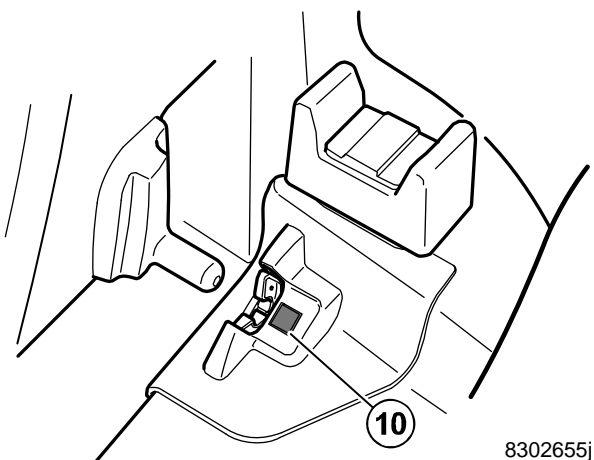
Hall sensor S9

Sensor S9 registers that the boot lid upper section is fully raised (at the front edge) before roof movement is permitted.

Closed signal is approx. 0.8 volts, i.e. the sensor is active.

Fully open signal is approx. 3.6 volts, i.e. the sensor is passive.

The sensor is activated by the boot lid's hinges.



8302655j

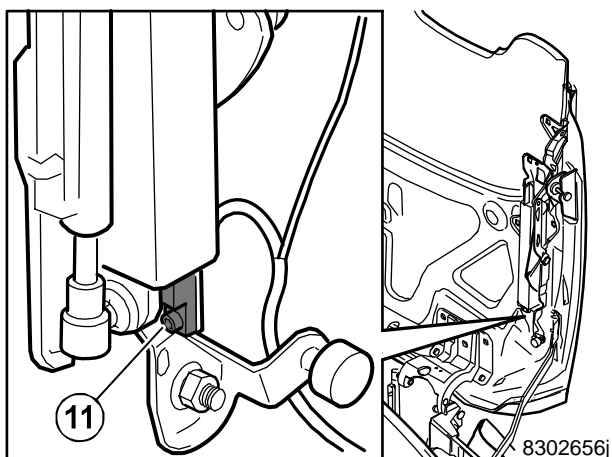
Hall sensor S10

Sensor S10 registers that the cargo compartment's cargo divider is correctly secured in its lower position.

Signal in lower position is approx. 0.8 volts, i.e. the sensor is active.

In other positions the signal is approx. 3.6 volts, i.e. the sensor is passive.

The sensor is activated by the cargo divider's left-hand fixing tape.



Hall sensors S11 and S12

Two sensors are located by the cover panel link system, left-hand side.

Sensor S11 registers the end position when the cover panel is fully retracted.

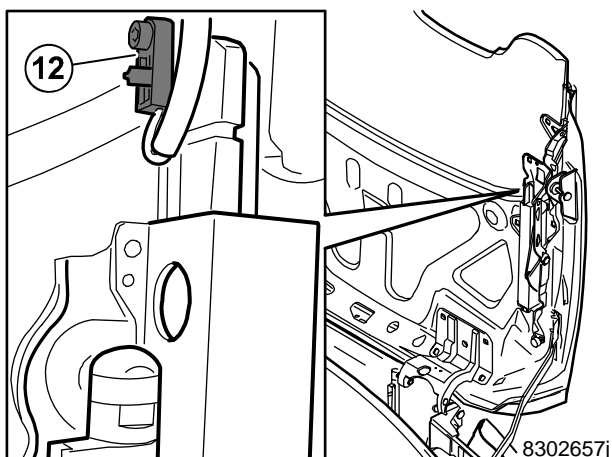
Retracted signal is approx. 0.8 volts, i.e. the sensor is active.

Extended signal is approx. 3.6 volts, i.e. the sensor is passive

Sensor S12 registers the end position when the cover panel is fully extended.

Extended signal is approx. 0.8 volts, i.e. the sensor is active.

Retracted signal is approx. 3.6 volts, i.e. the sensor is passive.



Hall sensors S15 and S16

Two sensors are located by the rear roof section's catches to the body.

S15 registers whether the roof is locked to the body.

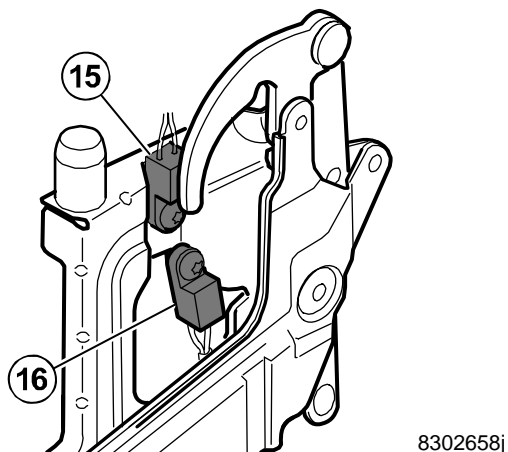
Locked roof signal is approx. 0.8 volts, i.e. the sensor is active.

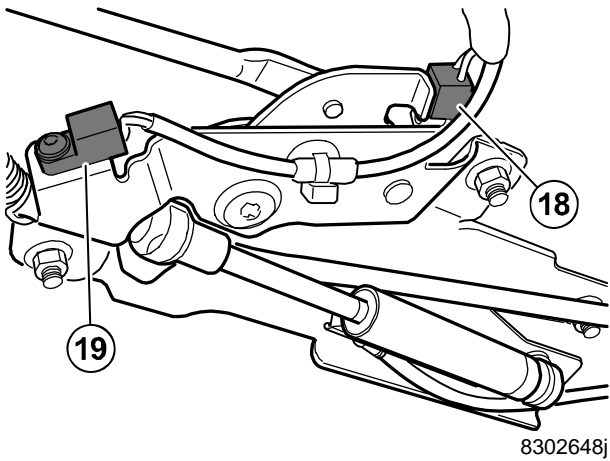
Unlocked roof signal is approx. 3.6 volts, i.e. the sensor is passive.

S16 registers whether the roof is unlocked from the body.

Unlocked roof signal is approx. 0.8 volts, i.e. the sensor is active.

Locked roof signal is approx. 3.6 volts, i.e. the sensor is passive.





Hall sensors S18 and S19

Two sensors are located by the links for the front roof section lock cylinders.

A lug on the links either acts on S18 or S19 depending on whether the roof is unlocked or locked.

S18 registers when the lock cylinder is in a position equivalent to the roof being unlocked from the windscreen frame.

Unlocked signal is approx. 0.8 volts, i.e. the sensor is active.

Locked signal is approx. 3.6 volts, i.e. the sensor is passive.

Sensor S19 registers when the lock cylinder is in a position equivalent to the roof being locked to the windscreen frame.

Locked signal is approx. 0.8 volts, i.e. the sensor is active.

Unlocked signal is approx. 3.6 volts, i.e. the sensor is passive.

Position sensors

The function of the position sensors is to continuously inform the Convertible Roof Module (CRM) regarding roof movement.

The sensors register the change in movement/angle of the roof during opening/closing.

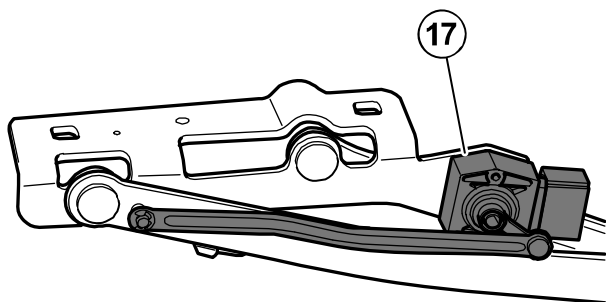
The sensors are the hall sensor type with internal electronics.

The sensors send a current/voltage signal to the Convertible Roof Module (CRM).

The Convertible Roof Module (CRM) uses the signals from the sensors to determine when the next phase for moving should take place.

A position sensor, S17, is located on the left-hand side link arms for the front roof section.

A position sensor, S2, is located on the main link arm left-hand side, furthest down toward the cargo compartment floor.



8302659j

Position S17, front roof section links

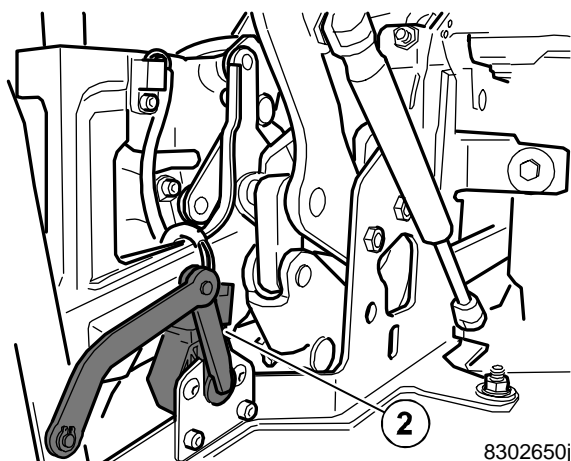
The sensor continuously registers the movement of the front roof section.

Closed roof signal is approx. 0.5 volts.

Open roof signal is approx. 4.5 volts.

The measurement range is equivalent to approx. 120°.

NOTE: The sensor must be calibrated with VIDA in the event of sensor replacement for example.



8302650j

Position sensor S2, main link arms

The sensor continuously registers the movement of the left-hand main link arm.

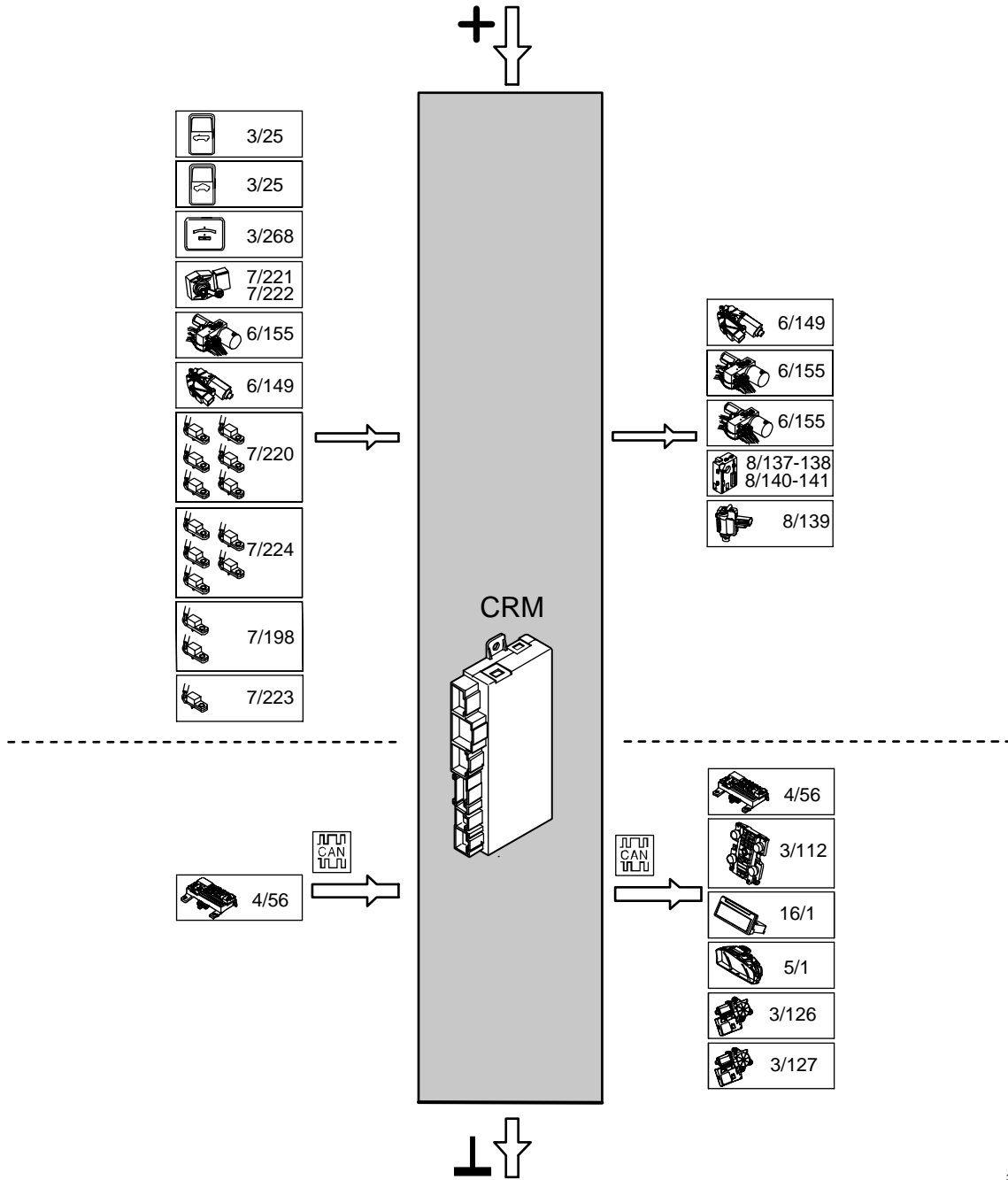
Closed roof signal is approx. 4.5 volts.

Open roof signal is approx. 0.5 volts.

The measurement range is equivalent to approx. 110°.

NOTE: The sensor must be calibrated with VIDA in the event of sensor replacement for example.

Input and output signals



Input signals, directly connected

- Switch for opening roof, (3/25)
- Switch for closing roof, (3/25)
- Switch for loading assistance, (3/268)
- Position sensor, centre/rear roof sections (7/221)
- Position sensor, front roof section (7/222)
- Temperature sensor for hydraulic pump electric motor, (6/155)
- Electric latch bolt motor, (6/149)
- 14 hall sensors, (7/198, 7/220, 7/223 and 7/224)

Output signals, directly connected

- Electric latch bolt motor, (6/149)
- 4 x hydraulic valves, (6/155)
- Hydraulic pump electric motor, (6/155)
- Electric motors for locking storage compartments
 - Driver's door (8/137)
 - Passenger door (8/138)
 - Side panel, passenger side rear (8/140)
 - Side panel, driver's side rear (8/141)
- Electric motor for locking rear seat centre cushion, (8/139)

Input signals via CAN

- CEM, (4/56)

Output signals via CAN

- CEM, (4/56)
- CCM, (3/112)
- ICM, (16/1)
- DIM, (5/1)
- DDM, (3/126)
- PDM, (3/127)

Functions, miscellaneous

Lowering of side windows, so-called "Short drop"

In order to prevent interference between roof sections and windows all side windows are lowered approx. 80 mm from their top position (fully closed) during roof operation. This function is called "Short drop".

This function is also used during the opening and closing of the doors. The difference then is that the windows are lowered and raised respectively approx. 4 mm. This is so that the windows will be inside the rubber strip when the door is closed.

Passenger Door Module (PDM), Driver Door Module (DDM), Left Rear Door Module (LDM) and Right Rear Door Module (RDM) receive a message from Convertible Roof Module (CRM) via CAN and LIN in order to initiate the function during roof operation.

Window operation options are deactivated during the period for which roof operation is underway.

When roof opening/closing is completed the side windows are raised to their top position (irrespective of previous position).

Low voltage

The Central Electronic Module (CEM) signals low battery voltage on the CAN network to the Convertible Roof Module (CRM). The Convertible Roof Module (CRM) prevents roof operation.

The Convertible Roof Module (CRM) also measures battery voltage internally to prevent roof operation when the voltage is low.

The limit for low voltage is approx. 9 volts.

Tip: The roof can be closed and loading assistance lowered once in the event of low battery voltage.

Roof operation in the event of a roof fault

Roof operation in the event of a roof fault is a function that enables roof operation despite certain sensors signalling errors. If the signal pattern from the sensors does not correspond with that of the programmed position then the movement of the roof is stopped. This is to prevent the roof sections from colliding.

However, it is possible to operate the roof (depending on diagnostic trouble code (DTC) generated) by holding one of the opening/closing buttons depressed for longer than 5 seconds.

This is called "Electrical Override" and requires that great attention is paid to the roof and its movement so that the roof sections do not collide and sustain damage.

In "Electrical Override" mode the roof can be operated in accordance with the following conditions:

- When only position sensor S2 is working \Rightarrow the roof can be closed.
- When only position sensors S2 and S17 are working \Rightarrow the roof can be opened and closed.
- When the roof is closed (i.e. an operating cycle is concluded) no further roof operation is permitted at all.

NOTE. If a fault is repaired when the Convertible Roof Module (CRM) is in "Electrical Override" mode then roof operation again functions normally following a "Resetting the Convertible Roof Module (CRM)".

Resetting the Convertible Roof Module (CRM)

The Convertible Roof Module (CRM) returns to "normal status" by means of removing the power supply to the Convertible Roof Module (CRM) (simplest method is to remove the battery negative cable) following the generation of a diagnostic trouble code (DTC) that limits roof functionality for example. The Convertible Roof Module (CRM) then assumes that the system is fault-free.

Following "Resetting the Central Electronic Module (CEM)" the Convertible Roof Module (CRM) activates the electric latch bolt motor in the "opening-closing-opening" sequence. This is to initialise the system and to establish the starting position for roof operation.

Temperature compensation, temperature sensor, hydraulic unit electric motor

An NTC type temperature sensor is located in the hydraulic unit electric motor. The temperature of the electric motor is registered by the Convertible Roof Module (CRM).

The Convertible Roof Module (CRM) limits are based on the electric motor temperature and pump functionality in accordance with the table.

Temperature range	Functionality
Lower than 90°C	Full hydraulic pump functionality.
90°C-120°C	Only one roof closure or only one roof lowering from the upper position to the lower for the loading assistance function.
Higher than 120°C	No functionality permitted at all.
Lower than -9°C	Only one roof closure is permitted.
Lower than -11°C	No functionality permitted at all.

In the event of limited functionality a text message regarding status is shown in the Driver Information Module (DIM).

Temperature compensation, outside temperature

The Convertible Roof Module (CRM) limits are based on the "normal" outside temperature sensor signal (from Central Electronic Module (CEM) via the CAN network), functionality in accordance with the table.

Temperature range	Functionality
Lower than -9°C	Only one roof closure is permitted.
Lower than -11°C	No functionality permitted at all.

In the event of limited functionality a text message regarding status is shown in the Driver Information Module (DIM).

Loading assistance

Before the roof is raised the front roof cylinder unlocks the front roof section from the body.

At the same time all latch bolts for the rear roof section are unlocked which takes place "blind" (the roof is of course in the cargo compartment).

As the hydraulic control is the same as when the roof is closed the boot lid hydraulic cylinders are also activated. However, the lock for the boot lid upper section is not unlocked (the latch bolt motor has not been activated). This means that the hydraulic cylinder pistons are working and attempt to open the boot lid.

The result is that the lower section of the boot lid moves slightly in relation to its upper section. This is a design characteristic and consequently not a fault.

Boot lid lock function

When the Convertible Roof Module (CRM) has initiated roof opening/closing, no "conventional" boot lid opening is permitted (the signal from the boot lid handle requesting unlocking is ignored by the Central Electronic Module (CEM)).

If any roof sequence is not implemented/completed correctly (e.g. a sensor signal is absent/incorrect) then a status message is shown in the Driver Information Module (DIM). Under such circumstances the boot lid remains locked and can only be opened by means of the lock located in the tunnel console.

Miscellaneous

If the roof is unlocked and the speed is > 2 km/h then the Infotainment Control Module (ICM) initiates a warning sound in the speakers via the Audio Control Module (AUD). A text message is shown in the Driver Information Module (DIM) at the same time.

Manual roof operation

Closing the roof

If the roof cannot be operated normally then it can be closed manually.

A description of the method is available in VIDA.

VIDA recommends that at least two people work together for manual roof operation.

A summary:

1. Lower the side windows to their lower end position.
2. Open the boot lid "as normal". Unlock the lock for the boot lid upper section by rotating the latch bolt motor. If required, remove the cover so that the recess for the hexagon socket is accessible.
3. Release the hydraulic pressure by pulling the cable to release the relief valve. Make sure that the relief valve adopts its upper position.
4. Close the boot lid. Now open the upper section of the boot lid (at the front edge).
5. In the passenger compartment, push in the long load cover so that it is possible to access the front roof section in the cargo compartment.
6. Remove the cover for the links of the front roof section's hydraulic cylinder. Make sure that the recess for the hexagon socket is accessible. Unlock the lock for the front roof section by turning the roof cylinder's links to their open position (clockwise). The roof is then released from the body.
7. Unlock the latch bolts for the roof's rear catch to the body by moving the pistons for the lock cylinders to their front position. If this is not done then the roof will not adopt closed position correctly.
8. Lift the roof assembly to the position where the rear roof section is highest.
9. Lift the front roof section forward to its closed position while the centre roof section and rear roof section adopt their closed positions.
10. Move the cover panel to its retracted position and close the upper section of the boot lid.

NOTE. This is an outline description. Take great care that the roof sections do not collide.

Opening the roof

In principle roof opening takes place in reverse order to closing.

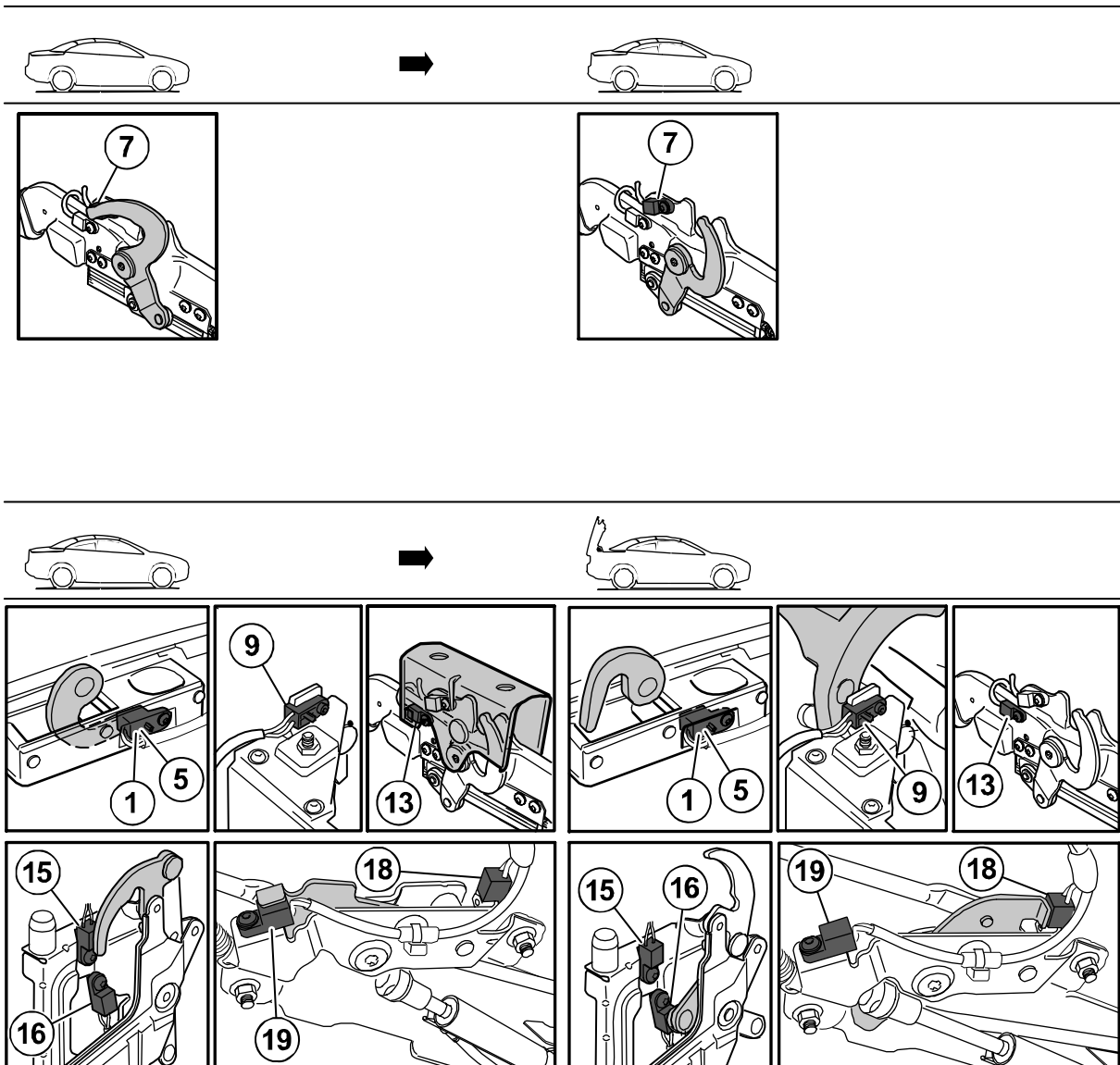
However, the critical point is unlocking the catches:

- between the roof's front section rear edge and its centre section front edge.
- between the roof's centre section rear edge and its rear section front edge.

This takes place by means of pulling the roof cylinders towards their extended position.

This requires that the headlining is uncovered to provide access to the roof cylinders.

Sequences, opening and closing the roof, opening



Explanation

X = sensor active	L = Sensor in "loading assistance" position
C = sensor in closed position	— = sensor position not evaluated
O = sensor in open position	Shaded = sensor position has changed during the operation
I = sensor in intermediate position	

1. Unlocking boot lid front edge

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C	X		X	X	X		X	X		X	X			X

The latch bolt motor unlocks the lock for the boot lid upper section.

For roof opening to be permitted requires that hall sensor S10 is active, i.e. cargo divider in lower position.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C	X		X	X			X	X		X	X			X

The latch bolt motor has locked the lock for the boot lid upper section.

2. Opening the boot lid, unlocking the roof's front lock and unlocking the roof's rear lock

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C	X		X	X			X	X		X	X			X

The boot lid cylinders raise the boot lid upper section in the front edge.

The lock cylinder for the front roof section unlocks the roof from the windscreen frame.

The lock cylinders for the rear roof section unlock the roof from the body.

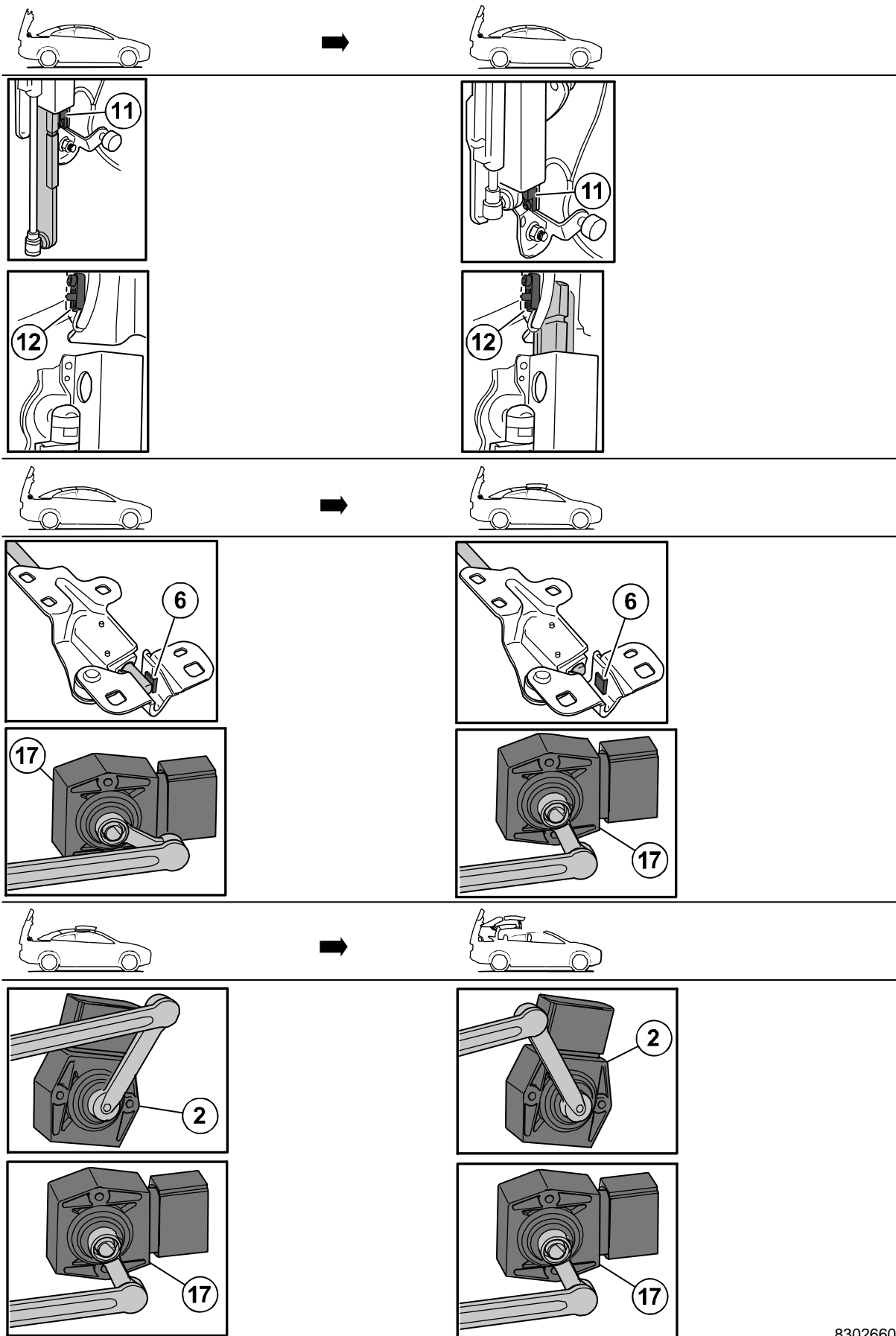
2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	X	X				X	X	

The boot lid upper section has been opened.

The front roof section lock cylinder has unlocked the roof from the windscreen frame.

The rear roof section lock cylinders have unlocked the roof from the body.



8302660j

3. Extending the cover panel

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	X	X				X	X	

The cover panel is in its retracted position.
The hydraulic cylinders extend the cover panel.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	X		X			X	X	

The cover panel is in its extended position.

4. Unlocking the front/centre roof section and the centre/rear roof section and opening the front roof section

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	X		X			X	X	

The roof cylinders unlock the latch bolts for the front/centre roof section and puller rod for the centre/rear section.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	I						X	X		X			X	X	

The roof cylinders have unlocked the front/centre roof section and the centre/rear roof section.
The movement of the roof cylinders continues at which the front roof section is raised/opened.

5. Opening the front, centre and rear roof sections

1

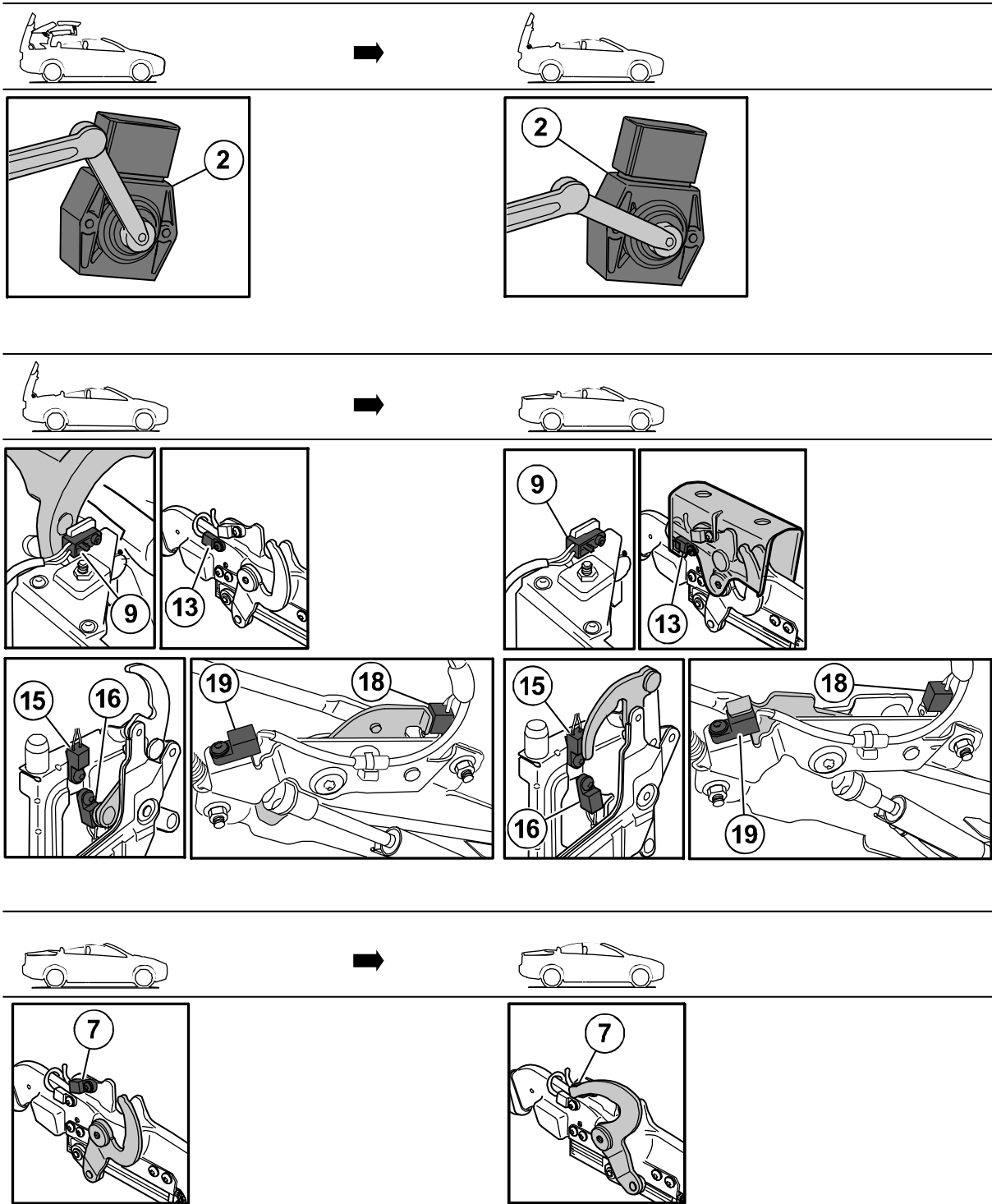
S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	I						X	X		X			X	X	

The movement of the roof cylinders continues at which the movement for the front roof section continues.
The master cylinders are activated at which the centre and rear roof sections are opened.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
I	O						X	X		X			X	X	

The movement of the roof cylinders is concluded i.e. the front roof section is now in its open end position.
The movement of the master cylinders continues at which the centre and rear roof sections continue and are opened.



6. Finishing the opening

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
I	O						X	X		X			X	X	

The movement of the master cylinders continues.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O						X	X		X			X	X	

The master cylinders complete the movement of the roof which reaches its rest position in the cargo compartment.

7. Closing the boot lid upper section and locking in the roof

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O						X	X		X			X	X	

The boot lid cylinders close its upper section.

The lock cylinder locks the front roof section to the body (in the cargo compartment).

NOTE. At the same time, the lock cylinders lock the latch bolts for the rear roof section to the body. Takes place "blind".

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O							X		X	X	X			X

The boot lid upper section is closed and the front roof section is locked to the body.

NOTE. The latch bolts for the rear roof section are now in locked position. Takes place "blind".

8. Locking the boot lid upper section

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O							X		X	X	X			X

The latch bolt motor locks the boot lid upper section at the front edge.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O					X		X		X	X	X			X

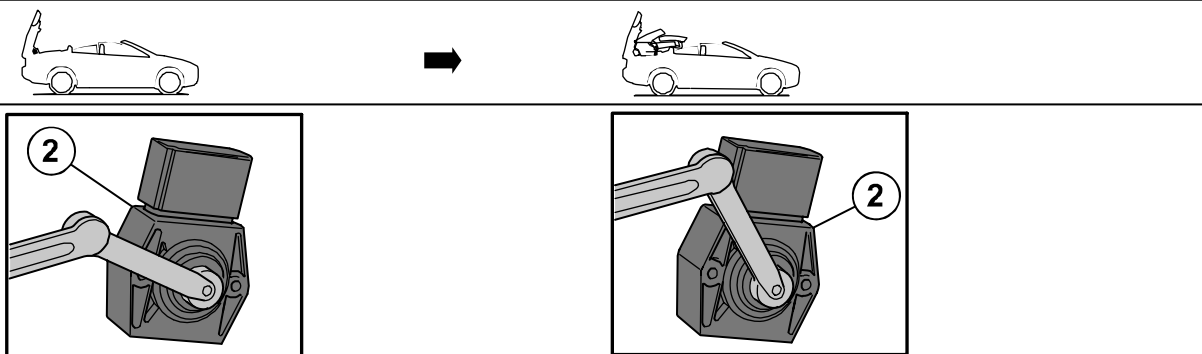
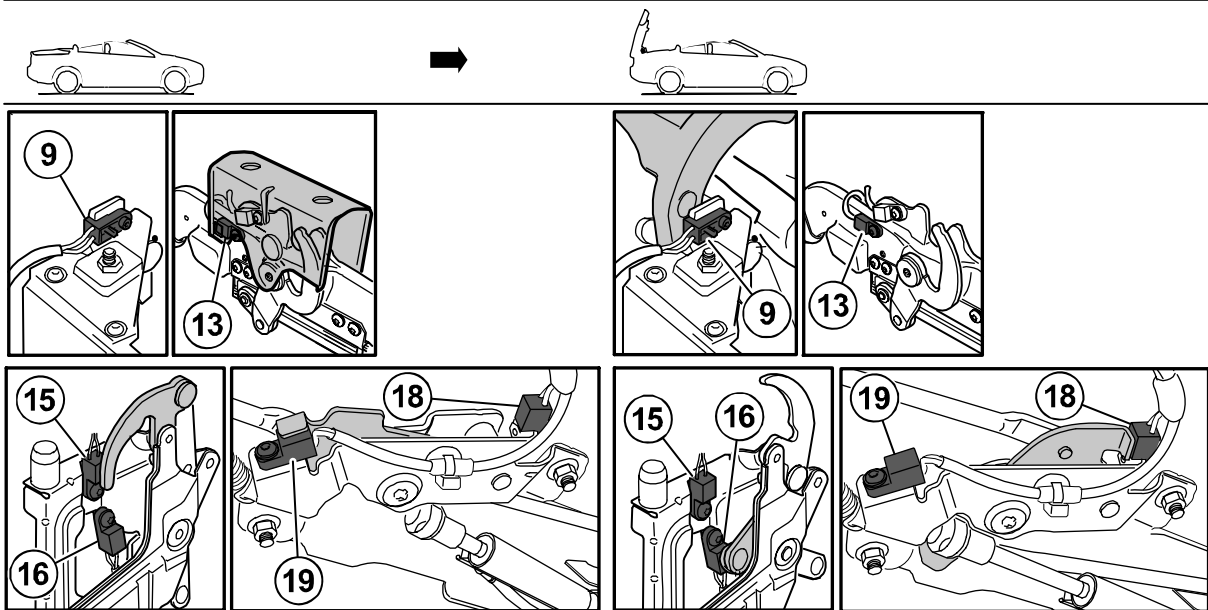
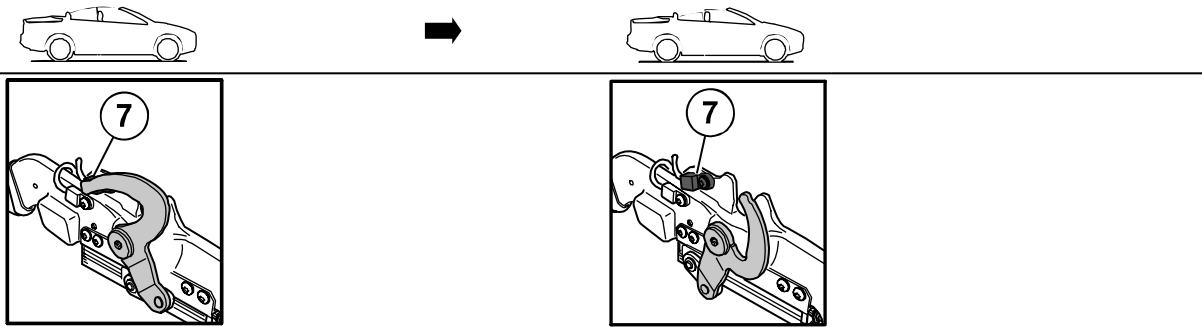
The boot lid upper section is locked at the front edge.

In addition:

The side windows adopt their upper end positions.

The Convertible Roof Module (CRM) requests an audio signal and text message as confirmation that the opening sequence is completed.

Sequences, opening and closing the roof, closing



1. Unlocking boot lid front edge

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O					X		—		X	X	X			X

Note that the signal from hall sensor S10 is not evaluated when closing the roof.
The latch bolt motor unlocks the boot lid upper section at the front edge.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O							—		X	X	X			X

The boot lid upper section is unlocked at the front edge.

2. Opening the boot lid upper section and unlocking the roof

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O							—		X	X	X			X

The front roof section lock cylinder unlocks the roof from the body.

NOTE. The latch bolts for the rear roof section are unlocked by the lock cylinders. Takes place "blind".
The boot lid cylinders open its upper section.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O						X	—		X			X	X	

The locks are unlocked and the boot lid is opened.

3. Closing the roof

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O						X	—		X			X	X	

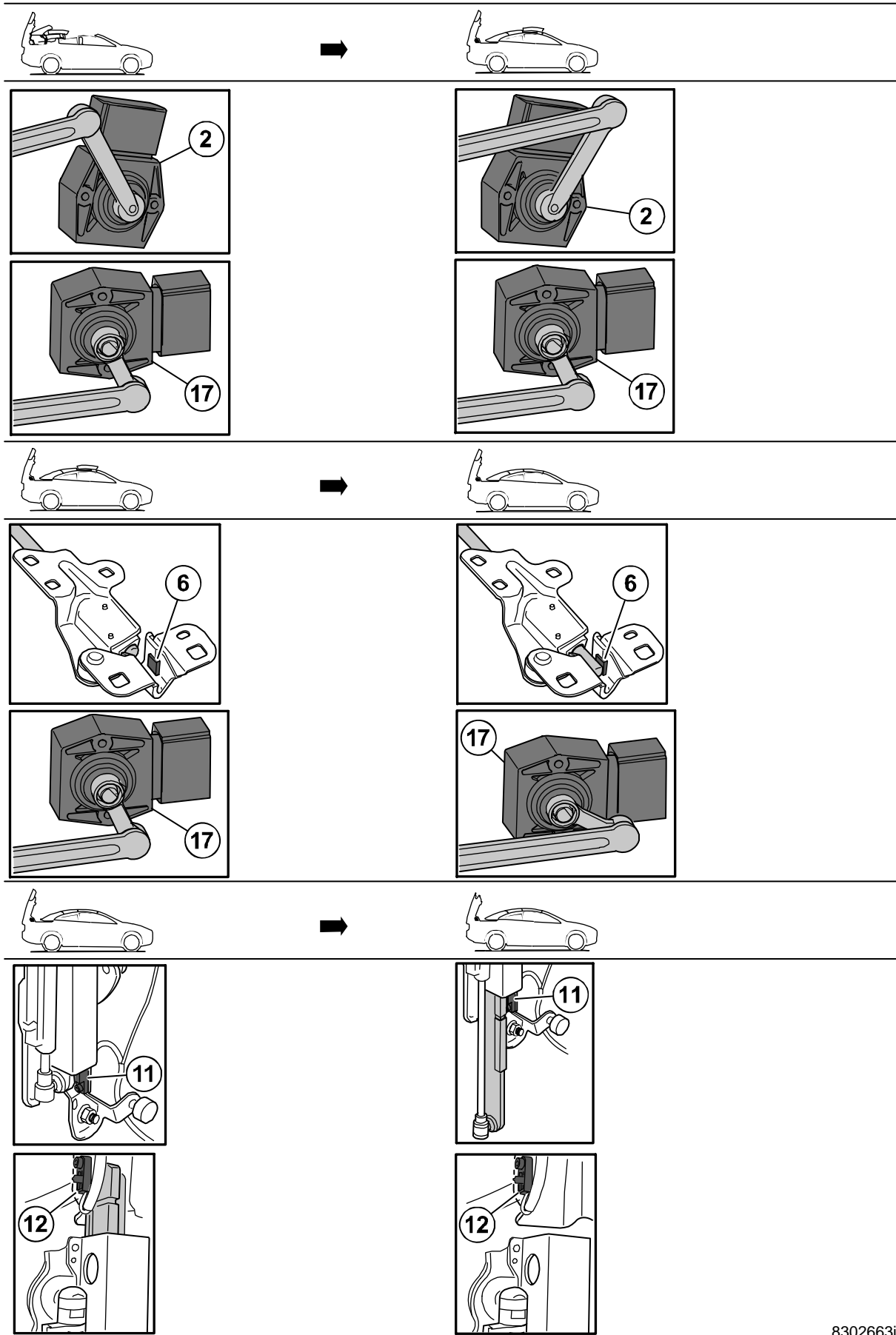
The master cylinders begin to raise the roof.

The Convertible Roof Module (CRM) uses the signal from position sensor S2 to determine the position/movement of the roof.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
I	O						X	—		X			X	X	

Position sensor S2 continuously registers the movement of the roof.



8302663j

4. Closing the roof, continued

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
I	O						X	—		X			X	X	

Position sensor S2 continuously registers the movement of the roof.

The master cylinders continue to close the centre and rear roof sections. The roof cylinders also start to close the front roof section. Position sensor S17 registers the movement.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	I						X	—		X			X	X	

Position sensor S2 registers closed position for the centre and rear roof sections.

The roof cylinders continue to close the front roof section.

5. Continued roof closing and locking of front/centre roof section and centre/rear roof section

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	I						X	—		X			X	X	

The roof cylinders continue to close the front roof section.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	—		X			X	X	

Position sensor S17 registers closed position for the front roof section.

The roof cylinders continue their movement at which the front roof section is locked with the centre roof section, and the centre roof section is locked with the rear roof section.

6. Retracting the cover panel

1

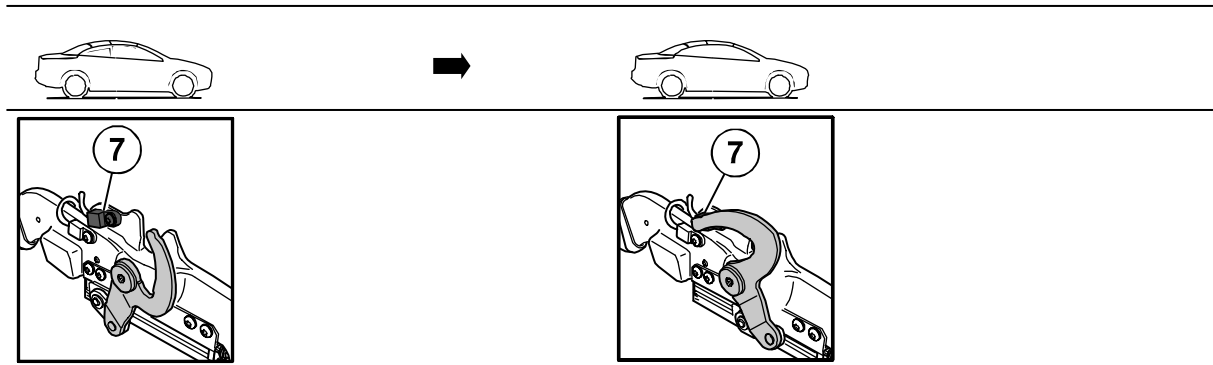
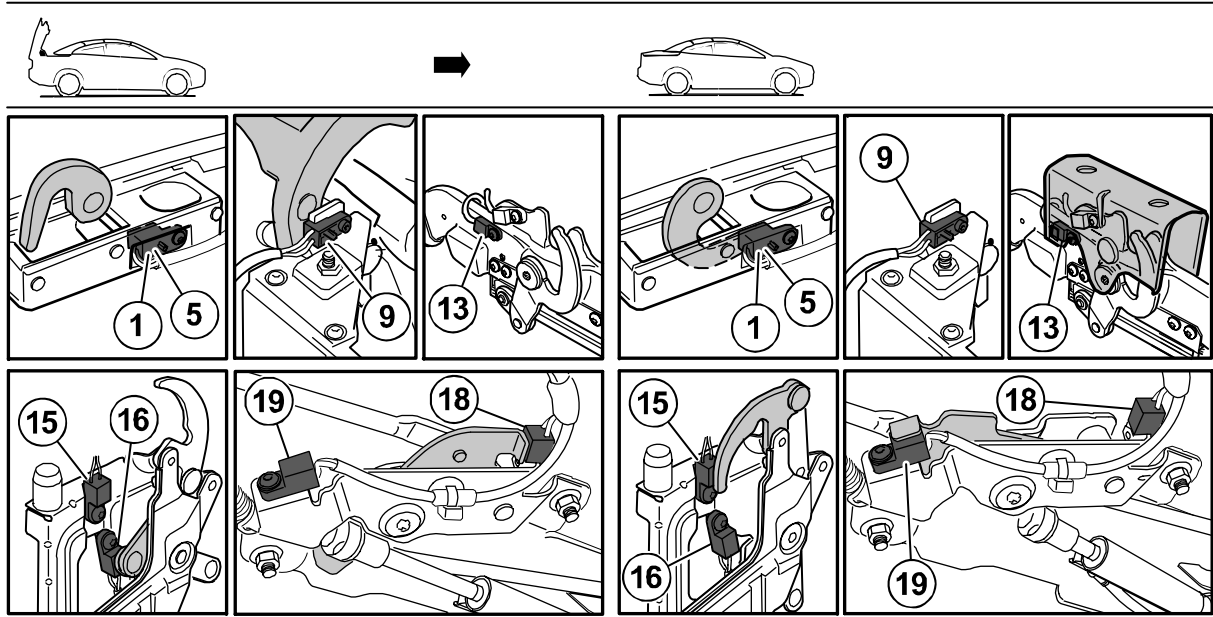
S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	—		X			X	X	

The cover panel cylinders retract the cover panel.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	—	X				X	X	

The cover panel is fully retracted.



7. Closing the boot lid upper section and locking the front and rear roof sections.

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C				X		X	—	X				X	X	

The boot lid upper section is closed.

The front roof section is locked against the windscreen frame.

The rear roof section is locked against the body.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C	X		X	X			—	X		X	X			X

The boot lid upper section is closed and the roof is locked.

8. Locking the boot lid upper section

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C	X		X	X			—	X		X	X			X

The latch bolt motor locks the boot lid upper section at the front edge.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
C	C	X		X	X	X		—	X		X	X			X

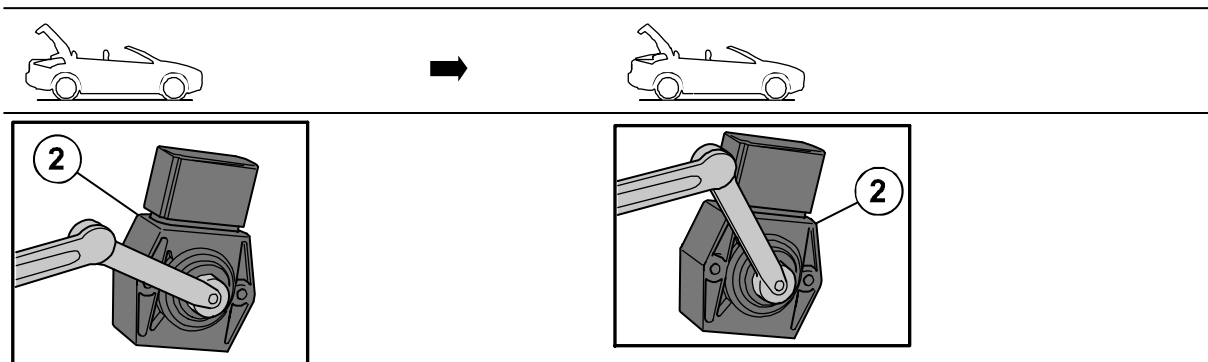
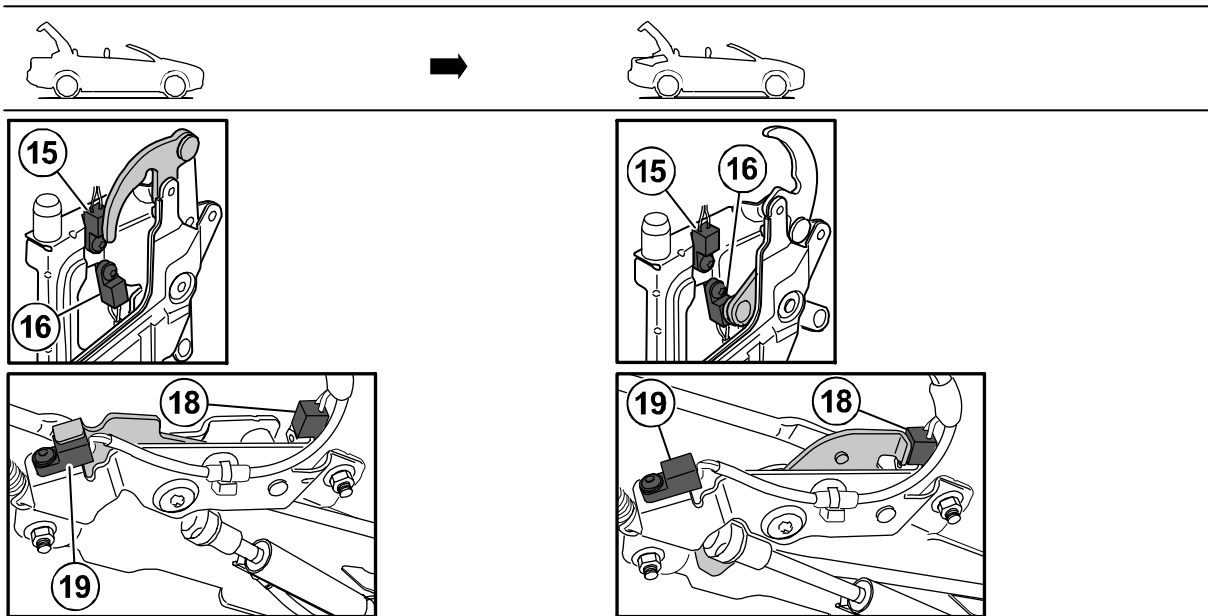
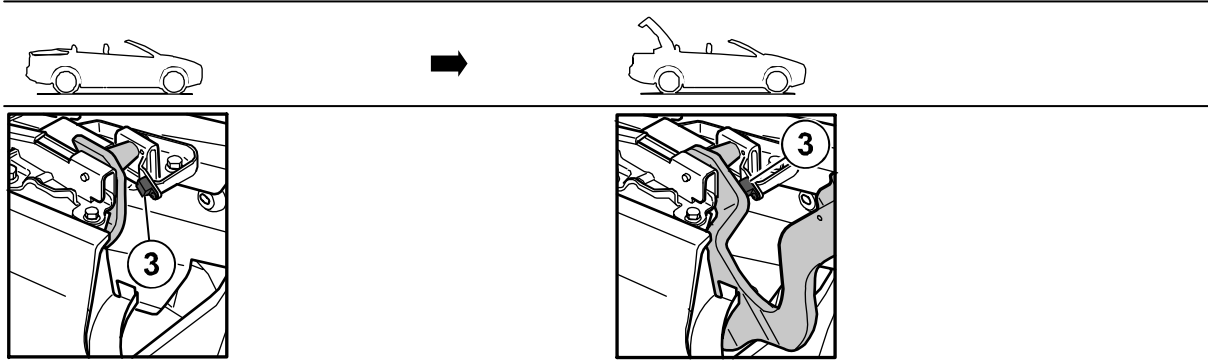
The boot lid upper section is locked.

In addition:

The side windows adopt their upper end positions.

The Convertible Roof Module (CRM) requests an audio signal and text message as confirmation that the closing sequence is completed.

Loading assistance



General

The function is designed for simplifying the loading of luggage when the roof is open, i.e. stored in the cargo compartment.

For the loading assistance function to be permitted requires that hall sensor S10 is active, i.e. cargo divider in lower position.

1. Opening the boot lid ("manually" at the rear edge)

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O					X		X		X	X	X			X

Boot lid closed.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O		X			X		X		X	X	X			X

Boot lid open at the rear edge.

2. Unlocking the roof

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O		X			X		X		X	X	X			X

The front roof section lock cylinder unlocks the roof from the body.

The lock cylinders for the rear roof section unlock the latch bolts. Takes place "blind".

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O		X			X		X		X	X		—	X	

The roof is unlocked from the body.

The signal from hall sensor S16 is not evaluated.

3. Raising the roof

1

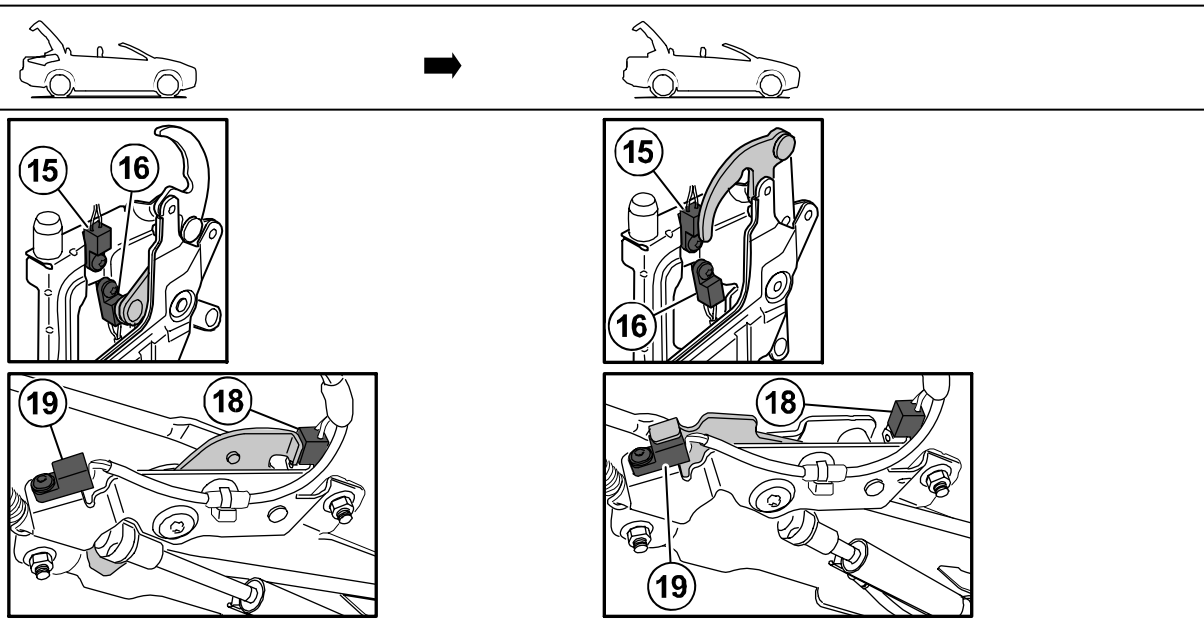
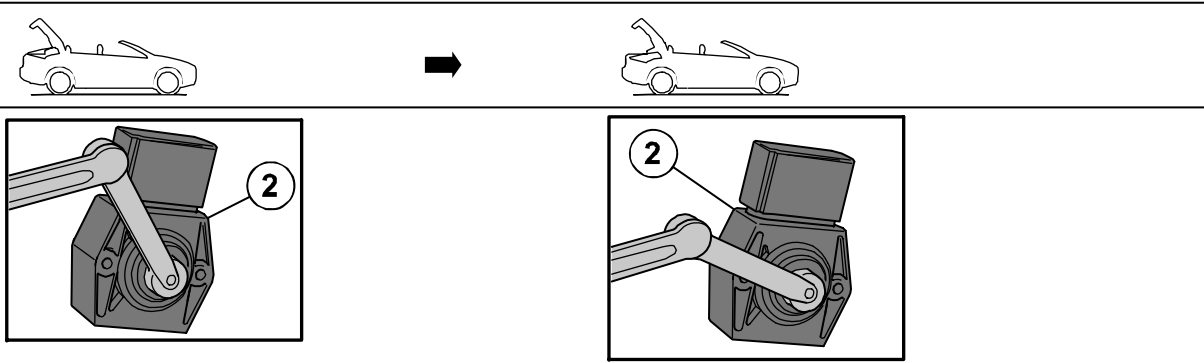
S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O		X			X		X		X	X		—	X	

The master cylinders raise the roof.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
L	O		X			X		X		X	X		—	X	

The end position of the roof is programmed in the Convertible Roof Module (CRM). The Convertible Roof Module (CRM) interrupts the movement based on the signal from position sensor S2.



4. Lowering the roof

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
L	O		X			X		X		X	X		—	X	

The roof is lowered by means of the master cylinders.

2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O		X			X		X		X	X		—	X	

The Convertible Roof Module (CRM) determines the end position based on the signal from position sensor S2.

5. Locking the roof

1

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O		X			X		X		X	X		—	X	

The front roof section lock cylinder locks the front roof section to the body.
The rear roof section lock cylinders lock the latch bolts. Takes place "blind".

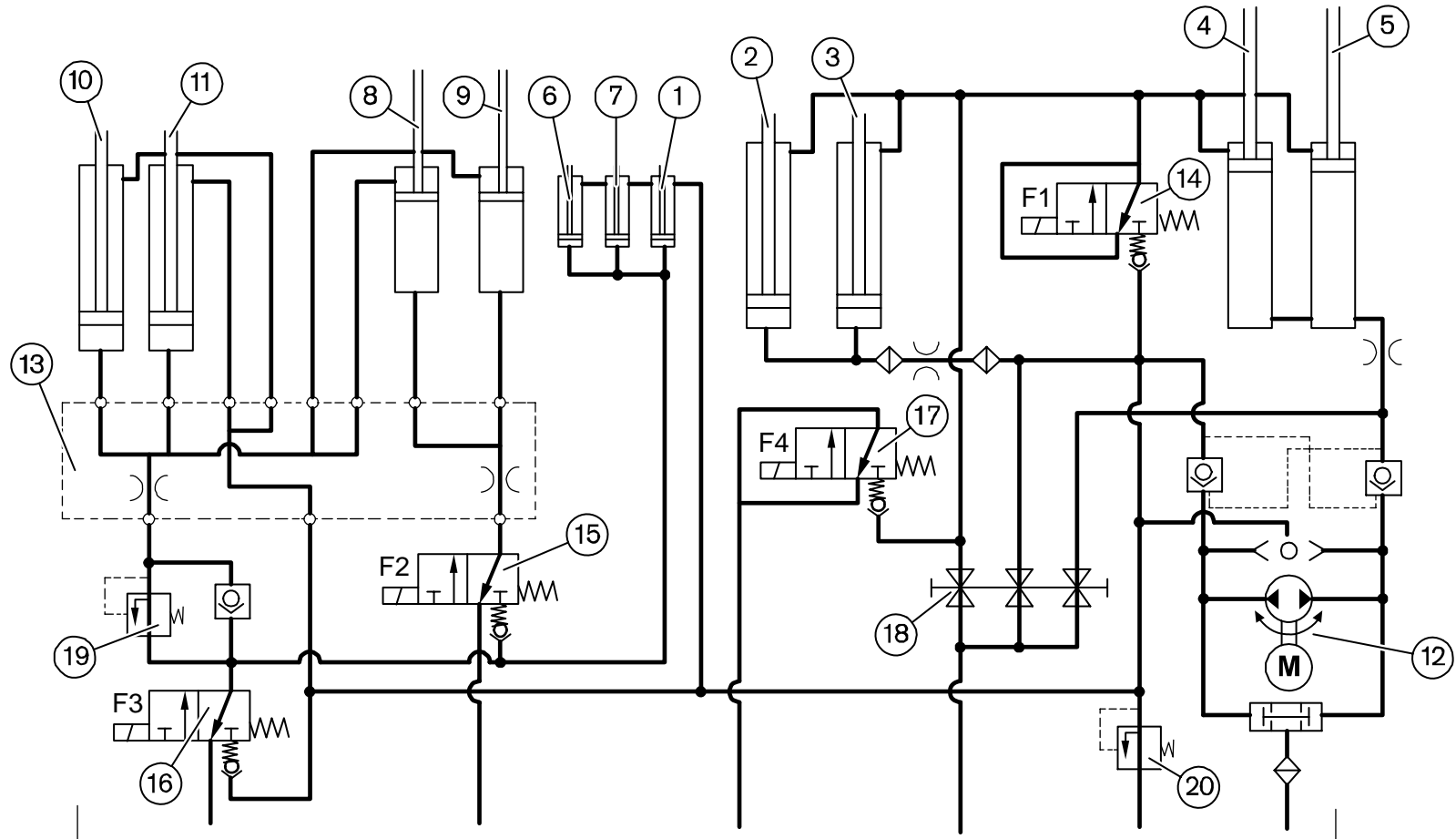
2

S2	S17	S1	S3	S5	S6	S7	S9	S10	S11	S12	S13	S15	S16	S18	S19
O	O		X			X		X		X	X	X			X

The roof is locked to the body.

Hydraulics

Hydraulic diagram



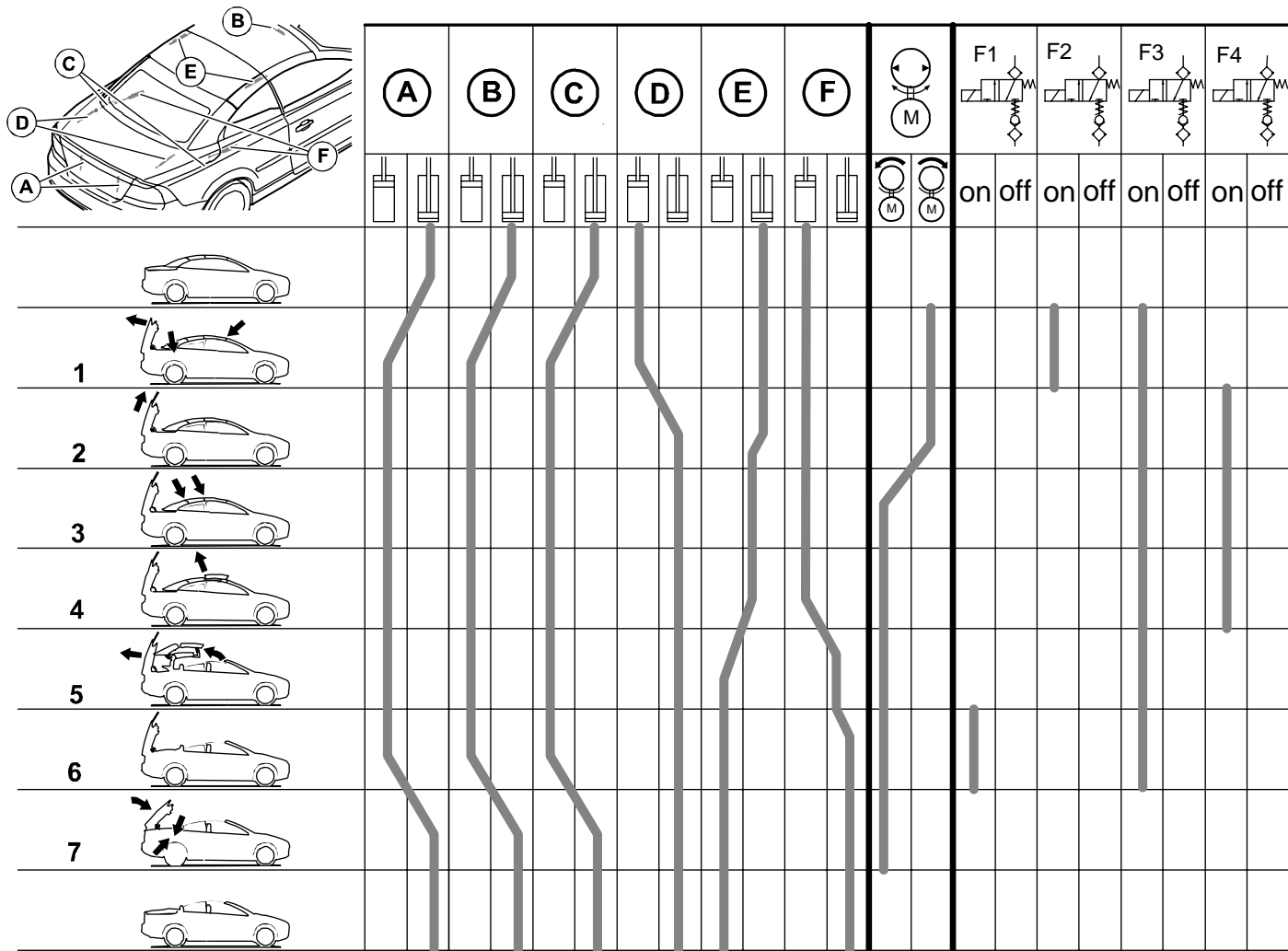
3603873j

1	Lock cylinder, front roof	11	Cylinder, boot lid, right
2	Roof cylinder, left	12	Electric motor driven pump with two flow directions and constant displacement
3	Roof cylinder, right	13	Distribution box
4	Master cylinder, left	14	F1, electrically controlled valve with two positions
5	Master cylinder, right	15	F2, electrically controlled valve with two positions
6	Lock cylinder, rear roof, left	16	F3, electrically controlled valve with two positions
7	Lock cylinder, rear roof, right	17	F4, electrically controlled valve with two positions
8	Cylinder, cover panel, left	18	Relief valve for depressurising the system
9	Cylinder, cover panel, right	19	Pressure limiting valve, opening pressure 35 (+/-7) bar
10	Cylinder, boot lid, left	20	Pressure limiting valve, opening pressure 140 (+/-10) bar

The hydraulic pressure in the system is 140 bar apart from the boot lid cylinders. These operate with a pressure of 35 (+/-7) bar. This is in order to enable the operation of the loading assistance function.

If roof operation is stopped in an intermediate position (with the ignition key remaining in position II) then the Convertible Roof Module (CRM) interrupts the power supply to the electrically controlled valves after approx. 30 seconds. This is to prevent the valve coils from overheating. When the power supply is interrupted the valves adopt their rest positions.

Opening the roof



8302571j

The position of the roof is controlled by the Convertible Roof Module (CRM) based on the request from one of the "Open" or "Close" switches. The sequence continues as long as the switch is depressed.

When the Convertible Roof Module (CRM) has registered that the roof is closed and locked and that the boot lid is closed, the Convertible Roof Module (CRM) starts the opening procedure. The following action takes place in order:

Preparations:

The Convertible Roof Module (CRM) requests that the front and rear side windows are lowered.

The Convertible Roof Module (CRM) unlocks the boot lid (upper section) at the front edge by means of the electric latch bolt motor.

1. Opens the boot lid at the front edge by means of the two hydraulic cylinders. Unlocks the roof at the rear edge from the body by means of the lock cylinders for the rear roof section.
Unlocks the roof from the windscreen frame by means of the lock cylinder for the front roof section.
2. Moves the cover panel to its extended position by means of the hydraulic cylinders.
3. Unlocks the roof's front section from the centre section, and the roof's centre section from the rear section. This takes place by means of the roof cylinders.
4. Raises the front roof section.
5. Raises the roof's front, centre and rear sections. This initially takes place by means of both roof cylinders and master cylinders.
The sequence is concluded by means of the master cylinders alone.
6. The roof sections reach their positions in the cargo compartment by means of the master cylinders.
7. The front roof section is locked at the front edge to the body by means of the lock cylinder for the front roof section.
At the same time the lock cylinders also lock the rear roof section's latch bolts to the body (takes place "blind").
The boot lid is closed by means of its cylinders.

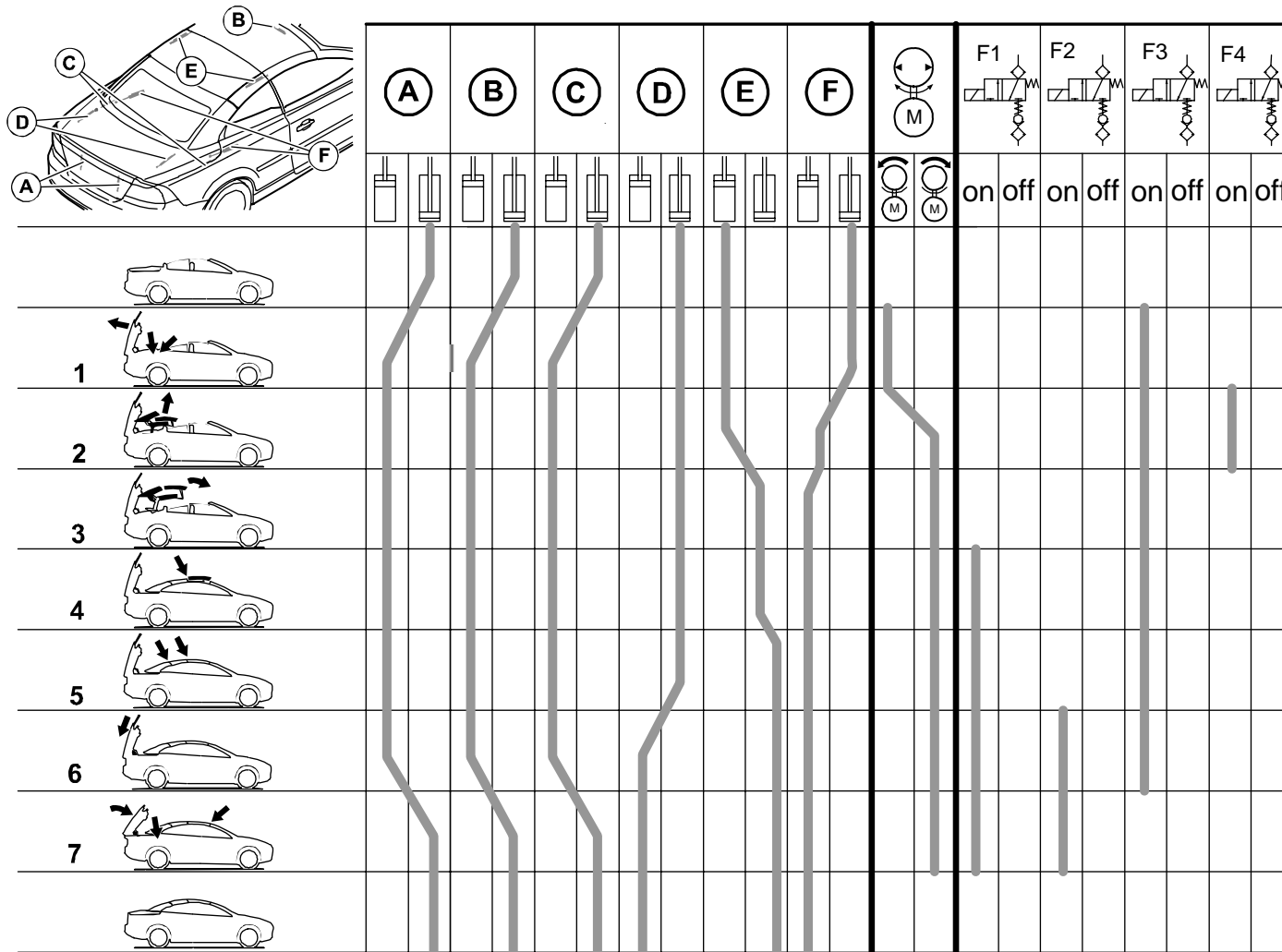
Conclusion:

The Convertible Roof Module (CRM) locks the boot lid by means of the electric latch bolt motor.

The Convertible Roof Module (CRM) requests that the front and rear side windows are raised to their upper end positions.

The Convertible Roof Module (CRM) requests an audio signal and text message as confirmation that the opening sequence is completed.

Closing the roof



8302572j

The position of the roof is controlled by the Convertible Roof Module (CRM) based on the request from one of the "Open" or "Close" switches. The sequence continues as long as the switch is depressed.

When the Convertible Roof Module (CRM) has registered that the roof is open and locked and that the boot lid is closed, the Convertible Roof Module (CRM) starts the closing procedure. The following action takes place in order:

Preparations:

The Convertible Roof Module (CRM) requests that the front and rear side windows are lowered.

The Convertible Roof Module (CRM) unlocks the boot lid (upper section) at the front edge by means of the electric latch bolt motor.

1. Opens the boot lid upper section at the front edge by means of its two hydraulic cylinders.
Unlocks the front roof section from the body by means of the lock cylinder for the front roof section.
The lock cylinders for the rear roof section also unlock the latch bolts (takes place "blind").
2. Raises the roof sections by means of the master cylinders.
3. The master cylinders continue to raise the roof while the roof cylinders start to close the front roof section.
4. The roof's rear and centre sections reach their closed positions. The roof cylinders continue to close the front roof section completely.
5. The roof cylinders continue their movement which locks the front roof section to the centre roof section and the centre roof section to the rear roof section.
6. The cover panel is pulled to its retracted position by means of its hydraulic cylinders.
7. The roof is locked to the windscreen frame by means of the lock cylinder for the front roof section.
At the same time the rear roof section is locked to the body by means of the lock cylinders.
The boot lid upper section is closed by means of its cylinders.

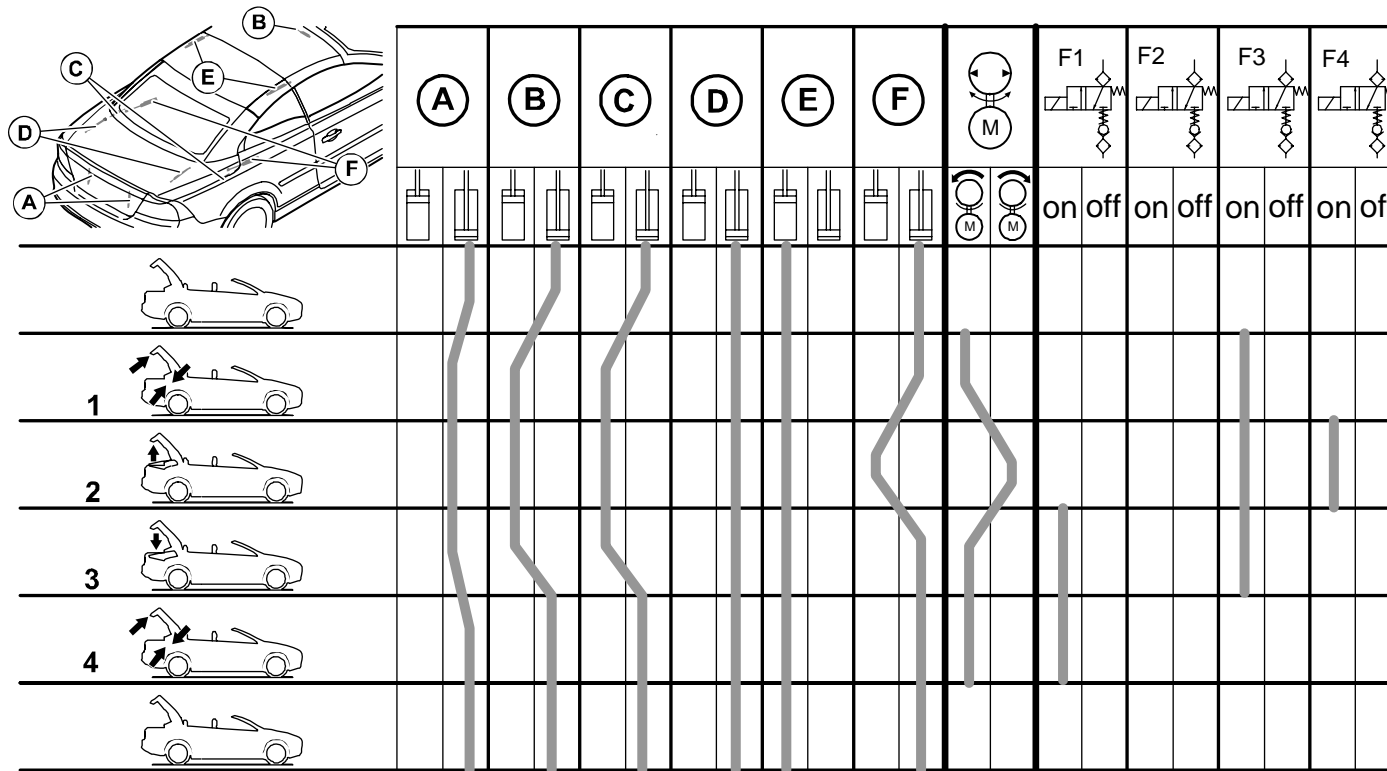
Conclusion:

The Convertible Roof Module (CRM) locks the boot lid upper section by means of the electric latch bolt motor.

The Convertible Roof Module (CRM) requests that the front and rear side windows are raised to their upper end positions.

The Convertible Roof Module (CRM) requests an audio signal and text message as confirmation that the closing sequence is completed.

Loading assistance



8302573j

The position of the roof is controlled by the switch for loading assistance.

The Convertible Roof Module (CRM) registers

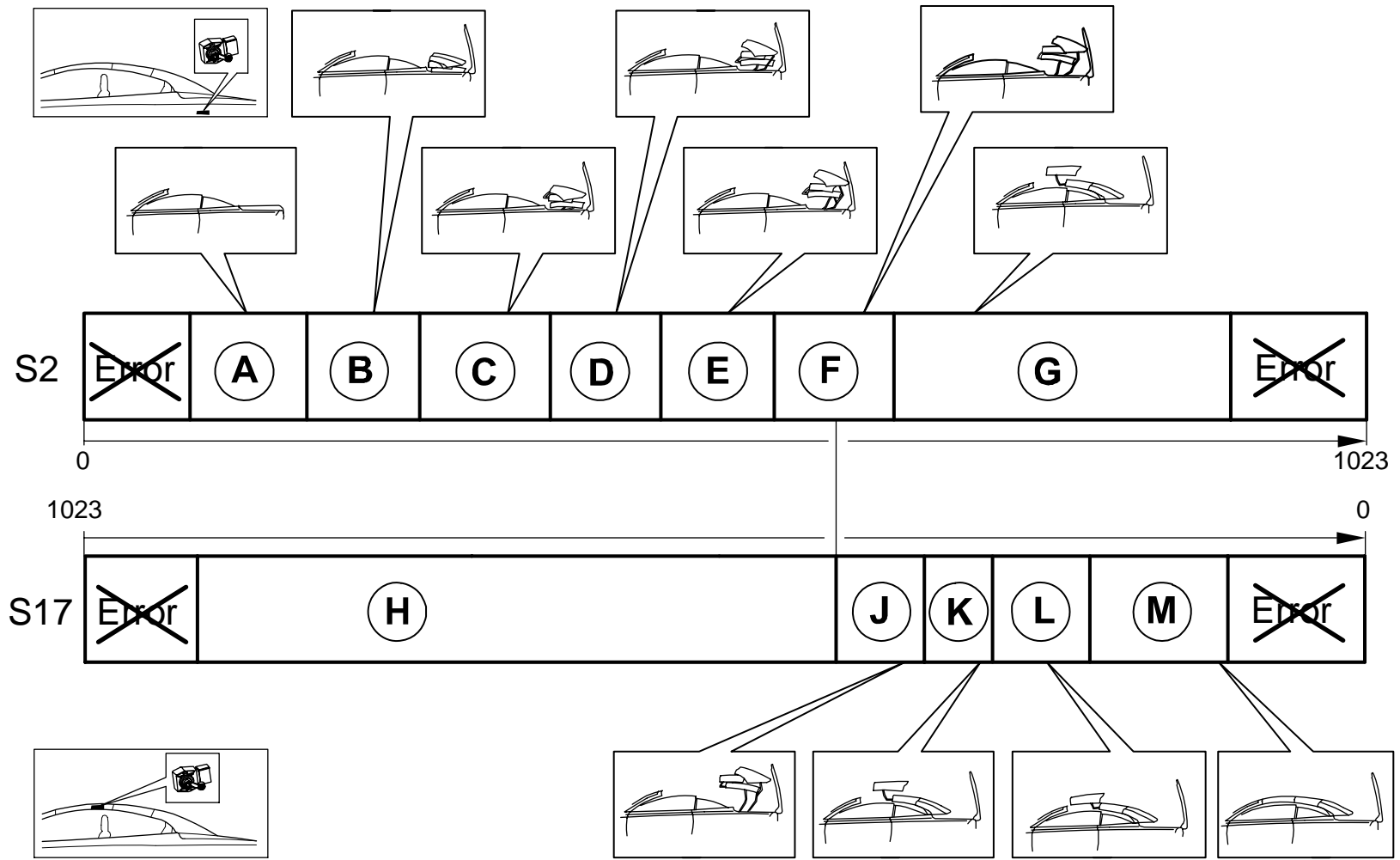
- that the roof is fully open
- that the boot lid is fully open (at the rear edge). Takes place by means of hall sensor S3 located by the hinge for the boot lid, on the left-hand side.

After which, the following takes place:

1. The front roof section lock cylinder unlocks the roof's front section from the body.
The lock cylinders also unlock the latch bolts for the rear roof section, which takes place "blind".
The boot lid cylinders attempt to open the boot lid upper section at the front edge.
However, this cannot take place as the latch bolt motor has not unlocked the latch bolts.
2. The roof is raised by means of the master cylinders. The movement is registered by the position sensor for the main link arms, S2.
When the roof has reached its end position, calculated by the Convertible Roof Module (CRM), the movement is stopped.
3. The next press of a button means that the roof is lowered, which takes place by means of the master cylinders.
NOTE The divider in the cargo compartment must be in its lower position. The position is registered by the divider's hall sensor, S10.
When the roof has reached its end position ("rest position"), calculated by the Convertible Roof Module (CRM) based on the signal from the position sensor for the main link arms, S2, the movement is stopped.
4. The front roof section is locked to the body by means of the lock cylinder for the front roof.
At the same time the latch bolts for the rear roof section are also locked "blind" by the lock cylinders.
The boot lid cylinders also close the boot lid upper section "blind".

The sequence is completed.

Parameters, position sensor S2 and S17



8302595j

The signals from the two position sensors S2 and S17 provide information to the Convertible Roof Module (CRM) regarding the movement of the roof. The signals are processed by the Convertible Roof Module (CRM) which subdivides the whole movement from closed position to open position into 1023 steps. This applies individually for both sensors.

A certain value is equivalent to a certain position.

This means that within a certain range (a certain "movement window") the values from the position sensors shall be equivalent to a certain reference value programmed into the Convertible Roof Module (CRM).

By comparing the hall sensor signals that provide information on which position the roof has passed with the programmed value 0-1023 the Convertible Roof Module (CRM) can determine whether the roof movement is the correct one and that there is no risk of collision.

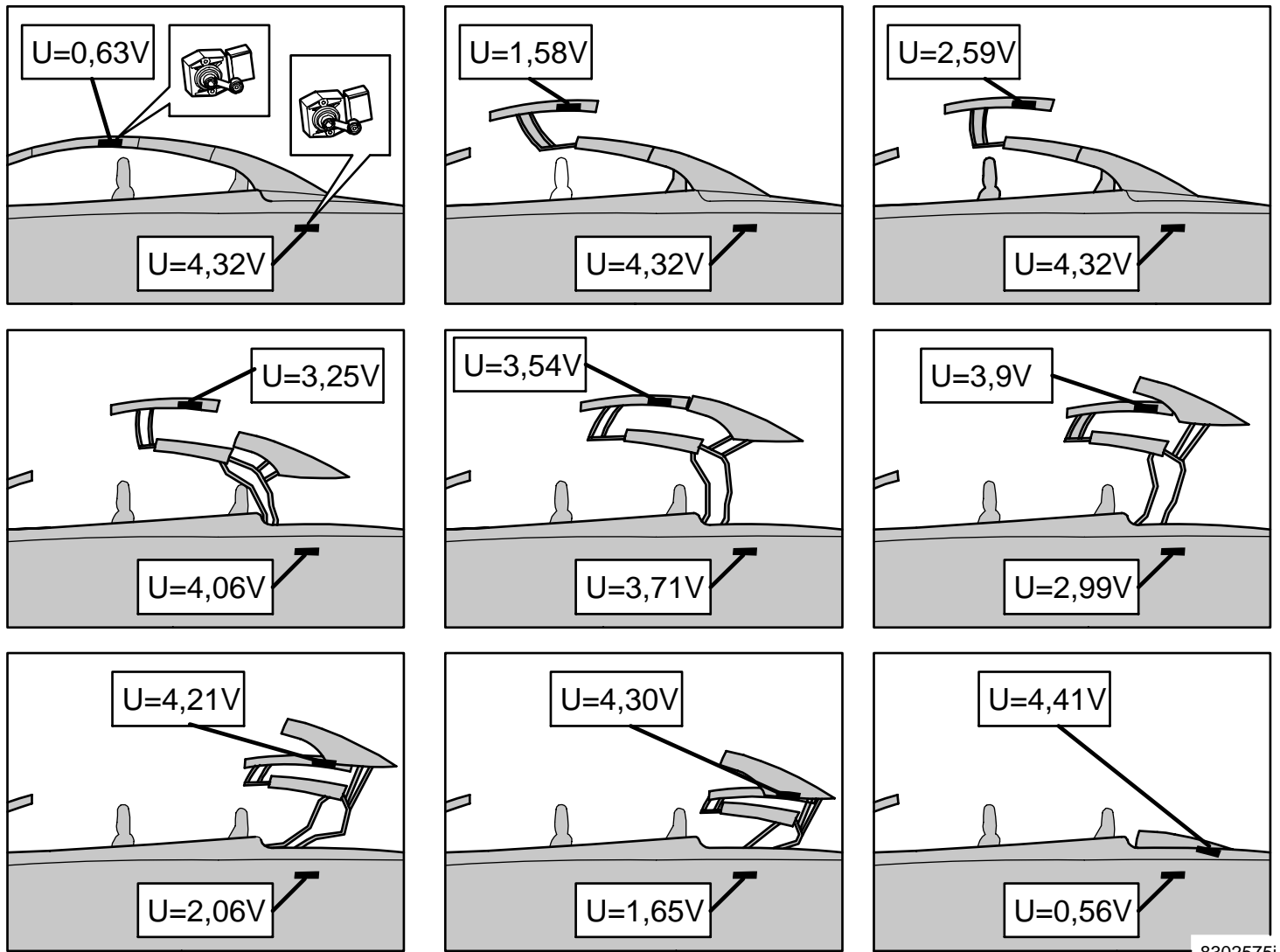
Consequently it is of the utmost importance that the position sensors are calibrated using VIDA, after replacement for example.

The different areas can be read via VIDA and can be described as follows:

ERROR = unpermitted area

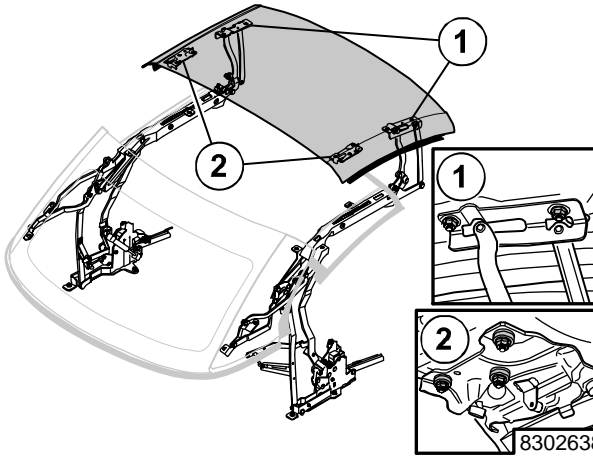
Area	Position sensor S2, centre and rear roof section.	Position S17, front roof section
A	Open	-----
B	Intermediate 3	-----
C	Loading assistance	-----
D	Intermediate 2	-----
E	Activating the front roof section	-----
F	Intermediate 1	-----
G	Closed	-----
H	-----	Open
J	-----	Intermediate 2
K	-----	Activating the rear roof section
L	-----	Intermediate 1
M	-----	Closed

Signals, position sensor S2 and S17



8302575j

The illustration shows position sensor signals when operating the roof.
The voltage values provide an understanding of the signal characteristics and consequently can vary slightly in reality.
The values can be read from the Convertible Roof Module (CRM) using the adapter and breakout box.
Note the reverse signal characteristics of the sensors.



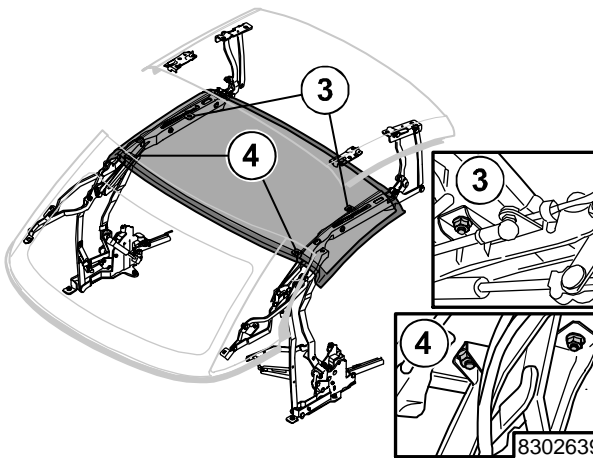
Front roof section

The roof section is secured in the link system at the front with two nuts, **1**, per side.

There are a number of shims between the roof section and link system for adjusting the front mounting brackets.

On the rear roof section there are brackets screwed in with three nuts, **2**, per side.

The rear brackets have three adjustment sleeves at each screw/nut mounting for adjusting the roof section.

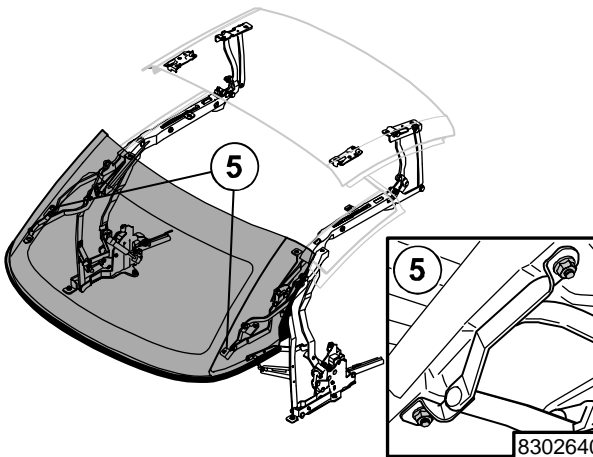


Centre roof section

The roof section is secured in the mounting plates at the front with two nuts, **3**, per side.

The roof section is secured at the rear with two nuts, **4**, per side in the mounting plates.

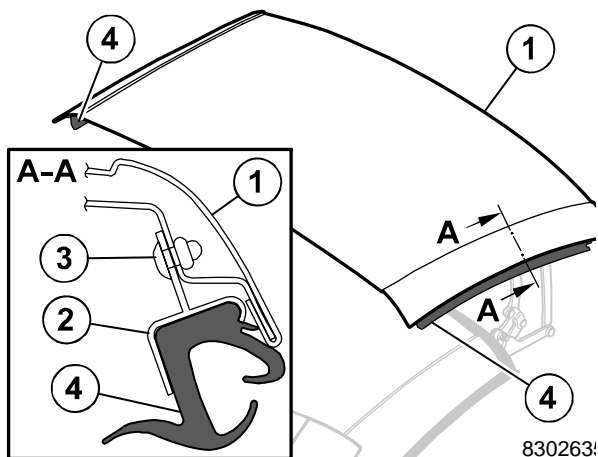
At each mounting point there is a number of shims for adjusting the roof section against the link system.



Rear roof section

The roof section is secured in the link system with two nuts, **5**, per side.

At each mounting point there is a number of shims for adjusting the roof section against the link system.



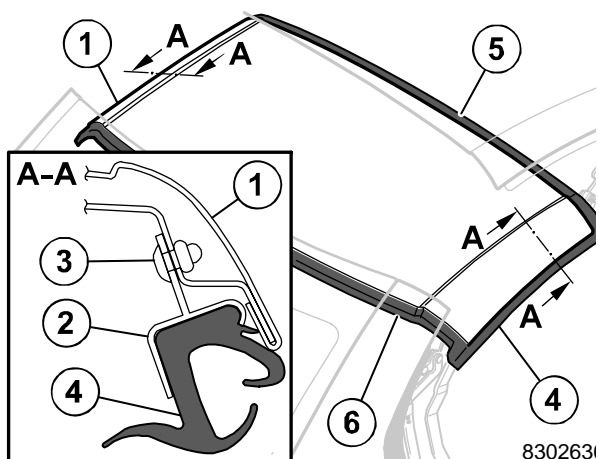
Rubber strips/seals, front roof section

The roof section, 1, has a sealing strip, 4, per side which seals between the roof section and the windows.

Cross section A-A shows how the seals are secured.

The sealing strip, 4, is secured in the rail, 2.

The rail, 2, is secured in the roof section with five pop rivets, 3.



Rubber strips/seals, centre roof section

The roof section, 1, has a sealing strip, 4, which runs around the whole roof section.

The strip seals against the front and rear roof sections along the transverse edges 5 and 6, see cross section C-C.

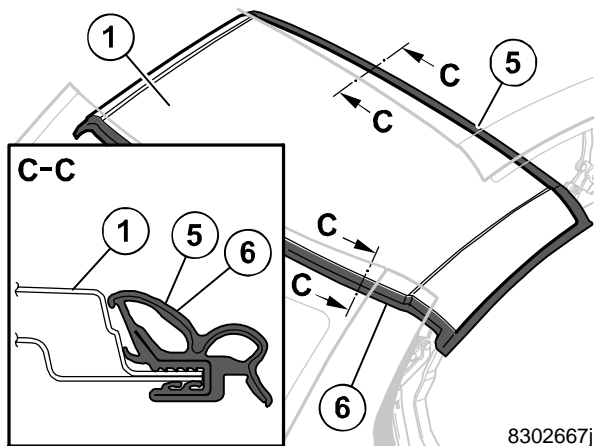
The strip is pressed into the roof section flange on these edges 5 and 6.

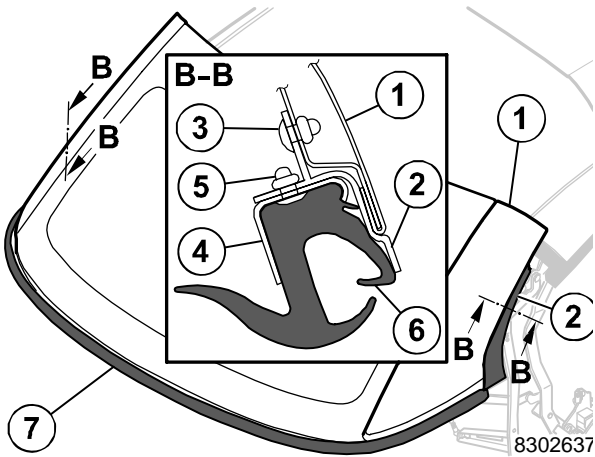
The transverse edges seal against the windows.

Cross section A-A shows how the seal is secured longitudinally.

The sealing strip, 4, is secured in the rail, 2.

The rail, 2, is secured in the roof section with four pop rivets, 3.





Rubber strips/seals, rear roof section

The roof section, 1, has a sealing strip, 6, per side which seals against the side windows.

Cross section B-B shows how these strips are secured.

The sealing strip, 6, is secured in a rail, 4, to the roof section.

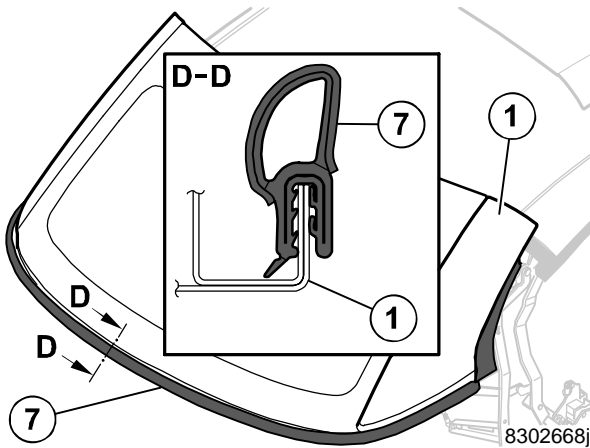
The rail 4 is secured with four pop rivets, 5, in a plastic panel, 2.

The plastic panel, 2, is secured in the roof section with five pop rivets, 3.

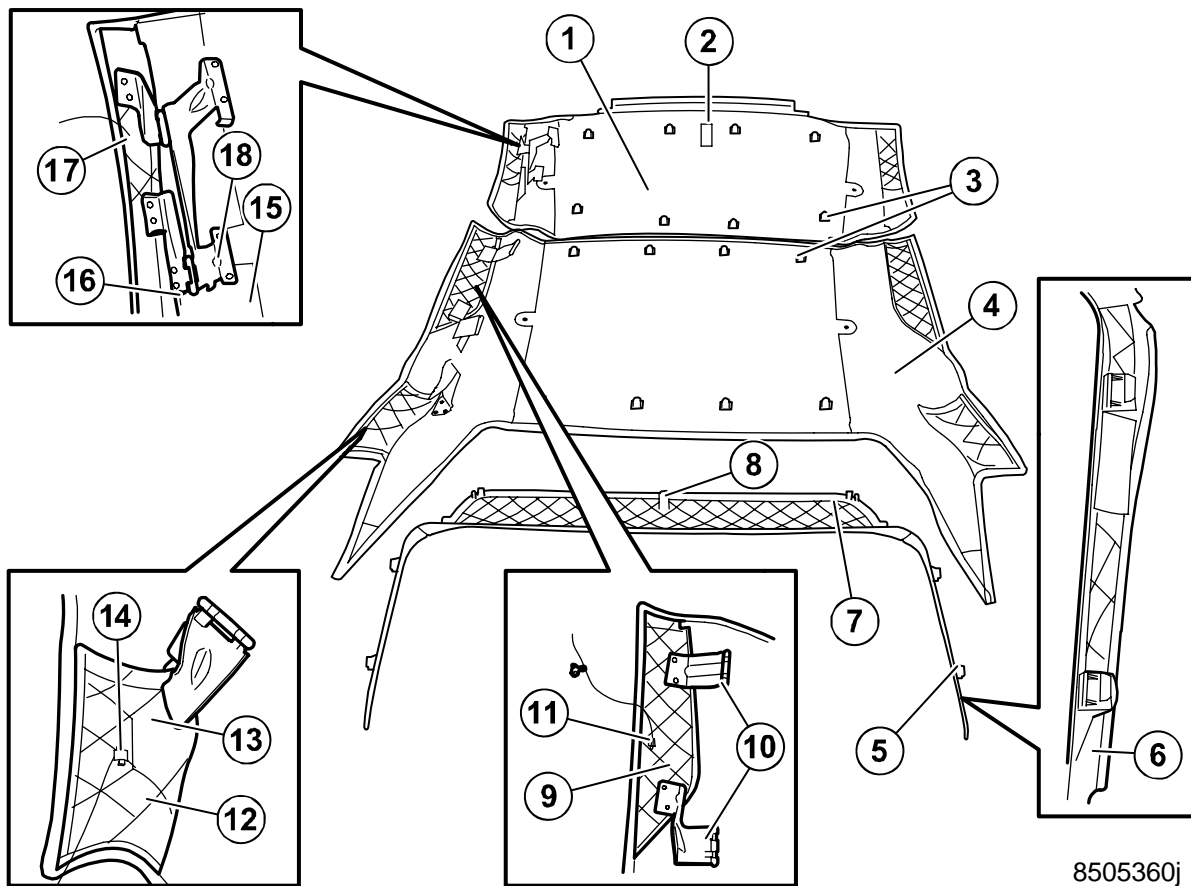
Another sealing strip, 7, seals between the rear roof section and boot lid.

The strip, 7, is pressed into the roof section flange, see cross section C-C.

The ends of the strip have brackets that are riveted in with two pop rivets per side in the roof section.



Notes



Roof trim

Pos	Designation	Pos	Designation
1	Front roof trim	10	Hinge (x 2) centre flap, right/left
2	Cover	11	Bracket for wire, centre flap
3	Clips for front and rear roof trims	12	Rear flap, right-hand/left-hand side
4	Centre roof trim	13	Hinge, rear flap, right-hand/left-hand side
5	Rear roof trim/panels left-hand/right-hand side	14	Bracket for wire, rear flap
6	Clips for panels, left-hand/right-hand	15	Front flap, right-hand/left-hand side
7	Rear roof trim/panel, centre	16	Bracket for wire
8	Plastic hooks	17	Hinge, front flap, right-hand/left-hand side
9	Centre flap, right-hand/left-hand side		

General

NOTE: Brackets for the roof trim shown on left-hand/right-hand side in the illustration also have the equivalent brackets on the right-hand/left-hand side.

Each roof section has separate roof trim.

The trims on the front and centre roof sections are equipped with moving flaps.

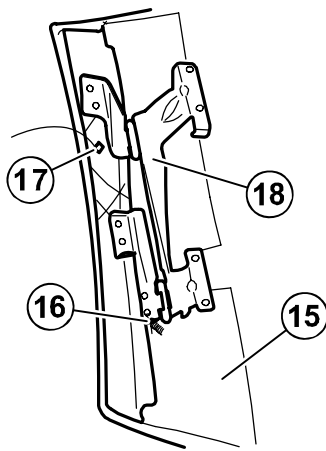
The flaps are secured in spring-loaded hinges, and the hinges in turn are secured in the front and centre roof sections.

Between the flaps and the centre section of the roof trim there is an area of roof fabric which is elastic. When the roof is opened the trim is folded inward which allows the necessary space for the movements of the link system.

The movement of the flaps is controlled using a number of wires and a number of spring-loaded hinges.

The wires and the spring-loaded hinges help to guide the roof trim to the correct positions when opening/closing the roof.

Each flap has a separate wire. The wires are secured to the link system in a number of mounting points.



8505361j

Front roof trim

The trim is secured at the front edge against the front roof section using four screws.

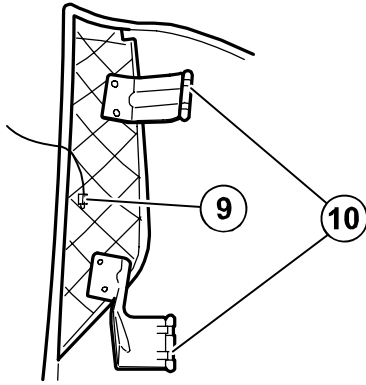
The centre section of the trim is secured with eight clips.

The front roof trim, **1**, also has a folding flap, **15**, per side. The flaps, **15**, are screwed into the hinges, **17**, with four screws per side.

The hinges, **17**, are secured in the front roof section with four nuts per side.

There is a spring between each hinge and front roof section, **16**, continue. The springs pull the hinges in so that the roof fabric is folded when the roof is opened.

The wires that help to control the flap are secured in position **15**.



8505362j

Centre roof trim

General

The centre section of the trim is secured with eight clips, 3.

There is a cover on the centre, front section of the roof fabric, 2.

The cover must be removed for manual operation of the lock cylinders/latch bolts.

Centre flap

The centre roof trim, 4, has two folding flaps, 9 and 12, per side.

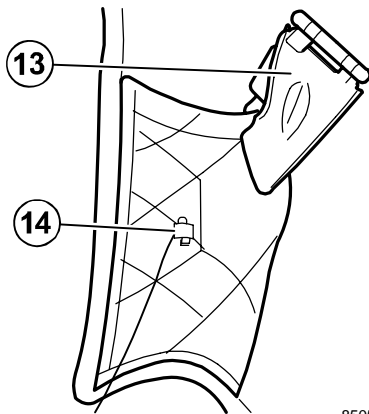
The centre flaps, 9, have two separate hinges, 10, per side.

The flaps are screwed into the hinges using two screws per side.

The hinges, 10, are spring-loaded.

Each hinge, 10, is secured to the centre roof section with two nuts.

The wires that help to control the centre flap are secured in position 11.



8505363j

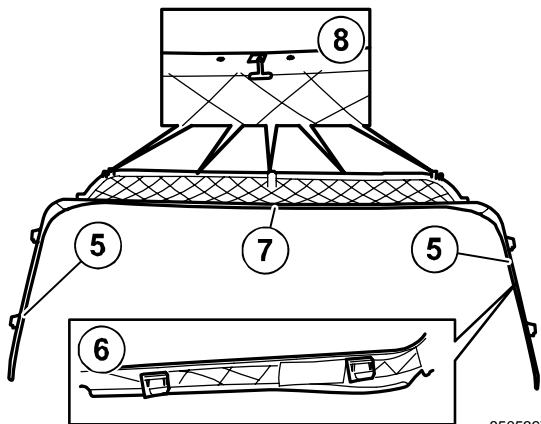
Rear flap

The rear flaps, 12, are screwed into the hinges, 13, with two screws per side.

The hinges, 13, are secured by the roof with three nuts per side.

The hinges, 13, are spring-loaded.

The wires that help to control the rear flap are secured in position 14.



8505367j

Rear roof trim/panels

The panels on the rear roof section are divided into right and left-hand side panels, 5, and one panel, 7, in the centre.

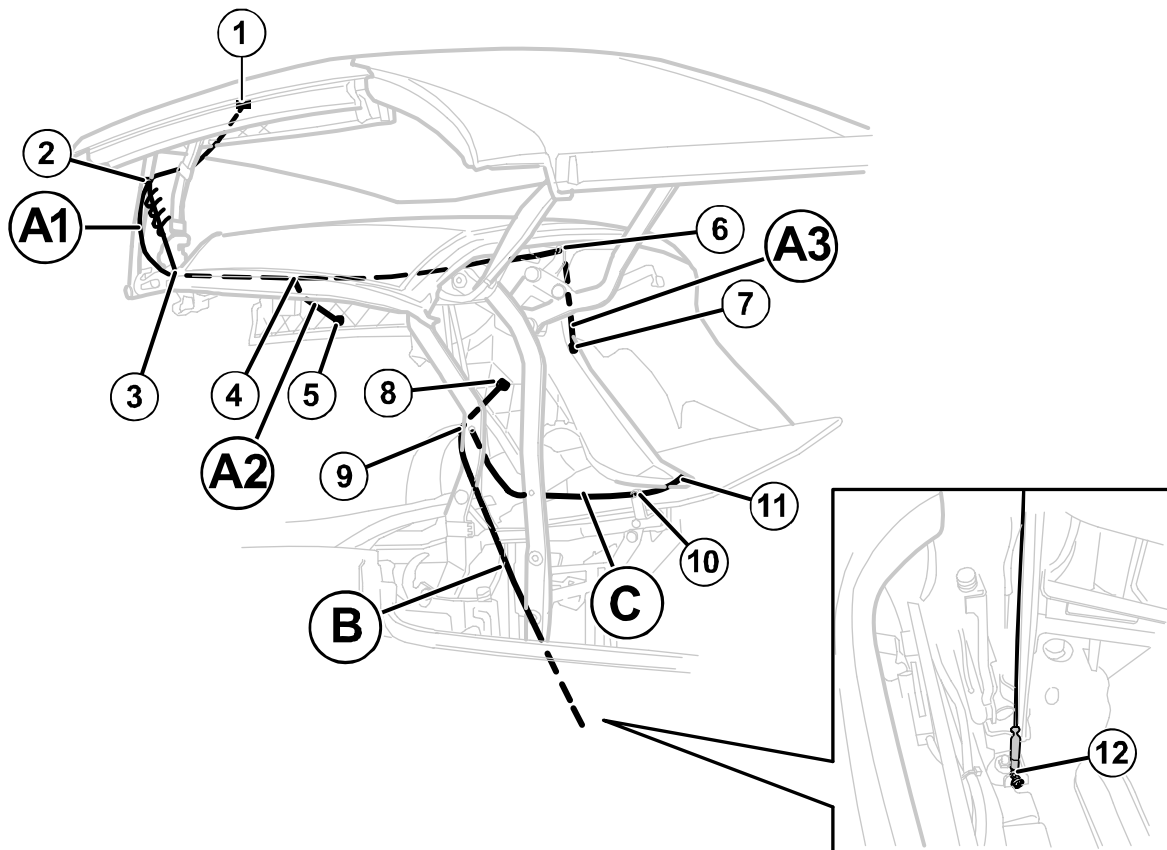
The panels cover the area between rear window and centre roof trim when the roof is closed.

The side panels are secured in the roof section with two metal clips, 5, per side.

The centre panel is secured in the roof section with five plastic hooks, 8, which are integrated into the centre panel.

The three panels are held together with two plastic hooks per joint.

Notes



8505345j

Wires, roof trim

General

NOTE: Wires for the roof trim shown on left-hand side in the illustration also have the equivalent wires on the right-hand side.

The wires for the headlining consist of three wire units A, B and C.

Wire unit A consists of three wires, A1, A2 and A3.

Wires B and C are separate wires.

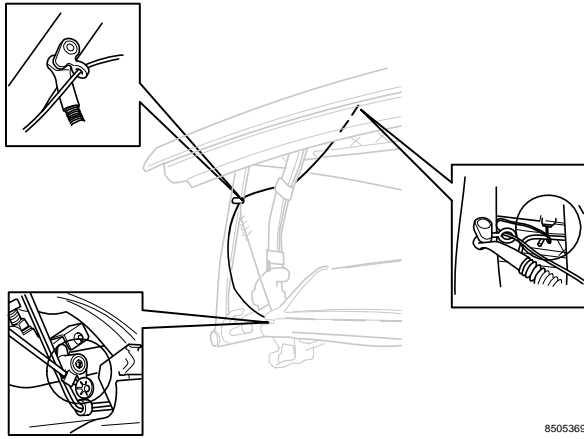
Certain mounting points in the link system have both sliding eye and wire mounting in the same mounting point.

Wire units

Wire	End points	Wire	End points
A1	Wire A1 is routed between pos 1 and pos 3.	B	Wire B is routed between pos 8 and pos 12.
A2	Wire A2 is routed between pos 2 and pos 5.	C	Wire C is routed between pos 9 and pos 11.
A3	Wire A3 is routed between pos 2 and pos 7.		

Fixed and sliding points

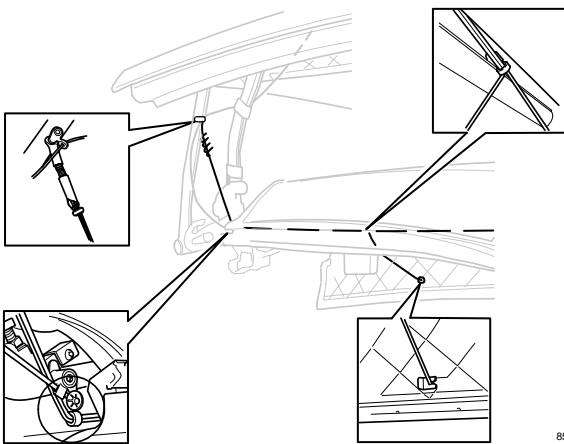
Point	Fixed points	Point	Fixed points
1	Wire A1, mounting in front flap	7	Wire A3, mounting in headlining "C-pillar"
2	Wire A1; sliding eye mounted on link system Wire A2/A3: mounting with spring on link system	8	Wire B, mounting in rear flap
3	Wire A1: mounting on link system Wire A2/A3: sliding eye mounted on link system	9	Wire B, sliding eye mounted on link system Wire C, mounting with spring on link system
4	Wire A2/A3, sliding eye mounted on link system	10	Wire C, sliding eye in parcel shelf
5	Wire A2, mounting in centre flap	11	Wire C, mounting in headlining tab
6	Wire A3, sliding eye mounted on link system	12	Wire B, mounting with spring on bracket for link system



8505369j

Brackets/sliding points, Wire A1

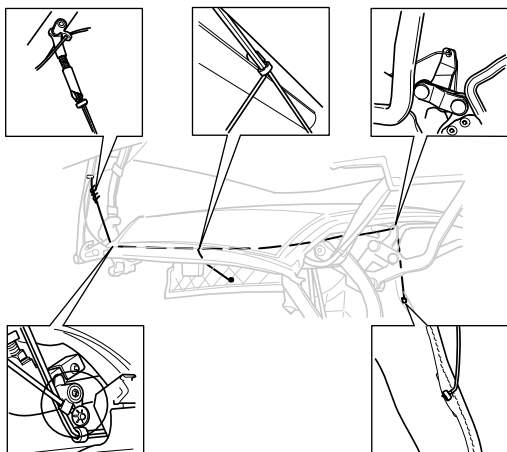
- mounting in front flap.
- sliding eye mounted on link system.
- mounting on link system.



8505370j

Brackets/sliding points, Wire A2

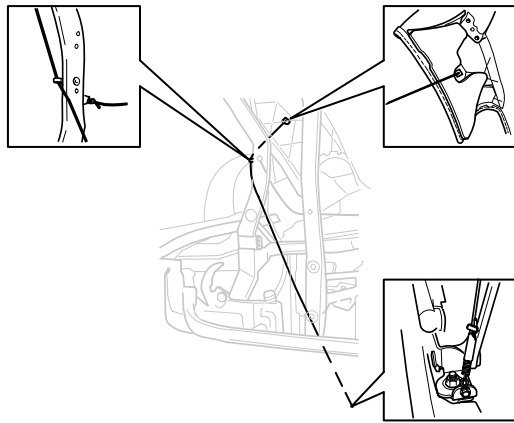
- mounting with spring on link system.
- sliding eye 1, mounted on link system.
- sliding eye 2, mounted on link system.
- mounting in centre flap.



8505371j

Brackets/sliding points, Wire A3

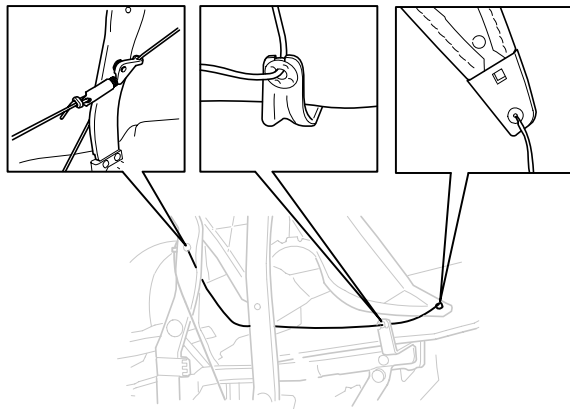
- mounting with spring on link system.
- sliding eye 1, mounted on link system.
- sliding eye 2, mounted on link system.
- sliding eye 3, mounted on link system.
- mounting in headlining.



8505372j

Brackets/sliding points, Wire B

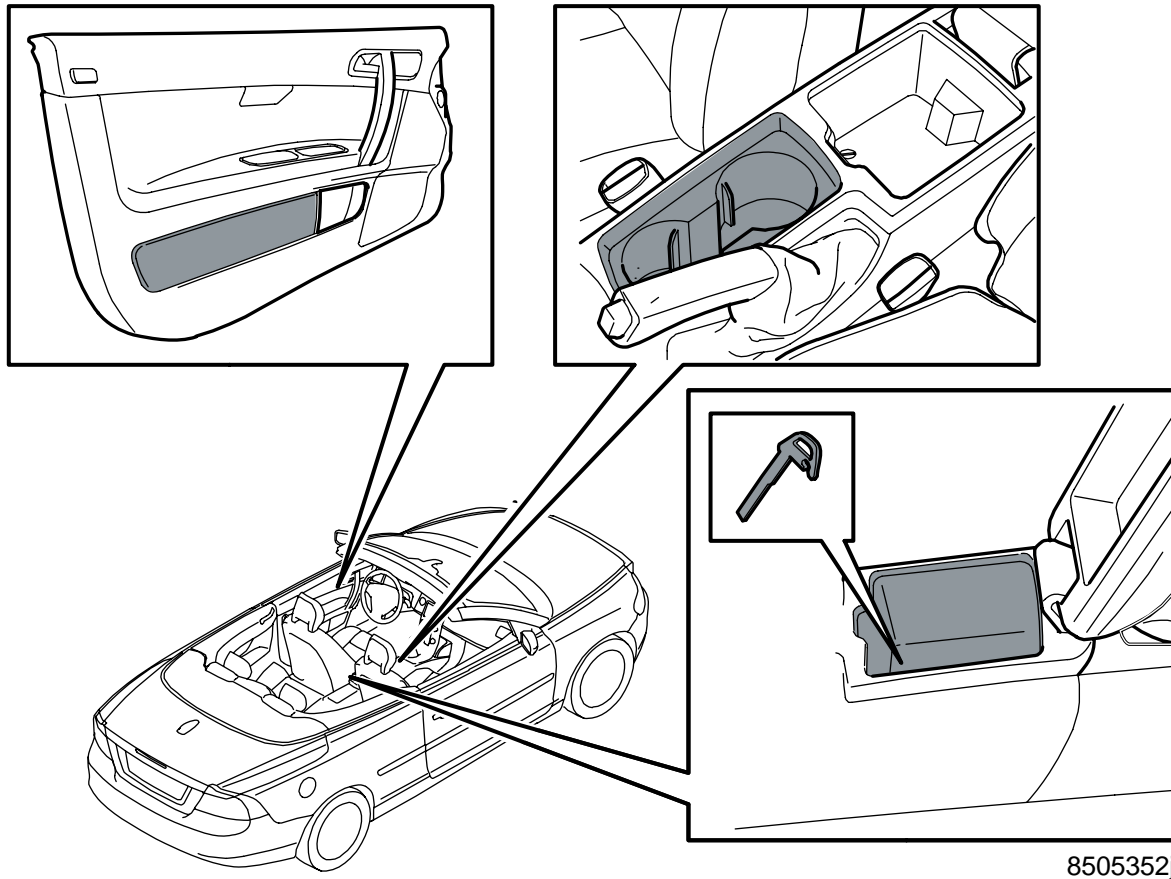
- mounting in rear flap.
- sliding eye in parcel shelf.
- mounting in headlining tab.



8505373j

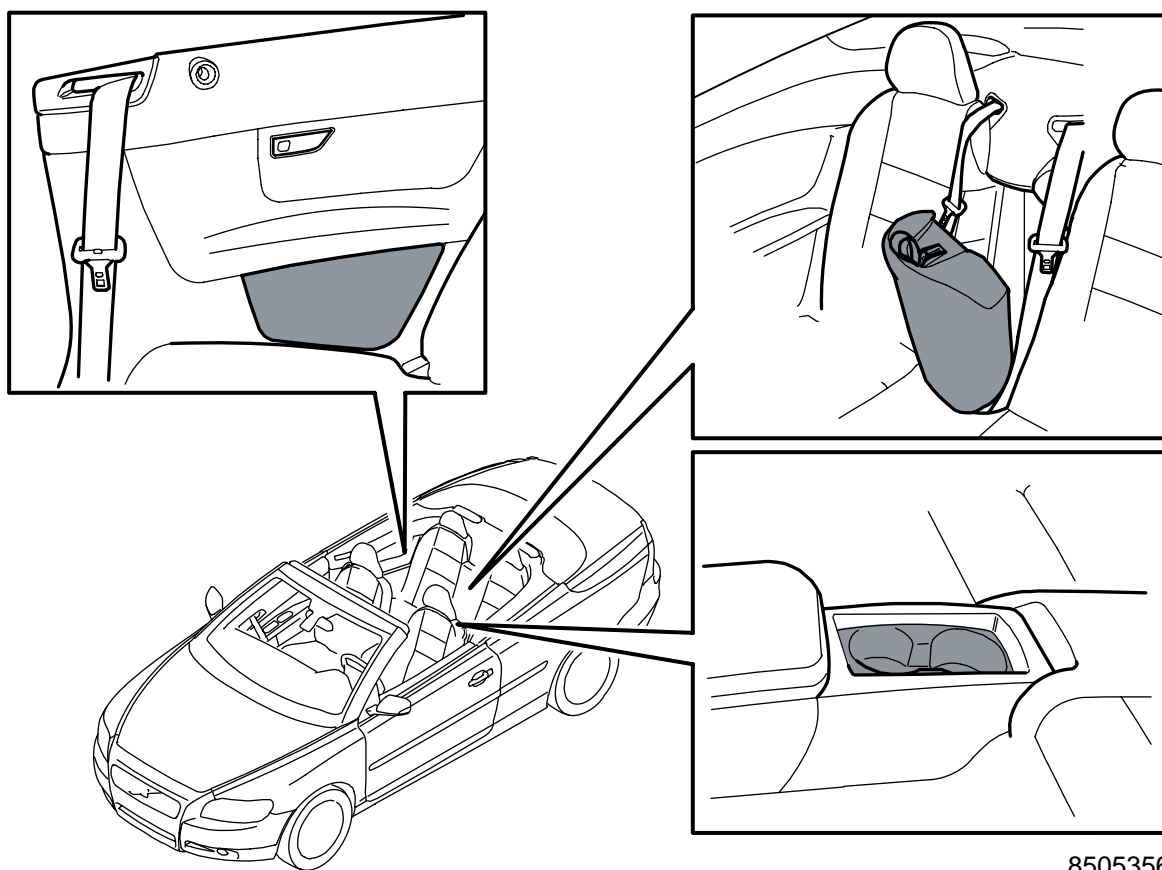
Brackets/sliding points, Wire C

- mounting in rear flap.
- mounting with spring on link system.
- mounting with spring on bracket for link system.



Interior, front passenger compartment

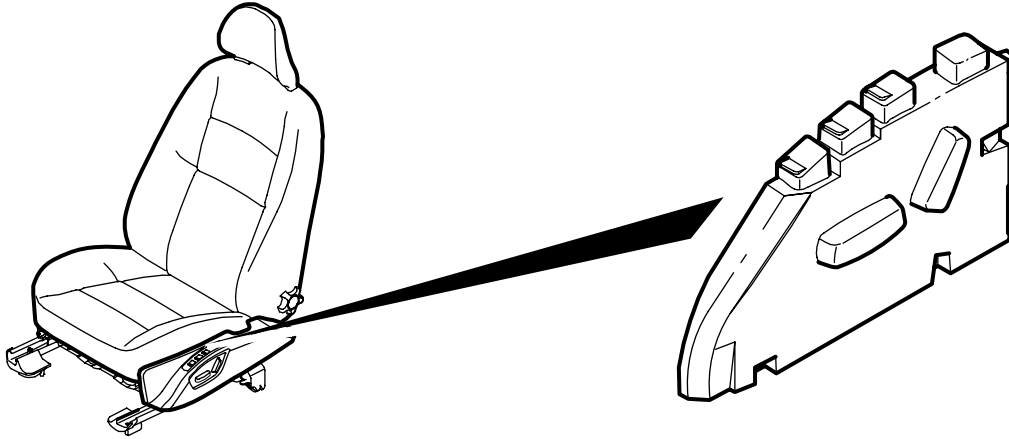
- Dashboard and centre stack are the same as in the S40/V50.
- The tunnel console has two cup holders for the front passengers. The lock for mechanically opening the boot lid is located in the storage compartment behind the cup holders.
- The doors are wider than the doors in the earlier C70. This means that the storage compartments in the door panels have more space. The storage compartments can be equipped with lockable hatches as an option.



8505356j

Interior, rear passenger compartment

- The side panels in the rear passenger compartment can be equipped with lockable hatches as an option. The rear interior lighting is also located in the panels.
- The first aid kit is located in the detachable rear seat centre cushion. There is a rain cover inside the centre cushion that can be used to cover the car if necessary. The tyre repair kit with compressor for punctured tyres is also located here.
- There are two cup holders located in the rear section of the tunnel console for the rear seat passengers.



8505339j

Front seats, PSL/PSR

PSL and PSR are designed to handle the functions for seat control and storing memory positions. The control modules are located on the outside of the front seats and are integrated with the control panels. They communicate both with directly connected components and with other control modules via CAN communication.

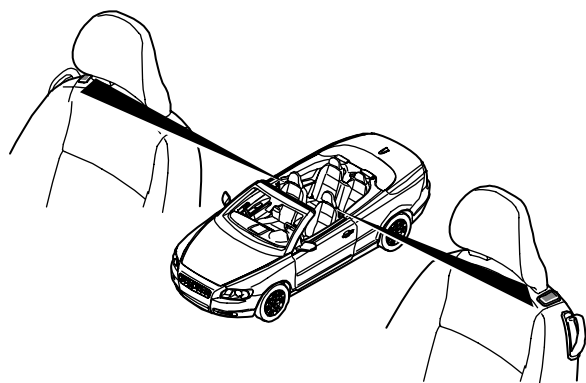
Function

Same operating principle for the Power Seat Module (PSM) as in the S40/V50. See "New Car Features 0338-0347, S40/V50" for further information.

Thermal protection circuit

The transistors that control the current to the electric motors work as temperature fuses.

The power circuit is interrupted at a certain temperature in order to prevent excessive current and then overheating (caused due to a short circuit in a motor for example). When the temperature in the circuit has fallen to the normal level the transistors are reactivated.



8505341j

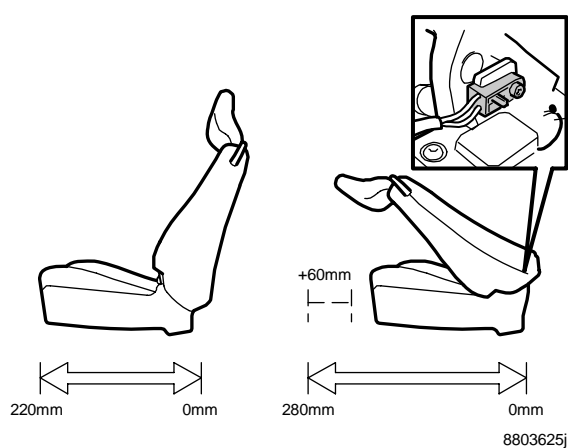
Easy Entry

To enable passengers to step into and to leave the rear seat of the vehicle more easily there is the "Easy Entry" function. Each front seat has a switch located on the top of its backrest.

When the front edge of the switch is depressed the seat moves down and forward.

When the rear edge of the switch is depressed the seat returns to its original position.

The switches are directly connected to the Power Seat Module, Left (PSL)/Power Seat Module, Right (PSR), which activates the motors controlling the longitudinal and vertical movement of the seat (6/18, 6/19).



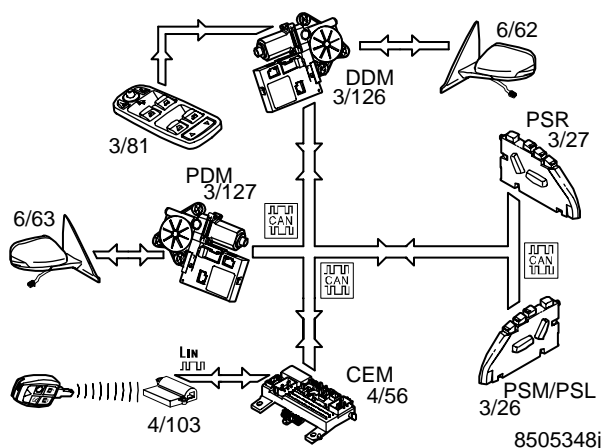
8803625j

Dual End Stop

When the backrest is folded forward the longitudinal adjustment is 60 mm longer (from the maximum 220 mm to 280 mm).

When the seat is furthest forward and the backrest is folded back to normal seating position the PSL/PSR will automatically move the seat back 60 mm.

When the handle for folding the backrest is lifted this acts on a hall sensor which is connected to the PSL/PSR. The hall sensor signal's characteristics then change and the control module permits longer adjustment.



8505348j

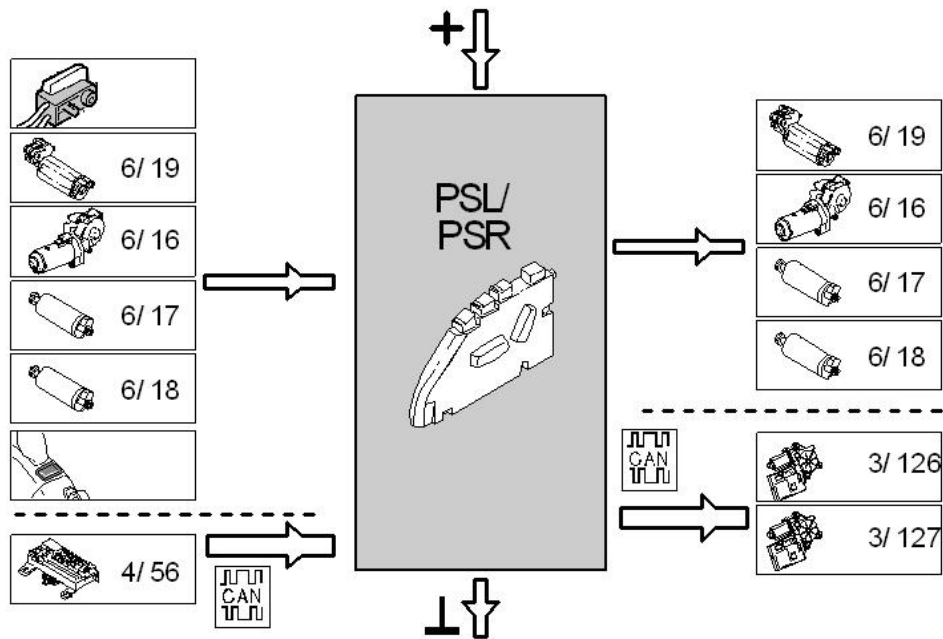
Memory position, power seats and door mirrors

When the vehicle is equipped power seats the memory function is also included for rearview mirror position. Pressing the driver's memory button or the remote control unlock button also sets the programmed rearview mirror position.

The information is sent from the PSL/PSR, (depending on left or right-hand drive market) to the Passenger Door Module (PDM) and the Driver Door Module (DDM).

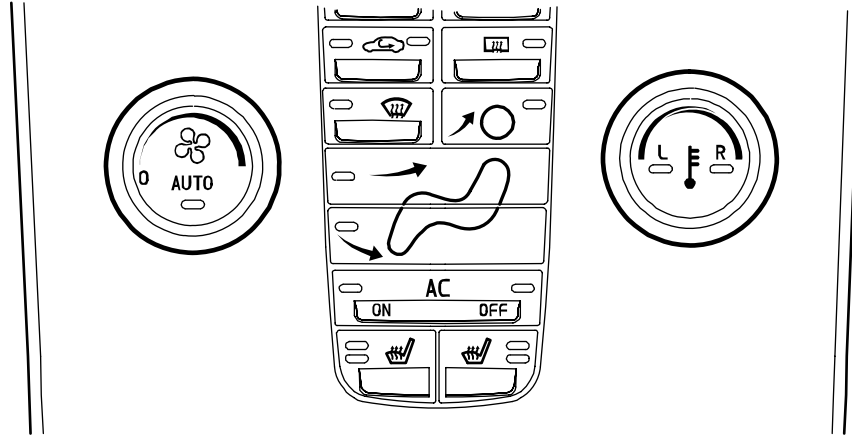
The Passenger Door Module (PDM) and the Driver Door Module (DDM) in turn set the rearview mirrors to programmed position. The rearview mirror position stored is the position the rearview mirrors had when the seat position was programmed or when the car was last locked with the relevant remote control. A total of three seat memory positions and three remote controls can be stored.

The driver's rearview mirror position is stored in the Driver Door Module (DDM) and the passenger rearview mirror position is stored in the Passenger Door Module (PDM).



8505340j

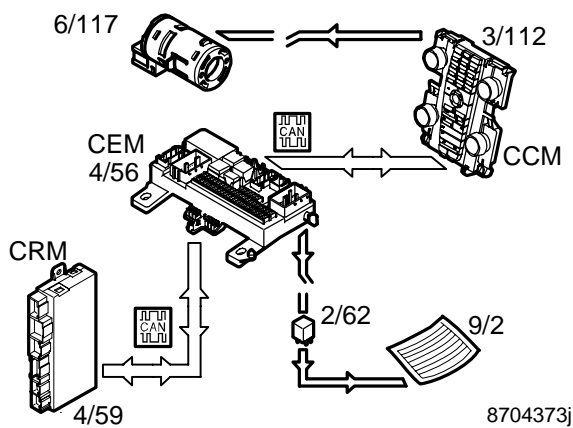
<i>Input signals</i>		<i>Output signals</i>	
without number	Hall sensor, backrest folded/not folded	3/126	Control module, driver's door
without number	Switch, Easy Entry	3/127	Control module, passenger door
4/56	CEM	6/16	Seat motor, backrest
6/16	Hall sensor integrated into seat motor	6/17	Seat motor, up/down, front edge
6/17	Hall sensor integrated into seat motor	6/18	Seat motor, up/down, rear edge
6/18	Hall sensor integrated into seat motor	6/19	Seat motor, forward/backward
6/19	Hall sensor integrated into seat motor		



8704376j

Climate control

Climate control is only available with ECC and operates in the same way as in the S40/V50. For further information, see "New Car Features 0338-0347, S40/V50", Section 8.

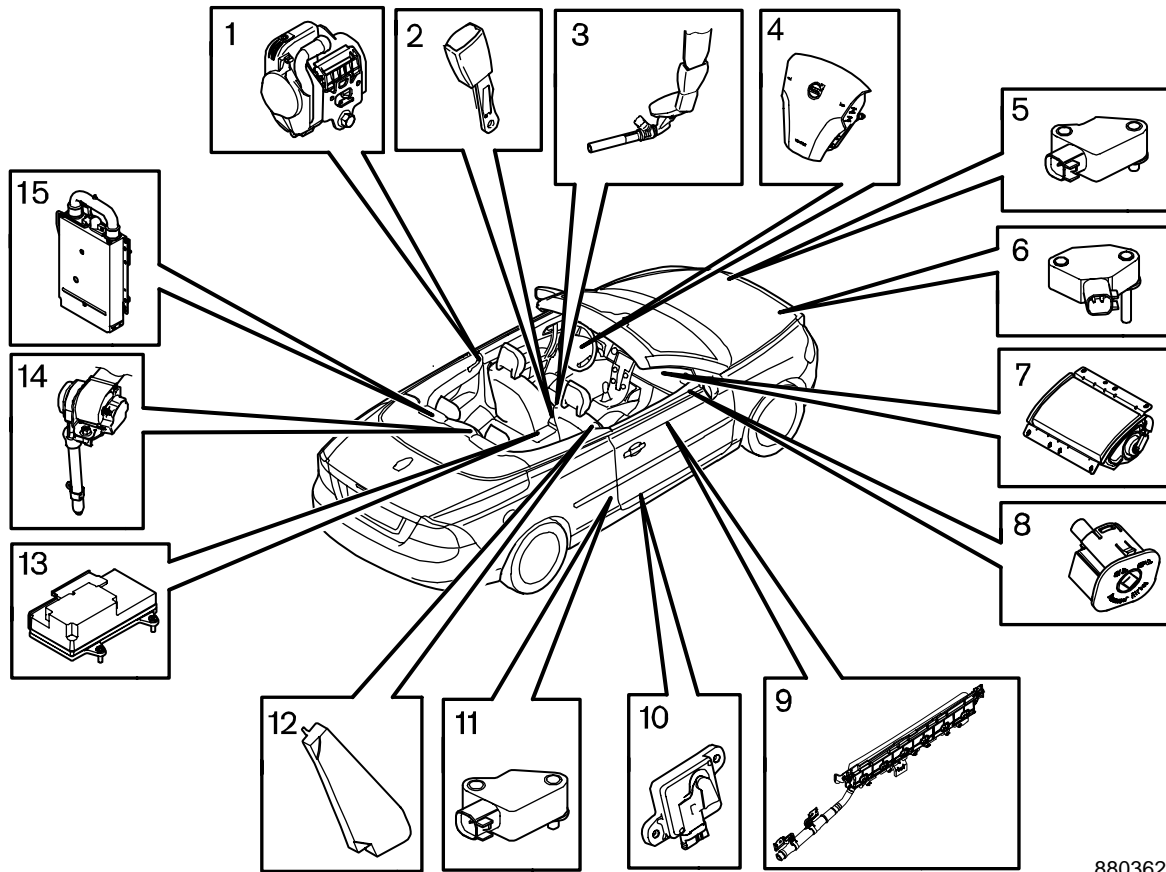


Controlling the passenger compartment climate

There is a difference in climate control when the roof is open:

- When the roof is opened the rear window defroster is switched off (9/2). When the roof is then closed the defroster is switched on again.
- When the roof is open and climate control is in auto mode the passenger compartment temperature sensor signal is not used (6/117).

8704373j

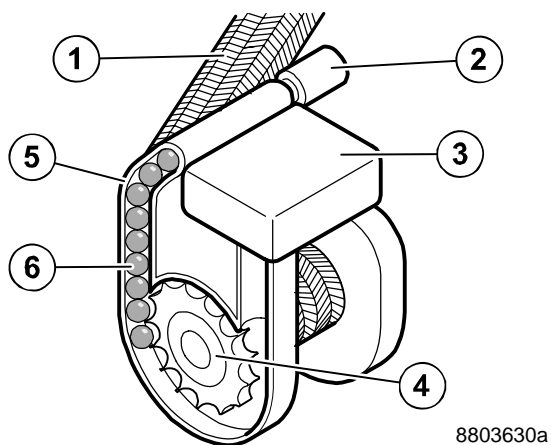


8803627j

Safety systems

Components/Component location (Excluding USA/CDN)

Pos	Designation	Pos	Designation
1	Front seatbelts with pyrotechnic belt tensioners and mechanical force limiters	9	Door mounted inflatable curtains
2	Seatbelt buckle, left and right-hand front seats	10	Side impact sensors in doors
3	Hip belt tensioner, driver's seat, only EU	11	Side impact sensors in B-pillars
4	Airbag, driver	12	Side airbag, left and right-hand front seats
5	Front impact sensor, left-hand front	13	Supplemental Restraint System Module (SRS)
6	Front impact sensor, right-hand front	14	Rear passenger seatbelts, left and right-hand, with pyrotechnic belt tensioners
7	Airbag, passenger	15	ROPS (Roll Over Protection System)
8	Switch On/Off, airbag, passenger, front		



1. Seatbelt	4. Gear wheel
2. Ignition unit	5. Pipe
3. Ball trap	6. Steel balls

Front seatbelts

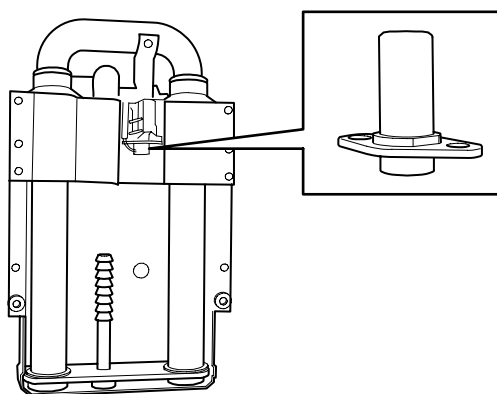
In the event of no upper B-pillar section a more compressed inertia reel is used compared with the S40/V50's inertia reel.

The inertia reel has rotation tensioner. The tensioner consists of a bent pipe containing a number of balls. The pipe goes around a gear wheel which is fixed at the centre spindle.

When the tensioner is activated the balls are forced through the pipe.

The balls hit the gear wheel which then rotates.

By means of this the centre spindle also rotates and the belt is tensioned.



ROPS

The ROPS unit in the new C70 has, in principle, the same function as the unit in the old C70.

The differences are:

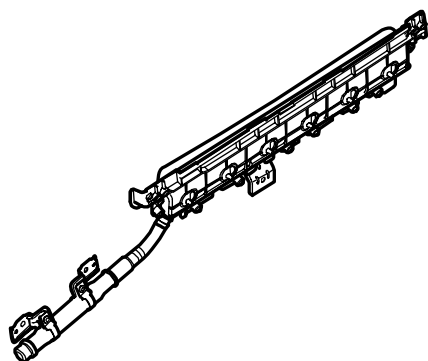
- ROPS is deployed by a signal from the Supplemental Restraint System Module (SRS) to the pyrotechnically controlled mechanism that releases the roll bar (see inset illustration).
- more powerful springs that force the roll bar up so that it breaks the window more easily.
- a pointed tip is located on the top of the roll bar to further facilitate the breaking of the window when ROPS is deployed.
- activated in the event of a rear end collision.

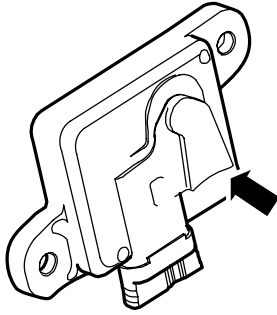
Door mounted inflatable curtain

The inflatable curtain is located in the upper sections of the door panels.

When activated the inflatable curtain is deployed upward.

The inflatable curtain is activated in the event of a side collision and when the vehicle rolls over.





8803586j

Side impact sensor door

The side impact sensors are located in the centre of the doors.

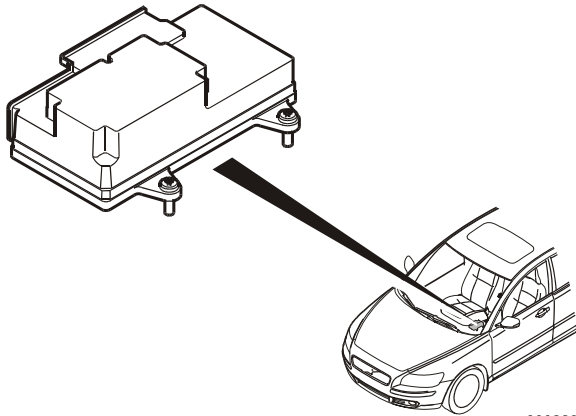
The arrow shows the pressure intake location.

The sensors register the change in pressure inside the doors when the outer panel is pressed in for example.

When the pressure changes the sensor sends the information to the Supplemental Restraint System Module (SRS).

The Supplemental Restraint System Module (SRS) determines the nature of the information and whether any Supplemental Restraint System Module (SRS) components should be deployed.

The sensors deploy the inflatable curtains and the front seatbelts.



8803288

Supplemental Restraint System Module (SRS)

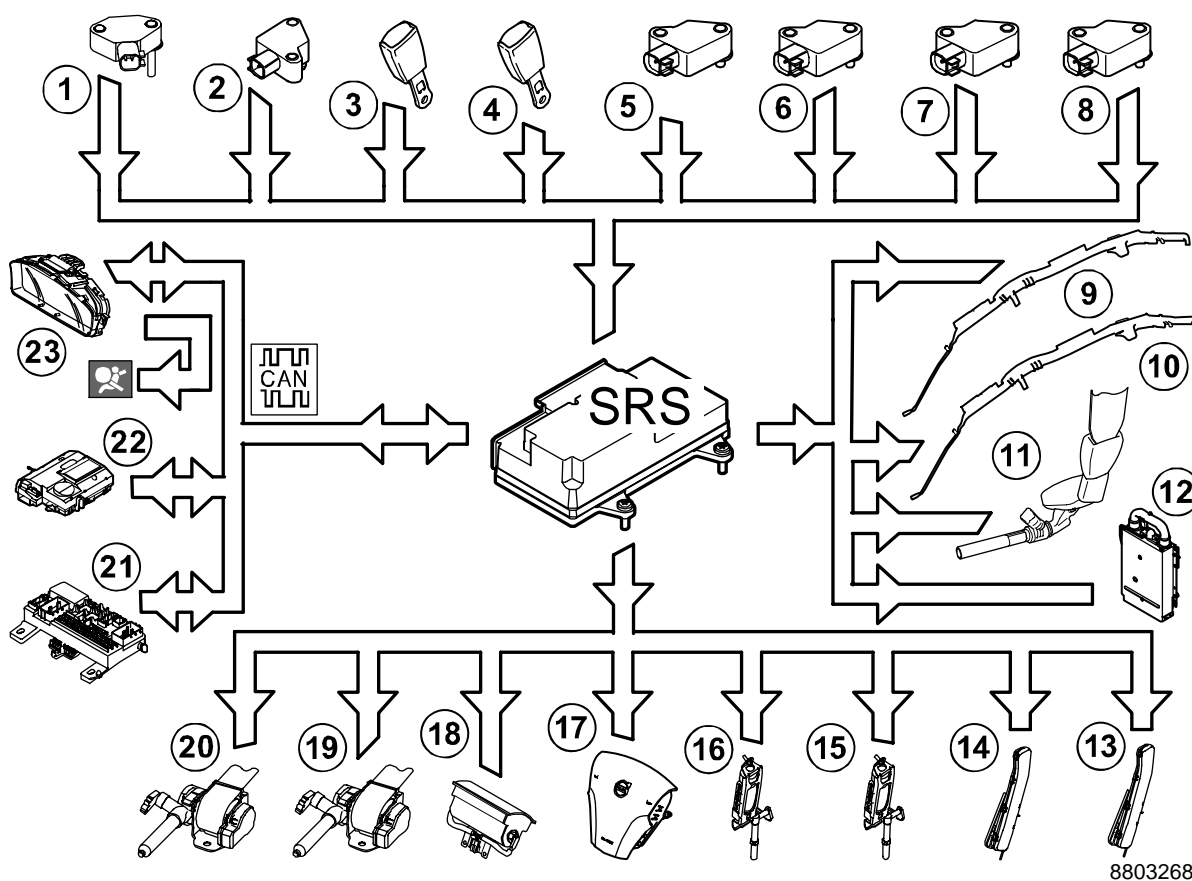
Compared with the S40/V50's Supplemental Restraint System Module (SRS), there are new functions in the new C70.

The control module has both gyro and accelerometers to register if the vehicle starts to overturn (rolling).

In the event of a roll the gyro information is used.

The gyro measures the angle of acceleration and based on this calculates how much the car is tilting.

Both the angle of acceleration and the angle are used as conditions for ROPS deployment.



Signal descriptions (Excluding USA/CDN)

Directly connected input signals

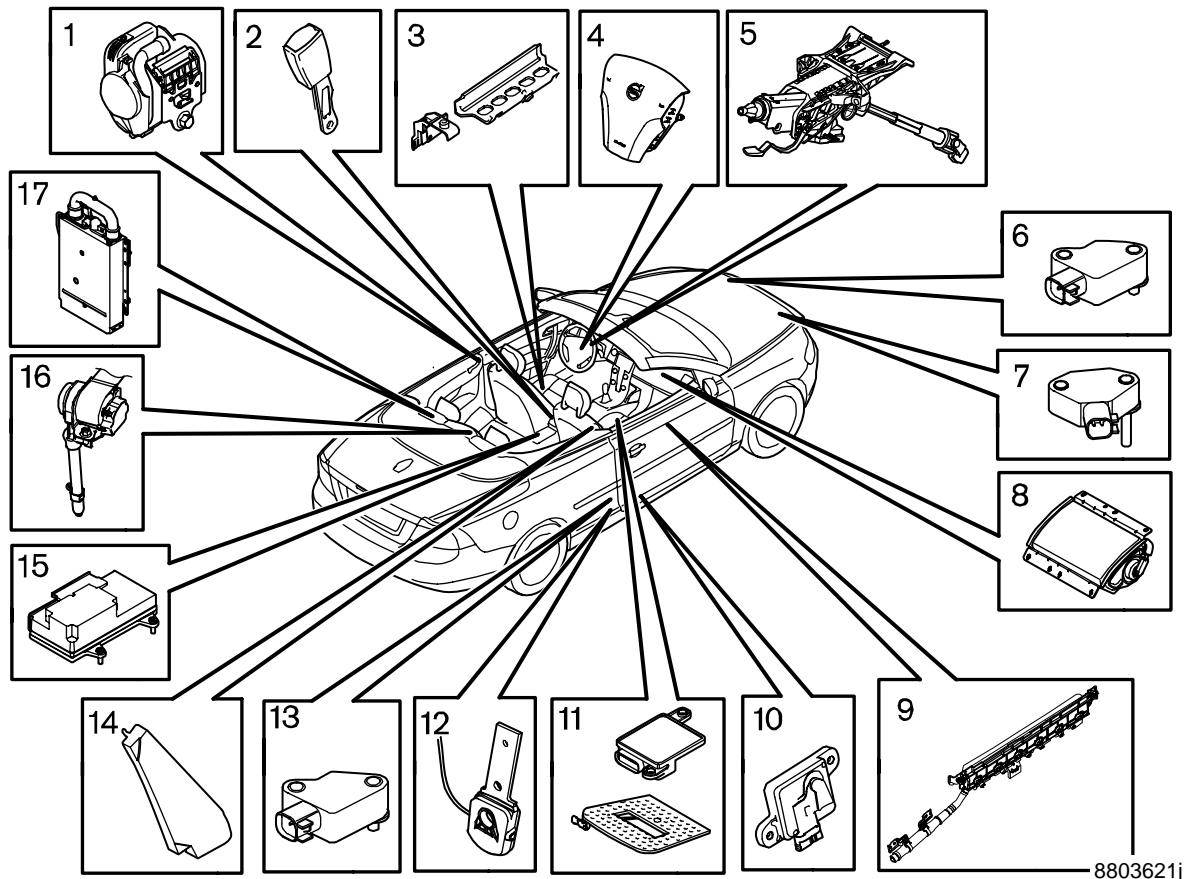
1	Front impact sensor, right-hand front	5	Side impact sensor, left door
2	Front impact sensor, left-hand front	6	Side impact sensor, right door
3	Seatbelt buckle, left front	7	Side impact sensor, left B-pillar
4	Seatbelt buckle, right front	8	Side impact sensor, right B-pillar

Directly connected output signals

9	Inflatable curtain, left door	15	Seatbelt tensioner, right front
10	Inflatable curtain, right door	16	Seatbelt tensioner, left front
11	Hip belt tensioner, driver's seat	17	Airbag, driver's seat
12	ROPS	18	Airbag, passenger seat
13	Side airbag, right-hand side	19	Seatbelt tensioner, right rear
14	Side airbag, left-hand side	20	Seatbelt tensioner, left rear

Signals via CAN communication

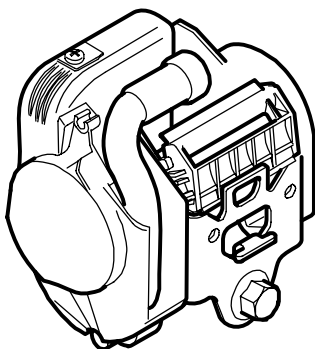
21	Central Electronic Module (CEM)	23	DIM (combined instrument panel)
22	Phone Module (PHM)		



8803621j

Components/Component location, USA/CDN

1	Front seatbelts with pyrotechnic belt tensioners and adaptive pyrotechnic force limiters	10	Side impact sensors in doors
2	Seatbelt buckle, front seats	11	Passenger weight function, OWS (Occupant Weight System)
3	Seat position sensor, front seats	12	Seatbelt tensioner sensor BTS (Belt Tension Sensor), included in OWS
4	Airbag, driver	13	Side impact sensors in B-pillars
5	Adaptive steering column	14	Side airbag, front seats
6	Front impact sensor, left-hand side	15	Supplemental Restraint System Module (SRS)
7	Front impact sensor, right-hand side	16	Rear passenger seatbelts with pyrotechnic seatbelt tensioners
8	Airbag, passenger	17	ROPS (Roll Over Protection System)
9	Door mounted inflatable curtains		



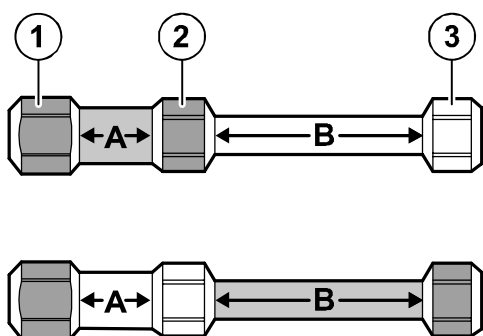
8803622j

Front seatbelts, USA/CDN

In addition to the seatbelt tensioners the front seatbelts for USA/CDN have a 2-stage adaptive force limiter.

The force limiter has two different levels for force limitation.

This is to adapt force limitation to different situations.



8803631j

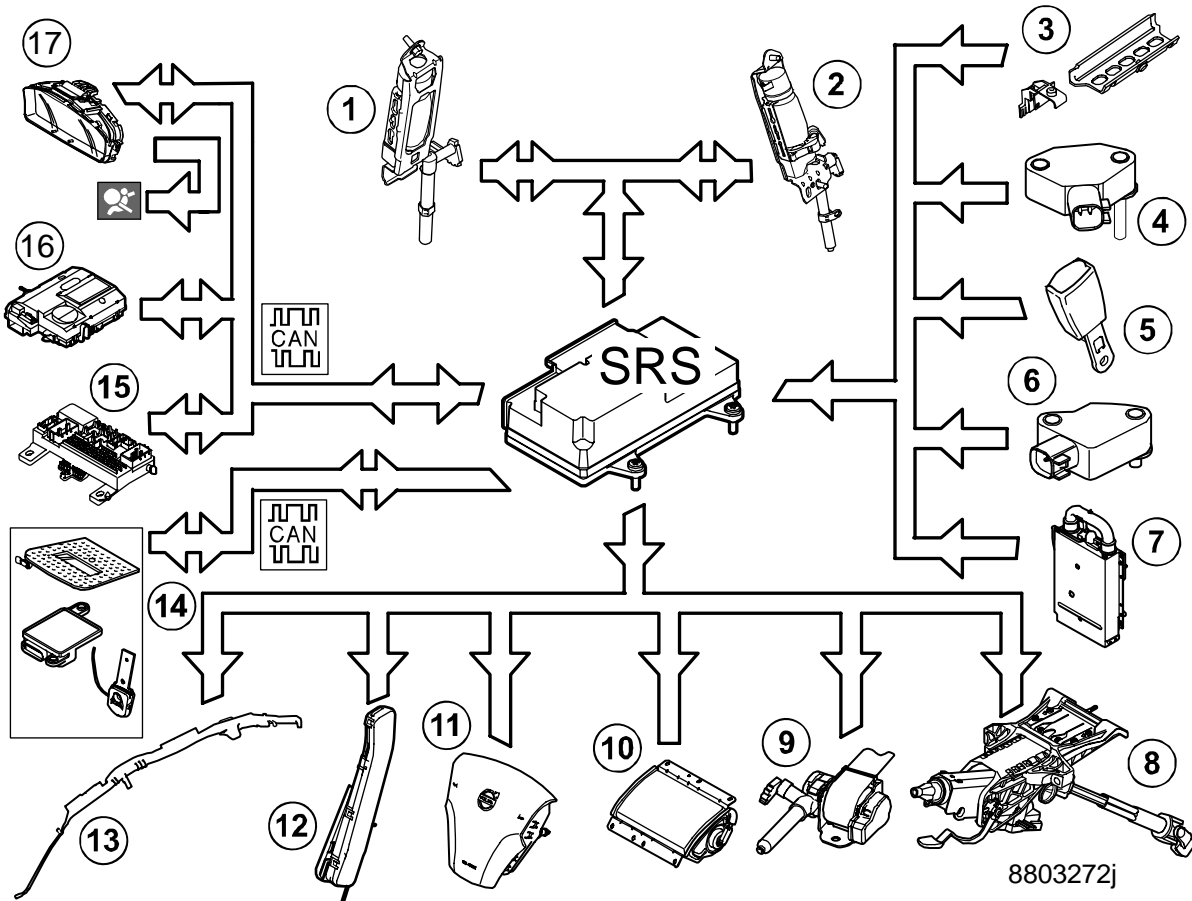
2-stage force limiting function

When the seatbelt tensioner starts the surface **1** is fixed at the lock mechanism located on the belt strap. At the same time the surfaces **2** and **3** are fixed at the centre spindle. This means that surface **A** is used for force limitation.

Shifting to the second stage of force limitation takes place with the deployment of a pyrotechnic charge.

The explosion ejects a lock ring and surface **2** is released from the centre spindle.

Now the force limitation is along the whole torsion rod. As surface **B** is thinner than surface **A** all force is absorbed by surface **B**.



Signal descriptions, USA/CDN

Directly connected input signals

3	Seat position sensor, left-hand/right-hand side	5	Seatbelt buckle, front left-hand/right-hand side
4	Side impact sensors, doors and B-pillars, left-hand/right-hand side	6	Front impact sensor left-hand/right-hand side

Directly connected output signals

1	Seatbelt tensioner and adaptive force limiter, left front	10	Airbag, passenger seat
2	Seatbelt tensioner and adaptive force limiter, right front	11	Airbag, driver's seat
7	ROPS	12	Side airbag, left-hand/right-hand side
8	Adaptive steering column	13	Inflatable curtain, left-hand/right-hand side
9	Seatbelt tensioner, left-hand/right-hand rear		

Signals via CAN communication

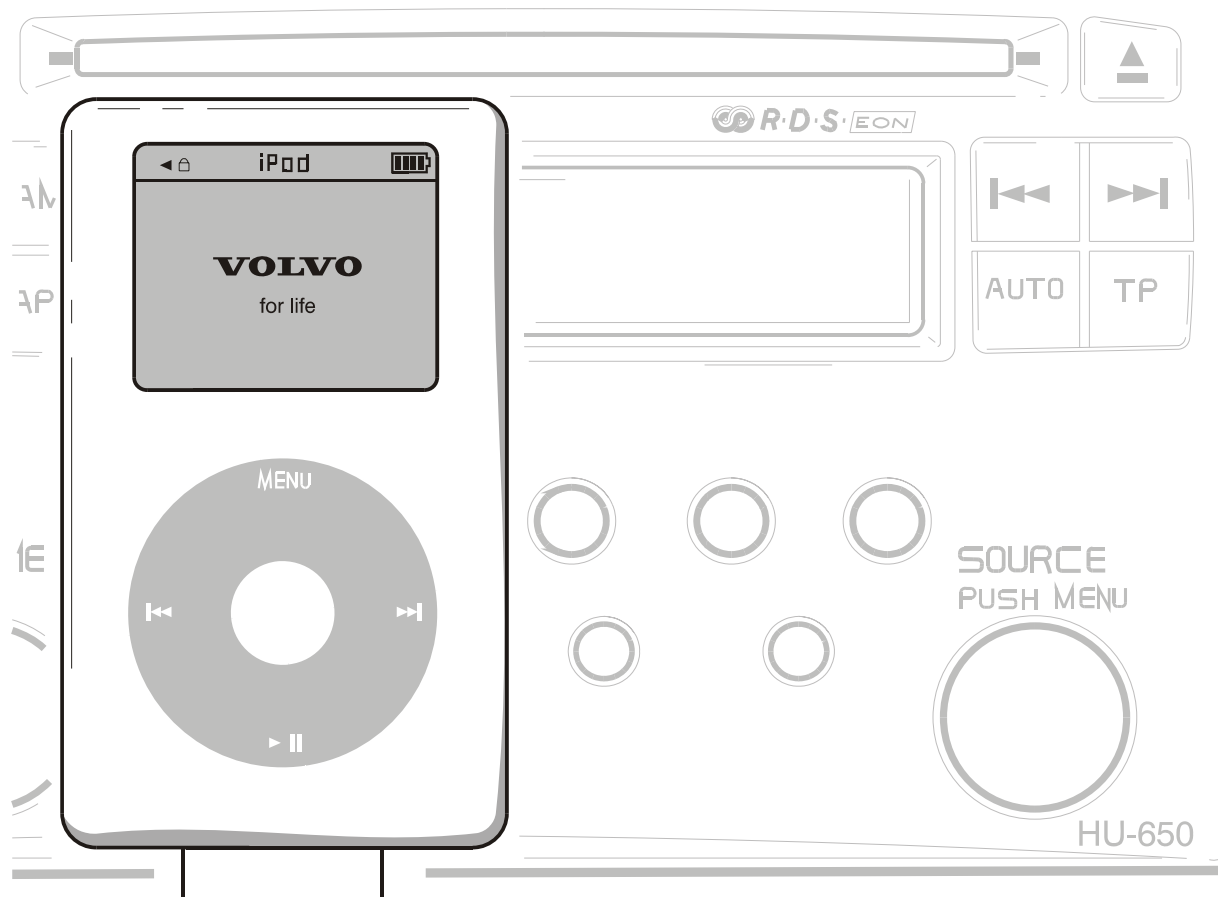
14	Central Electronic Module (CEM)	16	DIM (combined instrument panel)
15	Phone Module (PHM)		

Signals via local CAN-communication (only USA/CDN)

13	Passenger weight sensor (OWS)
----	-------------------------------

Activating the safety systems

System	Activation
Seatbelt tensioner	In the event of frontal and/or side collision and/or in the event of overturning
Airbags	In the event of frontal collision
Side airbag	In the event of side collision
Inflatable curtain	In the event of side collision and/or overturning
WHIPS (Whiplash protection)	In the event of rear end collision
ROPS (Roll-Over Protection System)	In the event of overturning and rear end collision



Accessories

iPod “Plug and Play” Adapter

General

The iPod is a hand-held unit which can be used to save music in different formats such as MP3, AAC, WAV etc. The different file formats can be played back in the car’s audio system by means of Volvo’s iPod adapter with converter. The adapter is connected to the HU unit’s CD changer socket.

iPod adapter

The iPod adapter is suitable for all S60, V70, XC70 and S80 models with Volvo audio systems and it facilitates control and playback of music files from an iPod via the car’s audio system.

The adapter converts the iPod’s output signal to a Melbus signal which can be processed by the HU unit.

Operation

There is access to up to nine playlists using the CD controls on the HU unit.

A playlist can be likened to a “data folder” which can contain a number of music files sorted according to artist or music taste for example.

Each playlist equates to one CD disc in the CD changer. If there are more than 9 playlists in an iPod then these can only be accessed via the tenth list (so-called “All songs list”) which is created by the iPod. This is where all music files available in the iPod are stored as one single playlist.

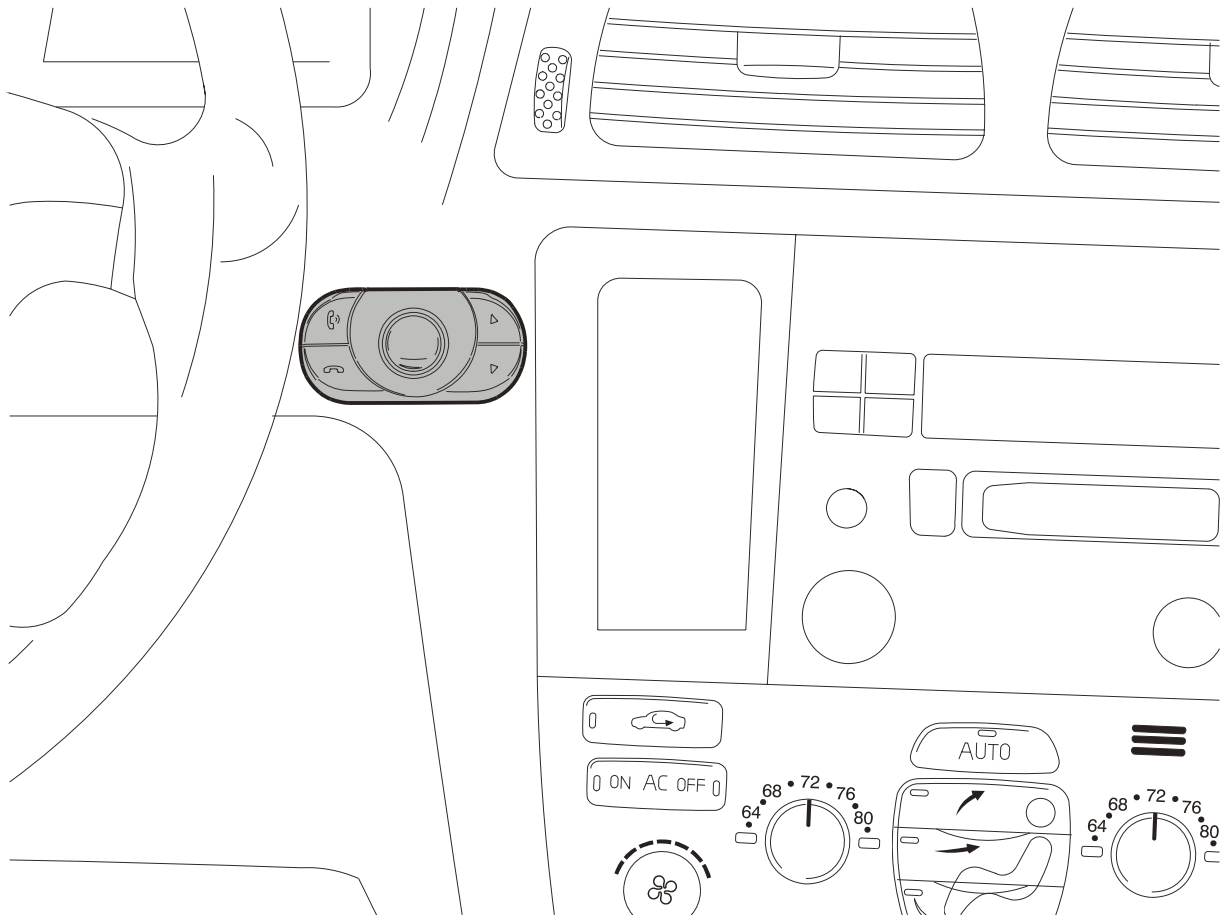
Function

Volvo’s iPod adapter charges the iPod battery during the journey.

The adapter is compatible with most iPods available on the market apart from the Shuffle.

The iPod adapter cannot be used in combination with a separate CD changer or Digital Jukebox because these use the same input and controls on the car’s HU unit.

For further information on the iPod, see: www.ipod.com



Hands Free with Bluetooth

General

“Bluetooth” is a wireless communication standard used to transfer information between transmitters and receivers. The transfer takes place by means of radio waves with a frequency of 2.45 GHz and with a limited range of approx. 10 metres.

“Bluetooth” is the English word for the original Nordic word “blåtand” which comes from the Danish King Harald Blåtand (900s) who succeeded in uniting countries in cooperation instead of warfare by means of good communication.

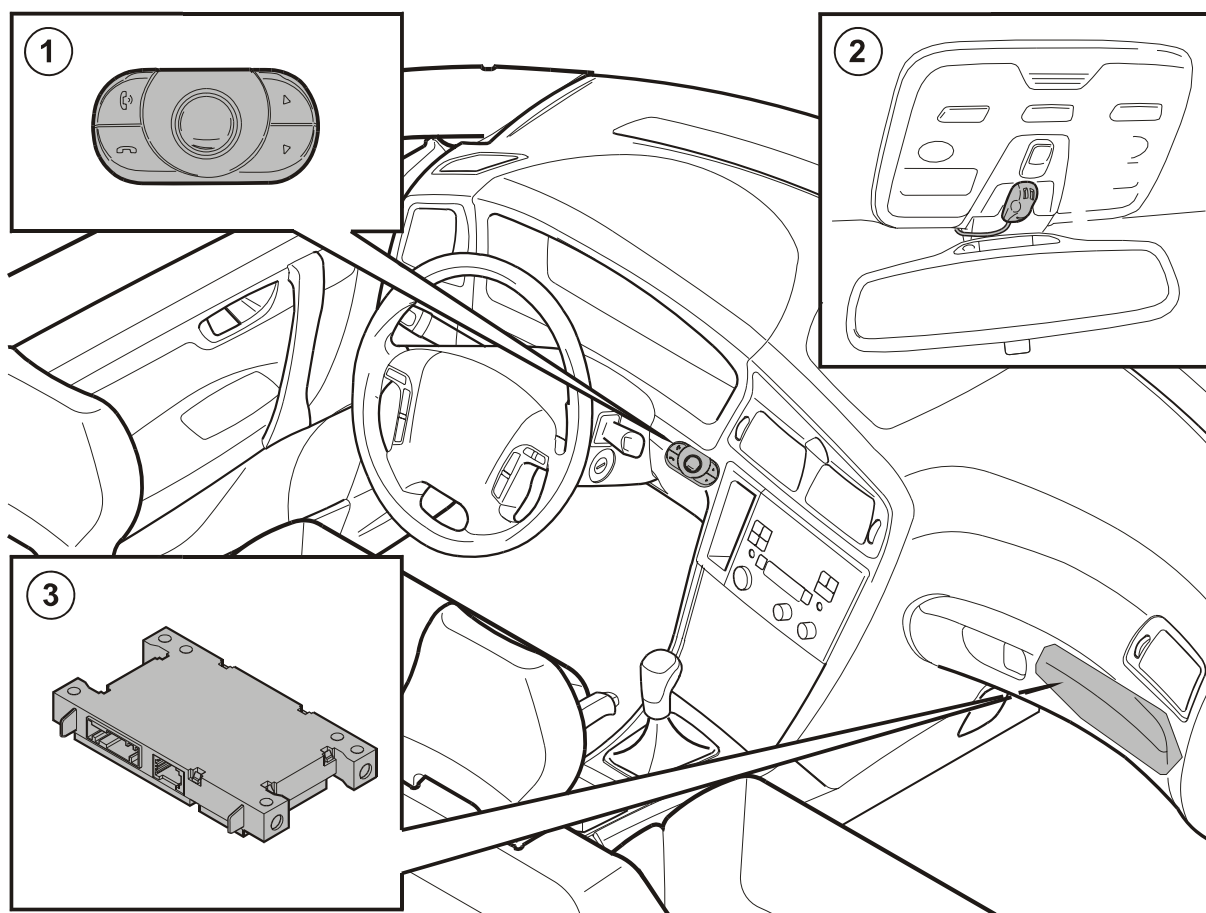
This system enables a wireless connection between mobile phone and the car’s audio system.

A compatible mobile phone must have the Bluetooth function in order to communicate with the receiver in the car.

Information on compatible phones will be available at the local Volvo dealer.

All mobile phone calls are heard through the car’s front speakers and at the same time this mutes the radio and navigation equipment. This provides very good sound quality for the calls.

The system must not be installed in cars equipped with PAS (Parking Assistance System) because the PAS warning signal would be muted in the event of a call using handsfree Bluetooth.



Components

1. UIM (User Interface Module)
2. Microphone with cable
3. Handsfree unit

Operation

Once a mobile phone has been synchronised with the handsfree unit for the first time the system will recognise the mobile phone whenever it is in range of the system. The system then communicates automatically if Bluetooth is activated on the mobile phone and is then ready for use.

The system can be controlled using a voice command of name and number, or using the mobile phone's buttons.

Commands can also be input by means of the buttons on the UIM.

A voice advises of system options and also repeats commands as a checking function.

There is the option to use the commands "help" or "repeat" at any time by means of the voice recognition function.

The "help" function provides voice information on the menu options available in the current situation when the system is active.

The "repeat" function repeats the latest voice information, e.g. available menu option.

For further information on operation, see Motorola's interactive Web page:

<http://motorola.nycd.com/MIM/carkit/1000/index.html>

Function

The control unit is located on the dashboard and is easy to reach from the driver's seat.

The microphone is located centrally by the interior rearview mirror in order to provide optimum sound reproduction for the whole passenger compartment.

The system can process up to 4 Bluetooth equipped mobile phones which also enables passengers to use the system.

Hands Free with Bluetooth will be sold in a basic kit containing Hands Free module, microphone, wiring and control unit, as well as four auxiliary kits depending on car model:

- XC90
- S60/V70/V70XC/S80
- S40/V50 without extra amplifier
- S40/V50 with extra amplifier