HATCHES / FANS

Eleon

Ventilation and emergency escape roof hatch

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1 Introduction

1.1 Content and purpose

This workshop manual is used during service and repair of ventilation and emergency escape hatches (further referred to as roof hatches) Eleon, Eleon Comfort, Eleon Clear and Eleon Clear Comfort.

1.2 Effectivity of the workshop manual

The workshop manual applies to roof hatches listed on the title page of this document.
It may be subjected to modifications and amendments.
The respectively currently effective version is binding.
This version can be found on the Valeo website under Service/Downloads/Hatches-Fans.

1.3 Meaning of highlighted content

Throughout this manual the emphasized words Warning!, Caution!, ATTENTION: and NOTE: used as follows:

- **Warning!** - Danger to life and health!
  This caption is used to indicate possible severe injuries or fatal accidents if instructions or procedures are carried out incorrectly or entirely disregarded.

- **Caution!** - Hazardous to health!
  This caption is used to indicate possible minor injuries if instructions or procedures are carried out incorrectly or entirely disregarded.

- **ATTENTION:**
  This caption points to actions which may cause material damage.

- **NOTE:**
  This caption is used to draw attention to an important feature.

1.4 Symbols

Symbol tightening torque value:
Identifies in graphics parts (eg nuts, bolts) that are to be mounted with a specific tightening torque. The torque values are shown at the symbol and are binding.

1.5 Further documentation to be used

The use of additional service literature is required.
References are provided in the workshop manual at appropriate locations.
Use the following documents during operation and service of the roof hatches:
- Operating instructions
- Installation instructions
- Technical information (TI)
- Spare parts list

1.6 Safety information and regulations

Basically, general accident prevention provisions and the valid industrial safety directions must be adhered to.
"General Safety Regulations" which exceed the framework of these provisions are listed below. The specific safety regulations which affect the present manual are issued highlighted in the individual sections or procedures.

1.6.1 General safety regulations

When working on the bus roof or on any hoisting equipment, scaffolding etc. suitable safety precautions must be taken to prevent falls.

- **Warning!** - Danger to life and health!

Read the Eleon Series Operating instructions before operating the roof hatch for first time.
Familiarize yourself with the Eleon Series Installation instructions before you make any modifications to the existing roof hatch installation.

- **NOTE:**
  The Eleon Operating Instructions contain safety
instructions and regulations to be followed for safe operation of the roof hatch.

The Eleon Installation instructions contain the statutory regulations and other safety hints and regulations for the proper installation of the roof hatch(es).

1.7 Suggestions for improvement and change

Please direct any complaints, improvement or modification suggestions regarding this manual to:

service-valeobus@valeo.com
# Technical Data

The following table contains the technical data of the individual versions of the Eleon series.

<table>
<thead>
<tr>
<th>Table 201 Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hatch cover dimensions (mm)</strong></td>
</tr>
<tr>
<td>(A) 1092 x (B) 777</td>
</tr>
<tr>
<td><strong>Hatch, interior opening (mm)</strong></td>
</tr>
<tr>
<td>(E) 68 / (F) 144</td>
</tr>
<tr>
<td><strong>Vent gap (mm)</strong></td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
</tr>
<tr>
<td><strong>Operating voltage (V)</strong></td>
</tr>
<tr>
<td><strong>Quiescent current</strong></td>
</tr>
<tr>
<td><strong>Glass</strong></td>
</tr>
<tr>
<td><strong>Fuse (A)</strong></td>
</tr>
<tr>
<td><strong>Emergency exit approval acc. to</strong></td>
</tr>
<tr>
<td><strong>Fire resistance approval acc. to</strong></td>
</tr>
<tr>
<td><strong>EMC approval acc. to</strong></td>
</tr>
<tr>
<td><strong>UN ECE R.10.05</strong></td>
</tr>
</tbody>
</table>
3 Description of assemblies and components

The roof hatches of the Eleon series are used for ventilation of the interior in city buses, coaches and intercity buses as well as for the emergency exit of persons in case of danger.

The roof hatches essentially consist of
- the frame
- the lifting mechanisms
- the control unit (electrical operated hatches only)
- the cover, and
- the interior trim.

For arrangement of the individual components, see Fig. 303 and Fig. 304.

3.1 The frame

The frame consists of the 4 corner parts, which are connected by 2 short and 2 long profiles (see Fig. 303). The frame is the main structural element of each roof hatch. By means of it the roof hatch is attached to the bus structure. The frame accommodates the lifting mechanisms, the roof hatch seal and, in the case of the electrical versions, the control unit and the wiring harness.

3.2 The lifting mechanisms

The 4 lifting mechanisms of each roof hatch make possible to open it at the front, at the rear, and both - at the front and rear. Each mechanism is connected by means of a cover carrier with the hatch cover.

Manually operated lifting mechanism (Fig. 301)

When opening and closing the hatch, tension or pressure is exerted on the cover carrier of the lifting mechanism via the handle on the hatch cover. This causes a folding or unfolding of a lever assembly.

Electrically operated lifting mechanism (Fig. 302)

Each of the lifting mechanisms raises or lowers a cover carrier, while the in direction of travel front and / or rear lifting mechanisms work synchronously. The cover carriers are attached to the hatch cover. In principle, an electric motor generates a linear movement via a spindle. This is converted via levers in a lifting or lowering movement of the cover carrier.
Hatch with plastic/glass cover - manually operated:

1. Frame
2. Lifting mechanism, manually operated

Hatch with plastic/glass cover - electrically operated:

1. Frame
2. Lifting mechanism, electrically operated
3. Wiring harness
4. Control unit

Fig. 303 Eleon hatches - components (part 1)
Hatch with plastic cover:

1. Seal
2. Cover carrier, upper part (4)
3. Cover carrier, lower part (4)
4. Retaining clip (4)
5. Screw (8)
6. Cover body
7. Emergency handle, outer
8. Gasket ring
9. Emerg. handle, inner
10. Screw
11. Covering

Hatch with glass cover:

1. Seal
2. Cover carrier, upper part (4)
3. Cover carrier, upper part (4)
4. Retaining clip (4)
12. Glass
13. Edge rubber
14. Screw, plastic (4)
15. Gasket ring
16. Gasket ring
17. Handle (2)
18. Gasket, handle (4)
19. Screw, handle (4)

Fig. 304 Eleon hatches - components (part 2)
3.3 Control unit

The motors of the lifting mechanisms are controlled by the control unit (Fig. 305).

![Control unit diagram]

The control unit evaluates the current consumption of the individual motors and generates appropriate switching signals.

3.4 Hatch cover

**Plastic hatch cover**
The cover consists of two glued half shells. The bottom shell has a compartment with a cover. In this compartment, behind the cover is a red emergency opening lever. The wires of the emergency release are integrated in the cover and can not be replaced separately (only version with emergency release). Furthermore, at the front and rear of the lower shell are recessed grips embedded. The top has a red handle in a hollow for emergency opening of the hatch from the outside.

**Glass hatch cover**
The cover is made of single-pane safety glass. At the underside of the hatch cover, the holder for the emergency hammer is centered mounted (only variants with emergency hammer). In the manual version, a handle is bolted to the underside of the hatch cover at the front and rear.

3.5 Interior trim

The interior trim is used to cover the roof cutout. It is bolted to the aluminum frame or secured by special retaining clips. It is removed for service and repair work on the hatch. The main components of the hatch are then accessible.
Hatch functions

4.1 Eleon and Eleon Clear

These hatches are operated by hand. They can be opened at the front side and / or at the rear.

**NOTE:**
The Eleon ventilation and emergency escape hatch Operating instructions contain safety instructions and other information about operating the hatch.

The hatch cover is attached to 4 lifting mechanisms: two at the front and two at the rear side. By a force on the front handle upwards, in the two front lifting mechanisms lever arrangements are deployed upward - the front part of the hatch cover is raised.

Each lifting mechanism contains a tension spring. When opening the hatch, the spring force must first be overcome. After exceeding the dead point (toggle action principle), the spring supports the opening process and ensures that the hatch remains in the open state.

Conversely, when pulling the front handle of the open hatch, the lever linkage of the two front lifting mechanisms is folded down together. The opening force created by the spring must first be overcome until the hatch is pulled into the closed position. The closing pressure ensures a tight fit of the hatch cover on the seal in the closed position.

4.2 Eleon Comfort and Clear Comfort

These hatches are electrically operated and controlled via a control panel (Driver Unit via S-Bus), switch with operating display or CAN bus. They can be opened at the front side and / or at the rear.

**NOTE:**
The Eleon ventilation and emergency escape hatch Operating instructions contain safety instructions and other information about operating the hatch.

The hatches have an opening mechanism in each corner of the frame with electric motor, gear and lever mechanism. Each of the lifting mechanisms raises (opening) or lowers (closing) a cover carrier, while the in direction of travel front and / or rear lifting mechanisms work synchronously.

The cover carriers are attached to the hatch cover. An electric motor generates a linear movement via a spindle. This is converted via levers in a lifting or lowering movement of the cover carrier.

4.2.1 Control unit

The control of the 4 mutually independent lifting mechanisms with one motor each is done by the controller.

There are 3 control unit variants. They differ by the operating voltage range and the communication interface to the vehicle.

<table>
<thead>
<tr>
<th>Variant</th>
<th>Designation</th>
<th>Voltage</th>
<th>Possible control sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CAN 24V</td>
<td>X</td>
</tr>
<tr>
<td>Variant I</td>
<td>S bus 12V</td>
<td>12V</td>
<td>X X</td>
</tr>
<tr>
<td>Variant II</td>
<td>S bus 24V</td>
<td>24V</td>
<td>X X</td>
</tr>
</tbody>
</table>

The two control inputs of the control unit have two functions:

1. Variant I has inputs for addressing the CAN bus messages. As a result, on one CAN bus can be controlled up to four roof hatches independently of each other.
2. Variant II and III have switch inputs. If a control voltage is present at the input, the roof hatch is raised at the front or at the rear.

4.2.2 Control principle

The motors M1 and M4 control the front lifting mechanisms and the motors M2 and M3 the rear lifting mechanisms.

Since the motors are designed for a nominal voltage of 12V, the motors are operated with a PWM frequency at which the effective voltage is limited. The two lifting mechanisms at front and rear are always controlled simultaneously.
If the lifting mechanism is activated, the motor current is continuously monitored. If the motor current increases strongly, the motors are switched off. If the end position is not reached within a certain time window, the motor is also switched off.

### 4.2.3 Operating indicator

The hardware versions II and III have a lamp output which reflects the condition of the roof hatch. If the roof hatch is closed, the operating indicator is off. When the roof hatch is open, the operating indicator is switched on. If an error occurs, a flash code is generated. For variant I, this operating indicator output is not available, here all information is transmitted via the CAN bus.

![Flash code output](image)

**Fig. 401 Flash code at the operating indicator**

<table>
<thead>
<tr>
<th>Flash code</th>
<th>Description of malfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Control unit malfunction (hardware CD defective)</td>
</tr>
<tr>
<td>1</td>
<td>Low voltage or overvoltage</td>
</tr>
<tr>
<td>2</td>
<td>Malfunction of one of the 4 drive units</td>
</tr>
</tbody>
</table>
### 4.2.4 Control sequence

Depending on the desired hatch position there are different functional sequences. In order to reduce bending of the hatch cover and mechanical stresses within the lifting mechanisms, first one side of the hatch is slightly raised before the opposite side moves up (for sequence, see table). When closing this step is omitted.

<table>
<thead>
<tr>
<th>Control sequence</th>
<th>Open hatch front side (ca. 15s)</th>
<th>Open hatch rear side (ca. 15s)</th>
<th>Open hatch completely (ca. 30s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Rear part lifts slightly</td>
<td>Front part lifts slightly</td>
<td>Rear part lifts slightly</td>
</tr>
<tr>
<td></td>
<td>![Diagram 1]</td>
<td>![Diagram 2]</td>
<td>![Diagram 3]</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Front part opens completely</td>
<td>Rear part opens completely</td>
<td>Front part opens completely</td>
</tr>
<tr>
<td></td>
<td>![Diagram 4]</td>
<td>![Diagram 5]</td>
<td>![Diagram 6]</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Rear part lowers again</td>
<td>Front part lowers again</td>
<td>Rear part opens completely</td>
</tr>
<tr>
<td></td>
<td>![Diagram 7]</td>
<td>![Diagram 8]</td>
<td>![Diagram 9]</td>
</tr>
</tbody>
</table>
# 5 Troubleshooting

## 5.1 General

**ATTENTION:**
Prior to replacing a fuse, troubleshooting needs to be performed. The hatch must be disconnected from the vehicle electrical system. A properly dimensioned fuse must be inserted (see chapter 6 Wiring diagrams).

After each error correction a functional test must be performed in the vehicle.

## 5.2 General error symptoms

The following table lists possible, general error symptoms.

<table>
<thead>
<tr>
<th>Kind of operation</th>
<th>Error symptom</th>
<th>Possible cause</th>
<th>Error correction</th>
</tr>
</thead>
</table>
| electrically      | hatch does not open / close | no power supply | - switch on vehicle main switch  
- check fuse, replace if necessary  
- examine contacts, replace if necessary  
- corrosion on plugs  
- loose plug connections  
- crimp failures on plugs and/or pins  
- corrosion on cable and fuses  
- corrosion on battery terminals  
- cable insulation damage  
- damage to contacts due to frequent plugging in and out.  
- measure voltage on the control device input |
| cable disconnected or damaged | - check cable connection between lifting mechanism and control unit, replace if necessary |
| lifting mechanism runs asynchronously | - check if a lifting mechanism is blocked or if a motor is defective, manual operation possible (see 5.6) |
| control unit defective | replace control unit |

- Continued on next page -
<table>
<thead>
<tr>
<th>Kind of operation</th>
<th>Error symptom</th>
<th>Possible cause</th>
<th>Error correction</th>
</tr>
</thead>
</table>
| **electrically**  | movement stops repeatedly | sluggishly | - check mechanical components for sluggishness, replace if necessary  
- Check if cover is mechanically blocked |
|                   |              | plug connection to the lifting mechanism defective | Check connector and contacts, replace if necessary |
|                   |              | cable damaged | Check cable and replace if necessary |
|                   |              | alternating voltage interruptions, operating voltage not stable | - check operating voltage  
- Check connector and contacts, repair if necessary |
|                   |              | lifting mechanism defective or too sluggish | replace lifting mechanism |
|                   |              | control unit defective | replace control unit |
| **manually / electrically** | ingress of moisture while hatch is closed | hatch seal defective, permeable or worn | replace seal |
|                   |              | moisture ingress via external emergency lever | install new emergency handle lock and actuation cables |
|                   |              | lifting mechanism defective | replace lifting mechanism |
| **manually**      | noises       | defective mechanism or parts thereof | - check individual parts of the mechanism for damage  
- missing safety pin |
|                   | hatch does not open / close or end position not stable | lifting mechanism defective | check levers and spring for damage |
5.3 Functional check of the hatch

5.3.1 Roof hatch - operated manually

1. Open hatch front side
   The hatch cover must be able to open at the front side evenly, without unilateral resistances, without abnormal noises and horizontally. After that, the cover is open at front side about 7cm.
2. Open rear side
   The hatch cover must be able to open at the rear side evenly, without unilateral resistances, without abnormal noises and horizontally. After that, the cover is at all sides about 7cm open.
3. Close front side
   The hatch cover must be able to close at the front side evenly, without unilateral resistances, without abnormal noises and horizontally.
4. Close rear side
   The hatch cover must be able to close at the rear side evenly, without unilateral resistances, without abnormal noises and horizontally.

5.3.2 Roof hatch - operated electrically

1. Check the control sequence of the roof hatch (see 4.2.4). Pay attention to the following:
   – The hatch cover moves smoothly, without any stoppages and abnormal noises into the desired position.
   – The motors 1/4 and 2/3 work synchronously.
   – The operating indication (depending on the variant) corresponds to the position of the hatch cover.
   – The opening gap at the front / rear or on all sides is approx. 6cm.
2. When closed, the hatch cover sits evenly close on the hatch seal on all sides.

5.4 Visual inspection of a lifting mechanism

5.4.1 Lifting mechanism - operated manually

1. Remove lifting mechanism from hatch (see 8.5).
2. Check all moveable parts for damage and their correct arrangement and bearing.

5.4.2 Lifting mechanism - operated electrically

1. Remove lifting mechanism from hatch (see 8.5).
2. Check all moveable parts for damage and their correct arrangement and bearing.
3. Are the plug and the cables to the motor visible damaged?
4. Check the correct position of the spindle and its condition (corrosion, mechanical damage, dirt deposit).

5.5 Checking the motor of a lifting mechanism

1. Remove lifting mechanism from hatch (see 8.5).
2. Inspect the mechanism visually (see 5.4.2).
3. Test the motor by applying 12V DC with a duration of max. 5s (Attention, also the 24V variant). Check both directions of rotation by reversing the polarity. In the event of a malfunction, replace the lifting mechanism.

5.6 Manual adjustment of the electrically operated lifting mechanism

The height of the cover carrier of a lifting mechanism can be readjusted manually in each of the end positions. Proceed as follows:

1. Disconnect the roof hatch from the vehicle electrical system.
2. Remove the screws securing the hatch interior trim and remove the trim.
3. Locate the hole in the bottom of the lifting mechanism (see Fig. 501), insert an Allen wrench (6mm) and turn it in the desired direction - clockwise - cover carrier moves down - counterclockwise - cover carrier moves up.

   **NOTE:**
   Consider the mark on the hole for the Allen wrench.
4. Reconnect the roof hatch from to the vehicle electrical system.
5. Check the correct function of the hatch.
6. Place the interior trim into position and secure using screws.
Fig. 501 Manual readjustment
6 Wiring diagrams

6.1 General

The following illustrations show the wiring variants of the electrically operated roof hatch to the vehicle electrical system as well as the connector pin assignment.

Fig. 601 - Connector data and pin assignment / hatch and motor numbering
Fig. 601 - Wiring diagram 1..4 roof hatches using switches
Fig. 601 - Wiring diagram 1..4 roof hatches via S bus using control panel "Driver unit"
Fig. 601 - Wiring diagram 1..4 roof hatches via CAN bus
### Mating plug / Gegenstecker

![Connector and wiring diagram](image-url)

**Table pinning / Tabelle Pinbelegung**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connector A (vehicle)</th>
<th>Connector B (roof hatch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cl. 30, plus / Kl. 30, Plus</td>
<td>M1, Motor front right (red)</td>
</tr>
<tr>
<td>2</td>
<td>Cl. 31, ground / Kl. 31, Masse</td>
<td>M2, Motor rear right (red)</td>
</tr>
<tr>
<td>3</td>
<td>A0 address input / A0 Adresseingang</td>
<td>M3, Motor front left (red)</td>
</tr>
<tr>
<td>4</td>
<td>A1 address input / A1 Adresseingang</td>
<td>M1, Motor front left (red)</td>
</tr>
<tr>
<td>5</td>
<td>CAN-H input / CAN-H ankommen</td>
<td>M1 / M2 (black)</td>
</tr>
<tr>
<td>6</td>
<td>CAN-L input / CAN-L ankommen</td>
<td>M3 / M4 (black)</td>
</tr>
<tr>
<td>7</td>
<td>CAN-H output / CAN-H abgehend</td>
<td>--</td>
</tr>
<tr>
<td>8</td>
<td>CAN-L output / CAN-L abgehend</td>
<td>--</td>
</tr>
<tr>
<td>9</td>
<td>120R-CAN-H not used / nicht belegt</td>
<td>--</td>
</tr>
</tbody>
</table>

*Wire size 0.75 ... 1mm² / Leitungsquerschnitt  0.75 ... 1mm²*

*Wire size cl. 30 and cl. 31 1.5 ... 2.5mm² / Leitungsquerschnitt Kl. 30 und Kl. 31 1.5 ... 2.5mm² (*)

*Number of contact durability: 10 / Anzahl der Steckzyklen: 10*

(*) Ab Leitungslänge ? m sind 2,5mm² erforderlich

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The table above lists the pin assignments for the connector, where each pin is associated with a specific function and connection to the vehicle or roof hatch. The connector details and pinout are provided for proper installation and functionality. The diagram illustrates the connection points and the direction of travel for the roof hatches.
Fig. 601 Wiring diagram 1..4 roof hatches using switches
Ventilation and emergency escape hatches

6 Wiring diagrams

Fig. 601 Wiring diagram 1..4 roof hatches via S bus using control panel “Driver unit”
Ventilation and emergency escape hatches

6 Wiring diagrams

Fig. 601 Wiring diagram 1..4 roof hatches via CAN bus

Legend:
- cl. 30/31  clamp 30/31
- F1  Fuse in accordance with ISO 8820-3
- CAN  Communication

- Kl. 30/31  Klemme 30/31
- F1  Sicherung gemäß ISO 8820-3
- CAN  Kommunikation
7 Servicing

7.1 General

The safety information and regulations in Chapter 1 (see 1.6) must be adhered.

The scope of service work on the roof hatches is limited to their cleaning.

7.2 Cleaning of the roof hatches

Before the roof hatch is cleaned from the outside, it is advisable to open and close the roof hatch completely to ensure that the roof hatch is completely closed.

The cleaning of the roof hatch may be carried out as for the other similar external surfaces of the bus and by the same means as e.g. for windows with seals.

Further information can be found in the section Exterior cleaning of the bus in the service documentation of the vehicle manufacturer.
8 Components removal and installation

8.1 General

**Warning!** Danger to life and health!

The safety information and regulations in Chapter 1 (see 1.6) must be adhered.

**ATTENTION:**
Prior to disassembling components the hatch must be disconnected from the vehicle electrical system

**NOTE:**
If components are disassembled to a degree not covered in this workshop manual, any warranty claim shall be voided.
Only genuine Valeo spare parts should be used.

Symbol tightening torque value:
Identifies in graphics parts (eg nuts, bolts) that are to be mounted with a specific tightening torque. The torque values are shown at the symbol and are binding.
Hatch with plastic/glass cover - manually operated:
1  Frame
2  Lifting mechanism, manually operated

Hatch with plastic/glass cover - electrically operated:
1  Frame
2  Lifting mechanism, electrically operated
3  Wiring harness
4  Control unit

Fig. 801 Eleon hatches - Components (part 1)
Hatch with plastic cover:

1. Seal
2. Cover carrier, upper part (4)
3. Cover carrier, lower part (4)
4. Retaining clip (4)
5. Screw (8)
6. Cover body
7. Emergency handle, outer
8. Gasket ring
9. Emerg. handle, inner
10. Screw
11. Covering

Hatch with glass cover:

1. Seal
2. Cover carrier, upper part (4)
3. Cover carrier, upper part (4)
4. Retaining clip (4)
12. Glass
13. Edge rubber
14. Screw, plastic (4)
15. Gasket ring
16. Gasket ring
17. Handle (2)
18. Gasket, handle (4)
19. Screw, handle (4)
8.2 Seal removal and installation

Removal
1. Open the roof hatch completely.
2. Remove the seal (1, Fig. 802) from its groove in the frame (1, Fig. 801) by pulling it upward all around the roof hatch.
3. Lift one end of the seal loop onto the top of the cover and remove the seal from the roof hatch.

Installation
1. Clean the groove.
2. Place the new seal (1, Fig. 802) onto the hatch frame. Locate the seal so that the vulcanized seam is in the first quarter of a long frame side, the seal lip must point outwards (see Fig. 803).
3. Then, install the seal into all 4 corners so that the seal is stretched evenly.
4. Install the remaining seal into the groove.

**NOTE:**
Make sure that the seal is pressed to the bottom of the groove.

**NOTE:**
If the loop is too long or too short, loosen the seal from the groove at the area were the length needs to be readjusted. Depending on the length pull or push the seal and re-install it into the groove.

5. After the assembly of the seal, operate the roof hatch through its full cycles a couple of times and check that the seal stays in its groove.

**NOTE:**
A water leakage test is recommended to be done after installing a new seal.

8.3 Cover assembly removal and installation (glass cover)

Removal
1. Open the roof hatch completely.
2. Pull retaining clips (4, Fig. 802) from all 4 cover carriers (2, 3).
3. Remove cover assembly.

Installation
1. Position cover assembly onto the lower parts (3, Fig. 802) of the cover carriers.
2. Starting at a corner, use one hand to connect the cover carrier (2, 3) and use the other hand to insert the retaining clip (4) into the cover carrier.
3. Repeat the procedure on the remaining cover carriers.

**NOTE:**
Make sure all retaining clips (4) are installed properly. They must be pushed to bottom and from correct direction.
8.4 Cover assembly removal and installation (plastic cover)

Removal
1. Open the roof hatch completely.
2. Disconnect cover assembly from the lower parts (3, Fig. 802) of the cover carriers.
   Roof hatch without emergency opening system:
   - Pull retaining clips (4) from all 4 cover carriers.
   Roof hatch with emergency opening system:
   - Turn the emergency opening lever (9) from the inside clockwise until the stop.
3. Unhook safety rope (Fig. 804) from its holder.
   Hold the hatch cover as close to the frame as possible to facilitate unhooking of the safety rope.
4. Remove the hatch cover.

Installation
1. Hook in the safety rope (Fig. 804) into the holder.
2. Position cover assembly onto the lower parts (3, Fig. 802) of the cover carriers.

8.5 Lifting mechanism removal and installation

Removal
1. Open the roof hatch completely.
2. Unplug the plug to the motor (see Fig. 302, electrically operated opening mechanisms only).
3. Pull retaining clip (4, Fig. 802) out from the cover carrier (2, 3).
4. Insert disassembly tool P/N 8610291 into the both holes at the bottom of the lifting mechanism (see Fig. 806).
5. Push the tool up and simultaneously slide the mechanism in the direction of the motor connector.

Note:
By the disassembly tool two locking tabs (see Fig. 302) are pushed upwards, which allows the sliding out of the complete lifting mechanism from its holder.

Installation
6. Once the release mechanism has moved slightly, remove the disassembly tool.
7. Pull the lifting mechanism completely out of its holder and remove it downwards out of the frame.
Installation
1. Insert the lifting mechanism (2 or 3, Fig. 801) from below into the corner section and push it in the direction of the corner until it snaps into place.
2. Position the lower part of the cover carrier (3, Fig. 802) onto the ball head of the lifting mechanism and place the upper part of the cover carrier (2) onto it.
3. Insert retaining clip (4) into the cover carrier.

NOTE:
For hatches with plastic cover, pay attention to the installation direction of the clip (emergency release).
4. Connect motor plug (electrically operated opening mechanisms only).
5. After installation of the lifting mechanism, open and close the hatch several times and check that the lifting mechanism works correctly.

8.6 Control unit removal and installation

Removal
1. Disconnect hatch from vehicle electrical system, for example pull F1 fuse (see chapter 6).
2. By means of a for example screwdriver, push in the locking tab on top of the control unit bracket (see Fig. 305) and pull out the control unit (5, Fig. 801) downwards.
3. Disconnect the two plugs from the control unit.

Installation
1. Plug the two connectors (see Fig. 305) into the control unit.
2. Slide control unit upwards into its bracket until it snaps into place.
3. After installation of the control unit, open and close the hatch several times and check that the hatch works correctly.
8.7  Wiring harness removal and installation

**Removal**
1. Open the roof hatch completely.
2. Remove the control unit (see 8.6).
3. Disconnect all motor connectors (see Fig. 302).
4. Start with detaching the cable harness (4, Fig. 801) from the two corner pieces and lift the cable straight up.
5. Continue with detaching the cable harness from the aluminium profile groove.
6. Remove wiring harness from hatch frame.

**Installation**
1. Install the control unit (see 8.6).
2. Connect all motor connectors (see Fig. 302).
3. Insert the wiring harness in the guides of the corner pieces and in the groove of the aluminium profile (see Fig. 807).
4. After installation of the wiring harness, open and close the hatch several times and check that hatch works correctly.

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8.8  Emergency hammer removal and installation

This procedure is only necessary if the hammer bracket is damaged or missing.

**Removal**
1. Remove the seal.
2. Take the hammer from its bracket.
3. Remove bracket from hatch cover.
4. Remove adhesive residue from the hatch cover.

**Installation**
1. Remove the protective foil from the adhesive tape on the bottom of the bracket.
2. Identify the glue mark for the bracket on the hatch cover.
3. Press bracket with at least 100N for at least 3s onto the cover.
4. Install hammer into the bracket.
5. Install seal.
9 Modifications and retrofits

For further optimization the roof hatches are continuously improved. Units in the field can usually be upgraded or retrofitted. For this purpose respective modification kits will be available. Information can be found on the Valeo homepage under Service.
10 Packing/storage/shipping

10.1 General

The roof hatch or its components, which are sent to Valeo for inspection or repair, must be cleaned and packaged to ensure that handling, transport and storage will not damage them.