



DESCRIPTIONS 70 FITTINGS 7030 SUN ROOF/GLASS PANEL GLASS ROOF

GLASS ROOF

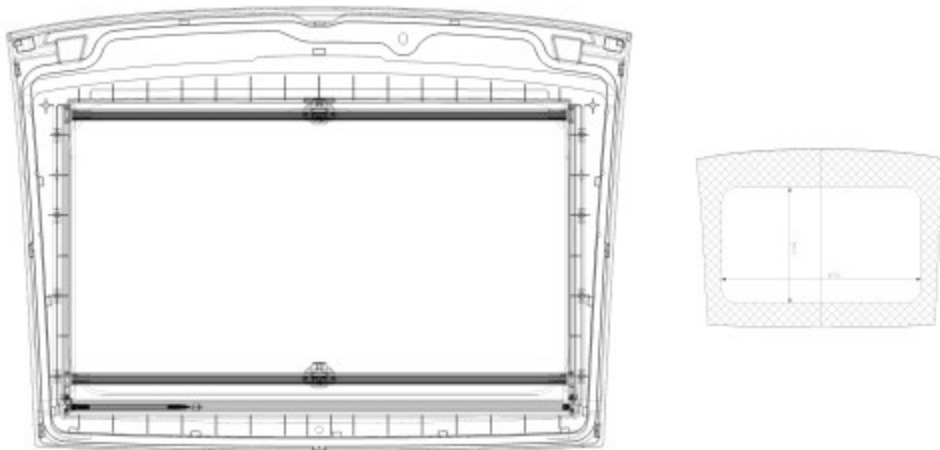
The new Fiat 500 is available with an (optional) glass roof.

There are two versions of this glass roof:

- Fixed glass roof
- Electrically operated glass roof.

FIXED GLASS ROOF

The Fiat 500 is available with a fixed glass roof as illustrated below; the glass is about 5 mm thick with a light transmission of 16% and energy transmission below 19%.



ELECTRICALLY OPERATED GLASS ROOF

Introduction

The (Webasto) sun roof has a specific system comprising a moving glass panel and a front panel with a deflector function.

When the glazed panel is closed it allows outside light to enter the passenger compartment and you can see out of it. When the moving panel is opening it slides outside the roof panel (spoiler position).

The sun roof specifically consists of the following:

- a metal frame to which the other components are fastened;
- a system of right and left mechanisms, secured to the frame, for moving the glass panel, operated by the electric motor by means of a coiled metal cable;
- a tempered glass panel,
- a front panel with a deflector function (which raises when the roof is opened);
- a manually operated roller sun blind.

Technical specifications

Tempered glass - Thickness 4 ± 0.2 mm.

Light transmission: TL 19 ± 2 %.

Energy transmission: TE $19 < 19$ %.

Blind sliding load 30N max.

Opening/closing time: 5 ± 2 secs.

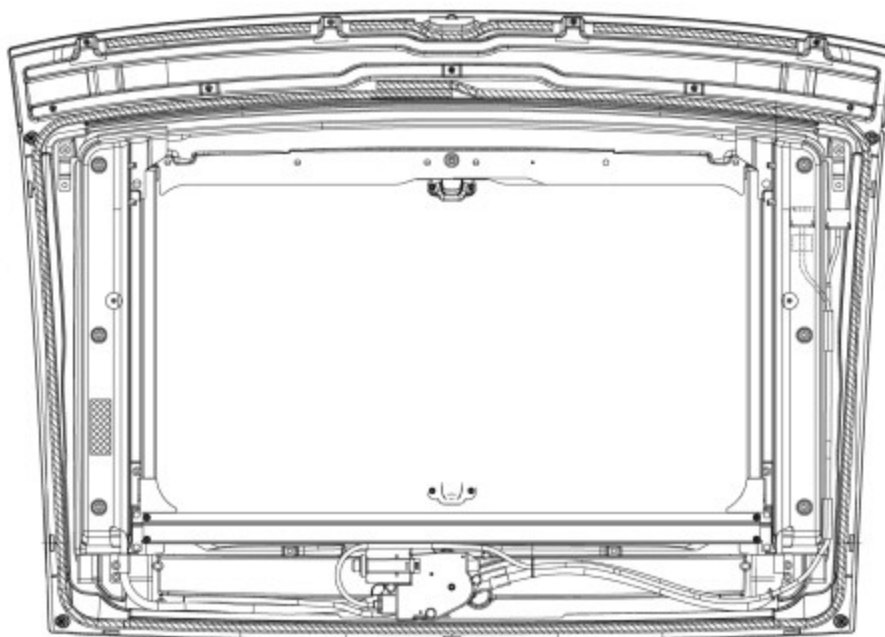
Motor absorption: 30 Amp. max.

Motor absorption when opening/closing: 12 Amp.

Composition

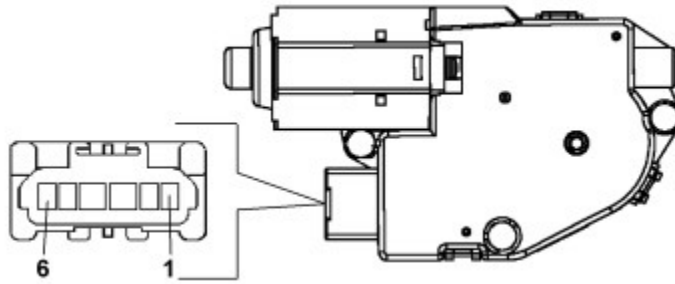
Frame assembly

The frame assembly is the load carrying base for all the sun roof mechanical and electrical components.



Control unit

The sun roof control unit also incorporates the electric motor.

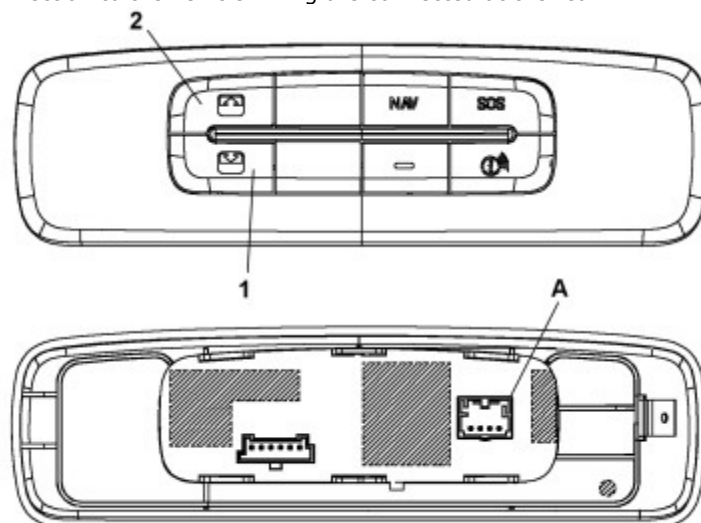


Connector - Sun roof control unit pin out

Pin	Description
1	+ 15 from Body Computer
2	VSO
3	+30 from engine junction unit
4	Earths (gnd)
5	Opening control (earth - gnd)
6	Closing control (earth - gnd)

Control panel (on ceiling)

The two sun roof opening/closing controls are located in the control panel.
The two connectors for connection to the vehicle wiring are connected at the rear.



1. Sun roof closing control
2. Sun roof opening control

Connector A pin out	
Pin	Description
1	Earth (gnd)
2	Roof closing control
3	Roof opening control
4	Ideogram LED on control

Sun roof operation

The operation of the sun roof is activated using the opening/closing switch with an unstable button located in the panel near the front centre courtesy light.

The operating strategy described below is achieved by operating an electric motor managed by an electronic control unit.

The sun roof movements using the control button are only permitted with the panel on (key on).

Roof opening

Pressing the button (opening side) with the key on allows two opening modes for the front glass panel.

Automatic opening

By pressing the button on the "opening" side normally (for >300 ms) from completely closed the front glass panel assumes the max comfort position; a second command places the panel in the max tilting position (guaranteeing minimum aerodynamic noise) and then pressing the button on the same side places the front glass panel in the maximum opening position. After the initial opening command, the glass panel may be stopped in an intermediate position by pressing the button again.

Manual opening

Pressing the button briefly (for $60 < T < 300$ ms) from completely closed, the front panel moves proportionally to the time T that the button is pressed and it stops in that position when the button is released; pressing the button again on the same side and always within the time span T between $60 < T < 300$ ms, the panel will move "push by push" into the maximum opening position. This function allows the front panel to be positioned in positions intermediate to those achieved during automatic opening.

Roof closing

Similar to the opening, pressing the button (closing side) with the key on allows two operating modes, automatic and manual with the same operating modes as the opening button.

Automatic closure

By pressing the button on the "opening" side normally (for >300 ms) from completely open the front glass panel assumes the max tilting position; pressing the button a second time places the panel in the max comfort position and then pressing the button on the same side afterwards places the front panel in the closed position.

After the initial opening command, the glass panel may be stopped in an intermediate position by pressing the button again.

Manual closing

Pressing the button briefly (for $60 < T < 300$ ms) from completely open, the front panel moves proportionally to the time T that the button is pressed between $60 < T < 300$ ms and it stops in that position when the button is released; pressing the button again on the same side and always within the time span T between $60 < T < 300$ ms, the panel will move "push by push" into the closed position.

This function allows the front panel to be positioned in positions intermediate to those achieved during automatic opening.

Sun blinds

The light intensity inside the passenger compartment can be adjusted by a sun blind.

The sun blinds are made from polyester, each sliding and wrapped around a roller, with sliding pads that allow restraint in Y, preventing them from slipping out of the guides.

They are opened manually and can only be open or closed. The sun blind can be closed irrespective of the opening position of the glass panel.

Roof closing safety devices (anti-crush function)

In addition to conforming with the requirement of directive 2000/4/CE, the anti-crush safety function, managed by the electronic control unit, is activated during the horizontal and vertical closing of the front panel after an obstacle (e.g. finger, hand) is encountered:

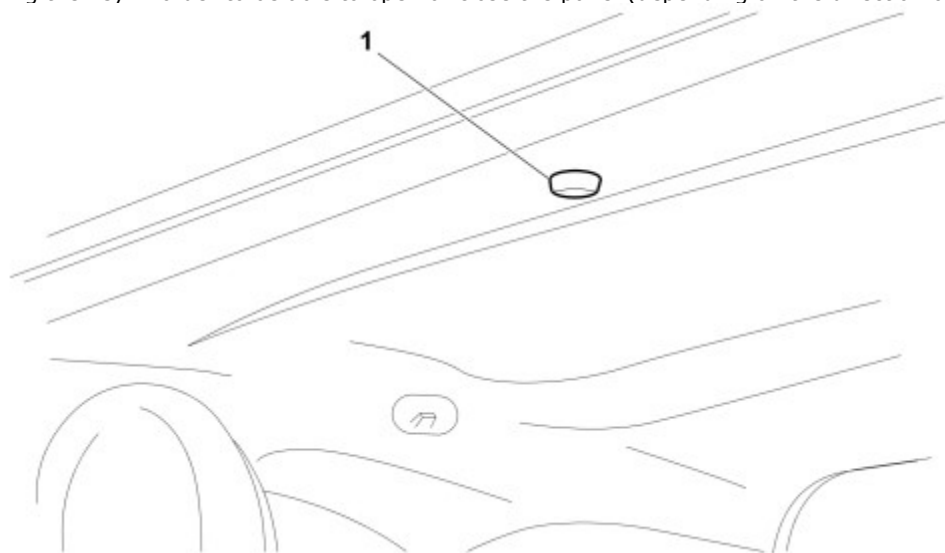
- during the horizontal closure movement, it is active throughout the travel (if it had been opened by more than 4 mm). If it meets an obstacle on the front side of the glass panel, it guarantees the reversal of motion for a travel of 100 mm from the movement reversal point.
- during the vertical closure movement, it is active (if previously opened by more than 4mm from the seal) after meeting an obstacle on the rear side of the panel, it ensures the direction of motion is reversed until the max tilting position is reached.

In both cases, the reversal load is $< 100\text{ N}$, as required by Directive 2000/4/EC. The possibility of crushing from the inside of the vehicle in the side areas of the panel is avoided through the adoption of side guards that prevent access to risk areas.

Maintenance/emergency

In cases of emergency or maintenance it is possible to move the electric motor for opening/closing the glass panel manually without a power supply by carrying out the following operations:

- 1) Removing access plug on front crossmember;
- 2) Using an emergency key to be inserted in the motor;
- 3) Turning the key in order to be able to open or close the panel (depending on the direction of rotation).



1. Access plug

Initialization of the system

After the battery has been disconnected, a fuse has blown or the motor has been disconnected, the sun roof system must be initialized once again following the instructions given below.

- Press the sliding roof button in closed position and hold down until the roof is fully closed. Then, without releasing, wait for the motor to click (metallic noise) (this takes place about 5 seconds after closure).
- Release the button, then press again within 5 seconds and hold down throughout an entire sliding roof opening and closure cycle. Release the button once the roof is fully closed.
- The initialisation cycle is complete.

Safety and technical specifications

The design of the sun roof meets very stringent criteria, guaranteeing a sturdy product that is suitable for even the most demanding operating conditions:

- The raising of the front panel (due to the aerodynamic effect whilst moving) towards the outside at a top speed of 180 Km/h is less than or equal to 2 mm.
- The stresses on the roof panel measured/calculated whilst driving over cobbled streets does not produce vibrations or noise that adversely affect driving comfort. If the sun roof has to be closed manually using the emergency key, the force required (tightening torque) is less than or equal to 8 Nm.
- Accessibility to the roof motor: this is permitted by means of an emergency cover in the centre roof crossmember.
- Weatherstrips on the front and centre transverse sections.
- The bonding of the rear glass section is technologically treated like a windscreen, not allowing water penetration into the passenger compartment under any circumstances.