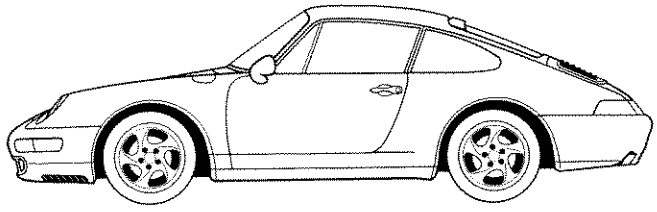
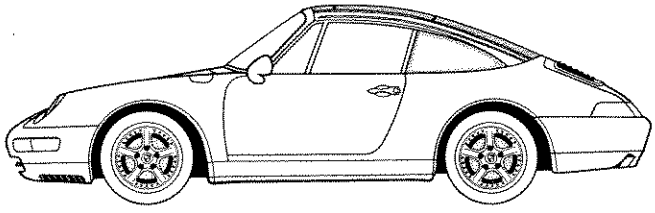
PORSCHE

Service Information
Technik

'96



911 Carrera 4S



911 targa

The new features of the

911 Carrera

and the

911 Carrera 4

499 521 96

Introduction

In the 1996 Model Year, the **911 Carrera** and **911 Carrera 4** will remain in production with a number of modifications. Two additional versions, the **911 Carrera 4S** and the **911 Targa**, will also be marketed.

The **911 Carrera 4S** is based on the 911 Turbo. It is fitted with a naturally-aspirated engine, combined with the varioram system and features the wider body work.

The **911 Targa** is based on the 911 Cabriolet but features an individual glass roof that is described in full detail in this Service Information.

12/95

This Service Information covers the engineering modifications applicable to all versions as well as those new features that are unique to specific models. The applicable model is indicated in the heading of the respective chapters to highlight the scope of the unique modifications and new features.

This Service Information is up-to-date as of August, 1995

Note:

This Service Information will not be revised. For current informations, please refer to the repective Repair Manual and/or the Technical Information bulletins.

PORSCHE

Service Training Center

List of Contents

Electrical System

Overview

1 Engine

Four engine versions are offered for the 911 Carrera in Model Year '96:

M64/21 = Engine for manual-transmission vehicle (RoW)

M64/21S = Engine (increased output) for manual-transmission vehicle (RoW)*

M64/22 = Engine for Tiptronic vehicle (RoW)

M64/23 = Engine for manual-transmission vehicle (USA)

M64/24 = Engine for Tiptronic vehicle (USA)

Key modifications over the engines used in the MY '95 vehicles are:

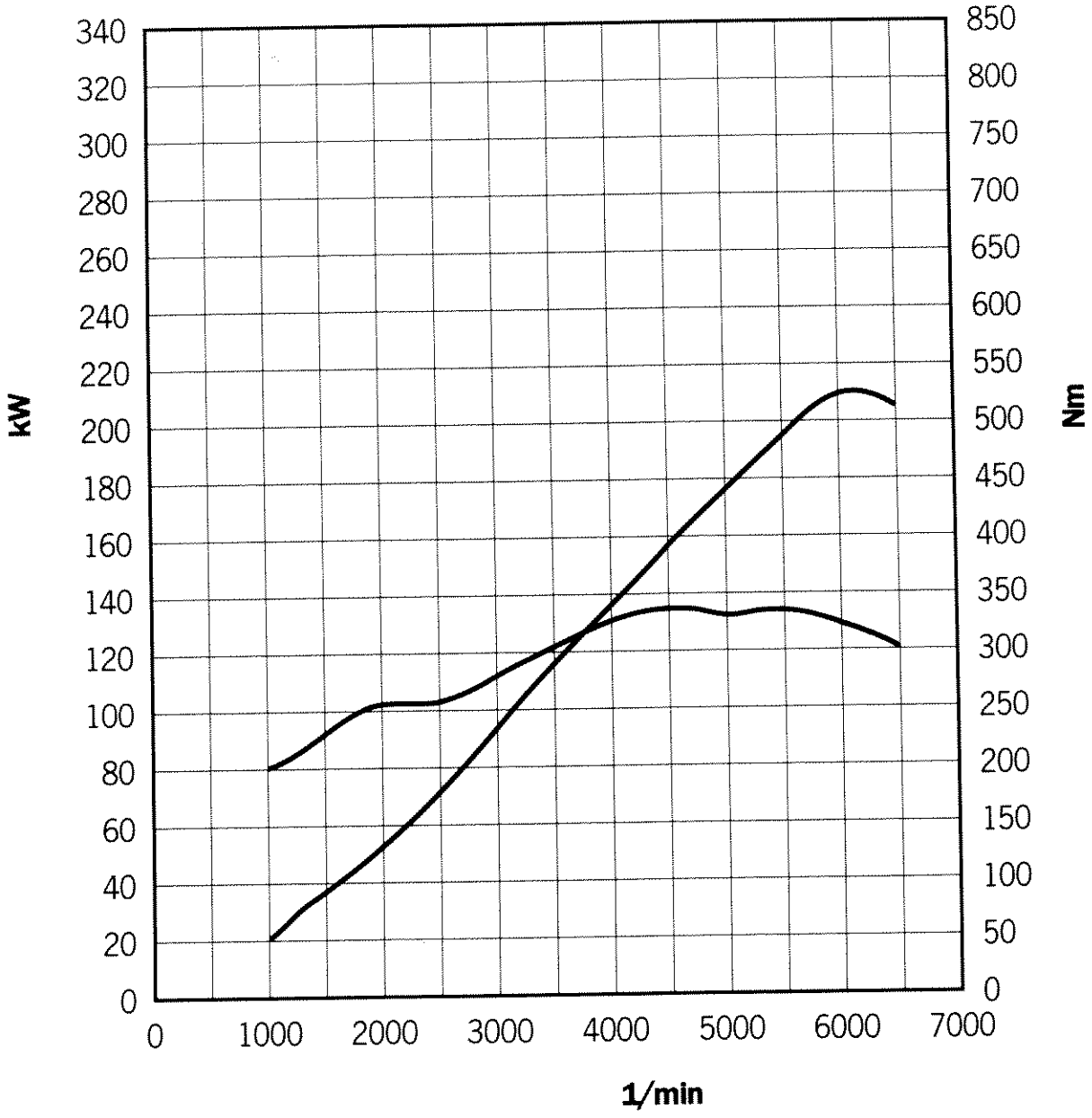
- Cylinder heads, larger valves
- Pistons: New location of box-type land
- Camshafts: Modified cam lobe shape
- Modified hydraulic valve lash adjuster element
- Varioram intake system

* Key specifications - M64/21S

Displacement	3746 cm^3
Engine power	221kW/300 PS at 6,500 rpm
Torque	355 Nm at 5,400 rpm

A Technical Information will be released later.

Full Load Curves of 911 Carrera (M 64/21...24)



Displacement	3,600 cm^3	Max. torque	340 Nm at 5,250 rpm
Stroke	76.4 mm	Compression ratio	11.3:1
Bore ∅	100 mm	Output per liter	58.3 kW/liter
Engine power	210 kW (285 hp) at 6,100 rpm	Fuel grade	98 RON / 85 MON

1310

Pistons

The piston spray cooling system was optimized by modifying the spray jet angle and by increasing the cross-sectional area. As a result, the box-type wall of the piston had to be relocated.

Valve pockets are machined in the piston crown to accommodate the larger valve heads.

1505

Camshafts

The cam lobe shape was adapted to suit the engine.

1570

Cylinder Head

To improve cylinder charging, the size of the inlet and exhaust valves as well as of the inlet and exhaust ports in the cylinder head was increased.

Valve Lash Adjuster Element

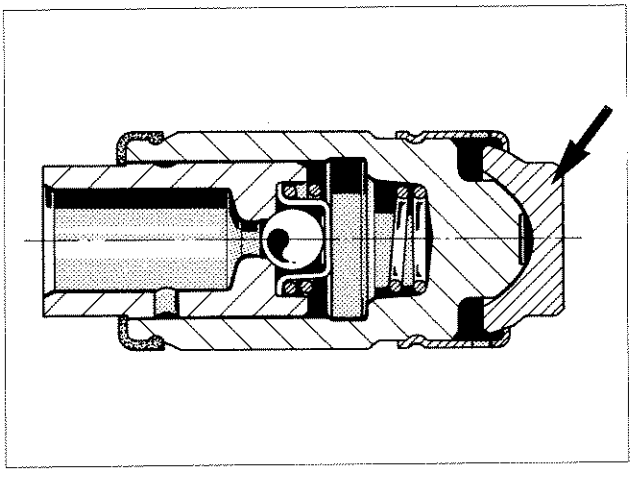
The internal design of the hydraulic valve lash adjuster element was modified.

To identify the modified component, the mobile cage (arrow) is given a phosphate treatment and can thus be distinguished by the darker color.

In addition to the production valve lash adjuster element, service elements are available in two lengths for repair requirements.

Note:

The new valve lash adjuster element may also be fitted to the 200-kW engine. The earlier element, however, cannot be fitted to the new engines.



149

2 Fuel and Ignition System

Rest of World Vehicles

To compute the ignition timing angle and injection timing, the engine of the 911 Carrera is fitted with the DME 2 - 10 used since MY '94. This system is described in the 1994 Model Info but now incorporates the following modifications:

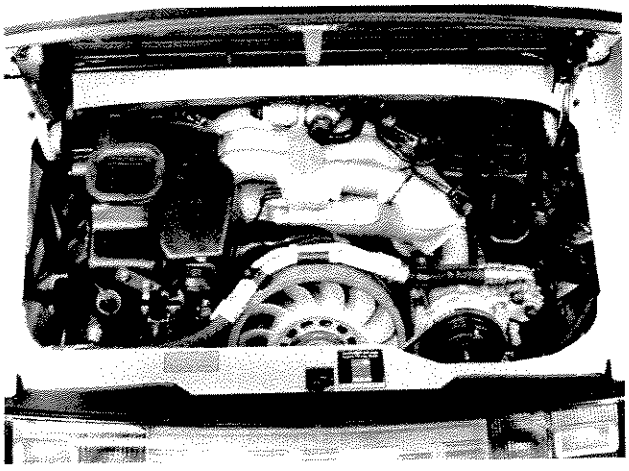
- Ignition timing angle and injection maps have been adapted to the new engine.
- Varioram intake system made of aluminum, activated by DME control module.
- Modified DME plug assignment (due to Varioram).
- Modified idle speed (880 ± 40 rpm).

Note:

The DME control module of Model Year '96 vehicles must not be retrofitted to earlier models.

Varioram Intake System

To achieve high engine output and increased torque in the middle rpm range, the 911 Carrera is fitted with a timed tuning flap and variable-length intake pipes.



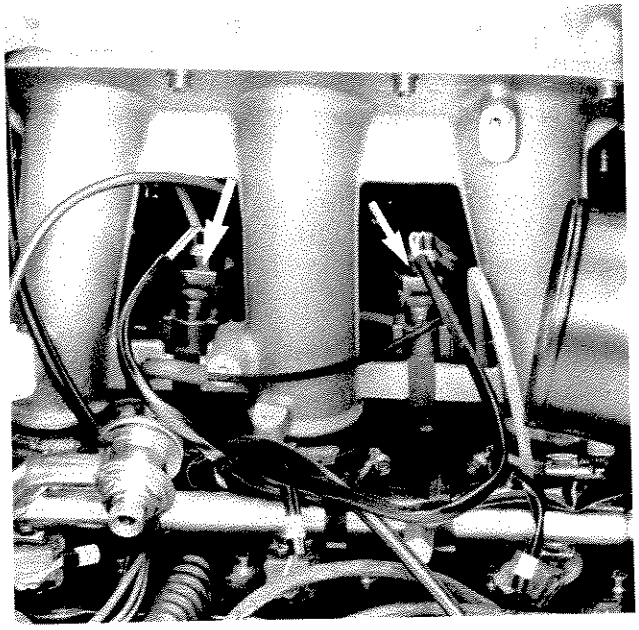
95/164

Intake pipes of variable length

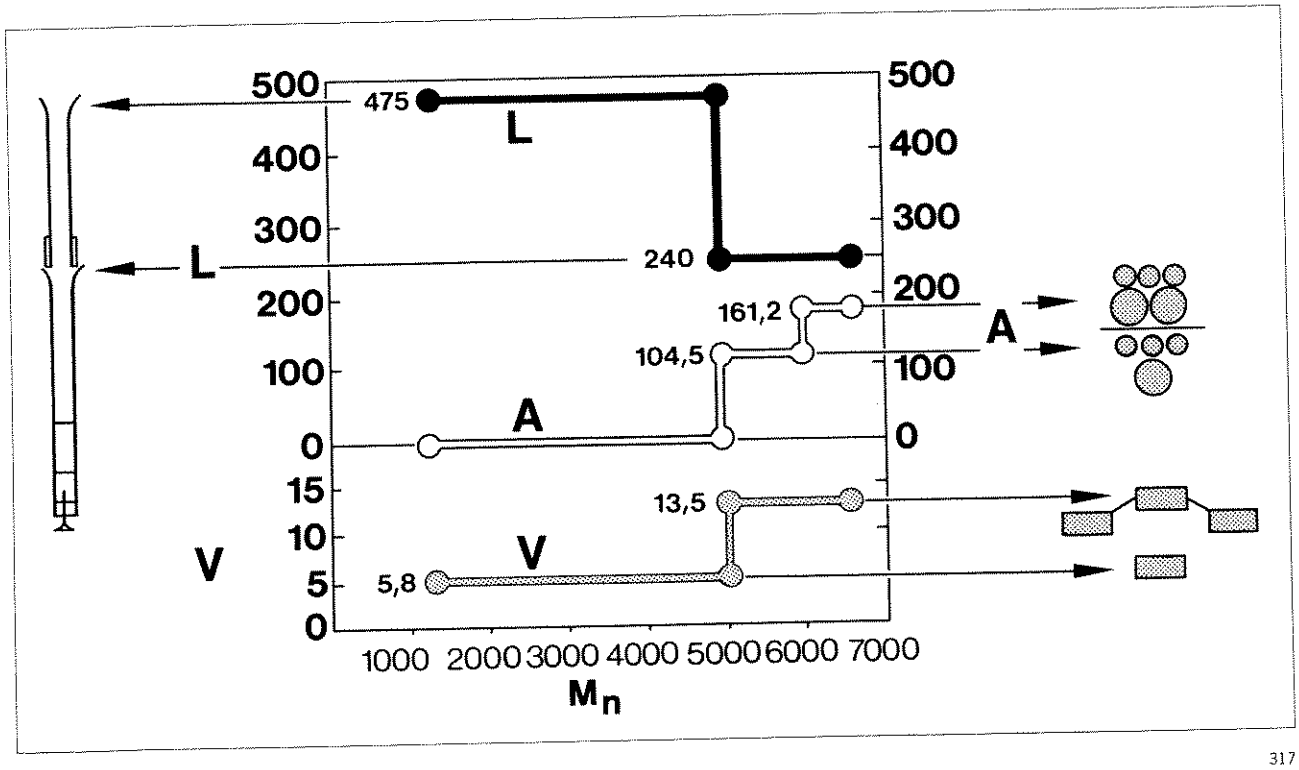
Tuning of the intake pipes is based on the principle of effective length tuning.

Each individual intake pipe is made up of two sections. One section is bolted rigidly to the cylinder head while the other section slides in or out to double the overall intake pipe length.

For this purpose, the engine is fitted with one vacuum-controlled slide per cylinder bank. The slides are actuated by solenoids that are connected to vacuum by a solenoid switching valve.



95/165



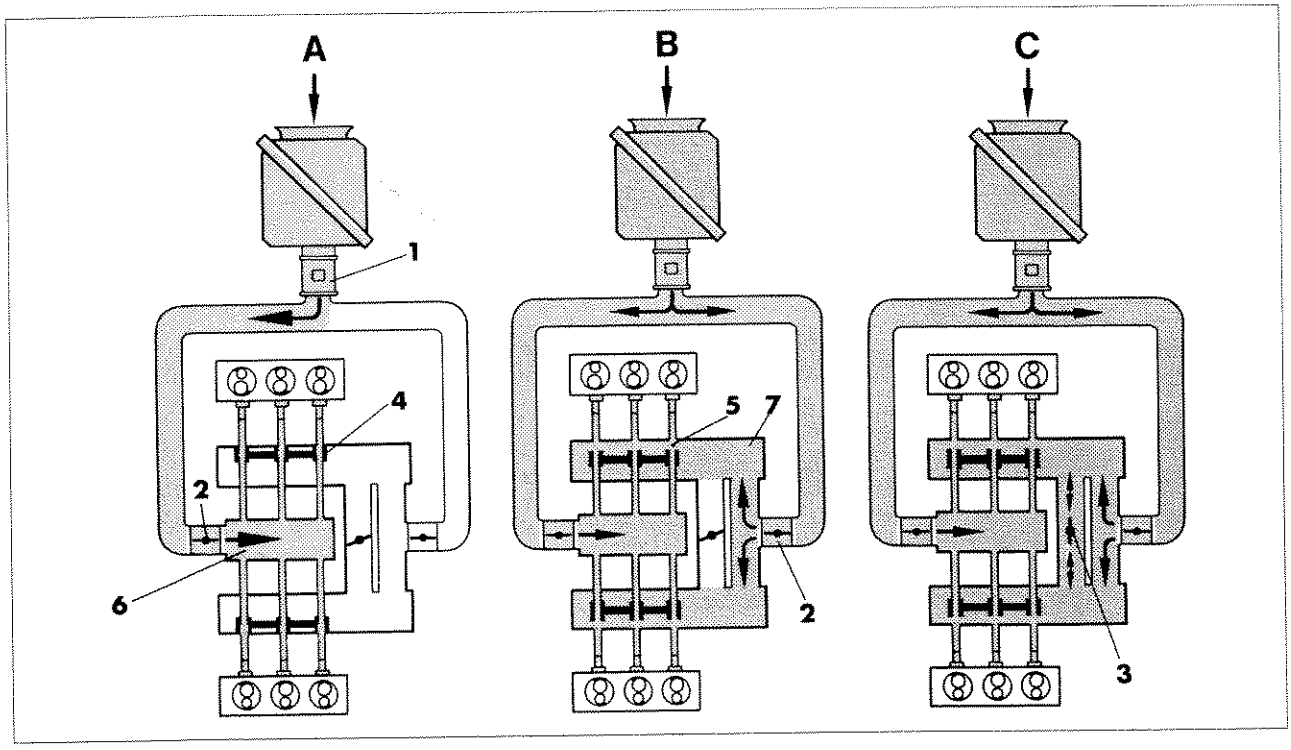
317

L = Intake pipe length in mm

A = Resonance tube cross-sectional area in cm^2

V = Intake system volume in dm^3

M_n = Engine speed



297

1 - Air mass sensor
2 - Throttle valve
3 - Tuning flap
4 - Vacuum-controlled slides
5 - Pipe gap
6 - Central intake rail
7 - Tuned-intake pressure charging system

A

Pulse pipe charging with long intake pipes

B

Tuned-intake pressure charging with short intake pipes (Tuning flap closed)

C

Tuned-intake pressure charging with short intake pipes (Tuning flap open)

A - Pulse pipe charging

When the pipe gap (5) between the slide (4) and the central intake rail (6) is **closed**, the single-chamber system, i.e. the **pulse-pipe supercharging system,** is activated. The intake air now flows from the central intake rail across torque-optimized pulse pipes (intake pipes) into the cylinders.

B - Tuned-intake pressure charging

When opening the slides (4) to switch from pulse pipe charging to tuned-intake pressure charging, the intake air flow is separated into individual flows in the intake section downstream of the air mass sensor (1).

This branch system is connected both to the central intake rail (6) of the single-chamber system and to the tuned-intake system (7) located beneath.

From the central intake rail, part of the intake air flows across the intake pipe extensions designed as tuning pipes directly into the intake stacks of the short vibration pipes and then to the individual cylinders that are in the intake stroke at that particular moment (2). Most of the intake air passes the second throttle valve (2) to enter the first large tuning pipe of the tuned-intake pressure charging system (7) to the resonance chambers. In this process, the air mass flowing to the short vibration pipes is optimized by the tuned-intake pressure charging system.

C - Tuned-intake pressure charging with open tuning flap

The tuning flap (3) is located in the second large tuning pipe. The tuning flap is closed initially but is opened from a certain engine speed, causing the flow cross-sectional area between the resonance chambers to be increased. Air can now flow into the resonance chambers across all connecting pipes.

Switching conditions of the intake pipe extensions and the tuning flap

1. When the ignition is switched on, the DME control module triggers the solenoid valves. When the engine is started, both the intake pipe extensions and the tuning flap are actuated. As soon as the idle rpm is reached, the signal to the solenoids is interrupted and both the intake pipe extensions and the tuning flap now assume their home positions.

2. When reaching an engine speed of 4,840 rpm and a throttle opening angle of at least 50°, the DME control module feeds an electrical signal to the solenoids of the intake pipe extensions, causing the extensions to be actuated. The intake system now switches from pulse pipe charging to tuned-intake pressure charging.

3. When an engine speed of 5,840 rpm is reached and when the throttle is opened by more than 50°, the DME control module opens the tuning flap and thus increases the tuning pipe cross-sectional area.

4. At an engine speed of 6,640 rpm, the tuning flap is closed again.

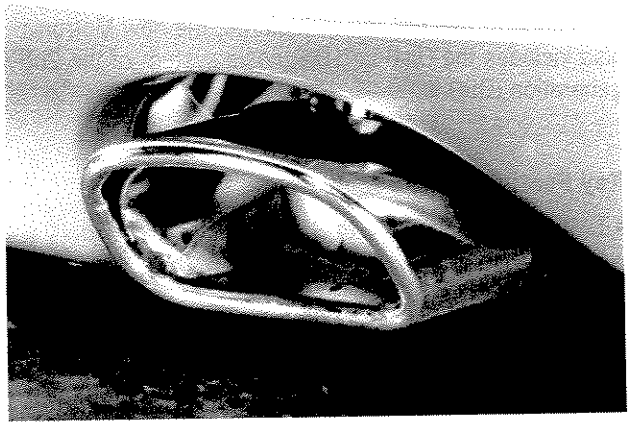
Modified Idle Speed of RoW Vehicles

The idle speed is controlled across the cylinder charge controller and is set to 880 ± 40 rpm.

When selecting a drive range on a vehicle with Tiptronic transmission, the control module lowers the idle speed to 750 ± 40 rpm.

Tailpipe extension

All vehicles will be supplied with a modified tailpipe extension to provide a visual distinction between Model Year '96 vehicles and earlier models.



95/131

USA Vehicles

General

The 911 Carrera engine for the U.S. market is identical with the RoW version but the MY '96 version will be fitted with the Motronic M 5.2 (DME) (as fitted to the 911 Turbo) adapted to the naturally-aspirated engine to comply with legal regulations.

This engine also differs from the RoW engine in that the secondary air injection system has been used here since Model Year '94.

In addition to the well-known features, the new Motronic also includes the On-Board-Diagnosis system of the 2nd generation (OBD II).

Key Features of the Motronic:

- DME control module with 88-pin connector fitted beneath left seat.
- Electronic-map ignition system.
- Adaptive knock control.
- Adaptive oxygen sensor control, separate for each cylinder bank.
- Sequential injection system.
- Stereo A/F control with 4 oxygen sensors, potential-free.
- Enhanced diagnostic system (OBD II).
- Hall sender unit installed in distributor.
- Twin ignition with two ignition coils triggered by the final stages built into the control module (DME).
- NTC-type intake air and engine temperature sensors.
- Adaptive charge control with twin-coil rotary adjuster.
- Air mass metering with hot film mass air flow sensor.
- Electronically controlled secondary air injection system.
- Carbon canister with electronically controlled venting.
- Adaptive throttle potentiometer.
- Fuel pump control with anticipatory operation.
- Plausibility check and provision of replacement values.

2470

DME Control Module (Motronic)

The electrical system of the engine is controlled by the DME control module. For this purpose, measuring parameters such as air mass, engine speed, engine temperature, intake air temperature, throttle position, camshaft (Hall-effect sensor) position, oxygen sensor signals and knock sensor signals are fed into the DME control module as analog signals. These values are converted into digital signals and are then processed by the processing unit of the control module.

The DME control module also controls actuators such as injection valves, ignition final stage, IACV, tank vent solenoid, fuel pump control, oxygen sensor heater, Check Engine lamp and the secondary air injection system.

Permanent Positive Voltage at DME Control Module

Since the Motronic M 5.2 includes several adaptative systems, a positive voltage is permanently present at terminal 26 of the DME connector.

If the connector is disconnected from the control module or if the vehicle battery is disconnected, the engine must run for 250 seconds before an initial adaptation phase occurs.

In addition, the DME control module has a volatile fault memory. The fault memory must therefore always be read out before the battery is disconnected.

Note:

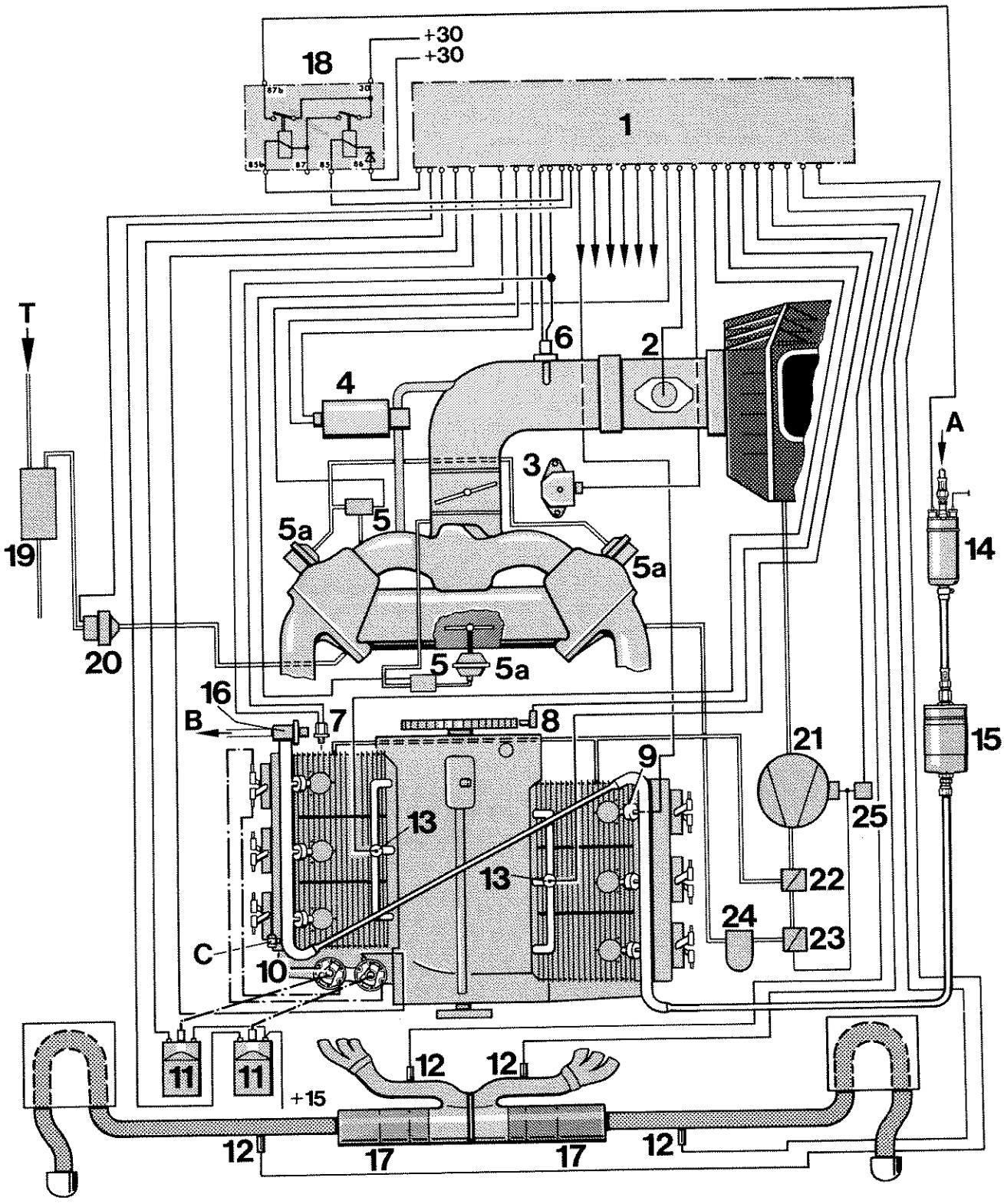
On vehicles with catalytic converter and an oxygen sensing system, the air-fuel mixture is adapted during vehicle operation, i.e. the oxygen sensing system modifies the injection timing and, hence, the injection signal as required when a deviation from the nominal value is detected.

This process compensates for engine-specific tolerances and specific mixture composition faults. Thanks to this adaptive modification of the air-fuel mixture, it is no longer necessary to adjust the idle CO to a basic setting.

DME Overview

1 - DME control module
2 - Mass air flow sensor
3 - Throttle potentiometer
4 - Idle Air Control Valve (IACV)
5 - Solenoid valve
5a - Diaphragm valve
6 - Intake air temperature sensor
7 - Engine temperature sensor
8 - Rpm reference mark sensor
9 - Injection valve
10 - Twin distributor with Hall-effect sensor
11 - Ignition coil
12 - Oxygen sensor
13 - Knock sensor
14 - Fuel pump
15 - Fuel filter
16 - Fuel pressure regulator
17 - Catalytic converter
18 - DME relay
19 - Carbon canister
20 - Tank venting valve
21 - Secondary air pump
22 - Pneumatic valve
23 - Solenoid valve
24 - Vacuum tank

A - From tank
B - Return line to tank
C - Fuel pressure test connection
T - Tank venting line


+30
+30
18
1
T
6
2
4
A
3
5a
5
5a
19
14
20
5
5a
16
B
7
8
21
9
15
13
25
13
22
24
23
C
10
11
11
+15
12
12
12
17
17

Operation of DME 5.2

The operation of the DME 5.2 is the same as on the 911 Turbo. This system is covered in the Service Information „Technik" of the 911 Turbo (1996 Model Year). The electronic air mass control system, however, is omitted on the 911 Carrera (naturally-aspirated engine).

On-Board Diagnosis II

Operation of the diagnostic system is also described in the 911 Turbo Service Information Technik. Fault management and definitions of „Trip", „Warm-up Cycle" etc. remain unchanged. Monitoring of the solenoids of the variable-length intake pipes has been added as a new feature.

Check Engine Lamp

If the Check Engine lamp comes on even if no fault is stored in the DME fault memory, a readout of the Tiptronic control unit must be made.

Starting with Model Year '96, the Tiptronic control unit is also covered by OBD II diagnosis, i.e. faults that cause emission limits to be exceeded are stored in the Tiptronic control unit. The OBD II diagnosis system of the Tiptronic control unit is described separately.

Exhaust System

Due to the introduction of the OBD II system, the exhaust system of the U.S. 911 Carrera had to be subdivided into two sections. For this purpose, a separating plate is welded in place between both catalytic converters. Note that the exhaust gas of cylinder bank 1 - 3 exits from the left tailpipe while the exhaust gas from cylinder bank 4 - 6 exist from the right tailpipe.

Varioram Intake System

The Varioram intake system and its operation are described on page 2 - 1.

Switching points of Varioram intake system:

Resonance flap:	Open: 5,880 rpm
	Close: 6,640 rpm
Intake pipe switching:	5,040 rpm

Idle Speed

On the 911 Carrera engine, the idle speed is set to the following specifications:

Manual transmission **without** A/C system switched on:
800 ± 40 rpm

Manual transmission **with** A/C system switched on:
880 ± 40 rpm

Tiptronic transmission: Selector lever set to P + N **without** A/C system switched on:
800 ± 40 rpm

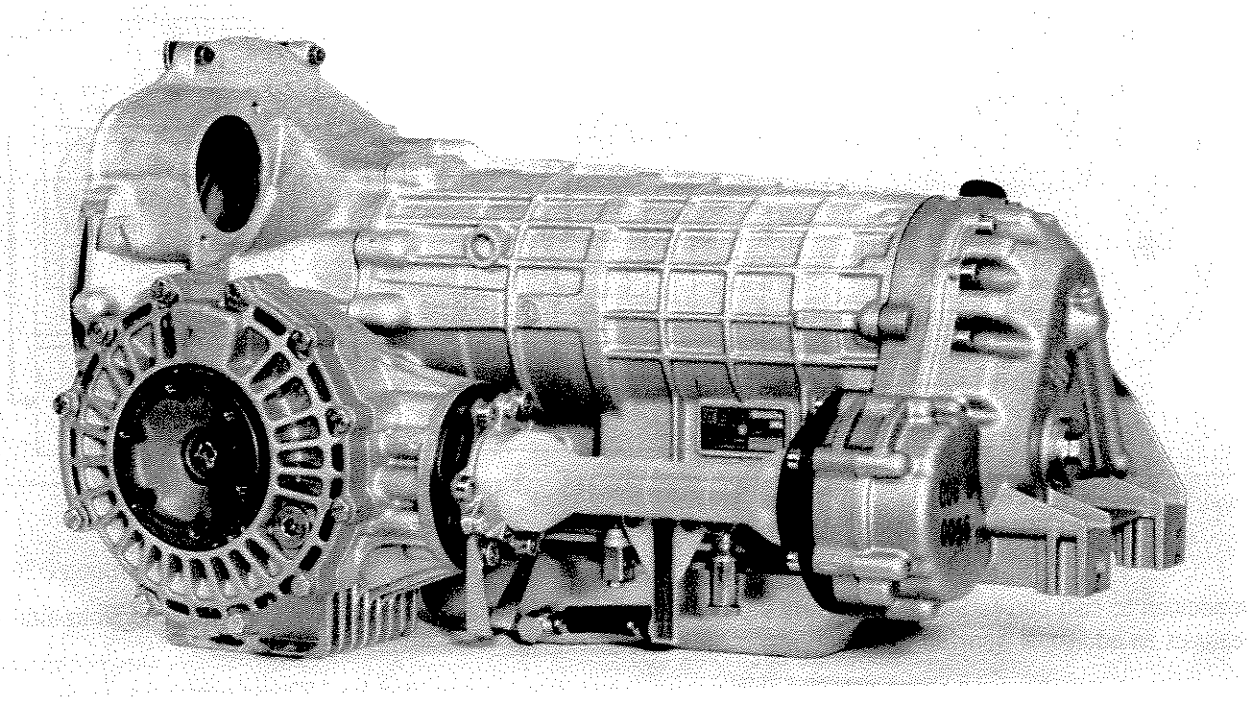
Tiptronic transmission: Selector lever set to P + N **with** A/C system switched on:
880 ± 40 rpm

Tiptronic transmission: Driving range selected, **with** and **without** A/C switched on:
750± 40 rpm

3 Transmission

911 Carrera

37
Porsche Tiptronic A50/04 (RoW), A50/05 (USA)



90/8

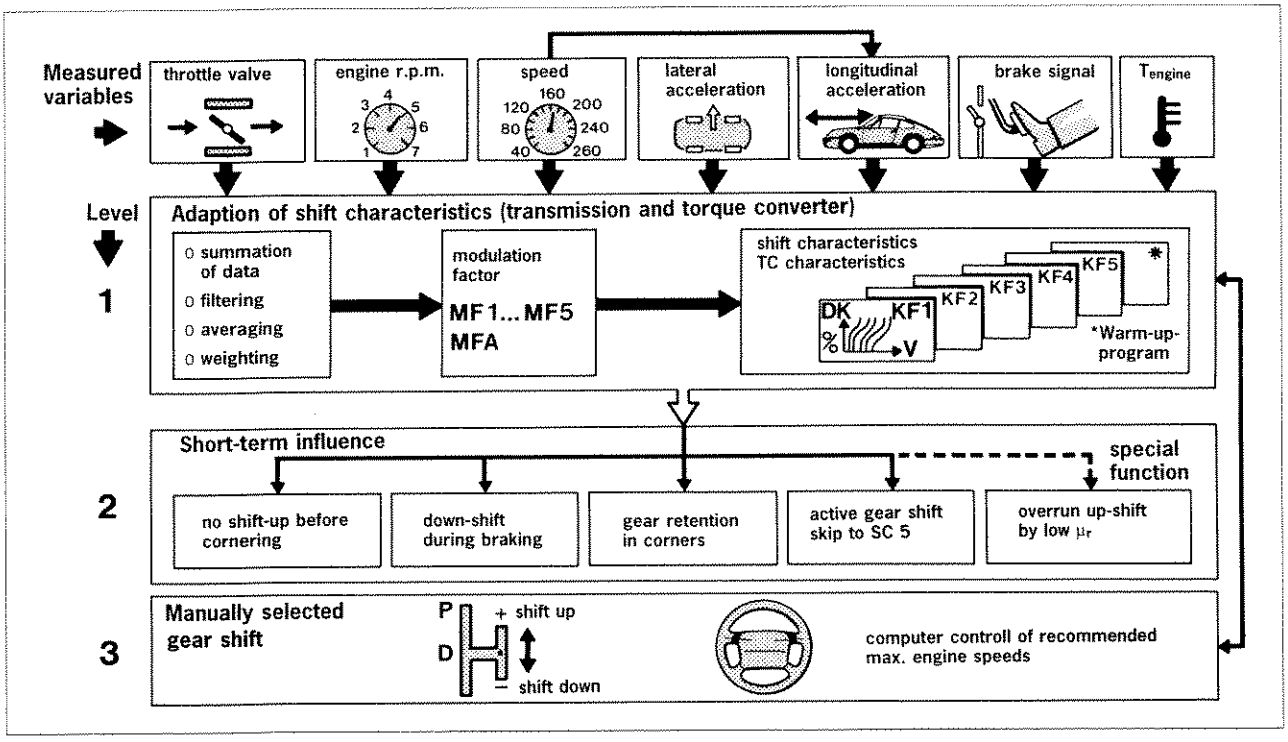
Tuning as well as upshift and downshift points of the transmission used on the Model Year '96 911 Carrera were revised in order to improve engine output, environmental compatibility and comfort.

As an additional feature, the transmission electronics was modified to incorporate the OBD II system for the U.S. market.

Major Modifications

- Retarded activation of reverse light.
- Coding via system tester.
- Modified hydraulic control unit.
- Gear monitoring based on computing of transmission ratio.
- Shift lock control unit deleted.
- Lateral acceleration sensor deleted.
- Fault memory can only be erased with System Tester.
- Reduced tooth backlash.

Modifications over Model '96



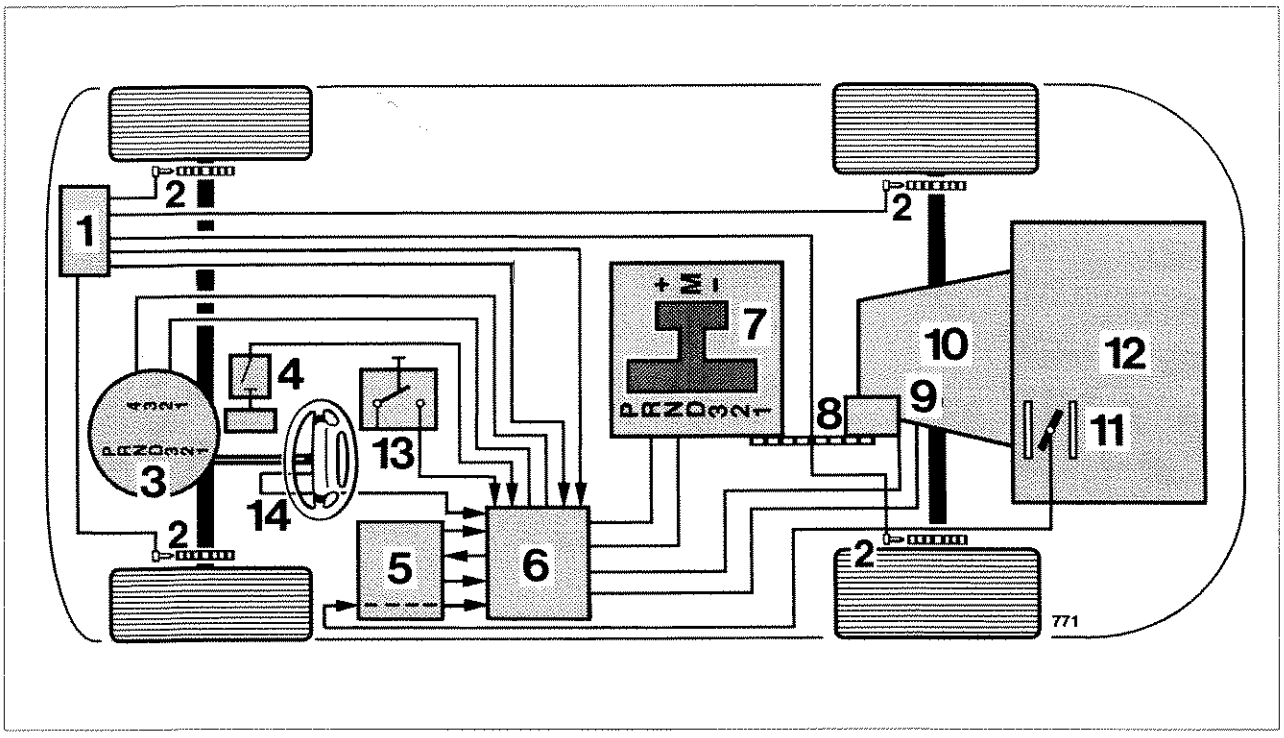
301

In addition to shift curves SK1 to SK5 (very comfortable and economical to very sporting), the Porsche Tiptronic features an additional warm-up map.

The warm-up map covers a range between shift curves 2 and 3 and is activated for 120 seconds if the engine temperature is < 50° C after starting the engine.

In the course of Model Year 1995, activation of the reverse light after shifting from P to N was retarded by approx. 0.5 sec.

Tiptronic Control Unit



301

1945-37

1 - ABS control unit
2 - ABS sensors at wheels
3 - Speedometer
4 - Kickdown switch
5 - DME control module
6 - Tiptronic control unit
7 - Selector lever system with two selection gates
8 - Cable
9 - Multi-function switch
10 - Automatic transmission
11 - Throttle with potentiometer
12 - Engine
13 - Brake light switch
14 - Manual switch in steering wheel

Transmission electrics and operation of the transmission are controlled by the Tiptronic control unit (fitted under left seat).

For this purpose, measuring parameters such as engine rpm, throttle position, vehicle speed, selector lever position, front left and right wheel speeds as well as transmission output speed (for computing of lateral and axial acceleration) stop light contact, engine and transmission temperature, kickdown switch etc. are supplied to the control unit and are processed in the unit.

The actuators such as solenoids, pressure regulators, reverse light, torque converter lockup clutch etc. are triggered by the Tiptronic control unit.

Permanent Positive Voltage at Tiptronic Control Unit

Since the Tiptronic transmission is equipped with adaptive systems, a permanent positive voltage is present at the control unit.

After pulling off the control unit connector or after disconnecting the vehicle battery, the vehicle must be test-driven for some time to allow the control unit to readapt itself.

Note:

During the adaption period, the shift operations may be somewhat harsher and less comfortable.

Fault memory

The Tiptronic control unit fitted as of MY '96 has a permanent fault memory, i.e. the fault memory can only be erased with System Tester 9288 and not by disconnecting the vehicle battery.

Coding the Tiptronic Control Unit

From Model Year '96, System Tester 9288 can be used to code the Tiptronic control unit to the individual national versions. Further information on this subject will be published at a later date.

Hydraulic/Electronic Control Unit

Internal modifications were incorporated into the hydraulic and electronic control units to make upshifts and downshifts even more comfortable. As these modifications were introduced during Model Year '95, the modified control units are identified by a „P503 C2525" data status.

In addition, the upshift and downshifts points have been adapted to the increased engine output on the MY '96 units.

Shift Monitoring

When the electronic control unit sends an upshift or downshift command to the hydraulic control unit, causing a solenoid to be activated, the input and output shaft speeds are used to compute if the respective gear has been engaged.

Shiftlock Triggering

As of Model Year '96, the shiftlock solenoids are triggered via the Tiptronic control unit (pin 2). The shiftlock control unit is therefore deleted.

Computing Lateral Acceleration

To remain in a particular gear during cornering, the control unit uses the vehicle speed and the speed differential of the front wheels to compute lateral acceleration. The lateral acceleration sensor in the center console is therefore omitted.

Ring and Bevel Gears

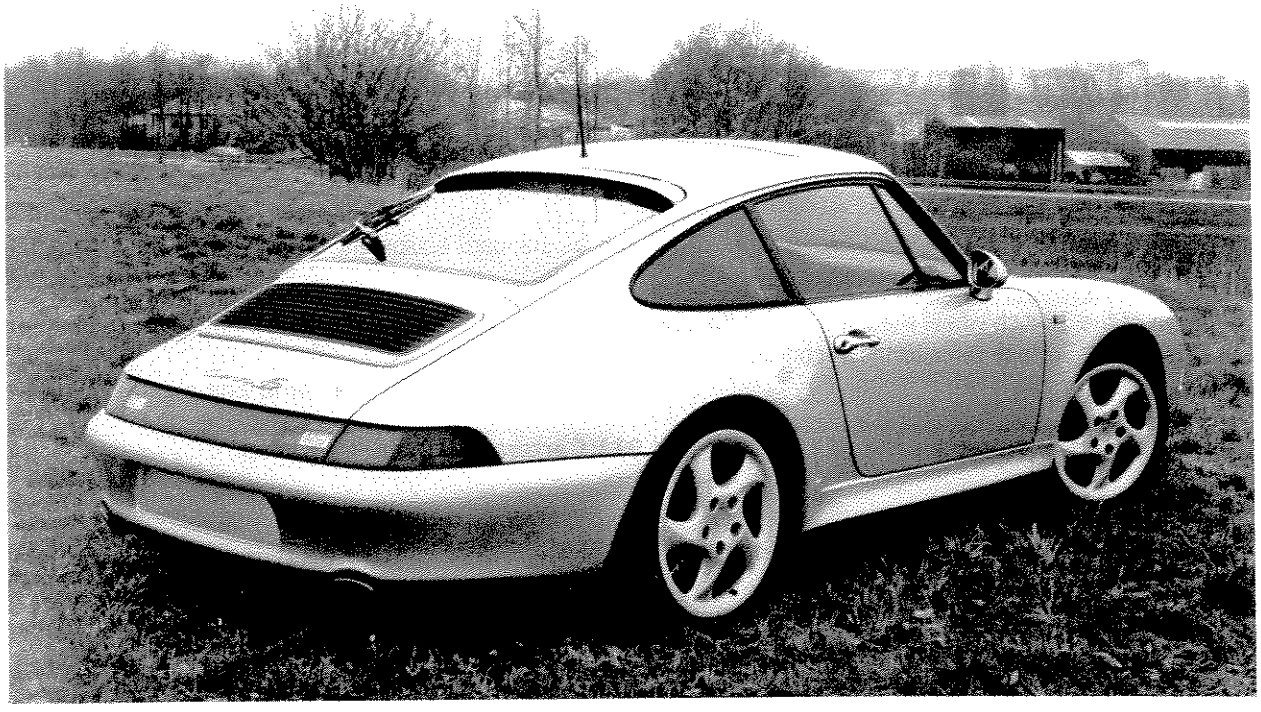
To reduce gear noise further, the tooth backlash between the ring and bevel gears is reduced to 0.08 to 0.17mm (introduced in production from transmission No. 14774 during Model Year '95).

Shims are available for adjustment in 0.03 mm steps.

The differential bevel gears are additionally preloaded by spring discs (introduced in production from transmission No. 15482 during Mode Year '95).

4 Running Gear

The running gear and brake system of the **911 Carrera and 911 Carrera 4** models were adopted with minor modifications from the MY '95 versions. 18-inch wheels are available optionally.



95/91

The **911 Carrera 4S** will be equipped with the same running gear as that of the 911 Carrera, or optionally with the sports-type running gear. This model is fitted with 18-inch wheels.

The running gear of the **911 Targa** is the same as that of the 911 Carrera but is supplied with special „Targa wheels".

Some of the modifications applied to the 911 Turbo (reinforced front axle joint, reinforced wheel carriers and stabilizer bar bolt joints of rear axle) have also been adopted for the Carrera models, and the remainder will be introduced at the time of model change.

911 Carrera 4S

4272
Rear Springs

The spring rate of the rear spring is 36 N/mm (color code: RoW pink USA crome-yellow).

911 Carrera, 911 Carrera 4

4405
Wheels and Tires

911 Carrera and 911 Carrera 4 are fitted with 16-inch wheels as standard equipment. 17 or 18-inch wheels are available optionally.

The design of the 18-inch wheel matches that of the „Technology Wheel" but has a rear wheel rim offset of 65 mm. For further details, please refer to the Technical Informations.

Approved wheels and tires for the 911 Carrera and 911 Carrera 4 (Coupé, Cabriolet)

Wheel and tire sizes		Tire make and type
front	205/55 ZR 16	Bridgestone Expedia S-01 N2
on	7J x 16 H2 ET 55	Continental CZ 91 NO
		Michelin MXX3 Pilot SX N1
rear	245/45 ZR 16	Toyo Proxes F1 S NO
on	9J x 16 H2 ET 70	Pirelli P Zero Asimmetrico N2
M Equipment, 17-inch wheels		
front	205/50 ZR 17	Bridgestone Expedia S-01 N1
on	7J x 17 H2 ET 55	Continental Sport Contact CZ 91 NO
		Michelin MXX3 Pilot SX NO
rear	255/40 ZR 17	Toyo Proxes F1 S NO
on	9J x 17 H2 ET 55	Dunlop SP Sport 8000 NO
		Pirelli P Zero Asimmetrico N1
M Equipment, 18-inch wheels (Coupé only)		
front	225/40 ZR 18	Bridgestone S-02 N1
on	8J x 18 H2 ET 52	Continental Sport Contact NO
		Pirelli P Zero Asimetrico N1
rear	265/35 ZR 18	
on	10J x 18 H2 ET 65	

911 Carrera 4S

The wheels of the 911 Carrera 4S (Turbo Look design) are the same as on the 911 Turbo but are not constructed as hollow-spoke wheels.

95/80

Approved wheels and tires for 911 Carrera 4S

front	225/40 ZR 18	Bridgestone S-02 N1
on	8J x 18 H2 ET 52	Pirelli P Zero Asimmetrico N1*
rear	285/30 ZR 18	
on	10J x 18 H2 ET 40	* not for CH

911 Targa

Wheels and Tires

The 911 Targa is fitted with special 17-inch „Targa Design" wheels as standard.

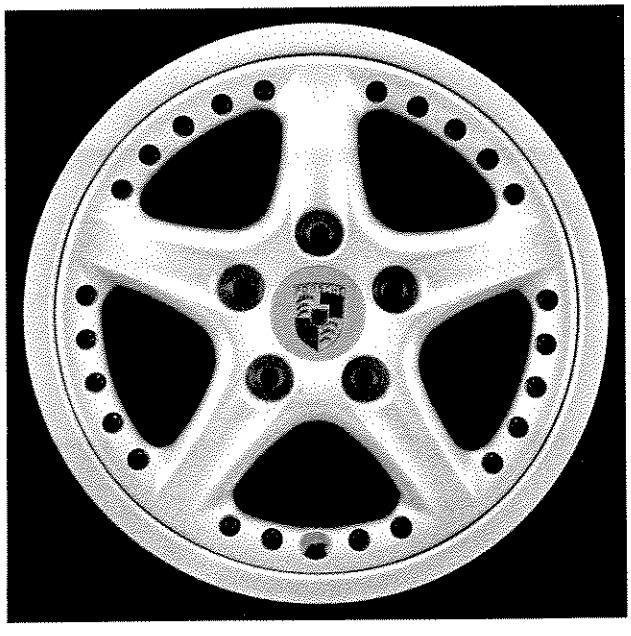


Abb. 21

40
Brake System

The brake system of the **911 Carrera and 911 Carrera 4 vehicles** remains unchanged and is the same as on Model Year '95 vehicles.

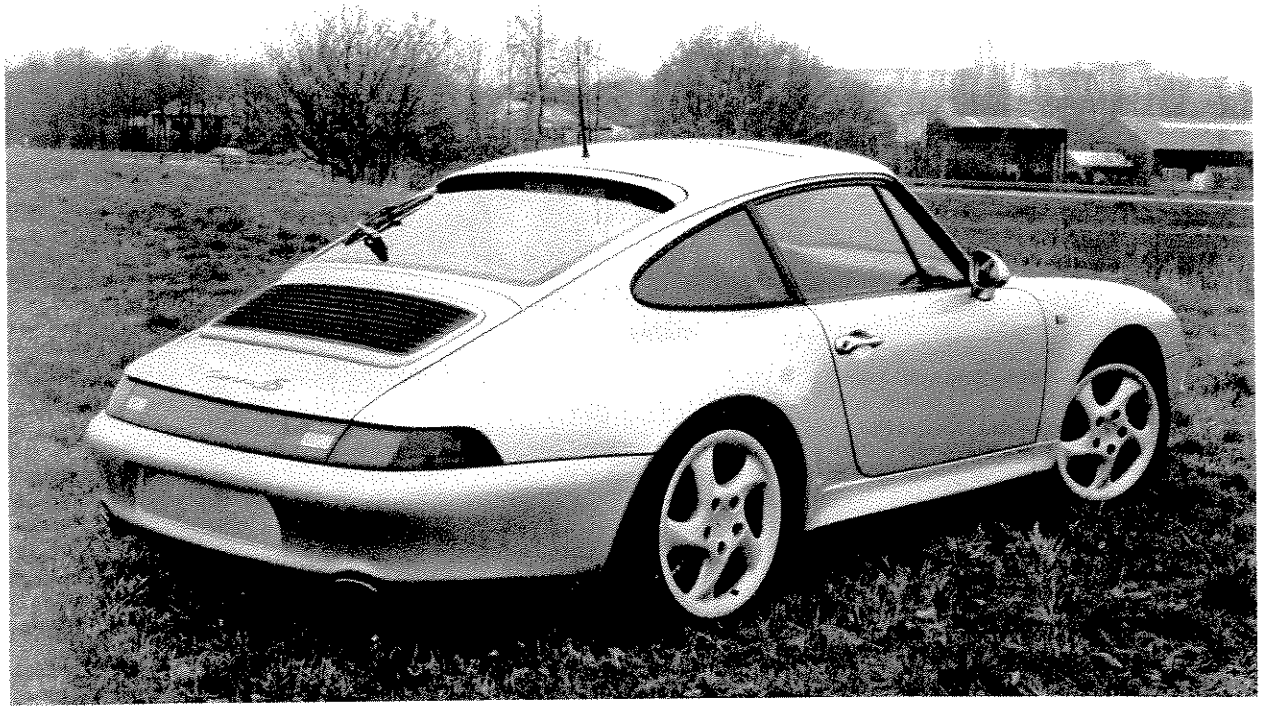
The brake system of the **911 Carrera 4S** is the same as on the 911 Turbo but is fitted with an additional brake proportioning valve with a switchover pressure of 40 bar.

The **911 Targa** will be fitted with the brake system of the 911 Carrera.

5 Body

911 Carrera 4S

The bodywork is based on that of the 911 Turbo. An electrically retractable rear spoiler is fitted instead of a fixed rear spoiler. Following the lines of the 911 Turbo, the 911 Carrera 4S also features a roof molding with integral brake light. As on the 911 Carrera 4, the front flasher lenses are white and the rear lenses are red.



95/91

Engine Compartment Lid

A titanium-color „Carrera 4S" script is fitted to the rear engine compartment lid.

95/89

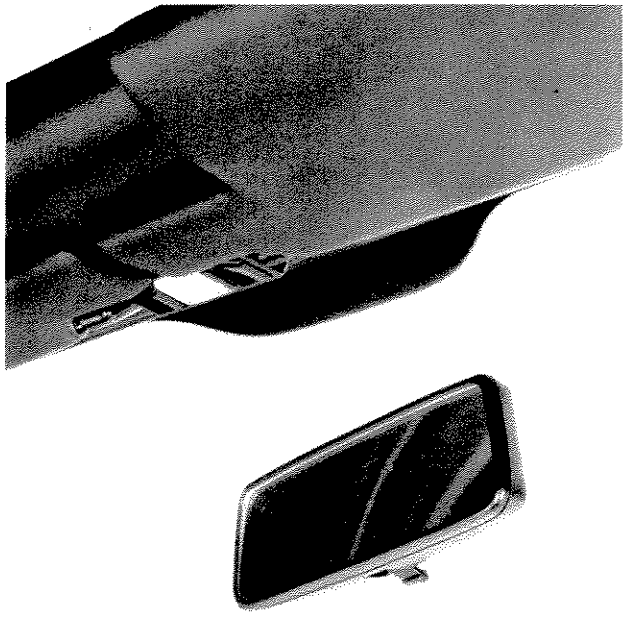
911 Carrera, 911 Carrera 4 (Coupé)

Roof Molding

Similar to the 911 Turbo, the 911 Carrera and 911 Carrera 4 are fitted with a roof molding with integral brake light. Depending on national equipment specifications, the brake light is either supplied as standard or optionally as M equipment item.

6412
Windshield

To retain the required clearance for the passenger compartment monitoring sensor, the sun visor size was reduced and the screen printing in this area was enlarged.



95/163

5717
Door Lock

Since the doors are locked and unlocked with the hand-held transmitter or the central locking system, the driver's door cannot be locked mechanically. The lock barrel in the driver's door has therefore been omitted.

Operating the door from the inside is possible in the same way as before.

Note:

The modifications of the locks were not introduced at the time of the production start of Model Year '96 vehicles.

911 Cabriolet

Tank Lock

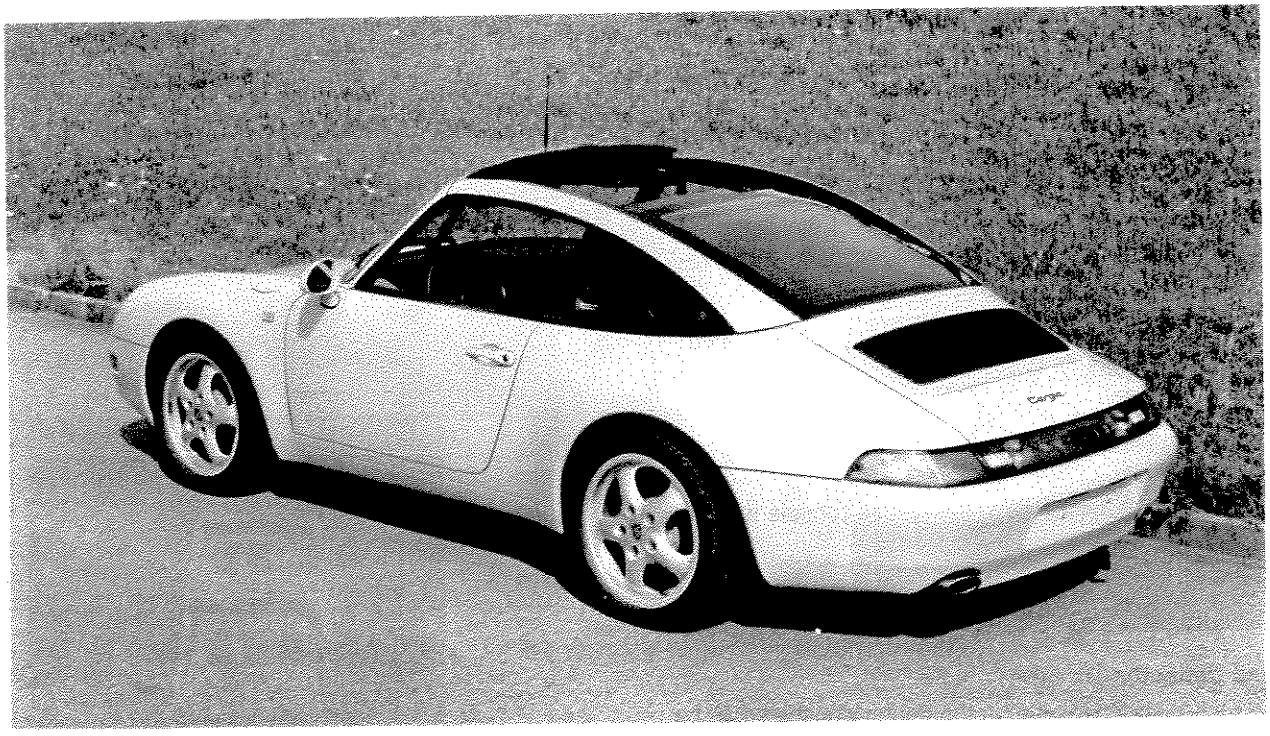
The lock barrel in the filler flap is omitted on the Cabriolet.

Body

911 Targa

The new 911 Targa is an individual body version within the 911 range. The body design is largely identical with that of the 911 Cabriolet and also features the same body shell reinforcements.

The roof assembly design is both light and rigid. It is an attractive complement to the classic lines of the 911 and, when seen from the side, features a body styling that reflects the lines of the Coupe.



95/159

The 911 Targa model also offers full 2+2 seating. Compared with the Coupe, headroom is the same in the rear and is actually actually slightly more generous in the front.

Operating Instructions

Targa

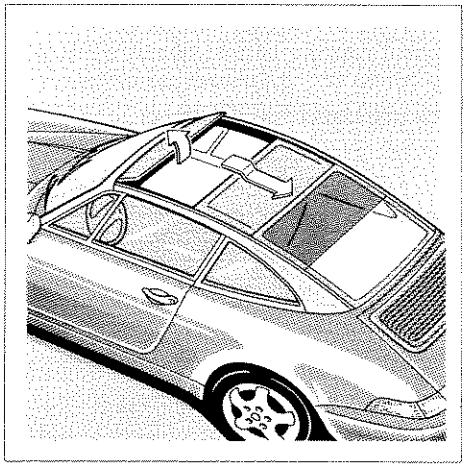
The wind deflector, the Targa roof and the blind protecting the passengers from sunlight or cold are operated electrically. They are operated by rocker switches located in the center console.

With the doors open, the rocker switches are operative regardless of the ignition key position; with the doors closed, they can only be operated with the ignition key in position "1" and "2".

Note:

When opening or closing the roof, make sure that you, your passengers or bystanders do not get their fingers, hands, hair etc. within the action range of the Targa roof, the wind deflector or the sun blind as this may result in injury.

The action range of the Targa roof must not be limited by any pieces of luggage or other objects.



B 9

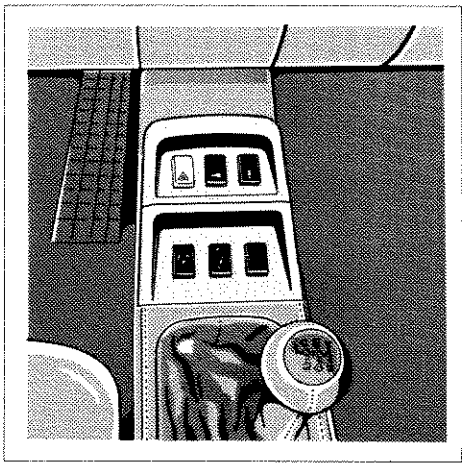
Sun blind

The rocker switch located in the center console is used to infinitely unfold or fold the sun blind.

The sun blind can only be unfolded with the Targa roof closed (regardless of the wind deflector position).

Wind deflector

The rocker switch located in the center consoles can be used to infinitely raise or retract the wind deflector.



B 10

Targa roof

Opening the roof

Press the rocker switch located in the center console until the wind deflector has been raised completely.

Press rocker switch again.

If the sun blind has been unfolded, it will be rolled up before the roof is opened.

The roof opens and will remain in the desired position as soon as the switch is released.

Closing the roof

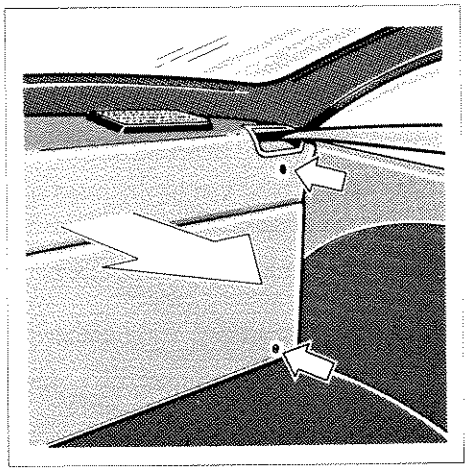
Press the rocker switch until the roof has closed completely.

Press the rocker switch again until the wind deflector has folded down.

Emergency Operation

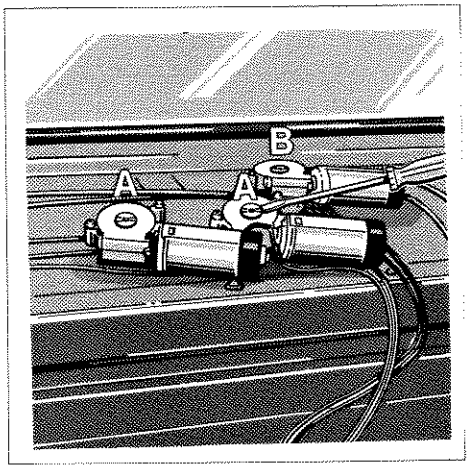
In case of failure of the drive motors, the roof, wind deflector and sun blind can also be closed manually.

1. Fold down rear seat backrests.
2. Remove four screws (arrows) from rear parcel shelf. Pull rear parcel shelf forward carefully until the drive motors are accessible.



B 11

3. Carefully lever red plastic drivers from the drive unit using a flat-tip screwdriver.

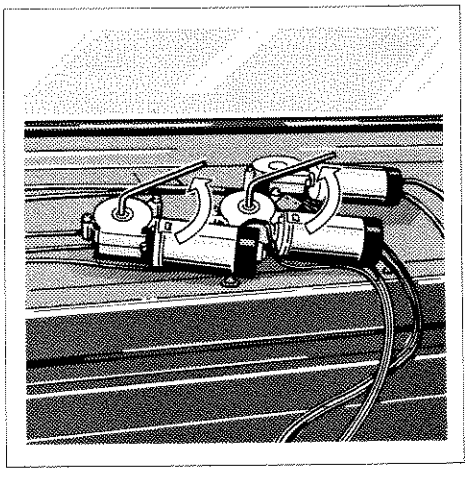


B 12

4. The motor axles can be rotated with an allen wrench. These are located in the motor section.

   In case of failure of the sun blind motor, rotate the motor (B) counterclockwise until the sun blind has been rolled up.

   In case of failure of the roof drive, rotate both motors (A) counterclockwise simultaneously until the roof and the wind deflector have been closed completely.



B 13

5. Return plastic driver to its position, clip allen wrenches back in place and refit rear parcel shelf.

The cause of the failure should be remedied as soon as possible by an Official Porsche Dealer.

Opening Positions

A — Both the wind deflector and the glass roof are closed.

The sun blind can be operated regardless of the position of the wind deflector. In this case, however, the glass roof must be closed.

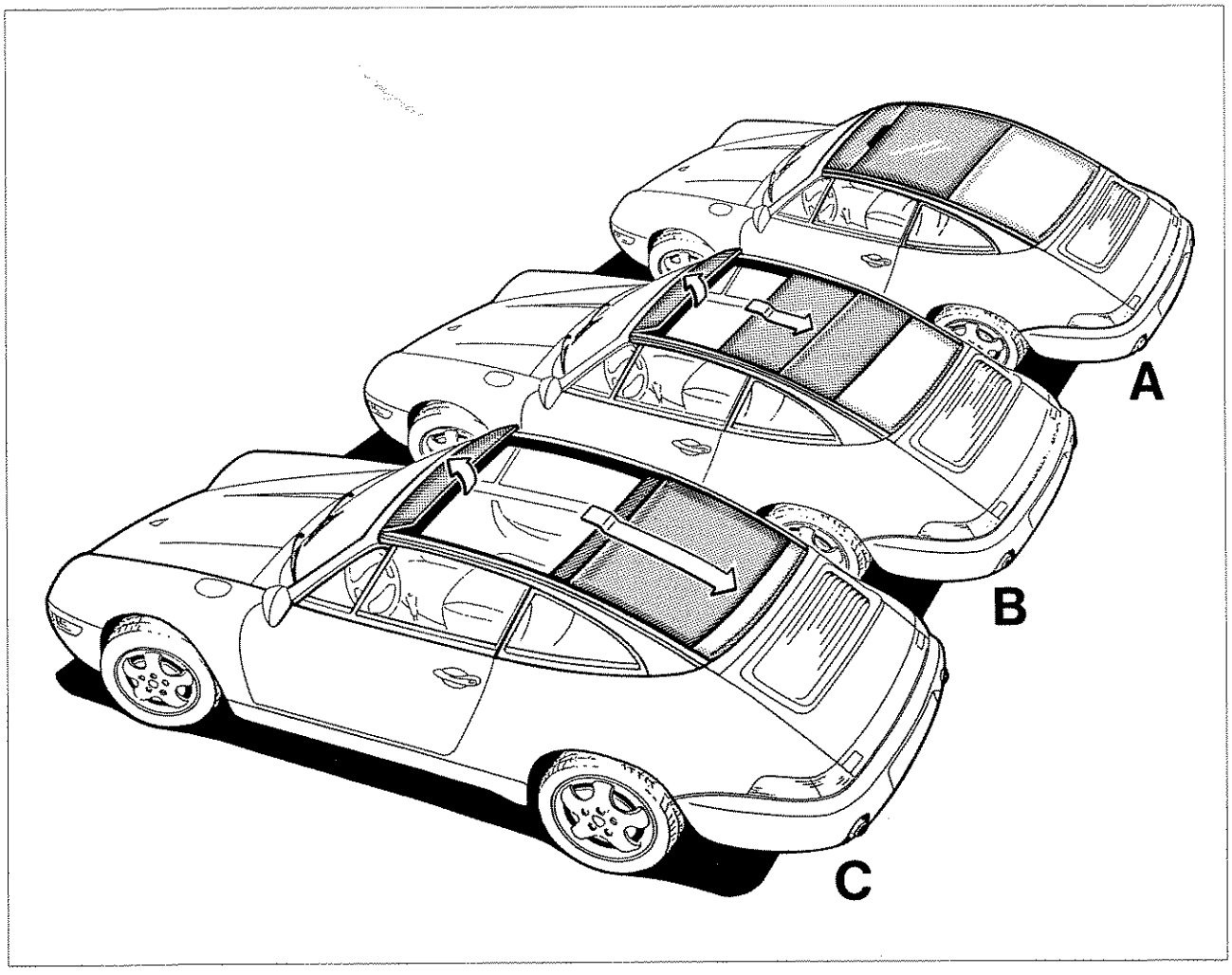
If the sun blind has been unfolded, it will be rolled down before the roof is opened.

B — The wind deflector can be folded up and retracted in an infinite number of positions.

The glass roof can only be opened infinitely when the wind deflector is fully folded up.

C — The glass roof is fully open and is in the end of travel position.

Opening Positions



307

Body-in-White

Windshield Frame

The windshield frame is based on the Cabriolet version but has been modified to accommodate the roof assembly.

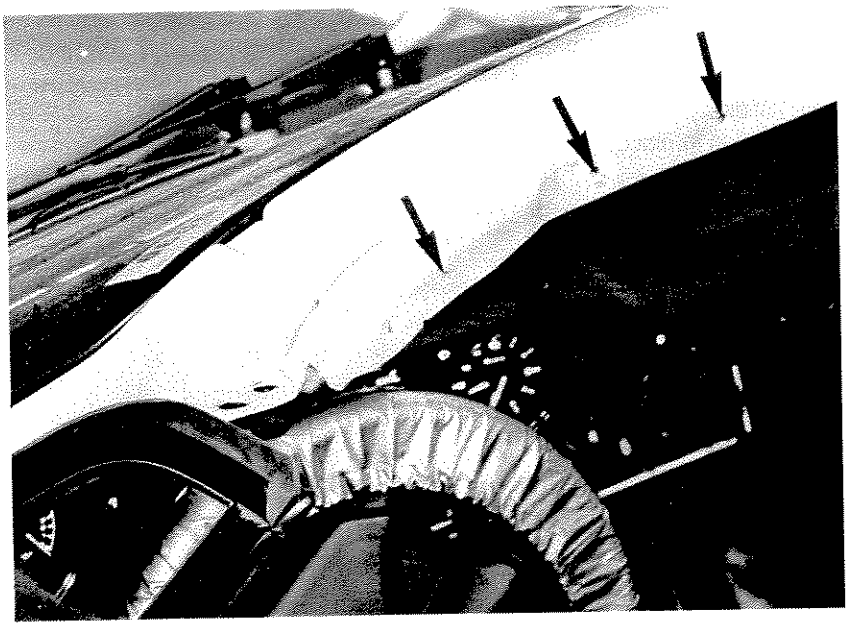
A new separation joint was introduced at the transition between the A-post and the cowl.

95/124

Two openings are provided in the outer windshield frame panel to hold the roof assembly in place and to allow water to be drained.

95/127

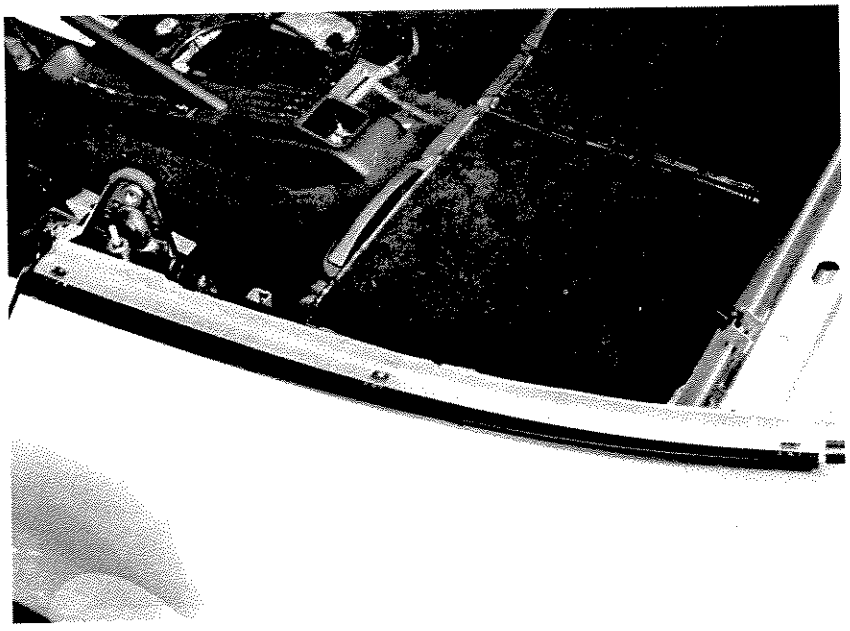
Threaded inserts (arrows) in the inner windshield frame panel allow the roof assembly or the crossbow, respectively, to be screwed in place.



95/155

Side panel

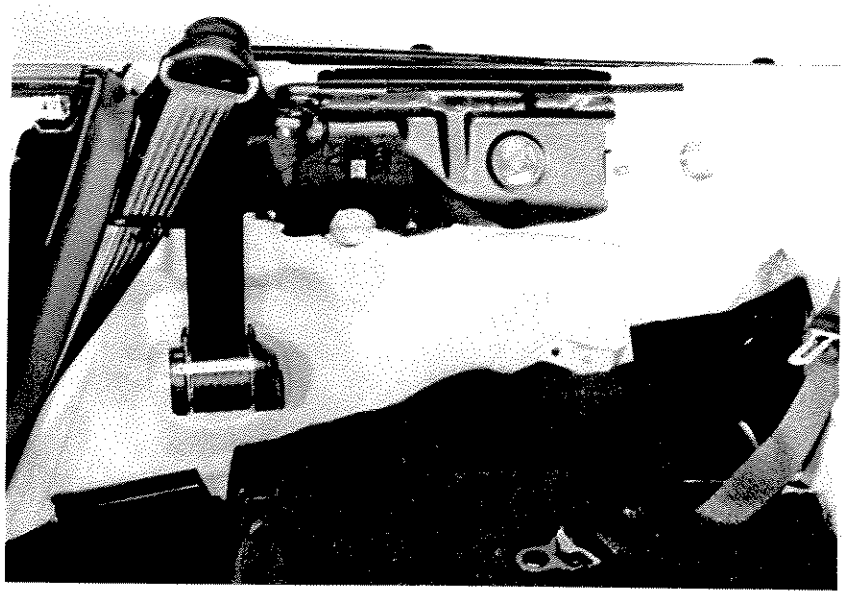
The side panel has been modified to accommodate the roof assembly and the trim strip. The body flange of the side panel extends up to the front edge.



95/129

Rear Inner Wall

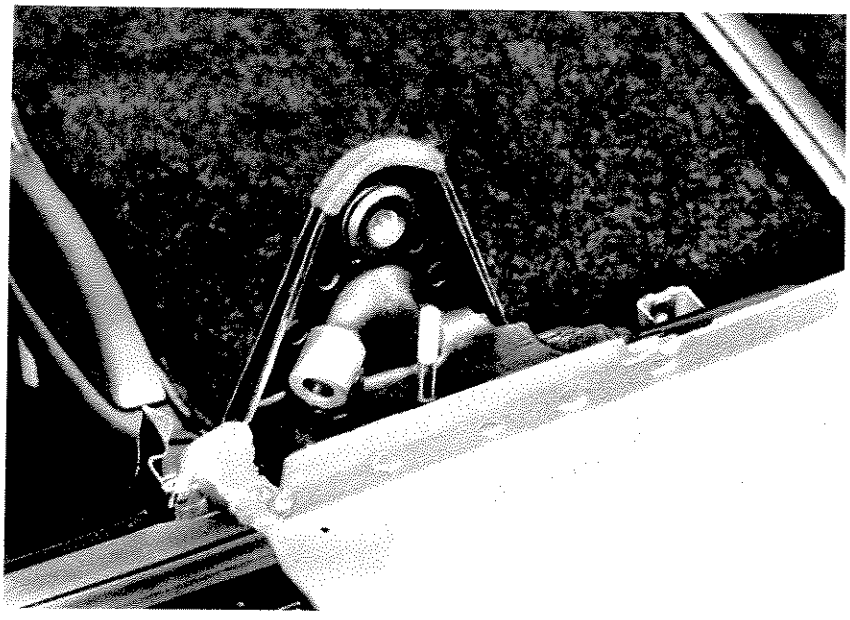
The rear inner wall has been modified to accommodate the roof assembly and to hold the trim section in place.



95/156

The support panel for the mounting studs is part of the seat belt anchorage and is welded to the body rear inner wall and the body flange of the side panel.

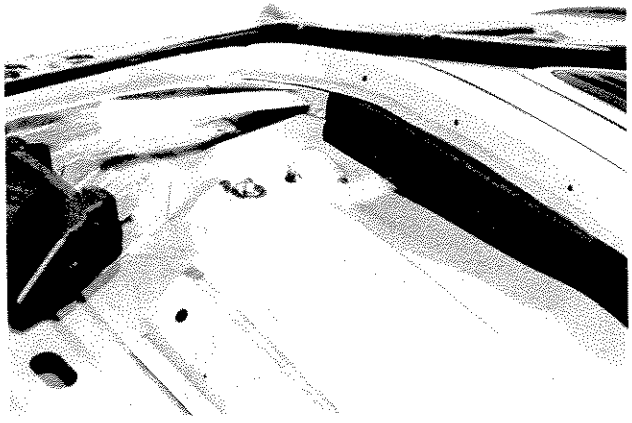
The bushing is placed on the mounting stud.



95/132

Rear Wall

The rear section of the roof assembly is held in place by two threaded studs that are welded to the rear wall.



95/152

Rear center section

The transition between the rear center section and the side panel was modified and has a stepped joint.

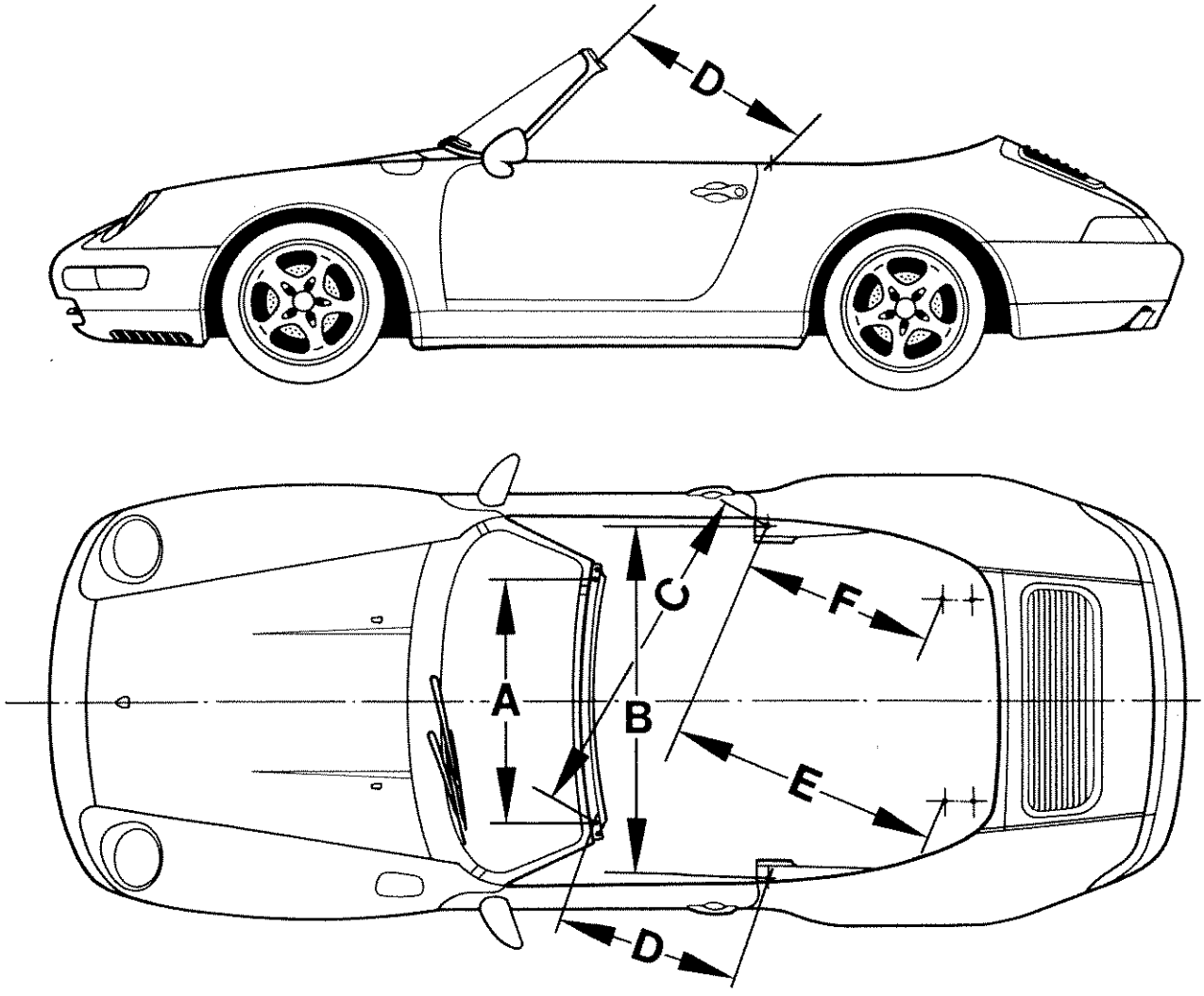
Note:

This modification was also introduced on the 911 Carrera Cabriolet.

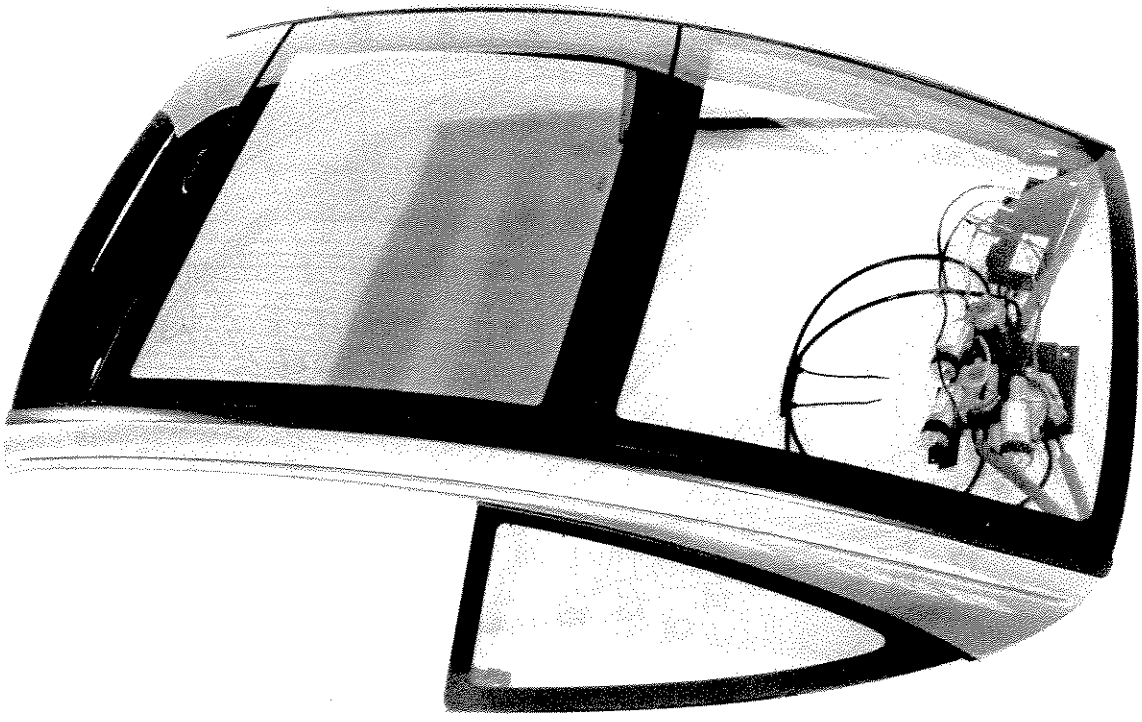
95/128

Repair Check Dimensions

Dimension	mm	Description
A	930 ± 2	Horizontal plane between support of LH locating pin (for convertible top) and support of RH locating pin.
B	1250 ± 3	Horizontal plane between LH mounting pin of roof assembly and RH mounting pin.
C	1315 ± 3	Diagonal plane between locating pin support (convertible top) and roof assembly mounting stud.
D	753 ± 2	Inclined plane between locating pin support (convertible top) and roof assembly mounting stud.
E	1250 ± 3	Diagonal plane between roof assembly mounting stud and front mounting stud on rear wall.
F	751 ± 2	Inclined plane between roof assembly mounting stud and front mounting stud on rear wall.


D
A
B
C
F
E
D

Roof Assembly



95/153

The roof assembly includes the following main components:

- Roof rail with side window glass
- Wind deflector
- Glass roof
- Rear window
- Drive motor

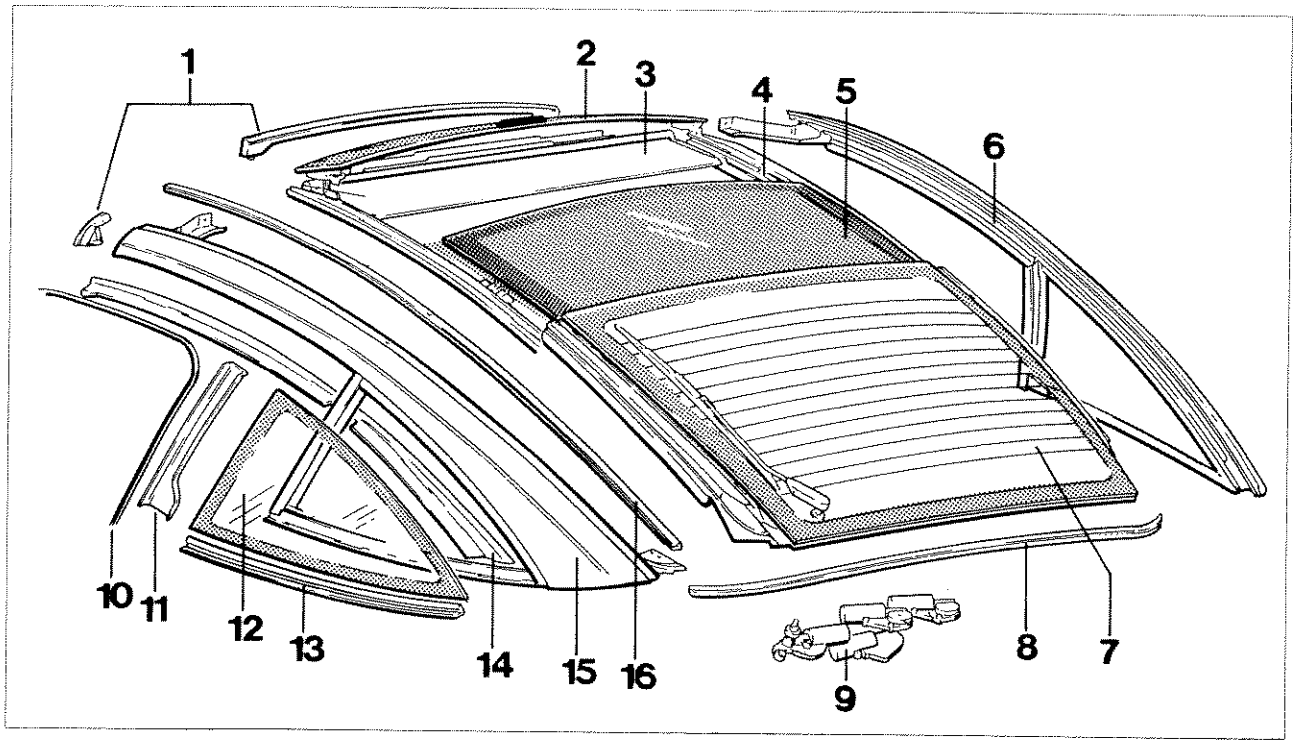
The roof assembly is a preassembled subassembly and is fitted to the vehicle as one unit.

The wind deflector and the glass roof are made of durable twin-layer safety glass. The glass parts are tinted, offer UV protection and cannot easily be looked through from the outside.

The rear window is also made of tinted safety glass and is electrically heatable. A rear window wiper is available as optional equipment.

The glass parts have a black screen-printed outline along their outer circumference.

Individual Components of the Roof Module



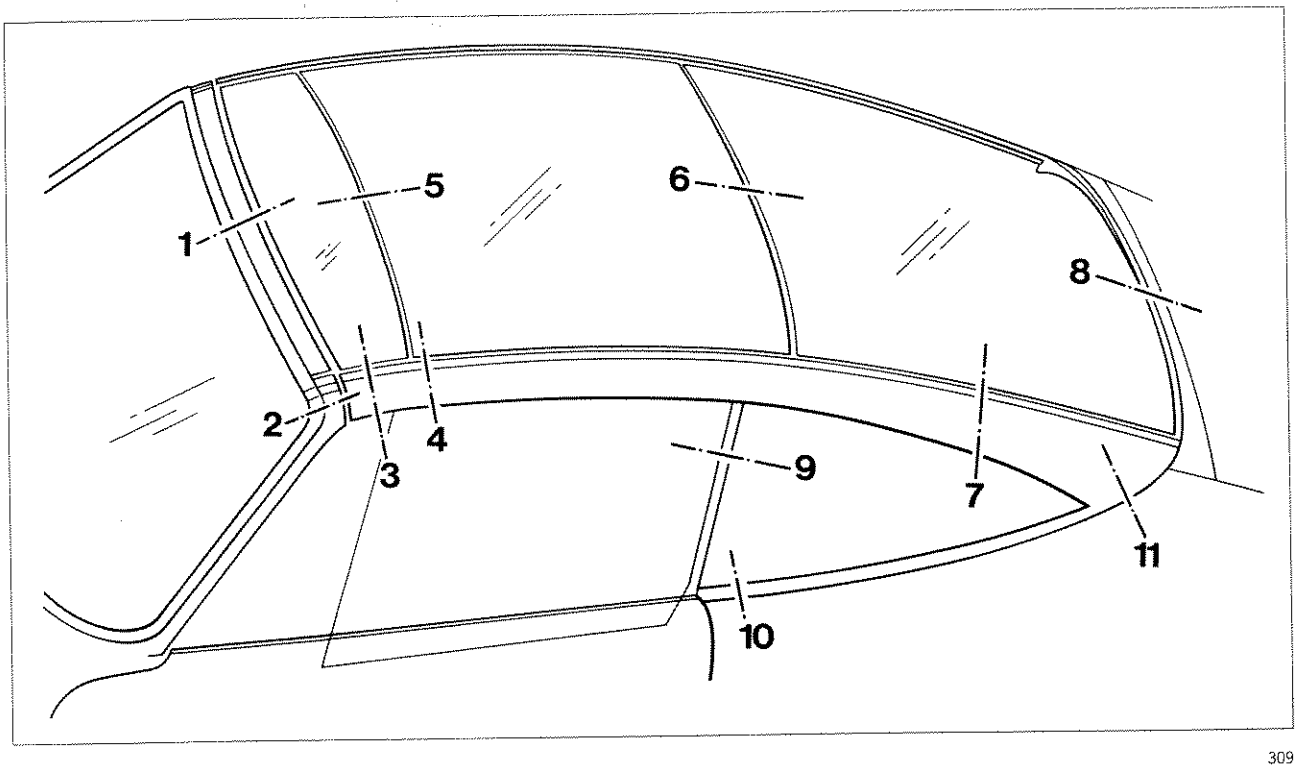
306

1 - Windshield frame seal
2 - Wind deflector
3 - Sun blind
4 - Guide rail
5 - Glass roof
6 - Roof rail assembly
7 - Rear window
8 - Seal
9 - Drive motor
10 - Door seal
11 - Trim section
12 - Side window
13 - Weatherstrip
14 - Trim section
15 - Roof rail
16 - Cover molding

Roof Assembly Design

Sectional overview

This overview of sectional drawings shows the location of the sectional drawings that are shown in detail on the following pages.



309

Sectional view 1 - Windshield frame - roof assembly, center

Sectional view 2 - Windshield frame - roof assembly, side

Sectional view 3 - Roof rail - wind deflector

Sectional view 4 - Roof rail - glass roof

Sectional view 5 - Wind deflector - glass roof

Sectional view 6 - Glass roof - rear window

Sectional view 7 - Roof rail - rear window

Sectional view 8 - Rear window - rear center section

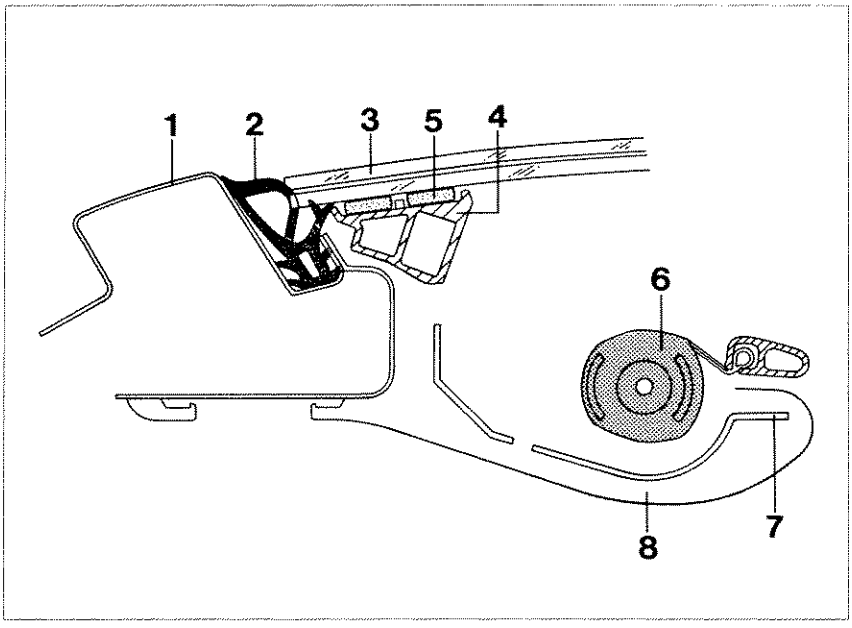
Sectional view 9 - Door window - side window

Sectional view 10 - B-post mounting

Sectional view 11 - Roof rail - side panel

Sectional view 1

Windshield frame - roof assembly (center)



304

1 - Windshield frame
2 - Windshield frame seal
3 - Wind deflector
4 - Profile section
5 - Bonding material
6 - Sun blind
7 - Crossbow
8 - Trim insert

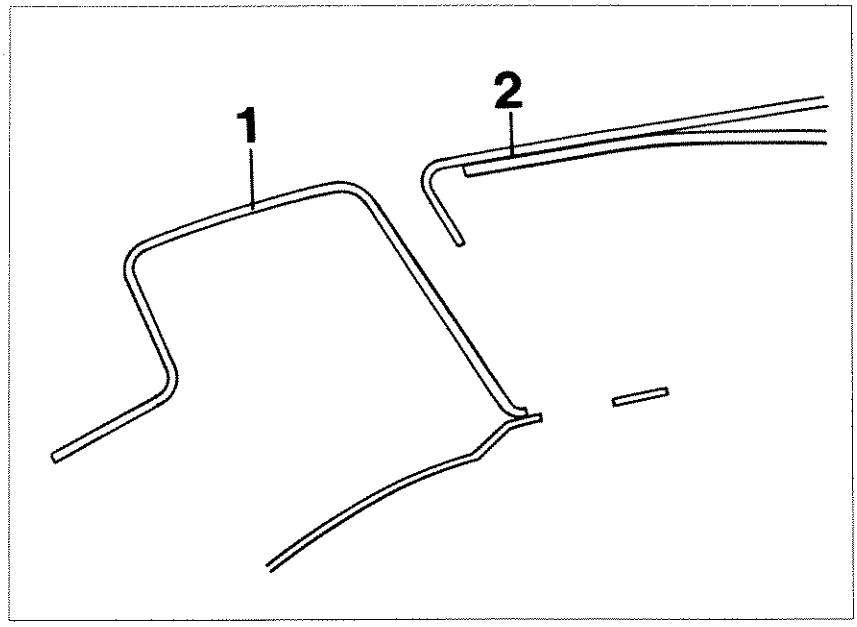
The windshield frame seal (2) engages into the edge of the windshield frame (1). The joint with the side seal is established by the corner section. This seal is fitted prior to installing the roof assembly.

The profile section (4) is bonded (5) to the wind deflector (3). The wind deflector prop is attached to the profile section across the hinge rail.

The sun blind (6) with the roll-up mechanism is attached to the crossbow (7). A trim insert (8) is fitted to cover the crossbow.

Sectional view 2

Windshield frame - roof assembly (side)



316

1 - Windshield frame

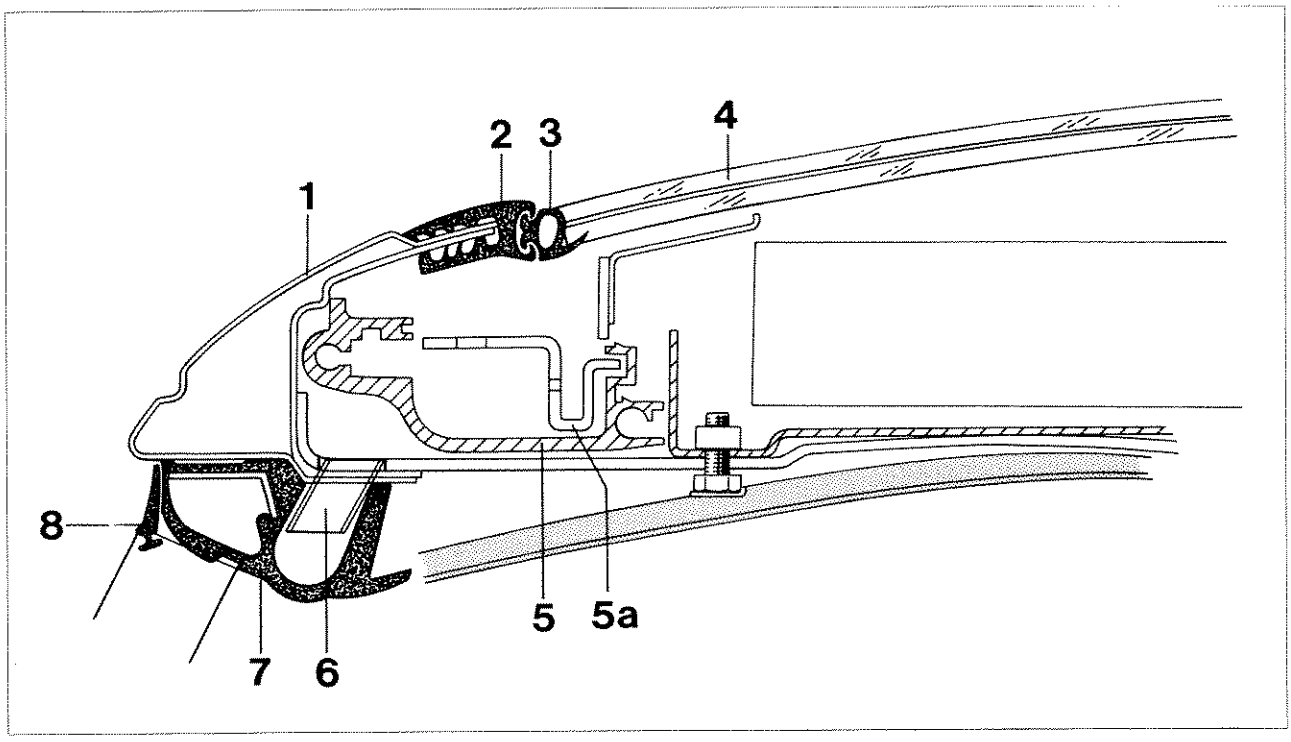
2 - Roof rail

Note:

The gap at the transition between the windshield frame (1) and the roof rail (2) has a width of 7 ± 1 mm.

Sectional view 3

Roof rail - wind deflector



305

1 - Roof rail
2 - Cover molding
3 - Seal
4 - Wind deflector
5 - Guide rail
5a - Support plate
6 - Water drain tube
7 - Door seal
8 - Auxiliary door seal

The roof rail (1) is made of hot-dip galvanized sheet steel. A cover molding (2) is fitted to mask the joint with the glass area. The cover molding is made of an aluminum extrusion profile with a special powder coating. A flock-coated seal (3) mating up with the wind deflector (4) is held in place in the groove in the cover molding.

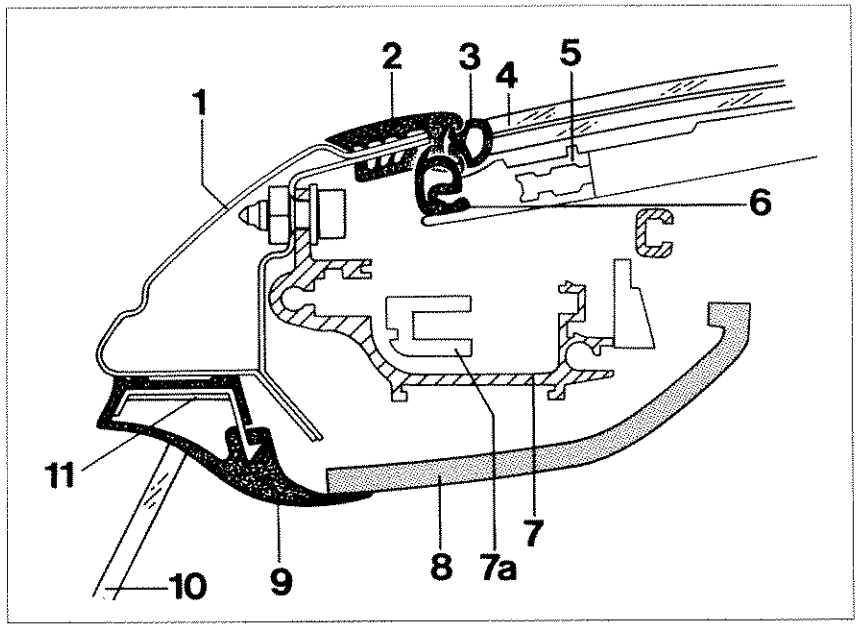
The guide rail (5) is screwed in place on the roof rail. The support panel (5a) is located in the guide rail.

The front closing section of the roof rails houses a water drain tube (6) that exits into the door seal (7).

The joint between the roof rail and the door window frame is sealed towards the outside by the auxiliary door seal. This seal is held in place in the groove of the door window frame.

Sectional view 4

Roof rail - glass roof



303

1 - Roof rail
2 - Cover molding
3 - Seal
4 - Glass roof
5 - Profile frame
6 - Seal
7 - Guide rail
7a - Slide
8 - Trim section
9 - Door seal
10 - Door window
11 - Retaining strip of door seal

A powder-coated cover molding (2) is fitted to establish the joint between the roof rail (1) and the glass area. A flock-coated seal (3) mating up with the glass roof (4) is installed in the groove of the cover molding.

The powder-coated profile frame (5) is bonded to the inside of the glass roof. Another seal (6) is fitted into the profile section groove along its circumference.

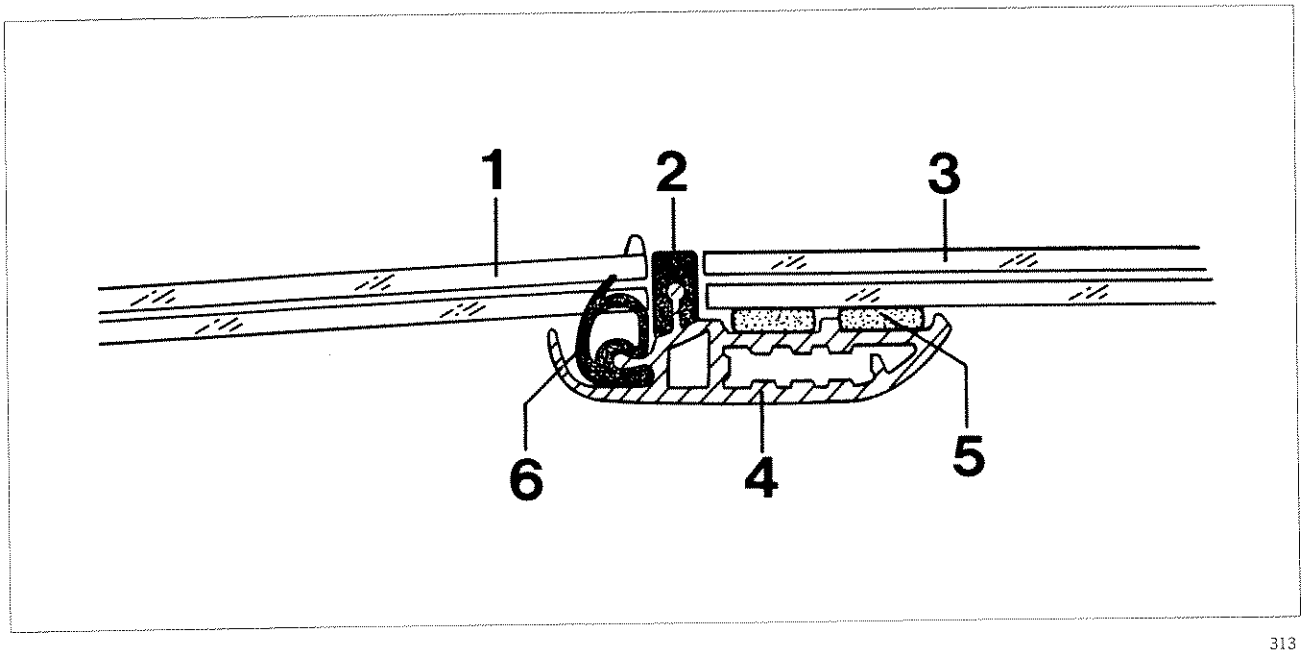
The guide rail (7) is screwed to the side of the roof rail. The slide (7a) is aligned in the guide rail.

Trim section (8) covers both the guide rails and the roof rail and is held in place by two slides at the front in addition to the screw assemblies with the coat hook.

The door seal (9) mating up with the door window (10) consists of a set of profiled sections and is screwed to the roof rail along a retaining strip (11). The fastening screws are accessible after releasing the seal from the retaining strip.

Sectional view 5

Wind deflector - glass roof



313

1 - Wind deflector

2 - Seal

3 - Glass roof

4 - Profile frame

5 - Bonding material

6 - Seal

A seal (2) is fitted between the wind deflector (1) and the glass roof (3). This seal is clipped into the profile frame. An additional flock coating is applied to the top of this seal.

The profile frame (4) is bonded (5) to the glass roof. The seal (6) is held in place in the groove of the profile frame.

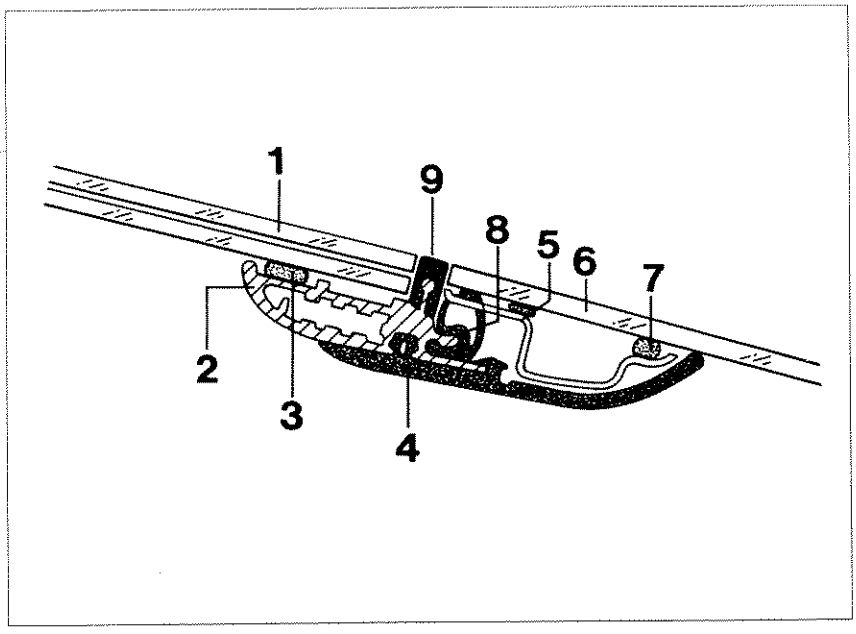
Note:

When adjusting the wind deflector to the glass roof, it should be flush with the roof edge or 2 mm above the edge ($0\ ^{+2}_{-0}$).

The clearance between the glass roof and the wind deflector is 7 ± 1 mm.

Sectional view 6

Glass roof - rear window



314

1 - Glass roof
2 - Profile frame
3 - Bonding material
4 - Weatherstrip
5 - Rear window inner panel
6 - Rear window
7 - Bonding material
8 - Seal
9 - Seal

Profile frame (2) is bonded (3) to the inside of the glass roof (1). A weatherstrip (4) clipped into the profile frame covers the joint with the rear window inner panel (5).

The rear window inner panel is bonded (7) to the rear window (6). The seal (8) is clipped into the profile section.

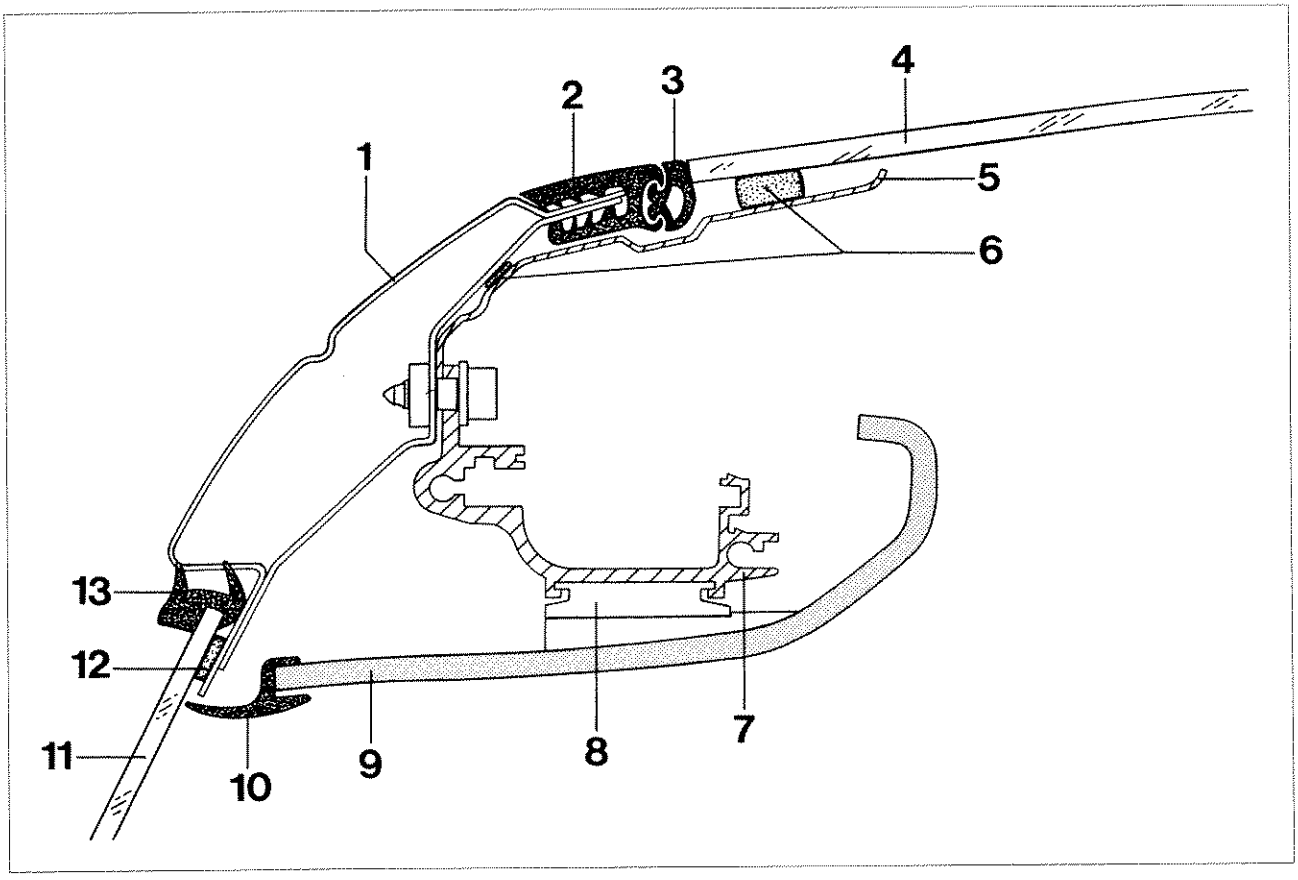
An additional seal (9) is fitted between the glass roof and the rear window. The surface of this seal is flock-coated.

Note:

The clearance between the glass roof and the rear window is 7 ± 1 mm.

Sectional view 7

Roof rail - rear window



315

1 - Roof rail
2 - Cover molding
3 - Seal
4 - Rear window
5 - Rear window inner panel
6 - Bonding material
7 - Guide rail
8 - Slide
9 - Trim section
10 - Seal
11 - Side window
12 - Bonding material
13 - Seal

A cover molding (2) is fitted to establish the joint between the roof rail (1) and the rear window (4). A flock-covered seal (3) is installed in the groove of the cover molding.

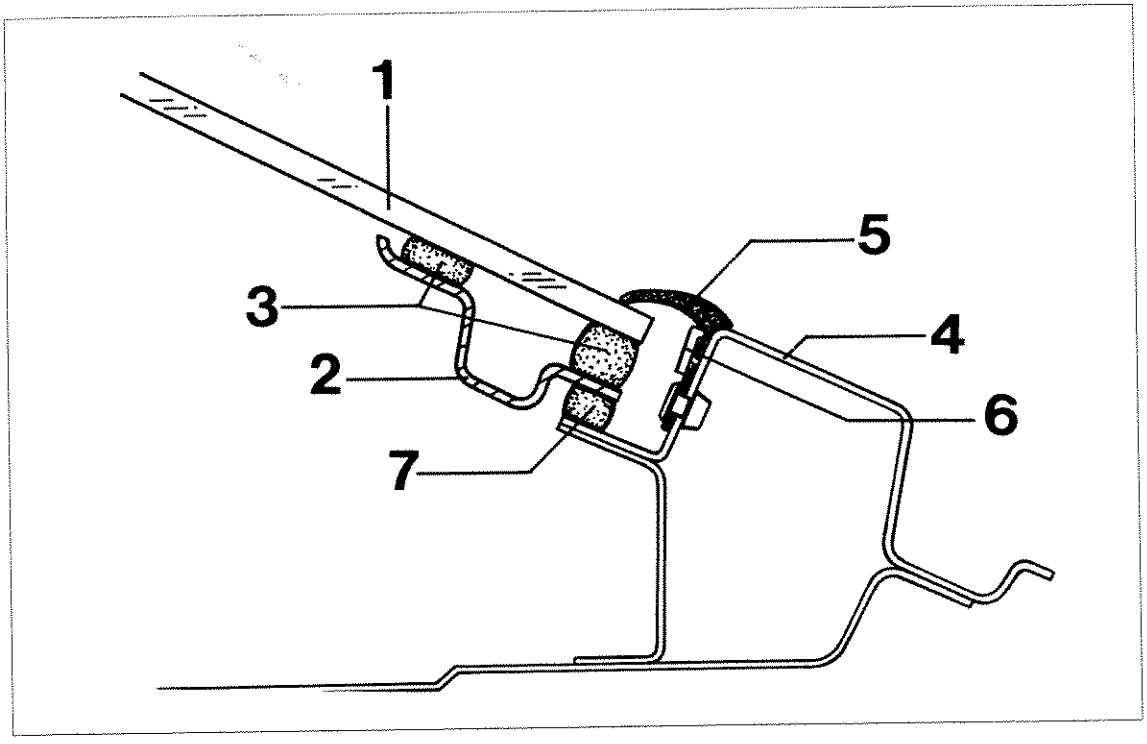
The rear window inner panel (5) is bonded to the rear window (6) and is additionally screw-fitted and bonded to the roof rail. The guide rail (7) is also screwed to the roof rail. Two slides (8) are used to attach the trim section (9) to the guide rail.

A push-on seal (10) is located between the trim section and the side window (11).
A screen-print strip runs along the outline of the side window.

Bonding (12) of the side window is made along the flange of the roof rail. A seal (13) clipped in place on the edge of the side window covers the joint with the roof rail.

Sectional view 8

Rear window - rear center section



302

1 - Rear window

2 - Rear window inner panel

3 - Bonding material

4 - Rear center section

5 - Seal

6 - Retaining strip

7 - Bonding material

The rear window (1) is bonded (3) to the rear window inner panel (2).

A seal (5) is fitted between the rear window and the rear center section (4). A riveted retaining strip (6) locates this seal in the correct installation position.

The bonding line (7) of the roof assembly runs between the rear window inner panel and the body flange.

Note:

The clearance between the rear window and the rear center section is 8 ± 3 mm.

Sectional view 9

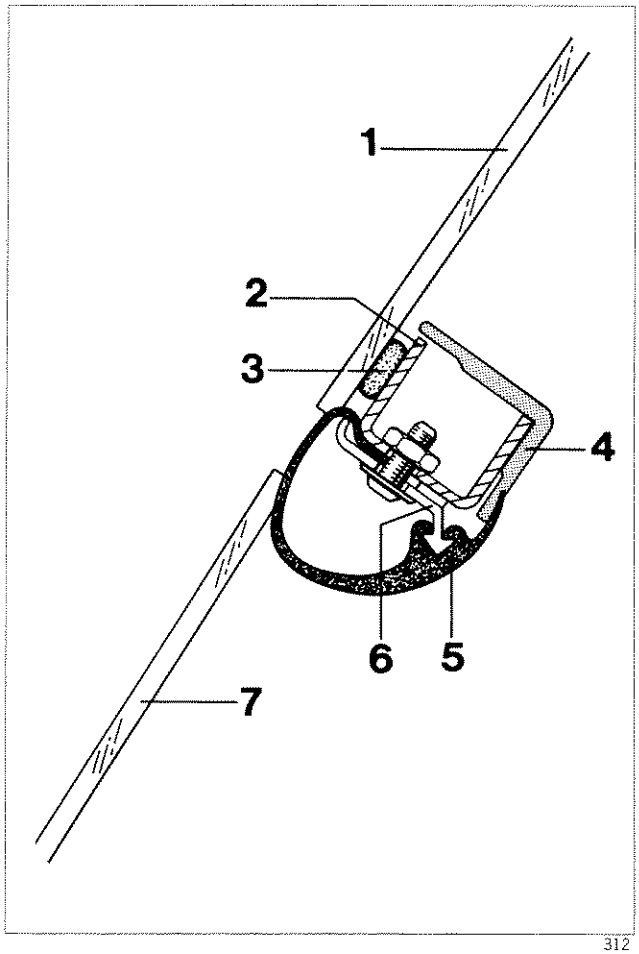
Door window - side window

The side window (1) is bonded (3) to the B-post (2). The B-post section is welded to the roof rail. A trim section (4) is fitted to the B-post.

A seal (5) screwed to the B-post with a retaining strip (6) covers the joint with the door window (7). The screw locations are accessible after removing the trim section.

Note:

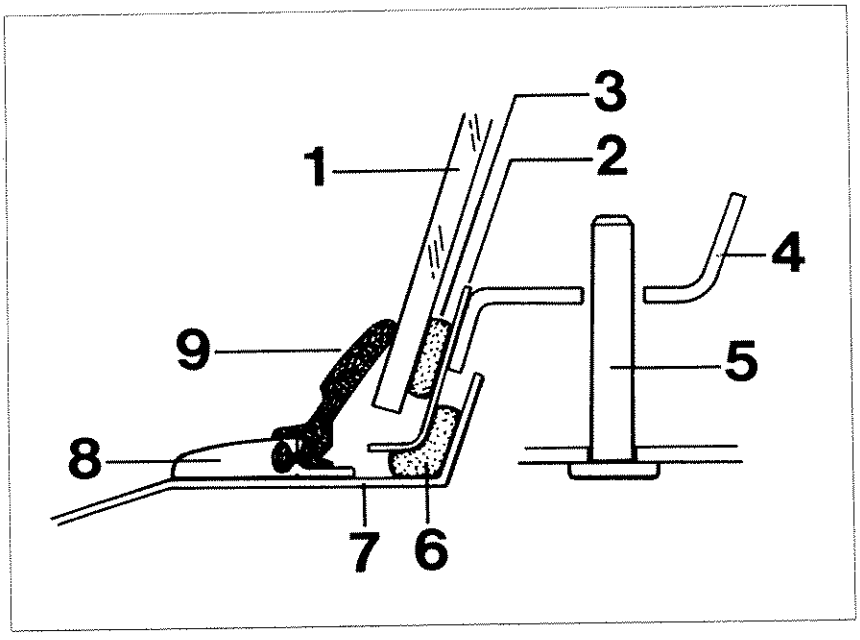
The clearance between the door window and the side window is 15 ± 3 mm.



1 - Side window
2 - B-post
3 - Bonding material
4 - Trim section
5 - Seal
6 - Retaining strip
7 - Door window

Sectional view 10

Mounting at B-post



311

1 - Side window
2 - Frame panel
3 - Bonding material
4 - Screw-on tab
5 - Mounting stud
6 - Bonding material
7 - Side section
8 - Trim molding
9 - Seal

The side window (1) is bonded (3) to the frame panel (2) that also delimits the lower closing section of the roof rail. The screw-on tab (4) is a connecting piece welded in place between the B-post and the frame panel.

The roof assembly is bolded to the screw-on tab at the mounting stud (5).

The bonding material (6) of the roof assembly bond area is applied between the frame panel and the body flange of the side panel (7). The trim molding (8) is attached with retaining clips to the body flange of the side section. A seal (9) is installed in the groove of the trim molding to cover the joint with the side window.

Sectional view 11

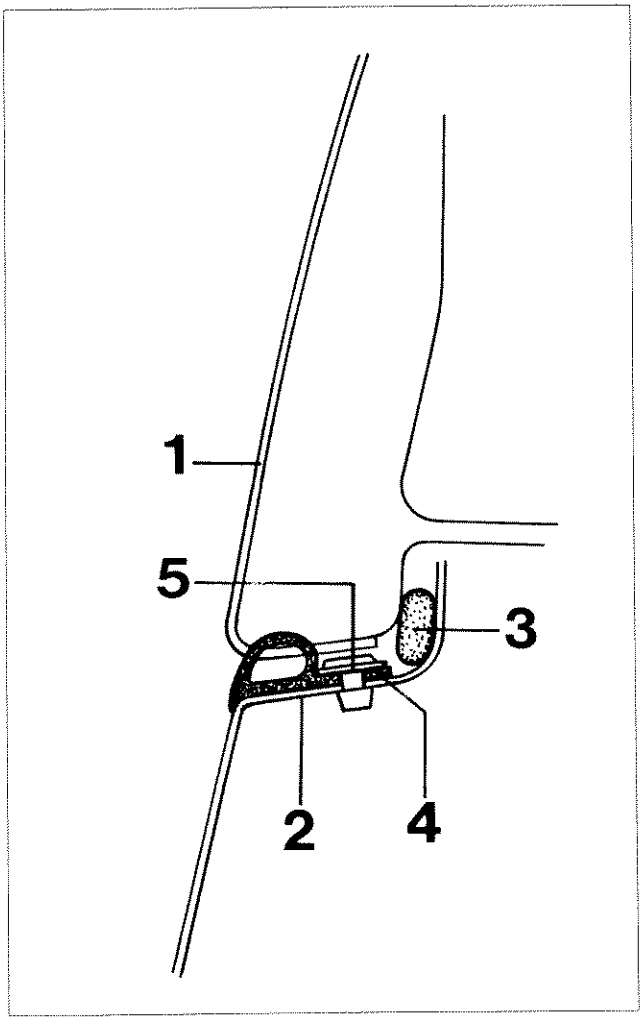
Roof rail - side panel

The bonding material (3) for the roof assembly bond area is applied between the roof rail (1) and the body flange of the side panel (2).

The seal (4) covers the joint with the side panel and is held in place by a retaining strip (5) that is riveted to the body flange.

Note:

The clearance between the roof assembly and the side panel is 5 ± 1,5 mm. A difference of 0.5 mm between the left and right-hand sides of the vehicle is acceptable.

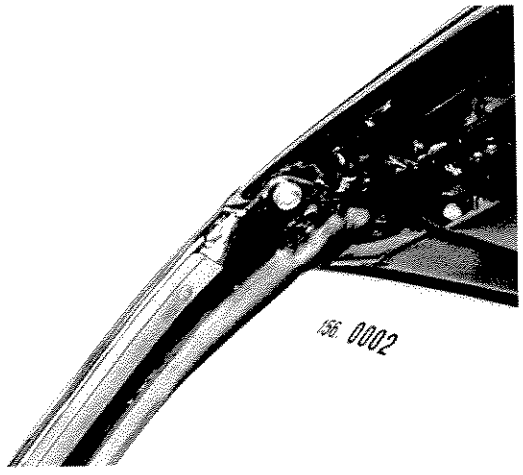


310

1 - Roof rail
2 - Side section
3 - Bonding material
4 - Seal
5 - Retaining strip

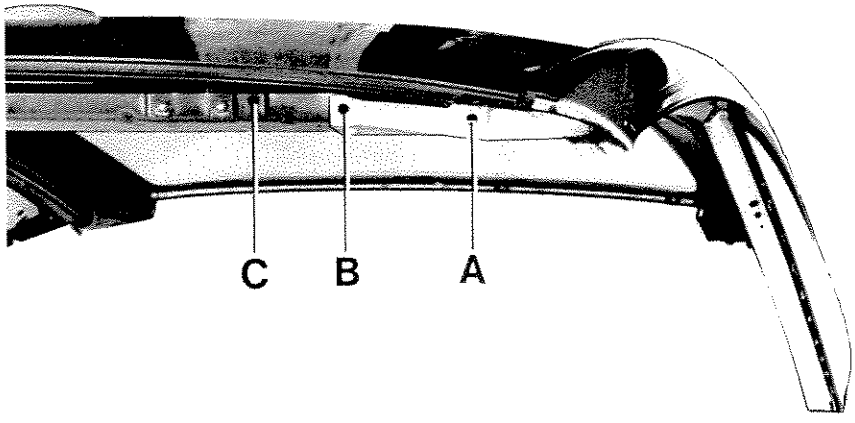
Roof assembly mounting

The roof assembly is fitted to the screw-on tab of the windshield frame. The screw locations are accessible from below.



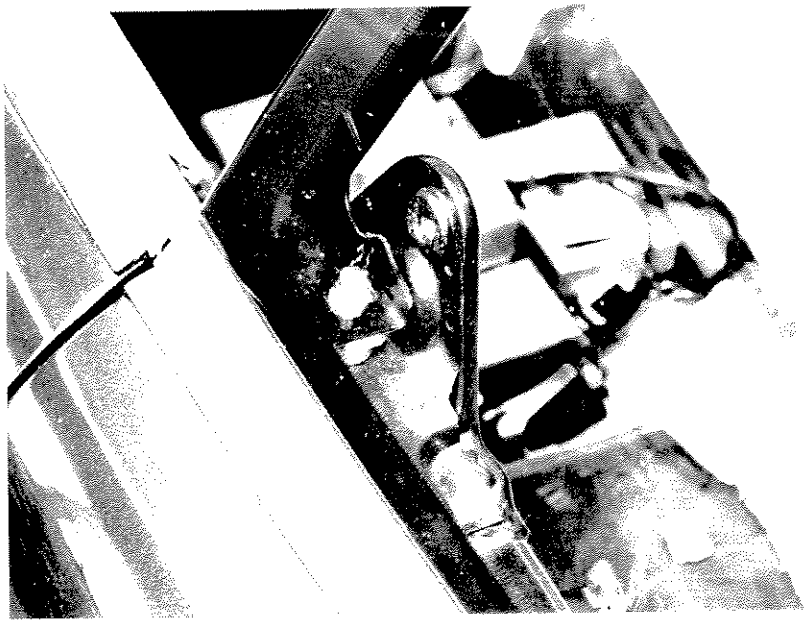
95/137a

The roof assembly is bolted to the inner panel at points A and B. The crossbow is bolted to the inner panel at point C.



95/146

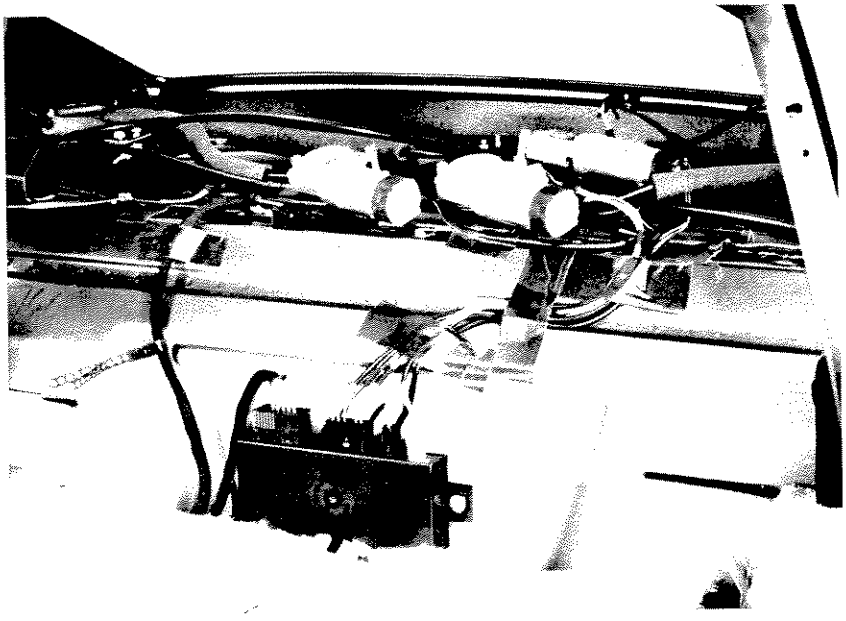
The roof assembly is bolted to the mounting stud in the B-post area using screw-on tab.



95/138

In addition to the lateral roof assembly mounting points located at the threaded studs, the rear panel upper section also provides the mounting points for the drive motor.

The control unit is fitted to the center of the rear panel.

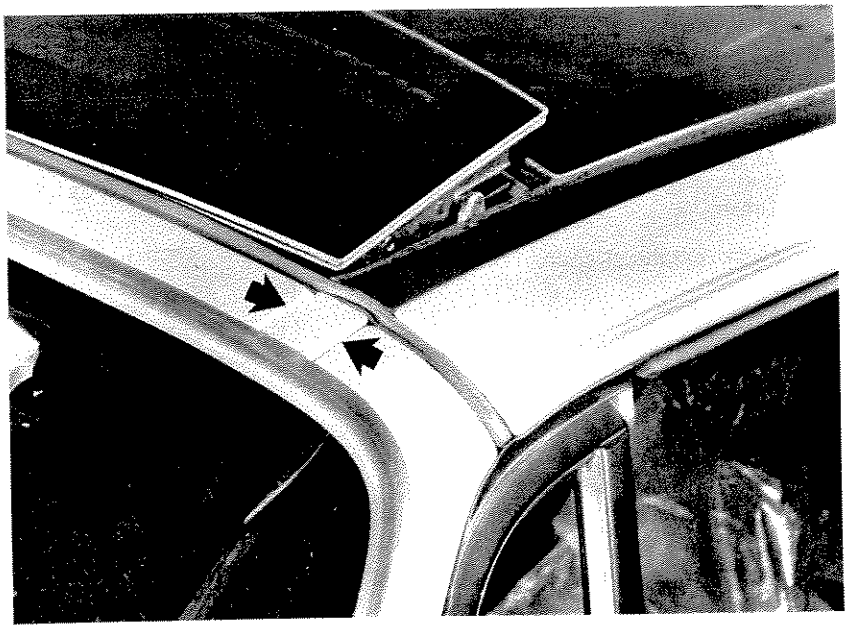


95/142

Wind deflector

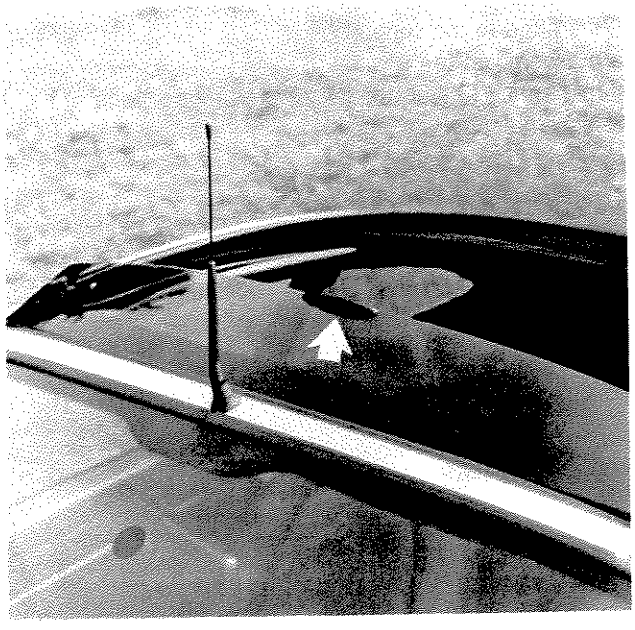
The power-operated wind deflector lines up with the windshield frame and can be folded up in an infinite number of positions.

A cover strip (arrow) is bonded in place between the outer panel of the windshield frame and the upper transverse panel.



95/149

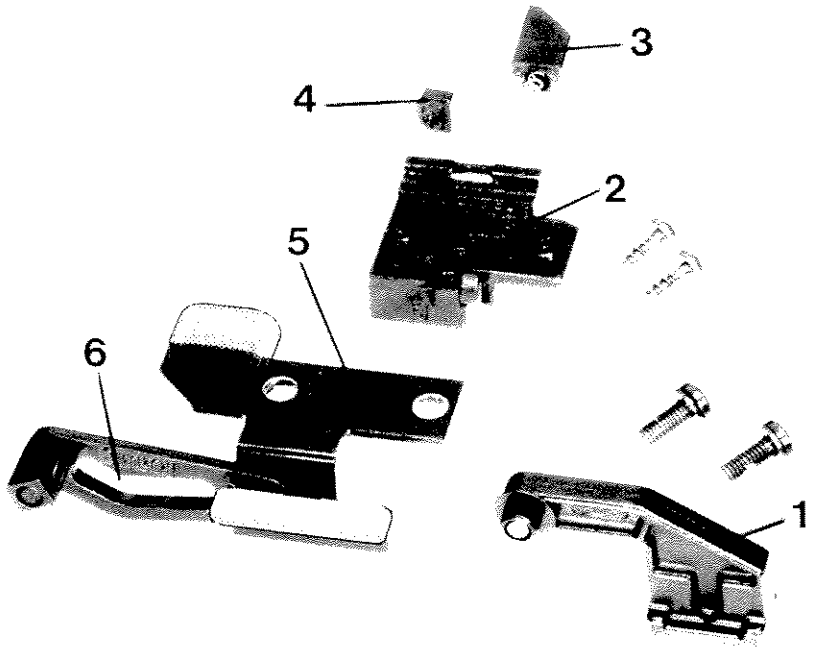
A diffuser (molding) is bonded to the wind deflector (arrow) to duct the air flow when the glass roof is open.



95/162

Wind deflector
The fold-up slide consists of the following components:

1 - Mounting bracket
2 - Driver
3 - Slide with thrust spring
4 - Latching elements
5 - Support plate
6 - Fold-up lever



95/173

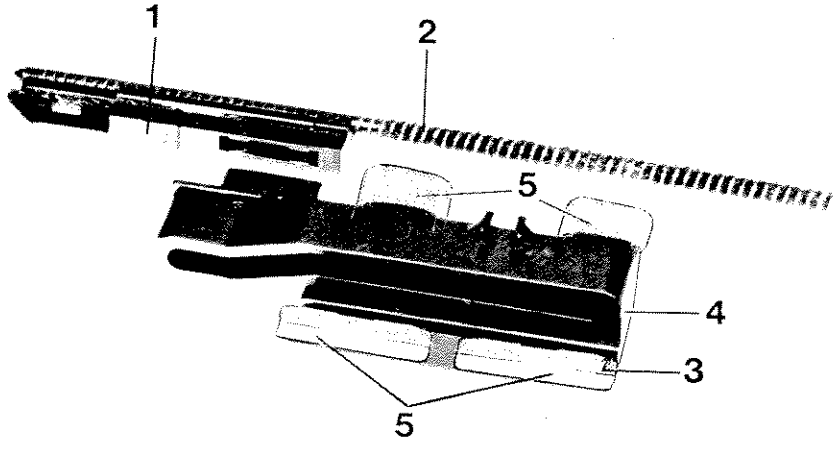
The mounting bracket (1) is bolted to the guide rail and engages in the slide of the fold-up lever (6). The driver (2) is fitted to the support plate (5), and the slide jaws are assembled to the sides of this plate. The slide with thrust spring (3) and the latching element (4) are used to assemble the fold-up and gate slides with each other.

When the wind deflector is folded up, the gate slide is released in the end of travel position and the latching element is used to locate the fold-up slide in the cutout of the guide rail.

The gate slide consists of the following components:

1 - Wiring attachment
2 - Drive cable
3 - Mounting plate
4 - Gate
5 - Sliding jaws

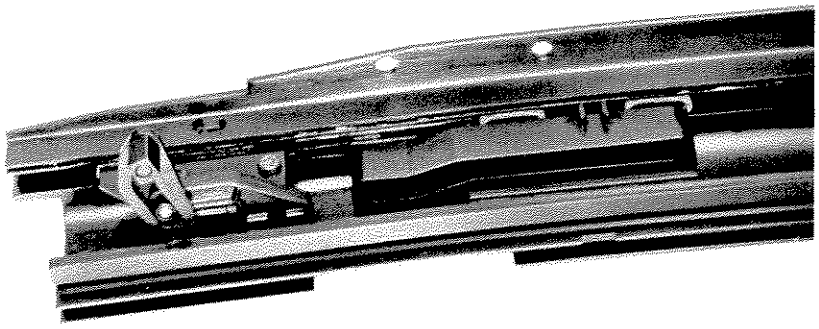
The cable attachment (1) is part of the drive cable (2). The gate (4) mounted on the support plate (3) engages in the cutout of the cable attachment. Sliding jaws (5) are fitted to the sides of the support plate. The gate is used to locate the glass roof.



95/171

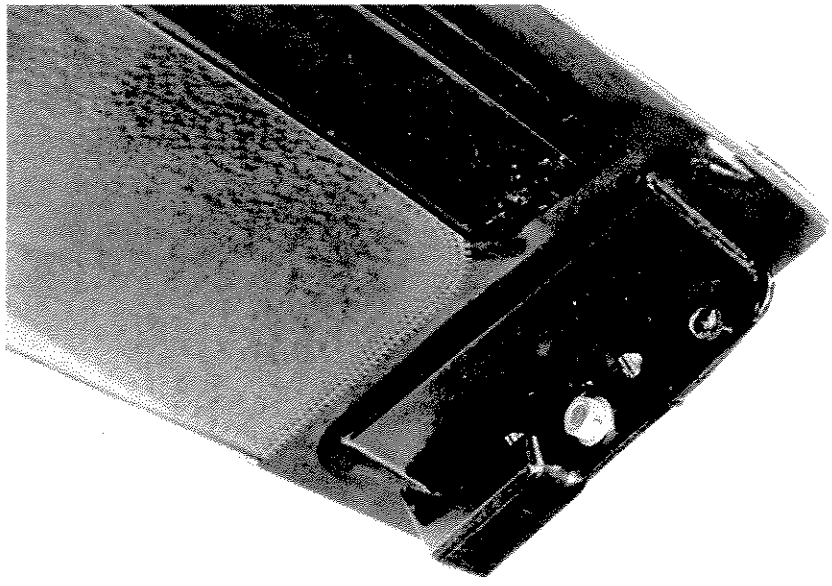
The fold-up and gate slides engage into the guide rail and are located in the inner and outer grooves.

The outer groove is used to house the drive cable.



95/170

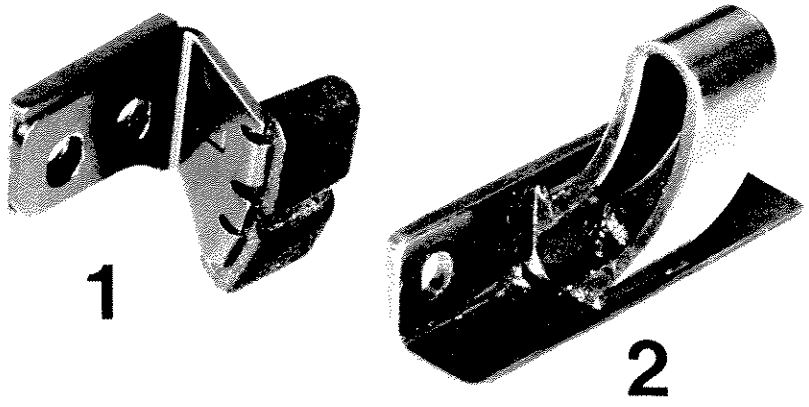
A retainer is fitted to the side of the wind deflector to locate the fold-up lever.



95/120

1 - Sliding bracket

2 - Hinge gate



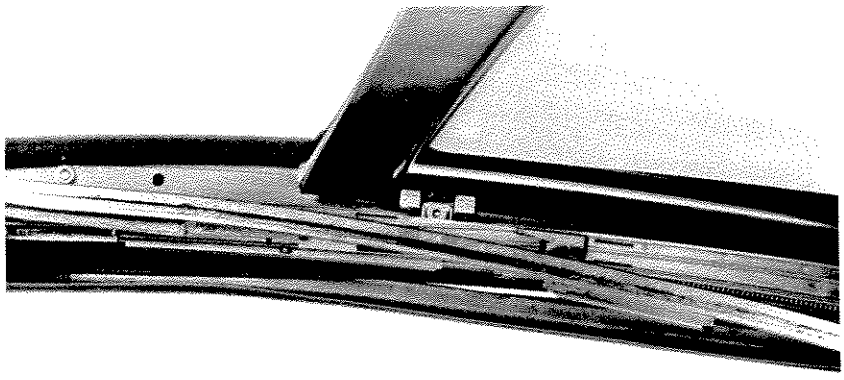
95/189

At the front, the wind deflector is held in place by the sliding bracket (1) complete with slide jaws bolted to the profile section of the wind deflector. The sliding bracket engages into the hinge gate (2) that is bolted to the crossbow in such a manner that it remains adjustable.

Glass roof

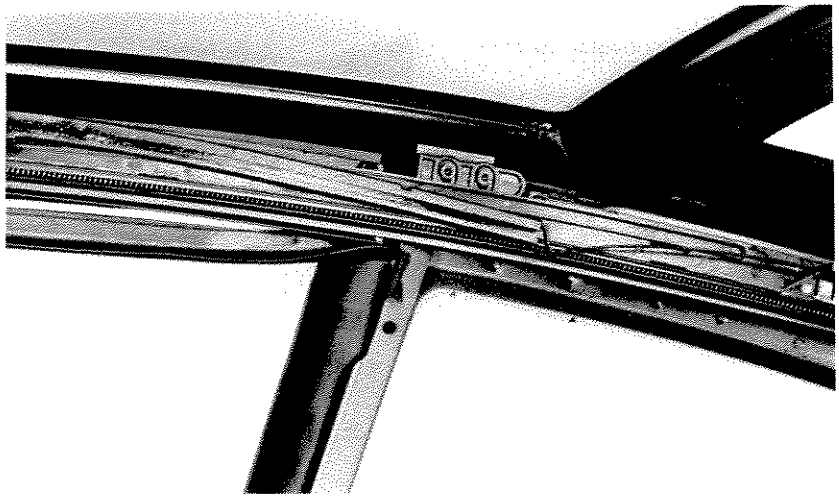
One screw is used to attach the front of the glass roof to the support.

The mounting point is covered by the guide rail of the sun blind and is only accessible after opening the glass roof.



95/139

The rear of the glass roof is fitted to the support with two screws.



95/141

The rear gate slide consists of the following components:

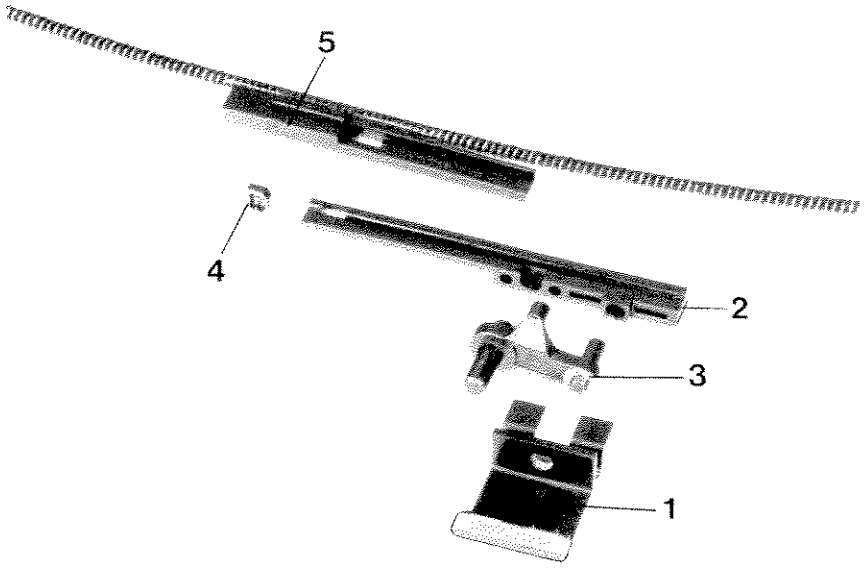
1 - Support plate

2 - Lever mount

3 - Lever

4 - Latching element

5 - Cable attachment



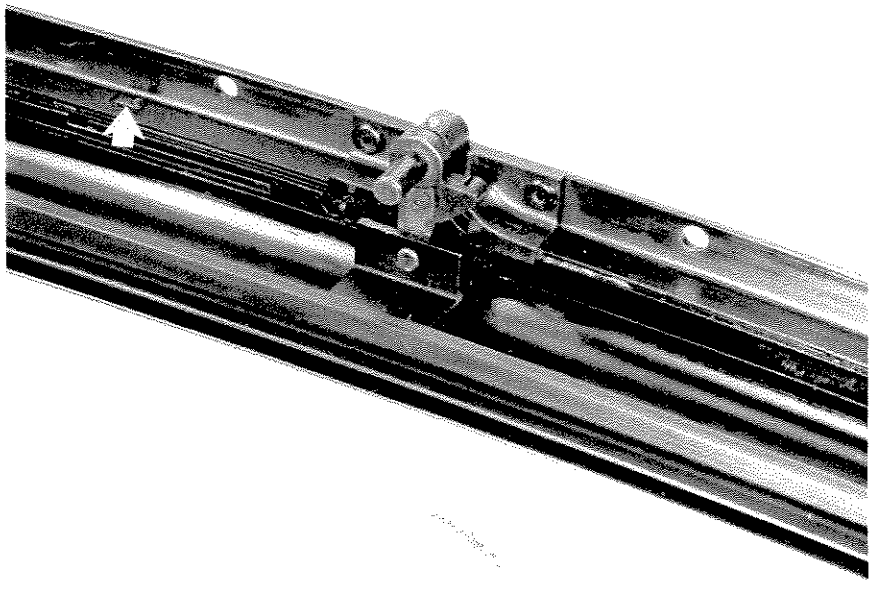
95/172

The support plate (1) engages into the cutouts of the lever mount (2). A sliding jaw is attached to the inside. The lever (3) is attached to the support plate and to the lever mount.

The latching element (4) is used to disconnect/connect the cable attachment (5) to the drive cable and to the lever mount.

The gate guide of the raising/lowering mechanism is riveted to the guide rail.

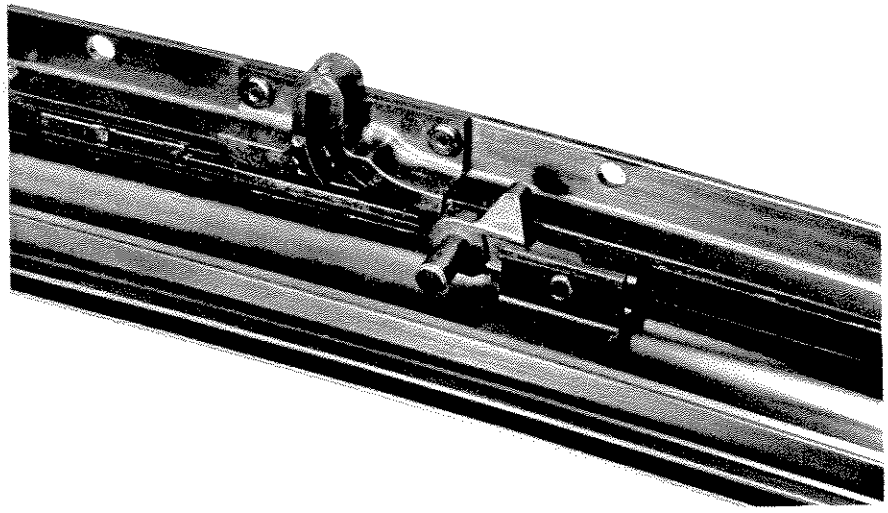
When the roof is closed, the lever is moved upwards across the guide rail, causing the glass roof to be raised. The latching element locates the gate slide in the guide rail across the cutout (arrow) and releases the cable attachment.



95/169

When opening the roof, the latching element engages into the cutout of the cable attachment. This causes the mounting of the gate slide to be released and the the glass roof to be lowered.

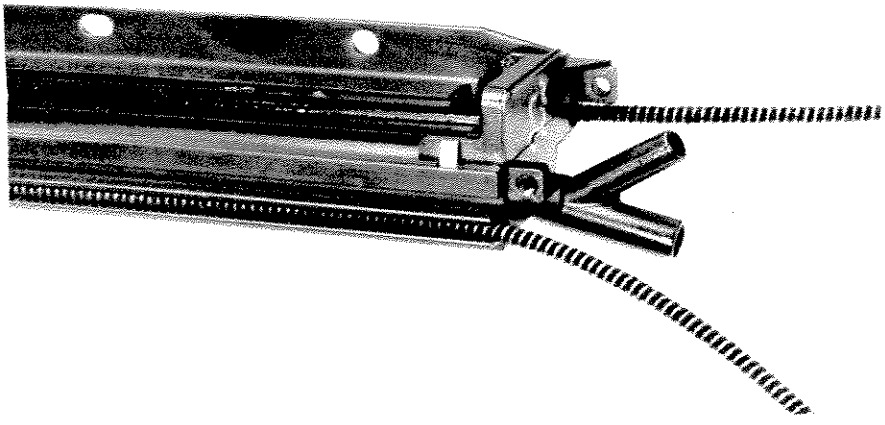
In this process, the lever engages into the cutout of the lever mount.



95/190

The rear closing section engages into the guide rail and is additionally screwed in place.

The water entering from the rear window inner panel is ducted across the upper tube flange to the closing section and then exits across the lower tube section.



95/193

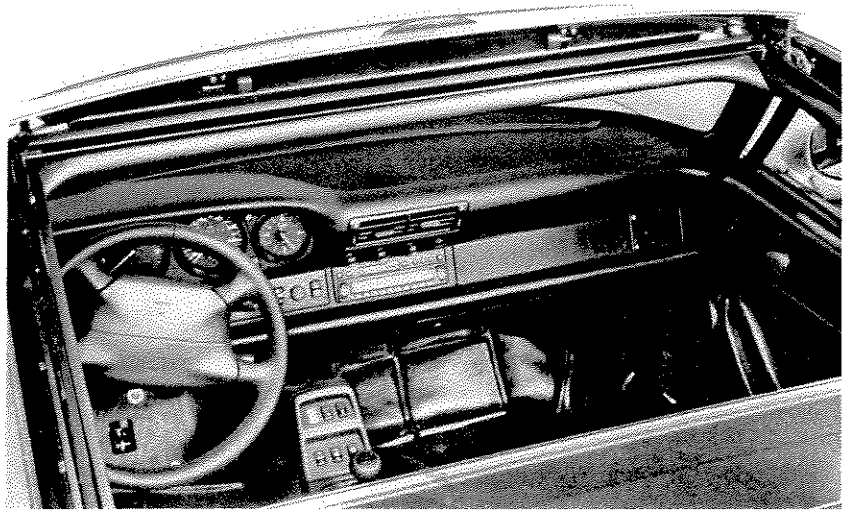
Sun blind

The sun blind is fitted below the wind deflector in the front crossbow. Combined with the tinting of the glass, the unfolded sun blind offers additional protection against sun radiation.

The sun blind is made of polyester fabric.

95/143

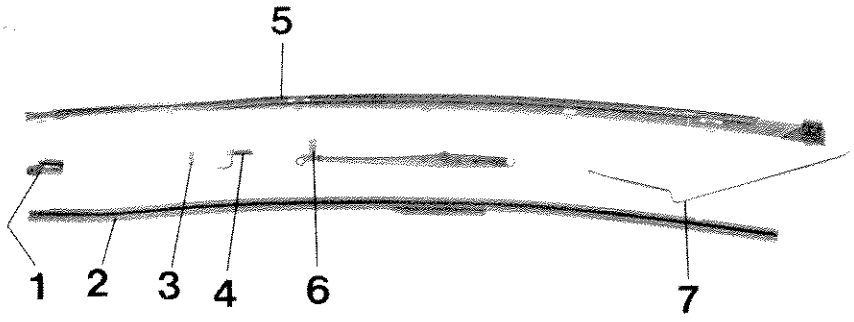
An electrical drive motor is provided to fold or unfold the sun blind and to adjust it to an infinite number of positions. A guide mechanism allows the blind to move in the guide rails.



95/151

The guide mechanism of the sun blind includes the following components:

1 - Mount
2 - Upper guide rail
3 - Sliding jaws
4 - Sliding mount
5 - Gate slide
6 - Pull bow
7 - Spring



95/194

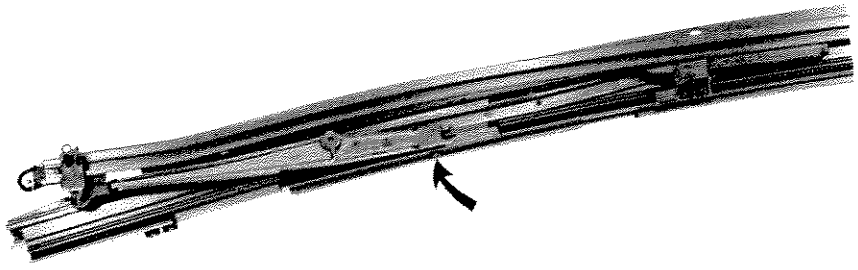
A body-bound rivet is used to locate the mount (1) in the crossbow. The upper guide rail (2) is inserted into this mount.

The sliding mount (4) is guided in the guide rail complete with the installed sliding jaws (3) and is located in the pull bow.

The gate slide (5) of the sun blind is clipped to the guide rail along the roof rail.
The pull bow (6) connects the sliding mount to the cable attachment of the drive cable and engages into the front cable attachment.
Spring (7) is inserted into the rear of the guide rail.

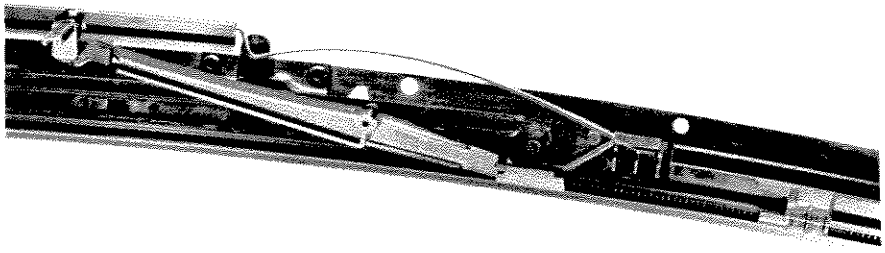
The inner groove of the guide rail is designed to house the drive cable with the cable attachment.
The front stop of the drive cable is defined by a sheetmetal screw insert (arrow).

When the sun blind is rolled up, the rear cable attachment engages into the gate section of the upper guide rail. In this way, the assembly is located additionally.



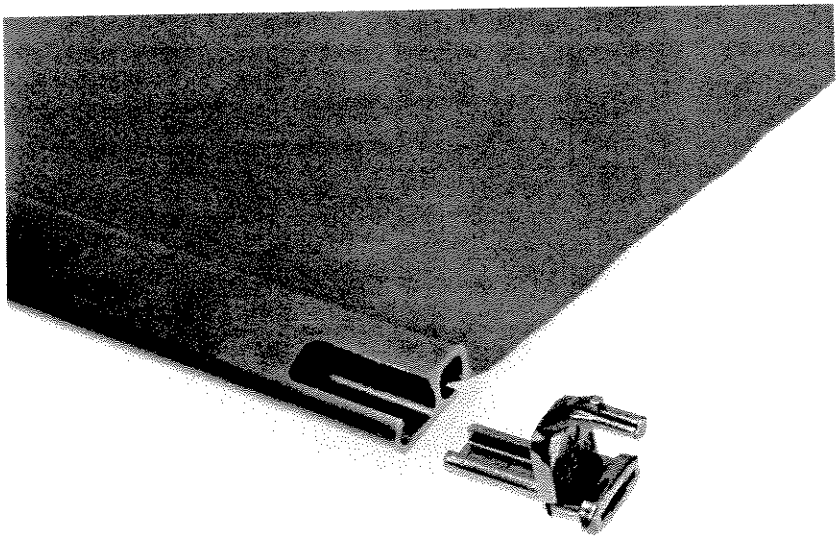
95/192

The pull bow is guided across the cable attachment of the drive cable and pulls the sun blind towards the rear across the sliding mount. During this motion, the pin of the pull bow moves along the path of the gate rail.
In the unfolded position, the guide mechanism is pushed upwards under the tensioning action of the spring.



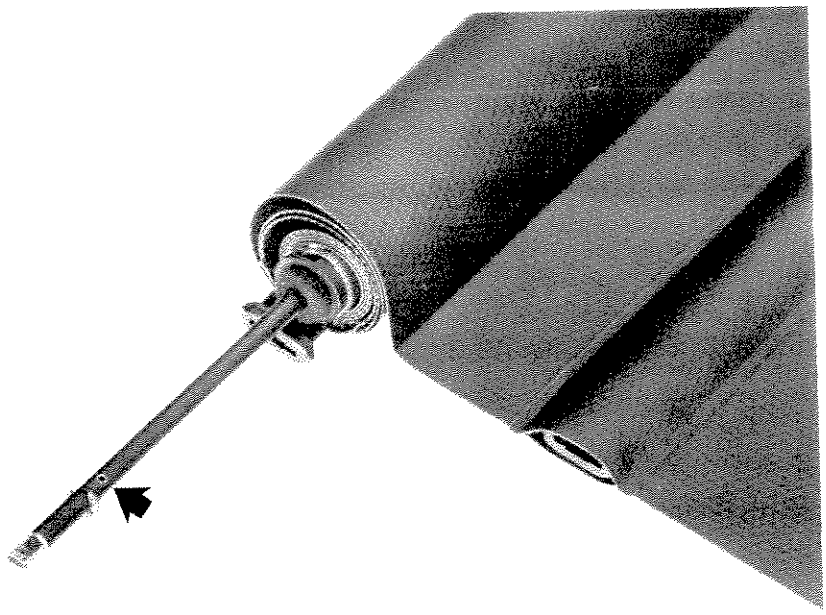
95/191

To dismantle the assembly, turn the tensioning rail of the sun blind out of the sliding mount.



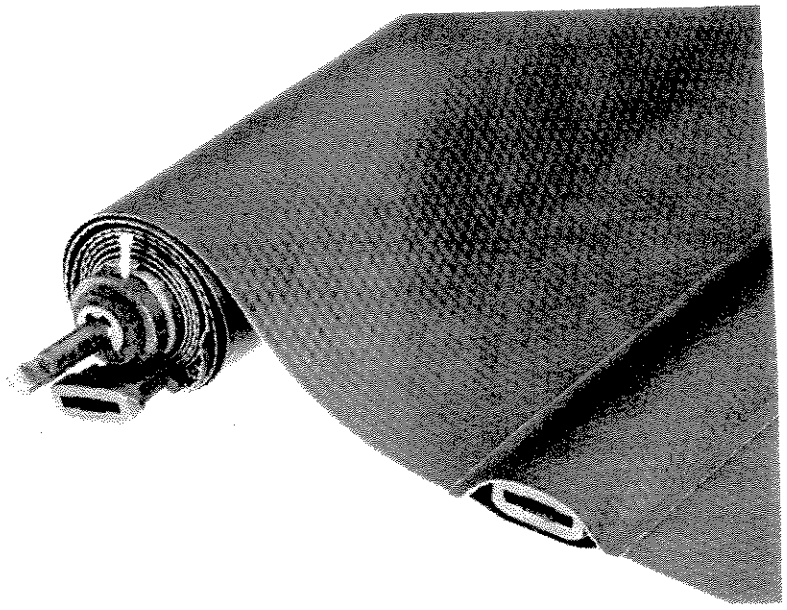
95/186

On the right-hand side, the sun blind and the tensioning bar are push-fitted into the mount in the cross-bow.
On the left-hand side, a slot-type mount is machined in the assembly so that the tensioning bar can be inserted and secured against rotating. A drill hole in the tensioning bar allows a preset pretension to be maintained.



95/187

When removing the sun blind, a steel rivet (Ø 1 mm) or a similar item must be inserted into this hole to maintain the pretension (19 rotations).



95/185