Audi TT Roadster
Design and Function
Self-Study Programme 220
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The Self-Study Programme provides you with information regarding designs and functions.

**The Self-Study Programme is not a Workshop Manual!**

For maintenance and repair work, always refer to the current Technical Literature.
The A pillar comprises a pipe-in-pipe system reinforced with high-tensile steel. In addition, tubular aluminium roll bars adapted from the body contours of the vehicle occupants give the roadster a special, sporty look.

Despite the lack of a roof structure, the convertible driver is provided with sufficient protection in the event of a rollover, and a saloon-like survival space is preserved. The conceptual drawback of open-top convertibles is offset in the Audi TT roadster by a highly effective and yet exceedingly aesthetic solution. Two roll bars anchored to the vehicle body and projecting beyond the two head restraints, in combination with the ultra-rigid A pillar / windscreen cross-member combination, afford the vehicle occupants highly effective protection even in the event of a rollover.

You can find information regarding further occupant protection measures in SSP 207.
As with the Audi TT Coupé, the alignment bracket set VAS 5020/6 is also used in the Audi TT roadster. In connection with the known gantry gauge VAS 5007, the TT roadster requires alignment bracket set supplement VAS 5007/8.

The following locating points are measured:

- Soft top locks at left/right on windsreen frame
- A pillar
- Striker plate mount, B pillar
- Soft top main bearing mount, left/right

Correctly positioned on the vehicle body, the locating points ensure an ideal soft top geometry.
Semiautomatic soft top

Open soft top:

1. – Vehicle stationary (< 5 kph)
   – Ignition “On”

2. – Press down the release knob and fold down the locking handle.

3. – Turn the handle anticlockwise as far as the stop and push the soft top up out of the interlock.
   (turn back handle and fold in)

4. – The warning lamp for the soft top comes on, and the door window panes are lowered automatically by approx. 30 mm.

5. – Pull switch in central console.
   – The soft top is opened and stowed in the soft top box by means of two hydraulic cylinders.
   – The door window panes close automatically.
   – The warning lamp goes out.

6. – Fit tonneau cover.
   (refer to Operating Manual)

For safety reasons, the vehicle should only be driven with the tonneau cover fitted when the soft top is open.
Close soft top

1. – Remove the tonneau cover and stow it away in the luggage compartment. (refer to Operating Manual)

2. – Vehicle stationary (< 5 kph)
   – Ignition “On”

   ! When the tonneau cover is fitted, the soft top function is deactivated or disabled.

   – Press down the switch in the central console in order to close the soft top.

   – The warning lamp for the soft top comes on and the door window panes are lowered automatically by approx. 30 mm.

3. – Press down the release knob and fold down the locking handle.

4. – Turn the handle anticlockwise as far as the stop, then pull the soft top down into the lock and close.
   – The door window panes close automatically.
   – The warning lamp goes out.
Soft top design

Soft top fabric

The weave and tensioning of the soft top fabric are designed to maintain an airflow stream for as long as possible.

The soft top fabric is secured to the bracing hoops by tension clamps. For visual reasons, these bracing hoops have plastic linings.

Soft top frame

Raising the front roof rail allows the soft top to be stowed away in the soft top box by means of a kinematic chain (roof links 1 and 2 plus the main link). The tensioning strut simultaneously folds down from its “stretched” position into the stowed position in the soft top box.

Hydraulic cylinder with main bearing

For better stowage of the soft top, there is a guide part on the tensioning strut at the point of anchoring to the main bearing.
Tonneau cover

Use the tonneau cover to protect the stowed soft top.
Hydraulic diagram

Depending on the direction of rotation of the electric motor, the rotor piston pump forces oil through a 2-way valve into the corresponding pressure lines routed to the hydraulic cylinders.

"Open" soft top

To open the soft top, the extended piston rods are pushed back into the hydraulic cylinder and the soft top is opened via the main bearing.

"Close" soft top

To close the soft top, the piston rods are pushed out of the cylinders and the soft top is closed via the main bearing.
**Position “soft top stowed”**

Double-action, bidirectional hydraulic cylinder.
Hydraulic pump

The pump is designed as a rotor piston pump. The pump draws hydraulic fluid out of the tank through bore E. The cylinders are filled under the centrifugal force exerted by the pistons. The rotor, together with the pistons, rotates around an excentrically mounted stator. Thus, the pistons are pushed back in and the hydraulic fluid is pumped through bore A into the lines of the individual hydraulic cylinders at a pressure not exceeding 100 bar.
To enhance ease of use, the soft top is equipped with two gas-filled springs which make it easier to lift the soft top out of the soft top box. In addition, a set of compression springs is installed in the main bearing (left/right) in order to make the soft top easier to open and close.
Semiautomatic soft top

- Hydraulic pump
- Hydr. cylinder
- Central locking and anti-theft alarm control unit J 379
- Microswitch Tonneau cover, right
- Microswitch Tonneau cover, left
- Soft top operating switch
- Bulkhead operating switch
- Microswitch Soft top stowed
- Soft top released (autom. air conditioner off)
- Soft top released
Semiautomatic soft top
System overview

Ignition "On"

Road speed signal, dash panel insert

Switch for soft top control

Air conditioner operating and display unit (no automatic operation)

Microswitch (Soft top released)

Microswitch (soft top released)

Microswitch (Soft top stowed)

Microswitch (tonneau cover, left)

Microswitch (tonneau cover, right)

Hydraulic cylinder switch, left
Central locking and anti-theft alarm control unit J 379

Hydraulic pump (with changeover relay)

Power windows

Soft top warning light
Semiautomatic soft top

The soft top is controlled via central locking control unit J379.

Self-diagnosis: Address word 35

Combination processor in instrument cluster J218

Signal utilisation:
Central locking control unit J379 receives the vehicle road speed signal from the combination processor. This is a criterion for enabling the switch for soft top operation at road speeds of less than 5 kph.

Microswitch - soft top released

The left catch hook on the soft top operates the microswitch integrated in the lock. This signal is utilised for:

- Activating the soft top warning lamp
- Lowering the door window panes (30 mm)
- Switching off the automatic air conditioning mode

The signal supplied by the sender for interior temperature sensor G65 in the air conditioner/Climatronic operating and display unit is suppressed and the previously set temperature and fresh-air blower values are retained.

The short-stroke function (10 mm) for raising and lowering the door window panes is executed via the door contact switch.

Microswitch - soft top released

The microswitch integrated in the right lock in the windscreen frame closes as soon as the centring pin leaves the lock when raising the soft top. The second criterion for enabling the switch for soft top control is fulfilled.
Switch for soft top control

If the previous two criteria have been fulfilled, the hydraulic pump is activated via central locking control unit J379 when the soft top switch is operated.

Microswitch - soft top stowed
(in the left-hand main bearing)

Signal utilisation:
- Switches the hydraulic pump off
- Rear window heating off
- Soft top warning light off
- Door window panes being raised

If the soft top is open and stored, the short-stroke function is not executed when opening and closing the doors.

Microswitch - tonneau cover, left/right

If the tonneau cover is fitted properly, the microswitches are closed. The central locking control unit uses this signal to suppress the function of the switch for soft top operation. Consequently, it is not possible to close the soft top.

Switch at left-hand hydraulic cylinder

The switch closes as soon as the piston of the hydraulic cylinder reaches the upper stop and the soft top begins to close. The incoming signal is utilised to switch off the hydraulic pump.

Switch statuses can be exported to measured value blocks 9 and 10 by means of the Diagnostic Testing and Information System.
Function diagram
Semiautomatic soft top

E87  Signal for air conditioner operating and display unit (no automatic operation)
E137 Soft top operation button
F171 Soft top stowed switch
F172 Soft top released switch
F202 Soft top switch, front
F205 Soft top released switch
F254 Tonneau cover left switch
F267 Tonneau cover right switch
J321 Relay for hydraulic pump soft top operation
J379 Central locking and anti-theft alarm control unit
J531 Bulkhead control unit
K98 Soft top released warning lamp
N272 Solenoid valve for hydraulic pump
S Fuse
V118 Soft top hydraulic pump

1 Road speed signal from combination processor in dash panel insert J218
The bulkhead can only be raised if the soft top is stowed; the latter is detected via the “Soft top stowed” microswitch.
Function diagram

E278 Button for bulkhead operation
F171 Soft top stowed switch
F172 Soft top released switch
J379 Central locking and anti-theft alarm control unit
J531 Bulkhead control unit
S227 Fuse
V186 Motor for bulkhead operation
Central locking

Stowage compartment

The stowage compartment is locked and unlocked by the central locking system.

Emergency release, luggage compartment

Operating the handle activates the luggage compartment emergency release by means of a bowden cable. The compartment must be locked with the ignition key.

CD changer tray

The CD changer tray is locked and released by the central locking system. CD player optional.
Audi has developed a new interior monitoring system which is ideal for such open-topped vehicles as the Audi TT Roadster.

The system requirement is a precisely demarcated theoretical “protective sheath” in the form of a hemispherical shell whose intrusion is detectable at any time. However, the system must not pick up movements outside this protective sheath irrespective of their velocity, object size and reflectivity.

The radius of the “protective sheath” is defined by the distance between the ultrasonic sensor module and the shortest point within the bounds of the vehicle.

The megawave interior protection system is implemented by pulse radar.
When the system is active, the module cyclically emits radar pulses with a very low wattage \( (t_1) \).

The same pulse is supplied to a so-called delay line within the control unit \( (t_2) \).

A measuring process in parallel with actual measurement in the defined vehicle interior is therefore simulated.

If the propagation time of the radar pulse from the transmitter antenna to the reflecting object and back to the receiver antenna equals to at least the period set in the control unit \( (t_2) \), then the signal is evaluated in the control unit and the alarm is triggered if necessary.

The interior monitor can still be switched off using the switch in the central console.
Dear Reader,

In this Self-Study Programme you will have been able to familiarise yourself with the Audi TT Roadster.

Our objective is to make our Self-Study Programmes interesting for you!

That is why we are giving you the opportunity to submit your views or suggestions for future Self-Study Programmes. To help you, we have provided the following questionnaire.

We will take into consideration suggestions sent to us under the fax number +49 841/ 89-36367.

Thank you for your support.

With kind regards,
Service Technology Training Team