SAAB

9000

SERVICE MANUAL

8:6 Airbag

M 1988–

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Foreword

The "Airbag" passive safety system is described here. The information contained herein is not binding. We reserve the right to changes without prior notice.

Saab-Scania
Saab Car Division

Units

The basic and derived units used throughout the Service Manual are in accordance with the SI system.

For users not familiar with the SI units, some English units are given in brackets after the respective SI unit.

The following symbols and abbreviations are used:

SI unit	Equivalent unit and symbol
mm	inch (in)
kg	pound (lb)
N	pound-force (lbf)
Nm	pound-force foot (lbf ft)
bar	pound-force per square inch (lbf/in^2) (Also abbreviated: psi)
l (liter)	US liquid quart (liq qt) (Also abbreviated: qts) US gallon (USgal)
°C	°F

Conversion factors

1 in = 25.4 mm	1 mm = 0.039 in
1 lbf = 4.45 N	1 N = 0.23 lbf
1 lbf ft = 1.36 Nm	1 Nm = 0.74 lbf ft
1 psi = 0.07 bar	1 bar = 14.7 lbf/in^2
1 US qt = 0.95 l	1 l = 1.06 US qt
°F = °C x 9/5 + 32	°C = (°F − 32) x 5/9

Production: Technical Publications, Saab-Scania, Trollhättan, Sweden

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Technical data

Front sensor

The contacts close at a retardation force of 16 g.

Safety sensor

The contacts close at a retardation force of 2 g.

Electronic unit

Microprocessor-based

Storage capacity, 6 + 6 fault codes

Operating voltage, detonation circuit: 35 V
Current, detonation circuit: 1.75 A

Steering wheel pad

Airbag volume: 70 liters
Inflation time: 20-30 ms

General

Supplemental Restraint System (SRS)

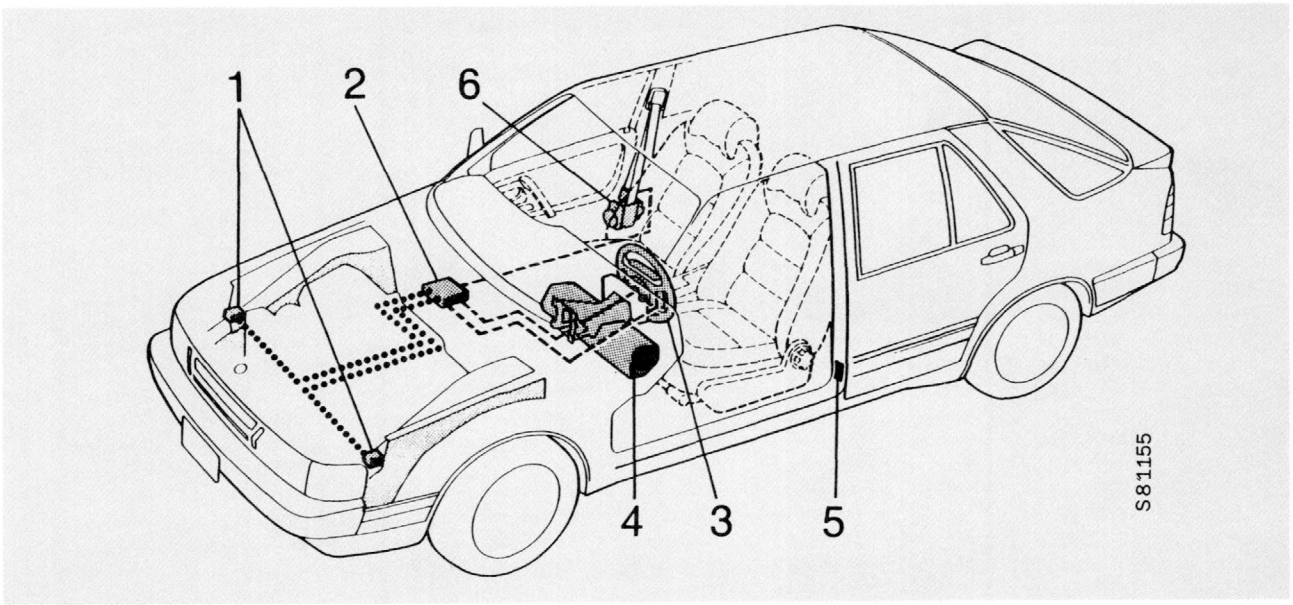
SRS augments the protection afforded by the three-point seat belt.

The system consists of two front sensors connected in parallel, a safety sensor, an electronic unit and a steering wheel pad containing the gas generator and the airbag.

The seat-belt tensioner on the passenger side is also connected to the system.

The system also includes a knee guard attached to the steering column, which keeps the driver from sliding under the steering wheel.

The system is activated when at least one of the two front sensors and the safety sensor are subjected to a force equivalent to a head-on collision with a stationary barrier at a speed of about 15 mph.

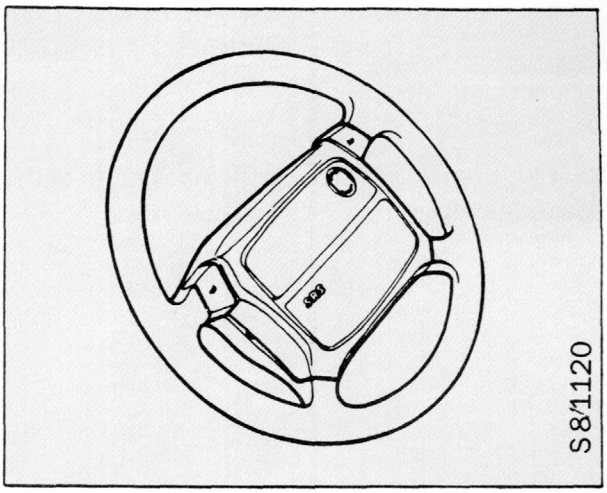


1 Front sensors
2 Electronic unit containing safety sensor, diagnostic unit and capacitor pack
3 Steering wheel with steering wheel pad
4 Knee guard
5 Warning label
6 Seat-belt tensioner

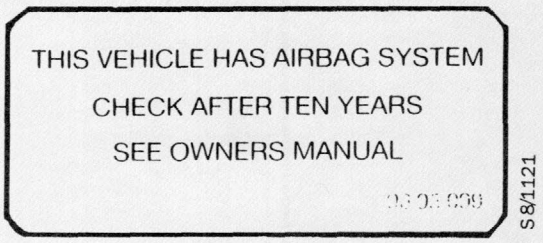
Warning and instruction signs

The following warning and instruction signs are provided in the car and shall be observed to ensure personal safety:

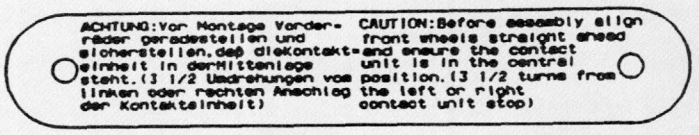
Cars equipped with SRS have the marking "SRS" on the steering wheel pad.



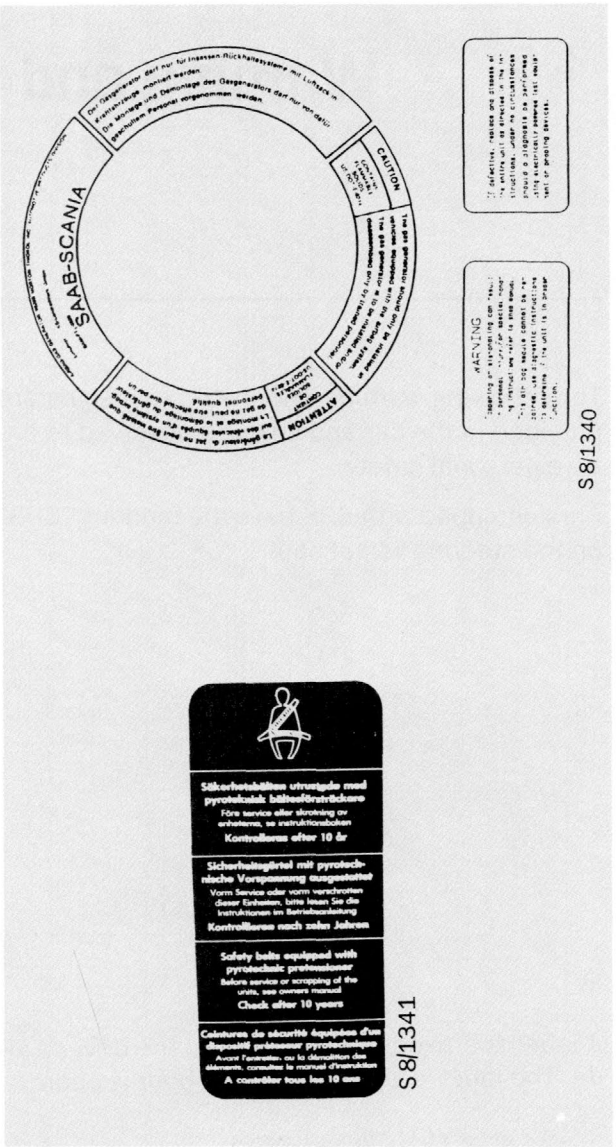
A label is affixed to the B post on the driver's side. The label is visible when the door is open.



On the contact unit (coil spring)



Warning text on the back of the airbag



Seat-belt tensioner sign on the back edge of the passenger door.

Safety and handling instructions

Always follow the instructions in the service manual when working on the system. Exercise caution to prevent injury.

Components in the system shall not be handled in such a way that their function is jeopardized, for example, they shall not be taken apart and repaired or subjected to impact, heat, moisture or the like.

Always disconnect the negative cable from the battery before working on the system.

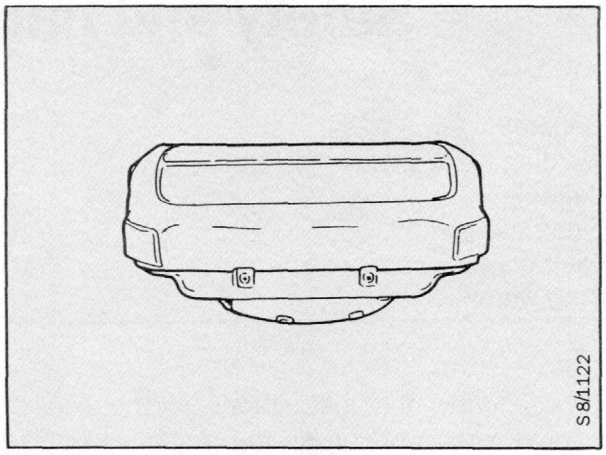
After disconnecting the negative cable, wait 20 minutes, to let the capacitors discharge, before starting work on the system.

The steering wheel pad and seat-belt tensioner are classified as explosive (pyrotechnic) items and must be handled as indicated below and in compliance with federal and local laws and regulations.

The pyrotechnic items must be installed immediately after they have been taken out of storage. If the work is interrupted, return the pyrotechnic items to the storeroom and lock them up. Under no circumstances may the pyrotechnic items be left out and unattended.

- The airbag is a closed unit. Do not attempt to disassemble or repair it under any circumstances.
- The airbag may not be stored at a temperature higher than 158°F (70°C). At temperatures above 275°F (135°C), there is a risk of self-detonation.
- Handle the airbag carefully so that it is not exposed to impacts or vibrations.
- When the airbag is not installed in the steering wheel, it must be stored in compliance with federal and local regulations governing the storage of pyrotechnic items.

- The airbag must be stored and carried with the black case facing up in order to prevent injury in the event of accidental detonation.



- Do not store the airbag together with petroleum products or other flammable material.
- Wear safety goggles and protective gloves during removal of a detonated airbag. Place the airbag in a tightly sealed plastic bag. The airbag surface may contain deposits of sodium hydroxide, a by-product of the gas generated during deployment. Because sodium hydroxide is irritating to the skin, wash your hands in mild soap solution and lukewarm water after handling a detonated airbag.

Welding

Before doing any welding:

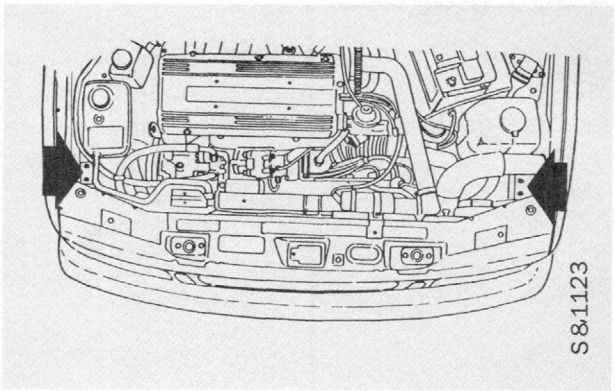
- Disconnect the negative cable from the battery and cover it.

Painting

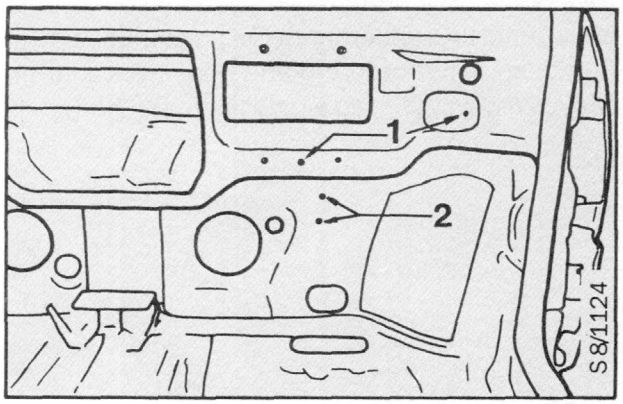
If the car is to be painted and then force-dried:

- Mask the following areas to ensure good ground contact between the body and the components in the airbag system.

A The threads of the rivet nuts and their contact surfaces against the front sensors.



B A 20 mm diameter area around the holes in the firewall for the electronic unit mounting bracket.



1 Mask these areas from the passenger compartment side
2 Mask these areas from the engine compartment side

Electrical work

- Do not splice SRS cables under any circumstances. Splicing can cause disturbances in the system that can lead to injuries or render the system unusable.

  Damaged insulation on SRS cables may be replaced with new insulation if the copper conductor is undamaged.

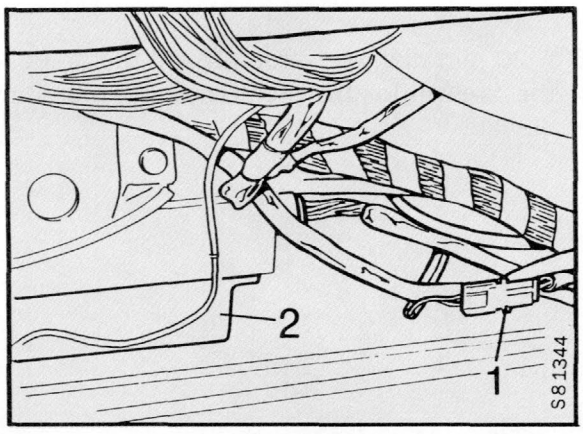
  Never apply grease to connectors in the SRS system.

Fault diagnosis

Do not use instruments with their own power source - such as ohmmeters, diode testers or buzzers - for fault diagnosis in the steering wheel pad and electronic unit. For fault diagnosis and reading of fault codes, see page 25.

Body work

Disconnect the orange two-pin connector at the electronic unit underneath the passenger side of the dash panel before doing body work that involves applying blows or shocks to the body.



1 Connector
2 Electronic unit

Replacing the windshield

When the airbag detonates, it contacts the windshield. The windshield cementing procedure is therefore slightly different on an airbag-equipped car.

See Windshield, replacement, page 33.

Steering gear work etc.

During all work when the contact unit (coil spring) is installed and the steering column shaft is not engaged with the steering gear, the steering wheel must be locked by the steering wheel lock so that the starting position of the contact unit (coil spring) will not be changed. If the starting position of the contact unit (coil spring) is changed, the coiled conductor for the contact unit (coil spring) will be destroyed when the steering wheel is turned to full lock.

See Locking the wheel by means of the steering wheel lock, page 130.

Repairing a car after the airbag has detonated (after a collision)

When repairing a car after the airbag has detonated, always replace the following parts:

Steering wheel pad

Steering wheel

Contact unit (coil spring)

Electronic unit

Front sensors

Seat-belt tensioner on passenger side

Check the following parts for burns and deformations:

System wiring

Steering column bracket, cable and knee guard

Steering column shaft

Brackets for sensors

To guarantee the function of the system after damage to the body, brackets and other damaged parts must be restored to new condition. Replace damaged parts.

Cleaning the car after the airbag has detonated

Clean a car which is to be repaired or used after the airbag unit has detonated as follows:

Always wear safety goggles and protective gloves.

Remove the detonated airbag and place it in a tightly-sealing plastic bag.

When the airbag detonates, talcum powder and combustion residues in the form of dust particles are released. Carefully vacuum-clean all surfaces in the car.

Scrapping instructions

Scrapping of airbag module and seat-belt tensioner

Caution
Under no circumstances should either deployed or undeployed airbags and pre-tensioner seat-belts along with their system components be removed from one vehicle for use in a different vehicle.

The airbag module and seat-belt tensioner must be rendered unusable prior to the scrapping of either the vehicle or the component by electrical detonation. These precautions are necessary since the pyrotechnic objects can otherwise cause injuries when handled by untrained personnel.

Caution
The airbag module to be deployed must be firmly mounted to the vehicle. Verify that there is no loose debris around the unit. Deployment of loose or unmounted airbag modules may cause personal injury.

There is risk of an accidental deployment if undeployed airbag modules or seatbelt tensioners are exposed to high temepratures. The use of cutting torches in the scrapping process causing the melting or burning of components could result in such a deployment.

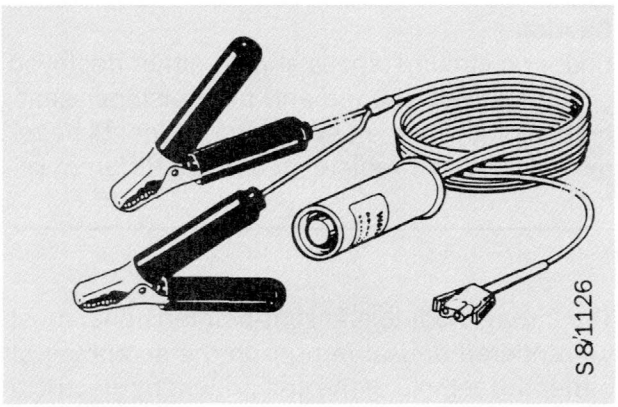
Scrapping instructions, airbag

Scrapping the belt pretensioner, see Service manual 8:2.

Before a car equipped with SRS is scrapped, the airbag module in the steering wheel hub must be activated at a safe distance using a detonating device.

The detonating device consists of a two-core cable about 50 feet long equipped with a push-button, clamps for connection to the battery and a connector for connection to the airbag.

Make sure the battery connected to the detonating device is in good condition.

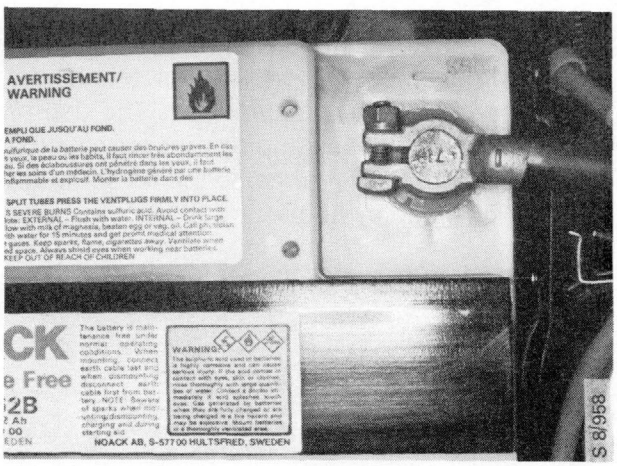


Detonating device, part no. 84 71 104.

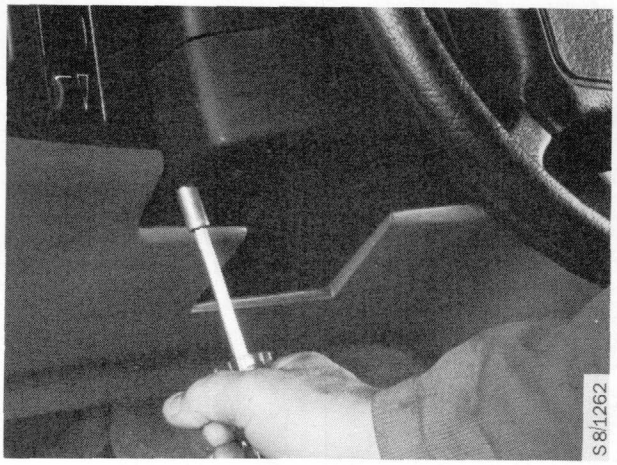
The car must be located outdoors. Make sure no person or object is located within the safety distance. The safety distance from the car is 30 feet. Make sure that there are no loose objects or debris in the front seat or on the dash panel and that no one is in the car.

Wear safety goggles and protective gloves.

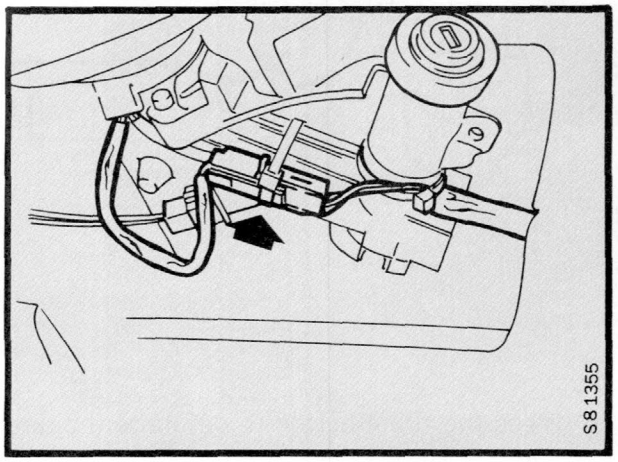
1 Disconnect the negative battery cable.



2 Remove the bottom half of the steering column cover.



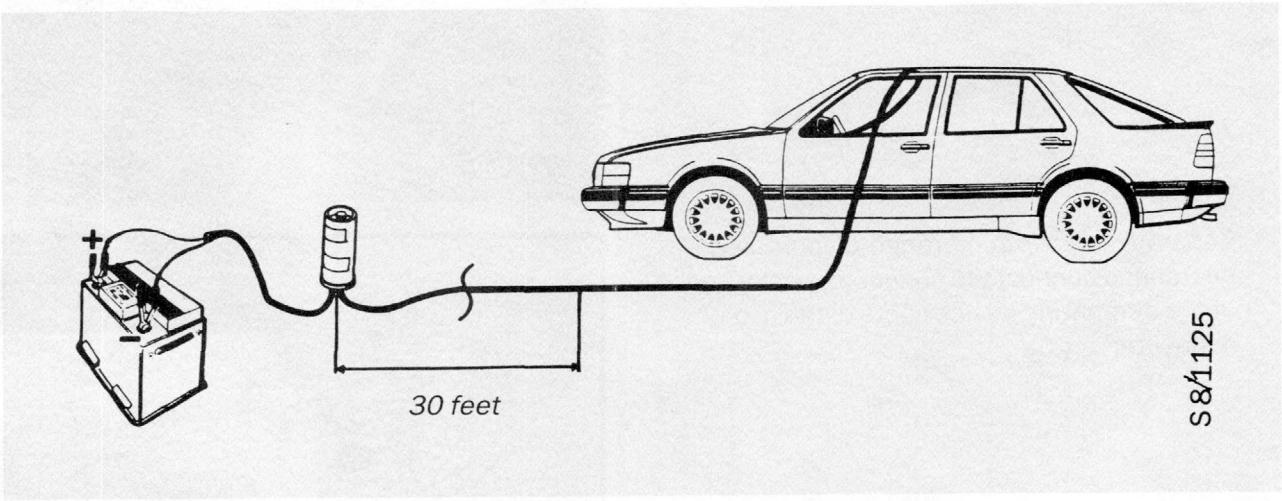
3 Separate the two-pin orange-coloured connector and connect the connector on the end of the detonating device cable to the two-pin connector.



4 Run the cable out through the door opening and shut the door. Make sure the car doors and windows are closed.

In cases of severly damaged car, attempt to seal off the passenger compartment as much as possible.

5 Place a battery about 30 feet from the car. Connect the other end of the detonating device cable to the battery. Check that nobody is within 30 feet of the car.



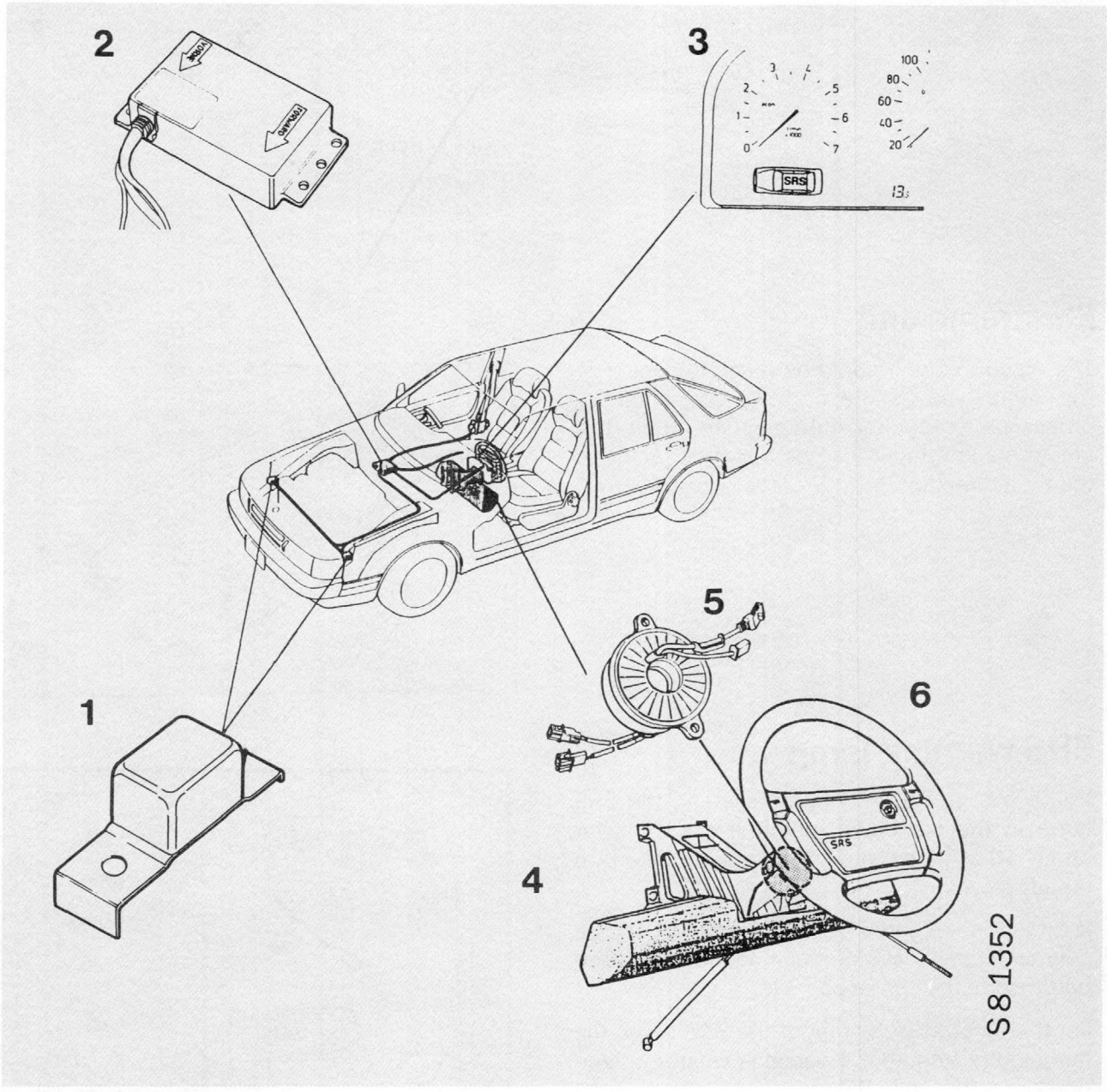
6 Press the firing button to detonate the airbag.

7 When the airbag is activated, you will hear a bang and see white smoke in the passenger compartment.

Disconnect the detonating device cables from the battery immediately after the airbag has been activated. Wait 30 minutes before starting work on the car to allow the airbag module to cool.

Warning
If the airbag or seatbelt tensioner did not detonate on the first attempt, disconnect the battery connections and exercise extreme care when rechecking wiring.

Design of the airbag system



1 Front sensor

2 Electronic unit containing safety sensor, capacitor pack and diagnostic unit.

3 SRS warning lamp

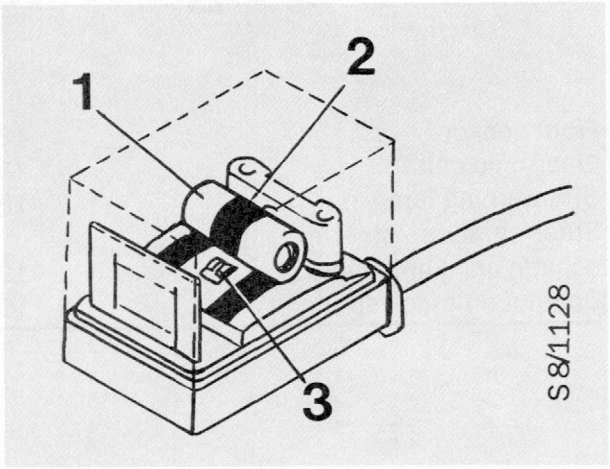
4 Steering column with knee guard

5 Contact unit (coil spring)

6 Steering wheel pad (airbag module)

Front sensor

The sensor consists of a contact roller held in a metal band that serves as a contact surface and spring. The spring force holds the roller in its resting position. When the roller is subjected to a force in excess of 16 g, it rolls forward and closes the circuit between the contact reed and the contact surface on the roller. The front sensor must therefore be installed facing in the right direction.

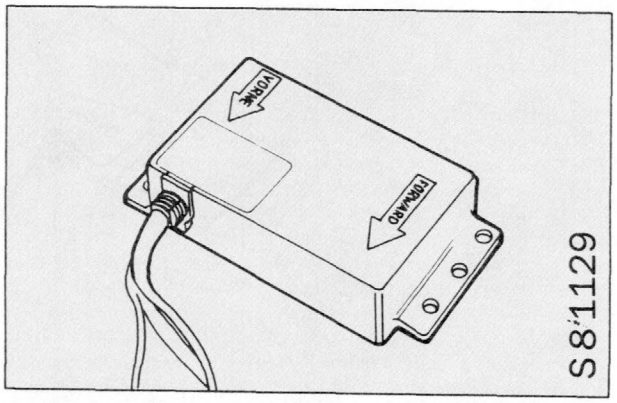


Front sensor

1 Contact roller
2 Contact surface
3 Contact reed

Electronic unit

The electronic unit contains a safety sensor of the same type as the front sensor, a microprocessor, a capacitor and a diagnostic unit. The electronic unit must also be installed facing in the right direction.



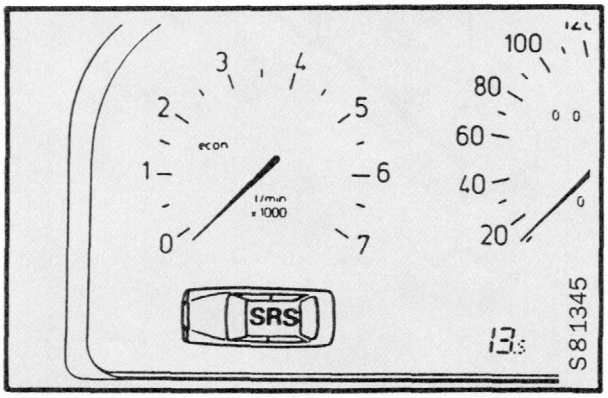
SRS warning lamp

In the event of a fault in the system, the SRS lamp in the combined instrument flashes for about 10 minutes and then remains lit with a steady glow.

If a fault is indicated, a test instrument can be connected to a test outlet behind the lower compartment in the center console.

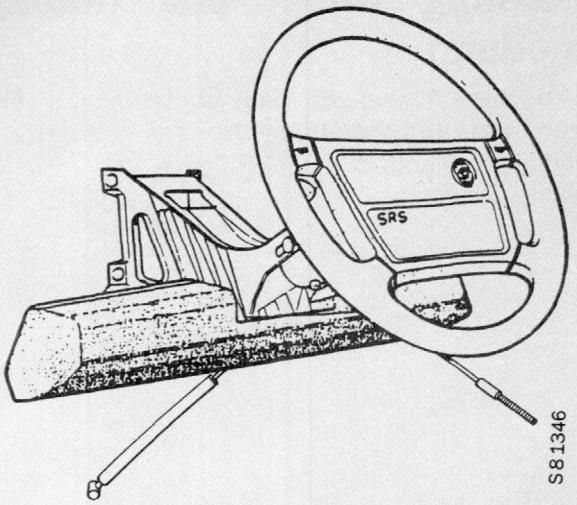
For the purpose of testing of the SRS lamp, the lamp lights for about 6 seconds when the ignition key is turned to the start or drive position. It then goes out if there are no faults in the system.

After a collision causing detonation of the airbag, the SRS lamp flashes for 5 seconds and then remains lit with a steady glow.



Steering wheel, steering column and knee guard

The steering wheel and steering column are of special design. To stabilize the steering column in a collision, a cable is stretched from the lower part of the A post, over the steering column to the reinforcing tunnel in the floor. The steering wheel is not adjustable. A knee guard plate is welded to the steering column, and a knee guard of shock-absorbing material is bolted to the plate. The center of the steering wheel is designed to accommodate a pad containing the airbag and the gas generator (airbag module).

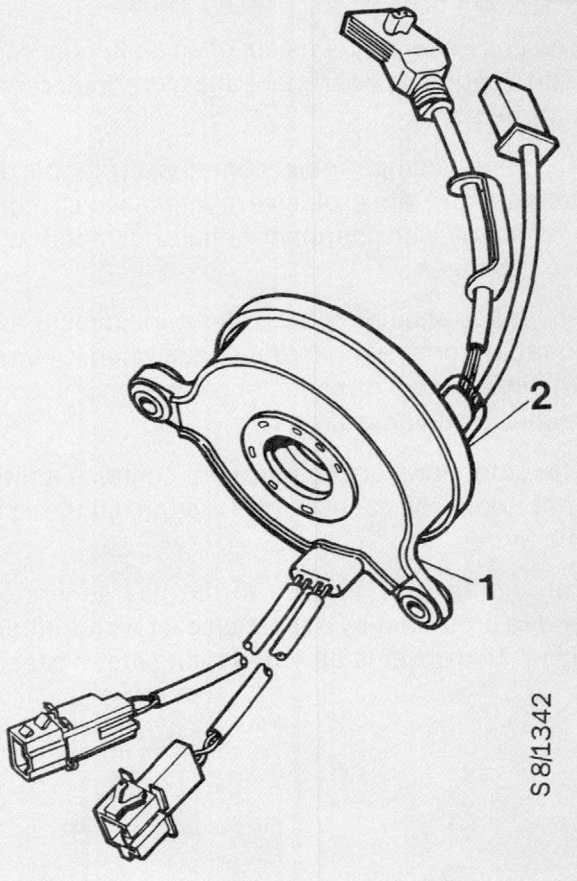


Contact unit (coil spring)

A contact unit (coil spring) is installed between the steering wheel and the steering wheel bracket for the purpose of conducting test and detonating current to the airbag module.

The contact unit (coil spring) also conducts current to the horn through two separate wires.

The contact unit (coil spring) consists of a fixed part and a moving part. Between the fixed part and the moving part is a coiled plastic band with four wires embedded in it.

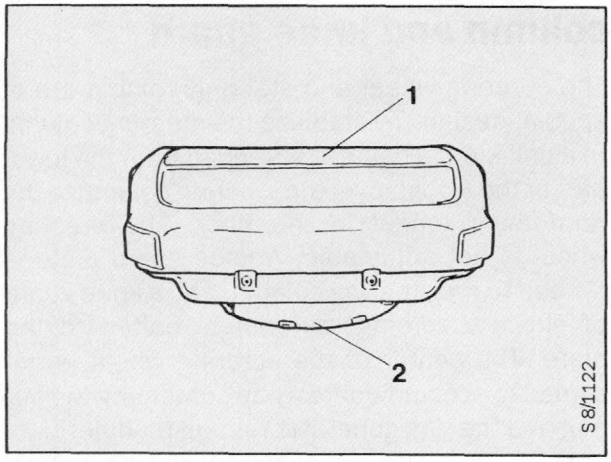


1 Fixed part
2 Moving part

The moving part of the contact unit (coil spring) can be rotated about 7 turns, i.e. about 3.5 turns from the middle position in either direction. If it is rotated more than this, the coiled plastic band will break and the aribag system will be rendered inoperable.

Steering wheel pad (airbag module)

The steering wheel pad contains the gas generator and the airbag. The gas generator is riveted and bolted to a metal case.



1 Airbag
2 Gas generator

Gas generator

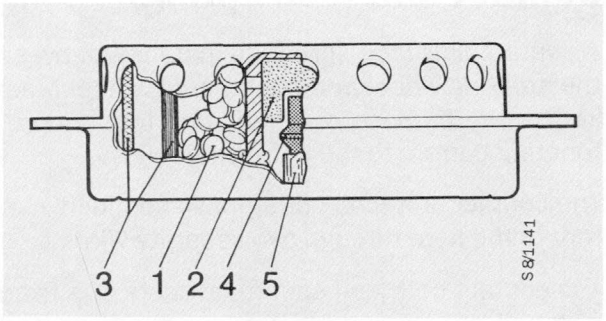
The gas generator consists of an aluminum case with a center compartment and two annular compartments.

The center compartment contains an electric detonator and an explosive charge, which communicates with the inner annular compartment via passages.

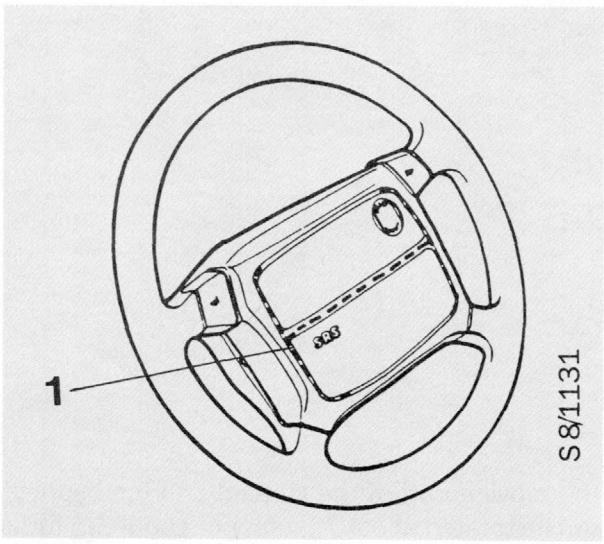
The inner annular compartment contains a fuel in tablet form that generates gas when it burns. The inner and outer annular compartments communicate via passages.

The outer annular compartment contains a filter that cleans the gases before they are admitted to the airbag.

The airbag is connected to the gas generator, and is protected by a plastic cover with fracture lines. This cover is attached to the metal case.



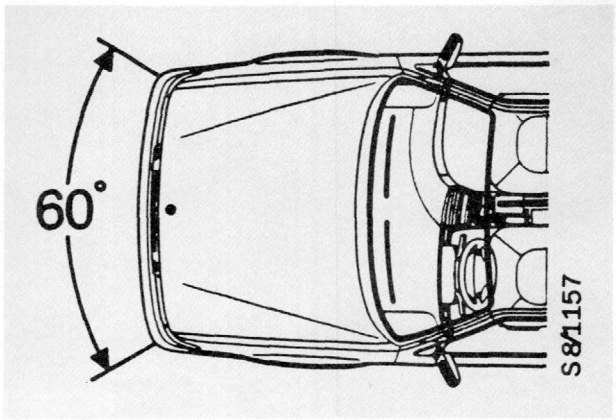
1 Fuel
2 Explosive charge
3 Filter
4 Electric detonator
5 Electrical connection

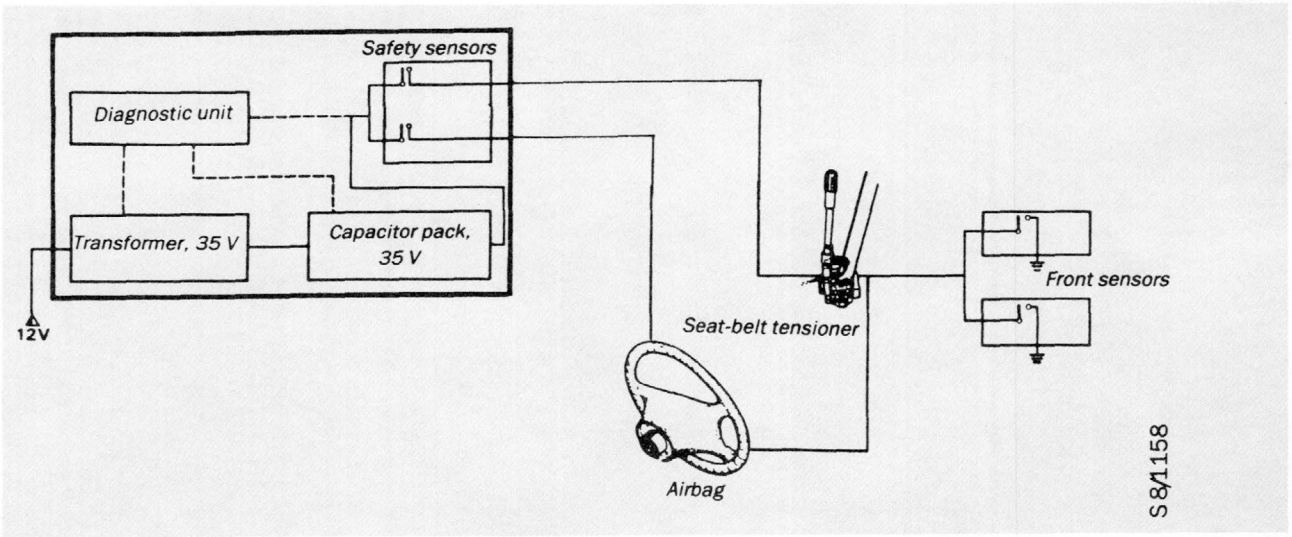


1 Fracture line

Sequence of events in a collision

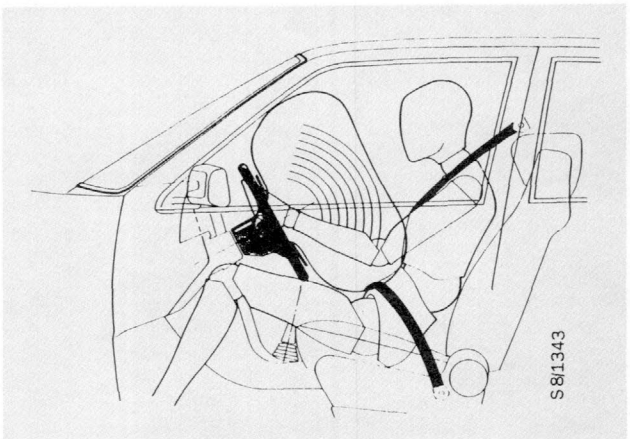
If the car is subjected to a retardation force of at least 16 g within a sector of 60° as shown in the figure, the contacts in the front sensor and in the safety sensor close. Electric current flows through the contact in the safety sensor (closes at 2 g), via the contact unit (coil spring), to the electric detonator.





The detonator is grounded to the body via the contact unit (coil spring) and the front sensor. The electric detonator fires the explosive charge, which ignites the fuel in the gas generator, causing gas to be generated at high pressure.

The gas inflates the airbag in 20-30 milliseconds.



Description of function

The system is energized from the +15 distribution terminal when the ignition switch is in the start or drive position, and from the +50 supply when the ignition is in the start position.

Power supply

When the ignition switch is turned to the start or drive position, the +15 supply flows via pin 3 in connector 58 to pin 4 in test outlet 330, and then to pin 18 in electronic unit 331, thus charging the capacitor. The capacitor serves as a power supply reserve in the event of a loss of power at the instant of collision. At the same time, SRS lamp 47 T in the pictogram is energized by a +15 supply from fuse 13 via distribution terminal 159.

SRS lamp 47 T is lit by being grounded via pin 7 in connector 58, pin 10 in test outlet 330 and pin 20 in electronic unit 331.

When the ignition switch is turned to the start position, pin 16 in electronic unit 331 is energized (+50) and generates an impulse to start the measuring sequence etc. in the diagnostic unit.

Activation of airbag

In a collision, the airbag and the seat-belt tensioner are activated if one of the front sensors and the safety sensor in the electronic unit sense a retardation of at least 16 g at the front sensor and at least 2 g at the safety sensor.

The contacts in the sensors then close and the capacitor in the electronic unit discharges, generating a firing pulse to the electric detonators in the airbag and the seat-belt tensioner.

Grounding

Do not connect ground cables belonging to other systems to the retaining screws for the front sensors and the electronic unit. Doing so may cause disturbances in the function of the system and may cause the diagnostic unit to indicate non-existent faults.

Fault diagnosis

Always disconnect the negative cable from the battery before working on the system.

After disconnecting the negative cable, wait 20 minutes before starting work on the system.

Do not attempt to repair defective airbag components. Always replace them with new ones.

Damaged insulation on SRS cables may be replaced with new insulation if the copper conductors are undamaged.

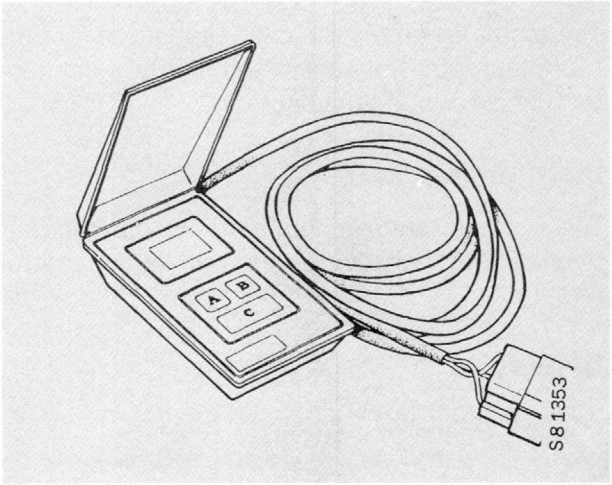
Diagnostic unit

The diagnostic unit monitors the airbag system continuously. If any fault occurs in the system, this is indicated by a red symbol "SRS" lighting up in the pictogram in the combined instrument. The symbol flashes for about 10 minutes and then remains lit with a steady glow until the ignition is switched off. If the fault persists when the ignition is switched on, the lamp flashes again for about 10 minutes.

Fault indications are stored in the form of fault codes in the memory of the diagnostic unit.

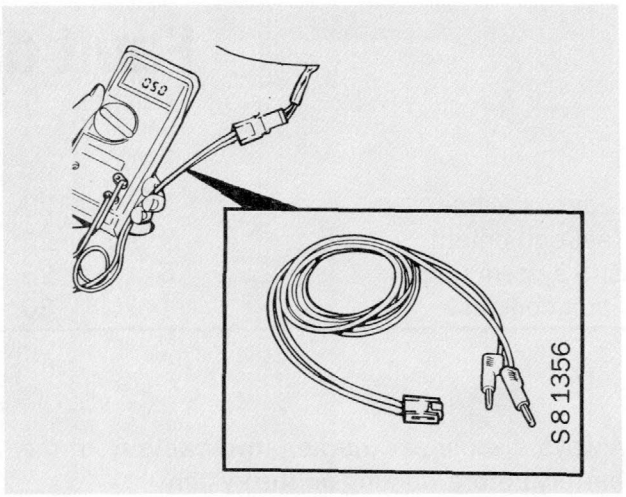
Test equipment

Use the SRS system tester (part no. 84 71 112) to read fault codes.

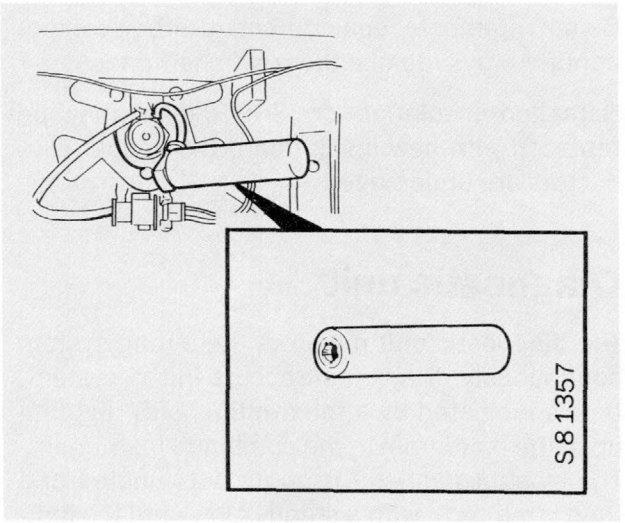


84 71 112
SRS system tester

For fault tracing use measuring cable, part no. 84 71 146, and reference resistance, part no. 84 71 153.



84 71 146
Measuring cable



84 71 153
Reference resistance

SRS system tester

Technical data, instrument

The tester is connected to the test outlet for SRS (Supplemental Restraint System) via a connector and a 40-inch-long cable.

Instrument case

The case is made of high-impact oil-resistant black plastic with a protective cap for the control panel.

Display

Product-adapted 14-segment LCD.

Control panel

Product-adapted design with three diaphragm switches.

Microprocessor

Crystal-controlled 8-bit processor med 1.8 kB memory.

Description

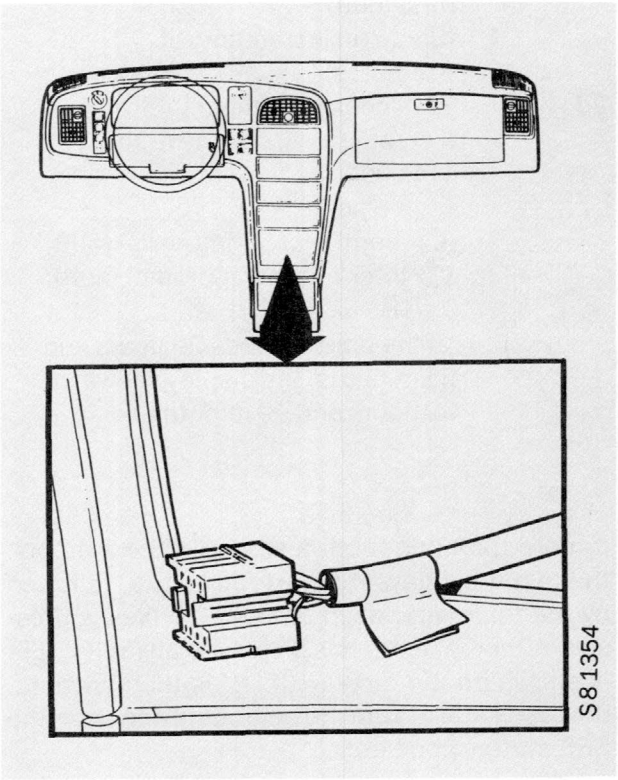
The Saab SRS system tester has been developed to facilitate service and fault diagnosis work. The test equipment consists of the instrument, a cable and a connector.

In addition, the tester has been pre-wired for the connection of additional equipment in the future.

All permanent (long-term) and intermittent (sporadic) faults occurring in the system are stored in the electronic unit and can be displayed on the tester.

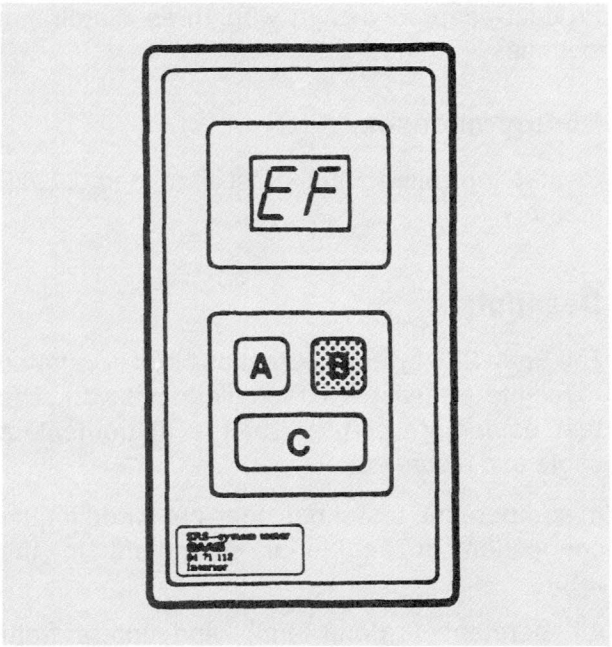
Connection to the car

Connect the tester to the special SRS test outlet, which is located behind the lower compartment in the center console. When the ignition is switched on, "00" is displayed.



Checking for external faults (in wiring or sensors etc.)

Press "B". "EF" is then shown on the display. Then press "C". The first time it is pressed, the SRS system code is displayed, the second time the program issue etc., as shown in the table.



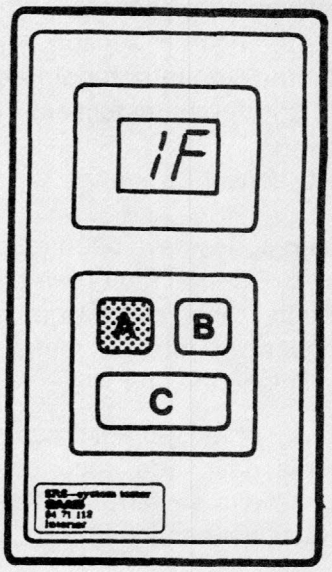
Code	Explanation
41	SRS system code
03	Program issue
01	Length of fault in hours* (first fault)
15	Length of fault in minutes* (first fault) (Shown in increments of 5 minutes)
2d	Fault code (2 numbers/letters) (For remedies, see the fault code list)
L	Fault type (L = Permanent (long-term) fault, S = Intermittent (sporadic) fault)

*If the time exceeds 99 hours and 55 minutes, the display shows 99 hours and 99 minutes.

If more than one fault is stored in the memory, the tester displays the next fault code, followed by the fault type, each time the "C" key is pressed. After the tester has displayed all faults, "EF" is shown on the display. If "C" is then pressed, the tester starts from the beginning and show the SRS system code etc.

Checking for internal faults (in the electronic unit)

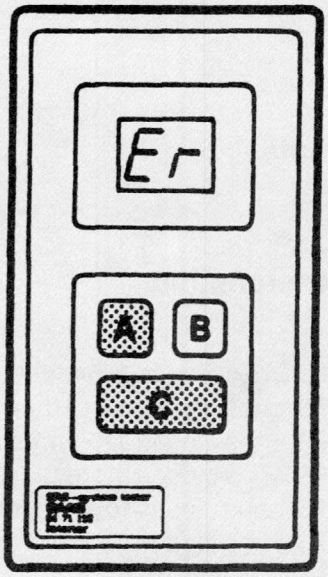
Press "A". "IF" is shown on the display. Then press "C". The procedure and the code sequence are the same as for external faults.



Erasing stored faults

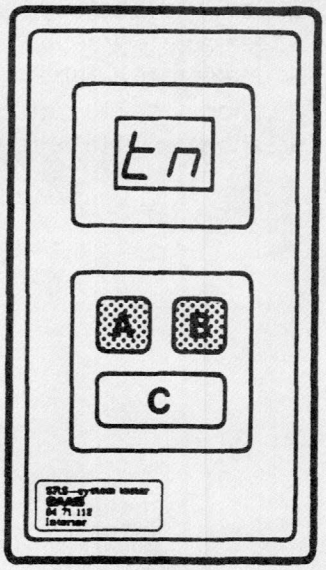
Press "A" and "C" simultaneously. "Er" is shown on the display. Then press "C". The first time "C" is pressed, the SRS system code is displayed, and the second time the program issue. The third time, all faults are erased. If the memory has been cleared correctly, "01" is displayed. Otherwise "02" is displayed. If "02" is displayed, the erasure must be repeated.

If the airbag has been activated, the fault codes cannot be erased.



Electronic unit number

Each electronic unit has its own number, which can be obtained by pressing "A" and "B" simultaneously. "tn" is shown on the display. Then press "C" several times to obtain the entire number. The number consists of ten digits, which are displayed two at the time.



Fault code list

FS 1 = Left-hand front sensor
FS 2 = Right-hand front sensor
ED 1 = Electric detonator for airbag
ED 2 = Electric detonator for seat-belt tensioners
SS = Safety sensor

If several fault codes have been recorded, start by attending to External faults (wiring and external components). Then check whether there are any fault codes for Internal faults (electronic unit). If so, replace the unit.

If the fault is of a sporadic nature (S), the measurements described under the following remedy may have to be performed several times to find the fault while touching

External faults

Fault Code	Explanation	Remedy
01	FS 1 has closed 1-5 times	Replace FS 1
02	FS 1 has closed more than 5 times	Replace FS 1
03	FS 2 has closed 1-5 times	Replace FS 2
04	FS 2 has closed more than 5 times	Replace FS 2
05	FS 1 has closed for more than 2 s	Replace FS 1
06	FS 2 has closed for more than 2 s	Replace FS 2
07	FS 1 leakage to battery positive	See remedy 1
08	FS 2 leakage to battery positive	See remedy 1
09	FS 1 leakage to ground	See remedy 2
0A	FS 2 leakage to ground	See remedy 2
0B	FS 1 short circuit to battery positive	See remedy 3
0C	FS 2 short circuit to battery positive	See remedy 3

Fault Code	Explanation	Remedy
0d	Fault code 2d present more than 10 minutes Fault code 0d is only found on cars with electronic unit with part No. 91 24 074	See remedy 20
0E	System ground resistance too high	See remedy 4
0F	FS 1 ground resistance greater than or equal to 3 ohms	See remedy 5
10	FS 2 ground resistance greater than or equal to 3 ohms	See remedy 5
11	FS 1 open circuit in wiring	See remedy 6
12	FS 2 open circuit in wiring	See remedy 6
13	FS 1 wiring resistance too high	See remedy 7
14	FS 2 wiring resistance too high	See remedy 7
17	Capacitance of 4700 uF capacitor too low	Replace electronic unit
19	Resistance of 4700 uF capacitor too high	Replace electronic unit
1b	ED 1 leakage to battery positive	See remedy 8
1C	ED 2 leakage to battery positive	See remedy 9
1E	ED 1 short circuit to battery positive	See remedy 10
1F	ED 2 short circuit to battery positive	See remedy 11
21	ED 1 leakage to ground	See remedy 12
22	ED 2 leakage to ground	See remedy 13
24	ED 1 short circuit to ground	See remedy 14
25	ED 2 short circuit to ground	See remedy 15
27	ED 1 open circuit	See remedy 16
28	ED 2 open circuit	See remedy 17
2A	ED 1 resistance too low	See remedy 18
2b	ED 2 resistance too low	See remedy 19
2d	ED 1 resistance too high For cars with electronic unit with part No. 91 24 074 the fault must have been continuous for at least 35 s before the SRS lamp lights up	See remedy 20
2E	ED 2 resistance too high	See remedy 21
30	SRS lamp short circuit to battery positive or ground	See remedy 22
31	SRS lamp defective	See remedy 23

After investigating and remedying codes 1-31, continue with the Internal faults.

Internal faults

Fault code	Explanation	Remedy
32	Diagnostic unit defective	Replace electronic unit
33, 34	Collision recording, indicates correct detonation sequence The code arises after a collision where the airbag and seat-belt tensioners have been activated correctly	
37	Firing current has flowed through electric detonator 2 without firing it	Replace seat-belt tensioner
39	Voltage from 4700 uF capacitor too low	Replace electronic unit
3A	Voltage from 4700 uF capacitor too high	Replace electronic unit
3E	Diode D5, short circuit or open circuit	Replace electronic unit
40	ED 1 current supply defective	Replace electronic unit
41	ED 2 current supply defective	Replace electronic unit
43	Diode D7, short circuitor open circuit	Replace electronic unit
44	Diode D8, short circuit or open circuit	Replace electronic unit
47	FS 1, current supply defective	Replace electronic unit
48	FS 2, current supply defective	Replace electronic unit
49	SS, open circuit in wiring	Replace electronic unit
4b	SS has closed for more than 2 s	Replace electronic unit
52	IC for measurement defective	Replace electronic unit
53	5V voltage regulator defective	Replace electronic unit
54	EEPROM defective	Replace electronic unit
56	IC for measurement, temperature too high	Replace electronic unit

Fault code	Explanation	Remedy
57	Microprocessor defective	Replace electronic unit
58	Multiplexer defective	Replace electronic unit
59	Power supply for leakage current measurement defective	Replace electronic unit
5A	A/D converter defective	
5b	FS 1 monostable flip-flop outside limit values	Replace electronic unit
5C	FS 2 monostable flip-flop outside limit values	Replace electronic unit
5d	SS monostable flip-flop outside limit values	Replace electronic unit
5E	Start of collision recording defective	Replace electronic unit
5F	Start of sensor recording defective	Replace electronic unit

Remedies

Note

To prevent the ohmmeter from being damaged during resistance measurement to battery positive, be sure not to ground the ohmmeter.

Remedy 1

Fault code 07. Front sensor 1, leakage to battery positive
Fault code 08. Front sensor 2, leakage to battery positive

A Separate connector 58.

Measure the resistance in the wire to the front sensor with an ohmmeter.

Measure for front sensor 1
between pin 1 and battery positive
between pin 2 and battery positive

Measure for front sensor 2:
between pin 11 and battery positive
between pin 12 and battery positive

Make sure during the measurements that the engine is running, all loads (lighting, electric motors etc.) are turned on one at a time.

If both resistance readings are greater than 4.7 kohms, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If either of the resistance readings is less than or equal to 4.7 kohms, proceed to B below.

B Separate connector 57.

Proceed as described under A below.

If both resistance readings are greater than 4.7 kohms, the fault is located in the front sensor. Replace the front sensor.

If either of the resistance readings is less than or equal to 4.7 kohms, the fault is located in the wiring between connectors 58 and 57. Investigate the cause. Remedy or replace the wiring, if necessary.

Remedy 2

Fault code 09. Front sensor 1, leakage to ground
Fault code 0A. Front sensor 2, leakage to ground

A Separate connector 58.

Measure the resistance in the wire to the front sensor with an ohmmeter.

Measure for front sensor 1:
between pin 1 and ground
between pin 2 and ground

Measure for front sensor 2:
between pin 11 and ground
between pin 12 and ground

If both resistance readings are greater than 4.7 kohms, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If either of the resistance readings is less than or equal to 4.7 kohms, proceed to B below.

B Separate connector 57.

Proceed as described under A below.

If both resistance readings are greater than 4.7 kohms, the fault is located in the front sensor. Replace the front sensor.

If either of the resistance readings is less than or equal to 4.7 kohms, the fault is located in the wiring between connectors 58 and 57. Investigate the cause. Remedy or replace the wiring, if necessary.

Remedy 3

Fault code 0B. Front sensor 1, short circuit to battery positive
Fault code 0C. Front sensor 2, short circuit to battery positive

A Separate connector 58.

Measure the resistance in the wire to the front sensor with an ohmmeter.

Measure for front sensor 1:
between pin 1 and battery positive
between pin 2 and battery positive

Measure for front sensor 2:
between pin 11 and battery positive
between pin 12 and battery positive

Make sure during the measurements that the engine is running, all loads (lighting, electric motors etc.) are turned on one at a time

If both resistance readings are greater than 470 ohms, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If either of the resistance readings is less than or equal to 470 ohms, proceed to B below.

B Separate connector 57.

Proceed as described under A below.

If both resistance readings are greater than 470 ohms, the fault is located in the front sensor. Replace the front sensor.

If either of the resistance readings is less than or equal to 470 ohms, the fault is located in the wiring between connectors 58 and 57. Investigate the cause. Remedy or replace the wiring, if necessary.

Remedy 4

Fault code 0E. System ground resistance too high.

The fault code means that the ground resistance between the front sensors and the electronic unit is too high.

A Separate the two connectors 57.

Check that the pins are firmly in place and in the correct position. Push together and pull apart several times. Check whether the fault code is still present. If so, proceed to B below.

B Unscrew the retaining screws on the front sensors. Clean the contact surfaces between the sensor and the bracket on the body. Screw down the sensor with new retaining screws. Check that the fault code is gone. If the fault is still present, proceed to C below.

C Pull apart and push together connector 58 several times. Check that the fault code is gone. If the fault is still present, proceed to D below.

D Unscrew the retaining screws for the electronic unit. Clean the contact surfaces under the screws. Screw back the screws, being careful to reattach the two ground cable lugs to the right screws.

Check that the fault code is gone. If the fault is still present, replace the electronic unit.

Remedy 5

Fault code 0F. Front sensor 1 ground resistance greater than or equal to 3 ohms

Fault code 10. Front sensor 2 ground resistance greater than or equal to 3 ohms

A Unscrew the retaining screws for the front sensor. Clean the contact surfaces between the sensor and the bracket on the car. Screw down the sensor with new retaining screws. Check that the fault code is gone.

Remedy 6

Fault code 11. Front sensor 1 open circuit in wiring
Fault code 12. Front sensor 2 open circuit in wiring

A Check connectors 58 and 57 for poor contact. Erase and check whether the fault code is still present.

If the fault code is gone, the fault was in one of the connectors 57 or 58.

If the fault code is still present, proceed to B below.

B Separate connector 58.

Measure the resistance in the wire to the front sensor with an ohmmeter.

Measure for front sensor 1:
between pins 1 and 2

Measure for front sensor 2:
between pins 11 and 12

If the resistance reading is less than 40 ohms, the fault is located in the wiring between connector 58 and the electronic unit. Replace the electronic unit.

If the resistance reading is greater than or equal to 40 ohms, proceed to C below.

C Separate connector 57.

Measure the resistance in the wire to the front sensor with an ohmmeter.

Measure for front sensor 1:
between pins 1 and 3

Measure for front sensor 2:
between pins 1 and 3

If the resistance reading is greater than or equal to 40 ohms, the fault is located in the front sensor. Replace the front sensor.

If the resistance reading is less than 40 ohms, the fault is located in the wiring between connectors 58 and 57. Replace the wiring.

Remedy 7

Fault code 13. Front sensor 1 wiring resistance too high

Fault code 14. Front sensor 2 wiring resistance too high

A Check connectors 58 and 57 for poor contact. Erase and check whether the fault code is still present.

If the fault code is gone, the fault was in one of the connectors 57 or 58.

If the fault code is still present, proceed to B below.

B Separate connector 58.

Measure the resistance in the wire to the front sensor with an ohmmeter.

Measure for front sensor 1:
between pins 1 and 2

Measure for front sensor 2:
between pins 11 and 12

If the resistance reading is less than 3 ohms, the fault is located in the wiring between connector 58 and the electronic unit. Replace the electronic unit.

If the resistance reading is greater than or equal to 3 ohms, proceed to C below.

C Separate connector 57.

Measure the resistance in the wire to the front sensor with an ohmmeter.

Measure for front sensor 1:
between pins 1 and 3

Measure for front sensor 2:
between pins 1 and 3

If the resistance reading is greater than or equal to 3 ohms, the fault is located in the front sensor. Replace the front sensor.

If the resistance reading is less than 3 ohms, the fault is located in the wiring between connectors 58 and 57. Replace the wiring.

Remedy 8

Fault code 1b. Electric detonator 1 leakage to battery positive

Note
Turn the steering wheel lock-to-lock several times during measurement.

A Unscrew the steering wheel pad (airbag module) and disconnect the connector from the rear of the pad. Connect reference resistance 84 71 153 to the connector. Separate connector 59 and connect measuring cable 84 71 146 to the connector. Measure between each pin and battery positive with an ohmmeter.

If both resistance readings are greater than 4.7 kohms, the fault is located in the wiring between connector 59 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If either of the resistance readings is less than or equal to 4.7 kohms, proceed to B below.

B Separate connector 335.

Repeat the measurement described under A.

If both resistance readings are greater than 4.7 kohms, the fault is located in the contact unit (coil spring). Replace the contact unit (coil spring).

If either of the resistance readings is less than or equal to 4.7 kohms, the fault is located in the wiring between connectors 335 and 59. Investigate the cause. Remedy or replace the wiring, if necessary.

Remedy 9

Fault code 1C. Electric detonator 2 leakage to battery positive

A Disconnect the connector on the seat-belt tensioner. Connect reference resistance 84 71 153 to the connector. Separate connector 58.

B Measure the resistance in the wire to the seat-belt tensioner in the connector using an ohmmeter. Measure between pin 9 and battery positive and between pin 5 and battery positive.

Make sure during the measurements that the engine is running, all loads (lighting, electric motors etc.) are turned on one at a time.

If either of the resistance readings is less than or equal to 4.7 kohms, the fault is located in the wiring between connector 58 and the seat-belt tensioner. Investigate the cause. Remedy or replace the wiring, if necessary.

If both resistance readings are greater than 4.7 kohms, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Replace the electronic unit, if necessary.

Remedy 10

Fault code 1E. Electric detonator 1 short circuit to battery positive.

Note
Turn the steering wheel lock-to-lock several times during measurement.

A Unscrew the steering wheel pad (airbag module) and disconnect the connector from the rear of the pad. Connect reference resistance 84 71 153 to the connector. Separate connector 59 and connect measuring cable 84 71 146 to the connector. Measure between each pin and battery positive with an ohmmeter.

If both resistance readings are greater than 470 ohms, the fault is located in the wiring between connector 59 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If either of the resistance readings is less than or equal to 470 ohms, proceed to B below.

B Separate connector 335.

Repeat the measurement described under A.

If both resistance readings are greater than 470 ohms, the fault is located in the contact unit (coil spring). Replace the contact unit (coil spring).

If either of the resistance readings is less than or equal to 470 ohms, the fault is located in the wiring between connectors 335 and 59. Investigate the cause. Remedy or replace the wiring, if necessary.

Remedy 11

Fault code 1F. Electric detonator 2 short circuit to battery positive

A Disconnect the connector on the seat-belt tensioner. Connect reference resistance 84 71 153 to the connector. Separate connector 58.

B Measure the resistance in the wire to the seat-belt tensioner in the connector using an ohmmeter. Measure between pin 9 and battery positive and between pin 5 and battery positive.

Make sure during the measurements that the engine is running, all loads (lighting, electric motors etc.) are turned on one at a time.

If either of the resistance readings is less than or equal to 470 ohms, the fault is located in the wiring between connector 58 and the seat-belt tensioner. Investigate the cause. Remedy or replace the wiring, if necessary.

If both resistance readings are greater than 470 ohms, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Replace the electronic unit, if necessary.

Remedy 12

Fault code 21. Electric detonator 1 leakage to ground

Note
Turn the steering wheel lock-to-lock several times during measurement.

A Unscrew the steering wheel pad (airbag module) and disconnect the connector from the rear of the pad. Connect reference resistance 84 71 153 to the connector. Separate connector 59 and connect measuring cable 84 71 146 to the connector. Measure between the one pin and ground and between the other pin and ground with an ohmmeter.

If both resistance readings are greater than 4.7 kohms, the fault is located in the wiring between connector 59 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If either of the resistance readings is less than or equal to 4.7 kohms, proceed to B below.

B Separate connector 335 and connect the measuring cable to the connector. Measure between the one pin and ground and between the other pin and ground with an ohmmeter.

If both resistance readings are greater than 4.7 kohms, the fault is located in the wiring between connectors 59 and 335. Investigate the cause. Remedy or replace the wiring, if necessary.

If either of the resistance readings is less than or equal to 4.7 kohms, the fault is located in the contact unit (coil spring). Replace the contact unit (coil spring).

Remedy 13

Fault code 22. Electric detonator 2 leakage to ground

A Disconnect the connector on the seat-belt tensioner. Connect reference resistance 84 71 153 to the connector. Separate connector 58. Measure in the connector with an ohmmeter. Measure between pin 9 and ground and between pin 5 and ground.

If either of the resistance readings is less than or equal to 4.7 kohms, the fault is located in the wiring between connector 58 and the seat-belt tensioner. Investigate the cause. Remedy or replace the wiring, if necessary.

If both resistance readings are greater than 4.7 kohms, proceed to B below.

B Put together connector 58. Erase and check if the fault code is still present.

If the fault code is still present, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If the fault code is not still present, the fault is located in the seat-belt tensioner. Replace the seat-belt tensioner.

Remedy 14

Fault code 24. Electric detonator 1 short circuit to ground

Note
Turn the steering wheel lock-to-lock several times during measurement.

A Unscrew the steering wheel pad (airbag module) and disconnect the connector from the rear of the pad. Connect reference resistance 84 71 153 to the connector. Separate connector 59 and connect measuring cable 84 71 146 to the connector. Measure between the one pin and ground and between the other pin and ground with an ohmmeter.

If both resistance readings are greater than 470 ohms, the fault is located in the wiring between connector 59 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If either of the resistance readings is less than or equal to 470 ohms, proceed to B below.

B Separate connector 335 and connect the measuring cable to the connector. Measure between the one pin and ground and between the other pin and ground with an ohmmeter.

If both resistance readings are greater than 470 ohms, the fault is located in the wiring between connectors 59 and 335. Investigate the cause. Remedy or replace the wiring, if necessary.

If either of the resistance readings is less than or equal to 470 ohms, the fault is located in the contact unit (coil spring). Replace the contact unit (coil spring).

Remedy 15

Fault code 25. Electric detonator 2 short circuit to ground

A Disconnect the connector on the seat-belt tensioner. Connect reference resistance 84 71 153 to the connector. Separate connector 58. Measure in the connector with an ohmmeter. Measure between pin 9 and ground and between pin 5 and ground.

If either of the resistance readings is less than or equal to 470 ohms, the fault is located in the wiring between connector 58 and the seat-belt tensioner. Investigate the cause. Remedy or replace the wiring, if necessary.

If both resistance readings are greater than 470 ohms, proceed to B below.

B Put together connector 58. Erase and check if the fault code is still present.

If the fault code is still present, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If the fault code is not still present, the fault is located in the seat-belt tensioner. Replace the seat-belt tensioner.

Remedy 16

Fault code 27. Electric detonator 1 open circuit

Note
Turn the steering wheel lock-to-lock several times during measurement.

A Check the pins and sleeves in connectors 59 and 335 for any open circuits.

B Put the connectors together. Erase and check whether the fault code is still present.

If the fault code is gone, the fault was located in one of the connectors.

If the fault code is still present, proceed to C below.

C Unscrew the steering wheel pad (airbag module) and disconnect the connector from the rear of the pad. Connect reference resistance 84 71 153 to the connector.

Make sure that connector 335 is put together.

Separate connector 59 and connect measuring cable 84 71 146 to the connector. Measure between the two pins with an ohmmeter.

If the resistance reading is less than 40 ohms, the fault is located in the steering wheel pad. Replace the steering wheel pad.

If the resistance reading is greater than 40 ohms, proceed to D below.

D Separate connector 335 and connect the measuring cable to the connector. Measure between the two pins with an ohmmeter.

If the resistance reading is greater than 40 ohms, the fault is located in the contact unit (coil spring). Replace the contact unit (coil spring).

If the resistance reading is less than to 40 ohms, the fault is located in the wiring between connectors 335 and 59. Replace the wiring.

Remedy 17

Fault code 28. Electric detonator 2 open circuit

A Separate connector 58. Check the pins and sleeves for open circuits. Put the connector together. Erase and check whether the fault code is still present.

If the fault code is gone, the fault was located in the connector.

If the fault code is still present, proceed to B below.

B Disconnect the connector on the seat-belt tensioner. Connect reference resistance 84 71 153 to the connector.Erase and check whether the fault code is still present.

If the fault code is gone, the fault is located in the seat-belt tensioner. Replace the seat-belt tensioner.

If the fault code is still present, proceed to C below.

C Separate connector 58. Measure between pins 5 and 9 in the wire to the seat-belt tensioner with an ohmmeter.

If the resistance reading is less than 40 ohms, the fault is located in the wiring between connector 58 and the electronic unit. Replace the electronic unit.

If the resistance reading is greater than or equal to 40 ohms, the fault is located in the wiring between connector 58 and the seat-belt tensioner. Replace the wiring.

Remedy 18

Fault code 2A. Electric detonator 1 resistance too low.

Note
Turn the steering wheel lock-to-lock several times during measurement.

A Unscrew the steering wheel pad (airbag module) and disconnect the connector from the rear of the pad. Connect reference resistance 84 71 153 to the connector. Erase and check whether the fault code is still present.

If the fault code is gone, the fault is located in the steering wheel pad. Replace the steering wheel pad.

If the fault code is still present, proceed to B below.

B Separate connector 59. Connect measuring cable 84 71 146 to the connector. Measure between the pins with an ohmmeter.

If the resistance reading is greater than 2.5 ohms, the fault is located in the wiring between connector 59 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If the resistance reading is less than or equal to 2.5 ohms, proceed to C below.

C Separate connector 335. Connect measuring cable 84 71 146 to the connector. Measure between the pins with an ohmmeter.

If the resistance reading is greater than 2.5 ohms, the fault is located in the wiring between connectors 335 and 59. Investigate the cause. Remedy or replace the wiring, if necessary.

If the resistance reading is less than or equal to 2.5 ohms, the fault is located in the contact unit (coil spring). Replace the contact unit (coil spring).

Remedy 19

Fault code 2b. Electric detonator 2 resistance too low.

A Disconnect the connector on the seat-belt tensioner. Connect reference resistance 84 71 153 to the connector. Erase and check whether the fault code is still present.

If the fault code is gone, the fault is located in the seat-belt tensioner. Replace the seat-belt tensioner.

If the fault code is still present, proceed to B below.

B Separate connector 58. Measure between pins 5 and 9 in the wire to the seat-belt tensioner with an ohmmeter.

If the resistance reading is greater than 1.7 ohms, the fault is located in the wiring between connector 58 and the electronic unit. Investigate the cause. Remedy or replace the electronic unit, if necessary.

If the resistance reading is less than or equal to 1.7 ohms, the fault is located in the wiring between connector 58 and the seat-belt tensioner. Investigate the cause. Remedy or replace the wiring, if necessary.

Remedy 20

Fault code 2d. Electric detonator 1 resistance too high.

Note
Turn the steering wheel lock-to-lock several times during measurement.

A Check the pins and sleeves in connectors 59 and 335 for any open circuits.

B Put the connectors together. Erase and check whether the fault code is still present.

If the fault code is gone, the fault was located in one of the connectors.

If the fault code is still present, proceed to C below.

C Unscrew the steering wheel pad (airbag module) and disconnect the connector from the rear of the pad. Connect reference resistance 84 71 153 to the connector.

Make sure that connector 335 is put together.

Separate connector 59 and connect measuring cable 84 71 146 to the connector. Measure between the two pins with an ohmmeter.

If the resistance reading is less than 5.9 ohms, the fault is located in the steering wheel pad. Replace the steering wheel pad.

If the resistance reading is greater than 5.9 ohms, proceed to D below.

D Separate connector 335 and connect the measuring cable to the connector. Measure between the two pins with an ohmmeter.

If the resistance reading is greater than 5.9 ohms, the fault is located in the contact unit (coil spring). Replace the contact unit (coil spring).

If the resistance reading is less than to 5.9 ohms, the fault is located in the wiring between connectors 335 and 59. Replace the wiring.

Remedy 21

Fault code 2E. Electric detonator 2 resistance too high.

A Separate connector 58. Check the pins and sleeves for open circuits. Put the connector together. Erase and check whether the fault code is still present.

If the fault code is gone, the fault was located in the connector.

If the fault code is still present, proceed to B below.

B Disconnect the connector on the seat-belt tensioner. Connect reference resistance 84 71 153 to the connector.Erase and check whether the fault code is still present.

If the fault code is gone, the fault is located in the seat-belt tensioner. Replace the seat-belt tensioner.

If the fault code is still present, proceed to C below.

C Separate connector 58. Measure between pins 5 and 9 in the wire to the seat-belt tensioner with an ohmmeter.

If the resistance reading is less than 2.7 ohms, the fault is located in the wiring between connector 58 and the electronic unit. Replace the electronic unit.

If the resistance reading is greater than or equal to 2.7 ohms, the fault is located in the wiring between connector 58 and the seat-belt tensioner. Replace the wiring.

Remedy 22

Fault code 30. SRS lamp, short circuit to battery positive or ground.

A short circuit to ground can be recognized by the fact that the SRS lamp is constantly lit when the ignition is switched on.

A short circuit to battery positive can be recognized by the fact that the SRS lamp does not light at all when the ignition is switched on.

The fault must have lasted without interruption for at least 20 seconds before the fault code is stored.

A Check wire 920 and 920A between pin 7 in connector 58, pin 10 in test outlet 330 and pin 20 on the electronic unit for a short circuit to ground or battery positive.

B Check wire 920 between pin 7 in connector 58 and pin 8 in the pictogram for a short circuit to ground or battery positive.

Remedy 23

Fault code 31. SRS defective

The fault must have lasted without interruption for at least 20 seconds before the fault code is stored.

A Check fuse 13.

B Separate connector 58.

Switch on the ignition.

Ground pin 7 in the connector (the wire to the SRS lamp). Check whether the SRS lamp is lit.

If the SRS lamp is not lit, it is defective and must be replaced.

If the SRS lamp is lit, proceed to C below.

C Put together connector 58.

Switch on the ignition.

Ground pin 10 in test outlet 330.

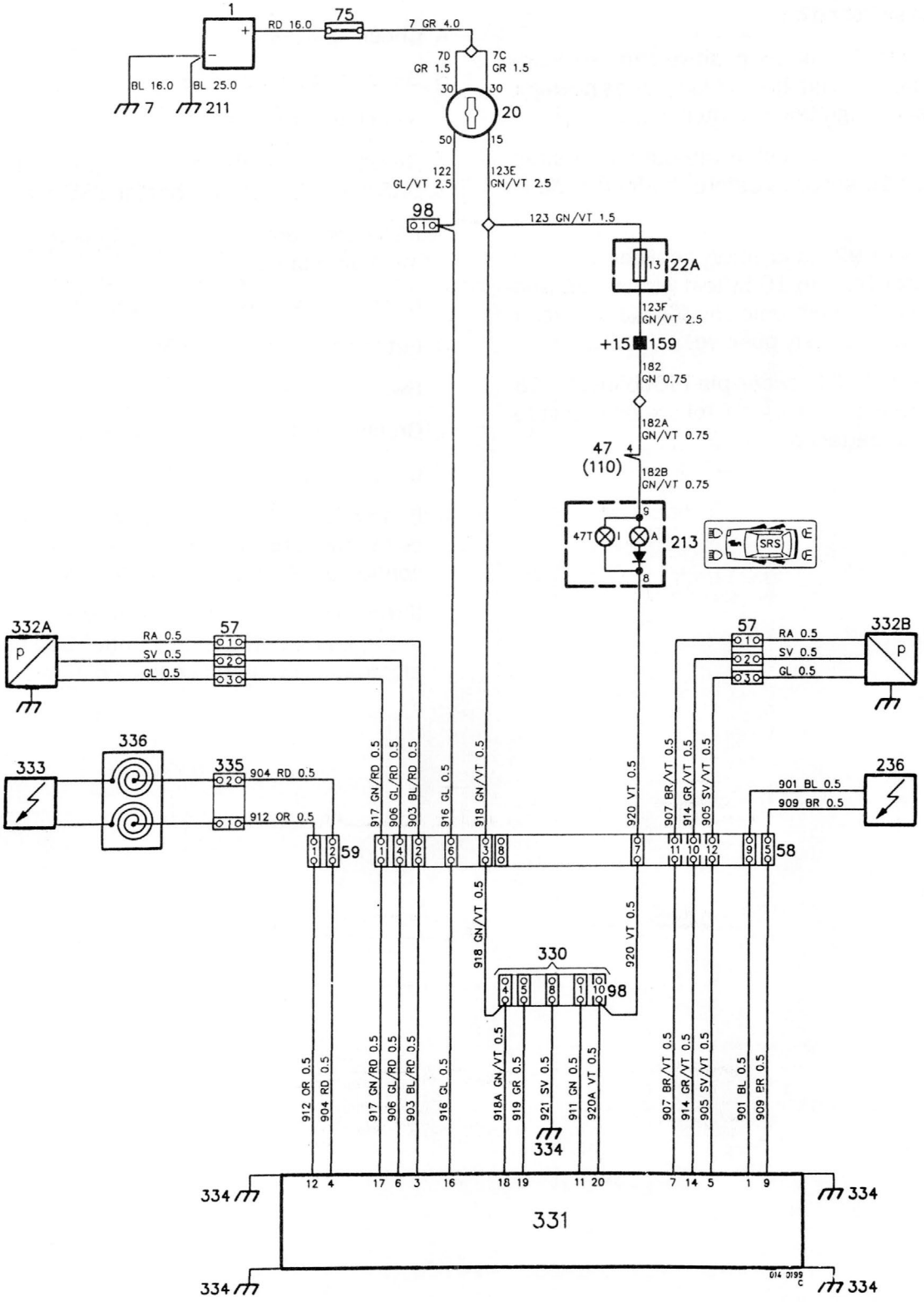
Check whether the SRS lamp is lit.

If the SRS lamp is not lit, there is an open circuit in the wiring between test outlet 330 and connector 58. Replace the electronic unit.

If the SRS lamp is lit, there is an open circuit in the wiring between test outlet 330 and the electronic unit. Replace the electronic unit.

Wiring diagram

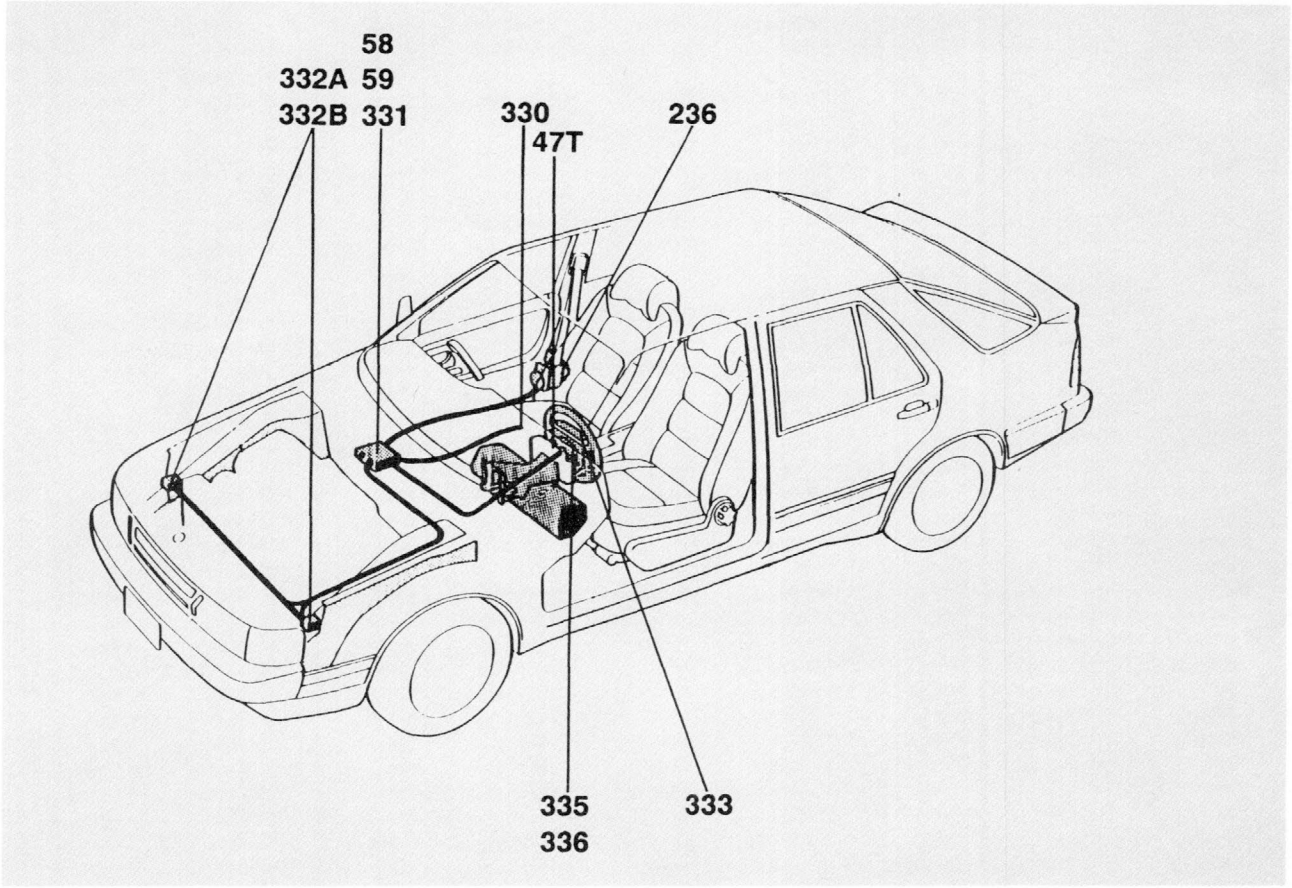
Airbag (US)

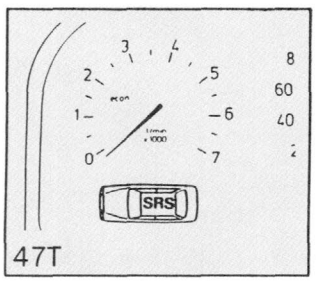


List of components

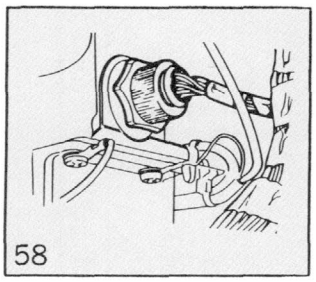
47T	Airbag warning lamp in pictogram 213
58	12-pin connector
59	2-pin connector (orange). The male pins are short-circuited when the connector is separated.
236	Seat-belt tensioner, right-hand
330	Test outlet, 10-pin, airbag
331	Electronic unit, airbag
332 A	Front sensor, left-hand
332 B	Front sensor, right-hand
333	Steering wheel pad, airbag
334	Ground point for electronic unit and test outlet
335	2-pin connector (orange). The male pins are short-circuited when the connector is separated.
336	Contact unit (coil spring)

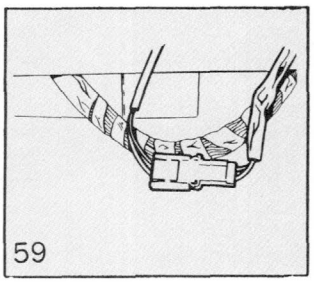
Components

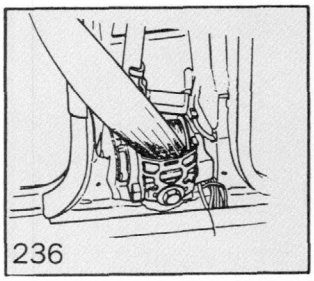




47T


58


59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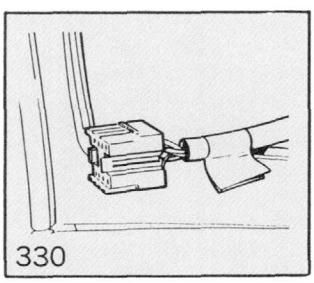
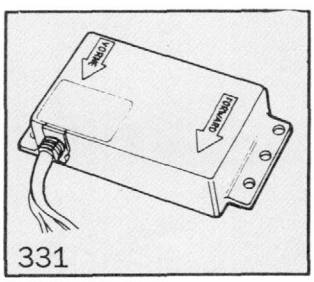
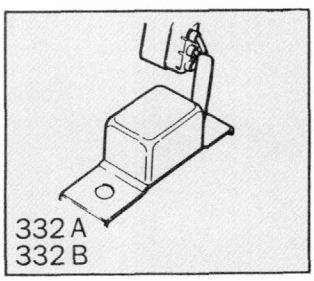
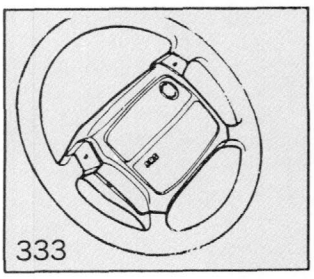
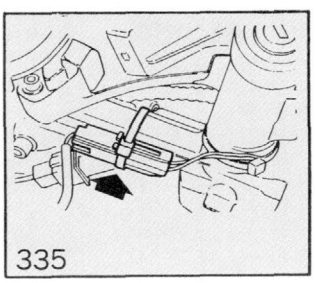

330

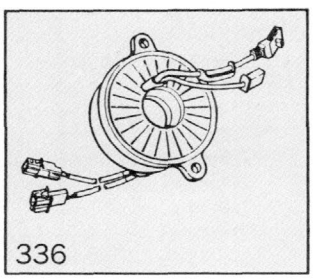


331


332 A
332 B

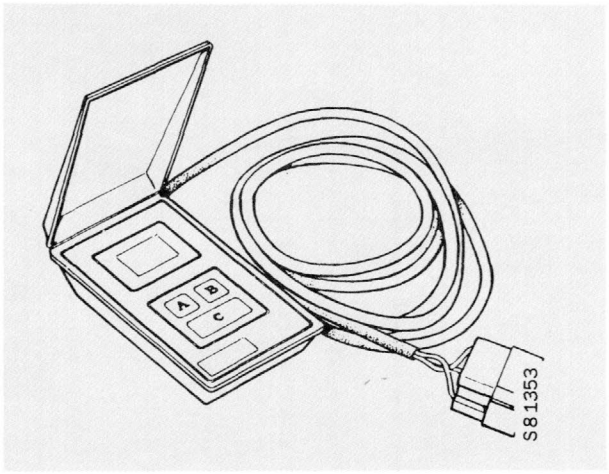

333


335

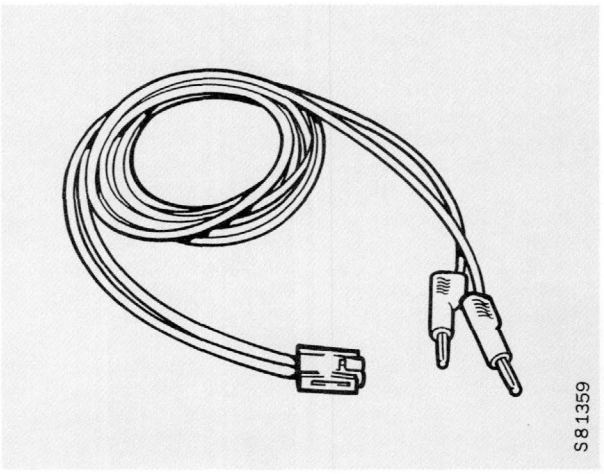

336

Removal and installation instructions

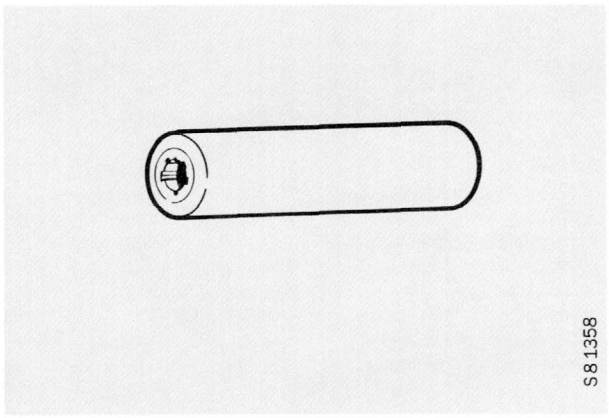
Special tools



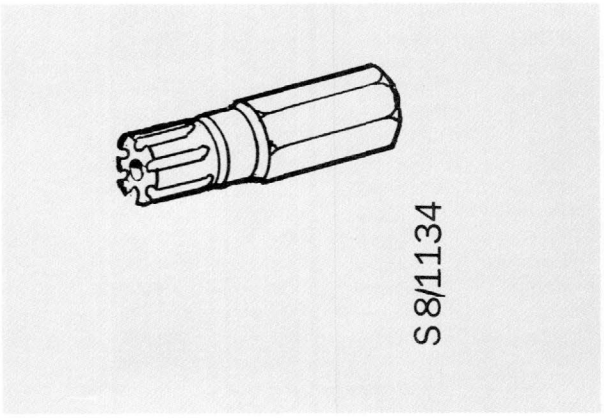
84 71 112
SRS system tester



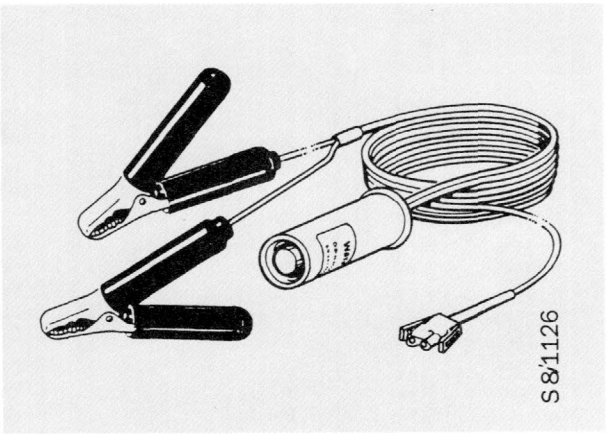
84 71 146
Measuring cable



84 71 153
Reference resistance



84 71 120
Special T 30 Torx bit for the front sensors and attachment of the electronic unit



84 71 104
Detonation device for scrapping the Airbag

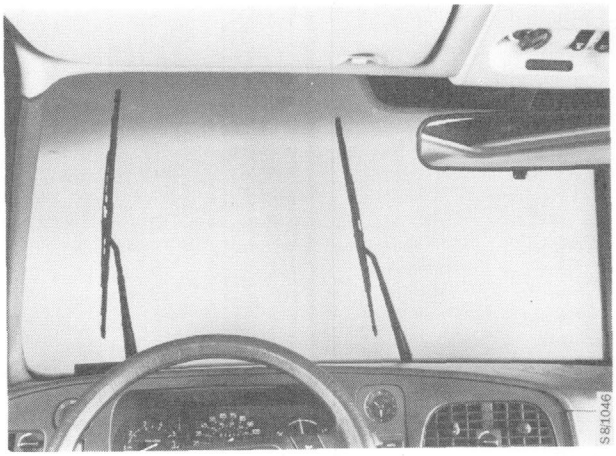
Steering column

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

Removal

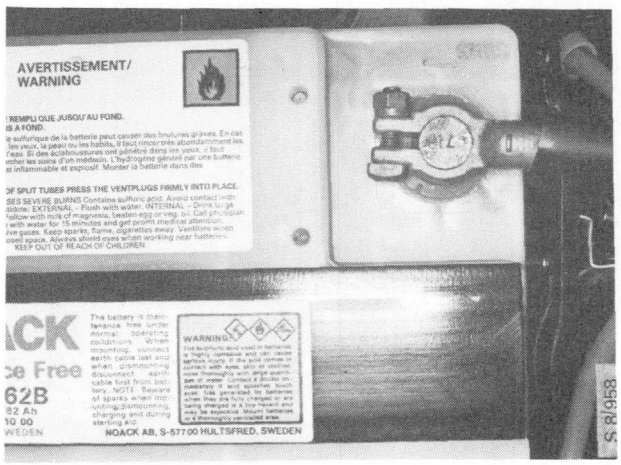
1 Remove the front door sill plate on the left-hand side.

2 Point the windshield wipers straight up by switching on the ignition, switching on the wipers and then switching off the ignition at the appropriate instant.

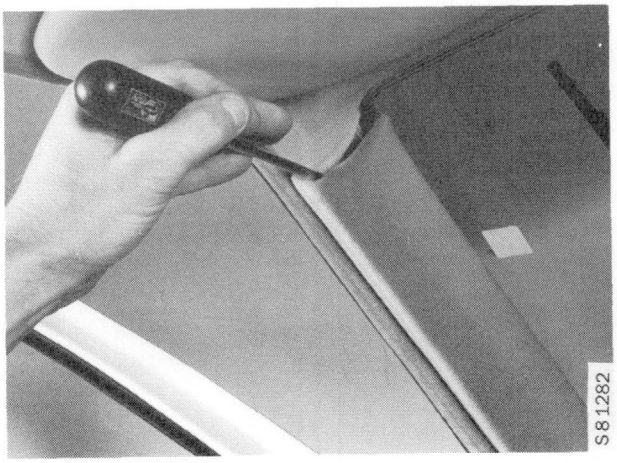


3 Disconnect the negative cable from the battery.

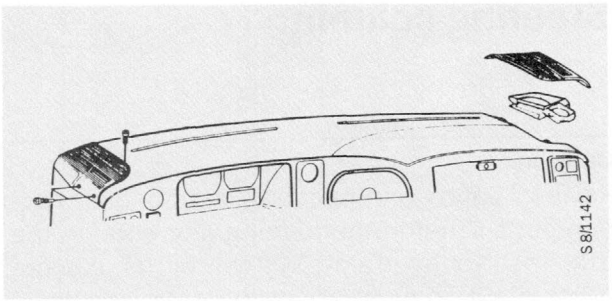
Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.



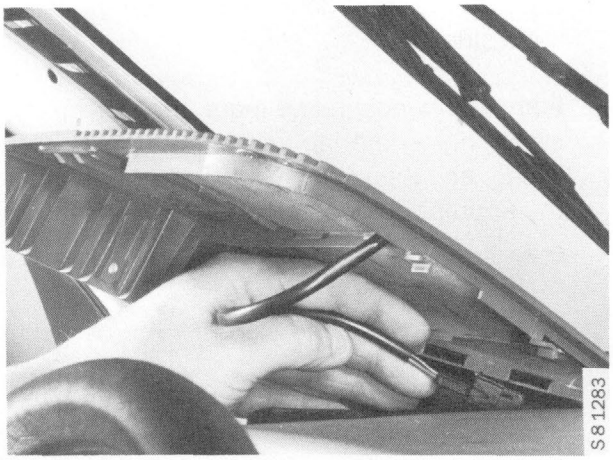
4 Remove the A-post trim.



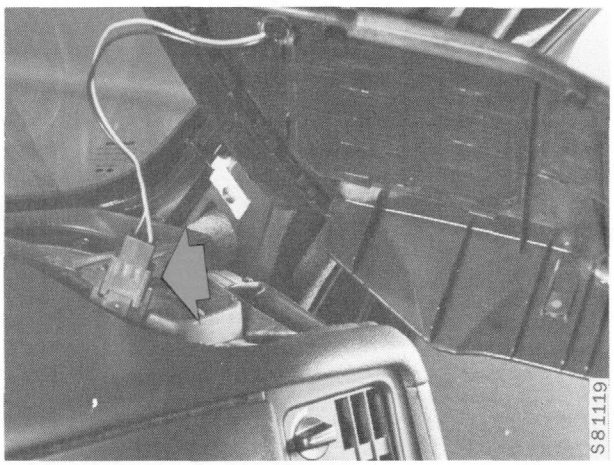
5 Remove the speaker grilles.



Separate the connector for the burglar alarm LED.

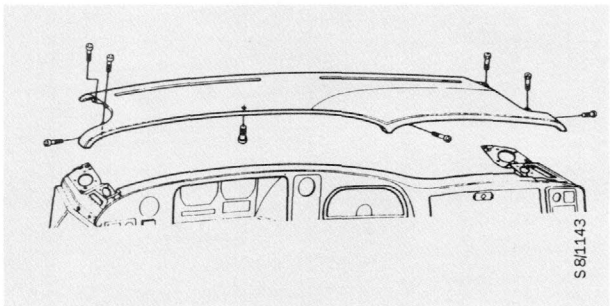


Separate the connector for the sun sensor, which is located in the right-hand speaker grille.



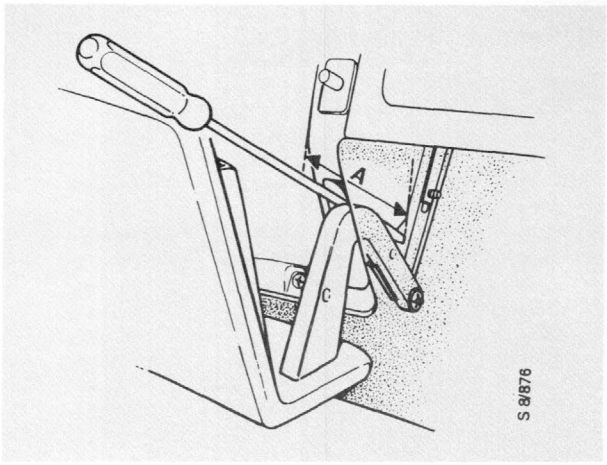
Remove the gaskets.

6 Remove the top of the dash panel (8 screws). One of the screws is located behind the rubber plug inside the glove compartment door.



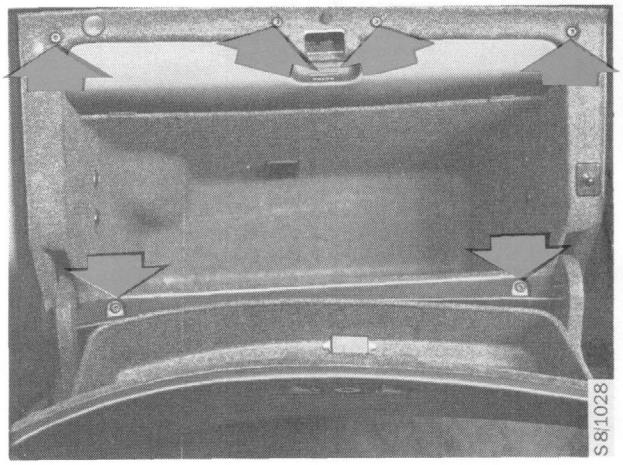
7 Remove the glove compartment as follows:

Drop the glove compartment door to its lower position by prying out the hinge arms to release the stop cleats.

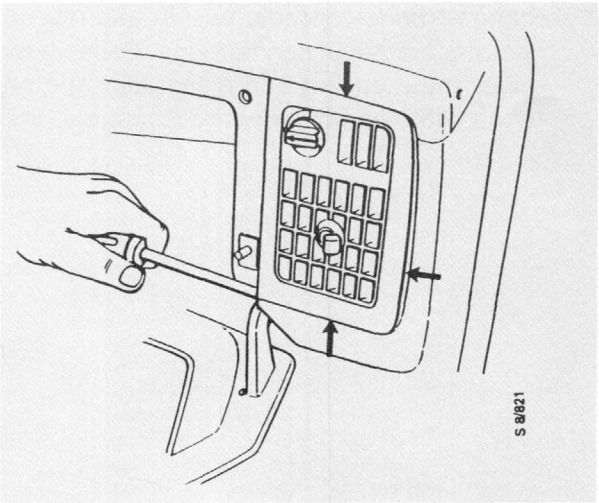


A = 100 mm (4")

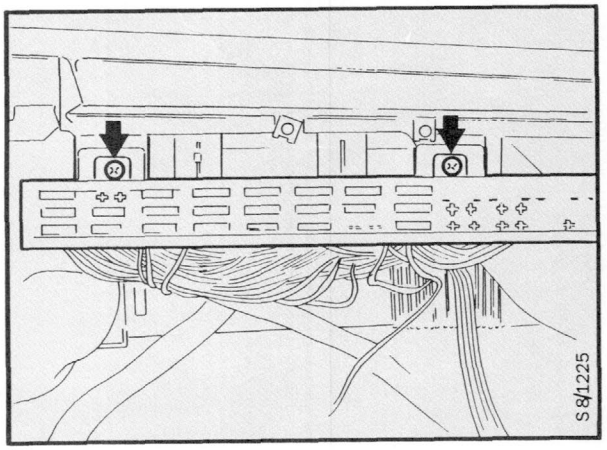
Remove the glove compartment retaining screws.



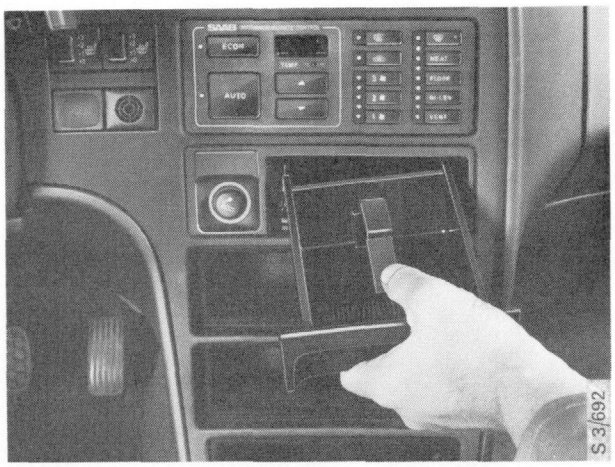
Pull out the glove compartment together with the right-hand ventilation air outlet. Pry the outlet out carefully with a screwdriver. Note the positions of the clips. Disconnect the cables for the glove compartment light and the light switch.



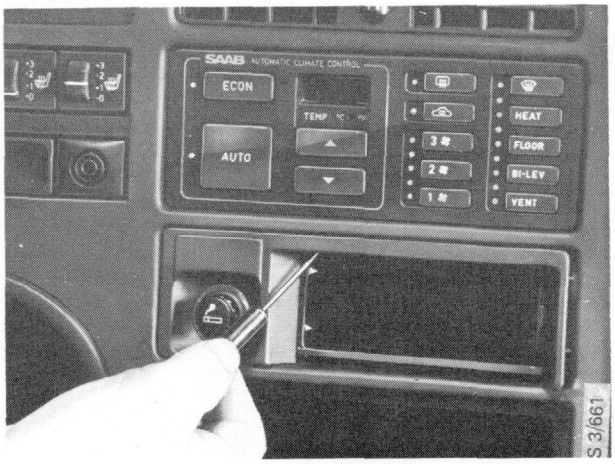
8 Remove the screws holding the electrical distribution box and lower the box.



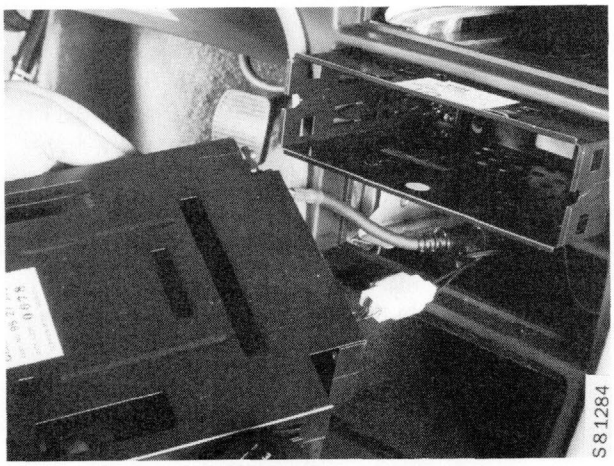
9 Remove the ashtray.



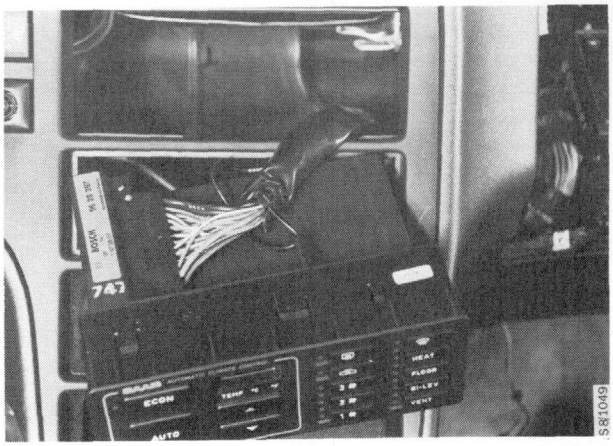
Bend down the two locking tabs at the top of the ashtray holder. Pull out the holder and disconnect the electrical connections.



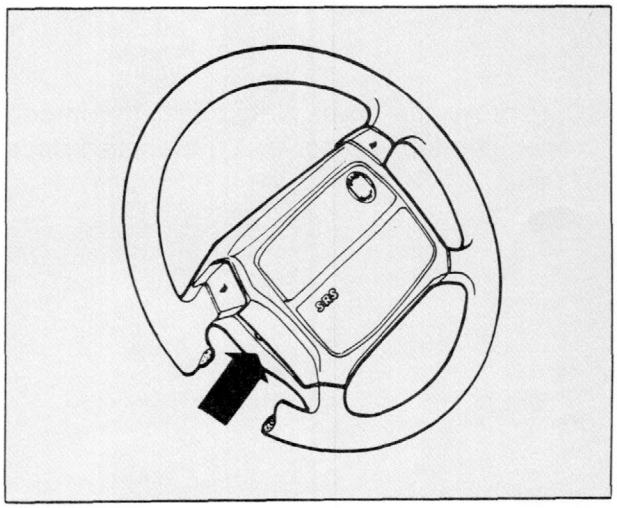
10 Remove the lower radio basket and disconnect the electrical connections. Remove the upper radio basket and disconnect the antenna cable and the electrical connections.

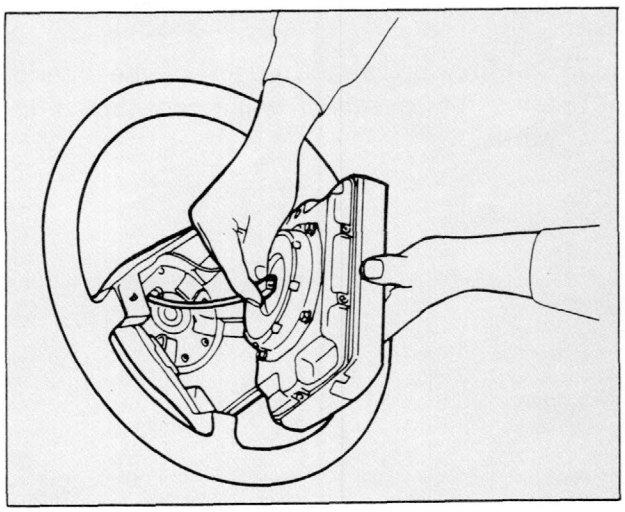


11 Press out the ACC control unit and disconnect the connectors.



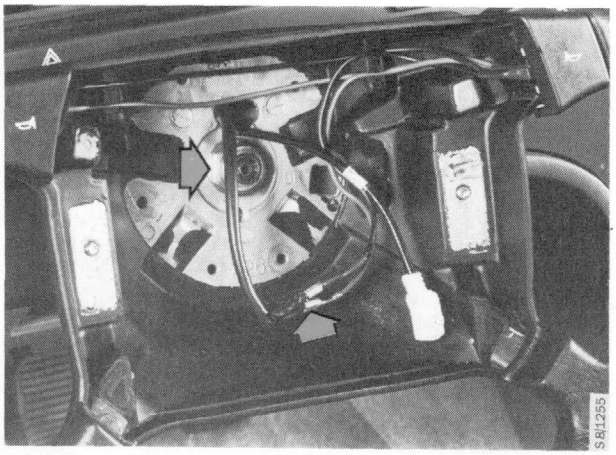
12 Remove the two screws securing the steering wheel pad (airbag module), disconnect the electrical connections and remove the pad.



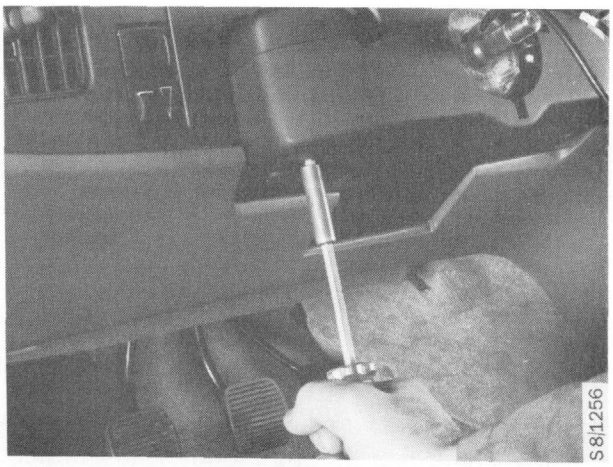


13 Point the wheels straight ahead.

14 Separate the connector for the horn in the steering wheel. Remove the steering wheel (M22).



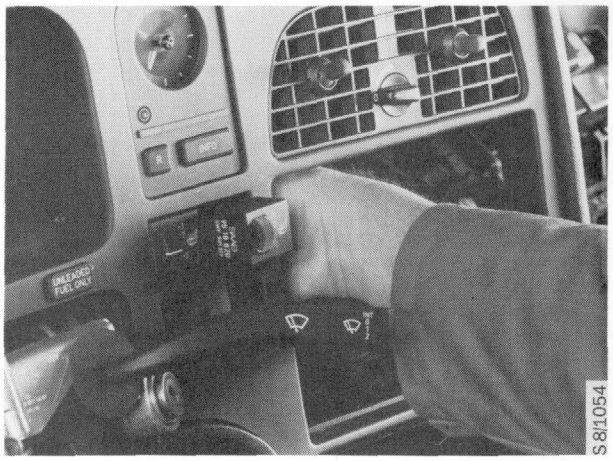
15 Remove the top and bottom steering column covers.



16 Remove the cover plates over the interior temperature sensor and the unused openings.

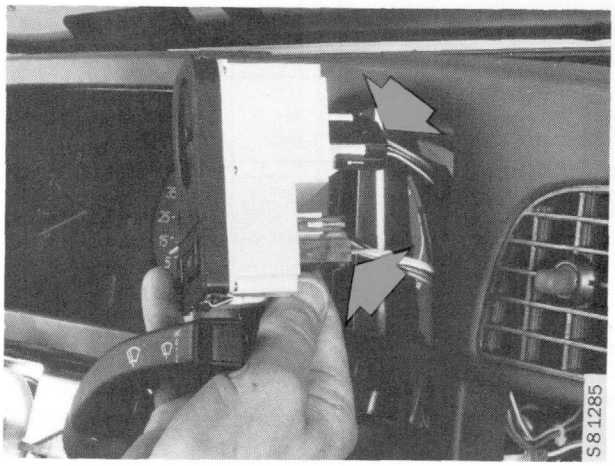
17 Carefully pry at the edges of the interior temperature sensor while pressing it inwards.

18 Press out all the switches and disconnect the connectors.

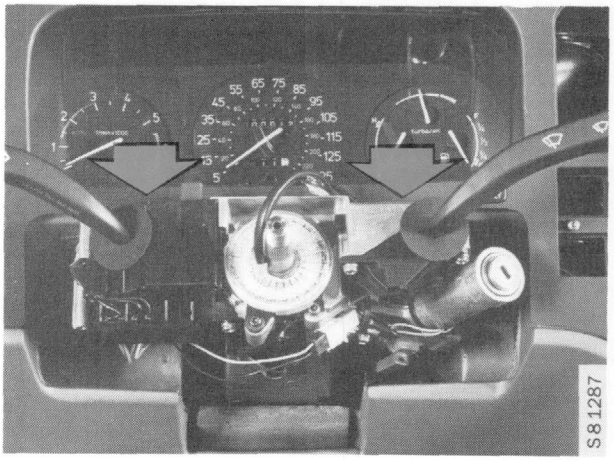


Note
Mark all the connectors to avoid mistakes when reconnecting them.

19 Remove the clock/DCC instrument. Disconnect the two connectors.

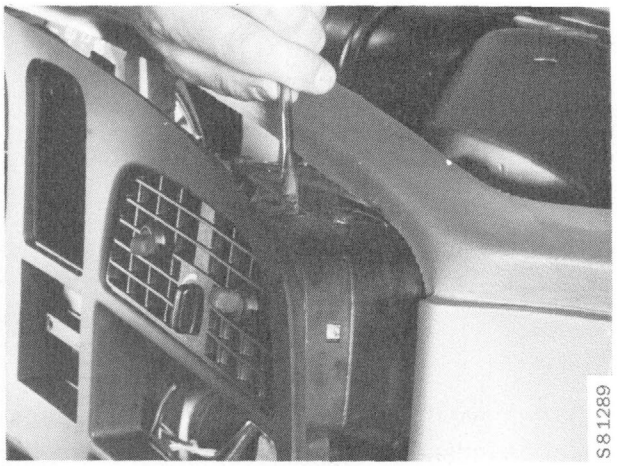


20 Remove the upper connector from the direction indicator/light stalk switch. Remove the connector from the washer/wiper stalk switch. Remove the stalk switches. Remove the two remaining connectors from the direction indicator/light stalk switch.

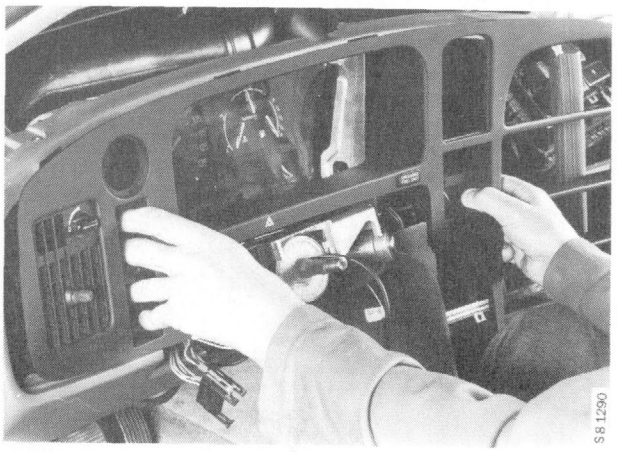


21 Remove the 5 instrument panel retaining screws (1 screw is located under the rubber cover at the gearshift lever). Remove the cover plate around the gearshift lever.

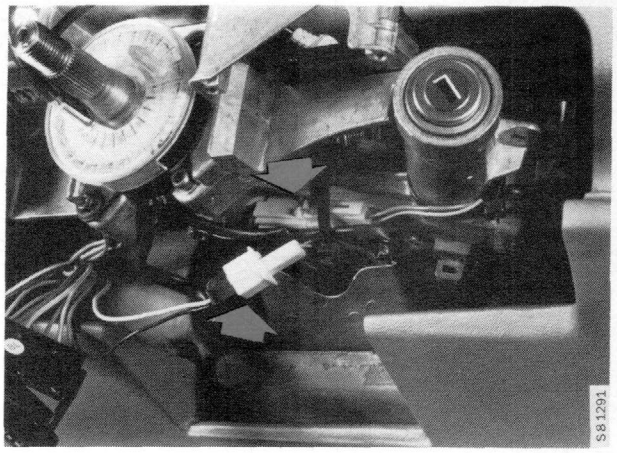
Pull out the instrument panel slightly and carefully pry up the plastic catches that lock the panel to the middle ventilation air outlet.



Lift out the panel in the middle and pull it out of the bracket at the outer side.

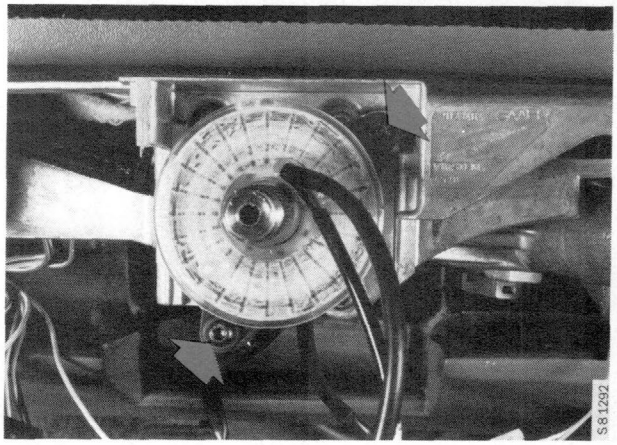


22 Cut the straps and separate the connectors for the horn and the contact unit (coil spring).

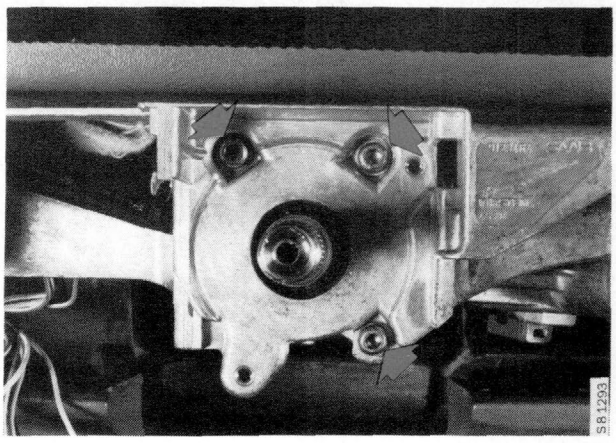


23 Remove the two screws holding the contact unit (coil spring) and lift it away.

Note
The contact unit (coil spring) is fragile. Handle it with care.

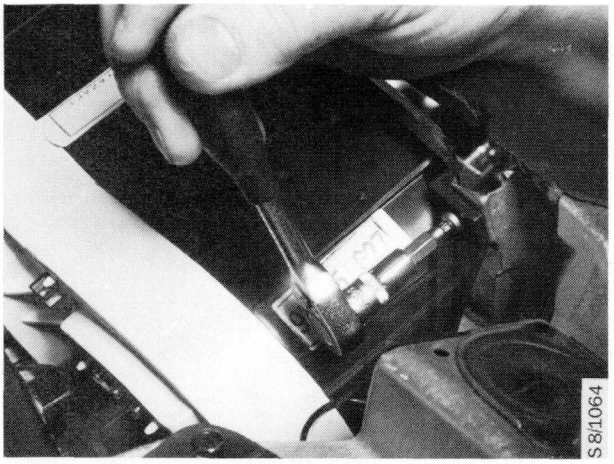


24 Remove the stalk switch holder.

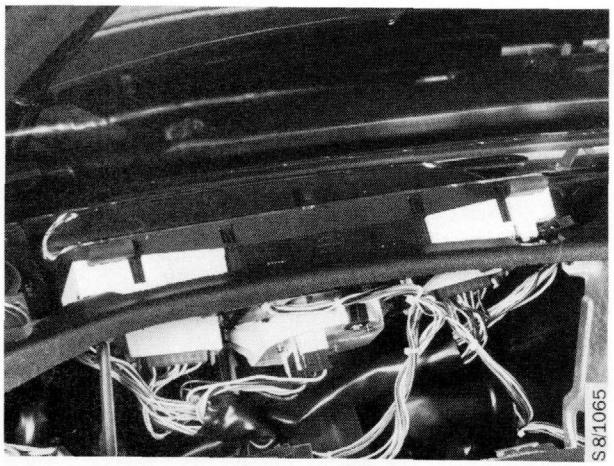


25 Remove the combined instrument as follows:

Remove the two screws securing the combined instrument.

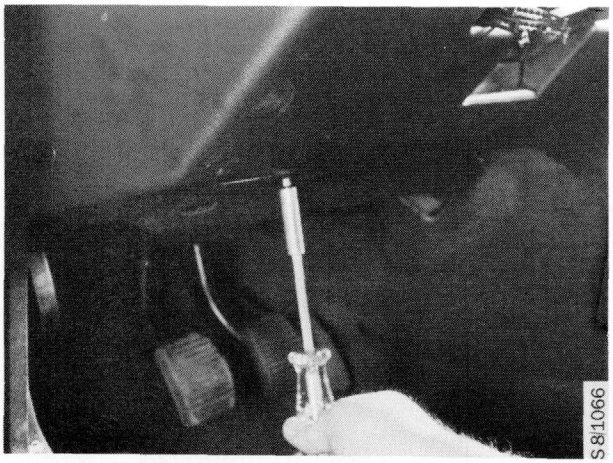


Remove the hose to the boost pressure gauge and turn the instrument up so that its glass faces the windshield.

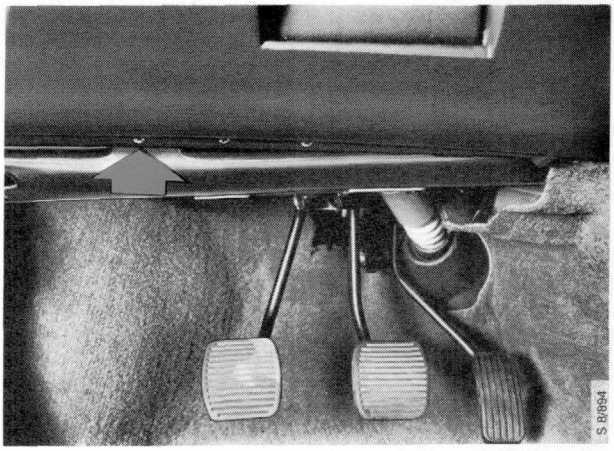


Remove the connectors and the rubber supports from the instrument and lift it out.

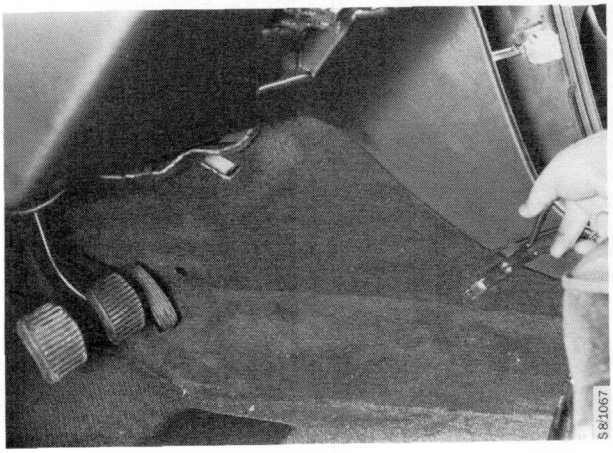
26 Remove the left-hand and right-hand sound baffles.



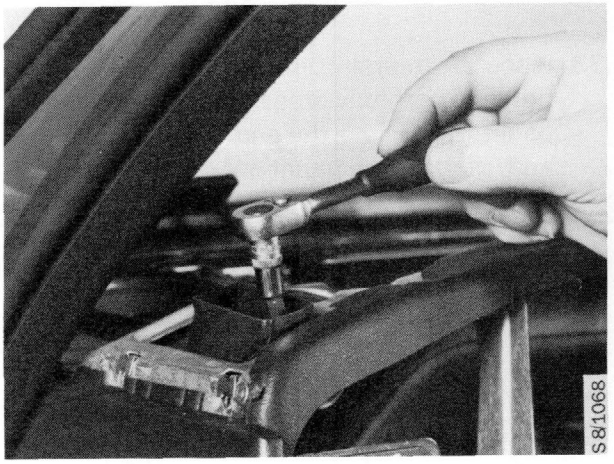
27 Remove the right-hand and left-hand floor ducts.



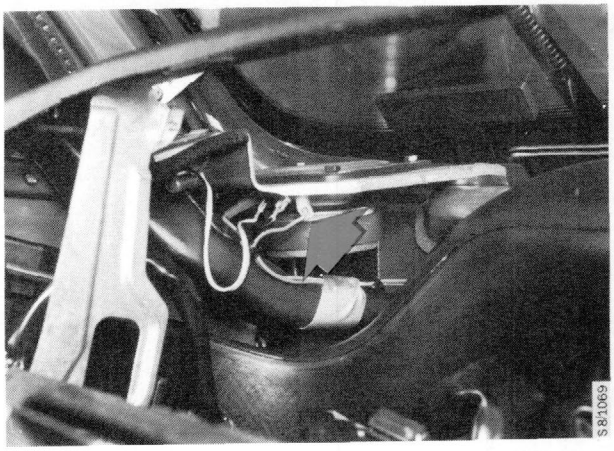
28 Remove the right-hand and left-hand center console panels (carpeted).



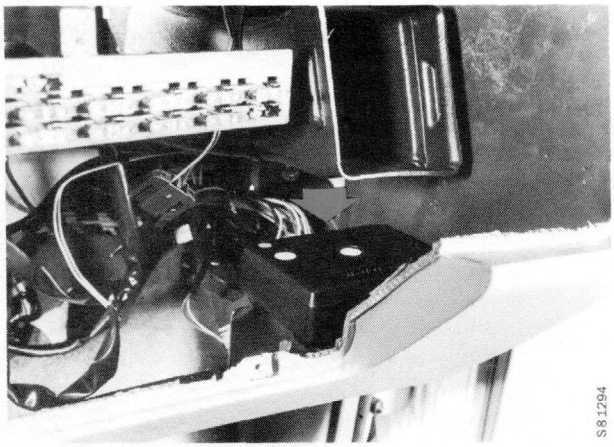
29 Remove the screws holding the side defroster outlets to the dash panel.



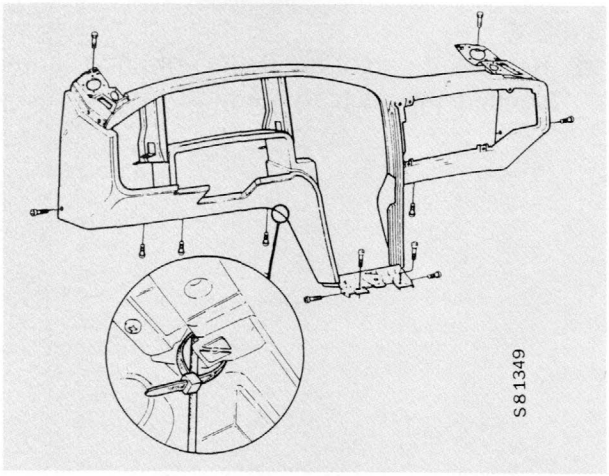
30 Disconnect the speaker leads.



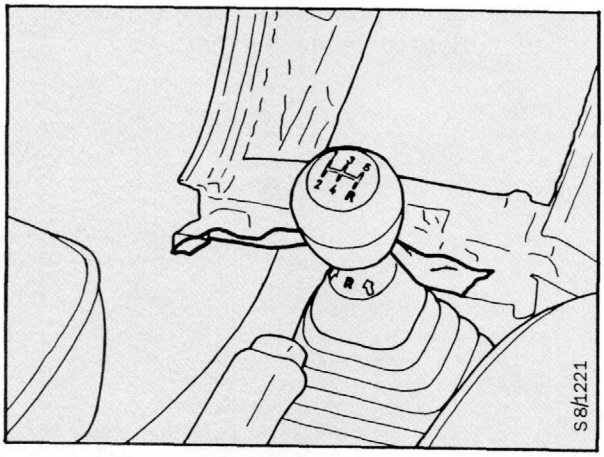
31 Remove the burglar alarm control unit from the panel and leave it hanging by its cables.



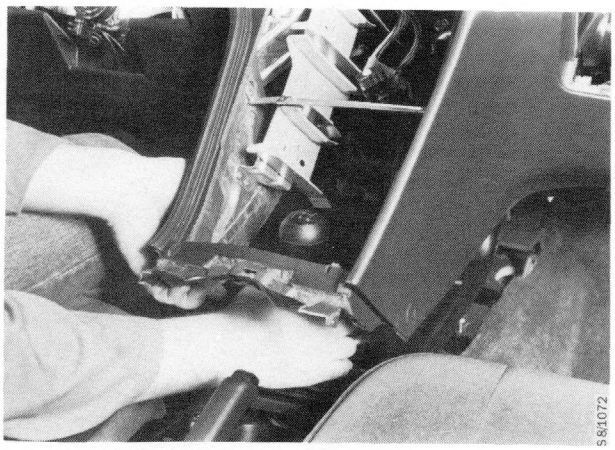
32 Remove the dash panel retaining screws. Two of the screws are located under plastic covers on the center console. Cut the strap holding the safety cable to the panel.



33 Place the gearshift lever in the reverse position and carefully press the lower part of the panel. Then move the gearshift lever forward and lift the dash panel out of the car.

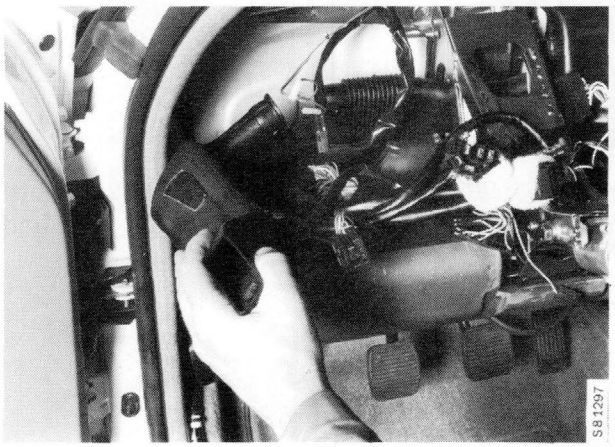


Tape the panel to protect the gearshift lever.

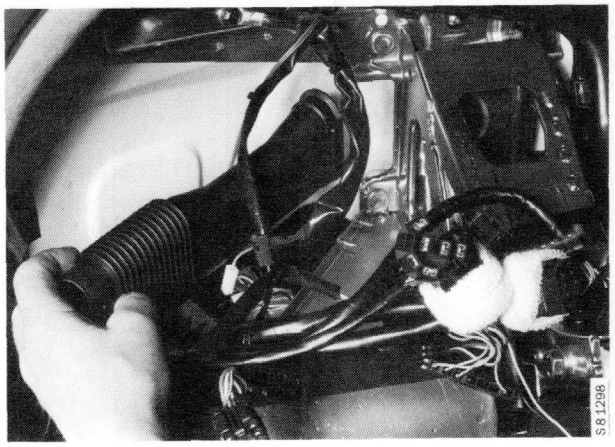


34 Cut off the strap and remove the left-hand air duct.

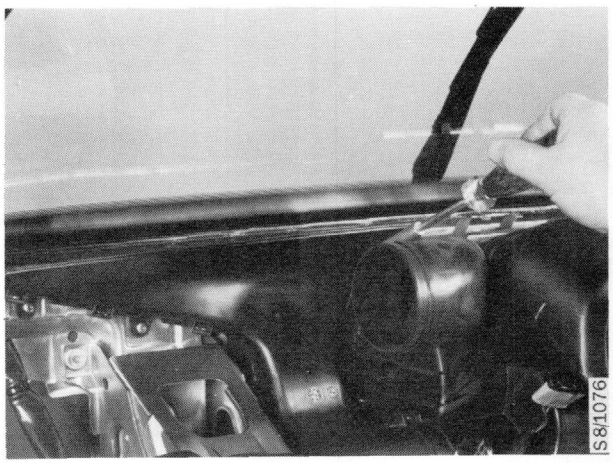
Remove the left-hand ventilation air outlet.



35 Remove the inner part of the left-hand ventilation air outlet. Note the clip.

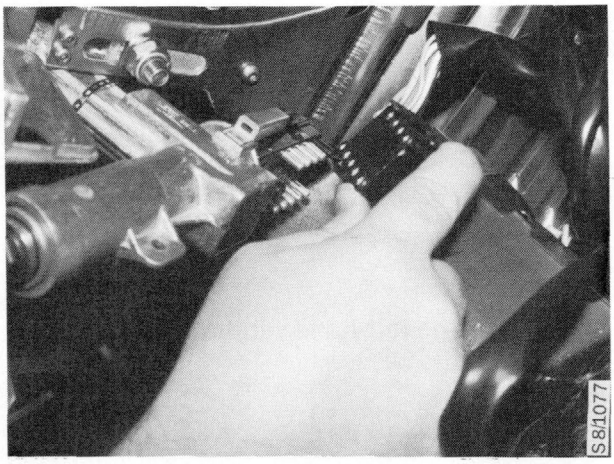


36 Remove the defroster outlet for the left-hand of the windshield.

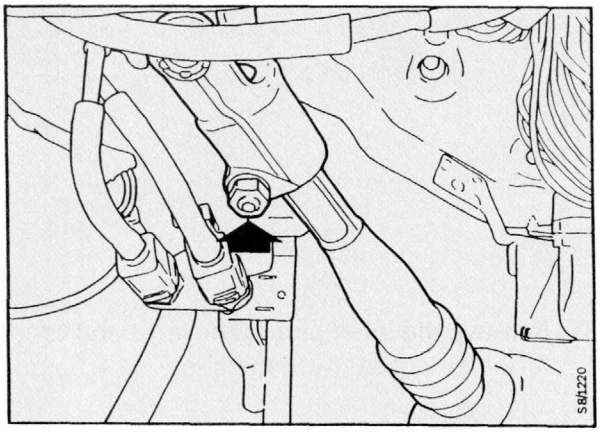


37 Move aside the wiring harness on the left-hand side of the steering column.

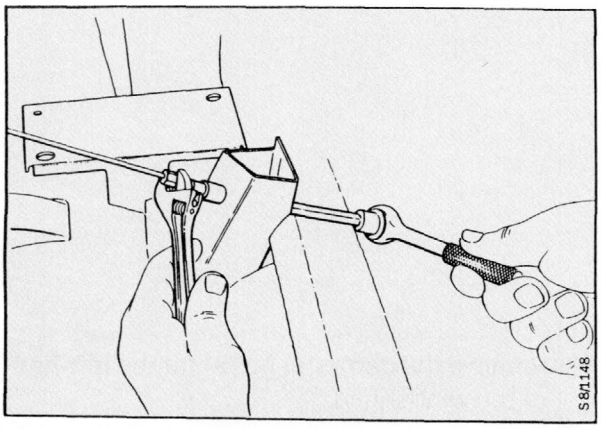
38 Disconnect the connector from the ignition switch and remove the strap securing the cable. Remove the strap securing the wiring harness to the right-hand side of the steering column.

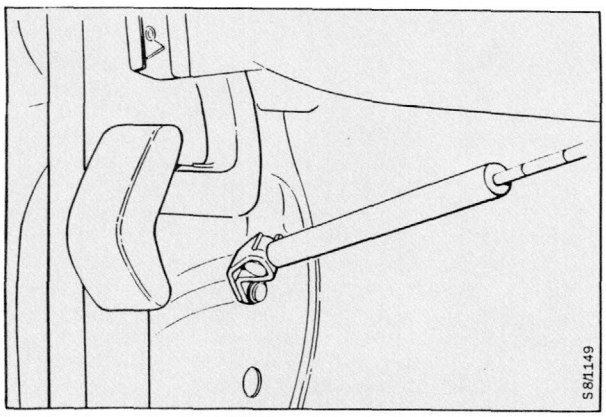


39 Disconnect the clamped joint and remove the screw between the universal joint and the intermediate shaft.

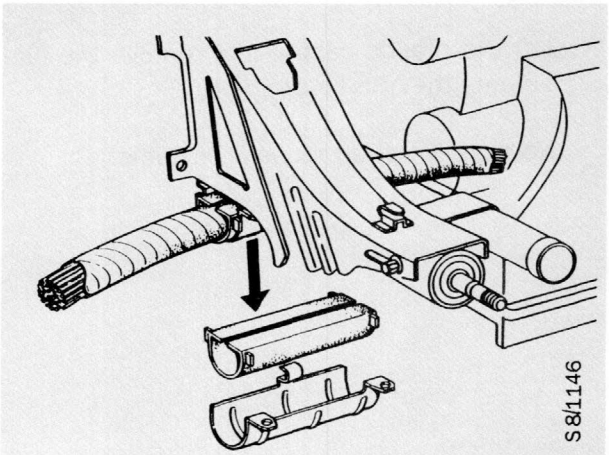


40 Remove the safety cable from the bracket on the tunnel. Detach the cable from the retainer on the other side.

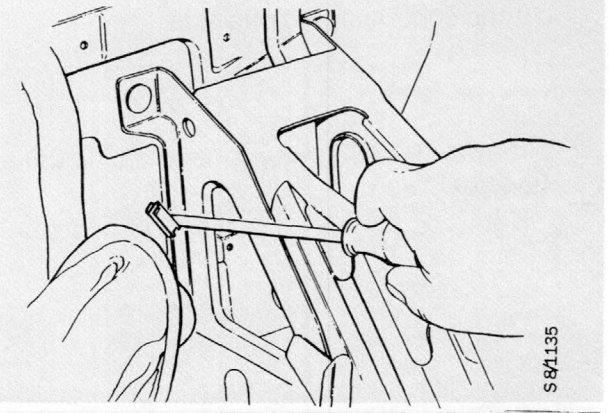




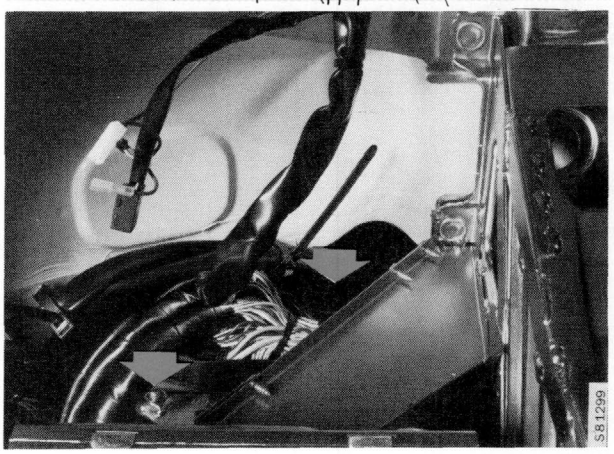
41 Remove the holder for the wiring harness.



42 Remove the metal clips between the steering column and the dash panel cross-member. (The clips do not have to be put back during installation.)

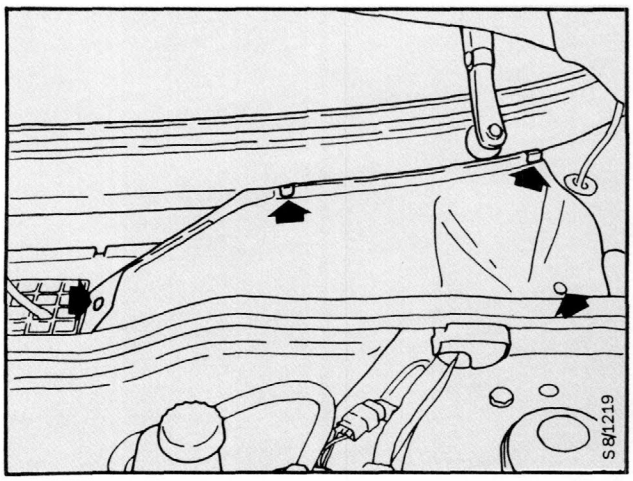


43 Remove the two screws that hold the electronic holder on the steering column.



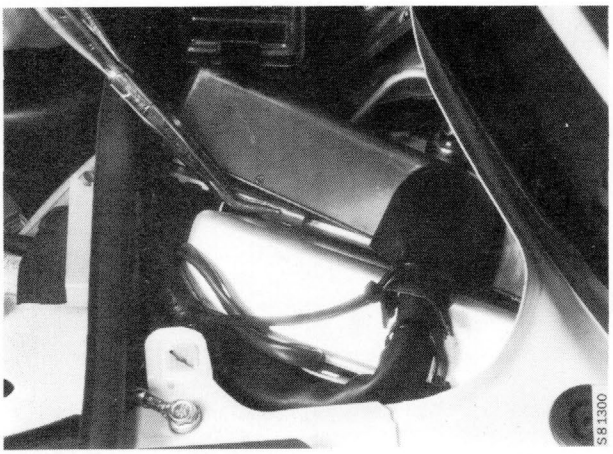
From the engine compartment:

44 Remove the cover from the left-hand portion of the firewall space.



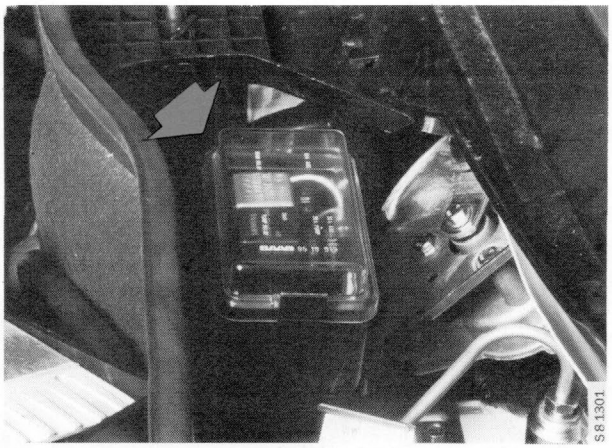
45 Lift the plastic casing and remove the clip holding the ABS control unit.

Remove the strap around the cable.



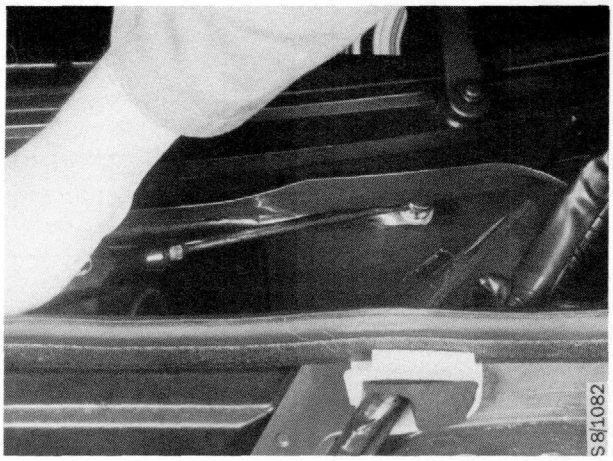
Lift the control unit to one side.

Lift away the ABS system electrical distribution box.

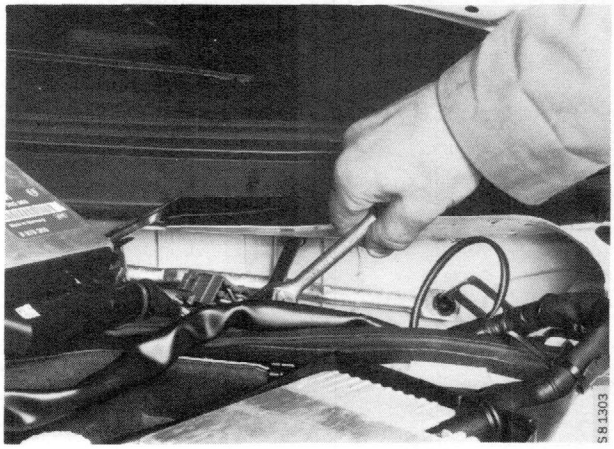


Remove the ABS control unit mounting bracket and lift the LH control unit to one side.

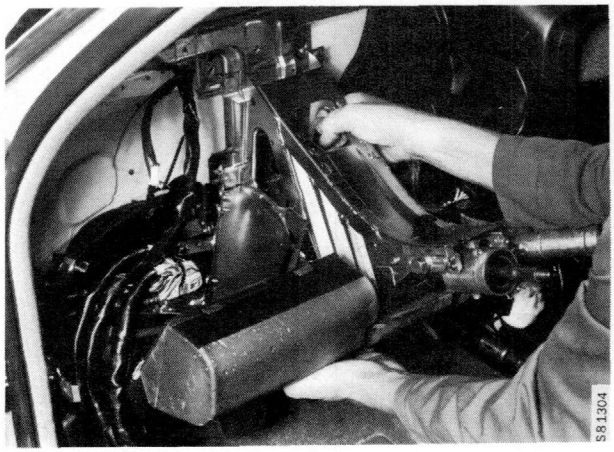
46 Pry off the plastic bushing that holds the link rod to the left-hand wiper spindle.



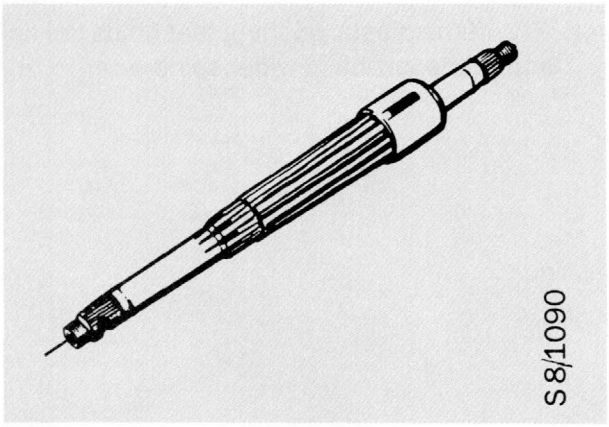
47 Remove the four nuts holding the steering column.



48 Disengage the vacuum hose from the steering column and lift it out of the car. Note the location of the washers.

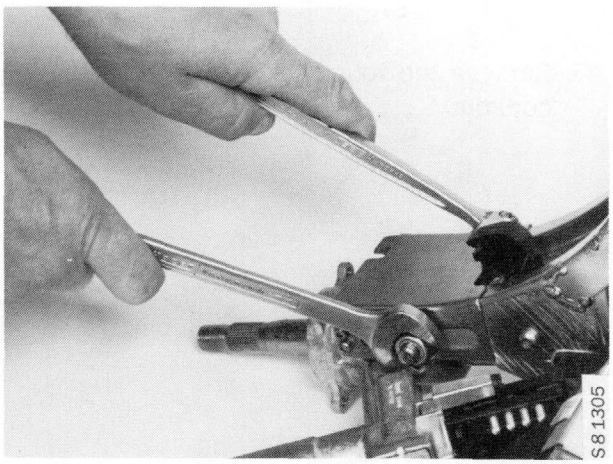


Steering column, disassembly

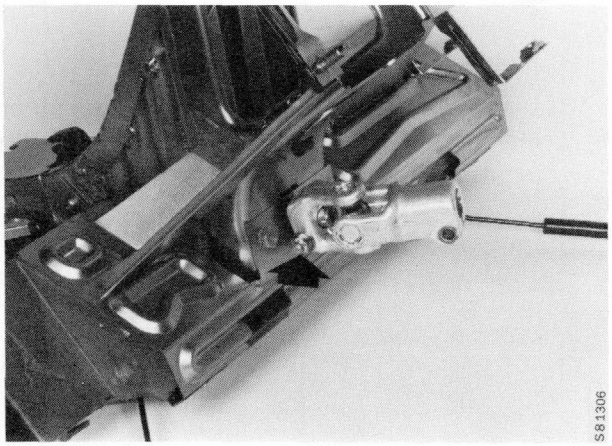


Note
The two sections of the steering column shaft are matched and must not be pulled apart under any circumstances.

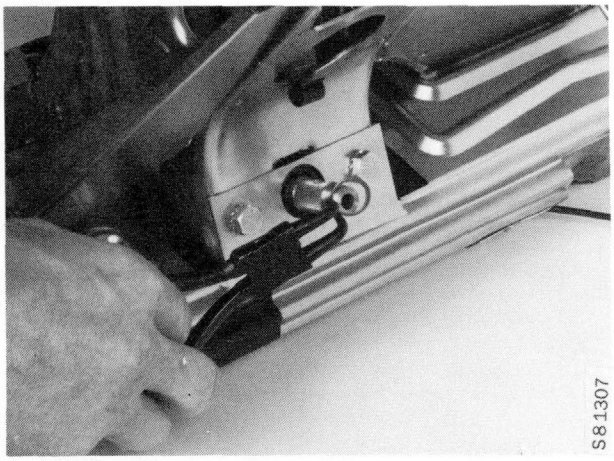
1 Remove the transverse bolt together with the spacer and the washers.



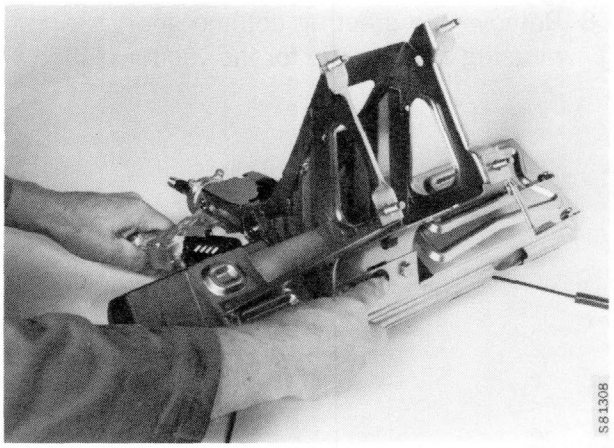
2 Detach the universal joint from the steering column shaft.



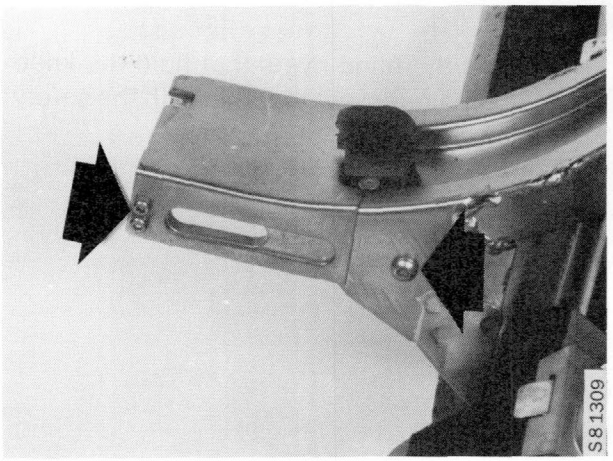
3 Remove the circlip at the lower end of the steering column shaft.



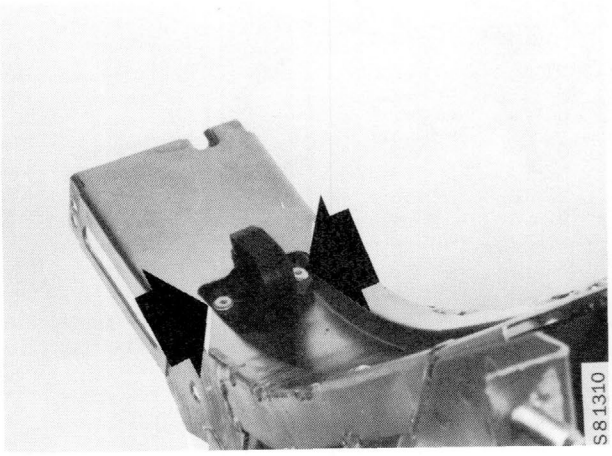
4 Press the steering column shaft together so that it comes out of the lower bearing and withdraw the complete steering column shaft with the ignition switch.



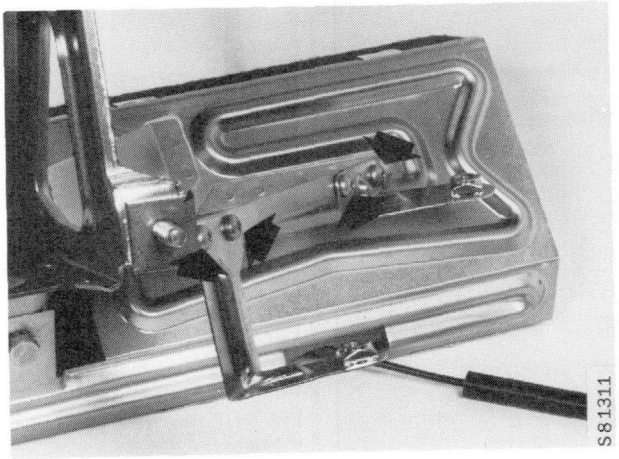
5 Remove the slide rails.



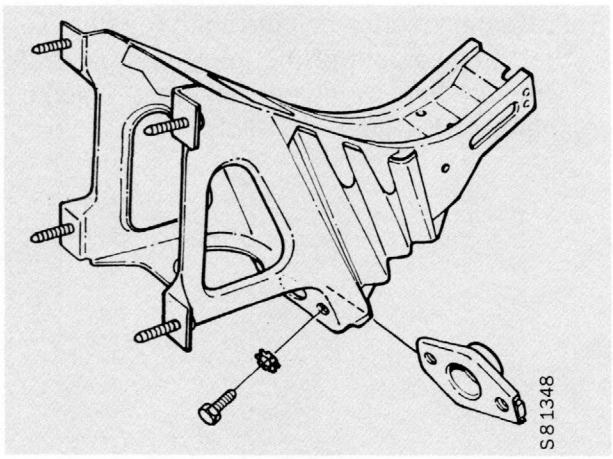
6 Drill out the blind rivets and remove the holder for the dash panel.



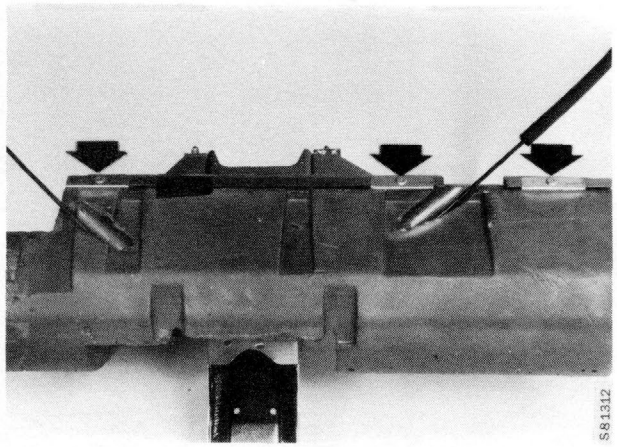
7 Remove the electronic holder mounting brackets.



8 Remove the steering column shaft bearing housing and the clip for the vacuum tube.

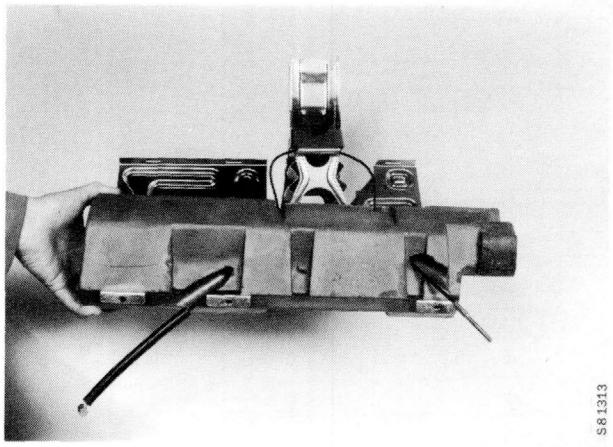


9 Drill out the blind rivets that hold the knee guard and remove it together with the safety cable.

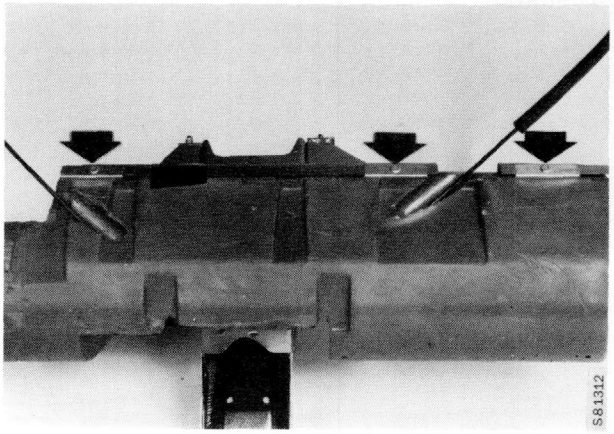


Assembly

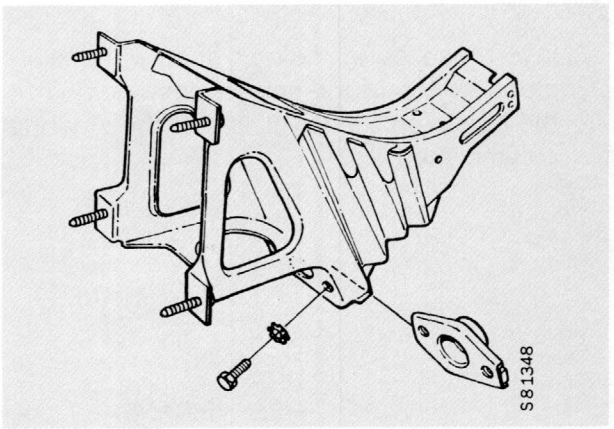
1 Insert the cable so that the threaded end comes up against the center console.



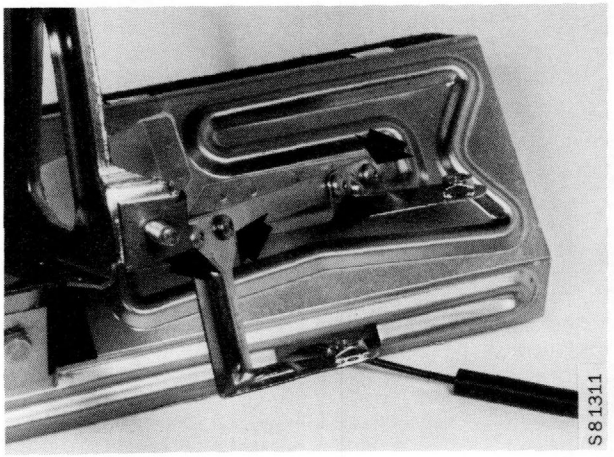
2 Install the knee guard.



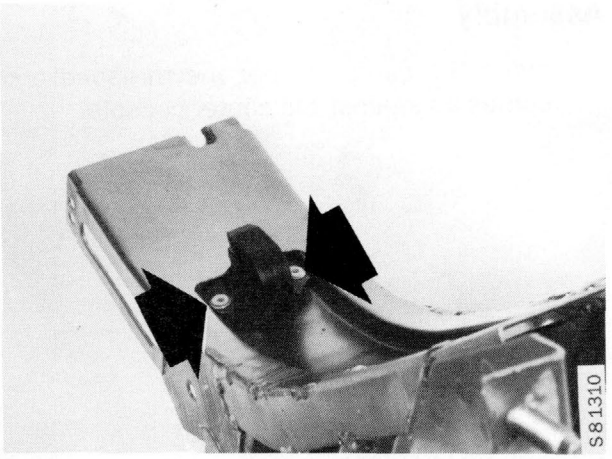
3 Install the steering column shaft bearing housing and the clip for the vacuum hose.



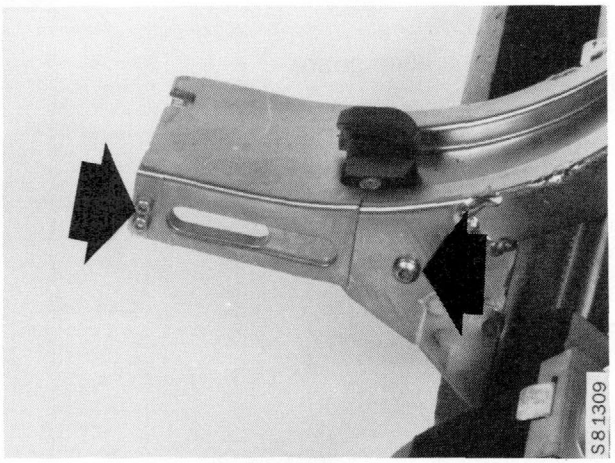
4 Install the mounting brackets for the electronic holder.



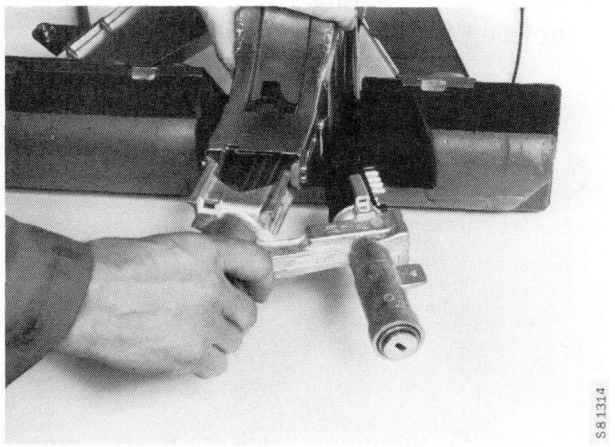
5 Install the holder for the dash panel.

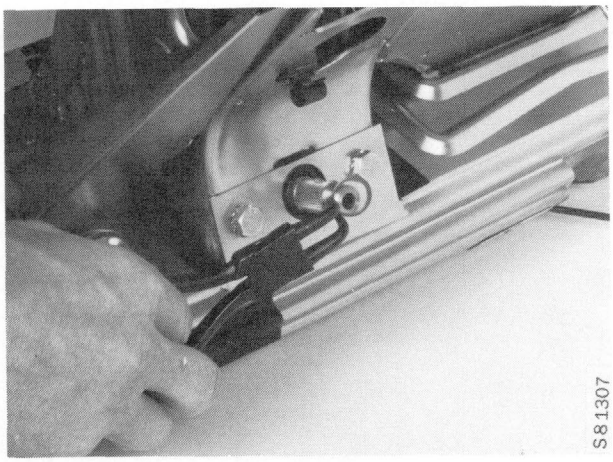


6 Install the slide rails.



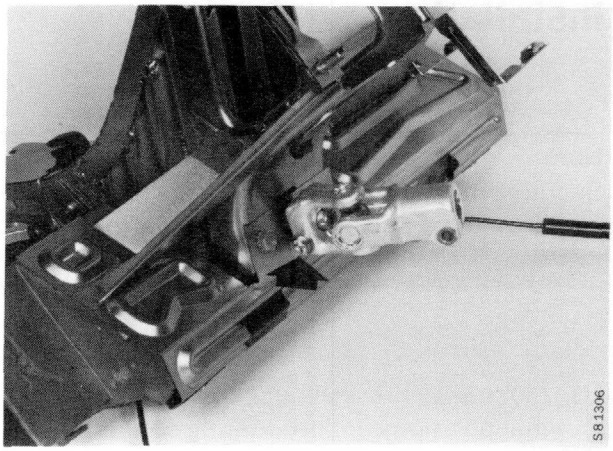
7 Insert the steering column shaft with the ignition switch in the correct position and fit the circlip on the lower end of the steering column shaft.





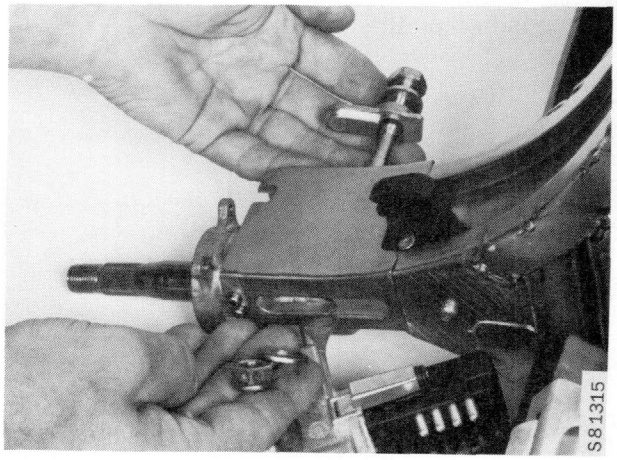
8 Install the universal joint on the steering column shaft.

Tightening torque: 23-30 Nm (17.0-22.1 lbf ft)



9 Fit the transverse bolt together with the spacer and the washers.

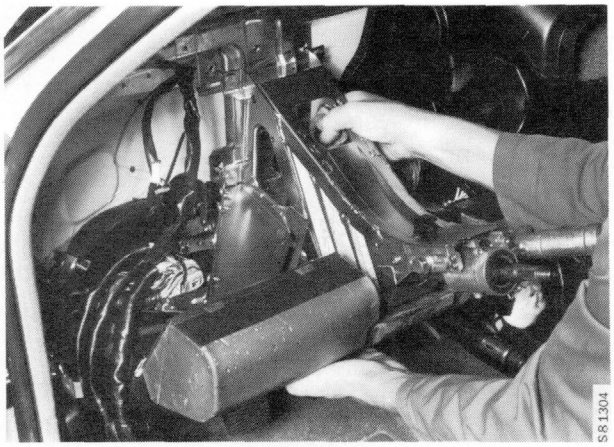
Tightening torque: 20 Nm (14.8 lbf ft)



Installation

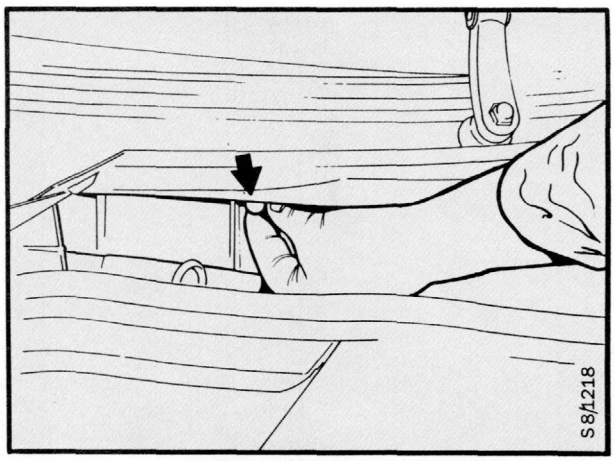
Note
Secure previously loosened parts, for example electric cables and air ducts, so that they will not rattle.

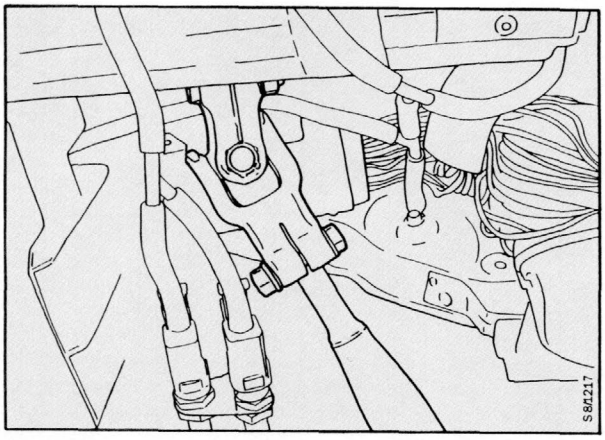
1 Make sure that washers are put in their original positions on the steering column retaining bolts and place the steering column in position on the firewall.



Secure the vacuum hose to the steering column. Pull up the wiring harness on the right-hand side of the steering column and attach the strap to the steering column.

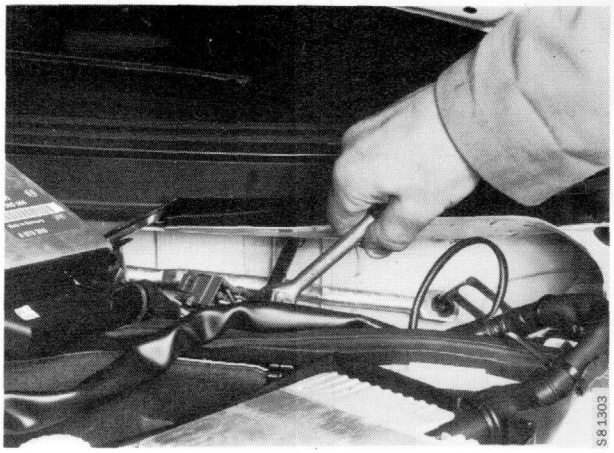
Loosely fit the upper nuts that hold the steering column. Fit the steering column universal joint loosely to the intermediate steering column shaft.





Fit the lower nuts for the steering column and tighten all four nuts.

Tightening torque:
20-26 Nm (14.8-19.2 lbf ft)
Waxed nuts (green-chromated):
15-21 Nm (11.1-15.5 lbf ft)

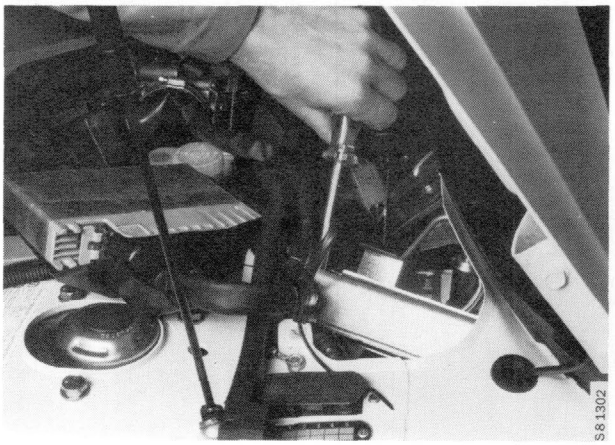


2 Press the link rod onto the wiper spindle.

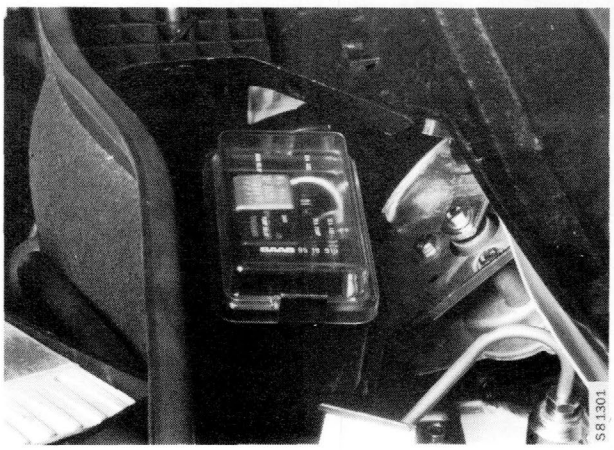
3 Lay the electric cables in place.

Put back the LH control unit.

Install the bracket for the ABS control unit.



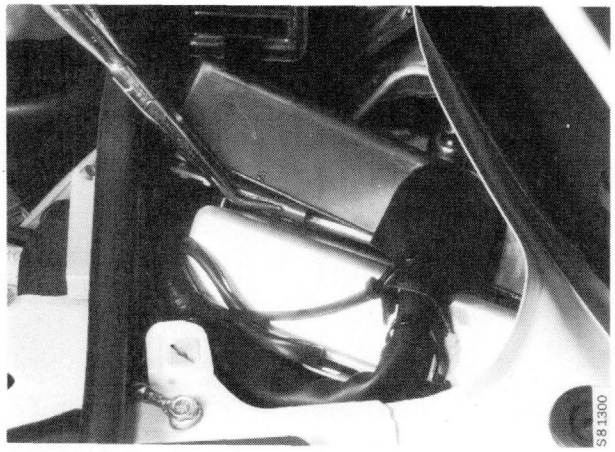
Install the ABS system electrical distribution box.



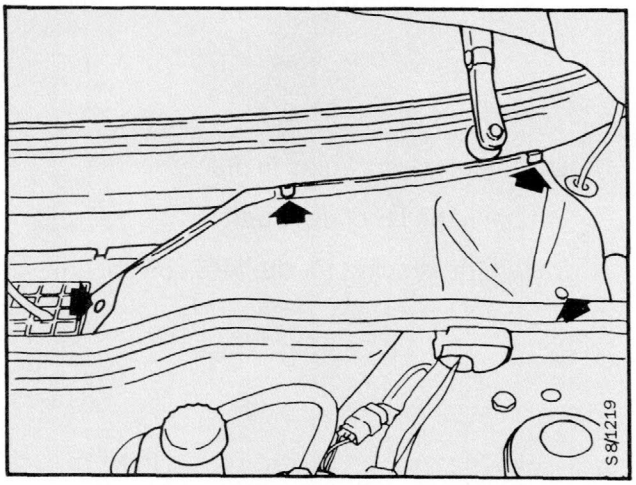
Put the ABS control unit together with the plastic casing in place.

Fit the clip that holds the ABS control unit.

Secure the strap around the cable.

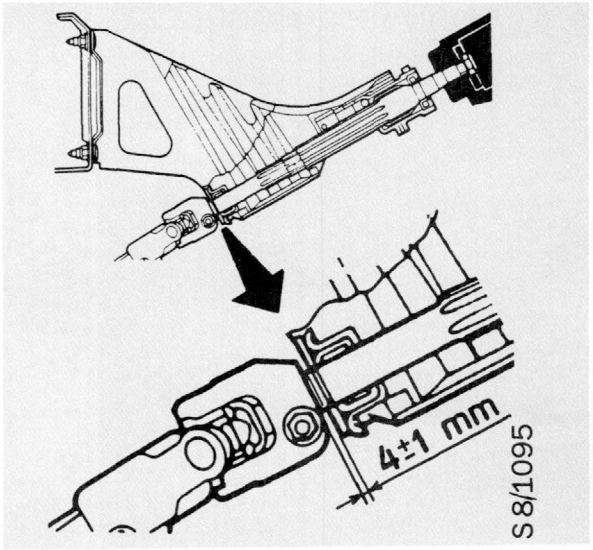


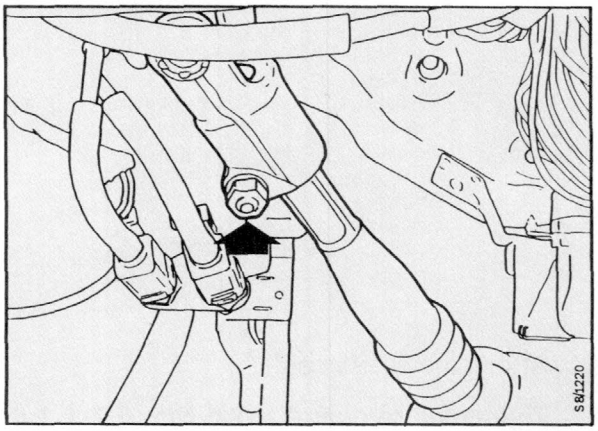
4 Put back the cover over the firewall space.



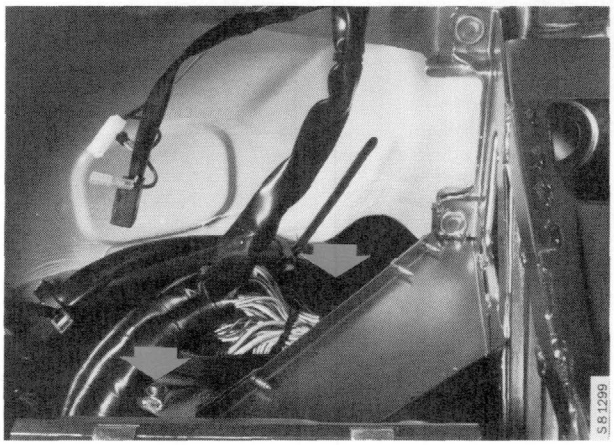
5 Adjust the clearance between the upper intermediate shaft universal joint and the steering column. Tighten the bolt for the steering column universal joint.

Tightening torque:
23-30 Nm (17.0-22.1 lbf ft)

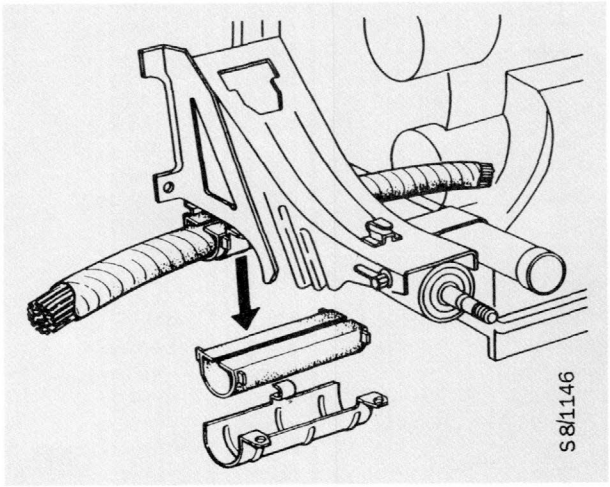




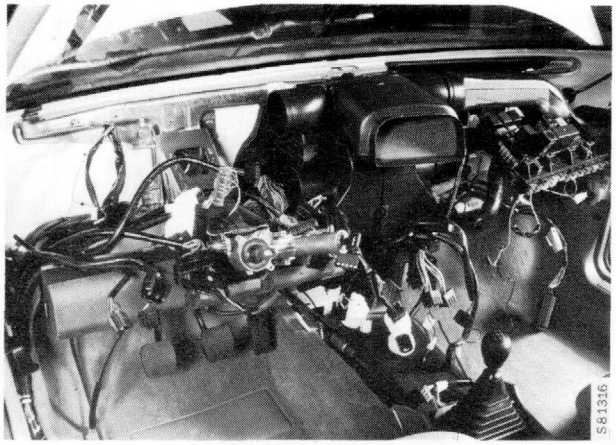
6 Attach the electronic holder to the steering column.



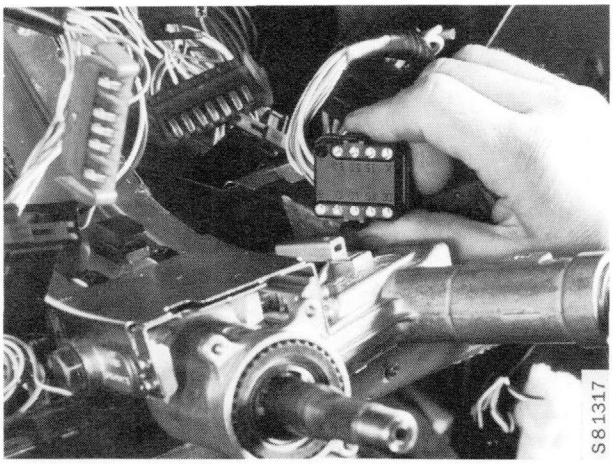
7 Install the holder for the wiring harness. Make sure that the plastic cover is correctly positioned so that it covers the entire metal holder.



8 Arrange the wiring correctly.

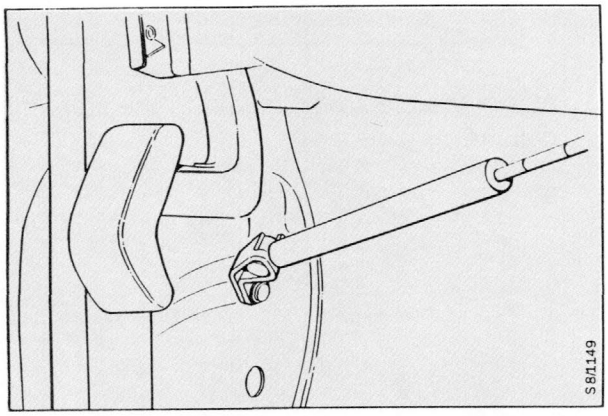


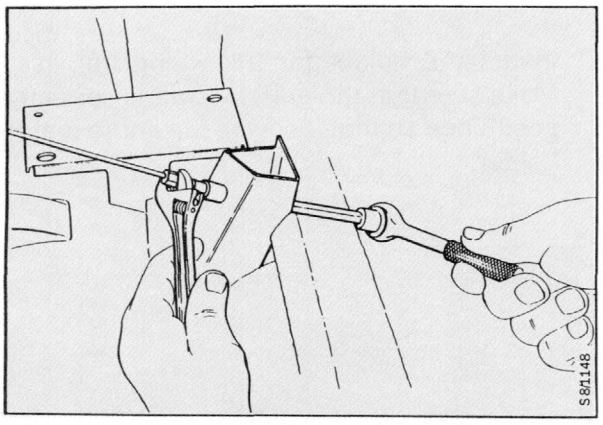
9 Connect the connector to the ignition switch.



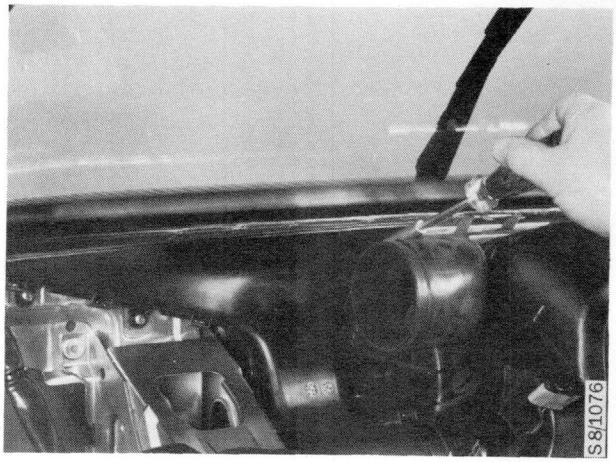
10 Attach the safety cable.

Tightening torque: 0.9-1.5 Nm (0.7-1.1 lbf ft)

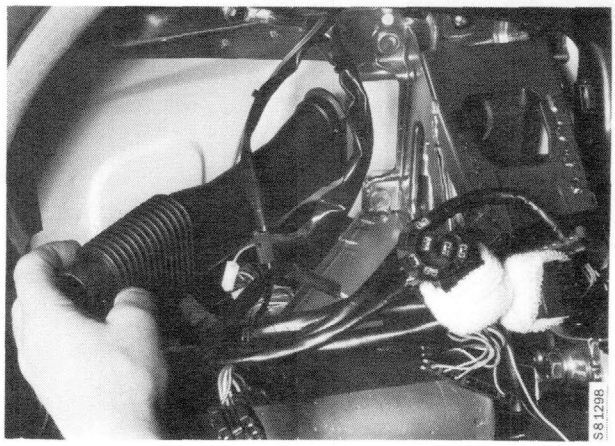




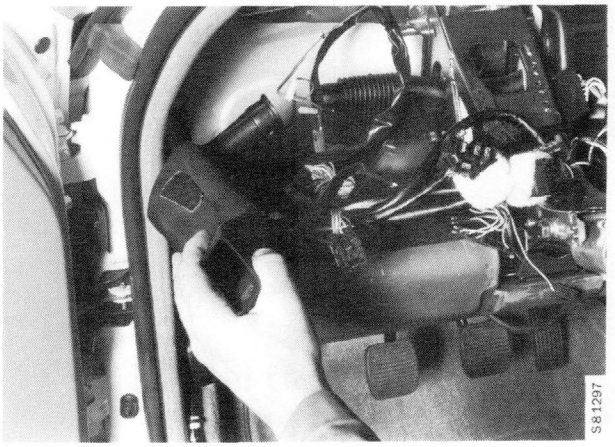
11 Install the defroster outlet for the left-hand side of the windshield.



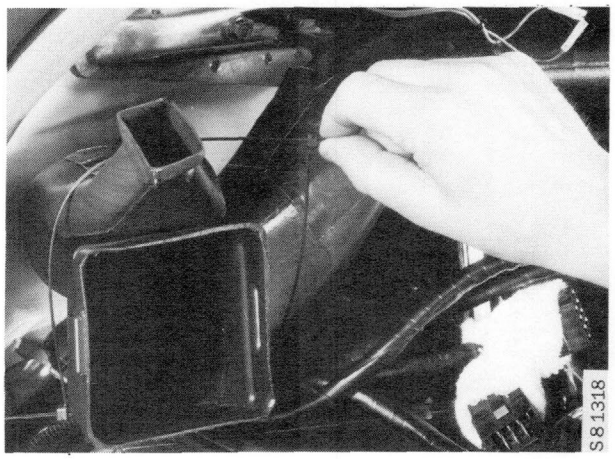
12 Install the inner section of the left-hand ventilation air outlet. Note the clip.



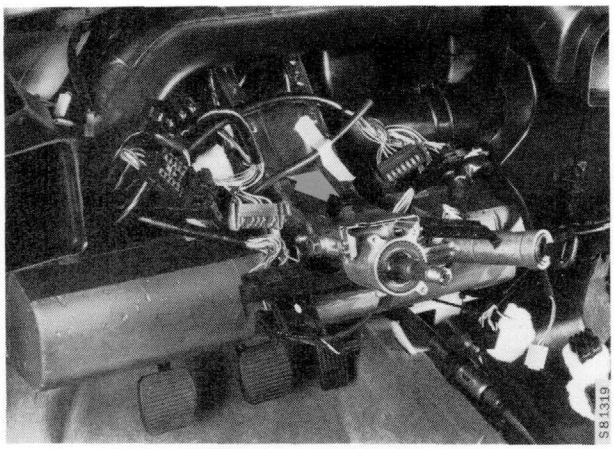
13 Install the left-hand ventilation air outlet.



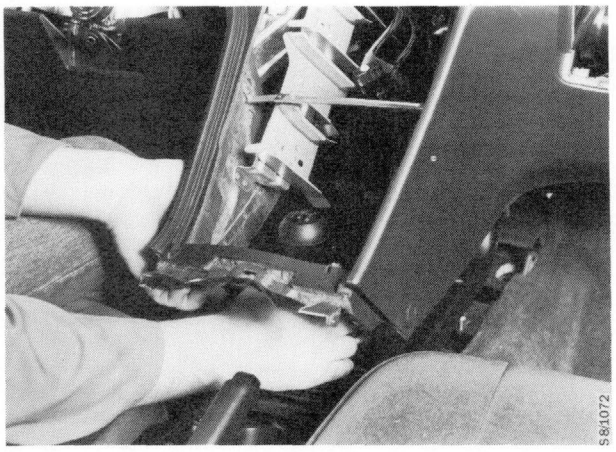
Install the left-hand air duct. Secure them together with a strap.

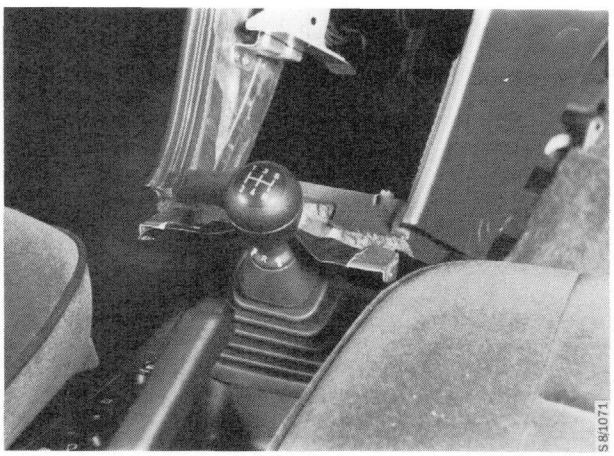


14 Arrange the wiring correctly. Pull up the hose for the boost pressure gauge on the left-hand side of the steering column and secure it with tape.

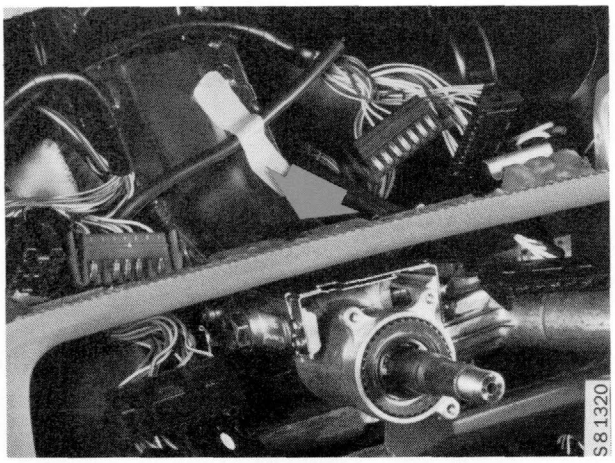


Lift the dash panel into place. This is easier to do if you have someone to help you.



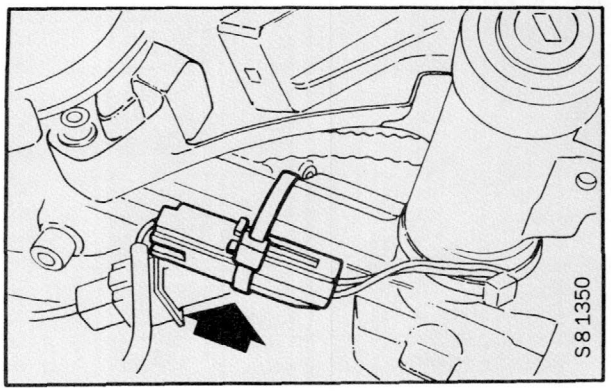


Make sure that the panel enters the guide slots correctly.

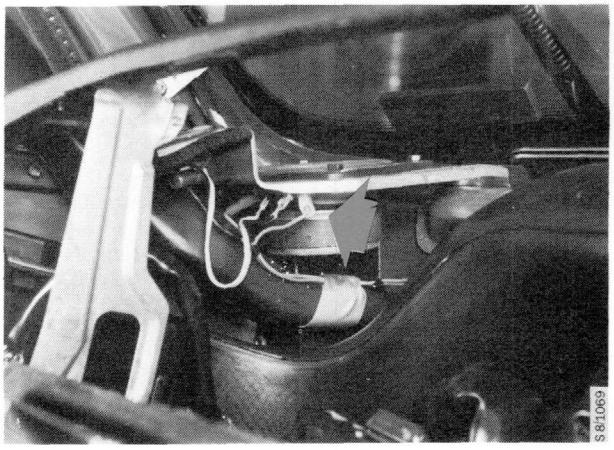


Fit and tighten the retaining screws. Put back the plastic covers over the screws.

Fasten the safety cable with a strap to the panel.

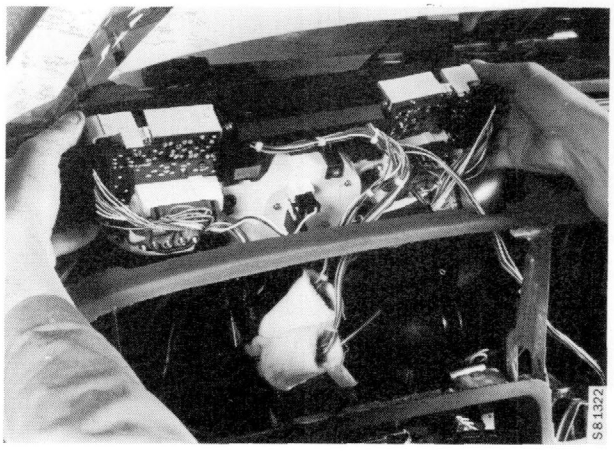


15 Connect the speaker connectors.



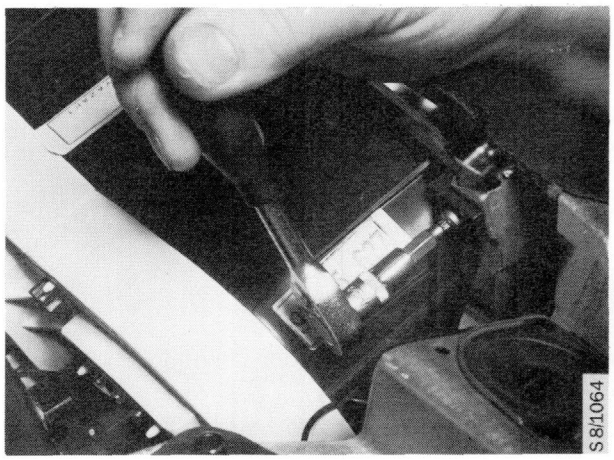
16 Place the combined instrument upside down with the glass facing the windshield and connect all connectors.

Turn the instrument over and fit the rubber supports.

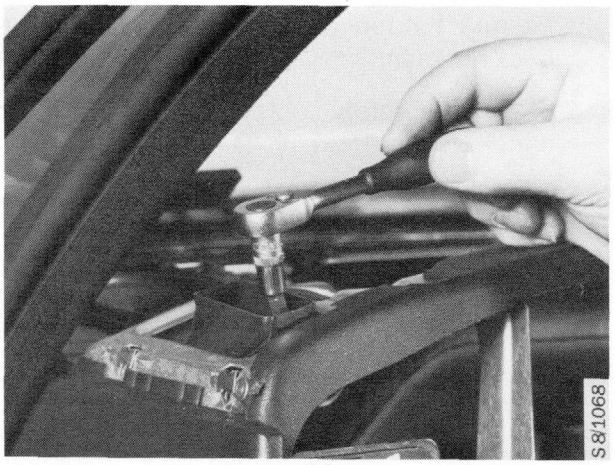


17 Put the instrument in position in the panel. Fit the hose for the boost pressure gauge.

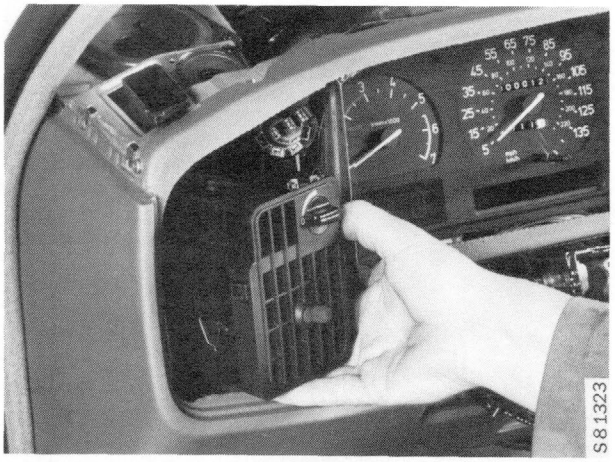
Fit the two retaining screws.



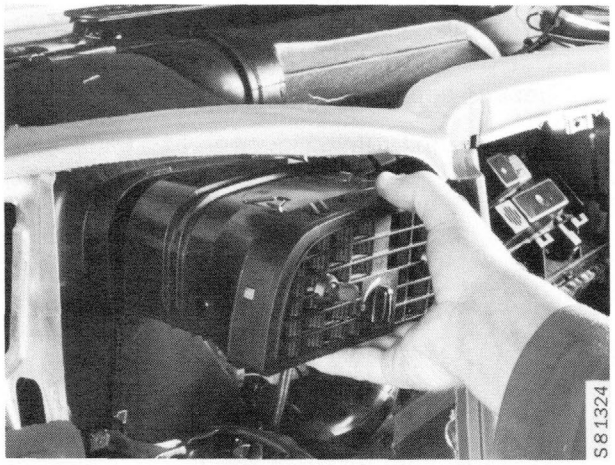
18 Screw the side defroster outlets to the dash panel.



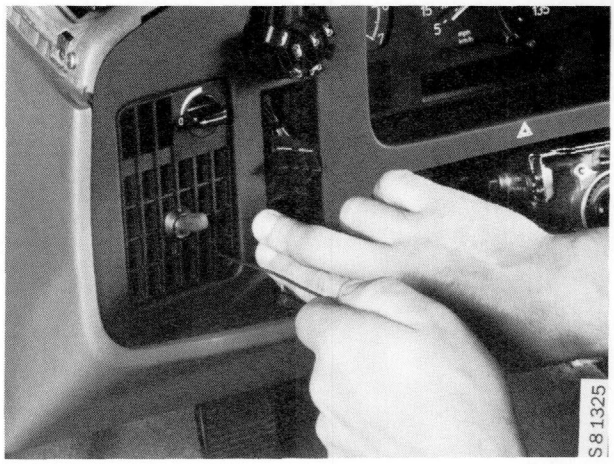
19 Remove the outer ventilation air damper from the instrument panel and attach it to the air duct.



Install the middle ventilation air damper.

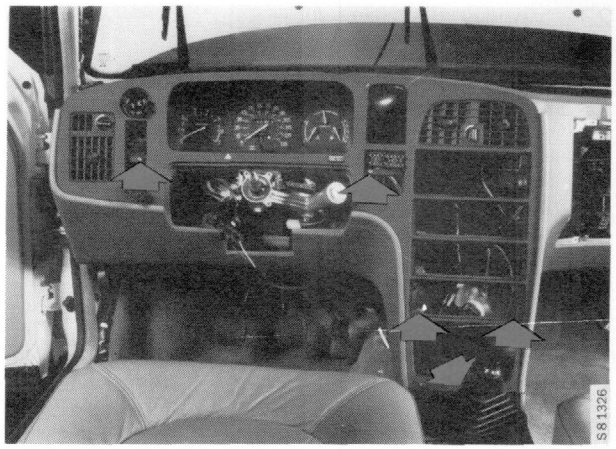


Place the instrument panel in position. Pull the switch connectors out. Attach the ventilation air dampers to the instrument panel using a bent piece of wire.

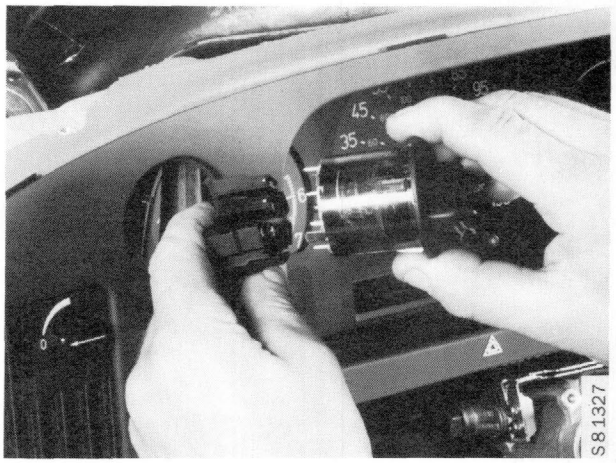


Screw down the instrument panel as well as the cover plate over the gearshift lever housing.

Install the gearshift lever boot.

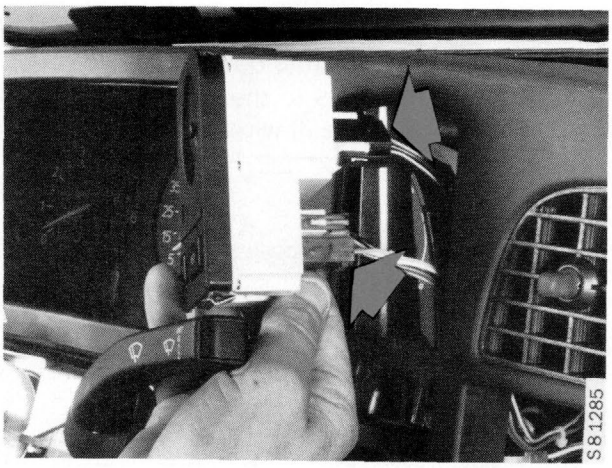


20 Connect the connectors to the switches. Press the switches in place and fit the covers.



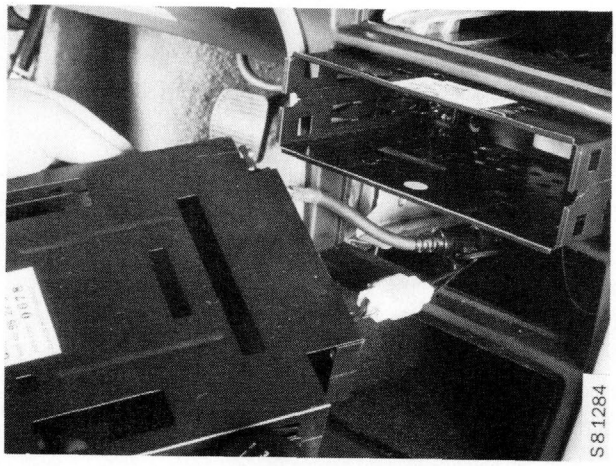
21 Press the interior temperature sensor into place and fit the cover.

22 Connect the connectors to the clock/DCC instrument. Install the clock/DCC instrument.



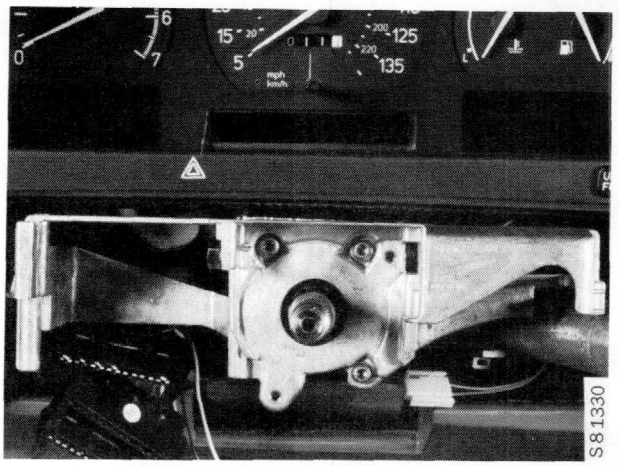
23 Connect and install the ACC control unit. Clamp the cable.

24 Position the lower radio basket. Connect the antenna cable and the electrical connections to the upper radio basket and install the baskets.



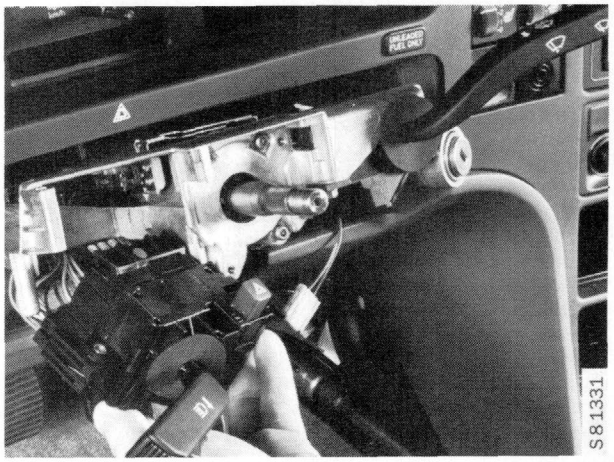
25 Connect th ashtray light and the cigarette lighter connector. Install the ashtray holder. Put in the ashtray.

26 Install the stalk switch holder. Be careful to adjust the holder to a horizontal position.

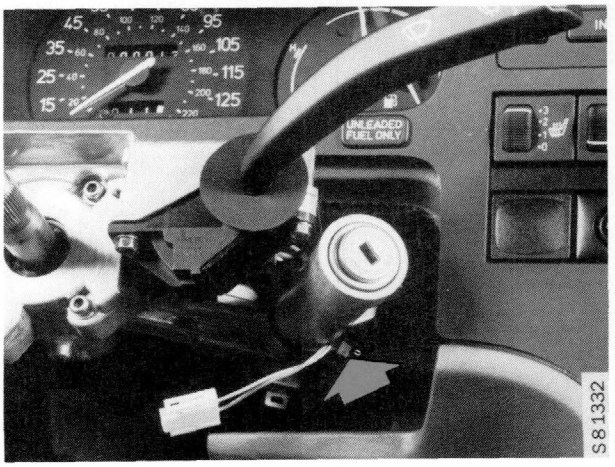


27 Attach the washer/wiper stalk switch to the stalk switch holder and connect the connector.

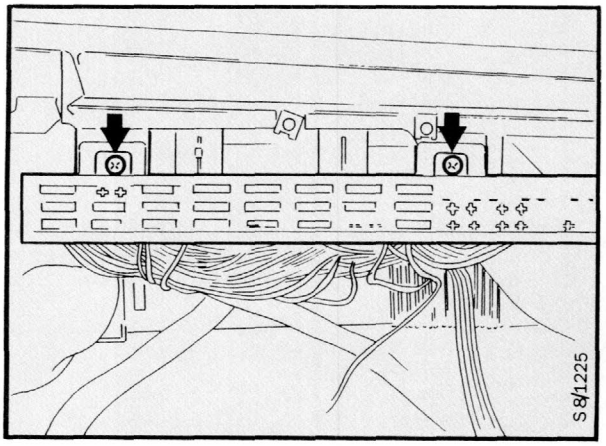
Install the direction indicator/light stalk switch to the stalk switch holder and connect the connectors.



28 Secure the airbag cable and the wiper/washer cable with a strap to the ignition switch housing.

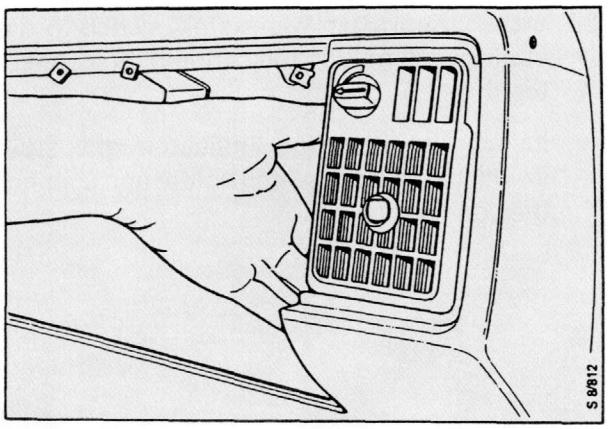


29 Install the electrical distribution box.

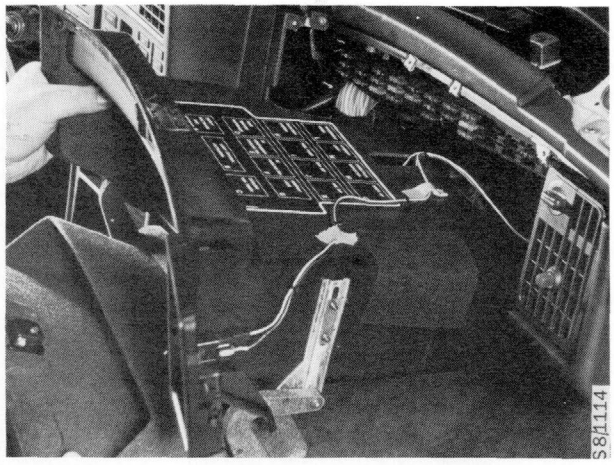


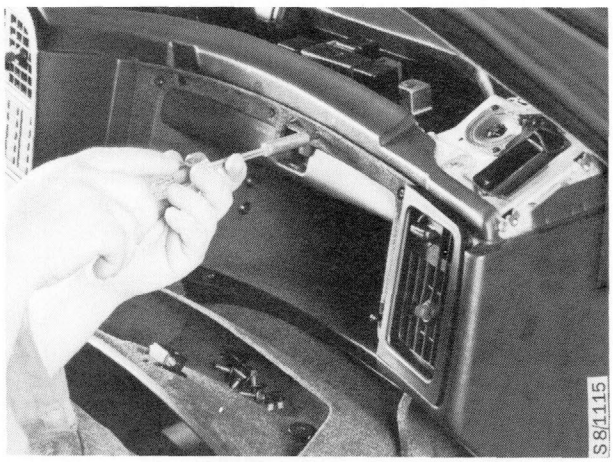
30 Attach the burglar alarm control unit to the dash panel.

31 Remove the ventilation air damper from the glove compartment and attach the damper to the air duct.

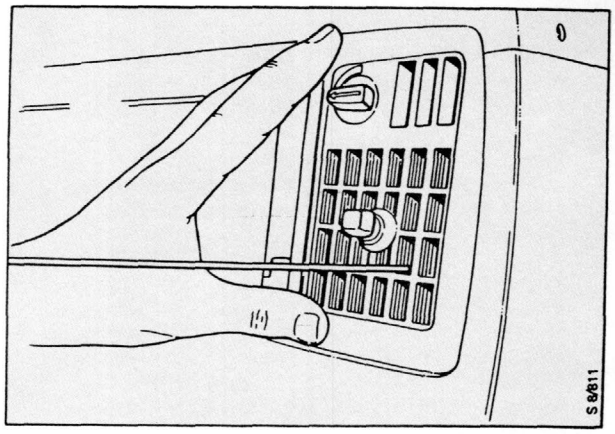


32 Connect the cables to the glove compartment light and the switch. Install the glove compartment.

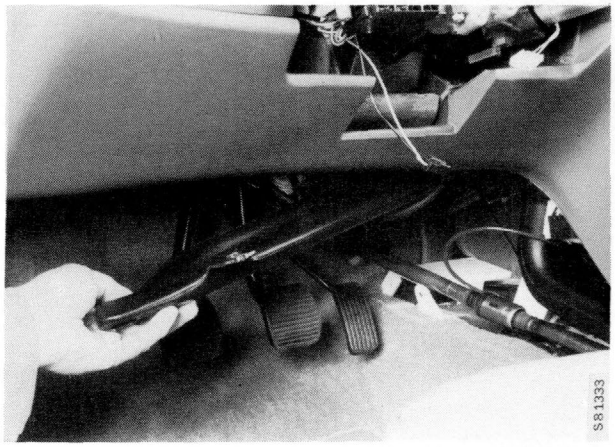




33 Pull the ventilation air damper into position using a bent piece of wire.

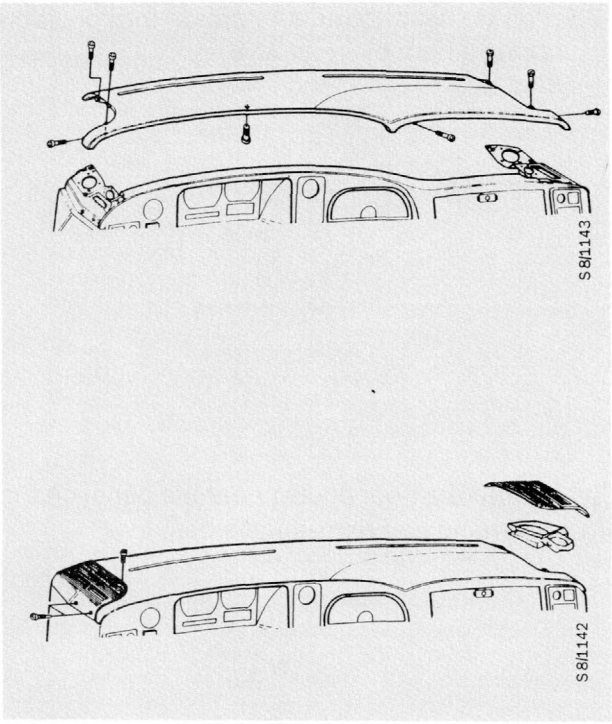


34 Install the floor ducts under the panel on the left-hand and right-hand sides.



35 Attach the panels (carpeted) to the center console. Guide the upper edge into the groove in the center console, then fit the clips.

36 Install the top of the dash panel.



Left-hand side:
Connect the connector for the burglar alarm's LED, fit the gasket and the speaker grille.

Right-hand side:
Connect the sun sensor, fit the gasket and the speaker grille.

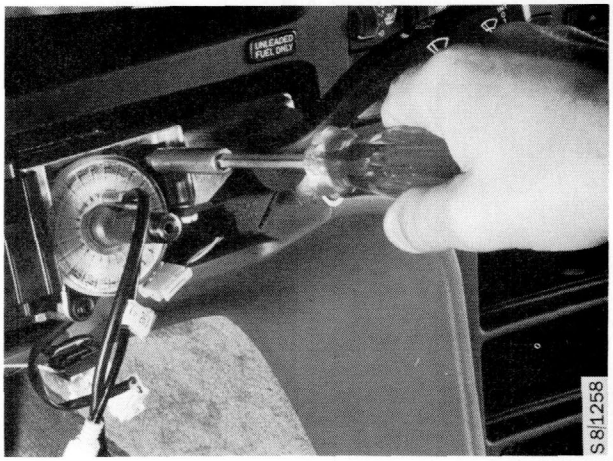
37 Install the A-post trim.

38 Install the contact unit (coil spring) as follows:

Note
The contact unit (coil spring) is fragile. Handle it with care.

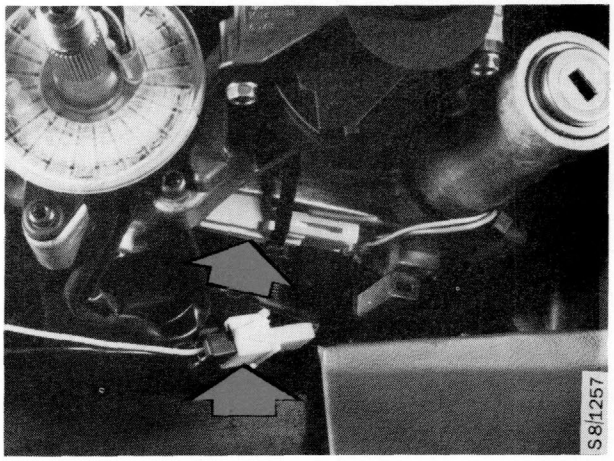
Remove the transport lock (if any).

Attach the contact unit (coil spring) to the holder.

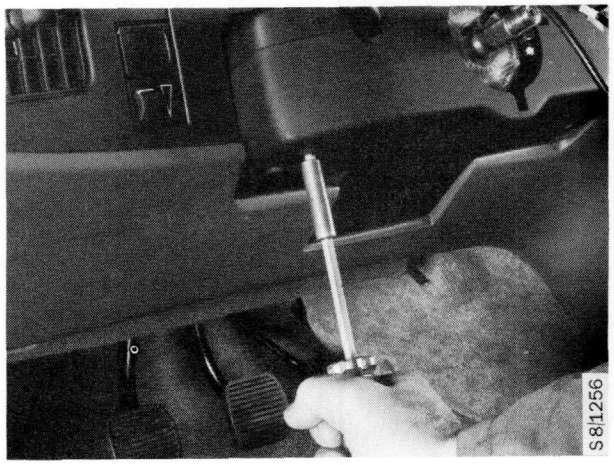


Connect the connectors (orange) for the airbag and for the horn.

Secure the connectors and cables to the steering column with a strap.



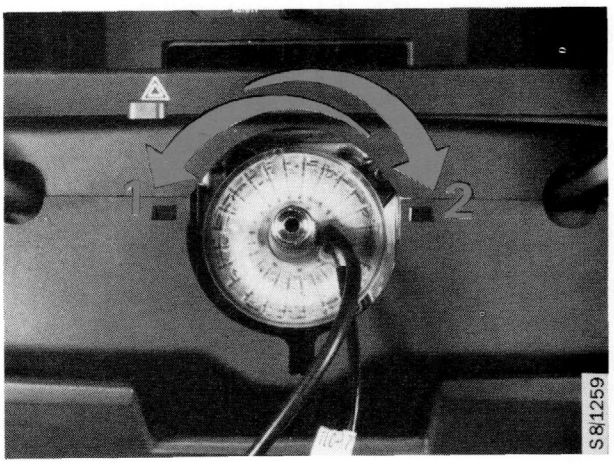
Install the top steering column cover and then the bottom cover (4 screws). Make sure that the cables to the contact unit (coil spring) are not pinched by the middle retaining screw for the cover.



Adjust the contact unit (coil spring) to the middle position as follows:

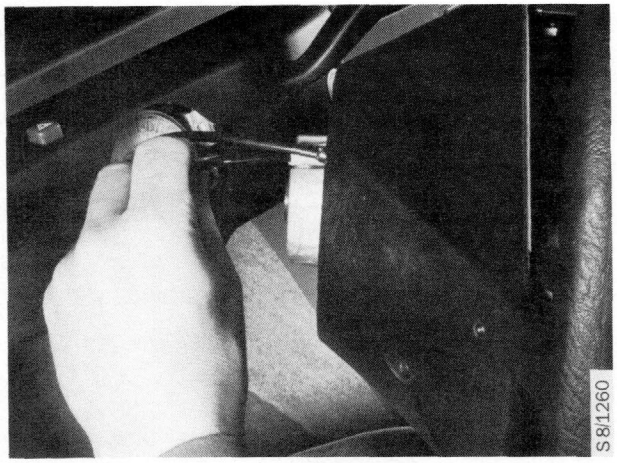
Make sure that the wheels are pointing straight ahead.

Rotate the contact unit (coil spring) counterclockwise to the end position. Then rotate it back clockwise about 3.5 turns.



39 Install the steering wheel as follows:

Insert the cables through the hole.

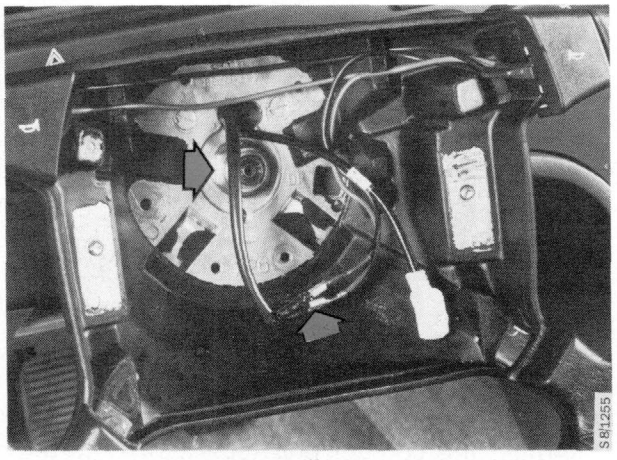


Adjust the steering wheel position at the same time as the contact unit (coil spring) is adjusted against the steering wheel.

Fit the steering wheel nut.

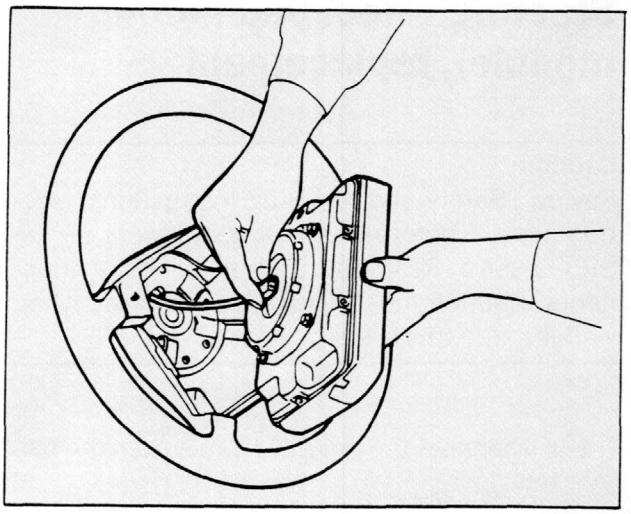
Tightening torque: 30 Nm (22.1 lbf ft)

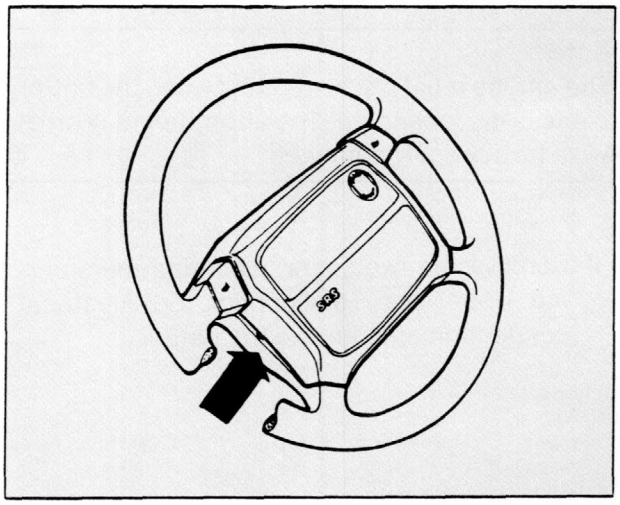
Connect the horn connector.



40 Connect the connector for the steering wheel pad (airbag module) and attach the pad.

Tightening torque: 5.5-7.5 Nm (4.1-5.3 lbf ft)





41 Connect the battery cable.

42 Install the door sill plate. Install the left-hand and right-hand sound baffles.

43 Withdraw the lower storage compartment in the center console. Connect the SRS tester and erase any fault codes.

Start the car. Check that the SRS lamp lights up for about 6 seconds and then goes out. For cars with electronic unit with part No. 91 24 074, the engine must be allowed to idle for about 15 minutes. Then make sure that the SRS lamp does not flash (fault indication).

Remove the SRS tester. Install the lower storage compartment.

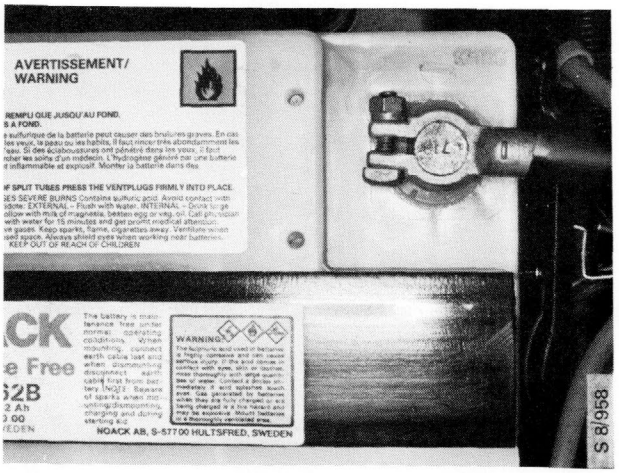
Steering wheel pad (airbag module), replacement

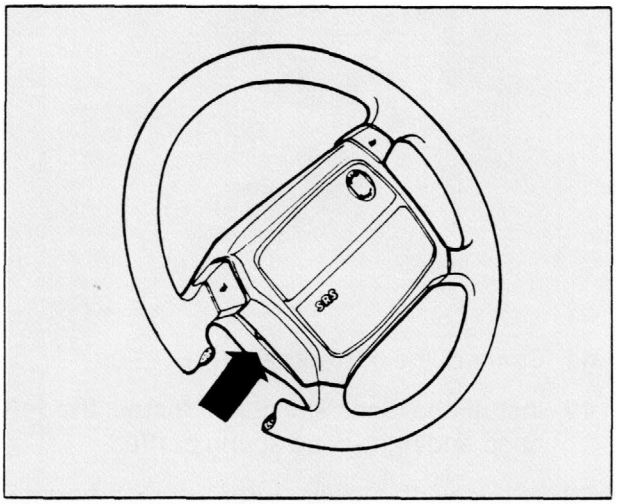
Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

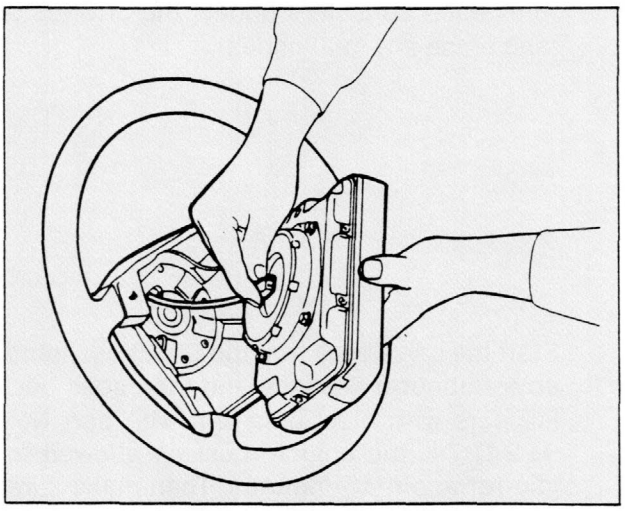
1 Disconnect the negative cable from the battery.

Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.

2 Remove the two screws securing the steering wheel pad, disconnect the electrical connection and remove the pad.







Install in reverse order.

Tightening torque: Screws for steering wheel pad 5.5-7.5 Nm (4.1-5.3 lbf ft).

Withdraw the lower storage compartment in the center console. Connect the SRS tester and erase any fault codes.

Start the car. Check that the SRS lamp lights up for about 6 seconds and then goes out. For cars with electronic unit with part No. 91 24 074, the engine must be allowed to idle for about 15 minutes. Then make sure that the SRS lamp does not flash (fault indication).

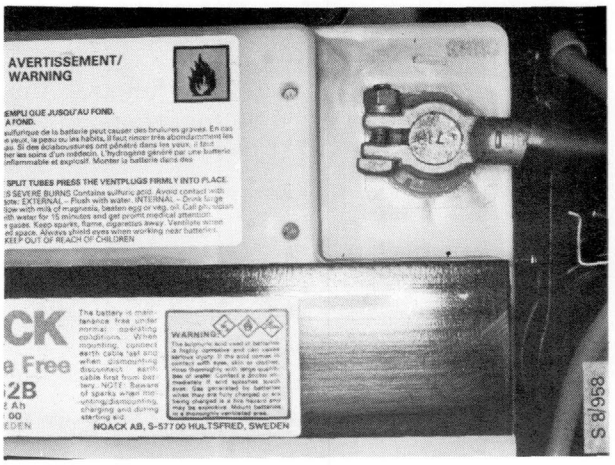
Remove the SRS tester. Install the lower storage compartment.

Horn switch, replacement

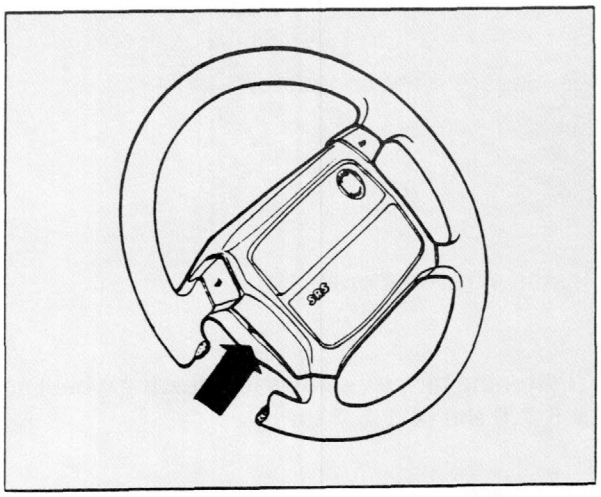
Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

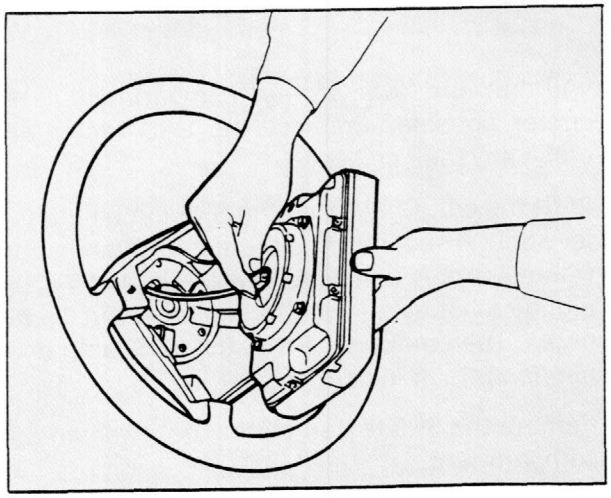
1 Disconnect the negative cable from the battery.

Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.

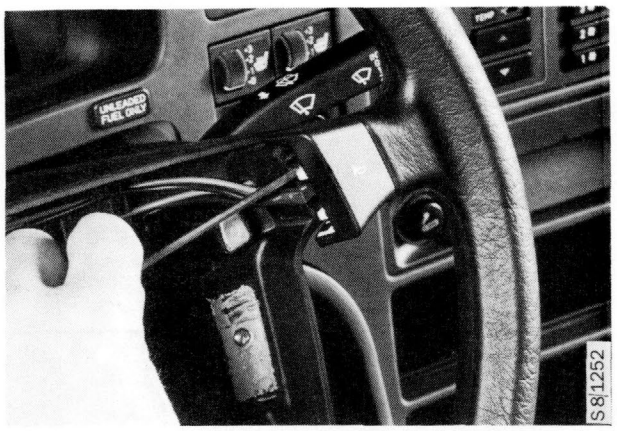


2 Remove the two screws securing the steering wheel pad (airbag module), disconnect the electrical connections and remove the pad.



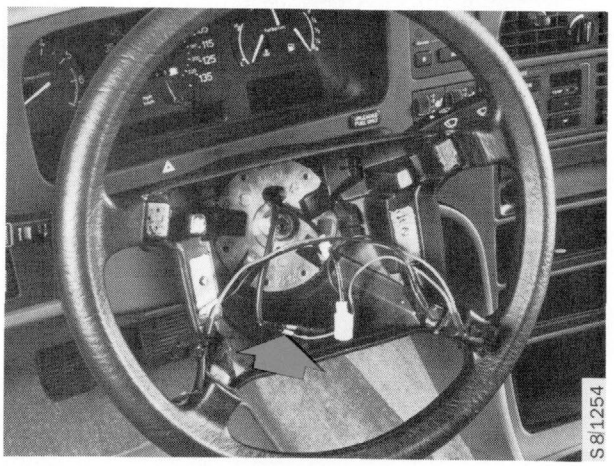


3 Remove the horn buttons.



4 Lift off the upper contacts. Remove the screws and remove the bottom contacts.

5 Separate the connector.



Install in reverse order.

Tightening torque, screws for steering wheel pad 5.5-7.5 Nm (4.1-5.3 lbf ft).

Withdraw the lower storage compartment in the center console. Connect the SRS tester and erase any fault codes.

Start the car. Check that the SRS lamp lights up for about 6 seconds and then goes out. For cars with electronic unit with part No. 91 24 074, the engine must be allowed to idle for about 15 minutes. Then make sure that the SRS lamp does not flash (fault indication).

Remove the SRS tester. Install the lower storage compartment.

Electronic unit

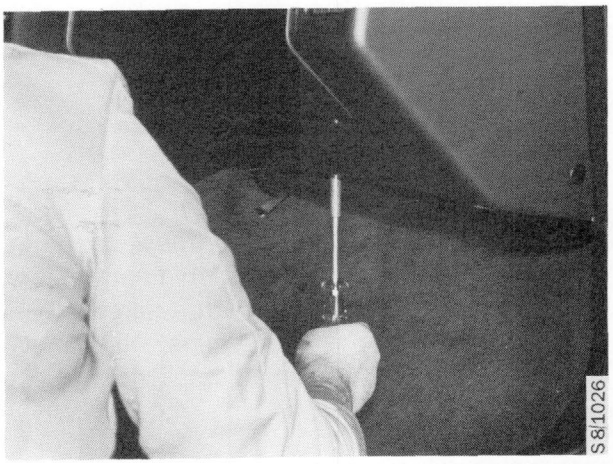
Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

Removal and installation

1 Disconnect the negative cable from the battery.

Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.

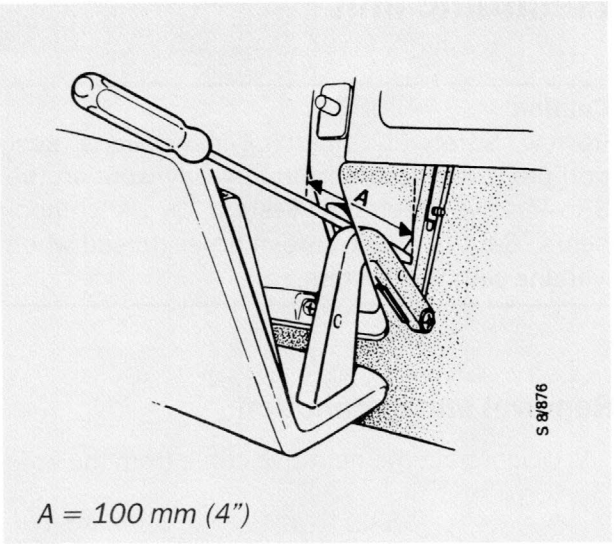
2 Remove the right-hand sound baffle under the dash panel.



3 Remove the floor duct.

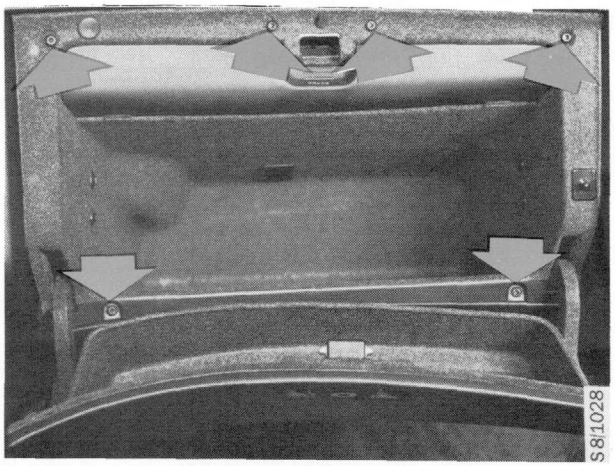
4 Remove the glove compartment as follows:

Drop the glove compartment lid to its lower position by prying out the hinge arms to release the stop cleats.

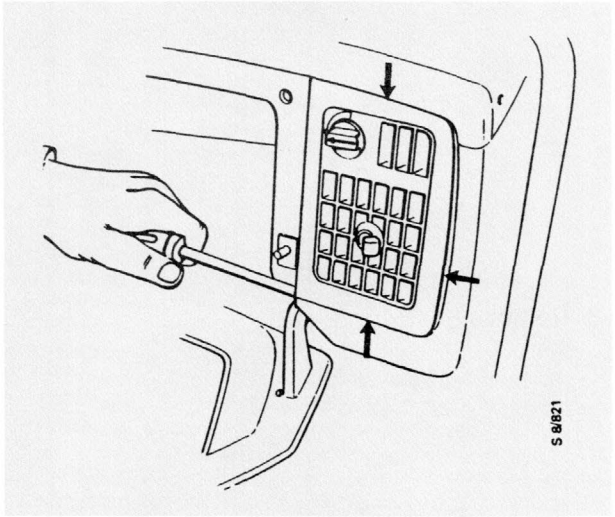


A = 100 mm (4")

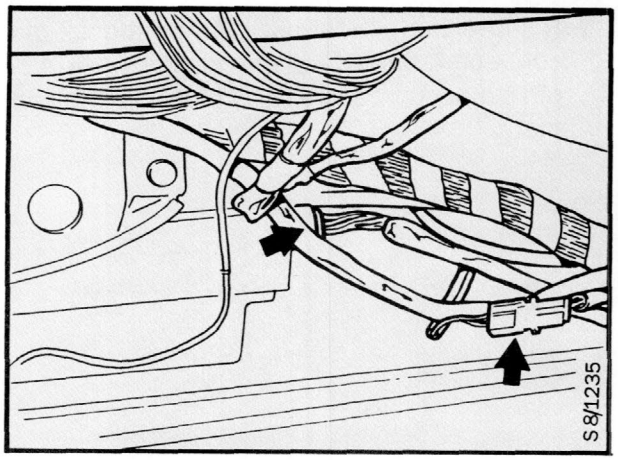
Remove the glove compartment retaining screws.



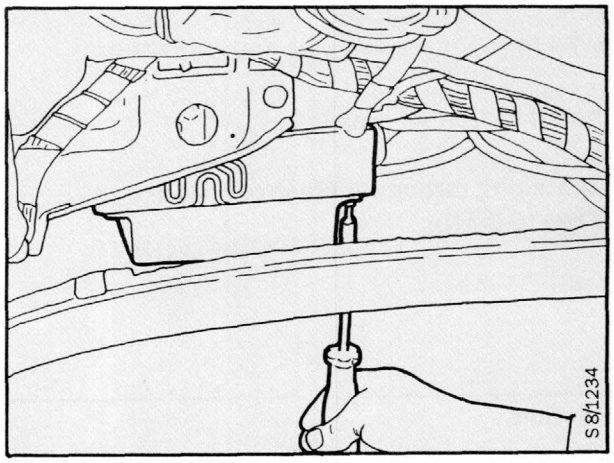
Pull out the glove compartment together with the right-hand ventilation air outlet. Pry the outlet out carefully with a screwdriver. Note the positions of the clips. Disconnect the cables for the glove compartment light and the light switch.



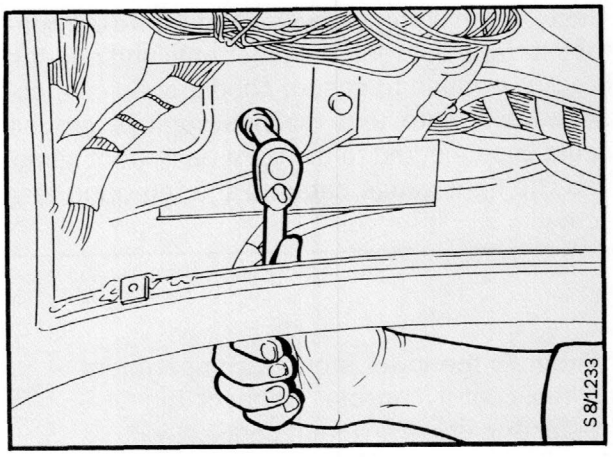
5 Separate the orange-coloured 2-pin connector. Separate the 12-pin connector mounted on the end of the electronic unit mounting bracket.



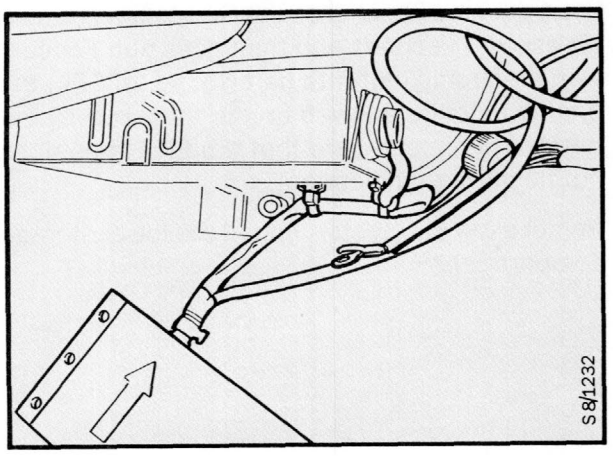
6 Unscrew the electronic unit from the bracket. Note the mounting positions of the ground cables.



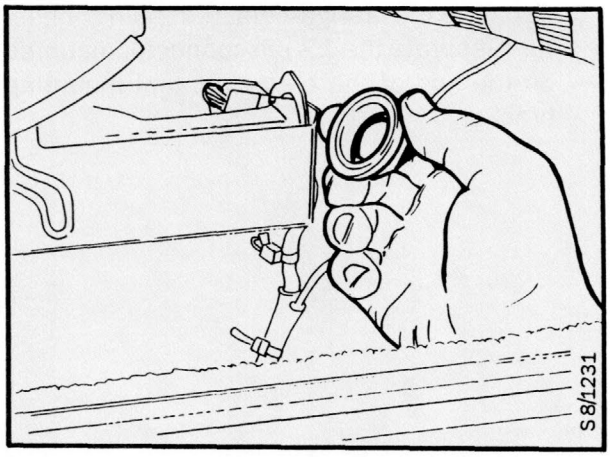
7 Remove the bracket retaining screw.



8 Release the straps and free the cables from the bracket.



9 Remove the plastic nut holding the 12-pin connector. Bend down the bracket so the 12-pin connector can be detached from the end plate.



10 Lift out the electronic unit.

Install in reverse order.

Tightening torque for electronic unit:
8 Nm (6 lbf ft)

Caution
During installation, make sure the arrows on the electronic unit point forward. Make sure the contact surface between the electronic unit and the bracket is clean to ensure good ground connection. Make sure that the heavy-gauge ground cable is connected to the right-hand front screw and the light-gauge cable to the left-hand rear screw.

Withdraw the lower storage compartment in the center console. Connect the SRS tester and erase any fault codes.

Start the car. Check that the SRS lamp lights up for about 6 seconds and then goes out. For cars with electronic unit with part No. 91 24 074, the engine must be allowed to idle for about 15 minutes. Then make sure that the SRS lamp does not flash (fault indication).

Remove the SRS tester. Install the lower storage compartment.

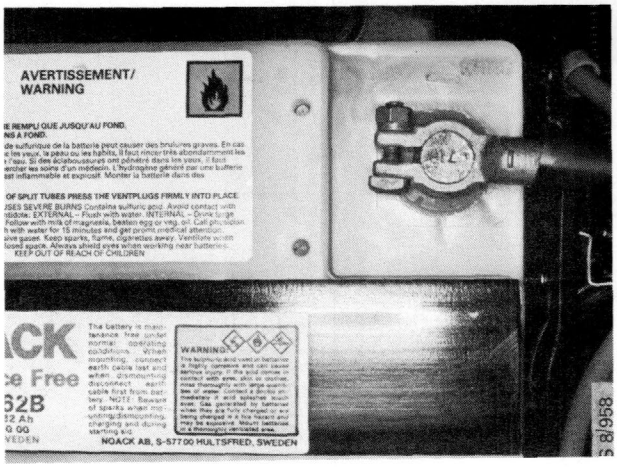
Front sensors

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

Removal

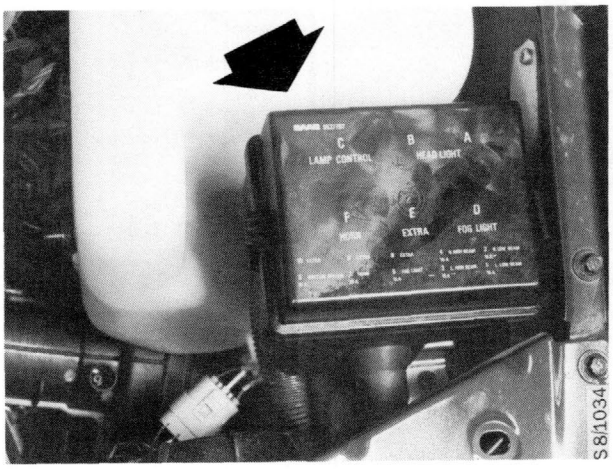
1 Disconnect the negative cable from the battery.

Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.



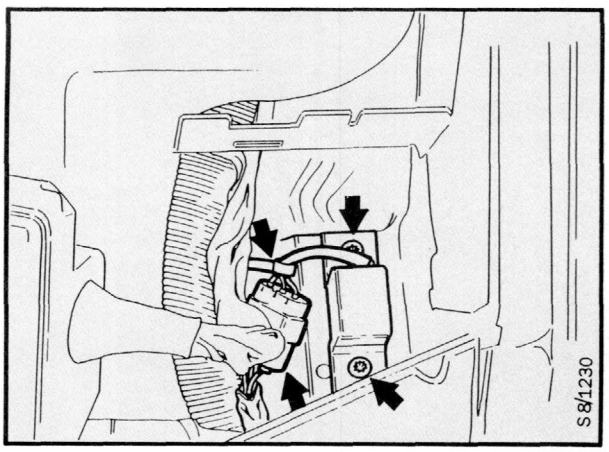
2 On the left-hand side:

Move the electrical distribution box to one side.



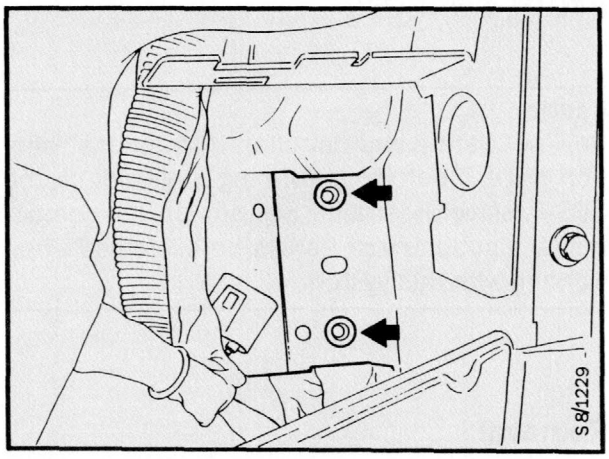
3 Cut the strap, separate the connector and remove the front sensor.

Use a special Torx bit (part No. 84 71 120).



Installation

1 Clean the contact surfaces between the front sensor and the body to ensure a good ground connection.



Caution
A poor ground connection can cause faults in the system.

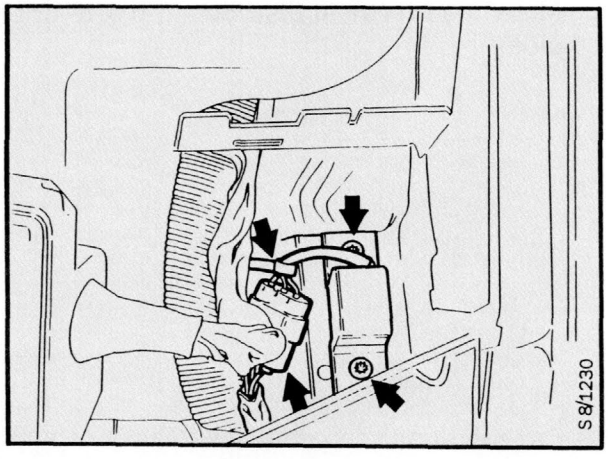
Caution
During installation, make sure the arrows on the sensor point forward. Make sure the contact surface between the sensor and the body is clean to ensure good ground connection. Otherwise, the system may not work properly.

2 Secure the front sensor with the two screws.

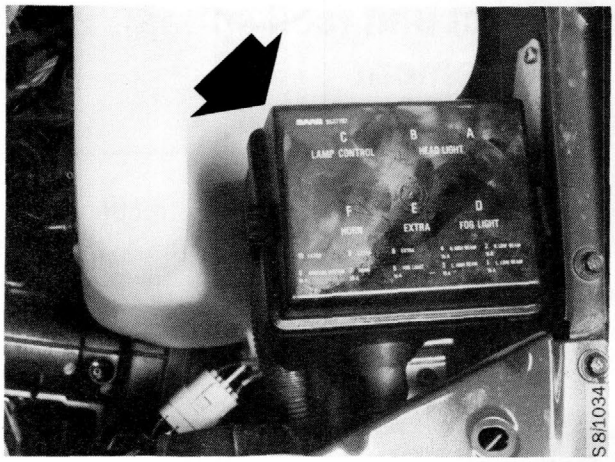
Use a special Torx bit (part No. 84 71 120).

Tightening torque: 8 Nm (6 lbf ft)

Connect the connector to the front sensor and secure the strap.



3 On the left-hand side: Refit the electrical distribution box.



4 Connect the battery cable.

Withdraw the lower storage compartment in the center console. Connect the SRS tester and erase any fault codes.

Start the car. Check that the SRS lamp lights up for about 6 seconds and then goes out.

Then make sure the lamp does not flash (fault indication).

Remove the SRS tester. Install the lower storage compartment.

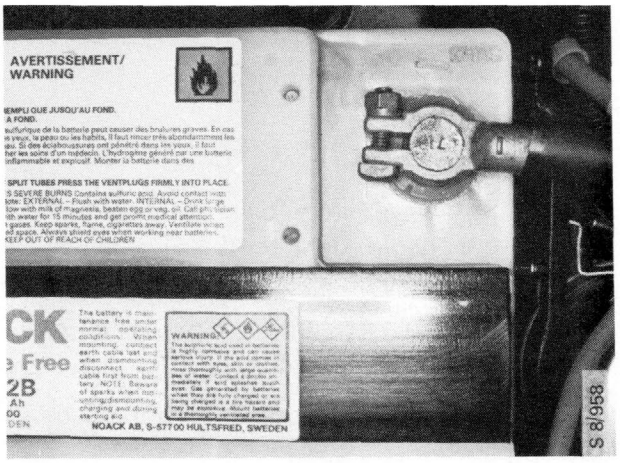
Contact unit (coil spring), replacement

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

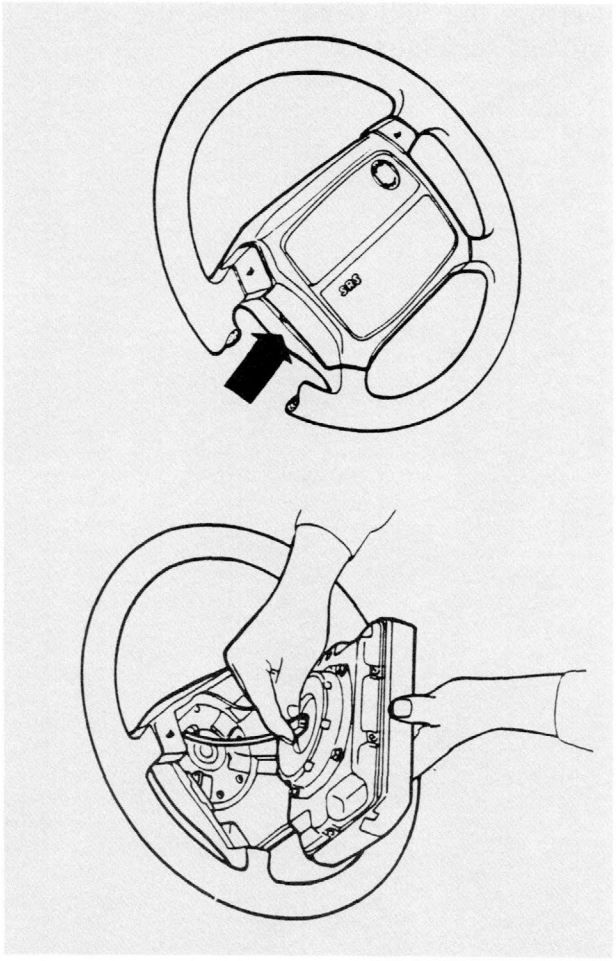
Removal

1 Disconnect the negative cable from the battery.

Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.

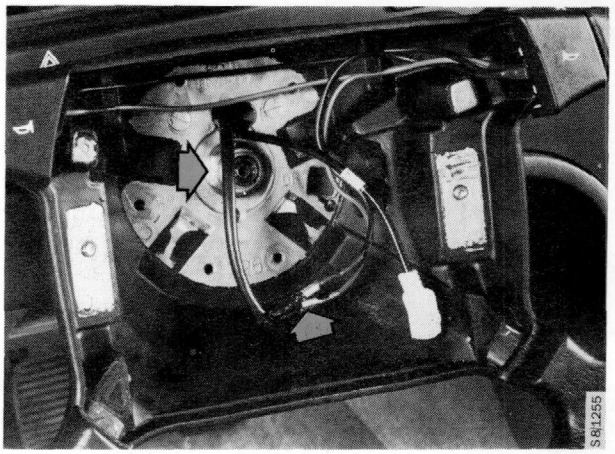


2 Remove the two screws securing the steering wheel pad (airbag module), disconnect the electrical connections and remove the pad.

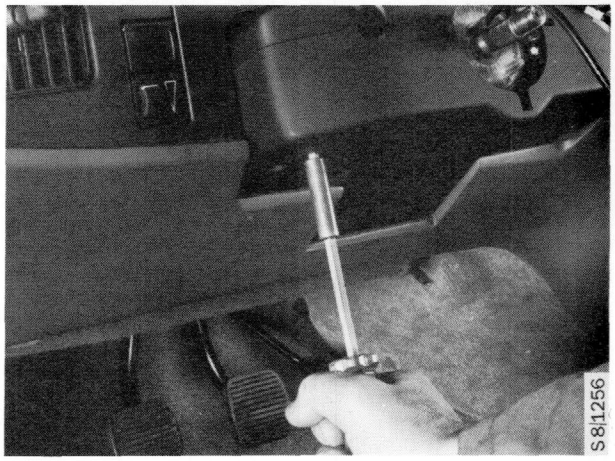


3 Point the wheels straight ahead. Separate the connector for the horn in the steering wheel.

Remove the steering wheel (M22).

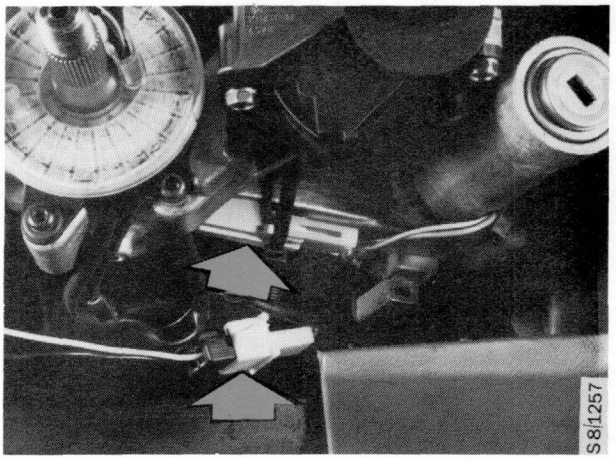


4 Remove the steering column covers.

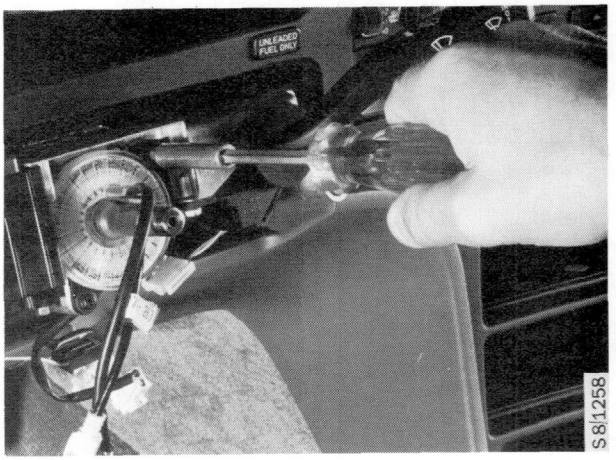


5 Separate the connector for the horn.

Cut the strap and separate the contact unit (coil spring) connector.



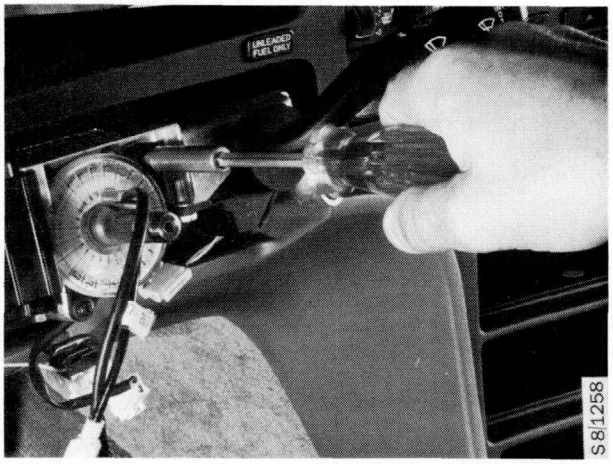
6 Remove the two screws holding the contact unit (coil spring) and lift it off.



Note
The contact unit (coil spring) is fragile. Handle it with care.

Installation

1 Install the contact unit (coil spring) as follows:

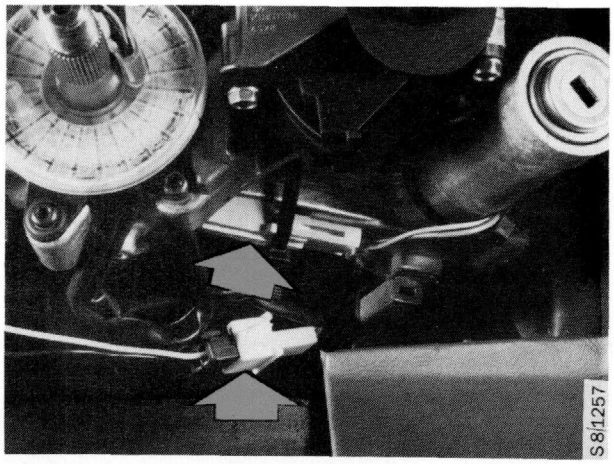


Note
The contact unit (coil spring) is fragile. Handle it with care.

Remove the transport lock (if any).

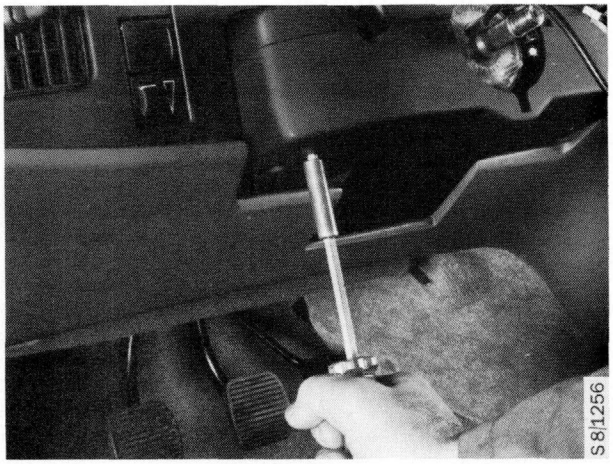
Attach the contact unit (coil spring) to the holder.

Connect the connectors (orange) for the airbag and for the horn.



Secure the connectors and cables to the steering column with a strap.

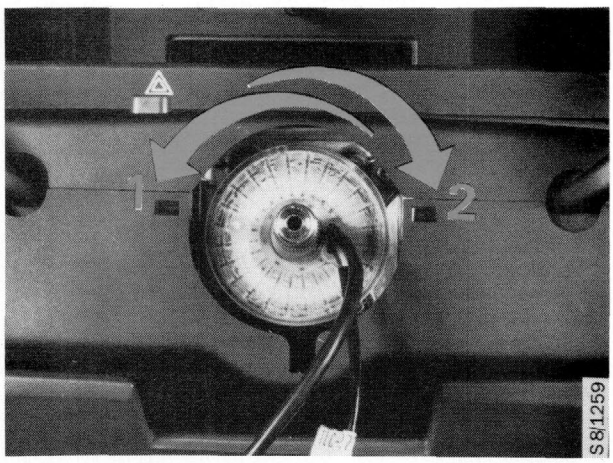
Install the top steering column cover and then the bottom cover (4 screws). Make sure that the cables to the contact unit (coil spring) are not pinched by the middle retaining screw for the cover.



Adjust the contact unit (coil spring) to the middle position as follows:

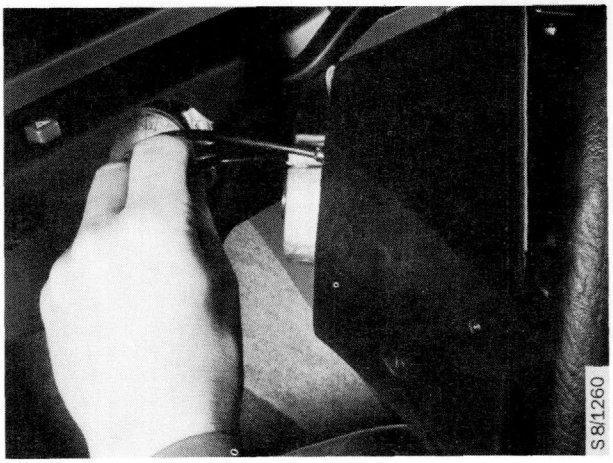
Make sure that the wheels are pointing straight ahead.

Rotate the contact unit (coil spring) counterclockwise to the end position. Then rotate it back clockwise about 3.5 turns.

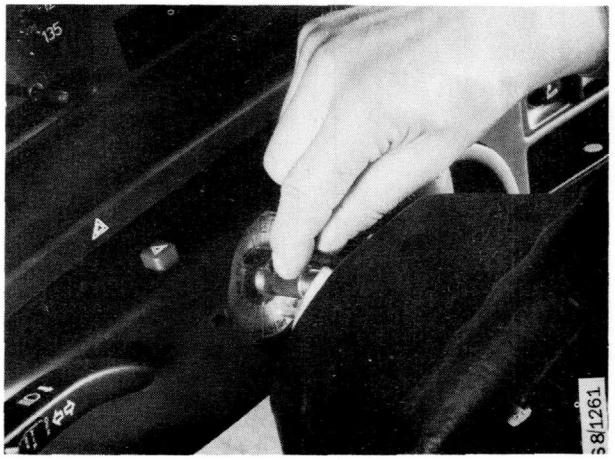


2 Install the steering wheel as follows:

Insert the cables through the hole.



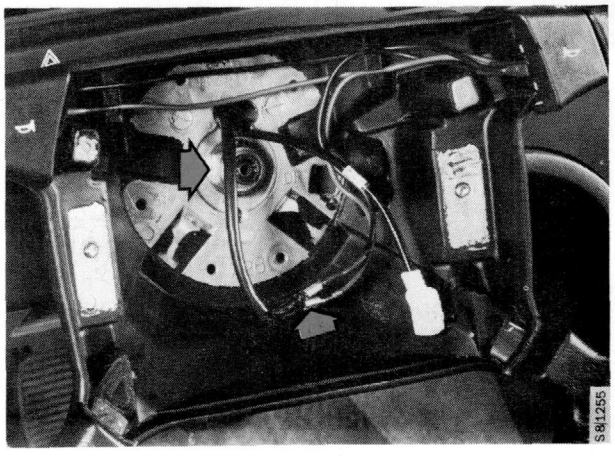
Adjust the steering wheel position at the same time as the contact unit (coil spring) is adjusted against the steering wheel.



Fit the steering wheel nut.

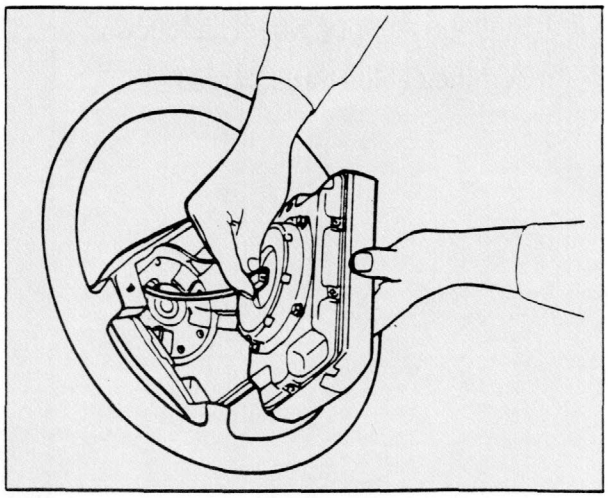
Tightening torque: 30 Nm (22.1 lbf ft)

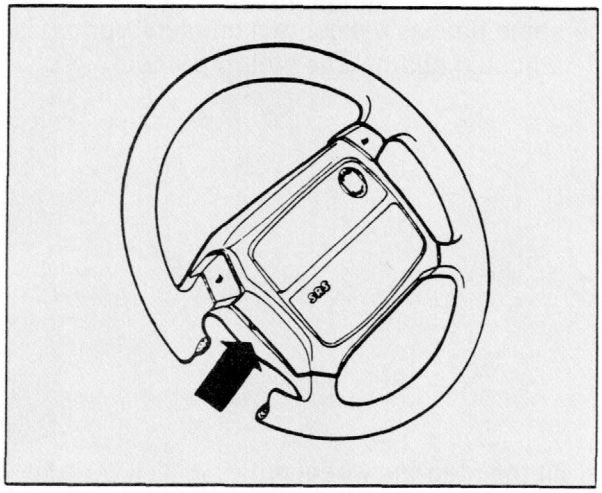
Connect the horn connector.



3 Connect the connector for the steering wheel pad (airbag module) and attach the pad.

Tightening torque: 5.5-7.5 Nm (4.1-5.3 lbf ft)





4 Connect the battery cable.

5 Withdraw the lower storage compartment in the center console. Connect the SRS tester and erase any fault codes.

Start the car. Check that the SRS lamp lights up for about 6 seconds and then goes out. For cars with electronic unit with part No. 91 24 074, the engine must be allowed to idle for about 15 minutes. Then make sure that the SRS lamp does not flash (fault indication).

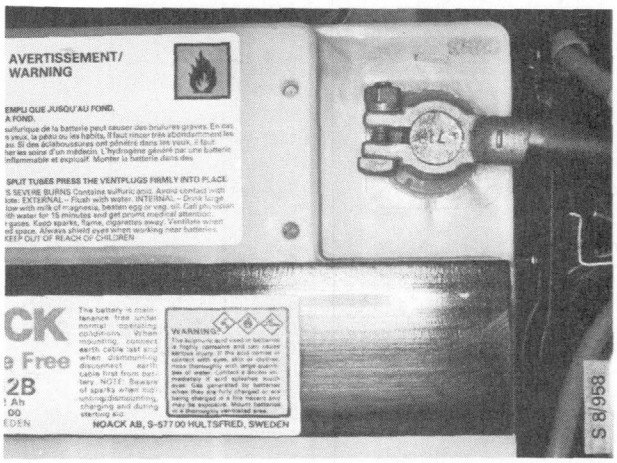
Remove the SRS tester. Install the lower storage compartment.

Direction indicator stalk switch, replacement

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

1 Disconnect the negative cable from the battery.

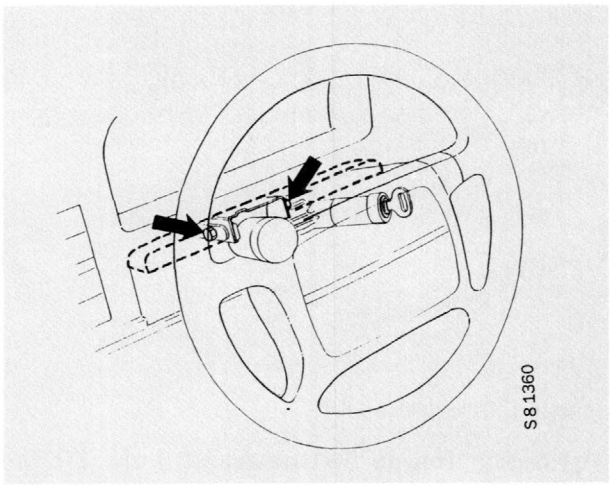
Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.



2 Remove the lower steering column bearing cover.

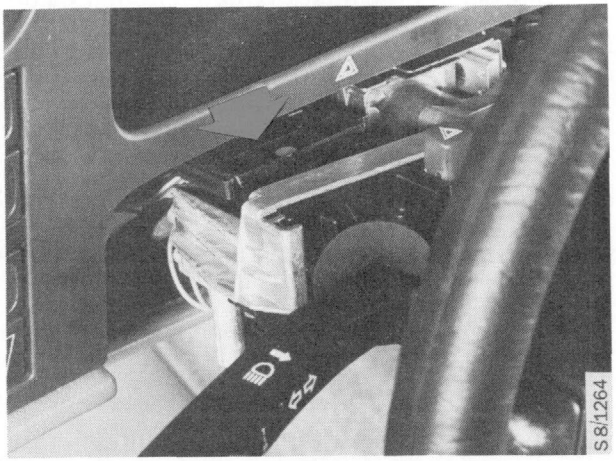
3 Pull up the steering wheel to allow the upper steering column bearing cover to be removed.

Unscrew the transverse bolt on the steering column to release the spacer and pull up the steering wheel.

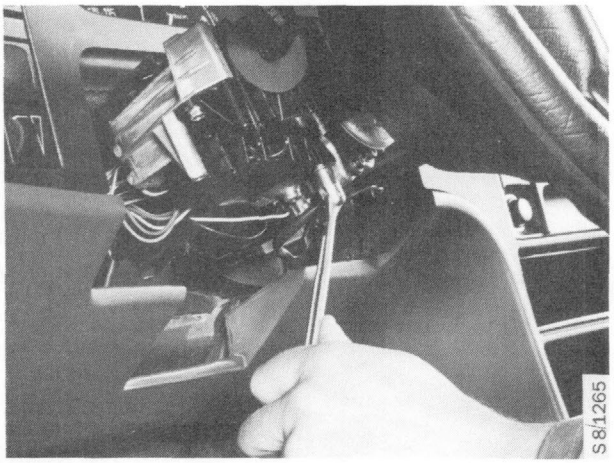


Lift off the upper cover.

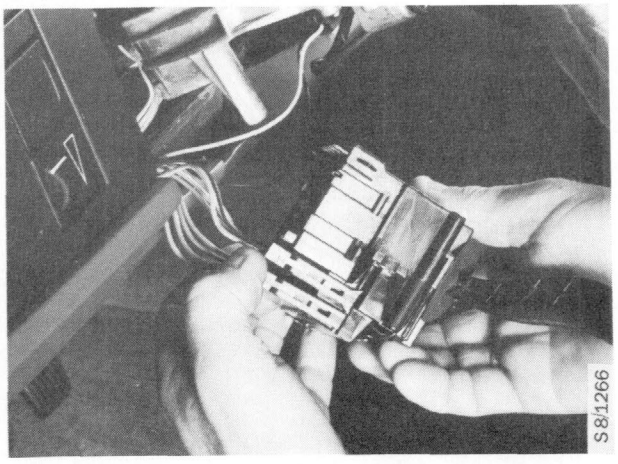
4 Disconnect the upper connector.



5 Remove the two retaining screws for the direction indicator stalk switch.



6 Pull the direction indicator stalk switch forward and then disconnect the lower connectors.



Install in reverse order.

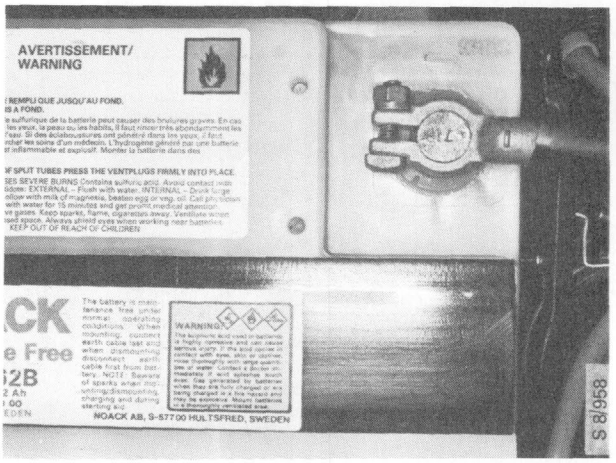
Tightening torque for transverse bolt: 20 Nm (14.8 lbf ft)

Wiper stalk switch, replacement

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

1 Disconnect the negative cable from the battery.

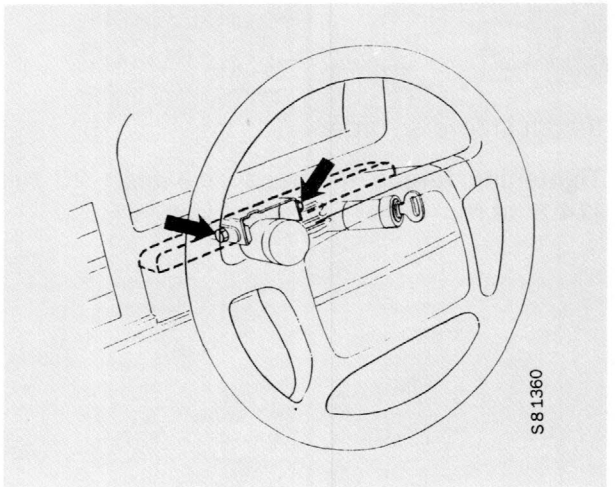
Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.



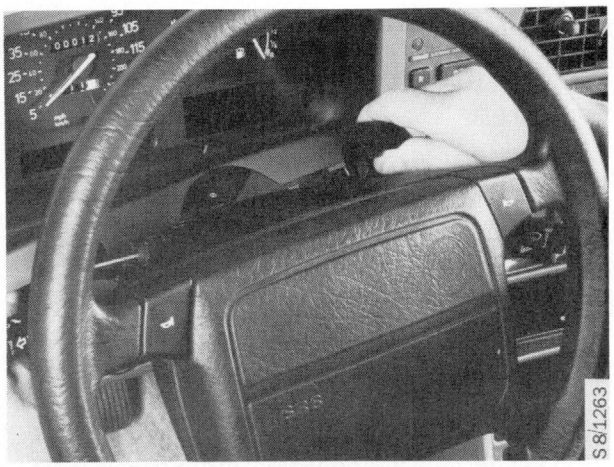
2 Remove the lower steering column bearing cover.

3 Pull up the steering wheel to allow the upper steering column bearing cover to be removed.

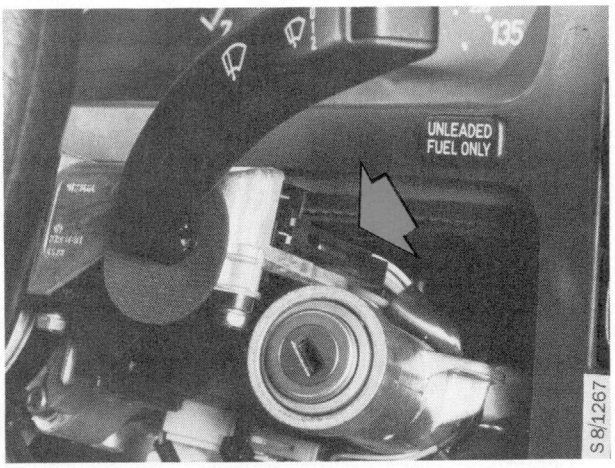
Unscrew the transverse bolt on the steering wheel column to release the spacer and pull up the steering wheel.



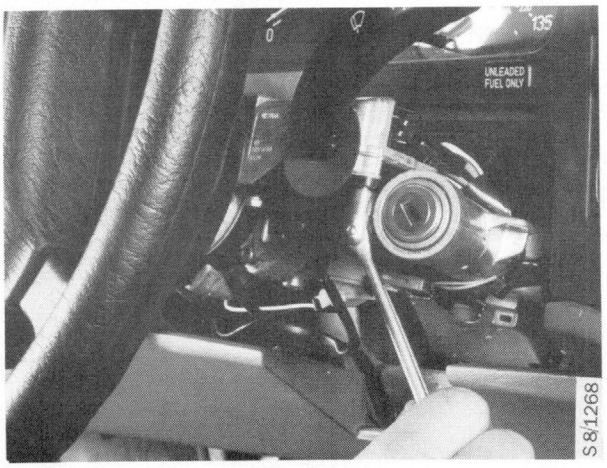
Lift off the upper cover.



4 Disconnect the connector.



5 Remove the screws for the wiper stalk switch.



Install in reverse order.

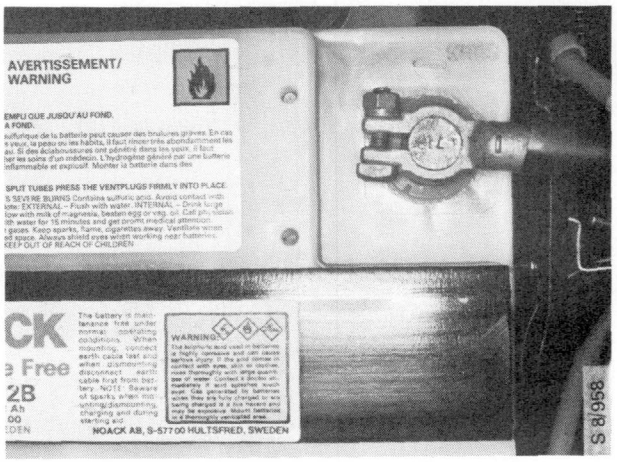
Tightening torque for transverse bolt: 20 Nm (14.8 lbf ft)

Ignition switch, replacement

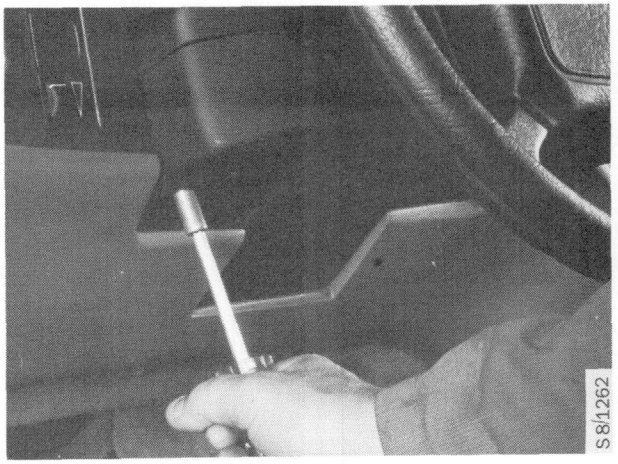
Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

1 Disconnect the negative cable from the battery.

Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.

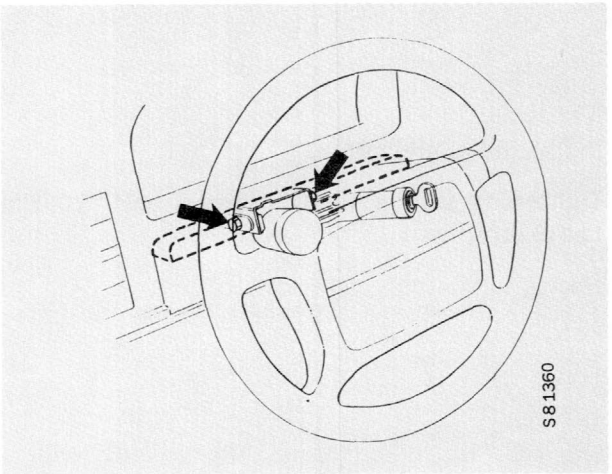


2 Remove the lower steering column bearing cover.



3 Pull up the steering wheel to allow the upper steering column bearing cover to be removed.

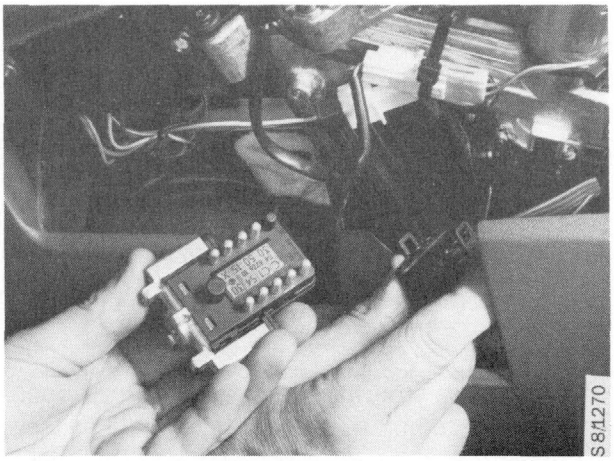
Unscrew the transverse bolt on the steering wheel column to release the spacer and pull up the steering wheel.



Lift off the upper cover.

4 Unscrew the two socket screws holding the ignition switch.

5 Pull out and disconnect the connector from the ignition switch.



Install in reverse order.

Tightening torque for transverse bolt: 20 Nm (14.8 lbf ft)

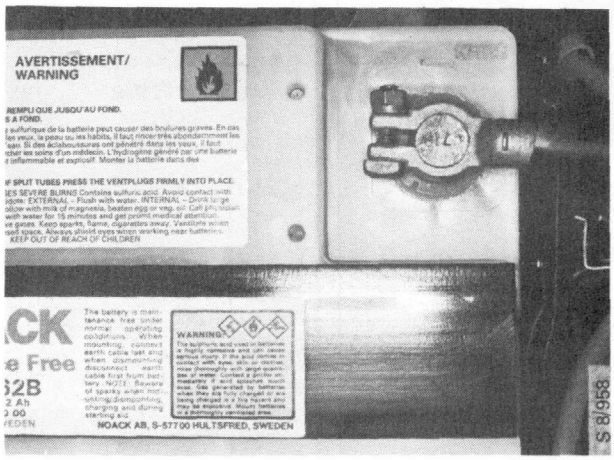
Steering wheel lock

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

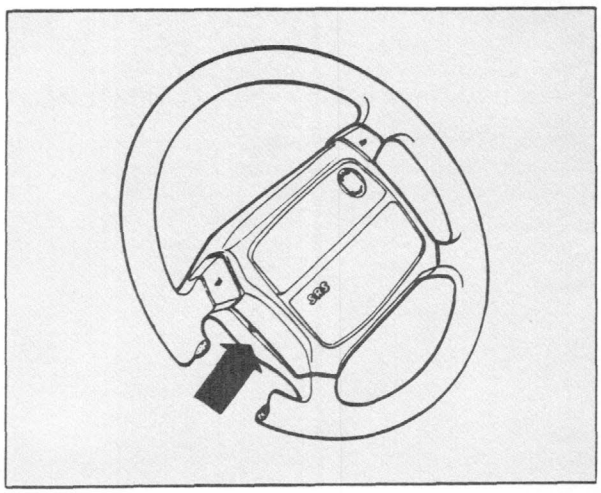
Removal from car

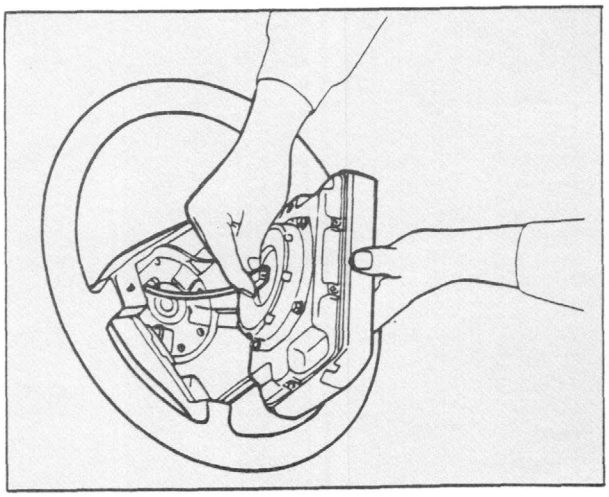
1 Disconnect the negative cable from the battery.

Note
The engine must not be running when the battery cable is disconnected. The alternator may otherwise be seriously damaged.



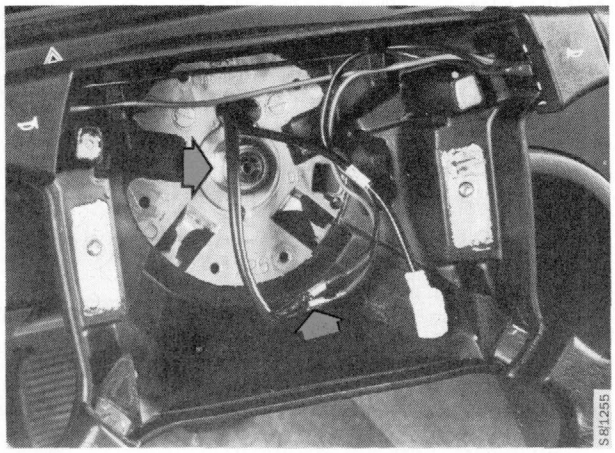
2 Remove the two screws securing the steering wheel pad (airbag module), disconnect the electrical connections and remove the pad.



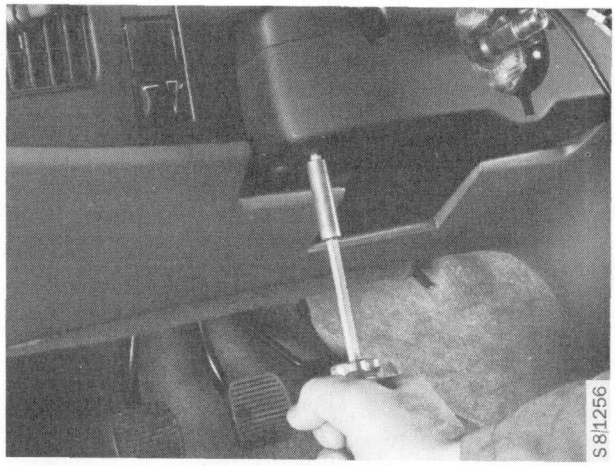


3 Point the wheels straight ahead.

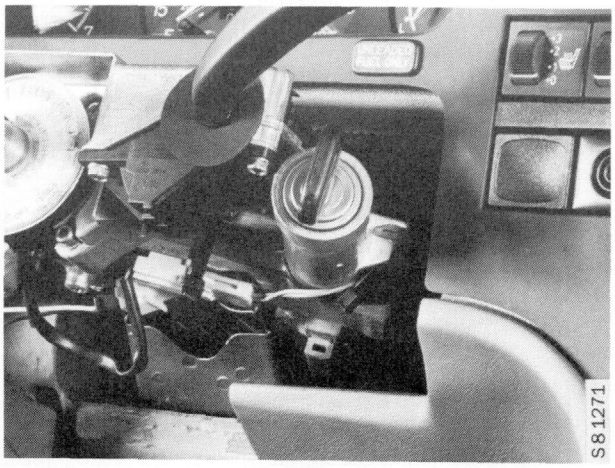
4 Separate the connector for the horn. Remove the steering wheel (M22).



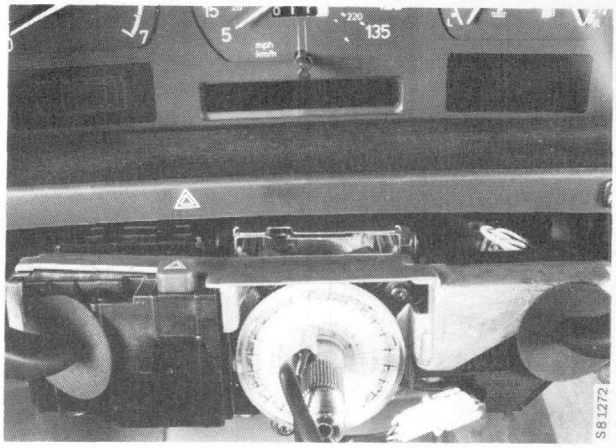
5 Remove the top and bottom steering column covers (4 screws).



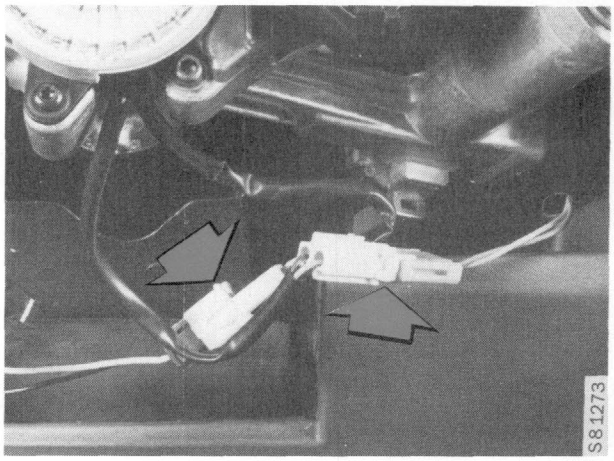
6 Cut the straps holding the electric cables to the steering column.



7 Remove the connectors from the washer/ wiper and direction indicator stalk switches.

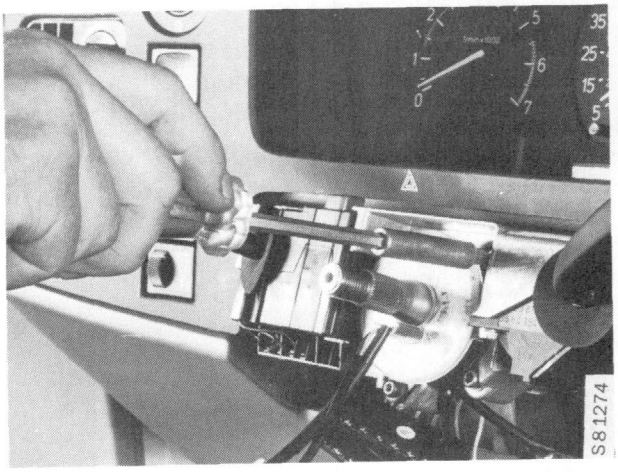


Separate the connectors for the airbag and the horn. Mark the connectors.

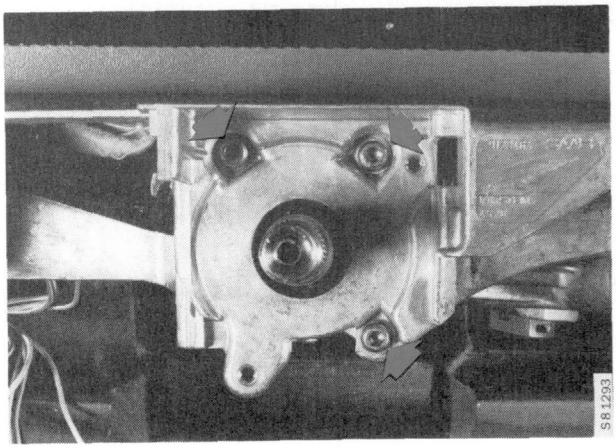


8 Remove the two screws holding the contact unit (coil spring) and lift it off.

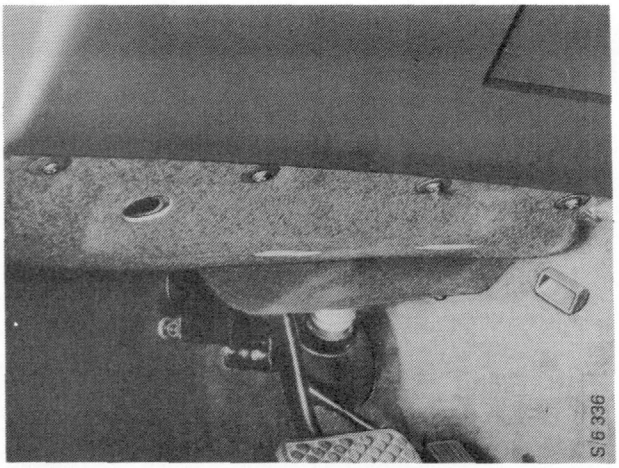
Note
The contact unit (coil spring) is fragile. Handle it with care.



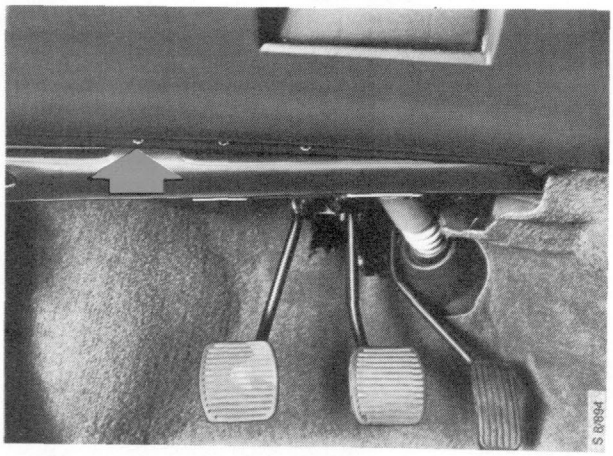
9 Remove the stalk switch holder.



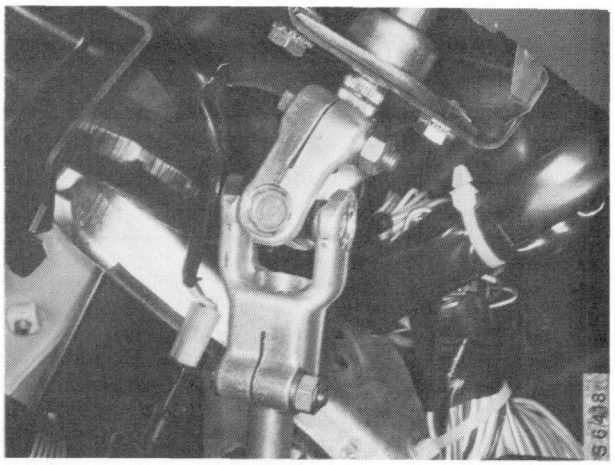
10 Remove the sound baffle under the dash panel.



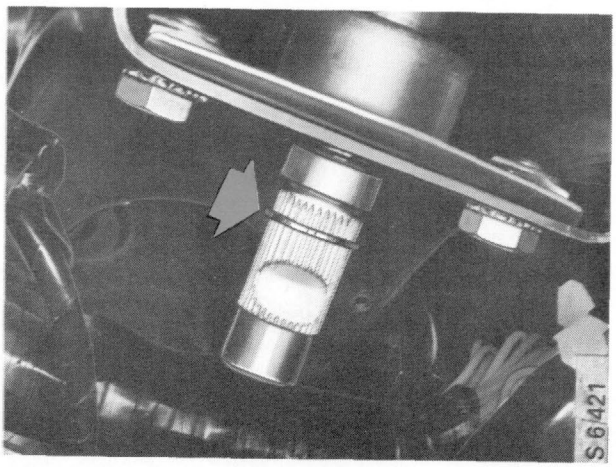
11 Remove the floor duct.



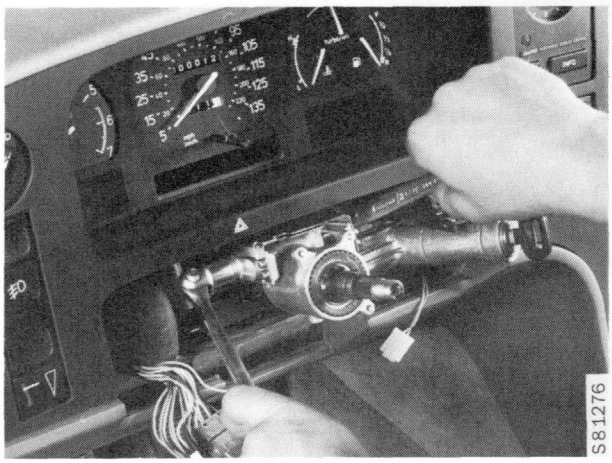
12 Remove the two bolts on the universal joint between the steering column shaft and the intermediate steering column shaft and pull the universal joint out of the steering column shaft splines.



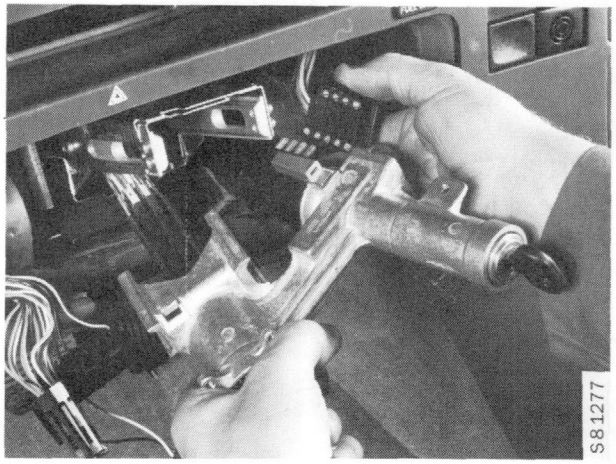
13 Remove the circlip at the bottom end of the steering column.



14 Remove the transverse bolt together with the spacer and the washers.



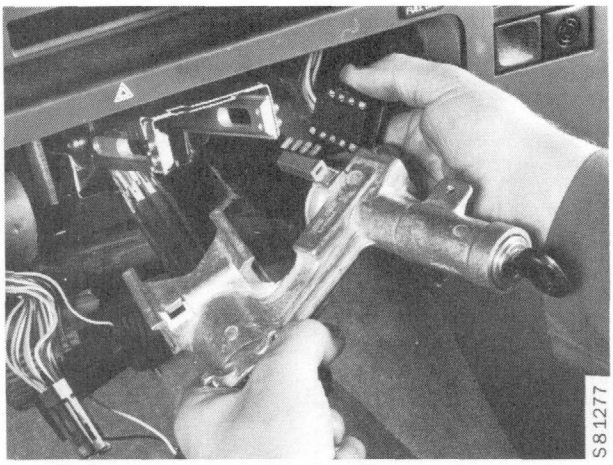
15 Push the steering column shaft up through the lower bearing and pull it out together with the steering wheel lock from the steering column. Disconnect the connector from the ignition switch.

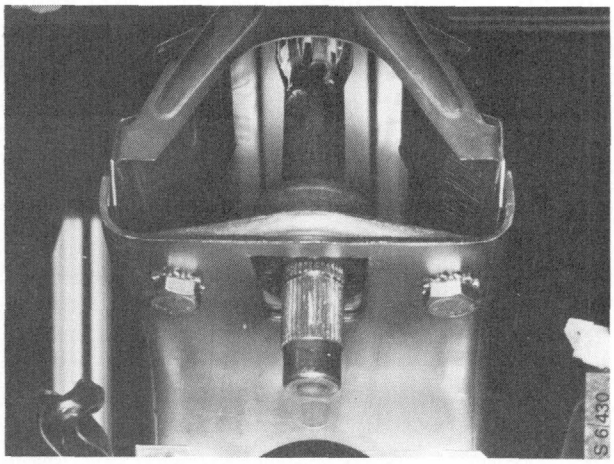


Note
The two sections of the steering column shaft are matched. Do not pull them apart under any circumstances.

Installation in car

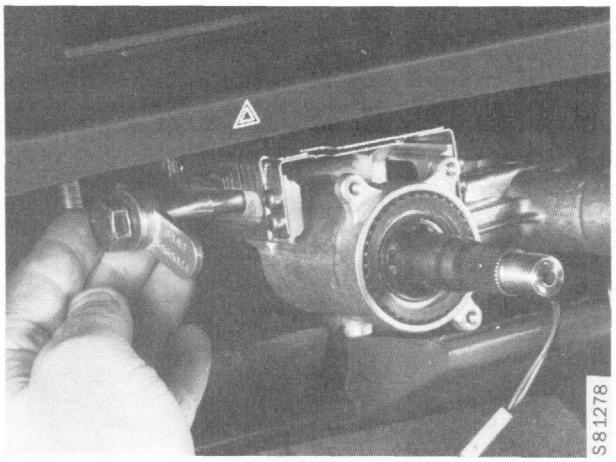
1 Put the steering column shaft with the steering wheel lock in place. Connect the connector to the ignition switch. Make sure that the steering column shaft goes into the lower bearing in the steering column and sticks out about an inch so that the universal joint can be mounted.



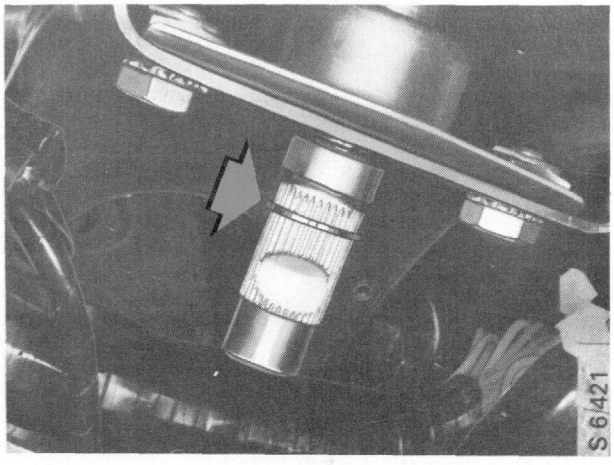


2 Install the transverse bolt together with spacer and washers.

Tightening torque: 20 Nm (14.8 lbf ft)



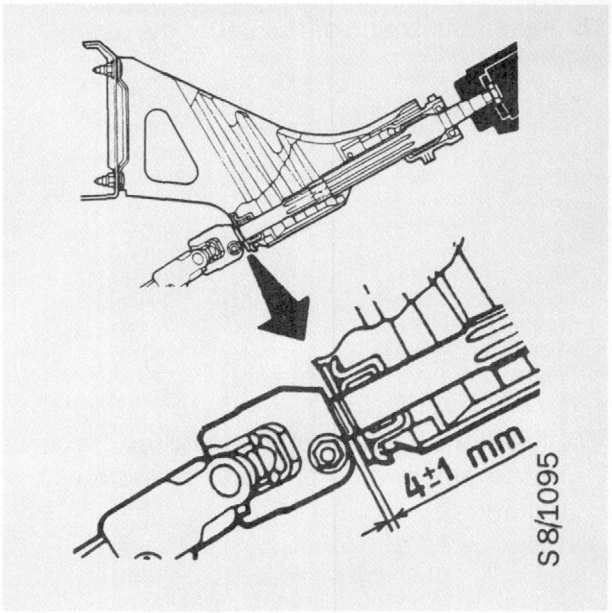
3 Attach the circlip to the bottom end of the steering column shaft.

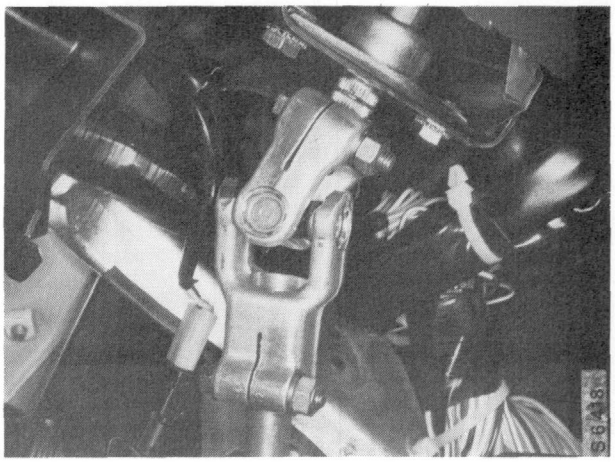


4 Attach the universal joint between the steering column shaft and the intermediate steering column shaft. Make sure that the bolt in the lower clamped joint is tightened below the stop cleat in the end of the intermediate shaft. Adjust the clearance between the universal joint and the steering column.

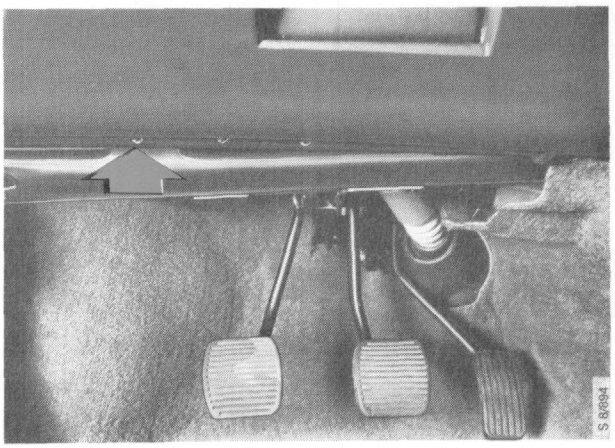
Tightening torque: 23-30 Nm (17.0-22.1 lbf ft)

The clearance should be 4 +/- 1 mm (0.16 +/- 0.04 in)

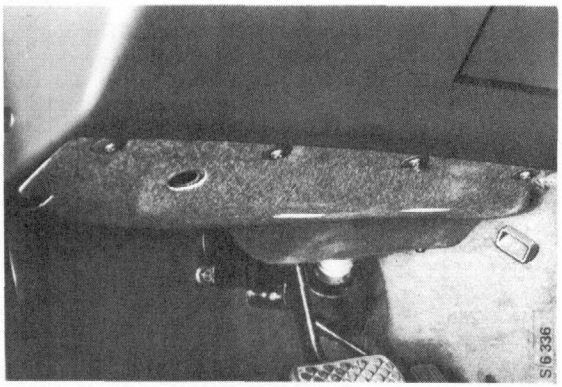




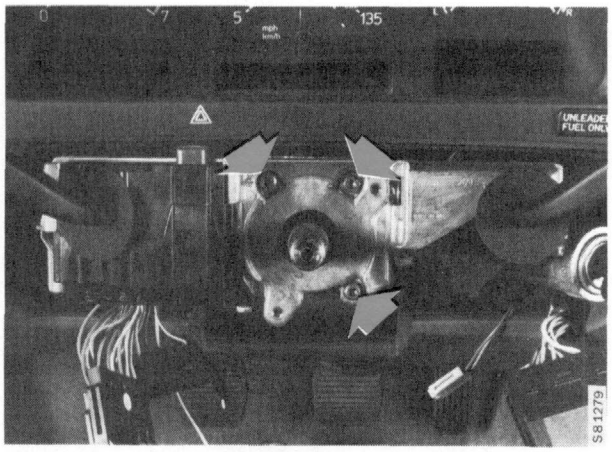
5 Attach the floor air duct.



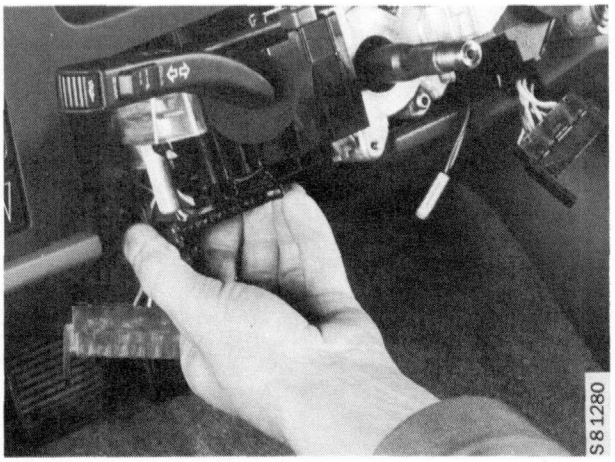
6 Install the sound baffle under the panel.



7 Install the holder with the switches. Be careful to adjust the horizontal position of the holder.



8 Connect the connectors to the switches.

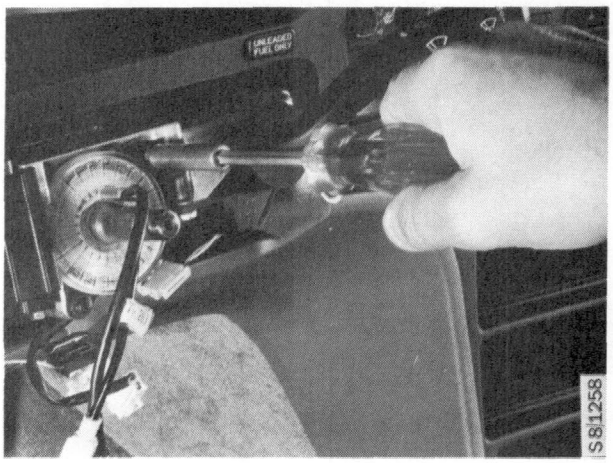


9 Install the contact unit (coil spring) as follows:

Note
The contact unit (coil spring) is fragile. Handle it with care.

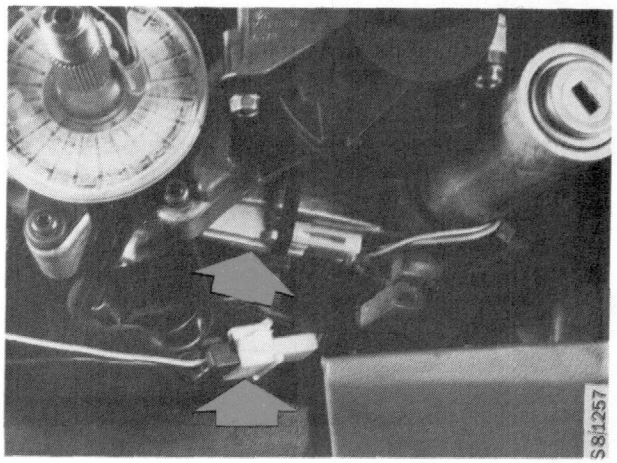
Remove the transport lock (if any).

Attach the contact unit (coil spring) to the holder.

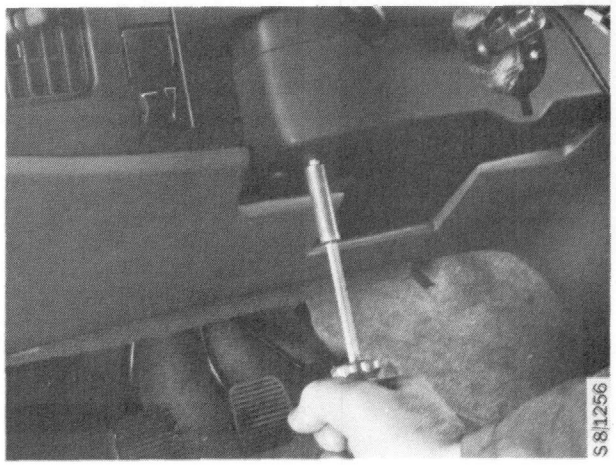


Connect the connectors (orange) for the airbag and for the horn.

Secure the connectors and cables to the steering column with a strap.



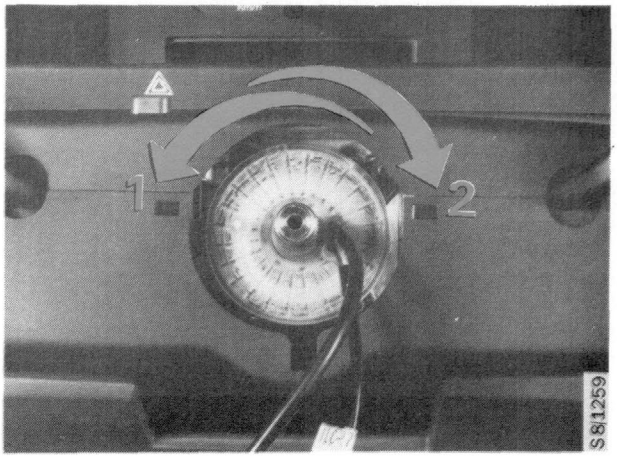
Install the top steering column cover and then the bottom one (4 screws). Make sure that the cables to the contact unit (coil spring) are not pinched by the cover's middle retaining screw.



Adjust the contact unit (coil spring) to the middle position as follows:

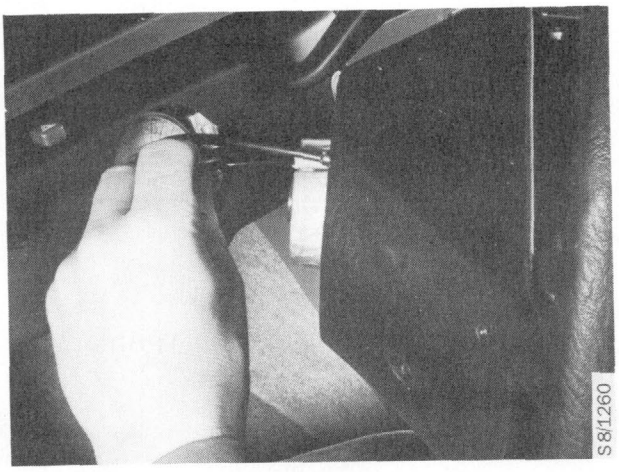
Make sure that the wheels are pointing straight ahead.

Rotate the contact unit (coil spring) counterclockwise to the end position. Then rotate it back clockwise about 3.5 turns.

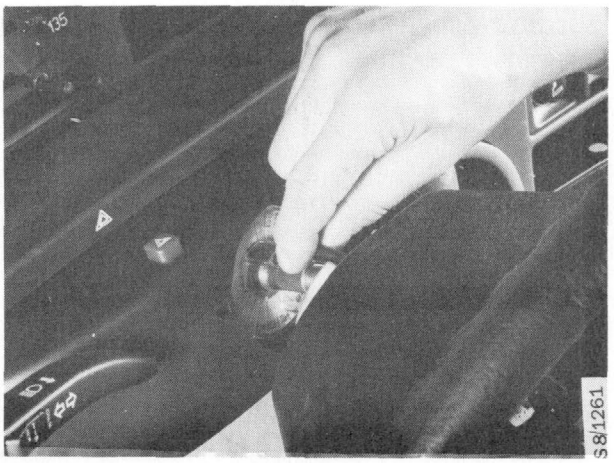


10 Install the steering wheel as follows:

Insert the cables through the hole.



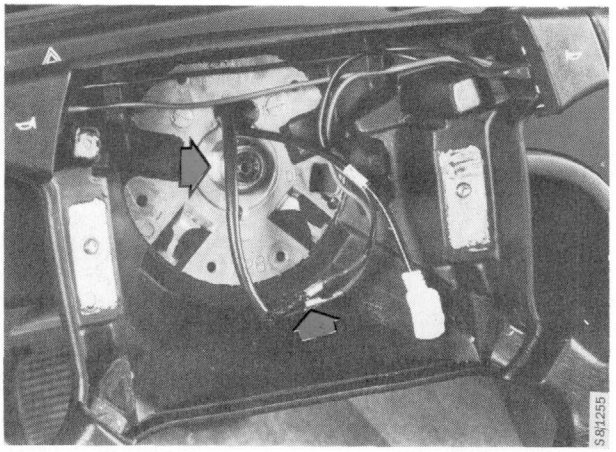
Adjust the steering wheel position at the same time as the contact unit (coil spring) is adjusted against the steering wheel.



Fit the steering wheel nut.

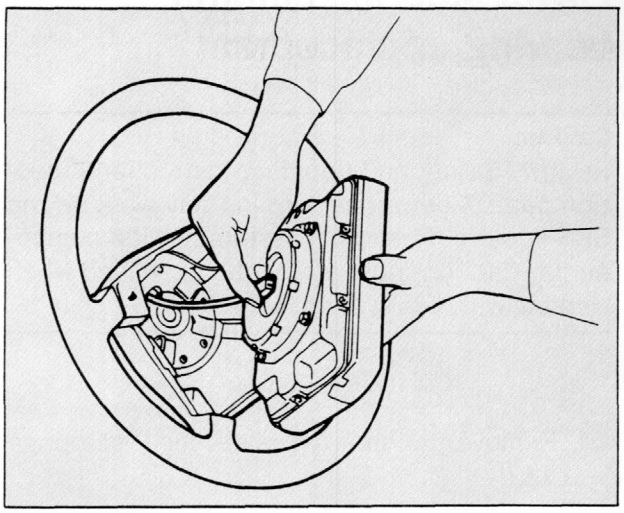
Tightening torque: 30 Nm (22.1 lbf ft)

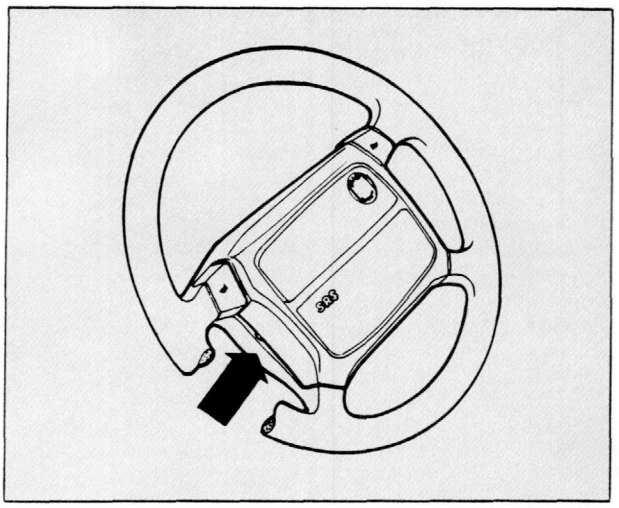
Connect the horn connector.



11 Connect the steering wheel pad (airbag module) connector and attach the pad.

Tightening torque: 5.5-7.5 Nm (4.1-5.3 lbf ft)





12 Connect the battery cable.

Withdraw the lower storage compartment in the center console.

Connect the SRS tester and erase any fault codes.

Start the car. Check that the SRS lamp lights up for about 6 seconds and then goes out. For cars with electronic unit with part No. 91 24 074, the engine must be allowed to idle for about 15 minutes. Then make sure that the SRS lamp does not flash (fault indication).

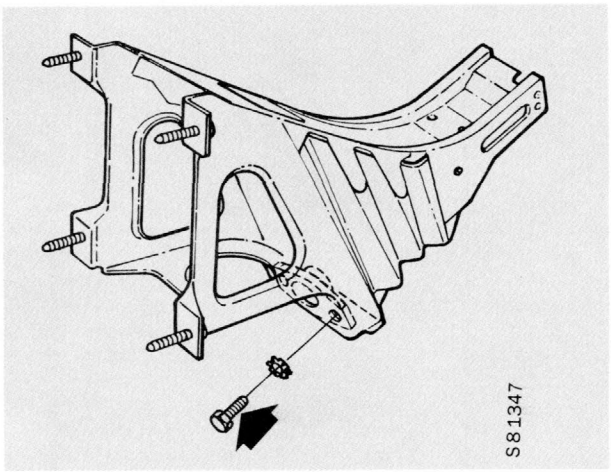
Remove the SRS tester. Install the lower storage compartment.

Lower steering column bearing, replacement

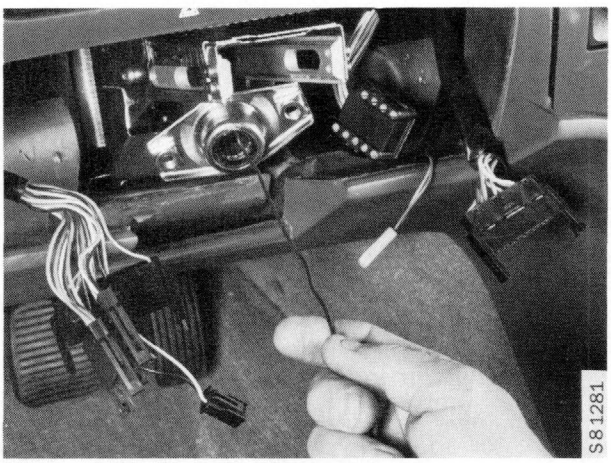
Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

1 Remove the steering wheel lock, see page 117.

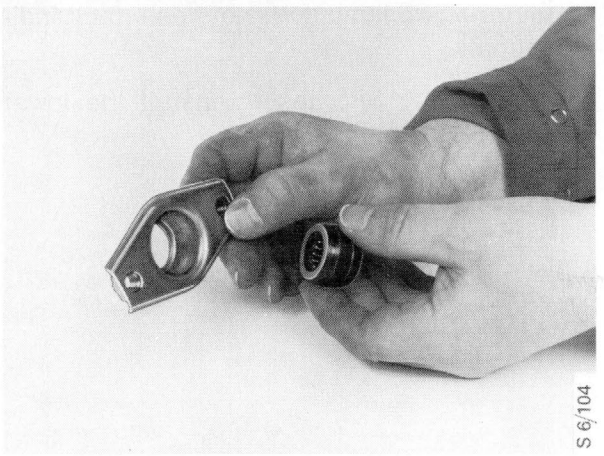
2 Remove the retainig screws for the bearing housing.



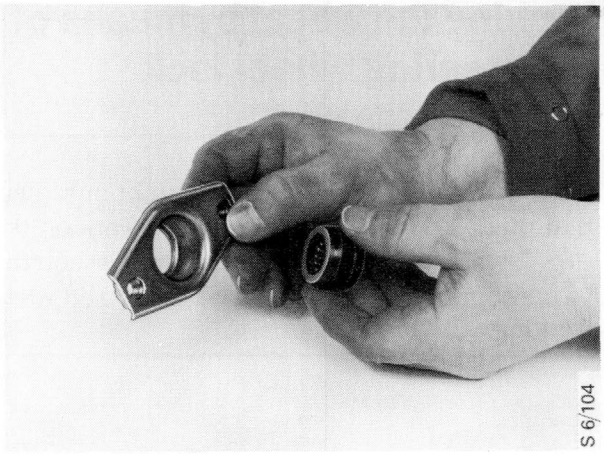
3 Lift off the bearing housing from the steering column.



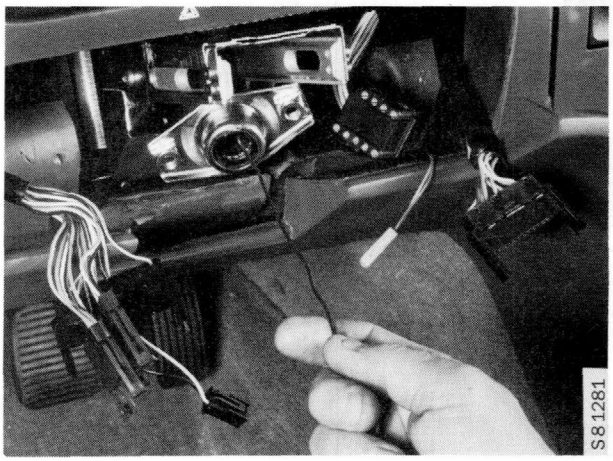
4 Press the bearing out of the housing.

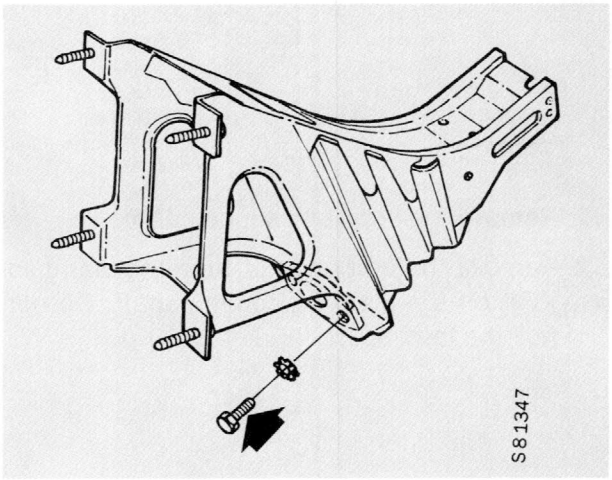


5 Apply a little petroleum jelly to the bearing rubber bushing and press the bearing into the housing.



6 Install the bearing housing in the steering column.





7 Install the steering wheel lock (see page 122).

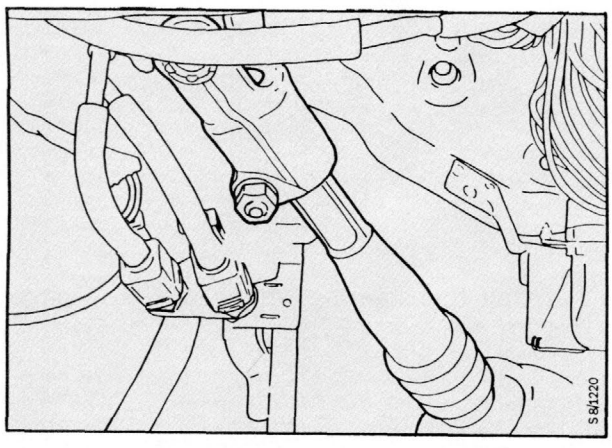
Locking the wheel by means of the steering wheel lock

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

Note
In all work when the contact unit (coil spring) is installed and the steering column is not engaged with the steering gear, the steering wheel must be locked by the steering wheel lock so that the starting position of the contact unit (coil spring) is not changed. If the starting position of the contact unit (coil spring) is changed, the coiled conductor for the contact unit (coil spring) will be destroyed when the steering wheel is turned to full lock.

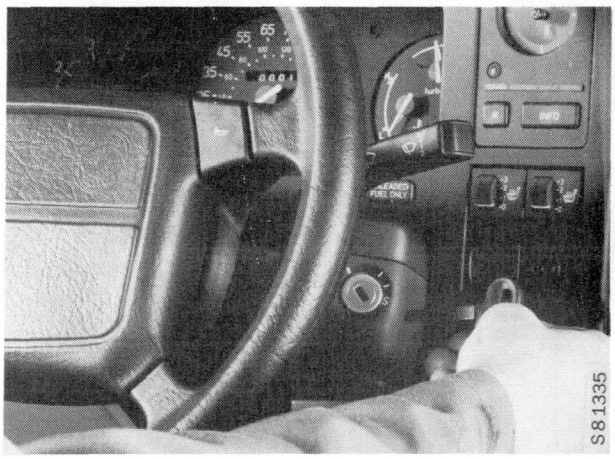
1 Remove the left-hand sound baffle.

2 Remove the bolt and nut from the clamped joint on the steering column shaft. Do not pull the joint apart.

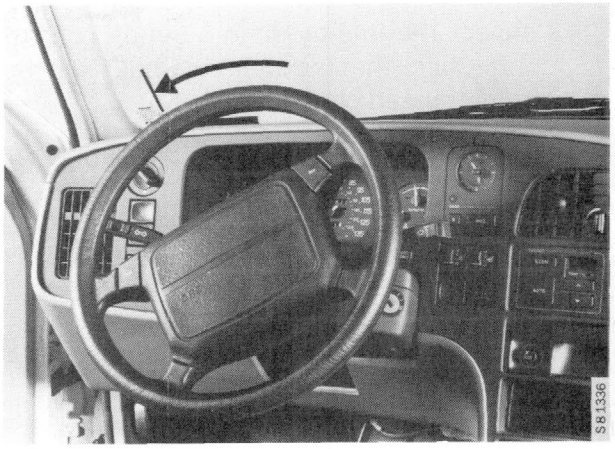


3 Point the wheels straight ahead.

4 Remove the key from the ignition switch.



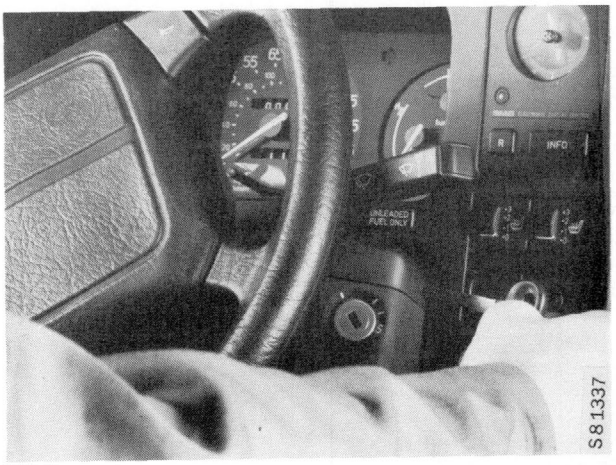
5 Turn the steering wheel **counterclockwise** to the locked position.



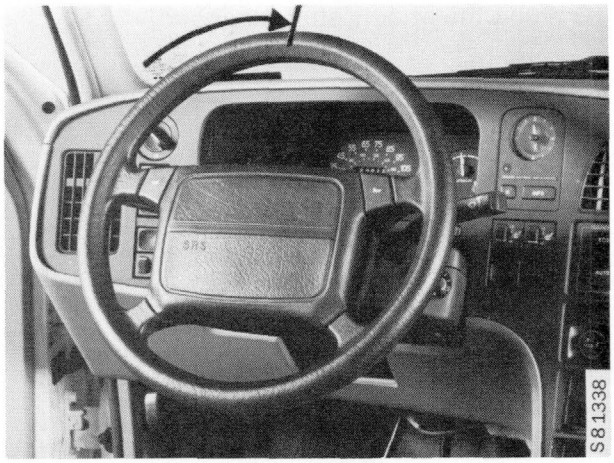
Restoration

6 Point the wheels straight ahead.

7 Insert the key into the ignition switch.



8 Turn the steering wheel **clockwise** to the horizontal position (straight ahead).

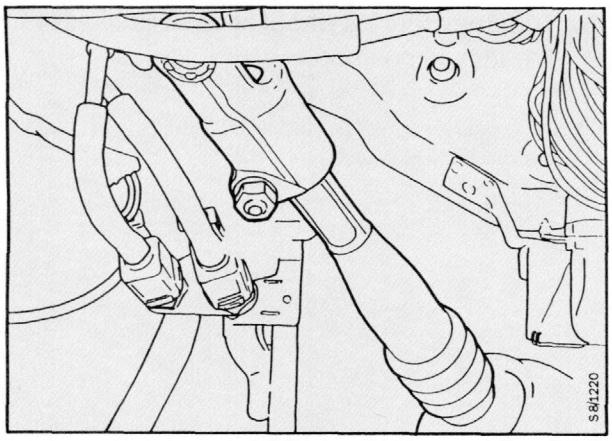


Note
Do not turn the steering wheel counterclockwise. The starting position of the contact unit (coil spring) will then be changed.

If the starting position has been changed, see page 106. Contact unit (coil spring), replacement.

9 Connect the intermediate steering column shaft. Check that the steering wheel is in the straight-ahead position.

10 Fit the bolt and nut in the clamped joint on the steering column shaft.



11 Install the sound baffle.

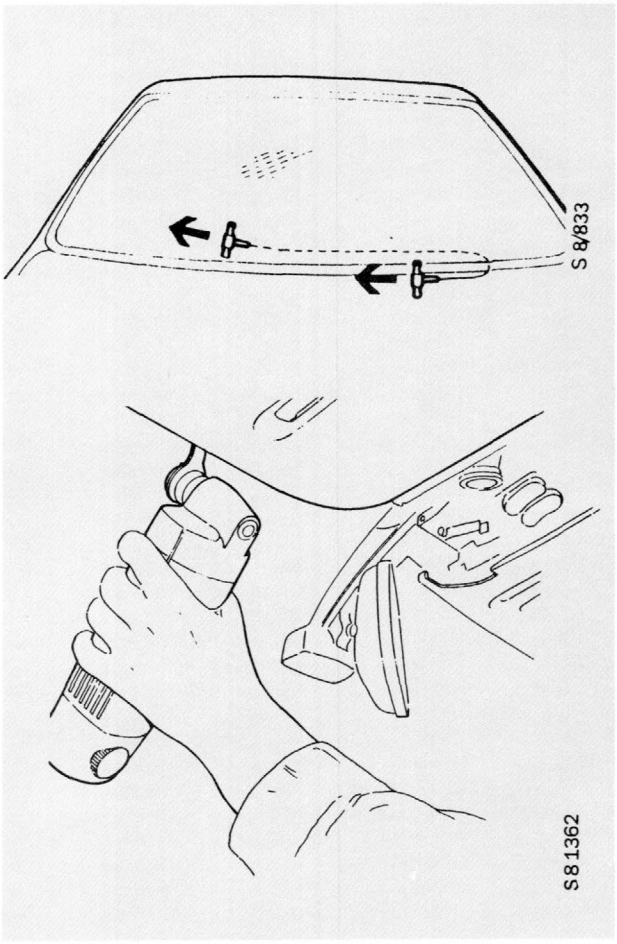
Windshield, replacement

Caution
Review "Safety and handling instructions" section page 7 before performing any work on the SRS-Passive Restraint System or its components. Caution must always be exercised when working with this system.

Removal and installation of the windshield is carried out as described in Service Manual 8:1 with the following addition:

Removal:

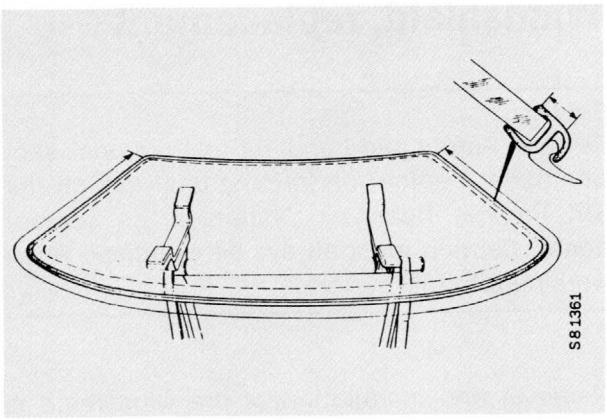
Cut off the bead of adhesive at the bottom edge with a cutting wire. Then cut off the bead of adhesive from the top edge and the A posts from the inside by means of an oscillating cutter. Use a carpet knife (straight blade).



Installation:

Apply primer to the edge of the glass as described in the Service Manual. Fit the molding retaining strip and the cover pieces. Treat the retaining strip with primer on the surfaces that abut against the firewall and the A posts.

Note
Do not use cleaning agent on the retaining strip.



Surface on the retaining strip to be coated with primer.

REPORT TECHNICAL PUBLICATIONS

Answers to be completed in your own language.

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