PORSCHE

Technical Manual

Boxster

Technical Information

Repair

Contents:

Group 2
Fuel, exhaust, engine electronics

WKD 483 521

Foreword

The workshop documentation for the Boxster model has the designation **"Boxster" Technical Manual** and contains **Technical Information** as well as instructions on **Repairs**.

The integration of the technical information published in the "Boxster" Technical Manual with the descriptive matter on repairs provides the user with a complex reference work that combines into one book associated or cross-referenced material of relevance to workshops and originating from various information media.

The "Boxster" Technical Manual consists of 15 folders, subdivided into the following Groups

0	Entire vehicle – General
0	Diagnosis, part 1 (up to Repair Group 45) *1
0	Diagnosis, part 2 (as of Repair Group 69) *2
1	Engine, part 1 (up to Repair Group 13) *3
1	Engine, part 2 (as of Repair Group 15) *4
2	Fuel, exhaust, engine electronics
3	Transmission, manual transmission
3	Transmission, automatic transmission
4	Running gear
5	Body
6	Body equipment, exterior
7	Body equipment, interior
8 / 9	Air conditioning / Electrics
9	Circuit diagrams, part 1 (up to and including the '99 model) *5
9	Circuit diagrams, part 2 (as of the '00 model) *6

*1 The two folders with Group 0 are to be regarded as one folder; i.e. file the "Technical Information" notices only in front of the repair descriptions in the folder "Group 0 – Diagnosis, part 1" **(up to Repair Group 45)**.

*2 The **second folder** "Group 0 – Diagnosis, part 2" **(as of Repair Group 69)** includes the further Repair Groups belonging to Group 0.

*3 The two folders with Group 1 are to be regarded as one folder; i.e. file the "Technical Information" notices only in front of the repair descriptions in the folder "Group 1 – Engine, part 1" **(up to Repair Group 13)**.

*4 The **second folder** "Group 1 – Engine, part 2" **(as of Repair Group 15)** includes the further Repair Groups belonging to Group 1.

*5 The two folders with Group 9 are to be regarded as one folder; i.e. file the "Technical Information" notices only in front of the repair descriptions in the folder "Group 9 – Circuit diagrams, part 1" **(up to the '99 model)**.

*6 The **second folder** "Group 9 – Circuit diagrams, part 2" **(as of the '00 model)** includes the further circuit diagrams belonging to Group 9.

The "Boxster" Technical Manual has the same structure in each folder, with the following breakdown for all Groups:

Title page, "Boxster" Technical Manual
> Foreword

Title page: "Technical Information"
> Table of Contents, Technical information
> Technical information

Title page: "Repair"
> Repair Groups: overview
> Table of Contents, repairs
> General / technical data
> Instructions on repairs

As can be seen from the breakdown, the published Technical Information is in the front part of each folder – numbered according to the Groups. The Table of Contents assigned to each Group will be periodically updated.

Following the Technical Information, separated by a title page, the instructions on repairs – assigned according to the Groups or broken down into Repair Groups – are included in the folder.

The instructions on repairs will be extended and updated by means of supplements.

Note

Sheets that already exist in the "Boxster" Technical Manual and are updated or revised and thereby exchanged by a supplement are designated "Replacement sheet". Revisions or technical modifications on pages of these replacement sheets are identified for the user with a vertical bar at the margin.

Group 0:	**Entire vehicle – General**	**0**
	Maintenance	03
Group 0:	**Diagnosis**	**0**
	Sales check	01
	On-board diagnosis	03
	DME diagnosis	24
	Tiptronic diagnosis	37
	ABS diagnosis	45
Group 0:	**Diagnosis**	**0**
	Airbag diagnosis	69
	Seat memory diagnosis	72
	Heating diagnosis	80
	Alarm system diagnosis	90
	PCM diagnosis	91
	ParkAssistent diagnosis	91
	HBA diagnosis	94
Group 1:	**Engine**	**1**
	Engine – Crankcase, suspension	10
	Engine – Crankshaft, pistons	13
Group 1:	**Engine**	**1**
	Engine – Cylinder head, valve drive	15
	Engine – Lubrication	17
	Engine – Cooling	19
Group 2:	**Fuel, exhaust, engine electronics**	**2**
	Fuel supply, control	20
	Exhaust system, turbocharging	21
	Fuel system, electronic injection	24
	Fuel system, K-Jetronic	25
	Exhaust system	26
	Starter, power supply, cruise control	27
	Ignition system	28
Group 3:	**Transmission, manual transmission**	**3**
	Clutch, control	30
	Manual transmission – Actuation, housing	34
	Manual transmission – Gears, shafts, int. gearsh.	35
	Final drive, differential, differential lock	39
Group 3:	**Transmission, automatic transmission**	**3**
	Torque converter	32
	Automatic transmission – Actuation, housing	37
	Automatic transmission – Gears, control	38
	Final drive, differential, differential lock	39

Group 4:	**Running gear**	**4**
	Front wheel suspension, drive shafts	40
	Rear wheel suspension, drive shafts	42
	Wheels, tires, suspension alignment	44
	Anti-Lock Brake System (ABS)	45
	Brakes – Brake mechanics	46
	Brakes – Hydraulics, regulator, booster	47
	Steering	48
Group 5:	**Body**	**5**
	Body front	50
	Body center, roof, frame	51
	Body rear	53
	Lids, flaps	55
	Door front, central locking system	57
Group 6:	**Body equipment, exterior**	**6**
	Sliding roof	60
	Convertible top, hardtop	61
	Bumpers	63
	Glazing, window control	64
	Exterior equipment	66
	Interior equipment	68
	Passenger protection	69
Group 7:	**Body equipment, interior**	**7**
	Linings, insulation	70
	Seat frames	72
	Seat upholsteries, covers	74
Group 8:	**Air conditioning**	**8**
	Heating	80
	Ventilation	85
	Air conditioning	87
	Auxiliary air conditioning system	88
Group 9	**Electrics**	**9**
	Instruments, alarm system	90
	Radio, telephone, on-board computer, navigation	91
	Windshield wiper and washer system	92
	Lights, lamps, switches exterior	94
	Lights, lamps, switches interior, theft protection	96
Group 9:	**Circuit diagrams**	**9**
	Wiring (up to and including the '99 model)	97
Group 9:	**Circuit diagrams**	**9**
	Wiring (from the '00 model)	97

2 Fuel, exhaust, engine electronics

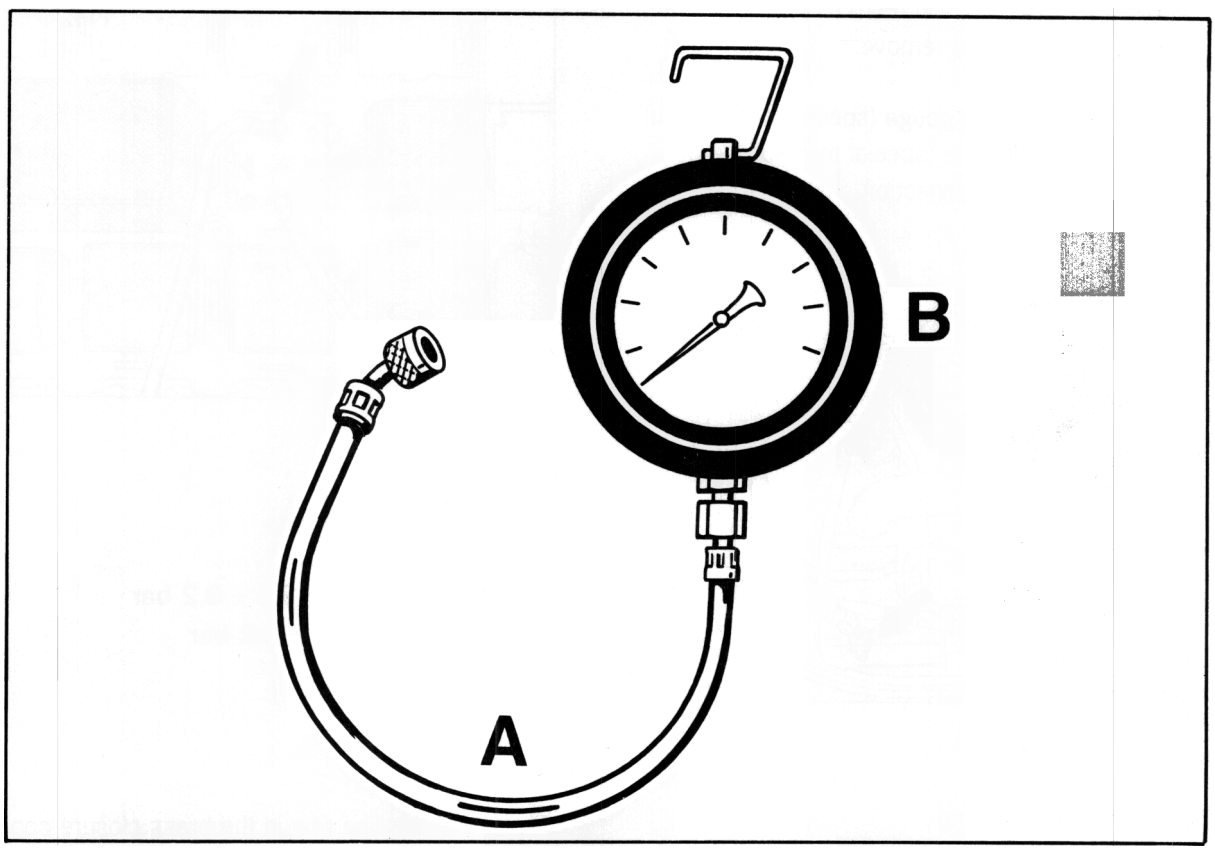
20	**Fuel supply, control**	
20 02 01	Checking fuel pressure	20 - 1
20 66 01	Checking quantity delivered by fuel pump	20 - 3
20 66 19	Removing and installing fuel pump	20 - 5
20 15 01	Calibrating fuel level sensor system	20 - 9
20 39 19	Removing and installing fuel return line	20 - 11
24	**Fuel system, electronic injection**	
24 30 37	Disassembling and assembling fuel ring pipe	24 - 1
24 46 37	Disassembling and assembling intake distributor	24 - 7
24	Diagram of hose connections	24 - 13
24 35 37	Disassembling and assembling air guide cowl	24 - 15
24 70	Programming DME control module	24 - 19
24 45 19	Removing and installing mass air flow sensor	24 - 23
24 70 19	Removing and installing DME control module	24 - 25
24 69 19	Removing and installing oxygen sensor	24 - 27
24 42 19	Removing and installing throttle body – Boxster S	24 - 31
24 42 21	Removing throttle body – Boxster S	24 - 33
24 42 23	Installing throttle body – Boxster S	24 - 39
24 40 20	Removing and installing injection valves – Boxster S	24 - 47
24 40 22	Removing injection valves – Boxster S	24 - 49
24 40 24	Installing injection valves – Boxster S	24 - 55
24 46 23	Removing and installing intake distributor – Boxster S	24 - 61
24 46 21	Removing intake distributor – Boxster S	24 - 63
24 46 23	Installing intake distributor – Boxster S	24 - 73
26	**Exhaust system**	
26 01 55	Replacing exhaust system	26 - 1
27	**Starter, power supply, cruise control**	
27 60 19	Removing and installing starter	27 - 1
27 22 19	Removing and installing three-phase generator	27 - 3
27 84 19	Removing and installing cruise control actuator	27 - 5
27 60 19	Removing and installing starter – Boxster S	27 - 7

Printed in Germany - 32, 1999 986TOC

27 06	Work instructions after disconnecting the battery .	. . . 27 - 9
28	**Ignition system**	
27 44 19	Removing and installing rotor for hall sender	. . 28 - 1
28 73 19	Removing and installing pulse sender . . .	. . 28 - 3

20 02 01 Checking fuel pressure

Special tools



No.	Designation	Special tool	Explanation
A	Pressure gauge	P 378a	
B	Connection line	9559	

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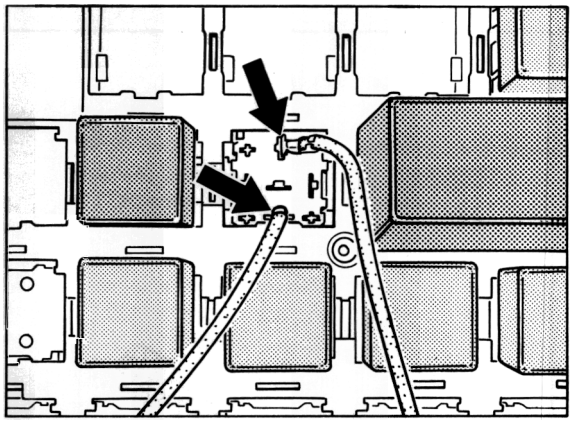
Checking fuel pressure

Checking

1. Undo covering cap on test connection of fuel collection pipe and remove.

2. Connect pressure gauge (special tool P 378a) with connecting line (special tool 9559) and connect to test connection.



4. **Nominal test values:**

   Stationary engine 3.8 ± 0.2 bar
   Engine idling 3.3 ± 0.2 bar

3. Actuating fuel pump

   with Porsche System Tester 2:
   The fuel pump can be actuated with the Porsche System Tester 2 or by bridging the fuel-pump relay.

   Via fuel-pump relay without Tester:
   Disconnect fuel-pump relay from the central electrical board and bridge contacts 30 and 87 (identified as 3 and 5 on the central electrical board) with a fused shop-made cable. The fuel pump must now operate or deliver fuel.

The seal or sealing ring in the brass closure cap is **not** exchangeable. It must therefore be used only **once**.

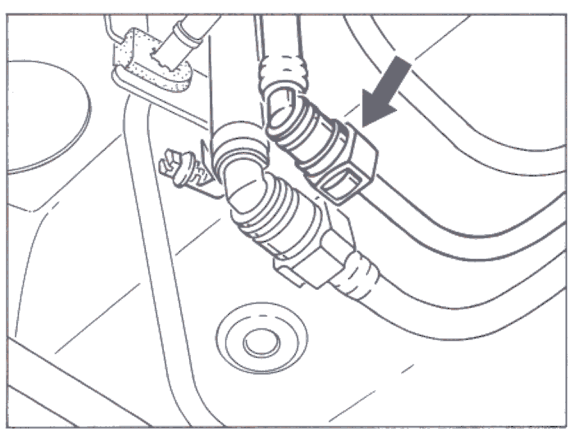
Tightening torque of new brass closure cap 2.5 ± 0.5 Nm (2.0 ± 0.5 ftlb.).

20 66 01 Checking quantity delivered by fuel pump

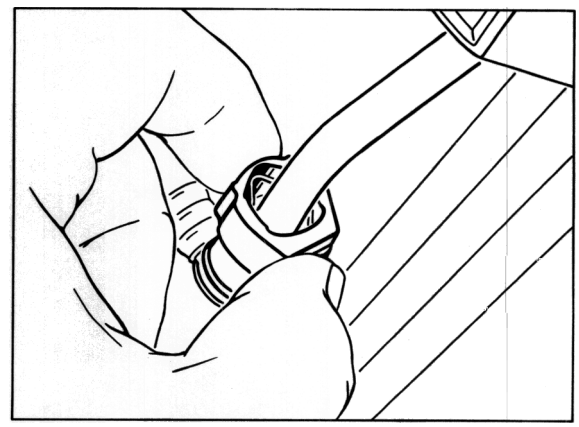
Precondition:

Fuel filter and electrical supply in order.

1. Relieve pressure in fuel tank by opening tank cap.
2. Connect Porsche System Tester 2.
3. Raise vehicle.
4. Remove rear underside panel.
5. Disconnect fuel return line. Collect residual fuel.



367 - 96



368 - 96

6. Hold fuel line in a measuring container. Actuate fuel pump with the Porsche System Tester 2 and allow fuel to flow for 30 seconds into a measuring container.
   Quantity supplied must be at least 850 cm^3/30 s, i.e. after 30 seconds at least 850 cm^3 of fuel must be present in the measuring container.

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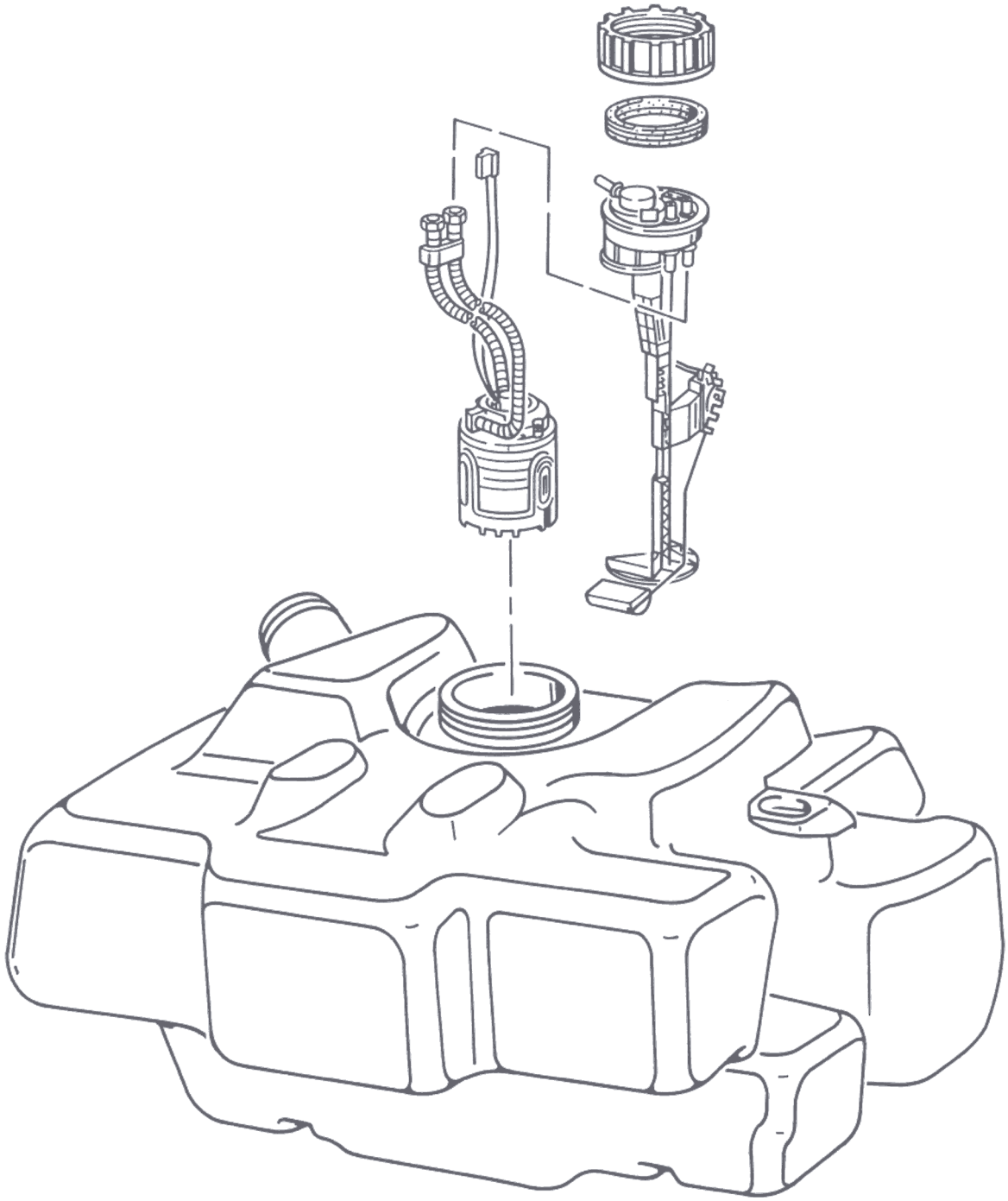
20 66 19 Removing and installing fuel pump



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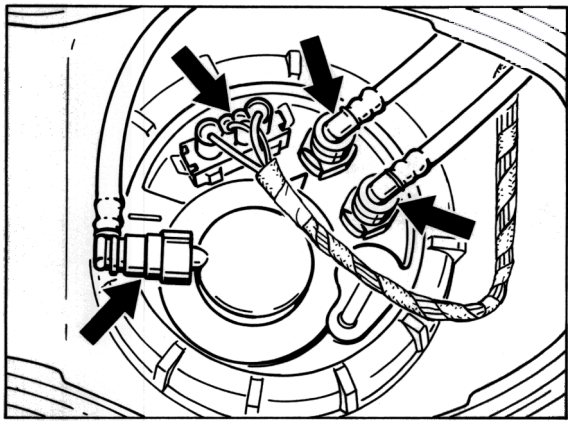
Removing and installing fuel pump

Removal

1. Undo battery terminals and battery holder. Lift battery out by holding strap.

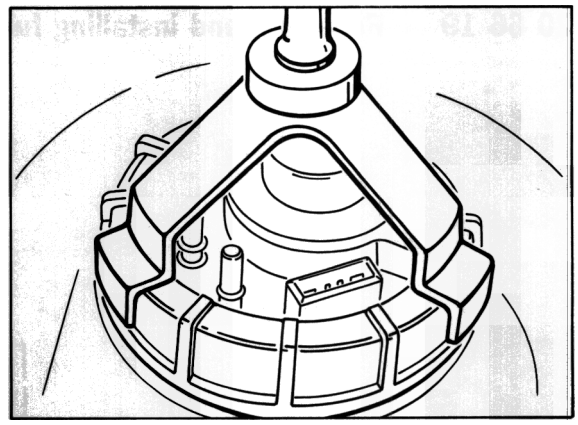
2. Undo battery support cover (four hexagon nuts, wrench size 13).

3. Disengage fuel line and disconnect electrical plug connection.



445 - 96

4. Undo union nut with VW special tool 3217.



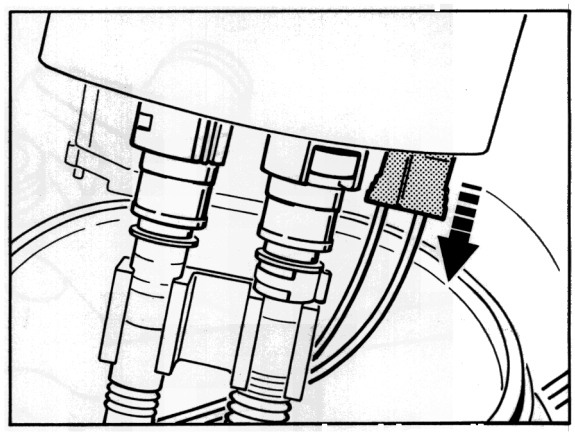
446 - 96

5. Extract residual fuel.

Note

Observe safety regulations.

6. Lift fuel gauge and disconnect electrical plug connection and fuel pipes.

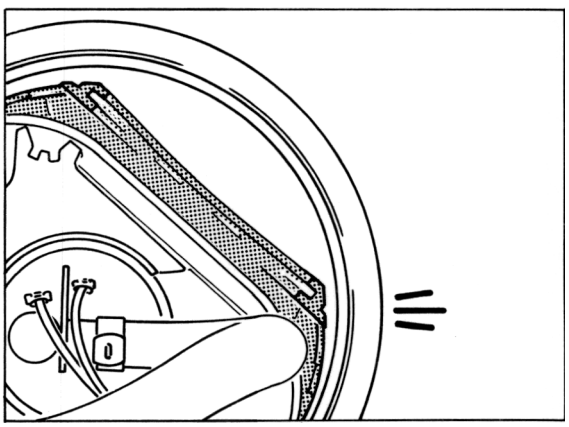


447 - 96

7. Put on fuel-proof glove, hold the fuel pump fastened to tank floor, turn it to left (approx. 15°, bayonet lock) and remove fuel pump.

Installation

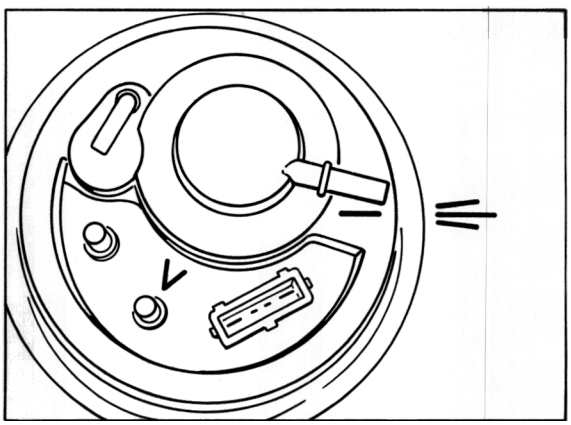
Position fuel pump; the edge of the fuel-pump housing faces the fuel tank sending unit installation-position markings.



149 - 96

2. Place fuel pump in this position on tank floor bayonet fixture and turn fuel pump to the right as far as the stop. Then check proper seating of fuel pump by pulling it up.

3. Insert fuel tank sending unit and turn until the marking on the sending unit matches the marking on the fuel tank.



448 - 96

4. Tighten union nut with special tool 3217. Tightening torque with new union nut and new sealing ring: 70 Nm (52 ftlb.).

5. Attach fuel lines and electrical plug connection. The fuel lines must audibly engage. **Correct engagement must be checked with a gentle pull.**
The colour-coded plug (green) must be fitted to the connection identified with "V".

20 15 01 Calibrating fuel level sensor system

Warning!
Danger of fire and injury!

> Observe general safety regulations on the fuel system.

> Wear protective gloves.

Note

Calibration is necessary after replacement of the fuel tank, fuel level sensor or instrument cluster.

Remove battery and detach battery cover.

2. Remove fuel level sensor; refer to Serv. No. 20 66 19 (Removing fuel pump).

3. Using a fuel extractor, completely drain the fuel tank through the fuel level sensor opening. Fuel extractor: Refer to the Workshop Equipment Manual, Chapter 3 "Workshop Equipment".

4. Reinstall the fuel level sensor and, with "ignition off", fill the tank with **12 litres** of fuel.

5. Perform tank calibration with the Porsche System Tester 2.

Select vehicle type (911 Boxster)

– Select control modules

Select instrument cluster

– Select menu item Tank calibration

– Confirm calibration

The fuel level sensor system has now been calibrated.

Note

The fuel level sensor system need not be calibrated if the battery was disconnected or a plug connection on the instrument cluster or fuel level sensor was removed. The values remain stored in the instrument cluster.

A range on remaining fuel of less than 15 km is not displayed in the instrument cluster.

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20 39 19 Removing and installing fuel return line

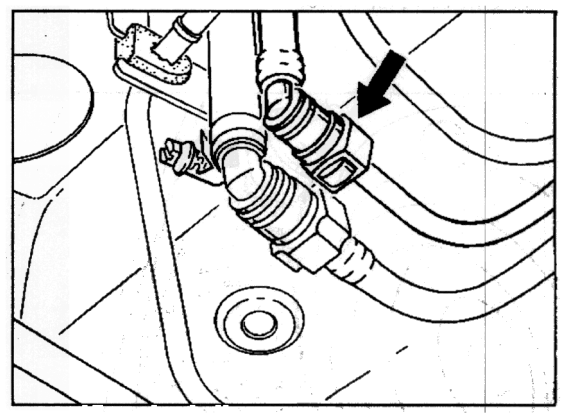
Warning:
Danger of fire and injury!

> Observe general safety regulations on the fuel system.

> Wear protective gloves.

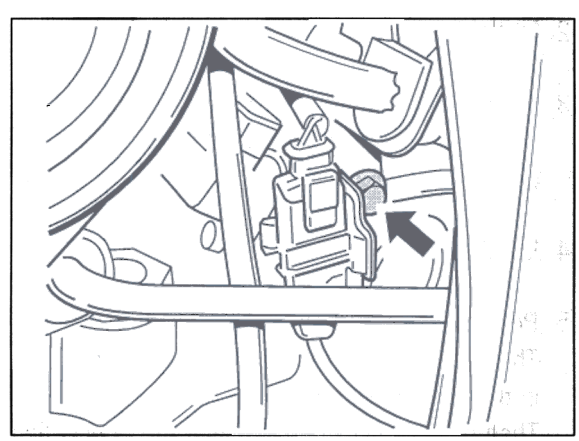
Removal

1. Move convertible top to service position.
2. Detach negative terminal of battery (a/f 10 mm).
3. Place protective cover on ground.
4. Remove engine compartment lining and lid.
5. Remove rear wall lining and rear wall cover
6. Raise vehicle and remove engine underside guard.
7. Unclip fuel return line from the line holder on the body.
8. Detach the fuel return line.
   Press unlocking buttons and simultaneously pull off the line. Immediately seal the fuel line supports with a suitable plug.



367_96

9. Lower vehicle.
10. Remove holder for servo return line, electrical plug connection and ground strap. (Hexagon-head bolt M6 x 12)



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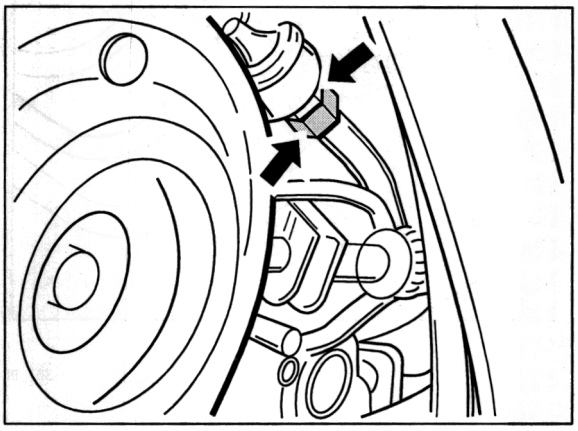
11. Undo return line (wrench size 17); simultaneously counter (wrench size 19). Remove return line.



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Installation

1. Fasten fuel return line to pressure regulator, simultaneously counter.

2. Fit holder.

3. Put on rear wall cover, rear wall lining, engine compartment lining and engine compartment lid.

4. Lift the vehicle.

5. Position fuel return line in a straight line. The plug (plug part) must audibly engage in the plug-in coupling. Then pull slightly to ensure that the connection is properly locked. Clip fuel return line onto the body.

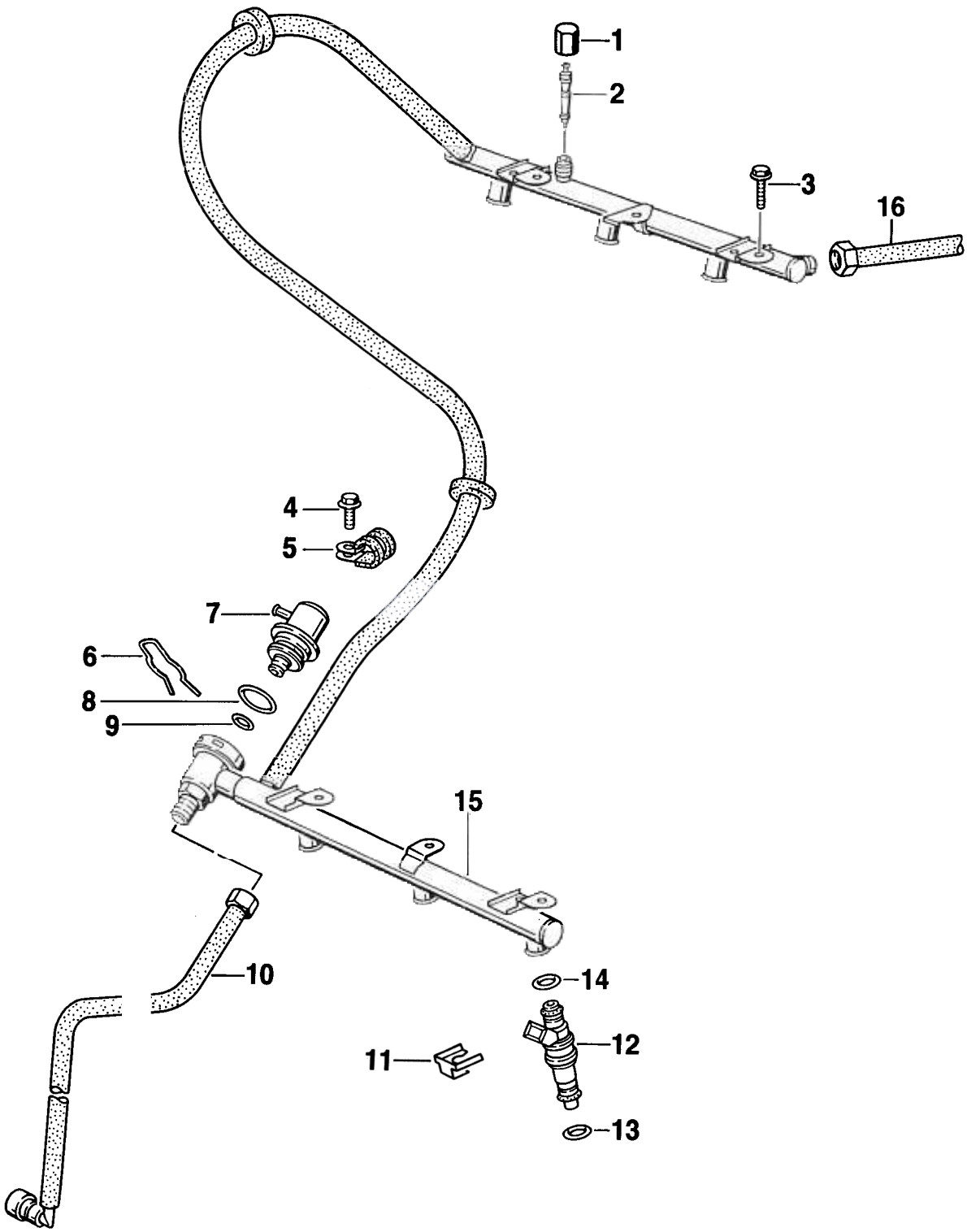
6. Connect battery, close convertible top.

7. Start engine and carry out tightness test.

8. Fit engine underside guard.

9. Read out fault memory. Enter radio code.

Disassembling and assembling fuel ring pipe



Disassembling and assembling fuel ring pipe

No.	Designation	Qty.	Removal	Note: Installation
	Closure cap	1		**Note** The seal or sealing ring in the closure cap is **not** exchangeable. It must therefore be used only **once**. Tightening torque: 2.5 ± 0.5 Nm (2 ± 0.5 ftlb.). Wrench size 13 mm.
2	Valve	1		
3	Hexagon-head bolt M6x12	4		
4	Hexagon-head bolt	1		
5	Fastening clamp for throttle cable 16x15	1		
6	Clamp	1		Ensure correct seating.
7	Pressure regulator	1		Push or plug vacuum control pipe into the left-hand intake distributor rubber sleeve (see assembly instructions).
8	O-ring 20x2.5	1		Replace
9	O-ring 5x2.5	1		Replace
10	Fuel return line M14x1.5	1	Ensure it is countered with a wrench while being loosened.	Tightening torque 25 ± 5 Nm (18 ± 3.5 ftlb.) Wrench size 17 mm. Ensure it is countered with a wrench while being tightened.
11	Clamp	6		Ensure correct seating.

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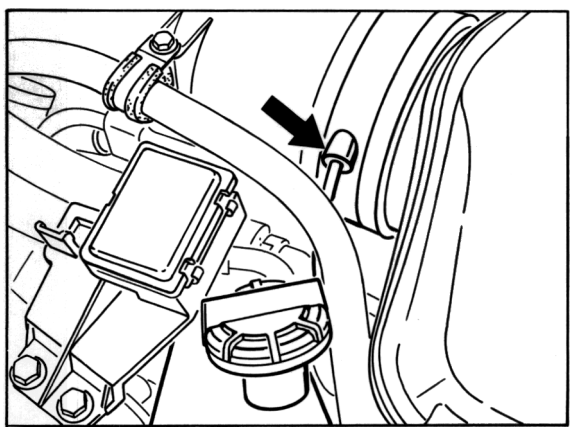
No.	Designation	Qty.	Note: Removal	Installation
12	Injection valve	6		
13	O-ring	6		Replace
14	O-ring	6		Replace
15	Fuel ring pipe	1		
16	Fuel supply line M16x1.5	1	Ensure it is countered with a wrench while being loosened.	Tightening torque: 30 + 5 Nm (22 + 3.5 ftlb.). Wrench size 19 mm. Ensure it is countered with a wrench while being tightened!

Assembly instructions

Fitting vacuum control pipe on the intake distributor

Mount the vacuum control pipe between fuel pressure regulator and intake distributor at the left-hand rubber sleeve. Route the vacuum control pipe so it is tension-free.



375-96

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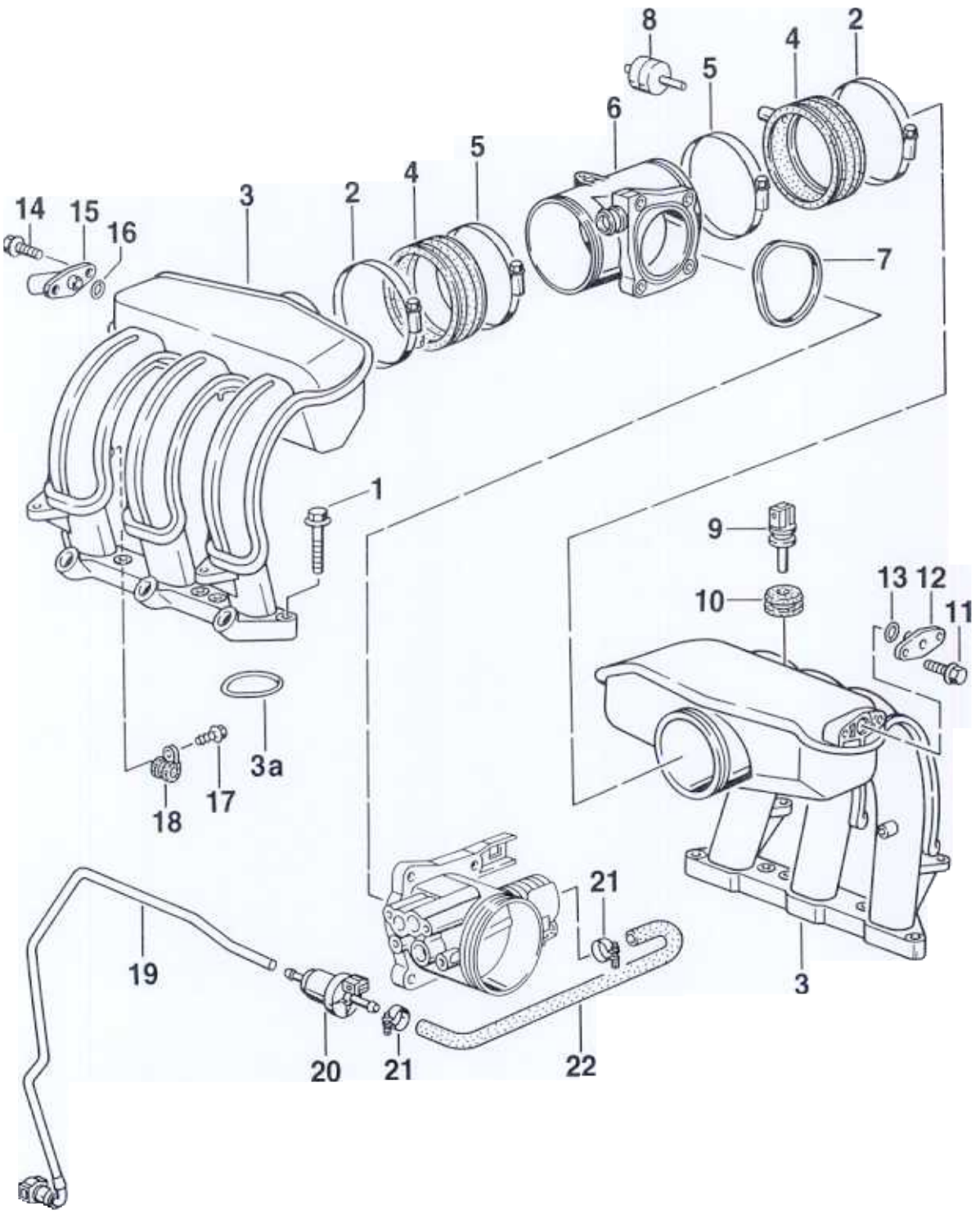
Disassembling and assembling intake distributor



Disassembling and assembling intake distributor

No.	Designation	Qty.	Removal / Installation Note:
1	Hexagon-head bolt 6x35	12	Tightening torque: 10 Nm (7 ftlb.)
2	Hose clamp 90-110/9	2	
3	Intake distributor	2	
3a	O-ring 48x3	6	
4	Rubber sleeve	2	Connecting bores for vacuum control pipes face the front (in direction of travel).
5	Hose clamp 90-110/9	2	
6	Intermediate piece	1	
7	Sealing ring	1	Replace
8	Check valve	1	Ensure correct installation position. Assemble with black side facing rubber sleeve (see assembly instructions).
9	Temperature sensor for intake air	1	
10	Grommet	1	
11	Hexagon-head bolt 6.0x18	2	
12	Closure cap	1	
13	O-ring 11x2.5	1	Replace
14	Hexagon-head bolt 6.0x18	2	
15	Adapter	1	
16	O-ring 11x2.5	1	Replace
17	Hexagon-head bolt	1	

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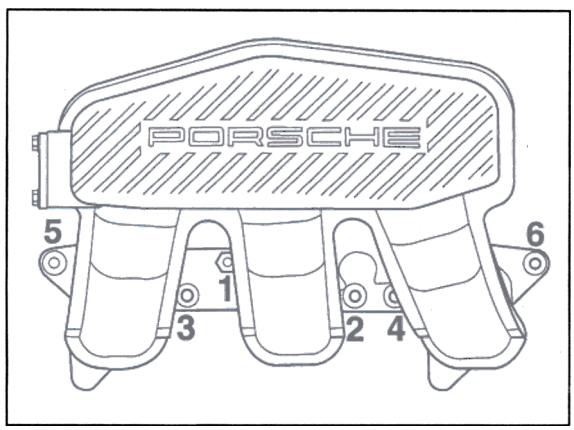
No.	Designation	Qty.	Removal	Note: Installation
18	Fastening clamp for vent line	1		
19	Vent line	1		
20	Tank venting valve	1		
21	Hose clamp 8-16/9	1		

Assembly instructions

Assembling intake distributor

Tighten the micro-encapsulated hexagon-head bolts M6 x 16 in the prescribed sequence.
Tightening torque 9.7 Nm (7 ftlb.).



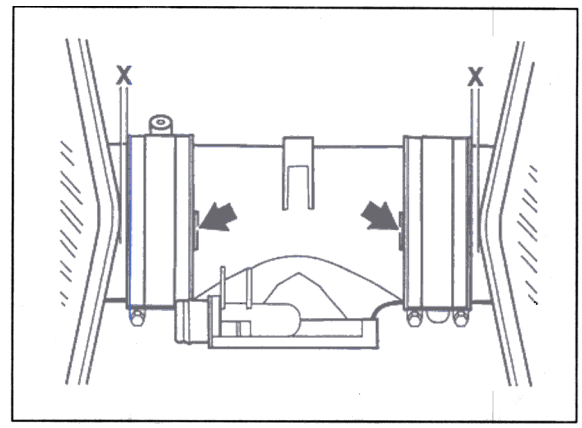
182 - 97

Aligning rubber sleeves between distributor pipe and intake distributors.

Line up the rubber sleeves with the markings (arrows) and tighten the **inner** hose clamps.

Push the distributor pipe between the intake distributors and align so that the dimension "X" is the same on both right and left. Tighten the **outer** hose clamps.

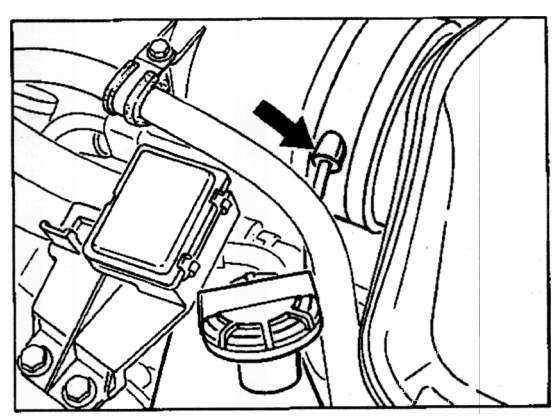
Secure the support between the throttle body and crankcase.



171 - 97

Fitting vacuum control pipe on the intake distributor

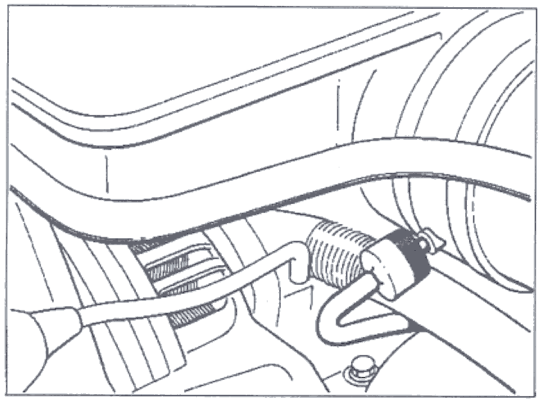
Mount the vacuum control pipe between the fuel pressure regulator and the intake distributor at the left-hand rubber sleeve. Route the vacuum control pipe so that it is tension-free.



375-96

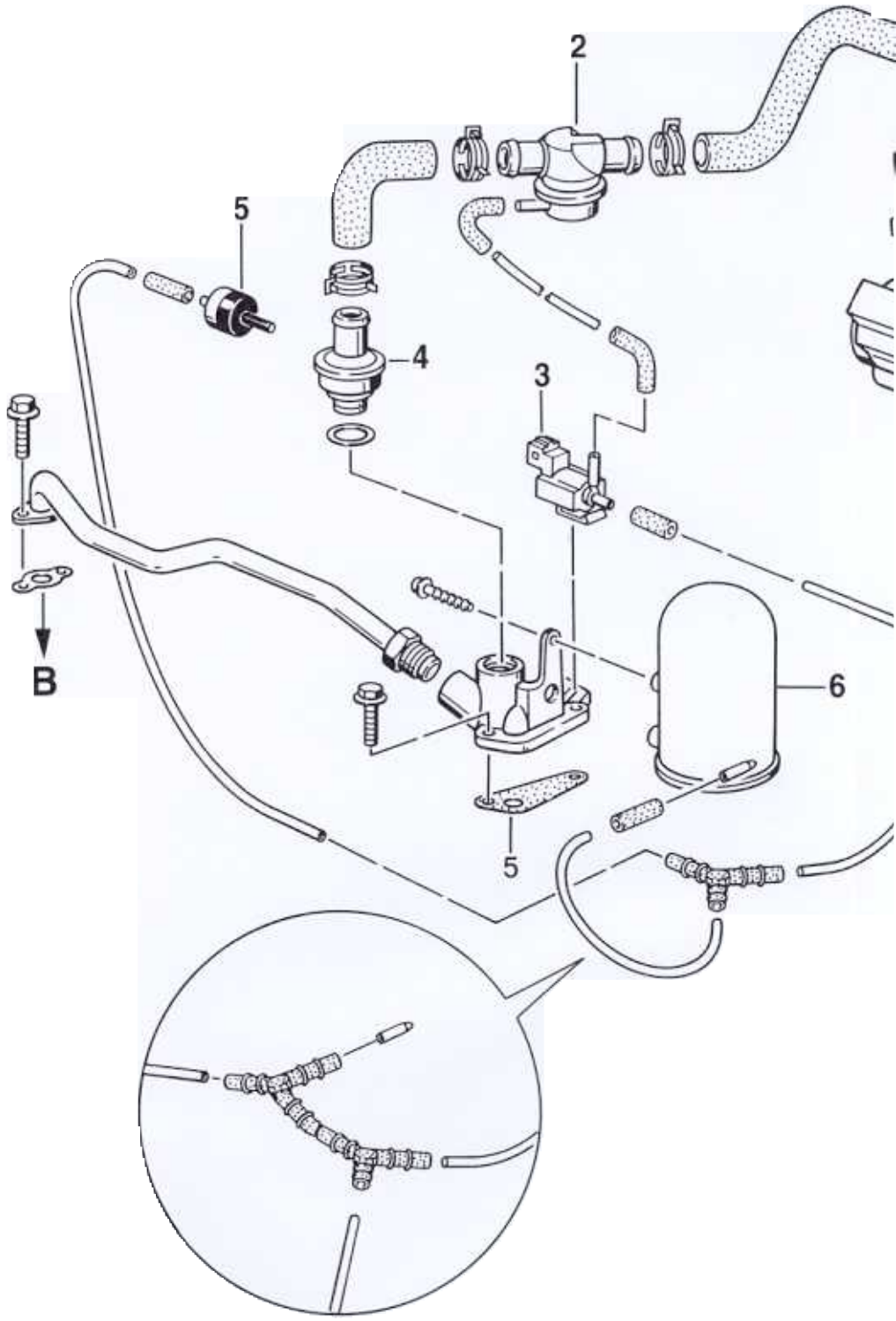
Fitting check valve on intake distributor.

The black side of check valve must face rubber sleeve. Lay vacuum hose tension-free.



377-96

24 Diagram of hose connections: air injection



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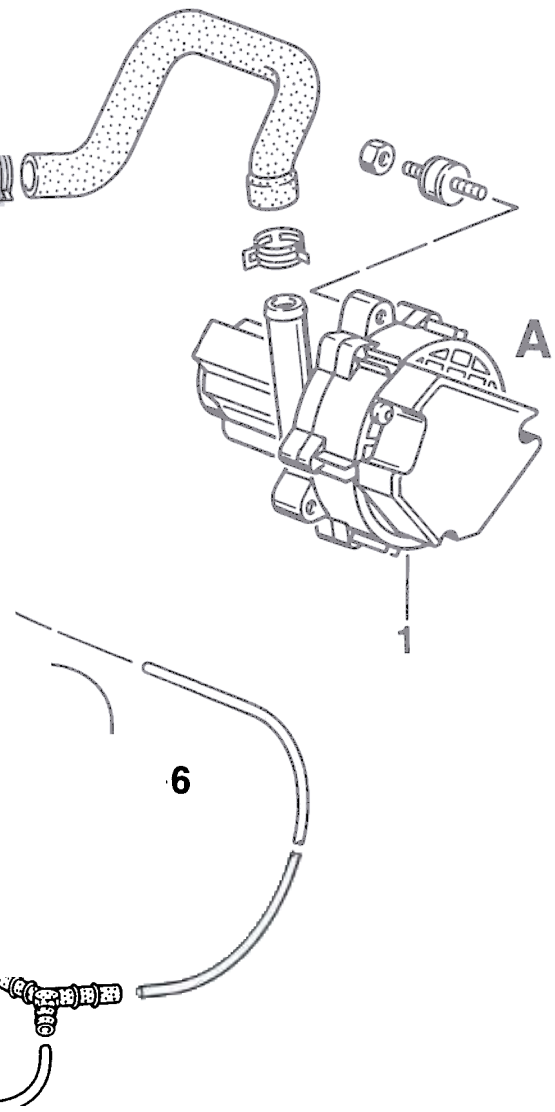
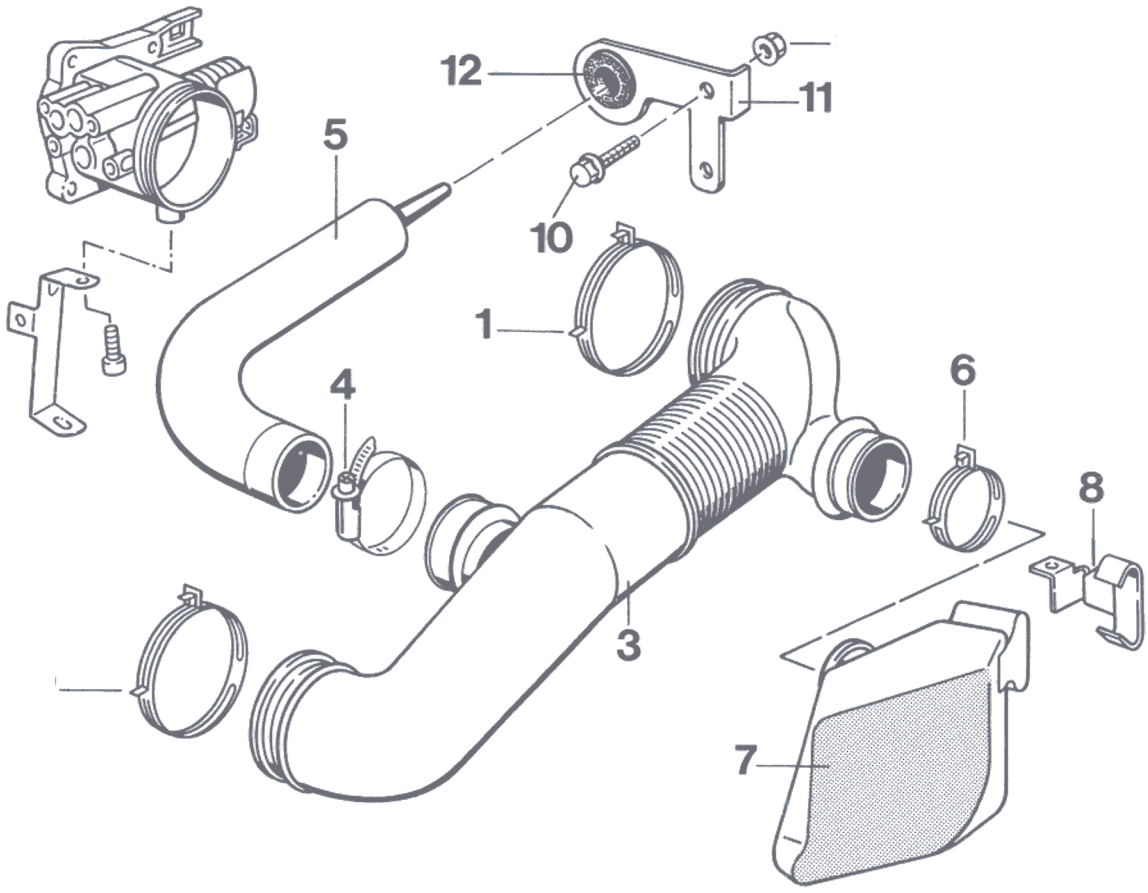


Item		Designation
1	=	Secondary air pump
2	=	Pneumatic anti-run-on valve
3	=	Electronic switch-over valve for secondary air
4	=	Check valve
5	=	Vacuum reservoir
6	=	Check valve
A		Intake air from engine compartment
B	->	to camshaft housings / cylinder heads
C	->	to intake distributor
D	->	to vacuum reservoir

381-96

Disassembling and assembling air guide cowl



Disassembling and assembling air guide cowl

No.	Designation	Qty.	Note: Removal	Installation
1	Hose clamp 86 x 12	1		
2	Hose clamp 86 x 12	1		
3	Intake cowl	1		
4	Hose clamp	1		Tighten only after intake cowl has been fastened
5	Resonance tube (only on vehicles with Tiptronic)	1		
6	Hose clamp 53 x 12	1		
7	Silencer with plastic damping film	1		
8	Holder	1		
9	M6 hexagon nut	1		
10	Combination screw M6 x 15 (micro-encaps.)	1		
11	Holder for resonance tube	1		
12	Rubber sleeve			

Printed in Germany – 6, 1996 9862415

2470 Programming DME control module

General

When a DME control module is replaced, the new DME control module must be programmed. This sets the new DME control module to the catalytic converter version installed, among other things.

Four catalytic converter versions are available in the Porsche System Tester 2:

1. OBD II control module (W-range)

2. RoW control module (bi-metal catalytic converter)

3. OBD II control module (V-range)

4. OBD II control module (tri-metal catalytic converter, X-range)

Note:

The OBD II control modules (V, W or X-range) are installed in **USA vehicles**.

Work preparation

The following vehicle data must be provided before programming of the new DME control module can begin:

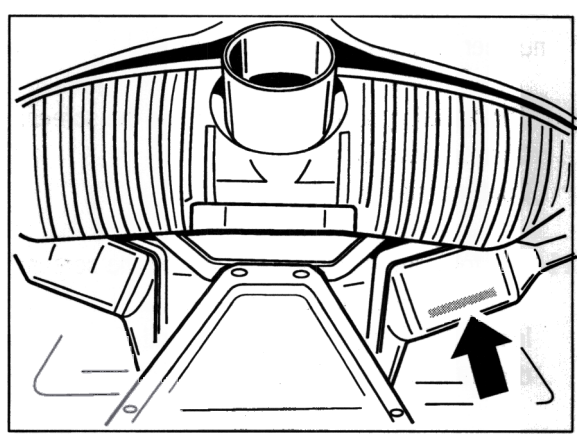
Vehicle Ident. No.

Catalytic converter Item No. corresponding to the catalytic converter version used

DME and immobilizer programming codes (from the Porsche IPAS system)

With the information about the *Vehicle Ident. Number* and *catalytic converter item number*, the associated programme can be selected from the allocation table.

Figure 308_98 shows where the catalytic converter item number can be found on the vehicle.



Catalytic converter item number 308_98

Programming

1. Connect and switch on the Porsche System Tester 2 and switch on the ignition.
2. Select **Boxster** in the *Vehicle type* menu.
3. Select **DME** in the *Control unit* menu and press the double arrow key [>>].
4. Select *Program control unit* in the *DME function selection* menu and press the double arrow key [>>].

5. Select "Read control units" and press the double arrow key [>>].

6. Install new DME control module.

7. Select **Program control unit** in the *Control unit programming* menu and press the double arrow key [>>].

8. Ensure that all requirements requested on the screen are fulfilled and then press the double arrow key [>>].

9. The following message appears on the screen: "Input Vehicle Ident. Number".
   Use the double arrow key [>>] to accept the number displayed on the screen.

10. The following message appears on the screen: *"Please confirm input"*
    Confirm input with the [F7] key.

11. The following message appears on the screen: *"Input old DME programming code"*
    Input DME programming code and press the double arrow key [>>].

12. The following message appears on the screen: *"Please confirm input"*
    Confirm input with the [F7] key.

13. The following message appears on the screen: *"Input new programming code"*
    Input new DME programming code and press the double arrow key [>>].

14. The following message appears on the screen: *"Please confirm input"*
    Confirm input with the [F7] key.

15. The following message appears on the screen: *Input new immobilizer code"*
    Input immobilizer code and press the double arrow key [>>].

16. The following message appears on the screen: *"Please confirm input"*
    Confirm input with the [F7] key.

17. The following message appears on the screen: *"Select data record "*
    Select data record according to the allocation table and press the double arrow key [>>].

The control module will now be programmed. Programming will take approx. 5 minutes.

Warning:

> Never interrupt the programming process

18. The following message will appear after the programming time has elapsed: *"Programming was completed successfully"*
    Press the double arrow key [>>], switch the ignition off and then on again.

This completes programming of the DME control module.

Warning:
Risk of damage if allocation is incorrect!

> Ensure correct allocation of the data record in the control module to the installed catalytic converter (refer to the allocation table).

Catalytic converter version	Vehicle Ident. Number	Catalytic converter item number
OBD II control module (**V**-range)	WP0xx**2**xxx**V**xxxxxxx	996.113.031.06 996.113.032.06
RoW control module (bi-metal catalytic converter)	WP0**ZZZ**xxx**V**xxxxxxx	996.113.021.06 996.113.022.06 996.113.921.01 996.113.922.01
RoW control module (bi-metal catalytic converter)	WP0**ZZZ**xxx**W**xxxxxxx	996.113.021.08 996.113.022.08 996.113.021.09 996.113.022.09 996.113.921.01 996.113.922.01
OBD II control module (**W**-range)	WP0xx**2**xxx**W**xxxxxxx	996.113.021.05 996.113.022.05 996.113.021.06 996.113.022.06 996.113.021.08 996.113.022.08 996.113.021.09 996.113.022.09
RoW control module (tri-metal catalytic converter, **X**-range)	WP0**ZZZ**xxx**X**xxxxxxx	996.113.021.10 996.113.022.10
OBD II control module (tri-metal catalytic converter, **X**-range)	WP0xx**2**xxx**X**xxxxxxx	996.113.021.10 996.113.022.10 996.113.931.00 996.113.932.00

Allocation table

Printed in Germany - 21, 1998 9862419

Information:

The DME control module can also be reprogrammed using the Porsche System Tester 2.
In this case, the old data record will be overwritten by a new record.

Program map/data must be selected in Step 7 if reprogramming is necessary.

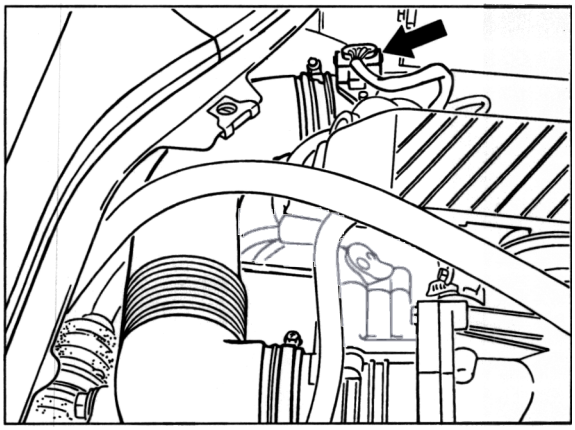
24 45 19 Removing and installing mass air flow sensor

Removal

1. Move convertible top or convertible top compartment lid to service position.

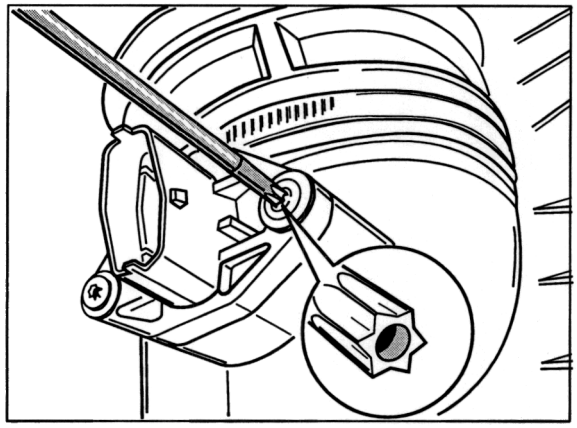
2. Remove linings for convertible top rest and engine compartment lid.

3. Pull off electrical plug connection on the mass air flow sensor.



412_98

4. Undo oval-head screws with a commercially available Torx T 20 tool (with a bore in the drive tip).



406_98

Installation

1. Fit mass air flow sensor with seal and fasten with 5.0 x 20 oval-head screws.
   Tightening torque 3 - 4 Nm (2.0 - 3.0 ftlb).

2. Check whether a seal is present and the sensor is seated correctly. Fit plug.

3. Fit lining and engine compartment lid.

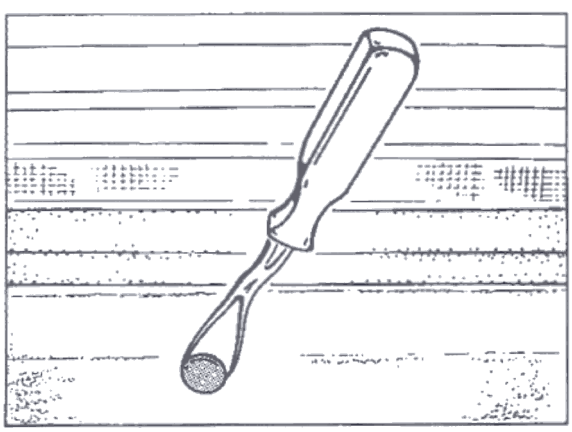
Printed in Germany - 23, 1998 9862423

24 70 19 Removing and installing DME control unit

Removal

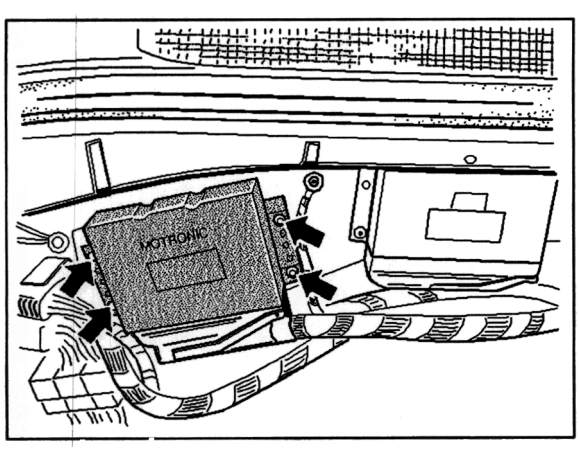
1. Put rear body-protection cover on the vehicle.

2. Press off expanding rivets of the luggage compartment lining with a removal tool (refer to Technical Equipment Manual, Chapter 2.4, No. 21).



459_96

3. Undo four hexagon nuts (wrench size 10 mm).



330_98

4. Take off control module.
   Open locking clip and pull the control module connector off.

Installation

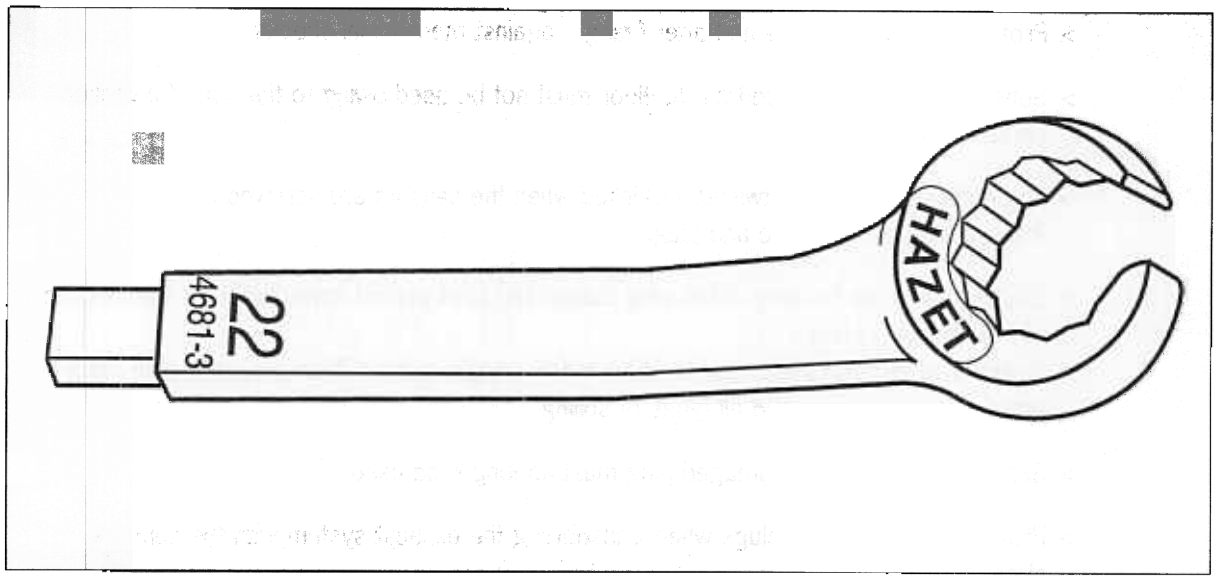
1. Engage control module connector in the control module guide and press and lock the plug onto the terminal strip.

2. Fasten the control module.
   Tightening torque 10 Nm (7.5 ftlb.).

3. Fit luggage compartment lining.

24 69 19 Removing and installing oxygen sensor

Tools



410_98

Item	Designation	Special tool	Explanation
	Open-end ring wrench (angled)	Commercially available	Refer to Workshop Equipment Manual, Chapter 2.4, No. 98

Warning
Oxygen sensor can be damaged if handled improperly.

> Do not remove the plastic cap on the thread until just prior to fitting the oxygen sensor. The thread grease must under no circumstances come into contact with the plug.

> Protect sensors – before and after fitting – against mechanical shocks.

> Sensors that were dropped on the floor must not be used owing to the risk of a broken ceramic insulator.

> The cables must not be twisted or kinked when the sensors are screwed in. Avoid pulling on the cable and plug.

> Cleanliness in the housing of the plug connection is of utmost importance for the function of the oxygen sensor.
Particles of dirt can impair the function of the oxygen sensor. Therefore, the plug must be protected against any and all types of soiling.

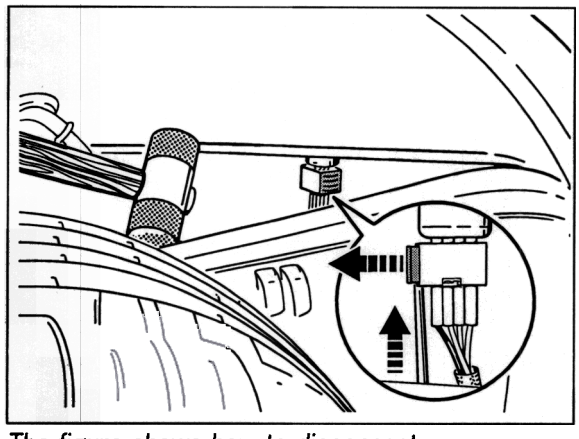
> Sensors with soiled or damaged plug must no longer be used.

> Protect the cables and plugs when transporting the exhaust system with the sensors already fitted.

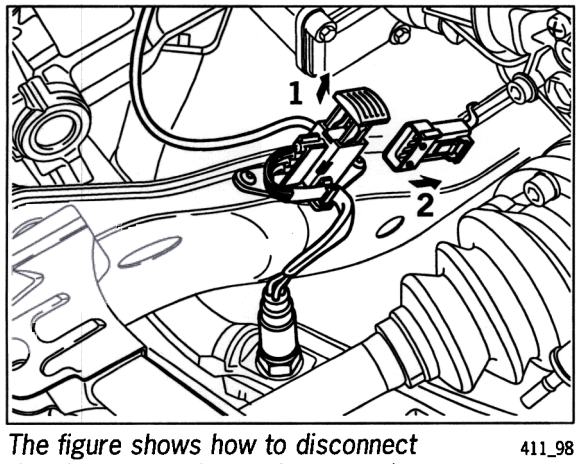
> High-pressure cleaning equipment must not be used in the area of the sensors and plug connections.

Removal

1. Disconnect the electrical plug connection of the oxygen sensors.

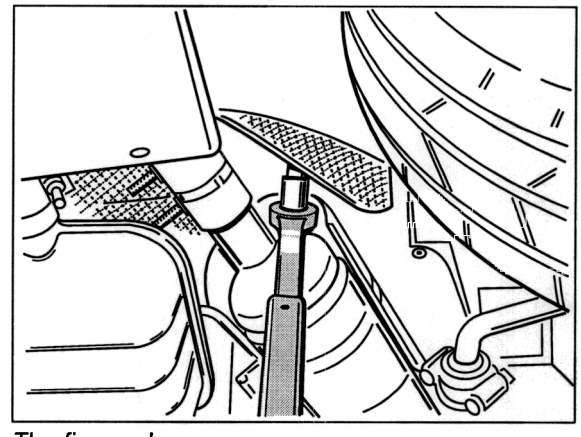


The figure shows how to disconnect the plug connection to the oxygen sensor behind the catalytic converter, cylinder bank 4 - 6 328_98



The figure shows how to disconnect the plug connection at the rear-axle support for the oxygen sensor ahead of the catalytic converter, cylinder bank 4 - 6. 411_98

2. Undo oxygen sensor using the specified ring wrench (wrench size 22 mm).



The figure shows oxygen sensor behind the catalytic converter, cylinder bank 1 - 3. 347_98

Installation

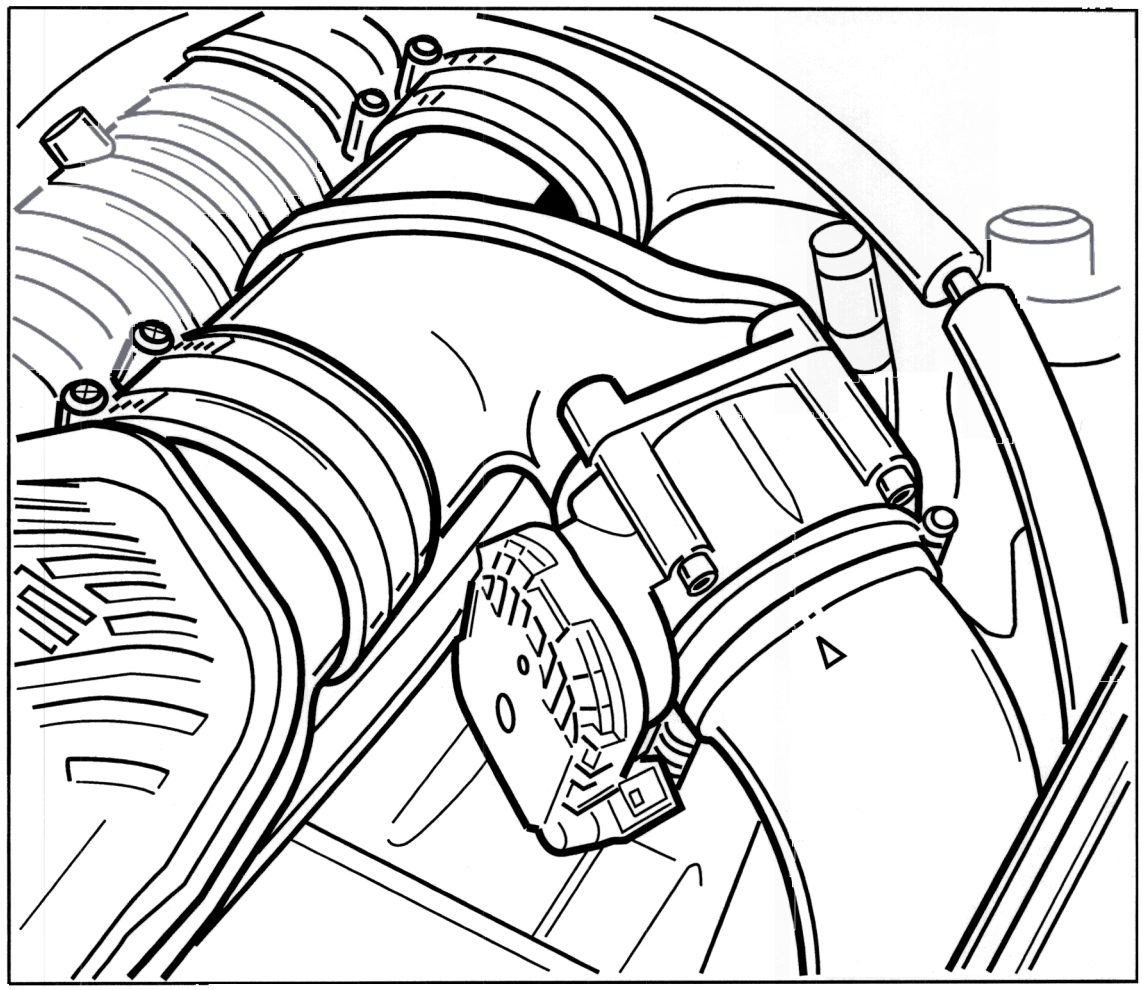
1. Screw in the oxygen sensor whilst simultaneously turning the cable with it. Tightening torque: 50 - 60 Nm (37 - 44 ftlb.)

Note

Different tightening torque if the specified special tool is used.
Tightening torque: **38 - 46 Nm (28 - 34 ftlb.)**

Printed in Germany - 23, 1998 9862427

24 42 19 Removing and installing throttle body – Boxster S



24400011

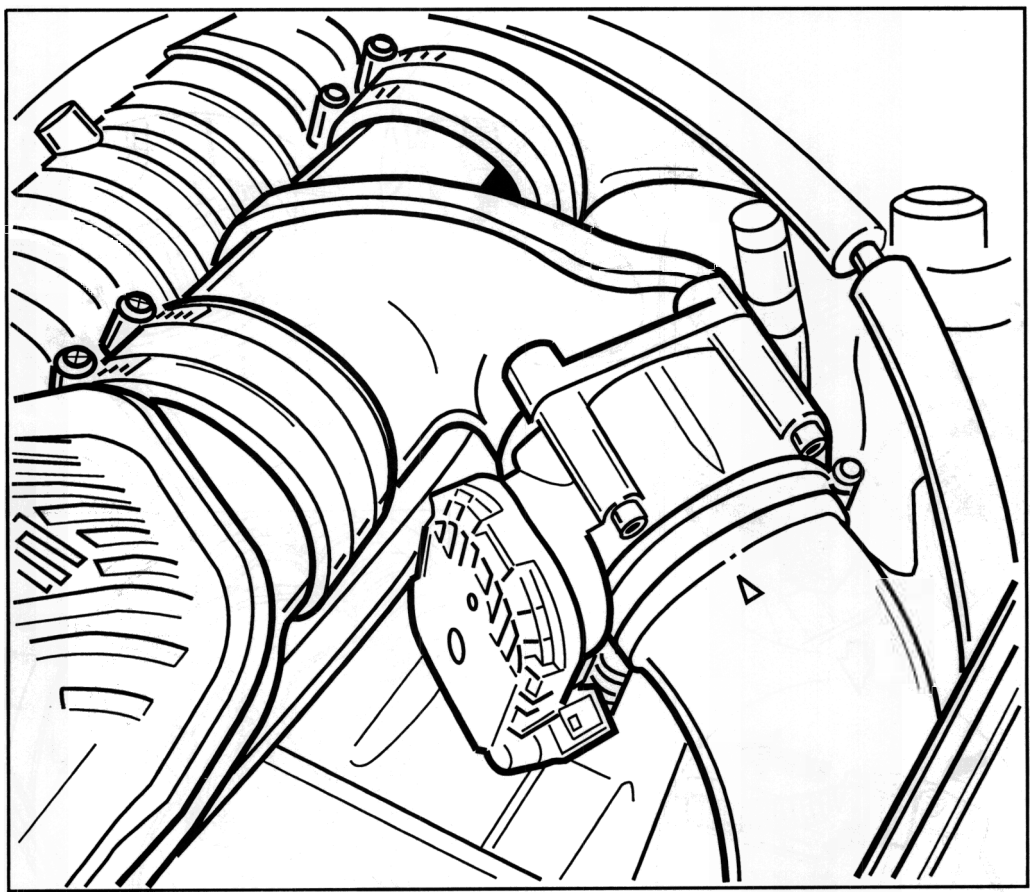
Includes:

24 42 21 Removing throttle body – Boxster S

24 42 23 Installing throttle body – Boxster S

Printed in Germany - 30, 1999 9862431

24 42 21 Removing throttle body – Boxster S



24400011

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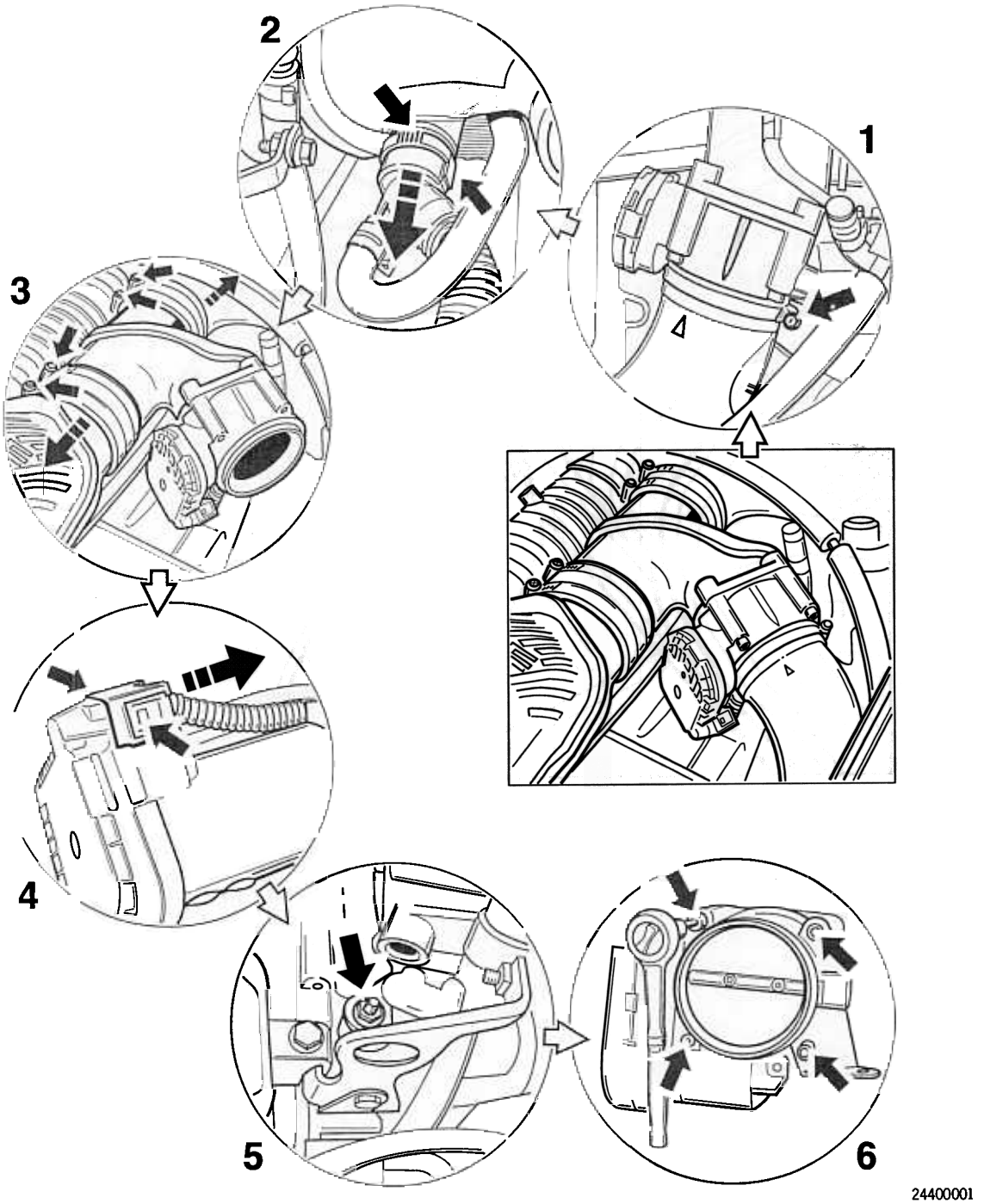
Removing throttle body – Boxster S

Removal overview:



Removing throttle body – Boxster S

1 Undoing intake manifold

2 Removing crankcase venting

3 Removing rubber sleeve

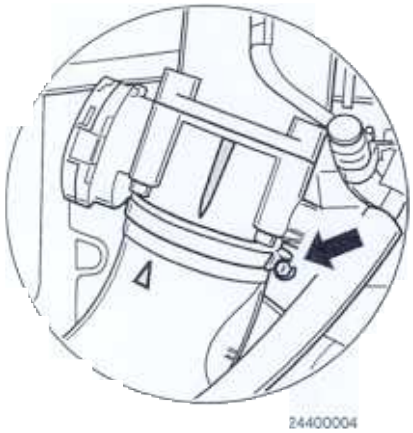
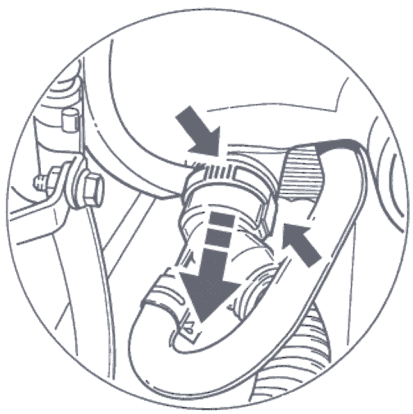
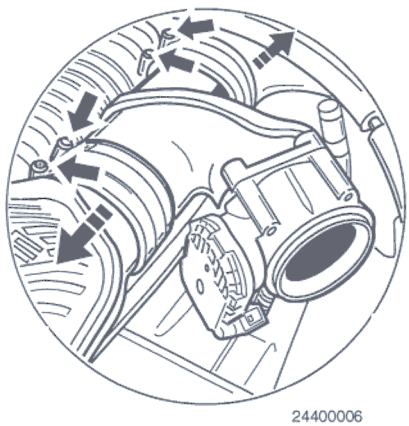
4 Disconnecting electric plug

5 Undoing throttle body holder

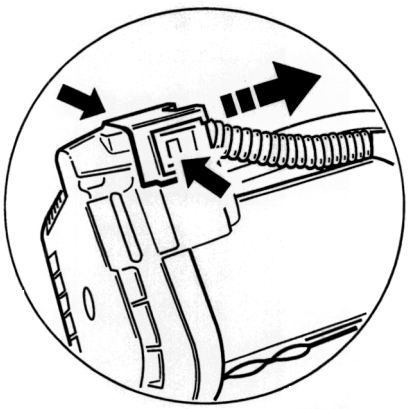
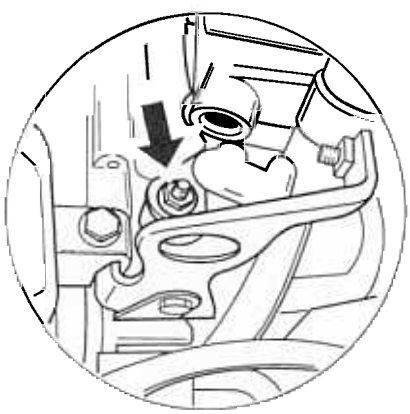
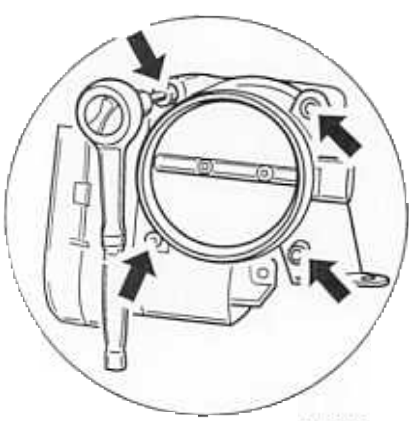
6 Removing throttle body from flange

Printed in Germany - 30, 1999 9862433

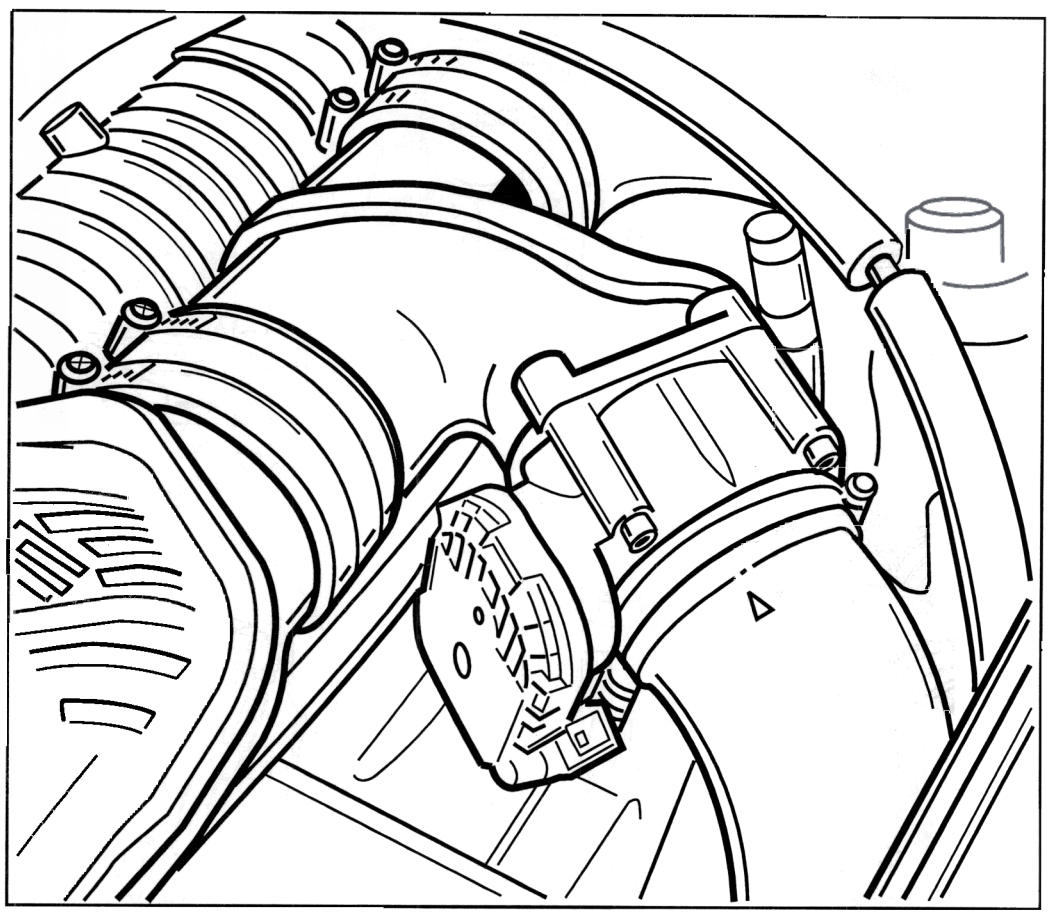
Removing throttle body – Boxster S

No.	Procedure	Instructions
1	 24400004	Undoing intake manifold Open the hose clamp on the throttle body. Pull off the connection hose between the air cleaner housing and the throttle body and put it aside.
2	 24400005	Removing crankcase venting Remove the crankcase venting on the throttle body. To do this, push the connecting plug on the grooved surfaces together and pull off simultaneously.
3	 24400006	Removing rubber sleeve Undo the two rubber sleeves on the centre part of the intake distributor and push outwards.

Removing throttle body – Boxster S

No.	Procedure	Instructions
4	 24400007	Disconnecting electric plug Disconnect the electric plug on the throttle body. To do this, gently push plug on the left and right and remove.
5	 24400008	Undoing throttle body holder Unscrew the fastening nuts on the throttle body holder and take the throttle body and the centre part of the intake distributor out of the engine compartment.
6	 24400009	Removing throttle body from flange Unscrew the four fastening screws on the throttle body and remove the throttle body. Do not use the moulded rubber seal again.

24 42 23 Installing throttle body – Boxster S

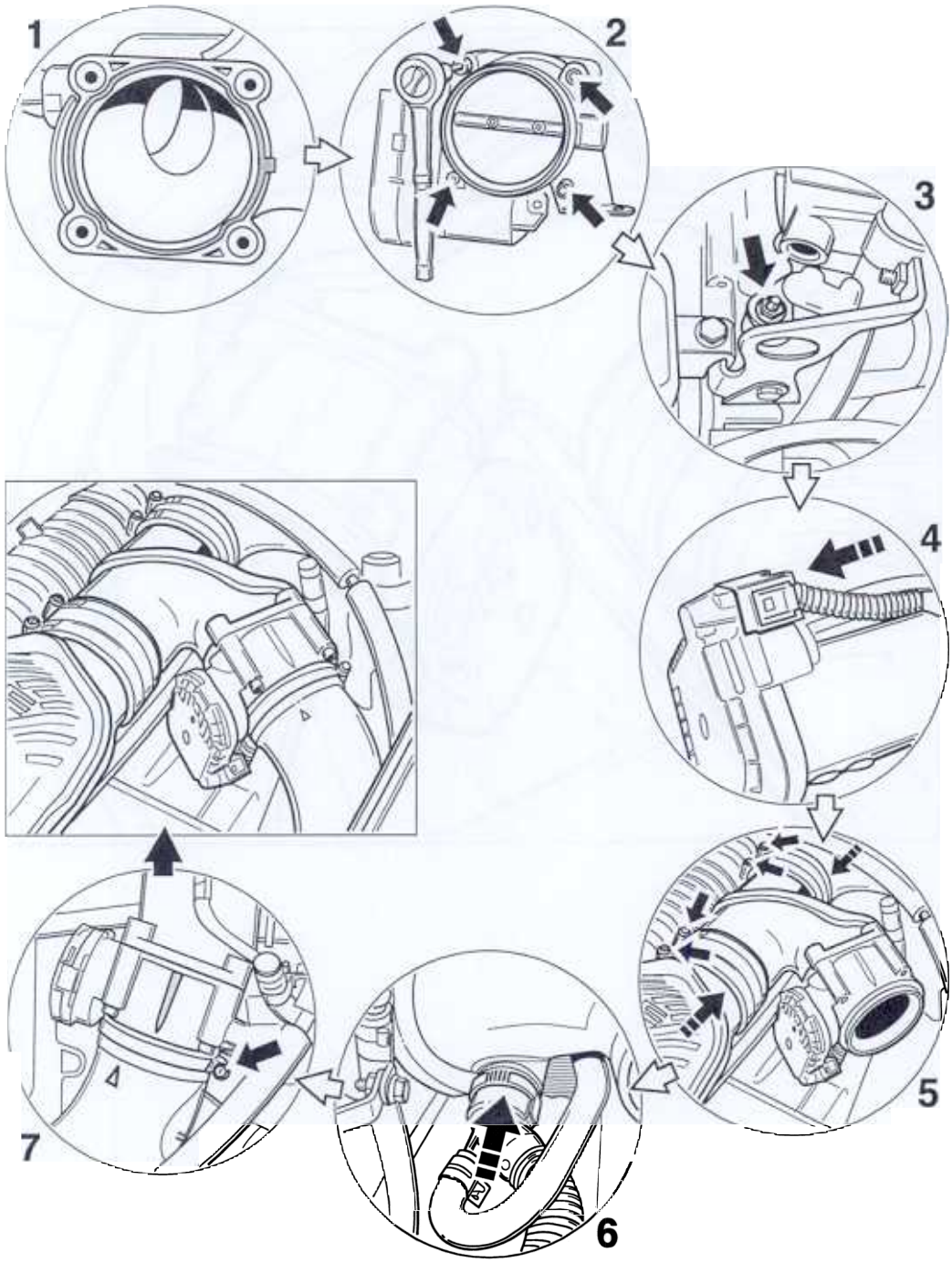


24400011

Printed in Germany - 30, 1999 9862439

Installing throttle body – Boxster S

Installation overview:



24400012

Installing throttle body – Boxster S

1 Replacing seal

2 Fitting throttle body

3 Tightening throttle body holder

4 Securing rubber sleeve

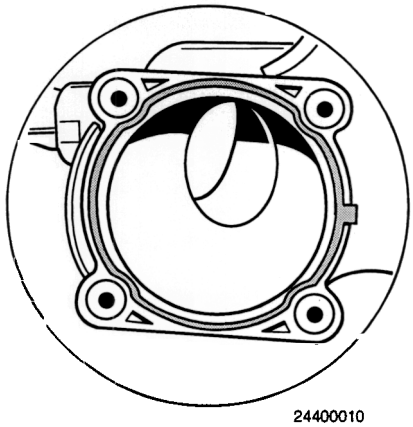
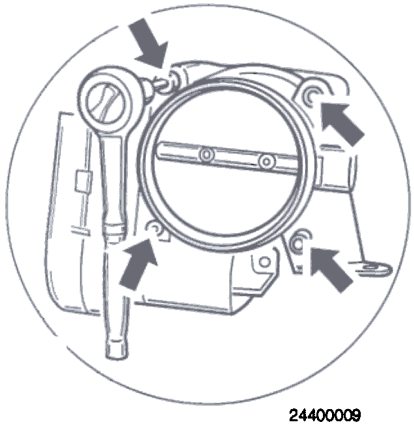
5 Connecting electric plug

6 Putting on crankcase venting

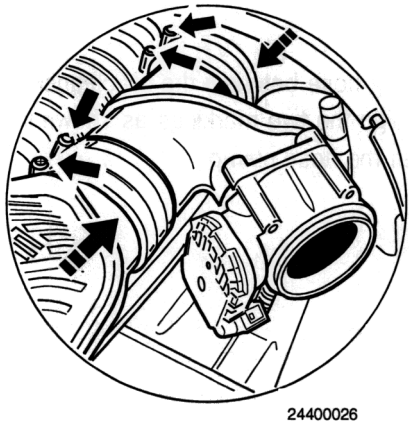
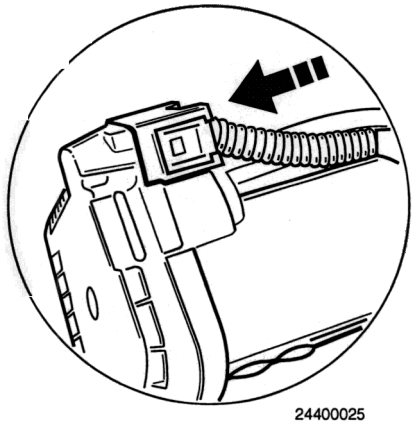
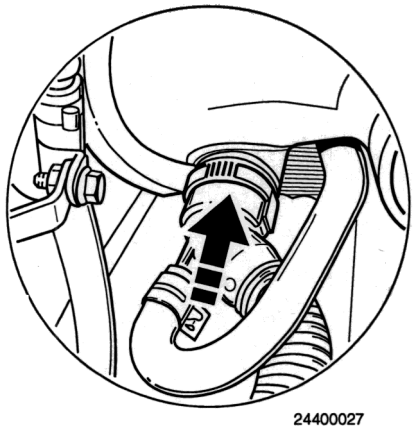
Fastening intake hose

Printed in Germany - 30, 1999 9862439

Installing throttle body – Boxster S

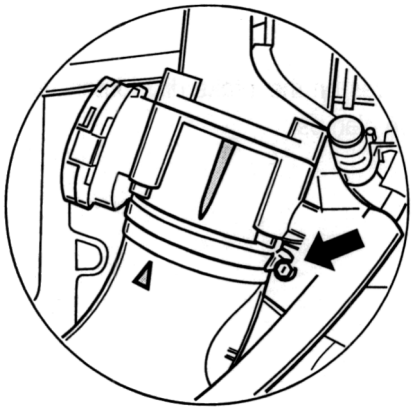
No.	Procedure	Instructions
	 24400010	Replacing seal Replace the moulded rubber seal between the centre part of the intake distributor and the throttle body. When inserting the seal, make sure that the lug on the seal is located in the groove provided.
2	 24400009	Fitting throttle body Lay the throttle body holder on the right hand side of the throttle body. Screw in the four fastening screws and tighten to 9.7 Nm (7.0 ftlb.).
3	 24400008	Tightening throttle body holder Place the throttle body with the centre part of the intake distributor into the engine compartment. Push on the rubber sleeves and tighten the fastening nuts on the throttle body holder to 9.7 Nm (7 ftlb.).

Removing throttle body – Boxster S

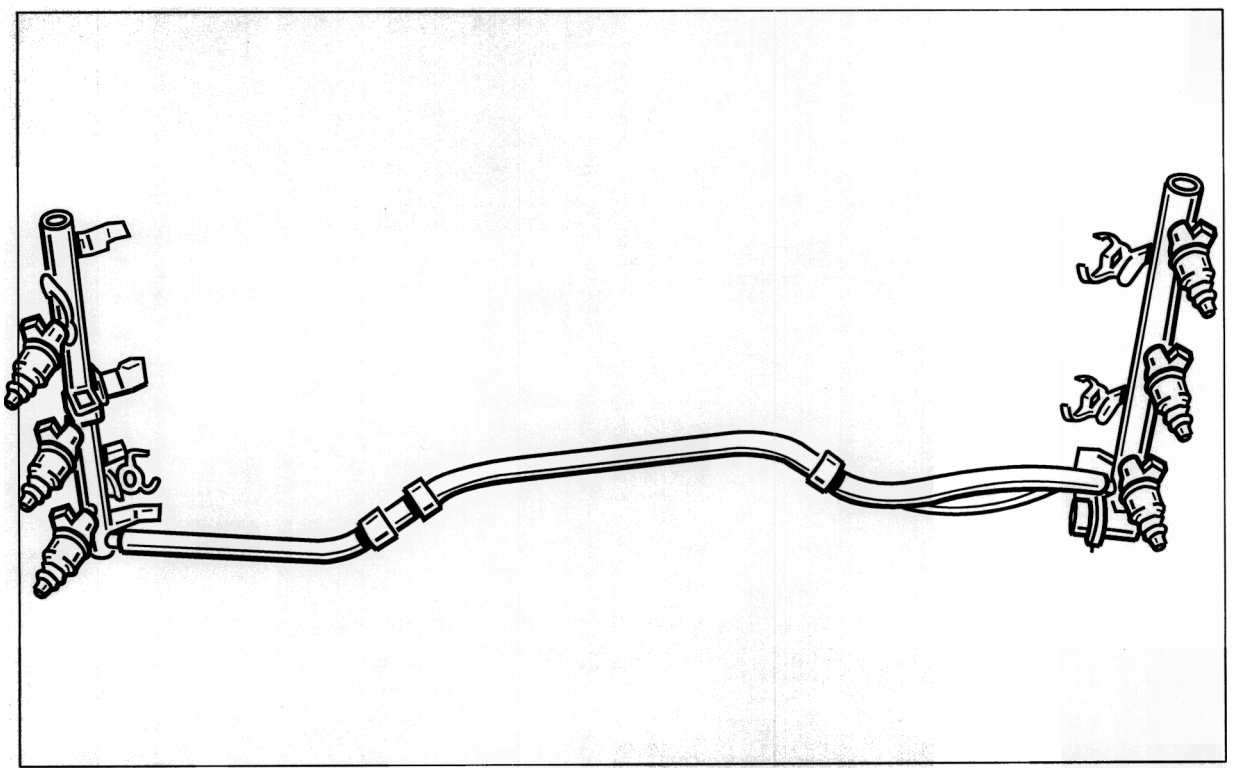
No.	Procedure	Instructions
4	 24400026	Securing rubber sleeves Align the rubber sleeves on the intake distributor and tighten the four hose clamps.
5	 24400025	Connecting electric plug Connect the electric plug on the throttle body again. The plug must audibly engage.
6	 24400027	Putting on crankcase venting Put the crankcase venting back onto the centre part of the intake distributor. The plug must audibly engage.

Printed in Germany - 30, 1999 9862439

Installing throttle body – Boxster S

No.	Procedure	Instructions
7	 24400004	Fastening intake hose Put on the connecting hose between the air cleaner and the throttle body. Align the two markings as shown in the diagram and tighten the hose clamp.

24 40 20 Removing and installing injection valves – Boxster S



2440001

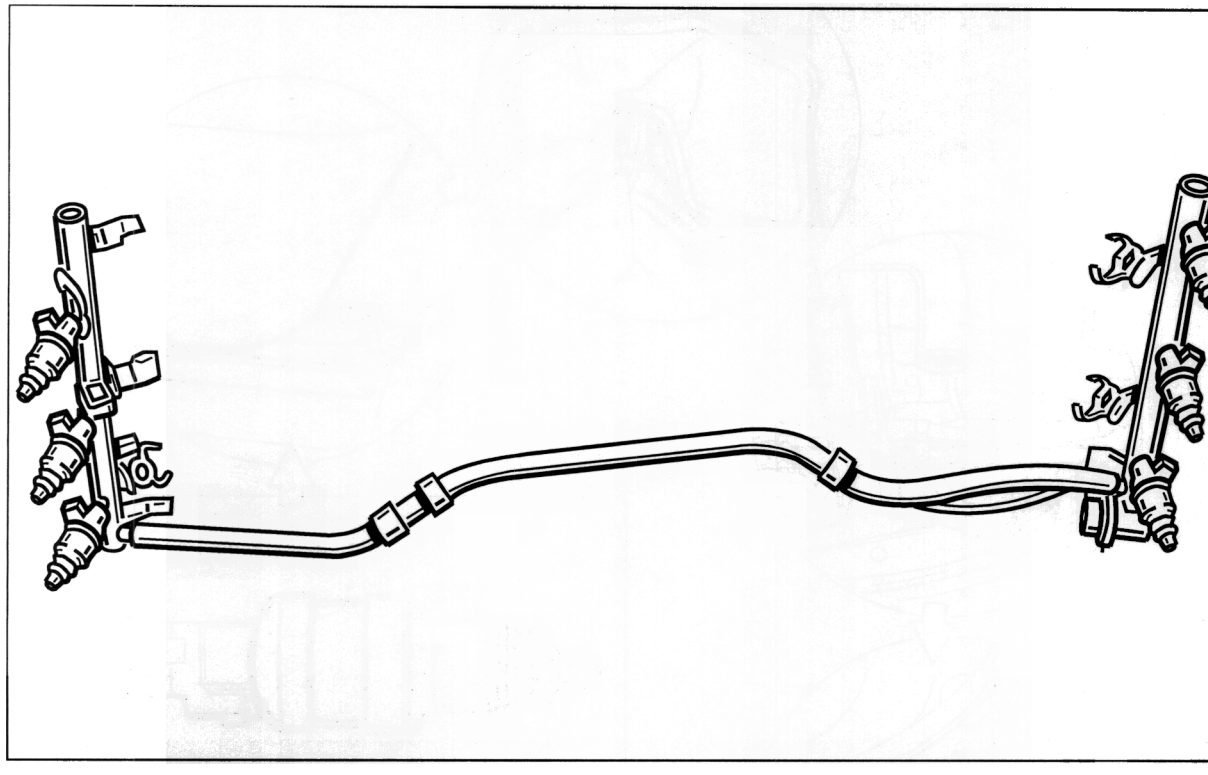
Includes:

24 40 22 Removing injection valves – Boxster S

24 40 24 Installing injection valves – Boxster S

Printed in Germany - 30, 1999 9862447

24 40 22 Removing injection valves – Boxster S

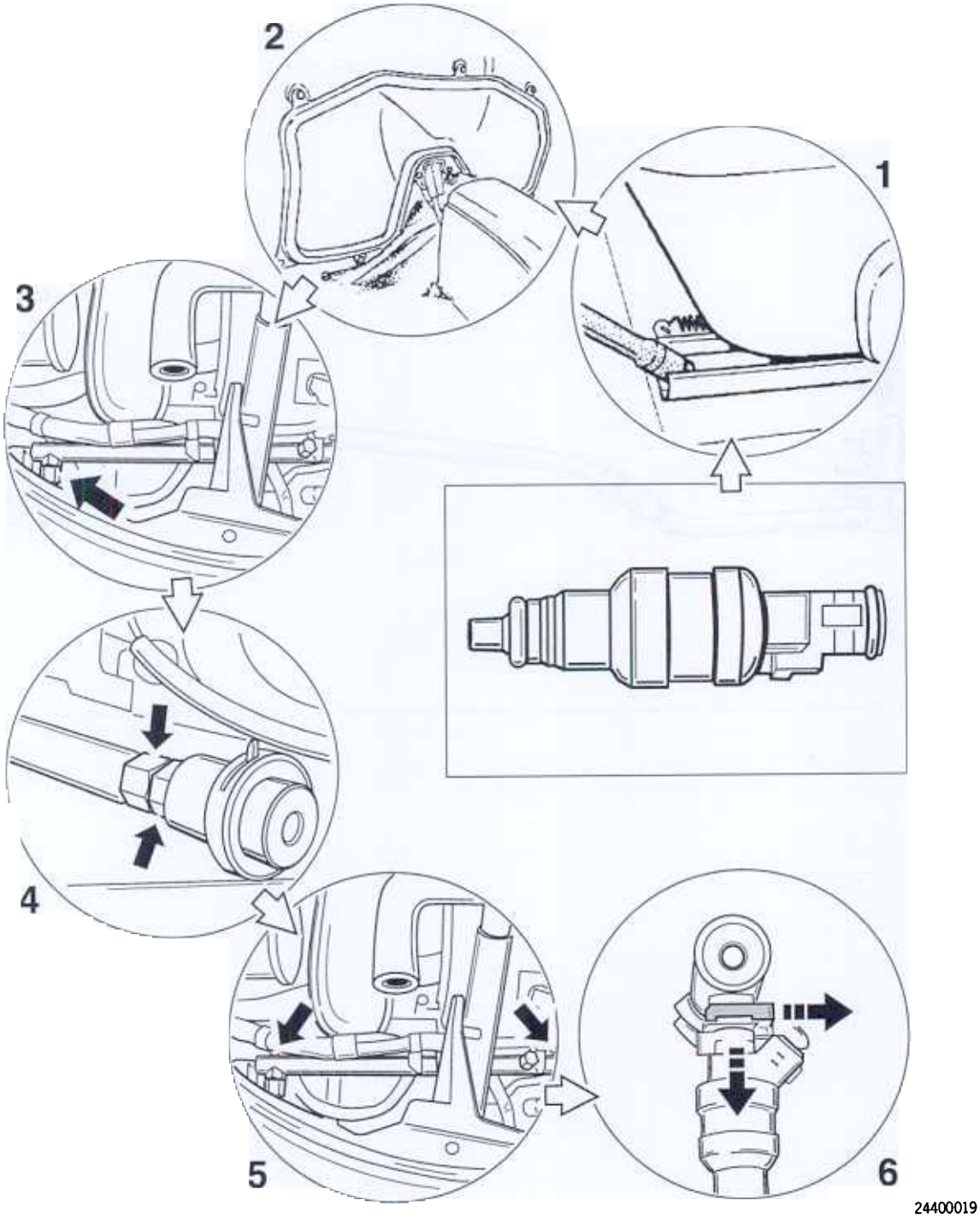


24400013

Printed in Germany - 30, 1999 9862449

Removing injection valves – Boxster S

Removal overview:



24400019

Removing injection valves – Boxster S

Removal overview:

1 Removing passenger's seat

2 Opening maintenance cover

3 Removing fuel line on pressure regulator

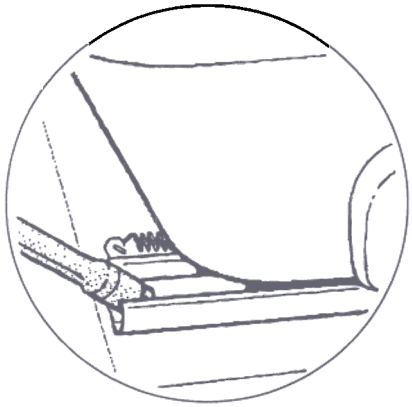
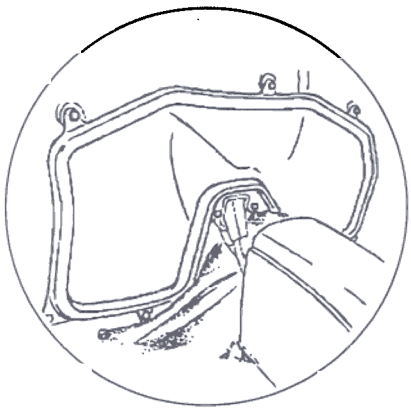
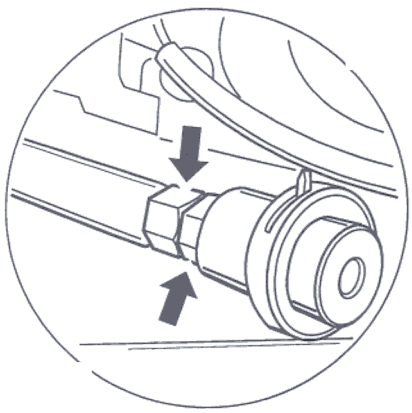
4 Undoing fuel return line

5 Unscrewing fastening screws

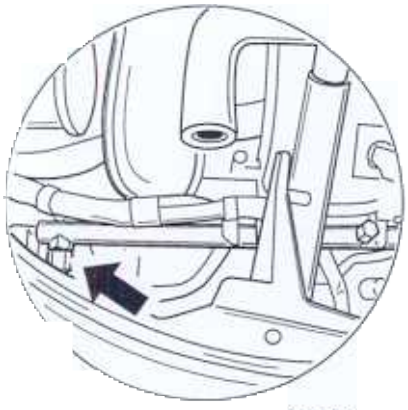
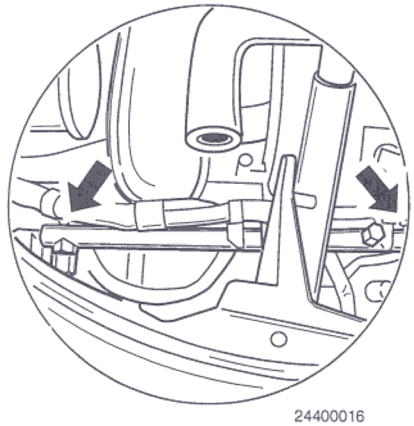
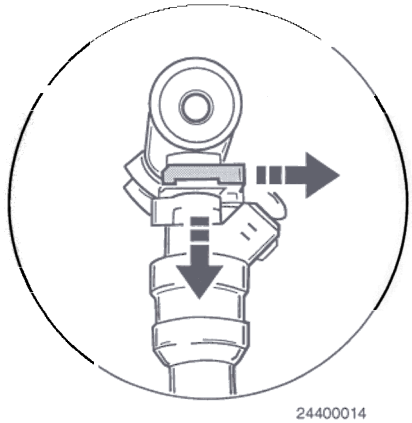
6 Removing injection valves

Printed in Germany - 30, 1999 9862449

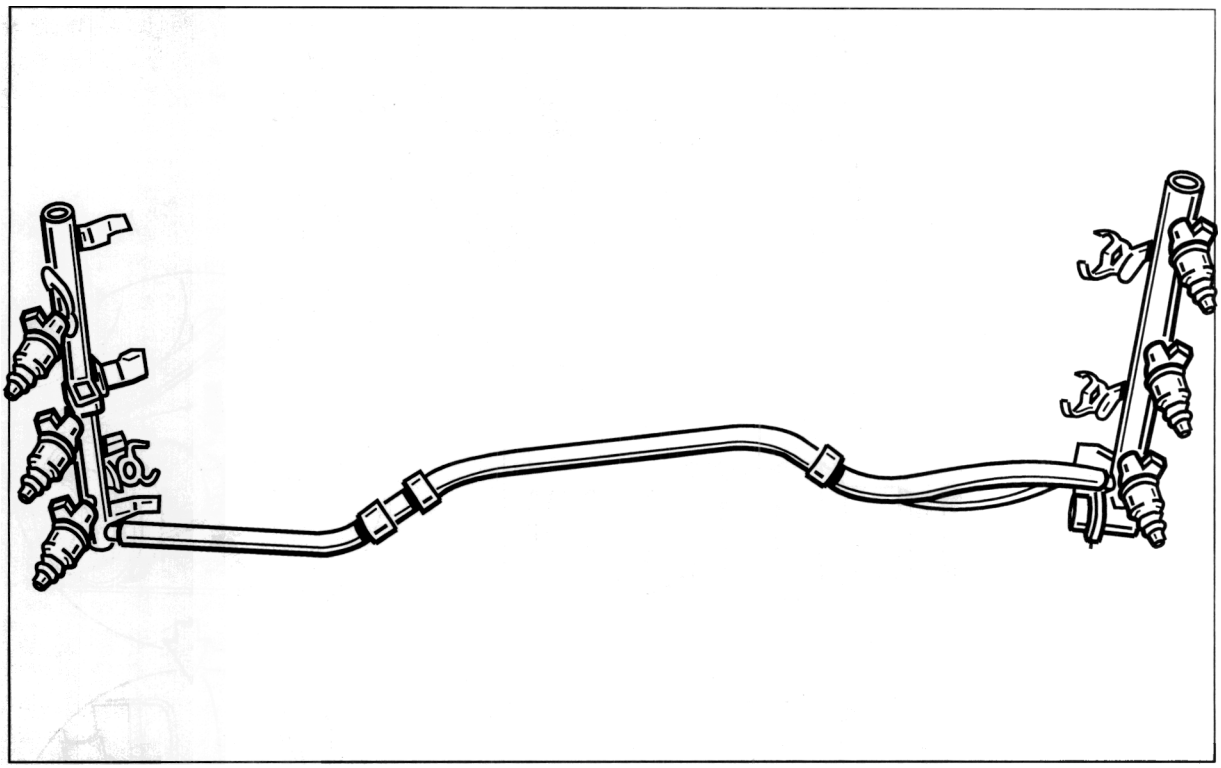
Removing injection valves – Boxster S

No.	Procedure	Instructions
	 24400002	Removing passenger's seat Remove the passenger's seat for better accessibility. Unscrew the four fastening screws for this purpose. Disconnect the electrical connections under the seat and take the seat out of the vehicle.
2	 24400003	Opening maintenance cover Remove rear wall lining. Then remove the maintenance cover. Unscrew the seven hexagon-head bolts and the two fastening nuts for this purpose. Take the maintenance cover out of the vehicle.
3	 24400017	Removing fuel line on pressure regulator Make sure to place a cloth beneath the screwed connection since fuel emerges when opening. Undo the fuel line from the vehicle interior (through the maintenance cover). Counter with a second open-ended wrench when doing this in order to prevent damage to the pressure regulator.

Removing injection valves – Boxster S

No.	Procedure	Instructions
4	 24400028	Undoing fuel return line Place a cloth beneath the screwed connection of the fuel return line. Undo the screwed connection of the fuel return line at the back end of the right ring pipe. Counter with an open-ended wrench to avoid damage.
5	 24400016	Unscrewing fastening screws Unscrew the two fastening screws of the fuel ring pipe on the left and right of the intake system (diagram shows only one side of the ring pipe). Disconnect the electrical connections of the injection valves. To do this, press the metal spring on the plug and pull off the plug at the same time. Carefully lift the fuel ring pipe upwards out of the engine compartment. Undo the fastening screws on the intake distributor for this purpose.
6	 24400014	Removing injection valves Push the fastening clips of the injection valve to do this. Then pull the injection valve concerned out of the fuel ring pipe. Do not use the old sealing rings again.

24 40 24 Installing injection valves – Boxster S



24400013

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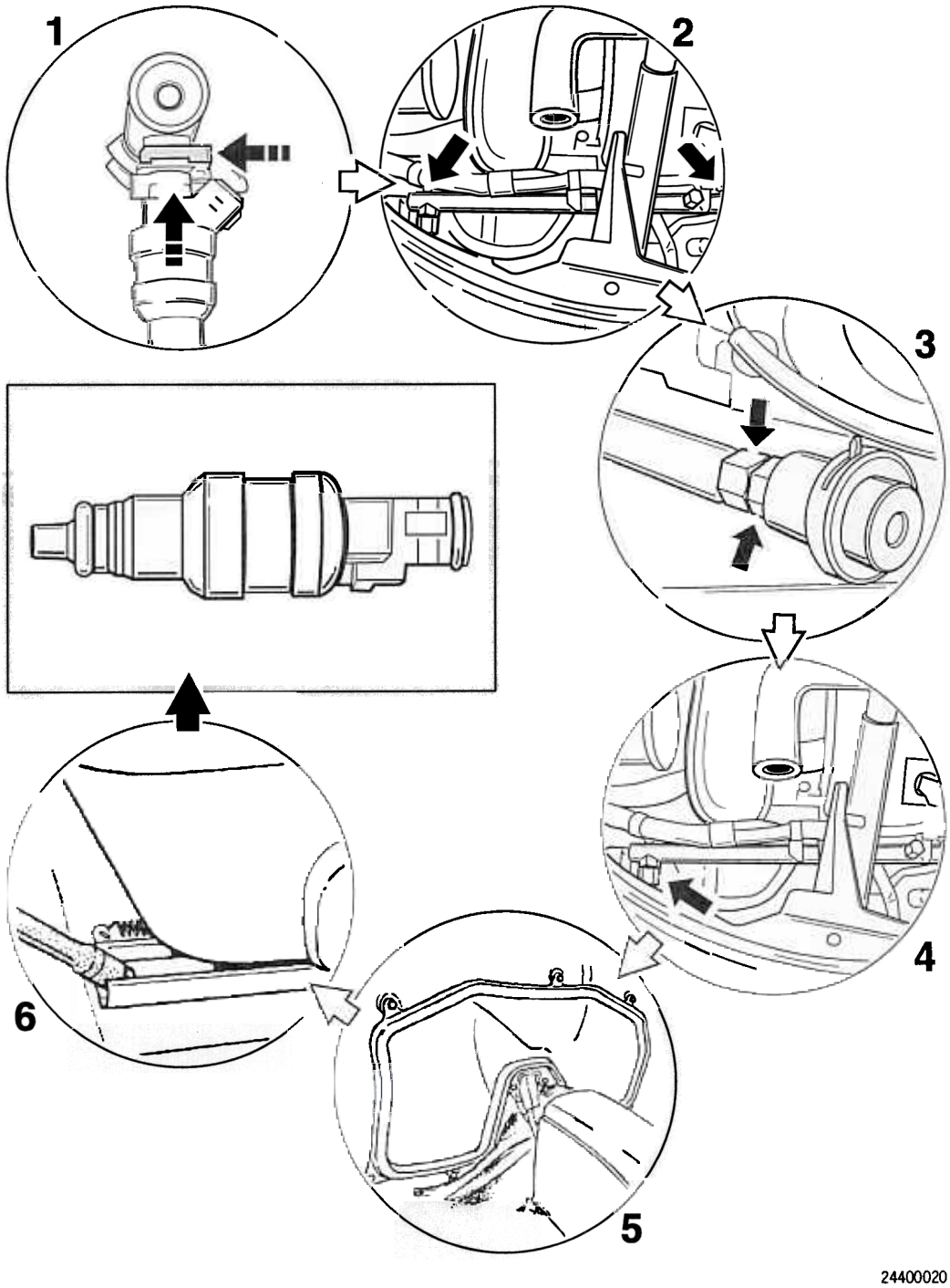
Installing injection valves – Boxster S

Installation overview:



24400020

Installing injection valves – Boxster S

Installation overview:

1 Installing injection valves

2 Fastening fuel ring pipe

3 Tightening fuel line on pressure regulator

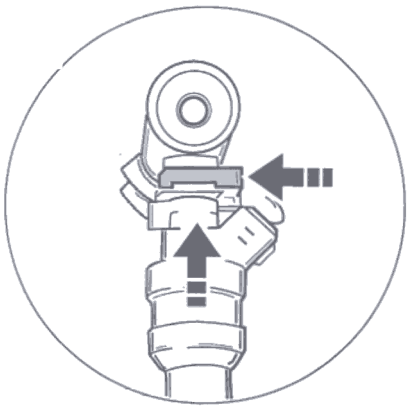
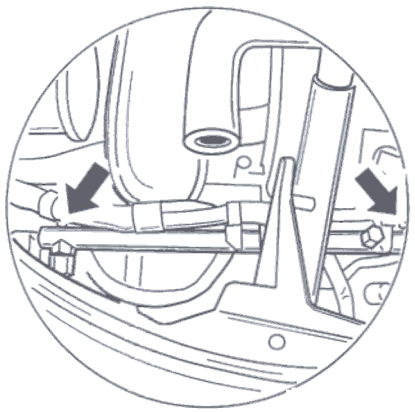
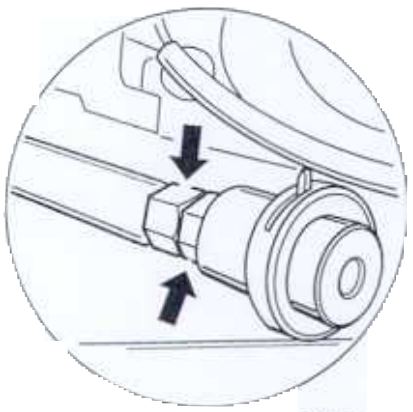
4 Tightening fuel return line

5 Closing maintenance cover

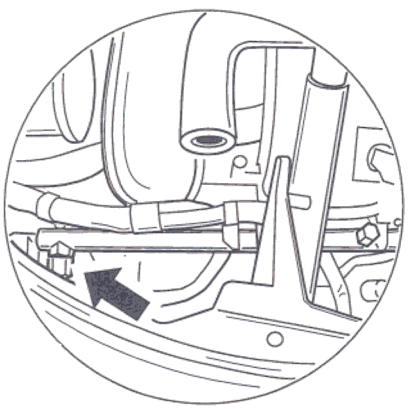
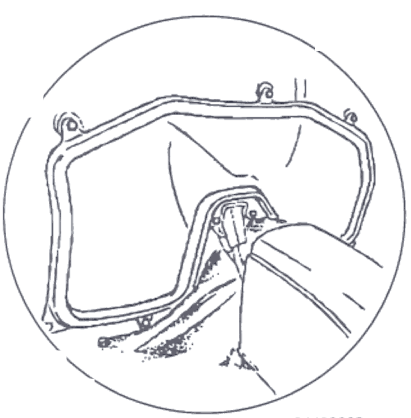
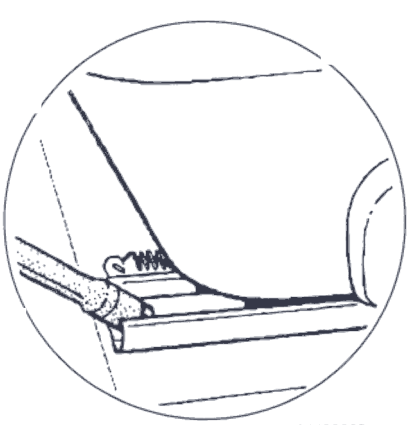
6 Installing passenger's seat

Printed in Germany - 30, 1999 9862455

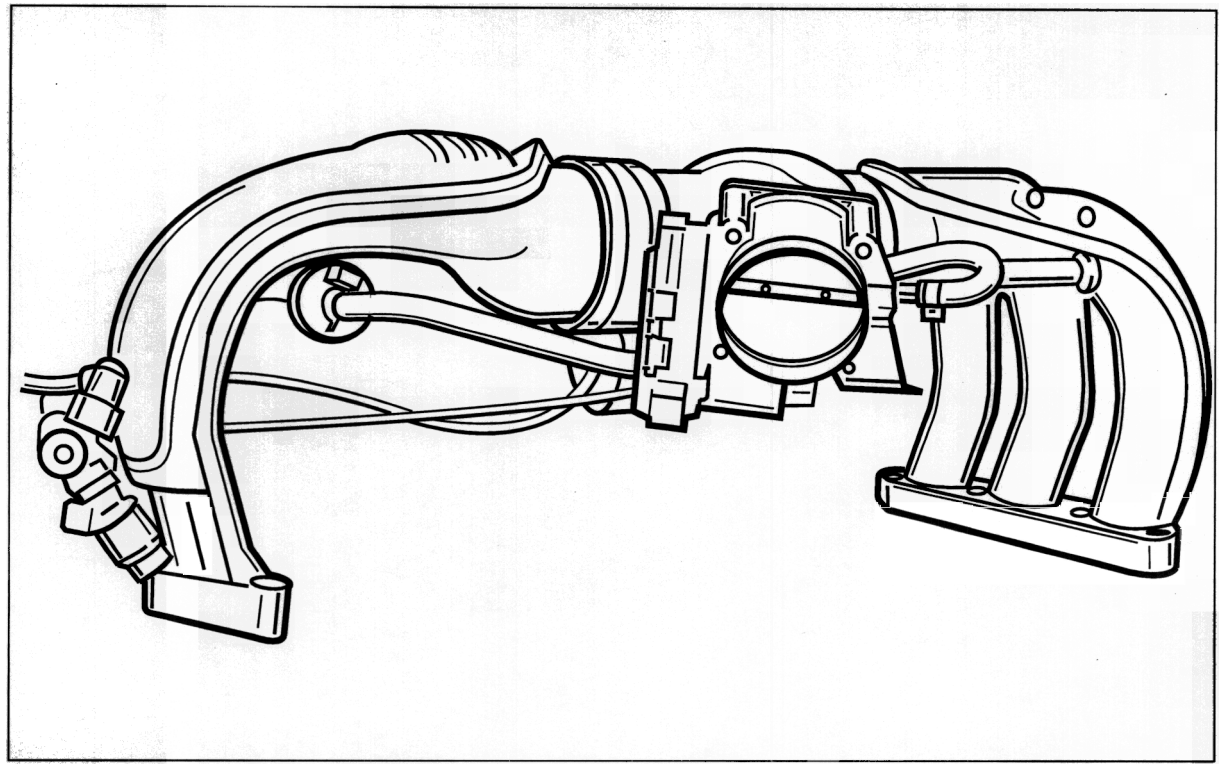
Installing injection valves – Boxster S

No.	Procedure	Instructions
1	 24400015	Installing injection valves Fit new sealing rings on the respective injection valve. Align the injection valve so that the lug on the valve and the lug on the fuel ring pipe lie directly above one another. Push on the fastening clip again.
2	 24400016	Fastening fuel ring pipe Lift the fuel ring pipe back into the engine compartment. Carefully insert the injection valves into the opening in the intake distributor. Tighten the two fastening screws on the left and right of the fuel ring pipe to 9.7 Nm (7 ftlb.). Connect electrical connections again. Then tighten the fastening screws on the intake distributor to 9.7 Nm (7 ftlb.).
3	 24400017	Tightening fuel line on pressure regulator Position the union nut on the fuel line and tighten. Make sure to counter with a wrench when doing this. The screwed connection must be checked for leaks.

Installing injection valves – Boxster S

No.	Procedure	Instructions
4	 24400028	Tightening fuel return line Tighten the screwed connection of the fuel return line at the back end of the right ring pipe. Counter with an open-ended wrench to avoid damage. The screwed connection must then be checked for leaks.
5	 24400003	Closing maintenance cover Place the maintenance cover in the vehicle. Tighten the seven fastening screws and the two fastening nuts. Fit cover again.
6	 24400002	Installing passenger's seat Lift the passenger's seat into the vehicle interior. Connect electrical connections. Tighten the four fastening screws to 65 Nm (48 ftlb.).

24 46 23 Removing and installing intake distributor – Boxster S



24400022

Includes:

24 46 21 Removing intake distributor – Boxster S

24 46 23 Installing intake distributor – Boxster S

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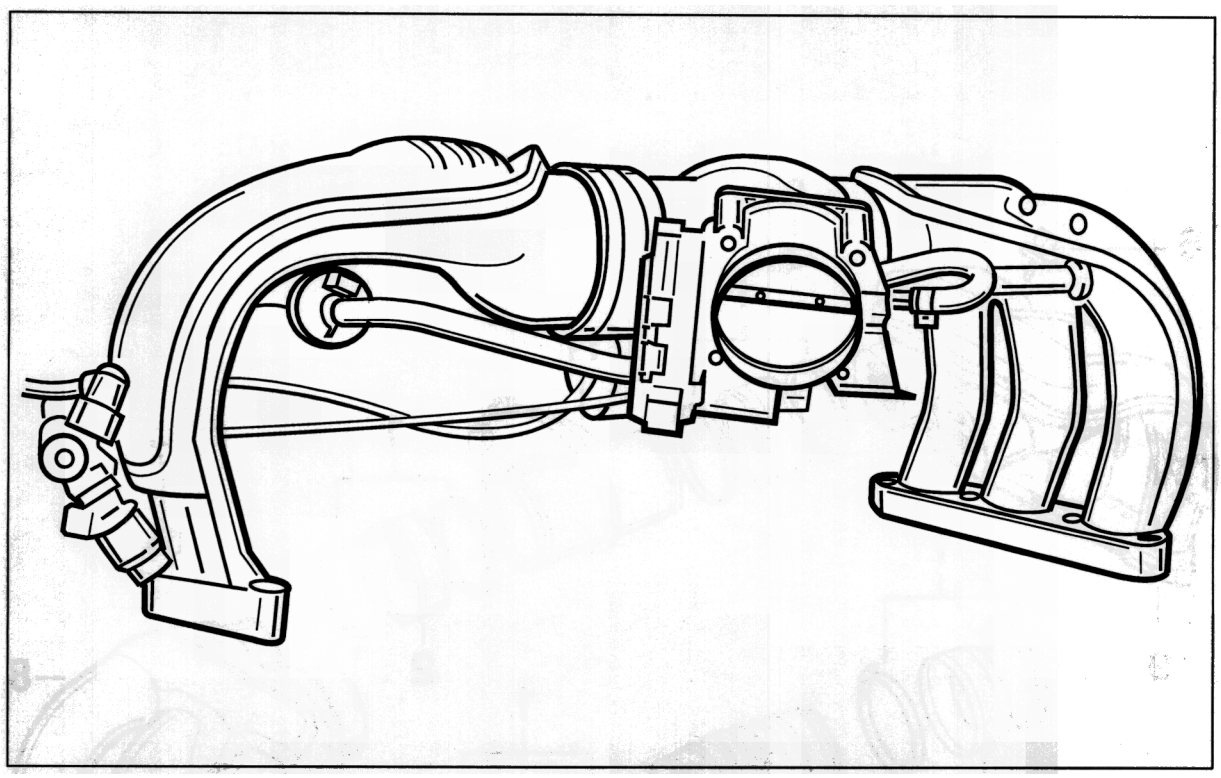
24 46 21 Removing intake distributor – Boxster S



24400022

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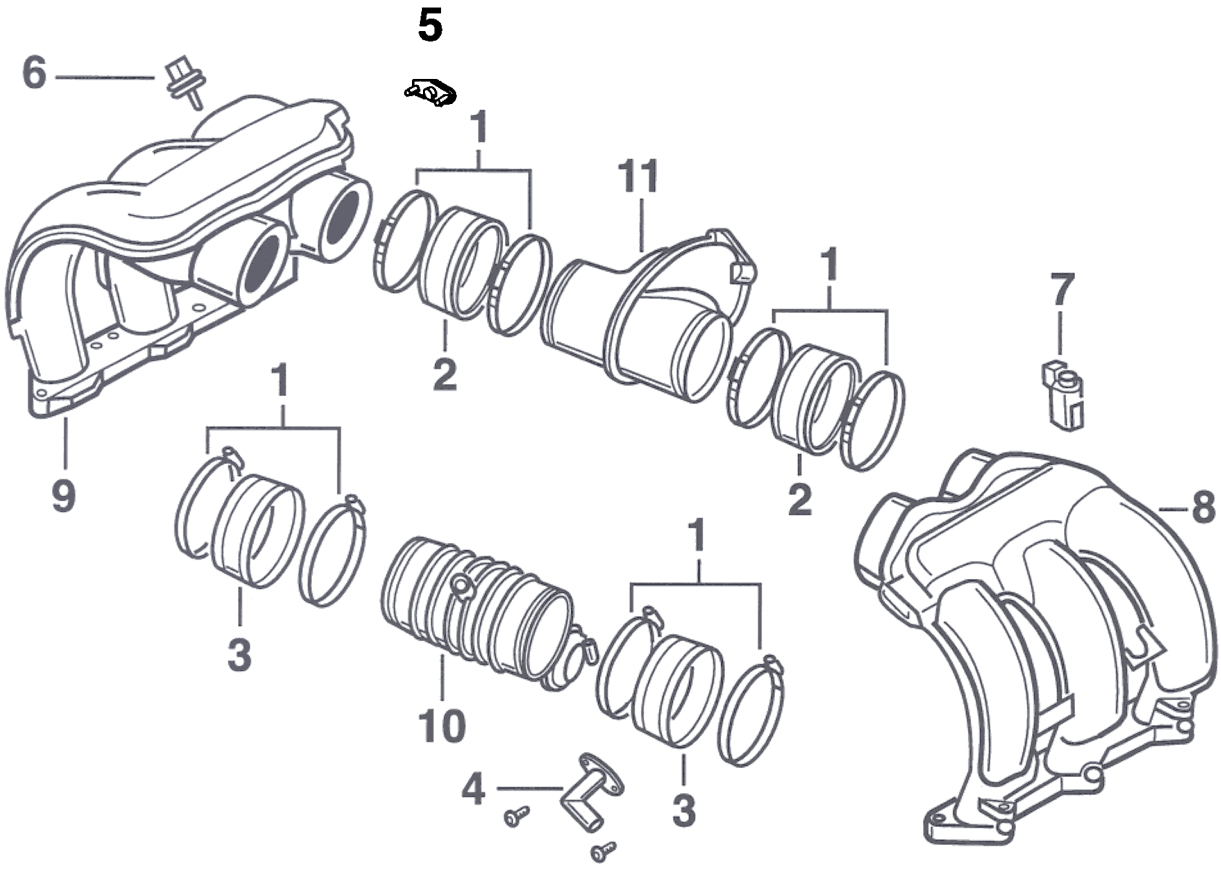
Removing intake distributor – Boxster S



24400029

Removing intake distributor – Boxster S

No.	Designation	Qty.	Note: Removal	Installation
1	Hose clamp	8		
2	Rubber sleeve	2		
3	Rubber sleeve with vacuum connection	2		
4	Vacuum connection for brake booster	1		Replace O-ring
5	Closure cap	1		Replace O-ring
6	Temperature sensor	1		
7	Bleeder valve for carbon canister	1		
8	Left intake distributor	1		
9	Right intake distributor	1		
10	Tuning pipe	1		
11	Centre part of intake distributor	1		

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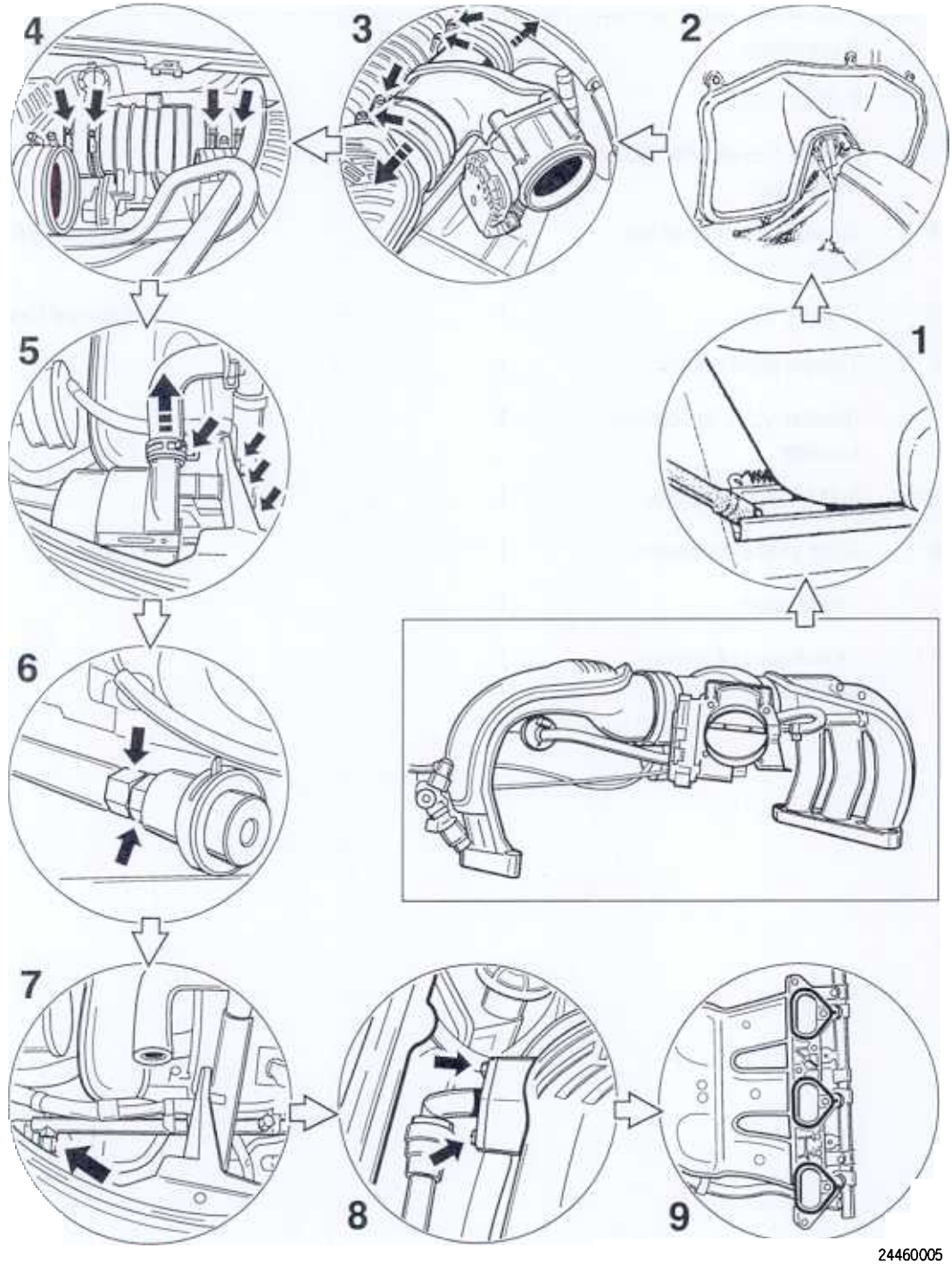
Removing intake distributor – Boxster S

Removal overview:



Removing intake distributor – Boxster S

Removal overview:

1 Removing passenger's seat

2 Opening maintenance cover

3 Removing throttle body

4 Removing tuning pipe

5 Removing secondary air pump

6 Undoing fuel return line

7 Undoing fuel line

8 Undoing vacuum line

9 Unscrewing fastening screws

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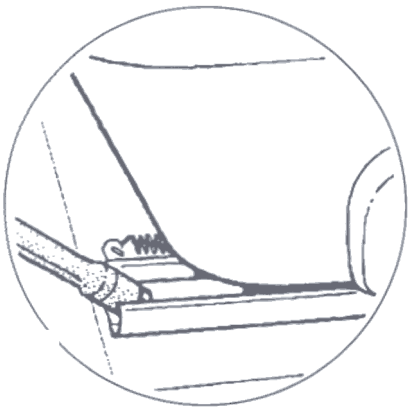
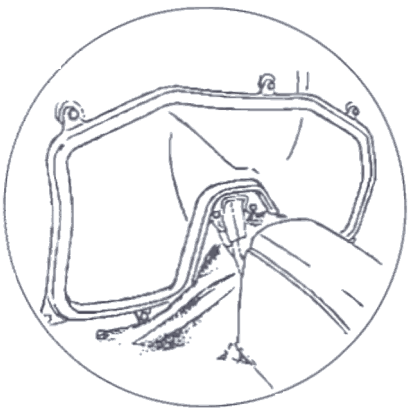
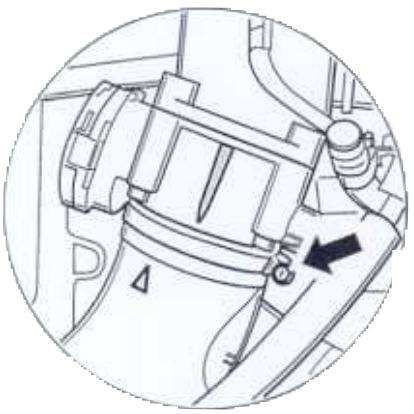
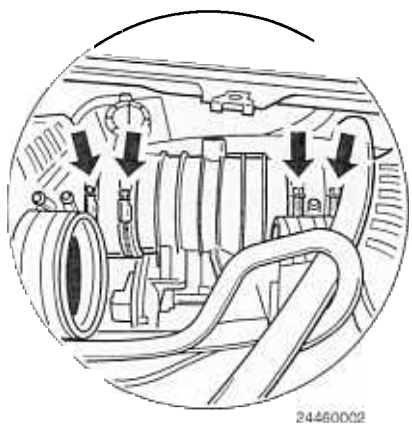
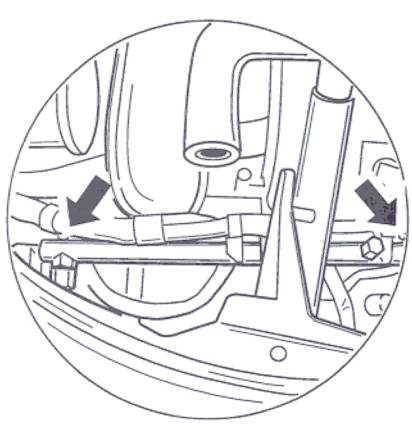
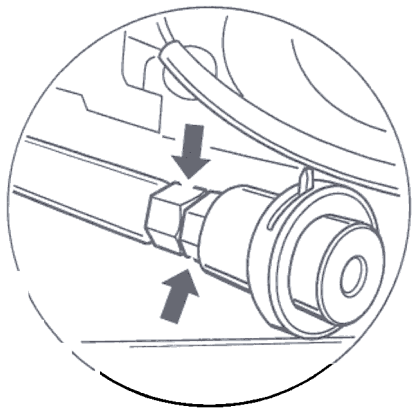
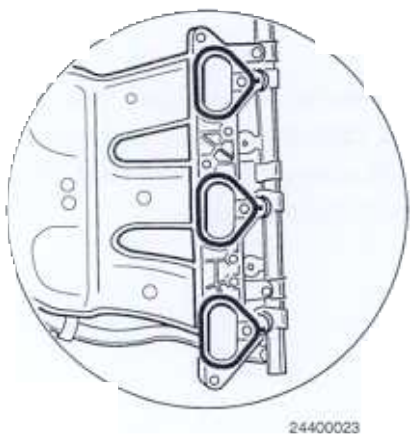
Removing intake distributor – Boxster S

No.	Procedure	Instructions
	 24400002	Removing passenger's seat Remove the passenger's seat for better accessibility. Unscrew the four fastening screws for this purpose. Disconnect the electrical connections under the seat and take the seat out of the vehicle.
2	 24400003	Opening maintenance cover Remove rear wall lining. Then remove the maintenance cover. Unscrew the seven hexagon-head bolts and the two fastening nuts for this purpose. Take the maintenance cover out of the vehicle.
3	 24400004	Removing throttle body (Serv. No.: 24 42 21) Undo the four hose clamps on the throttle body. Push the two rubber sleeves outwards as far as they will go. Unscrew the fastening nuts. Remove crankcase vent. Remove centre part of intake distributor with throttle body.

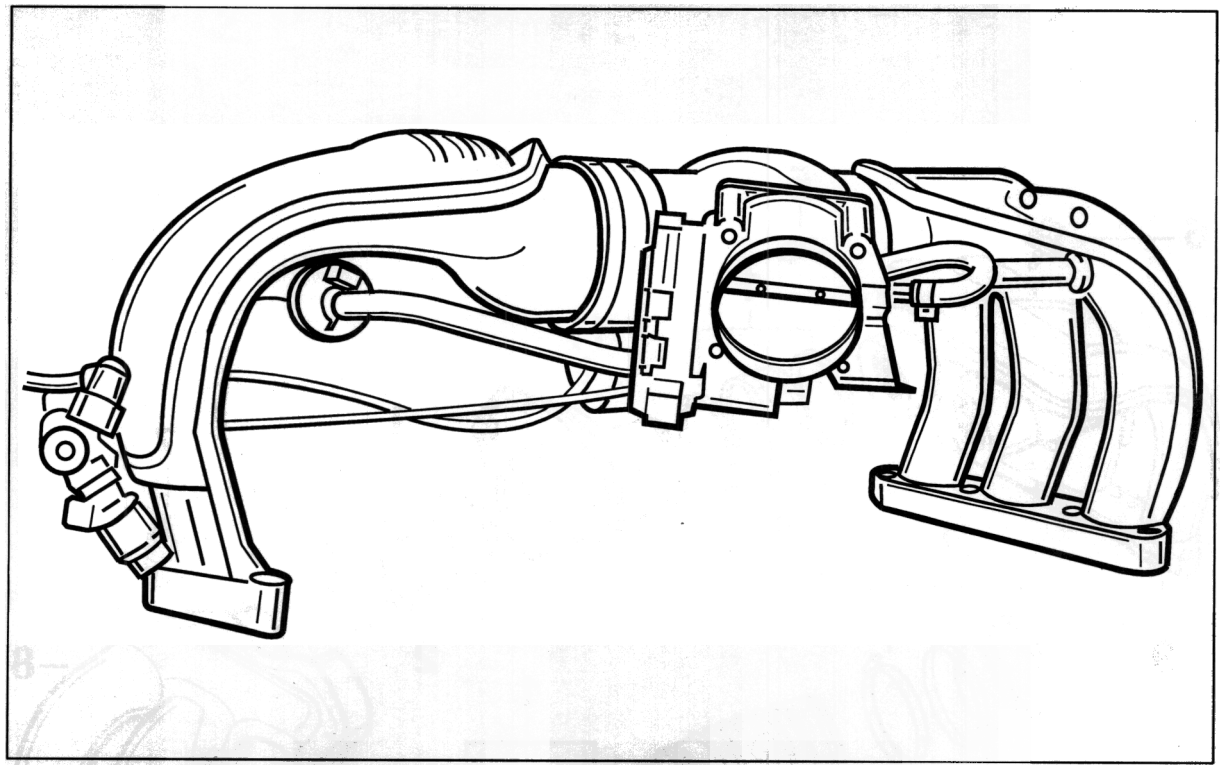
Removing intake distributor – Boxster S

No.	Procedure	Instructions
4	 24460002	Removing tuning pipe Undo the four hose clamps. Pull off the vacuum hose on the left rubber sleeve. Push the two rubber sleeves outwards as far as they will go. Take out the tuning pipe and pull the vacuum hose off the control box.
5	 24460003	Removing secondary air pump (USA vehicles only) Undo the starter ground cable on the body. Open the spring band clamp using commercially available spring-band clamp pliers No. 72 or No. 73 and push to the rear. Undo the three fastening screws on the secondary air pump. Disconnect electrical connection and remove pump from vehicle.
6	 2440016	Undoing fuel return line Place a clean cloth under the screwed connection and collect emerging fuel. Undo the screwed connection on the pressure regulator. An open-ended wrench must be used to counter it in order to avoid damage.

Removing intake distributor – Boxster S

No.	Procedure	Instructions
7	 24400017	Undoing fuel line Place a clean cloth under the screwed connection. Undo the screwed connection of the fuel line. Counter with an open-ended wrench to avoid damage. Pull out the temperature switch for the engine compartment blower and set aside.
8	 24460004	Undoing vacuum lines Disconnect the vacuum lines to the brake booster. To do this, unscrew the two screws on the intake manifold. Unscrew the fastening screw of the bleeder valve for the carbon canister on the left intake manifold. Disconnect electric plug. Remove the crankcase vent on cylinder bank 1 - 3. Unclip the switch-over valve for the tuning pipe and set aside.
9	 24400023	Unscrewing fastening screws Open the omega clips on the fuel ring pipe and disengage the wiring harnesses. Unscrew the two fastening screws on the fuel ring pipe respectively. Unscrew the six fastening screws on the intake system on all sides. Raise the intake distributor pipes gently and immediately seal the intake channels in the cylinder head with a clean, lint-free cloth so that no dirt can enter. Lift the intake distributor upwards out of the engine compartment.

24 46 23 Installing intake distributor – Boxster S



24400022

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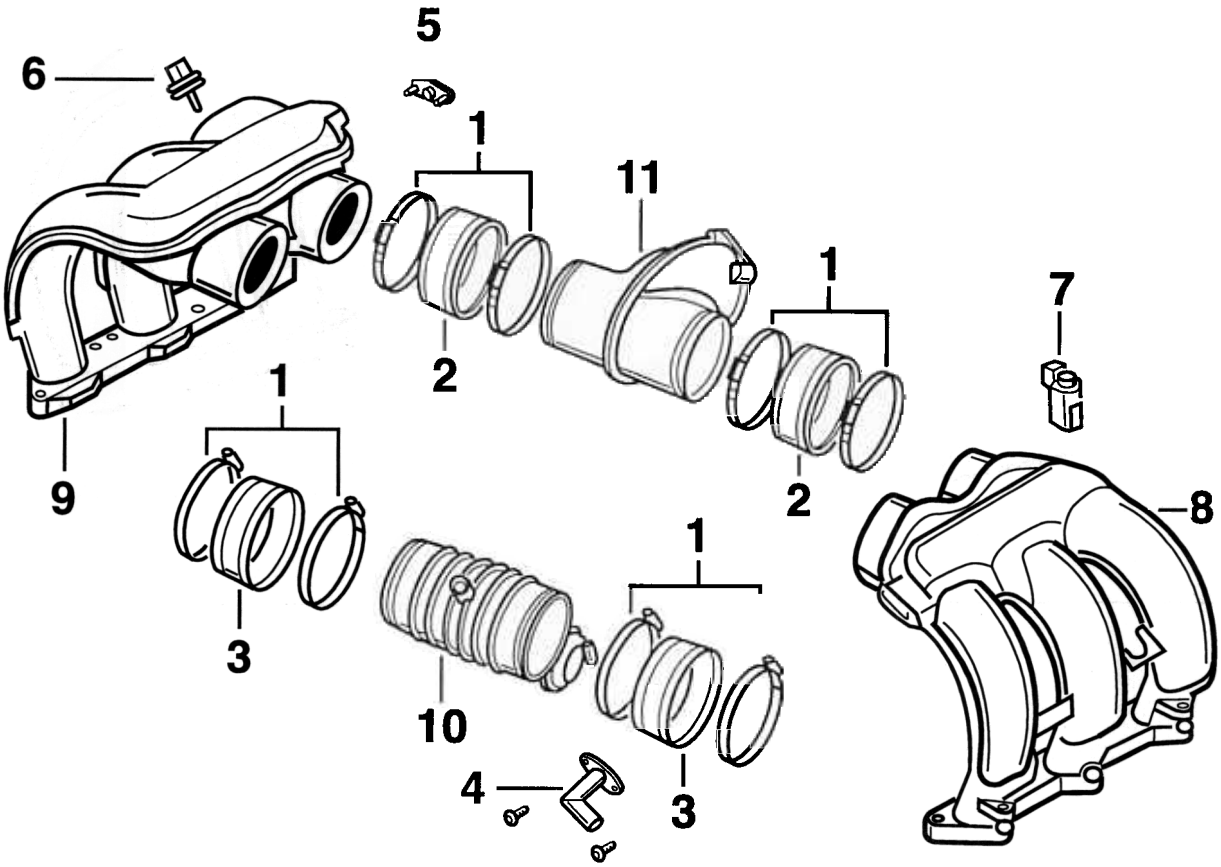
Installing intake distributor – Boxster S



24400029

Installing intake distributor – Boxster S

No.	Designation	Qty.	Removal	Note: Installation
1	Hose clamp	8		
2	Rubber sleeve	2		
3	Rubber sleeve with vacuum connection	2		
4	Vacuum connection for brake booster	1		Replace O-ring
5	Closure cap	1		Replace O-ring
6	Temperature sensor	1		
7	Bleeder valve for carbon canister	1		
8	Left intake distributor	1		
9	Right intake distributor	1		
10	Tuning pipe	1		
	Centre part of intake distributor	1		

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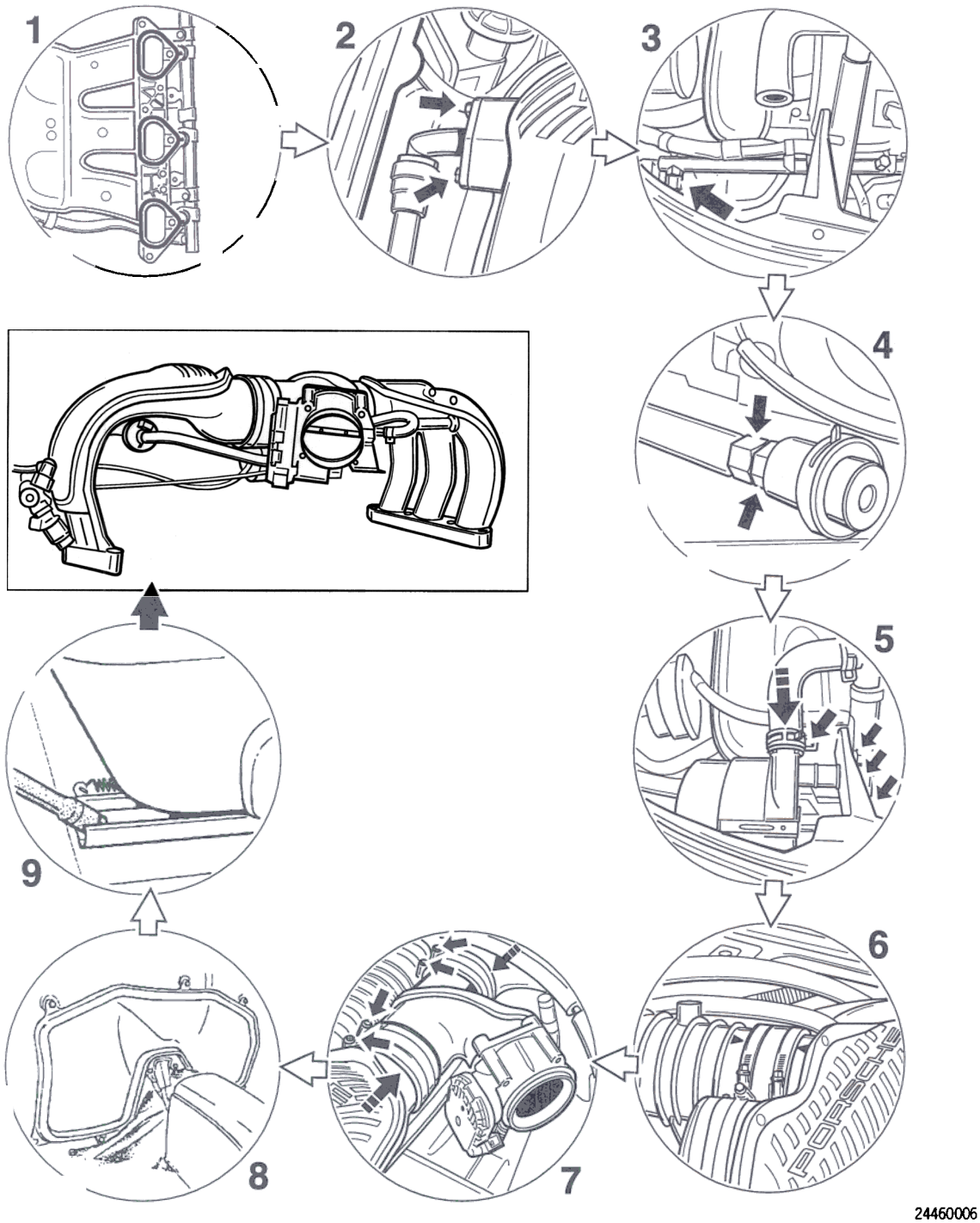
Installing intake distributor – Boxster S

Installation overview:



Installing intake distributor – Boxster S

Installation overview:

	Tightening fastening screws
2	Fitting vacuum lines
3	Tightening fuel line
4	Tightening fuel return line
5	Installing secondary air pump (USA vehicles only)
6	Installing tuning pipe
7	Installing throttle body
8	Closing maintenance cover
9	Installing passenger's seat

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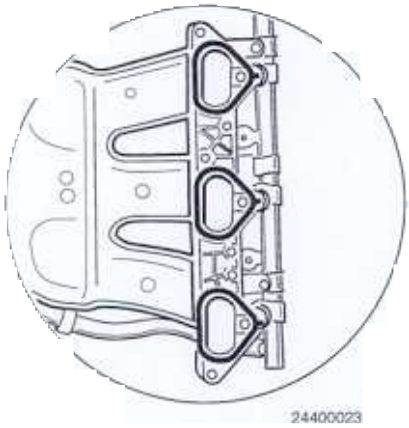
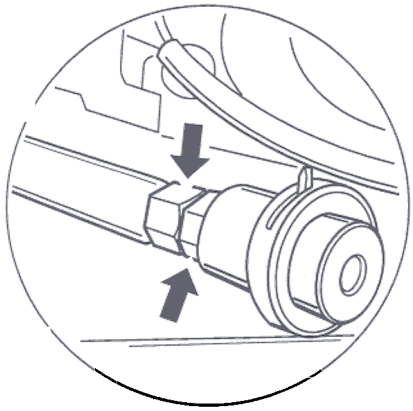
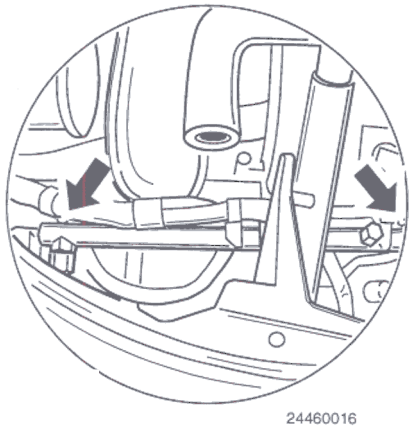
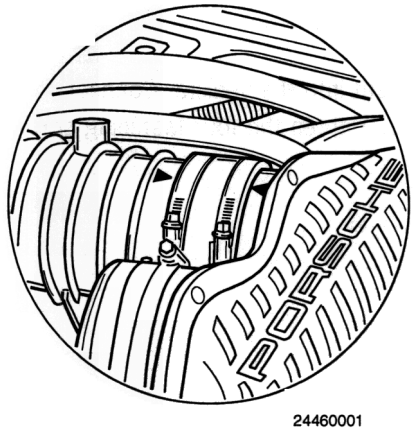
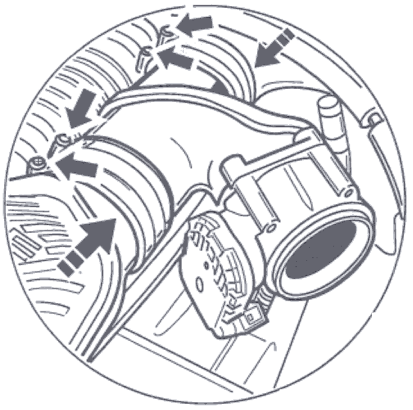
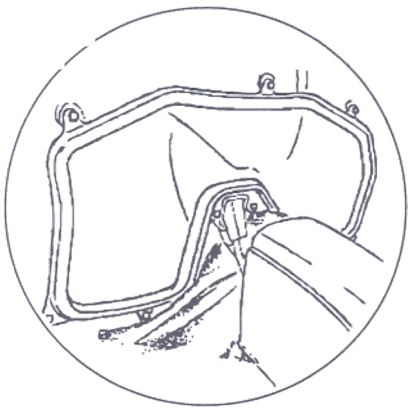
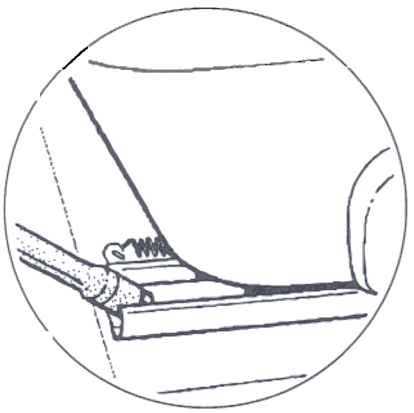
Installing intake distributor – Boxster S

No.	Procedure	Instructions
	 24400023	Tightening fastening screws Replace the seals on the intake distributor. Pay attention to the position of the lugs when doing this. Fit the intake manifolds with the fuel ring pipe and take the cloths out of the intake channels. Replace the micro-encapsulated screws on the intake system and tighten to 9.7 Nm (7 ftlb.).
2	 24460004	Fitting vacuum lines Put on the vacuum line to the brake booster with a new O-ring. Tighten the two fastening screws. Tighten the fastening screw of the bleeder valve for the carbon canister on the left intake manifold. Put on the crankcase vent on cylinder bank 1 - 3. Clip in the switch-over valve for the tuning flap.
3	 24400017	Tightening fuel line Tighten the screwed connection of the fuel line. Make sure to counter with an open-ended wrench when doing this. Check screwed connection for leaks.

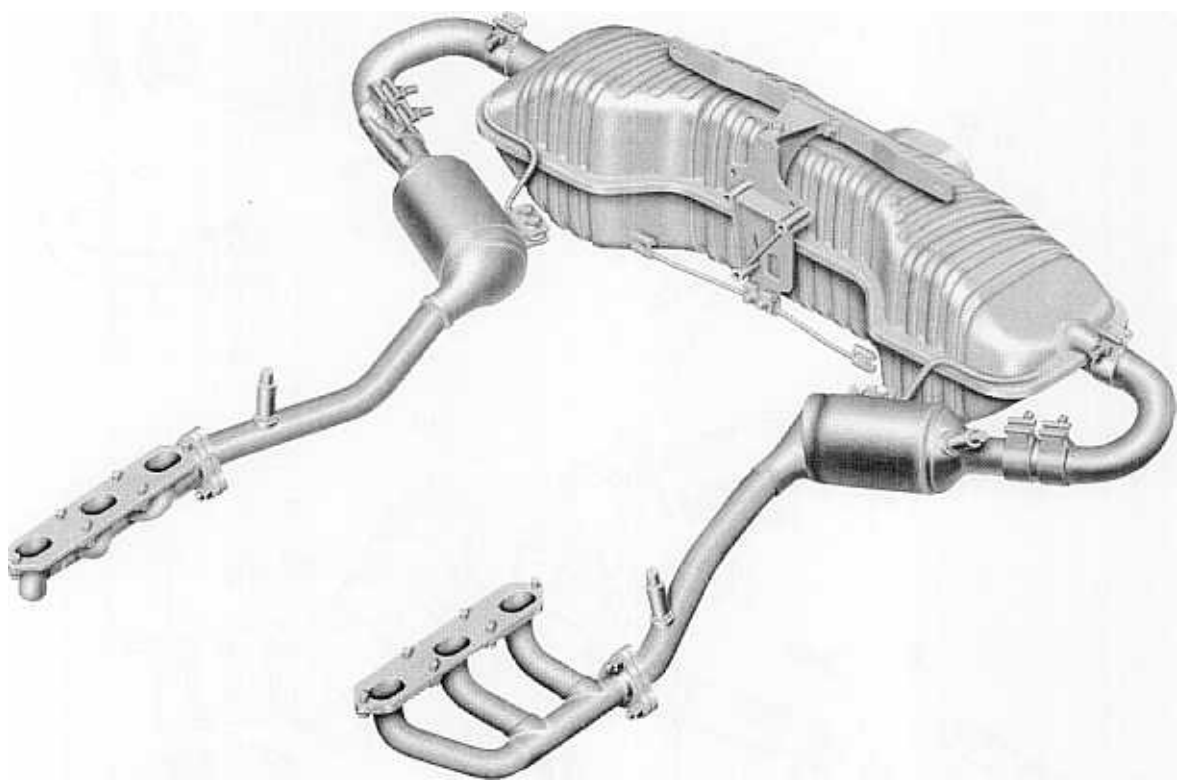
Installing intake distributor – Boxster S

No.	Procedure	Instructions
4	 24460016	Tightening fuel return line Tighten the screwed connection of the fuel return line. Then check the screwed connection for leaks.
5	 24460007	Installing secondary air pump (USA vehicles only) Tighten the starter ground cable on the body. Open the spring band clamp using commercially available spring-band clamp pliers No. 72 or No. 73 and push it on. Tighten the three fastening screws on the secondary air pump to 9.7 Nm (7 ftlb.). Connect electrical connection.
6	 24460001	Installing tuning pipe Move tuning pipe into installation position. Push the two rubber sleeves over the pipe and align. Align the tuning pipe so that the two arrows are lined up. Then tighten the four fastening screws and connect the vacuum lines to the vacuum modulator and the rubber sleeves.

Installing intake distributor – Boxster S

No.	Procedure	Instructions
7	 24400026	Installing throttle body Move throttle body into installation position. Push the two rubber sleeves over it and tighten the four hose clamps. Push on the connector tube between the air cleaner and the throttle, and tighten the hose clamp. Tighten the fastening nuts to 9.7 Nm (7 ftlb.).
8	 24400003	Closing maintenance cover Tighten the seven hexagon-head bolts and the two fastening nuts. Affix rear wall lining.
9	 24400002	Installing passenger's seat Lift the passenger's seat into the vehicle. Connect electrical connections. Tighten the four fastening screws to 65 Nm (48 ftlb.).

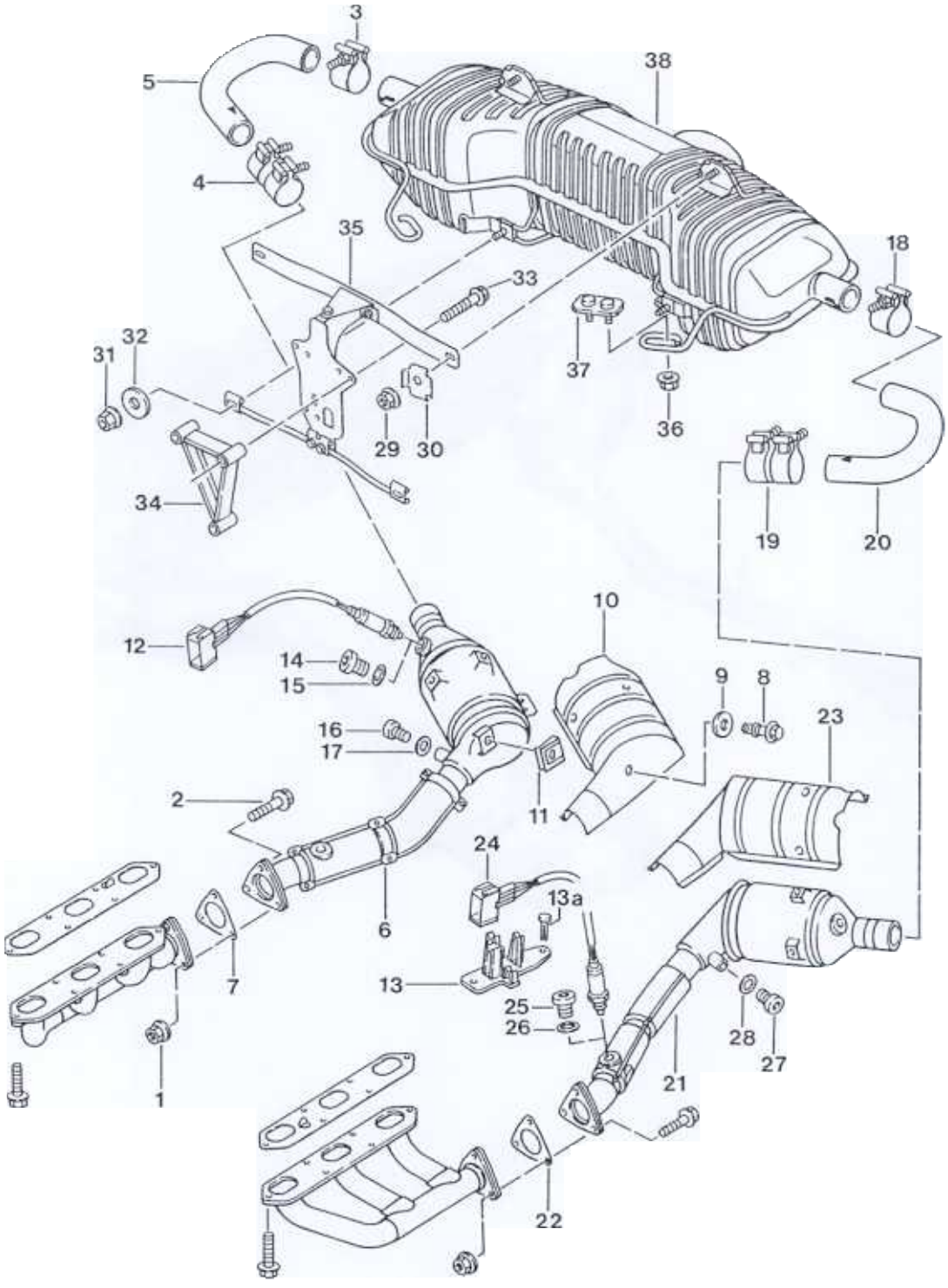
26 01 55 Replacing exhaust system



386 - 96

Printed in Germany. 1996 986261

Replacing exhaust system



Replacing exhaust system

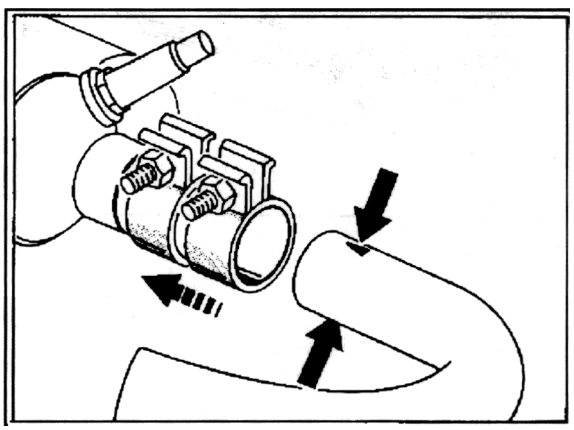
Location		Thread		Tightening torque Nm (ftlb.)
1	Hexagon nut	5		
2	Hexagon-head bolt M8 x 35	1		
3	Clamp	1		**Replace**, bolt points upwards
4	Connecting sleeve	1	Push in the direction of catalytic converter	**Replace**, bolt points upwards
5	Connector tube	1		Pay attention to markings (rings and arrows). See Assembly instructions
6	Catalytic converter Cylinder bank 1 - 3	1		
7	Gasket	1		**Replace**
8	Closing bolt	1		Wrench size 8 mm
9	Washer 7.4	1		
10	Shield	1		
	Holder	1		
12	Oxygen sensor (only OBDII vehicles)	1		Tightening torque 55 - 60 Nm (41 - 44 ftlb.).
13	Holder for oxygen sensors - joint	1		
13a	Expanding rivet			
14	Plug (vehicles without OBDII)	1		Tightening torque 30 Nm (22 ftlb.)
15	Sealing ring	1		**Replace**
16	Plug (exhaust-gas sample point)	1		Tightening torque 10 Nm (7.5 ftlb.)
17	Sealing ring	1		**Replace**

Printed in Germany - 35, 1999 986261

Location		Thread	Tightening torque Nm (ftlb.)
18	Clamp	1	Replace
19	Connecting sleeve	1	**Replace**
20	Connector tube	1	Pay attention to markings (rings and arrows).
21	Catalytic converter Cylinder bank 4 - 6	1	
22	Gasket	1	**Replace**
23	Shield		
24	Oxygen sensor	1	Tightening torque 55 - 60 Nm (41 - 44 ftlb).
25	Plug	1	Tightening torque 30 Nm (22 ftlb.)
26	Sealing ring	1	Replace
27	Plug (exhaust-gas sample point)		
28	Sealing ring	1	Replace
29	Hexagon nut M8	2	
30	Reinforcing plate	2	Pay attention to the installation position. See Assembly instructions
31	Hexagon nut M8	2	
32	Washer	2	
33	Hexagon-head bolt M8 x 20 (Tiptronic) M8 x 60 (manual transmission)	3	
34	Adapter		
35	Holder		
36	Hexagon nut M8	1	
37	Retainer plate		
38	Muffler		

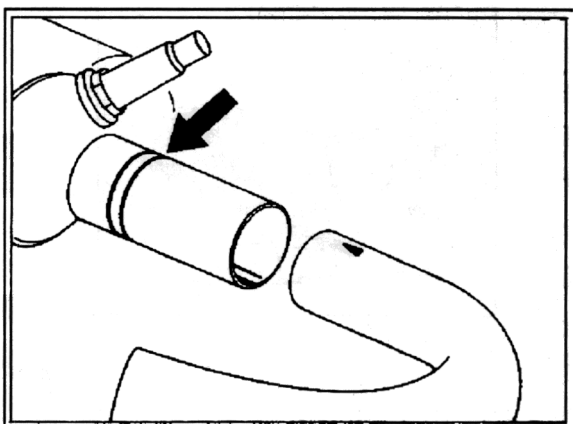
Installation notes exhaust system – general

The 90° bend in the connector tube between the end muffler and the catalytic converter must be mounted facing the catalytic converter. It is designated by embossed arrowheads. The arrows are visible from above and below.
In order to separate the connector tube and the catalytic converter, the connecting sleeve must always be pushed in the direction of the catalytic converter.



455_96

The position of the sleeves is located in the middle between the arrowheads on the connector tube and the two circumferential grooves on the socket piece of the catalytic converter. When mounted correctly, only one groove should be visible.



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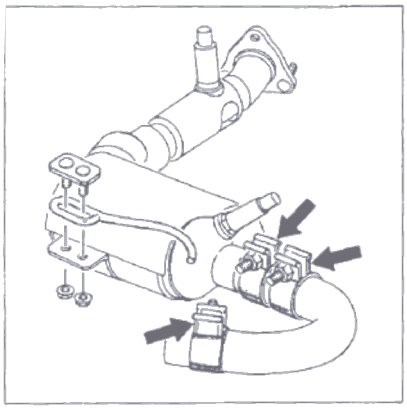
Note:

The connecting sleeves must always be replaced. When using used connecting sleeves, there is a danger that the exhaust system will leak.

Assembly instructions on the exhaust system components

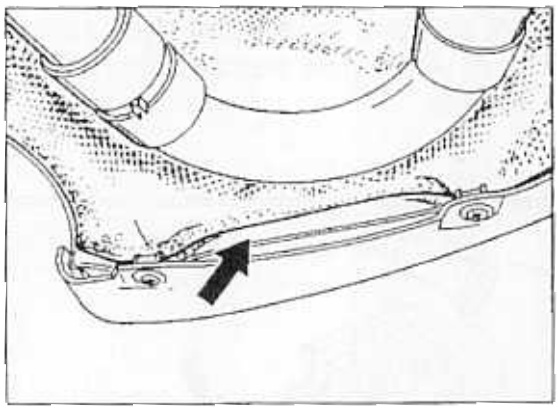
Installation position of the sleeves

The openings of the sleeves or the fastening screws must point upwards.



457_96

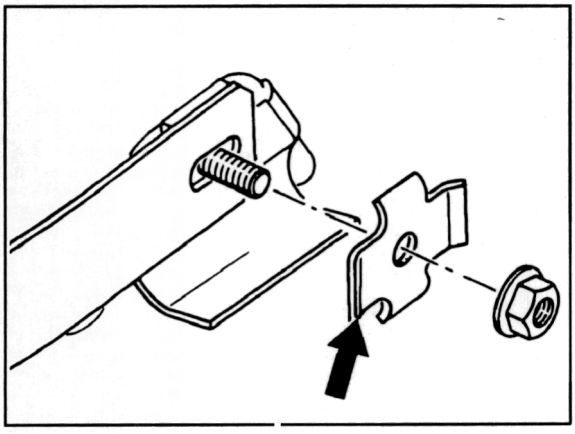
After assembly work on the exhaust system, the ventilation openings should be checked for distortion; if necessary, the panel should be aligned.



466_96

Installation of end muffler

The flow edge of the reinforcing plates for the muffler holder must point forwards in the direction of travel and towards the centre of the engine.



26010011

Check heat shield panel

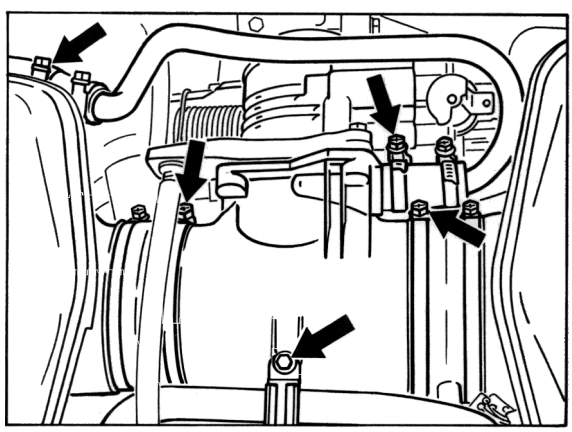
27 60 19 Removing and installing starter

Removal

1. Disconnect battery and cover terminal or battery. Open engine compartment lid.

2. Remove air guide from between throttle body and air filter. Take out vent line from between intake distributor and oil separator.

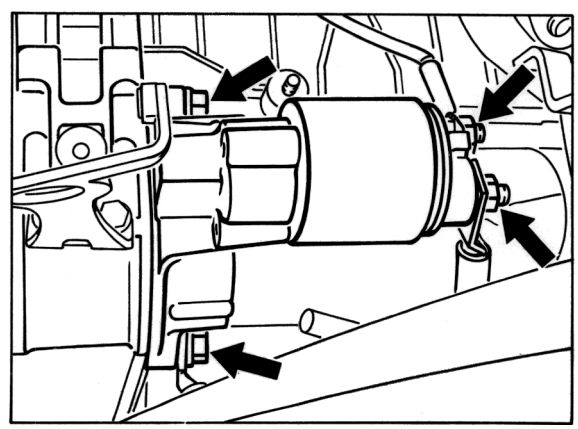
3. Loosen both hose clamps at intake distributor. Unscrew fastening screws (M6) for fuel pipe at intake distributor.



33-96

4. Loosen bracket for throttle body on the crankcase. Swing intake distributor and throttle body upwards by approximately 45° and remove bracket on the throttle body.

5. Loosen cable at teminal 30 (M8) and terminal 50 (M6) at solenoid switch. Undo both hexagon-head bolts M10 on the starter and remove ground cable. Withdraw starter upwards from its bracket.



34-96

Installation

Tightening torques:

Terminal 30	Nut M8	**15 Nm (11 ftlb.)**
Terminal 50	Nut M6	**6.5 Nm (5 ftlb.)**
Hexagon-head bolt	M10	**45 Nm (33 ftlb.)**

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27 22 19 Removing and installing generator

Removal

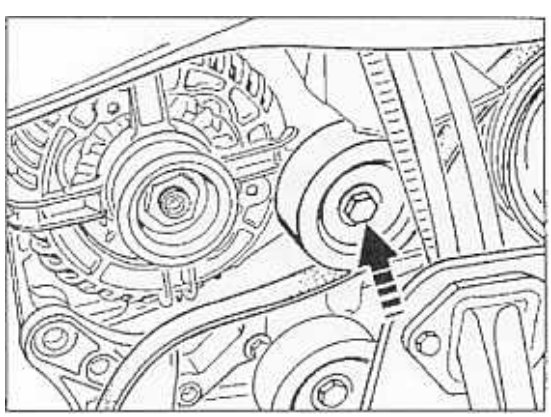
1. Disconnect the battery and cover terminal or battery. Remove right seat. Open rear wall cover behind the seats.

2. Open engine compartment lid and disconnect the cable lug of the B+ lines to the generator and to the starter at the B+ connection point.

3. Relieve the drive belt at the tensioning pulley and remove the belt.

4. Undo right-hand fastening screws (in direction of travel) and unscrew.

5. Undo left-hand fastening screw (with deflection roller) by three turns. A gentle tap on the fastening screw loosens the threaded bushing in the generator arm (use aluminium mandrel).

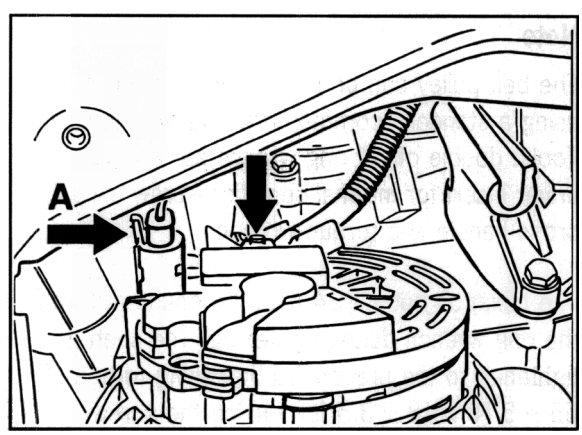


35_96

6. Lift generator up and out of the slotted generator bracket. Unscrew fastening screw and remove with deflection roller.

7. The generator must be turned clockwise so that the swivel arm is near the crankcase and the holding arm projects beyond the fastening eye.

8. Carefully pull the generator forward a little and undo the electrical connections, or press the plug connection to the generator housing, release (arrow A) and pull off. Pull out generator to the front.



640_96

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Installation

Tightening torques:

Hexagon nut a/f 24 M16x1.5	**65±5 Nm (48±3.5 ftlb.)**
Hexagon-head bolts M10	**45 Nm (33 ftlb.)**
Hexagon nut a/f 13 M8	**15 Nm (11.0 ftlb.)**

The line to the generator must be **on top** when the cable lug of the B+ lines to the generator and to the starter is reconnected to the B+ connector. Engage plug connection and route wire carefully.

Undoing and tightening the belt pulley

Note

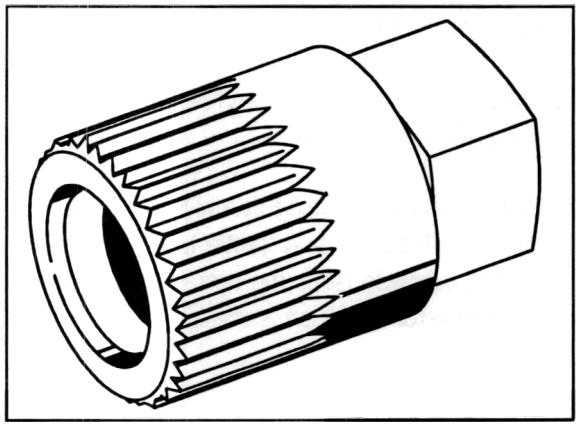
The belt pulley can be undone and tightened using a standard commercially available tool. Tools: double offset ring wrench a/f 24, screwdriver insert for internal serration screw a/f 10, cross handle and torque wrench.

The hexagon nut a/f 24 must be countered with the ring wrench during tightening. The shaft is tightened to the prescribed tightening torque of 65 ± 5 Nm (48 ± 3.5 ftlb.) using the screwdriver insert and the torque wrench.

Tool for holding the free-wheel pulley

For 2.7 l Boxster and 3.2 l Boxster S (manual transmission only)
2.7 l as from Engine No. 65 Y 02460
3.2 l as from Engine No. 67 Y 00936

Use an a/f 17 multiple-tooth adapter to hold the free-wheel pulley.
A/f 17 multiple-tooth adapter: see Workshop Equipment Manual, chapter on commercially available tools, No. 32-1.



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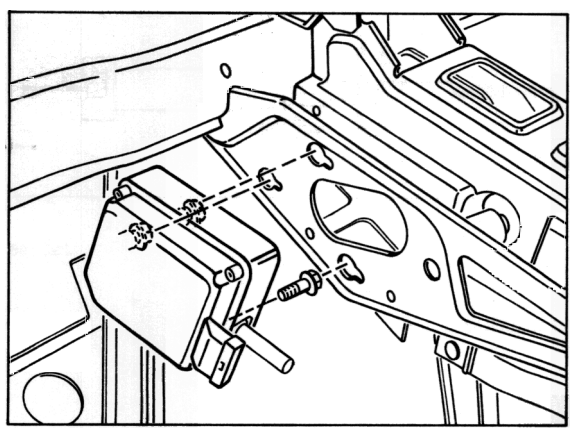
Note

Counter with a double ring wrench when tightening with the a/f 17 multiple-tooth adapter. The shaft is tightened to the prescribed **tightening torque of 80 ± 5 Nm (59 ± 5 ftlb.)** using the screwdriver insert (a/f 10 internal serration screw) and torque wrench.

27 84 19 Removing and installing cruise-control actuator

Note

The cruise-control actuator is fastened with three screws to the pedal bearing block above the accelerator.



212 - 96

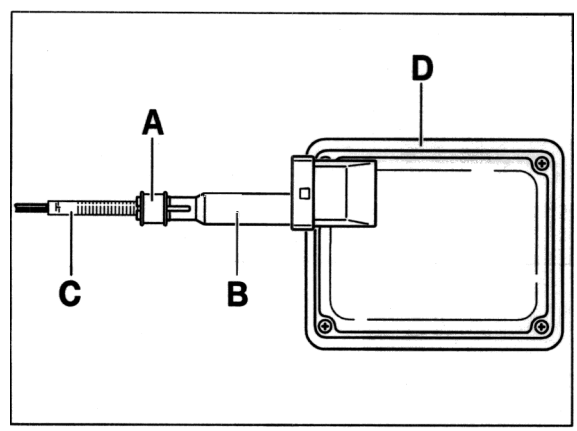
1. Remove air guide and footwell air vent of the heating and air conditioning system. Remove brake-light switch from pedal bearing block.

2. **Only** loosen fastening screws on the cruise-control actuator.

3. Draw cruise-control actuator to the rear and extract to the side. Disconnect electrical plug connection.

4. Loosen snap ring at adjusting piece (displace it) and push threaded part through along with cruise-control cable.

5. Loosen adjusting piece at cruise-control actuator (bayonet lock) and disengage cruise-control cable.



213 - 96

A – Snap ring

B – Adjusting piece

C – Threaded part

D – Cruise-control actuator

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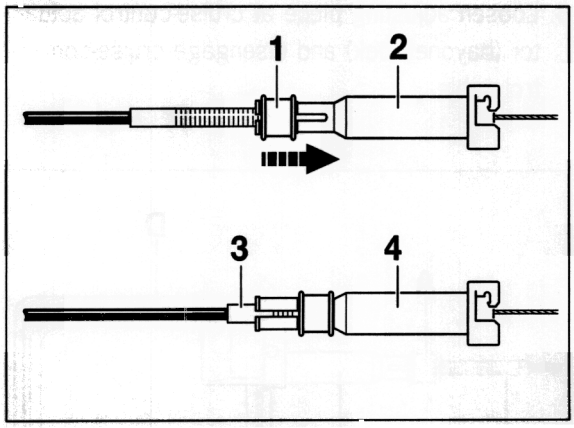
Adjusting cruise-control cable



291 - 96

Sequence 1...4

1. Loosen snap ring 1 at adjusting piece 2 (displace it) and push threaded part 3 through along with cruise-control cable.

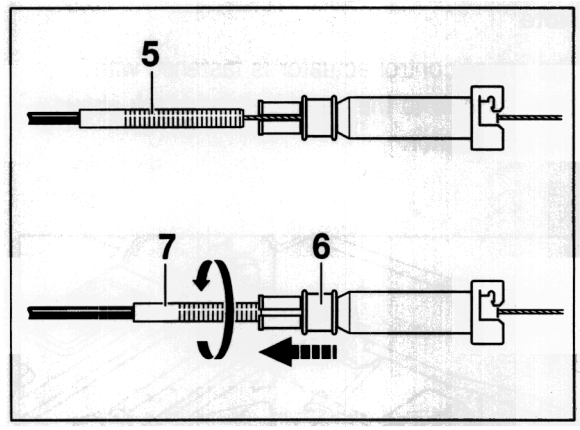
2. Engage cruise-control cable on cruise-control actuator and clip on adjusting piece 4 (bayonet lock).

3. Unscrew threaded part 5 until the accelerator plate is noticeably pulled.

4. Draw accelerator plate firmly back against its idle stop.

5. Push snap ring 6 back (fixing it).

6. Make fine adjustment by turning the threaded part 7.
   Permissible play: 0 + 1 mm.



292 - 96

Sequence 5...7

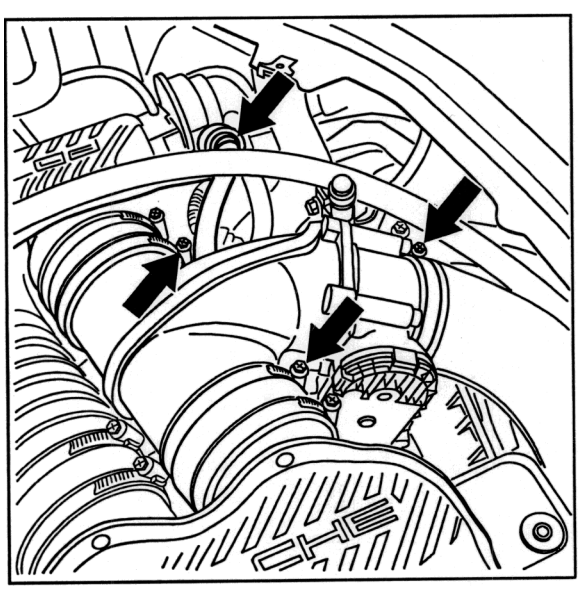
27 60 19 Removing and installing starter – Boxster S

Removal

1. Move convertible top to service position. Disconnect the battery and cover terminal or battery. Open the engine-compartment lid.

2. Undo hose clamp between throttle body and air cleaner. Disconnect vent line between intake distributor and oil separator.

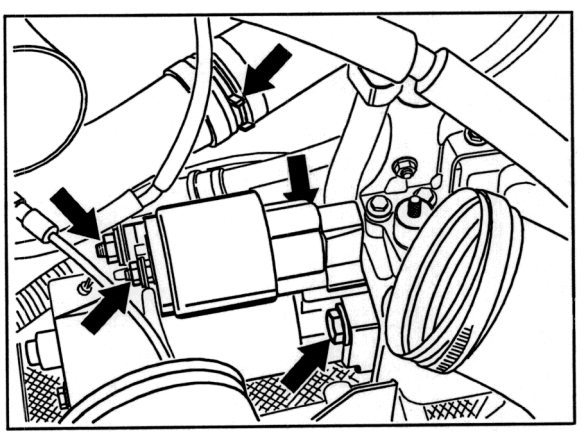
3. Loosen both inner hose clamps at the intake distributor.



27600001

4. Undo holder for the throttle body on the crankcase. Swivel the intake distributor with throttle body upward by approx. 45° and detach the oil filler hose.

5. Detach the cable of terminal 30 (M8) and terminal 50 (M6) on the solenoid switch. Undo both hexagon-head bolts M10 on the starter and remove the ground lead. Lift starter out of the holder.



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Installation

Tightening torques:

Terminal 30	Nut M8	**15 Nm (11.0 ftlb.)**
Terminal 50	Nut M6	**6.5 Nm (5.0 ftlb.)**
Hexagon-head bolt	M10	**45 Nm (33 ftlb.)**

27 06 Work instructions after disconnecting the battery

Effect of disconnection or total discharge of the battery on electrical systems in the vehicle, subsequent measures:

1. Never disconnect battery with engine running.
2. Never start engine without securely connected battery.
3. Do not use a boost charger to start the engine.
4. Whenever possible, use jump leads with overvoltage protection.
5. Always disconnect the battery terminals before carrying out welding work on the vehicle.
6. Wiring harness plugs of control modules or other electronic components must be connected or disconnected with the ignition off. Exception: vehicles with the additional equipment M 536 (alarm siren with tilt sensor).

Note concerning M 536:

In order to avoid triggering the alarm siren (installed on right next to the battery) of vehicles with M 536, the battery must be disconnected with the ignition on (all loads must be switched off beforehand).

Control module memories:

Values and faults stored in the control modules can be deleted if the battery is disconnected or completely discharged.

Remedy:

If possible, all fault memories should be checked and, if necessary, printed out before the battery is disconnected.

Supply voltage fault entry:

The entry "supply voltage" could be stored in various control modules if the battery has been completely discharged.

Remedy:

Delete the "supply voltage" entry from the control modules in question.

Test drive after connecting the battery:

The fault memories of all vehicle control modules should be read out again after the test drive.

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24 70 DME control module:

After disconnection of the power supply, the idle speed might change or fluctuate briefly until the idle speed positioner (M 5.2) or the throttle adjusting unit (ME 7.2) is readapted. The mixture adaptation is also lost.

Remedy:

After the battery is connected:

With the DME ME 7.2, it is necessary to carry out a learning and adaptation routine as described below:

Switch the ignition on for 1 minute without starting the engine. Do not operate accelerator pedal.

Switch off ignition for at least 10 seconds.

This completes the adaptation of the throttle adjusting unit.

With all DME systems, the engine must run for several minutes before the engine control module can relearn the idle speed and mixture adaptation values.

37 30 Tiptronic:

The stored pressure adaptation valves are lost if the power supply to terminal 30 is interrupted. This can result in poor shifting quality and rough shift operations during the adaptation phase.

Remedy:

Perform a test drive. During the test drive, drive the vehicle with varying load conditions and at various speeds so that all shift functions (manual and automatic programs) are executed at least once. This readapts the shifting pressures of the system and thereby re-establishes smooth shifting.

64 52 Power windows:

The limit positions of the power windows are deleted from the control module when the battery is disconnected and connected.

Remedy:

Manually close each power window as far as it will go, then press the rocker switch for closing the window again. The limit position of the respective power window is now stored in the control module again.

90 25 Instrument cluster:

The trip counter is set to 0 when the power supply is disconnected.

90 30 Clock:

Depending on the software version, the clock is set to 12:00 a.m. or 1:00 a.m. when the power supply is disconnected.

Remedy:

Enter the current time again.

Note:

On vehicles with PCM, 91 10 PCM position 3.

90 80 On-board computer:

Disconnection of the vehicle battery deletes the memories for average speed and average consumption.
As a result, the displayed range on remaining fuel can be markedly different or even 0.
The outside temperature indicator loses its memory effect. In other words, the indicated outside temperature can be too high due to the heat radiated when the vehicle is hot.

91 20 Radio:

The radio reverts to the Code function when the battery is disconnected and is thus no longer ready for operation.

Remedy:

Input the radio code. If the code card is unavailable, the radio code can be read from the DME control module (under "Vehicle data"). The code is also available from the Porsche IPAS.

91 10 PCM:

1. The PCM reverts to the *Code input* function when the battery is disconnected and is thus no longer ready for operation.

2. When the power supply is disconnected, the built-in GPS receiver loses the so-called "*almanac*" containing the satellite orbital paths.

3. The date and time are deleted when the battery is disconnected.

4. Radio stations stored by the customer are no longer displayed.

5. If the telephone card was inserted and the telephone was ready for operation, the telephone is subsequently disabled.

Remedy:

1. Input the PCM code. If the code card is unavailable, the PCM code can also be read from the DME control module (under "Vehicle data"). This code is also available from the Porsche IPAS.

2. Switch on the PCM with a free panoramic view for approx. 20 minutes (to load GPS almanac).

3. The date and time are also adopted once the GPS almanac has been loaded (see step 2); it may be necessary to change over to summer time (daylight-saving time). This time is transferred to the instrument cluster. If the time is then manually changed by means of the instrument cluster, this time is adopted by the PCM and synchronised with GPS time.

4. The stored stations are displayed again when station buttons 1 to 6 are pressed.

5. The telephone is enabled again when the telephone PIN code is entered with the SIM telephone card inserted.

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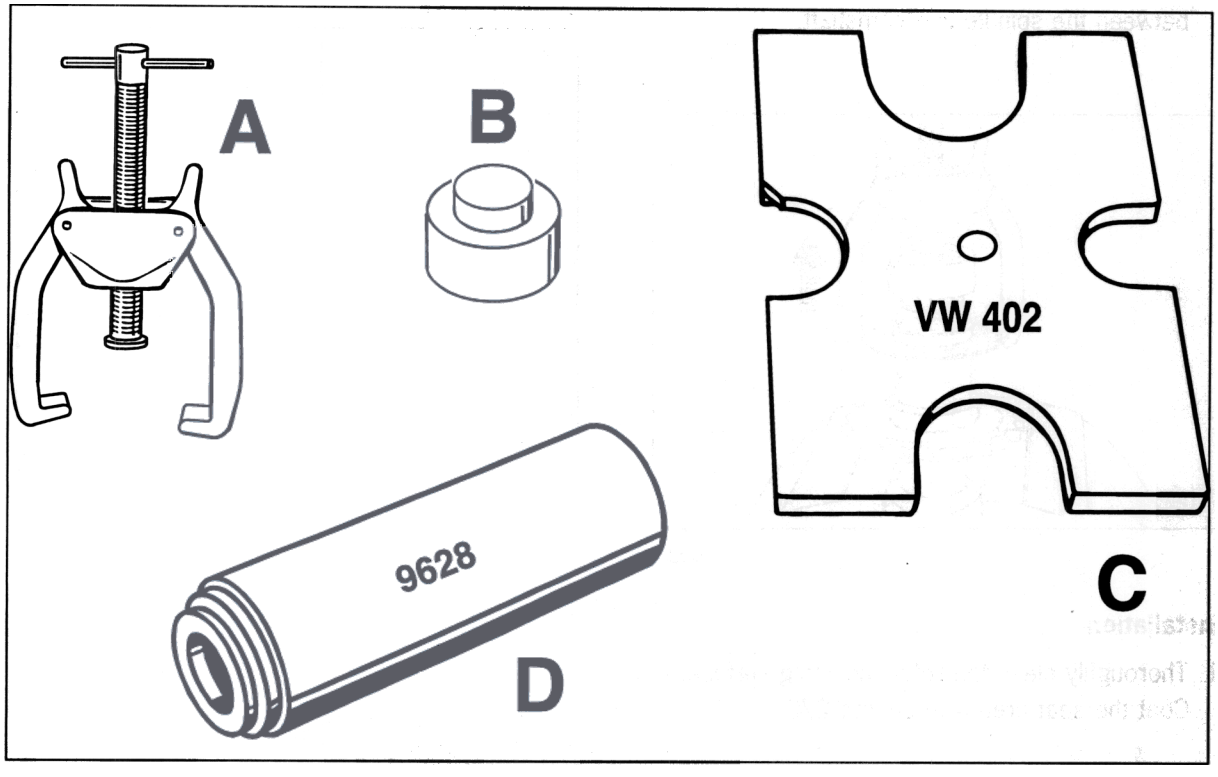
28 44 19 Removing and installing rotor for hall sensor

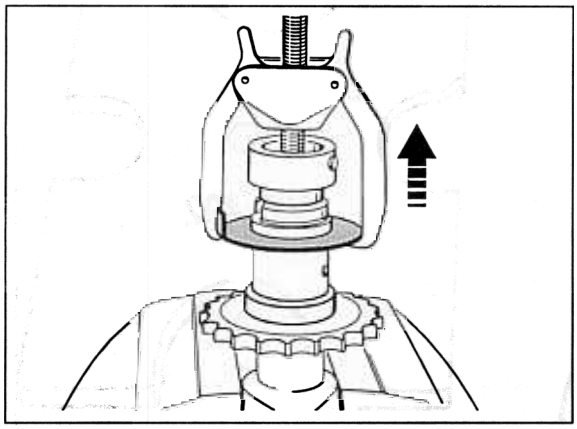
Tools



	Designation	Special tool	Explanation
	Extractor	Commercially available	
B	Spacer	VW 545/2	
C	Pressure plate	VW 402	
D	Pressure piece	9628	

Removal

1. Heat rotor area with a hot-air gun.
   Pull off rotor with a commercially available extractor.
   Place a spacer, e.g. VW 545/2, between the spindle and camshaft.

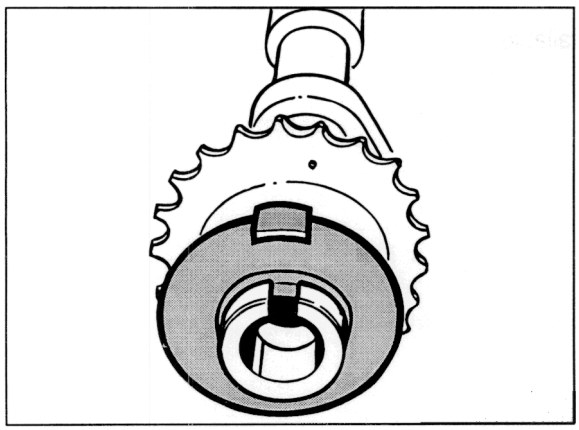


365_98

Installation

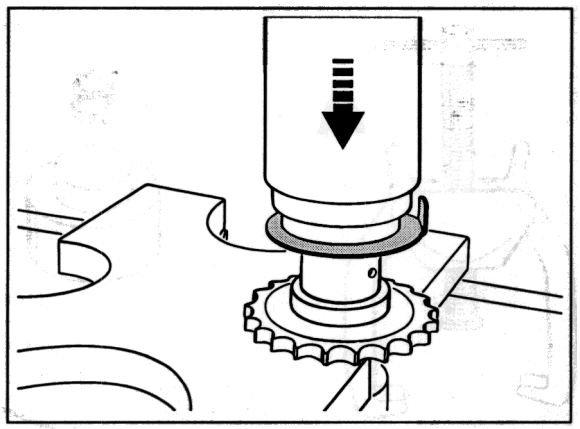
1. Thoroughly clean the rotor mounting surface.
   Coat the seat area with Loctite 270.

2. Fit new rotor in the correct position by hand.



407_98

3. Use the pressure piece (special tool 9628) to press the rotor onto its seat. Use pressure plate VW 402 as the camshaft support surface on the workshop press.



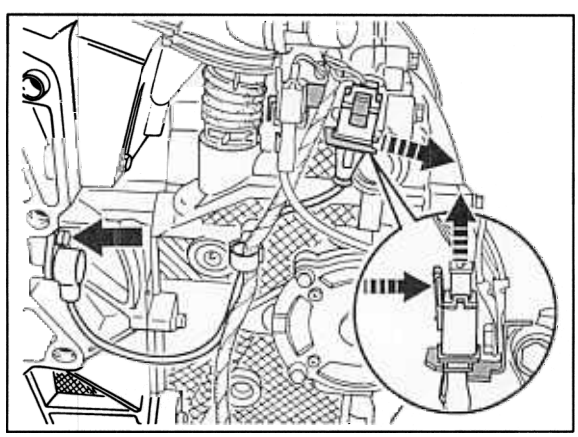
366_98

28 73 19 Removing and installing pulse sender

Removal

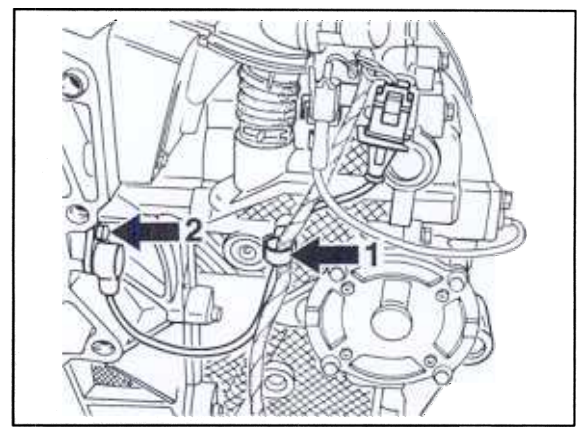
1. Remove right rear wheel.

2. Disconnect plug connection; to do this, press the clip and simultaneously pull off the plug. Pull the lower plug half out of the holder to the right.



Engine removed for the sake of clarity 316_98

3. Unclip cable (arrow 1). Undo M6 x 16 pan-head screw (arrow 2) (wrench size 4 mm) and remove the pulse sender.



Engine removed for the sake of clarity 403_98

Installation

1. Install pulse sender. Tightening torque of the pan-head screw (M6x16): 10±0.5 Nm (7.5±0.5 ftlb.).

2. Push in lower plug half on the holder.

3. Push plug on until it audibly engages.