

Note

Perform test program in the event of unknown causes of trouble, customer complaints which are not clearly expressed, and following repairs for guaranteeing all functions.

Prior to starting the following test, check all fuses for automatic climate control, auxiliary fan and blower motor. It is additionally recommended to perform a manual and optical function test of air flaps according to 83-601 first.

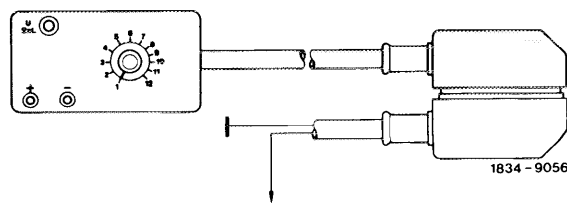
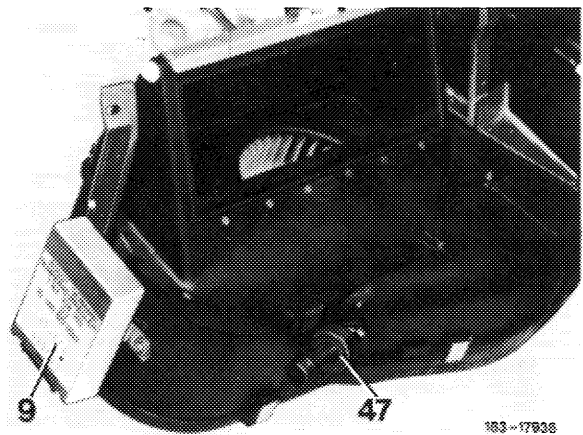
During all tests refer also to 83-600/11 to 13.

During electric test of monovalve (with voltmeter, test lamp or the like) be sure to avoid a short, since in such a case the electronic switching unit for temperature control may be damaged.

Test

Testing voltage supply and connecting lines 1 and 6	
Switch-on ignition.	
Position of adaptor switch	Nominal value
1	> 11 V
Nominal value correct	Nominal value wrong

- 1. Test electric lines and fuses for correct connection and interruption.
- 2. Test battery for state of charge.



Testing connecting lines 6 and 10

Pull 2-point plug of auxiliary harness from in-car temperature sensor. Connect plug of additional line/adaptor to 2-point plug from harness and bridge 2-point plug of auxiliary harness.

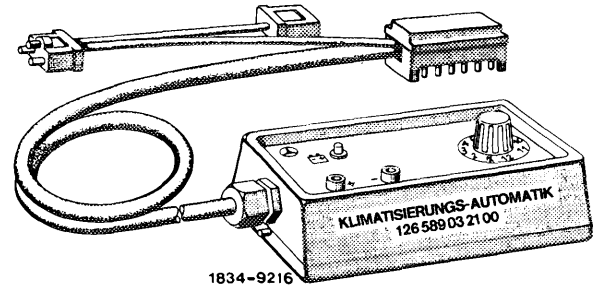
Disconnect battery, switch-on ignition.

Position of adaptor switch	Nominal value
2	0 Ω

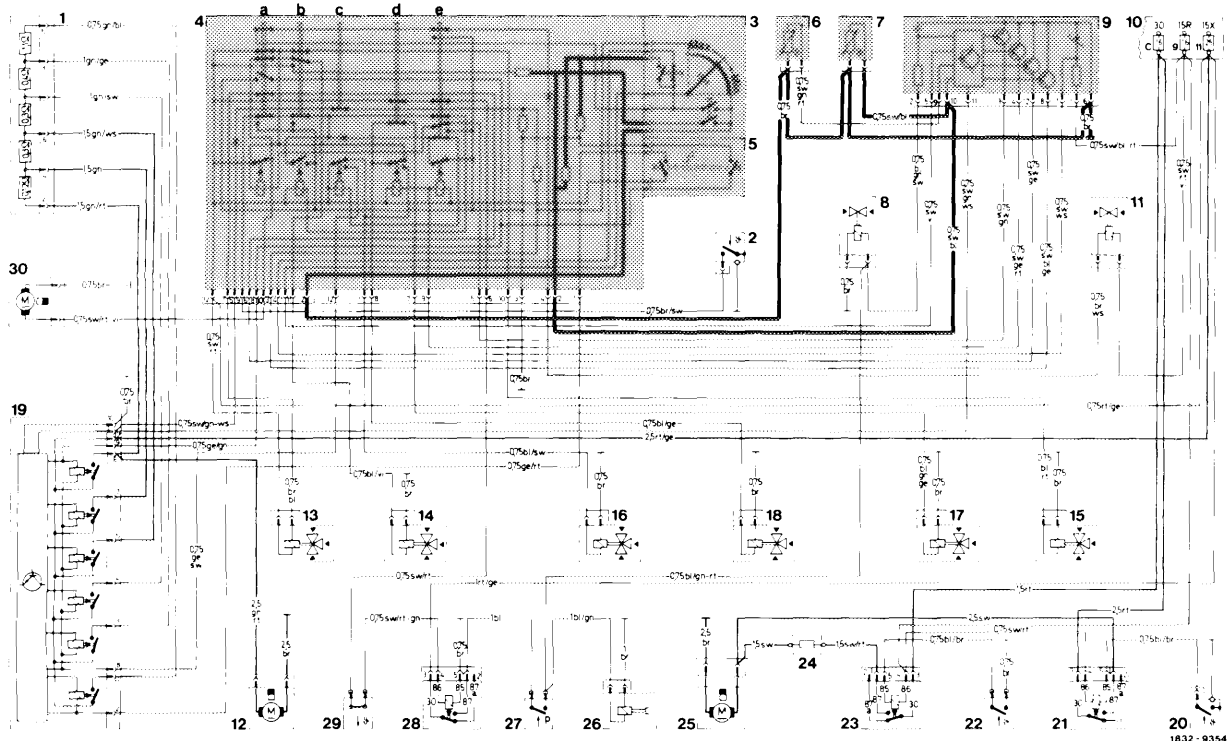
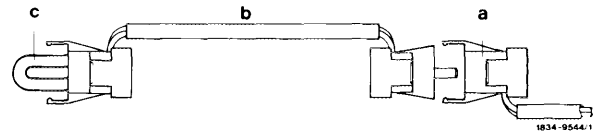
Nominal value correct	Nominal value wrong
↓	↓

1. Check electric lines for correct connection.

2. Replace control unit.



- a Plug from harness in-car sensor.
- b Additional line from adaptor
- c Bridge



Wiring diagram for test step 2 with adaptor

- 3 Temperature dial
- 4 Pushbutton switch unit
 - a Defrosting
 - b Overall ventilation
 - c Normal setting (air conditioning on)
 - d EC (air conditioning off)
 - e Off
- 5 Blower switch
- 6 Temperature sensor for heat exchanger
- 7 In-car temperature sensor
- 9 Electronic switchgear for temperature control

Testing temperature sensor for heat exchanger and connecting lines 6 and 9

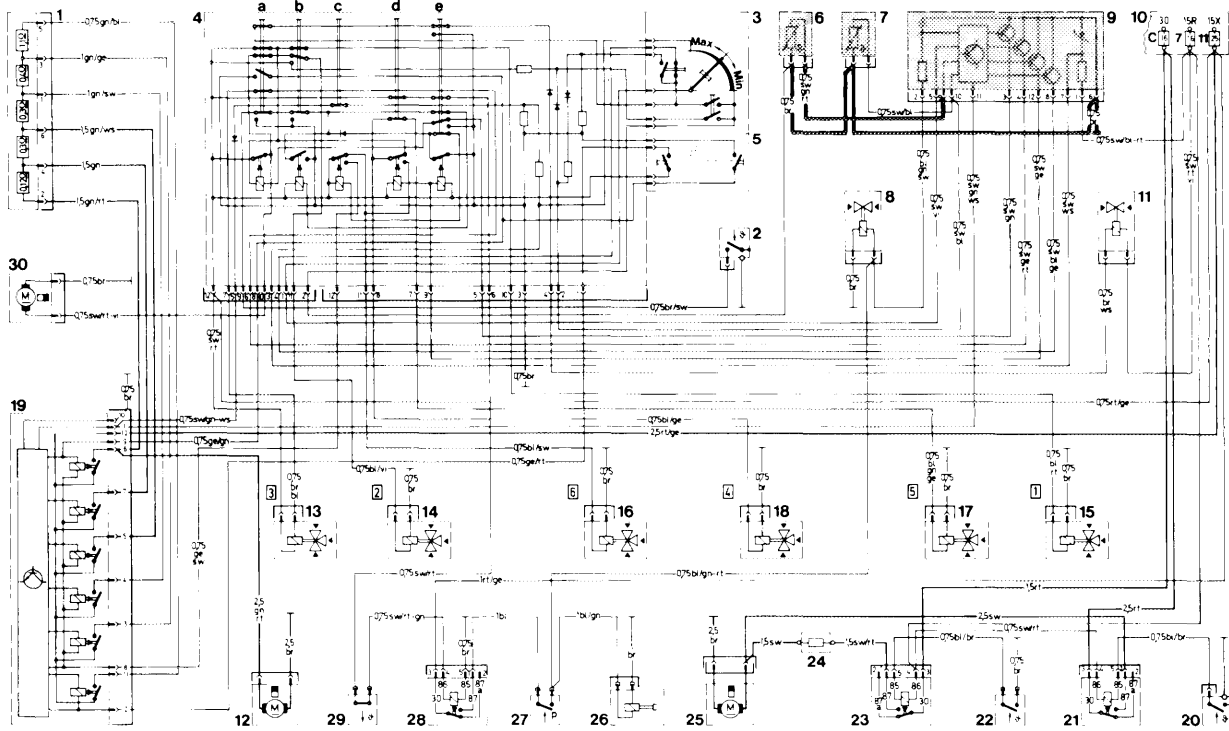
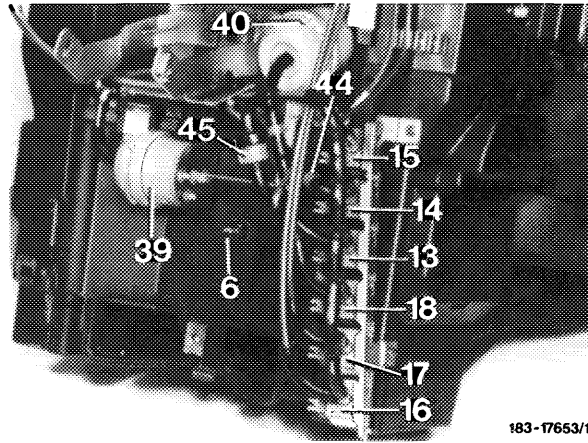
Disconnect additional line/adaptor and plug 2-point plug for in-car temperature sensor on again.

Disconnect battery, switch-in ignition.

Position of adaptor switch	Ambient temperature heat exchanger	Nominal value $\pm 0.5 \text{ k}\Omega$
3	15 °C	15.7 k Ω
	25 °C	10.0 k Ω
	35 °C	6.5 k Ω
	80 °C operating temperature	1.5 k Ω

Nominal value correct	Nominal value wrong
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1. Check electric lines for correct connection.
2. Replace temperature sensor for heat exchanger.



Wiring diagram for test step 3 with adaptor

- | | |
|--|---|
| 3 Temperature dial | d EC (air conditioning off) |
| 4 Pushbutton switch unit | e Off |
| a Defrosting | 6 Temperature sensor for heat exchanger |
| b Overall ventilation | 7 In-car temperature sensor |
| c Normal setting (air conditioning on) | 9 Electronic switchgear for temperature control |

Testing temperature dial (3) and connecting lines 5 and 6

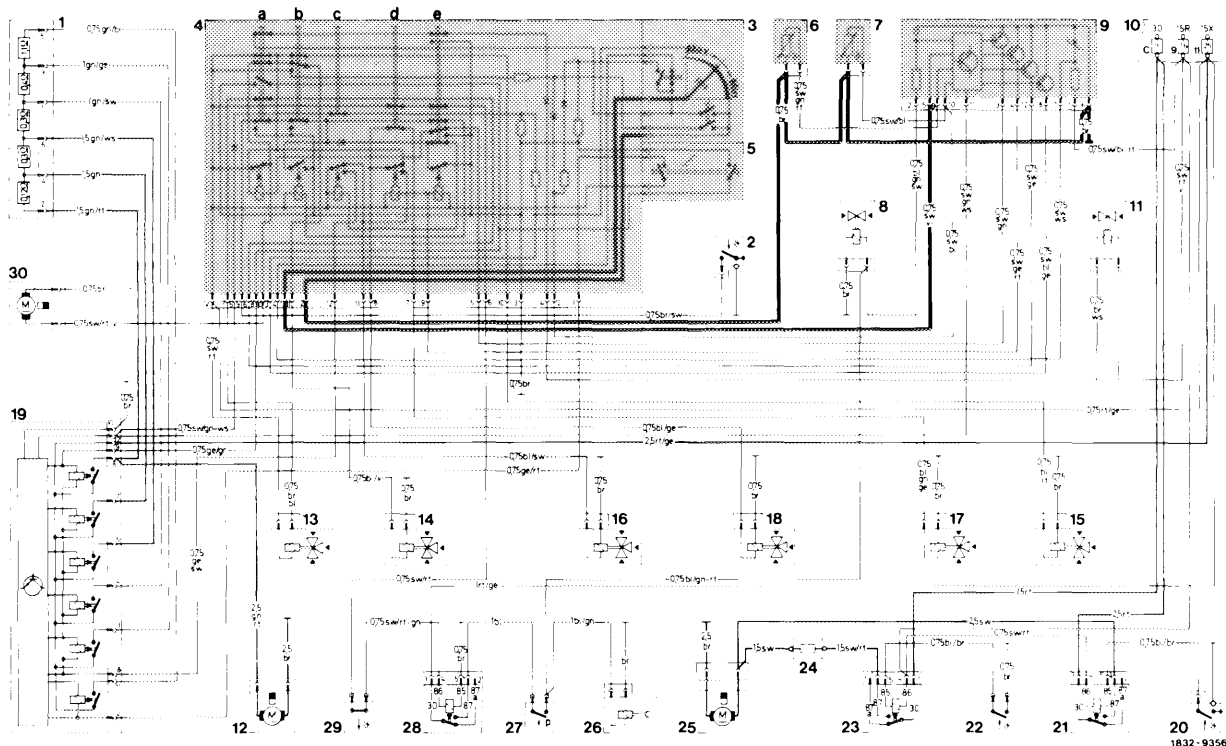
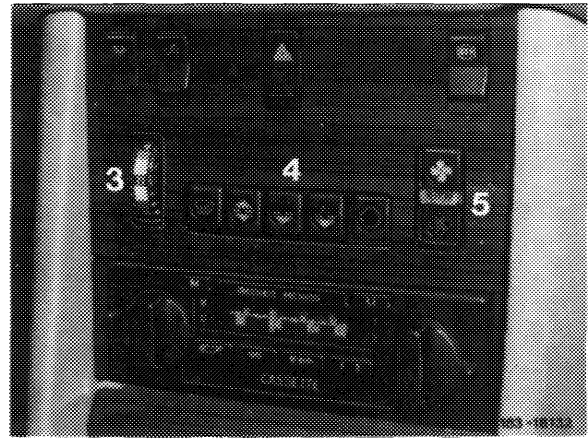
Disconnect battery, switch-on ignition.
Function selection button "c" pushed.

Position of adaptor switch	Position of temperature dial	Nominal value $\pm 0.5 \text{ k}\Omega$
4	"MIN"	1.6 $\text{k}\Omega$
	22 °C	3.15 $\text{k}\Omega$
	"MAX"	1.6 $\text{k}\Omega$

Nominal value correct

Nominal value wrong

1. Check electric lines for correct connection.
2. Connect new temperature dial, if test step 7 also shows deviating values.
3. Replace pushbutton switch.



Wiring diagram for test step 4 with adaptor

- 3 Temperature dial
- 4 Pushbutton switch unit
 - a Defrosting
 - b Overall ventilation
 - c Normal setting (air conditioning on)

- d EC (air conditioning on)
- e Off
- 6 Temperature sensor for heat exchanger
- 7 In-car temperature sensor
- 9 Electronic switchgear for temperature control

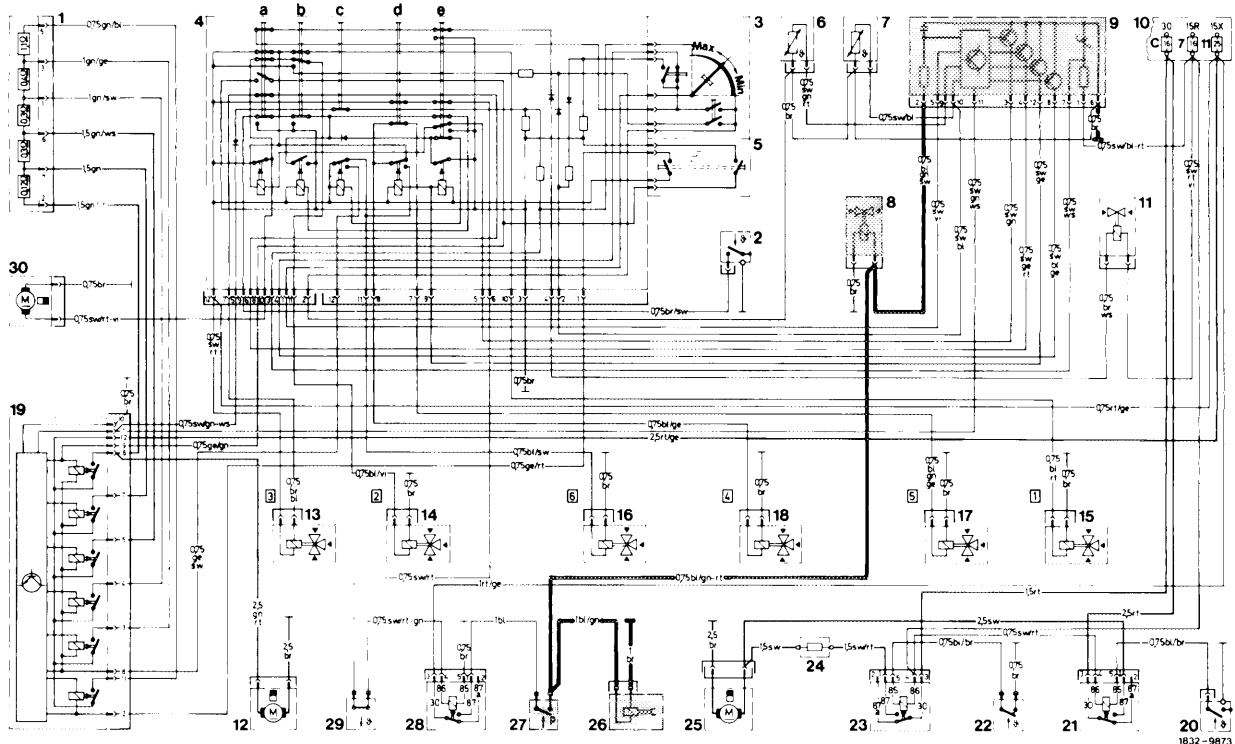
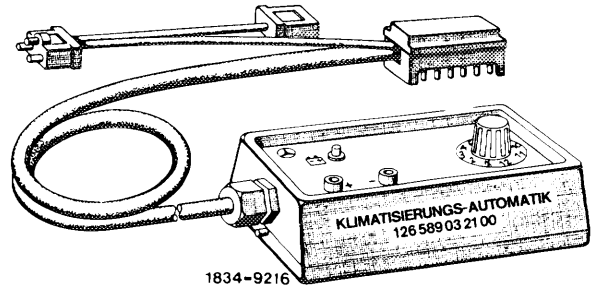
Testing electromagnetic clutch and connecting lines 2 and 6 via switchover valve 8.

Disconnect battery, switch-on ignition.

Position of adaptor switch	Nominal value $\pm 1 \Omega$
5	4 Ω

Nominal value correct	Nominal value wrong.
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1. Check electric lines for correct connection.
2. Test switchover valve (8) for ground connection (only if readout is approx. 0 Ω).
3. Replace electromagnetic clutch.



Wiring diagram for test step 5 with adaptor.

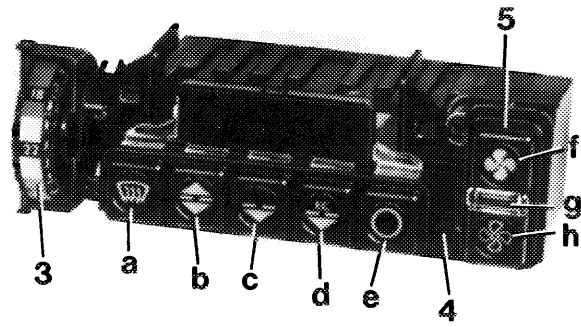
- 8 Switchover valve for rpm stabilization
- 9 Electronic switchgear for temperature control
- 26 Electromagnetic clutch – refrigerant compressor
- 27 Pressure switch refrigerant compressor

Testing function selection "a" or "e", as well as connecting lines 1 and 3

Disconnect battery, switch-on ignition.

Position of adaptor switch	Function selection	Nominal value $\pm 30 \Omega$
6	"a" pushed	80 Ω
	"e" pushed	∞

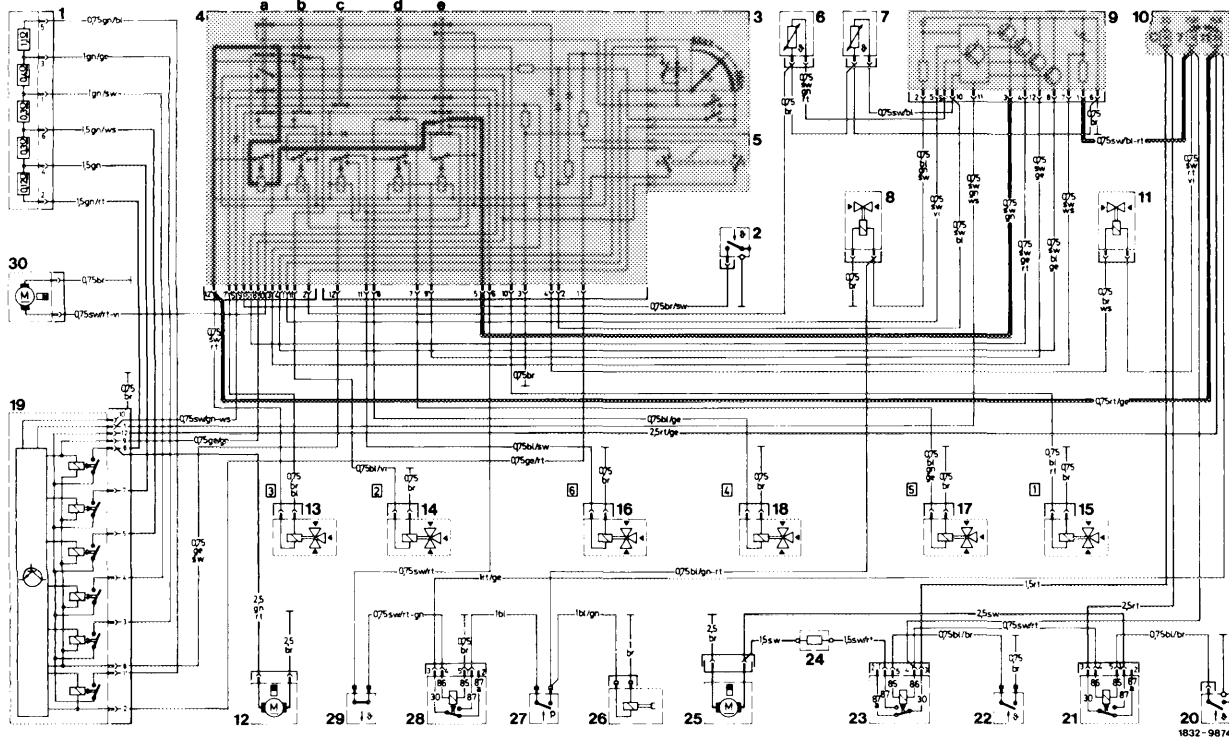
Nominal value correct	Nominal value wrong
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183-17660/1

1. Check electric lines for correct connection.

2. Replace pushbutton switch unit.



Wiring diagram for test step 6 with adaptor

4 Pushbutton switch unit

- a Defrosting
- b Overall ventilation
- c Normal setting (air conditioning on)
- d EC (air conditioning off)
- e Off

9 Electronic switchgear for temperature control

10 Fusebox

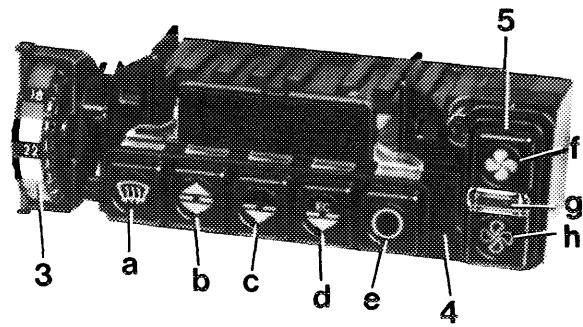
Testing temperature dial and connecting lines 5 and 7

Disconnect battery, switch-on ignition.
Push function selection button "c".

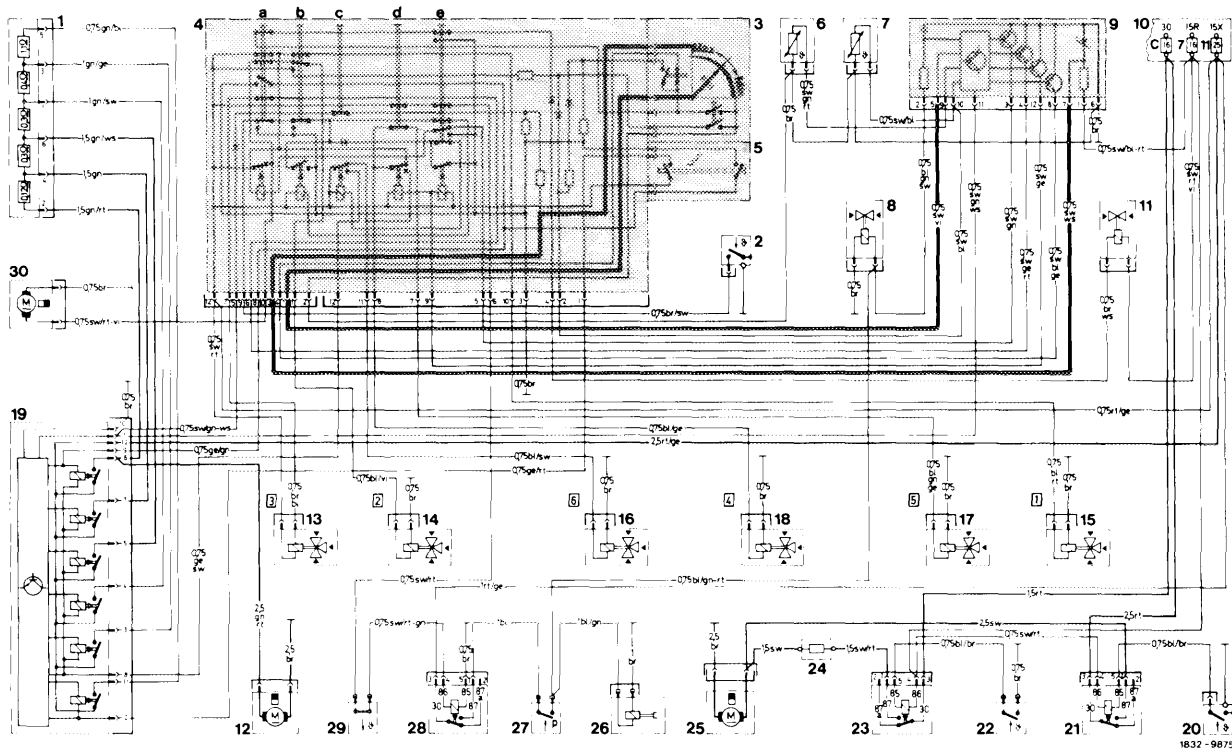
Position of adaptor switch	Position of temperature dial	Nominal value $\pm 1.5 \text{ k}\Omega$
7	"MIN"	2.0 $\text{k}\Omega$
	22 °C	3.5 $\text{k}\Omega$
	"MAX"	2.0 $\text{k}\Omega$

Nominal value correct	Nominal value wrong
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1. Check electric lines for correct connection.
2. Replace temperature dial (potentiometer).
3. Replace pushbutton switch unit.



183-17660/1



Wiring diagram for test step 7 with adaptor

- | | |
|--------------------------|---|
| 3 Temperature dial | c Normal setting (air conditioning on) |
| 4 Pushbutton switch unit | d EC (air conditioning off) |
| a Defrosting | e Off |
| b Overall ventilation | 9 Electronic switchgear for temperature control |

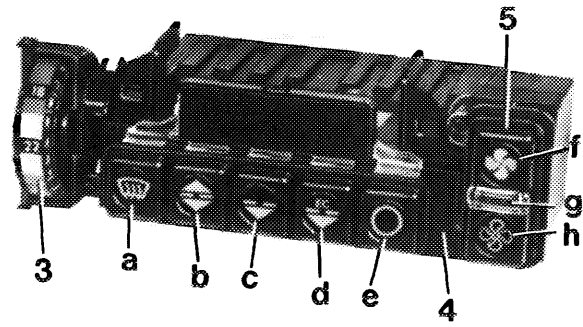
Testing control voltage recirculated air and connecting lines 1 and 12

Disconnect battery, switch-on ignition.

Position of adaptor switch	Nominal value $\pm 20 \Omega$
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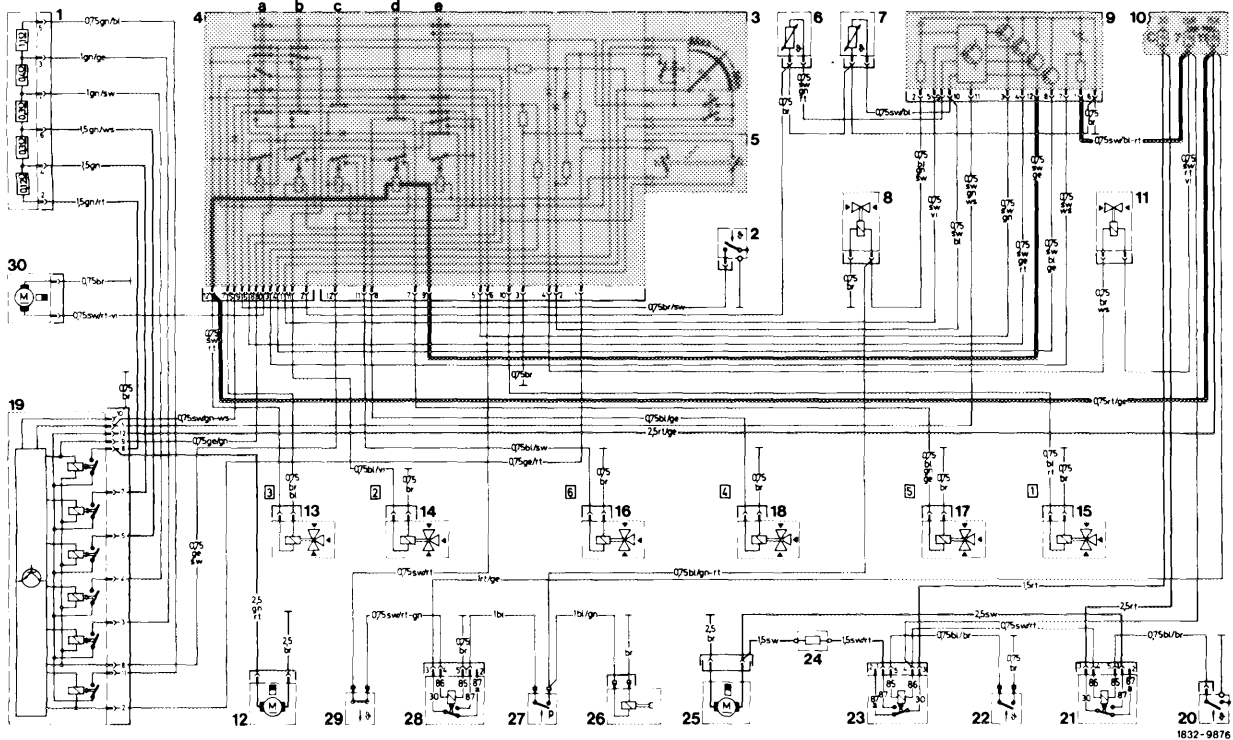
8	45 Ω
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Nominal value correct	Nominal value wrong
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183-17660/1

1. Check electric lines for correct connection.
2. Pushbutton switch unit defective.
3. Switchover valve defective.



1832-9876

Wiring diagram for test step 8 with adaptor

4 Pushbutton switch unit

- a Defrosting
- b Overall ventilation
- c Normal setting (air conditioning on)
- d EC (air conditioning off)
- e Off

9 Electronic switchgear for temperature control

10 Fusebox

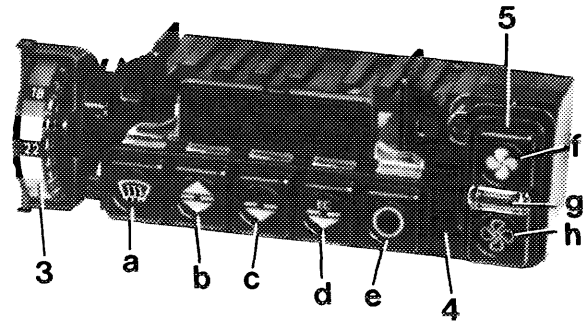
Testing switchover valve for center nozzle flap and connecting lines 1 and 4

Disconnect battery, switch-on ignition.
Push function selection button "c".

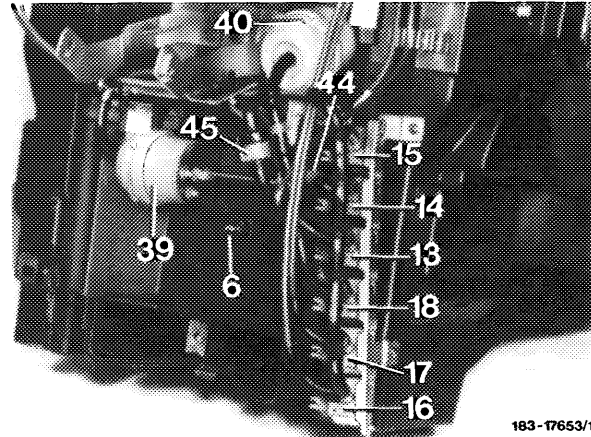
Position of adaptor switch	Nominal value $\pm 20 \Omega$
9	45 Ω

Nominal value correct	Nominal value wrong
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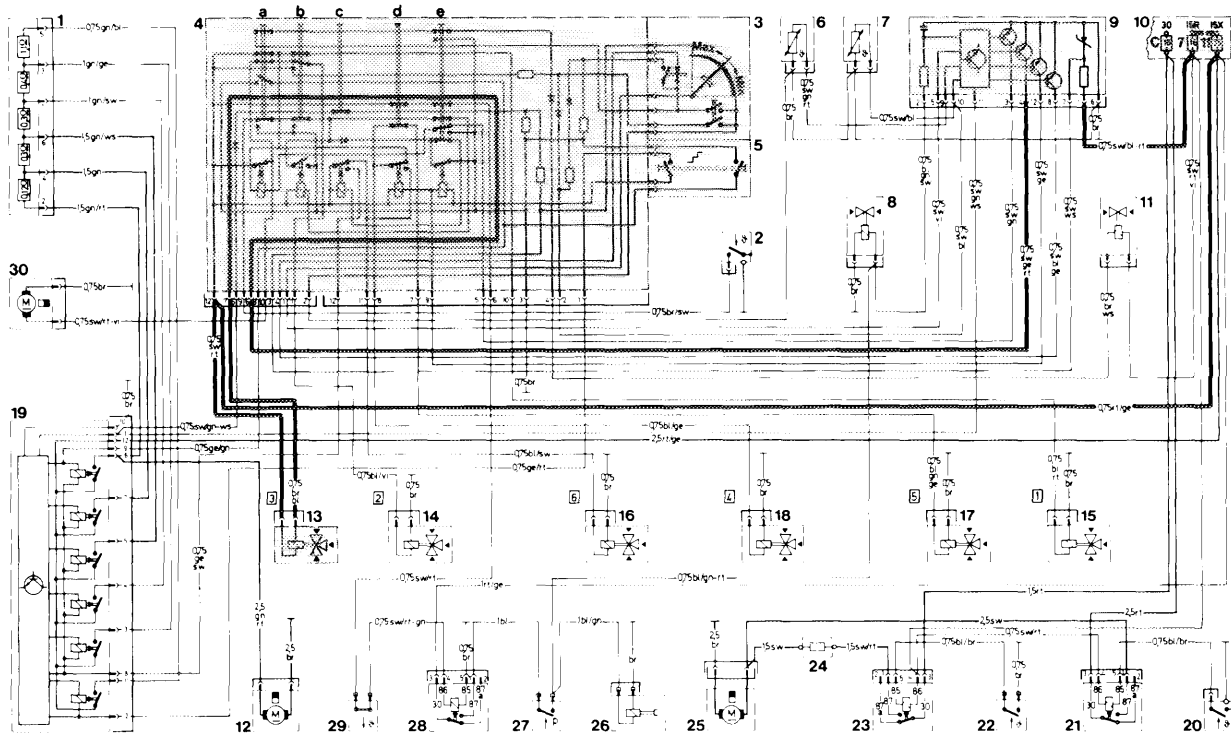
1. Check electric lines for correct connection.
2. Test switchover valve for center nozzle flap and replace, if required.
3. Replace pushbutton switch unit.



183-17660/1



183-17653/1



1832-987

Wiring diagram for test step 9 with adaptor

- | | |
|--|---|
| 4 Pushbutton switch unit | 9 Electronic switchgear for temperature control |
| a Defrosting | 10 Fusebox |
| b Overall ventilation | 13 Switchover valve for center nozzle flap |
| c Normal setting (air conditioning on) | |
| d EC (air conditioning off) | |
| e Off | |

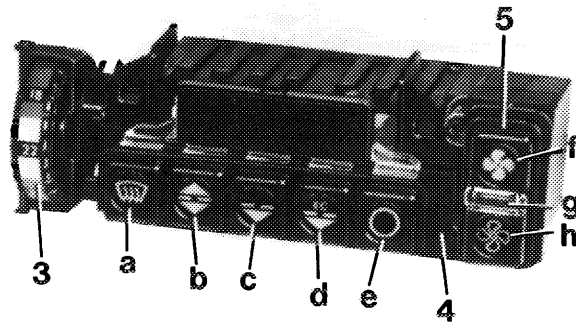
Testing function selection "c", connecting lines 6 and 11, as well as electronic switchgear for blower control

Connect battery, switch-on ignition.

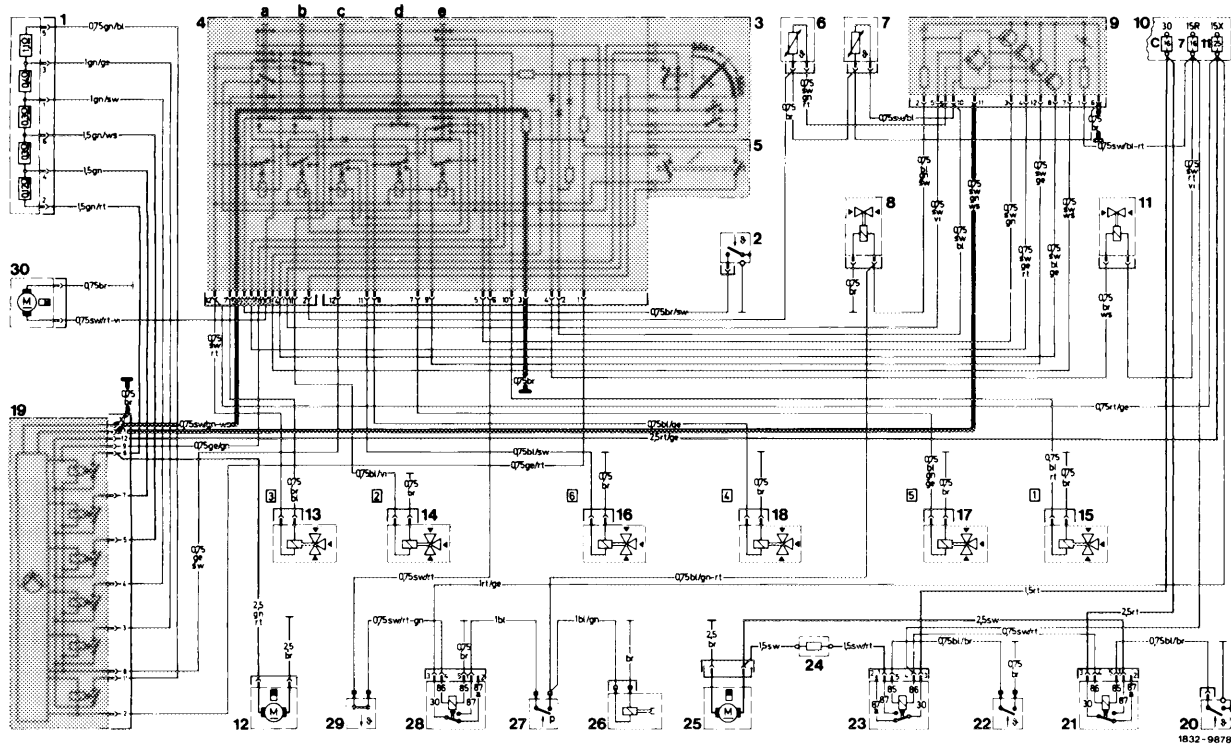
Position of adaptor switch	Function selection	Nominal value ± 0.3 V
10	"c" pushed and "h" pushed	0.6 V

Nominal value correct	Nominal value wrong
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1. Check electric lines for correct connection.
2. Electronic switchgear for blower control defective.
3. Replace pushbutton switch unit.



183-17660/1



1832-9878

Wiring diagram for test step 10 with adaptor

- 3 Temperature dial
- 4 Pushbutton switch unit

- a Defrosting
- b Overall ventilation
- c Normal setting (air conditioning on)
- d EC (air conditioning off)
- e Off

- 9 Electronic switchgear for temperature control
- 19 Electronic switchgear for blower control

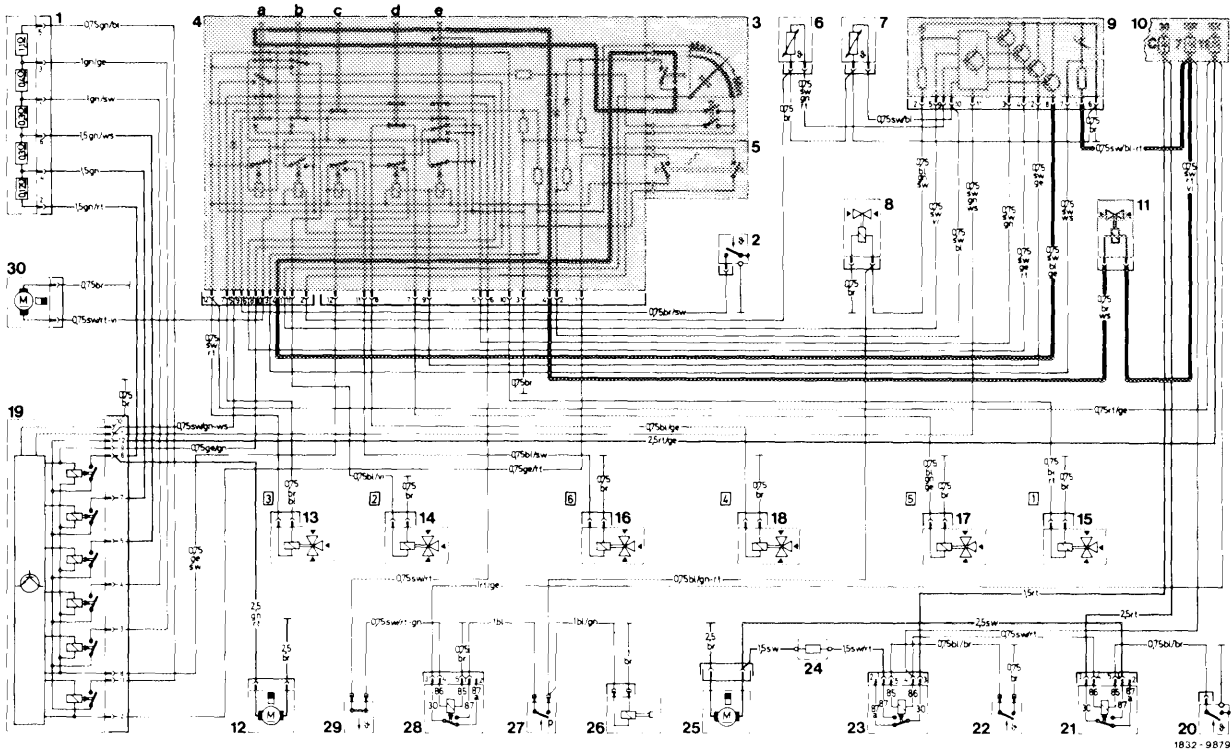
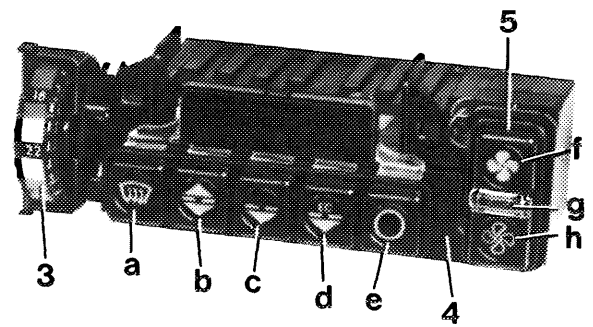
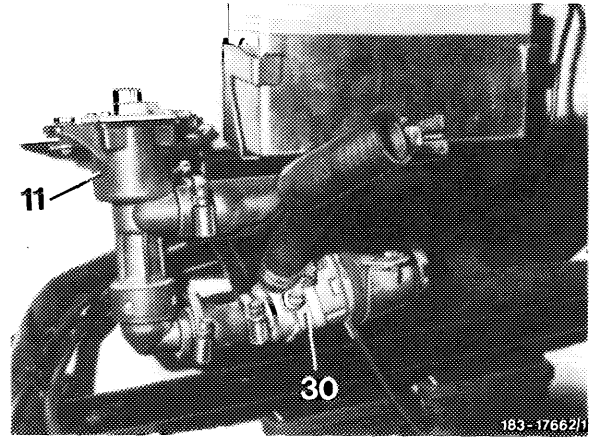
**Testing monovalve, function selection "c"
and connecting lines 1 and 8**

Connect battery, switch-on ignition.
Push function selection button "c".

Position of adaptor switch	Position of temperature dial	Nominal value
11	"MIN"	∞
	22 °C	$15 \pm 4 \Omega$
	"MAX"	∞

Nominal value correct	Nominal value wrong
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1. Check electric lines for correct connection.
2. Test monovalve, replace if required.
3. Replace pushbutton switch unit.



Wiring diagram for test step 11 with adaptor

- | | |
|--|---|
| 3 Temperature dial | d EC (air conditioning off) |
| 4 Pushbutton switch unit | e Off |
| a Defrosting | 5 Blower switch |
| b Overall ventilation | 9 Electronic switchgear for temperature control |
| c Normal setting (air conditioning on) | 10 Fusebox |

12 Testing blower motor

Reattach plug of electronic switchgear for temperature control. Then pull 2-point connecting plug (82) from blower motor and connect 2-point plug from adaptor, switch-on ignition and bridge 33 °C switch (31). Run engine at idle speed.

Position of pushbuttons in blower switch	Blower speed	Nominal value ± 1 V (+ 1A) (- 2A)
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Pushbutton "h" pushed	Fixed stage slow 1st stage	3.5 V (4A)
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Pushbutton "g" pushed ¹⁾	2nd stage	4.5 V (5.5A)
	3rd stage	5.5 V (7.5A)
	4th stage	6.5 V (9A)
	5th stage	8.5 V (13A)

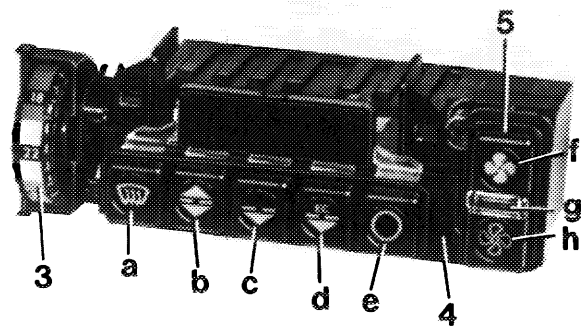
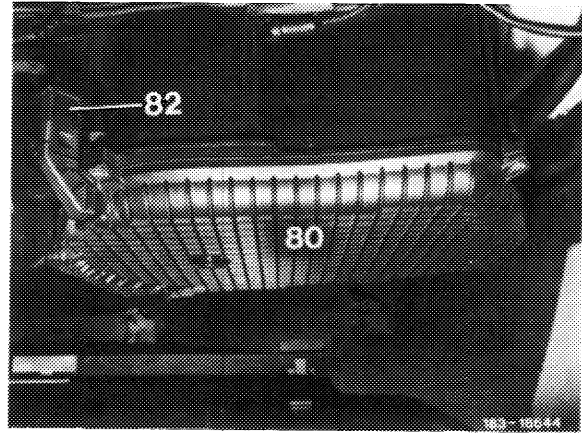
Pushbutton "f" pushed	Fixed stage fast 6th stage	> 11 V (18A)
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¹⁾ In warm environment (interior), set temperature dial before "MIN" or in cool environment before "MAX".

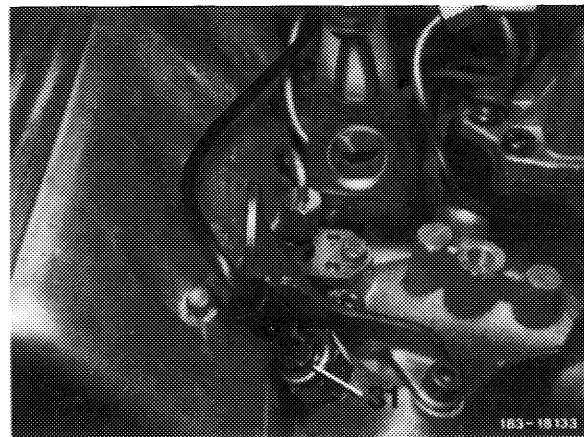
Nominal value correct

Nominal value wrong

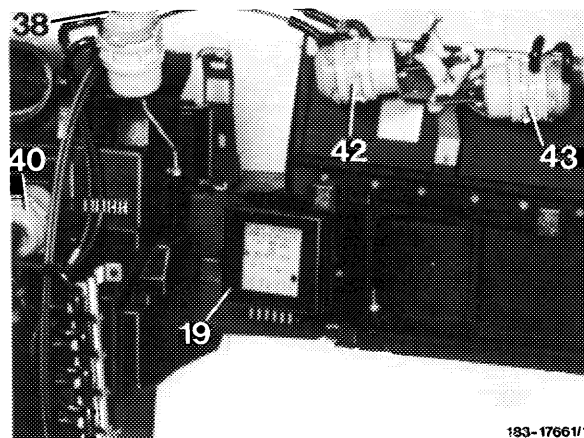
1. Check all electric lines for correct connection.
2. Connect new electronic switchgear for blower control for tryout.
3. Connect new blower switch for tryout.
4. Replace blower motor.
5. Replace preresistance group.



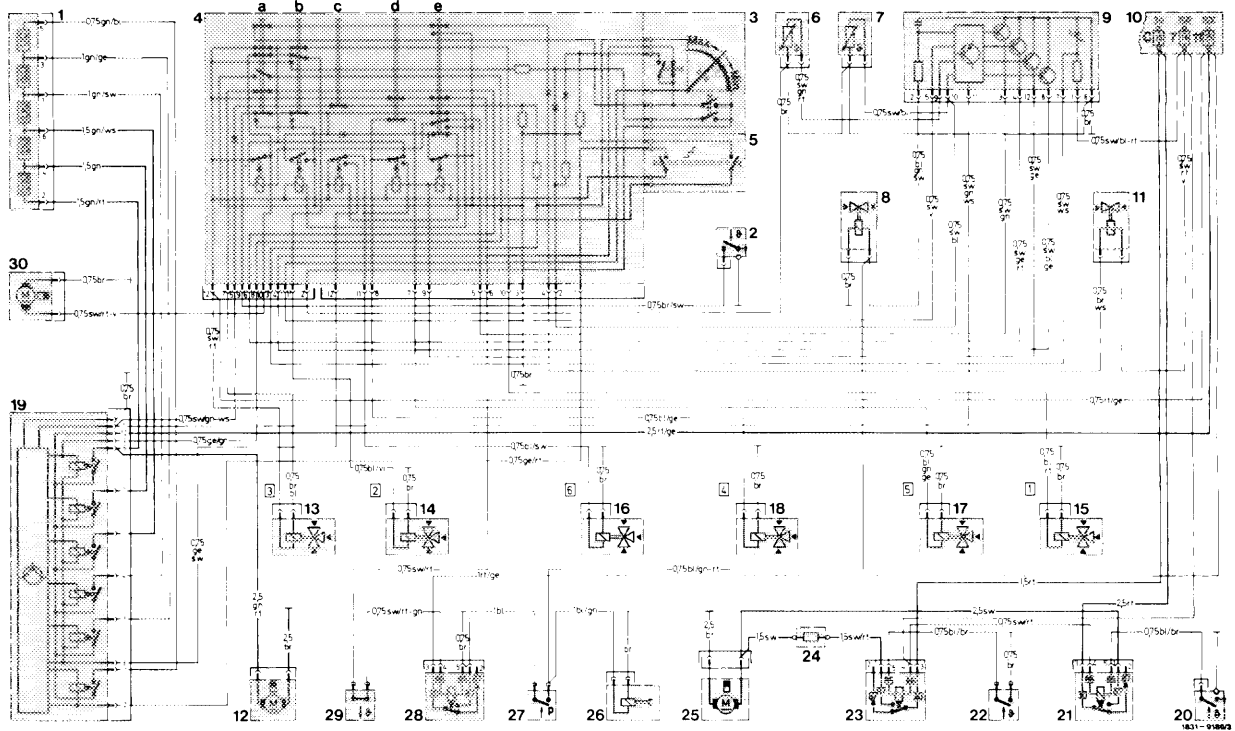
183-17660/1



183-18133

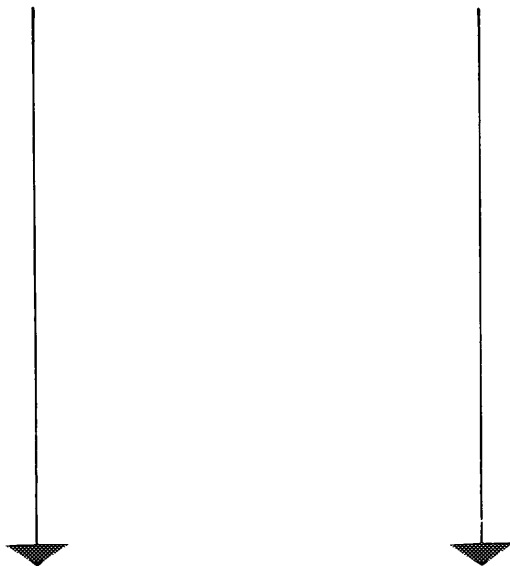


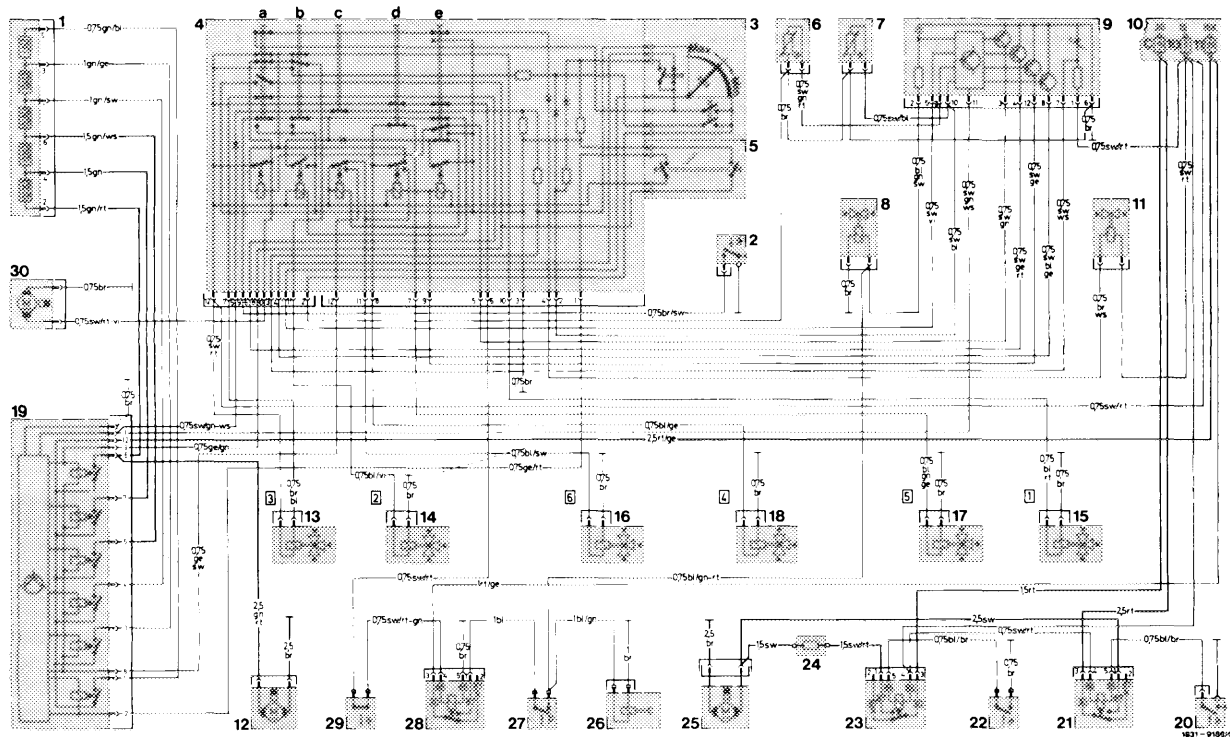
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Wiring diagram for test step 12 with adaptor (up to 07/80)

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Preresistance group 2 Temperature switch (cold engine lock) 3 Temperature dial 4 Pushbutton switch unit <ul style="list-style-type: none"> a Defrosting b Overall ventilation c Normal setting (air conditioning on) d EC (air conditioning off) e Off 5 Blower switch 6 Temperature sensor for heat exchanger 7 In-car temperature sensor 8 Switchover valve for rpm stabilization 9 Electronic switchgear for temperature control 10 Fusebox 11 Monovalve 12 Blower motor 13 Switchover valve for center nozzle flap 14 Switchover valve for leg room flaps 15 Switchover valve for defroster nozzle flaps | <ul style="list-style-type: none"> 16 Switchover valve for vacuum elements of fresh air- recirculated air flap and main air flap (small stroke) 17 Switchover valve for vacuum elements of fresh air-recirculated air flap and main air flap (large stroke) 18 Switchover valve for scoop air flap 19 Electronic switchgear for blower control 20 Temperature switch 100 °C or 110 °C for auxiliary fan 21 Relay auxiliary fan 22 Temperature switch 62 °C for auxiliary fan 23 Relay auxiliary fan (preresistance) only on vehicles with 8-cylinder engines 24 Preresistance auxiliary fan (0.2 Ω) only on vehicles with 8-cylinder engines 25 Auxiliary fan 26 Electromagnetic clutch – refrigerant compressor 27 Low pressure switch refrigerant compressor 28 Relay air conditioning system 29 ETR-switch 30 Recirculating pump |
|--|--|





Electric wiring diagram automatic climate control (J) (USA) starting 08/80

- | | |
|---|--|
| <ul style="list-style-type: none"> 1 Pre-resistor group 2 Temperature switch (cold engine lock) 3 Temperature dial 4 Pushbutton switch <ul style="list-style-type: none"> a Defrosting b Overall ventilation c Normal adjustment (air-conditioning system on) d Normal adjustment (air-conditioning system off) e Off 5 Blower switch 6 Temperature sensor of heat exchanger 7 In-car temperature sensor 8 Switchover valve for rpm stabilization (except USA and Japan) 9 Electronic switching unit for temperature control 10 Fusebox
Starting 8/80 connection of fuse 7 (15 R) relocated to 10, terminal 15 (color code black/red) 11 Monovalve 12 Blower motor 13 Switchover valve for center nozzle flap 14 Switchover valve for legroom flaps 15 Switchover valve for defroster nozzle flaps | <ul style="list-style-type: none"> 16 Switchover valve for vacuum elements of fresh air-recirculating air flap and main air flap (small stroke) 17 Switchover valve for vacuum elements of fresh air-recirculating air flap and main air flap (large stroke) 18 Switchover valve for scoop air flap 19 Electronic switching unit for blower control 20 Temperature switch 100 °C for auxiliary fan (coolant) 21 Relay auxiliary fan 22 Temperature switch 52 °C for auxiliary fan (receiver dehydrator) 23 Relay auxiliary fan (pre-resistor) 8-cylinder engines only 24 Pre-resistor auxiliary fan (0.2 Ω) for 8-cylinder engines only 25 Auxiliary fan 26 Electromagnetic clutch-refrigerant compressor 27 Pressure switch refrigerant compressor 28 Relay refrigerant compressor 29 ETR-switch 30 Recirculating pump |
|---|--|

Since 08/80 the fuse layout (item 10) has been changed. Electronic switching unit (item 9), monovalve (item 11) and relay for additional fan (item 23) are connected to fuse 10, terminal 15. The same applies also to line on terminal 12 of lefthand coupling of control unit (item 4).

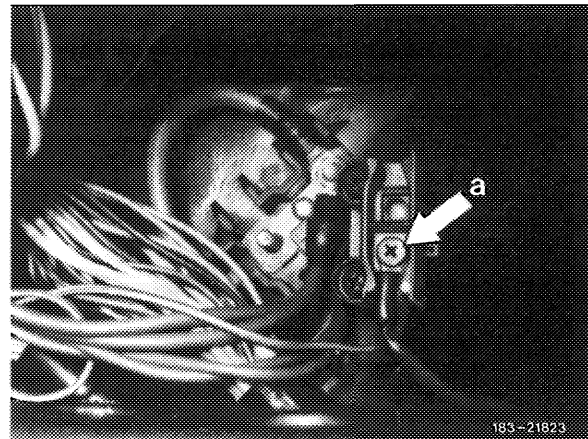
As a result, the recirculating pump and the monovalve are not switched on in steering lock position 1.

The lines toward fuse 10, terminal 15 are identified a uniform black/red.

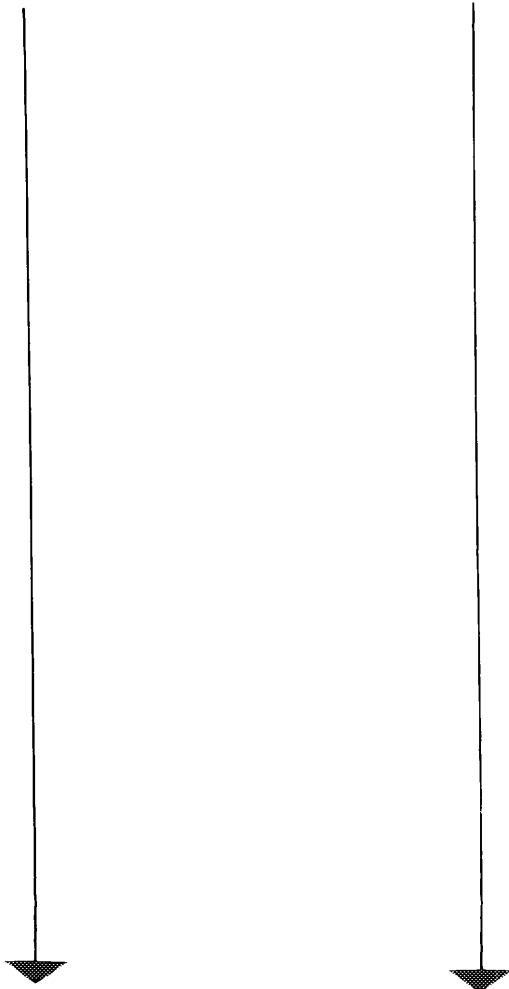
Attention!

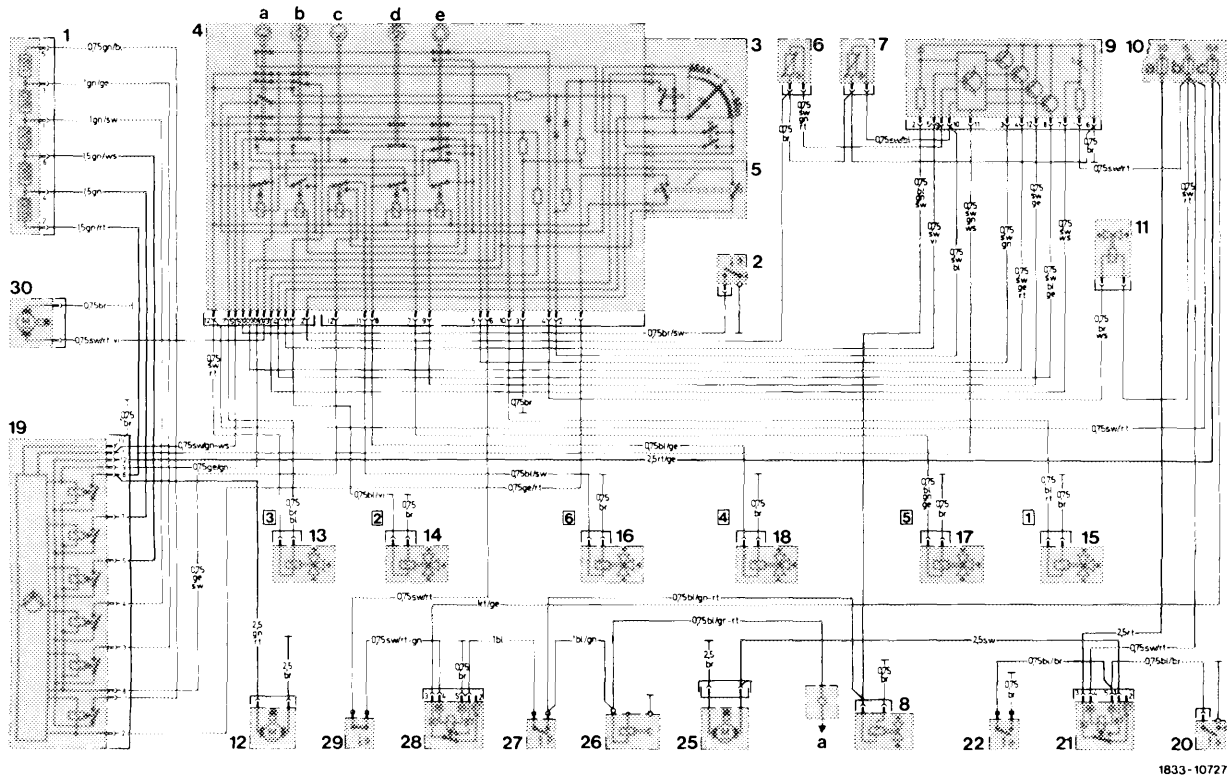
On vehicles starting 09/81, closing of ETR-switch will additionally switch on the magnetic clutch for the refrigerant compressor via delay valve under a delay of approx. 0.7 s. Simultaneously, voltage is applied at control unit for electronic idle speed regulation via lug "a". As a result, the idle speed of the engine will be increased before the refrigerant compressor will be additionally switched on.

For activating the control unit for idle speed regulation, the lug "a" (refer to Fig.) is located on floor of fusebox adjacent to cable connector terminal 30. In addition, the cut-in point for the temperature switch and for the auxiliary fan has been changed from 110 °C to 100 °C and from 62 °C to 52 °C.



Layout lug "a" in fusebox, signal refrigerant compressor for idle speed regulation

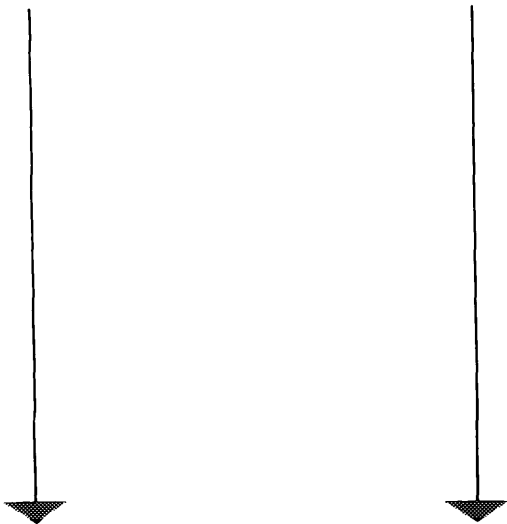




Electric wiring diagram automatic climate control (6-cylinder engine starting 09/81)

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Pre-resistor group 2 Temperature switch (cold engine lock) 3 Temperature dial 4 Pushbutton switch <ul style="list-style-type: none"> a Defrosting b Top and bottom c Normal adjustment (air-conditioning system on) d Normal adjustment (air-conditioning system off) e Off 5 Blower switch 6 Temperature sensor (heat exchanger) 7 In-car temperature sensor 8 Switchover valve for rpm increase 9 Electronic switching unit for temperature control 10 Fusebox 11 Monovalve 12 Blower motor 13 Switchover valve for center nozzle flap 14 Switchover valve for legroom flaps 15 Switchover valve for defroster nozzle flaps 16 Switchover valve for fresh air-recirculating air flap and main air flap (small stroke) | <ul style="list-style-type: none"> 17 Switchover valve for fresh air-recirculating air flap and main air flap (large stroke) 18 Switchover valve for scoop air flap 19 Electronic switching unit for blower control 20 Temperature switch 100 °C for auxiliary fan (coolant) 21 Relay auxiliary fan 22 Temperature switch 52 °C auxiliary fan (coolant) 25 Auxiliary fan 26 Electromagnetic clutch-refrigerant compressor 27 Pressure switch refrigerant compressor 28 Relay refrigerant compressor 29 ETR-switch 30 Recirculating pump <ul style="list-style-type: none"> a Lug main harness, signal refrigerant compressor for decel shutoff |
|--|--|

Fuses:
 Fuse a, terminal 30: 16 amps.
 Fuse b, terminal 15: 8 amps.
 Fuse c, terminal 15X: 25 amps.



Testing switchover valves for fresh air-recirculated air flap, main air, center nozzle, defroster nozzle and leg room flaps

Plug 2-point plug of harness on in-car temperature sensor. Mount instrument cluster. Connect battery. Switch-on ignition. Run engine at idle.

Function selection	Mode	Main air flap fresh air-recirculated air flap (fresh air data in %)	Center nozzle flap	Defroster nozzle flaps	Leg room flaps	Scoop air flap
a	Heating mode	100	closed	open	closed	closed
b	Heating mode	100	closed	open	open	closed
	Cooling mode	20 ¹⁾	open	open	open	open
c	Heating mode	100	closed	leak air	open	closed
	Cooling mode	20 ¹⁾	open	closed	closed	open
d	Heating mode	100	closed	leak air	open	closed
	Cooling mode	100	open	closed	closed	closed
e	Off	closed	closed	open	closed	closed

¹⁾ If the in-car temperature is 3 °C higher than the temperature set on temperature dial, the system operates with recirculated air.

Flap position correct

Flap position wrong

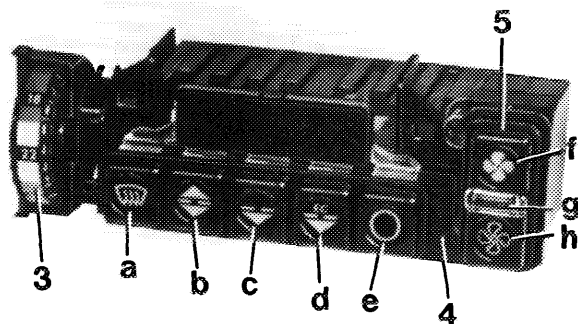
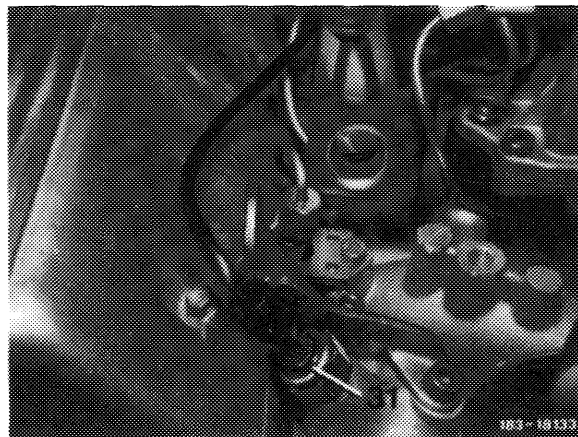
1. Check electric lines for correct connection.
2. Check vacuum lines for correct installation (refer to 83-604).
3. Check respective switchover valve and replace, if required (refer to 83-604).
4. Check respective vacuum element and replace, if required (refer to 83-604).

Testing cold engine lock (engine temperature below 35 °C) Switch-on ignition, push function button "c", pull electric connecting plug from cold engine lock (31) and bridge (ground).	
Heater blower should start.	
Heater blower starting	Heater blower not starting

1. Check electric lines for correct connection.
2. Check blower control (test step 12).
3. Change pushbutton switch unit.

Attach plug to cold engine lock and run engine warm at approx. 2000/min. Push function selection button "c". (Engine temperature > 33 °C). Heater blower should start.	
Heater blower starting	Heater blower not starting

Replace cold engine lock.



183-17660/1

Checking monovalve for leaks

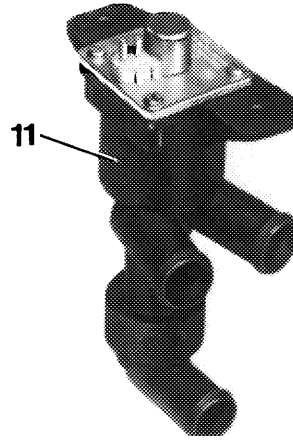
Set temperature dial to "MIN", push function selection button "b". Run engine to operating temperature (function test bench). Heat exchanger should remain cold, that is, no heated air should come out. (Valve connected to + and -).

Heated air not coming out

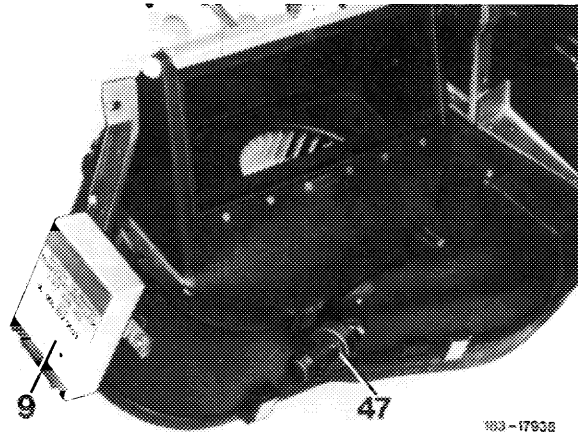
Heated air coming out

1. Contact inadequate, check activation of valve (sleeves as 2-point coupling or flared).
2. Connect electronic switchgear for temperature control for tryout.
3. Replace monovalve.

End of test



183-17654/1



183-17658