♦ Heater may remain in full load, part load or control interval operating statuses for lengthy periods depending on amount of heat generated by engine and supplied by heat exchangers of air conditioner unit => Pages 01-217 and 01-218.

♦ As additional heater operates with engine running, it is hardly noticeable during heating mode. Heater run-on is audible if engine is switched off.

♦ Actuation as additional heater is effected by engine control unit (via contact 3 of 6-pin connector at auxiliary heater). Engine control unit actuates auxiliary heater as soon as specified cut-in conditions are met. Operating sequence of auxiliary heater in "additional heating" mode corresponds to that for actuation by pre-selection clock/dash panel insert.

General notes:

♦ Temperature sensor (for detecting temperature of coolant in heater) is permanently installed in heater control unit -J162 and cannot be checked/removed.

♦ To guard against overheating, glow plug with flame monitor -Q8 is actuated with a regulated voltage.

♦ To ensure that combustion in the heater is always in the optimum range, the metering pump -V54 (clock frequency) and the combustion air blower -V6 (voltage) are regulated throughout the entire sequence.

♦ The temperatures given in the functional description and function chart are approximate.

♦ If heater has been interlocked (completely shut down) on account of overheating, it cannot be switched on again until the fault memory has been read out and its content erased.

♦ If heater is to be switched off when starting, position reached in starting sequence governs whether heater is switched off immediately or whether run-on(burn-off) is necessary.

♦ If temperature of coolant exceeds 77 °C (81 °C as of software version "D50") before attaining full load mode (e.g. with a hot engine), heater switches to control interval.

♦ Various functions are constantly monitored during operation (switch-off is immediate if a fault occurs).

– Undervoltage cut-out if supply voltage drops below specified cut-out voltage (e.g. on account of insufficient battery charge)

-Overvoltage cut-out if supply voltage exceeds 15.5 V for more than 6 s

-Cut-out due to flame interruption if resistance of glow plug with flame monitor -Q8 drops below specified value (e.g. flame interruption due to fault in fuel supply)

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- Cut-out due to overheating if coolant temperature in heater exceeds 125 °C (e.g. due to absence of coolant or on account of fault in coolant circuit or at recirculating pump -V55)

Prerequisites for sequence described on the following pages (when switching on heater):

Coolant circuit bled and coolant temperature less than 20 °C

Battery -A adequately charged

Sufficient fuel in tank

No faults stored in fault memory of heater

Ignition off

Notes:

♦ Only the main items of the operating sequence are presented on the following pages. Sequences taking place in the background are marked with a "-" and perceptible sequences (which can be heard or measured) with a "●".

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
1	Cut-in signal (setting for auxiliary heating mode at pre-selection clock/dash panel insert)		
	Auxiliary heating ● By pre-selection clock After pressing "Heating mode" button After receiving signal from auxiliary heating radio wave receiver -R64 At pre-set cut-in time – Interrogation of pre-selection clock ("auxiliary ventilation" mode active, symbol lights in pre-selection clock display)	– "Auxiliary ventilation" mode active (symbol lights in pre-selection clock display)	– Auxiliary ventilation (summer mode) =>No. 11
Continued on next page			

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No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
	● By dash panel insert (auxiliary heating mode) Following activation of "Heating mode" function via rotary knob/pushbutton After receiving signal from auxiliary heating radio wave receiver -R64 At pre-set cut-in time – Interrogation of auxiliary ventilation switch (in dash panel insert)	– Switch closed ("Auxiliary ventilation" mode active)	– Auxiliary ventilation (summer mode) =>No. 11
	Additional heating ● By engine control unit (fault reader)		
Continued on next page			

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
2	Initiation of starting procedure		
	– Interrogation of fault memory Interrogation of voltage at heater Monitoring of all electrical components and input signals Interrogation of glow plug with flame monitor -Q8 Interrogation of coolant temperature in heater (less than 77 °C/ 81 °C as of software version "D50")	– Fault interlock entered Voltage is or becomes lower than specified cut-out voltage Fault determined Resistance of glow plug with flame monitor -Q8 outside specified range Coolant temperature (greater than 77 °C/ 81 °C as of software version "D50")	– Termination of starting procedure/fault/off Termination of starting procedure (entry in fault memory)/fault/off See above See above Switchover to control interval (no. 7)

Continued on next page

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
3	Starting		
	– Monitoring as for no. 2	=>No. 2	=>No. 2
	● Recirculating pump -V55 on ● Actuation of operating and display unit for air conditioner/Climatronic - E87/thermotronic control unit - J214 and fresh-air blower -V2 on Up to software version "D49" if coolant temperature is greater than +30 °C (positive signal to -E87) As of software version "D50" and code "000XX" (large coolant circuit) if coolant temperature is greater than +30 °C (positive signal to -E87)		

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Notes:

- "Starting" sequence is described on Page 01-212.
- Auxiliary heaters with part number as of index "K" or "J" with software version "D52" have been gradually introduced into production since April 2001. With these auxiliary heaters, actuation of recirculating pump may be modified depending on encoding and adaption in adaption channel "10".

  With code "000XX" (large coolant circuit), output of recirculating pump is reduced up to a coolant temperature of approx. 72 °C so as to increase temperature of coolant exiting from auxiliary heater (actuation time approx. 20 % at less than 60 °C and 100% at greater than 72 °C).

  With code "001XX" (small coolant circuit), output of recirculating pump is also altered with adaption "2" or "3" in adaption channel "10".
- When auxiliary heater is encoded for a small coolant circuit, a square-wave signal is emitted via output for actuation of fresh-air blower (operating and display unit for air conditioner/Climatronic -E87). This signal is processed by coolant shut-off valve relay -J541 (-E87 cannot process signal). This signal is used to output temperature of coolant in auxiliary heater and instantaneous auxiliary heater operating status. A positive signal is output if auxiliary heater is encoded for large coolant circuit (as for software versions "D49" and "D48") =>Page 01-220.

Refer to next page for continuation.

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No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
3	Starting (continued)		
	● As of software version "D50" and code "001XX" (small coolant circuit), data signal to -J541 irrespective of coolant temperature and instantaneous operating status ● Actuation of -Q8 (regulated) ● Actuation of combustion air blower -V6 (regulated) ● Actuation of metering pump -V54 (regulated)		
Continued on next page			

Notes:

- "Starting" sequence is described on Page 01-212.
- When auxiliary heater is encoded for a small coolant circuit, a square-wave signal is emitted via output for actuation of fresh-air blower (operating and display unit for air conditioner/Climatronic -E87). This signal is processed by coolant shut-off valve relay -J541 (-E87 cannot process signal). This signal is used to output temperature of coolant in auxiliary heater and instantaneous auxiliary heater operating status. A positive signal is output if auxiliary heater is encoded for large coolant circuit (as for software versions "D49" and "D48") =>Page 01-220.

Refer to next page for continuation.

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
3	Starting (continued)		
	Stabilisation time ● Start of full load heating ● Switchover of -Q8 from glow plug to flame monitor Interrogation of -Q8 resistance (remains hot)	Resistance of glow plug with flame monitor -Q8 outside specified range Resistance of glow plug with flame monitor -Q8 still outside specified range after repeated starting	Termination of starting procedure (1x start repetition) =>No. 2 Termination of starting procedure (entry in fault memory)/fault/off
Continued on next page			

Note:

"Starting" sequence is described on Page 01-212.

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
4	Full load heating (max. heat output)		
	– Monitoring as for no. 2	=>No. 2	=>No. 2
	– Voltage at auxiliary heater remains in excess of required level No interruption of heating Coolant temperature increases and reaches 71 °C (75°C as of software version "D50")	– Voltage drops below specified cut-out voltage Flame goes out Coolant temperature remains less than 71 °C (75 °C as of software version "D50")	– Burn-off (entry in fault memory)/fault/off Burn-off and re-start =>No. 2 Heater remains in full load mode until switched off
Continued on next page			

Note:

"Full and part load mode" sequence is described on Page 01-213.

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No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
5	Part load heating (approx. 50% of heat output)		
	– Monitoring as for no. 4 ● Actuation of metering pump ● -V54 with reduced clock frequency ● Actuation of combustion air blower -V6 with reduced voltage Coolant temperature increases and reaches 77 °C (81 °C as of software version "D50")	=>No. 4 – Coolant temperature remains between 69 and 77 °C (73 and 81 °C as of software version "D50") Coolant temperature drops below 69 °C (73 °C as of software version "D50")	=>No. 4 – Heater remains in part load mode until switched off Heater switches from part to full load mode =>No. 4
Continued on next page			

Note:

"Full and part load mode" sequence is described on Page 01-213.

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
6	Burn-off/run-on		
	– Monitoring as for no. 2 ● Metering pump -V54 off ● Actuation of combustion air blower -V6 with regulated voltage ● Actuation of -Q8 (post-glow, regulated) ● Actuation of -Q8 off Interrogation of -Q8 resistance (becomes colder)	=>No. 2 Resistance of glow plug with flame monitor -Q8 outside specified range	=>No. 2 Burn-off (entry in fault memory)/fault/off
Continued on next page			

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Note:

"Burn-off/run-on" sequence is described on Page 01-216.

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
7	Control interval		
	– Monitoring as for no. 2 – Coolant temperature drops below 73 °C (77 °C as of software version "D50")	=>No. 2 – Coolant temperature continues to increase (engine runs and heats up coolant) Coolant temperature remains between 73 and 77 °C (77 and 81 °C as of software version "D50") Coolant temperature rises above 125 °C	=>No. 2 – Heater remains in control interval until switched off Fault (entry in fault memory)/off/fault interlock
Continued on next page			

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
8	Starting from control interval		
	– Monitoring as for no. 2 ● Actuation of -Q8 (regulated) ● Actuation of combustion air blower -V6 (regulated) ● Actuation of metering pump ● -V54 (regulated) Stabilisation time ● Start of full or part load heating (depending on coolant temperature) ● Switchover of -Q8 from glow plug to flame monitor Interrogation of -Q8 resistance (remains hot) Heating (then as for no. 4)	=>No. 2 Resistance of glow plug with flame monitor -Q8 outside specified range Resistance of glow plug with flame monitor -Q8 still outside specified range after repeated starting	=>No. 2 Termination of starting procedure (1x start repetition) =>No. 2 Termination of starting procedure (entry in fault memory)/fault/off
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Note:

Starting from control interval is implemented as described on Page 01-212. However, as the heater is at operating temperature, the times for the various sequences differ from those for fresh starting (e.g. pre-heating 20 instead of 40 s, fuel supply for 30 instead of 56 s).

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
9	Switch-off		
	Auxiliary heating ● No further signal from pre-selection clock -E111 ● No further signal from dash panel insert		
	Additional heating ● No further signal from engine control unit (fault reader)		
Continued on next page			

Notes:

- ♦ Auxiliary heater is switched off automatically by pre-selection clock -E111 or dash panel insert on completion of set operating time (between 30 and 60 min.).
- ♦ If heater is in control interval when switched off, it cuts out without burn-off and run-on.
- ♦ "Burn-off/run-on" sequence is described on Page 01-216.

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
10	Burn-off		
	– Monitoring as for no. 2	=>No. 2	=>No. 2
	● Metering pump -V54 off ● Recirculating pump -V55 off ● Actuation of operating and display unit for air conditioner/Climatronic - E87/thermotronic control unit - J214 and fresh-air blower -V2 off ● Actuation of combustion air blower -V6 with regulated voltage ● Actuation of -Q8 (post-glow, regulated) ● Actuation of -Q8 off Interrogation of -Q8 resistance (becomes colder) ● Off	Resistance of glow plug with flame monitor -Q8 outside specified range	Burn-off (entry in fault memory)/fault/off
Continued on next page			

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No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
11	Auxiliary ventilation		
	Cut-in signal ● From pre-selection clock - E111 "Auxiliary ventilation" mode active (symbol lights in pre-selection clock display) ● From dash panel insert (auxiliary ventilation mode) Interrogation of auxiliary ventilation switch (in dash panel insert)	"Auxiliary heating" mode active (symbol lights in pre-selection clock display) Switch in dash panel insert not closed	Auxiliary heating (winter mode) =>No. 1 Auxiliary heating (winter mode) =>No. 1
	– Interrogation of fault memory Interrogation of voltage at heater Monitoring of all electrical components and input signals	– Fault interlock entered Voltage is or becomes lower than specified cut-out voltage Fault determined	– Termination/fault/off Termination (entry in fault memory)/fault/off
Continued on next page			

No.	Control sequence	Possible cause of deviation	Continuation of sequence following deviation
	● Actuation of operating and display unit for air conditioner/Climatronic - E87/thermotronic control unit - J214 and fresh-air blower -V2 on		

Notes:

♦ Auxiliary ventilation is switched off automatically by pre-selection clock -E111 or dash panel insert on completion of set operating time (between 30 and 60 min.).

♦ On vehicles where auxiliary ventilation is actuated by way of dash panel insert, operating time can be set between 30 and 60 minutes => Page 82-35. If auxiliary heating/auxiliary ventilation is switched on via remote control, operating time is between 30 and 60 minutes. Mode of operation (auxiliary heating or auxiliary ventilation) and operating time are governed by setting in dash panel insert. It should be noted that these vehicles are provided with a remote control system, the signal of which contains a time module for an operating period of 60 min. (as opposed to 30 min. with version for vehicles with pre-selection clock).

♦ A positive signal is output by heater control unit -J162 with software versions "D48" and "D49" for actuating -E87. As of software version "D50", signal is governed by auxiliary heater encoding. With code "000XX" (large coolant circuit), a positive signal is output, as opposed to a square-wave signal (data signal) with code "001XX" (small coolant circuit). This data signal can only be processed by coolant shut-off valve relay.

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♦ When auxiliary heater is encoded for a small coolant circuit, a square-wave signal is emitted via output for actuation of fresh-air blower (operating and display unit for air conditioner/Climatronic -E87). This signal is processed by coolant shut-off valve relay -J541 (-E87 cannot process signal). This signal is used to output temperature of coolant in auxiliary heater and instantaneous auxiliary heater operating status. A positive signal is output if auxiliary heater is encoded for large coolant circuit (as for software versions "D49" and "D48") =>Page 01-220.

"Heater starting" sequence

Sequence	Duration approx.	Actuation			Resistance measurement
		-V6 with	-V54 with	-Q8 with	-Q8
– Commencement of starting sequence	-	0 V	0 Hz	0 V	no
– Flame monitor interrogation	1 s	8 V	0 Hz	0 V	yes
● Pre-heating	40 s	8 V	0 Hz	10 V	no
● Fuel pre-supply	3 s	0 V	2 Hz	9 V	no
● Fuel supply	56 s	2 to 5 V	1 Hz	9 V	no
– Stabilisation time	15 s	5 V	1 Hz	9 V	no
● Fuel supply	50 s	4 to 12 V	1 to 3 Hz	9 V	no
– Flame monitor interrogation	45 s	12 V	3 Hz	0 V	yes
– End of starting sequence Start of "full load" heating (=>Page 01-213)					

Notes:

♦ 1 Hertz (Hz) corresponds to 1 pulse per second.

♦ The voltages, times and frequencies listed in the table are approximate values regulated by the control unit on the basis of measured values (voltage, temperature etc.).

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"Heater full/part load heating" sequence

Sequence	Duration approx.	Actuation			Resistance measurement -Q8
		-V6 with	-V54 with	-Q8 with	
– End of starting sequence	-	12 V	3 Hz	0 V	yes
– Full load heating	Until coolant temperature in heater reaches 71 °C (75 °C as of software version "D50")	12 V	3 Hz	0 V	yes
● Switchover from full to part load mode	5 s	from 12 V to 7 V	from 3 Hz to 1.5 Hz	0 V	yes
Continued on next page					

Sequence	Duration approx.	Actuation			Resistance measurement -Q8
		-V6 with	-V54 with	-Q8 with	
● Part load heating	As long as coolant temperature in heater is below 69 °C or reaches 77 °C (below 73 °C or reaches 81 °C as of software version "D50")	7 V	1.5 Hz	0 V	yes
Continued on next page					

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Sequence	Duration approx.	Actuation			Resistance measurement -Q8
		-V6 with	-V54 with	-Q8 with	
● Switchover from part to full load mode if coolant temperature drops below 69 °C (73 °C as of software version "D50") Full load heating (=>Page 01-213)	Up to 50 s	from 7 V to 12 V	from 1.5 Hz to 3 Hz	0 V	yes
– Switchover from part load mode to control interval if coolant temperature reaches 77 °C (81 °C as of software version "D50") ● Burn-off/run-on (=>Page 01-216)	-	7 V	1.5 Hz	0 V	yes

Notes:

♦ 1 Hertz (Hz) corresponds to 1 pulse per second.

♦ The voltages, times and frequencies listed in the table are approximate values regulated by the control unit on the basis of measured values (voltage, temperature etc.).

"Burn-off, run-on" sequence

Sequence	Duration approx.	Actuation			Resistance measurement -Q8
		-V6 with	-V54 with	-Q8 with	
– Switchover from part load mode to control interval Switch-off of heater during full or part load mode Termination of starting procedure on account of a fault	-	7 or 12 V	1.5 or 3 Hz	0 V	yes
● Burn-off (of heater)	15 to 60 s	4 to 12 V	0 Hz	6 to 8 V	no
● Cooling-down (of heater)	0 to 120 s	8 to 12 V	0 Hz	0 V	no
● Switchover to control interval ● Off	-	0 V	0 Hz	0 V	no

Notes:

♦ 1 Hertz (Hz) corresponds to 1 pulse per second.

♦ The voltages, times and frequencies listed in the table are approximate values regulated by the control unit on the basis of measured values (voltage, temperature etc.) and last operating status.

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Required heat output between 50 and 100 %

Note:

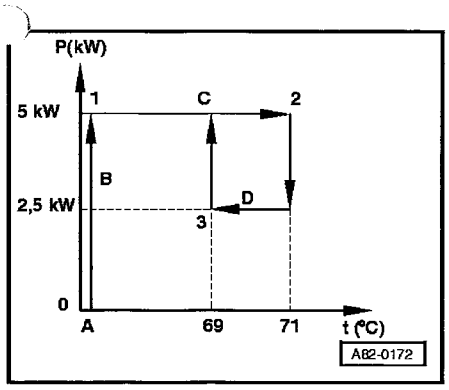

Fig. shows auxiliary heater switching temperatures applicable up to software version "D49". As of software version "D50" of heater control unit -J162, switching temperatures were increased by 4°C (as of "D50", switching from full to part load for example takes place at 75°C instead of 71°C as used to be the case).

P (KW) = Heat output in kilowatts

t (°C) = Temperature of coolant in heater

A = Commencement of starting procedure (coolant temperature in heater must be less than 73 °C)

B = Starting procedure

C = Full load mode

D = Part load mode

1 = Start of full load mode

2 = Switchover from full to part load mode

3 = Switchover from part to full load mode

Required heat output less than 50 %

Note:

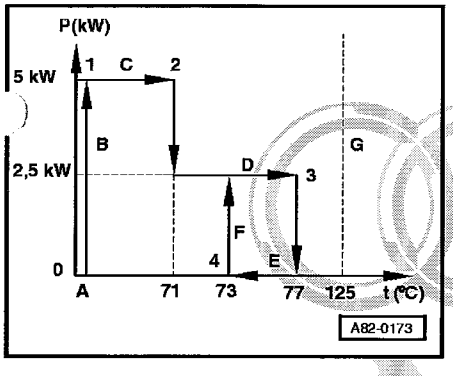

Fig. shows auxiliary heater switching temperatures applicable up to software version "D49". As of software version "D50" of heater control unit -J162, switching temperatures were increased by 4°C (as of "D50", switching from full to part load for example takes place at 75°C instead of 71°C as used to be the case).

P (KW) = Heat output in kilowatts

t (°C) = Temperature of coolant in heater

A = Commencement of starting procedure (coolant temperature in heater must be less than 73 °C)

B = Starting procedure

C = Full load mode

D = Part load mode

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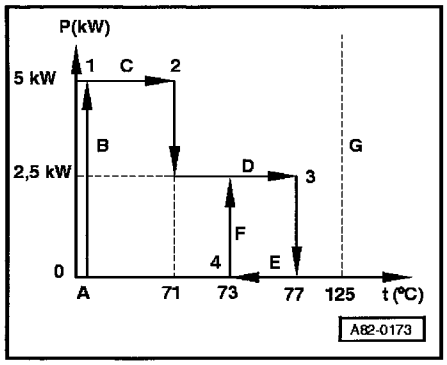

E = Control interval
F = Starting from control interval
G = Excess temperature cut-out
1 = Start of full load mode
2 = Switchover from full to part load mode
3 = Switchover from part load mode to control interval
4 = End of control interval

Coolant shut-off valve relay -J541

Notes:

- As of Model Year 2002, vehicle electrical system and coolant circuit are gradually being converted on vehicles with 8-cyl. engine. Following introduction of modified coolant circuit, auxiliary heater coolant is no longer drawn in via engine in auxiliary heating mode (small coolant circuit).

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- Coolant shut-off valve relay -J541 can only be actuated with a square-wave signal by auxiliary heaters for petrol with part number as of index "K" (software version "D50"). Such auxiliary heaters have been gradually introduced into production since November 2000.
- When auxiliary heater is encoded for a small coolant circuit, a square-wave signal is emitted via output for actuation of fresh-air blower (operating and display unit for air conditioner/Climatronic -E87). This signal is processed by coolant shut-off valve relay -J541 (-E87 cannot process signal). This signal is used to output temperature of coolant in auxiliary heater and instantaneous auxiliary heater operating status. A positive signal is output if auxiliary heater is encoded for large coolant circuit (as for software versions "D49" and "D48").
- If -J541 is actuated via a positive signal from auxiliary heater (contact "1"), -J541 does not actuate coolant shut-off valve -N279.

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Contact assignment and operation of coolant shut-off valve relay -J541

Notes:

- Incorporation of relay -J541 into vehicle electrical system

  => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
- Coolant shut-off valve relay -J541 acts as a control unit. It processes various signals and actuates coolant shut-off valve -N279 as well as operating and display unit for air conditioner/Climatronic -E87 on the basis of a range of data.
- Coolant shut-off valve relay -J541 can only be actuated by auxiliary heaters for petrol with part number as of index "K" (software version "D50") and this is the only auxiliary heater version which switches on recirculating pump when actuated by -J541 (earth applied to connector "B" contact "3"). Such auxiliary heaters were gradually introduced into production as of November 2000 (initially for vehicles with 8-cyl. petrol engine).

Contact	Contact assignment	Function
1	● Input for data signals from heater control unit -J162 (with additional information in the case of auxiliary heater as of "D50" and code "001XX") Auxiliary heating/auxiliary ventilation on Operating status of auxiliary heater (starting, full load, part load, control interval, run-on or auxiliary ventilation) Coolant temperature in auxiliary heater	● -J541 processes data signal and actuates coolant shut-off valve -N279 and -E87 as a function of coolant temperature supplied and operating status of auxiliary heater
	● Input for fresh-air blower cut-in signal (for auxiliary heater with "D49" or as of "D50" and code "000XX") Input signal (approx. battery voltage) for actuation of fresh-air blower by heater control unit -J162	● 2 s following detection of voltage, -J541 actuates ● -E87 only; coolant shut-off valve -N279 is not actuated

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Notes:

- Data signal can only be output by auxiliary heaters as of software version "D50" with code "001XX" for small coolant circuit. Auxiliary heaters with software version "D49" or with software version as of "D50" and code "000XX" for large coolant circuit only output a voltage signal.
- If auxiliary heater (as of software version "D50" and code "001XX") is in operating statuses (starting, full load, part load or control interval), coolant shut-off valve is actuated as a function of coolant temperature in auxiliary heater. Operating and display unit for air conditioner/Climatronic -E87 is actuated as soon as coolant temperature supplied exceeds 30 °C.
- If auxiliary heater (as of software version "D50" and code "001XX") is in "Auxiliary ventilation" mode, shut-off valve is not actuated but -E87 is actuated immediately.

Contact	Contact assignment	Function
2	● Output for actuation of coolant shut-off valve -N279 (for auxiliary heater as of "D50" and code "001XX") In auxiliary heating mode with engine stopped, terminal "30" (voltage) is connected to -N279 as a function of coolant temperature in auxiliary heater	-J541 switches voltage to -N279 and -N279 switches from large to small coolant circuit
	● Output for actuation of coolant shut-off valve -N279 (for auxiliary heater with "D49" or as of "D50" and code "000XX") In auxiliary heating mode with engine stopped, voltage is not switched to -N279 (application of voltage but no square-wave signal to contact "1")	-N279 is not actuated (and there is thus no switching to small coolant circuit)

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Notes:

- Coolant shut-off valve -N279 is actuated in auxiliary heating mode (as of software version "D50" and code "001XX") up to a coolant temperature of approx. 74 °C in auxiliary heater. Actuation is by way of a square-wave signal every 2 seconds. Duty cycle is governed by coolant temperature (approx. 90 % at 63 °C and 0 % at greater than 74 °C).

- If auxiliary heater does not output a square-wave signal but rather only a positive signal, -J541 does not actuate -N279. If vehicle is fitted with an auxiliary heater with software version "D49", -J541 (part number 4D0 909 516) cannot be actuated via "Fresh-air blower on" output.
- In auxiliary heating mode (with engine stopped), coolant leaving air-conditioner heat exchanger is routed directly back to auxiliary heater via coolant shut-off valve -N279 (small circuit) to provide better heating of passenger compartment. If coolant temperature (only applies to auxiliary heaters as of software version "D50" and code "001XX") attains a certain value or if engine is started, shut-off valve is no longer actuated and coolant can flow back to engine (large circuit).
- If auxiliary heater is on when engine is started, relay -J541 action is governed by coolant temperature in auxiliary heater (only applies to auxiliary heaters as of software version "D50" and code "001XX"). Switching to large circuit takes place immediately if coolant temperature is greater than 65 °C. If coolant temperature then drops below 60 °C, small circuit is selected again (valve is actuated).

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Contact	Contact assignment	Function
3	● Input for voltage at terminal D+ (for auxiliary heater as of "D50" and code "001XX") If voltage is less than 5 V (no voltage is applied with engine stopped), coolant shut-off valve -N279 is controlled in line with coolant temperature in auxiliary heater and operating and display unit for air conditioner/Climatronic -E87 switched on as soon as coolant temperature supplied by auxiliary heater is greater than 30 °C – If voltage is greater than 5 V, coolant shut-off valve -N279 is only actuated if auxiliary heater was already on when engine was started; switching to small coolant circuit takes place at different temperatures than in auxiliary heating mode – If voltage is greater than 5 V and engine coolant temperature supplied by dash panel insert is less than 80 °C, auxiliary heater recirculating pump -V55 is switched on (connection to -J162 not fitted at start of production, introduction not yet finalised)	Voltage is switched to -N279 and -E87 – Voltage is switched to -N279 – Earth is switched to heater control unit -J162, which switches on -V55
Continued ▼		

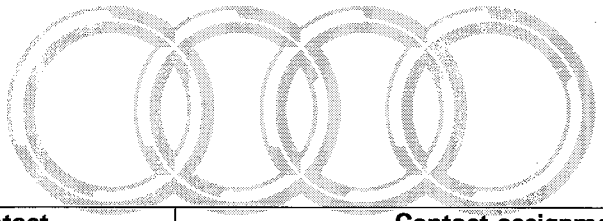
Contact	Contact assignment	Function
3 Continued	● Input for voltage at terminal D+ (for auxiliary heater with "D49" or as of "D50" and code "000XX") If voltage is less than 5 V (no voltage is applied with engine stopped), operating and display unit for air conditioner/Climatronic -E87 is switched on, but coolant shut-off valve -N279 is not actuated	Voltage is switched to -E87

Notes:

- ♦ Voltage at terminal D+ is used for detection of whether engine is running (voltage is applied if it is).
- ♦ If voltage is applied to D+ and engine coolant temperature supplied by dash panel insert is less than approx. 80 °C, relay -J541 connects earth to contact 3 at heater control unit -J162 and control unit -J162 switches on recirculating pump -V55 (connection to -J162 not fitted at start of production, introduction not yet finalised, designed to improve coolant supply for heat exchanger in air conditioner unit).
- ♦ Relay -J541 acts as control unit. Method of actuation differs. With auxiliary heaters for petrol with part number as of index "K" (software version "D50"), actuation is also governed by auxiliary heater encoding. Such auxiliary heaters have been gradually introduced into production since November 2000.
- ♦ Connection between relay -J541 and contact "3" in connector "B" at heater control unit -J162 was not fitted at start of production (introduction not yet finalised).

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- ♦ If engine is running and engine coolant temperature transmitted to -J541 by dash panel insert is less than approx. 80 °C, relay -J541 connects earth to connector "B" contact "3" at heater control unit -J162 and control unit -J162 switches on recirculating pump -V55. Under certain circumstances, this improves coolant supply for air-conditioner heat exchanger and increases heat output.



Contact	Contact assignment	Function
4	● Earth	
5	● Output for actuation of operating and display unit for air conditioner/Climatronic -E87 (for auxiliary heater as of "D50" and code "001XX") If "Auxiliary heating mode" is transmitted by heater control unit -J162 with engine stopped, -J541 switches on -E87 as soon as -J162 supplies a coolant temperature greater than 30 °C If "Auxiliary ventilation mode" is transmitted by heater control unit -J162 with engine stopped, -J541 immediately switches on -E87	– -J541 switches on -E87 with engine stopped (auxiliary heating/auxiliary ventilation mode)
	● Output for actuation of operating and display unit for air conditioner/Climatronic -E87 (for auxiliary heater with "D49" or as of "D50" and code "000XX") If voltage is switched through by heater control unit -J162 with engine stopped, -J541 switches on -E87	– -J541 switches on -E87 with engine stopped (auxiliary heating/auxiliary ventilation mode)

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Contact	Contact assignment	Function
6	● Power supply, terminal "30"	
7	● Output for actuation of heater control unit -J162 (connection to -J162 not fitted at start of production, introduction not yet finalised) If coolant temperature less than 80 °C is supplied by dash panel insert with engine running, -J541 connects earth (to -J162)	-J162 switches on recirculating pump as long as earth is applied to contact 3 (only applies to auxiliary heater as of "D50" and code "001XX") If auxiliary heater starts up as additional heater on starting cold engine on vehicles with petrol engine, heed notes on measured value block "003"

Notes:

♦ If engine is running and engine coolant temperature transmitted to -J541 by dash panel insert is less than approx. 80°C, relay -J541 connects earth via contact 7 to contact 3 at heater control unit -J162 and control unit -J162 switches on recirculating pump -V55. Under certain circumstances, this improves coolant supply for air-conditioner heat exchanger and increases heat output.

♦ If auxiliary heater starts up as additional heater on starting cold engine on vehicles with 8-cyl. engine, check adaption of heater control unit -J162. Adaption "1" must be set in adaption channel "10" for software versions "D50" and "D51". As of software version "D52", the adaption setting must be "3". Alter adaption of heater control unit -J162 if necessary => Page 01-125.

♦ Connection between relay -J541 (contact 7) and contact "3" in connector "B" at heater control unit -J162 was not fitted at start of production (introduction not yet finalised).

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

♦ Output from relay -J541 contact 8 is intended for Audi A8 and is not used with Audi A6.

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Contact	Contact assignment	Function
8	● Output (not used at present)	– With engine running, -J541 connects terminal "30" to this contact
9	● Input for coolant temperature determined by dash panel insert If engine coolant temperature supplied by dash panel insert with engine running is less than 80 °C, earth is connected to output, contact 7 at -J541 (this function is not used at present for Audi A6)	-J541 evaluates coolant temperature and connects earth to contact 7 if necessary (connection to -J162 not fitted at start of production, introduction not yet finalised)

Notes:

♦ Output from relay -J541 contact 7 is intended for Audi A8 and is not used at present with Audi A6.

♦ If engine is running and engine coolant temperature transmitted to -J541 by dash panel insert is less than approx. 80 °C, relay -J541 connects earth via contact 7 to contact 3 at heater control unit -J162 and control unit -J162 switches on recirculating pump -V55. Under certain circumstances, this improves coolant supply for air-conditioner heat exchanger and increases heat output.

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Checking coolant shut-off valve relay -J541

Notes:

♦ Assignment of contacts at socket for -J541 => Page 01-221 and => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

♦ For installation location of relay -J541, refer to => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

♦ Fitting location of coolant shut-off valve -N279 => Page 82-8 (only fitted on vehicles with 8-cyl. petrol engine as of Model Year 2002)

Checking

– Switch off ignition.

– Switch on auxiliary heater with cold engine.

– Check software version and encoding of heater control unit -J162 => Page 01-22.

Control unit -J162 as of software version "D50" is fitted and code "001XX" must be entered.

- Read out auxiliary heater measured value block (display group "001") => Page 01-99.

As soon as "on" appears in display zone 4, operating and display unit for air conditioner/Climatronic -E87 must start up.

- Check direction of coolant flow in auxiliary heating mode by feeling temperature of coolant hoses.

Coolant is drawn in via coolant shut-off valve -N279 by auxiliary heater directly from heat exchanger of air conditioner unit.

- Pull relay -J541 out of socket.

Coolant is now drawn in via coolant shut-off valve -N279 and engine by auxiliary heater from heat exchanger of air conditioner unit and -E87 is switched off.

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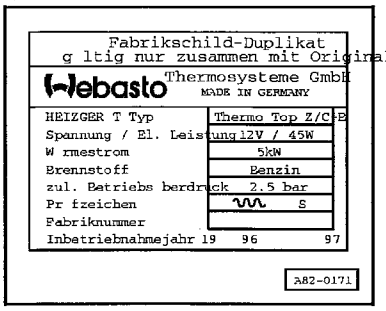
Servicing auxiliary heater



Notes:

- The heater rating plate indicates the version concerned.
  - Type "Z/C-D" with recirculating pump -V55 = auxiliary heater (for vehicles with diesel engine)
  - Type "Z/C-B" with recirculating pump -V55 = auxiliary heater (for vehicles with petrol engine only)

Problems with auxiliary heater operation may be encountered in cold weather on vehicles with diesel engines if use is predominantly made of vegetable-oil methylester as fuel.

Explanation:

On account of the physical properties, deposits may form during operation on the evaporation fabric in the burner element. These then cause combustion problems if the vehicle is run for lengthy periods on vegetable-oil methylester.

Safety precautions when working on vehicles fitted with auxiliary heater

- The auxiliary heater is not to be switched on in areas where there is a danger of fire or explosion.
- The auxiliary heater is not to be switched on in enclosed areas without an exhaust-gas extractor (this also applies to switch-on for a preselected cut-in time).
- Pay attention to the appropriate safety regulations when working on the fuel system.

=> Relevant Fuel Supply Workshop Manual; Repair Group 20 =>

- The engine is not to be started if parts of the fuel system (e.g. metering pump, fuel pipe or fuel gauge sender) have been removed or opened.

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♦ Before starting repair work on auxiliary heater:

- Dissipate pressure in cooling system by opening cap on coolant expansion tank.
- Interrupt power and fuel supply for auxiliary heater (e.g. by removing fuse for auxiliary heater).

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

♦ On completion of repairs to auxiliary heater or fuel system check operation of auxiliary heater.

♦ Perform self-diagnosis following completion of repair work on auxiliary heater.

Notes on general repair work on vehicles fitted with auxiliary heater

♦ Disconnect negative and positive terminals of battery before starting electric welding work on vehicle.

♦ If coolant has been drained, bleed auxiliary heater after filling cooling system (=>Page 82-118).

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♦ If parts of fuel system have been removed or replaced, make sure that all components used for diverting fuel to auxiliary heater are properly installed.

♦ Following replacement of battery -A on vehicles with auxiliary heater, perform auxiliary heater self-diagnosis and re-adapt (with "Basic setting" function) battery characteristic curve (=>Page 01-65).

- Depending on last operating status and coolant temperature in auxiliary heater, no-load current input of auxiliary heater may be up to max. 60 mA for a period of up to 5 hours following switch-off. During this time, the degree of cooling of the coolant for the period following switch-off is calculated by the heater control unit -J162. At the latest 5 hours after switch-off, the no-load current input of the heater control unit -J162 is less than 2 mA.
- After performing repairs in area of fuel pipe to auxiliary heater:
  - Check that fuel pipes are flush with bottom of vehicle and protected against mechanical damage.
  - Check that fuel pipe to auxiliary heater is protected against heat generation which could affect operation.
  - Check that fuel pipe does not make contact with vehicle components which become warm.

Rules for cleanliness when working on auxiliary heater and fuel system

- Carefully clean all joints and adjacent areas before disconnecting.
- Set down parts removed on a clean surface (use sheeting or paper, not fluffy cloths) and cover over.
- Carefully cover or seal opened components if repairs are not to be performed immediately.
- Only install clean components:
  - Do not remove replacement parts from wrapping until immediately prior to installation.
  - Do not use parts that have been stored loose (e.g. in tool boxes).

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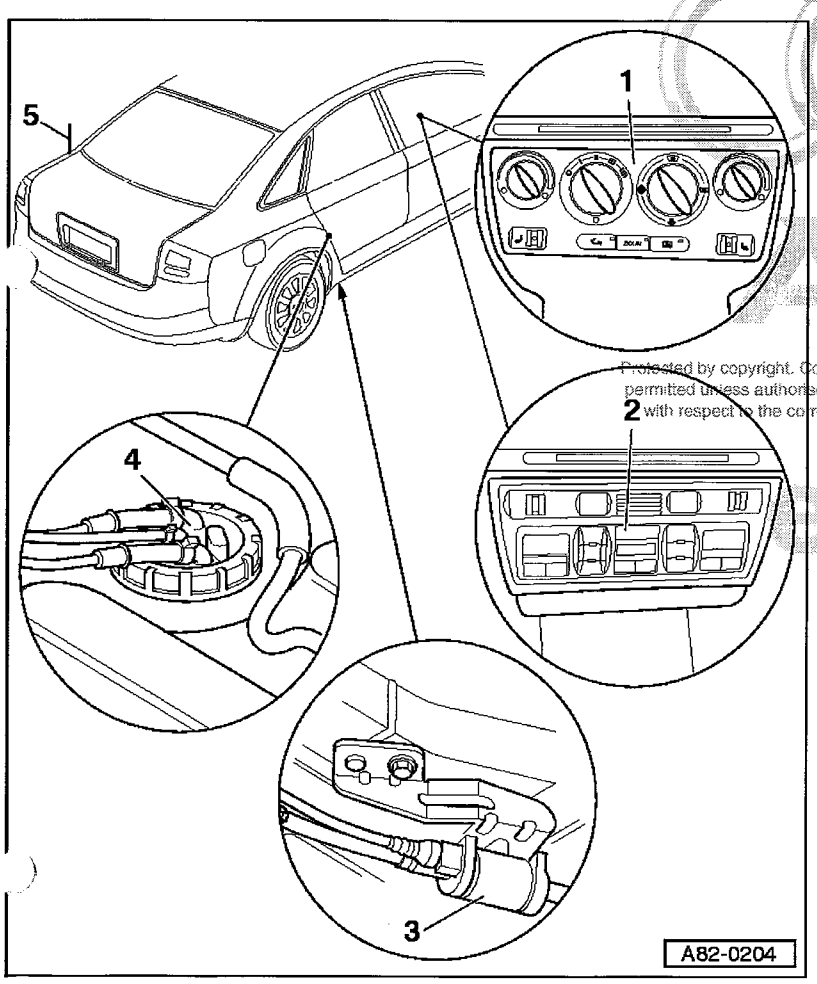
♦ When fuel system is open:
- Do not work with compressed air.
- Do not move vehicle.
- Do not start engine.
- Do not switch on auxiliary heater.



Layout of components for auxiliary heater in vehicle

Notes:

♦ Fitting locations of various relays and fuses for auxiliary heater => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

♦ Performing auxiliary heater self-diagnosis => Page 01-1

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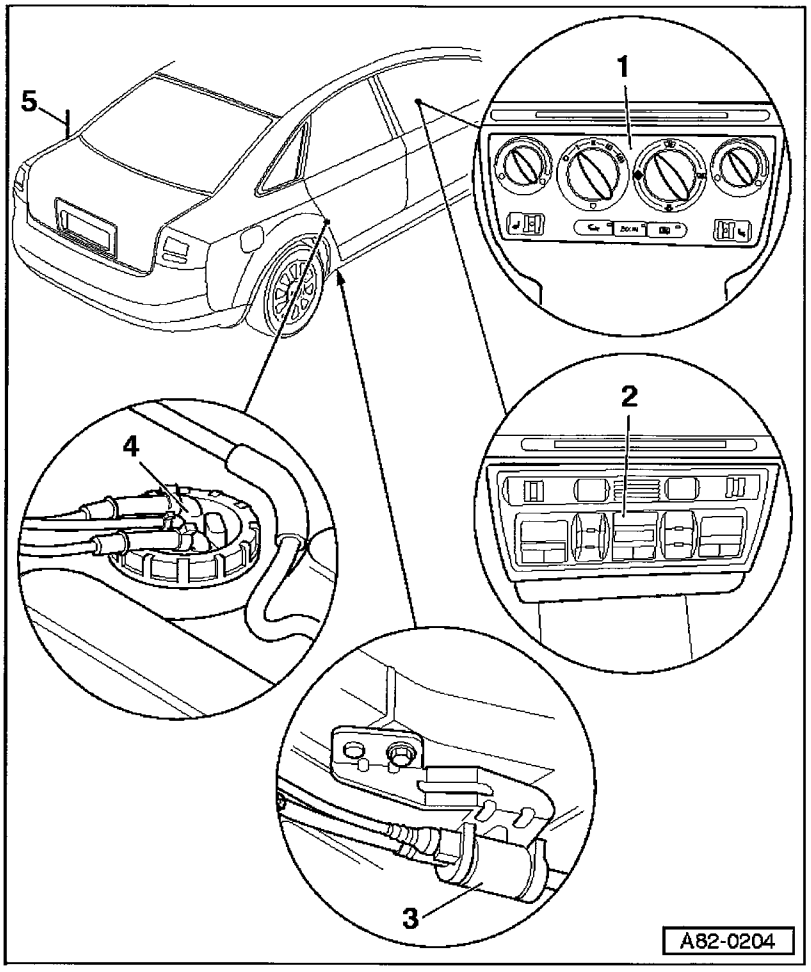
1 – Heater control

♦ With thermotronic control unit -J214

♦ Started up by heater control unit -J162

♦ Regulates air distribution



2 – Operating and display unit for air conditioner/Climatronic -E87

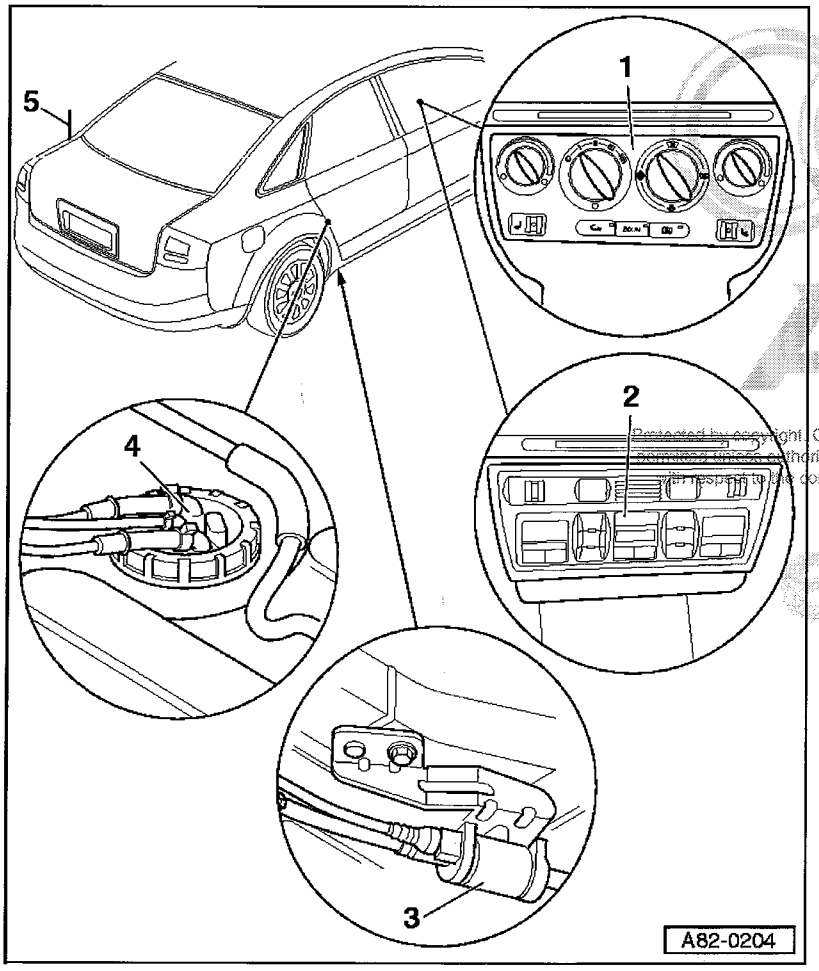
- Regulates fresh-air blower speed and air distribution
- Started up by heater control unit -J162

3 – Metering pump -V54

- Removing and installing => Page 82-95
- Diverting fuel for auxiliary heater => Page 82-73
- Checking fuel delivery => Page 82-89
- Checking actuation => Page 01-54

4 – Housing for fuel pump and fuel gauge

- With connection for diverting fuel for auxiliary heater



- Routing of fuel diversion pipe in fuel tank => Page 82-77
- Diverting fuel for auxiliary heater => Page 82-73

5 – Radio/telephone/auxiliary heater aerial -R51

- For vehicles with auxiliary heater remote control only
- Remote control is available as optional extra
- Incorporation of auxiliary heater remote control into aerial system => Page 82-162 and => Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
- Component fitting locations (different for Saloon and Avant) => Page 82-162 and => Radio, Navigation and Telephone; Repair Group 91

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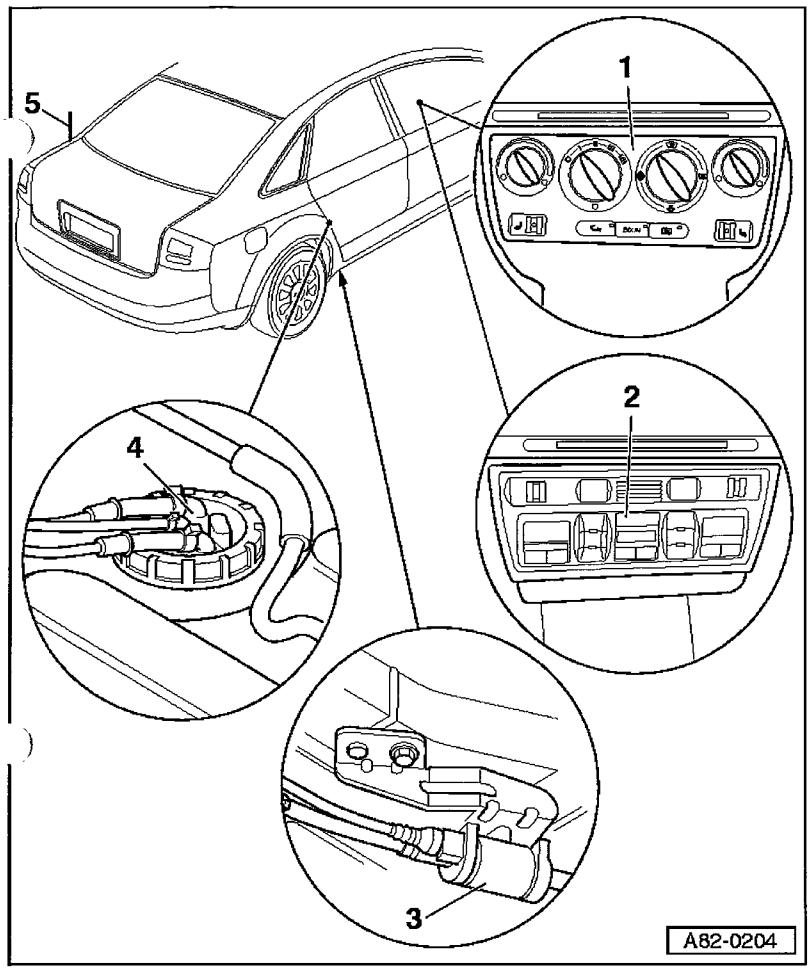
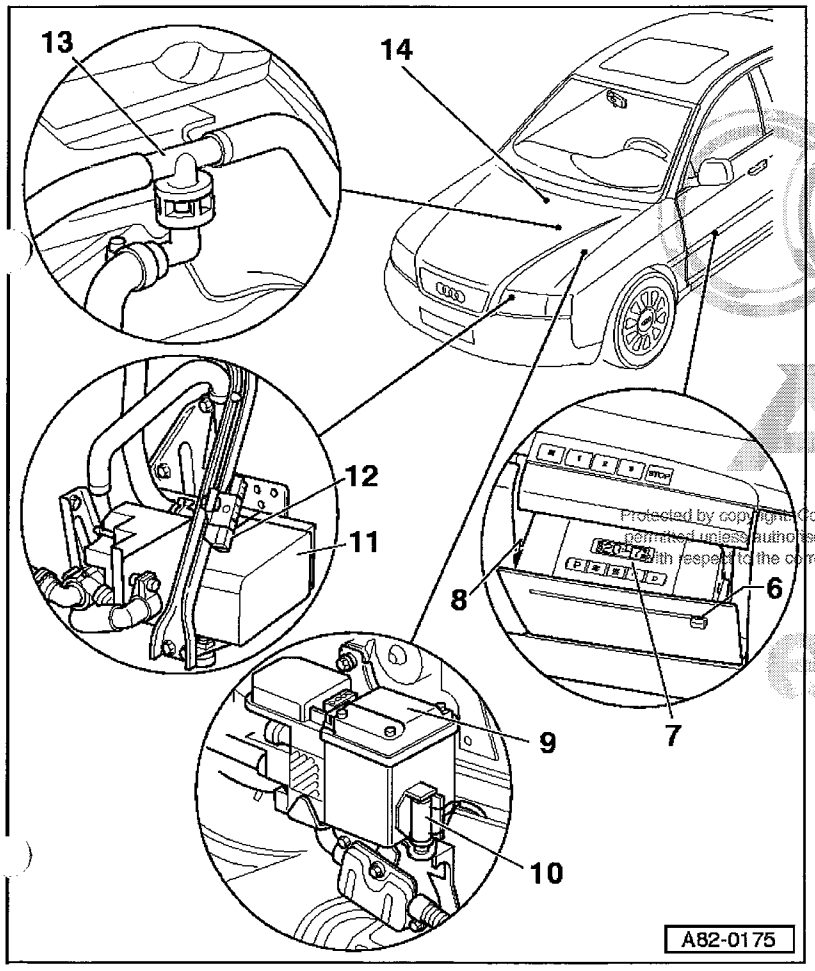


♦ Auxiliary heating radio wave receiver -R64
- Switches auxiliary heater on and off by way of pre-selection clock -E111 or dash panel insert when appropriate signals are received
- Duration of cut-in signal from -R64 depends on time module contained in remote control unit signal (cut-in time 30 or 60 min.) =>Page 82-50
- There are 2 remote control versions (max. operating time 30 or 60 min) =>Page 82-50
- Encoding remote control receiver for corresponding remote control unit =>Page 82-47



6 – Heater warning lamp -K11
♦ Lights if auxiliary heating/ventilation is on
♦ Flashes if cut-in time is active
♦ Only fitted on vehicles with pre-selection clock -E111

7 – Pre-selection clock -E111
♦ Removing and installing =>Page 82-70
♦ Controls and display panel =>Page 82-23
♦ Setting pre-selection clock (running time, remote control receiver, cut-out conditions) =>Page 82-29

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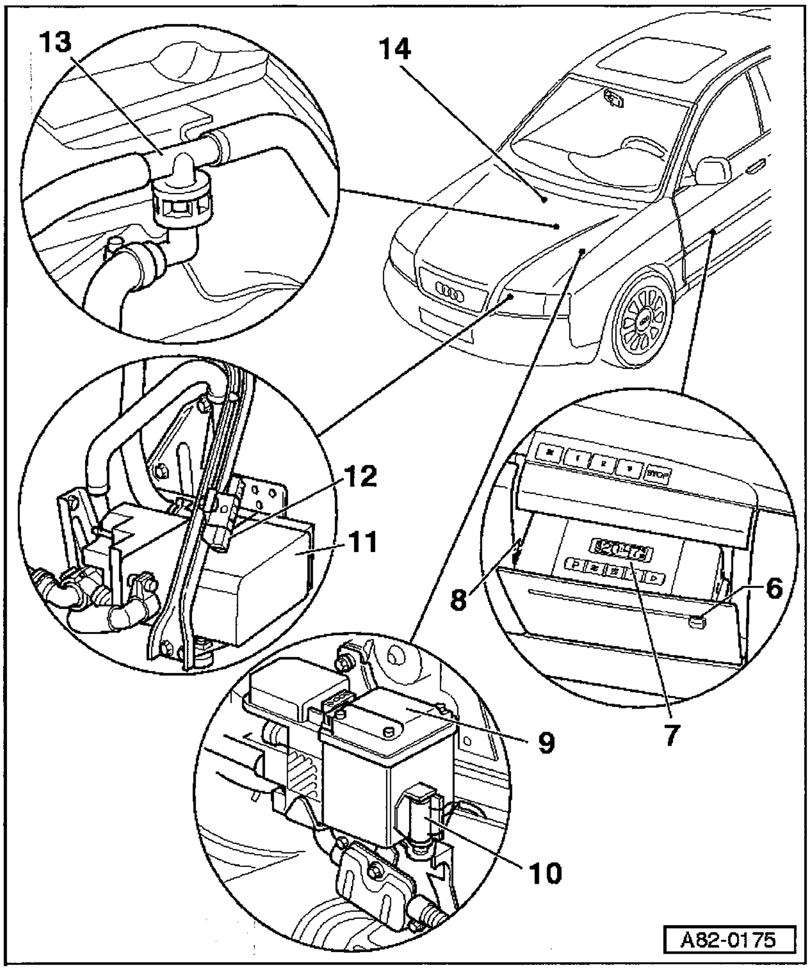
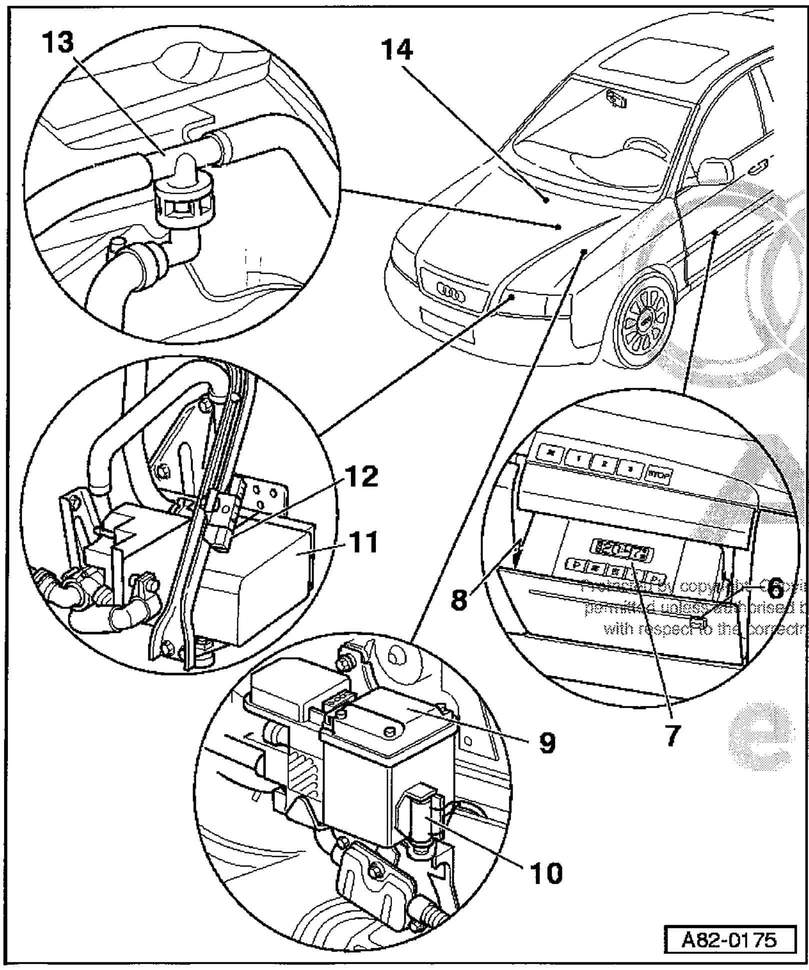


Notes:

- Various modifications to the vehicle as a whole were introduced in Model Year 2000 for the Audi A6. Introduction of a modified dash panel insert resulted in the following:
  - Discontinuation of pre-selection clock -E111, heater warning lamp -K11 and pre-selector clock switch -E255
  - Auxiliary heating/auxiliary ventilation is now set by way of a rotary knob/pushbutton in the centre console. Settings made are indicated on driver information system display in dash panel insert.



8 – **Pre-selector clock switch -E255**
- Switch is closed when flap is open
- Removing and installing = >Page 82-72
- Only fitted on vehicles with pre-selection clock -E111

9 – **Auxiliary heater**
- Fitting location on vehicles with 4-cyl. 1.9l TDI engine
- Removing and installing = >Page 82-120
- Incorporation into coolant circuit = >Page 82-112
- Dismantling and assembling = >Page 82-129
- Checking electrical components of auxiliary heater = > Page 01-144
- Block diagram of auxiliary heater = >Page 82-154

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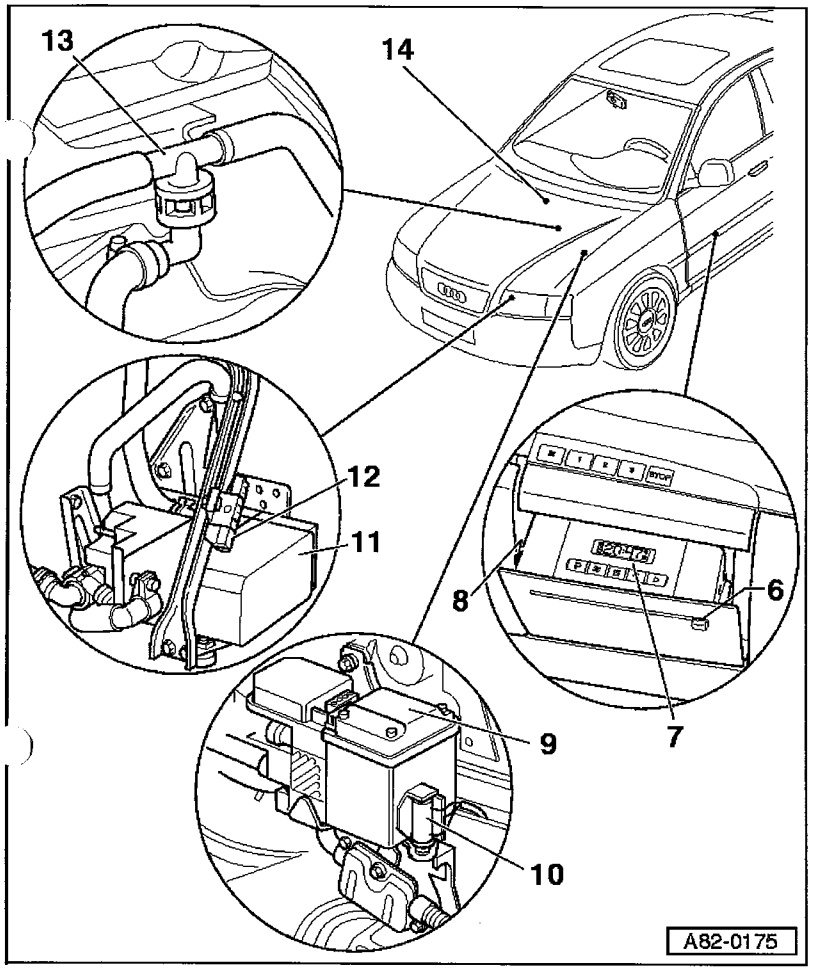


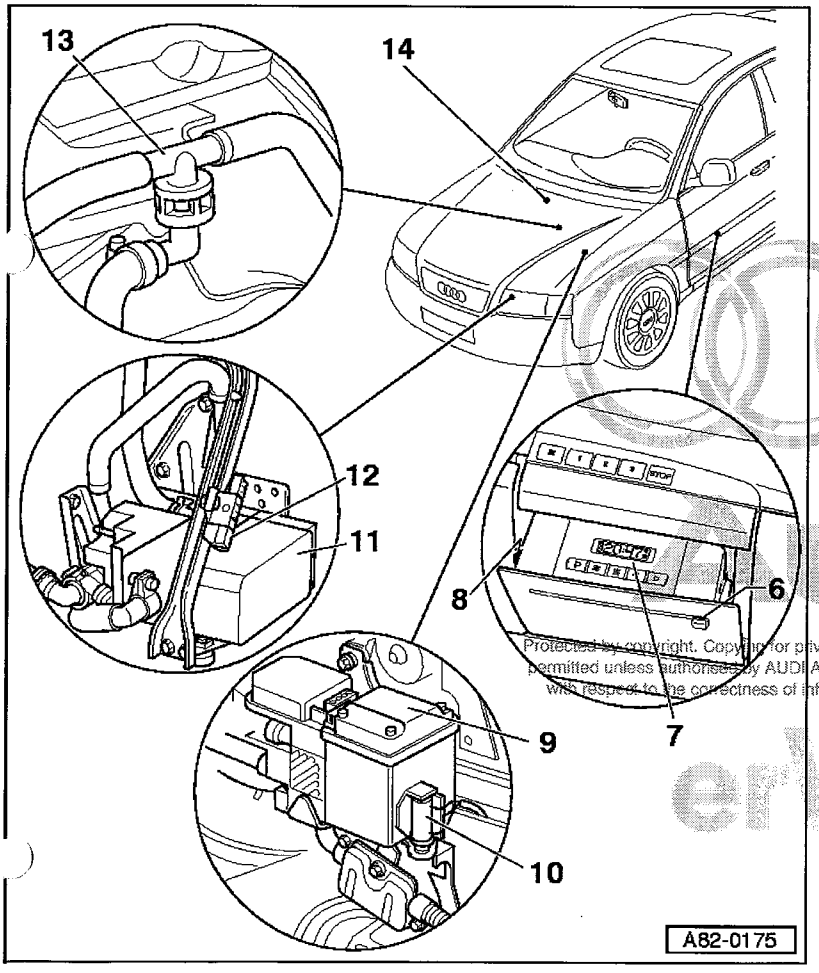
Note:
The auxiliary heater is fitted with the following electrical components:

- Heater control unit -J162
- Combustion air blower -V6
- Recirculating pump -V55
- Glow plug with flame monitor -Q8

10 – Series resistor -N6

- ♦ Fitting location on vehicles with 4-cyl. 1.9l TDI engine
- ♦ Only fitted on vehicles with heater
- ♦ Determines speed of fresh-air blower in auxiliary heating mode

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder



11 – Auxiliary heater

- ♦ Fitting location on vehicles with 6 and 8-cyl. engine
- ♦ Removing and installing => Page 82-124
- ♦ Incorporation into coolant circuit => Page 82-112
- ♦ Dismantling and assembling => Page 82-129
- ♦ For further notes, refer to Item 9

12 – Series resistor -N6

- ♦ Fitting location on vehicles with 6-cyl. engine
- ♦ Only fitted on vehicles with heater
- ♦ Determines speed of fresh-air blower in auxiliary heating mode

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

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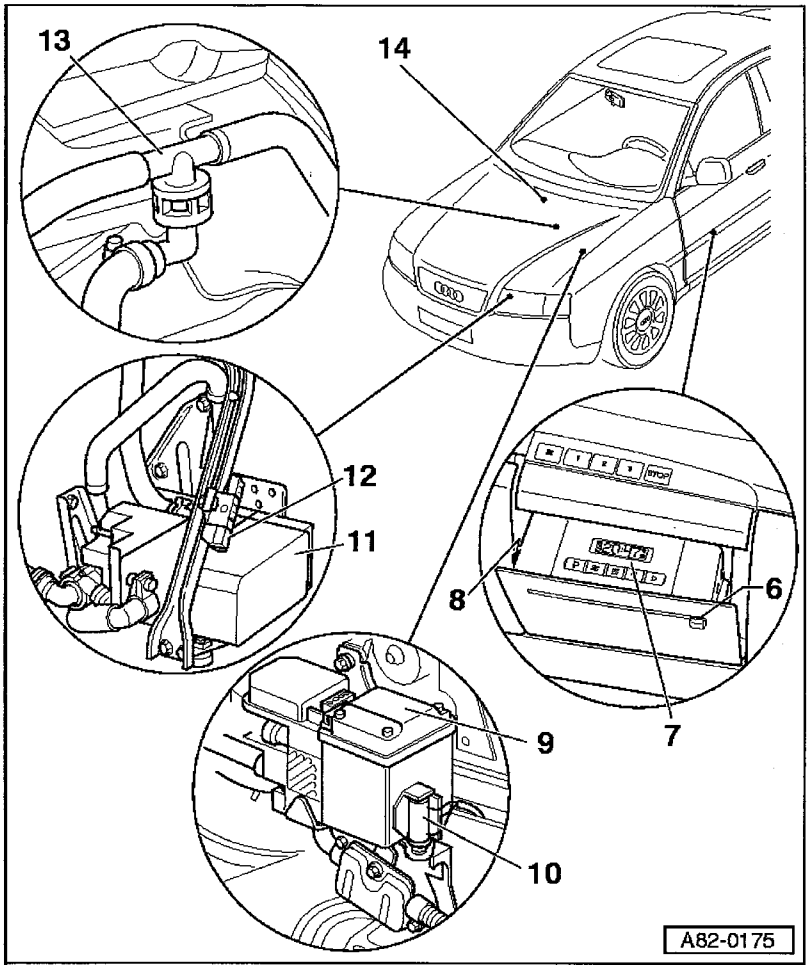
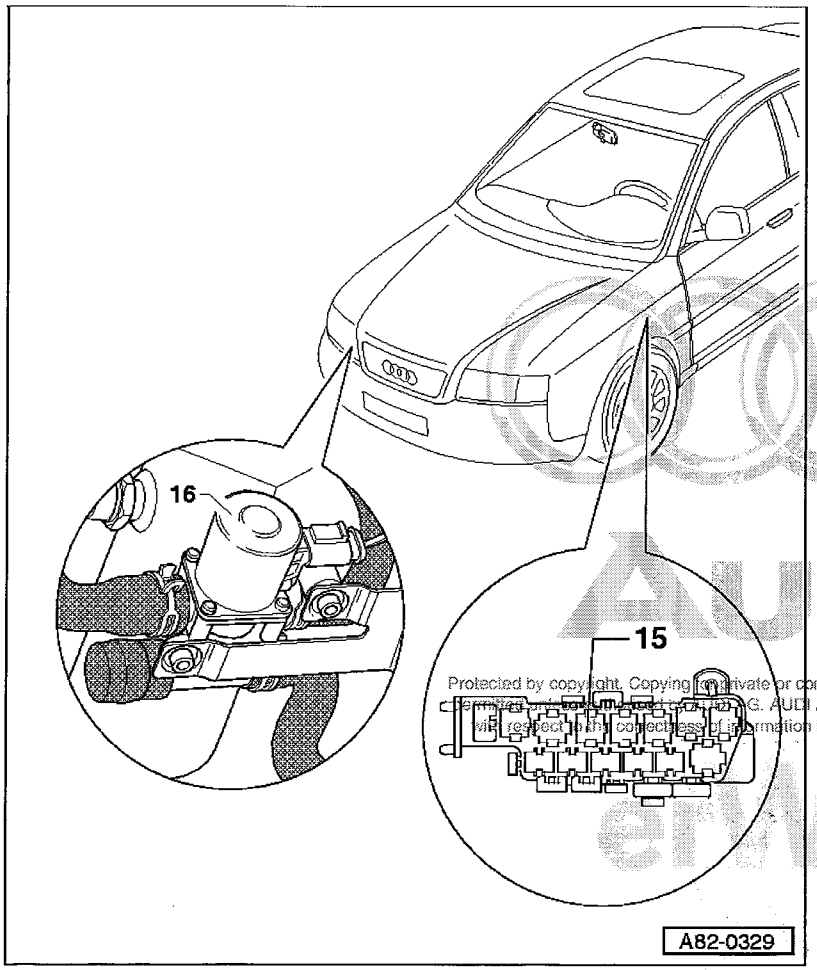


13 – Coolant non-return valve

- ♦ Only fitted on vehicles with 6-cyl. engine
- ♦ Controls direction of coolant flow in auxiliary heating mode
- ♦ Incorporation into coolant circuit
  =>Page 82-114

14 – Battery -A

- ♦ If battery voltage drops below value stored in heater control unit -J162 during auxiliary heating mode, auxiliary heater is switched off by control unit -J162



15 – 8-position relay carrier behind driver's storage compartment

- ♦ For fitting location of coolant shut-off valve relay -J541 and relay position assignment, refer to

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- ♦ Operation of relay -J541
  =>Page 01-220

Note:

Relay -J541 is only fitted on vehicles with coolant shut-off valve -N279.

16 – Coolant shut-off valve -N279

- ♦ Fitting location on vehicles with 8-cyl. 5-valve petrol engine
- ♦ Removing and installing=>Page 82-20

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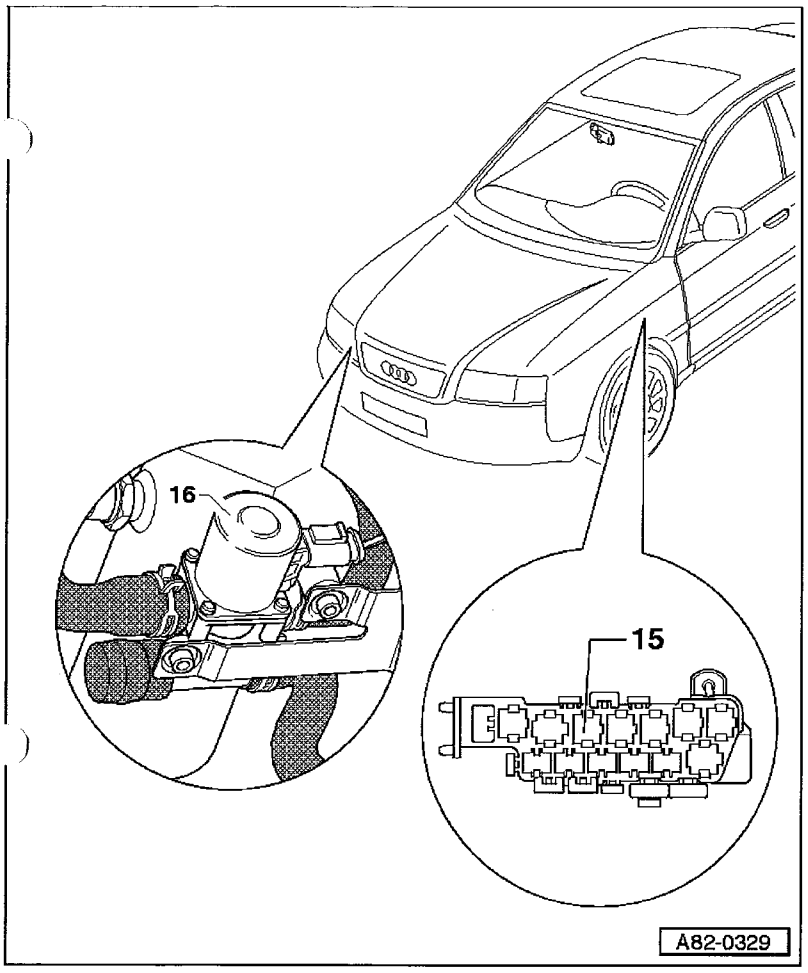


Notes:

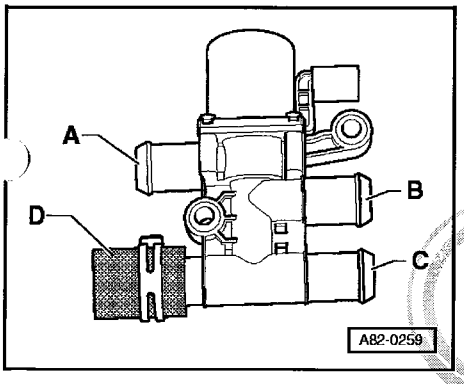
- Coolant shut-off valve -N279 is actuated by coolant shut-off valve relay -J541 => Page 01-220.

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- As of Model Year 2002, vehicle electrical system and coolant circuit are gradually being converted on vehicles with 8-cyl. engine. Following introduction of modified coolant circuit, auxiliary heater coolant is no longer drawn in via engine in auxiliary heating mode, but rather directly from air conditioner heat exchanger via shut-off valve -N279 (small circuit).

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

Removing and installing coolant shut-off valve -N279



Notes:

- Shut-off valve is only fitted on vehicles with 8-cyl. engine as of Model Year 2002 (gradual introduction).
- If voltage is not applied to coolant shut-off valve -N279 (large coolant circuit), coolant can flow from connection -B- (from air conditioner heat exchanger) to connection -A- (to engine).
- If voltage is applied to coolant shut-off valve -N279 (small coolant circuit), coolant can flow from connection -B- (from air conditioner heat exchanger) to connection -C- (to auxiliary heater).
- Connection -D- is sealed with a plug.
- Coolant shut-off valve -N279 is actuated by relay -J541 in auxiliary heating mode => Page 01-220.
- Connections -C- and -D- are interconnected in shut-off valve.
- Depending on design of -N279, connections of shut-off valve are marked with numbers and arrows ("1" = -A-, "2" = -C-, "3" = -B- and "4" = -D-).

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Special tools, testers and other items required

♦ Hose clamps 3093/3094

Removing

Notes:

♦ On removal, note down bolt lengths and assignment for re-installation.

♦ All cable ties and other wiring harness fasteners released or cut open on removing shut-off valve are to be re-attached in same position on installation.

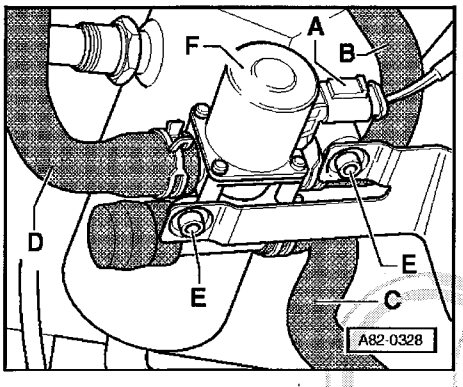
– Switch off ignition.

– Dissipate pressure in coolant circuit by opening cap at coolant expansion tank.

=> Relevant Engine, Mechanics Workshop Manual; Repair Group 19 =>

– Remove front bumper and noise insulation.

=> General Body Repairs; Repair Group 63; Front Bumper =>



– Unplug connector -A-.

– Mark positions of coolant hoses -B-, -C- and -D-.

– Pinch off coolant hoses to coolant shut-off valve -N279 (e.g. using V.A.G 3094) and detach hoses.

– Remove bolts -E-.

– Remove shut-off valve -F-.

Installing

– Re-install components removed in reverse order.

– Bleed coolant circuit => Page 82-118 and

=> Relevant Engine, Mechanics Workshop Manual; Repair Group 19 =>

– If necessary, check operation of shut-off valve => Page 01-220.

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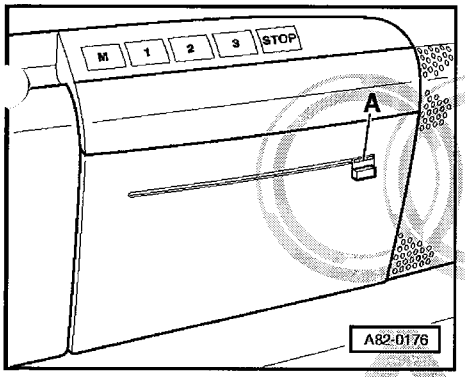
Display panel and controls of pre-selection clock - E111

Notes:

- ♦ Various modifications to the vehicle as a whole were introduced in Model Year 2000 for the Audi A6. Introduction of a modified dash panel insert resulted in the following:
- – Discontinuation of pre-selection clock -E111, heater warning lamp

  -K11 and pre-selector clock switch -E255
- – Auxiliary heating/auxiliary ventilation is now set by way of a rotary knob/pushbutton in the centre console. Settings made are indicated on driver information system display in dash panel insert.
- ♦ Operation of pre-selection clock is described in detail in the owner's manual.
- ♦ When ignition is switched off, pre-selection clock display illumination goes out within approx. 15 s after releasing adjuster buttons.

- ♦ Display disappears within approx. 15 s after last button actuation.
- ♦ Display of pre-selection clock is activated for approx. 15 s after opening pre-selection clock flap.



- ♦ Depending on setting of pre-selection clock -E111, auxiliary heating/auxiliary ventilation time is between 30 and 60 min. Period is limited via pre-selection clock (on vehicles with remote control => Page 82-50).
- ♦ Instantaneous operating status of pre-selection clock -E111 can be seen from heater warning lamp -K11 -A- even when flap is closed.
  - – Warning lamp off = auxiliary heater off, cut-in time not activated

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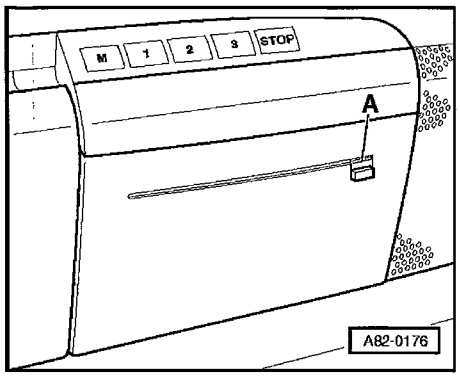
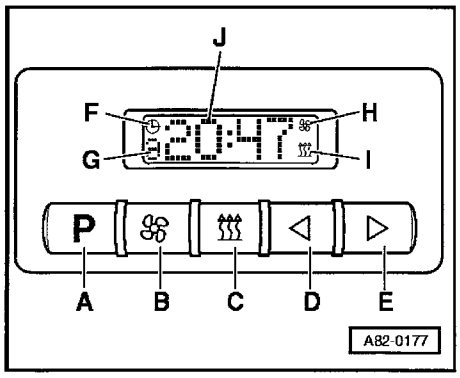


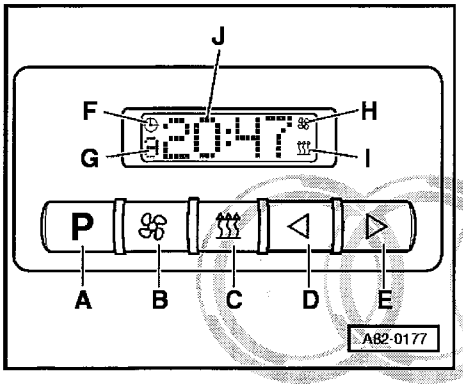
- Warning lamp flashes = cut-in time activated in pre-selection clock -E111
- Warning lamp lights = auxiliary heater on (auxiliary heating or auxiliary ventilation mode)

♦ When flap is closed (switch -E255 open, pre-selection clock not visible), illumination of pre-selection clock is switched off and operation of pre-selection clock -E111 is also restricted.



♦ The first 1000 vehicles with auxiliary heater were fitted with a pre-selection clock -E111 (part no. index A), on which all operating functions are deactivated when switch -E255 is open.

♦ In the case of pre-selection clocks (as of part no. index C), auxiliary ventilation/auxiliary heating can also be switched on and off with switch -E255 open by pressing buttons -B- and -C- (emergency operation if switch defective).



-A- Program selection button

- Activation and deactivation of cut-in times
- Three cut-in times can be programmed and activated one at a time (display -G-).
- Activated cut-in time can be altered by pressing buttons -D- and -E-.
- Desired operating status (auxiliary heating or auxiliary ventilation) can be set for activated cut-in time by pressing button -B- or -C-.
- Selection of clock/setting mode (display -F- flashes)

-B- Ventilation button

- On pressing button, auxiliary ventilation mode is activated, display -H- appears (for approx. 15 s) and warning lamp in button lights.
- With cut-in time activated (display -G-), pressing button preselects auxiliary ventilation mode, display -H- appears and warning lamp in button flashes.

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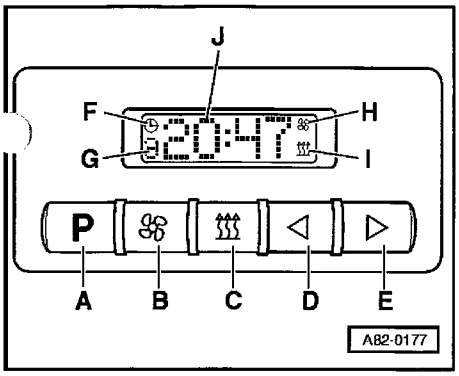


-C- Heating button

- On pressing button, auxiliary heating mode is activated, display -I- appears (for approx. 15 s) and warning lamp in button lights.
- With cut-in time activated (display -G-), pressing button preselects auxiliary heating mode, display -I- appears and warning lamp in button flashes.

-D- Time setting button, down

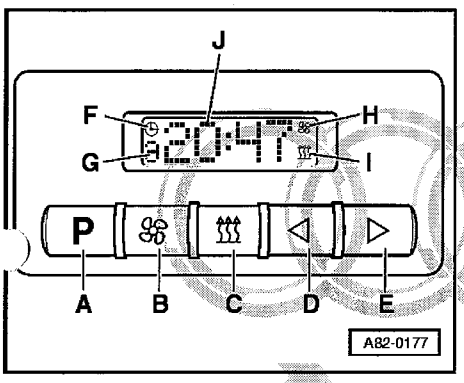
-E- Time setting button, up

-F- Display for clock mode

- Time displayed can be altered by pressing buttons -D- and -E-.

-G- Display for program number

- Program number displayed can be altered by pressing button -A-.



- Cut-in time set for this program number can be altered by pressing buttons -D- and -E-.
- Mode (auxiliary ventilation or auxiliary heating) set for this program number can be altered by pressing button -B- or -C-.

-H- Display for "auxiliary ventilation mode"

- This mode is selected by pressing button -B-.

-I- Display for "auxiliary heating mode"

- This mode is selected by pressing button -C-.

-J- Clock display

- Set time is displayed if pre-selection clock is in clock mode (display -F-).
- Display for cut-in time set for program number -G-

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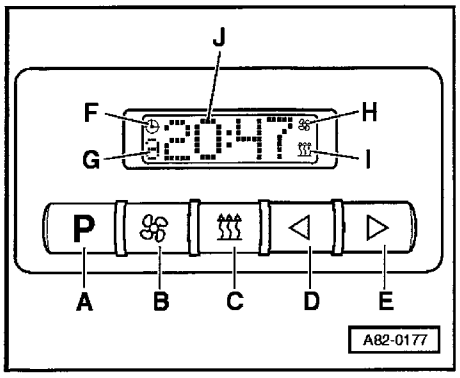
Checking/altering setting of pre-selection clock -E111

Note:

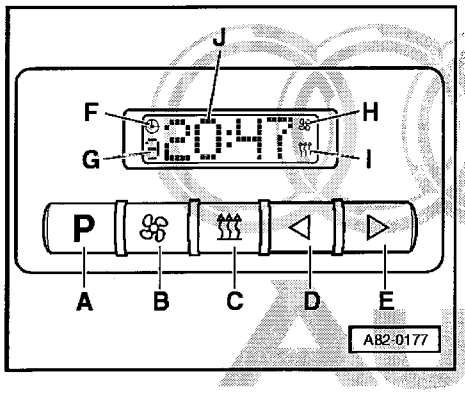
Certain pre-selection clock functions can be set or altered by simultaneously pressing two buttons.

Requirements

- Battery -A adequately charged



- Pre-selection clock in clock mode (display -F- lights) and cut-in time not activated (warning lamps in buttons -B- and -C- not flashing)
- Auxiliary heater off (warning lamps in buttons -B- and -C- not lit)
- Flap for pre-selection clock fully open (thus closing pre-selector clock switch -E255)



Checking and altering operating time set for auxiliary heater on pre-selection clock

- Simultaneously press and hold buttons -D- and -E- until display -J- switches from time to a number between 30 and 60.
- Release buttons -D- and -E-.
- Operating time can now be altered in 5-minute steps by pressing button -D- or -E-.

Notes:

- Auxiliary heating/auxiliary ventilation time can be set in 5-minute steps between 30 and 60 min.
- In basic setting (as-delivered condition), cut-in time is 30 min.
- If a button has not been pressed in the last approx. 15 s, the pre-selection clock stores the last operating time displayed and returns automatically to clock mode.

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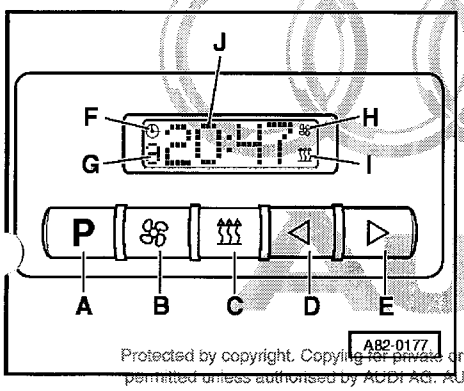
♦ Heed the following if cut-in time is extended:

- Extending the cut-in time increases the draw on the battery -A.
- Customers are to be informed that problems with auxiliary heater operation may be encountered under certain usage conditions, e.g. frequent use of auxiliary heating mode in a vehicle driven primarily over short distances. As a result of the extended cut-in time, the battery may no longer be sufficiently charged and auxiliary heating/auxiliary ventilation has to be switched off on account of inadequate battery voltage.

Checking and adjusting switch-off conditions for auxiliary heating/auxiliary ventilation mode

Note:

Basic setting (as-delivered condition) of pre-selection clock can be altered such that auxiliary heating and auxiliary ventilation modes are always switched off when ignition is switched off regardless of elapsed operating time.



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No display on pre-selection clock -E111 (display blank)

– Simultaneously press and hold buttons -A- and -E- until display -J- switches from time to an alternating display.

Display -J-

"OFF" or "ON"

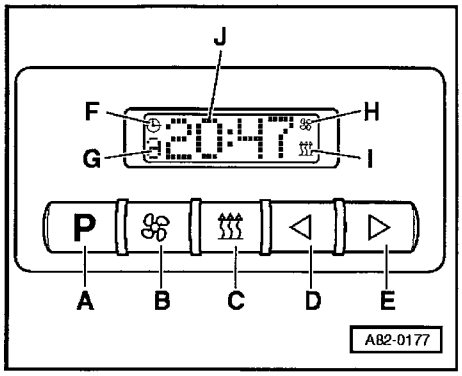
alternates with

"T60" or "T62"

– Release buttons -A- and -E-.

Explanation of display:

- "OFF" = Auxiliary heating/auxiliary ventilation switched off on switching off ignition
- "ON" = Auxiliary heating/auxiliary ventilation switched off on completion of set operating time (basic as-delivered setting)
- "T60" = Set to signal generated by auxiliary heating radio wave receiver -R64 (basic as-delivered setting)



- "T62" = This setting is not permissible (in this setting, pre-selection clock expects a data telegram (square-wave signals) from auxiliary heating radio wave receiver -R64, which means that auxiliary heater cannot be switched on via remote control in this case).
- Switch-off condition can be switched over by pressing button -A-.
- Press button -C- to confirm setting and exit from adjustment mode.

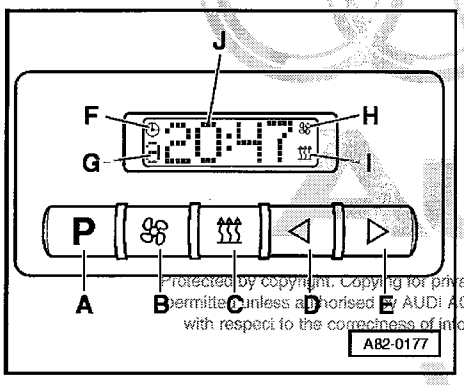
Note:

If button is not pressed, adjustment mode is terminated after approx. 15 s and original setting is retained.

Checking setting of pre-selection clock to auxiliary heating radio wave receiver -R64 (T60)

Note:

On vehicles with auxiliary heater remote control, pre-selection clock must be set to "T60" transmitter. Setting to "T62" transmitter would prevent remote controlled switch-on of auxiliary heating/auxiliary ventilation.



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No display on pre-selection clock -E111 (display blank)

- Simultaneously press and hold buttons -A- and -E- until display -J- switches from time to an alternating display.

Display -J-

"OFF" or "ON"

alternates with

"T60" or "T62"

Release buttons -A- and -E-.

Explanation of display =>Page 82-31

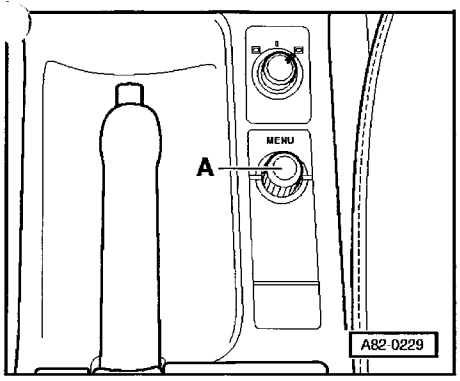
If pre-selection clock is to be set to remote control receiver "T62":

- Press button -E- to switch pre-selection clock to remote control receiver "T60".
- Press button -C- to confirm setting and exit from adjustment mode.

Note:

If button is not pressed, adjustment mode is terminated after approx. 15 s and original setting is retained.

Switching auxiliary heating/auxiliary ventilation on and off via dash panel insert

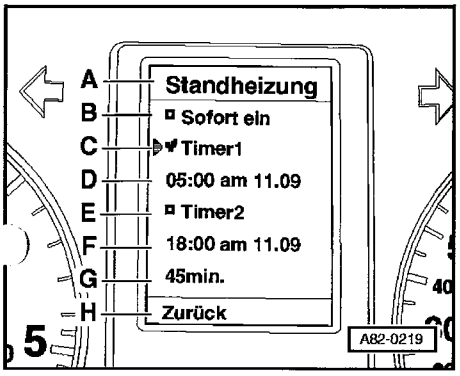


Notes:

♦ Various modifications to the vehicle as a whole were introduced in Model Year 2000 for the Audi A6. Introduction of a modified dash panel insert resulted in the following:

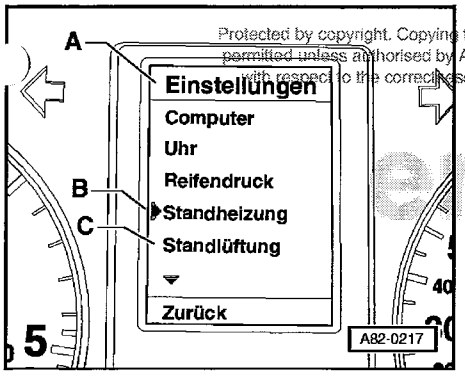
=> Parts List

- Discontinuation of pre-selection clock -E111
- Auxiliary heating/auxiliary ventilation is now set by way of a rotary knob/pushbutton -A- in the centre console.



- Settings made are indicated on driver information system display in dash panel insert.
- Dash panel insert is actuated by auxiliary heating radio wave receiver -R64. Dash panel insert then switches on auxiliary heating or auxiliary ventilation in line with last setting made.

♦ Fuel gauge sender is interrogated before dash panel insert switches on auxiliary heater. If there is not enough fuel in the tank (fuel gauge in "red zone"), auxiliary heater is not switched on (tick cannot be set in front of "Heating on" or it switches back automatically to a box).



♦ "Auxiliary heating" -B- and "Auxiliary ventilation" -C- must be entered in dash panel insert by way of adaption function.

=> Electrical System; Repair Group 01 =>

- Start dash panel insert self-diagnosis (address word "17").
- Enter "10" for adaption function.
- Select channel "18".
- Activate display for the various auxiliary heater functions.
  - Display "0" = No auxiliary heater fitted
    (corresponds to entry "00000")
  - Display "1" = Auxiliary heater fitted
    Auxiliary heating/auxiliary ventilation switched off automatically on completion of set operating time (basic as-delivered setting for vehicle)
    (corresponds to entry "00001")

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- Display "2" = Auxiliary heater fittedAuxiliary heating/auxiliary ventilation switched off automatically on completion of set operating time or after switching off engine (switching off ignition)

  Can be set if requested by customer; heed the following

  (corresponds to entry "00002", "00010" must be entered for certain vehicles)

=> Electrical System; Repair Group 01 =>

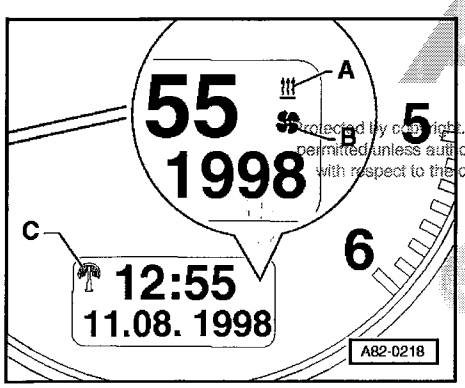
♦ At the start of Model Year 2000, dash panel inserts were still being fitted with which it is not possible to have auxiliary heating/auxiliary ventilation with display setting "2" after switching off ignition. Operation should therefore be checked with this setting. If auxiliary heating/auxiliary ventilation is switched off by dash panel insert when ignition is switched off, change dash panel insert setting to display "1".

Explanation:

As ignition has to be switched on to activate "Immediate on" auxiliary heating/auxiliary ventilation function, activation of auxiliary heating/auxiliary ventilation is cancelled again on switching off ignition with this dash panel insert version (although the engine has not been in operation).

=> Electrical System; Repair Group 01 =>

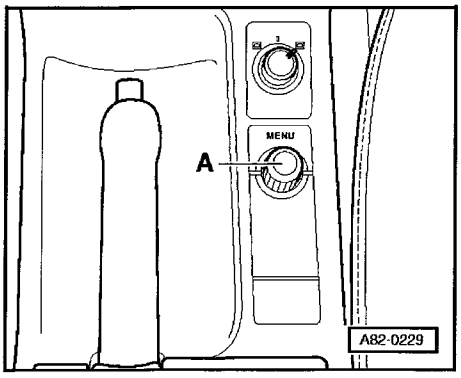
Switching auxiliary heating/auxiliary ventilation on and off



Notes:

♦ Activation of auxiliary heater timer is indicated by symbol -A- in digital clock. Symbol flashes when auxiliary heater is in operation.

♦ Activation of auxiliary ventilation timer is indicated by symbol -B- in digital clock. Symbol flashes when auxiliary ventilation is in operation.



♦ Auxiliary heating/auxiliary ventilation is controlled by way of settings made on driver information system display. Settings can be made as follows with the rotary knob/pushbutton -A- in the centre console. A full description is given in the owner's manual.

♦ Pressing the "MENU" button in front of the rotary knob/pushbutton always permits return to "Settings" menu.

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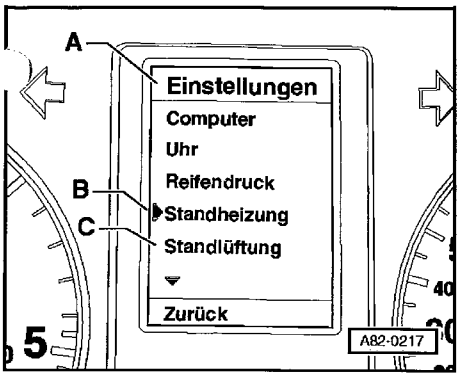


- Switch on ignition.
- Select "Settings" menu -A- by way of rotary knob/pushbutton in centre console.

Note:

If "Auxiliary heating" -B- and "Auxiliary ventilation" -C- are not displayed in "Settings" menu, dash panel insert setting must be altered by way of "Adaption" function. If adaption "0" has been entered in dash panel insert, auxiliary heating/auxiliary ventilation function is not active.

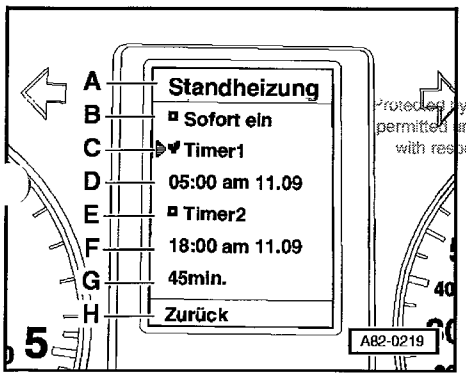
=> Electrical System; Repair Group 01 =>

- Use rotary knob/pushbutton to select "Auxiliary heating" -B- or "Auxiliary ventilation" -C- function in "Settings" menu.

Note:

Setting for auxiliary heating mode is described in the following. Auxiliary ventilation mode setting is to be made in the same way.

- Select function -B- "Auxiliary heating" by turning rotary knob/pushbutton.



Note:

Selection arrow in menu panel shows which function can now be activated by pressing rotary knob/pushbutton.

- Activate function -B- "Auxiliary heating" by pressing rotary knob/pushbutton.

Auxiliary heating mode menu then appears on driver information system display.

Rotary knob/pushbutton can then be used to make the various settings in "Auxiliary heating" menu -A-.

Tick = yes (function selected)

Box = no (function not selected)

- Make desired settings by turning and pressing rotary knob/pushbutton (=> Example, Page 82-44).

Note:

If tick cannot be set in front of "Heating on" or if it automatically switches back to a box (it is also not possible to switch on auxiliary heater by way of remote control or "Timer" function), check fuel level in fuel tank (display in dash panel insert must not be in red zone).

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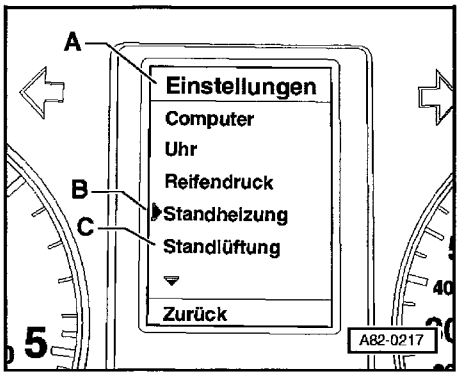
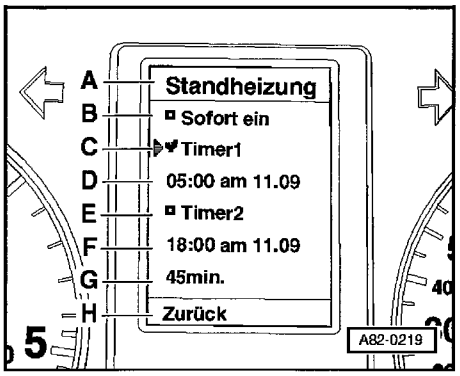
After required setting has been made:



– Position selection arrow in front of "Return" -H- to exit from "Auxiliary heating" menu and press rotary knob/pushbutton.

Driver information system returns to "Settings" function.

Notes:



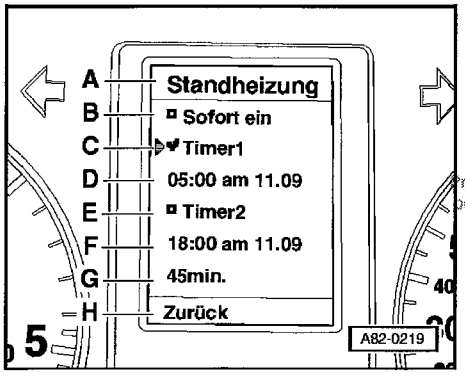
♦ Fig. shows the following settings

-A- "Auxiliary heating" menu panel

-B- "Immediate on" function off (box)

-C- "Timer 1" starting time on (tick)

-D- Startof auxiliary heating with activated "Timer 1"-C – at "05:00" hours on "11.09" (11th September)



-E- "Timer 2" starting time off (box)

-F- Startof auxiliary heating with activated "Timer 2"-E – at "18:00" hours on "11.09" (11th September)

-G- Auxiliary heating time "45min" (45 minutes)

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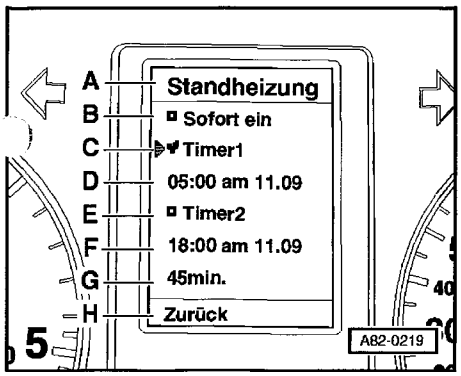
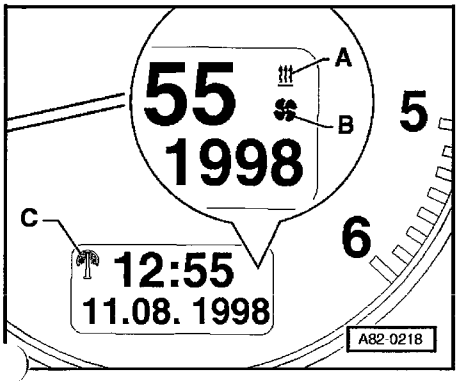
♦ Only one of the functions -B- "Immediate on", -C- "Timer 1" or -E- "Timer 2" can be activated at any time. Setting a new tick erases the previous one.

♦ Operating time -G- can be set between 30 (15) minutes and 60 minutes. Setting can only be made in 5-minute steps.

♦ Any time between 00:00 and 23:59 and any day between 01.01 (1st January) and 31.12 (31st December) can be set as starting time -D- and -F-. Setting can be made up to one month in advance.

♦ If auxiliary heating/auxiliary ventilation is switched on by way of remote control, operating time depends on setting in dash panel insert (between 30 and 60 min.). These vehicles are provided with a remote control system, the transmission signal of which contains a time module for 60 min. operating time.



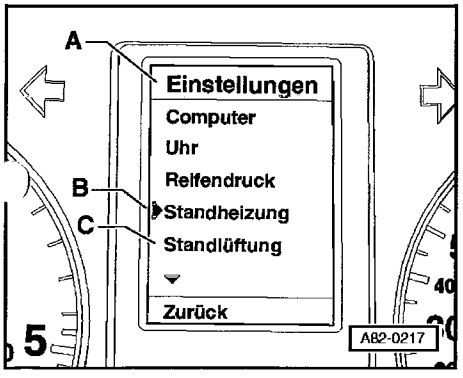


- ♦ If the starting time entered on the timer has already passed on the current day, the date automatically switches to the next day on activating the timer.
- ♦ The driver information system uses the time displayed by the digital clock in the dash panel insert to control the auxiliary heating/auxiliary ventilation cut-in times.

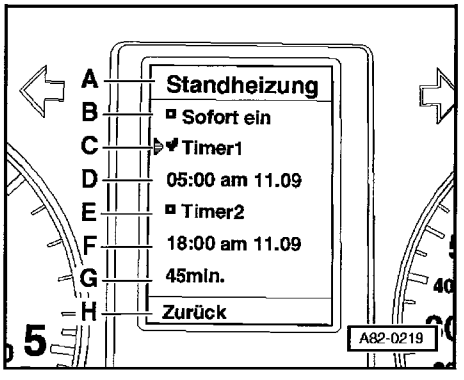
- ♦ If the vehicle is fitted with a radio clock, the symbol -C- appears in the digital clock in areas where a radio signal is received. The dash panel insert then always displays the correct time and date.
- – The time and date must be checked on vehicles with no radio clock or in areas where radio signal cannot be received.
- ♦ If auxiliary heating/auxiliary ventilation timer is active or auxiliary heating/auxiliary ventilation is on (symbol -A- or -B- appears in digital clock display), illumination of clock in dash panel insert remains switched on for approx. 30 seconds after switching off ignition.

Example:

Dash panel insert (driver information system) is to be set such that auxiliary heater is switched on at 5:00 a.m. on 5th September for 45 minutes.



- – Switch on ignition.
- – Select "Settings" menu in driver information system.
- – Use rotary knob/pushbutton to set selection arrow in "Settings" menu to "Auxiliary heating" function -B-.
- – Confirm setting made by pressing rotary knob/pushbutton.



- "Auxiliary heating" menu -A- then appears on driver information system display.
- – Use rotary knob/pushbutton to set selection arrow to -C- "Timer 1".
- – Press rotary knob/pushbutton in center console.

Display in front of "Timer 1" -C- changes (box disappears, to be replaced by a tick).

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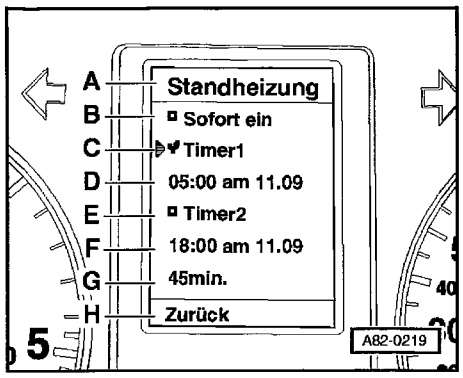


- Turn rotary knob/pushbutton to select desired menu panel (e.g. starting time -D- for "Timer 1").
- Confirm setting made by pressing rotary knob/pushbutton.

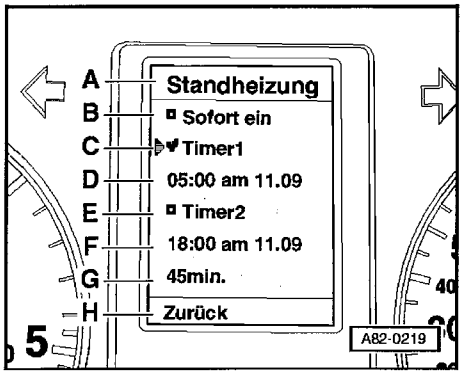
Hours display in menu panel -D- starts to flash.

- Set desired hour by turning rotary knob/pushbutton.
- Confirm setting made by pressing rotary knob/pushbutton.

Minutes display in menu panel -D- starts to flash.

- Set desired number of minutes by turning rotary knob/pushbutton (setting can only be made in 5-minute steps).
- Confirm setting made by pressing rotary knob/pushbutton.

Day display in menu panel -D- starts to flash.



- Set day and month by turning rotary knob/pushbutton and confirm by pressing.

This completes setting of "Timer 1" starting time.

- Use rotary knob/pushbutton to set selection arrow to "Operating time" function -F-.
- Confirm setting made by pressing rotary knob/pushbutton.
- Set desired operating time in minutes by turning rotary knob/pushbutton, e.g. 45 min. (operating time can be set between 15 / 30 and 60 minutes in 5-minute steps only).
- Confirm setting made by pressing rotary knob/pushbutton.

After required setting has been made:

- Position selection arrow in front of "Return" -H- to exit from "Auxiliary heating" menu and press rotary knob/pushbutton or press "Menu" button next to rotary knob/pushbutton.

Driver information system returns to "Settings" function.

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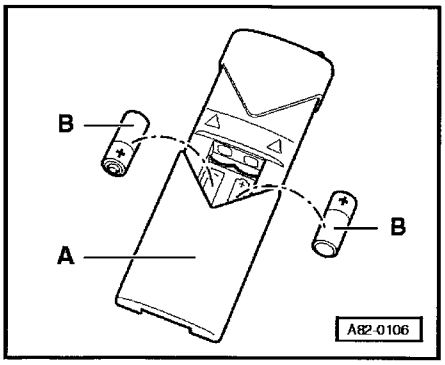
Encoding remote control receiver for corresponding remote control unit

Requirements

♦ Auxiliary heater off



♦ Battery -A adequately charged

♦ Batteries -B- in remote control unit OK and correctly fitted

♦ Radio/telephone/auxiliary heater aerial -R51 (on vehicle) OK and correctly installed

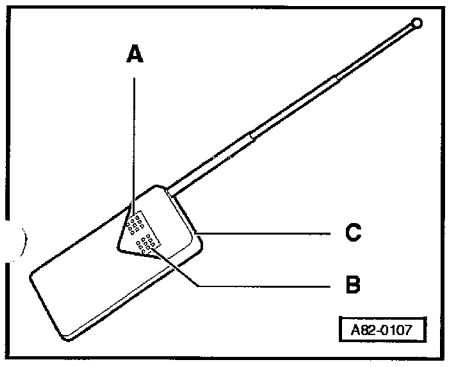
Encoding

Notes:

♦ At close range (less than 3m from vehicle aerial), remote control unit aerial does not have to be extended.

♦ Keep remote control vertical whilst pressing buttons.

♦ Times given must be heeded exactly for encoding purposes. Encoding will not be successful if time is too long or too short and the entire procedure must then be repeated.



♦ Each time button (-A- and -B-) is pressed, lamp in remote control -C- lights 3 times.

– Interrupt power supply to auxiliary heating radio wave receiver - R64 (remove fuse).

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

– Wait at least 10 seconds.

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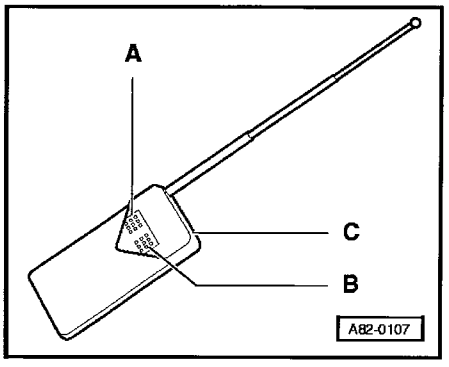
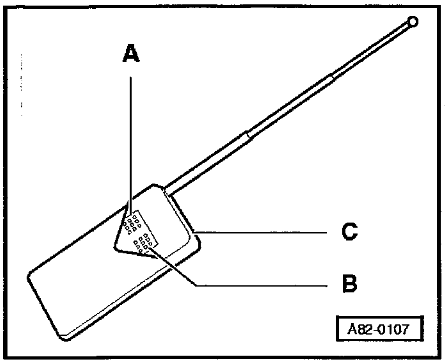


– Insert fuse and, within 3 s, press "OFF" button -B- on remote control for 1 s.

Lamp -C- on remote control starts to flash (initially 3 times).

– Wait at least 3 s (max. 8 s).

– Press "START" button -A- on remote control for 1 s.



- Wait at least 3 s (max. 8 s).
- Press "OFF" button -B- on remote control for 1 s.

Lamp -C- on remote control flashes 3 times. This concludes remote control assignment process.

Notes:

- ♦ Encode second remote control unit in same manner if applicable.
- ♦ A maximum of 2 remote control units can be assigned to one auxiliary heating radio wave receiver -R64.
- ♦ If more than 2 remote control units are assigned to one auxiliary heating radio wave receiver -R64, the first one to be encoded is erased.

- Set time on pre-selection clock -E111 (if fitted).
- Use remote control to switch auxiliary heating/auxiliary ventilation on and off (functional test).

Checking operation of remote control and auxiliary heating radio wave receiver -R64

Notes:

- ♦ Remote control can be used to switch auxiliary heating/auxiliary ventilation on and off from a distance of up to 600 m (in open areas). A reduced range must be expected in built-up areas or from inside buildings.
- ♦ Hold remote control vertical whilst pressing buttons (to achieve optimum reception of signals by vehicle aerial and maximum transmitter range).
- ♦ Auxiliary heating/auxiliary ventilation time is determined by remote control on activation (cut-in signal contains a time module). This time module is permanently stored in the remote control and cannot be altered. There are different versions for vehicles with and without pre-selection clock => Pages 82-61 and 82-64.

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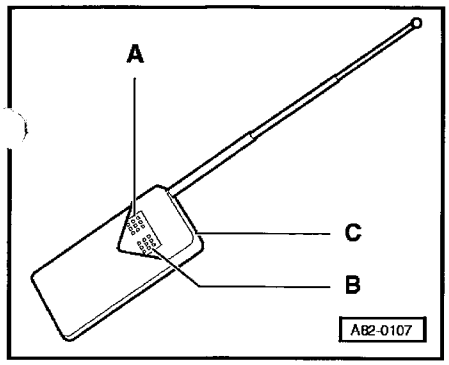
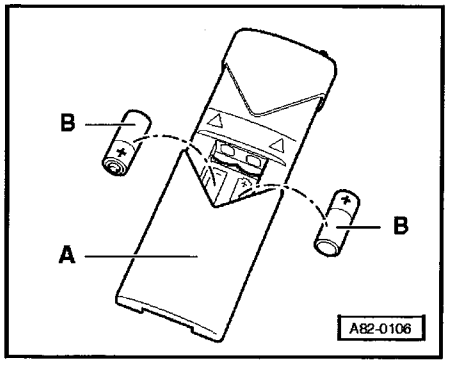
=> Parts List



- Lamp -C- on remote control starts to flash when "START" button -A- is pressed. By way of a check, this lamp flashes
  - In the case of the version with 30 min. operating time (for vehicles with pre-selection clock) until auxiliary heating/auxiliary ventilation is switched off by pressing "OFF" button -B- or until 30 min. running time has elapsed
  - In the case of the version with 60 min. operating time (for vehicles with no pre-selection clock) for approx. 30 s after pressing "START" button
- The remote control transmits at a frequency of 433.92 MHz (for approx. 3 s each time button is pressed).
- The remote control is a transmitter. Switch-on and switch-off of auxiliary heating/auxiliary ventilation via pre-selection clock - E111/dash panel insert is thus not recognised.

- On vehicles with remote control, auxiliary heating/auxiliary ventilation can be switched on and off by way of remote control independently of pre-selection clock -E111 or dash panel insert. The switching signals are evaluated by the auxiliary heating radio wave receiver -R64 and auxiliary heating/auxiliary ventilation switched on or off.
- Auxiliary heater switched on via pre-selection clock -E111 can also be switched off using remote control. This involves switching auxiliary heating/auxiliary ventilation on and then off again with remote control.
- Auxiliary heater switched on via dash panel insert can only be switched off by way of dash panel insert (not using remote control).



Test requirements

- Auxiliary heater off
- Batteries -B- in remote control unit OK and correctly fitted
- Radio/telephone/auxiliary heater aerial -R51 (on vehicle) OK and correctly installed
- Battery -A (vehicle battery) OK and adequately charged

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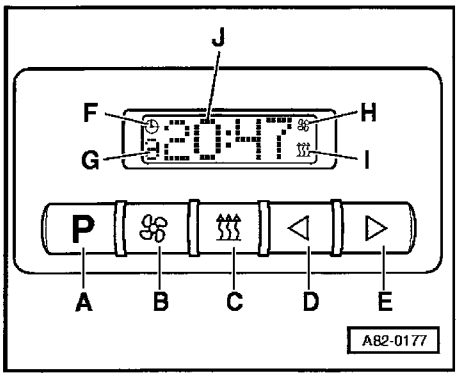
♦ Fault memory interrogated =>Page 01-38 and any faults displayed eliminated



♦ Remote control aerial fully extended (if distance between vehicle aerial and remote control is more than 3 m)

♦ Remote control properly encoded

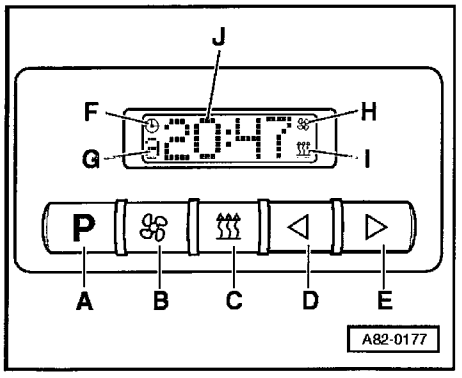
♦ Auxiliary heater set to "Auxiliary ventilation" mode

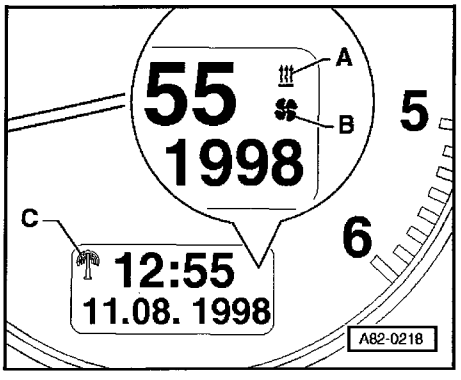
– On vehicles with pre-selection clock -E111, "Auxiliary ventilation" mode activated on -E111 (symbol -H- for auxiliary ventilation mode visible; if not, press button -B- twice)

– On vehicles with no pre-selection clock -E111, "Auxiliary ventilation" function switched briefly on and off again in dash panel insert via rotary knob/pushbutton =>Page 82-35

Notes:

♦ In auxiliary ventilation mode, function can be checked without having to allow for pre-running/run-on times and coolant temperature (operating and display unit for air conditioner/Climatronic -E87 / heater control (and fresh-air blower) switched on and off immediately).





♦ When using remote control, pre-selection clock activates the mode last switched on and off again by pressing button -B- or -C- (to select, press button twice for switch-on and switch-off).

♦ When using remote control, dash panel insert activates the function last set via the dash panel insert.

♦ On vehicles with no pre-selection clock -E111, symbol appears in display of digital clock in dash panel insert when auxiliary heating/auxiliary ventilation is switched on => Page 82-35.

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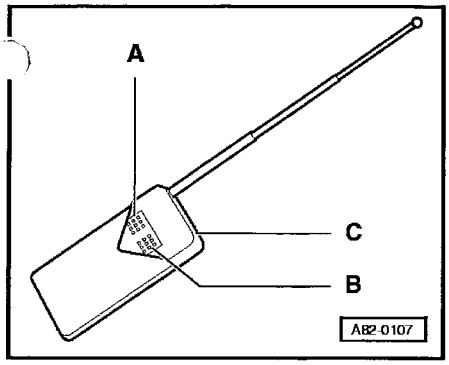
Checking



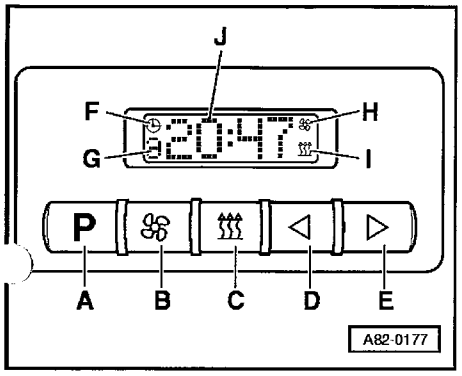
– Switch off ignition.

♦ Switch-on

– Press "START" button -A- on remote control.

Lamp -C- on remote control flashes (initially 3 times).

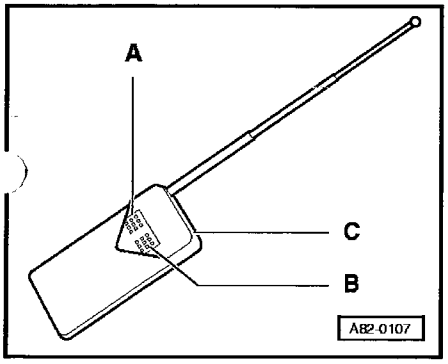
By way of a check, symbol for auxiliary ventilation mode appears in digital clock of dash panel insert on vehicles with no pre-selection clock.



On vehicles with pre-selection clock, lamp in button -B- lights as a check (auxiliary ventilation mode).

Operating and display unit for air conditioner/Climatronic - E87/heater control (and fresh-air blower) start up (auxiliary ventilation mode).

♦ Switch-off



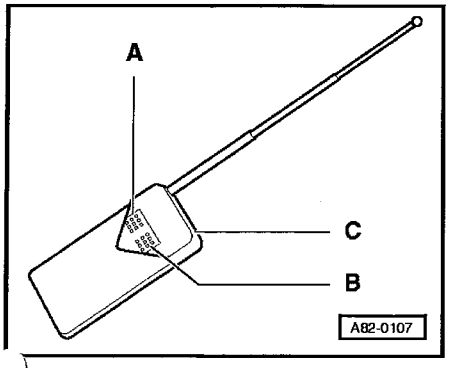
– Press "OFF" button -B- on remote control for 1 s.

Lamp -C- on remote control flashes 3 times and then stops.

Lamp in button -B- of pre-selection clock/symbol for auxiliary ventilation mode in digital clock goes out.

Operating and display unit for air conditioner/Climatronic -E87 / heater control (and fresh-air blower) cut out.

♦ Switch-on



– Press "START" button -A- on remote control.

Lamp -C- on remote control flashes.

Operating and display unit for air conditioner/Climatronic -E87 / heater control (and fresh-air blower) start up (auxiliary ventilation mode).

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♦ Switch-off

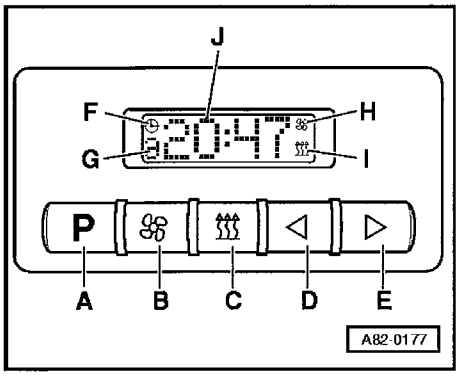
Vehicles with no pre-selection clock

– Switch on ignition.

– Select "Auxiliary ventilation" menu in driver information system in dash panel insert and switch off auxiliary ventilation function by way of rotary knob/pushbutton in centre section of dash panel => Page 82-35.

– Switch off ignition.

Operating and display unit for air conditioner/Climatronic - E87/heater control (and fresh-air blower) cut out (after approx. 15 s).

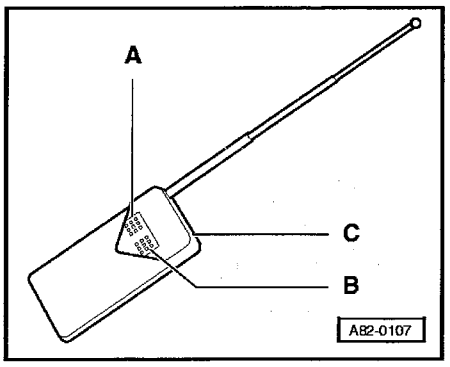


Vehicles with pre-selection clock

– Press button -B- of pre-selection clock -E111 to switch off auxiliary ventilation.

Lamp in button -B- of pre-selection clock goes out.

Operating and display unit for air conditioner/Climatronic - E87/heater control (and fresh-air blower) cut out (after approx. 15 s).



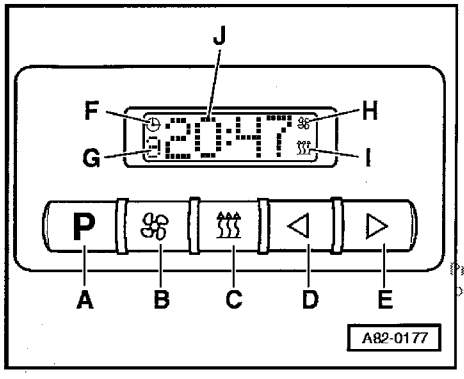
Lamp -C- on remote control continues to flash.

– Press "OFF" button -B- on remote control for 1 s.

Lamp -C- on remote control stops flashing.

♦ Switch-on

Vehicles with pre-selection clock



– Press button -B- of pre-selection clock -E111 to switch on auxiliary ventilation.

– Operating and display unit for air conditioner/Climatronic -E87 / heater control (and fresh-air blower) start up (auxiliary ventilation mode).

Vehicles with no pre-selection clock

– Switch on ignition.

– Switch on auxiliary ventilation via rotary knob/pushbutton in centre console => Page 82-35.

– Switch off ignition.

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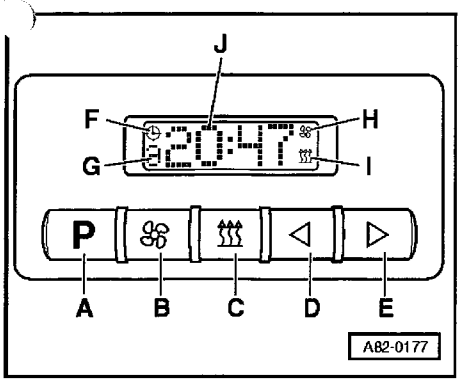
– Operating and display unit for air conditioner/Climatronic -E87 remains in operation after switching off ignition (auxiliary ventilation mode).



♦ Switch-off

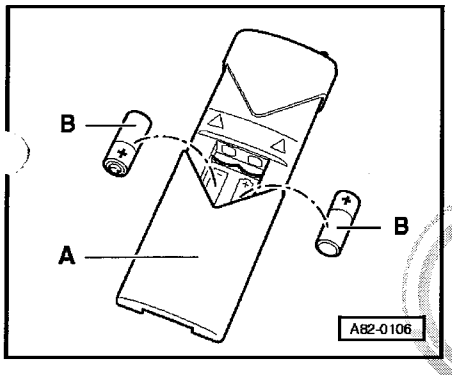
Vehicles with pre-selection clock

– Press button -B- of pre-selection clock -E111 to switch off auxiliary ventilation.
– Operating and display unit for air conditioner/Climatronic -E87 / heater control (and fresh-air blower) cut out.

Vehicles with no pre-selection clock

– Switch on ignition.
– Switch off auxiliary ventilation via rotary knob/pushbutton in centre console =>Page 82-35.
– Switch off ignition.
– Operating and display unit for air conditioner/Climatronic -E87 / heater control (and fresh-air blower) cut out when ignition is switched off.

Replacing remote control batteries



– Pull battery cover -A- on remote control to rear.
– Take out old batteries.
– Insert new batteries -B- correctly in remote control.

Notes:

♦ Only intended for vehicles with auxiliary heater as optional extra.

♦ Always replace all batteries.

♦ Always use batteries of the same type with a voltage of 1.5 V. Batteries with a higher rated voltage would destroy the remote control.

♦ Assignment of remote control to auxiliary heater is retained. Re-encoding is not necessary following battery replacement.

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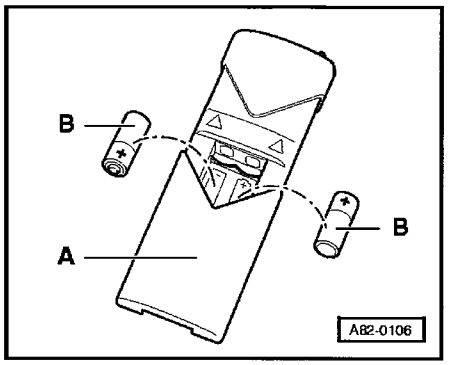
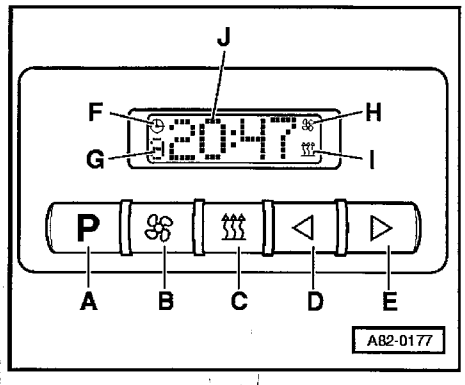
Detecting remote control faults on vehicles with pre-selection clock -E111



Test requirements

- ♦ Battery -A (vehicle battery) OK and adequately charged
- ♦ Fault memory interrogated =>Page 01-38 and any faults displayed eliminated
- ♦ Batteries -B- in remote control unit OK and correctly fitted

Notes:



- When using remote control, pre-selection clock activates the mode last switched on and off again by pressing button -B- or -C- (to select, press button twice for switch-on and switch-off).
- ♦ Various modifications to the vehicle as a whole were introduced in Model Year 2000 for the Audi A6. As a result of introduction of modified dash panel insert, pre-selection clock -E111 has been discontinued and auxiliary heating/auxiliary ventilation is actuated on these vehicles by way of dash panel insert.

Auxiliary heating/auxiliary ventilation cannot be switched on and off either via remote control or by way of pre-selection clock -E111

↓ yes

- Check actuation and electrical connections of pre-selection clock -E111 =>Page 01-177

↓ no

Auxiliary heating/auxiliary ventilation can only be switched on and off via pre-selection clock -E111

Check actuation and electrical connections of pre-selection clock -E111, perform test step 4 (actuation by auxiliary heating radio wave receiver -R64) =>Page 01-187

Readings match specifications in test step 4 and no actuation fault is found

↓ yes

- Check setting of pre-selection clock =>Page 82-29

Pre-selection clock set to remote control "T60"

↓ yes

- Replace pre-selection clock -E111

↓ no

- Set pre-selection clock =>Page 82-29

↓ no

Continued on next page

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Testing continued

– Check batteries in remote control and replace if necessary => Page 82-60.

Use current flow diagram to check positive and earth connection to aerial (for radio, navigation, telephone and auxiliary heater -R51).

Use current flow diagram to check positive and earth connection to auxiliary heating radio wave receiver -R64.

Use current flow diagram to check positive and earth connection to frequency divider -R46.

Use current flow diagram to check connection between aerial -R51 and receiver -R64 (via frequency divider -R46).

Encode remote control for auxiliary heating radio wave receiver -R64 => Page 82-47.

Encoding of remote control, batteries in remote control and connections to auxiliary heating radio wave receiver -R64 OK

↓ yes ↓

– Radio and telephone reception OK

↓ no ↓

– Replace aerial -R51

Check operation of auxiliary heater

↓ yes ↓

– Check operation with different remote control (do not forget encoding)

If operation is not OK, start by replacing aerial -R51 and check operation again

If fault is still present, swap aerial -R51 back again and proceed in the same manner with frequency divider -R46 and receiver -R64

↓ no ↓

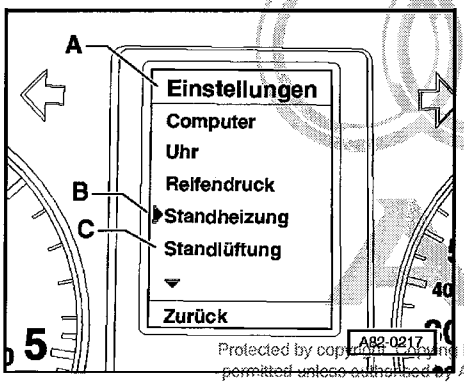
– Use current flow diagram to repair positive or earth connection

– Check operation of auxiliary heater

Detecting remote control faults on vehicles with no pre-selection clock -E111

Test requirements

- Vehicle battery -A OK and adequately charged
- Sufficient fuel in tank, fuel gauge not in red zone
- Auxiliary heater fault memory interrogated =>Page 01-38 and any faults displayed eliminated
- Dash panel insert properly adapted (functions "Auxiliary heating" -B- and "Auxiliary ventilation" -C- appear in "Settings" menu -A- on driver information system display) => Page 82-35



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Notes:

- Various modifications to the vehicle as a whole were introduced in Model Year 2000 for the Audi A6. As a result of introduction of modified dash panel insert, pre-selection clock - E111 has been discontinued and auxiliary heating/auxiliary ventilation is actuated on these vehicles by way of dash panel insert.
- Fuel gauge sender is interrogated before dash panel insert switches on auxiliary heater. Auxiliary heater is not switched on if there is insufficient fuel in tank (fuel gauge in "red zone").
- Vehicles with no pre-selection clock have a remote control with an operating time of 60 min. (30 min. version for vehicles with pre-selection clock). Actual auxiliary heating/auxiliary ventilation time is however governed by setting in dash panel insert. With this version, built-in lamp flashes for approx. 30 s as a check after pressing "START" button.

=> Parts List

Auxiliary heating/auxiliary ventilation cannot be switched on and off either by remote control or via dash panel insert (by actuating rotary knob/pushbutton)

– Interrogate fault memories of auxiliary heater and dash panel insert.

Fault stored in fault memory of auxiliary heater or control unit in dash panel insert

↓ no

– Use current flow diagram to check wiring from dash panel insert to auxiliary heater (to heater control unit -J162)

Both connections OK

↓ yes

– Unplug 6-pin connector from auxiliary heater

Fit diode test lamp V.A.G 1527 between contact 1 at 6-pin connector and earth => Page 82-154

Switch on auxiliary heater by way of dash panel insert

↓

Testing is continued on Page 82-67

↓ yes

– Use fault table to locate and eliminate faults displayed

– Check operation of auxiliary heater

↓ no

– Use current flow diagram to repair connections

Check operation of auxiliary heater

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Continuation of testing from Page 82-66

– Diode in test lamp lights on switching on auxiliary heating/auxiliary ventilation

↓ yes

– Perform electrical check on auxiliary heater =>Page 01-144

↓ no

– Service auxiliary heater actuator of dash panel insert => Electrical System; Repair Group 01 =>

Auxiliary heating/auxiliary ventilation can only be switched on and off via dash panel insert (and not via remote control)

– Check batteries in remote control and replace if necessary => Page 82-60.

Use current flow diagram to check positive and earth connection to aerial (for radio, navigation, telephone and auxiliary heater) -R51.

Use current flow diagram to check positive and earth connection to auxiliary heating radio wave receiver -R64.

Use current flow diagram to check connection between aerial -R51, receiver -R64 and dash panel insert.

Encode remote control for auxiliary heating radio wave receiver -R64 => Page 82-47.

Encoding of remote control and batteries in remote control OK

Connections from aerial -R51 (via aerial filter) to receiver -R64 and from dash panel insert to receiver -R64 OK

↓ yes

– Radio and telephone reception OK?

↓ no

– Replace aerial -R51

Check operation of auxiliary heater

↓ yes

– Continued on => Page 82-69

↓ no

– Eliminate fault determined

– Check operation of auxiliary heater

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Continuation of testing from Page 82-68

- Unplug connector from auxiliary heating radio wave receiver -R64 and jumper contact 4 (power supply) and contact 1 (to dash panel insert) = > Page 82-162.

Symbol for auxiliary heating or auxiliary ventilation appears in dash panel insert digital clock (depending on last setting) = > Page 82-35

↓ yes ↓

- Check operation with different remote control (do not forget encoding)

If operation is not OK, start by replacing aerial -R51 and check operation again

If fault is still present

↓ no ↓ End

↓ yes ↓

- Swap aerial -R51 back again and replace receiver -R64

Check operation again

↓ no ↓

- Check wiring between receiver -R64 and dash panel insert

= > Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- Check input at dash panel insert for signal from receiver -R64

= > Electrical System; Repair Group 01 = >

Removing and installing pre-selection clock -E111

Notes:

♦ Various modifications to the vehicle as a whole were introduced in Model Year 2000 for the Audi A6. Introduction of a modified dash panel insert resulted in the following:

- Discontinuation of pre-selection clock -E111, heater warning lamp -K11 and pre-selector clock switch -E255
- Auxiliary heating/auxiliary ventilation is now set by way of a rotary knob/pushbutton in the centre console. Settings made are indicated on driver information system display in dash panel insert.

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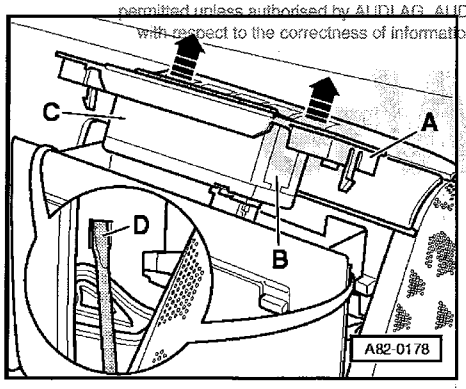
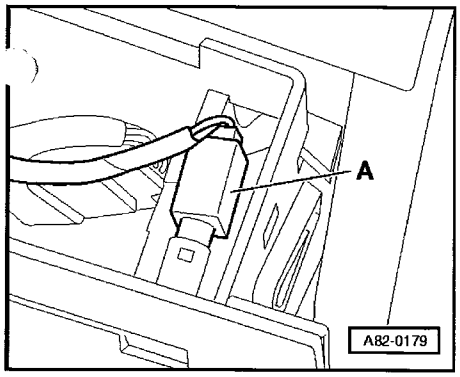


Removing

- Open flap for pre-selection clock.
- Use screwdriver -D- to release fasteners of mount -A-.
- Carefully lift mount -A- with pre-selection clock -C- out of flap.
- Press pre-selection clock -C- upwards out of mount -A-.

– Unplug connectors.



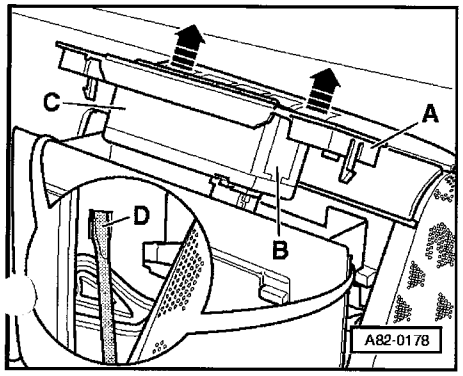
Note:

Pre-selection clock -C- is held in position in mount -A- with 2 clips -B-.

Installing

– Insert mount -A-.

– Check position of heater warning lamp -K11 -A-.



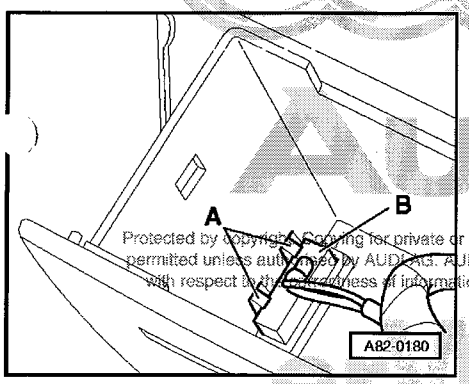
– Attach connectors.

– Insert pre-selection clock -C- in mount -A-.

Notes:

- When inserting pre-selection clock, make sure wiring does not press warning lamp out of holder.
- The first 1000 vehicles with auxiliary heater were fitted with a pre-selection clock -E111 (part no. index A). If this pre-selection clock is replaced by a version with part no. index C, mount -A- must also be replaced (different shape).

Removing and installing pre-selector clock switch - E255



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Note:

Only fitted on vehicles with pre-selection clock -E111

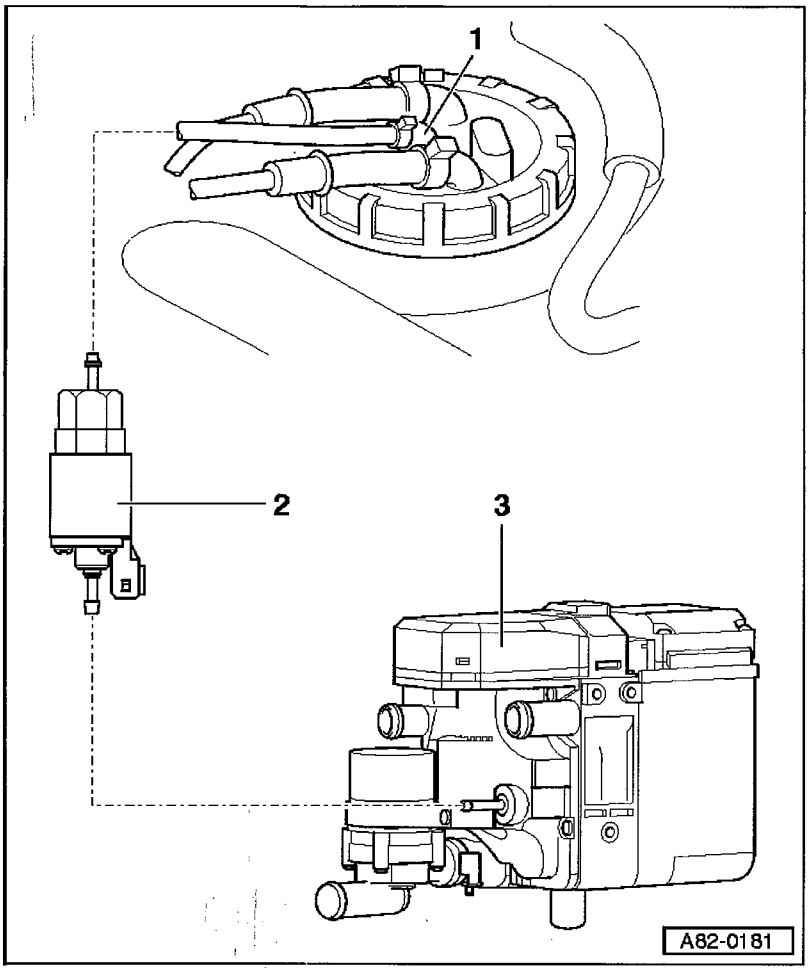
– Remove pre-selection clock -E111 => Page 82-70.

– Press back fasteners -A-.

– Remove switch -B-.

Notes:

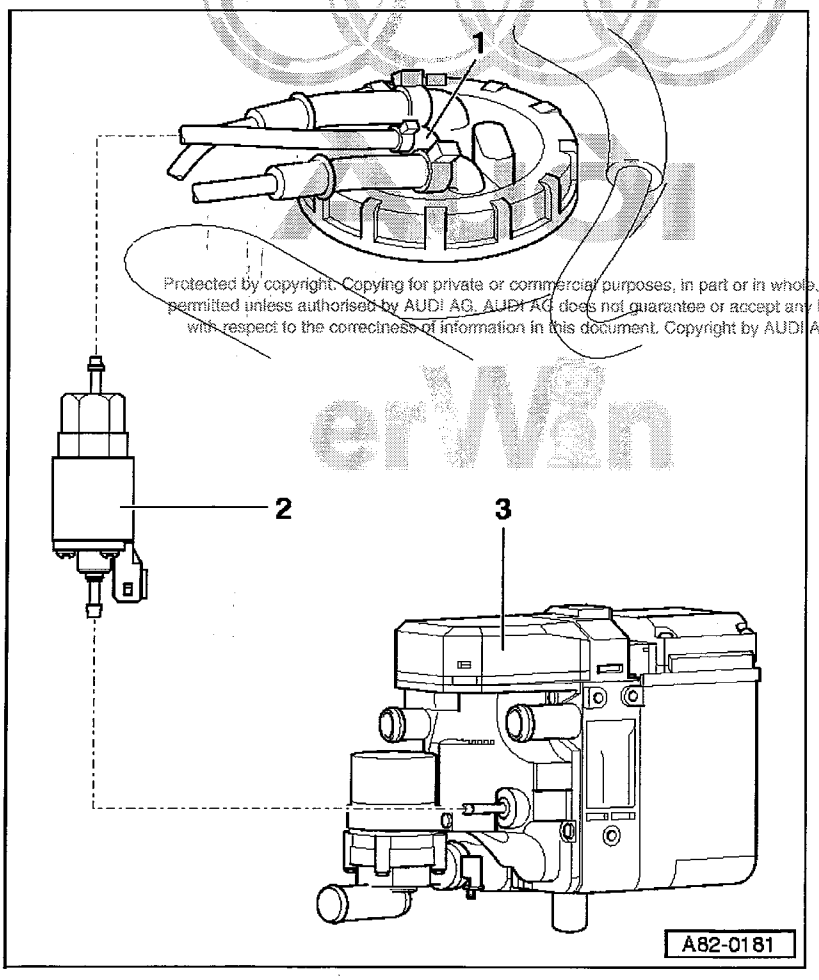
- Switch -B- is closed when flap is open.
- When switch is open, pre-selection clock is switched off and setting cannot be altered at all or only to a limited extent by way of buttons.



Diverting fuel for auxiliary heater

Note:
The following are prerequisites for operation of auxiliary heater:

- Fuel pipe flush with bottom of vehicle and protected against mechanical damage
- Fuel pipe to auxiliary heater protected against heat generation which could affect operation
- Fuel pipe not in contact with vehicle components which become warm



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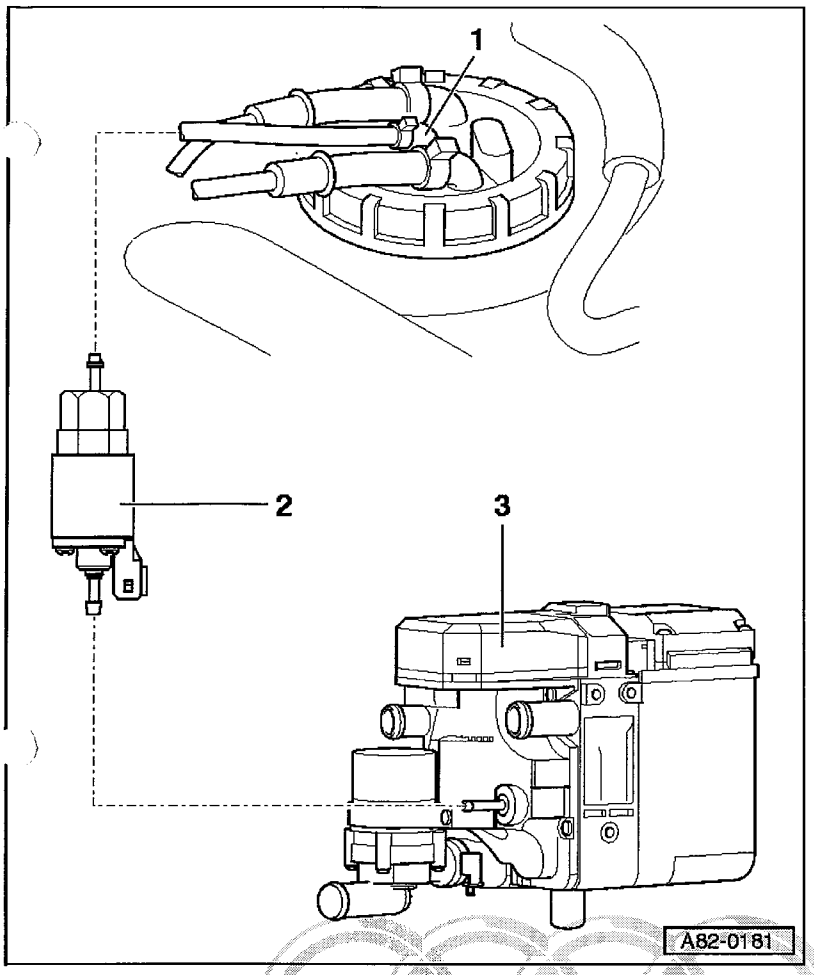
1 – Housing for fuel pump and fuel gauge

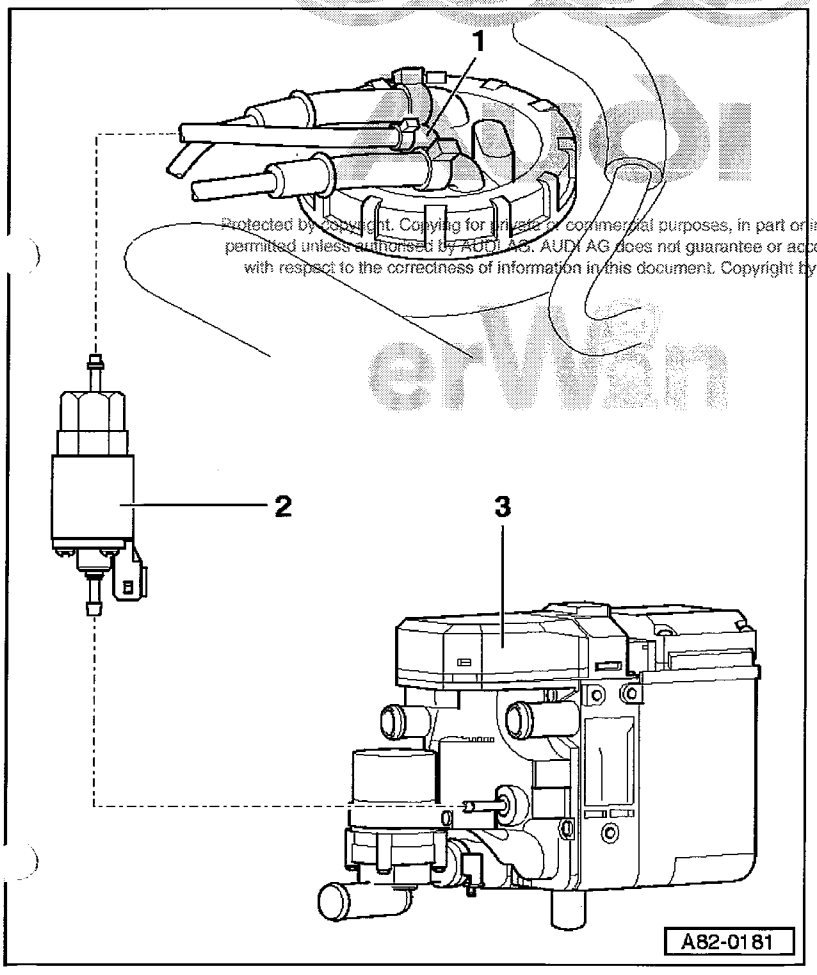
♦ Removing and installing
=> Relevant Engine, Mechanics Workshop Manual; Repair Group 20; Fuel Supply =>
=> Relevant Fuel System Workshop Manual, Petrol Engines; Repair Group 20 =>

♦ Diverting fuel from fuel tank

- Vehicles with front-wheel drive and petrol engine => Page 82-77
- Vehicles with front-wheel drive and diesel engine (except 4-cyl. engine) => Page 82-81
- Vehicles with four-wheel drive (except 6-cyl. diesel engine) =>Page 82-84
- Vehicles with 6-cyl. diesel engine and four-wheel drive => Page 82-88
- Vehicles with 4-cyl. diesel engine
=>Page 82-88



Note:
Adjacent illustration shows sealing flange on vehicle with petrol engine and front-wheel drive. Layout may differ depending on vehicle design.
=> Relevant Engine, Mechanics Workshop Manual; Repair Group 20; Fuel Supply =>
=> Relevant Fuel System Workshop Manual, Petrol Engines; Repair Group 20 =>
=> Relevant Fuel System Workshop Manual, Diesel Engines; Repair Group 20 =>



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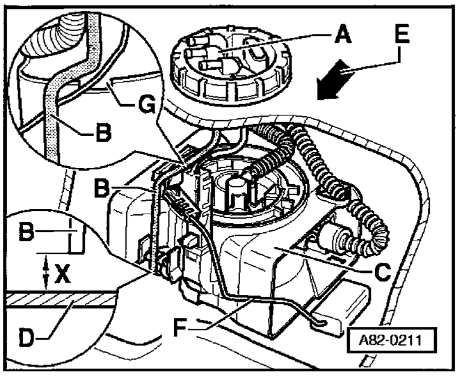
2 – Metering pump -V54
- ♦ Removing and installing
  - – Vehicles with front-wheel drive
    => Page 82-95
  - – Vehicles with four-wheel drive
    => Page 82-96
- ♦ Checking fuel delivery => Page 82-89
- ♦ Checking actuation => Page 01-54

3 – Auxiliary heater

Diverting fuel (for auxiliary heater) from fuel tank



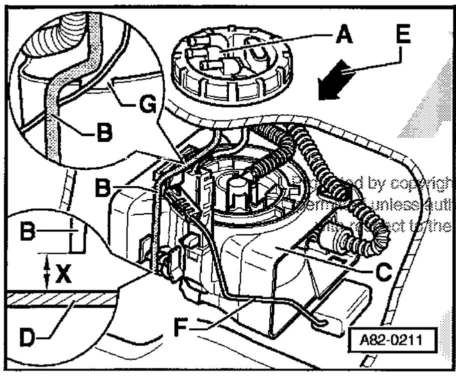
Vehicles with front-wheel drive and petrol engine (up to November 1998)

Fuel for auxiliary heater is drawn in from fuel tank via connection -A- and suction pipe -B-.

Suction pipe -B- must be routed vertically on outside of baffle housing -C- towards bottom of fuel tank -D-.

Notes:

- Arrow -E- indicates direction of travel.
- On these vehicles, suction pipe -B- is not to be routed into baffle housing.
- To ensure fuel supply even if fuel tank is nearly empty and vehicle is standing at an unfavourable angle, suction pipe -B- ends approx. 30 to 40 mm (dimension X) above bottom of fuel tank -D-.
- Vehicles with no auxiliary heater have a fuel delivery unit with no additional connection -A- and suction pipe -B-.



- Incorrect routing of suction pipe -B- can lead to problems with auxiliary heater operation if fuel tank is not completely full (fault message "No flame" or "Repeated flame interruption").
- When installing sealing flange, particular care is to be taken to ensure that suction pipe -B- is fitted as shown and that it is neither crushed by pipes in fuel tank nor rests on baffle housing -C-.
- Suction pipe -B- must not impede operation of fuel gauge sender -F-.
- With the suction pipes -B- fitted in Model Year 1998, tolerance overlaps can result in an excessive gap between suction pipe and bottom of fuel tank (suction pipe rests on baffle housing or fuel pump housing -G- and dimension X is thus greater than 40 mm). In such cases problems with auxiliary heater operation may occur if fuel tank is not completely full (fault message "No flame" or "Repeated flame interruption").
- If auxiliary heater functions properly when fuel tank is completely full, but problems are encountered when tank is only partially filled (fault message "No flame" or "Repeated flame interruption"), this is an indication of incorrect routing of suction pipe -B-.

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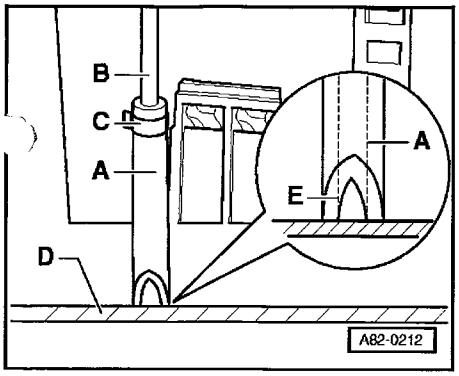
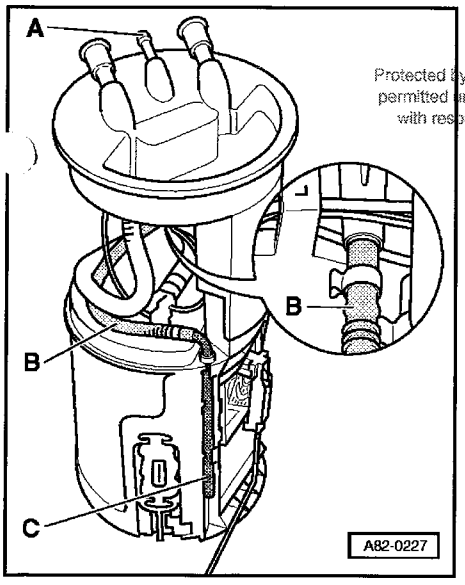


♦ To avoid having to replace the entire fuel delivery unit if complaints are received about such vehicles, suction pipe -B- can be extended by means of a fuel-resistant hose -A- (e.g. N 101 207 01).

- Hose -A- should be cut to length such that it still just rests on bottom of fuel tank when slipped approx. 5 cm over suction pipe -B-.
- To ensure that fuel can still be diverted even if hose -A- is resting vertically on bottom of fuel tank -D-, end -E- should take the form shown (dovetail).
- Slip hose -A- onto suction pipe -B- and secure in position with clip -C-.

Vehicles with front-wheel drive and petrol engine (as of November 1998)



Fuel for auxiliary heater is drawn in from fuel tank via connection -A-, corrugated pipe -B- and riser -C-.

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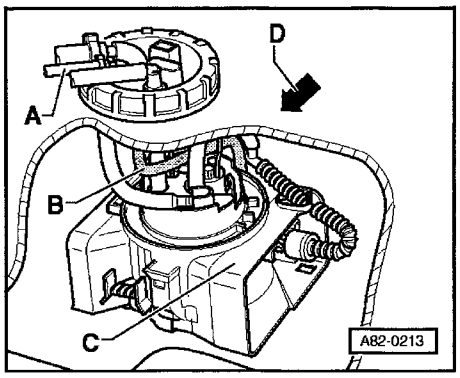
Notes:

♦ As of November 1998, vehicles with front-wheel drive have been fitted with a modified fuel tank, which also resulted in modifications to the fuel delivery unit.

♦ Riser -C- is attached to that part of the fuel delivery unit which rests on the bottom of the fuel tank. This ensures that auxiliary heater operation can still be maintained even if the fuel tank is nearly empty.

♦ To prevent fuel tank being completely emptied in auxiliary heating mode, riser -C- ends approx. 3.5 cm above bottom of tank.

Vehicles with front-wheel drive and diesel engine (except 4-cyl. diesel engine)

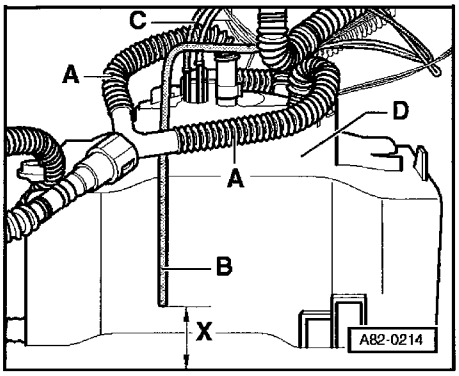


Fuel for auxiliary heater is drawn in from fuel tank via connection -A- and suction pipe -B-.

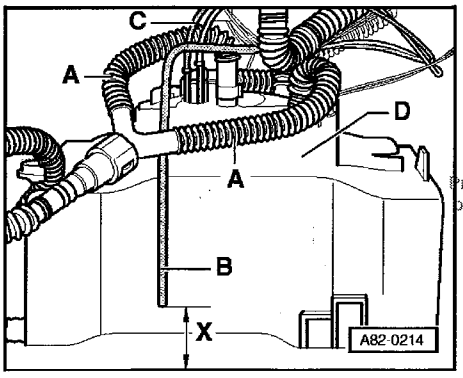
Suction pipe -B- must be routed vertically on outside of baffle housing -C- towards bottom of fuel tank.

Notes:

- Arrow -D- indicates direction of travel.
- On these vehicles, suction pipe -B- is not to be routed into baffle housing.



- Vehicles with no auxiliary heater have a fuel delivery unit with no additional connection -A- and suction pipe -B-.
- To ensure fuel supply even if fuel tank is nearly empty and vehicle is standing at an unfavourable angle, suction pipe -B- ends approx. 30 to 40 mm (dimension X) above bottom of fuel tank.



- When installing sealing flange, particular care is to be taken to ensure that suction pipe -B- is fitted as shown and that it is neither crushed by fuel pipes -A- in fuel tank nor by pipes to fuel pump -C- and that it does not rest on baffle housing -D-.
- Incorrect routing of suction pipe -B- can lead to problems with auxiliary heater operation if fuel tank is not completely full (fault message "No flame" or "Repeated flame interruption").
- If suction pipe -B- fitted is such that there is an excessive gap between suction pipe and bottom of fuel tank (suction pipe rests on baffle housing -D- or fuel pump housing and dimension X is thus greater than 40 mm), problems with auxiliary heater operation may occur if fuel tank is not completely full (fault message "No flame" or "Repeated flame interruption").

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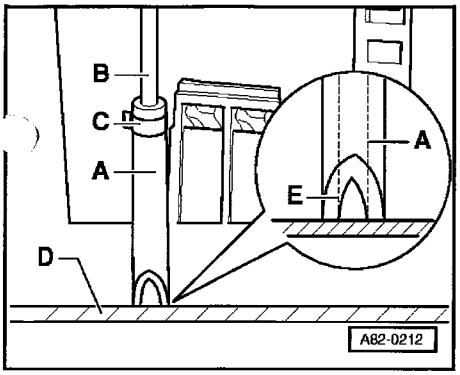
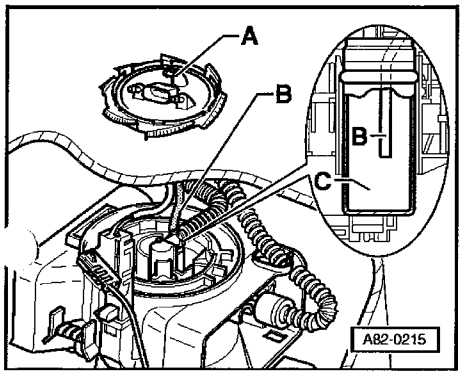


- To avoid having to replace the entire fuel delivery unit if complaints are received about such vehicles, suction pipe -B- can be extended by means of a fuel-resistant hose -A- (e.g. N 101 207 01).
  - Hose -A- should be cut to length such that it still just rests on bottom of fuel tank when slipped approx. 5 cm over suction pipe -B-.
  - To ensure that fuel can still be diverted even if hose -A- is resting vertically on bottom of fuel tank -D-, end -E- should take the form shown (dovetail).
  - Slip hose -A- onto suction pipe -B- and secure in position with clip -C-.



Vehicles with four-wheel drive (except 6-cyl. diesel engine)

Fuel for auxiliary heater is drawn in from baffle housing -C- via connection -A- and suction pipe -B- (thus ensuring fuel supply even if fuel tank is nearly empty and vehicle is standing at an unfavourable angle).

Notes:

- Vehicles with no auxiliary heater have a fuel delivery unit with no additional connection -A- and suction pipe -B-.
- Incorrect routing of suction pipe -B- can lead to problems with auxiliary heater operation if fuel tank is not completely full (fault message "No flame" or "Repeated flame interruption").
- When installing sealing flange, particular care is to be taken to ensure that suction pipe -B- is fitted as shown and that it is neither crushed by pipes in fuel tank nor rests on baffle housing -C-.
- On these vehicles, the shape of the fuel tank is such that suction pipe -B- has to end in baffle housing (suction jet pumps deliver the fuel to this point from less readily accessible parts of the fuel tank).

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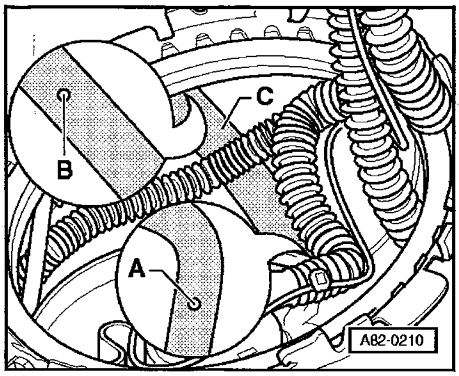
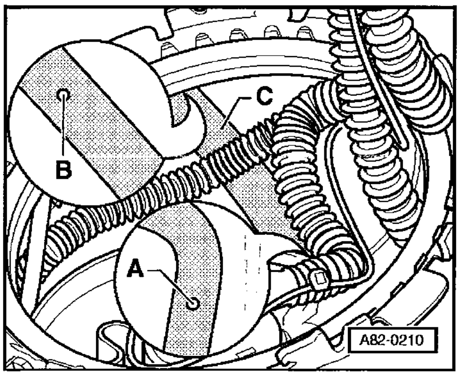


- ♦ The suction jet pumps convey the fuel through the rigid light grey fuel pipe -C- from the left fuel tank chamber into the right chamber (containing the fuel pump). A 2 mm diameter hole -A- is provided to stop fuel being drawn back into the left chamber after switching off the engine (linked pipe system).
  - Approx. 70 mm of the end of the fuel pipe was removed on vehicles manufactured in Model Year 1998. If the fuel tank is no longer completely full and the vehicle is standing at an unfavourable angle, fuel can flow back into the left chamber, the fuel level drops, the auxiliary heater can no longer draw in fuel and cuts out. This may also occur if the fuel pipe -C- is making contact with the holder, thus sealing off hole -A-.
  - As of May 1998, production was gradually converted and the hole moved to a different location -B- (not visible following assembly), thus eliminating the problem.



- ♦ Fuel pipe -C- cannot be replaced. However, to avoid having to replace the entire fuel tank in the event of a complaint on vehicles provided with hole -A-, an additional hole (max. diameter 2 mm) can be made at the highest point of fuel pipe -C- still accessible (rigid light grey pipe).

Attention:

Take the appropriate precautions and heed the relevant safety measures when working on open fuel system.

Electrically powered machines are not to be used when fuel system is open. => Relevant Fuel System Workshop Manual, Petrol Engines; Repair Group 20

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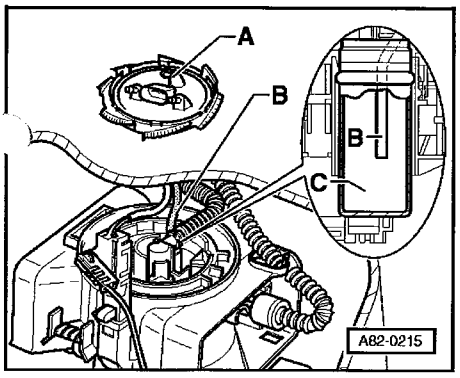
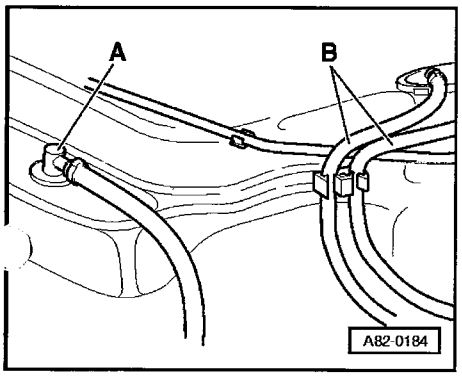
  - Drilling is only to be performed with a pneumatic or manual drill, never use electrically powered machines.



♦ If auxiliary heater functions properly when fuel tank is completely full, but problems are encountered when tank is only partially filled (fault message "No flame" or "Repeated flame interruption"), this is an indication of incorrect routing of suction pipe -B-.



Vehicles with 6-cyl. diesel engine and four-wheel drive

Fuel for auxiliary heater is diverted directly from fuel tank via connection -A-.

Notes:

♦ On vehicles with no auxiliary heater, connection -A- is sealed with a cap.

♦ There is no connection between fuel supply for auxiliary heater, fuel delivery unit and fuel pipes -B- (to engine).

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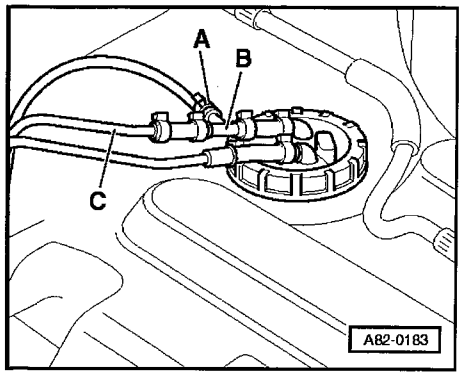


Vehicles with 4-cyl. diesel engine

Fuel for auxiliary heater is diverted from fuel supply pipe -C- via pipe -A- and T-piece -B-.

Checking fuel delivery (of metering pump -V54)

Test requirements:

- Coolant temperature less than 30°C
- Ambient temperature less than 20°C
- Fault memory interrogated =>Page 01-38 and any faults displayed located and eliminated

Note:

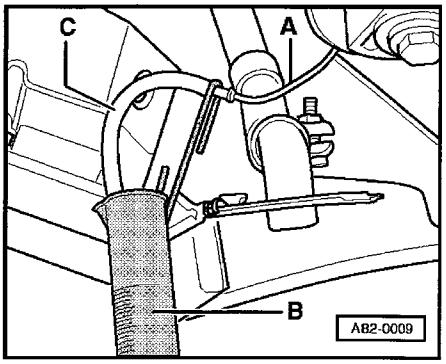
A higher ambient temperature can result in incorrect delivery measurements on account of fuel evaporation.

- Battery -A OK and adequately charged
- Sufficient fuel in tank (fuel gauge in dash panel insert not in red zone)

Checking:

- Switch off ignition.
- Remove noise insulation and front bumper (on vehicles with 6 or 8-cyl. engine).

=> General Body Repairs, Exterior; Repair Group 63; Front Bumper =>



- Detach fuel pipe -A- from auxiliary heater.
- Use piece of wire, for example, to secure graduated beaker -B- in area of fuel pipe and hold fuel pipe over beaker.

Note:

If necessary, use hose -C- as extension to fuel pipe.

- Start auxiliary heater self-diagnosis and select "Basic setting" function => Page 01-65.

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Rapid data transfer	Q
04 – Starting basic setting	

Indicated on display:

- Confirm entry with Q key.

Start basic setting HELP Enter display number XXX	Indicated on display: – Enter display group number 055. – Confirm entry with Q key.
System in basic setting 55→ Pipe filling	Indicated on display: ***Notes:*** ♦ Metering pump -V54 is now actuated for 50 s (clock frequency 5 Hertz). ♦ "Pipe filling" function is to be performed 3 times. Pipe is completely filled during first run; second and third runs are used to measure delivery (on account of low delivery rate 2 runs of 50 s each are required to increase measurement accuracy).
System in basic setting 55→ END	Wait until the following display appears: – Empty graduated beaker and re-attach. – Press → key.
Rapid data transfer HELP Select function XX	Indicated on display (function selection): – Press keys -0- and -4- to select "Basic setting" function 04.

Rapid data transfer Q 04 – Starting basic setting	Indicated on display: – Confirm entry with Q key.
Start basic setting HELP Enter display number 055	Indicated on display: – Enter display group number 055. – Confirm entry with Q key.
System in basic setting 55→ Pipe filling	Indicated on display: ***Note:*** *Metering pump -V54 is now actuated for 50 s (clock frequency 5 Hertz).*
System in basic setting 55→ END	Wait until the following display appears: – Press → key.
Rapid data transfer Q 04 – Starting basic setting	Indicated on display: – Confirm entry with Q key.
Start basic setting HELP Enter display number 055	Indicated on display: – Enter display group number 055. – Confirm entry with Q key.

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System in basic setting 55→
Pipe filling

Indicated on display:

Note:

Metering pump -V54 is now actuated for 50 s (clock frequency 5 Hertz).

System in basic setting 55→
END

Wait until the following display appears:

– Press → key.

Note:

To achieve a more accurate measurement result, metering pump -V54 has to be actuated for 100 s (2x implementation of "Pipe filling" function).

– Measure metering pump fuel delivery on completion of second pipe filling run.

Specification:

29 to 35 cm3 (millilitres)

Notes:

- During this test, fuel delivery is not governed by instantaneous battery voltage (delivery is stabilised by heater control unit - J162).
- There must not be any inclusion of vapour bubbles.
- If fuel delivery is outside tolerance range:
  - Check fuel pipe for damage and correct routing => Page 82-73.
  - If no fault is found, replace metering pump -V54 => Page 82-95.
- If starting problems are encountered with auxiliary heater although fuel delivery is OK, check CO2 level in exhaust gas => Page 82-97.

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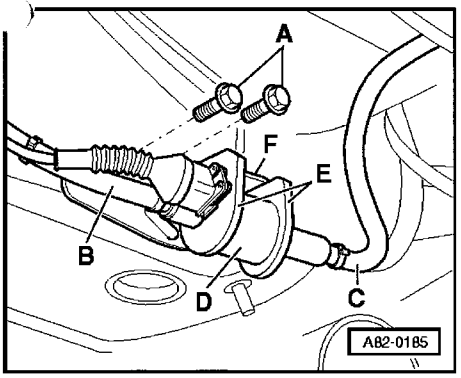
Removing and installing metering pump -V54

Front-wheel drive vehicles

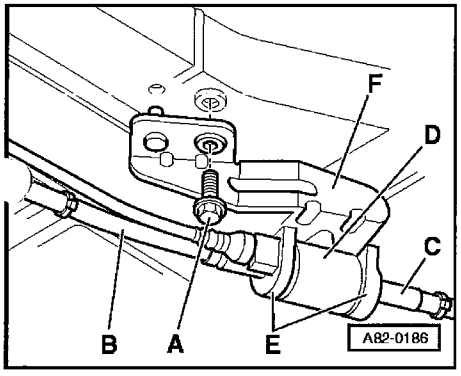


- Switch off ignition.
- Remove guard beneath tank.
- Remove bolts -A-.
- Detach fuel pipes -B- and -C- from metering pump and seal off.

Notes:

- Make sure metering pump and associated fuel pipes are not in contact with other components (noise).
- Metering pump -D- is secured in position with rubber elements -E- in holder -F-.
- Pay attention to delivery direction of metering pump on installation.

Four-wheel drive vehicles



- Switch off ignition.
- Remove guard beneath tank.
- Remove bolts -A-.
- Detach fuel pipes -B- and -C- from metering pump and seal off.

Notes:

- Make sure metering pump and associated fuel pipes are not in contact with other components (noise).
- Metering pump -D- is secured in position with rubber elements -E- in holder -F-.
- Pay attention to delivery direction of metering pump on installation.

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Checking and adjusting CO2 level in auxiliary heater exhaust gas

Notes:

- CO2 level can only be adjusted on heaters with control unit -J162 as of software version "D49". Channel number "02" is accepted for these heaters in function "10 Adaption". CO2 level in exhaust gas can be adjusted by way of this channel number.
- Only channel "01" is accepted by heater control units -J162 with software version "D47" or "D48".
- The adaption function varies the control curve for the combustion air blower -V6 (and thus the delivery rate) by way of the control unit.
- As soon as operating and display unit for air conditioner/Climatronic -E87 is switched on (by auxiliary heater), it is to be set to maximum heat output (temperature preselection "Hi").

Test requirements

- Coolant temperature at start of test less than 30° C
- Ambient temperature less than 20° C
- Battery -A OK and adequately charged
- Fault memory interrogated =>Page 01-38 and any faults displayed located and eliminated
- Sufficient fuel in tank (fuel gauge in dash panel insert not in red zone)
- As soon as operating and display unit for air conditioner/Climatronic -E87 is switched on by heater (on attaining specified coolant temperature), it is to be set to maximum heat output (temperature preselection "Hi").
- Set both rotary heater controls for temperature flaps to "Warm" stop.

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Checking CO2 level in auxiliary heater exhaust gas

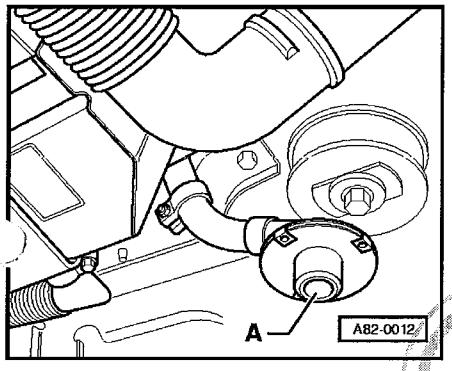
Notes:

- Auxiliary heater can be switched on via pre-selection clock - E111 / dash panel insert or by way of fault reader V.A.G 1551 (basic setting function, display group number 022 =>Page 01-77).
- In the case of heaters with control unit -J162 as of software version "D49", auxiliary/additional heater can be operated by way of "basic setting" function up to a coolant temperature of 115° C. Starting from control interval is possible. The operating time is limited to max. 8 minutes.
- Heed test requirements =>Page 82-98.

– Switch off ignition.

– Start auxiliary heater self-diagnosis => Page 01-22.

– Interrogate fault memory =>Page 01-38 and eliminate any faults displayed.



– Erase fault memory =>Page 01-83.

– Switch on exhaust analyzer V.A.G 1788 and insert corresponding hose of exhaust probe into exhaust pipe -A- of auxiliary heater.

Note:

Exhaust probe must not impede emergence of exhaust gas from exhaust pipe during test.

– Switch on auxiliary heater.

– Wait until auxiliary heater switches from starting to full load mode (roughly 4 minutes, interrogate instantaneous operating status =>Reading measured value block, Page 01-99).

– Allow auxiliary heater to run in full load mode for at least 1 minute.

– Read off measured value for CO2 (carbon dioxide) level in exhaust gas from CO2 measuring instrument (as of approx. 5 minutes after switch-on; auxiliary heater must be in full load mode).

Specifications:

- Diesel engine
  8 to 13 % by vol. CO2
- Petrol engine
  7 to 12 % by vol. CO2

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Notes:

- ♦ As soon as operating and display unit for air conditioner/Climatronic -E87 is switched on (by auxiliary heater), it is to be set to maximum heat output (temperature preselection "Hi").
- ♦ If measured value is outside permitted range:
  - Check combustion air blower intake area and auxiliary heater exhaust system for dirt and clean if necessary.
  - Check fuel delivery => Page 82-89.
- ♦ If CO2 level in exhaust gas and metering pump delivery rate are in lower specified range:
  - Replace metering pump -V54 => Page 82-95.
- ♦ If CO2 level in exhaust gas is not OK although fuel delivery is:

- Check air intake hose (with intake silencer) and auxiliary heater exhaust system and service if necessary. If no fault is found:

- In the case of auxiliary heater with control unit with software version "D47" or "D48" (CO2 level in exhaust gas not adjustable):
  - Check combustion air blower -V6.
  - Replace auxiliary heater with combustion air blower -V6 => Page 82-148.
- In the case of auxiliary heater with control unit with software version as of "D49" (CO2 level in exhaust gas adjustable):
  - Check combustion air blower -V6.
  - Adjust CO2 level in exhaust gas => Page 82-103.
  - If CO2level in exhaust gas cannot be adjusted, replace combustion air blower -V6 => Page 82-148.
- ♦ In the event of auxiliary heater starting problems although fuel delivery OK:
  - Check glow plug with flame monitor -Q8 => Page 01-144.
  - Remove residue from burner element (only applies to vehicles with diesel engine frequently run on vegetable-oil methylester as fuel) => Page 82-109.
  - Replace burner element => Page 82-150.

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Adjusting CO2 level in auxiliary heater exhaust gas

Note:

CO2 level in exhaust gas can only be adjusted for heaters as of software version "D49".

– Checking CO2 level in auxiliary heater exhaust gas => Page 82-99

Note:

Prerequisites for adjusting CO2 level in exhaust gas:

– Auxiliary heater in full load mode

– Fault reader connected and auxiliary heater self-diagnosis started

– CO2 measuring instrument ready for operation and exhaust probe positioned in auxiliary heater exhaust pipe such that emergence of exhaust gas is not impeded

Rapid data transfer HELP
Select function XX

Indicated on display (function selection):

– Press keys -1- and -0- to select "Adaption" function 10.

Rapid data transfer Q
10 – Adaption

Indicated on display:

– Confirm entry with Q key.

Adaption Q
Enter channel number XX

Indicated on display:

– Enter channel number -02-.

– Confirm entry with Q key.

Notes:

Function unknown or cannot →
be implemented at present

♦ If this display appears, a fault has occurred and adaption cannot be implemented (interrogate instantaneous operating status => Reading measured value block, Page 01-99).

Channel 02 Adaption XXX →
Wait

♦ If this display appears, auxiliary heater is currently not in full load mode (interrogate instantaneous operating status => Reading measured value block, Page 01-99).

– If auxiliary heater is in starting sequence, wait until it switches to full load mode.

– If auxiliary heater is in part load mode or control interval:

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- Switch off auxiliary heater via pre-selection clock - E111/dash panel insert and switch on again by way of fault reader V.A.G 1551 (basic setting function, display group number 022 =>Page 01-77). In this setting, full load mode is possible up to a coolant temperature of 115° C.
- Additionally switch on ignition, make temperature preselection "Hi" on operating and display unit for air conditioner/Climatronic -E87 and wait until coolant temperature has dropped to such an extent that auxiliary heater returns to full load mode.

Channel	02	Adaption	XXX →
CO2 adjustment			(-1 3-)

Indicated on display:

- Read off measured value for CO2 (carbon dioxide) level on CO2 measuring instrument.

Settings:

- Diesel engine
  9 to 12 % by vol. CO2
- Petrol engine
  8 to 11 % by vol. CO2

Channel	02	Adaption	XXX →
CO2 adjustment			(-1 3-)

Indicated on display:

- CO2 level in exhaust gas can be altered by pressing button -1- or -3-.
  - CO2 level in exhaust gas is increased by approx. 0.08 % each time button -1- is pressed.
  - CO2 level in exhaust gas is reduced by approx. 0.08 % each time button -3- is pressed.

Notes:

- Valid setting prior to adjustment remains stored if auxiliary heater is switched off during CO2 adjustment or on exit from full load mode.
- In the event of a considerable difference between specification and actual value, adaption value can also be entered directly.

- Press → key.

Channel	02	Adaption	XXX Q
Enter adaption value XXXXX			

Indicated on display:

- Enter desired numerical value and confirm entry with Q key.

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♦ CO2 level can only be altered within certain limits (adaption value between "00105" and "00136"). If CO2 level cannot be set as required, check combustion air blower and air intake, metering pump fuel delivery and auxiliary heater exhaust system.

– Read off measured value for CO2 (carbon dioxide) level on measuring instrument.

Channel 02 Adaption XXX →
CO2 adjustment (-1 3-)

Indicated on display:

If CO2 level in exhaust gas is in specified range:

– Press → key.

Channel 02 Adaption XXX Q
Enter adaption value XXXXX

Indicated on display:

– Confirm entry with Q key.

Channel 02 Adaption XXX Q
Store altered value?

Indicated on display:

– Confirm entry with Q key.

Channel 02 Adaption XXX →
Altered value stored

Indicated on display:

– Press → key.

Rapid data transfer HELP
Select function XX

Indicated on display:

– Press keys -0- and -6- to enter "End output" function 06.

Rapid data transfer Q
06 – End of output

Indicated on display:

– Confirm entry with Q key.

Rapid data transfer HELP
Enter address word XX

Indicated on display:

– Unplug diagnostic connector.

– Switch off auxiliary heater.

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Removing residue from burner element (operation with vegetable-oil methylester fuel only)

Notes:

- Problems with auxiliary heater operation may be encountered in cold weather on vehicles with diesel engines if use is predominantly made of vegetable-oil methylester as fuel.
- Explanation:

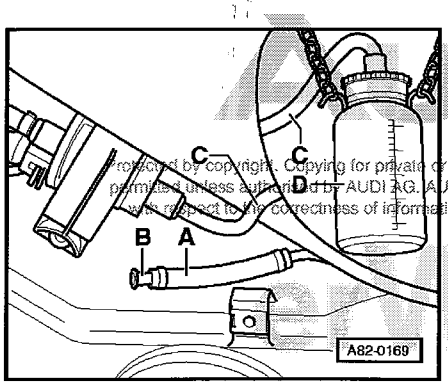
  On account of the physical properties, deposits may form during operation on the evaporation fabric in the burner element. These then cause combustion problems if the vehicle is run for lengthy periods on vegetable-oil methylester.
- Such deposits can be broken down and thus eliminated by the combustion of petrol.
- If evaporation fabric in burner element is clogged to such an extent that flame can no longer be formed, replace burner element => Page 82-143.

Requirements:

- Fault memory interrogated =>Page 01-38 and any faults displayed located and eliminated
- Coolant temperature (on commencement) less than 30°C

Removing residue:

- Switch off ignition.
- Remove guard beneath tank.



- Detach fuel pipe -A- from metering pump and seal with plug -B-.
- Pour 1l of fuel (petrol) into vessel -D-.

Notes:

- Vessel -D- must be provided with a riser reaching down to the bottom.
- There must be an opening in the cap to prevent formation of vacuum whilst drawing off fuel.

Audi
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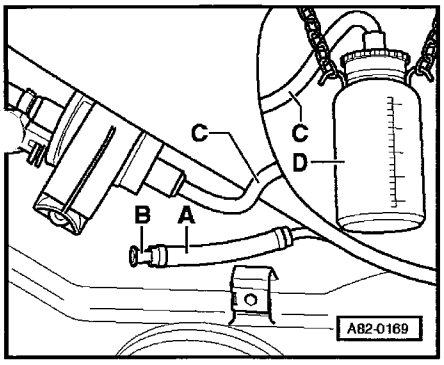
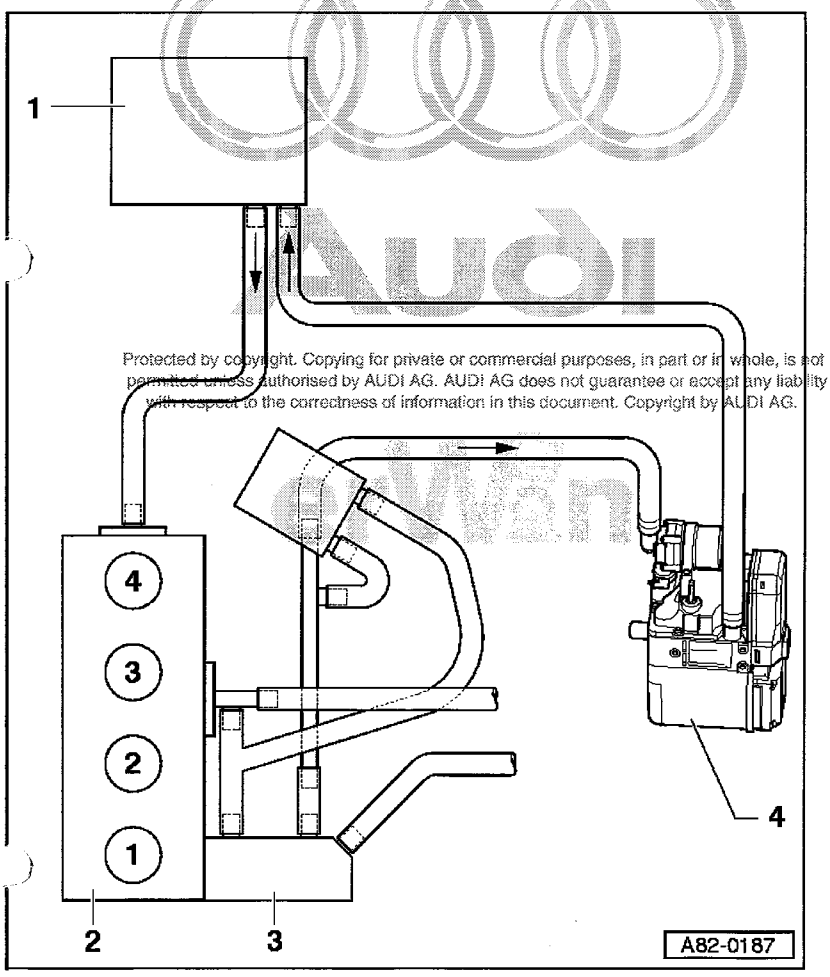


- Remove guard beneath tank.
- Attach vessel -D- (V.A.S 5086) to vehicle in area of metering pump.
- Squeeze vessel -D- until fuel appears at the end of hose -C- and then attach hose to metering pump.
- Switch on auxiliary heater.
- Open all windows.
- As soon as operating and display unit for air conditioner/Climatronic -E87 is switched on by heater (on attaining specified coolant temperature), it is to be set to maximum heat output (temperature preselection "Hi").
- Set both rotary heater controls for temperature flaps to "Warm" stop.
- Allow auxiliary heater to run on petrol for at least 30 minutes.



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Incorporation of auxiliary heater into coolant circuit

Vehicles with 4-cyl. engine

Notes:

♦ All components not mentioned => Relevant Engine, Mechanics Workshop Manual; Repair Group 19; Cooling =>

♦ Direction of coolant flow is the same in auxiliary heating mode and with engine running.

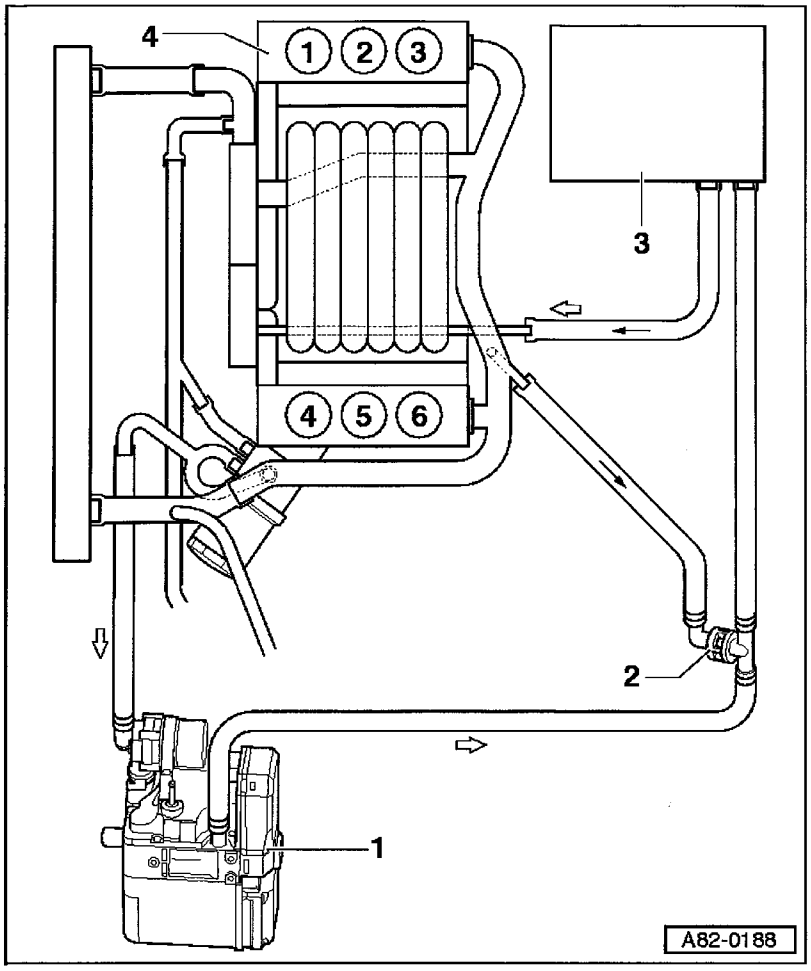
1 – Heat exchanger of heating system/air conditioner unit

2 – Cylinder block

3 – Compact holder

♦ With coolant pump and thermostat

4 – Auxiliary heater



Vehicles with 6-cyl. petrol engine

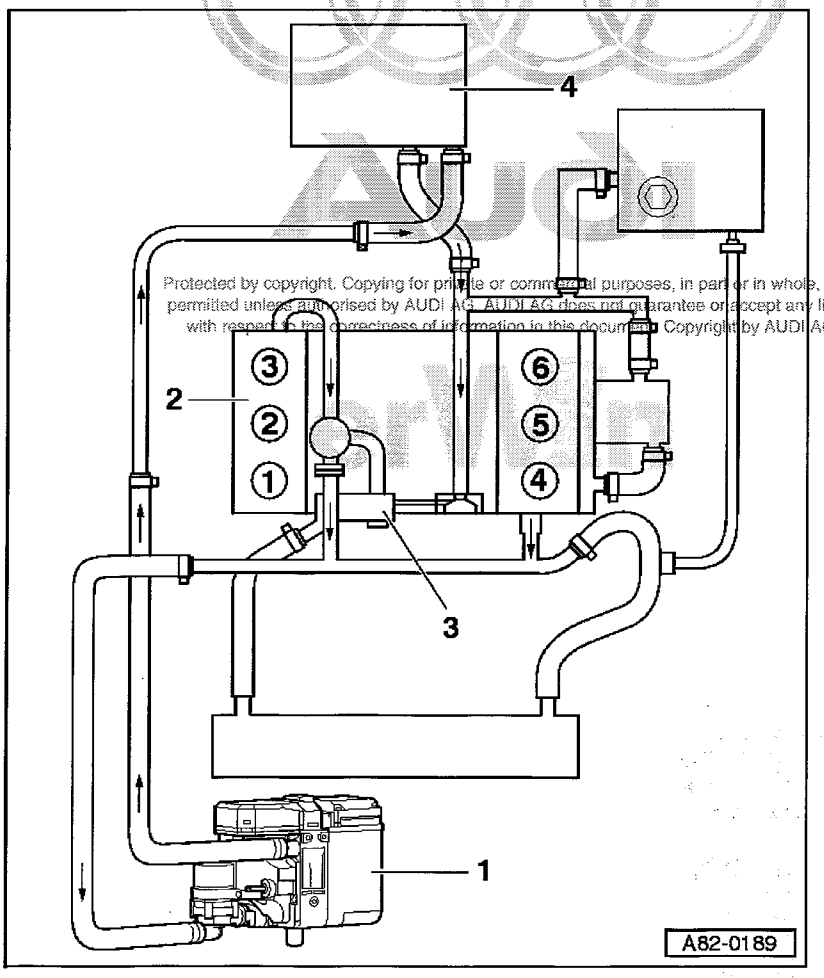
Note:
All components not mentioned
=> Relevant Engine, Mechanics Workshop Manual; Repair Group 19; Cooling =>
Direction of coolant flow:
=> In auxiliary heating mode
→With engine running

1 – Auxiliary heater

2 – Non-return valve

3 – Heat exchanger of heating system/air conditioner unit

4 – Cylinder block/cylinder head



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Vehicles with 6-cyl. diesel engine

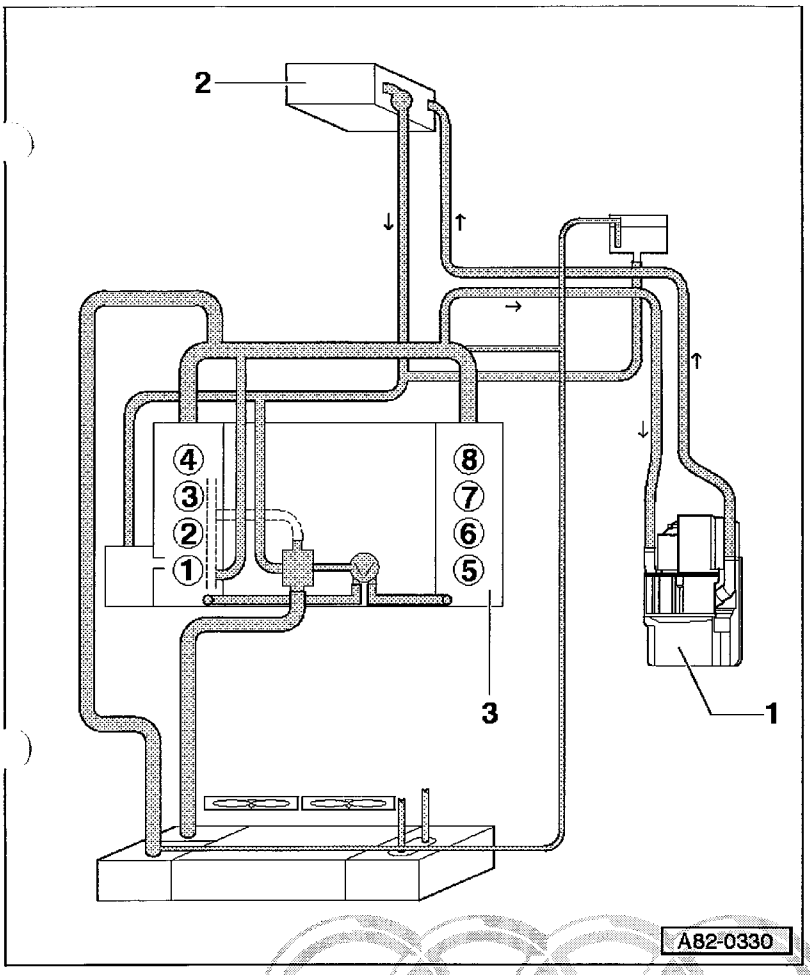
Notes:
♦ All components not mentioned
=> Relevant Engine, Mechanics Workshop Manual; Repair Group 19; Cooling =>
♦ Direction of coolant flow is the same in auxiliary heating mode and with engine running.
♦ Coolant pipe between auxiliary heater and heat exchanger is routed on left next to engine in direction of travel.

1 – Auxiliary heater

2 – Cylinder block/cylinder head

3 – Thermostat

4 – Heat exchanger of heating system/air conditioner unit



Vehicles with 8-cyl. engine (up to Model Year 2001)

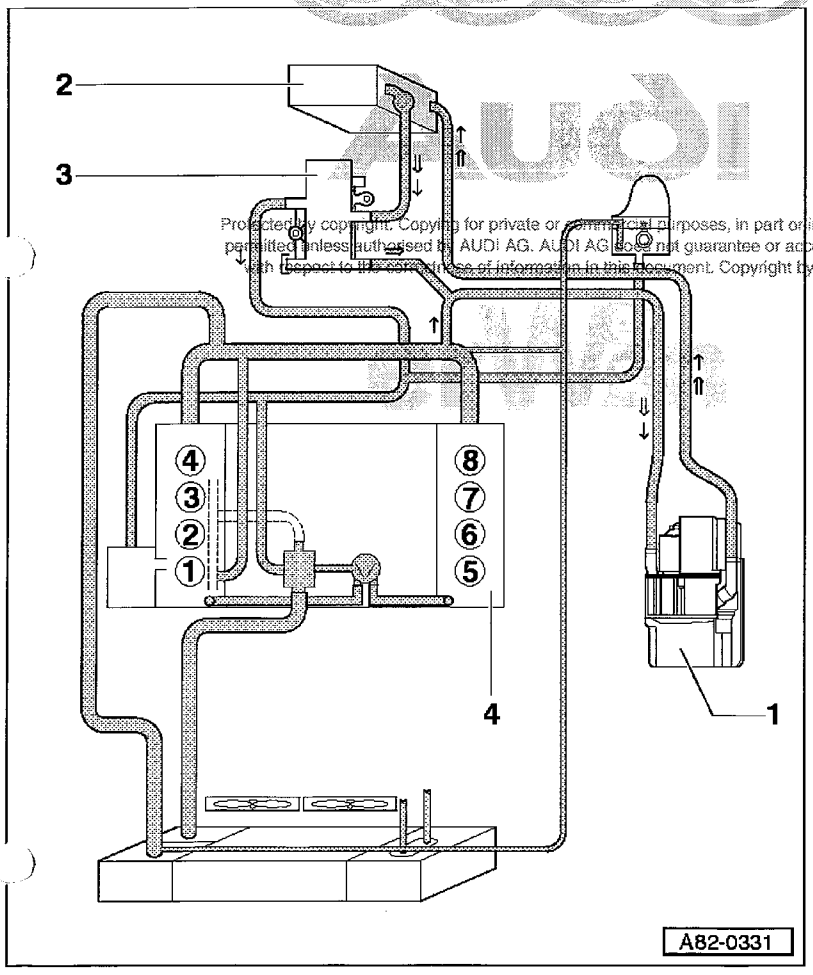
Notes:

- ♦ All components not mentioned => Relenant Engine, Mechanics Workshop Manual; Repair Group 19; Cooling =>
- ♦ Direction of coolant flow is the same in auxiliary heating mode and with engine running (arrows).
- ♦ As of Model Year 2002, such vehicles will be fitted with a coolant shut-off valve -N279 (gradual introduction)

1 – Auxiliary heater

2 – Heat exchanger of air conditioner unit

3 – Engine



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Vehicles with 8-cyl. engine (as of Model Year 2002)

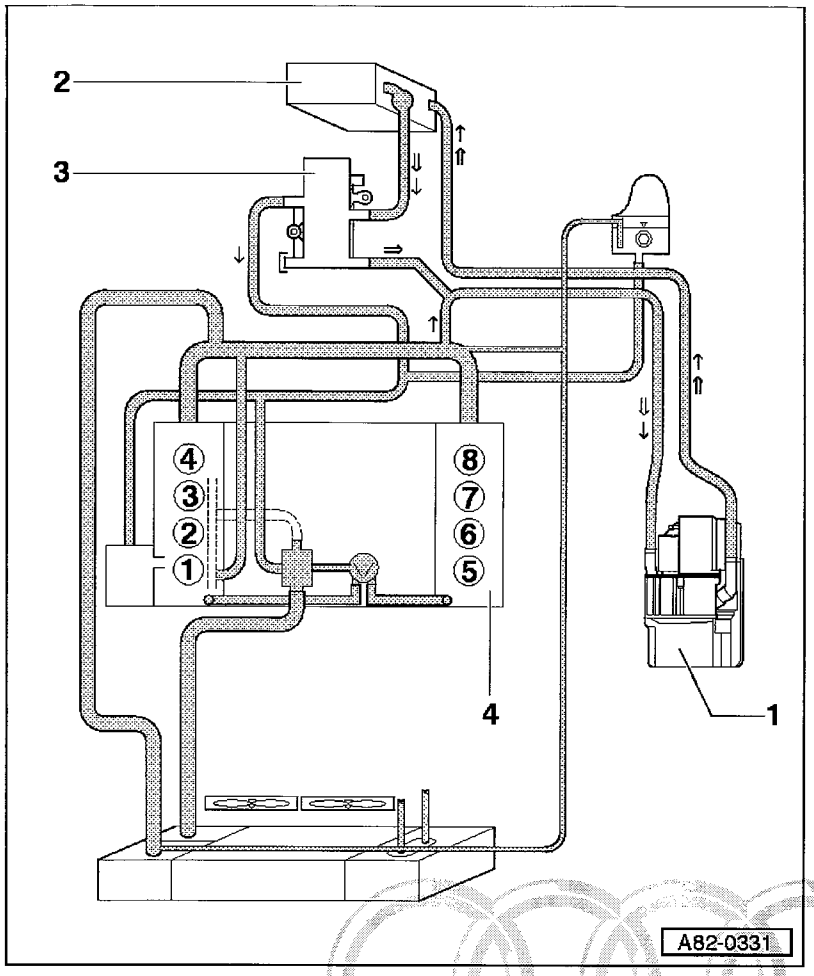
Notes:

- ♦ All components not mentioned => Relenant Engine, Mechanics Workshop Manual; Repair Group 19; Cooling =>
- ♦ As of Model Year 2002, such vehicles will be fitted with a coolant shut-off valve -N279 (gradual introduction)

Direction of coolant flow:

=>In auxiliary heating mode with engine stopped (coolant shut-off valve -N279 actuated)

→With engine running (coolant shut-off valve -N279 not actuated, exceptions =>Page 01-220)



1 – Auxiliary heater

2 – Heat exchanger of air conditioner unit

3 – Coolant shut-off valve -N279

- Removing and installing => Page 82-20
- Shut-off valve is actuated by coolant shut-off valve relay -J541
- Operation of relay -J541 => Page 01-220
- Connection assignment of coolant hoses => Page 82-20

4 – Engine

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Bleeding coolant circuit

– Bleed engine coolant circuit in specified manner.

=> Relevant Engine, Mechanics Workshop Manual; Repair Group 19; Cooling =>

Note:

On vehicles with coolant shut-off valve -N279, briefly switch on auxiliary heater (approx. 1 min.; sufficient to actuate coolant shut-off valve -N279 and recirculating pump -V55) after filling with coolant and before starting engine. With ignition switched off, shut-off valve is actuated in auxiliary heating mode and vented via auxiliary heater recirculating pump.

– Once engine has reached operating temperature:

  – Switch on auxiliary heater (on vehicles with 6-cyl. petrol engine and 8-cyl. engine with coolant shut-off valve -N279).

Notes:

- ♦ It is sufficient for the auxiliary heater recirculating pump to run (auxiliary heater switches to "control interval" operating status on account of coolant temperature).
- ♦ On vehicles with 4-cyl. engine, 6-cyl. diesel engine and 8-cyl. engine with no coolant shut-off valve -N279 it is not necessary to switch on auxiliary heater for bleeding, as it is subject to constant through-flow.

– Top up coolant if necessary.

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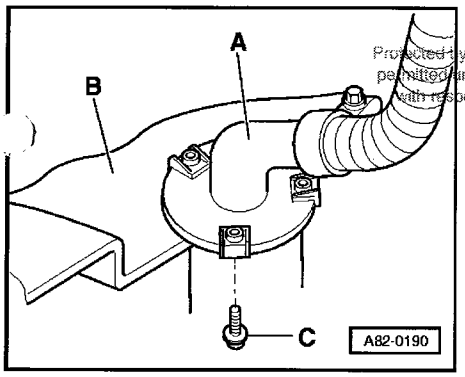
Removing and installing auxiliary heater (vehicles with 4-cyl. engine)



◀ – Remove bolts -C-.

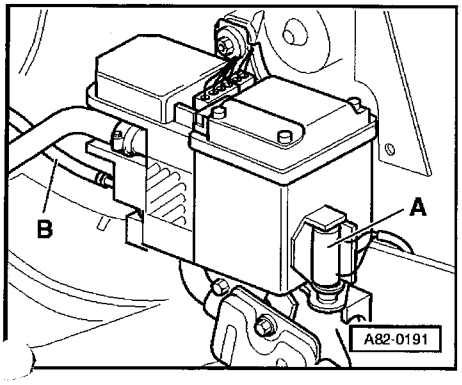
– Detach exhaust pipe from noise insulation -B-.

– Dissipate pressure in coolant circuit by opening cap on coolant expansion tank.

– Detach coolant expansion tank from vehicle and lay aside.

– Remove auxiliary heater relay -J8 to interrupt power supply to series resistor -N6.

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

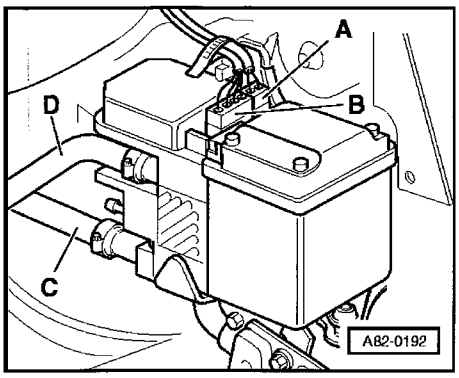


◀ – Detach series resistor -A- from auxiliary heater.

Note:

Series resistor -N6 is only fitted on vehicles with heater.

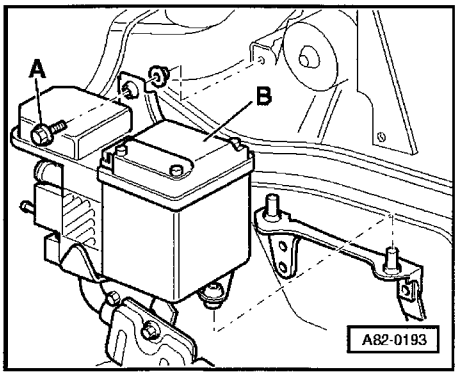
– Detach fuel pipe -B- to auxiliary heater and seal off.



- Unplug connectors -A- and -B- from auxiliary heater.
- Pinch off both coolant hoses to auxiliary heater (e.g. using V.A.G 3094), mark and detach.

Note:

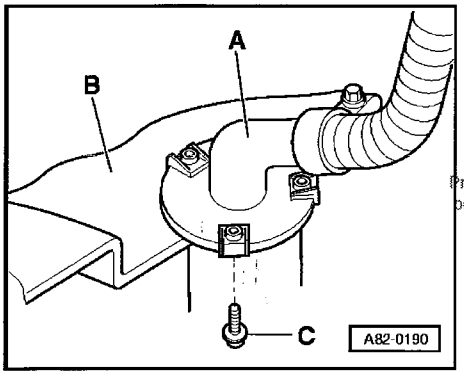
Coolant hoses -C- and -D- are not to be interchanged.



- Remove bolt -A-.
- Lift out auxiliary heater assembly -B-.

Notes on installation:

- ♦ Check exhaust pipes, coolant hoses, fuel pipe and wiring to auxiliary heater to ensure that there is no contact with other components.
- ♦ Before starting up auxiliary heater, bleed coolant circuit =>Page 82-118.



- ♦ Thermal insulation mat must be fitted between exhaust pipe -A- and noise insulation -B-.

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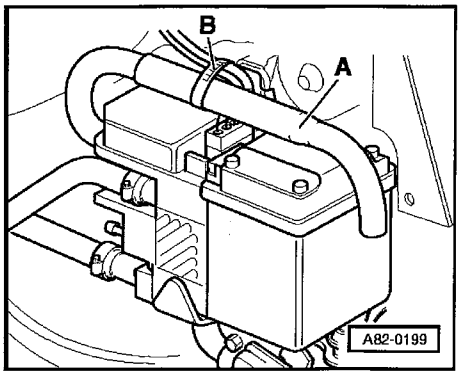
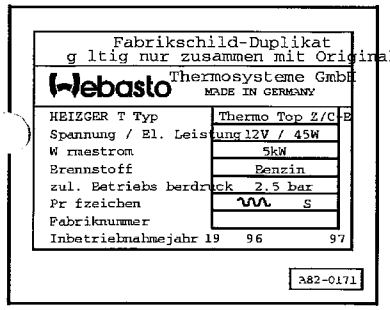
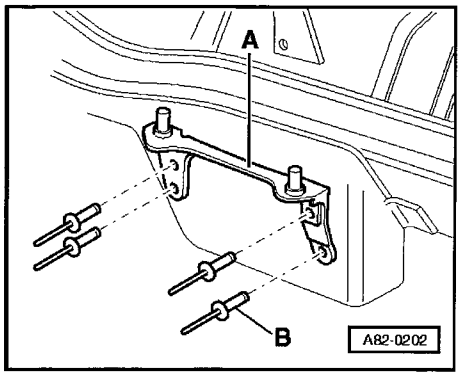


- ♦ Fit intake hose -A- and fix in position with cable tie -B- such that opening faces downwards (to prevent ingress of water and dirt).
- ♦ Intake hose -A- is to be fitted such that its cross-section is not constricted.



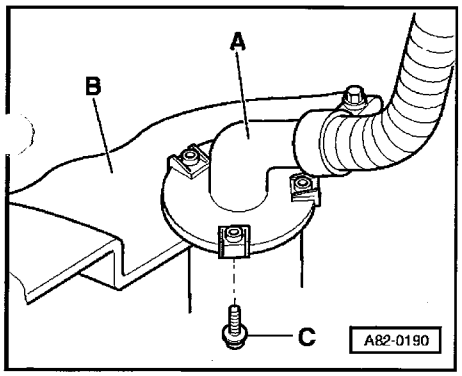
♦ If auxiliary heater has been replaced, enter year of initial commissioning for newly installed heater on rating plate of heater and on new "duplicate rating plate" (by deleting year of original initial commissioning).



Replacing holder

Holder -A- is secured with 4 pop rivets 4.8 x 8 mm.

Removing and installing auxiliary heater (vehicles with 6-cyl. and 8-cyl. engine)



– Dissipate pressure in coolant circuit by opening cap on coolant expansion tank.

– Remove bolts -C-.

– Remove front bumper and noise insulation.

=> General Body Repairs; Repair Group 63; Front Bumper =>

– Release front fasteners of left wheel housing liner.

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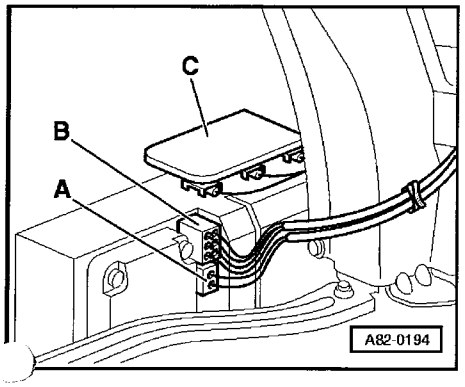
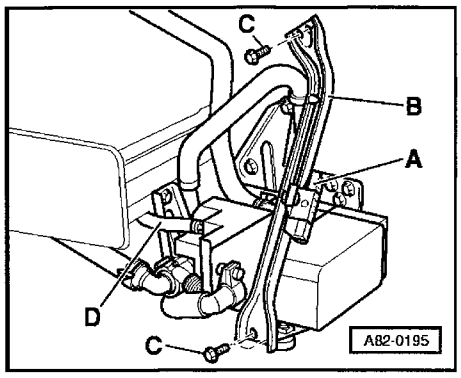


– Remove radiator fan single fuse -S42 to interrupt power supply to radiator fan series resistor -N39.

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

– Unplug connectors -A- and -B- from auxiliary heater.

– Detach series resistor -C- from auxiliary heater.



- Remove auxiliary heater relay -J8 to interrupt power supply to series resistor -N6.

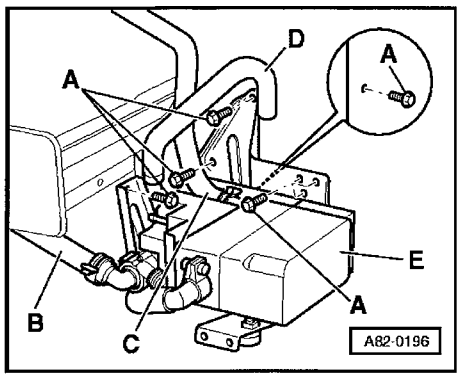
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- Detach series resistor -A- from auxiliary heater.

Note:

Series resistor -N6 is only fitted on vehicles with heater.

- Remove bolts -C-.
- Remove holder -B-.

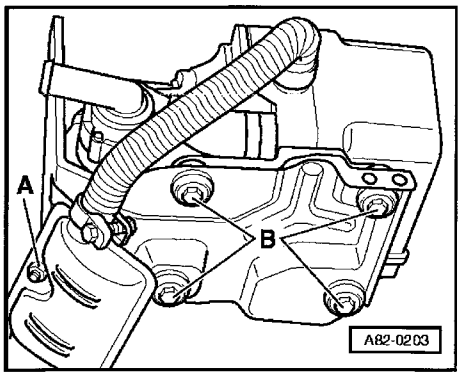


- Detach fuel pipe -D- to auxiliary heater and seal off.
- Pinch off both coolant hoses to auxiliary heater (e.g. using V.A.G 3094), mark and detach.

Note:

Coolant hoses -B- and -C- are not to be interchanged.

Removing auxiliary heater without holder



- Remove bolt -A-.
- Detach exhaust silencer from holder.
- Remove bolts -B-.
- Remove auxiliary heater assembly to front.

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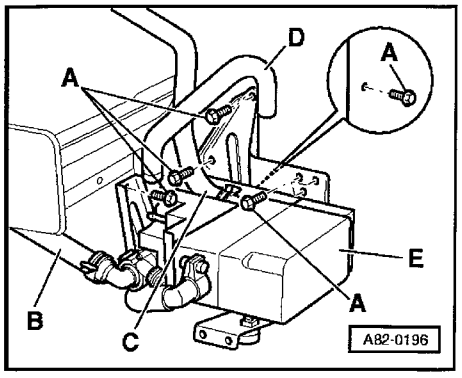
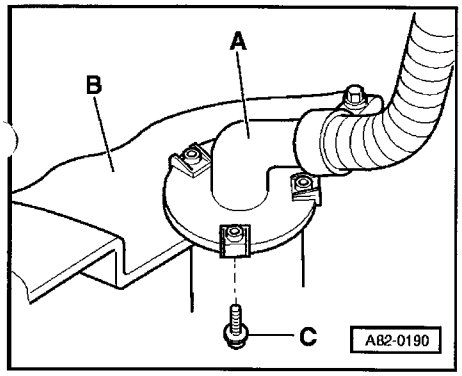
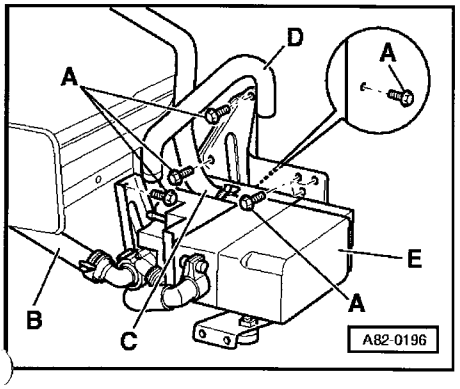
Removing auxiliary heater with holder



- Remove bolt -A-.
- Remove auxiliary heater -E- complete with holder to front.

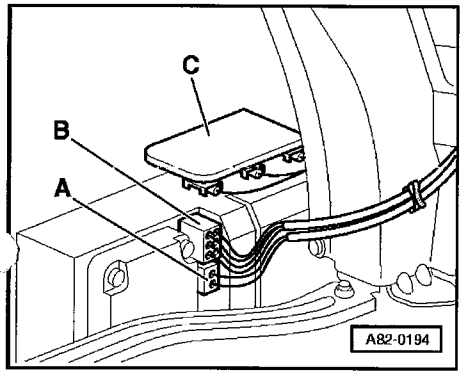




Notes on installation:

- ♦ Check exhaust pipes, coolant hoses, fuel pipe and wiring to auxiliary heater to ensure that there is no contact with other components.
- ♦ Before starting up auxiliary heater, bleed coolant circuit =>Page 82-118.
- ♦ Thermal insulation mat must be fitted between exhaust pipe -A- and noise insulation -B-.

- ♦ Fit intake hose -D- such that opening faces downwards (to prevent ingress of water and dirt).
- ♦ Intake hose -D- is to be fitted such that its cross-section is not constricted.



- ♦ After installing auxiliary heater, check distance from radiator fan series resistor -N39 -C- (danger of short circuit in the event of contact with other components).

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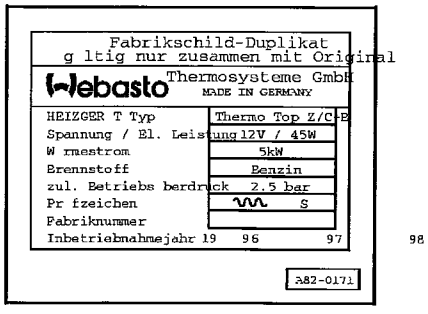
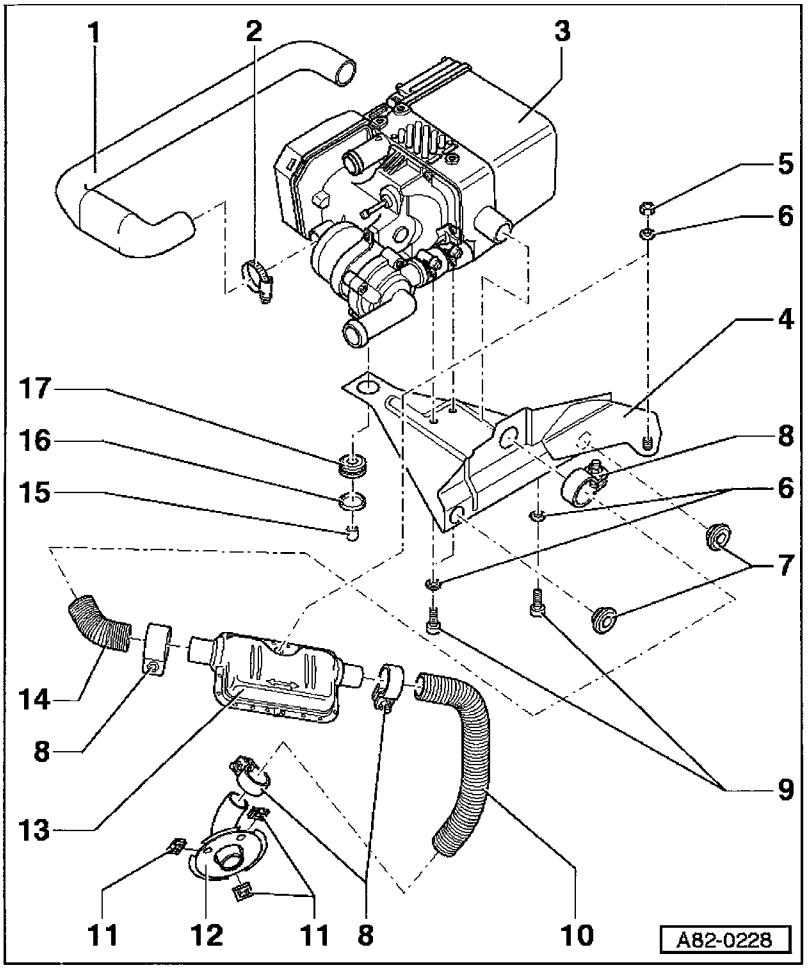


- ♦ If auxiliary heater has been replaced, enter year of initial commissioning for newly installed heater on rating plate of heater and on new "duplicate rating plate" (by deleting year of original initial commissioning).

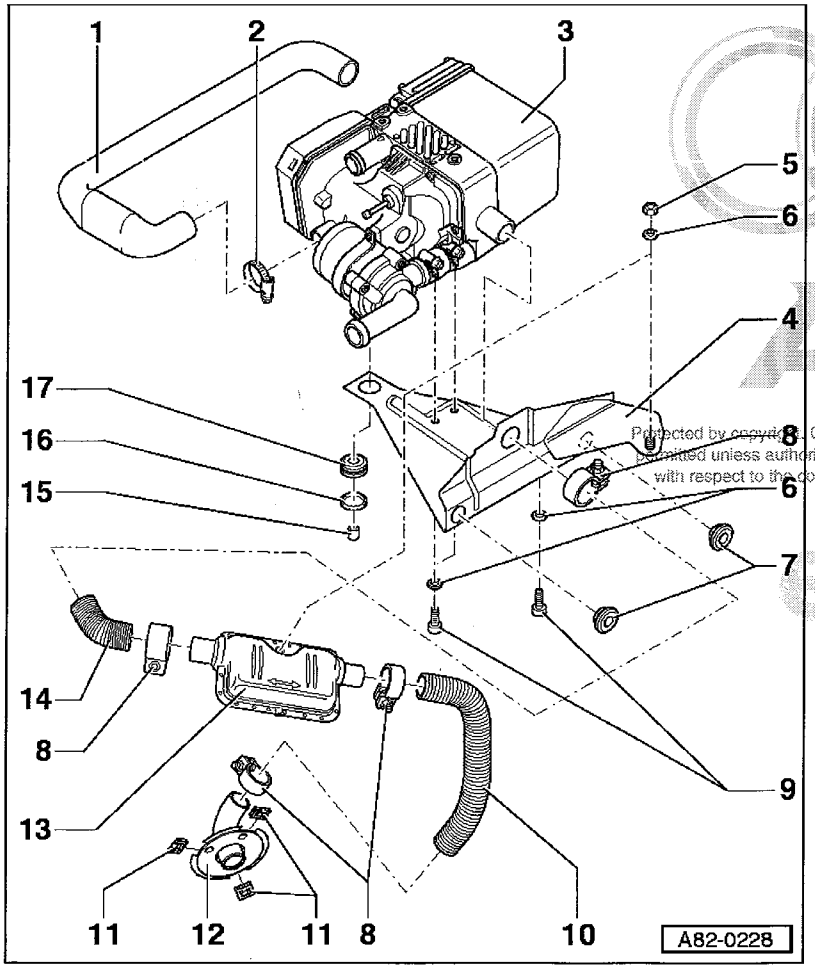


Dismantling and assembling auxiliary heater

Note:
Removing auxiliary heater
- Vehicles with 4-cyl. engine => Page 82-120
- Vehicles with 6-cyl. or 8-cyl. engine => Page 82-124

Detaching exhaust system bracket from heater/re-attaching (vehicles with 4-cyl. engine)

1 – Intake hose
- ♦ With intake silencer
- ♦ Cross-section of intake hose must not be constricted (e.g. by making bending radii too small)



- ♦ Different versions
- ♦ To prevent ingress of water and dirt, hose must be installed in vehicle with intake opening facing downwards

Note:
Intake silencer with intake hose may be fitted instead of just intake hose => Page 82-138.

2 – Hose clamp

3 – Auxiliary heater
- ♦ Different control units (software versions) => Parts List
- ♦ Detaching recirculating pump - V55 => Page 82-139
- ♦ Dismantling and assembling => Page 82-143

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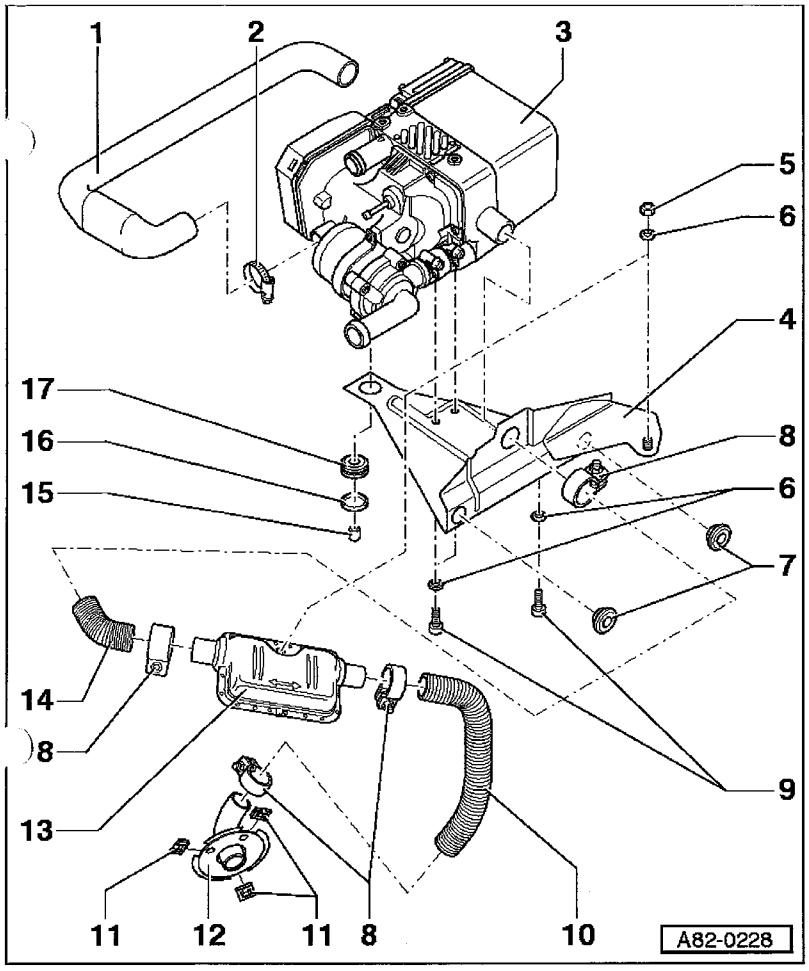
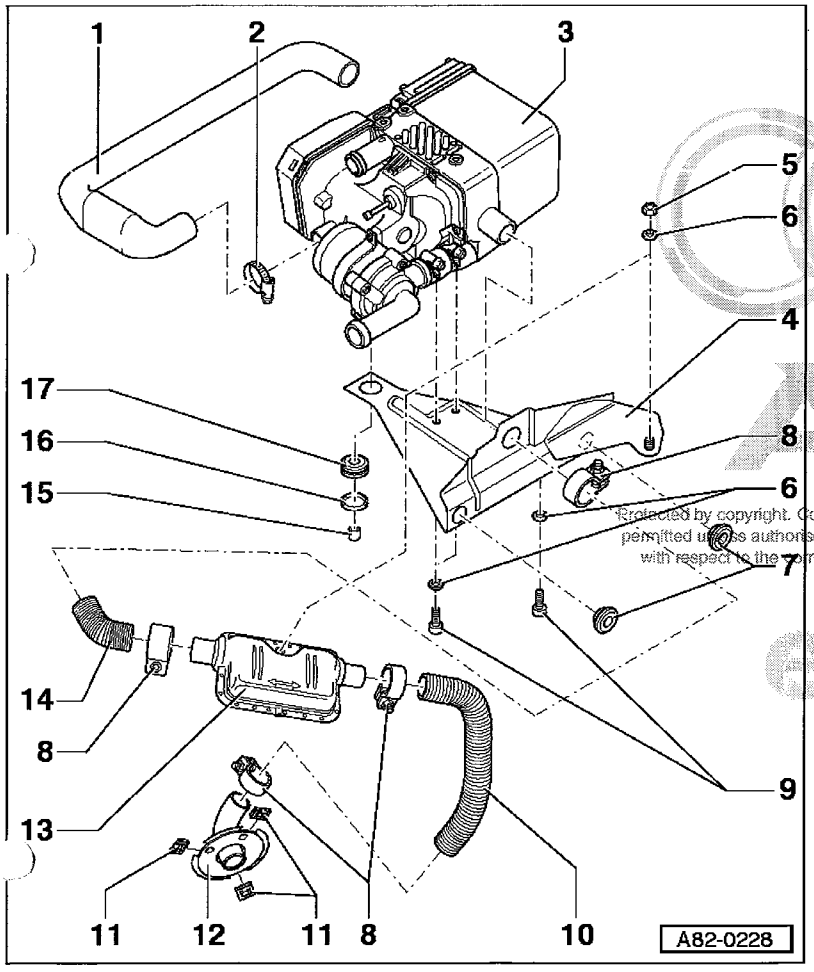


Note:
There are different heater control units -J162. As of software version "D50", the heater control unit -J162 can be encoded for a small coolant circuit. As of software version "D52", the recirculating pump -V55 is actuated as a function of coolant temperature on encoding for a large coolant circuit = > Page 01-17.

4 – Auxiliary heater holder

5 – Hexagon nut



6 – Washer

7 – Rubber bush

8 – Clip

9 – Self-tapping hexagon bolt

10 – Corrugated exhaust pipe

11 – Speed nut

12 – Exhaust pipe tail piece
♦ With thermal insulation mat

13 – Exhaust silencer

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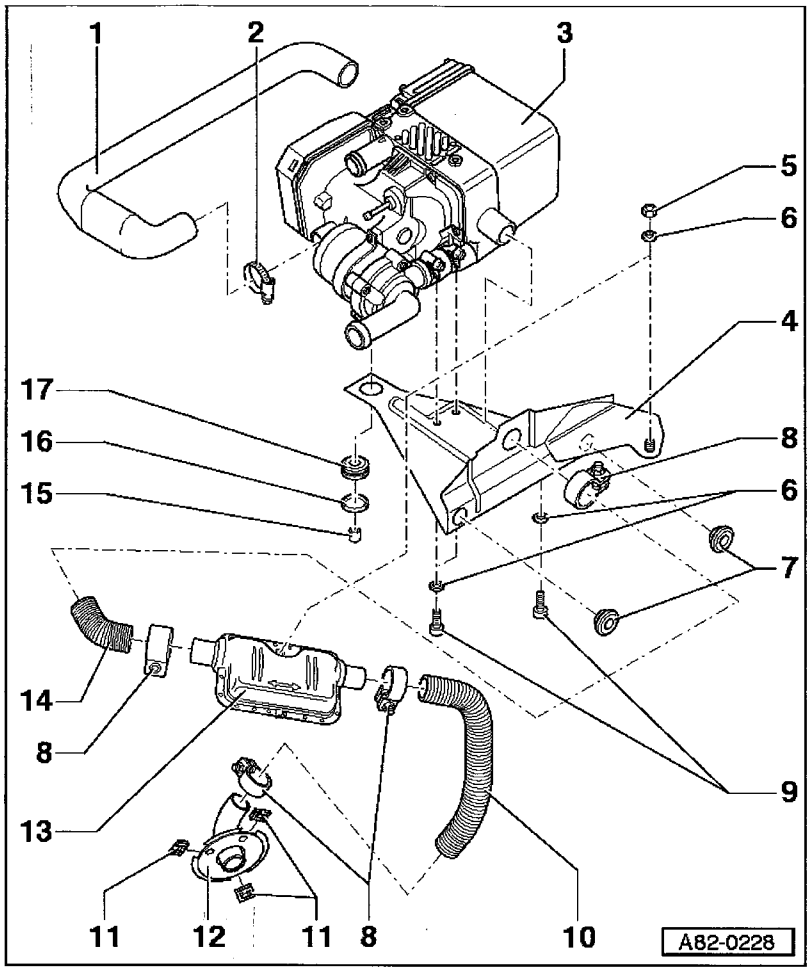
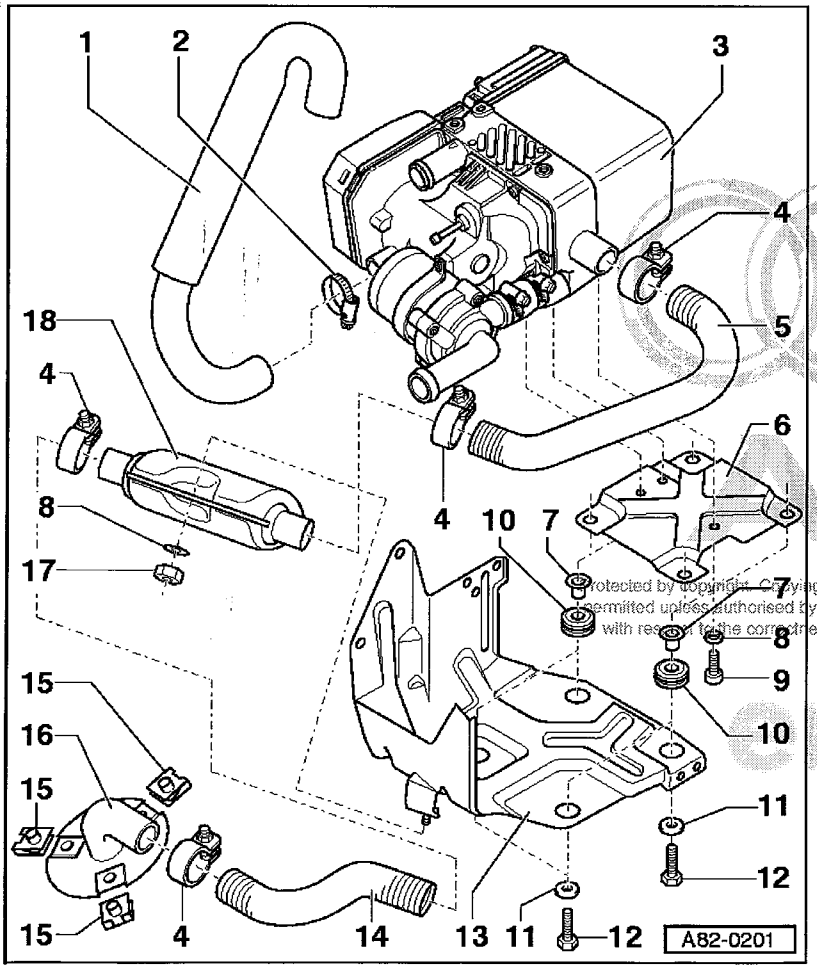


14 – Corrugated exhaust pipe
- ♦ After dismantling, corrugated exhaust pipe is to be fitted with two clamps on assembly (may not be provided on delivery)

15 – Metal bush

16 – Metal ring
- ♦ Insert in rubber bush with chamfer facing holder

17 – Rubber bush
- ♦ Insert in hole of auxiliary heater holder



Detaching exhaust system bracket from heater/re-attaching (vehicles with 6-cyl. or 8-cyl. engine)

1 – Intake hose
- ♦ With intake silencer
- ♦ Cross-section of intake hose must not be constricted (e.g. by making bending radii too small)
- ♦ Different versions
- ♦ To prevent ingress of water and dirt, hose must be installed in vehicle with intake opening facing downwards

Note:
Intake silencer with intake hose may be fitted instead of just intake hose => Page 82-138.

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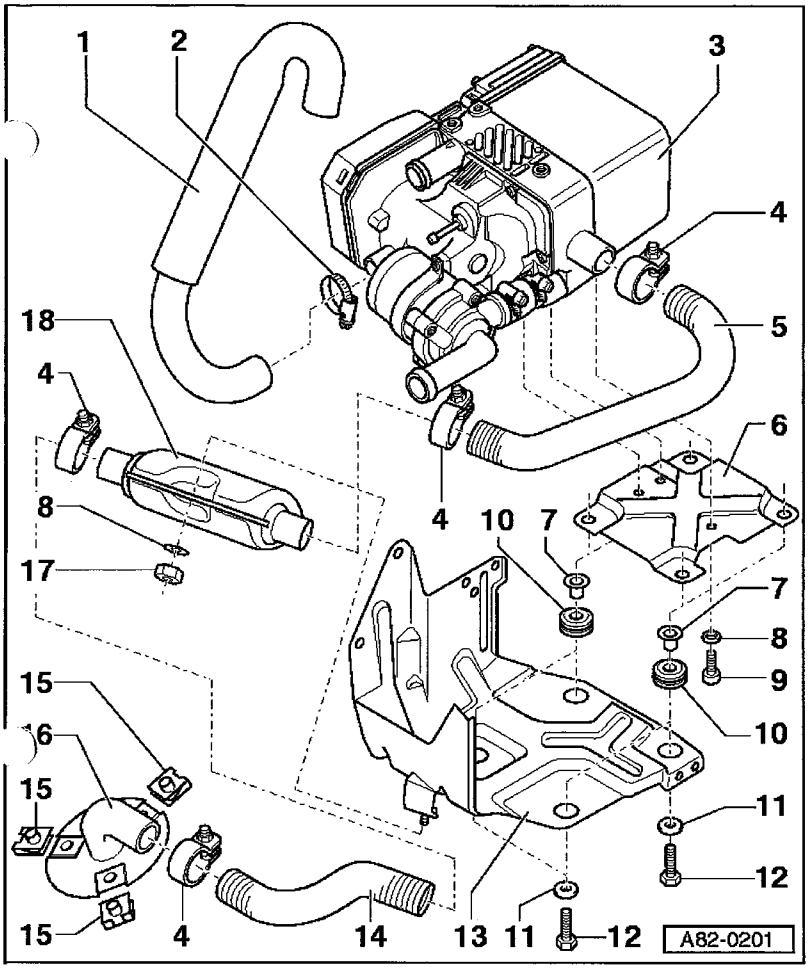
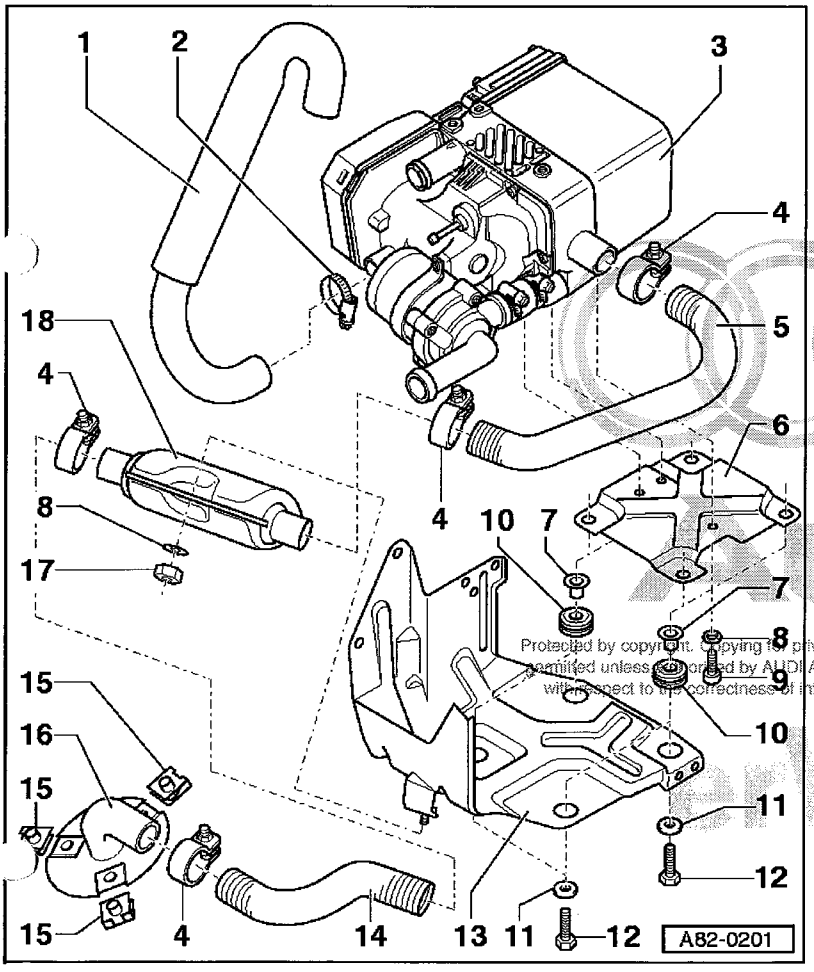


2 – Hose clamp

3 – Auxiliary heater
- ♦ Different control units (software versions)

=> Parts List
- ♦ Detaching recirculating pump - V55
  => Page 82-139
- ♦ Dismantling and assembling
  => Page 82-143

Note:
There are different heater control units -J162. As of software version "D50", the heater control unit -J162 can be encoded for a small coolant circuit. As of software version "D52", the recirculating pump -V55 is actuated as a function of coolant temperature on encoding for a large coolant circuit => Page 01-17.



4 – Clip

5 – Corrugated exhaust pipe

6 – Holder

7 – Metal bush

8 – Washer

9 – Self-tapping hexagon bolt

10 – Rubber bush
- ♦ Insert in holes of auxiliary heater holder

11 – Washer

12 – Hexagon bolt

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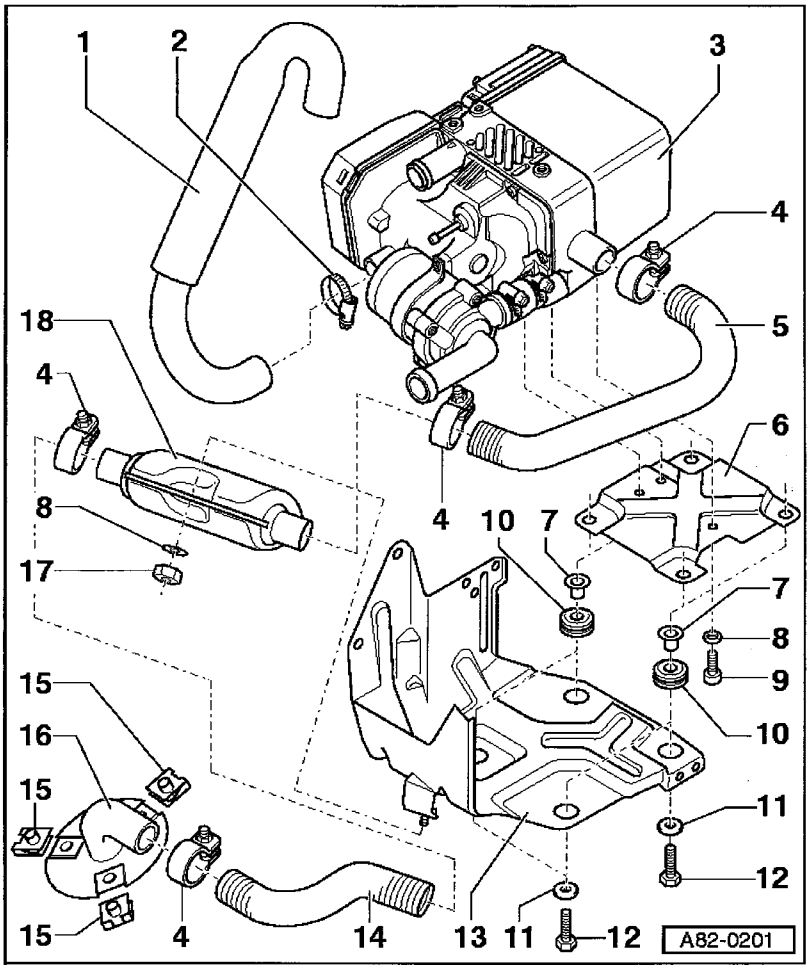


13 – Auxiliary heater holder

14 – Corrugated exhaust pipe

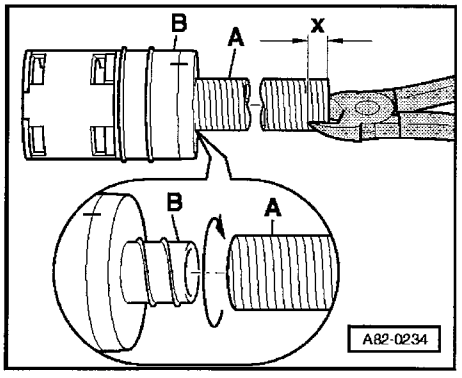
15 – Speed nut

16 – Exhaust pipe tail piece
♦ With thermal insulation mat

17 – Hexagon nut

18 – Exhaust silencer

Attaching intake hose with intake silencer



Notes:

♦ Intake hose -A- is bolted to intake silencer -B-.

♦ To enable intake hose -A- to be attached with a hose clamp to auxiliary/additional heater intake pipe, two cuts of approx. 10 mm each have to be made (dimension X) using side-cutting pliers.

♦ Intake silencer -B- is attached to heater with a cable tie.

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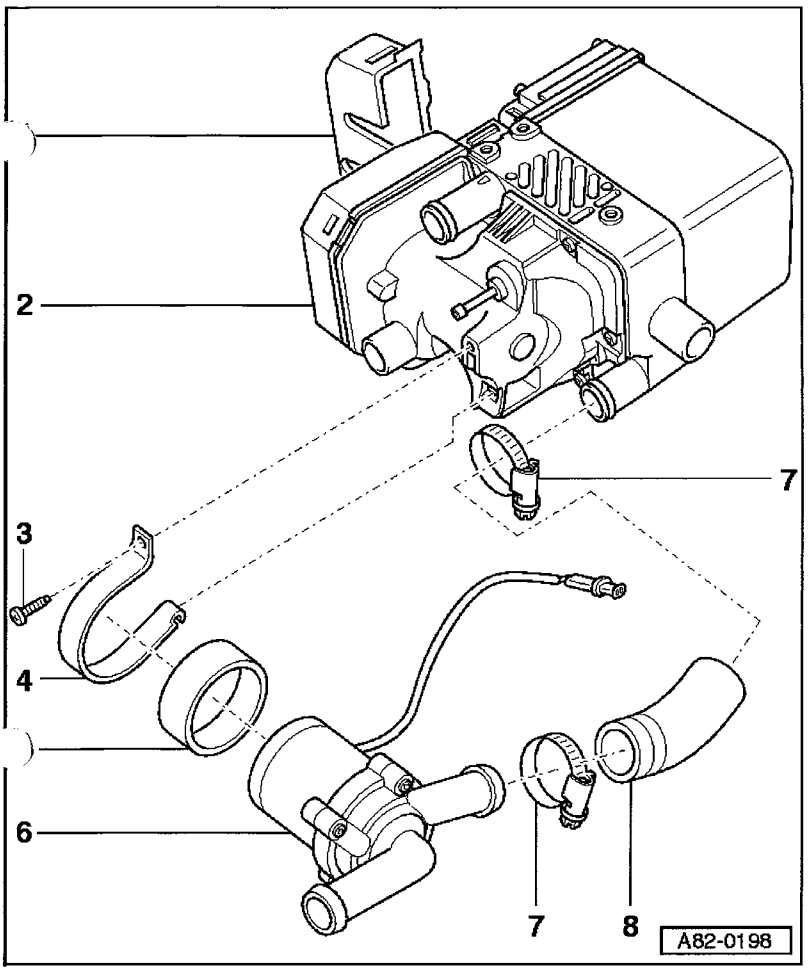
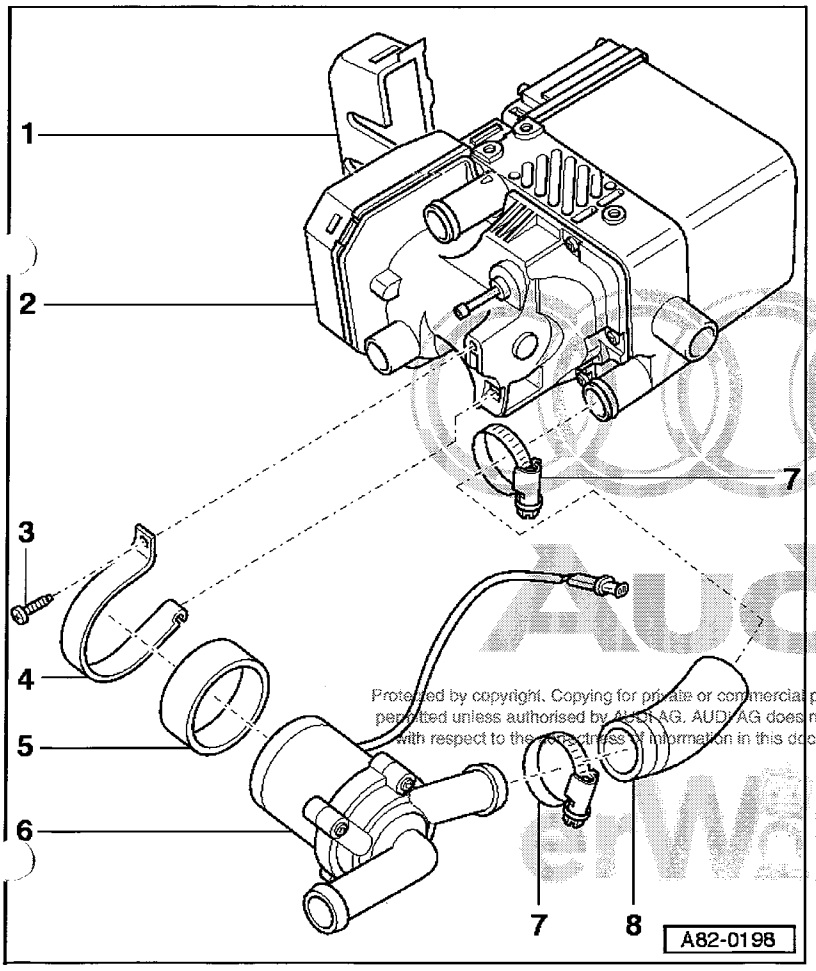


Detaching recirculating pump - V55 from auxiliary heater/re-attaching

Note:
Detaching exhaust system bracket from heater/re-attaching:
- Vehicles with 4-cyl. engine => Page 82-129
- Vehicles with 6-cyl. or 8-cyl. engine => Page 82-134

1 – Cover
- ♦ For connector rail
- ♦ Removing and installing => Page 82-147
- ♦ Assignment of connector rail => Page 82-147



2 – Auxiliary heater
- ♦ Different software versions => Parts List
- ♦ Dismantling and assembling => Page 82-143

Note:
There are different heater control units -J162. As of software version "D50", the heater control unit -J162 can be encoded for a small coolant circuit. As of software version "D52", the recirculating pump -V55 is actuated as a function of coolant temperature on encoding for a large coolant circuit => Page 01-17.

3 – Bolt

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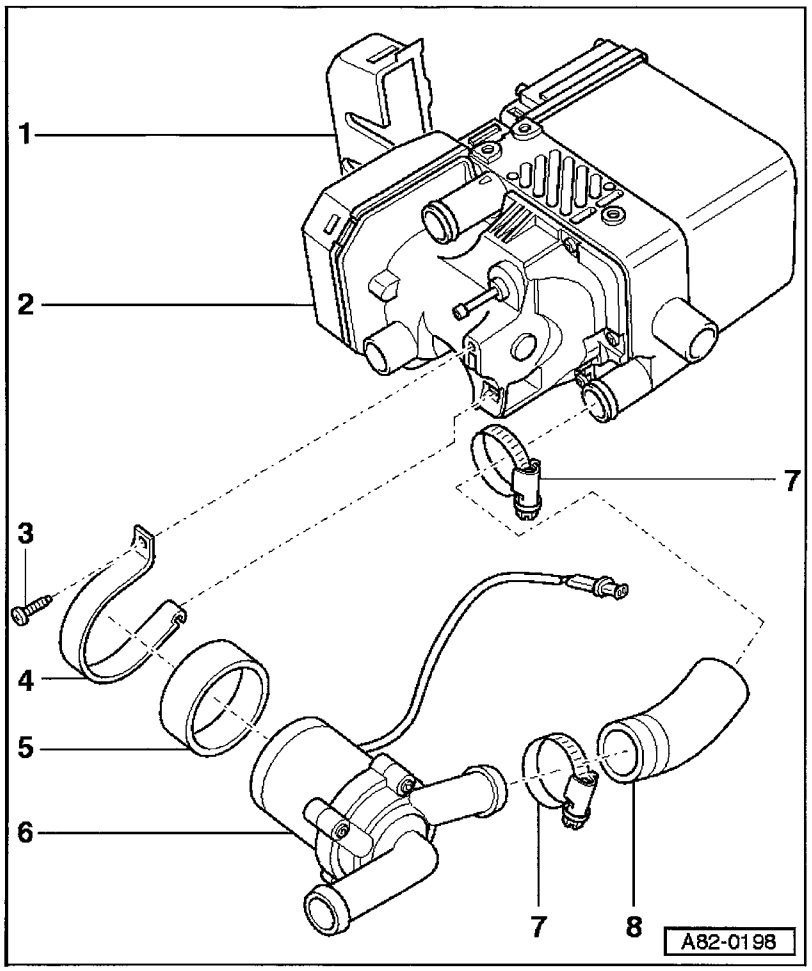


4 – Clip

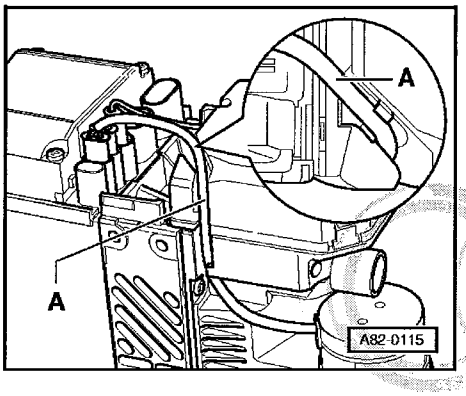
5 – Spacer

6 – Recirculating pump -V55
♦ Wiring to connector rail
=>Page 82-142

7 – Hose clamp

8 – Coolant hose

Routing wiring to recirculating pump -V55



◀ – Lay wiring -A- in groove as shown.

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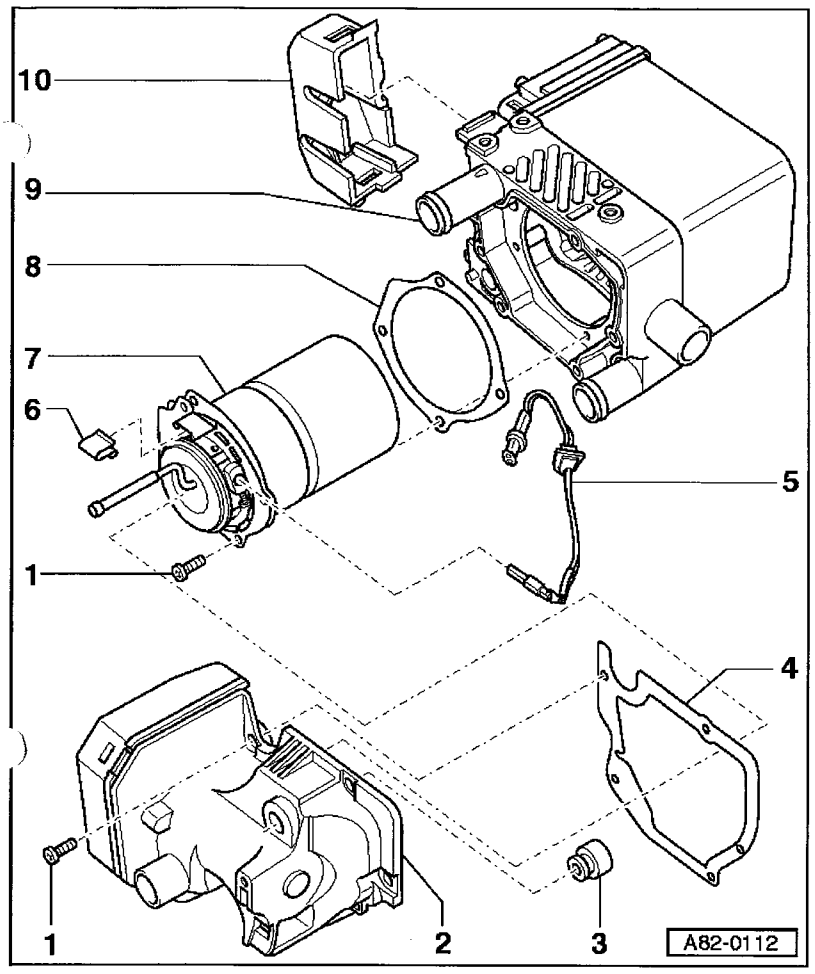


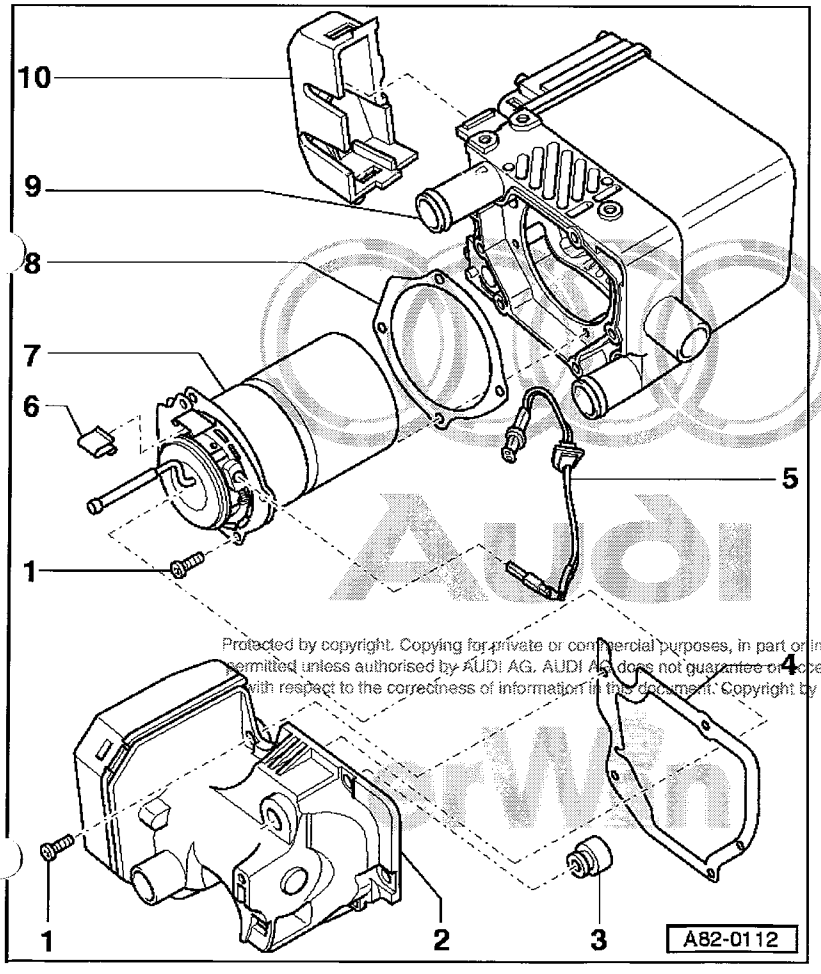
Dismantling and assembling auxiliary heater

Note:
Detaching exhaust system bracket from heater/re-attaching:
- Vehicles with 4-cyl. engine => Page 82-129
- Vehicles with 6-cyl. or 8-cyl. engine => Page 82-134

1 – Bolt

2 – Combustion air blower -V6
- ♦ Checking => Page 01-144
- ♦ Removing and installing => Page 82-148

3 – Gasket



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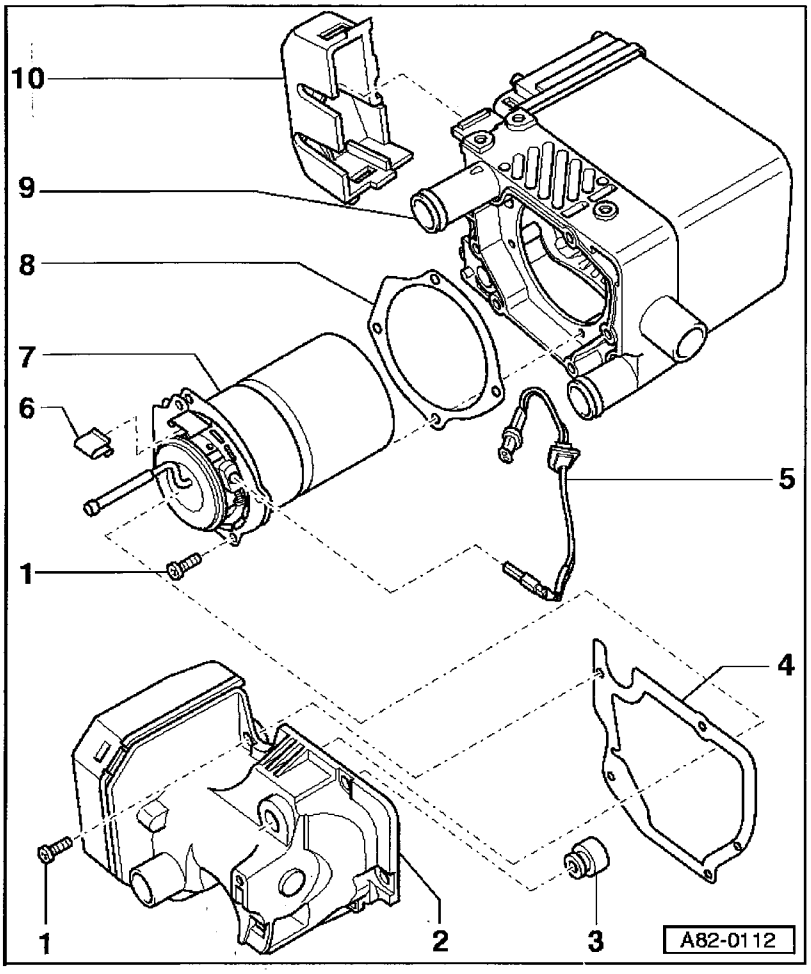
4 – Moulded gasket
- ♦ Replace

5 – Glow plug with flame monitor - Q8
- ♦ With internal heater coils (sheathed element)
- ♦ Different versions for attachment with bolt or clip => Page 82-152
- ♦ Checking => Page 01-144
- ♦ Removing and installing => Page 82-152

6 – Clip
- ♦ Ensure correct installation



7 – Burner element

- ♦ Removing and installing => Page 82-150
- ♦ Different versions for attachment of glow plug with flame monitor -Q8 with bolt or clip => Page 82-152

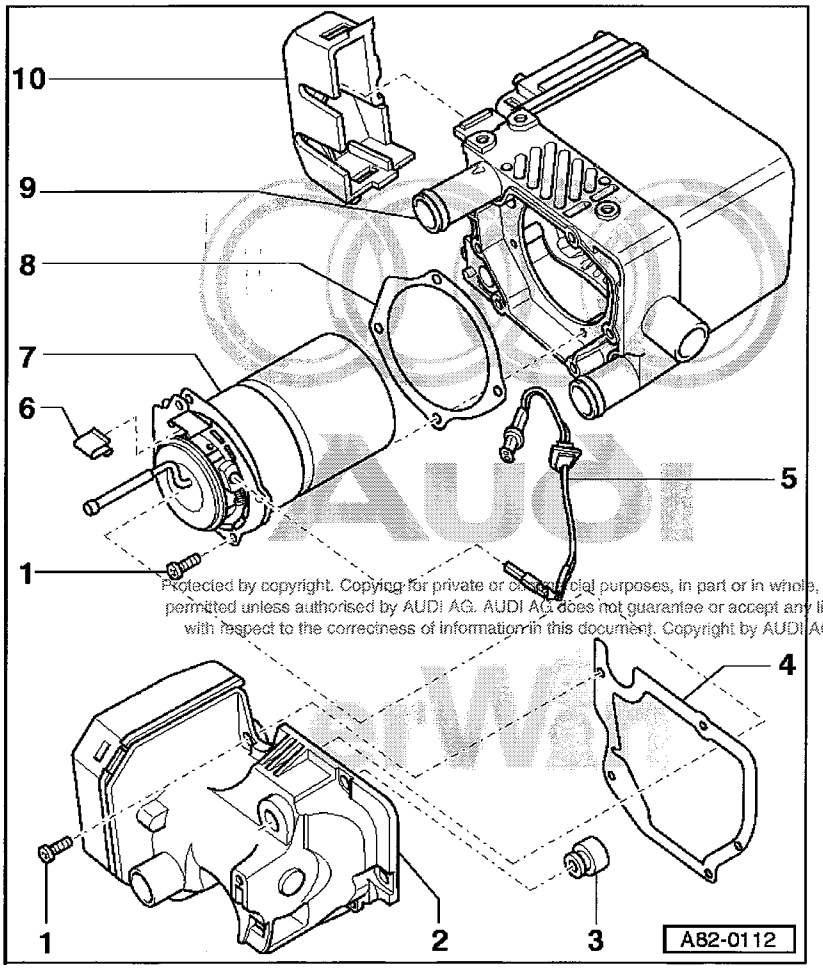
8 – Moulded gasket

- ♦ Replace

9 – Burner housing, heat exchanger and heater control unit -J162

- ♦ Not to be dismantled
- ♦ Different versions (software in control unit -J162)

=> Parts List



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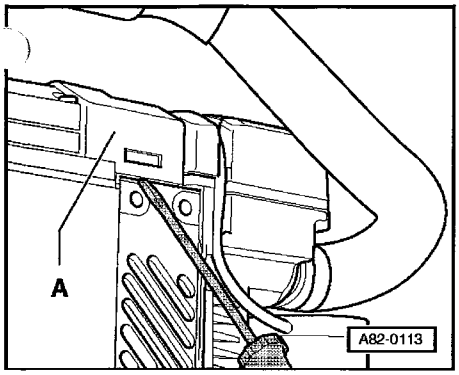
Note:

There are different heater control units -J162. As of software version "D50", the heater control unit -J162 can be encoded for a small coolant circuit. As of software version "D52", the recirculating pump -V55 is actuated as a function of coolant temperature on encoding for a large coolant circuit => Page 01-17.

10 – Cover

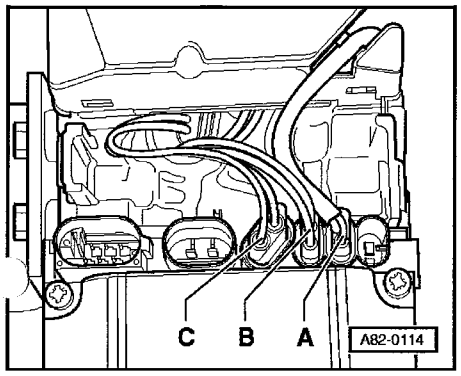
- ♦ For connector rail
- ♦ Removing and installing => Page 82-147
- ♦ Assignment of connector rail => Page 82-147

Removing and installing cover for connector rail



- Detach auxiliary heater from holder (vehicles with 6 or 8-cyl. engine only) => Page 82-124.
- Use screwdriver to prise off cover -A-.

Assignment of auxiliary heater connector rail



- Connector -A- to recirculating pump -V55
- Connector -B- to combustion air blower -V6
- Connector -C- to glow plug with flame monitor -Q8

Removing and installing combustion air blower -V6

Notes:

- Separate replacement of combustion air blower is only possible for auxiliary heaters with control unit -J162 featuring software as of version "D49". Only with these heaters is it possible to adjust CO2 level in exhaust gas by way of "Adaption" function => Page 82-97.
- Delivery of combustion air blower is subject to certain tolerances. At the auxiliary heater production stage, the CO2 level in the exhaust gas is set at the heater control unit -J162 on a test bench. This setting cannot be altered on auxiliary heaters with a control unit up to software version "D48". Replacement of combustion air blower on these heaters would lead to a danger of CO2 level in exhaust gas being outside permitted range.
- After replacing combustion air blower, check and if necessary adjust CO2 level in exhaust gas => Page 82-97.

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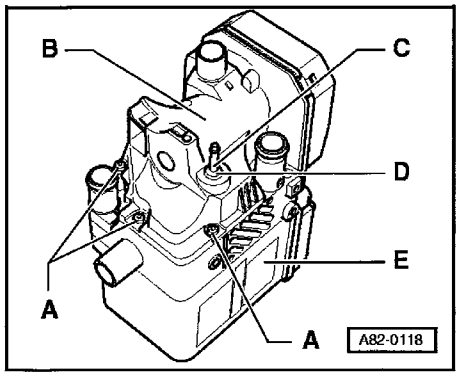


– Detach bracket and exhaust system from heater.

  – Vehicles with 4-cyl. engine => Page 82-129
  – Vehicles with 6-cyl. or 8-cyl. engine => Page 82-134

– Remove cover for connector rail and unplug connectors to rail => Page 82-147.

◀ – Remove recirculating pump -V55 => Page 82-139.

– Remove bolts -A-.

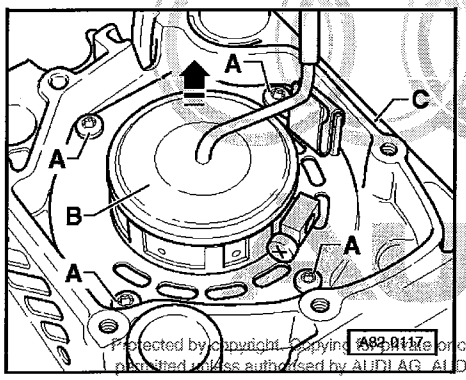
– Separate combustion air blower -B- from heater -E-.

Notes on installation:

♦ Before fitting combustion air blower, replace moulded gasket (between combustion air blower and heater).

♦ When inserting fuel pipe -C-, make sure grommet -D- is properly positioned in combustion air blower -B-.

Removing and installing burner element



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◀ – Remove combustion air blower -V6 => Page 82-148.

– Remove bolts -A-.

– Lift burner element -B- with glow plug out of heater -C-.

Notes:

♦ Before fitting burner element, replace moulded gasket (between burner element and heater).

♦ Problems with auxiliary heater operation may be encountered in cold weather on vehicles with diesel engines if use is predominantly made of vegetable-oil methylester as fuel.

Explanation:

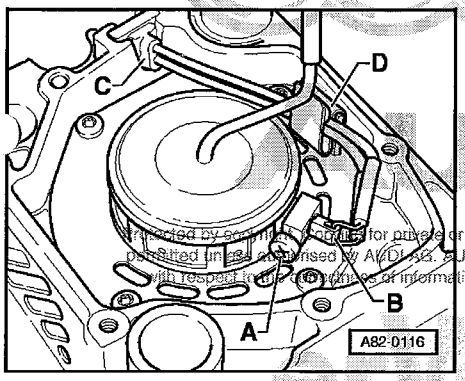
On account of the physical properties, deposits may form during operation on the evaporation fabric in the burner element. These then cause combustion problems if the vehicle is run for lengthy periods on vegetable-oil methylester.

♦ Different versions of burner element (for attachment of glow plug with flame monitor -Q8 with bolt or clip) =>Page 82-152

♦ Removing glow plug with flame monitor -Q8 =>Page 82-152

♦ Replace glow plug as well if burner element is defective.

Removing and installing glow plug with flame monitor -Q8



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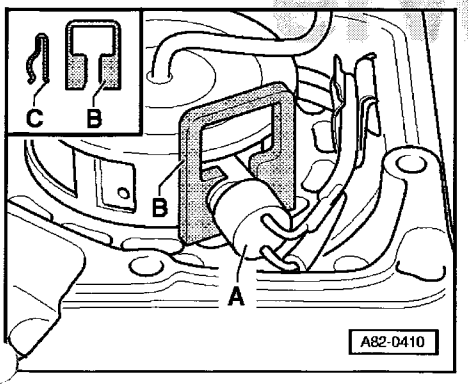
Notes:

♦ Different versions of burner element and glow plug with flame monitor -Q8 (attachment with bolt or clip)

– Between start of production and 06.99, glow plug with flame monitor -Q8 was attached in burner element with bolt -A- (gradual conversion).

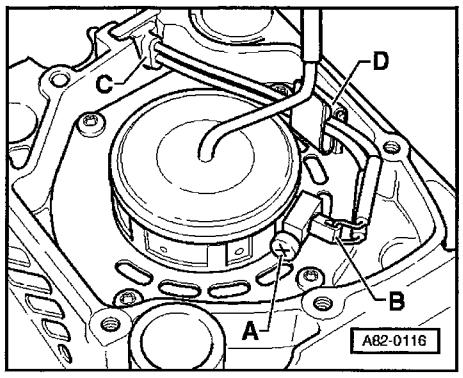


– Between 06.99 and 11.01 (gradual conversion), glow plug with flame monitor -Q8 was attached in burner element with clip -C- .

– As of 11.01 (gradual conversion), glow plug with flame monitor -Q8 has been attached in burner element with clip -B-.

♦ The design of clip -B- is such that the dissipation of heat at glow plug -Q8 is better than with clip -C-. Exclusive use is therefore to be made of burner elements where the glow plug is attached with a bolt or clip -B-.

– Remove burner element => Page 82-150.

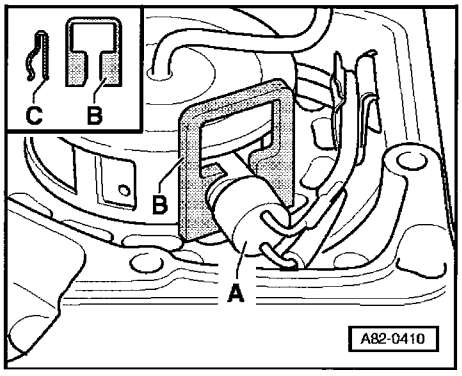


– Remove bolts -A- (or clip).

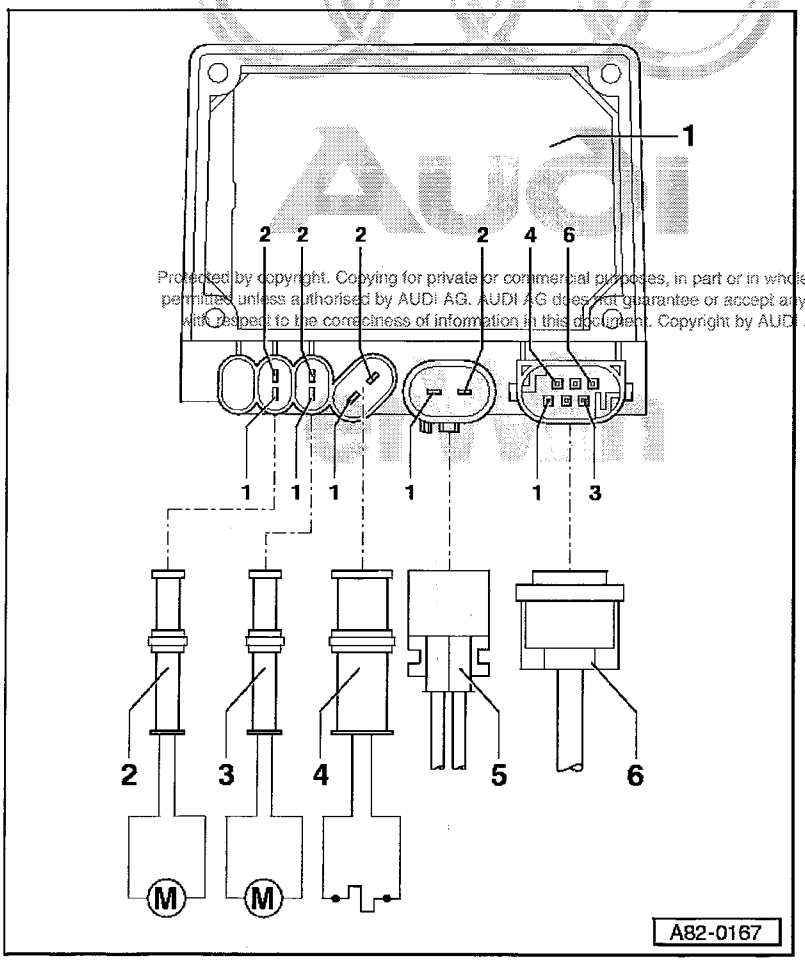
– Pull glow plug with flame monitor -B- out of burner element.

Notes on installation:

- Bolt -A- is only to be tightened to approx. 0.5 Nm; greater torque could damage glow plug.
- Replace burner element as well if glow plug is defective.
- Fix wiring in position in clip -D- and route as shown.
- Check proper positioning of grommets -C- after installation.
- Check non-insulated part of wire to glow plug before installing combustion air blower; wires must not make mutual contact or come into contact with other components (danger of short circuit).



- In the case of burner elements where glow plug -Q8 is attached with clip -B-, pay attention to firm fit of clip and make exclusive use of burner elements where glow plug is attached with a bolt or clip -B-.



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Block diagram of auxiliary heater

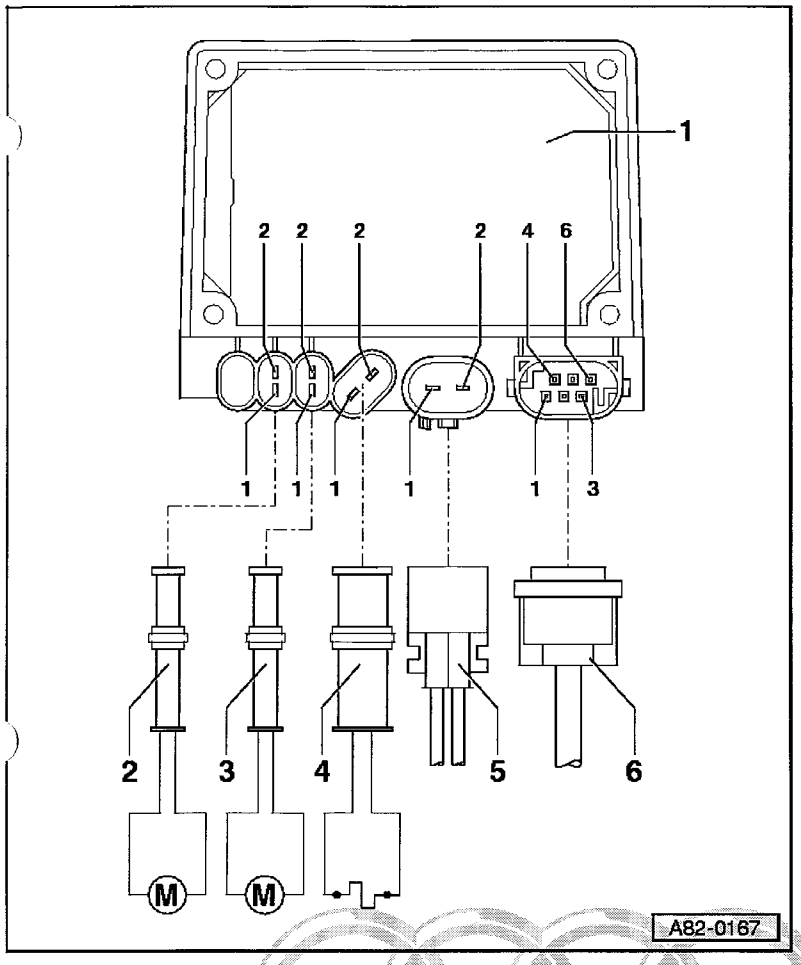
Note:

Incorporation of auxiliary heater into vehicle electrical system

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

1 – Heater control unit -J162 with connector rail

- Control unit is fitted with temperature sensors for determining coolant temperature and to safeguard against overheating
- Control unit is permanently connected to burner housing/heat exchanger



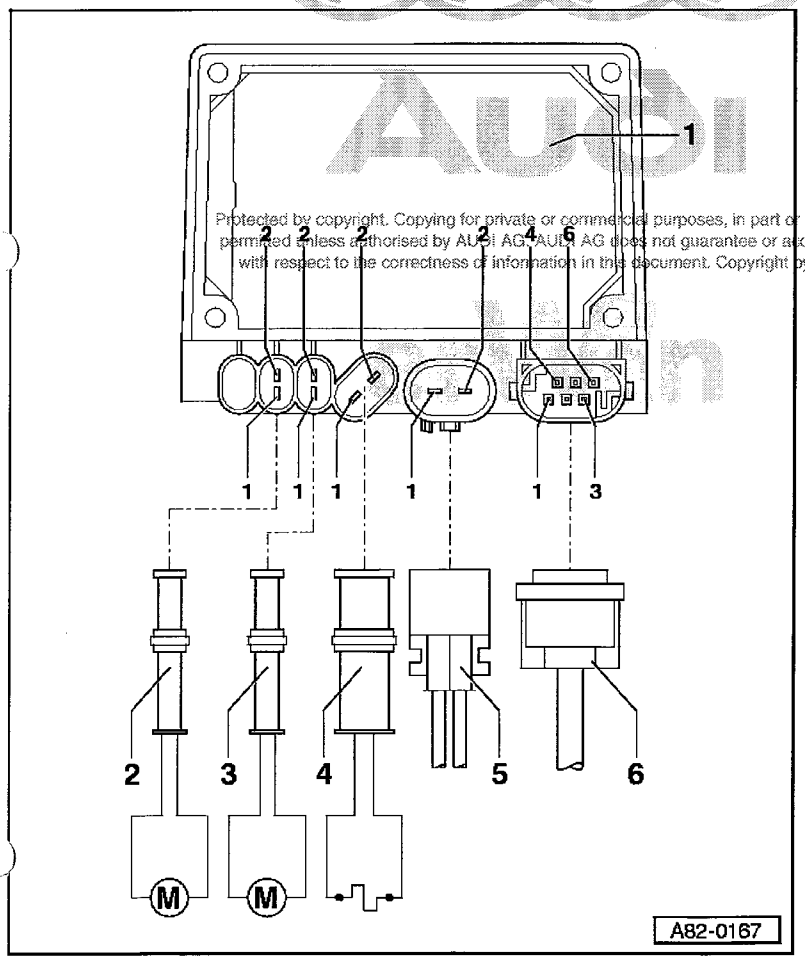
♦ There are different heater control units -J162. As of software version "D50", the heater control unit -J162 can be encoded for a small coolant circuit. As of software version "D52", the recirculating pump -V55 is actuated as a function of coolant temperature on encoding for a large coolant circuit =>Page 01-17.

2 – Recirculating pump -V55

3 – Combustion air blower -V6

4 – Glow plug with flame monitor - Q8

5 – 2-pin connector
- ♦ Contact 1
- – Power supply, terminal 30 (via fuse)
- ♦ Contact 2
- – Earth connection



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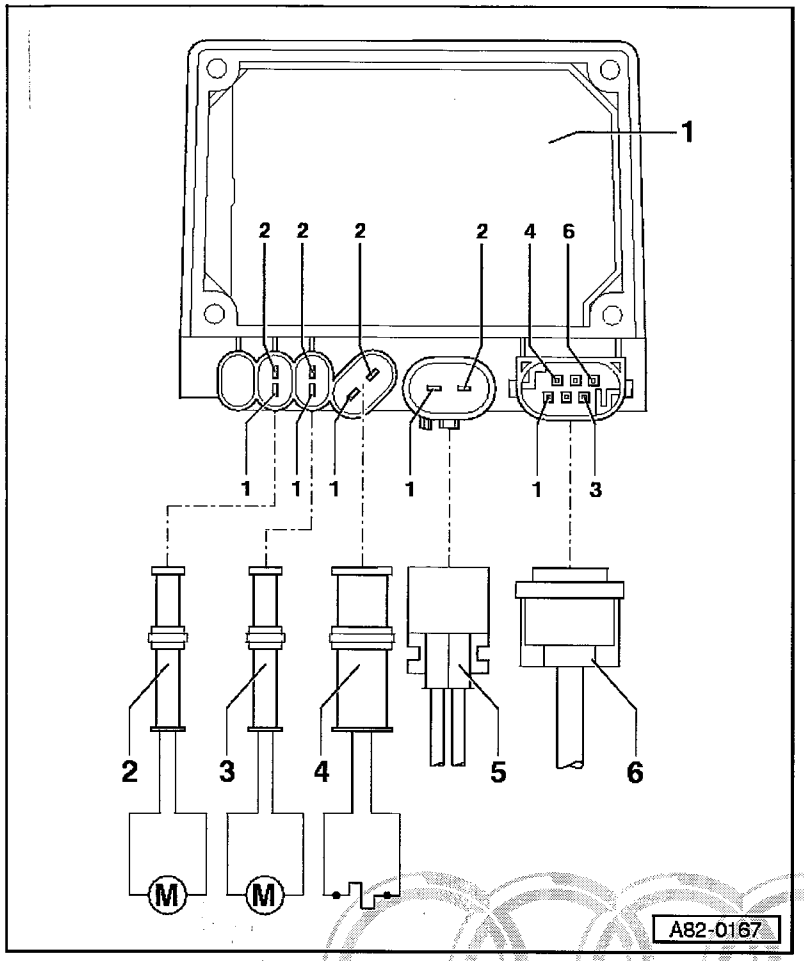
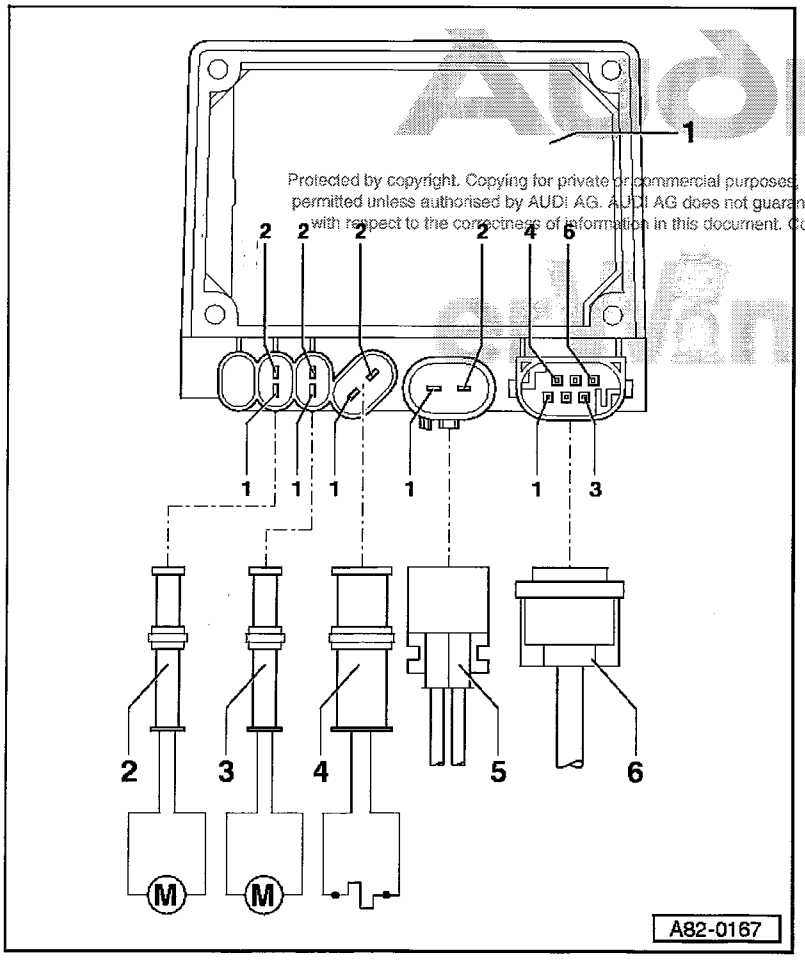
6 – 6-pin connector
- ♦ Contact 1
- – Cut-in signal for "auxiliary heating/auxiliary ventilation" (positive from pre-selection clock -E111 or from dash panel insert)
- – Signal comes from dash panel insert on vehicles with no pre-selection clock -E111
- ♦ Contact 2
- – Diagnosis (K-wire)
- ♦ Contact 3
- – Cut-in signal for "additional heater" (earth from diesel direct injection system control unit -J248)
- – Only used on vehicles with 6-cyl. diesel engine with no electric additional heater
- – Signal comes from diesel direct injection system control unit-J248 as soon as specified cut-in criteria are met

=> Relevant Diesel Direct-injection and Glow Plug System Workshop Manual; Repair Group 01 =>



Notes:

- Model Year 1999: Gradual discontinuation of additional heating heater element -Z35 on vehicles with 6-cyl. diesel engine with auxiliary heater as optional extra. On these vehicles, electric additional heater function is assumed by auxiliary heater.
- Applying earth to contact 3 in the case of version for vehicles with diesel engine results in permanent operation of the auxiliary heater ("additional heater" function).
- Applying earth to contact 3 in the case of auxiliary heaters with a control unit as of software version "D50" and version for vehicles with petrol engine results in constant operation of recirculating pump -V55.



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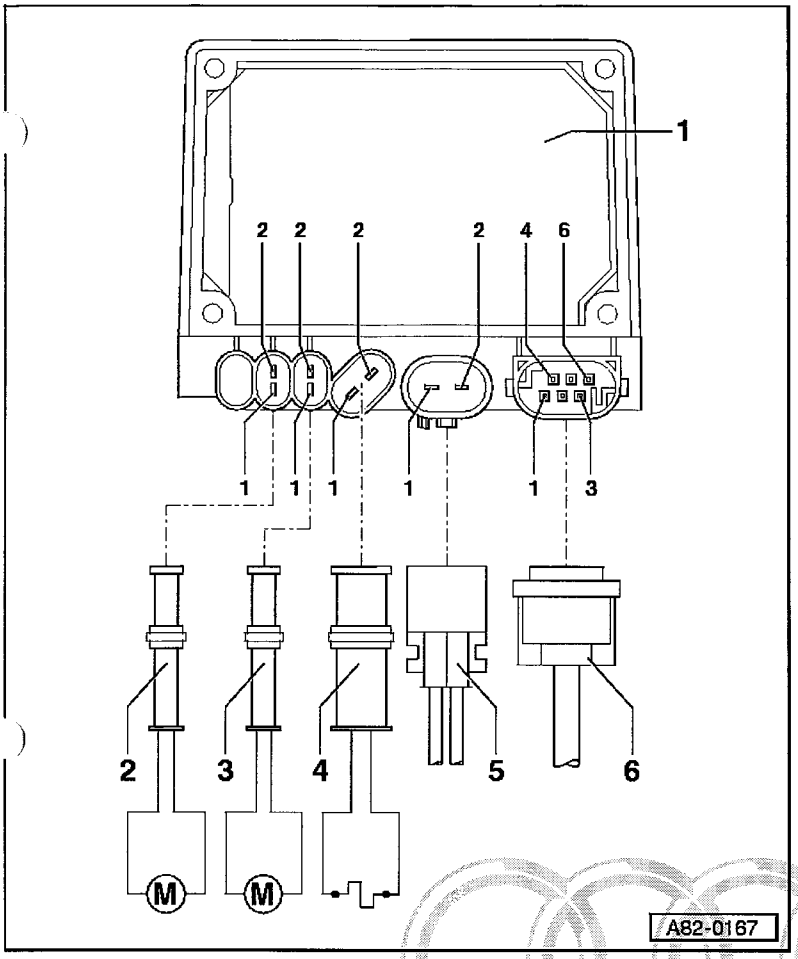
- On vehicles with petrol engine, this contact can only be used on models with 8-cyl. engine and a small coolant circuit (gradual introduction as of Model Year 2002) => Page 01-17. Introduction of wiring to coolant shut-off valve relay -J541 has still to be finalized; the vehicles actually fitted with this connection can be seen from the relevant current flow diagram.

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- When the engine is running, the coolant shut-off valve relay -J541 connects earth to the appropriate output as a function of coolant temperature. If vehicle is fitted with the corresponding wire, -J162 switches on recirculating pump -V55 => Page 01-220 (to assist engine coolant pump on vehicles with small coolant circuit).



♦ Contact 4
- Actuation of operating and display unit for air conditioner/Climatronic -E87
- Actuation of thermotronic control unit -J214 and fresh-air blower -V2
- Max. output load 2 A

Notes:

♦ On vehicles with small coolant circuit (gradual introduction for 8-cyl. petrol engine as of Model Year 2002), -E87 is actuated by way of coolant shut-off valve relay -J541.

♦ Depending on encoding, positive or square-wave signal is output by heater control unit -J162 as of software version "D50" =>Page 01-220.

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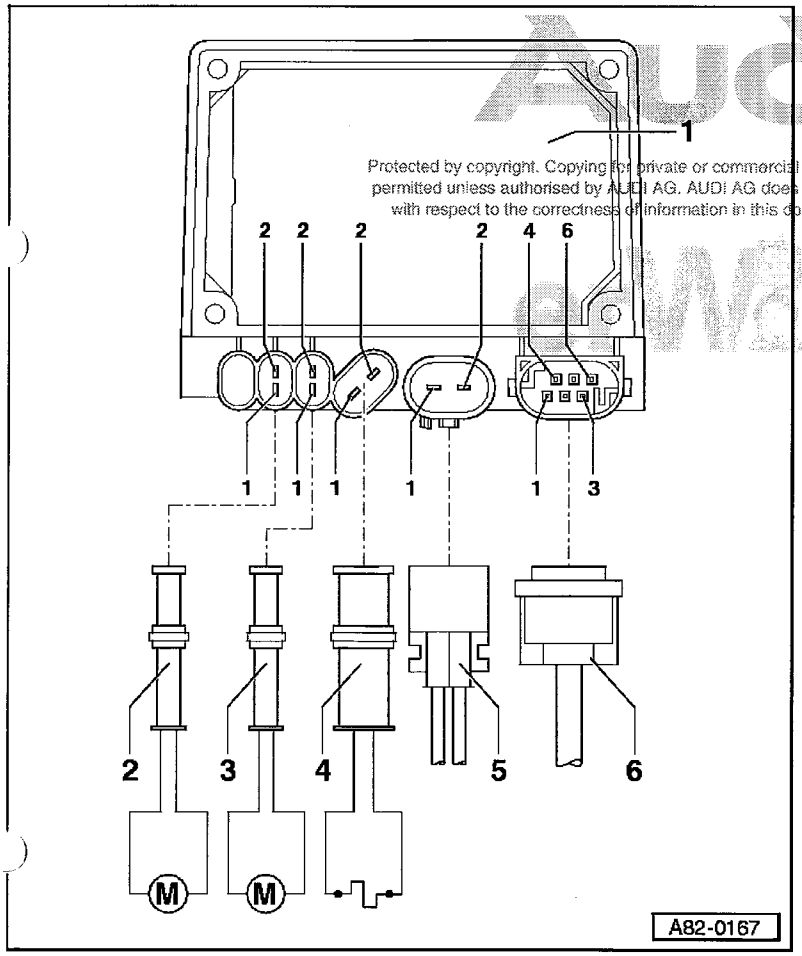
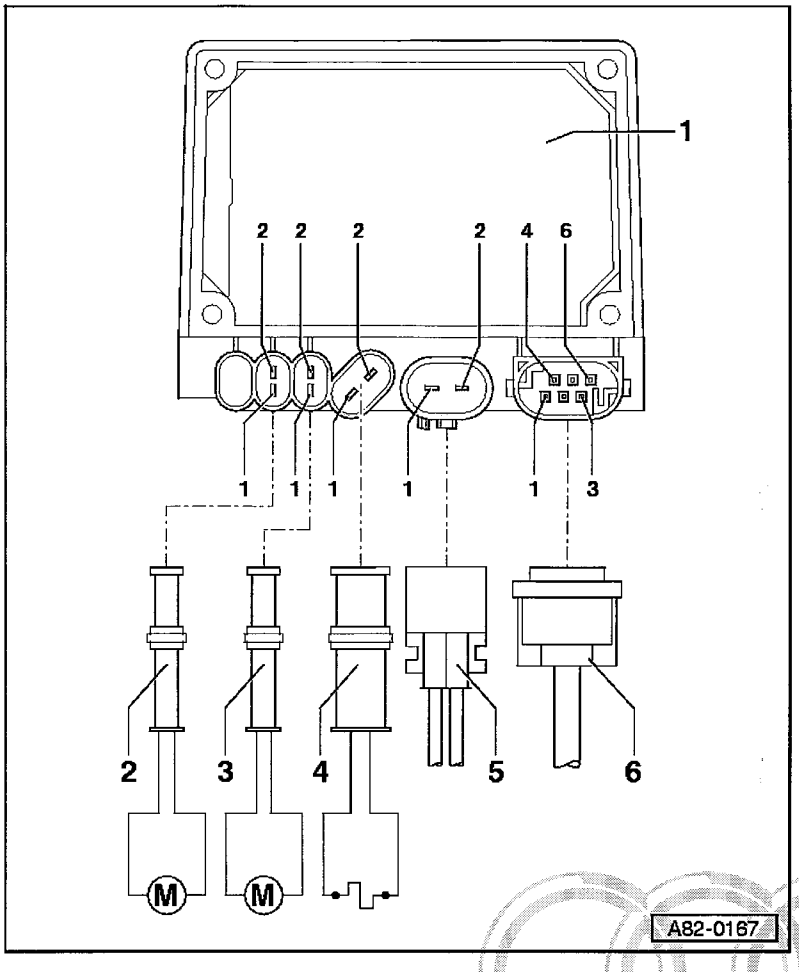


♦ Contact 5
- Input from pre-selection clock -E111 (switch open = auxiliary heating mode, switch closed = earth = auxiliary ventilation mode)
- Input from switch in dash panel insert on vehicles with no pre-selection clock -E111 (switch open = auxiliary heating mode, switch closed = earth = auxiliary ventilation mode)



♦ Contact 6
– Actuation of metering pump - V54
– Delivery of metering pump is determined by frequency of square-wave signal (number of voltage pulses per second)

Note:
On vehicles with 6-cyl. diesel engine with no additional heating heater element -Z35, contact 6 is also connected to engine control unit. Engine control unit uses metering pump pulse signal to incorporate fuel consumption of auxiliary heater into calculation of consumption signal with engine running.

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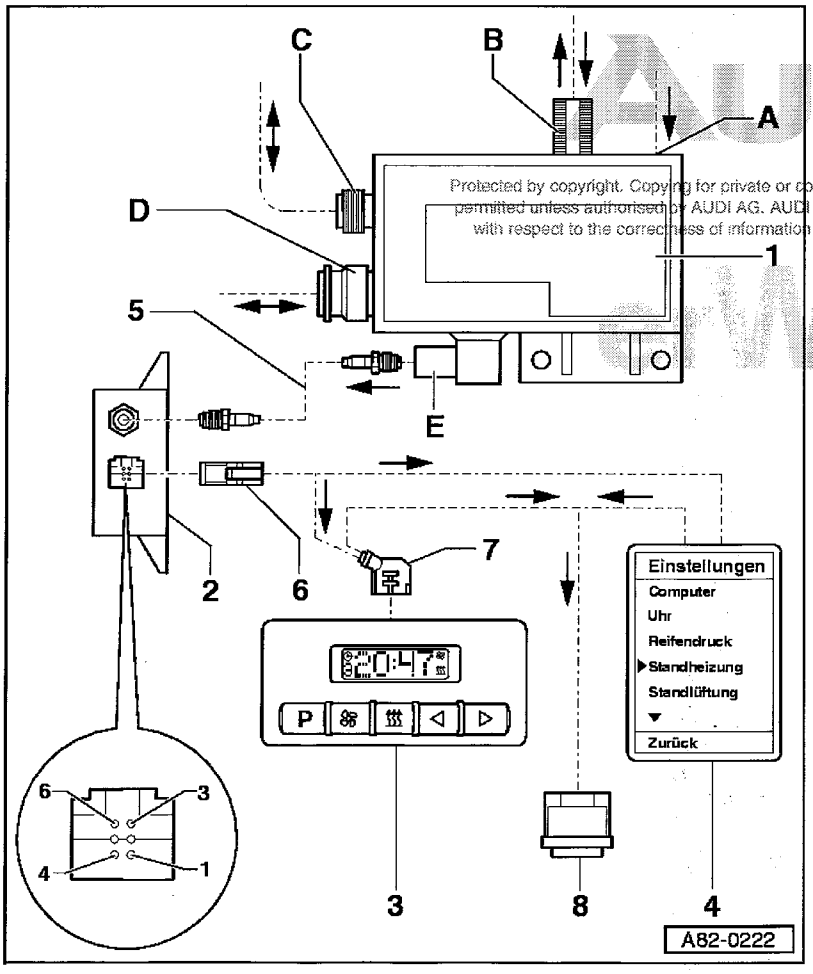
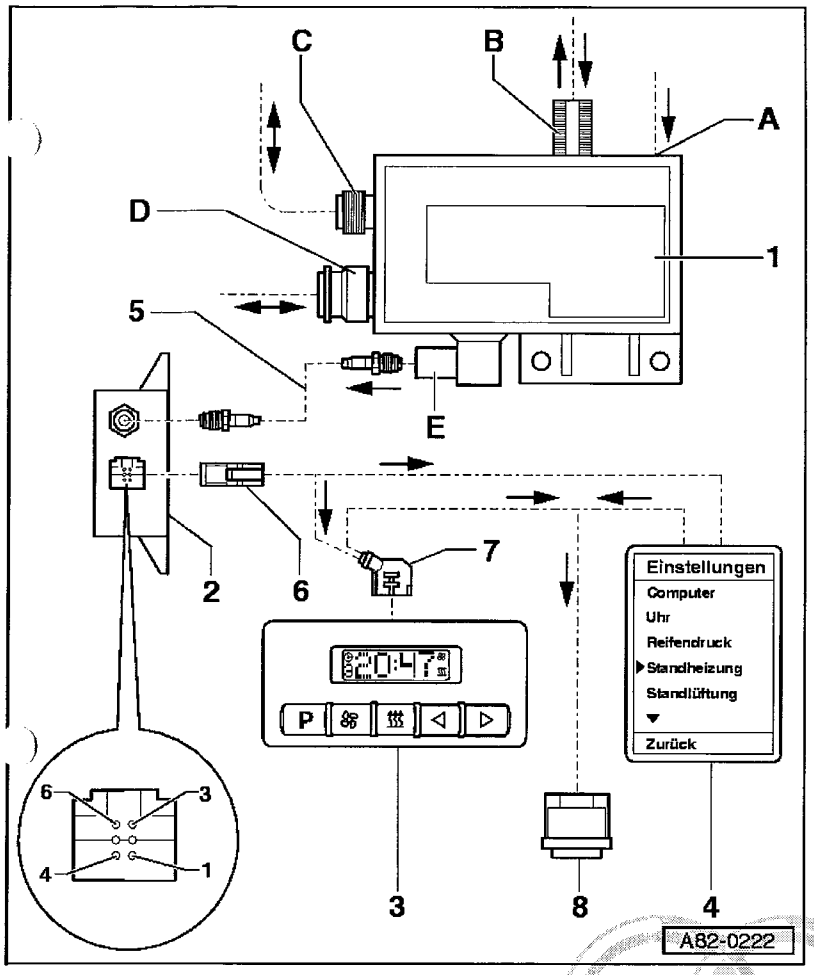
Block diagram of auxiliary heater actuation with remote control

Block diagram for Saloon



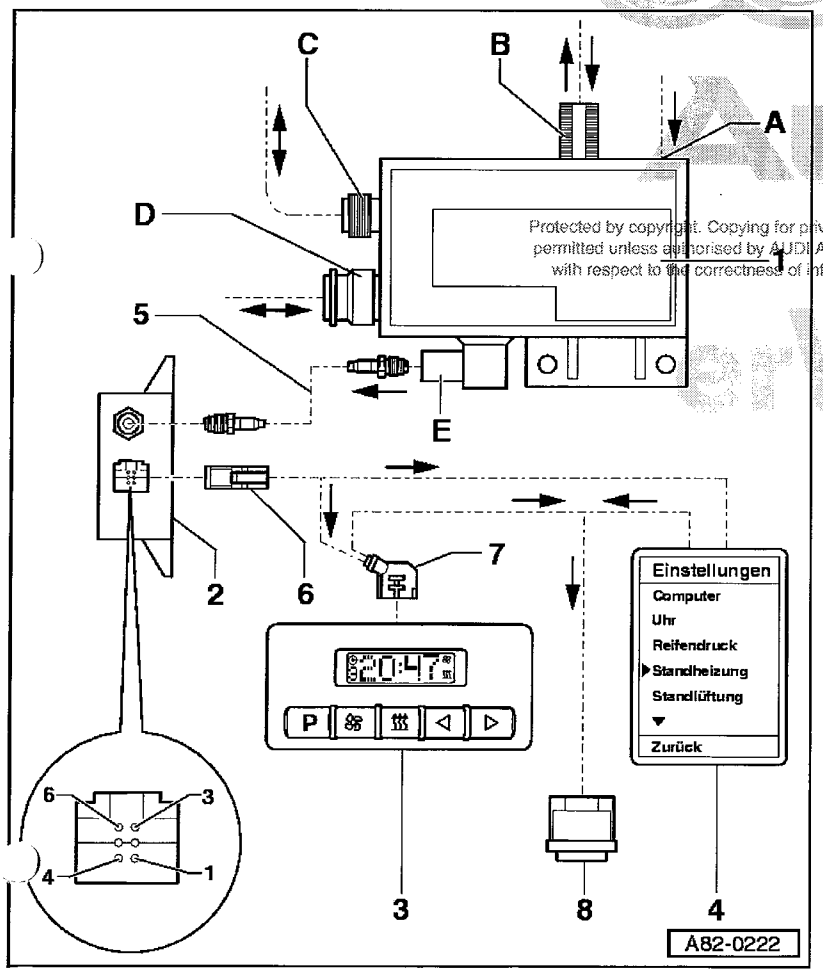
Notes:
♦ Remote control is available as an optional extra.
♦ Auxiliary heating radio wave receiver -R64 and aerial filter are installed in luggage compartment on left in direction of travel behind luggage compartment lining in area of wheel housing => Page 82-180 and
=> Radio, Telephone, Navigation; Repair Group 91 =>



♦ Pre-selection clock -E111 was discontinued in Model Year 2000 and auxiliary heater is actuated by way of dash panel insert.
=> Electrical System; Repair Group 01 =>

♦ On vehicles up to Model Year 2001 with rear window aerial and no telephone, rod of radio/telephone/auxiliary heater aerial -R51 is connected directly to auxiliary heating radio wave receiver - R64 (without frequency divider).
=> Radio, Telephone, Navigation; Repair Group 91 =>
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

♦ On vehicles as of Model Year 2002 without rod aerial (gradual introduction), on/off signal for auxiliary heater is received via rear window aerial. Heed the following for such vehicles:



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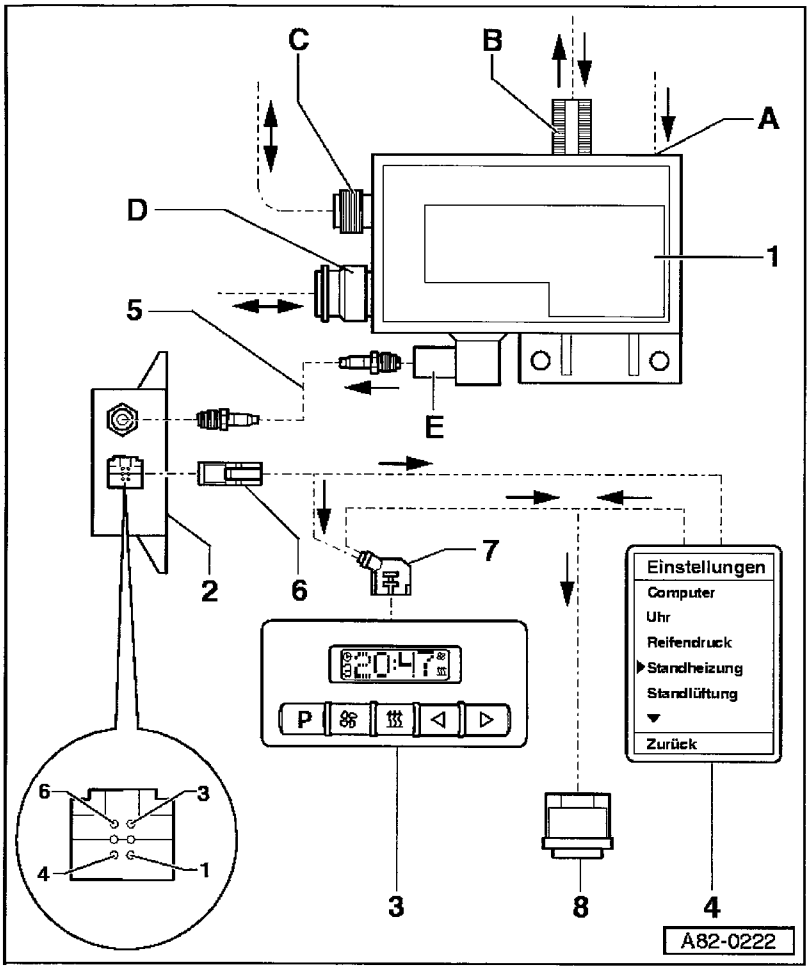
– The rear window has an additional aerial and a separate connection for the remote control signal for auxiliary heater actuation.
– There is a separate aerial amplifier for the auxiliary heater hand transmitter signal (currently located beneath rear shelf to right of centre of vehicle in direction of travel).
– Hand transmitter signal is relayed directly from auxiliary heater remote control signal amplifier to auxiliary heater remote control receiver (there is no frequency divider).
=> Radio, Telephone, Navigation; Repair Group 91 =>
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder
=> Parts List

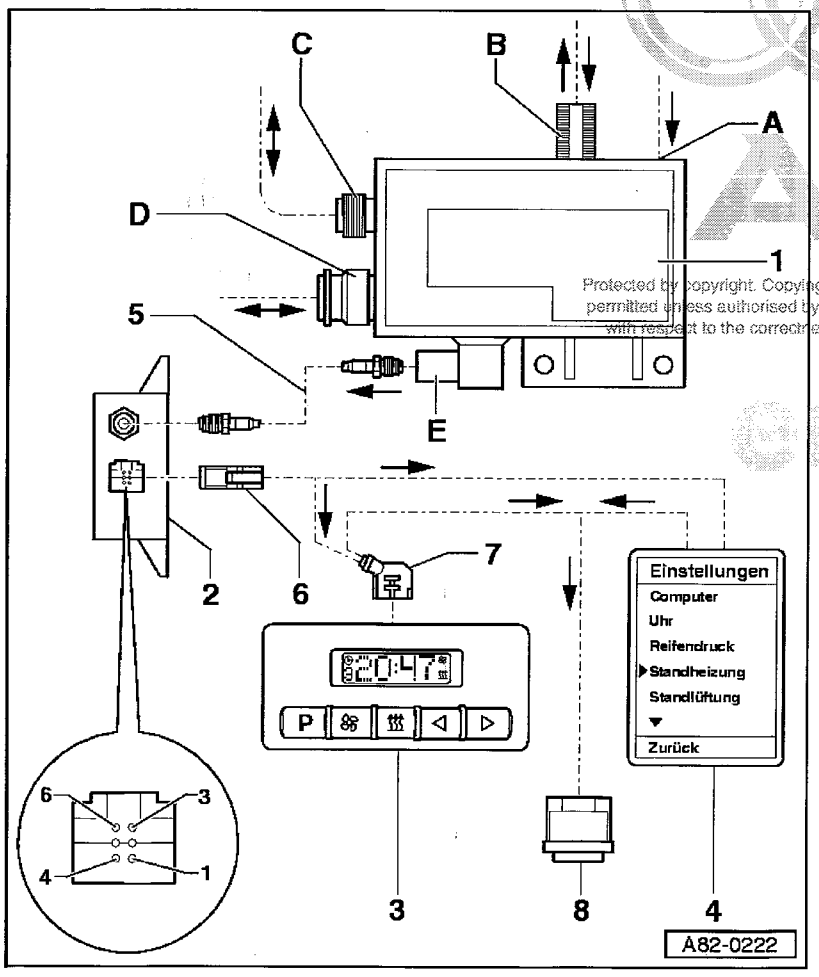


1 – Frequency divider for two-way radio, radio system and telephone -R46

- A- Not used (intended for power supply; not required on vehicles with genuine Audi radios, power is supplied via input "B")
- B- Output to radio/voltage signal input from radio
- C- Input/output to rod of aerial (-R11/-R51) / from window aerial amplifier
- D- Input/output to telephone
- E- Output to -R64

=> Radio, Telephone, Navigation; Repair Group 91 =>

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder



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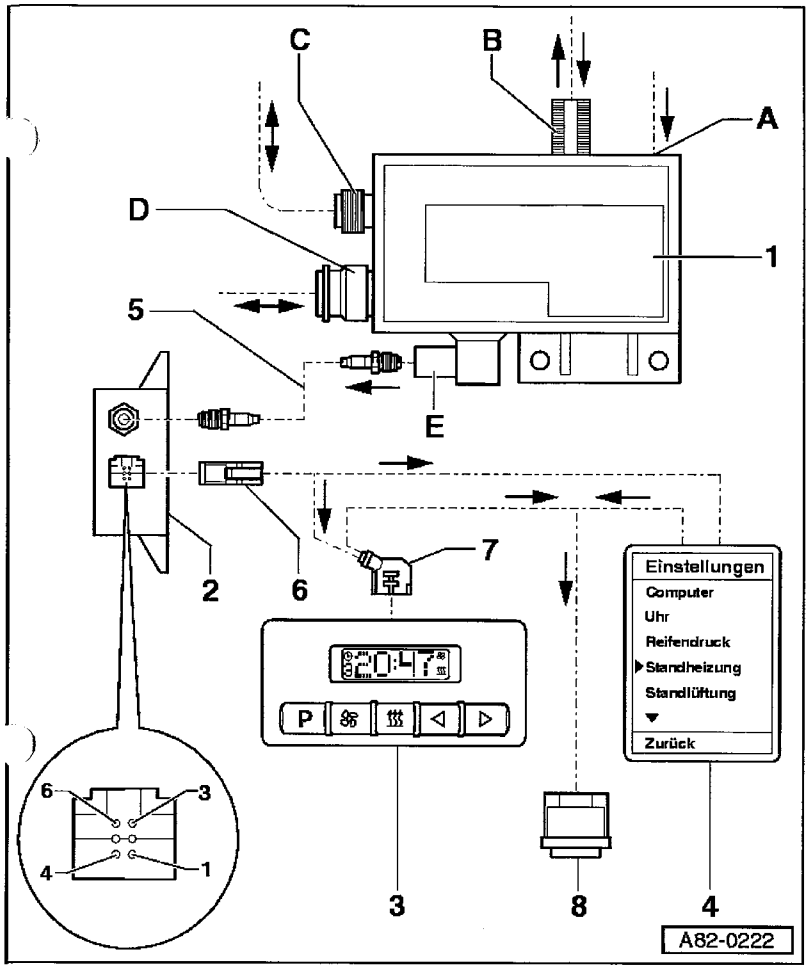
Notes:

- Frequency divider (aerial filter) is fitted on vehicles up to Model Year 2001 on which radio reception is by way of rod aerial or which are equipped with a telephone system.
- On vehicles as of Model Year 2002, auxiliary heater remote control signal is generally received via a separate aerial in the rear window (such vehicles have no frequency divider). Reception via rear window is however not possible with certain optional extras or special equipment. Such vehicles are equipped with a rod aerial and possibly also a frequency divider.

=> Radio, Telephone, Navigation; Repair Group 91 =>



2 – Auxiliary heating radio wave receiver -R64

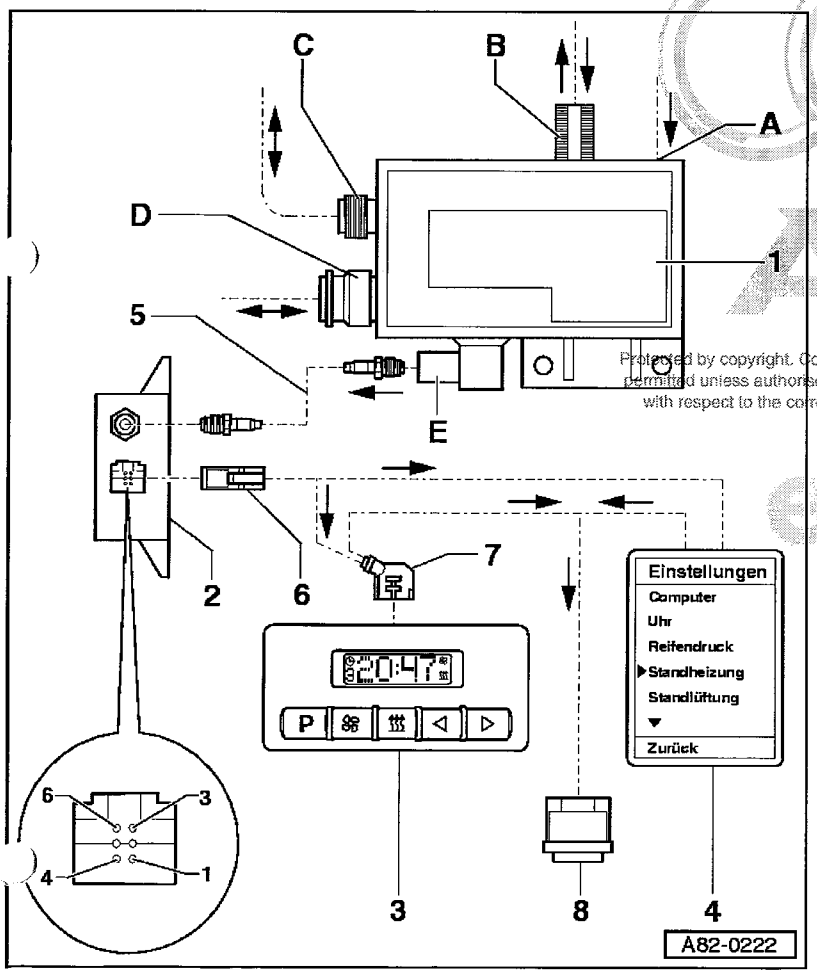
– Switches auxiliary heater on and off by way of pre-selection clock -E111 or dash panel insert when remote control signal is received

3 – Pre-selection clock -E111

- ♦ Removing and installing => Page 82-70
- ♦ Controls and display panel => Page 82-23

4 – Control unit in dash panel insert

- ♦ Making settings on display of driver information system => Page 82-35
- ♦ Instantaneous switching status of auxiliary heating/auxiliary ventilation appears on digital clock display => Page 82-35



5 – Wiring

- ♦ Screened

6 – 6-pin connector to -R64

- ♦ Contact 1
- – Output for cut-in signal to pre-selection clock -E111 or dash panel insert
- ♦ Contact 2
- – Not used
- ♦ Contact 3
- – Not used
- ♦ Contact 4
- – Power supply
- ♦ Contact 5
- – Not used
- ♦ Contact 6
- – Earth

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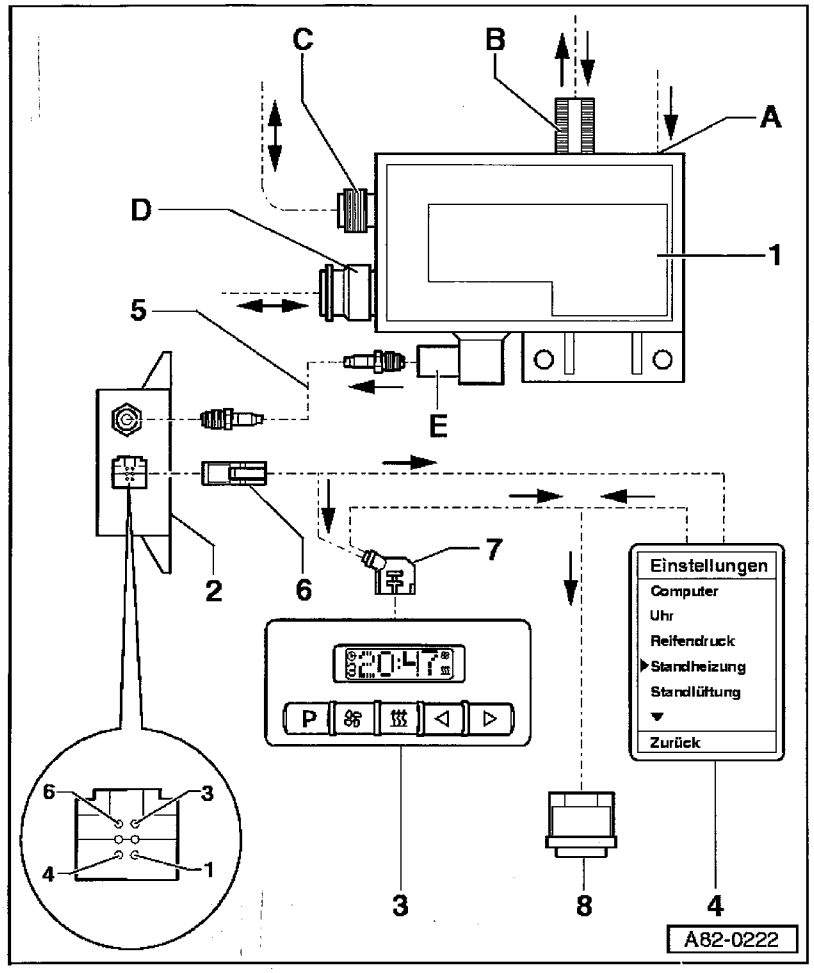


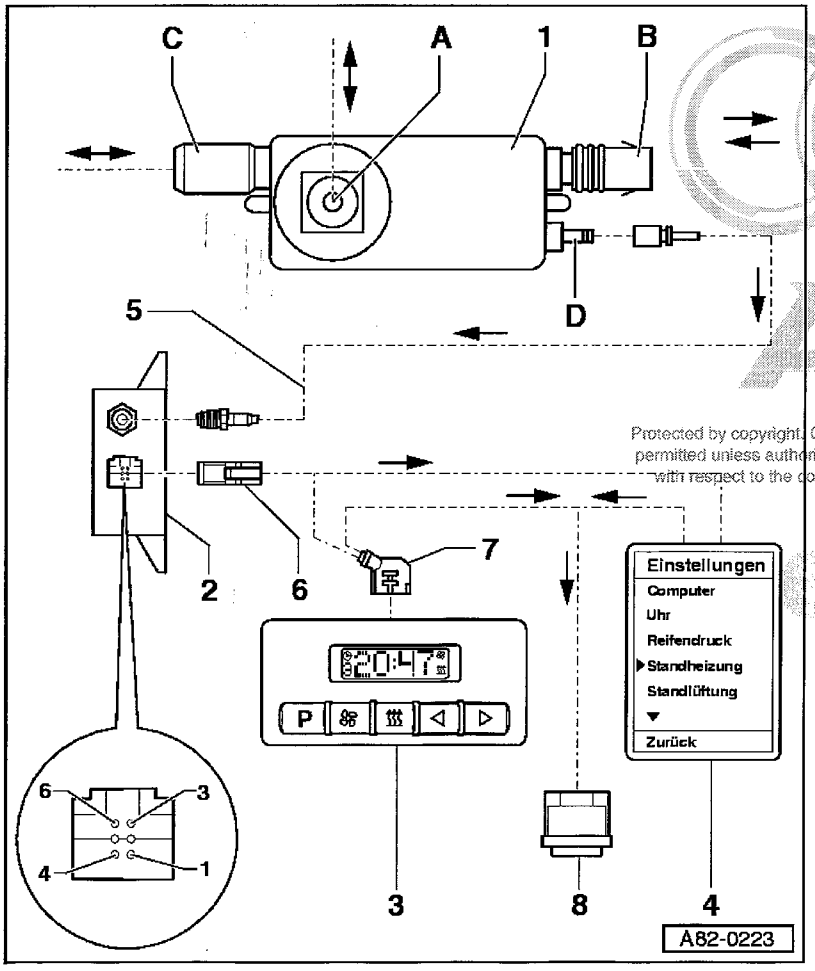
7 – 12-pin connector to pre-selection clock -E111

- ♦ Electrical Check => Page 01-144
- ♦ Pin assignment

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

8 – 6-pin connector to auxiliary heater

- ♦ Contact 1
  - – Cut-in signal for auxiliary heater
- ♦ Contact 5
  - – Additional information on auxiliary ventilation or auxiliary heating from pre-selection clock -E111 or dash panel insert
  - – Auxiliary heater will not start up if earth is applied to this contact (auxiliary ventilation mode)
- ♦ Contacts 2, 3, 4 and 6 =>Page 82-154



Block diagram for Avant with no navigation system

Notes:

- ♦ Remote control is available as an optional extra.
- ♦ Auxiliary heating radio wave receiver -R64 is installed in luggage compartment on left in direction of travel behind luggage compartment lining in area of wheel housing => Page 82-180 and => Radio, Telephone, Navigation; Repair Group 91 =>
- ♦ Pre-selection clock -E111 was discontinued in Model Year 2000 and auxiliary heater is actuated by way of dash panel insert. => Electrical System; Repair Group 01 =>

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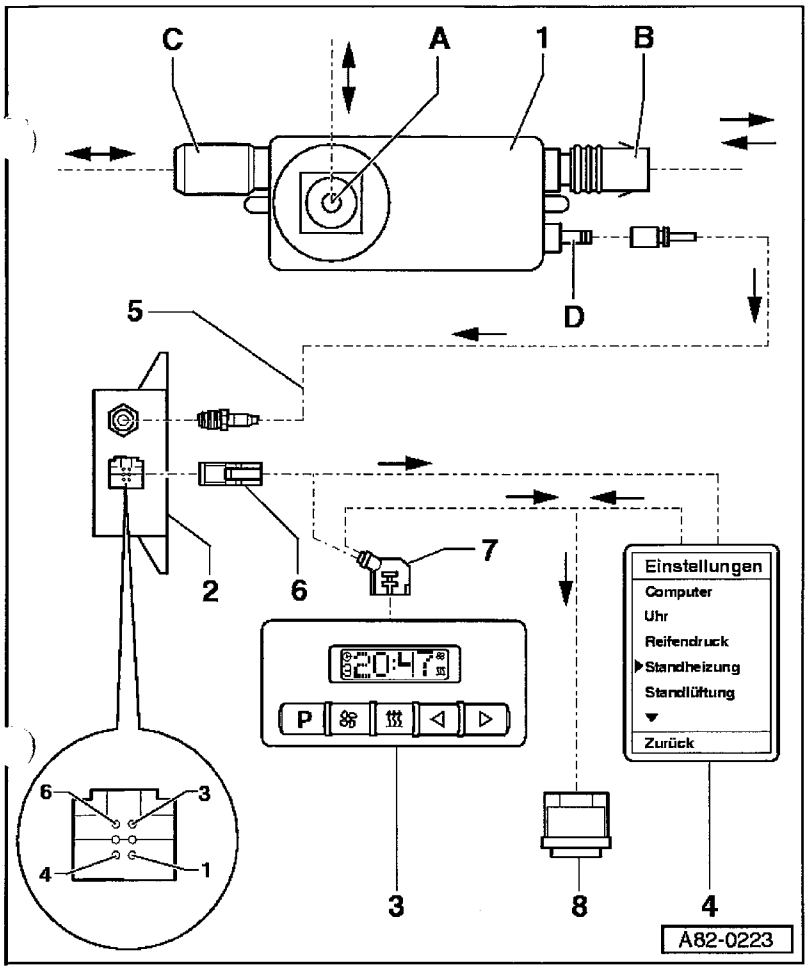


1 – Radio / telephone / auxiliary heater aerial -R51

- ♦ With frequency divider for two-way radio, radio system and telephone
- – A- To aerial rod
- – B- Output to radio/voltage signal input from radio
- – C- Input/output to telephone
- – D- Output to -R64

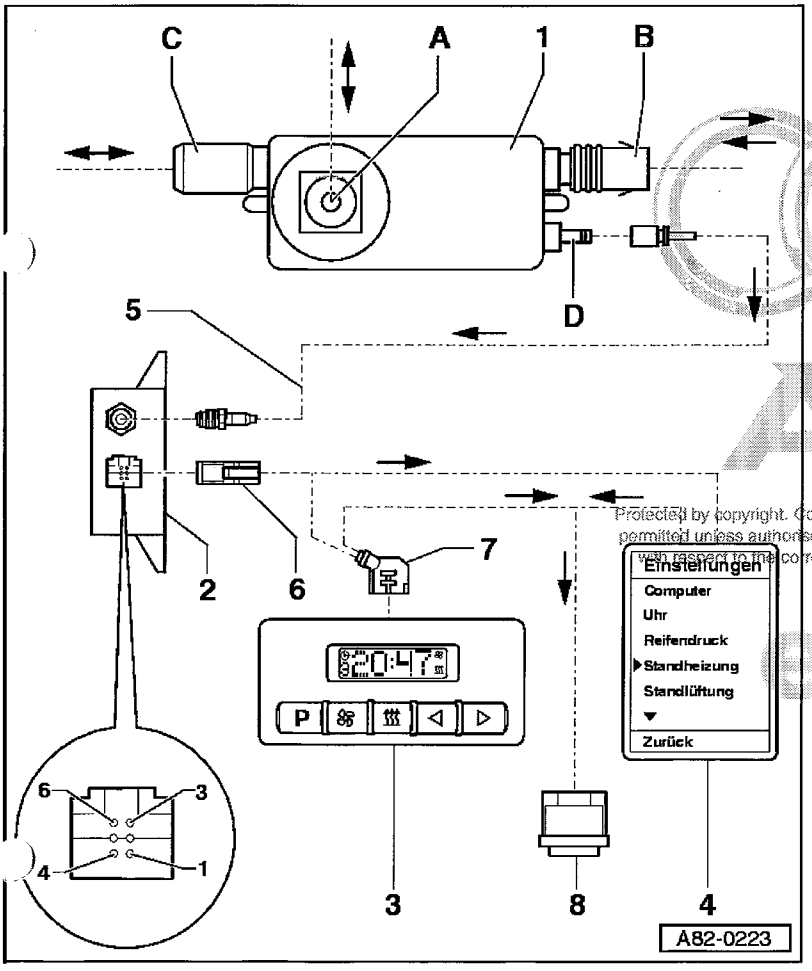
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

2 – Auxiliary heating radio wave receiver -R64

- – Switches auxiliary heater on and off by way of pre-selection clock -E111 or dash panel insert when remote control signal is received

3 – Pre-selection clock -E111

- ♦ Removing and installing => Page 82-70
- ♦ Controls and display panel => Page 82-23



4 – Control unit in dash panel insert

- ♦ Making settings on display of driver information system => Page 82-35
- ♦ Instantaneous switching status of auxiliary heating/auxiliary ventilation appears on digital clock display => Page 82-35

5 – Wiring

- ♦ Screened

6 – 6-pin connector to -R64

- ♦ Contact 1
- – Output for cut-in signal to pre-selection clock -E111 or dash panel insert
- ♦ Contact 2
- – Not used
- ♦ Contact 3
- – Not used

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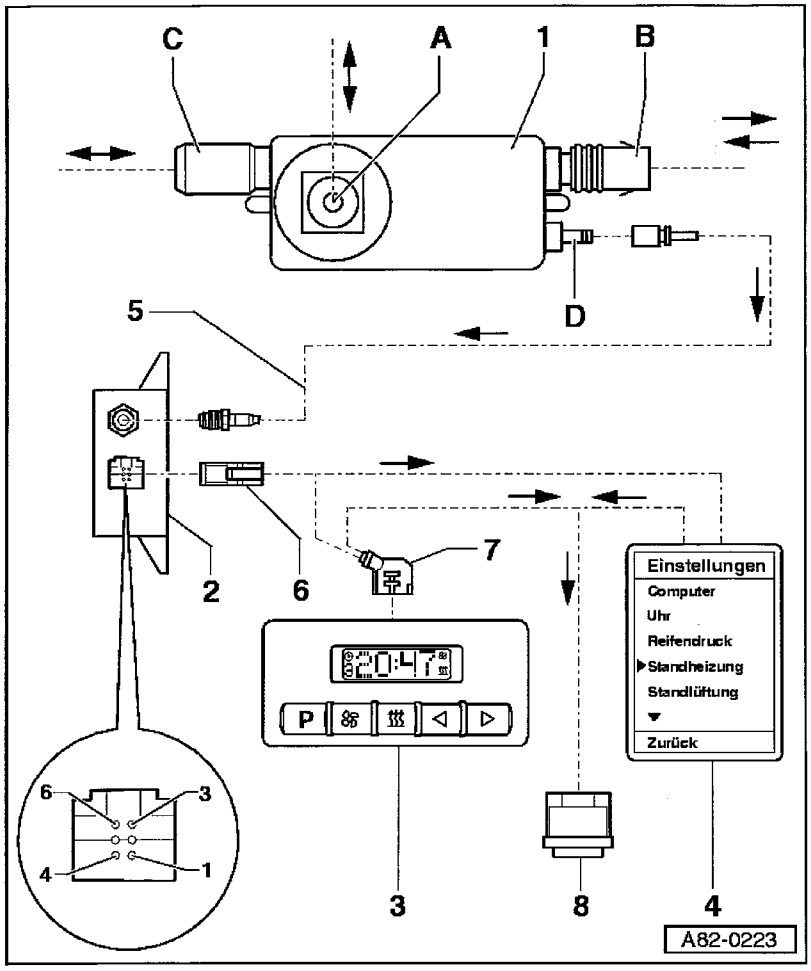
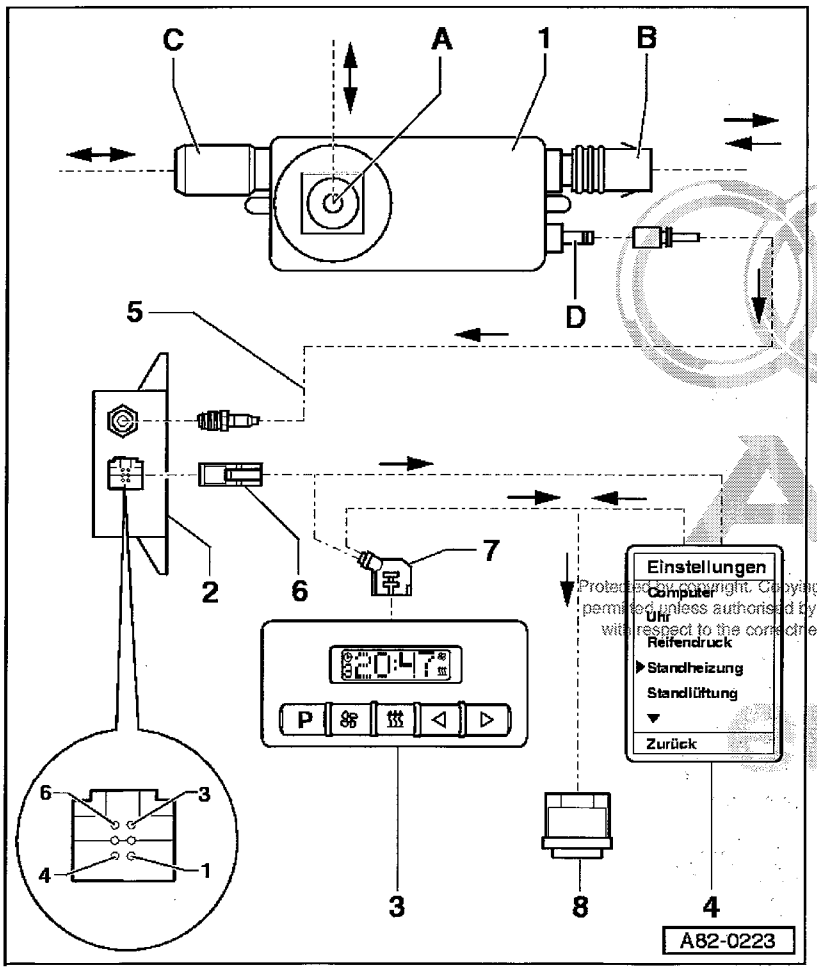


♦ Contact 4
– Power supply
♦ Contact 5
– Not used
♦ Contact 6
– Earth

7 – 12-pin connector to pre-selection clock -E111
♦ Electrical Check => Page 01-144
♦ Pin assignment
=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

8 – 6-pin connector to auxiliary heater
♦ Contact 1
– Cut-in signal for auxiliary heater



♦ Contact 5
– Additional information on auxiliary ventilation or auxiliary heating from pre-selection clock -E111 or dash panel insert
– Auxiliary heater will not start up if earth is applied to this contact (auxiliary ventilation mode)
♦ Contacts 2, 3, 4 and 6
=> Page 82-154

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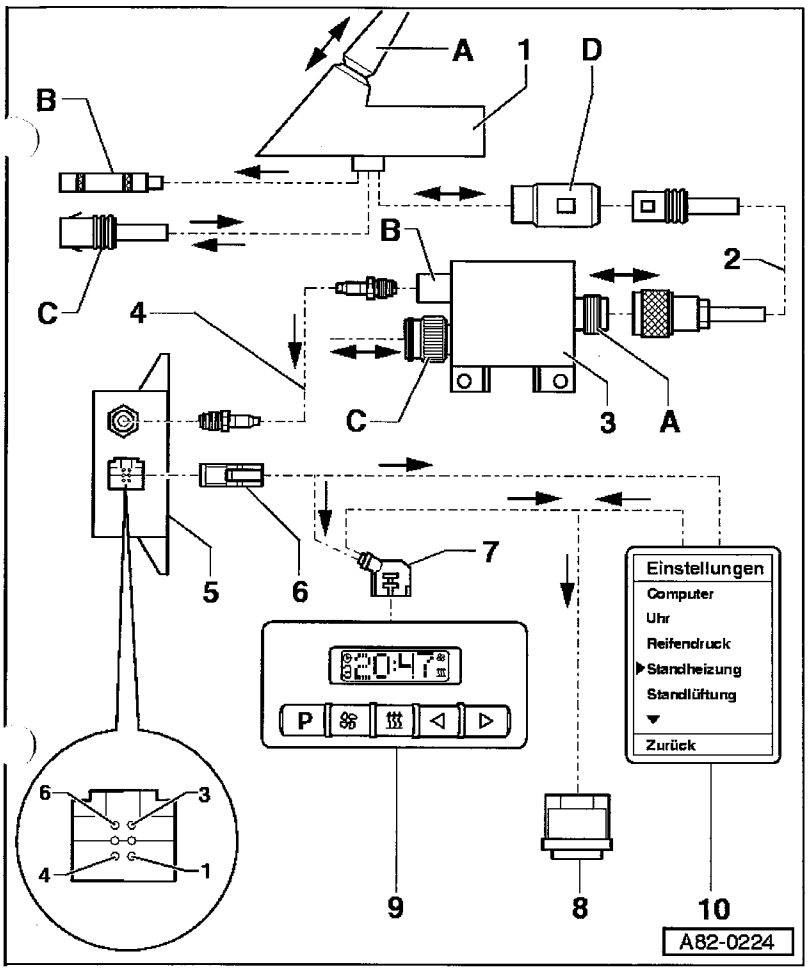
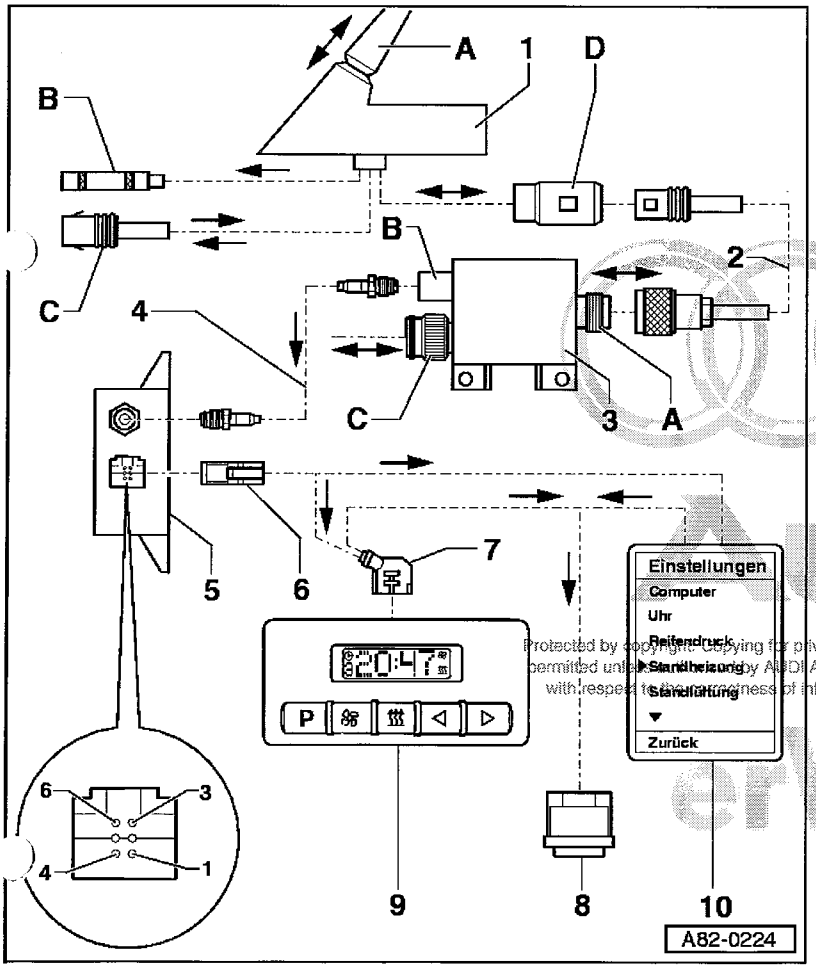


Block diagram for Avant with navigation system

Notes:

- ♦ Remote control is available as an optional extra.
- ♦ Auxiliary heating radio wave receiver -R64 and aerial filter for telephone/auxiliary heater are installed in luggage compartment on left in direction of travel behind luggage compartment lining in area of wheel housing => Page 82-180 and => Radio, Telephone, Navigation; Repair Group 91 =>
- ♦ Pre-selection clock -E111 was discontinued in Model Year 2000 and auxiliary heater is actuated by way of dash panel insert. => Electrical System; Repair Group 01 =>



1 – Radio/telephone/navigation aerial -R52

- ♦ With frequency divider for radio system and telephone
  - A- Aerial rod
  - B- Output to navigation system
  - C- Output to radio/voltage signal input from radio
  - D- Input/output to telephone/auxiliary heater aerial filter

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

2 – Wiring

- ♦ Screened

3 – Aerial filter for telephone/auxiliary heater

- ♦ On vehicles with no telephone, aerial is connected directly to -R64 (no filter)

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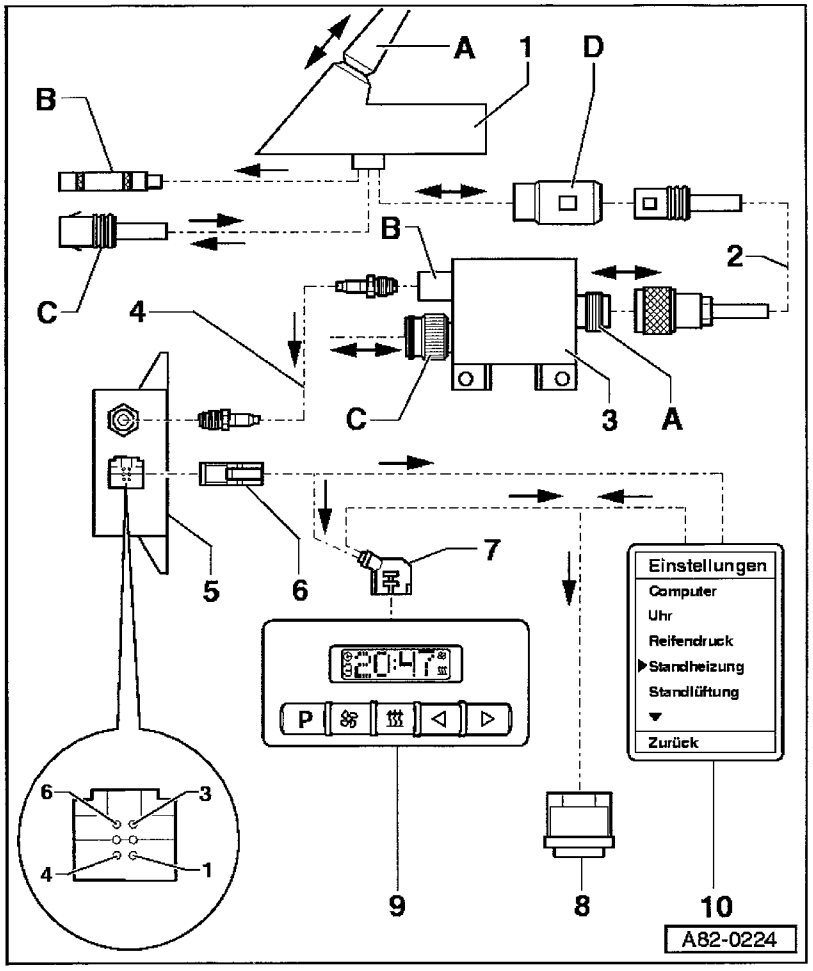


4 – Wiring

♦ Screened

5 – Auxiliary heating radio wave receiver -R64

– Switches auxiliary heater on and off by way of pre-selection clock -E111 or dash panel insert when remote control signal is received

6 – 6-pin connector to -R64

♦ Contact 1

– Output for cut-in signal to pre-selection clock -E111 or dash panel insert

♦ Contact 2

– Not used

♦ Contact 3

– Not used

♦ Contact 4

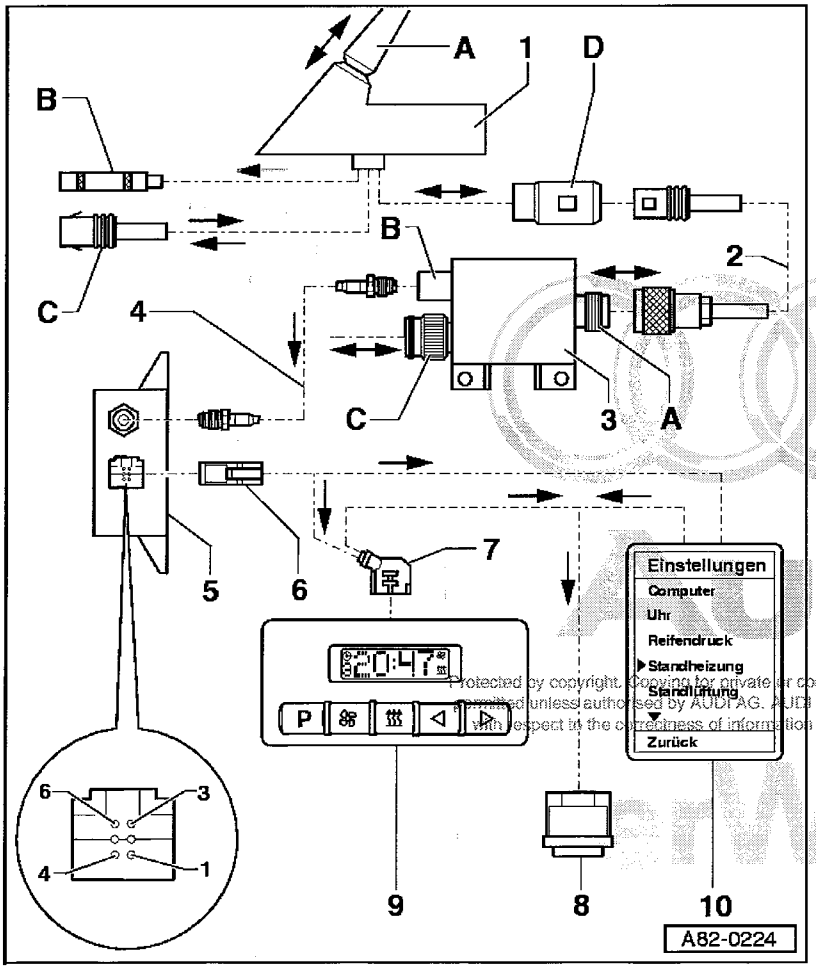
– Power supply

♦ Contact 5

– Not used

♦ Contact 6

– Earth



7 – 12-pin connector to pre-selection clock -E111

♦ Electrical Check => Page 01-144

♦ Pin assignment

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

8 – 6-pin connector to auxiliary heater

♦ Contact 1

– Cut-in signal for auxiliary heater

♦ Contact 5

– Additional information on auxiliary ventilation or auxiliary heating from pre-selection clock -E111 or dash panel insert

– Auxiliary heater will not start up if earth is applied to this contact (auxiliary ventilation mode)

♦ Contacts 2, 3, 4 and 6

=>Page 82-154

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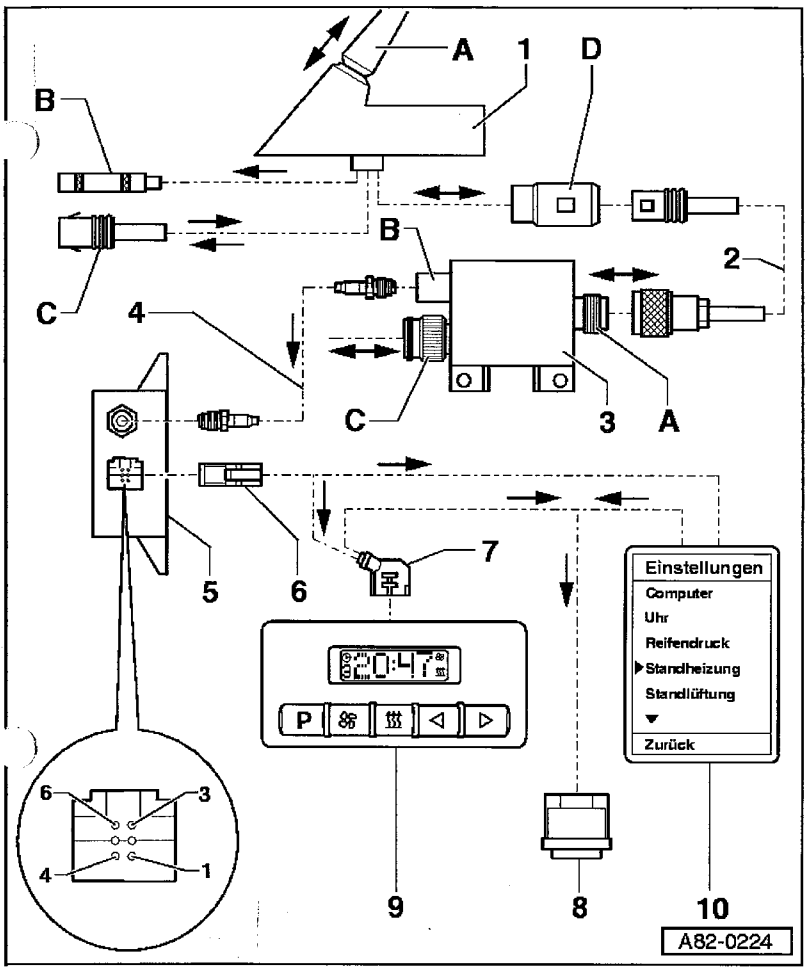


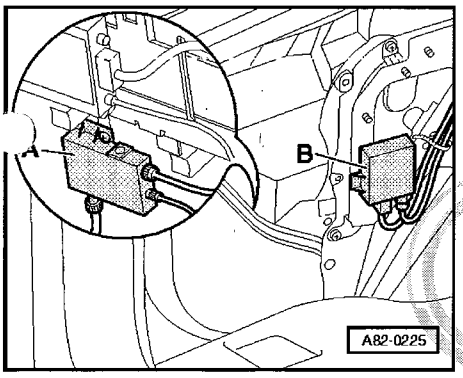
9 – Pre-selection clock -E111

- ♦ Removing and installing => Page 82-70
- ♦ Controls and display panel => Page 82-23

10 – Control unit in dash panel insert

- ♦ Making settings on display of driver information system => Page 82-35
- ♦ Instantaneous switching status of auxiliary heating/auxiliary ventilation appears on digital clock display => Page 82-35

Fitting locations for auxiliary heating radio wave receiver -R64 and aerial filters



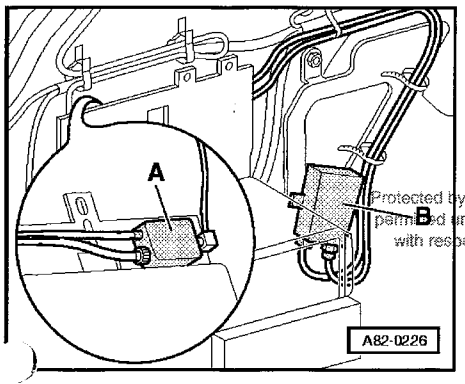
Note:

Installed in luggage compartment on left behind lining

Saloon

A- Aerial filter (only fitted on vehicles up to Model Year 2001 with telephone and auxiliary heater or on vehicles with heat-absorbing glass for rear window, radio and auxiliary heater/telephone)

B-Auxiliary heating radio wave receiver -R64



Avant

A- Aerial filter (only fitted on vehicles with navigation system, telephone and auxiliary heater)

B-Auxiliary heating radio wave receiver -R64

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