

Required for installation:

Crowd	Designation	Order no.
1	Thermo Top water heater (type BW50) with scope of delivery	313 95A
	or	
1	Water heater Thermo Top T (type BW50) with scope of delivery	313 97A

Additional required parts

Crowd	Designation	Order no.
1	installation kit Fiat Bravo/Brava	867 15A
1	Heat protection hose 2m - only for air conditioning	330 49A

Preface

This installation suggestion applies to the Fiat Bravo and Fiat Brava cars - see title page for validity - model year 1995 and later, provided that technical changes to the vehicle do not affect installation, with the exclusion of any liability claims. Depending on the version and equipment of the vehicle, changes to this installation suggestion may be necessary during installation. In any case, however, the regulations in the "Installation Instructions" and "Operating Instructions" for Thermo Top/Thermo Top S must be followed. The relevant technical rules must be observed during installation.

The installation documented in this installation suggestion was carried out on a Fiat Bravo 1.6 16V without air conditioning.

DANGER:

The approval regulations must be observed!

In the Federal Republic of Germany, the subsequent installation of the Thermo Top additional heating according to this installation proposal is subject to approval, as there is no special addendum to the ABG for this.

Installation must be carried out in accordance with the installation instructions.

He is

- a) during the type approval of vehicles according to §20 StVZO,
- b) in the individual test according to §21 StVZO or
- c) in the assessment pursuant to Section 19 of the Road Traffic Licensing Regulations by an officially recognised expert or inspector for motor vehicle traffic, a motor vehicle expert or employee pursuant to Section 7.4a of Annex VIII to the Road Traffic Licensing Regulations

to be checked and, in case c), to have it certified on the acceptance certificate, stating the vehicle manufacturer, vehicle type and vehicle identification number. The validity of the type approval depends on this.

Instructions for installing the heater for different engine and equipment variants

Installation location for different engines and for vehicles with or without air conditioning see Figure 2 to Figure 4

Installation in the 1.6l 16V vehicle without air conditioning is described in detail below. The installation-related deviations for the 1.4l 12V and 1.8l 16V vehicles when installing the flat fuse holder and the water and fuel connections are listed.

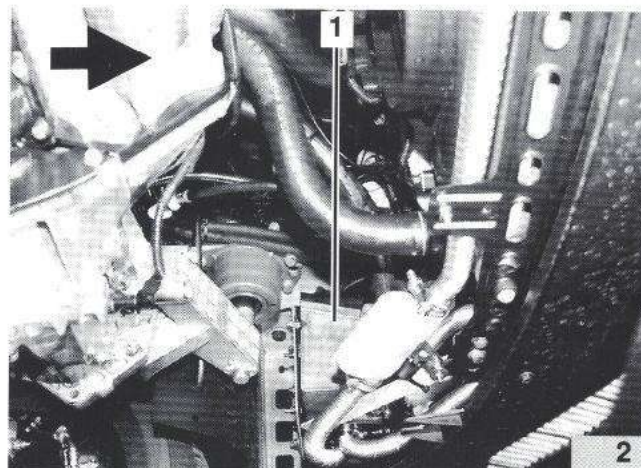
When installing in vehicles 1.4l 12V, 1.6l 16V, 1.8l 16V with air conditioning and 2.0l 20V with or without air conditioning, the bracket required for installation on the right-hand side must be made by yourself or the enclosed bracket must be modified. Installation can be carried out in accordance with the installation described, observing the operating and installation instructions.

Installation location and installation position

- **1.4 12V**
- 1.6 16V
- 1.8 16V

without air conditioning

In vehicles without air conditioning, the heater (2/1) is installed horizontally on the left in the direction of travel, between the bumper and the wheel house

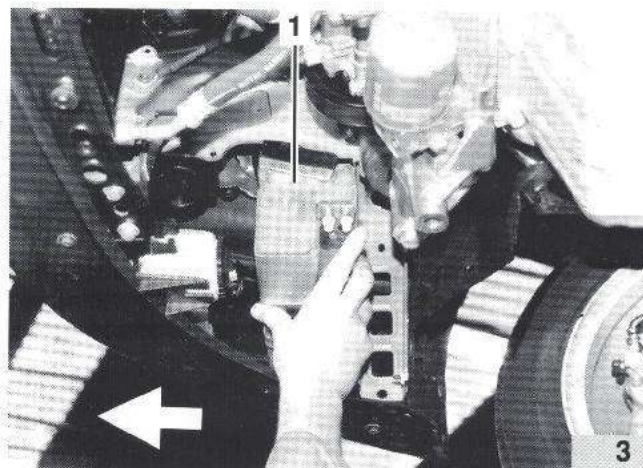


Installation location and installation position

- **1.4 12V**
- 1.6 16V
- 1.8 16V

with air conditioning

In vehicles with air conditioning, the heater (3/1) can be installed horizontally on the right-hand side in the direction of travel, between the bumper and the wheel house

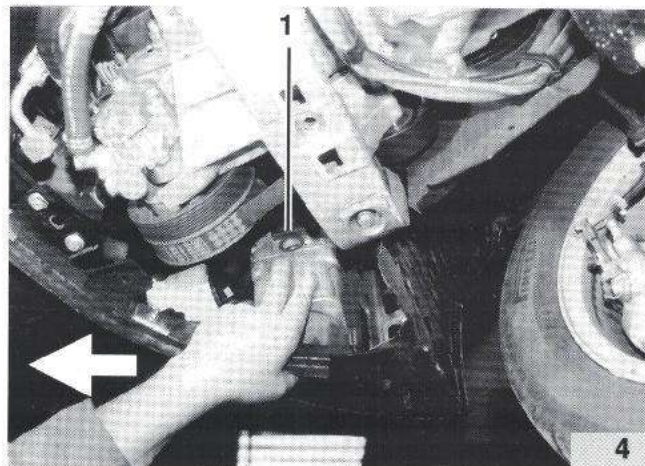


Installation location and installation position

- **2.0 20V**

with or without air conditioning

In the 2.0 20V vehicle, the heater (4/1) can be installed vertically on the right-hand side in the direction of travel, between the bumper and the wheel house



A NOTICE:

Move the fanfares up!

Holes for fastening the retaining plate must be drilled as required!

General information

- Bare body parts, e.g. at holes, are provided with corrosion protection
- Secure hoses, cables and cable harnesses with cable ties and provide protective hoses at chafing points
- Provide sharp edges with edge protection (cut fuel hose)

Preparatory work (valid for all vehicles)

- Transfer data from type plate to duplicate plate (type plate)

Engine compartment

DANGER:

Disconnect the vehicle battery!

- Relieve pressure from the cooling system

Vehicle exterior

- Open the tank cap, release pressure from the tank system and close the tank cap again

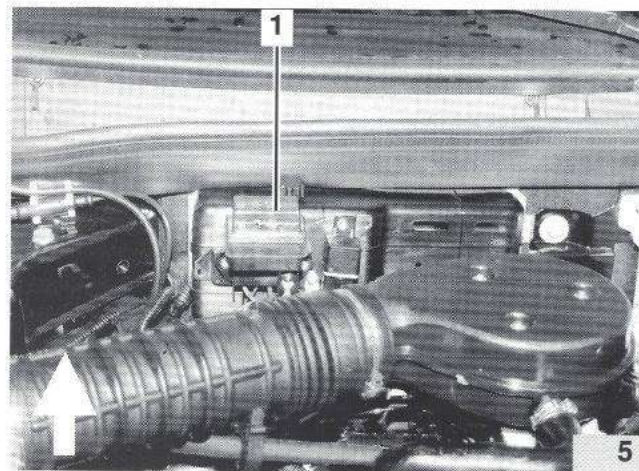
Underside of the vehicle

- Remove underrun protection (if present)

blade fuse holder and fan relay

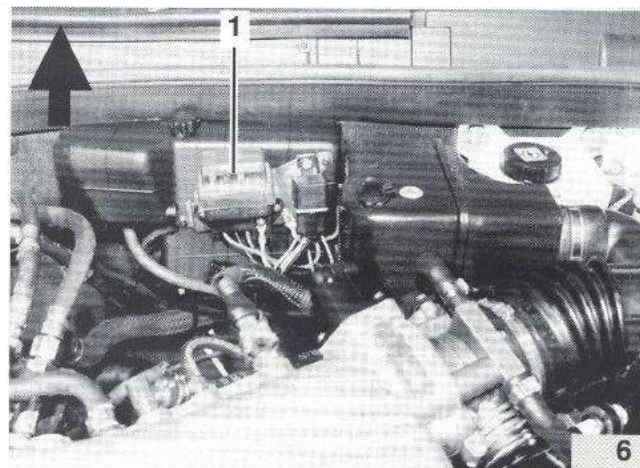
1.41 12V (Figure 5)

- Place the flat fuse holder (5/1) and fan relay on the plastic cover as shown in Figure 5 and transfer the hole pattern
- Remove plastic cover
- Drill two holes \varnothing 5.5 mm in the cover
- Fasten the flat fuse holder and fan relay to the cover with two M5x12 screws, washers, spring washers and nuts
- Reinstall the cover



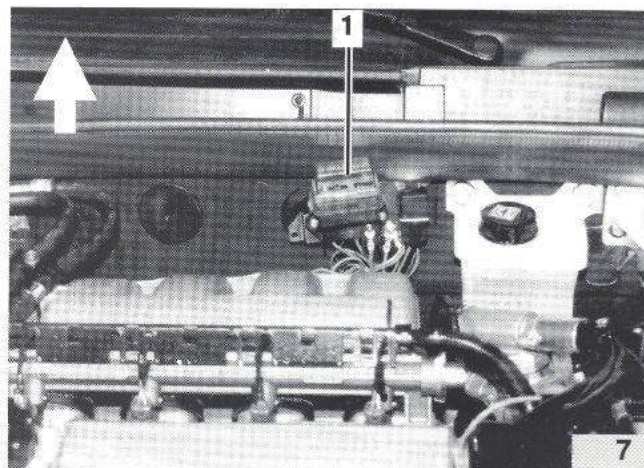
1.61 12V (Figure 6)

- Place the flat fuse holder (6/1) and fan relay on the plastic cover as shown in Figure 6 and transfer the hole pattern
- Remove plastic cover
- Drill two holes \varnothing 5.5 mm in the cover
- Fasten the flat fuse holder and fan relay to the cover with two M5x12 screws, washers, spring washers and nuts
- Reinstall the cover



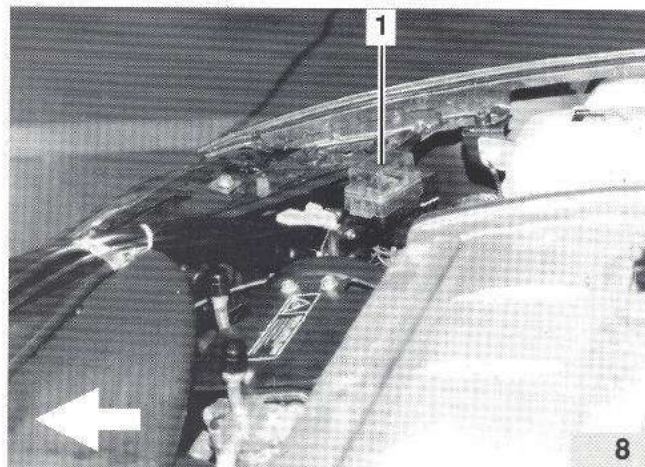
1.81 12V (Figure 7)

- Place the flat fuse holder (7/1) and fan relay on the bulkhead as shown in Figure 7 and transfer the hole pattern
- Fasten the flat fuse holder and fan relay with two self-tapping screws



2.01 20V (Figure 8)

- Mount the flat fuse holder (8/1) and blower relay behind the right headlight as shown in Figure 8 using perforated strips, screws, washers, spring washers and nuts



Installation of retaining plate (left direction of travel)

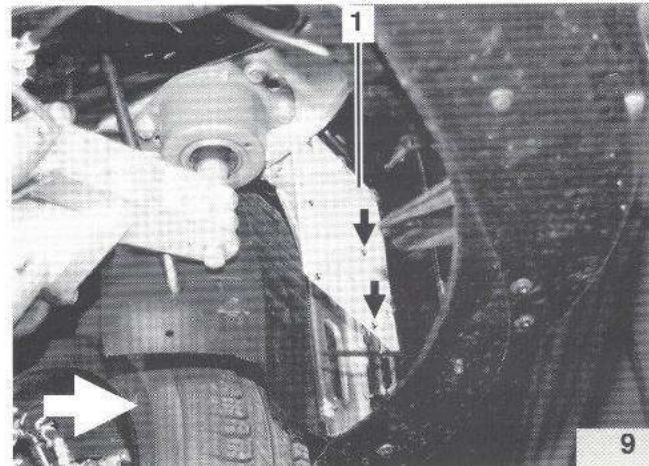
- 1.41 12V without air conditioning
- 1.6l 16V without air conditioning
- 1.81 16V without air conditioning

(Image 9 to Image 12)

A NOTICE:

Unclip the wiring harness for the fog lights and fix it to the headlight holder with cable ties!

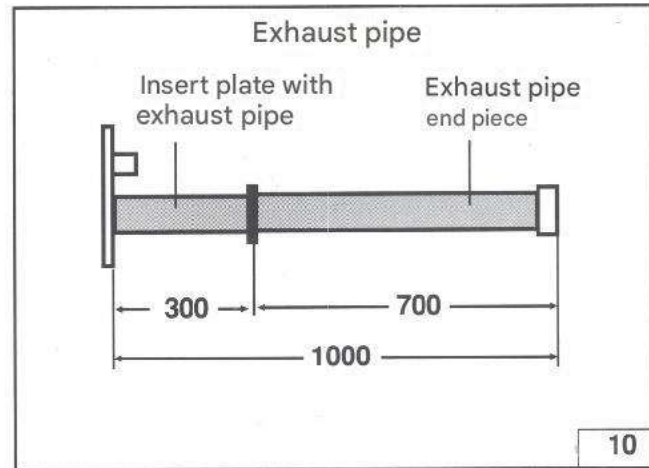
- Fasten the holder (9/1) to the existing holes using three M8x20 screws as shown in Figure 9 and transfer the hole pattern of the holder (two holes for the retaining plate, on the left in the direction of travel) to the body
- Remove the holder and drill two holes \varnothing 6.5 mm



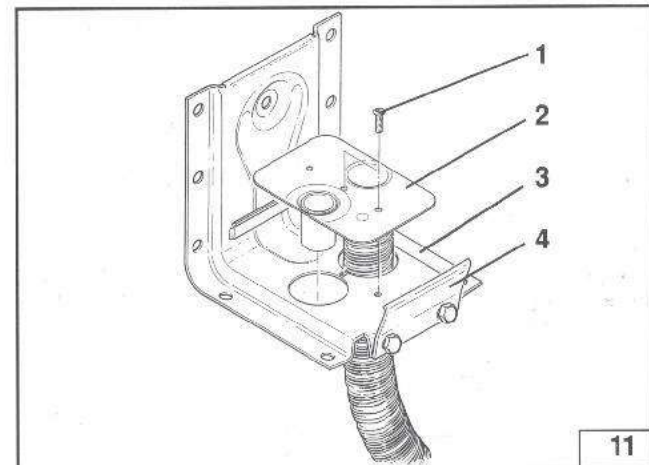
- Cut the exhaust pipe and exhaust pipe end piece to length as per sketch Figure 10:

A NOTICE:

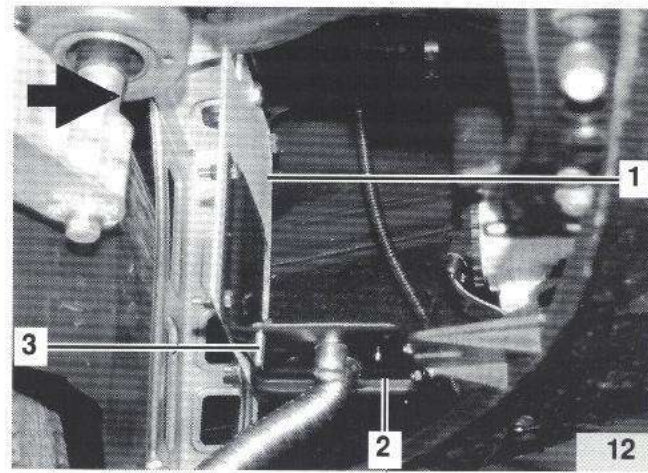
Lengths in sketch Figure 10 only apply when installed on the left in the direction of travel. When installed on the right in the direction of travel, the exhaust pipe must be cut to length in accordance with the installation conditions!



- Insert the insert plate (11/2) into the retaining plate (11/3) as shown in Figure 11 (exhaust gas outlet on the right). Fasten the insert plate (11/2) with two countersunk screws (11/1).
- Loosely mount the side panel (11/4) onto the mounting plate using two M6x20 screws and washers



- Fasten the bracket (12/1) to the existing holes on the body using three M8x20 screws, washers, spring washers and nuts
- Mount the retaining plate (12/2) with four M6x20 screws, two body washers (left in direction of travel), washers, spring washers and nuts on the holder (12/1)
- Insert the M6x20 screw (12/3) for fastening the strut (18/3) into the rear hole of the retaining plate as shown in Figure 12



Installation of retaining plate (right direction of travel)

- 1.41 12V with air conditioning
- 1.6l 16V with air conditioning
- 1.81 16V with air conditioning
- 2.0l 20V with or without air conditioning

(without picture)

A NOTICE:

If necessary, mount the modified bracket, retaining plate and insert plate in accordance with the installation conditions on the right side of the direction of travel

Pre-assemble the heater

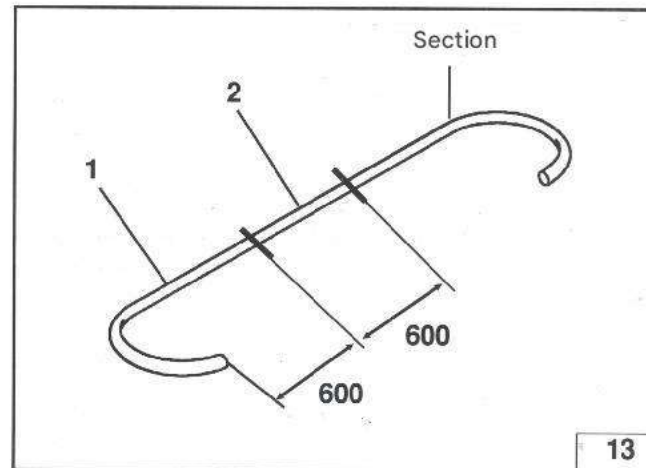
Cutting water hoses to length (left direction of travel)

- 1.41 12V without air conditioning (Image 13)
- 1.81 16V without air conditioning (picture 13)

- Cut two pieces of hose from the enclosed water hose (Figure 13)

1 x 600 mm + 180° bend (13/1) 1 x 600 mm straight (13/2)

- Pre-assemble the straight water hose (12/2) at the heater water outlet

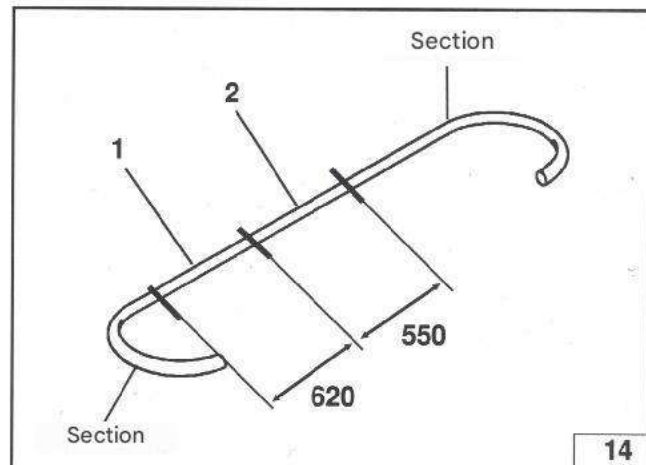


1.6l 16V without air conditioning (Image 14)

- Cut two pieces of hose from the enclosed water hose (Figure 14)

1 x 620 mm straight (14/1)
1 x 550 mm straight (14/2)

- Pre-assemble straight water hose (14/1) 620 mm long at the heater water outlet



A NOTICE:

Lengths in Figure 13 and Figure 14 only apply when installed on the left in the direction of travel. When installing on the right in the direction of travel, cut the water hose to the correct length according to the installation conditions or as required!

Mount the wiring harness on the heater

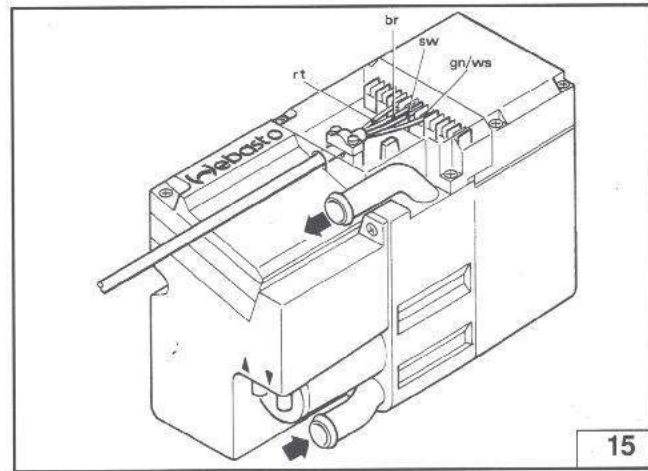
(valid for all vehicles)

- Lay the wiring harness from the flat fuse holder to the installation location of the heater.
- Connect the wiring harness to the heater (Figure 15)

DANGER:

If present, cover the membrane in the control unit cover when spraying with anti-corrosion wax (e.g. with a strip of cardboard). The membrane in the cover must remain permeable to water!

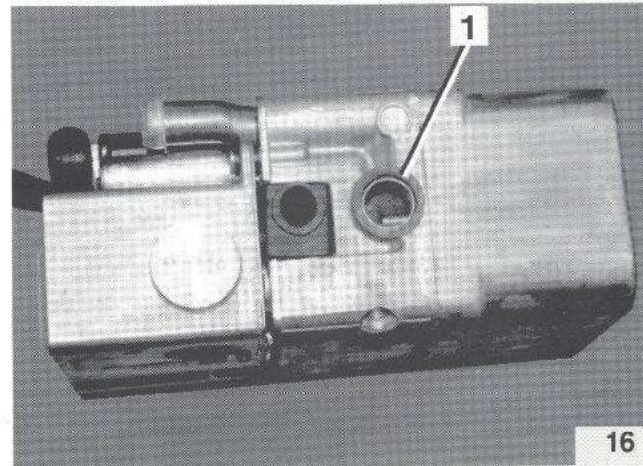
- Spray the connector strip with anti-corrosion wax (e.g. Tectyl) to protect it from moisture. Attach the strain relief for the cable harness and mount the cover on the heater.



Install the heater

(valid for all vehicles)

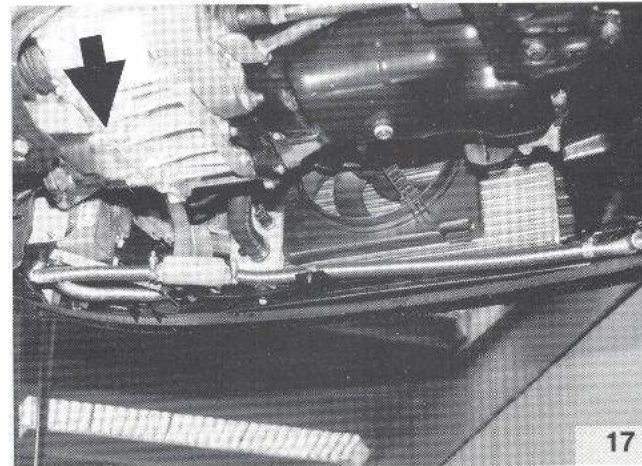
- Insert bushing (exhaust seal) (16/1) if not present on the heater into the exhaust outlet
- Insert the heater into the mounting plate and clamp it with the side panel (vehicle without air conditioning see Figure 18)



exhaust system and combustion air intake line
(left direction of travel)

- 1.4l 12V without air conditioning
- 1.6l 16V without air conditioning
- 1.8l 16V without air conditioning

(Image 17 to Image 21)

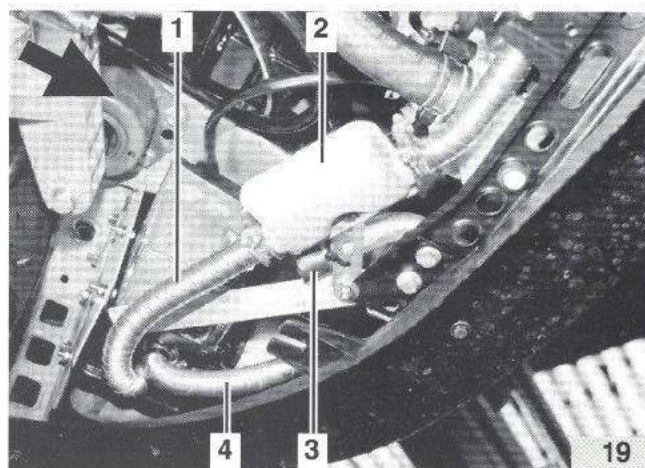
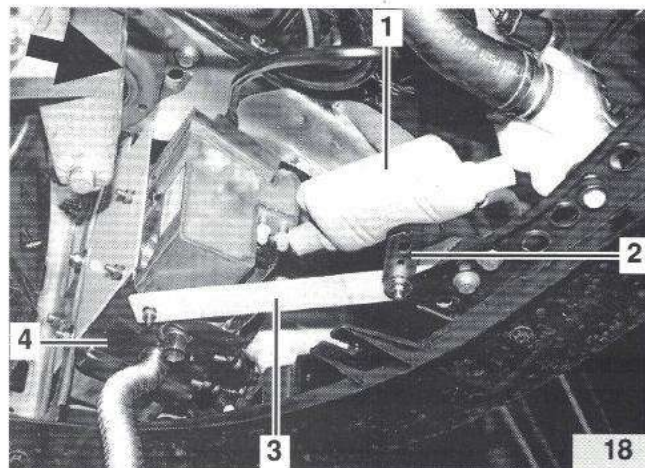


- Loosely mount the strut (18/3) with the pre-assembled M6x20 screw (12/3), washer, spring washer and nut onto the retaining plate (18/4)
- Loosely mount the strut (18/3) and perforated band (18/2) with screw M6x20, body washer, spring washer and nut on the existing hole
- Align the perforated strip as shown in Figure 18 and tighten the screws

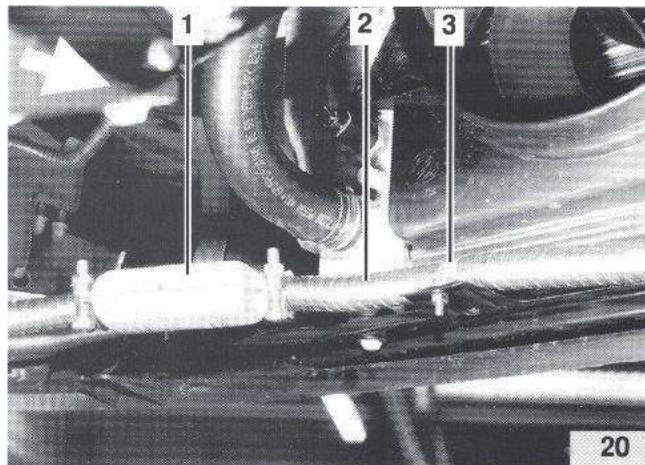
DANGER:

When installing the exhaust silencer (18/1), ensure there is sufficient clearance (min. 20 mm)!

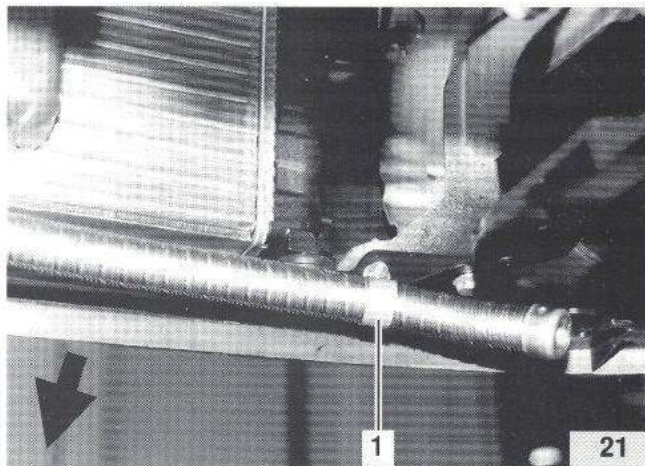
- Exhaust silencer (18/1) as shown position in Figure 18 with screw M6x20, washer, spring washer and nut on the perforated band
- Fasten the exhaust pipe (19/1) to the silencer (19/2) using a hose clamp
- Attach the combustion air line (19/4) to the nozzle of the insert plate and fasten with a hose clamp. Attach the end cap (19/3), lay the combustion air line as shown in Figure 19 and fix it to the perforated strip with a cable tie.



- Fasten the exhaust pipe end piece (20/2) to the silencer (20/1) using a hose clamp
- Fix the exhaust pipe end piece to the existing hole using a pipe clamp (20/3), screw M6x20, washer, spring washer and nut



- Drill a hole \varnothing 6.5 mm in the radiator support plate to attach the pipe clamp (21/1) as shown in Figure 21. To compensate for the edge in the support plate, pre-mount the M6x20 screw with nut in the hole. Fasten the exhaust pipe end piece to the radiator support plate (pre-mounted screw) using the pipe clamp (21/1), washer, spring washer and nut. Align the exhaust pipe end piece as shown in Figure 21.



exhaust system and combustion air intake line
(right direction of travel)

- 1.41 12V with air conditioning
- 1.6l 16V with air conditioning
- 1.81 16V with air conditioning
- 2.0l 20V with or without air conditioning

(without picture)

A NOTICE:
Install the exhaust system and combustion air line according to the installation conditions

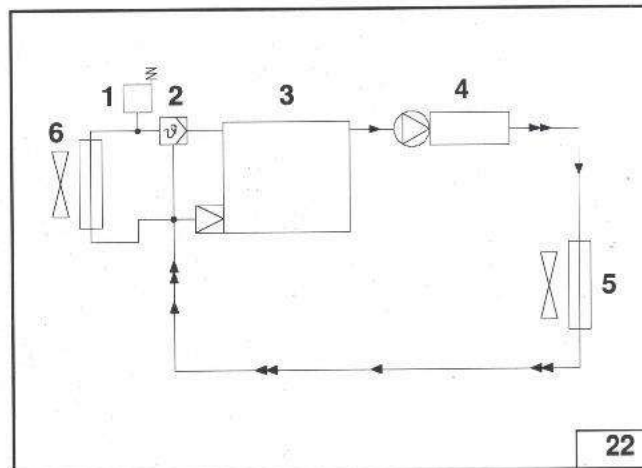
Water connection

A NOTICE:
Tighten all hose clamps with 2.0 + 0.5 Nm! Collect any escaping coolant in a suitable container!

The following describes the integration of the heater "in series" (inline) into the cooling water circuit of the vehicle (Figure 22)

Caption to Figure 22:

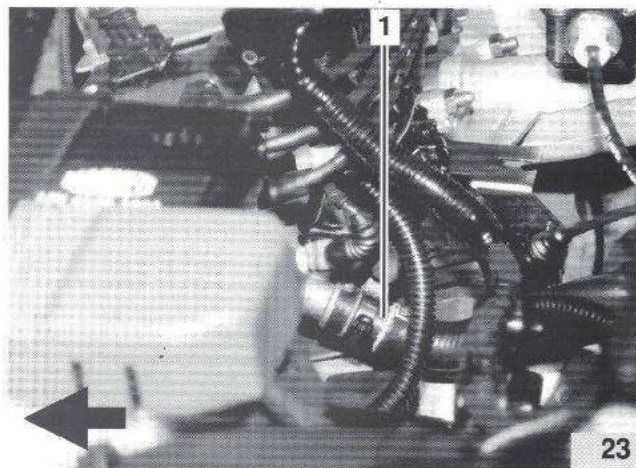
- 1 expansion tank
- 2 radiator thermostat
- 3 vehicle engine
- 4 heater
- 5 heating heat exchangers (vehicle)
- 6 coolers



water connection (left direction of travel)

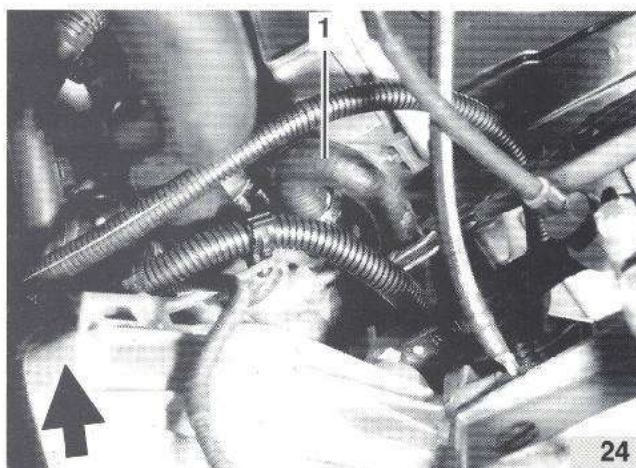
1.41 12V without air conditioning (Figure 23)

- Remove the vehicle-side water hose (23/1) from the engine outlet to the heating heat exchanger at the engine outlet
- Attach the water hose (600 mm long + 180° bend) with a 180° bend to the engine outlet and the straight side to the heater inlet and secure with hose clamps
- Connect the pre-assembled water hose from the heater outlet to the water hose (23/1) to the heater heat exchanger using a connecting pipe 18/18 and secure with hose clamps

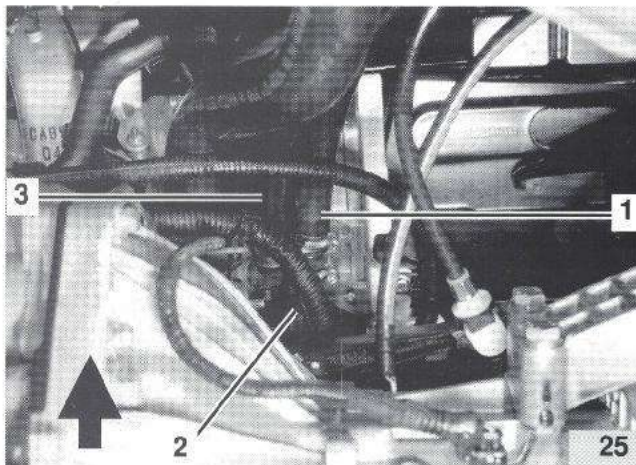


1.6l 16V without air conditioning (picture 24 to picture 26)

- Remove the vehicle-side water hose (26/1) from the engine outlet to the heating heat exchanger at the engine outlet and separate the bend

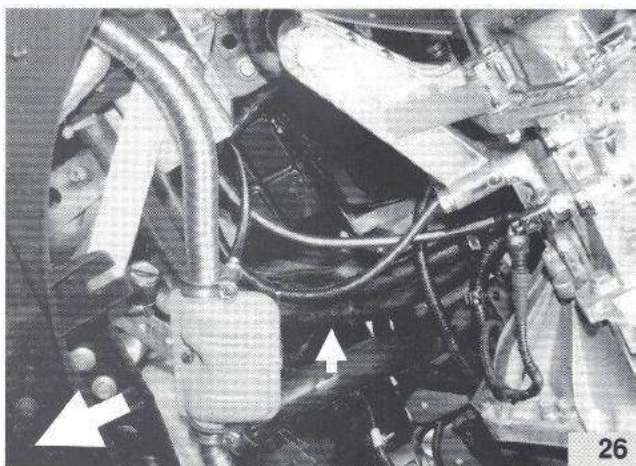


- Connect the pre-assembled water hose (25/1) from the heater outlet to the water hose (25/2) to the heater heat exchanger using a connecting pipe 18/18 and secure with hose clamps



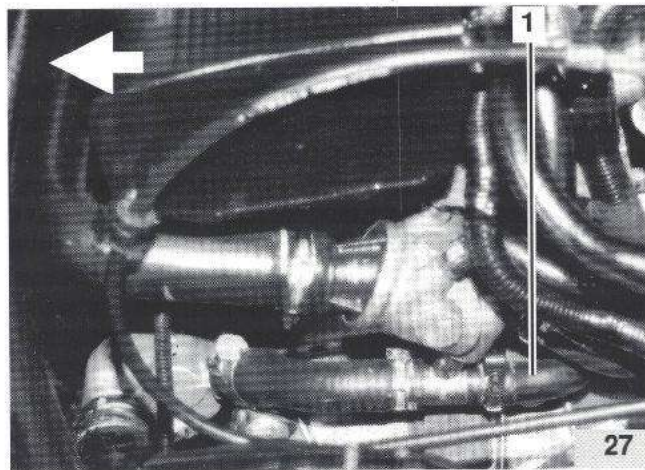
- Attach the water hose (25/3) (620 mm long) to the engine outlet and the heater inlet and secure with hose clamps

- hose routing, see Figure 26



1.81 16V without air conditioning (picture 27)

- Remove the vehicle-side water hose (27/1) from the engine outlet to the heating heat exchanger at the engine outlet
- Attach the water hose (600 mm long + 180° bend) with a 180° bend to the engine outlet and the straight side to the heater inlet and secure with hose clamps
- Connect the pre-assembled water hose from the heater outlet to the water hose (27/1) to the heater heat exchanger using a connecting pipe 18/18 and secure with hose clamps



water connection (direction of travel right)

A NOTICE:

When laying the water hoses, ensure that there is sufficient distance from the pulley!

1.41 12V with air conditioning

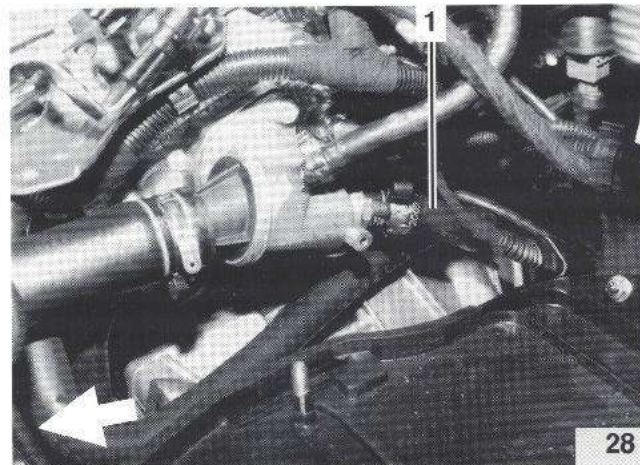
1.6l 16V with air conditioning

1.81 16V with air conditioning

- Cut water hoses to length according to the installation conditions, pull heat protection hose over them and install as described.

2.01 20V with or without air conditioning (Figure 28)

- Cut water hoses to length according to the installation conditions and cover with heat protection hose
- Remove the vehicle-side water hose (28/1) from the engine outlet to the heating heat exchanger at the engine outlet
- Attach the water hose with a 180° bend to the engine outlet and the heater inlet and secure with hose clamps
- Connect the water hose from the heater outlet to the water hose (28/1) to the heater heat exchanger using a connecting pipe 18/18 and secure with hose clamps



Fuel integration

The fuel is taken from the vehicle-side fuel return line

DANGER:

Open the vehicle's fuel tank cap, ventilate the tank and close the fuel tank cap again! Collect any leaking fuel in a suitable container!

A NOTICE:

When installing on the right-hand side in the direction of travel, ensure that there is sufficient distance between the fuel hoses and the belt pulley!

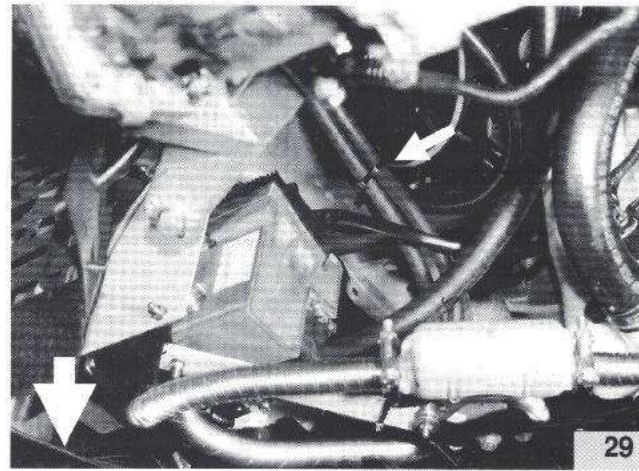
fuel integration (heater)

(Valid for all vehicles) Picture 29 shows 1.6l 16V!

A NOTICE:

Pay attention to the flow direction (arrows on the heater)!

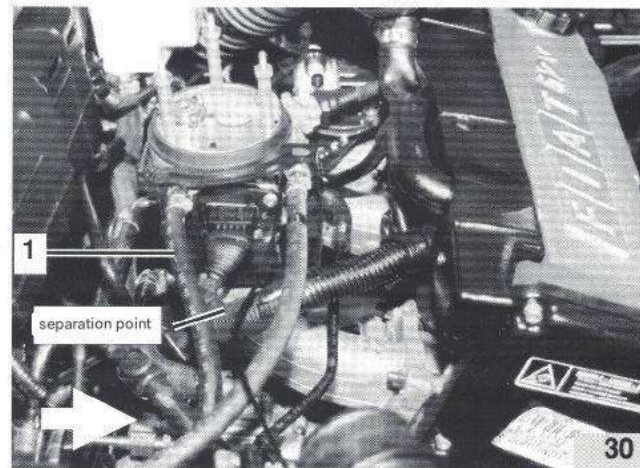
- Cut the enclosed fuel line in the middle, attach it to the heater (Figure 29), fasten it with hose clamps and mark the free ends. Route the fuel lines from the heater
- upwards to the bulkhead, lead them to the vehicle's own fuel return line (on the right in the direction of travel) and cut to length.
- Fix fuel lines to existing lines with cable ties



fuel connection (vehicle side)

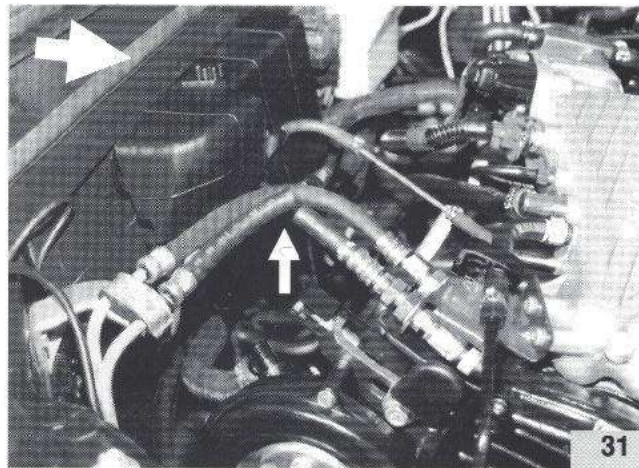
1.41 12V (Figure 30)

- Disconnect the vehicle's fuel return line (30/1)
- Connect the fuel line from the heater inlet to the fuel return line (from the injection system) using an 8x8 connecting pipe and secure with hose clamps
- Connect the fuel line from the heater outlet to the fuel return line (to the tank) using an 8x8 connecting pipe and secure with hose clamps

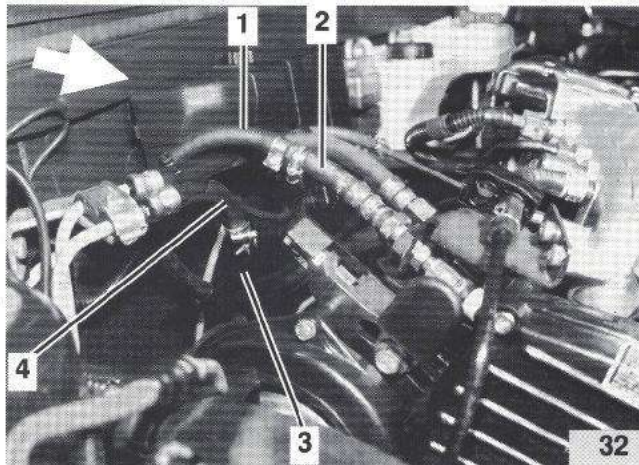


1.6l 16V (Figure 31 and Figure 32)

- Disconnect the vehicle's fuel return line as shown in Figure 31

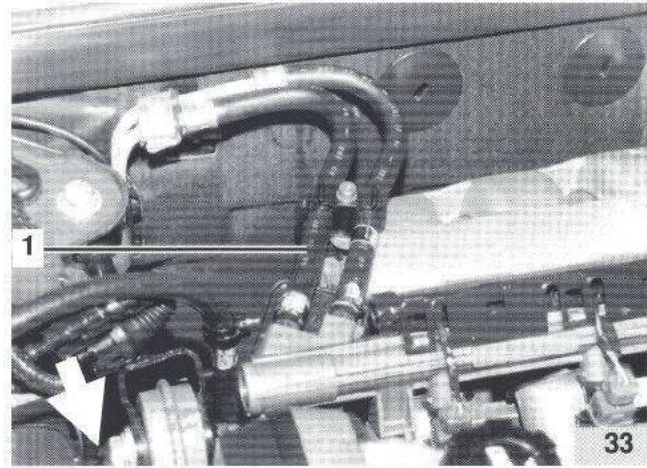


- Connect the fuel line (32/1) from the heater inlet to the fuel return line (32/2) (from the injection system) using an 8x8 connecting pipe and secure with hose clamps. Connect the fuel line (32/3) from the heater
- outlet to the fuel return line (32/4) (to the tank) using an 8x8 connecting pipe and secure with hose clamps.



1.81 16V (Figure 33)

- Remove the vehicle's fuel return line (33/1) from the engine
- Connect the fuel line from the heater inlet to the engine outlet and secure with a hose clamp
- Connect the fuel line from the heater outlet to the fuel return line (to the tank) using an 8x8 connecting pipe and secure with hose clamps



2.01 20V (Figure 34)

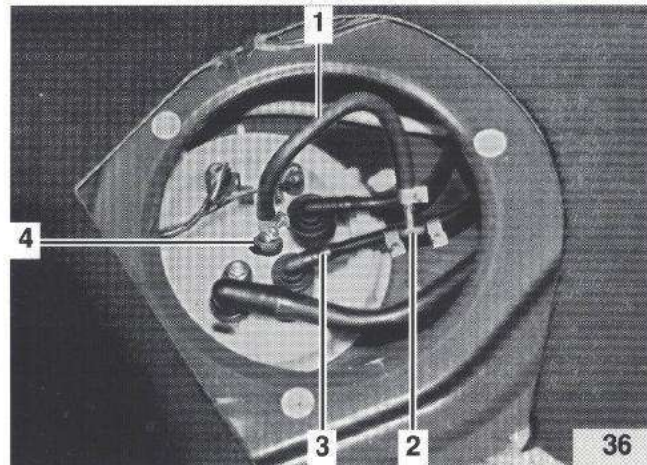
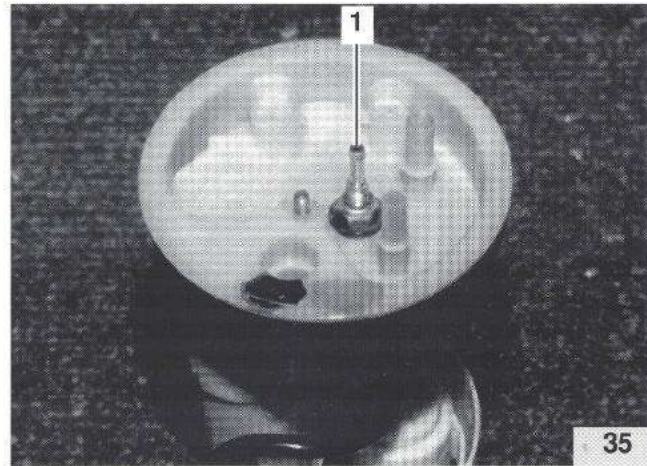
- Remove the vehicle's fuel return line (34/1) from the engine
- Connect the fuel line from the heater inlet to the engine outlet and secure with a hose clamp
- Connect the fuel line from the heater outlet to the fuel return line (to the tank) using an 8x8 connecting pipe and secure with hose clamps



Bypass for check valve in the fuel return line (tank fitting)

(valid for all vehicles)

- Remove the cover to the tank (in the trunk) and
- install the bypass as shown in Figure 35 and Figure 36
- Remove the tank fitting according to the manufacturer's instructions. Drill a hole \varnothing 8.5 mm for the tank extractor (35/1) in the tank fitting as shown in Figure 35.
- Insert tank extractor (35/1) Order No. 83813A into tank fitting with washers, seals and M8 nut
- Install the tank fitting according to the manufacturer's instructions
- Disconnect the vehicle's return line (36/3) as shown in Figure 36
- Insert the fuel extractor (36/2) into the return line and secure with hose clamps
- Connect the tank extractor (36/4) to the fuel extractor (36/2) using the hose piece (36/1) and hose clamps. Replace the cover



Electrical connections

(valid for all vehicles)

A NOTICE:

Make sure that all cable ducts are protected against abrasion!

- Wiring harness for timer and fan control lead through existing cable duct into the interior
- Seal the cable duct with sealant
- Connect the positive wire to the battery positive and the ground wire to the negative
- Establish electrical connections (heater side) according to the corresponding circuit diagram in the Thermo Top operating and installation instructions

Timer assembly

(valid for all vehicles)

DANGER:

When installing the timer, do not press on the LCD display

A NOTICE:

The installation location of the timer shown is a recommendation! Please agree the installation location with your customer before installation

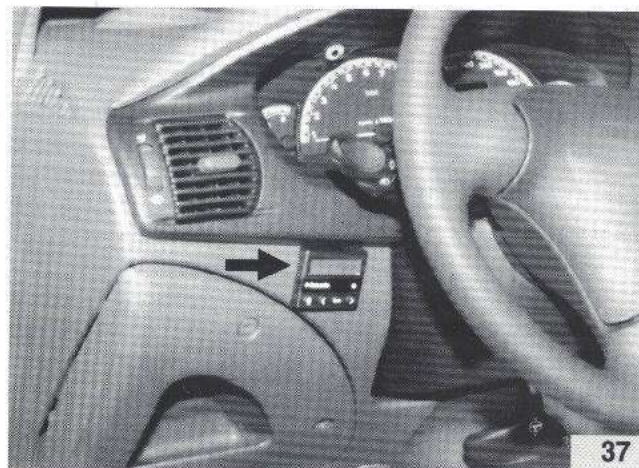
- Glue the drilling template for the timer to the position suggested in Figure 37
- drill two holes according to the template
- Remove stencil
- Install the fastening sleeve with sheet metal screws

A NOTICE:

Pay attention to the direction of the locking teeth (see installation instructions)!

When laying the cable harness, pay attention to chafing protection!

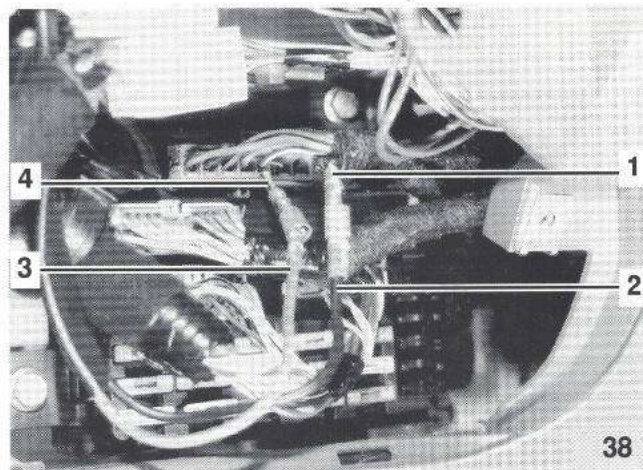
- Pull the cable harness of the timer through the hole and connect the plug to the timer
- Attach the timer



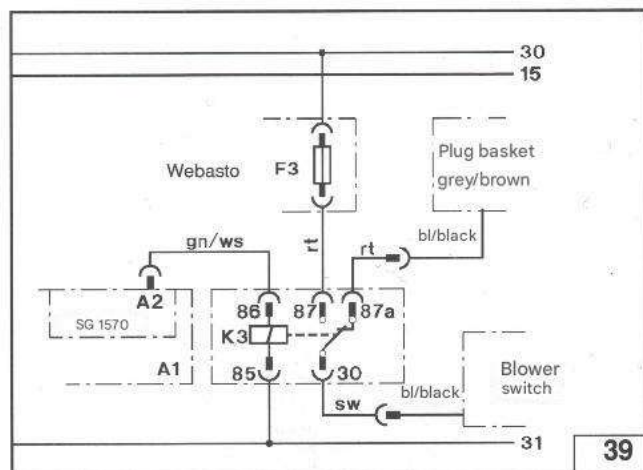
37

Fan control

- Remove the panel on the driver's side
- Disconnect the blue/black cable approx. 30 mm before the plug (plug basket grey/brown) (Figure 38)
- Crimping circular connectors



- Connect the black cable (38/2) from the fan relay K3/30 to the blue/black cable (38/1) to the fan switch
- Connect the red cable (38/3) from the fan relay K3/87a to the blue/black cable (38/4) to the connector



Final work and initial commissioning

- Attach the duplicate type plate visibly in the engine compartment
- Reassemble dismantled parts in reverse order
- Check all hose lines, hose and pipe clamps as well as all electrical connections for tightness
- Secure all loose cables with cable ties
- Spray heater components with anti-corrosion wax (Tectyl 100K, Order No. 111329)
- Start the engine, bleed the water circuit, refill the cooling water
- Set the vehicle heating to "warm" and the fan speed to "2"
- Switch on the Webasto heater, see "Operating Instructions"

Webasto

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