HYDRONIC

Installation Recommentations

Eberspächer

J. Eberspächer
GmbH & Co. KG
Eberspächerstr. 24
D - 73730 Esslingen

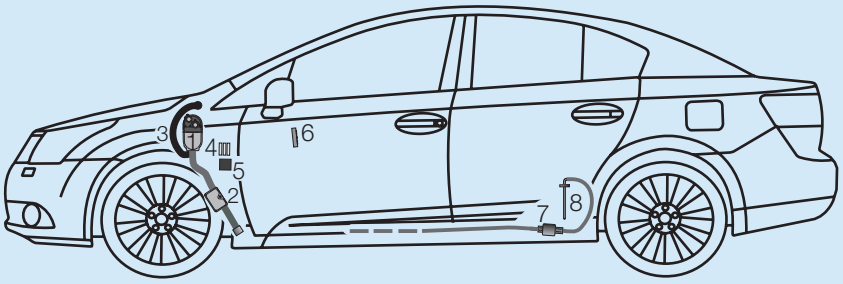
Service-Hotline
01805 - 26 26 26
Facsimile
01805 - 26 26 24

New vehicle-specific mounting kit + auxiliary heating

HYDRONIC B5W SC in Toyota Avensis (T 27)

2009 model
with automatic air conditioning
with fog lamps
with manual transmission or multidrive-s-transmission
• 1,6 l cubic capacity / 4-cylinder-in-line engine / 97 kW - 132 HP (Valvematic)
• 1,8 l cubic capacity / 4-cylinder-in-line engine / 108 kW - 147 HP (Valvematic)
• 2,0 l cubic capacity / 4-cylinder-in-line engine / 112 kW - 152 HP (Valvematic)

This installation recommendation is valid for the vehicle described above and is exempt from any liability claims whatsoever. Depending on the version or modification status of the vehicle, differences can result between it and this installation recommendation. The installer must check this before installation and, if necessary, take into account the differences compared to this installation recommendation.



1 *HYDRONIC* B5W SC
2 Exhaust pipe with exhaust silencer
3 Combustion air tube
4 Fuse bracket
5 Fan relay
6 EasyStart T
7 Fuel metering pump
8 fuel tank extraction

Installation position
The *HYDRONIC* B5W SC is fixed by the heater bracket in normal position to the engine partition on the right.
The exhaust stack is pointing downwards, the water connections are pointing to the left.

For the installation required:
(1) vehicle-specific mounting kit
(2) auxiliary heating *HYDRONIC* B5W SC
(3) operating element EasyStart at buyer´s option

Installation time: approx. 6 h

Contents

		Page
1	Introduction	2
2	Installation - Heater	4
3	Exhaust - and combustion air circuit	6
4	Water circuit	8
5	Fuel supply	11
6	Electrics	13
7	After installation	19
8	Parts overview	20
9	Leaflet for the customer	21

20 1820 95 22 98 07.2009 We reserve the right to make changes. Printed in Germany © J. Eberspächer GmbH & Co. KG

1 Introduction

Caution!
Safety instructions for installation and repair work!

Improper installation or repair of Eberspächer heaters can cause a fire or result poisonous exhaust entering the inside of the vehicle.
This can cause serious and even fatal risks.

The heater may only be installed according to the specifications in the technical documents and repaired using original spare parts by authorised and trained persons. Installation and repairs by unauthorised and untrained persons, repairs using non-original spare parts and without the technical documents required for installation and repair are dangerous and therefore are not perwithted.

Please note!

Installation according to this installation recommendation may only be carried out in conjunction with the respective unit type-related technical description, installation instructions, operating instructions and maintenance instructions.
This document must be read through carefully before / during installation and followed throughout.
Particular attention is to be paid to the safety instructions and general instructions.
The relevant rules of sound engineering practice and any information provided by the vehicle manufacturer are to be noted observed during the installation.
Eberspächer does not accept any liability for defects and damage due to installation by unauthorized and untrained persons.

Accident prevention

General accident prevention regulations / health and safety regulations and the corresponding workshop, company and operating safety instructions are to be observed.

Installation recommendation validity

The installation recommendation is valid for the vehicle with the engine and gearbox options listed in the following.

Engine- and transmission versions		
cubic capacity	kW / HP	transmission
1,6 l	97 / 132	6S
1,8 l	108 / 147	6S / MS
2,0 l	112 / 152	6S / MS

6S = 6-speed manual gearbox
MS = Multidrive-S-gearbox

Please note!

The installation recommendation is not valid for right-hand drive vehicles.

Vehicle types, engine types and feature options not listed in this installation recommendation have not been tested. Installation according to this installation recommendation can, however, be possible.

1 Introduction

Parts required for the installation

Quantity / Designation	Order No.
(1) Vehicle-specific mounting kit:	
1 vehicle-specific mounting kit*	24 8443 00 00 00
(2) Auxiliary heating:	
1 *HYDRONIC* B5W SC	20 1820 05 00 00
(3) Operating element EasyStart optional:	
1 EasyStart T	22 1000 32 88 00
1 bracket	22 1000 51 32 00
or	
1 radio remote control EasyStart R+	22 1000 32 80 00
or	
1 radio remote control EasyStart R	22 1000 32 85 00

**** Please note:*** *In the new vehicle-specific mounting kit* ***all*** *parts required for the installation are included.*

Special tools required

- torque wrench (5...50 Nm)
- corrosion inhibitor
- crimping tool
- pliers for spring band clamps
- wrench for the coupling ring on the tank fitting

Tightening torques

If not tightening torques are specified, tighten the screw connections (hexagon screw and hexagon nut) according to the following table.

screwed connections	tightening torques
M6	10 Nm
M8	20 Nm
M10	45 Nm

Preparations to the vehicle

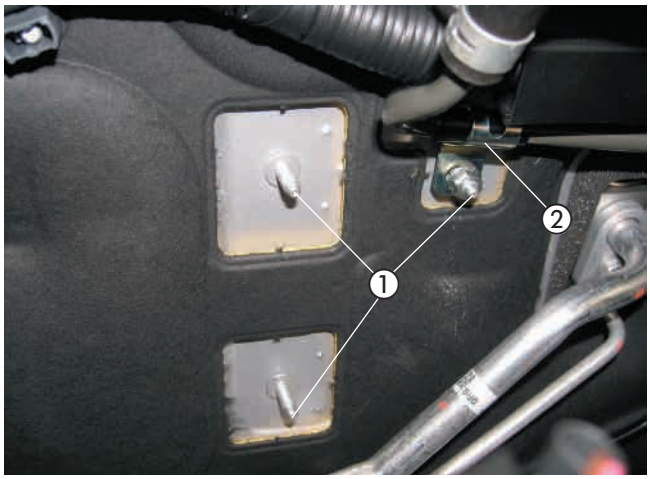
- disconnect battery
- remove back seat
- demount bottom left dashboard coating
- demount left centre console coating
- demount wiper tub cover
- demount wiper tub
- demount windscreen wiper linkage
- demount top engine cover
- demount bottom engine cover
- demount left under lining
- depressurise the cooling system
- drain coolant into a clean container

2 Installation - heater

Prepare installation position
(see picture 1)

Demount the vacuum pipe to the brake booster from the M6 stud bolt of the engine partition.

The three existing M6 stud bolts on the right side of the engine partition serve as mounting points of the heater bracket.

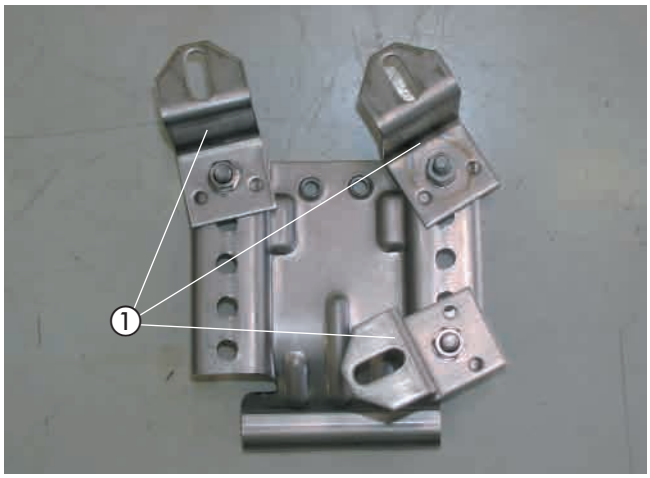


picture 1

① three existing M6 stud bolts
② vacuum pipe to the brake booster

Prepare and mount heater bracket
(see pictures 2 and 3)

Mount the three brackets (z-angle) to the heater bracket 22 1000 51 36 00 each with a M6 x 16 screw, and align it according to the picture.

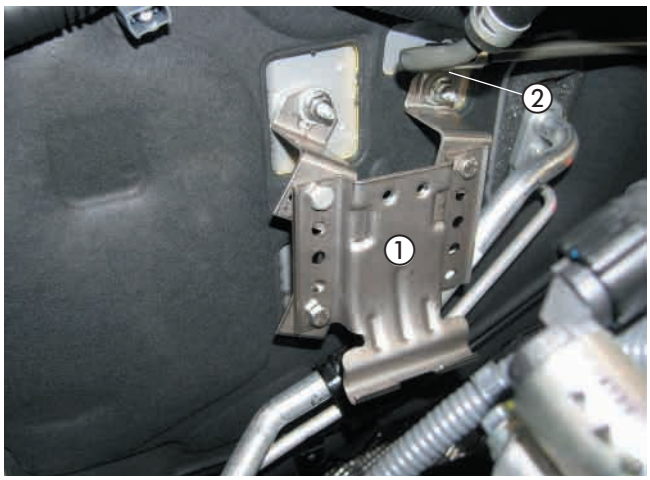


picture 2

① three brackets (z-angle) 20 1533 88 00 07, mounted to the heater bracket

Attach the heater bracket 22 1000 51 36 00 to the three M6 stud bolts of the engine partition using each a M6 nut and a B6 large diameter washer.

In doing so, also screw the vacuum pipe to the brake booster to the left upper M6 stud bolt.



picture 3

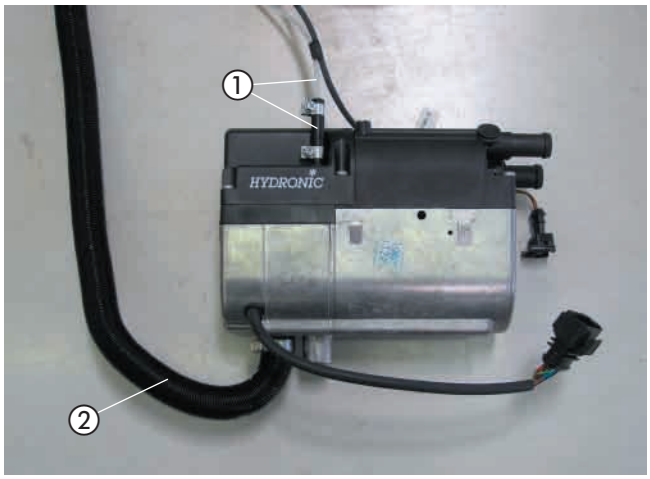
① heater bracket 22 1000 51 36 00, attached
② vacuum pipe to the brake booster, attached

2 Installation - heater

Install heater
(see pictures 4 and 5)

Connect the fuel pipe Ø 4 x 1.25 mm with fuel hose, Ø 3.5 x 3 mm, length 50 mm, to the fuel socket of the heater.

Connect the combustion air pipe using a hose clamp Ø 16-25 mm to the heater and and turn it up, according to the picture.



picture 4

① fuel pipe, Ø 4 x 1.25 mm, mounted to the heater
② combustion air pipe, connected

Remove the second factory plate (duplicate) from the heater. Deface the dates which are not applicable.
Attach the second factory plate in a suitable, clearly visible position in the engine compartment.

Insert the heater into the heater bracket 22 1000 51 36 00 and fix in the right threaded hole using the M6 x 95 fixing screw with $6^{+0,5}$ Nm.



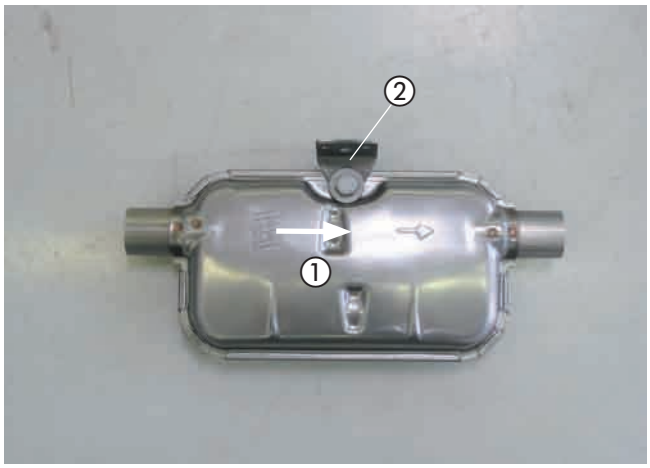
picture 5

① heater, attached

3 Exhaust - and combustion air circuit

Install exhaust silencer and connect
(see pictures 6 to 9)

Attach the bracket (90°-angle) to the exhaust silencer using a M6 x 16 screw and a large diameter washer B6, according to the picture.

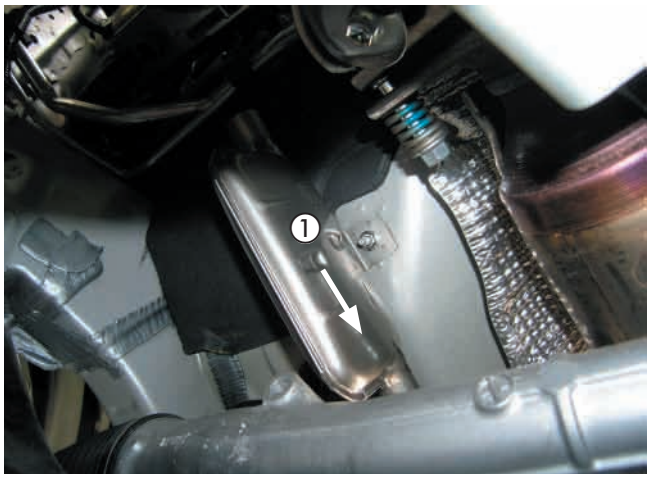


picture 6

① bracket (90°-angle), attached to the exhaust silencer

Mount the exhaust silencer with the bracket (90°-angle) to the existing M6 stud bolt at the engine compartment according to the picture.

The arrow on the exhaust silencer is showing the throughflow direction and points backwards.

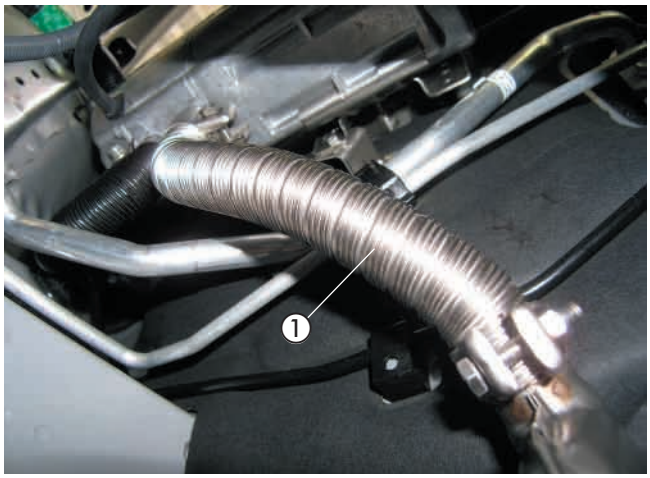


picture 7

① exhaust silencer, attached

Cut the exhaust pipe to a length of 240 mm and shape it according to the picture.

Connect the exhaust pipe each with a pipe clamp to the exhaust outlet connection of the heater and to the inlet connection of the exhaust silencer.



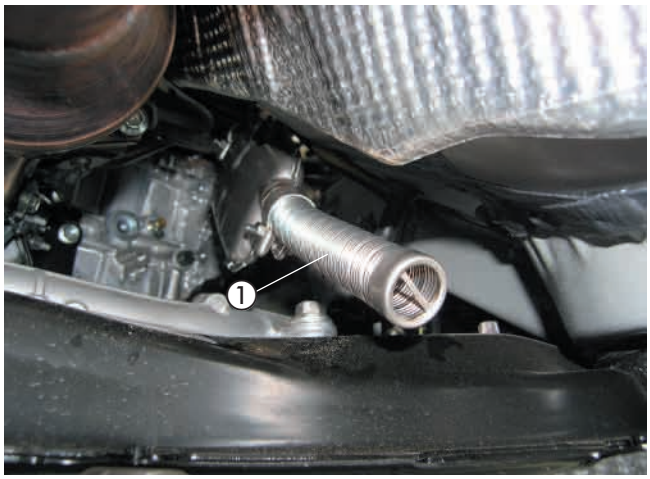
picture 8

① exhaust pipe, mounted

3 Exhaust - and combustion air circuit

Cut the exhaust tailpipe to a length of 150 mm.

Connect the exhaust tailpipe to the outlet connection of the exhaust silencer, using a pipe clamp.



picture 9

① exhaust tailpipe, connected

Please note!

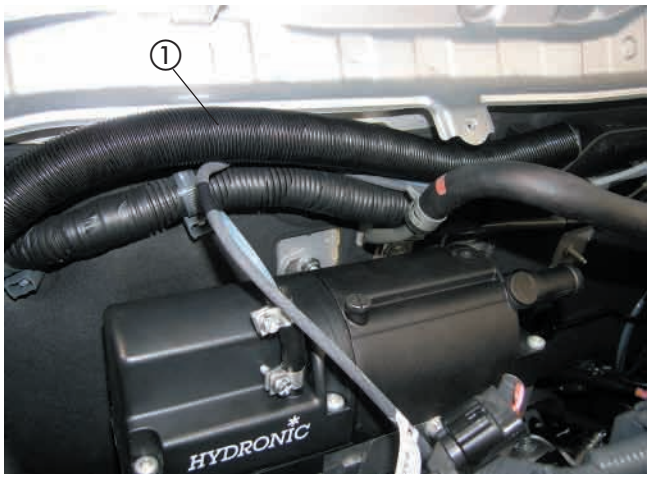
When laying the exhaust pipes, ensure they are at a sufficient distance from adjacent components and lines.

Lay combustion air pipe
(see picture 10)

Guide the combustion air pipe upwards and lay it to the protected range of the engine compartment.

Fix the combustion air pipe to the on-board wiring harness, using cable ties.

Make a drain hole, Ø 2 mm, for condensation in the deepest point of the laid combustion air pipe.



picture 10

① combustion air pipe , laid

Please note!

Lay the combustion air pipe so that only clean and dry combustion air can be drawn in through the heater.

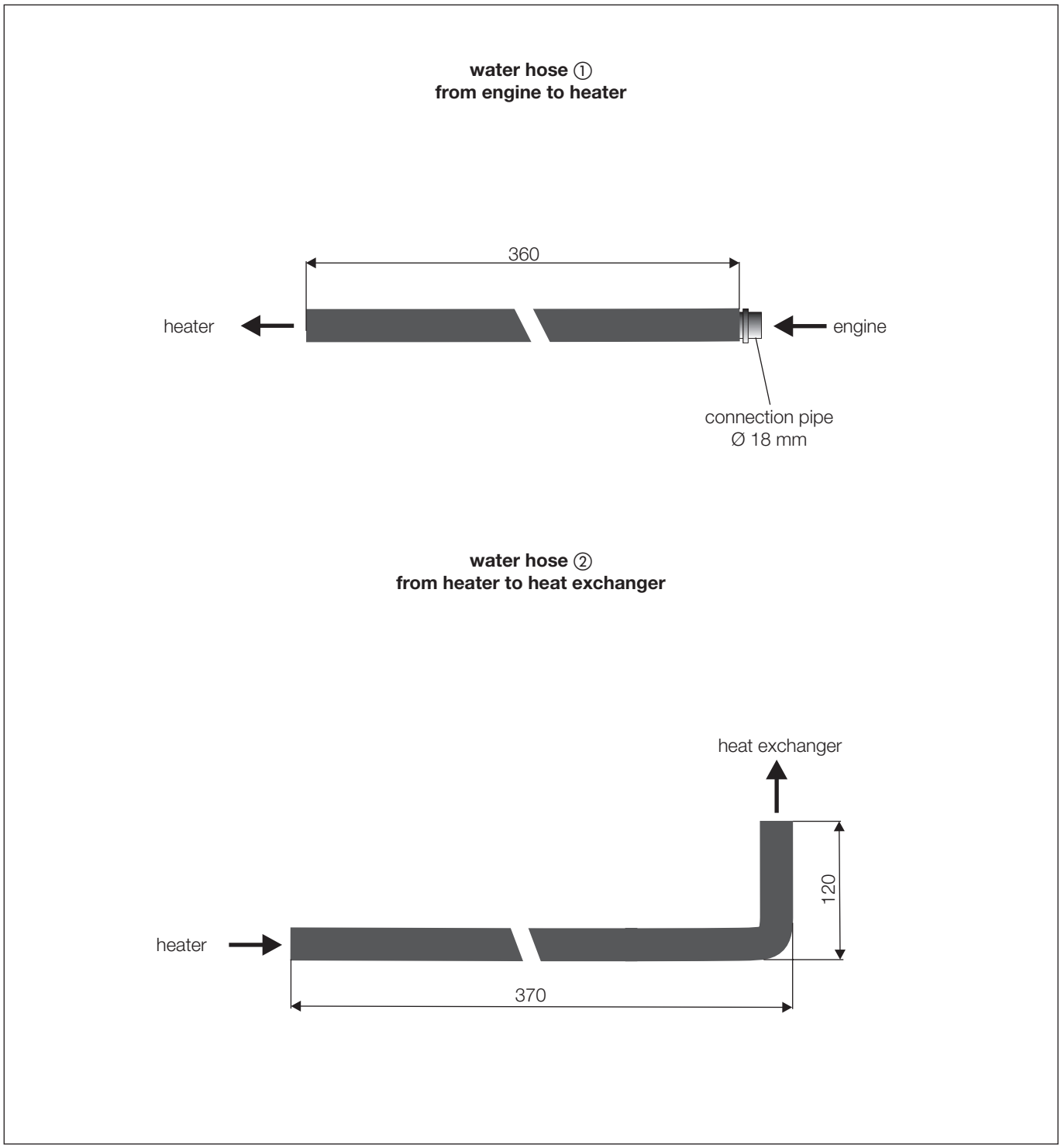
4 Water circuit

Prepare water hoses
(see sketch 1)

Cut the water hoses to size according to the dimensioning shown in the sketch.

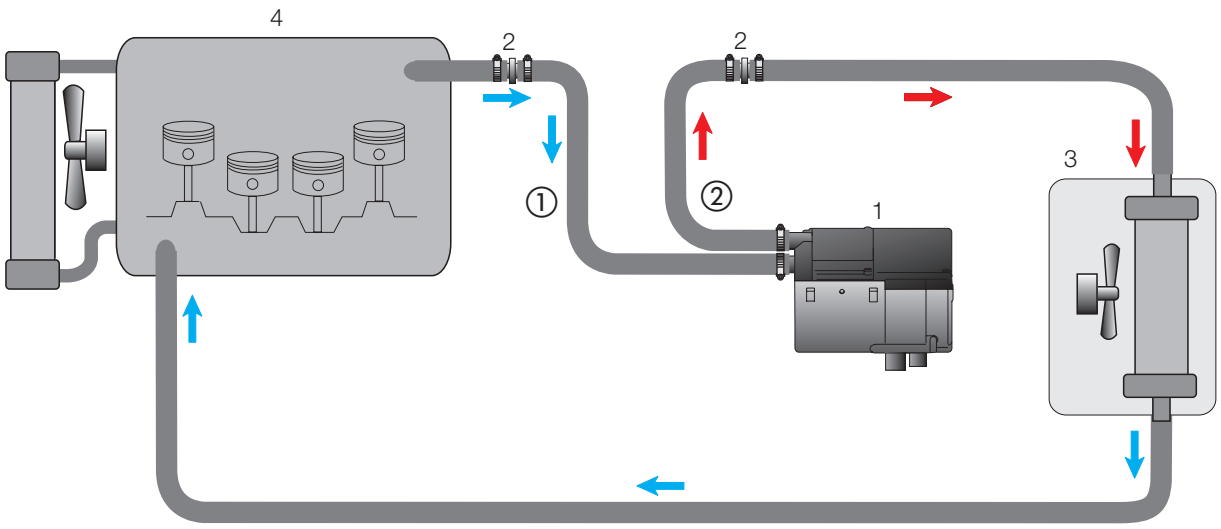
Please note!

The water hoses are connected to the water circuit “Inline“, refer to the Technical Description, “Installation“ chapter Connection to the cooling water circuit“ section.



sketch 1

4 Water circuit



1 - heater
2 - connection pipe Ø 18 mm
3 - vehicle heat exchanger
4 - engine
- hose clamp Ø 20 - 32 mm

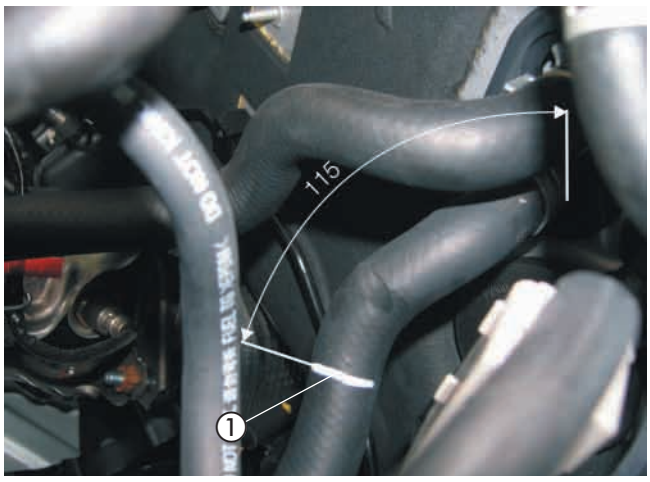
sketch 2

Cut water feed hose
(see picture 11)

Cut the water feed hose from the engine to the heat exchanger (the lower water hose at the heat exchanger) according to the dimensioning in the picture.

Loosen the hose clamp at the lower heat exchanger connection and pull off the hose piece.

The detached hose piece is no longer required.



picture 11

① cut-off point at the water feed hose

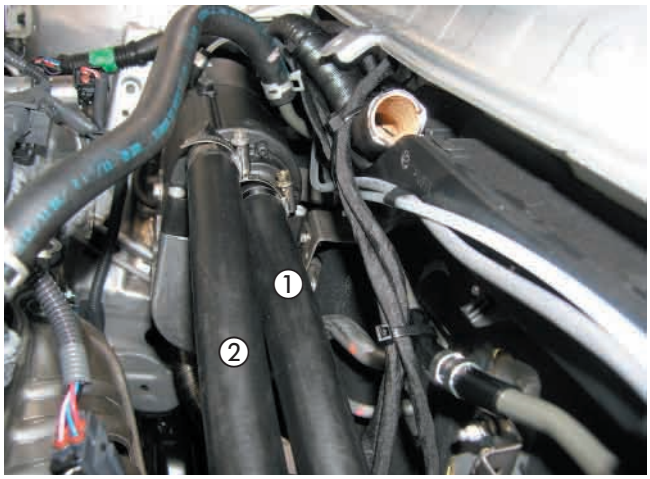
4 Water circuit

Lay and connect water hoses
(see pictures 12 and 13 as well as sketch 2)

Connect water hose ① to the water inlet connection of the heater.

Connect water hose ② to the water outlet connection of the heater.

Lay water hoses ① and ② to the cut-off point at the water feed hose.



picture 12

① water hose ①
② water hose ②

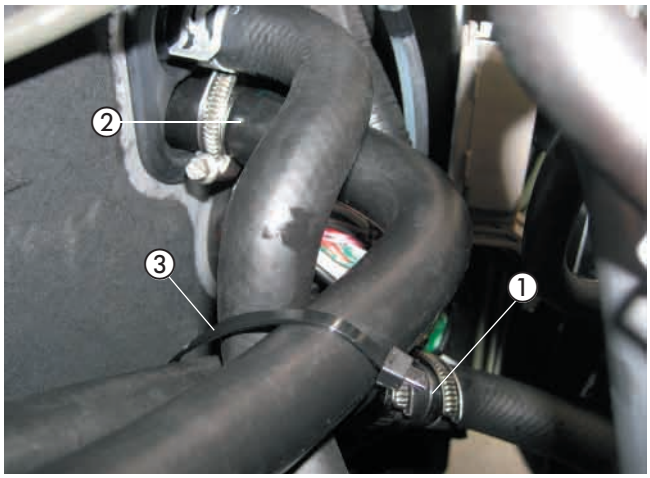
Connect water hose ① with connection pipe, Ø 18 mm, to the water feed hose from the engine.

Connect water hose ② to the lower hose connection of the heat exchanger.

Fix water hoses ① and ② as well as the on-board water hose, using a cable tie.

Please note!

Secure all hose connections with hose clamps.
Protect the water hoses against chafing and use cable ties to secure in suitable positions.



picture 13

① water hose ①
② water hose ②
③ cable tie

5 Fuel supply

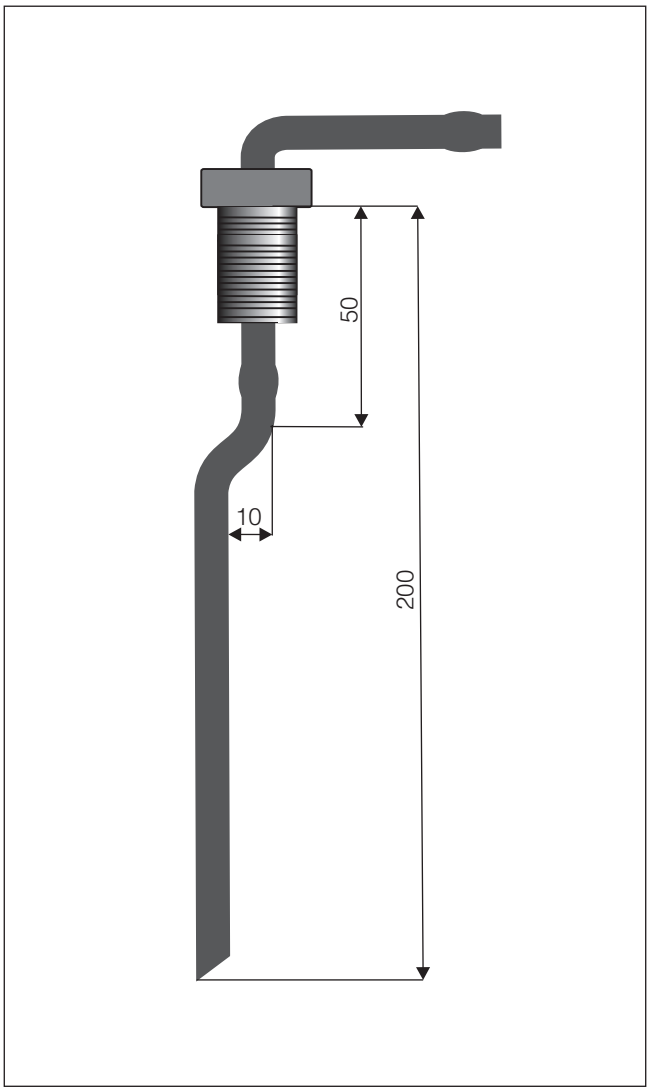
Install fuel connection
(see pictures 14 to16 as well as sketch 3)

Prepare the riser pipe of the fuel connection as shown in the sketch.
Obliquely cut the bottom end of the riser pipe, with approx. 45° angle, to the correct length.

Undo the plug-in connection and the fuel line at the tank connection.
Remove the tank fitting from the tank opening by loosening the universal nut.

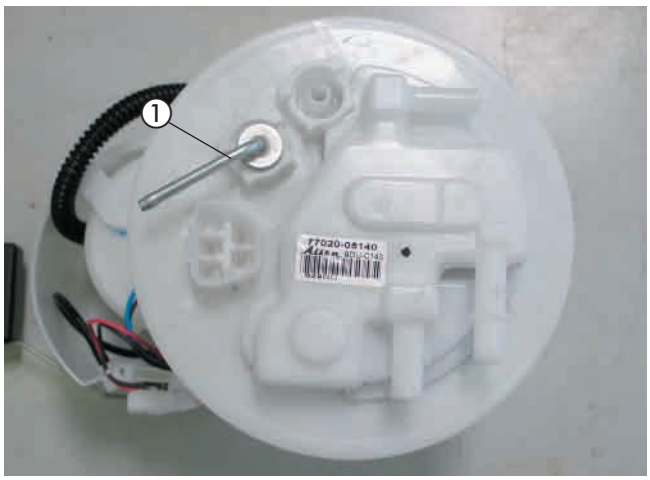
Please note!

The tank fitting should not be removed for longer than 10 minutes because of expansion of the tank!
When drilling, ensure that no dirt gets into the the tank or the supply lines.



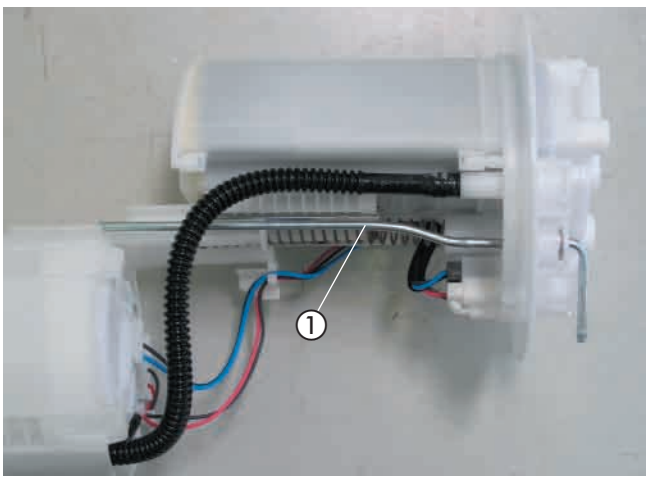
sketch 3

Make a Ø 8 mm drill hole in the pre-marked position in the upper section of the tank fitting.
Guide the fuel connection through the prepared drill hole in the cover of the tank fitting, screw tight with the M8 nut underside and align as shown in the photo.



picture 14

① fuel connection installed



picture 15

① fuel connection installed

5 Fuel supply

Insert the tank fitting back into the tank, ensure the seal fits properly.
Reconnect the plug-in connection and the fuel line at the tank fitting.

Connect the fuel pipe Ø 4 x 1 mm with fuel hose Ø 3.5 x 3 mm, length 50 mm, to the intake connection of the fuel connection and lay to the installation position of the fuel metering pump on the left next to the tank.

Refit the cover in the floor panel above the tank.

Please note!

Secure all connection points with hose clips, Ø 9 mm.



picture 16

① fuel connection, installed

Install and connect fuel metering pump
(see pictures 17 and 18)

Insert the fuel metering pump into the rubber holder and fix to the existing M6 stud bolt on the left side of the underbody using a
M6 nut as well as a B6 large diameter washer, according to the picture.
Ensure it is installed with at least 15° rising gradient for the pressure socket.
The pressure socket of the fuel metering pump is pointing backwards.

Cut the fuel pipe Ø 4 x 1 mm from the fuel connection to the fuel metering pump and connect with fuel hose, Ø 3.5 x 3 mm, length 50 mm to the intake socket of the fuel metering pump.

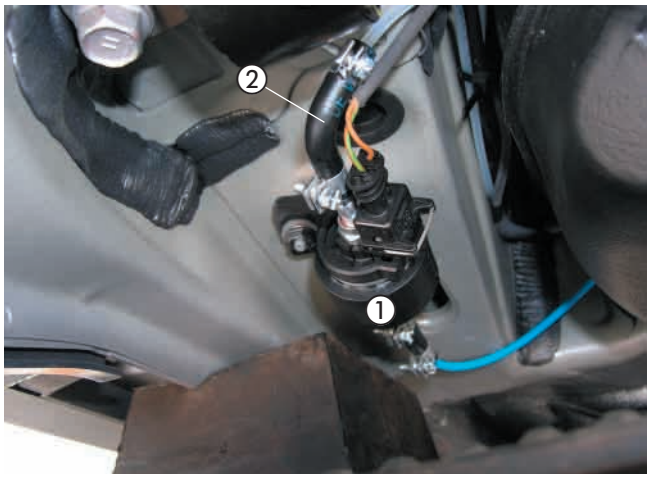
Remove the mating connector of the fuel metering pump connection at the main wiring harness.
Remove the dummy plugs from the mating connector.
Plug the connector of the enclosed fuel metering pump cable into the fuel metering pump connection of the main wiring harness.

Lay the fuel pipe Ø 4 x 1.25 mm from the heater in conjunction with the fuel metering pump cable along the on-board fuel pipes to the fuel metering pump and fix it using cable ties.
Cut the fuel pipe Ø 4 x 1.25 mm to length and connect it with the 90°- fuel hose bend to the pressure socket of the fuel metering pump.

Engage the plug-in contacts of the fuel metering pump cable into the mating connector without noting the polarity.
Plug the connector in to the fuel metering pump.

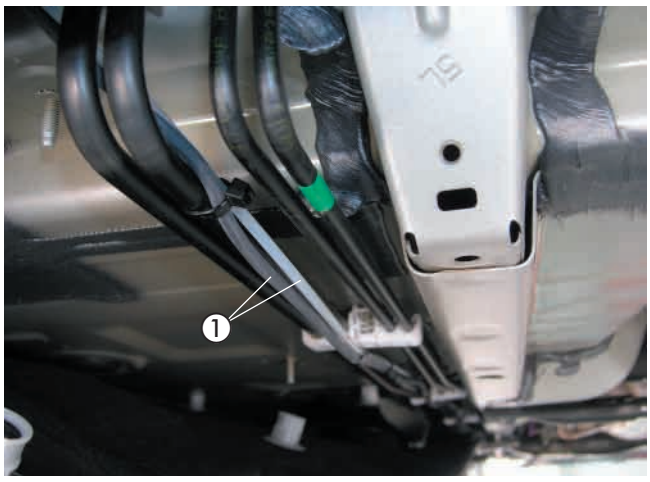
Please note!

Use a sharp knife to cut the fuel pipe to length.
Secure all hose connections with hose clips.
When laying fuel lines, always ensure they are at an adequate distance from hot vehicle and heater parts.



picture 17

① fuel metering pump with rubber holder, installed
② 90°- fuel hose bend, installed



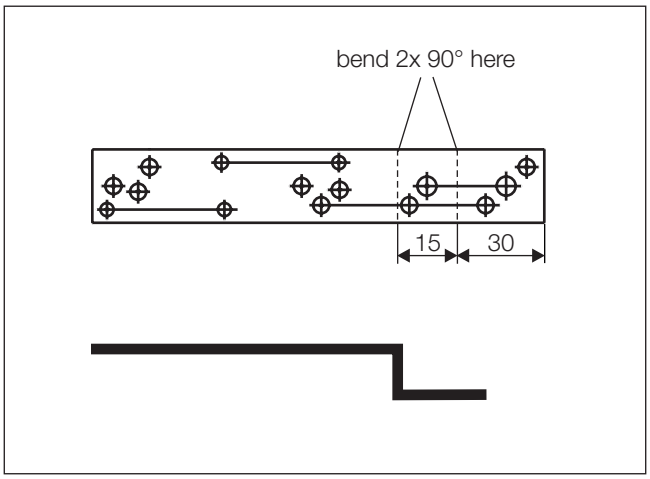
picture 18

① fuel pipe Ø 4 x 1.25 mm and wiring harness, laid

Install fuses and blower relay
(see picture 19 as well as sketches 4 und 5)

Prepare the bracket of the fuse and relay base according to the sketch.

Tighten the fuse holder, using two M4 x 16 screws, and the relay base, using a M5 x 10 screw, to the bracket of the fuse and relay base.



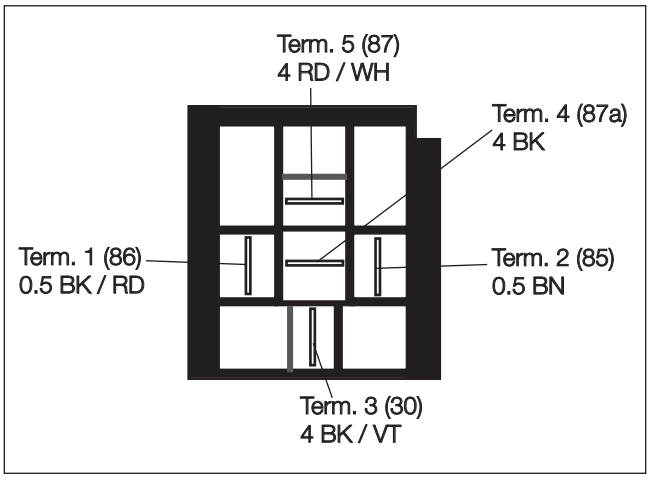
sketch 4

Latch the cable 0.5 mm² BN of the main wiring harness into terminal 85 of the relay base.

Remove the push-on contact housing from 0.5 mm² BKRD cable of the main wiring harness, and latch the push-on contact into terminal 86.

Remove the dummy plugs from the fuse base.
Latch the cable 4 mm² RDWH from the relay base into the still free slot of the fuse base.

Connect the 8 pin connector of the main cable harness to the 8 pin flat connector housing of the heater´s wiring harness.

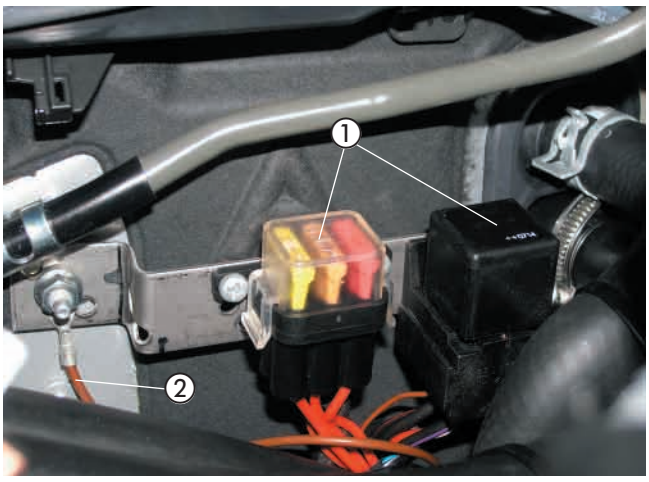


sketch 5

Cut the 2.5 mm² BN minus cable to length and crimp a A6 cable lug.

Install the bracket of the fuse and relay base along with the minus cable 2.5 mm² BN to the existing M6 stud bolt at the engine compartment using a M6 nut.

Remove the 25 A fuse of the vehicle blower from the fuse base and set in a 10 A fuse.



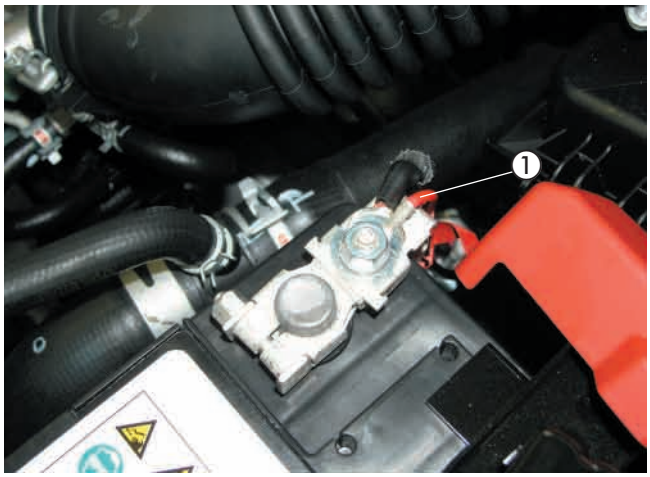
picture 19

① fuses and blower relay, installed
② 2.5 mm² BN minus cable, connected

6 Electrics

Power supply
(see picture 20)

The positive power supply occurs at the battery positive terminal.
For that purpose, lay the 4 mm² RD plus cable to the battery positive terminal and connect using a A6 cable lug.



picture 20

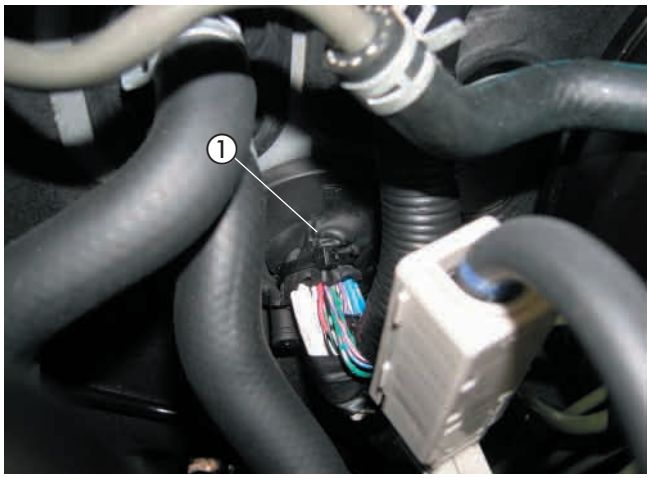
① 4 mm² rt power supply plus cable

Cable laying
(see picture 21)

Lay the wiring harnesses “operating element” and “blower control“ through the existing grommet in the engine compartment, to the right of the break booster, into the vehicle interior.

Please note!

When laying wiring harnesses, always ensure they are at an adequate distance from hot and flexible vehicle and heater parts.
Use cable ties to fix the wiring harnesses in suitable places.



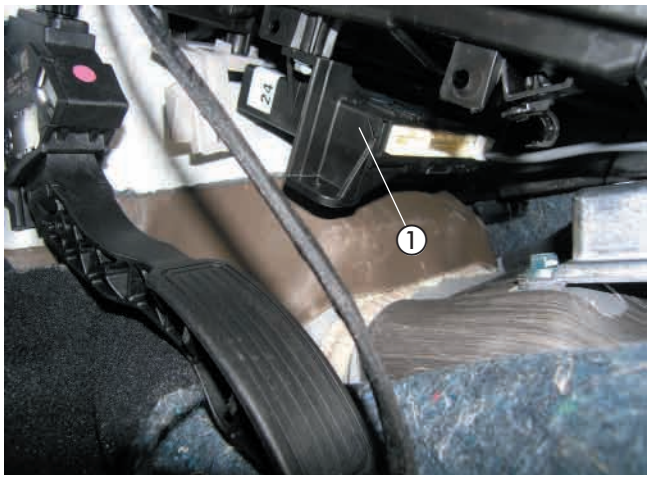
picture 21

① on-board cable grommet

Power supply
(see pictures 22 and 23 as well as sketch 6)

The electronic control unit AC-control is provided to the right of the accelerator pedal above the transmission tunnel.

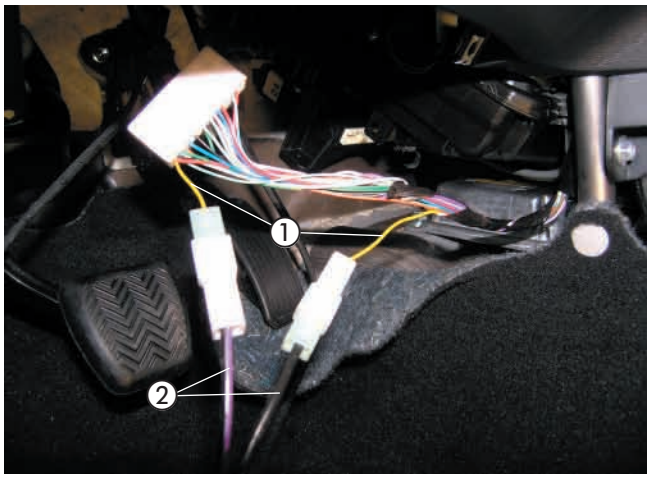
Unplug the 40 pin connector D 47 from the control unit AC-control.



picture 22

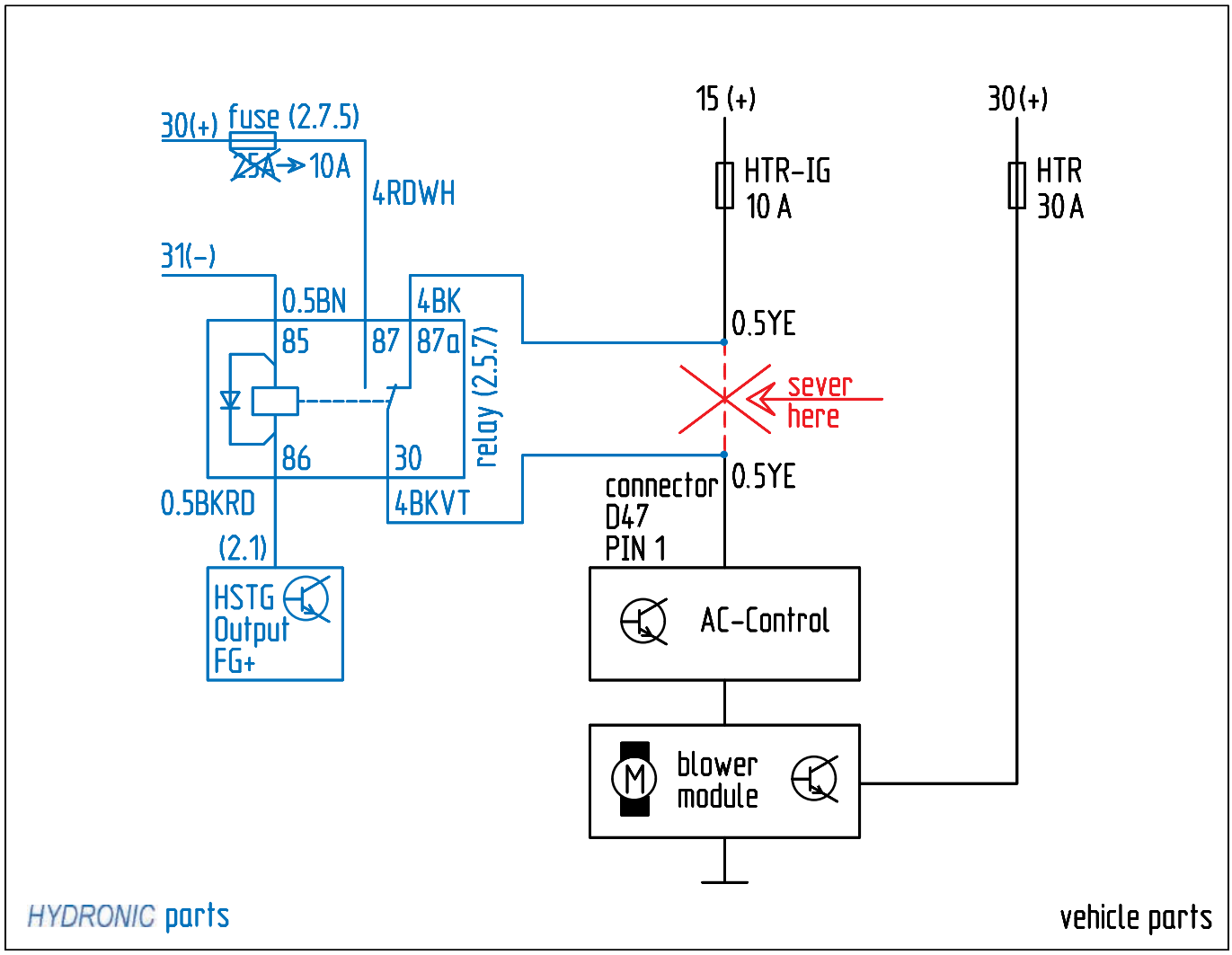
① electronic control unit AC-control

Cut through the 0.5 YE cable (pin 1) at the 40 pin connector D47 and tie the cables 4 mm² BK and 4 mm² BKVT in, according to the circuit diagram, using plug-in connectors.



picture 23

① 0.5 mm² YE cable (pin 1), cut through
② 4 mm² BK cable and 4 mm² BKVT, tied in


30(+)
fuse (2.7.5)
25A → 10A
4RDWH
31(-)
0.5BN
85
87
4BK
87a
relay (2.5.7)
86
30
0.5BKRD
4BKVT
(2.1)
HSTG
Output
FG+
15 (+)
HTR-IG
10 A
0.5YE
sever
here
connector
D47
PIN 1
0.5YE
AC-Control
blower
module
30(+)
HTR
30 A
HYDRONIC parts
vehicle parts

sketch 6

Install EasyStart T
(see picture 24)

The EasyStart T is installed according to the “EasyStart T“ installation instruction.

Install the EasyStart T timer with the bracket on the dashboard cladding to the left of the steering column.

Align the bracket on the mounting surface and trace the drill holes onto the mounting surface.
Make the Ø 3 mm and Ø 8 mm drill holes.
After drilling, remove the drilling template.
Attach the bracket using the enclosed B 3.5 x 19 attachment screws.

Guide the “control” lead harness through the Ø 8 mm drill hole, and use the expansion plug to pre-install the timer in the Ø 6.5 mm hole.
Push or screw the attachment screw into the expansion plug and use it to fix the timer.

Latch in the flat connector from the “control” lead harness into the 9 pin flat connector housing, the already installed push-on contacts into the push-on contact housing.
Push the safety clip into the flat connector housing.
Pull off the protective film of the cover cap and paste in the cover cap.

Please note!

Do not decide on the installed location of the timer until consulting the customer.



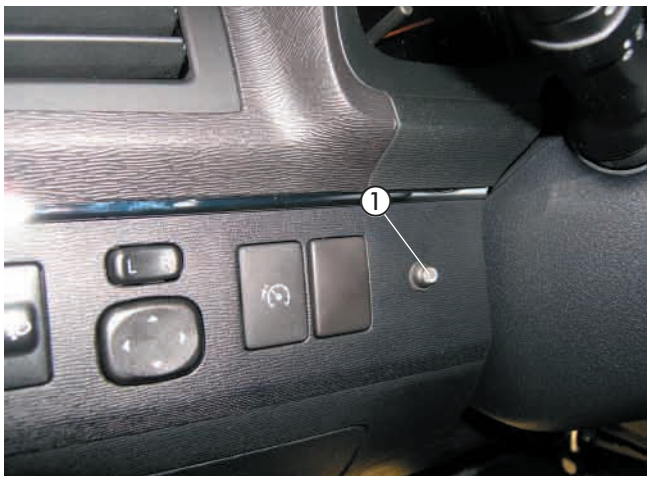
picture 24

① EasyStart T

Install EasyStart R/R+ radio remote control (alternative suggestion - consult with the costumer)
(see pictures 25 and 26 as well as sketch 7)

The EasyStart R/R+ is installed according to the Technical Description for the EasyStart R/R+ Radio Remote Control, see the “Installation Instruction“ section.

Install the EasyStart R/R+ push button on the dashboard cladding to the left of the steering column.
For that purpose, make a Ø 8 mm drill hole into the lining and insert the push button into the drill hole.



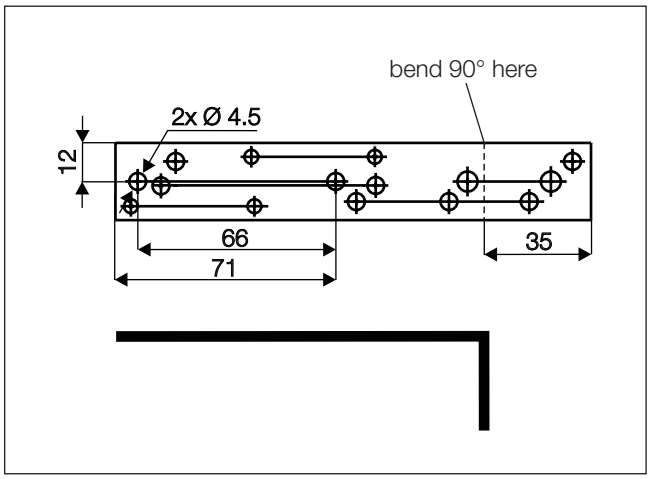
picture 25

① EasyStart R/R+ push button

6 Electrics

Prepare the bracket for the stationary device (receiver) of the EasyStart R/R+ as shown in the sketch.

Tighten the stationary device (receiver) of the EasyStart R/R+ to the bracket, using two M4 x 16 screws.



sketch 7

Mount the stationary device (receiver) of the EasyStart R/R+, along with the bracket, on the driver´s side behind the shelf, to the supporting strut of the dashboard using a M6 x 16 screw.

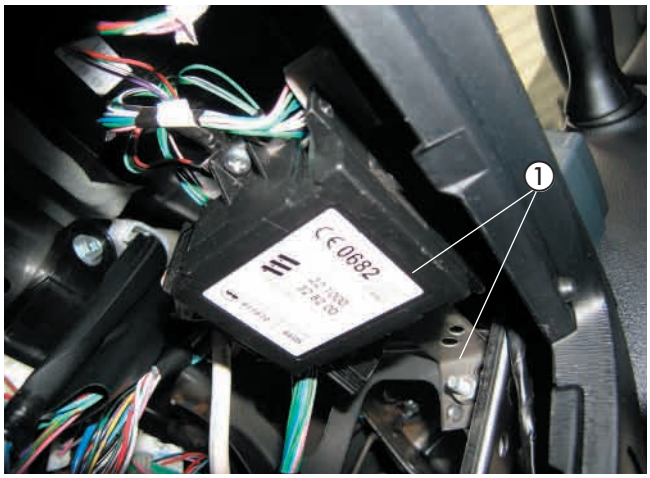
Fix the temperature sensor of the EasyStart R/R+ at the A-pillar coating on the driver´s side.

Guide the cables from the mounted push-button and from the temperature sensor, along with the “operating element” wiring harness to the stationary device (receiver)´s installation place and connect to the stationary device (receiver).

Connect the antenna cable of the EasyStart R/R+ to the stationary device (receiver), guide it to the left and lay it inside the weatherstrip on the driver´s side.

Please note!

Avoid contact with metal parts at the uninsulated end of the antenna cable.
Use cable ties to fix any excessive length of antenna cable underneath the dashboard.



picture 26

① stationary device (receiver) of the EasyStart R/R+, installed along with bracket

7 After installation

Complete the vehicle

- Install all removed parts in the reverse order.
- Reconnect the battery.
- Check the hoses, hose clamps and pipe clamps as well as electrical connections for secure fit.
- Use cable ties to secure all loose cables, lines, etc.
- Set the clock time.
- Fill the coolling system, start the engine, vent the cooling system and check for leaks, top up any missing cooling liquid up to the marking (arrow).
- Please also note and follow the vehicle manufacturer‘s information on filling and venting the cooling system.
- Read and observe all official regulations and safety instructions in the Technical Description.
- Program the operating element and place the Operating Instruction together with the leaflet for the customer in the glove compartment.

Please note!

Fill the cooling system with the coolant liquid specified by the vehicle manufacturer only.

Starting up the heater

- Switch on the heater at the operating element. See Operating Instructions - Operating element.

8 Parts overview

Item	Designation	Quantity	Order number
1	Vehicle-specific mounting kit		24 8443 00 00 00
	heater bracket, new	1	
	hexagon screw, M6 x 95	1	
	wiring harness heater	1	
	bracket fuses	1	
	exhaust silencer	1	
	exhaust pipe, l = 300 mm	1	
	hose, form, Ø 18 mm	1	
	hose clamp, Ø 16 - 25 mm	1	
	hose clamp, Ø 20 - 32 mm	6	
	pipe clamp, Ø 26 - 28 mm	3	
	bracket fuel metering pump	1	
	wiring harness fuel metering pump	1	
	fuel hose, Ø (3.5 x 3) mm, l = 50 mm	3	
	hose clamp, one-piece with clamping jaws	6	
	fuel pipe, Ø (4 x 1) mm	2 m	
	fuel pipe, Ø (4 x 1.25) mm	5 m	
	cable tie, (2.5 x 100) mm	10	
	cable tie, (5.0 x 200) mm	20	
	cable tie, internal gearing	5	
	hexagon screw, M4 x 16	2	
	hexagon nut, M4	2	
	hexagon screw, M5 x 10	1	
	hexagon nut, M5	1	
	hexagon screw, M6 x 16	5	
	hexagon screw, M6 x 20	1	
	hexagon nut, M6	6	
	bracket (z-angle)	3	
	bracket (90°-angle)	1	
	bracket R+	1	
	hexagon nut, M6	4	
	screw, M4 x 16	2	
	hexagon nut, M4	2	
	large diameter washer B6	6	
	connection pipe, Ø 18 mm	1	
	fuel hose bend, 90°	1	
	clamp, Ø 9 mm	2	
	fuel connection	1	
	push-on contact housing	2	
	flat connection housing	2	
	push-on contact, B 6.3 - 1	1	
	push-on contact, B 6.3 - 6	1	
	flat connection, B 6.3 - 1	1	
	flat connection, B 6.3 - 6	1	
	cable lug, A6	1	
	cable lug, A8	1	
	fuse, 10 A	1	
	relay, 12V	1	
	wiring harness, blower	1	
	exhaust pipe	0.35 m	

9 Leaflet for the customer

Before switching-on
(see picture 1)

- Before switching-on or pre-programming heating mode, set the vehicles temperature controller ① to “HI” (maximum) when the ignition is switched on.
- Switch the push button for the air system ② to “defrost”. Maximum air directed to the windscreen.
- Switch the push button for the blower ③ to blower stage 2.



picture 1

① temperature controller
② push button for the air system
③ push button for the blower