HYDRONIC

Installation Recommentations

Eberspächer

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

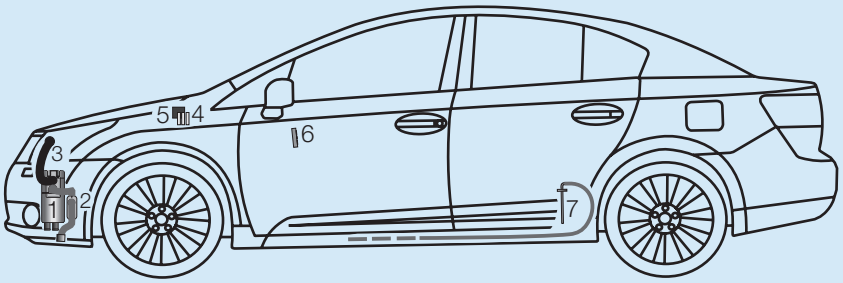
Service-Hotline
01805 - 26 26 26
Facsimile
01805 - 26 26 24

New vehicle-specific mounting kit + auxiliary heating

HYDRONIC D5W SC in Toyota Avensis (T 27)

2009 model
with automatic air conditioning
with fog lamps
with manual transmission or 6 speed automatic transmission
- **2,0 l cubic capacity / 4-cylinder-in-line engine / 93 kW - 126 HP (D-4D)**
- **2,2 l cubic capacity / 4-cylinder-in-line engine / 110 kW - 150 HP (D-4D)**

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* D5W SC
2 exhaust pipe with exhaust silencer
3 combustion air tube
4 fuse bracket
5 blower relay
6 EasyStart T
7 fuel tank extraction

Installation position
The *HYDRONIC* D5W SC is fixed vertically in the left corner of the front bumper.
The exhaust stack is pointing to the left and the water connections are pointing downwards.

For the installation required:
(1) verhicle-specivic mounting kit
(2) auxiliary heating *HYDRONIC* D5W SC
(3) operating element EasyStart at buyer´s option

Installation time: approx. 6 h

Contents

		Page
1	Introduction	2
2	Installation - heater	4
3	Water circuit	7
4	Fuel supply	13
5	Electrics	15
6	After installation	21
7	Parts overview	22
8	Leaflet for the customer	23

25 2219 95 22 99 08.2009 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
2,0 l D-4D	93 / 126	6S
2,2 l D-4D	110 / 150	6A

6S = 6-speed manual transmission
6A = 6-speed automatic transmission

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 8445 00 00 00
(2) Auxiliary heating:	
1 *HYDRONIC* D5W SC	25 2219 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
- step drill
- 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

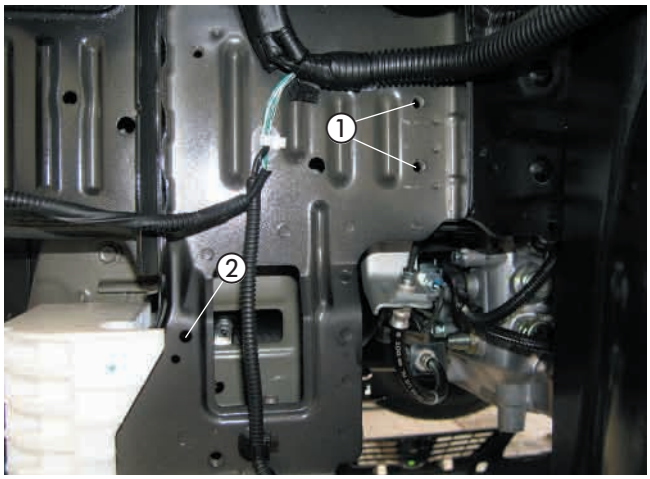
Preparations to the vehicle

- disconnect batterie
- remove back seat
- demount bottom left dashboard coating
- demount left centre console coating
- demount top engine cover
- demount bottom engine cover
- demount left under lining
- demount front bumper
- demount air-filter housing
- depressurise the cooling system
- drain coolant into a clean container

2 Installation - heater

Prepare installation position
(see picture 1)

The two existing M8 tapped holes in the left main chassis beam as well as the existing Ø 7 mm drill hole in the gusset plate of the left main chassis beam serve as mounting points of the heater bracket.



picture 1

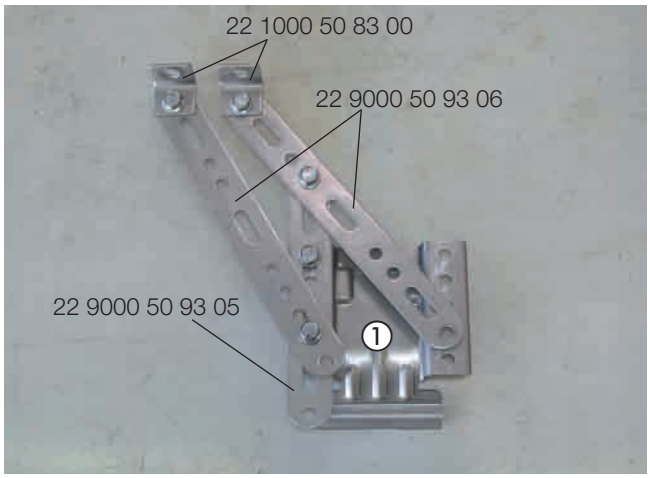
① two existing M8 tapped holes
② existing Ø 7 mm drill hole

Prepare heater bracket
(see picture 2)

Mount the brackets (90°-angle) 22 1000 50 83 00 each with a M6 x 12 scew to the brackets 93 06 and align, according to the picture.

Mount the bracket 93 05 to the heater bracket using a M6 x 12 screw, according to the picture.

Mount the brackets 93 06 each with a M6 x 12 screw to the bracket 93 05 and align, according to the picture.



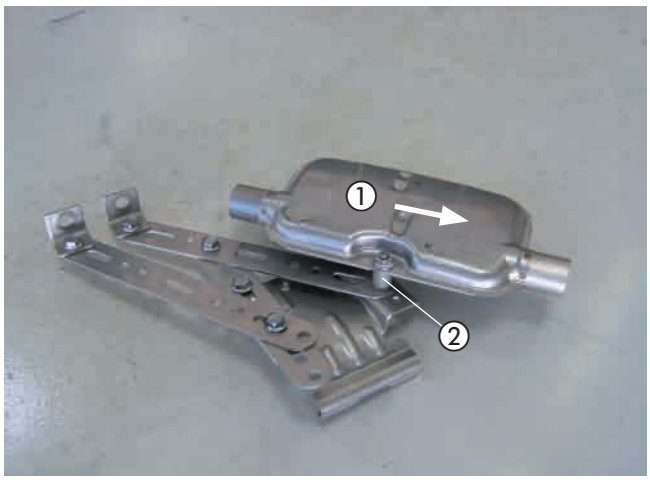
picture 2

① heater bracket, assembled with brackets

Pre-assemble heater and exhaust silencer
(see pictures 3 to 5 as well as sketch 1)

Attach the exhaust silencer to the pre-mounted heater bracket using a M6 x 30 screw as well as the space sleeve 22 1000 50 68 00 and align, according to the picture.

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

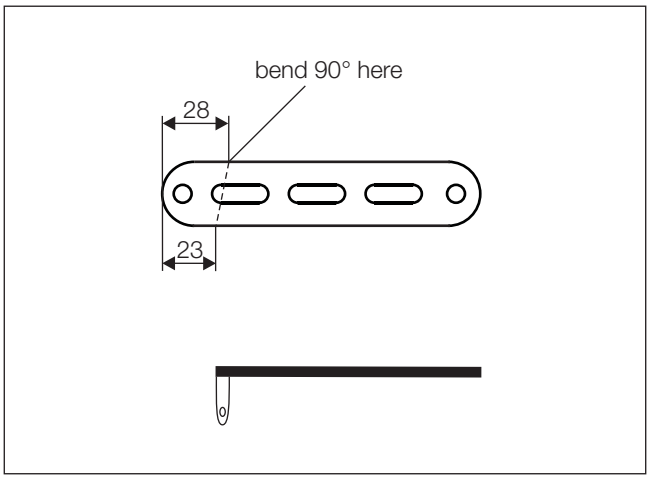


picture 3

① exhaust silencer
② spacer sleeve 22 1000 50 68 00

2 Installation - heater

Prepare the bracket 93 04 according to the sketch .

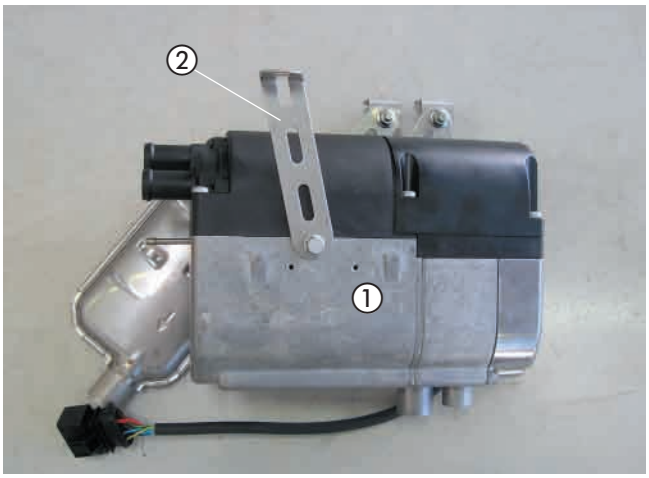


sketch 1

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 and fix, along to bracket 93 04, in the heater bracket´s right threaded hole using the M6 x 95 fixing screw with $6^{+0,5}$ Nm.

Align the bracket 93 04 according to the picture.



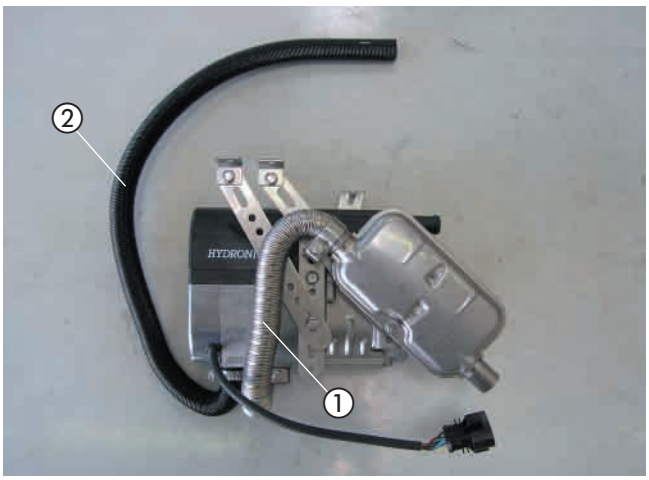
picture 4

① heater, fixed to the pre-assembled heater bracket
② bracket 93 04, mounted

Cut the exhaust pipe to a length of 300 mm zuschneiden 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.

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



picture 5

① exhaust pipe, mounted
② combustion air pipe, connected

2 Installation - heater

install heater
(see picture 6)

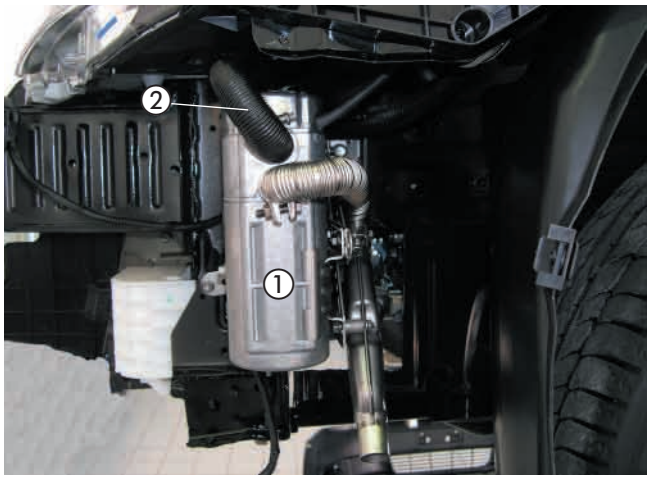
Attach the pre-assembled heater to the M8 tapped holes and the existing Ø 7 mm drill hole using two M8 x 16 screws and aM6 x 16 screw.

Guide the combustion air pipe upwards and lay it to the protected range under the left headlamp and further along the front middle part.

Fix the combustion air pipe to appropriate places by means of calbe ties.
Make a drain hole, Ø 2 mm, for condensation in the deepest point of the laid combustion air pipe.

Please note!

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



picture 6

① heater, mounted
② combustion air pipe, laid

Install grommet for exhaust tailpipe
(see pictures 7 and 8)

Make a drill hole, Ø 38 mm, into the left wheelhouse lining, according to the dimensioning in the picture.

Insert the grommet, Ø 41 mm, into the manufactured drill hole.



picture 7

① grommet for exhaust tailpipe, mounted

Cut the exhaust tailpipe to a length of 165 mm.

Shape the exhaust tailpipe according to the picture and connect it to the outlet connection of the exhaust silencer.

Guide the exhaust tailpipe through the grommet, Ø 41 mm.



picture 8

① exhaust tailpipe, mounted

Please note!

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

3 Water circuit

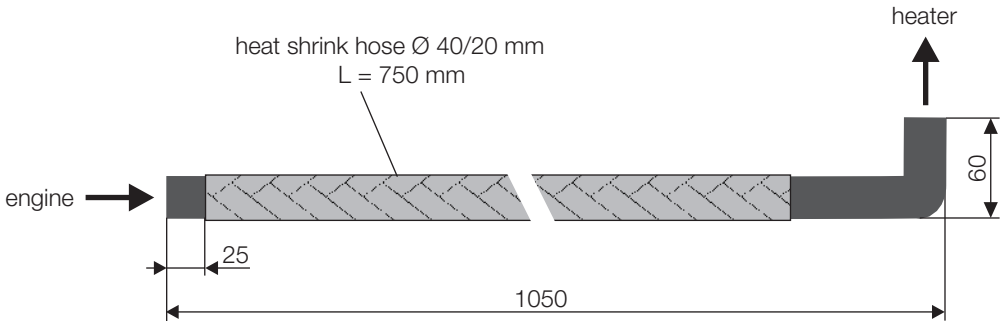
Prepare water hoses
in vehicles with manual gearbox
(see sketch 2)

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

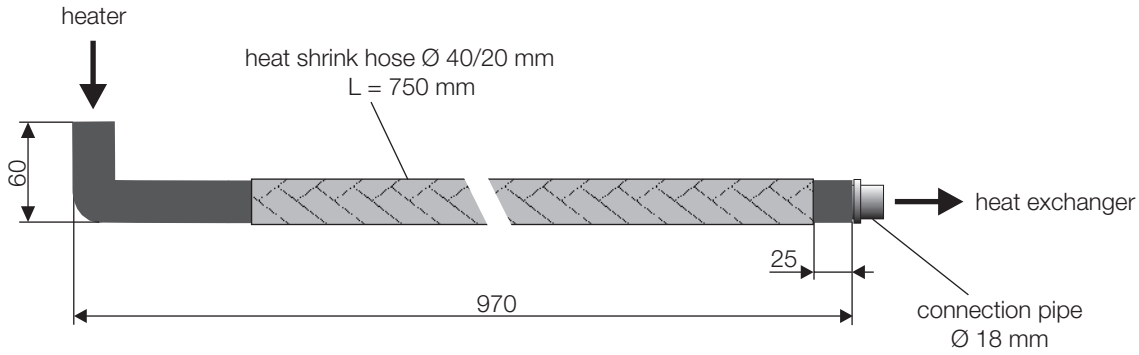
Please note!

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

water hose ①
from engine to heater



water hose ②
from heater to heat exchanger



sketch 2

3 Water circuit

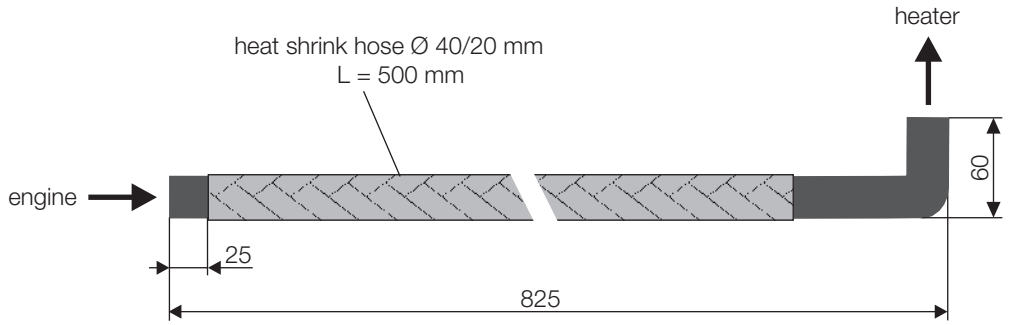
Prepare water hoses
in vehicles with automatic transmission
(see sketch 3)

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

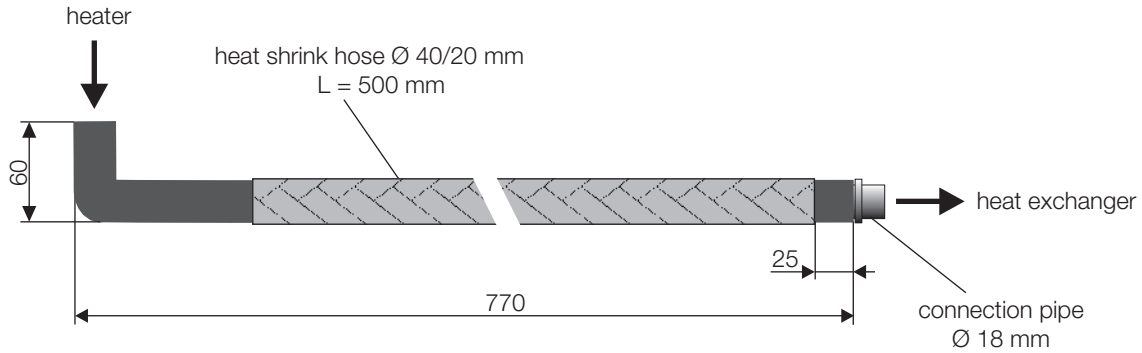
Please note!

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

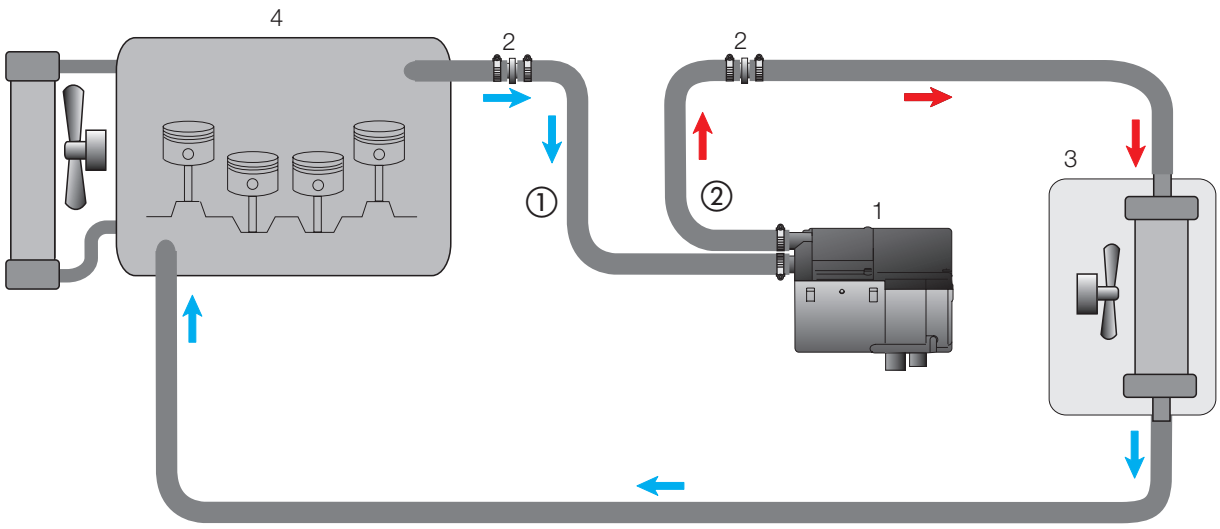
water hose ①
from engine to heater



water hose ②
from heater to heat exchanger



sketch 3

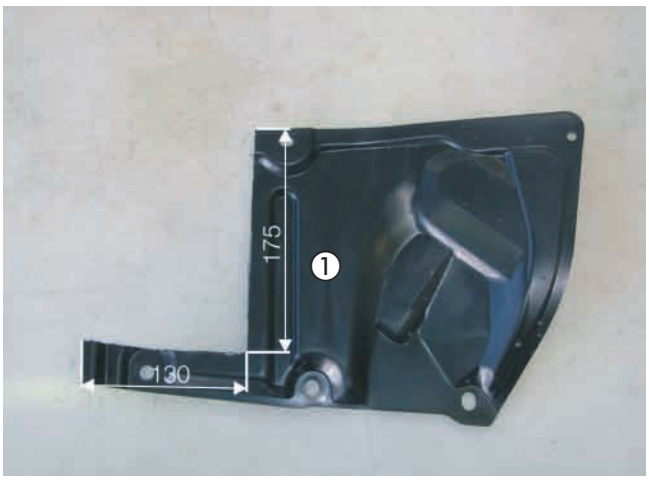


1 - heater
2 - connection pipe Ø 18 mm
3 - vehicle heat exchanger
4 - engine
- hose clamp Ø 20 - 32 mm

sketch 4

Cut cladding of the left longitudinal chassis beam
(see picture 9)

In order to lay the der water hoses cut the cladding of the left longitudinal chassis beam, according to the dimensioning in the picture.



picture 9

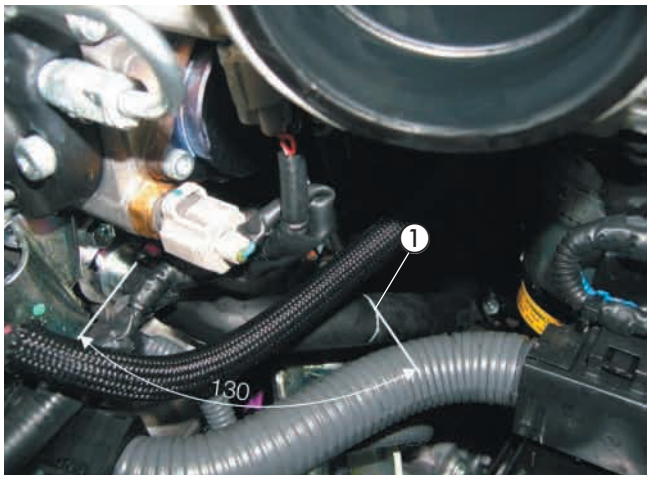
① cut the cladding

Cut water feed hose and remove throttle
(see pictures 10 and 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 clamp at the engine connection and pull off the hose piece.

The detached hose piece is no longer required.



picture 10

① cut-off point at the water feed hose

Remove the throttle from the water feed hose from the engine to the heat exchanger.

The throttle is no longer required.



picture 11

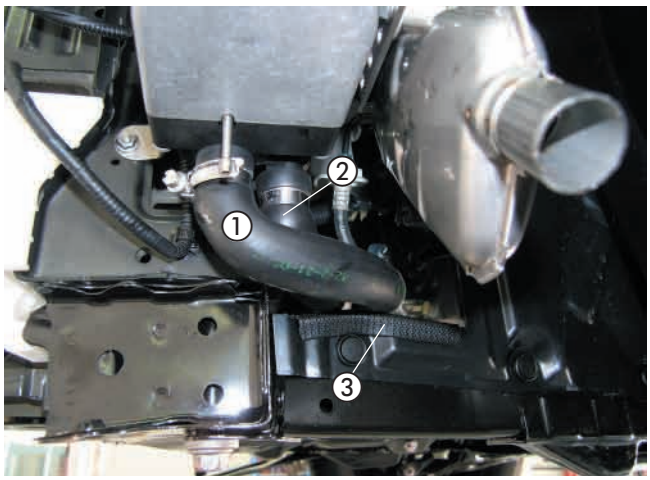
① remove throttle from the water feed hose

Lay water hoses and connect
(see pictures 12 to 17 as well as sketch 4)

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

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

Attach the edge protection on the cladding of the left longitudinal chassis beam, according to the picture.



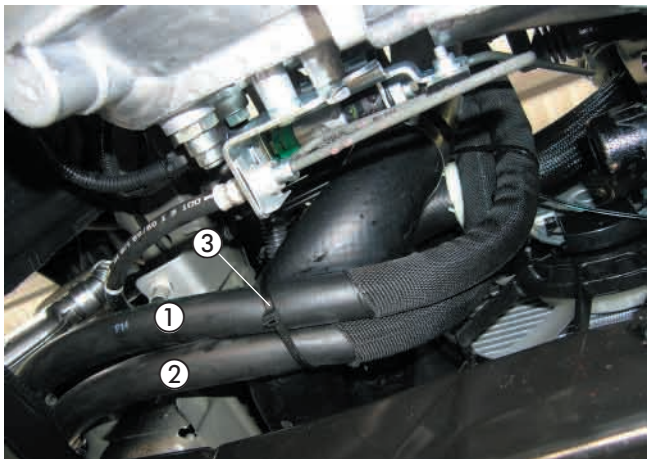
picture 12

① water hose ①
② water hose ②
③ edge protection

in vehicles with manual gear box
(see pictures 13 to15)

Lay water hoses ① and ② to the charge air pipe above the gear box.

Fix water hoses ① and ② at the charge air pipe, using a cable tie.

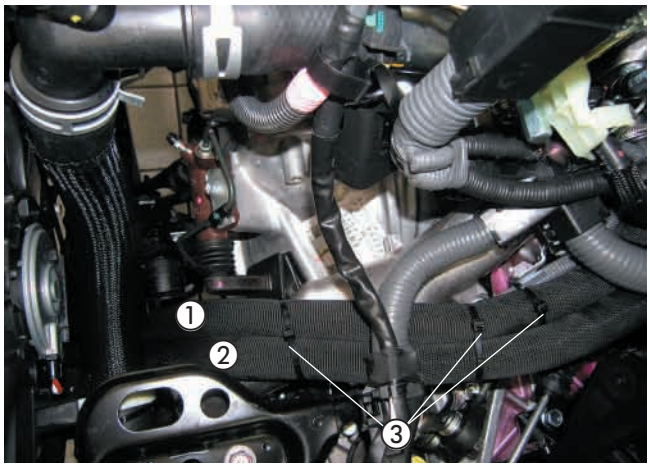


picture 13

① water hose ①
② water hose ②
③ cable tie

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

Fix water hoses ① and ② to one another, to the charge air pipe and to the on-board wiring harness, using cable ties.



picture 14

① water hose ①
② water hose ②
③ cable ties

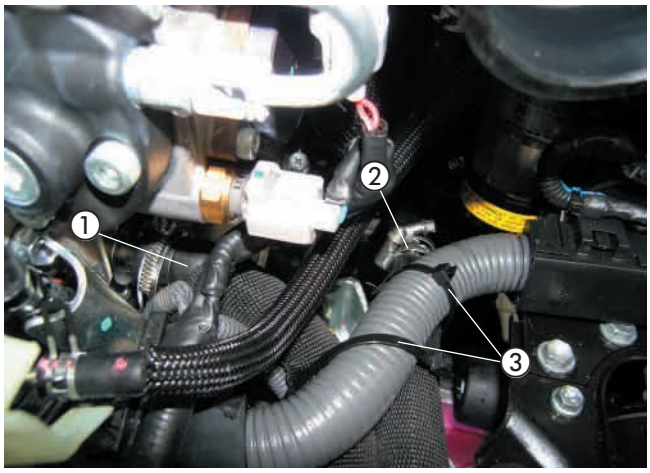
Please note!

When laying the water hoses ensure they are at a sufficient distance from gear shift cables.

Connect water hose ① to the hose connection tube of the engine.

Connect water hose ② with the connection pipe Ø 18 mm to the water feed hose to the heat exchanger.

Fix water hoses ① and ② to the on-board wiring harness, using cable ties.



picture 15

① water hose ①
② water hose ②
③ cable tie

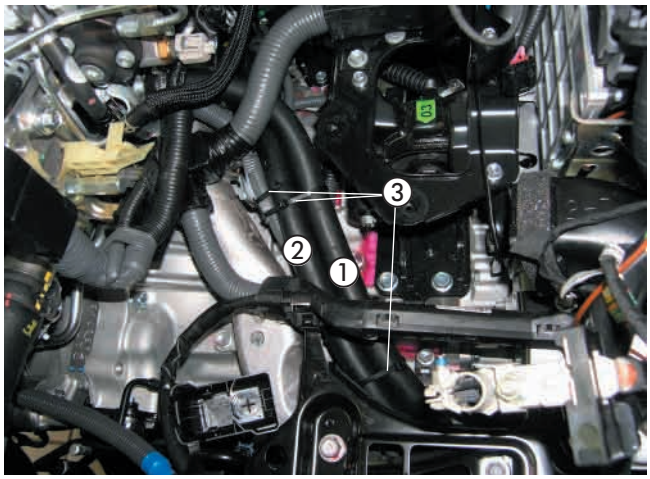
Please note!

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

in vehicles with automatic transmission
(see pictures 16 and 17)

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

Fix water hoses ① and ② to one another and to the on-board wiring harness, using cable ties.

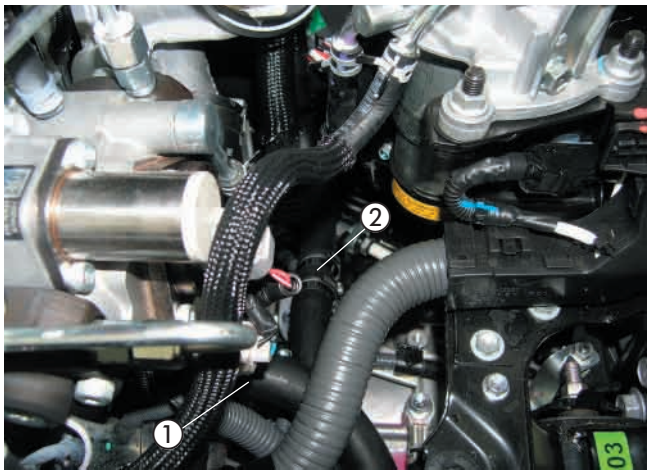


picture 16

① water hose ①
② water hose ②
③ cable tie

Connect water hose ① to the hose connection tube of the engine.

Connect water hose ② with the connection pipe Ø 18 mm to the water feed hose to the heat exchanger.



picture 17

① water hose ①
② water hose ②

Please note!

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

4 Fuel supply

Install fuel connection
(see pictures 18 to 22 as well as sketch 5)

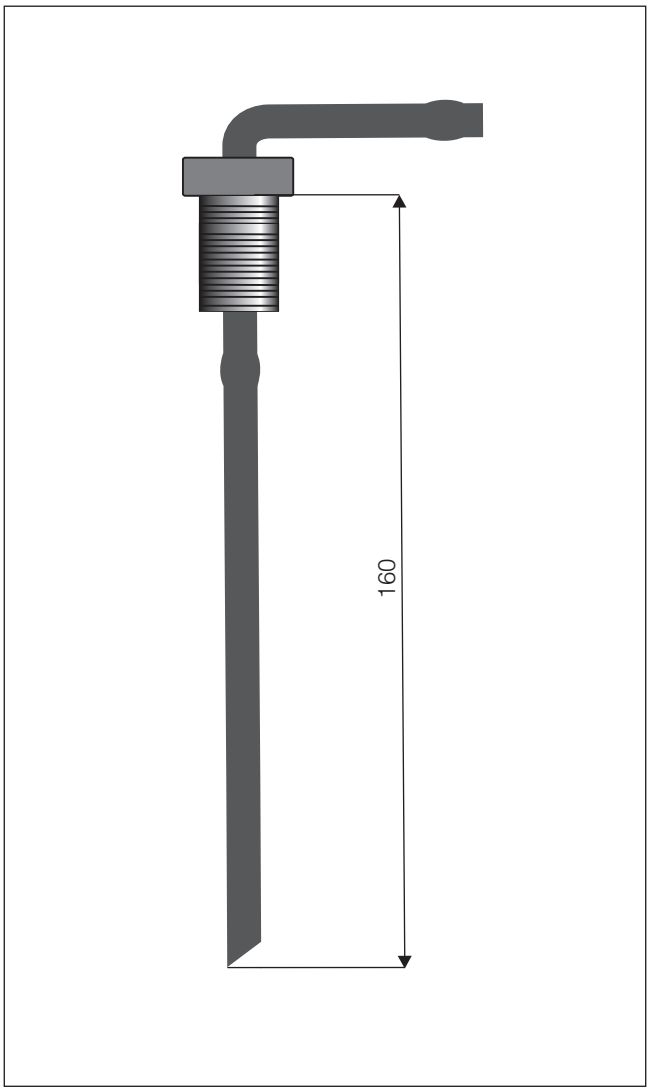
Prepare the riser pipe of the fuel connection as shown in the sketch.
Obliquely cut the bottom end of the riser pipe, with approx. 45° angle, to the correct length.

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

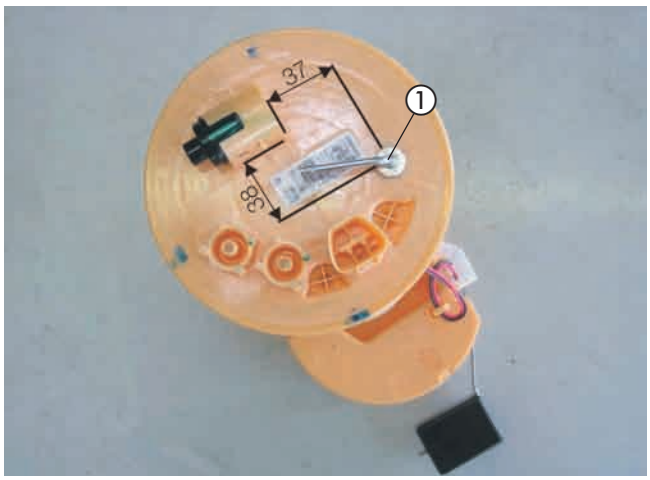
Please note!

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.

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.

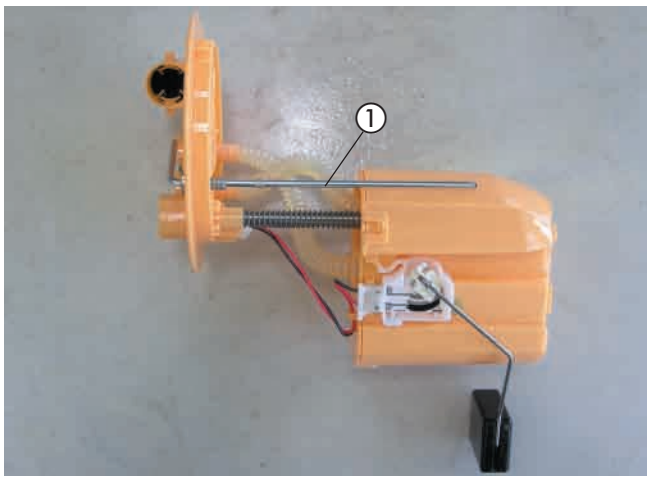


sketch 5



picture 18

① fuel tank extractor installed



picture 19

① fuel tank extractor installed

4 Fuel supply

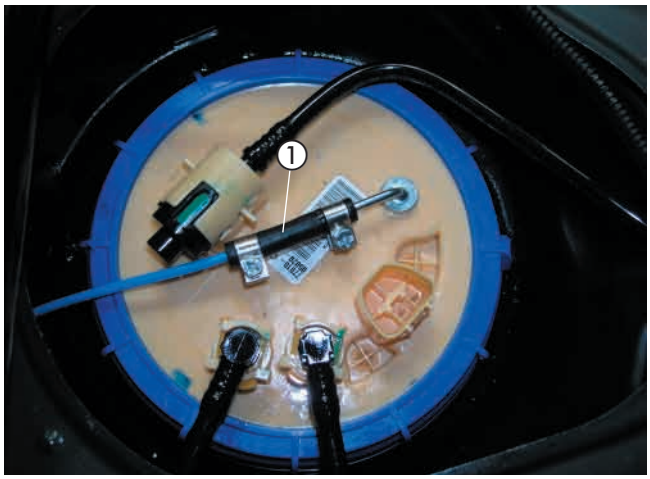
Insert the tank fitting back into the tank, ensure the seal fits properly.
Reconnect the plug-in connection and the fuel lines at the tank fitting.

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 tank extractor.

Refit the cover in the floor panel above the tank.

Please note!

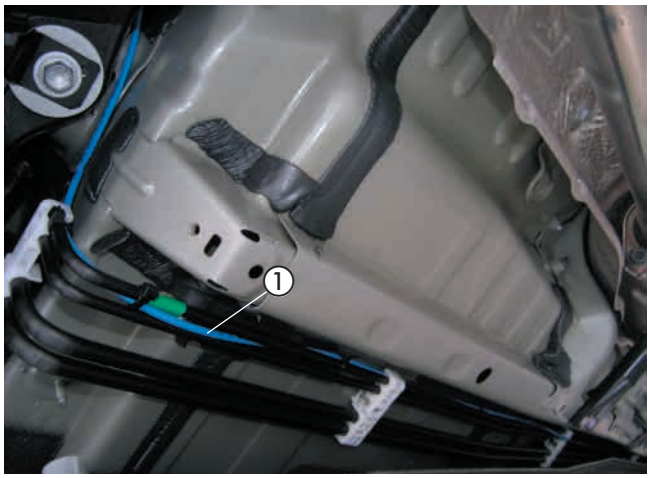
Secure all connection points with hose clips, Ø 9 mm.



picture 20

① fuel tank extractor, installed

Lay the fuel pipe Ø 4 x 1 mm along the on-board fuel pipes on the left vehicle underside to the heater and fix to suitable positions, using cable ties.



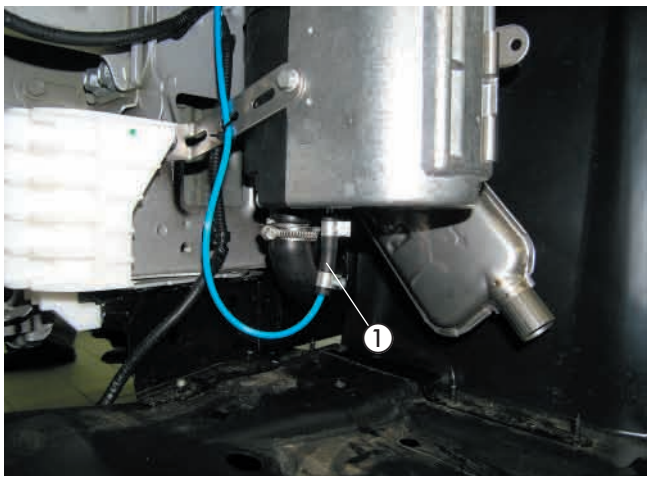
picture 21

① fuel pipe Ø 4 x 1 mm, laid

Connect the fuel pipe Ø 4 x 1 mm with fuel hose Ø 3.5 x 3 mm, length 50 mm, to the heater´s fuel socket.

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.



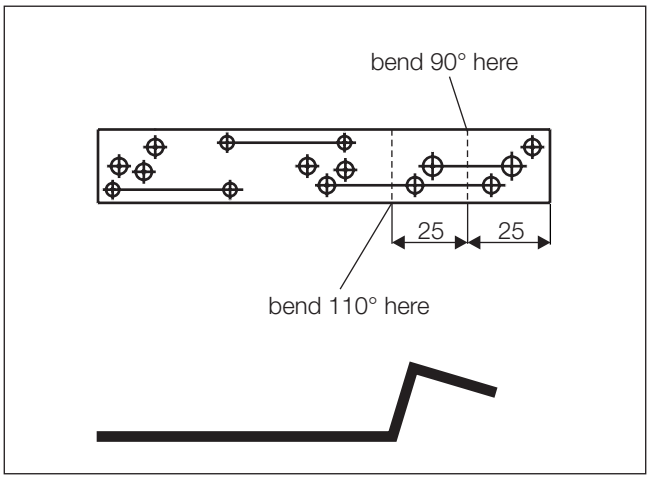
picture 22

① fuel pipe Ø 4 x 1 mm with fuel hose Ø 3.5 x 3 mm, length 50 mm, mounted to the heater

Install fuses and blower relay
(see picture 23 as well as sketches 6 and 7)

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.



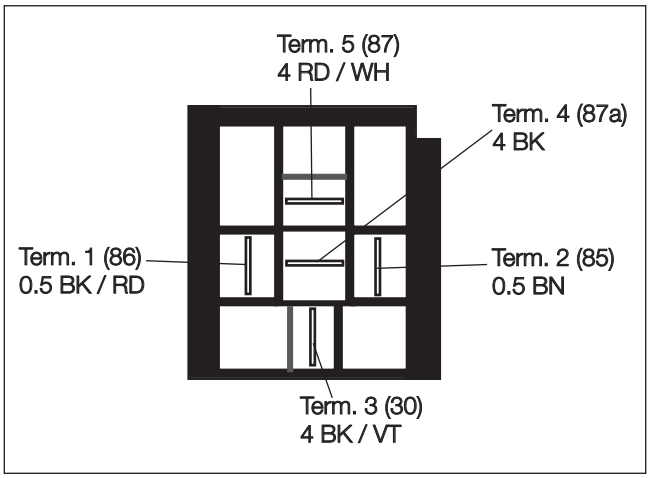
sketch 6

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 cabel harness to the 8 pin flat connector housing of the heater´s wiring harness.

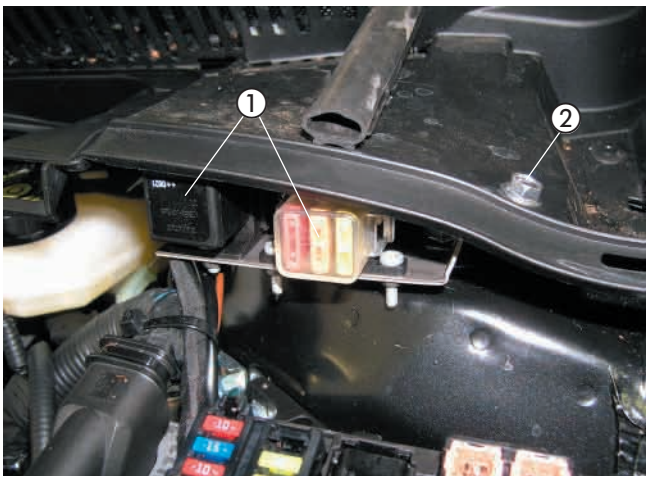


sketch 7

Make a Ø 7 mm drill hole into the covering of the wiper tub, according to the picture.

Install the bracket of the fuse and relay base to the manufactured Ø 7 mm drill hole, using a M6 x 12 screw.

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



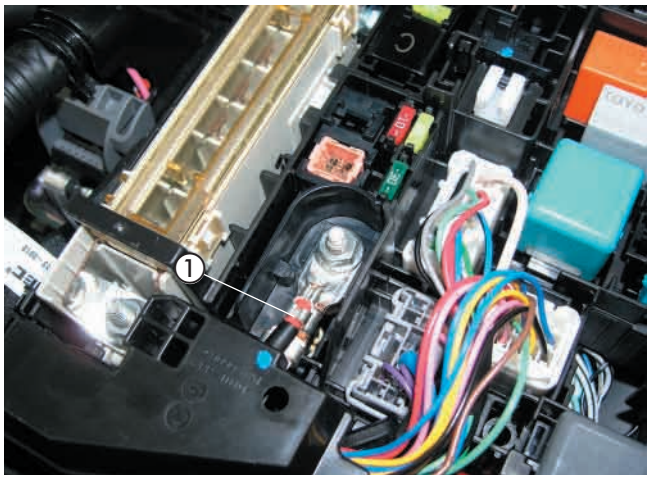
picture 23

① fuses and blower relay, installed
② bracket for fuses and blower relay, installed

Power supply
(see pictures 24 and 25)

The positive power supply occurs at the fuse and relay box in the engine compartment on the left vehicle side.

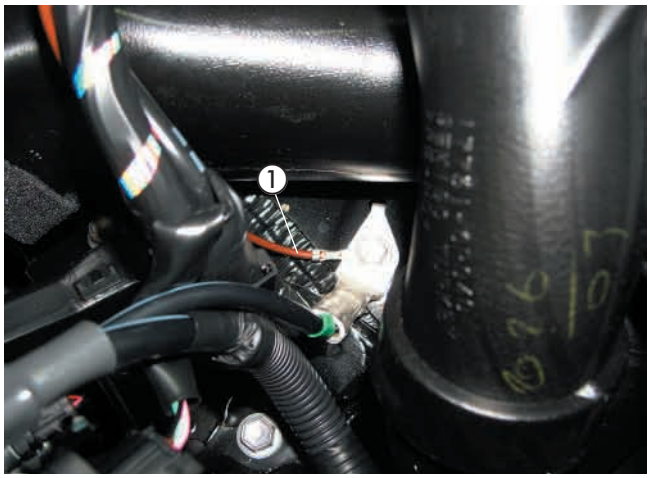
Guide the 4 mm² RD positive cable to the positive connection at the fuse and relay box and connect it with A6 cable lugs, according to the picture.



picture 24

① 4 mm² RD positive cable, connected

Guide the 2.5 mm² BN ground cable to the existend ground connection in front of the fuse and relay box and connect it with the A6 cable lug.



picture 25

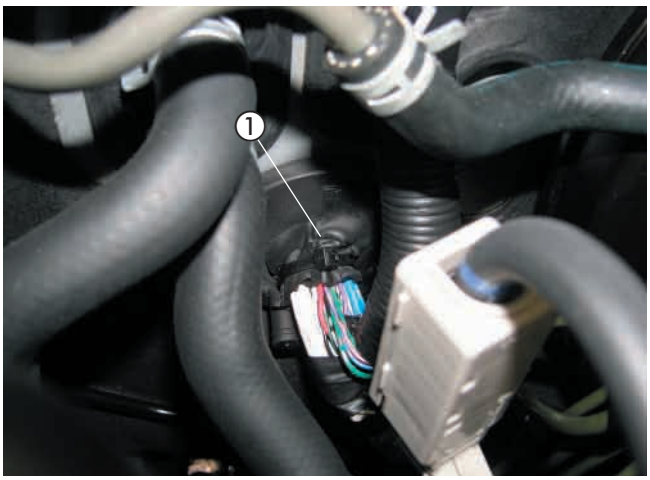
① 2.5 mm² BN ground cable, connected

Cable laying
(see picture 26)

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.



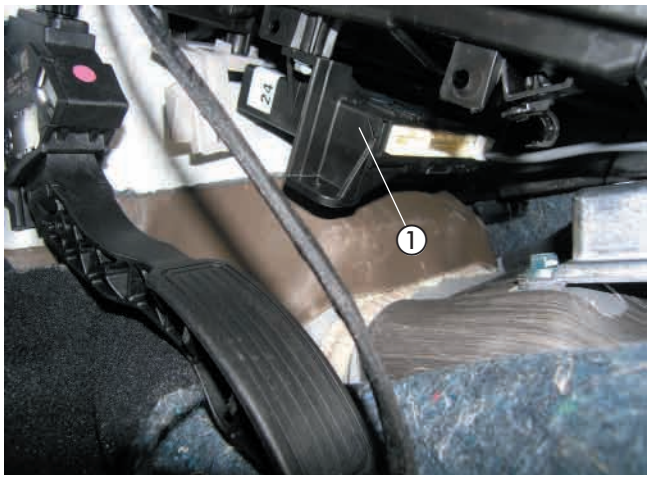
picture 26

① on-board cable grommet

Blower control
(see pictures 27 and 28 as well as sketch 8)

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

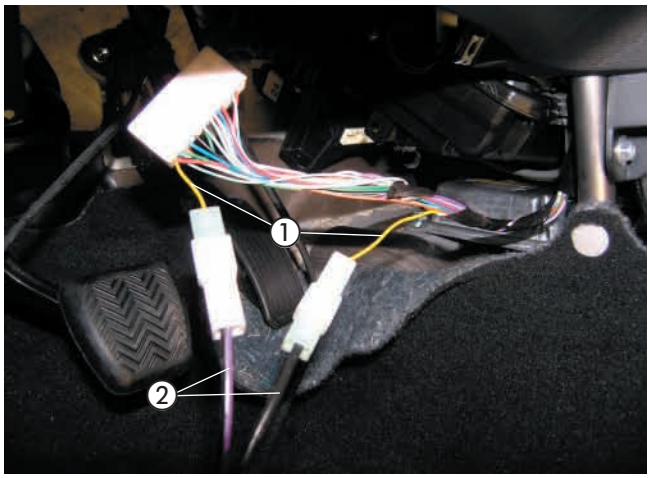
Unplug the 40 pin connector D 47 from the control unit AC-control.



picture 27

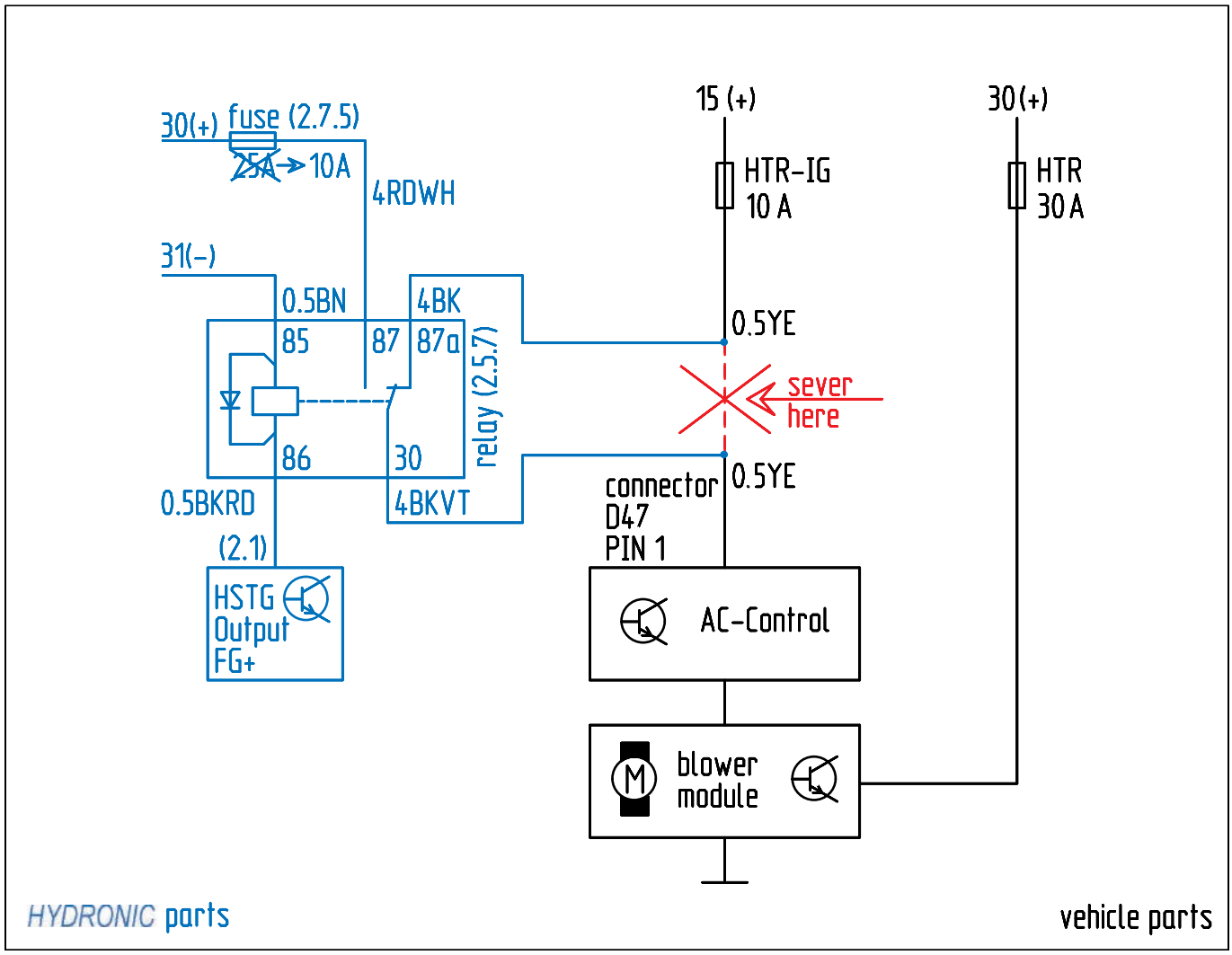
① electronic control unit AC-control

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 28

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 8

Install EasyStart T
(see picture 29)

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.



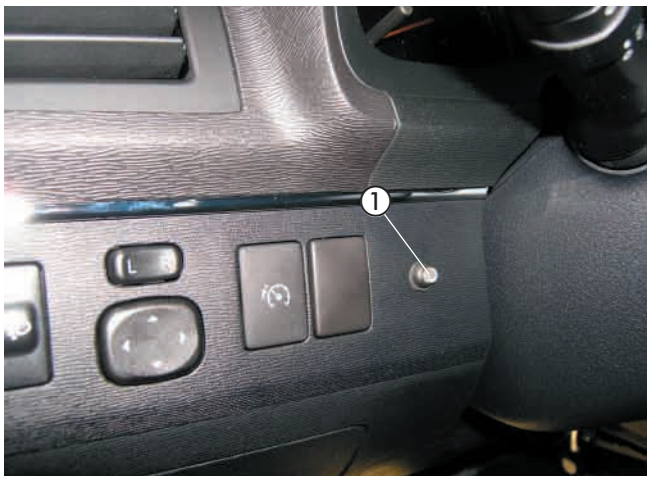
picture 29

① EasyStart T

Install EasyStart R/R+ radio remote control (alternative suggestion - consult with the costumer)
(see pictures 30 and 31 as well as sketch 9)

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.



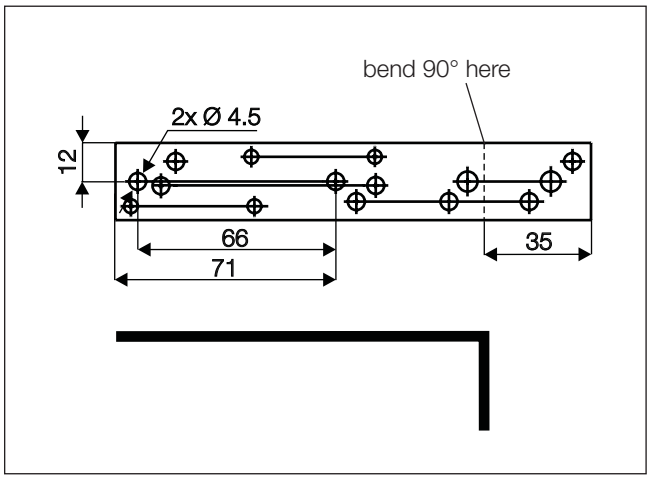
picture 30

① EasyStart R/R+ push button

5 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 9

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.

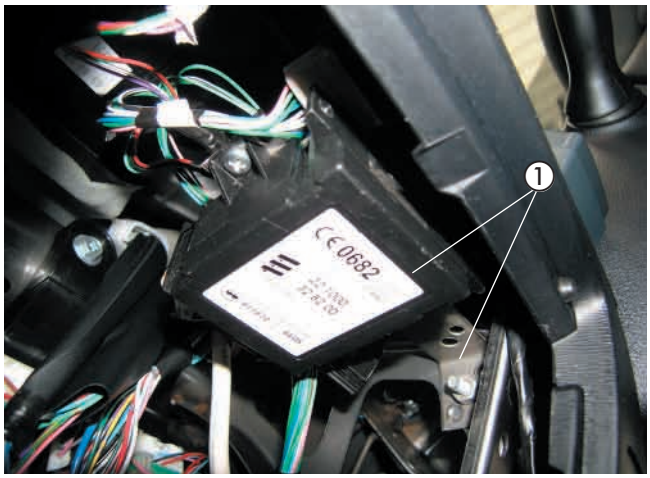
Fix the temperature sensor of the EasyStart R/R+ at the A-pillar coating on the driver´s side.

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.



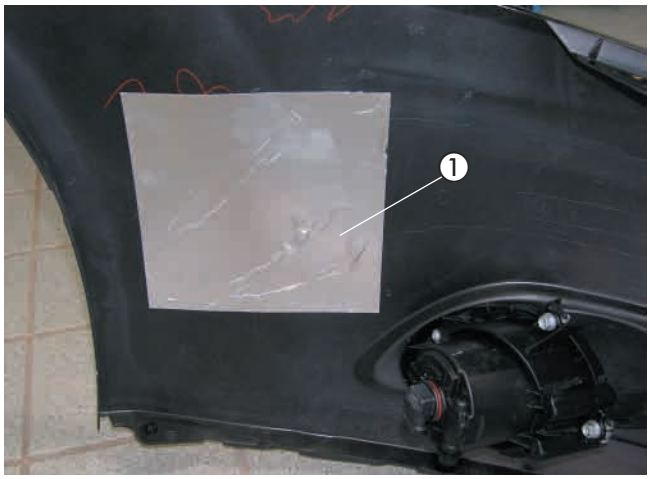
picture 31

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

6 After installation

Paste the aluminium foil
(see pictures 32 and 33)

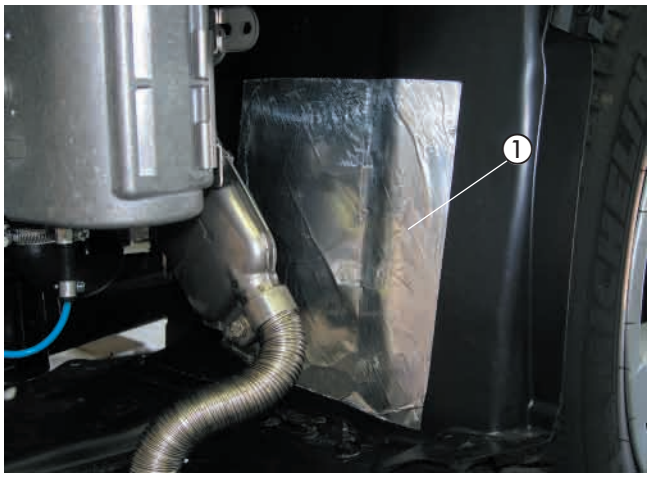
Paste the aluminium foil into the front bumper on the left, according to the picture.



picture 32

① aluminium foil in the front bumper on the left, pasted

Paste the aluminium foil to the left wheelhouse lining, according to the picture.



picture 32

① aluminium foil at the left wheelhouse lining, pasted

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.

Starting up the heater

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

Please note!

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

7 Parts overview

Item	Designation	Quantity	Order number
1	Vehicle-specific mounting kit		24 8445 00 00 00
	heater bracket, new	1	
	hexagon screw, M6 x 95	1	
	wiring harness, heater	1	
	bracket fuse	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	
	fuel hose, Ø (3.5 x 3) mm, L = 50 mm	1	
	hose clamp, one-piece with clamping jaws	2	
	fuel pipe, Ø (4 x 1) mm	6 m	
	cable tie, (2.5 x 100) mm	10	
	cable tie, (5.0 x 200) mm	20	
	cable tie, innenverzahnt	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 nut, M6	4	
	bracket (93 06)	2	
	bracket (93 04)	1	
	bracket (93 05)	1	
	bracket (90°-angle)	2	
	bracket R+	1	
	hexagon screw, M6 x 30	1	
	hexagon screw, M6 x 12	6	
	hexagon nut, M6	7	
	screw M4 x 16	2	
	hexagon nut, M4	2	
	hexagon screw, M8 x 16	2	
	connection pipe Ø 18 mm	1	
	clamp Ø 9 mm	2	
	spacer sleeve	1	
	aluminium foil	2	
	grommet, Ø 41 mm	1	
	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	
	push-on contact housing	2	
	flat connection housing	2	
	fuse 10 A	1	
	relay 12 V	1	
	wiring harness, blower	1	
	fuel tank extractor	1	
	edge protection	0.1 m	
	heat shrink hose, Ø 40/20 mm	1.5 m	
	fuel hose, Ø 3.5 x 3 mm	0.05 m	
	exhaust pipe	0.3 m	

8 Leaflet for the customer

Vor dem Einschalten
(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