

Water Heater



Thermo Top E Parking Heater


00 0003

Thermo Top C Parking Heater


00 0002

Thermo Top P Parking Heater


00 0104

Installation documentation

Toyota RAV 4

Petrol

from Model Year 2006

Left-hand drive vehicle

Manual / automatic air-conditioning system

Manual transmission, automatic transmission (continuous)

2WD, 4WD



WARNING!

Hazard warning:

Incorrect installation or repair of Webasto heating systems may cause a fire or result in the emission of carbon monoxide, which can be fatal. Serious or fatal injuries can be caused as a result.



Specialist company training, technical documentation, specialised tools and equipment are required to install and repair Webasto heating and cooling systems.

Only original Webasto parts must be used. For this, also see the catalog of air and water heater accessories from Webasto.

NEVER attempt to install or repair Webasto heating or cooling systems if you have not successfully completed the company training and thereby acquired the required technical skills, or if you do not have access to the required technical documentation, tools and equipment needed to carry out correct installation and repairs.

ALWAYS follow all Webasto installation and repair instructions and observe all warnings.

The initial startup is to be executed with the Webasto Thermo Test Diagnosis.

Webasto does not accept any liability for defects and damage that are attributable to installation by untrained staff.

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Validity

Manufacturer	Model	Type	EG-BE No./ABE
Toyota	RAV 4	XA3	e6 * 2001 / 116 * 0105 * ...

Engine type	Engine model	Output in kW	Displacement in cm ³
1AZ-FE	Petrol	112	1998
3ZR-FAE	Petrol	116	1987

Vehicle and engine types and equipment versions not listed in this installation documentation have not been tested. However, installation according to this installation documentation may be possible. The installation location of a digital timer and summer/winter switch should be confirmed with the end customer before installation.

Heater/Installation Kit

Quantity	Description	Order No.:
1	<i>Thermo Top E / C / P</i> retail accessories	See price list
1	Installation kit for Toyota RAV 4 2006 Petrol	1310903B
1	Heater control	See price list

Heater recommended for the respective vehicle class:

Vehicle	Heater
Compact car	Thermo Top E
Mid-size car, station wagon	Thermo Top C
Full-size car, van, offroader	Thermo Top P

The selection of the heater is based on the passenger compartment size of the vehicle and the level of comfort required by the customer!



Foreword

This installation documentation applies to the Toyota RAV 4 vehicles with Petrol engine - for validity, see page 2 - from model year 2006 and later, assuming technical modifications to the vehicle do not affect installation, any liability claims excluded. Depending on the vehicle version and equipment, modifications may be necessary during installation with respect to this installation documentation.

In any case, please follow the specifications of this installation documentation and the installation instructions of the *Thermo Top C/P/E*.

The corresponding rules of technology and any information from the vehicle manufacturer should be observed during the installation work.

General Instructions

Installation should be carried out according to the general, standard rules of technology. Unless specified otherwise, fasten hoses, lines and wiring harnesses to original vehicle lines and wiring harnesses using cable ties.

Sharp edges should be fitted with rub protection (split-open plastic hose).

Spray unfinished body areas, e.g. drilled holes, with anti-corrosion wax (Tectyl 100K, Order No. 111329).

While installing an IPCU, the corresponding settings must be checked or adjusted.

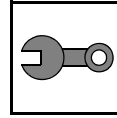
Special Tools

- Torque wrench for 2.0 - 10 Nm
- Hose clamping pliers

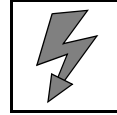
Explanatory Notes on Document

To provide you with a quick overview of the individual working steps, you will find an identification mark on the outside top right corner of the page in question.

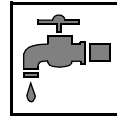
Mechanical system



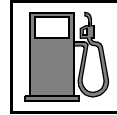
Electrical system



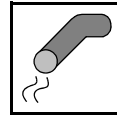
Coolant circuit



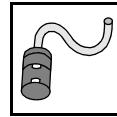
Fuel



Exhaust gas



Combustion air



Special features are highlighted using the following symbols:



Specific risk of injury or fatal accidents.



Specific risk of damage to components.



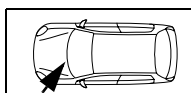
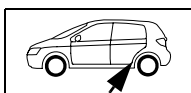
Specific risk of fire or explosion.



Reference to general installation instructions of Webasto components or to the manufacturer's vehicle-specific documents.



Reference to a special technical feature.



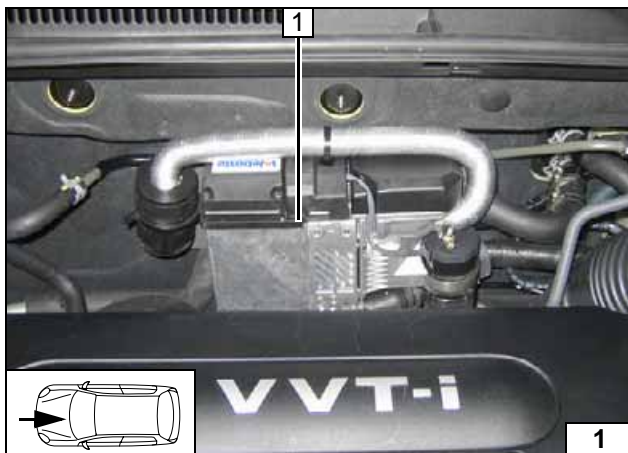
The arrow in the vehicle icon indicates the position on the vehicle and the viewing angle.

Preliminary Work

WARNING!

- Disconnect the battery "earth" or "ground" connection.
- Depressurise the cooling system.
- Copy the factory number from the original type label to the duplicate type label.
- Remove years that do not apply from the duplicate label.
- Attach the duplicate label (type label) in the appropriate place.
- Remove the entire air-filter housing cover.
- Remove the coolant reservoir cap.
- Remove the entire windscreen wiper linkage.
- Remove the coolant reservoir trim in the engine compartment.
- Remove the left-hand spring strut cover.
- Open the fuel tank cap, ventilate the tank.
- Close the tank cap again.
- Remove the left-hand underride protection.
- Remove the lower engine cover.
- Remove the fuel tank according to the manufacturer's instructions.
- Remove the fuel-tank sending unit in accordance with the manufacturer's instructions
- Remove the lower glove compartment cover (with Telestart and manual A/C system)
- Remove the glove compartment (with Telestart and manual A/C system)
- Remove the side trim in the footwell on the right of the centre console (with Telestart or manual A/C system)
- Remove the lower cover of the instrument panel on the driver's side (with automatic A/C system).
- Remove the side trim of the centre console in the footwell on the left (with automatic A/C system).
- Detach the AC booster from the centre console (with automatic air-conditioning).

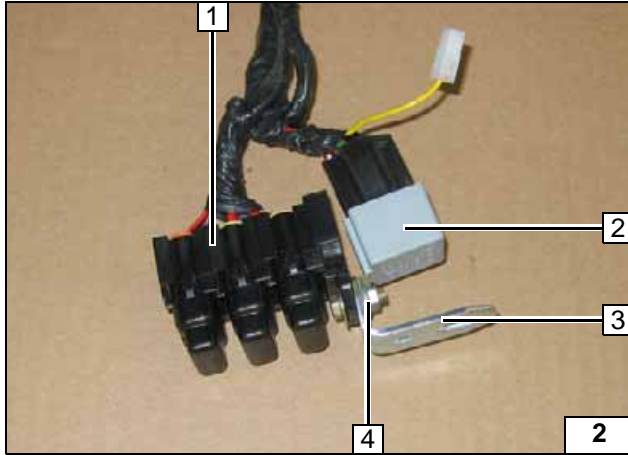
Please remove Page 29 of the "Operating instructions for the end customer" and add it to the operating instructions of the vehicle.



Heater installation location

1 Heater

Installation location



Preparing electrical system

Premount wiring harness as shown.
Replace 25A fuse F3 with 10 A fuse for automatic air-conditioning.

- 1 Fuse holder
- 2 Fan relay K3
- 3 Angle bracket
- 4 M5x12 bolt, washer, M5 flanged nut



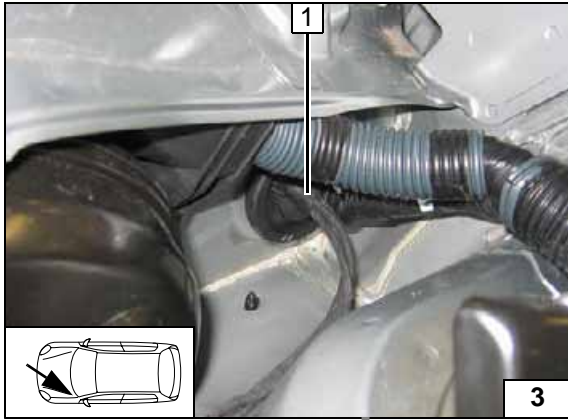
Preparing wiring harness of heater



Electrical system

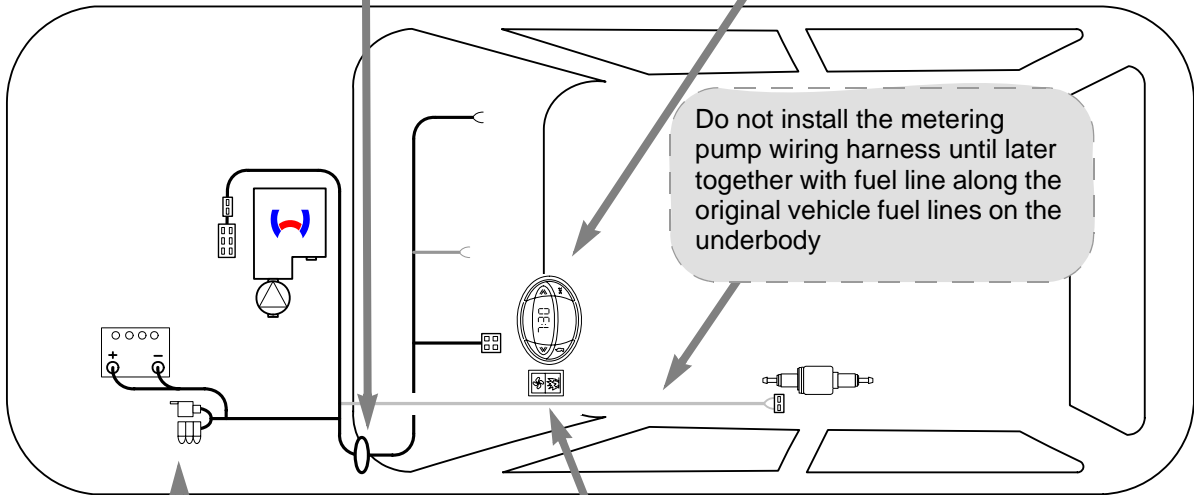
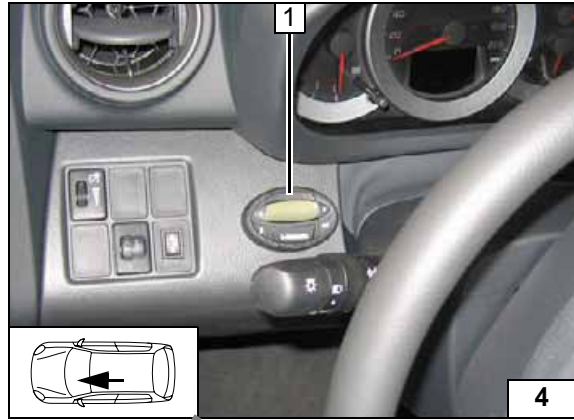
Wiring harness pass through

- 1 Protective rubber plug

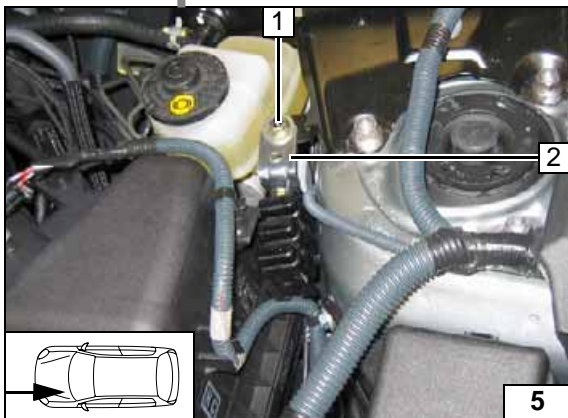


Digital timer

- 1 Digital timer

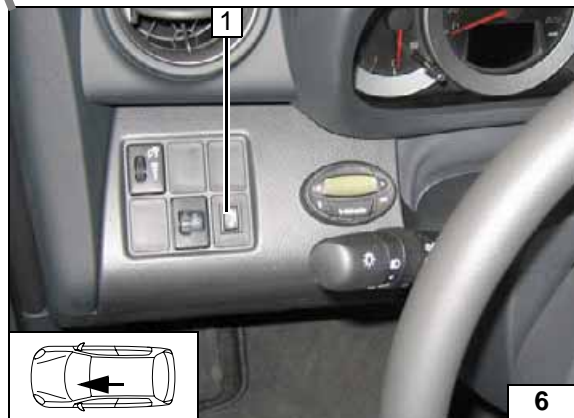


Wiring harness routing diagram



Fuse holder, K3 relay

- 1 Original vehicle stud bolt
- 2 Premounted angle bracket, large diameter washer, M6 flanged nut

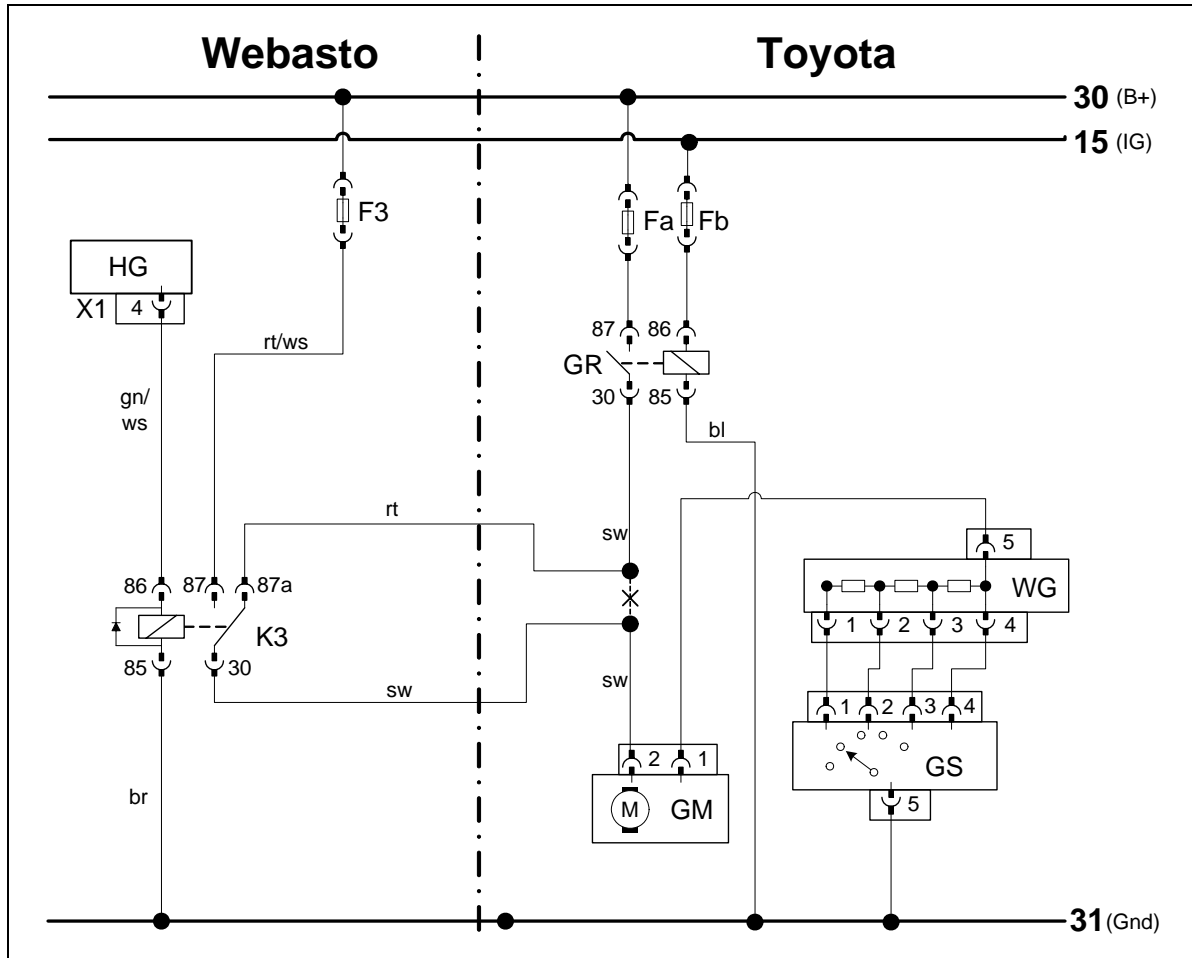


Summer/winter switch option

- 1 Summer/winter switch, drilled hole 12 mm dia.



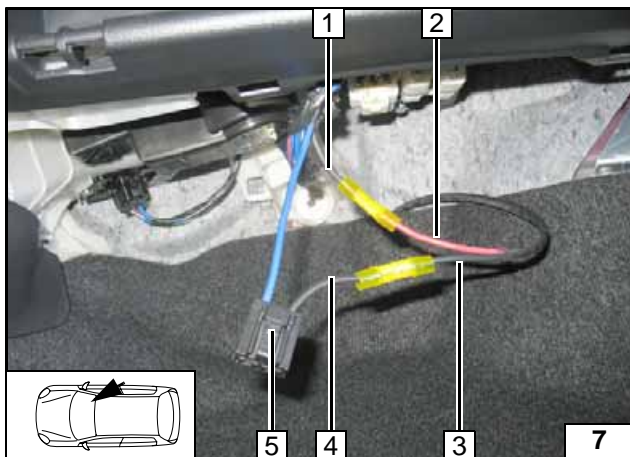
Fan control for manual air conditioning



Wiring diagram

Webasto components		Vehicle components		Colours and symbols	
HG	Heater TT-C/E/P	GM	Fan motor	rt	red
X1	6-pin heater connector	GR	Fan relay	ws	white
F3	25A fuse	GW	Fan resistance	sw	black
K3	Fan relay	GS	Fan switch	br	brown
		Fb	Fuse gauge	gn	green
		Fa	Fuse HTR	bl	blue
				X	Cutting point
				Wiring colours may vary.	

Legend



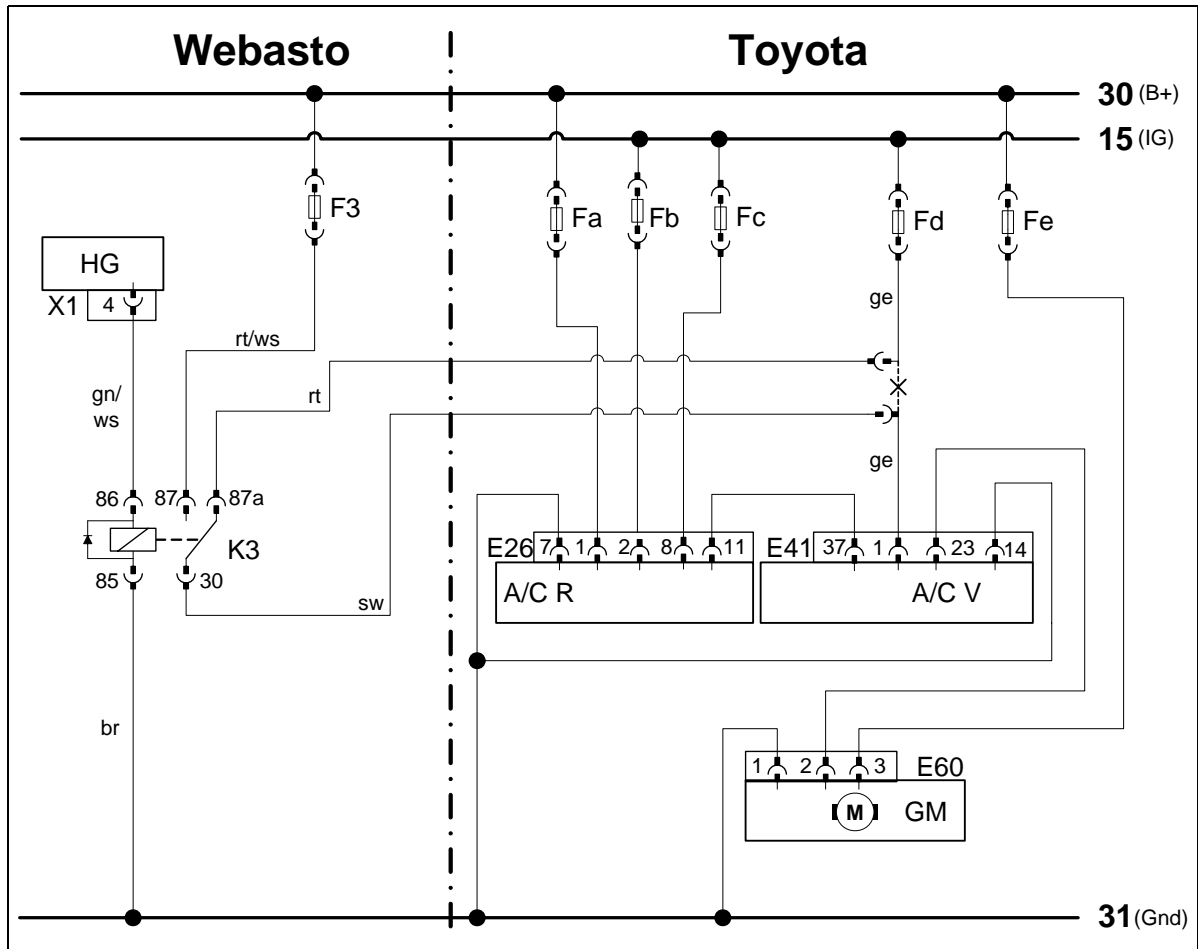
Connection to 2-pin connector 5 from the fan motor.
Produce connections as shown in wiring diagram.

- 1 Black (sw) wire of Fa fuse
- 2 Red (rt) wire of K3/87a
- 3 Black (sw) wire of K3/30
- 4 Black (sw) wire of connector

Connecting fan motor



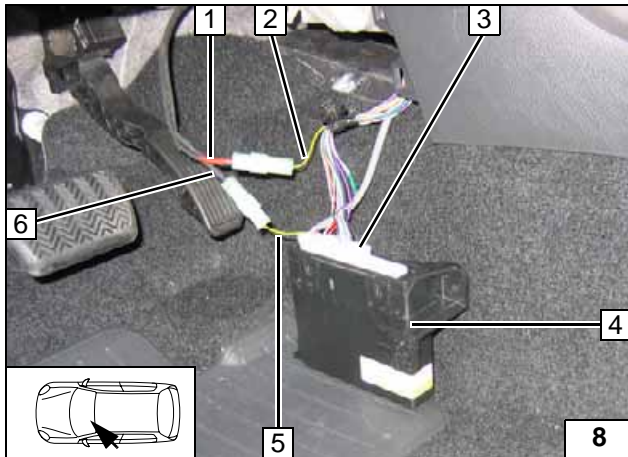
Automatic air-conditioning fan control



Automatic air-conditioning wiring diagram

Webasto components		Components Toyota RAV 4		Colours and symbols	
HG	Heater TT-C/E/P	GM	Fan motor	rt	red
X1	6-pin heater connector	A/C R	Controls (connection on Control and Panel Assembly)	ws	white
F3	Replace 25 A with 10 A fuse.	A/C V	A/C amplifier (AC amplifier)	sw	black
K3	Fan relay	Fa	10 A fuse ECU-B	br	brown
		Fb	10 A fuse ECU-IG1	br	brown
		Fc	7.5 A fuse ACC	ge	yellow
		FD	10 A fuse ECU-IG2		
		FE	50 A fuse HTR	X	Cutting point
					Wiring colours may vary.

Legend

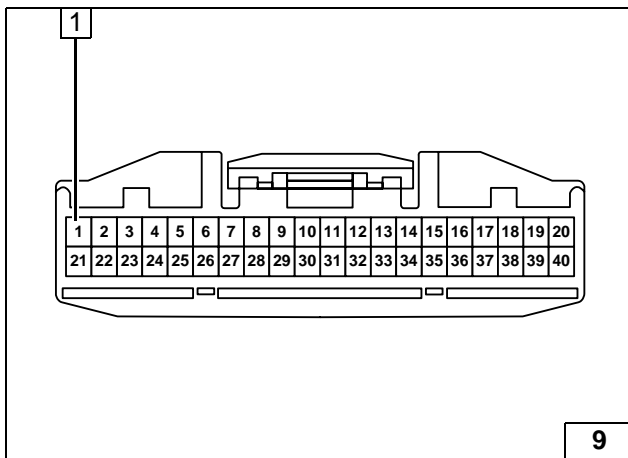


Connection on white (ws) 40-pin connector 3 E41 from AC booster 4.
Produce connections as shown in wiring diagram.

- 1 Red (rt) wire from K3/87a
- 2 Yellow (ge) wire from ECU-IG fuse
- 5 Yellow (ge) wire to connector, Pin 1
- 6 Black (sw) wire from K3/30

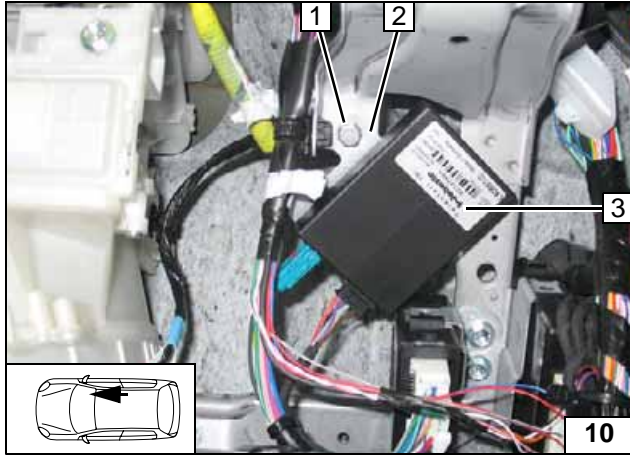


**Connect-
ing fan mo-
tor**



- 1 Connector E41, Pin 1

**Connector
E41 con-
tact side
(from front)**



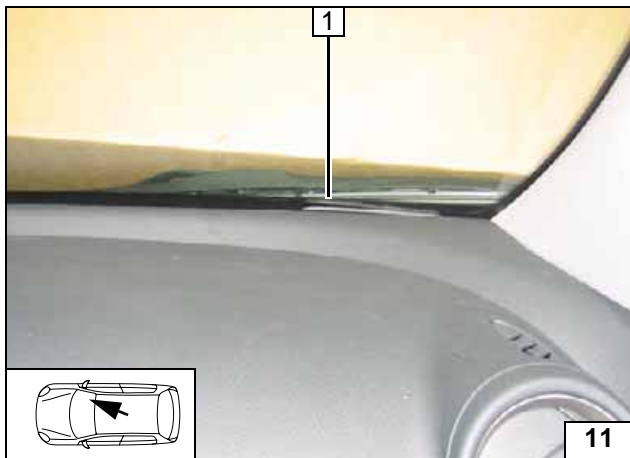
Remote option (Telestart)

Drill out bracket 2 to 6.5 mm dia. at Position 1.

- 1 M6x20 bolt, existing hole, flanged nut
- 3 Receiver



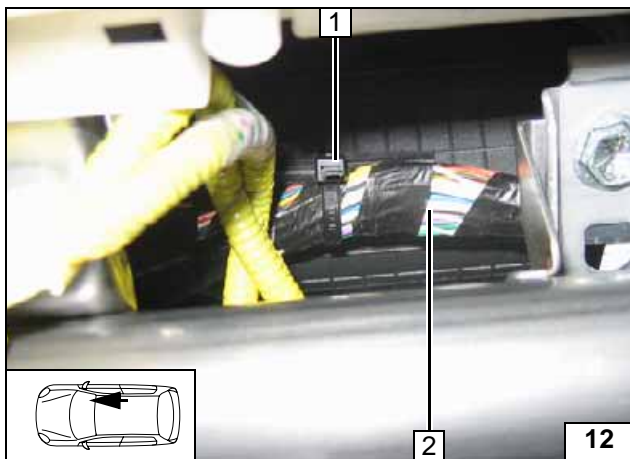
Installing receiver



Mount antenna 1 in the black area of the windscreen.



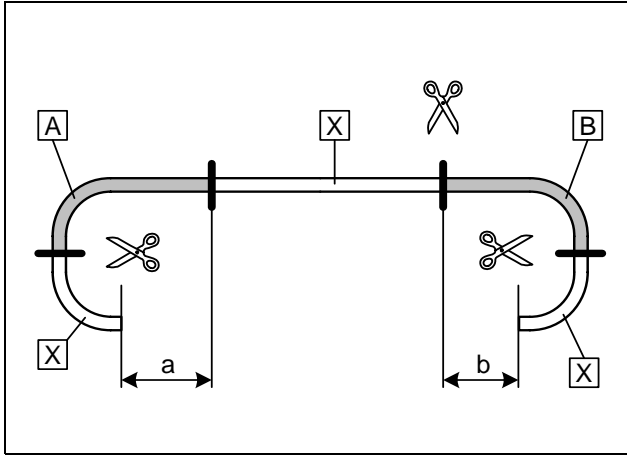
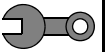
Installing antenna



Temperature sensor only with T100 HTM

- 1 Temperature sensor, cable tie
- 2 Original vehicle wiring harness behind glove compartment below ventilation duct on right

Installing temperature sensor



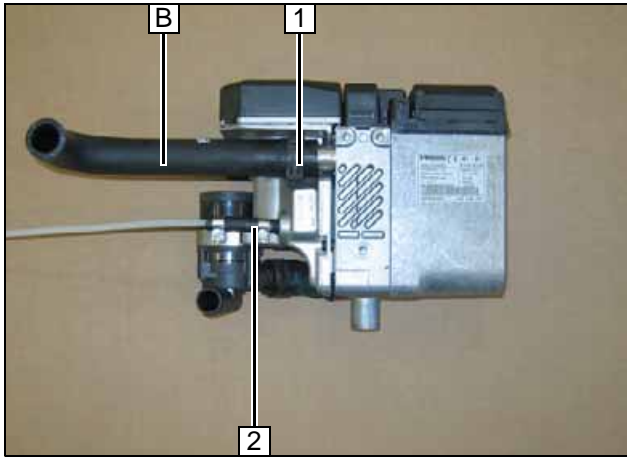
Preparing heater

Discard section X.

a = 80mm
b = 125mm

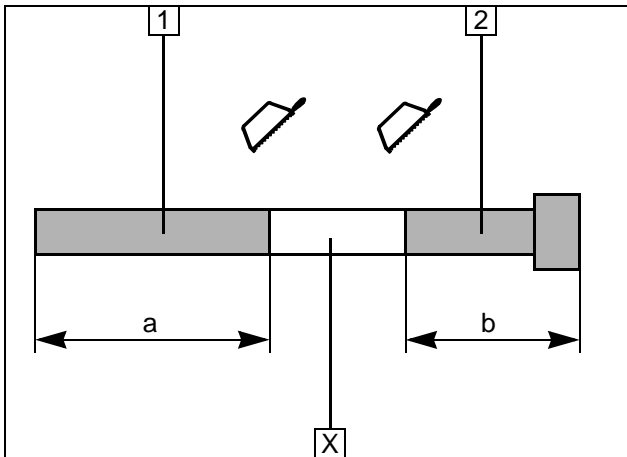


Cutting coolant hoses to length



- 1 27 mm dia. spring clip
- 2 Hose section, 10 mm dia. hose clamp [2x], Mecanyl fuel line cut to 2,500 mm

Premounting heater



Discard section X

1AZ-FE:

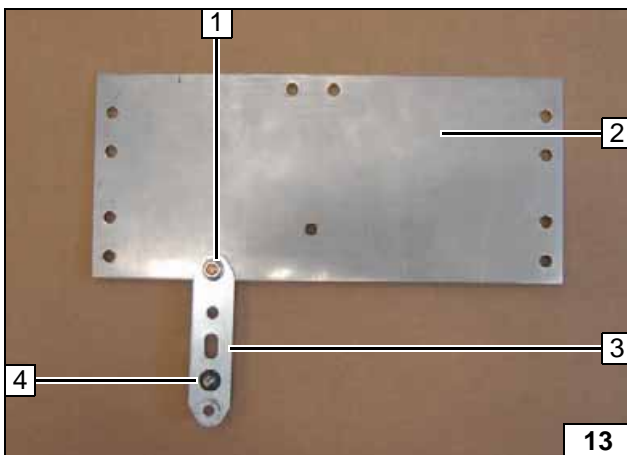
- 1 Exhaust pipe
a = 630mm
- 2 Exhaust end section
b = 285mm

3ZR-FAE:

- 1 Exhaust pipe
a = 700mm
- 2 Exhaust end section
b = 300mm



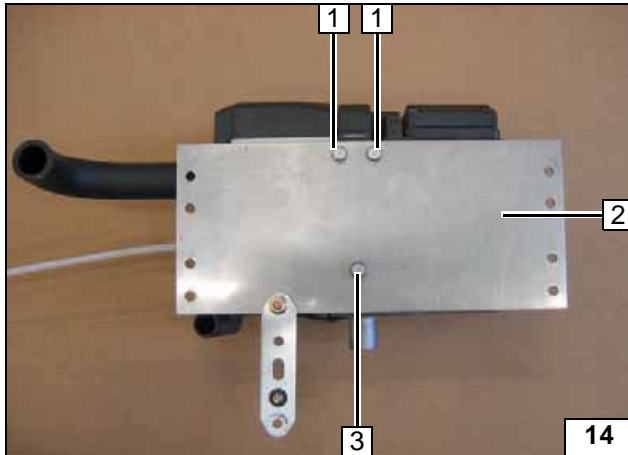
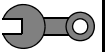
Preparing exhaust pipe



All vehicles

- 1 M6x12 bolt, flanged nut M6
- 2 Bracket
- 3 Perforated bracket
- 4 M6x12 bolt, spring lockwasher, pin lock

Premounting bracket

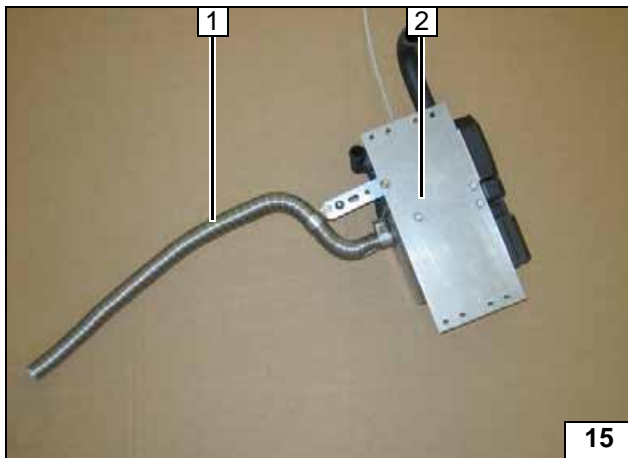


Ejot screws, tightening torque 10 Nm!
Insert washers between bracket 2 and heater 3 at position 3.

- 1 E-jot screw, washer [2x each]
- 3 E-jot screw, washer [3x]

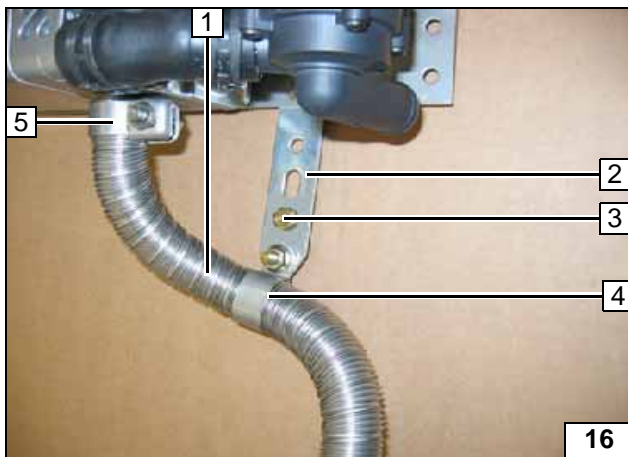


Premounting bracket



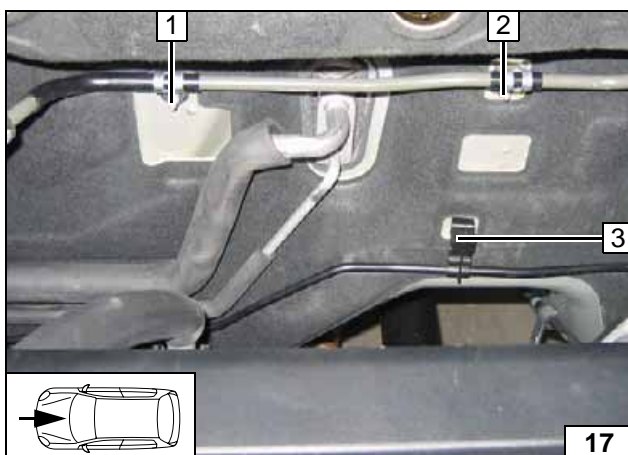
- 1 Exhaust pipe
- 2 Heater, bracket

Premounting exhaust pipe



- 1 Exhaust pipe
- 2 Perforated bracket
- 3 M6x12 bolt, spring lockwasher, pin lock
- 4 Pipe clamp, M6x20 bolt, M6 flanged nut
- 5 Hose clamp

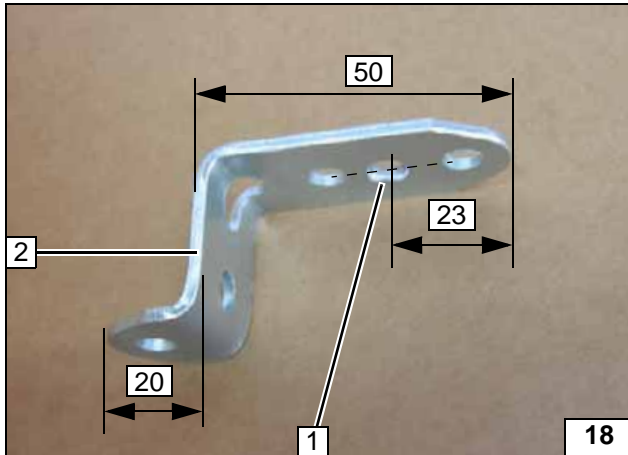
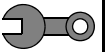
Premounting exhaust pipe



Preparing installation location

- 1 Remove original vehicle nut
- 2 Remove original vehicle nut; will be reused
- 3 Remove retaining clip

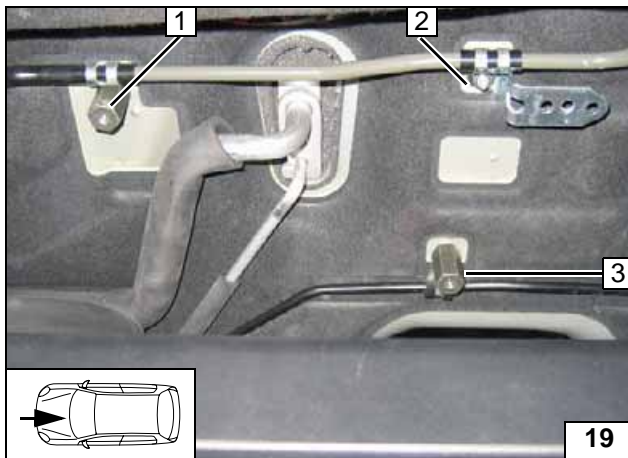
Removing parts



Angle down perforated bracket 2 2x 90° and drill 7mm dia. hole at position 1.

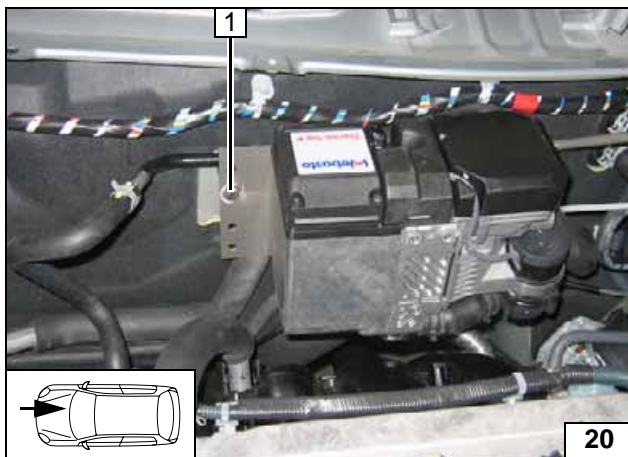


Preparing perforated bracket



- 1 M6x30 spacer nut, retaining clip, original vehicle stud bolt
- 2 Perforated bracket, retaining clip, original vehicle stud bolt, original vehicle flanged nut
- 3 M6x30 spacer nut, 15 mm dia. rubber-coated p-clamp, original vehicle line

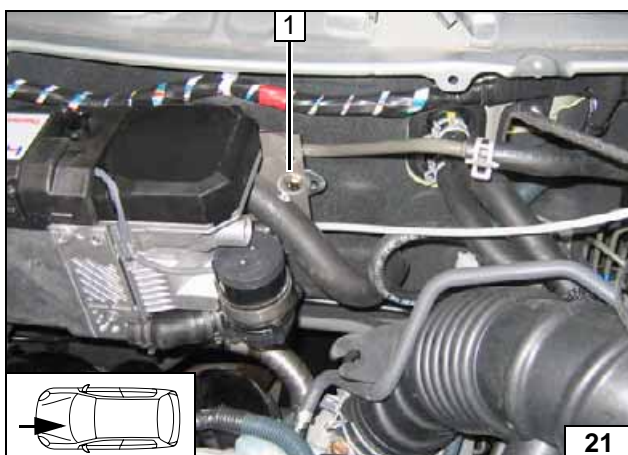
Preparing installation location



Installing heater

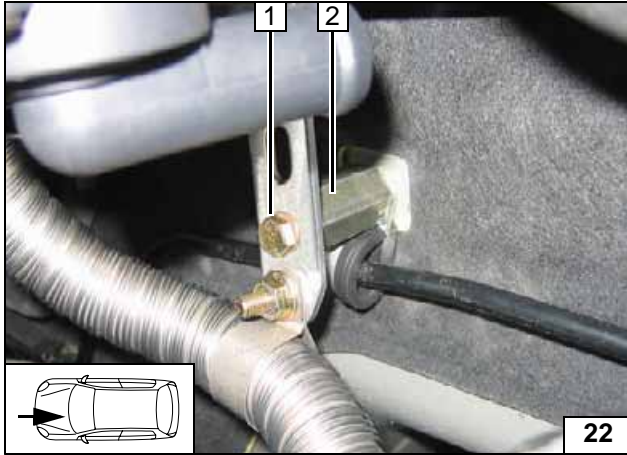
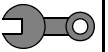
- 1 M6x12 bolt, spring lockwasher, M6x30 spacer nut premounted

Installing heater



- 1 M6x20 bolt, M6 flanged nut, perforated bracket premounted

Installing heater



Check position of all components and adjust if necessary. Check that they have freedom of movement.

Tighten all screw connections.

1 M6x12 bolt

2 Premounted M6x30 spacer nut, 15 mm dia. rubber-coated p-clamp



**Installing
heater**



Fuel

CAUTION!

Open the vehicle's fuel tank cap, ventilate the tank and then re-close the tank lock.

Catch any fuel running off with an appropriate container.

Install fuel line and metering pump wiring harness so that they are protected against stone impact. Unless specified otherwise, always fasten using cable ties.

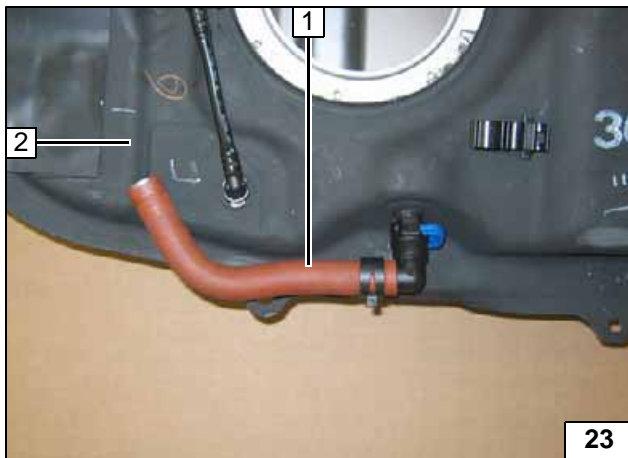
Mount the fuel line and wiring harness with rub protection on sharp edges.

WARNING!

The fuel line and wiring harness are routed to the metering pump in as shown in the wiring harness routing diagram.

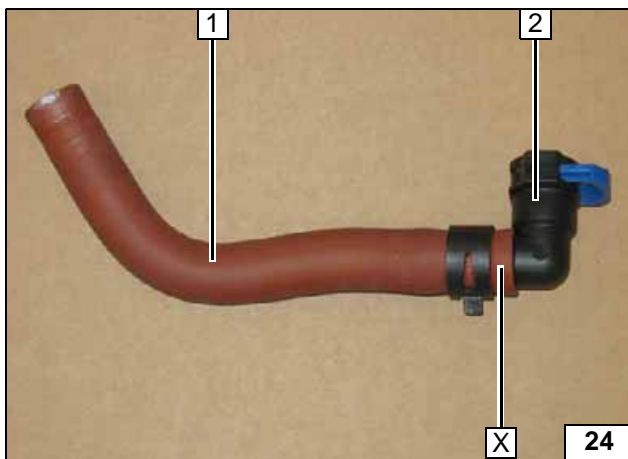


Preparing fuel stand-pipe



Disconnect fuel-tank vent line 1.

2 Fuel tank

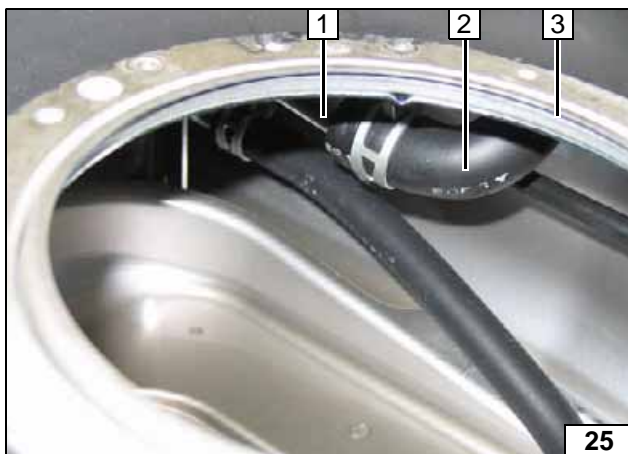


Remove quick-release coupling 2 not required anymore; spring clip will be reused. Apply marking at position X.

1 Fuel-tank vent line



Preparing fuel stand-pipe

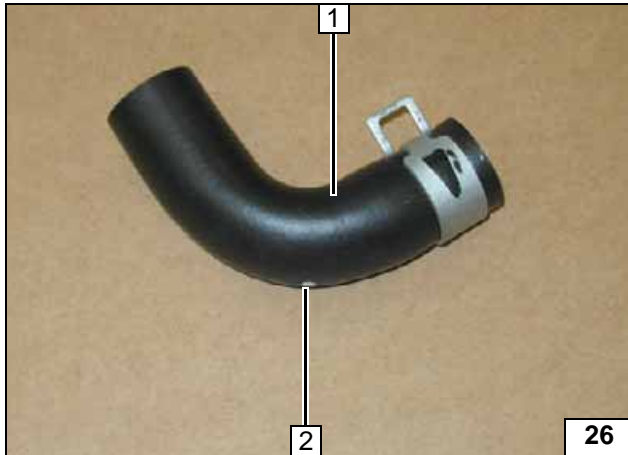


Remove inside 90° hose elbow of fuel tank ventilation; will be reused!

- 1 Pipe of fuel tank ventilation
- 2 90° Hose elbow of fuel tank ventilation
- 3 Fuel tank



Preparing fuel stand-pipe

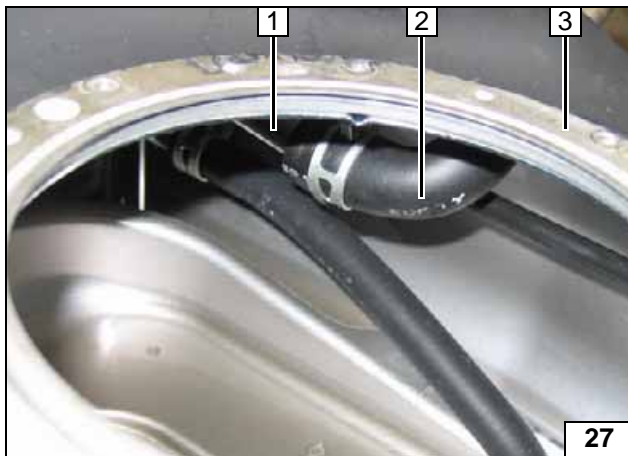


Drill hose elbow in position 2 (3 mm dia.)

- 1 Moulded hose
- 2 Hole 3-4 mm dia.



Preparing fuel stand-pipe

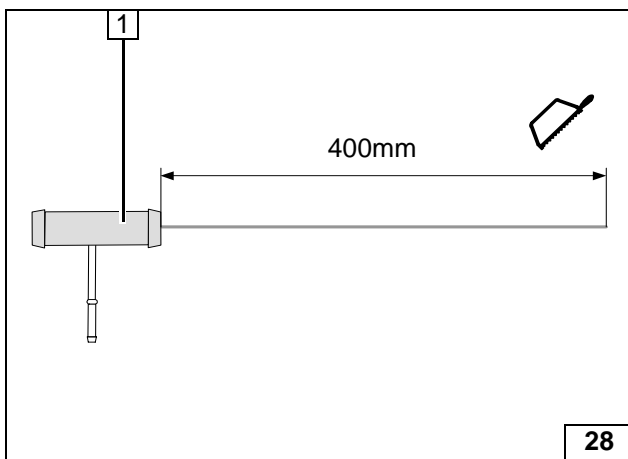


Reinstall hose elbow for fuel tank ventilation.

- 1 Pipe of fuel tank ventilation
- 2 90° Hose elbow of fuel tank ventilation
- 3 Fuel tank

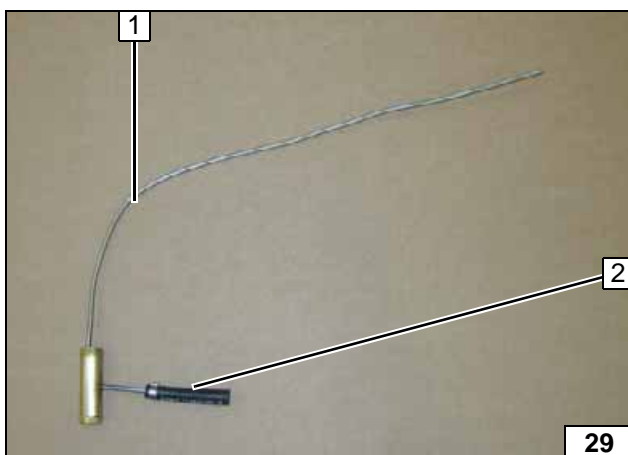


Preparing fuel stand-pipe



1 Fuel standpipe

Cutting fuel stand-pipe to length

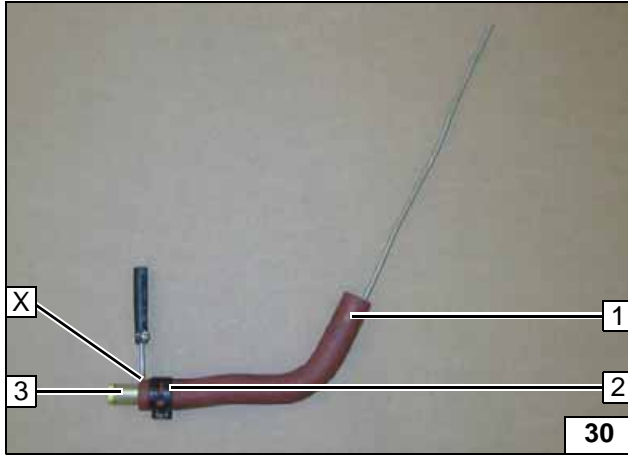


Bend fuel standpipe according to template.

- 1 Fuel standpipe
- 2 Hose section, 10 mm dia. clamp



Preparing fuel stand-pipe

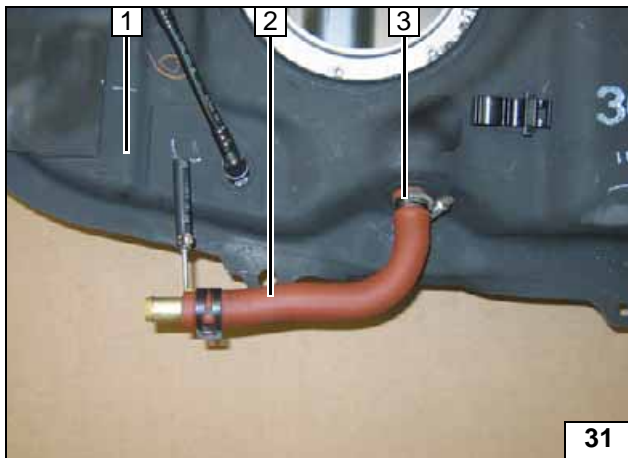


Install fuel-tank vent line as shown; watch X marking

- 1 Fuel-tank vent line
- 2 Original vehicle spring clip
- 3 Fuel standpipe

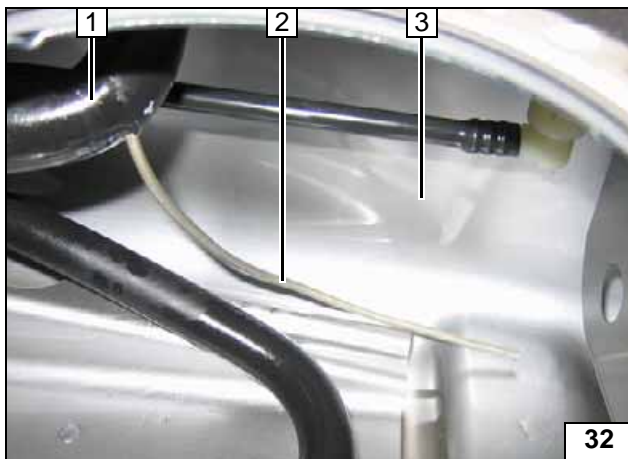


Premounting fuel standpipe



- 1 Fuel tank
- 2 Fuel standpipe, ventilation line
- 3 16-24 mm dia. hose clamp

Mounting fuel standpipe



Mould fuel standpipe 2 as shown

- 1 Hose section of fuel tank ventilation in fuel tank
- 3 Fuel tank



Installing fuel standpipe

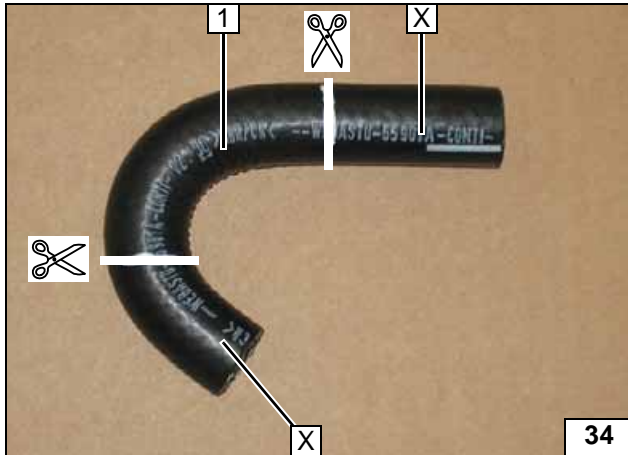


Install fuel-tank sending unit according to manufacturer's instructions. Fasten fuel line 3 to original vehicle fuel line with cable ties.

- 1 Fuel tank
- 2 10 mm dia. clamp



Routing fuel line

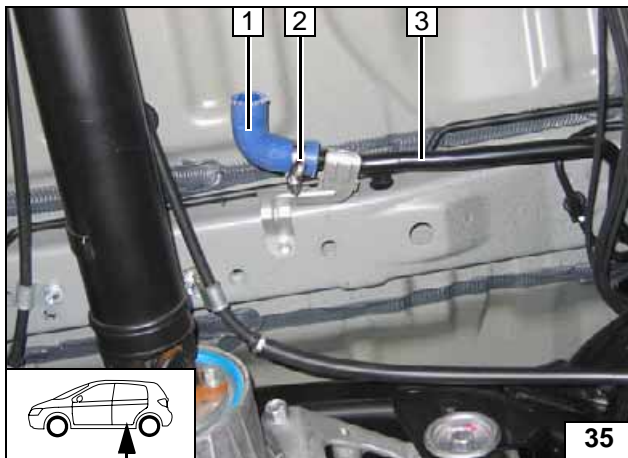


Discard section **X**

1 Moulded hose

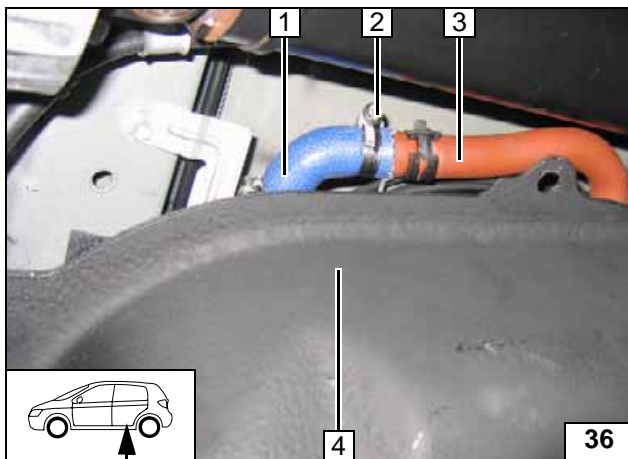


**Preparing
moulded
hose of
fuel tank
ventilation**



1 Moulded hose of fuel tank ventilation
2 16-24 mm dia. hose clamp
3 Pipe of fuel tank ventilation

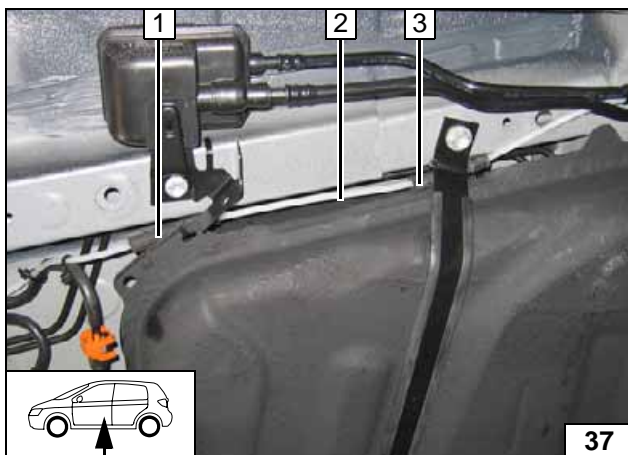
**Installing
fuel-tank
vent line**



Install fuel tank **4** according to manufacturer's specifications.
Connect premounted moulded hose of fuel tank ventilation to connection piece of fuel standpipe.

1 Moulded hose of fuel tank ventilation
2 16-24 mm dia. hose clamp
3 Hose of fuel tank ventilation, fuel standpipe

**Installing
fuel-tank
vent line**

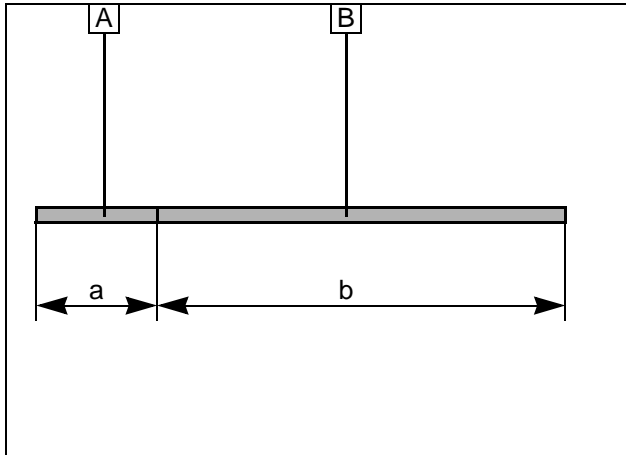


Use 8x12 moulded hose as rub protection.

1 8x12 moulded hose, cable tie
2 Mecanyl fuel line
3 8x12 moulded hose, cable tie



**Routing
fuel line**

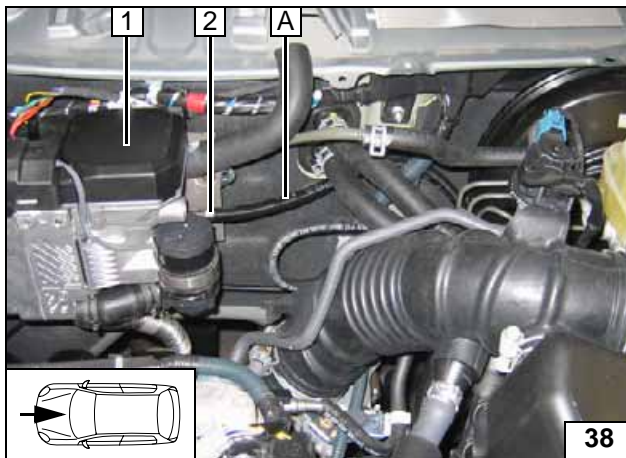


Discard section **X**.

a = 350
b = 780



Cutting corrugated tube to length

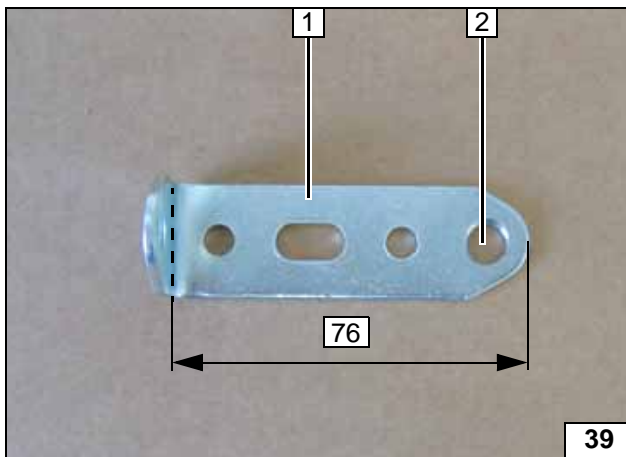


Slide corrugated tube **A** on to Mecanyl fuel line and route together with wiring harness for the metering pump along the original vehicle fuel lines to the vehicle underbody

- 1 Heater
- 2 Premounted Mecanyl fuel line



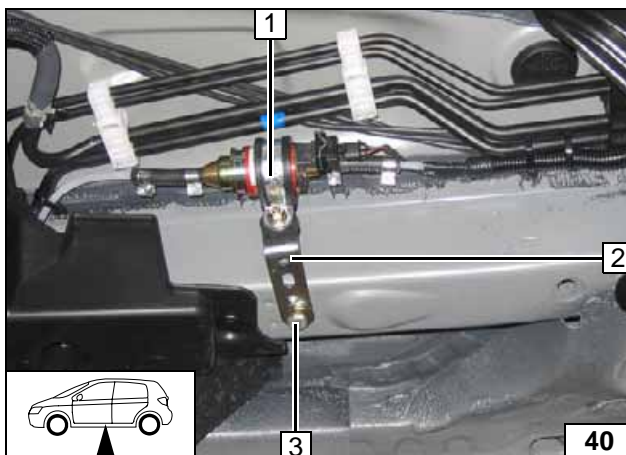
Connecting heater



Bend perforated bracket **1** by 90°. Drill out hole at position **2** to 8.5 mm dia.



Preparing perforated bracket

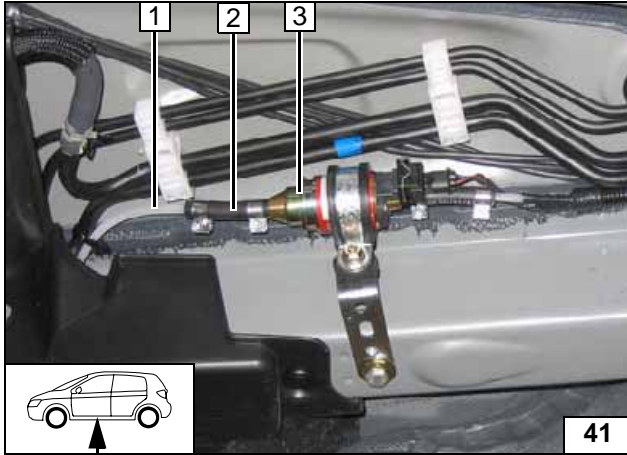


Ensure proper installation position of metering pump, see "Installation Instructions".

- 1 Metering pump, silent block, M6 flanged nut, rubber-coated p-clamp
- 2 Perforated bracket
- 3 M8x20 bolt, spring lockwasher, existing M8 threaded insert



Installation location of metering pump

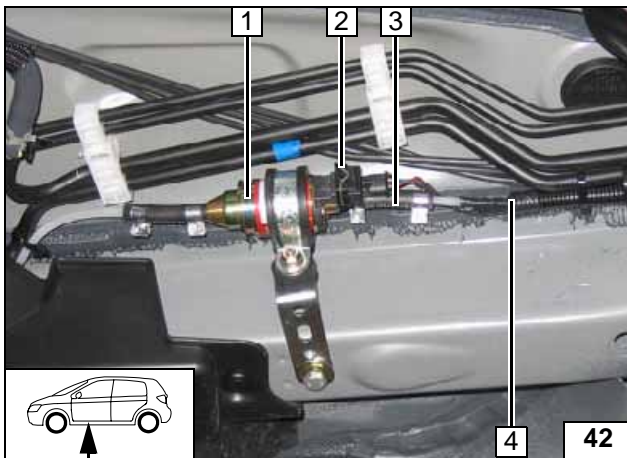


Fuel line from fuel standpipe on intake side of metering pump [side without connector]. Check the position of the components; adjust if necessary. Check that they have freedom of movement.

- 1 Mecanyl fuel line
- 2 Hose section, 10 mm dia. hose clamp [2x]
- 3 Metering pump



**Connect-
ing meter-
ing pump**

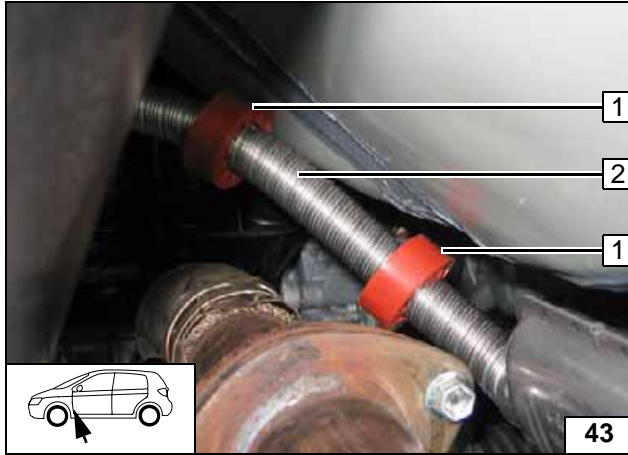
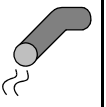


Fuel line from heater on pressure side of metering pump [side with connector]. Check the position of the components; adjust if necessary. Check that they have freedom of movement.

- 1 Metering pump
- 2 Connector of wiring harness of metering pump
- 3 Hose section, 10 mm dia. hose clamp [2x]
- 4 Corrugated tube **B**, Mecanyl fuel line, wiring harness of metering pump



**Connect-
ing meter-
ing pump**



Exhaust gas

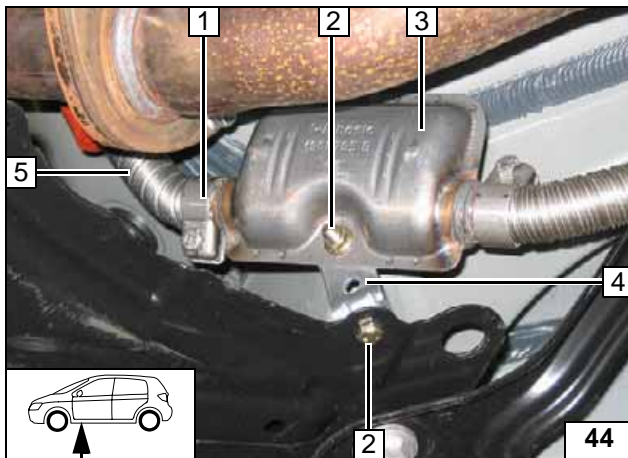
1AZ-FE:

Slide on red (rt) rubber isolator 1 [2x] as shown.

2 Premounted exhaust pipe from heater



Installing exhaust pipe

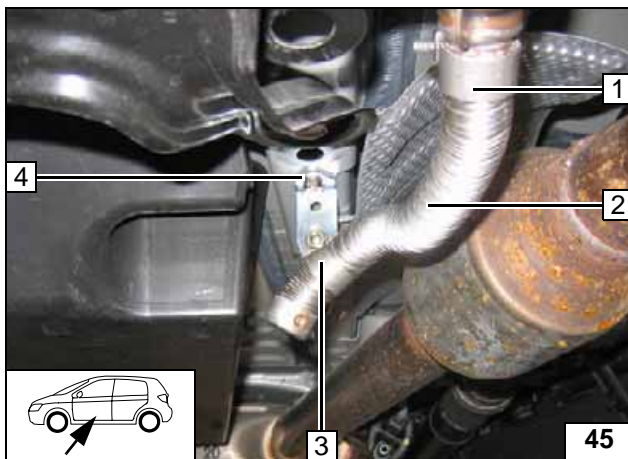


Ensure sufficient distance to neighbouring components.

- 1 Hose clamp
- 2 M6x20 bolt, M6 flanged nut [2x each]
- 3 Exhaust silencer
- 4 Angle bracket
- 5 Exhaust pipe



Installing silencer

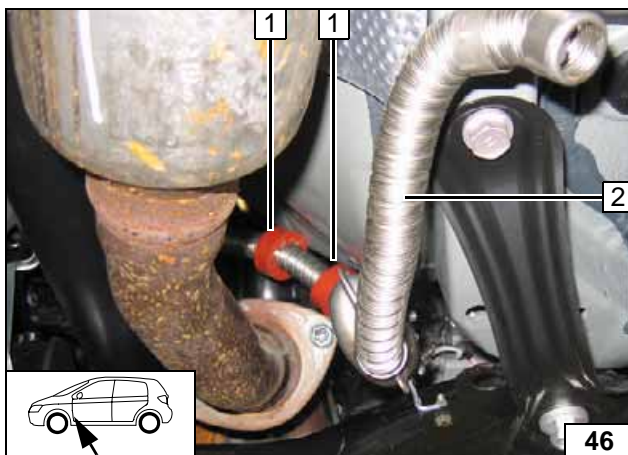


Ensure sufficient distance to neighbouring components.

- 1 Exhaust silencer, hose clamp
- 2 Exhaust-pipe end section
- 3 Pipe clamp, M6x20 bolt, M6 flanged nut
- 4 M6x20 bolt, spring lockwasher, angle bracket, original vehicle threaded insert



Installing exhaust end section

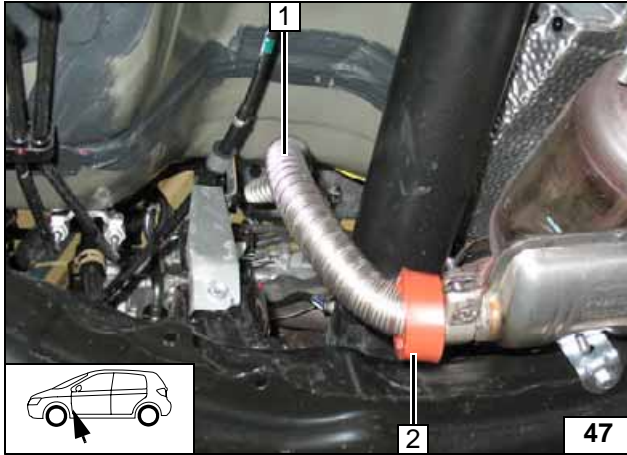
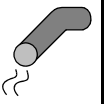


Ensure sufficient distance to neighbouring components.

- 1 Red (rt) rubber isolator [2x]
- 2 Align exhaust end section



Aligning rubber iso-lator

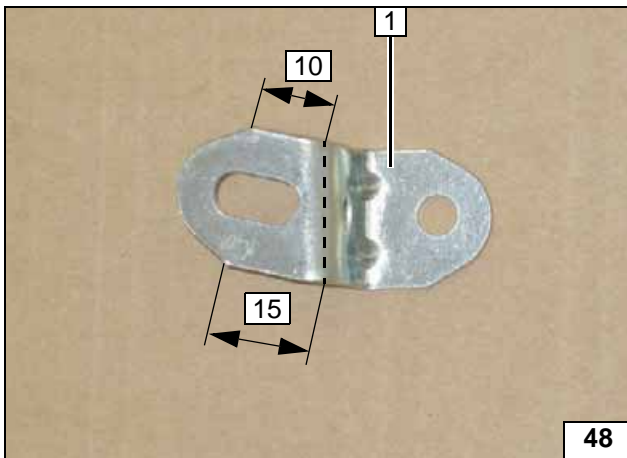


3ZR-FAE:

Route exhaust pipe 1 to underbody and slide on red (rt) rubber isolator 2 as shown.



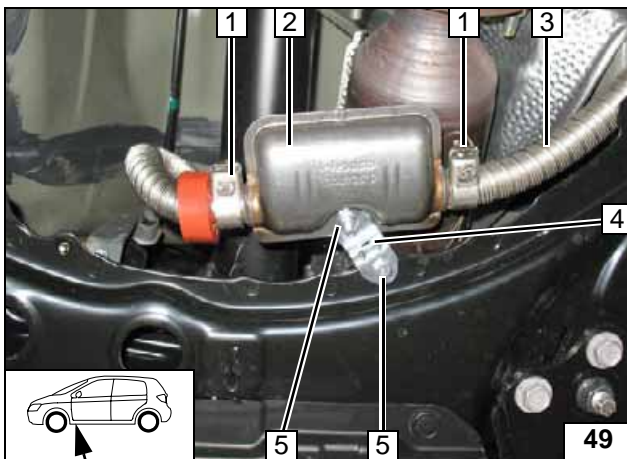
Installing exhaust pipe



Bend angle bracket 1 by 90°.



Preparing angle bracket

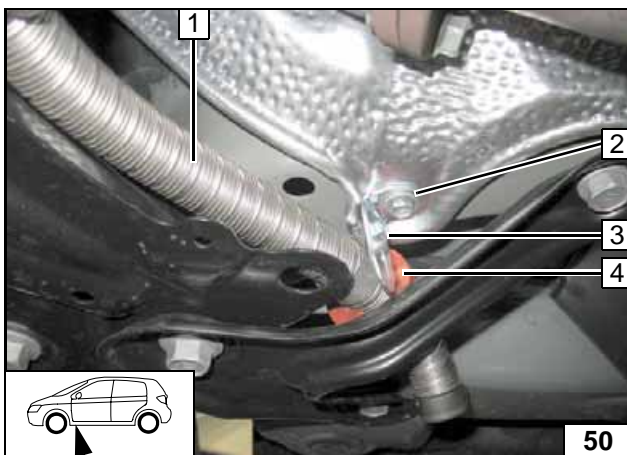


Ensure sufficient distance to neighbouring components.

- 1 Hose clamp [2x]
- 2 Exhaust silencer
- 3 Exhaust end section
- 4 Angle bracket
- 5 M6x20 bolt, M6 flanged nut [2x each]



Installing silencer

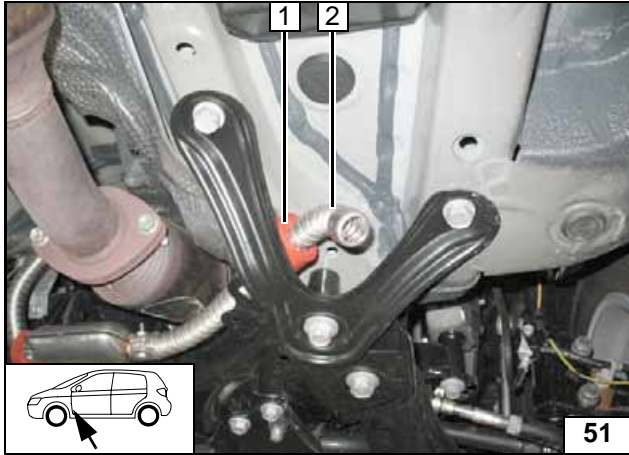
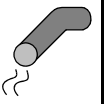


Slide red (rt) rubber isolator 4 onto exhaust end section 1. Ensure sufficient distance to neighbouring components.

- 2 Original vehicle bolt
- 3 M6x20 bolt, p-clamp, M6 flanged nut



Fastening exhaust end section

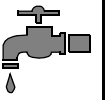


Ensure sufficient distance to neighbouring components.

- 1 Red (rt) rubber isolator
- 2 Exhaust end section



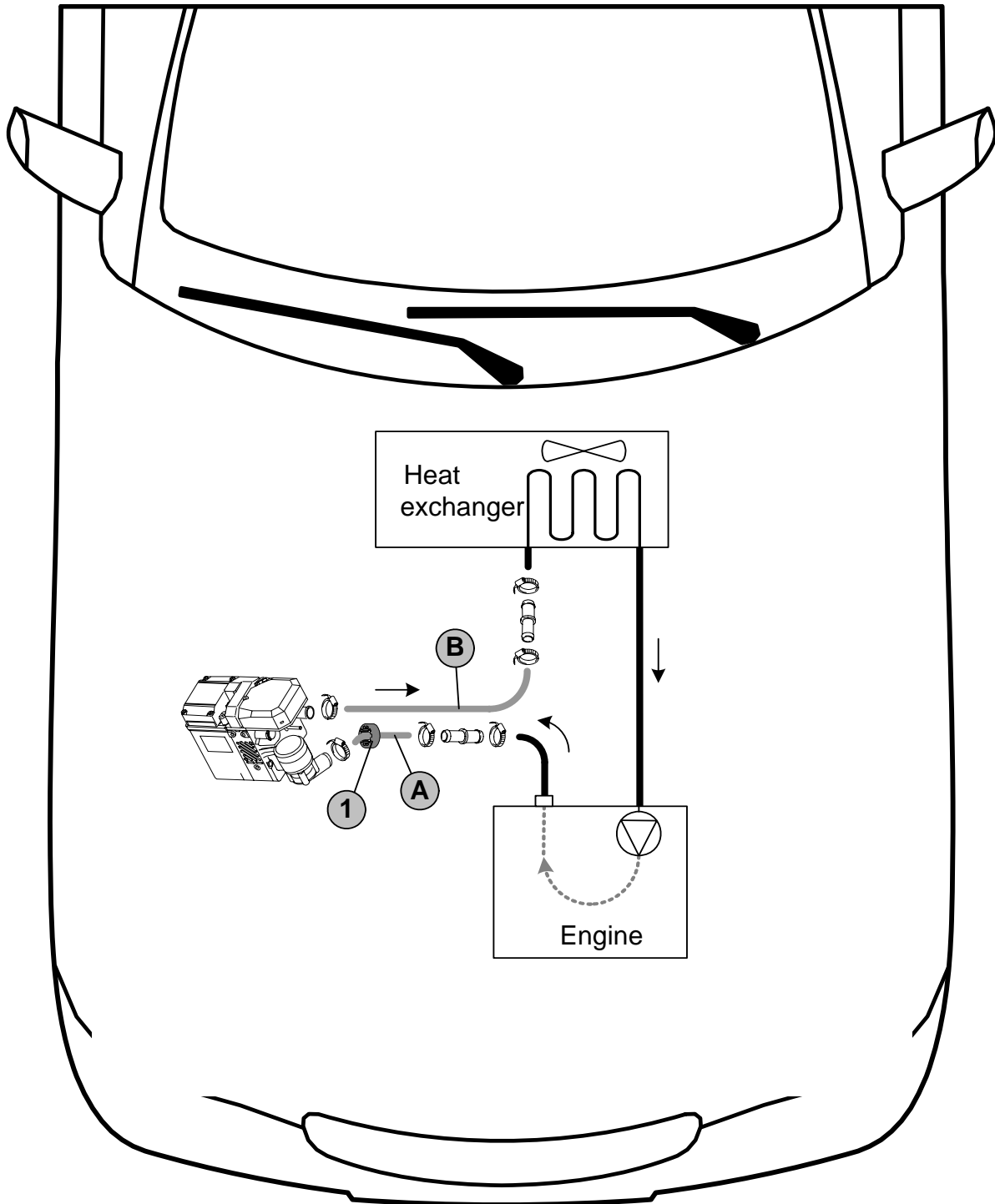
**Aligning
exhaust
end section**



Coolant circuit

WARNING!

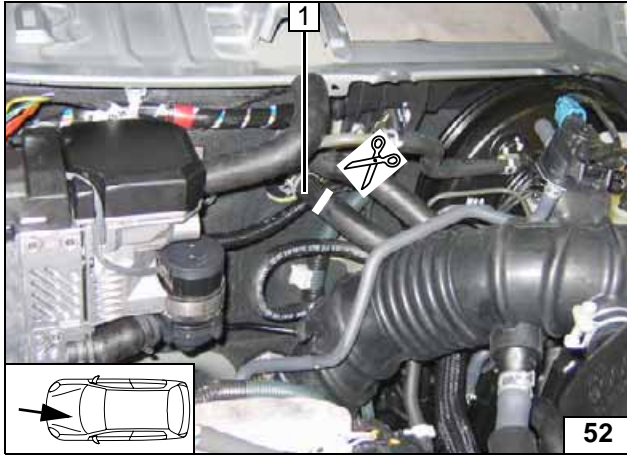
Any coolant running off should be collected using an appropriate container. Install hoses so that they are kink-free. Unless specified otherwise, always fasten using cable ties. Position clamps so that no other hose can be damaged. When installing the hoses, the heater must be filled with coolant. The connection should be "inline" based on the following diagram:



Hose routing diagram

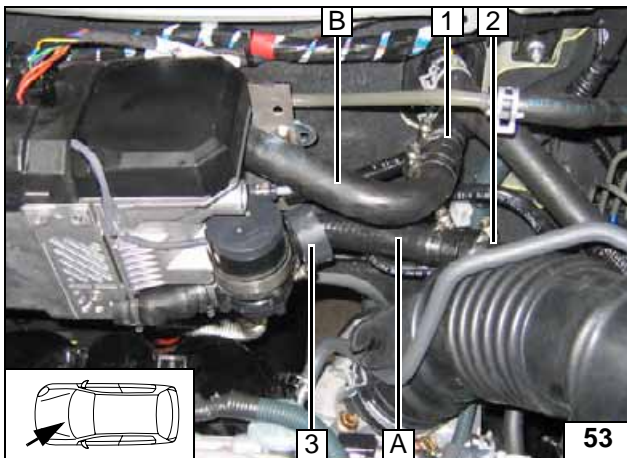
All hose clamps = 20-27 mm dia.! All connecting pipes = 17x20 dia.
Position 1 = Black rubber isolator!





1 Hose of engine outlet

Cutting point

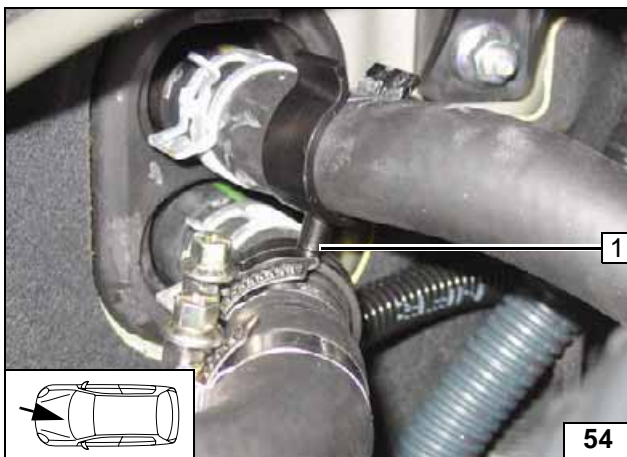


Before connecting, fill the coolant hoses with coolant.

- 1 Hose section of heat exchanger inlet
- 2 Engine-outlet hose section
- 3 Black rubber isolator



Routing in engine compartment



1AZ-FE:

Mount spacer bracket 1 as shown.



Installing spacer bracket

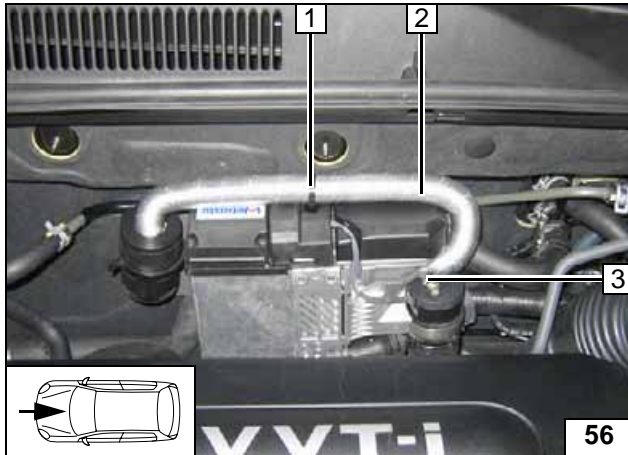
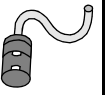


3ZR-FAE:

Mount spacer bracket 1 as shown.



Installing spacer bracket



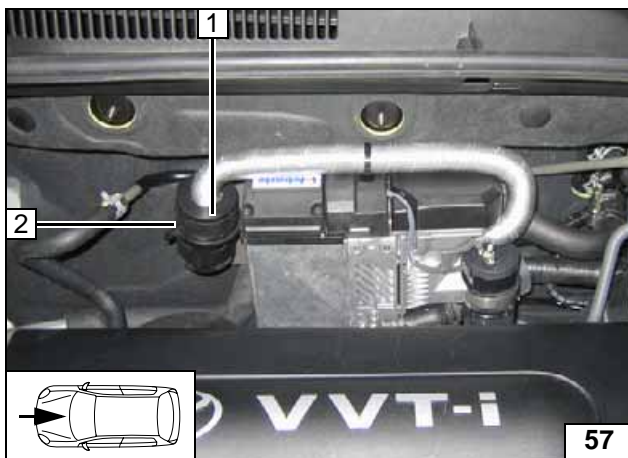
Combustion air

Punch through perforation in centre heater cover and mount clip-type cable tie 1

- 2 Combustion air pipe
- 3 27 mm dia. hose clamp



Installing intake pipe



- 1 Silencer
- 2 Retaining clip in hole of bracket



Installing silencer



Final Work

WARNING!

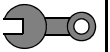
Reassemble the disassembled components in reverse order. Check all hoses, clamps and all electrical connections for firm seating. Insulate and tie back all loose wires.

Only use manufacturer-approved coolant. Spray the heater components with anti-corrosion wax (Tectyl 100K, Order No. 111329).

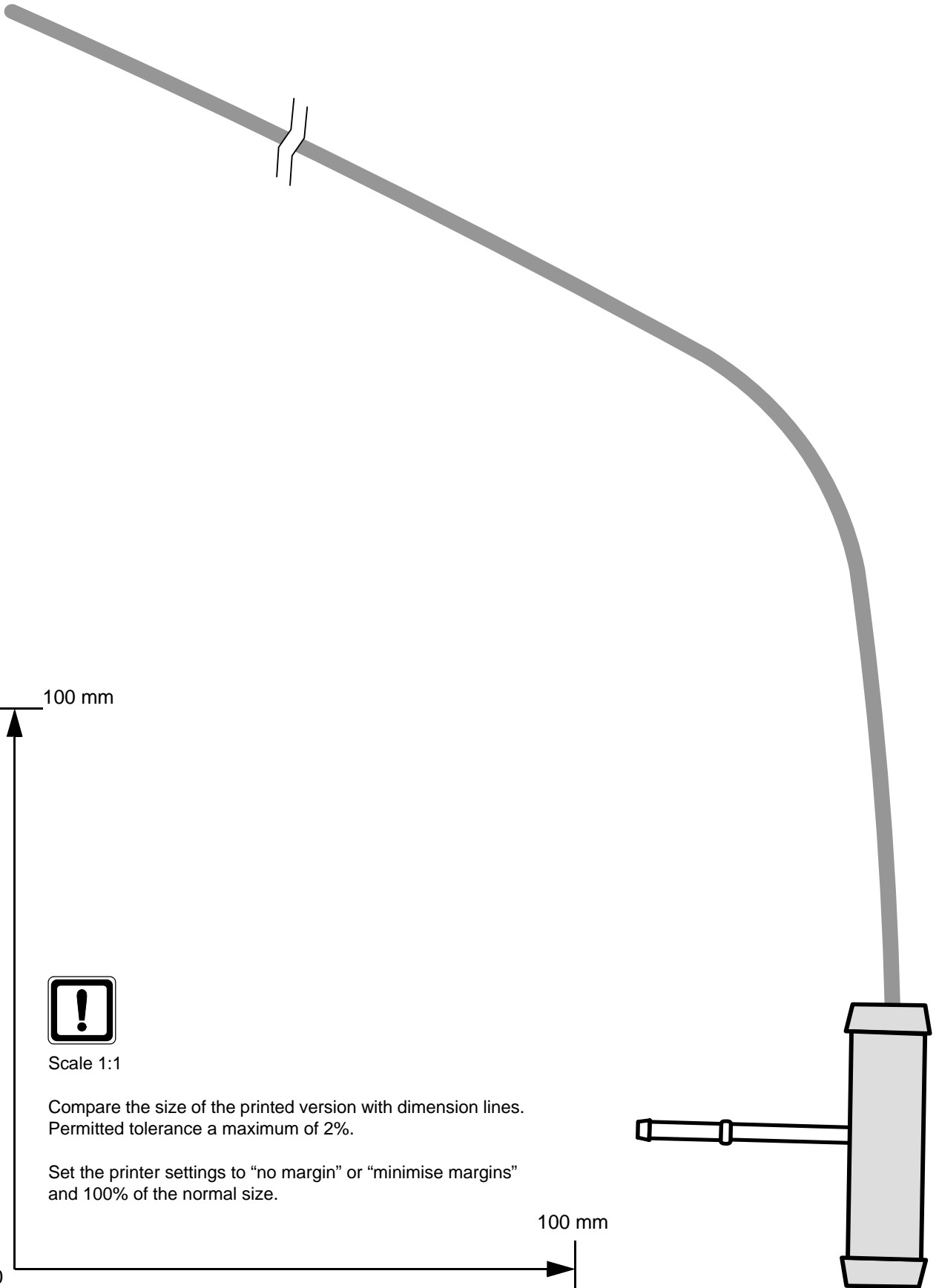
- **Connect the battery**
- **Fill and bleed the coolant circuit according to the vehicle manufacturer's specifications.**
- **Set digital timer, teach Telestart transmitter**
- **Make settings on A/C control panel according to the "Operating Instructions for End Customer".**
- **Mount sticker "Switch off parking heater before refueling" in area of filler neck.**
- **For initial startup and function check, see installation instructions.**

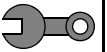


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Template for fuel standpipe





Operating Instructions for End Customer



Please remove page and add to the vehicle operating instructions.

Note:

We recommend matching the heating time to the driving time.

Heating time = driving time

Example:

For a driving time of approx. 20 min. (in one direction), we recommend not exceeding a switch-on time of 20 min.

For vehicles with a passenger compartment monitoring unit, deactivate it in addition to vehicle settings for the heating cycle.

Please refer to the operating manual of the vehicle for instructions regarding deactivation.

If the summer/winter switch option has been installed, this must be switched in accordance with the time of year. The heater will then heat in the position Winter and in the position Summer it will only switch on the vehicle fan to ventilate the vehicle interior.

Before parking the vehicle, make the following settings:



- 1 Set AC button to "off"
- 2 Air outlet to windscreen
- 3 Set fan to level "2" or max. "3"
- 4 Set temperature to "HI"

Automatic air-conditioning



- 1 Air outlet to windscreen
- 2 Set fan to level "1" or max. "2"
- 3 Set temperature to "HI"

Manual air conditioning