Water Heater

Thermo Top Evo Parking Heater

E1
00 0258

With FuelFix

Installation Documentation
Opel Karl

Validity

Manufacturer	Model	Type	EG BE No. / ABE
Opel	Karl	D-A	e4 * 2007 / 46 * 0957 * 00

Motorisation	Fuel	Transmission type	Output in kW	Displacement in cm³	Engine code
1.0 P	Petrol	5-speed SG	55	999	L5Q

SG = manual transmission

From model year 2016
Left-hand drive vehicle

Verified equipment variants: Automatic air-conditioning
Euro 6

Not verified: Automatic Start-Stop system

Total installation time: approx. 6.7 hours

Opel Karl

Table of Contents

Necessary Components

- Basic delivery scope of Thermo Top Evo according to price list
- Installation kit with FuelFix for Opel Karl 2016 Petrol: **1324755A**
- To be ordered additionally in case of automatic air-conditioning: Additional kit for Opel automatic air-conditioning: **1321695**_
- Heater control in accordance with price list and upon consultation with end customer
- In case of Telestart, indicator lamp in accordance with price list and in consultation with end customer

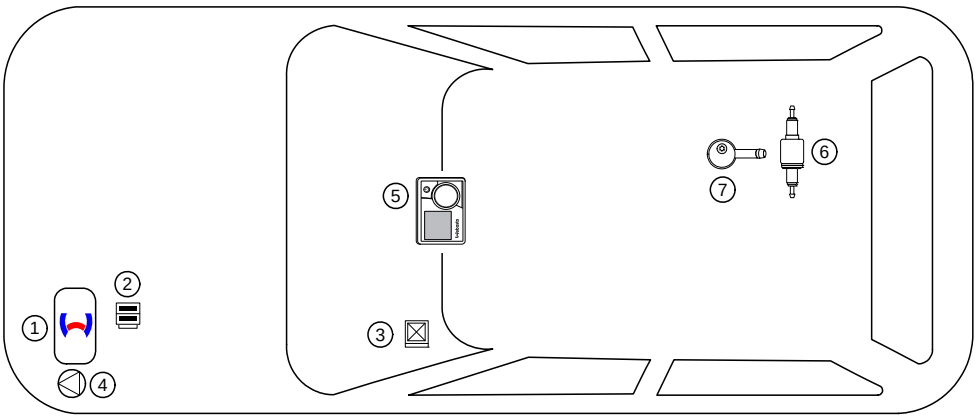
Installation instructions:

- Arrange for the vehicle to be delivered with the tank only about ¼ full.
- The installation location of the push button in case of Telestart or Thermo Call should be confirmed with the end customer.
- Depending on the space required and the vehicle manufacturer's instructions, we recommend the use of a vehicle battery with a higher electrical capacity.

Installation Overview

Legend:

1. Heater
2. Engine compartment fuse holder
3. CAN module
4. Circulating pump
5. MultiControl CAR
6. Metering pump
7. FuelFix



Information on Total Installation Time

The total installation time includes the time needed for mounting and demounting the vehicle-specific components, the heater specific installation time and all other times required for the system integration and initial start-up of the heater.
The total installation time may vary for vehicle equipment other than provided.

Information on Operating and Installation Instructions

1 Important information (not complete)

1.1 Installation and repair

The improper installation or repair of Webasto heating and cooling systems can cause fire or the leakage of deadly carbon monoxide, leading to serious injury or death.

To install and repair Webasto heating and cooling systems you need to have completed a special company training course and have the appropriate technical documentation, special tools and special equipment.

Installation and repair may ONLY be carried out by persons trained and certified in a Webasto training course. NEVER try to install or repair Webasto heating or cooling systems if you have not completed a Webasto training course, you do not have the necessary technical skills and you do not have the technical documentation, tools and equipment available to ensure that you can complete the installation and repair work properly.

Only use genuine Webasto parts. See the Webasto air and water heaters accessories catalogue for this purpose.

1.2 Operation

To ensure safe operation, we recommend having the heater checked every two years by an authorised Webasto dealer, especially when used over a long period and/or under extreme environmental conditions.

Do not operate the heater in closed rooms due to the danger of poisoning and suffocation.

Always switch off the heater before refuelling.

The heater may only be used with the prescribed fuel diesel (DIN EN 590) or petrol (DIN EN 228).

The heater may not be cleaned with a high-pressure cleaner.

1.3 Please note

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

To become familiar with and understand all functions and properties of the heater, the operating instructions must be read carefully and observed at all times.

For proper, safe installation and repair work, the installation instructions with all warnings and safety information must be carefully read and observed at all times. Please always contact a workshop authorised by Webasto for all installation and repair work.

Important

Webasto shall assume no liability for defects, damage and injuries resulting from a failure to observe the installation, repair and operating instructions of the information contained in them.

This liability exclusion particularly applies to improper installations and repairs, installations and repairs by untrained persons or in the case of a failure to use genuine spare parts.

The liability due to culpable disregard to life, limb or health and due to damage or injuries caused by a wilful or reckless breach of duty remain unaffected, as does the obligatory product liability.

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. Insulate loose wire ends and tie back. Connectors on electronic components have to audibly click into place during installation.

Sharp edges should be fitted with rub protection. Spray unfinished body areas, e.g. drilled holes, with anti-corrosion wax (Tectyl 100K).

Observe the instructions and guidelines of the respective vehicle manufacturer for demounting and mounting vehicle specific components!

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

When installing a programmable control module (e.g. a PWM Gateway), the corresponding settings must be checked or adjusted.

2 Statutory regulations governing installation

Guidelines	Thermo Top Evo
Heating Directive ECE R122	E1 00 0258
EMC Directive ECE R10	E1 04 5627

Note

The regulations of these guidelines are binding in the scope of the Directive 70/156/EEC and/or 2007/46/EC (for new vehicle models from 29/04/2009) and should also be observed in countries in which there are no special regulations.

Important

Failure to follow the installation instructions will result in the invalidation of the type approval for the heater and therefore invalidation of the general **homologation of the vehicle**.

Note

The heater is licensed in accordance with paragraph 19, section 3, No. 2b of the StVZO (German Road Traffic Licensing Authority).

2.1 Excerpt from ECE regulation 122 (heating system) paragraph 5 for the installation of the heater

Beginning of excerpt.

ANNEX VII

REQUIREMENTS FOR COMBUSTION HEATERS AND THEIR INSTALLATION

1. GENERAL REQUIREMENTS

1.7.1. A clearly visible tell-tale in the operator's field of view shall inform when the combustion heater is switched on or off.

2. VEHICLE INSTALLATION REQUIREMENTS

2.1. Scope

2.1.1. Subject to paragraph 2.1.2. combustion heaters shall be installed according to the requirements of this Annex.

2.1.2. Vehicles of category O having liquid fuel heaters are deemed to comply with the requirements of this Annex.

2.2. Positioning of heater

2.2.1. Body sections and any other components in the vicinity of the heater must be protected from excessive heat and the possibility of fuel or oil contamination.

2.2.2. The combustion heater shall not constitute a risk of fire, even in the case of overheating. This requirement shall be deemed to be fulfilled if the installation ensures an adequate distance to all parts and suitable ventilation, by the use of fire resistant materials or by the use of heat shields.

2.2.3. In the case of M2 and M3 vehicles, the heater must not be positioned in the passenger compartment. However, an installation in an effectively sealed envelope which also complies with the conditions in paragraph 2.2.2. may be used.

2.2.4. The label referred to in paragraph 1.4 or a duplicate, must be positioned so that it can be easily read when the heater is installed in the vehicle.

2.2.5. Every reasonable precaution should be taken in positioning the heater to minimise the risk of injury and damage to personal property.

2.3. Fuel supply

2.3.1. The fuel filler must not be situated in the passenger compartment and must be provided with an effective cap to prevent fuel spillage.

2.3.2. In the case of liquid fuel heaters, where a supply separate to that of the vehicle is provided, the type of fuel and its filler point must be clearly labelled.

2.3.3. A notice, indicating that the heater must be shut down before refuelling, must be affixed to the fuelling point. In addition a suitable instruction must be included in the manufacturer's operating manual.

2.4. Exhaust system

2.4.1. The exhaust outlet must be located so as to prevent emissions from entering the vehicle through ventilators, heated air inlets or opening windows.

2.5. Combustion air inlet

2.5.1. The air for the combustion chamber of the heater must not be drawn from the passenger compartment of the vehicle.

2.5.2. The air inlet must be so positioned or guarded that blocking by rubbish or luggage is unlikely.

2.6. Heating air inlet

2.6.1. The heating air supply may be fresh or recirculated air and must be drawn from a clean area not likely to be contaminated by exhaust fumes emitted either by the propulsion engine, the combustion heater or any other vehicle source.

2.6.2. The inlet duct must be protected by mesh or other suitable means.

2.7. Heating air outlet

2.7.1. Any ducting used to route the hot air through the vehicle must be so positioned or protected that no injury or damage could be caused if it were to be touched.

2.7.2. The air outlet must be so positioned or guarded that blocking by rubbish or luggage is unlikely.

End of excerpt.

In multilingual versions the German language is binding.

Opel Karl

Information on Validity

This installation documentation applies to Opel Karl Petrol vehicles - for validity, see page 1 - from model year 2016 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’.

Vehicle and engine types, equipment variants and other specifications not listed in this installation documentation have not been tested. However, installation according to this installation documentation may be possible.

Technical Information

Special Tools
- Hose clamp pliers for auto-tightening hose clamps
- Hose clamp pliers for Clic hose clamps of type W
- Automatic wire stripper 0.2 - 6mm²
- Crimping pliers for cable lug / tab connector 0.5 - 6mm²
- Torque wrench for 2.0 - 10 Nm
- Hose clamping pliers
- Metric thread-setter kit
- Deep-hole marker
- Webasto Thermo Test Diagnosis with current software

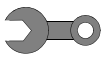
Dimensions
- All dimensions are in mm.

Tightening torque values
- Tightening torque values of 5x13 heater bolts and 5x11 heater stud bolts = 8Nm.
- Tightening torque value of 5x15 water connection piece retaining plate bolt = 7Nm.
- Tighten other bolt connections in accordance with manufacturer's instructions or in accordance with state-of-the-art-technology.

Explanatory Notes on Document

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

Mechanical System



Electrical System

Coolant Circuit

Combustion Air

Fuel

Exhaust Gas

Software

Special features are highlighted using the following symbols:

Specific risk of damage to components.

Specific risk due to electrical voltage.

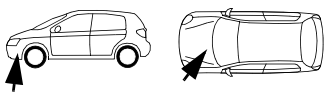
Specific risk of injury or fatal accidents.

Specific risk of fire or explosion.

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

Reference to a special technical feature.

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



Tightening torque according to the manufacturer's vehicle-specific documents.

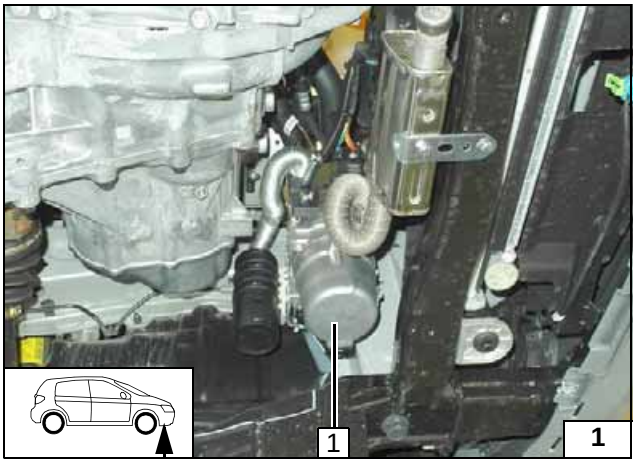
Preliminary Work

Vehicle

- Open the fuel tank cap.
- Ventilate the fuel tank.
- Close the fuel tank cap again.
- Depressurise the cooling system.
- Remove the battery
  Warning: Do not reconnect the battery until all the operations required to integrate the heater and its components, especially the CAN module, are completed. Failure to do so may result in malfunctions of the CAN module.
- Remove the engine control unit.
- Remove the battery carrier.
- Remove the fuel tank in accordance with the manufacturer's instructions.
- Remove the cover of the instrument panel on the left.
- Remove the lower instrument panel trim on the left.
- Remove the cover of the fuse box on the left.

Heater

- Remove years that do not apply from the type and duplicate label.
- Attach the duplicate label (type label) visibly in the appropriate place in the engine compartment.



Heater Installation Location

1 Heater

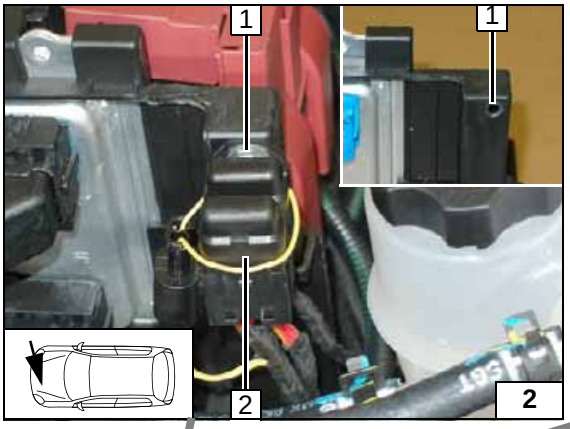
Installation location

Electrical System

Engine compartment fuse holder

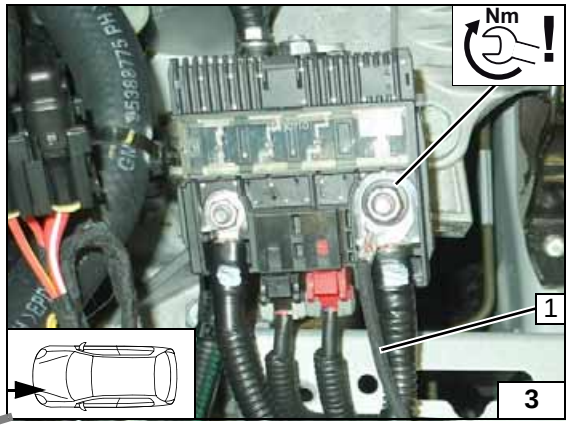
Replace 30A fuse F2 with 1A fuse.

1 5.5mm dia. hole, M5x16 bolt, large diameter washer [2x], fuse holder retaining plate, nut
2 Fuses F1-2

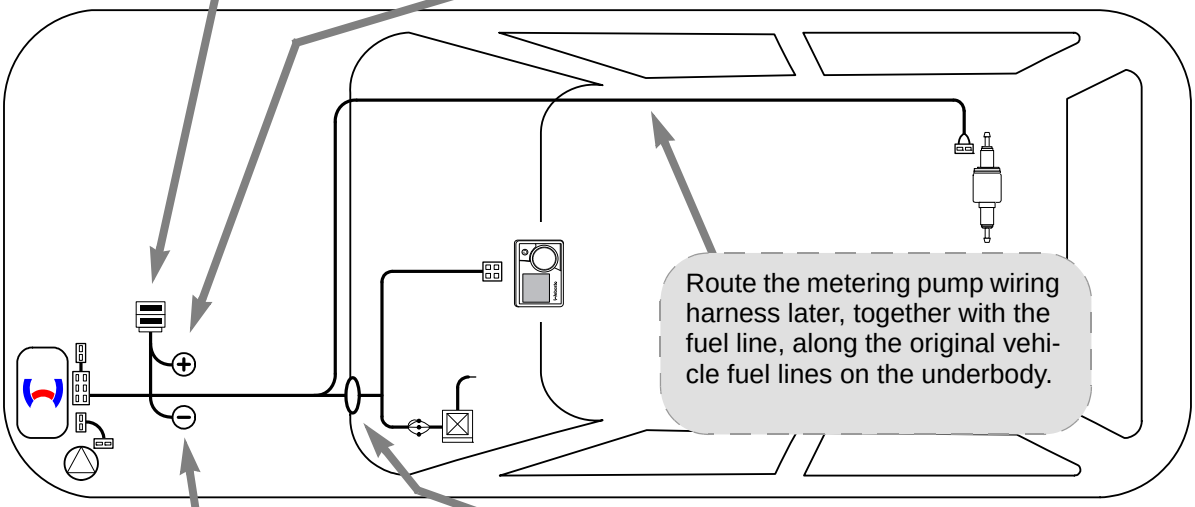


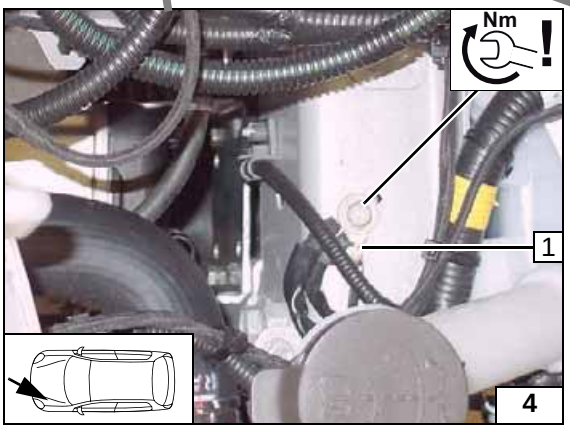
Positive wire

1 Positive wire on positive battery distributor



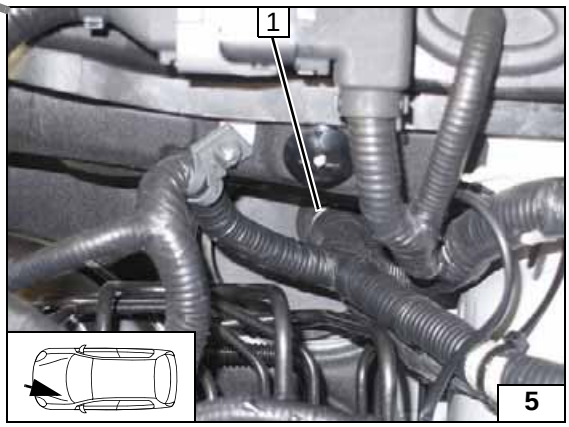
Wiring harness routing diagram





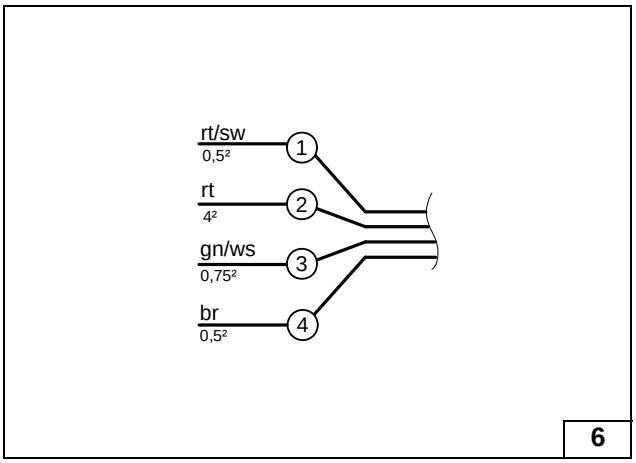
Earth wire

1 Earth wire on earth support point



Wiring harness pass through

1 Protective rubber plug



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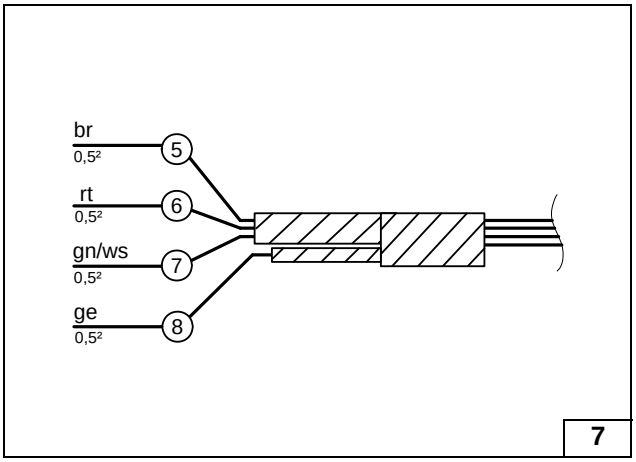

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Automatic Air-Conditioning Fan Controller

Wire sections retain their numbering in the entire document.

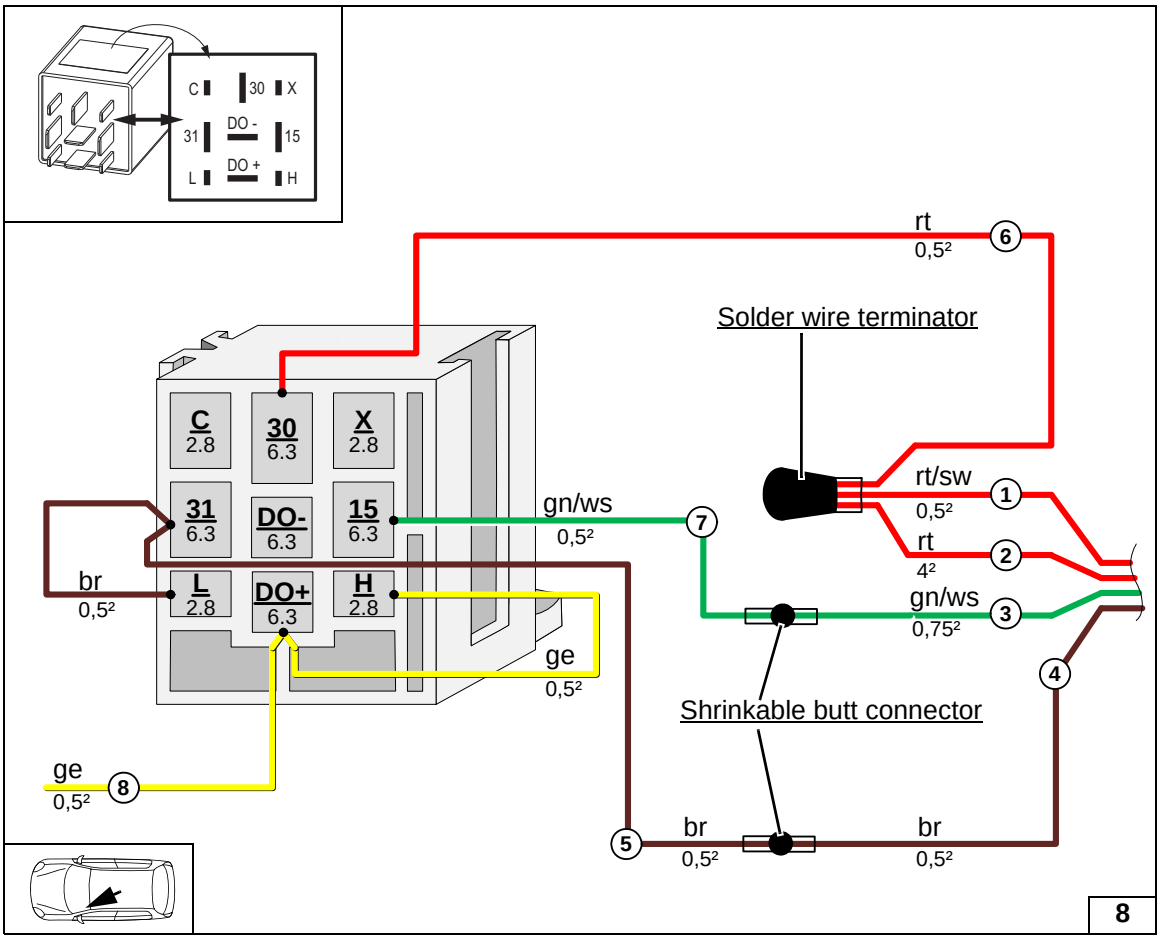
Produce all following electrical connections as shown in the wiring diagram.

Assigning heater wiring harness

① Red/black (rt/sw) wire of heater wiring harness/ X10
② Red (rt) wire of heater wiring harness/ F2
③ Green/white (gn/ws) wire of heater wiring harness/ X1/5
④ Brown (br) wire of heater wiring harness/ earth 31

Assigning CAN wiring harness

⑤ Brown (br) wire from CAN wiring harness/ 31
⑥ Red (rt) wire from CAN wiring harness/ 30
⑦ Green/white (gn/ws) wire of CAN wiring harness/ 15
⑧ Yellow (ge) wire of CAN wiring harness/DO+



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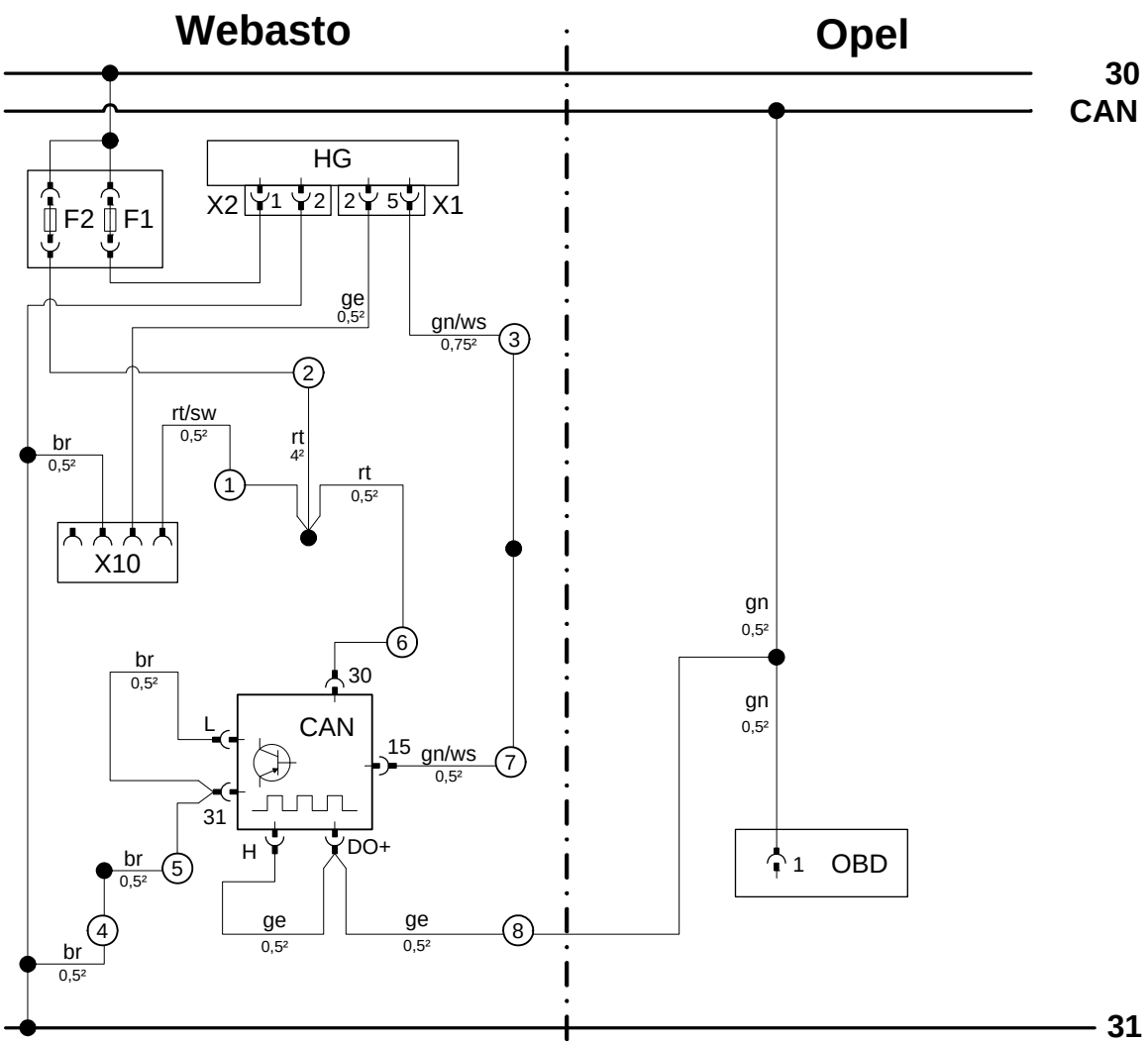
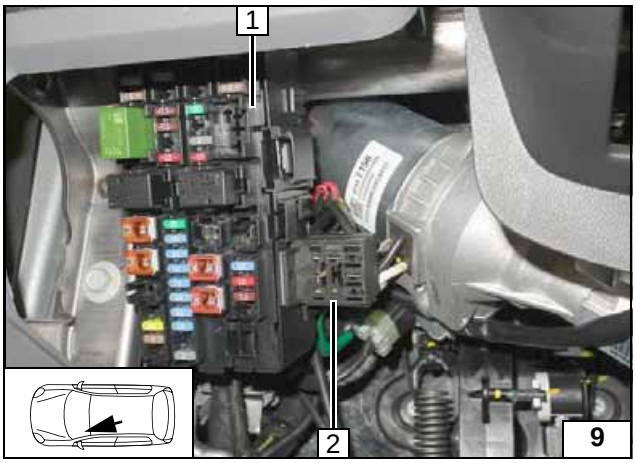
Connecting wires from heater wiring harness and CAN-module wiring harness in passenger compartment

Wiring diagram



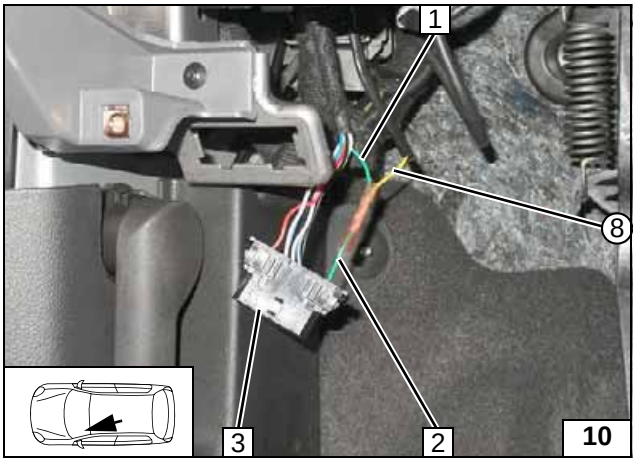
Legend

Webasto components		Vehicle components		Colours and symbols	
HG	TT-Evo heater	OBD	16-pin OBD connector	rt	red
X1	6-pin heater connector			sw	black
X2	2-pin heater connector			ge	yellow
F1	20A fuse			gn	green
F2	**Replace 30A with 1A fuse**			br	brown
				ws	white
X10	4-pin connector of heater control				
CAN	CAN module				
				Wiring colours may vary.	



1 Instrument panel fuse box
2 Fasten CAN module socket with double-sided adhesive tape

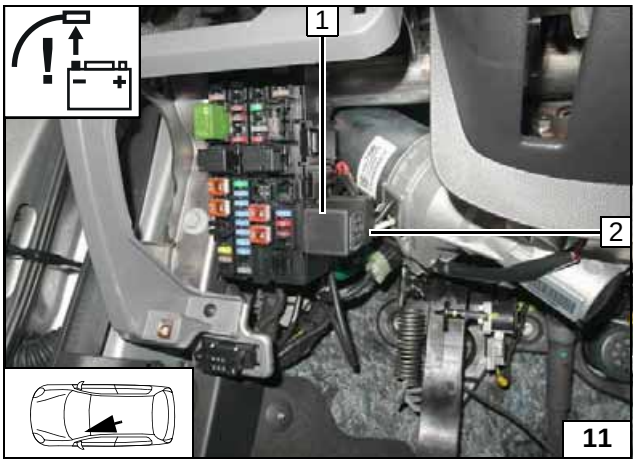
Installing CAN module socket



Produce connections by crimping and shrinking.

1 Green (gn) wire of CAN bus
2 Green (gn) wire of OBD/1
3 16 pin OBD connector
⑧ Yellow (ge) wire of CAN module/DO+

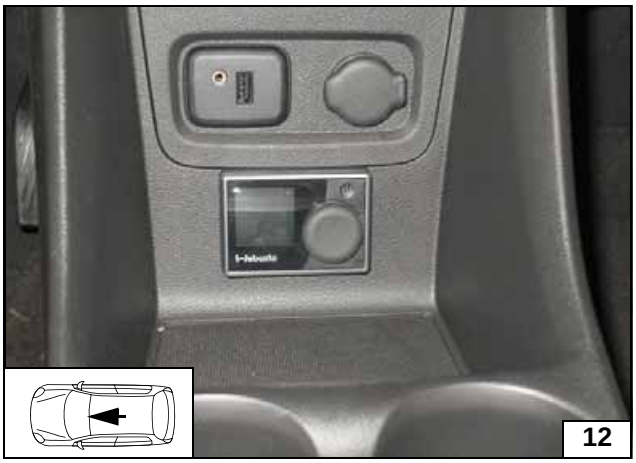
CAN connection CAN module



Before installation see info on battery in section ‘Preliminary Work’!

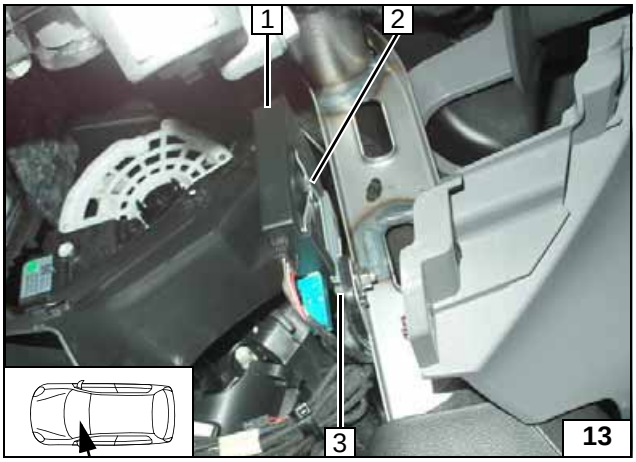
1 CAN module
2 CAN module socket

Installing CAN module



MultiControl CAR Option

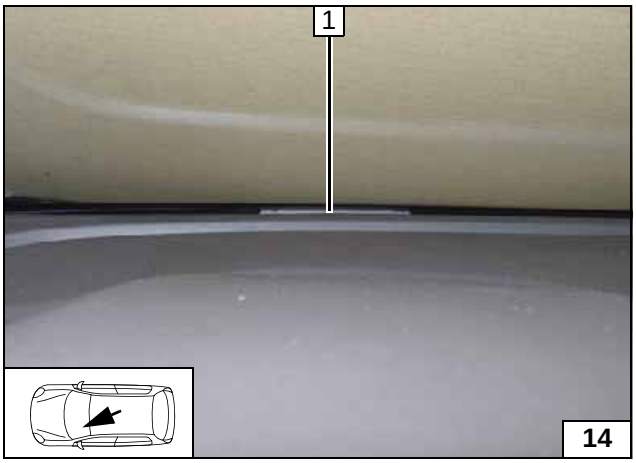
Installing MultiControl CAR



Remote Option (Telestart)

1 Receiver
2 Bracket
3 Original vehicle bolt

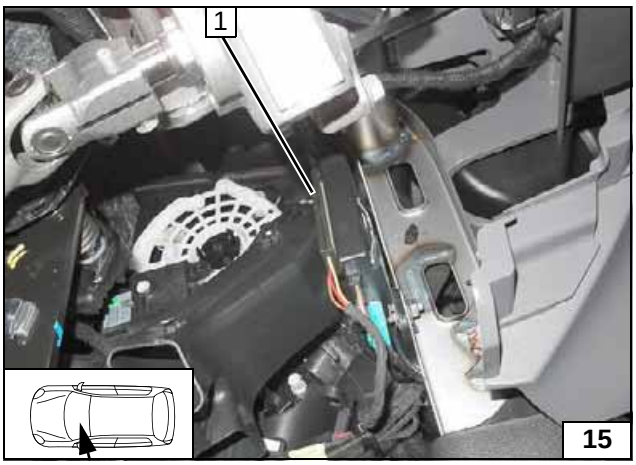
Installing receiver



In case of a coated or heated windscreen, only use the installation location specified by the manufacturer.

1 Aerial

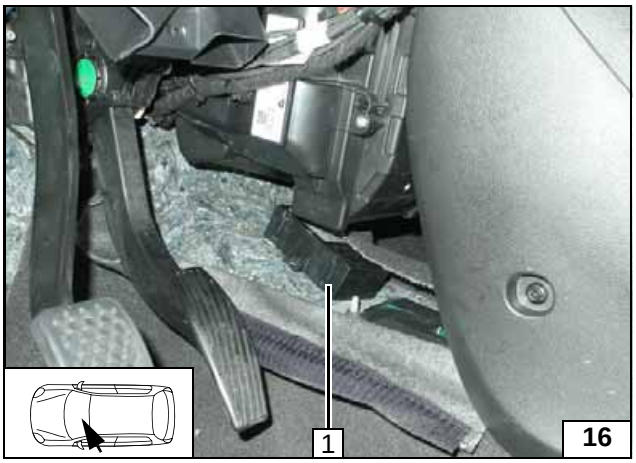
Installing aerial



Temperature sensor T100 HTM

Fasten temperature sensor **1** with double-sided adhesive tape.

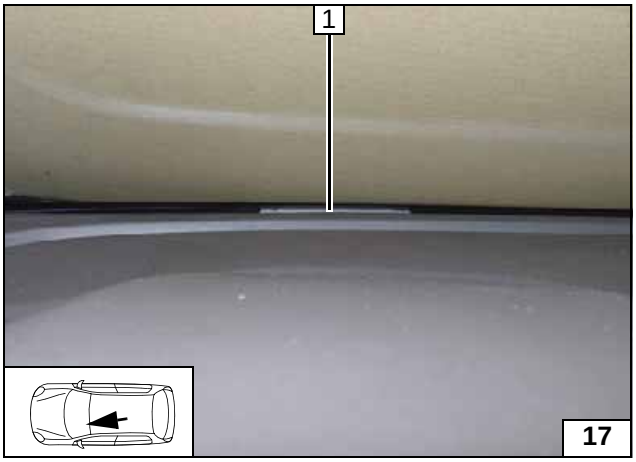
Installing temperature sensor



ThermoCall Option

Fasten receiver **1** with double-sided adhesive tape.

Installing receiver



In case of a coated or heated windscreen, only use the installation location specified by the manufacturer.

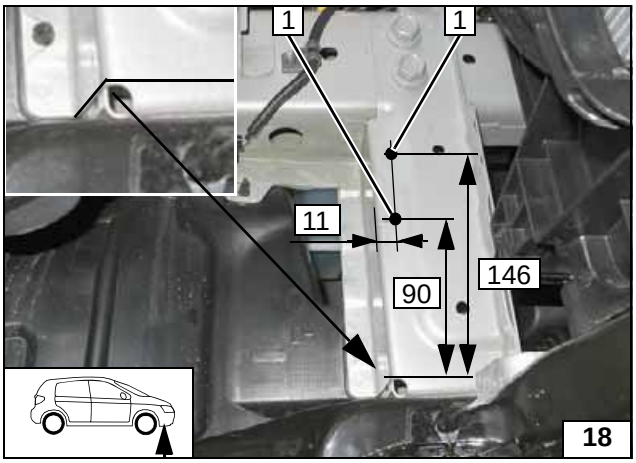
1 Aerial (optional)

Installing aerial

Preparing Installation Location

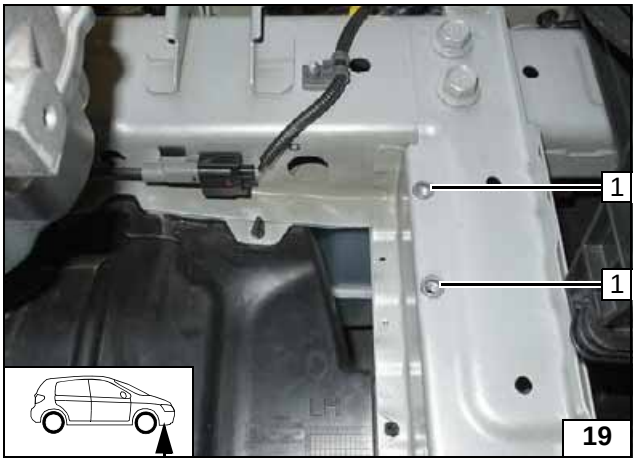
1 Copy hole pattern, 9mm dia. hole [2x]

Copying hole pattern



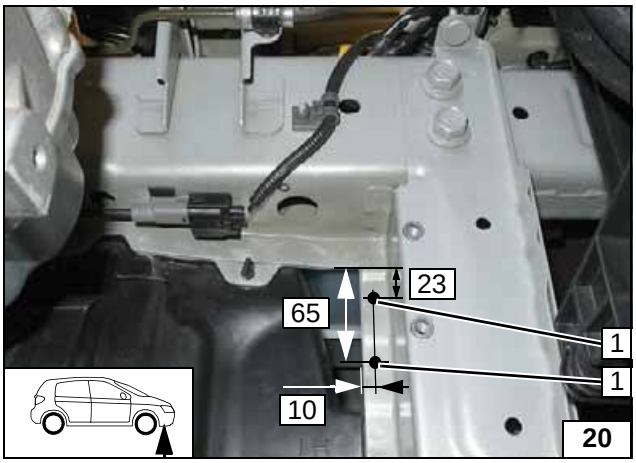
1 Rivet nut [2x]

Installing rivet nut

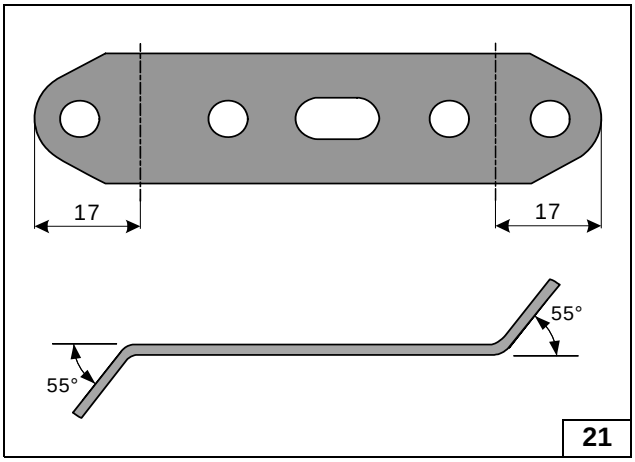


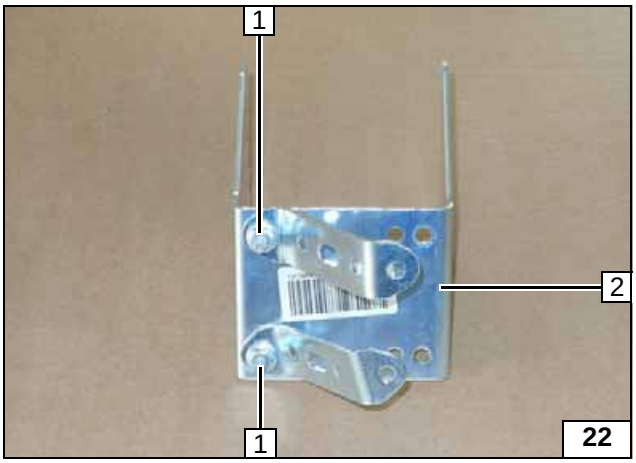
1 Copy hole pattern, 7mm dia. hole [2x each]

Drilling hole



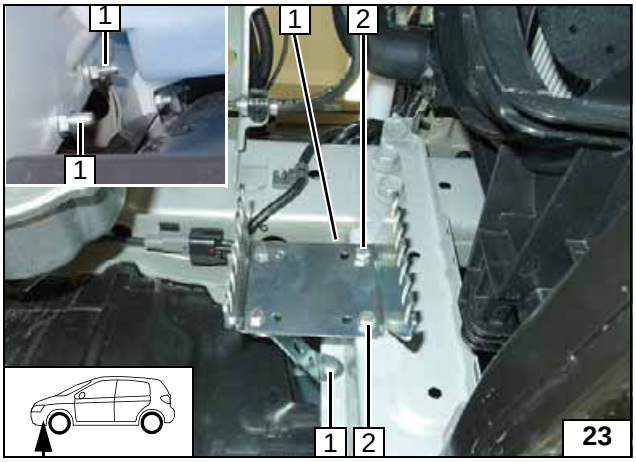
Angling down 2 perforated brackets





1 M6x20 bolt, perforated bracket, premount flanged nut loosely [2x each]
2 Bracket

Premounting bracket

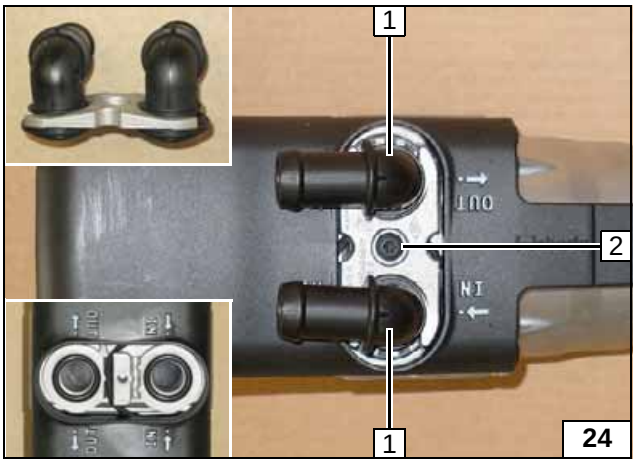


1 M6x20 bolt, flanged nut [2x each]
2 M6x20 bolt, spring lockwasher [2x each]

Installing bracket

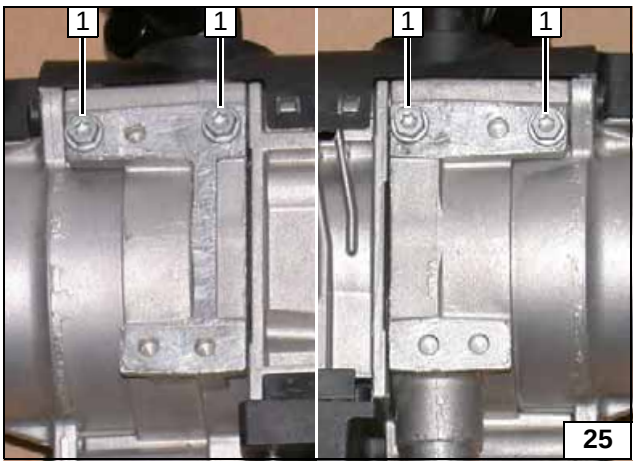
Tighten all the screw connection.

Preparing Heater



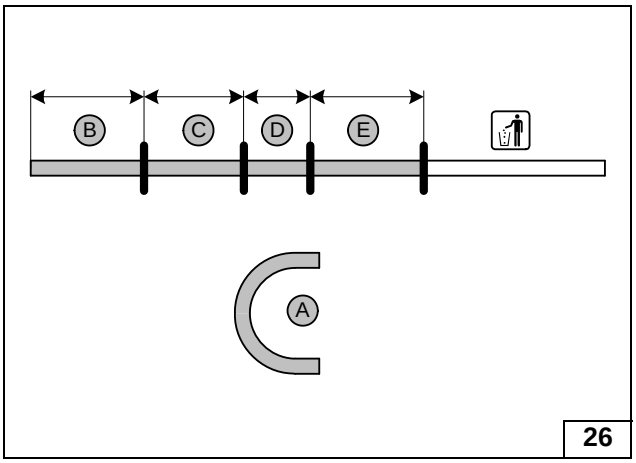
1 Water connection piece, sealing ring [2x each]
2 5x15 self-tapping bolt, retaining plate of water connection piece

Installing water connection piece



Screw 5x13 self tapping bolts **1** [4x] into existing holes by a maximum of 3 thread turns.

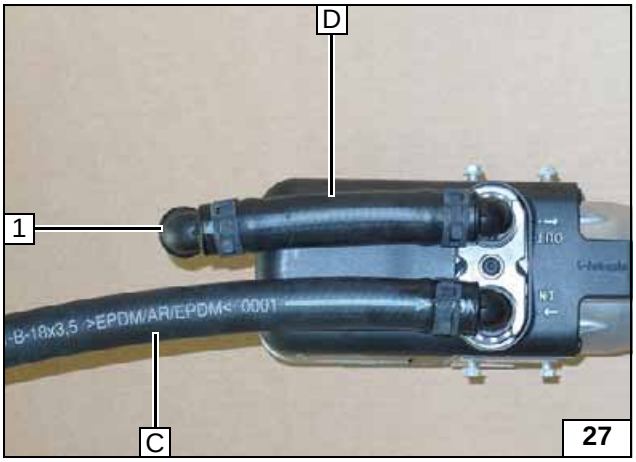
Premounting bolts loosely



A = 180°, 18mm dia. moulded hose

B = 320
C = 240
D = 130
E = 330

Cutting hoses to length

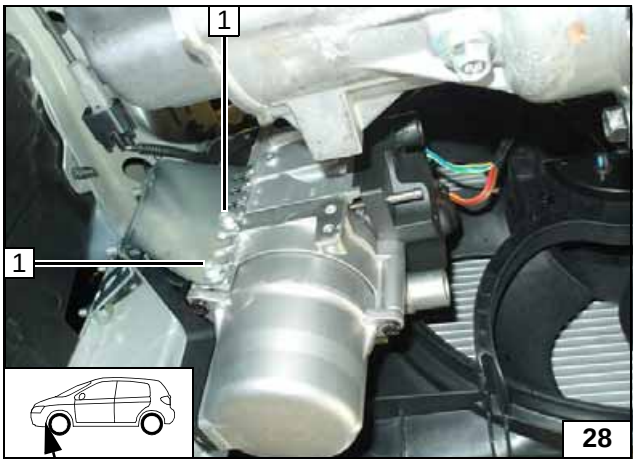


All spring clips = 25mm dia.

1 90°, 18x18 connecting pipe

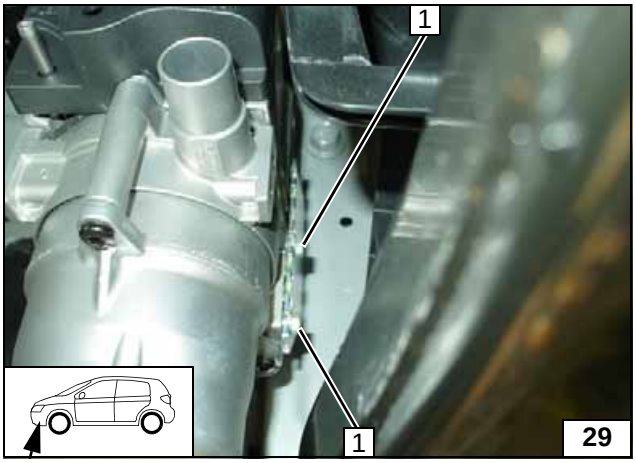
Premounting hoses

Installing Heater



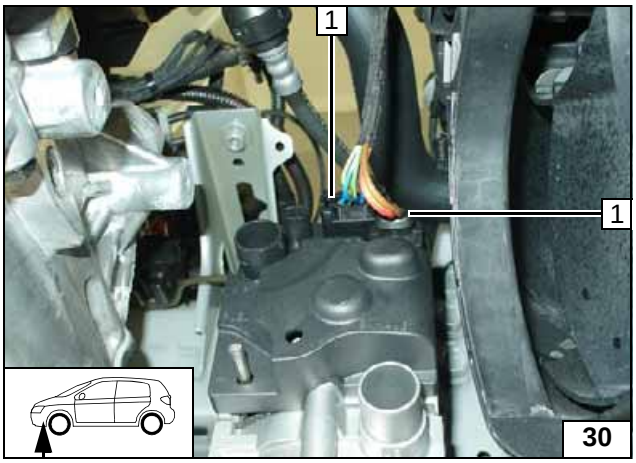
1 Tighten 5x13 self-tapping bolts [2x]

Installing heater



1 Tighten 5x13 self-tapping bolts [2x]

Installing heater



1 Heater wiring harness connector [2x]

Installing wiring harness

Fuel

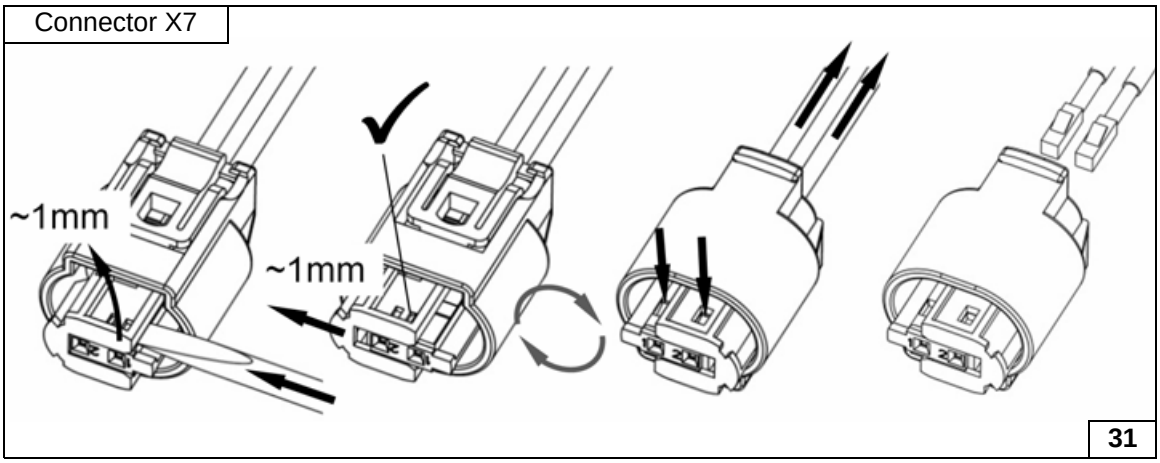
Open the vehicle's fuel tank cap, ventilate the tank and then re-close the tank lock.

Catch any fuel running off in an appropriate container.

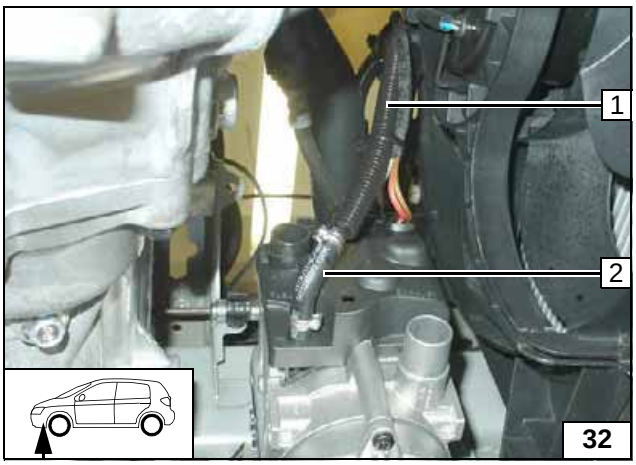
Route fuel line and metering pump wiring harness so that they are protected against stone impact.
Unless specified otherwise, always fasten using cable ties.
Provide rub protection for fuel line and wiring harness in areas where there are sharp edges.

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

Dismantling metering pump connector

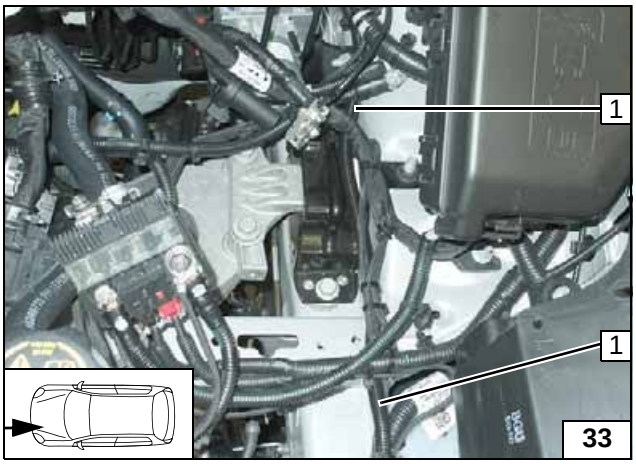


Connecting heater

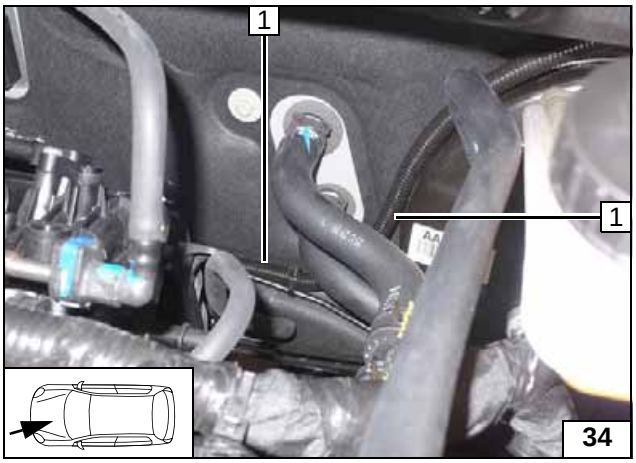


1 Fuel line and wiring harness of metering pump in corrugated tube
2 90° moulded hose, 10 mm dia. clamp [2x]

Routing lines

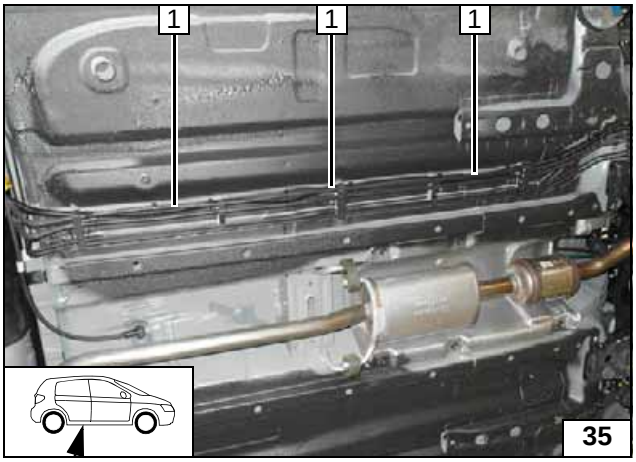


1 Fuel line and wiring harness of metering pump in corrugated tube



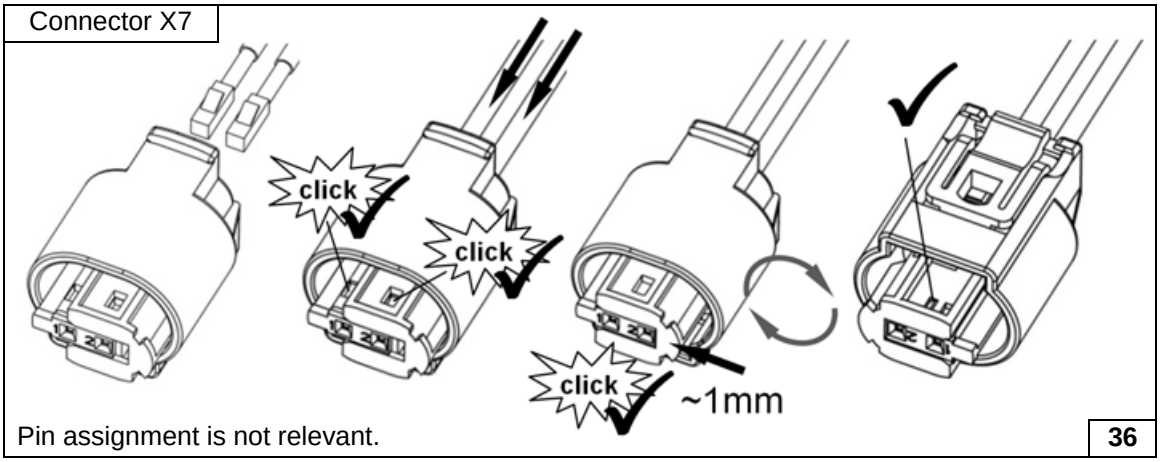
Route fuel line and wiring harness of metering pump in corrugated tube **1** to the left side of the vehicle and along original vehicle fuel lines to the underbody.

Routing lines

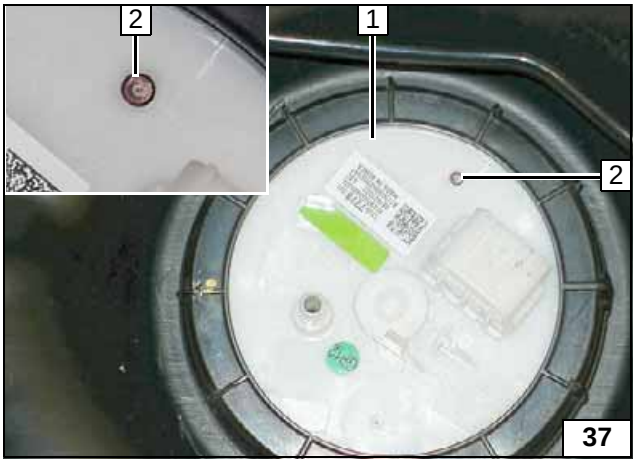


Route fuel line and wiring harness of metering pump in corrugated tube **1** along original vehicle fuel lines to the installation location of the metering pump.

Routing lines



Completing metering pump connector



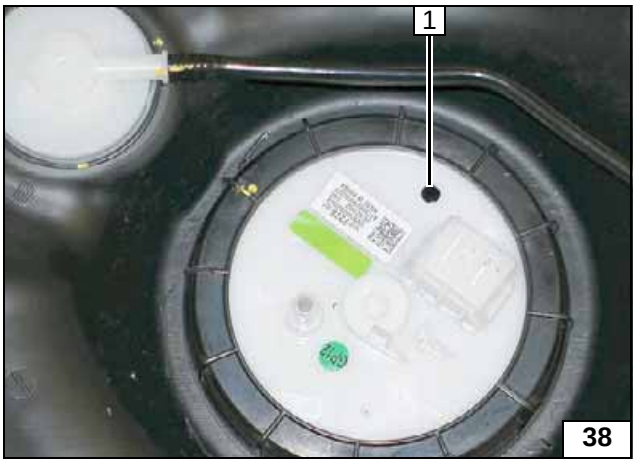
Installing FuelFix

Remove the fuel tank according to the manufacturer's instructions.

Work steps F1 and F2.

1 Fuel tank sending unit
2 Hole pattern in the centre of the embossed area

Copying hole pattern

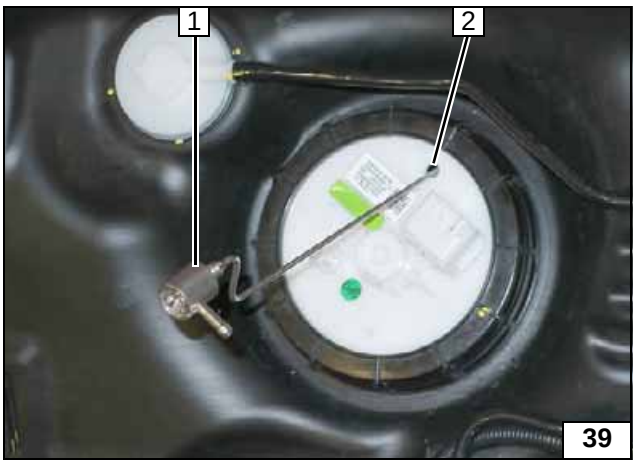


38

Work step F3.

1 Hole made with provided drill

Hole for FuelFix



39

Work steps F4 and F5.

Bend FuelFix **1** according to template and cut to length.
Insert into hole **2**.

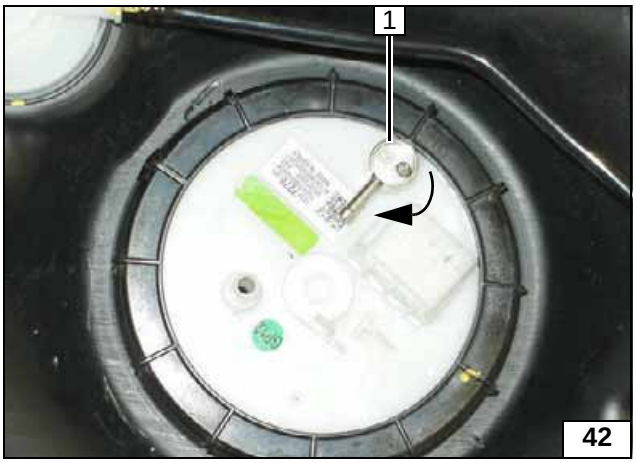
Inserting FuelFix

40

Inserting FuelFix

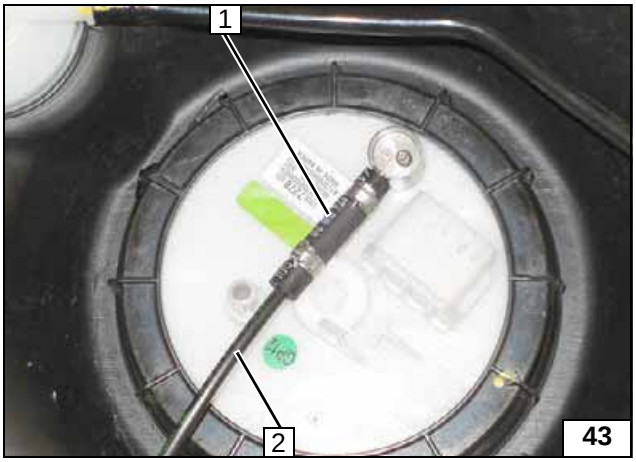
41

Inserting FuelFix



Work steps F5.3 and F5.4.

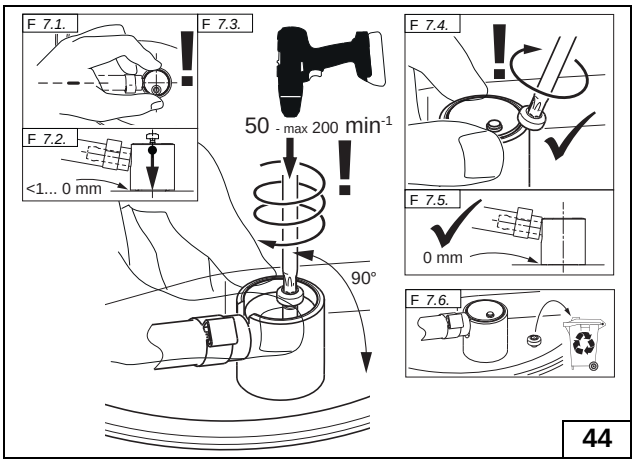
Aligning FuelFix



Work step F6.

1 Hose section, 10 mm dia. clamp [2x]
2 Fuel line

Connecting fuel line

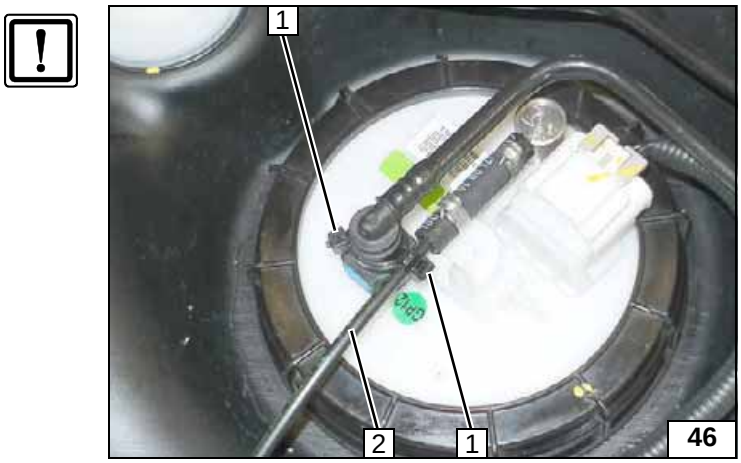


Work step F7.

Installing FuelFix

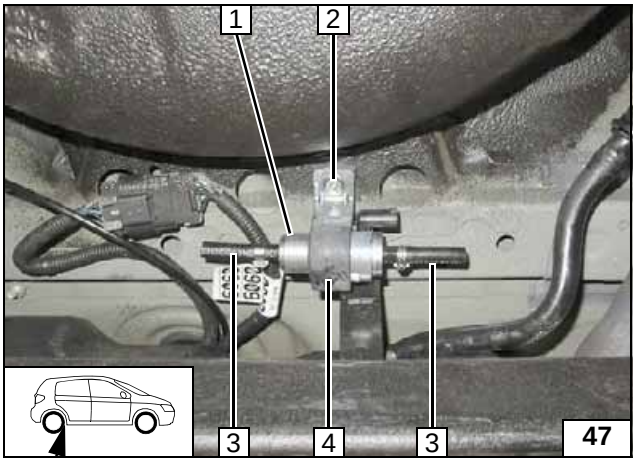
Work step F8.

Ensuring firm seating of FuelFix



1 Cable tie as tension relief [2x]
2 Fuel line of FuelFix

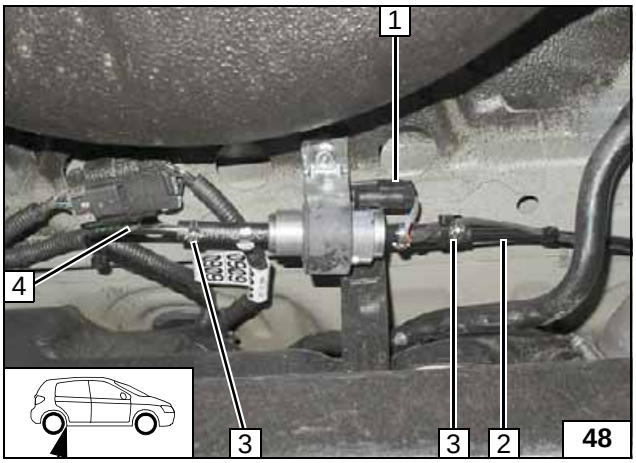
Securing fuel line



Install fuel tank in accordance with manufacturer's instructions.

1 Metering pump
2 M6x25 bolt, original vehicle hole, flanged nut
3 Hose section, 10mm dia. clamp [2x each]
4 Metering pump mount

Installing metering pump



Ensure sufficient distance from neighbouring components, correct if necessary.

1 Connector of metering pump wiring harness
2 Fuel line of heater
3 10 mm dia. clamp [2x]
4 Fuel line of FuelFix

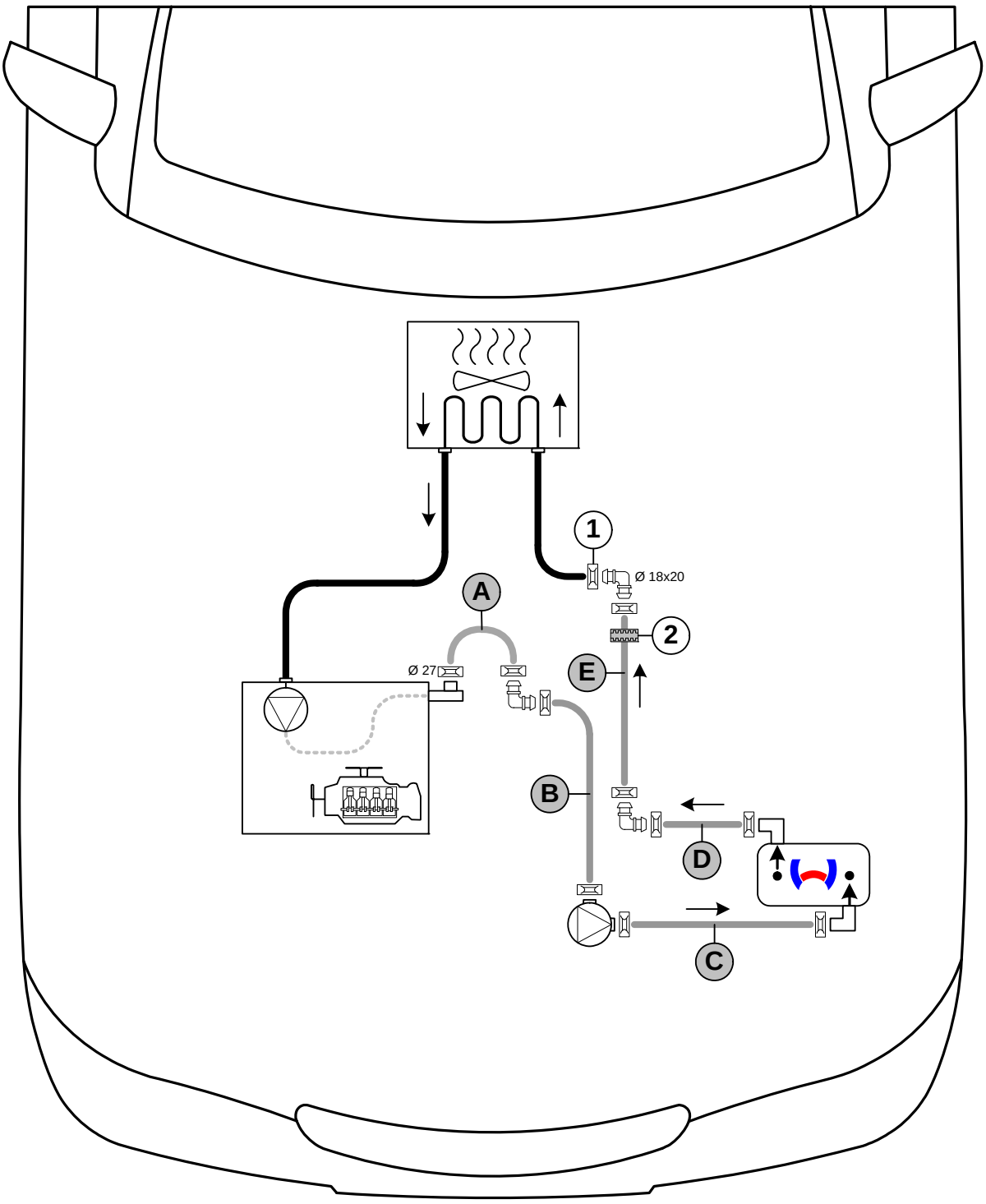
Connecting metering pump

Coolant Circuit

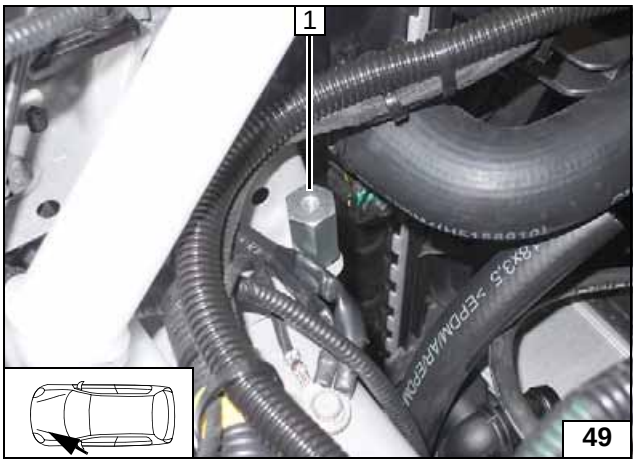
Any coolant running off should be collected in an appropriate container. Route hoses kink-free. Unless specified otherwise, always fasten using cable ties. Position clamps so that other hoses cannot be damaged. The heater must be filled with coolant when installing the hoses.

The connection should be modelled on an ‘inline’ circuit and based on the following diagram:

Hose routing diagram

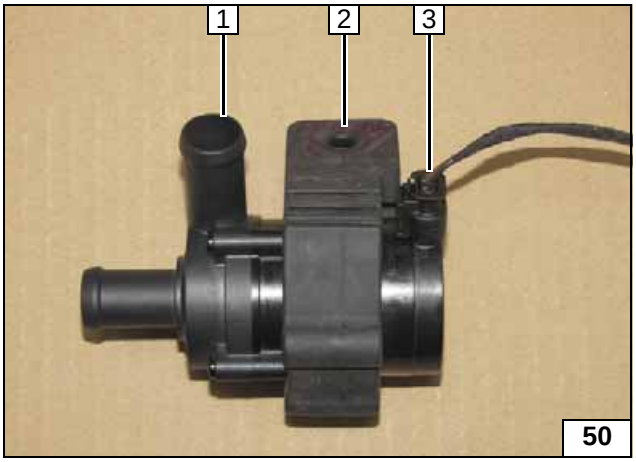


All spring clips without a specific designation = 25 mm dia.
All connecting pipes without a specific designation = 18x18mm dia.
1 = Original vehicle spring clip.
2 = Black (sw) rubber isolator



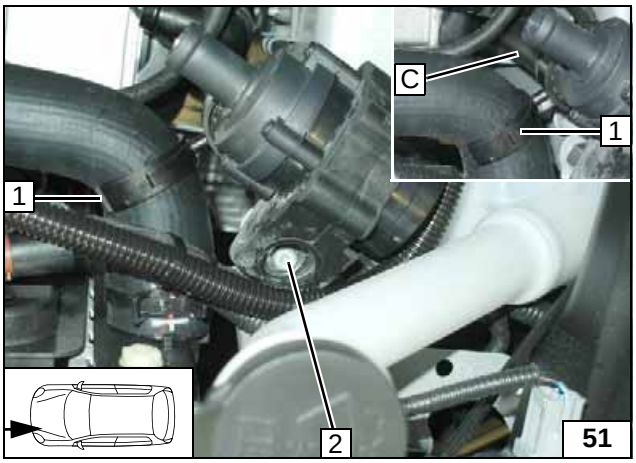
1 M6x30 spacer nut, original vehicle bolt

Installing spacer nut



1 Circulating pump
2 Circulating pump mount
3 Connector of circulating pump wiring harness

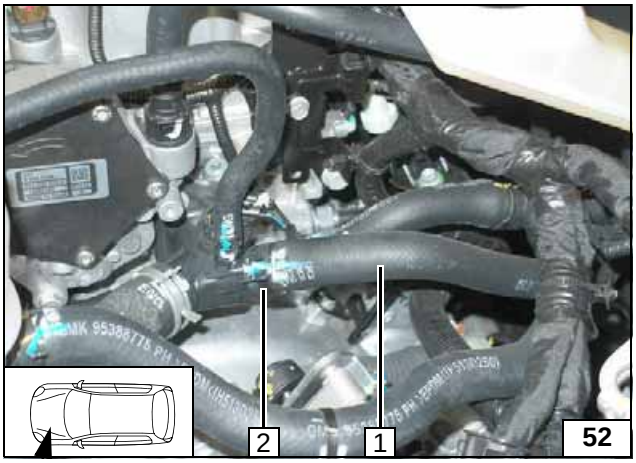
Premounting circulating pump



When installing the circulating pump, connect hose **C** to the circulating pump outlet.

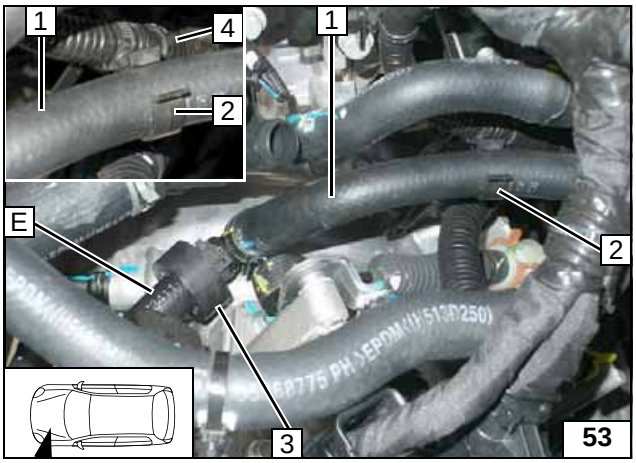
1 25x37 hose bracket between hose **C** and original vehicle hose
2 M6x25 bolt, spacer nut

Installing circulating pump



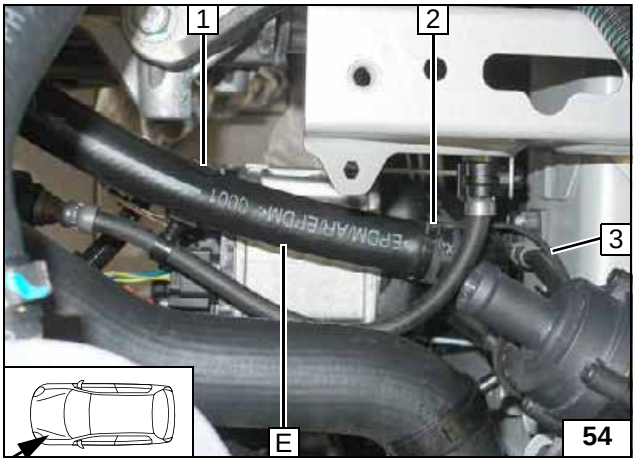
Pull hose of engine outlet / heat exchanger inlet **1** from engine outlet. Spring clip **2** will be reused.

Cutting point



1 Hose of heat exchanger inlet
2 Cable tie hose bracket between **1** and **4**
3 Black (sw) rubber isolator
4 Original vehicle wiring harness

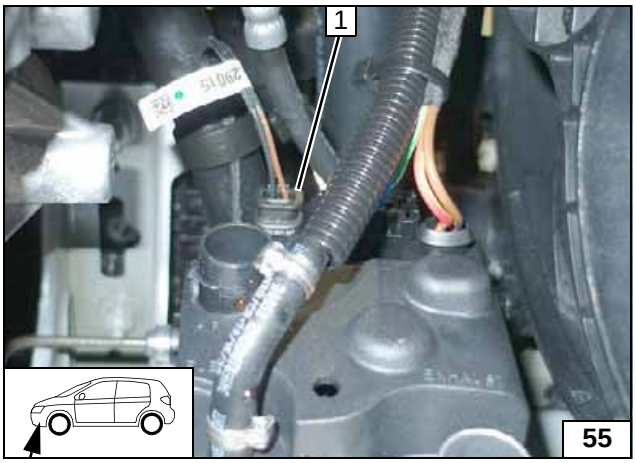
Connecting heat exchanger inlet



Connect hose **E** with 90° connecting pipe of hose **D**.

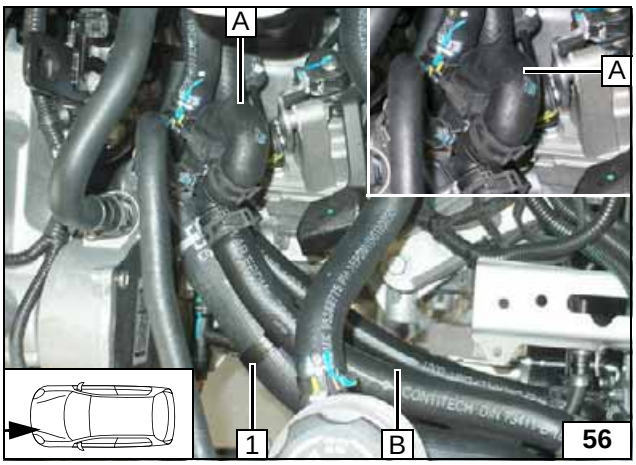
1 9x22 hose bracket
2 Cable tie
3 Circulating pump wiring harness

Connecting heater



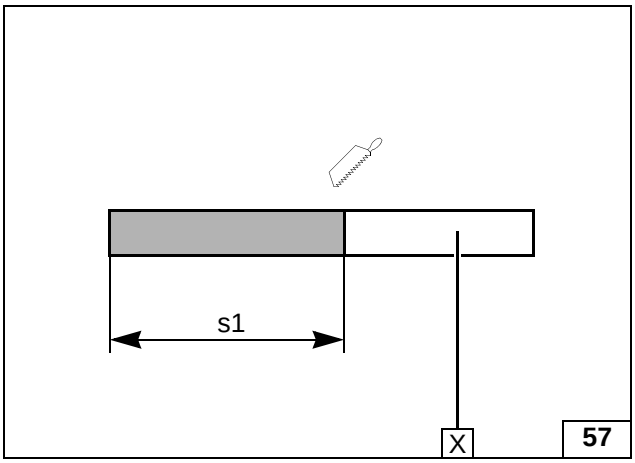
1 Connector of circulating pump wiring harness

Installing wiring harness of circulating pump



1 25x37 hose bracket

Connecting engine outlet / circulating pump

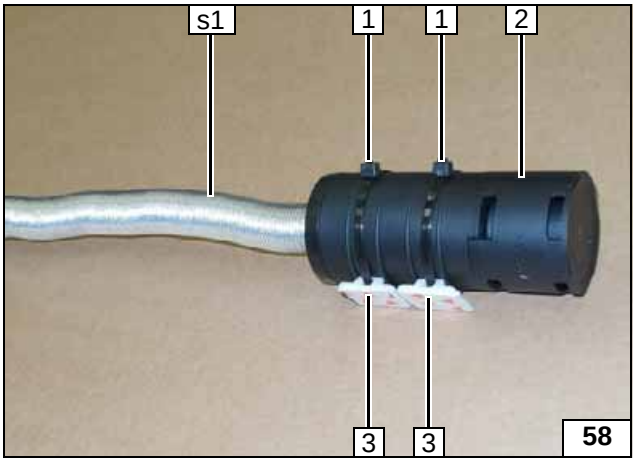


Combustion Air

s1 = 250

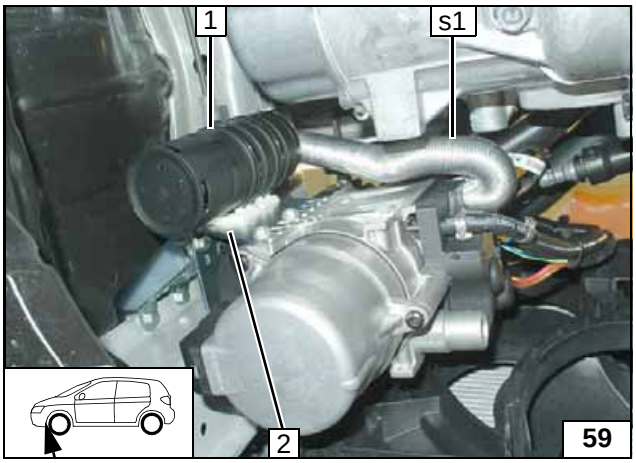
X =

Cutting combustion air pipe to length



1 Cable tie [2x]
2 Silencer
3 Self-adhesive socket [2x]

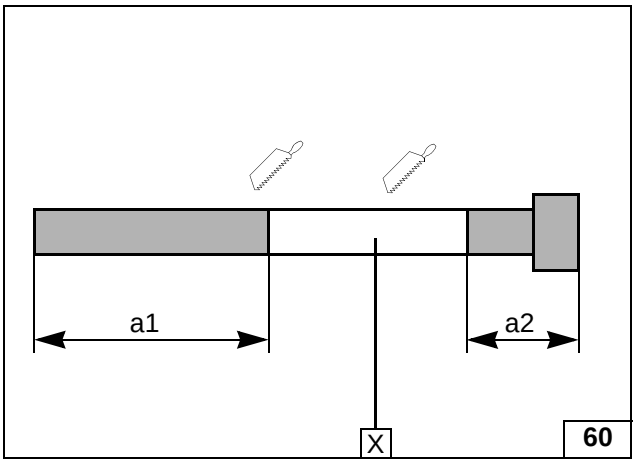
Premounting silencer



First, install combustion air pipe **s1** onto heater. Degrease the bonding surface on heater bracket **2**.

1 Silencer

Installing silencer

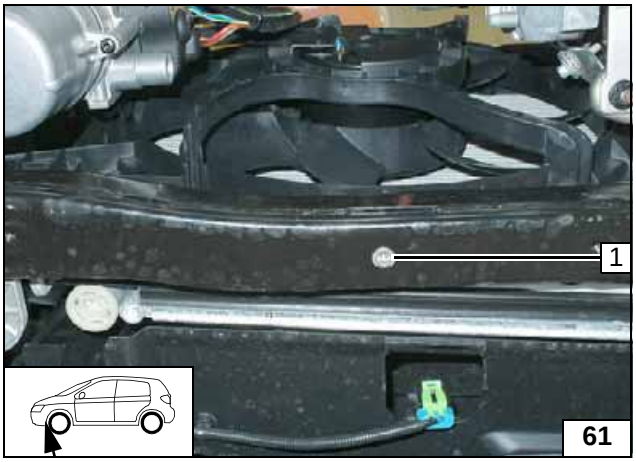


Exhaust Gas

a1 = 250
a2 = 50

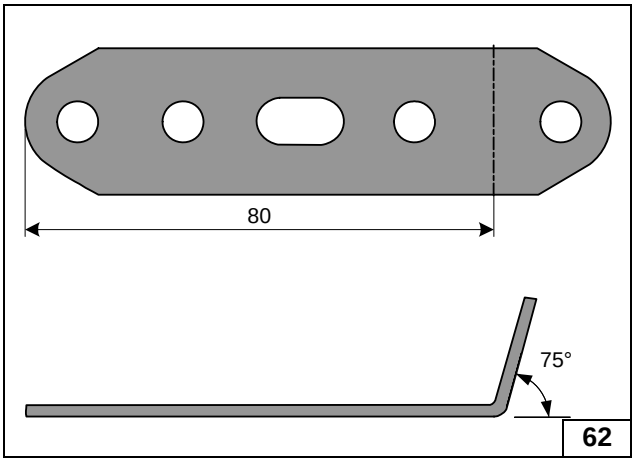
X =

Preparing exhaust pipe

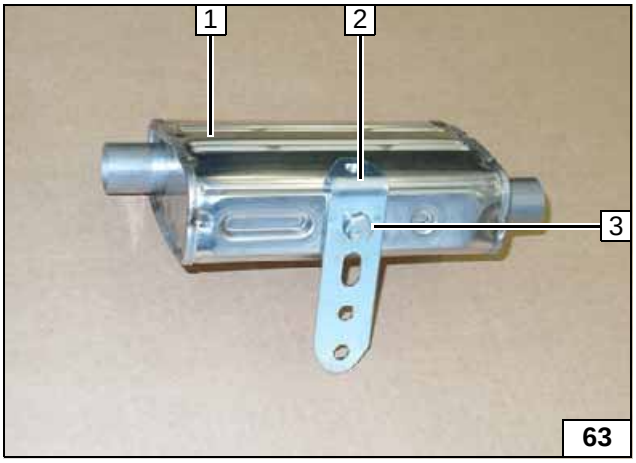


Drill out existing hole at Position **1** to 9mm dia., insert rivet nut.

Installing rivet nut

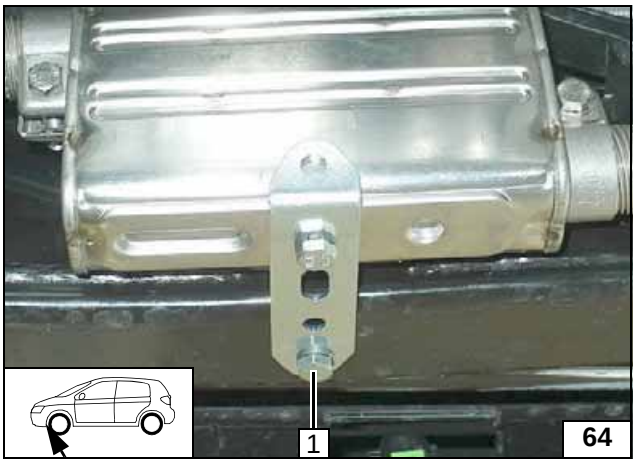


Angling down perforated bracket



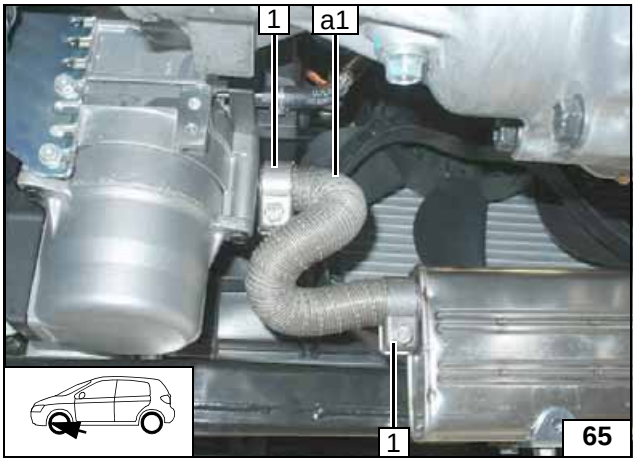
1 Silencer
2 Perforated bracket
3 M6x16 bolt, spring lockwasher

Premounting silencer



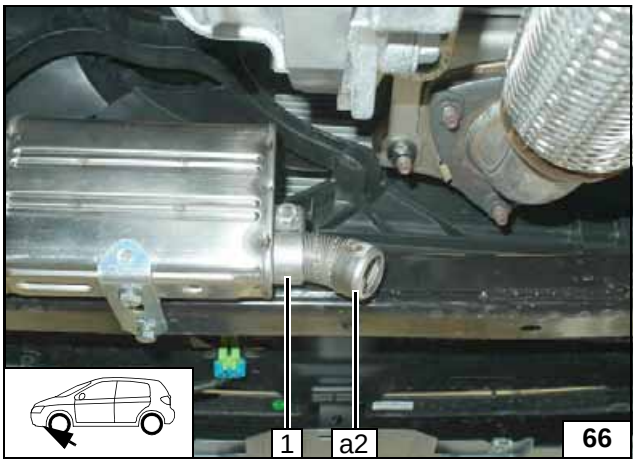
1 M6x20 bolt, spring lockwasher

Installing silencer



1 Hose clamp [2x]

Installing exhaust pipe a1



Ensure sufficient distance from neighbouring components, correct if necessary.

1 Hose clamp

Installing exhaust pipe a2

Final Work

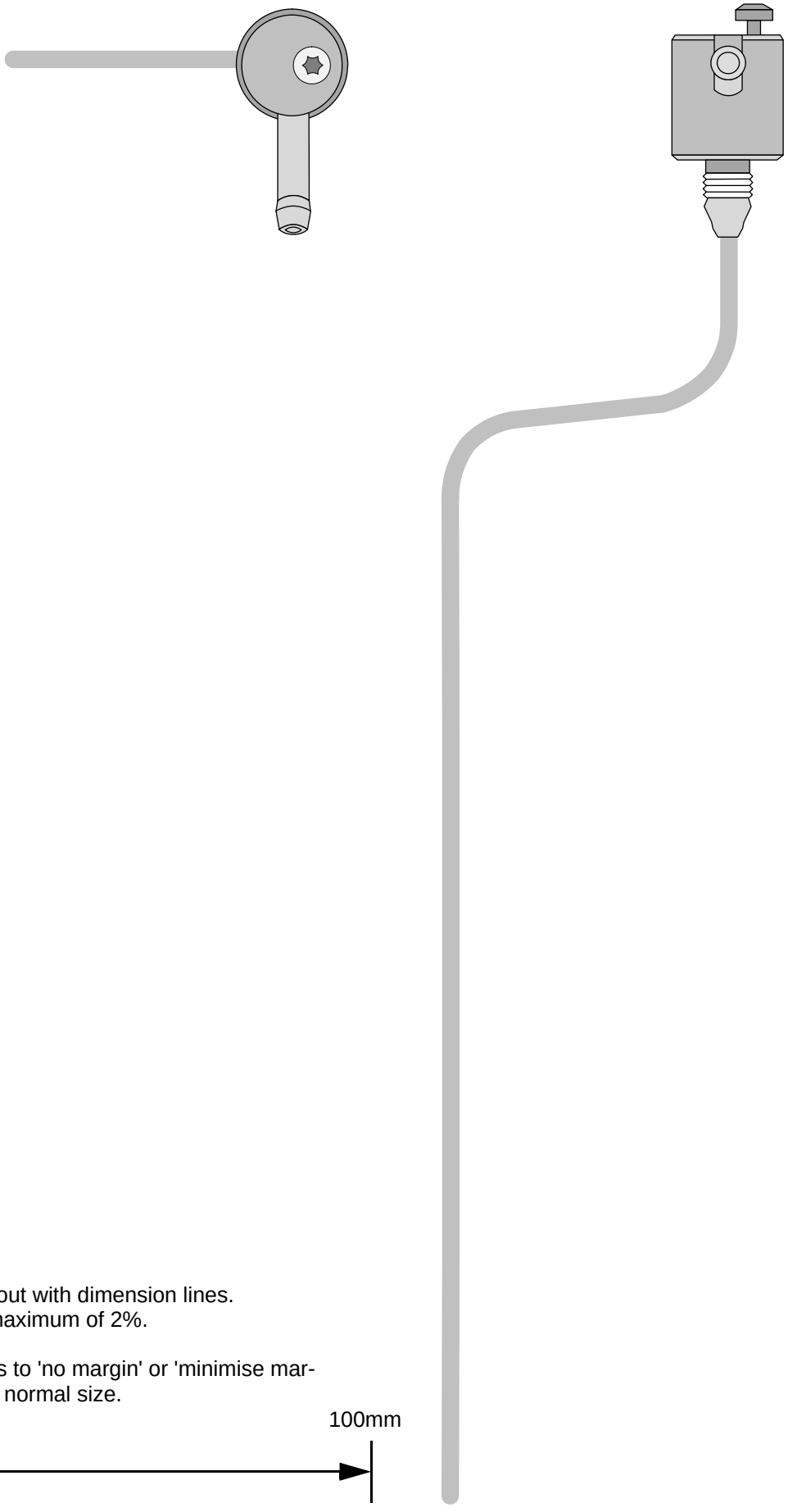
Reassemble the components in reverse order. Check all hoses, clamps and all electrical connections for firm seating. Insulate and tie back loose lines.
Only use manufacturer-approved coolant. Spray the heater components with anti-corrosion wax (Tectyl 100K).

- **Connect the battery.**
- **Fill and bleed the coolant circuit according to the vehicle manufacturer's specifications.**
- **Program MultiControl CAR, teach Telestart transmitter.**
- **For initial startup and function check, please see installation instructions.**
- **Make settings on A/C control panel according to the 'Operating Instructions for Automatic Air-Conditioning'.**
- **Place the 'Switch off parking heater before refuelling' caution label near the filler neck.**

Webasto Thermo & Comfort SE
Postfach 1410
82199 Gilching
Germany
Internet: www.webasto.com
Technical Extranet:
http://dealers.webasto.com

FuelFix Template

Top view



100mm

Scale 1:1

Compare size of printout with dimension lines.
Allowed tolerance a maximum of 2%.

Set the printer settings to 'no margin' or 'minimise margins' and 100% of the normal size.

100mm

0

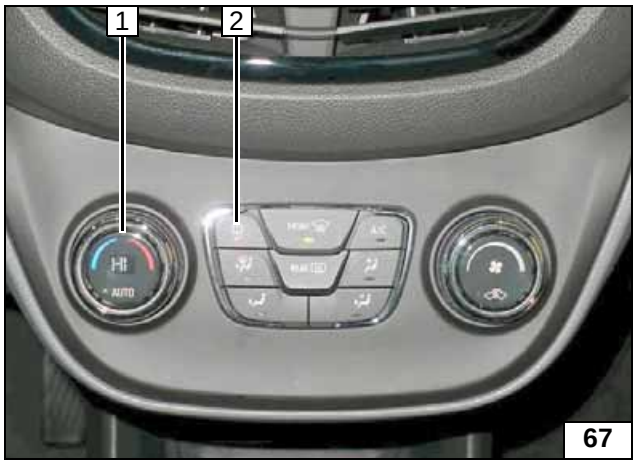
Operating Instructions for Automatic Air-Conditioning

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.

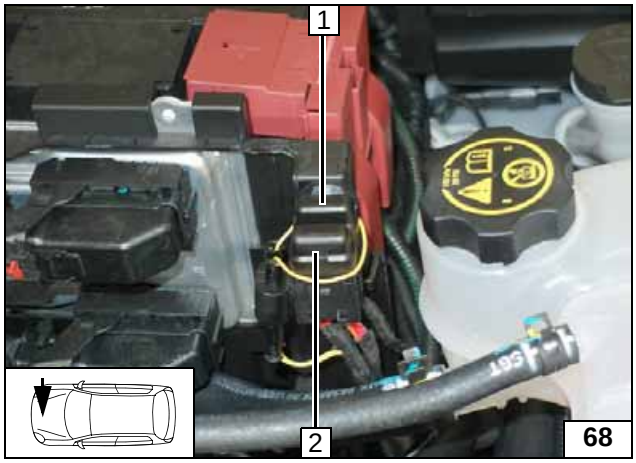
Passenger compartment monitoring, if installed, must be deactivated in addition to the vehicle settings for the heating operation.
For instructions on deactivation, please refer to the operating instructions of the vehicle.

Before parking the vehicle, make the following settings:



1 Set temperature to ‘HI’
2 Air outlet to windscreen

A/C control panel



1 1A passenger compartment main fuse F2
2 20A heater fuse F1

Engine compartment fuses