# Water Heater

***Thermo Top Evo* Parking Heater** e1 00 0258

# Installation Documentation
# Volvo C30 / S40 / V50 D2

## Validity

| Manufacturer | Model | Type | EG-BE No. / ABE |
|---|---|---|---|
| Volvo | C30 | 533 | e4 * 2001/116 * 0076 * ... |
| Volvo | S40 | 533 | e4 * 2001/116 * 0076 * ... |
| Volvo | V50 | 533 | e4 * 2001/116 * 0076 * ... |

| Motorisation | Fuel | Transmission type | Output in kW | Displacement in cm³ | Engine code |
|---|---|---|---|---|---|
| 1.6 | Diesel | SG | 84 | 1560 | D4162T |

SG = Manual transmission

**From Model Year 2012**
**Left-hand drive vehicle**

| | |
|---|---|
| **Verified equipment variants:** | Automatic air-conditioning |
| | Front fog light |
| | Headlight washer system |
| **Not verified:** | Passenger compartment monitoring |
| | Automatic transmission |
| | Manual air-conditioning |
| **Total installation time:** | about 8 hours |

## Volvo C30 / S40 / V50 D2

## Table of Contents



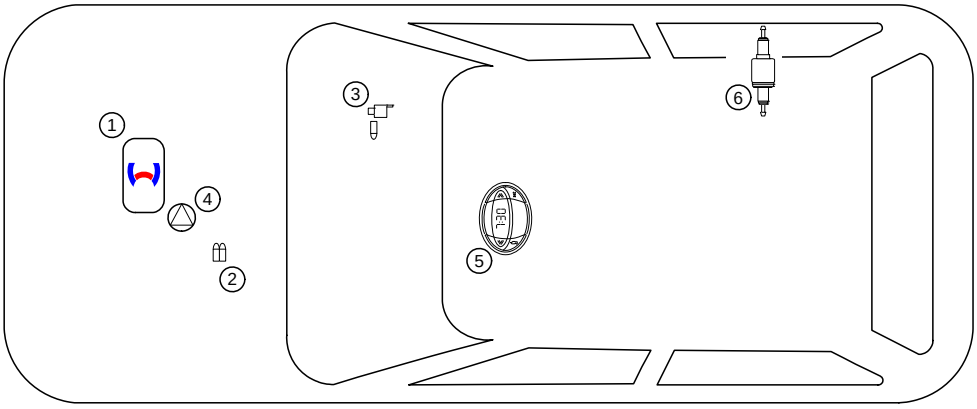
## Necessary Components

- Basic delivery scope of *Thermo Top Evo*based on price list
- Installation kit for Volvo C30 / S40 / V50 D2 2012 petrol and diesel: **1318178A**
- Heater control in accordance with price list and upon consultation with final customer
- In case of Telestart, indicator lamp in accordance with price list and upon consultation with final customer

## Installation Overview

**Legend:**

**1**. Heater
**2**. Fuse holder of engine compartment
**3**. Fuse holder of passenger compartment
**4**. Circulating pump
**5**. Digital timer
**6**. Metering pump




## Notes on Total Installation Time

The total installation time includes the time needed for mounting and demounting of 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 227).

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.**

**Sharp edges should be fitted with rub protection (split-open fuel hose)! Spray unfinished body areas, e.g. drilled holes, with anti-corrosion wax (Tectyl 100K, Order No. 111329).**

**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 an IPCU, the corresponding settings must be checked or adjusted before the installation.**

## 2 Statutory regulations governing installation

| Guidelines | Thermo Top Evo |
|---|---|
| Heating Directive ECE R122 | E1 00 0258 |
| EMC Directive ECE R10 | E1 03 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**

For vehicles with an EU permit, no entry in accordance with § 19 Sub-Section 4 of Annex VIII b to the Road Traffic Act is required.

### 2.1 Excerpt from the directive 2001/56/EC Appendix VII 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.

## Notes on Validity

This installation documentation applies to Volvo C30 / S40 / V50 D2 petrol and diesel vehicles - for validity, see page 1 - from model year 2012 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 Instructions

**Special Tools**
- Hose clamp pliers for self-clamping 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 for M10 steel rivet nut (e.g. Würth Order No. 0964948900)
- Webasto Thermo Test diagnosis with current software

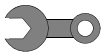
**Dimensions**
- All dimensions are in mm

**Tightening torque values**
- Tightening torque values of 5x13 heater bolts = 8Nm.
- Tightening torque values of 5x15 retaining plate of water connection piece bolt = 7Nm.
- Tighten other screw 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 injury or fatal accidents**

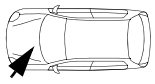
**Specific risk of damage to components**

**Specific risk of fire or explosion.**

**Reference to general installation instructions of the 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**



## Volvo C30 / S40 / V50 D2

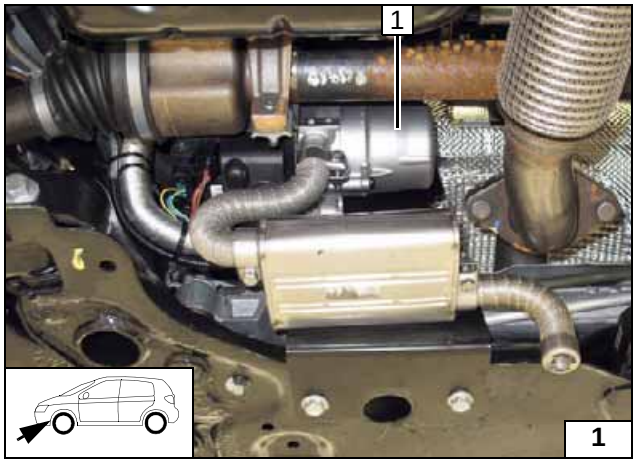
## Preliminary Work

### Vehicle

- Open the fuel tank cap.
- Ventilate the fuel tank.
- Close the fuel tank cap again.
- Depressurise the cooling system.
- Disconnect and remove the battery.
- Remove the engine cover.
- Drain the coolant according to manufacturer's instructions.
- Remove the underride protection of the engine.
- Remove the right-hand trim next to the fuel tank.
- Detach the heat protection trim of the exhaust system in the fuel tank area.
- Remove the fuel tank according to manufacturer's instructions.
- Remove the fuel-tank sending unit in accordance with manufacturer's instructions.
- Remove the footwell trim on the front passenger side.
- Remove the glove compartment.
- Remove the A-pillar trim in the footwell on the front passenger side (only with Telestart).

### Heater

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




## Heater Installation Location

**1** Heater

**Installation location**

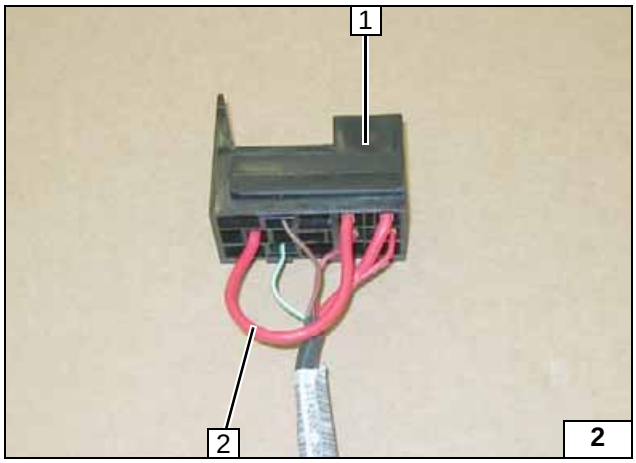
## Preparing Electrical System

Wire sections retain their numbering in the entire document.

**Detaching wire**

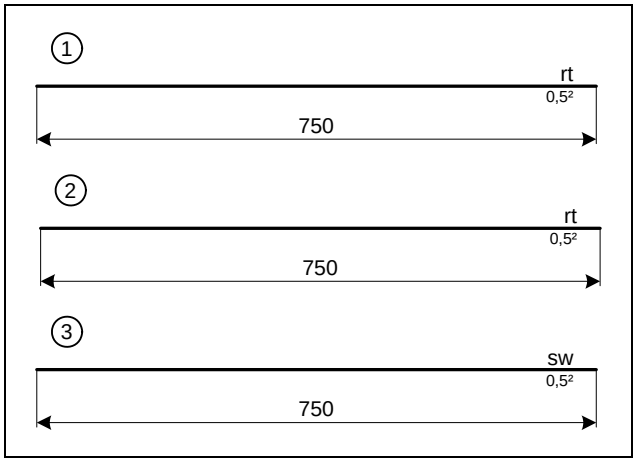
Uncrimp red (rt) wire **2**, will not be used anymore.

**1** Fuse holder of passenger compartment




**Preparing lines**

Pull wire section **1** into the provided protective sleeving.

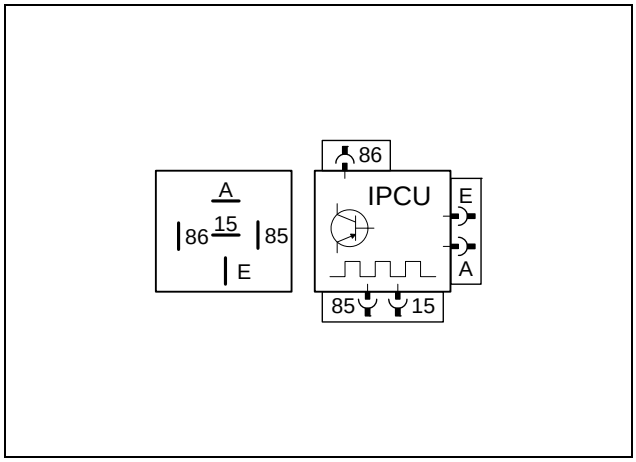



**Preparing IPCU**

IPCU view on contact side.
The IPCU included in the kit is pre-programmed with the following adjustment values:

Duty cycle: 60%
Frequency: 400Hz
Voltage: 10V
Function: Low-side

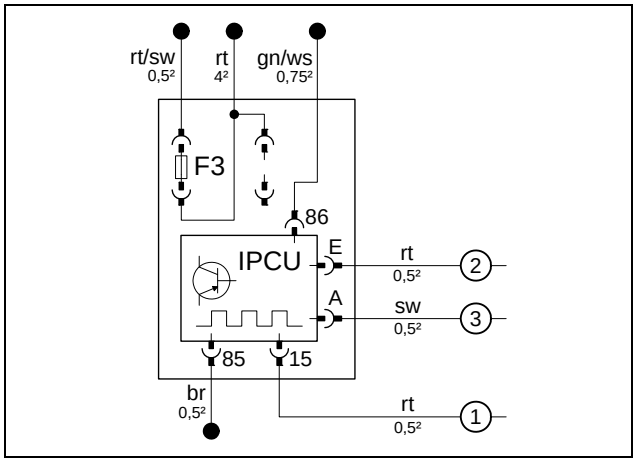
The adjustment values are to be checked during heater start-up, and adapted if necessary.



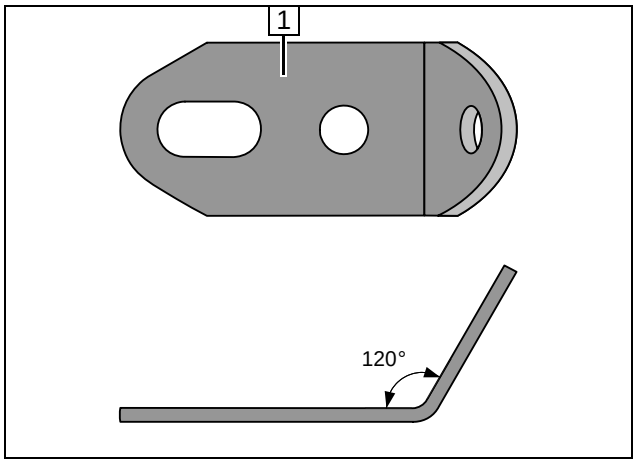

**Premounting IPCU**

Connect wires to the IPCU socket according to the wiring diagram. IPCU is to be inserted only after the fuse holder has been installed.

① Red (rt) wire of IPCU/15
② Red (rt) wire of IPCU/E
③ Black (sw) wire of IPCU/A

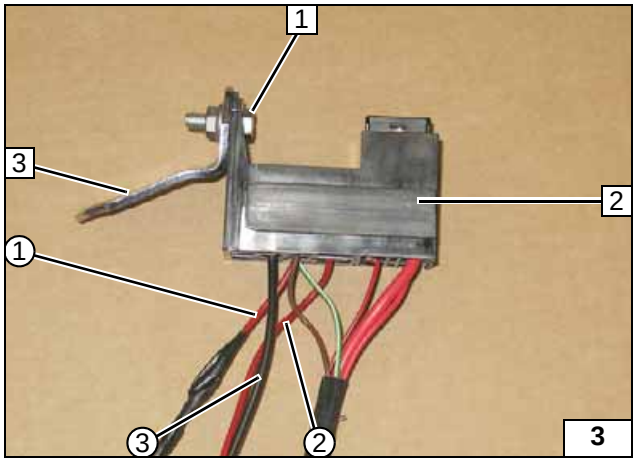





**1** Angle bracket

**Bending angle bracket**



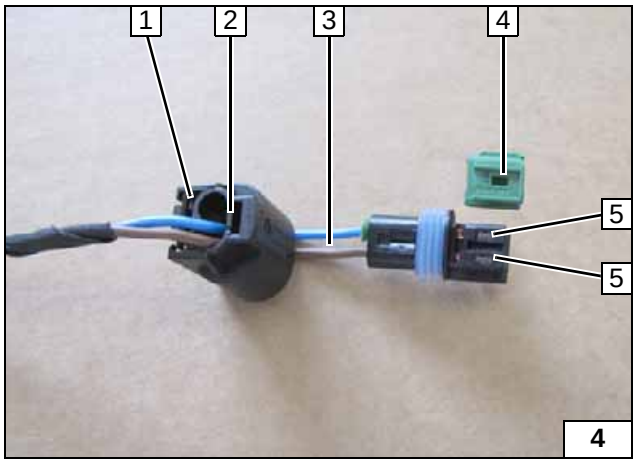

3

IPCU is to be inserted only after the fuse holder has been installed.

**1** M5x16 bolt, washer [2x], nut
**2** Fuse holder of passenger compartment
**3** Angle bracket

① Red (rt) wire of IPCU/15
② Red (rt) wire of IPCU/E
③ Black (sw) wire of IPCU/A

**Premounting fuse holder of passenger compartment**




4

Complete connector of metering pump after routing. Pin assignment is not relevant.

**1** Connector housing
**2** Lock
**3** Blue/brown (bl / br) wires
**4** Coding
**5** Timer lock

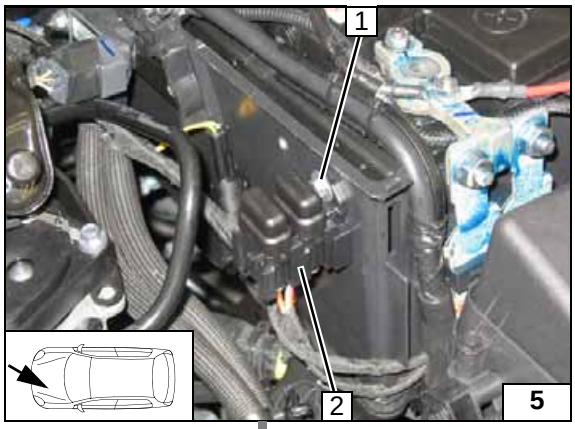
**Dismounting connector**

## Electrical System

### Fuse holder of engine compartment

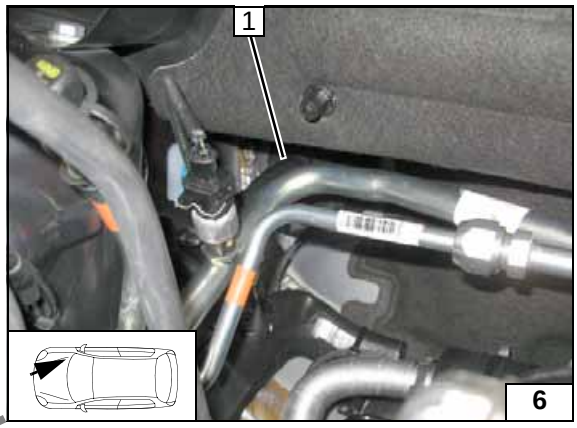
5.5 mm dia. hole at position **1**. When drilling, pay attention to components located behind!

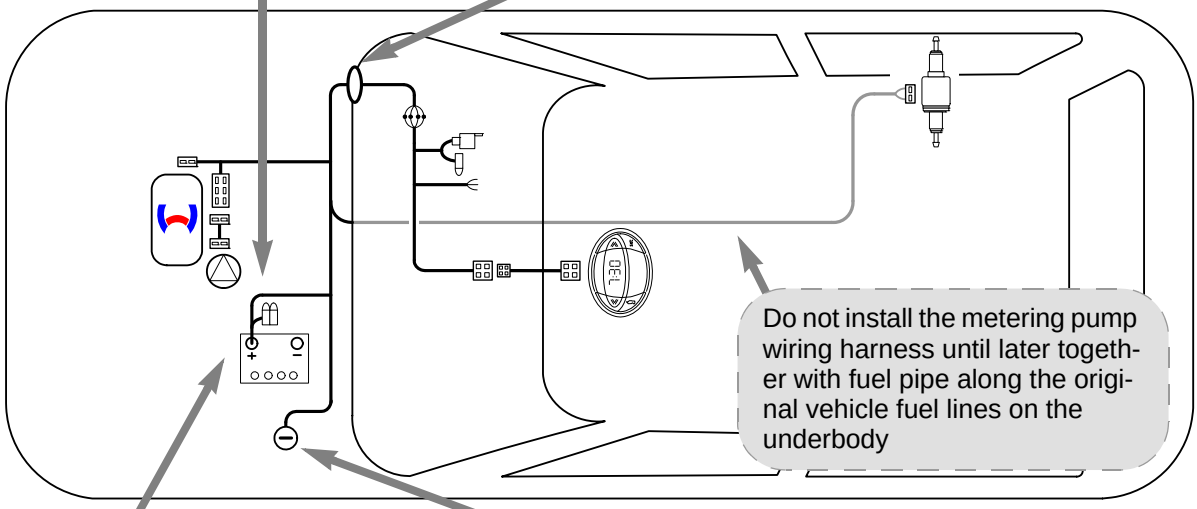
**1** M5x16 bolt, washers, retaining plate of fuse holder, nut
**2** F1-2 fuses



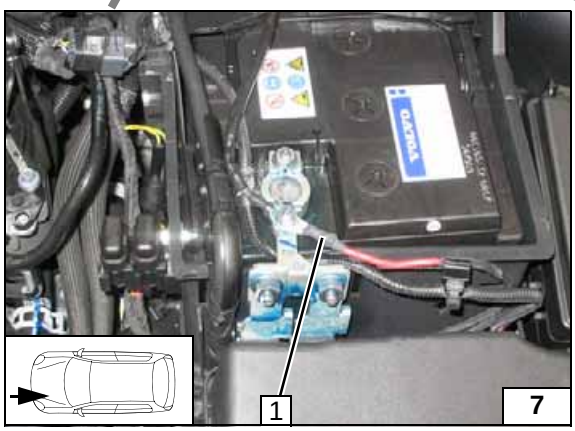

### Wiring harness pass through

**1** Protective rubber plug



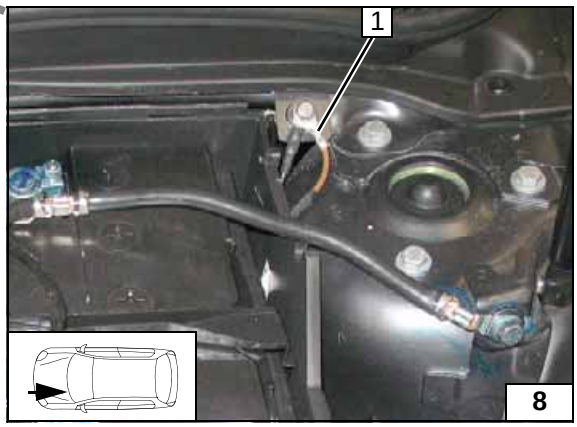




**Wiring harness routing diagram**




### Positive wire

**1** Positive wire on positive battery terminal



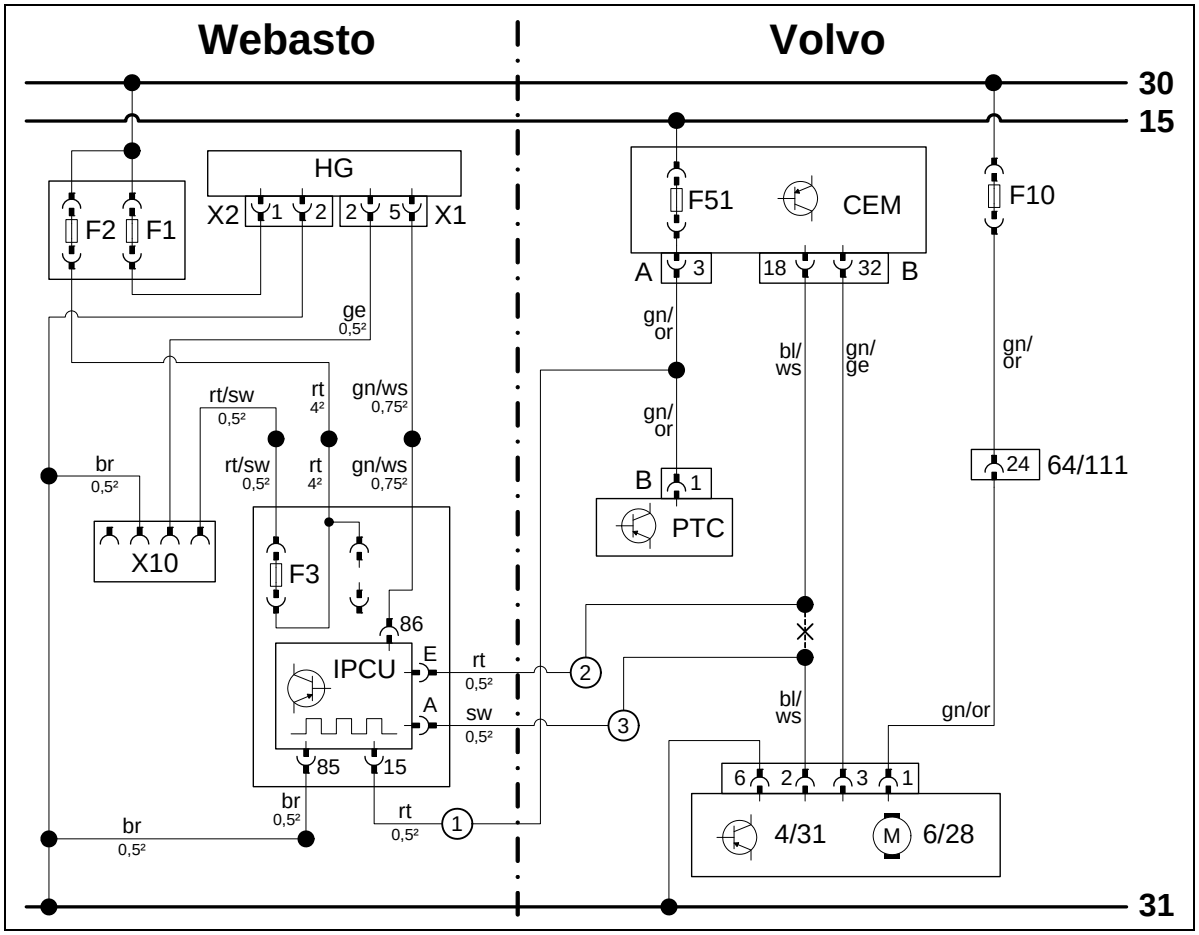

### Earth wire

**1** Earth wire on original vehicle earth support point

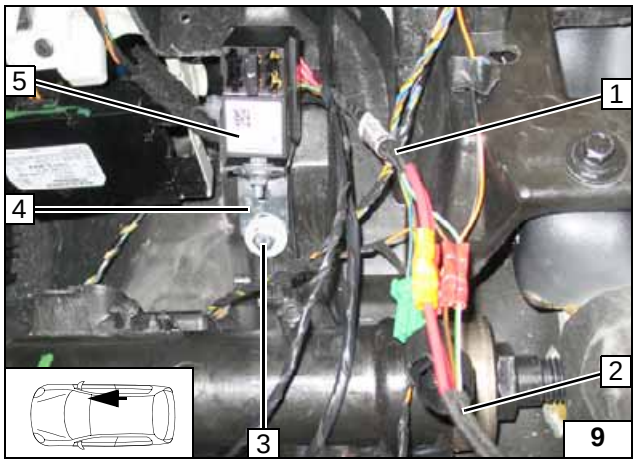
## Fan Controller

**Wiring diagram**




| Webasto components | | Vehicle components | | Colours and symbols | |
|---|---|---|---|---|---|
| HG | TT-Evo heater | 4/31 | Fan controller | rt | red |
| X1 | 6-pin heater connector | 6/28 | Fan motor | ws | white |
| X2 | 2-pin heater connector | F10 | 30 A fan fuse | sw | black |
| X10 | 4-pin connector Heater control | 64/111 | Connector on right-hand A-pillar | br | brown |
| | | | | gn | green |
| F1 | 20A fuse | CEM | Central Electrical Module | or | orange |
| F2 | 30A fuse | A | Connector on CEM | bl | blue |
| F3 | 1 A fuse | B | Connector on CEM | ge | yellow |
| | | PTC | Heating element | | |
| | | B | Connector on PTC | | |
| IPCU | Pulse width modulator | F51 | Fuse | | |
| IPCU settings: | | | | | |
| Duty cycle: 60% | | | | | |
| Frequency: 400Hz | | | | | |
| Voltage: 10V | | | | X | Cutting point |
| Function: Low-side | | | | Wiring colours may vary. | |

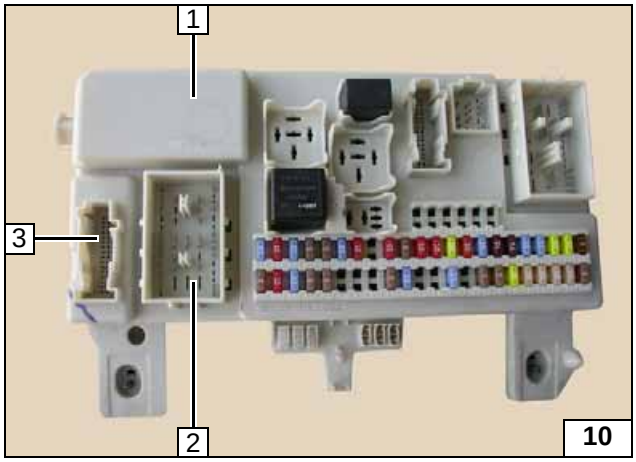
**Legend**




Connect same colour lines of wiring harness of passenger compartment fuse holder **1** with wiring harness of heater **2** according to wiring diagram.

**3** M6x20 bolt, large diameter washer, original vehicle threaded hole
**4** Angle bracket
**5** Connect IPCU

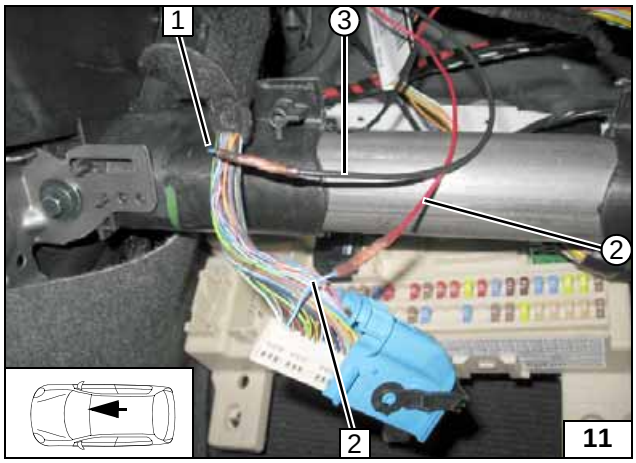
**Installing fuse holder of passenger compartment**




Detach CEM module **1** under glove compartment. Dismount connector **B**!

**2** Socket for connector **A**
**3** Socket for connector **B** / Cockpit 2

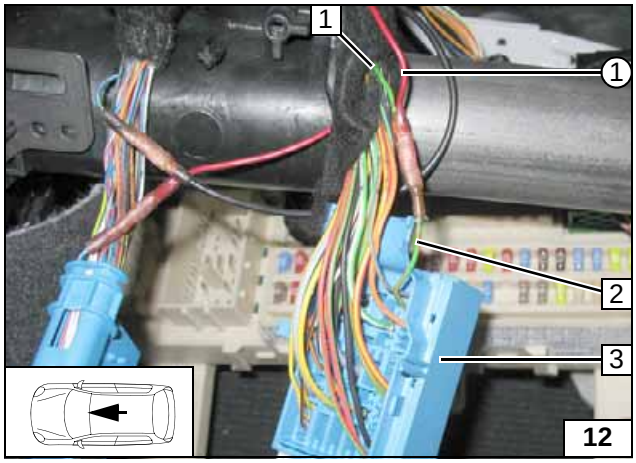
**View of CEM**




Produce connections as shown in wiring diagram.

**1** Blue/white (bl/ws) wire of fan unit
**2** Blue/white (bl/ws) wire of connector **B**, Pin 18
② Red (rt) wire of IPCU/E
③ Black (sw) wire of IPCU/A

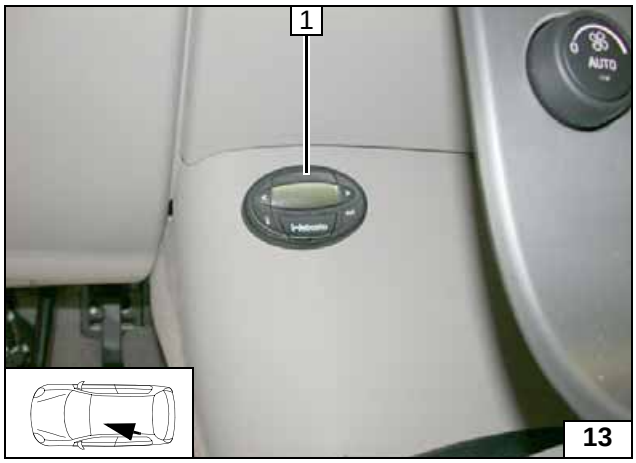
**Connection to CEM**




Produce connections as shown in wiring diagram.

**1** Green/orange (gn/or) wire of PTC heating element
**2** Green/orange (gn/or) wire of connector **A** Pin 3
**3** Connector **A** of CEM
① Red (rt) wire of IPCU/15

**IPCU connection**

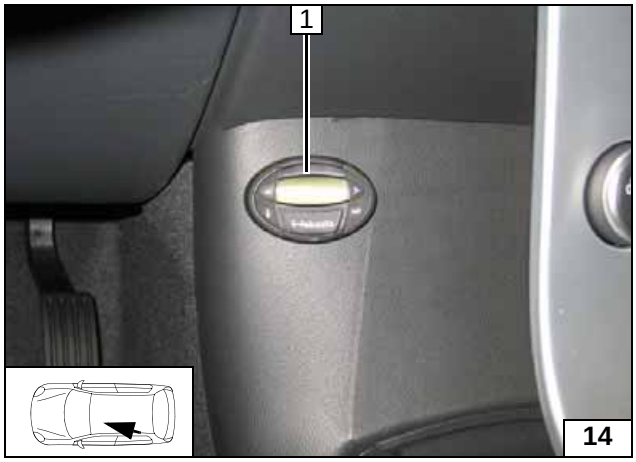



## Digital Timer

**C30**

**1** Digital timer

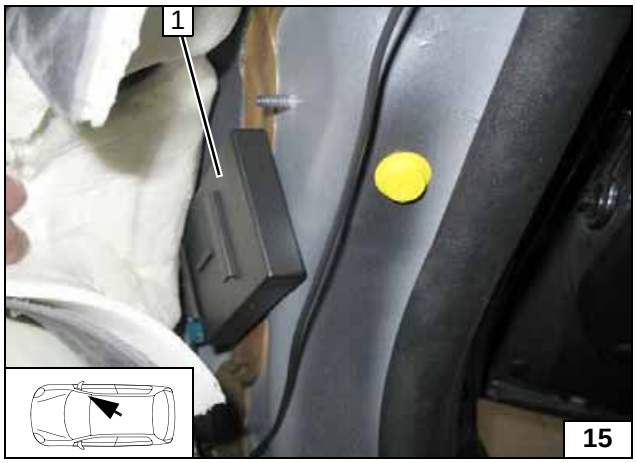
**Installing digital timer**




**S40 / V50**

**1** Digital timer

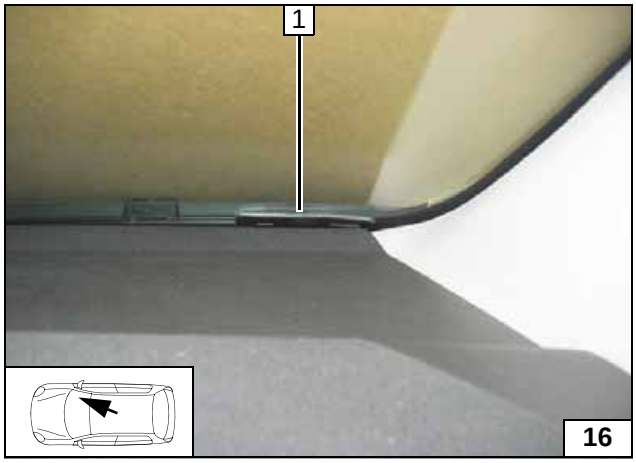
**Installing digital timer**




## Remote Option (Telestart)

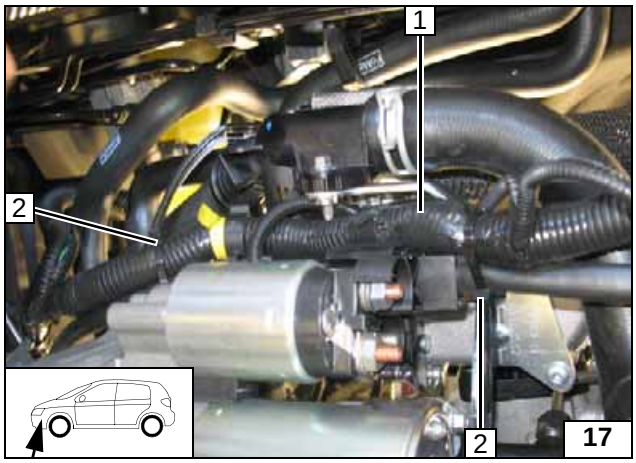
Fasten receiver **1** with adhesive tape.

**Installing receiver**




**1** Antenna

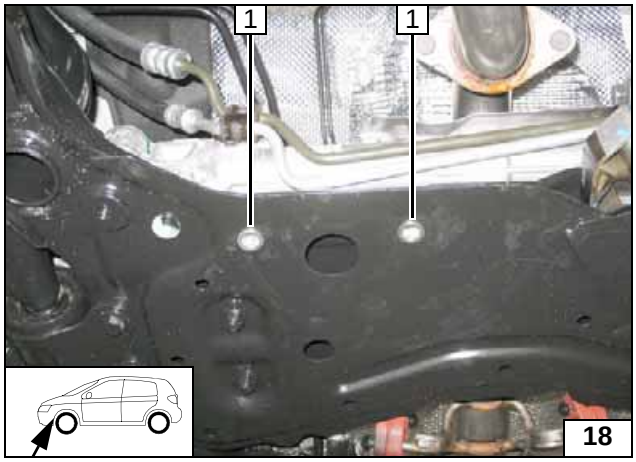
**Installing antenna**




## Preparing Installation Location

**1** Tie up original vehicle wiring harness
**2** Cable tie

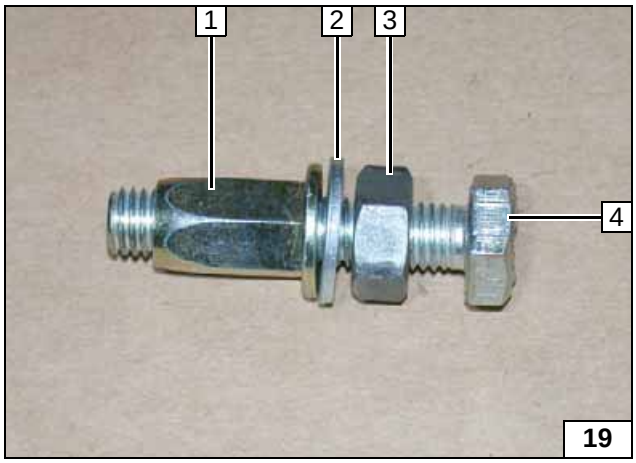
**Fastening wiring harness**




Insert and tighten M10 rivet nuts in hexagon holes. Use special tool as shown on page 3. See next image for an alternative.

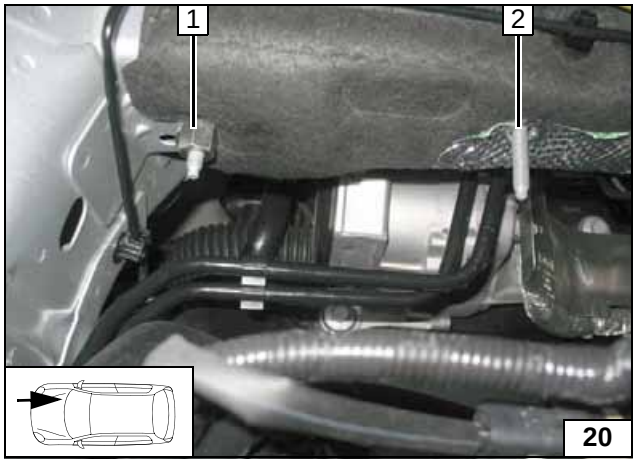
**1** M10 steel rivet nut [2x]

**Inserting and tightening rivet nuts**




**1** M10 rivet nut (steel)
**2** Washer
**3** M10 nut
**4** M10 bolt

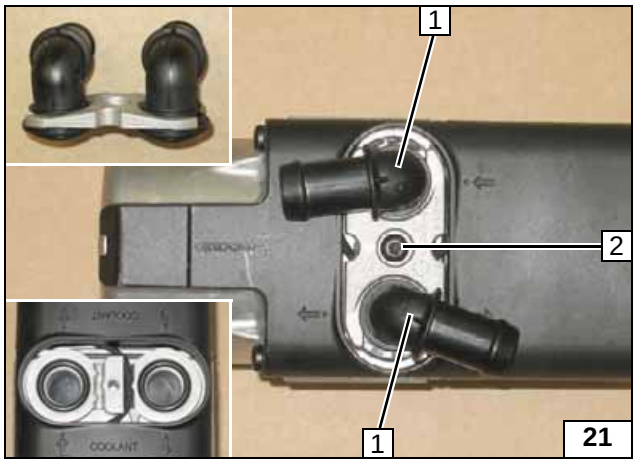
**Alternative rivet-down tool**




**1** M8x20 spacer nut, original vehicle stud bolts
**2** Original vehicle stud bolt for mounting heater

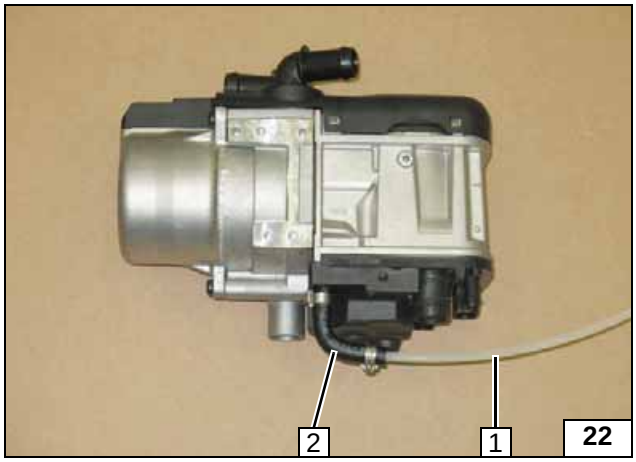
**Preparing installation location**

## Preparing Heater



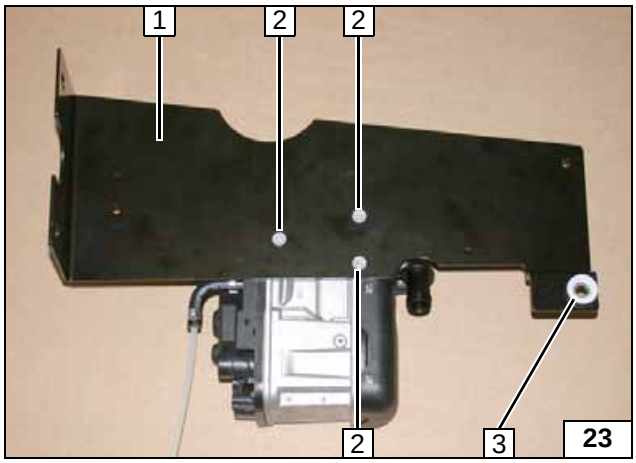

**1** Water connection piece, sealing ring [2x each]
**2** 5x15 self-tapping bolt, retaining plate of water connection piece

**Installing water connection piece**




**1** Fuel line
**2** 90° moulded hose, 10 mm dia. clamp [2x]

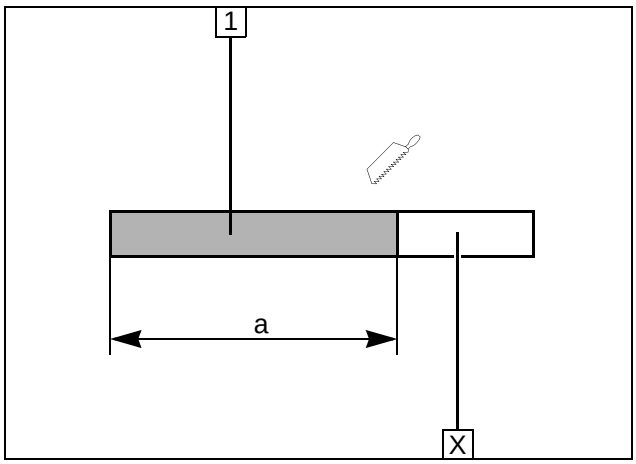
**Premounting fuel line**




If this has not already been done,drill out existing hole at position **3** to 18 mm dia.

**1** Bracket
**2** 5x13 self-tapping bolt [3x]
**3** Insert rubber buffer, sleeve

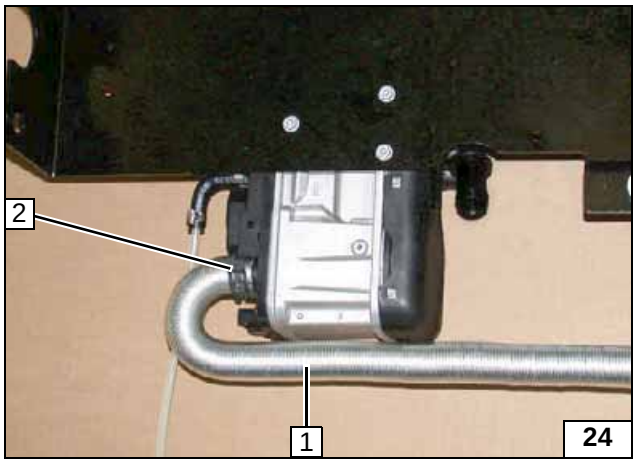
**Installing bracket**




Discard section **X**.

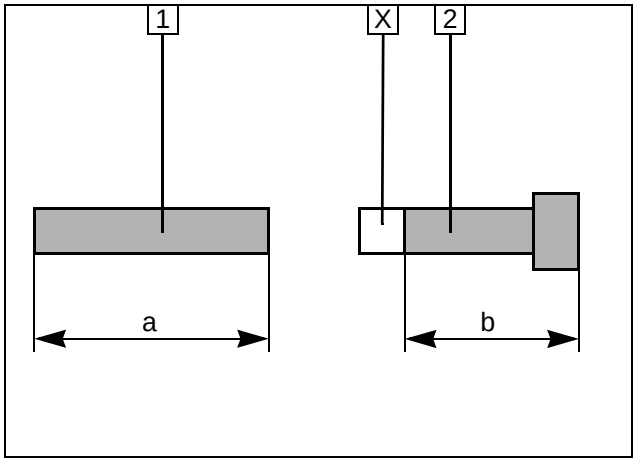
**1** Combustion air pipe
a = 600

**Cutting combustion air pipe to length**




**1** Combustion air pipe
**2** 25 mm dia. spring clip

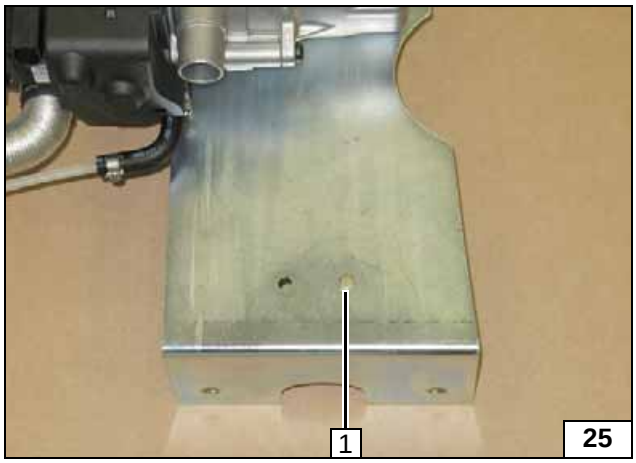
**Installing combustion air pipe**




Discard section **X**.

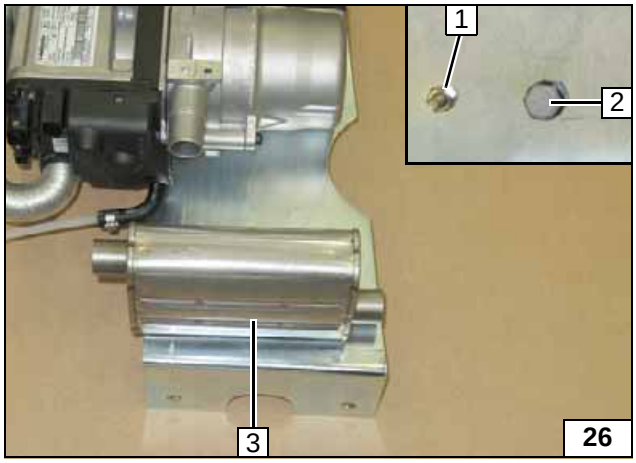
**1** Exhaust pipe
a = 200
**2** Exhaust end section
b = 120

**Preparing exhaust pipe**




**1** M4x12 bolt, nut at the back

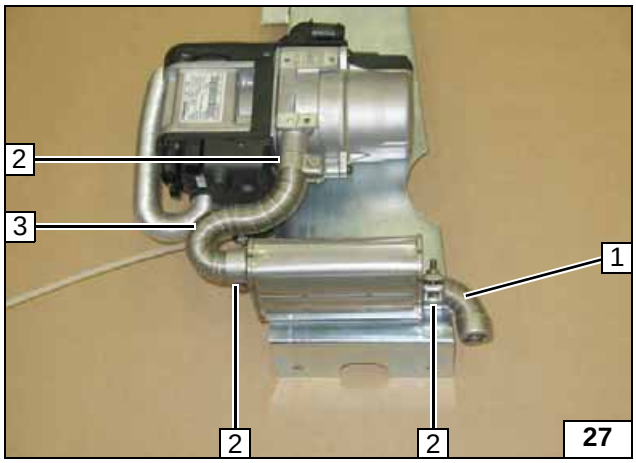
**Installing rotation lock**




Position housing notch of silencer **3** over bolt head **1** (rotation lock).

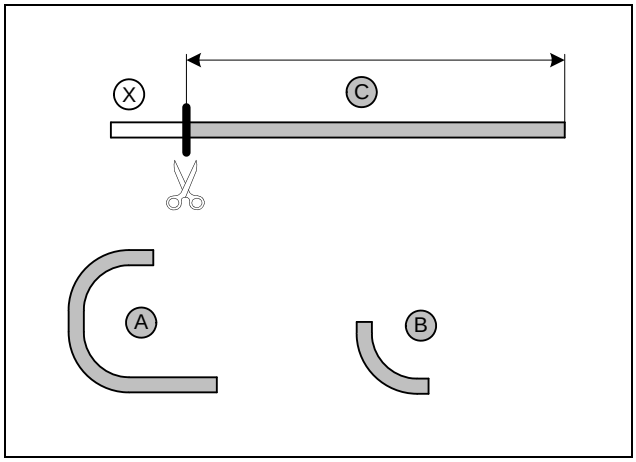
**2** M6x16 bolt, spring lockwasher

**Installing silencer**




**1** Exhaust end section
**2** Hose clamp [3x]
**3** Exhaust pipe

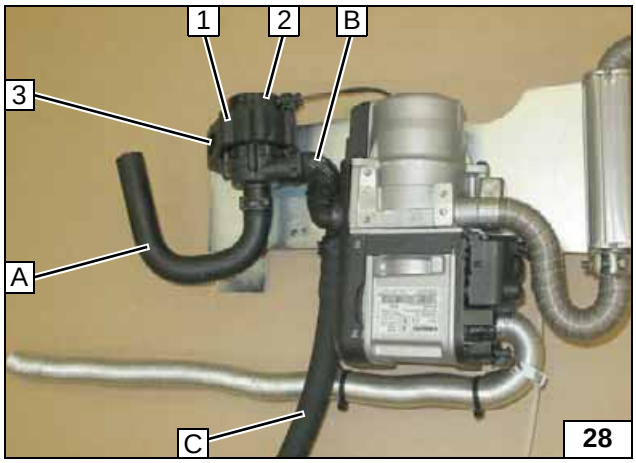
**Installing exhaust pipe**




Discard section **X**.
Hose **A** = 180°, 18 mm dia. moulded hose
Hose **B** = 90°, 18 mm dia. moulded hose

**C** = 480

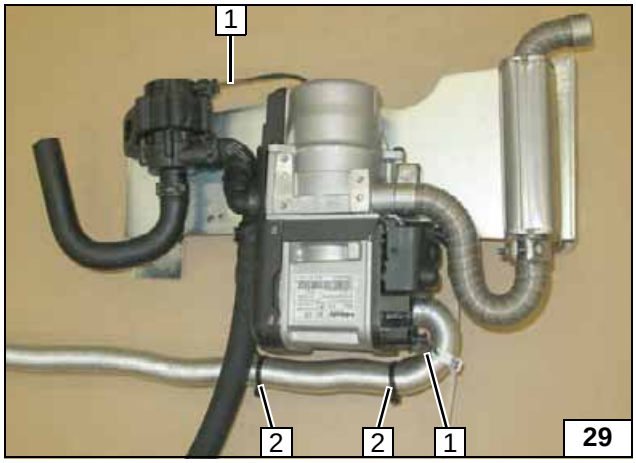
**Preparing hoses**




All 25mm dia. spring clips.

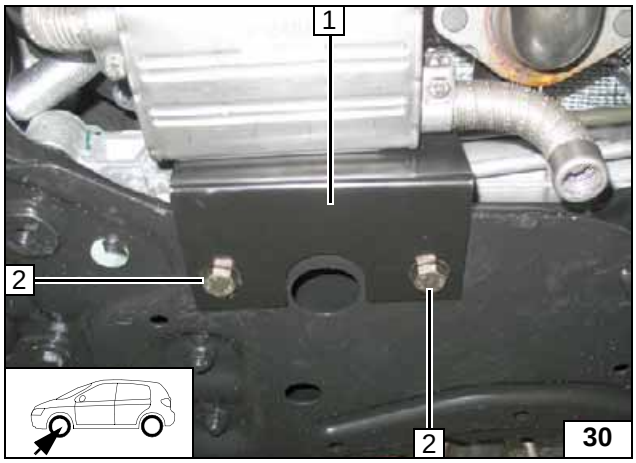
**1** Circulating pump support
**2** Circulating pump
**3** M6x25 bolt, flanged nut

**Installing hoses and circulating pump**




**1** Wiring harness of circulating pump
**2** Cable tie [2x]

**Mounting wiring harness**

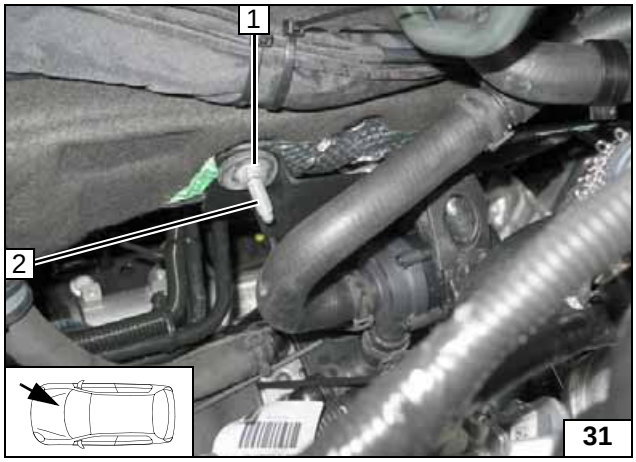



## Installing Heater

Use existing threaded holes or M10 rivet nuts at position 2.

**1** Bracket
**2** M10x35 bolt, loosely mount spring lock-washer [2x each]

**Installing heater loosely**




Mount heater on original vehicle stud bolt **2**. Install large diameter washer and M8 flanged nut **1** loosely.

**Installing heater loosely**


Align heater. Ensure sufficient distance to neighbouring components. Ensure minimum distance of > 5 mm from steering components and > 15 mm from parts of transmission, cardan shaft and engine.
Tighten M10x35 bolt.

**Aligning heater**

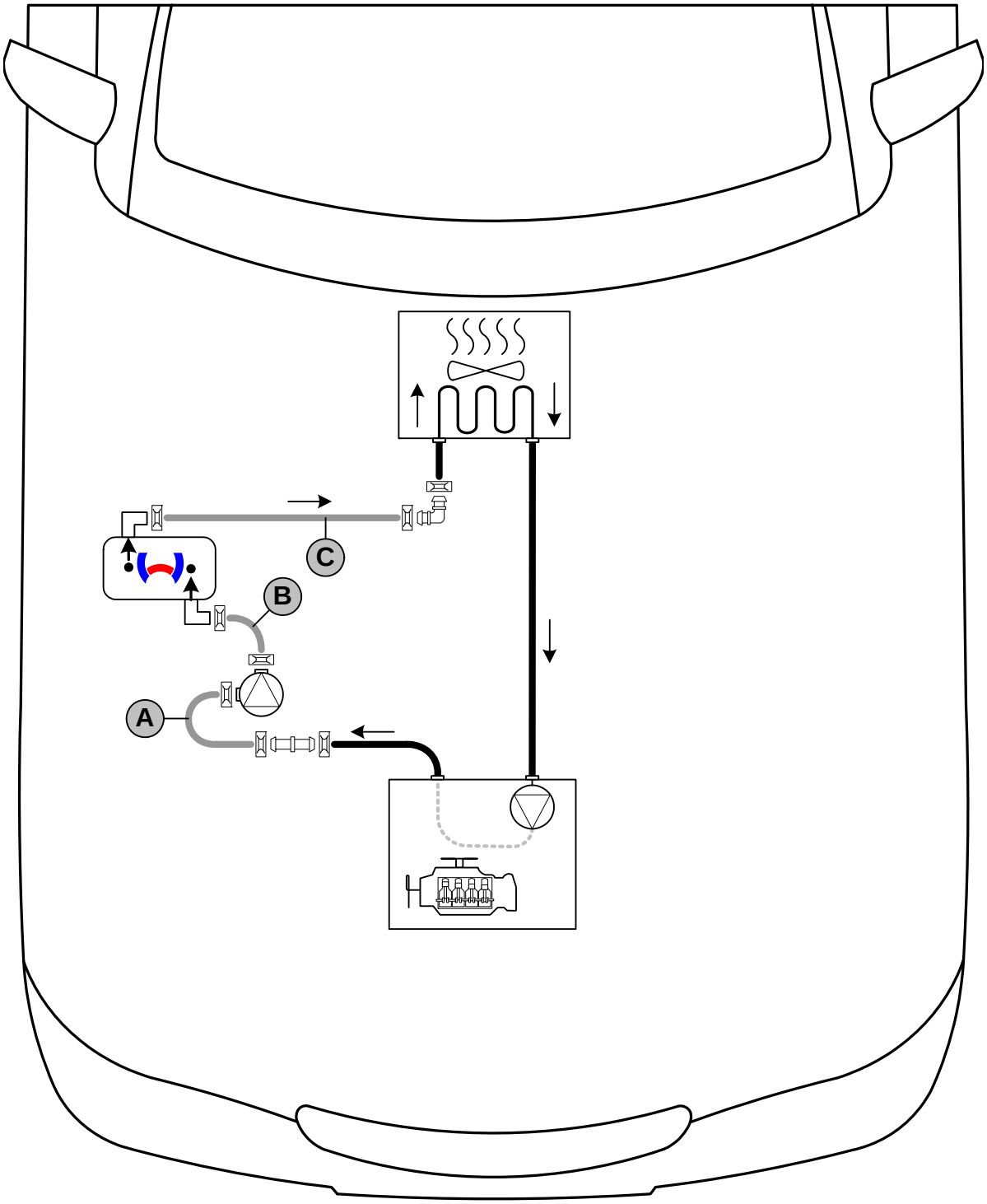

**1** Tighten M8 flanged nut

**Installing heater**

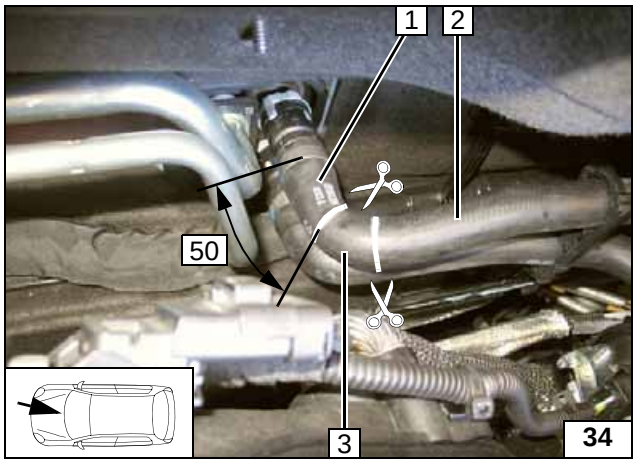
## Coolant Circuit

**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**



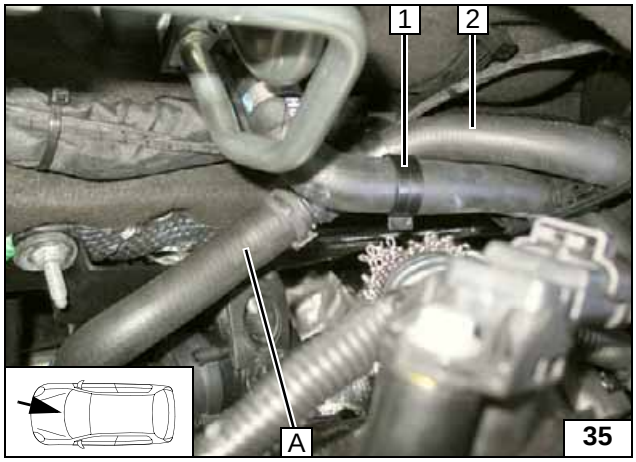

All spring clips = 25 mm dia.
All connecting pipes and = 18x18 mm dia.




Cut engine outlet/heat exchanger inlet hose at the markings. Remove hose section of heat exchanger inlet **1**.

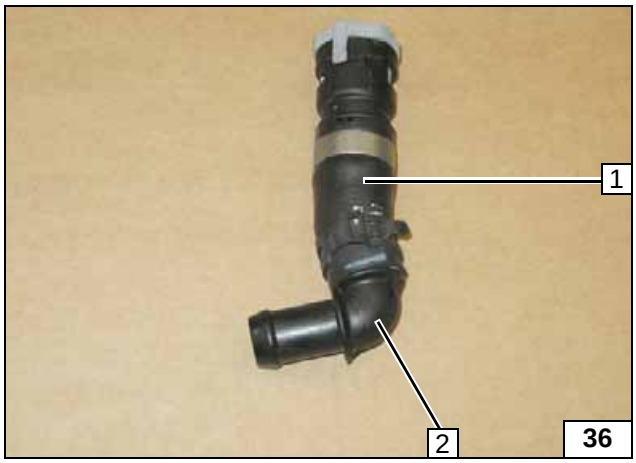
**2** Engine outlet hose section
**3** Discard section

**Cutting point**



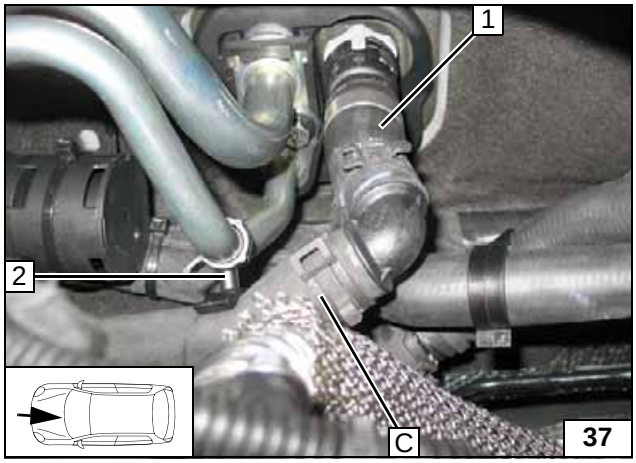

**1** Hose bracket
**2** Hose of engine outlet

**Connection engine outlet**




**1** Hose on heat exchanger inlet
**2** 90° connecting pipe, spring clip

**Preparing heat exchanger inlet connection**




Align hoses. Ensure sufficient distance to neighbouring components, adjust if necessary.

**1** Hose on heat exchanger inlet
**2** Hose bracket

**Heat exchanger inlet connection**

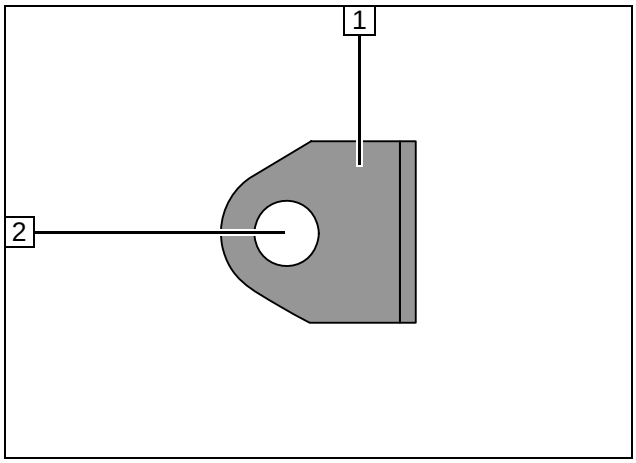
  

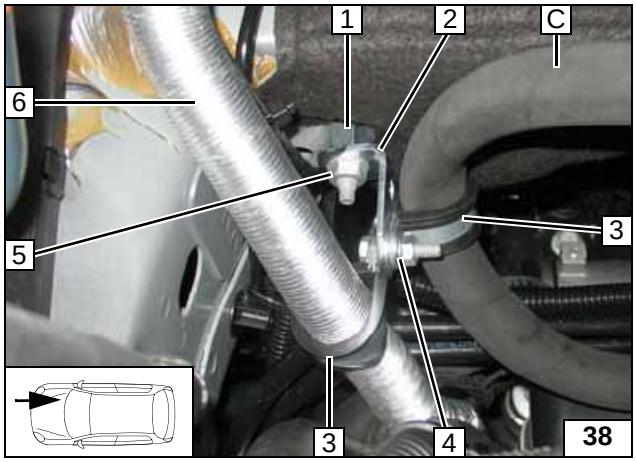
## Combustion Air

Drill hole in the short leg of the angle bracket **1**.

**2** 8.5 mm dia. hole

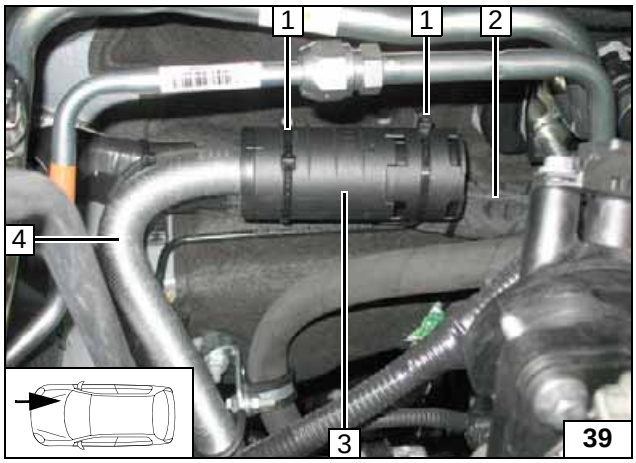
**Drilling out angle bracket**




**1** M8x15 spacer nut, original vehicle stud bolt
**2** Angle bracket
**3** 25 mm dia. rubber-coated p-clamp [2x]
**4** M6x20 bolt, flanged nut
**5** M8 flanged nut
**6** Combustion air pipe

**Fastening hose C and combustion air pipe**




**1** Cable tie [2x each]
**2** Original vehicle wiring harness
**3** Silencer
**4** Combustion air pipe

**Installing silencer**

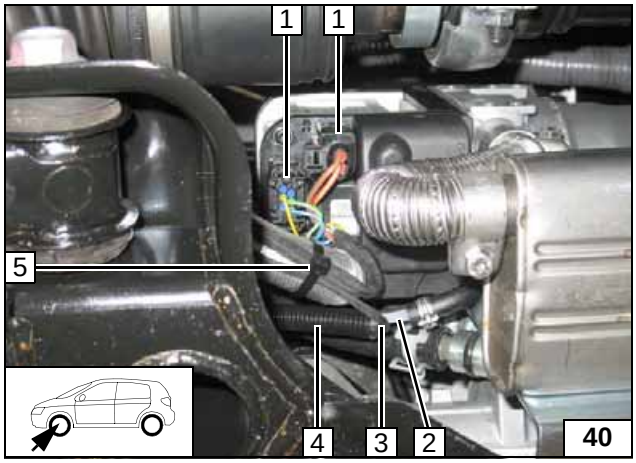
## Fuel

**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.

Route 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.

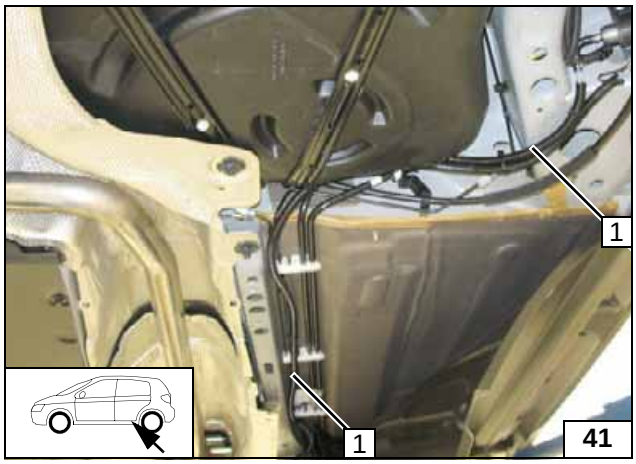
**WARNING!**
The fuel line and wiring harness are routed to the metering pump as shown in the wiring harness routing diagram.




Draw wiring harness of metering pump **3** and fuel line **2** into corrugated tube **4** and route to underbody.

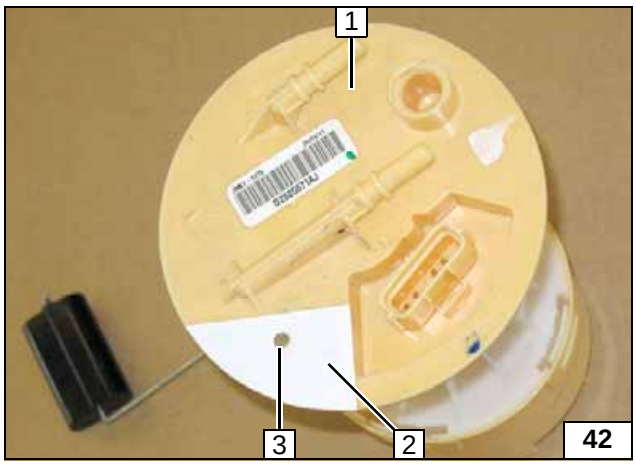
**1** Mount wiring harness of heater [2x]
**5** Cable tie

**Mounting wiring harnesses**




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

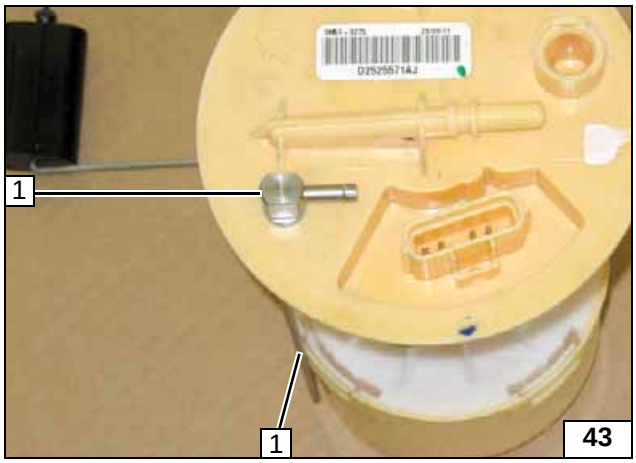
**Installing lines**




Remove fuel tank according to manufacturer's instructions. Remove fuel-tank sending unit **1** in accordance with manufacturer's instructions. Align template **2** with contours.

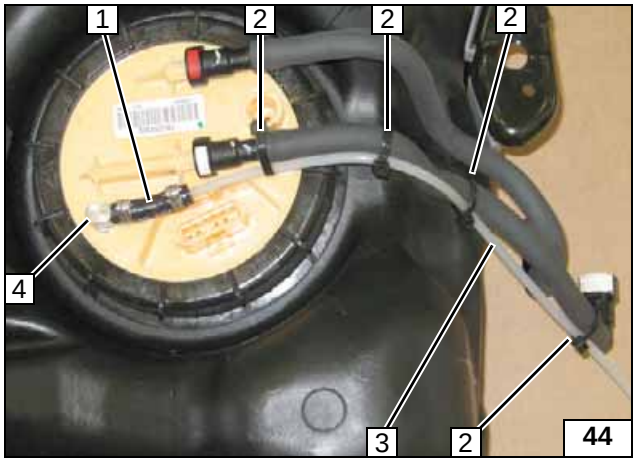
**3** Copy hole pattern, 6 mm dia. hole

**Fuel extraction**




Form fuel standpipe **1** in accordance with the template, cut it to length and insert it.

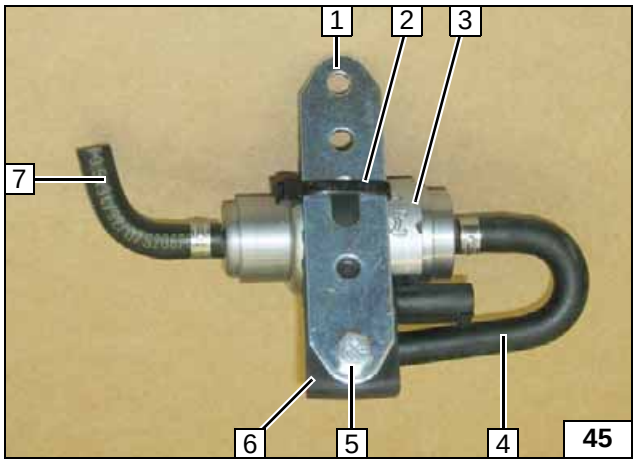
**Installing fuel standpipe**




Install fuel-tank sending unit according to manufacturer's instructions. Install tank after assembly according to manufacturer's instructions.

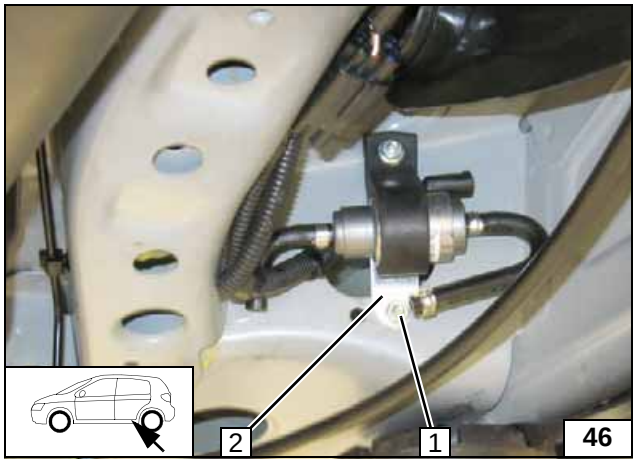
**1** Hose section, 10 mm dia. clamp [2x]
**2** Cable tie
**3** Fuel line
**4** Fuel standpipe

**Connecting fuel line**



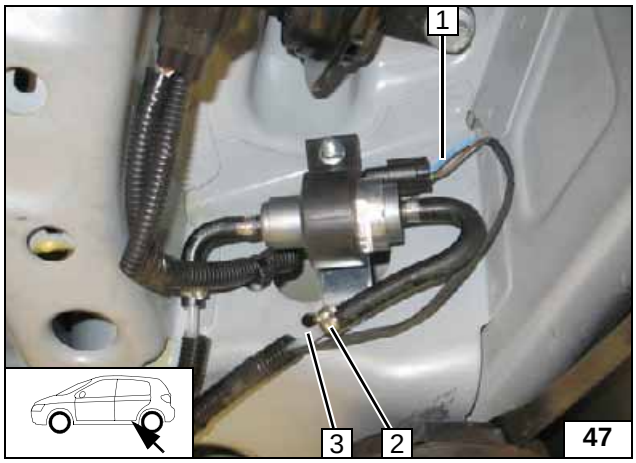

**1** Perforated bracket
**2** Cable tie
**3** Metering pump
**4** 180° moulded hose, 10 mm dia. clamp
**5** M6x25 bolt, flanged nut
**6** Metering pump support
**7** 90° moulded hose, 10 mm dia. clamp

**Premounting metering pump**




**1** M6x20 bolt, large diameter washer, flanged nut, existing hole
**2** Perforated bracket

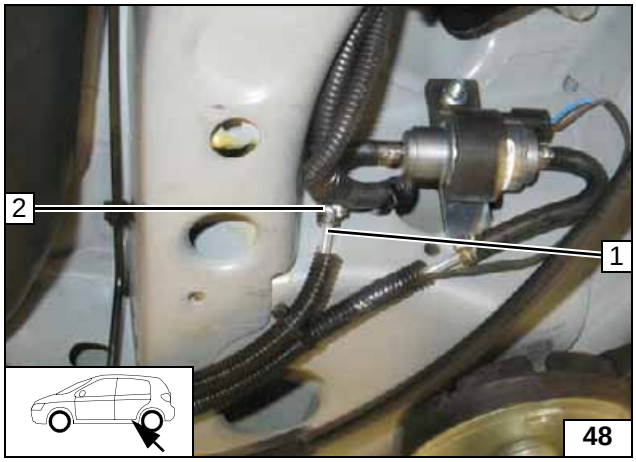
**Installing metering pump**




Check the position of the components; correct if necessary. Check that they have freedom of movement.

**1** Wiring harness of metering pump, connector mounted
**2** 10 mm dia. clamp
**3** Fuel line from heater

**Connection of metering pump**




Slide corrugated tube onto fuel line of fuel standpipe **1**. Check the position of the components; correct if necessary. Check that they have freedom of movement.

**2** 10 mm dia. clamp

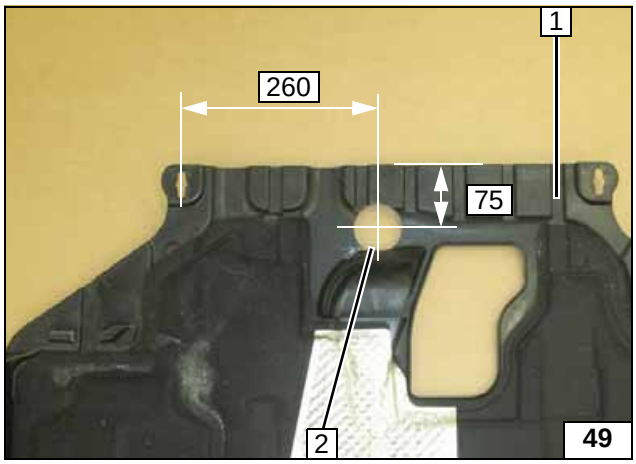
**Connection of metering pump**

## Final Work

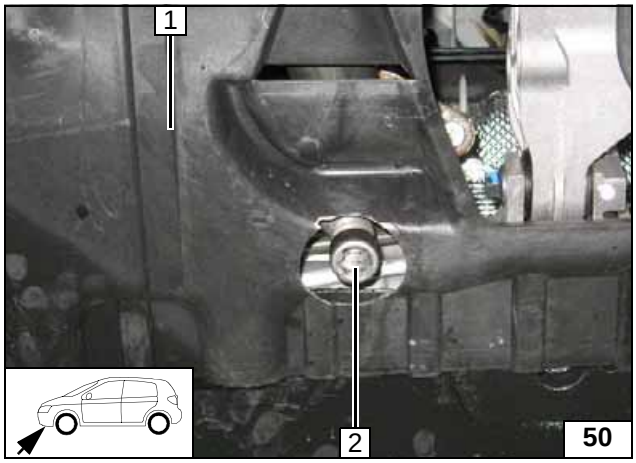
**WARNING!**
Reassemble the disassembled components in reverse order. Check all hoses, clamps and all electrical connections for firm seating. Insulate and tie back all loose wires.
Only use manufacturer-approved coolant. Spray heater components with anti-corrosion wax (Tectyl 100K, Order No. 111329).

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




**1** Underride protection
**2** 60 mm dia. hole

**Cutting out underride protection**

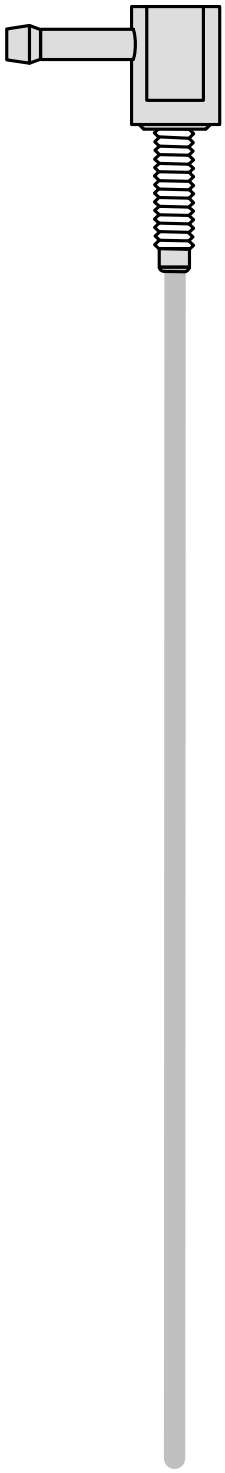



Align exhaust end section **2** in the middle of the hole and flush on underride protection **1**.

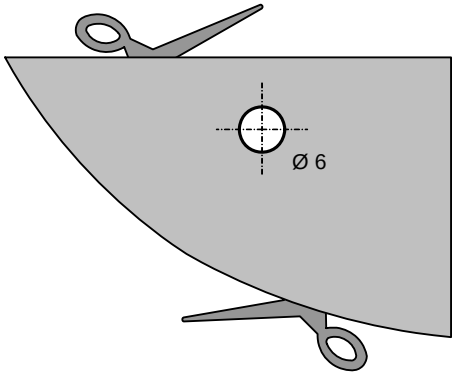
**Aligning exhaust end section**

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

## Template for Fuel Standpipe



## Template for Fuel Tank Sending Unit




100mm

1:1 scale

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

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

100mm

0

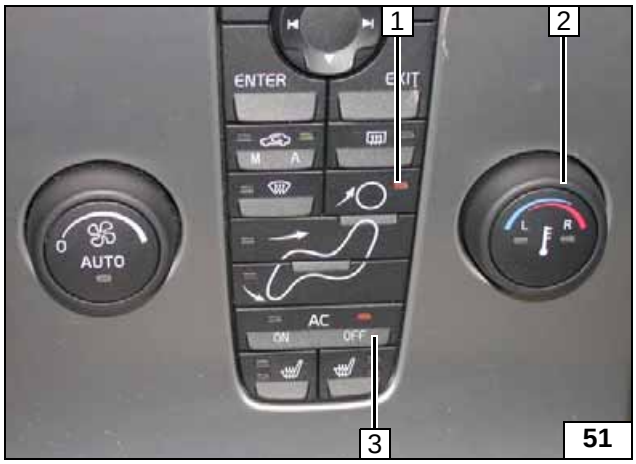
## Operating Instructions for End Customer

Please remove page in case of automatic air-conditioning and add it 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.

If vehicles have passenger compartment monitoring, this must be deactivated in addition to vehicle settings for the heating operation.
Deactivation instructions can be found in the operating instructions of the vehicle.

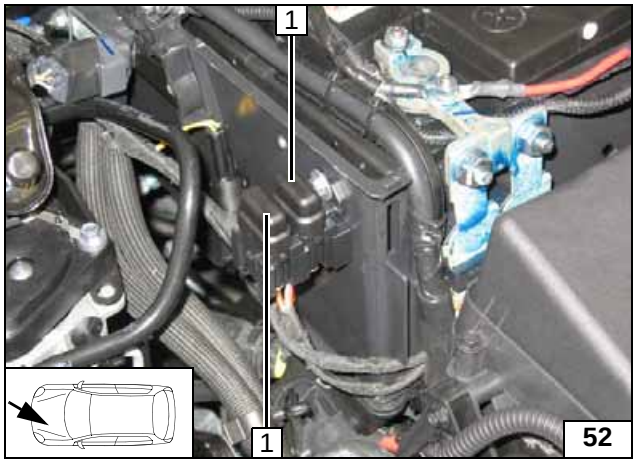
Before parking the vehicle, make the following settings:




No need to pre-select fan speed.

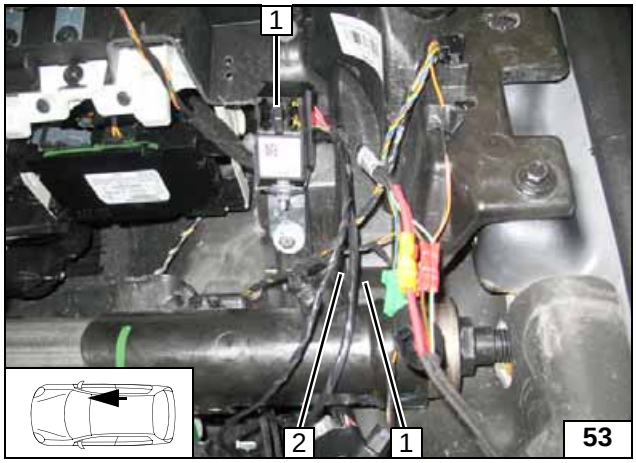
**1** Air outlet faces upward
**2** Set temperature to "HI"
**3** Set AC button to "OFF"

**A/C control panel**




**1** 30A main fuse F2 of passenger compartment
**2** 20A heater fuse F1

**Fuses of engine compartment**




**1** 1A fuse F3 of heater control

**Fuses of passenger compartment**