Water Heater

***Thermo Top Evo* Parking Heater** E1 00 0258

Installation Documentation
Mitsubishi Outlander

Validity

Manufacturer	Model	Type	EG-BE No./ABE
Mitsubishi	Outlander	CWB	e1 * 2001 / 116 * 0482 * ...

Motorisation	Fuel	Transmission type	Output in kW	Displacement in cm³	Engine code
2.2 DID	Diesel	AG	115	2179	4HN

AG = Automatic transmission

From Model Year 2010
Left-hand drive vehicle

Verified equipment variants: Automatic air-conditioning
Front fog light
Headlight washer system

Not verified: Passenger compartment monitoring

Total installation time: about 10 hours

Mitsubishi Outlander

Table of Contents

Necessary Components

- Basic delivery scope of *Thermo Top Evo* based on price list
- Installation kit for Mitsubishi Outlander 2010 2.2 l Diesel: **1315930A**
- 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

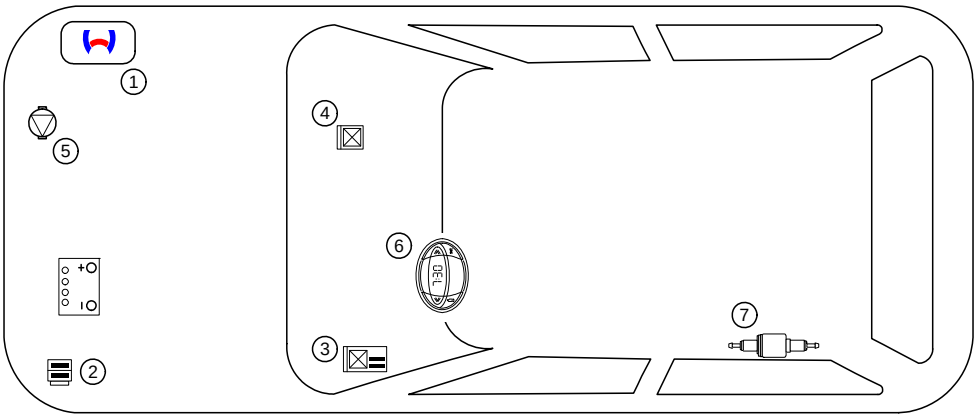
Notes on installation:

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

Installation Overview

Legend:

1. Heater
2. Engine compartment fuse holder
3. Passenger compartment relay and fuse holder
4. PWM GW
5. Circulating pump
6. Digital timer
7. 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 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 must audibly snap into place during assembly.

Sharp edges should be fitted with rub protection. 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 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.

Notes on Validity

This installation documentation applies to the Mitsubishi Outlander 2.2 l Diesel vehicles - for validity, see page 1 - from model year 2010 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
- Webasto Thermo Test Diagnosis with current software

Dimensions
- All dimensions are in mm

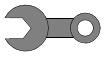
Tightening torque values
- Tightening torque values of 5x13 heater bolts and 5x11 heater stud bolts = 8Nm.
- Tightening torque of bolt on retaining plate of 5x15 water connection piece = 7Nm.
- Tighten other bolt connections in accordance with manufacturer's instructions or in accordance with state-of-the-art-technology.

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.

Special features are highlighted using the following symbols:

Mechanical system



Electrical system

Coolant circuit

Combustion air

Fuel

Exhaust gas

Software

Specific risk of injury or fatal accidents.

Specific risk due to electrical voltage

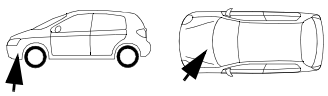
Specific risk of damage to components.

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



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

Mitsubishi Outlander

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 air filter together with the intake hose.
- Loosen the coolant expansion tank
- Loosen the right and left-hand wheel well trim.
- Remove the bottom engine trim.
- Remove the left-hand stoneguard in front of the fuel tank (if present).
- Remove the bumper.
- Remove the right-hand headlight
- Drain the coolant into a suitable container.
- Remove the underride protection on the front left.
- Remove the rear seat
- Fold back the floor covering.
- Open the tank-fitting service lid.
- Remove the fuel-tank sending unit in accordance with the manufacturer's instructions.
- Remove the footwell trim on the driver's and front passenger's side.
- Remove the lateral instrument panel trim on the driver's side (only with Telestart).
- Remove the A-pillar trim on the driver's side (only with Telestart option).

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

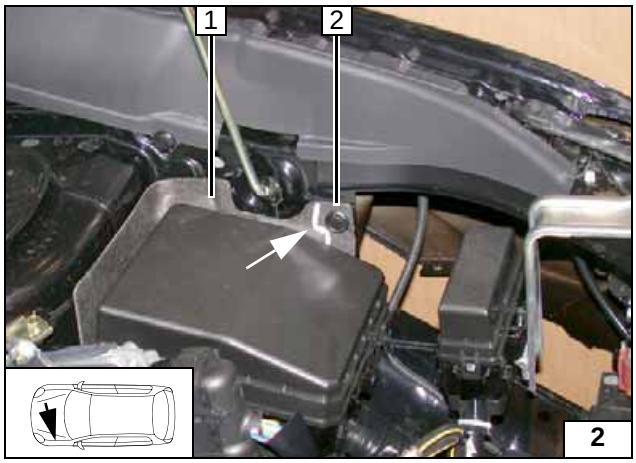
1 Heater

Installation location

Preparing Electrical System

Cut away insulation mat **1** from fuse and relay box at marking.
Remove retaining clip **2** and discard.

Adapting insulation mat



2

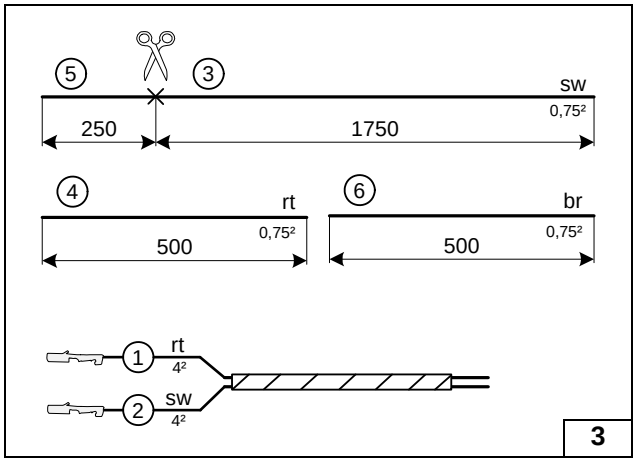
Wire sections retain their numbering in the entire document.

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

Pull wire ③ into the provided protective sleeving.

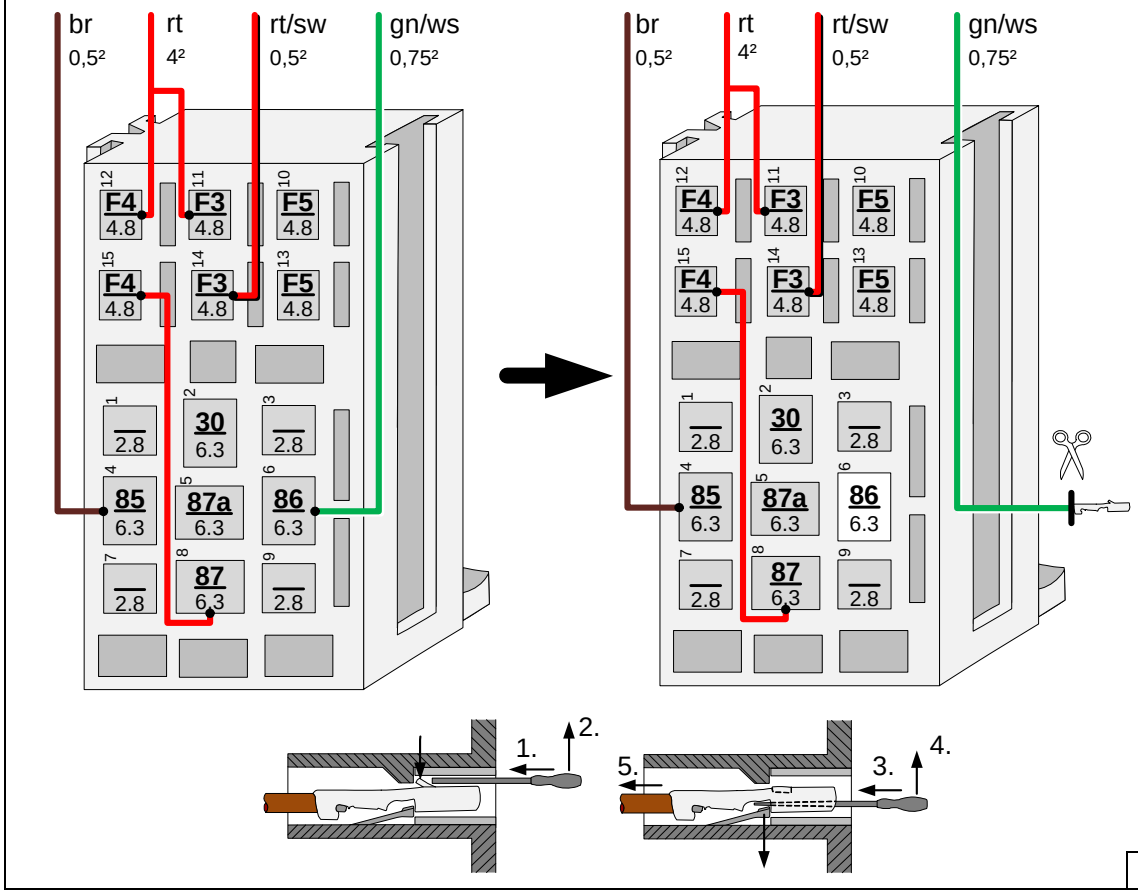
① Red (rt) wire of fan wiring harness
② Black (sw) wire of fan wiring harness

Cutting wires to length/ assigning wires



3

Preparing passenger compartment relay and fuse holder



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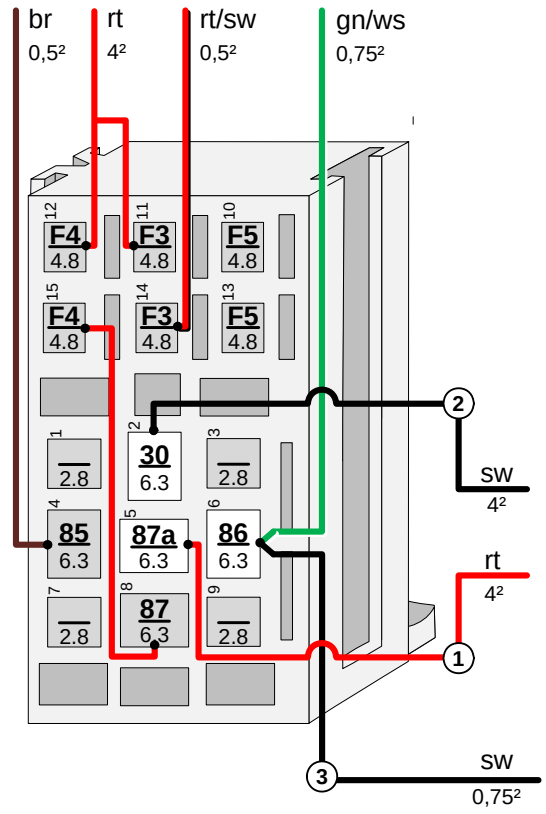

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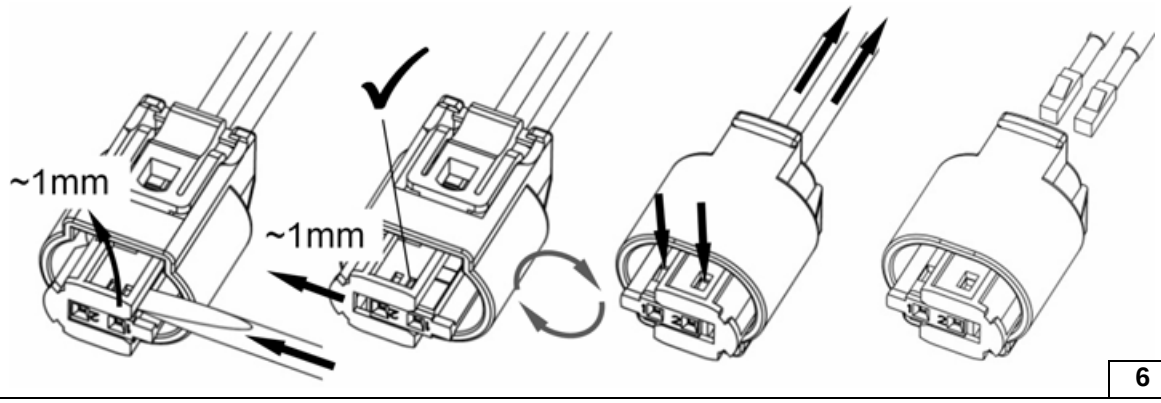
Connecting wires to passenger compartment relay and fuse holder

Connector X7



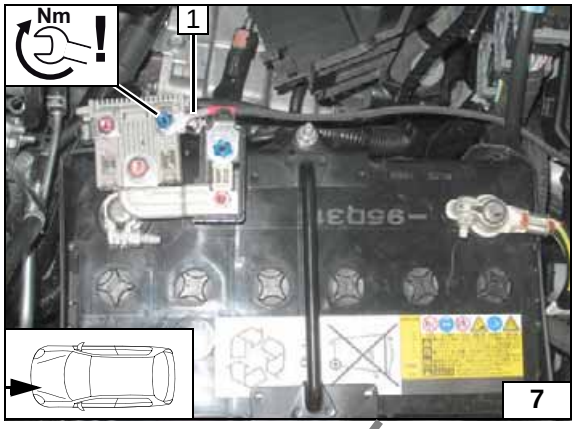
6

Dismantling connector of metering pump

Electrical Connections

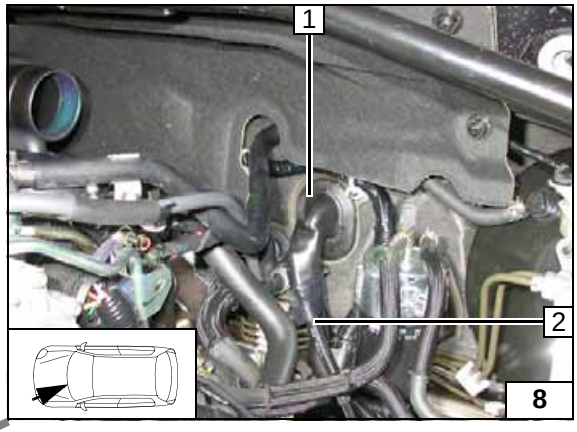
Positive wire

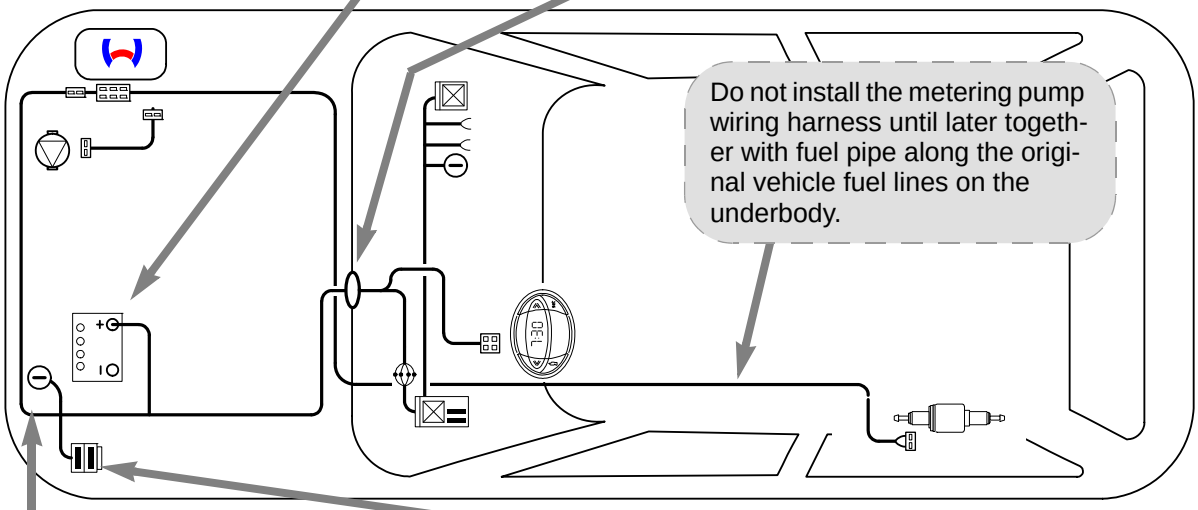
1 Positive wire to positive battery terminal



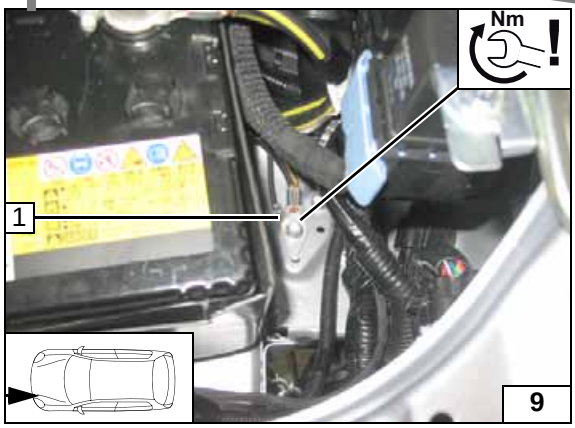
Wiring harness pass through

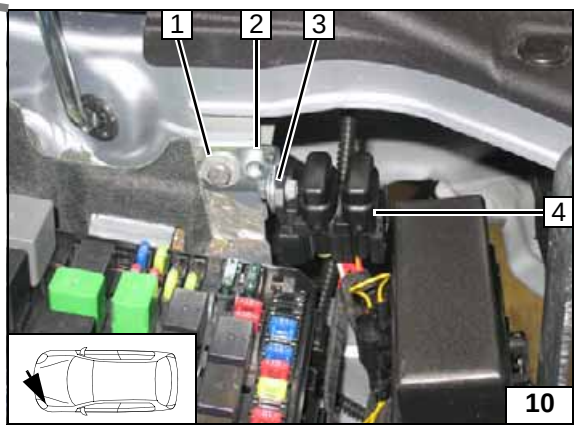
1 Protective rubber plug
2 Wiring harnesses of heater and heater control





Wiring harness routing diagram





Earth wire

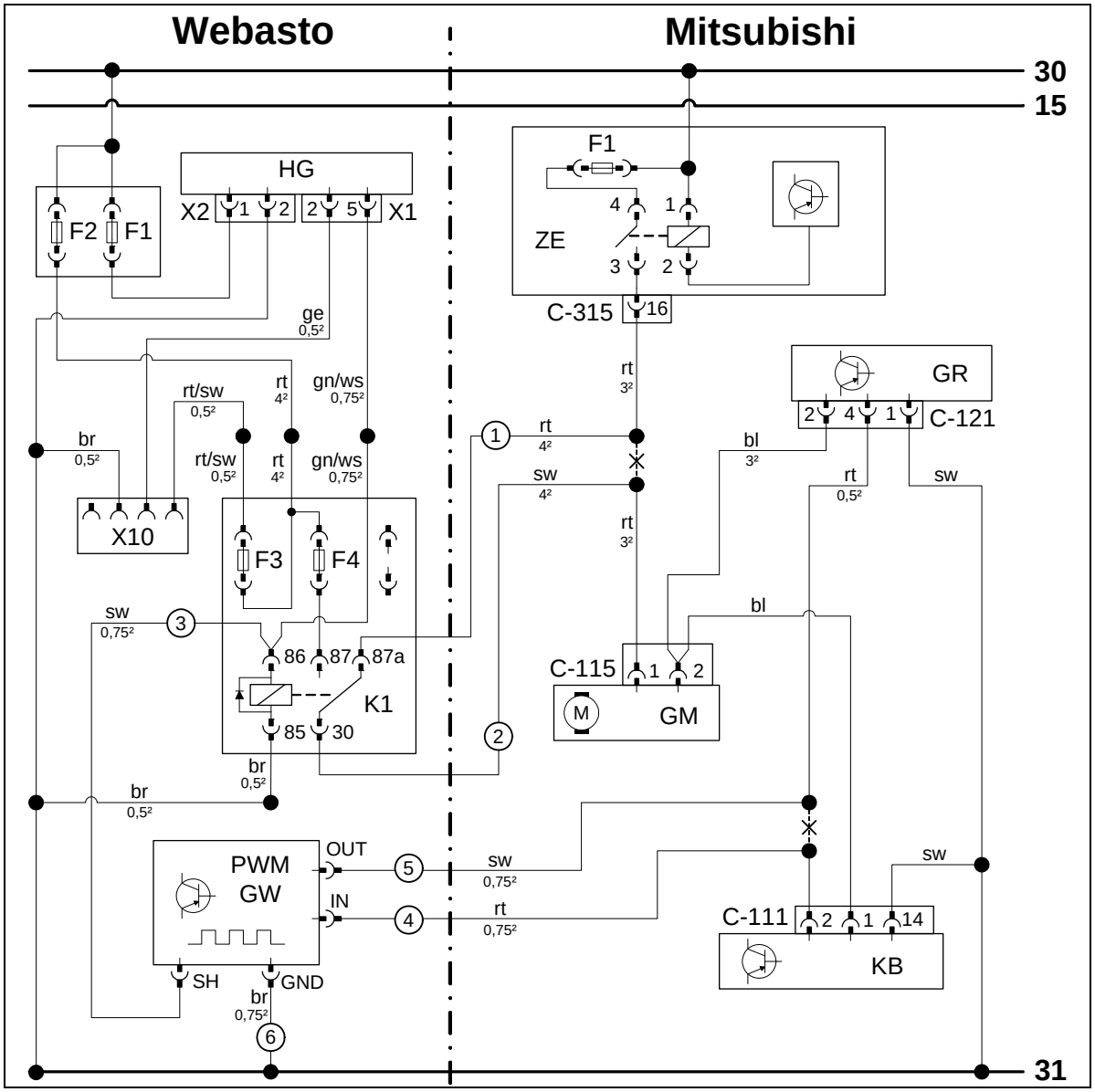
1 Earth wire to original vehicle earth support point

Engine compartment fuse holder

1 M6x20 bolt, flanged nut on hole of retaining clip
2 Angle bracket
3 M5x16 bolt, fuse holder retaining plate, washer, flanged nut
4 F1 and F2 fuses mounted

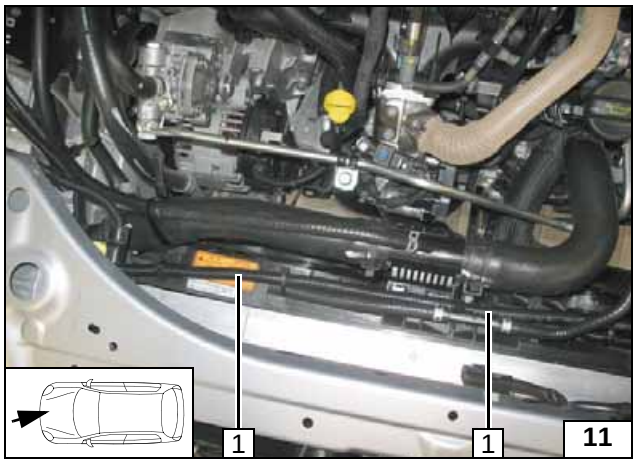
Fan Controller

Wiring diagram



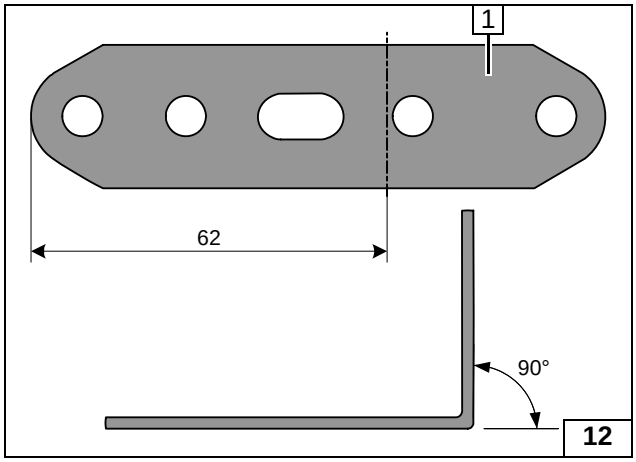
Webasto components		Vehicle components		Colours and symbols	
HG	TT-Evo heater	ZE	Central electrical box	rt	red
X1	6-pin heater connector	F1	Fuse	ws	white
X2	2-pin heater connector	C-315	19-pin connector ZE	sw	black
F1	20A fuse	GR	Fan controller	br	brown
F2	30A fuse	C-121	4-pin connector GR	gn	green
X10	4-pin connector of heater control	GM	Fan motor	bl	blue
		C-115	2-pin connector GM	ge	yellow
F3	1A fuse	KB	A/C control panel		
F4	25 A fuse	C-111	20-pin connector KB		
K1	Fan relay				
PWM GW	Pulse width modulator				
Settings of PWM GW:					
Duty cycle:	100% (DC)				
Frequency:	not relevant				
Voltage:	4.7V			**X**	Cutting point
Function:	High-side			Wiring colours may vary.	

Legend



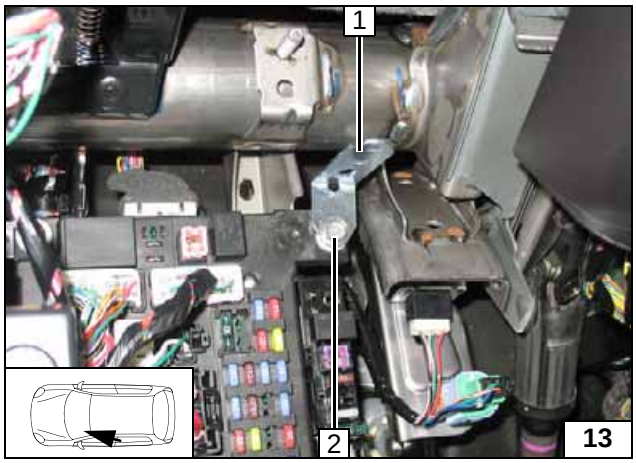
Install wiring harness of heater in corrugated tube **1** (cut corrugated tube to the right size) on the right side of vehicle!

Routing wiring harness of heater



1 Angle down perforated bracket to length

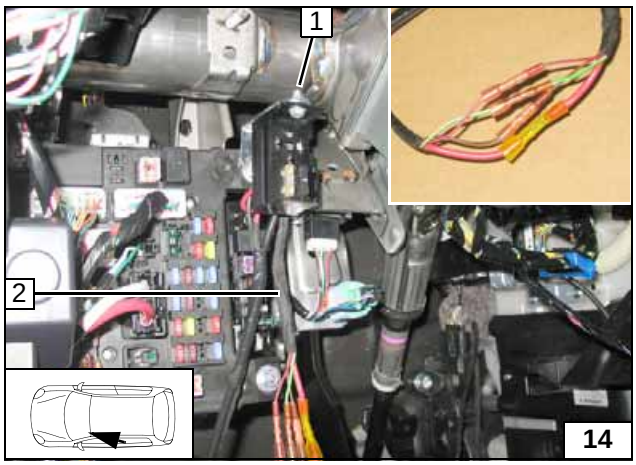
Preparing perforated bracket



Remove original vehicle bolt at position **2** and discard. Insert three washers between perforated bracket **1** and passenger compartment fuse box as height adjustment.

2 M6x35 bolt, perforated bracket **1**, washer [3x], existing threaded hole

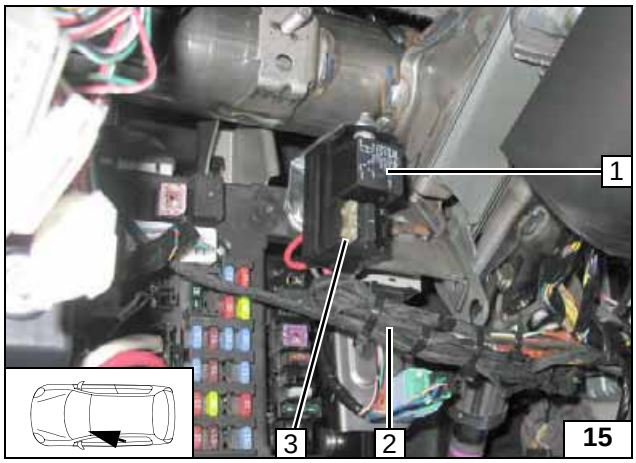
Mounting perforated bracket



Connect wiring harness of passenger compartment relay and fuse holder **2** to the wiring harness of the heater in such a way that the wires of the same colour are connected to each other.

1 M5x16 bolt, flanged nut

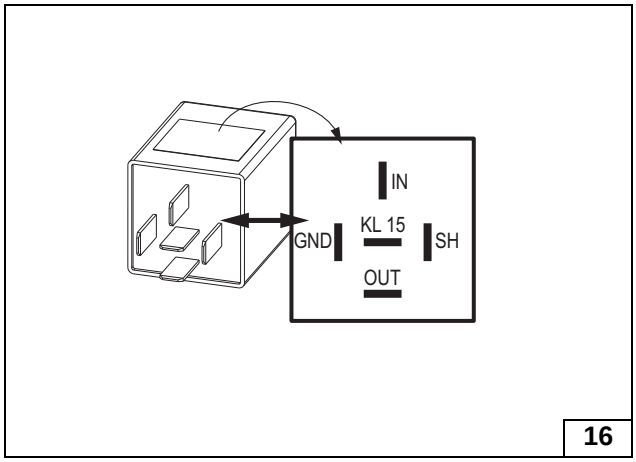
Installing relay and fuse holder of passenger compartment



Tie back wiring harnesses **2**. Route black (sw) additional wire ③ of K1/86 together with the wiring harness of the fan controller to the right side of the vehicle.

1 K1 relay
3 25A fuse F4

Installing relay and fuse holder of passenger compartment

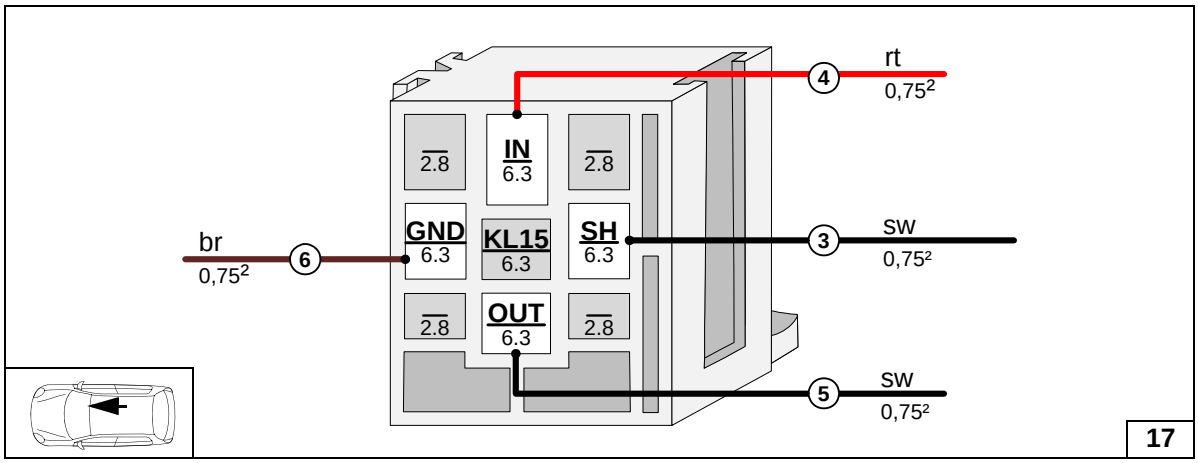


Check the PWM Gateway settings when starting up the heater and adjust if necessary.

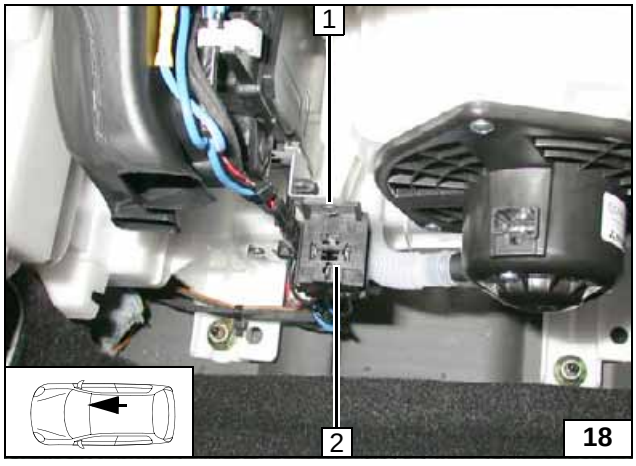
Settings:

Duty cycle: 100% (DC)
Frequency: not relevant
Voltage: 4.7V
Function: High-side

View of PWM-GW

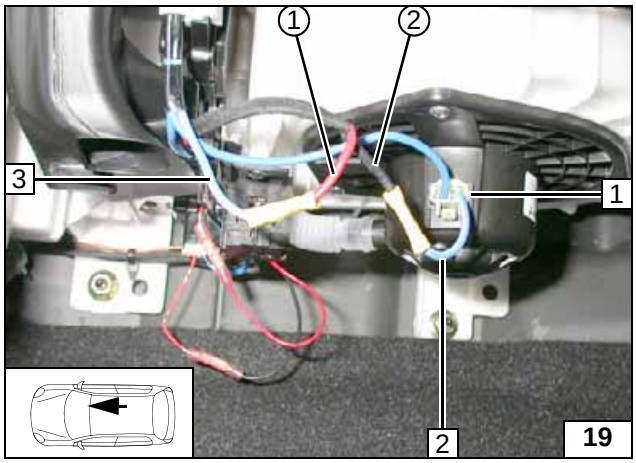


Connecting wires to socket of PWM GW in passenger compartment



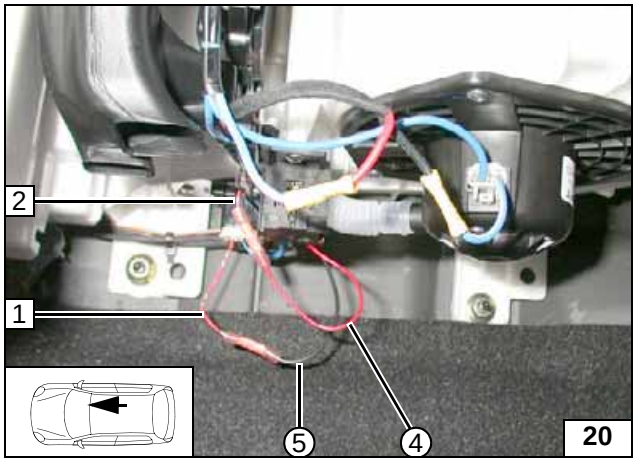
1 Original vehicle bolt
2 PWM GW socket

Installing PWM GW socket



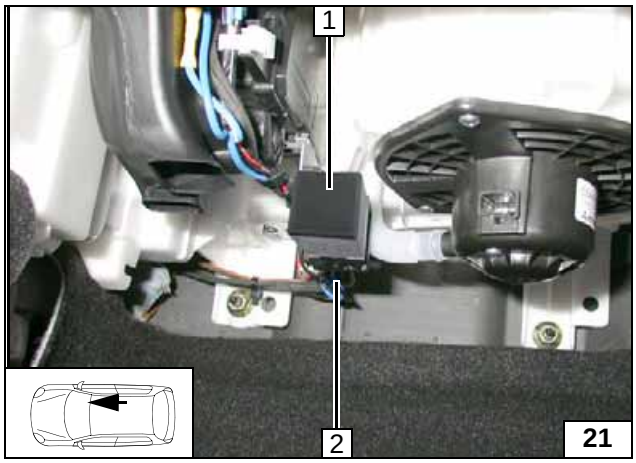
1 2-pin connector C-115 of fan motor
2 Blue/white (bl/ws) wire from connector C-115/Pin 1 of fan motor
3 Blue/white (bl/ws) wire from connector C-315/Pin 16 of central electrical box
① Red (rt) wire from K1/87a, fan wiring harness
② Black (sw) wire from K1/30 of fan wiring harness

Connecting fan motor



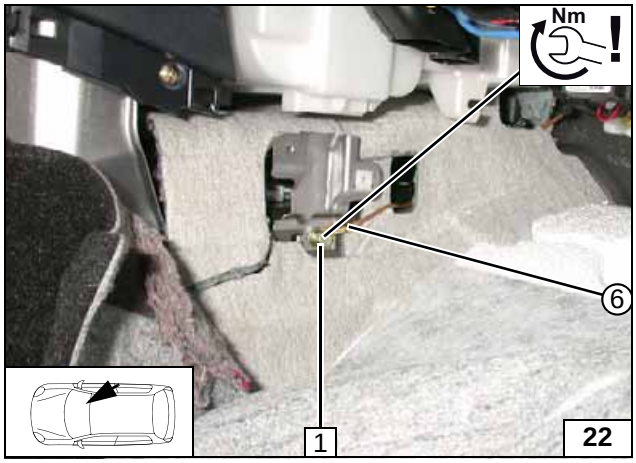
1 Red (rt) wire from connector C121/ pin 4 of fan controller
2 Red (rt) wire from connector C111/ pin 2 of A/C control panel
④ Red (rt) wire of PWM GW/IN
⑤ Black (sw) wire of PWM GW/OUT

Connecting PWM GW



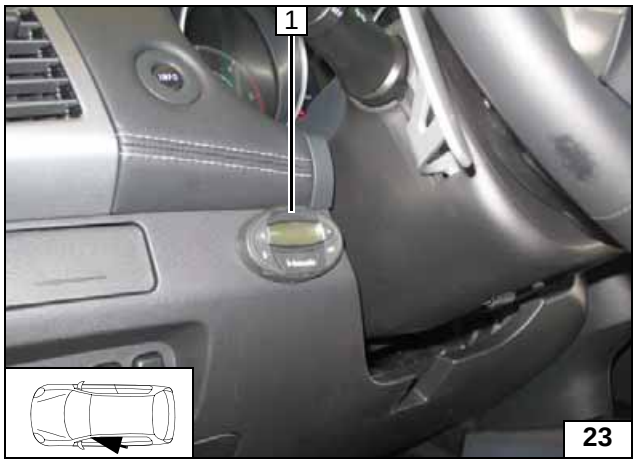
1 PWM GW
2 PWM GW socket

Installing PWM GW



1 Bolt of original vehicle earth point
⑥ Brown (br) wire of PWM GW/GND

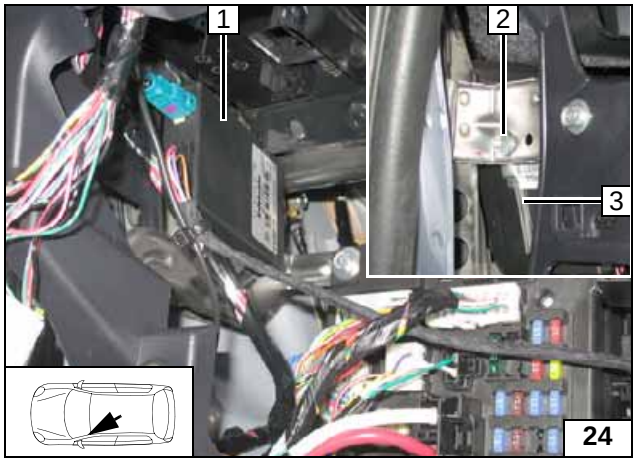
Connecting earth wire



Digital Timer

1 Digital timer

Mounting digital timer

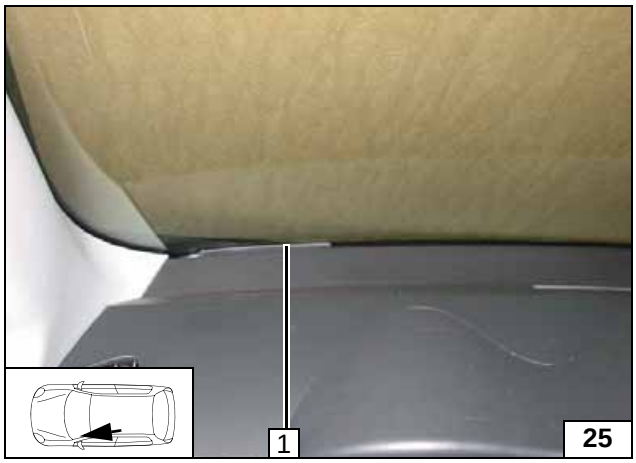


Remote Option (Telestart)

Drill out bracket **3** to 6.5 mm dia. at position **2**.

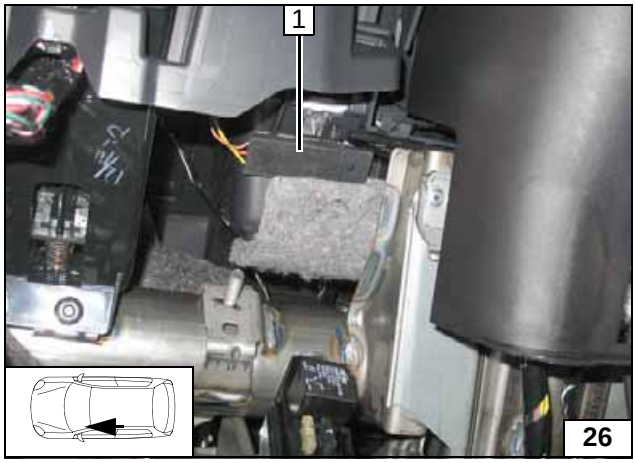
1 Receiver
2 Mount M6x16 bolt, bracket, flanged nut in existing hole

Mounting receiver



1 Antenna

Mounting antenna

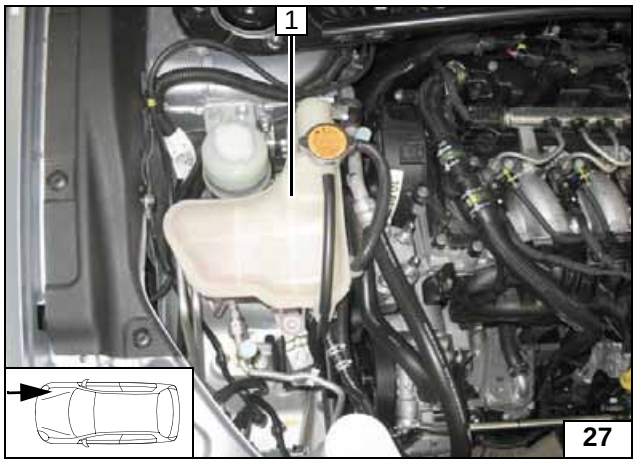


Temperature sensor only for T100 HTM

1 Fasten temperature sensor with suitable means

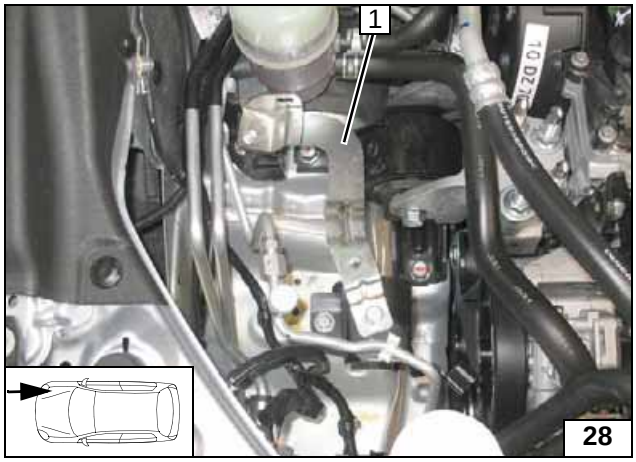
Mounting temperature sensor

Preparing Installation Location



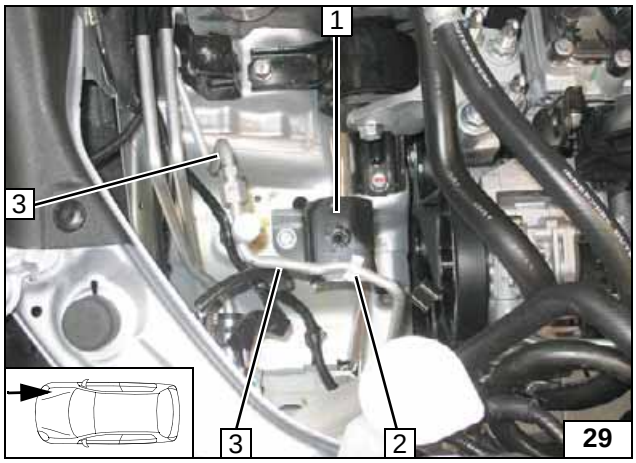
1 Expansion tank

Removing expansion tank



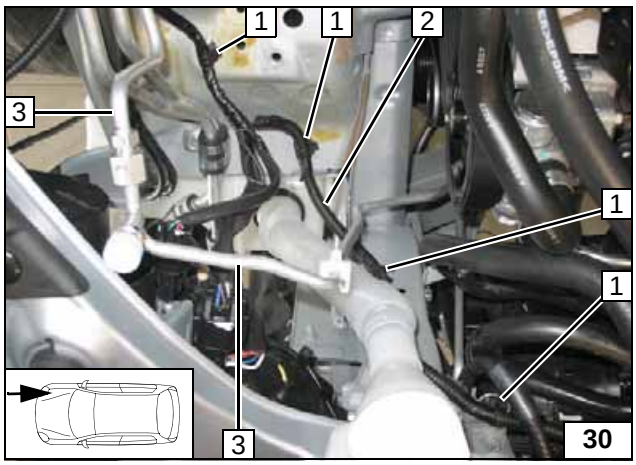
Remove bracket of expansion tank **1**, will be partially used again later.

Removing bracket of expansion tank



Remove retaining clip **2** of air-conditioning line **3**. Remove bracket **1** and discard. Original vehicle bolts [2x] will be reused. Align air-conditioning line **3** to the right according to the following figure!

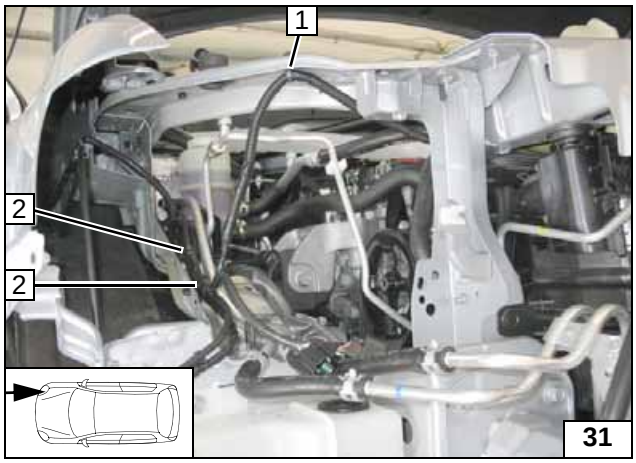
Removing bracket, aligning A/C line



Remove retaining clip **1** [4x] of original vehicle wiring harness **2**!

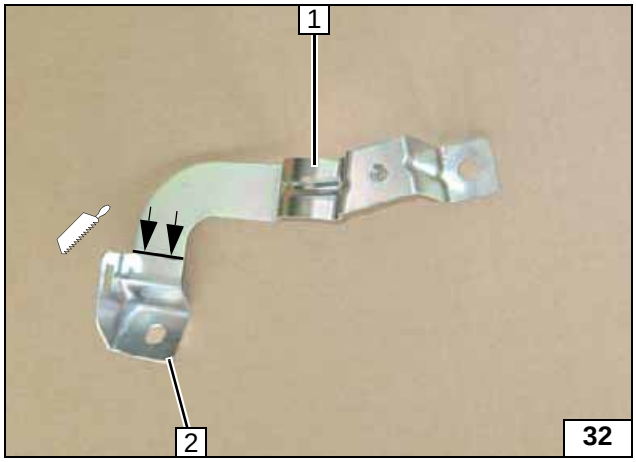
3 A/C line

Disconnecting wiring harness.



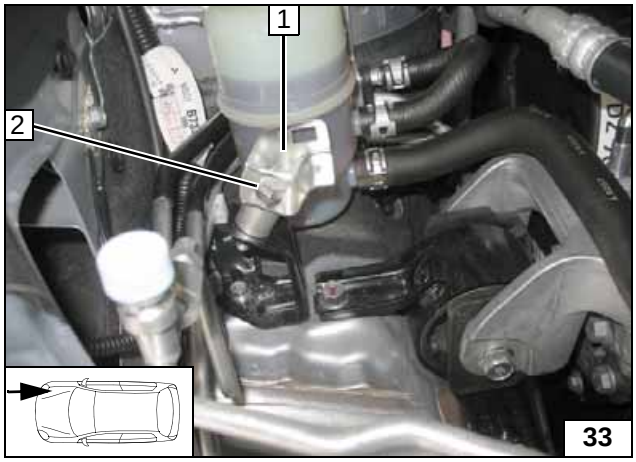
1 Clip-type cable tie, existing hole
2 Cable tie [2x]

Fastening wiring harness



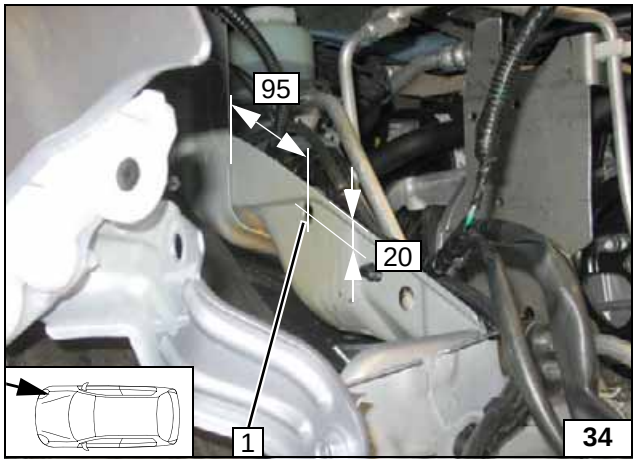
1 Discard section
2 Bracket of expansion tank

Cutting bracket of expansion tank



1 Bracket of expansion tank
2 M8x40 bolt, spring lockwasher, 20 mm shim on existing threaded hole

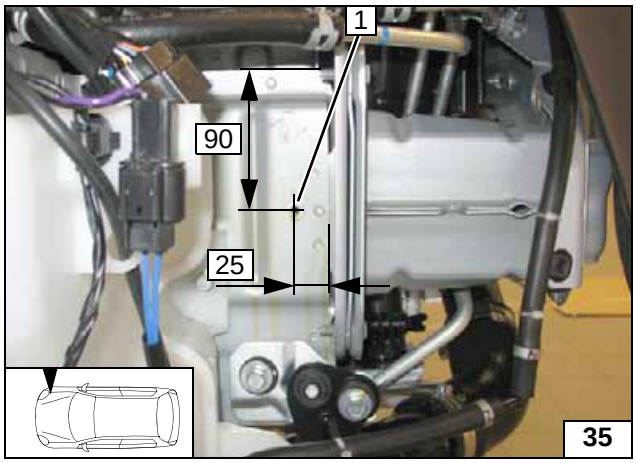
Installing bracket of expansion tank



When drilling, watch components located behind! Apply corrosion protection.

1 6.5 mm dia. hole

Hole for combustion air silencer

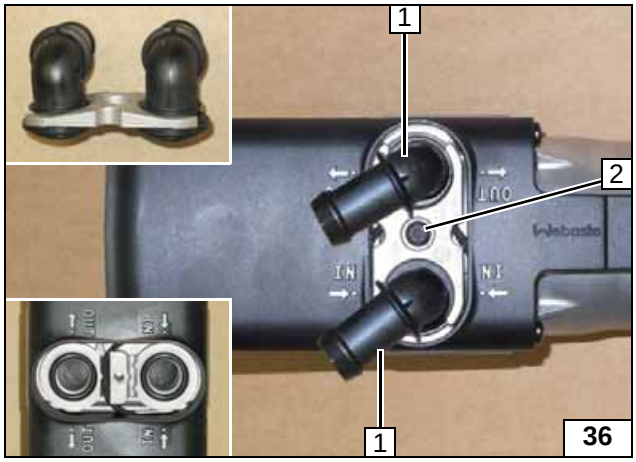


Apply corrosion protection.

1 9.1mm dia. hole; rivet nut

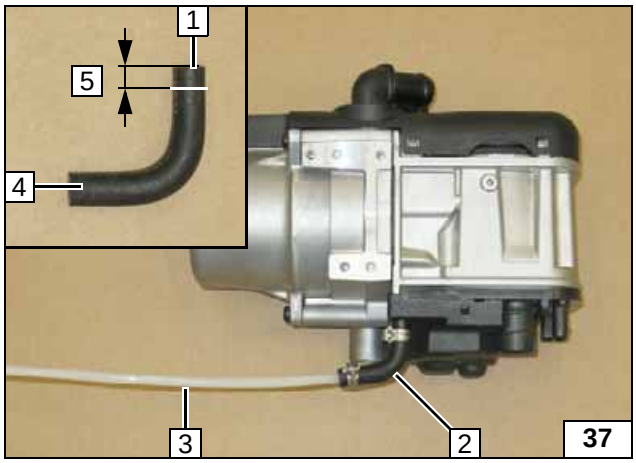
Rivet nut for exhaust silencer

Preparing Heater



1 Water connection piece, sealing ring [2x each]
2 5x15mm self-tapping bolt, retaining plate of water connection piece

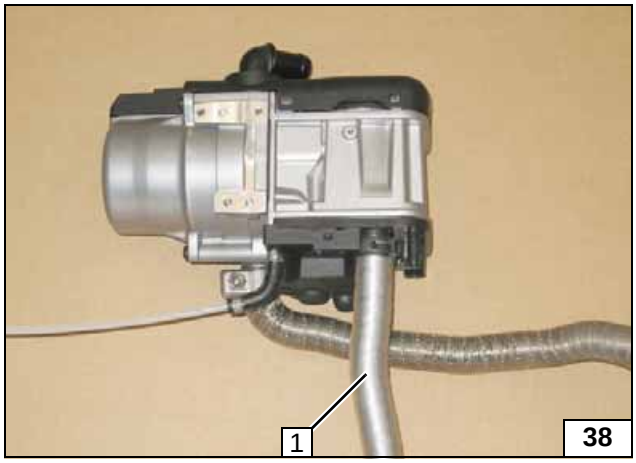
Mounting water connection pieces



Shortening 90° moulded hose **4**!

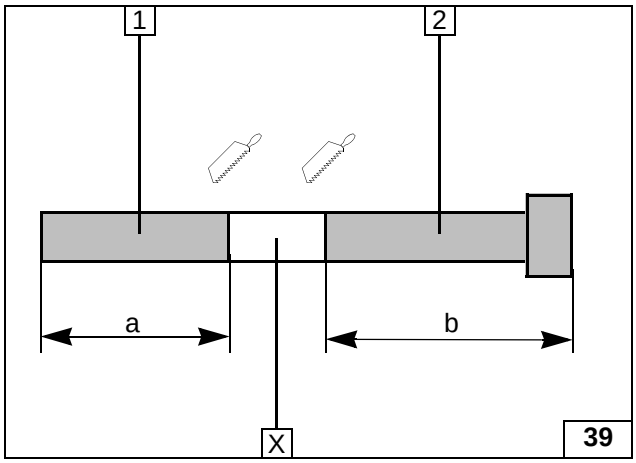
1 Discard section
2 90° moulded hose, 10 mm dia. clamp [2x]
3 Fuel line

Connecting fuel line



1 Combustion air pipe

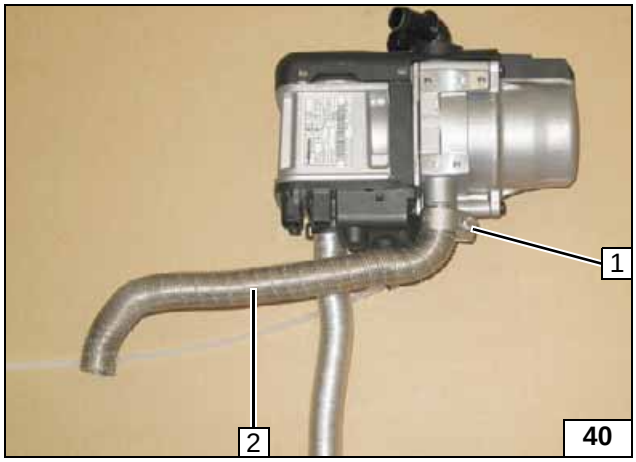
Preparing heater



Discard section **X**.

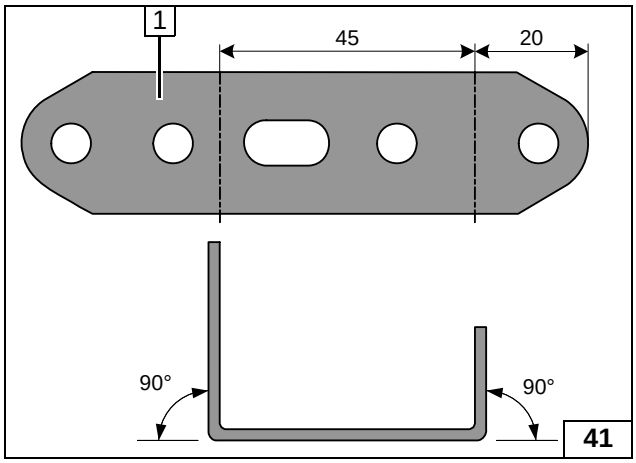
1 Exhaust pipe
a=390
2 Exhaust end section
b =470

Preparing exhaust pipe



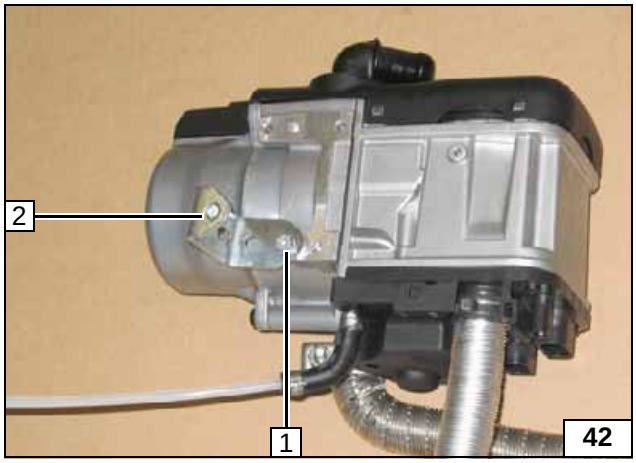
1 Hose clamp
2 Exhaust pipe

Mounting exhaust pipe



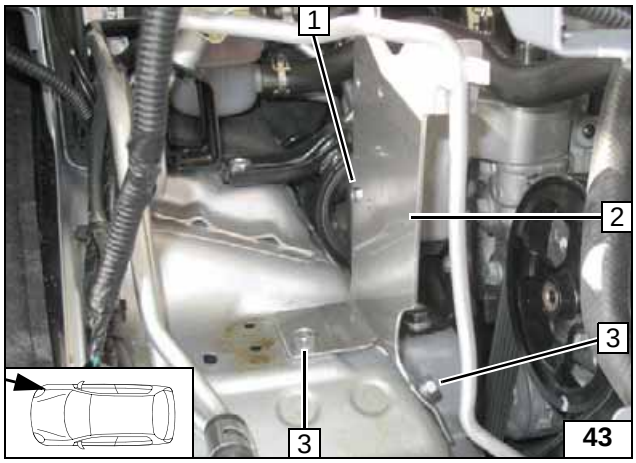
Angle down perforated bracket **1** 2x.

Preparing perforated bracket



1 5x13 self-tapping bolt
2 Install perforated bracket loosely

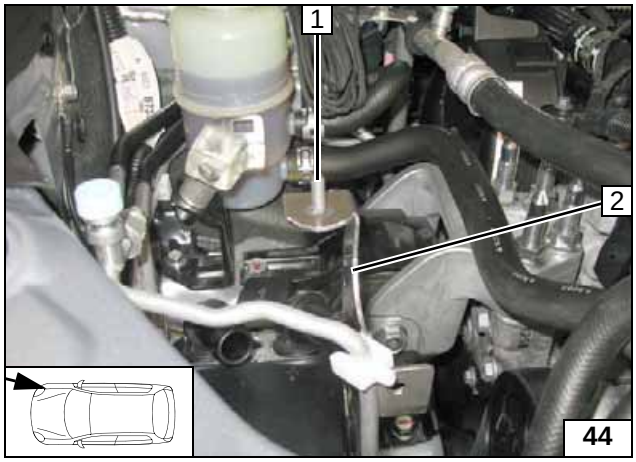
Installing perforated bracket loosely



Installing Bracket of Heater

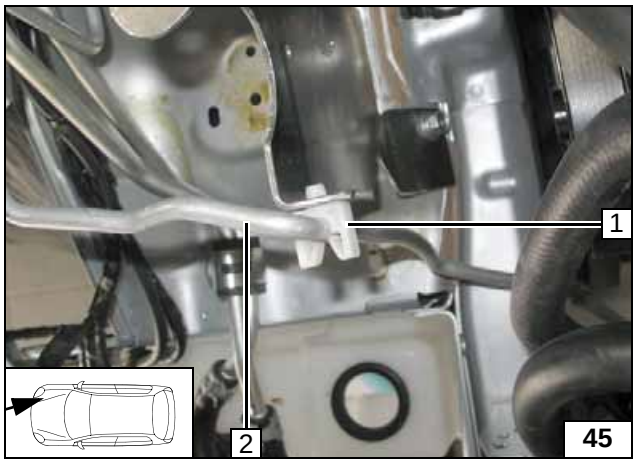
1 Mount M6x20 bolt, pin lock, existing hole in bracket
2 Bracket of heater
3 M8 original vehicle bolt, existing threaded hole [2x]

Mounting bracket



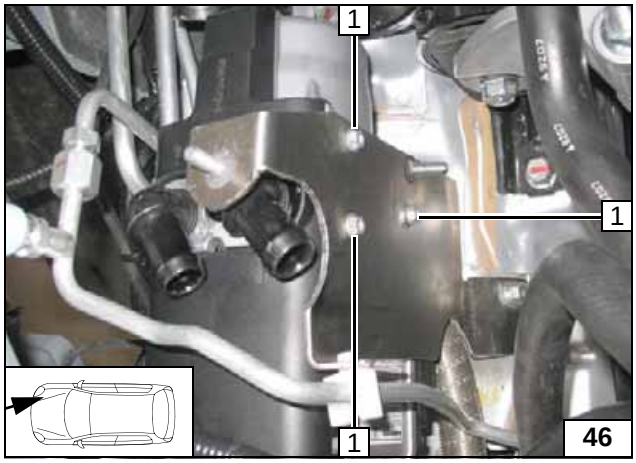
1 M6x20 bolt, pin lock
2 Bracket of heater

Inserting bolt



Install retaining clip **1** of A/C line **2** in the hole of the heater bracket!

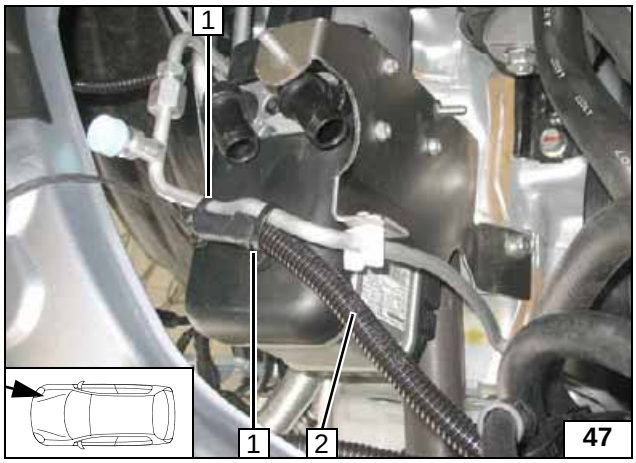
Fastening A/C line



Installing Heater

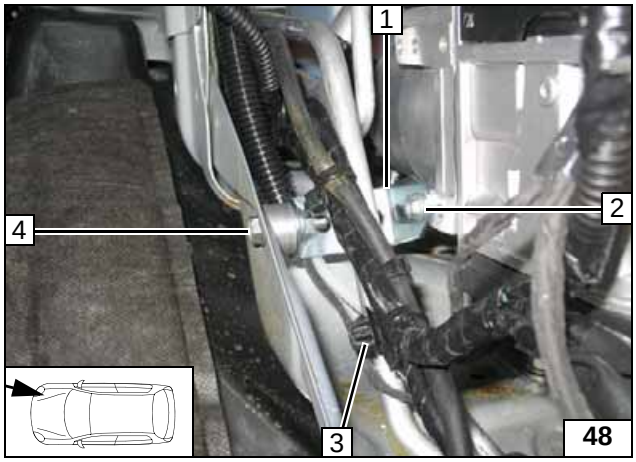
1 5x13 self-tapping bolt [3x]

Mounting heater



1 Cable tie [2x]
2 Wiring harness of heater in corrugated tube

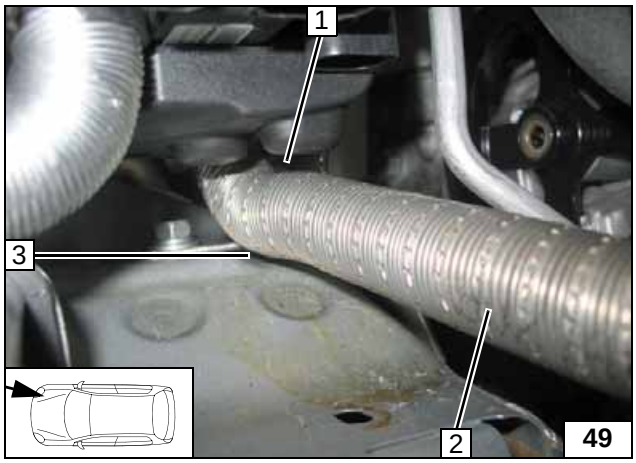
Fastening wiring harness of heater



Remove the retaining clip **3** of the original vehicle wiring harness. Insert 10mm shim between perforated bracket **1** and body. Align perforated bracket **1** and tighten 5x13 bolt **2**.

4 M6x25 bolt, 10 mm shim, flanged nut

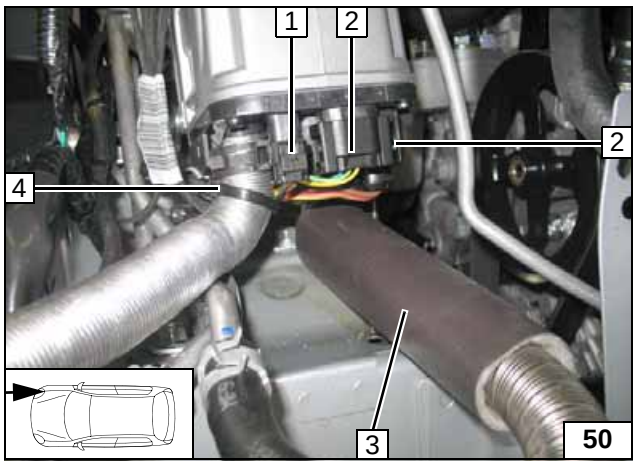
Mounting heater



Ensure adequate distance from the neighbouring components, especially from the heater control unit at position **1** and from the vehicle body at position **3**, correct if necessary!

2 Exhaust pipe

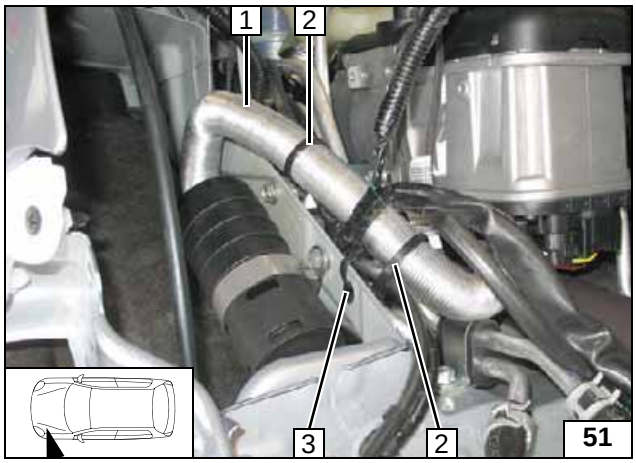
Aligning exhaust pipe



Push exhaust insulation **3** onto the exhaust pipe. Fasten wiring harness of heater **4** on combustion air pipe using a cable tie.

1 Wiring harness connector of circulating pump
2 Wiring harness connector of heater [2x]

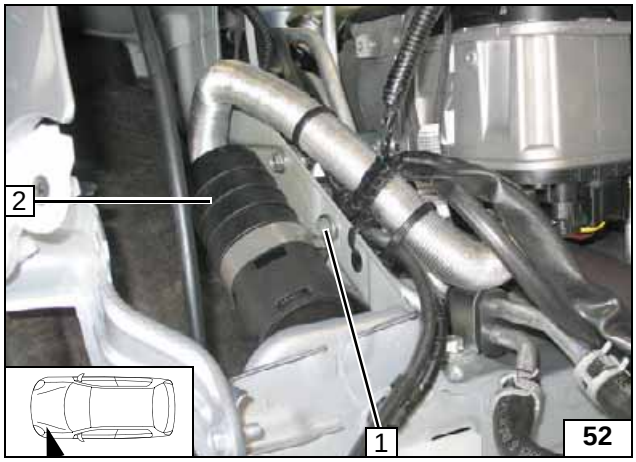
Mounting the wiring harnesses



Combustion Air

Fasten original vehicle wiring harness **3** on existing hole using a cable tie. Fasten combustion air pipe **1** with cable tie **2** [2x] to original vehicle wiring harness.

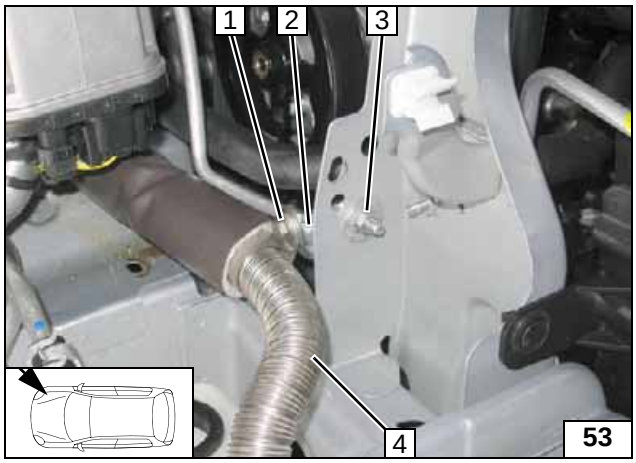
Fastening combustion air pipe



Remove rubber-coating of 48mm dia. clamp.

1 M6x20 bolt, 48mm dia. clamp, flanged nut
2 Silencer

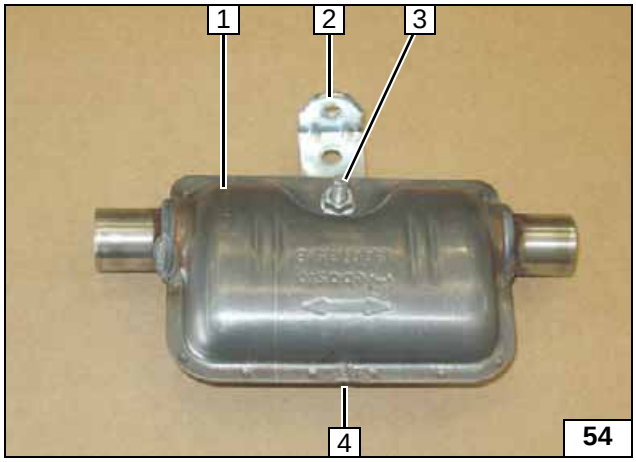
Mounting silencer



Exhaust Gas

1 M6x20 bolt, p-clamp, flanged nut
2 Angle bracket
3 M6x20 bolt, large diameter washer [2x], flanged nut
4 Exhaust pipe

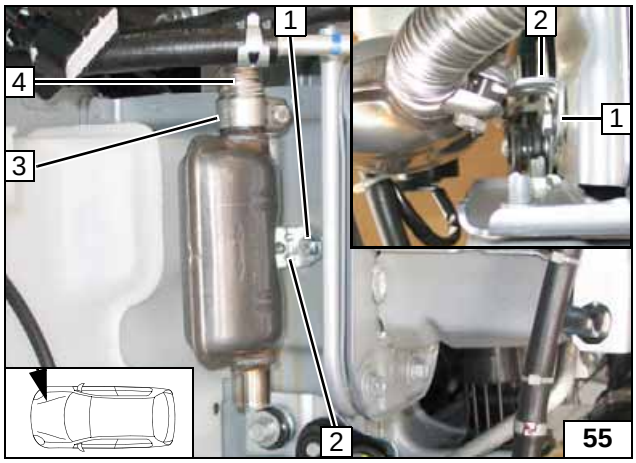
Fastening exhaust pipe



Pinch closed drain hole at position **4**.

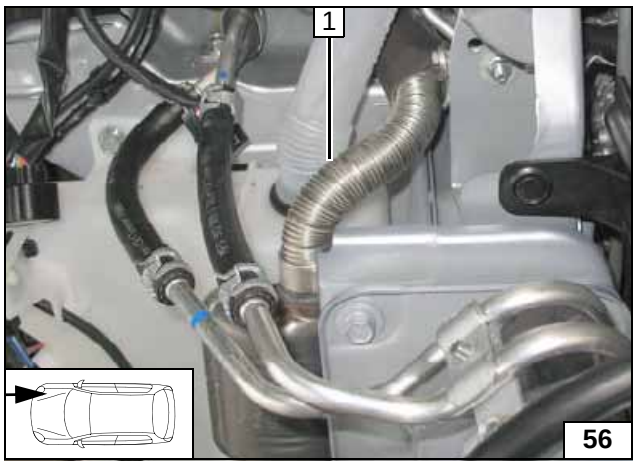
1 Exhaust silencer
2 Angle bracket
3 M6x20 bolt, spring lockwasher, flanged nut

Premounting silencer



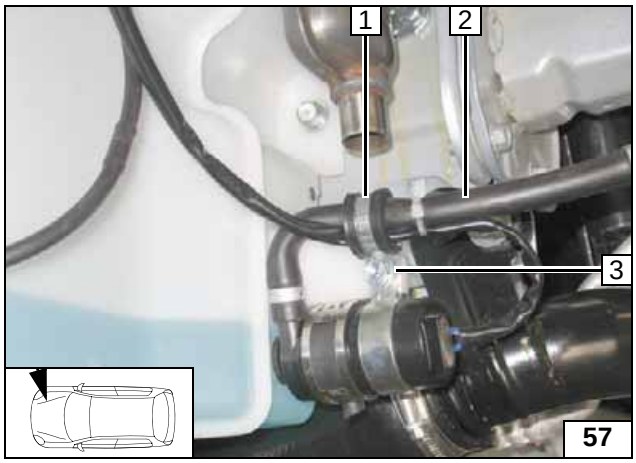
1 M6x20 bolt, spring lockwasher
2 Angle bracket
3 Hose clamp
4 Exhaust pipe

Mounting silencer



Ensure adequate distance from neighbouring components, especially from connection pieces of washing system tank at position **1**, correct if necessary!

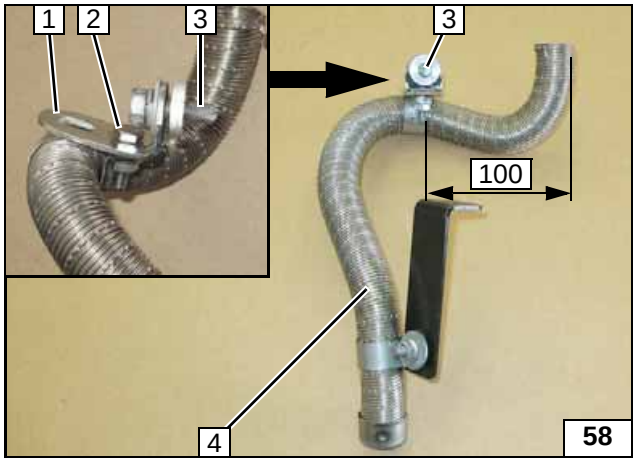
Aligning exhaust pipe



Only for headlight washer system

1 18 mm dia. rubber-coated p-clamp
2 Original vehicle hose, wiring harness
3 Original vehicle bolt

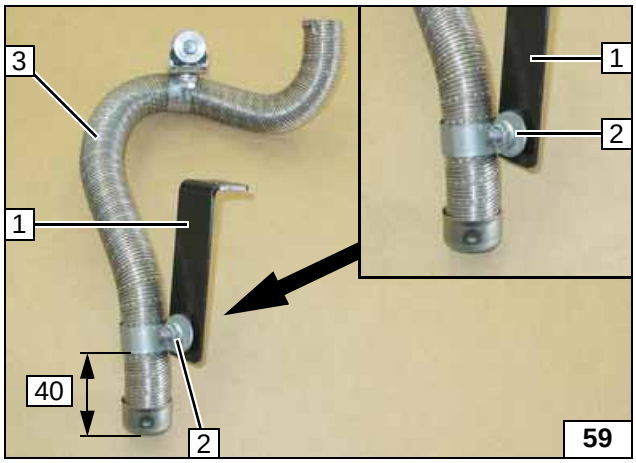
Fastening hose



All vehicles

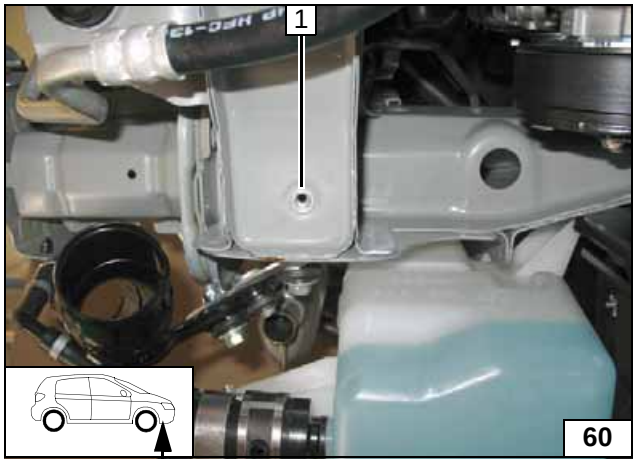
1 Install angle bracket loosely
2 M6x20 bolt, p-clamp, flanged nut
3 Original vehicle bolt with spring lock-washer and washer, 5mm shim
4 Shape exhaust end section

Premount-ing exhaust end section



1 Loosely mount bracket of exhaust end section.
2 M6x20 bolt, p-clamp, flanged nut
3 Shape exhaust end section

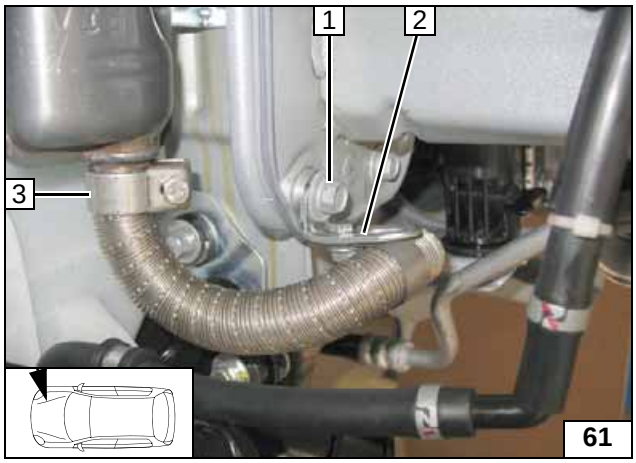
Premount-ing exhaust end section



Charge-air tube for the installation of exhaust end-section removed only for demonstration purposes!
Drill out existing hole to 9.1mm dia.!

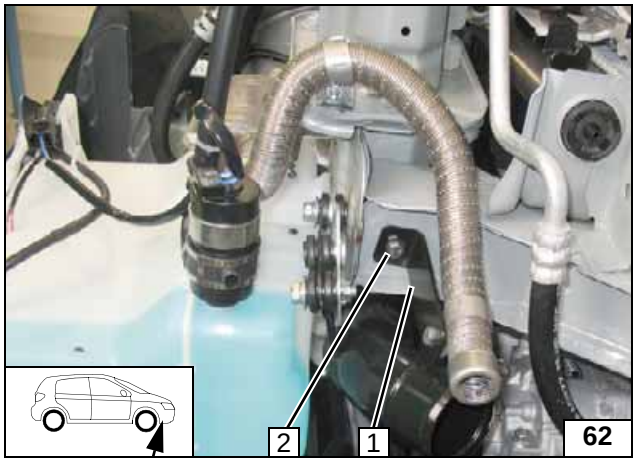
1 Rivet nut

Installing rivet nut



1 Original vehicle bolt
2 Angle bracket
3 Hose clamp

Installing exhaust end section

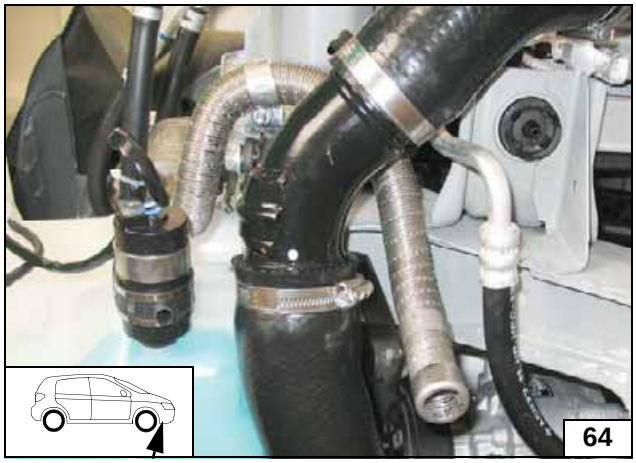


1 Bracket of exhaust end section
2 M6x20 bolt, spring lockwasher

Installing exhaust end section

Ensure sufficient distance from adjacent components; correct if necessary.

Aligning exhaust end section.



Ensure sufficient distance from adjacent components, especially from charge-air tube; correct if necessary.
Tighten all loose bolt connections!

Aligning exhaust end section.

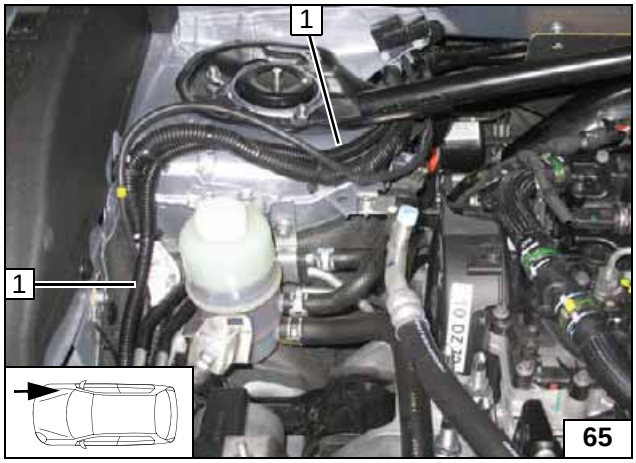
Fuel

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.

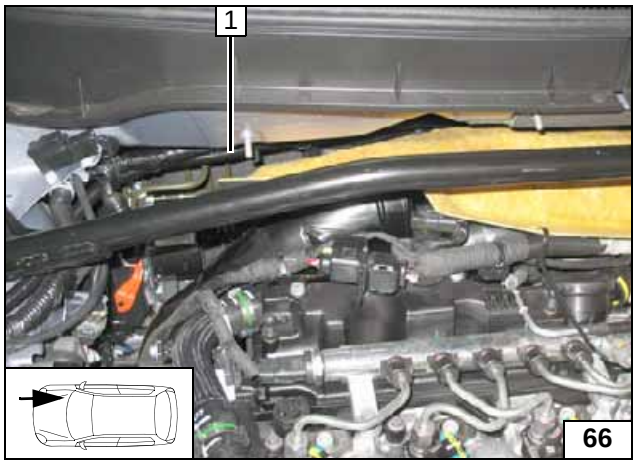
Install fuel line and metering pump wiring harness so that they are protected against stone impact. Unless specified otherwise, always fasten using cable ties.
Provide rub protection for fuel line and wiring harness in areas where there are sharp edges.

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



Route fuel line and wiring harness of metering pump in corrugated tube **1** to the firewall.

Routing lines



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

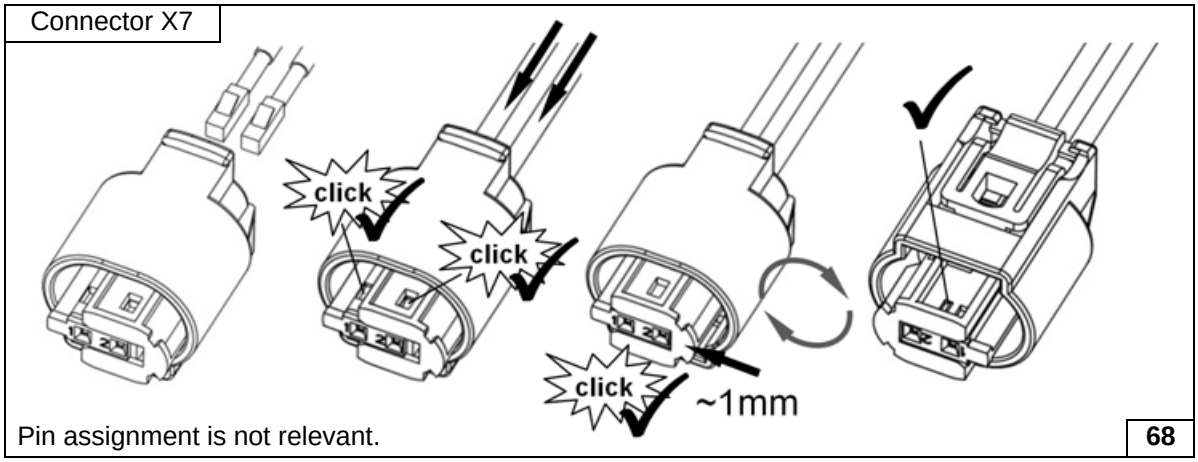
Routing lines

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

Routing lines

Completing connector of metering pump

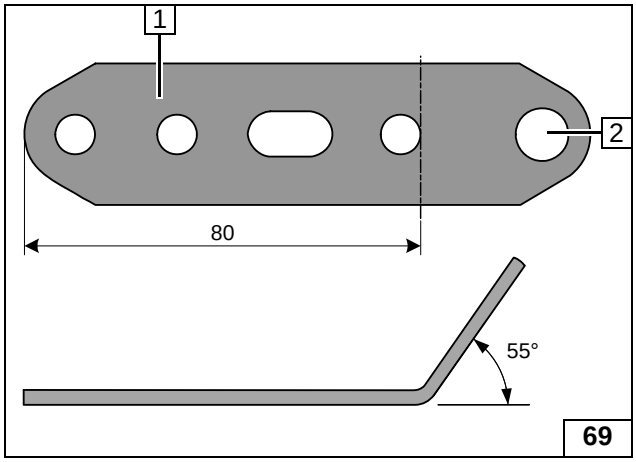
Connector X7



Pin assignment is not relevant.

68

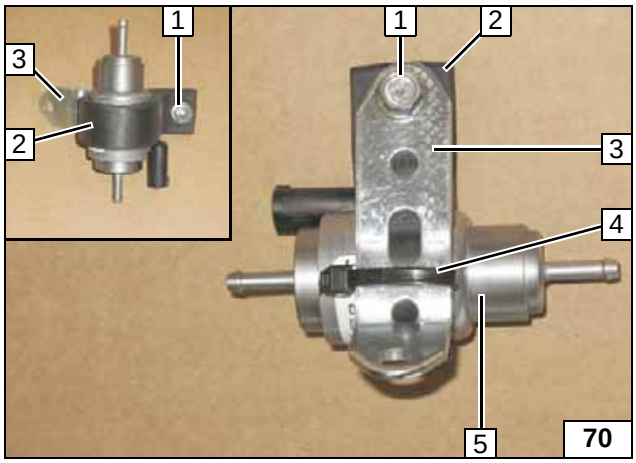
Preparing perforated bracket



69

Angle down perforated bracket **1** and drill out to 8.5 mm dia. at position **2**.

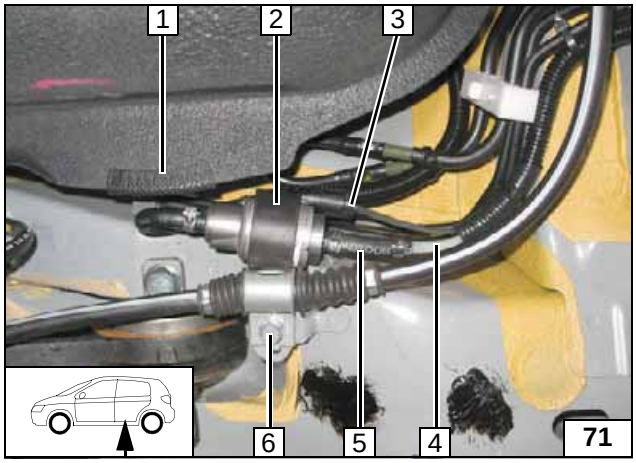
Premounting metering pump



70

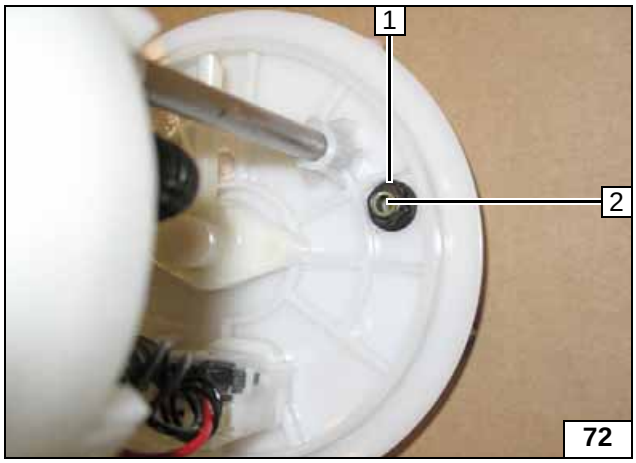
1 M6x25 bolt, flanged nut
2 Mounting of metering pump
3 Perforated bracket
4 Cable tie
5 Metering pump

Mounting metering pump



71

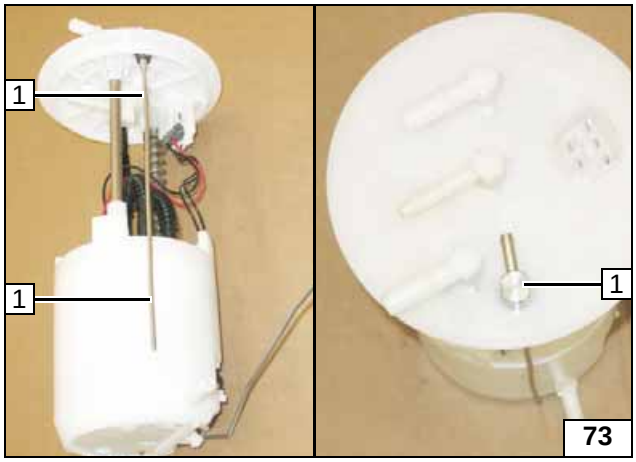
1 Install 50mm edge protection
2 Mounting of metering pump
3 Wiring harness of metering pump, connector mounted
4 Fuel line of heater
5 Hose section, 10 mm dia. hose clamps [2x]
6 Original vehicle M8 bolt



Remove fuel-tank sending unit in accordance with manufacturer's instructions.
Ensure correct seating of flanged nut of fuel standpipe **1** between ribs while drilling.

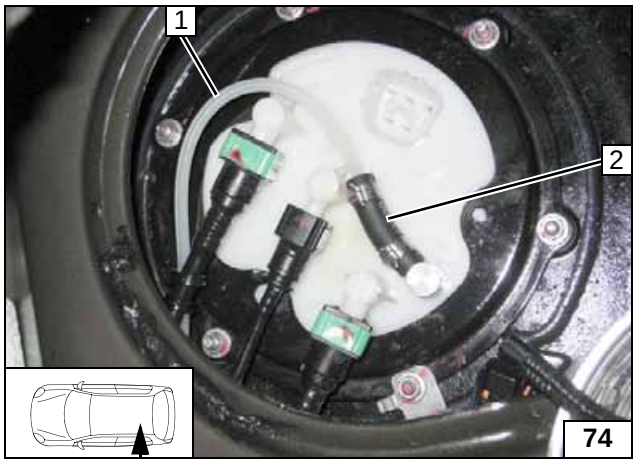
2 Copy hole pattern, 6 mm dia. hole

Fuel extraction



Bend fuel standpipe **1** according to template and cut to length.

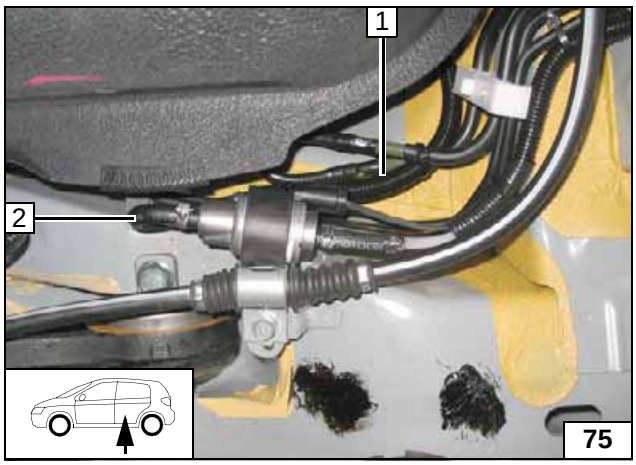
Installing fuel standpipe



Install fuel-tank sending unit in accordance with manufacturer's instructions. Push corrugated tube onto fuel line pipe **1**!

2 Hose section, 10 mm dia. hose clamps [2x]

Connecting fuel line



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

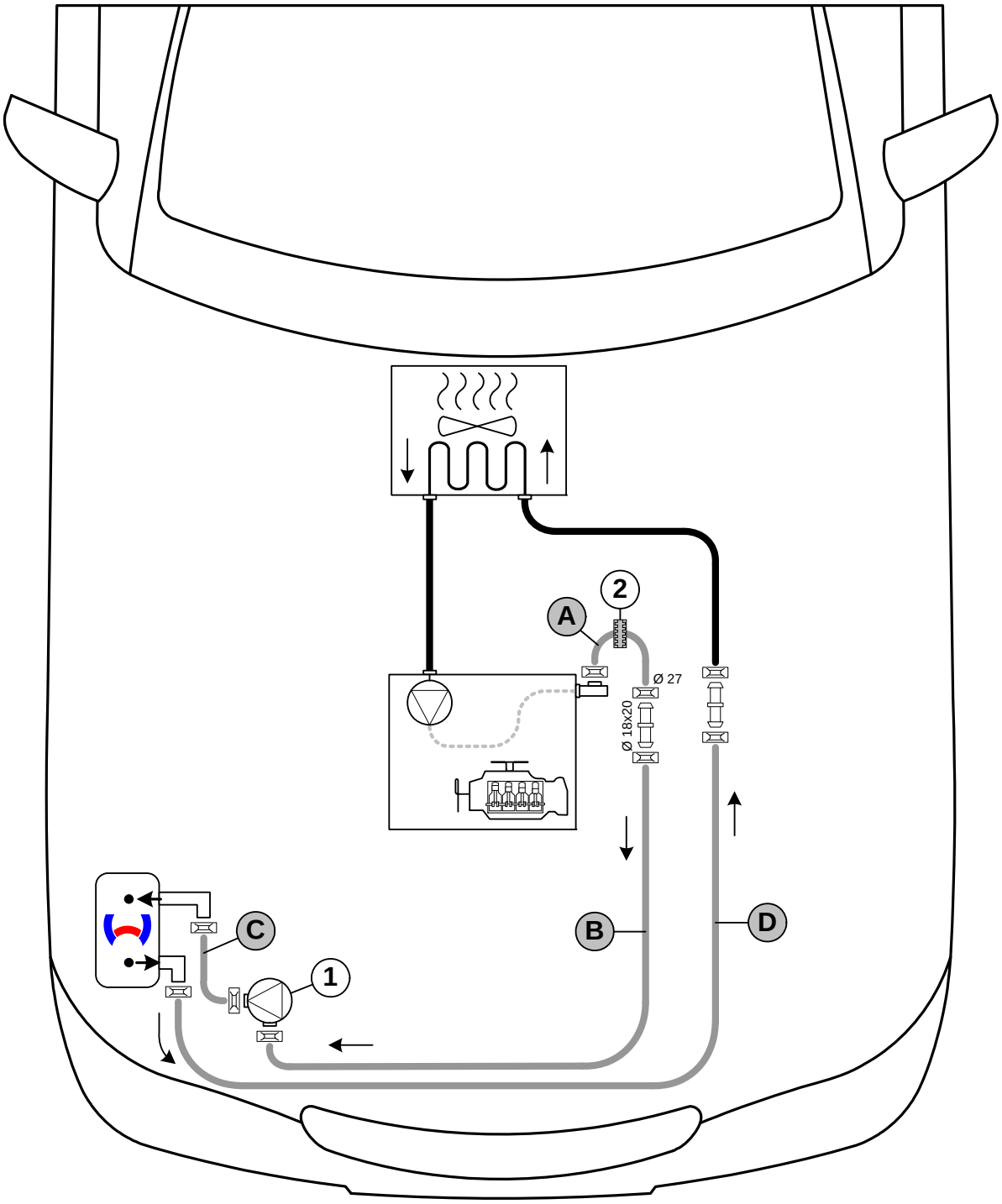
1 Fuel line of fuel standpipe in corrugated tube
2 180° moulded hose, 10 mm dia. clamp [2x]

Connecting metering pump

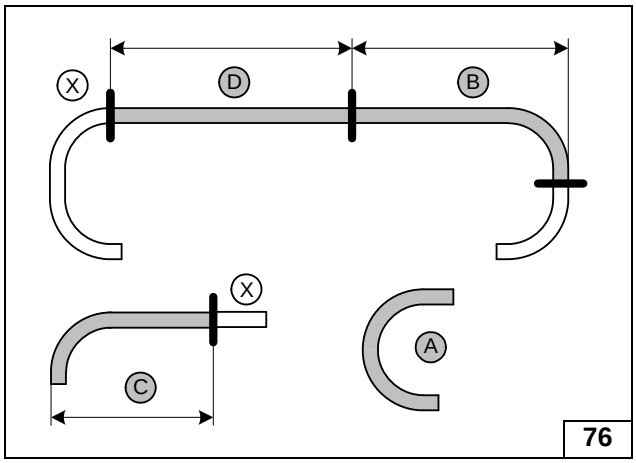
Coolant Circuit

WARNING!
Any coolant running off should be collected using an appropriate container. Route hoses so that they are 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



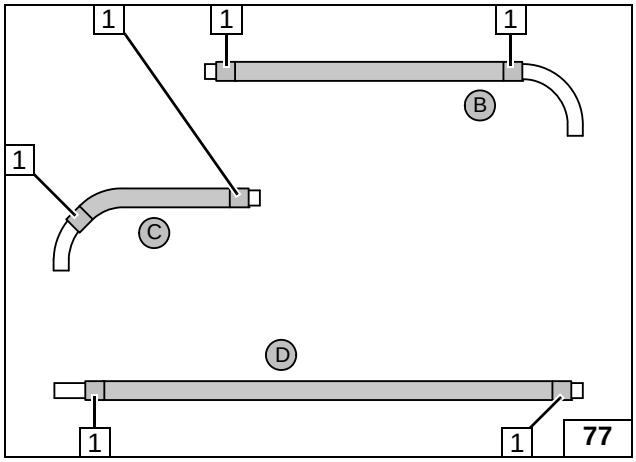
All connecting pipes without a specific designation = dia. 18x18. **1** = Circulating pump!
All spring clips without a specific designation = 25 mm dia. **2** = Black (sw) rubber isolator .



Hose **A** =180°, 18x20 dia. moulded hose
Hose **C** = 90°, 18mm dia. moulded hose
Hose **B**, **D** = 18mm dia. moulded hose
Discard section **X**.

B = 880
C = 235
D = 1135

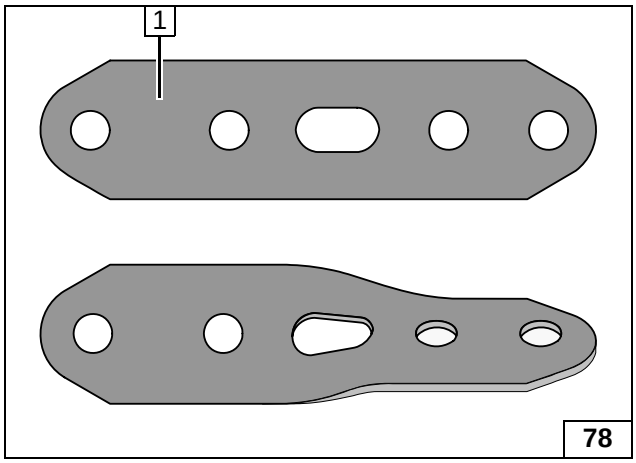
Cutting hoses to length



Push braided protection hoses onto hoses **B**, **C**, **D** and cut to length.
Cut heat shrink plastic tubing to size.

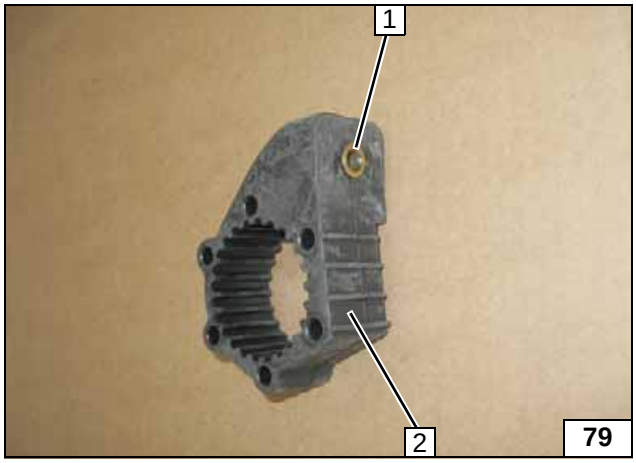
1 25 mm heat shrink plastic tubing [6x]

Preparing hoses



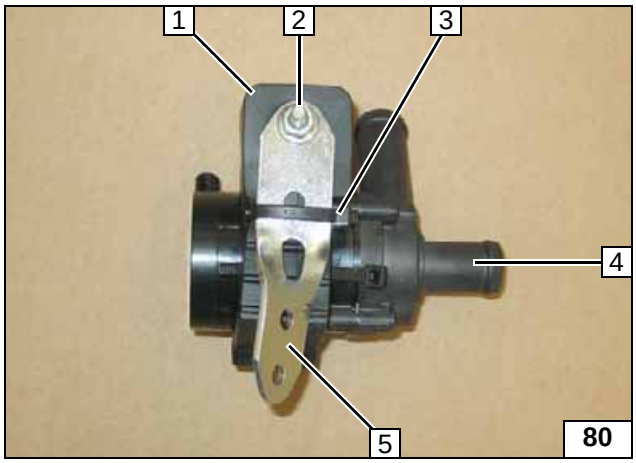
Twist perforated bracket **1** by 45° on the longitudinal axis!

Preparing perforated bracket



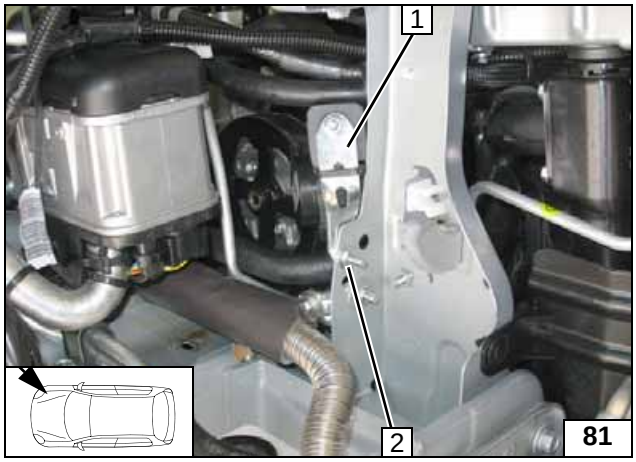
1 Install support sleeve
2 Bracket of circulating pump

Preparing bracket of circulating pump



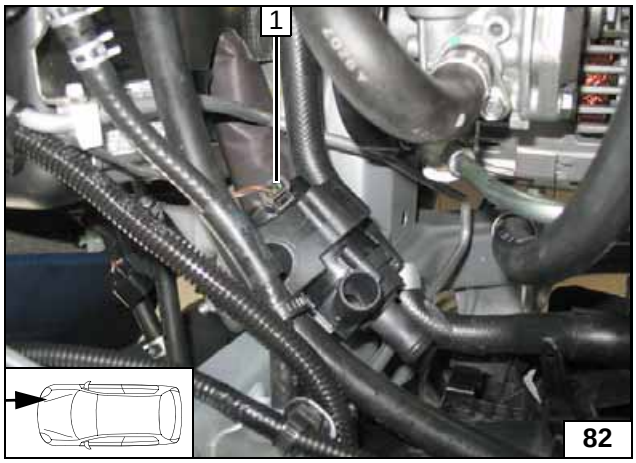
1 Bracket of circulating pump
2 M6x25 bolt, flanged nut
3 Cable tie
4 Circulating pump
5 Perforated bracket

Premounting circulating pump



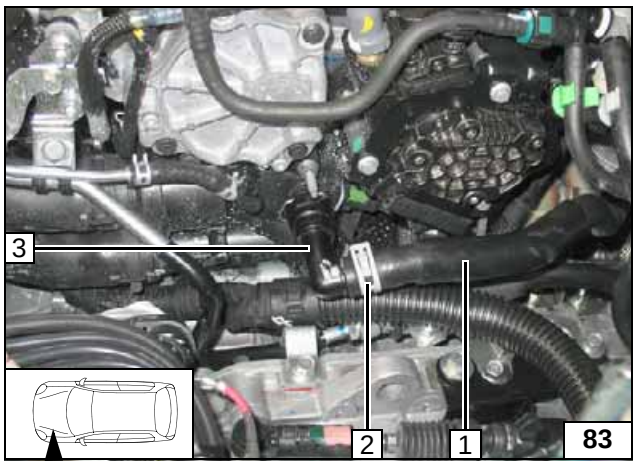
1 Perforated bracket
2 M6x20 bolt, flanged nut

Mounting circulating pump



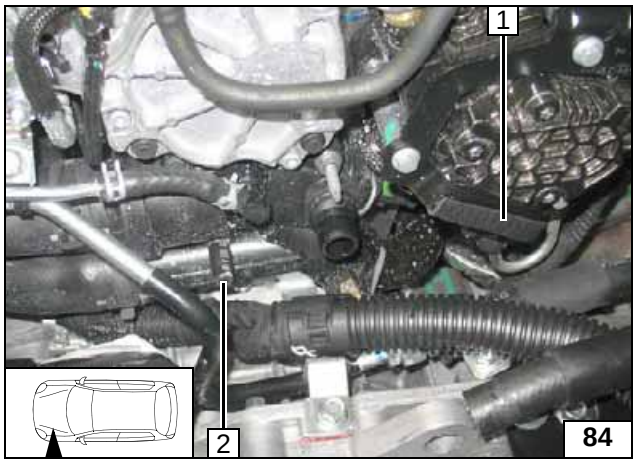
Mount connector of circulating pump **1**, install on heater and connect!

Mounting circulating pump



Pull original vehicle hose **1** off engine outlet/heat exchanger inlet on coupling of engine outlet **3**. Spring clip **2** will be reused. Pull off coupling of engine outlet **3**.

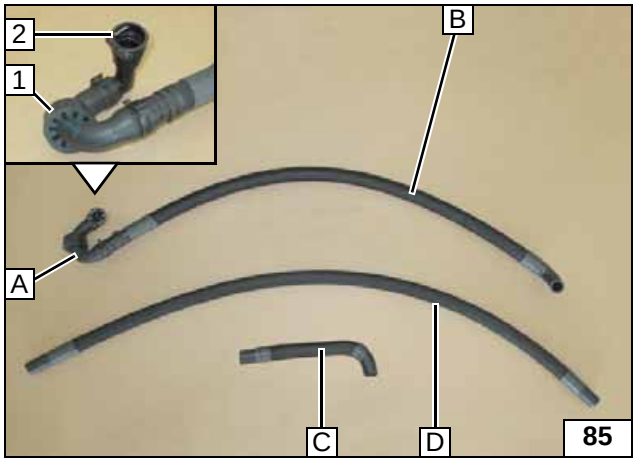
Cutting point



Cut hose section in the middle and mount on original vehicle bolt **2**.

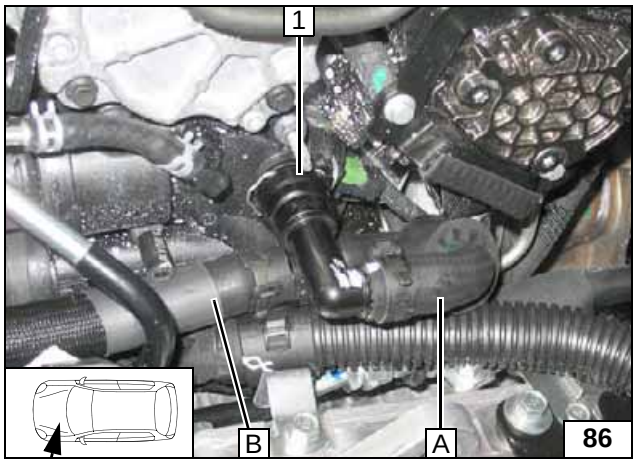
1 Mount 50mm edge protection

Installing rub protection



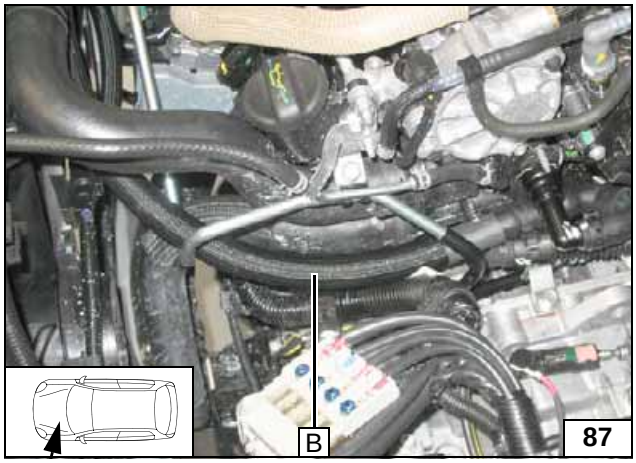
Push black (sw) rubber isolator **1** on to hose **A**. Connect coupling of engine outlet **2** to hose **A**. Connect hoses **A** and **B**.

Preparing hoses

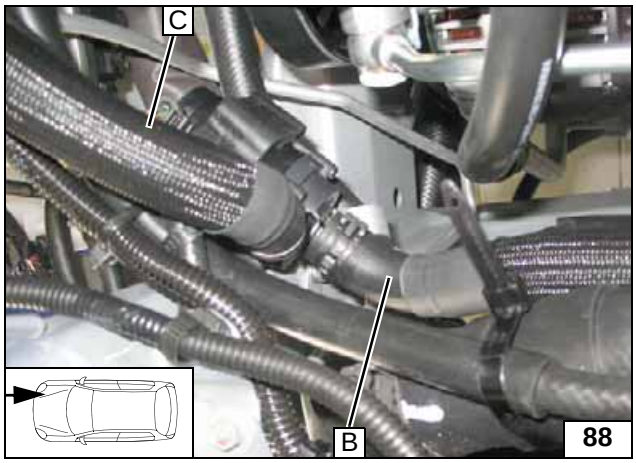


1 Coupling mounted on engine outlet

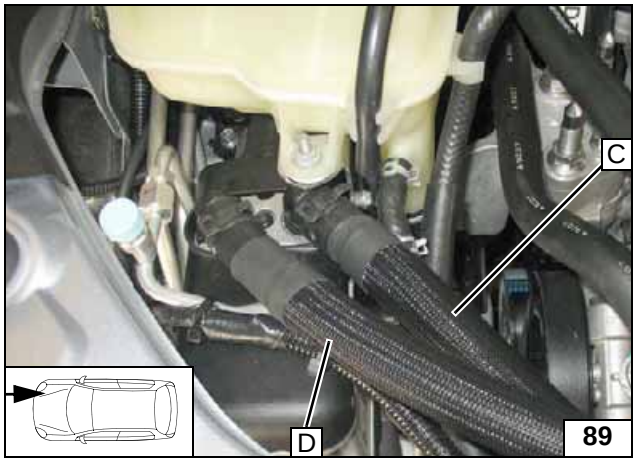
Connecting engine outlet



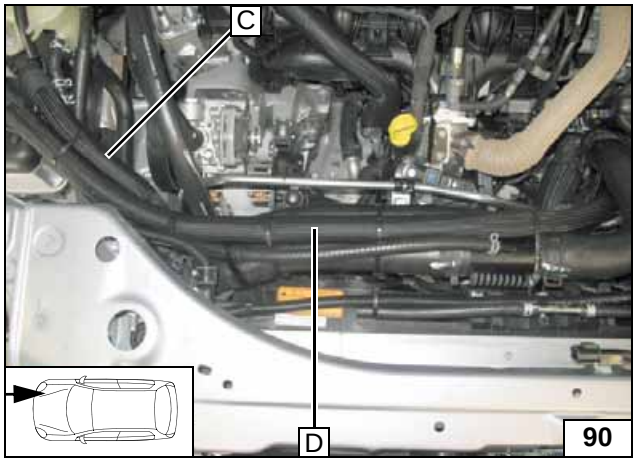
Routing in engine compartment



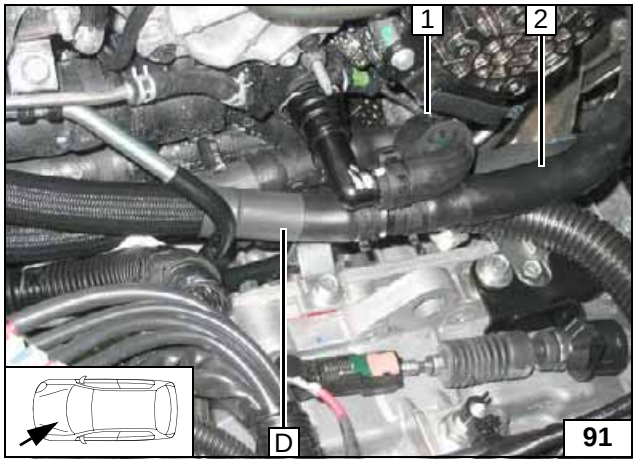
Connecting circulating pump



Connecting heater



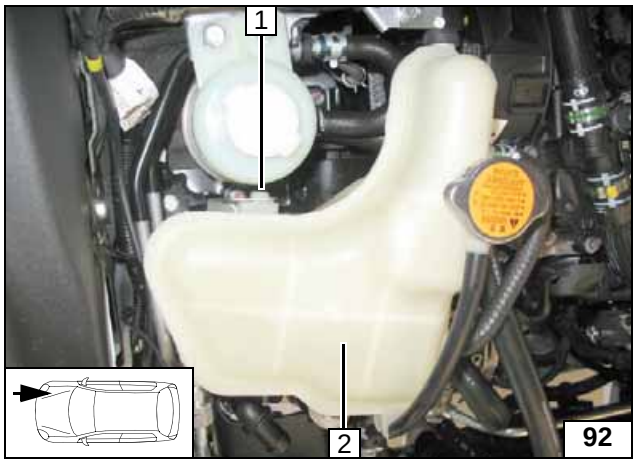
Routing in engine compartment



Align hoses. Ensure sufficient distance from adjacent components; correct if necessary.

1 Align black (sw) rubber isolator
2 Hose on heat exchanger inlet

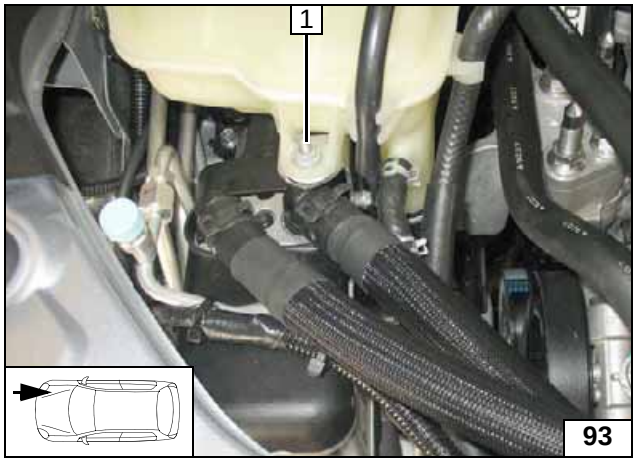
Connecting heat exchanger inlet



Final Work

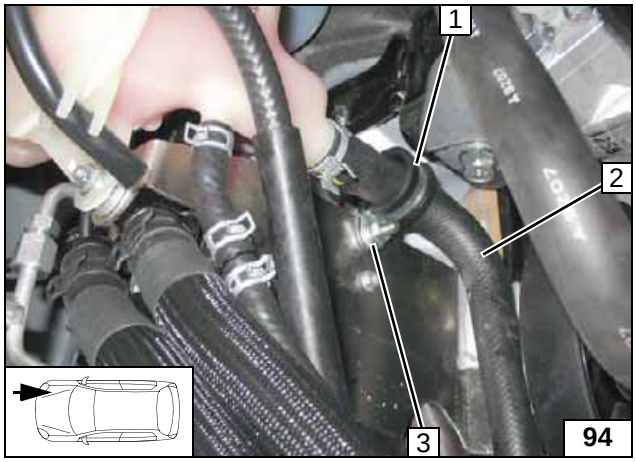
Install tab of expansion tank **2** in the existing cutout **1**!

Installing expansion tank



1 Flanged nut, pre-assembled bolt

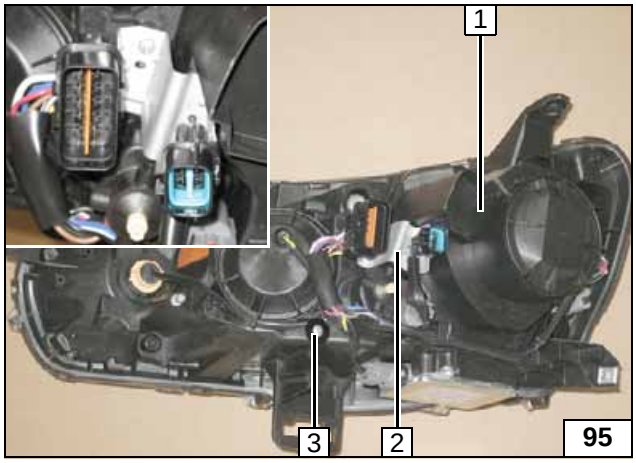
Installing expansion tank



Ensure sufficient distance from adjacent components; correct if necessary.

1 25 mm dia. rubber-coated p-clamp
2 Original vehicle hose, expansion tank
3 Flanged nut, pre-assembled bolt

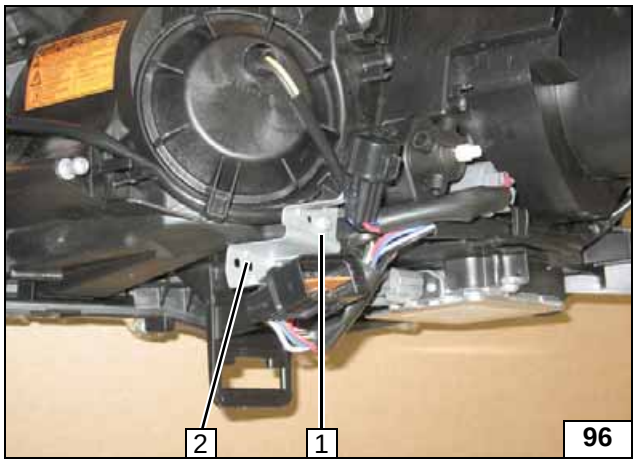
Fastening hose



Remove bracket of connector **2** of headlight **1** on the right side (two bolts)!

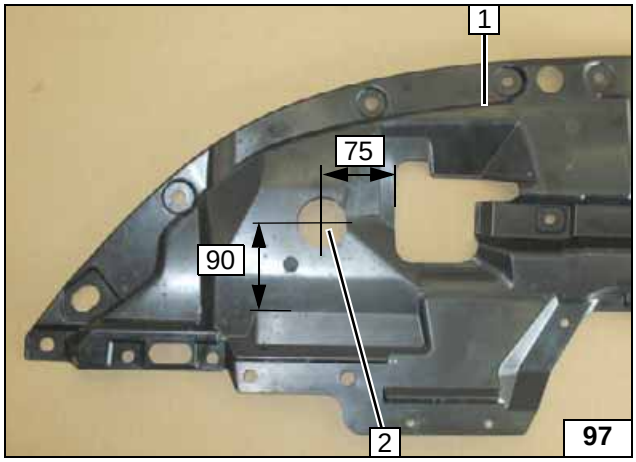
3 Remove original vehicle bolt

Repositioning connector bracket



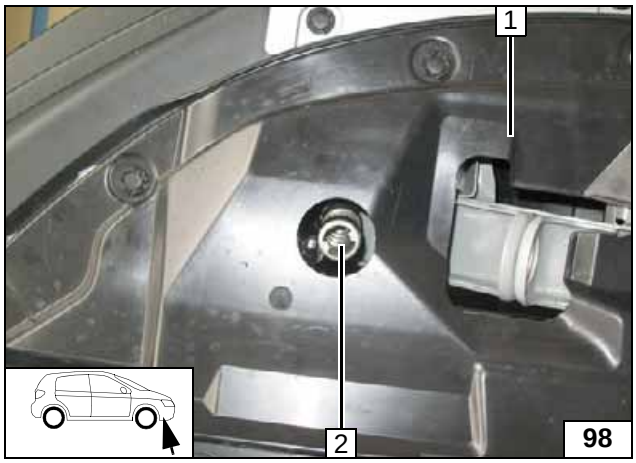
1 Original vehicle bolt
2 Bracket of connector

Repositioning connector bracket



1 Underride protection
2 55mm dia. hole

Cutting out underride protection



Align exhaust end section **2** with the middle of the hole and flush with underride protection **1**! Ensure sufficient distance from adjacent components; correct if necessary.

Aligning exhaust end section

Final Work

WARNING!
Mount removed parts 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.**
- **Adjust the digital timer, teach telestart transmitter**
- **Make settings on A/C control panel according to the "Operating Instructions for End Customer".**
- **Place the "Switch off parking heater before refuelling" caution label near the filler neck.**
- **For initial start up and function check, see Installation Instructions**

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

Template for Fuel Standpipe

100mm

Scale 1:1

Compare the size of the printed version 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 Automatic Air-Conditioning

Please remove page in case of automatic air-conditioning and add it to the vehicle operating instructions.

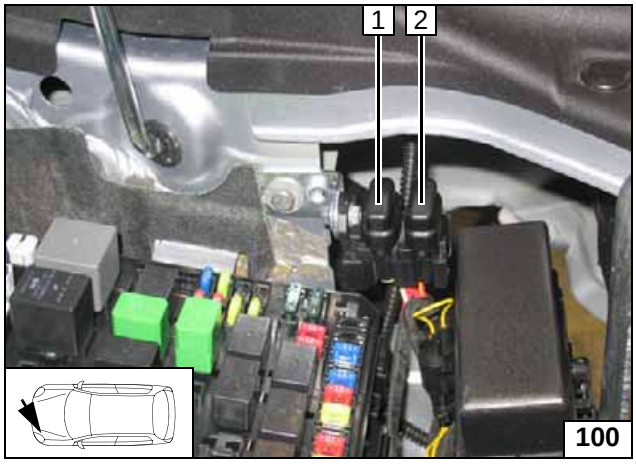
Note:
We recommend matching the heating time to the driving time.
Heating time = driving time
Example:
For a driving time of approx. 20 min. (in one direction), we recommend not exceeding a switch-on time of 20 min.

If vehicles have passenger compartment monitoring this must be deactivated in addition to the vehicle settings for the heating operation.
For information on deactivation, please see the vehicle owner's manual.

Before parking the vehicle, make the following settings:

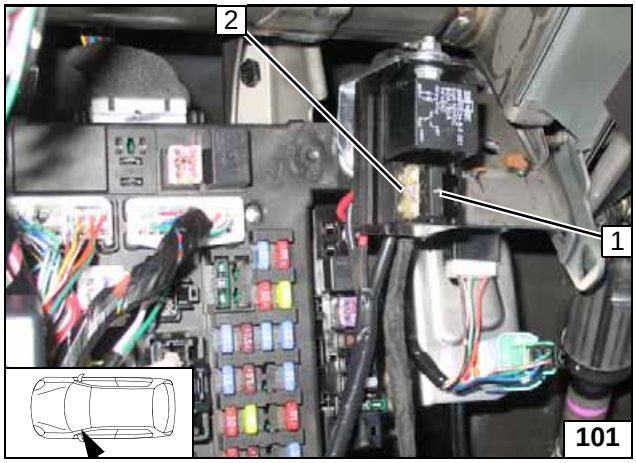
1 Air outlet to windscreen
2 Set temperature to "max."

A/C control panel



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

Engine compartment fuses



1 1A fuse F3 of heater control
2 25A fan fuse F4

Passenger compartment fuses