Water Heater

Thermo Top Evo Parking Heater

E1
00 0258

With FuelFix

Installation Documentation
Mazda 2

Validity

Manufacturer	Model	Type	EG BE No. / ABE
Mazda	2	DJ1	e1 * 2007 / 46 * 1335 * 01

Motorisation	Fuel	Transmission type	Output in kW	Displacement in cm³	Engine code
1.5 P	Petrol	5-speed SG	66	1496	P5
1.5 P	Petrol	6-speed SG	85	1496	P5

SG = manual transmission

From model year 2015
Left-hand drive vehicle

Verified equipment variants: Automatic air-conditioning
Halogen front fog lights
LED daytime running lights
Start button
Automatic Start-Stop system
Euro 6

Not verified: Manual air-conditioning
LED main headlights

Exclusion: Automatic transmission

Total installation time: approx. 8 hours

Mazda 2

Table of Contents

Necessary Components

- Basic delivery scope of Thermo Top Evo according to price list
- Installation kit with FuelFix for Mazda 2 2015 Petrol: **1324286A**
- 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
- Due to the assembly situation, we advise not to install a MultiControl CAR

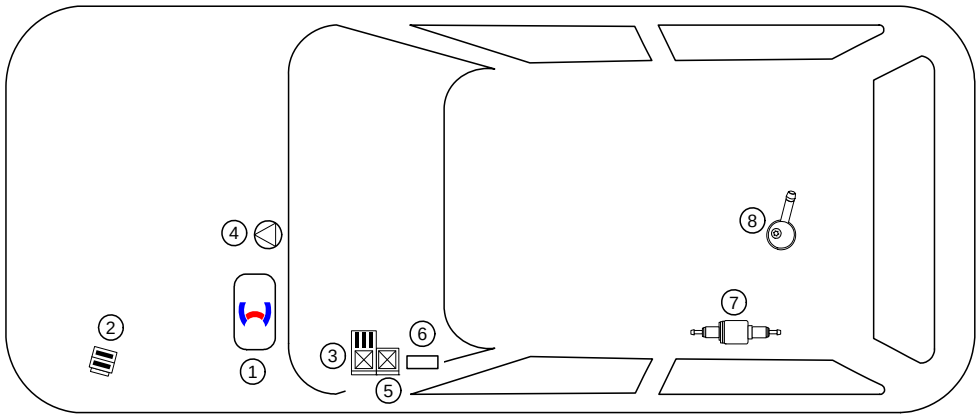
Installation instructions:

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

Installation Overview

Legend:

1. Heater
2. Engine compartment fuse holder
3. Passenger compartment relay and fuse holder
4. Circulating pump
5. PWM GW
6. Telestart receiver
7. Metering pump
8. FuelFix



Information on Total Installation Time

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

Information on Operating and Installation Instructions

1 Important information (not complete)

1.1 Installation and repair

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

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

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

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

1.2 Operation

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

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

Always switch off the heater before refuelling.

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

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

1.3 Please note

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

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

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

Important

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

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

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

Installation should be carried out according to the general, standard rules of technology. Unless specified otherwise, fasten hoses, lines and wiring harnesses to original vehicle lines and wiring harnesses using cable ties. Insulate loose wire ends and tie back. Connectors on electronic components 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).

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.

Information on Validity

This installation documentation applies to Mazda 2 Petrol vehicles - for validity, see page 1 - from model year 2015 and later, assuming technical modifications to the vehicle do not affect installation, any liability claims excluded. Depending on the vehicle version and equipment, modifications may be necessary during installation with respect to this 'installation documentation'.

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

Technical Information

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

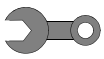
Dimensions
- All dimensions are in mm.

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

Explanatory Notes on Document

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

Mechanical System



Electrical System

Coolant Circuit

Combustion Air

Fuel

Exhaust Gas

Software

Special features are highlighted using the following symbols:

Specific risk of damage to components.

Specific risk due to electrical voltage.

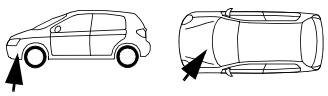
Specific risk of injury or fatal accidents.

Specific risk of fire or explosion.

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

Reference to a special technical feature.

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



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

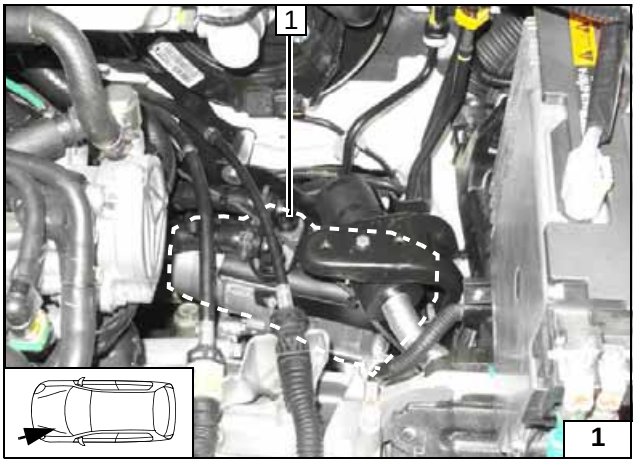
Preliminary Work

Vehicle

- Disconnect and completely remove the battery together with the carrier.
- Remove the upper engine cover.
- Open the fuel tank cap.
- Ventilate the fuel tank.
- Close the fuel tank cap again.
- Completely remove the air filter and housing.
- Remove the lower engine cover.
- Remove the underbody trim.
- Depressurise the cooling system.
- Remove the middle underride protection (heat shield plate).
- Completely remove the rear seat cushions.
- Open the left tank-fitting service lid.
- Remove the front left entrance strip.
- Remove the left footwell trim.
- Remove the instrument panel trim on the driver's side.
- Remove the left A-pillar trim (only for Telestart and/or ThermoCall aerial).
- Remove the centre console side trim on the left and right sides.
- Remove the trim under the glove box.

Heater

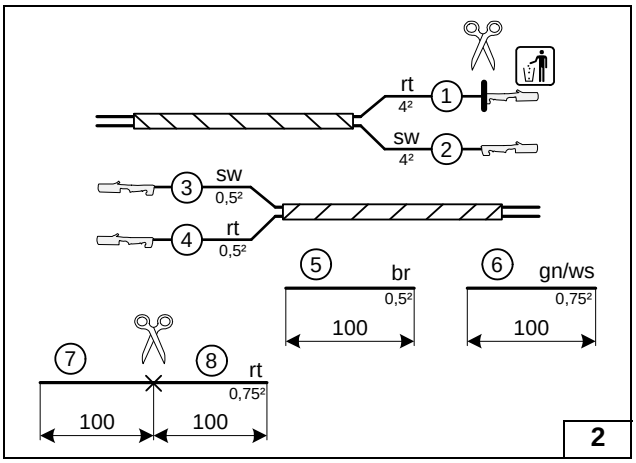
- Remove years that do not apply from the type and duplicate label.
- Attach the duplicate label (type label) visibly in the appropriate place in the engine compartment.



Heater Installation Location

1 Heater

Installation location



2

Preparing Electrical System

Wire sections retain their numbering in the entire document.

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

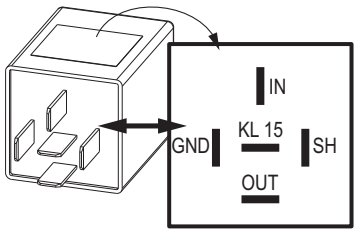
Cutting to length / assigning wires

① Red (rt) wire of fan wiring harness
② Black (sw) wire of fan wiring harness
③ Black (sw) wire from wiring harness of PWM control
④ Red (rt) wire from wiring harness of PWM control

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

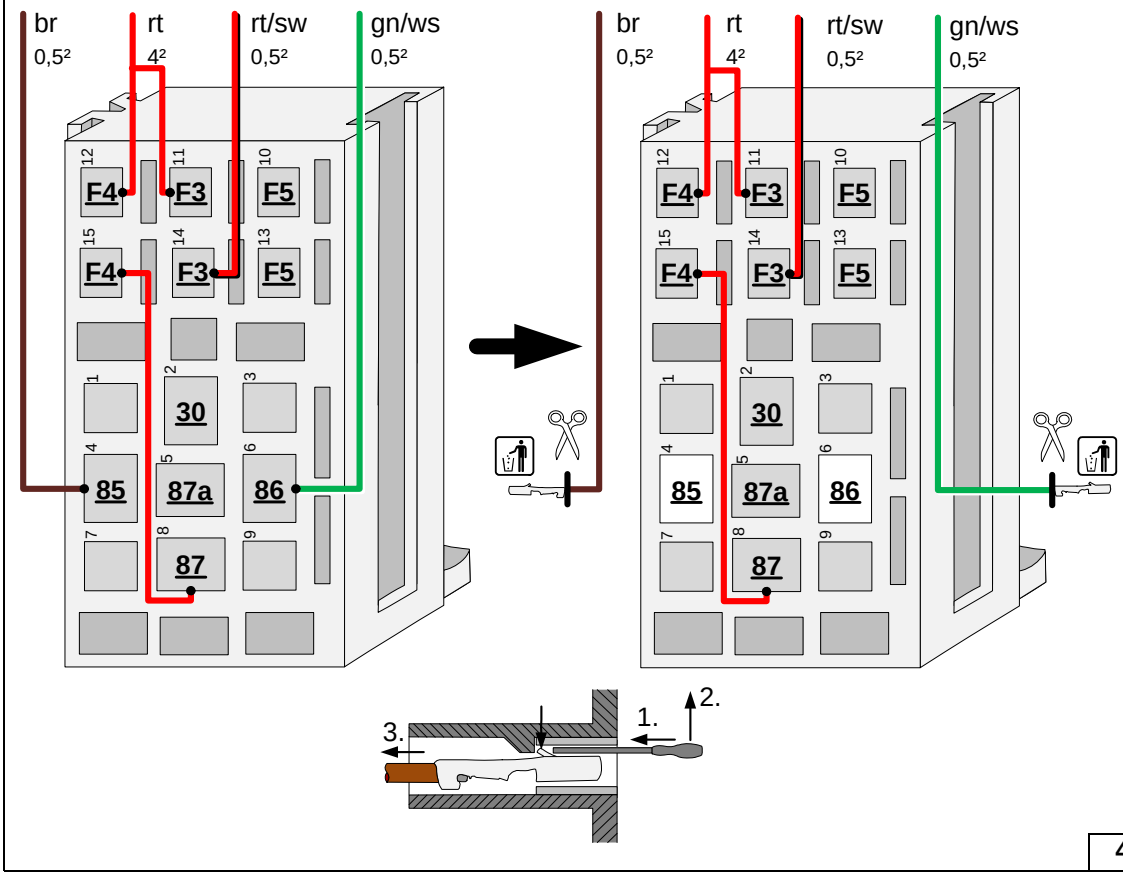
Settings:

Duty cycle:	60%
Frequency	500Hz
Voltage:	not relevant
Function:	Low side



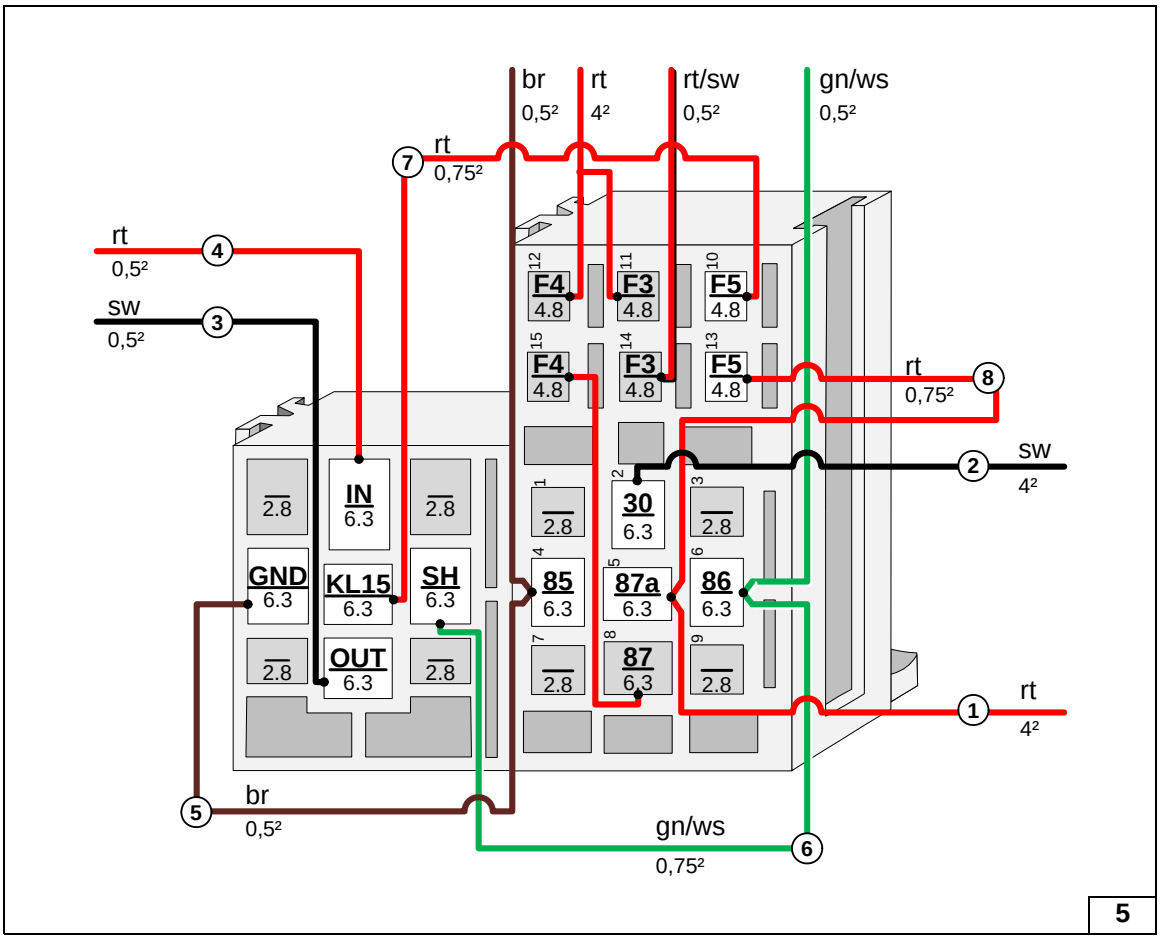
3

View of PWM GW



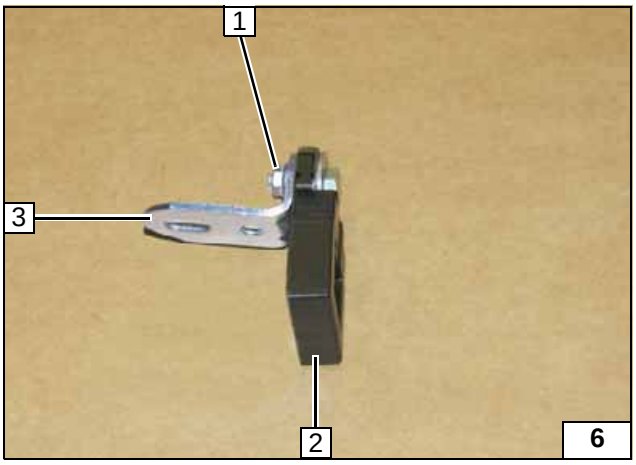
4

Preparing passenger compartment relay and fuse holder



5

Interlocking socket of PWM GW and passenger compartment relay and fuse holder, connecting wires

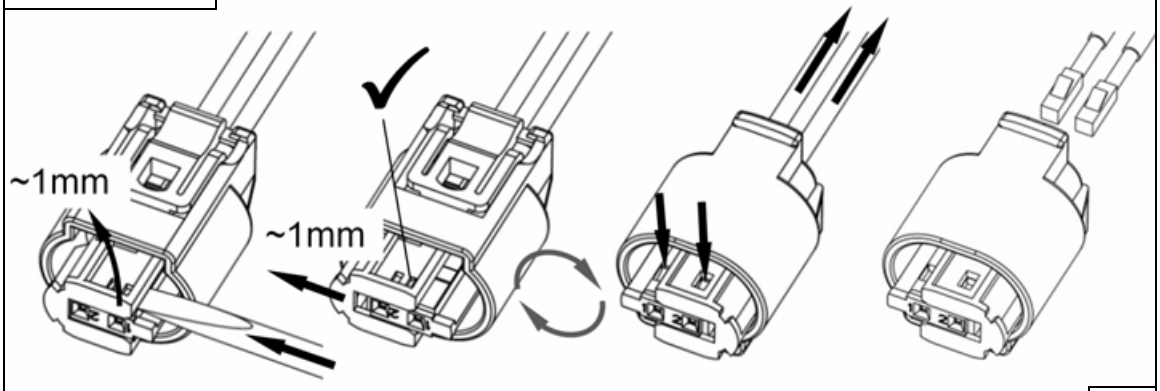


6

1 M5x16 bolt, large diameter washer [2x], nut
2 Retaining plate of engine compartment fuse holder
3 Angle bracket

Preparing retaining plate of engine compartment fuse holder

Connector X7



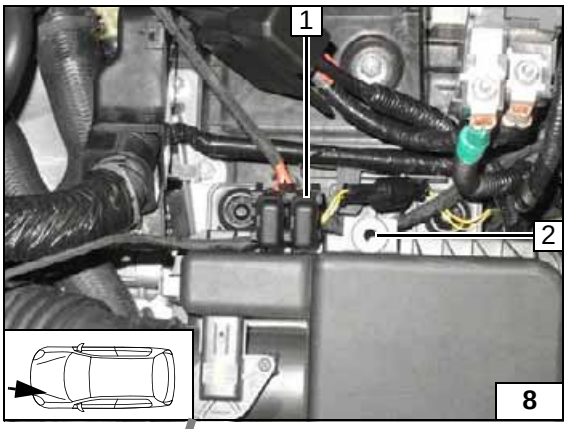
7

Dismantling metering pump connector

Electrical System

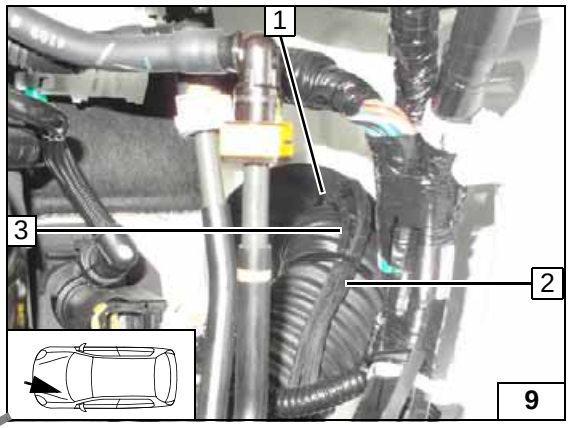
Engine compartment fuse holder

Unclip original vehicle wiring harness at position **2**, discard clip.
Position engine compartment fuse holder **1**, will be fastened later.

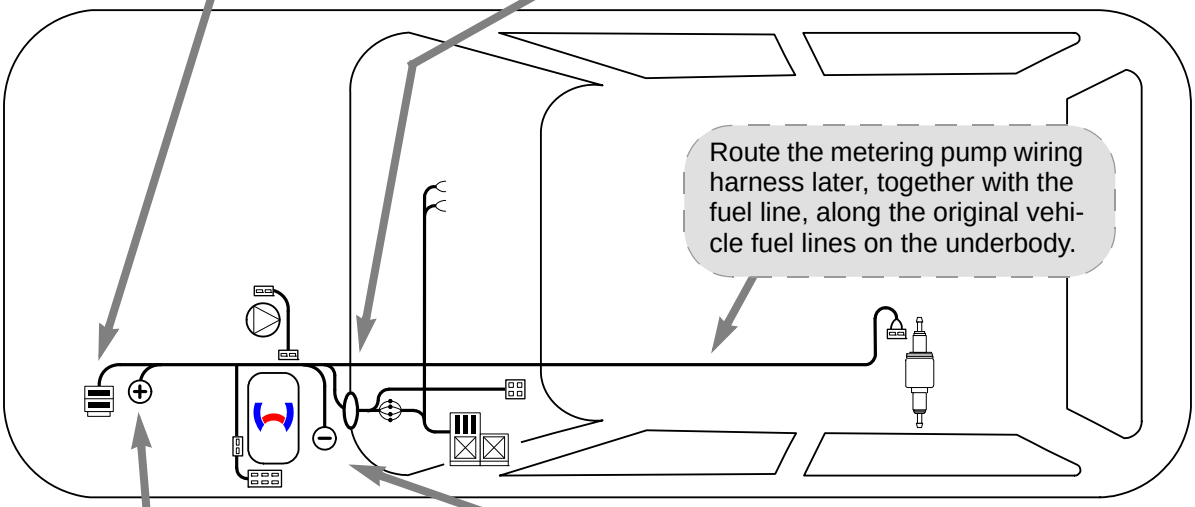


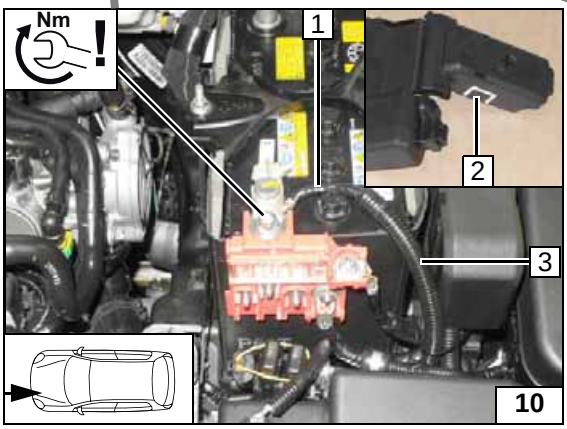
Wiring harness pass through

1 Protective rubber plug
2 Wiring harness for fan controller
3 Wiring harness for heater control



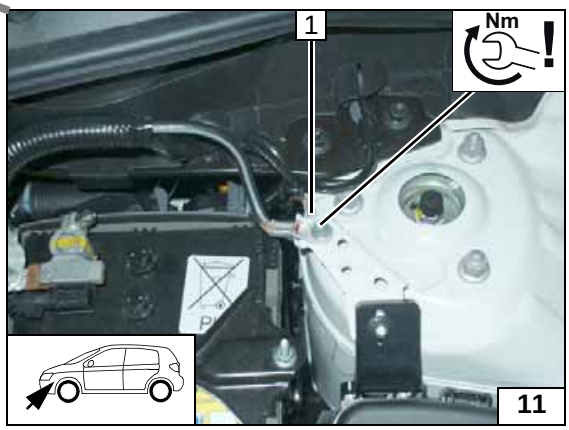
Wiring harness routing diagram





Positive wire

1 Positive wire on positive battery terminal
2 Prepare positive terminal cover as shown
3 430mm long corrugated tube

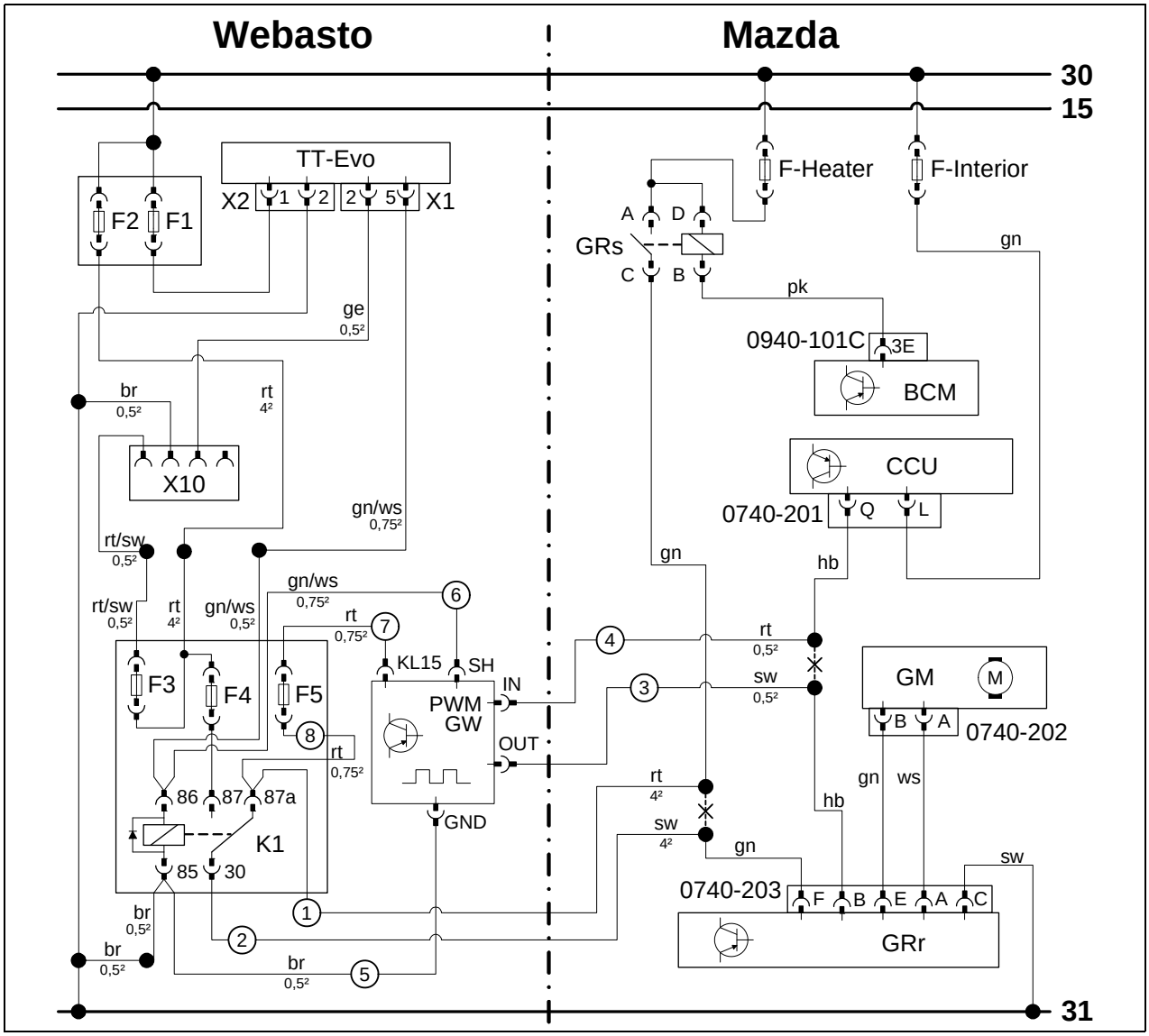


Earth wire

1 Earth wire on original vehicle earth support point

Automatic Air-Conditioning Fan Controller

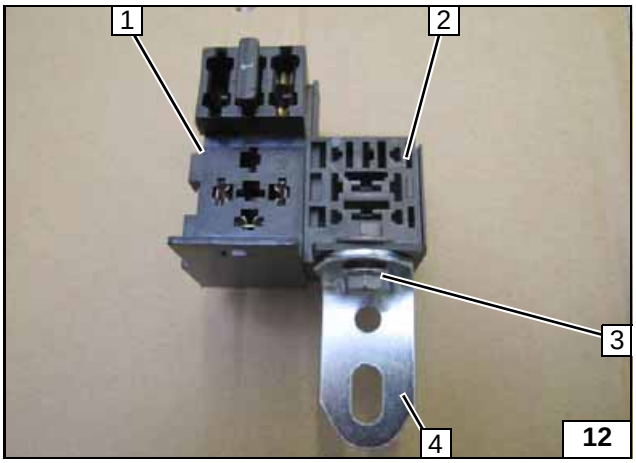
Wiring diagram



Webasto components		Vehicle components		Colours and symbols	
TT-Evo	TT-Evo heater	F-Heater	40A fuse	rt	red
X1	6-pin heater connector	F-Interior	15A fuse	sw	black
X2	2-pin heater connector	GRs	Fan relay	ge	yellow
F1	20A fuse	BCM	Body control unit	gn	green
F2	30A fuse	0940-101C	Connector of BCM	br	brown
X10	4-pin connector of heater control	CCU	A/C control unit	ws	white
		0740-201	Connector of automatic A/C, CCU	hb	sky blue
F3	1A fuse	GM	Fan motor	pk	pink
F4	25A fuse	0740-202	2-pin connector of GM		
F5	5A fuse	GRr	Fan controller		
PWM GW	Pulse width modulator Gateway	0740-203	6-pin connector of GRr		
K1	Fan relay				
PWM GW settings:					
Duty cycle:	60%				
Frequency:	500Hz				
Voltage:	not relevant			**X**	Cutting point
Function:	Low side			Wiring colours may vary.	

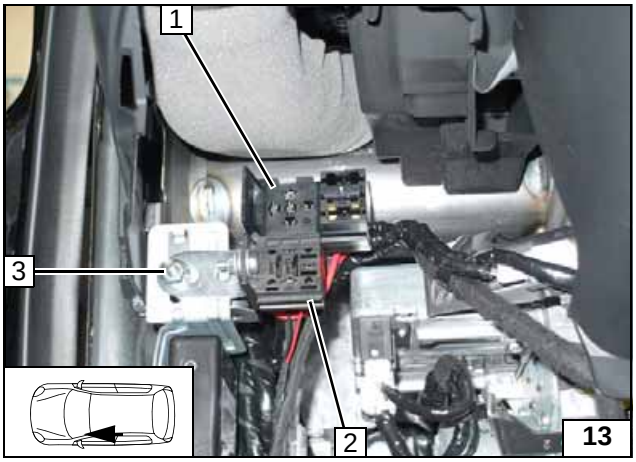
Legend

Installing angle bracket



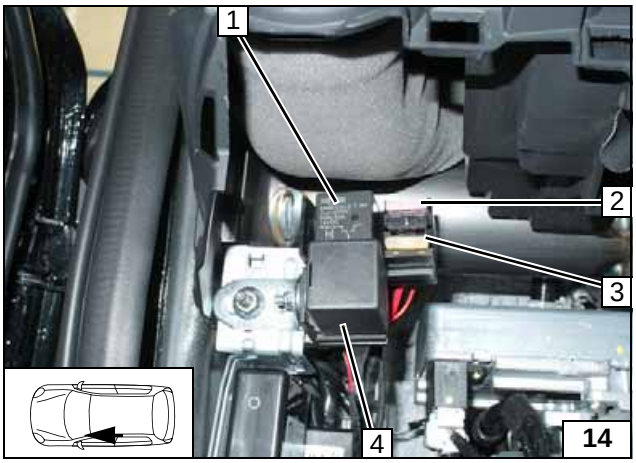
1 Passenger compartment relay and fuse holder
2 PWM GW socket
3 M5x16 bolt, large diameter washer [2x], nut
4 Angle bracket

Installing passenger compartment relay and fuse holder



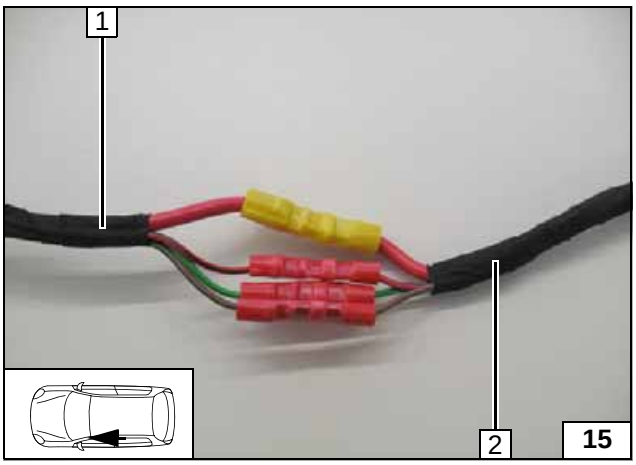
1 Passenger compartment relay and fuse holder
2 PWM GW socket
3 Original vehicle bolt, flanged nut

Installing PWM GW, relay K1 and fuse F4 / F5

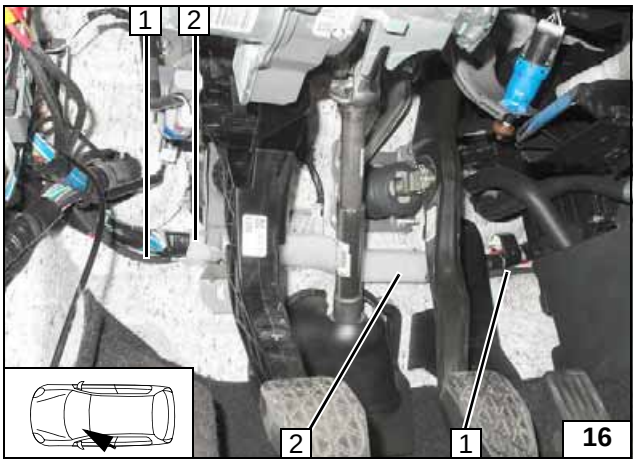


1 Relay K1
2 5A fuse F5
3 25A fuse F4
4 PWM GW

Connecting same colour wires of wiring harnesses

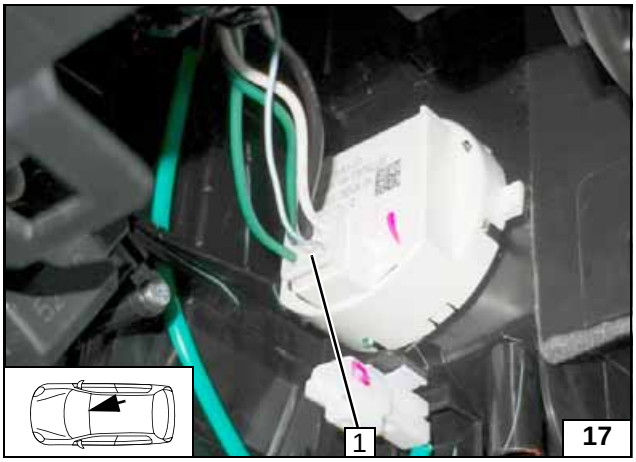


1 Passenger compartment relay and fuse holder wiring harness
2 Heater wiring harness



Route fan wiring harness **1** through line duct **2** to front passenger's side.

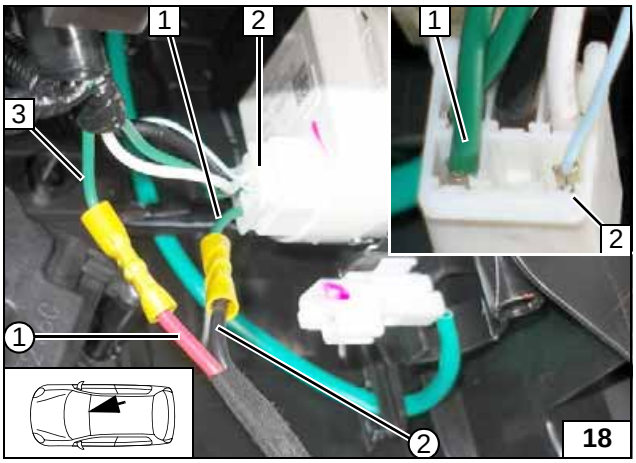
Routing wiring harness



Air duct dismantled for documentation purposes.

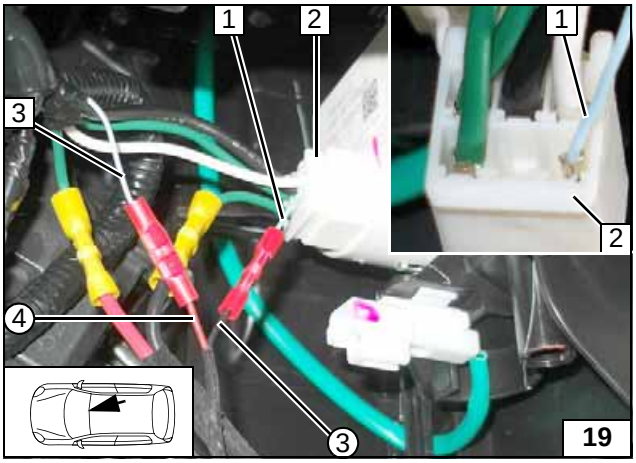
1 6-pin fan controller connector

Connection to fan controller



1 Green (gn) wire of 6-pin connector from fan controller/ pin F
2 6-pin fan controller connector
3 Green (gn) wire of fan relay, pin C
① Red (rt) wire of K1/87a, fan wiring harness
② Black (sw) wire of K1/30, fan wiring harness

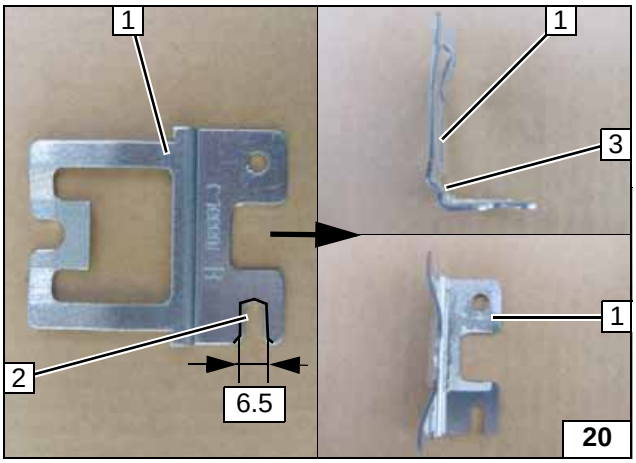
Connection to fan controller



1 Sky blue (hb) wire of 6-pin fan controller connector/ pin B
2 6-pin fan controller connector
3 Sky blue (hb) wire of CCU/ pin Q
③ Black (sw) wire of PWM GW/OUT from PWM control wiring harness
④ Red (rt) wire of PWM GW/IN from PWM control wiring harness

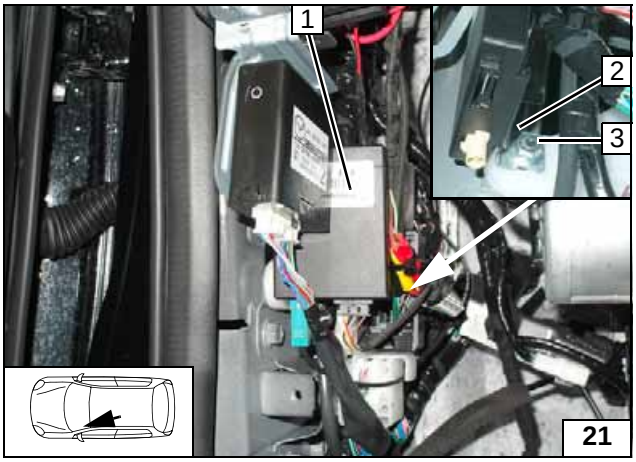
Connection to fan controller

Remote Option (Telestart)



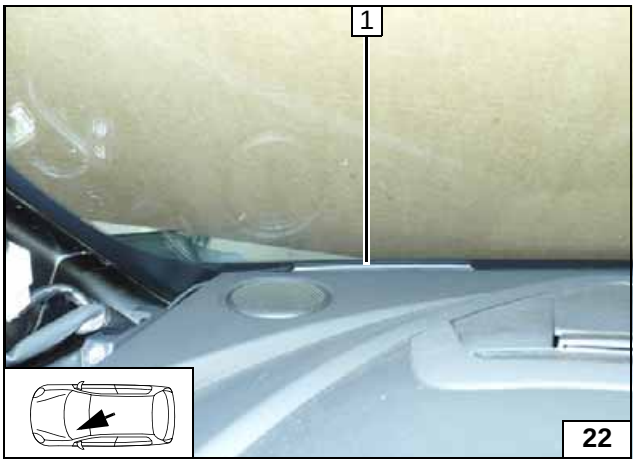
1 Receiver bracket
2 Enlarge opening to 6.5mm
3 Bend by 90°

Preparing bracket



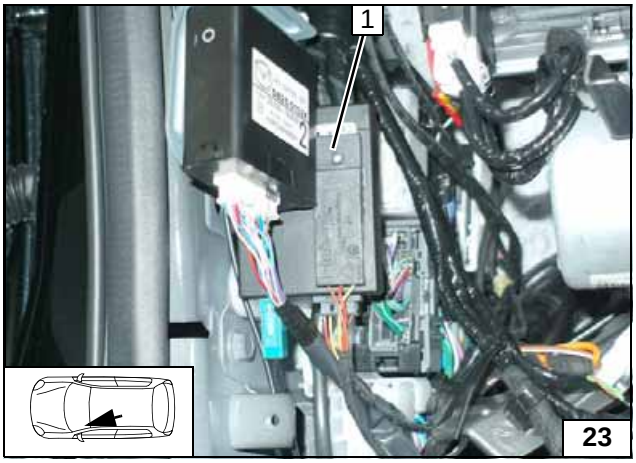
1 Receiver
2 Receiver bracket
3 Original vehicle bolt, flanged nut

Installing receiver



1 Aerial

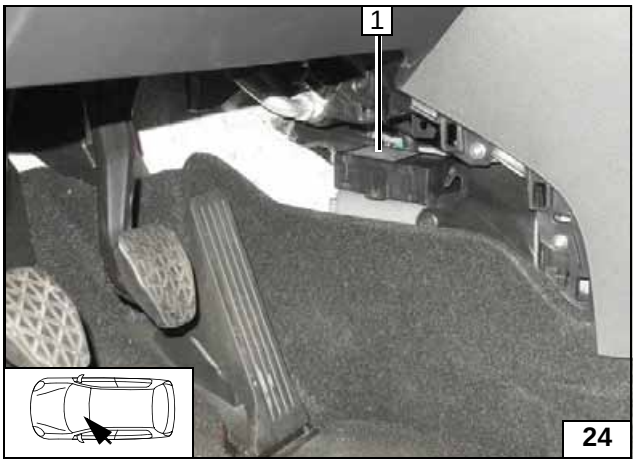
Installing aerial



Temperature sensor T100 HTM

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

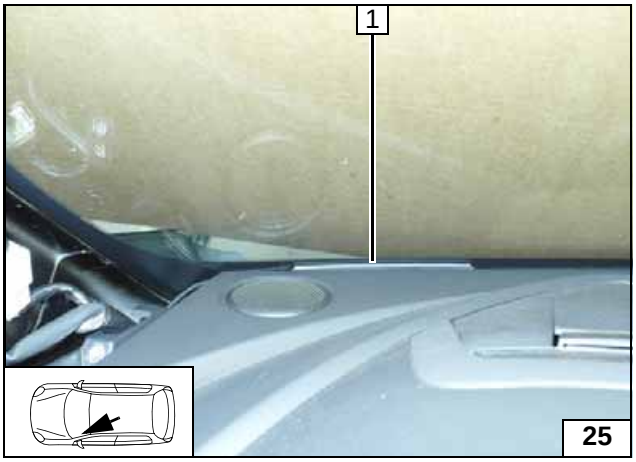
Installing temperature sensor



ThermoCall Option

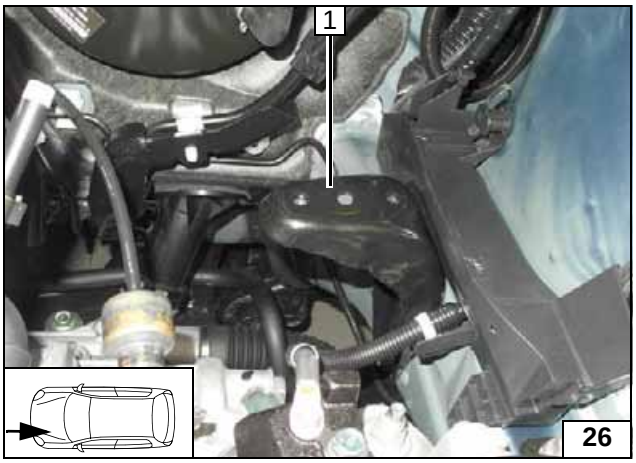
Fasten receiver **1** with double-sided adhesive tape.

Installing receiver



1 Aerial (optional)

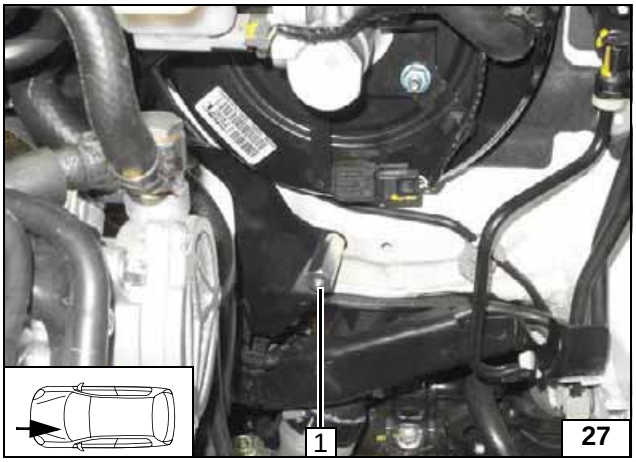
Installing aerial



Preparing Installation Location

Remove original vehicle bracket **1**.
Bracket and bolts are reinstalled here later.

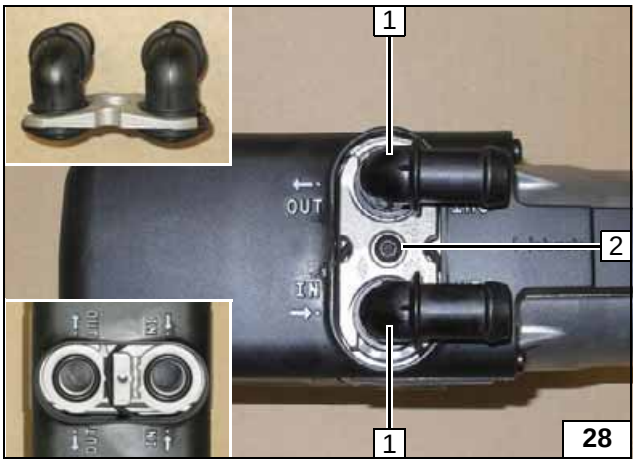
Copying hole pattern



Remove original vehicle nut at position **1** .

1 M6x40 spacer nut

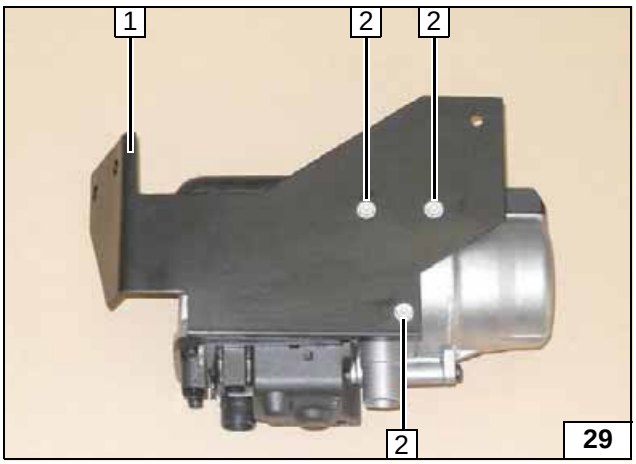
Installing spacer nut



Preparing Heater

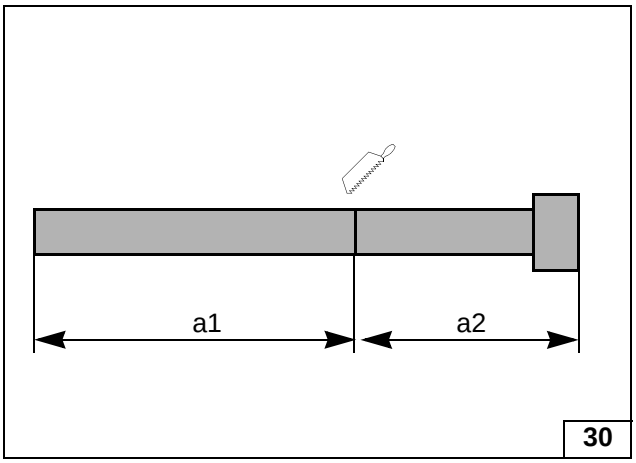
1 Water connection piece, sealing ring [2x each]
2 5x15 self-tapping bolt, retaining plate of water connection piece

Installing water connection piece



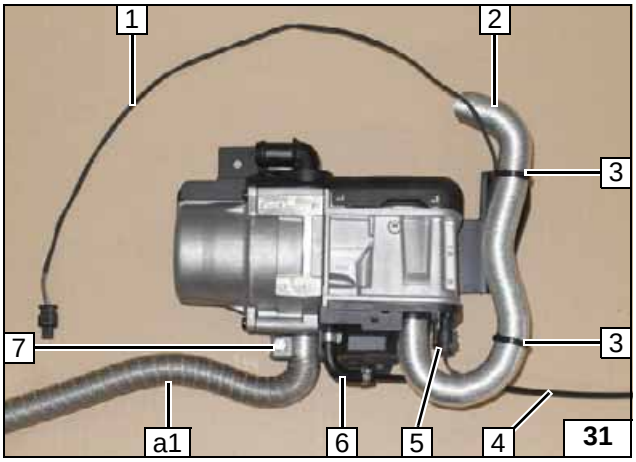
1 Bracket A
2 5x13 self-tapping bolts [3x]

Installing bracket A



a1 = 330
a2 = 270

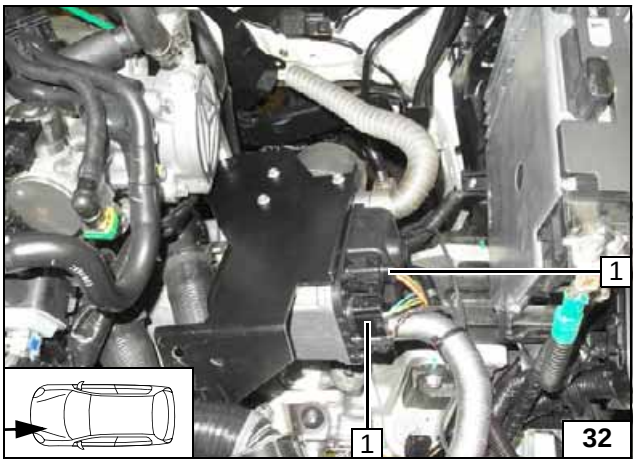
Preparing exhaust pipe



1 Circulating pump wiring harness
2 Combustion air pipe
3 Cable tie
4 Fuel line
5 Connector of circulating pump wiring harness
6 90° moulded hose, 10 mm dia. clamp [2x]
7 Hose clamp

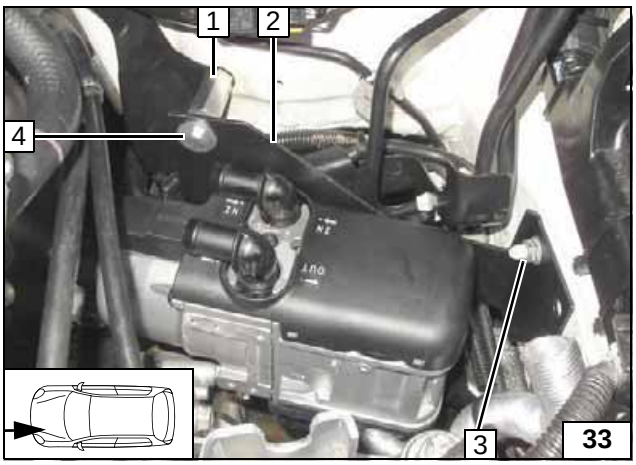
Premounting heater

Installing Heater



1 Heater wiring harness connector [2x]

Installing wiring harness



Install a 10mm spacer at position **4** between bracket A **2** and spacer nut **1**.

3 M8 flanged nut, original vehicle stud bolt
4 M6x20 bolt, spring lockwasher, large diameter washer

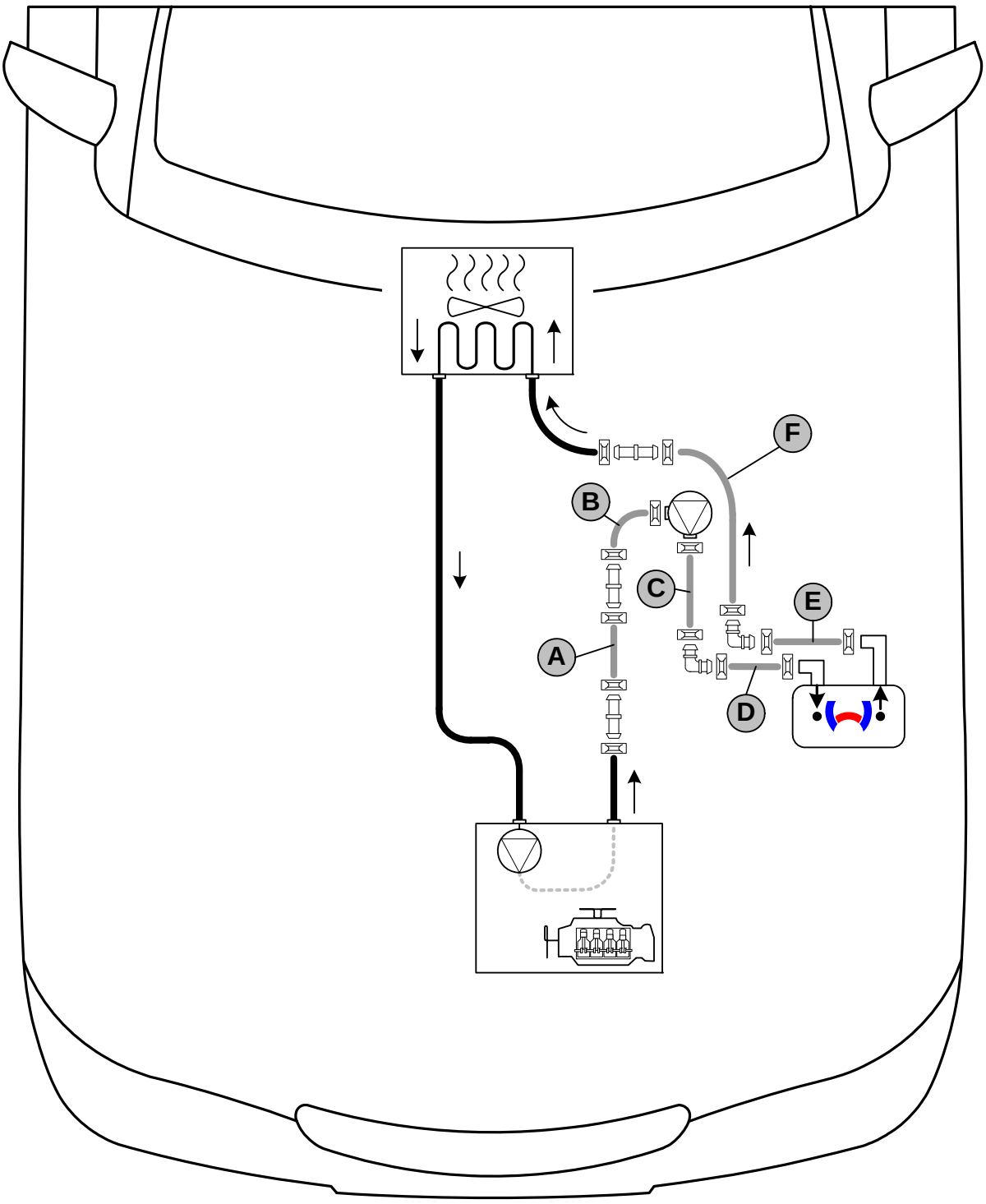
Installing heater

Coolant Circuit

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

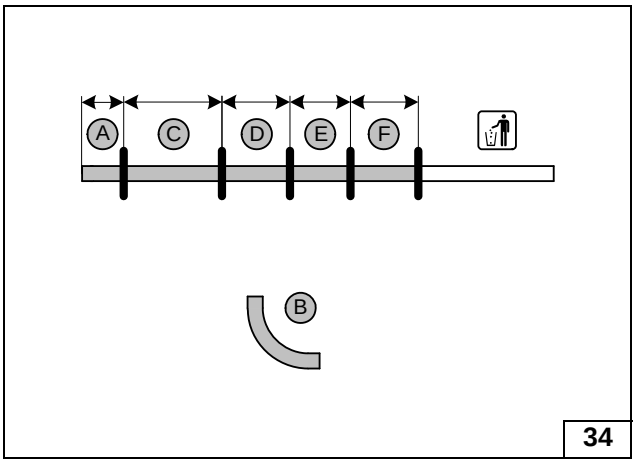
The connection should be modelled on an ‘inline’ circuit and based on the following diagram:

Hose routing diagram

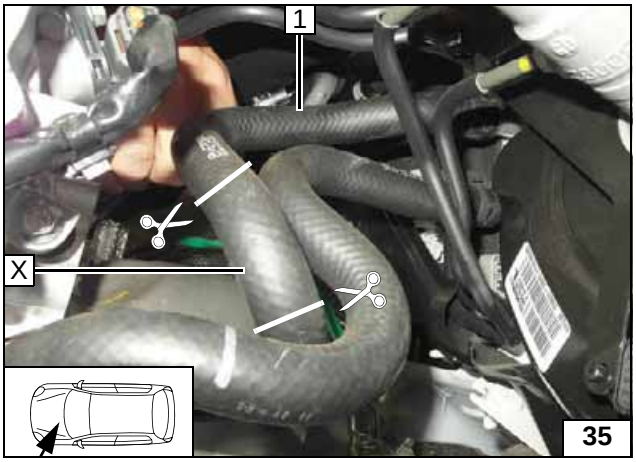


All spring clips without a specific designation = 25 mm dia. All connecting pipes and = 18x18mm dia.

Cutting hoses to length



A = 65
B = 90°, 18mm dia.
C = 245
D = 105
E = 95
F = 100

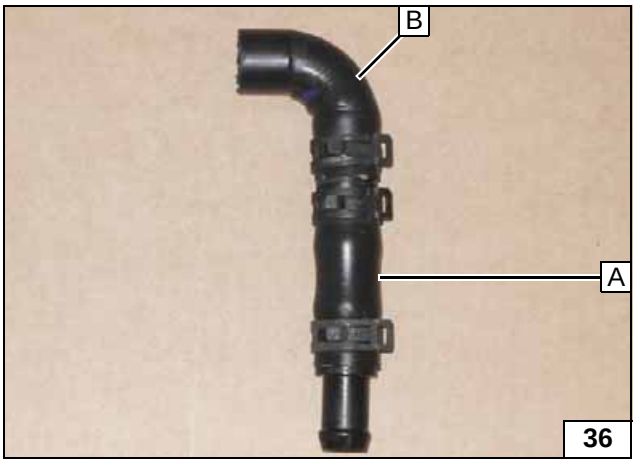


Cut hose of engine outlet / heat exchanger inlet **1** at the markings.

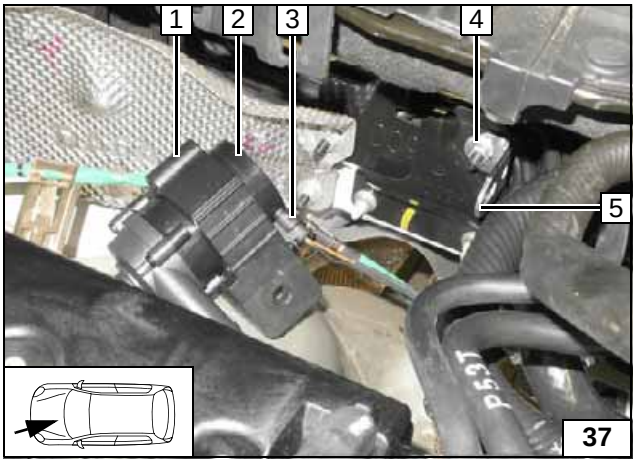
X =

Cutting point

Premounting hoses A and B



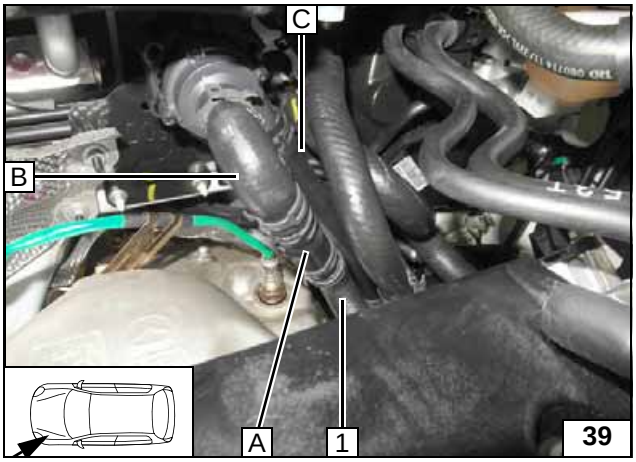
Installing angle bracket



1 Circulating pump mount
2 Circulating pump
3 Connector of circulating pump wiring harness
4 Original vehicle flanged nut
5 Angle bracket

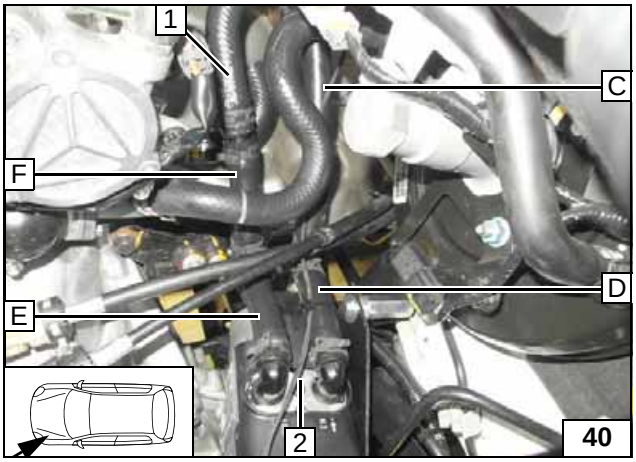
1 M6x25 bolt, flanged nut

Installing circulating pump



1 Hose section of engine outlet

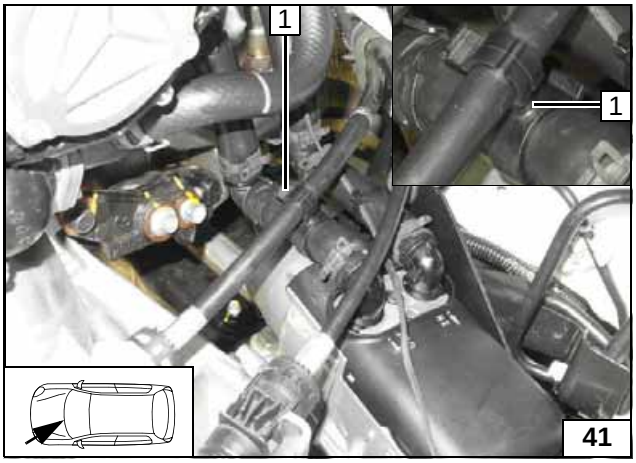
Connecting circulating pump



Fasten circulating pump wiring harness **2** to hoses **C** and **D** using cable ties.

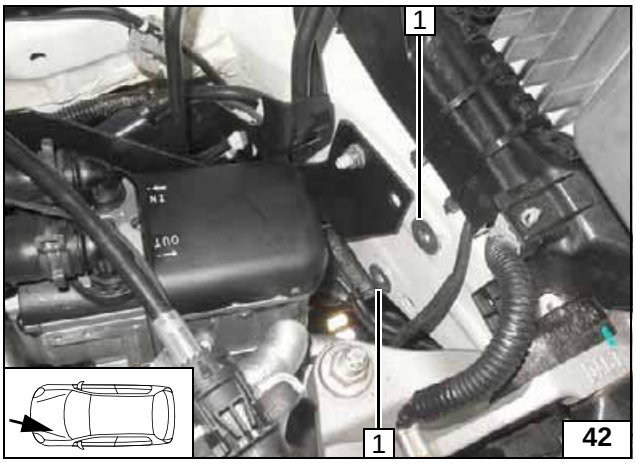
1 Hose section of heat exchanger inlet

Connecting heater



1 15x22 hose bracket

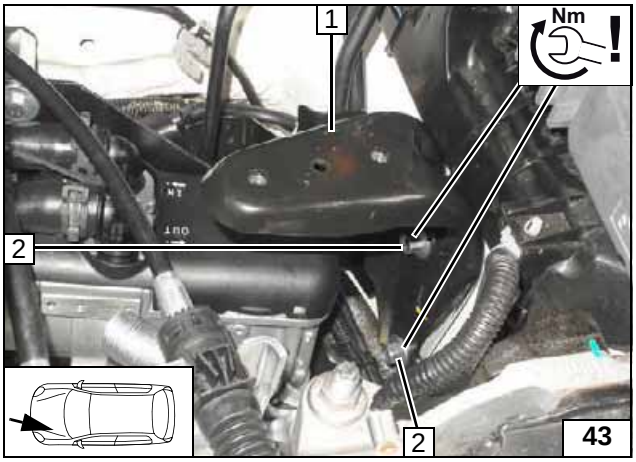
Routing in engine compartment



Position a large diameter washer at position **1** in front of the original vehicle thread using suitable means.

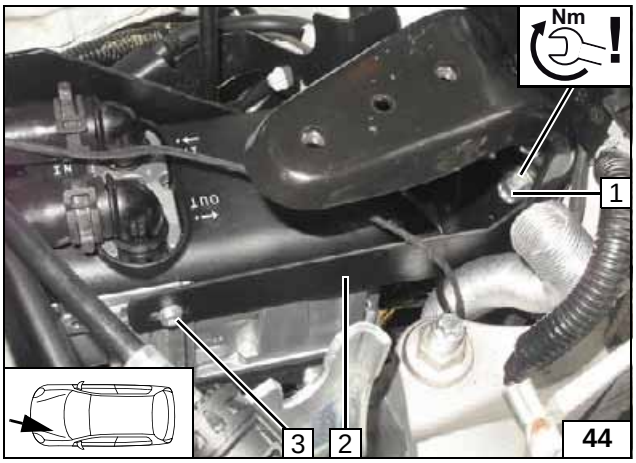
1 Large diameter washer [2x]

Positioning large diameter washer



1 Original vehicle bracket
2 Original vehicle bolt [2x]

Installing original vehicle bracket



1 Original vehicle bolt
2 Bracket B
3 5x13 self-tapping bolts

Installing bracket B

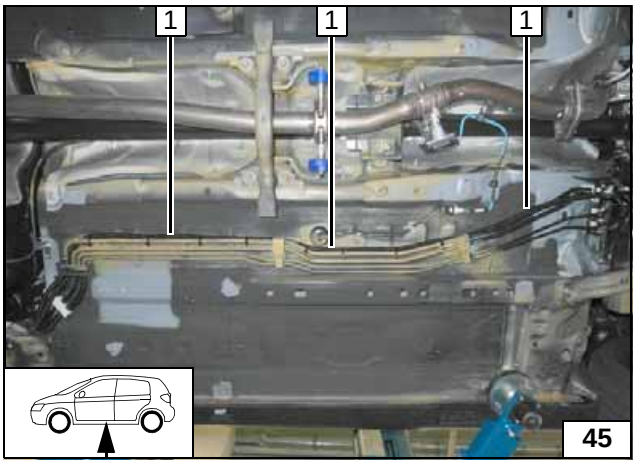
Fuel

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

Catch any fuel running off in an appropriate container.

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

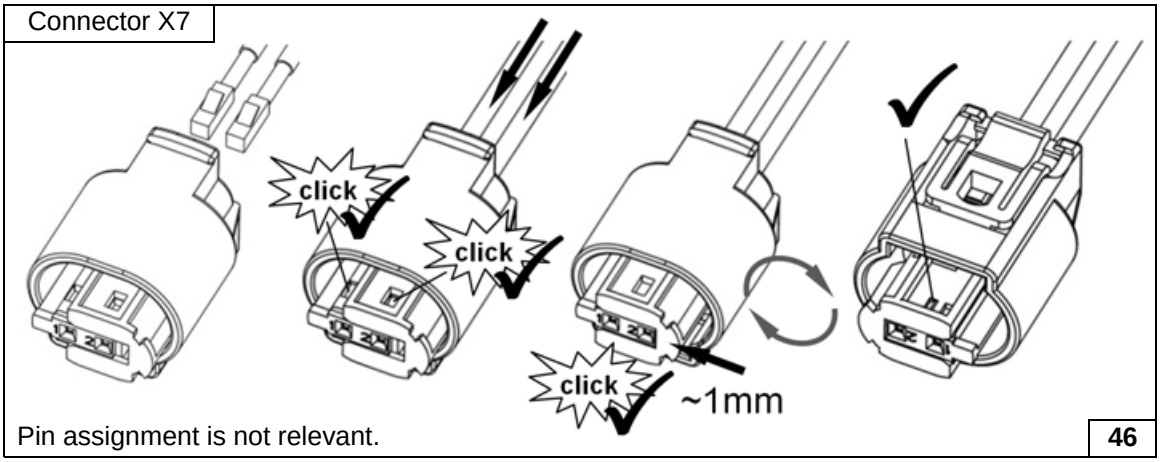
The fuel line and wiring harness are routed to the metering pump as shown in the wiring harness routing diagram.



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

Routing lines

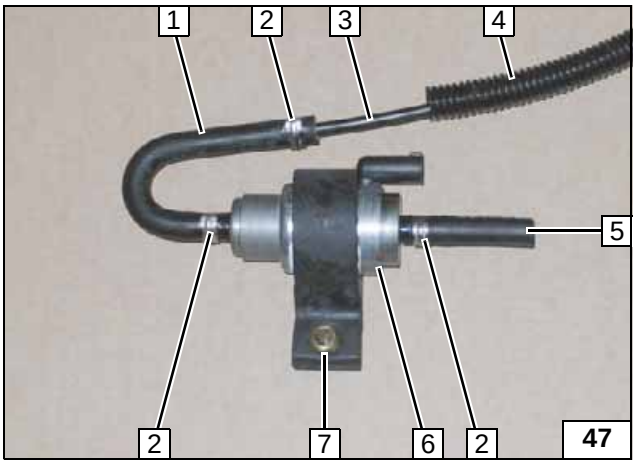
Connector X7



Pin assignment is not relevant.

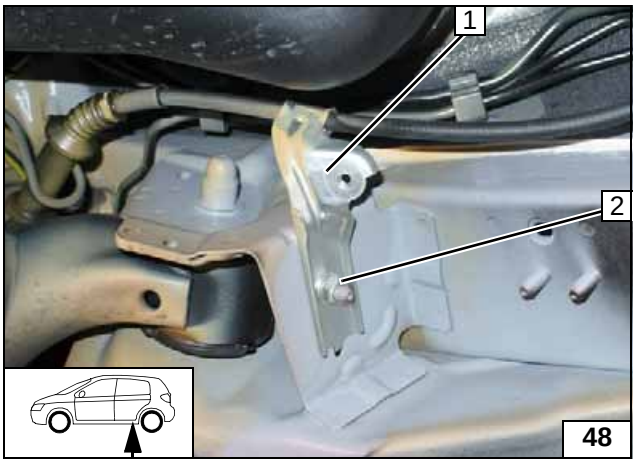
46

Completing metering pump connector



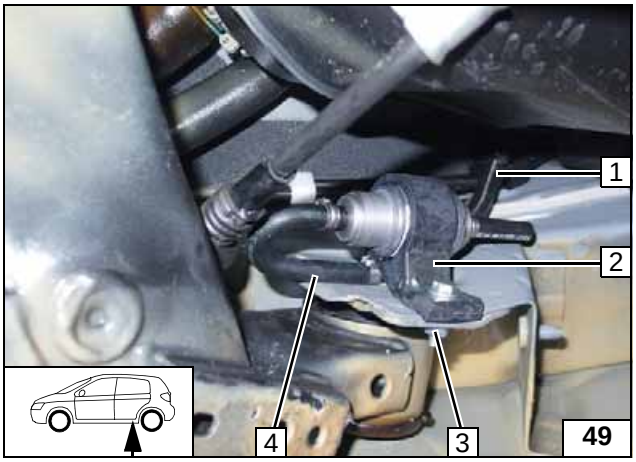
1 180° moulded hose
2 10 mm dia. Clamp [3x]
3 800mm long fuel line
4 700mm long corrugated tube
5 Hose section
6 Metering pump
7 Metering pump mount

Premounting metering pump



Detach handbrake cable bracket **1** at position **2**.

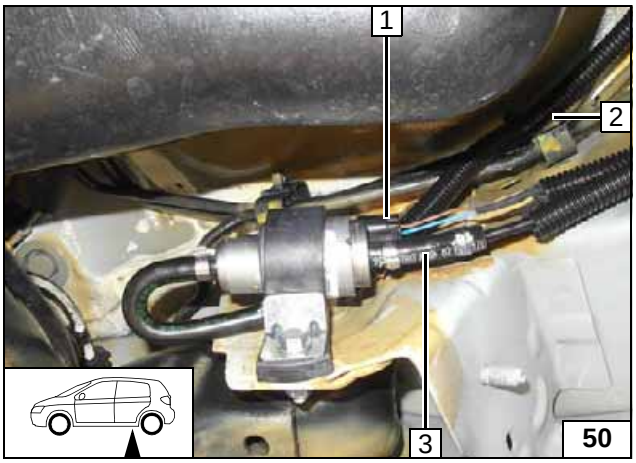
Detaching handbrake cable



Route fuel line in 10mm dia. corrugated tube **1** to fuel tank sending unit.
Align 180° moulded hose **4** as shown.

2 Support angle bracket
3 M6x25 bolt, flanged nut, existing hole

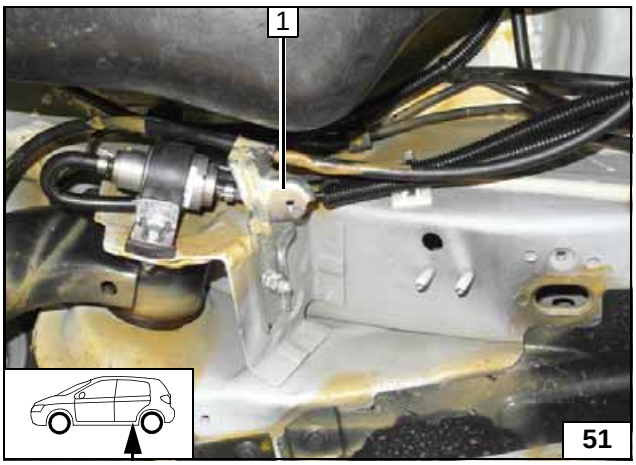
Installing metering pump



Ensure sufficient distance from neighbouring components, correct if necessary.

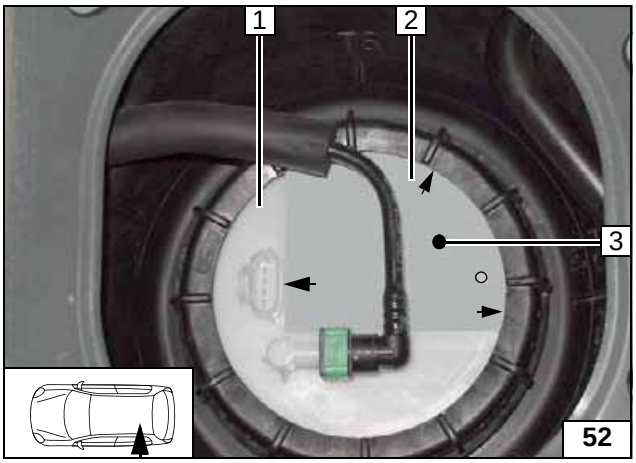
1 Connector of metering pump wiring harness
2 Fuel line of FuelFix in corrugated tube
3 Hose section, 10mm dia. clamp [2x]

Connecting metering pump



1 Handbrake cable bracket

Installing handbrake cable bracket

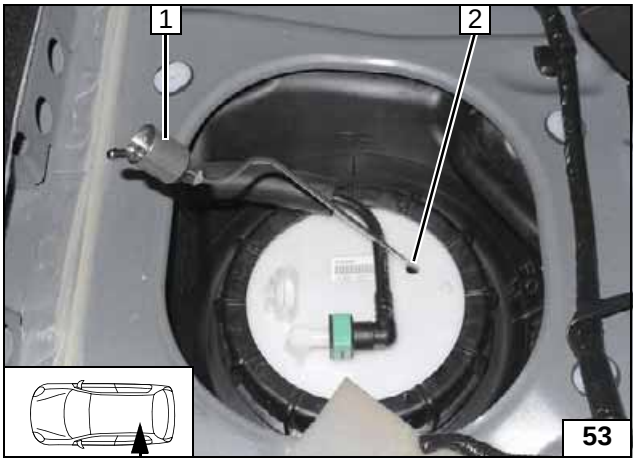


Installing FuelFix

Work steps F1, F2 and F3.

1 Fuel tank sending unit
2 Cut out fuel tank sending unit drilling template and position
3 Hole pattern, hole made with provided drill

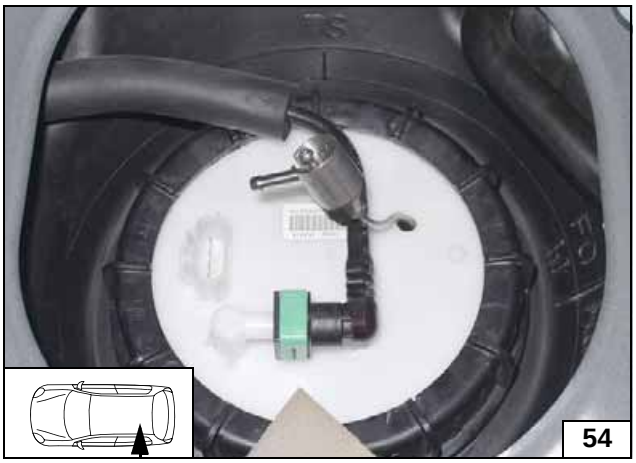
Copying hole pattern



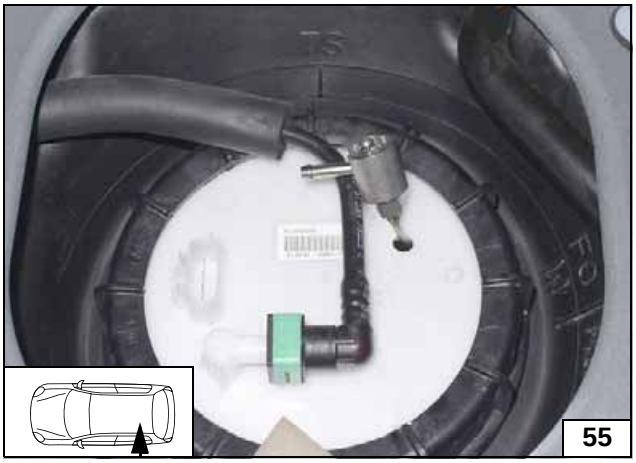
Work steps F4 and F5.

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

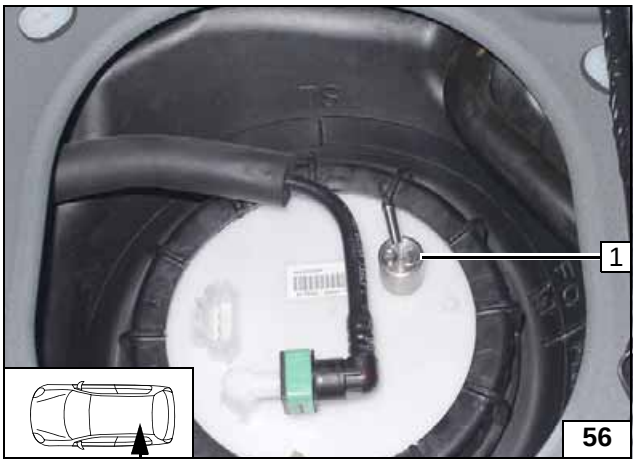
Inserting FuelFix



Inserting FuelFix



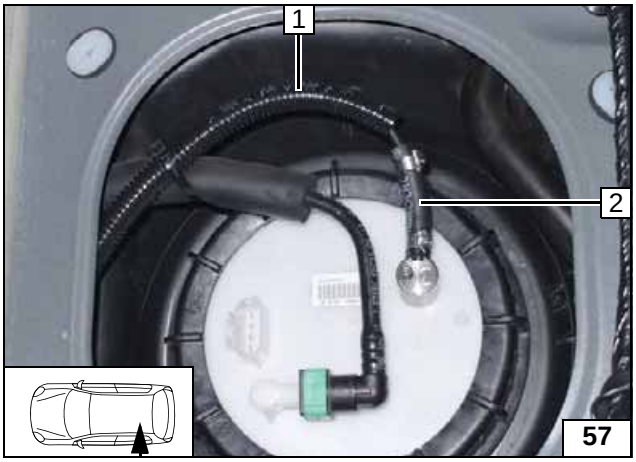
Inserting FuelFix



Work steps F5.3 and F5.4.

Align FuelFix **1** as shown.

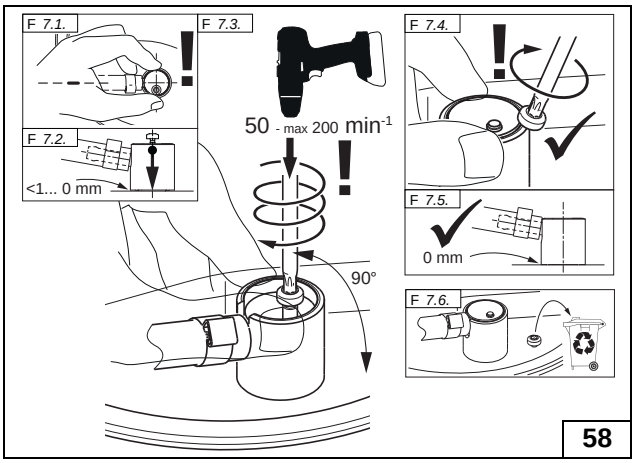
Aligning FuelFix



Work step F6.

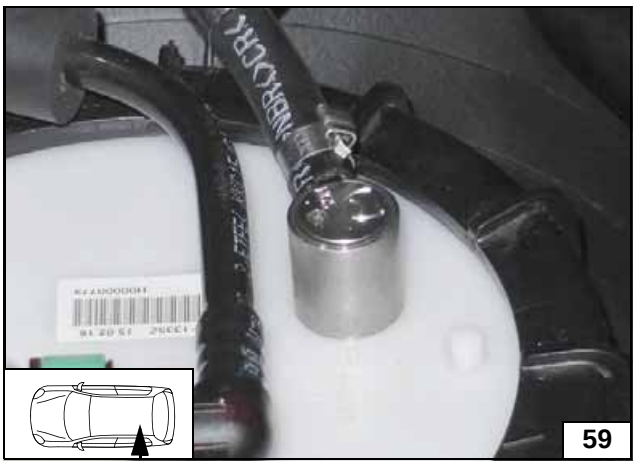
1 Fuel line of FuelFix in corrugated tube
2 Hose section, 10mm dia. clamp [2x]

Connecting fuel line



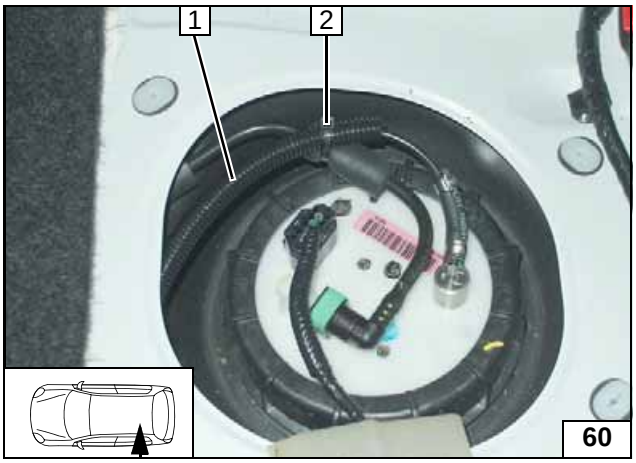
Work step F7.

Installing FuelFix



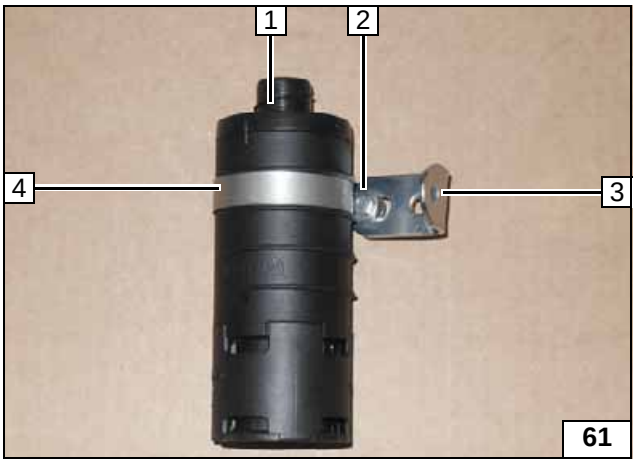
Work step F8.

Ensuring firm seating of FuelFix



1 Fuel line of FuelFix in corrugated tube
2 Cable tie for strain relief

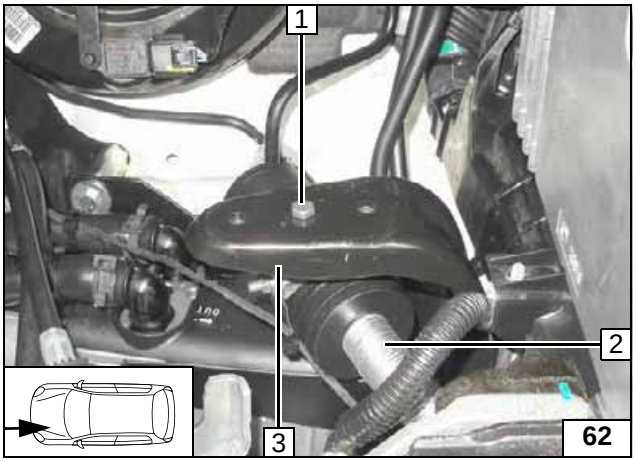
Securing fuel line



Combustion Air

1 Silencer
2 M5x16 bolt, flanged nut
3 Angle bracket
4 51mm dia. clamp

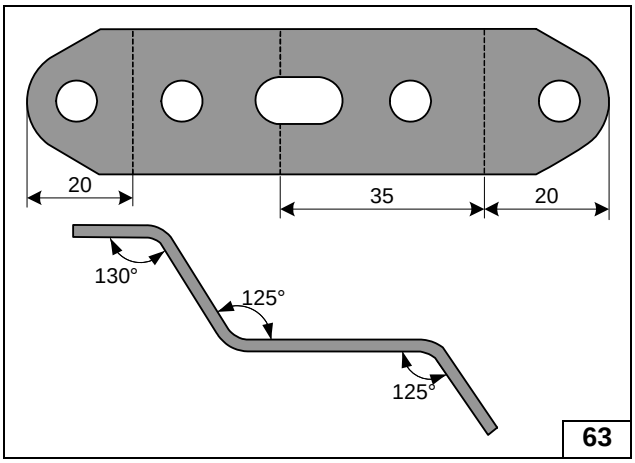
Premounting silencer



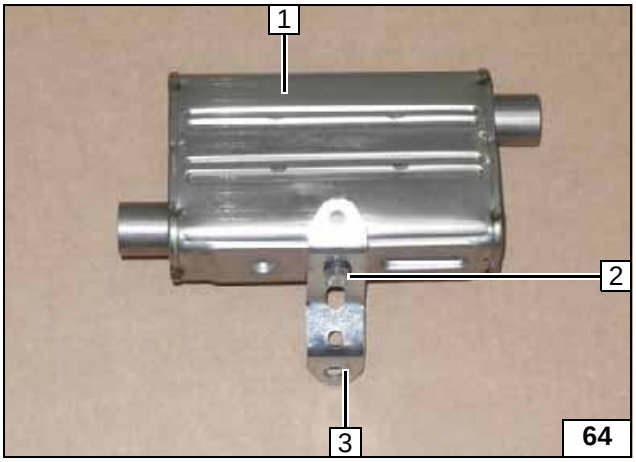
1 M6x20 bolt, original vehicle hole, flanged nut
2 Combustion air pipe
3 Original vehicle bracket

Installing silencer

Exhaust Gas

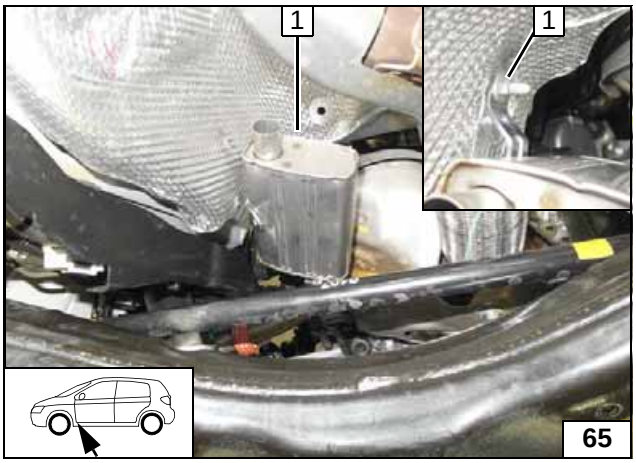


Preparing perforated bracket



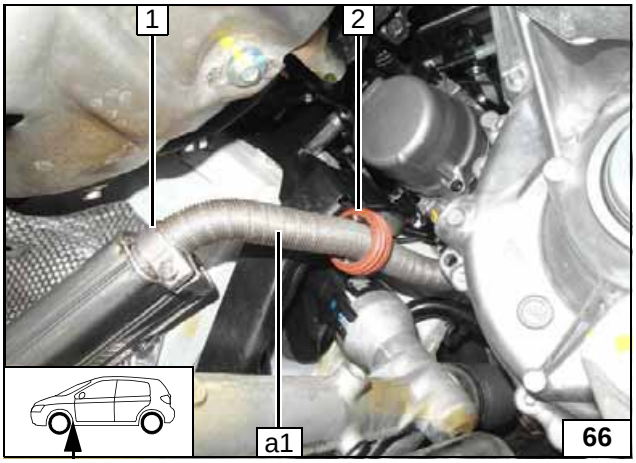
1 Silencer
2 M6x16 bolt, spring lockwasher
3 Perforated bracket

Premounting silencer



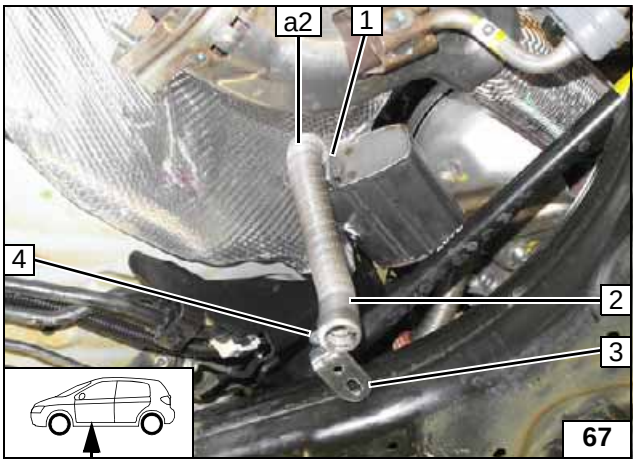
1 Original vehicle stud bolt with flanged nut

Installing silencer



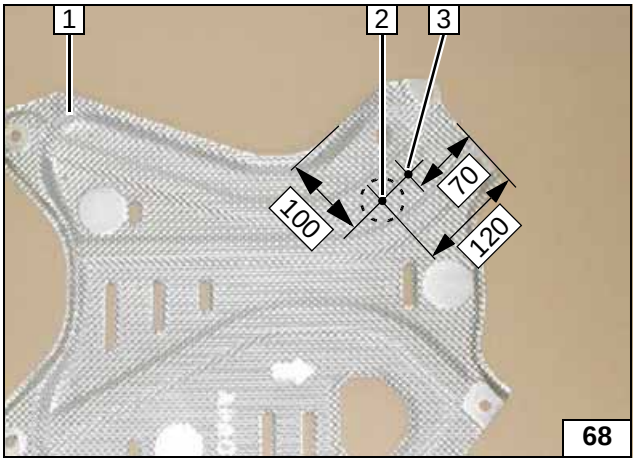
1 Hose clamp
2 Spacer bracket

Installing exhaust pipe a1



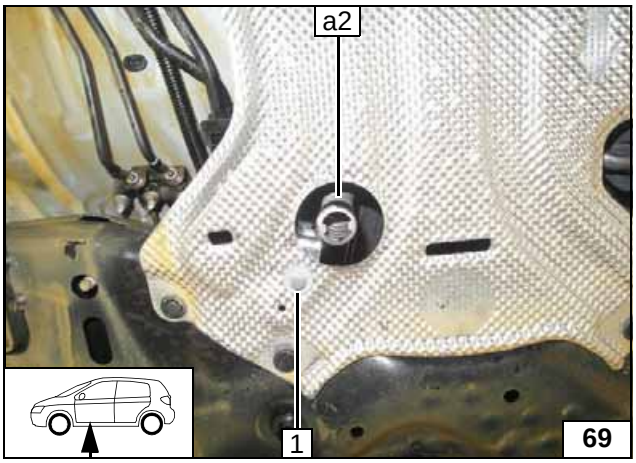
1 Hose clamp
2 P-clamp
3 Angle bracket
4 M6x20 bolt, flanged nut

Premounting exhaust pipe a2



1 Heat protection
2 60 mm dia. hole
3 7 mm dia. hole

Preparing heat protection



Install heat protection, align exhaust pipe a2 flush.

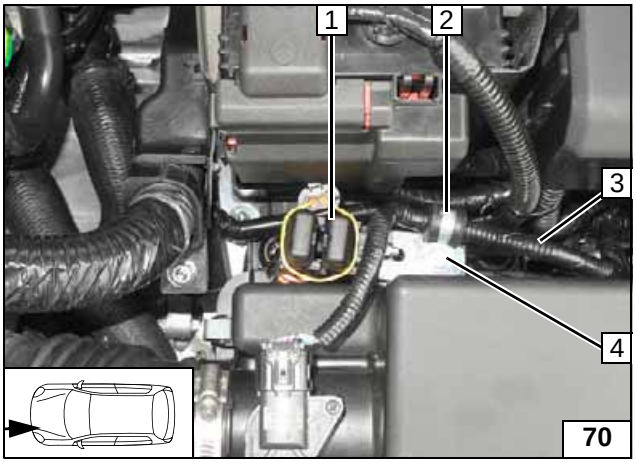
1 M6x20 bolt, large diameter washer, flanged nut

Installing angle bracket / aligning exhaust pipe a2

Final Work

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

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

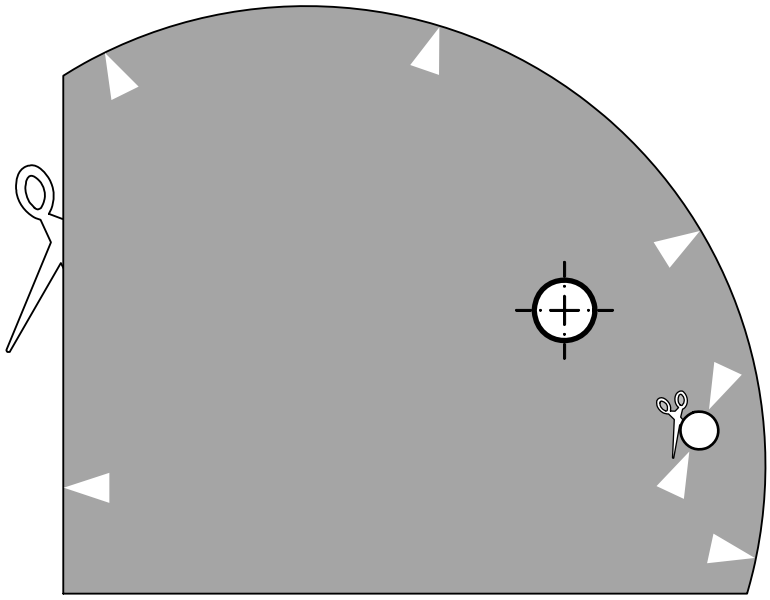


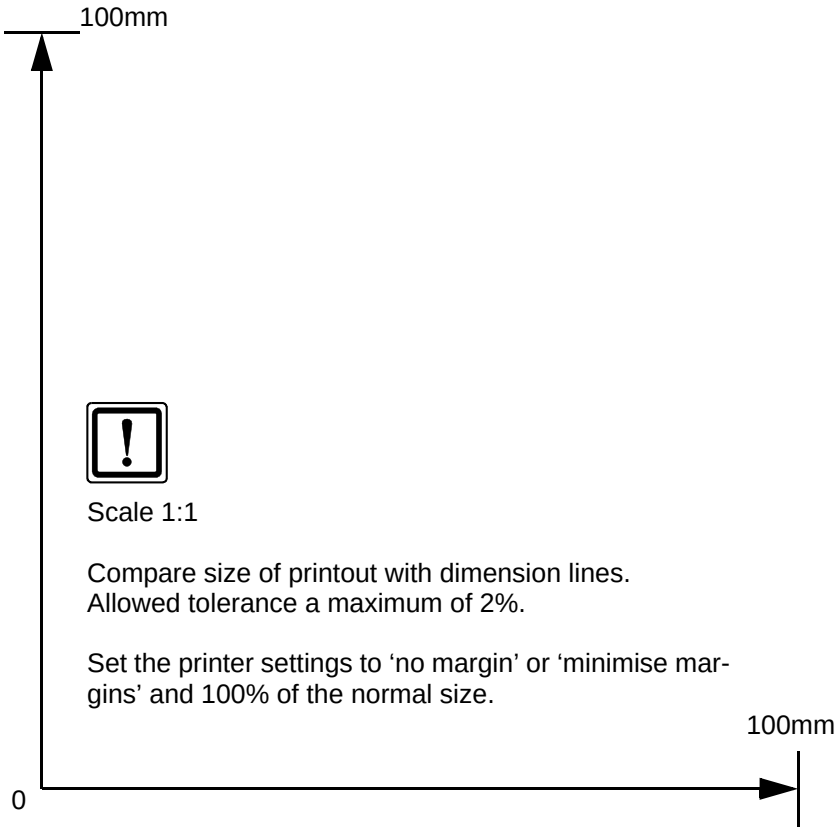
1 Premounted engine compartment fuse holder
2 10 mm dia. rubber-coated p-clamp
3 Original vehicle wiring harness
4 M6x20 bolt, original vehicle hole, flanged nut

Installing fuse holder of engine compartment

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

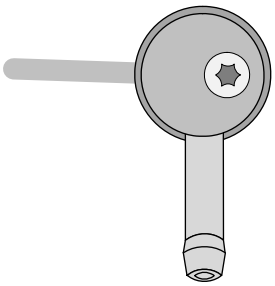
Fuel Tank Sending Unit Drilling Template

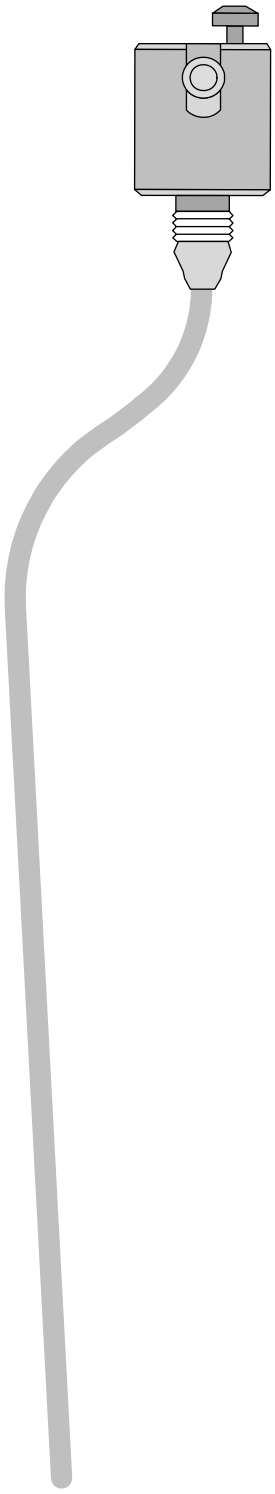




FuelFix Template

Top view





100mm

Scale 1:1

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

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

100mm

0

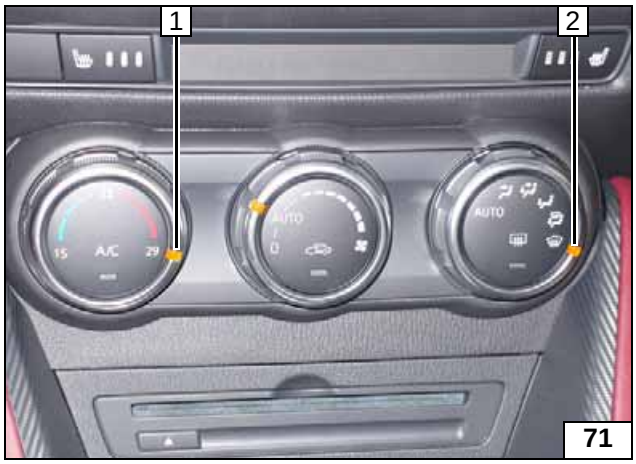
Operating Instructions for Automatic Air-Conditioning

Please remove page and add to the vehicle operating instructions.

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

Passenger compartment monitoring, if installed, must be deactivated in addition to the vehicle settings for the heating operation.
Deactivation instructions can be found in the operating instructions of the vehicle.

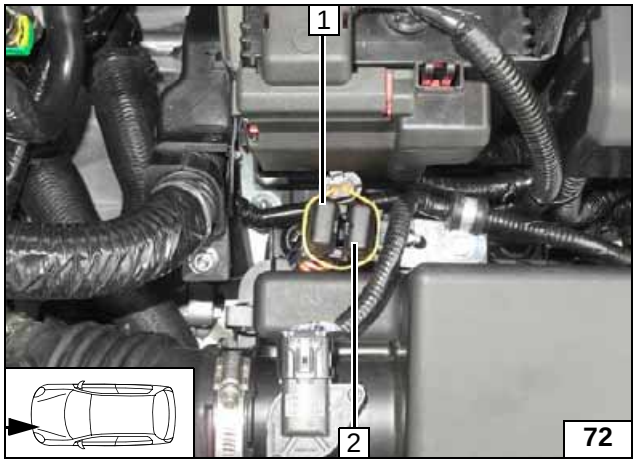
Before parking the vehicle, make the following settings:



The fan speed need not be preset!

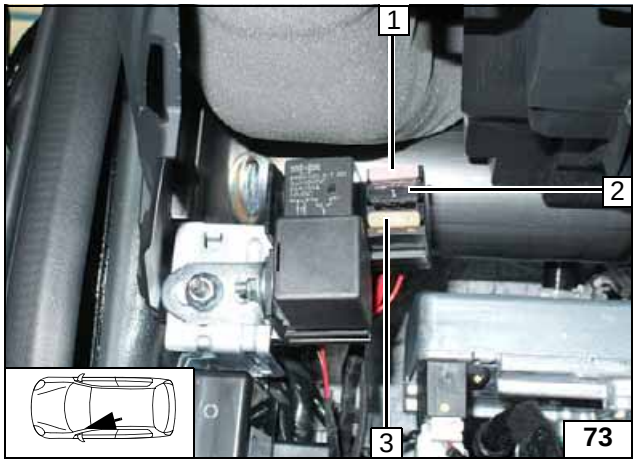
1 Set temperature to ‘max.’
2 Air outlet to windscreen

A/C control panel



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

Engine compartment fuses



1 5A fan fuse F5
2 1A heater control fuse F3
3 25A fan fuse F4

Passenger compartment fuses