Water Heater

Thermo Top Evo Parking Heater

E1
00 0258

Installation Documentation
Ford Ranger

Validity

Manufacturer	Model	Type	EG BE No. / ABE
Ford	Ranger	2AB	e11 * 2007 / 46 * 0154 *..

Motorisation	Fuel	Transmission type	Output in kW	Displacement in cm³	Engine code
2.2 Duratorq TDCI	Diesel	6-speed SG	92	2198	GBVAJQW
2.2 Duratorq TDCI	Diesel	6-speed SG	110	2198	GBVAJQJ
2.2 Duratorq TDCI	Diesel	6-speed SG	117	2198	QJ2S
3.2 Duratorq TDCI	Diesel	6-speed AG	147	3196	SAFA
3.2 Duratorq TDCI	Diesel	6-speed SG	147	3198	SA2S

SG = manual transmission
AG = automatic transmission

From model year 2012
Left-hand drive vehicle

Verified equipment variants: Manual air-conditioning
Automatic air-conditioning
Front fog lights
2WD / 4WD
Euro 5
Euro 6 (147 kW)

Not verified: Passenger compartment monitoring

Total installation time: approx. 9 hours

Ford Ranger

Table of Contents

Necessary Components

- Basic delivery scope of Thermo Top Evo based on price list
- Installation kit for Ford Ranger 2012 Diesel: **1318643C**
- Up to model year 2015 in case of automatic air-conditioning: Additional kit automatic air-conditioning for Ford Ranger: **1318911**_
- From model year 2016: Additional kit ‘Webasto Comfort’ A/C control for Ford Ranger: **1324050**_ **Warning**: Predefined customer settings are necessary in case of manual air-conditioning! See section ‘operating instructions’ in the ‘Webasto Comfort’ installation documentation
- 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
- In case of MultiControl CAR installation: MultiControl installation frame: **9030077**_

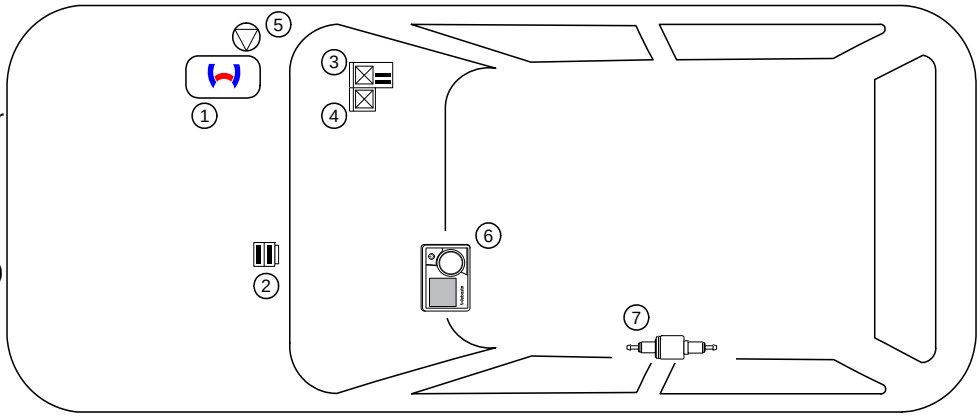
Installation instructions:

- 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 ThermoCall 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 (only up to MY 2015)
4. PWM Gateway (only in case of automatic A/C up to MY 2015)
5. Circulating pump
6. MultiControl CAR
7. Metering pump



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.

Ford Ranger

Information on Validity

This installation documentation applies to Ford Ranger Diesel vehicles - for validity, see page 1 - from model year 2012 and later, assuming technical modifications to the vehicle do not affect installation, any liability claims excluded. Depending on the vehicle version and equipment, modifications may be necessary during installation with respect to this ‘installation documentation’.

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

Technical 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

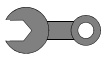
Dimensions
- All dimensions are in mm.

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.

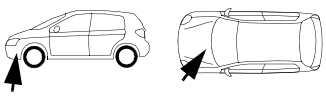
Specific risk of injury or fatal accidents.

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.

Ford Ranger

Preliminary Work

Vehicle

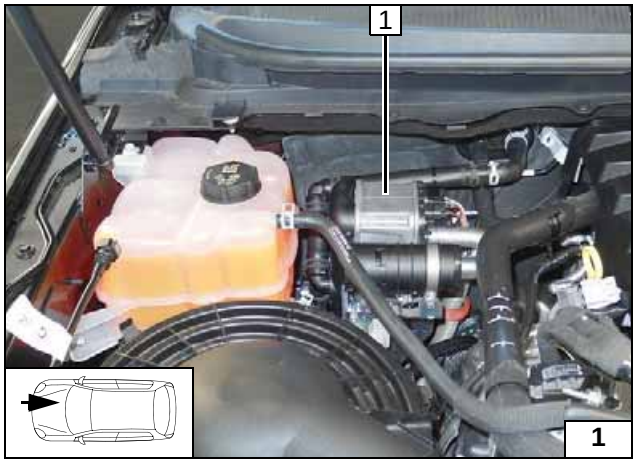
- Open the fuel tank cap.
- Ventilate the fuel tank.
- Close the fuel tank cap again.
- Depressurise the cooling system.
- Disconnect the battery.
- Remove the air filter box.
- Loosen the coolant expansion tank.
- Loosen the lateral rubber cover in the right wheel well.
- Remove the trim next to the instrument panel (only in case of Telestart).
- Remove the lower instrument panel trim on the front passenger's side.
- Remove the glove box.

Only carry out the following tasks when the procedure requires it:

- Remove the left rear wheel well trim.
- Remove the bolt from the filler neck.
- Lower the fuel tank.
- Remove the fuel tank sending unit in accordance with the manufacturer's instructions.

Heater

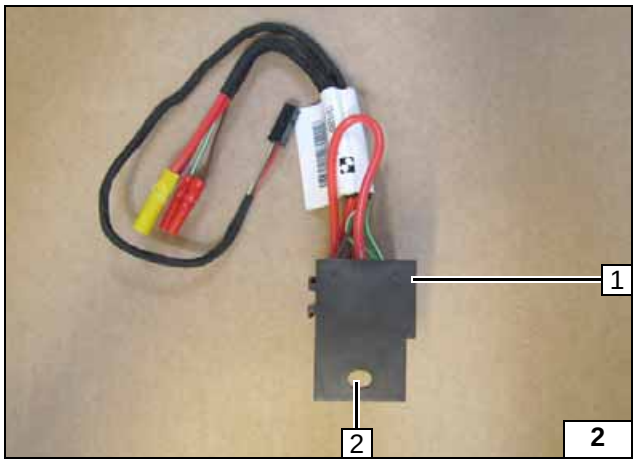
- Remove years that do not apply from the type and duplicate label.
- Attach the duplicate label (type label) visibly in the appropriate place in the engine compartment.



Heater Installation Location

1 Heater

Installation location



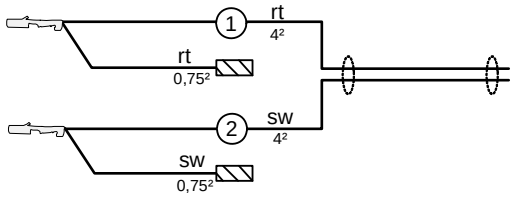
2

Preparing Electrical System

Wire sections retain their numbering in the entire document.

1 Passenger compartment relay and fuse holder
2 Drill out 6 mm dia. hole

Preparing passenger compartment relay and fuse holder

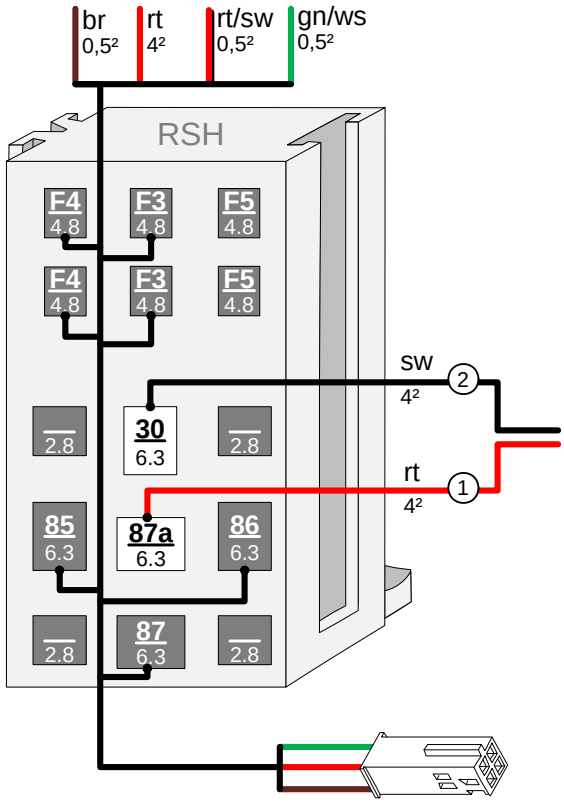


3

Manual air-conditioning up to MY 2015

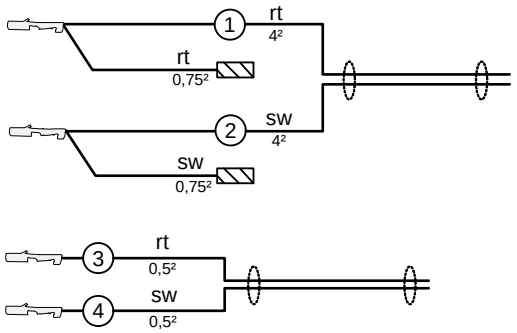
① Red (rt) wire of fan wiring harness
② Black (sw) wire of fan wiring harness

Preparing / assigning wiring harness



4

Connecting wires to passenger compartment relay and fuse holder

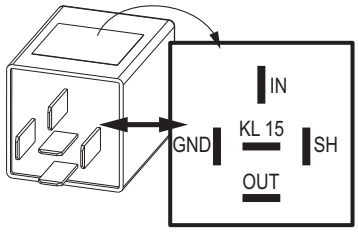


5

Automatic air-conditioning up to MY 2015

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

Preparing / assigning wiring harnesses



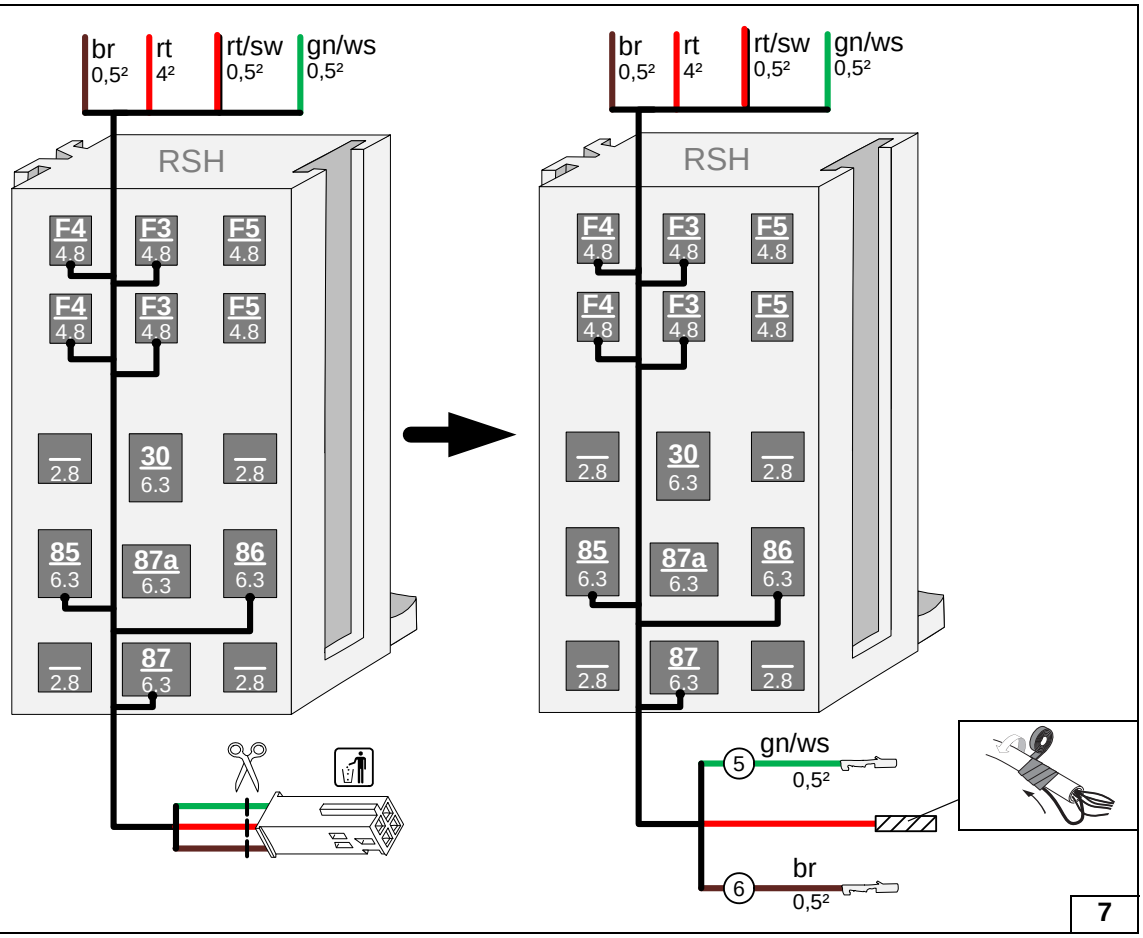
6

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

Settings:

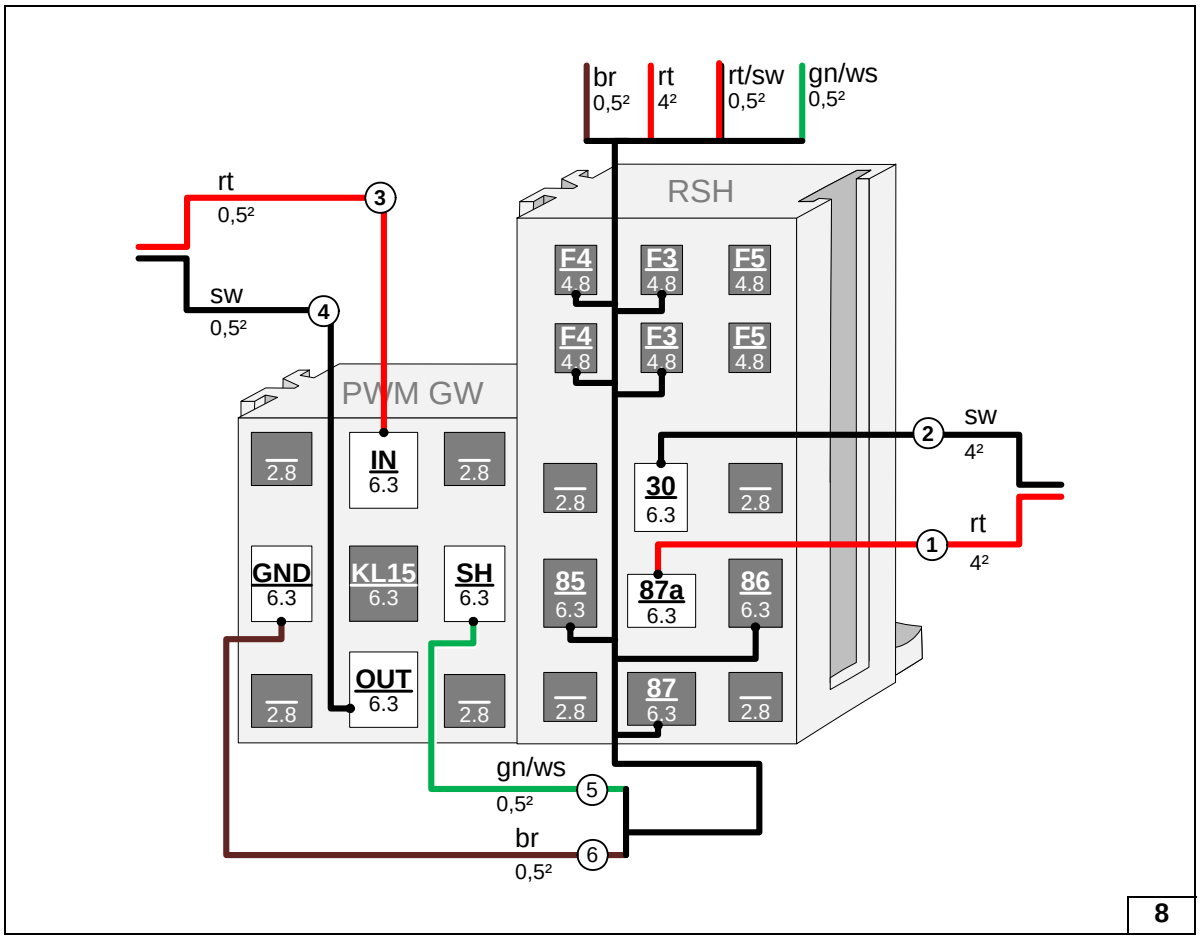
Duty cycle: 65%
Frequency: 400Hz
Voltage: not relevant
Function: Low side

View of PWM GW



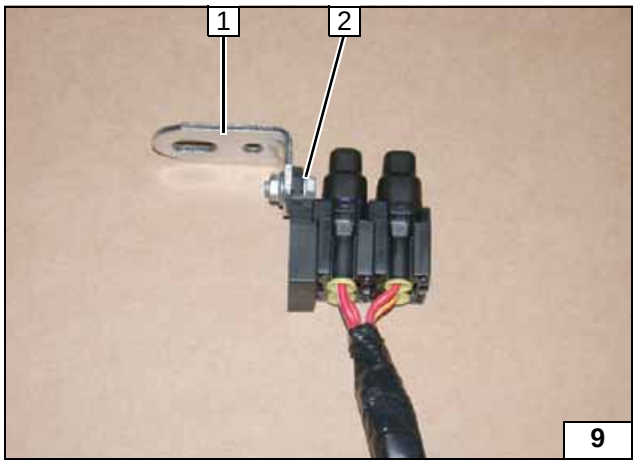
7

Preparing passenger compartment relay and fuse holder/ installing blade receptacles/ assigning/insulating wires



8

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



9

All vehicles

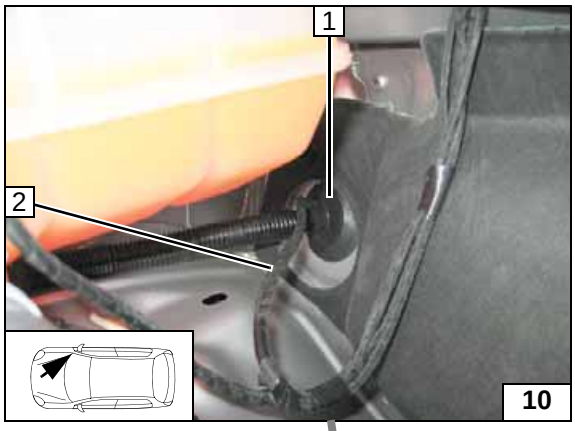
1 Angle bracket
2 M5x16 bolt, large diameter washer [2x], nut

Preparing fuse holder of engine compartment

Electrical System

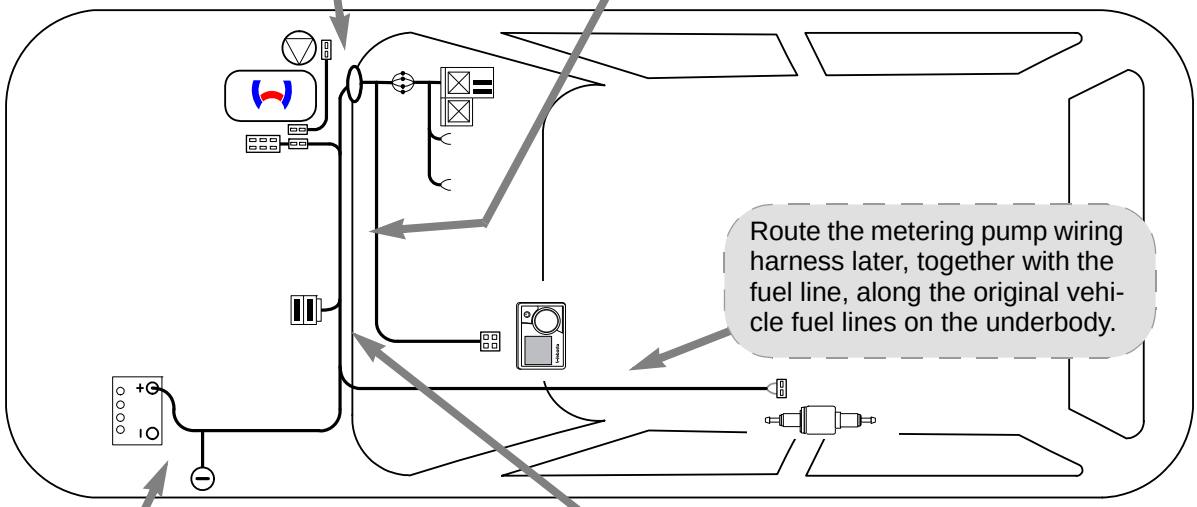
Wiring harness pass through

1 Protective rubber plug
2 Heater wiring harnesses, heater control

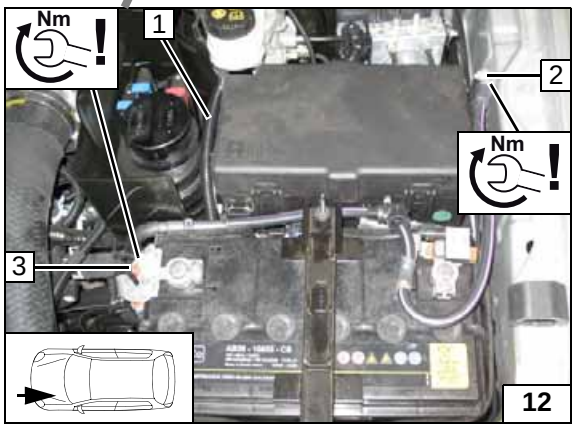


Wiring Harness Routing

Route wiring harnesses of heater and heater control **1** behind insulation.



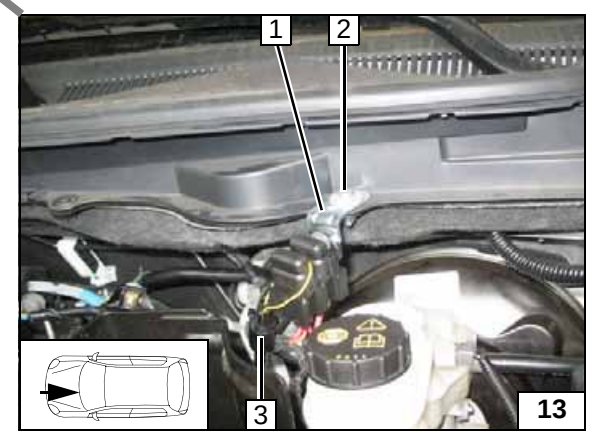
Wiring harness routing diagram



Positive and earth wire

Route positive wire in 270mm long, 6mm dia. corrugated tube **1**.

2 Earth wire, 8 mm dia. cable lug, original vehicle earth support point
3 Positive wire, 8 mm dia. cable lug on positive battery terminal



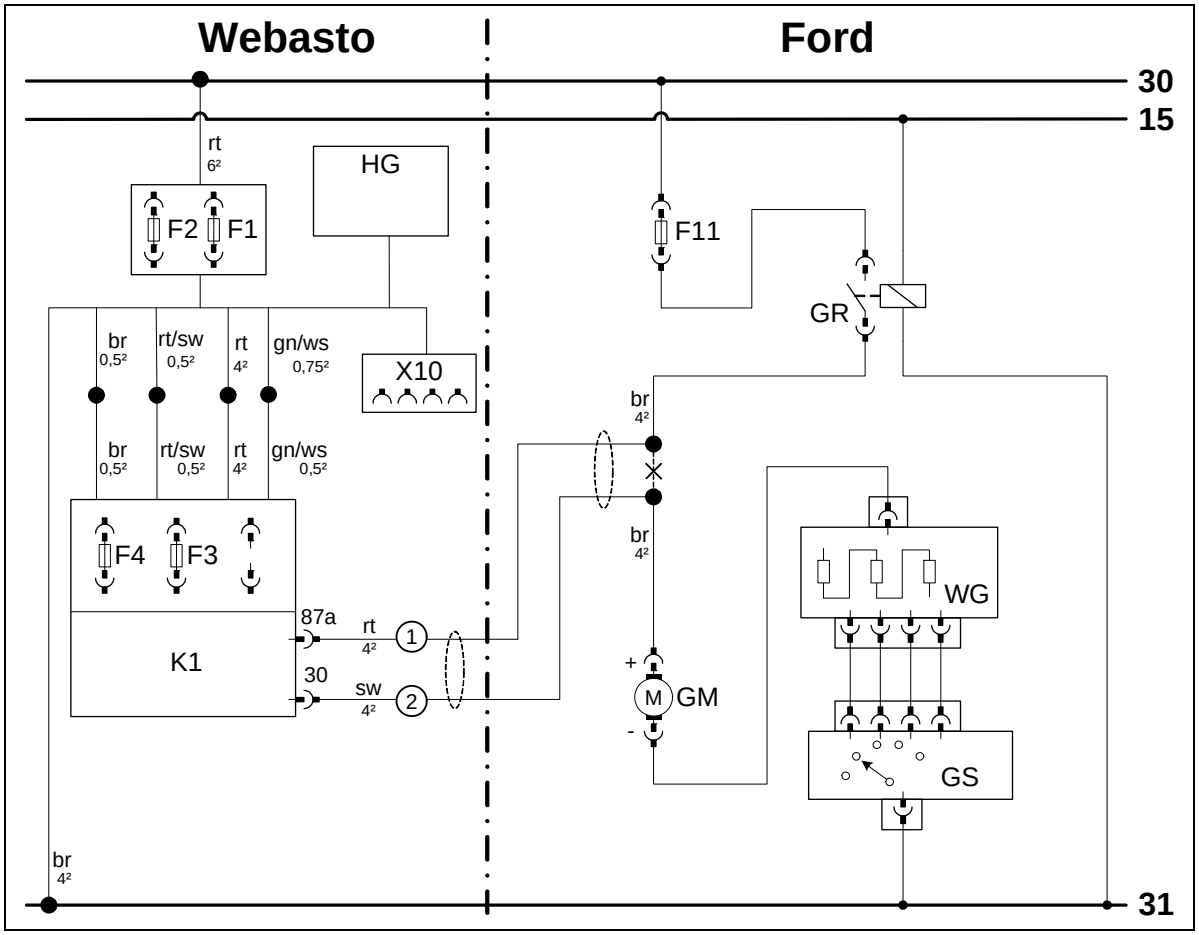
Engine compartment fuse holder

Remove clip at position **2**.

1 Angle bracket
2 M6x20 bolt, washer [2x] , nut, existing hole
3 Diagnostic connector

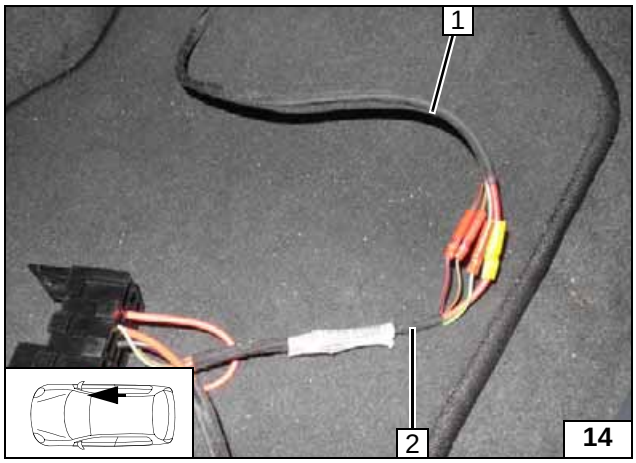
Manual A/C Fan Controller up to MY 2015

System wiring diagram



Legend

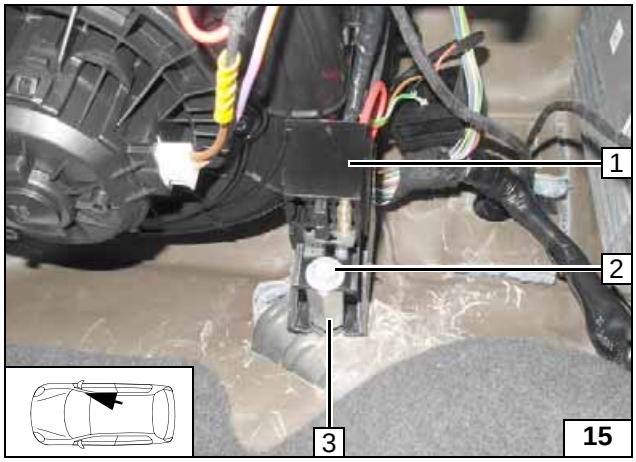
Webasto components		Vehicle components		Colours and symbols	
HG	TT-Evo heater	F11	30A fan fuse	rt	red
F1	20A fuse	GR	R26 fan relay	sw	black
F2	30A fuse	WG	Resistor group	ge	yellow
X10	4-pin connector of heater control	GM	Fan motor	gn	green
		GS	Fan switch	br	brown
F3	1A fuse			ws	white
F4	25A fuse				
K1	Fan relay				
				X	Cutting point
				Wiring colours may vary.	



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

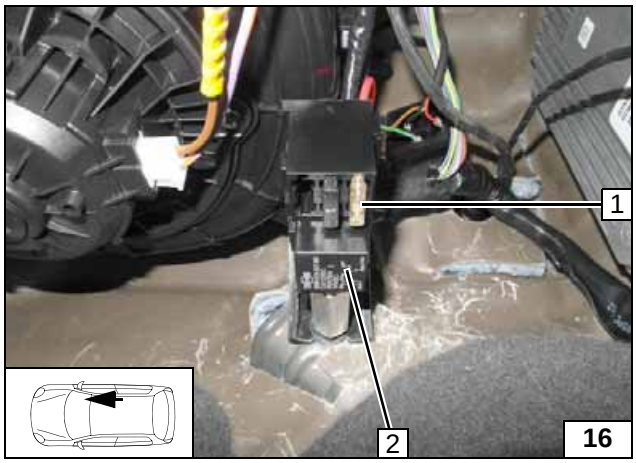
1 Heater wiring harness
2 Passenger compartment relay and fuse holder wiring harness

Connecting same colour wires of wiring harnesses



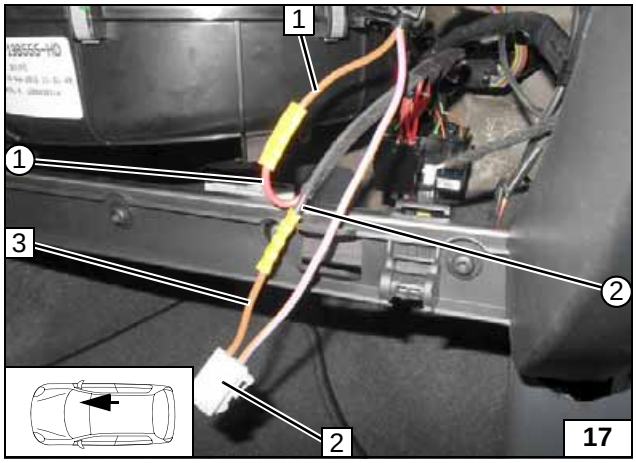
1 Passenger compartment relay and fuse holder
2 M6x12 bolt, large diameter washer
3 M6x40 spacer nut, original vehicle stud bolt

Installing passenger compartment relay and fuse holder



1 25A fuse F4
2 Relay K1

Inserting relay K1

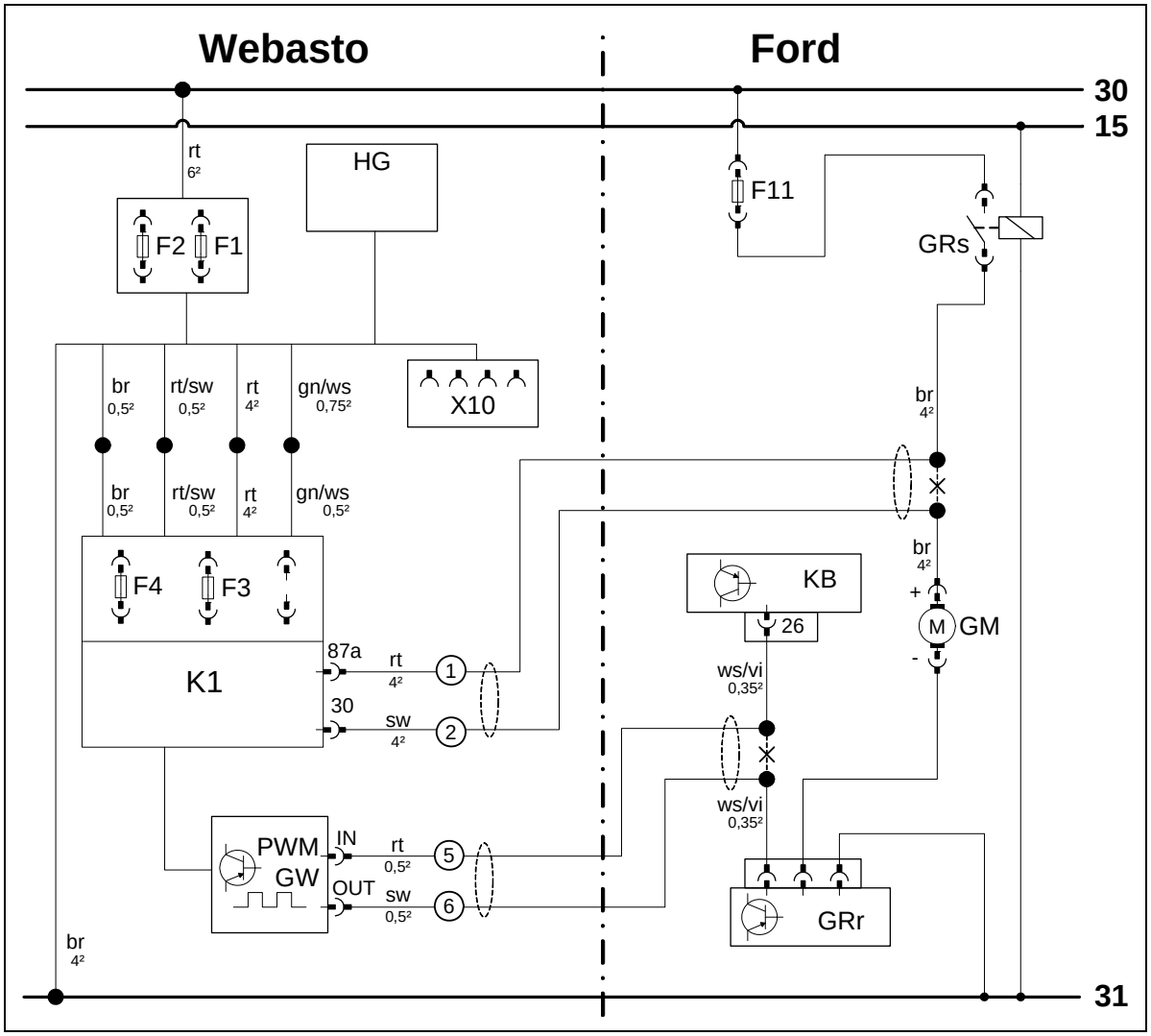


1 Brown (br) wire of fuse
2 2-pin connector GM
3 Brown (br) wire of fan motor (GM) connector
① Red (rt) wire of K1/87a, fan wiring harness
② Black (sw) wire of K1/30, fan wiring harness

Connecting fan motor

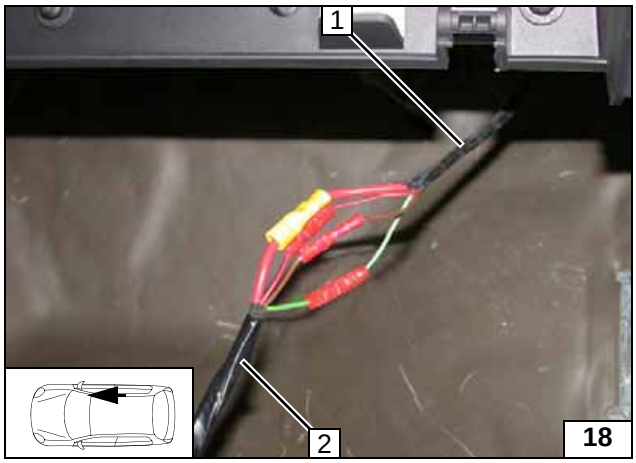
Automatic A/C Fan Controller up to MY 2015

System wiring diagram



Webasto components		Vehicle components		Colours and symbols	
HG	TT-Evo heater	F11	30A fan fuse	rt	red
F1	20A fuse	GRs	R26 fan relay	sw	black
F2	30A fuse	KB	A/C control panel	ge	yellow
X10	4-pin connector of heater control	GM	Fan motor	gn	green
		GRr	Fan controller	br	brown
F3	1A fuse			ws	white
F4	25A fuse			vi	violet
K1	Fan relay				
PWM GW	Pulse width modulator				
PWM GW settings:					
Duty cycle:	100% (DC)				
Frequency:	not relevant				
Voltage:	4.2V			**X**	Cutting point
Function:	High side			Wiring colours may vary.	

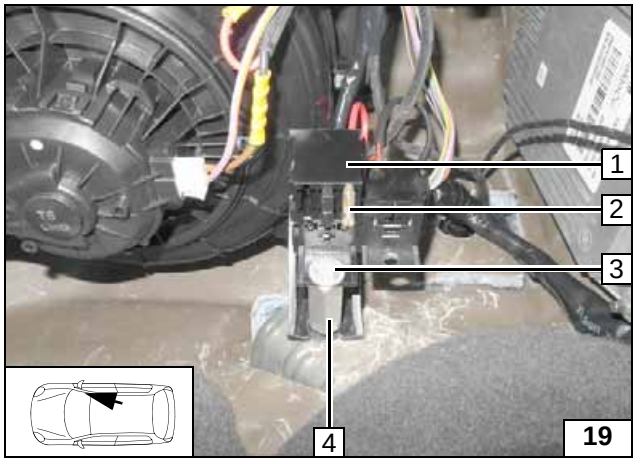
Legend



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

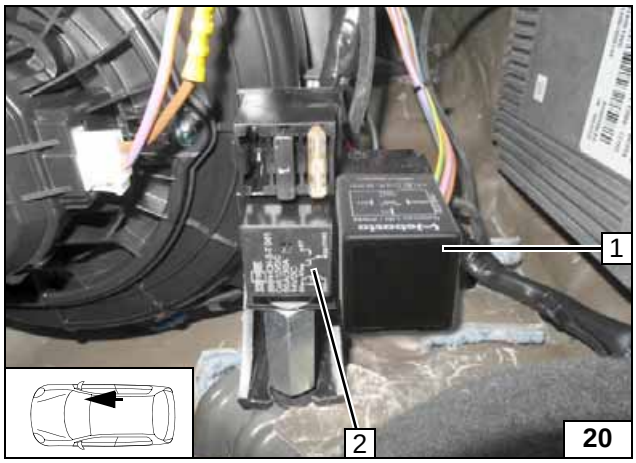
1 Heater wiring harness
2 Passenger compartment relay and fuse holder wiring harness

Connecting same colour wires of wiring harnesses



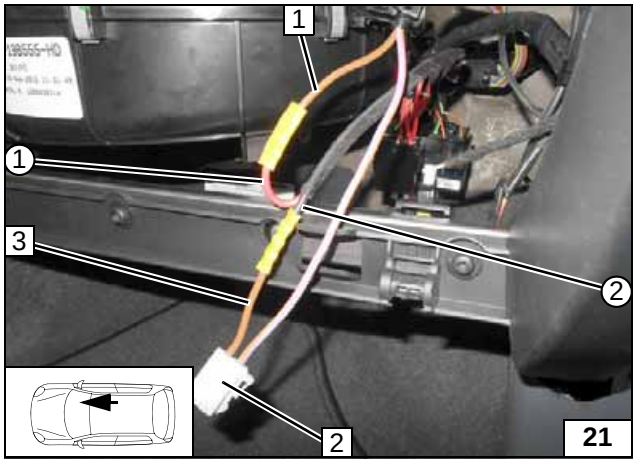
1 Passenger compartment relay and fuse holder
2 25A fuse F4
3 M6x12 bolt, large diameter washer
4 M6x40 spacer nut, original vehicle stud bolt

Installing passenger compartment relay and fuse holder



1 PWM GW
2 Relay K1

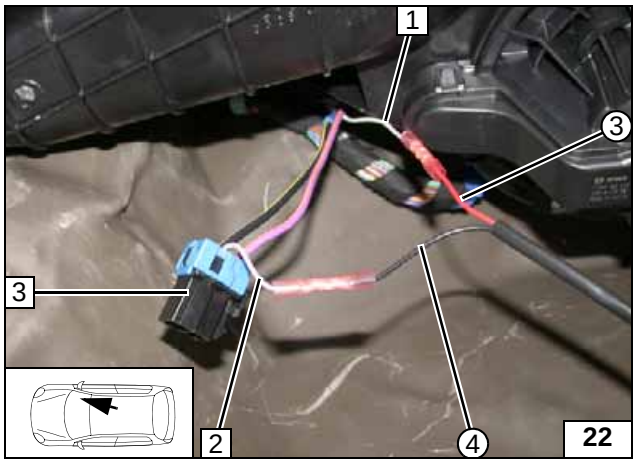
Installing PWM GW and relay K1



Connection on 2-pin connector **2** from fan motor.

1 Brown (br) wire of fuse
3 Brown (br) wire of fan motor (GM) connector
① Red (rt) wire of K1/87a, fan wiring harness
② Black (sw) wire of K1/30, fan wiring harness

Connecting fan motor



Connection to 3-pin connector **3** from fan controller.

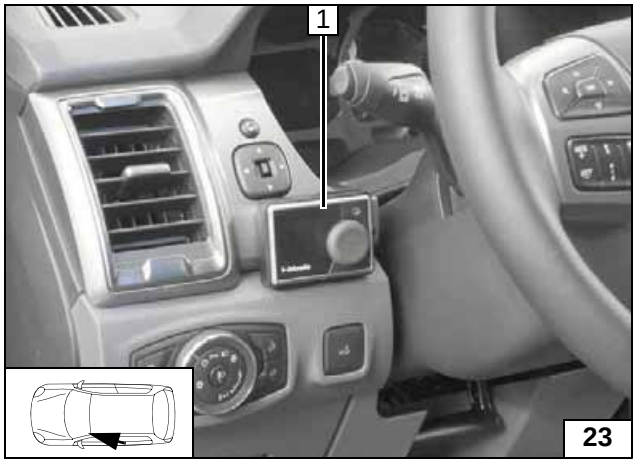
1 White/violet (ws/vi) wire of A/C control panel
2 White/violet (ws/vi) wire of connector GRr
③ Red (rt) wire from PWM GW/IN of PWM control wiring harness
④ Black (sw) wire from PWM GW/OUT of PWM control wiring harness

Connecting fan controller

Fan Controller from MY 2016

! Integrate the A/C control from MY 2016 as explained in the separate installation documentation:

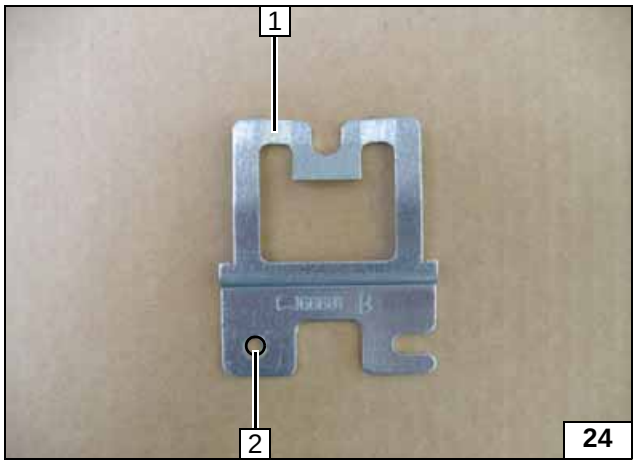
Installation documentation **'Webasto Comfort'** A/C control for Ford Ranger with AAC



MultiControl CAR Option

1 MultiControl CAR

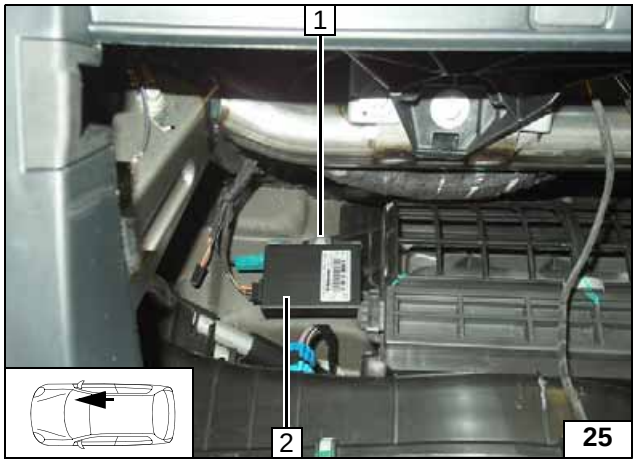
Installing MultiControl CAR



Remote Option (Telestart)

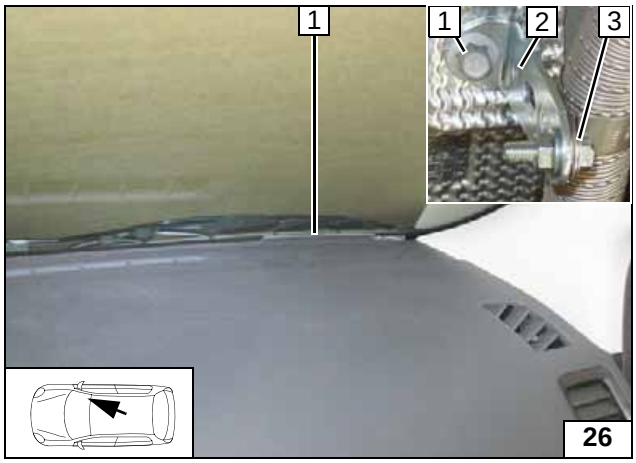
1 Bracket of receiver
2 Drill out hole to 7mm dia.

Preparing bracket



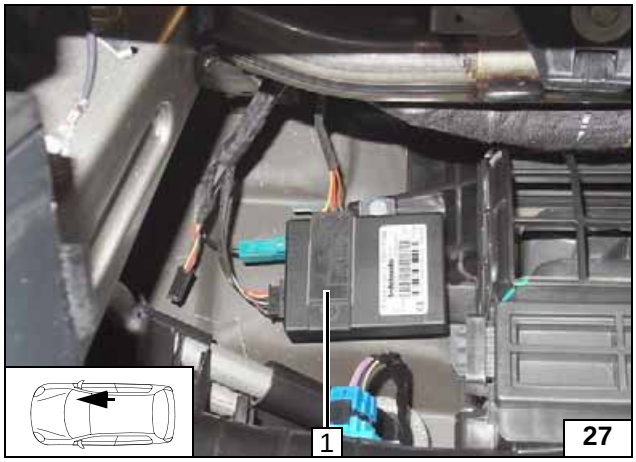
1 M6x12 bolt, spring lockwasher, 20mm spacer nut, original vehicle stud bolt
2 Receiver

Installing receiver



1 Aerial

Installing aerial

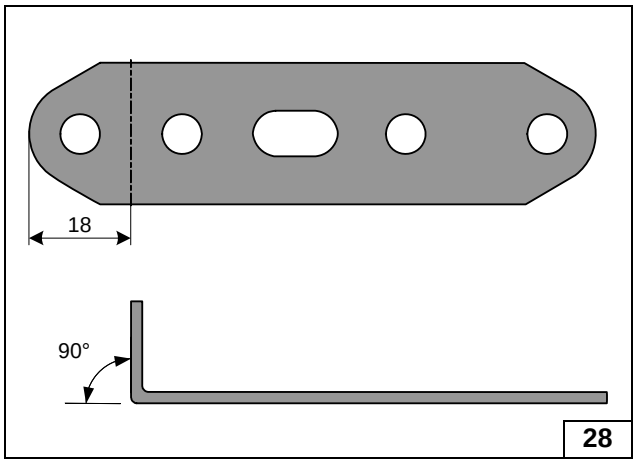


Temperature sensor T100 HTM

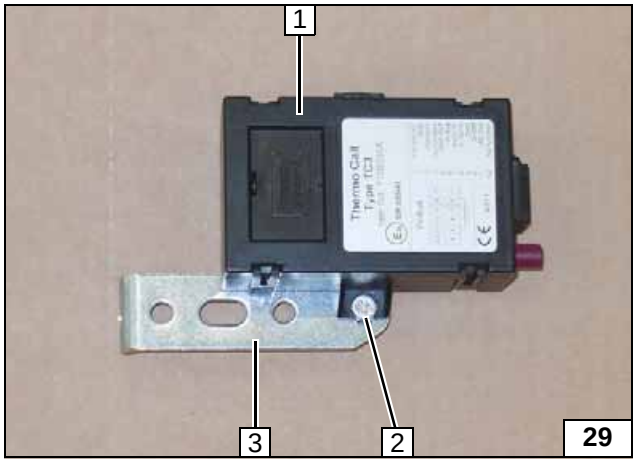
Fasten temperature sensor **1** with double-sided adhesive tape.

Installing temperature sensor

ThermoCall Option

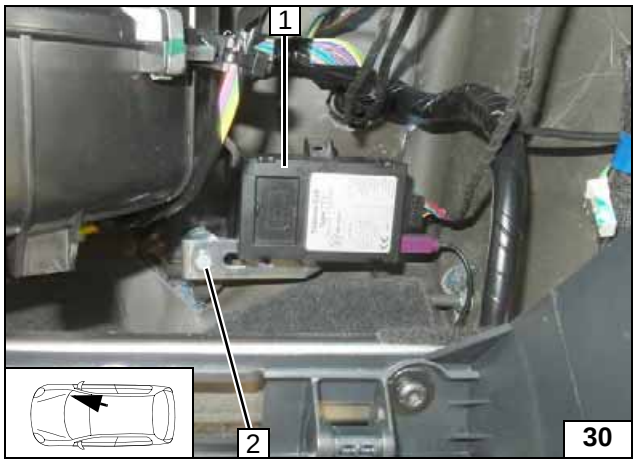


Preparing perforated bracket



1 Receiver
2 M5x16 bolt, washer, flanged nut
3 Perforated bracket

Premounting receiver



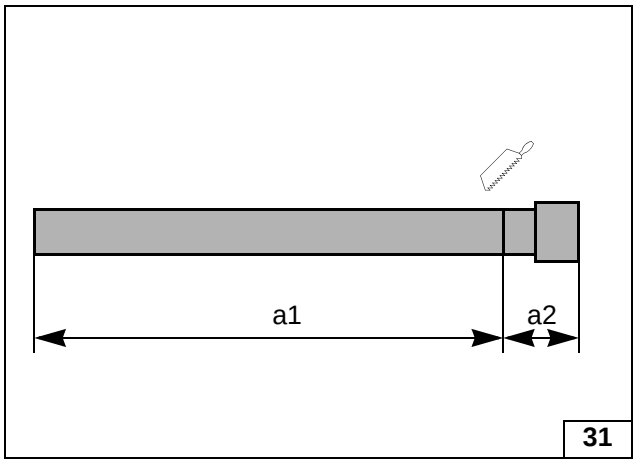
1 Receiver
2 M6x12 bolt, spring lockwasher, 20mm spacer nut, original vehicle stud bolt

Installing receiver

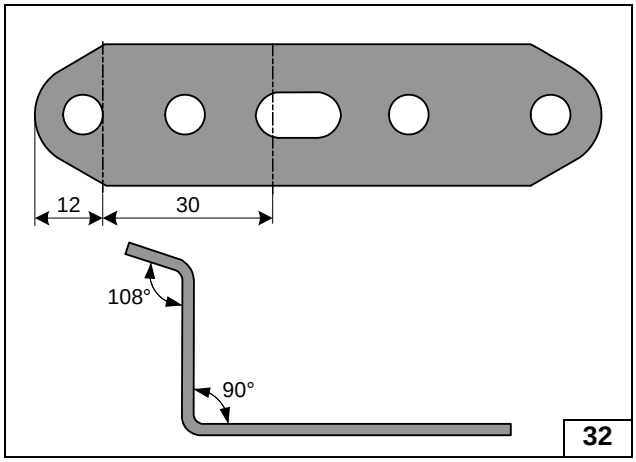
Exhaust Gas

a1 = 950
a2 = 50

Preparing exhaust pipe

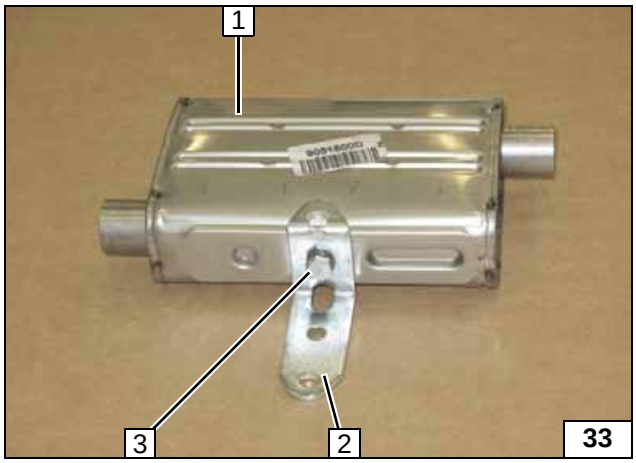


Preparing perforated bracket



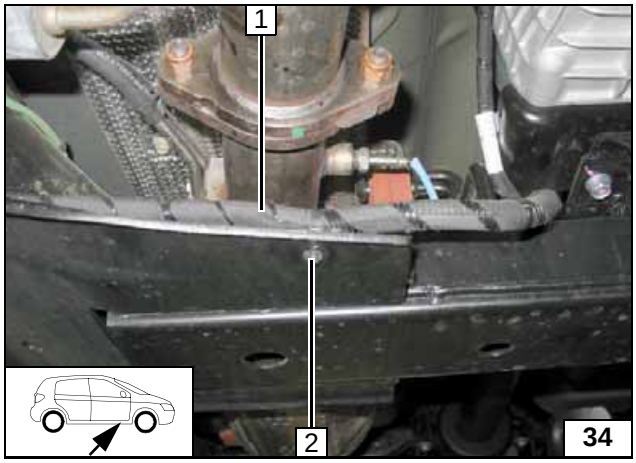
Premounting silencer

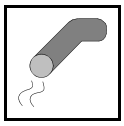
1 Silencer
2 Perforated bracket
3 M6x16 bolt, spring lockwasher

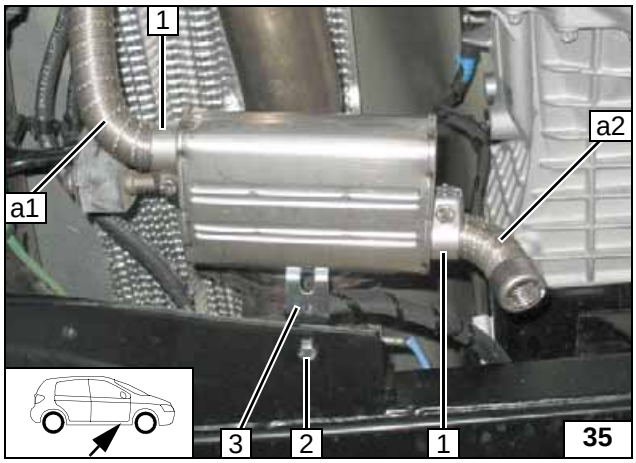


Detaching clip

1 Original vehicle wiring harness, if present
2 Detach retaining clip, if present

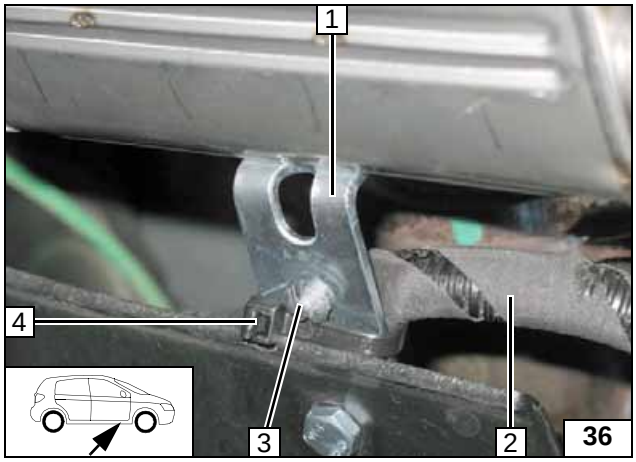






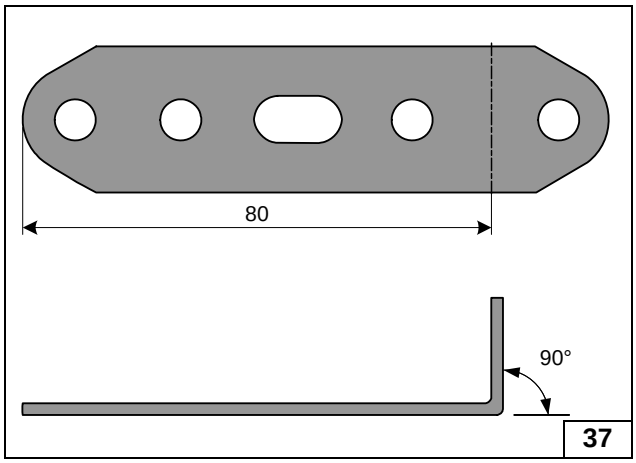
1 Hose clamp [2x]
2 M6x20 bolt, flanged nut, existing hole
3 Perforated bracket

Installing silencer

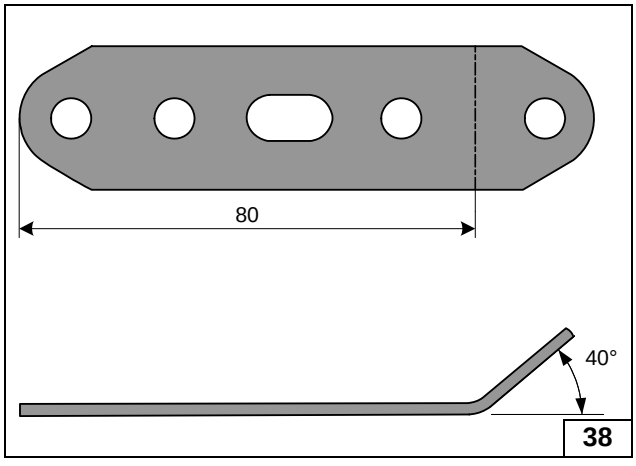


Insert retaining clip **3** of original vehicle wiring harness **2** into hole of perforated bracket **1** and secure it using cable tie **4**.

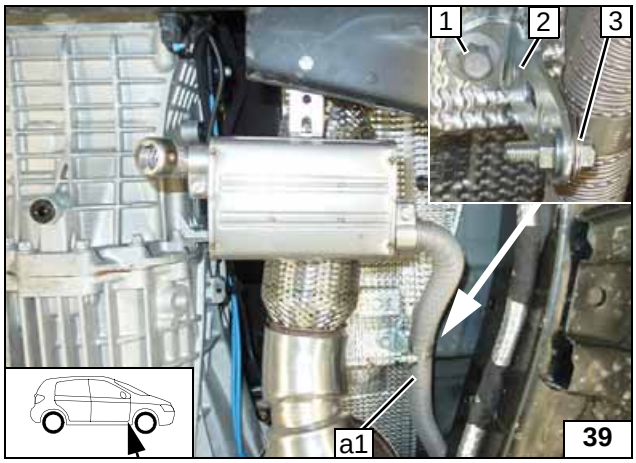
Attaching wiring harness, if present



Preparing perforated bracket with 90° angle bracket

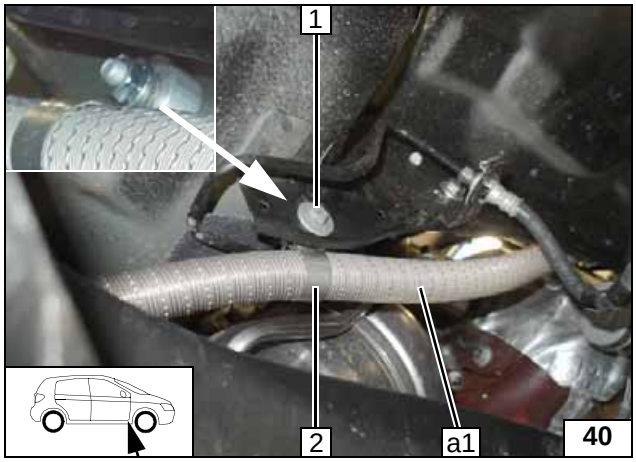


Preparing perforated bracket with 40° angle bracket



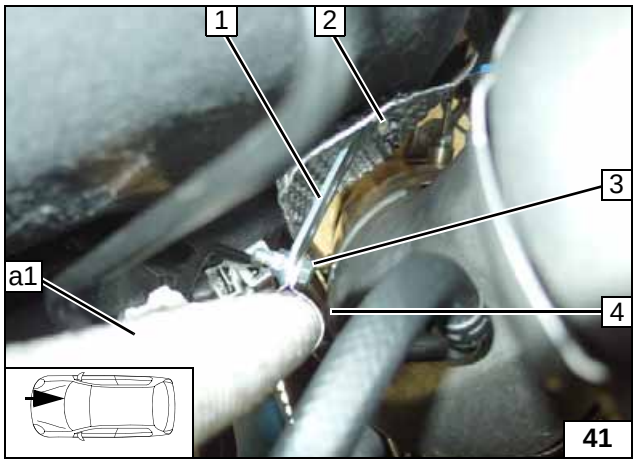
1 Original vehicle bolt
2 Perforated bracket with 90° angle bracket
3 M6x20 bolt, p-clamp, flanged nut

Installing exhaust pipe a1



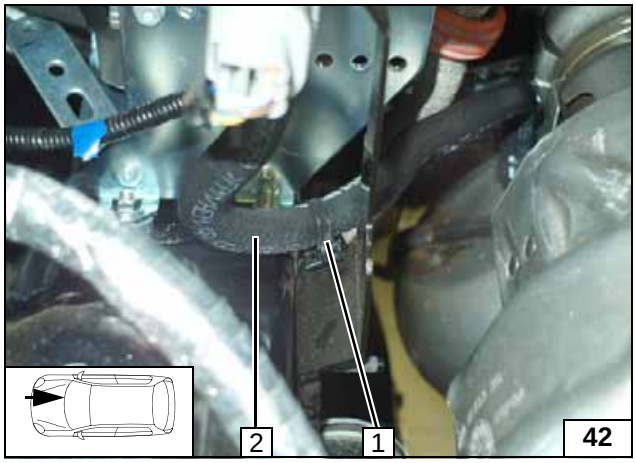
1 M6x25 bolt, large diameter washer, 10mm shim, flanged nut
2 P-clamp

Installing exhaust pipe a1



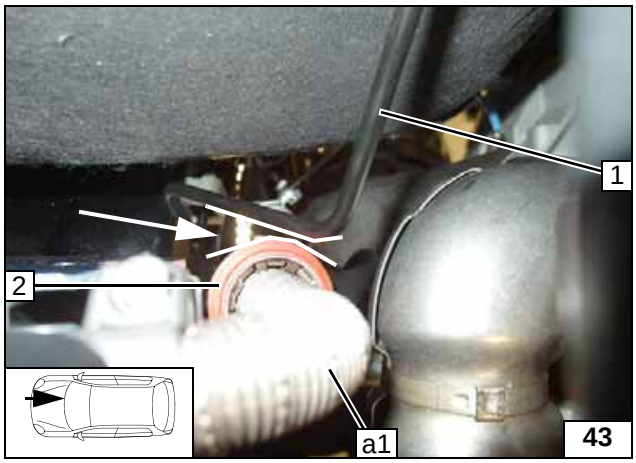
1 Perforated bracket with 40° angle bracket
2 Original vehicle stud bolt, flanged nut
3 M6x20 bolt, flanged nut
4 P-clamp

Installing exhaust pipe a1

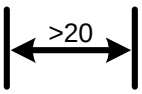


1 Clip-type cable tie
2 Original vehicle rubber hose

Attaching original vehicle rubber hose, if present



1 Original vehicle brake line
2 Spacer bracket



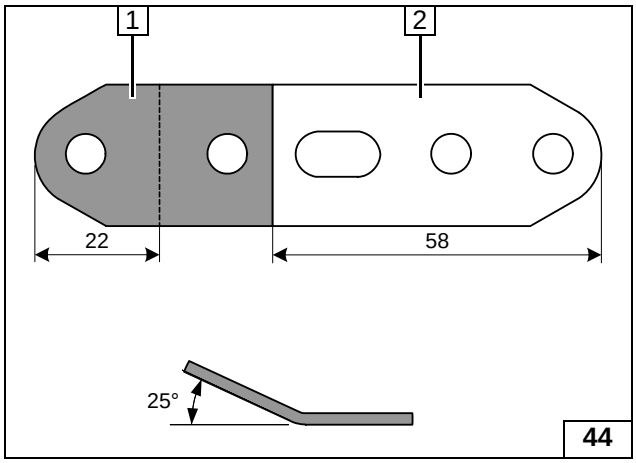
Installing spacer bracket

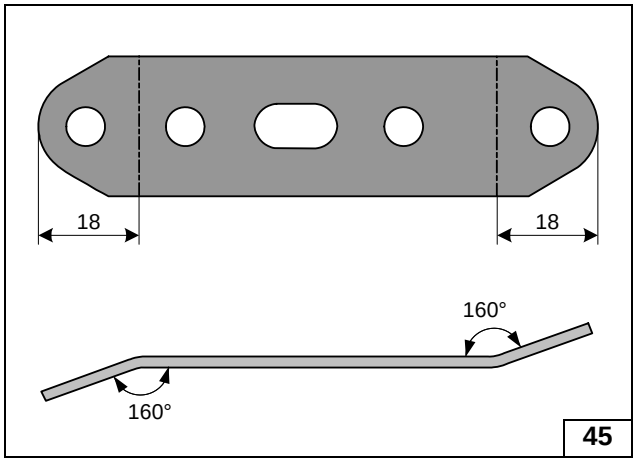
Preparing Bracket

Section **2** will be needed 1x for mounting the metering pump and 1x for mounting the combustion air silencer.

1 Cut perforated bracket [2x] to length and bend

Preparing 2x perforated bracket

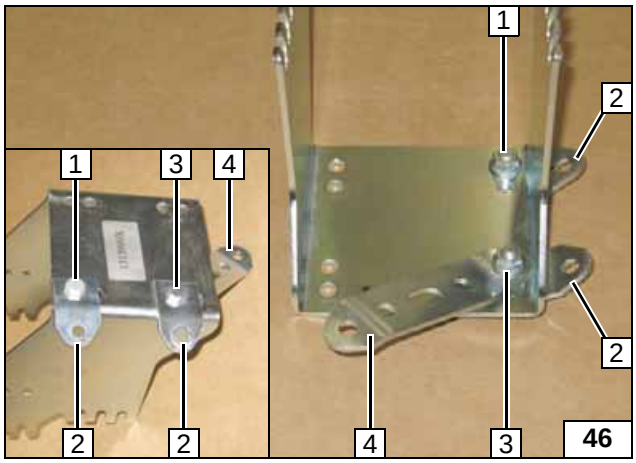




Preparing perforated bracket

1 M6x12 bolt, flanged nut
2 Perforated bracket [2x]
3 M6x12 bolt, flanged nut
4 Perforated bracket

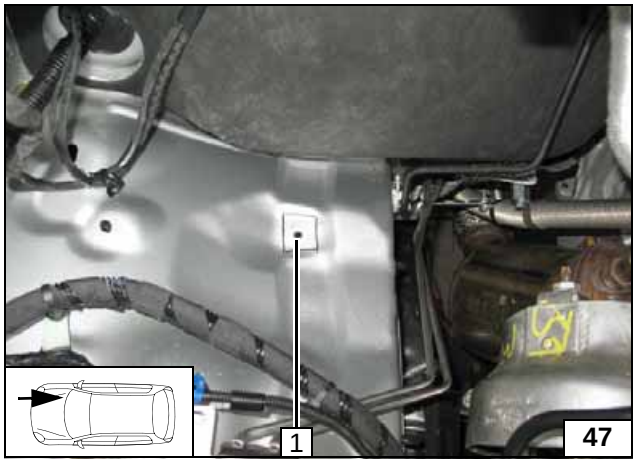
Premounting bracket

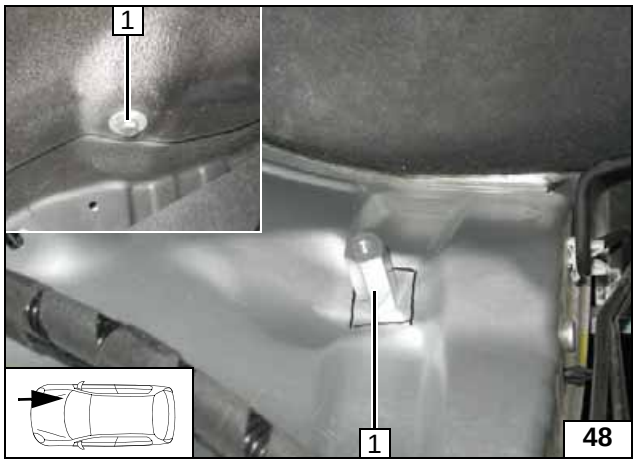


Bracket Installation

7mm dia. hole **1** in centre of square recess.

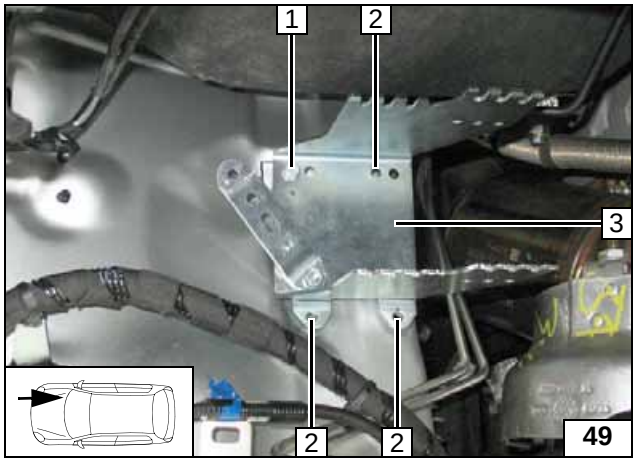
Hole in wheel well





1 M6x20 bolt, spring lockwasher, large diameter washer, M6x40 spacer nut

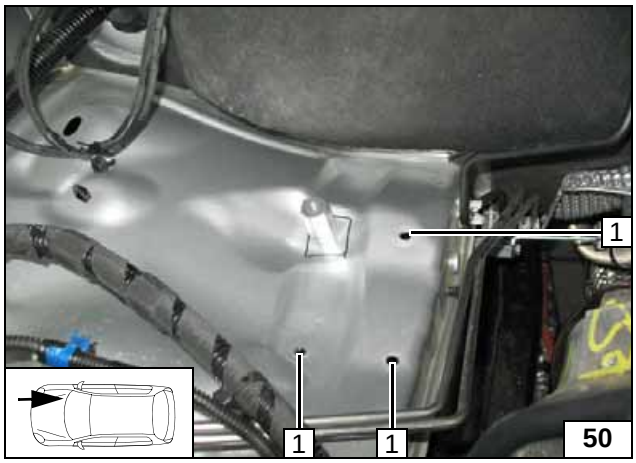
Installing spacer nut



Align bracket **3** with firewall and mount loosely.

1 M6x20 bolt
2 Copy hole pattern [3x]

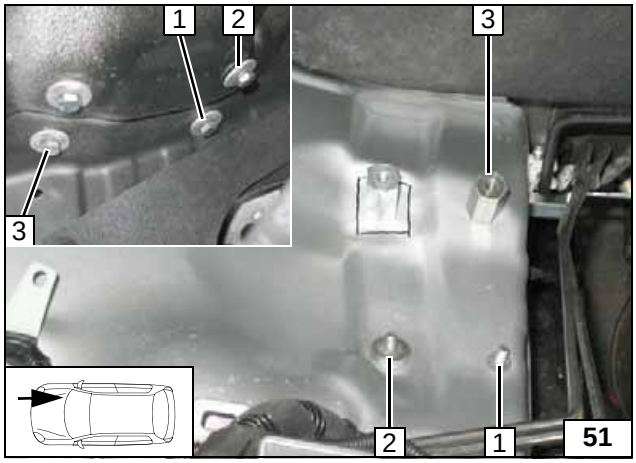
Installing bracket loosely



Remove bracket.

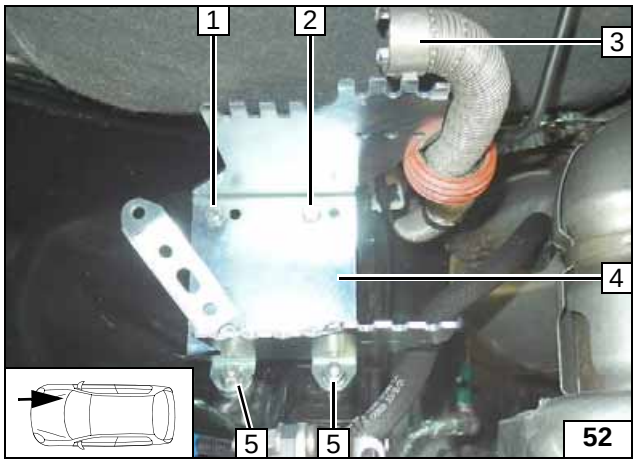
1 7 mm dia. hole [3x]

Holes in wheel well



1 M6x20 bolt, spring lockwasher, large diameter washer, screw locking device
2 M6x20 bolt, spring lockwasher, large diameter washer, 5 mm shim, pin lock
3 M6x16 bolt, spring lockwasher, large diameter washer, M6x30 spacer nut

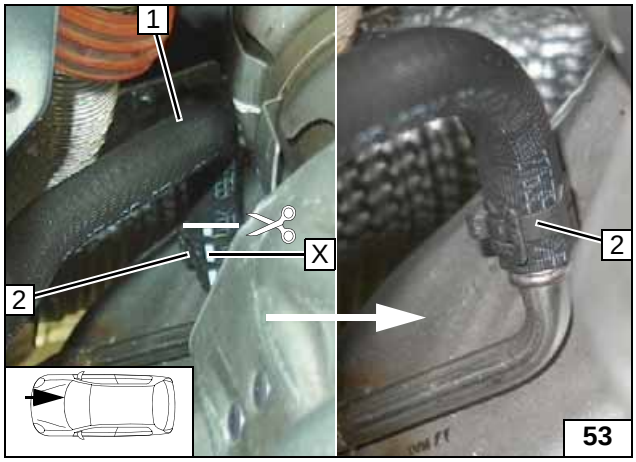
Inserting bolts, installing spacer nut



Align bracket **4** with firewall and install.

1 M6x20 bolt, spring lockwasher
2 M6x16 bolt, spring lockwasher
3 Slide on hose clamp
5 Flanged nut [2x]

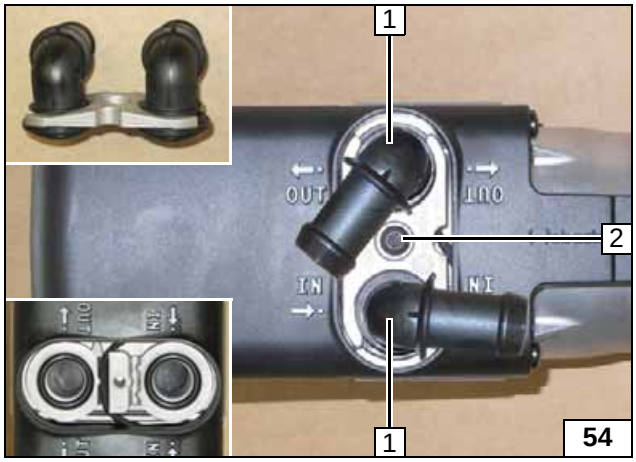
Installing bracket / aligning exhaust pipe



Disconnect original vehicle rubber hose **1** from exhaust system, shorten as shown and reinstall. At the same time, turn it away from the heater exhaust pipe! Original vehicle spring clip **2** will be reused!

X =

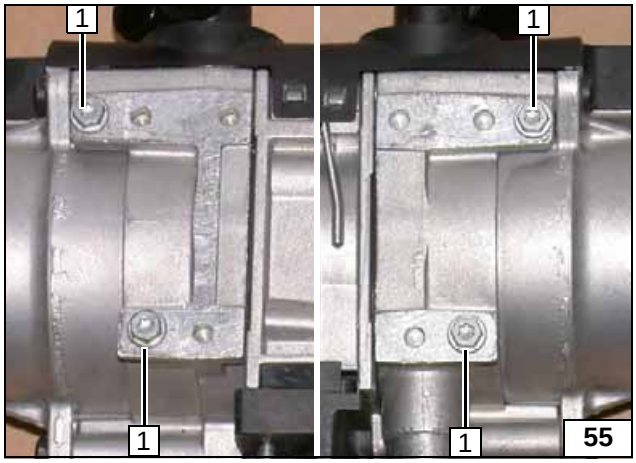
Shortening original vehicle rubber hose



Preparing Heater

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

Installing water connection piece



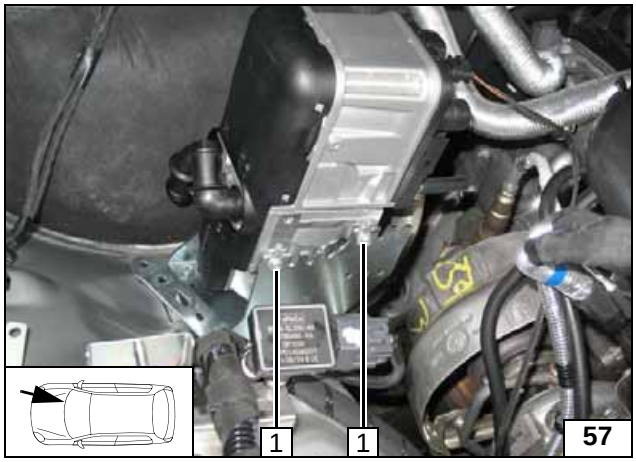
Screw 5x13 self-tapping bolts **1** [4x] into existing holes by a maximum of 3 thread turns.

Premounting bolts loosely

1 Circulating pump connector
2 Hose section, 10 mm dia. clamp

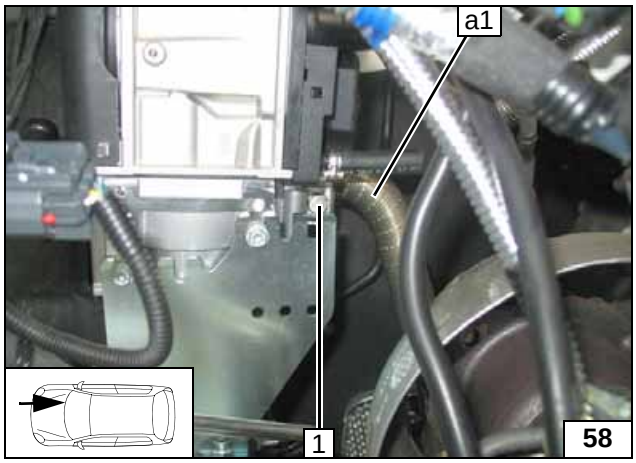
Installing wiring harness

Installing Heater



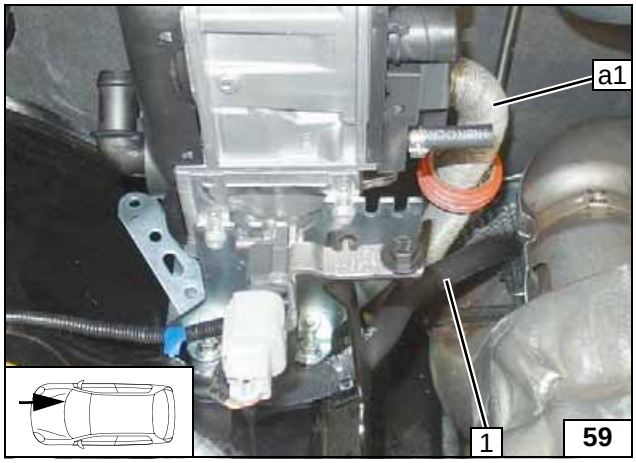
1 Tighten 5x13 self-tapping bolt [4x] (bolts on the opposite side not visible)

Installing heater



1 Tighten hose clamp

Installing exhaust pipe a1



Ensure sufficient distance between exhaust pipe **a1** and original vehicle rubber hose **1**, correct if necessary!

Checking distance

Fuel

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

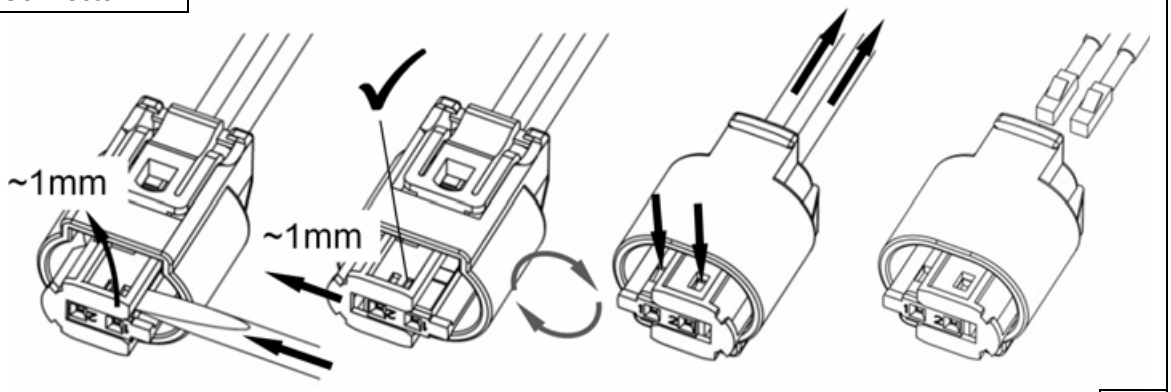
Catch any fuel running off in an appropriate container.

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.

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

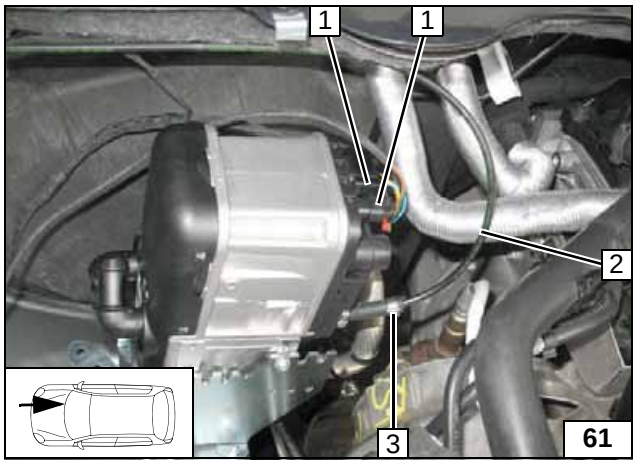
Dismantling metering pump connector

Connector X7



60

Connecting heater



61

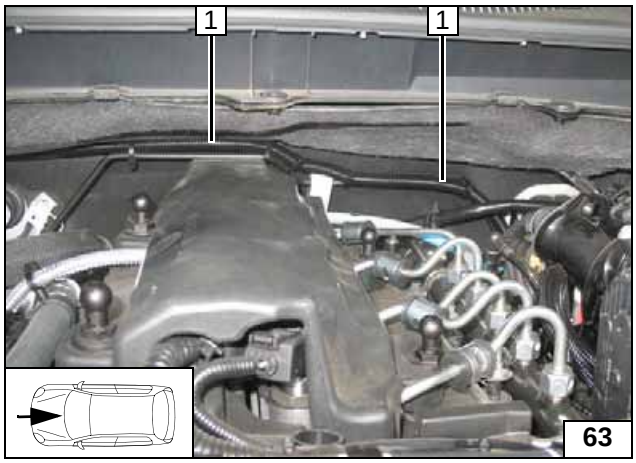
1 Heater wiring harness connector [2x]
2 Fuel line
3 10 mm dia. clamp

Connecting heater

Route 10 mm dia. corrugated tube **2** to the left side of the vehicle along original vehicle lines.

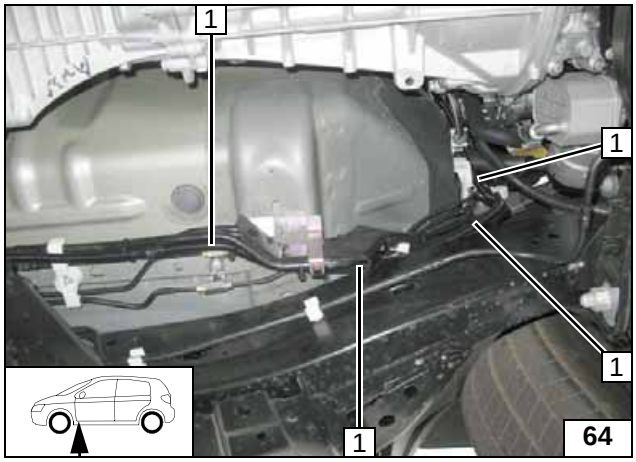
62

1 14.5 mm dia., 300 mm long heat protection hose on wiring harness of metering pump and fuel line
2 10 mm dia., 2100 mm long corrugated tube on wiring harness of metering pump and fuel line



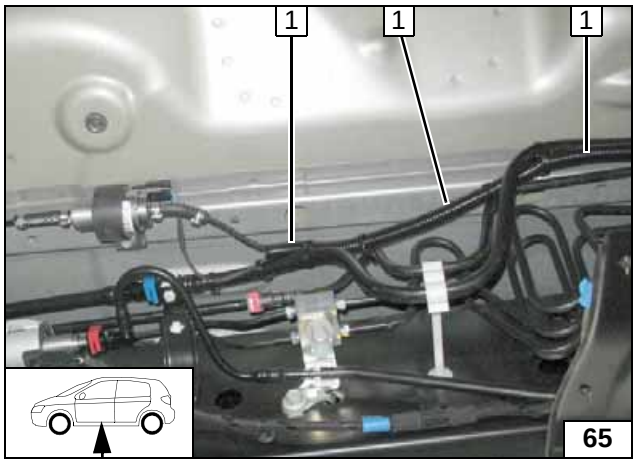
Route wiring harness of metering pump and fuel line in 10mm dia. corrugated tube **1** to the underbody along original vehicle lines.

Routing lines



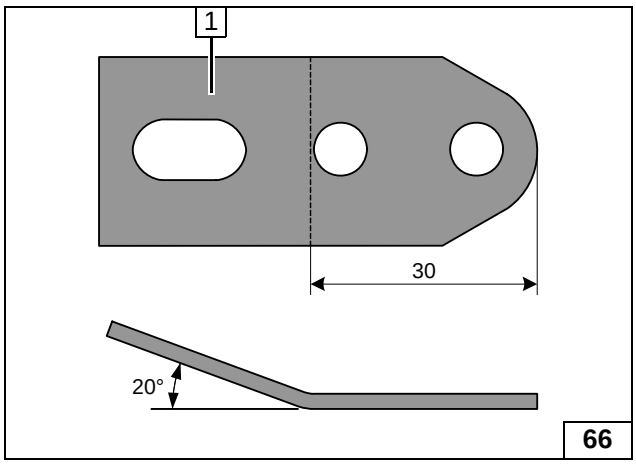
Route wiring harness of metering pump and fuel line in 10mm dia. corrugated tube **1** along original vehicle lines.

Routing lines



Route wiring harness of metering pump and fuel line in 10mm dia., 1000 mm long corrugated tube **1** to the installation location of the metering pump along original vehicle lines.

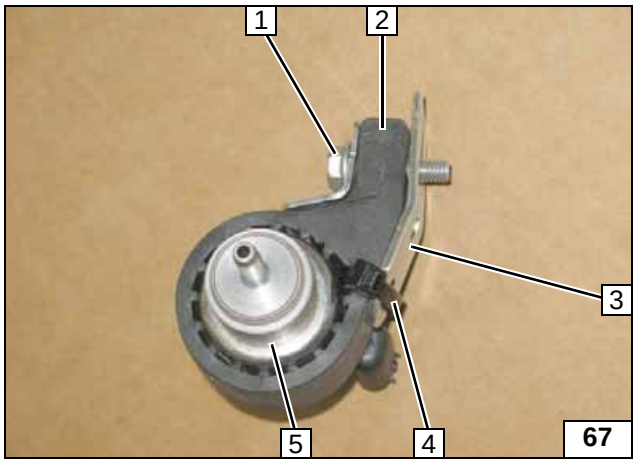
Routing lines



1 Perforated bracket (see section ‘Preparing Bracket’)

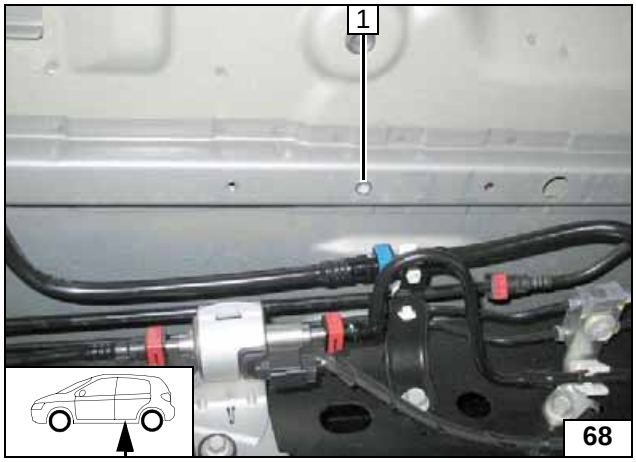
Bending perforated bracket section

Premounting metering pump



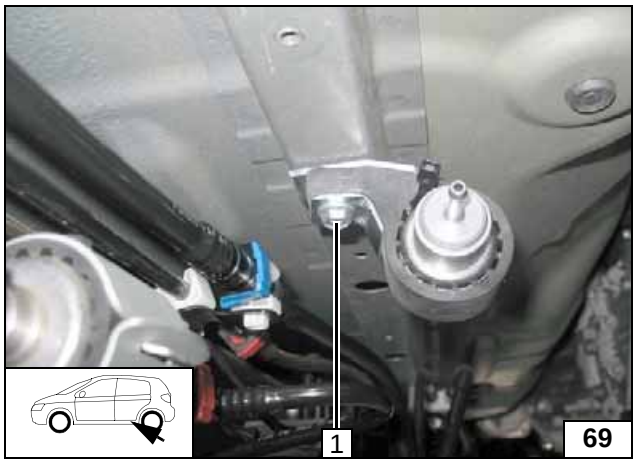
1 M6x25 bolt, support angle bracket
2 Metering pump mount
3 Perforated bracket
4 Cable tie
5 Metering pump

Installing rivet nut



1 Drill out existing hole to 9.1 mm dia., rivet nut

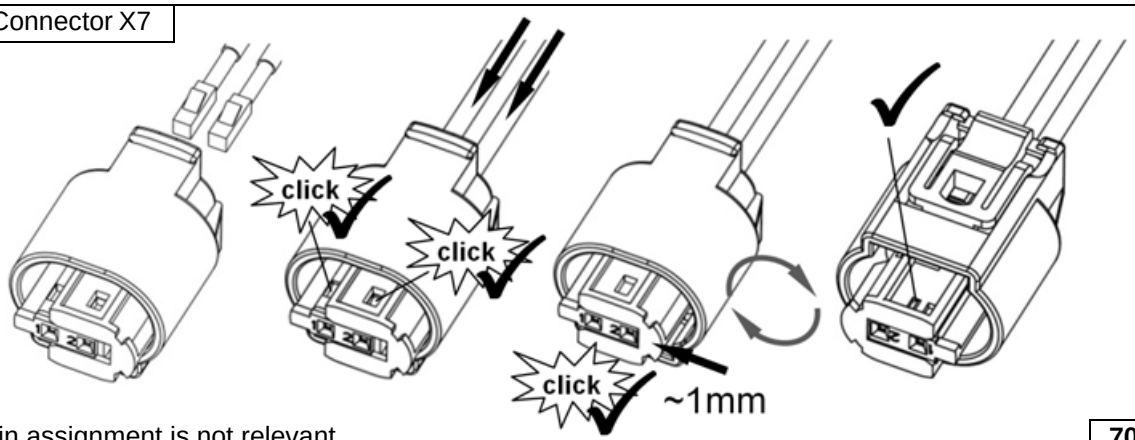
Installing metering pump



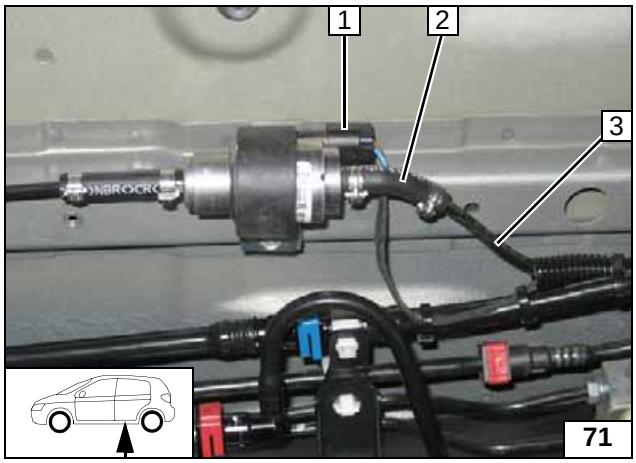
1 Tighten bolt

Completing metering pump connector

Connector X7



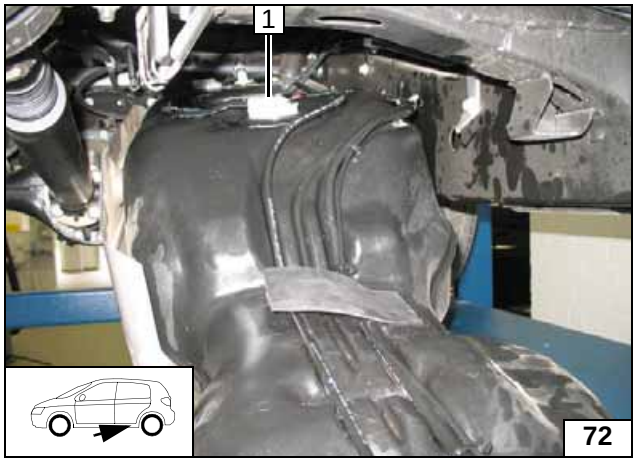
Pin assignment is not relevant.



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

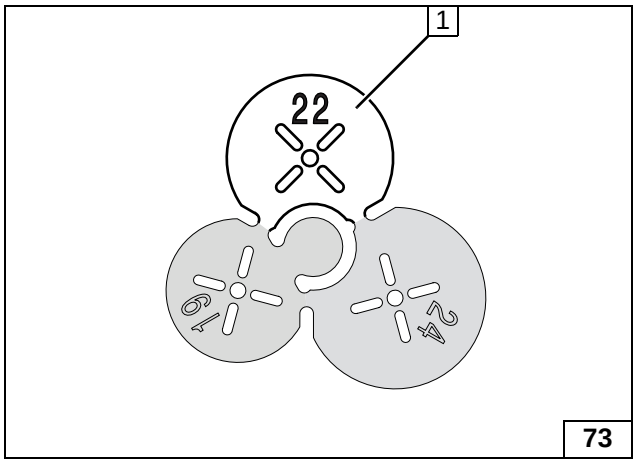
1 Metering pump wiring harness, connector X7 mounted
2 Hose section, 10mm dia. clamp [2x]
3 Fuel line of heater

Connecting metering pump



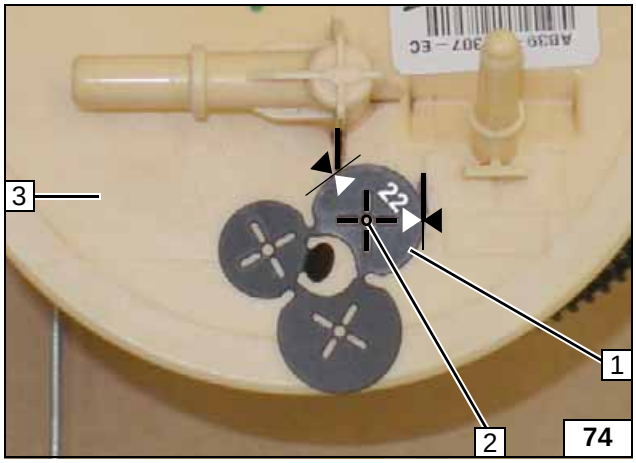
Lower fuel tank. Remove fuel tank sending unit **1** in accordance with manufacturer's instructions.

Removing fuel tank sending unit



1 Drilling template

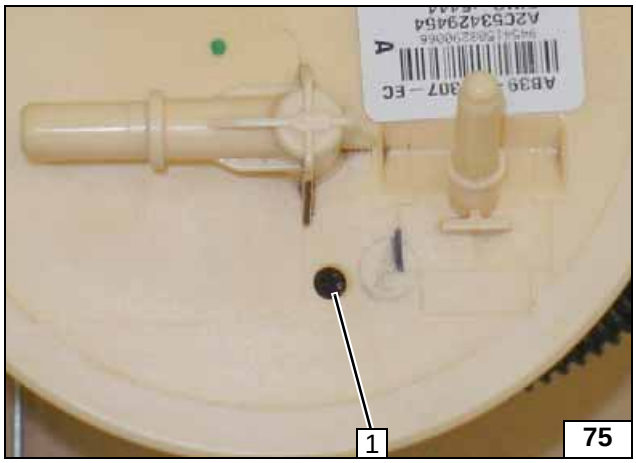
Fuel extraction



Position 22mm dia. drilling template **1** at the raised parts (see marking).

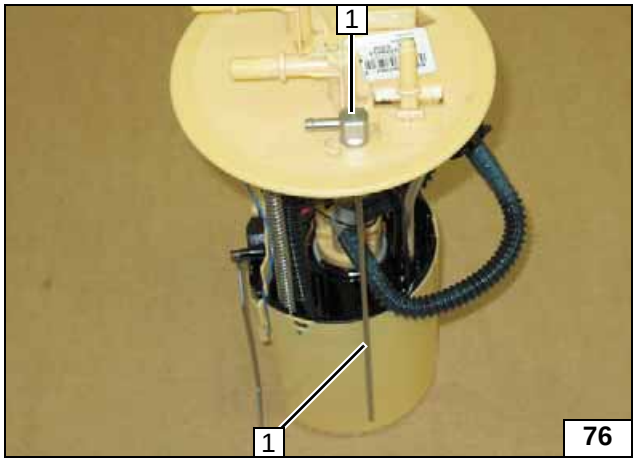
2 Copy hole pattern
3 Fuel tank sending unit

Fuel extraction



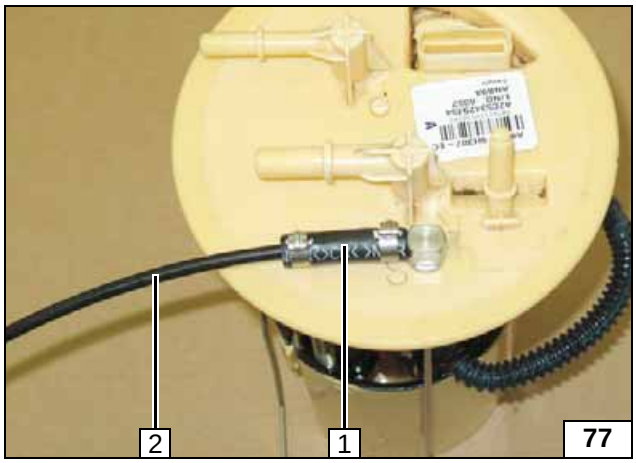
1 6 mm dia. hole

Fuel extraction



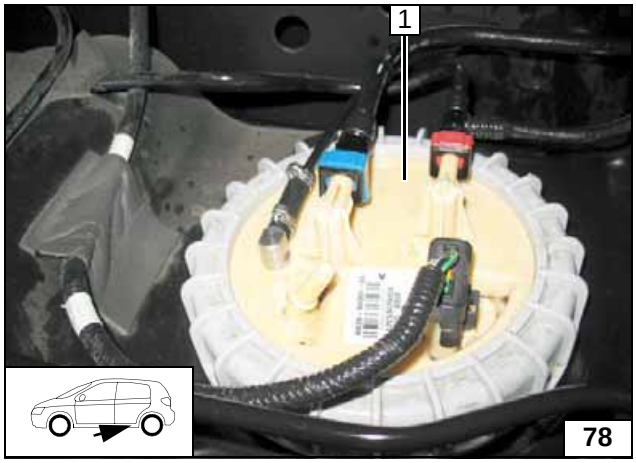
Bend fuel standpipe **1** according to template and cut to length.

Installing fuel standpipe



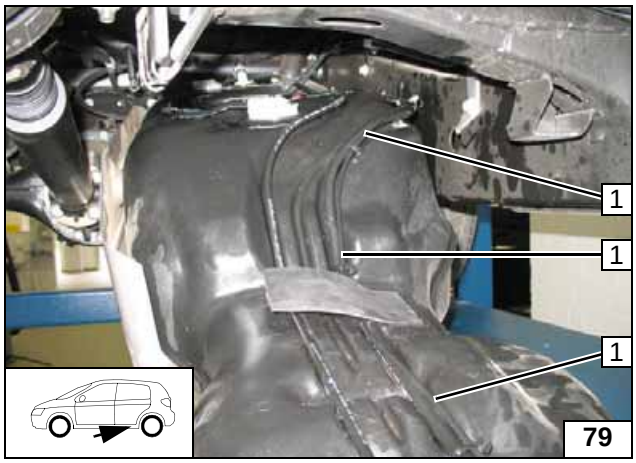
1 Hose section, 10mm dia. clamp [2x]
2 Fuel line

Connecting fuel line



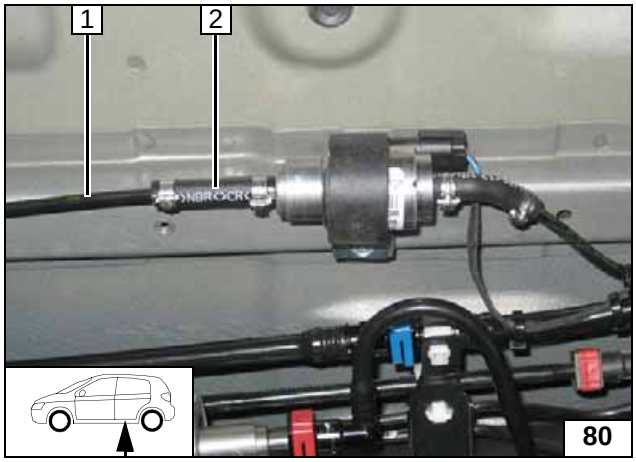
Install fuel tank sending unit **1** according to manufacturer's instructions.

Installing fuel tank sending unit



Route fuel line **1** on original vehicle fuel line and fasten using cable ties. Install fuel tank.

Routing fuel line



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

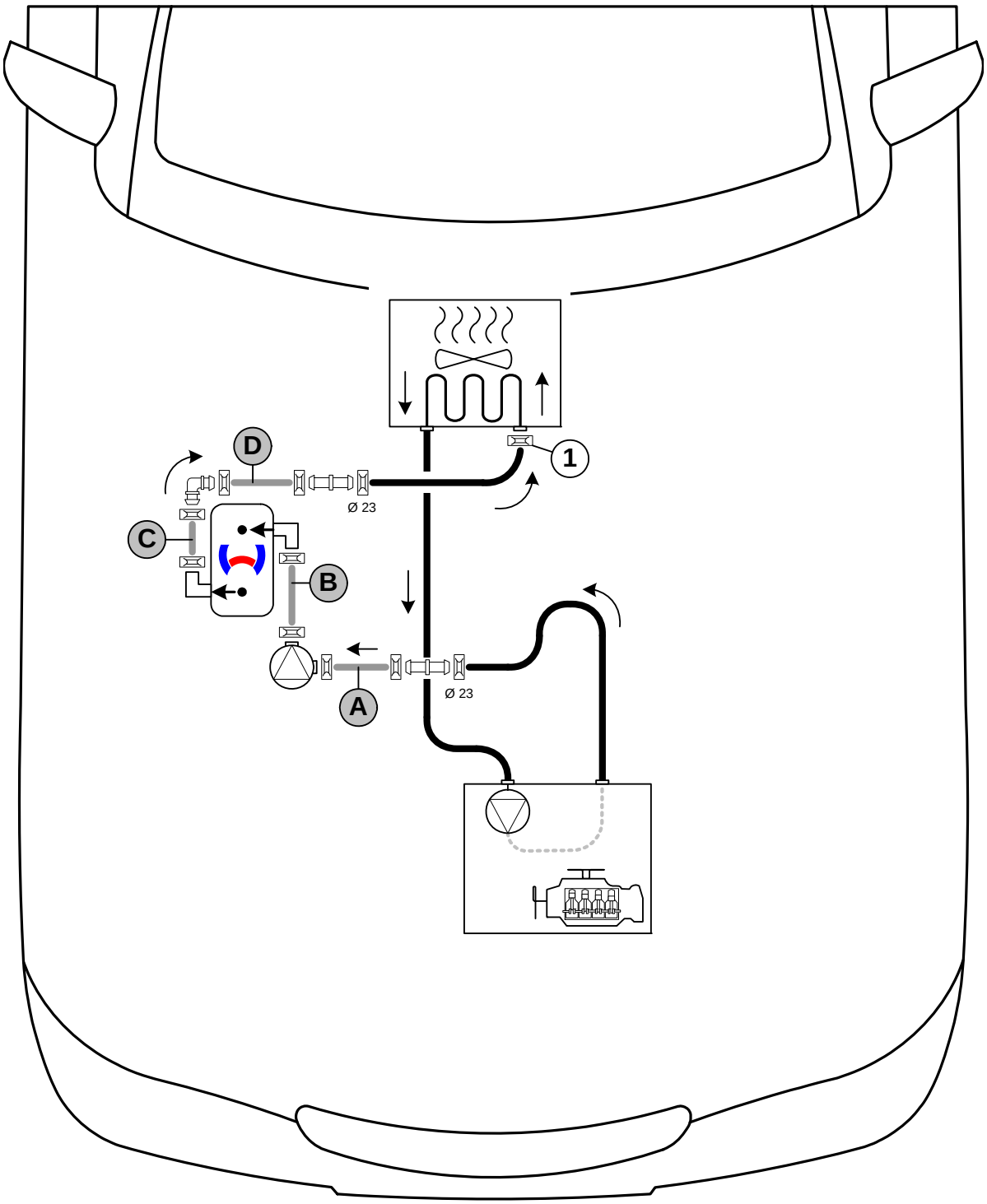
1 Fuel line of fuel standpipe
2 Hose section, 10mm dia. clamp [2x]

Connecting metering pump

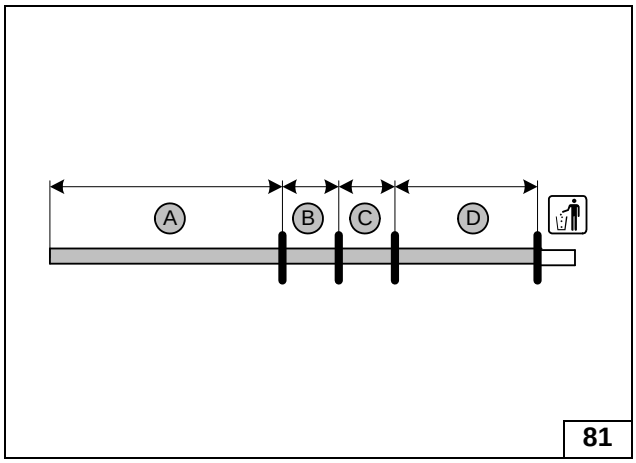
Coolant Circuit

WARNING!
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



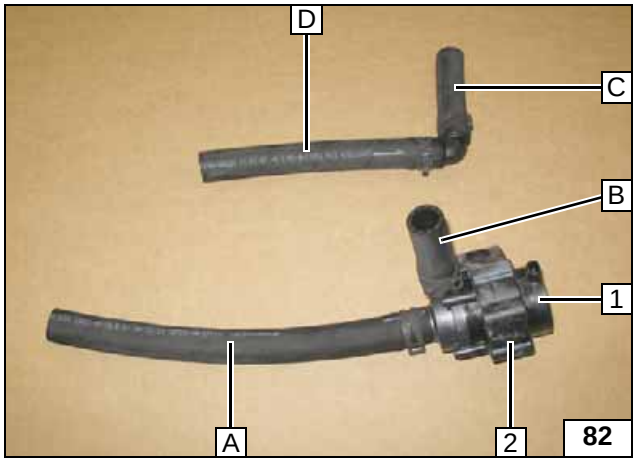
All spring clips without a specific designation = 25 mm dia. Connecting pipe = 18x18 mm dia.
All connecting pipes = 16x18mm dia.
1 = Original vehicle spring clip



81

A = 270
B = 65
C = 95
D = 190

Cutting hoses to length

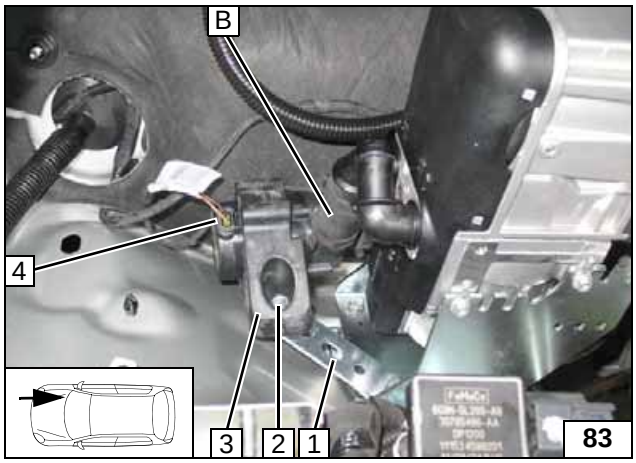


82

All vehicles except 147kW SG

1 Circulating pump
2 Circulating pump mount

Preparing hoses

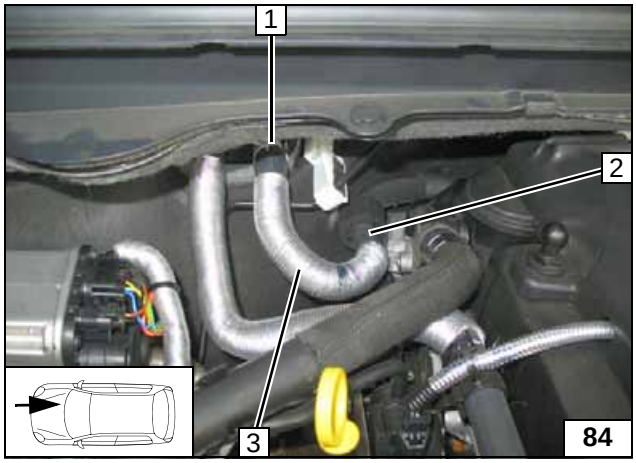


83

Hose **B** on heater inlet.

1 Perforated bracket
2 M6x25 bolt, flanged nut
3 Circulating pump mount
4 Connector of circulating pump wiring harness

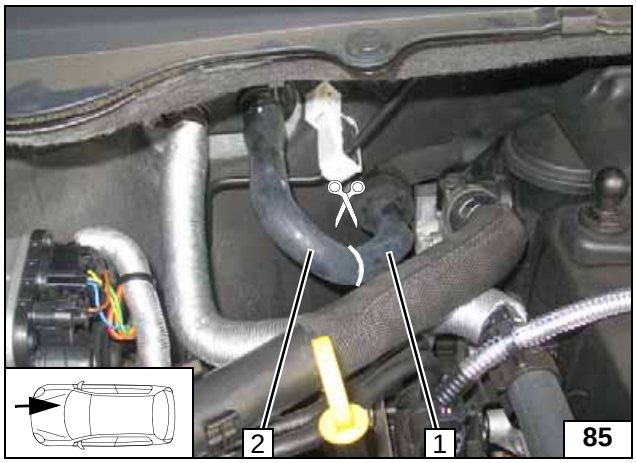
Installing circulating pump



84

Pull hose of engine outlet / heat exchanger inlet **2** from connection piece of heat exchanger inlet. Pull off heat protection hose **3** and separate it in the middle. Spring clip **1** will be reused.

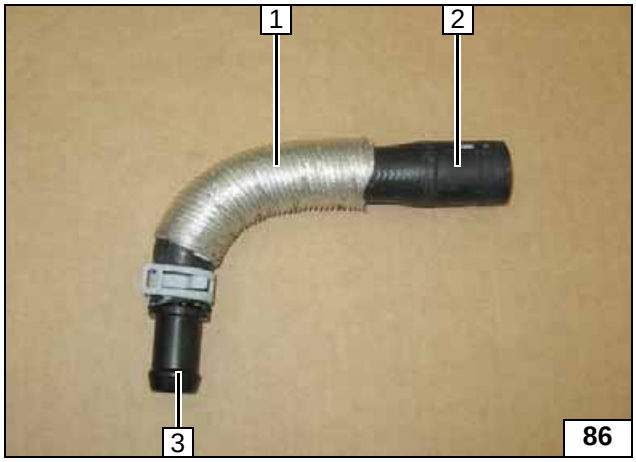
Cutting point



Cut hose of engine outlet / heat exchanger inlet at the marking.

1 Engine outlet hose section
2 Remove hose section of heat exchanger inlet

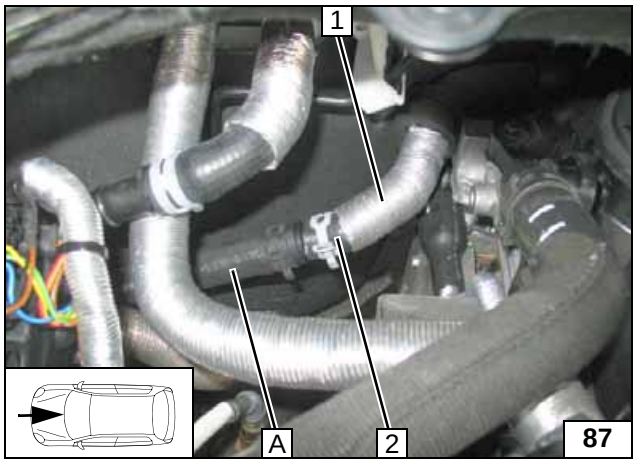
Cutting point



Push onhalf heat protection hose **1** onto hose of heat exchanger inlet **2**.

3 16x18 mm dia. connecting pipe, 23 mm dia. spring clip

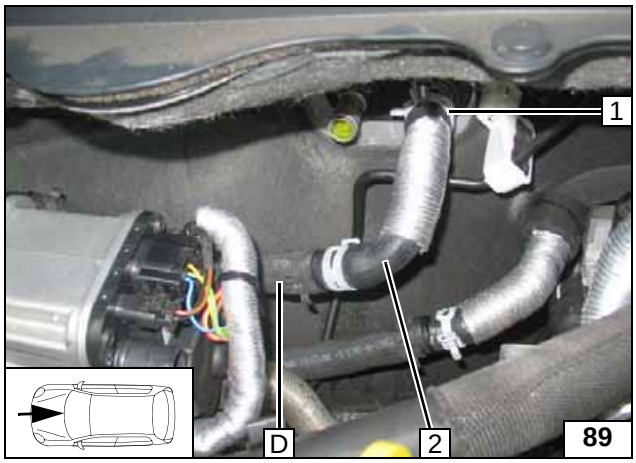
Preparing hose



Push onhalf heat protection hose **1** onto hose of engine outlet **2**.

Connecting engine outlet

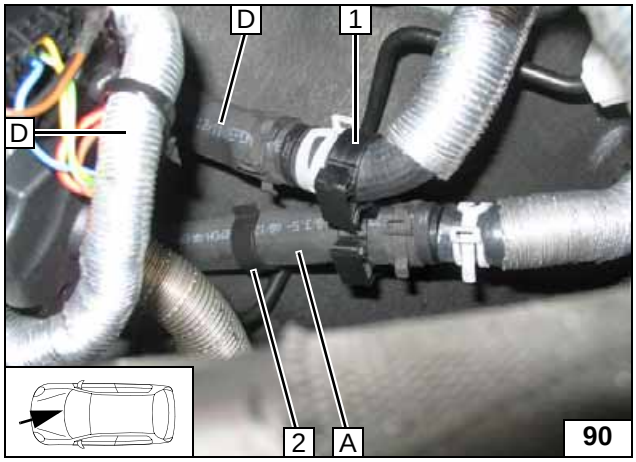
Connecting heater outlet



Hose on connection piece of heat exchanger outlet removed to improve illustration.

1 Original vehicle spring clip
2 Hose on heat exchanger inlet

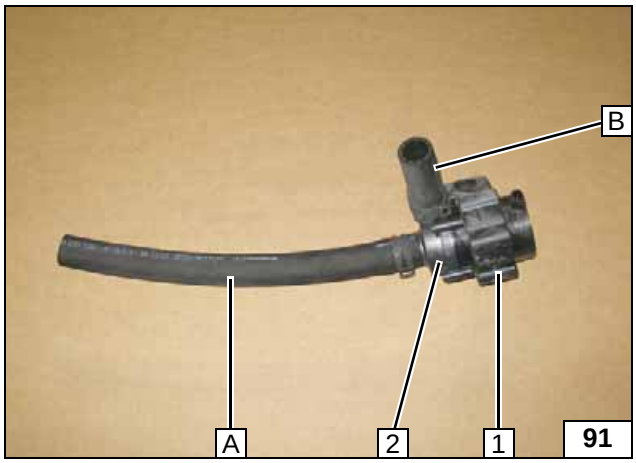
Connecting heat exchanger inlet



Align hoses. Ensure sufficient distance from neighbouring components (especially from hose **A** to exhaust pipe), correct if necessary.

1 Lockable hose bracket
2 Hose bracket

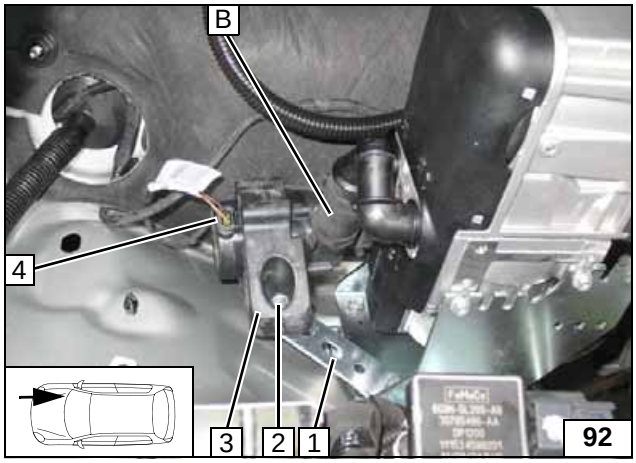
Inserting hose bracket



147kW SG

1 Circulating pump mount
2 Circulating pump

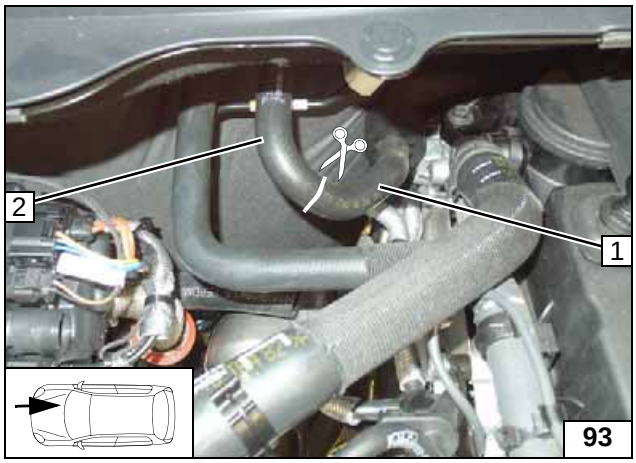
Preparing hoses



Hose **B** on heater inlet.

1 Perforated bracket
2 M6x25 bolt, flanged nut
3 Circulating pump mount
4 Connector of circulating pump wiring harness

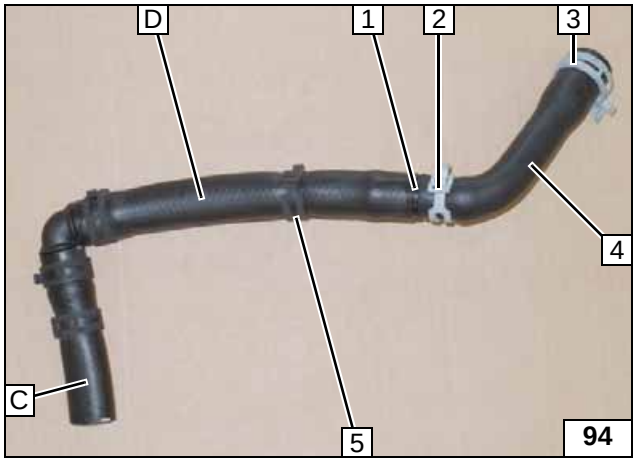
Installing circulating pump



Cut hose of engine outlet / heat exchanger inlet at the marking. Remove heat exchanger inlet hose section **2**. Original vehicle spring clip will be reused.

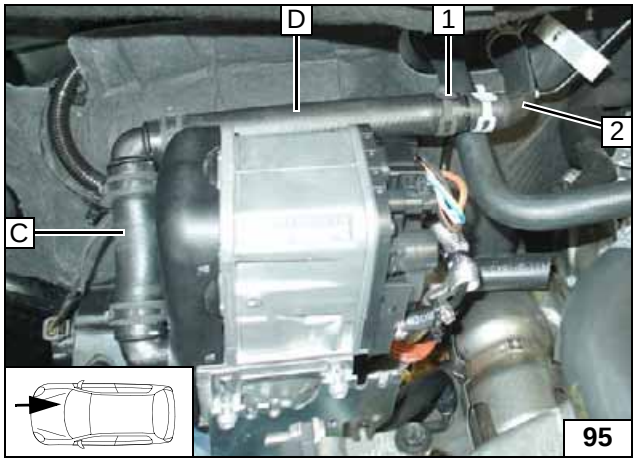
1 Engine outlet hose section

Cutting point



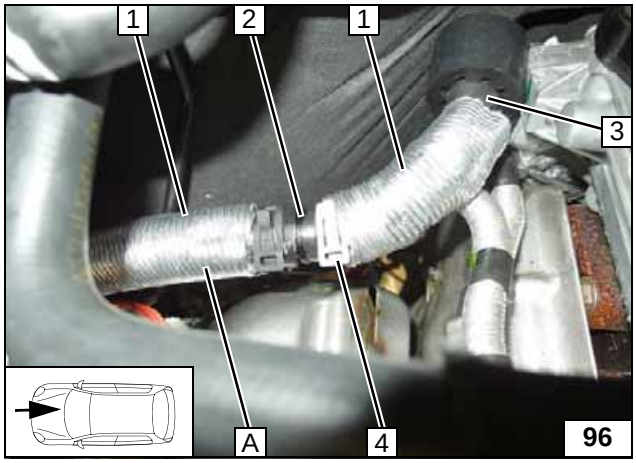
1 15x18mm dia. connecting pipe
2 23mm dia. spring clip
3 Original vehicle spring clip
4 Heat exchanger inlet hose section
5 25mm dia. spring clip; will be positioned later (see next figure)

Premounting hoses



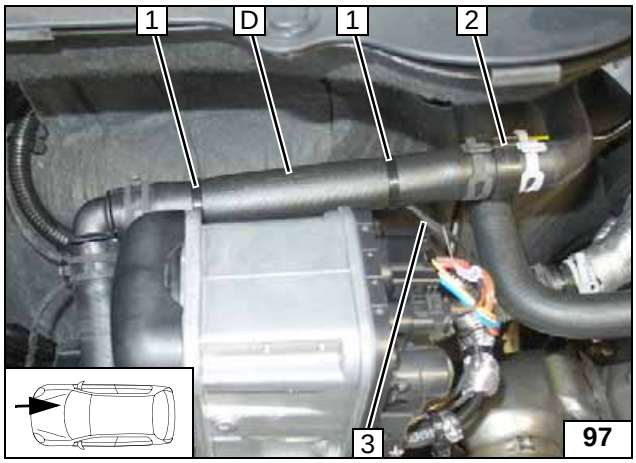
Align heat exchanger inlet hose section **2** and hose section **D**, then attach 25mm dia. spring clip **1**.

Connecting heater outlet / heat exchanger inlet



1 Slide on heat protection hose [2x]
2 15x20 connecting pipe
3 Engine outlet hose section
4 23mm dia. spring clip

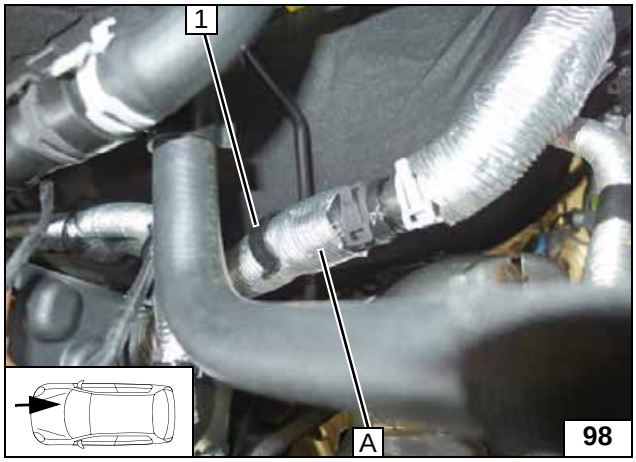
Connecting engine outlet



Attach circulating pump wiring harness **3** along hose section **D** using cable ties **1** [2x].

2 20x22 hose bracket between hose section **D** and heat exchanger outlet hose

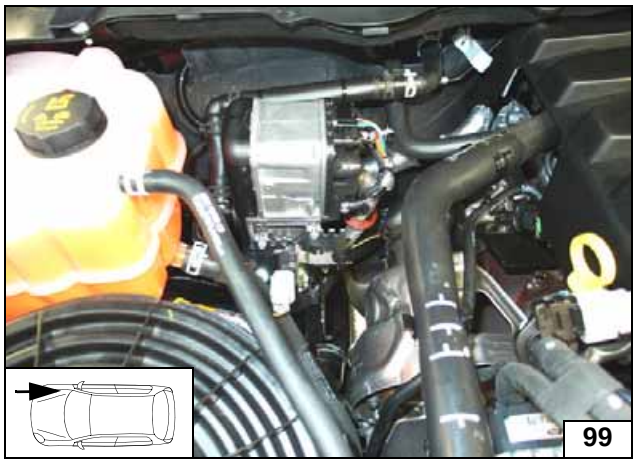
Inserting hose bracket



Align hoses. Ensure sufficient distance from neighbouring components (especially from hose **A** to exhaust pipe), correct if necessary.

1 8x22 hose bracket between hose section **A** and original vehicle line

Inserting hose bracket

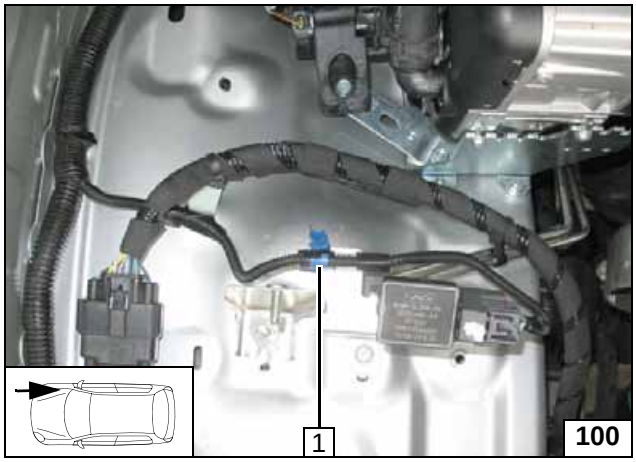


Combustion Air

Version 1

Vehicle without wiring harness bracket

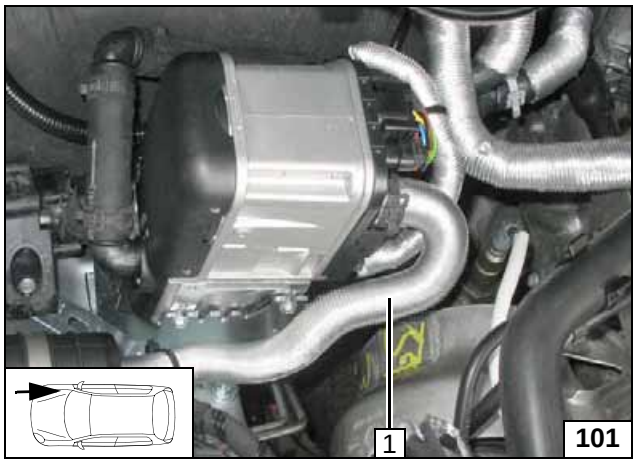
Detaching wiring harness



Version 2

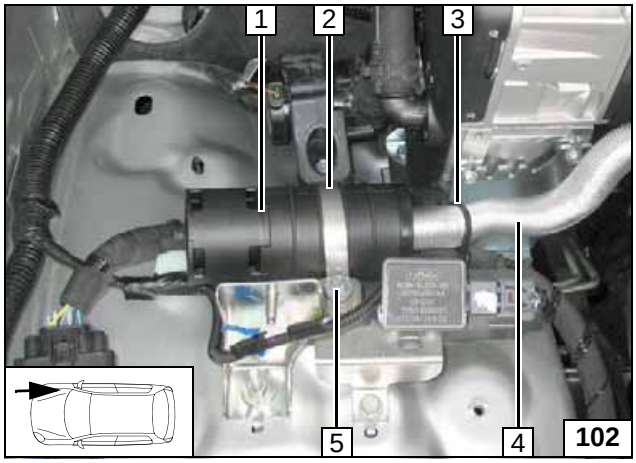
Detach original vehicle wiring harness from bracket **1** .

Detaching wiring harness



1 Combustion air pipe

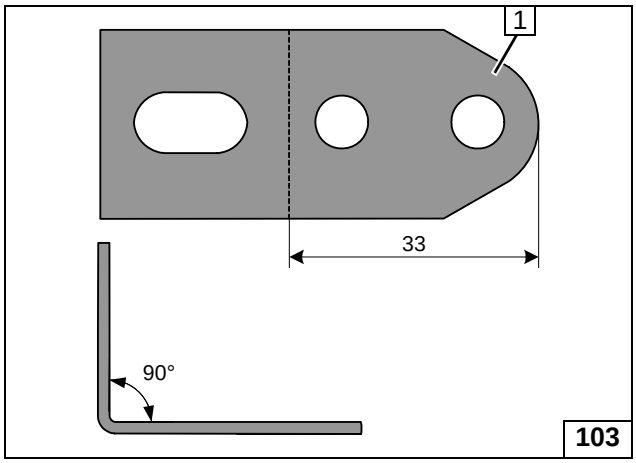
Installing combustion air pipe



Fasten original vehicle wiring harness to combustion air pipe **4** with cable tie **3**.

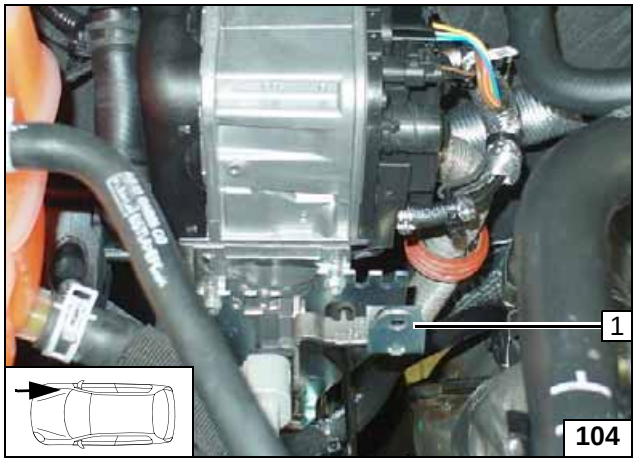
1 Silencer
2 51 mm dia. clamp
5 M5x16 bolt, large diameter washer, flanged nut, existing hole

Installing silencer



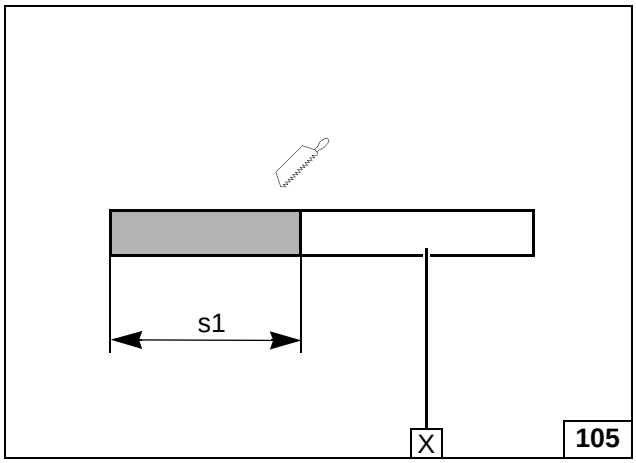
1 Perforated bracket (see section 'Preparing Bracket')

Bending perforated bracket section



1 Original vehicle bolt, prepared perforated bracket

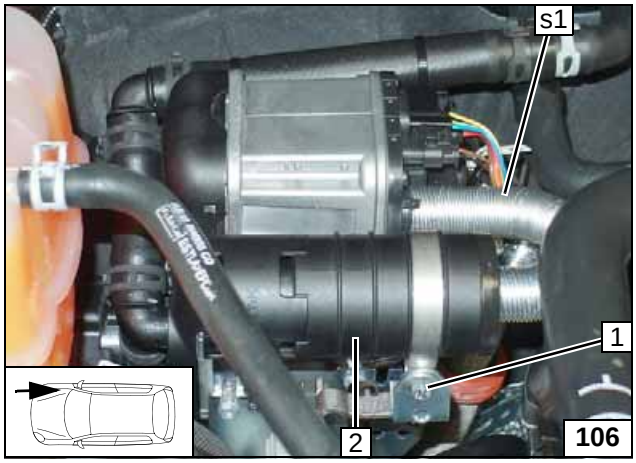
Installing perforated bracket



s1 = 180

X =

Cutting combustion air pipe to length



Bend combustion air pipe **s1** as shown.

1 51mm dia. clamp, M5x16 bolt, large diameter washer [2x], flanged nut
2 Silencer

Installing combustion air pipe s1 and silencer

Final Work

WARNING!
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 instructions.**
- **Program MultiControl CAR, teach Telestart transmitter.**
- **Make settings on the A/C control panel according to the 'operating instructions'**
- **Place the 'Switch off parking heater before refuelling' caution label near the filler neck.**
- **For initial startup and function check, please see installation instructions.**

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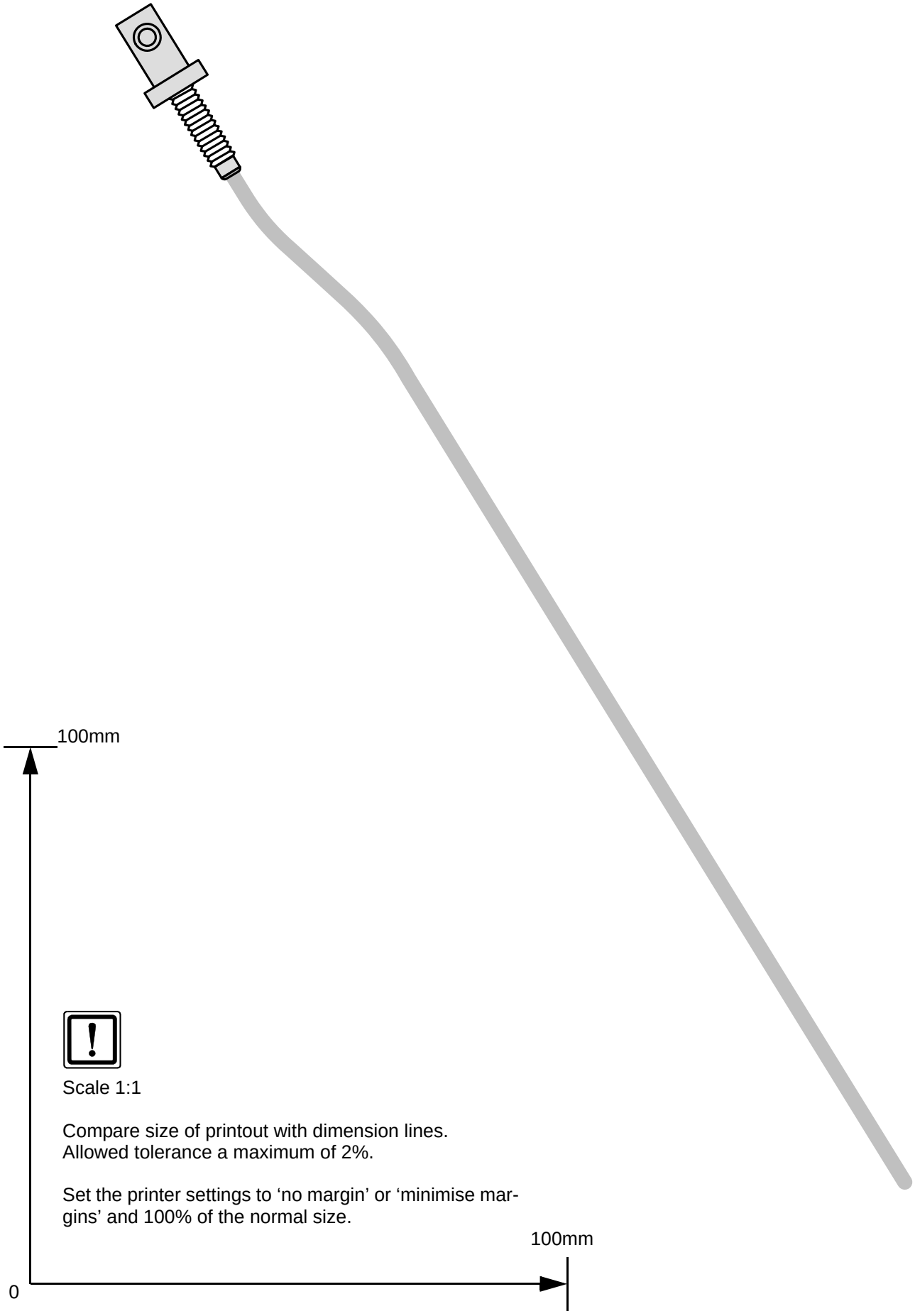
Postfach 1410
82199 Gilching
Germany
Internet: www.webasto.com
Technical Extranet:
http://dealers.webasto.com

Fuel Standpipe Template



Webasto
Feel the Drive

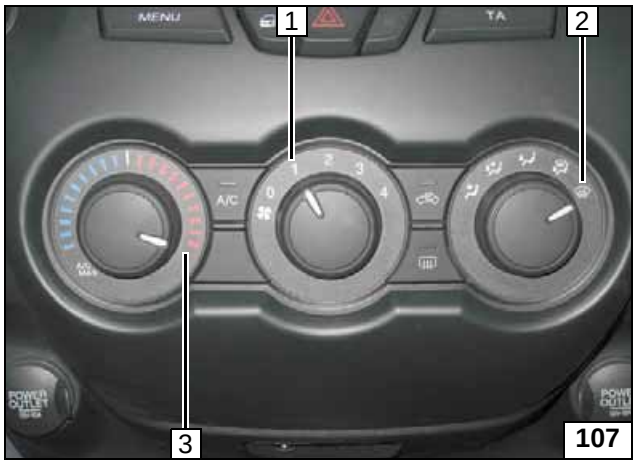
Manual A/C Operating Instructions up to MY 2015

Please remove page and add to the vehicle operating instructions.

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

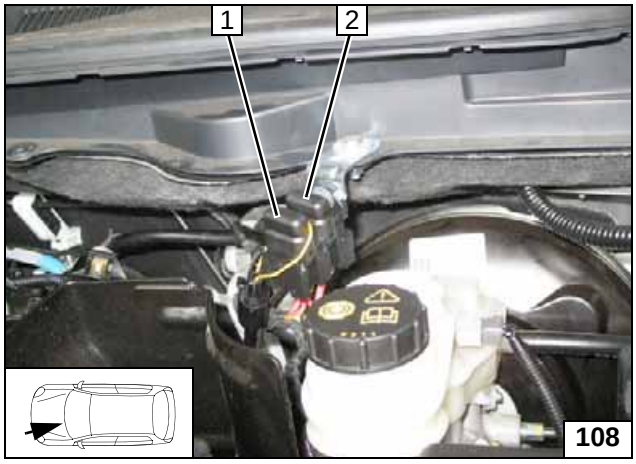
Passenger compartment monitoring, if installed, must be deactivated in addition to the vehicle settings for the heating operation.
For instructions on deactivation, please refer to the operating instructions of the vehicle.

Before parking the vehicle, make the following settings:



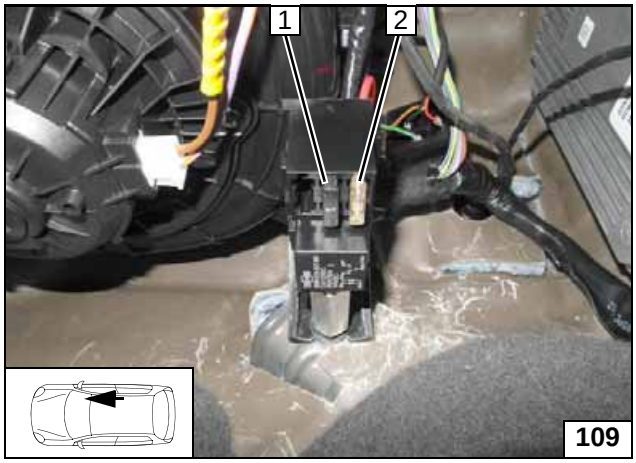
1 Set fan to level ‘1’, or max. ‘2’
2 Air outlet to windscreen
3 Set temperature to ‘max.’

A/C control panel



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

Engine compartment fuses



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

Passenger compartment fuses

Webasto
Feel the Drive

Automatic A/C Operating Instructions up to MY 2015

Please remove page and add to the vehicle operating instructions.

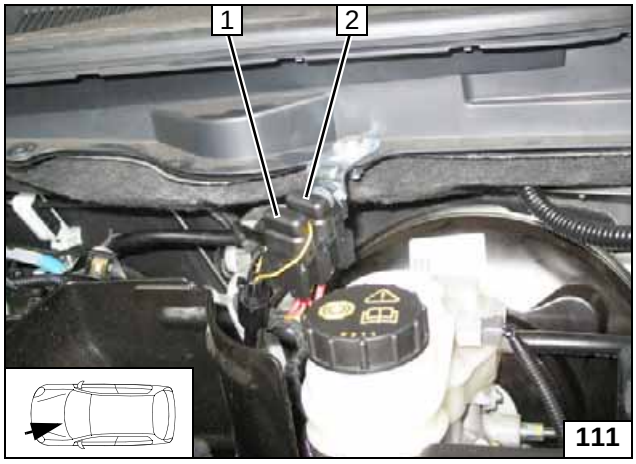
Note:
We recommend matching the heating time to the driving time.
Heating time = driving time
Example:
For a driving time of approx. 20 min. (in one direction), we recommend not exceeding a switch-on time of 20 min.

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

Before parking the vehicle, make the following settings:

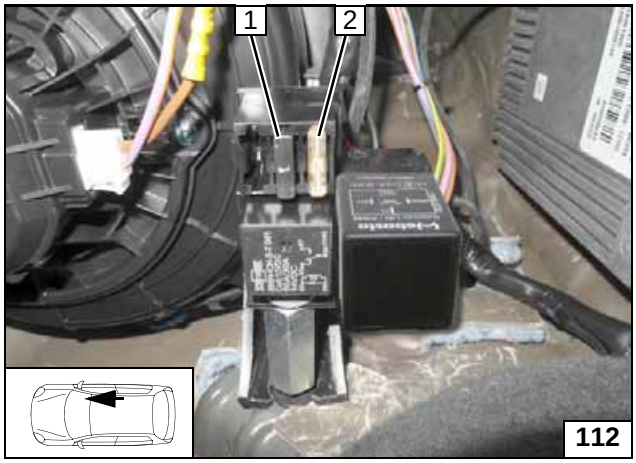
1 Set temperature on both sides to ‘HI’
2 Air outlet to windscreen

A/C control panel



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

Engine compartment fuses



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

Passenger compartment fuses