Water Heater

Webasto
Feel the Drive

***Thermo Top Evo* Parking Heater**

E1
00 0258

Installation Documentation
Lexus GS 300h

Validity

Manufacturer	Model	Type	EG-BE No./ABE
Lexus	GS 300h	HS19(A)	e6 * 2001/116 * 0106 * ...

Motorisation	Fuel	Transmission type	Output in kW	Displacement in cm³	Engine code
2.5 P Hybrid	Petrol	E-CVT	133	2494	2AR

E-CVT = Electronic continuously variable transmission

from Model Year 2014
Left-hand drive vehicle

Verified equipment variants: Automatic air-conditioning 2 zones and 3 zones
Front fog light
Passenger compartment monitoring
LED Daytime Running Lights
LED Headlight with headlight washer system and cornering light
Bi Xenon with headlight washer system
F-Sport-Package

Total installation time: about 9 hours

Note:

Only experts in high-voltage systems for vehicles should be authorised to carry out independent work on hybrid vehicles!
The high-voltage system must be taken out of operation, secured and reactivated according to the manufacturer's instructions.

Lexus GS 300h

Table of Contents

Necessary Components

- Basic delivery scope of *Thermo Top Evo* based on price list
- Installation kit for Lexus GS 300h 2014 Petrol: **1322950A**
- To be orderedfrom Lexus as an additional item:

Fuel-tank sending unit assembly parts	**Part No.:**
Seal	77169-47030

Optional	
Battery Full Charge Indicator	DENGS-56380-37
Battery charger MXS 3.8	DENGS-MXS38-37

- Heater control in accordance with price list and upon consultation with end customer
- In case of Telestart, indicator lamp in accordance with price list and in consultation with end customer

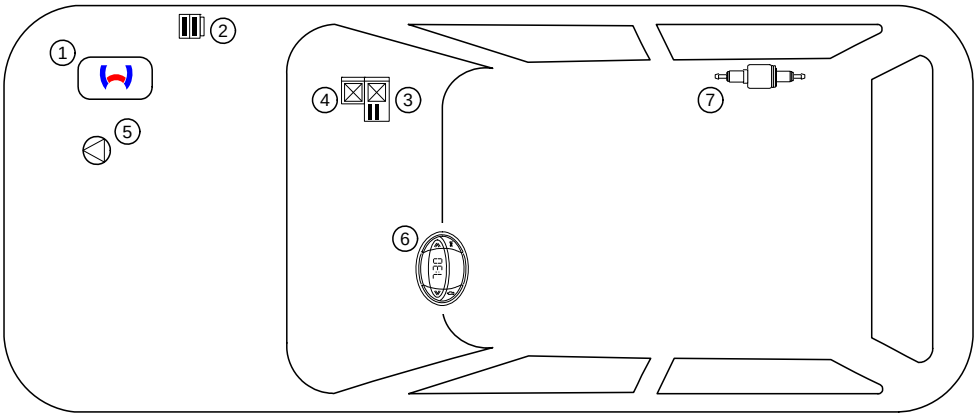
Installation instructions

- Arrange for the vehicle to be delivered with the tank only around ¼ full!
- The installation location of the push button in the case of Telestart or Thermo Call should be confirmed with the end customer.

Installation Overview

Legend:

1. Heater
2. Fuse holder of engine compartment
3. Relay and fuse holder of passenger compartment
4. PWM gateway
5. Circulating pump
6. Digital timer
7. Metering pump



Notes on Total Installation Time

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

Information on Operating and Installation Instructions

1 Important Information (not complete)

1.1 Installation and Repair

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

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

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

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

1.2 Operation

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

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

Always switch off the heater before refuelling.

The heater may only be used with the prescribed fuel Diesel (DIN EN 590) or petrol (DIN EN 227).

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

1.3 Please note

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

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

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

Important

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

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

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

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

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

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

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

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

2 Statutory regulations governing installation

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

Note

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

Important

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

Note

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

2.1 Excerpt from EC directive 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.

Lexus GS 300h

Notes on Validity

This installation documentation applies to the Lexus GS 300h Petrol vehicles - for validity, see page 1 - from model year 2014 and later, assuming technical modifications to the vehicle do not affect installation, any liability claims excluded. Depending on the vehicle version and equipment, modifications may be necessary during installation with respect to this installation documentation.

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

Technical Instructions

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

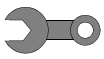
Dimensions
- All dimensions are in mm

Tightening torque values
- Tightening torque values of 5x13 heater bolts and 5x11 heater stud bolts = 8Nm.
- Tightening torque values of 5x15 bolt of water connection piece retaining plate = 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

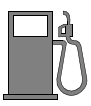


Electrical system

Coolant circuit

Combustion air

Fuel



Exhaust gas

Software

Special features are highlighted using the following symbols:

Specific risk of injury or fatal accidents.

Specific risk due to electrical voltage

Specific risk of damage to components.

Specific risk of fire or explosion.

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

Reference to a special technical feature

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

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

Lexus GS 300h

Preliminary Work

Vehicle

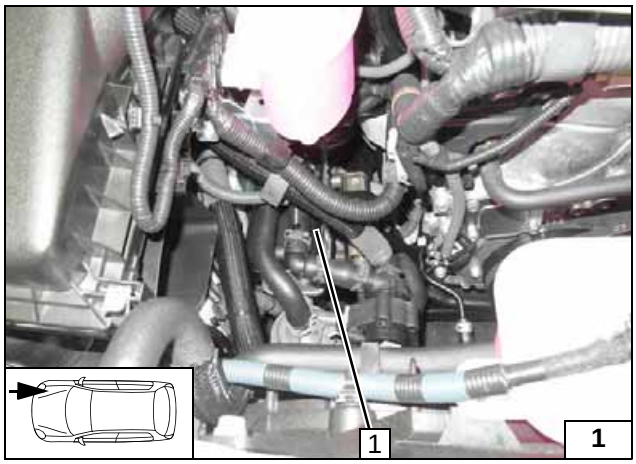
- Open the fuel tank cap.
- Ventilate the fuel tank.
- Close the fuel tank cap again.
- Depressurise the cooling system.
- Remove the engine cover.
- Disconnect the 12V vehicle battery.
- Deactivate the hybrid system according to the vehicle manufacturer's workshop manual.
- Remove the front wheel on the right.
- Remove the wheel well trim on the right.
- Remove the engine design cover.
- Remove the trim of the engine compartment.
- Remove the lower engine trim.
- Detach the lower transmission cover.
- Remove the right underbody trim.
- Remove the air filter box fully together with the intake pipe.
- Drain the engine coolant (will be reused).
- Drain the coolant of the hybrid system according to the manufacturer's workshop manual (will be reused).
- Remove the lower footwell trim.
- Remove the right speaker cover on the instrument panel trim (only in case of Telestart).

The following work should only be performed during the corresponding installation sequence:

- Remove rear bench seat surface.
- Open the tank-fitting service lid on the left and right.
- Remove the left fuel-tank sending unit according to the manufacturer's instructions.

Heater

- Remove years that do not apply from the type and duplicate label.
- Apply the duplicate label (type label) to the B-pillar on the driver's side next to the original vehicle's type label.



Heater Installation Location

1 Heater

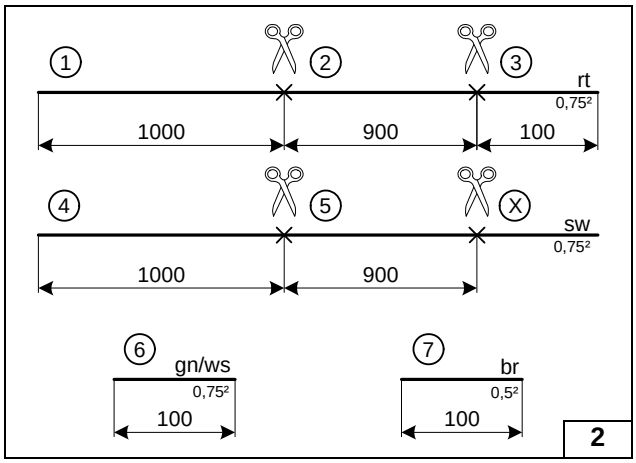
Installation location

Preparing Electrical System

Wire sections retain their numbering throughout the whole document.

Cutting wires to length

Discard section **X**.
Cut enclosed protective sleeving in half and pull wire sections ① and ④ as well as ② and ⑤ into one protective sleeving each.



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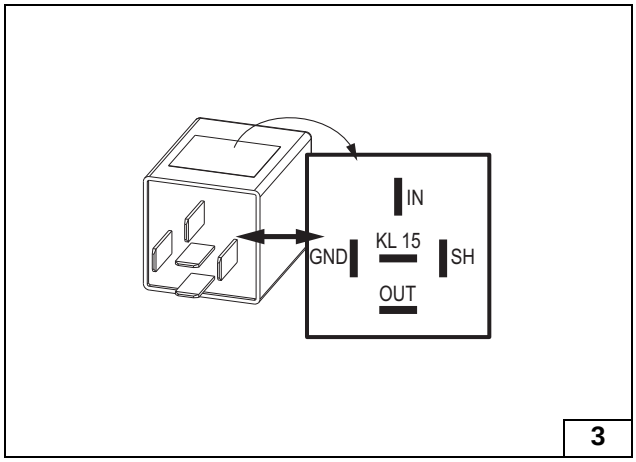
PWM gateway

Check PWM Gateway settings before heater startup and adjust if necessary.

Settings:

Duty cycle: 65%
Frequency: 400Hz
Function: Low side



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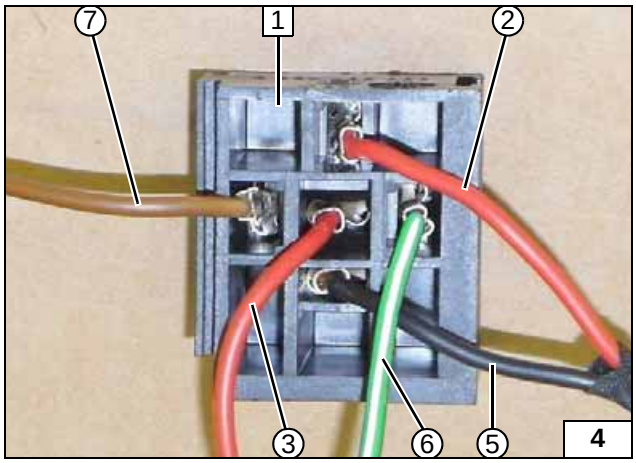
Connecting wires to PWM GW socket

Connect wires as shown in the wiring diagram (see following figure).
Install PWM gateway.

1 PWM GW socket
② Red (rt) wire of PWM GW/IN
③ Red (rt) wire of PWM GW/KL15
⑤ Black (sw) wire of PWM GW/OUT
⑥ Green/white (gn/ws) wire of PWM GW/SH
⑦ Brown (br) wire of PWM GW/GND



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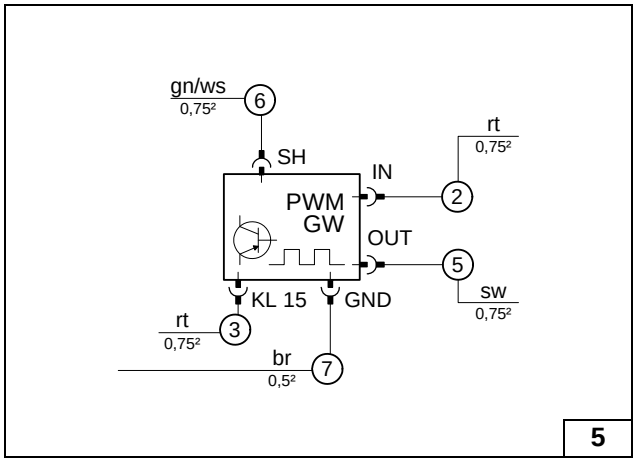
Preparing PWM GW



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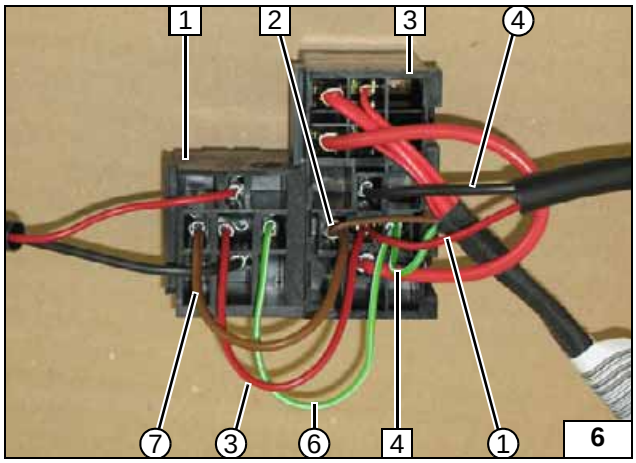

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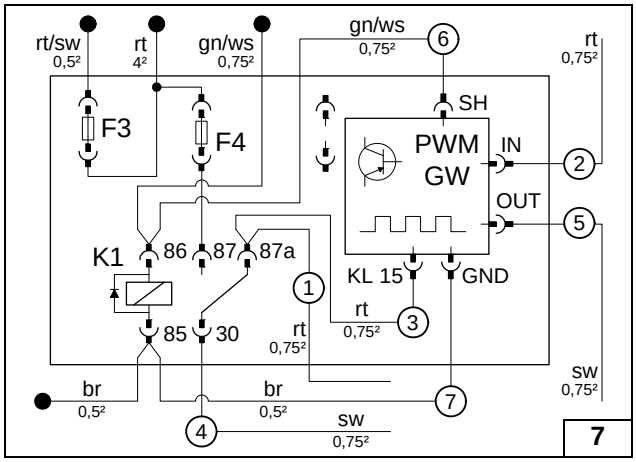
Interlock PWM Gateway socket **1** with passenger compartment relay and fuse holder **3**. Loosen and remove the contacts for K1/85 and K1/86. Install wires as shown in the following connection diagram using the contacts supplied.

2 Brown (br) wire of K1/85
4 Green/white (gn/ws) wire of K1/86
① Red (rt) wire of K1/87a
③ Red (rt) wire of K1/87a and PWM GW/KL15
④ Black (sw) wire of K1/30
⑥ Green/white (gn/ws) wire of K1/86 and PWM GW/SH
⑦ Brown (br) wire of K1/85 and PWM GW/GND

Preparing passenger compartment relay and fuse holder



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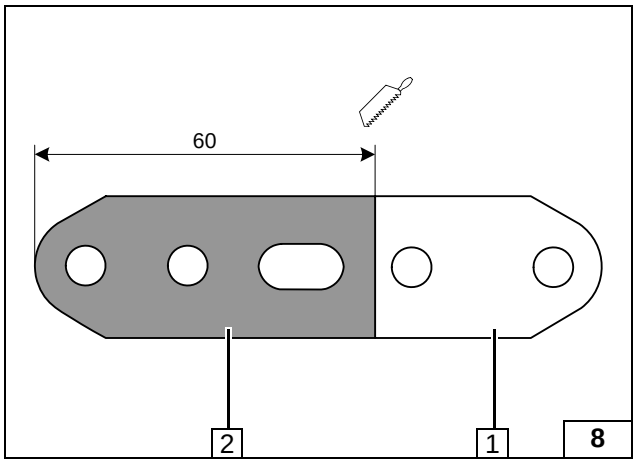
Connection diagram



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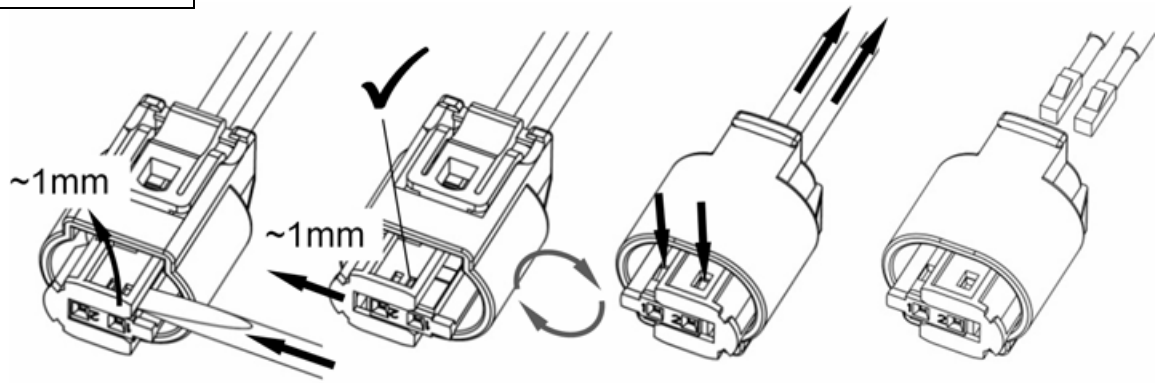
1 Discard section
2 Perforated bracket of engine compartment fuse holder

Preparing perforated bracket

Connector X7



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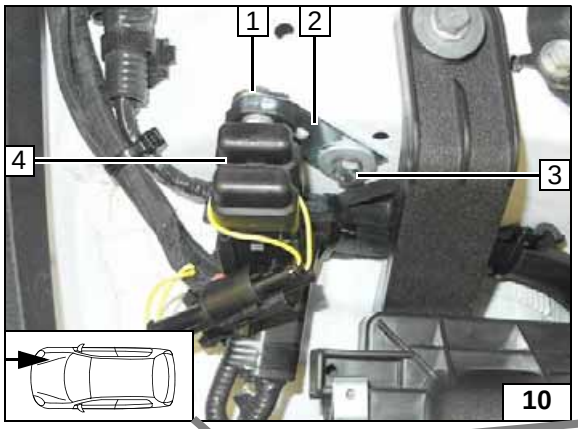
Removing connector of metering pump

Electrical System

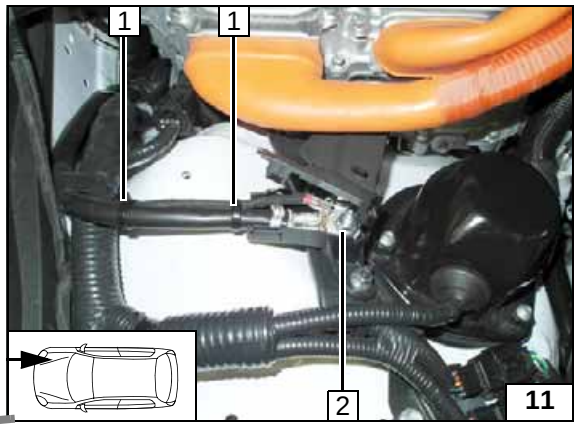
Fuse holder of engine compartment

1 M5x16 bolt, washer [2x], retaining plate of fuse holder, nut
2 Perforated bracket
3 M6x20 bolt, spring lockwasher, large diameter washer, existing threaded hole
4 Fuses F1-2

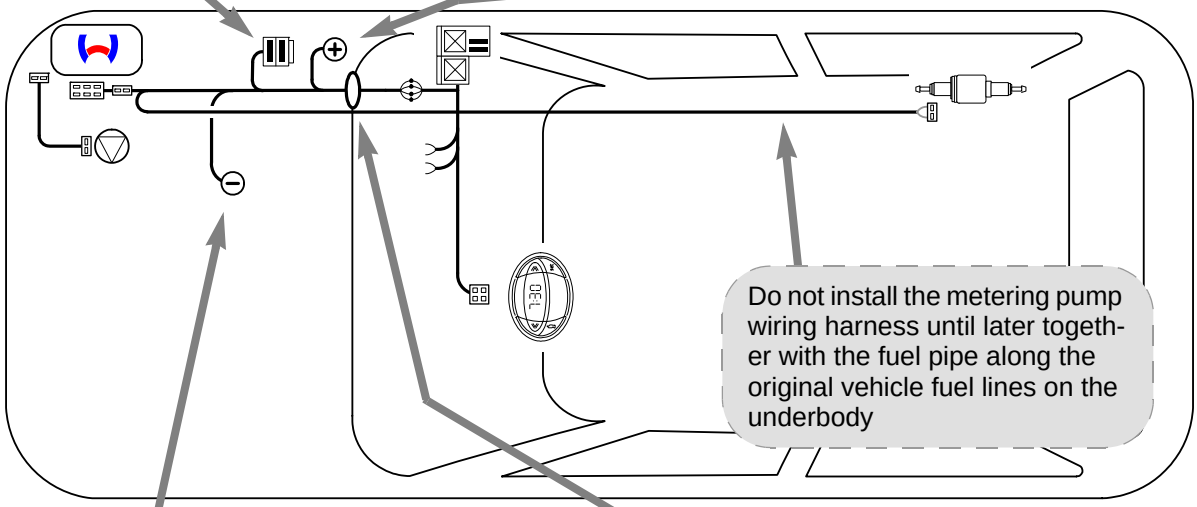


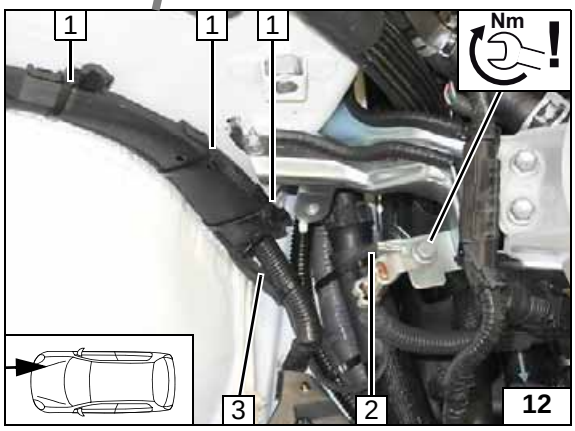
Positive wire

1 Cable tie [2x]
2 Positive wire on original vehicle positive support point



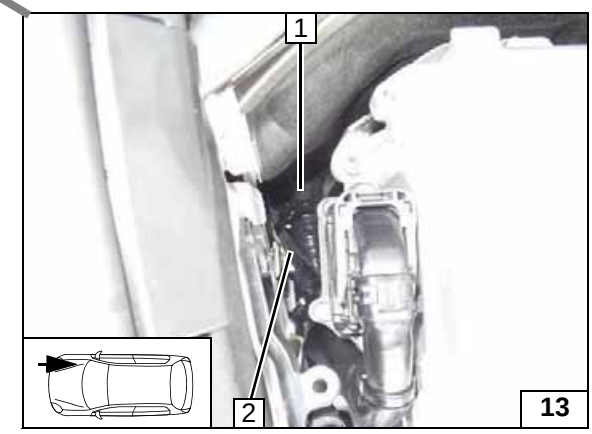
Wiring harness routing diagram





Earth wire

1 Cable tie [3x]
2 Earth wire on original vehicle earth support point (will be mounted after installation of the coolant expansion tank)
3 Wiring harness of heater

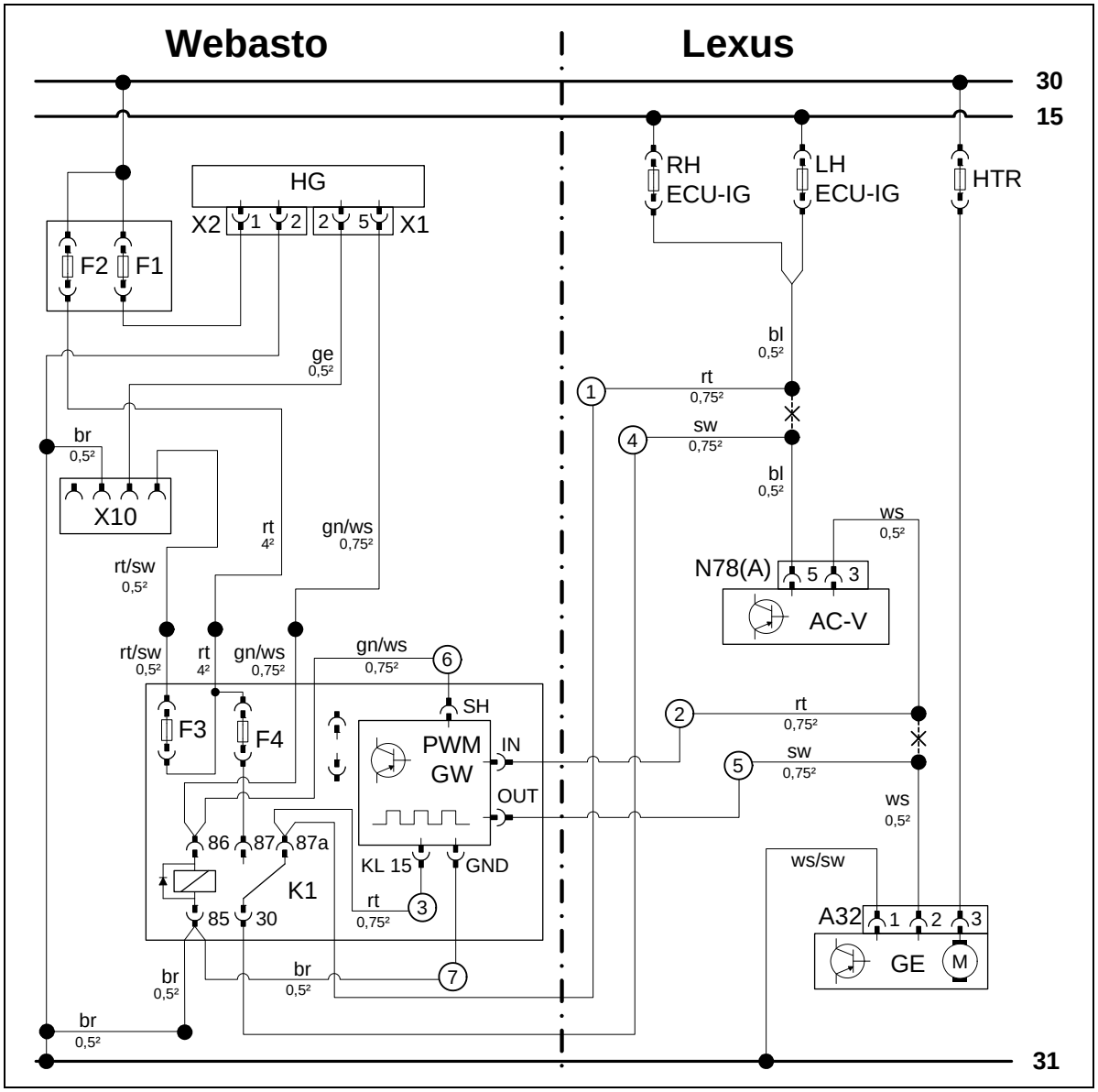


Wiring harness pass through

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

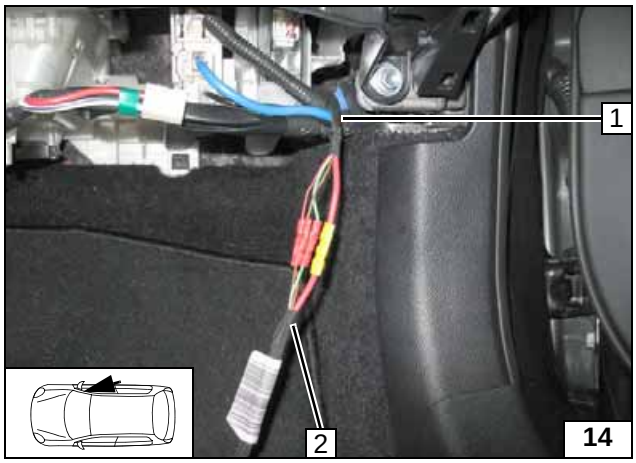
Fan Controller

Wiring diagram



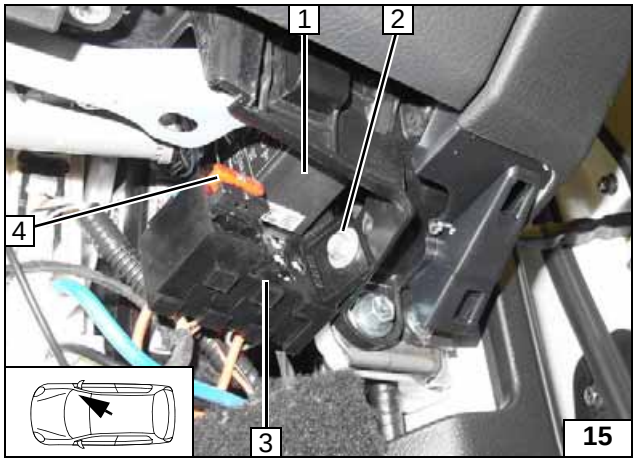
Webasto components		Vehicle components		Colours and symbols	
HG	TT-Evo heater	RH ECU-IG	10A fuse	rt	red
X1	6-pin heater connector			sw	black
X2	2-pin heater connector	LH ECU-IG	10A fuse	ge	yellow
X10	4-pin connector of heater control			gn	green
		HTR	50A fuse	br	brown
K1	Fan relay	N78 (A)	35-pin connector of AC-V	ws	white
F1	20A fuse	AC-V	AC booster	bl	blue
F2	30A fuse	A32	GE connector		
F3	1A fuse	GE	Fan unit		
F4	10A fuse				
PWM GW	Pulse width modulator				
PWM Gateway settings:					
Duty cycle: 65%					
Frequency: 400Hz					
Function: Low side				**X**	Cutting point
				Wiring colours may vary.	

Legend



Connect same colour wires of wiring harness of passenger compartment relay and fuse holder **2** with wiring harness of heater **1** according to the wiring diagram.

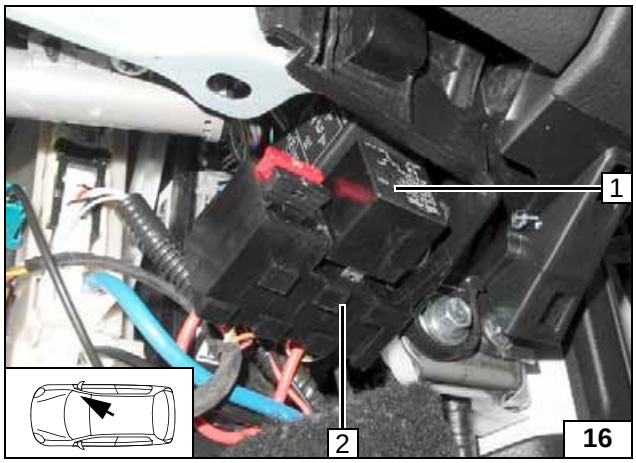
Connecting wiring harnesses



5.5mm dia. hole in instrument panel trim at position **2**.

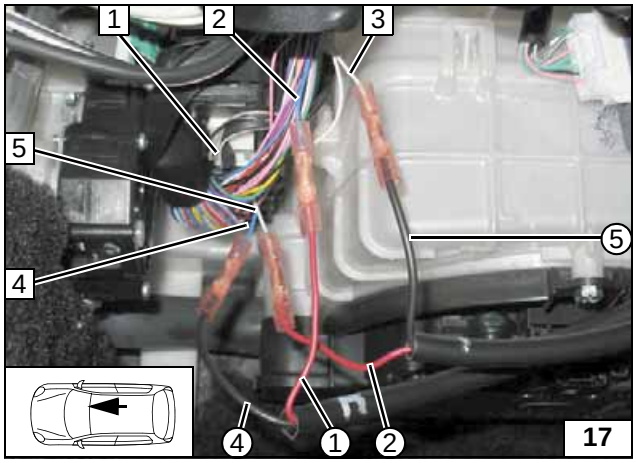
1 PWM Gateway
2 M5x16 bolt, large diameter washer [2x], nut
3 Relay and fuse holder of passenger compartment
4 10A fuse F4

Installing relay and fuse holder of passenger compartment



1 K1 relay
2 Relay and fuse holder of passenger compartment

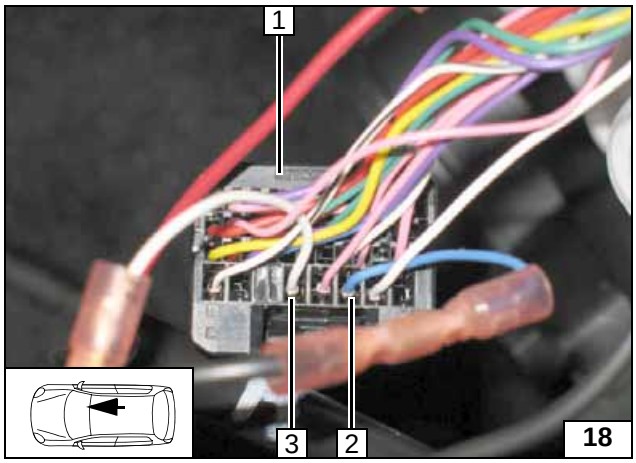
Installing K1 relay



Connect 35-pin connector **1** of AC booster as shown in the wiring diagram (see following figure)!

2 Blue (bl) wire of ECU-IG fuses
3 White (ws) wire of Pin 2 GE
4 Blue (bl) wire of Pin 5, AC-V
5 White (ws) wire of Pin 3, AC-V
① Red (rt) wire of K1/87a
② Red (rt) wire of PWM GW/IN
④ Black (sw) wire of K1/30
⑤ Black (sw) wire of PWM GW/OUT

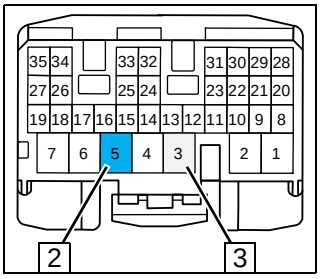
Connection of AC booster



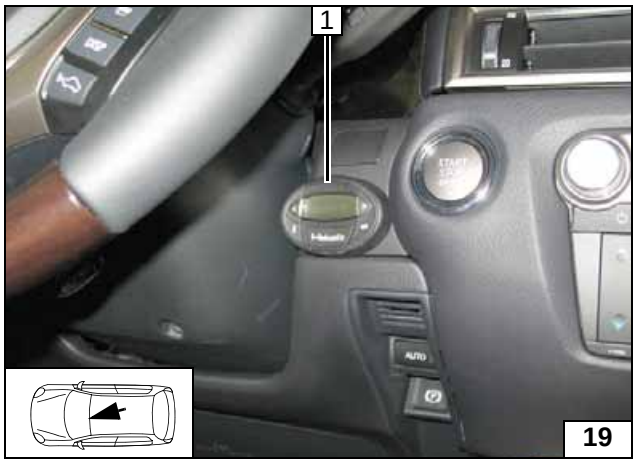
1 35-pin connector N78(A)
2 Blue (bl) wire of A/C-V connector, pin 5
3 White (ws) wire for A/C-V connector, pin 3

Wire side

Contact side



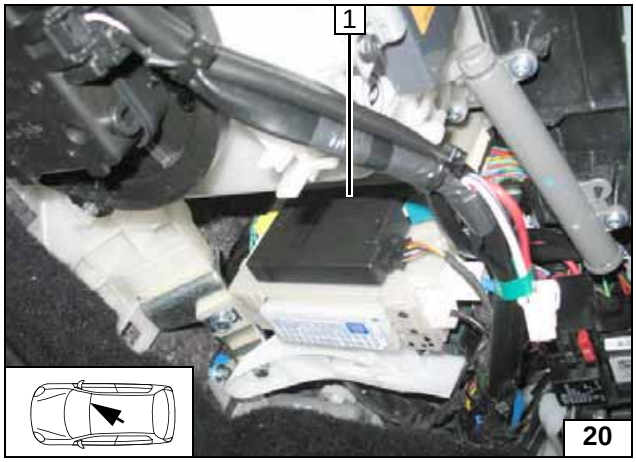
View of connector N78 (A)



Digital Timer

1 Digital timer

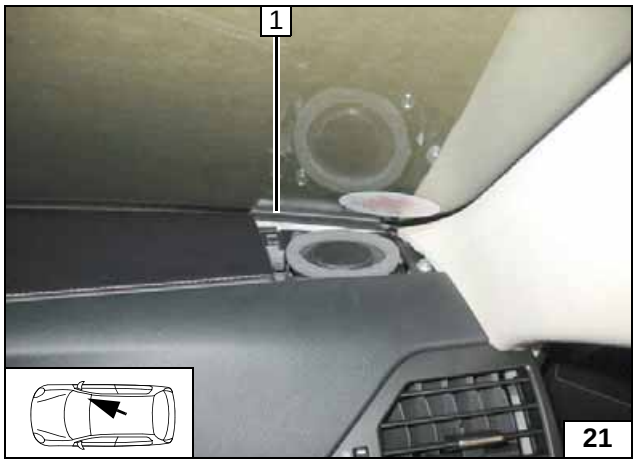
Installing digital timer



Remote Option (Telestart)

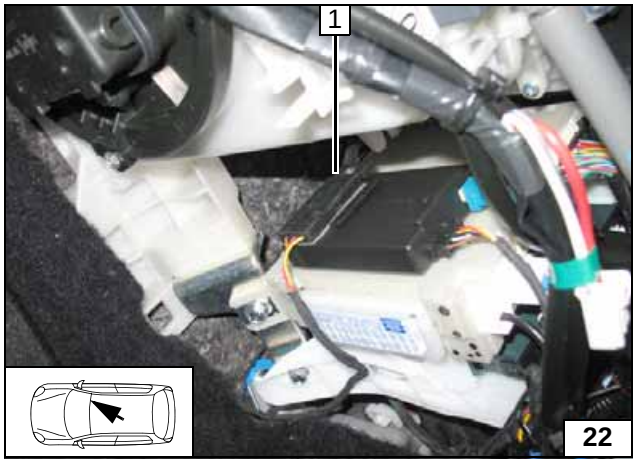
Fasten receiver **1** with double-sided adhesive tape.

Installing receiver



1 Antenna

Installing antenna

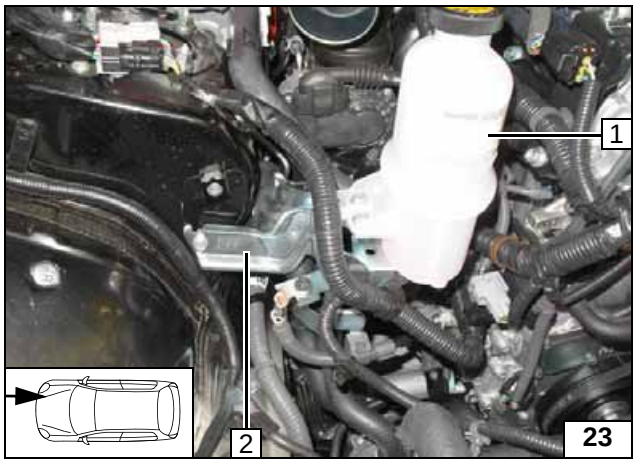


Temperature sensor T100 HTM

1 Temperature sensor, double-sided adhesive tape

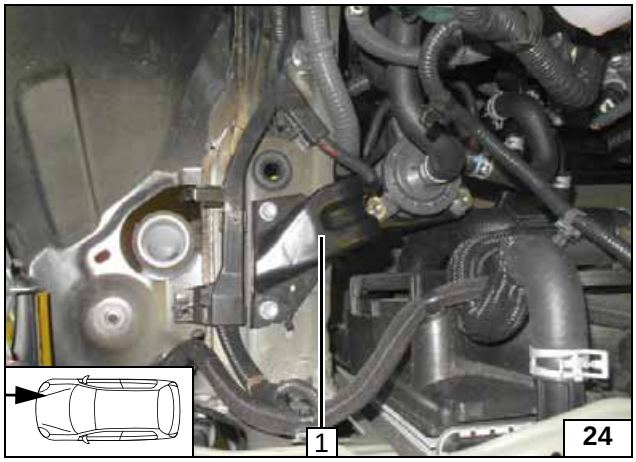
Installing temperature sensor

Preparing Installation Location



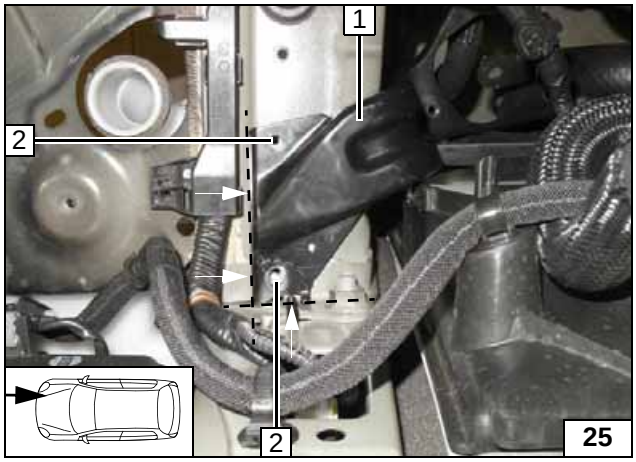
1 Detach expansion tank of hybrid system
2 Remove bracket

Removing bracket



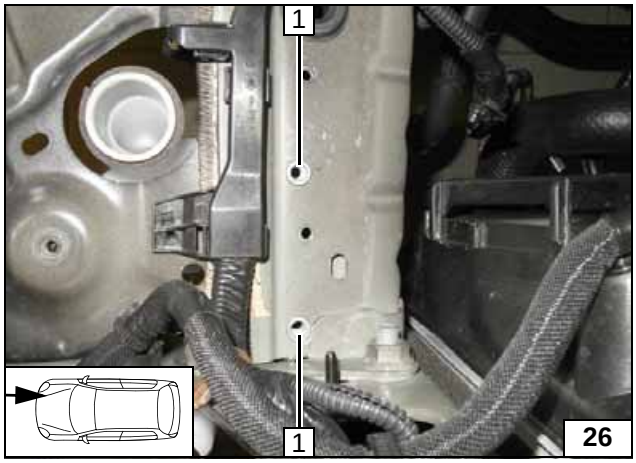
1 Remove bracket of original vehicle circulating pump for hybrid system

Removing bracket



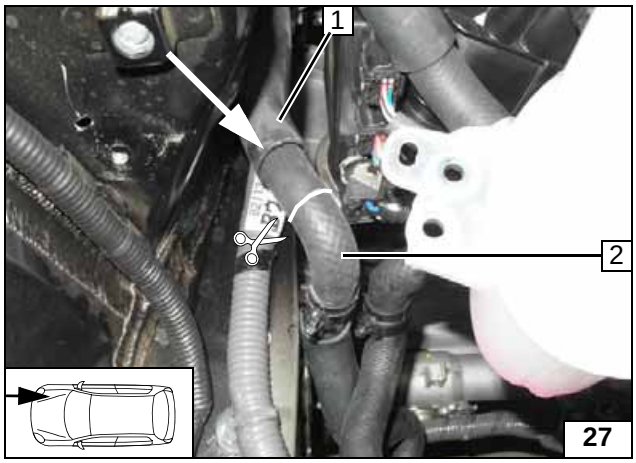
Position bracket **1** as shown and copy hole pattern **2** [2x]!

Copying hole pattern



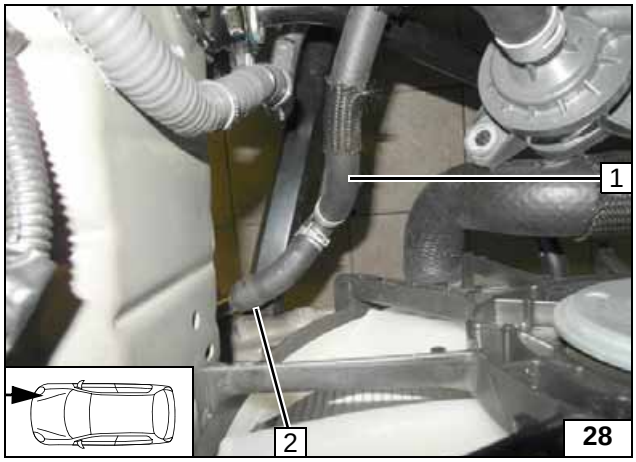
1 9.1mm dia. hole; rivet nut [2x each]

Installing rivet nuts



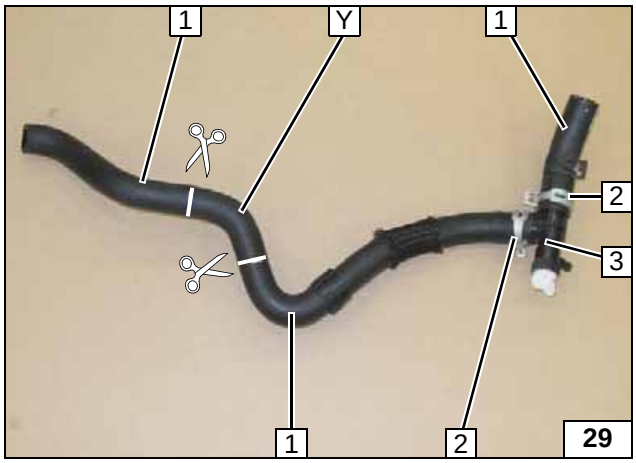
Shorten protective hose **1** of hybrid system coolant hose as shown.
Cut hybrid system coolant hose **2** at the marking.

Cutting point



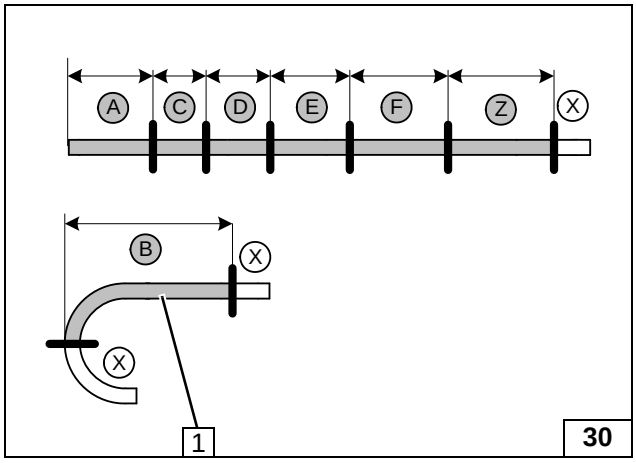
1 Remove hybrid system coolant hose
2 Remove original vehicle spring clip and discard

Preparing coolant hose



1 Discard hose section [3x]
2 Original vehicle spring clip [2x] will be reused
3 Drain valve will be reused
Y Hose section will be reused

Preparing coolant hose

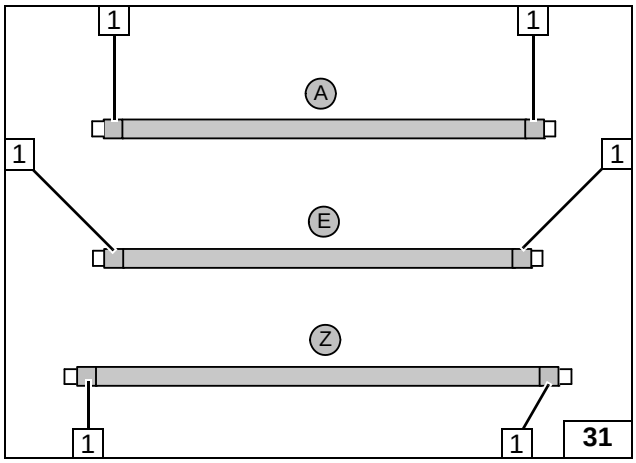


Discard section **X**.

Hose **1** = 180°, 18mm dia., 580mm long moulded hose
Hose **Z** for hybrid cooling

A = 390
B = 530
C = 65
D = 125
E = 350
F = 470
Z = 440

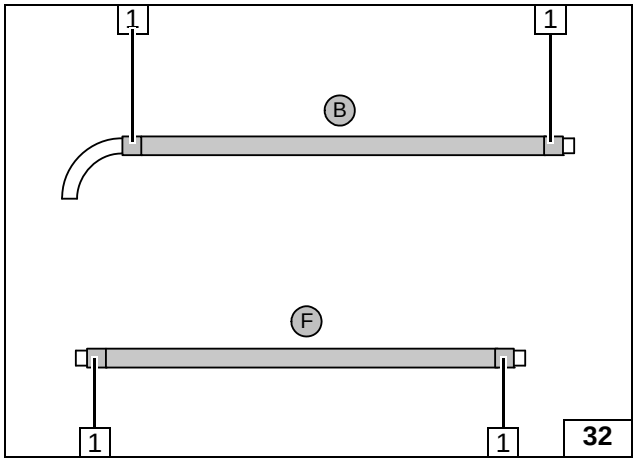
Cutting hoses to length



Slide braided protection hoses onto hoses **A, E** and **Z** and cut to length. Cut heat shrink plastic tubing to length.

1 Heat shrink plastic tubing, 50 mm long [6x]

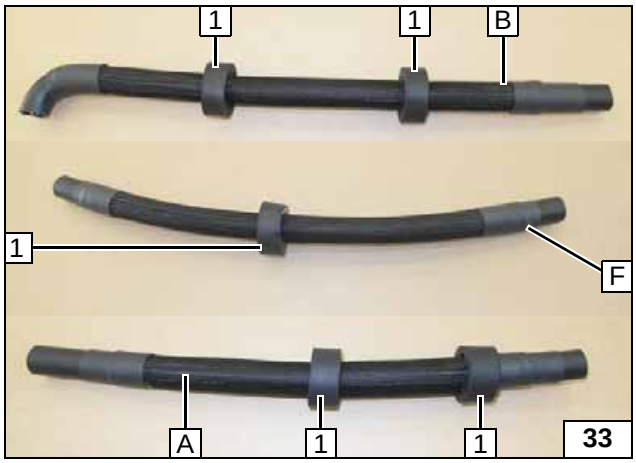
Preparing hoses



Push braided protection hose onto hose **B** and **F** and cut to length. Cut heat shrink plastic tubing to length.

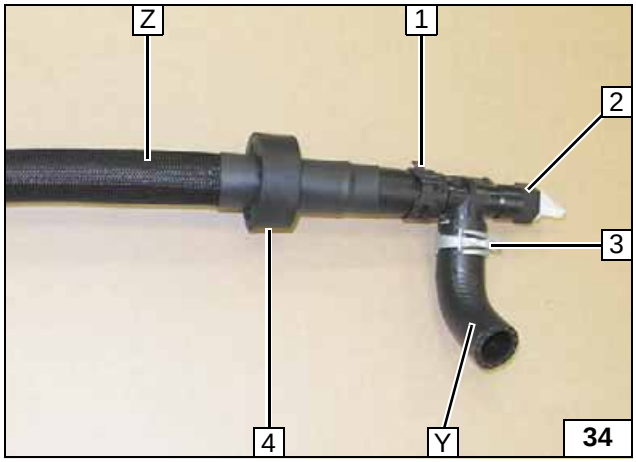
1 Heat shrink plastic tubing, 50 mm long [4x]

Preparing hoses



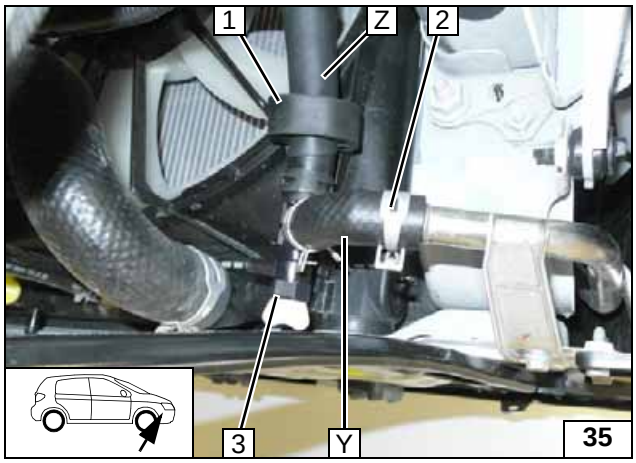
1 Slide on black (sw) rubber isolator [5x]

Preparing hoses



1 25mm dia. spring clip
2 Drain valve
3 Original vehicle spring clip
4 Black (sw) rubber isolator
Y Original vehicle hose section

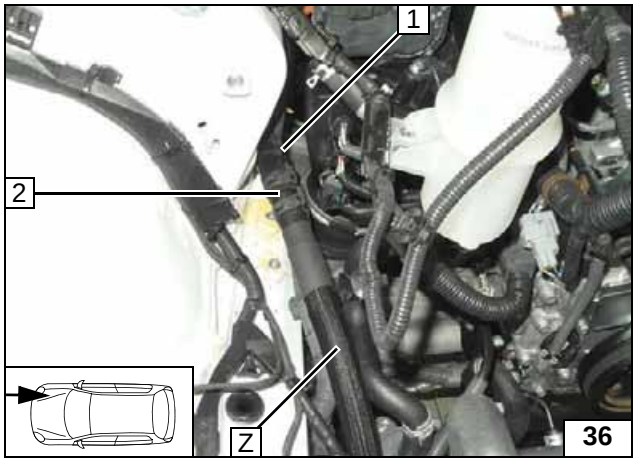
Premounting hoses Y and Z



Align black (sw) rubber isolator **1** with radiator frame.

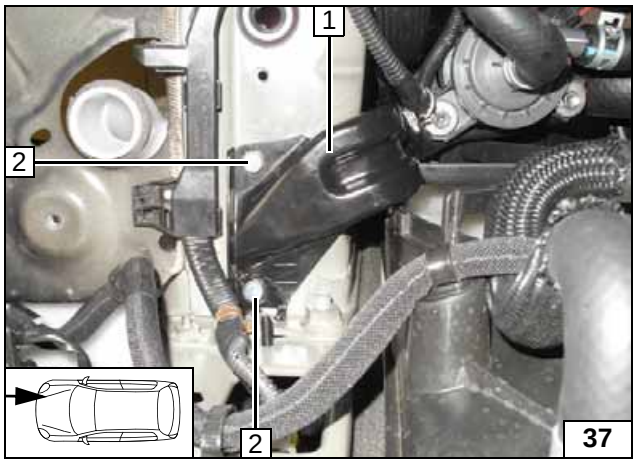
2 Original vehicle spring clip
3 Drain valve

Installing hose Y



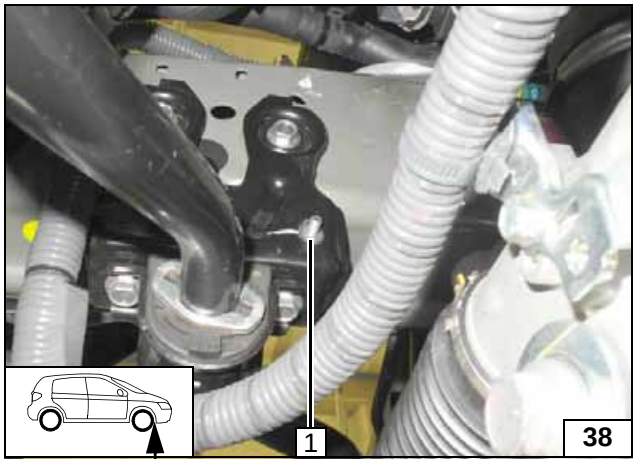
1 Hybrid system coolant hose
2 18x18 mm dia. connecting pipe, 25 mm dia. spring clip [2x]

Mounting hose Z



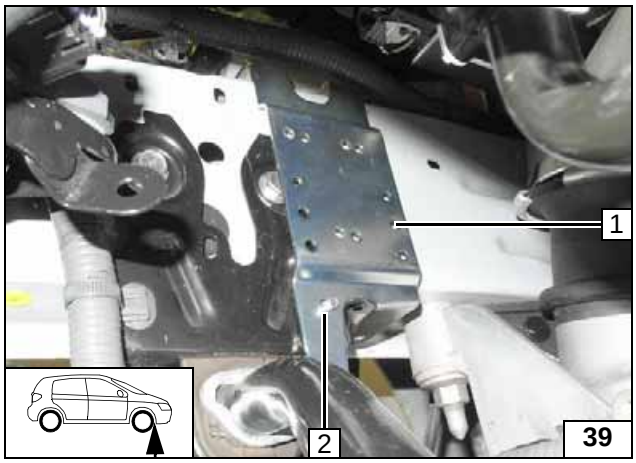
1 Bracket of original vehicle circulating pump for hybrid system
2 Original vehicle bolt [2x]

Installing bracket



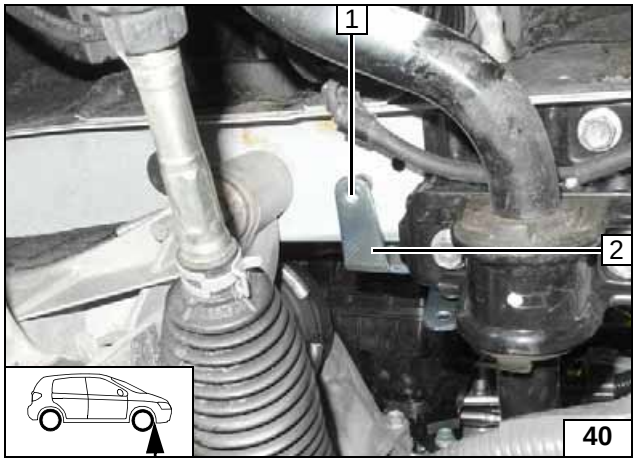
1 M6x16 bolt, large diameter washer, pin lock, existing hole

Mounting bolt



Prepare heater bracket **1** according to template and use flanged nut M6 **2** to loosely install on M6x16 bolt!

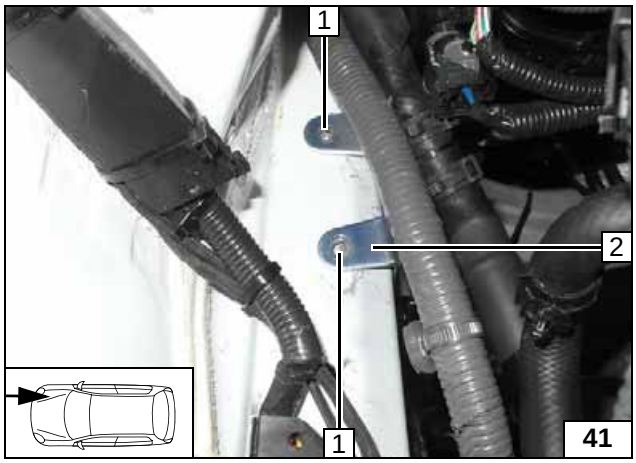
Installing bracket loosely



Align heater bracket **2** vertically.

1 Copy the hole pattern

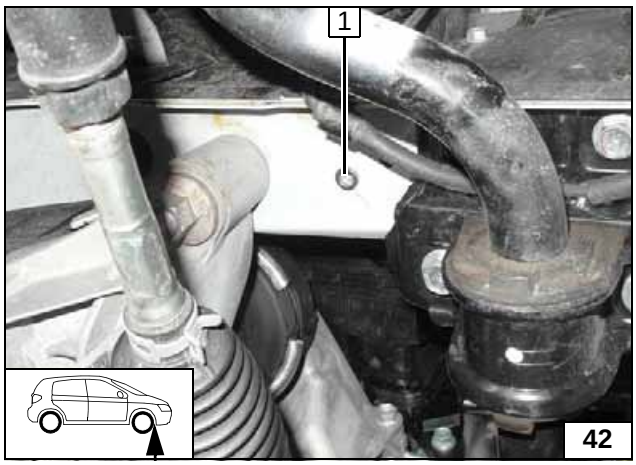
Copying hole pattern



After copying hole pattern, remove bracket **2**.

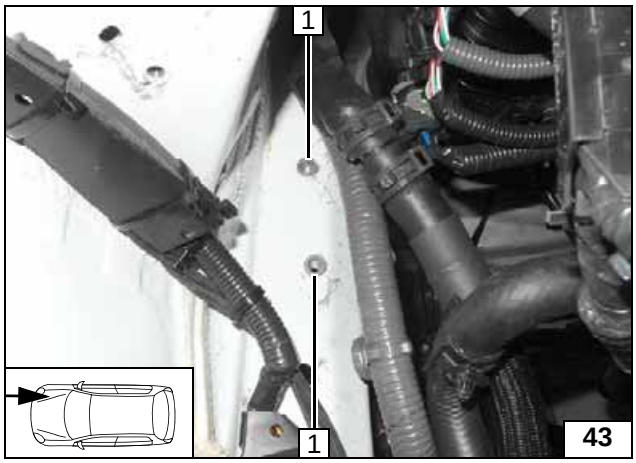
1 Copy the hole pattern [2x]

Copying hole pattern



1 9.1 mm dia. hole; rivet nut

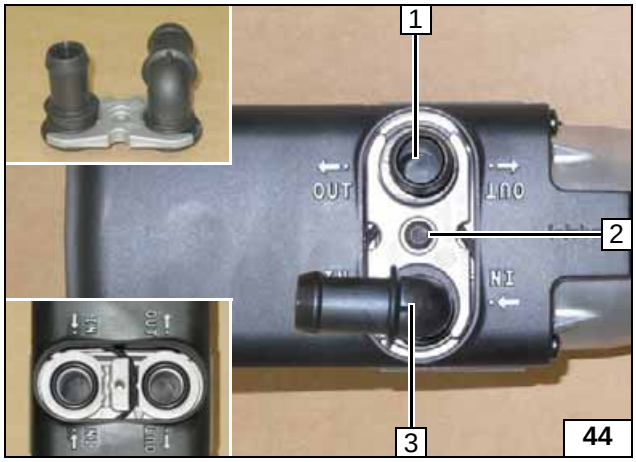
Installing rivet nut



1 9.1mm dia. hole; rivet nut [2x each]

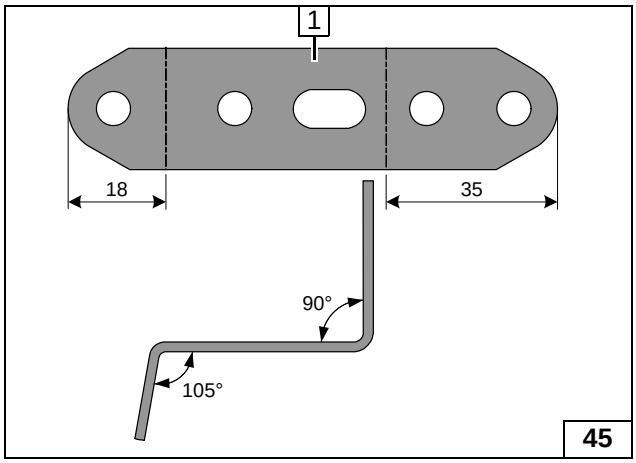
Installing rivet nuts

Preparing Heater



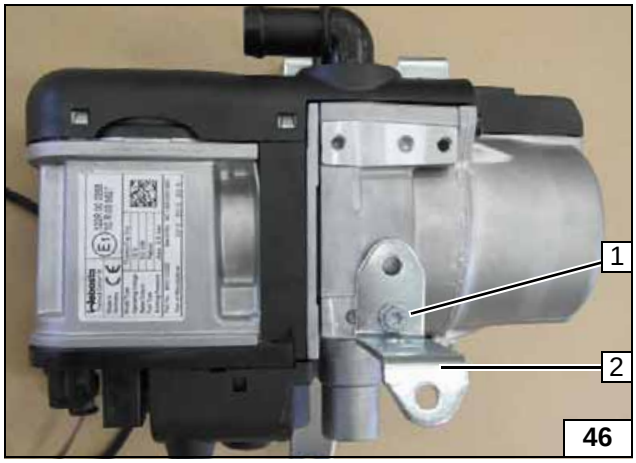
1 Axial water connection piece, sealing ring
2 5x15 self-tapping bolt, retaining plate of water connection piece
3 90° water connection piece, sealing ring

Installing water connection piece



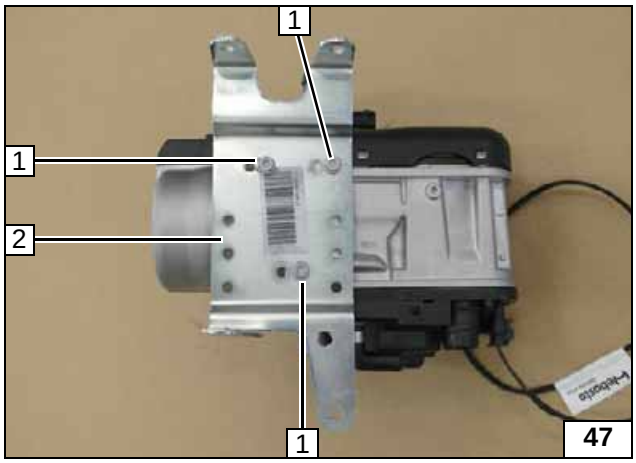
1 Perforated bracket

Preparing perforated bracket



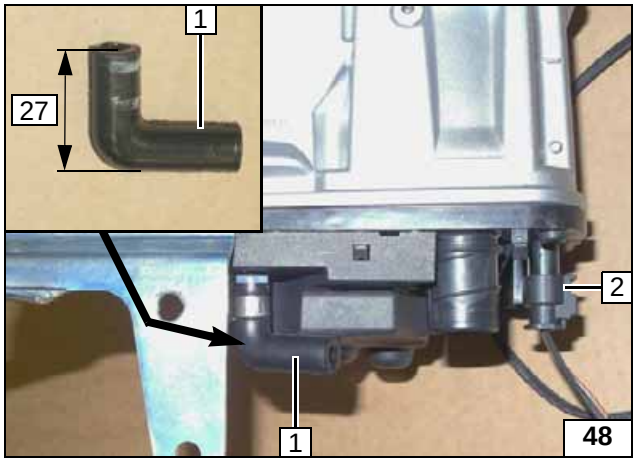
1 5x13 self-tapping bolt
2 Perforated bracket

Mounting perforated bracket



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

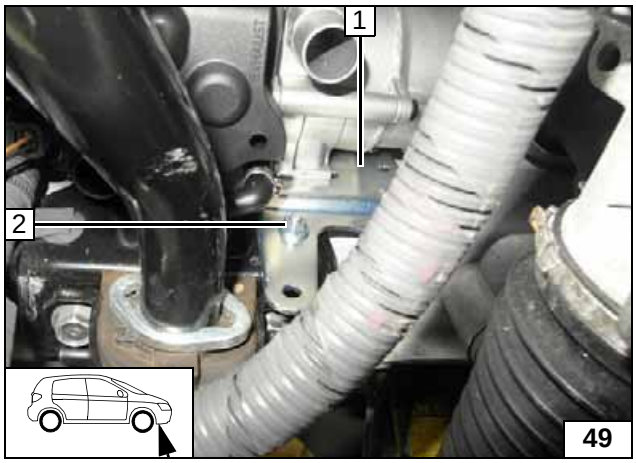
Installing bracket



1 90°, short moulded hose, 10 mm dia. clamp
2 Connector of circulating pump wiring harness

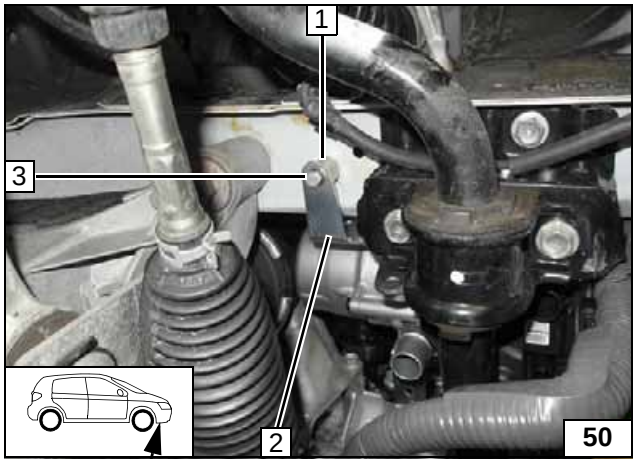
Premounting heater

Installing Heater



1 Bracket
2 Loosely mount flanged nut

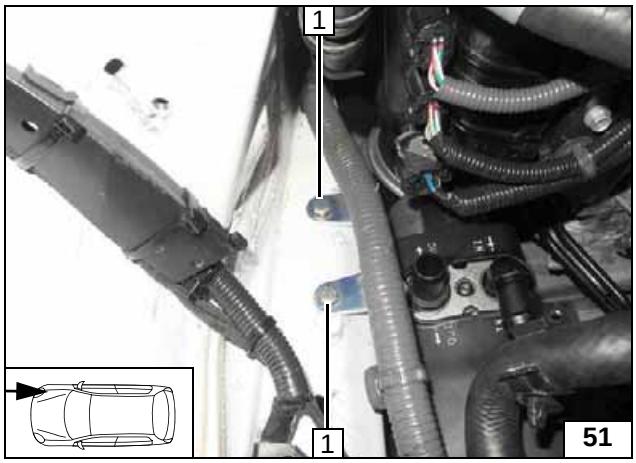
Loosely installing heater



Insert 15mm shim **1** between frame side member and bracket **2**.

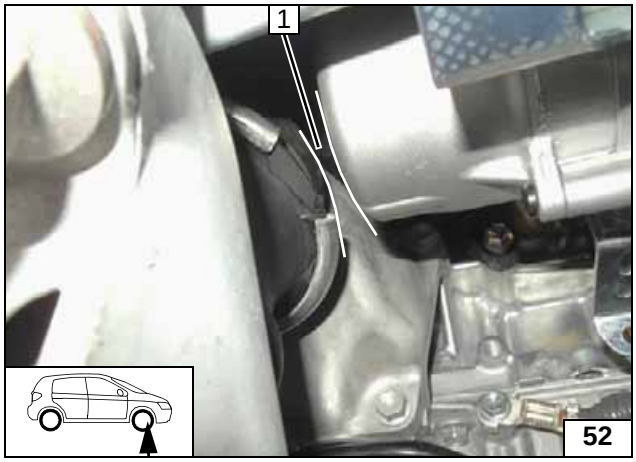
3 Loosely mount M6x30 bolt, spring lock washer, shim 15

Loosely installing heater



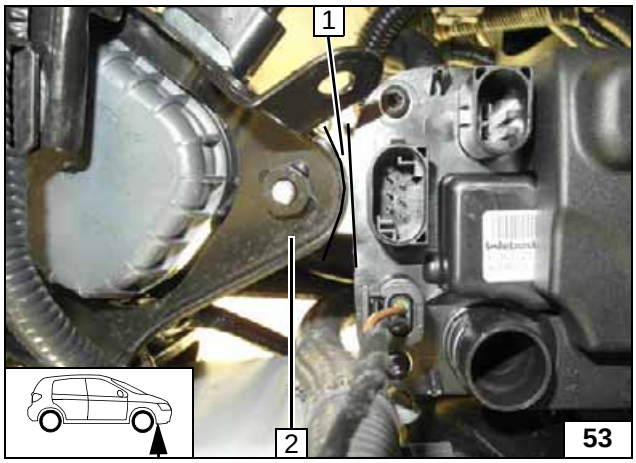
1 Loosely mount M6x20 bolt, spring lock-washer [2x each]

Loosely installing heater



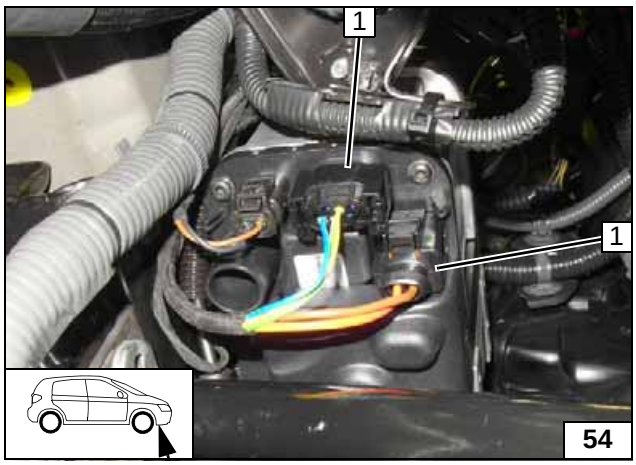
Ensure sufficient space between heater and engine mount (at least 10 mm) at position **1**; align heater if necessary.

Aligning heater



Ensure sufficient distance between heater and hybrid system circulating pump bracket**2** (at least 5mm) at position **1**; align bracket **2** if necessary.
Tighten all loose bolt connections.

Aligning heater



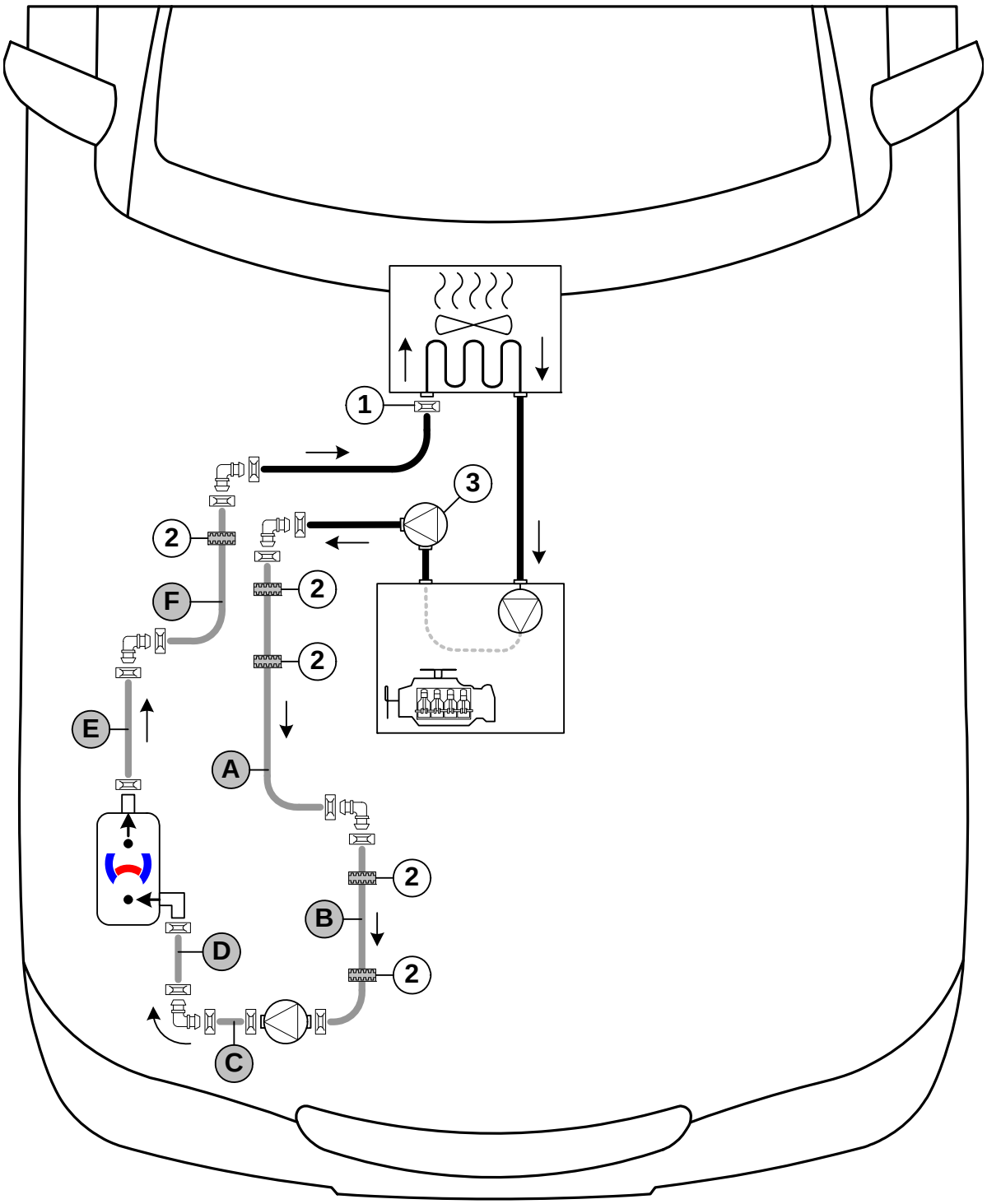
1 Wiring harness of heater [2x]

Installing wiring harness

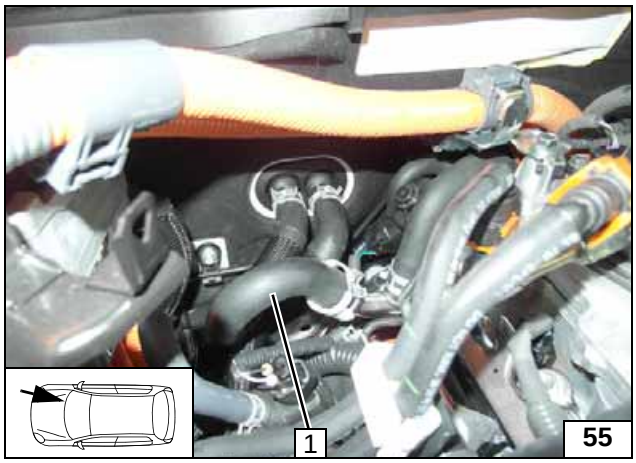
Coolant Circuit

WARNING!
Any coolant running off should be collected using an appropriate container. Install hoses so that they are kink-free. Unless specified otherwise, always fasten using cable ties. Position clamps so that other hoses cannot be damaged. When installing the hoses, the heater must be filled with coolant.
The connection should be "inline" based on the following diagram:

Hose routing diagram

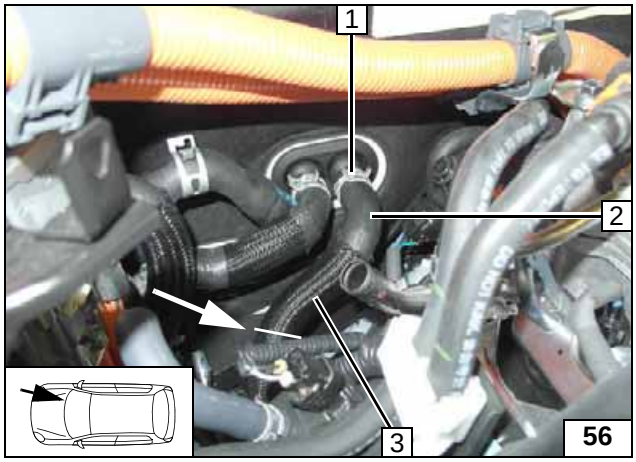


All spring clips without a specific designation = 25mm dia. **1** = Original vehicle spring clip .
2 = Black (sw) rubber isolator **3** = Original vehicle circulating pump
All connecting pipes = 18x18mm dia.



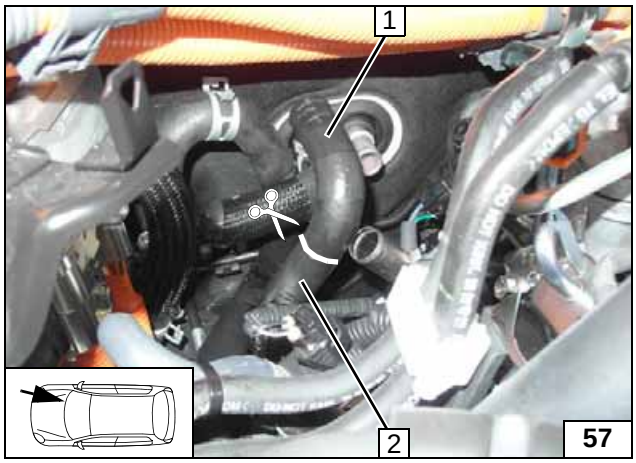
Detach hose of heat exchanger outlet **1** for better handling and put it aside.

Cutting point



Remove hose of engine outlet / heat exchanger inlet **2** from connection piece of heat exchanger inlet. Spring clip **1** will be reused. Remove braided protection hose **3** up to the marking.

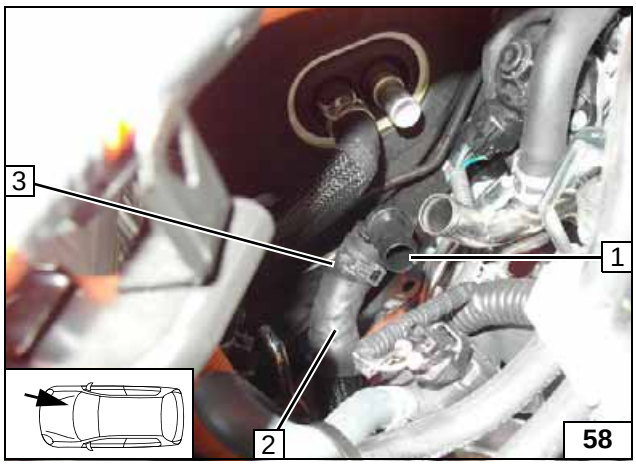
Cutting point



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

1 Hose section will be reused
2 Engine outlet hose section

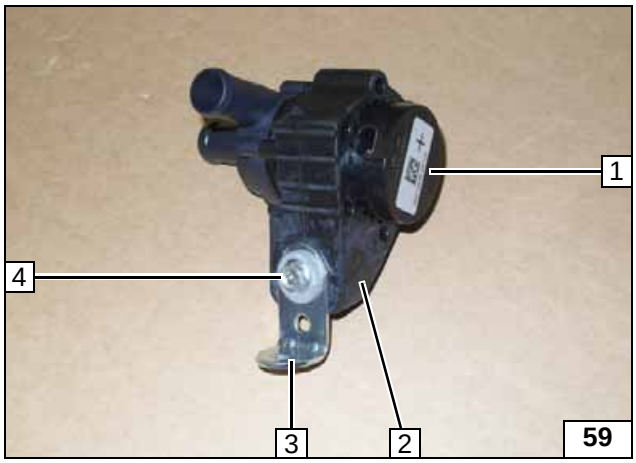
Cutting point



Slide 50mm heat shrink plastic tubing **2** onto hose of engine outlet **3** and shrink.

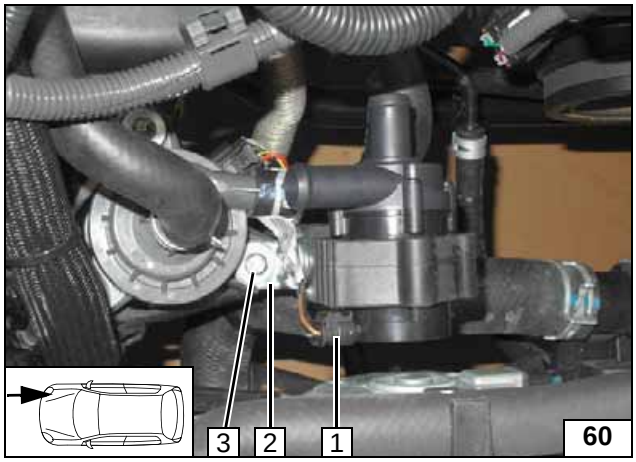
1 Install connecting pipe

Preparing engine outlet hose



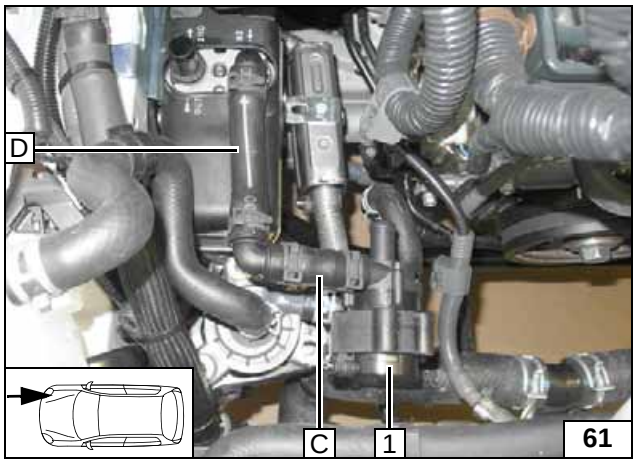
1 Circulating pump
2 Mounting of circulating pump
3 Angle bracket
4 M6x25 bolt, large diameter washer, flanged nut

Premounting circulating pump



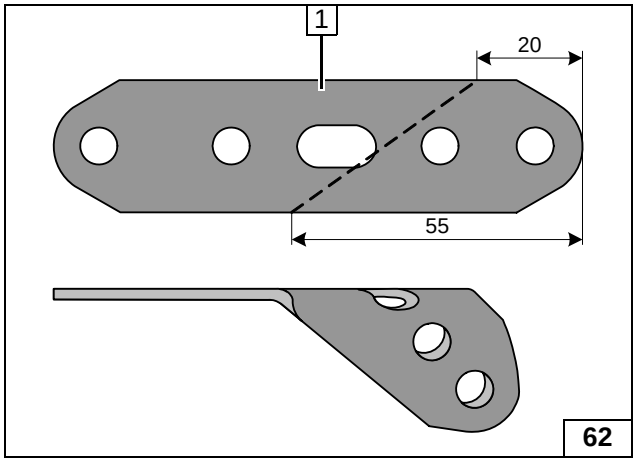
1 Connector of circulating pump wiring harness
2 Angle bracket
3 Remove original vehicle bolt of hybrid system circulating pump bracket und replace it with M6x40 bolt

Installing circulating pump



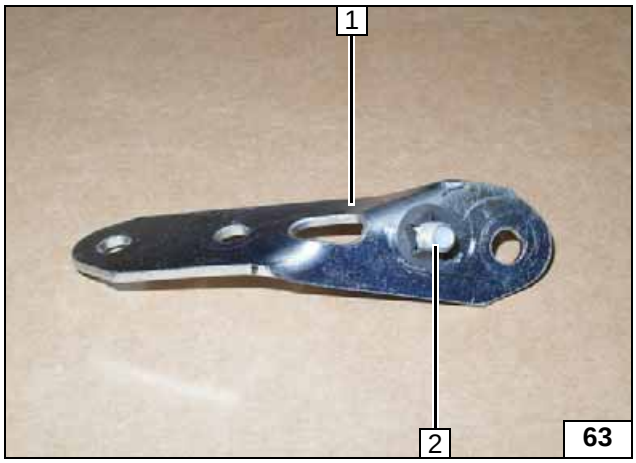
1 Circulating pump

Connection of heater inlet and circulating pump



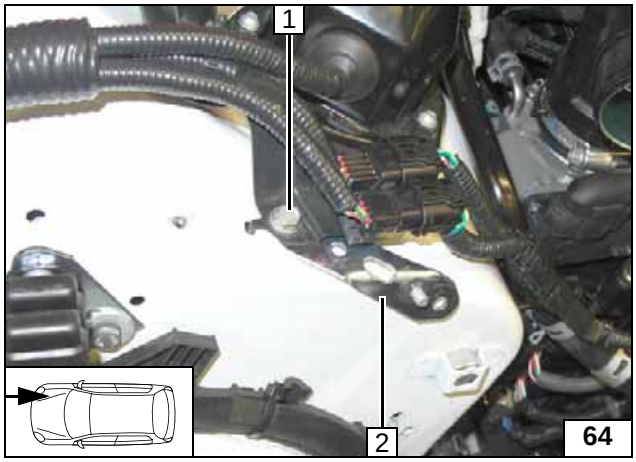
1 Angle down perforated bracket by 90°

Preparing perforated bracket



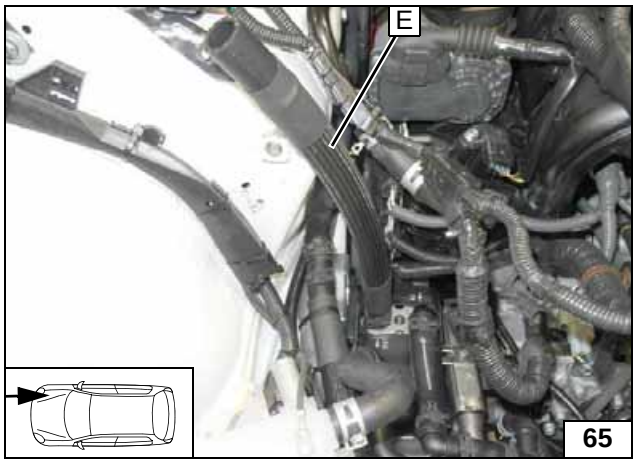
1 Perforated bracket
2 M6x20 bolt, pin lock

Preparing perforated bracket

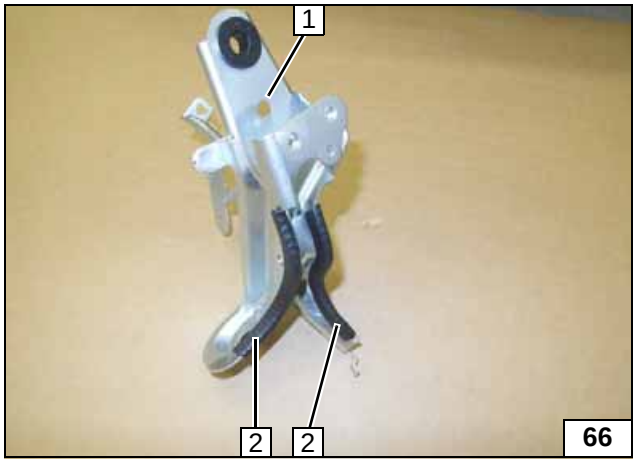


1 Original vehicle bolt
2 Perforated bracket

Mounting perforated bracket



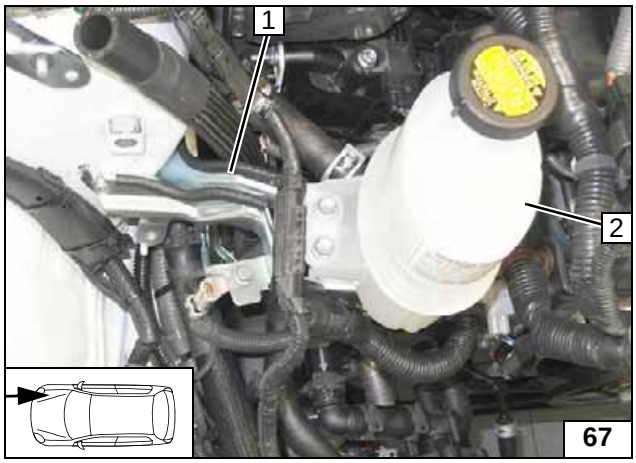
Connecting heater outlet



Cut 200mm long edge protection in half!

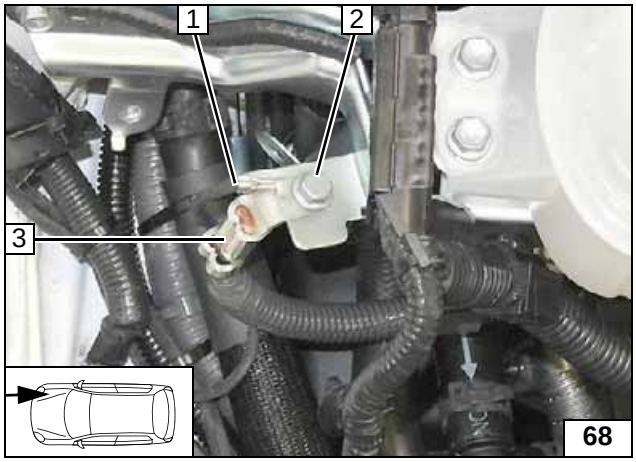
1 Hybrid system expansion tank bracket
2 100 mm edge protection [2x]

Preparing hybrid system expansion tank bracket



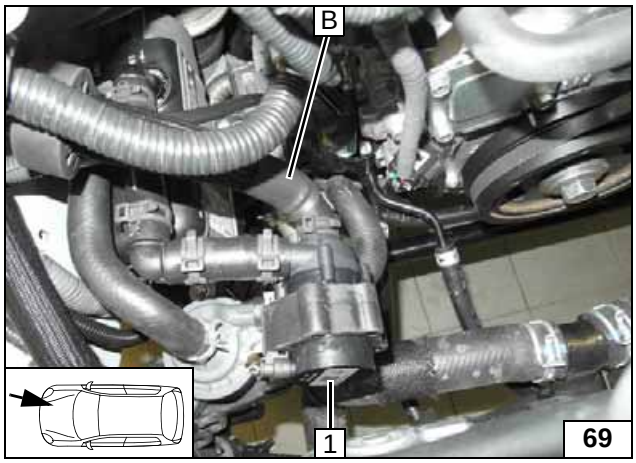
1 Hybrid system expansion tank bracket
2 Hybrid system expansion tank

Installing hybrid system expansion tank



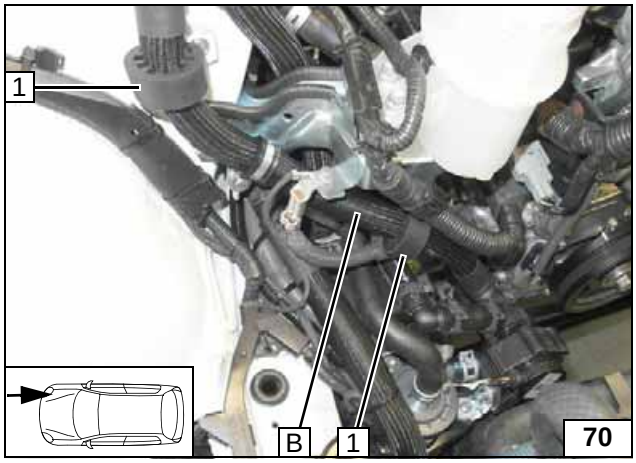
1 Earth wire of heater wiring harness
2 Original vehicle bolt
3 Original vehicle earth wire

Installing earth wire



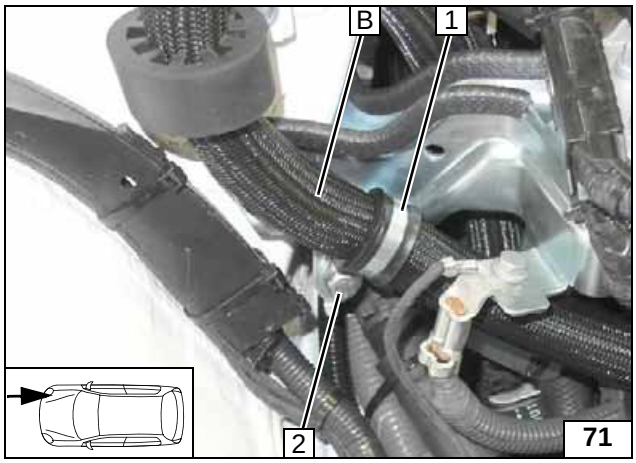
1 Circulating pump

Connecting circulating pump



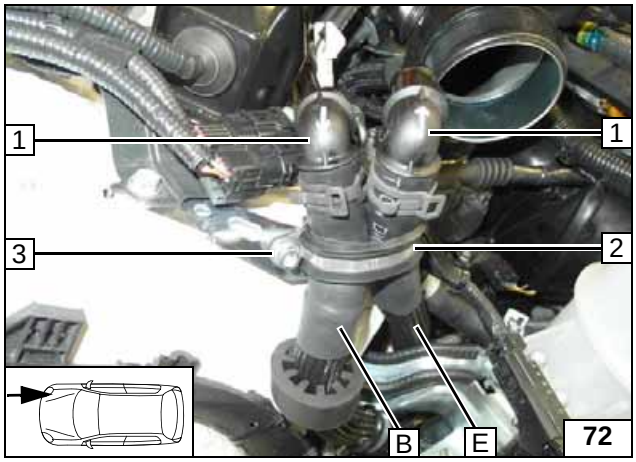
1 Align black (sw) rubber isolator [2x]

Routing hose B



1 25 mm dia. rubber-coated p-clamp
2 M6x20 bolt, flanged nut, existing hole

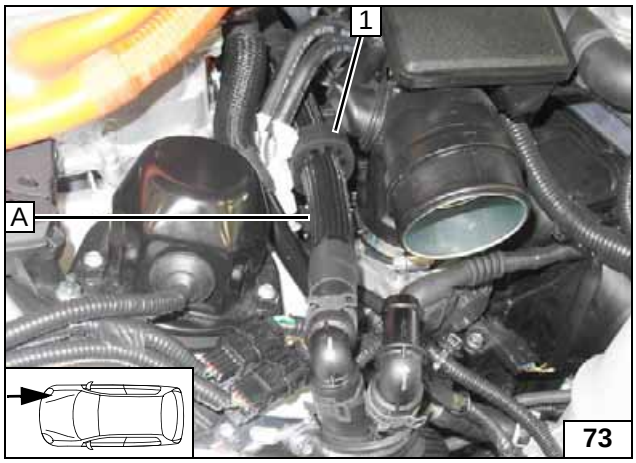
Attaching hose B



Install 90°, 18x18mm dia. connecting pipe **1** [2x].

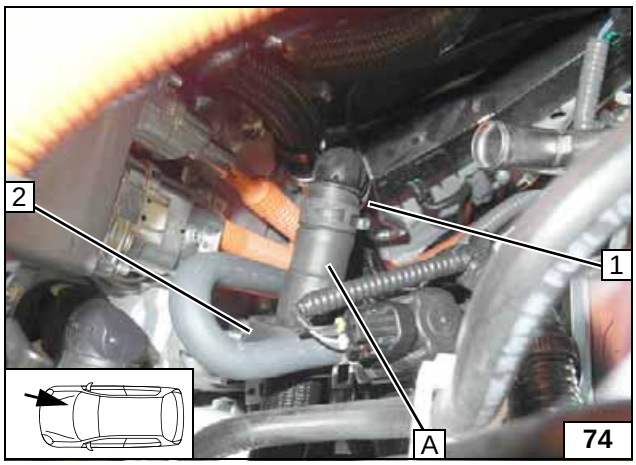
2 38 mm dia. rubber-coated p-clamp
3 Flanged nut on M6x20 bolt

Securing hoses B and E



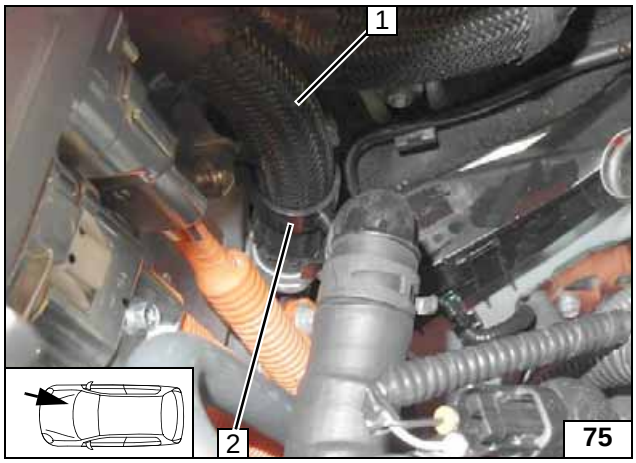
1 Align black (sw) rubber isolator as shown

Installing hose A



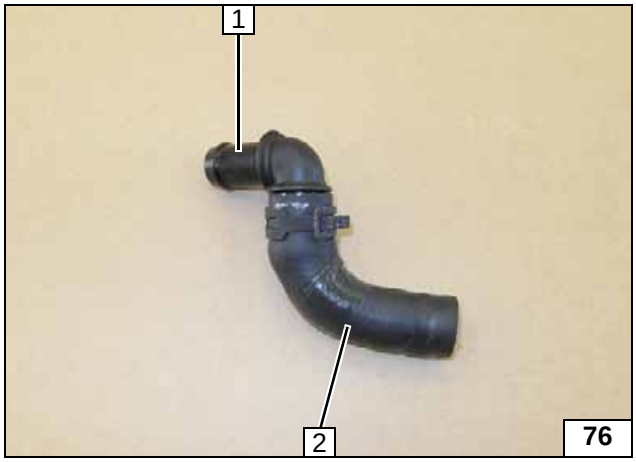
1 Engine outlet hose
2 Align black (sw) rubber isolator with original vehicle hose

Installing hose A



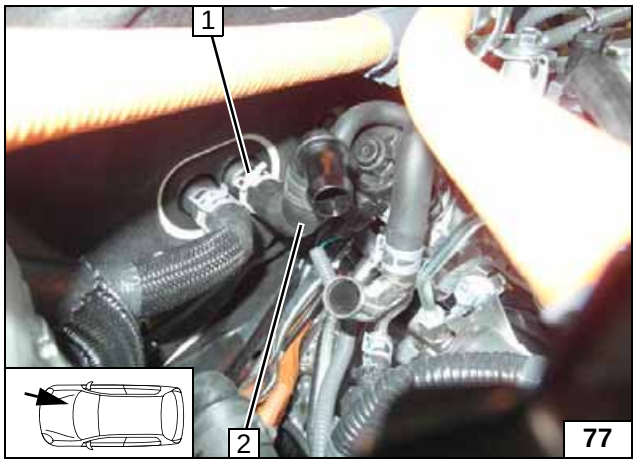
1 Original vehicle hose
2 23x23 hose bracket between hose of engine outlet and original vehicle hose

Inserting hose bracket



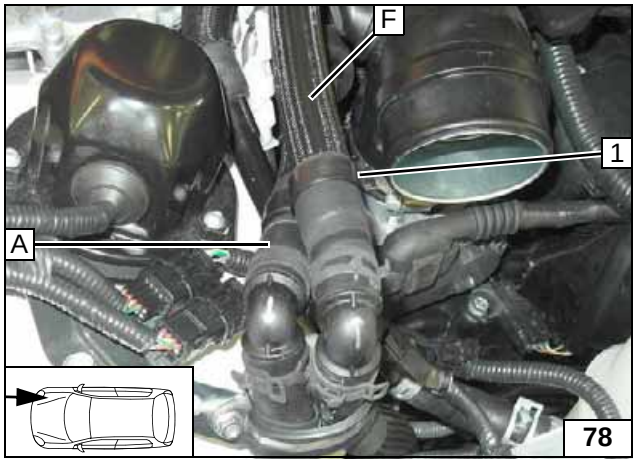
1 Premount connecting pipe
2 Hose of heat exchanger inlet

Preparing hose on heat exchanger inlet



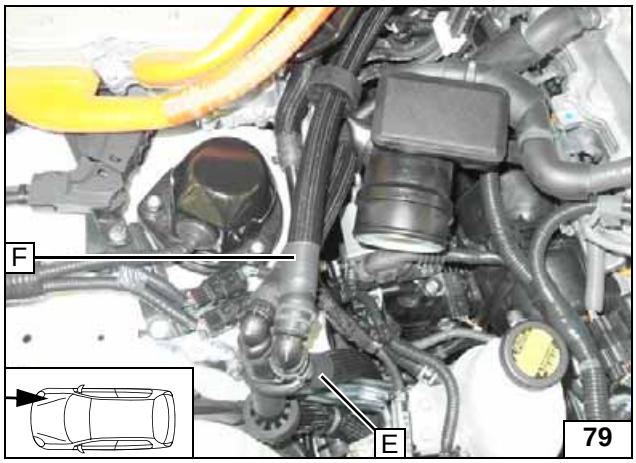
1 Original vehicle spring clip
2 Hose of heat exchanger inlet

Connecting heat exchanger inlet



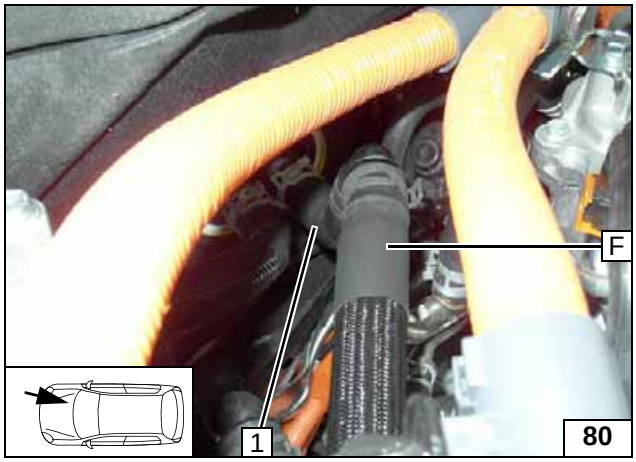
1 23x23 hose bracket between hoses **A** and **F**

Inserting hose bracket



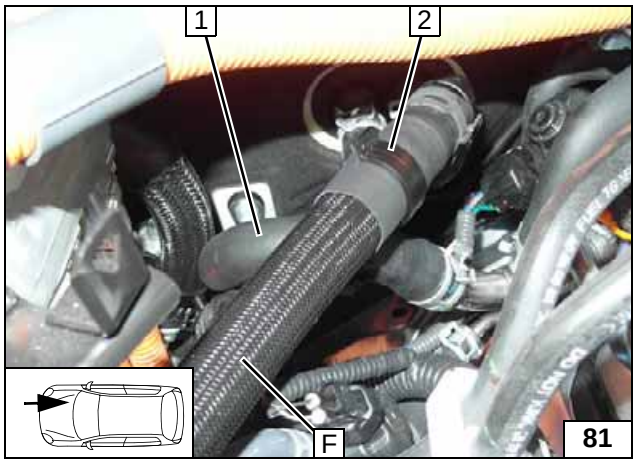
Connect hose **E** and **F**.

Connecting heater outlet



1 Hose of heat exchanger inlet

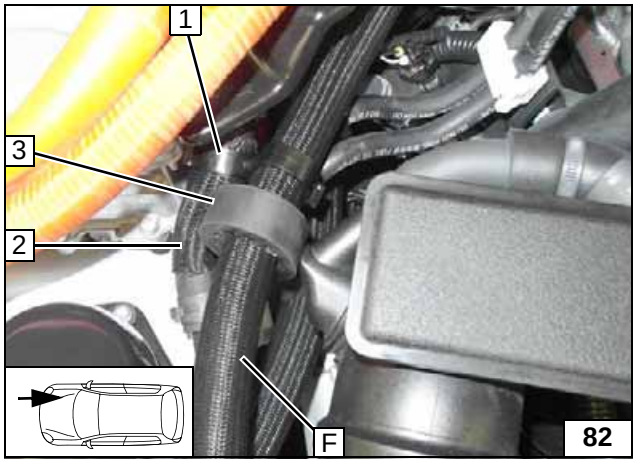
Installing hose F



Re-install hose of heat exchanger outlet **1**.

2 23x23 hose bracket between hose **F** and hose of heat exchanger outlet

Inserting hose bracket



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

1 23x23 hose bracket between hose **F** and original vehicle hose
2 Original vehicle hose
3 Align black (sw) rubber isolator as shown

Inserting hose bracket

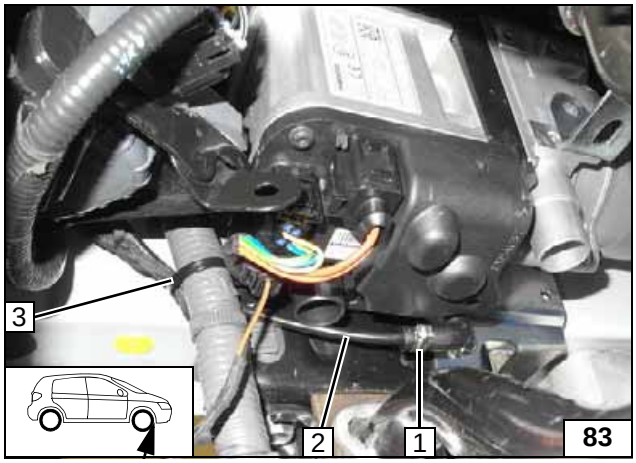
Fuel

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

Catch any fuel running off with an appropriate container.

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

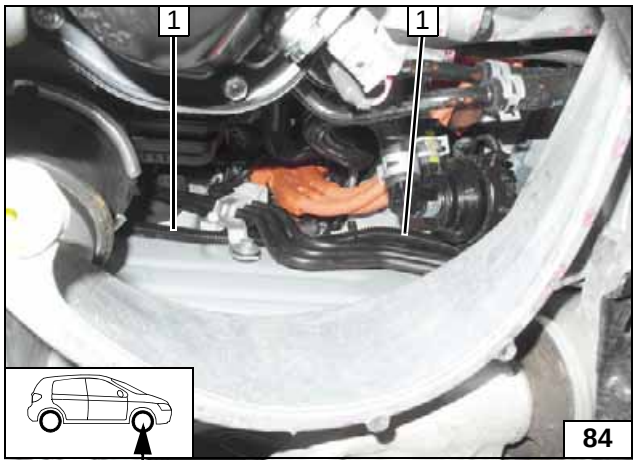
WARNING!
The fuel line and wiring harness are routed to the metering pump as shown in the wiring harness routing diagram.



Fasten fuel line and wiring harness of metering pump to original vehicle wiring harness using cable tie **3**.

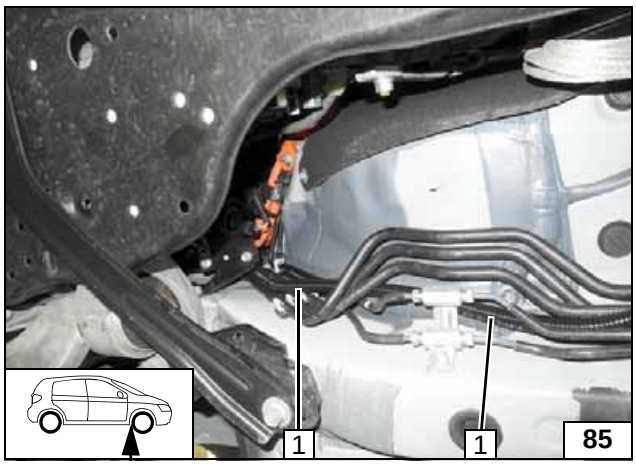
1 10 mm dia. clamp
2 Fuel line of heater

Connecting heater



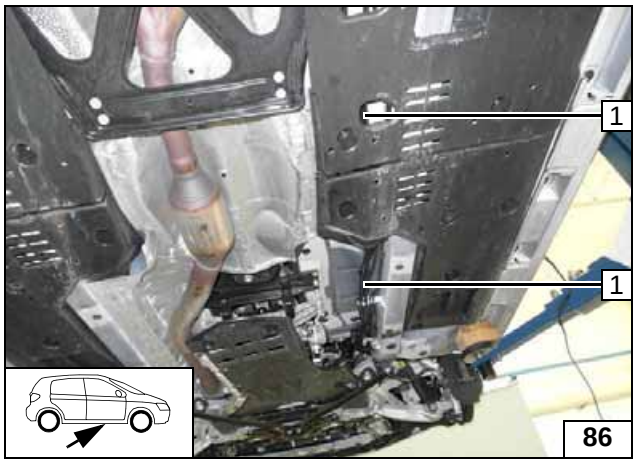
Pull fuel line and wiring harness of metering pump in 10mm dia., 2100mm corrugated tube **1** and route along original vehicle lines to the back.

Installing lines



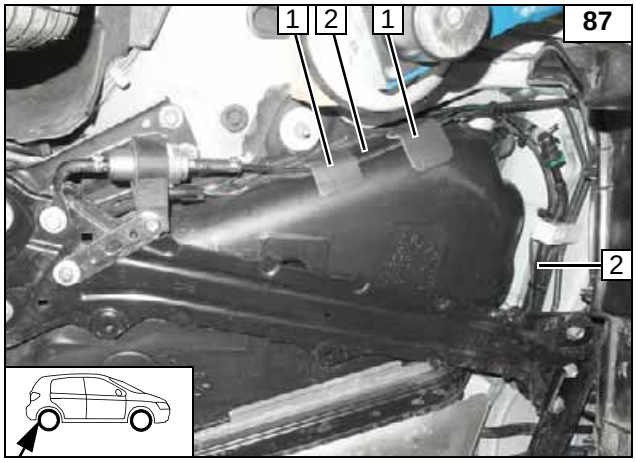
Route fuel line and wiring harness of metering pump in 10mm dia. corrugated tube **1** along original vehicle lines to the back.

Installing lines



Route the fuel line and the wiring harness of the metering pump behind the underride protection along the original vehicle lines to the installation location of the metering pump.

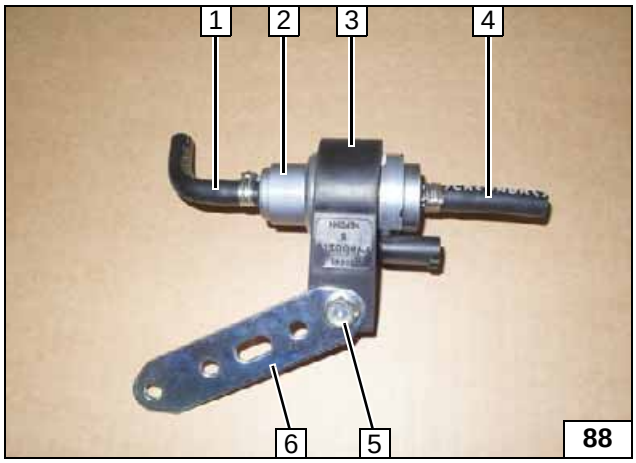
Installing lines



Cut insulation protection strips in half**!**
Route fuel line and wiring harness of metering pump **2** along original vehicle lines to installation location of metering pump.

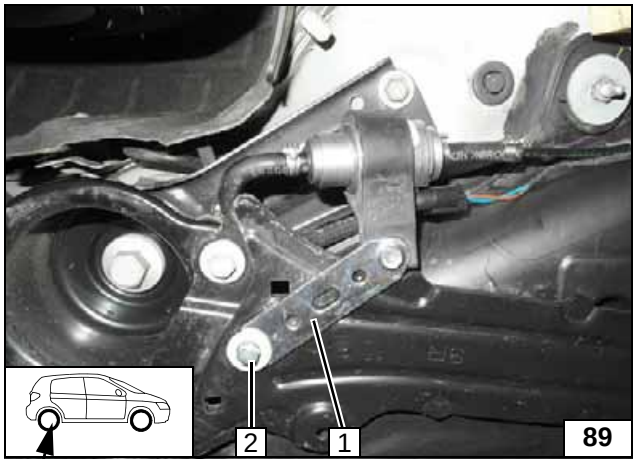
1 Section of insulation protection strip [2x]

Installing lines



1 90° moulded hose, 10 mm dia. clamp
2 Metering pump
3 Receptacle for metering pump
4 Hose section, 10mm dia. clamp
5 M6x25 bolt, support angle bracket, flanged nut
6 Perforated bracket

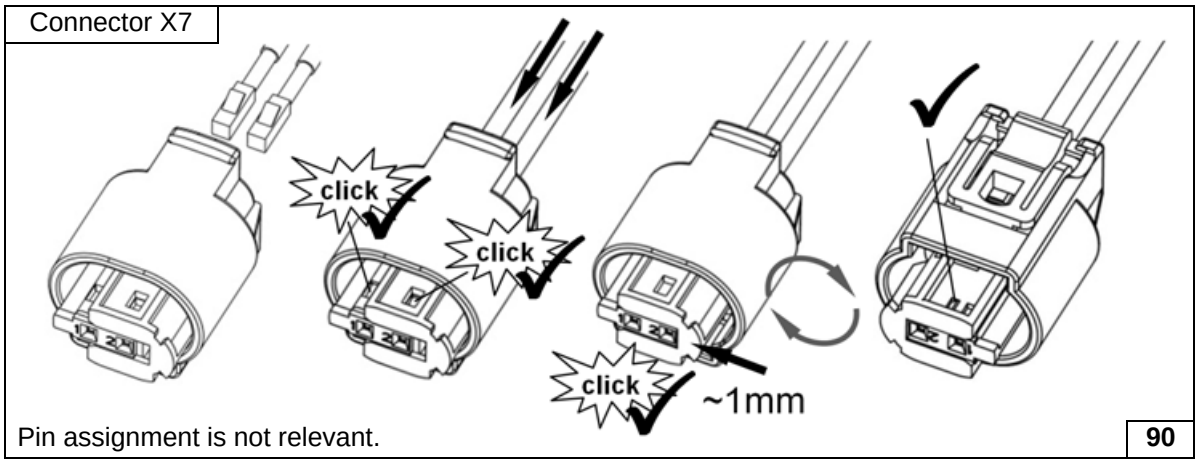
Premounting metering pump

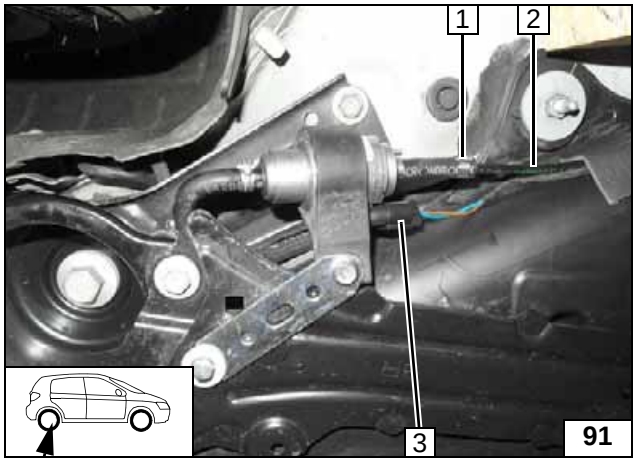


1 Perforated bracket
2 M6x20 bolt, spring lockwasher, large diameter washer, existing threaded hole

Installing metering pump

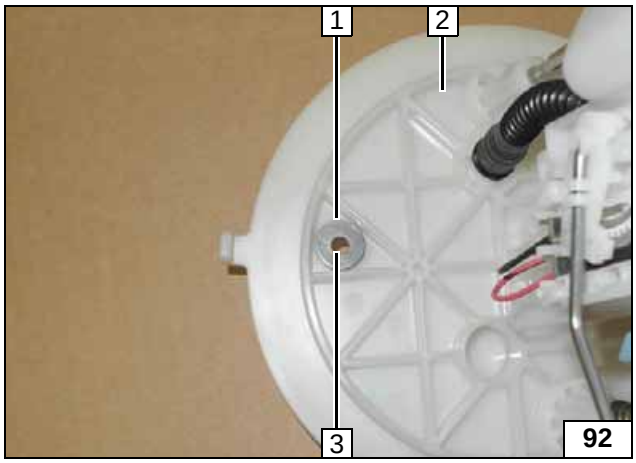
Completing connector of metering pump





1 10 mm dia. clamp
2 Fuel line of heater
3 Wiring harness of metering pump, connector X7 mounted

Connecting metering pump



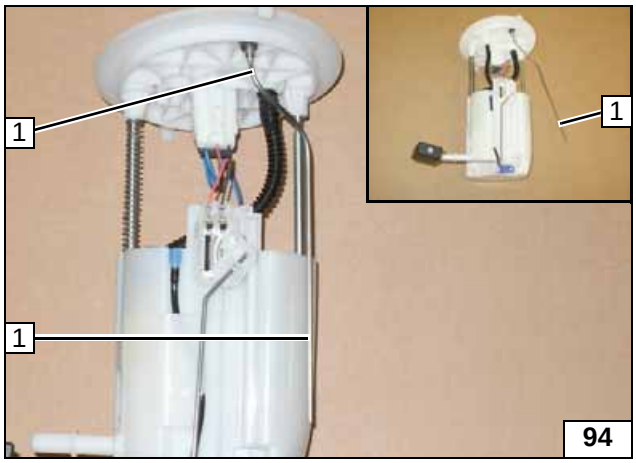
Remove left fuel-tank sending unit **2** according to manufacturer's instructions.

1 Washer with outer dia. d_a = 15mm
3 Copy hole pattern, 6 mm dia. hole

Fuel extraction

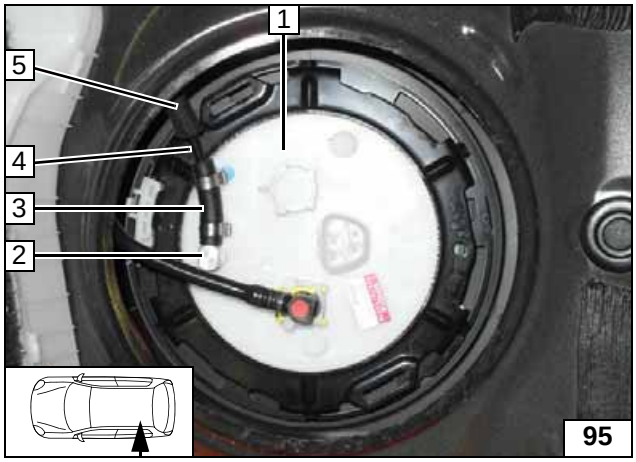
Shape fuel standpipe **1** according to template and cut to length.

Mounting fuel standpipe



1 Adjust fuel standpipe to swirl pot

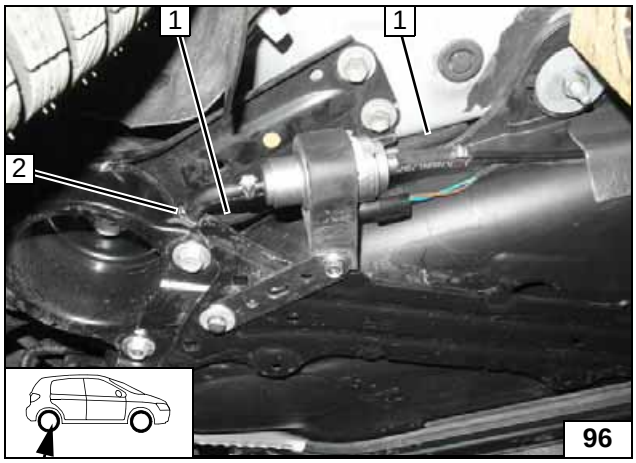
Mounting fuel standpipe



Install fuel-tank sending unit **1** in accordance with manufacturer's instructions. Route fuel line **4** in 6x11 fabric protective hose **5** above the tank to the metering pump.

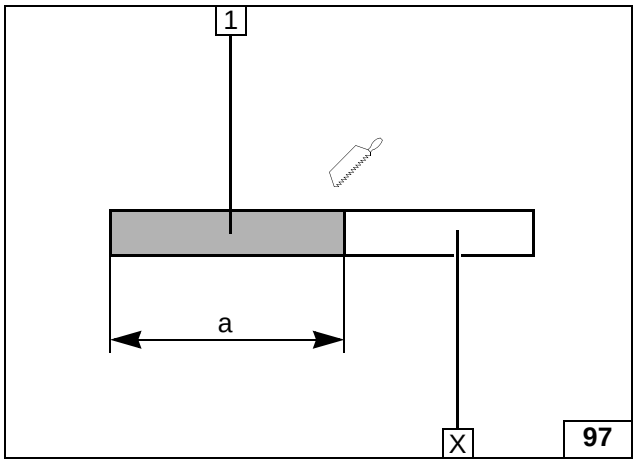
2 Fuel standpipe
3 Hose section, 10mm dia. clamp [2x]

Connecting fuel line



1 Fuel line of fuel standpipe in 6x11 fabric protective hose
2 10mm dia. clamp, fuel line of fuel standpipe

Connecting metering pump

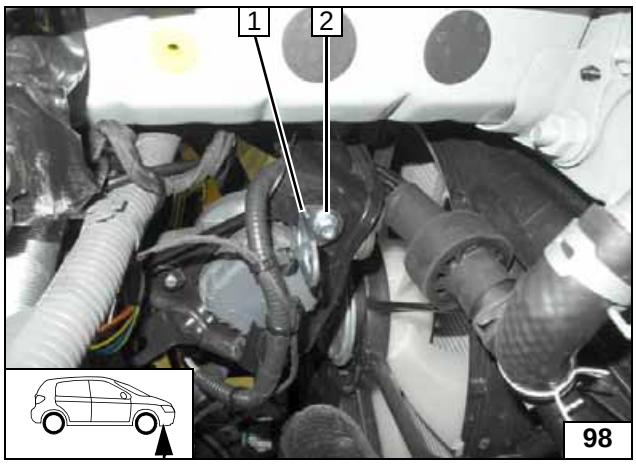


Combustion Air

Discard section **X**.

1 Combustion air pipe
a =250 mm

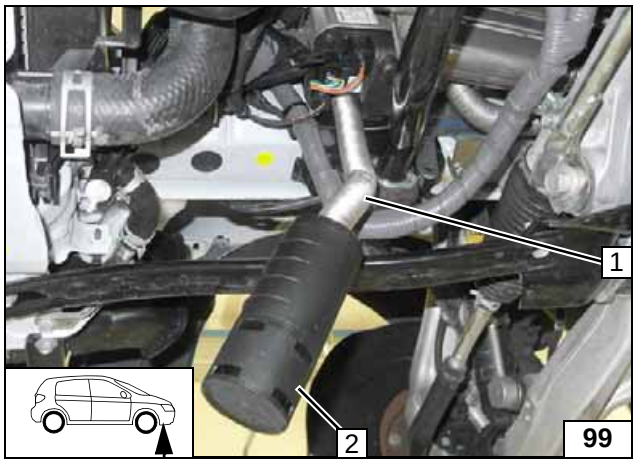
Cutting combustion air pipe to length



Replace original vehicle bolt at position **2** with M6x40 bolt.

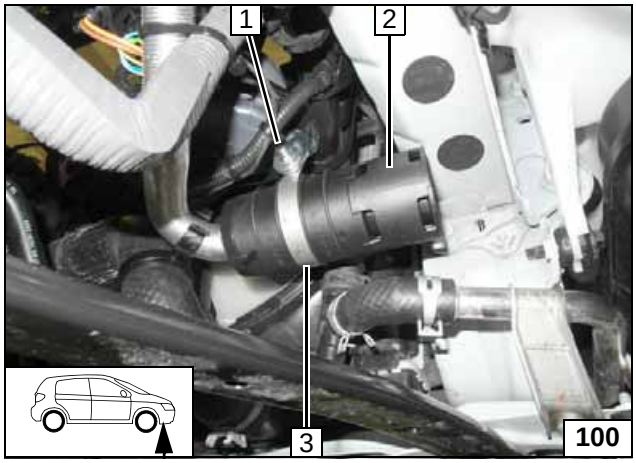
1 Angle bracket
2 M6x40 bolt, flanged nut

Installing angle bracket



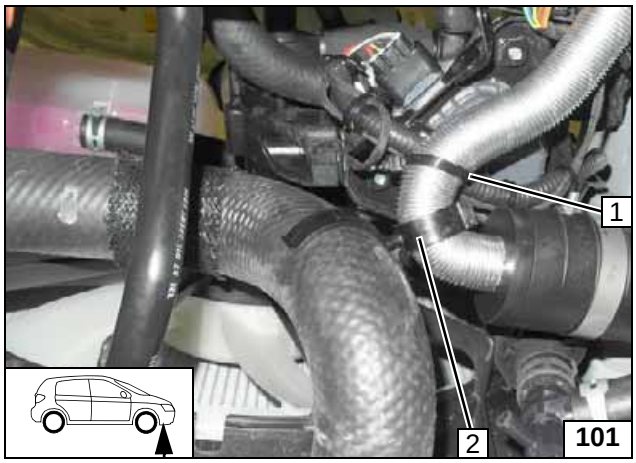
1 Combustion air pipe
2 Silencer

Installing silencer and combustion air pipe



1 M5x16 bolt, large diameter washer, flanged nut
2 Silencer
3 51mm dia. clamp

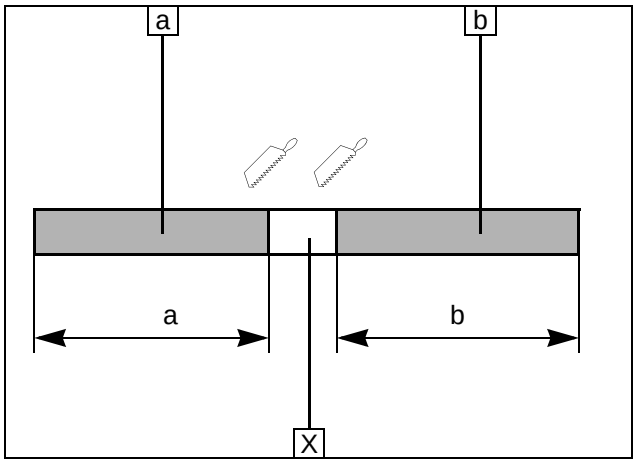
Installing silencer



Ensure sufficient distance to neighbouring components.

1 Cable tie
2 25x37 spacer bracket between combustion air pipe and original vehicle hose

Installing spacer bracket

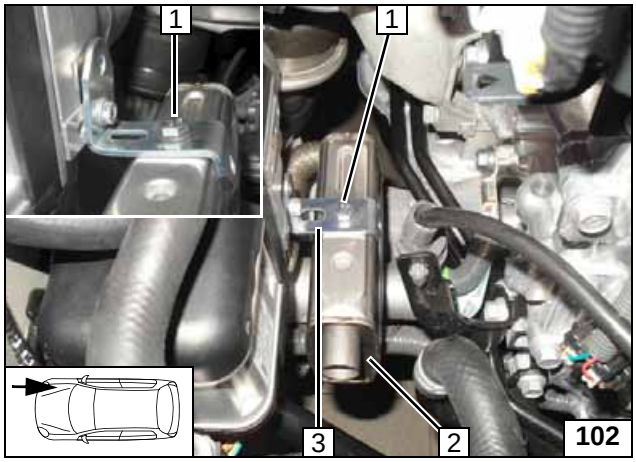


Exhaust

Discard section **X**.

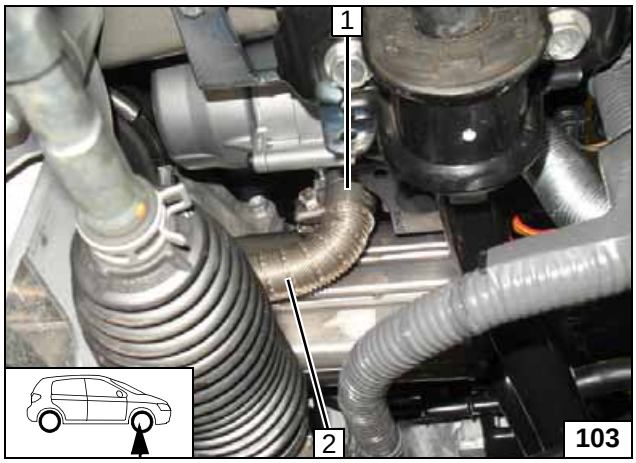
a Exhaust pipe
a = 220 mm
b Exhaust end section
b =290 mm

Preparing exhaust pipe



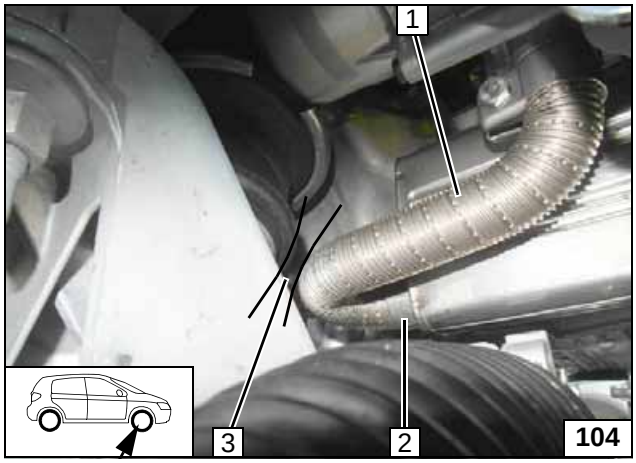
1 6x16 bolt, spring lockwasher
2 Silencer
3 Premounted perforated bracket

Installing silencer



1 Hose clamp
2 Exhaust pipe

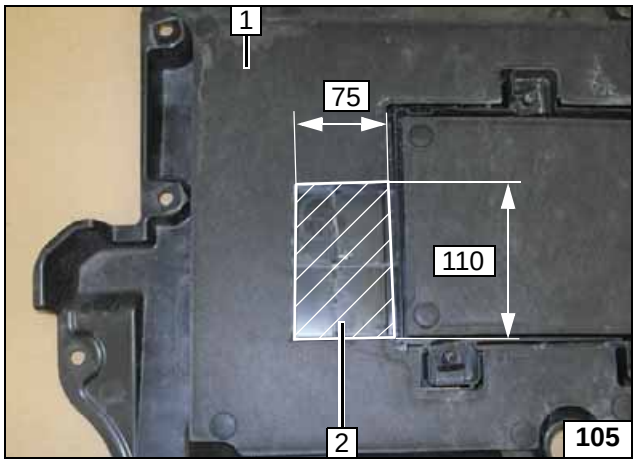
Installing exhaust pipe



Ensure sufficient distance between exhaust pipe **1** and engine mount (at least 20 mm) at position **3**; correct if necessary.

2 Hose clamp

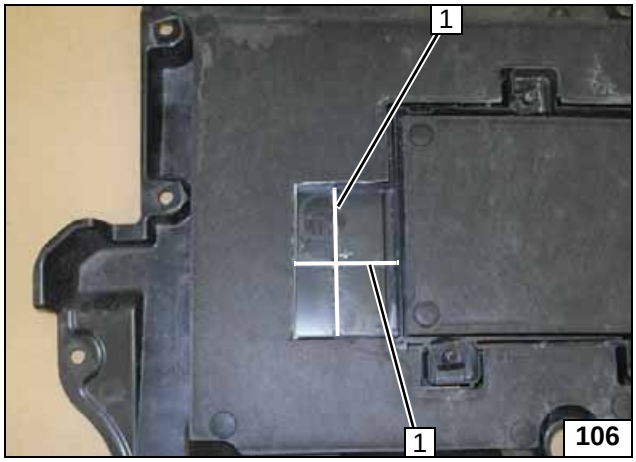
Installing exhaust pipe



Cut out insulation **2** in the marked area and discard.

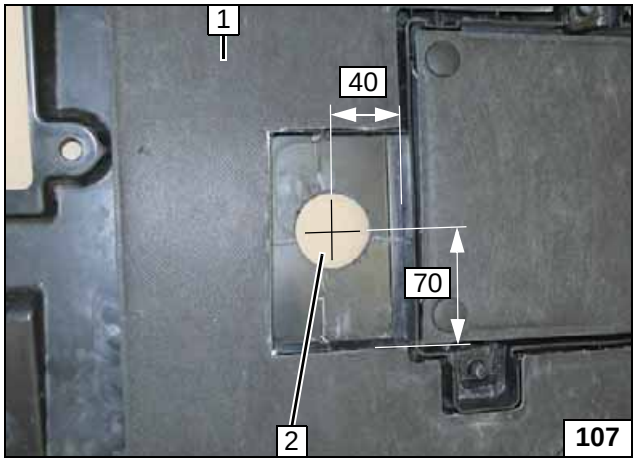
1 Underride protection

Processing underride protection



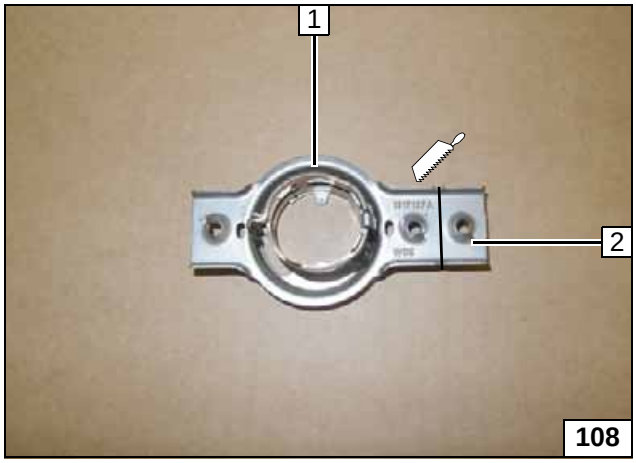
Remove marked ribs **1**!

Processing underride protection



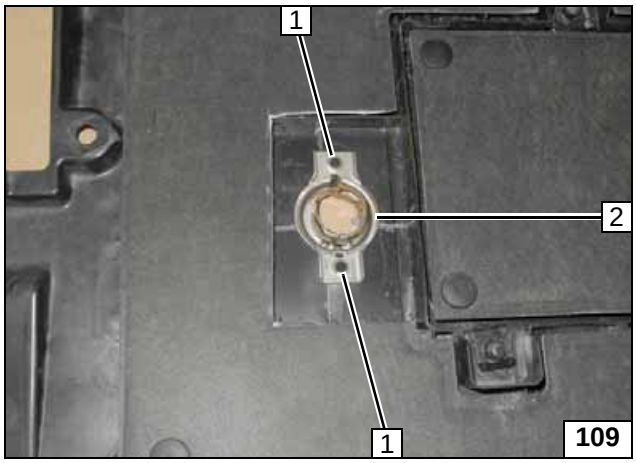
1 Underride protection
2 Hole (as per work step 1 of the EFIX installation instructions)

Hole in underride protection



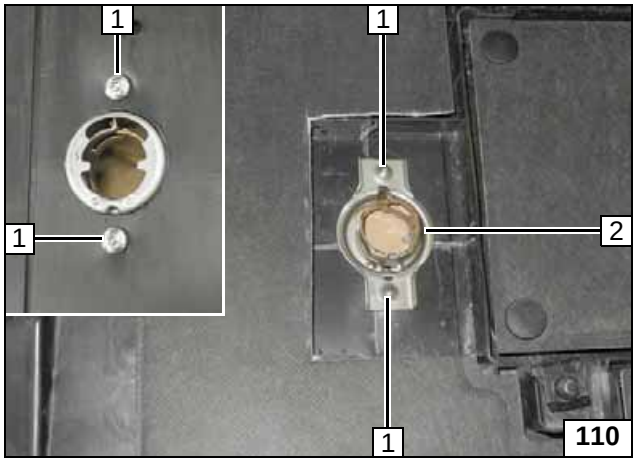
1 Cut exhaust end fastener according to the installation instructions
2 Discard section

Preparing exhaust end fastener



Position exhaust end fastener **2** as per work step 3 of the installation instructions and copy hole pattern **1** [2x]!

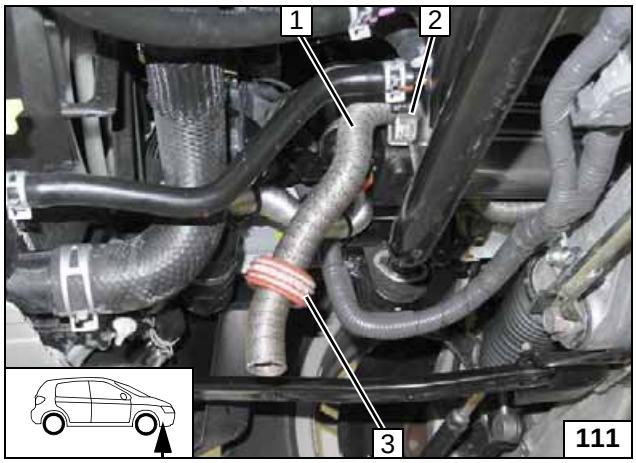
Copying hole pattern



Hole [2x] at position **1** as per work step 4 of the installation instructions!

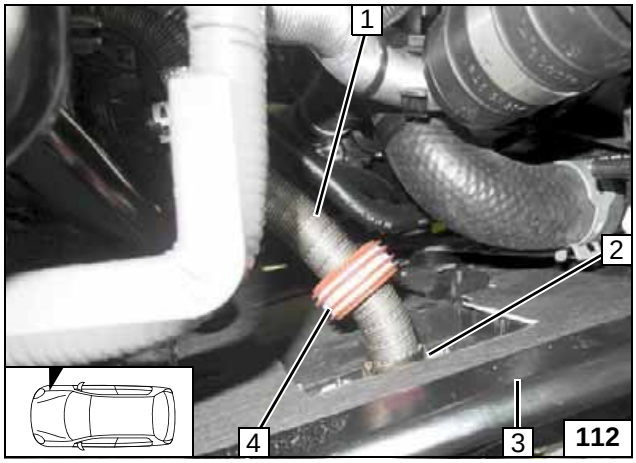
1 5x13 self-tapping screw [2x] as per work step 5 of the installation instructions
2 Exhaust end fastener

Mounting exhaust end fastener



1 Exhaust end section
2 Hose clamp
3 Push on spacer bracket

Installing exhaust end section

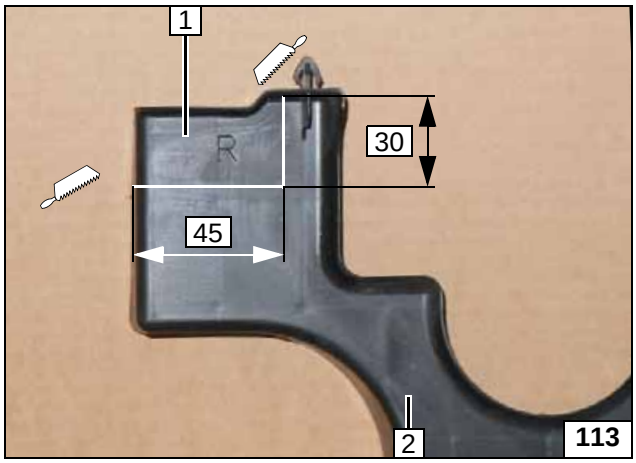


Mount underride protection **3**. Install exhaust end section **1** as per work steps 6 - 8 of the installation instructions. Check the space between the radiator hose and the spacer bracket.

2 Hose clamp
4 Align spacer bracket

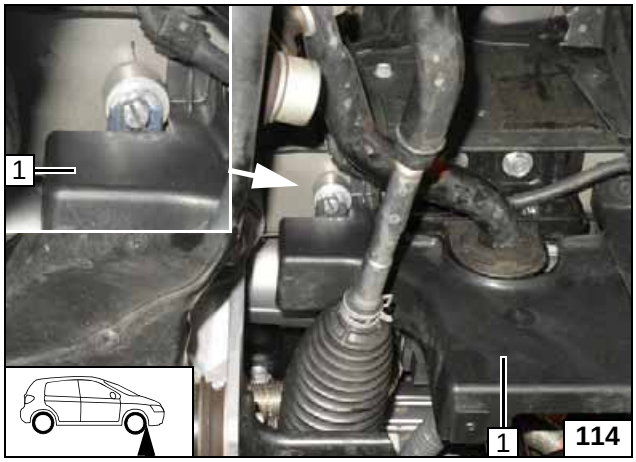
Installing exhaust end section

Final Work



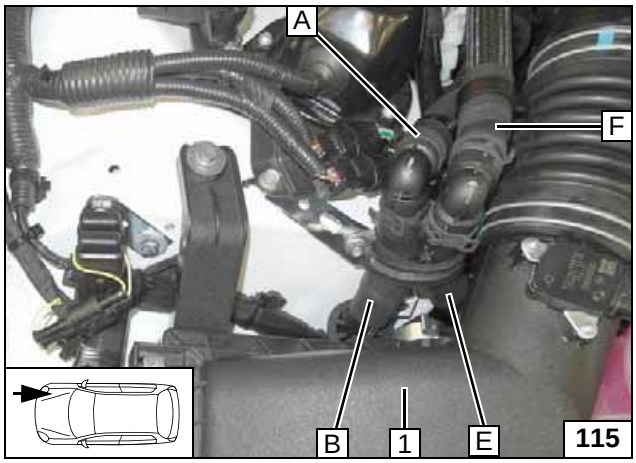
1 Discard section
2 Cover for engine compartment/wheel well trim on the right

Cutting out cover



1 Cover for engine compartment/wheel well trim on the right

Installing cover



Install air filter box **1**. Align hoses!

Checking hose routing

CAUTION!

Activate the hybrid system only in accordance with the vehicle manufacturer's workshop manual.
Observe the order of the work steps.

Install removed parts in reverse order.
Check all hoses, clamps and all electrical connections for firm seating.
Insulate all loose cables and secure them using cable ties.
Only use manufacturer-approved coolant.
Spray the heater components with anti-corrosion wax (Tectyl 100K, Order No. 111329).

- **Activate the hybrid system according to the vehicle manufacturer's workshop manual.**
- **Connect the 12V vehicle battery.**
- **Fill and bleed the coolant circuit of the engine and hybrid system according to the vehicle manufacturer's specifications.**
- **Adjust digital timer, teach Telestart transmitter**
- **Make settings on A/C control panel according to the "Operating Instructions for End Customer".**
- **Checking of fan function (PWM gateway):**
  Set fan power to maximum. Afterwards, deactivate ignition and activate parking heater. Upon reaching the start-up temperature of 55ºC, the fan speed must correspond to the value predefined by the PWM gateway of around 1/3 of the maximum speed.
- **Apply the caution label "Switch off parking heater before refilling" in the area of the filler neck.**

For initial startup, the Webasto Thermo Test Diagnosis is to be carried out as follows:

- **Control coolant pump under component test menu, check coolant level**
- **Pre-feed fuel for the heater using the line filling menu.**
- **Check CO_2-Setting, gather settings from general installation instructions**
- **Check all water and fuel connections for seal tightness and firm seating during the trial run**
- **Conduct troubleshooting in case of malfunctions.**

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

Template for Fuel Standpipe

100mm

Scale 1:1

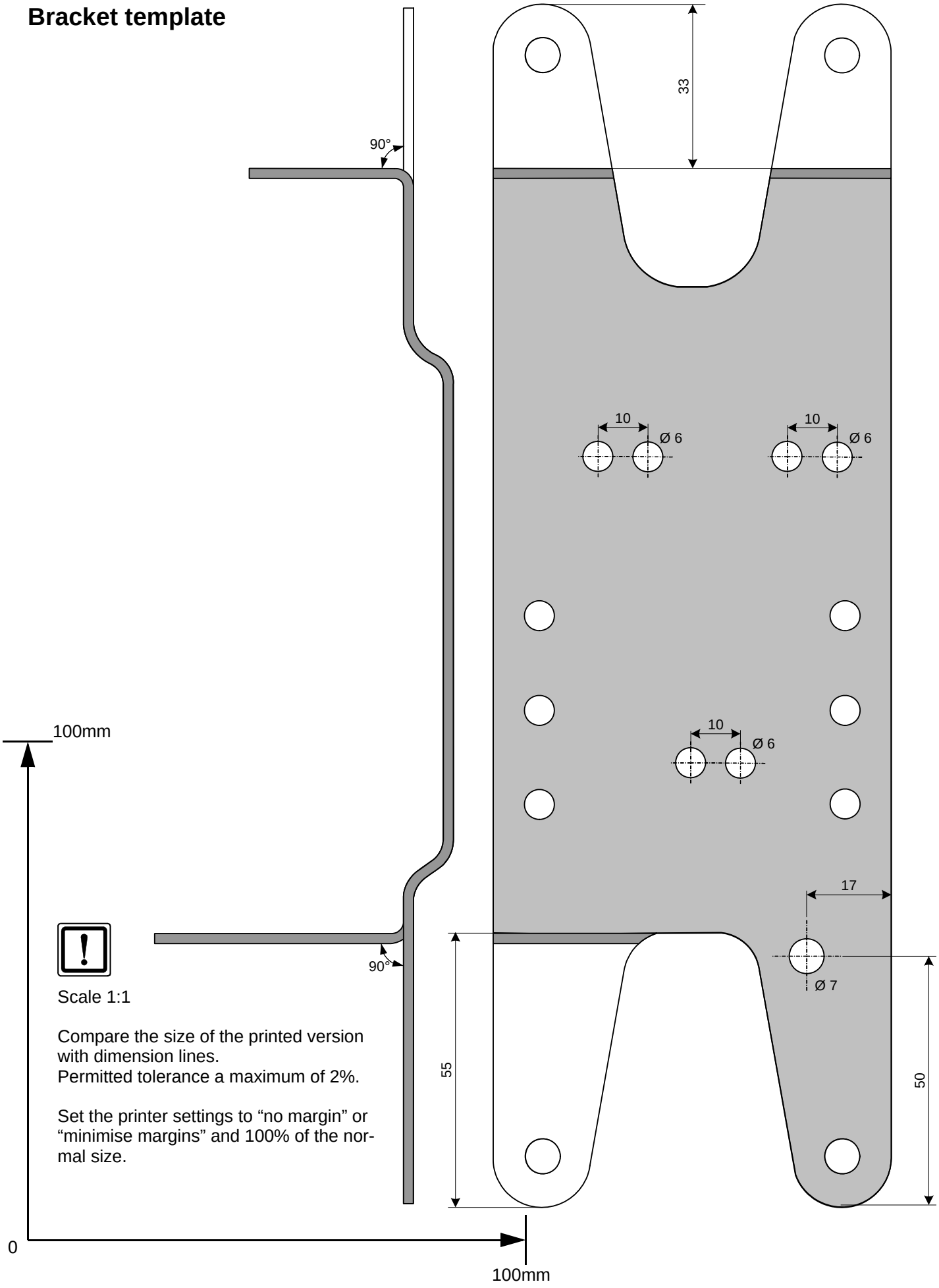
Compare the size of the printed version with dimension lines.
Permitted tolerance a maximum of 2%.

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

100mm

0

Bracket template



Scale 1:1

Compare the size of the printed version with dimension lines.
Permitted tolerance a maximum of 2%.

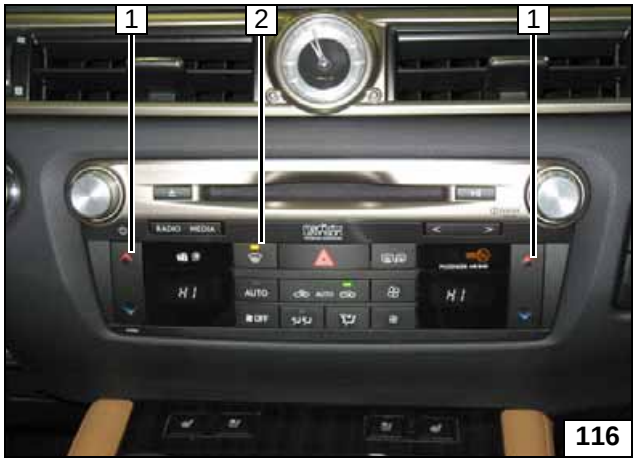
Set the printer settings to “no margin” or “minimise margins” and 100% of the normal size.

Operating Instructions for End Customer

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.

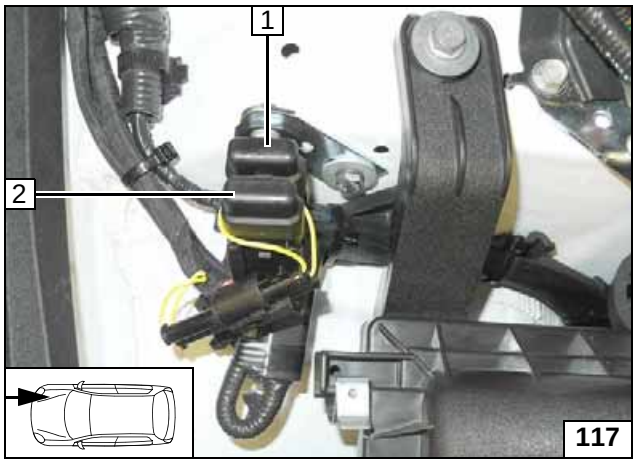
Before parking the vehicle, make the following settings:



Note:
The fan speed does not have to be preset.

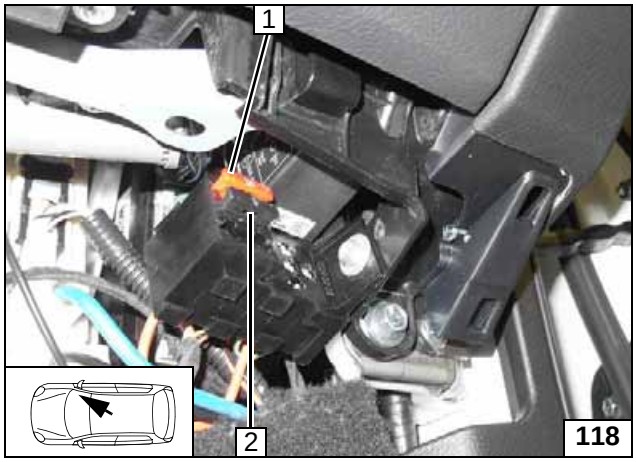
1 Set temperature on both sides to "HI"
2 Air outlet to windscreen

A/C control panel



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

Engine compartment fuses



1 10A fan fuse F4
2 1A fuse F3 of heater control

Passenger compartment fuses