Water Heater

***Thermo Top Evo 5* Parking Heater** E1 00 0258

Installation Documentation
Lexus LS 460 / LS 600h

Validity

Manufacturer	Model	Type	EG-BE No./ABE
Lexus	LS 460	F4	e6 * 2001 / 116 * 0108 * ...
Lexus	LS 600h	HF4	e6 * 2001 / 116 * 0109 * ...

Motorisation	Fuel	Transmission type	Output in kW	Displacement in cm³	Engine code
4.7 P	Petrol	AG	280	4608	1UR-FSE
5.0 P hybrid	Petrol	AG	290	4969	2UR-FSE

AG = Automatic transmission

LS 460 starting with model year 2009
LS 600h starting with model year 2009 up to 2012
Left-hand drive vehicle

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

Not verified: Passenger compartment monitoring

Total installation time: about 9.5 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 LS 460 / LS 600h

Table of Contents

Necessary Components

- Basic delivery scope of *Thermo Top Evo* based on price list
- Installation kit for Lexus LS 460 / LS 600h 2009 Petrol: **1316670B**
- 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

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

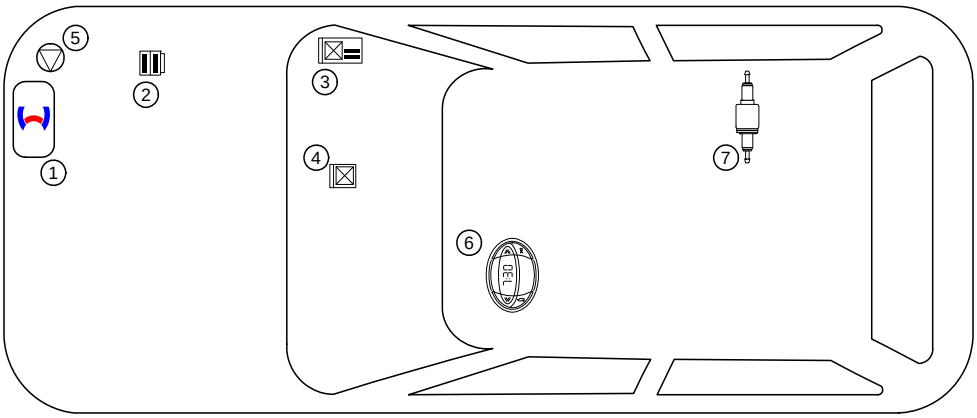
Installation instructions

- 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.
- Depending on the available space and manufacturer's instructions, we recommend the use of a vehicle battery with more electrical capacity.

Installation Overview

Legend:

1. Heater
2. Fuse holder of engine compartment
3. Relay and fuse holder of passenger compartment
4. IPCU
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 ECE regulation 122 (heating system) paragraph 5 for the installation of the heater

Beginning of excerpt.

ANNEX VII

REQUIREMENTS FOR COMBUSTION HEATERS AND THEIR INSTALLATION

1. GENERAL REQUIREMENTS

1.7.1. A clearly visible tell-tale in the operator's field of view shall inform when the combustion heater is switched on or off.

2. VEHICLE INSTALLATION REQUIREMENTS

2.1. Scope

2.1.1. Subject to paragraph 2.1.2. combustion heaters shall be installed according to the requirements of this Annex.

2.1.2. Vehicles of category O having liquid fuel heaters are deemed to comply with the requirements of this Annex.

2.2. Positioning of heater

2.2.1. Body sections and any other components in the vicinity of the heater must be protected from excessive heat and the possibility of fuel or oil contamination.

2.2.2. The combustion heater shall not constitute a risk of fire, even in the case of overheating. This requirement shall be deemed to be fulfilled if the installation ensures an adequate distance to all parts and suitable ventilation, by the use of fire resistant materials or by the use of heat shields.

2.2.3. In the case of M2 and M3 vehicles, the heater must not be positioned in the passenger compartment. However, an installation in an effectively sealed envelope which also complies with the conditions in paragraph 2.2.2 may be used.

2.2.4. The label referred to in paragraph 1.4 or a duplicate, must be positioned so that it can be easily read when the heater is installed in the vehicle.

2.2.5. Every reasonable precaution should be taken in positioning the heater to minimise the risk of injury and damage to personal property.

2.3. Fuel supply

2.3.1. The fuel filler must not be situated in the passenger compartment and must be provided with an effective cap to prevent fuel spillage.

2.3.2. In the case of liquid fuel heaters, where a supply separate to that of the vehicle is provided, the type of fuel and its filler point must be clearly labelled.

2.3.3. A notice, indicating that the heater must be shut down before refuelling, must be affixed to the fuelling point. In addition a suitable instruction must be included in the manufacturer's operating manual.

2.4. Exhaust system

2.4.1. The exhaust outlet must be located so as to prevent emissions from entering the vehicle through ventilators, heated air inlets or opening windows.

2.5. Combustion air inlet

2.5.1. The air for the combustion chamber of the heater must not be drawn from the passenger compartment of the vehicle.

2.5.2. The air inlet must be so positioned or guarded that blocking by rubbish or luggage is unlikely.

2.6. Heating air inlet

2.6.1. The heating air supply may be fresh or recirculated air and must be drawn from a clean area not likely to be contaminated by exhaust fumes emitted either by the propulsion engine, the combustion heater or any other vehicle source.

2.6.2. The inlet duct must be protected by mesh or other suitable means.

2.7. Heating air outlet

2.7.1. Any ducting used to route the hot air through the vehicle must be so positioned or protected that no injury or damage could be caused if it were to be touched.

2.7.2. The air outlet must be so positioned or guarded that blocking by rubbish or luggage is unlikely.

End of excerpt.

In multilingual versions the German language is binding.

Notes on Validity

This installation documentation applies to the Lexus LS 460 / LS 600h Petrol vehicles - for validity, see page 1 - from model year 2009 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

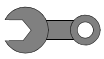
Dimensions
- All dimensions are in mm

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

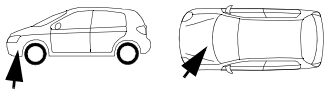
Specific risk of damage to components

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 LS 460 / LS 600h

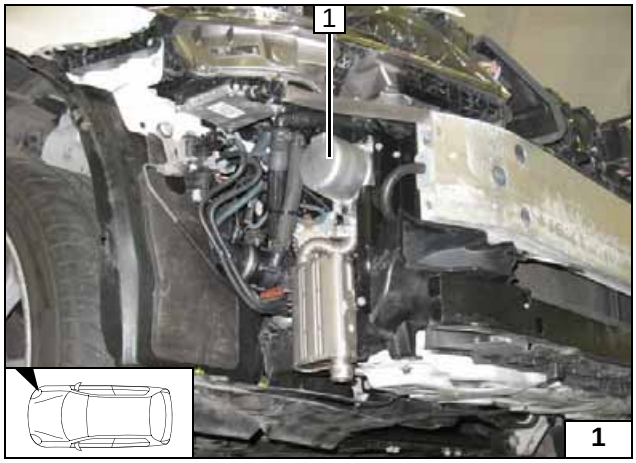
Preliminary Work

Vehicle

- Open the fuel tank cap.
- Ventilate the fuel tank.
- Close the fuel tank cap again.
- Depressurise the cooling system.
- Deactivate the high voltage system in accordance with the manufacturer's instructions for hybrid vehicles.
- Disconnect the battery from the on-board power supply network.
- Remove the air filter.
- Remove the engine cover.
- Remove the coolant expansion tank.
- Remove the bumper trim.
- Detach the ventilation duct for the brake located to the right of the bumper.
- Remove the bumper.
- Remove the underride protection.
- Remove the underbody trim on the right.
- Remove the rear bench seat on the left.
- Open the tank-fitting service lid on the right.
- Remove the fuel-tank sending unit in accordance with the manufacturer's instructions.
- Remove the left footwell trim.
- Remove the glove compartment.

Heater

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



Heater Installation Location

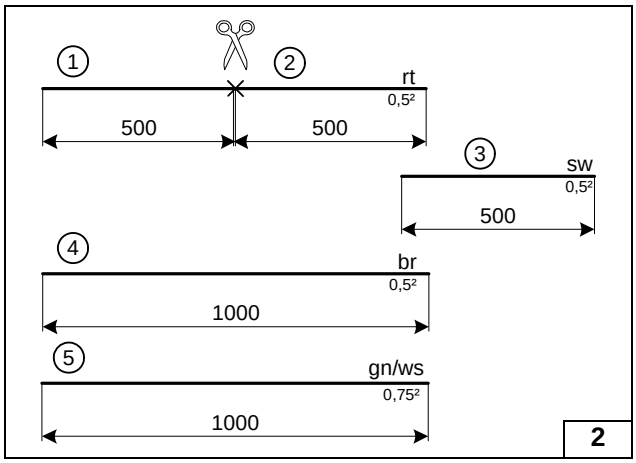
1 Heater

Installation location

Preparing Electrical System

Wire sections retain their numbering throughout the whole document.

Cutting wires to length



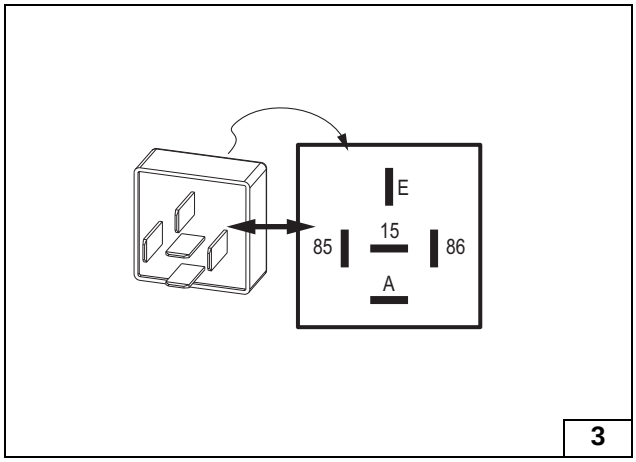
2

Check settings before heater startup and adjust if necessary.

Settings:

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

IPCU connections

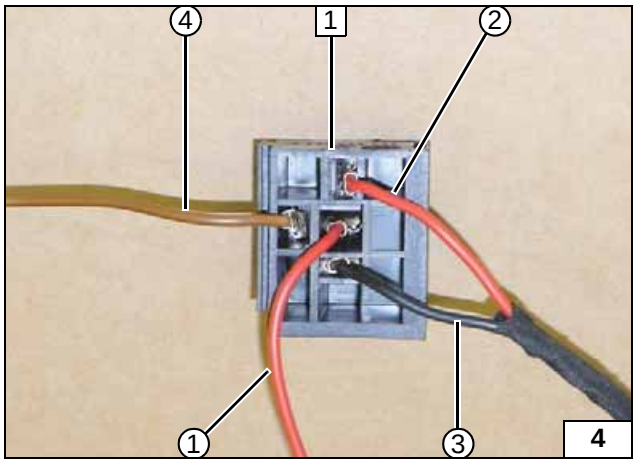


3

Connect the lines to the IPCU socket as per the following connection diagram.

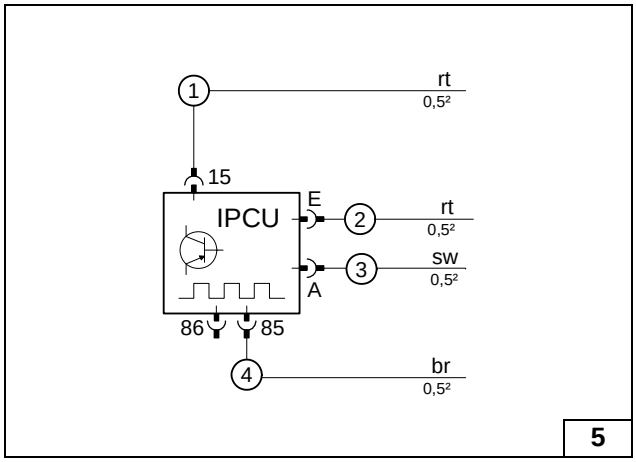
1 IPCU socket
① Red (rt) wire of IPCU/15
② Red (rt) wire of IPCU/E
③ Black (sw) wire of IPCU/A
④ Brown (br) wire of IPCU/85

Premounting IPCU



4

IPCU connection diagram



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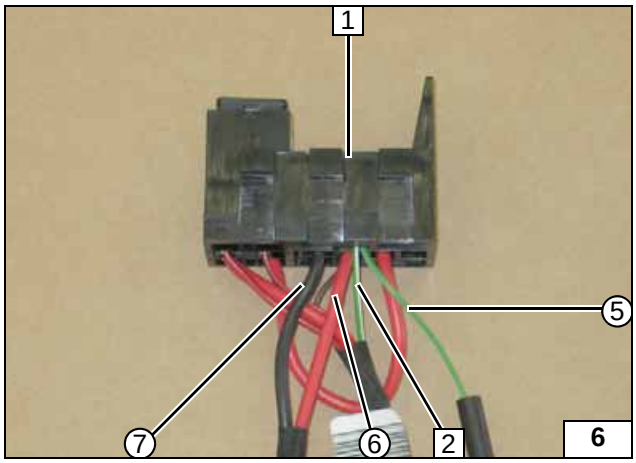
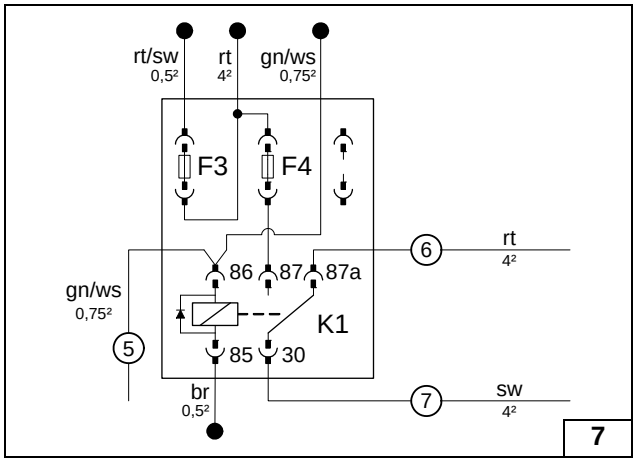


Loosen and remove contact K1/86.
Install wires as shown in the following connection diagram using the contacts supplied.

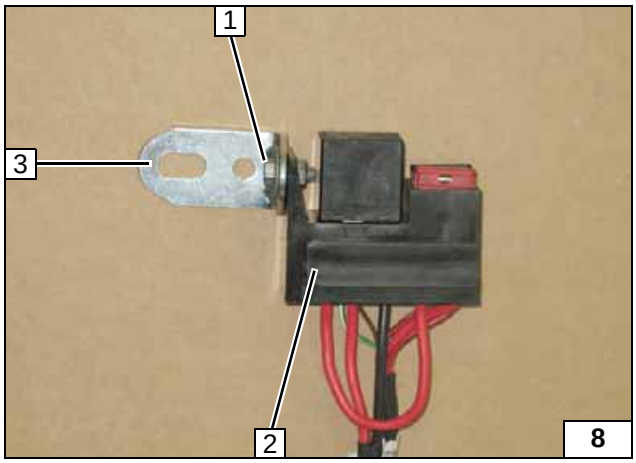
1 Relay and fuse holder of passenger compartment
2 Green/white (gn/ws) wire of K1/86
⑤ Green/white (gn/ws) wire of K1/86
⑥ Red (rt) wire of K1/87a fan wiring harness
⑦ Black (sw) wire of K1/30 fan wiring harness

Preparing passenger compartment relay and fuse holder



Pull wire ⑤ into the provided protective sleeving .

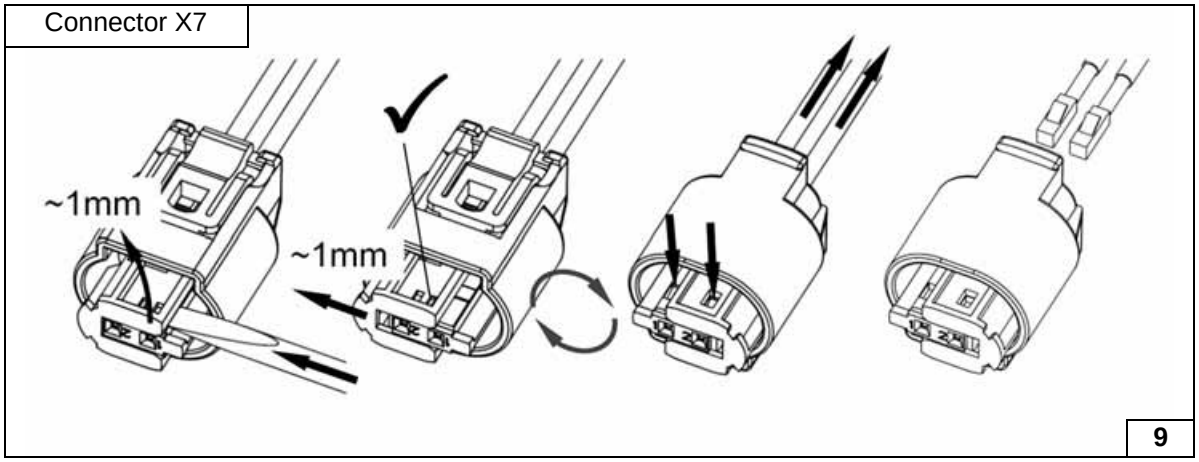
Passenger compartment relay and fuse holder connection diagram



After installation of the angle bracket, insert K1 relay and 10A fuse F4 in the passenger compartment relay and fuse holder.

1 M5x12 bolt, washers [2x], nut
2 Relay and fuse holder of passenger compartment
3 Angle bracket

Preparing passenger compartment relay and fuse holder

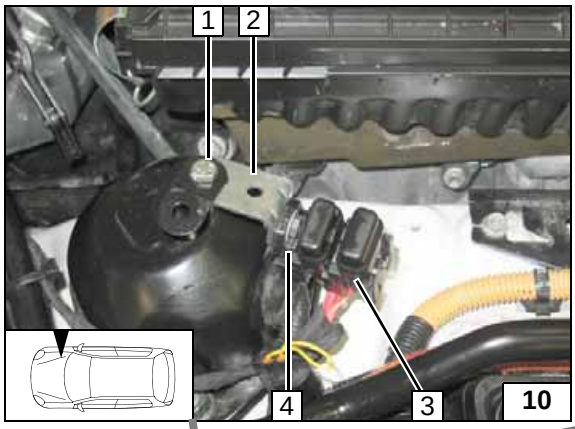


Removing connector of metering pump

LS 460 Electrical System

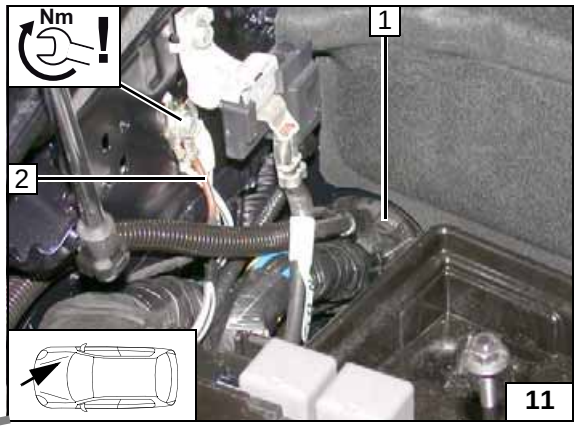
Fuse holder of LS 460 engine compartment

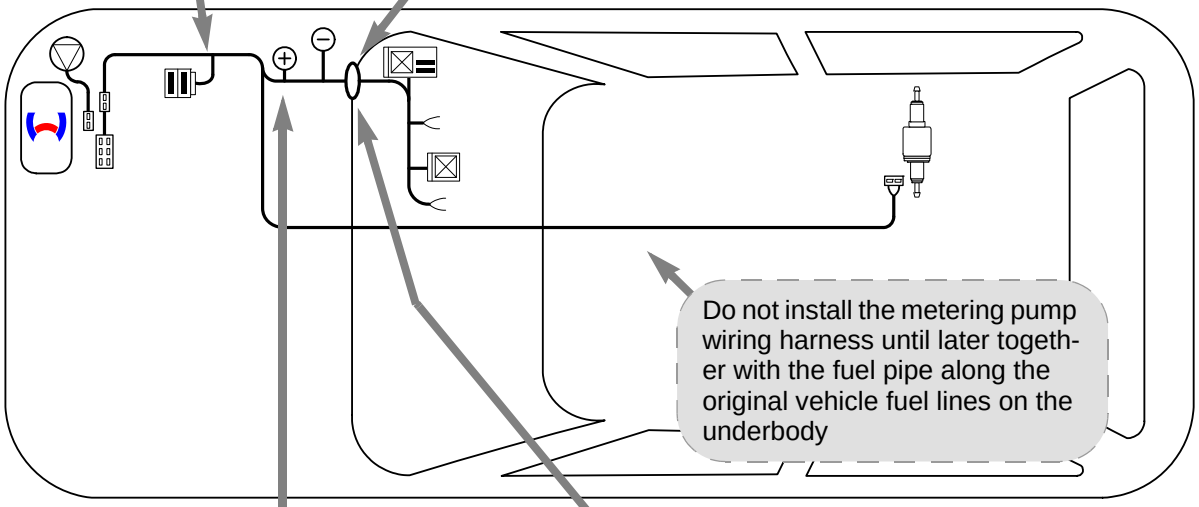
1 M6x16 bolt, large diameter washer, flanged nut, existing hole
2 Angle bracket
3 Fuses F1-2
4 M5x16 bolt, washer [2x], retaining plate of fuse holder, nut



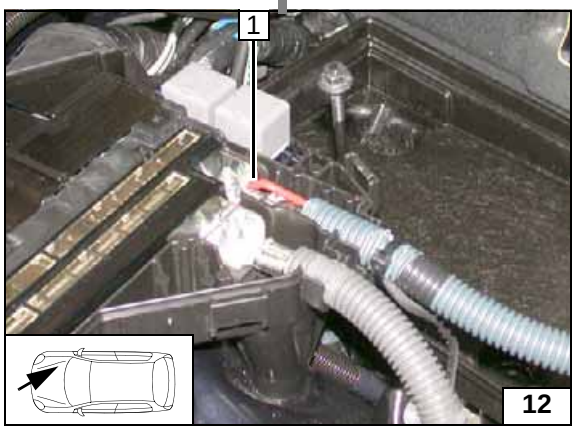
Wiring harness pass through of engine compartment, connection of earth wire LS 460

1 Protective rubber plug
2 Earth wire on earth support point



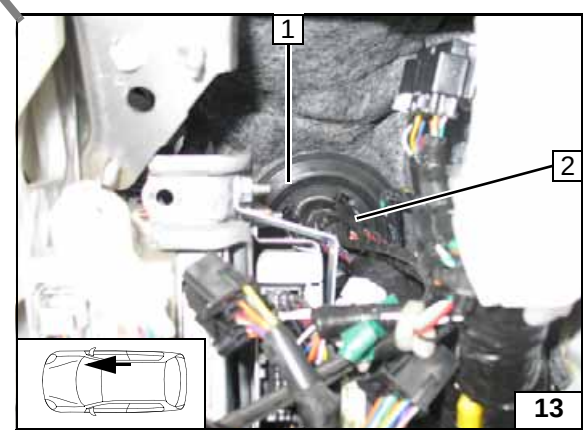


Wiring harness routing diagram



Connecting LS 460 positive wire

1 Positive wire on positive support point



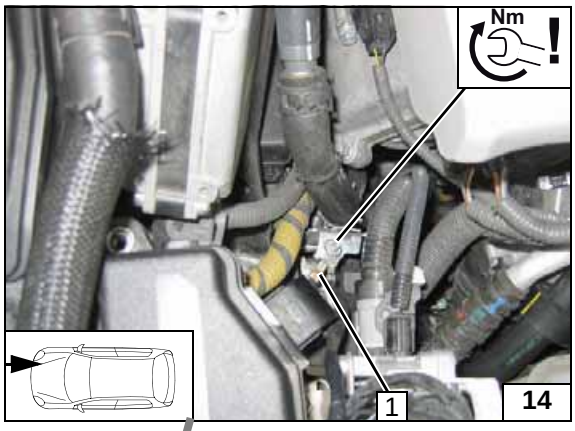
Passenger compartment wiring harness pass through

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

LS 600h Electrical System

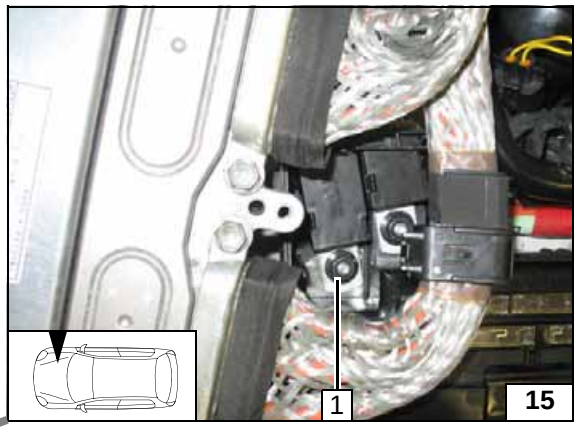
Connecting earth wire LS 600

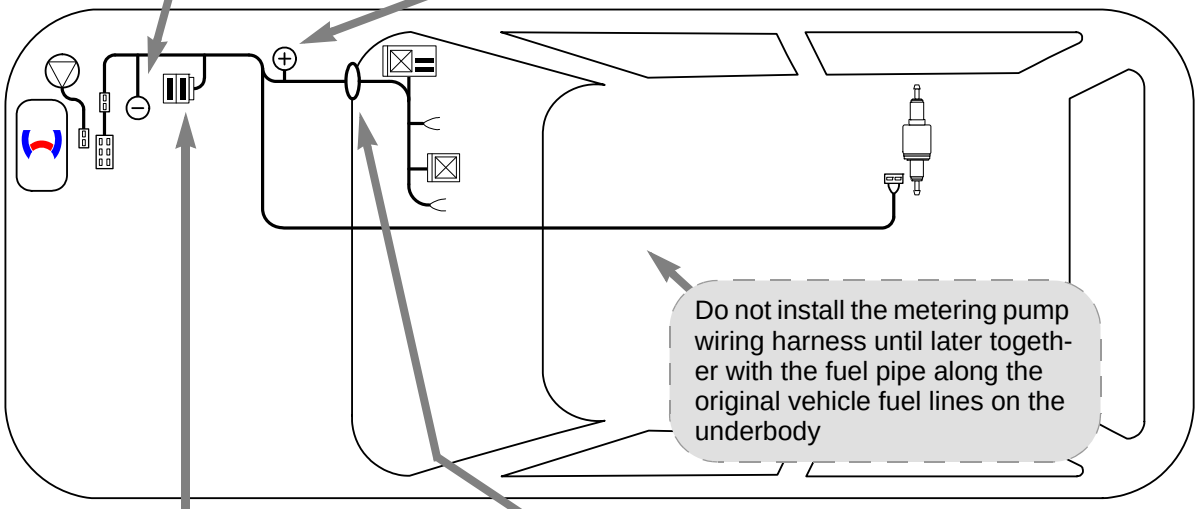
1 Original vehicle earth support point



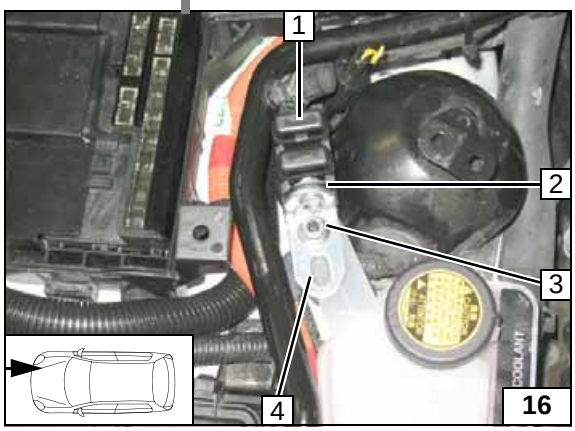
Connecting LS 600 positive wire

1 Original vehicle positive support point



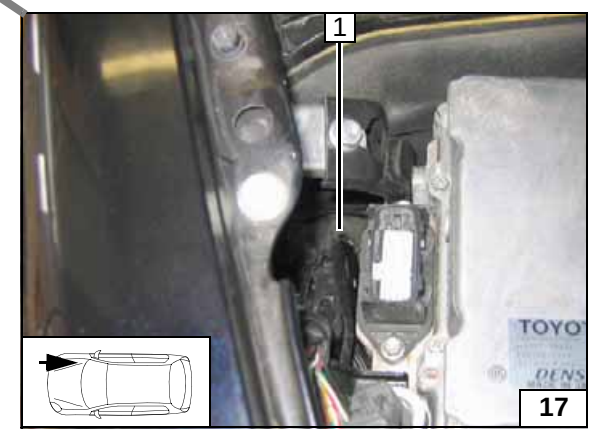


Wiring harness routing diagram



Fuse holder of LS 600 engine compartment

1 Fuses F1-2
2 M5x16 bolt, washer [2x], retaining plate of fuse holder, nut
3 Original vehicle flanged nut
4 Angle bracket

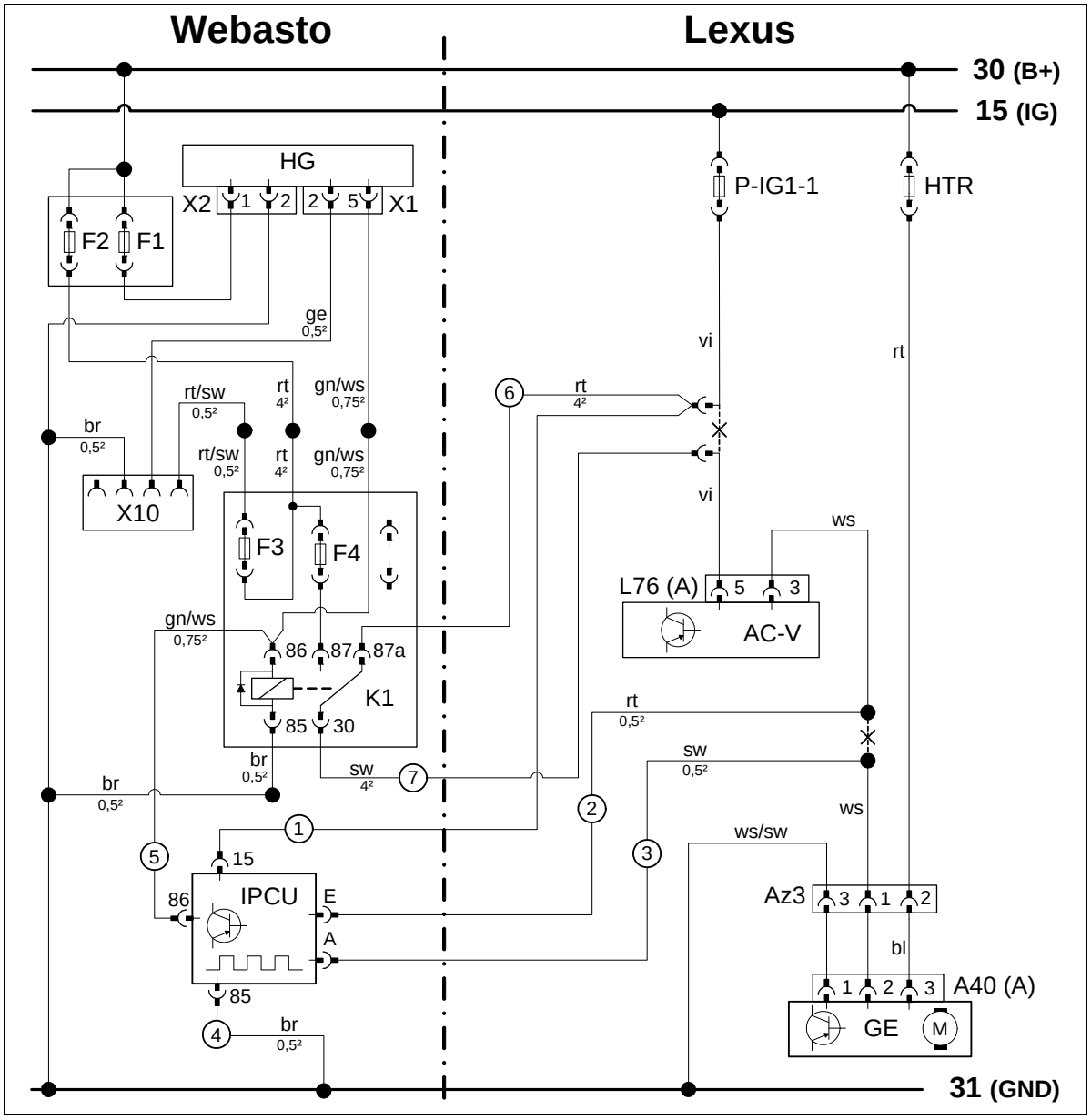


Wiring harness pass through LS 600

Protect wiring harnesses with corrugated tubes.

1 Protective rubber plug

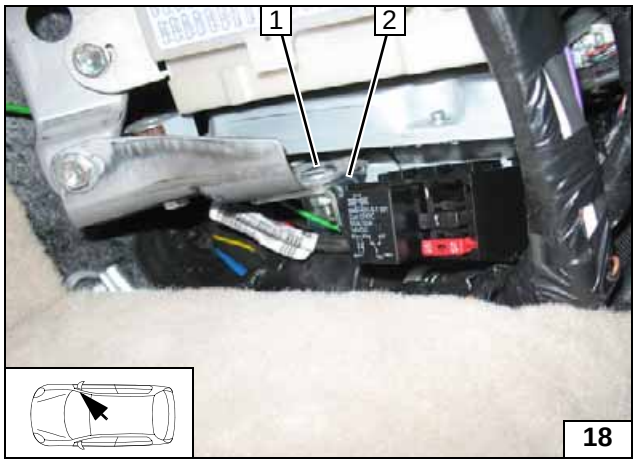
Fan Controller



Wiring diagram

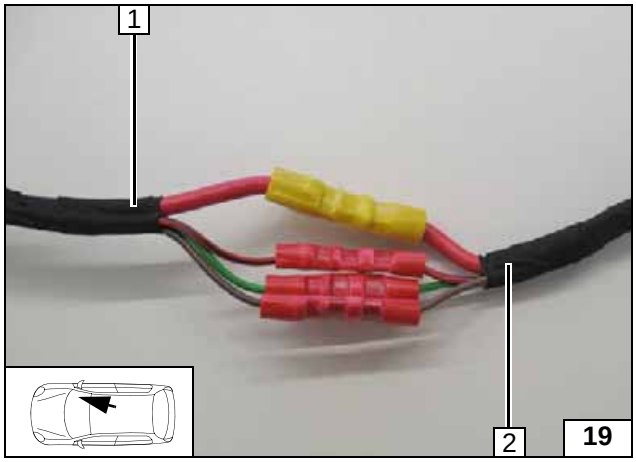
Webasto components		Vehicle components		Colours and symbols	
HG	TT-Evo heater	P-IG1-1	10A fuse	rt	red
X1	6-pin heater connector	HTR	50 A fan fuse	ws	white
X2	2-pin heater connector	AC-V	A/C booster	sw	black
F1	20A fuse	L76 (A)	White (ws) 35-pin connector A/C-V	br	brown
F2	30A fuse			gn	green
X10	4-pin connector Heater control	Az3	3-pin connector	vi	violet
		GE	Fan unit		
F3	1A fuse	A40 (A)	GE connector		
F4	10A fuse				
K1	Fan relay				
IPCU	Pulse width modulator				
IPCU settings:					
Duty cycle:	65%				
Frequency:	400Hz				
Voltage:	not relevant			**X**	Cutting point
Function:	Low side			Wiring colours may vary.	

Legend



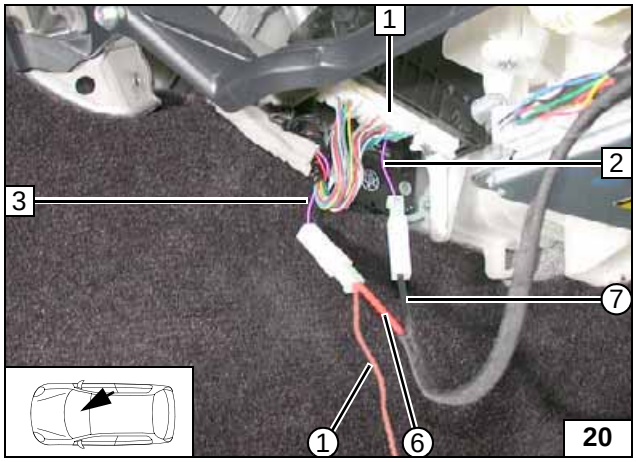
1 Original vehicle bolt
2 Angle bracket

Installing passenger compartment relay and fuse holder



1 Relay and fuse holder wiring harness of passenger compartment
2 Wiring harness of heater

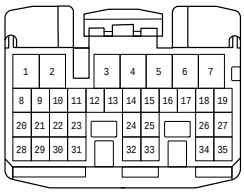
Connecting wiring harnesses using same colour wires



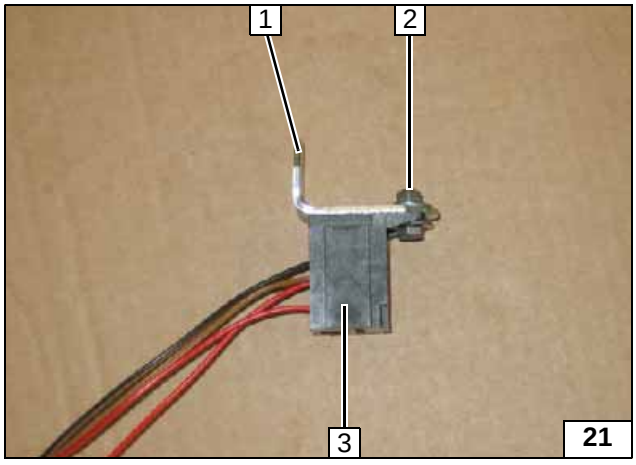
Connection on white (ws) 35-pin connector L76 (A) **1**, Pin 5 from A/C booster.
Produce connections as shown in wiring diagram.

2 Violet (vi) wire of connector L76 (A)
3 Violet (vi) wire from fuse P-IG1-1
① Red (rt) wire of IPCU/15
⑥ Red (rt) wire of K1/87a fan wiring harness
⑦ Black (sw) wire of K1/30 fan wiring harness

Connecting A/C booster

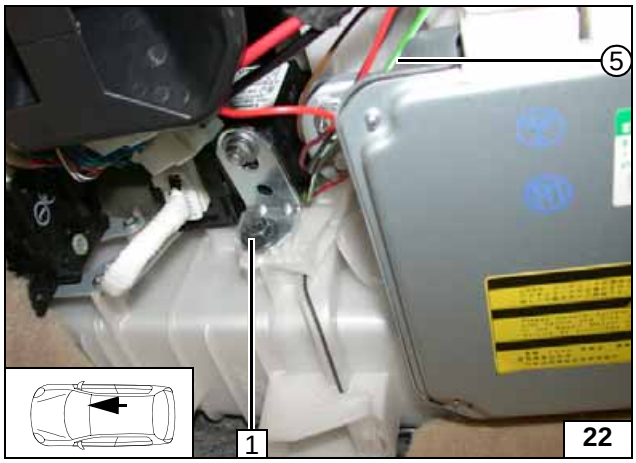


Connector L76 (A) on contact side.



1 Angle bracket
2 M5x16 bolt, washers [2x], nut
3 IPCU socket

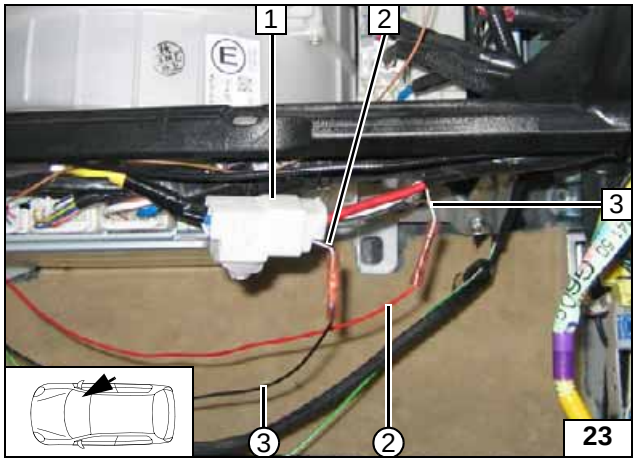
Premounting IPCU socket



Prior to installation, insert green/white (gn/ws) wire ⑤ into IPCU/86 socket. Install IPCU.

1 Original vehicle bolt

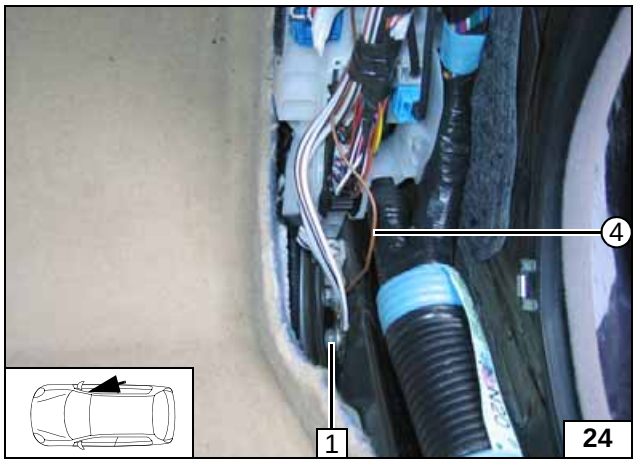
IPCU installation



Connection to 3-pin connector A3 **1** of fan unit. Produce connections as shown in wiring diagram.

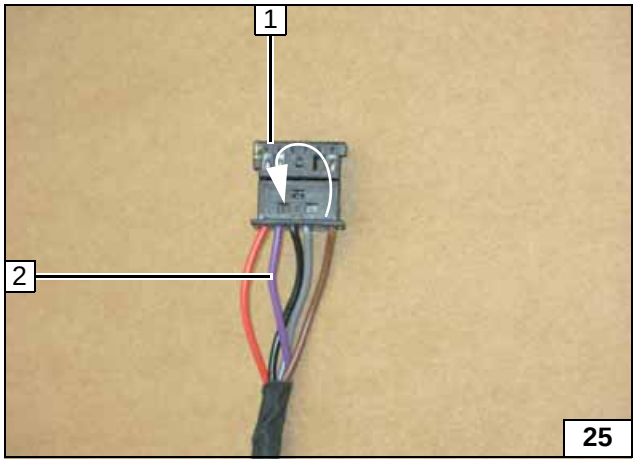
2 White (ws) wire to connector Az3
3 White (ws) wire from A/C control panel Pin 3
② Red (rt) wire of IPCU/E
③ Black (sw) wire of IPCU/A

Connecting IPCU



1 Original vehicle earth support point
④ Brown (br) wire of IPCU/85, cable lug

Connecting earth wire



Combination Heater Controls

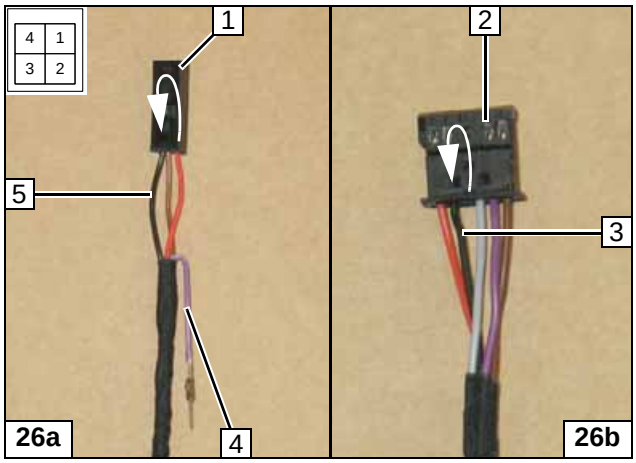
Only for "silver" transmitter.
See provided installation instructions for "black" transmitter.

Telestart T91 with and without push button.

Figure 25 (Y-adapter of connector)

Detach violet (vi) wire **2** from 6-pin connector **1** Pin5 and insert it in Pin2

Preparing connector



Digital timer and Telestart T91.

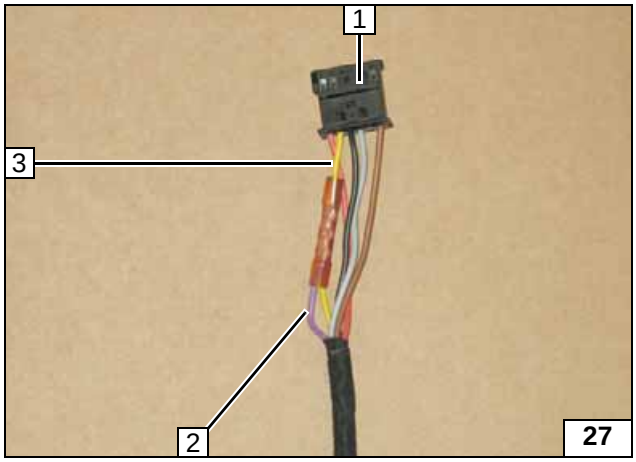
Figure 26a (Y-adapter coupling, wire-side view)

Detach, insulate and tie back violet (vi) wire **4** from 4-pin coupling **1** Pin1.
Detach black (sw) wire **5** from 4-pin coupling **1** Pin2 and insert it in Pin1.

Figure 26b (connector of Y-adapter)

Detach black (sw) wire **3** from 6-pin connector **2** pin 3 and insert it in pin 2.

Preparing connector

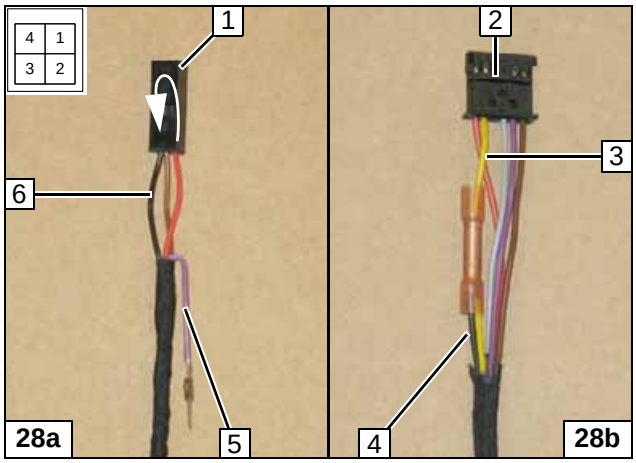


Telestart T100 HTM with and without push button.

Figure 27 (connector of ESV adapter)

Detach violet (vi) wire **2** from 6-pin connector **1** Pin5. Cut yellow (ge) wire **3** approx. 50mm before connector **1**. Connect violet (vi) wire **2** and yellow (ge) wire **3** to connector.

Preparing connector



Digital timer and Telestart T100 HTM!

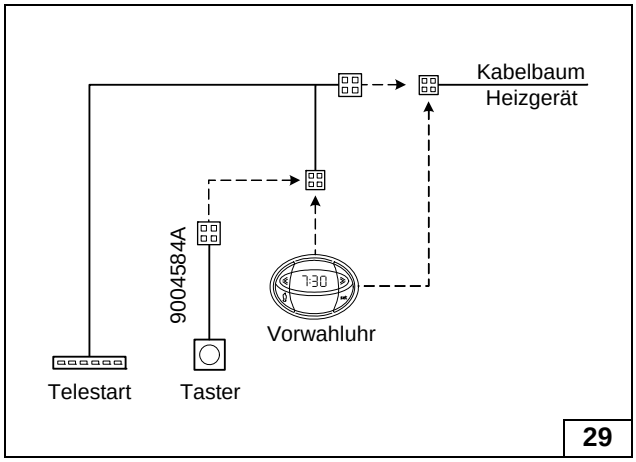
Figure 28a (ESV adapter coupling, view on the side of the wires)

Detach, insulate and tie back violet (vi) wire **5** from 4-pin coupling **1** Pin1.
Detach black (sw) wire **6** from 4-pin coupling **1** Pin2 and insert it in Pin1.

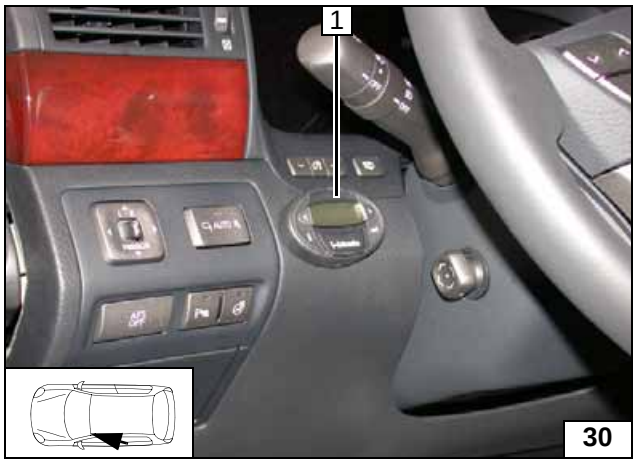
Figure 28b (connector of ESV adapter)

Detach black (sw) wire **4** from 6-pin connector **2** Pin3. Cut yellow (ge) wire **3** approx. 50mm before connector **2**. Connect black (sw) wire **4** and yellow (ge) wire **3** to connector.

Preparing connector



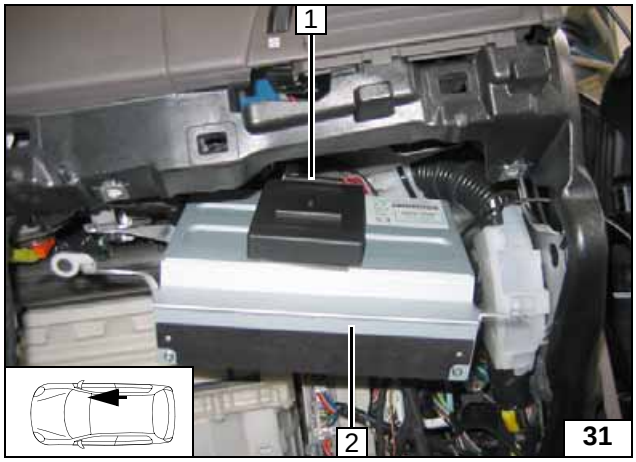
Heater controls diagram



Digital Timer

1 Digital timer

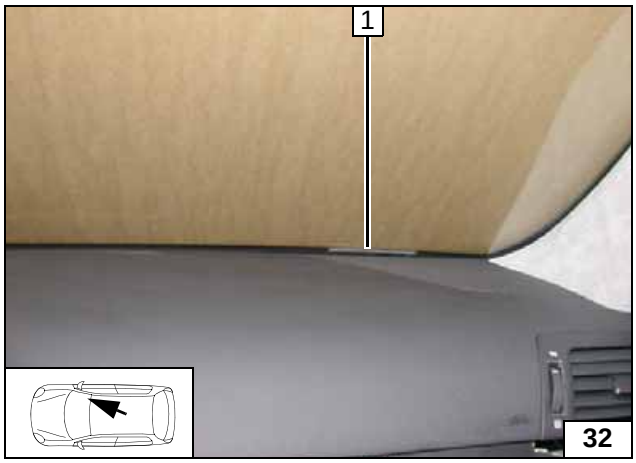
Installing digital timer



Telestart

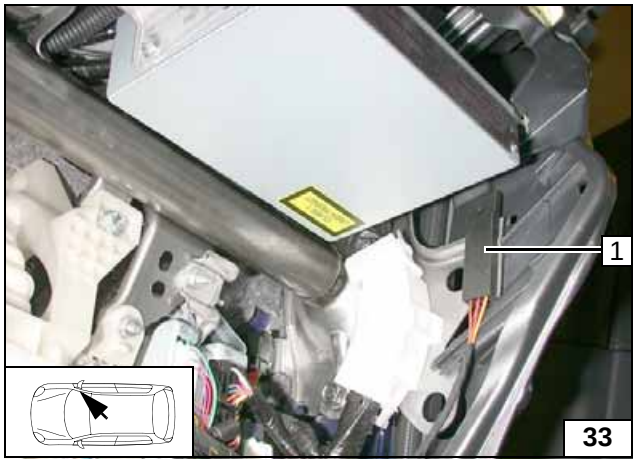
Detach player **2** and fasten receiver **1** with adhesive tape.

Installing receiver



Stick on antenna **1** in the black area of the windscreen.

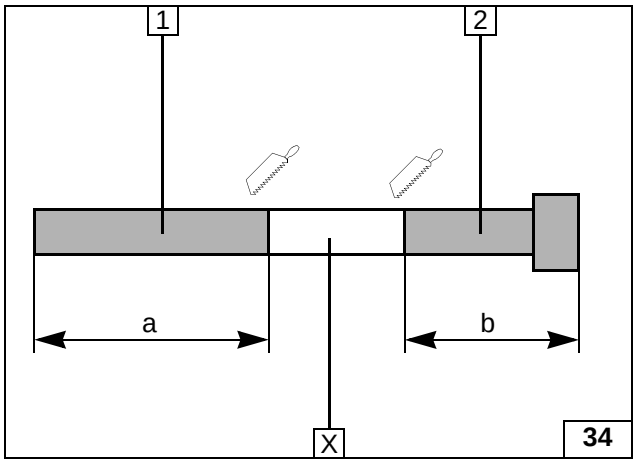
Installing antenna



Temperature sensor T100 HTM

Fasten temperature sensor **1** with adhesive tape.

Installing temperature sensor

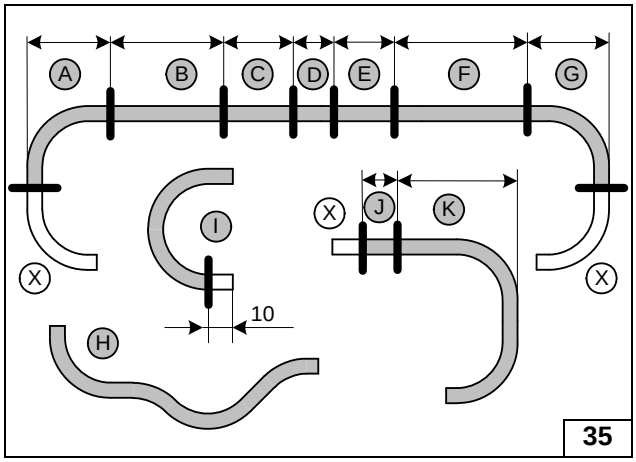


Preparing Heater

1 Exhaust pipe
a = 130 mm
2 Exhaust end section
b =25 mm

Discard section **X**

Preparing exhaust pipe

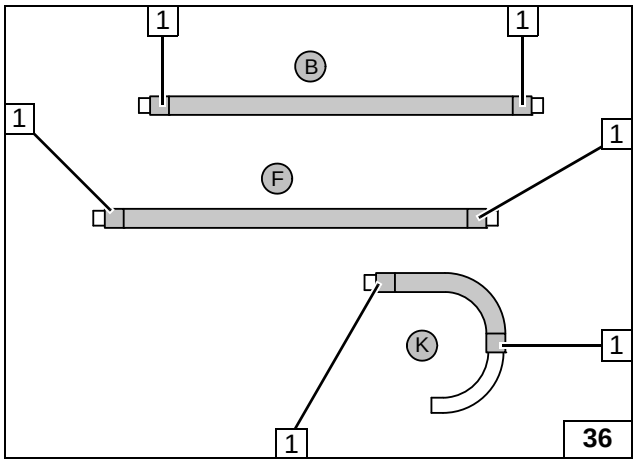


LS 460

Hose **H** will be cut to length later. Discard section **X**.

A = 110
B = 730
C = 170
D = 60
E = 120
F = 860
G = 90
J = 55
K = 270

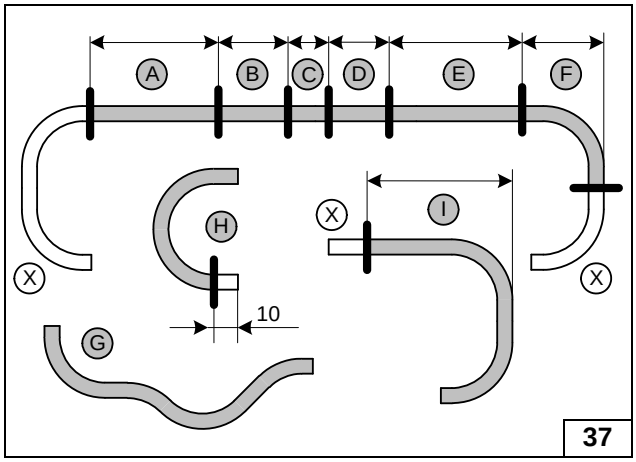
Cutting hoses to length



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

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

Preparing hoses

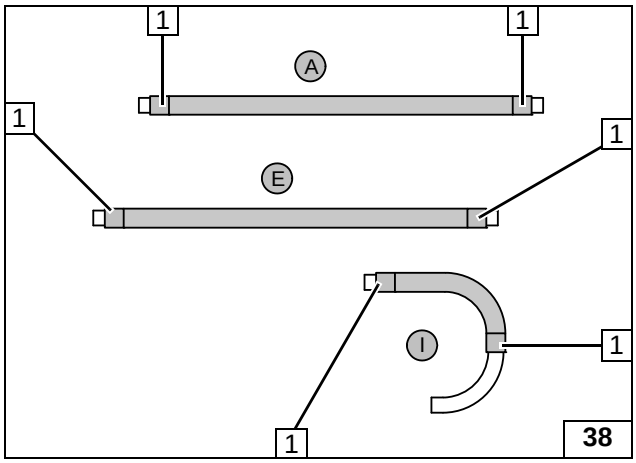


LS 600h

Hose **G** will be cut to length later. Discard section **X**.

A = 500
B = 170
C = 60
D = 120
E = 750
F = 90
I = 240

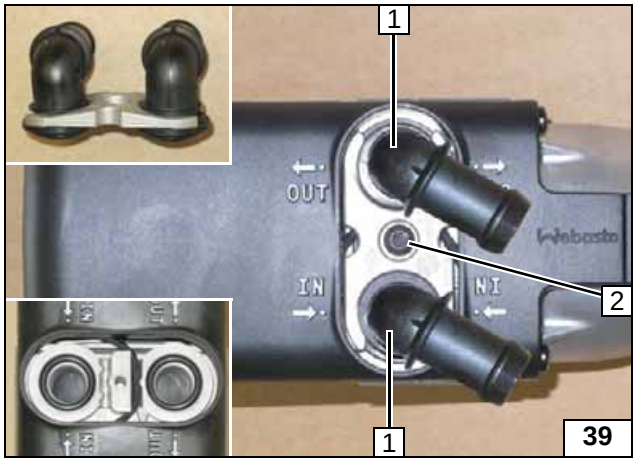
Cutting hoses to length



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

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

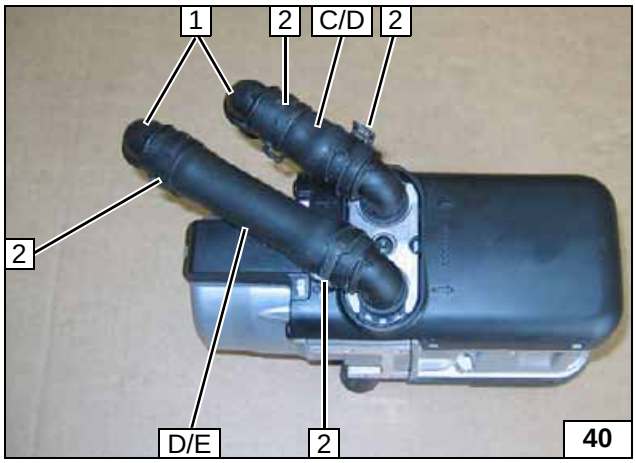
Preparing hoses



All vehicles

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

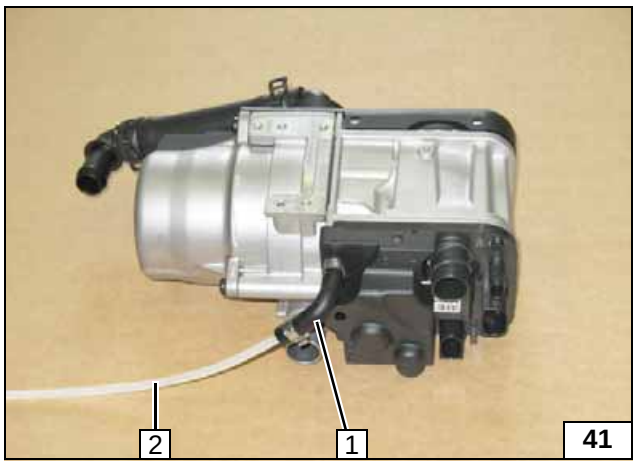
Installing water connection piece



Hose **D** = heater inlet LS 460h
Hose **E** = heater outlet LS 460h
Hose **C** = heater inlet LS 600h
Hose **D** = heater outlet LS 600h

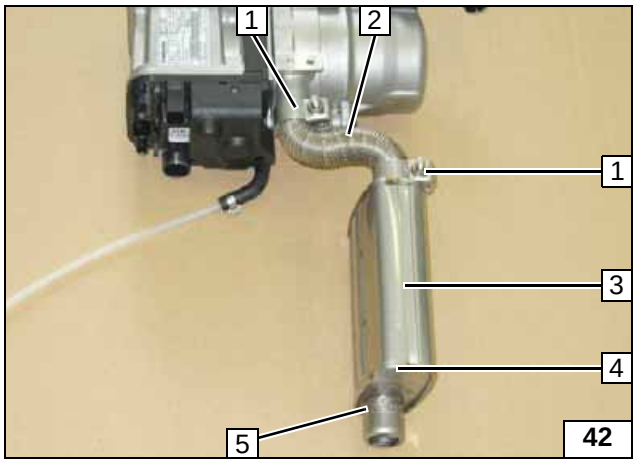
1 18x18mm, 90° connecting pipe [2x]
2 25mm dia. spring clip [4x]

Premounting hoses



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

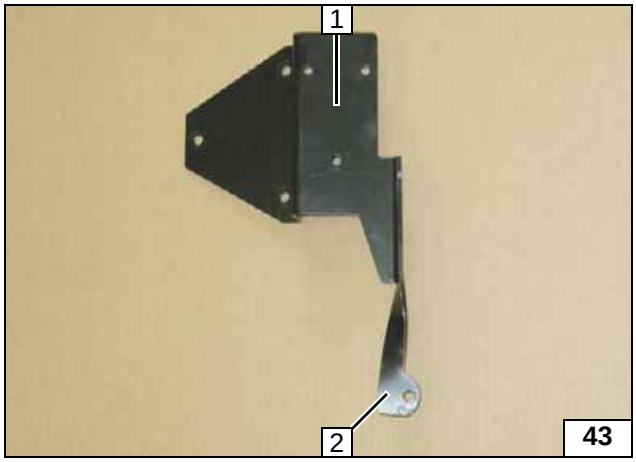
Premounting fuel line



3 mm dia. drain hole **4** in exhaust silencer **3**. Mount exhaust end section **5** and lock with 4 blows of a staking punch.

1 Hose clamp [2x]
2 Exhaust pipe

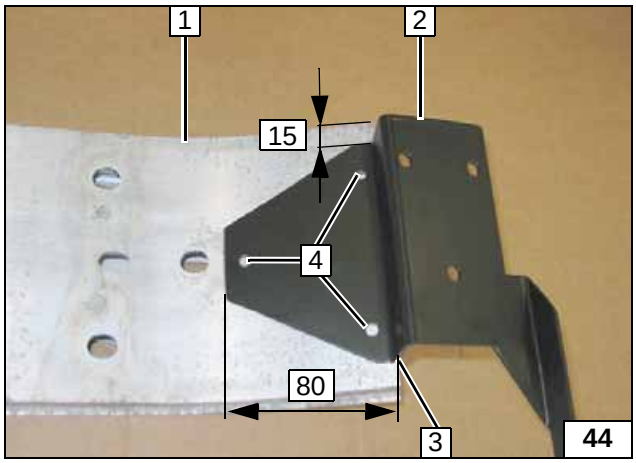
Premounting exhaust system



Bend tab **2** of bracket **1** by 90°. Apply corrosion protection at bending point.

Preparing bracket

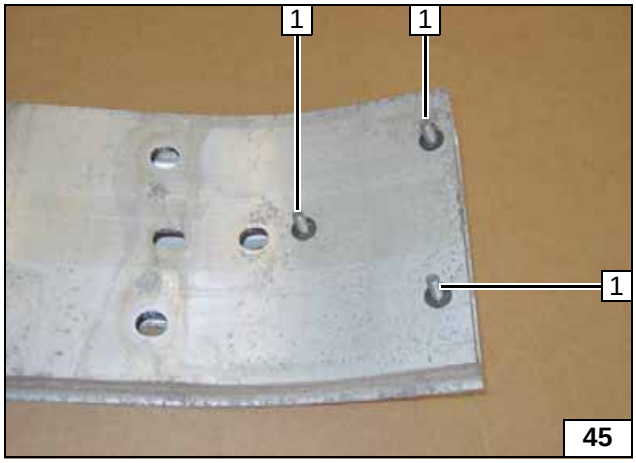
Preparing Installation Location



Position bracket **2** and align it parallel to bumper edge **3**.

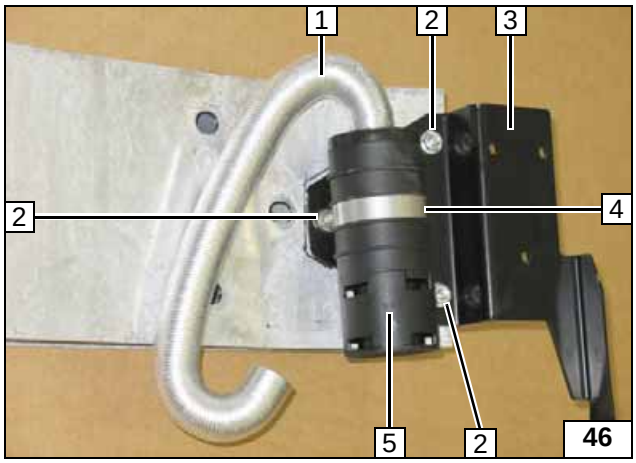
1 Bumper
4 Copy hole pattern, 7mm dia. hole [3x]

Copying hole pattern



1 M6x20 bolt, pin lock [3x each]

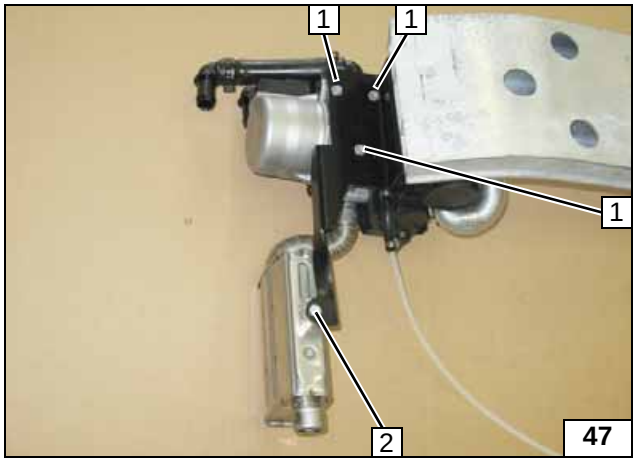
Premounting bolts



1 Combustion air pipe
2 Flanged nut [3x]
3 Bracket
4 48mm p-clamp
5 Silencer

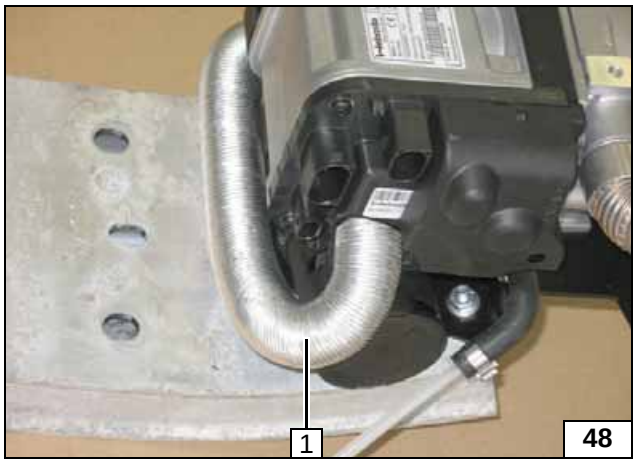
Installing bracket

Installing Heater



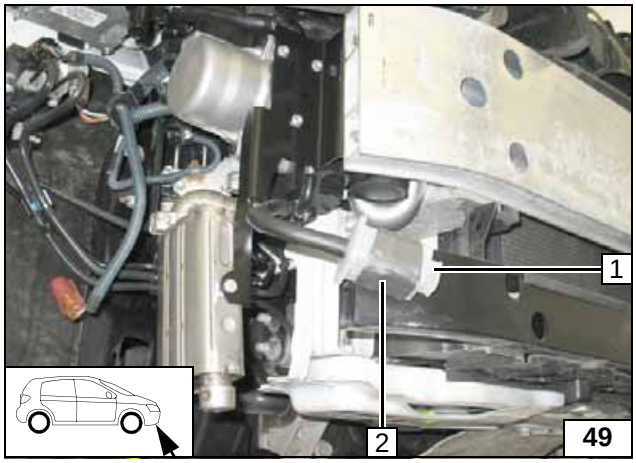
1 5x15 Self-tapping bolt [3x]
2 M6x25 bolt, spring lockwasher, 15mm spacer nut

Installing heater



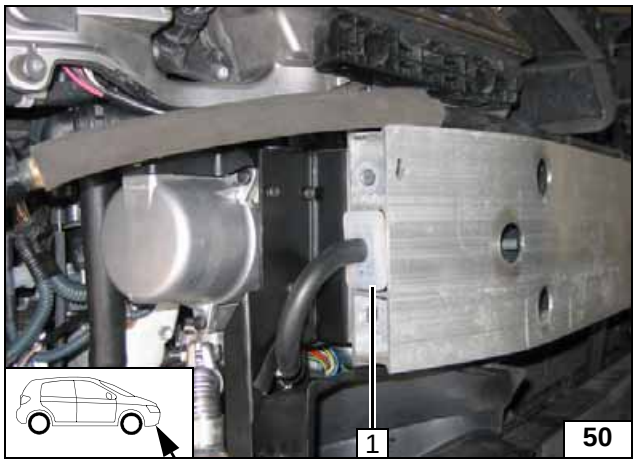
1 Combustion air pipe

Installing combustion air pipe



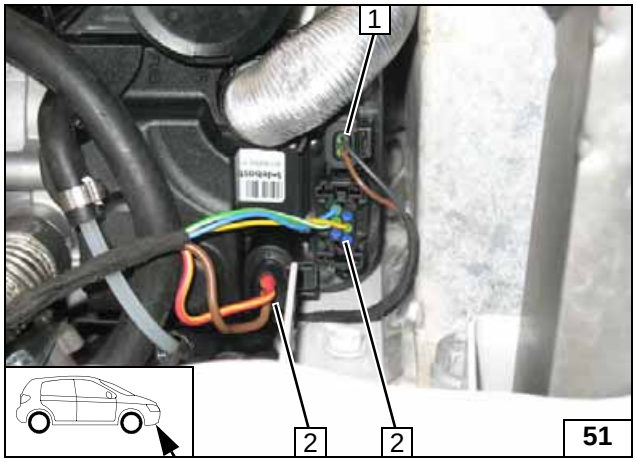
Wrap bumper and air filter housing **1** with insulation material **2**.

Installing bumper



Position air filter **1** laterally in bumper.

Installing air filter



1 Connector of circulating pump wiring harness
2 Connector of heater wiring harness [2x]

Mounting wiring harnesses

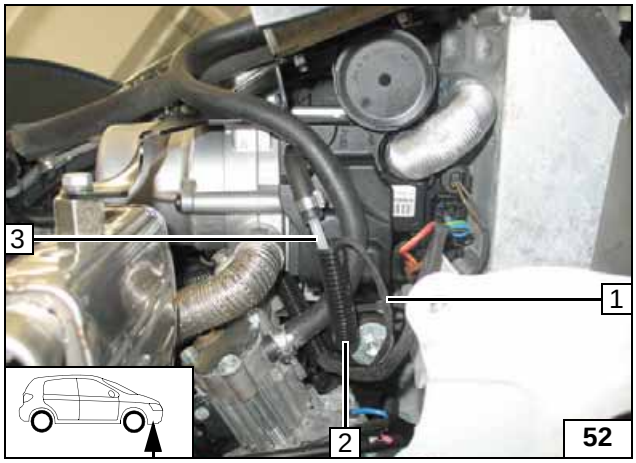
Fuel

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.

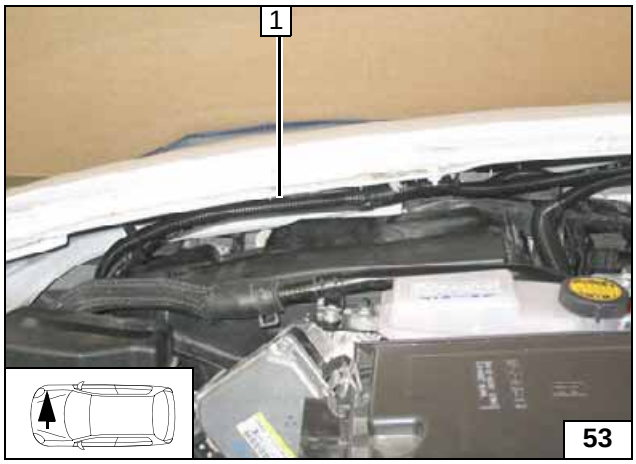
Install fuel line and metering pump wiring harness so that they are protected against stone impact. Unless specified otherwise, always fasten using cable ties.
Provide rub protection for fuel line and wiring harness in areas where there are sharp edges.

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



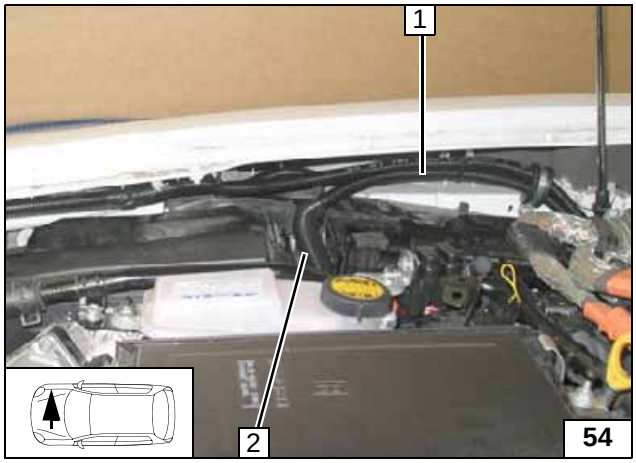
Pull fuel line **3** and wiring harness of metering pump **1** into 2100mm long corrugated tube **2** and route into the engine compartment (see engine compartment wiring harness routing).

Installing lines



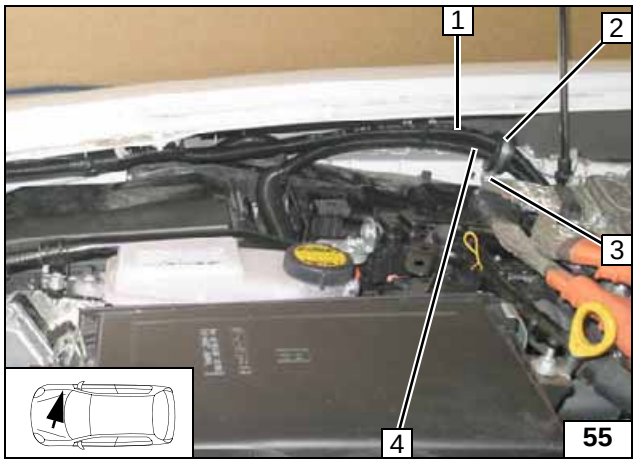
Route wiring harness of metering pump and fuel line into 10mm dia., 2100mm long corrugated tube **1** to the firewall (see fuel).

Installing lines



Cut open 17mm dia., 200mm long corrugated tube **2** lengthwise and slide onto wiring harnesses of heater, heater control and earth wire. Route wiring harness of heater control in 10mm dia., 1130mm long corrugated tube **1** to the firewall.

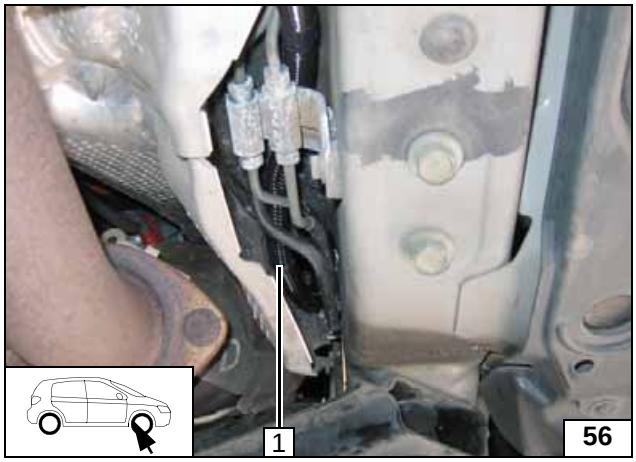
Installing lines



Route 10mm dia., 2100mm long corrugated tube **1** and 10mm dia., 1130mm long corrugated tube **4** through rubber-coated pipe clamp **2**. Route corrugated tube **1** further on the firewall to the underbody.

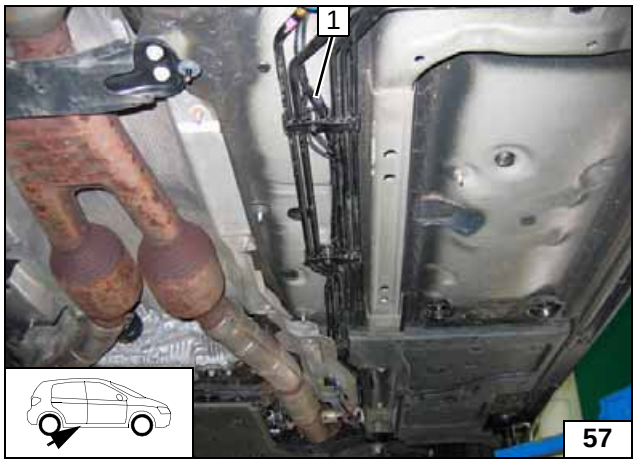
3 M6x20 bolt, spring lock washer, 29mm dia. rubber-coated p-clamp, existing threaded hole

Installing lines



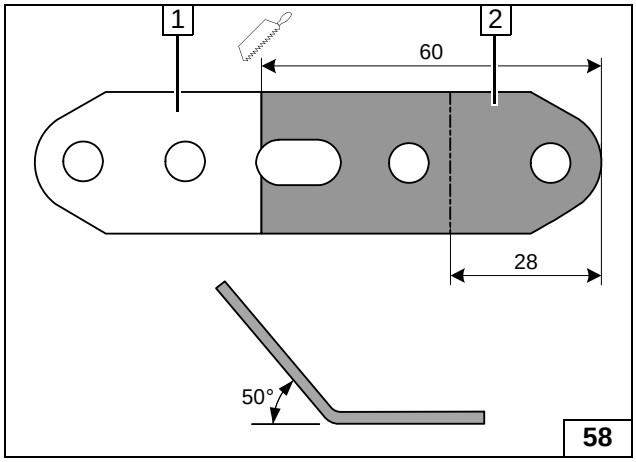
1 Fuel line and wiring harness for metering pump in corrugated tube

Installing lines



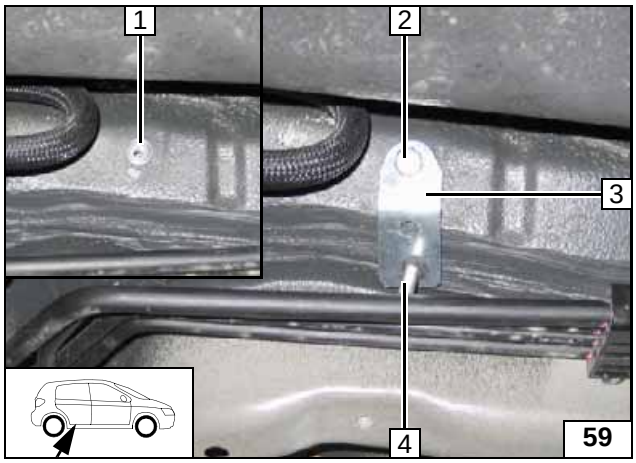
1 Fuel line and wiring harness for metering pump in corrugated tube

Installing lines



1 Discard section
2 Perforated bracket

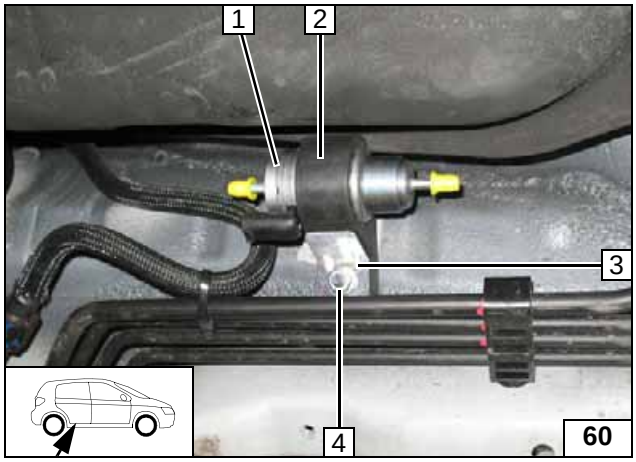
Preparing perforated bracket



Remove and discard rubber plug at position **1**. Insert M6 rivet nut **1** into existing hole.

2 M6x20 bolt, spring lockwasher
3 Perforated bracket
4 M6x25 detent edged bolt, pin lock

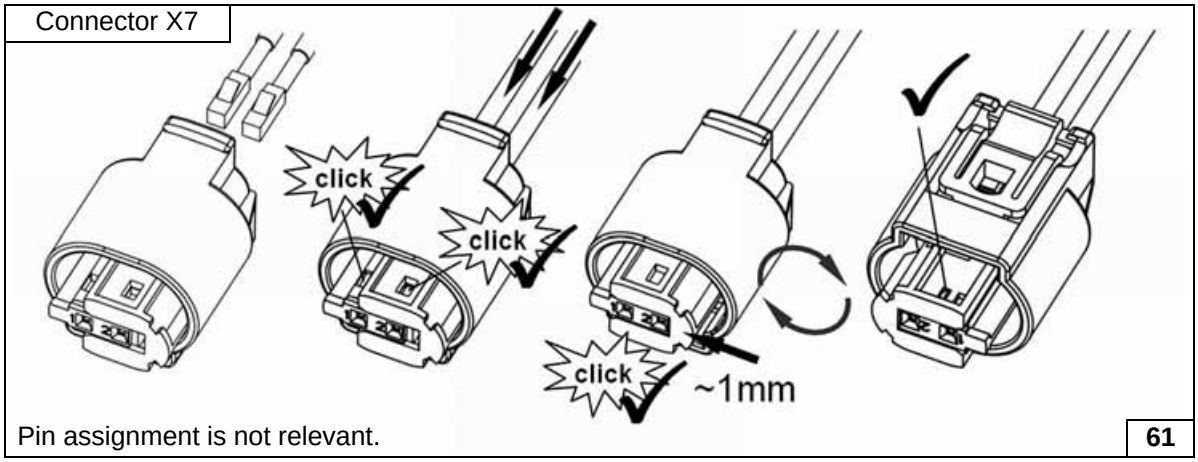
Mounting perforated bracket



1 Metering pump
2 Receptacle for metering pump
3 Support angle bracket
4 M6 flanged nut

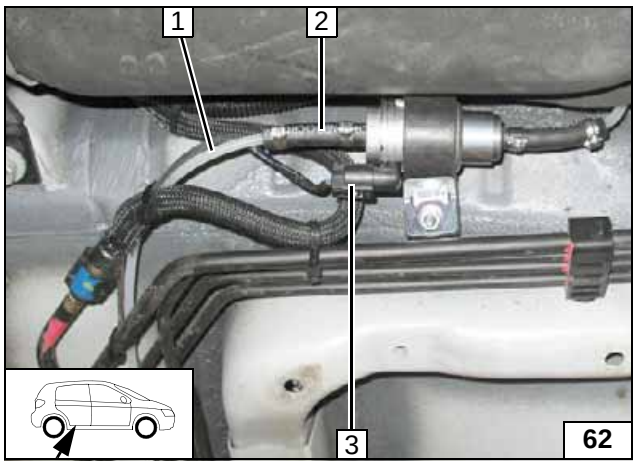
Installing metering pump

Connector X7



Pin assignment is not relevant.

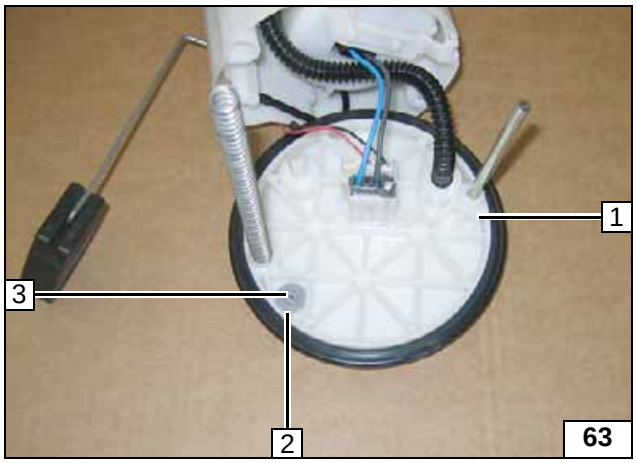
Completing connector of metering pump



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

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

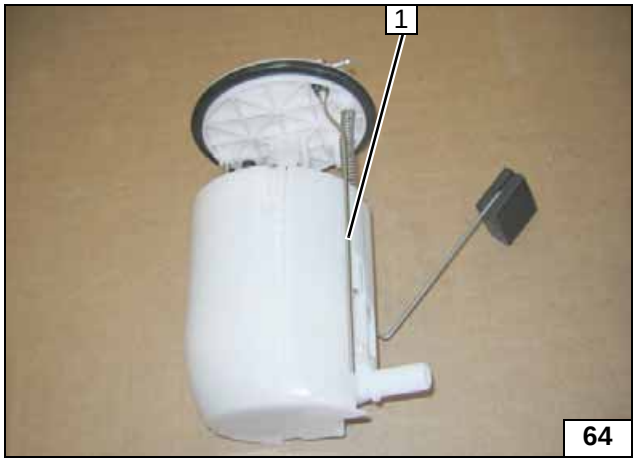
Connecting metering pump



Remove and dismantle fuel-tank sending unit **1** according to manufacturer's instructions.

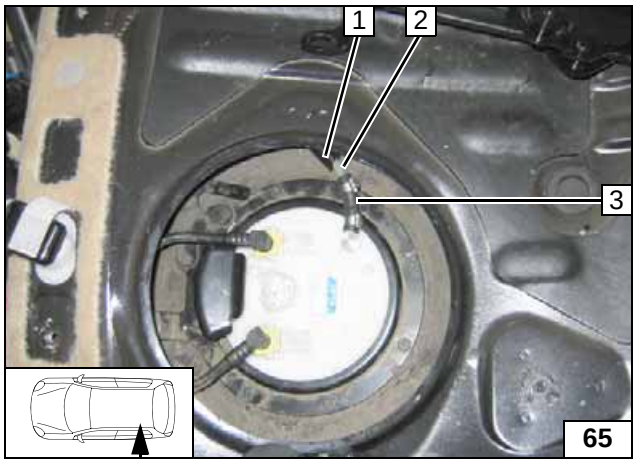
2 Large diameter washer, dia. da = 14.8mm
3 Copy hole pattern, 6 mm dia. hole

Fuel extraction



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

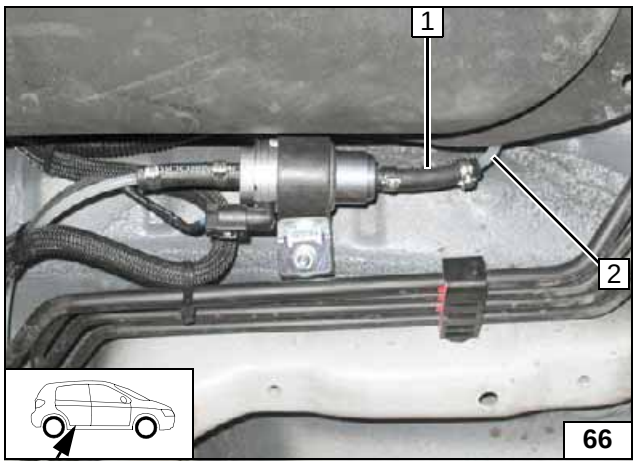
Mounting fuel standpipe



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

1 2100mm long corrugated tube
2 Fuel line
3 Hose section, 10 mm dia. clamp [2x]

Connecting fuel line



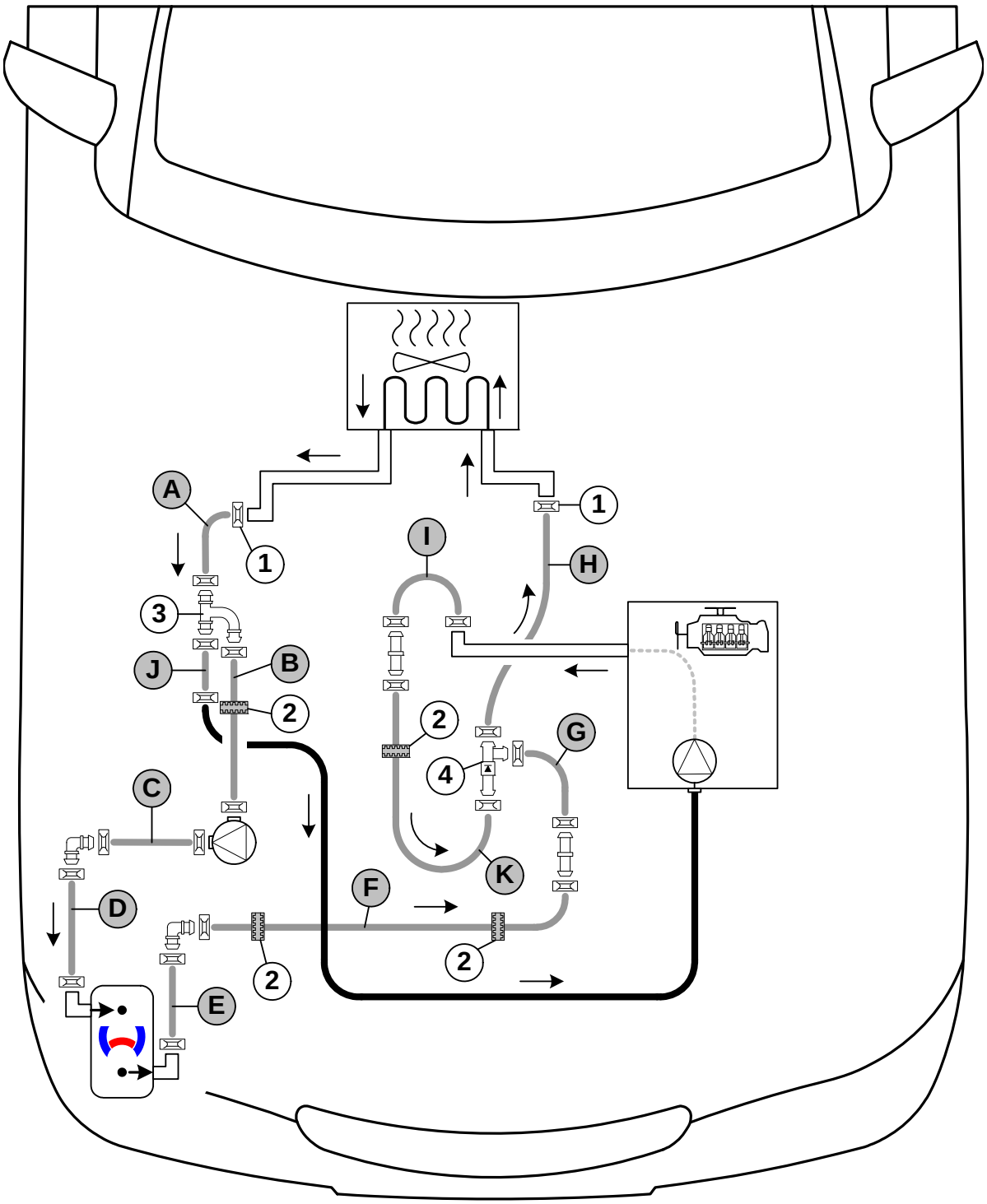
Check the position of the components; adjust if necessary. Check that they have freedom of movement.

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

Connecting metering pump

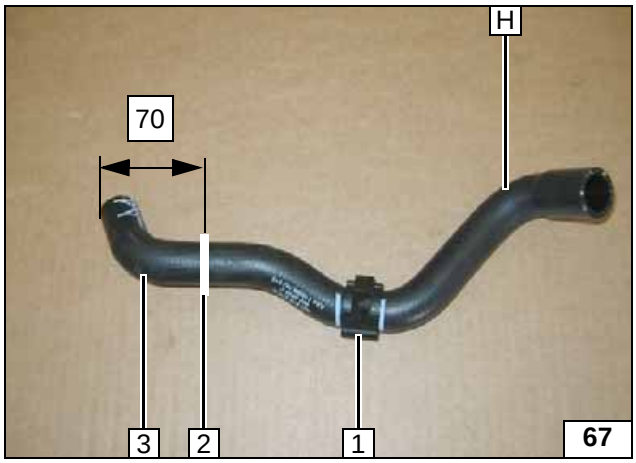
Coolant Circuit LS 460

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 modelled on an "inline" circuit and based on the following diagram:



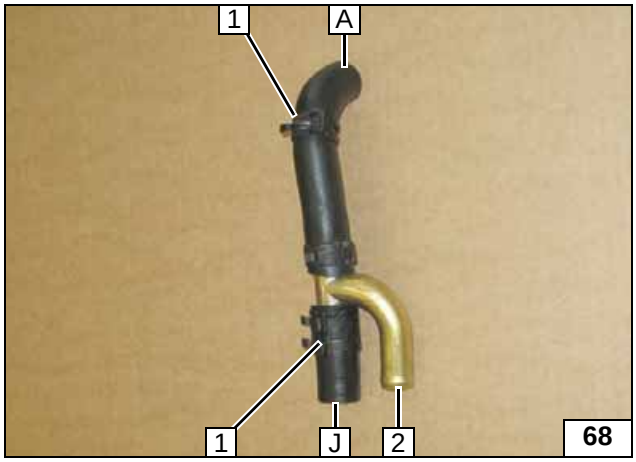
Coolant routing diagram

All spring clips = 25mm dia. **1** = Original vehicle spring clip . **3** = 90° T-piece !
2 = Black (sw) rubber isolator All connecting pipes and = 18x18mm dia.
4 = Check valve .



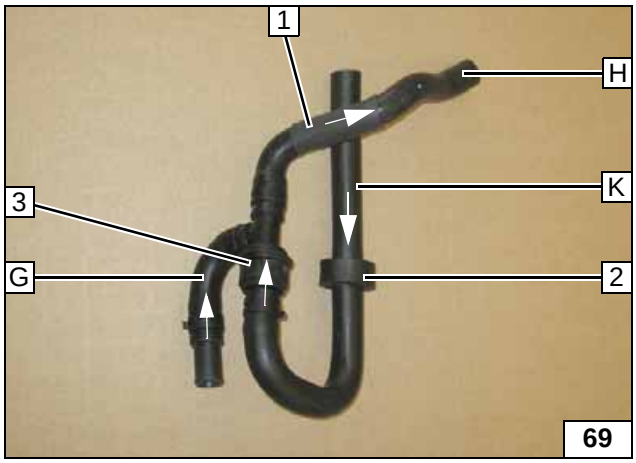
1 Discard clip
2 Cutting point
3 Discard section

Cutting to length water hose H



1 Slide spring clip onto hose [2x]
2 T-piece

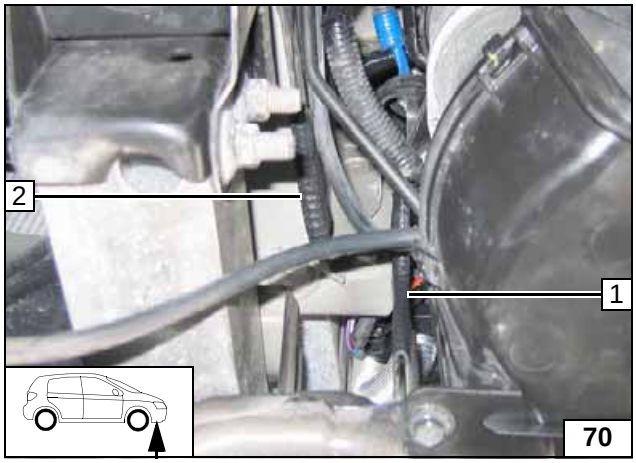
Premounting T-piece



Pay attention to the direction of flow of check valve **3**. Slide 100mm heat shrink plastic tubing **1** onto hose **H** and shrink.

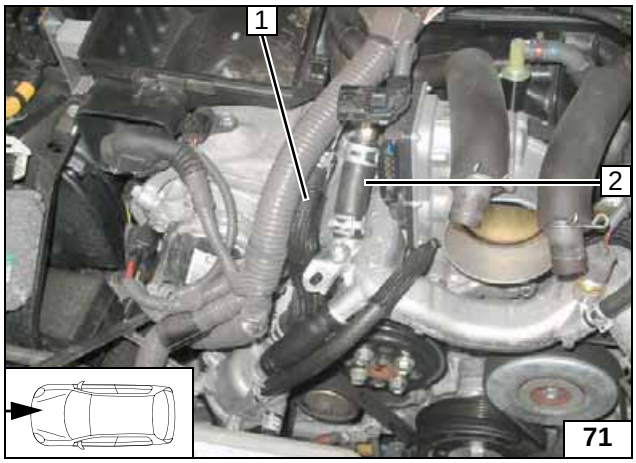
2 Position black (sw) rubber isolator

Premounting check valve



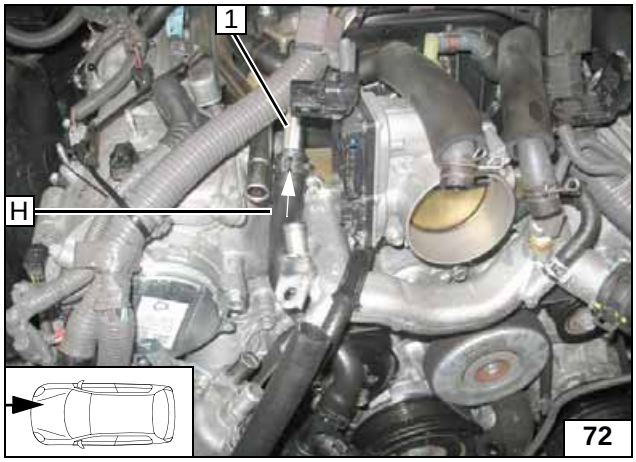
1 70mm long narrow edge protection
2 50mm long broad edge protection

Installing edge protection



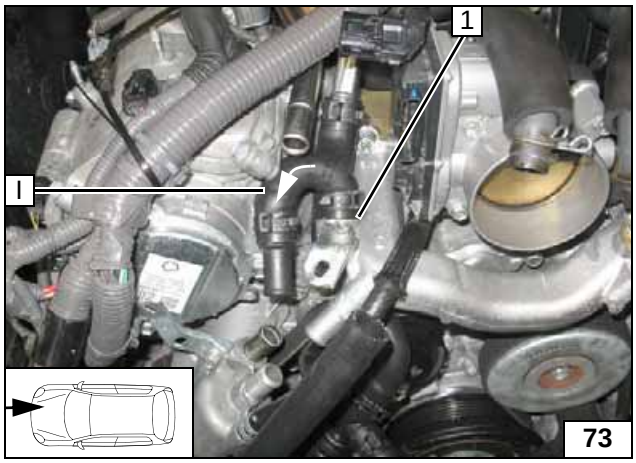
1 Discard hose section on heat exchanger outlet
2 Discard hose section on engine outlet

Cutting point



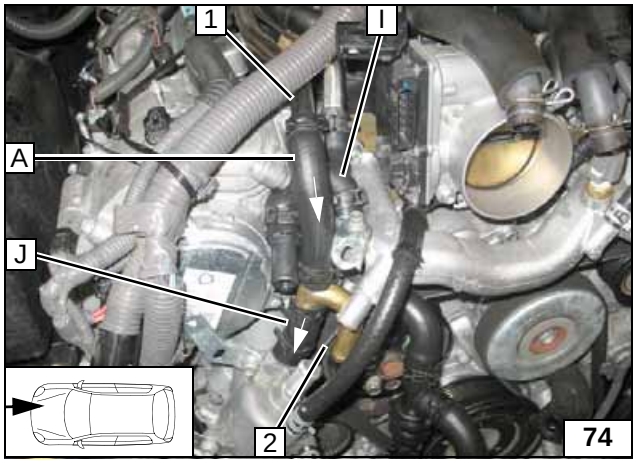
Bend pipe of heat exchanger inlet **1** if necessary
towards the engine.

Connecting hose H



Install hose **I** with shortened side on connection piece of engine outlet **1**.

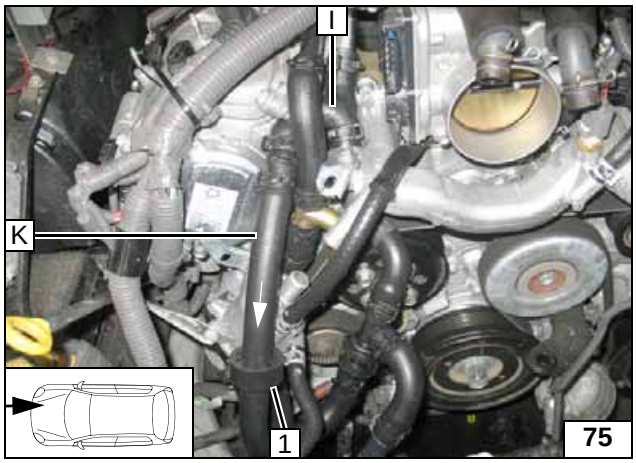
Connecting hose I



Align T-piece and ensure sufficient distance from pulley at position **2**.

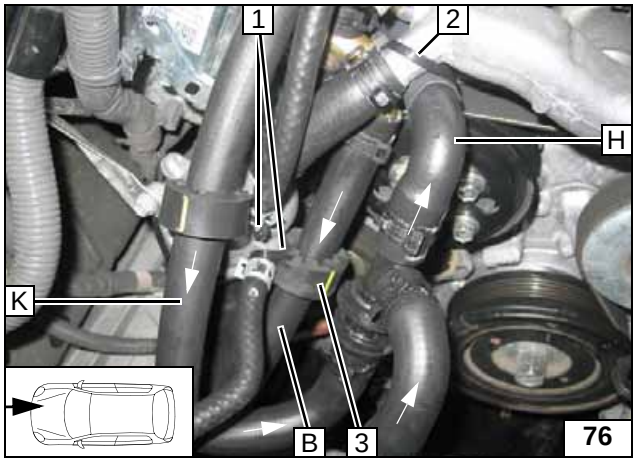
1 Pipe of heat exchanger outlet

Connecting T-piece



1 Align black (sw) rubber isolator

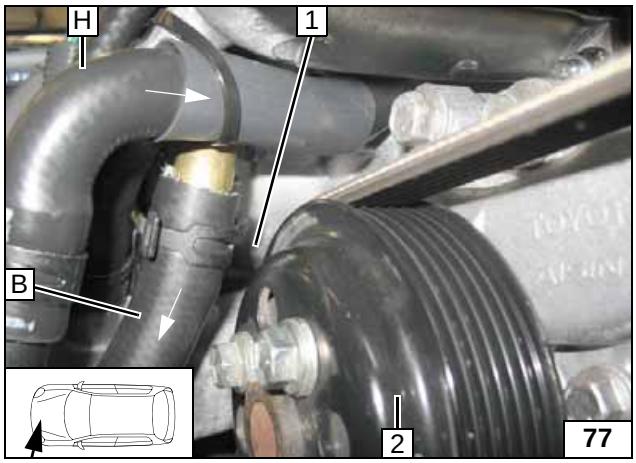
Connecting hose K



Install hose **B** on T-piece. Fasten black (sw) rubber isolator **3** with cable tie **1** [2x].

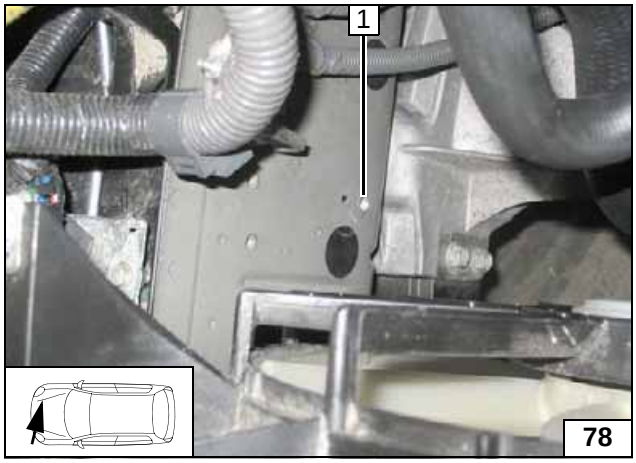
2 Hose **H** fastened with cable tie

Connecting hose B



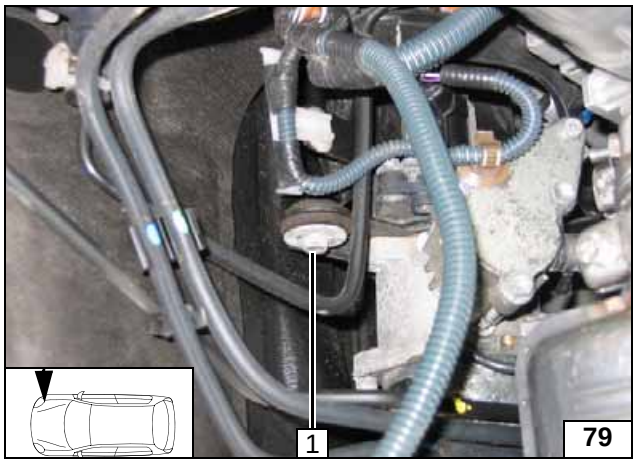
Ensure sufficient distance between pulley **2** and hose **B** at position **1**.

Checking distance from pulley



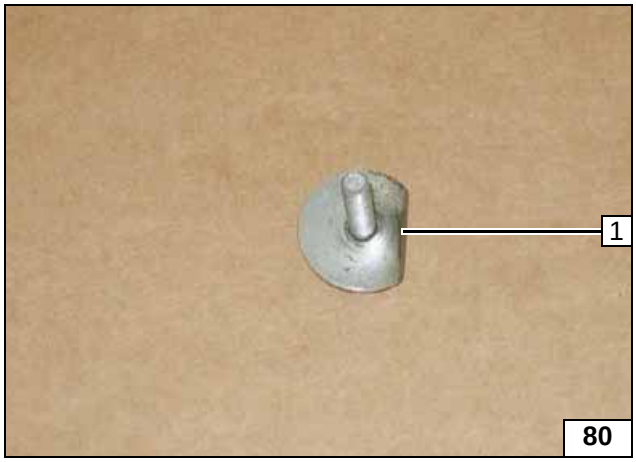
1 M6 rivet nut in existing hole

Installing rivet nut



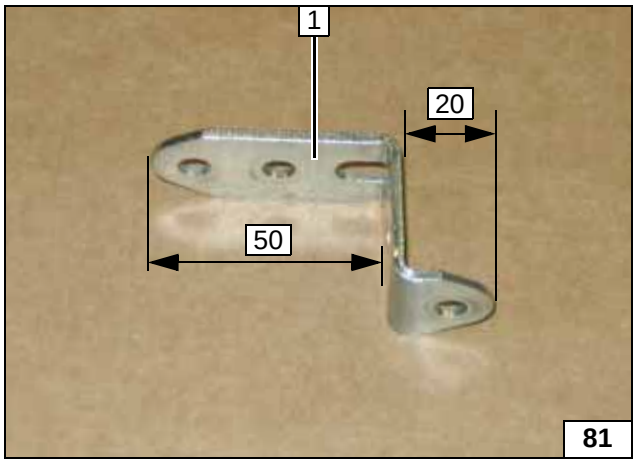
1 Dismantle original vehicle bolt

Preparing installation of circulating pump



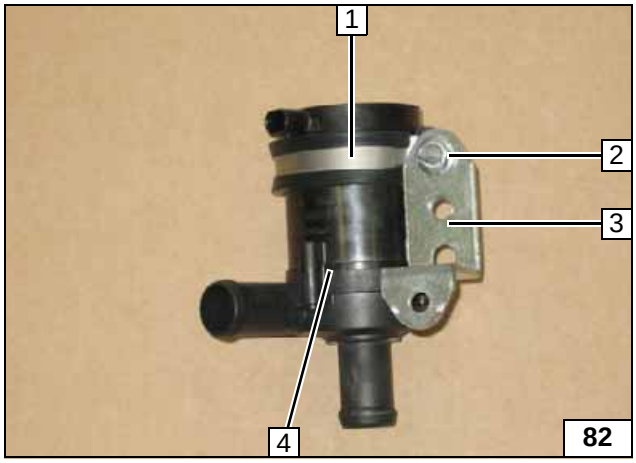
1 Shorten large diameter washer

Preparing installation of circulating pump



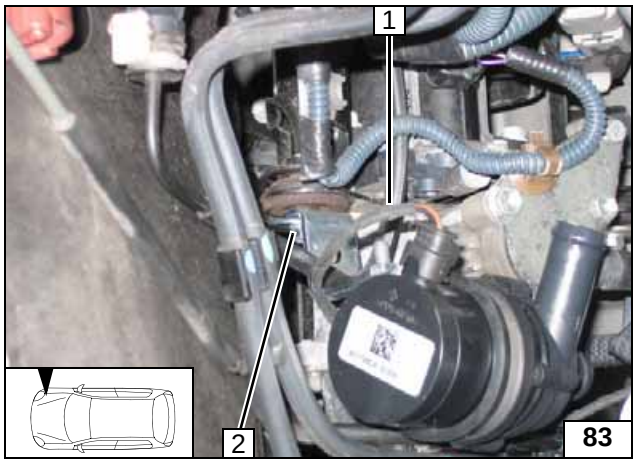
1 Perforated bracket

Angling down perforated bracket 2x 90°



1 48mm dia. rubber-coated p-clamp
2 Mount M6x20 bolt, flanged nut loosely
3 Perforated bracket
4 Circulating pump

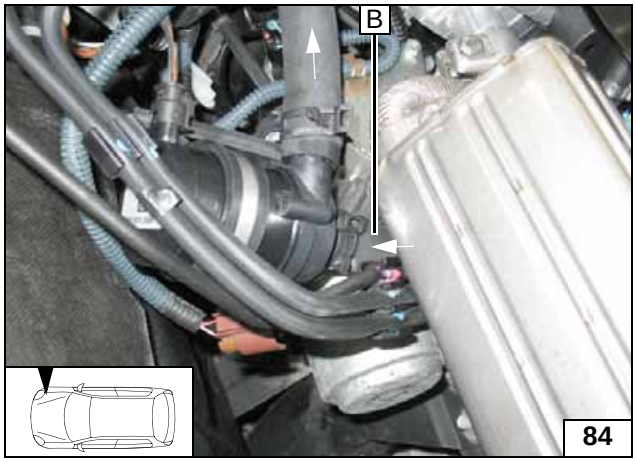
Preparing circulating pump



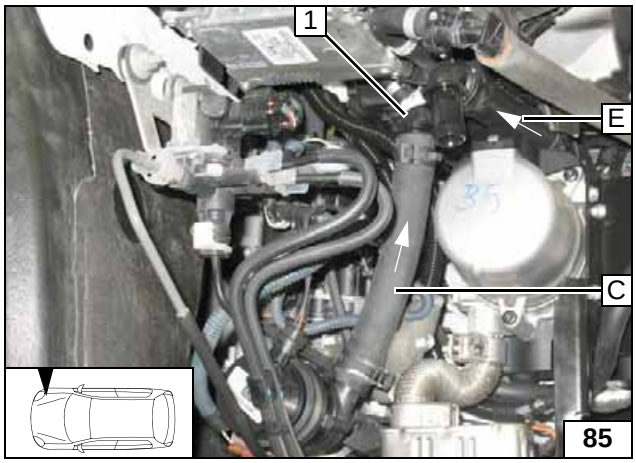
Align circulating pump. Tighten M6x20 bolt, flanged nut.

1 Install wiring harness of circulating pump
2 Original vehicle bolt

Installing circulating pump

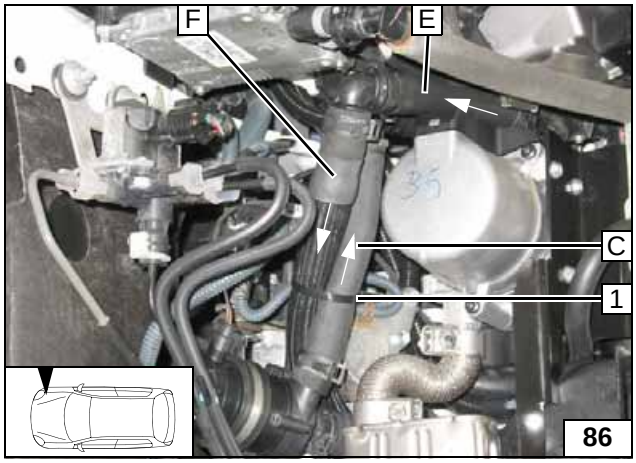


Connecting hose B



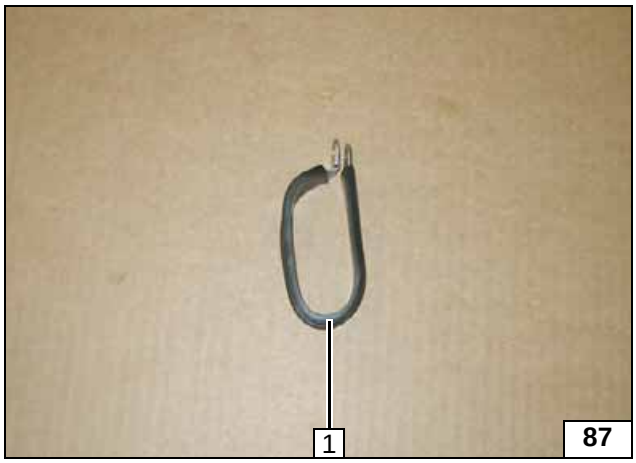
1 Hose **D** with 90° connecting pipe

Connecting hose C



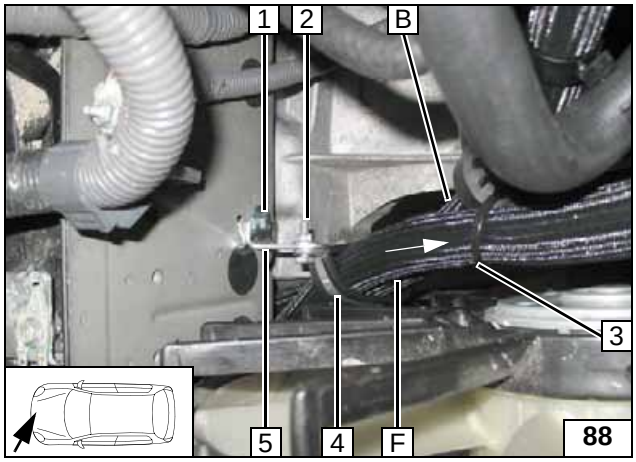
1 Cable tie

Connecting hose F



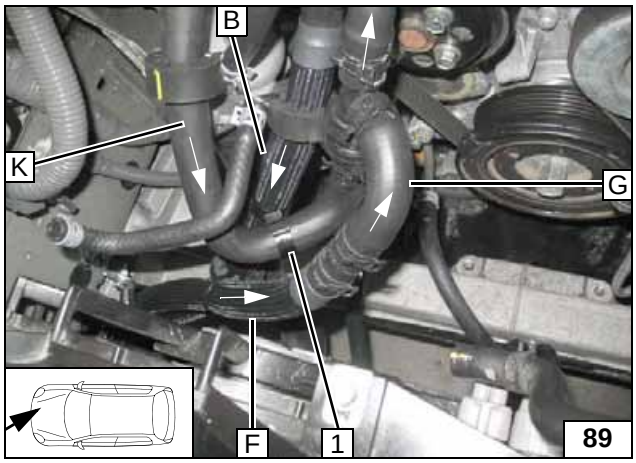
Shape rubber-coated 48mm dia. p-clamp **1** as shown.

Shaping rubber-coated p-clamp



1 M6x20 bolt, spring lockwasher
2 M6x20 bolt, flanged nut M6
3 Cable tie
4 Rubber-coated pipe clamp
5 Angle bracket

Routing in engine compartment



Ensure sufficient distance to neighbouring components.

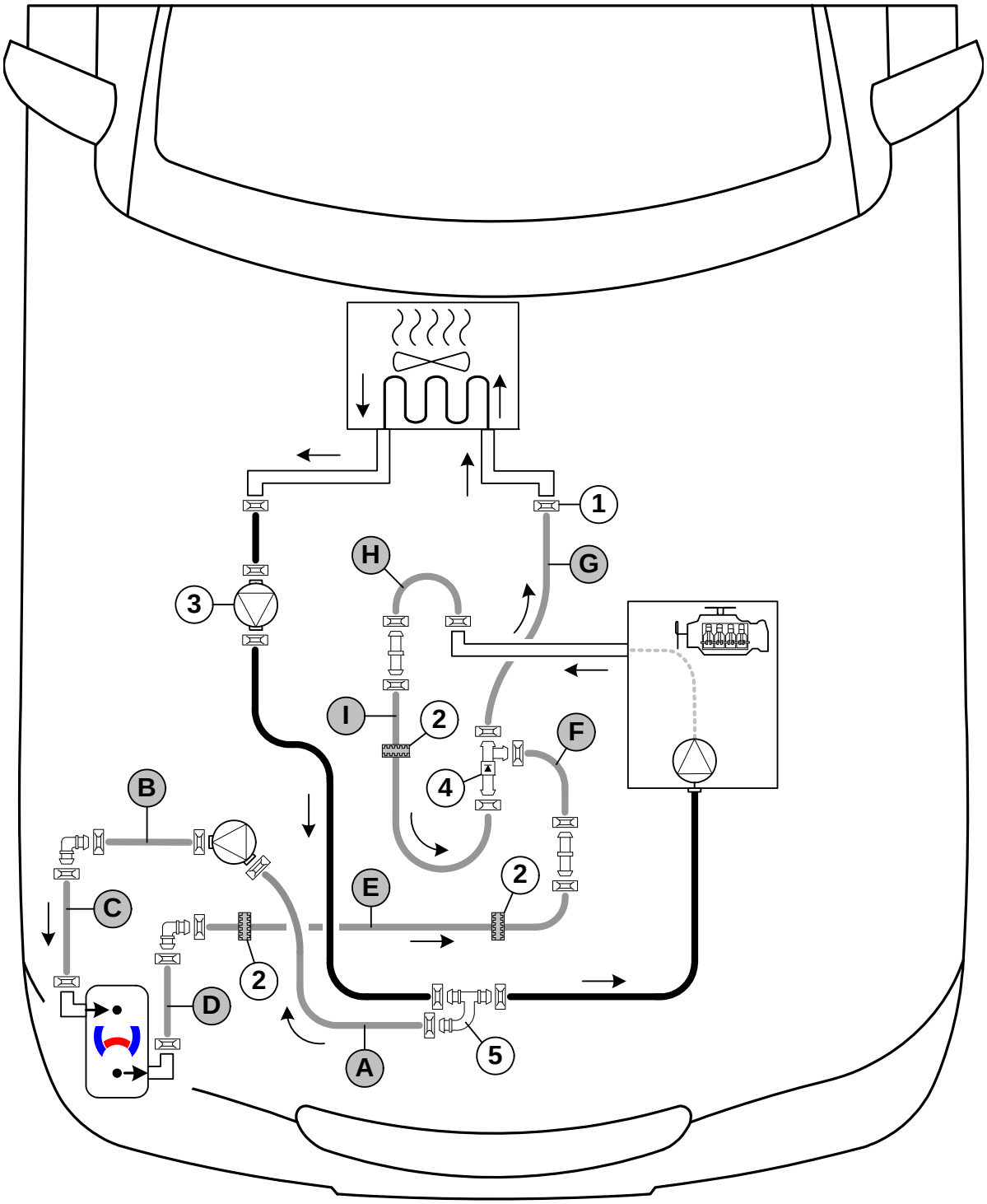
1 Spacer bracket

Connecting hose F

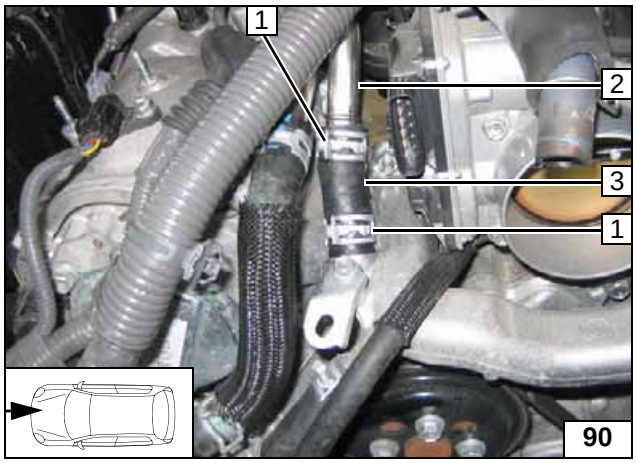
Coolant Circuit LS 600h

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

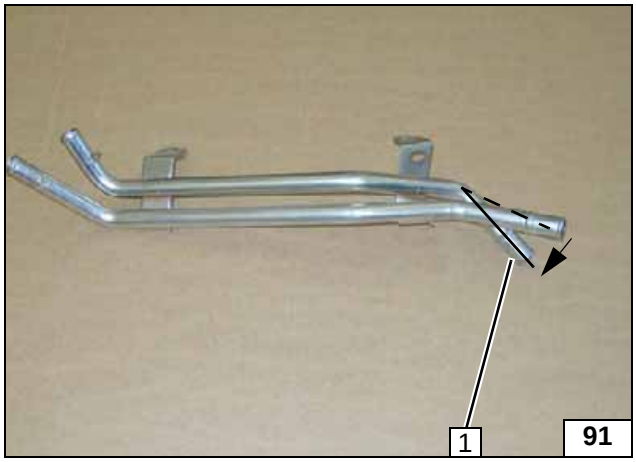


All spring clips = 25mm dia. **1** = Original vehicle spring clip . **3** = Original vehicle water pump.
2 = Black (sw) rubber isolator All connecting pipes and = 18x18mm dia.
4 = Check valve . **5** = 90° T-piece !



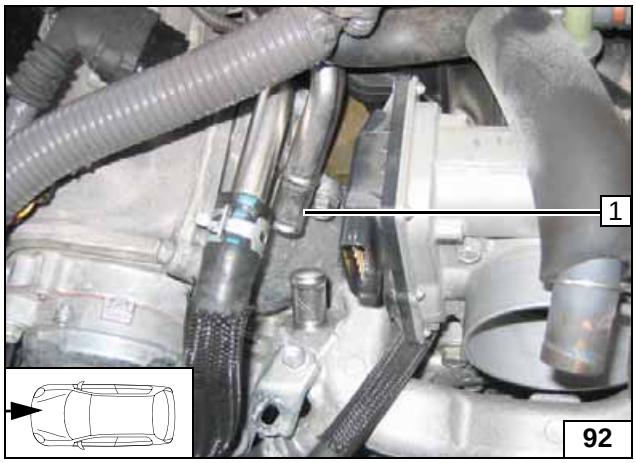
1 Original vehicle spring clips will be required again [2x]
2 Dismantle pipe group
3 Remove and discard hose section on heat exchanger outlet

Cutting point



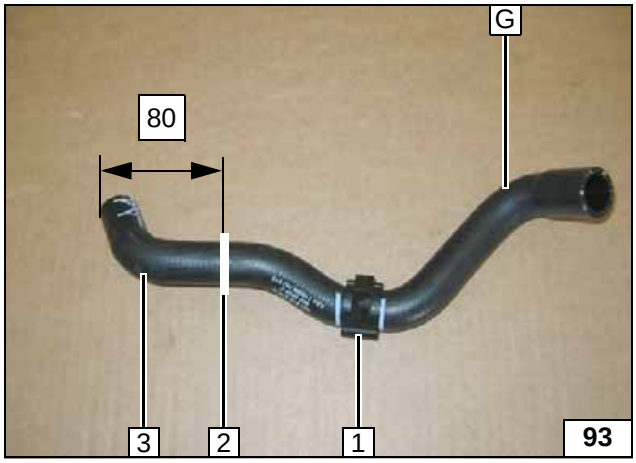
Align pipe end **1** by 15mm in the direction of the arrow, see following Figure.
Prevent breaking of pipe.

Aligning pipe group



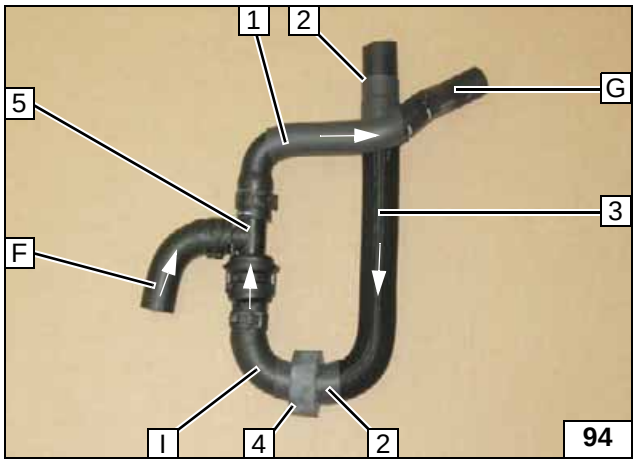
1 Pipe group installed

Installing pipe group



1 Discard clip
2 Cutting point
3 Discard section

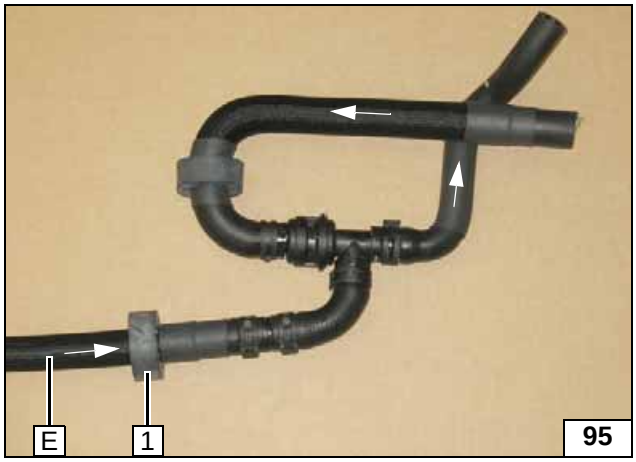
Cutting to lenght water hose G



Pay attention to the direction of flow of check valve **5**. Slide 100mm heat shrink plastic tubing **1** onto hose **G** and shrink. Cut 300mm braided protection hose **3** to length and slide onto hose **I**.

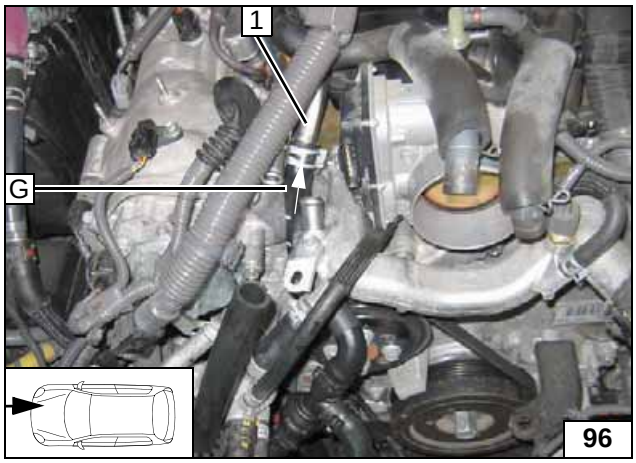
Premounting check valve

2 Slide on 50mm heat shrink plastic tubing [2x] and shrink
4 Position black (sw) rubber isolator



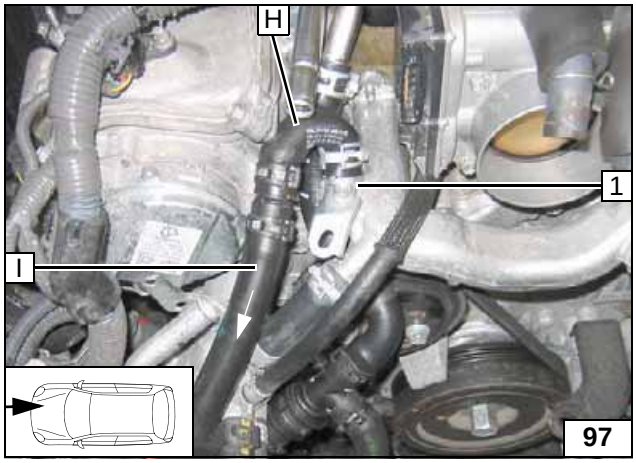
1 Position black (sw) rubber isolator

Premounting hose E



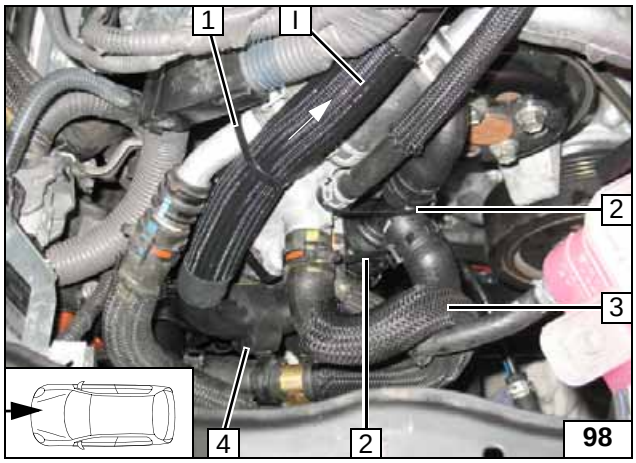
1 Pipe of heat exchanger inlet

Connecting hose G



Install hose **H** with shortened side on connection piece of engine outlet **1**.

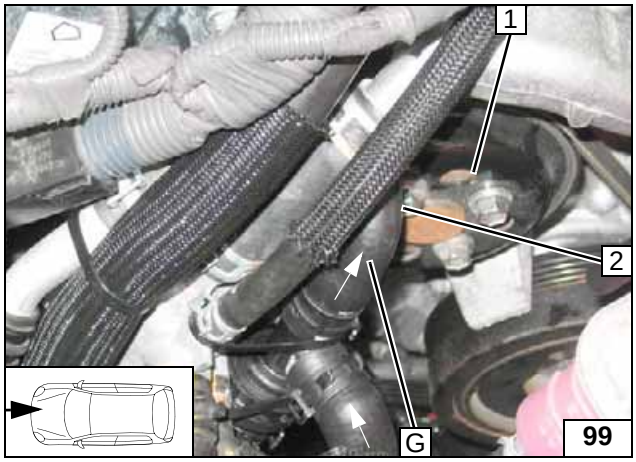
Connecting hose H



Fasten hose **I** with cable tie **1**.

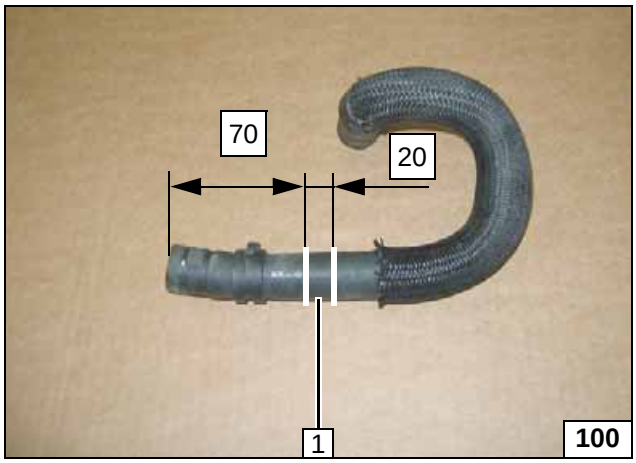
2 Fasten check valve with cable tie [2x]
3 Remove original vehicle hose
4 Align black (sw) rubber isolator

Fastening hoses



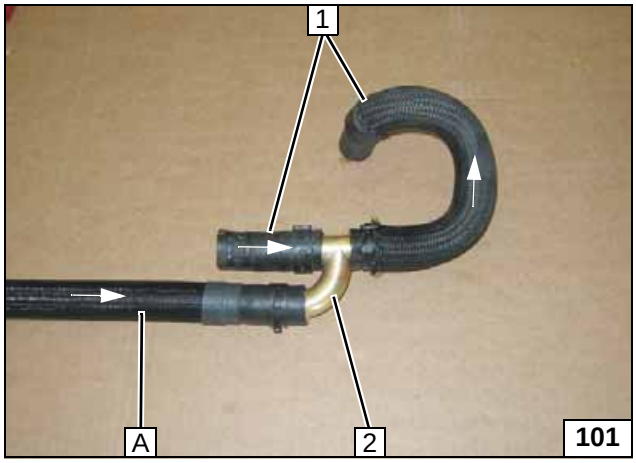
Ensure sufficient distance between pulley **1** and hose **G** at position **2**.

Checking distance from pulley



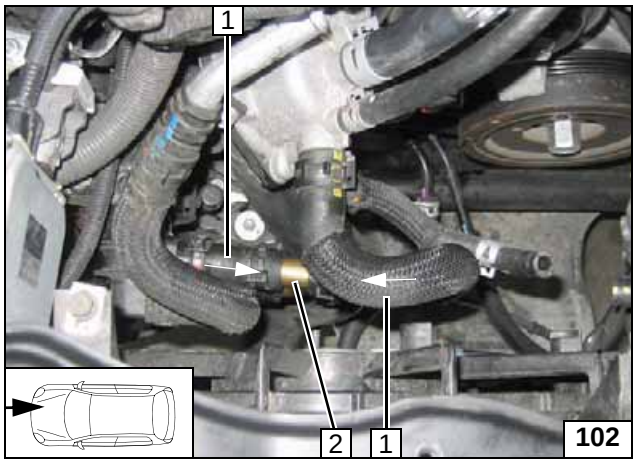
1 Discard section

Cutting original vehicle hose to length



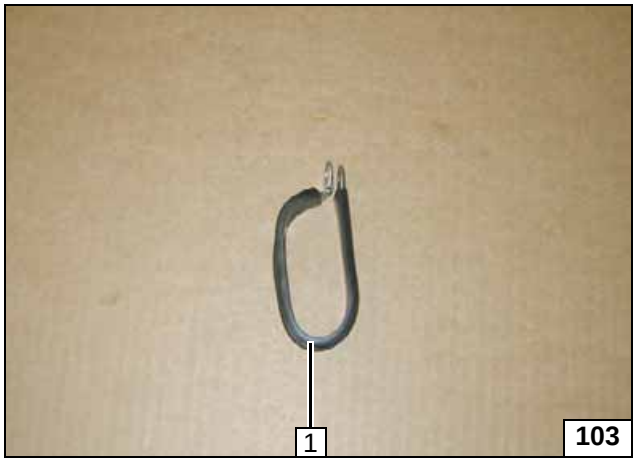
1 Original vehicle hose
2 T-piece

Premounting T-piece



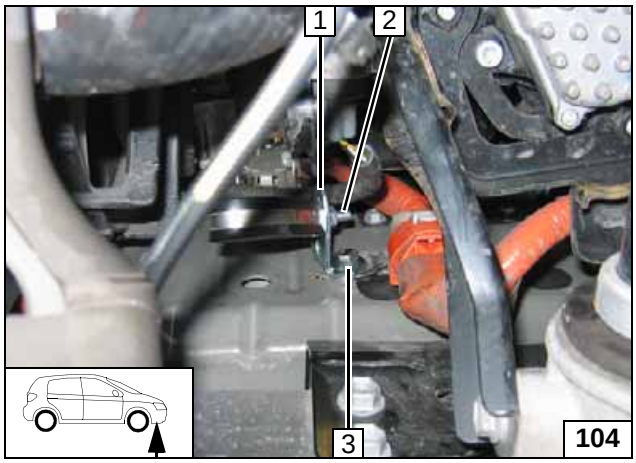
1 Original vehicle hose [2x]
2 T-piece

Assembling original vehicle hose



Shape rubber-coated 48mm dia. p-clamp **1** as shown.

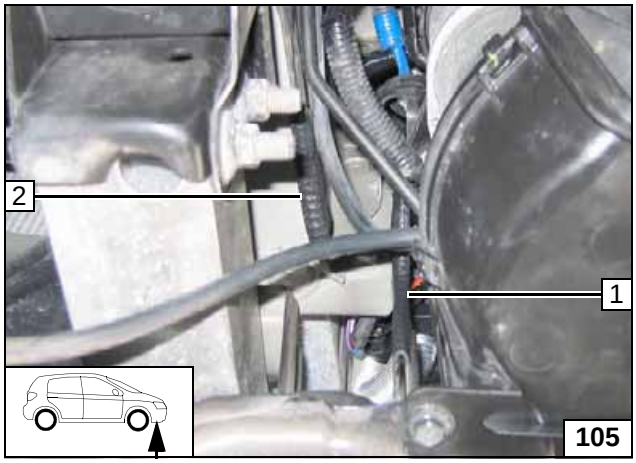
Shaping rubber-coated p-clamp



Discard original vehicle bolt at position **3**. Install 5mm shim between angle bracket **1** and body.

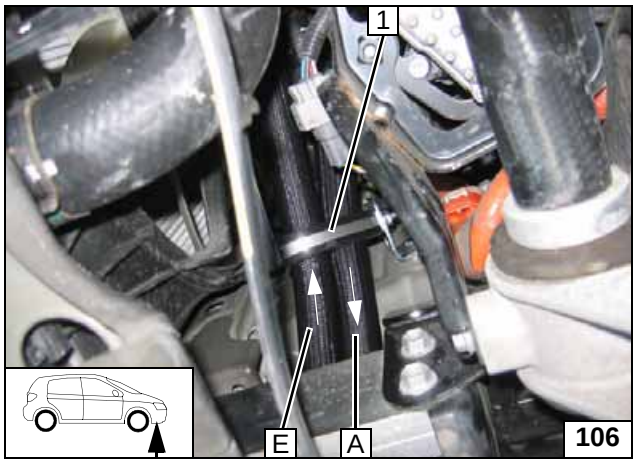
2 M6x20 bolt, 48mm dia. rubber-coated p-clamp, flanged nut
3 M6x20 bolt, spring lockwasher, 5mm shim, original vehicle threaded hole

Installing rubber-coated p-clamp



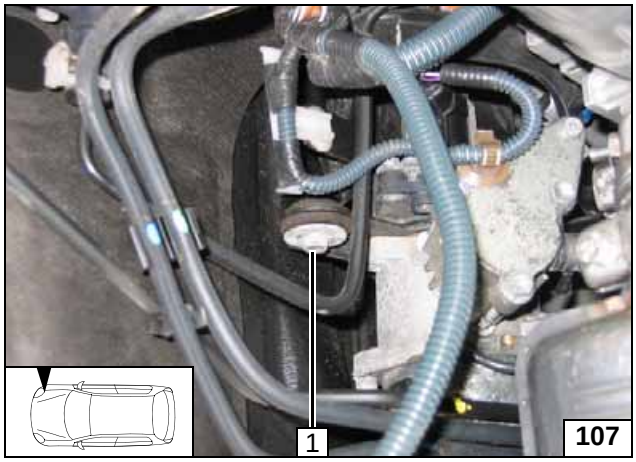
1 70mm long narrow edge protection
2 50mm long broad edge protection

Installing edge protection



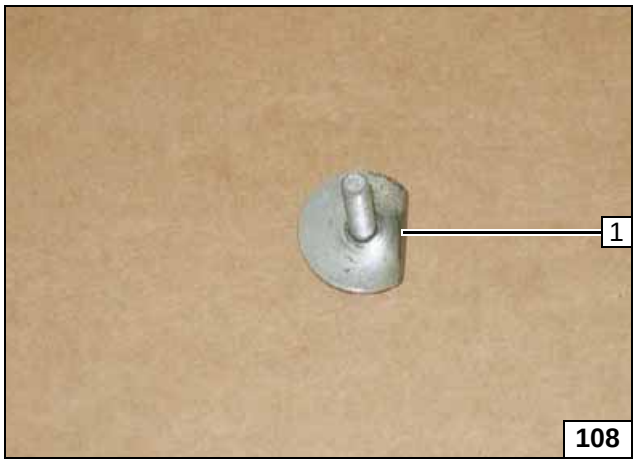
Route hose **A** and **E** through rubber-coated p-clamp **1**.

Routing hose A and E



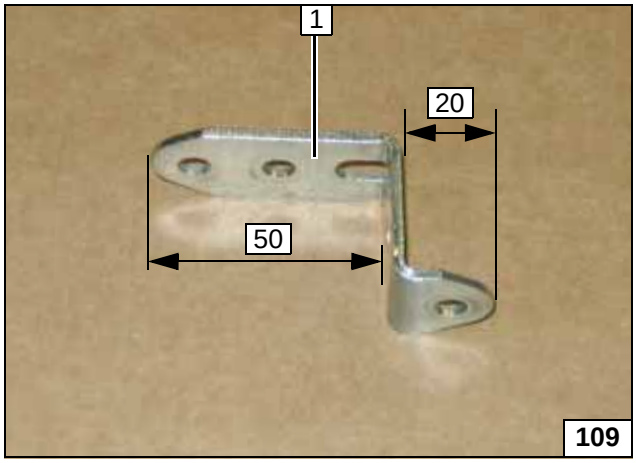
1 Dismantle original vehicle bolt

Preparing installation of circulating pump



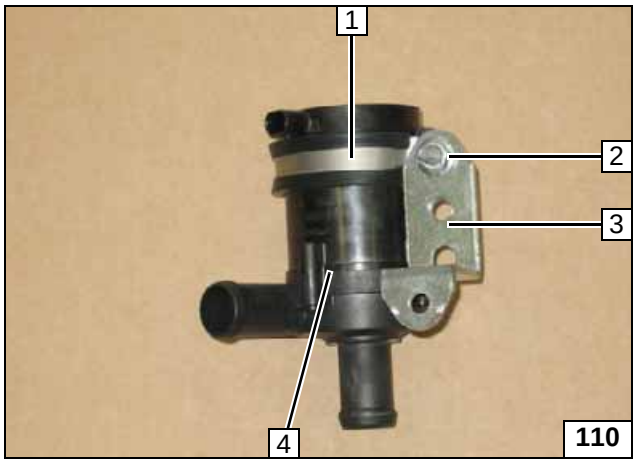
1 Shorten large diameter washer

Preparing installation of circulating pump



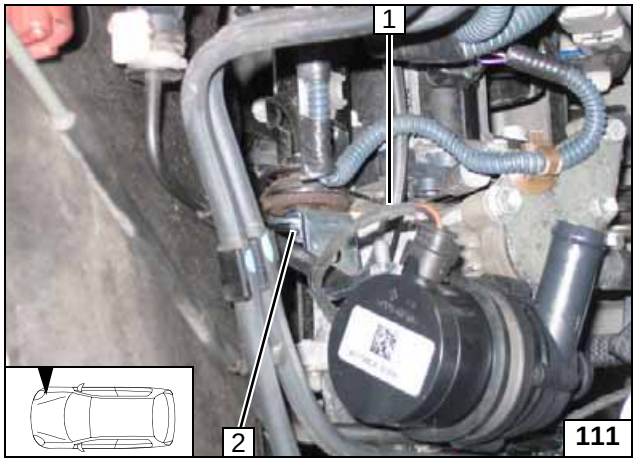
1 Perforated bracket

Angling down perforated bracket 2x 90°



1 48mm dia. rubber-coated p-clamp
2 Mount M6x20 bolt, flanged nut loosely
3 Perforated bracket
4 Circulating pump

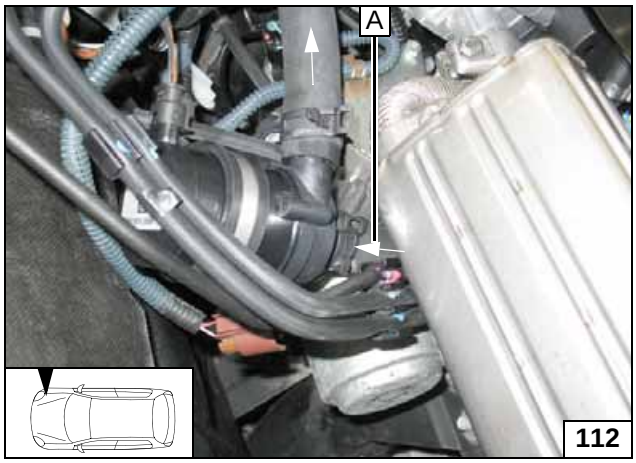
Preparing circulating pump



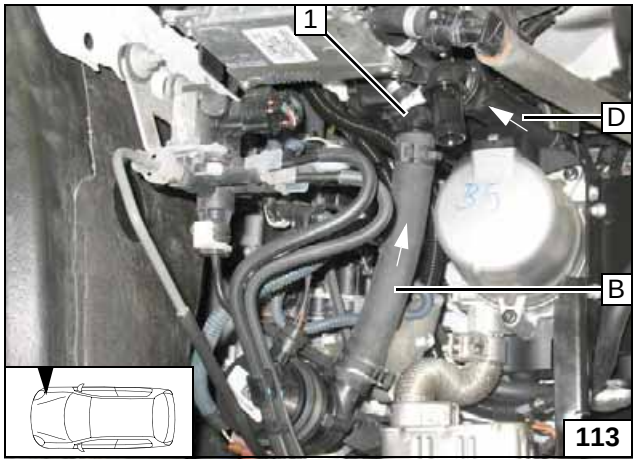
Align circulating pump. Tighten M6x20 bolt, flanged nut.

1 Install wiring harness of circulating pump
2 Original vehicle bolt

Installing circulating pump

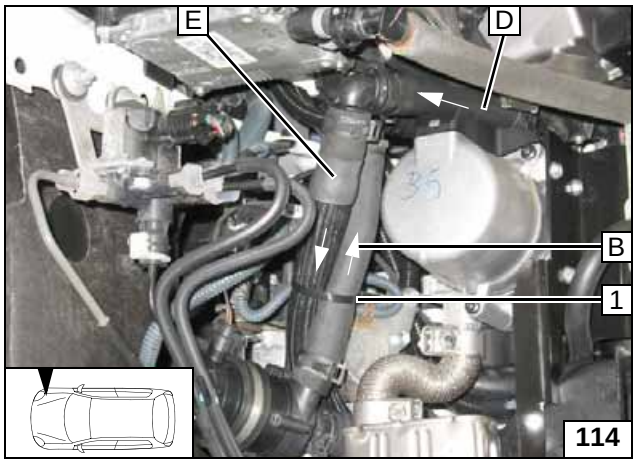


Connecting hose A



1 Hose **C** with 90° connecting pipe

Connecting hose B



1 Cable tie

Connecting hose E

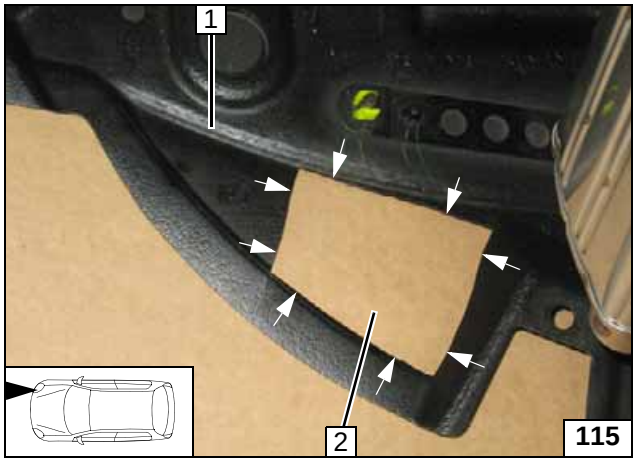
Final Work

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

Activation of hybrid system
Re-activate the hybrid system before connecting the 12V vehicle battery!

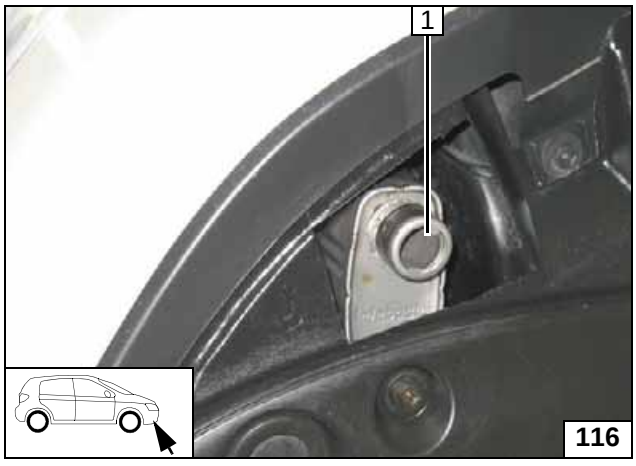
- **Connect the battery**
- **Fill and bleed the coolant circuit according to the vehicle manufacturer's specifications.**
- **Adjust digital timer, teach Telestart transmitter**
- **Make settings on A/C control panel according to the "Operating Instructions for End Customer".**
- **Checking of fan function (IPCU):**
  Set fan power to maximum. Afterwards, deactivate ignition and activate parking heater. Upon reaching the start-up temperature of 50°C, the fan speed has to correspond to the value predefined by the IPCU, about 1/3 of the maximum rotational 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 adjustment values 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.



Cut out wheel-well inner panel **1** at the markings. Discard section **2**.

Cutting out wheel-well inner panel

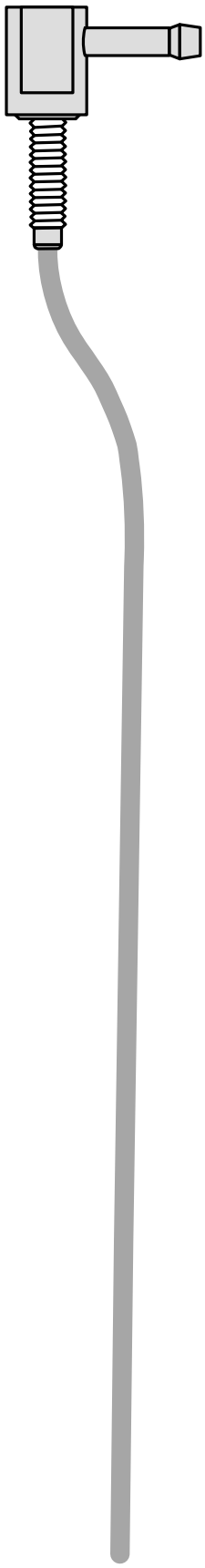


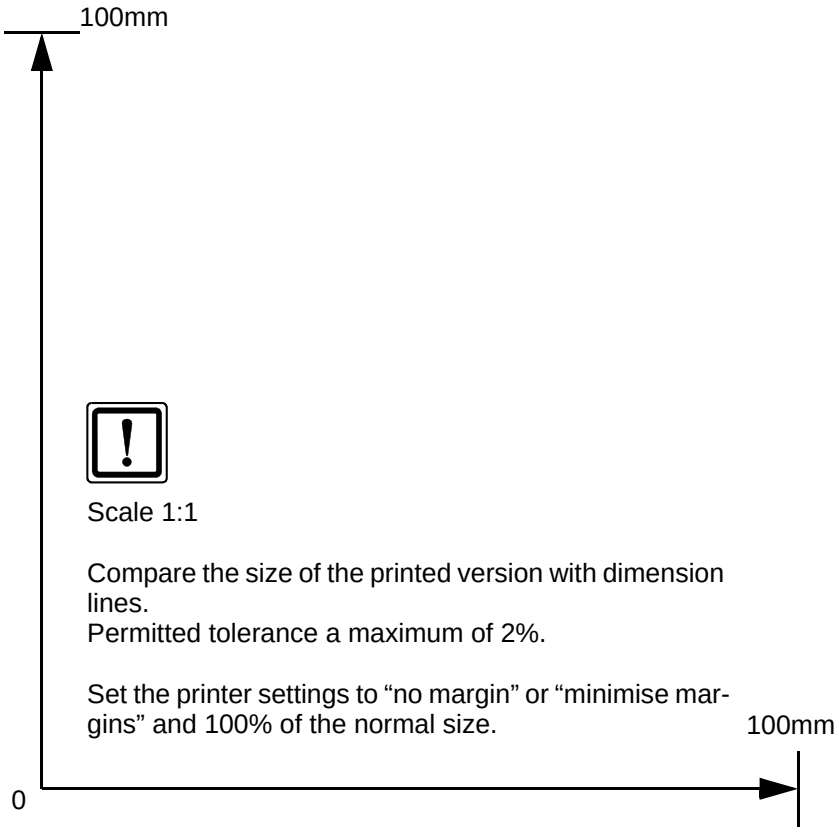
1 Position exhaust end section at the centre of the recess

Exhaust end section

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

Template for Fuel Standpipe





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.

Webasto
Feel the Drive

Operating Instructions for LS 460 Automatic A/C

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.

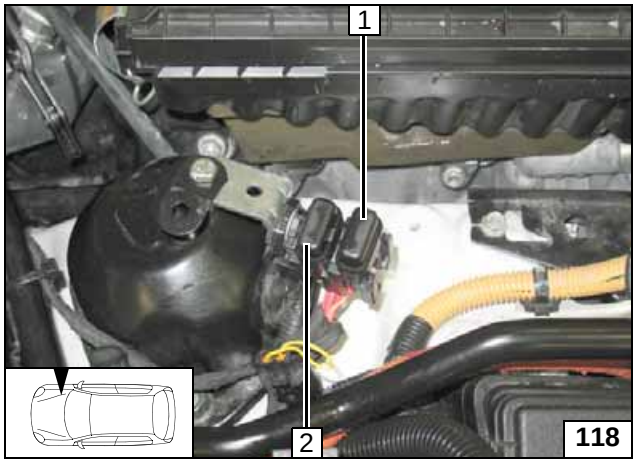
Passenger compartment monitoring, if installed, must be deactivated in addition to vehicle settings for the heating operation.
Instructions on deactivation can be taken from the operating instructions of the vehicle.

Before parking the vehicle, make the following settings:

A/C control panel

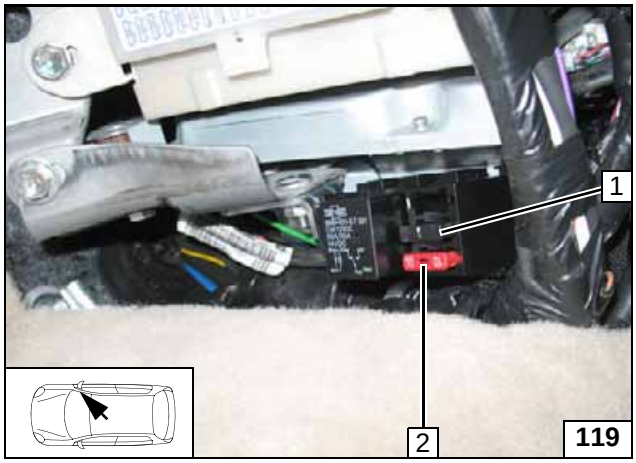
1 Set temperature to "HI“ [2x]
2 Air outlet to windscreen on both sides

Engine compartment fuses



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

Passenger compartment fuses



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

Operating Instructions for LS 600h Automatic A/C

Please remove page and add to the vehicle operating instructions.

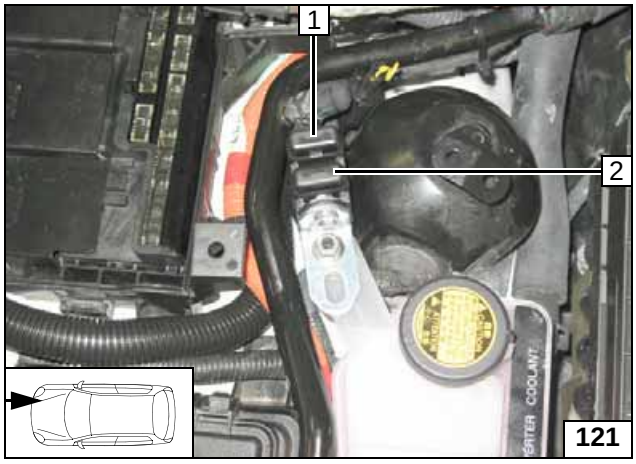
Note:
We recommend matching the heating time to the driving time.
Heating time = driving time
Example:
For a driving time of approx. 20 min. (in one direction), we recommend not exceeding a switch-on time of 20 min.

Passenger compartment monitoring, if installed, must be deactivated in addition to vehicle settings for the heating operation.
Instructions on deactivation can be taken from the operating instructions of the vehicle.

Before parking the vehicle, make the following settings:

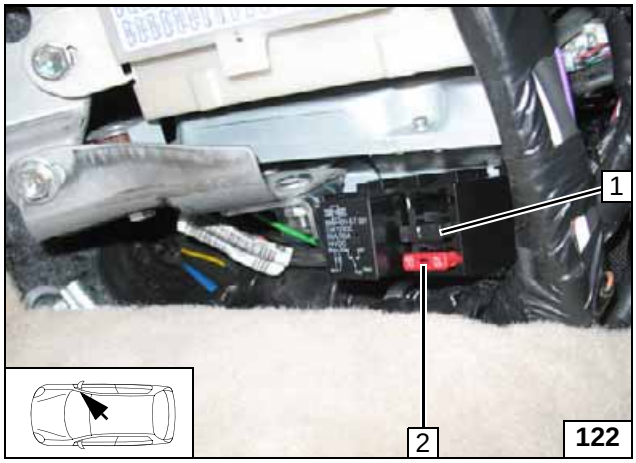
1 Set temperature to "HI“ [2x]
2 Air outlet to windscreen on both sides

A/C control panel



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

Engine compartment fuses



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

Passenger compartment fuses