

K Installation documentation

for water heater Thermo Top Evo

'Inline' coolant circuit with engine preheating

Toyota LC150

Left-hand drive vehicle

Manufacturer	Model	Type	Model year	EG-BE-No. / ABE		
Toyota	LC 150	J15TM	from production 08/2017	e6* 2007/46* 0001*...		
Motorisation	Fuel	Emission standard	Transmission type	Output [kW]	Displacement [cm ³]	Engine code
2.8D	Diesel	Euro6;W;...	6-speed SG	130	2755	1GD-FTV
2.8D	Diesel	Euro6;W;...	6-speed AG	130	2755	1GD-FTV
2.8D	Diesel	Euro6;WLTP;AP;...	6-speed AG	150	2755	1GD-FTV

Validity	Equipment variants	Model
		Toyota LC150
Verified equipment variants	Manual air conditioning	x
	2 zone automatic air-conditioning	x
	3 zone automatic air-conditioning	x
	LED main headlights	x
	LED front fog lights	x
	LED daytime running lights	x
	Halogen main headlights	x
	Halogen front fog lights	x
	Keyless Go	x
	Automatic Start-Stop system	x
	Headlight washer system	x
	Alarm system	x
	AWD	x
	Short wheelbase	x
	Long wheelbase	x
Exclusion	Fuel-driven auxiliary heater	x

Total installation time	Note
6.7 hours	Vehicle up to MY 2020
7.0 hours	Vehicle from MY 2021

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1 List of abbreviations

AWD	All-wheel drive
DP	Fuel pump
HG	Heater
K2	Additional relay
MY	Model year
PWM	Pulse width modulator
RSH	Relay and fuse holder of passenger compartment
SH2	Engine compartment fuse holder for F1/F2
UP	Coolant pump
Veh.	Vehicle
Wire	Cable

2 Installation notes

2.1 Information on Validity

This installation documentation applies to vehicles listed on page 1, 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.

2.2 Components used

Designation	Order number
Basic delivery scope of Thermo Top Evo	In accordance with price list
Installation kit for Toyota LC150 diesel 2018 TT-Evo	1326519B
In case of Telestart, control element, as well as indicator lamp in consultation with end customer	In accordance with price list
The installation location for the MultiControl CAR should be chosen in coordination with the end customer.	

2.3 Notes on installation, in coordination with the end customer

- ▶ Arrange for the vehicle to be delivered with the tank only about ¼ full.
- ▶ The installation location of the following elements should be chosen in coordination with the end customer:
 - the push button in case of the Telestart and/or ThermoCall and/or ThermoConnect options
 - the MultiControl CAR option

2.4 Information on Total Installation Time

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

The total installation time may vary for vehicle equipment other than provided.

3 About this document

3.1 Purpose of the document

This installation documentation is part of the product and contains all the information required to ensure professional vehicle specific installation of the:

Thermo Top Evo heater

3.2 Warranty and liability

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 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.

Spray unfinished body areas, e.g. drilled holes, with anti-corrosion wax (Tectyl 100K).

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

The initial start-up 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.

3.2.1 Statutory regulations governing installation

The Thermo Top Evo heater has been type-tested and approved in accordance with ECE-R 10 (EMC) and ECE-R 122 (heater). 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.

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

3.3 Safety

Qualifications of installation personnel

The installation personnel must have the following qualifications:

- Successful completion of Webasto training
- Corresponding qualification for working on technical systems

Regulations and legal requirements

The regulations from the heater's general installation and operating instructions must be observed.

3.3.1 Safety information on installation

Danger posed by live parts

- ▶ Prior to installation, disconnect the vehicle from the voltage supply.
- ▶ Make sure the electrical system is earthed correctly.
- ▶ Always comply with legal requirements.
- ▶ Observe data on type label.

Danger of fire and leaking toxic gases due to improper installation

- ▶ Vehicle parts in the vicinity of the heater must be protected against excessive heating by the following measures:
 - ⇒ Maintain minimum safety distances.
 - ⇒ Ensure adequate ventilation.
 - ⇒ Use fire-resistant materials or heat shields.

Danger due to sharp edges

- Lacerations
 - Short circuit due to electrical wire damage
- ▶ Fit protectors on sharp edges.

3.4 Using this document

Before installing and operating the heater, read this installation documentation, the installation instructions of the heater, the operating instructions and supplementary sheets provided.

3.4.1 Explanatory Notes on the Document

There is an identification mark near the respective work step to allow you to quickly allocate the other applicable documents to the Webasto components to be installed:

Generally valid Webasto documentation	
Vehicle-specific installation documentation	
Vehicle-specific installation documentation of the cold start kit	
Webasto Comfort A/C control	
Webasto Standard A/C control	
Tank extracting device (e.g. FuelFix)	
Exhaust end fastener (EFIX)	
Combustion air intake silencer	
Spacer bracket (ASH)	

3.4.2 Use of symbols



DANGER

Type and source of the risk

Consequences: Failure to follow the instructions can result in death

► Actions to protect yourself against risks.



WARNING

Type and source of the risk

Consequences: Failure to follow the instructions can lead to serious or even fatal injuries

► Actions to protect yourself against risks.



CAUTION

Type and source of the risk

Consequences: Failure to follow the instructions can lead to minor injuries

► Actions to protect yourself against risks.



Type and source of the risk

Consequences: Failure to follow the instructions can lead to material damage

► Actions to protect yourself against risks.



Reference to the vehicle manufacturer's specific documents.



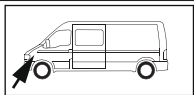
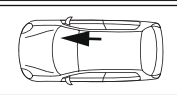
Note on a special technical feature

3.4.3 Work step identification marks

The ongoing work step is indicated on the outside top corner of the page:

Mechanical system	Electrical system	High-voltage	Coolant
Combustion air	Fuel	Exhaust	Software

3.4.4 Orientation aid



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

3.4.5 Use of highlighting

Highlight	Explanation
✓	Action
►	Necessary action
⇒	Result of an action
1 / 12 / a1	Position numbers for the image descriptions
① / ⑫ / Ⓐ	Position numbers for the image descriptions for electrical wires and components as well as coolant hose sections

4 Technical Information

Dimension specifications

- All dimensions specified in mm
- Perforated brackets and mounting angles are shown to scale
- Observe data regarding scale on the templates

Tightening torque specifications

- Tightening torque values of 5x13 heater bolts and 5x11 heater stud bolts = 8Nm
- Tightening torque values of 5x15 retaining plate of water connection piece bolts = 7Nm
- 5x12 bolt tightening torque of 2-part heater bracket = 6Nm
- Tighten other bolt connections in accordance with manufacturer's instructions or in accordance with state-of-the-art-technology

Temperature specification for heat shrink plastic tubings

- Fabric heat shrink tubing: shrink temperature max. 230°C
- Standard heat shrink plastic tubing: shrink temperature max. 300°C

Necessary special tools

- Hose clamp pliers for auto-tightening hose clamps
- Hose clamp pliers for Clic hose clamps of type W
- Hose clamping pliers
- Hose cutter
- Automatic wire stripper 0.2 - 6 mm²
- Crimping pliers for cable lugs 0.5 – 10 mm²
- Crimping pliers for male connector 0.14 – 6 mm²
- Crimping pliers for connector 0.25 – 6 mm²
- Torque wrench for 2.0 - 10 Nm
- Deep-hole marker
- Metric thread-setter kit
- Webasto Thermo Test Diagnosis with current software

5 Preparations

5.1 Vehicle preparation



Further information can be found in the vehicle manufacturer's technical documentation.

Vehicle area	Components to be removed	Other applicable documents
General	<ul style="list-style-type: none">▶ Open the fuel tank cap▶ Ventilate the fuel tank▶ Close the fuel tank cap again▶ Depressurise the cooling system	
Engine compartment and body	<ul style="list-style-type: none">▶ Battery▶ Engine design cover▶ Air filter complete with intake hose	
Passenger compartment	<ul style="list-style-type: none">▶ Top, side and lower A-pillar trim on the front passenger's side▶ Entrance strip on the front passenger's side▶ Lower footwell trim on the front passenger's side▶ Glove box▶ Glove box trim	

5.2 Heater preparation

Engine compartment	<ul style="list-style-type: none">▶ Remove years that do not apply from the type and duplicate label▶ Attach the duplicate label (type label) in the appropriate place in the engine compartment	
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6 Installation overview

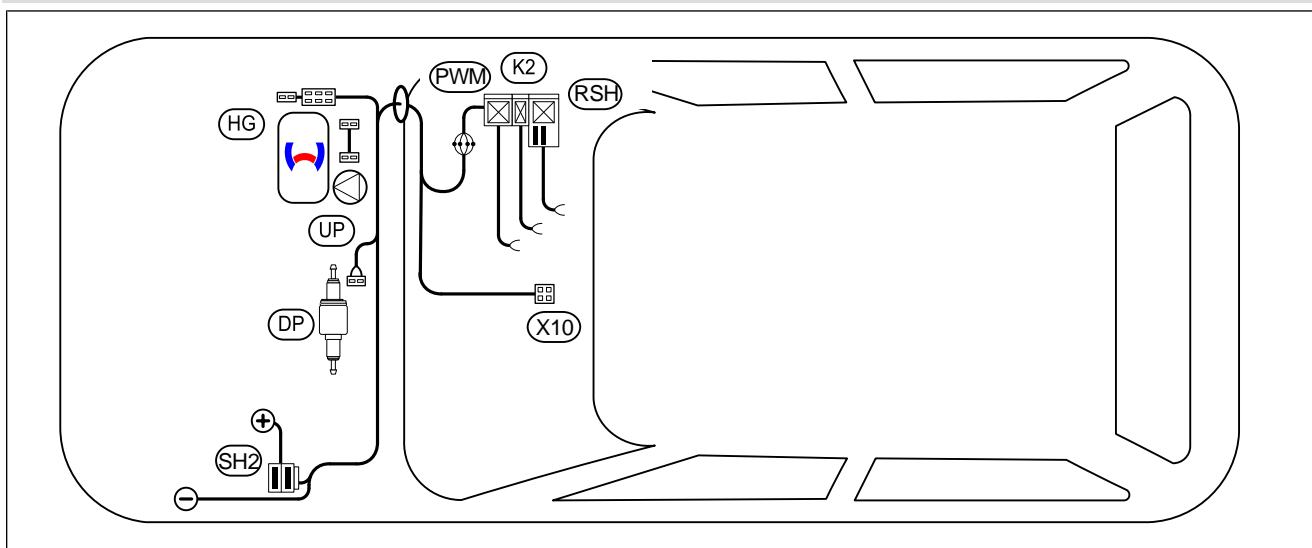
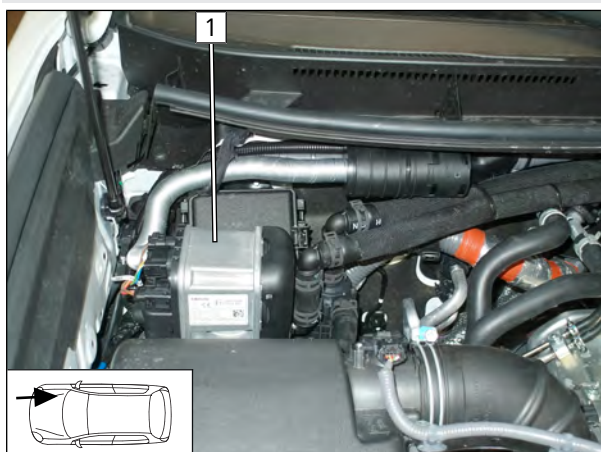


Fig. 1

Legend to installation overview

Abbreviation	Component
DP	Fuel pump
HG	Heater
K2	Relay K2 (only for 3 zone automatic air-conditioning)
PWM	Pulse width modulator
RSH	Relay and fuse holder of passenger compartment
SH2	Fuse holder of engine compartment
UP	Coolant pump
X10	Female plug for control element

Heater installation location



1 Heater

Fig. 2



7 Electrical system of engine compartment

Preparing angle bracket

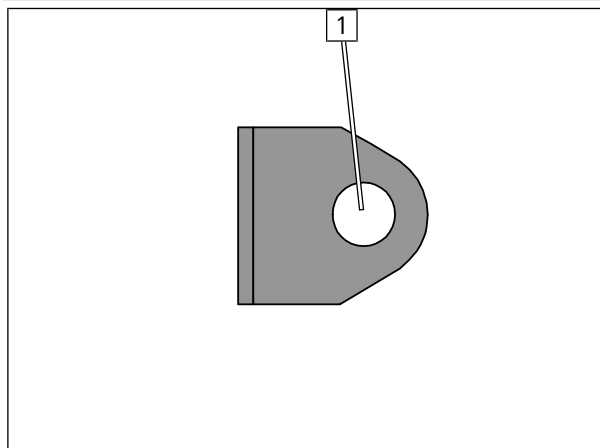


Fig. 3

- 1 Drill out hole to Ø8.5

Premounting fuse holder retaining plate

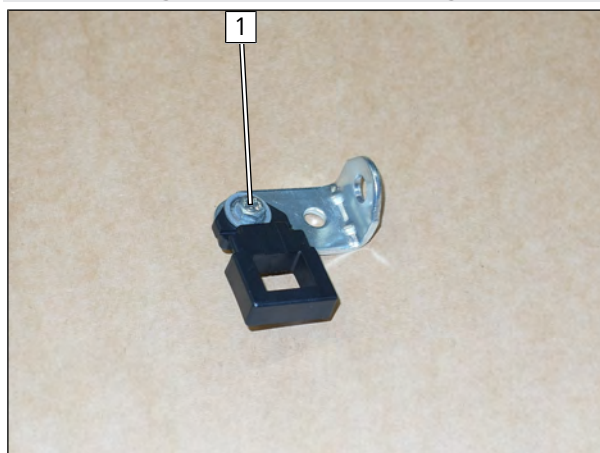


Fig. 4

- 1 M5x16 bolt, large diameter washer, fuse holder, angle bracket, large diameter washer, nut

Fuse F1/F2 retaining plate installation

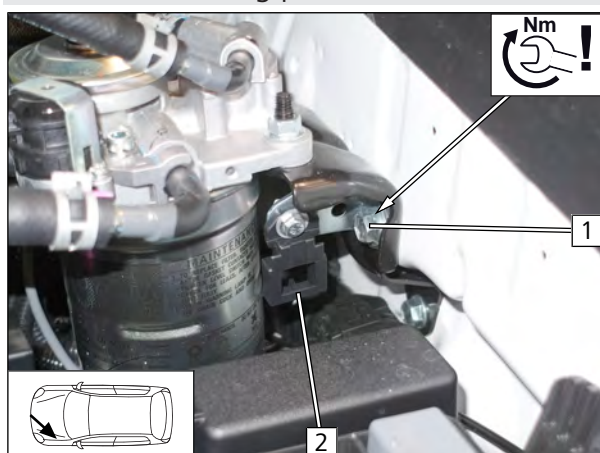


Fig. 5

- 1 Original vehicle bolt, premounted angle bracket
- 2 Premounted fuse F1/F2 bracket



Fuse F1/F2 installation

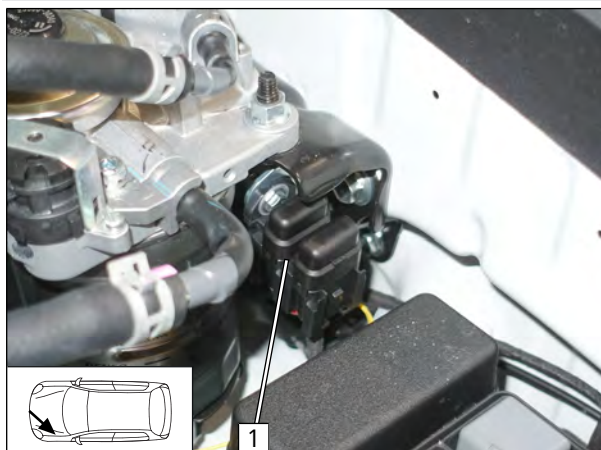


Fig. 6

- 1 Fuse F1: 20A and F2: 30A

Detaching original vehicle positive wire

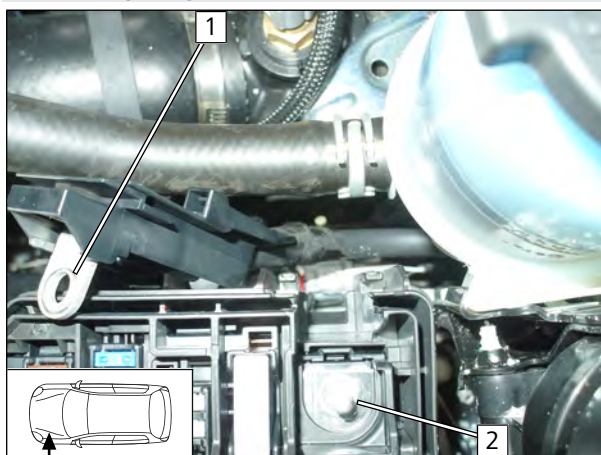


Fig. 7

- 1 Original vehicle positive wire
2 Positive support point

Routing positive wire

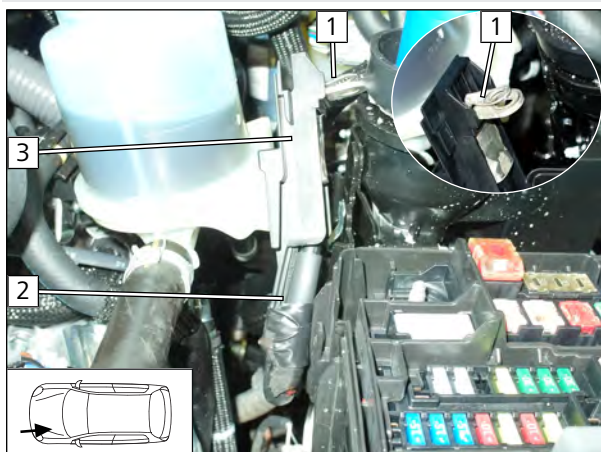


Fig. 8

- Draw positive wire into Ø10, 300 long corrugated tube.
- Draw cable lug 1 of positive wire 2 through cable duct 3.



Premounting positive wire

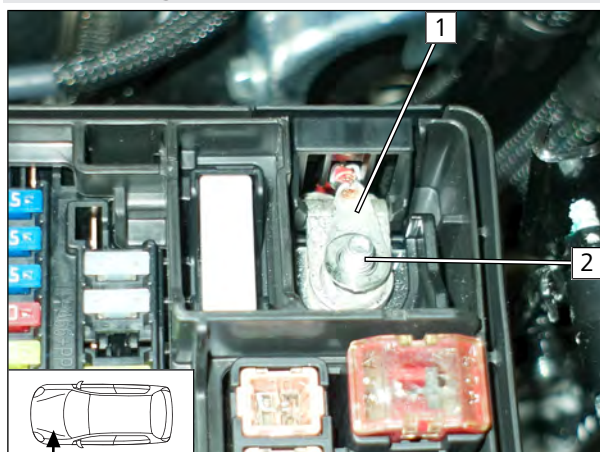


Fig. 9

- 1 Cable lug of positive wire
- 2 Positive support point

Mounting positive wire

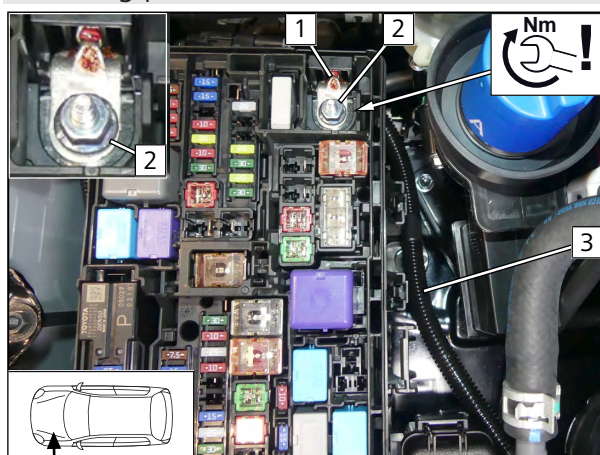


Fig. 10



DANGER

Observe tightening torque

- 1 Positive wire
- 2 Flanged nut of positive support point
- 3 Positive wire in corrugated tube

Earth connection

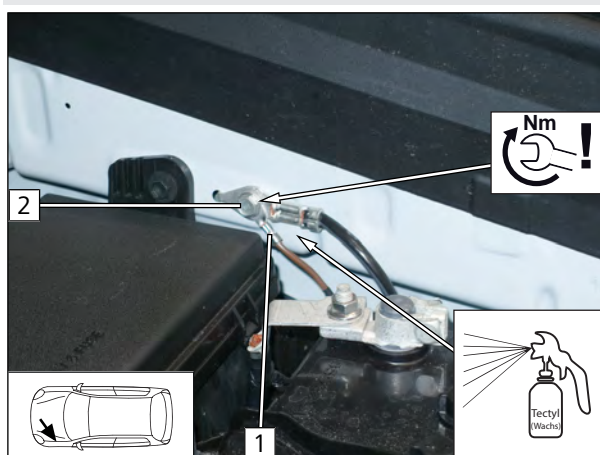


Fig. 11



DANGER

Observe tightening torque

- 1 Earth wire
- 2 Original vehicle earth point



Wiring harness routing

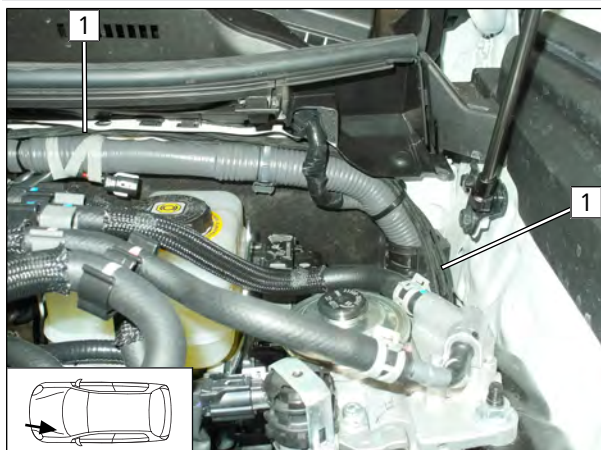


Fig. 12

- 1 Heater wiring harness, control element, passenger compartment



Fig. 13

- 1 Heater wiring harness, control element, passenger compartment
- 2 Heater wiring harness connector

Passenger compartment wiring harness pass through

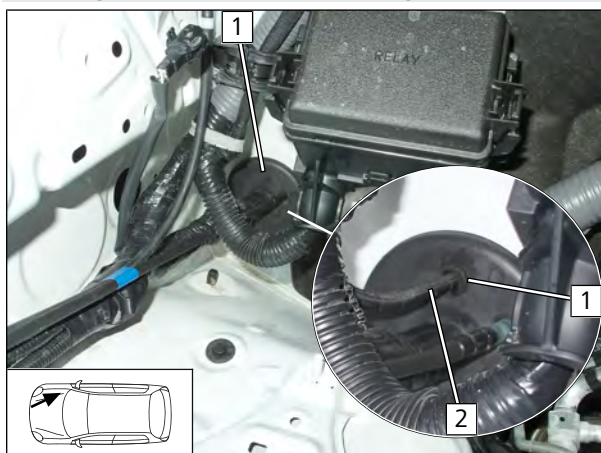


Fig. 14



To prevent water seeping into the passenger compartment, the wiring harness must be routed upwards to the protective rubber plug and this plug must then be sealed with a suitable sealing compound.

- Route passenger compartment and control element wiring harness 2 through protective rubber plug 1 into the passenger compartment.

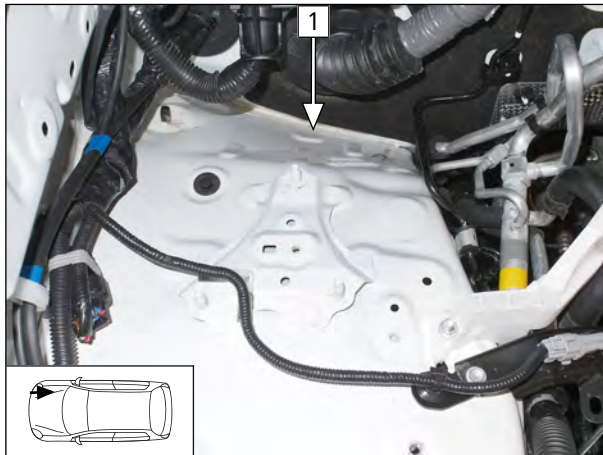


8 Mechanical system

8.1 Installation location preparation

Installation location for variant 1

Vehicles up to model 07/2020 without original vehicle control unit at heater installation location **1**



Installation location for variant 2

Vehicles from model 08/2020 with original vehicle control unit at heater installation location **2**

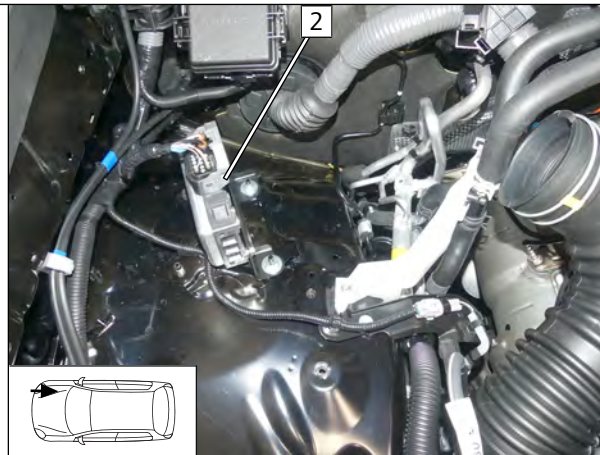


Fig. 15

Removing original vehicle control unit

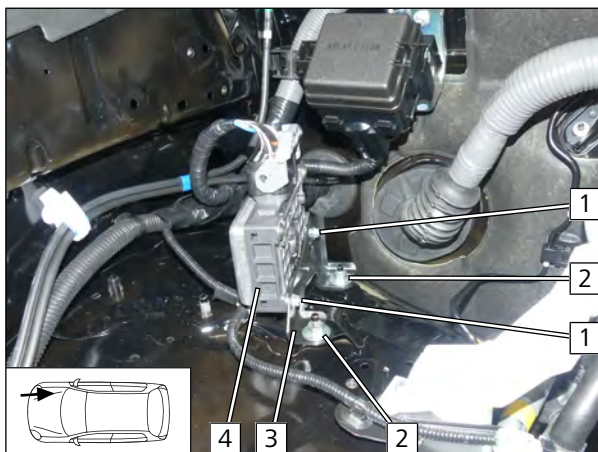


Fig. 16



Only in case of variant 2 installation location:
vehicles from 08/2020 (with control unit at HG installation location)

- 1** Original vehicle bolt will be reused
- 2** Discard original vehicle flanged nut
- 3** Discard original vehicle bracket
- 4** Original vehicle control unit

Detaching wiring harness

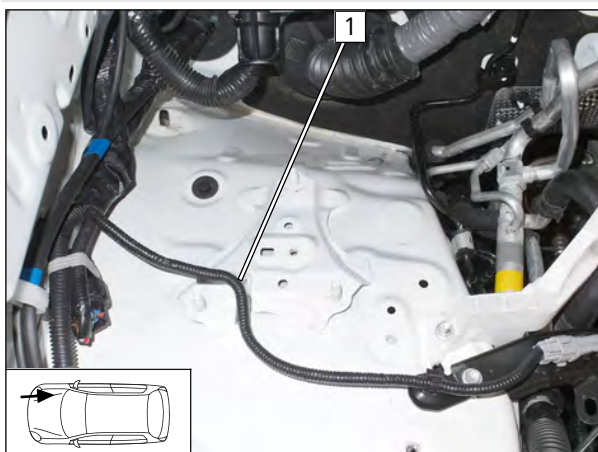


Fig. 17



All versions

- Remove and discard original vehicle wiring harness bracket **1**.



Preparing angle bracket

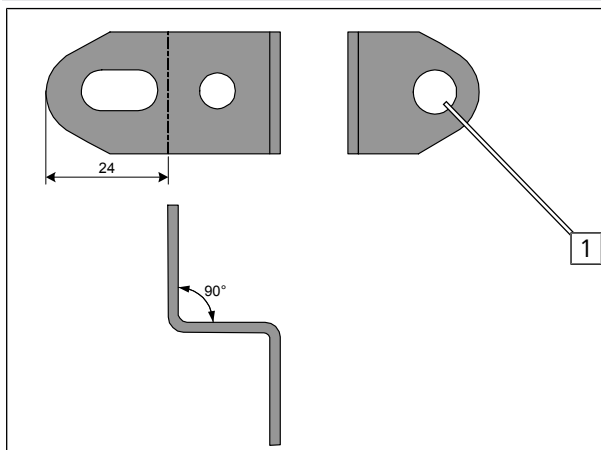


Fig. 18

- 1 Drill out hole to 8.5mm dia.

Premounting angle bracket

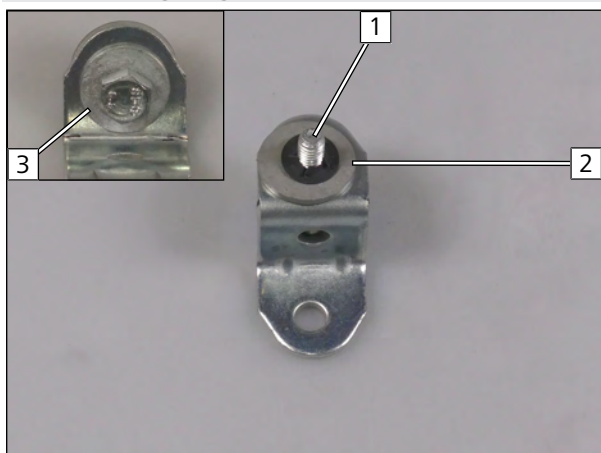


Fig. 19

- 1 M6x16 bolt, large diameter washer with outer $\varnothing_a 18$
3 angle bracket, large diameter washer with outer $\varnothing_a 22$ 2 lock washer

Mounting angle bracket loosely

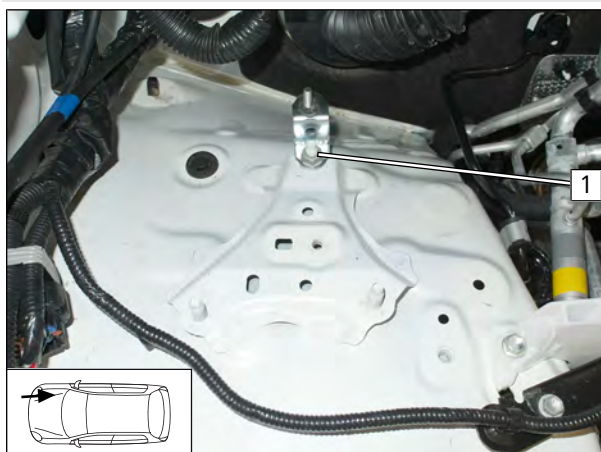


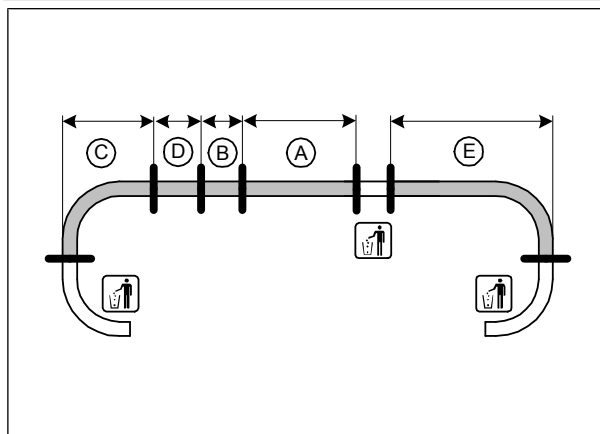
Fig. 20

- 1 Original vehicle stud bolt, premounted angle bracket, M8 flanged nut



8.2 Heater bracket preparation

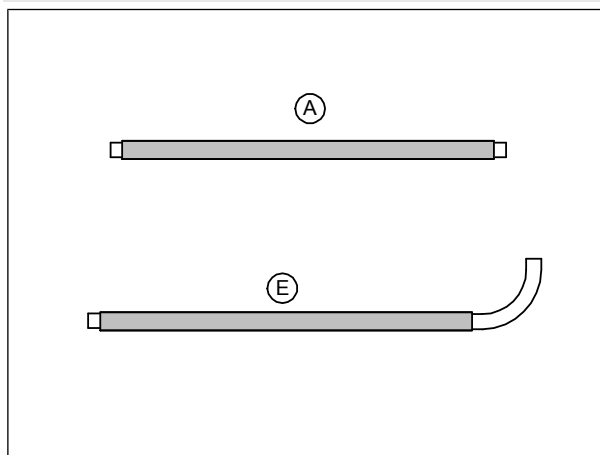
Cutting hoses to length



A	800
B	65
C	90
D	65
E	900

Fig. 21

Mounting fabric heat shrink tubings



- 1. Slide on and cut to length
- 2. Shrink, use at most 230 °C

Fig. 22

Premounting mount and tubular rivet on coolant pump

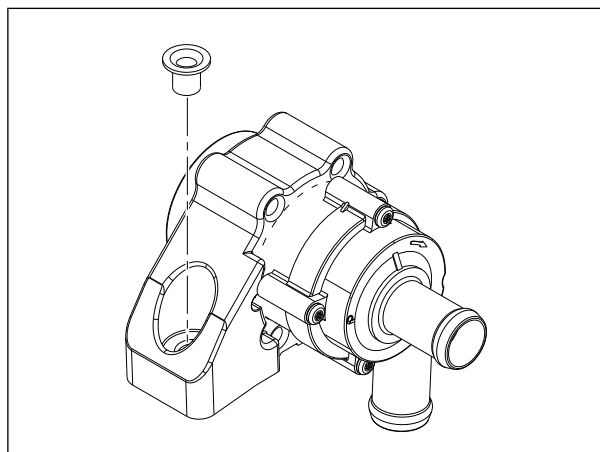


Fig. 23



Premounting circulating pump

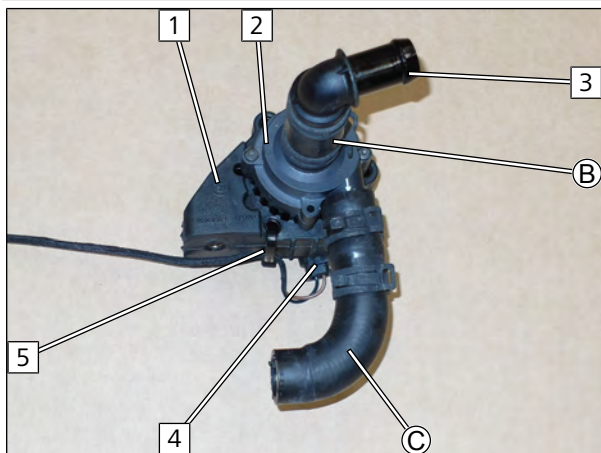


Fig. 24

- 1 Coolant pump mount
- 2 Coolant pump
- 3 Ø18x18 90° connecting pipe
- 4 Coolant pump wiring harness connector
- 5 Cable tie

Premounting UP onto bracket

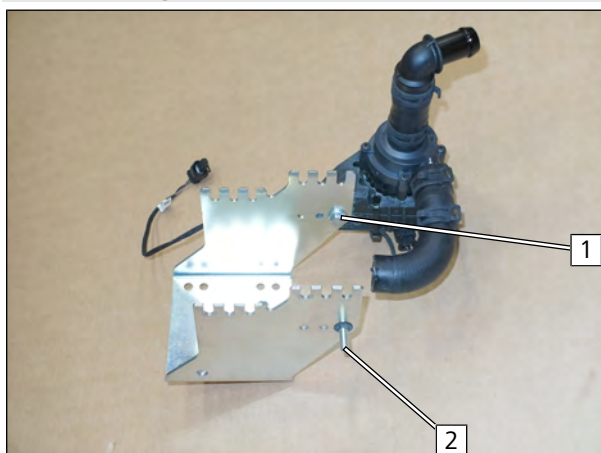


Fig. 25

- 1 M6x25 bolt, UP mount, HG bracket, flanged nut
- 2 M6x20 bolt, HG bracket, lock washer

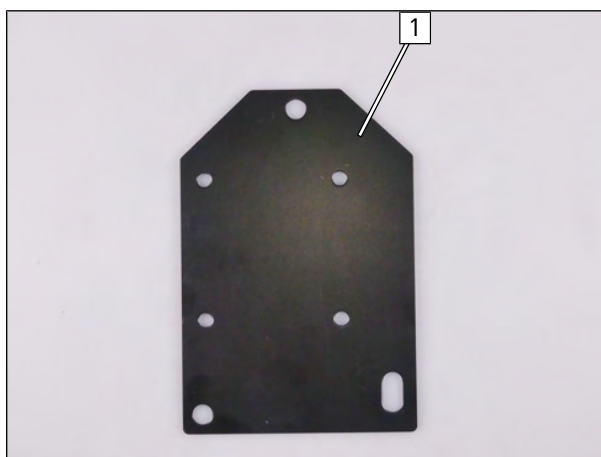
8.3 Mounting plate preparation

View of mounting plate variants



One of the shown mounting plates is included in the installation kit.
For each provided variant, there are different and necessary work steps described below.

1 Mounting plate variant A



2 Mounting plate variant B

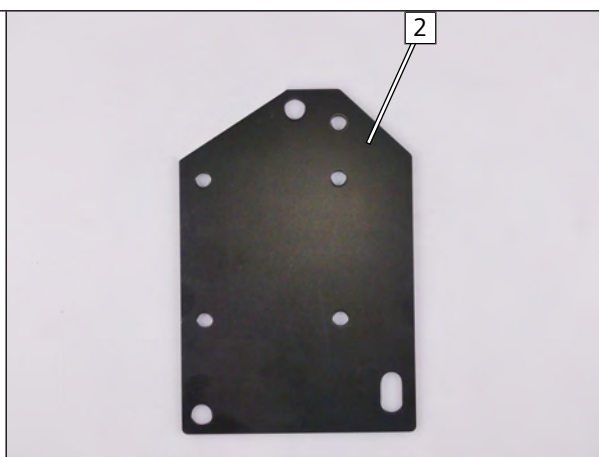


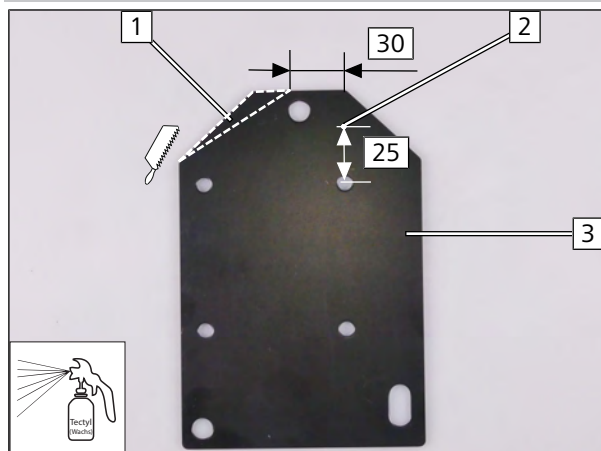
Fig. 26



Adapting mounting plate variant A



Only necessary for vehicles from 08/2020 with Start-Stop system **and** when there is a variant A mounting plate in the kit.



- Remove marked area **1** from variant A mounting plate **3** as shown.
- Drill a Ø7 hole at position **2**.

Fig. 27



8.4 HG bracket installation, variant 1 installation location

Mounting HG bracket onto mounting plate



Only in case of variant 1 installation location: vehicles up to 07/2020 (without control unit at HG installation location)

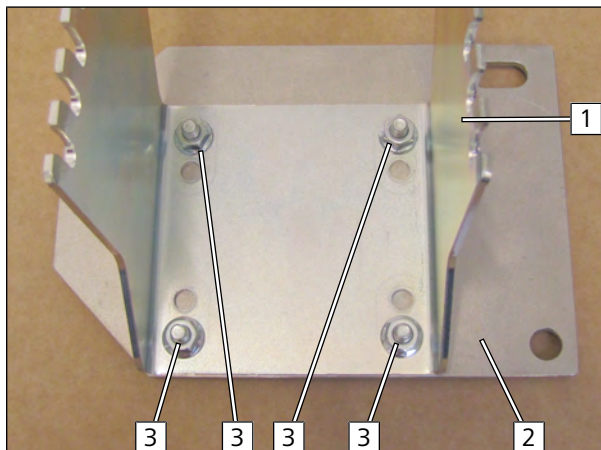


Fig. 28

- 1 Heater bracket
- 2 Mounting plate for HG bracket
- 3 M6x16 bolt, HG bracket, mounting plate, flanged nut

Mounting mounting plate loosely

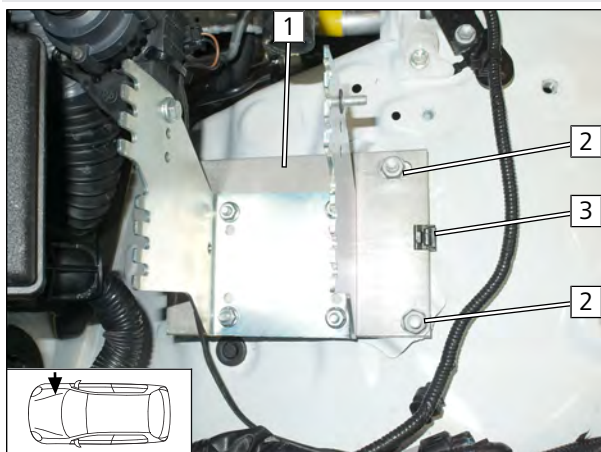


Fig. 29

- 1 Premounted mounting plate
- 2 Mount original vehicle stud bolt, mounting plate, M8 flanged nut loosely
- 3 Edge clip cable tie

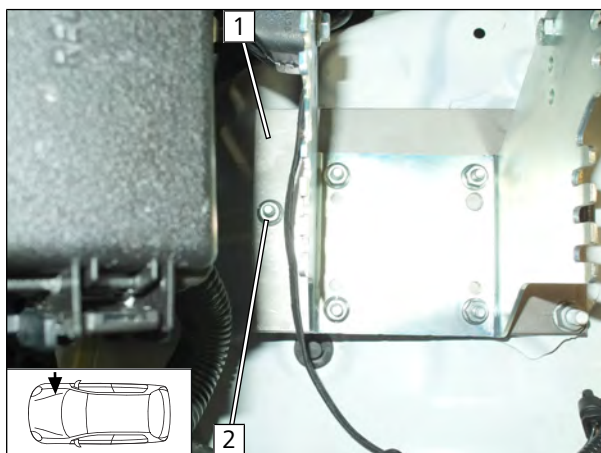


Fig. 30

► Align mounting plate as shown and tighten all screw connections.

- 1 Premounted mounting plate
- 2 Premounted M6x16 bolt, mounting plate, flanged nut



8.5 HG bracket installation, variant 2 installation location

Mounting HG bracket onto mounting plate



Only in case of variant 2 installation location: vehicles from 08/2020 (with control unit at HG installation location)

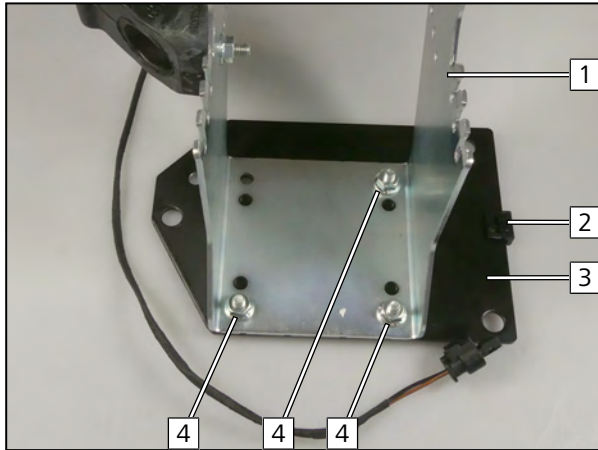


Fig. 31

- 1 Heater bracket
- 2 Edge clip cable tie
- 3 Variant B mounting plate for HG bracket
- 4 M6x16 bolt, HG bracket, variant B mounting plate, flanged nut

Bending perforated bracket

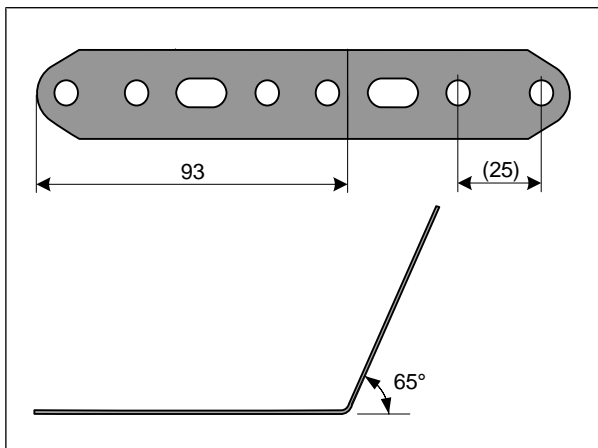


Fig. 32

Premounting original vehicle control unit

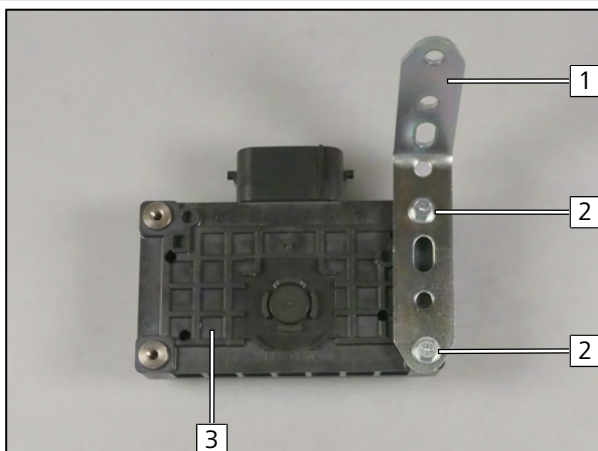


Fig. 33

- 1 Prepared perforated bracket
- 2 Original vehicle bolt
- 3 Original vehicle control unit



Mounting premounted control unit onto mounting plate

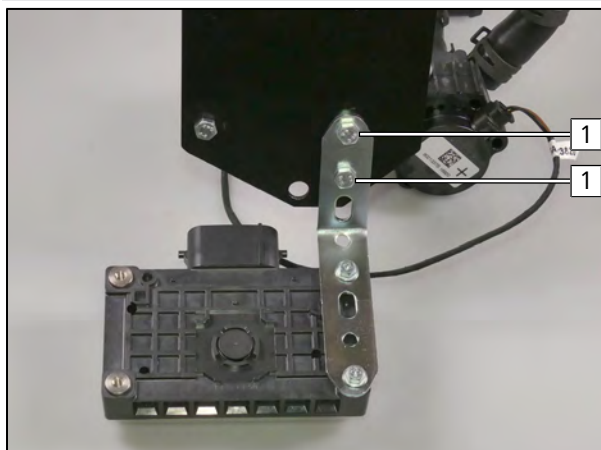


Fig. 34

- 1 M6x16 bolt, perforated bracket, mounting plate, HG bracket, flanged nut

Installing mounting plate loosely

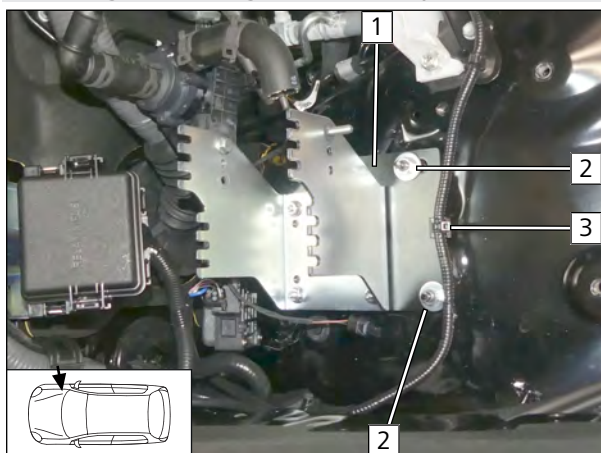


Fig. 35

- 1 Premounted mounting plate
- 2 Mount original vehicle stud bolt, mounting plate, M8 flanged nut loosely
- 3 Premounted edge clip cable tie around original vehicle wiring harness

Installing mounting plate

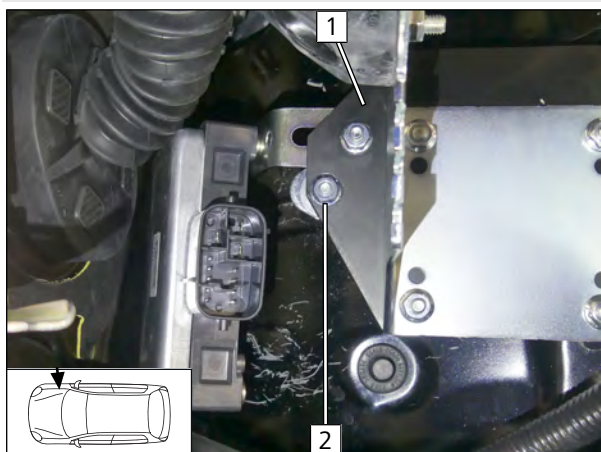


Fig. 36

► Align mounting plate 1 as shown and tighten all screw connections.

- 1 Premounted mounting plate
- 2 Premounted M6x16 bolt, mounting plate, flanged nut



Checking distance

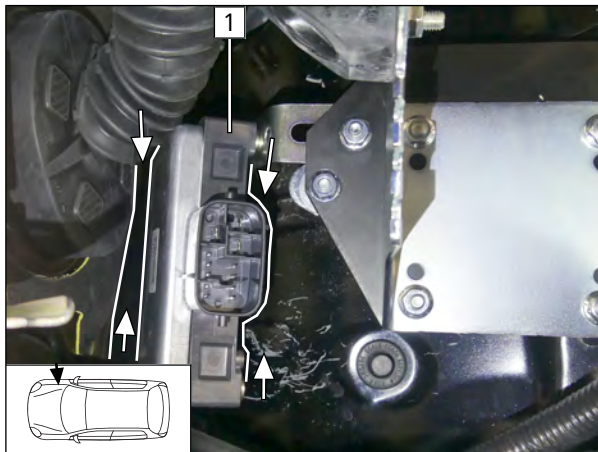


Fig. 37



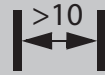
Danger of damage to components

Ensure sufficient distance between control unit **1** and wiring harness, correct if necessary.



Danger of damage to components

Ensure sufficient distance between control unit **1** and body, correct if necessary.



Mounting original vehicle connector

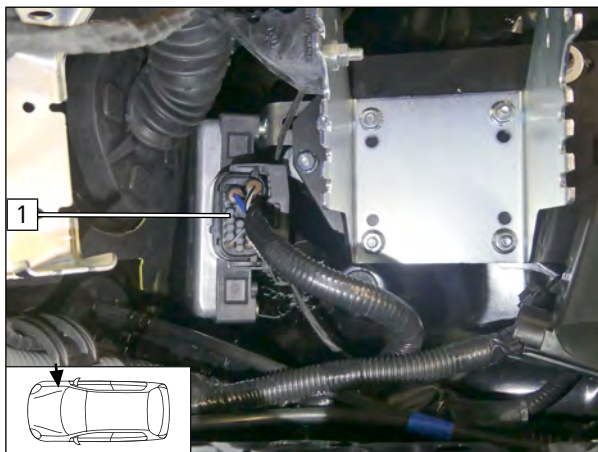


Fig. 38

1 Original vehicle connector



8.6 Premounting heater

Premounting M5x13 self-tapping bolts

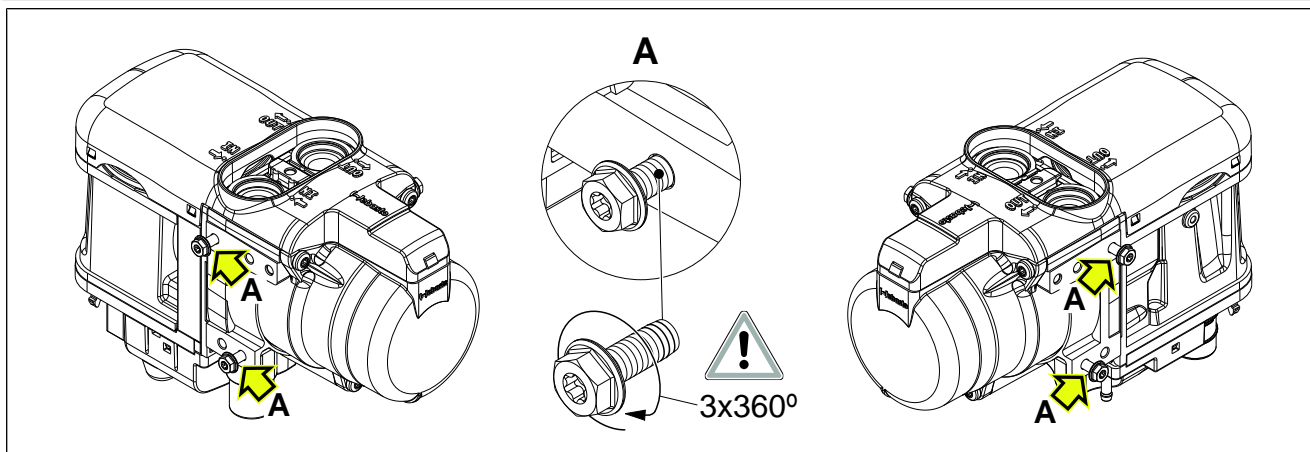


Fig. 39

Mounting, aligning and fastening with 7Nm water connection piece with sealing ring and retaining plate

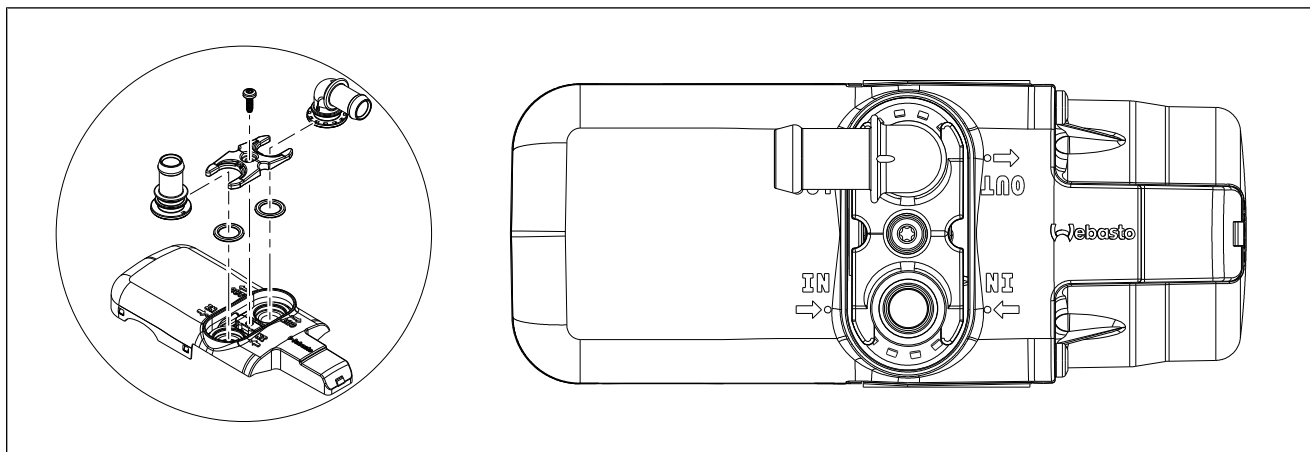


Fig. 40

Mounting hose **D**

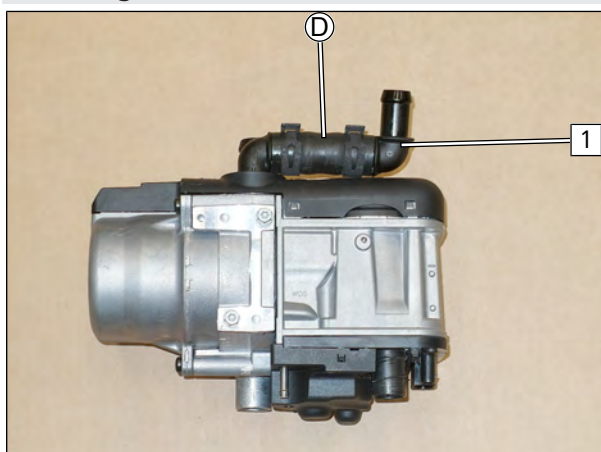


Fig. 41



All spring clips Ø25

1 90° connecting pipe



Mounting fuel line

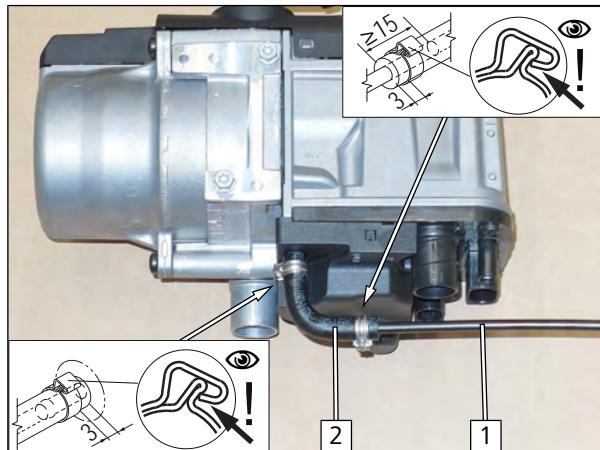


Fig. 42



Observe the general installation instructions of the heater.

- 1 Fuel line
- 2 90° moulded hose, Ø10 clamp [2x]

Mounting combustion air intake pipe **s1**

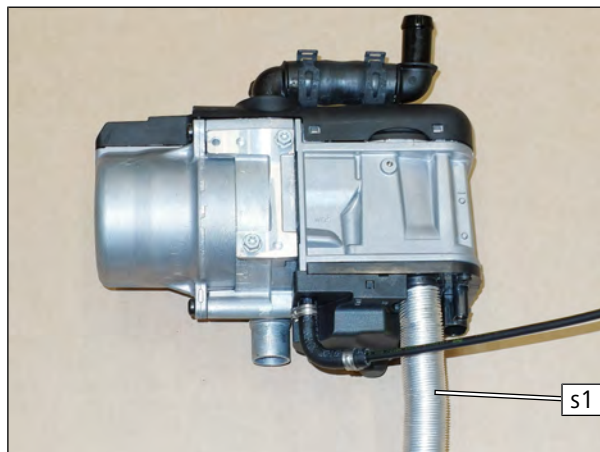


Fig. 43



Observe the installation instructions of the combustion air intake silencer.

8.7 Heater mounting

Mounting heater



Fig. 44



Observe the general installation instructions of the heater.

- Insert heater into bracket.
- Tighten 5x13 self-tapping bolt **1**. (Tighten also the 2 bolts on the back)



Mounting hose ③



Fig. 45

Mounting wiring harnesses

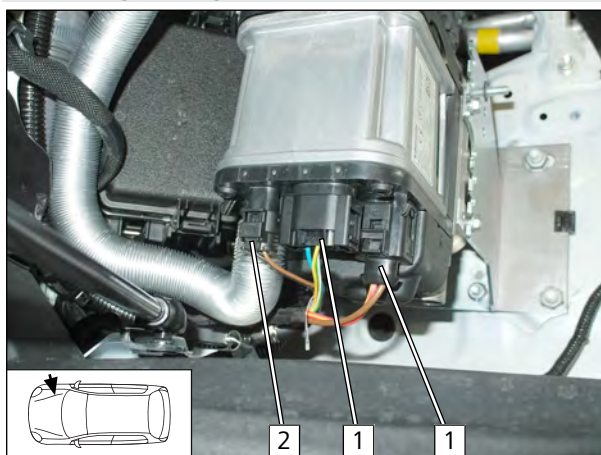


Fig. 46

- ① Heater wiring harness connector
- ② Coolant pump wiring harness connector



9 Fuel



DANGER

Risk of fire and explosion due to leaking fuel and escaping fuel vapours.

The incorrect installation of the fuel extractor can cause damage and fire.

- ▶ Avoid electrostatic discharges and open fire
- ▶ When working on the fuel system, ensure sufficient ventilation and bleeding
- ▶ Open the fuel tank cap of the vehicle
- ▶ Ventilate the fuel tank
- ▶ Re-close the tank lock
- ▶ Catch any fuel running off with an appropriate container



Danger of damage to components

- ▶ Install fuel line and fuel pump wiring harness so that they are protected against stone impact
- ▶ Provide rub protection for fuel line and wiring harness in areas where there are sharp edges

Dismantling fuel pump connector X7

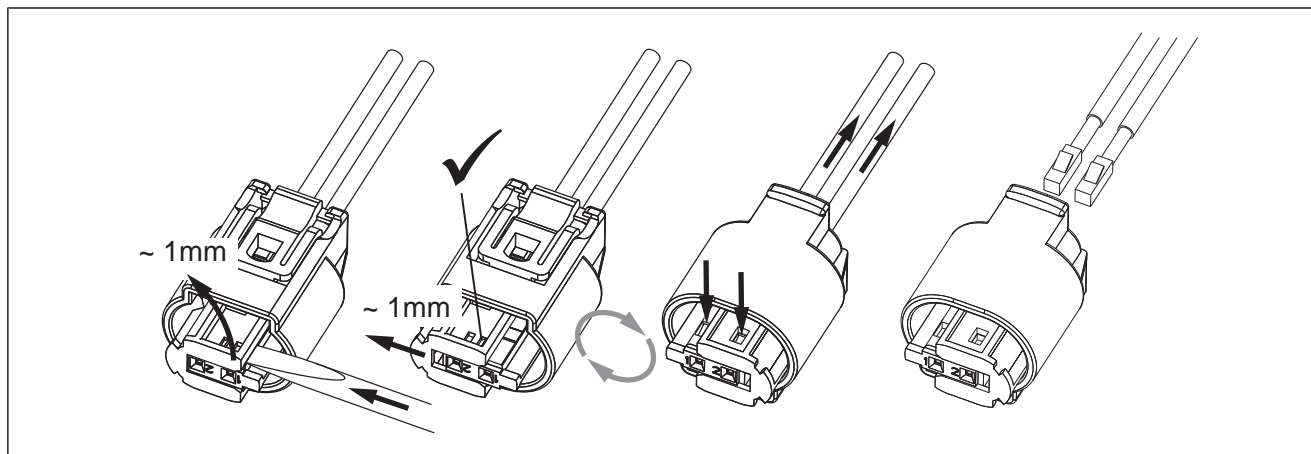


Fig. 47

Connection to heater

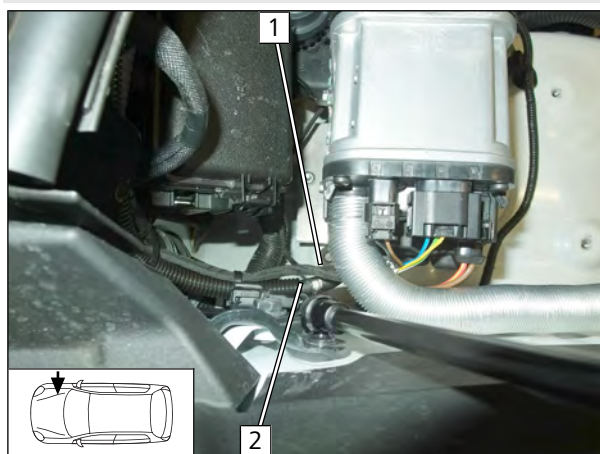


Fig. 48

- ▶ Route provisionally Ø10 corrugated tube from heater to fuel pump installation location on the firewall as shown in the next figures and cut to length accordingly.
- ▶ Draw fuel line **2** and fuel pump wiring harness **1** into cut Ø10 corrugated tube and route to firewall.



Routing in engine compartment



Fig. 49

- Route fuel line and fuel pump wiring harness in corrugated tube **1** in engine compartment to fuel pump installation location and fasten.

Premounting fuel pump

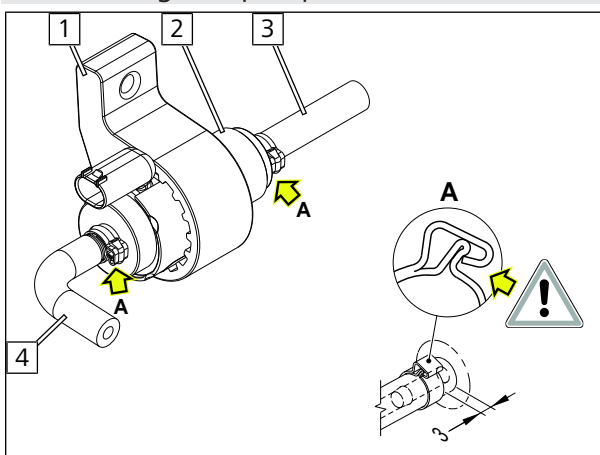


Fig. 50



The alignment of the fuel pump and fuel hoses will be carried out afterwards, during the installation.

- 1** Fuel pump mount
- 2** Fuel pump
- 3** Hose section, Ø10 clamp
- 4** 90° moulded hose, Ø10 clamp

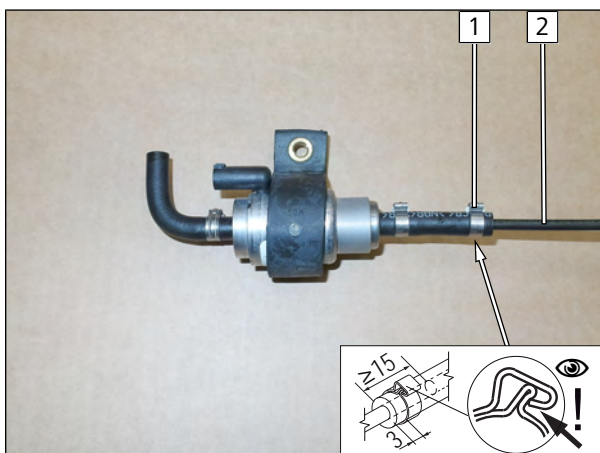


Fig. 51



Observe the general installation instructions of the heater.

- 1** Ø10 clamp
- 2** Fuel line of tank extracting device



Mounting fuel pump

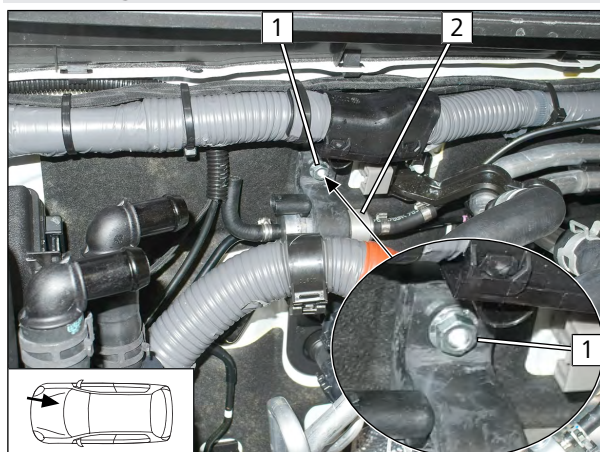


Fig. 52



Observe the general installation instructions of the heater.

- 1 Original vehicle stud bolt, flanged nut
- 2 DP premounted

Assembling fuel pump connector X7

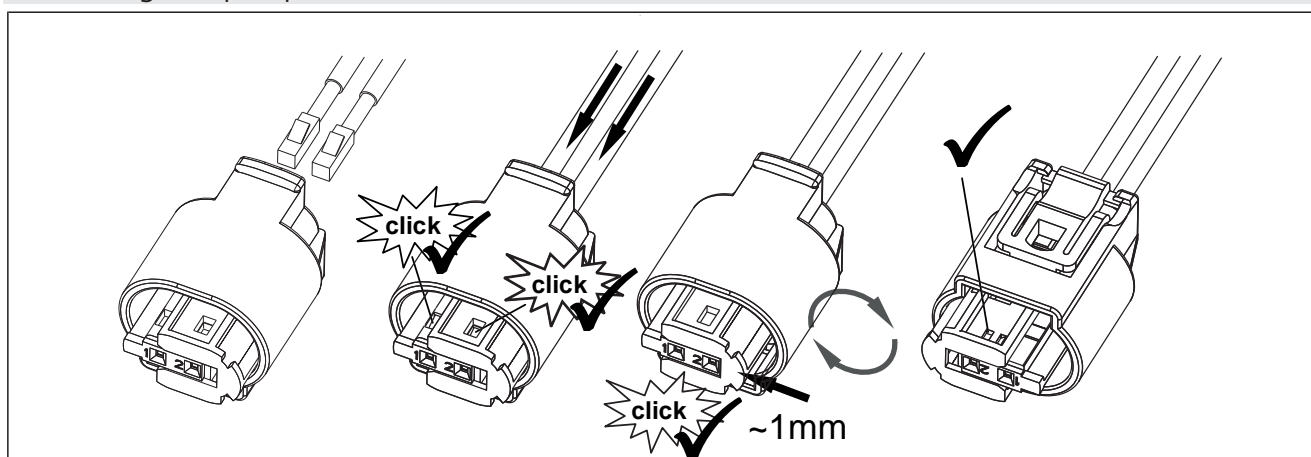


Fig. 53

Fuel pump connection

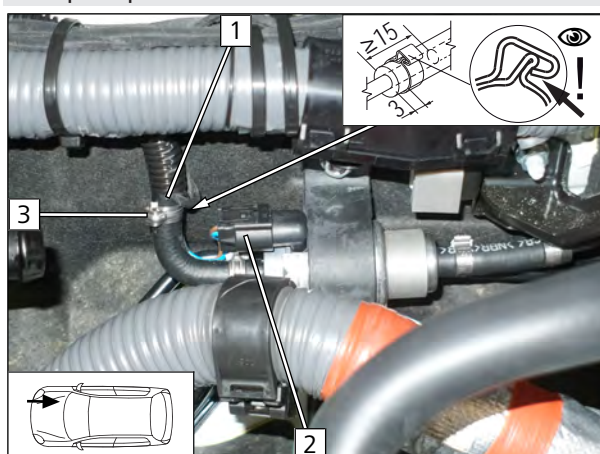


Fig. 54

- 1 Heater fuel line
- 2 Fuel pump wiring harness, connector X7 mounted
- 3 Ø10 clamp



Routing to fuel extraction

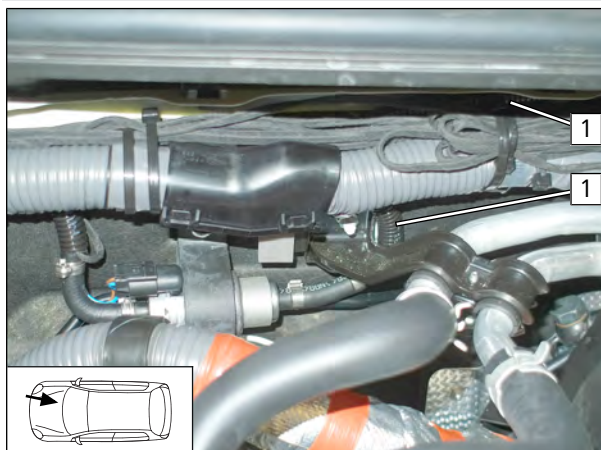


Fig. 55

- Draw fuel line of tank extracting device into Ø10 corrugated tube **1** and route to firewall.

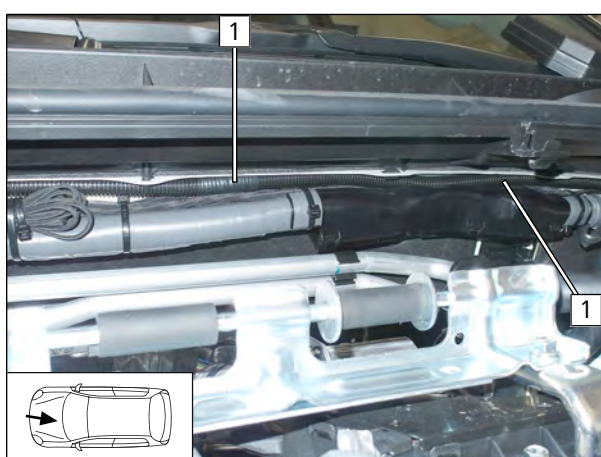


Fig. 56

- Route fuel line of tank extracting device in corrugated tube **1** on the firewall to the driver's side.

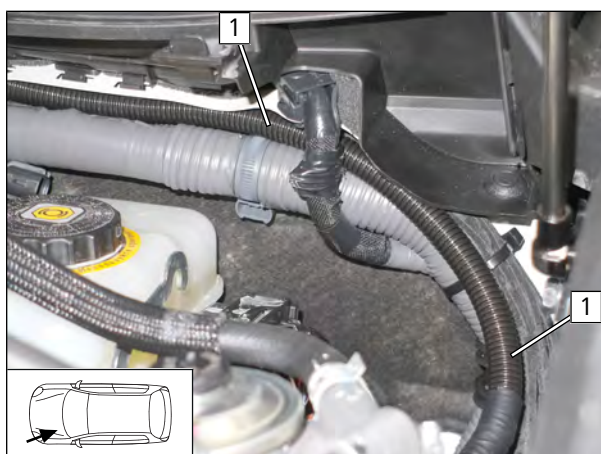


Fig. 57

- Route fuel line of tank extracting device in corrugated tube **1** to fuel filter.



Detaching original vehicle fuel supply line

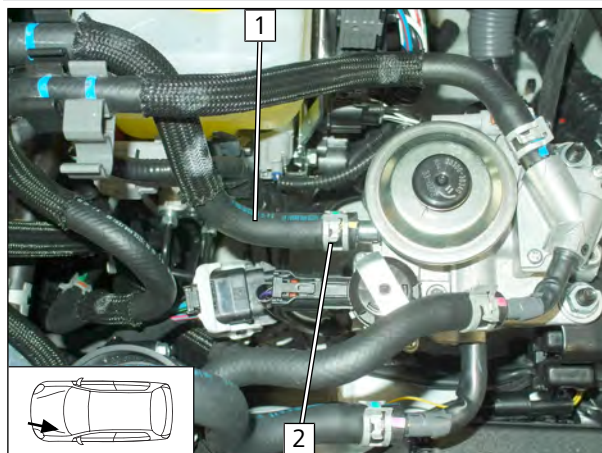


Fig. 58

- 1 Original vehicle fuel supply line
- 2 Original vehicle spring clip, will be reused

Premounting T-piece

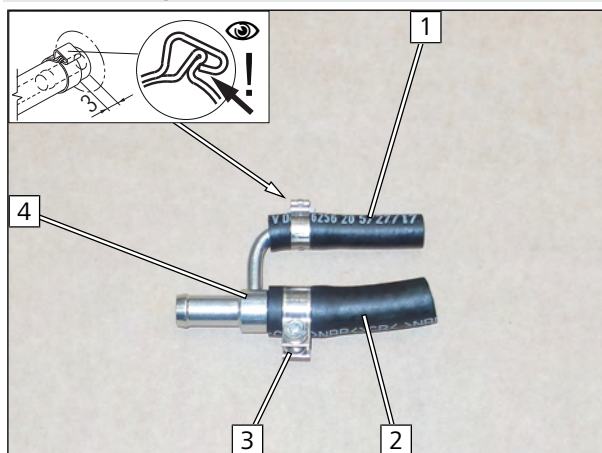


Fig. 59



Observe maximum torque of screw clamp.



$\leq 1.2\text{Nm}$

- 1 Hose section with 4.5mm inner dia., 10mm dia. clamp
- 2 Hose section with 10mm inner dia.
- 3 14mm dia. screw clamp
- 4 T-piece (10x5x10) used as tank extracting device

Mounting fuel line of tank extracting device

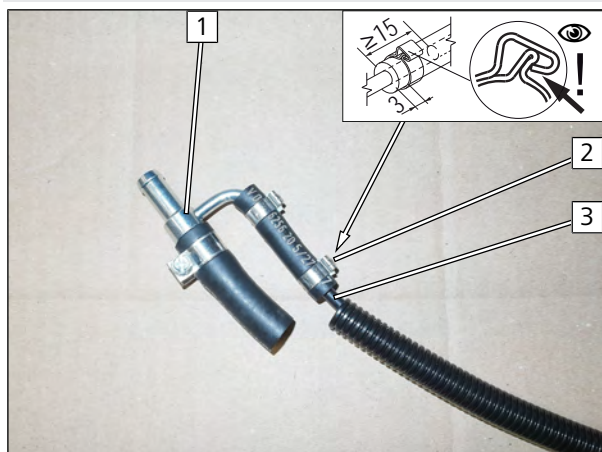


Fig. 60

- 1 Premounted T-piece
- 2 Ø10 clamp
- 3 Fuel line of tank extracting device



Mounting tank extracting device

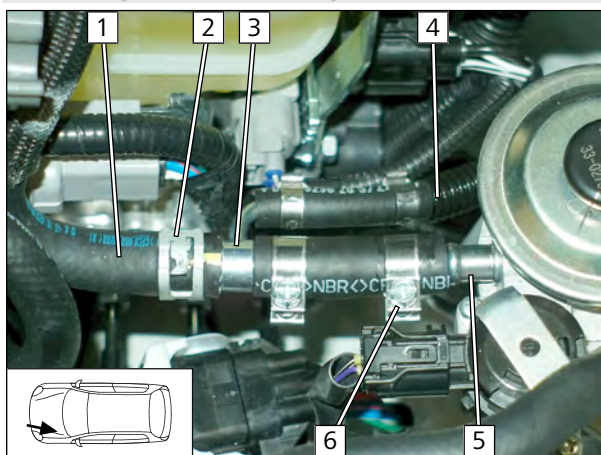


Fig. 61



Observe maximum torque of screw clamp.



$\leq 1.2\text{Nm}$

- 1 Original vehicle fuel supply line
- 2 Original vehicle spring clip
- 3 T piece
- 4 Fuel line of tank extracting device
- 5 Fuel supply line connection piece
- 6 Ø14 screw clamp



10 Coolant

10.1 Hose routing diagram

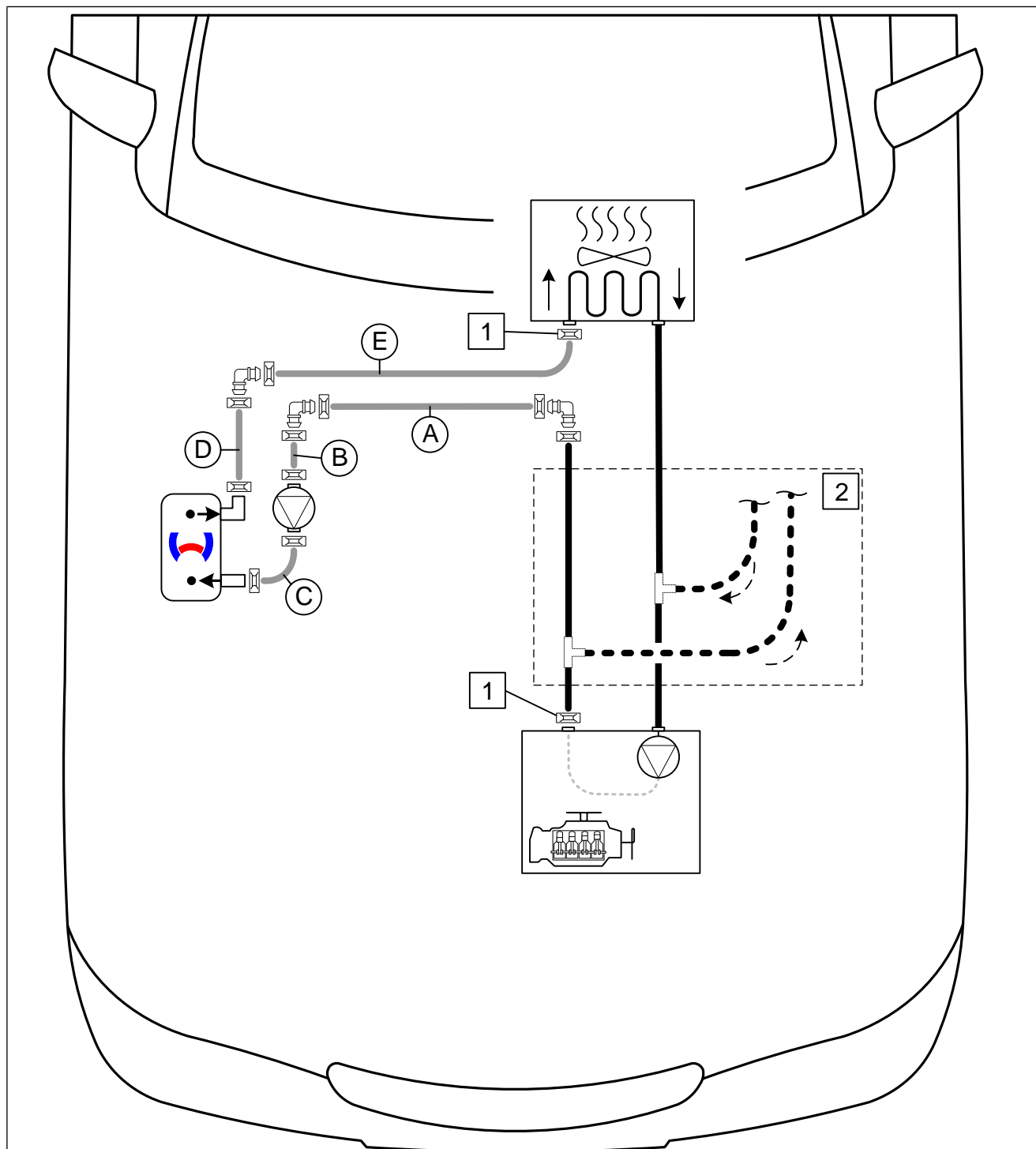





Fig. 62

- 1 Original vehicle spring clip 
- 2 Only in case of vehicles with 2 heat exchangers
- All spring clips without a specific designation  = 25mm dia.
- All connecting pipes  = Ø18x18



10.2 Coolant circuit installation

Mounting edge protection

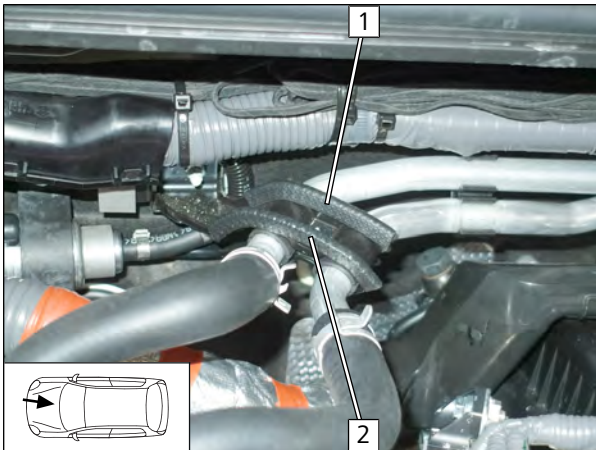


Fig. 63



Only necessary in case of a vehicle with a second heat exchanger.

► Cut edge protection in sections of 80 and 100mm

- 1 80mm edge protection
- 2 100mm edge protection

Cutting point

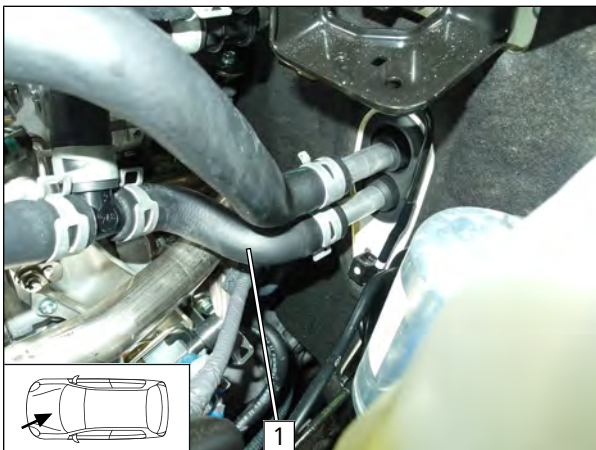


Fig. 64



Vehicle with a second heat exchanger

► Remove hose of engine outlet / heat exchanger inlet 1. Original vehicle spring clips will be reused.

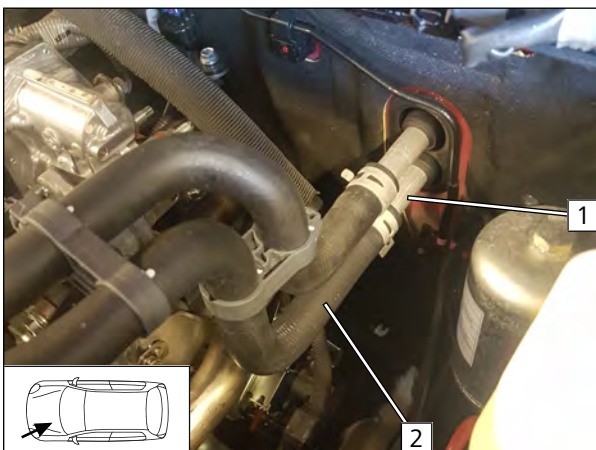


Fig. 65



Vehicle with one heat exchanger

► Remove hose of engine outlet / heat exchanger inlet 2 from heat exchanger inlet connection piece 1. Original vehicle spring clip will be reused.



Preparing hose of heat exchanger inlet / engine outlet

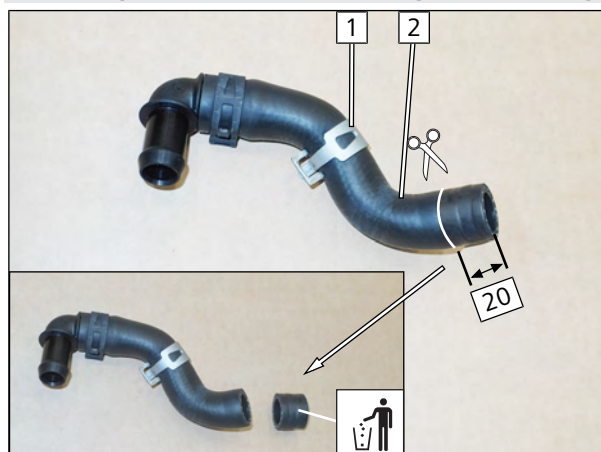


Fig. 66



Only necessary in case of a vehicle with a second heat exchanger.

- 1 Position original vehicle spring clip
- 2 Hose of heat exchanger inlet / engine outlet, becomes engine outlet hose section

Premounting hose (A)

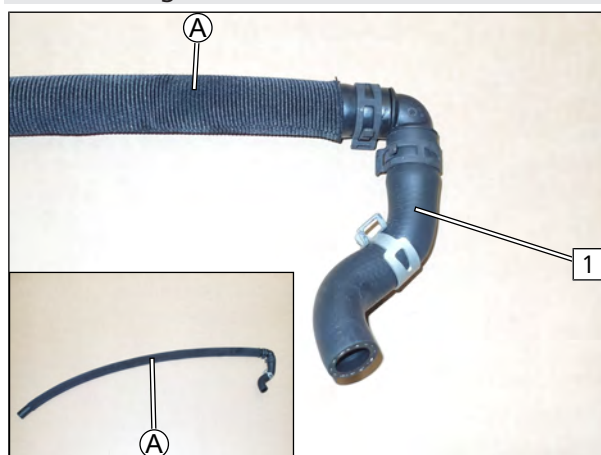


Fig. 67



Only necessary in case of a vehicle with a second heat exchanger.

- 1 Engine outlet hose section

Mounting hose (A)

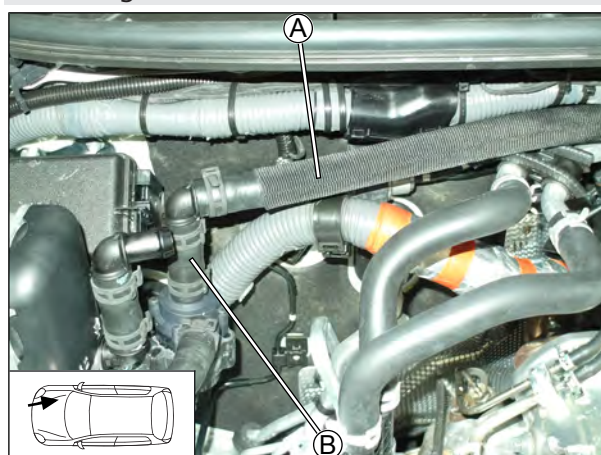


Fig. 68



This and next figures show a vehicle with a second heat exchanger, but apply to all vehicles.



Routing hose (A)

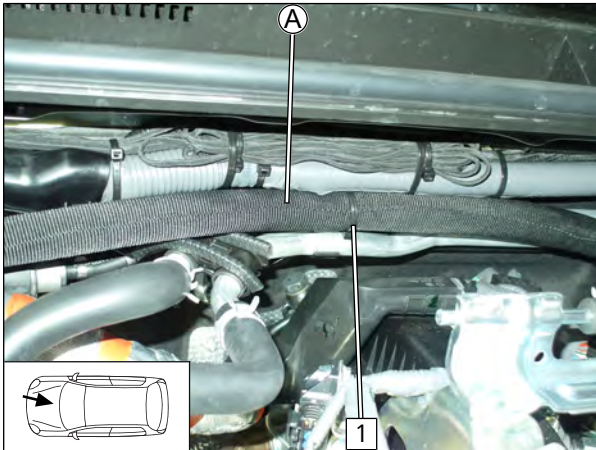


Fig. 69

- 1 Cable tie

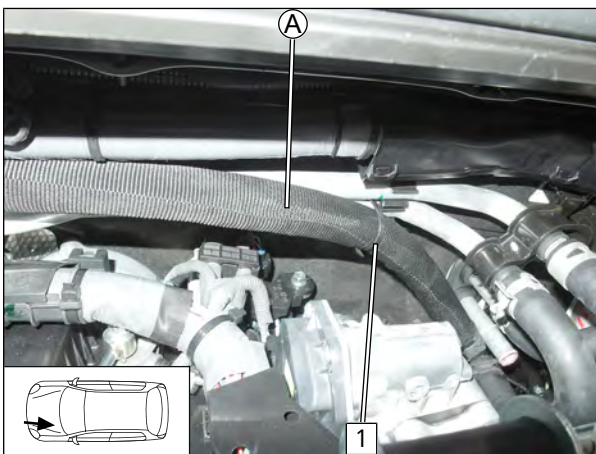


Fig. 70

- 1 Cable tie

Engine outlet connection

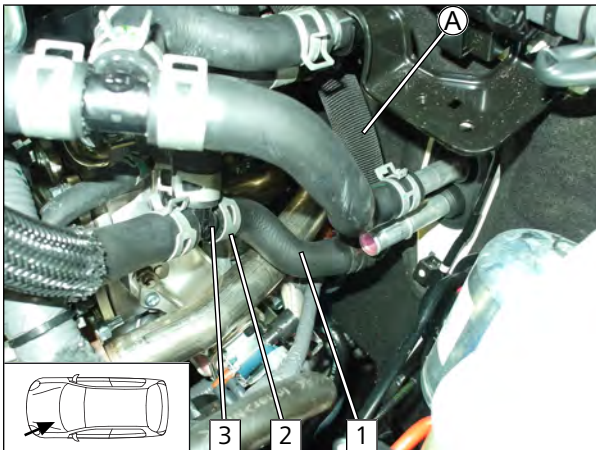


Fig. 71



Vehicle with a second heat exchanger

- 1 Engine outlet hose section
- 2 Original vehicle spring clip
- 3 Engine outlet connection piece

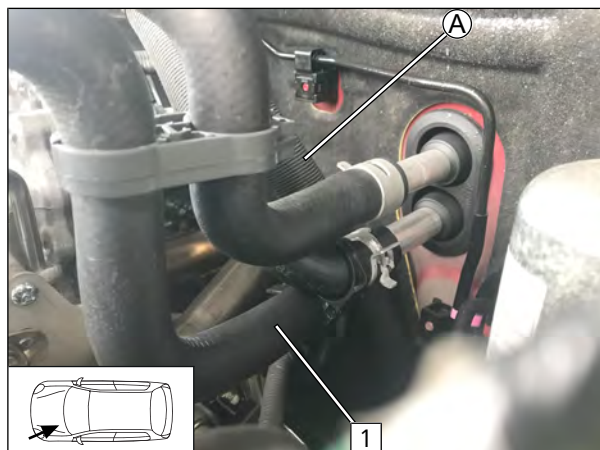


Fig. 72



Vehicle with one heat exchanger

- 1 Engine outlet hose section

Heat exchanger inlet connection

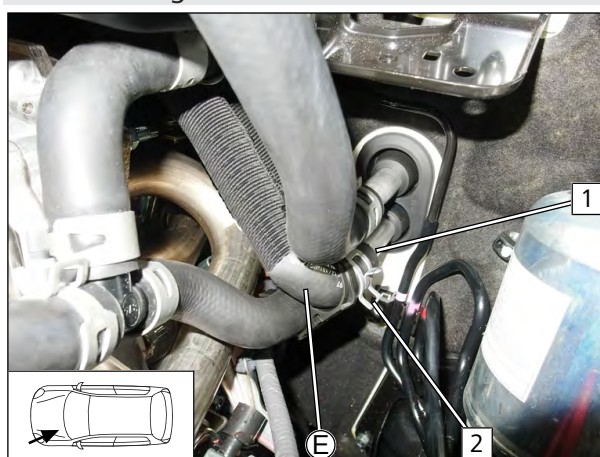


Fig. 73



Vehicle with a second heat exchanger

- 1 Heat exchanger inlet connection piece
- 2 Original vehicle spring clip

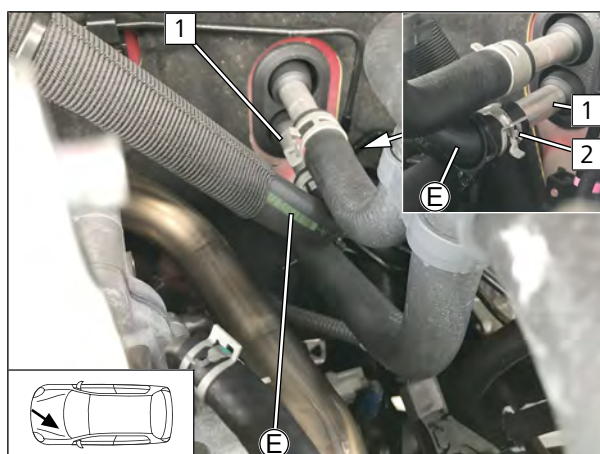


Fig. 74



Vehicle with one heat exchanger

- 1 Heat exchanger inlet connection piece
- 2 Original vehicle spring clip



Routing hose (E)

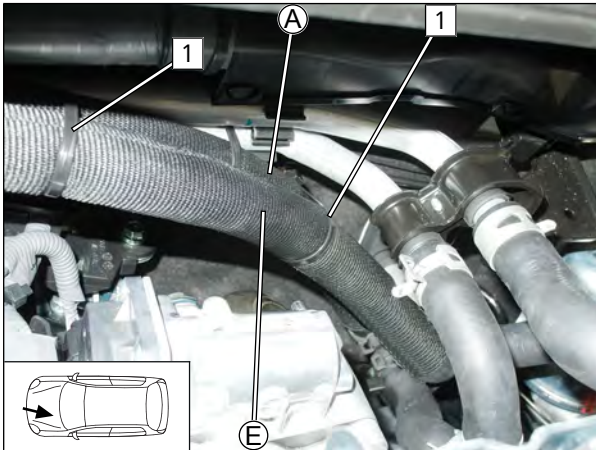


Fig. 75



This and next figures show a vehicle with a second heat exchanger, but apply to all vehicles.

1 Cable tie

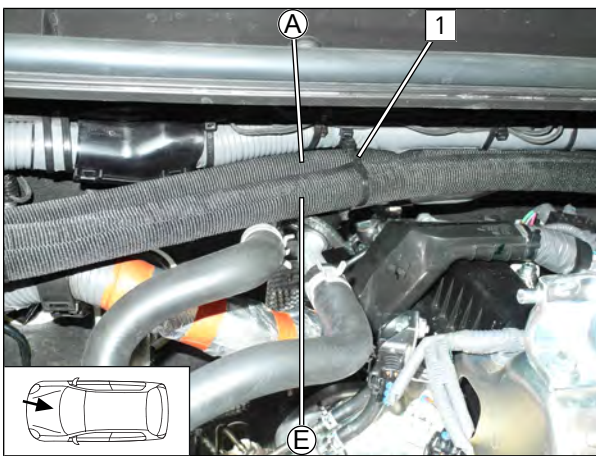


Fig. 76

1 Cable tie

Mounting hose (E)

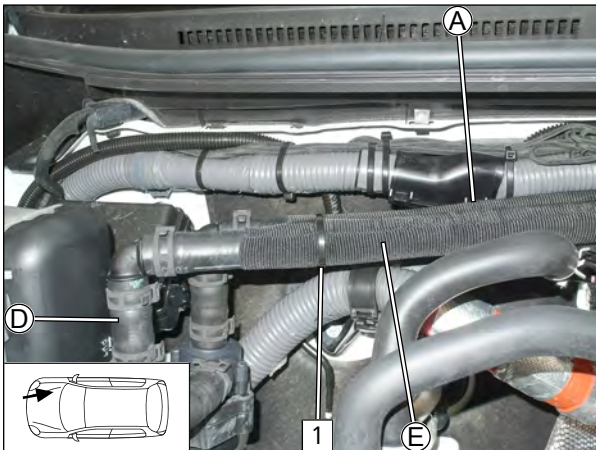


Fig. 77

1 Cable tie



Mounting hose bracket

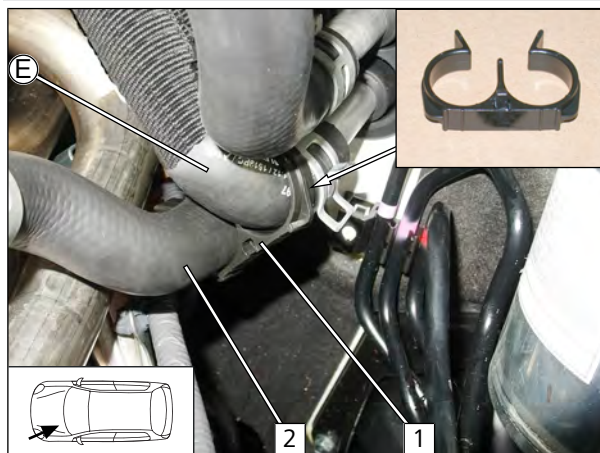


Fig. 78



Danger of damage to components

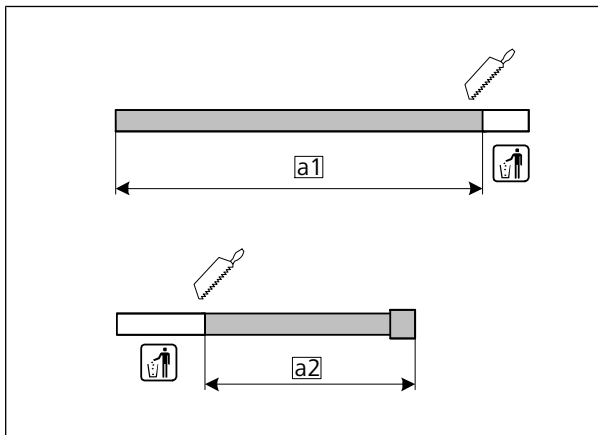
► Ensure sufficient distance from neighbouring components, correct if necessary.

► Hose bracket **1** around hose **E** and engine outlet hose section **2**.



11 Exhaust

Preparing exhaust pipes

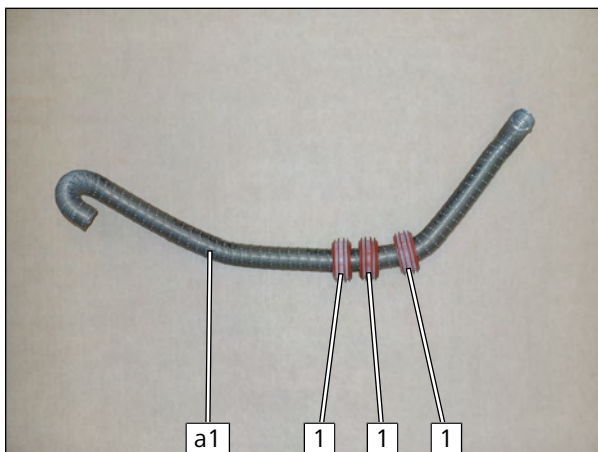


a1 700

a2 450

Fig. 79

Bending exhaust pipe **a1**, premounting spacer bracket



1 Spacer bracket

Fig. 80

Bending perforated bracket

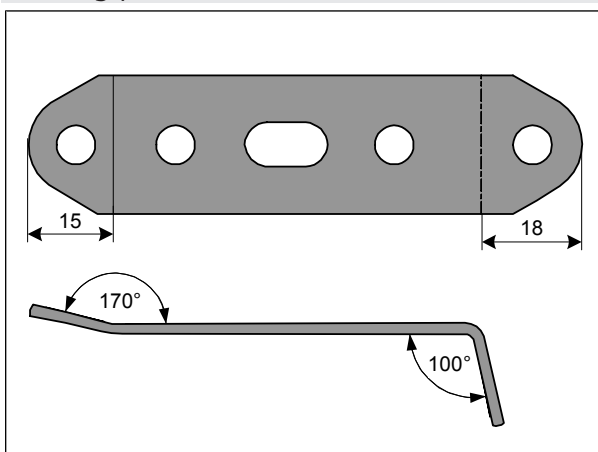


Fig. 81



Premounting exhaust silencer

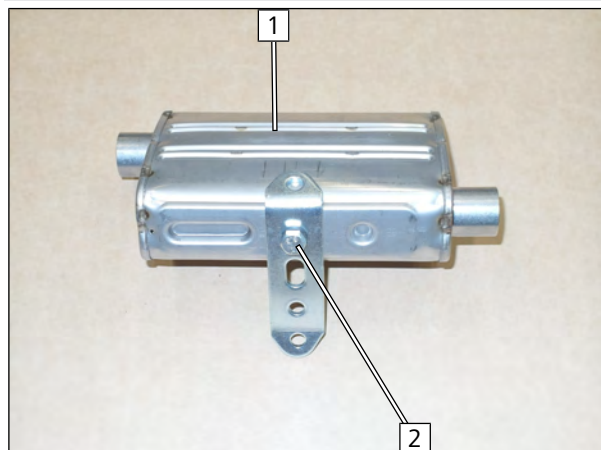


Fig. 82

- 1 Exhaust silencer
- 2 M6x16 bolt, spring lockwasher, perforated bracket

Mounting rivet nut

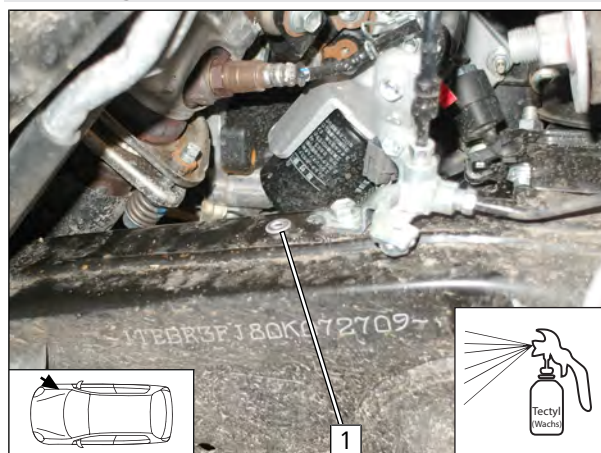


Fig. 83

- 1 Original vehicle hole (enlarge to Ø9 if necessary), rivet nut

Mounting exhaust silencer

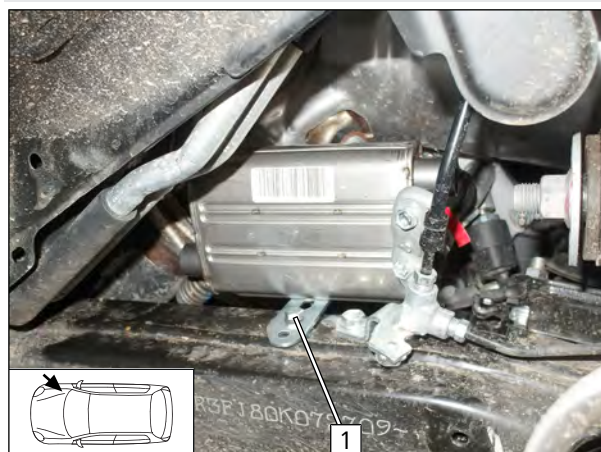


Fig. 84

- 1 M6x20 bolt, spring lockwasher, premounted perforated bracket, rivet nut



Mounting exhaust pipe **a1** onto HG

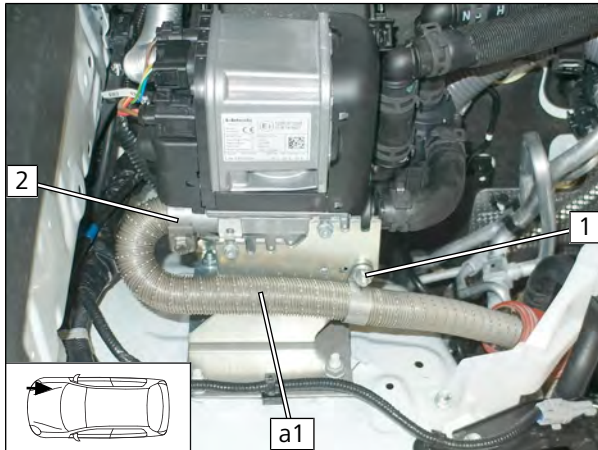


Fig. 85

- 1 Premounted M6x16 bolt, p-clamp, flanged nut
- 2 Hose clamp

Fastening original vehicle wiring harness

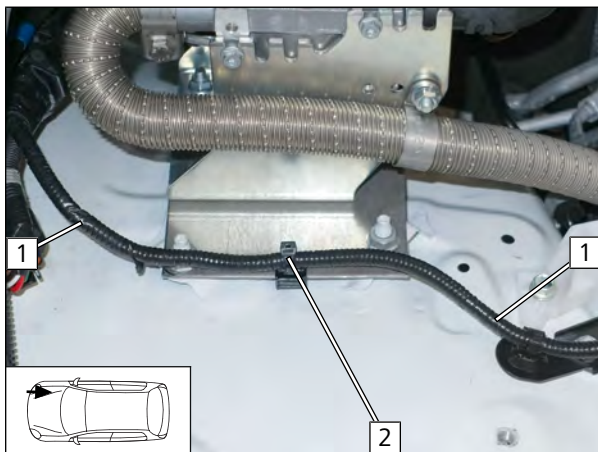


Fig. 86

- 1 Original vehicle wiring harness
- 2 Edge clip cable tie

Routing exhaust pipe **a1**

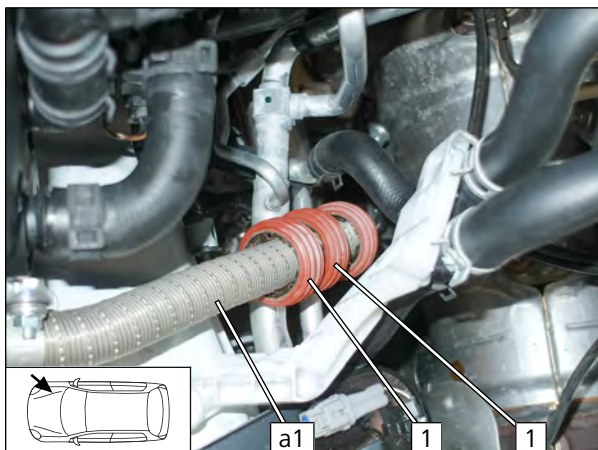


Fig. 87



The figure shows a vehicle with rear A/C.



Danger of damage to components

► Ensure sufficient distance between exhaust pipe **a1** and neighbouring components, correct if necessary.

► Position spacer bracket **1** on A/C lines as shown.



Mounting exhaust pipe **a1** onto exhaust silencer

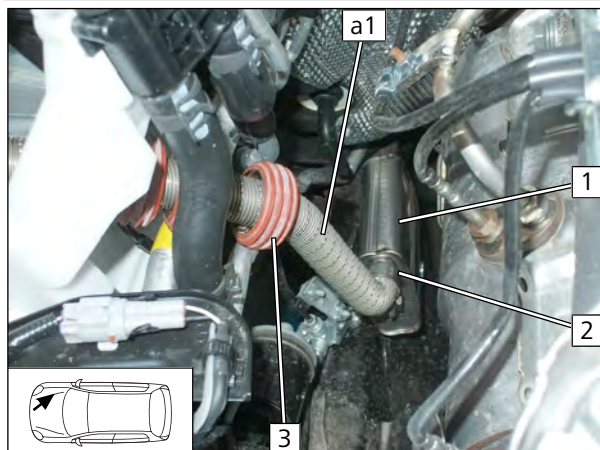


Fig. 88



Danger of damage to components

► Ensure sufficient distance between exhaust pipe **a1** and neighbouring components, correct if necessary.

1 Exhaust silencer

2 Hose clamp

► Position spacer bracket **3** on A/C line as shown.

Mounting angle bracket

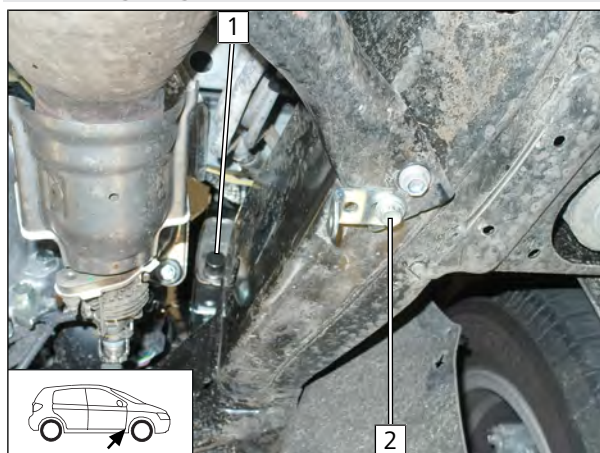


Fig. 89

1 Exhaust silencer connection piece

2 Original vehicle bolt, angle bracket

Mounting exhaust pipe **a2**

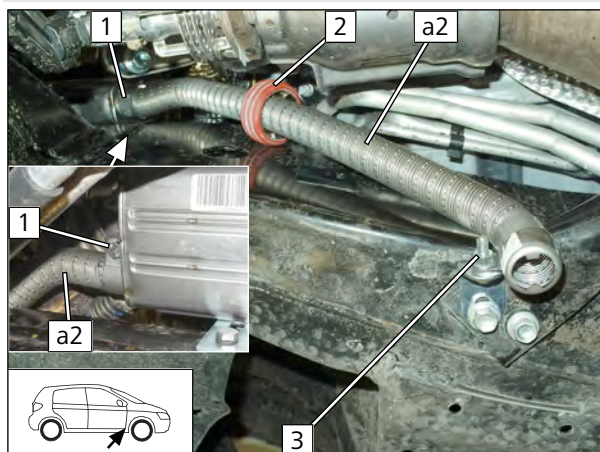


Fig. 90

1 Hose clamp

2 Position spacer bracket as shown

3 M6x20 bolt, pre-mounted angle bracket, p-clamp, flanged nut



Checking distance

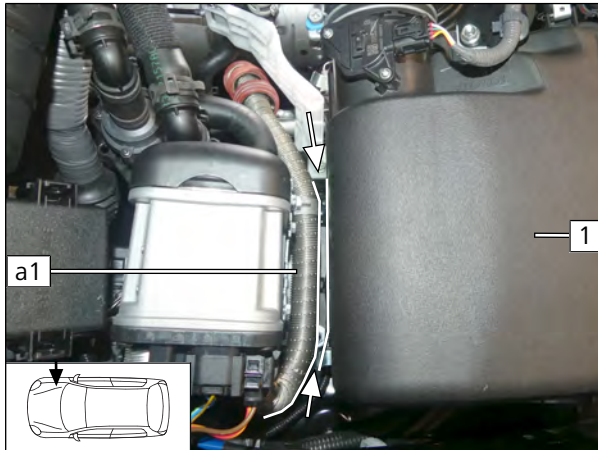


Fig. 91

► Mount air filter **1**.



Danger of damage to components

Ensure sufficient distance between exhaust pipe **a1** and air filter **1**, correct if necessary.





12 Combustion air

Mounting combustion air intake silencer

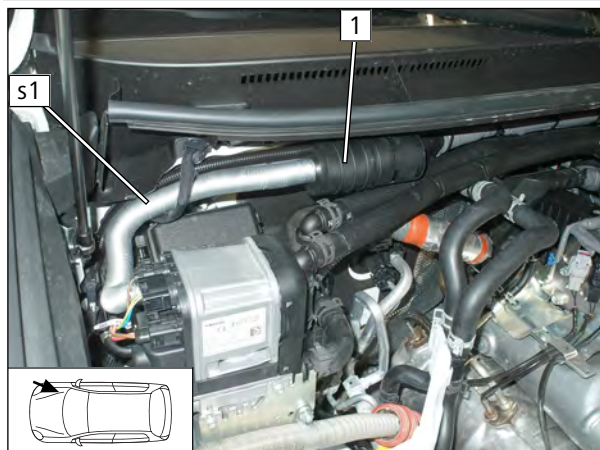


Fig. 92



Observe the installation instructions of the combustion air intake silencer.

1 Combustion air intake silencer

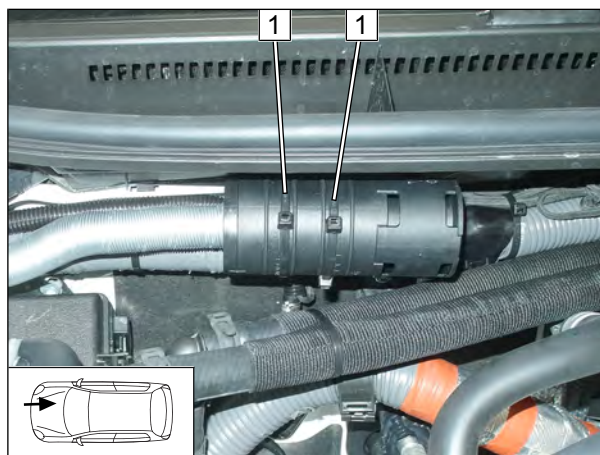


Fig. 93

1 Cable tie



13 Electrical system of passenger compartment

13.1 Electrical system preparation

Preparing / assigning wiring harness and wires

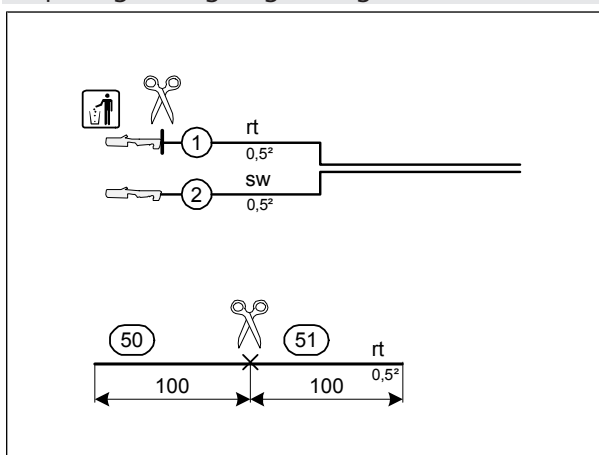


Fig. 94



Wire sections retain their numbering in the entire document.

- ① Red (rt) wire of fan wiring harness
- ② Black (sw) wire of fan wiring harness
- 50 Red (rt) wire (for all vehicles)
- 51 Red (rt) wire (only in case of 3 zone automatic air-conditioning)

Premounting wiring harness and wires

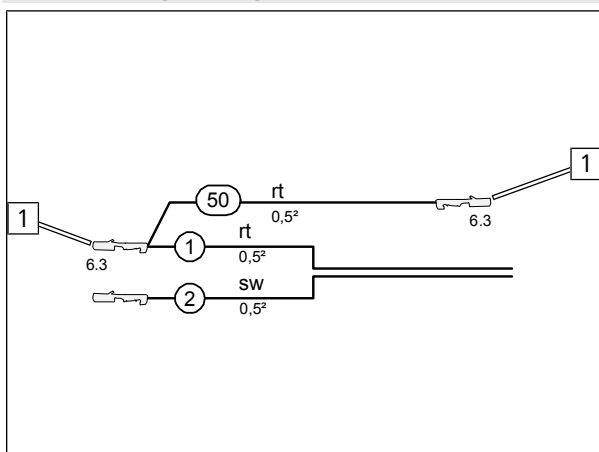


Fig. 95



Only for manual air-conditioning and 2 zone automatic air-conditioning

- 1 6.3 female connector
- ① Red (rt) wire of fan wiring harness
- ② Black (sw) wire of fan wiring harness

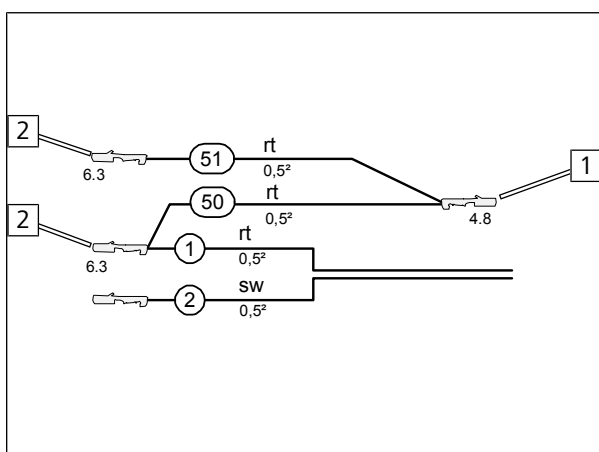


Fig. 96



Only for 3 zone automatic air-conditioning

- 1 4.8 female connector
- 2 6.3 female connector
- ① Red (rt) wire of fan wiring harness
- ② Black (sw) wire of fan wiring harness



Assigning wires

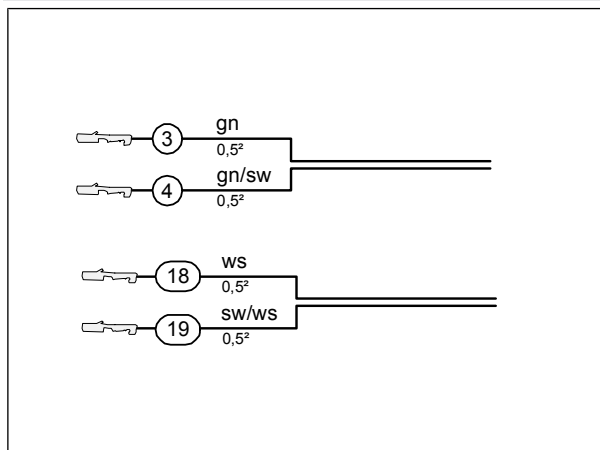


Fig. 97

- ③ Green (gn) wire from wiring harness of PWM control
- ④ Green/black (gn/sw) wire from wiring harness of PWM control
- ⑱ White (ws) wire of isolating relay wiring harness (only for vehicles with 3 zone automatic air-conditioning)
- ⑲ Black/white (sw/ws) wire of isolating relay wiring harness (only for vehicles with 3 zone automatic air-conditioning)

View of PWM Gateway

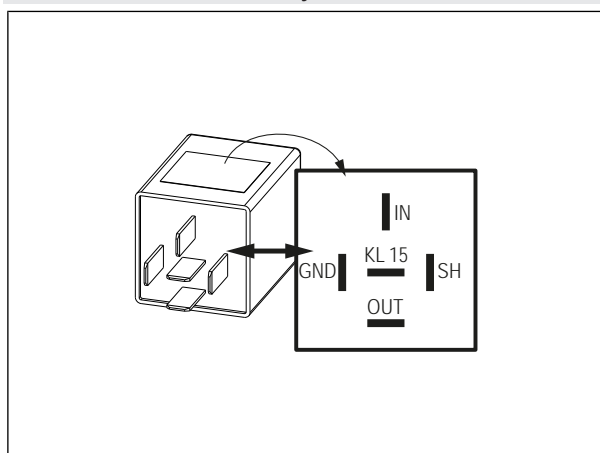


Fig. 98

► Check PWM Gateway settings when starting-up the heater, adjust if necessary.

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

Connecting wires to PWM GW socket

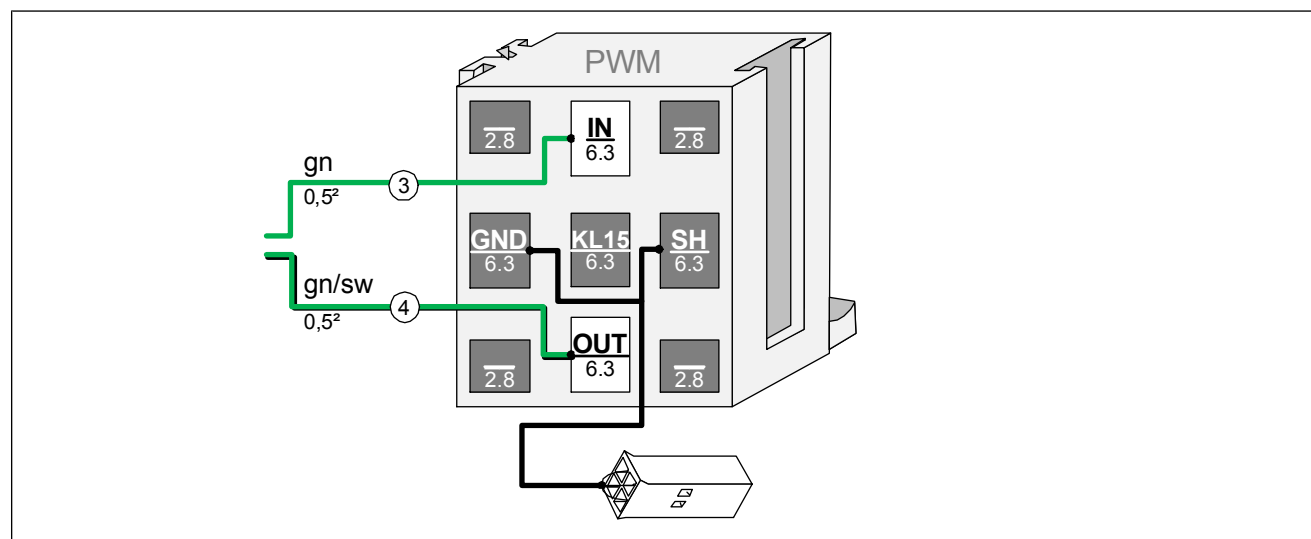
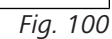


Fig. 99



- ▶ Connect wires.
- ▶ Connect connector and socket.
- ▶ Assemble RSH and PWM GW socket together.





13.1.2 3 zone automatic air-conditioning

Preparing relay K2

- Uncrimp blue (bl) wires with blade receptacle from socket of terminal 86.
- Secure open blade receptacles either by using the provided receptacle housings or by insulating them individually with insulating tape as shown.

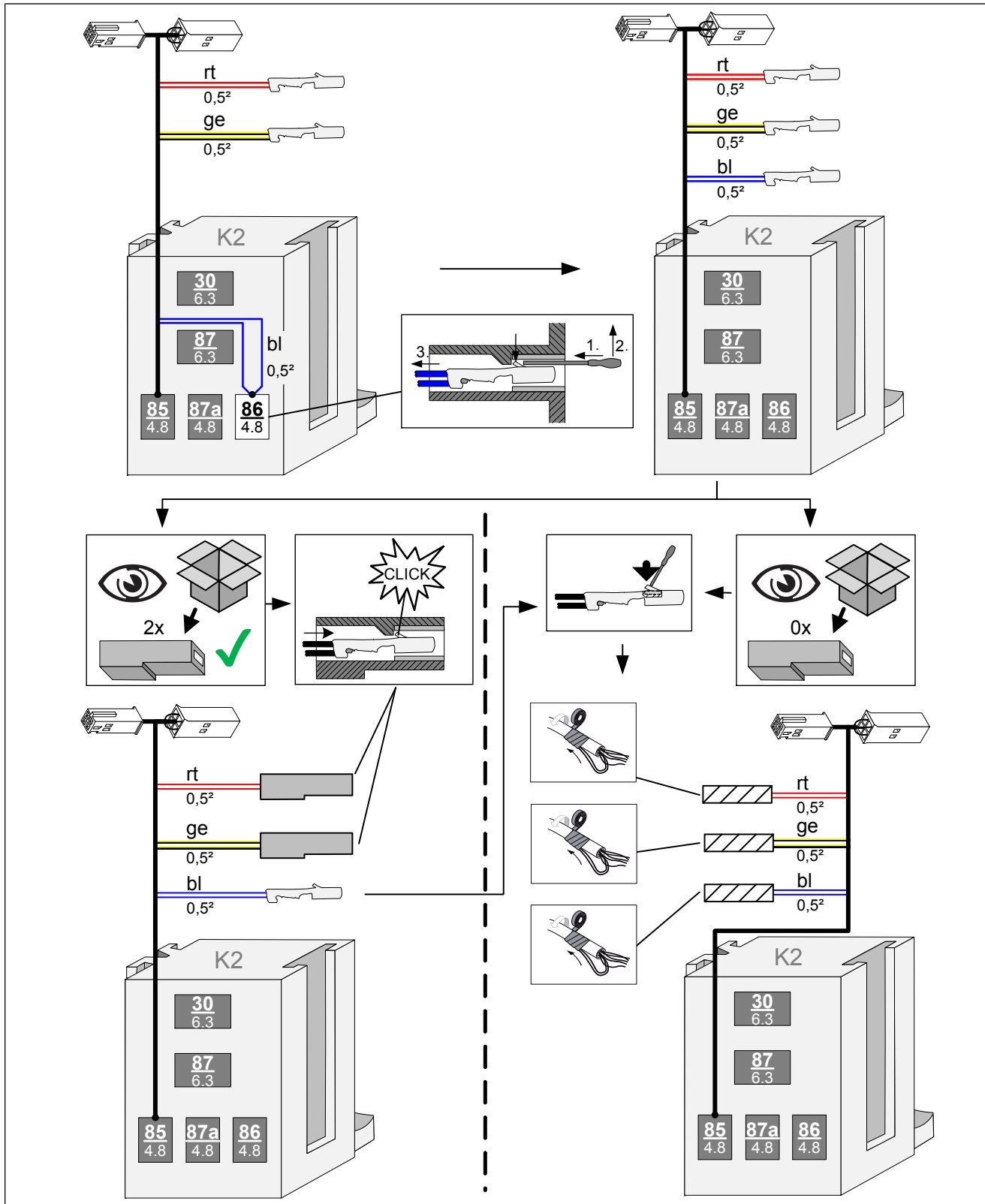


Fig. 101



Mounting wires

- Connect wires to relay K2 socket

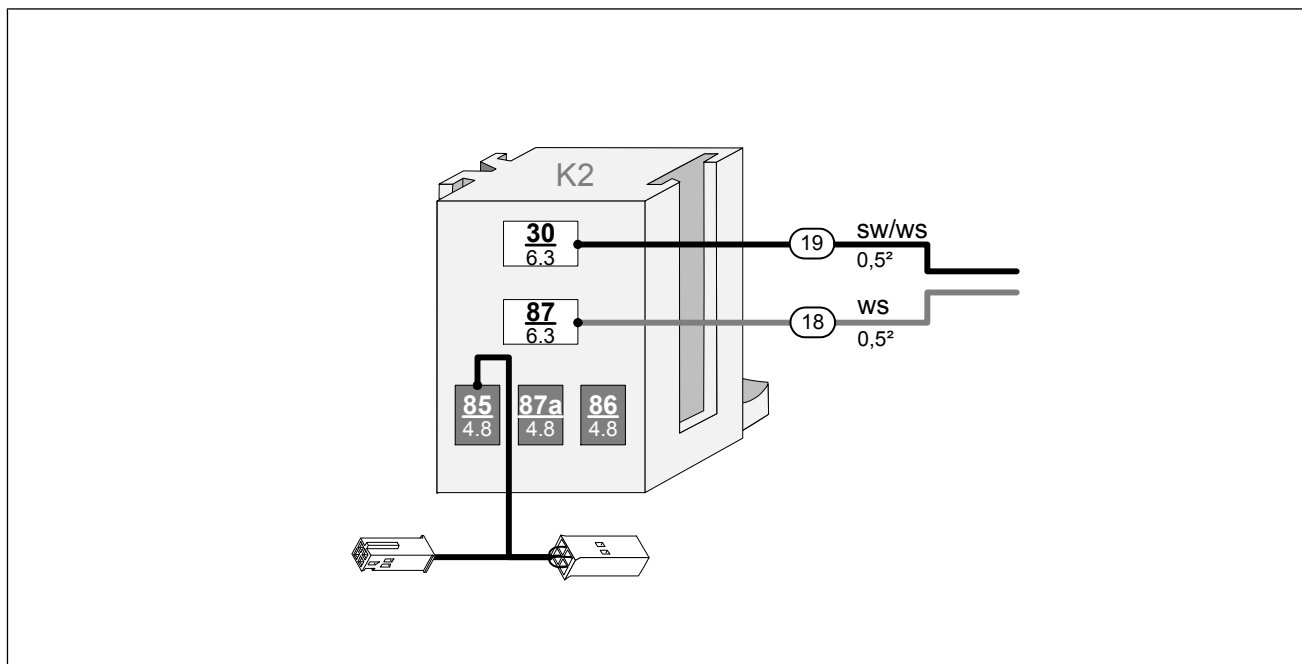


Fig. 102

Preparing RSH, relay K2 socket and PWM Gateway socket

- Connect wires.
- Connect connectors and sockets.
- Assemble RSH , relay K2 socket and PWM GW socket together.

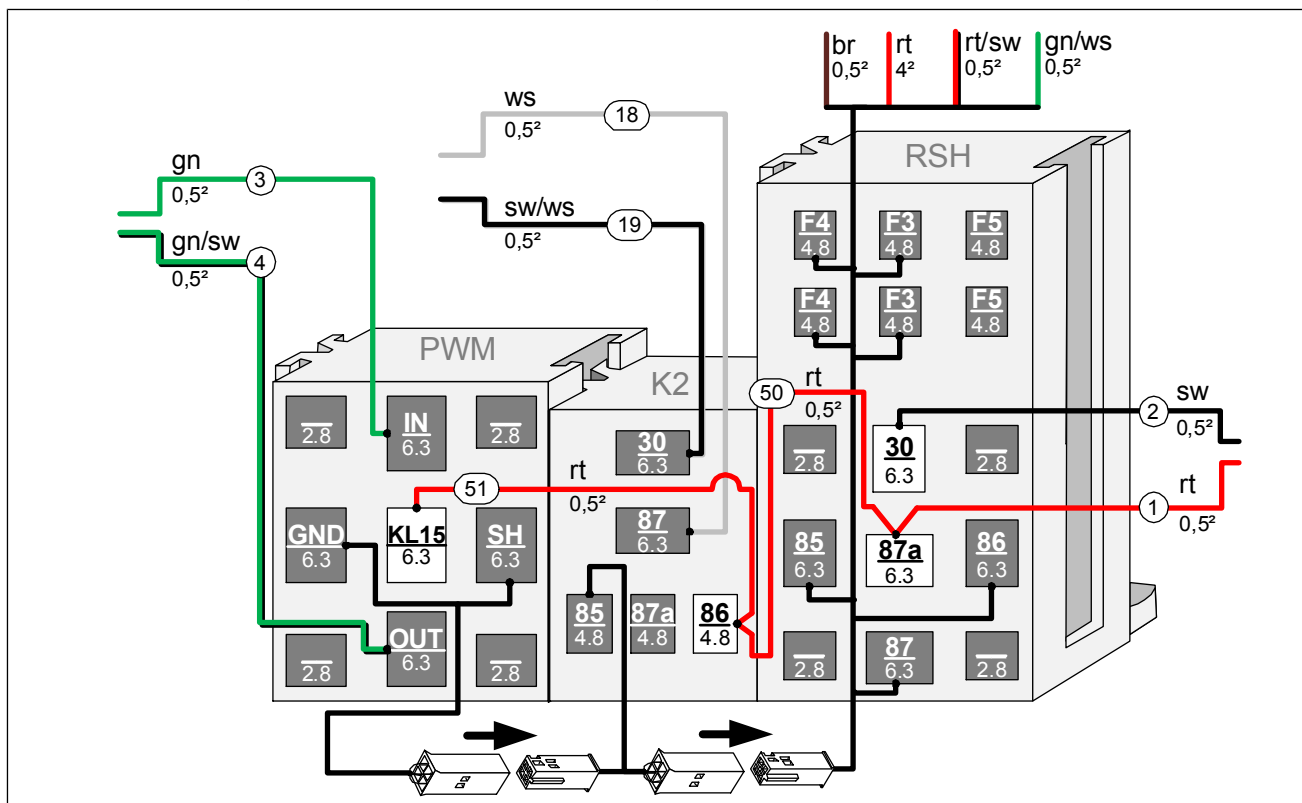


Fig. 103



13.2 System wiring diagrams

13.2.1 System wiring diagram for manual air-conditioning and 2-zone automatic A/C



Interactive system wiring diagram with WD Code **10389** at <https://my.webasto.com/download/System-schaltplan>

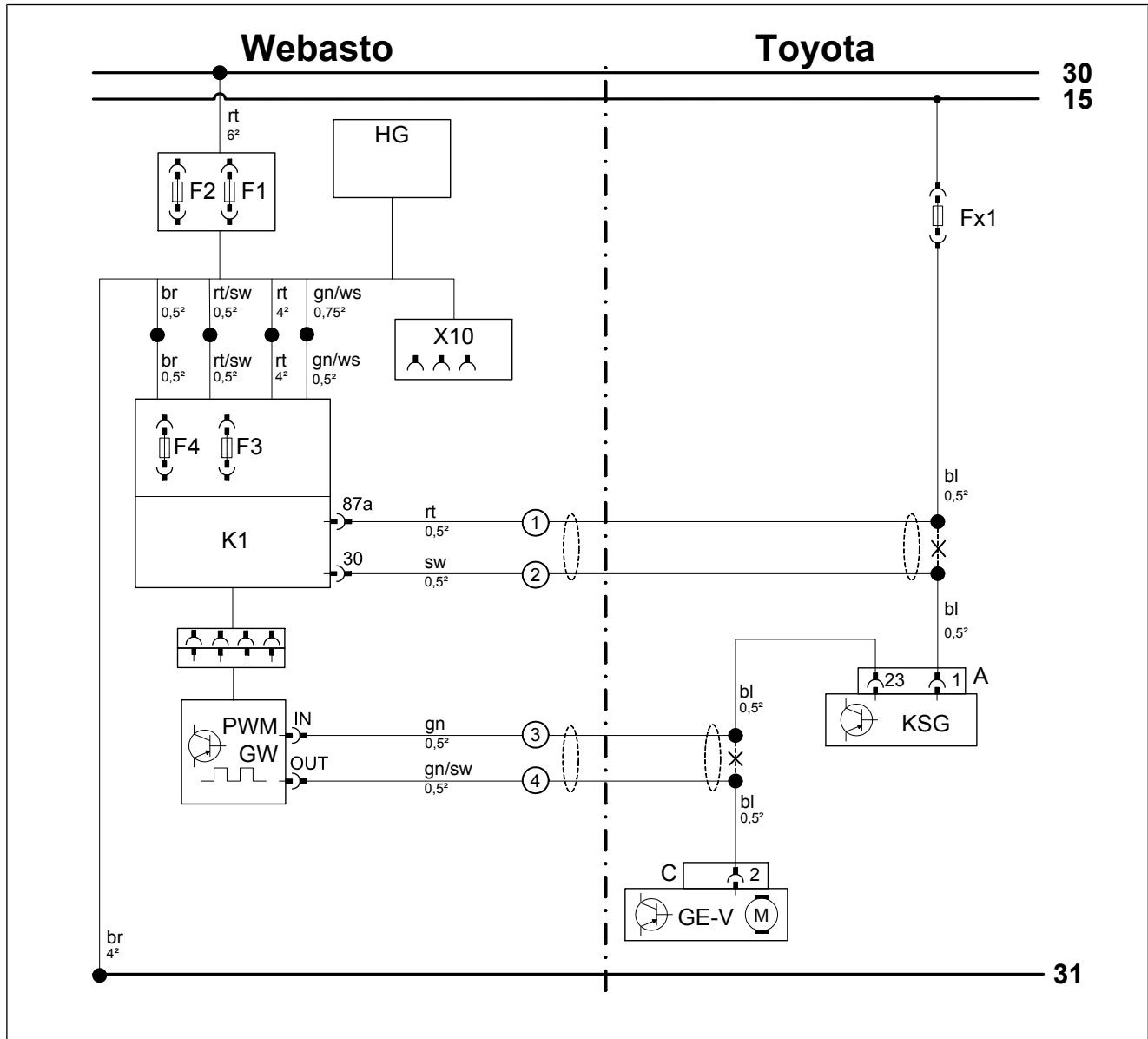


Fig. 104



13.2.2 System wiring diagram for 3 zone automatic air-conditioning



Interactive system wiring diagram with WD Code **10821** at <https://my.webasto.com/download/System-schaltplan>

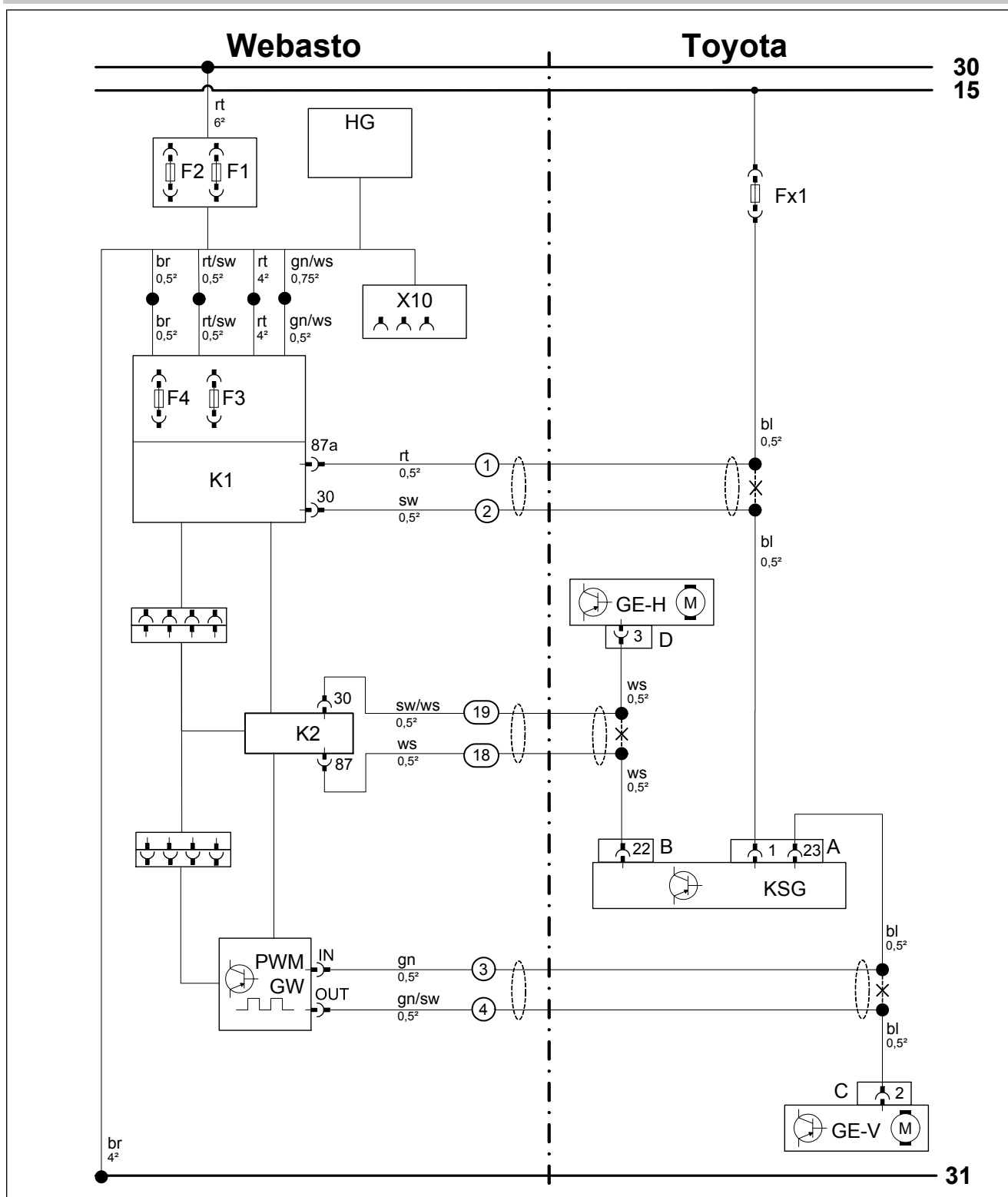


Fig. 105



13.2.3 Legend to the system wiring diagrams



The vehicle connector and component designations are freely chosen by Webasto.
Cable colours may vary.

Vehicle components		Symbols	
Abbreviation	Component	Abbreviation	Explanation
Fx1	Fuse	X	Cutting point
KSG	Air-conditioning control unit		
A	KSG connector		
B	KSG connector		
GE-V	Fan unit for front area		
C	Connector of GE-V		
GE-H	Fan unit for rear area		
D	Connector of GE-H		

Webasto components		Cable colours	
Abbreviation	Component	Abbreviation	Colour
A	Male plug for CLR module wiring harness	bg	beige
B	Female plug for CLR module wiring harness	bl	blue
C	Male plug for adapter wiring harness	br	brown
D	Female plug for adapter wiring harness	dbl	dark blue
E	Male plug for Plug&Play wiring harness	dgn	dark green
F	Female plug for Plug&Play wiring harness	ge	yellow
CCL GW	Micro Gateway CAN CAN LIN	gn	green
CL GW	Micro SPS CAN / WBus (Gateway CAN LIN)	gr	grey
CLR	CAN LIN Rxx (cold start module)	hbl	light blue
D1	Diode	hgn	light green
D2	Diode group	la	salmon
F0	Additional fuse for power supply	or	orange
F1	Heater main fuse	pk	pink
F2	Passenger compartment fan controller main fuse	ro	Pink
F3	Control element fuse	rt	red
F4	Fan controller fuse	sw	black
F5	Additional fuse	vi	violet
HG	Heater TT-Evo	ws	white
K1	Relay K1		
K2	Relay K2		
K3	Relay K3		
LA	Power adapter		
LIN GW	LIN Gateway		
MV	Solenoid valve		
PWM GW	LIN Gateway / PWM (pulse width modulator)		
RSH	Relay and fuse holder of passenger compartment		
RTD	Temperature sensor		
X10	Female plug for control element		



13.3 Fan controller

Moving original vehicle wiring harness

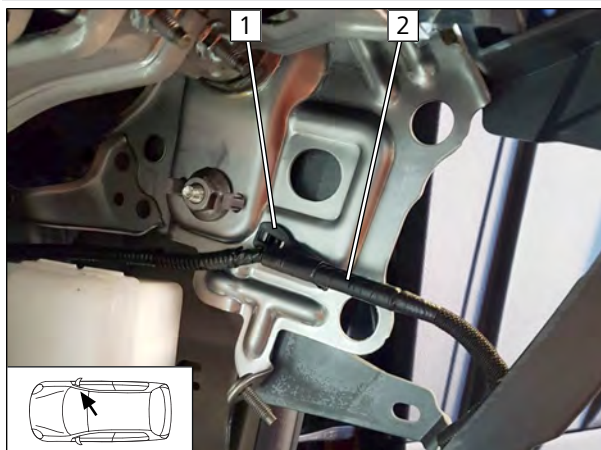


Fig. 106

- Detach clip-type cable tie **1** from original vehicle wiring harness **2**.

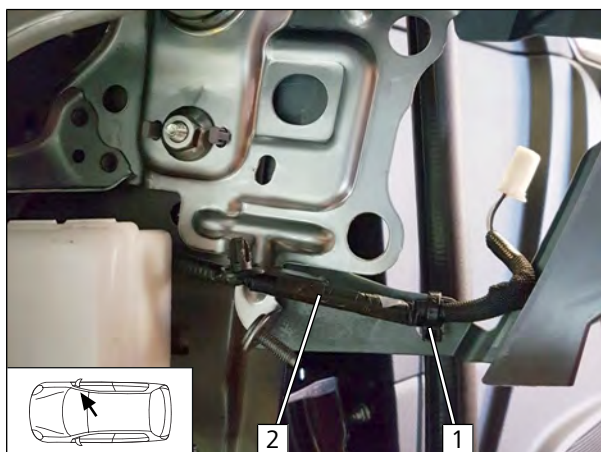


Fig. 107

- Fasten original vehicle wiring harness **2** with cable tie **1** as shown.

Mounting RSH

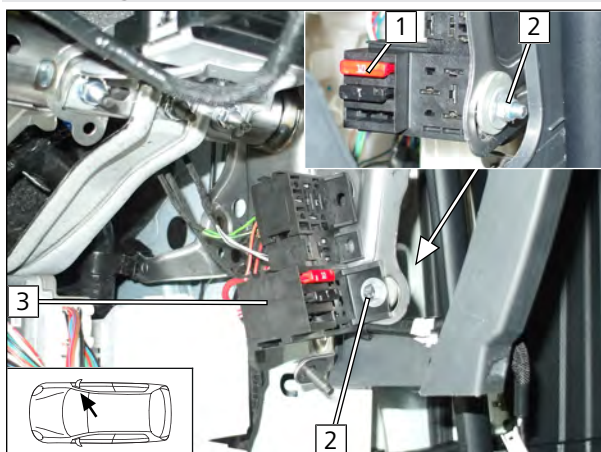


Fig. 108



The figure shows a vehicle with a 3 zone automatic air-conditioning but it applies to all vehicles.



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

- 1** Fuse F4:10A
- 2** M5x16 bolt, large diameter washer with 15mm outer dia., RSH, original vehicle hole, large diameter washer with 22mm outer dia., large diameter washer with 15mm outer dia., M5 flanged nut
- 3** Premounted RSH



Mounting PWM GW and relay

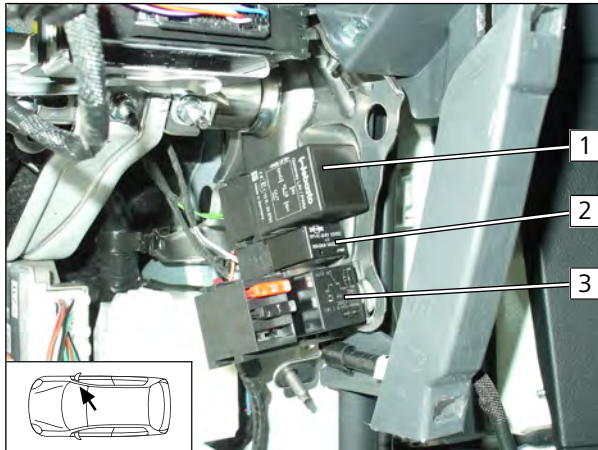


Fig. 109

- 1 PWM GW
- 2 Relay K2 (only in case of 3 zone automatic air-conditioning)
- 3 Relay K1

Connecting same colour wires of wiring harnesses

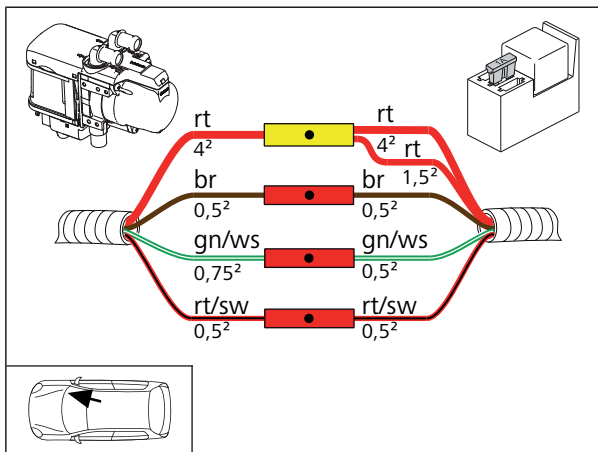


Fig. 110

View of A/C control unit connector

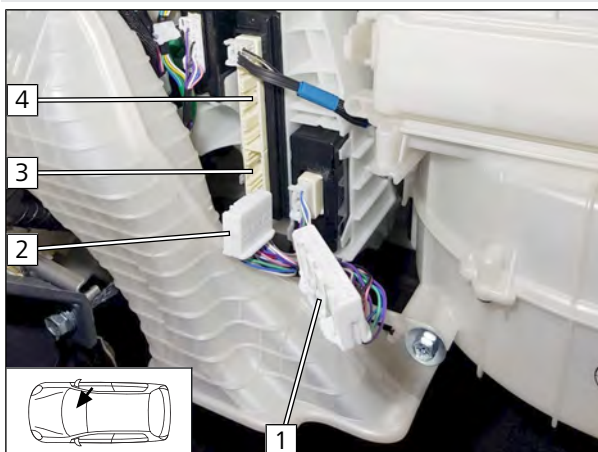


Fig. 111

- 1 KSG connector A
- 2 KSG connector B
- 3 Slot for connector B
- 4 Slot for connector A

Connection to air-conditioning control unit



Produce all the following electrical connections only with shrinkable butt connectors.

- 1. crimp
- 2. shrink

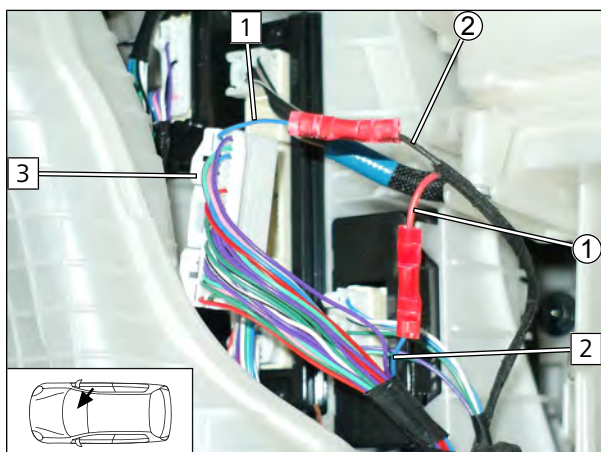


Fig. 112

- 1 Blue (bl) wire of KSG connector A / pin 1
- 2 Blue (bl) wire of fuse Fx1
- 3 Air-conditioning control unit connector A
- 1 Red (rt) wire of K1/87a fan wiring harness
- 2 Black (sw) wire of K1/30 fan wiring harness

View of KSG connector A on wiring side:

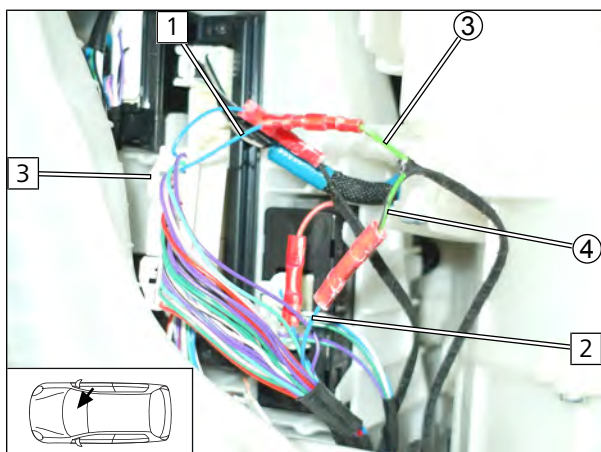
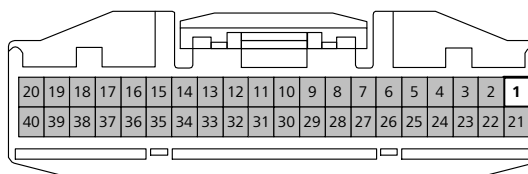


Fig. 113

- 1 Blue (bl) wire of KSG connector A / pin 23
- 2 Blue (bl) wire of GE-V connector C / pin 2
- 3 Air-conditioning control unit connector A
- 3 Green (gn) wire of PWM GW/IN wiring harness from PWM control
- 4 Green/black (gn/sw) wire of PWM GW/OUT wiring harness from PWM control

View of KSG connector A on wiring side:

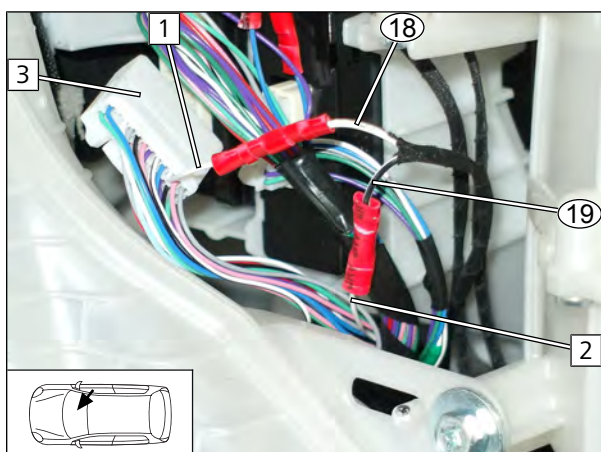
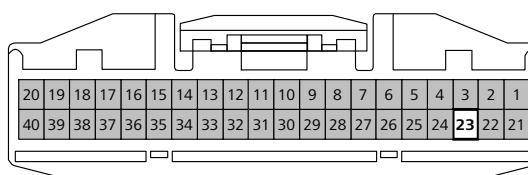
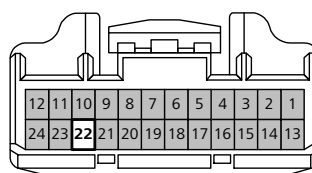


Fig. 114

- 1 White (ws) wire of KSG connector B / pin 22
- 2 White (ws) wire of GE-H connector D / pin 3
- 3 Air-conditioning control unit connector B
- 18 White (ws) wire of K2/87 from isolating relay wiring harness
- 19 Black/white (sw/ws) wire of K2/30 from isolating relay wiring harness

View of KSG connector B KSG on wiring side:





14 Electrical system of control elements

14.1 Telestart option

Mounting receiver

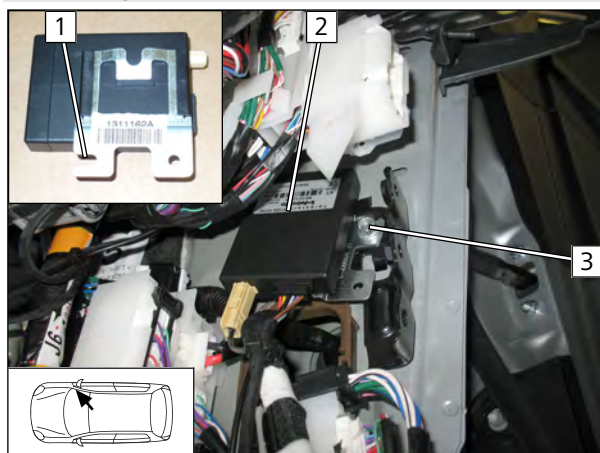


Fig. 115



Observe the Telestart installation documentation.

- Remove and discard original vehicle bolt (if present) at position **3**.
- Widen existing oblong hole **1** in receiver bracket to Ø6.5.

2 Receiver

3 M6x16 bolt, receiver bracket, original vehicle thread

Mounting temperature sensor, only in case of T100 HTM

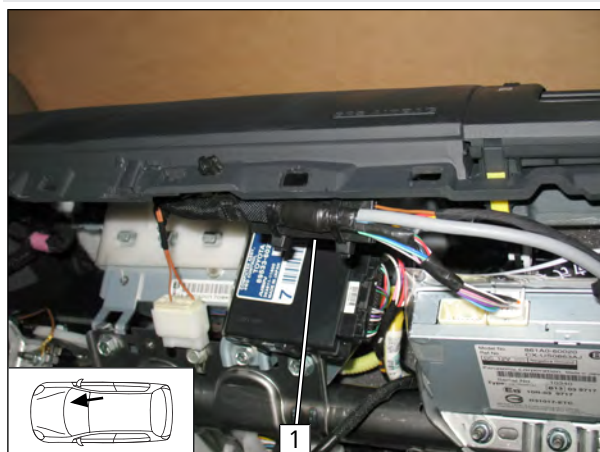


Fig. 116

- Fasten temperature sensor **1** with a cable tie.

Mounting aerial

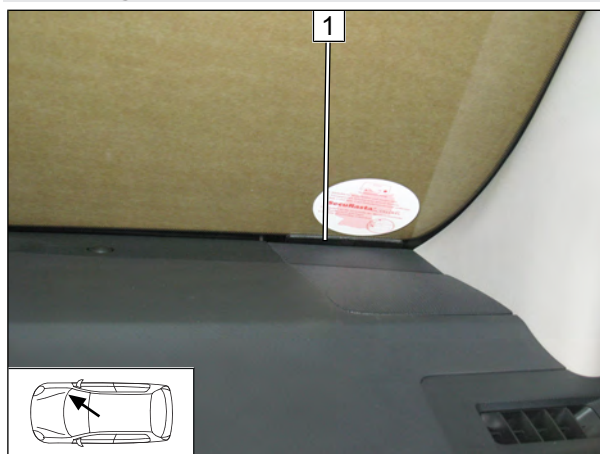


Fig. 117

1 Aerial



14.2 ThermoConnect option

Mounting receiver

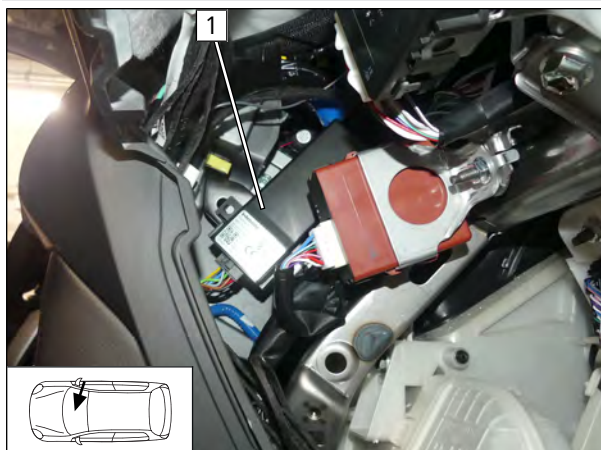


Fig. 118



Observe the ThermoConnect 2 installation documentation.

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



15 Final Work



Further information can be found in the vehicle manufacturer's technical documentation.

- ▶ Mount removed parts in reverse order.



- ▶ Check all hoses, clamps and all electrical connections for firm seating.
- ▶ Insulate and tie back loose lines
- ▶ Spray heater and electrical components with anti-corrosion wax (Tectyl 100K).
- ▶ Connect the battery.



Only use manufacturer-approved coolant.

- ▶ Fill and bleed the coolant circuit according to the vehicle manufacturer's specifications.



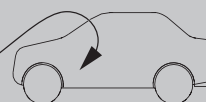
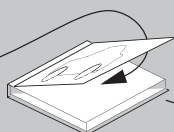
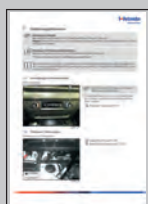
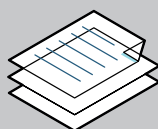
Further information can be found in the general installation and operating instructions of the Webasto components.

- ▶ Program MultiControl CAR, teach Telestart transmitter
- ▶ Make settings on A/C control panel according to the 'Operating Instructions'.
- ▶ Initial operation and functional test
- ▶ Affix 'Switch off parking heater before refueling' caution label in area of filler neck



Vehicle event log after parking heating mode

- ✓ Components of the original vehicle air conditioning system are activated during parking heating mode. Other vehicle components remain inactive, which in some circumstances may be interpreted as an error and can be filed as such in the event log. An increased power consumption (quiescent current) may also be registered for some vehicles.
- ▶ If an incorrect installation can be excluded, these entries are exclusively related to the parking heating mode situation and have no effect on the vehicle functions in driving mode.



These are the original instructions. The German language is binding.

You can request your language if it is missing. The telephone number of each country can be found in the Webasto service centre leaflet or the website of the respective Webasto representative of your country.

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16 Operating instructions for manual air-conditioning



Information regarding the heating time:

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.



Vehicles with passenger compartment monitoring:

Further information can be found in the vehicle operating instructions.

- Deactivate passenger compartment monitoring for the heating operation



Note for parking heater function

Your vehicle is equipped with a passenger compartment and engine preheating unit.



Note for current consumption in case of parking heating mode

Depending on the vehicle model, there may be an increased quiescent current consumption message in the vehicle information system during or directly after operation in parking heating mode.

- This is not an error that can affect the vehicle on a technical level.

16.1 A/C control panel settings

Manual air-conditioning control panel



No need to pre-select the fan speed.

Before parking the vehicle, make the following settings:

- 1 Air outlet to windscreen / footwell
- 2 Set temperature to 'max.'

Fig. 119

16.2 Installation location of fuses

Fuses in engine compartment

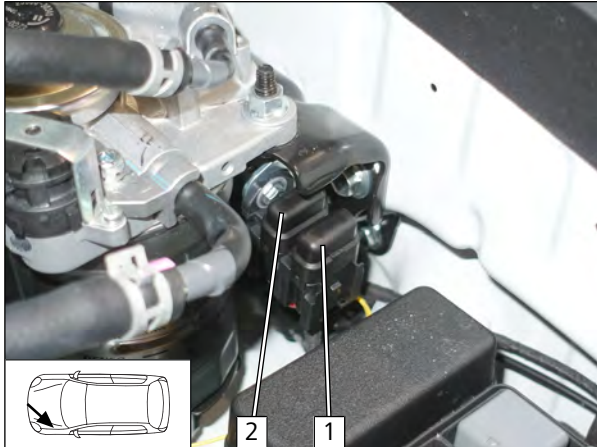


Fig. 120

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

Fuses in passenger compartment

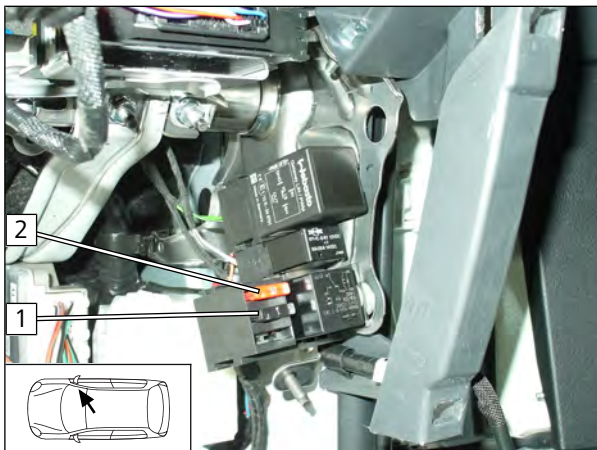


Fig. 121

- 1 F3 - 1A control element fuse
- 2 F4 - 10A fan controller fuse

17 Operating instructions for 2 and 3 zone automatic air-conditioning



Information regarding the heating time:

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.



Vehicles with passenger compartment monitoring:

Further information can be found in the vehicle operating instructions.

- Deactivate passenger compartment monitoring for the heating operation



Note for parking heater function

Your vehicle is equipped with a passenger compartment and engine preheating unit.



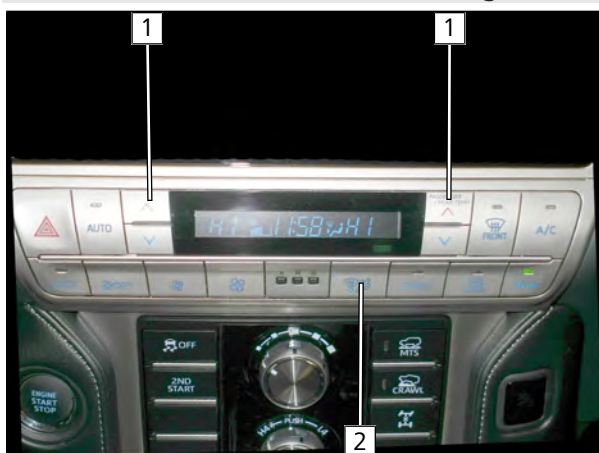
Note for current consumption in case of parking heating mode

Depending on the vehicle model, there may be an increased quiescent current consumption message in the vehicle information system during or directly after operation in parking heating mode.

- This is not an error that can affect the vehicle on a technical level.

17.1 A/C control panel settings

2 / 3 zone automatic air-conditioning control panel



No need to pre-select the fan speed.

Before parking the vehicle, make the following settings:

- 1 Temperature on both sides to 'HI'
- 2 Air outlet to windscreen / footwell

Fig. 122

17.2 Installation location of fuses

Fuses in engine compartment

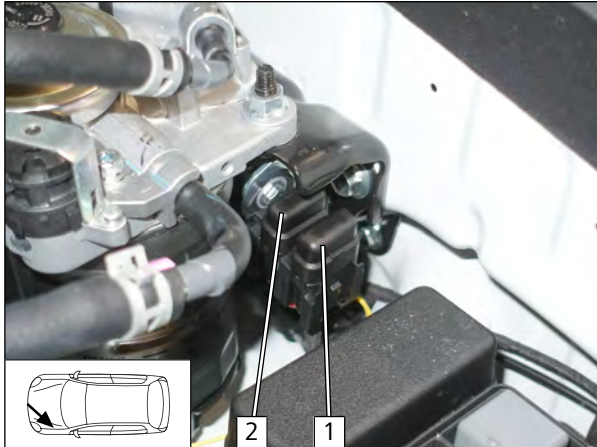


Fig. 123

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

Fuses in passenger compartment

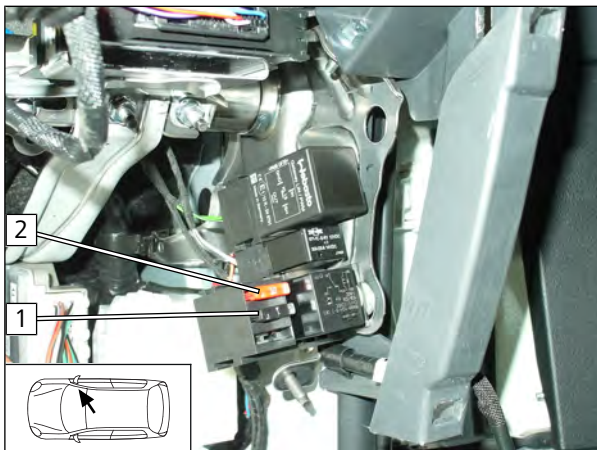


Fig. 124

- 1 F3 - 1A control element fuse
- 2 F4 - 10A fan controller fuse