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Installation documentation

for water heater Thermo Top Evo

'Inline' coolant circuit with engine preheating

Mitsubishi ASX

Left-hand drive vehicle

Manufacturer	Model	Type	Model year	EG-BE-No. / ABE
Mitsubishi	ASX	GA0	from 2020	e1* 2007/46* 0368*…

Motorisation	Fuel	Emission standard	Transmission type	Output [kW]	Displace-ment [cm³]	Engine code
2.0 P MIVEC	Petrol	Euro 6;WLTP;DG…	CVT	110	1998	4J11
2.0 P MIVEC	Petrol	Euro 6;WLTP;DG…	5-speed SG	110	1998	4J11

Validity	Equipment variants	Model
		ASX
Verified equipment variants	Automatic air-conditioning	x
	Automatic Start-Stop system	x
	LED main headlights	x
	LED front fog lights	x
	Keyless Go	x
	4 WD	x
	2 WD	x

Total installation time	Note
6 hours	

Contents

1 List of abbreviations

CVT	Continuously variable automatic transmission
DP	Fuel pump
FF	FuelFix (tank extracting device)
HG	Heater
PWM	Pulse width modulator
RSH	Relay and fuse holder of passenger compartment
SG	Manual transmission
SH2	Engine compartment fuse holder for F1/F2
UP	Coolant pump
Veh.	Vehicle
Wire	Cable
X10	Female plug for control element

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 Mitsubishi ASX 2.0P model year 2020	1327792A
In case of Telestart, control element, as well as indicator lamp in consultation with end customer	In accordance with price list

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

Depending on the space required and the veh. manufacturer's instructions, we recommend the use of a vehicle battery with a higher electrical capacity.

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	K
Vehicle-specific installation documentation of the cold start kit	M
Webasto Comfort A/C control	H
Webasto Standard A/C control	G
Tank extracting device (e.g. FuelFix)	F
Exhaust end fastener (EFIX)	E
Combustion air intake silencer	L
Spacer bracket (ASH)	S

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

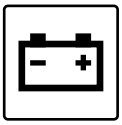
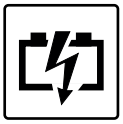
▶ Actions to protect yourself against risks.

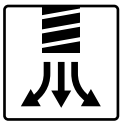
Reference to the vehicle manufacturer's specific documents.

Note on a special technical feature

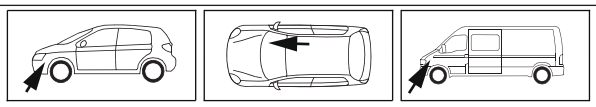
3.4.3 Work step identification marks

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 mm^2
- Crimping pliers for cable lugs 0.5 – 10 mm^2
- Crimping pliers for male connector 0.14 – 6 mm^2
- Crimping pliers for connector 0.25 – 6 mm^2
- 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	▶ Open the fuel tank cap ▶ Ventilate the fuel tank ▶ Close the fuel tank cap again ▶ Depressurise the cooling system	
Engine compartment and body	▶ Disconnect the battery ▶ Complete air filter ▶ Engine control unit ▶ Engine underride protection ▶ Stoneguard on the left in front of the tank (if present) ▶ Drain and store the engine coolant	
Passenger compartment	▶ Glove box ▶ Rear seat cushion ▶ Tank fitting service lid	

5.2 Heater preparation

Engine compartment	▶ 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	

6 Installation overview

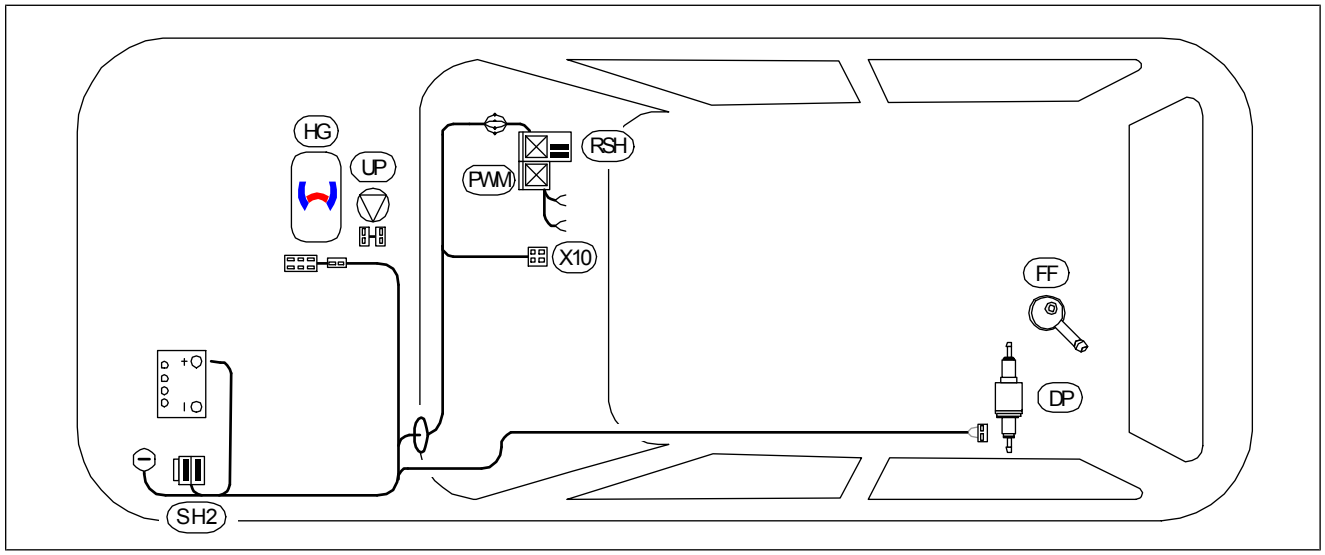


Fig. 1

Legend to installation overview

Abbreviation	Component
DP	Fuel pump
FF	FuelFix
HG	Heater
PWM	Pulse width modulator
RSH	Relay and fuse holder of passenger compartment
SH2	Engine compartment fuse holder for F1/F2
UP	Coolant pump
X10	Female plug for control element

Heater installation location

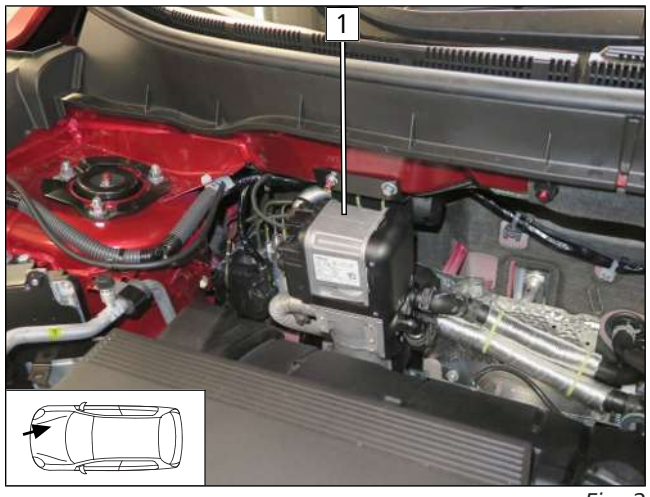


Fig. 2

1 Heater

7 Electrical system of engine compartment

Enlarging hole in angle bracket

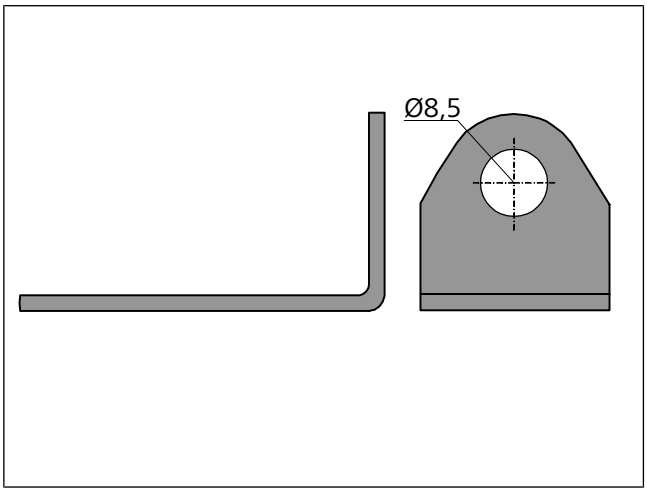


Fig. 3

Premounting SH2

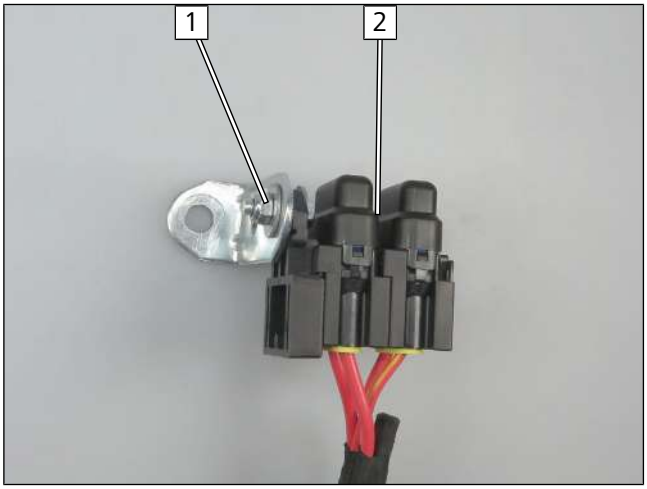


Fig. 4

1 M5x16 bolt, large diameter washer, retaining plate of SH2, angle bracket, large diameter washer, nut

2 Fuses F1, F2

Installing SH2

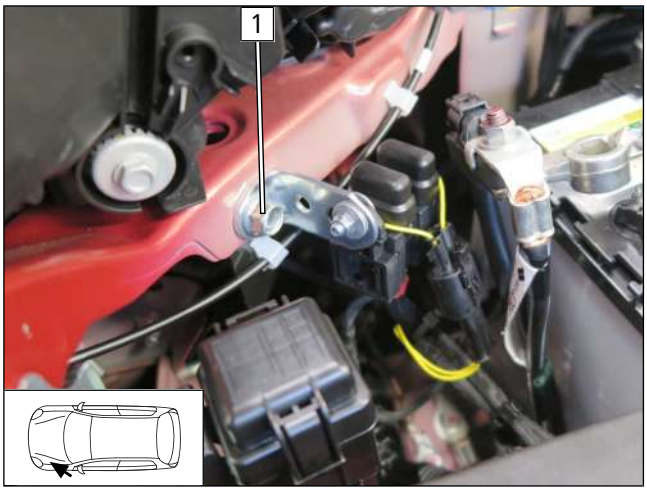


Fig. 5

2 Original vehicle bolt, angle bracket, original vehicle threaded hole

Mounting earth wire

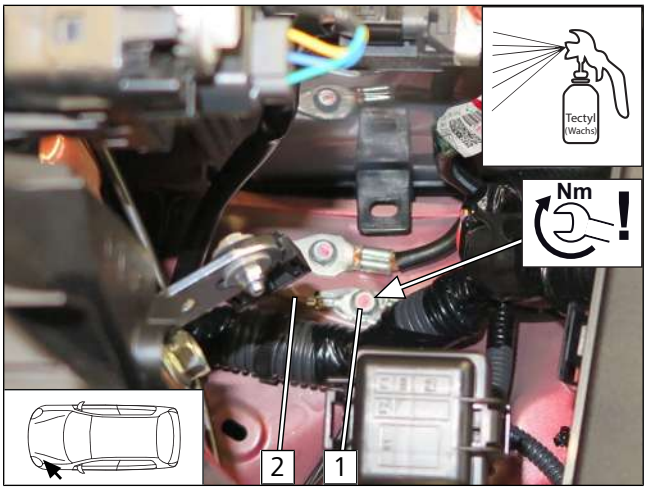


Fig. 6

DANGER

Fire hazard due to insufficient tightening torque

▶ Observe tightening torque

1 Original vehicle earth support point
2 Earth wire

Mounting positive wire

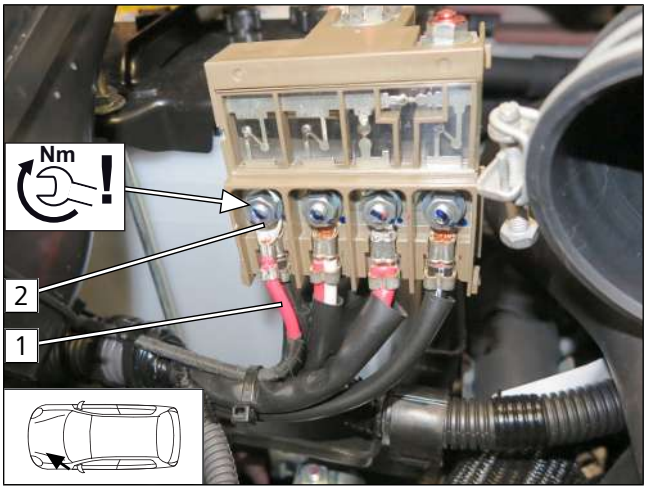


Fig. 7

DANGER

Fire hazard due to insufficient tightening torque

▶ Observe tightening torque

1 Positive wire
2 Original vehicle positive support point

Routing heater wiring harness

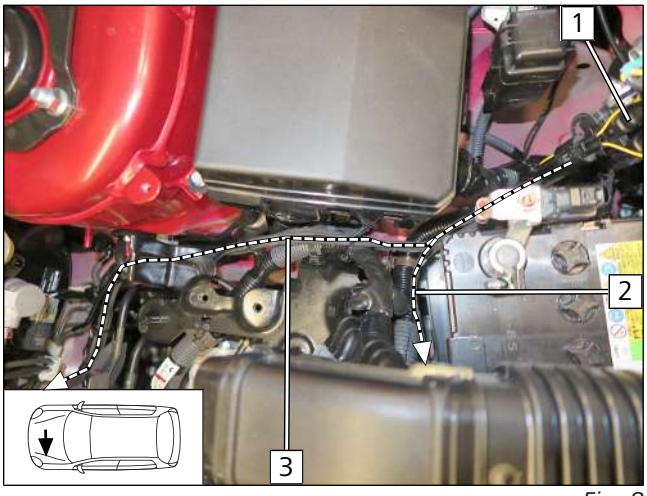


Fig. 8

1 SH2
2 Positive wire
3 Heater, passenger compartment and control element wiring harnesses

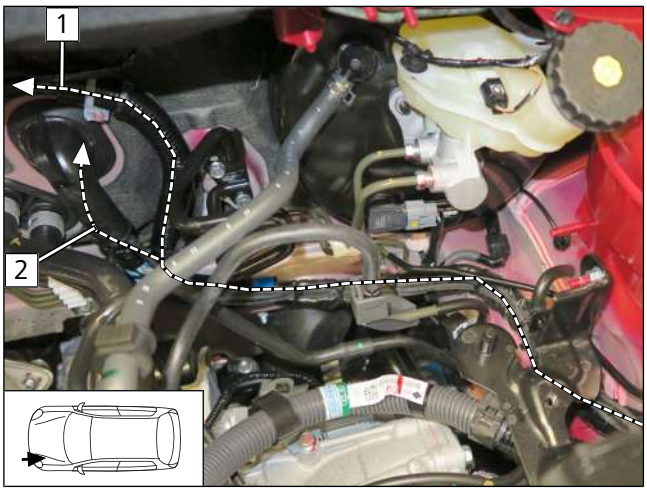


Fig. 9

1 Heater wiring harness

2 Passenger compartment and control element wiring harnesses to the passenger compartment pass through

Passenger compartment wiring harness pass through

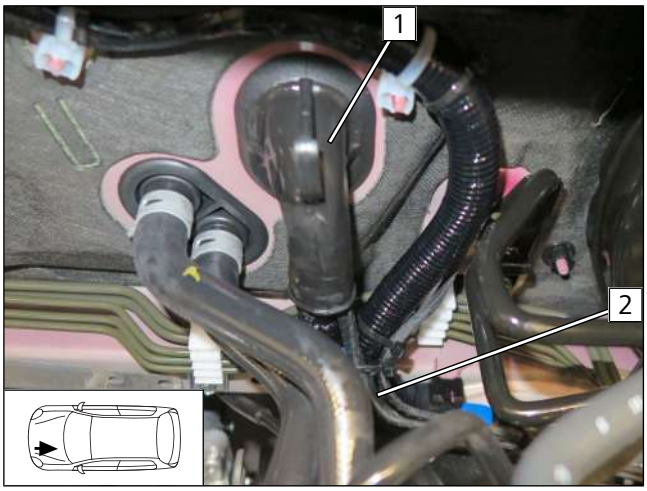


Fig. 10

1 Passenger compartment pass through

2 Passenger compartment and control element wiring harnesses

8 Mechanical system

8.1 Preparing installation location

Preparing HG bracket

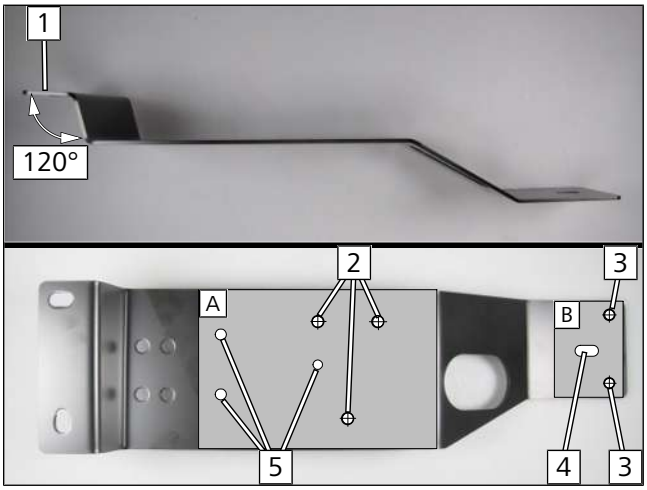


Fig. 11

- ▶ Prepare HG bracket in accordance with templates **A**, **B** and **C**.
- ▶ Bend side **1** from original 108° angle to 120° as shown in bending template **C**.
- ▶ Align template **A** with hole pattern **5**, then drill Ø7 holes **2**.
- ▶ Align template **B** with hole pattern **4**, then drill Ø7 hole **3**.

Copying hole pattern

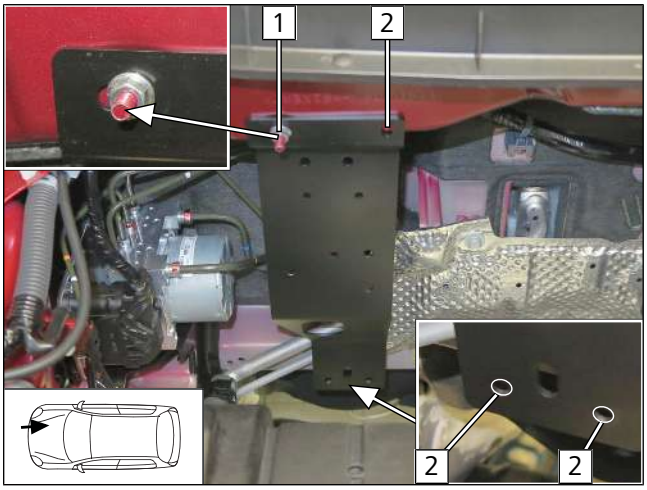


Fig. 12

- ▶ Straighten position of HG bracket and push it as far as possible in the oblong hole at pos **1** in the direction of the front passenger's side.

1 Original vehicle stud bolt, HG bracket, flanged nut

2 Hole pattern

Drilling holes, inserting rivet nuts

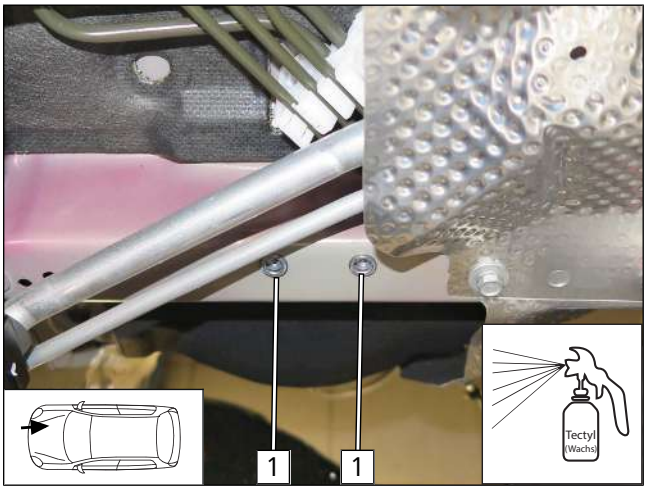


Fig. 13

1 Ø9 hole, rivet nut

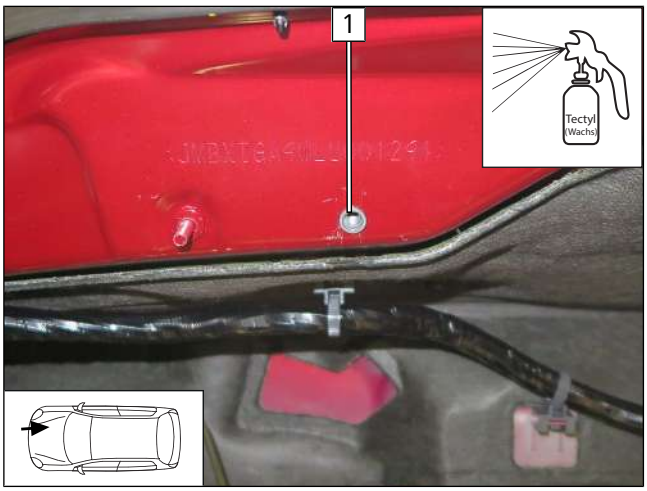


Fig. 14

[1] Ø9 hole, rivet nut

Bending line holder

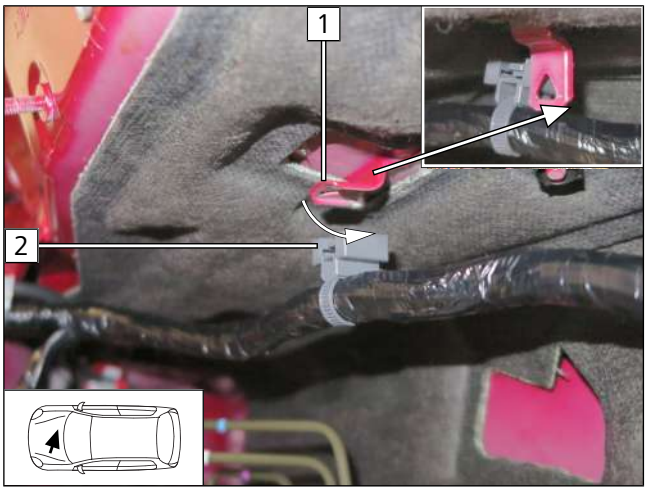


Fig. 15

- ▶ Detach line holder [2].
- ▶ Bend tab [1] by 90° downward.

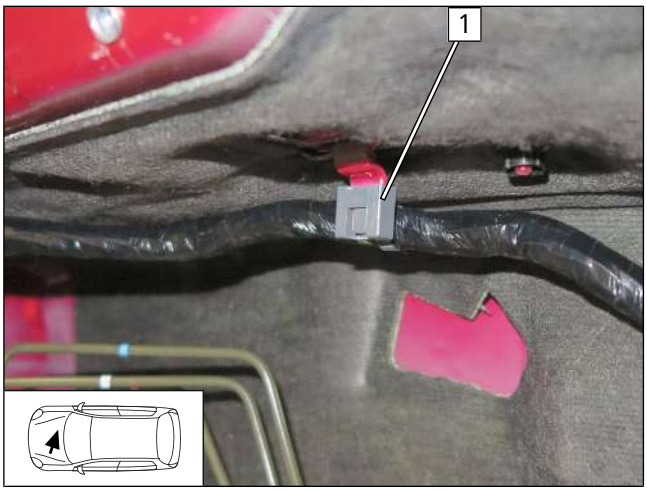


Fig. 16

- ▶ Reattach line holder [1].

Routing HG wiring harness

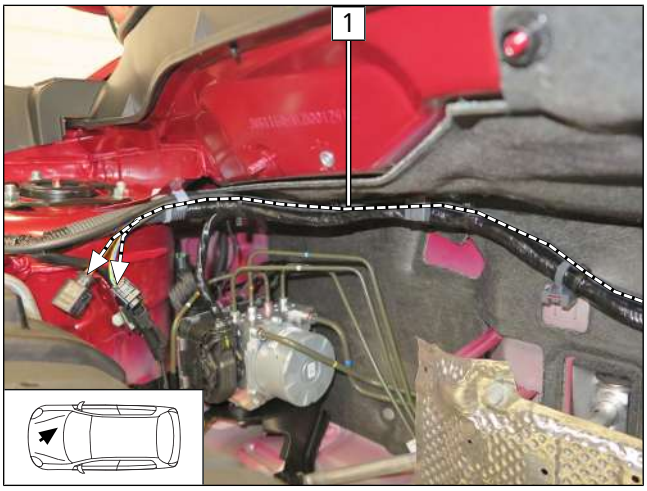


Fig. 17

▶ Route HG wiring harness [1] to HG installation location.

8.2 Premounting heater

Mounting water connection piece

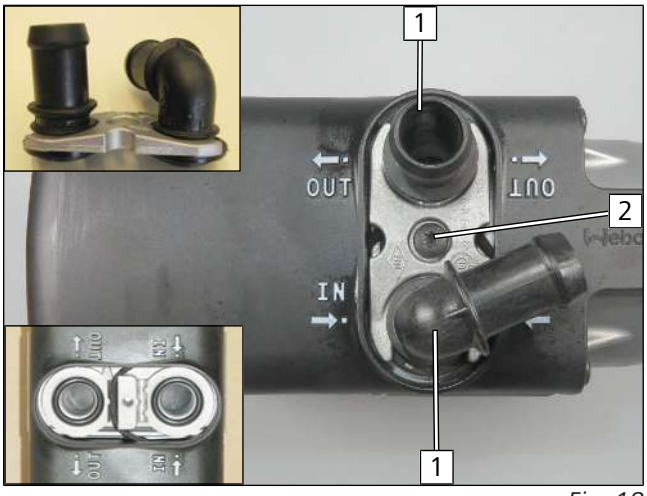


Fig. 18

Observe the general installation instructions of the heater.

[1] Water connection piece, seal

[2] 5x15 self-tapping bolt, water connection piece retaining plate

Mounting fuel hose

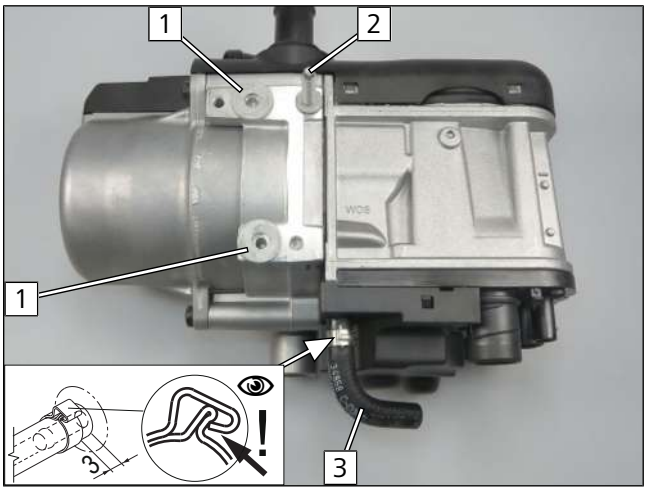


Fig. 19

[1] Large diameter washer (6.4)

[2] Self-tapping M5/6 x25 stud bolt

[3] 90° moulded hose, Ø10 clamp

Mounting heater bracket

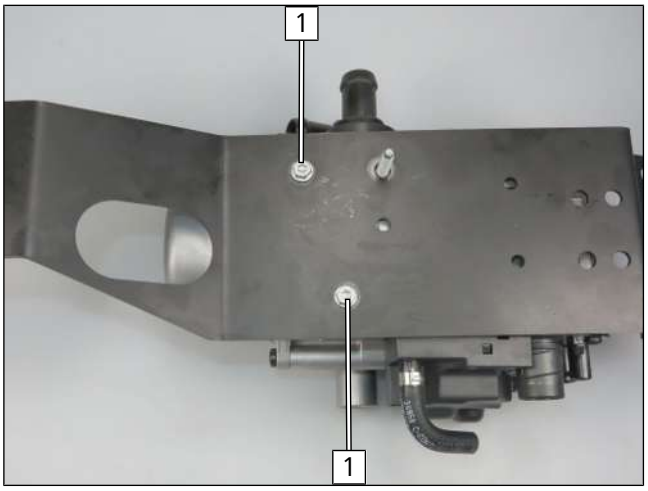


Fig. 20

1 5x13 self-tapping bolt, HG bracket, large diameter washer, hole in HG

Preparing combustion air intake pipe

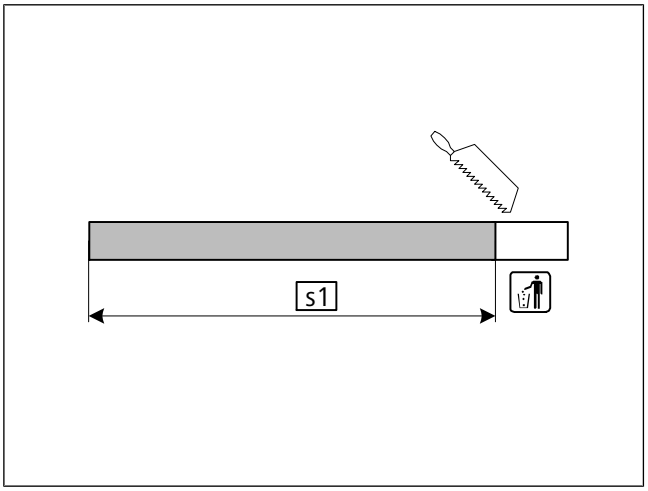


Fig. 21

s1 110

Premounting combustion air intake silencer

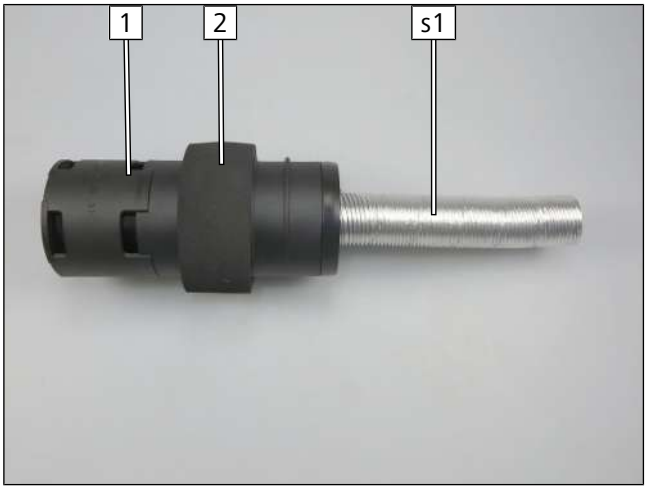


Fig. 22

Observe the installation instructions of the combustion air intake silencer.

1 Combustion air intake silencer

2 Foam ring

Mounting combustion air intake silencer

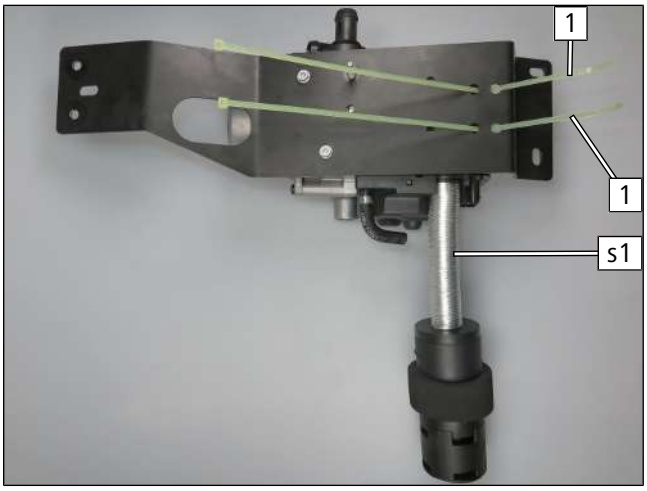


Fig. 23

▶ Mount combustion air intake pipe **s1** onto HG.

1 Cable tie

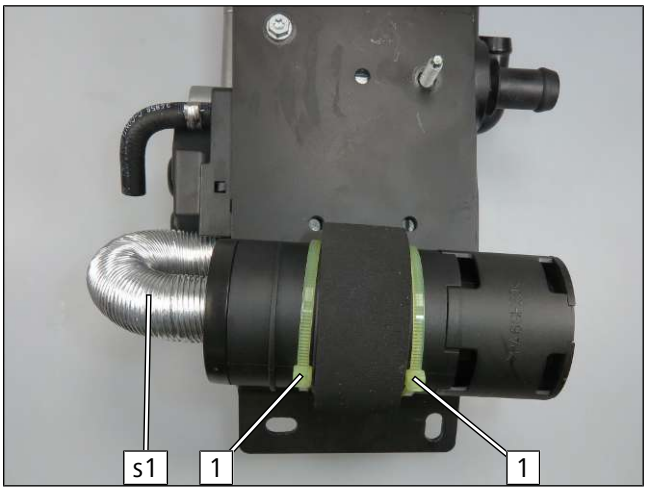


Fig. 24

▶ Position combustion air intake silencer, close cable tie **1**.

Preparing eyelet cable tie

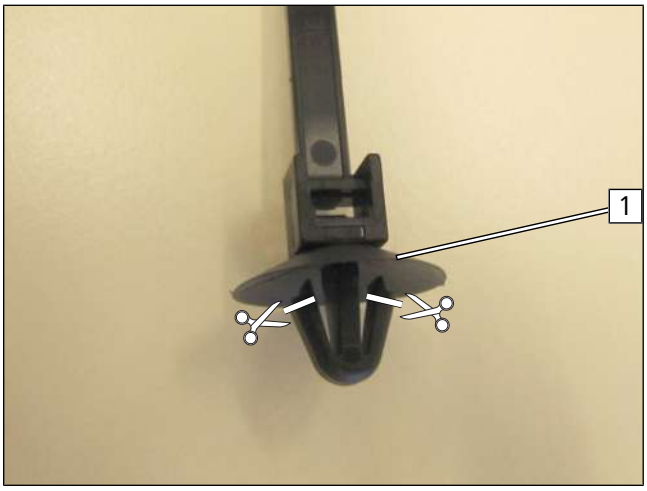


Fig. 25

▶ Shorten locking tab of eyelet cable tie **1** as shown.

Mounting coolant pump

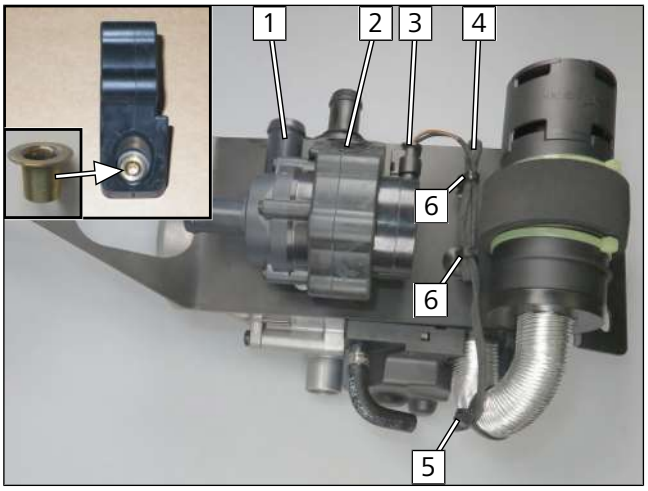


Fig. 26

1. Coolant pump
2. Stud bolt, coolant pump mount, flanged nut
3. Coolant pump wiring harness connector
4. Coolant pump wiring harness
5. Cable tie for fastening coolant pump wiring harness
6. Eyelet cable tie for fastening coolant pump wiring harness

Mounting coolant pump wiring harness connector onto HG

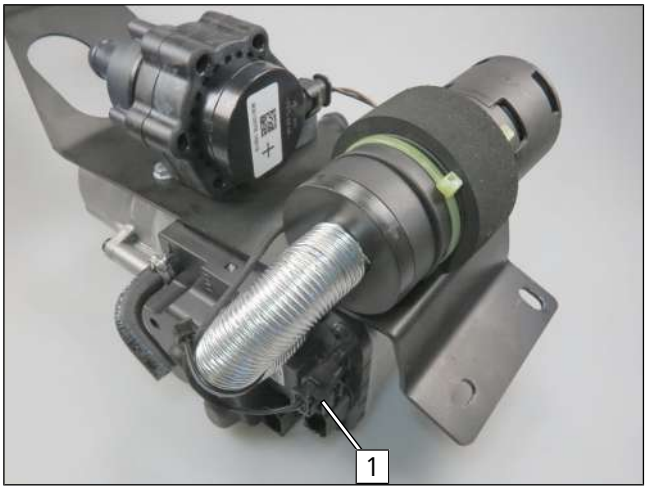


Fig. 27

1. Coolant pump wiring harness connector

Preparing hoses

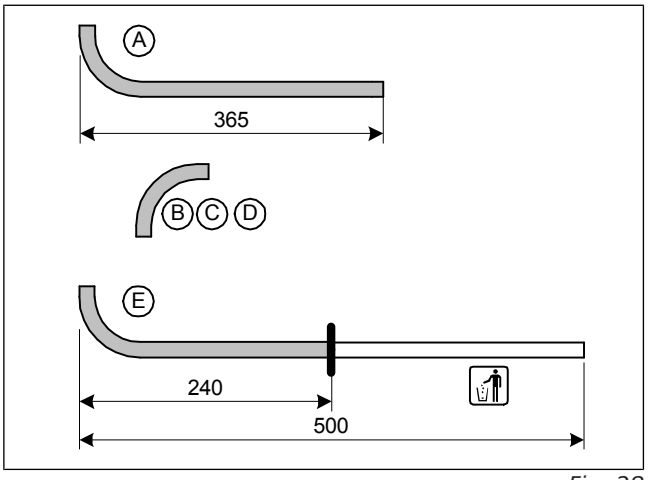


Fig. 28

(A)	90° moulded hose
(B) / (C) / (D)	90° moulded hose
(E)	90° moulded hose

Premounting hoses Ⓑ and Ⓒ

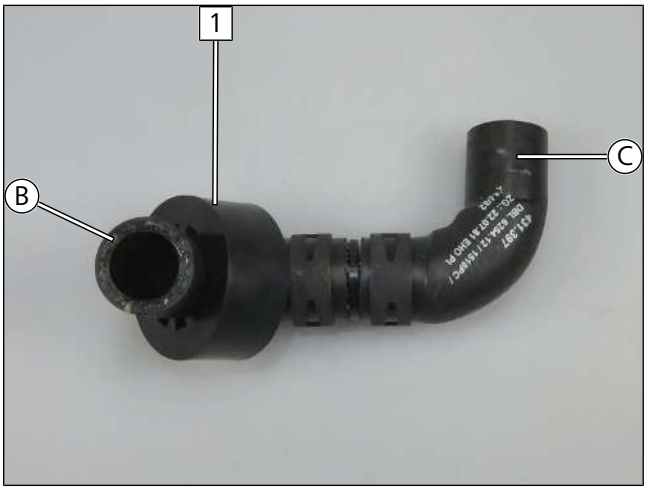


Fig. 29

All spring clips Ø25,
Ø18x18 connecting pipe

1 Black (sw) rubber isolator

Mounting hoses Ⓑ and Ⓒ

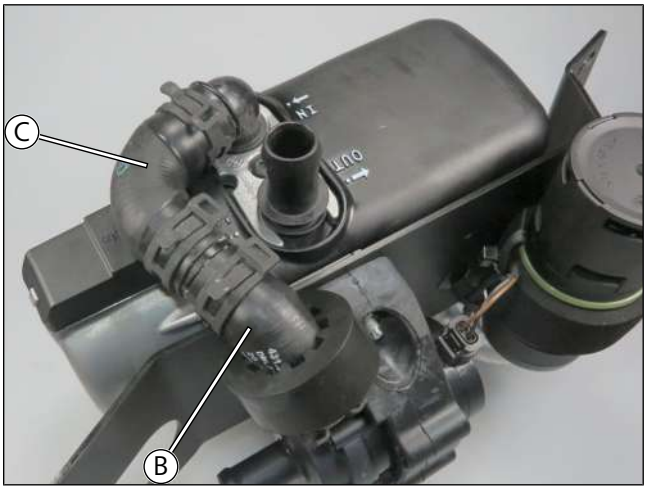


Fig. 30

All spring clips Ø25

- ▶ Mount hose Ⓒ onto HG/IN.
- ▶ Mount hose Ⓑ on coolant pump outlet.

Cutting heat protection tube to length

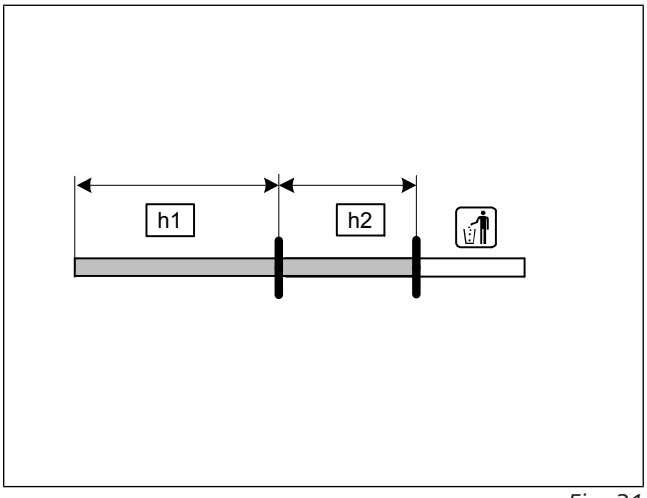


Fig. 31

h1 240
h2 150

Premounting hose Ⓐ

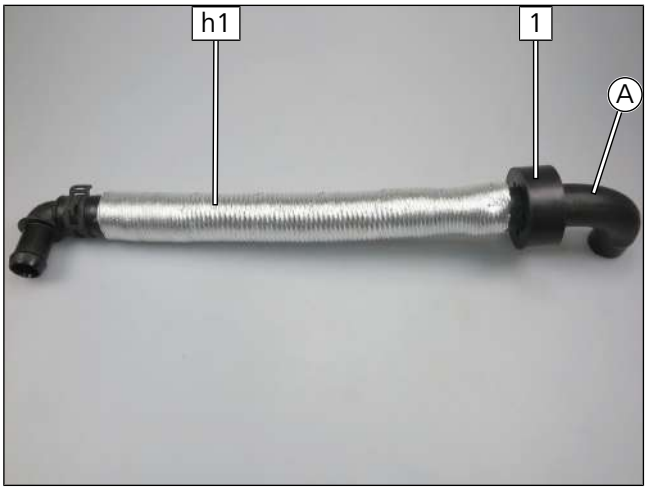


Fig. 32

All spring clips Ø25,
Ø18x18 / 90° connecting pipe

1 Black (sw) rubber isolator

Mounting hose Ⓐ

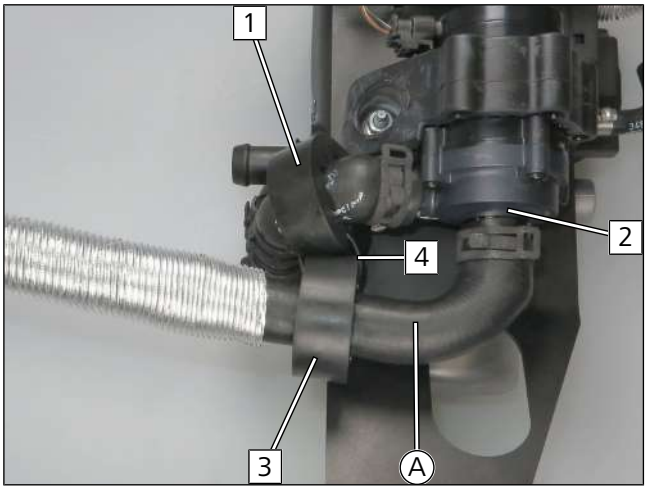


Fig. 33

Ø25 spring clip

▶ Align rubber isolators **1** and **3** and strap together using cable tie **4**.

2 Coolant pump inlet

Premounting hoses Ⓓ and Ⓔ

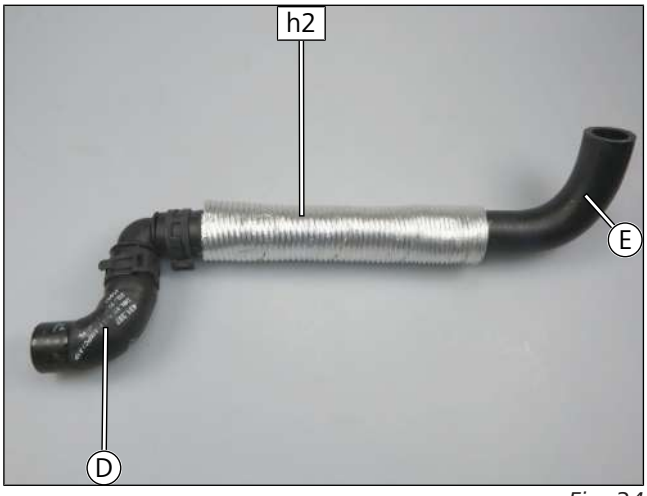


Fig. 34

Ø25 spring clips,
Ø18x18 / 90° connecting pipe

Mounting hoses Ⓓ and Ⓔ

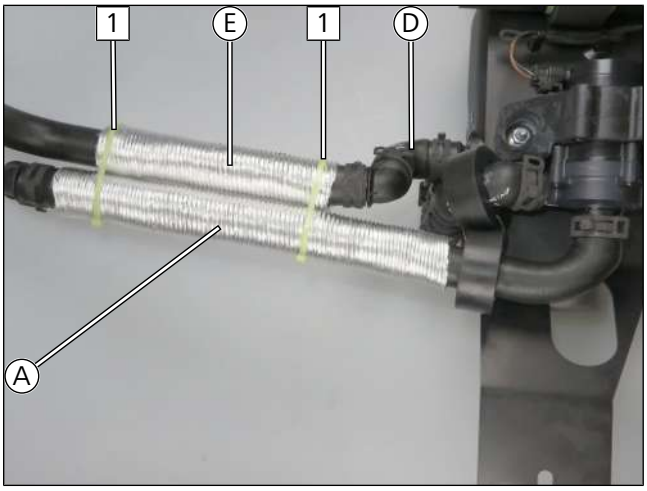


Fig. 35

Ø25 spring clip

▶ Mount hose Ⓓ onto HG/OUT.

1 Cable tie around hoses Ⓐ and Ⓔ

Preparing perforated bracket

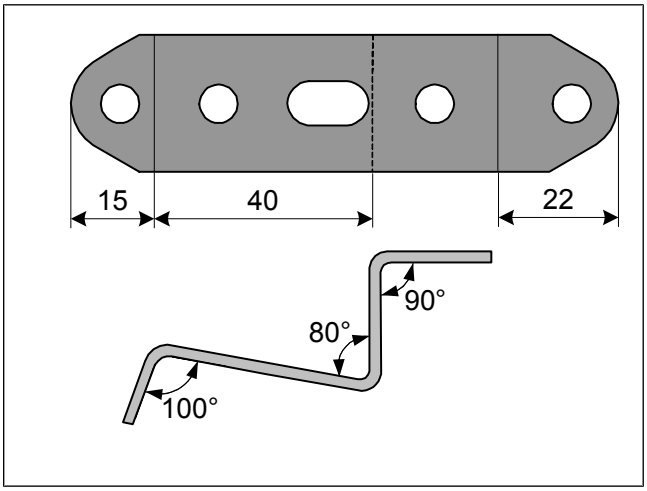


Fig. 36

Installing perforated bracket

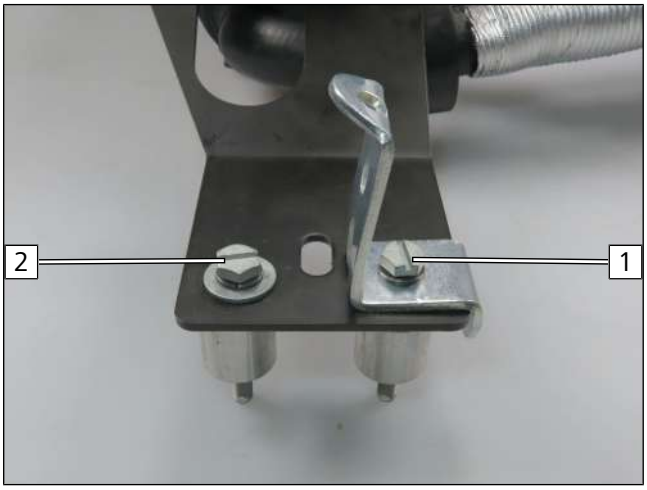


Fig. 37

1 M6x50 bolt, spring lock washer, perforated bracket, HG bracket, distance washer (20), distance washer (5), lock washer

2 M6x50 bolt, spring lock washer, large diameter washer, HG bracket, distance washer (20), distance washer (5), lock washer

Preparing exhaust pipe

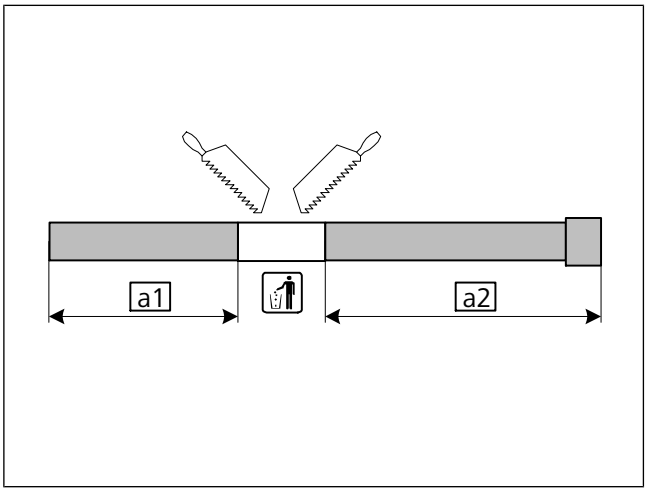


Fig. 38

a1 230
a2 430

Mounting exhaust pipe **a1**

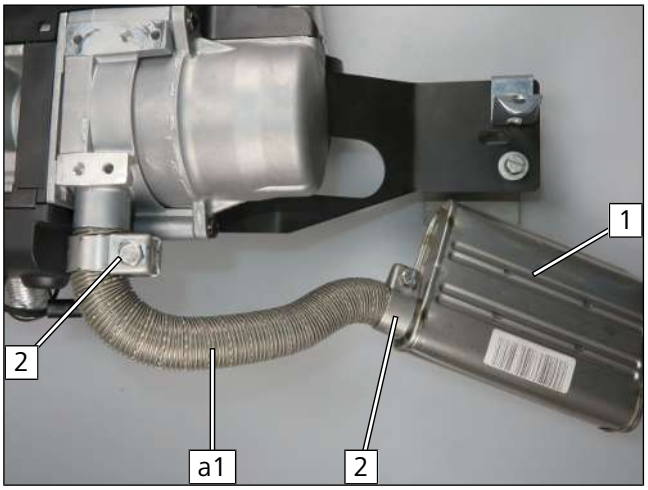


Fig. 39

▶ Mount exhaust silencer **1** onto exhaust pipe **a1**.

2 Hose clamp

8.3 Heater mounting

Mounting heater

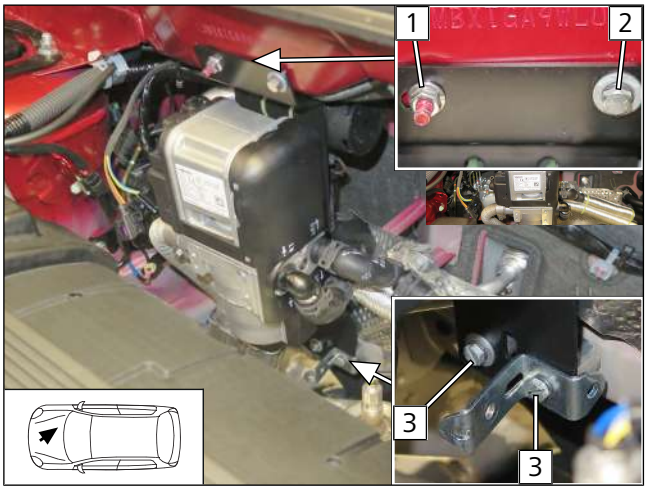


Fig. 40

Observe the general installation instructions of the heater.

1 Original vehicle stud bolt, HG bracket, flanged nut

2 M6x20 bolt, spring lockwasher, large diameter washer, rivet nut

3 Tighten premounted M6x50 bolt in rivet nut

Mounting exhaust silencer

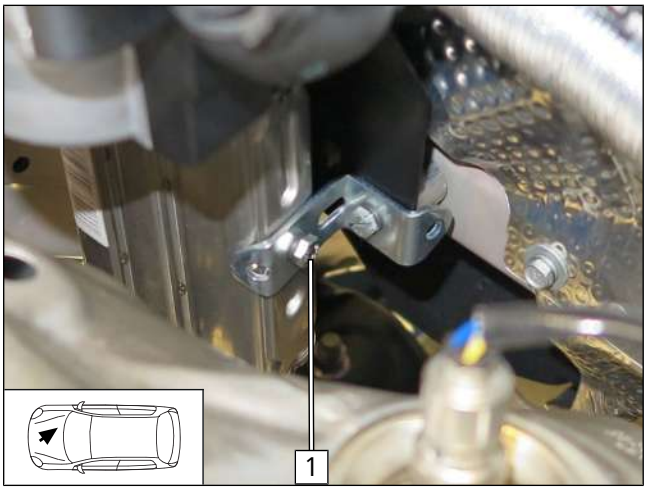


Fig. 41

1 M6x16 bolt, spring lock washer, perforated bracket, exhaust silencer

Mounting heater wiring harness connector

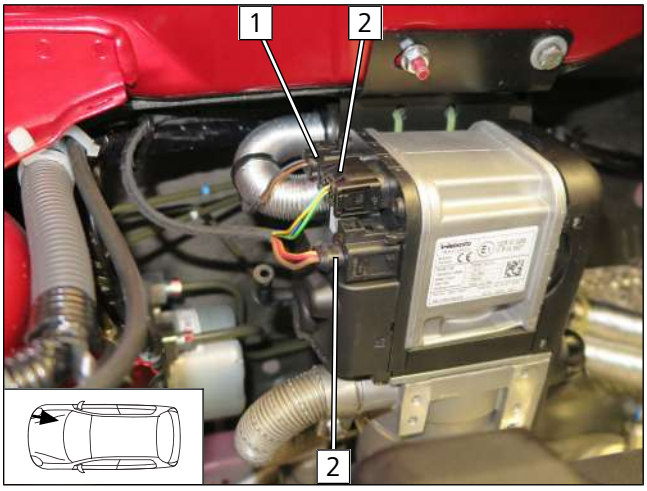


Fig. 42

1 Coolant pump wiring harness connector

2 Heater wiring harness connector

9 Coolant

9.1 Hose routing diagram

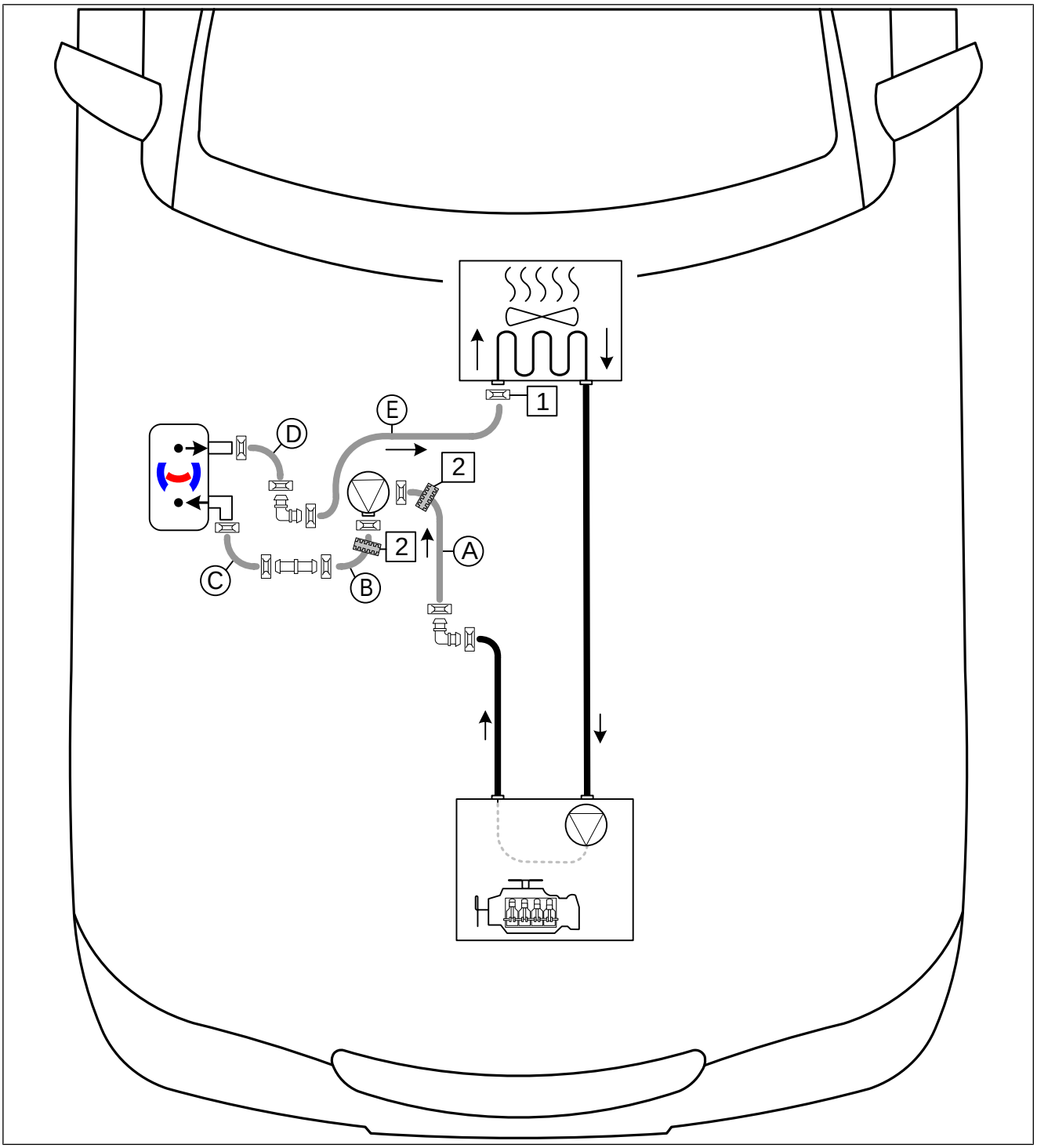


Fig. 43

All spring clips without a specific designation = Ø25

All connecting pipes without a specific designation or = Ø18x18

1 Original vehicle spring clip; 2 Ø22 black (sw) rubber isolator

9.2 Coolant circuit installation

Removing engine outlet / heat exchanger inlet hose

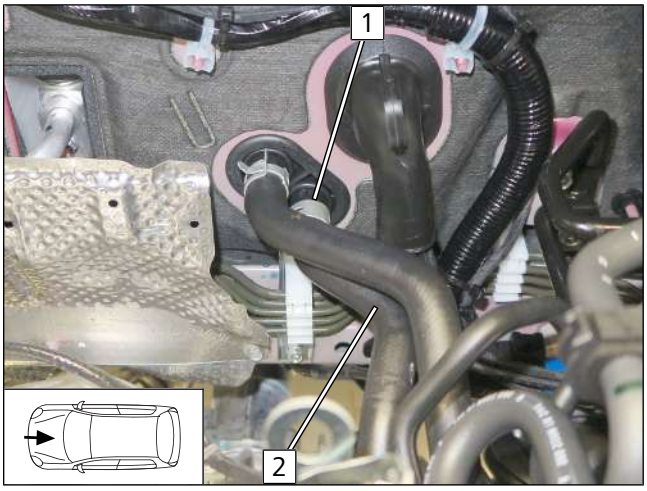


Fig. 44

▶ Disconnect engine outlet/heat exchanger inlet hose 2 from heat exchanger inlet connection piece 1.

Connecting hose (E) to heat exchanger inlet

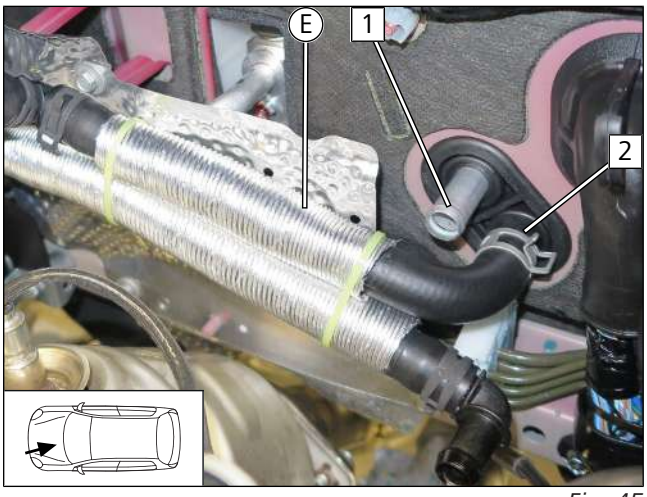


Fig. 45

For a better view, the heat exchanger outlet/ engine inlet hose 1 for a better view.

2 Heat exchanger inlet connection with original vehicle spring clip

Shortening engine outlet/heat exchanger inlet hose

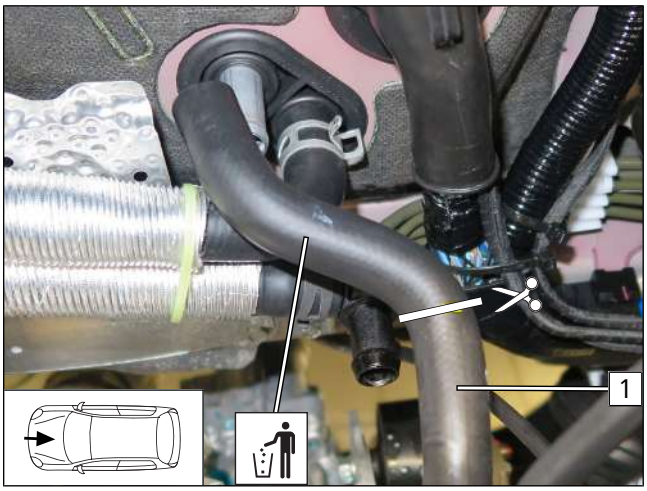


Fig. 46

1 Hose section to engine outlet

Connecting hose Ⓐ to engine outlet

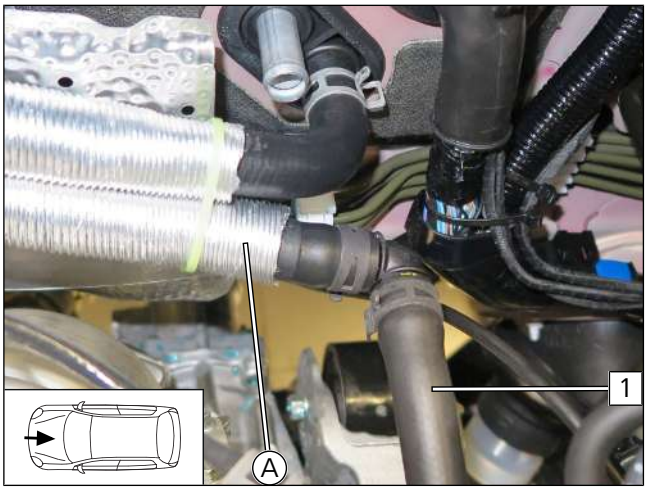


Fig. 47

1 Engine outlet hose section

Fastening hoses

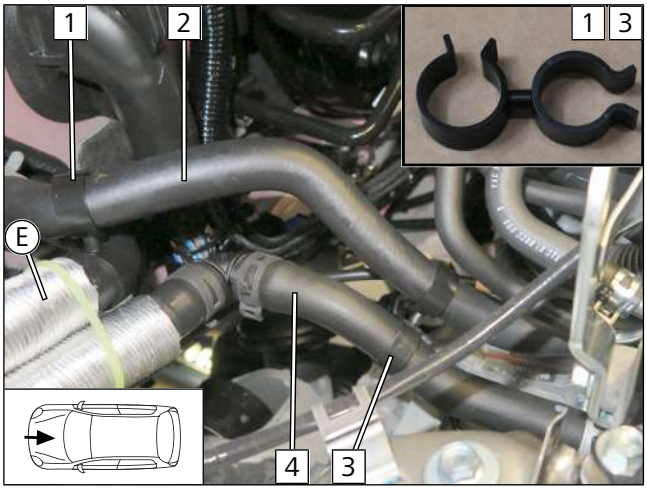


Fig. 48

1 Hose bracket around heat exchanger outlet hose 2 and hose Ⓑ

3 Hose bracket around engine outlet hose 4 and heat exchanger outlet hose 2

10 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

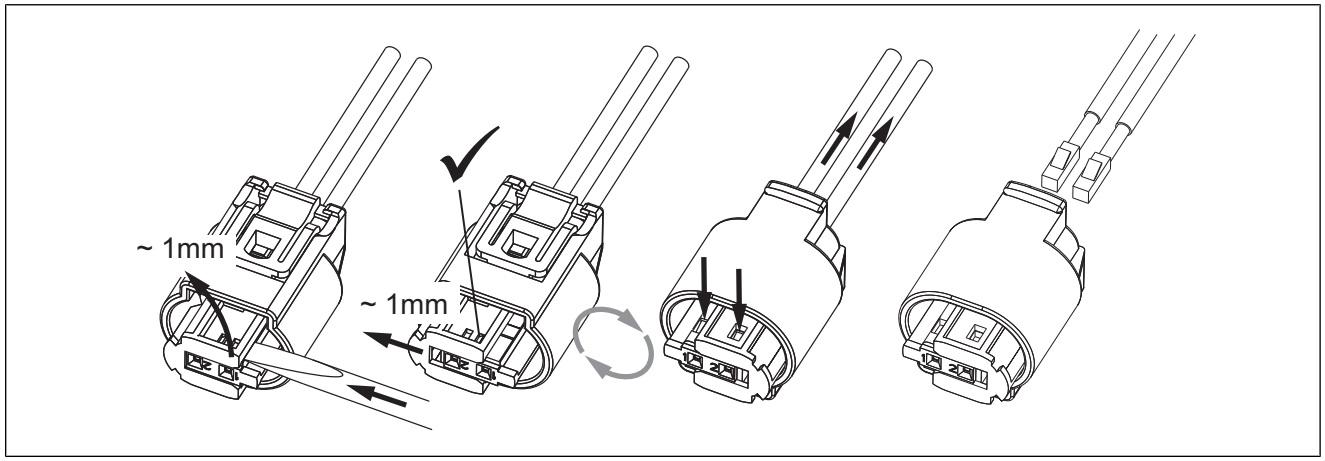


Fig. 49

10.1 Routing fuel line

Connecting heater

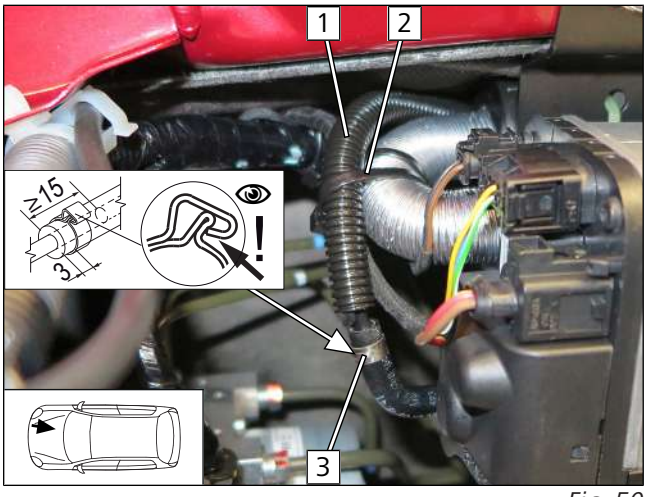


Fig. 50

- ▶ Draw fuel line and fuel pump wiring harness into corrugated tube [1] and route along original vehicle lines to the driver's side.

[2] Cable tie around corrugated tube and combustion air intake pipe

[3] Ø10 clamp

Routing in engine compartment

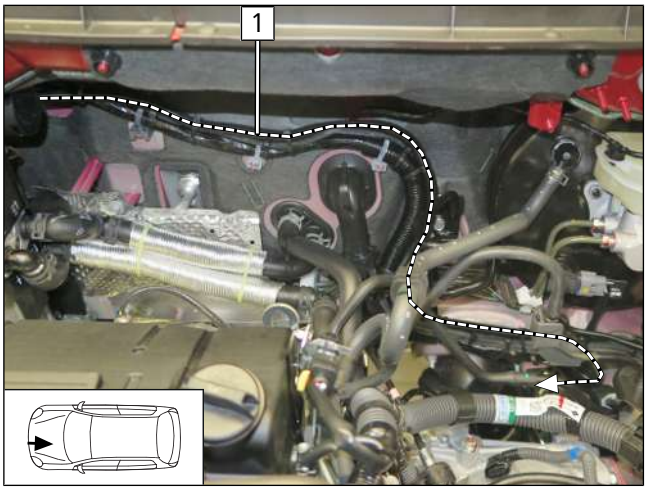


Fig. 51

- Route corrugated tube 1 along the firewall on original vehicle lines to the underbody.

Routing on underbody

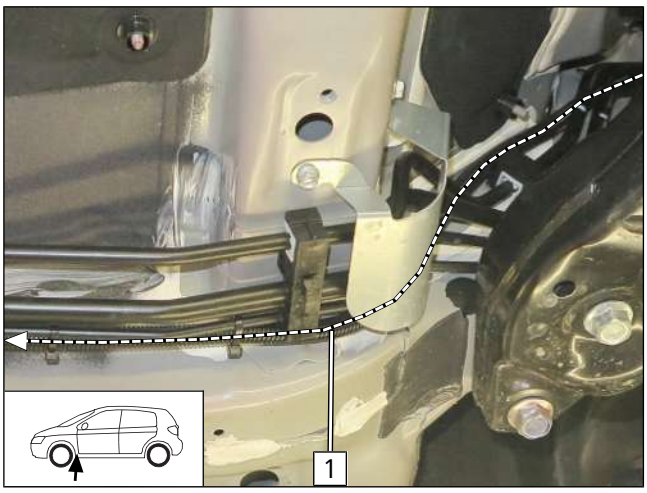


Fig. 52

- Route corrugated tube 1 along original vehicle fuel lines on the underbody.

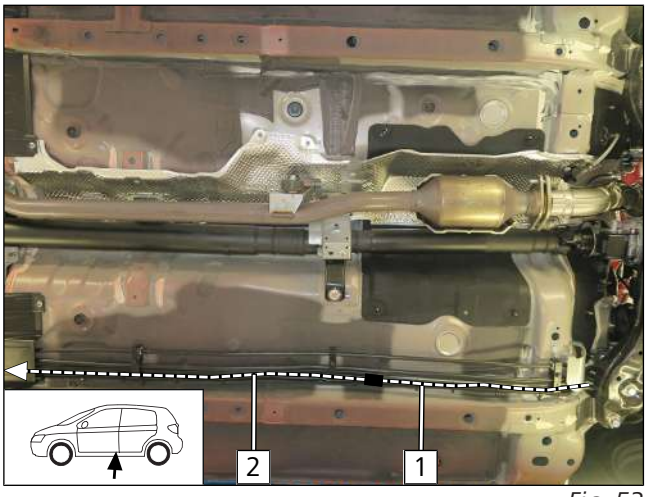


Fig. 53

- Draw 1000 long fuel line into corrugated tube 2.
- Wrap the joint between corrugated tubes 1 and 2 with insulating tape.
- Route corrugated tubes on underbody along original vehicle lines to the installation location of the fuel pump and fasten with cable ties.

10.2 Mounting and connecting fuel pump

Removing stoneguard

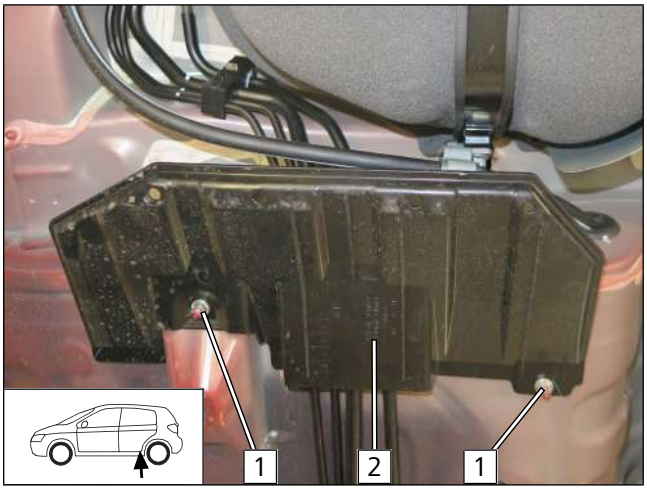


Fig. 54

▶ Temove stoneguard [2] at pos. [1].

Preparing perforated bracket

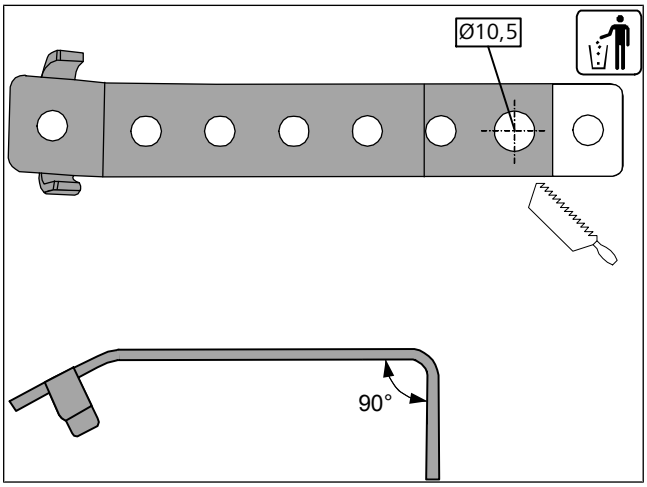


Fig. 55

Installing perforated bracket

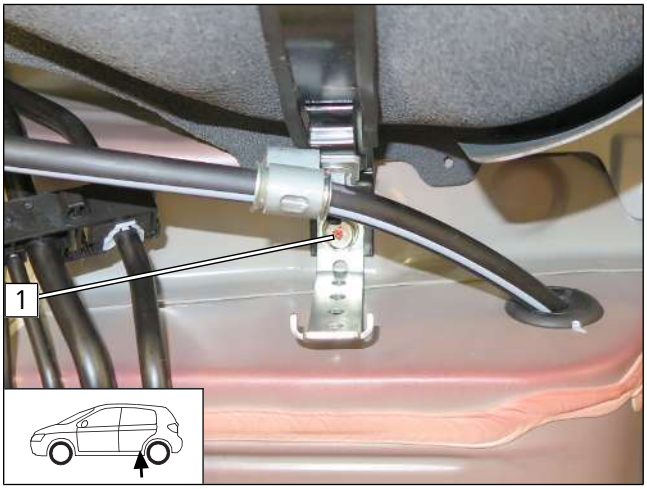


Fig. 56

▶ Remove original vehicle bolt an pos. [1], position perforated bracket, fit bolt again.

Premounting fuel pump

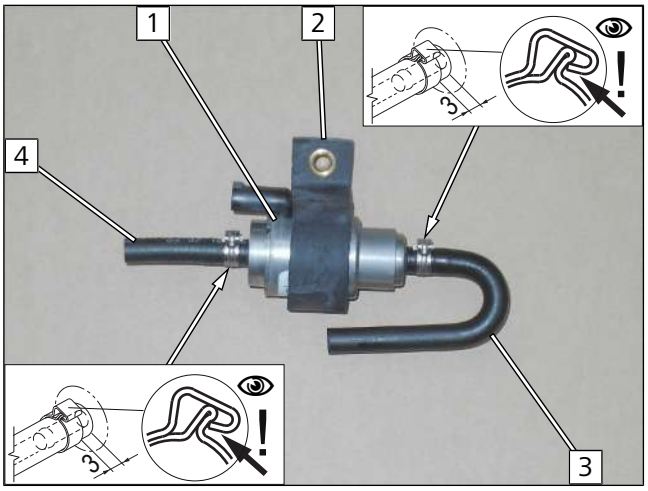


Fig. 57

1 Fuel pump
2 Fuel pump mount
3 180° moulded hose, Ø10 clamp
4 Hose section, Ø10 clamp

Mounting fuel pump

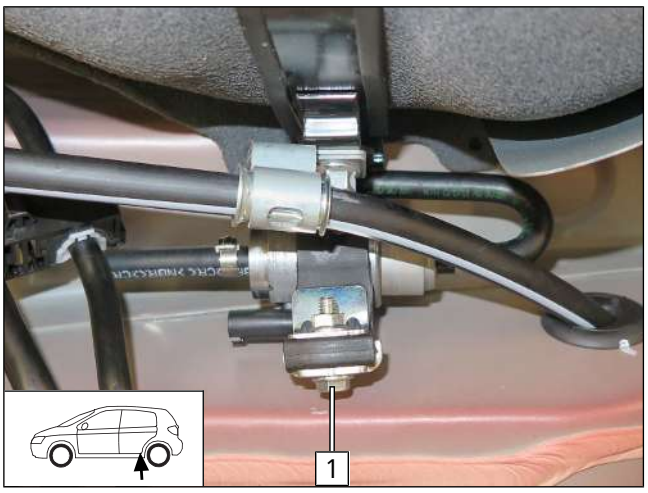


Fig. 58

1 M6x25 bolt, perforated bracket, fuel pump mount, support angle bracket, flanged nut

Aligning fuel pump

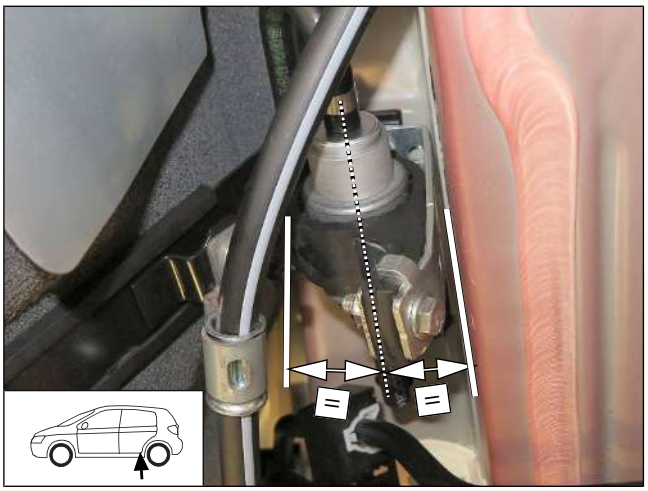


Fig. 59

▶ Centre the fuel pump as shown.

Assembling fuel pump connector X7

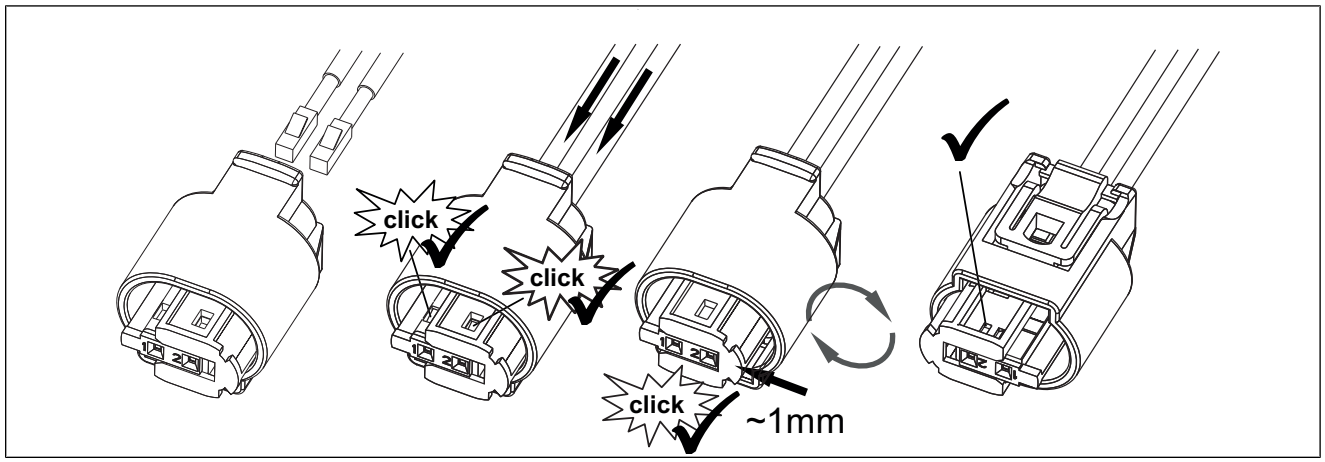


Fig. 60

Connecting fuel pump

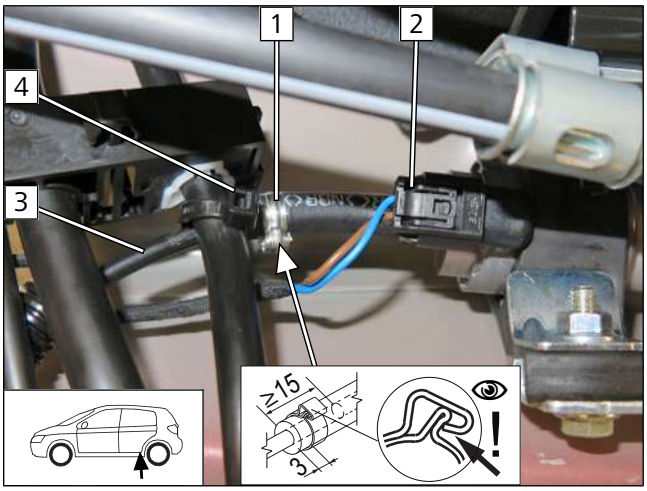


Fig. 61

1. Ø10 clamp
2. Fuel pump wiring harness, connector X7 mounted
3. Heater fuel line
4. Cable tie around fuel line and original vehicle line

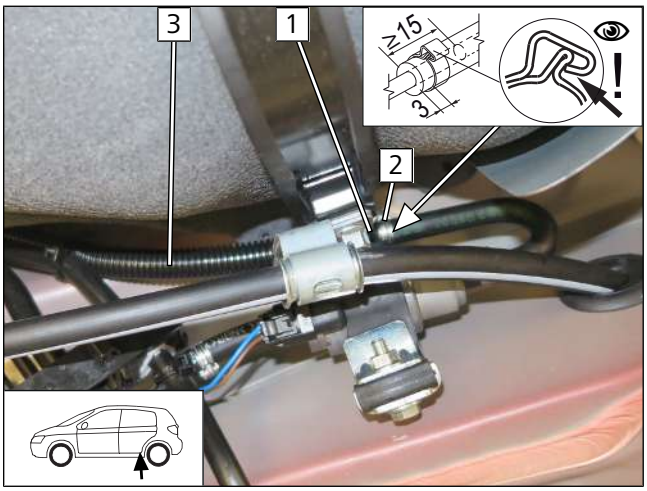


Fig. 62

1. Fuel line of FuelFix
2. Ø10 clamp
3. Ø10, 60 long corrugated tube

Routing fuel line

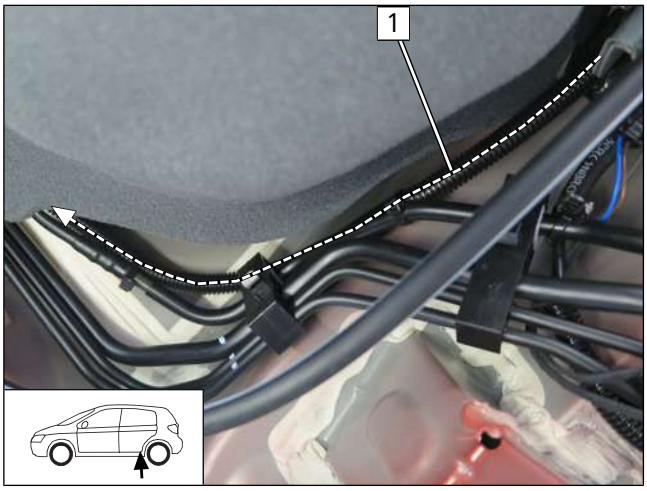


Fig. 63

▶ Route corrugated tube with fuel line **1** to tank fitting.

Fastening fuel pump wiring harness

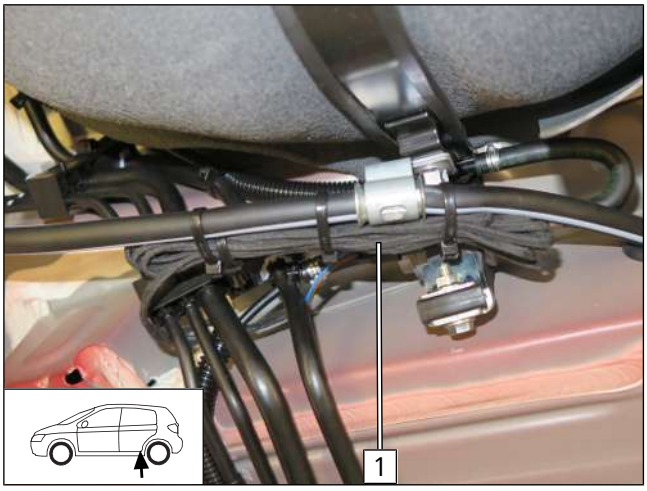


Fig. 64

▶ Fasten the rest of fuel pump wiring harness **1** with cable ties to the handbrake cable.

Mounting stoneguard

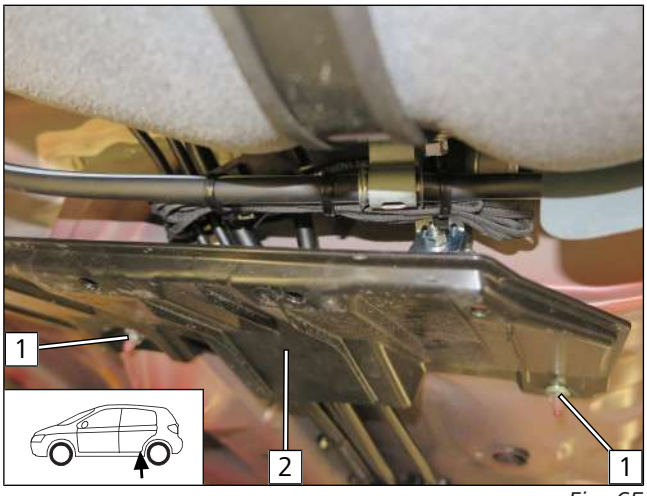


Fig. 65

▶ Mount stoneguard **2** at pos. **1**.

10.3 Installing FuelFix

View of drilling template

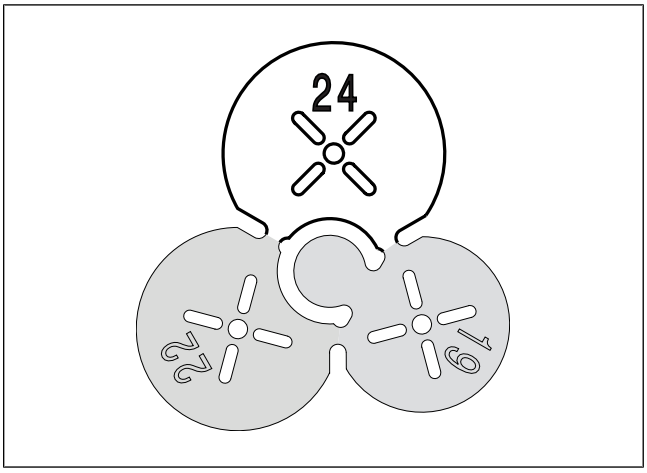


Fig. 66

Work steps F1, F2

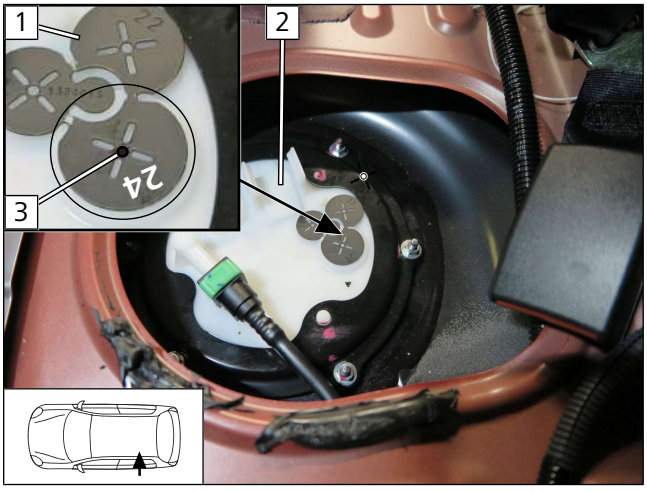


Fig. 67

Observe the installation instructions of the tank extracting device.

▶ Position Ø24 drilling template [1] at the centre of the raised part as shown.

[2] Tank fitting

[3] Hole pattern

Work step F3

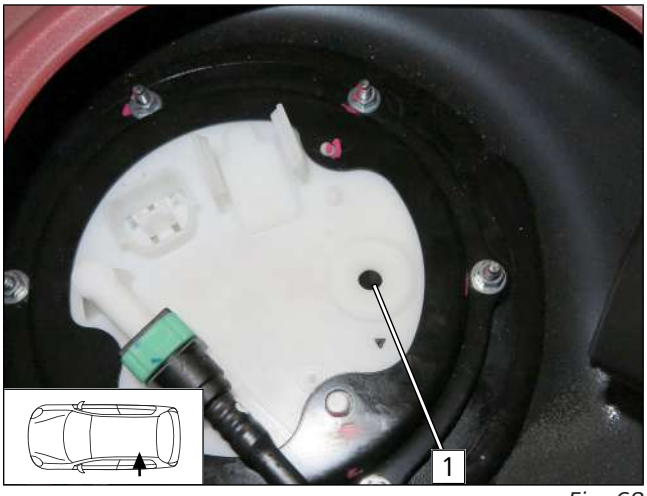


Fig. 68

DANGER

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

[1] Hole made with provided drill

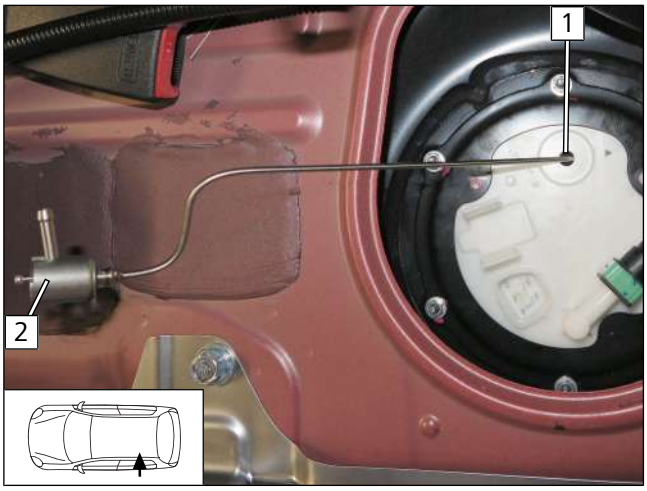


Fig. 69

▶ Bend FuelFix [2] according to template and cut to length. Insert in hole [1].

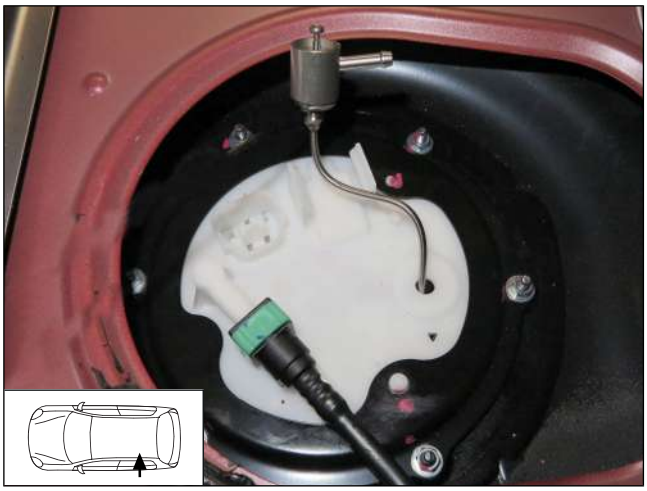


Fig. 70

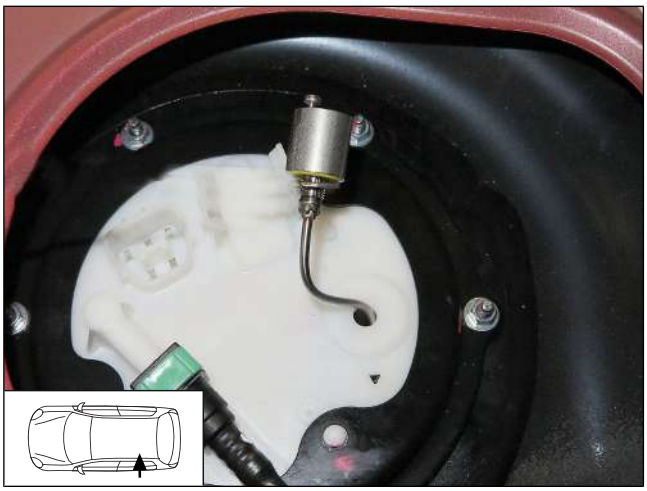


Fig. 71

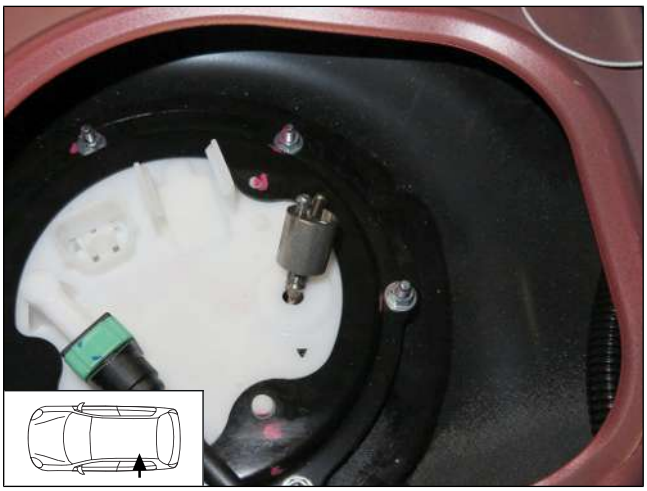


Fig. 72

Work steps F5.3, F5.4

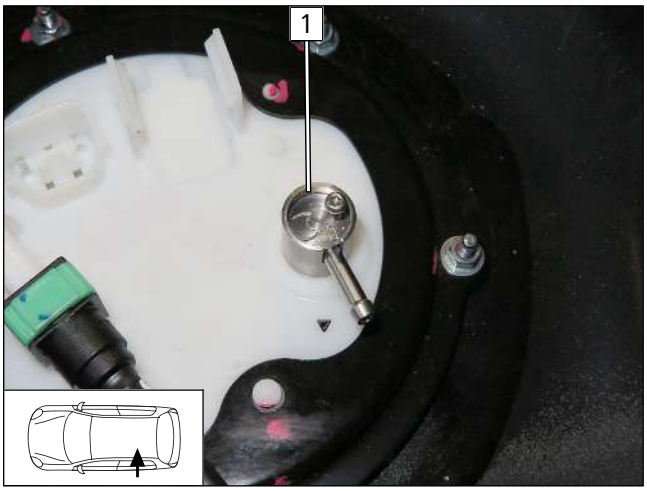


Fig. 73

▶ Align FuelFix **1** as shown.

Work step F6

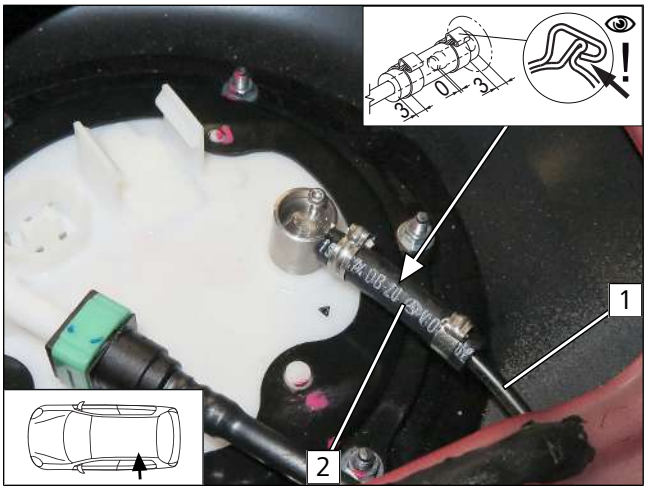


Fig. 74

1 Fuel line
2 Hose section, Ø10 clamp [2x]

Work step F7

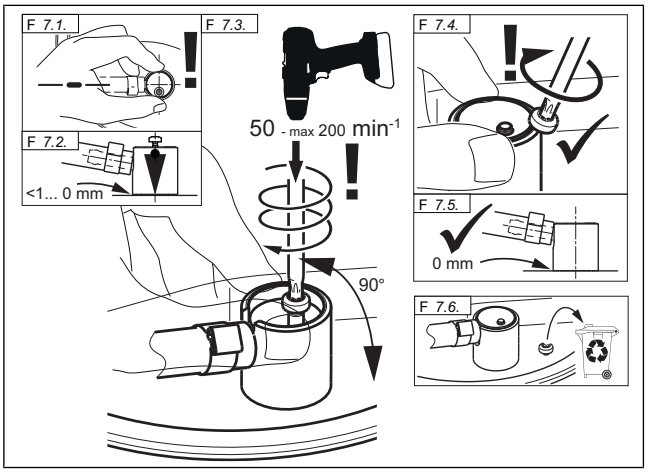


Fig. 75

DANGER

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

Work step F8

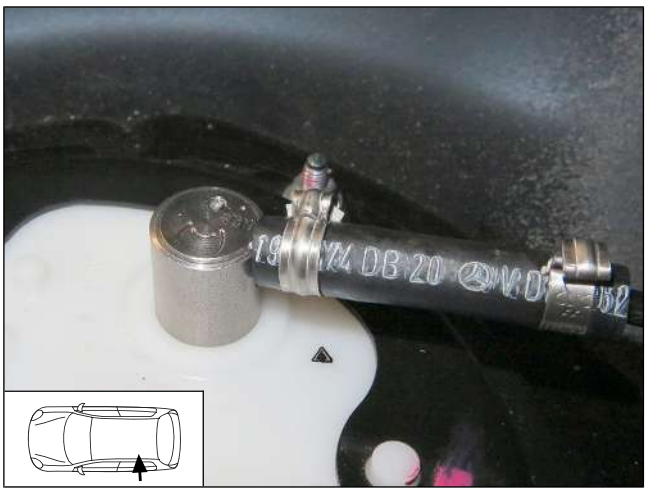


Fig. 76

Securing fuel line

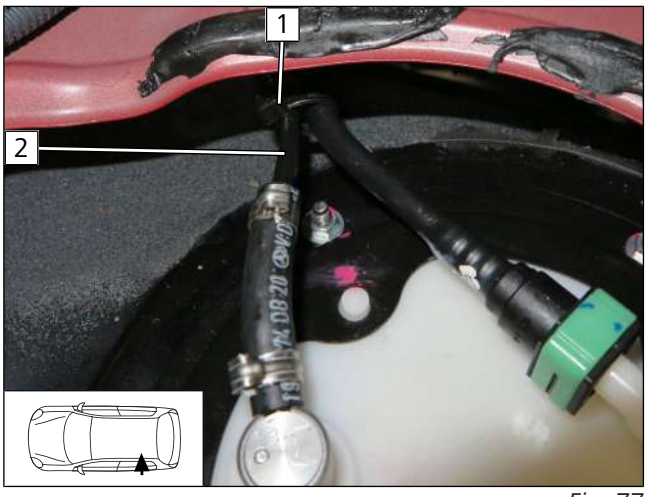


Fig. 77

▶ Secure fuel line 2 using cable tie 1 for tension relief.

11 Exhaust

Preparing exhaust pipe **a2**

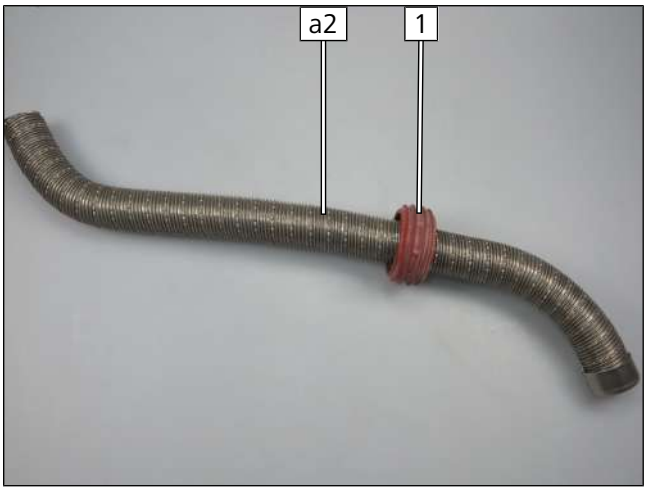


Fig. 78

1 Spacer bracket

Preparing perforated bracket 1

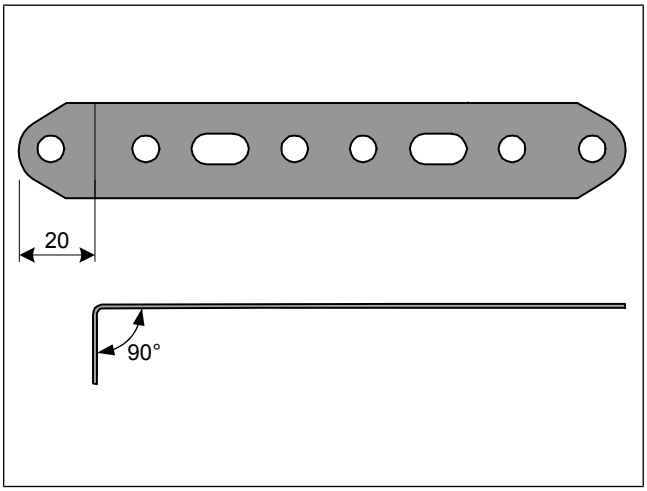


Fig. 79

Preparing perforated bracket 2

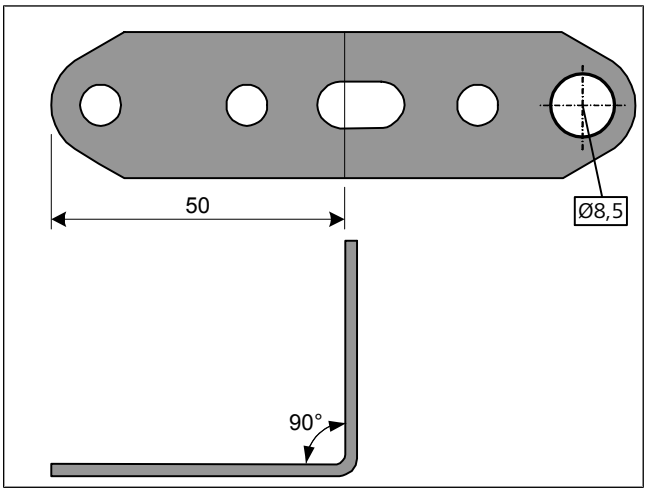


Fig. 80

Inserting rivet nut

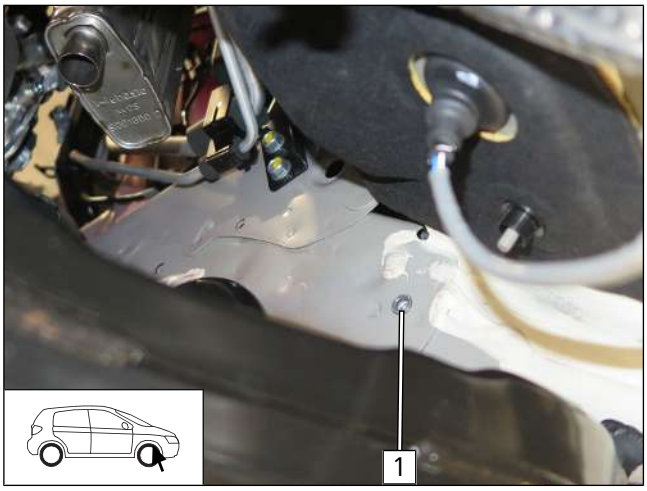


Fig. 81

1 Rivet nut in original vehicle hole

Mounting perforated bracket 1

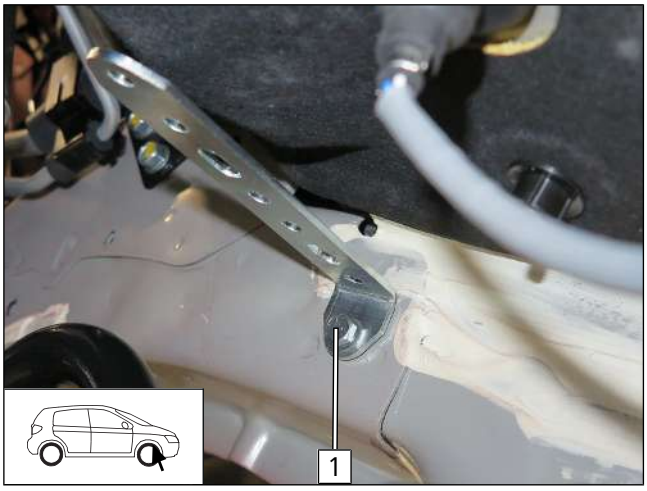


Fig. 82

1 M6x20 bolt, spring lock washer, perforated bracket 1, rivet nut

Mounting exhaust pipe **a2** onto exhaust silencer

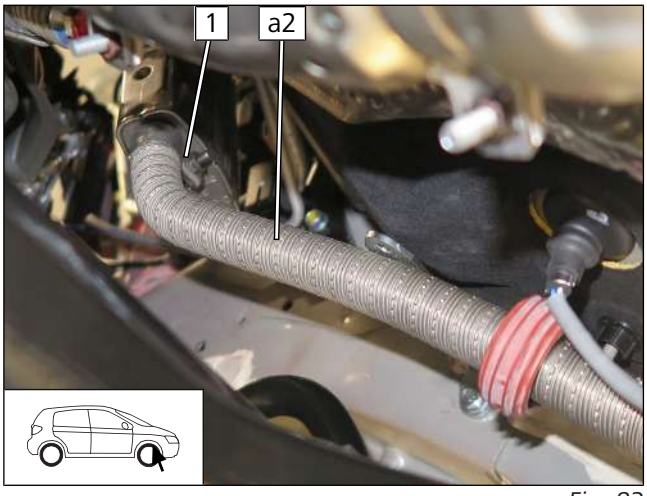


Fig. 83

1 Hose clamp

Fastening exhaust pipes

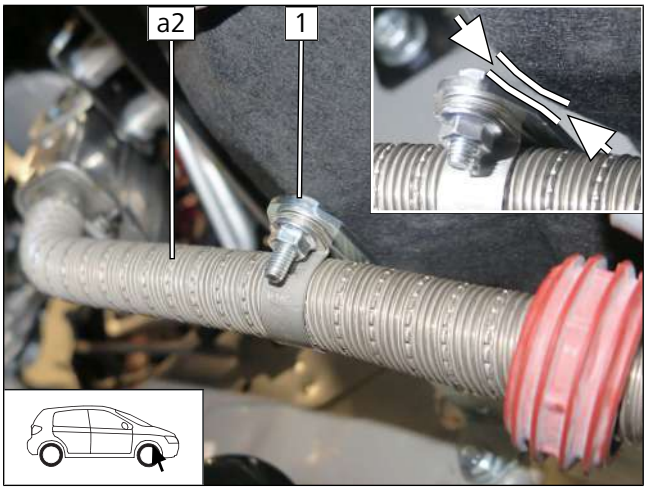


Fig. 84

Ensure sufficient distance from neighbouring components, correct if necessary.

>10

1 M6x20 bolt, perforated bracket 1, Ø25 clamp, flanged nut

Mounting perforated bracket 2

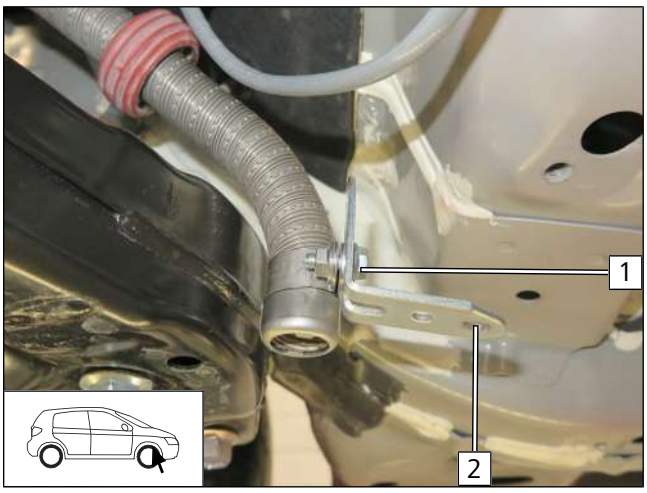


Fig. 85

1 M6x16 bolt, perforated bracket 2, Ø25 clamp, flanged nut

2 Ø8.5 hole

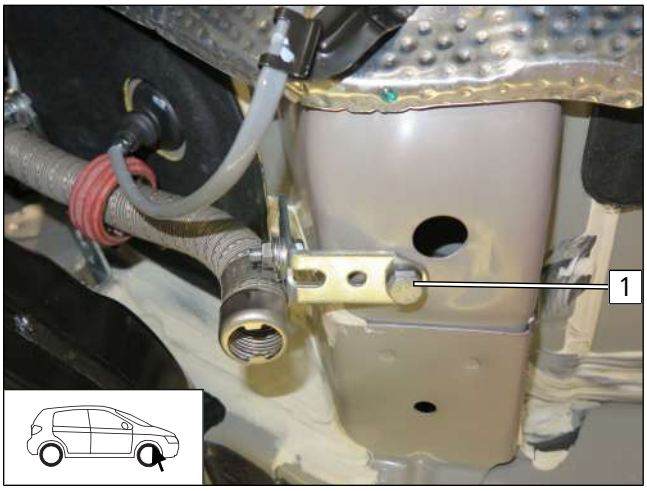


Fig. 86

1 M8x20 bolt, spring lock washer, perforated bracket 2, original vehicle threaded hole

Aligning spacer bracket

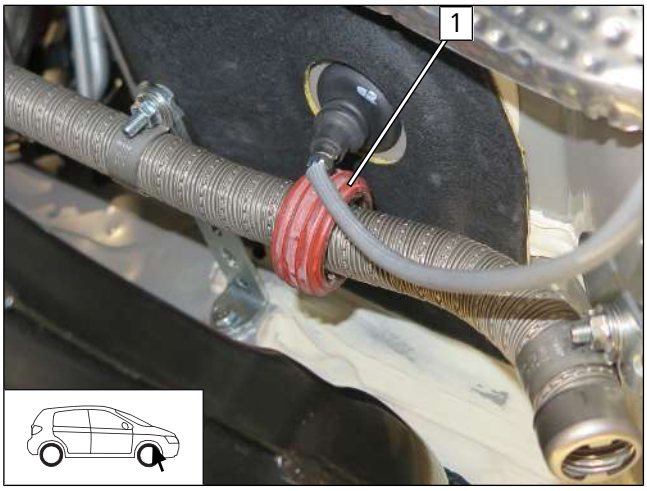


Fig. 87

▶ Align spacer bracket **1** with line.

Checking distance

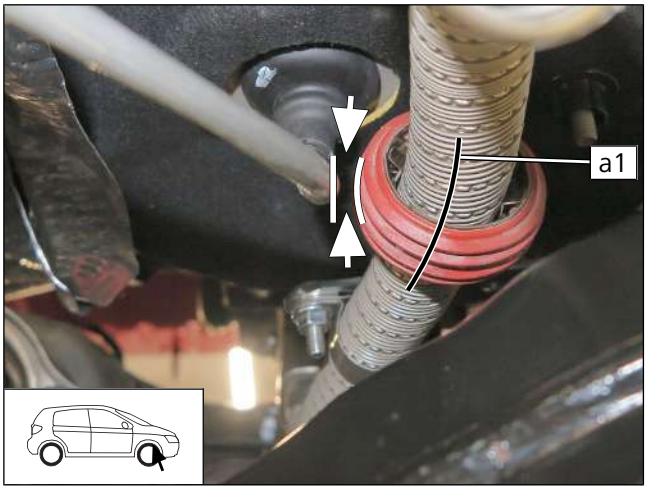


Fig. 88

Ensure sufficient distance between exhaust pipe **a1** and original vehicle line, correct if necessary.

▶ Bend exhaust pipe **a1** slightly.

12 Electrical system of passenger compartment

12.1 Electrical system preparation

Assigning wires

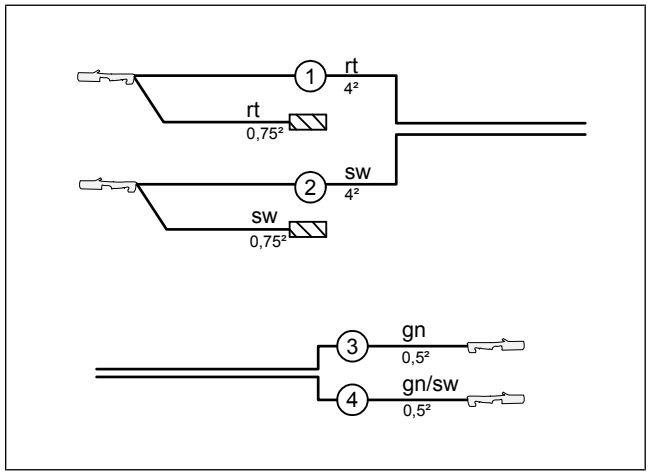


Fig. 89

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
③ Green (gn) wire from wiring harness of PWM control
④ Green/black (gn/sw) wire from wiring harness of PWM control

View of PWM GW

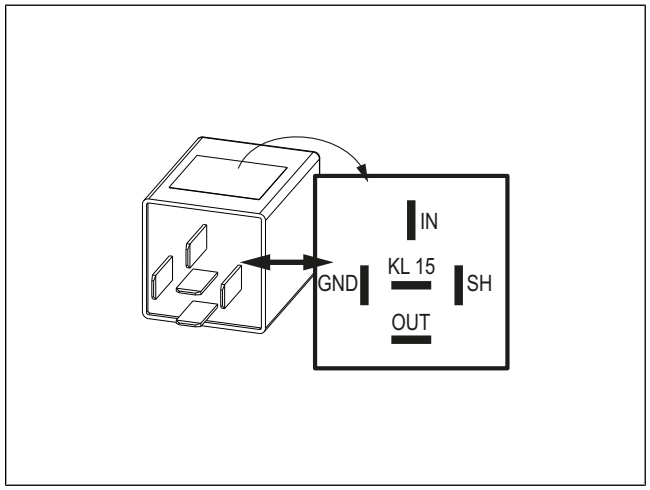


Fig. 90

▶ Check PWM GW settings when starting-up the heater, adjust if necessary to 1/3 of the fan capacity by changing the voltage.

Parameter	Setting
Duty cycle	100% [DC]
Frequency	not relevant
Voltage	4.3 V
Function	High side

Preparing RSH and PWM GW socket

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

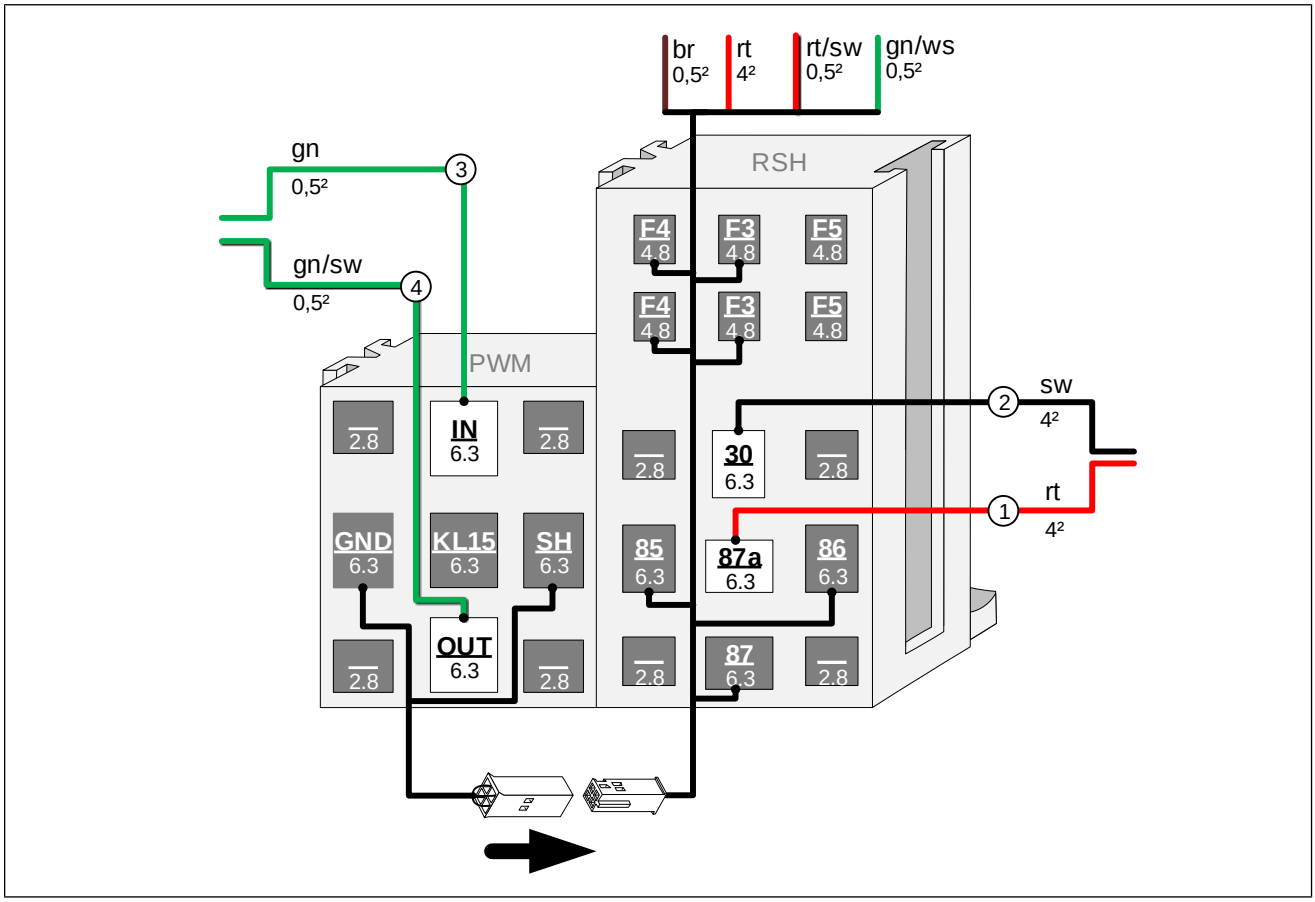


Fig. 91

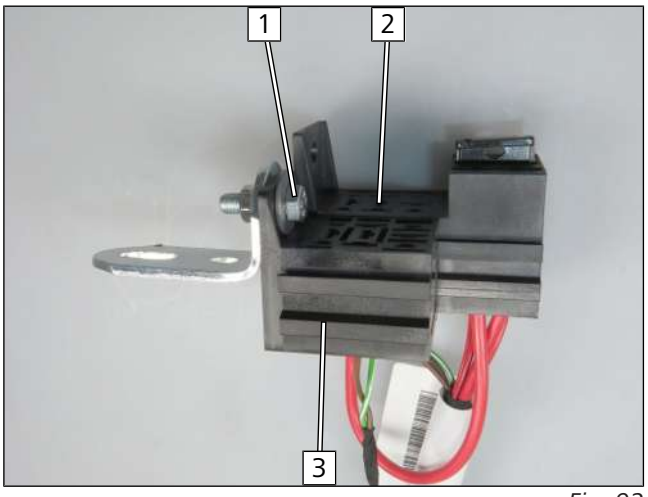


Fig. 92

1 M5x16 bolt, large diameter washer, PWM GW socket, angle bracket, large diameter washer, nut

2 RSH socket

3 PWM GW socket

Preparing RSH installation location

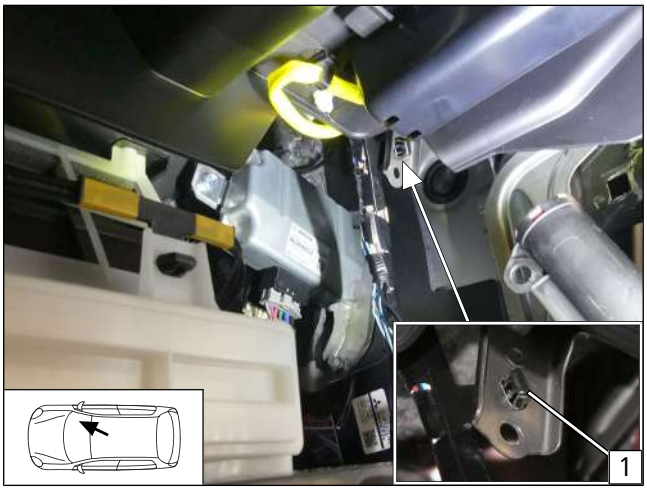


Fig. 93

▶ Detach original vehicle wiring harness an pos. 1.

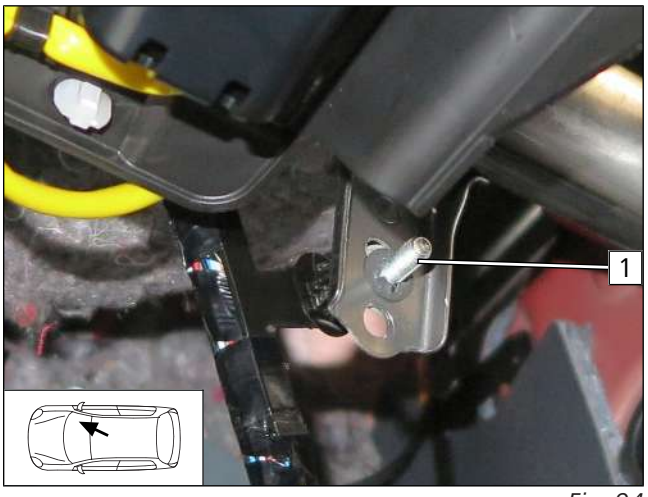


Fig. 94

1 M6x20 bolt, large diameter washer, original vehicle hole, lock washer

Mounting RSH and PWM GW

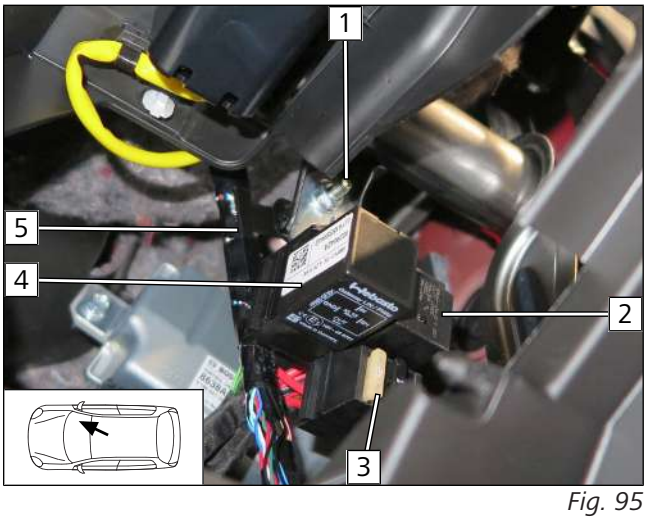


Fig. 95

▶ Fasten original vehicle wiring harness 5 to the angle bracket with a cable tie.

1 Premounted bolt, prepared RSH, flanged nut
2 Relay K1
3 25A fuse F4
4 PWM GW

Connecting same colour wires of wiring harnesses

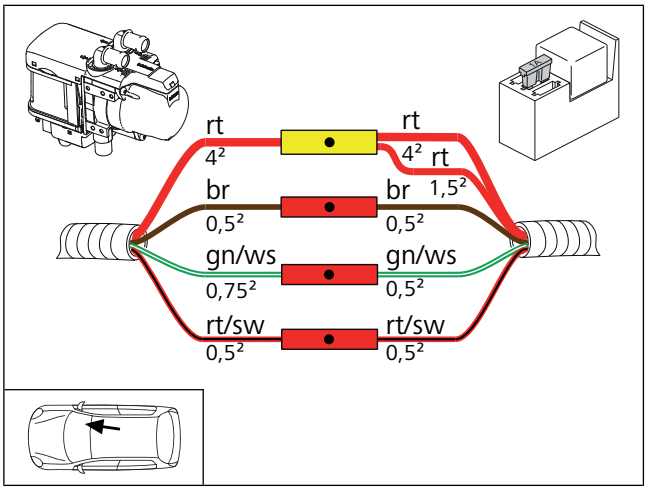


Fig. 96

Installing lines

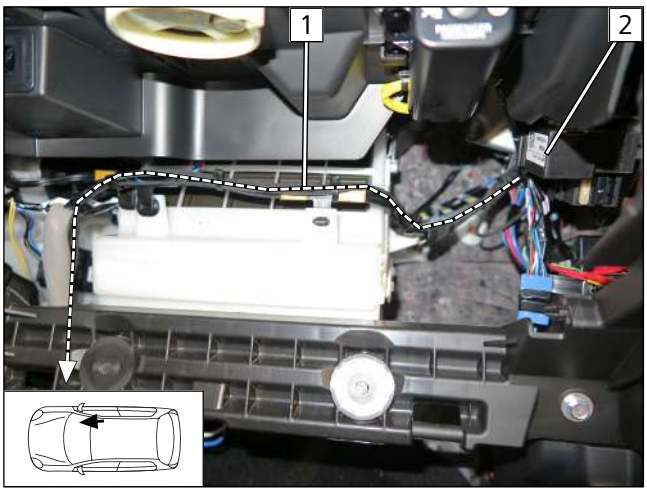


Fig. 97

▶ Route fan wiring harness and PWM control wiring harness [1] from RSH [2] along original vehicle lines in the footwell.

12.2 Wiring diagram

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

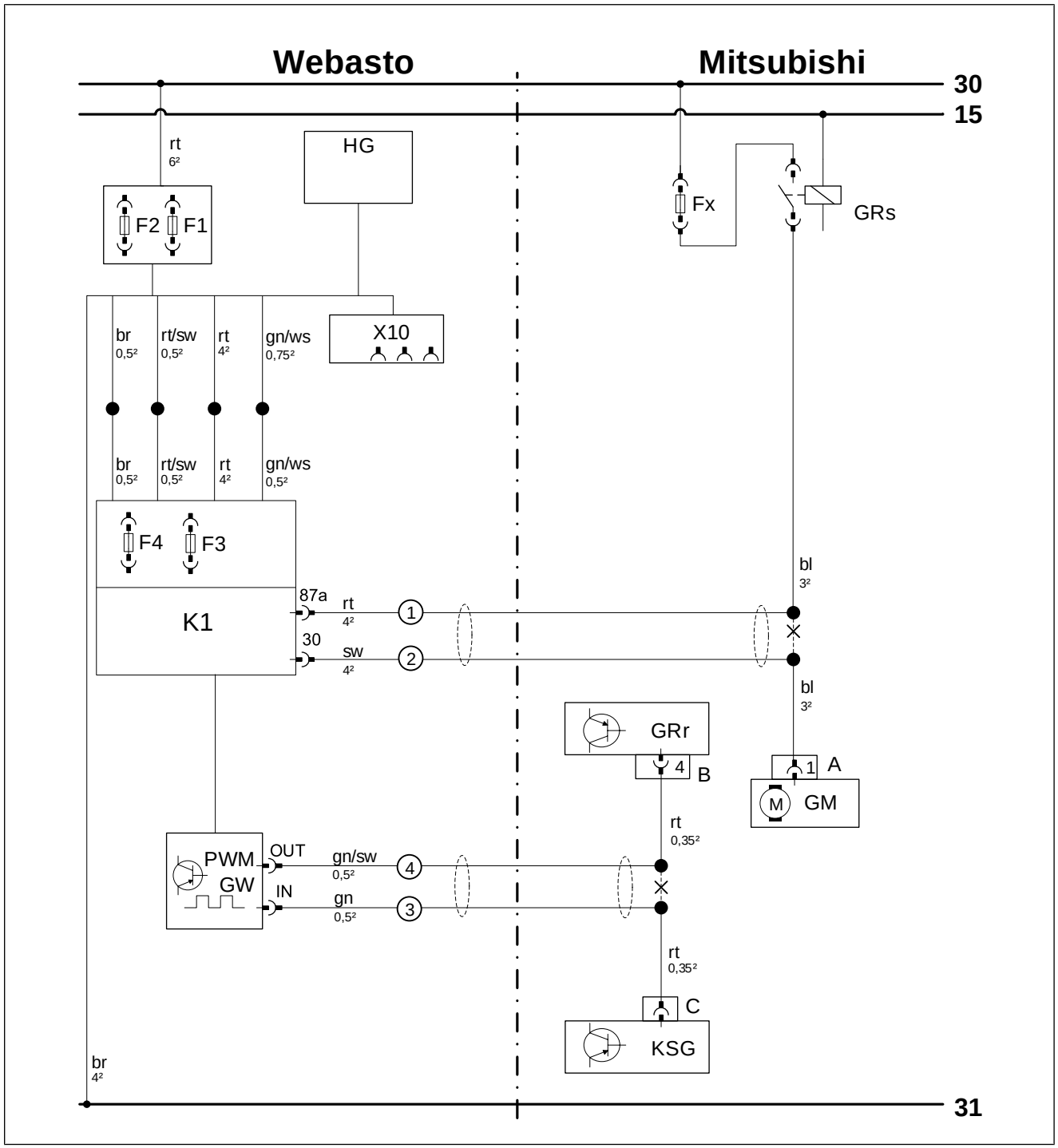


Fig. 98

Legend to wiring diagram

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

Vehicle components		Symbols	
Abbreviation	Component	Abbreviation	Explanation
Fx	Fuse	X	Cutting point
GRs	Fan relay		
GM	Fan motor		
A	Fan motor connector		
GRr	Fan controller		
B	Fan controller connector		
KSG	Air-conditioning control unit		
C	Air-conditioning control unit connector		

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	rt	red
F3	Control element fuse	sw	black
F4	Fan controller fuse	vi	violet
F5	Additional fuse	ws	white
HG	Heater TT-Evo		
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		

12.3 Fan controller

View of connector A and B

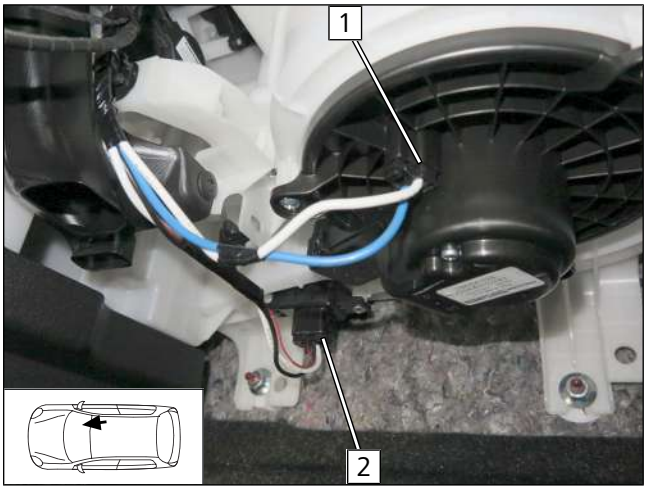


Fig. 99

1 Fan motor connector A
2 Detach fan controller connector B

Fan motor connection

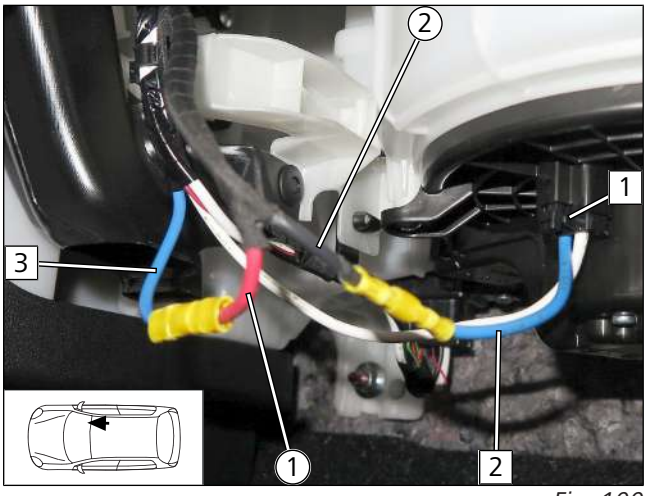


Fig. 100

1 Fan motor connector A
2 Blue (bl) wire of connector A/ pin 1
3 Wire blue (bl) wire of fan relay
① Red (rt) wire of K1/87a fan wiring harness
② Black (sw) wire of K1/30 fan wiring harness

Connection to fan controller

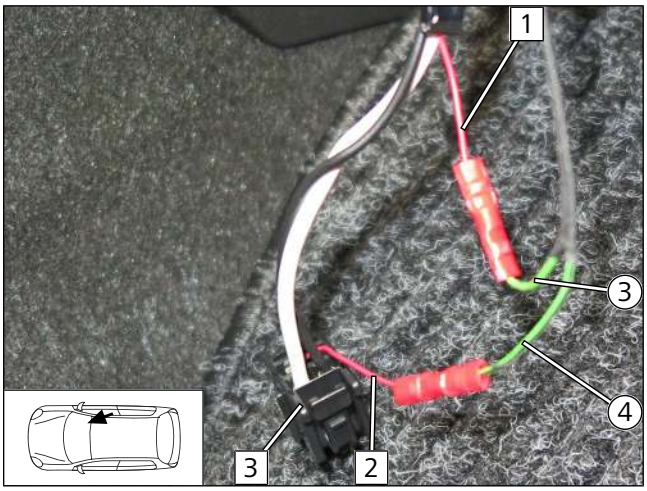


Fig. 101

1 Red (rt) wire of connector C from A/C control unit
2 Red (rt) wire of connector B / pin 4 from fan controller
3 Fan controller connector B
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

12.4 Control element installation

Install the control element in accordance with the provided relevant general installation documentation. The installation location of the optional control element MultiControl or the push button of the Telestart or ThermoCall/ThermoConnect options should be confirmed with the end customer and should comply with the installation conditions.

13 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'.

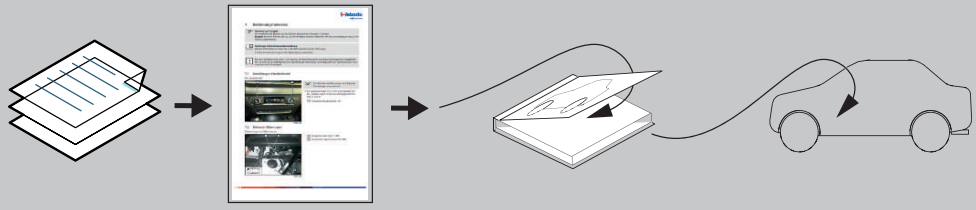
▶ Initial operation and functional test

▶ 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.

Webasto Thermo & Comfort SE
Postfach 1410
82199 Gilching
Germany

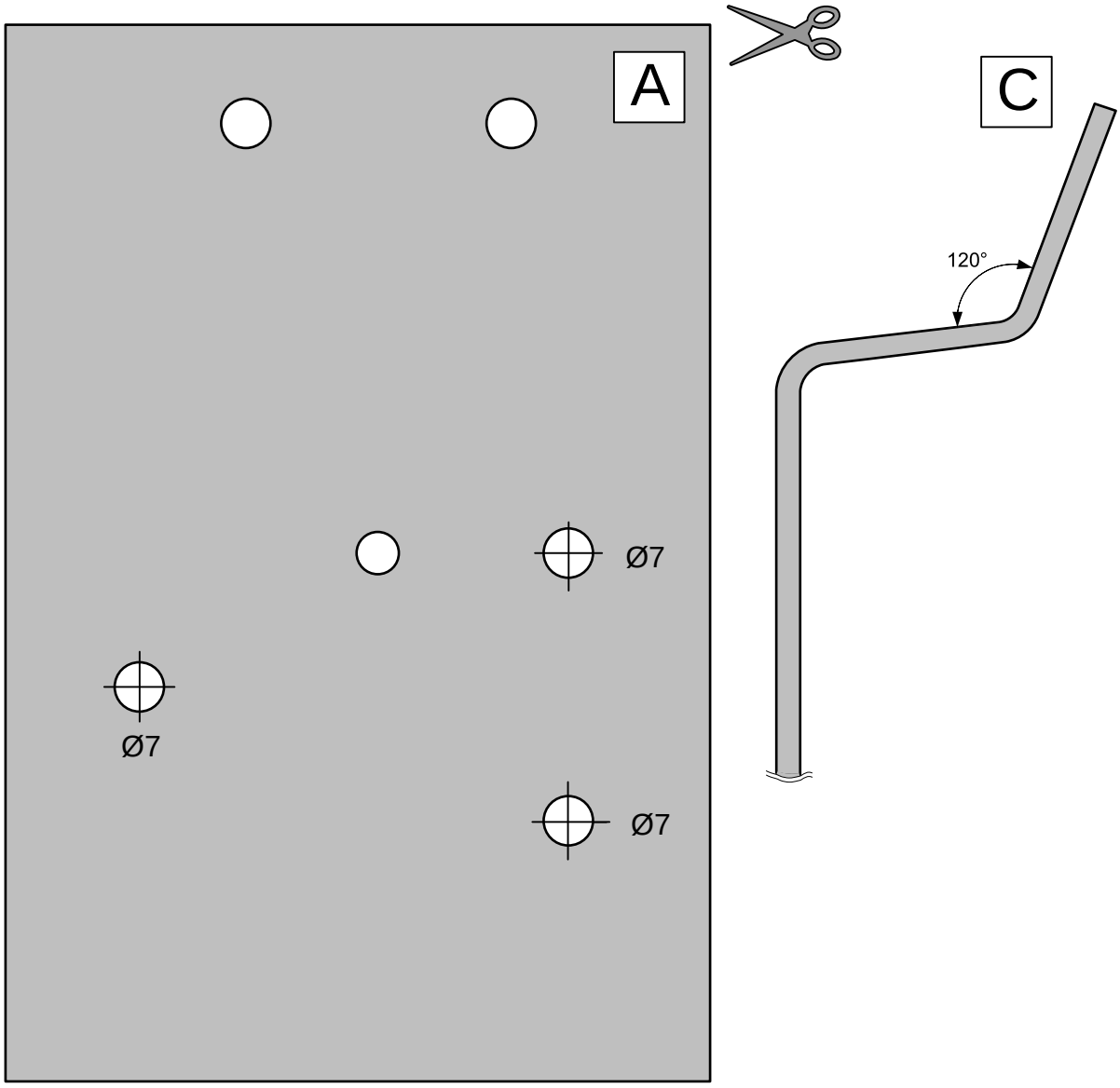
Company address:
Friedrichshafener Str. 9
82205 Gilching
Germany

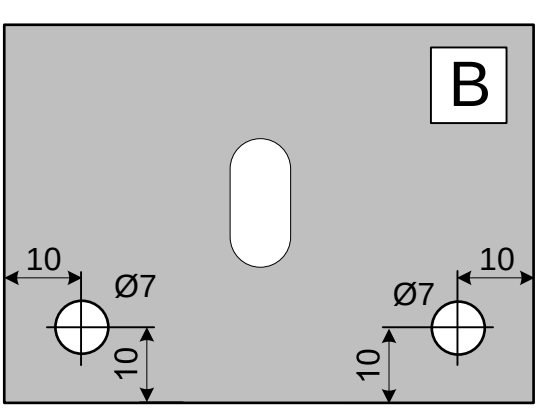
Technical Extranet: https://dealers.webasto.com

CE

WWW.WEBASTO.COM

14 Templates A and B for HG bracket





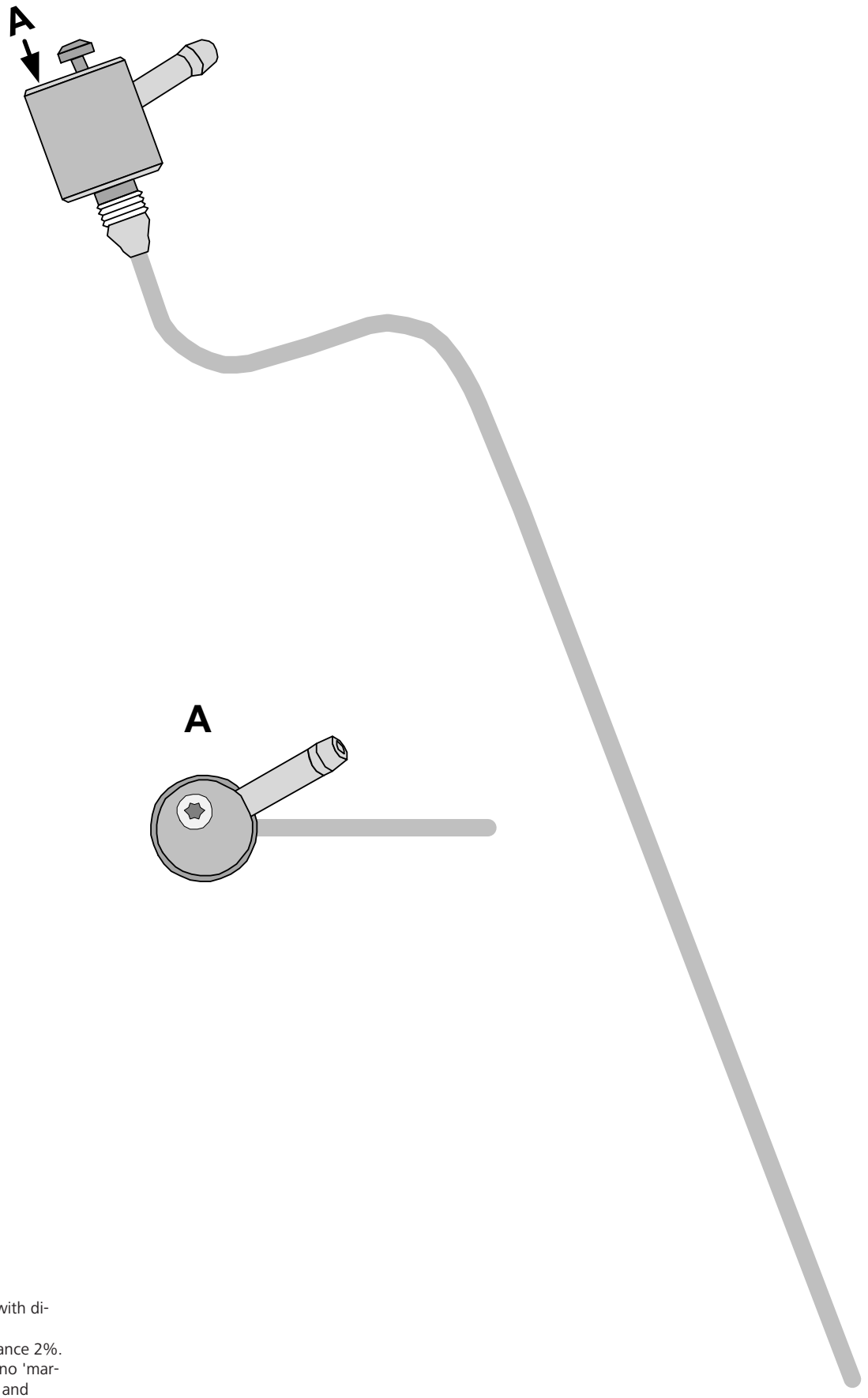
100mm

Scale 1:1
Compare size of printout with dimension lines.
Maximum permitted tolerance 2%.
Set the printer settings to no 'margin' or 'minimise margins' and 100% of the normal size.

0

100mm

15 FuelFix template



100mm

Scale 1:1
Compare size of printout with dimension lines.
Maximum permitted tolerance 2%.
Set the printer settings to no 'margin' or 'minimise margins' and 100% of the normal size.

0

100mm

16 Operating instructions for automatic air-conditioning

Vehicles with passenger compartment monitoring:

Further information can be found in the vehicle operating instructions.

▶ Deactivate passenger compartment monitoring for the heating operation

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.

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.

Note for parking heater function

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

16.1 A/C control panel settings

Fig. 102

Before parking the vehicle, make the following settings:

▶ The fan speed must not be preset.

1 Air outlet to windscreen
2 Set temperature to 'max.'

16.2 Installation location of fuses

Fuses in engine compartment

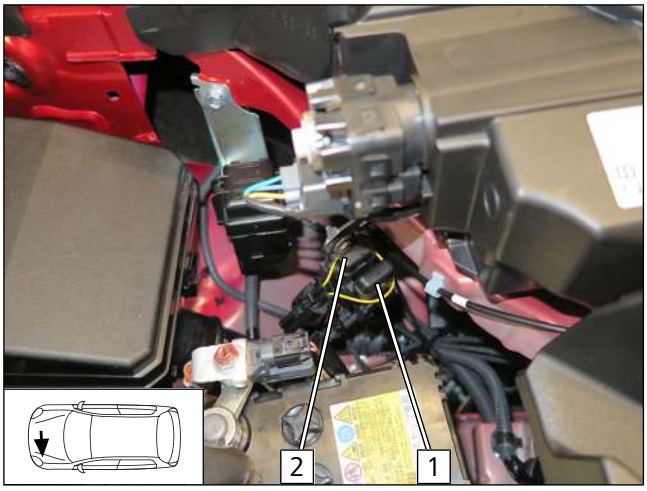


Fig. 103

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

Fuses in passenger compartment

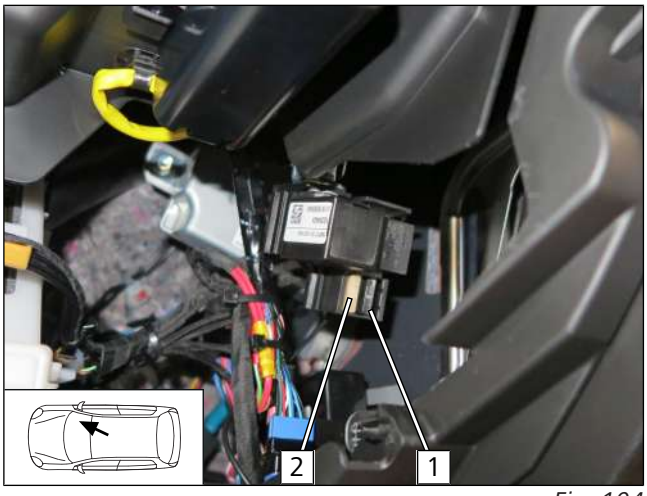


Fig. 104

1 F3 - 1A control element fuse
2 F4 - 25A fan controller fuse