EN

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# Installation documentation

for water heater Thermo Top Evo

'Island' coolant circuit without engine preheating

Hyundai i10

Left-hand drive vehicle

| Manufacturer | Model | Type | Model year | EG-BE-No. / ABE |
|---|---|---|---|---|
| Hyundai | i10 | AC3 | from 2019 | e5* 2007/46* 0090*… |

| Motorisation | Fuel | Emission standard | Transmission type | Output [kW] | Displace-ment [cm³] | Engine code |
|---|---|---|---|---|---|---|
| 1.0 | Petrol | Euro 6d Temp | SG | 49 | 998 | |
| 1.2 | Petrol | Euro 6d Temp | AG | 62 | 1197 | |
| 1.2 | Petrol | Euro 6d Temp | SG | 62 | 1197 | |

| Validity | Equipment variants | Model |
|---|---|---|
| | | i10 |
| Verified equipment variants | Manual air conditioning | x |
| | Automatic air-conditioning | x |
| | Halogen main headlights | x |
| | LED daytime running lights | x |
| | Automatic Start-Stop system | x |
| Unverified equipment variants | Alarm system | x |
| | Halogen front fog lights | x |
| | Keyless Go | x |
| | Start button | x |
| | Static cornering light | X |

| Total installation time | Note |
|---|---|
| 6.9 hours | |

# Contents

# 1 List of abbreviations

| | |
|---|---|
| AG | Automatic transmission |
| DP | Fuel pump |
| FF | FuelFix (tank extracting device) |
| HG | Heater |
| MCC | MultiControl (control element) |
| RSH | Relay and fuse holder of passenger compartment |
| SG | Manual transmission |
| SH2 | Engine compartment fuse holder for F1/F2 |
| UP | Coolant pump |
| Veh. | Vehicle |

# 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.

## 2.2 Components used

| Designation | Order number |
|---|---|
| Basic delivery scope of Thermo Top Evo (see 'installation recommendations') | In accordance with price list |
| Installation kit for Hyundai i10 petrol MY 2020 TT-Evo | 1327909A |
| In case of MultiControl CAR installation - MultiControl installation frame | 9030077_ |
| 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

We recommend:

- installing a Thermo Top Evo 4. The heater is integrated into the coolant circuit as an 'island' and heats up the vehicle passenger compartment. There is no engine pre-heating.

## 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

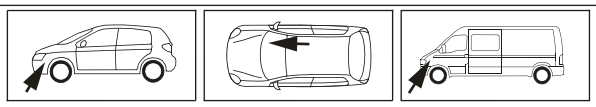
### 3.4.3 Work step identification marks

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<br>▶ Ventilate the fuel tank<br>▶ Close the fuel tank cap again<br>▶ Depressurise the cooling system | |
| Engine compartment and body | ▶ Battery and battery carrier<br>▶ Engine control unit<br>▶ Transmission control unit (automatic transmission only)<br>▶ Entire air filter housing<br>▶ Engine compartment trim on the driver's side<br>▶ Engine underride protection<br>▶ Drain the engine coolant | |
| Passenger compartment | ▶ Lower instrument panel trim on the driver's side<br>▶ A/C control panel (AAC only)<br>▶ Rear bench seat<br>▶ Open the tank fitting service lid | |

## 5.2 Heater preparation

| | | |
|---|---|---|
| Engine compartment | ▶ Remove years that do not apply from the type and duplicate label<br>▶ Attach the duplicate label (type label) in the appropriate place in the engine compartment | |

# 6 Installation overview

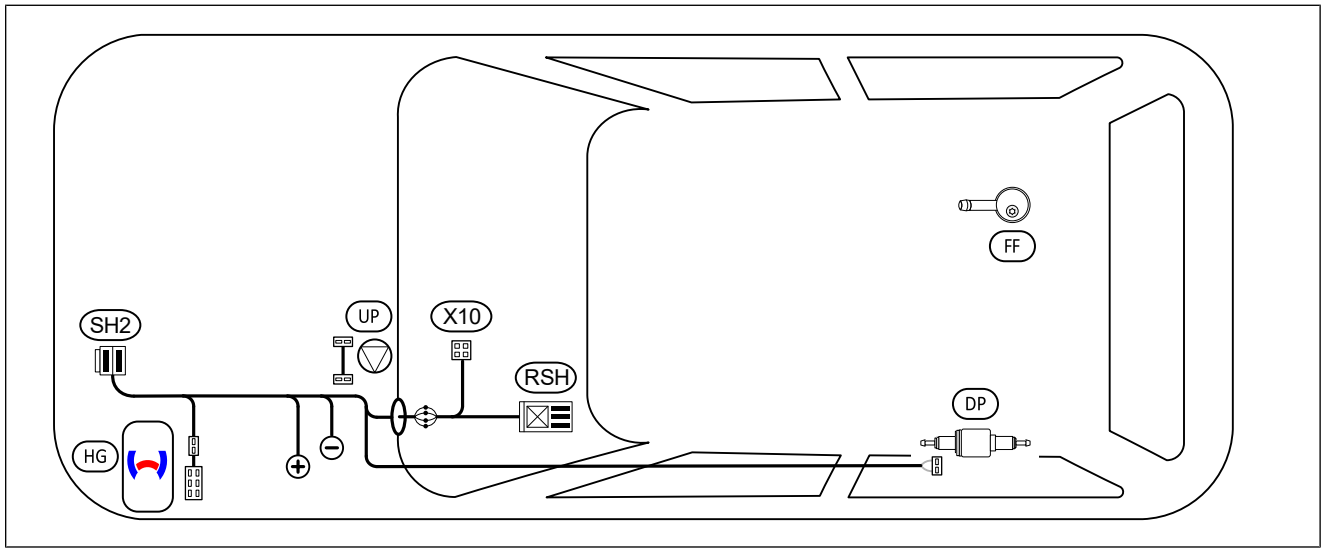



*Fig. 1*

## Legend to installation overview

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

## Heater installation location

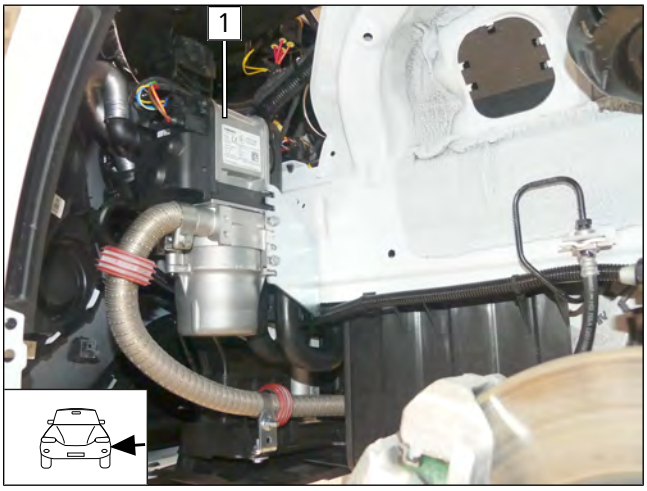



*Fig. 2*

1 Heater

# 7 Electrical system of engine compartment

## Preparing fuse holder of engine compartment

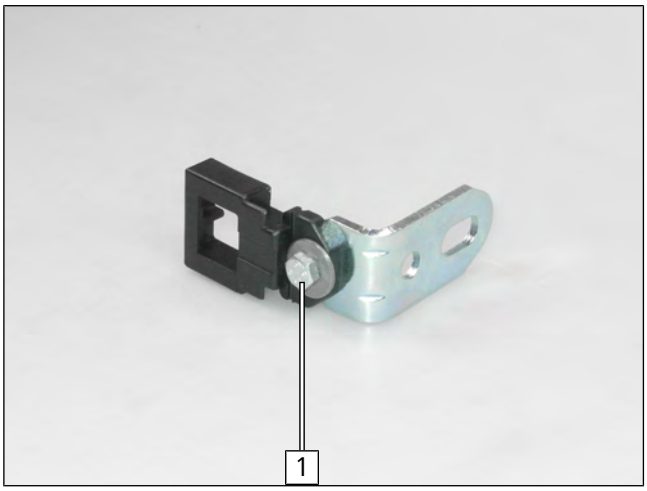



*Fig. 3*

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

## Mounting SH2

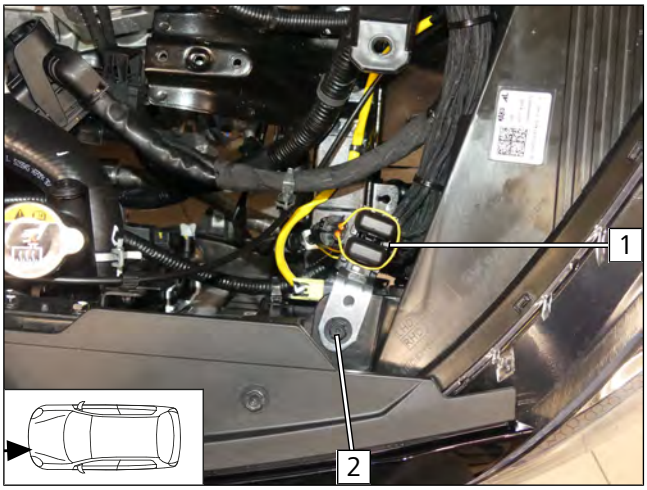



*Fig. 4*

1 SH2 with F1/F2

2 Original vehicle bolt, premounted angle bracket

## Mounting positive wire

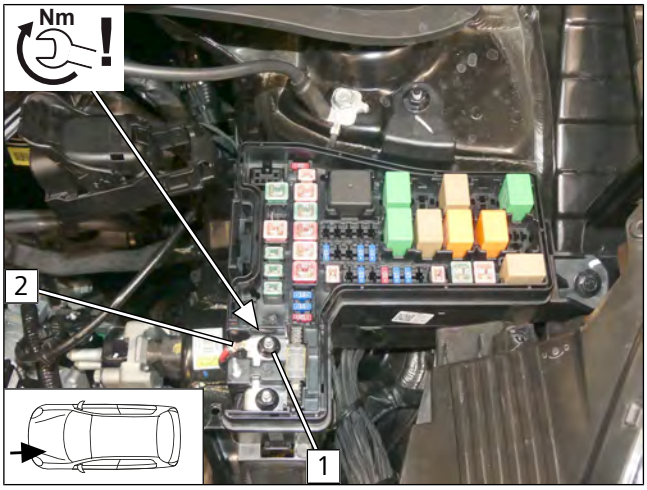



*Fig. 5*

**DANGER**

Observe tightening torque

The Fig. shows the installation situation. The battery is connected during the final work phase.

1 Original vehicle positive support point

2 Positive wire

## Mounting earth wire

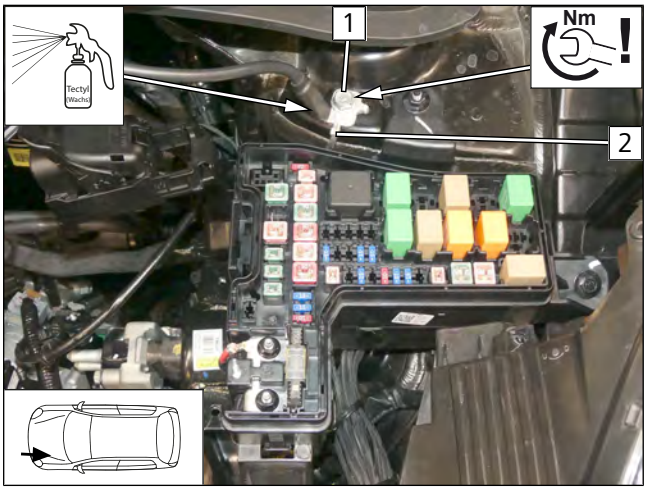



*Fig. 6*

**DANGER**

Observe tightening torque

The Fig. shows the installation situation. The battery is connected during the final work phase.

1 Original vehicle earth point

2 Earth wire

## Passenger compartment and coolant pump wiring harness routing

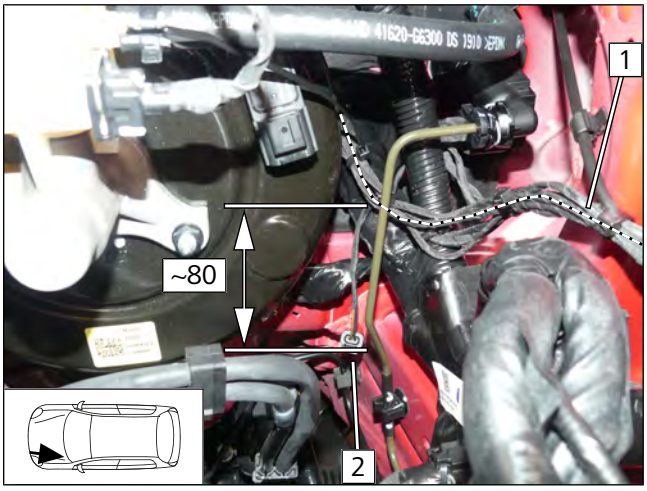



*Fig. 7*

1 Passenger compartment and control element wiring harnesses

2 Coolant pump wiring harness

## Passenger compartment wiring harness pass through

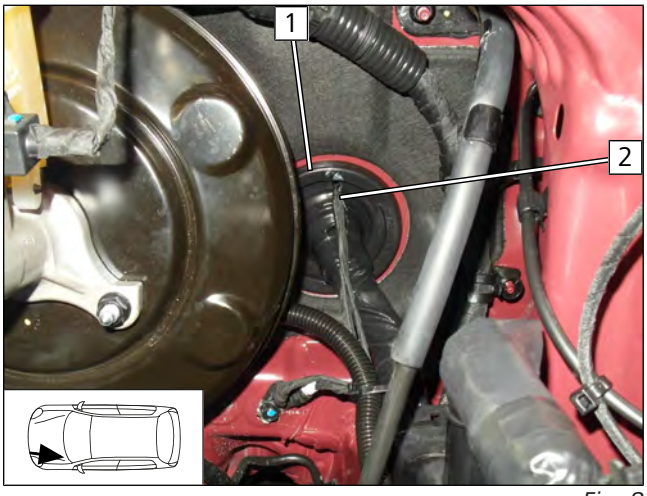



*Fig. 8*

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.

1 Protective rubber plug

2 Passenger compartment and control element wiring harnesses

HG wiring harness routing

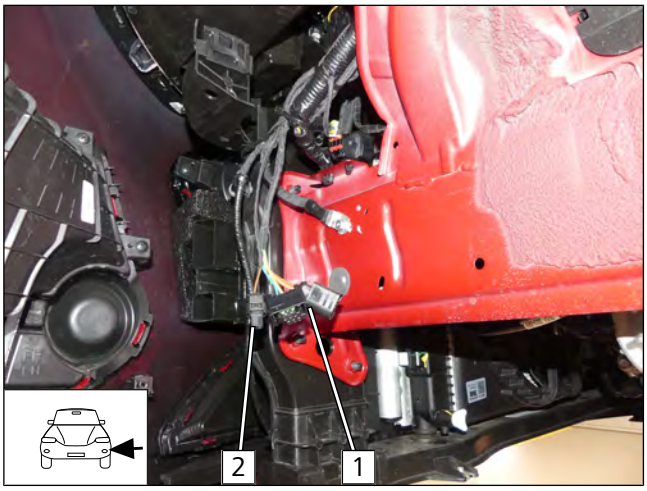



*Fig. 9*

1 Heater wiring harness
2 Coolant pump wiring harness

# 8 Mechanical system

## 8.1 Preparing installation location

Drilling holes in HG bracket

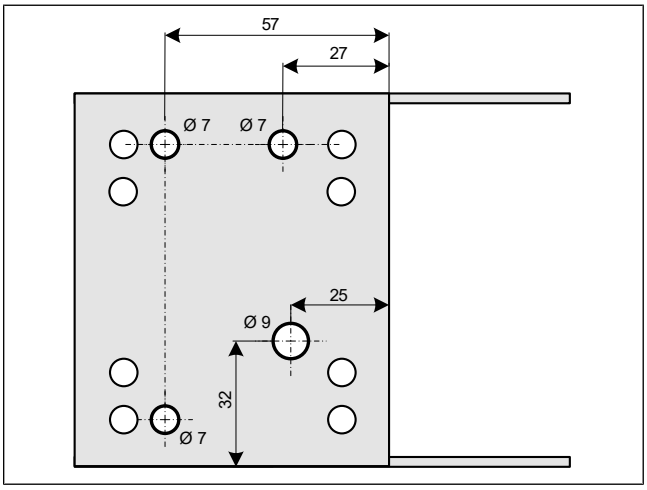



*Fig. 10*

Inserting and tightening rivet nuts

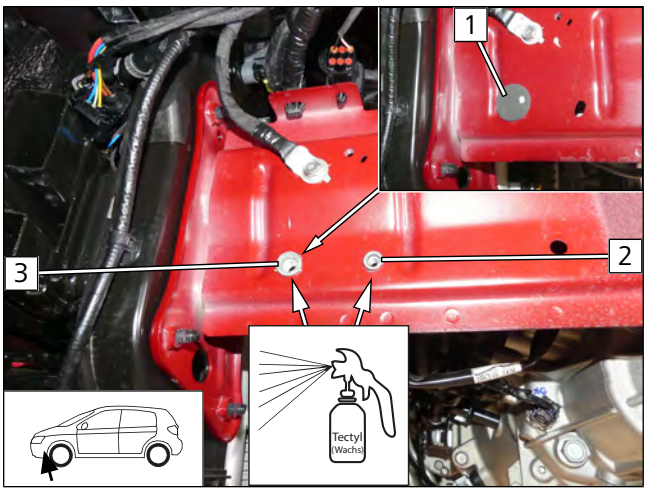



*Fig. 11*

1 Remove sticker
2 Enlarge oblong hole in the middle to Ø9, insert M6 rivet nut
3 M8 rivet nut

Copying hole pattern

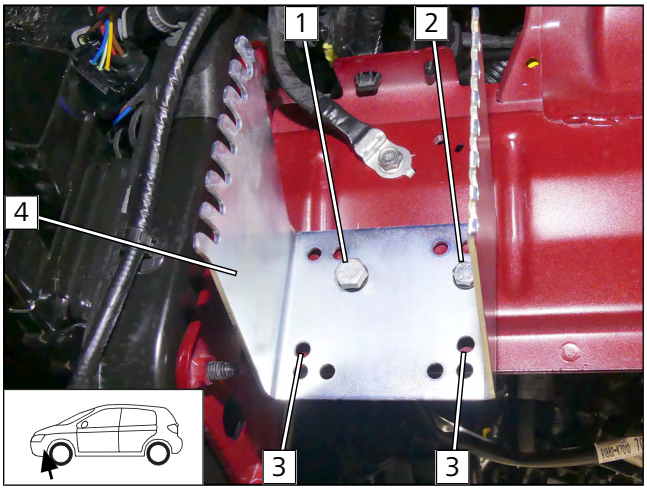



*Fig. 12*

1 M8x20 bolt, spring lockwasher
2 M6x20 bolt, spring lockwasher
3 Hole pattern
4 Heater bracket

▶ Remove bracket.

Drilling holes

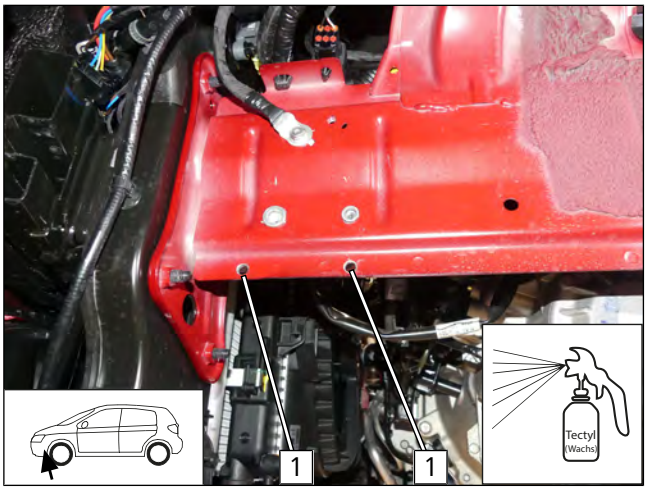



*Fig. 13*

1 Ø7 hole

Mounting heater bracket

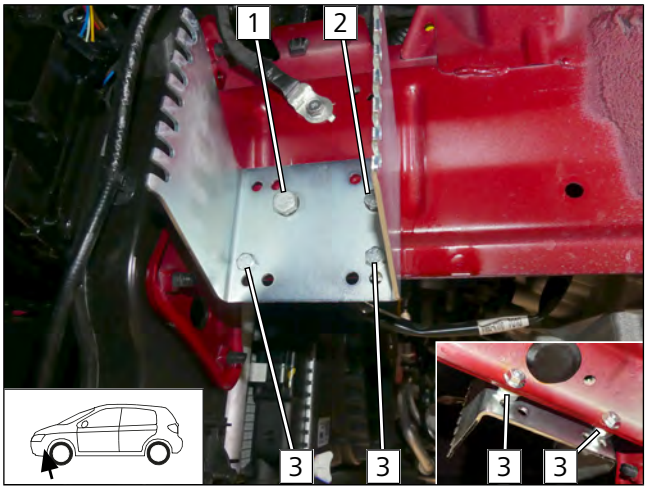



*Fig. 14*

1 M8x20 bolt, spring lock washer, bracket, rivet nut

2 M6x20 bolt, spring lock washer, bracket, rivet nut

3 M6x20 bolt, bracket, large diameter washer, M8 nut (as spacer),

prepared hole, M6 flanged nut

## 8.2 Combustion air

Premounting combustion air intake silencer

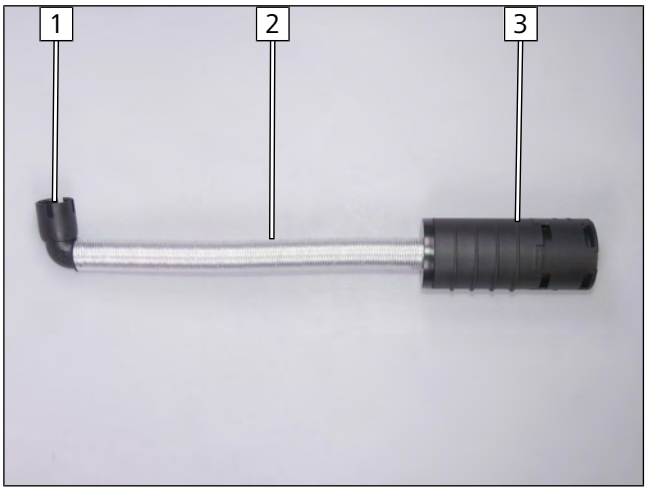



*Fig. 15*

1 Air intake elbow

2 Combustion air intake line

3 Combustion air intake silencer

## Shortening perforated bracket and drilling

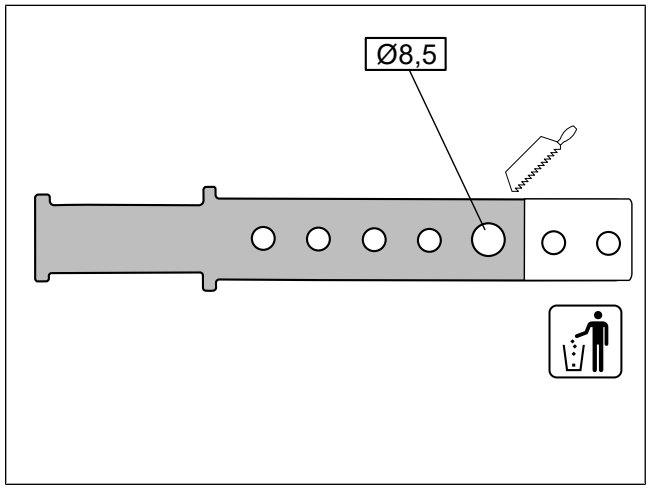



*Fig. 16*

## Premounting perforated bracket

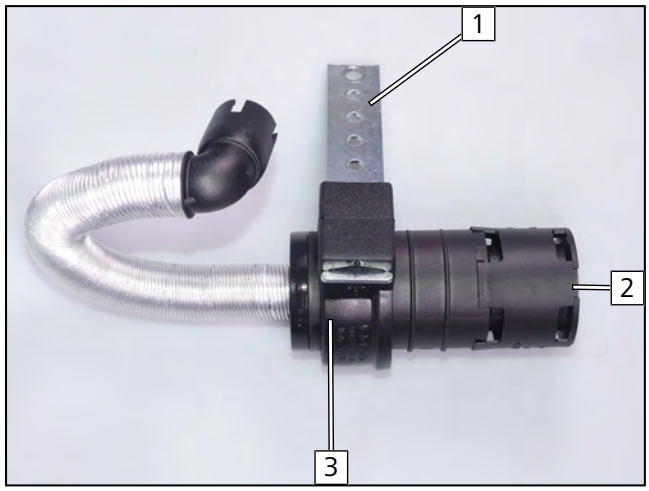



*Fig. 17*

1 Prepared perforated bracket
2 Combustion air intake silencer
3 Combustion air intake silencer mount

## Mounting combustion air intake silencer

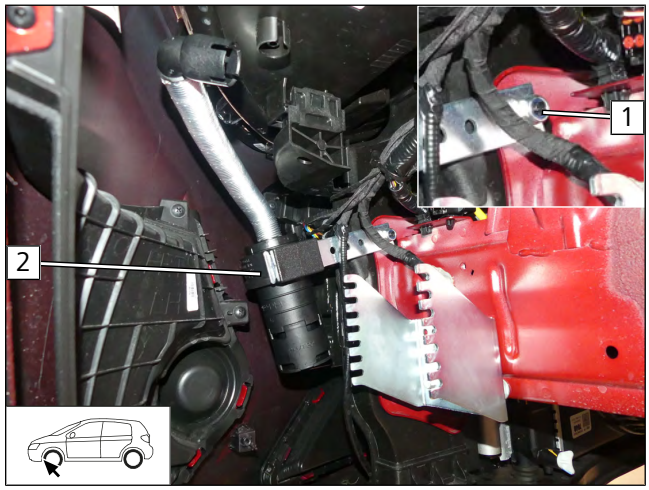



*Fig. 18*

Observe the installation instructions of the combustion air intake silencer.

1 M8 self-locking nut, perforated bracket, original vehicle stud bolt
2 Combustion air intake silencer

## 8.3 Premounting heater

### Premounting bolts loosely

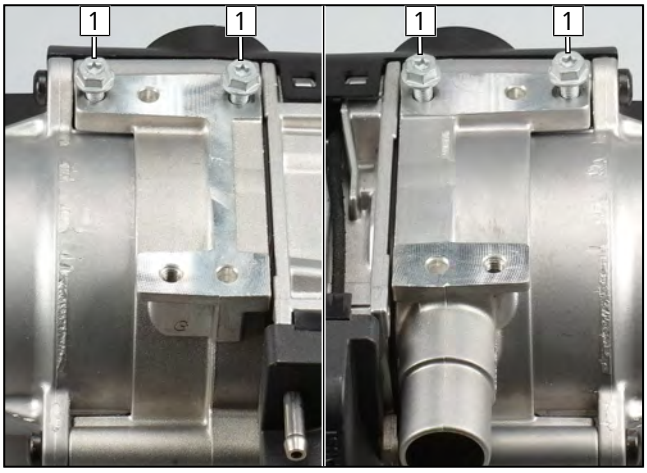



*Fig. 19*

Observe the general installation instructions of the heater.

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

### Mounting water connection piece

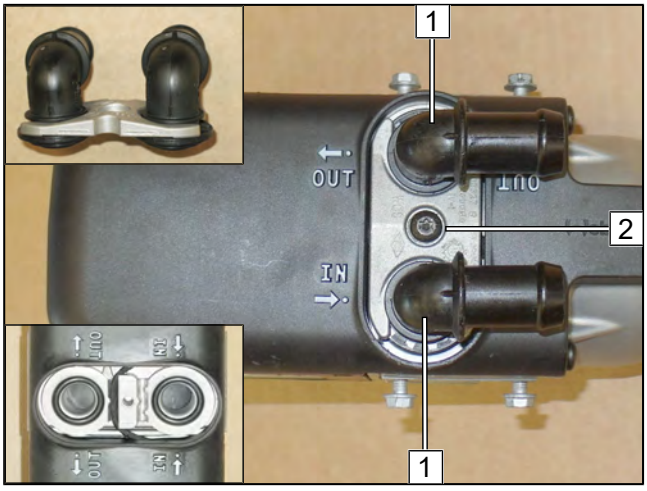



*Fig. 20*

[1] 90° water connection piece, seal

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

### Mounting fuel hose

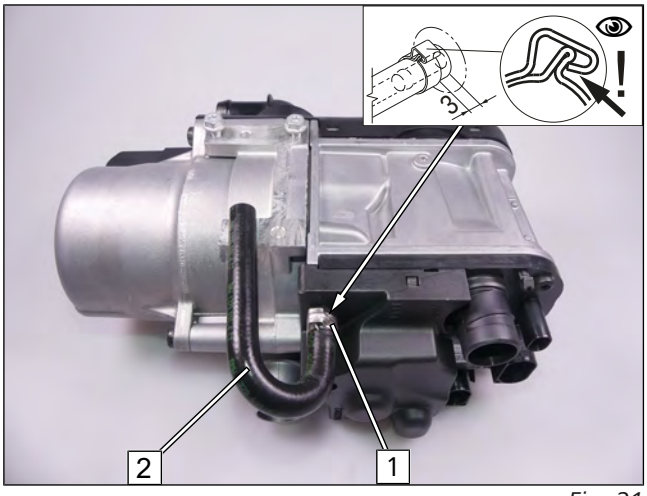
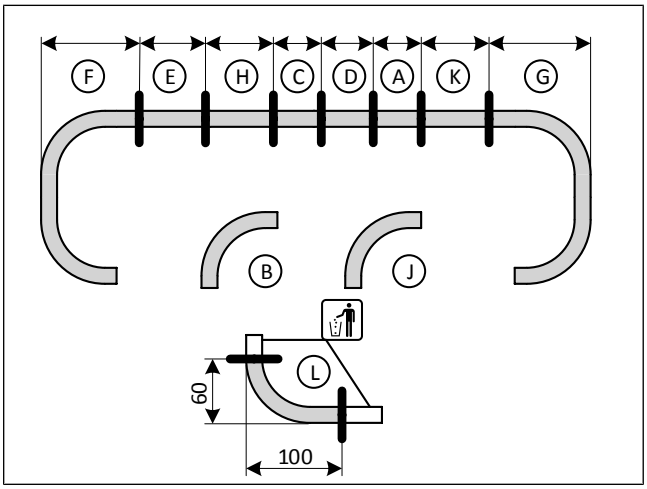



*Fig. 21*

[1] Ø10 clamp

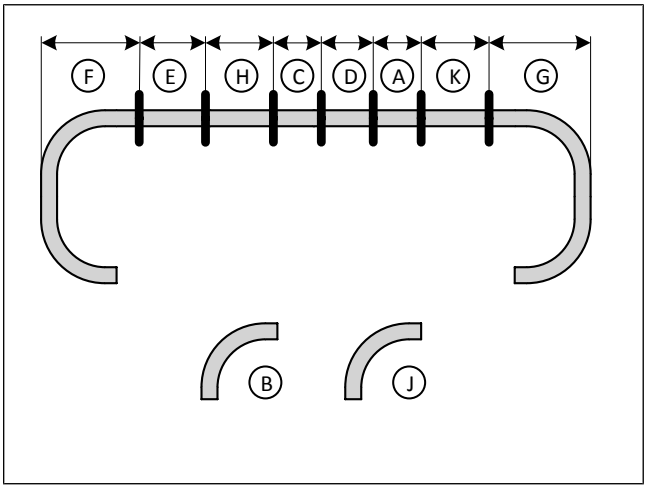
[2] 180° moulded hose, short side on HG

## Cutting hoses to length




1.0

| | | | |
|---|---|---|---|
| A | 210 | G | 110 |
| B | 90° | H | 430 |
| C | 110 | J | 90° |
| D | 190 | K | 330 |
| E | 430 | L | 90° |
| F | 110 | | |




1.2

| | | | |
|---|---|---|---|
| A | 170 | F | 110 |
| B | 90° | G | 110 |
| C | 130 | H | 430 |
| D | 160 | J | 90° |
| E | 430 | K | 300 |

## Premounting hoses

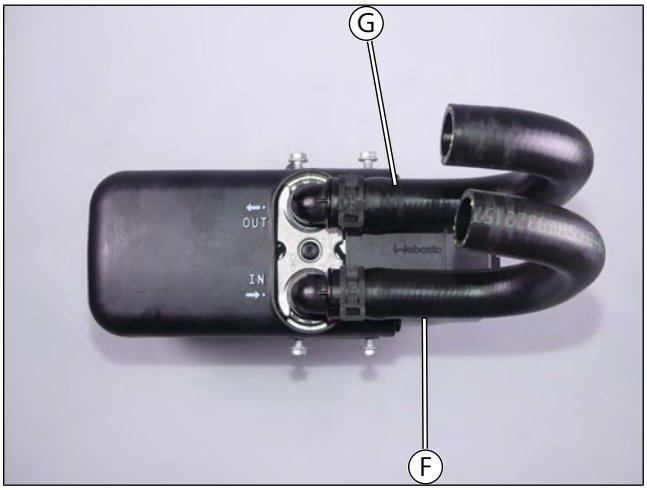



*Fig. 22*

All spring clips Ø25

## 8.4 Heater mounting

### Mounting heater

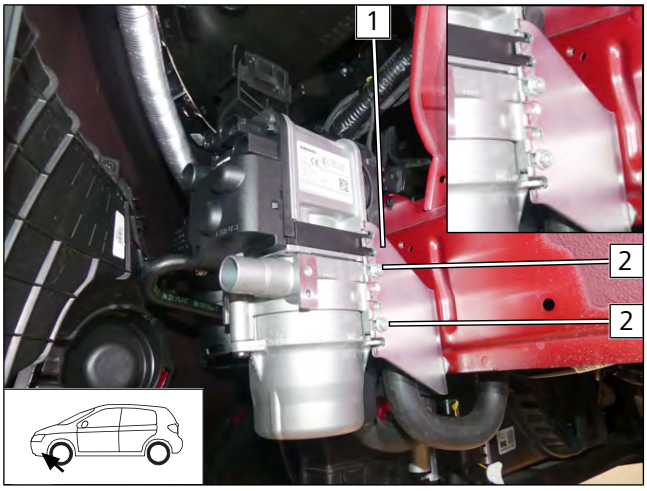



*Fig. 23*

1 Bracket
2 5x13 self-tapping bolt

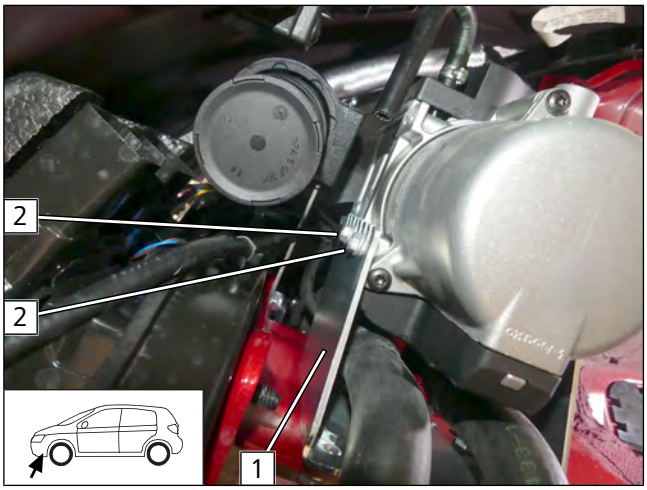



*Fig. 24*

1 Bracket
2 5x13 self-tapping bolt

### Mounting wiring harnesses and mounting air intake elbow

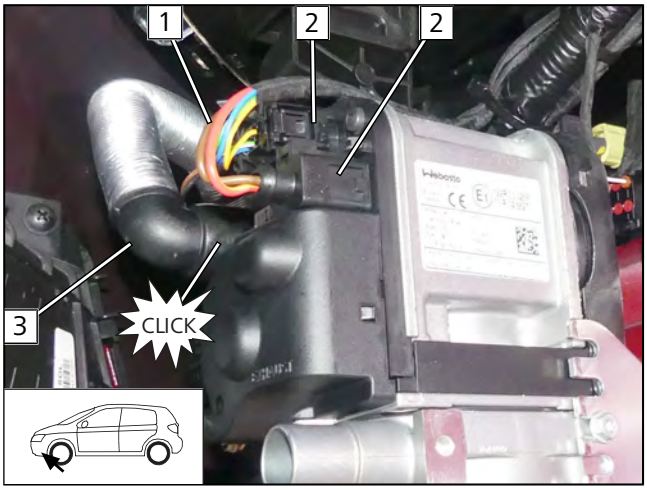



*Fig. 25*

1 Coolant pump wiring harness connector
2 Heater wiring harness connector
3 Air intake elbow

# 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

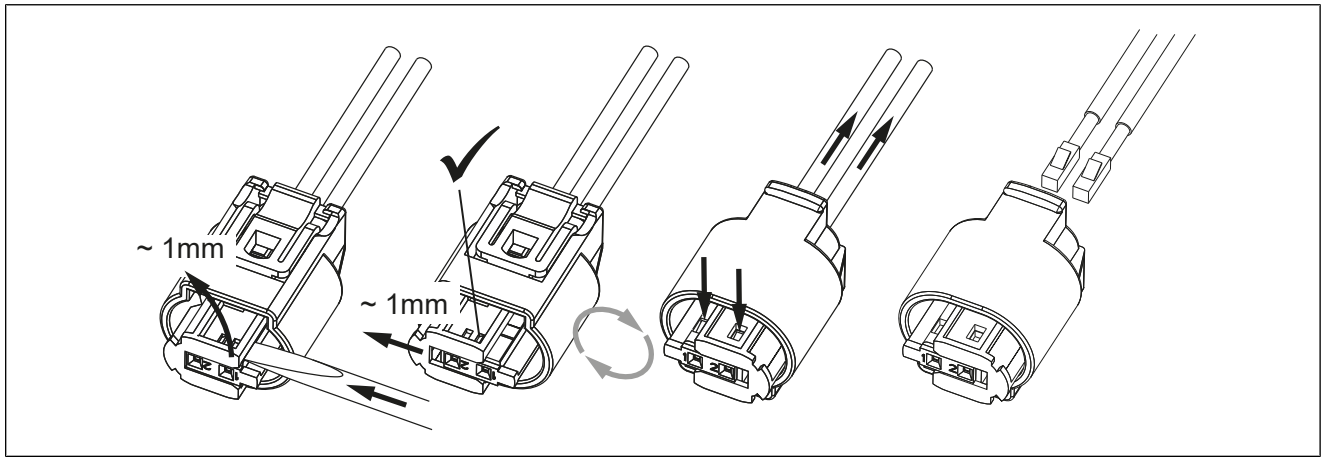



*Fig. 26*

## 9.1 Routing fuel line

Connecting heater

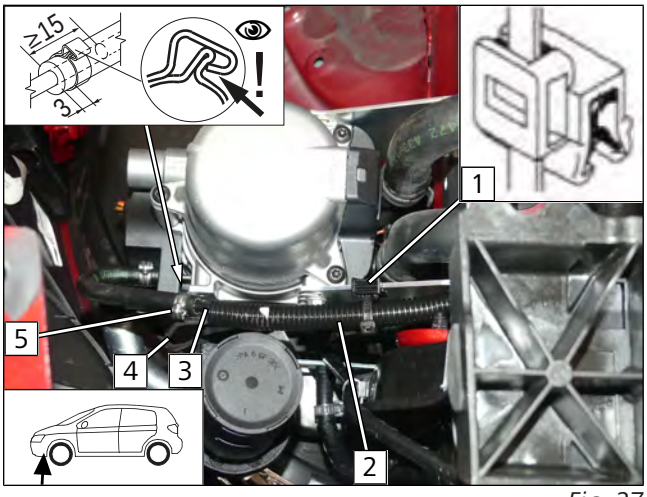



*Fig. 27*

- ▶ Draw fuel line [3] and fuel pump wiring harness [4] into Ø10 corrugated tube [2] and route as shown in next figure.

[1] Edge clip cable tie
[5] Ø10 clamp

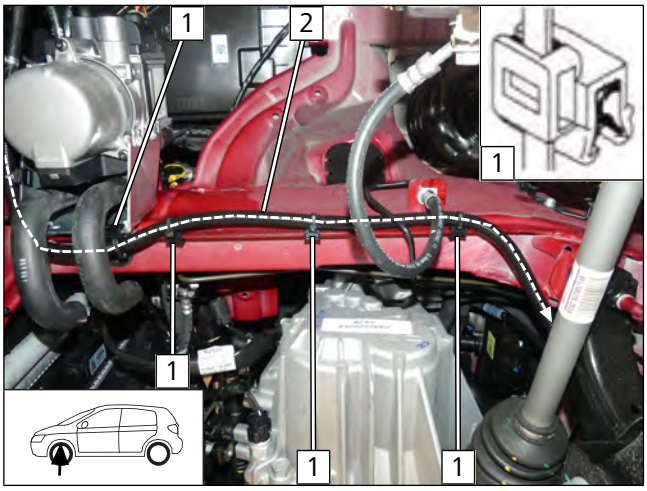



*Fig. 28*

1 Edge clip cable tie
2 Fuel line and fuel pump wiring harness in Ø10 corrugated tube

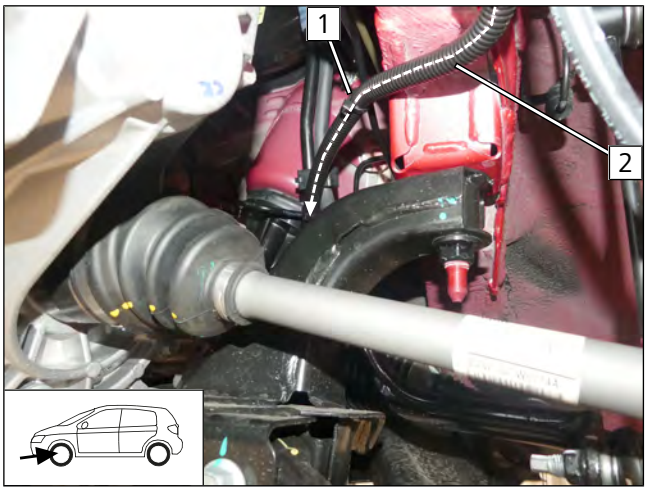



*Fig. 29*

▶ Route fuel line and fuel pump wiring harness in Ø10 corrugated tube 2 along original vehicle fuel lines to the underbody and secure with cable ties.

1 Cable tie
2 Fuel line and fuel pump wiring harness in Ø10 corrugated tube

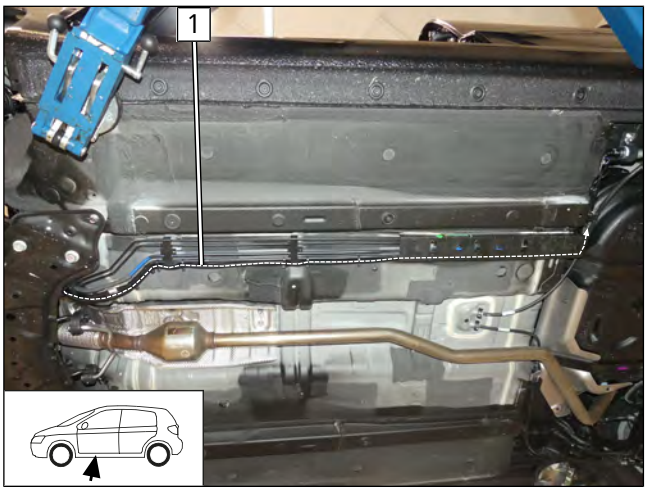



*Fig. 30*

▶ Route fuel line and fuel pump wiring harness in Ø10 corrugated tube 1 along original vehicle fuel lines to fuel pump installation location and secure using cable ties.

## Preparing fuel pump installation location

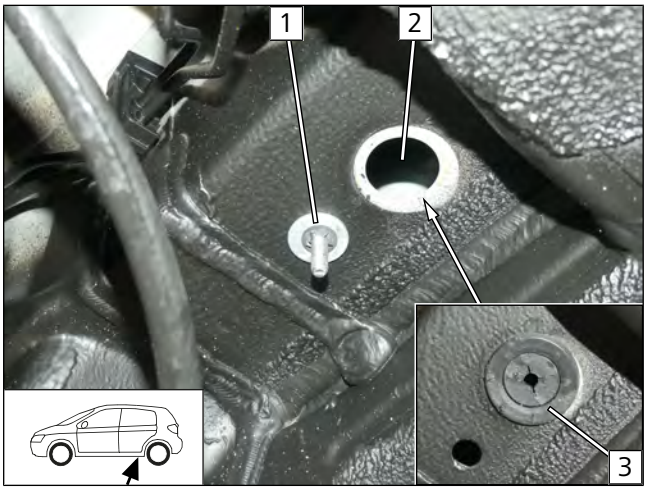



*Fig. 31*

▶ Remove original vehicle dummy plug [3], it will be reinserted after installation of M6x25 bolt [1].

[1] M6x25 bolt, large diameter washer, original vehicle hole, large diameter washer, lock washer

[2] Original vehicle hole

## Premounting fuel pump

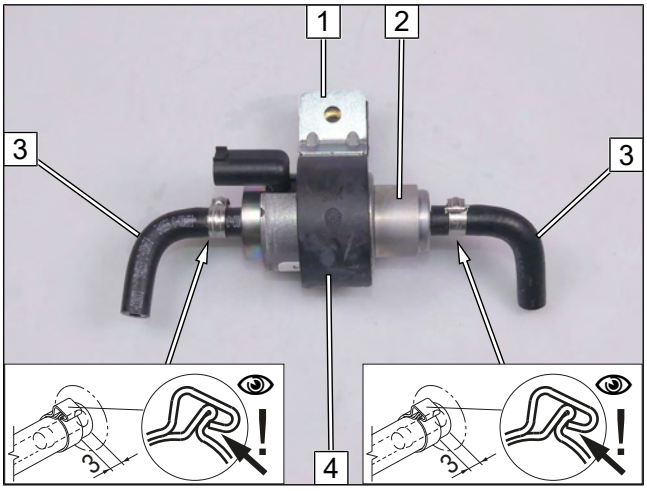



*Fig. 32*

[1] Support angle bracket

[2] Fuel pump

[3] 90° hose section, Ø10 clamp

[4] Fuel pump mount

## Mounting fuel pump

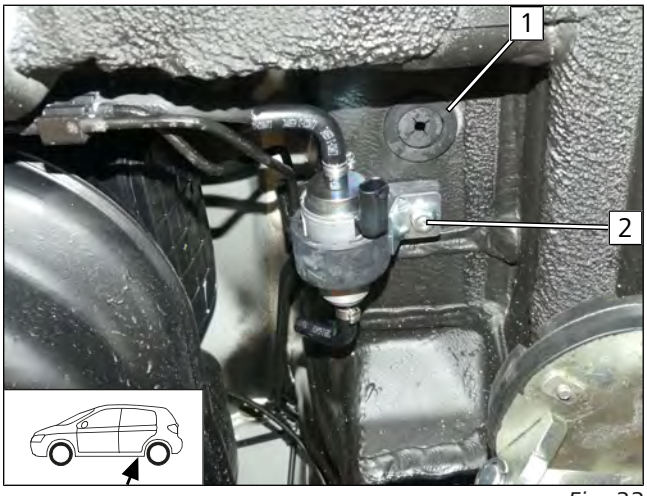



*Fig. 33*

[1] Reinsert original vehicle dummy plug

[2] Premounted M6x25 bolt, premounted fuel pump, support angle bracket, M6 flanged nut

Assembling fuel pump connector X7

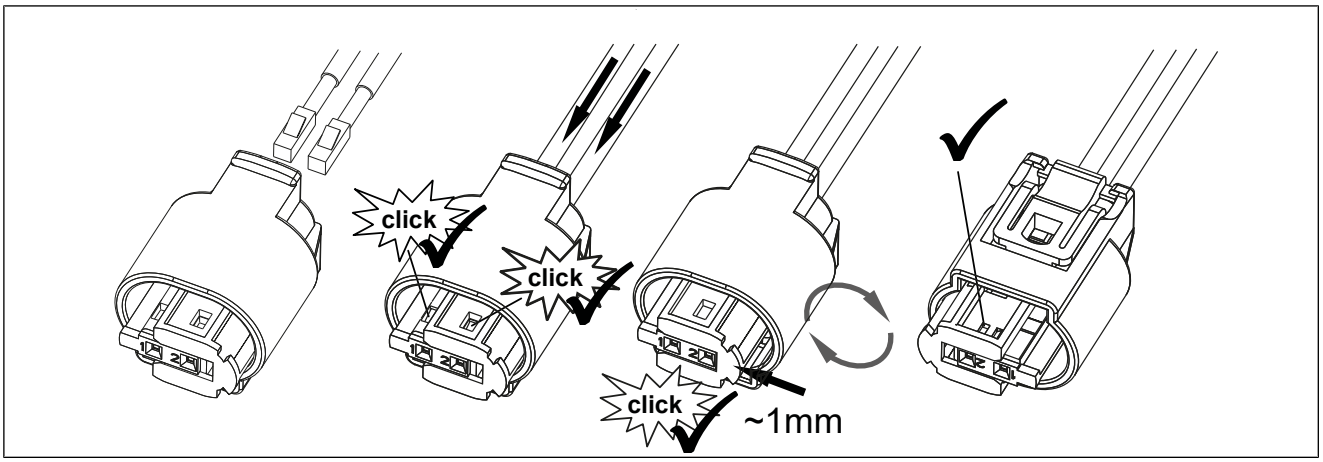



*Fig. 34*

Fuel pump connection

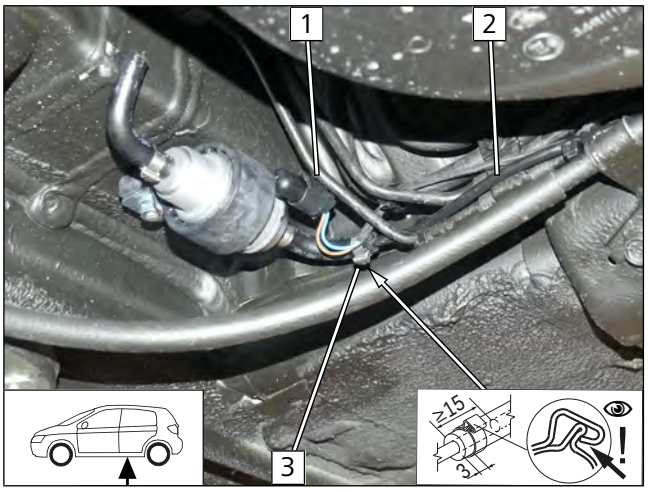



*Fig. 35*

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

## 9.2 Installing FuelFix

View of drilling template

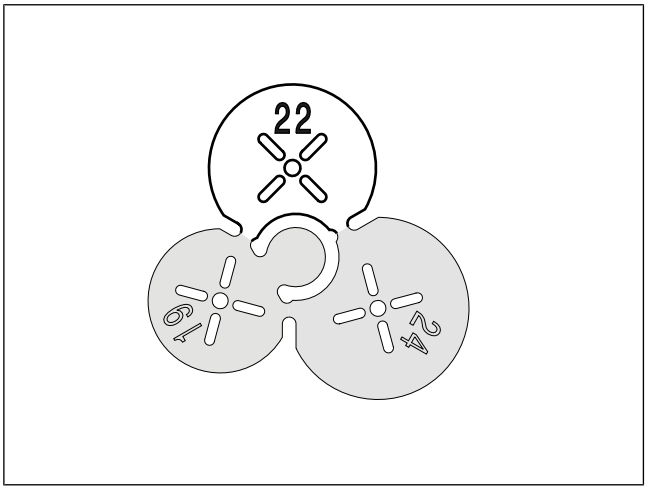



*Fig. 36*

Work step F1

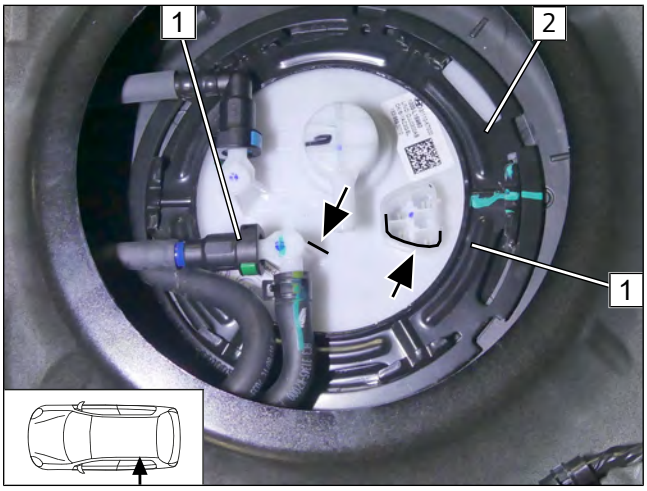



*Fig. 37*

Observe the installation instructions of the tank extracting device.

▶ Trace outline [1] on tank fitting [2] as shown.

Work step F2

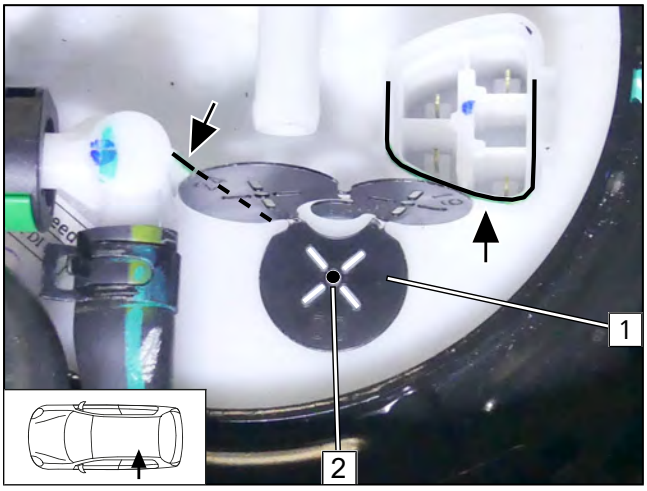



*Fig. 38*

[1] Bend and position Ø22 drilling template as shown

[2] Copy hole pattern

Work step F3

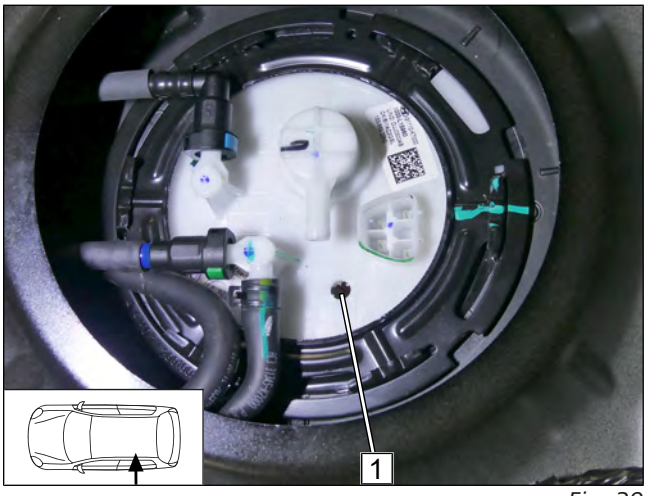



*Fig. 39*

**DANGER**

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

[1] Hole made with provided drill

## Work steps F4, F5

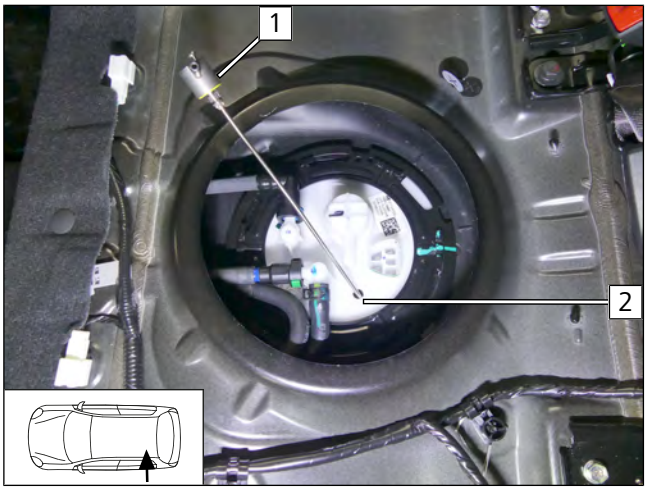



*Fig. 40*

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

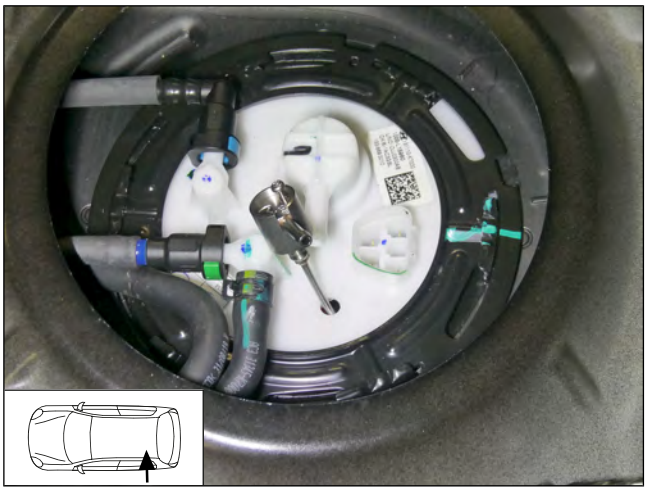


*Fig. 41*

## Work steps F5.3, F5.4

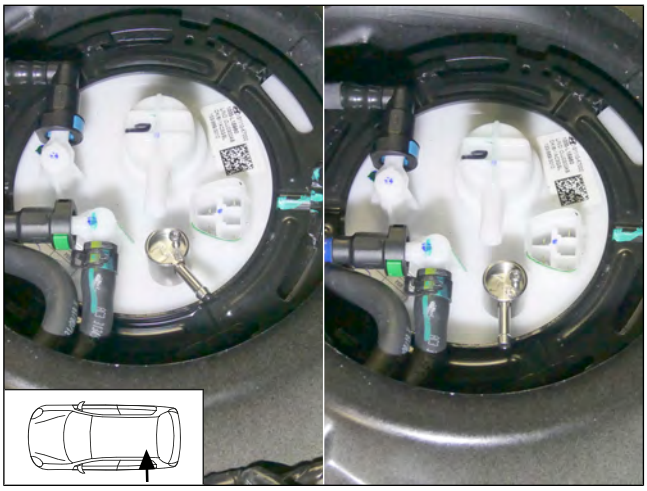


*Fig. 42*

▶ Align FuelFix as shown.

## Work step F6

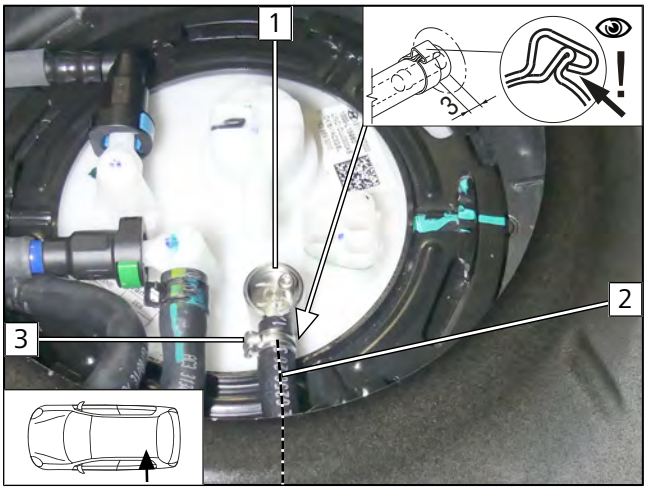



*Fig. 43*

1 FuelFix
2 Hose section
3 Ø10 clamp

## Work step F7

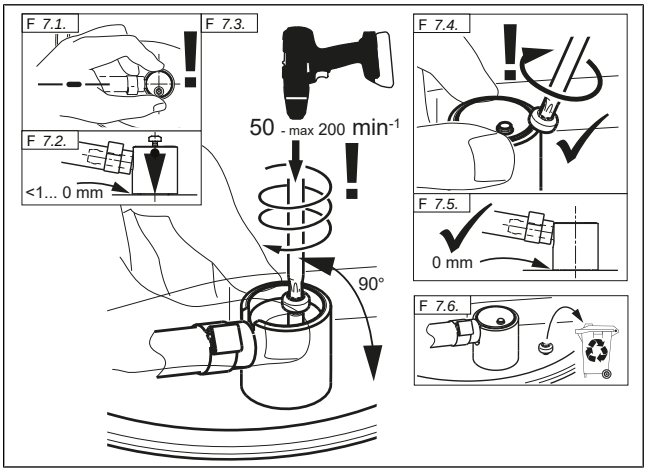



*Fig. 44*

**DANGER**
Risk of fire and explosion due to leaking fuel and escaping fuel vapours

## Work step F8

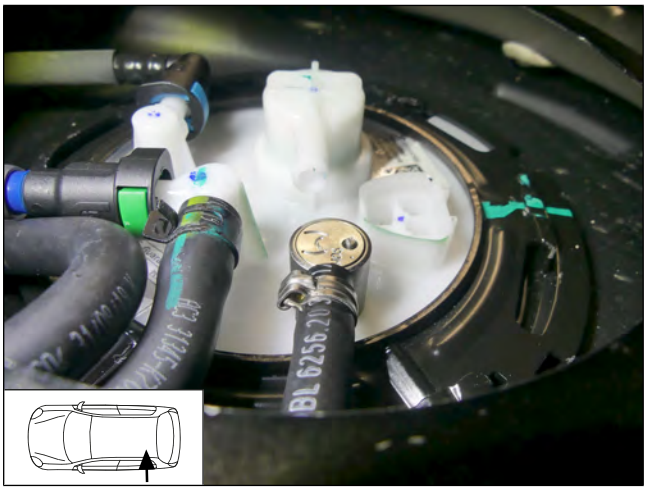


*Fig. 45*

▶ Check if FuelFix is firmly mounted.

## Securing fuel line

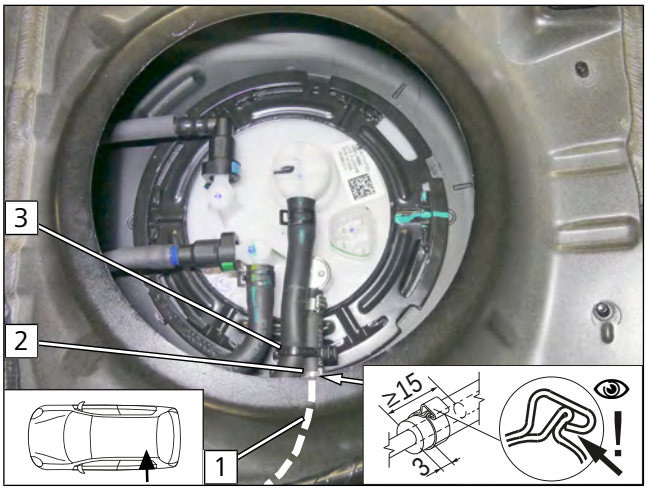



*Fig. 46*

1 Fuel line of FuelFix
2 Ø10 clamp
3 Cable tie for tension relief

## Fuel pump connection

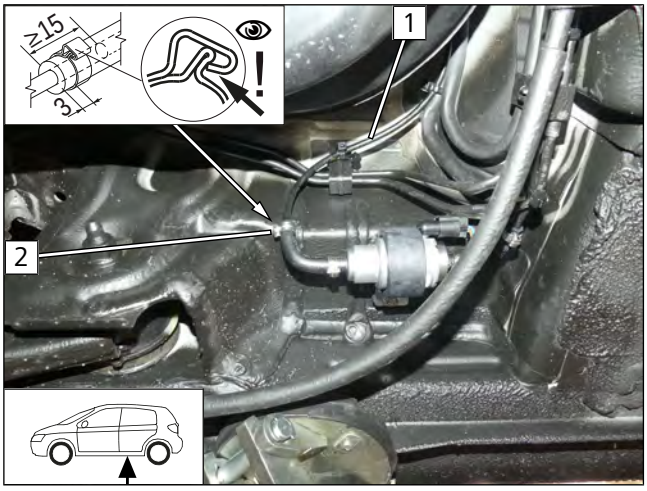



*Fig. 47*

▶ Route fuel line 1 to FuelFix installation location.

1 Fuel line of FuelFix
2 Ø10 clamp

## 10 Exhaust

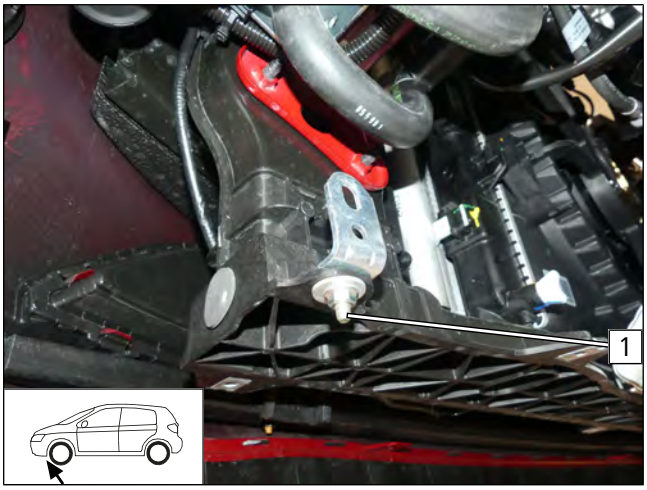



*Fig. 48*

1 M6x20 bolt, angle bracket, original vehicle hole, large diameter washer, flanged nut

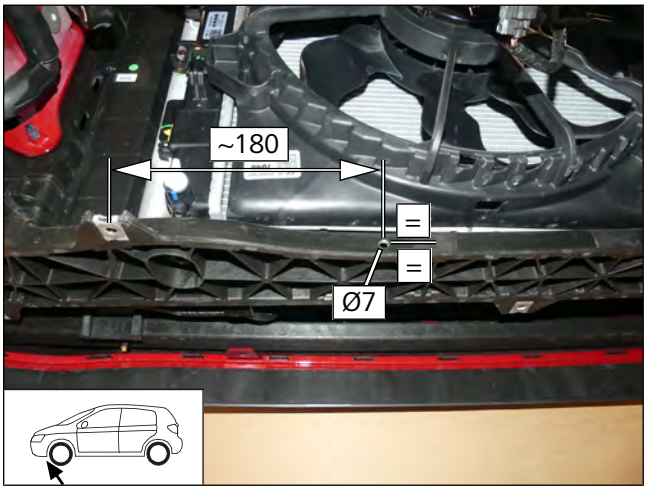



*Fig. 49*

1 Drill Ø7 hole

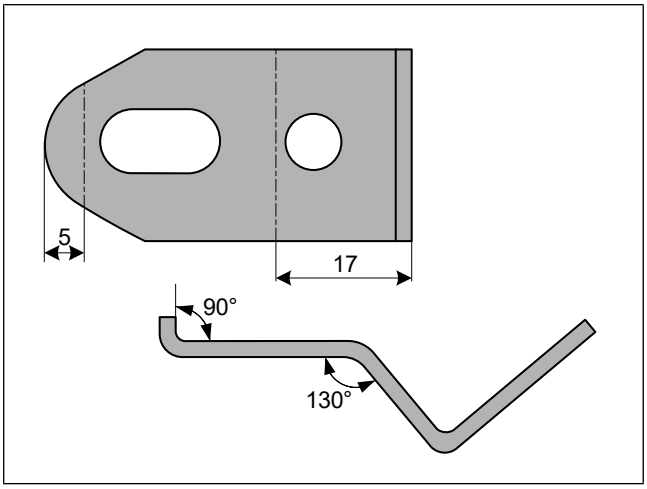



*Fig. 50*

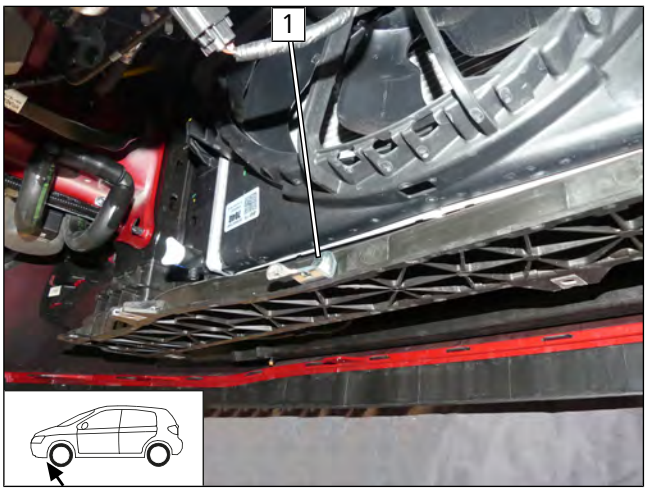



*Fig. 51*

**1** M6x20 bolt, angle bracket, prepared hole, flanged nut

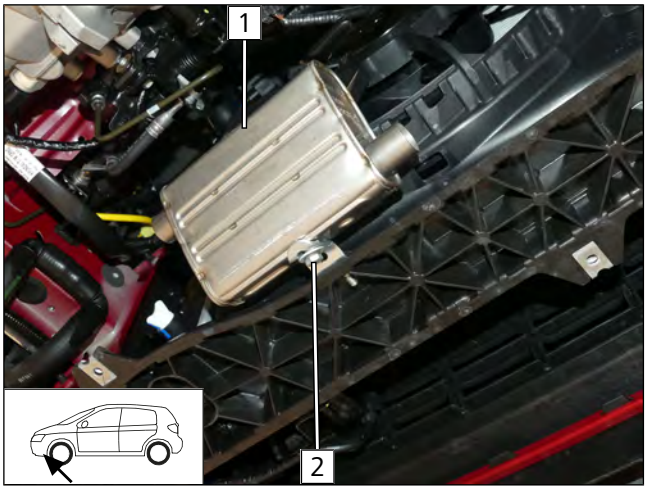



*Fig. 52*

**1** Exhaust silencer

**2** M6x16 bolt, spring lockwasher, large diameter washer

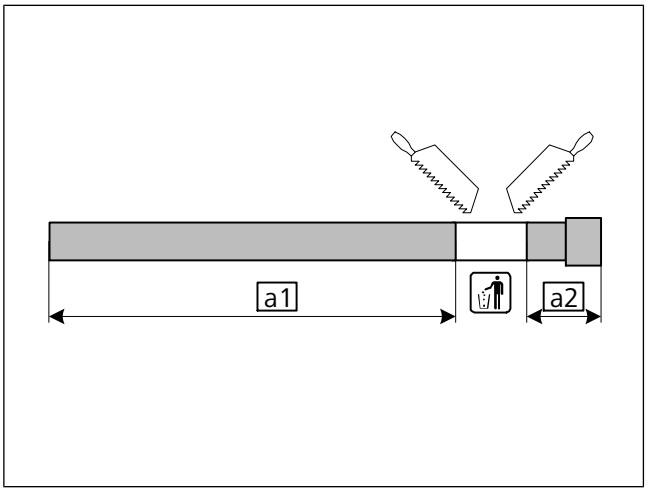



*Fig. 53*

**a1** 650

**a2** 100

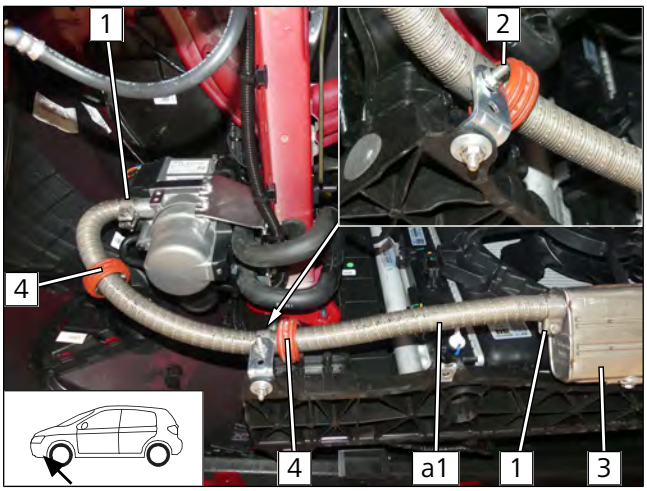



*Fig. 54*

1 Hose clamp
2 M6x20 bolt, pipe clamp, angle bracket, flanged nut
3 Exhaust silencer
4 Align spacer bracket as shown

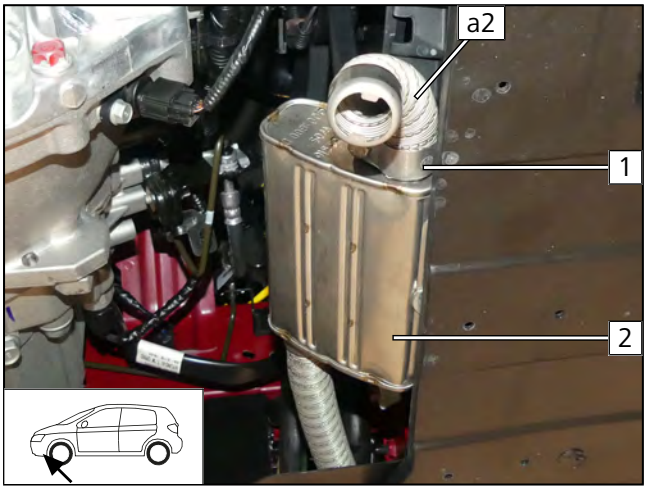



*Fig. 55*

1 Hose clamp
2 Exhaust silencer

## 11 Preliminary work for coolant, all vehicles

Preparing perforated bracket A

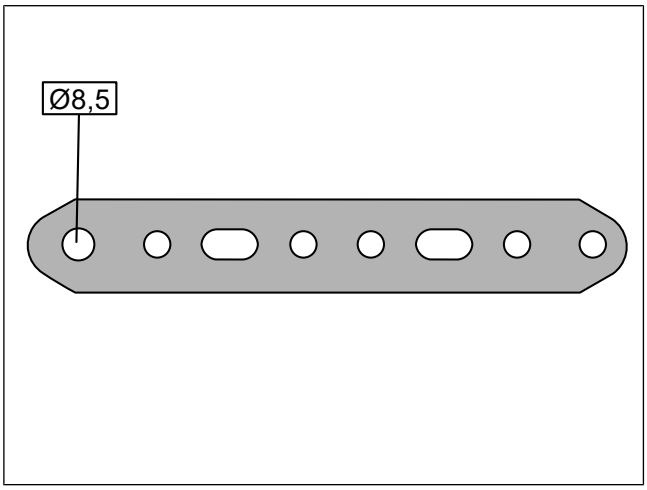



*Fig. 56*

Mounting perforated bracket A

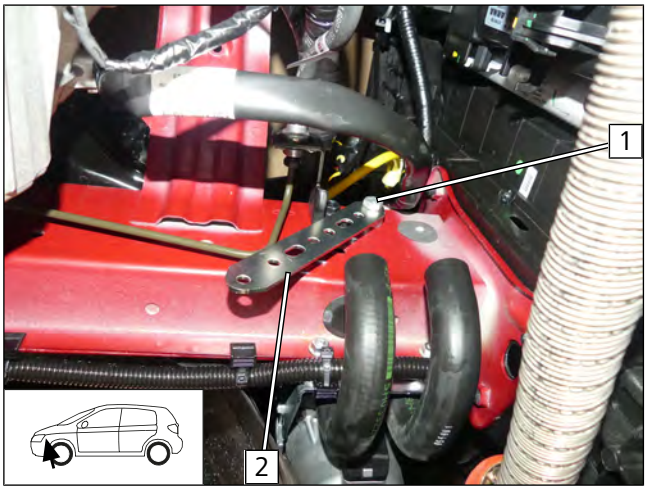



*Fig. 57*

Danger of damage to components

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

1 M8x25 bolt, spring lock washer, perforated bracket A, spacer (10), original vehicle threaded hole

Inserting rivet nut

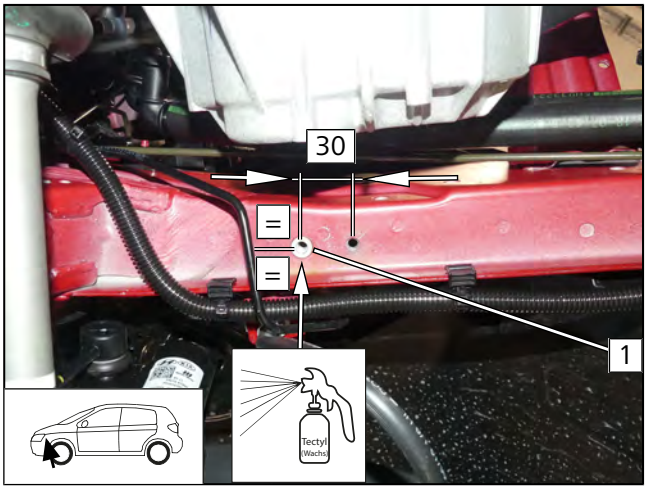



*Fig. 58*

1 Copy hole pattern, Ø9 hole, rivet nut

## Preparing perforated bracket B

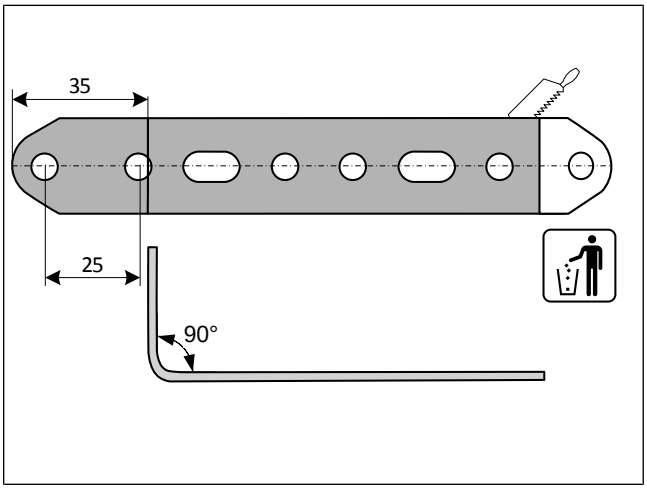



*Fig. 59*

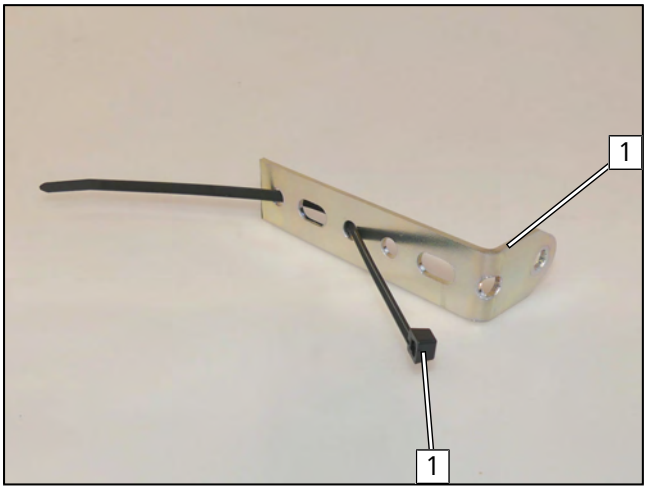



*Fig. 60*

1 Perforated bracket B
2 Position cable tie as shown

## Mounting perforated bracket B

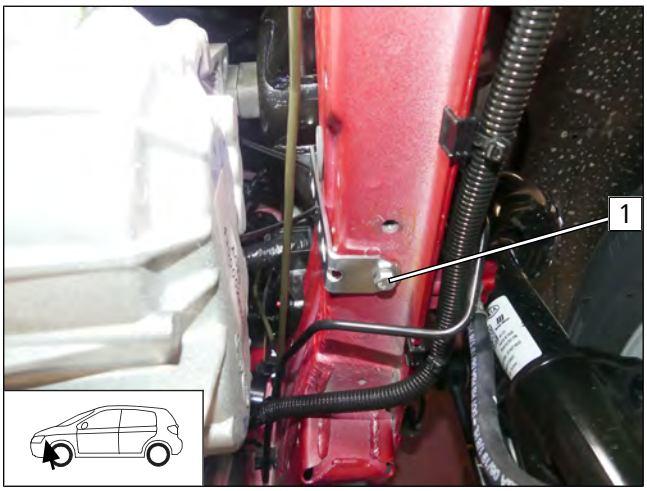



*Fig. 61*

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

Preparing hose group with hoses Ⓔ and Ⓗ

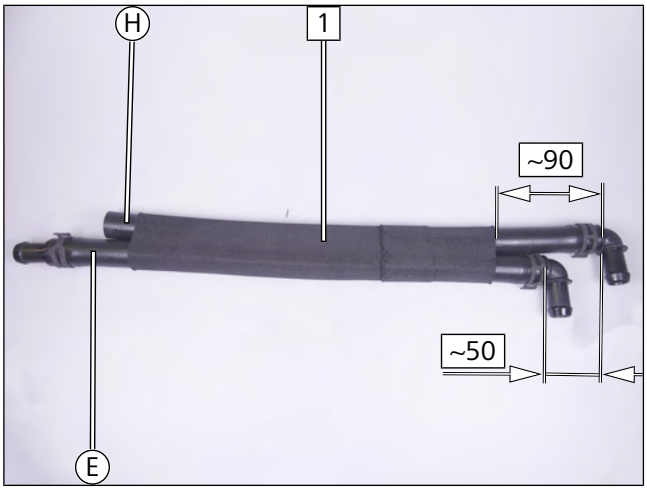



*Fig. 62*

All spring clips Ø25

Mount fabric heat shrink tubing 1.

▶ 1. Slide on and cut to length

▶ 2. Shrink, use at most 230 °C

# 12 Coolant 1.0P

## 12.1 Hose routing diagram

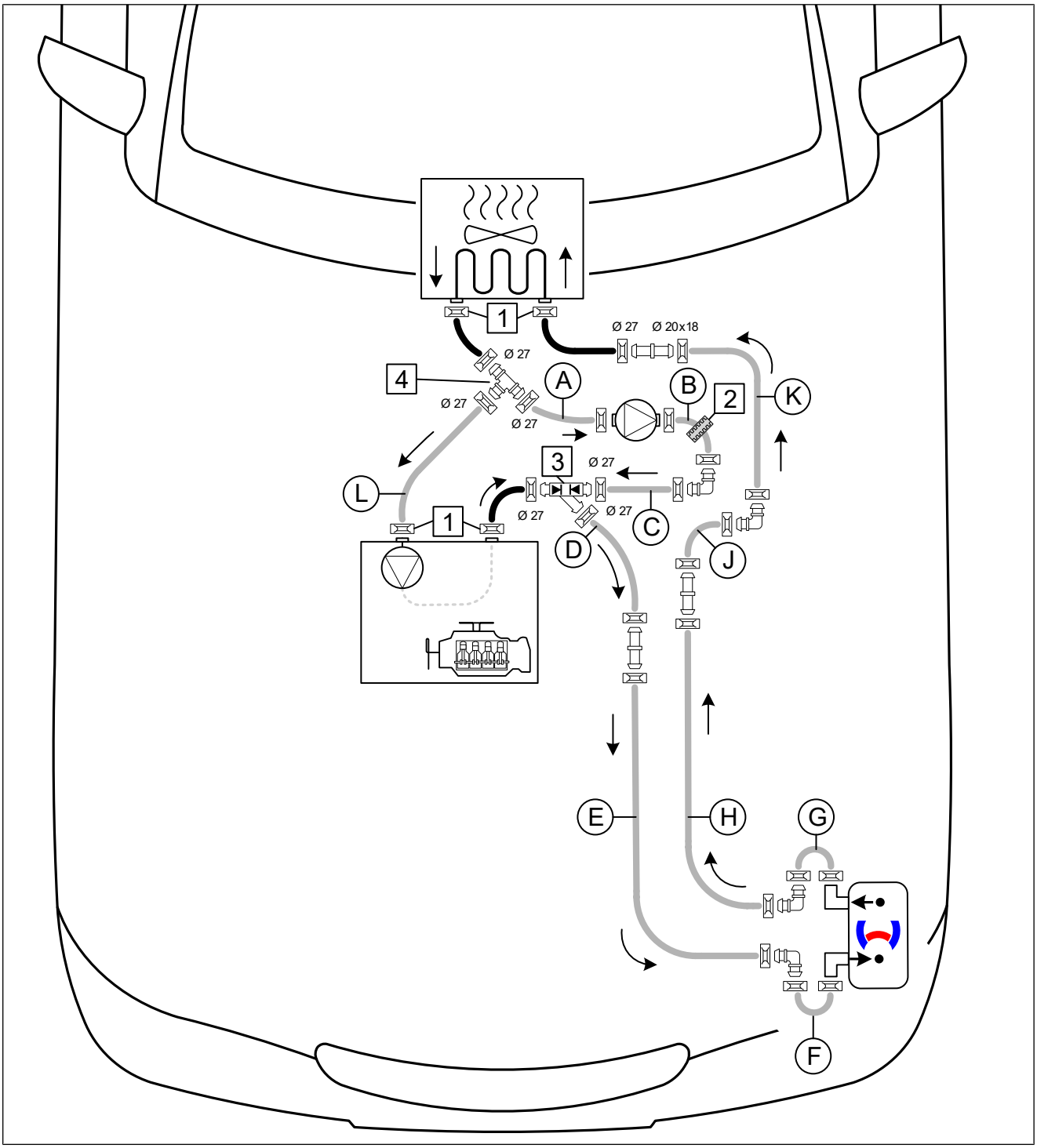



*Fig. 63*

All spring clips without a specific designation = Ø25

All connecting pipes without a specific designation = Ø18x18; = Ø18x18

[1] Original vehicle spring clip; [2] Rubber isolator; [3] Double non-return valve; [4] T-piece

## 12.2 Coolant circuit installation

Mounting hose group with hoses Ⓔ and Ⓗ

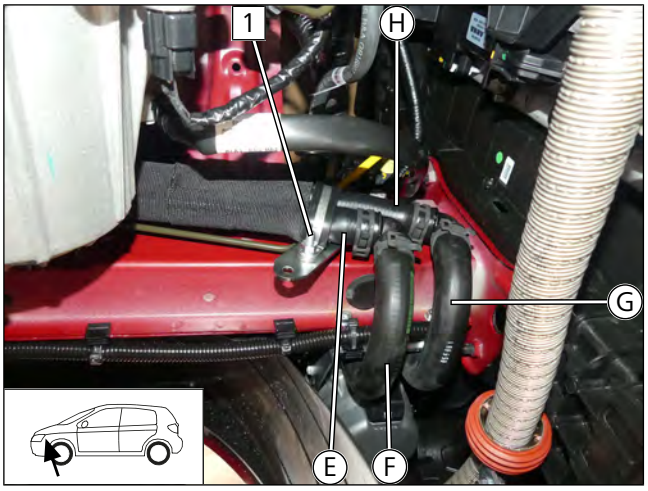



*Fig. 64*

1 M6x20 bolt, perforated bracket, Ø38 rubber-coated p-clamp, flanged nut

Repositioning hose group

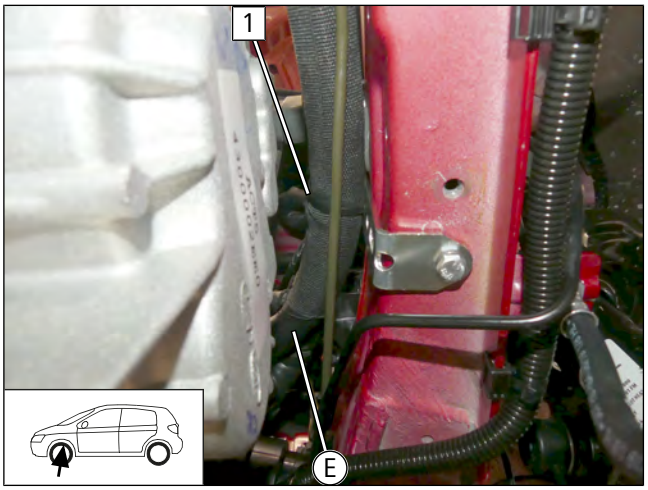



*Fig. 65*

1 Cable tie around hoses Ⓔ and Ⓗ

Preparing perforated bracket

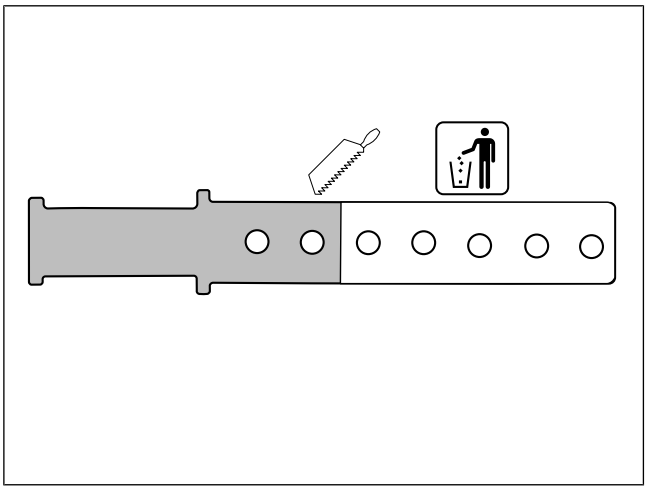


*Fig. 66*

## Premounting coolant pump

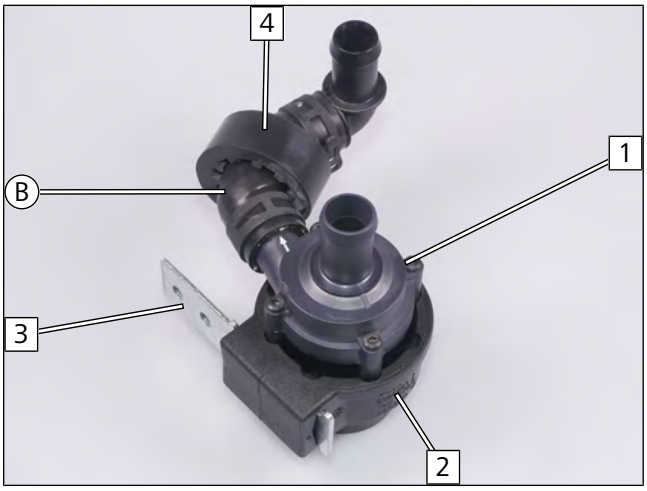



*Fig. 67*

1 Coolant pump
2 Coolant pump mount
3 Perforated bracket
4 Rubber isolator

## Mounting coolant pump

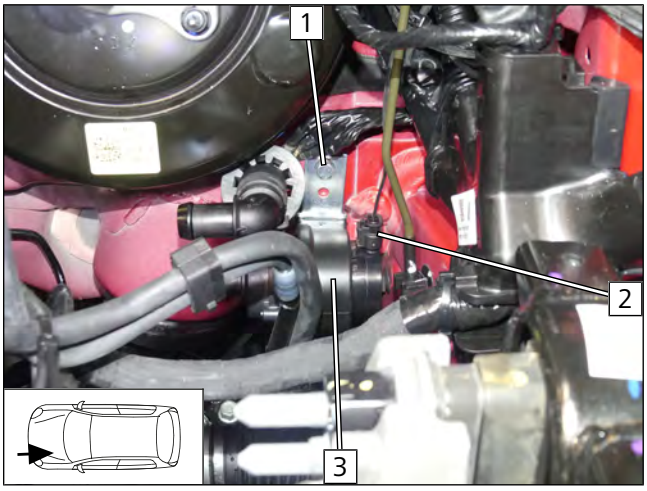



*Fig. 68*

1 M6x20 bolt, spring lock washer, perforated bracket, original vehicle threaded hole
2 Coolant pump wiring harness connector
3 Premounted coolant pump

## Dismantling hoses

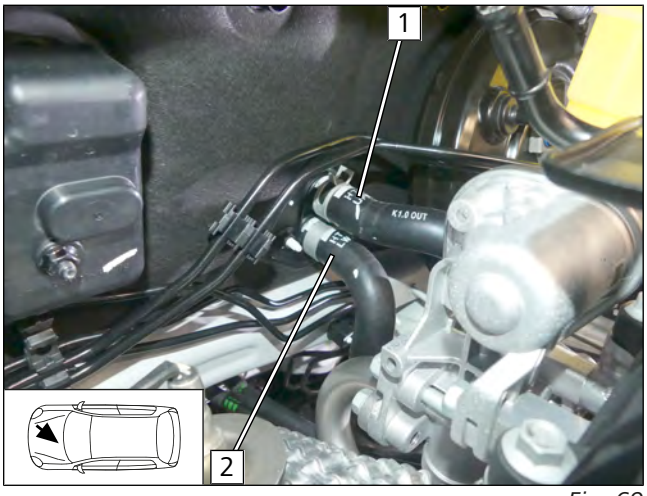



*Fig. 69*

Original vehicle spring clips will be reused.

1 Heat exchanger outlet / engine inlet hose
2 Engine outlet / heat exchanger inlet hose

## Preparing heat exchanger outlet / engine inlet hose

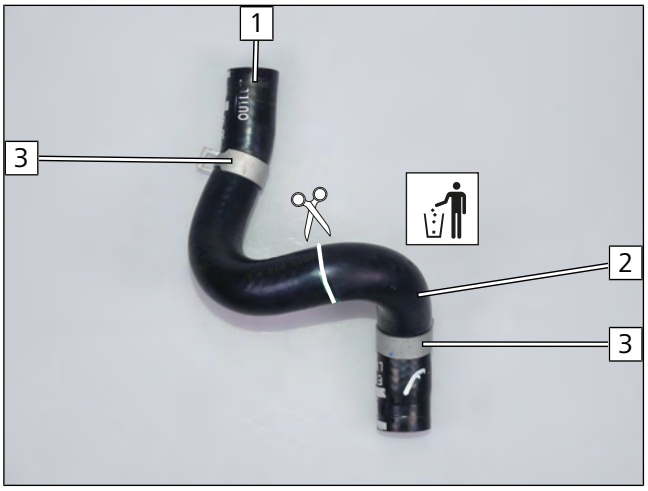



*Fig. 70*

1 Heat exchanger outlet hose section
2 Discard engine inlet hose section
3 Original vehicle spring clip will be reused

## Preparing hose group with T-piece

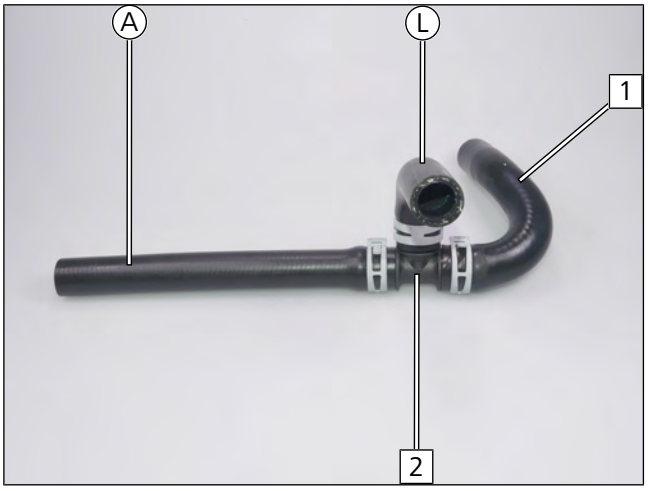



*Fig. 71*

All spring clips Ø27

1 Heat exchanger outlet hose section
2 3xØ20 T-piece

## Preparing hose of engine outlet / heat exchanger inlet

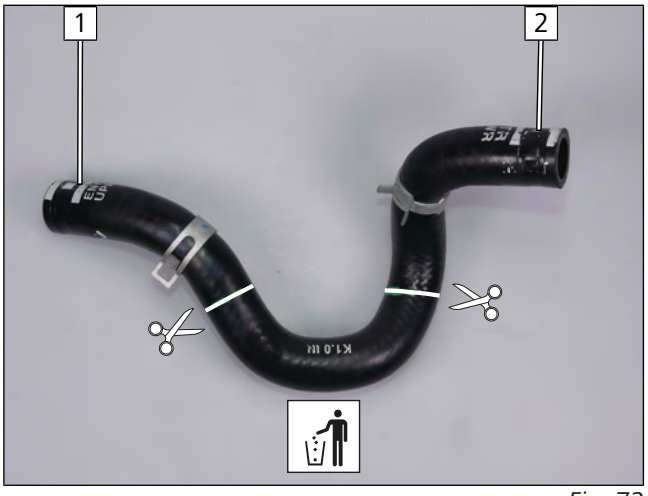



*Fig. 72*

Original vehicle spring clips will be reused.

1 Engine outlet hose section
2 Heat exchanger inlet hose section

## Preparing hose group with double non-return valve

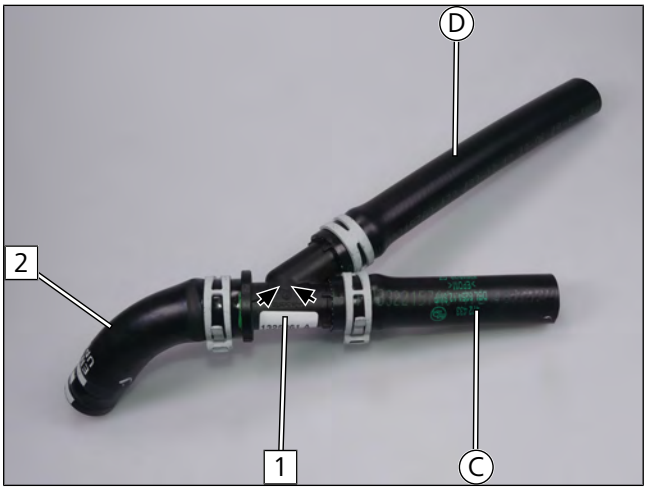



*Fig. 73*

All spring clips Ø27

1 3xØ20 double non-return valve
2 Engine outlet hose section

## Preparing heat exchanger inlet hose group

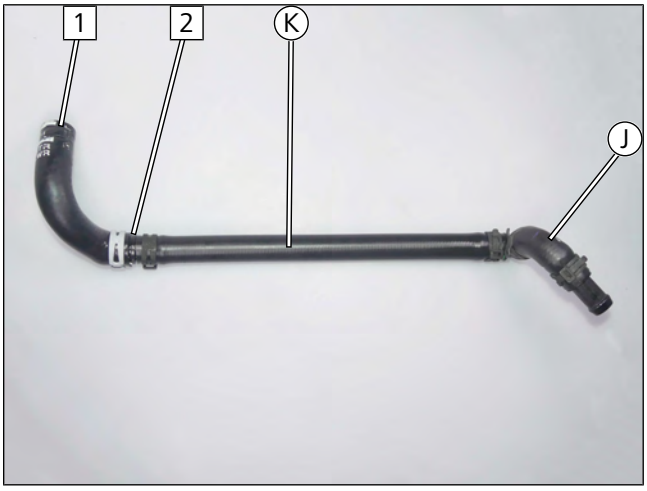



*Fig. 74*

1 Heat exchanger inlet hose section
2 20/18 connecting pipe

## Mounting T-piece hose group

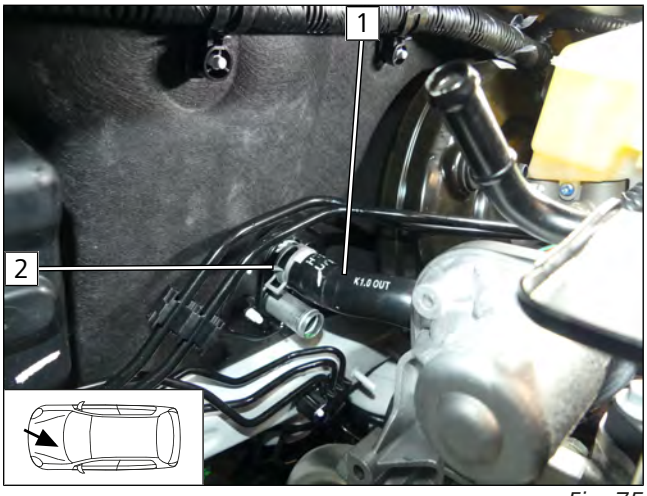



*Fig. 75*

1 Heat exchanger outlet hose section
2 Original vehicle spring clip

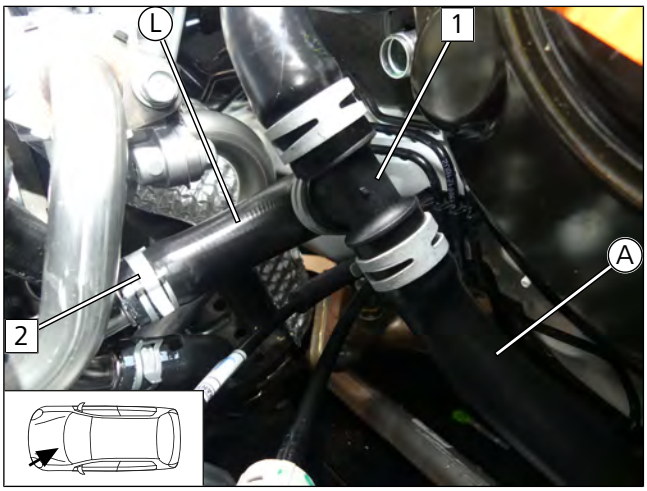



*Fig. 76*

1 T piece
2 Original vehicle spring clip

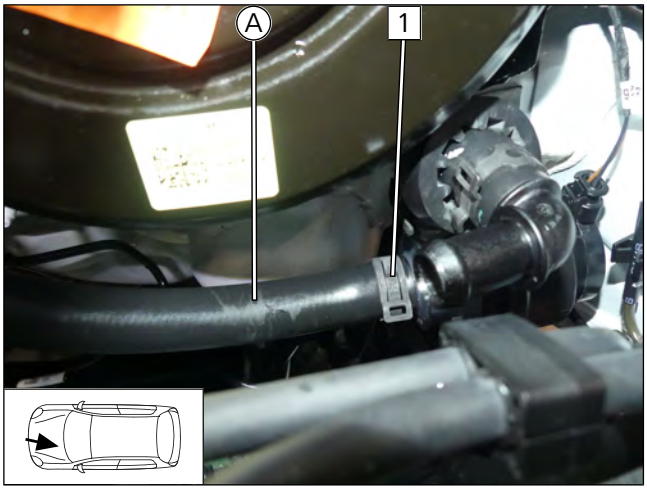



*Fig. 77*

1 Coolant pump inlet (covered)

## Mounting heat exchanger inlet hose group

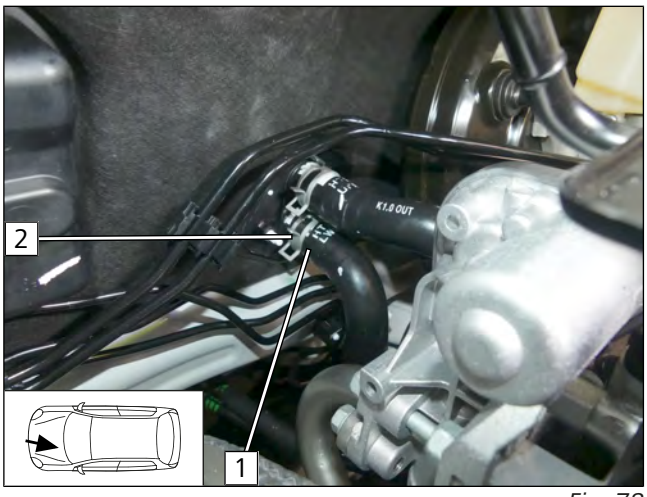



*Fig. 78*

1 Heat exchanger inlet hose section
2 Original vehicle spring clip

## Mounting hose group with double non-return valve

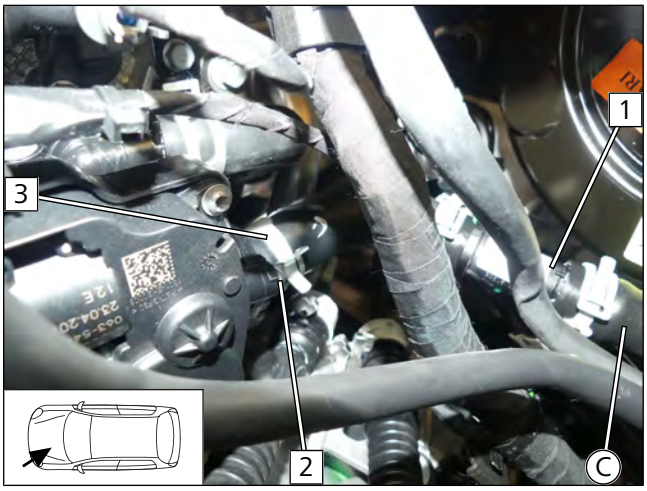



*Fig. 79*

Original vehicle spring clips will be reused.

1 Double non-return valve
2 Engine outlet hose section
3 Original vehicle spring clip

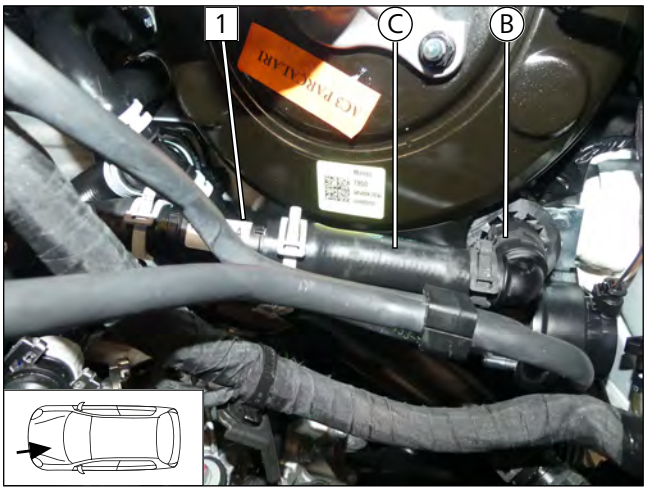



*Fig. 80*

1 Double non-return valve

## Connecting hoses (D) and (E) as well as hoses (H) and (J)

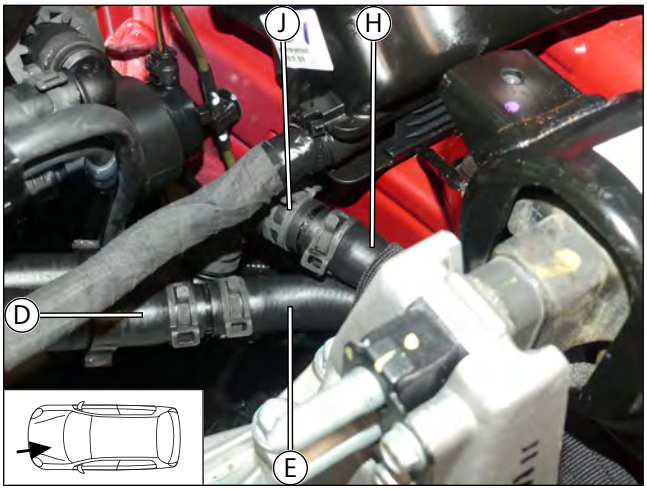



*Fig. 81*

## Mounting spacer bracket

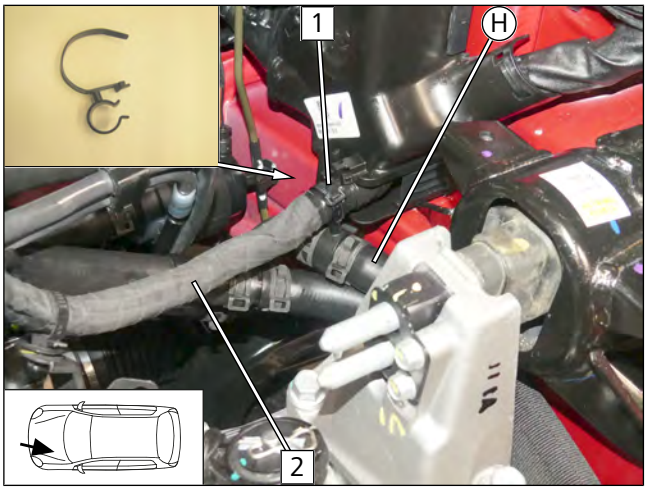



*Fig. 82*

> **Danger of damage to components**
>
> ▶ Ensure sufficient distance from neighbouring components, correct if necessary.

[1] Spacer bracket

[2] Original vehicle wiring harness

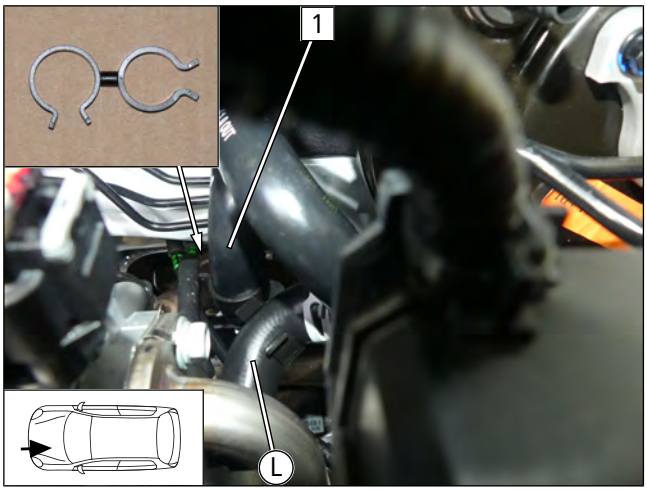



*Fig. 83*

▶ Position spacer bracket between hose (L) and heat exchanger inlet hose section [1].

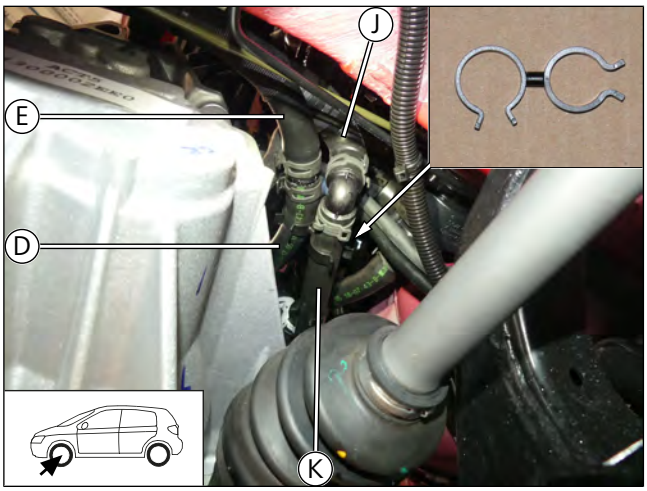
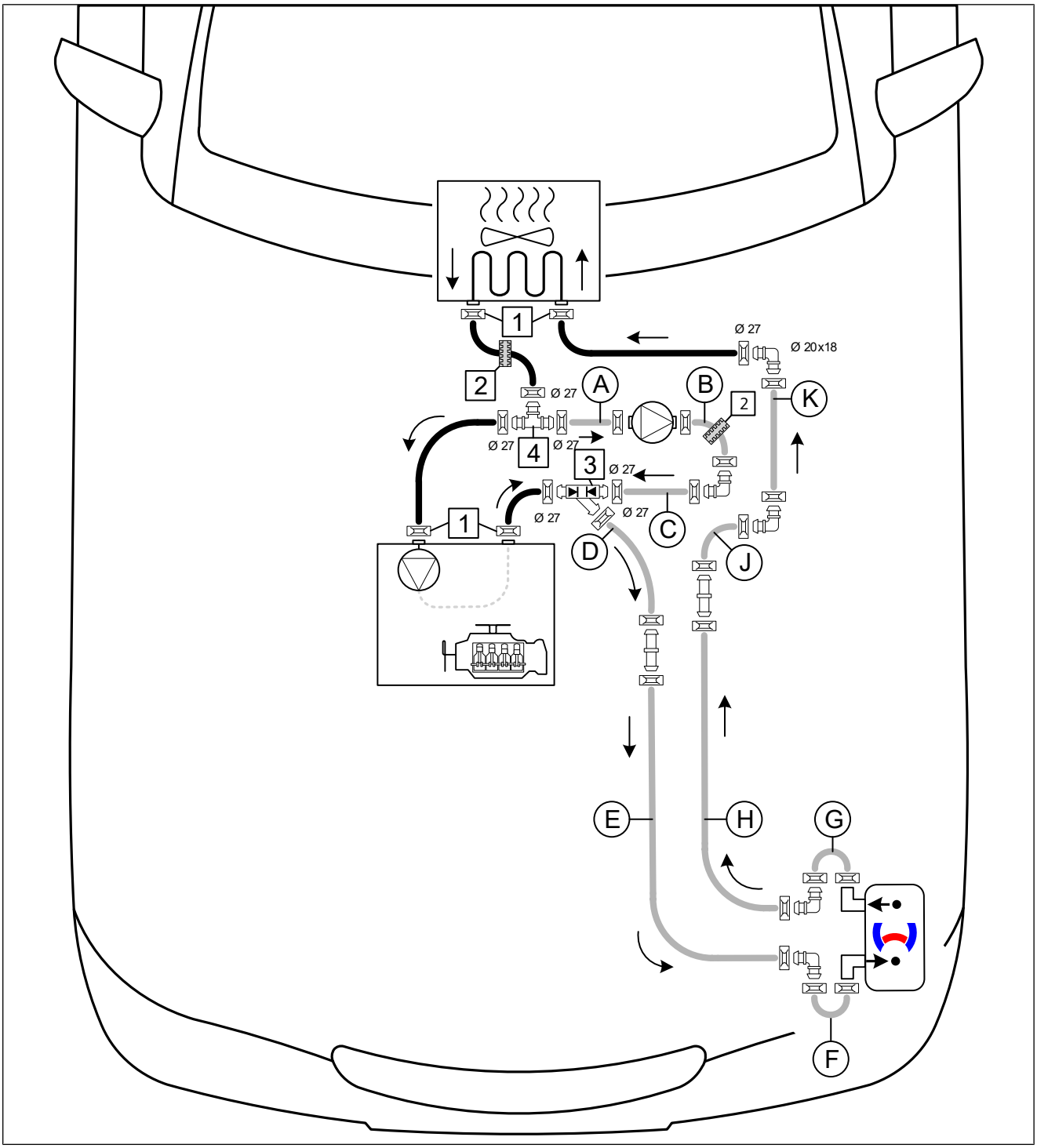



*Fig. 84*

▶ Position spacer bracket between hose (D) and hose (K).

# 13 Coolant 1.2P

## 13.1 Hose routing diagram




All spring clips without a specific designation = Ø25

All connecting pipes without a specific designation = Ø18x18; = Ø18x18

1 Original vehicle spring clip; 2 Rubber isolator; 3 Double non-return valve; 4 T-piece

## 13.2 Coolant circuit installation

Mounting hose group with hoses Ⓔ and Ⓗ

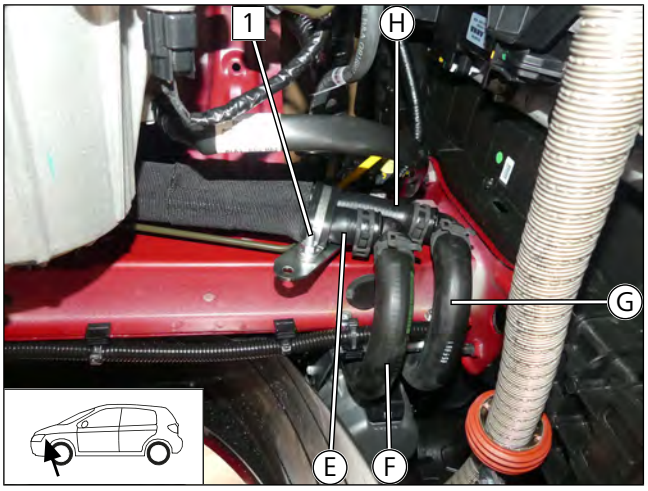



*Fig. 85*

1 M6x20 bolt, perforated bracket, Ø38 rubber-coated p-clamp, flanged nut

Repositioning hose group

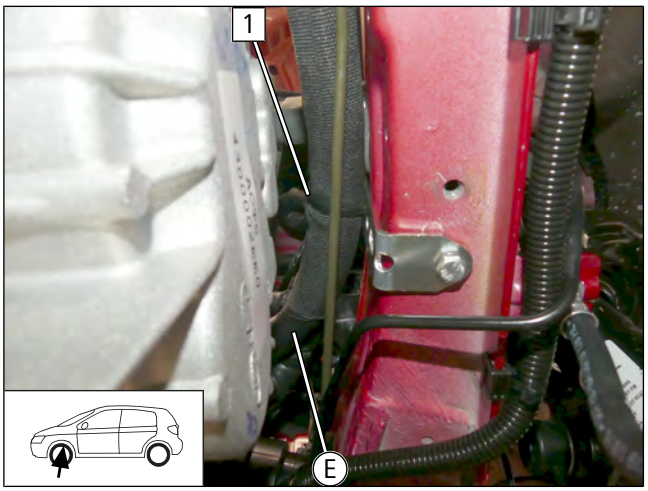



*Fig. 86*

1 Cable tie around hoses Ⓔ and Ⓗ

Preparing perforated bracket

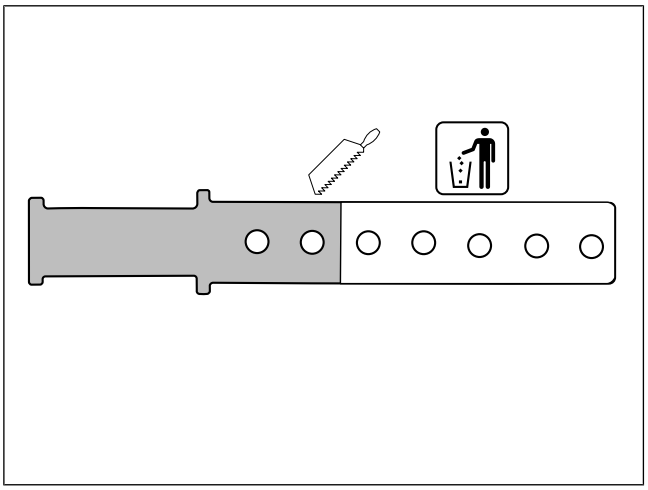


*Fig. 87*

## Preparing coolant pump

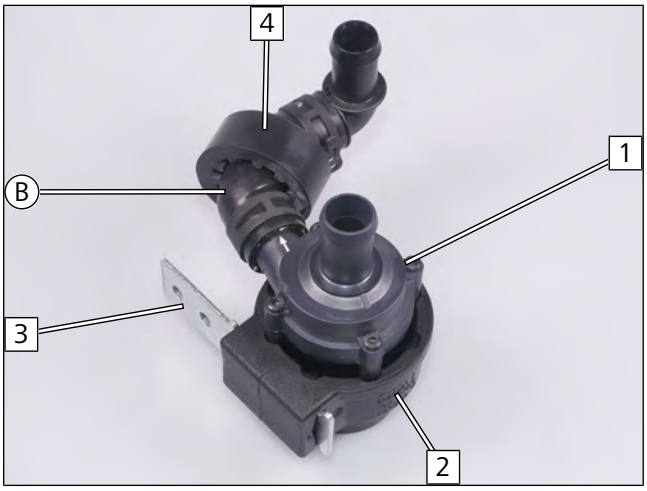



*Fig. 88*

1 Coolant pump
2 Coolant pump mount
3 Perforated bracket
4 Rubber isolator

## Mounting coolant pump

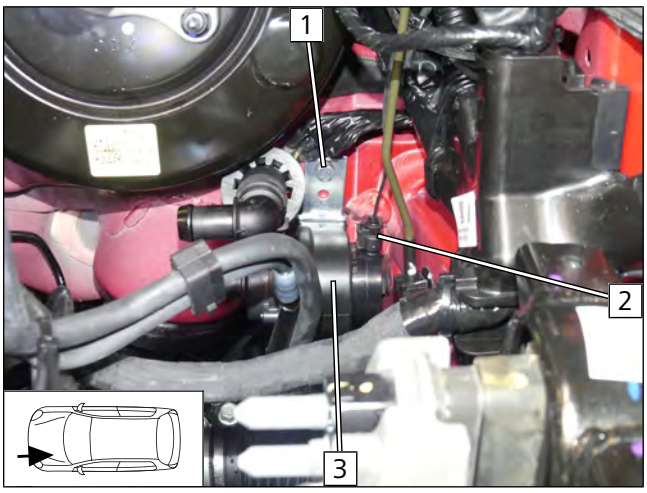



*Fig. 89*

1 M6x20 bolt, spring lock washer, perforated bracket, original vehicle threaded hole
2 Coolant pump wiring harness connector
3 Premounted coolant pump

## Dismantling hoses

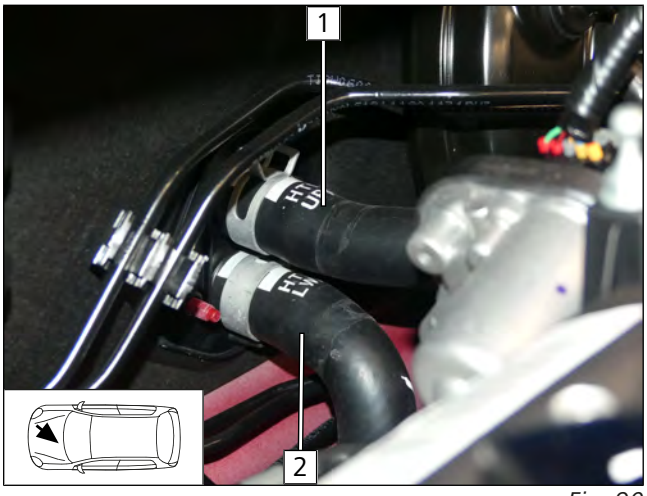



*Fig. 90*

Original vehicle spring clips will be reused.

1 Heat exchanger outlet / engine inlet hose
2 Engine outlet / heat exchanger inlet hose

## Preparing heat exchanger outlet / engine inlet hose

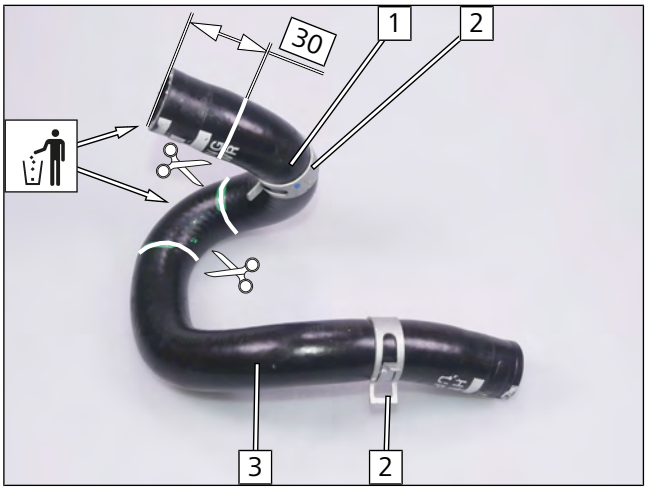



*Fig. 91*

1 Engine inlet hose section
2 Original vehicle spring clip will be reused
3 Heat exchanger outlet hose section

## Preparing hose group with T-piece

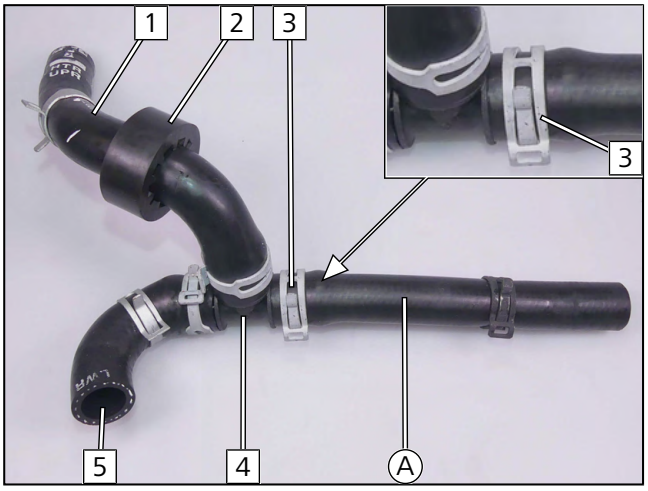



*Fig. 92*

All spring clips Ø27

Observe the location of the clamp fastener at position 3.

1 Heat exchanger outlet hose section
2 Rubber isolator
4 3xØ20 T-piece
5 Engine inlet hose section

## Preparing hose of engine outlet / heat exchanger inlet

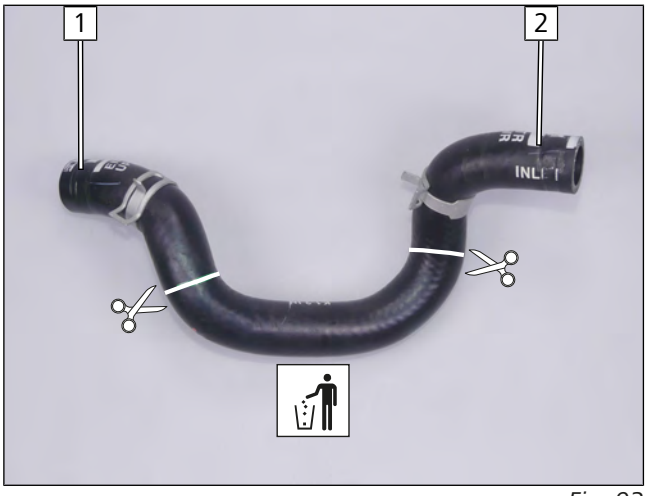



*Fig. 93*

Original vehicle spring clips will be reused.

1 Engine outlet hose section
2 Heat exchanger inlet hose section

## Preparing hose group with double non-return valve

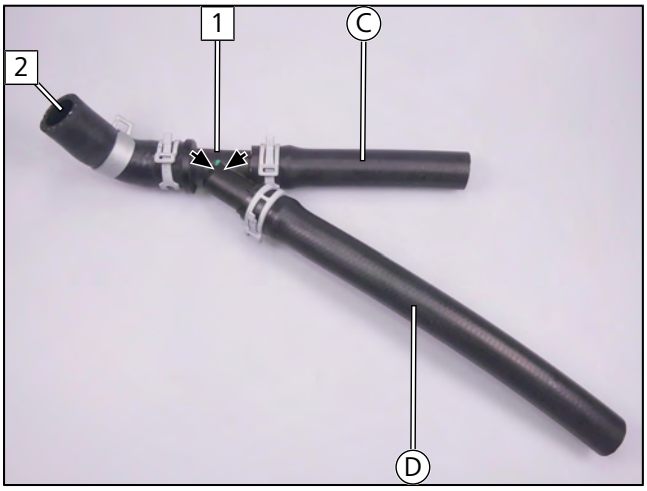



*Fig. 94*

1 3xØ20 double non-return valve
2 Engine outlet hose section

## Preparing heat exchanger inlet hose group

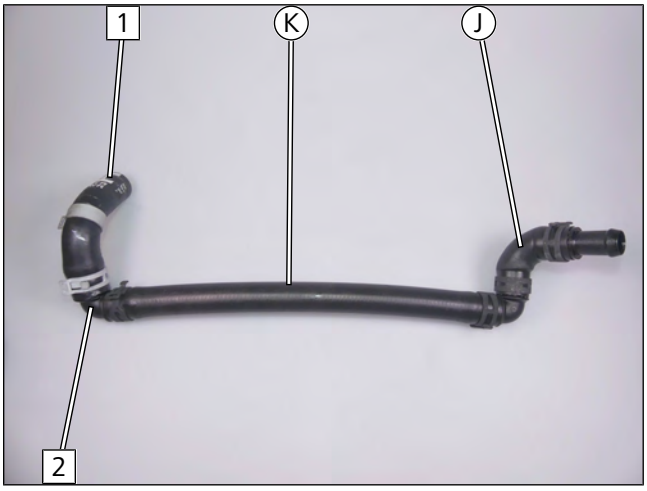



*Fig. 95*

1 Heat exchanger inlet hose section
2 20/18, 90° connecting pipe

## Mounting T-piece hose group

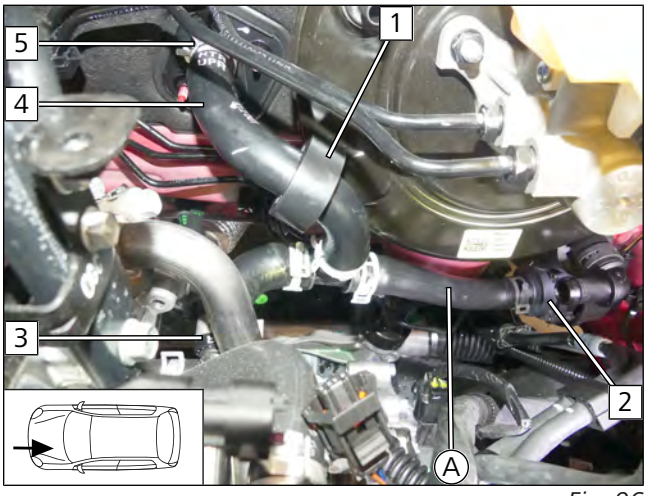



*Fig. 96*

Original vehicle spring clips will be reused.

1 Align rubber isolator
2 Coolant pump inlet
3 Engine inlet hose section
4 Heat exchanger outlet hose section
5 Original vehicle spring clip

## Mounting heat exchanger inlet hose group

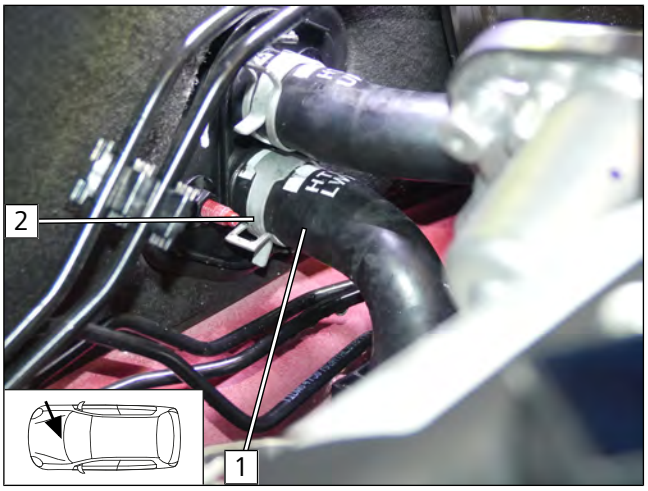



*Fig. 97*

1 Heat exchanger inlet hose section
2 Original vehicle spring clip

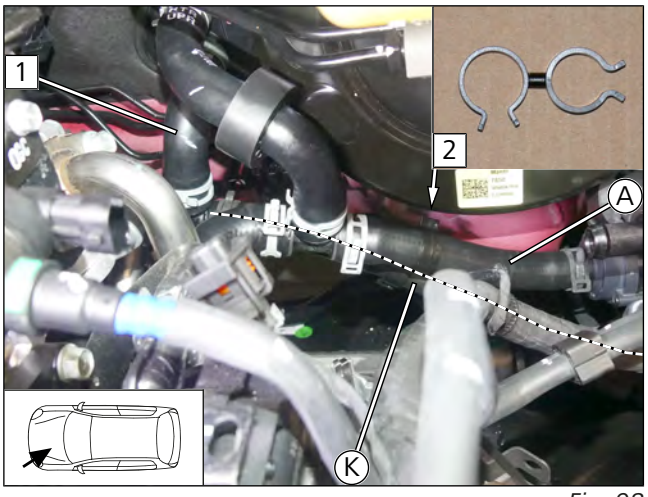



*Fig. 98*

▶ Position spacer bracket 2 between hose Ⓐ and hose Ⓚ.

1 Heat exchanger inlet hose section

## Mounting hose group with double non-return valve

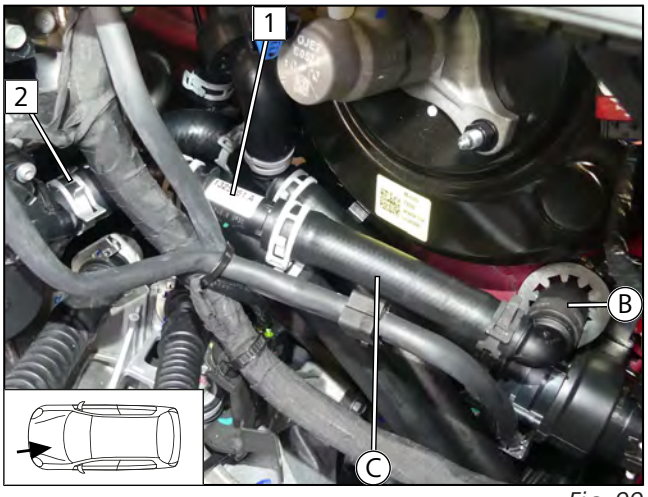



*Fig. 99*

1 Double non-return valve
2 Engine outlet hose section

Connecting hoses (D) and (E) as well as hoses (H) and (J)

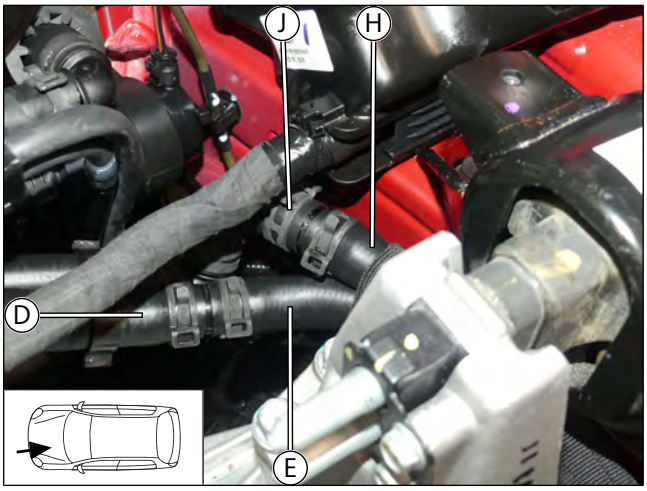



*Fig. 100*

Mounting spacer bracket

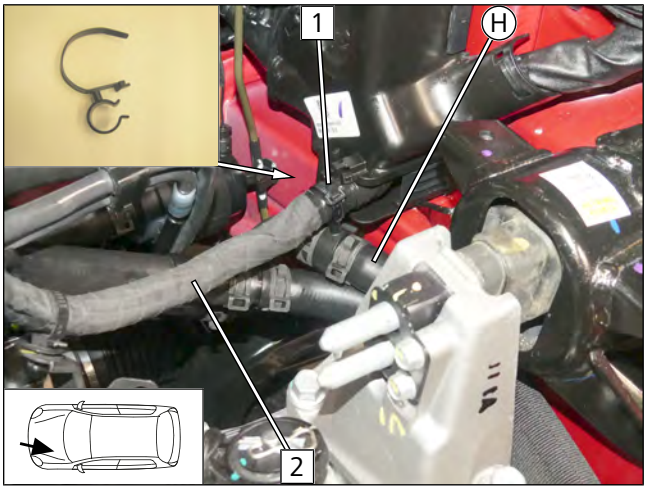



*Fig. 101*

**Danger of damage to components**

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

[1] Spacer bracket

[2] Original vehicle wiring harness

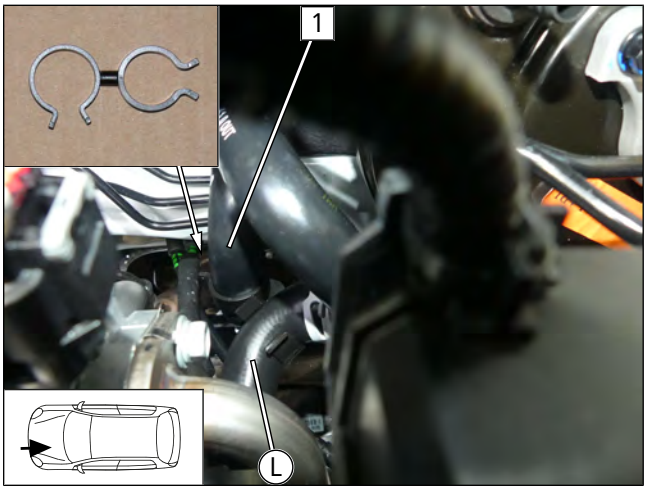



*Fig. 102*

▶ Position spacer bracket between hose (L) and heat exchanger inlet hose section [1].

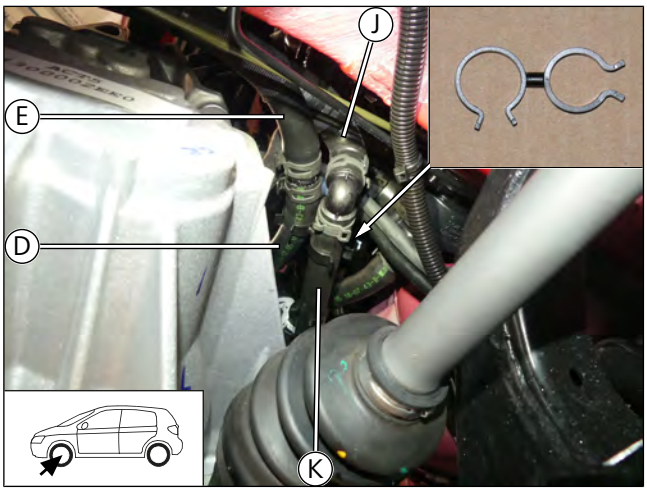



*Fig. 103*

▶ Position spacer bracket between hose Ⓓ and hose Ⓚ.

## 14 Final work in engine compartment

### Adapting engine trim

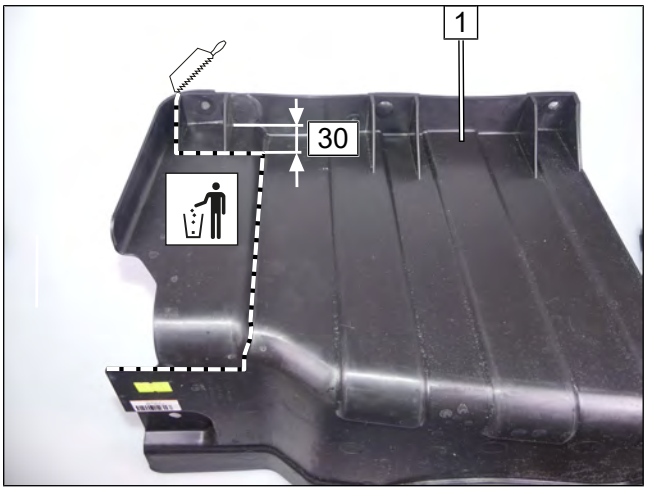



*Fig. 104*

▶ Cut trim 1 as shown.

### Fitting edge protection


*Fig. 105*

1 Engine trim
2 Edge protection

### Installing engine trim

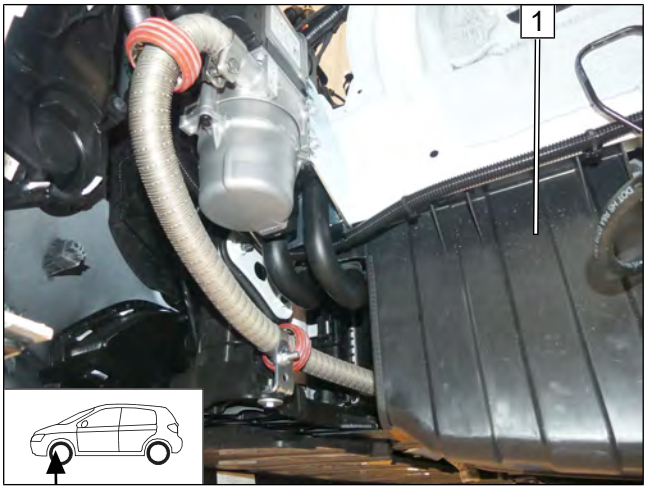



*Fig. 106*

Danger of damage to components

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

1 Engine trim

# 15 Electric system of passenger compartment manual air-conditioning

## 15.1 Electrical system preparation

Assigning wires

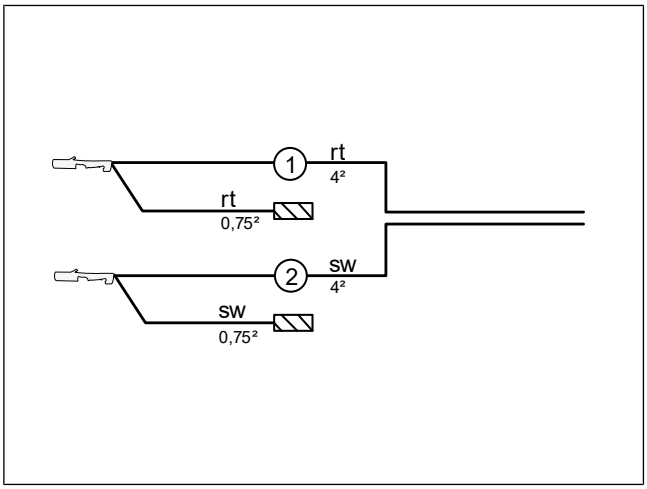



*Fig. 107*

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

Connecting wires to RSH

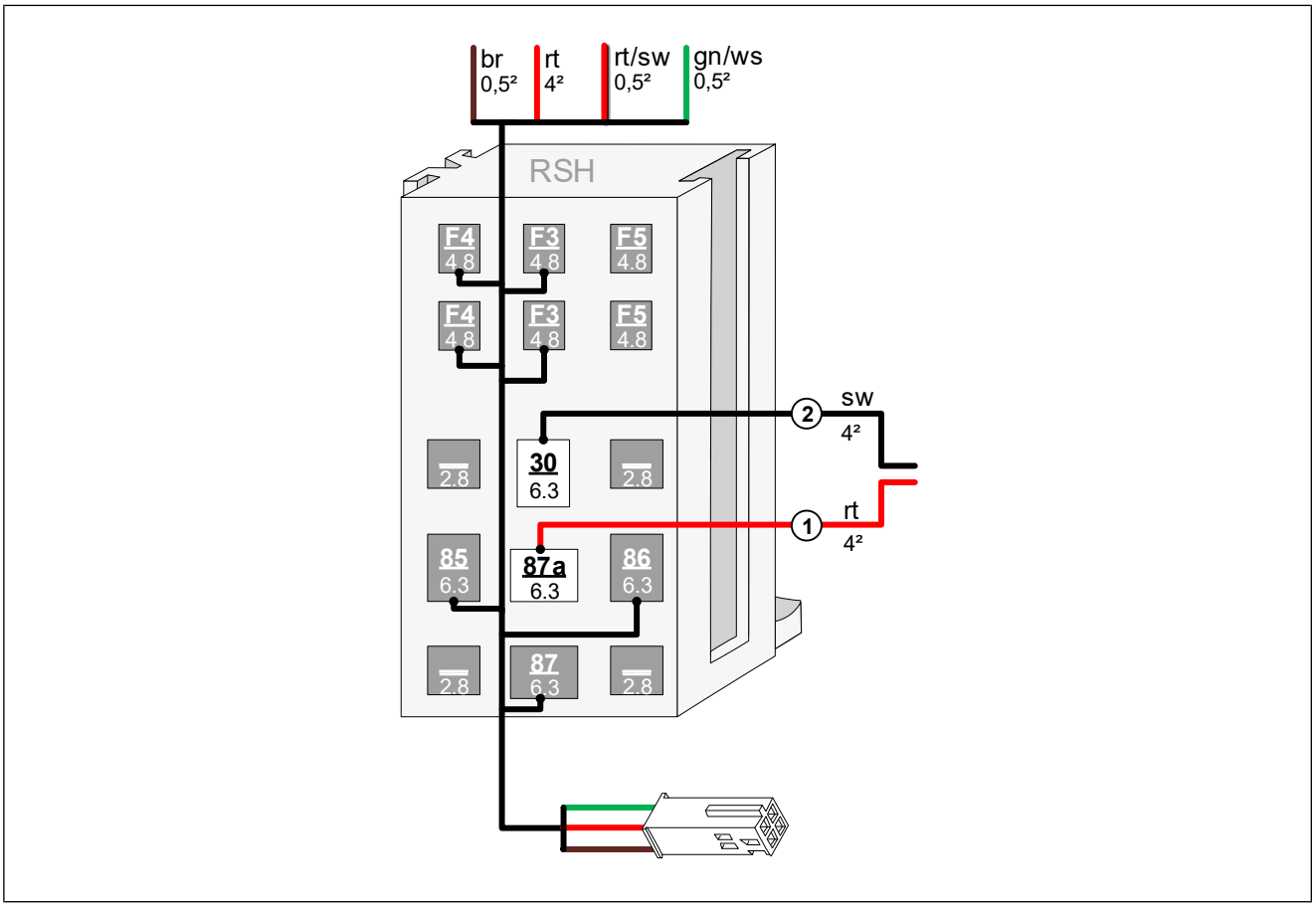



*Fig. 108*

## Premounting RSH

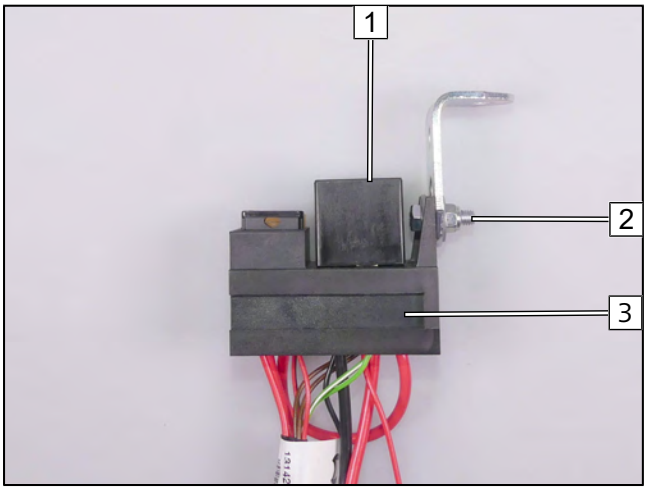



*Fig. 109*

1 Relay K1

2 Mount M5x16 bolt, large diameter washer, RSH, angle bracket, large diameter washer, nut loosely

3 RSH

## 15.2 Wiring diagram

Interactive system wiring diagram with WD Code **8341** at https://my.webasto.com/download/System-schaltplan

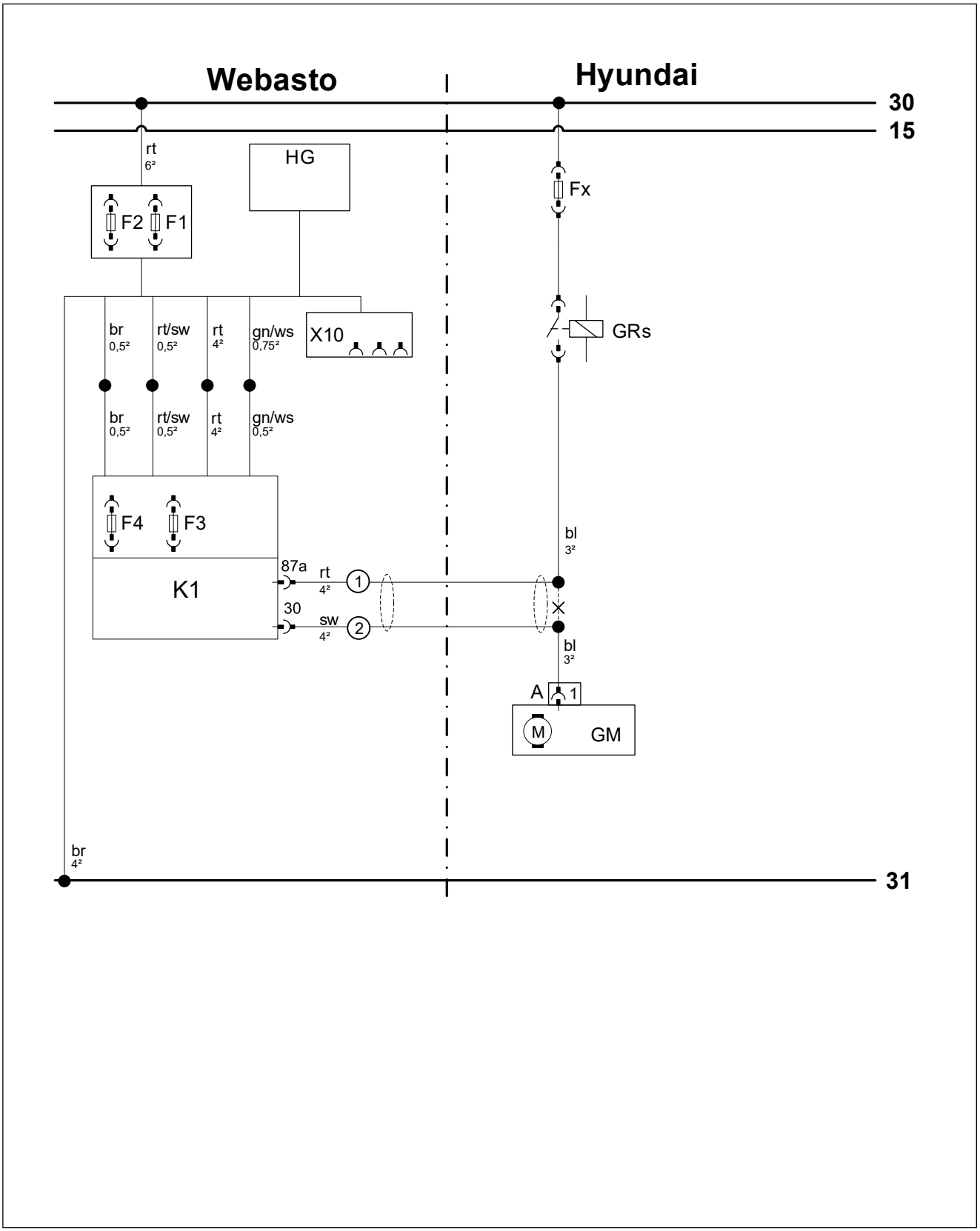



*Fig. 110*

## 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 | Designation |
| Fx | Fuse | X | Cutting point |
| GRs | Fan relay | | |
| GM | Fan motor | | |
| A | 2-pin GM 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 | | |

## 15.3 Fan controller

### Mounting RSH

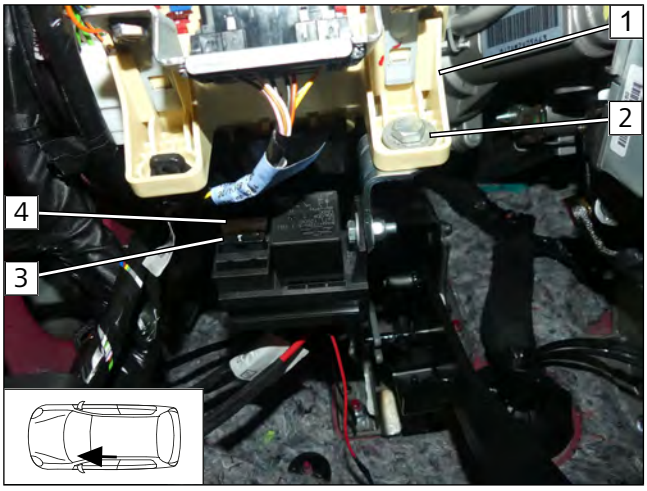



*Fig. 111*

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

1 Fuse box of passenger compartment
2 M6x20 bolt, large diameter washer, original vehicle hole, angle bracket, M6 flanged nut
3 1A fuse F3
4 25A fuse F4

### Connecting same colour wires of wiring harnesses

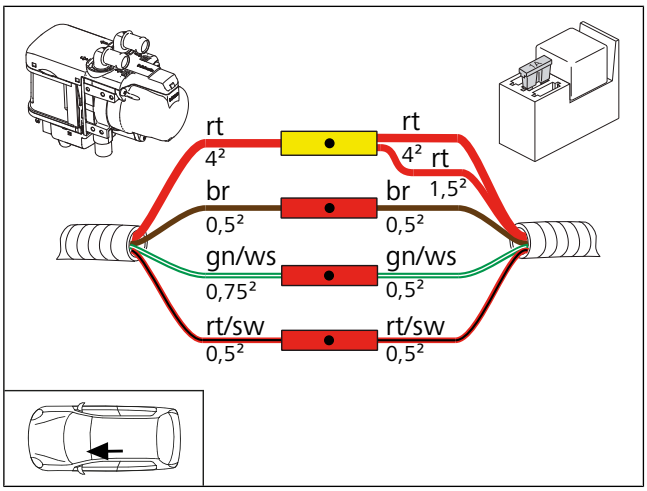



*Fig. 112*

### Fan motor connection

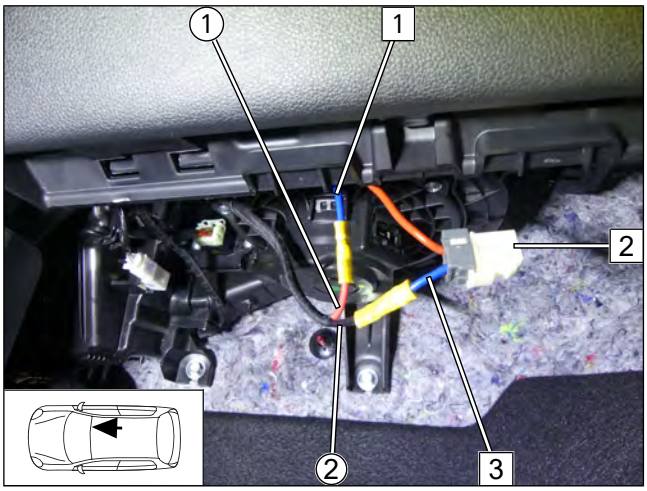



*Fig. 113*

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

# 16 Electrical system of passenger compartment automatic A/C

## 16.1 Electrical system preparation

### Preparing / assigning wires

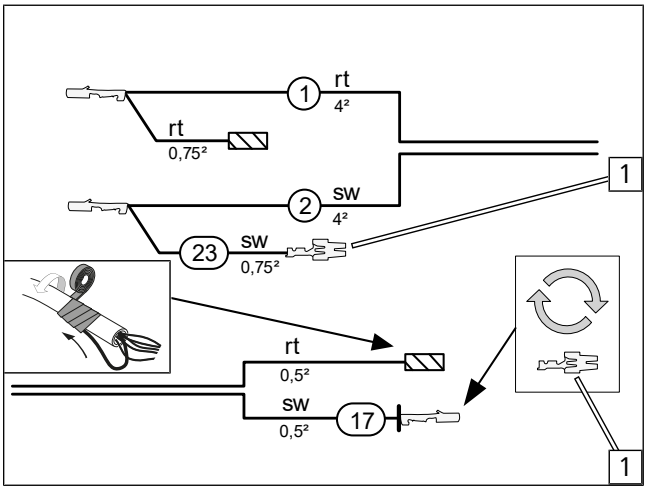



*Fig. 114*

Wire sections retain their numbering in the entire document.

- 1 Flat spring contact
- ① Red (rt) wire of fan wiring harness
- ② Black (sw) wire of fan wiring harness
- ⑰ Black (sw) wire of power supply wiring harness
- ㉓ Additional output

### Connecting wires to RSH

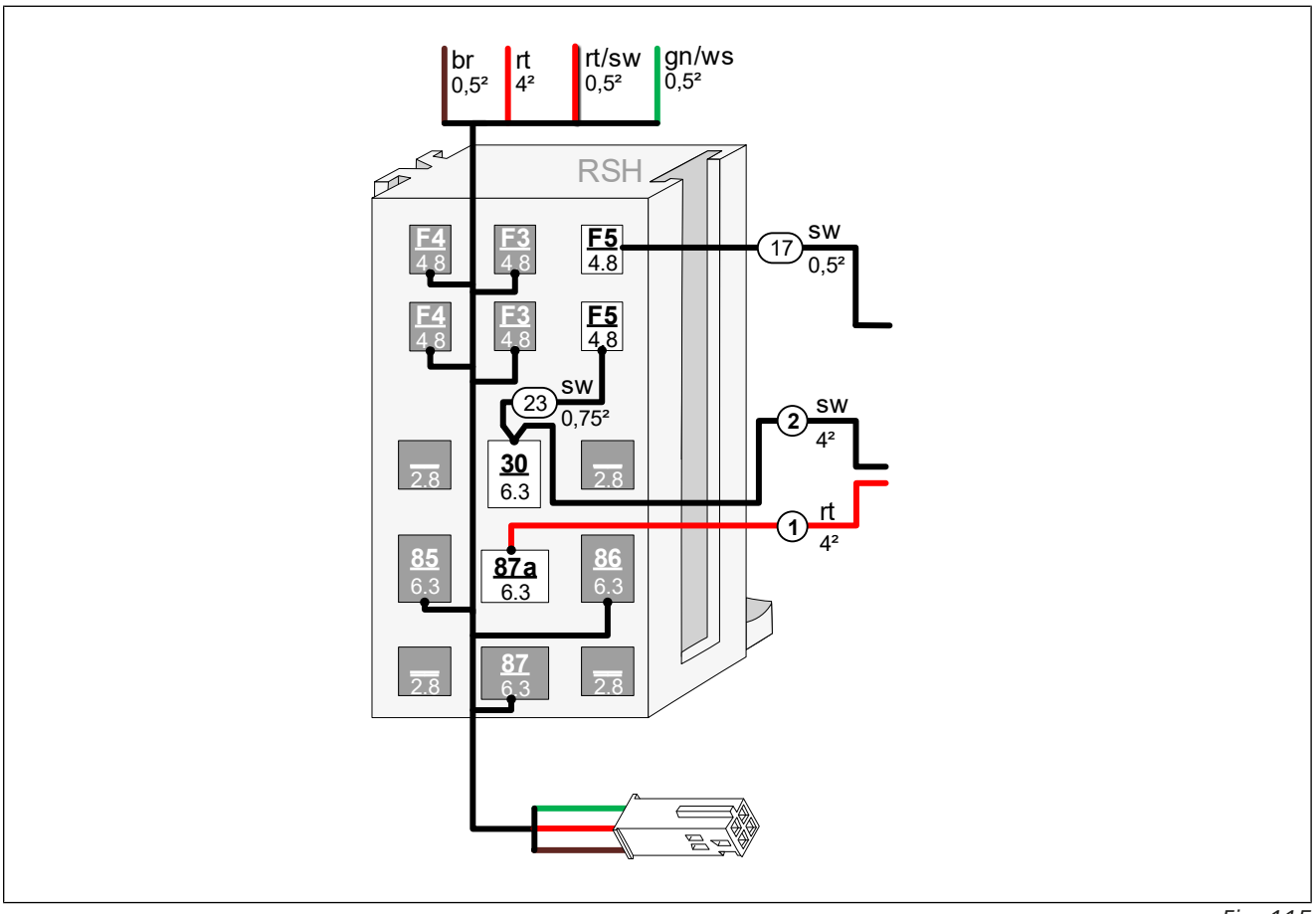



*Fig. 115*

Premounting RSH

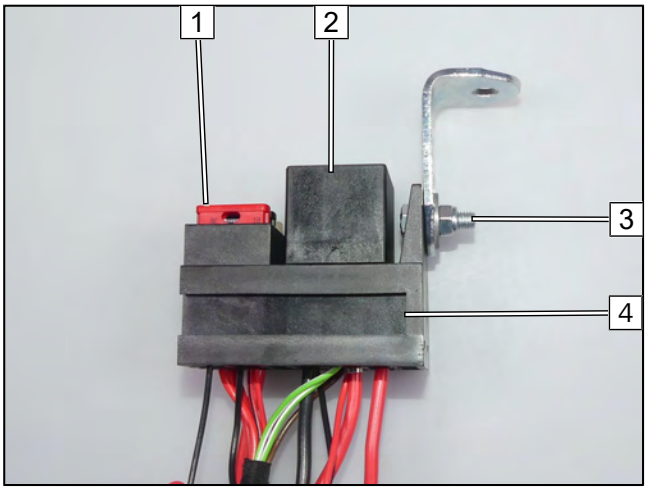



*Fig. 116*

1. 7.5A fuse F5
2. Relay K1
3. M5x16 bolt, large diameter washer, RSH, angle bracket, large diameter washer, nut
4. RSH

## 16.2 Wiring diagram

Interactive system wiring diagram with WD Code **8341** at https://my.webasto.com/download/System-schaltplan

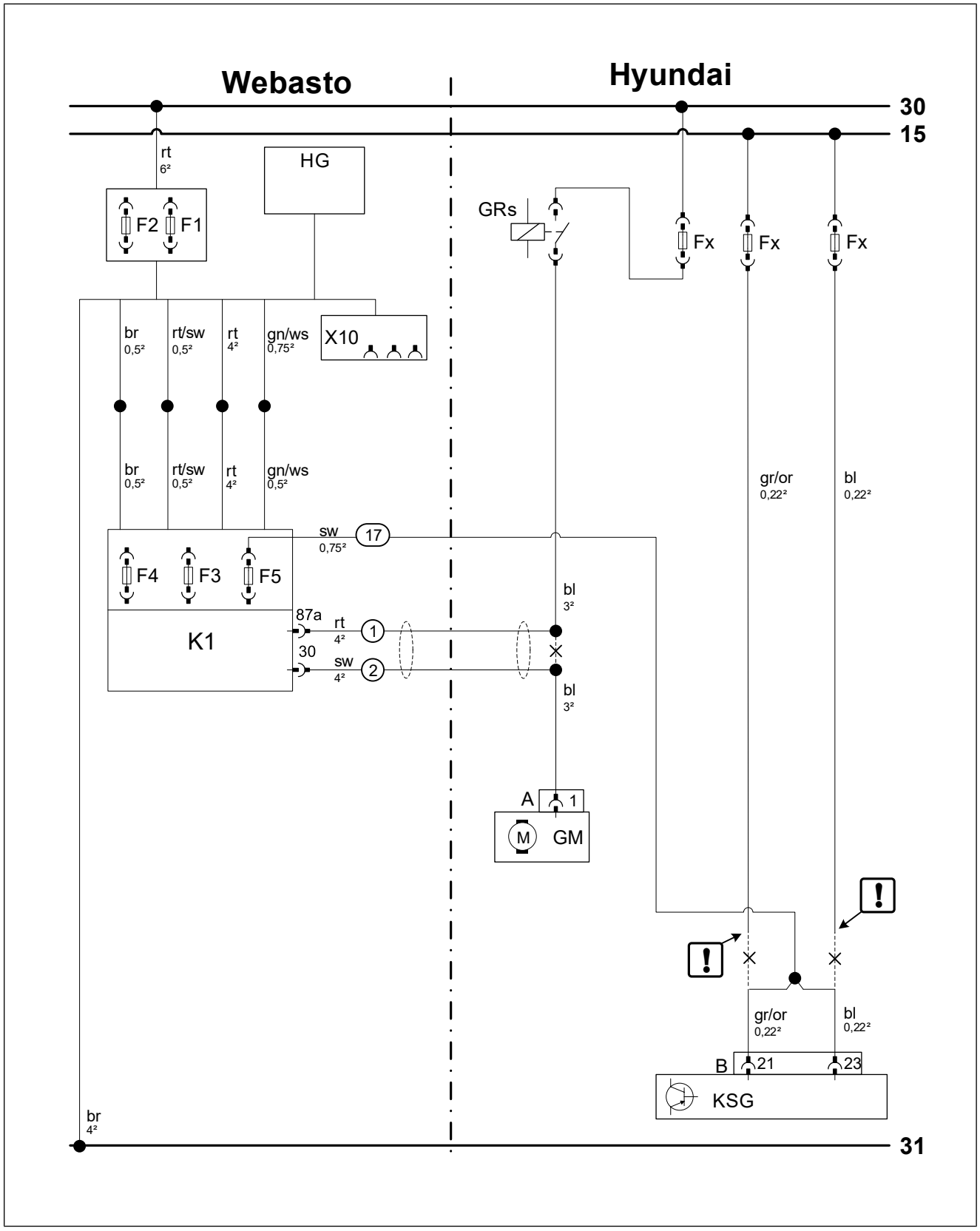



*Fig. 117*

## 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 | Designation |
| Fx | Fuse | X | Cutting point |
| GRs | Fan relay | ! | insulate and tie back |
| GM | Fan motor | | |
| A | 2-pin GM connector | | |
| KSG | Air-conditioning control unit | | |
| B | 40-pin KSG 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 | | |

## 16.3 Fan controller

### Mounting RSH

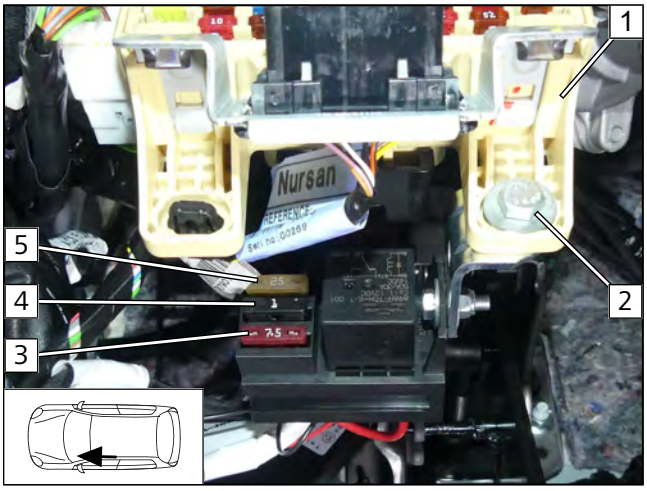



*Fig. 118*

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

1 Fuse box of passenger compartment
2 M6x20 bolt, large diameter washer, original vehicle hole, angle bracket, M6 flanged nut
3 7.5A fuse F5
4 1A fuse F3
5 25A fuse F4

### Connecting same colour wires of wiring harnesses

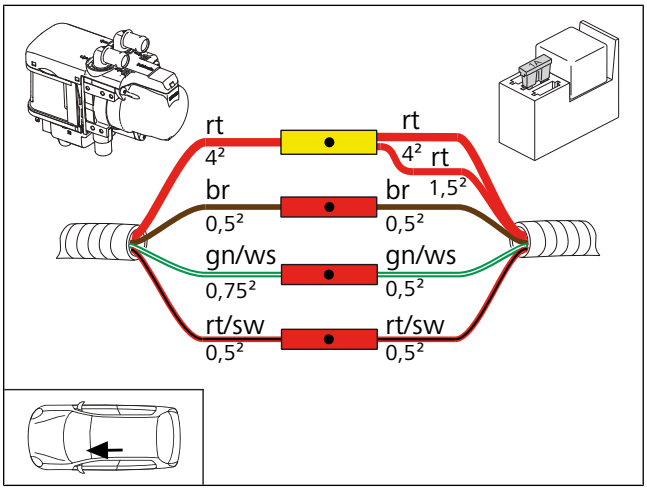



*Fig. 119*

### Fan motor connection

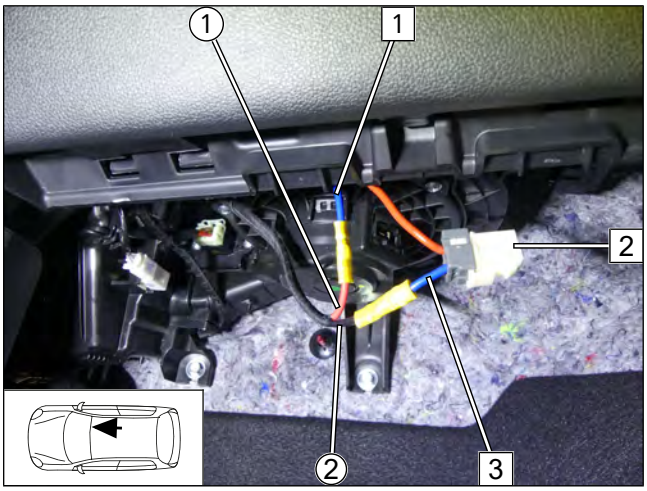



*Fig. 120*

1 Wire of connector A, pin 1
2 2-pin connector of GM
3 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

Connecting KSG

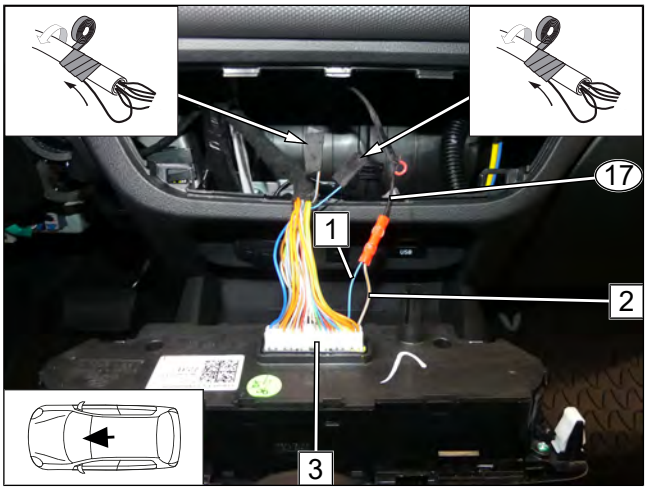



*Fig. 121*

1 Blue (bl) wire of 40-pin connector of KSG / pin 23

2 Grey/orange (gr/or) wire from 40-pin connector of KSG/ pin 21

3 40-pin KSG connector B

17 Black (sw) wire of fuse F5

## 16.4 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.

# 17 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'.

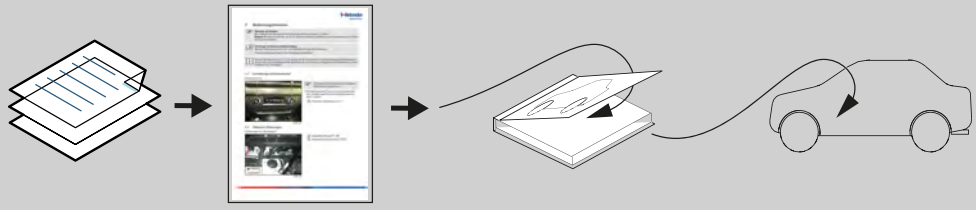
▶ Initial operation and functional test

▶ 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

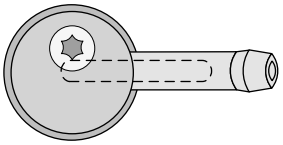
Company address:
Friedrichshafener Str. 9
82205 Gilching
Germany

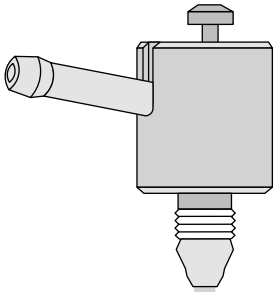
Technical Extranet: https://dealers.webasto.com

CE

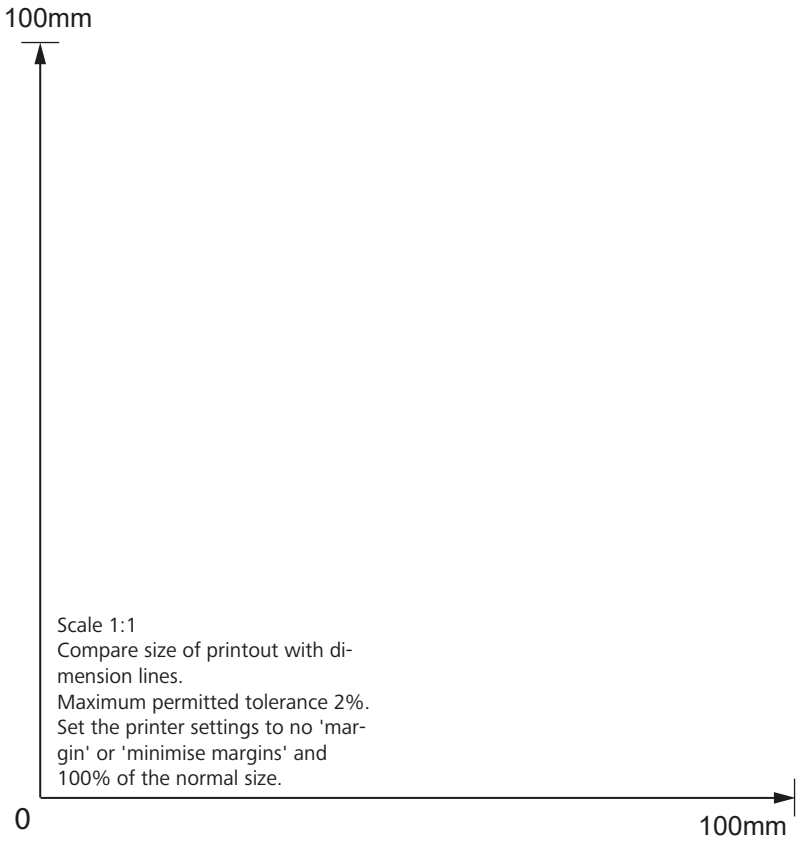
WWW.WEBASTO.COM

# 18 FuelFix template










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.

# 19 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 current consumption in case of parking heating mode**

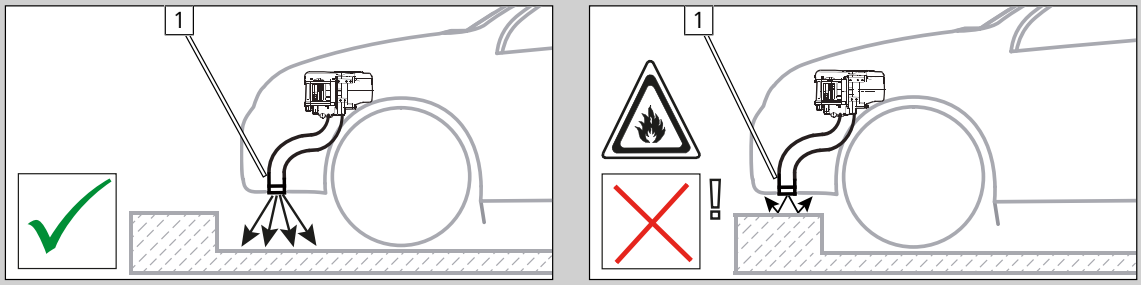
Depending on the vehicle model, there may be an increased quiescent current consumption message in the vehicle information system during or directly after operation in parking heating mode.

▶ 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 preheating unit. There is **no** engine pre-heating.

**Notes on parking heater exhaust outlet 1**




## 19.1 A/C control panel settings

Manual air-conditioning control panel

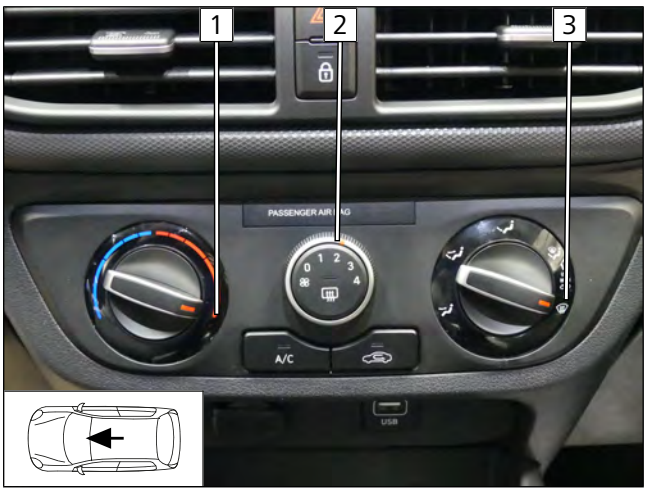



*Fig. 122*

Before parking the vehicle, make the following settings:

1 Set temperature to 'HI'
2 Set fan to level '2' to '3'
3 Air outlet to windscreen

## 19.2 Installation location of fuses

Fuses in engine compartment

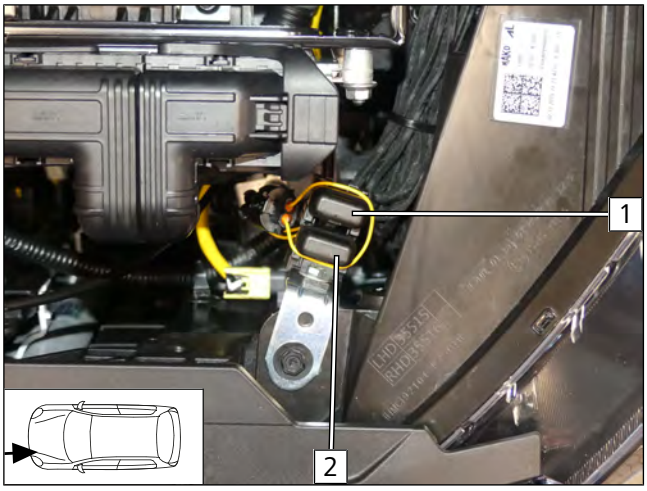



*Fig. 123*

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

Fuses in passenger compartment

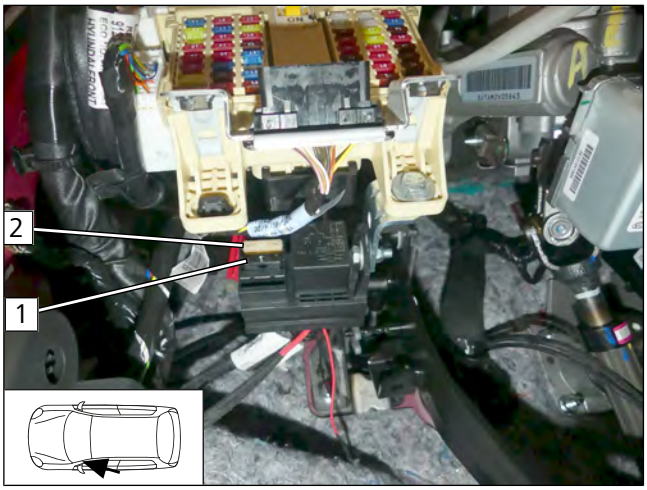



*Fig. 124*

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

# 20 Operating instructions for 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 current consumption in case of parking heating mode**

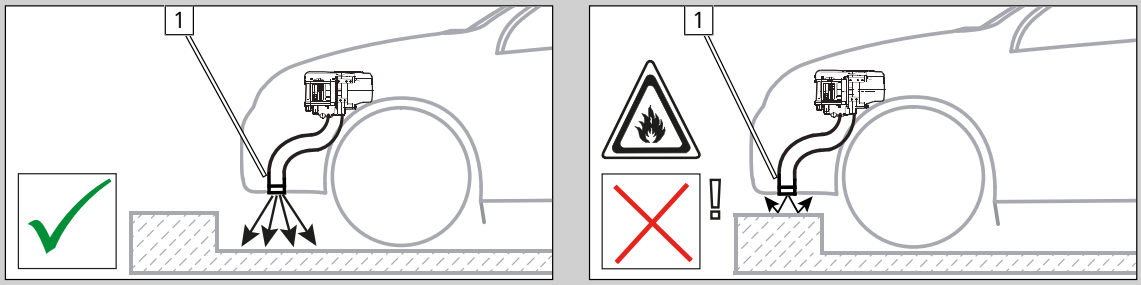
Depending on the vehicle model, there may be an increased quiescent current consumption message in the vehicle information system during or directly after operation in parking heating mode.

▶ 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 preheating unit. There is **no** engine pre-heating.

**Notes on parking heater exhaust outlet 1**




## 20.1 A/C control panel settings

Automatic A/C control panel

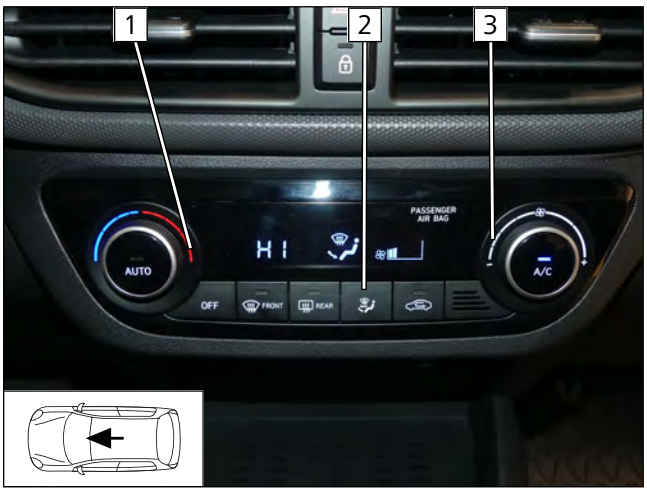



*Fig. 125*

Before parking the vehicle, make the following settings:

1 Set temperature to 'HI'
2 Air outlet to windscreen and footwell
3 Set fan to level '2' to '3'

## 20.2 Installation location of fuses

Fuses in engine compartment

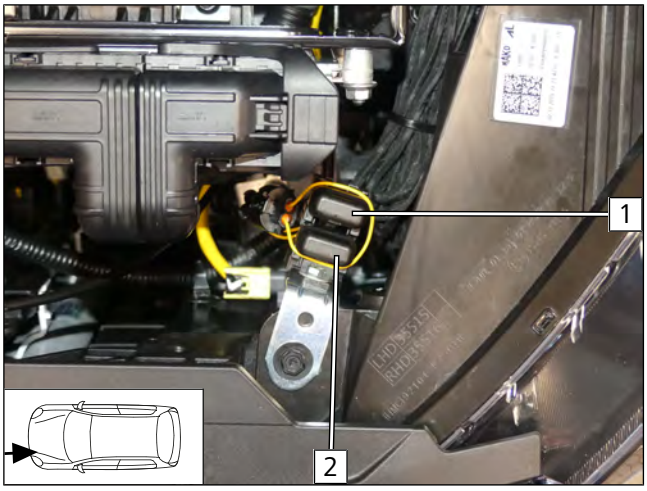



*Fig. 126*

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

Fuses in passenger compartment

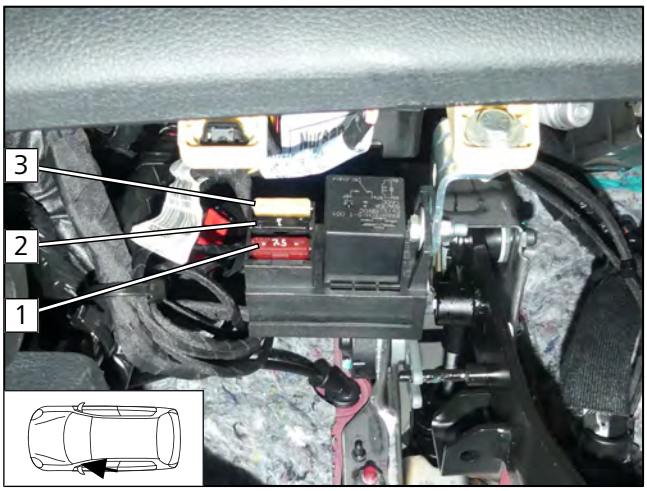



*Fig. 127*

1 F5 - 7.5A A/C control panel fuse
2 F3 - 1A control element fuse
3 F4 - 25A fan fuse