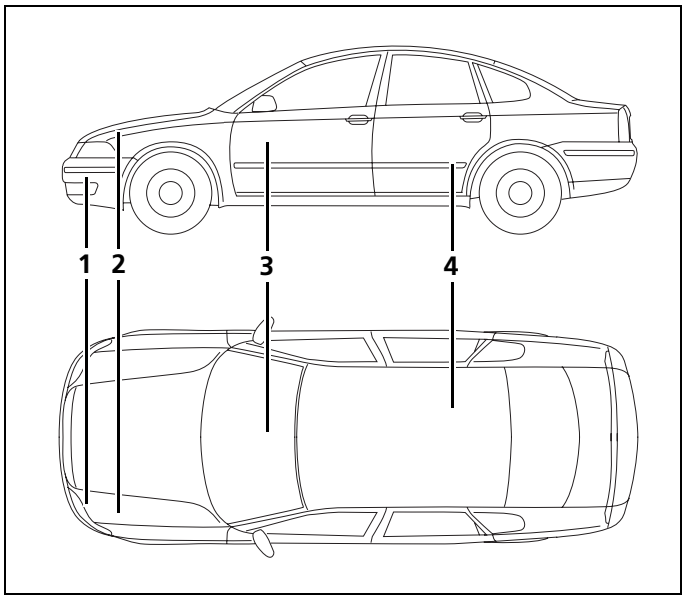
Blue*Heat* *Coolant Heater*

Webasto
Feel the drive

Thermo Top



VW Passat

2.0L, 4CYL- FSI, Gasoline
Beginning Model Year: 2006

Special instructions for these models
Part locations may differ slightly dependent on the vehicle model.

Be sure to check **WWW.techwebasto.com** for the latest addition of this manual.

Legend

1 Blue*Heat* Coolant Heater, Exhaust Tube, and Combustion Air Intake Silencer
2 Fuse Holder, Relays and Resistor Assembly
3 Timer Control
4 Fuel Pump

Special Tools

– Hose Clamping pliers
– Torque Wrench

Table of Contents

– Improper installation or repair of Webasto heating and cooling systems can cause fire or the leakage of deadly carbon monoxide leading to serious injury or death.
– Installation and repair of Webasto heating and cooling systems requires special Webasto training, technical information, special tools and special equipment.
– NEVER attempt to install or repair a Webasto heating or cooling system unless you have successfully completed the factory training course and have the technical skills, technical information, tools and equipment required to properly complete the necessary procedures.
– ALWAYS carefully follow Webasto installation and repair instructions and heed all WARNINGS.
– Webasto rejects any liability for problems and damage caused by the system being installed by untrained personnel.

Parts List

Quantity	Part	Part Number
1	Installation Kit For Vehicles With Automatic Temperature Controls (Climatronic)	9013645A
1	Installation Kit For Vehicles With Manual Temperature Controls (Climatic)	5001100A

Vehicle Information

Manufacturer	Model	Year	Engine Type
Volkswagen	Passat	Beginning 2006	2.0L, 4CYL FSI

Foreword

This installation requires special expertise from a Webasto training course to install a Webasto Thermo Top heater, which means that it may only be installed by a specially trained workshop or dealership. Webasto cannot accept any liability for faults and damage caused by the system being installed by untrained personnel.

Scope and Purpose

These installation instructions are intended to support authorized Webasto trained distributors, dealers and personnel in the installation of the Thermo Top (Blue*Heat)* Coolant Heaters.

These installation instructions apply to the vehicles listed on the front cover of this installation

document unless technical modifications on the vehicle influence the installation, excluding all liability claims. Depending on the version and equipment in the vehicle, changes may be required to the installation work set out in these installation instructions. In any event, the directives in the "installation manual" and "operating manual" must be followed.

ATTENTION

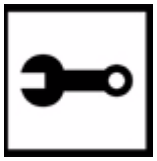
All relevant state and provincial licensing regulations if any, governing the installation and use of auxiliary heating devices must be observed!

CAUTION

Location of heater, installation of coolant lines, fuel system and components, wiring and control devices are important for proper operation. Failure to comply with the installation instructions provided may result in poor operation or damage to heater and vehicle components.

Symbol Identification

Symbols that define sections in manual



Mechanical Preparation

Fuel

Electrical

Exhaust

Coolant

Combustion Air Intake

General Symbol Descriptions

Warning

Caution

Refer to Webasto or Manufacturer Manual

Attention

General References

– Bare body parts, for example around drilled holes, must be treated with anti-corrosive coating.
– Secure hoses, cables and wiring harnesses with cable ties and fit protective hoses around them at chafing points.
– Fit edge protectors (opened fuel hose) to sharp edges.

Preparation

Heater Kit

– Verify and identify all contents of kit.

Vehicle

– Open fuel cap and vent tank
– Release radiator pressure
– Remove battery and battery tray
– Remove air filter assembly and hoses
– Remove front left wheel well splashshield
– Remove left front fog lamp or trim panel
– Remove underbody splash shields
– Remove rear seat bottom
– Remove driver's side floor trim
– Remove driver's side dash trim panel

CAUTION
For reasons of safety due to possible fuel spillage, it is recommended that there be no more than 1/2 tank of fuel present. If fuel quantity is greater than 1/2 of capacity, make provisions to reduce quantity of fuel.

– Protect vehicle fenders, panels and interior with covers

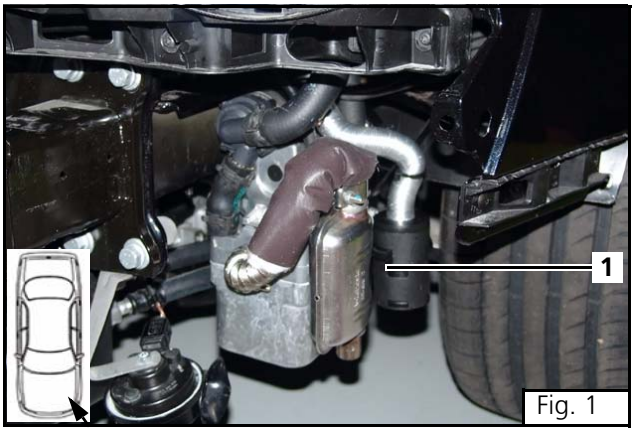


Fig. 1

Heater Installation Site

ATTENTION
The Webasto Auxiliary Coolant Heater is installed on the left side of the vehicle behind the front bumper.

Front bumper cover was removed for photographic purposes only.

– (1) Webasto Auxiliary Coolant Heater (Installed)

Electrical - Overview

ATTENTION

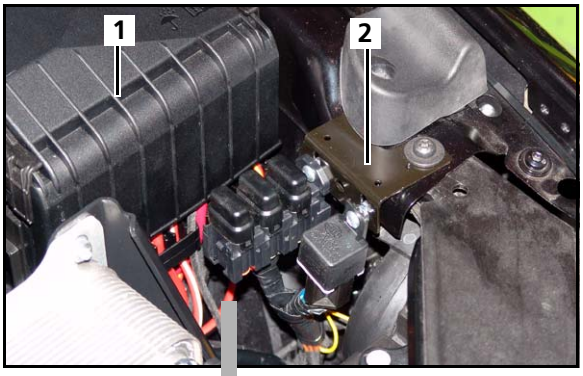
If not described differently, securing of wiring and cables is done with cable ties to the vehicle's own wires and cable harnesses.

ATTENTION

Timer control location is a recommendation only. Please consult with the customer before mounting.

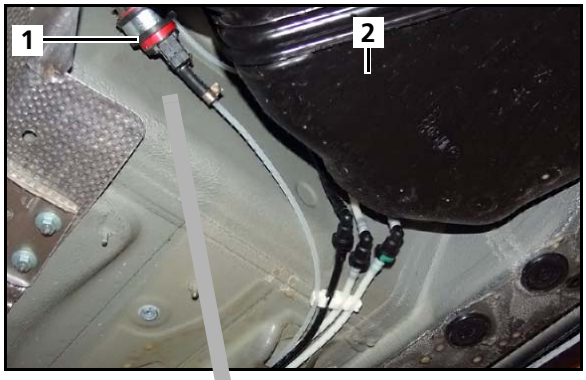
Relay and Fuse Holder

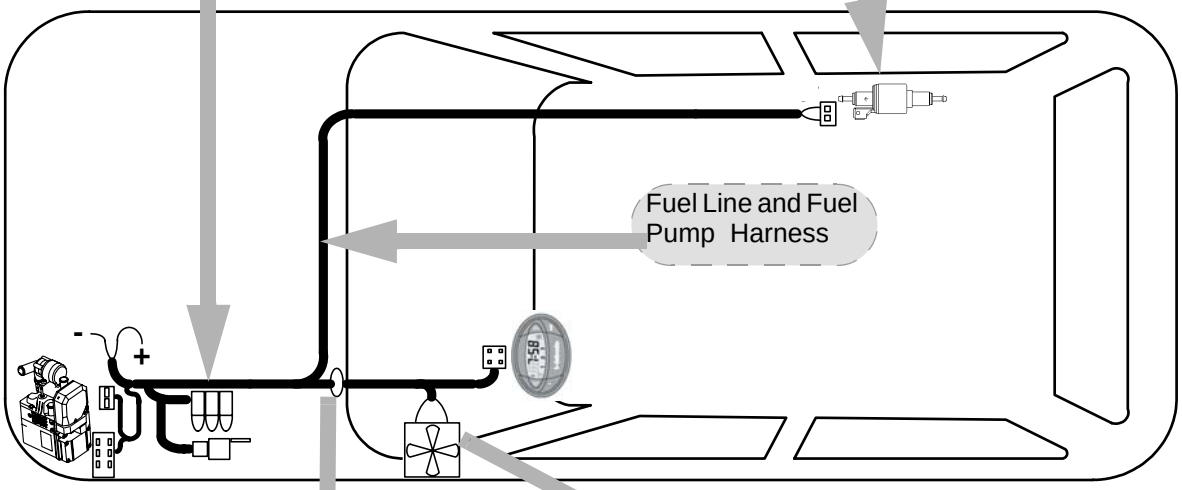
– (1) Vehicle underhood fuse/relay center
– (2) Heater relay, fuses and mounting bracket

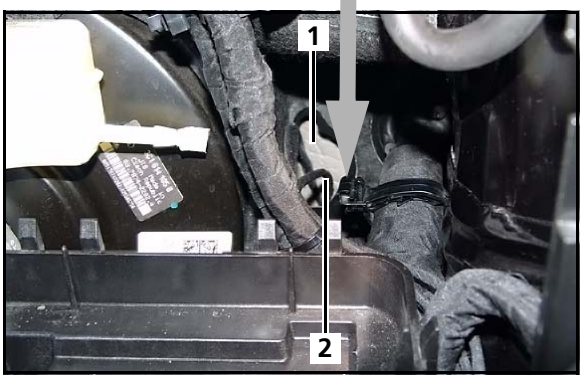


Fuel Pump Mounting Location

– (1) Webasto fuel pump
– (2) Vehicle fuel tank

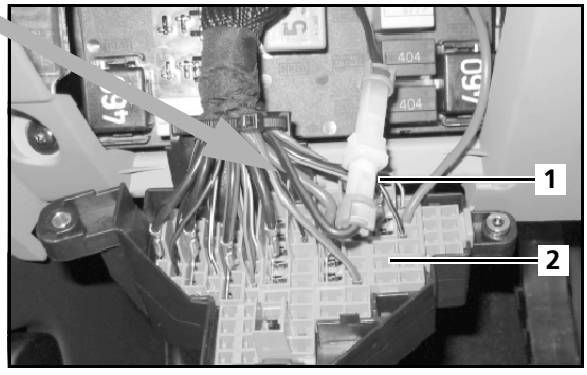






Bulkhead Pass-through

– (1) Bulkhead opening
– (2) Timer Harness



Interior Fuse/Relay Center

– (1) Webasto blower integration point
– (2) Interior fuse/relay center

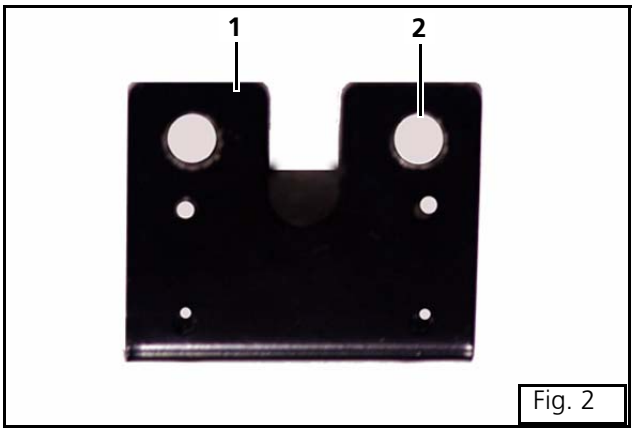


Fig. 2

Electrical Harness Installation

ATTENTION

The two holes in the top of the relay/fuse mounting bracket need to be enlarged to a accommodate two existing vehicle screws.

Using a 21/64 drill bit enlarge the two holes in the top of the relay/fuse mounting bracket.

– (1) Relay/fuse mounting bracket
– (2) 21/64 hole

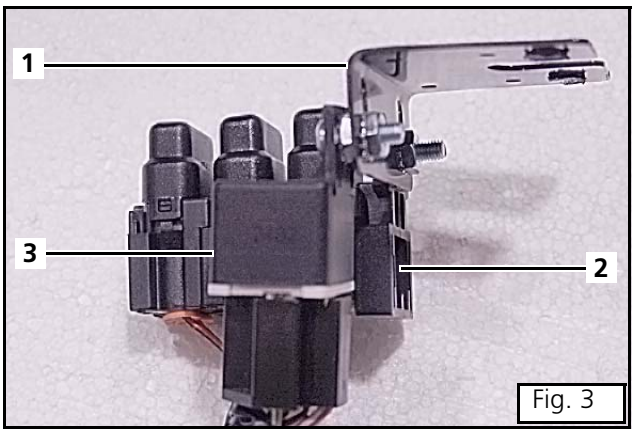


Fig. 3

Secure Webasto fuse holder and relay to mounting bracket as shown in Figure 3.

– (1) Relay/fuse mounting bracket
– (2) Fuse holder
– (3) Relay

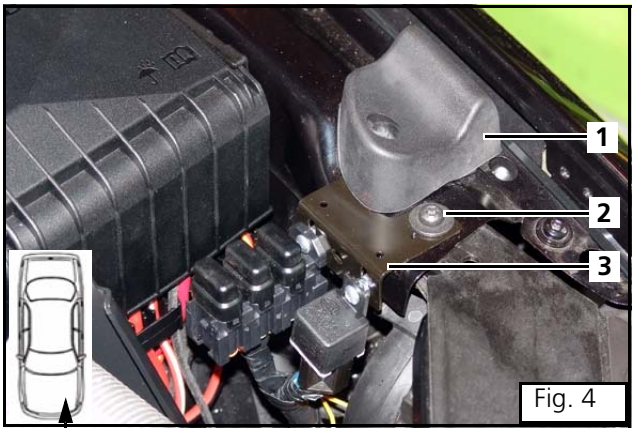


Fig. 4

Remove hood stop and adjacent vehicle screw.

Position electrical mounting bracket where shown in Figure 4 and re-install hood stop and existing screw.

– (1) Hood stop
– (2) Existing vehicle screw
– (3) Electrical mounting bracket

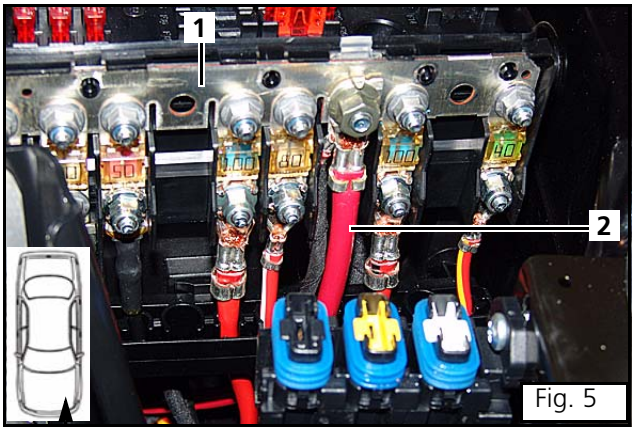


Fig. 5

Webasto Power wire Connection

Secure webasto power wire to the vehicle power strip located on the underhood fuse/relay center.

– (1) Fuse/relay power strip
– (2) Webasto power wire (+12V)

Webasto Harness Ground Wire Connection

Secure the webasto harness ground wire to an existing vehicle ground located below the front headlight.

– (1) Existing vehicle ground location
– (2) Below front headlight
– (3) Webasto harness ground wire

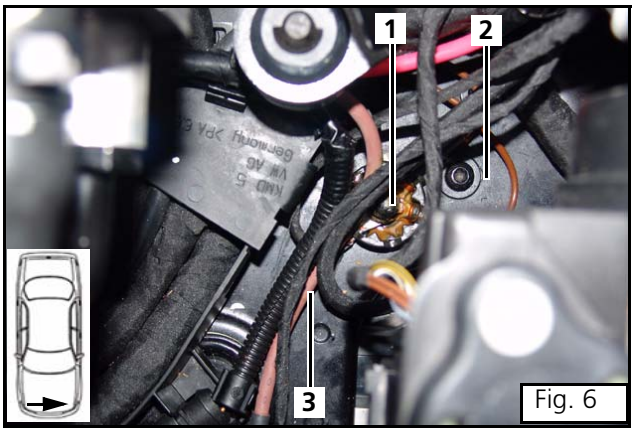


Fig. 6

Timer Harness Routing

Route the timer harness from the engine compartment to the interior of the vehicle through the bulkhead grommet next to the brake booster.

– (1) Brake booster
– (2) Bulkhead grommet location
– (3) Timer harness

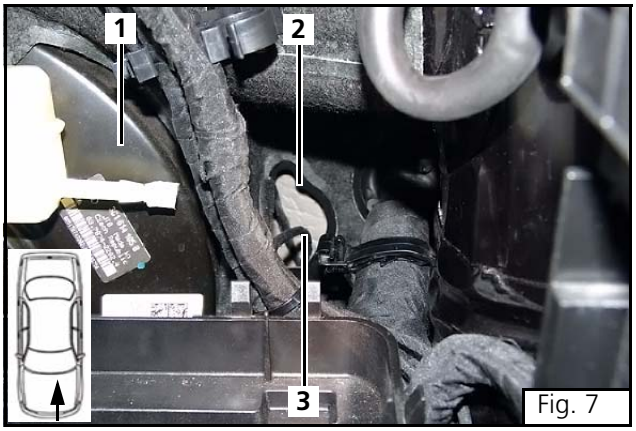


Fig. 7

Timer Installation

CAUTION
Check behind panels for obstructions before drilling holes.

ATTENTION
Before installing the timer, please confirm the installation location with the customer.

Affix supplied template to panel. Drill 10 mm (25/64 in.) and 2.5 mm (3/32 in.) holes where indicated on template. Figure 6 shows a translated sample of the template supplied.

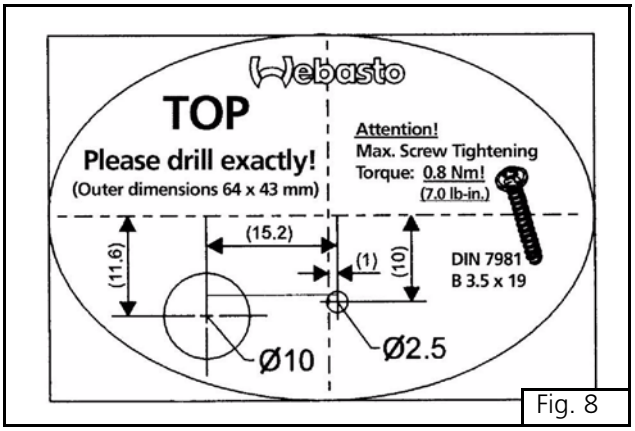


Fig. 8

ATTENTION
Before installing the timer, please confirm the installation location with the customer.

– (1) Timer


Example of Timer Mounting
Fig. 9

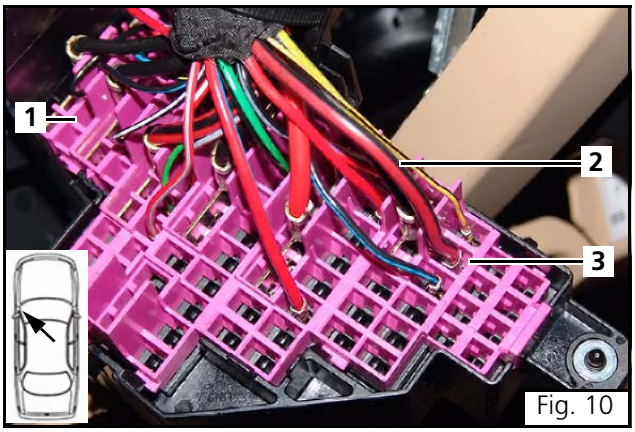


Fig. 10

Integration into the Blower System With Manual Temp. Controls - Climatic

Loosen vehicle interior fuse center.

Disengage contact (3).

Remove black/red wire (2) from fuse block.

– (1) Interior fuse/relay center
– (2) Black/Red wire
– (3) Contact

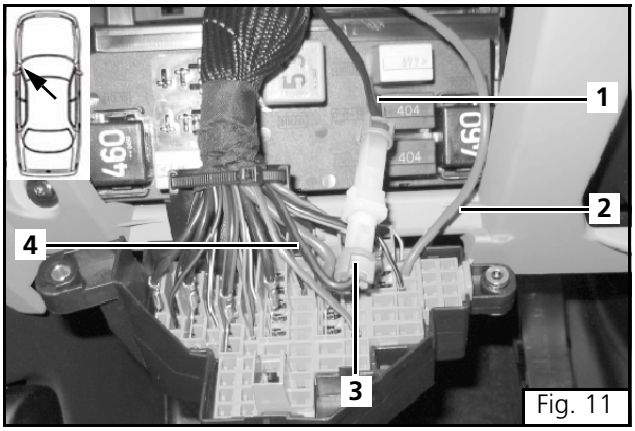


Fig. 11

ATTENTION

Make connections as shown in wiring schematic (fig. 12).

– (1) Black wire from K3 relay pin 30
– (2) Red wire from relay K3 pin 87 to vehicle SC40
– (3) Connector
– (3) Black/Red wire from fuse panel

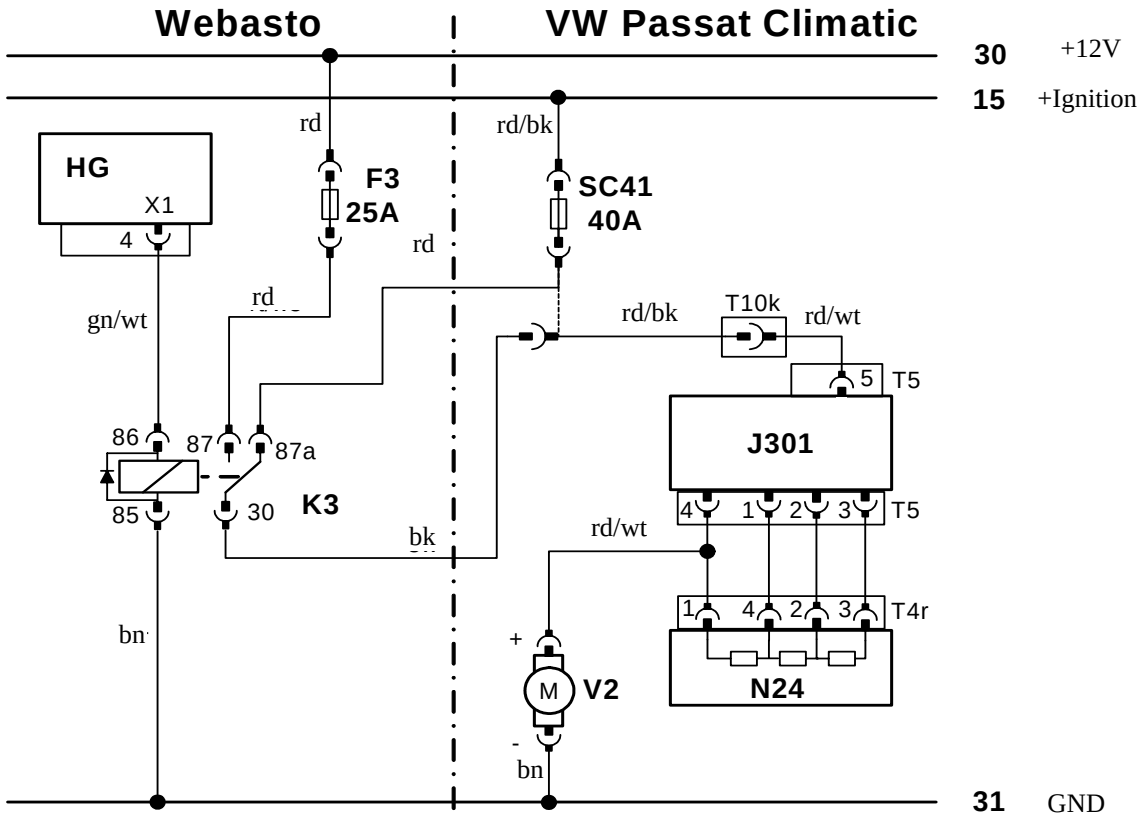


Fig. 12

TABLE 1. Climatic Control System

Webasto Heater Comp.	Vehicle Components	Wire Colors
HG = Webasto Heater	SC40 = Blower Fuse	rd = red
F3 = Fuse	J301 = Climate Control Module	wt = white
K3 = Blower Relay	N24 = Resistor Pack	bk = black
	V2 = Blower Motor	bn = brown
	T = Harness Connections	gn = green

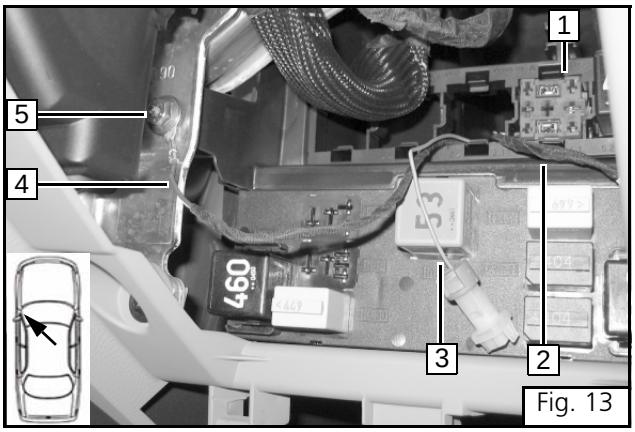


Fig. 13

Integration into the Blower System With Automatic Temp. Controls - Climatronic

– (1) IPCU base
– (2) Harness from IPCU
– (3) Green/White wire from IPCU pin 86
– (4) Brown wire from IPCU pin 85
– (5) Ground

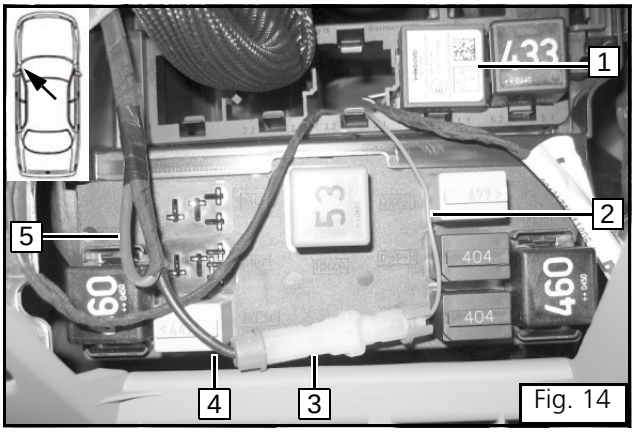


Fig. 14

Insert IPCU into empty base and make connections according to Figure 14.

– (1) IPCU
– (2) Green/White wire
– (3) Connector
– (4) Black wire from K3 relay/pin 30
– (5) Red wire from K3 relay - Isolate and secure

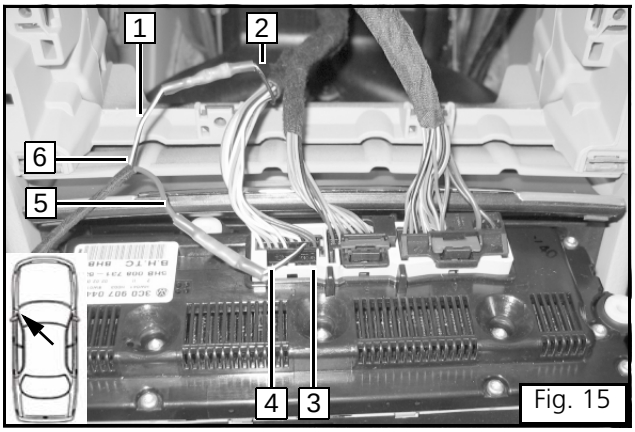


Fig. 15

Cut, crimp, and shrink black/white wire as shown in Figure 15.

– (1) Black/White wire - webasto harness
– (2) Black/White wire - blower control
– (3) HVAC blower control module
– (4) Black/White wire at connector
– (5) Red wire from webasto harness to climate control module
– (6) IPCU harness

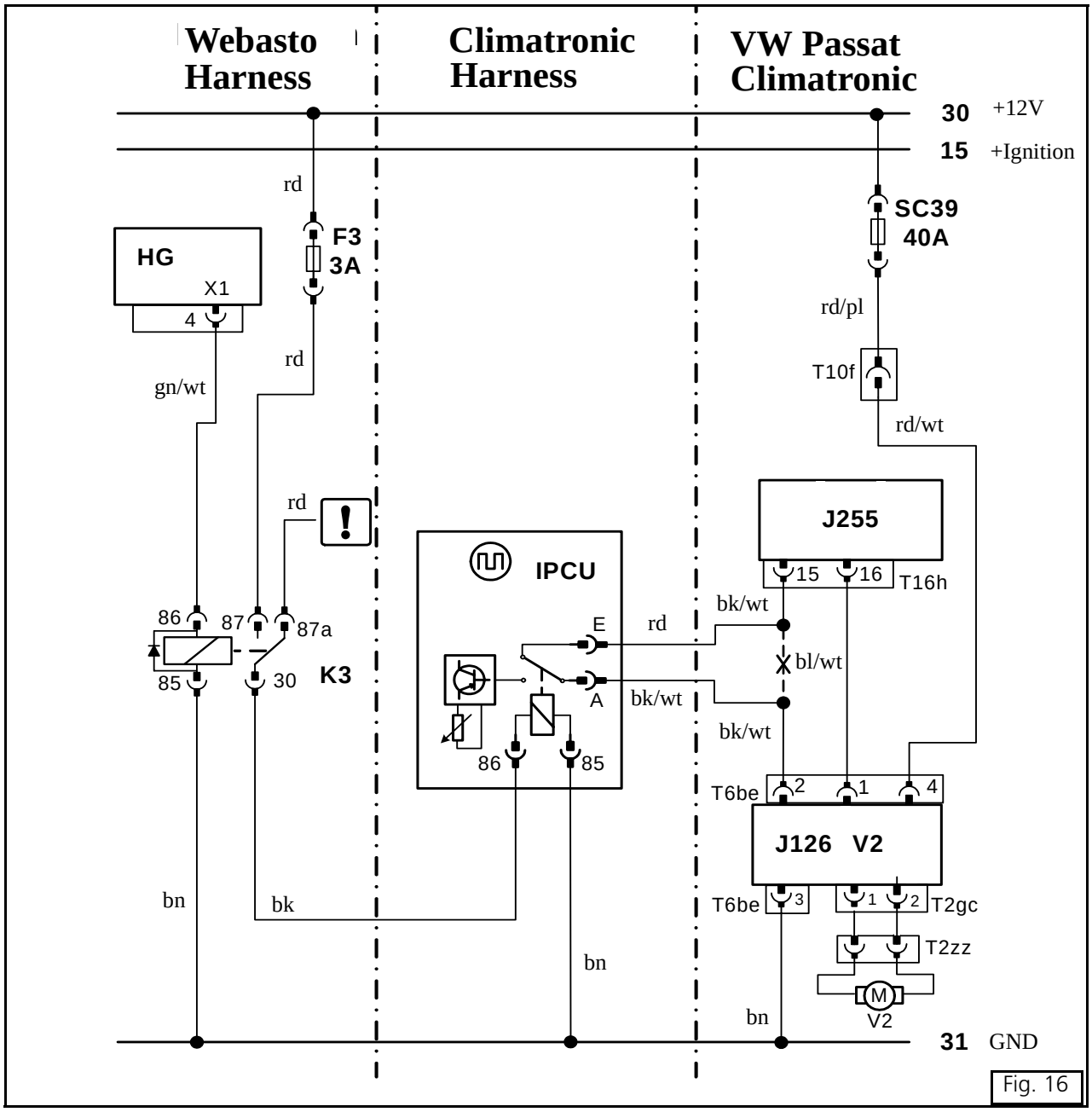


TABLE 2. Climatronic Control System

Webasto Heater Comp.	Vehicle Components	Wire Colors
HG = Webasto Heater	SC39 = Blower Fuse	rd = red
F3 = Fuse	J255 = Climatronic Control Unit	wt = white
K3 = Blower Relay	J126 = Blower Motor Control Unit	bk = black
IPCU = Pulse Control Unit	V2 = Blower Motor	bn = brown
	T = Harness Connector	gn = green
	X = Cut Here	bl = blue
		pl = purple

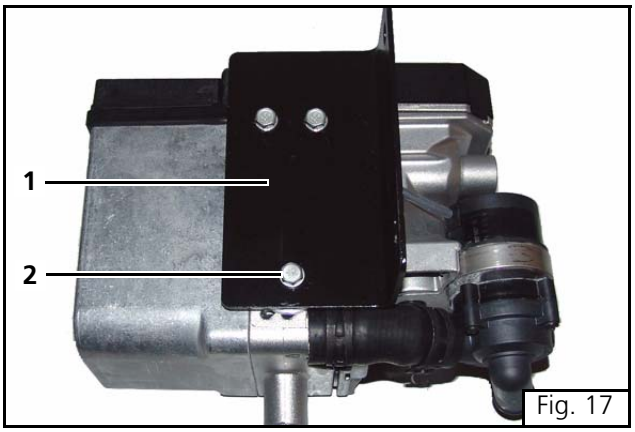


Fig. 17

Heater Preparation/Installation

ATTENTION

Observe torque specifications.

Install heater mounting bracket with three EJOT screws. Tighten EJOT screws to 10 Nm (88.5 lb.-in.).

– (1) Mounting bracket
– (2) EJOT screws

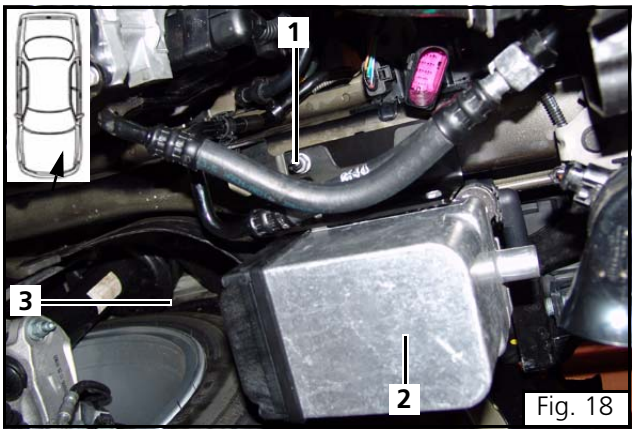


Fig. 18

Install heater on existing vehicle studs with two nuts provided. See figures 18 and 19.

– (1) Existing vehicle stud
– (2) Heater
– (3) Front drivers side tire

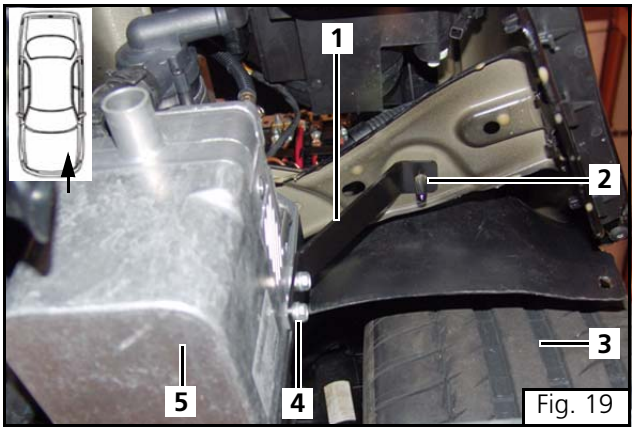


Fig. 19

Secure heater by installing support bracket on heater and existing vehicle stud.

– (1) Support bracket
– (2) Existing vehicle stud
– (3) Front drivers side tire
– (4) EJOT screws - 2ea.
– (5) Heater

Air Intake Tube Installation

ATTENTION

Cut supplied air intake tube as shown in Figure 20.

– (1) Air intake tube - a= 250 mm (9.8 in.)
– (X) Scrap

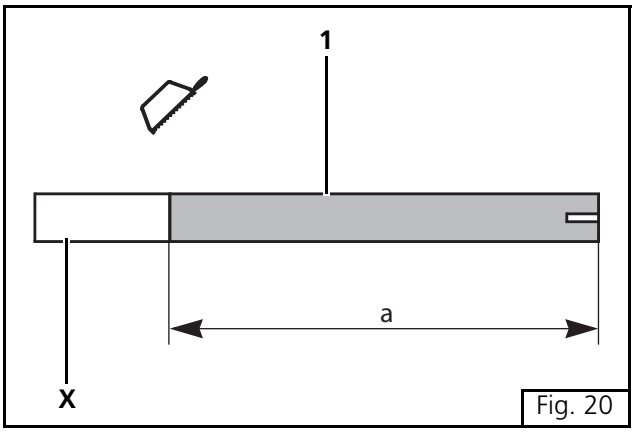


Fig. 20

Bend and install L-bracket on heater with EJOT screw as shown in Figure 21.

– (1) Heater support bracket
– (2) EJOT screw
– (3) L-bracket

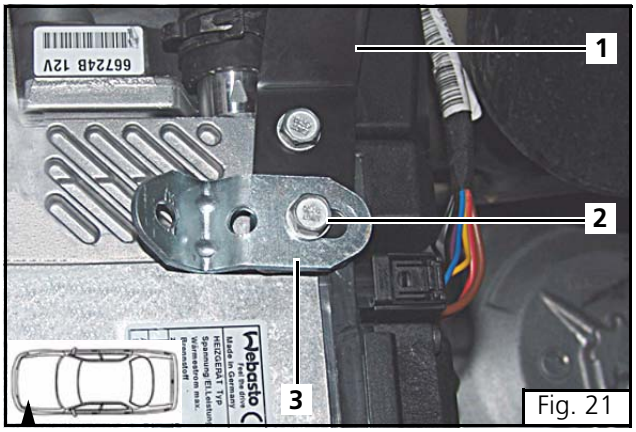


Fig. 21

Install air intake tube on heater with clamp provided.

Install air intake silencer on air intake tube.

Secure air intake silencer to side of heater by inserting the end of the clamp into the L-bracket previously installed.

Secure air intake tube to heater support bracket with nylon cable tie.

– (1) Air intake tube
– (2) Nylon cable tie
– (3) Air intake silencer
– (4) Air intake silencer clamp
– (5) L-bracket

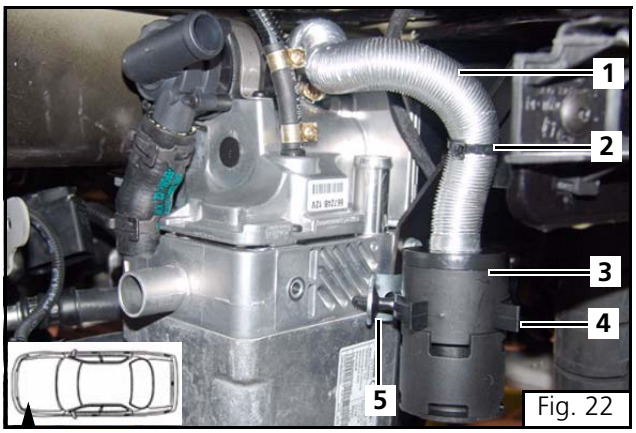


Fig. 22

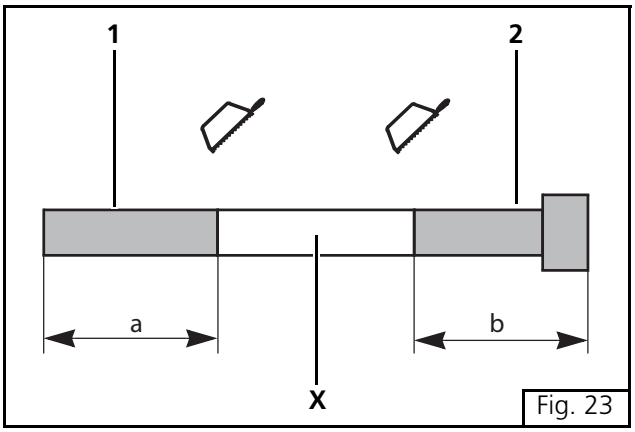


Fig. 23

Exhaust Installation

Cut supplied exhaust tubing as shown in figure 23.

– (1) Exhaust tube - a=165 mm (6.5 in.)
– (2) Exhaust endpiece - b=240 mm (9.4 in.)
– (X) Scrap

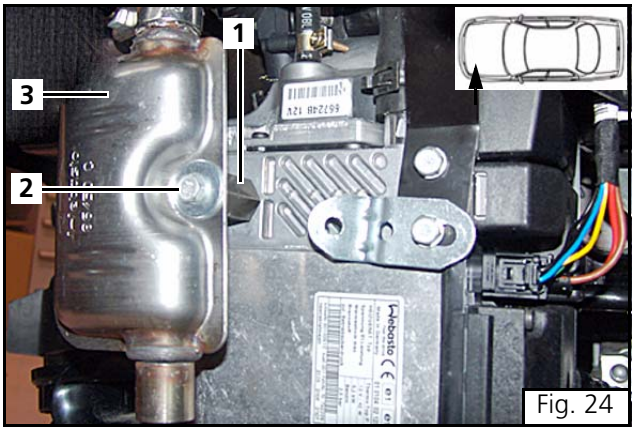


Fig. 24

Install EJOT stud, spacer nut, and muffler on heater as shown in Figure 24.

– (1) Spacer nut
– (2) Nut and washer
– (3) Muffler

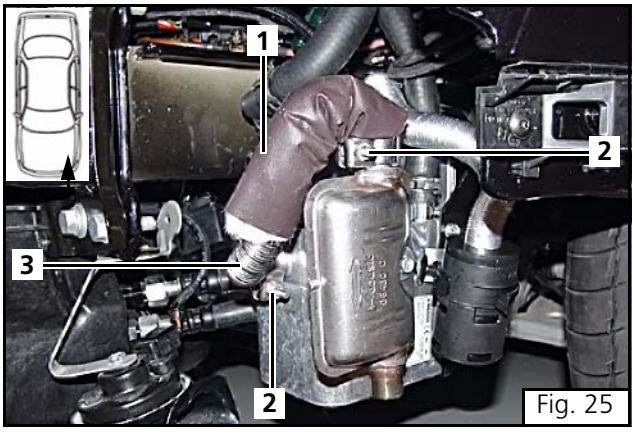


Fig. 25

CAUTION
Ensure there is sufficient room between vehicle components and the heater exhaust tube. Secure vehicle wiring harnesses with nylon cable ties.

ATTENTION
Assemble exhaust tubing using supplied exhaust wrap as shown in Figure 25.

Install exhaust tube between heater and muffler with clamps provided.

– (1) Exhaust wrap
– (2) Exhaust clamp
– (3) Exhaust tube

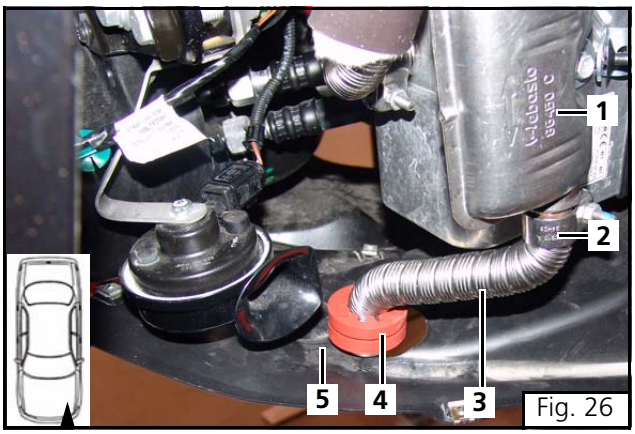


Fig. 26

Install exhaust end piece on heater with clamp.

CAUTION
Ensure the rubber exhaust insulator is positioned inside the hole in the vehicle splashshield before attempting to start the heater.

Using the rubber exhaust insulator as a template, mark and cut a hole through the vehicle splashshield where shown in Figure 26.

– (1) Muffler
– (2) Exhaust clamp
– (3) Exhaust tube
– (4) Rubber exhaust insulator
– (5) Vehicle splash shield

Integration into the Coolant System

ATTENTION

Torque hose clamps to 2.0 - 2.5 Nm (18 - 22 lb-in.)

Avoid sharp bends and kinks when installing coolant hoses.

Position hose clamps in such a way to avoid cutting or damaging adjacent components.

ATTENTION

Clamp vehicle coolant hose with hose clamping pliers prior to cutting to prevent coolant spillage.

The coolant heater integration into the vehicle heater circuit is done in an "INLINE" fashion. Refer to Figure 27.

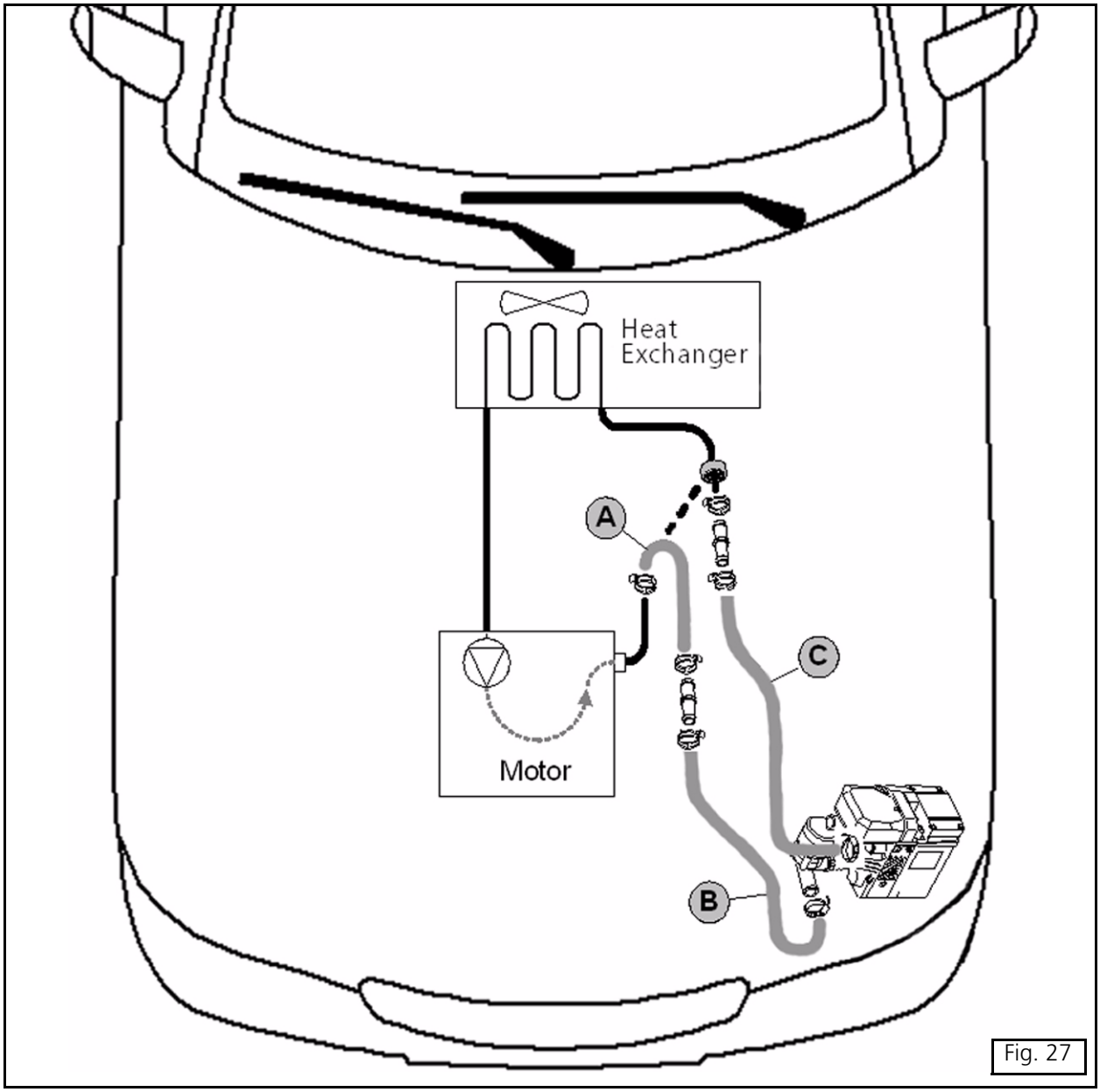


Fig. 27

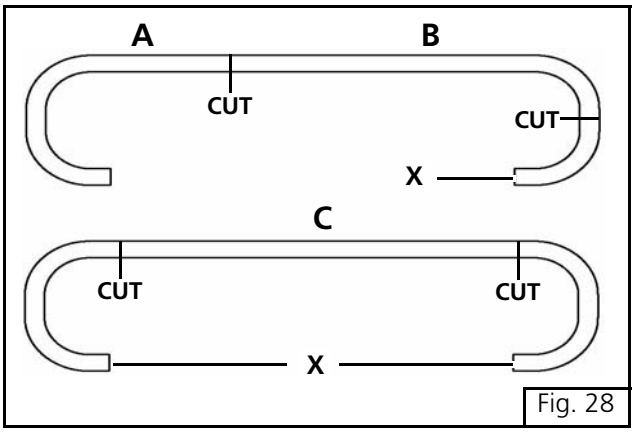


Fig. 28

Coolant Hose Preparation

Cut supplied coolant hoses to the lengths shown and trim to fit under the hood.

Coolant Hose **A = 280 (11 in.)**

Coolant Hose **B = 620 mm(24.5 in.)**

Coolant Hose **C = 900 mm (36 in.)**

X = Discard

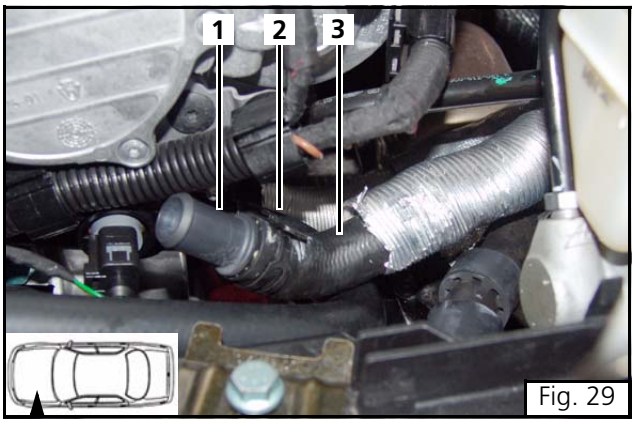


Fig. 29

Coolant Hose Connections

Disconnect the coolant hose on the left side of the engine that goes to the heat exchanger.

Install coolant hose adapter using the existing hose clamp.

– (1) Coolant hose adapter
– (2) Existing hose clamp
– (3) Vehicle Coolant hose - engine block to heat exchanger

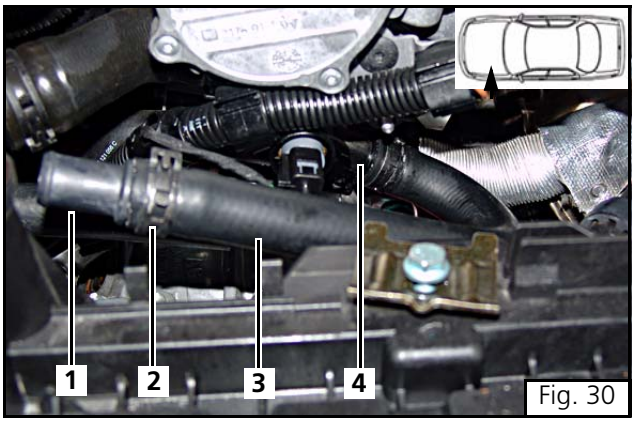


Fig. 30

Connect the 180° coolant hose, made from the coolant hose provided, to the engine coolant outlet tube.

Install the coolant hose adapter with clamp provided.

– (1) Coolant hose adapter
– (2) Hose clamp - 2ea.
– (3) 180° coolant hose
– (4) Coolant outlet from engine

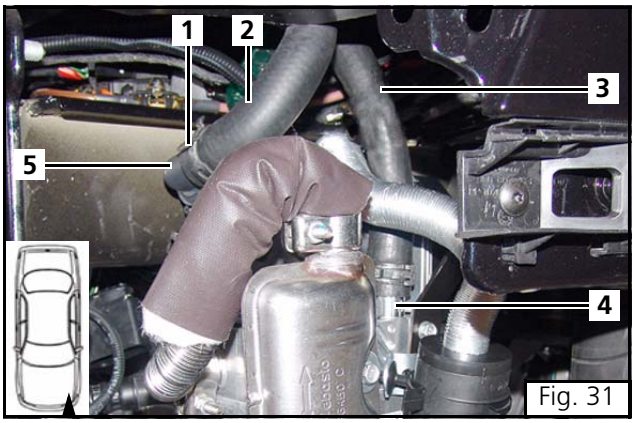


Fig. 31

Connect the 90° end of the prepared coolant hose to the coolant circulation pump on the heater.

Connect the remaining section of coolant hose to the heater outlet.

– (1) Hose clamp - 2ea.
– (2) 90° coolant hose to engine outlet
– (3) Straight section of coolant hose to vehicle heat exchanger
– (4) Heater coolant outlet
– (5) Heater coolant circulation pump

Route coolant hoses to the left side of the engine compartment.

Secure coolant hoses in the engine compartment with nylon cable ties.

– (1) Nylon cable tie
– (2) Heater outlet hose
– (3) Heater inlet hose

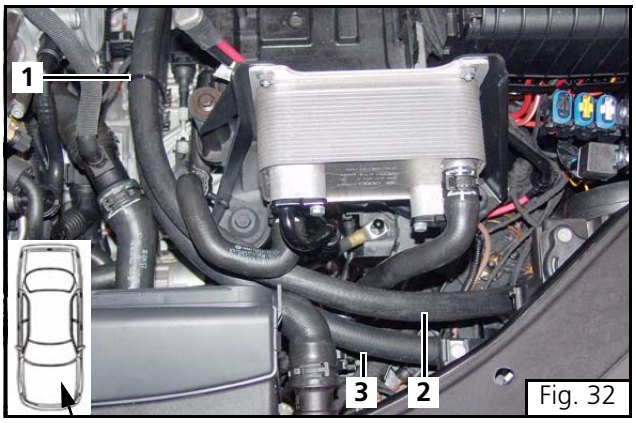


Fig. 32

ATTENTION
Trim coolant hoses to fit before making connections under the hood.

Connect coolant inlet hose to coolant hose coming from the engine.

Connect coolant outlet hose to the coolant hose going to the heat exchanger.

– (1) Heater coolant outlet hose
– (2) Hose clamp - 2ea.
– (3) Heater core inlet hose
– (4) Coolant hose from engine
– (5) Heater coolant inlet hose

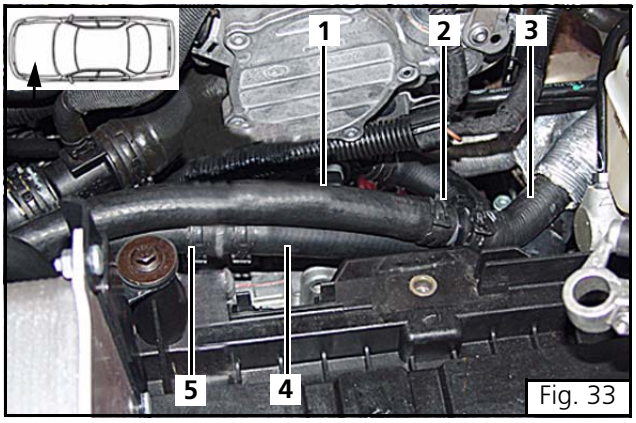


Fig. 33

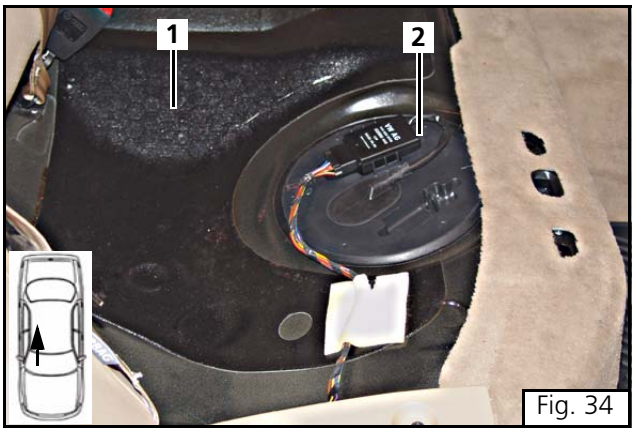


Fig. 34

Integration into the Fuel System

ATTENTION
The vehicle fuel sender can be accessed from inside the vehicle.

Remove the sending unit from the fuel tank following the manufactures service instructions.

– (1) Under rear seat - passenger side
– (2) Fuel sender location

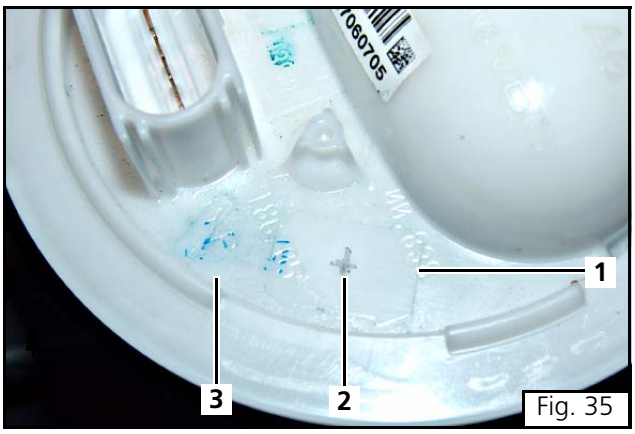


Fig. 35

Standpipe Preparation

Locate and mark the center of the raised rectangle molded into the top of the sending unit.

– (1) Raised rectangle
– (2) Center marked
– (3) Top of sender

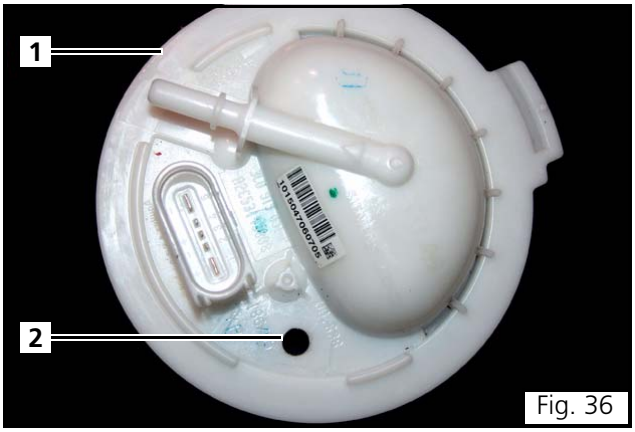


Fig. 36

ATTENTION
Remove any burrs that may exist after drilling through sender. Ensure sealing surfaces of fuel sender are smooth before installing the standpipe.

Drill a 5/16 in. hole through the top of the sending unit where previously marked.

– (1) Fuel sender
– (2) 5/16 in. hole

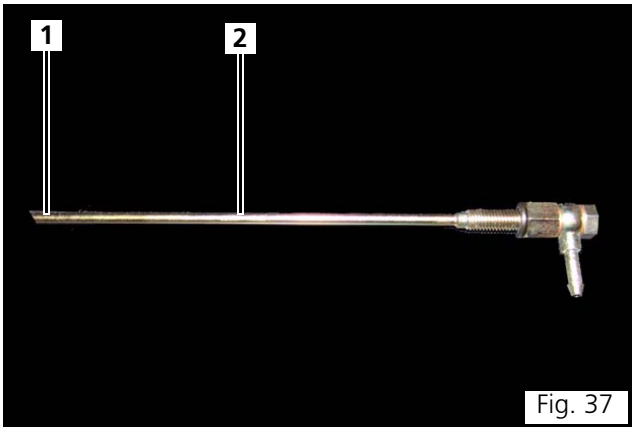


Fig. 37

ATTENTION
Maintain a 1 in. clearance from the bottom of the fuel tank.

Measure the depth of the fuel tank and subtract approximately 1 in.

Cut the supplied fuel standpipe to the length determined (approximately 185 mm) at a 45 degree angle.

– (1) 45 degree cut
– (2) Fuel standpipe

ATTENTION

Refer to figure 38 for banjo fitting installation sequence. Tighten locknut to 9.0 - 9.5 Nm (80 - 84 lb.-in.)

Legend for Figure 38

1 Banjo Bolt
2 Banjo Fitting
3 Standpipe
4 Upper Sealing Washer
5 Fuel Tank Sending Unit
4 Lower Sealing Washer
6 Lock Nut

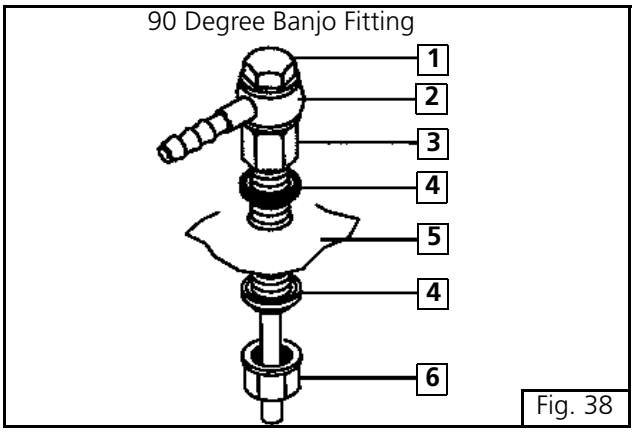


Fig. 38

Figure 39 shows the standpipe installed in the sending unit.

– (1) Sending unit
– (2) Standpipe installed

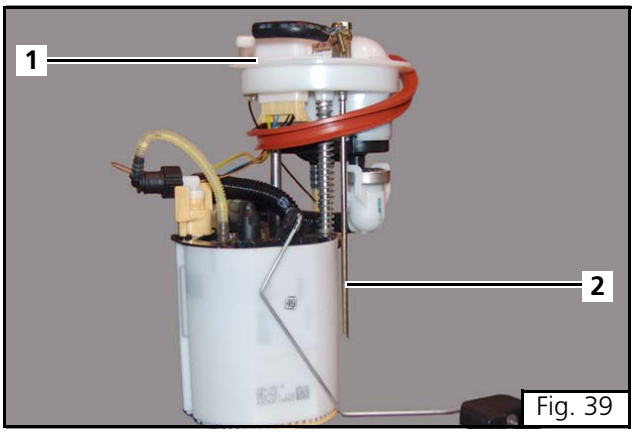


Fig. 39

CAUTION

Always cut fuel line with a sharp razor knife or razor. DO NOT cut with side cutters, scissors or similar tools as doing so will cause a restriction inside the fuel line.

ATTENTION

Ensure the fuel lines are fully seated within the fuel line connectors and any 90 degree bends are not buckled. Refer to fig. 40.

Tighten all fuel line clamps to 1.0 - 1.4 Nm (8.8 - 12.4 lb.-in.)

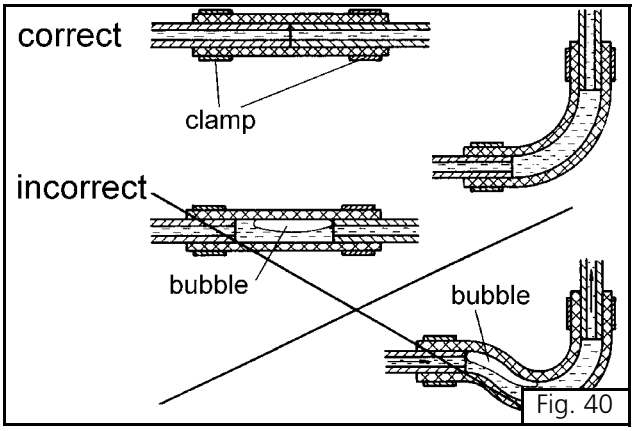


Fig. 40

Re-install the fuel sender according to the manufactures service instructions.

Install 90 degree fuel line connector on standpipe with clamp.

Insert fuel line into fuel line connector and tighten clamp.

Route the Mecanyl fuel line to the fuel pump mounting location following the vehicle fuel lines.

– (1) Fuel line connector
– (2) Mecanyl fuel line
– (3) Fuel line clamp

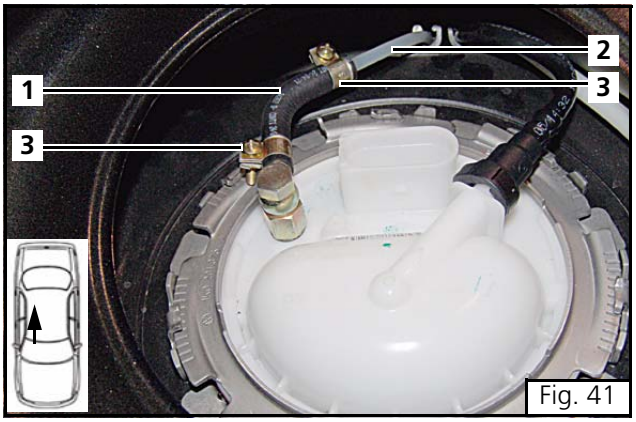


Fig. 41

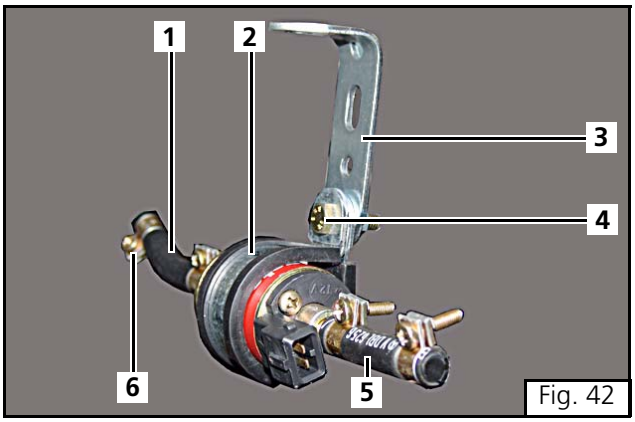


Fig. 42

Fuel Pump Preparation/Installation

Pre-assemble fuel pump as shown in Figure 42.

– (1) 90° fuel line connector
– (2) P-clamp
– (3) L-bracket
– (4) M6 nut and bolt
– (5) Straight fuel line connector
– (6) Fuel line clamps - 4ea.

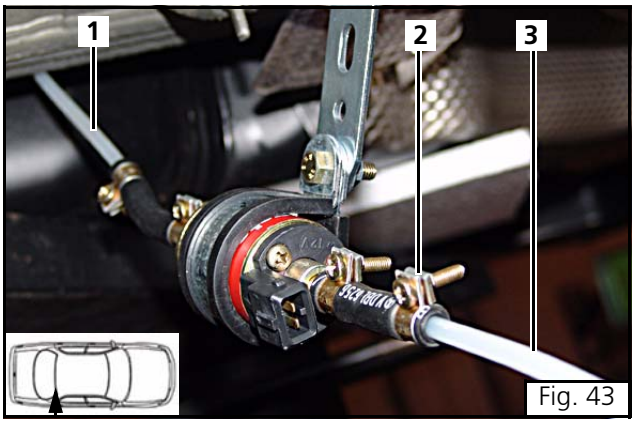


Fig. 43

ATTENTION
Ensure the fuel lines are fully seated within the fuel line connectors and any 90 degree bends are not buckled.

Tighten all fuel line clamps to 1.0 - 1.4 Nm (8.8 - 12.4 lb.-in.)

Connect fuel line prior to installing fuel pump on vehicle.

– (1) Mecanyl fuel line from fuel tank
– (2) Fuel line clamps
– (3) Mecanyl fuel line to heater

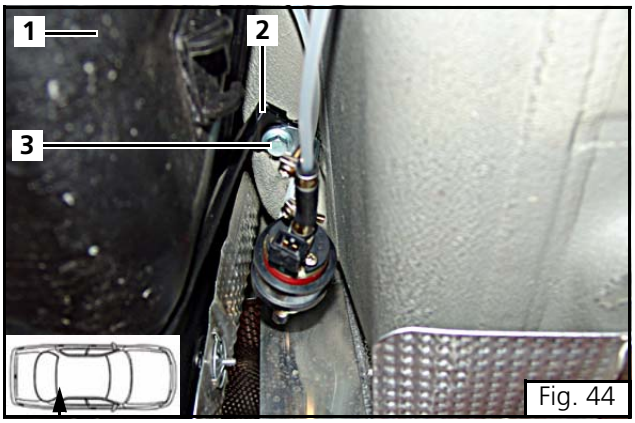


Fig. 44

CAUTION
Ensure fuel tank is properly supported prior to removing fuel tank hanger bolt.

Install the fuel pump on the vehicle using an existing fuel tank hanger bolt.

– (1) Vehicle fuel tank
– (2) Fuel tank hanger strap
– (3) Fuel tank hanger bolt

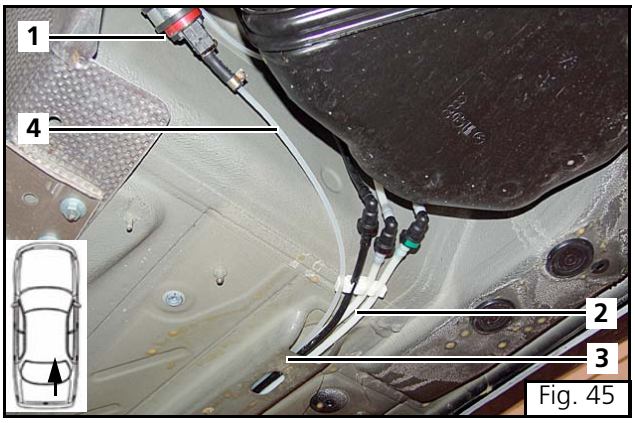


Fig. 45

Fuel Line Routing to Heater

Route mecanyl fuel line (inside channel) along vehicle fuel line towards the engine compartment.

– (1) Fuel pump
– (2) Vehicle fuel lines
– (3) Underbody channel
– (4) Mecanyl fuel line

Locate grommet in the engine compartment that is installed in the top of the channel and remove it. Bore a hole in the grommet large enough to fit the fuel line and the fuel pump harness.

Route mecanyl fuel line through the grommet towards the front of the vehicle. Install protective loom on fuel line.

– (1) Vehicle AC line
– (2) Grommet
– (3) Mecanyl fuel line
– (4) Protective loom

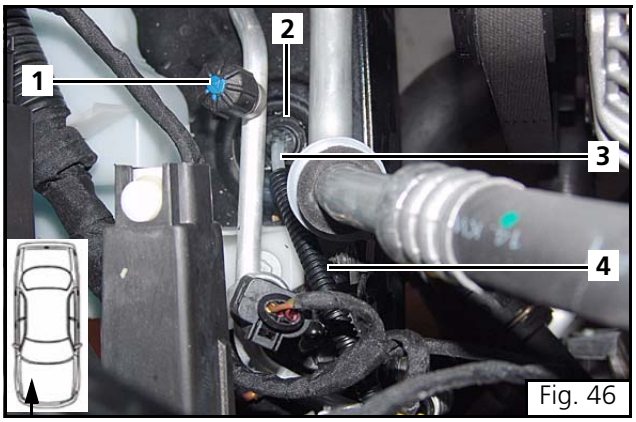


Fig. 46

Route the mecanyl fuel line across the front of the vehicle to the heater mounting location.

Secure fuel line to existing vehicle components with nylon cable ties.

– (1) Front fascia support
– (2) Nylon cable tie
– (3) Mecanyl fuel line

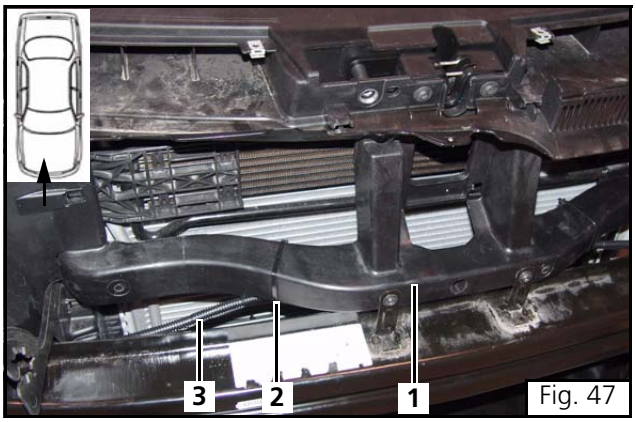


Fig. 47

ATTENTION

Ensure the fuel lines are fully seated within the fuel line connectors.

Tighten all fuel line clamps to 1.0 - 1.4 Nm (8.8 - 12.4 lb.-in.)

Connect fuel line to heater with fuel line connector and two clamps.

– (1) Mecanyl fuel line with protective loom
– (2) Fuel line clamp - 2ea.
– (3) Fuel line connector

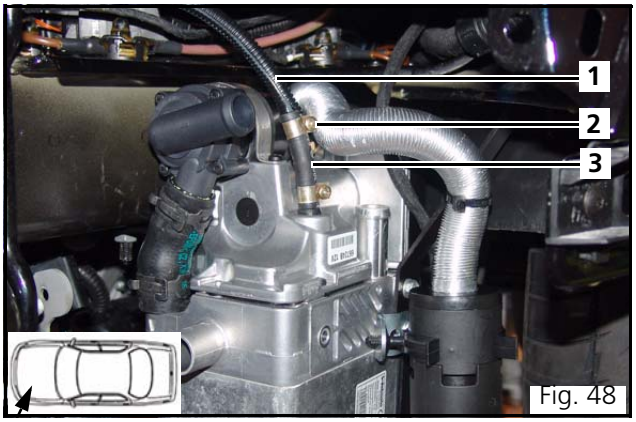


Fig. 48

Route the fuel pump electrical harness to the fuel pump following the mecanyl fuel line.

Secure electrical harness to the vehicle with nylon wire ties.

Install the fuel pump harness electrical connector following the instructions provided and connect to the fuel pump.

– (1) Fuel pump electrical harness
– (2) Mecanyl fuel line
– (3) Fuel pump electrical connector
– (4) Fuel pump

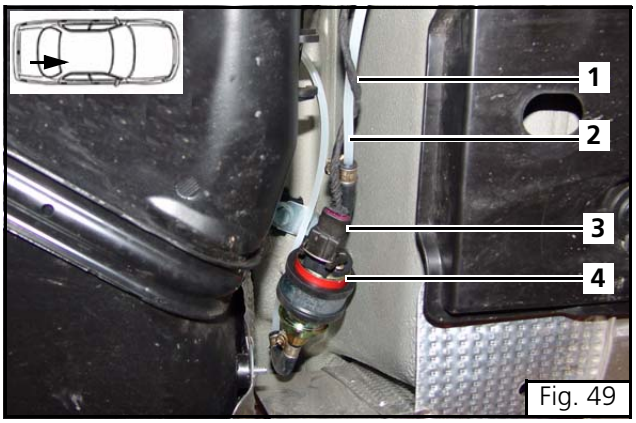


Fig. 49

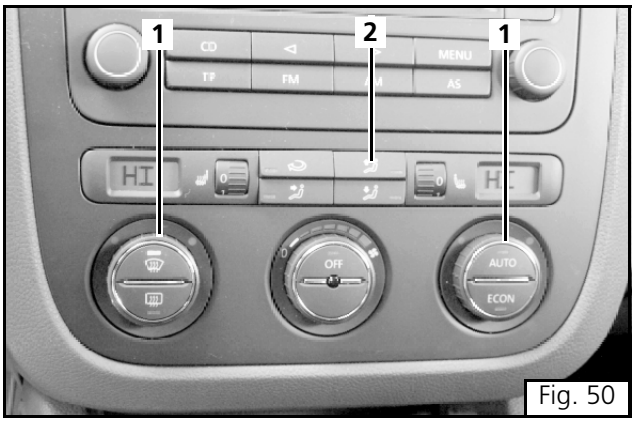


Fig. 50

Blower Control Settings - Climatronic

– (1) Temperature “max” heat
– (2) Defrost Position

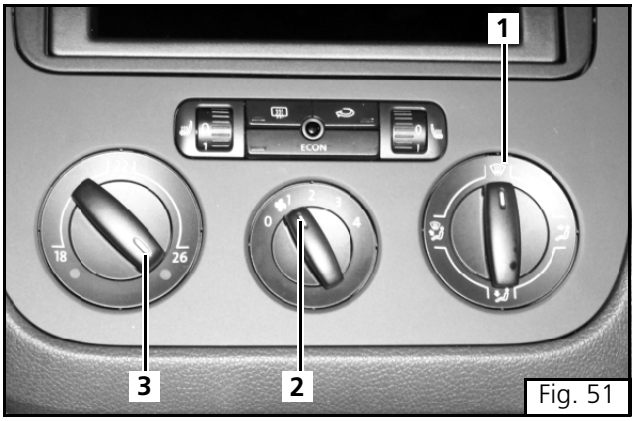


Fig. 51

Blower Control Settings - Climatic

– (1) Defrost position
– (2) Blower speed between 1 and 2
– (3) Temperature “max” heat

Final Inspection Initial Start-up and Concluding Work

Connect battery ground terminal

Final Inspection

Inspect installation for:
- Loose fasteners.
- Exhaust system routing and clamp tightness.
- Combustion air intake tube routing and clamp tightness.
- Loose coolant line clamps.
- Pinched coolant lines.
- Routing of coolant lines and coolant lines securely tied and protected against chafing and related damage.
- Loose fuel line clamps.
- Routing of fuel lines and fuel lines securely tied and protected against chafing and related damage.
- Loose wiring connections and battery connections.
- routing of wiring harness and wiring harness securely tied and protected against chafing and related damage.
- Check operation of vehicle heater fan with Webasto heater OFF.

Initial Start-up

1 Top off cooling system with coolant per engine/vehicle manufacturers recommendations.

ATTENTION
The fan speed control knob has to be between low and medium for blower operation while the Webasto heater is on. The position of the control knob determines the speed of the blower while the heater is on.

2 Set interior heater control to maximum heat position (hot), fan speed between low and medium, and switch off air conditioning system.

3 Start the vehicle engine and run on fast idle for 5 minutes to purge any remaining air from the Webasto heater and coolant system. While the engine is running check:
- Hose connections for leaks.
- Coolant level in expansion tank. (Add coolant as needed)

4 Switch off the engine.

ATTENTION
More than one start-up attempt of the heater may be required to purge air from fuel system before heater will start. Cycle heater Off and On after each failed start attempt until heater starts successfully. After 3 consecutive unsuccessful start attempts, the Webasto control unit enters into heater lockout.
See Heater Lockout section for reset instructions.

5 Switch on the Webasto heater by means of the instant heat button on timer and check:
- Timer panel and instant heat indicator illuminates.
- Circulating pump in operation.
- Initiation of start-up sequence.
- Successful start-up and operation.

6 Allow heater to run for 20 minutes or until coolant is heated to temperature. Re-tighten all hose clamps.

ATTENTION
Engine coolant temperature gauge may read lower than actual Webasto heater output temperature.
This is due to the location of the temperature gauge sensor on engine.

Concluding Work

- Check that all hose lines, hose clamps, pipe clips and electrical connections are secure. Secure all loose lines and cables with nylon cable ties.
- Spray the heater components and electrical connections with an anti-corrosive wax coating.
- Install all vehicle parts, panels and components removed during heater installation.

Heater Lockout Reset Procedure

The Blue*Heat* is designed with a lockout safety feature built into the control unit. After 3 consecutive unsuccessful startup attempts, the heater will lock itself out from any further start attempts. The heater may also enter the lockout mode after experiencing an overheat condition.

Reset Heater "Lockout" mode by performing the following procedure:

1 Ensure timer or switch is in the "OFF" position. Turn timer or switch to the "On" position. Remove main fuse F2 (20 Amp), reinsert after 5 seconds.
2 Cycle timer or switch off and then back on once more. Remove fuse F2 once again and reinsert after 5 seconds. Heater should attempt to start after inserting fuse.

ATTENTION
– The engine coolant must be below 86 °F (30 °C) before the Webasto heater will attempt to start.
– Should the heater fail to start or operate correctly, contact your Webasto technical representative at:

1-800-555-4518 or visit: www.techwebasto.com

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