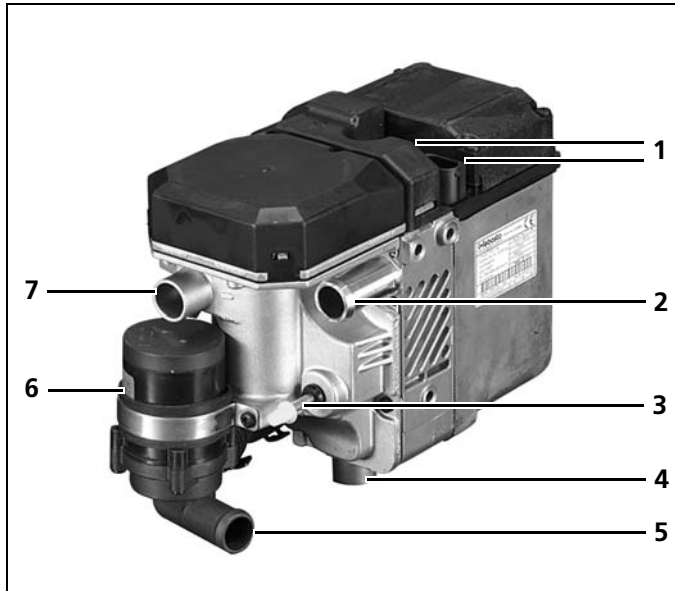


Thermo Top Series



Master Reference Manual

Legend

- 1 Electrical Harness sockets
- 2 Coolant Outlet
- 3 Fuel Inlet
- 4 Exhaust
- 5 Coolant Inlet
- 6 Coolant Circulation Pump
- 7 Combustion Air Intake

Special Tools

- Hose Clamping pliers
- Torque Wrench

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Warning

- *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 or by improper installation.*
- *Improper installation or installation by untrained personnel voids all warranties on this product.*

If there are any questions regarding the installation or maintenance of this product, please call technical support at **1-800-555-4518**.

1 Foreword

The installation and service of Webasto Thermo Top series (*BlueHeat*) heaters requires special expertise and training. Installations and servicing of Webasto products by untrained, unauthorized personnel and end-users voids all warranties and releases Webasto Product North America, Inc. and Webasto authorized distributors, dealers and their personnel from responsibility for damage to Webasto products, any resulting collateral property damage and personal injury.

Any use, operation, installation, modification or application of the product not described in Webasto manuals, or subjecting the product to extreme or unusual conditions beyond the limits of specified performance characteristics is misuse of the product.

Failure to comply with all installation instructions is a misuse of Webasto products. The same applies for repairs without using genuine Webasto service parts. This will void the coolant heaters "official Marks of Conformity."

1.1 Scope and Purpose

These installation instructions are intended to support Webasto trained and authorized distributors and dealers in the installation of the Thermo Top series (*BlueHeat*) Coolant Heaters. These instructions are not intended for use by untrained or unauthorized personnel.

The directives in the "master reference manual" and "operating manual" for the Thermo Top series heater must be followed. Acknowledged engineering conventions must be observed for the installation work.

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.



1.2 General Safety/Installation Instructions

- The heater must not be installed in the passenger compartments of the vehicle.
- Extracting combustion air from the passenger compartment of the vehicle is not permissible under any circumstance.
- Exhaust pipes must be routed so that exhaust fumes will not penetrate into the vehicle's interior.
- Do not route exhaust components within 100 mm (4 inches) of flammable materials such as fuel system components, polyurethane or similar foam insulation, styrene sheet installation, wood and paper products, carpet, glycol reservoirs, coolant lines, brake lines, electrical wiring, etc.
- The operational state of the heater, i.e. an indication "on" or "off", must be clearly visible to the operator.
- The coolant heater may only be operated within the specified voltage range designated.
- The coolant heater may only be operated with the specified fuel as recommended by the vehicle manufacture.
- The following important regulations must be adhered to when routing fuel lines:
 - Fuel lines are to be installed in such a way that they remain unaffected by torsional stresses created by vehicle and engine movement.
 - Fuel lines be securely fastened to the vehicle every 12 inches (30 cm) or less along the total length from heater to fuel tank.
 - Fuel-carrying components are to be protected against excessive heat and are to be installed so that any drippings or evaporating fuel can neither accumulate nor be ignited by hot components or electrical equipment.
 - In buses, fuel lines are not to be located in the passenger area or in the driver's compartment. Fuel supply must not be by means of gravity or pressurization of the fuel tank.
 - The fuel tank must be equipped with a vent cap or ventilated in another way (vent line)

1.3 Symbol Identification

1.3.1 Symbols that define sections in manual



Mechanical Preparation



Fuel



Electrical



Exhaust



Coolant



Combustion Air Intake

General Symbol Descriptions



Warning



Refer to Webasto or Manufacturer Manual



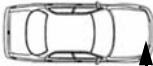
Caution



Attention



Flammable or Combustible



Line of Sight/Item Location on Vehicle

1.4 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.

1.5 Preparation

1.5.1 Heater Kit

- Verify and identify all contents of kit.

1.5.2 Vehicle

- Verify fuel content in tank.

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.

- Disconnect negative terminal of vehicle battery(s).
- Protect vehicle fenders, panels and interior with covers





2 Electrical Overview



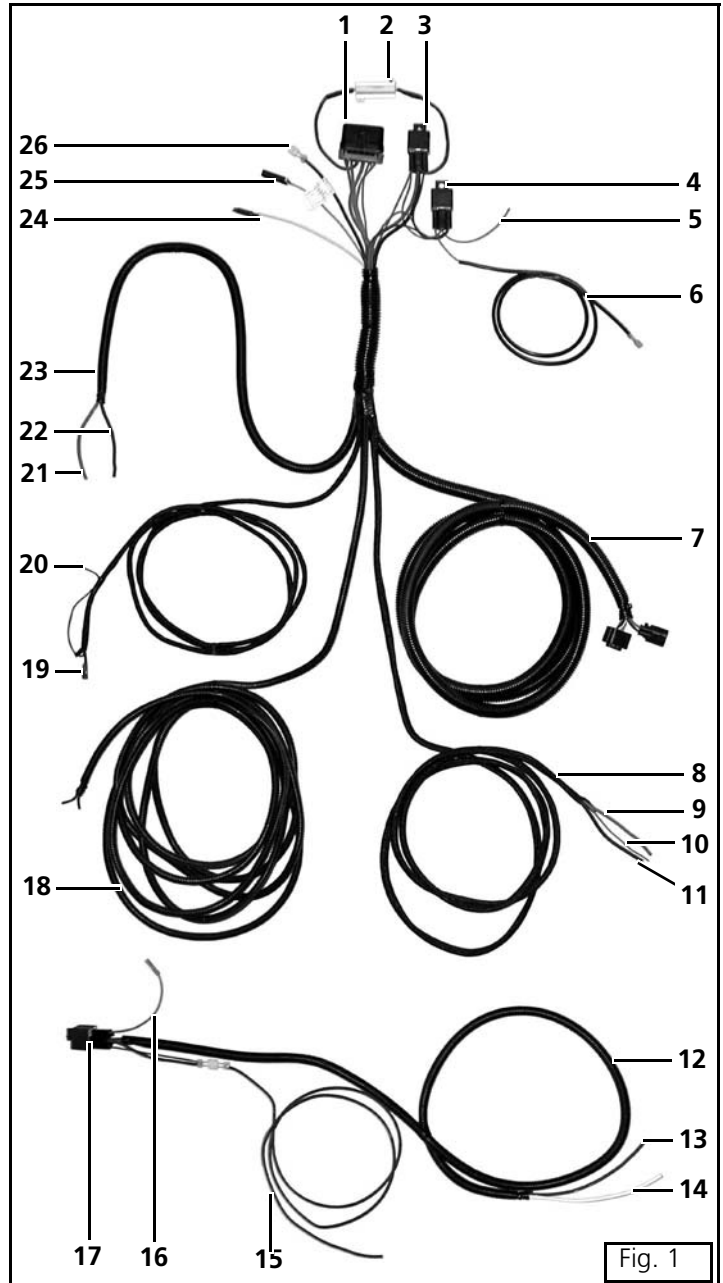
ATTENTION

Ensure wiring and wiring harnesses are securely fastened to the vehicle. If not described differently, securing of wiring is done with cable ties to the vehicle's own wiring harnesses.

2.1 Universal Electrical Harness Description

Legend for Figure 1

- 1 Fuse holder and fuses
- 2 Resistor - HVAC blower control
- 3 Relay K1 - HVAC control
- 4 Relay K2 - HVAC control
- 5 18 GA green - "ON" signal from relay K1 and K2 to relay K3, pin 86
- 6 18 GA blue - Ignition "ON" signal source
- 7 Main heater harness
- 8 Blower control harness - Positive side
- 9 10 GA red - HVAC control switch circuit, splice to blower motor positive circuit (motor side)
- 10 10 GA black - HVAC control switch circuit, splice to blower motor positive circuit (control side)
- 11 18 GA green - "ON" signal from relay K1 and K2 to relay K3, pin 86, use when relay K3 is mounted near HVAC blower motor (same circuit as item 5)
- 12 Blower control harness - Negative side
- 13 Harness is wire tied to main harness for shipping purposes only, cut wire tie to separate negative side blower harness from main harness
- 14 10 GA blue - HVAC control switch circuit, splice to blower motor negative circuit (motor side)
- 15 10 GA white - HVAC control switch circuit, splice to blower motor negative circuit (control side)
- 16 10 GA brown - Connect to vehicle ground point when relay K3 is mounted near HVAC blower motor
- 17 18 GA green - Relay K3, pin 86 (connects to "ON" signal 18 GA green from relay K1 and K2). See items 5 and 11.
- 18 Relay K3 - HVAC control (typically mounted near HVAC blower motor)
- 19 18 GA blue and brown - Fuel metering pump harness
- 20 20 GA black, red and brown - Timer harness
- 21 18 GA violet - "Vent Mode" for optional remote control
- 22 10 GA red - Battery positive
- 23 10 GA brown - Battery negative or ground point
- 24 Main power harness
- 25 18 GA yellow - Diagnostic connection
- 26 18 GA orange - Supplemental heating option (Not applicable for BlueHeat)
- 27 10 GA brown - Optional ground connection for relay K3 when K3 is mounted with relay K1 and K2



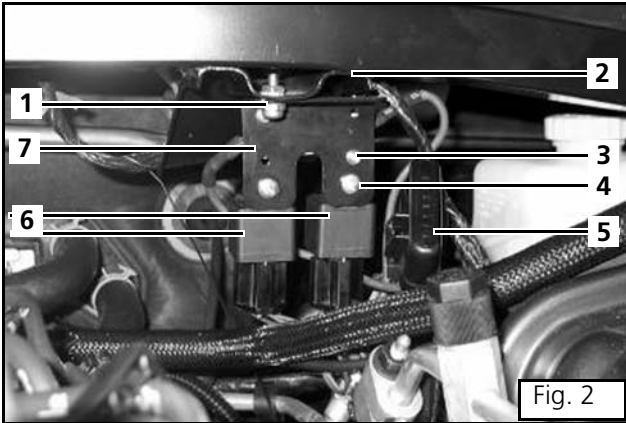


Fig. 2

2.2 Electrical Harness

ATTENTION

Remove cable tie holding the negative-side blower control harness from the main harness and set aside. This harness will be mounted near the vehicle blower motor.

Mount heater electrical components on supplied mounting bracket with hardware provided. Secure mounting bracket to vehicle in an appropriate location (away from plastic parts), keeping in mind the proximity of the vehicle battery and bulkhead pass-through grommet.

- (1) Nut 10-32 used as a spacer
- (2) Bulkhead brace
- (3) Screw M3x10, Nut M3 (2ea.)
- (4) Pan head screw 10-32x5/8", Nut 10-32 (3ea.)
- (5) Fuse holder
- (6) Relays K1 and K2
- (7) Mounting bracket

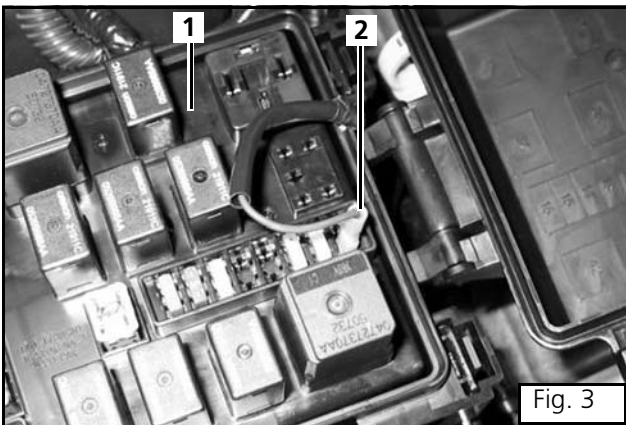


Fig. 3

2.3 Fuse Tap Connection - Relay K-1

CAUTION

Tap into the "fused" output side of the selected fuse. Fuse must remain hot with the ignition in the "ON" position only.

ATTENTION

- The blue fuse tap wire signals the Webasto heater of an ignition cycle, returning vehicle blower control to the driver's discretion.
- You may need to route the fuse tap wire into the interior of the vehicle. Refer to Routing Harness Through Bulkhead.

Route blue fuse tap wire from relay K-1, to the underhood or interior fuse/relay center.

- (1) Underhood or interior fuse/relay center
- (2) Fuse tap

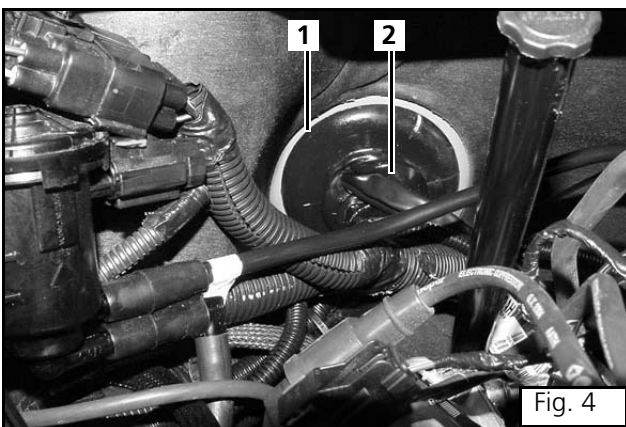


Fig. 4

2.4 Routing Harnesses Through Bulkhead

CAUTION

Check behind bulkhead for obstructions before drilling hole.

ATTENTION

Seal bulkhead grommet with silicone sealant after routing harnesses.

Cut a 13 mm (1/2 in.) slit in bulkhead grommet.

Route blower and timer control harnesses through grommet in bulkhead into the interior of the vehicle.

- (1) Vehicle bulkhead grommet
- (2) Blower and timer control harnesses





2.5 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 5 shows a translated sample of the template supplied.



ATTENTION

Do not over tighten mounting screw.

Carefully align timer harness plug with socket on rear of timer and push into socket until seated.

Place the timer into position and secure with screw provided. Tighten screw until the timer with foam cushion is firmly seated against panel. Install cover over screw.

- (1) Timer

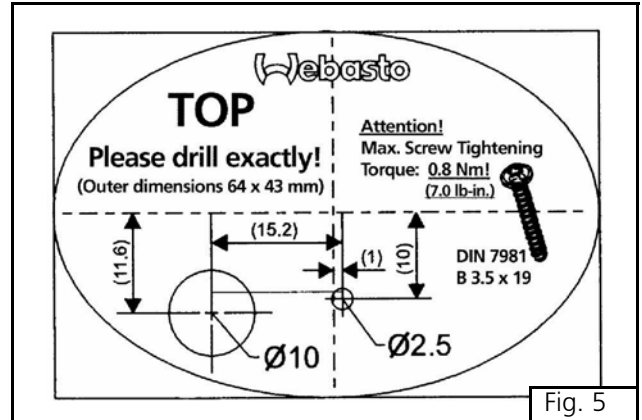


Fig. 5

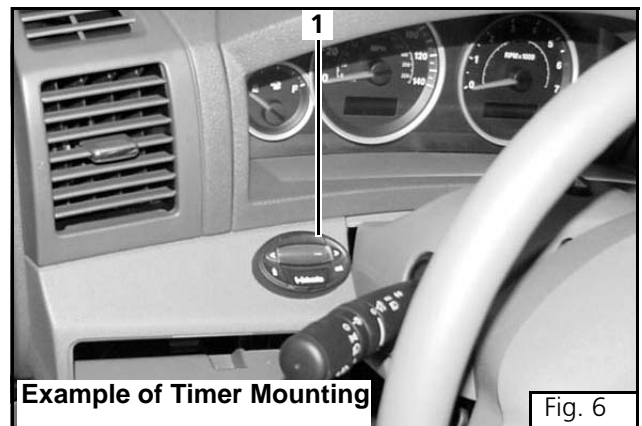


Fig. 6

2.6 Integration into the blower System

Route positive-side blower harness (black and red wires) over to blower motor area.

Mount negative-side blower harness (blue and white wires) and relay in vicinity of HVAC blower.

- (1) Chassis ground wire
- (2) Relay K-3 of negative-side harness

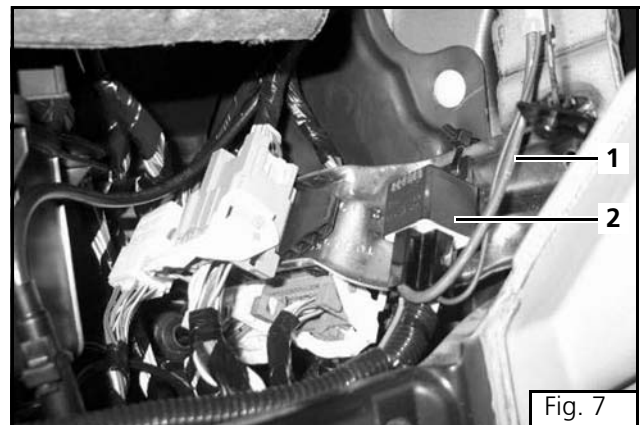


Fig. 7

2.6.1 HVAC Blower Motor Location

ATTENTION

The blower motor is usually located under the dash on the passenger side of the vehicle or attached to the bulkhead under the hood.

Disconnect the blower motor connector from the blower motor. Using a test light or similar tool identify the power and ground wires.

Cut blower control wires at a point approximately 50 mm (2 in.) from the connector end and make connections as described (see para. 2.6.2.).

- (1) HVAC blower motor
- (2) HVAC blower motor connector

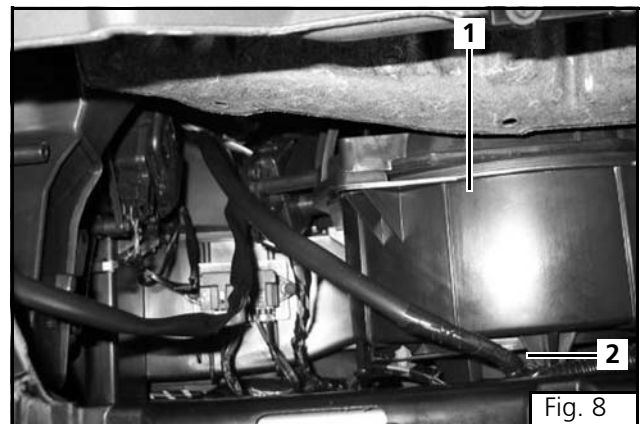
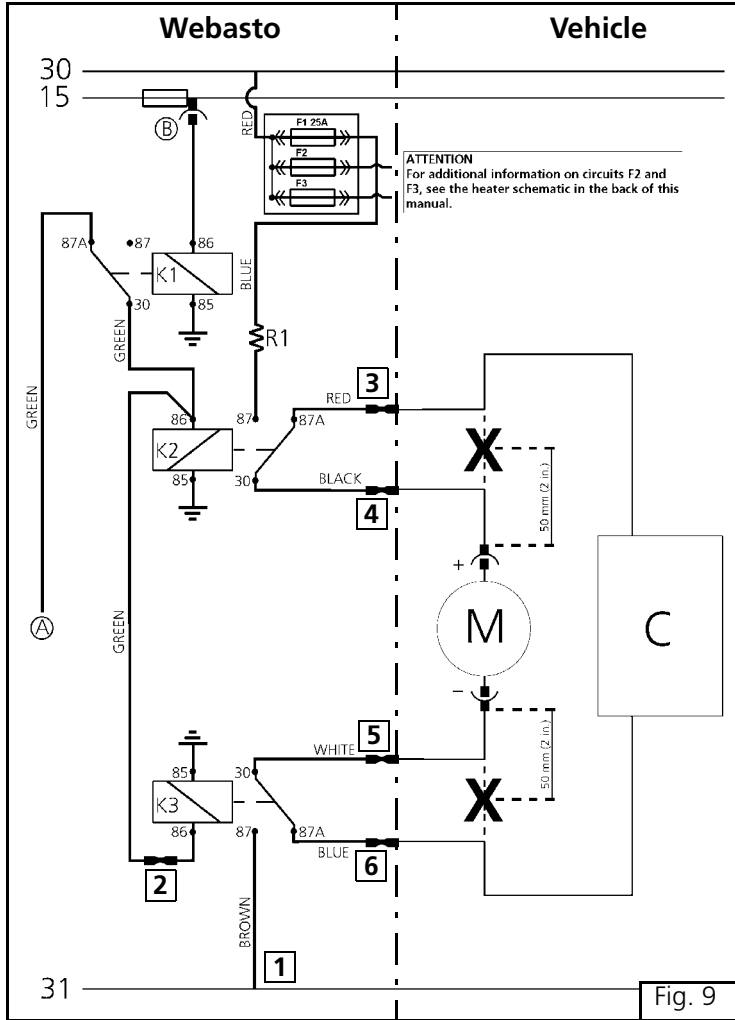


Fig. 8





2.6.2 3-Relay HVAC Harness Connections

NOTE:

It is permissible to cut excess length from Webasto HVAC wiring harnesses to fit the application.

Cut motor wires where indicated by "X"

- (1) Chassis ground
- (2) Splice green wire to green wire
- (3) Strip and crimp red wire to controller side blower control positive wire
- (4) Strip and crimp black wire to motor side blower control positive wire
- (5) Strip and crimp white wire to motor side blower control negative wire
- (6) Strip and crimp blue wire to controller side blower control negative wire

CAUTION

Check your wiring! Ensure that all connections have been done in accordance with the wiring diagram shown (Fig. 9). Sensitive electronic controls can be damaged if wired incorrectly!

Secure HVAC blower control wiring to vehicle structures with nylon wire ties. (Image not available)

NOTE:

Complete heater harness schematics are included on page 24 and 25 of this manual.



Legend for Figure 9

- A From Webasto Heater X1
- B 12 VDC Ignition 'On' Fuse Tap
- C HVAC Control Module
- M HVAC Blower Motor
- X Cut wire at 50 mm (2 in.) from motor
- F1 Fuse - Blower Circuit 25 Amp.
- K1 Relay - Ignition 'On' Interrupt
- K2 Relay - Positive Side of Blower Motor Circuit
- K3 Relay - Negative Side of Blower Motor Circuit
- R1 Resistor - Blower Speed Control
- 30 Battery Positive (Constant Power)
- 15 Ignition (Switched Power)
- 31 Battery Negative (Chassis Ground)



3 Heater Mounting

3.1 Recommended Locations

Refer to Figure 10 for the location of heater connections and dimensions, this will aid in determining the best mounting site.

CAUTION

The heater must not be installed in the immediate vicinity of hot vehicle parts or in the direct splash-water area of the wheels.

ATTENTION

Ensure to maintain sufficient clearance between the heater and moving vehicle components under all driving conditions, i.e. vehicle suspension, engine, etc. Consider how exposure to extreme elements will affect heater operation, i.e. rocks, mud, snow, etc.

Recommended heater locations:

- Engine Compartment
- Front Fenders (above splash shields)
- Behind Front Fascia
- Frame Rail or Crossmember

ATTENTION

The coolant pump on the Webasto heater is not of the self-priming type. To ensure automatic venting of the heater and circulation pump mount the heater in the lowest protected area possible.

CAUTION

The opening of the coolant connection pipes must never point in a downward direction in any installation position.

Figure 11 identifies the correct mounting positions for the proper operation of the Webasto heater.

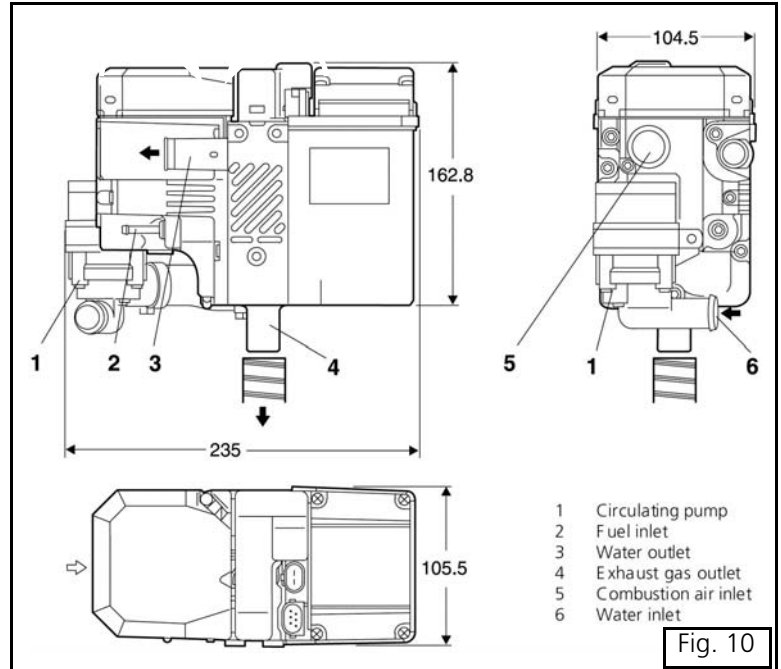


Fig. 10

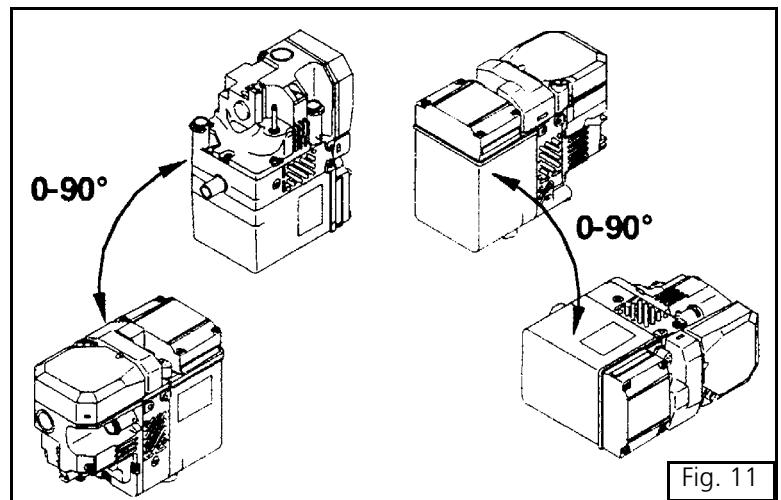


Fig. 11

3.1.1 Sample Heater Installation (Chrysler 300 C)

CAUTION

Sheet metal screws must never be used to secure heater mounting brackets to the vehicle.

ATTENTION

- The heater mounting brackets must have a minimum of three anchor points.
- Remove burrs and sharp edges from heater mounting bracket after modification.

Cut supplied mounting bracket as shown in figure 12. Bend mounting bracket "ears" inward 90° as shown.

- (1) Heater mounting bracket (Front View)
- (2) Heater mounting bracket (Side View)

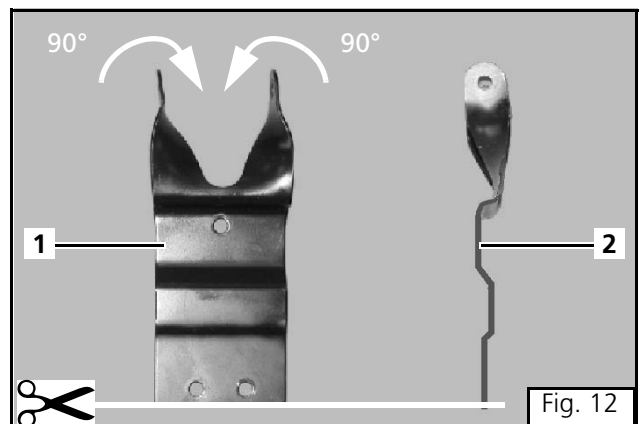
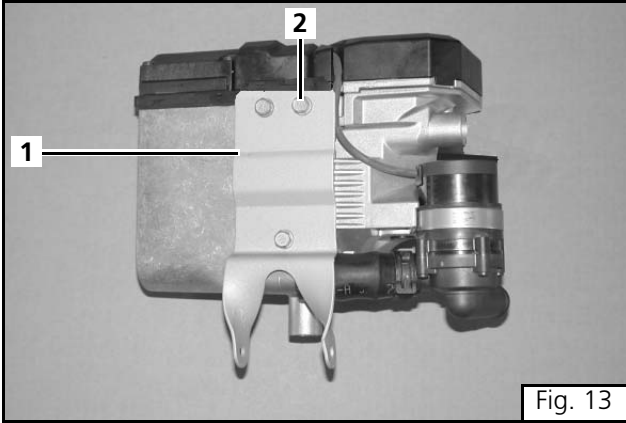


Fig. 12

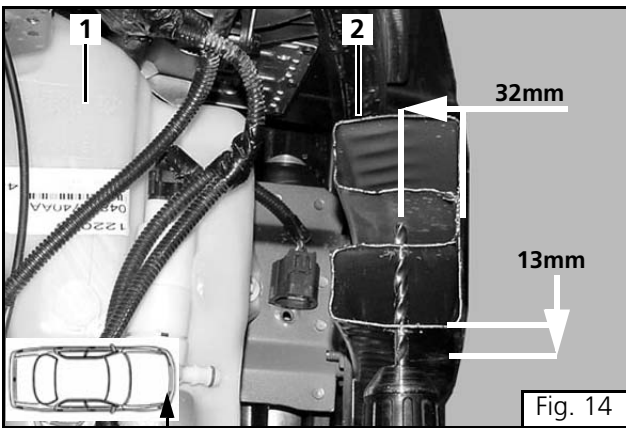


ATTENTION

Observe torque specifications.

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

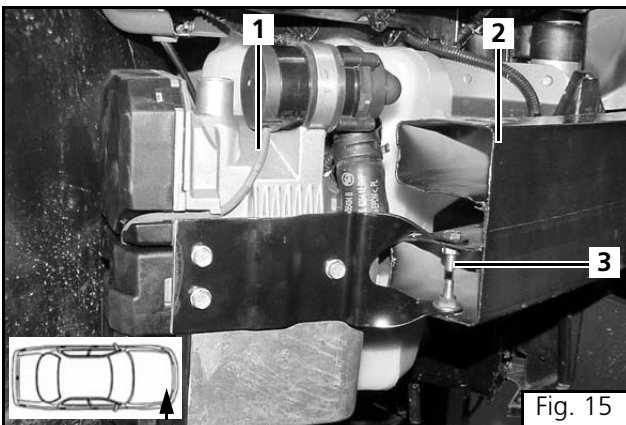
- (1) Heater mounting bracket
- (2) EJOT screws



Drill a 7mm (17/64 in.) hole through front bumper support as shown in Figure 14.

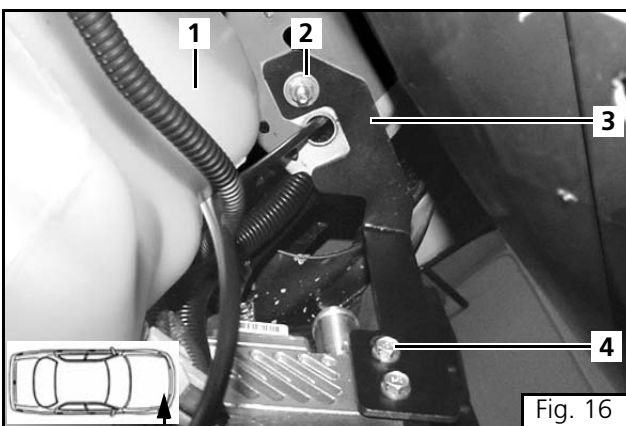
Locate the 7mm (17/64 in.) hole 13mm (0.5 in.) in from the end and 32mm (1.25 in.) in from the front.

- (1) Washer bottle
- (2) Front bumper support



Mount heater to front bumper support with hardware provided. See Figure 15.

- (1) Webasto heater
- (2) Front bumper support
- (3) Mounting hardware



Install rear heater support bracket on heater with two EJOT screws.

ATTENTION.

Use the rear support bracket to locate and drill a 7mm (17/64 in.) mounting hole for bracket installation.

Secure rear support bracket to vehicle with M6x20 bolt and nut.

- (1) Washer bottle
- (2) M6x20 bolt and nut
- (3) Rear heater support bracket
- (4) EJOT screws





3.1.2 Sample Heater Installation (Ford F-150)



ATTENTION

The Webasto Auxiliary Coolant Heater is to be installed behind left front head lamp assembly affixed to the front core support as shown in Figure 17.

- (1) Webasto Coolant Heater and Bracket.

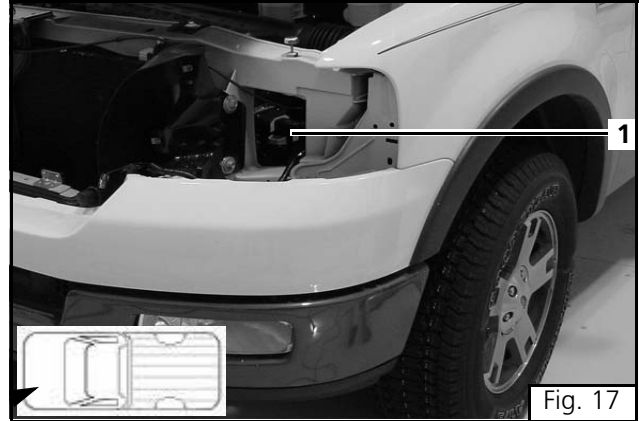


Fig. 17



ATTENTION

Bend heater mounting bracket as shown in Figures 18 and 21.

Using three self tapping EJOT screws, install heater mounting bracket to heater as shown.

- (1) Webasto Auxiliary Heater
- (2) EJOT Screw
- (3) Heater Mounting Bracket

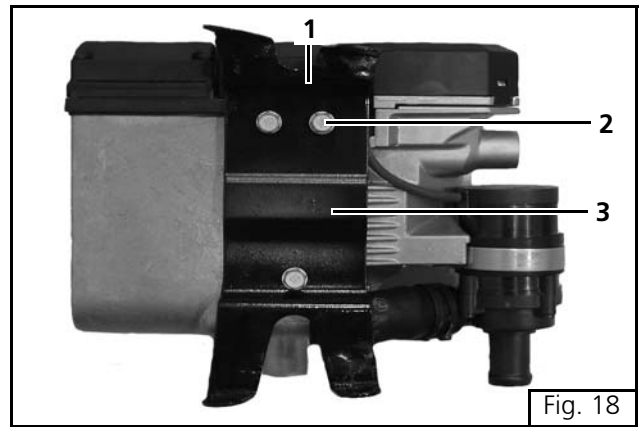


Fig. 18



ATTENTION

With head lamp removed, temporarily align heater and heater bracket in place ensuring clearance from surrounding vehicle structure. Adjust or bend "ears" on heater mounting bracket to conform to mounting location. Mark all four hole locations with marker. See Figures 19 and 20.

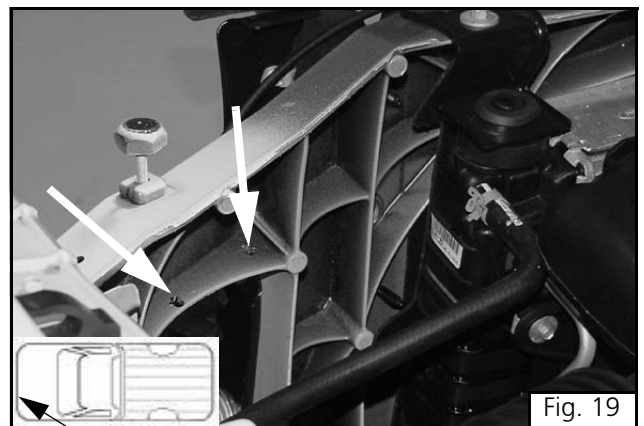
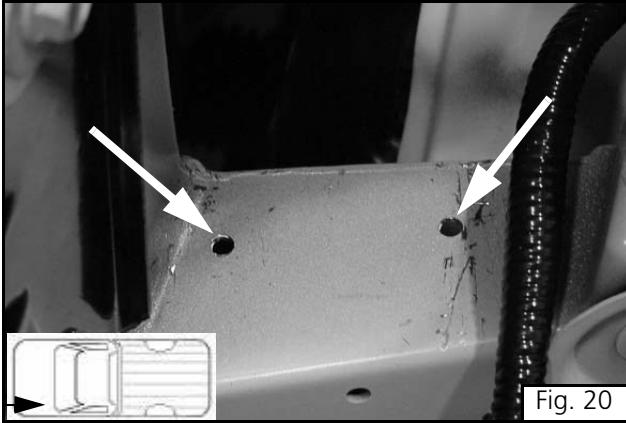
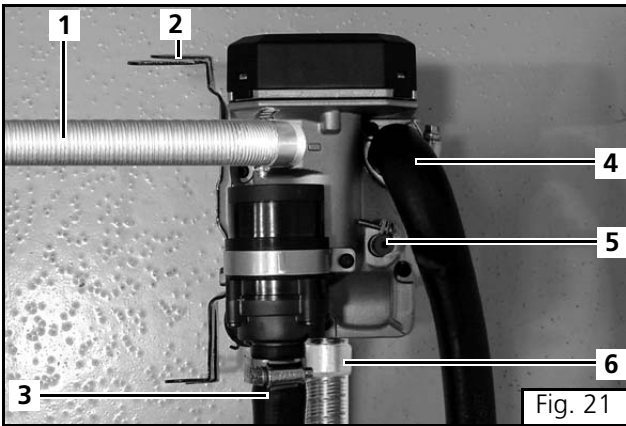


Fig. 19



ATTENTION

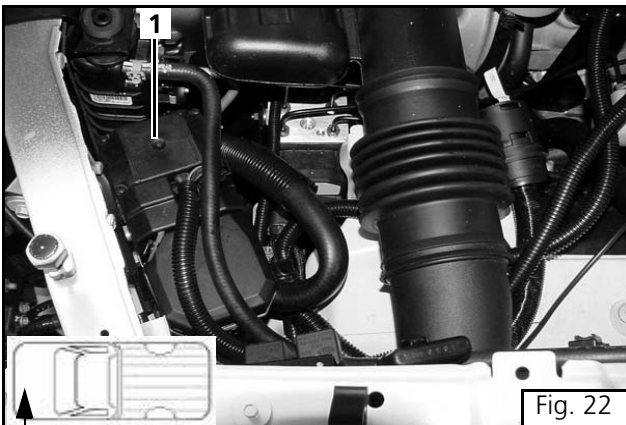
Remove heater and drill the four previously marked hole locations using a 6.5 mm (1/4 in.) bit.



ATTENTION

Prior to heater installation, the following components must be mounted to heater:

- (1) Combustion Air Intake Tube
- (2) Heater Bracket
- (3) Coolant Inlet Hose
- (4) Coolant Outlet Hose
- (5) Straight Fuel Line Connector
- (6) Exhaust Tube



ATTENTION

Top view of heater installed in vehicle.

- (1) Webasto Auxiliary Coolant Heater





4 Fuel system

4.1 Fuel Extraction

4.1.1 Standpipe with 90 Degree Banjo Fitting (Standard)

ATTENTION

The standpipe tube should terminate approximately 25 mm (1 in.) off bottom of tank when installed.

A 90 degree banjo fitting standpipe is provided in the generic kit. Use of this standpipe is recommended for most applications. Cut standpipe to the appropriate length at a 45 degree angle.

Legend for Figure 23

- | | |
|---------------------------|-----------------------------|
| 1 Banjo Bolt | 4 Sealing Washer |
| 2 Banjo Fitting 90 Degree | 5 Fuel Tank or Sender Plate |
| 3 Standpipe | 6 Locknut |

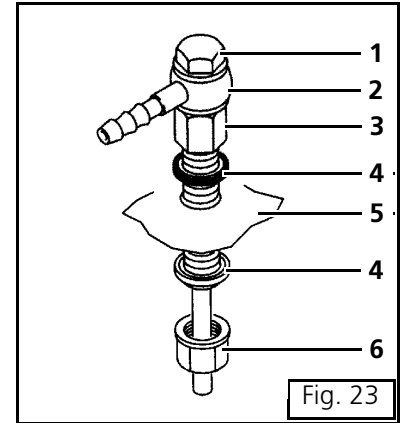


Fig. 23

4.1.2 Vent Line Adapter

This standpipe version utilizes the fuel tank filler vent tube to access the fuel supply.

The standpipe must extend into the fuel tank far enough to provide an adequate fuel supply to the heater. Ideally, the end of the standpipe should sit 25-50 mm (1-2 in.) off the bottom of the fuel tank.

Legend for Figure 24

- | |
|------------------------------|
| 1 Fuel Outlet |
| 2 Vent Tube Splice Connector |
| 3 Standpipe |

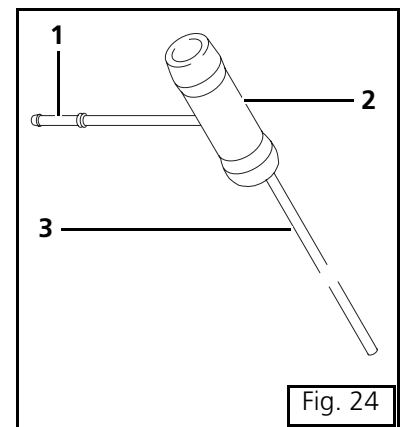


Fig. 24

4.1.3 Fuel line Tee Adapter

There are various sizes and shapes of fuel line adapters available from Webasto (see Figure 25).

CAUTION

A fuel line adapter should not be installed after the vehicle fuel pump. Fuel line pressure from the vehicle fuel pump could overcome the Webasto heater dosing pump, causing excessive fuel delivery to the heater.

If the heater is being installed in a vehicle equipped with a fuel injection system, determine if the vehicle fuel pump is mounted in the fuel tank. If the fuel pump is mounted outside of the fuel tank a fuel line adapter can be used in place of the standpipe. This is only true when the fuel line adapter can be installed prior to the vehicle fuel pump.

ATTENTION

Fuel should not be extracted from the vicinity of the engine (gasoline only) as gas bubbles (vapor lock) are likely to form in the fuel line, which could cause malfunctions in heater operation.

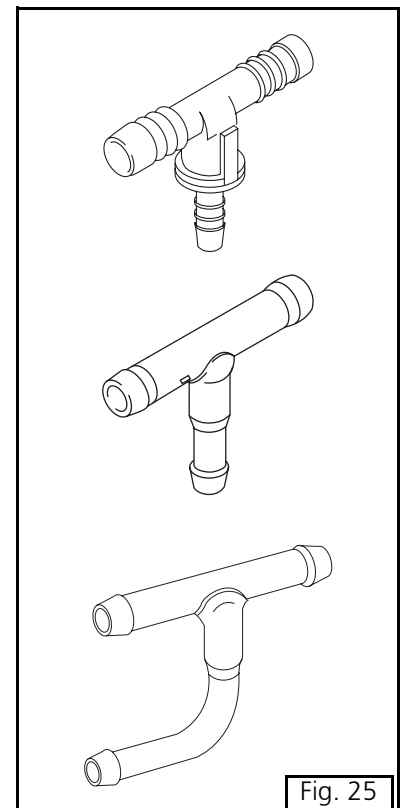
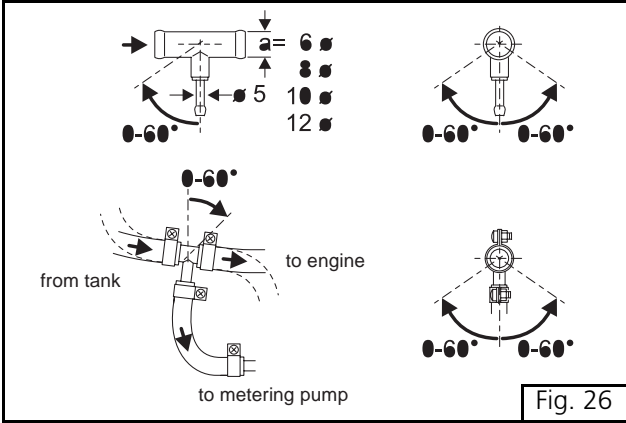


Fig. 25

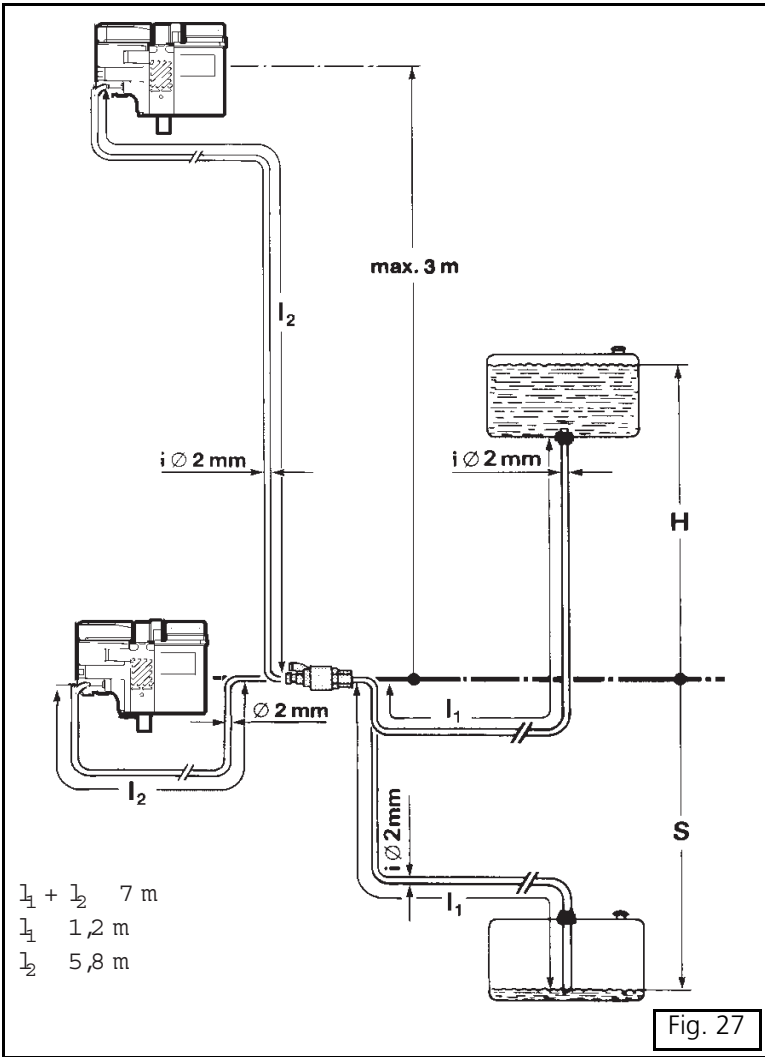




CAUTION

A special Webasto fuel line adapter must be used for fuel extraction from the vehicle fuel supply or return line (see figure 26).

The fuel line adapter must be mounted so that any air or gas bubbles that may form are automatically discharged toward the fuel tank.



4.2 Fuel Supply

Particulars on pressure values permitted to prevail at the point of fuel extraction are contained in the Table below.

TABLE 1. Permitted Pressure Values

permissible fuel feed height H (m)	at max. permissible overpressure (bar) in the fuel line
0.00	0.2
1.00	0.11
permissible fuel suction height S (m)	at max. permissible underpressure (bar) in the fuel tank
0.00	-0.10
0.50	-0.06
1.00	-0.02

Note: 1 bar = 14.5 psi and 1 psi = .069 bar



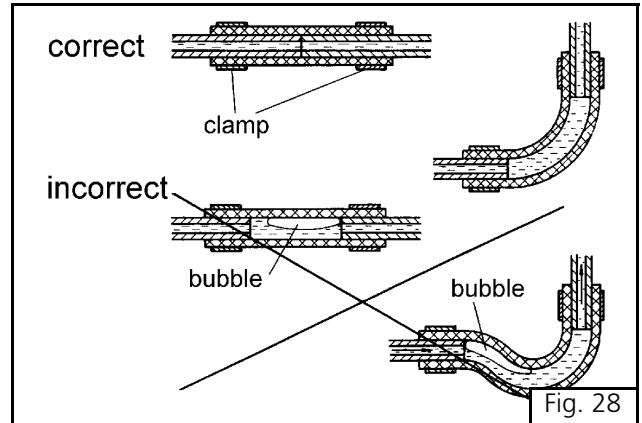
4.3 Fuel Lines

The special fuel line supplied in the kit is the only fuel line approved by Webasto for heater installation.

Ensure the fuel line from the metering pump to the heater is not routed in a downward pitch and is secured to the vehicle. Fuel line mounting should be done in such a manner that the lines are protected from flying objects and heat sources.

ATTENTION

- Ensure the fuel lines are fully seated within the fuel line couplers and any 90 degree bends are not buckled. Refer to Figure 28.
- Tighten all fuel line clamps to 1.0 - 1.4 Nm (8.8 - 12.4 lb.-in.)
- Always cut Mecanyl fuel line with a sharp razor knife or razor edged cutter. Using side cutters, scissors or similar tools will cause a restriction inside the fuel line.

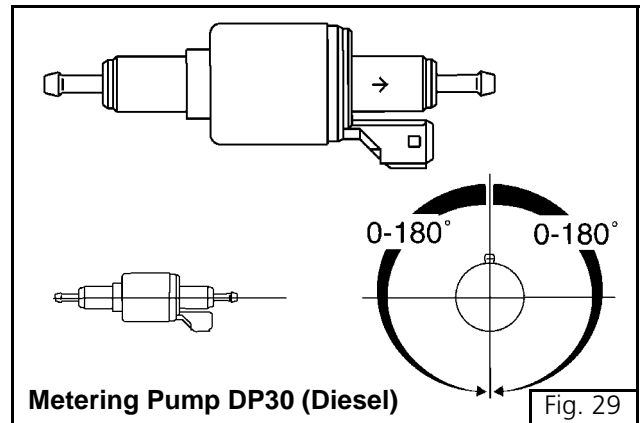


4.4 Fuel Pump Installation

The fuel metering pump is a combined fuel supply, metering, and shutoff system and is subject to certain installation criteria (See Figures 29 and 30).

Prior to installing the metering pump ensure the maximum pressure prevailing at the fuel extraction point is below 0.2 bar.

Install the fuel metering pump in accordance with Figures 29 or 30.

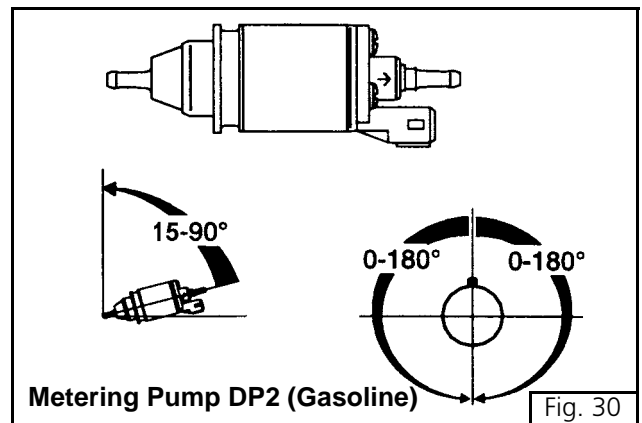


ATTENTION

The outlet side of the metering pump is located on the same end as the electrical connector.

It is recommended that the metering pump be installed in a location on the vehicle that stays reasonably cool, excessive heat may cause the pump to vapor lock.

The metering pump should be mounted to the vehicle by a sound and vibration-damping suspension (rubber mount provided in kit).



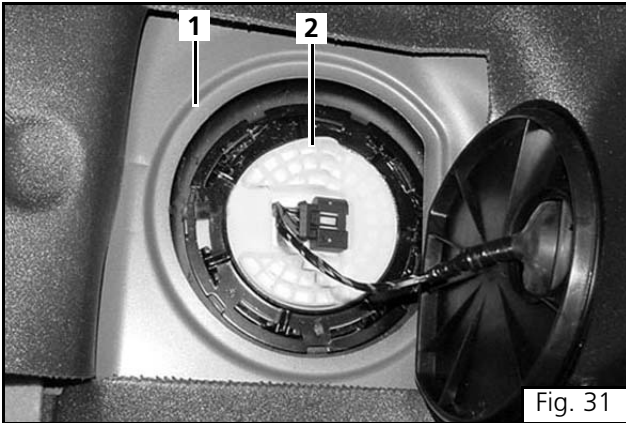


Fig. 31

4.5 Integration into the Fuel System

4.5.1 Typical Standpipe Installation (example only)

ATTENTION

Figure 31 shows a fuel sender accessible from inside the vehicle.

Remove the fuel sender from the vehicle following the manufacturer's service instructions.

- (1) Under rear seat
- (2) Fuel sender

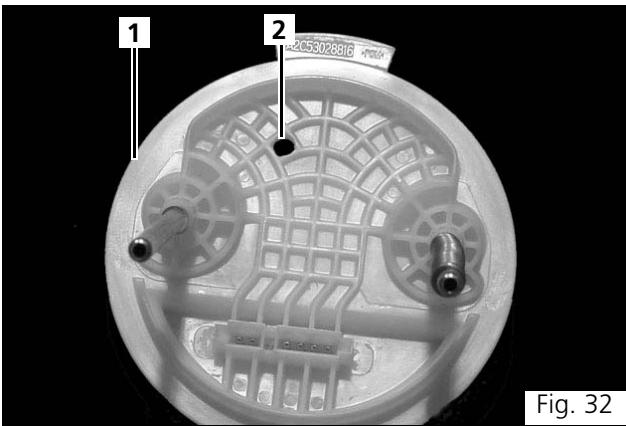


Fig. 32

ATTENTION

When selecting a location for standpipe installation, ensure to leave enough room for electrical connections and float arm operation.

Drill a 5/16 in. hole through the fuel sender where shown in Figure 32.

- (1) Fuel sender
- (2) 5/16 in. hole drilled for standpipe

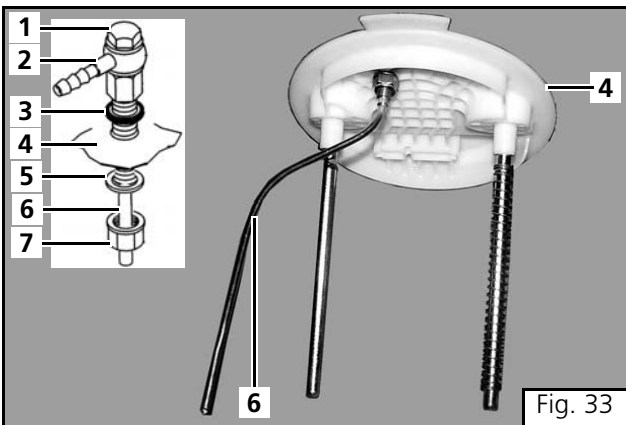


Fig. 33

4.5.2 Standpipe Assembly

ATTENTION

- The standpipe tube should terminate approximately 25 mm (1 in.) off bottom of tank when installed
- Ensure standpipe does not interfere with the float arm.

Cut standpipe (45° angle cut) to length and bend as necessary.

- (1) Banjo bolt
- (2) Banjo fitting
- (3) Sealing washer
- (4) Fuel sender
- (5) Flat washer
- (6) Standpipe
- (7) Locknut

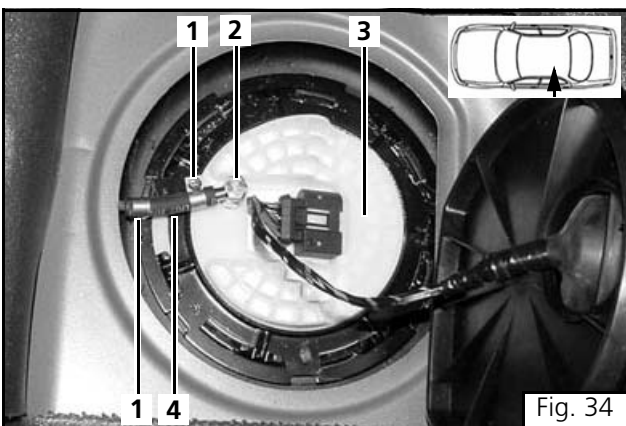


Fig. 34

Install fuel sender following the manufacturer's service instructions.

Position standpipe as desired. Tighten banjo bolt to 9 +/- 0.5 Nm (80 +/- 4.4 lb in.)

Connect fuel line to standpipe with fuel line coupler.

Route Mecanyl fuel line to fuel pump mounting location.

- (1) Fuel line clamp
- (2) Fuel standpipe - Banjo bolt
- (3) Fuel sender (installed in tank)
- (4) Fuel line coupler





5 Combustion Air Supply

ATTENTION

- The combustion air must never be drawn from the occupant area of the vehicle. If the heater is installed in an enclosed housing, a vent hole of at least 3 cm (1.2 in.) is required
- Ensure the combustion air intake opening on the heater is positioned to prevent the possibility of clogging due to contamination.

Locate the combustion air intake silencer in a splash-proof area, if possible.

When the heater is installed in the vicinity of the fuel tank, combustion air intake must be from the outside of the vehicle and the exhaust gas be discharged into the atmosphere.



5.1 Air Intake Silencer Installation

Install the air intake silencer tube onto the combustion air intake pipe of the heater and secure with hose clamp provided.

Screw air intake silencer into combustion air intake tube as far as possible.

CAUTION

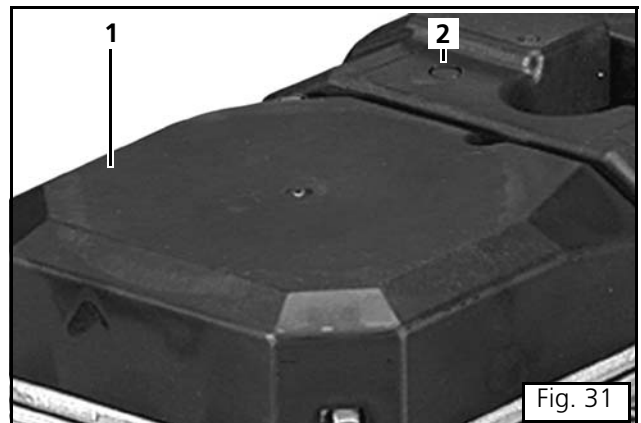
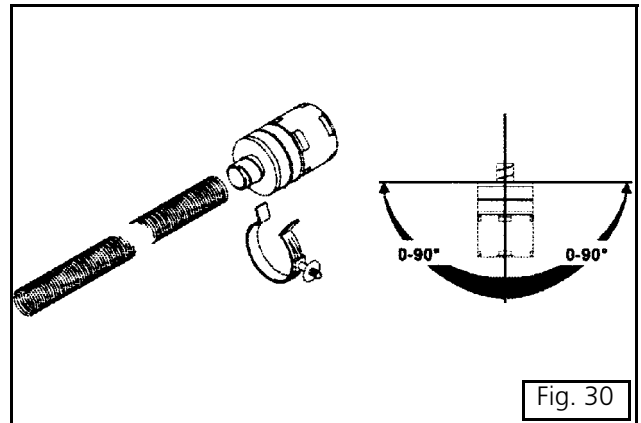
Ensure the air intake silencer does not come into contact with the exhaust system.

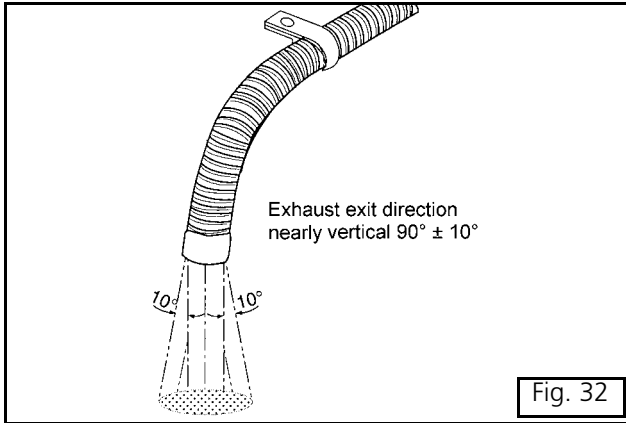
Attach the air intake silencer at a suitable place using the supplied mounting clip or cable tie.

The mounting clip can be inserted into the top of the heater after removing knockout or any other suitable location by drilling a 6.5 mm (1/4 in.) hole.

Position the air intake silencer between 0° and 90° with the silencer pointing downward.

- (1) Top of heater
- (2) Knockout for air intake silencer clip





6 Exhaust System

CAUTION

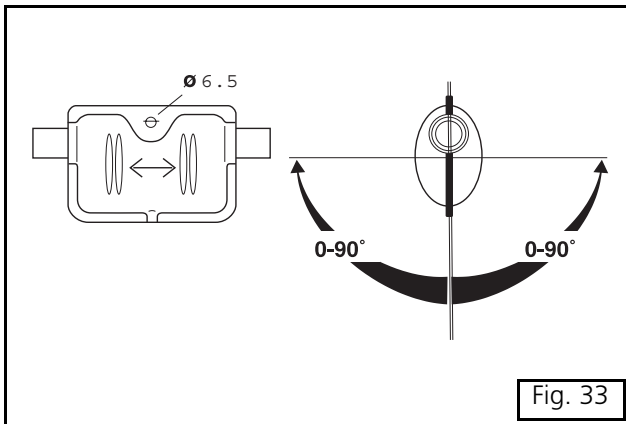
Keep exhaust tube away from heat sensitive vehicle components.

ATTENTION

Any collection of condensation in the exhaust pipe must be drained immediately; drill a small drain hole at the lowest point of the exhaust pipe.

The exhaust gas pipe can have several bends if necessary (total of 270°, smallest bending radius 50 mm or 2 in.).

The total length of the exhaust pipe should not be less than 500 mm (20 in.) or more than 1000 mm (39.5 in.).



The exhaust muffler should not be installed within 200 mm (8 in.) of the heater or the intake air silencer.

The discharge opening of the exhaust pipe must not point in the direction of travel.

Rigid pipes made of alloyed steel with a minimum wall thickness of 1.0 mm (0.039 in.) or flexible tubes of alloyed steel can be used for exhaust installation.

ATTENTION

Ensure all exhaust clamps are properly tightened. Check for exhaust leaks during heater operation.





7 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.
- The hose clamps at the heater must be mounted between the flared neck of the pipe and the heater.
- Position hose clamps in such a way to avoid cutting or damaging adjacent components.
- Ensure coolant hoses are routed at least 100 mm (4 in.) from heat generating components (exhaust, etc.)
- To ensure proper venting, route coolant hoses below coolant filler cap.

As a rule, the coolant hose supplied by Webasto should be used. If any other coolant hose is used it must conform to DN standard 73411. Ensure coolant hoses are routed in a way that prevent kinks and allow for proper venting. The coolant hoses should be pitched upward if possible.

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 39. The heaters are to be installed in the cooling system in the flow of the vehicle's heat exchanger.

ATTENTION

Follow the vehicle manufacture's specifications for proper coolant mixture and type.

Ensure the coolant circuit is properly vented before operating the heater for the first time or after a coolant change. The heater should be installed in a way to ensure static venting. Insufficient venting can result in a failure during heater operation due to overheating.

ATTENTION

Ensure to pressure test the coolant system after heater integration.

Also see the plumbing schematic, page 26, of this manual for a general outline of the coolant circuit arrangement.

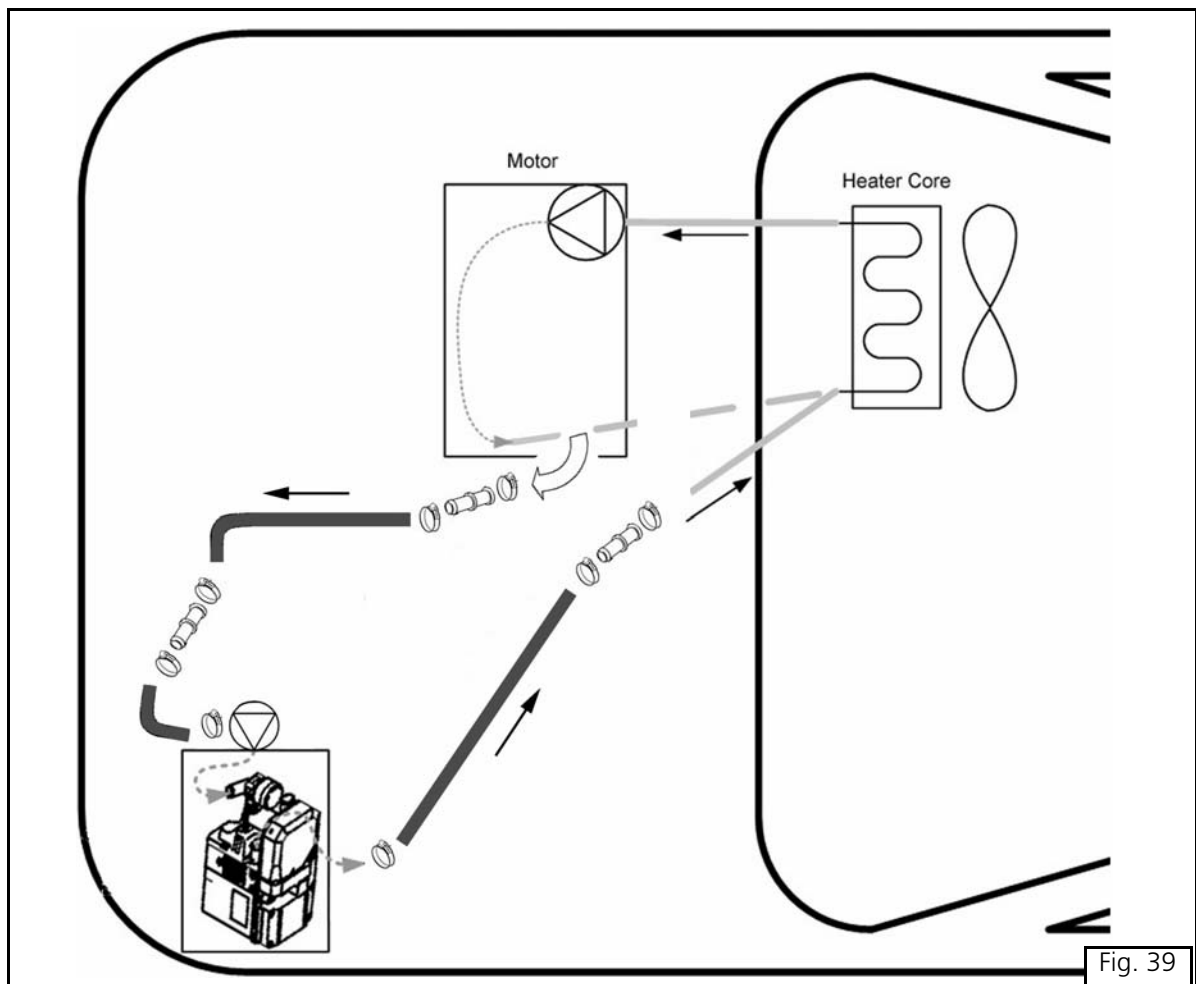


Fig. 39

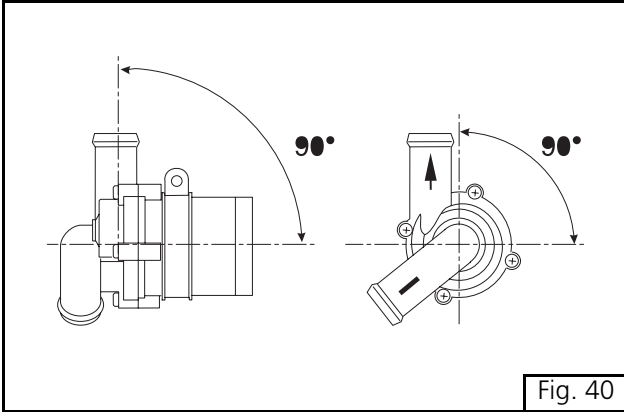


Fig. 40

7.1 Repositioning the Circulation Pump

The circulation pump can be mounted at the location provided on the heater or be integrated into the coolant circuit, away from the heater.

Ensure flow through the heater is correct (coolant outlet at the top / coolant inlet at the bottom) or the heater will malfunction.

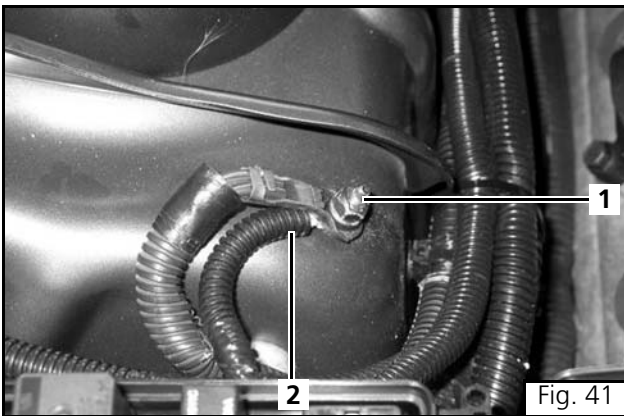


Fig. 41

8 Power and Ground Connections

8.1 Ground Connection

Use existing ground point to attach the control harness ground (brown wire).

- (1) Existing vehicle ground
- (2) Control harness ground

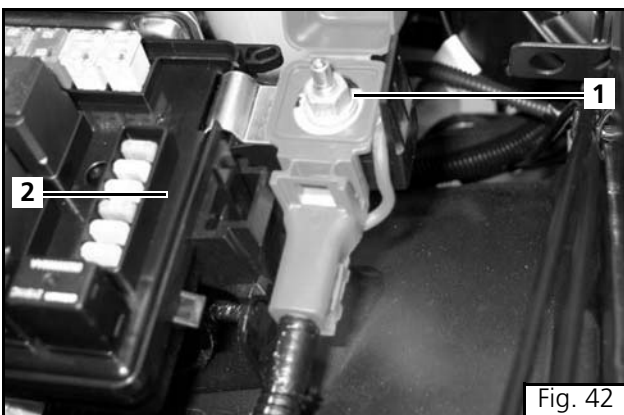


Fig. 42

8.2 Power Connection

Attach the control harness power lead (red wire) to the positive stud or the battery positive post.

- (1) Positive stud
- (2) Power distribution center

9 Final Inspection Initial Start-up and Concluding Work

Connect battery ground terminal

9.1 Final Inspection (use installation checklist)

Perform checks A through F from the installation checklist before operating the Webasto heater. Complete the installation checklist after performing the initial start-up procedure.

9.2 Initial Start-up

ATTENTION

The fan speed control knob has to be between low and maximum for blower operation while the Webasto heater is on. The position of the control knob does not change the speed of the blower while the heater is on.

- 1 Set interior temperature control to maximum heat position (hot), fan speed between low and maximum, and switch to defrost mode.
- 2 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)
- 3 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.

- 4 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.

ATTENTION

The vehicle blower motor should come on after 5 minutes of heater operation, depending on outside air temperatures.

- 5 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.

9.3 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.

BlueHeat - Master Reference

10 Heater Lockout Reset Procedure

The BlueHeat 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:

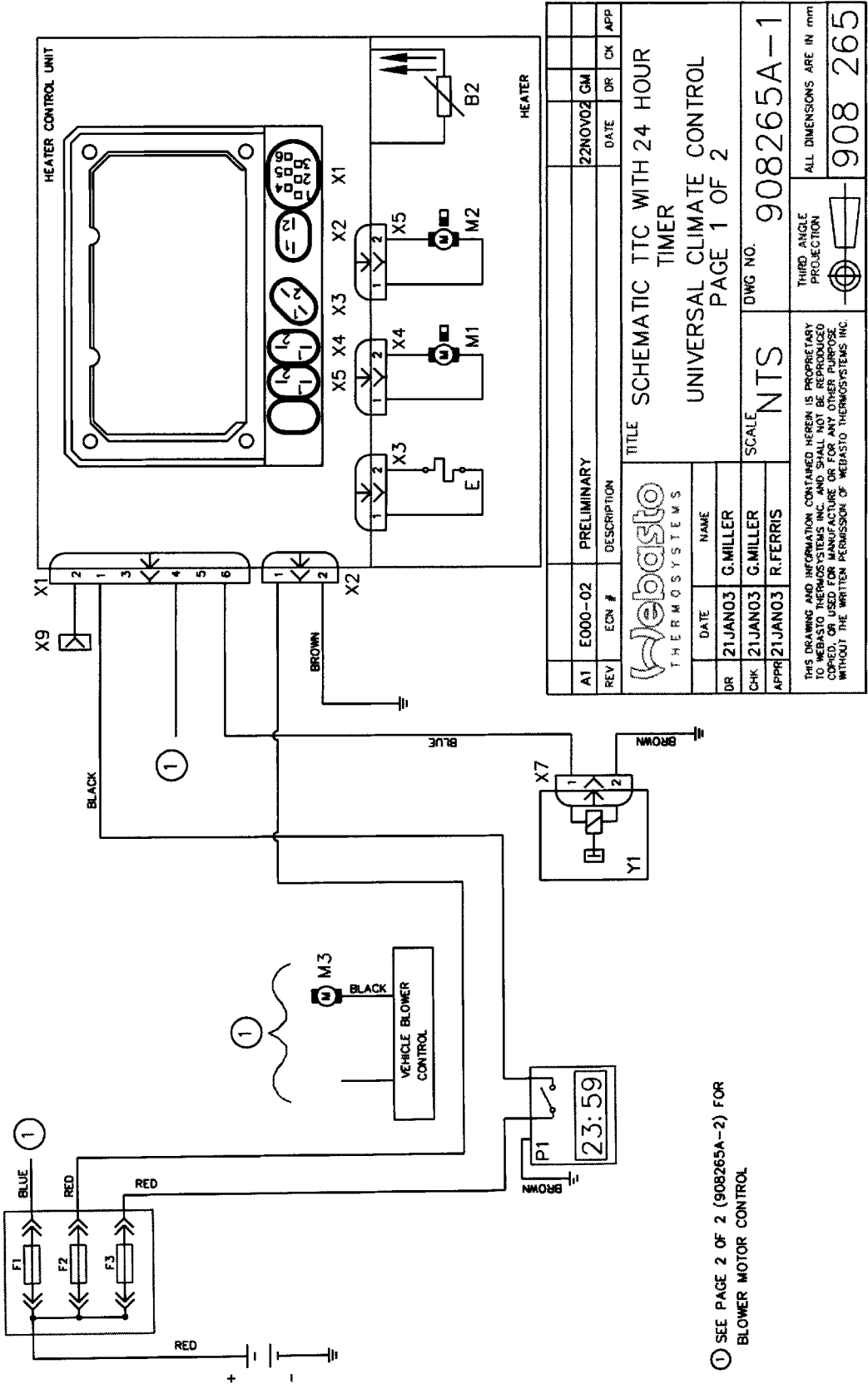
1-800-555-4518
Techwebasto.com



Electrical Harness Schematic - Part 1, Heater Control

NOTES:

- B2 : TEMPERATURE SENSOR - COOLANT
- E : CERAMIC IGNITOR / FLAME DETECTOR
- F1 : 25A BLOWER INTERLOCK
- F2 : 20A HEATER
- F3 : 2A TIMER
- K1 : IGNITION BLOWER CONTROL RELAY
- K2 : BLOWER RELAY 1
- K3 : BLOWER RELAY 2
- M1 : COMBUSTION AIR FAN
- M2 : COOLANT CIRCULATING PUMP
- M3 : VEHICLE BLOWER HTR/AC
- P1 : TIMER 24 HOUR
- R1 : RESISTOR 10HM/50W
- X9 : DIAGNOSTIC LINK
- Y1 : FUEL METERING PUMP



REV	DESCRIPTION	DATE	DR	CK	APP
A1	E000-02	22NOV02	GM		

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CHK	DATE	NAME	
APPR	DATE	NAME	
SCALE		NTS	
DWG NO.		908265A-1	

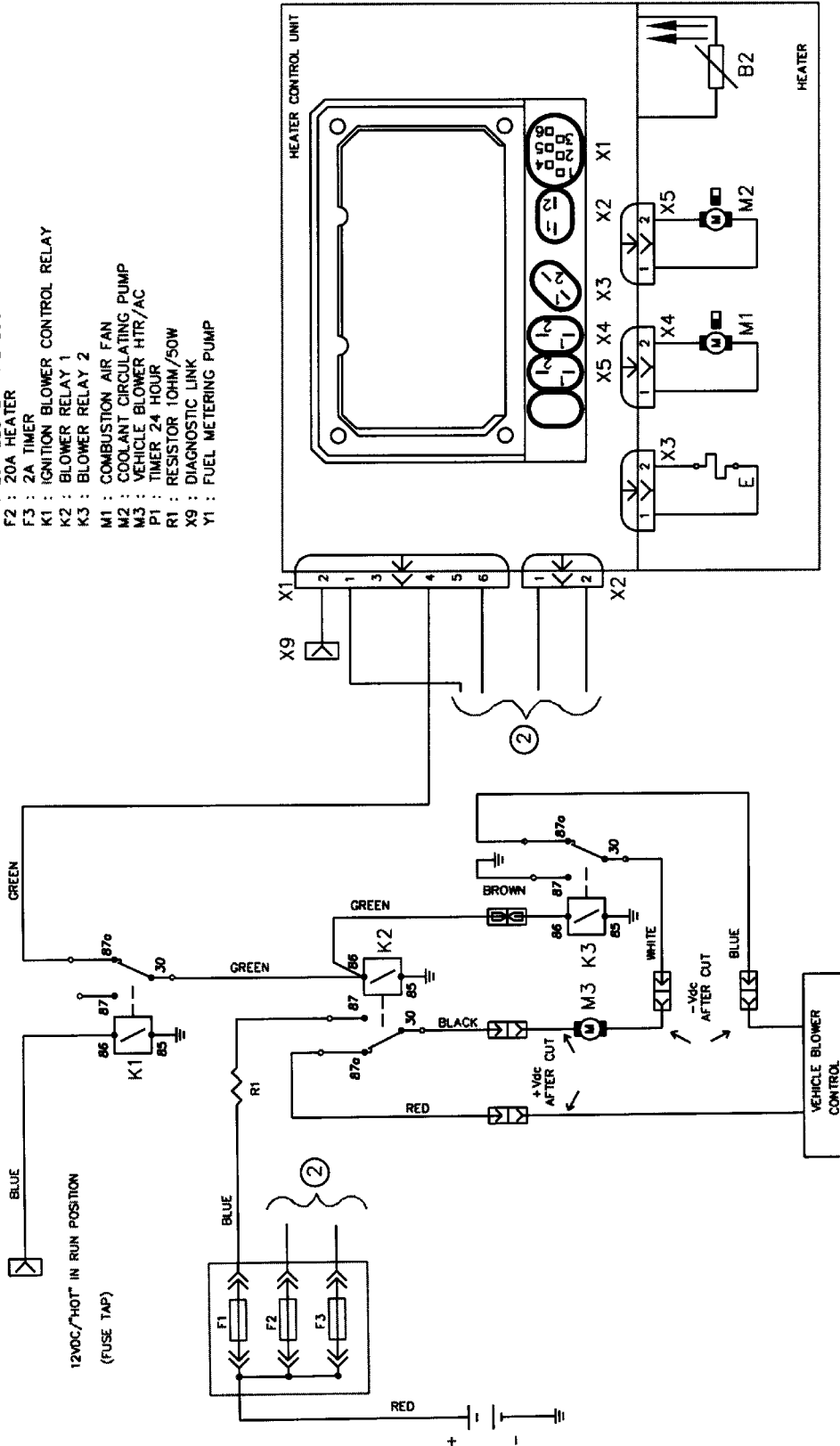
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ALL DIMENSIONS ARE IN mm		908 265

① SEE PAGE 2 OF 2 (908265A-2) FOR BLOWER MOTOR CONTROL

BlueHeat - Master Reference

Electrical Harness Schematic - Part 2, HVAC Blower Control

- B2 : TEMPERATURE SENSOR - COOLANT
- E : CERAMIC IGNITOR / FLAME DETECTOR
- F1 : 25A BLOWER INTERLOCK
- F2 : 20A HEATER
- F3 : 2A TIMER
- K1 : IGNITION BLOWER CONTROL RELAY
- K2 : BLOWER RELAY 1
- K3 : BLOWER RELAY 2
- M1 : COMBUSTION AIR FAN
- M2 : COOLANT CIRCULATING PUMP
- M3 : VEHICLE BLOWER HTR/AC
- P1 : TIMER 24 HOUR
- R1 : RESISTOR 10HM/50W
- X1 : DIAGNOSTIC LINK
- Y1 : FUEL METERING PUMP



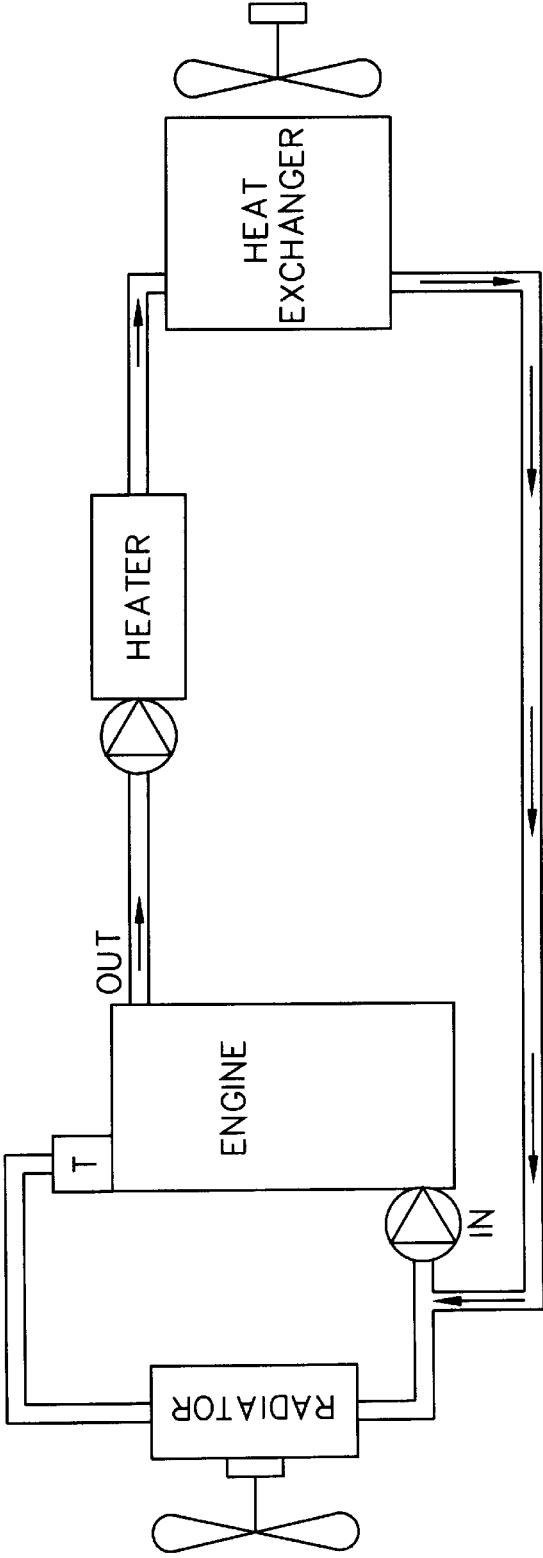
		TITLE SCHEMATIC TTC WITH 24 HOUR TIMER UNIVERSAL CLIMATE CONTROL PAGE 2 OF 2	
DR	DATE	NAME	
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APPR	21JAN03	R.FERRIS	
SCALE		NTS	DWG NO. 908265A-2
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			ALL DIMENSIONS ARE IN mm 908 265


FUNCTION : WHEN HEATER IS SWITCHED ON AND COOLANT REACHES 60°C (140°F) THE WEBASTO HEATER SENDS A SIGNAL THROUGH K1 TO K2 AND K3 VEHICLE BLOWER WILL COME ON AT LOW SPEED IF A VEHICLE IGNITION SIGNAL IS PRESENT AT K1, THE VEHICLE RETURNS TO NORMAL HVAC/OPERATOR CONTROLS


② SEE PAGE 1 OF 2 FOR ALL OTHER HEATER CONTROLS

Heater Plumbing Schematic - Inline Method

WEBASTO THERMO TOP C INLINE COOLANT SCHEMATIC



-  = THERMOSTAT
-  = COOLANT PUMP (2 PLC'S)

A1	E1B2-02	DRAWING RELEASED	21AUG02	BW	EK	MG
REV	ECN #	DESCRIPTION	DATE	DR	CK	APP
Webasto		THERMO SYSTEMS				
DR	21AUG02	B. WALKER	TITLE			
CHK	21AUG02	E. KOPP	COOLANT SCHEMATIC			
APPR	21AUG02	M. GRUPP	TTC INLINE			
			SCALE	NTS		DWG NO.
					908255A	
			THIRD ANGLE PROJECTION		ALL DIMENSIONS ARE IN mm	
					908255A	
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BlueHeat - Master Reference

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Please rate the overall usefulness of the documentation.	1	2	3	4	5
Rate the completeness and clarity of the instructions: did the procedures provide enough detail?	1	2	3	4	5

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