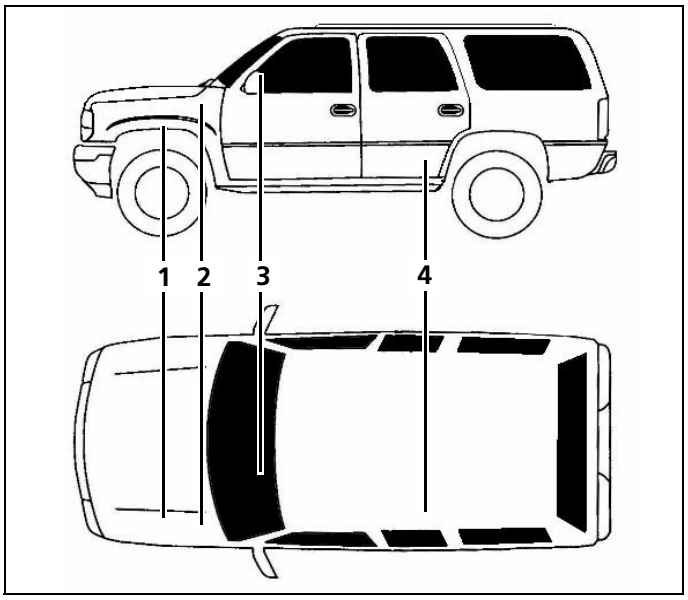
Blue*Heat* *Coolant Heater*

Webasto
Feel the drive

Thermo Top



Lincoln Navigator

2003 with 5.4 Liter V-8

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

Legend

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

Special Tools

– Hose Clamping pliers
– Torque Wrench (1/4' Drive)

Table of Contents

DOC P/N 5000679A KIT P/N 5000678B Printed in USA Webasto Product N.A., Inc.

– 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 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	Heater Kit	5000516C
1	Installation Kit	5000678A

Vehicle Information

Manufacturer	Model	Year	Engine Type
Lincoln	Navigator	2003	5.4 Liter V8 - FWD

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 non-binding 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 non-binding 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, however, the directives in the "installation manual" and "operating manual" must be followed. Acknowledged engineering conventions must be observed for the installation work.

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.

ATTENTION

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

Symbol Identification

Symbols that define sections in manual


Mechanical Preparation


Fuel


Electrical


Exhaust


Coolant


Combustion Air Intake

General Symbol Descriptions

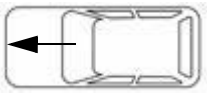

Warning


Refer to Webasto or Manufacturer Manua


Caution


Attention


Flammable or Combustible


Line of Sight/Item Location on Vehicle

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

– Verify fuel content in tank.

CAUTION

For reasons of safety due during the installation of a fuel standpipe, it is recommended there be no more than 1/4 tank of fuel present. If fuel quantity is greater than 1/4 of capacity, make provisions to reduce quantity of fuel.

– Disconnect negative terminal of vehicle battery (s).
– Protect vehicle against soiling and damage with fender covers and seat covers.

Heater Installation Site

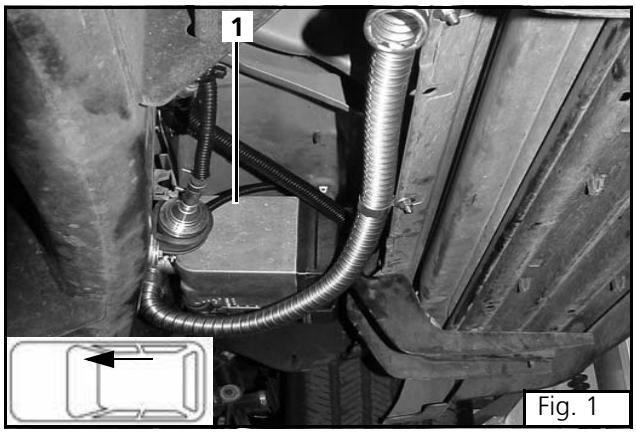


Fig. 1

ATTENTION

The Webasto BlueHeat auxiliary coolant heater is to be installed behind the right front wheel between the passenger frame rail and running board as shown.

– (1) Webasto Auxiliary Coolant Heater and Bracket

Installation

Electrical - Overview

ATTENTION

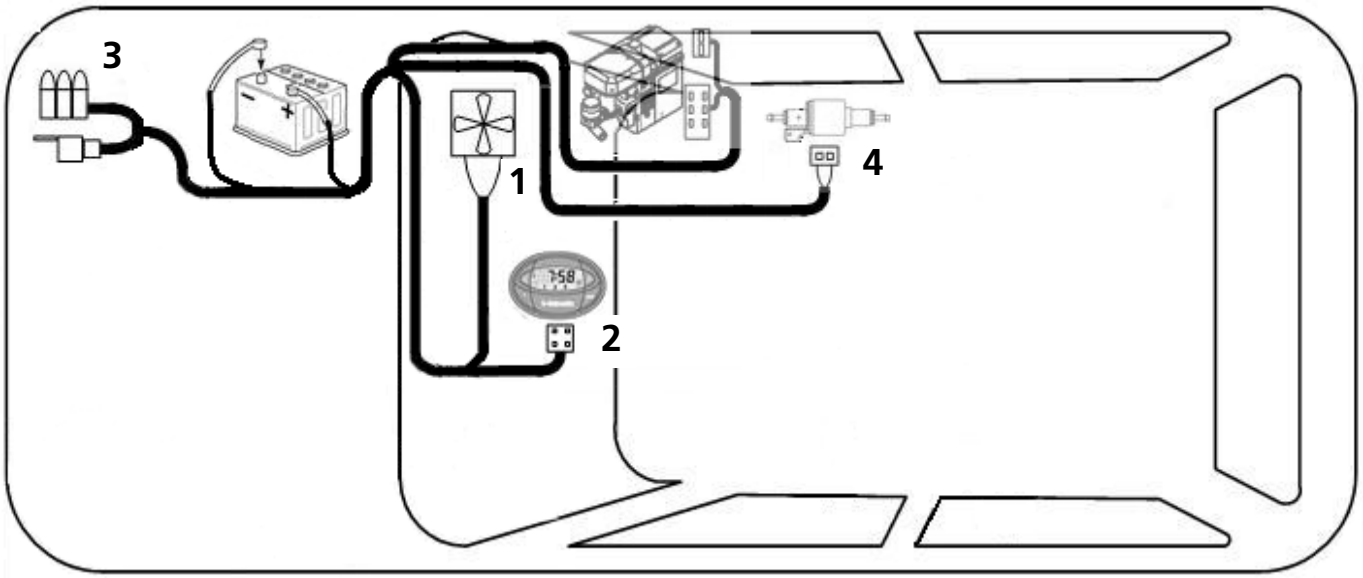
The timer control location is a recommendation only. Please consult with the customer before mounting.

Vehicle HVAC Blower Motor

Location: Under Instrument Panel Passenger Side

Timer Control Location

Location: Vehicle Interior - Center Console



Location: Just right of radiator as shown.

Webasto Blower Relay

Location: Mounted to frame rail behind heater.

Webasto Heater Fuel Pump

Electrical Harness

The electrical harness is a two-part assembly. Before installing, cut wire tie holding the negative side HVAC blower harness (with relay K3) to the main harness and separate.

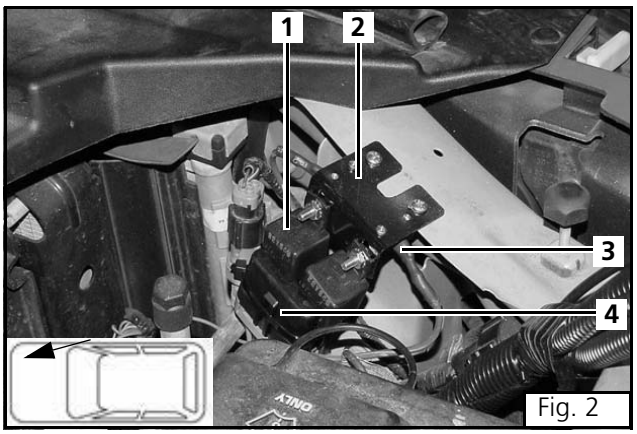


Fig. 2

ATTENTION
Fasten K1 and K2 relays using 10-32 pan-head screws and nuts. Mount Resistor to underside of bracket using M3x10 self-tapping screws. Secure Bracket to the right side of radiator support using 10-32 pan-head screws and nuts. Fasten fuse holder to relays using a nylon wire tie.

– (1) Relay
– (2) Retainer Bracket
– (3) Resistor
– (4) Fuse Holder

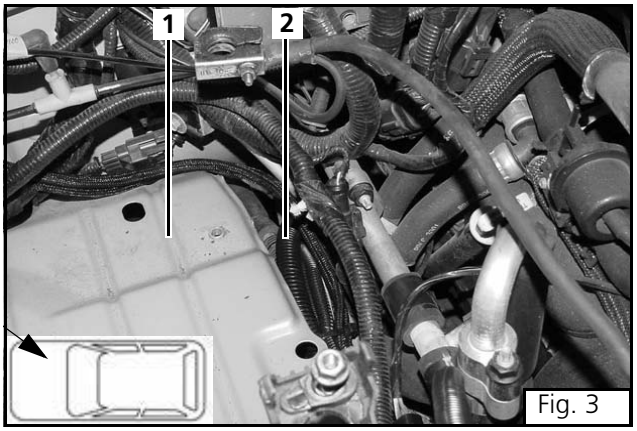


Fig. 3

ATTENTION
Maneuver harness rearward towards bulkhead. Route heater control and fuel pump harnesses over right inner fender towards battery tray. Continue down right side of frame rail to heater and fuel pump mounting locations.

– (1) Battery Tray
– (2) Heater Control and Fuel Pump Harnesses

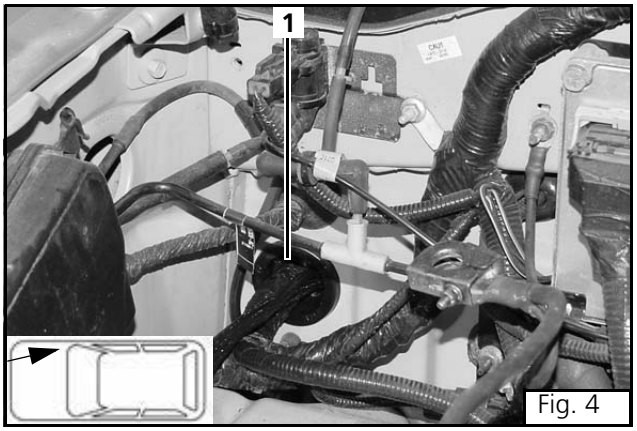


Fig. 4

ATTENTION
Prior to routing the ignition ON wire through firewall grommet, butt connect additional wire provided in kit as the harness will be to short without. Route the HVAC blower control, timer, and ignition 'ON' Harness to grommet as shown. Make slit in grommet and run harness through to inside of vehicle.

– (1) Bulkhead Grommet

Integration into the Blower System

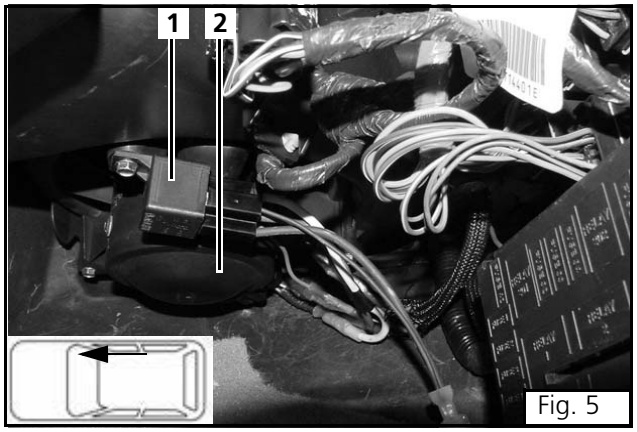


Fig. 5

ATTENTION
Cut excess length from blower control wiring harness. Fasten K3 relay / blower control harness near to HVAC blower motor.

– (1) K3 Relay
– (2) HVAC Blower Motor

3-Relay HVAC Harness Connections

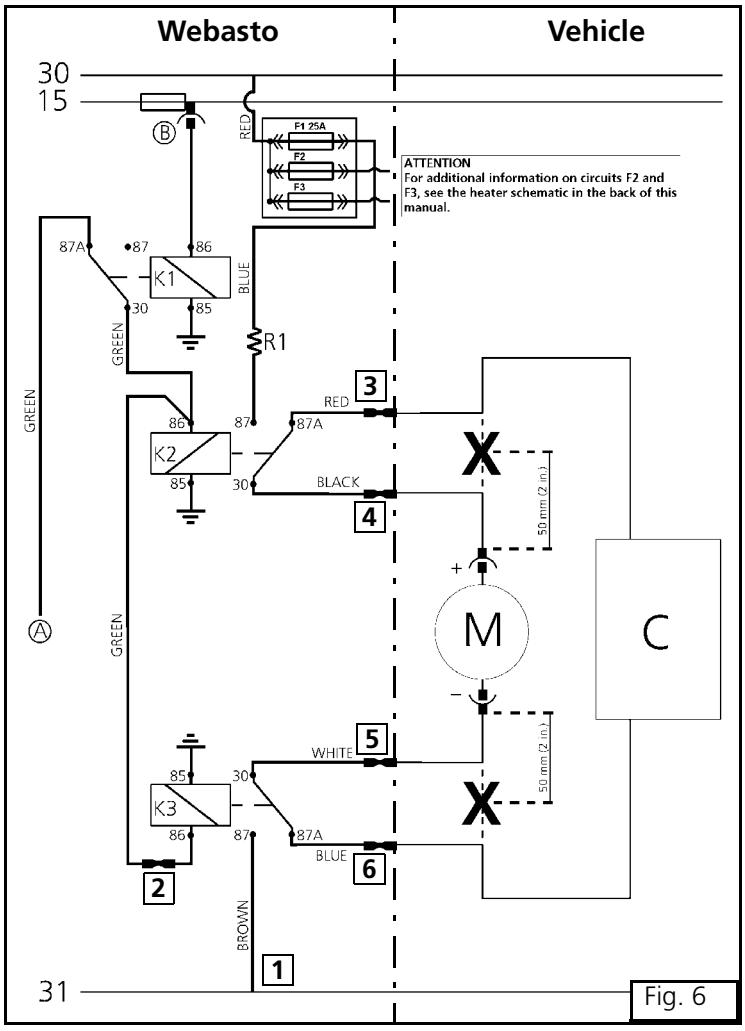


Fig. 6

HVAC Blower wiring connections:

– (1) Chassis ground
– (2) Splice green wire to green wire
– (3) Cut, strip and crimp
– (4) Cut, strip and crimp
– (5) Cut, strip and crimp
– (6) Cut, strip and crimp

CAUTION
Check your wiring! Ensure that all connections have been done in accordance with the wiring diagram shown (fig. 6). Sensitive electronic controls can be damaged if wired incorrectly!

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

Legend for Figure 6

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)

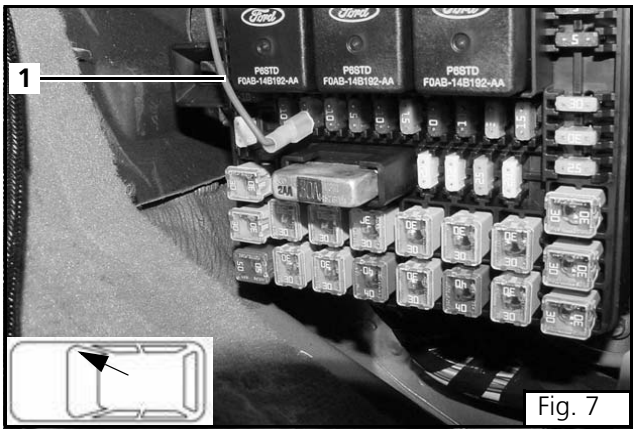


Fig. 7

Ignition ON Fuse Tap Connection

ATTENTION
Route blue Ignition ON fuse tap wire to fuse panel and install on fuse 13. (Ensure that fuse tap is installed on the fused side of the circuit.)

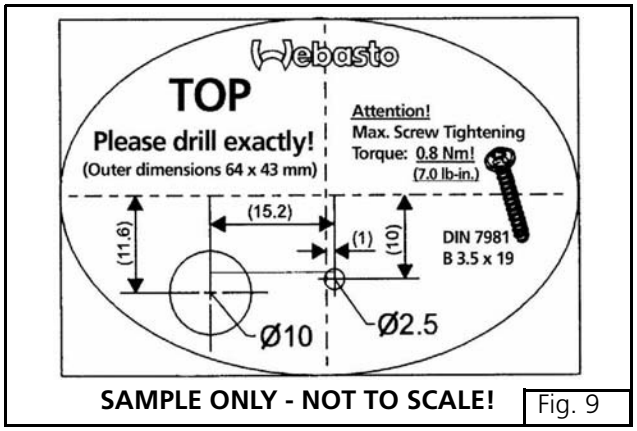
– (1) Blue Ignition ON Fuse Tap Wire

Timer Installation - Model 1533

Fig. 8

CAUTION
Before drilling into any panels, ensure there are no hidden components behind the panel that may be damaged or interfere with the timer installation! If necessary, to avoid damaging components, remove the panel before drilling holes.

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



SAMPLE ONLY - NOT TO SCALE!
Fig. 9

ATTENTION
Apply timer template to surface of desired timer location and bore a 10 mm (25/64 in.) and a 2.5 mm (3/32 in.) hole as specified on template.

Heater Preparation and Mounting

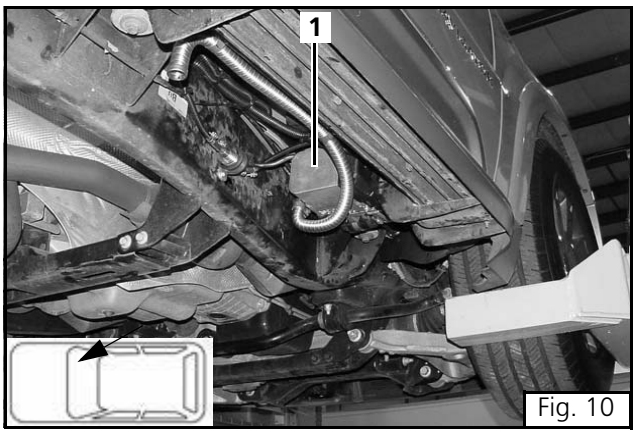


Fig. 10

ATTENTION
The Webasto auxiliary coolant heater is installed between passenger frame rail and running board as shown.

– (1) Webasto Auxiliary Heater

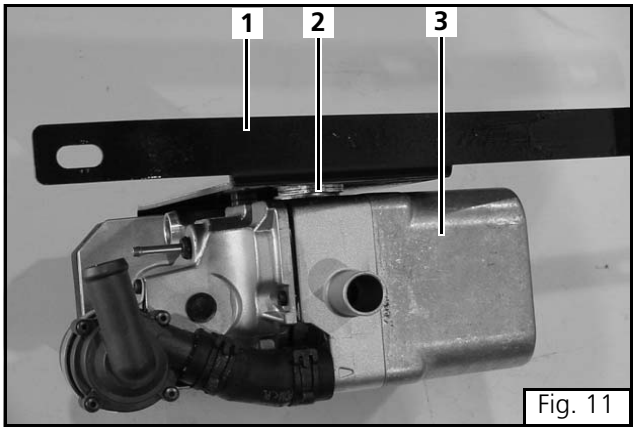


Fig. 11

ATTENTION
Using the provided 5/8 washers, ensure the heater is level on the bracket assembly. Insert the washers between the bracket and the heater as needed. Mount webasto heater to bracket using 3 self tapping EJOT screws. Torque screws to 10 Nm. (88.5 lb.-in).

– (1) Heater Bracket
– (2) 5/8 Washers
– (3) Auxiliary Heater

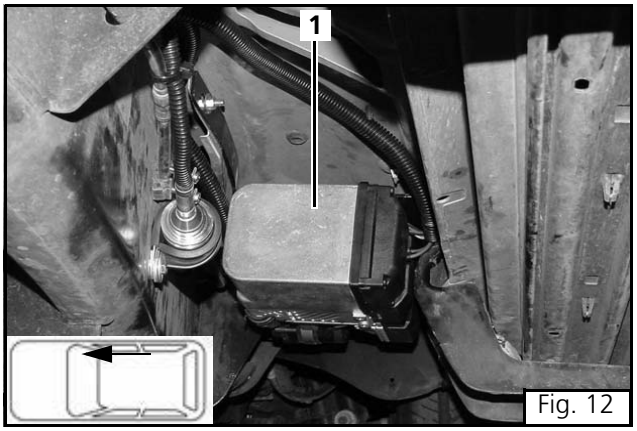


Fig. 12

– (1) Auxiliary Heater secured to vehicle

Integration into Fuel System

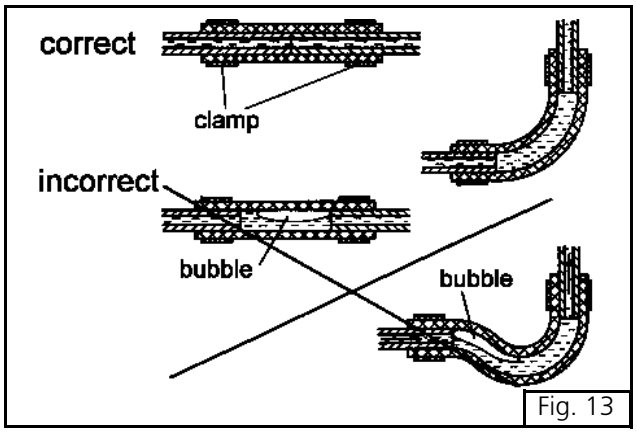


Fig. 13

ATTENTION
Fuel line must be cut using 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. Observe fig. 13 for correct fuel line connecting.

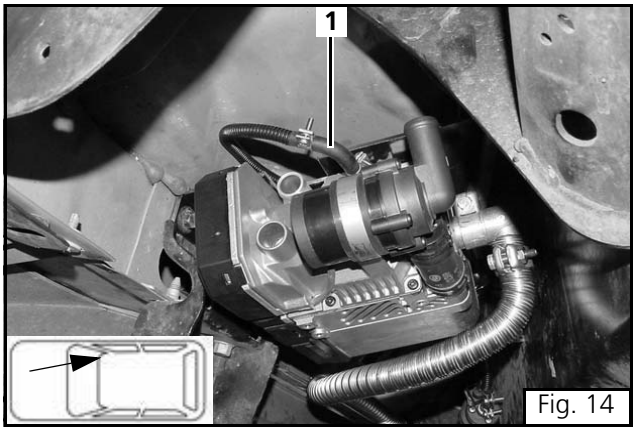


Fig. 14

ATTENTION
A 90 degree fuel line adapter was used to direct fuel line over heater assembly attaching to fuel pump outlet.

– (1) Fuel Line Attachment to Heater

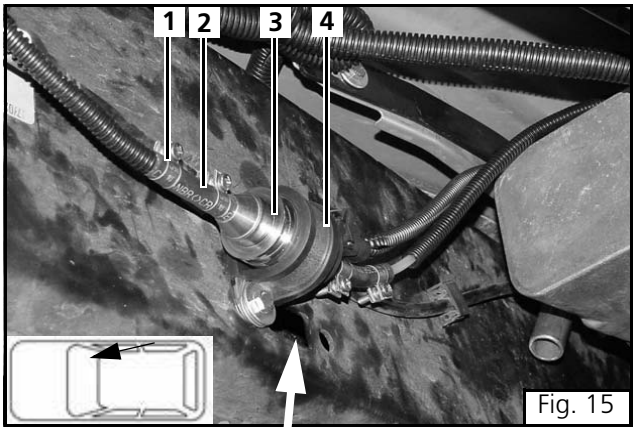


Fig. 15

ATTENTION
Install fuel pump to outboard side of passenger frame rail just behind the auxiliary heater mounting location.

– (1) Hose Clamp
– (2) Fuel Line Adapter
– (3) Fuel Pump
– (4) P-Clamp

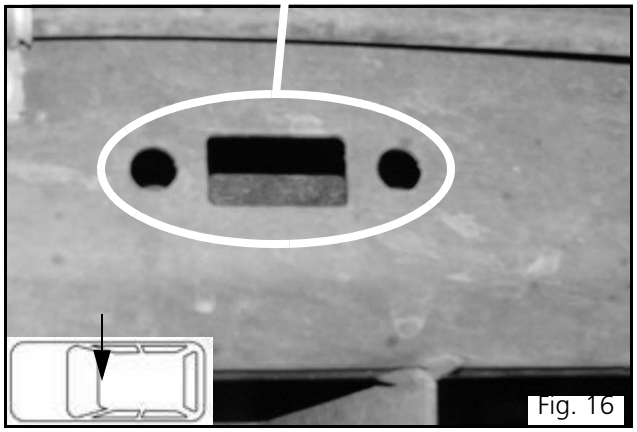


Fig. 16

ATTENTION
Figure 16 displays the pre-existing set of holes used to mount fuel pump to frame rail.

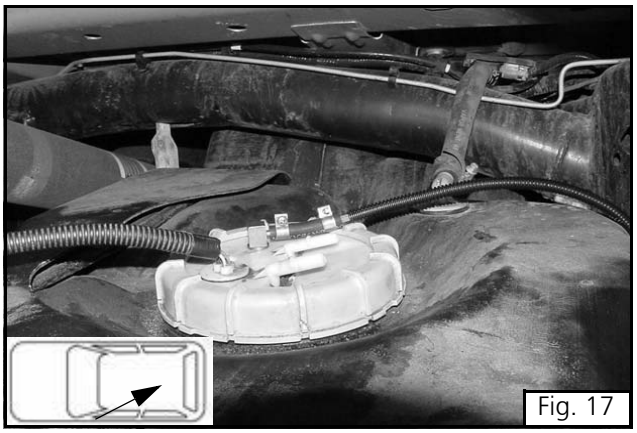


Fig. 17

WARNING
Full to partially filled fuel tanks are heavy and awkward to handle. Before removing fuel tank to gain access to the sending unit, ensure tank is near empty. To avoid accidents and injury to personnel, make sure tank is well supported while removing mounting hardware.

ATTENTION
Remove the fuel tank from the vehicle following the manufacturer's recommended service procedures. Remove sending unit from the fuel tank following the manufacturer's recommended service procedures.

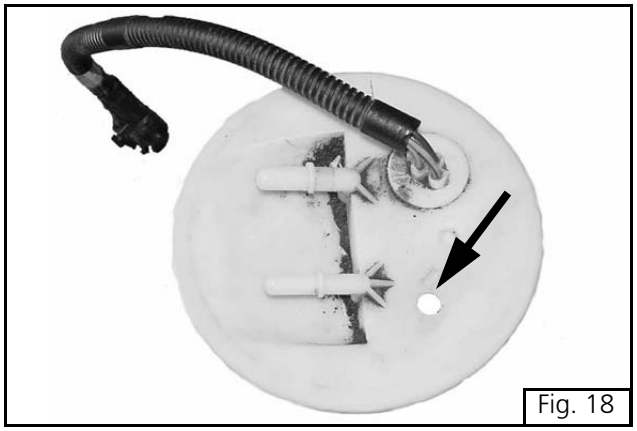


Fig. 18

WARNING
Fire and explosion risk! Do not use an electric power drill to bore into the sender unit as vaporizing fuel can be ignited. Keep all sources of ignition away from the fuel tank and work area.

ATTENTION
Bore a 6mm (1/4 in.) hole in top of sending unit as shown.

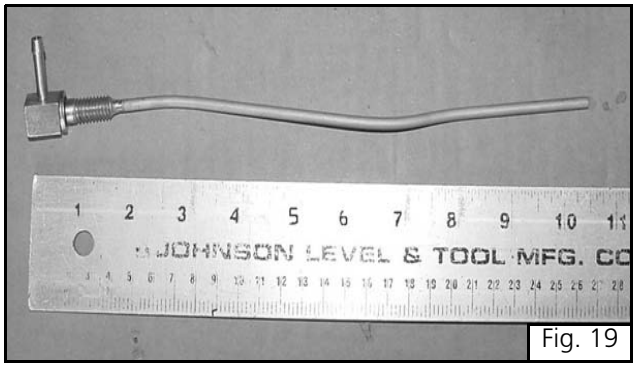


Fig. 19

ATTENTION
Cut approx. 247mm (9 3/4 in.) off fuel standpipe tube. Bend standpipe tube as necessary to clear moving parts. Install Standpipe in sending unit. See the Standpipe legend below for proper installation. Ensure a 1 in. clearance above the sending unit strainer.

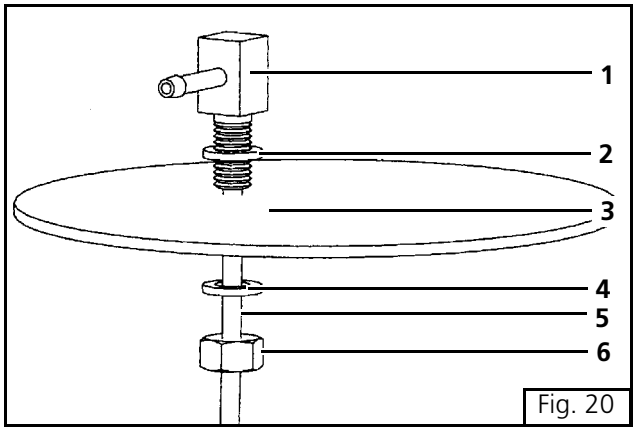


Fig. 20

Legend for Figure 20

1 90 degree nipple.
2 Upper Sealing Washer
3 Fuel Tank Sender Unit
4 Lower Sealing Washer
5 Standpipe
6 Nylon Lock Nut

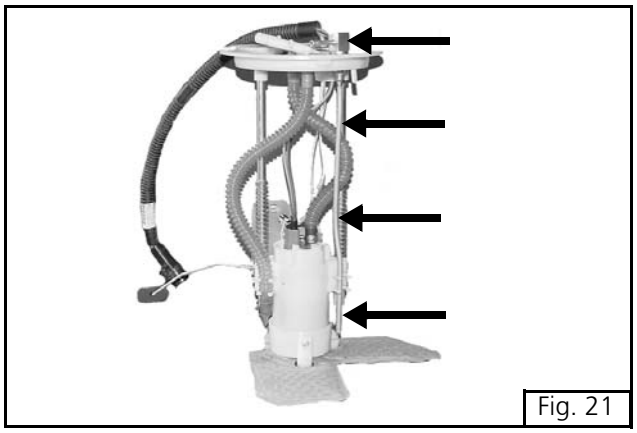


Fig. 21

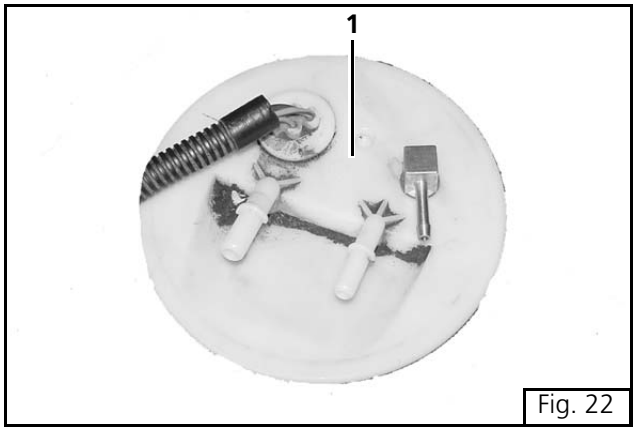


Fig. 22

ATTENTION

Ensure standpipe does not come in contact with moving parts such as the fuel gauge float.

– (1) Sending Unit with Standpipe Installed

Fuel Line Routing

Wrap fuel line with supplied protective loom. (Image not available) Attach fuel line to standpipe nipple using fuel line coupler and two hose clamps. Route fuel line along side vehicle fuel lines towards the heater mounting area, over transfer case and exhaust heat shield. Secure fuel line to vehicle where possible with nylon wire ties. Assemble and install the fuel tank according to manufacturer's recommended service procedure.

CAUTION

Ensure fuel lines do not come into contact with hot exhaust components or other sources of extreme heat. Make sure that lines are kept away from moving parts.

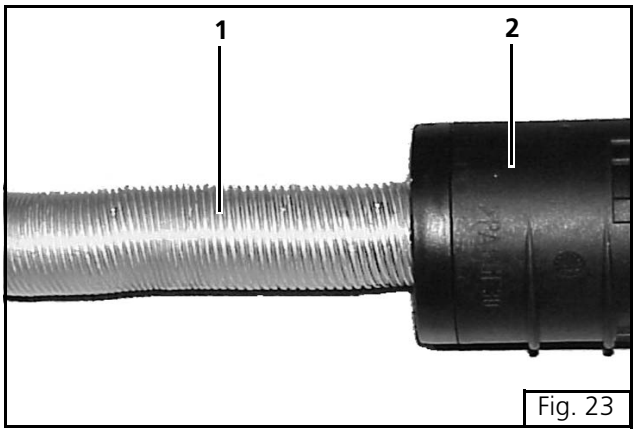


Fig. 23

Combustion Air Intake and Silencer

– (1) Combustion Air Intake Tube
– (2) Air Intake Silencer

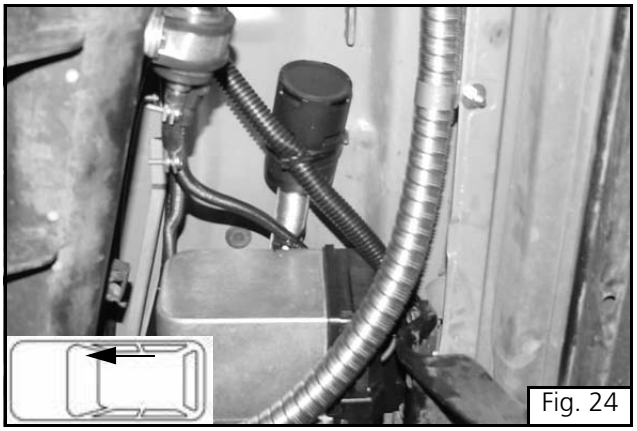


Fig. 24

ATTENTION
Route combustion air intake tube over top of heater towards the rear. Attach with nylon ties where needed.

Exhaust Routing and Installation

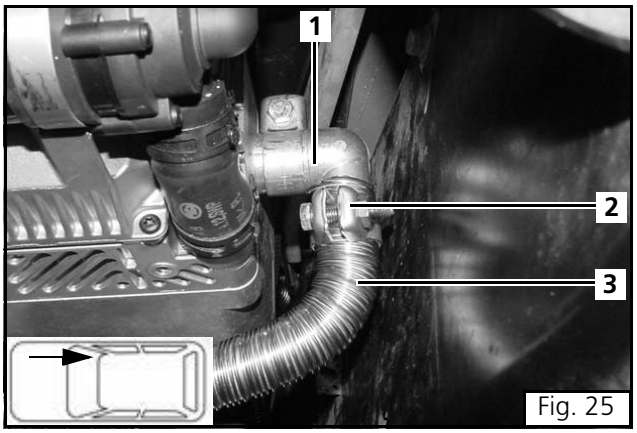


Fig. 25

ATTENTION
Attach exhaust tube to the 90 degree elbow installed on heater. Secure with exhaust clamp.

– (1) 90 Degree Elbow
– (2) Exhaust Clamp
– (3) Exhaust Tube

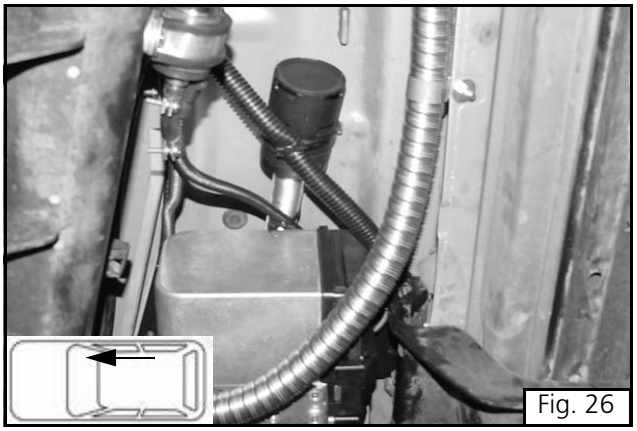


Fig. 26

ATTENTION
Route exhaust tube along frame rail towards rear of vehicle. Attach with provided P-Clamp.

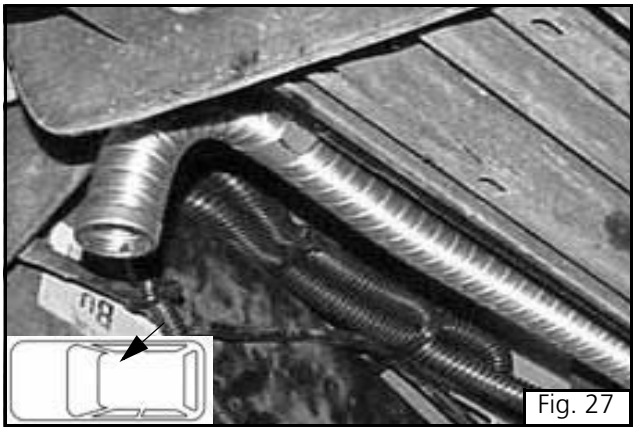


Fig. 27

ATTENTION
Ensure the heat insulators are properly positioned and that the tail pipe is positioned downward.

Integration into Coolant System

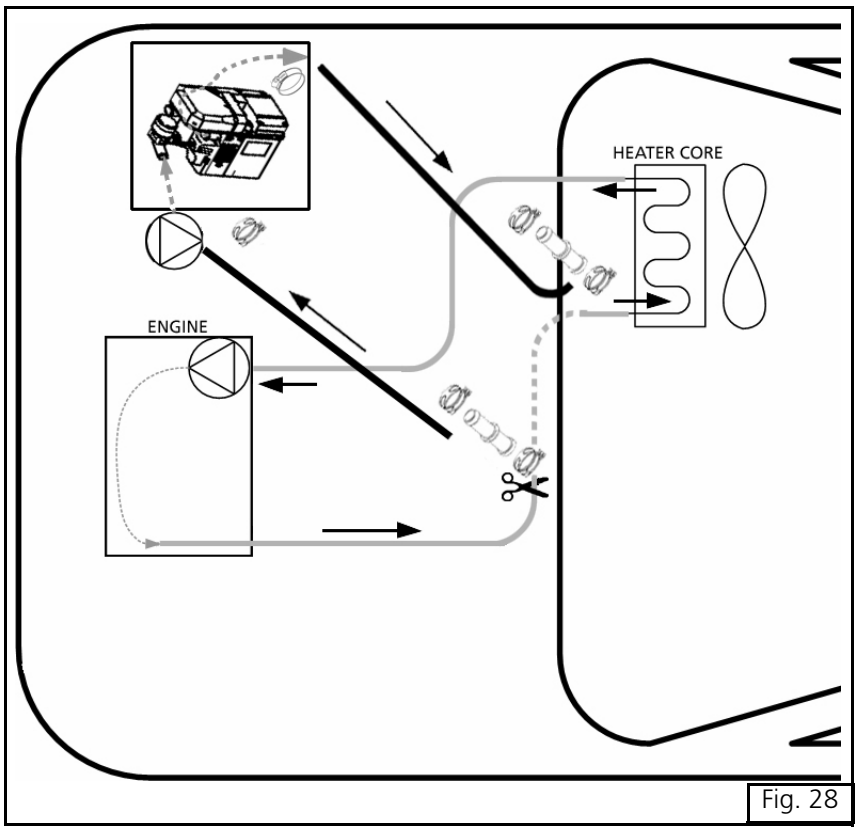


Fig. 28

ATTENTION
Fig. 28 displays the integration of the Webasto Coolant Heater into the vehicles cooling system.

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

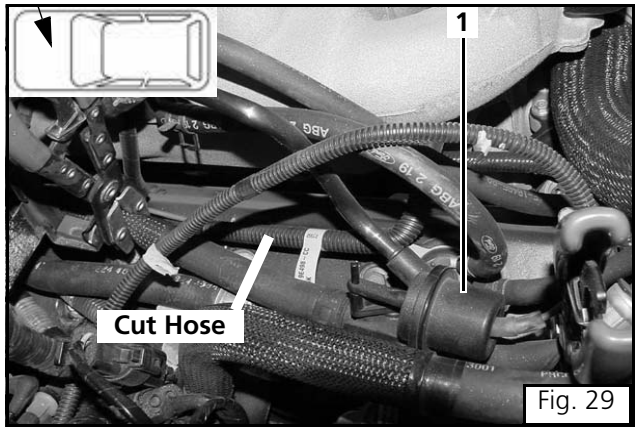


Fig. 29

ATTENTION
Locate vacuum controlled water valve from outlet hose originating from intake manifold. Cut coolant hose at white line 152mm (6 in.) past vacuum controlled water valve as shown in fig. 29.
– (1) Vacuum Controlled Water Valve

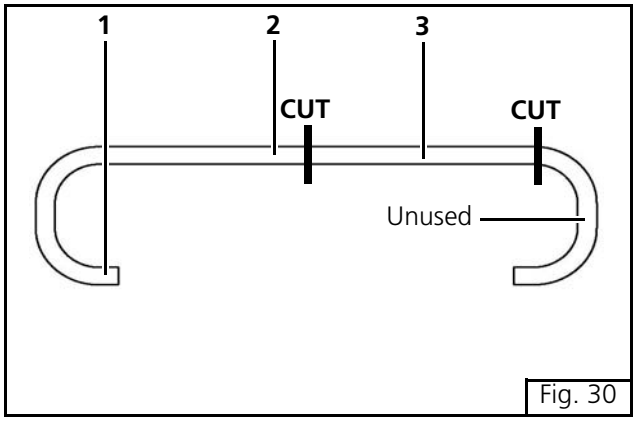


Fig. 30

ATTENTION
Cut provided coolant hoses according to fig. 30.
– (1) Connect to heater core side of cut coolant hose on vehicle.
– (2) Connect to coolant outlet on Webasto heater.
– (3) Connect one end to Webasto Heater inlet and the other end to the vacuum controlled water valve side of cut vehicle hose.

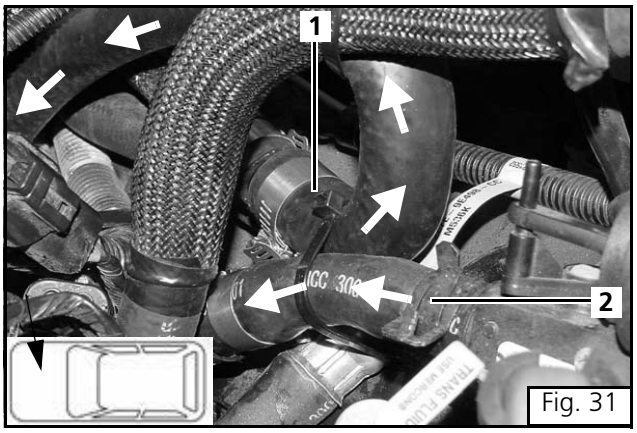


Fig. 31

– (1) Run coolant hose towards outside of frame rail and between passenger front inner wheel well housing down to heater unit.
– (2) Route coolant output hose along side the previously routed hose down to heater unit.

ATTENTION
After coolant hoses have been connected and routed to heater assembly, reinstall vehicle battery tray, battery and engine cover by following the manufacturer's recommended service procedures. Do NOT hookup the battery cables at this time.

ATTENTION
Wrap coolant hoses with protective loom where needed and secure to available components with nylon ties.

NOTE:
Also see the plumbing schematic in the back of this manual for a general outline of the coolant circuit arrangement.

Concluding Work

– Install all vehicle parts, panels and components removed during heater installation.
– 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.

Power Connection

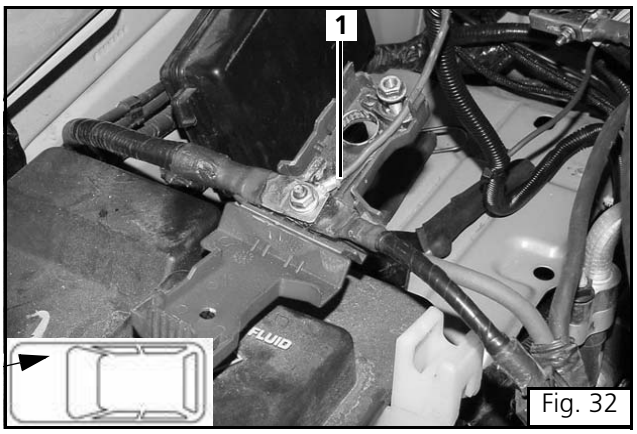


Fig. 32

ATTENTION
Connect red power lead to the positive terminal. Unsnap protective cable cover to mount.

– (1) Vehicle Power Stud

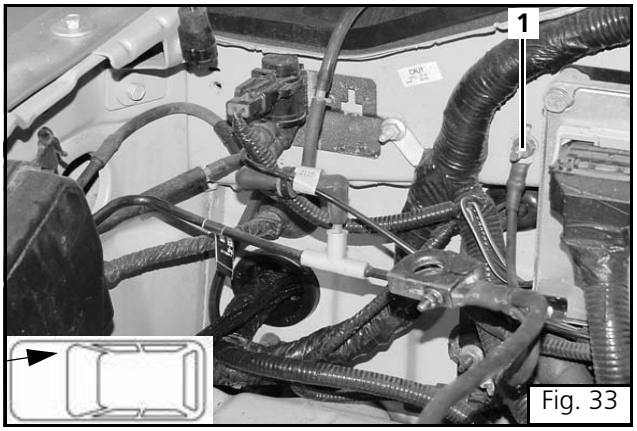


Fig. 33

ATTENTION
Mount heater ground wire to existing ground stud on bulkhead just left of the PCM as shown. Use provided M6 nut to secure. Re-connect battery ground cable.

– (1) Existing Ground Stud located on Vehicle Bulkhead

Final Inspection and Initial Start-up

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.
2. Set interior heater control to maximum heat position (hot) 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.

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.

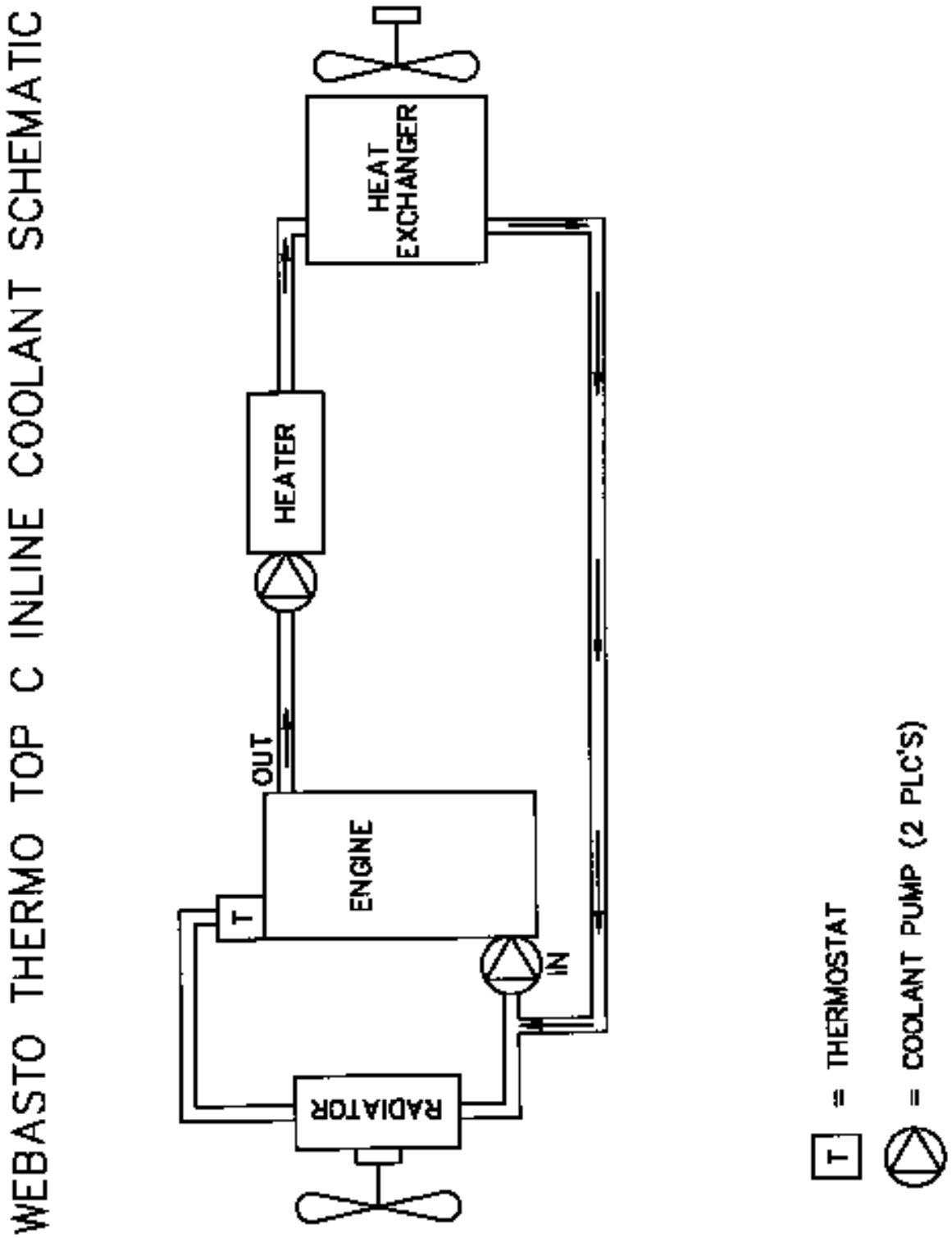
Reset Heater "Lockout" mode by performing the following procedure:

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.

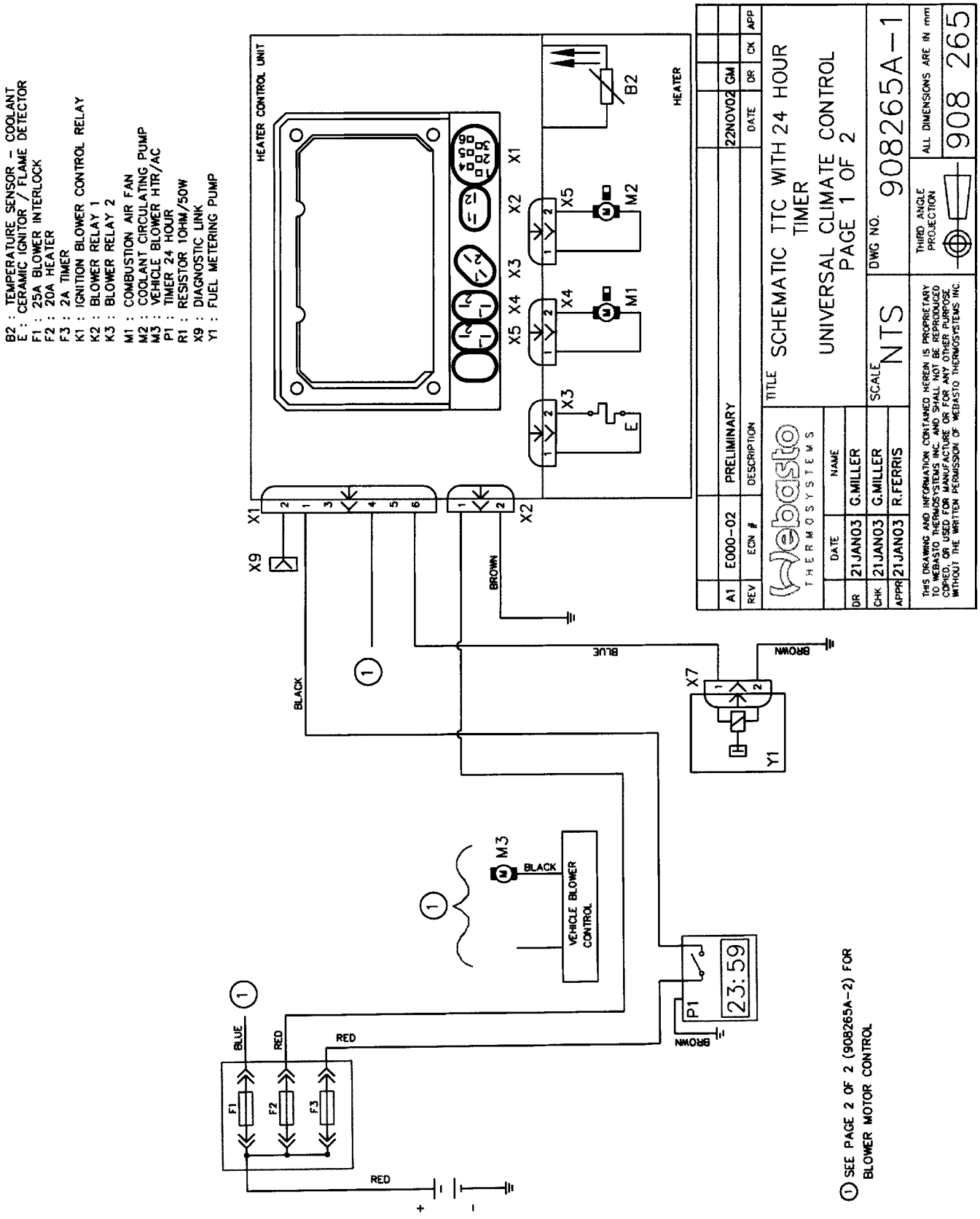
ATTENTION

– Coolant temperature must be below the lower threshold before heater will attempt to start.
– 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, call your Webasto technical representative at:
1-800-555-4518

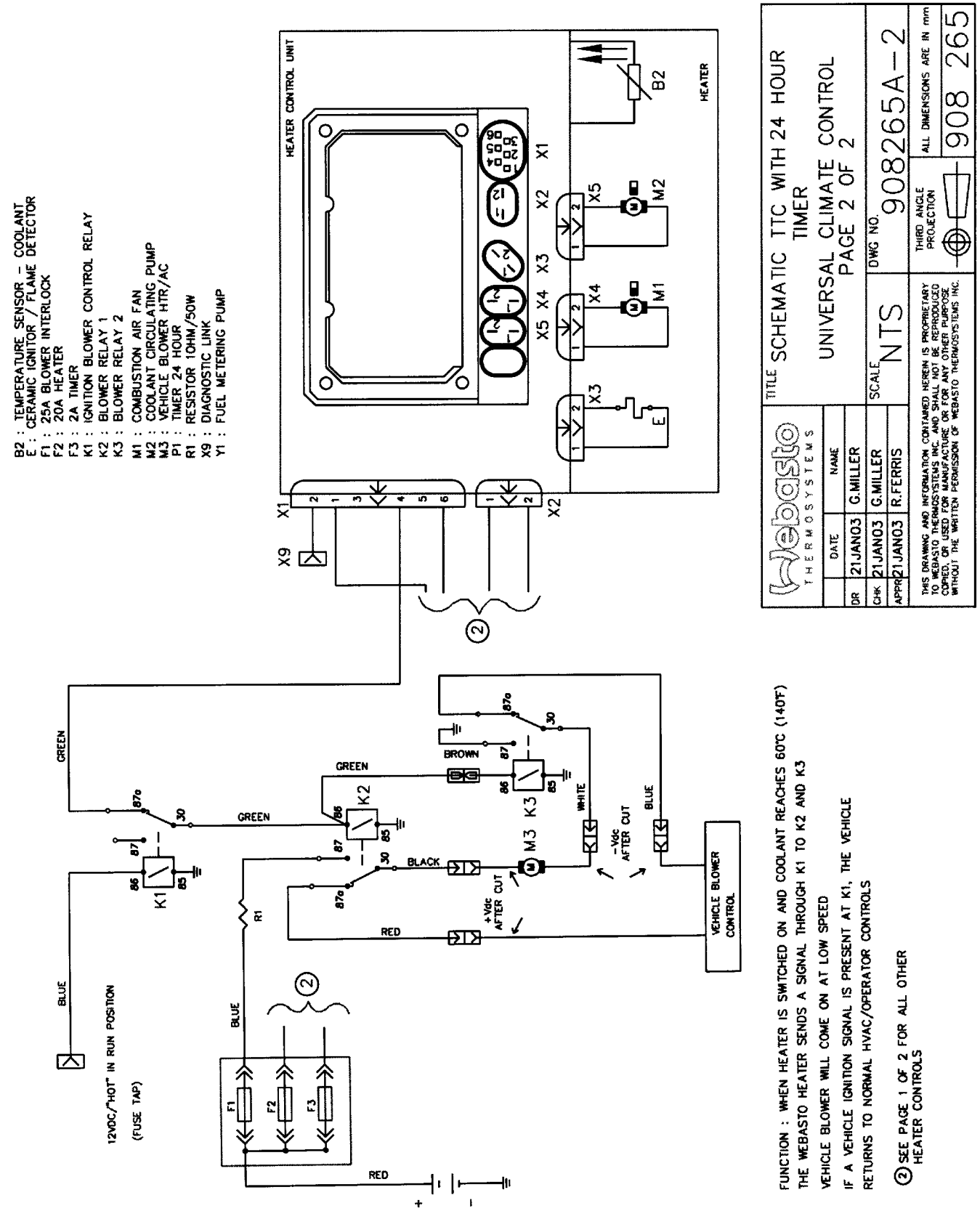
Heater Plumbing Schematic - Inline Method



Wiring Schematic Part 1 - Heater Control



Wiring Schematic Part 2 - Blower Control



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