Webasto
Feel the drive

Blue*Heat* *Coolant Heater*

Hummer H2

2003-2005 6.0 Liter Gasoline

Installation Instructions

DOC. P/N 5000622A
KIT P/N 5000435A

Table of Contents

1. Foreword

1.1 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 Series coolant heater.

Webasto Product North America, Inc. does not recommend the installation and servicing of Webasto products by untrained, unauthorized personnel or end-users.

Installations and servicing of Webasto products by untrained, unauthorized personnel and end-users will release Webasto Product North America, Inc. and Webasto authorized distributors, dealers and their personnel from responsibility for damage to Webasto product, 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 product. The same applies for repairs without using genuine Webasto service parts. This will void the coolant heaters "Official Marks of Conformity."

1.2 Meaning of Warning, Caution, and Attention Headings

Warning, Caution and Attention headings in this manual have the following meaning:

⚠WARNING
This heading is used to highlight that non-compliance with instructions or procedures may cause injuries or lethal accidents to personnel.

⚠CAUTION
This heading is used to highlight that non-compliance with instructions or procedures may cause damage to equipment.

ATTENTION!
This heading is used to highlight and draw specific attention to information.

1.3 Installation Documentation

These non-binding installation instructions apply to the Hummer H2 6.0 liter gasoline version, model year 2003-2005 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" Thermo Top Z/C/E 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!

1.4 General Safety Regulations and Information

The general safety regulations for the prevention of accidents and relevant operating safety instructions must be observed at all times.

The specific safety regulations applicable to this manual are highlighted in the individual chapters by Warnings, Cautions and Attention notations (see section 1.2).

1.4.1 General Safety Notes

The heater must not be installed in the passenger compartments of the vehicle. Should the heater be installed in such a compartment, the installation box must be sealed tight against the vehicle interior. There must be sufficient ventilation of the installation box from the exterior in order not to exceed a maximum temperature of 60 °C (140 °F) in the installation box. Excessive temperatures may cause malfunctions.

⚠WARNING
Due to the danger of poisoning and suffocation, the heater must not be operated in enclosed areas, such as garages or workshops, without an exhaust venting system, not even if the start-up is activated by the timer or remote start device.

At filling stations and fuel depots the heater must be switched off as there is a potential danger of explosions.

Where flammable fumes or dust may build up (e.g. in the vicinity of fuel, coal, wood, cereal grain deposits or similar situations) the heater must be switched off to prevent explosions.

In the vicinity of the coolant heater, a temperature of 85 °C (185 °F) must not be exceeded under any circumstances (e.g. during body paint work). A violation of this temperature limit may cause permanent damage to the electronics.

When checking the coolant level, proceed in accordance with the vehicle manufacturer's instructions.

The coolant in the heating circuit of the heater must contain a minimum of 10% of a quality brand glycol based anti-freeze.

Extracting combustion air from the vehicle interior is not permissible under any circumstance.

The exhaust pipe outlet is to be positioned below the vehicle floor, to the nearest possible location of the vehicle's left or right side.

Exhaust pipes must be routed so that exhaust fumes will not penetrate into the vehicle's interior. Condensation accumulation in the exhaust pipe must be directly drained. A condensation drain hole may be provided as required.

Do not route exhaust pipes and components within 100mm (4 inches) of flammable materials such as polyurethane or similar foam insulation, styrene sheet insulation, fuel tanks and containers, glycol reservoirs, coolant lines, wood and paper products, carpet, tires, electrical wiring, brake and air lines or any materials deemed to be flammable or heat sensitive.

Do not terminate exhaust above flammable materials such as polyurethane or similar foam, insulation, styrene sheet insulation, fuel tanks and containers, glycol reservoirs, coolant lines, wood and paper products, carpet, tires, electrical wiring, brake and air lines or any materials deemed to be flammable or heat sensitive.

Electrical lines, switch gear, and control gear of the heater must be located in the vehicle so that their proper function cannot be impaired under normal operating conditions.

The function of any parts vital for vehicle operation must not be impaired.

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 operating voltage range designated by type.

The coolant heater may only be operated with the specified fuel as recommended by the vehicle manufacturer.

For the routing of fuel lines, the following important regulations must be adhered to:

- Fuel lines are to be installed in such a way that they remain unaffected by torsional stresses created by vehicle and engine movement. They must be protected against mechanical damage. Fuel lines must be securely fastened to the vehicle every 12 inches (30 cm.) or less along the total length from heater to fuel tank. Fuel-carrying parts are to be protected against excessive heat and are to be installed so that any dripping 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 either be equipped with a vent cap or be ventilated in another way (ventilation line).
- The operational state of the heater, i.e. an indication "on" or "off", must be clearly visible to the operator.

1.5 Heater Installation Site

The Webasto auxiliary coolant heater is to be installed on the right side frame rail as shown in the illustrations below. All other major components are located as shown in illustration 1.

Illustration not available at time of printing

Illustration 1

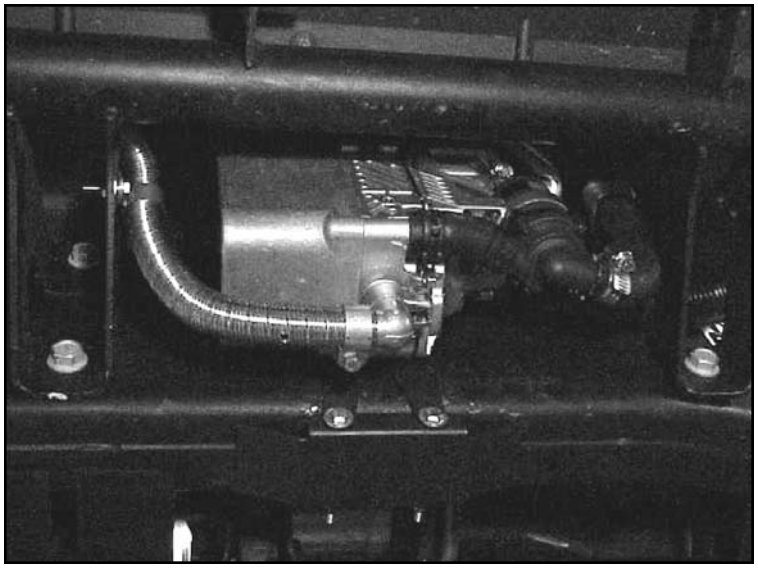


Illustration 2

2. Installation

2.1 General Information

The installation instructions provided will take you step by step through the installation process. Follow all directions carefully and read all Warnings, Cautions and Notations as you work through these instructions and the installation of the BlueHeat coolant heater.

⚠CAUTION

Do not deviate from the installation instructions provided in this manual. 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.

2.1.1 Tools Required

1/4" Drive Ratchet
1/4" Drive 4 inch extension
10 mm six point socket, 1/4" drive
10 mm six point deep well socket, 1/4" drive

3/8" Drive Ratchet
3/8" Drive 12 inch extension
13 mm socket, 3/8" drive
15 mm socket, 3/8" drive
17 mm socket, 3/8" drive

10 mm combination wrench

8 mm nut driver

Phillips #2 screwdriver

Combination side-cut/crimping pliers

Hose clamping pliers
Hose cutting pliers

Drill
2.5 mm (3/32 in.) drill bit
8.5 mm (21/64 in.) drill bit
10 mm (25/64 in.) drill bit

Hacksaw
Utility Knife
Mechanic's wire - 2 feet
Hoisting equipment and safety stands
Vehicle manufacturer's service reference manual

2.2 Preparations

Heater Kit

1. Verify and identify all contents of kit.

Vehicle

1. Verify fuel content in tank.

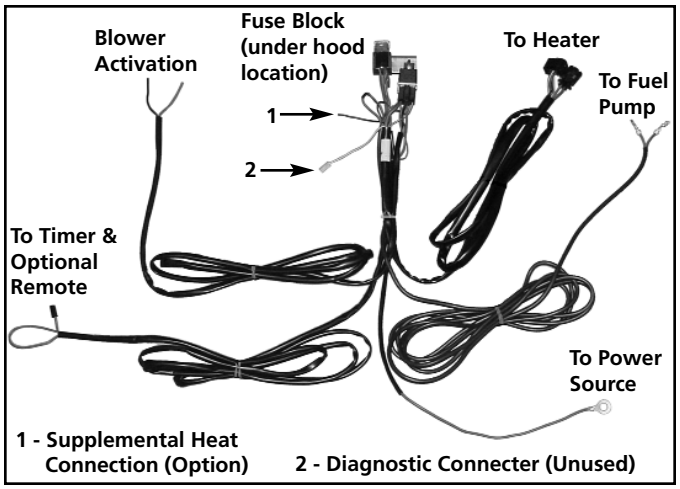
⚠CAUTION

For safety reasons due to weight of fuel and tank, it is recommended there be no more than 1/2 tank or less of fuel present. If fuel quantity is greater than 1/2 of capacity, make provisions to reduce quantity of fuel.

2. Disconnect negative terminal of vehicle battery(s).
3. Protect vehicle fenders with fender covers and protect seating surfaces against soiling.

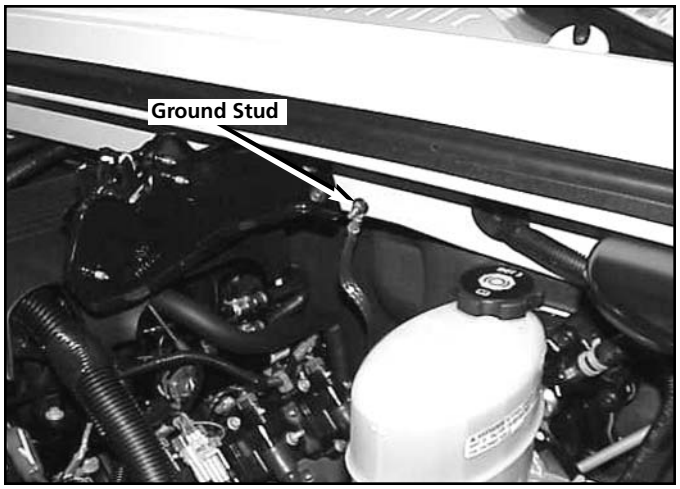
2.3 Electrical Harness and Connections

– Layout harness and familiarize yourself with harness connection points as shown in illustration 2-1.



2-1: Harness Configuration

– The fuse block and relay assembly is to be mounted to the ground stud where shown in illustration 2-2.



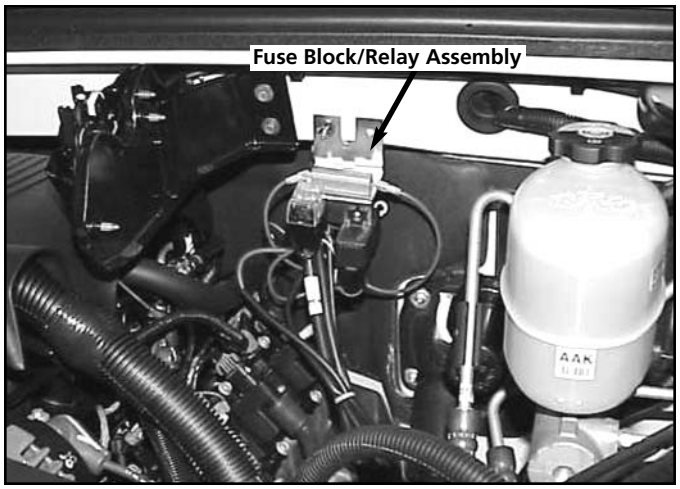
2-2: Vehicle Engine/Body Ground Stud

– Place the ground gang-plate onto the ground stud. (Ensure that the original vehicle ground strap is in place)

– Place the fuse block/relay bracket onto the ground stud as shown in illustration 2-3. Secure in place with original stud-nut.

– Route the fuel pump harness and the heater control harness from fuse block assembly, across the bulkhead to the right side and drop harnesses down through opening in wheel-well splash guard.

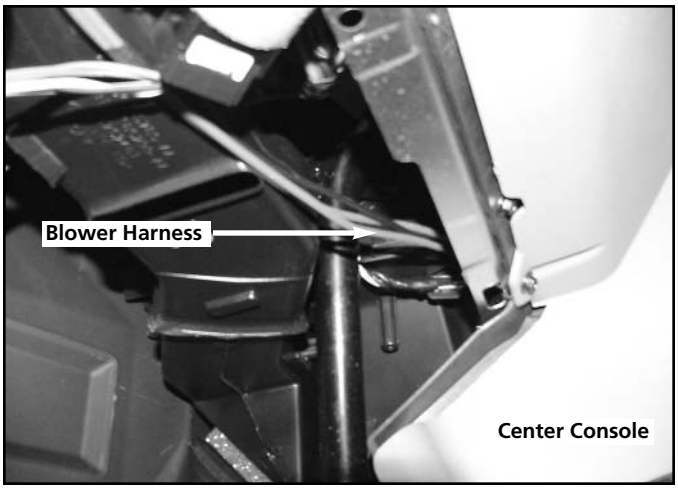
– Route the timer harness and blower control harness to the left side of the bulkhead and push them through the main electrical harness grommet.



2-3: Fuse Block/Relay Mounting

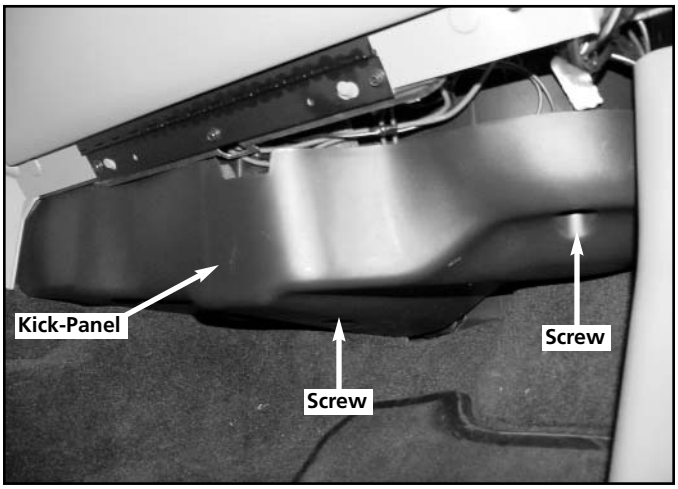
– From inside the drivers footwell area, locate the blower control harness.

– Route the blower control harness across the underside of the instrument panel over to the passenger side.



2-4: Blower Control Harness Routing

– Remove the two screws securing the passenger kick-panel in place and remove kick-panel.

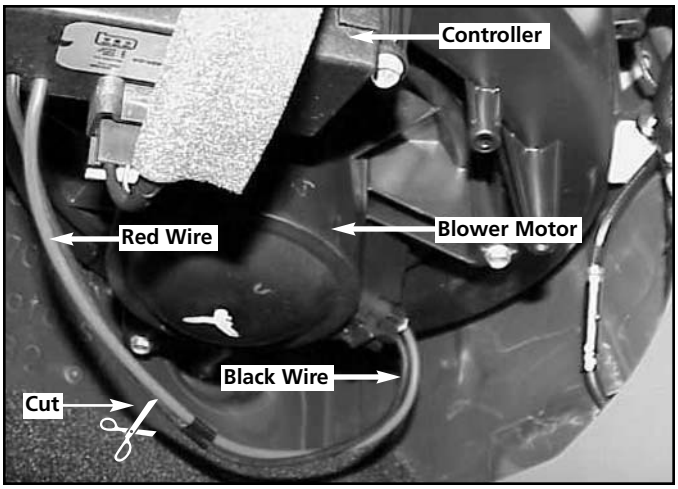


2-5: Passenger Kick-Panel - Access to Blower Motor

2.4 Integrating Webasto Heater Blower Control with Vehicle Blower System

– Cut the black wire leading to the blower motor at a mid point. Refer to illustration 2-6.

– Strip wire ends.



2-6: Main Bulkhead Grommet Access - Inside View

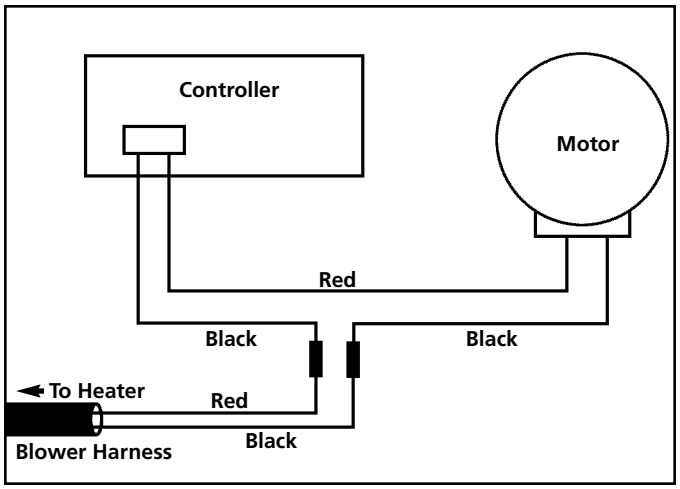
ATTENTION!
Ensure that connections are done correctly. Wiring connections must be properly oriented.

– Crimp the red wire of the Webasto harness to the portion of the black wire leading to the controller.

– Crimp the black wire of the Webasto harness to the portion of the black wire leading to the blower motor.

– With nylon wire ties, tie the blower harness to existing wiring, etc. underneath the instrument panel. Ensure harness does not interfere with moving parts, the driver or the passenger.

– Install the passenger side kick-panel.



2-7: Blower Control Harness Connections

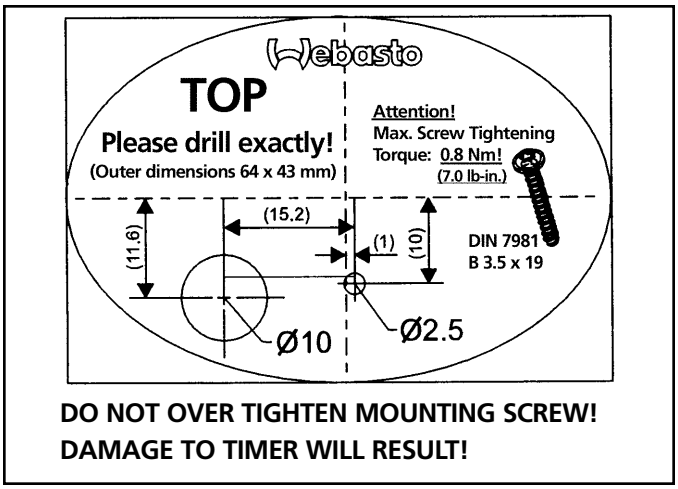
2.5 Timer Installation (General Instructions)

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

ATTENTION!
Before drilling into any panels, ensure there are no hidden components behind the panel that may be damaged or interfere with the timer installation!

– After selecting a site for the timer, temporarily apply the timer mounting template. Refer to illustration 2-8 for a translated sample of the template.

– As specified on template, drill the 10 mm (25/64in.) and the 2.5 mm (3/32 in.) holes.



2-8: Timer Mounting Template (NOT TO SCALE!)

– Remove drilling template.

– Route the timer harness through the 10 mm (25/64 in.) hole.

– Apply foam cushion to back of timer.

– 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 until the timer with foam cushion is firmly seated against panel. Tighten screw no more than 0.8 Nm (7.0 lb-in.). DO NOT OVER TIGHTEN!

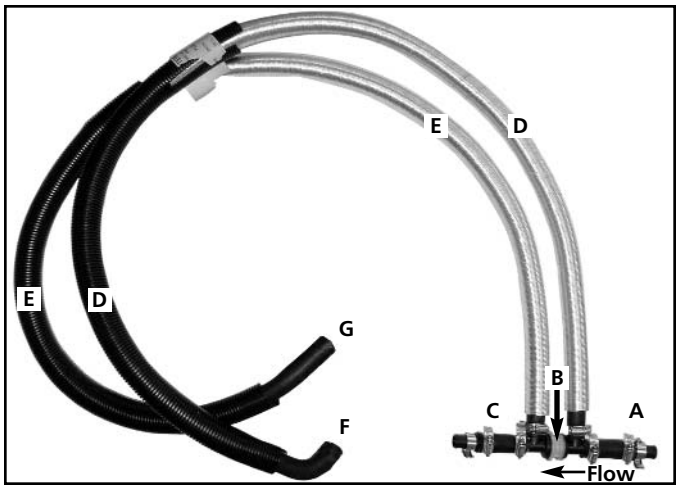
– Refer to illustration 2-9 for a completed timer installation example.

2-9: Timer Placement (EXAMPLE ONLY!)

2.6 Integration into the Coolant System

Take a moment to identify the components of the coolant hose assembly and verify that all connections, especially at the 4-way check valve, are correct from the factory. Refer to illustration 2-12.

A. Inlet (From Engine)
B. 4-way Check Valve - Note direction of arrow stamped on valve. Flow should be as indicated in illustration
C. Outlet (To Vehicle Heater Core Inlet)
D. Supply To Webasto Heater Coolant Pump - Note 90° bend on hose at coolant pump inlet (F)
E. Return Hose From Webasto Heater Outlet (G)
F. To Coolant Pump Inlet
G. From Webasto Heater Outlet

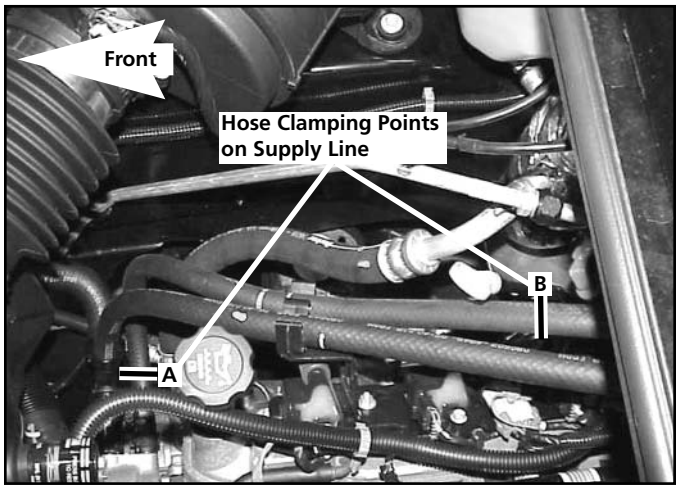


2-12: Inlet & Outlet Hose Connections - Overview

NOTE: For a general understanding of the coolant circuit, turn to section 4 of this manual and observe 4.2, Plumbing Schematic.

– Using hose clamping pliers, clamp the vehicle heater supply hose near the engine coolant pump. Refer to illustration 2-13, point "A."

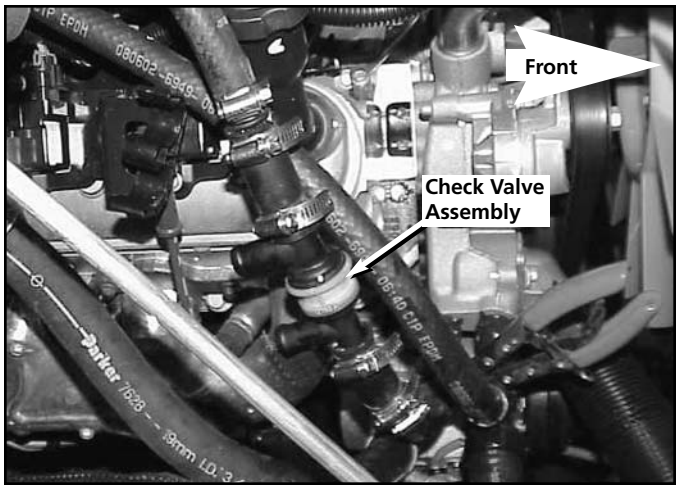
– Using hose clamping pliers, clamp the vehicle heater supply hose near the vehicle heater core inlet. Refer to illustration 2-13, point "B."



2-13: Hose Clamping on Vehicle Heater Supply Hose

– Route Webasto hose assemble into place by dropping the two hoses leading to the Webasto heater, down through the right fender wheel-well splash guard.

– Cut the coolant supply line near the engine coolant pump and connect the 4-way check valve section as shown in illustrations 2-14 and 2-15.

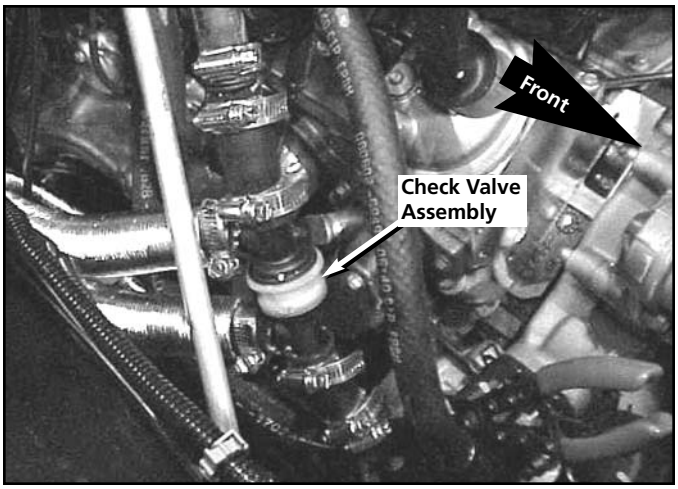


2-14: 4-way Check Valve Installation - 01

NOTE: You may have to shorten the hose leading to the heater core to allow for the additional length of the 4-way check valve section.

– Secure all connections with hose clamps. Torque all clamps to 15 in-lb.

NOTE: DO NOT remove hose clamping pliers at this time.



2-15: 4-way Check Valve Installation - 02

2.7 Integration into the Fuel System

⚠WARNING
Full to partially filled fuel tanks are heavy and awkward to handle. In the event the fuel tank must be removed to gain access to the sender unit, ensure tank is near empty. To prevent accidents and potential injury to personnel, make sure tank is well supported prior to removing mounting hardware.

– Verify the fuel content of the fuel tank. If the fuel content is greater than 1/2 full, make provisions to reduce the fuel content below 1/2 full.

– Raise vehicle and set on safety stands.

– Remove the fuel tank skid plate. The skid plate is held in place by one 13 mm bolt, two 13 mm nuts and one 10 mm nut located on the top side of the skid plate at the right front corner.

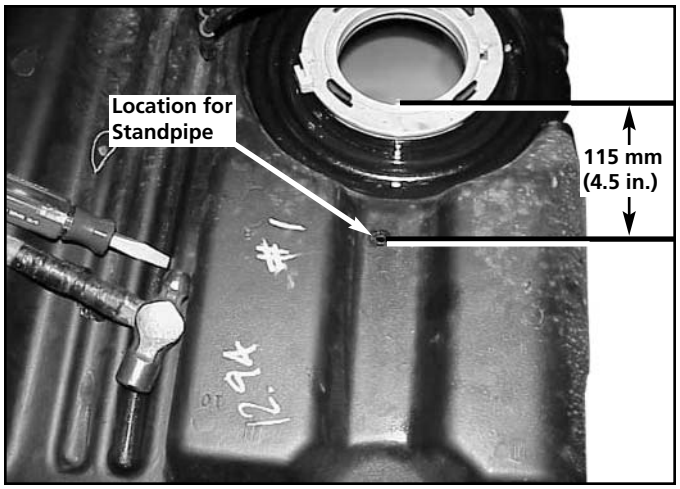
– Remove the fuel tank according to the vehicle manufacturers service procedures. Ensure the fuel tank is supported on a jack or jack stands during removal.

– Remove the fuel sender assembly according to the vehicle manufacturers service procedures.

– Measure and mark on the fuel tank the location for the additional fuel standpipe as shown in illustration 2-16 at 115 mm (4.5 in.) from the fuel sender unit opening.

⚠WARNING
Fire and explosion risk! Remove all sources of ignition from the area of the fuel tank. Do not use electrical drills for drilling into the fuel tank. Use a pneumatic drill!

– Drill an 8.5 mm (21/64 in.) hole through the fuel tank at the location marked in the previous step. Remove any burrs from the hole after drilling.



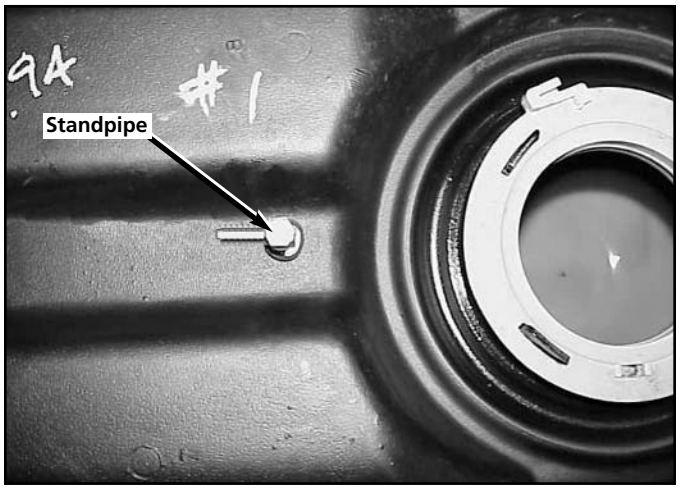
2-16: Fuel Standpipe Location - 01

– Mark the standpipe tube to a length approximately 25 mm (1 in.) shorter than the depth of the fuel tank and cut off excess at a 45° angle.
The end of the fuel standpipe tube should terminate 25 mm (1 in.) from the bottom of the fuel tank.

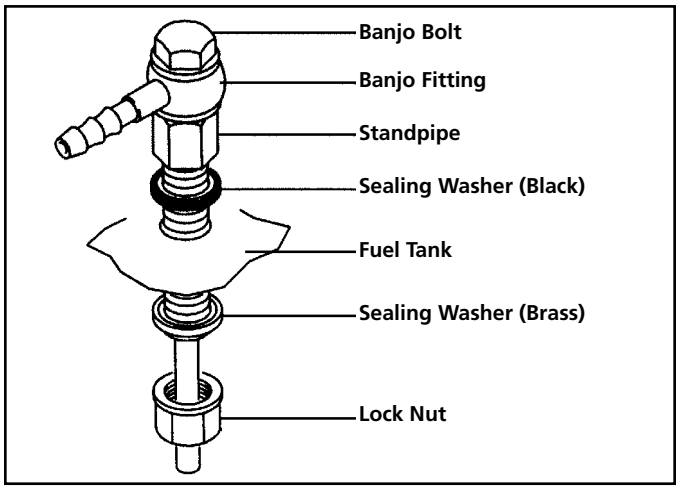
– Insert standpipe through the hole drilled in fuel tank as shown in illustration 2-17. Refer to illustration 2-18 for component sequence of the standpipe.

ATTENTION!
Ensure standpipe does not interfere with the fuel sender float assembly. Bend the standpipe tube to clear if necessary.

– Position the fuel standpipe banjo fitting outlet as shown in illustration 2-17. Secure in place with the lock-nut. Tighten lock-nut to 9.0 Nm. DO NOT OVER TIGHTEN!



2-17: Fuel Standpipe Installed in Fuel Tank

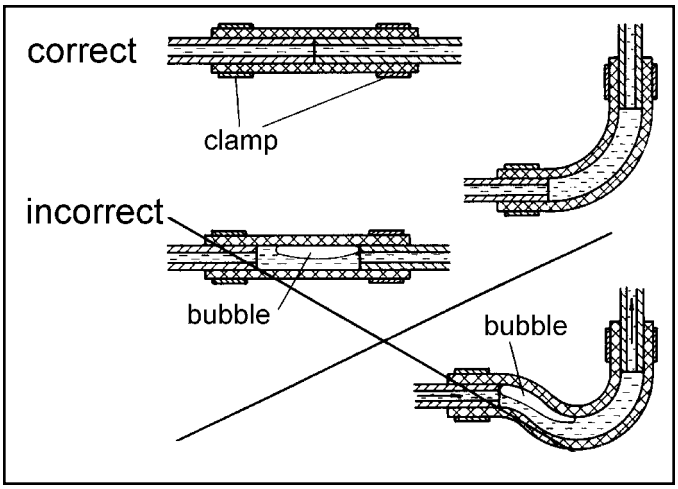


2-18: Fuel Standpipe Component Sequence

Working With Mecanyl Fuel Line

ATTENTION!
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!
Observe illustration 2-19 for correct fuel line connecting.



2-19: Correct Vs. Incorrect Fuel Line Connections

– Assemble one rubber fuel line connector with two hose clamps and push onto banjo fitting outlet. Tighten inboard clamp. Refer to illustration 2-20.

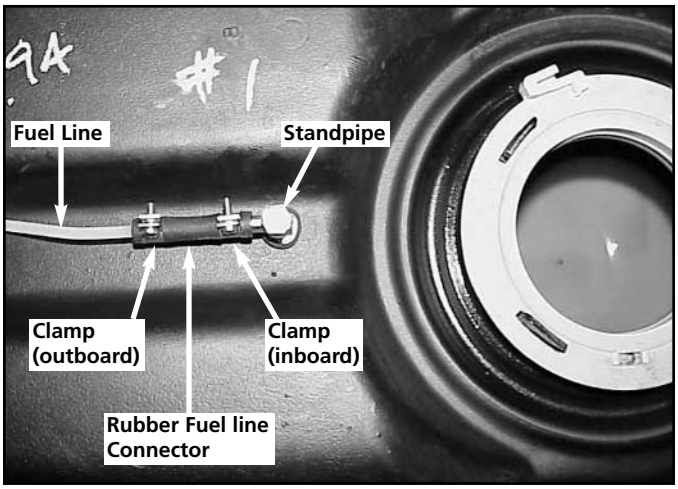
– Fully insert supplied Mecanyl fuel line into connector and tighten outboard clamp. Refer to illustration 2-20.

– Place protective split-loom over fuel line.

– Install fuel sender unit according to the vehicle manufacturers service procedures.

– Install the fuel tank assembly according to the vehicle manufacturers service procedures.

– Install the fuel tank skid plate.

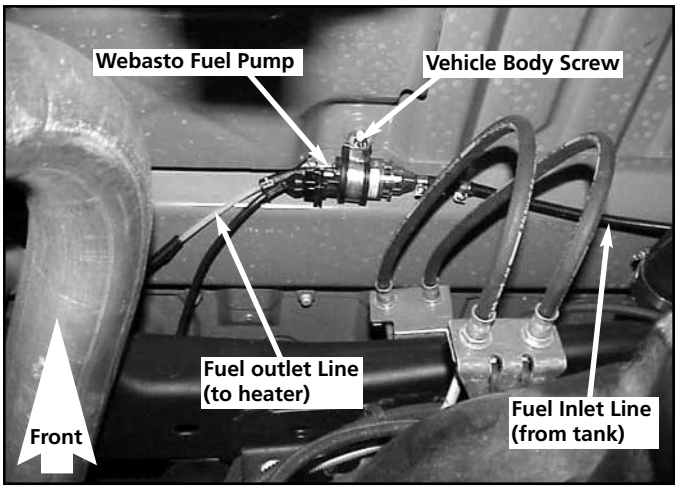


2-20: Fuel Line Connection

– Pre-assemble two rubber fuel line connectors with two hose clamps each. Push the rubber fuel line connectors onto the fuel pump inlet and outlet and tighten inboard hose clamps on both connectors leaving outboard clamps loose.

– Fit the rubber insulated P-clamp around the fuel pump Secure the pump to the vehicle using the existing body screw as shown in illustration 2-21 with the electrical connector socket (pump outlet) pointed towards the passenger side of the vehicle.

ATTENTION!
Fuel pump must be mounted horizontally in order to operate properly and ensure correct fuel metering to the heater.



2-21: Fuel Pump Mounting Position

– Route the Mecanyl fuel line (with protective split-loom) to the fuel pump inlet. Secure the fuel line to existing vehicle components where possible with nylon wire ties.

– With a razor knife or razor, cut the fuel line to length and fully insert into the fuel pump inlet connector. Tighten the outboard hose clamp.

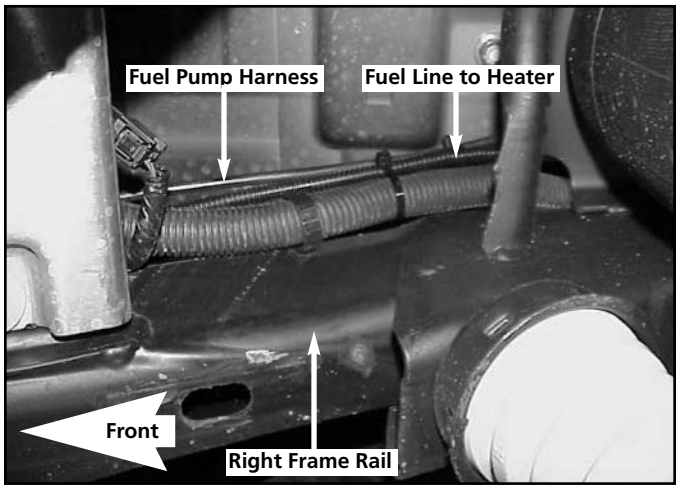
– Insert remaining piece of fuel line (with protective split-loom) that will connect to the heater into the fuel pump outlet connector fully. Tighten the outboard hose clamp. Refer to illustration 2-21.

– Route the fuel pump harness along the right frame rail to the fuel pump location.

– Insert the fuel pump electrical harness connector into the fuel pump electrical receptacle.

– Route fuel line towards the front of vehicle along the right frame rail following the vehicle fuel lines and fuel pump harness up to the heater installation site. Refer to illustration 2-22.

– Secure fuel line and fuel pump harness to vehicle harnesses, etc. with nylon wire ties. Refer to illustration 2-22.

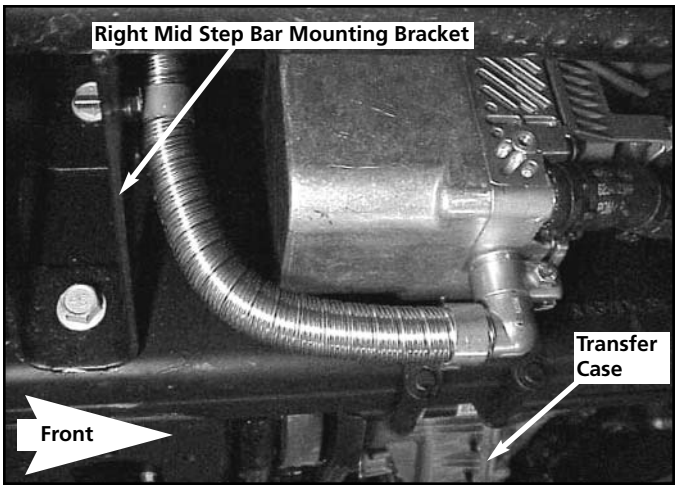


2-22: Fuel Line and Fuel Pump Harness Routing

2.8 Heater Installation

The Webasto auxiliary coolant heater is to be installed on the right hand frame rail slightly ahead of the mid step bar mounting bracket as shown in illustration 2-23.
Before the heater can be installed in the vehicle, it will be necessary to prepare the heater for installation.

NOTE: Two different styles of hose clamps are supplied in the installation kit. The wide band clamps are used on all coolant connections and the narrow band clamp will be used to attach the combustion air intake tube. Do not use the narrow band clamp to connect the coolant lines!



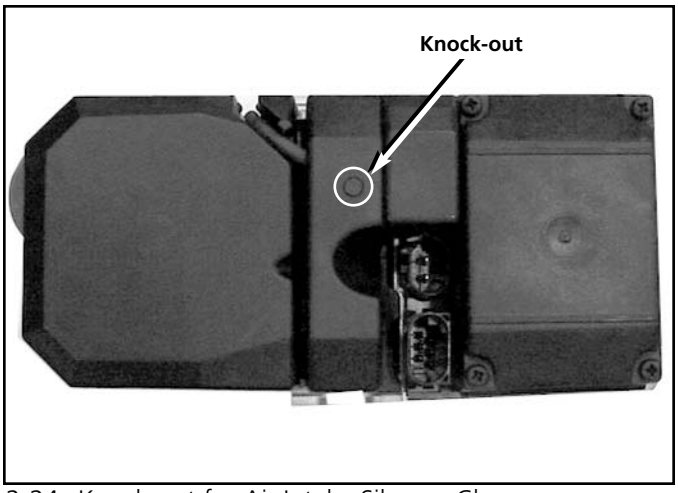
2-23: Heater Installation Site (shown with heater Installed)

Combustion Air Intake Tube and Silencer

Before attaching the heater mounting bracket, the combustion air intake tube and silencer must first be mounted and secured.

ATTENTION!
The combustion air inlet port and coolant outlet port look similar to one another. To tell them apart, the coolant outlet has a hose barb on the end while the combustion air inlet port is smooth with no barb.

– Remove the knock-out on the heater cover in order to mount the air intake silencer as shown in illustration 2-24.

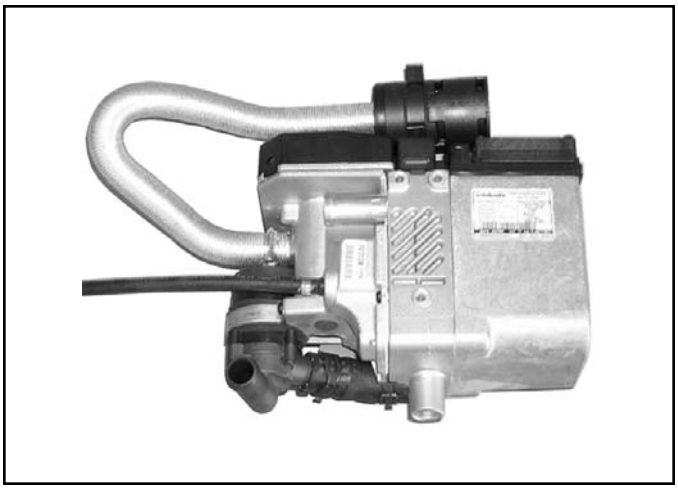


2-24: Knock-out for Air Intake Silencer Clamp

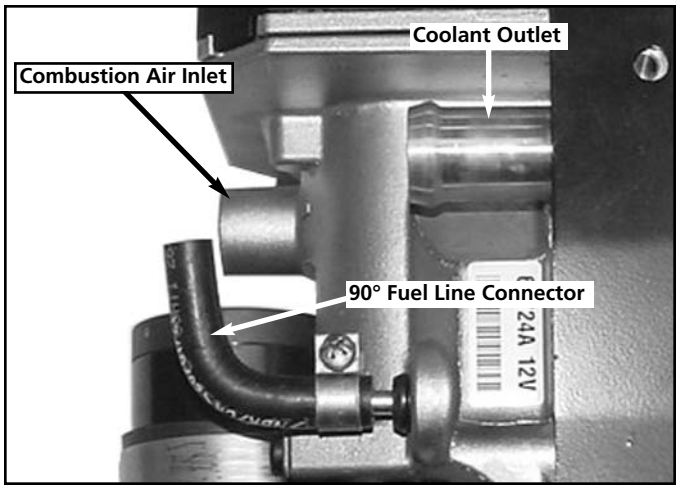
– Attach the slotted end of the combustion air intake tube to the heater combustion air intake port and secure with the narrow band hose clamp supplied.

– Cut 100 mm (4 in.) off of the combustion air intake tube and screw the intake silencer into the end of the tube.

– Place the air silencer support clamp around the air intake silencer and push the clamp stud into the knock-out hole on the heater cover.


2-25: Air Intake Tube and Silencer Installed

– Take a 90° fuel line connector from the kit. Place one fuel line clamp on one end and push connector onto fuel inlet nipple. Position elbow straight up and fully tighten clamp. Refer to illustration 2-26

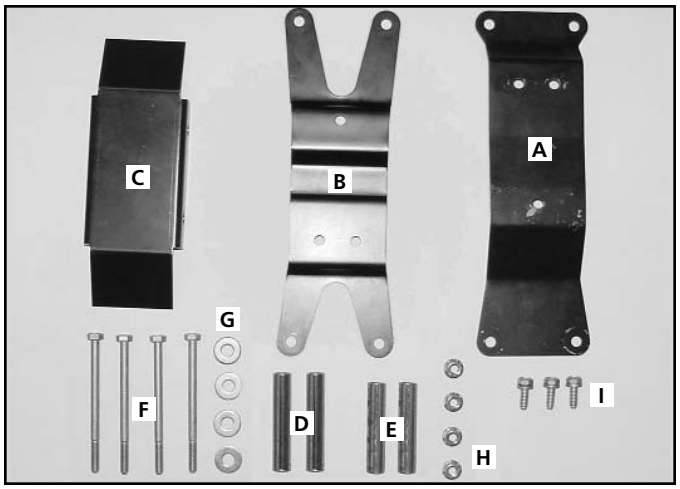


2-26: Heater Assembly - Fuel Line Connector

Mounting Bracket

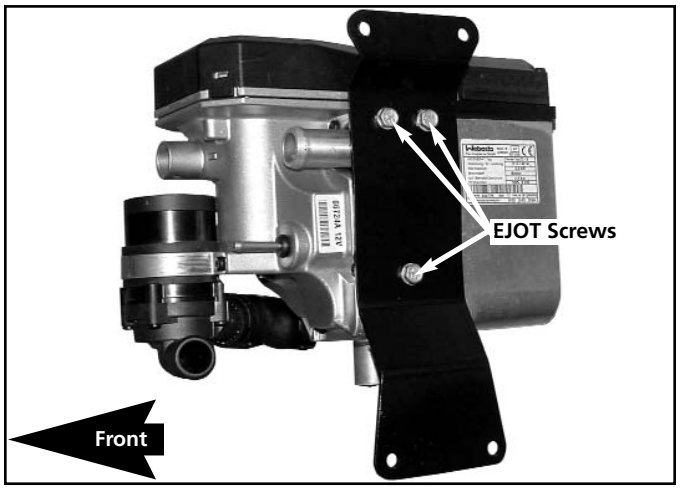
The mounting bracket assembly consists of the following:

A. Heater mounting plate
B. Inner frame plate
c. Under-ride plate
D. Upper Bushings (Long)
E. Lower Bushings (Short)
F. M6 x 90 mm Bolts
G. Washers
H. M6 Nuts
I. EJOT Heater Mounting Screws (Self-threading)



2-27: Mounting Bracket Assembly

– Attach the heater mounting plate to the heater with the three self-tapping EJOT screws provided.
Tighten screws to 10 Nm.



2-28: Mounting Bracket Installation

– Place two flat washers on two mounting bolts. Insert the two mounting bolts through the top holes of the heater mounting bracket. Place the two long bushings on the mounting bolts.

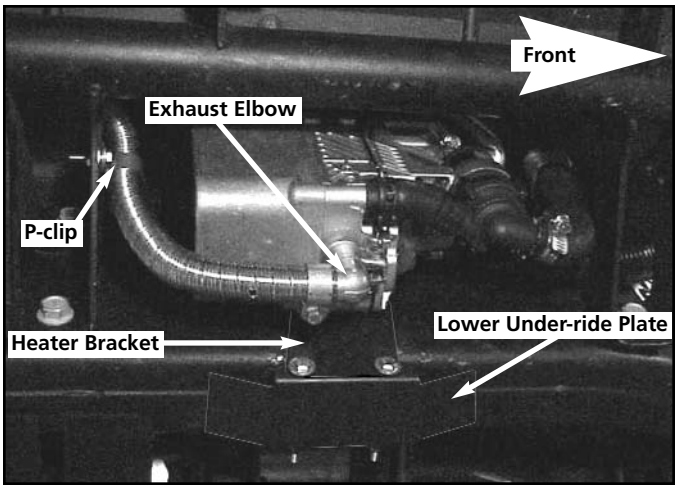
– Place the heater next to the right frame rail with the two mounting bolts over the top of the frame. The heater should be located at the VIN number stamped on the frame inline with the transfer case.

– Place the inner frame plate of the mounting assembly onto the two upper mounting bolts and install two nuts on the bolts to hold the heater in place. Do not tighten nuts. Refer to illustrations 2-29 and 2-30.

2-29: Mounting Bracket Assembly - Frame Rail Not Shown

– Complete the mounting bracket assembly with the lower under-ride plate, two short bushings, two bolts with washers and two nuts as shown in illustration 2-30.

– Tighten all four mounting bolts and nuts to secure the heater in place. Refer to illustration 2-30.



2-30: Heater Installed

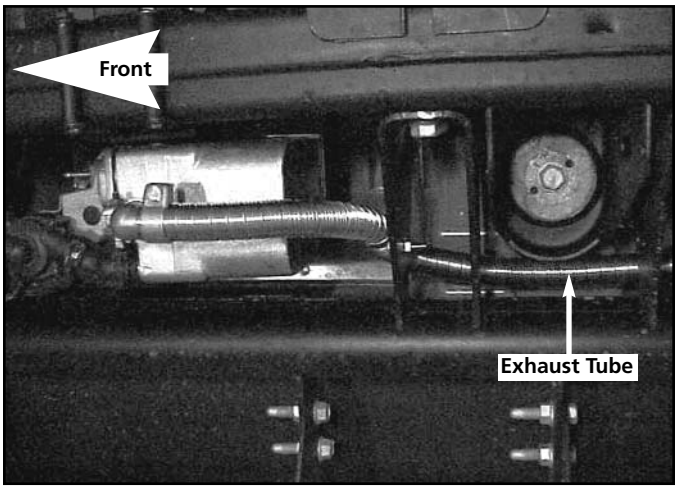
Exhaust Tube

– Place the exhaust elbow over the exhaust outlet and direct the exhaust elbow to the rear of the vehicle as shown in illustration 2-31. Secure tube with an exhaust clamp provided.

– Place the exhaust tube over the elbow and secure with an exhaust clamp. Refer to illustration 2-31.

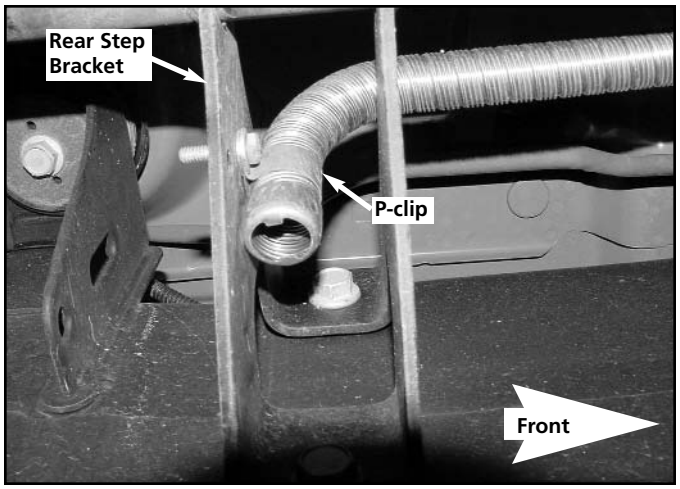
– Route the exhaust tube through the right step brackets as shown in illustration 2-31.

– Secure the exhaust tube to the mid step bracket with a P-clip as shown in illustration 2-30.



2-31: Exhaust Tube Routing

– Secure the exhaust tube to the right rear-most step bracket with a P-clip as shown in illustration 2-32.



2-32: Exhaust Tube Termination

2.9 Final Connections

Fuel Line to Heater Connection

– Bring the fuel line from behind the frame, over the top of the frame to the heater.

– If necessary, cut fuel line to length using a razor knife.

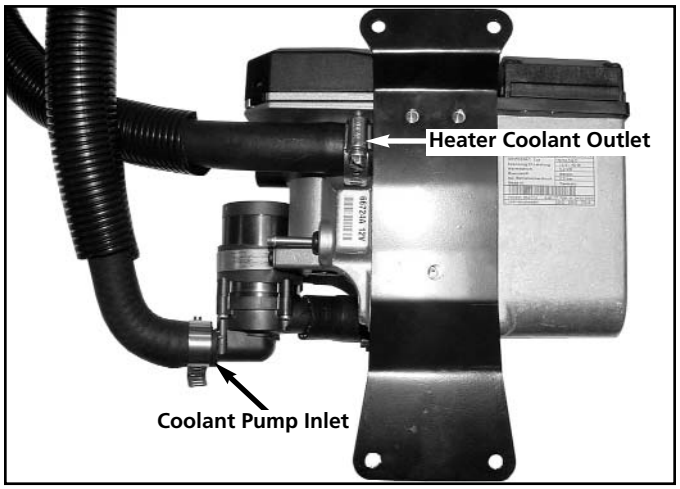
– Push fuel line into the 90° fuel line connector and secure with a hose clamp.

Coolant Hoses to Heater Connections

– Route coolant hoses from engine compartment down along the right frame rail to the heater.

– Connect the hose with the 90° bend to the heater coolant pump inlet. Secure with a wide band hose clamp, torque to 15 in-lb. Refer to illustration 2-33.

– Connect the hose with the straight end to the heater outlet. Secure with a wide band hose clamp, torque to 15 in-lb. Refer to illustration 2-33.



2-33: Coolant Hose Connections

Electrical Connections at Heater

- Route heater control harness down from bulkhead, along right frame rail to heater.
- Plug connectors into heater receptacles.
- Secure wiring harnesses, fuel lines, coolant hoses to available underbody components and lines with nylon wire ties.
- Remove safety stands and lower vehicle.

2.10 Coolant Circuit Priming

- Loosen hose clamp at outlet port of 4-way check valve (connection to hose leading to heater core) and pull off hose.
- Slowly release hose clamping pliers on supply line from engine allowing coolant to flow down supply line to Webasto heater.
- Allow coolant to flow until coolant begins to spill out of check valve outlet.

  Note: It may be necessary to fill coolant overflow reservoir as coolant level drops.
- Pinch off supply line.
- Re-connect coolant outlet hose and tighten clamp. The coolant system should now be primed.
- Remove hose clamping pliers.

  NOTE: Should the heater overheat during the first start-up sequence, it may be necessary to repeat the priming procedure.

2.11 Power Connection

- Route heater power lead to auxiliary power center and connect to positive terminal.
- Connect battery ground cable(s).

2.12 Final Inspection and Initial Start-up

2.12.1 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 chaffing and related damage.
- loose fuel line clamps.
- routing of fuel lines and fuel lines securely tied and protected against chaffing and related damage.
- loose wiring connections and battery connections.
- routing of wiring harness and wiring harness securely tied and protected against chaffing and related damage.
- check operation of vehicle heater fan with Webasto heater OFF.

2.12.2 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. If heater should go into the control unit lock-out mode, which is possible after three start attempts, refer to section 3 "Troubleshooting" and follow directions in sub-section 3.2 "Heater Lockout Reset Procedure." No further start attempts are possible until the control unit lockout condition is cleared.

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!
Coolant temperature must be below 30 °C (86 °F) before heater will attempt to start.

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.

3. Basic Troubleshooting

⚠CAUTION
Troubleshooting requires comprehensive knowledge about structure and theory of operation of the heater components and may only be performed by Webasto trained and certified, professionals.

3.1 General Information

This section describes troubleshooting procedures for the BlueHeat coolant heater within the scope of installation. Troubleshooting is normally limited to the isolation of defective components and provides information on defective wiring and connections.

Should the heater not function after completing the installation and initial start-up instructions, refer to the following troubleshooting instructions and information to isolate and remedy the cause for malfunction.

In the event you are unable to remedy a malfunction after following these troubleshooting instructions or for unanticipated malfunctions beyond what is covered in this troubleshooting section, please contact one of our Webasto Technical Assistance Representatives for further instructions.

In the USA, call (800) 555-4518
In Canada, call (800) 667-8900

Before troubleshooting, check for and eliminate the following probable causes for trouble:

- power supply to heater is less than 10.5 volts at main power connections (charge batteries and perform load test).
- blown fuses.
- corrosion on battery terminals for heater, electrical wiring, connections and fuses.
- loose contacts or connectors, wrong crimping on connectors.
- ensure heater and components have been correctly installed following all pertaining installation instructions.
- shut down initiated by temperature limiter.
- heater control unit locked out. Refer to heater lockout reset procedure described in section 3.2.

ATTENTION!
After correction of a malfunction, a functional test has to be performed with heater installed on the vehicle.

3.2 Heater Lockout Reset Procedure

The BlueHeat is designed with a lockout safety feature built in to 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.

Before troubleshooting the heater, ensure heater is not in the "Lockout" mode by performing the following reset procedure:

1. Ensure timer or switch is in the off position. Turn timer or switch to the on position. Remove main fuse F1 (15 Amp), Reinsert after 5 seconds.
2. Cycle timer or switch off and then back on once more. Remove fuse F1 once again and reinsert after 5 seconds. Heater should attempt to start in 10 seconds after inserting fuse.

ATTENTION!
Coolant must be below 60 °C (140 °F) before heater will attempt to start.

3.3 General Malfunction Symptoms

The following table lists possible malfunction symptoms.

Malfunction Symptom	Probable Cause	Remedy
Coolant heater switches off automatically (Fault lockout)	No combustion after start or automatic repeat start	Switch off heater momentarily and switch on once again
	Flame extinguishes during operation	Switch off heater momentarily and switch on once again
	Heater overheats	Check coolant lines for obstructions, closed valves and kinks. Check coolant level. Allow heater to cool down, reset overheat limiter, switch off heater momentarily and switch on once again
	Vehicle electrical system voltage too low	Charge battery Switch off heater momentarily and switch on once again
Heater expels black fumes from exhaust	Combustion air and/or exhaust ducting blocked	Check combustion and exhaust ducting for obstructions

Table 3-1: General Malfunction Symptoms

3.4 PC Diagnostics Interface Kit

⚠CAUTION

Diagnostics equipment is intended for use by Webasto trained personnel at authorized Webasto Distributor, Dealer and End User service facilities.

A PC Diagnostic Interface kit for the BlueHeat is available that allows for more thorough testing and troubleshooting of the heater and its components beyond the scope of this installation manual. The diagnostic kit makes it possible to read and remove (reset) stored malfunction codes from the BlueHeat memory.

The PC Diagnostic Interface Kit comes complete with connecting hardware, software and instructions for use with any IBM/PC compatible computer. Also available are several interface connectors for use with Webasto heaters equipped with internal diagnostic capabilities such as the BlueHeat.

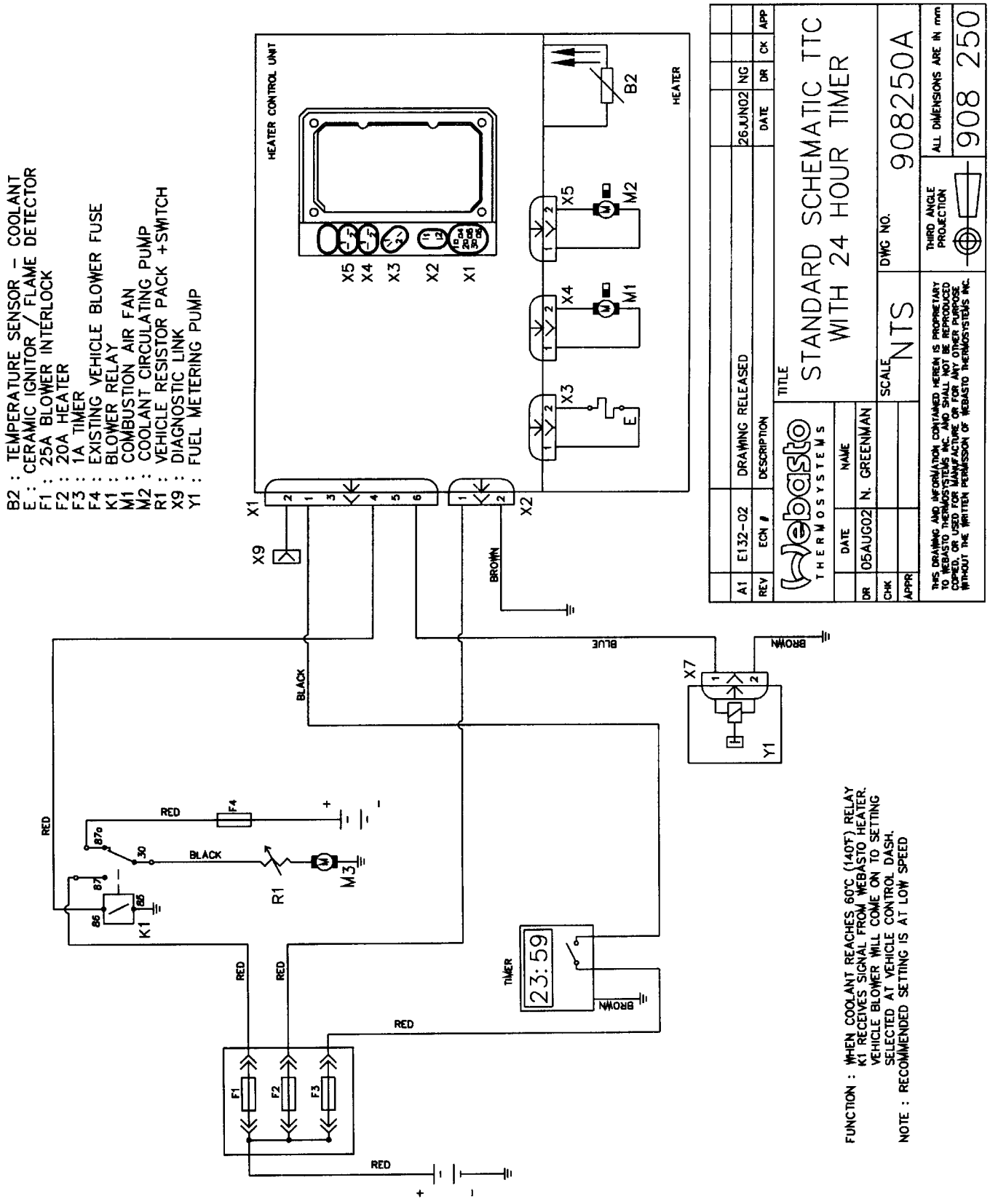
In addition to working with stored malfunction codes, the PC Diagnostics Interface Kit allows you to perform several other functions such as reading values while the heater is in operation or testing individual components. Printing out malfunction codes is also available (User supplied printer required).

For further capabilities and instructions for use with the BlueHeat heater, see the instruction manual supplied with the PC Diagnostics Interface Kit.

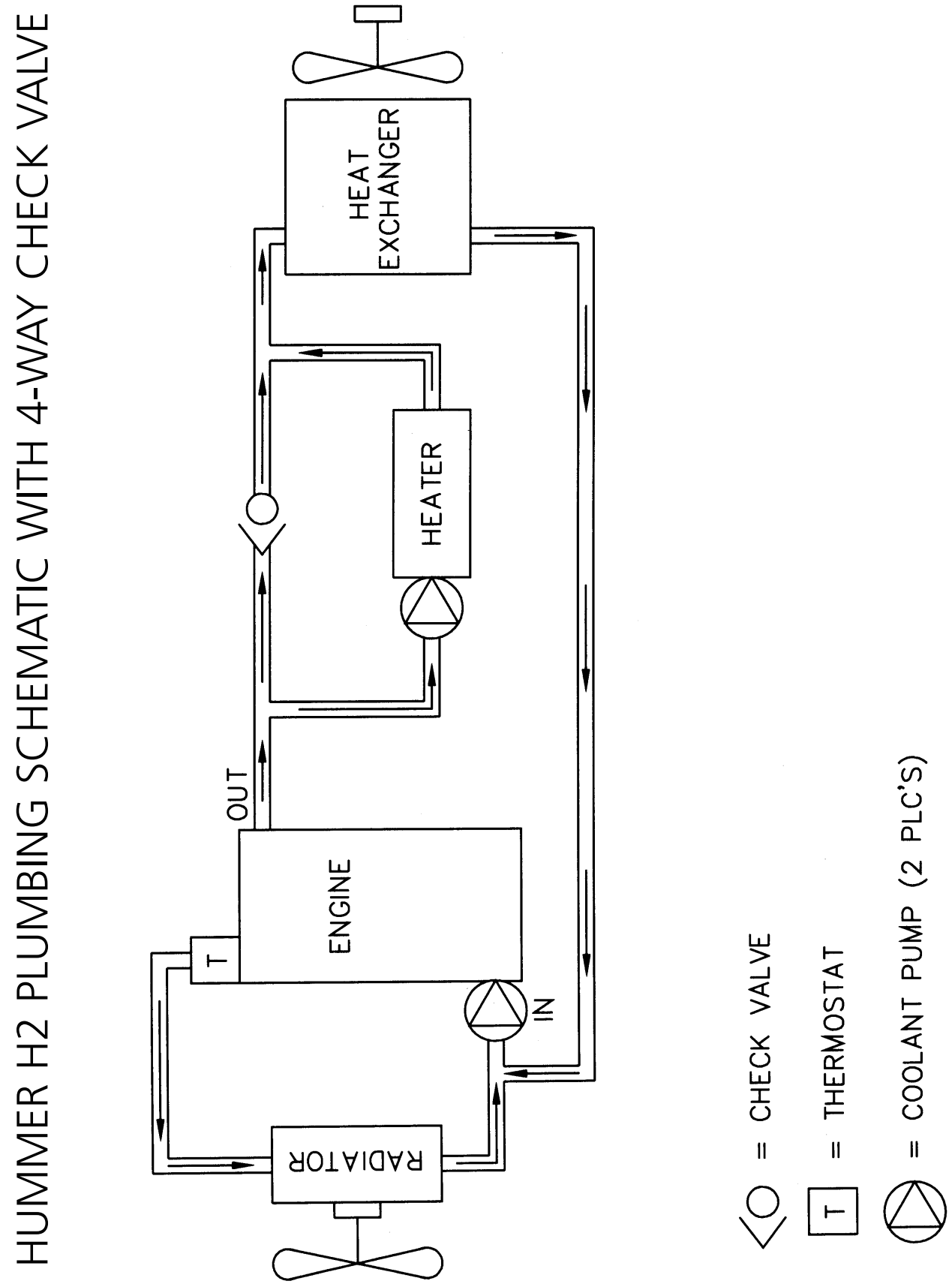
Order PC Diagnostics Interface Kit under part number 92542F. Kit does not include required adapter for the BlueHeat and must be included in your order. Order adapter under part number 92566A.

4. Schematics

4.1 Wiring Schematic



4.2 Plumbing Schematic



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