Webasto
Feel the Drive

Coolant Heater

Thermo Pro 50 Eco
24 Volt Diesel

Installation Manual

- While a Webasto heater is in use, the product surface, connected hoses, ducting and air outlet(s) may become hot to the touch. Contact with skin may cause burns.
- Improper installation or repair of Webasto heating systems can cause fire or the leakage of deadly carbon monoxide leading to serious injury or death.
- NEVER attempt to install or repair a Webasto heating system unless you have successfully completed Webasto factory training and have the technical skills, technical information, tools and equipment required to properly complete the necessary procedures. Only genuine Webasto parts may be used.
- Webasto rejects any liability for problems and damage caused by the system being installed by untrained personnel.
- Webasto products produce temperatures high enough to ignite surrounding combustible materials such as inflammable liquids, gases, vapor, and other combustible matter. The heater must be switched off when loading or unloading inflammable materials to prevent the risk of explosion.
- ALWAYS and carefully follow Webasto installation and repair instructions and heed all WARNINGS.

WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

Contents Page

1. Safety and General Information

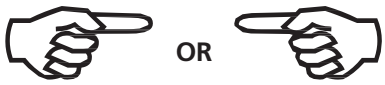
1.1 Warning Symbols in this Installation Manual

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words which are intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures.

Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury or property damage. It may also be used to alert against unsafe practices.



These symbols are used to alert the installer to important or useful information about proper installation of the equipment.

1.2 General Information

Webasto Thermo & Comfort North America, Inc. is pleased to provide this installation manual for the Thermo Pro 50 Eco. When used according to the guidelines stated in this manual, you can expect to provide years of trouble-free, enjoyable operation for your customer.

This manual represents our latest effort to produce the best technical documentation possible. In our efforts towards continuous, ongoing product improvement, we encourage our customers to write to us with their comments or criticisms concerning this manual and the Thermo Pro 50 Eco Heater Installation.

Please write to us at:
Webasto Thermo & Comfort North America, Inc.
ATTN: Technical Documentation Group
15083 North Road
Fenton, MI 48430

You are also invited to fill out our online questionnaire concerning our technical documentation and web site at:

www.techwebasto.com

If you have any immediate questions concerning this manual, the installation procedures within or the product itself, please call us at:

(800) 860-7866 or send a fax to: (810) 593-6001

2. Regulation for Installation in the Vehicle

Read this installation manual in its entirety before installing this equipment.

2.1 Scope

Internal combustion heaters must be installed in accordance with the requirements contained in this Annex.

In the case of vehicles and trailers with heaters for liquid fuel, it is presumed that these vehicles comply with the requirements in this Annex.

2.2 Position of the Heater

2.2.1 Parts of the vehicle body and other components in the immediate vicinity of the heater must be protected against excessive heat and the danger of contamination by fuel or oil.

2.2.2 The internal combustion heater must not pose a fire hazard even when overheated. This requirement is deemed to have been met if care is taken during installation to ensure an adequate distance from all parts, as well as adequate ventilation and if fire-resistant materials or heat shields are used.

2.2.3 For passenger carrying vehicles such as shuttle busses, transit busses, and coaches, the heater must not be installed in the passenger cabin.

2.2.4 The model/ Serial plate or a duplicate thereof (duplicate model/ Serial plate) must be fitted in such a way that it is still clearly legible when the heater has been installed in the vehicle.

2.2.5 When positioning the heater, all reasonable precautions must be taken to minimize the risk of personal injury or damage to items in the vehicle.

2.2.6 A clearly visible indicator within the user's field of vision must show when the heater is switched on or off.

2.3 Fuel Supply

2.3.1 The fuel filler neck must not be located in the passenger compartment and must have a tightly fitting cap to prevent any fuel leaks.

2.3.2 The type of fuel and the fuel filler neck must be clearly identified on heaters for liquid fuel, for which the fuel supply is separate from the fuel supply for the vehicle.

2.3.3 A sign must be affixed to the fuel filler neck warning that the heater must be switched off before refuelling.

2.4 Exhaust System

2.4.1 The exhaust outlet must be positioned in such a way that exhaust fumes cannot get into the interior of the vehicle through ventilation devices, hot-air inlets or open windows.

2.5 Combustion Air Inlet

2.5.1 The air for the combustion chamber of the heater must not be extracted from the passenger cabin of the vehicle.

2.5.2 The air inlet must be positioned in such a way that it cannot be obstructed by other objects.

2.6 Water Inlet / Outlet

2.6.1 The supply of water to be heated must be protected against freezing with a suitable antifreeze additive to the required strength as directed by the manufacturer. The supply of water to be heated must be uncontaminated by corrosive compounds and other impurities.

2.6.2 Hot water lines within the vehicle must be positioned or protected in such a way as to exclude all risk of injury or damage caused by direct contact.

IMPORTANT!
Failure to follow the installation instructions and the notes contained therein will lead to all liability being refused by Webasto. The same applies if repairs are carried out incorrectly or with the use of parts other than genuine Webasto service parts. This will result in the invalidation of the type approval for the heater and therefore of its homologation / type license.

Meets FMCSA Motor Vehicle Heater Requirements when installed in accordance with 49 CFR 393.77. For more information visit https://www.govinfo.gov/content/pkg/CFR-2012-title49-vol5/pdf/CFR-2012-title49-vol5-sec393-77.pdf

3. Purpose / Version

3.1 Purpose of the Coolant Heater

The Webasto Thermo Pro 50 Eco coolant heaters are used in connection with the vehicle's own heating system

- to heat the cab,
- to defrost vehicle windows and
- to preheat water-cooled engines,
- to heat boats and motorhomes (recreational vehicles)
- to be used as an independent heating system

The water heater operates independently of the engine and is connected to the cooling system, the fuel system and the electrical system of the vehicle.

3.2 Versions

Thermo Pro 50 Eco D

The Thermo Pro 50 Eco water heater is designed for 24V electrical systems using diesel fuel as a fuel source.

4. Installation

IMPORTANT!
The water heater must be installed outside the passenger cabin. The requirements of the latest version of "Hazmat" must also be observed for the installation of the heater into vehicles used to transport hazardous substances.

4.1 Installation site / Installation position

The heater must be installed in as low a position as possible to allow the heater and circulating pump to be bled automatically. This is particularly important as the circulating pump is not self-priming. The heater must also be secured with at least three M5 screws. The screws must be tightened with a torque of 6 lb-ft (8 Nm).

IMPORTANT!
If the vehicle manufacturer has issued specific installation instructions, they must be followed.

4.2 Model plate

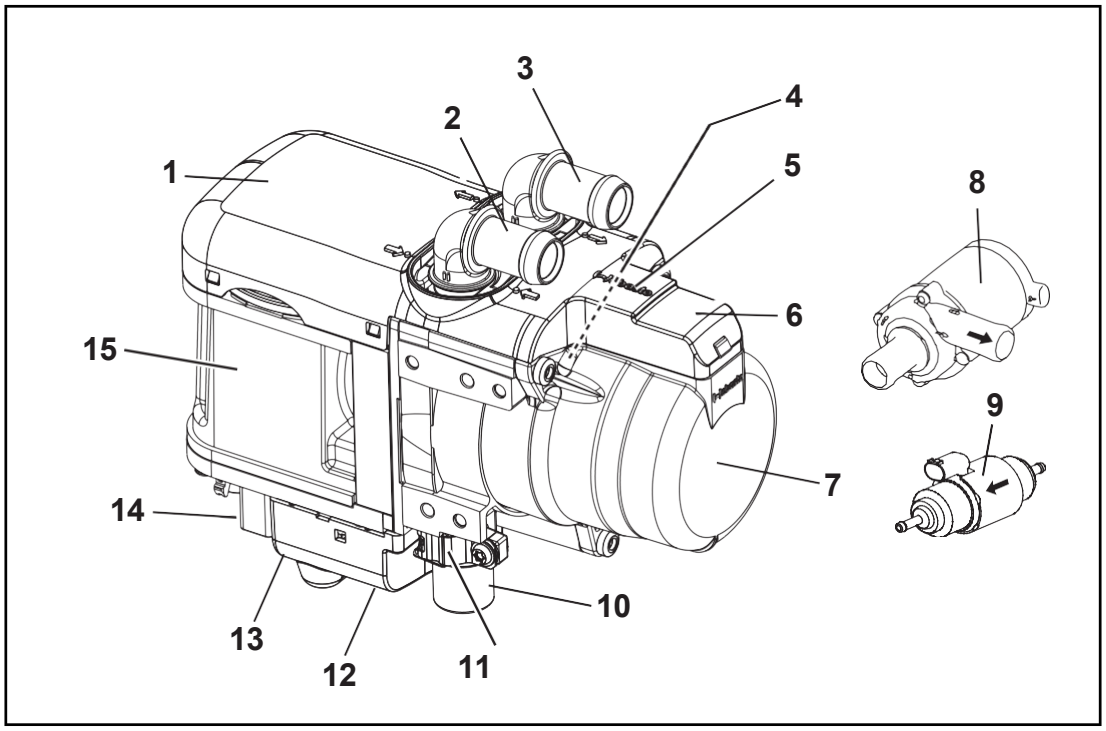
The model plate must be positioned so that it cannot be damaged and must be clearly legible when the heater is installed (otherwise a duplicate model plate must be used). Inapplicable years must be erased from the model plate.

4.3 CE mark

The Thermo Pro 50 Eco water heater carries the CE mark since it complies with the regulations in force. The heater satisfies the requirements of class A. As a result, the following supplement applies:

IMPORTANT!
This is a class A device. This device may produce radio interference in residential areas. As a rule, installation in the engine compartment represents sufficient screening.

4.4 Installation Example



Legend:

1) Combustion Air Fan
2) Water Inlet
3) Water Outlet
4) Glow Plug
5) Coolant Temperature Sensor
6) Overheat Sensor
7) Combustion Chamber
8) Circulation Pump
9) Fuel Metering Pump
10) Exhaust Outlet
11) Exhaust Temperature Sensor
12) Fuel Inlet
13) Air Inlet
14) Control Unit
15) Burner Motor

Figure 1: Installation Example

4.5 Mounting the Heater to the Vehicle

4.5.1 Allowable Mounting Positions

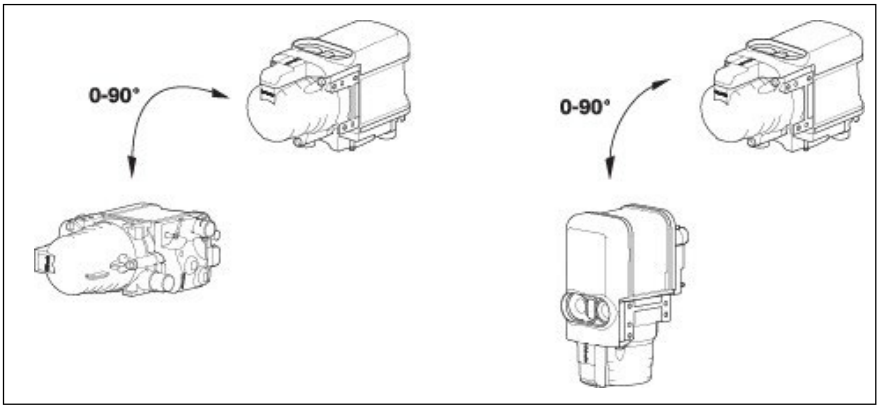


Figure 2: Allowable heater mounting positions with no enclosure

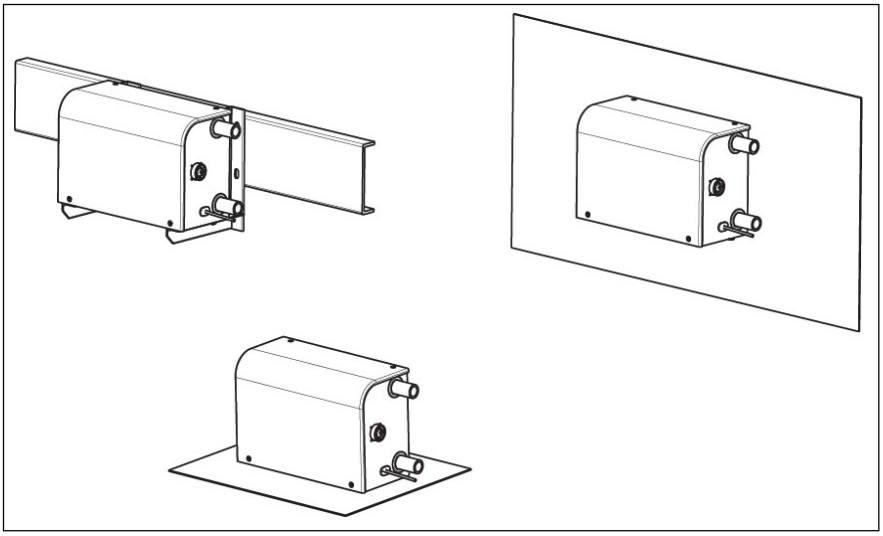


Figure 3: Allowable enclosure kit mounting positions.

4.5.2 Standard Bracket

The heater must be fastened on the bracket with at least 3x M5 bolts with 6 lb-ft (8 Nm). The heater fastening screws are approved for bracket metal thickness of .06" - 0.12" (1.5 to 3.0 mm). Example of a Thermo Pro 50 Eco bracket.

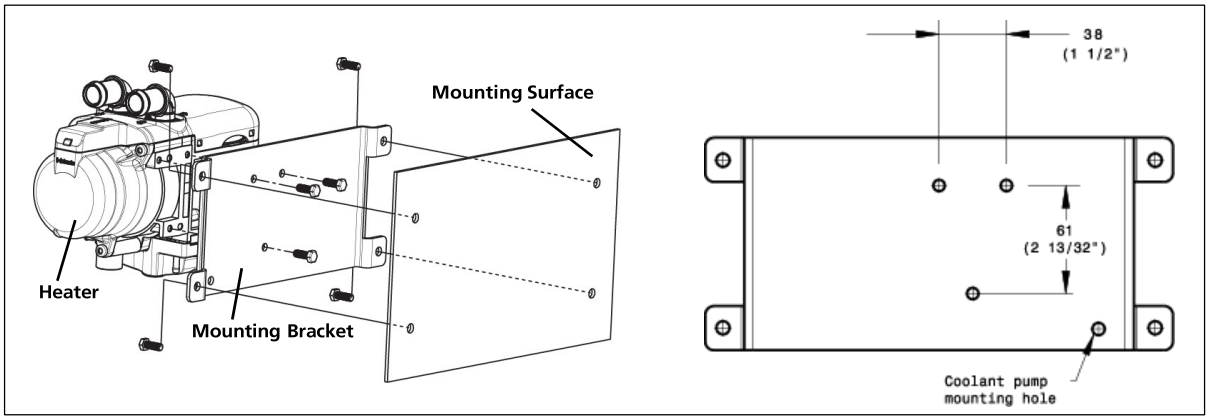


Figure 4: Exploded View Heater to Bracket Layout & Dimensions

⚠CAUTION Do not drill holes through top or bottom of vehicle frame flanges!
Do not weld vehicle frame or flanges!

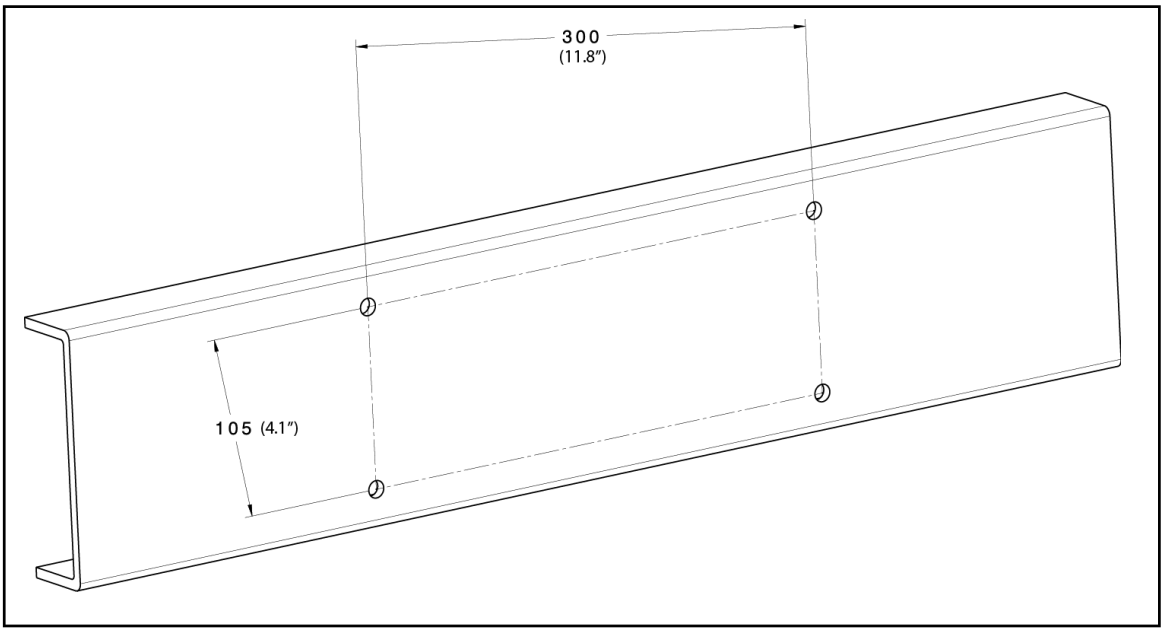


Figure 5: Do not drill holes through top or bottom of vehicle frame flanges!

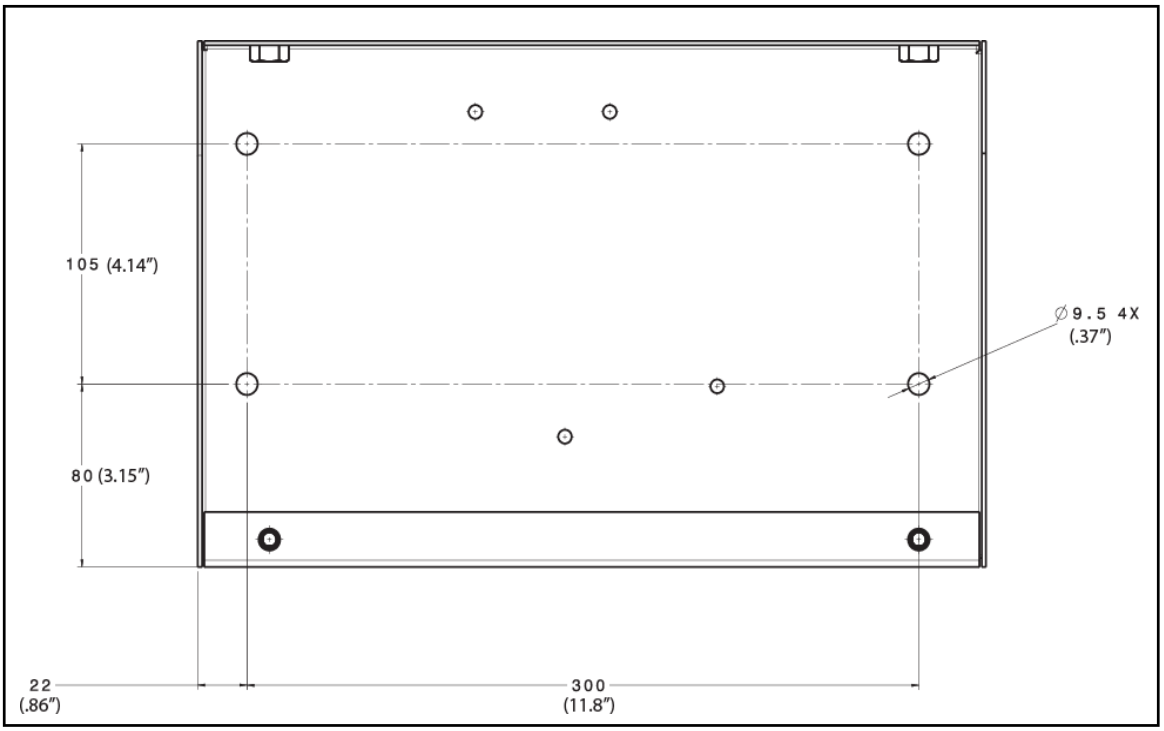


Figure 6: Mounting heater enclosure via back wall

5. Integration to Cooling System

5.1 Connection

The heater is connected to the vehicle's cooling system as shown in Fig. 7. The coolant quantity present must at least be equivalent to the volume specified in chapter 12, "Technical Data".

Always use the coolant hoses supplied by Webasto. If other hoses are used, they must at least comply with the SAE 20 R3 specifications. The hoses must be routed without kinking and preferably uphill from the heater to ensure proper bleeding.

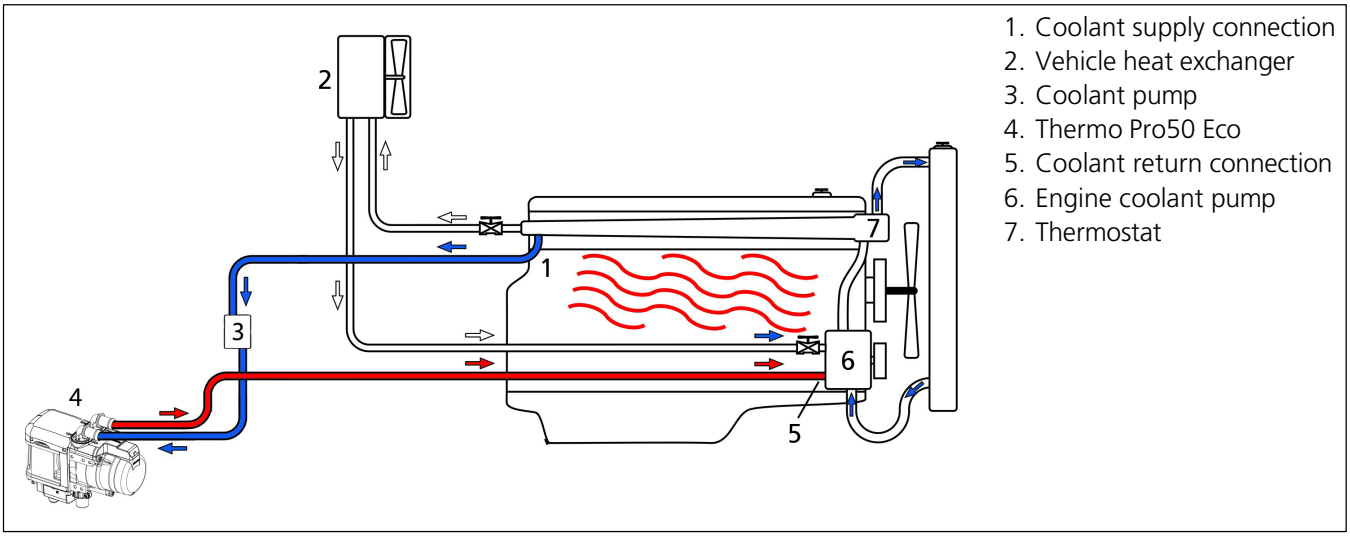
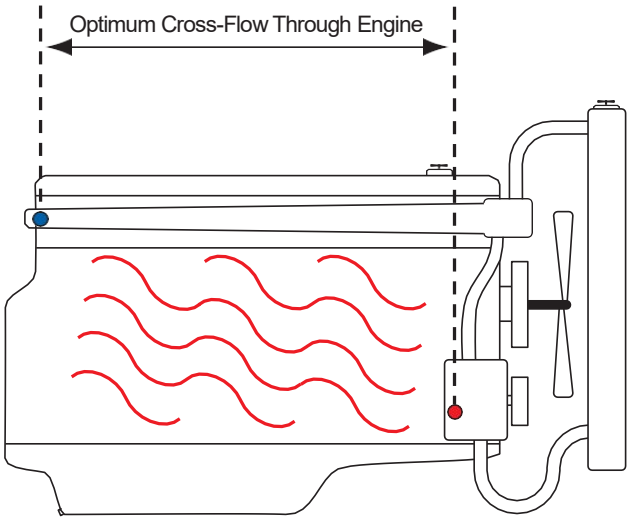


Figure 7: System configured for engine pre-heating and boost heating.

The cooling system must be bled carefully before using the heater for the first time or after replacing the coolant.

Proper venting of trapped air can be identified by the circulating pump operating virtually silent. Poor bleeding may cause the heater to fault due to an overheat condition. Refer to the workshop manual for fault codes and diagnosis.



Separate the heater supply and return connections at the engine as far apart as is practical for optimum engine heating and heater performance.

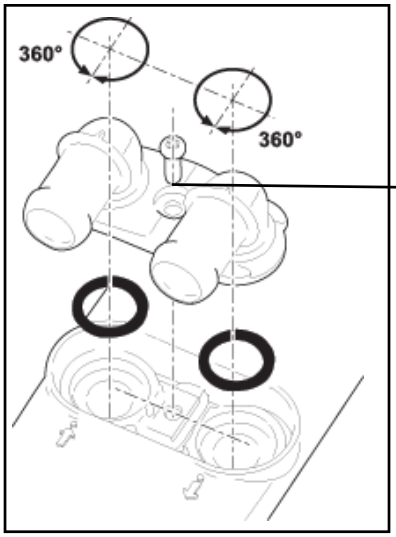
Figure 8: Ensure optimum cross-flow

5.2 Coolant Connection to Heater

Refer to fig. 9, the contact surfaces of the O-rings in the heat exchanger must be clean. Apply a suitable lubricant to the O-rings prior to installation in the heat exchanger.

Install the O-rings in place. Mount the coolant connector housing in the retaining plate. Rotate the connection pieces to the necessary installation position. Fasten the retaining plate.

To enable the self-bleeding of the heater, the coolant-outlet connection piece must be positioned pointing 0° to 90° upward.



This comes pre-assembled; however if direction of the water inlet or outlet needs to changed use the following torque specification.

5X15mm self-tapping screw, torque to 5.2 lb-ft (7 Nm).

Figure 9: Coolant Connection to Heater

5.3 Coolant Hoses Installation

When integrating the coolant hoses in the coolant circuit, the correct direction of flow of the coolant must be ensured. Use the coolant flow arrows on the heater when installing coolant hoses. Refer to fig. 10.

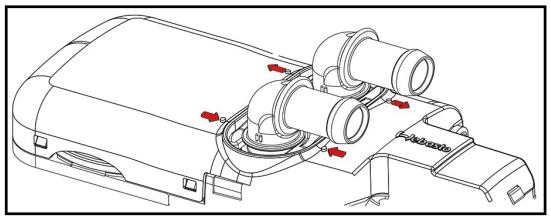


Figure 10: Coolant Direction

Care must be taken to bleed the cooling system before the heater is started for the first time or after refilling with fresh coolant. Heater and lines should be installed in such a way as to ensure static bleeding. Insufficiently bleeding the coolant circuit can lead to a malfunction due to overheating or to frequent switch-on/switch-off cycles of the heater.

IMPORTANT!

The hose clamps must be tightened with a torque of 35 lb.-in. (4 Nm.) The use of silicone hose requires special hose clamps.

Separate the heater supply and return connections at the engine as far apart as possible for optimum engine heating and heater performance.

5.4 Circulation Pump Installation

In most cases, the circulation pump comes pre-assembled and is attached to the heater. The circulation pump can also be mounted remotely if needed.

The circulation pump must be installed in the coolant circuit on the pressure side on the heater (heat-exchanger inlet). Ensure the correct direction of flow of the circulation pump (refer to fig. 11) to the vehicles coolant circuit. The installation position of the circulation pump must be chosen so that the circulation pump is self-bleeding. It must be possible for the air trapped in the circulation pump to escape upward via the connection piece. Incorrect installation can result in malfunction of the circulation pump.

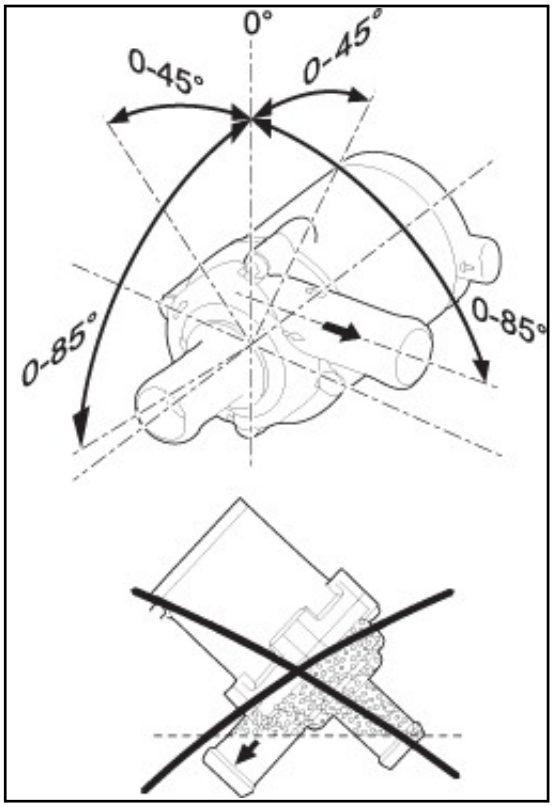


Figure 11: Circulation Pump Installation Positions

5.5 Coolant System Testing

After the heater and all coolant-carrying components have been installed, the entire coolant system must be checked for leaks with the system pressure specified by the vehicle manufacturer. To do this, start the engine and heater. Allow system to heat until radiator thermostat opens.

6. Fuel Integration

If the use of a separate fuel tank is required, the fuel filler cannot be installed in the passenger compartment and must have a filler cap to prevent fuel spillage. Follow the proceeding section for fuel extraction installation.

6.1 Fuel Standpipe Installation

The fuel pickup is carried out by use of a fuel standpipe. The standpipe is designed to fit a 0.25" fitting, available on some fuel tanks. If no fitting is available drill a 1 in. (25mm) hole and install the fittings as shown in fig. 12.

When extracting fuel, ensure that it is not blocked by check valves. In addition, make sure that the standpipe sits approximately 25mm (1") off the bottom of the fuel tank. This prevents the standpipe from picking up debris while also ensuring the heater never runs the vehicles fuel supply completely empty.

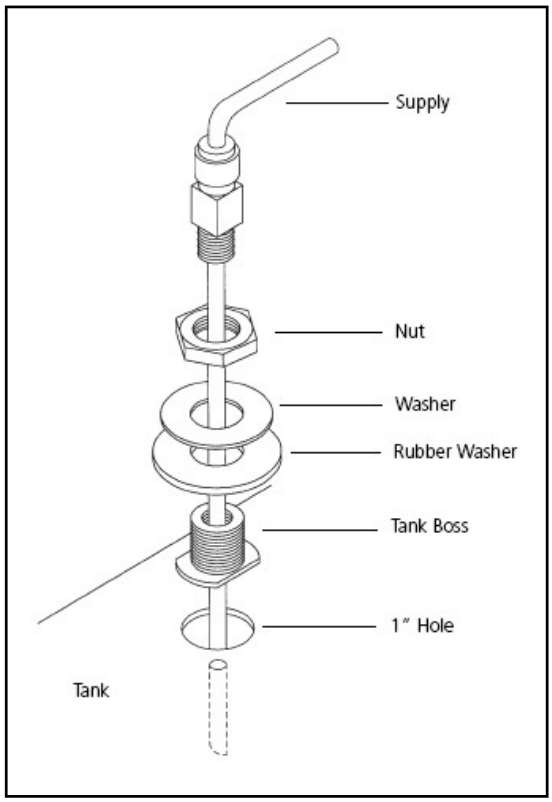


Figure 12:Fuel Standpipe

6.2 Fuel Line Installation

Only use fuel lines with an inside diameter of 0.082mm). The fuel line is divided into the intake and the delivery line. As a result, the intake line is a connection between the fuel tank and the fuel metering pump, while the delivery line produces the connection between the fuel metering pump and the heater.

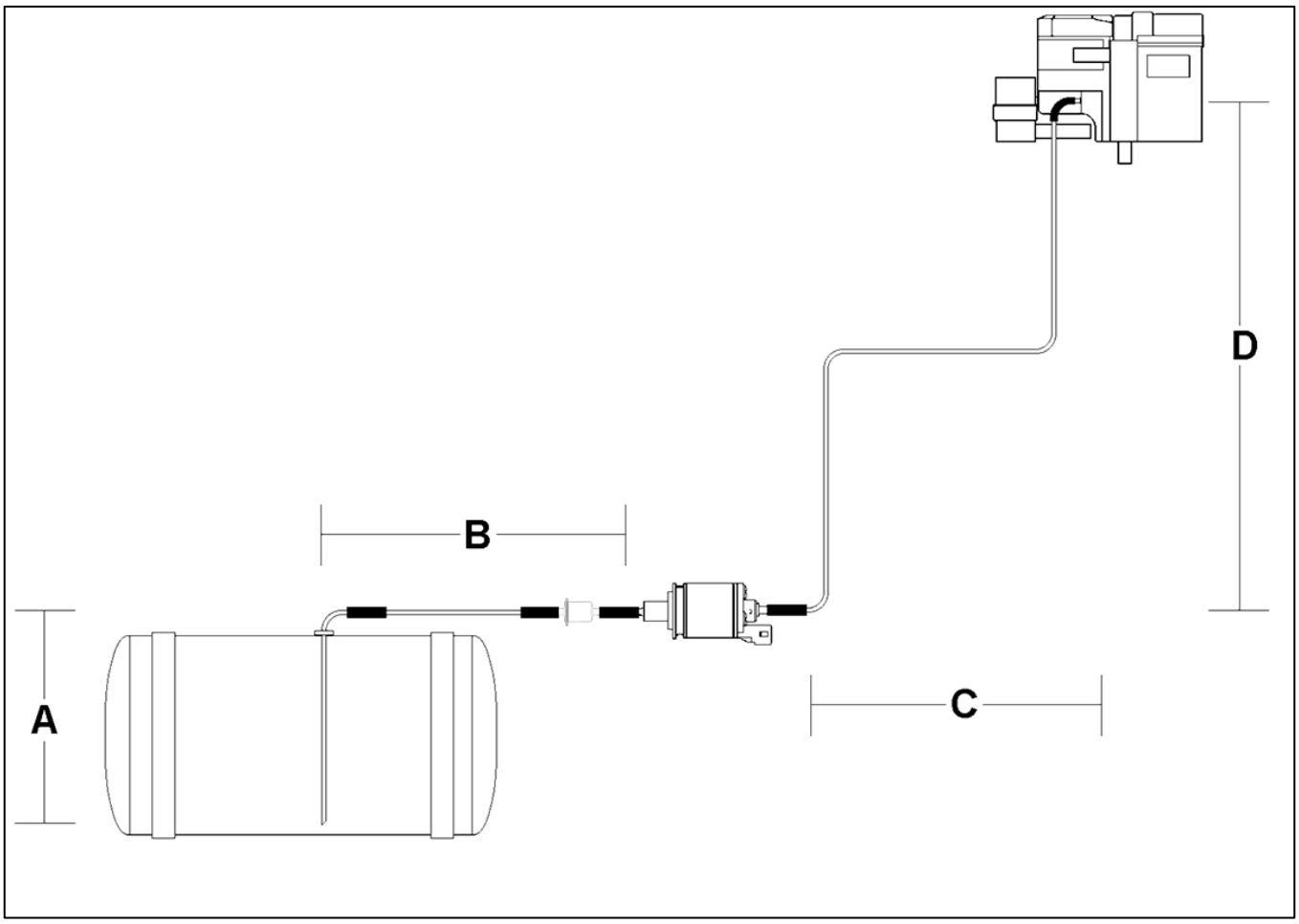


Figure 13: Fuel System Parameters

A - Maximum suction height – 3' 3" (1m)
A+B - Maximum suction length – 6' 6" (2m)
C+D - Maximum delivery length – 19' 6" (6m)
D - Maximum delivery height – 9' 9" (3m)

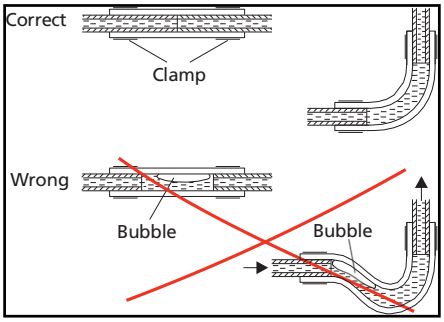
Fuel line coupler = (1)
Fuel line 2mm = (2)
Fuel filter = (3)
Fuel metering pump = (4)

6.2.1 Fuel Line Connections

The correct procedure for connecting fuel lines is shown in fig. 14. Ensure that there are no leaks. The line must be routed to be protected against damage (e.g. stone impact). The fuel line must be routed in cool areas to prevent the formation of bubbles due to heat sources.

Only steel, copper and plastic lines made of plasticized, light and temperature-stabilized PA 11 or PA 12 (e.g. Mecanyl RWTL) may be used for the fuel lines.

The lines should not be routed downwards from the fuel metering pump to the heater. Fuel lines must be secured to prevent them from sagging.

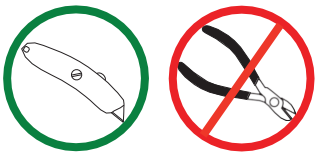


IMPORTANT!
Do not substitute the Webasto supplied fuel filter with a non Webasto replacement. Irregular heater operation may result.

IMPORTANT!
A sign must be affixed to the fuel tank's filler neck warning that the heater must be switched off before refuelling.

Figure 14:Fuel line / coupler hose connection

IMPORTANT!
Cut lines without burr and do not crush them. Do not cut fuel line with side cutting pliers!



6.3 Fuel Metering Pump

The fuel metering pump is a combined delivery, metering and shut-off system and is subject to specific installation criteria. The Thermo Pro 50 Eco heater may only be operated with the DP 42 fuel metering pump. The fuel metering pump must be secured with a vibration-damping mount.

The fuel metering pump may not be installed in an area near hot vehicle components. Use a heat shield if necessary (not included in kit). The pump should be installed as close to the fuel source as possible. The installation position is limited as shown in Fig. 15.

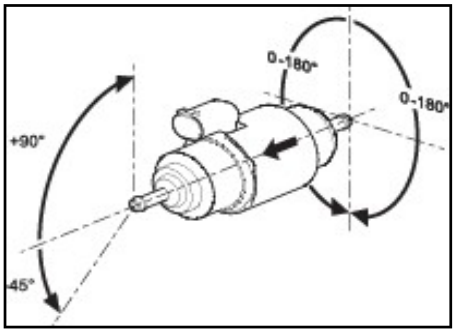


Figure 15: Fuel Metering Pump Mounting Position

6.4 Fuel Filter

If there is a possibility of using dirty or contaminated fuel, a Webasto fuel filter should be installed. Vertical positioning is preferred where possible, however horizontal is also acceptable. Note the installation position and direction of flow.

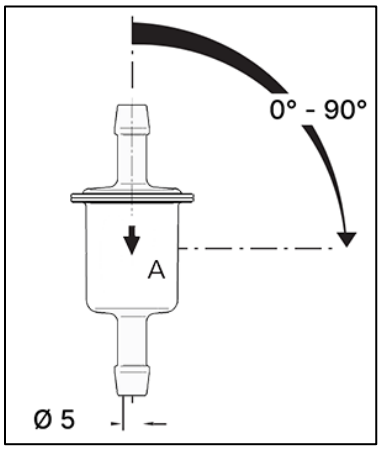


Figure 16: Fuel Filter

7. Combustion Air Supply

Under no circumstances may the combustion air be taken from areas occupied by people. The combustion air intake opening must not point in the direction of travel. It must be located so it cannot become clogged with dirt or snow and cannot suck in splashing water.

IMPORTANT!
The combustion air must be extracted using a combustion air line from a position that is as cool as possible and must never be located in the vicinity of the exhaust outlet.

A ventilation opening measuring at least .47 in^2 (3 cm^2)is required if the intake opening is installed in an enclosed installation space. If an optional combustion air intake silencer is utilized, it must be installed in a position between 0° and 90° pointing downwards. Refer to fig. 17.

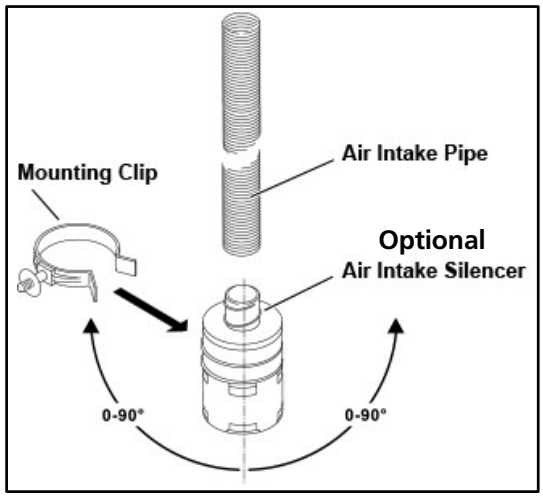


Figure 17:Optional Air Intake Assembly

IMPORTANT!
Screw a combustion-air intake pipe with a maximum length of 3 ft. (1m) onto the combustion-air intake connection piece of the heater. Screw the combustion-air intake silencer as far as possible into the combustion-air intake pipe.

8. Exhaust System

The exhaust pipe (inside diameter 22mm or 0.86”) can be routed with several bends; not to exceed a total of 270°, minimum bending radius 50mm (2”). The total line length must be between 0.5 and 3m (1.6’ and 9.8’).

An optional muffler can be installed near the heater. The exhaust pipe opening must be located so that it cannot become clogged with snow or dirt. The exhaust outlet must be unobstructed and must not be directed at vehicle parts.

The muffler and the exhaust pipe must not be fastened on temperature-sensitive vehicle parts. Sufficient spacing (at least 20mm or 0.80”) to temperature-sensitive components must be ensured. Thermal insulation of the exhaust pipe is permissible.

It is also recommended to route the exhaust pipes with a downhill gradient. If this is not possible, condensation drain holes (4 mm or 0.16”dia.) can be drilled at the lowest point.

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

To ensure that the exhaust pipe opening is positioned at an angle of 90° ± 10° to the road surface, a fastener must be mounted at an distance of less than 5.9 in (150mm) from the end of the exhaust pipe.

If the vehicle is equipped with an underbody shield, the exhaust pipe must be extended by an additional 0.40 in (10 mm).

Rigid pipes comprised of stainless steel with a minimum wall thickness of 0.04 in (1mm) or flexible piping of the same material must only be used as exhaust pipe. The exhaust pipe is secured to the muffler using supplied exhaust clamps.

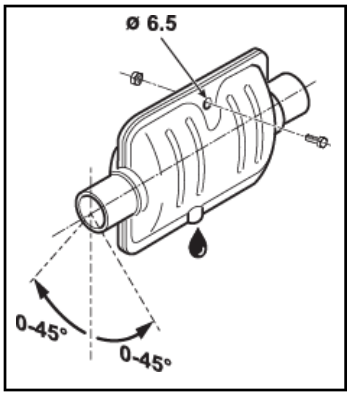


Figure 18: Optional Exhaust Muffler

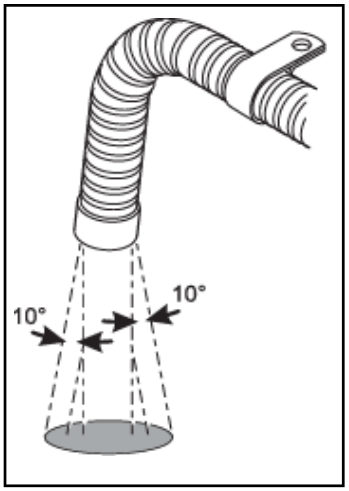
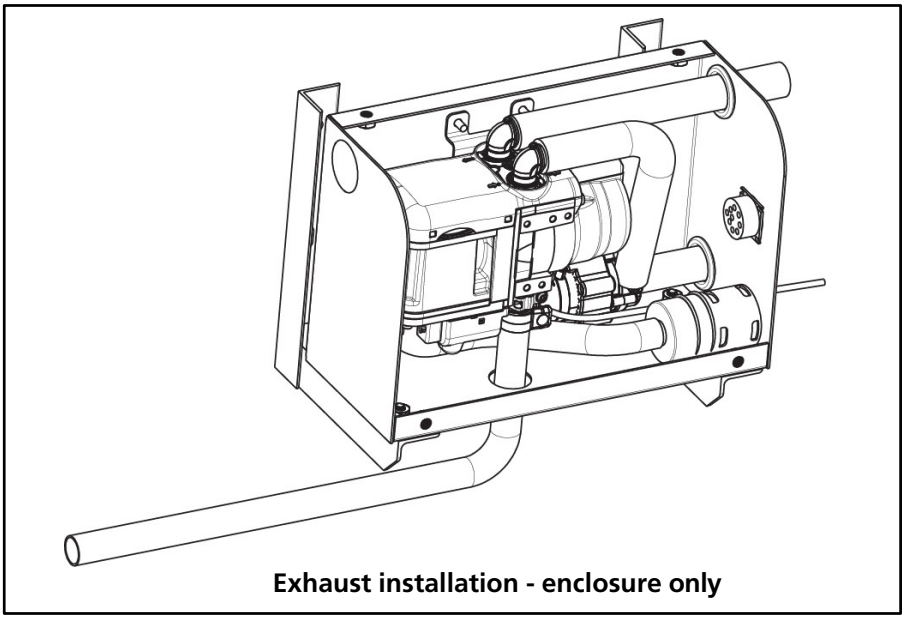


Figure 19: Exhaust Outlet



Exhaust installation - enclosure only

9. Electrical Connections

Electrical components, such as relays, fuses, switches, etc., must be installed so that they are protected. i.e. (water, high-pressure cleaners, etc.).

9.1 Power Connections to Battery

The heaters power supply should be directly from the vehicle's batteries or main buss-bar. Power and ground to the heater must be available after the heater is switched OFF to ensure for proper cool-down.

The heater control unit is equipped with low voltage protection. It is imperative that the vehicle batteries be kept in good condition for optimal heater operation.

1. Route and secure wire harness from Webasto heater to battery box.
2. Strip wires and crimp supplied ring terminals to the positive (red) and negative (brown) wire leads.
3. Clean any corrosion from battery terminals.
4. Connect the leads to the battery terminals.
5. Protect connections with an anticorrosion compound designed for use with electrical connections and battery terminals.

IMPORTANT: All power connections must be fused within 14 in (356 mm) of the battery.

9.2 Switch and Timer Connections

The heater can be switched on and off using the following Webasto controls:

9.2.1 Toggle Switch Installation

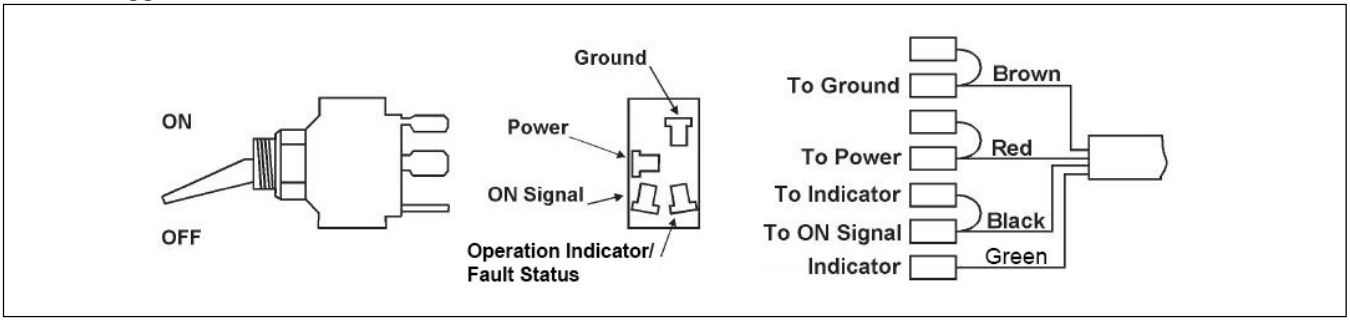


Figure 20: Toggle Switch

1. Select a suitable location in the vehicle for the On/Off toggle switch.
2. Drill a 1/2" hole for the toggle switch.
3. Route harness between heater and switch, secure harness along its length with wire ties. If possible, use existing hole in bulkhead or drill in a suitable location. Protect the harness with a grommet at the bulkhead.
4. Connect the terminals of the harness to the switch. See wiring diagrams fig. 21 and 22 for reference.

9.2.2 SmarTemp 2.0 fx Connection:

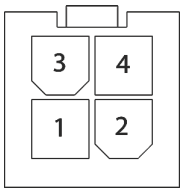
Heater Control Harness Connection Using SmarTemp Control fx

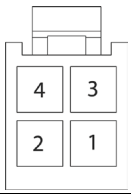
1. Red (Power)
2. Brown (Ground)
3. Black or Grey (ON/OFF Signal)
4. Green (Diagnostic Blink Code)

Figure 21: 7-Day, 4 Program SmarTemp Control 2.0 fx Timer

9.2.3 SmarTemp Control 3.0 and 3.0 Bluetooth Connection:

Connector end of housing





Pin No	Description	Pin No	Description
1	12V / 24V power	1	Brake signal input*
2	Battery ground	2	Open cavity
3	Not used	3	W-bus communication
4	Not used	4	Ambient temperature (air heaters only)

For terminal removal use Molex terminal removal tool P/N: 11-03-0044
http://www.molex.com

* Only used in original equipment installations

Figure 22: 7-Day, 4 Program SmarTemp Control 3.0 and 3.0 Blutooth Timer

⚠CAUTION ***Unused cables and wires must be insulated against accidental shorting or grounding.***

The Control Panel should be installed in a suitable location on a flat surface if possible in a visible area.

- Connect control panel to existing connectors on heater-unit wiring harness (see "Connections Diagrams Section")
- Use the drilling dimensions (fig. 24) to lightly mark the two mounting holes.
- **(Optional Step)** To route wire harness through the mounting surface, drill a 11/16 in (17mm) hole. Make sure to push harness through the hole before installing terminals into connector housing)
- Secure the SmarTemp Control using the two supplied #4 screws.
- Apply the supplied "Heater Off" warning sticker in a highly visible location to the driver's area.
- Observe the installation / operating manual supplied for proper menu setup.
- Always make sure there are no obstacles behind the mounting location prior to drilling.
- Ensure good readability when selecting installation location.
- Observe information on adhesive labels and colored markings when connecting the control element to vehicles wiring harness.

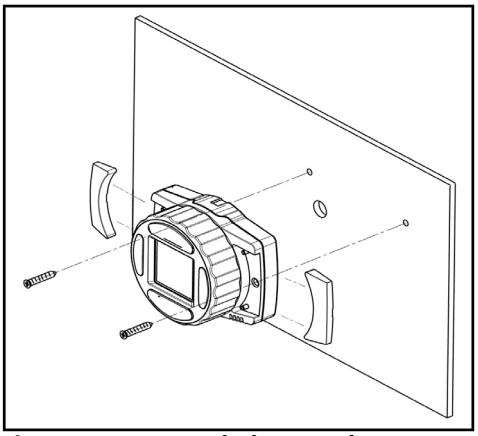


Figure 23. Control element (SmarTemp)

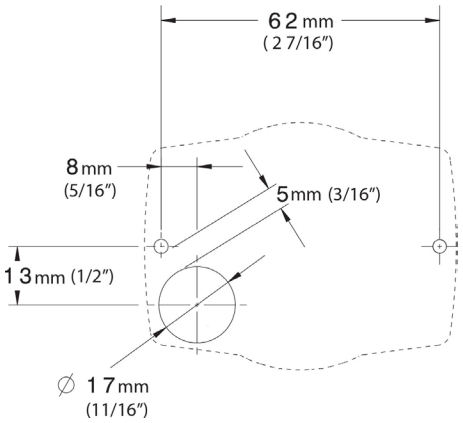


Figure 24. SmarTemp drilling dimensions
NOT TO SCALE

10. Circuit Diagrams

The wiring diagrams show the possible circuits for the Thermo Pro 50 Eco, 24 V:

- System wiring diagram for Thermo Pro 50 Eco with toggle switch fig. 24
- System wiring diagram for Thermo Pro 50 Eco with SmarTemp 2.0 fx timer fig. 25
- System wiring diagram for Thermo Pro 50 Eco with SmarTemp Control 3.0 fig. 26

For the legend for wiring diagrams, see Table 1 and Table 2. The connector assignment on the control unit is shown in the figures.

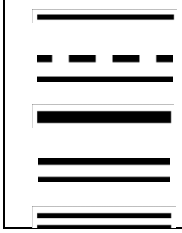
	Length < 24.5 ft (7.5m)	Length 24.5 – 49 ft (7.5 - 15m)
	20 GA (.75mm²)	18 GA (1.0mm²)
	1.0mm²	1.5mm²
	1.5mm²	2.5mm²
	2.5mm²	4.0mm²
	4.0mm²	6.0mm²

Table 1: Cable Cross-sections

The following Table applies to Figures 19 and 20.

Item	Description	Comment
2	Timer	– with positive on timer connection 10: Continuous operation with immediate heating – Timer connection 10 open: Heating duration is programmable (10 to 120 min.), basic setting 120 min.
A1	Heater	Thermo Pro 50 Eco
A2	Control module	Thermo Pro 50 Eco
B1	Exhaust Temperature Sensor	PT2000
B2	Coolant Temperature Sensor	Temperature sensor for coolant circuit
B3	Overheat Sensor	Sensor on heat exchanger
DP	Fuel Metering Pump	Fuel pump for heater
F1	Fuse (15A)	Mini fuse
F2	Fuse (5A)	Mini fuse
GS	Glow Plug	
H1	Operation Indicator Light	On switch or timer
M1	Combustion Air Fan	
M2	Circulation Pump	
S1	Toggle switch	ON/OFF operation
X1	Plug connector, 10 pin	Vehicle plug on item A2
X2	Plug connector, 2 pin	Power supply on item A2
X3	Plug connector, 4 pin	Overheat sensor and coolant temperature sensor on item A2
X4	Plug connector, 2 pin	Circulation pump to control module
X5	Plug connector, 2 pin	Glow plug to control module
X6	Plug connector, 2 pin	Exhaust temperature sensor to control module
X10	Plug connector, 4 pin	W-bus PC diagnostics
X11	Plug connector, 2 pin	to fuel metering pump
X20	Plug connector, 3 pin	control module engine contact

Table 2: Legend for wiring diagrams

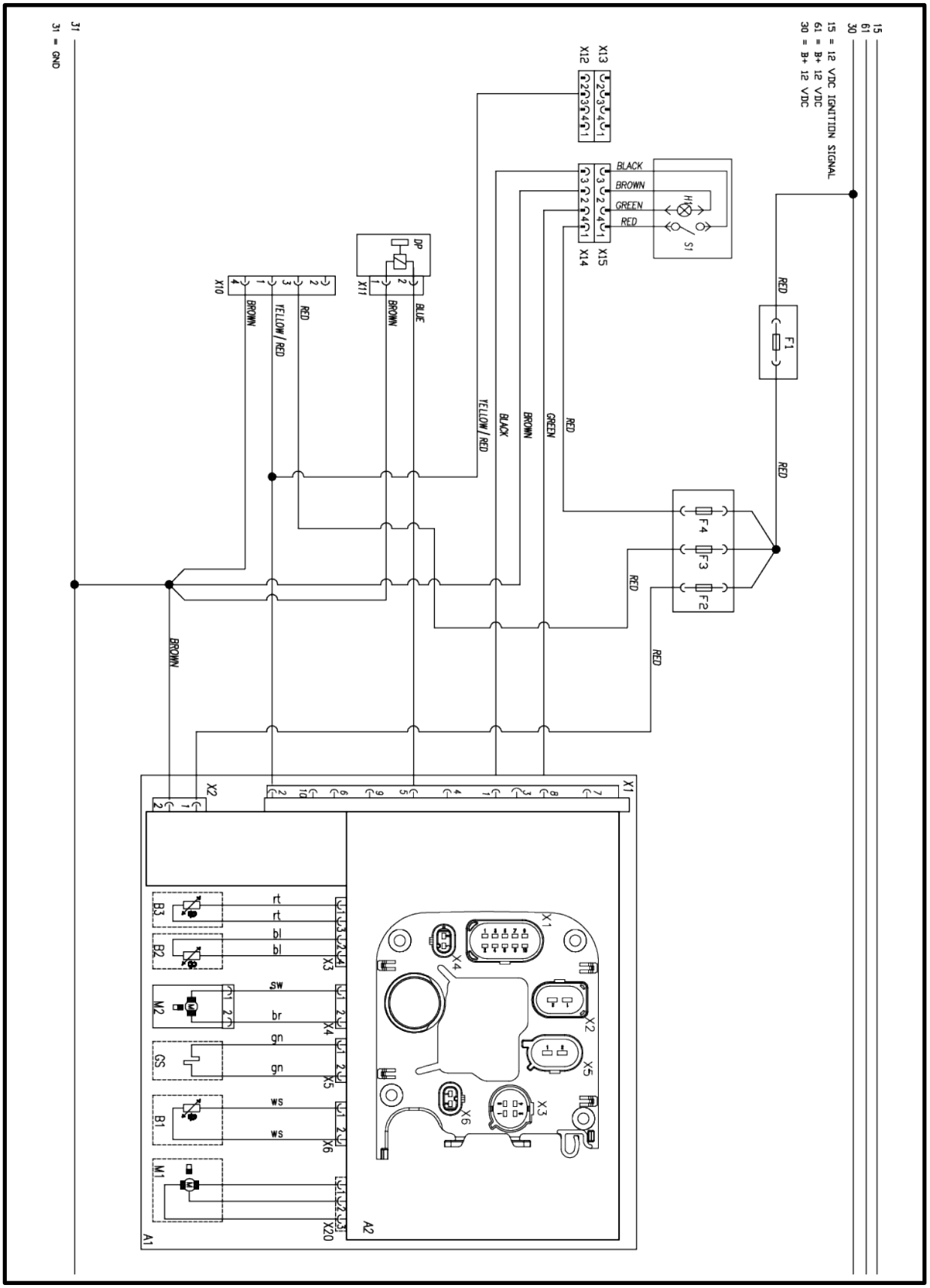


Figure 25: Thermo Pro 50 Eco with On/Off switch - wiring diagram

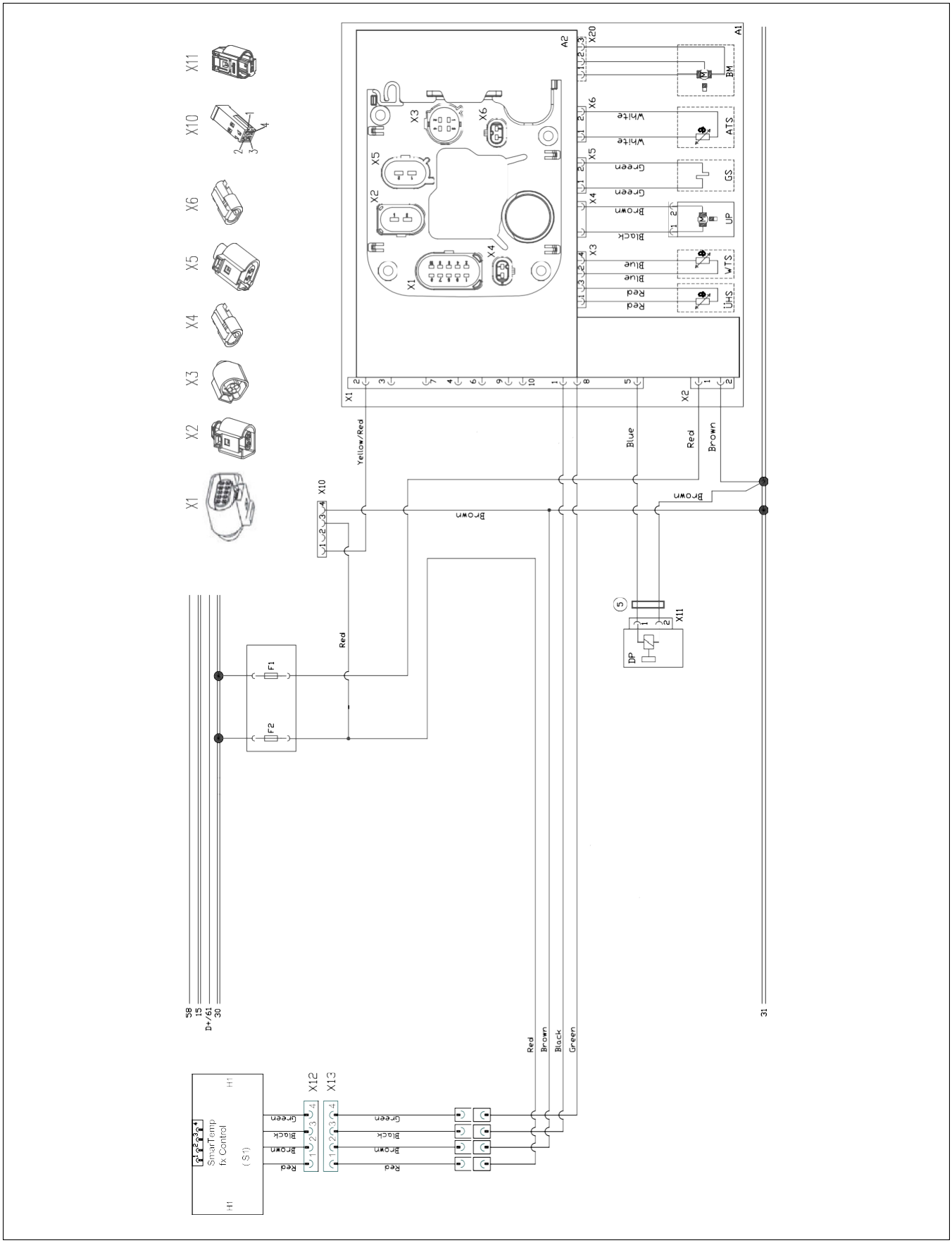


Figure 26: Thermo Pro 50 Eco with 7-Day, 4 Program SmarTemp Control 2.0 fx Timer

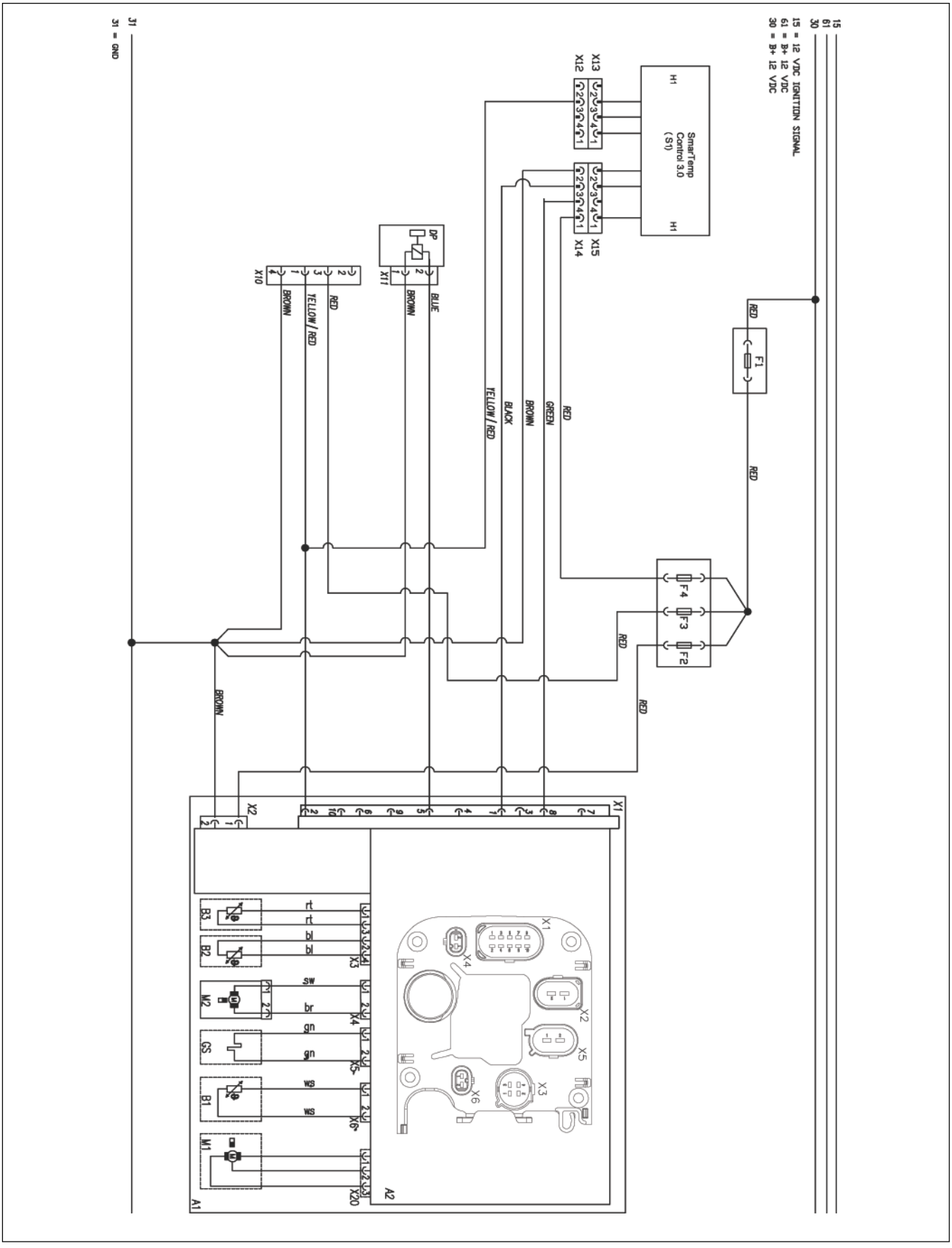


Figure 27: Thermo Pro 50 Eco with 7-Day, 4 Program SmarTemp Control 3.0 and 3.0 Bluetooth Timer

11. Initial Start-up and Operation

Before starting the heater for the first time complete the following checklist.

	HEATER MOUNTING	Complete (Yes/No/Comments)
1	Is the heater installation safely secure / rigid? (Ensure that all bracket bolts are tight)	
2	Is there a safe clearance from heat generating Components? (I.e. exhaust, etc...)	
3	Is there sufficient clearance between heater and any vehicle moving components under all operating conditions? (steering cranked to extreme positions, torqued engine, suspension, etc...)	
4	Is the heater mounted in an acceptable position according to the limitations noted in the installation manual?	
5	Is the heater installed in a protected location from road debris and splash-water or items stored in the same area?	
6	Is there a sufficient amount clearance between the heater and the ground? (Coolant heaters only)	

	COOLANT SYSTEM	Complete (Yes/No/Comments)
1	Is there a safe clearance (min 4 in.) from heat generating components? (exhaust, etc...)	
2	Is there a safe clearance from sharp edges / objects? Ensure a heat protective has been installed (if applicable)	
3	Are there any kinks, sharp bends or the possibility for pinched hoses or harnesses, cuts and rub through?	
4	Have all the hose clamps been properly positioned and tightened?	
5	Has the coolant system been topped off and bleed per the **vehicle manufacturers specifications for proper mixture and type?**	
6	Has a pressure test been performed on the coolant system under all operating conditions?	
7	Have the coolant hoses been installed so that they are below the coolant filler cap?	
8	Has the coolant flow direction been verified?	

	ELECTRICAL	Complete (Yes/No/Comments)
1	Has all wiring been safely secured away from moving components and / or heat sources?	
2	Check for proper power and ground connections.	

ELECTRICAL (Continued)		Complete (Yes/No/Comments)
3	Has blower motor functionality been tested (if applicable)?	
4	Check for proper fuse tap connection.	
5	Verify the correct fuses are in the specified locations per the installation manual.	
6	Ensure heater and vehicle fuse boxes are closed and secure. Was the Webasto fuse block installed in a location protected from water and / or moisture?	
7	Ensure blower motor resistor (1.0?) is securely mounted and has sufficient clearance from any plastic component and battery.	
8	Ensure battery is mounted securely and connections are properly tightened.	
9	Ensure battery is at ? 12.2Vdc for 12V, 24.4Vdc for 24V.	

FUEL SYSTEM		Complete (Yes/No/Comments)
1	Is the standpipe properly mounted in the fuel tank? (sealed, structural integrity maintained).	
2	Validate the standpipe does not interfere with function of sending unit by checking fuel gauge for proper operation before completing installation of tank.	
3	Verify that all fuel lines are properly secured and are a safe distance (min. 4 in.) from exhaust systems and / or moving components.	
4	Check all fuel lines for leaks or kinks.	
5	Check fuel line clamps for proper positioning and tightness. Ensure fuel system is free of leaks.	
6	Ensure fuel pump is securely mounted in a cool location **NOTE:** Vehicle fuel tank area is generally a location with minimal sound transfer path to vehicle interior.	

EXHAUST SYSTEMS		Complete (Yes/No/Comments)
1	Is the muffler and clamps securely tightened?	
2	Has muffler and exhaust tube been routed a safe distance from flammable material?	
3	Ensure drain-holes are drilled in low bend areas of exhaust tube.	
4	Ensure exhaust is venting a safe distance from any vehicle interior openings.	
5	Ensure exhaust is venting in the direction that will not cause back pressure while driving.	

COMBUSTION AIR INTAKE		Complete (Yes/No/Comments)
1	Is the combustion air intake drawing fresh air from a non-turbulent location? (i.e. not in direction of travel)	
2	Ensure air intake system is securely fastened.	

HEATER FUNCTION		Complete (Yes/No/Comments)
1	Ensure heater starts and runs for a minimum of 20 minutes.	
2	Ensure vehicle blower turns "ON".	
3	Ensure warm air is blown out of interior vents after blower is activated.	
4	Ensure timer (control device) is functioning.	
5	Check and Modify CO2 setting as needed based on altitude (will the heater "live" or spend a lot of time above XXXXXX Feet) **(See service manual for instructions to make adjustment)**	

COSMETICS		Complete (Yes/No/Comments)
1	Has the vehicle interior, engine compartment, trunk & glove compartment been inspected for cleanliness after installation.	
2	Has user manual placed in glove box?	
3	Is the vehicle clock time correct after disconnecting the battery?	

⚠ DANGER

WEBASTO HEATERS MUST BE SWITCHED "OFF" WHEN RE-FUELING AT FILLING STATIONS AND/OR WHILE LOADING OR UNLOADING FLAMMABLE MATERIALS FOR TRANSPORT, TO PREVENT THE RISK OF EXPLOSION. PLEASE REVIEW OWNER'S MANUAL FOR SAFETY AND USE INSTRUCTIONS.

Refer to the safety instructions in the operating and maintenance instructions.
The operating and maintenance instructions must be read through without fail before starting the heater.

NOTE:
As a result of the low fuel consumption the heater must be switched on several times to fill the fuel line and prime the system. Allow several cycles for priming.

After you have installed the heater, bleed the water system and the fuel supply system carefully. Follow the instructions supplied by the vehicle manufacturer for this purpose.

Conduct a trial of the heater to check all the water and fuel connections for leaks and to ensure that they are secure. If the heater suffers a fault during operation, the fault must be located and remedied. See workshop manual for further instruction.

IMPORTANT!
To maintain optimum heater condition, run heater for 20 minutes monthly during the off-season. Ensure any shut-off valves are open before operating the coolant heater.

12. Technical Data

12.1 Technical Data Thermo Pro 50 Eco

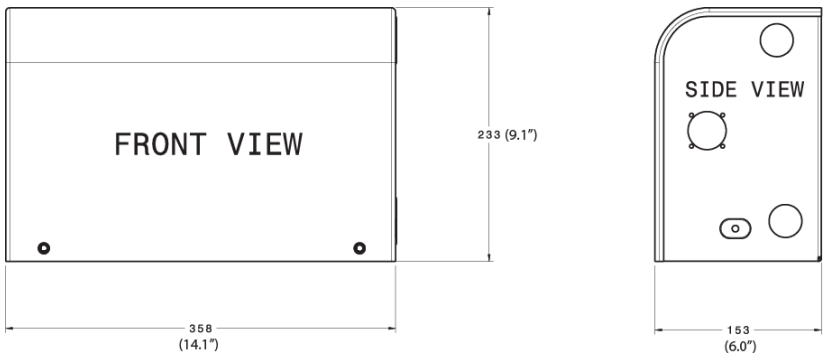
Except where limit values are specified, the technical data below refers to the usual heater tolerances of ± 10% at an ambient temperature of +20 °C (69 °F) and at the rated voltage.

Heater	**Thermo Pro 50 Eco**
ECE approval symbol	E1 122R -00 0334 (Heater) E1 10R -03 6271 (EMC)
Model	Water heater with evaporator-type burner
Heat flow (control range)	2.5 to 5 kW
Fuel	Diesel | Bio-Diesel up to 30%
Fuel consumption ± 10 % (control range)	0.08 to 0.17 gal/h (0.30 to 0.65 l/h)
Rated voltage	24 V
Operating voltage range	20.5 to 31 V
Nominal power consumption without circulation pump, without vehicle fan ± 10% (control range)	28 to 46 W
Perm. ambient temp.:	
Heater: - Operation	-40 to 176 °F (-40 to +80 °C)
- Storage	-40 °F to 248 °F (-40 to +120 °C)
Metering pump: - Operation	-40 °F to 86 °F (-40 to +30 °C)
- Storage	-40 °F to 194 °F (-40 to +90 °C)
Perm. operating pressure (heat medium)	36.25 PSI (2.5 bar)
Minimum quantity of coolant circuit	1.06 gal (4 l)
Minimum flow rate for the heater	66 gal/h (250 l/h)
Coolant	At least 20% mix of a brand-name antifreeze
CO_2 in exhaust gas (perm. function range)	8 to 12 vol.%
Dimensions of heater (Tolerance ± 3 mm)	L = Length: 8.6 in (218 mm) B = Width: 3.6 in (91 mm) H = Height: 5.8 in (147 mm)
Weight	4.8lb. (2.2 kg)

12.2 Circulation Pump

Circulation Pump	4847 Econ 24V
Volume flow with counter-pressure > 14 kPa	Approx. 119 gal/h (450 l/h)
Rated Voltage	24v
Operating Voltage Range	16 to 32v
Rated Power Consumption	14.4W
Dimensions, Circulation Pump	Max. length: 4.3 in (109mm) | Diameter: 1.9 in (48.5mm)
Weight	Approx. 0.66 lb (0.3 kg)

12.3 Enclosure Box



13. Basic Troubleshooting

13.1 General Information

This section describes troubleshooting procedures for the Thermo Pro 50 Eco coolant heater. Troubleshooting is normally limited to the isolation of defective components.

Troubleshooting requires expert knowledge about structure and theory of operation of the heater components and may only be performed by Webasto authorized personnel.

Before troubleshooting, check for and eliminate these defects:

- Blown fuses
- Fuel supply (plugged fuel filter)
- Corrosion on battery terminals, electrical wiring, connections and fuses
- Loose contact on connectors

IMPORTANT!
After any correction of a defect a functional test must be performed.

13.2 General Failure Symptoms

The following table lists possible failure symptoms.

Failure 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, bleed coolant circuit if necessary. Allow heater to cool down. Check for failure codes and repair as necessary.
	Vehicle electrical system voltage too low	Charge / replace batteries Switch off heater momentarily and switch on once again
Heater expels black fumes from exhaust	Combustion air and/or exhaust tube blocked	Check combustion and exhaust tube for obstructions.

Table 3: General Failure Symptoms

13.3 Heater Lockout Reset Procedure

The control unit continuously monitors the heater operation. The control unit identifies errors on individual heater components and faults during operation. Should the control unit experience component errors and operational faults, the heater may be shut down.

Heater Lock out Reset Procedure:

1. Using switch or standard timer control, turn heater on
2. Remove the main power connection to heater from battery or pull fuse for a minimum of 20 seconds.
3. Using switch or standard timer control, turn the heater off.
4. Reinstall main heater power connection where previously disconnected.

Rectify the cause of the fault.

IMPORTANT: Heater fault codes can be read using PC Diagnostics, however, the heater lockout reset must be manually performed using the procedure stated above.

If you have any questions, contact our technical support team at (800) 860-7866 or via email at: info-us@webasto.com.

13.4 PC Diagnostics Kit

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

It is possible to read and reset stored fault codes from the Thermo Pro 50 Eco's memory. This is achieved through the use of a diagnostic interface kit connected to the heaters diagnostic connector and a windows based compatible computer having the necessary software installed.

The PC Diagnostic Interface Kit comes complete with connecting hardware, software and instructions. Also available are several interface connectors for use with Webasto heaters equipped with internal diagnostics capabilities such as the Thermo Pro 50 Eco.

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

For further capabilities and instructions for use with the Thermo Pro 50 Eco heater, see instruction manual supplied with the PC Diagnostics Kit.

The heater can be registered by visiting www.techwebasto.com or by scanning the code.
A proof of purchase is required for all heaters that are not registered.

Feel the Drive

Webasto Thermo & Comfort N.A., Inc.

15083 North Road
Fenton, MI 48430

Technical Assistance Hotline
USA: (800) 860-7866
Canada: (800) 667-8900

www.techwebasto.com

Org. 6/2013 Rev. 11/2025 P/N 5010667D