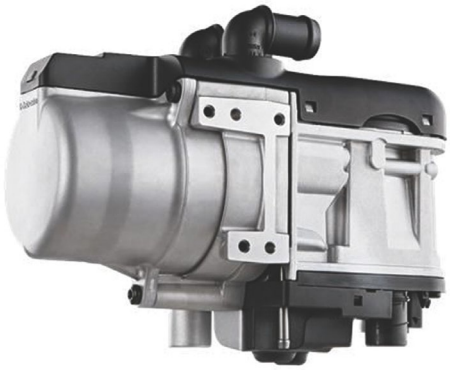
Installation Instructions

# Thermo Top Evo



## English

- ALWAYS carefully follow Webasto installation and repair instructions and heed all WARNINGS.
- 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.
- Only genuine Webasto parts may be used. See also Webasto air and water heaters accessories catalogue.
- Product produces 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 flammable materials to prevent the risk of explosion.
- Webasto heating and cooling systems require qualified and/or professional installation and repair technicians. Warranty shall be void if not installed by a certified or trained installer/repair technician who has successfully completed the factory training course for installation and repair of Webasto heating and cooling systems, and has been provided with the technical information, tools and equipment required to properly complete the necessary installation/repairs.
- When heater is in use, the surface of the hot air outlet may become hot to the touch. Contact with skin may cause burns.

# Table of Contents

# 1 Safety

## 1.1 Intended use

If installed in special-purpose vehicles, the applicable regulations must be observed. Consult with Webasto for alternative application options. Meets FMCSA Motor Vehicle 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?_sm_byp=iVVH7mFk84lJpmmmN.

**Parking heater**

The heater works independently of the vehicle's engine and is integrated into the coolant system, the fuel system, and the electrical systems of the vehicle.

**Auxiliary heater**

Operation of the heater depends on the vehicle's engine and is integrated into the coolant system, the fuel system, and the electrical systems of the vehicle. When the engine is switched off, the heater is automatically switched off and the fuel supply is interrupted.

## 1.2 Qualifications of Installation Personnel

The installation personnel must have the following qualifications:

- The repair, installation, and/or commissioning of the unit may only be carried by trained experts in accordance with the workshop manual and the installation instructions.

The year of initial start-up must be permanently marked on the type label by removing the inapplicable year(s).

## 1.3 Safety During Operation

**WARNING**

**Danger of explosion**

In environments with combustible vapor, flammable dust and hazardous goods (such as fuel stations, tank facilities, fuel store, coal bunkers, timber yard or grain ware- houses). Do not switch on or operate the heater.

**WARNING**

Do not operate the heater in an enclosed space, or one that does not have an exhaust extraction unit. Poisoning or suffocation can result.

## 1.4 Avoiding Damage to Property

**NOTE**

**Improper Handling**

Protect the heater against mechanical stress (e.g. dropping, impacts). Do not place any objects on the heater or stand on the heater.

Avoid shutting down the heater incorrectly during the cool-down period. After switching off using the control element, the fan of the heater will continue to for a short time. The heater must always be shut off using the control element except the in the case of an emergency. Do not disconnect the heater from the power supply until after the cool-down cycle is complete, including the cool-down period.

Use edge protection on the edges of metal panels that can come into contact with the wiring harness. Failure to do so can cause a short-circuit and fire.

## 1.5 General Safety Information

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

Please write to us at:

Webasto Thermo & Comfort North America, Inc.

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 contact us:

Phone: (800) 860-7866

Fax us at:(810) 593-6001

# 2 About This Document

## 2.1 Purpose of this Document

These installation instructions are an integral part of the product and contain all the information required to ensure correct and safe installation.

## 2.2 Warranty and Liability

Webasto shall not assume liability for defects or damage resulting from the failure to observe the installation and operating instructions and the information provided therein.
This liability exclusion particularly applies to:

- Installation by untrained personnel
- Improper use
- Repairs not carried out by a Webasto service workshop
- Use of non-original spare parts
- Conversion of the heater without permission from Webasto

## 2.3 Using This Document

Read and understand these Installation Instructions before installing the heater.

**WARNING**

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

**CAUTION**

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.

**NOTE**

This signal word is used to highlight operating instructions or procedures which, if not followed or followed correctly, may cause damage to this product or the vehicle/vessel it is installed in.

# 3 Regulations for Installing in Vehicle

Read this installation manual in its entirety before in- stalling this equipment.

## 3.1 Scope

3.1.1 Subject to the provisions of paragraph 3.1.2, internal combustion heaters must be installed in accordance with the requirements contained in this Annex.

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

## 3.2 Position of the Heater

**NOTE**

Improper Handling

Protect the heater against mechanical stress (e.g. dropping, impacts, or knocks).

Do not place any objects on top of the heater.

Do not stand on the heater.

Avoid shutting the heater down incorrectly during the after-running period or while the heater is running.

The heater fan will continue to run for up to several minutes after being shut off.

Always switch the heater off using the control element.

Do not disconnect from the power supply until the after-running period has elapsed.

Only switch the heater off using the battery disconnect in the case of danger or emergency.

Cables damaged from sharp edges can cause short-circuits.

3.2.1 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.

3.2.2 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.

3.2.3 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.

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

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

## 3.3 Fuel Supply

**WARNING**

Do not operate the heater in environments with combustible vapor, flammable dust and hazardous goods (such as gas stations, tank facilities, fuel store, coal bunkers, timber yard, or grain warehouses).

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

3.3.2 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.

3.3.3 A sign must be affixed to the fuel filler neck warning that the heater must be switched off before refuelling. An identical warning must also be included in the manufacturer's operating instructions.

## 3.4 Exhaust System

**WARNING**

Do not operate the heater in an enclosed space, or one that does not have an exhaust extraction unit. Poisoning or suffocation can result.

3.4.1 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.

## 3.5 Combustion Air Inlet

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

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

## 3.6 Water Inlet

3.6.1 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.

3.6.2 The inlet hose must be protected from damage.

## 3.7 Hot Water Outlet

**NOTE**

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 licence.

3.7.1 Hot water hoses 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.

3.7.2 The water outlet hose must be protected so that it cannot be obstructed by other objects or the flow of water through the hoses.

# 4 Technical Data

## 4.1 Technical Data - Thermo Top Evo

| Heater | Thermo Top EVO |
|---|---|
| ECE approval symbol | E1 122R -00 0334 (Heater)<br>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 20% |
| Fuel consumption ± 10 % (control range) | 0.8 to 0.13 gal/h (0.31 to 0.49 l/h) |
| Rated voltage | 12V |
| Operating voltage range | 10 to 16.5 V |
| Nominal power consumption without circulation pump, without vehicle fan ± 10% (control range) | 12 to 21 W |
| Permissible ambient temp | |
| Heater: - Operation | -40 to 176º F (-40 to +80 °C) |
| - Storage | -40 to 248º 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) |
| CO2 in exhaust gas (perm. function range) | 8 to 12 vol.% |
| Dimensions of heater<br>(Tolerance ± 3 mm) | L = Length: 8.6” (218 mm) B =<br>Width: 3.6: (91mm)<br>H = Height: 5.8” (147mm) |
| Weight | 4.8lb. (2.2 kg) |

## 4.2 Technical Data - Circulation Pump

| Circulation Pump | U4847 Econ |
|---|---|
| Volume flow with counter-pressure > 14 kPa | Approx. 450 l/h |
| Rated Voltage | 12V |
| Operating Voltage Range | 10.5 to 17V |
| Rated Power Consumption | ≤ 18W |
| Dimensions, Circulation Pump | Max. length: 109mm Diameter: 48.5mm |
| Coolant Hose connection | 18 mm ID |

## 4.3 Technical Data - Enclosure Box

**NOTE**
Drawing not to scale.

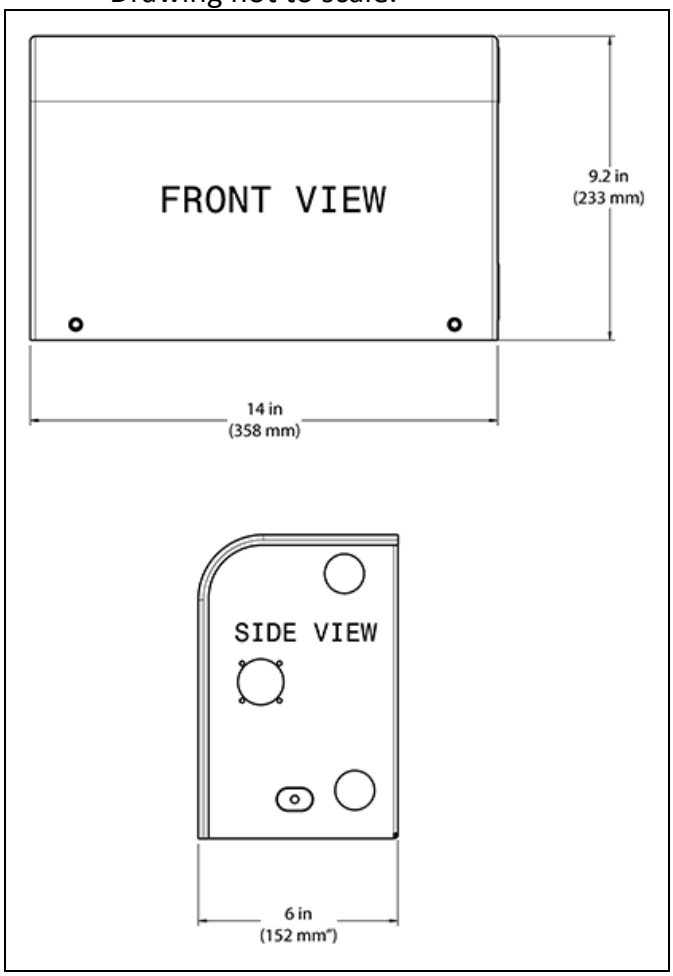



*Fig. 1: Enclosure Box Dimensions*

## 4.4 Technical Data - Mounting Plate

**NOTE**
Drawing not to scale.

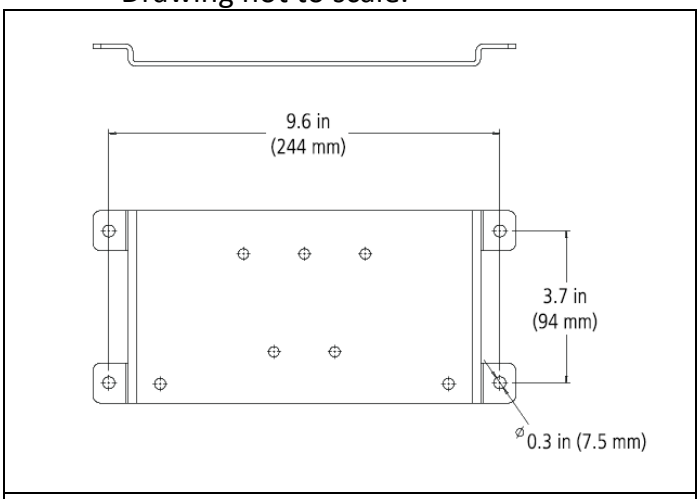



*Fig. 2: Mounting Plate front view*

# 5 Purpose and Version

## 5.1 Purpose of the Coolant Heater

Webasto coolant heaters are used in connection with the vehicle's own heating system

- to heat the cab
- to defrost vehicle windows
- to preheat water-cooled engines
- to heat boats and motorhomes (recreational vehicles)

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

## 5.2 Version Thermo Top EVO

**Thermo Top EVO D**

Water heater utilizing diesel fuel.

# 6 Installation Example

## 6.1 Safety Information

**NOTE**

The water heater must be installed outside the passenger cabin.

The requirements of the latest version of Hazmat regulations must also be observed for the installation of the heater into vehicles used to transport hazardous substances

## 6.2 Installation Location and Position

**NOTE**

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

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 installation must be performed in accordance with the installation instructions provided in this manual.

### 6.2.1 Model plate

The heater 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 removed from the model plate.

### 6.2.2 CE Mark

The Thermo Top Evo 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:
Installation in the engine compartment provides sufficient screening of radio interference.

## 6.3 Heater Components

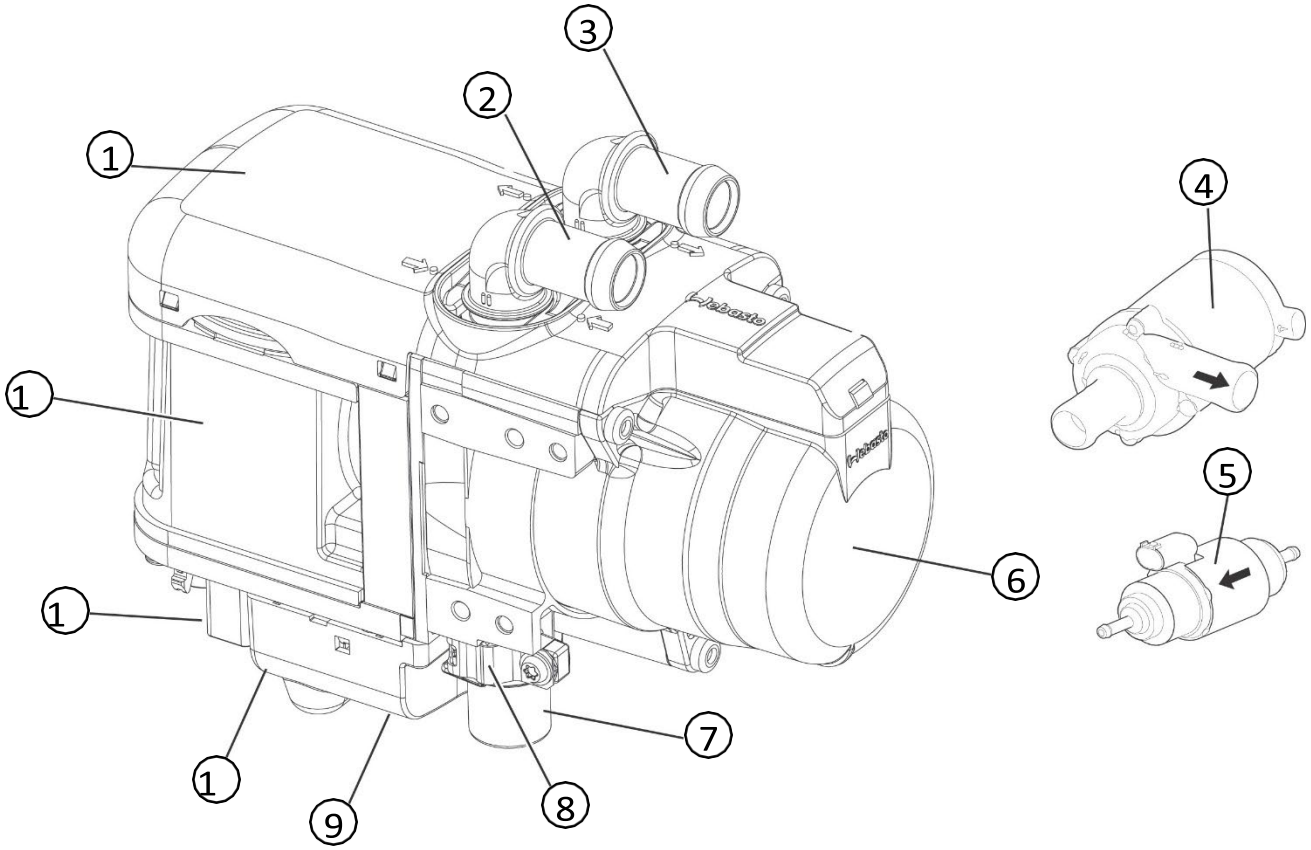



*Fig. 3: Thermo Top Evo Components*

| | | | |
|---|---|---|---|
| 1 | Combustion Air Fan | 7 | Exhaust Outlet |
| 2 | Water Inlet | 8 | Exhaust Gas Temperature Sensor |
| 3 | Water Outlet | 9 | Fuel Inlet |
| 4 | Circulation Pump | 10 | Air Inlet |
| 5 | Fuel Metering Pump | 11 | Control Unit |
| 6 | Combustion Chamber | 12 | Burner Motor |

## 6.4 Mounting the Heater to the Vehicle

### 6.4.1 Allowable Mounting Positions

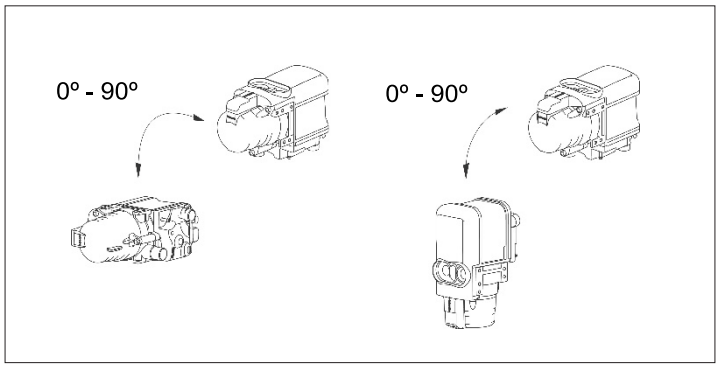



*Fig. 4: Thermo Top EVO Orientation*

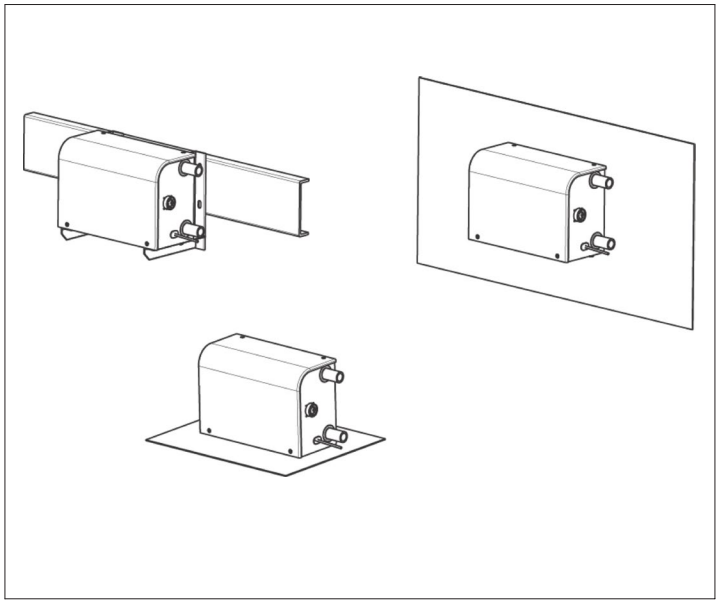


*Fig. 5: Allowable Enclosure Kit Mounting Positions*

### 6.4.2 Standard Mounting Bracket

The heater must be fastened on the bracket with at least 3 (three) M5 bolts torqued to 6 lb-ft (8Nm). The heater fastening screws are approved for bracket metal thickness of 0.06 in – 0.12 in (1.5 mm – 3.0 mm). The following figure is an example of a Thermo Top Evo bracket.

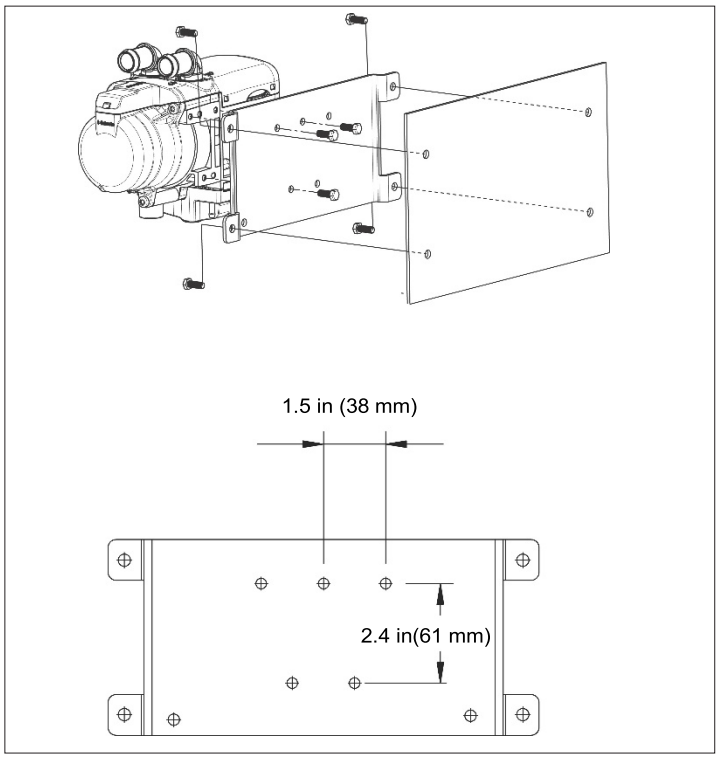



*Fig. 6: Thermo Top Evo Standard Bracket Exploded View and Dimensions*

**CAUTION**

Before drilling holes in the frame, consult the manufacturer for guidelines and restrictions!
Do not weld vehicle frame or flanges!

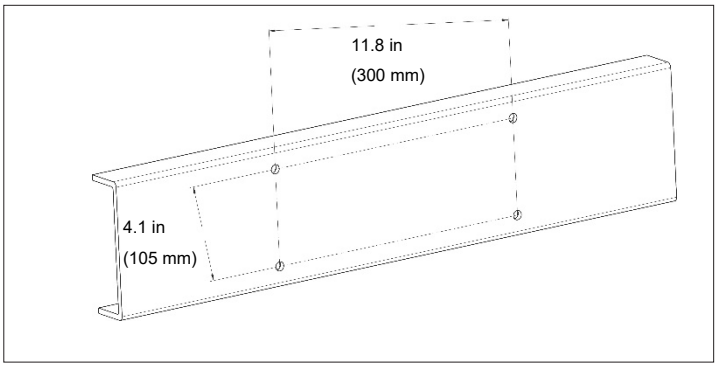



*Fig. 7: Mounting Hole Dimensions – Enclosure Box*

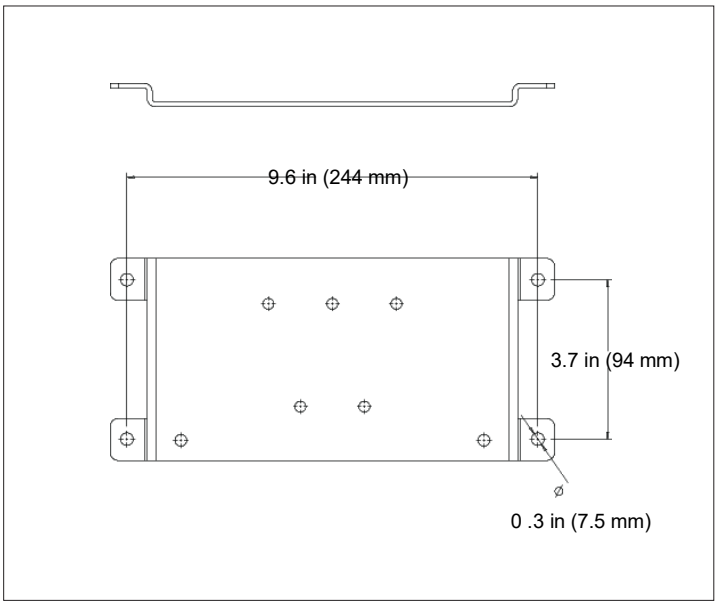



*Fig. 8: Mounting Points – Mounting Plate*

# 7 Coolant System

**WARNING**

The vehicle's cooling system is pressurized. Allow the system to cool before working on the cooling system. Failure to do so can cause burns.

The cooling system must be bled carefully before using the heater for the first time or after the cooling system has been serviced.

A properly bled cooling system can be identified by the circulating pump operating virtually silent. Improper bleeding may cause the heater to fault due to an overheat condition. Refer to the workshop manual for fault codes and diagnosis.

## 7.1 System Connections

Separate the heater supply and return connections at the engine as far apart as is practical for optimum engine heating and heater performance when the heater is used for engine pre-conditioning.

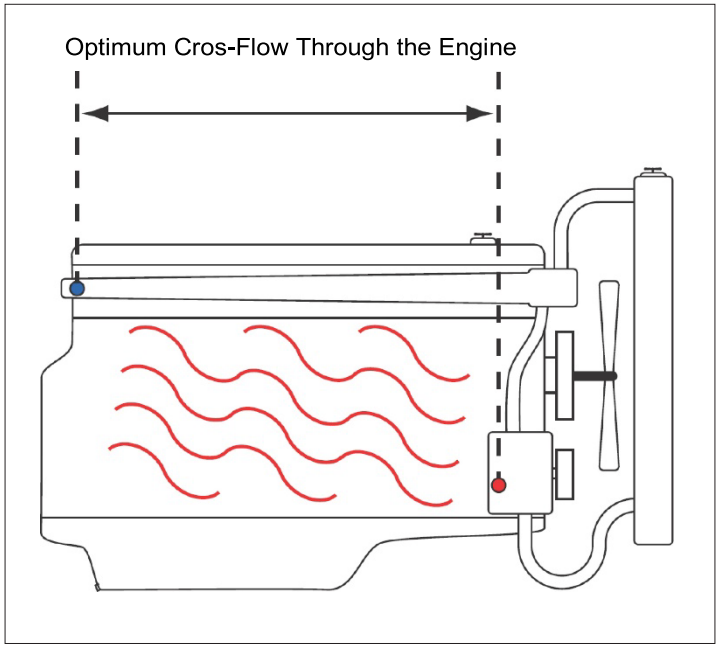



*Fig. 9: Ensure Optimum Cross-Flow*

The heater is connected to the vehicle's cooling system. The coolant quantity present must at least be equal to the volume specified. See Coolant Specifications in the Technical Data table on page 9. Heater hoses used in this installation must at least comply with SAE 20 R3 specifications. The hoses must be routed without kinking and preferably uphill from the heater to ensure proper bleeding.

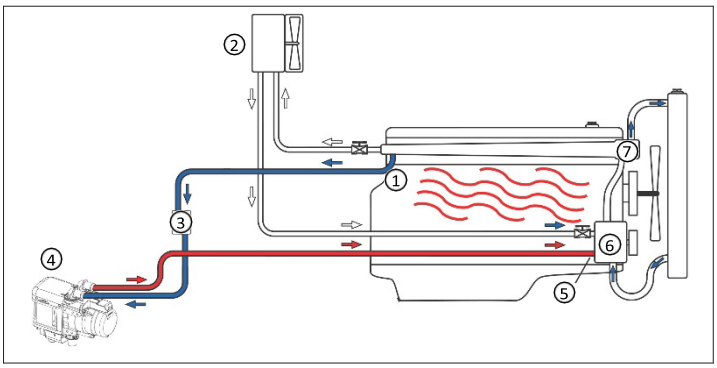



*Fig. 10: Typical Pre-Heating System Configuration*

| | | | |
|---|---|---|---|
| 1 | Coolant Supply Connection | **5** | Coolant Return Connection |
| 2 | Vehicle Heat Exchanger | **6** | Engine Water Pump |
| 3 | Coolant Pump | 7 | Thermostat |
| 4 | Thermo Top EVO | | |

## 7.2 Heater Connections

Refer to Fig. 11, 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.

**NOTE**

The heater 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 lb-ft (7 Nm).

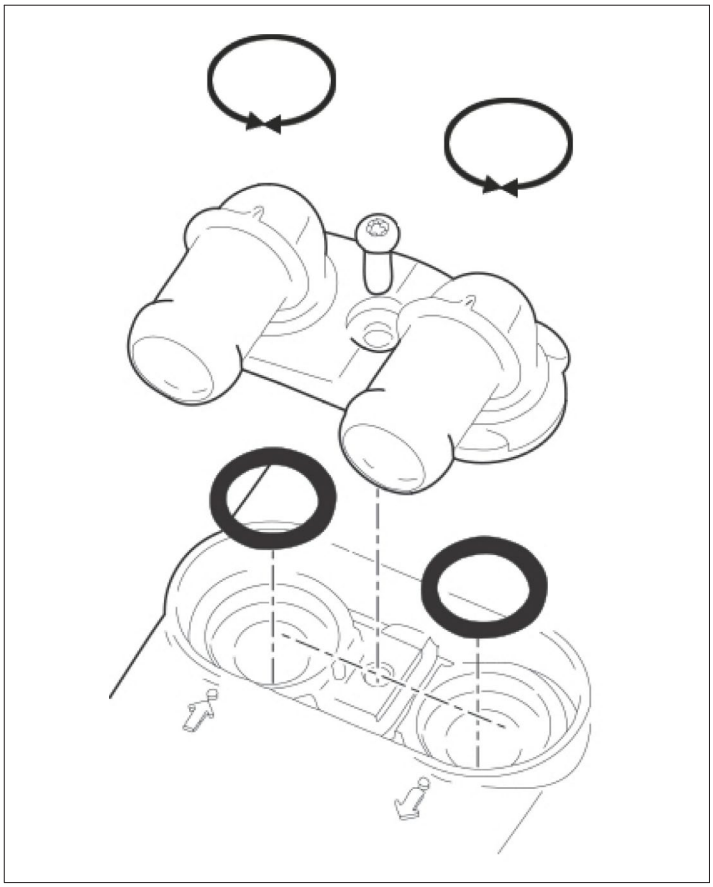


*Fig. 11: Coolant Connections at Heater (90º shown, straight similar)*

## 7.3 Coolant System Connections

**NOTE**

The hose clamps must be tightened with a torque of 40 lb. in. (4.5 Nm). The use of silicone hose requires special hose clamps.

The coolant quantity in the coolant circuit corresponds to the minimum volume specified in Technical Data on page 9.

The heater should preferably be integrated into the coolant system close to the inlet of the vehicle heat exchanger. Connect the heater to the vehicle coolant system as shown in Coolant System on page 15.

**NOTE**

The straight coolant fittings are 5/8 in (16 mm). The 90º fittings are ¾ in (19 mm). Be sure to use the appropriate size hose.

Route coolant hoses in such a way to avoid kinks and pinches. Be sure the hoses run slightly uphill from the heater to help in bleeding the coolant system.

Secure hose connections using hose clamps.

**NOTE**

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.

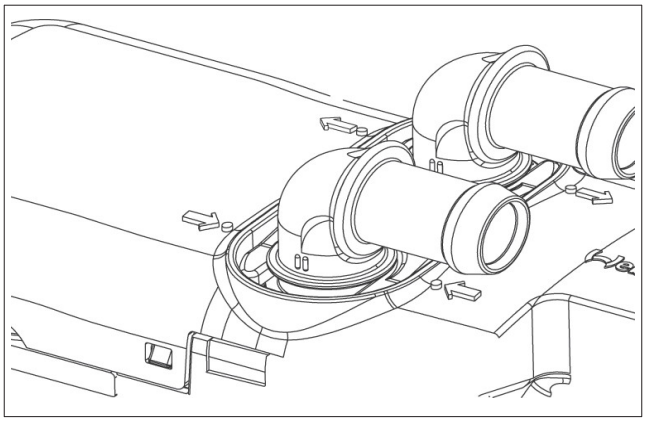


*Fig. 12: Flow Direction Arrows*

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.

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

## 7.4 Circulation Pump Installation

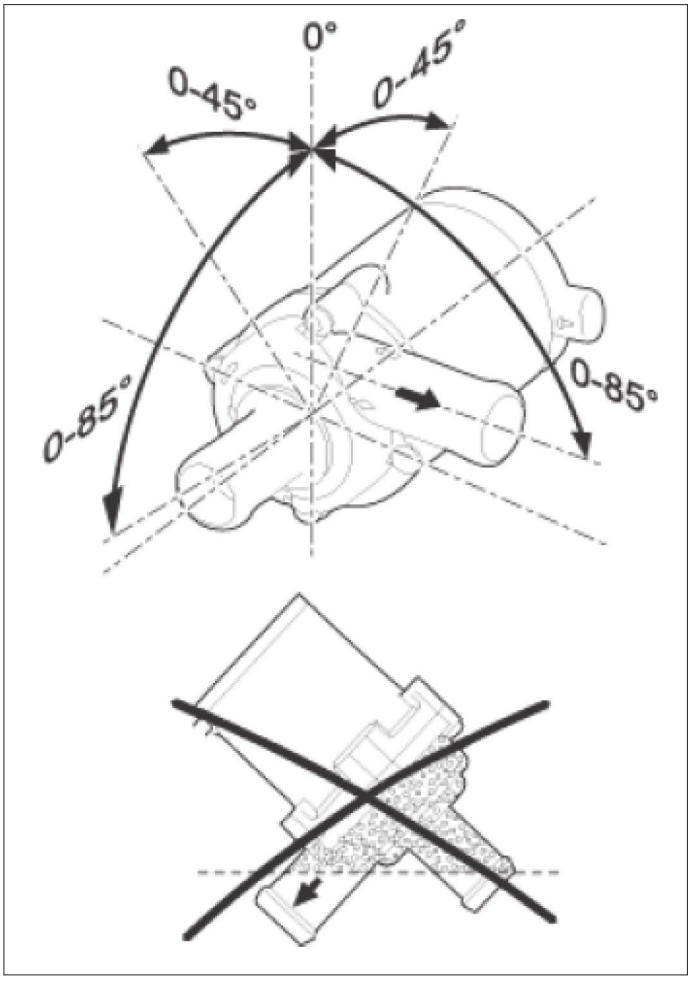



*Fig. 13: Circulation Pump Installation Positions - U4847*

In most cases, the circulation pump comes pre-assembled and is attached to the heater mounting bracket. 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 from the circulation pump to the vehicle's 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.

## 7.5 Inspecting the Coolant System

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 the radiator thermostat opens.

# 8 Fuel Supply

## 8.1 Extracting Fuel from a Fuel Tank

This separate fuel pickup precludes any effect of pressure.

Where available, a spare NPT threaded port can be used for the standpipe. If a spare port is not present, follow the instructions.

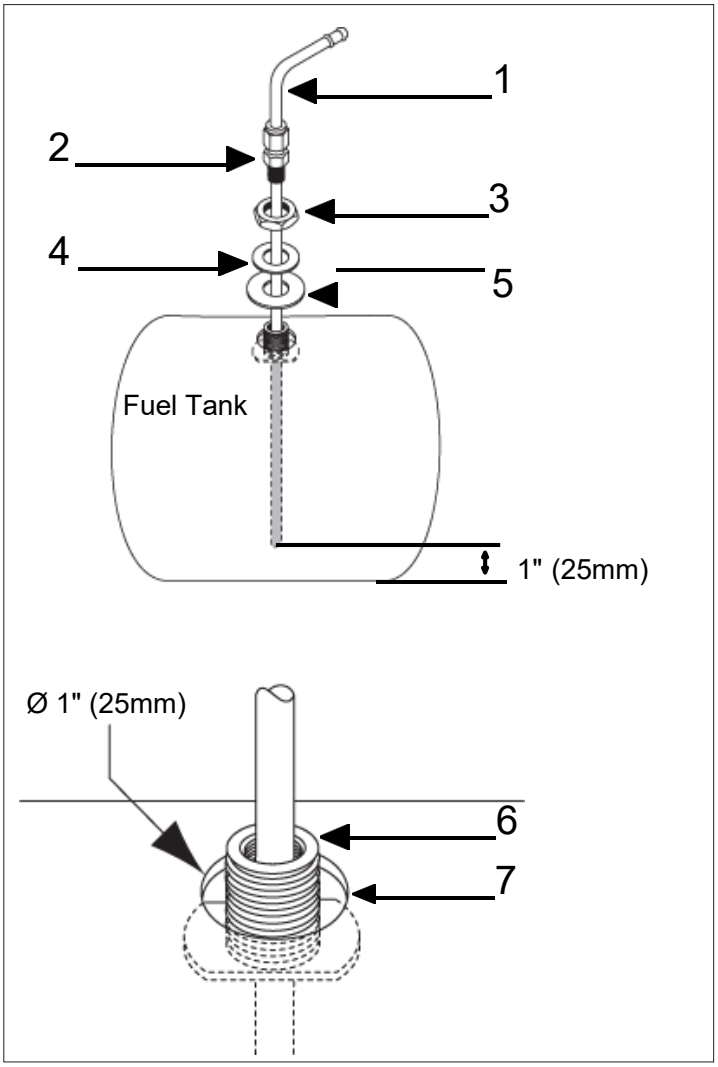



*Fig. 14: Fuel Standpipe*

1 Fuel standpipe
2 Compression fitting
3 Hex nut
4 Metal washer
5 Rubber washer
6 Tank boss (1/4” NPT)
7 1” (25mm) hole

### Separate Fuel Tank

A plastic or metal fuel tank may be installed. 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.

Install an appropriate tank extracting device based on the fuel tank material.

### All Fuel Tanks

The fuel system will build positive pressure in high-ambient-temperature conditions. Relieve pressure by removing the fuel filler cap or waiting for the fuel tank to cool down.

- Only drill a hole in the top of the fuel tank if installing a fuel standpipe.
- After any drilling or cutting is performed, clean and deburr the hole to eliminate potential leak paths.
- Clean the installation surface of the tank extracting device.
- In installed position, maintain a minimum distance of 1 in (25 mm) between the standpipe and base of the fuel tank / fuel delivery unit.
- Position the tank extracting device vertically.
- Use the specific tank extracting device (standpipe) approved by the manufacturer.
- Make sure that the standpipe of the tank extracting device does not impair the operation of the vehicle’s fuel delivery unit or fuel gauge in any operating mode.

## 8.2 Fuel Standpipe Installation

The fuel pickup is carried out by use of a fuel standpipe. The standpipe is designed to fit a 0.25 in (6mm) fitting, available on some fuel tanks. If no fitting is available drill a 1 in (25mm) hole and install the fittings as shown in Fuel Standpipe on page Fig. 14].

When extracting fuel, ensure that it is not blocked by check valves. In addition, make sure that the standpipe sits approximately 1 in (25mm) 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.
Refer to Fuel Standpipe on page Fig. 14]

### To install the standpipe:

1 - bore a 25mm (1”) hole through top of fuel tank.
2 - remove sharp burrs and smooth edges with emery cloth.
3 - determine length of standpipe when installed. End should sit at least 25mm (1”) above tank bottom.
Cut off excess standpipe at a 45-degree angle. Remove burrs.
4 - loosely assemble items.
5 - place sealing compound on threads of item 2 and thread into item 6. Tighten item 2 completely.
6 - slide standpipe into hole at angle. Slip one shoulder of item 6, inside the hole as shown.

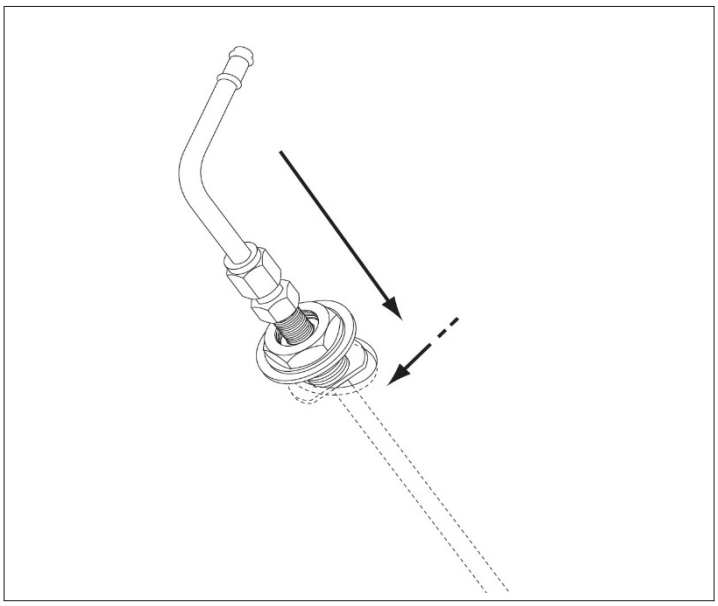


*Fig. 15: Standpipe Installation - Illustration 1*

7 - bring the standpipe up to vertical and insert the opposite shoulder through the hole in the tank.

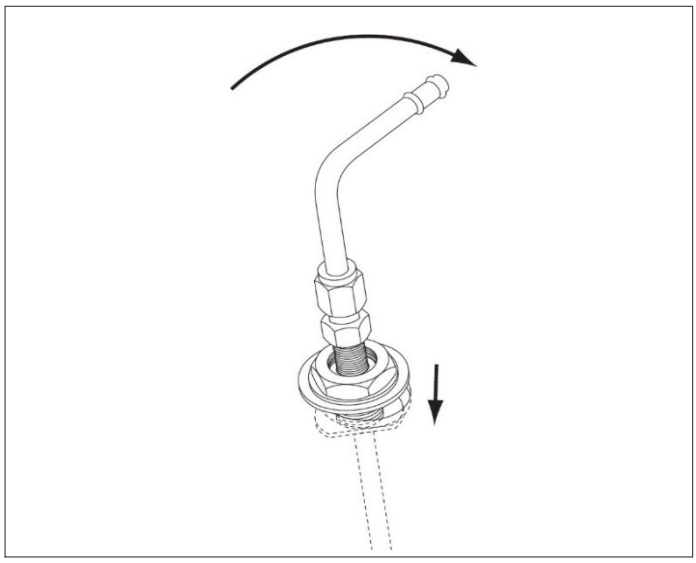


*Fig. 16: Standpipe Installation – 2*

8 - Center the standpipe in the hole in the fuel tank.

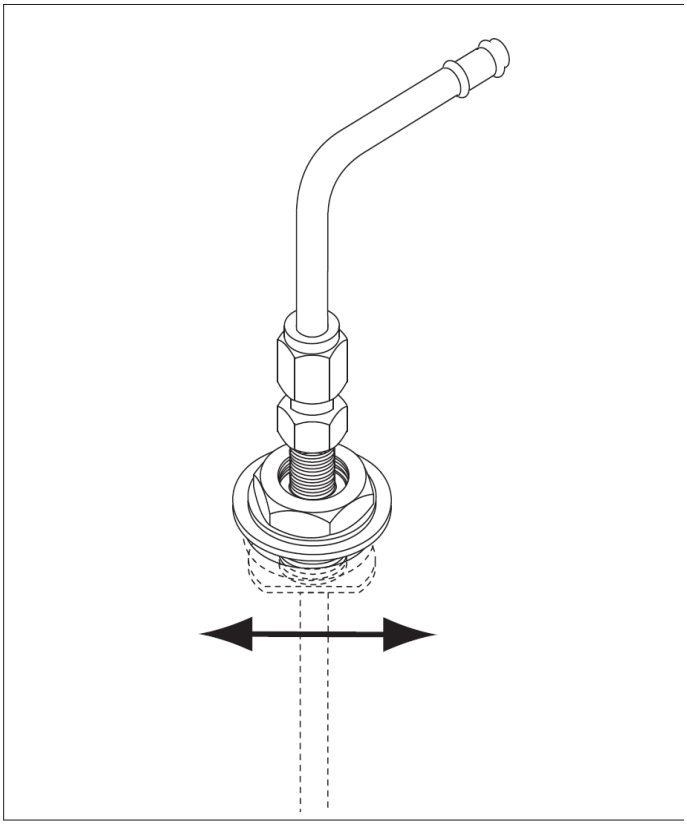


*Fig. 17: Standpipe Installation – 3*

9 - Pull up on the standpipe and tighten in place with the clamping nut (item 1). Do not overtighten the nut to prevent the rubber washing becoming distorted.

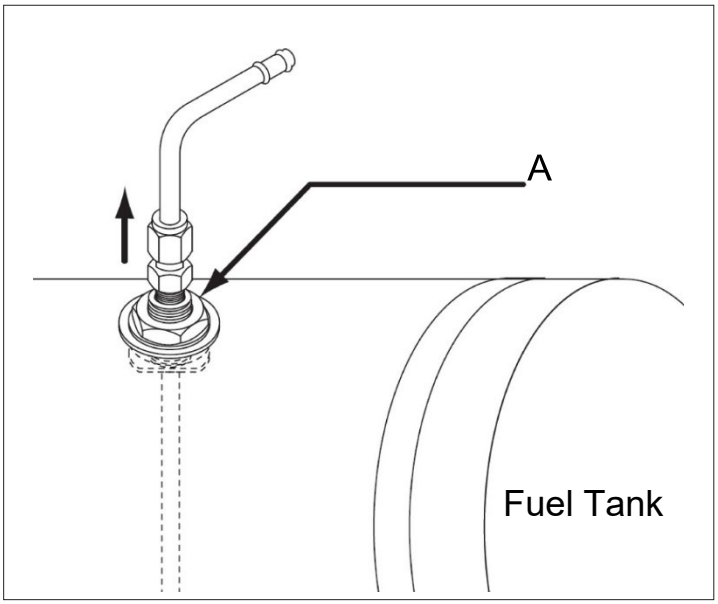



*Fig. 18: Standpipe Installation - 4*

## 8.3 Fuel system overview

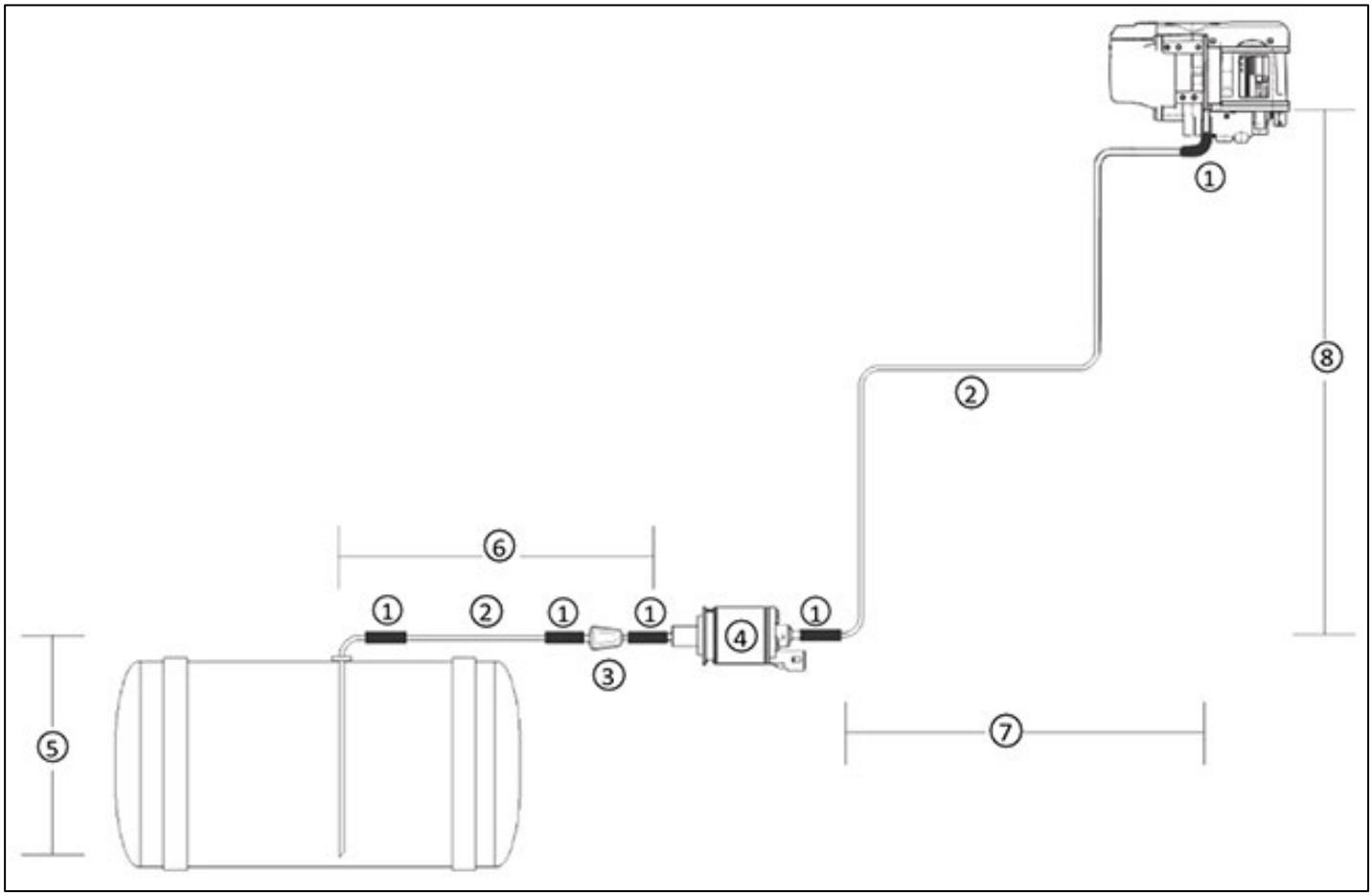



*Fig. 19: Fuel System Parameters*

1 Fuel Line Coupler
2 Fuel Line
3 Fuel Filter
4 Fuel Dosing Pump
5 Max Suction Height (A) = 3’ 3” (1m)
6 Max Suction Length (A + B) = 9’ 9” (3m)
7 Max Delivery Length (C + D) = 28’ 3” (9m)
8 Max Delivery Height (D) = 9’ 9” (3m)

## 8.4 Fuel Lines

**CAUTION**

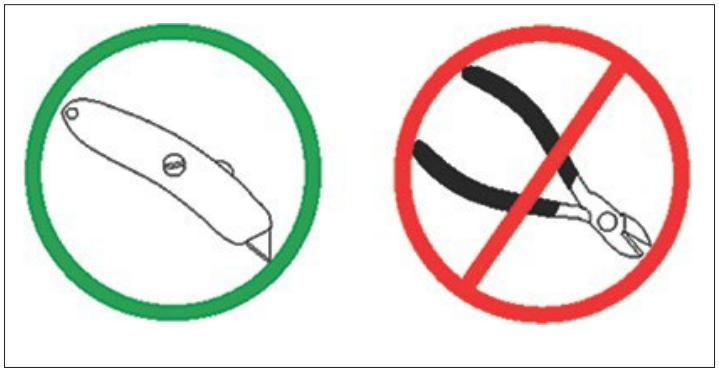
Do not use biodiesel with copper fuel lines. Failure to follow this instruction will result in damage to the heater and fuel system.

Since the lines normally cannot be routed with a constant rising gradient, the internal diameter must not be allowed to exceed a specific size. Air or gas bubbles will accumulate in lines with an internal diameter that is larger than is provided. These will cause malfunctions while the heater is operating if the lines sag or are routed downwards. The lines should not be routed downwards from the metering pump to the heater.

Unsupported fuel lines must be secured to prevent them from sagging. The fuel line must be installed in such a way that it cannot be damaged by flying road debris and high temperatures, i.e. close to the exhaust line. The fuel line must be secure at the connections using hose clamps to prevent slipping.

**NOTE**

Always cut fuel lines in such a way that you won't cause burrs. Be sure to check for, and remove burrs after each fuel line cut.



The correct procedure for connecting fuel lines is shown below. 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.

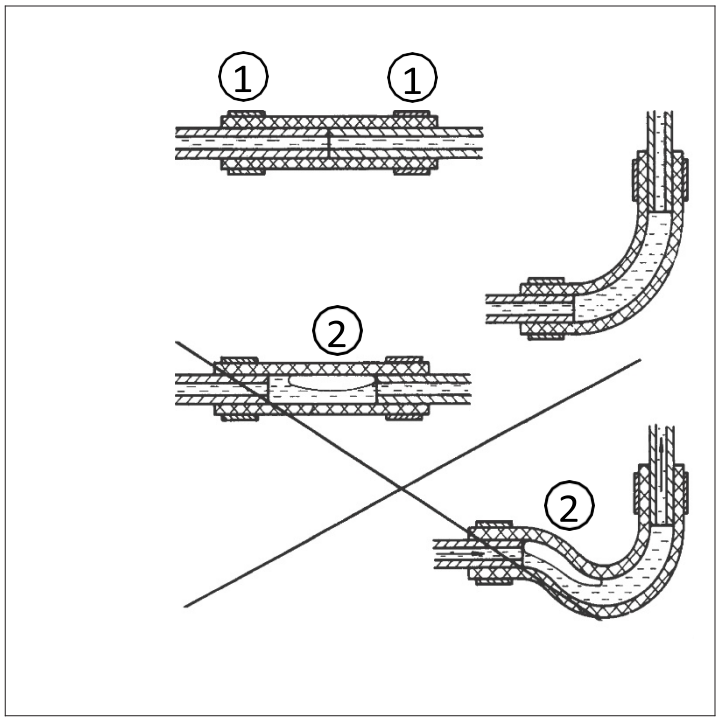



*Fig. 20: Fuel Line to Coupler Hose Location*

1 Clamp 2 Bubble

## 8.5 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.

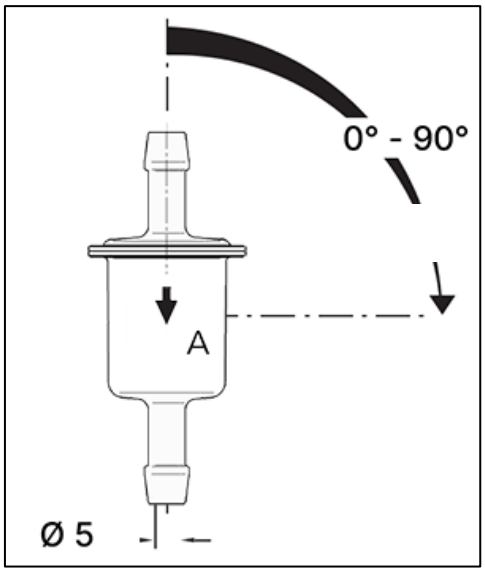



*Fig. 21: Fuel filter Orientation*

## 8.6 Fuel Metering Pump

The fuel metering pump is a combined pumping, metering and shut-off system. This dry-primeable solenoid-style piston pump pumps the fuel from the vehicle fuel tank to the fuel connection piece of the heater via fuel lines. Installation is usually carried out near the fuel tank. The metering pump contains no pulsation damper. The metering pump is connected to the control unit via the heater-unit wiring harness and to an earthing point on the vehicle body.

**NOTE**

Only the model DP42 fuel metering pump may be used for the Thermo Top EVO heater. Observe the model designation on the component for this purpose. When replacing the metering pump, the $CO_2$ settings must be checked.

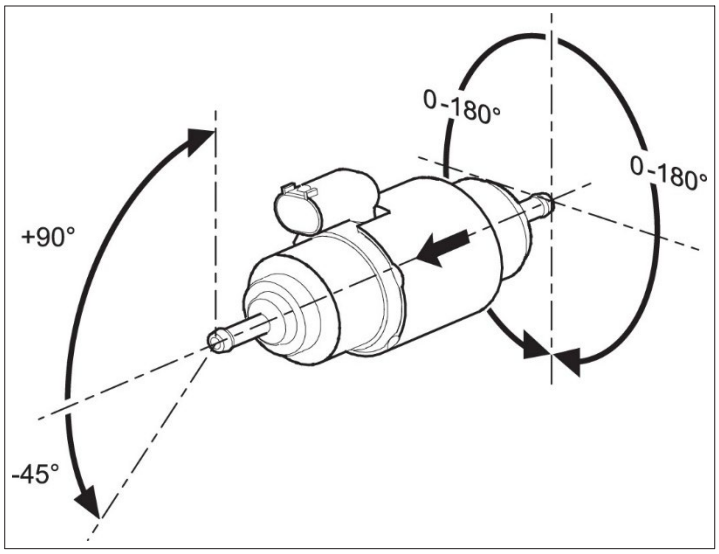



*Fig. 22: DP42 Metering Pump Orientation*

# 9 Combustion Air System

## 9.1 General

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 that it cannot become clogged with dirt or snow and cannot suck in splashing water.

**NOTE**

The combustion air must be extracted using a combustion air tube from a position that is as cool as possible and protected from splashing water.

**NOTE**

If the combustion air intake tube cannot be installed so that it slopes downwards, a water drain hole with a diameter of 5/32 in (4 mm) is to be made at its lowest point.

- There is no pressure difference (positive or negative) between the exhaust gas outlet and the combustion air inlet.
- Combustion air is not extracted from enclosed areas used by people.
- The combustion air intake must route in such a way that the intake will not terminate in the vicinity of the heater's or vehicle's exhaust pipe.
- The combustion air intake opening has the following requirements:
  - It must be positioned in a cool place above the maximum permissible fording level of the vehicle, in a location protected from spray.
  - It must not be possible for it to become clogged with dirt.
  - It must not be possible for it to draw in exhaust gases.
  - The combustion air intake opening does not face in the direction of travel.
- When installing the heater in the same compartment as the vehicle's fuel tank:
  - Combustion air must be drawn in from outside.
  - Exhaust gas must be routed to the outside.
  - Through holes must be splash-proof.

## 9.2 Combustion Air Silencer (Optional)

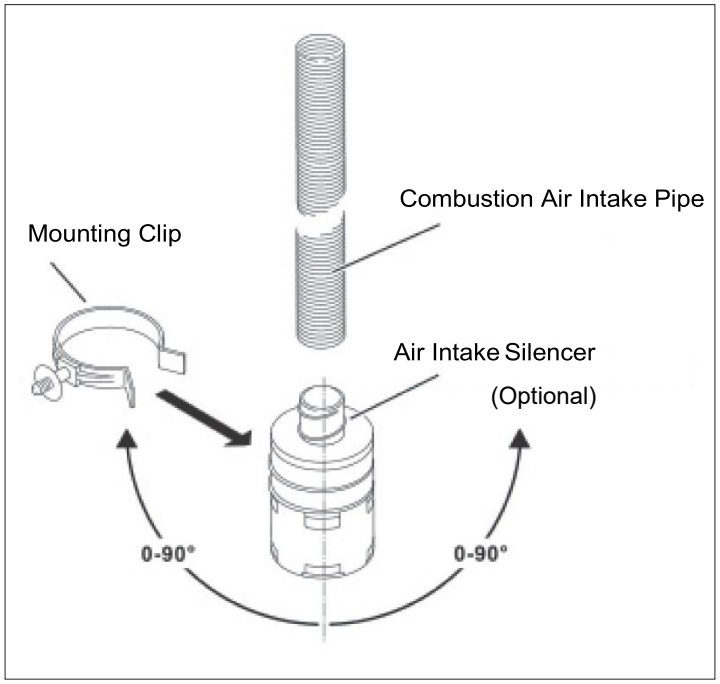



*Fig. 23: Optional Air Intake Assembly*

**NOTE**

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.

# 10 Exhaust System

Exhaust System Safety Information

**WARNING**

Do not direct the exhaust outlet toward highly flammable or heat-sensitive parts. Failure to do so can cause a fire.

**WARNING**

Protect vehicle components in the vicinity of the exhaust system from overheating by implementing the following measures:

- Maintain minimum safety distances.
- Ensure adequate ventilation.
- Use fire-resistant materials or heat shields.
- Always comply with any applicable legal requirements.

**WARNING**

Exhaust pipes must not be routed through the interior of the vehicle.

Exhaust has must be routed outside of, and beyond the edge of the vehicle. Failure to do so can cause exhaust gas to leak inside of the vehicle causing illness and death.

The exhaust pipe (inside diameter 0.86” (22 mm) can be routed with several bends; not to exceed a total of 270°, minimum bending radius 2” (50 mm). The total line length must be between 1’ 6” and 3’ 3” (0.5 and 1m).

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 to temperature-sensitive vehicle parts. Sufficient spacing (at least 0.8” (20mm) to temperature-sensitive components must be ensured. Thermal insulation of the exhaust pipe is permissible.

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

**NOTE**

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 a distance of less than 6” (150 mm) 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 0.4” (10 mm).

Rigid pipes comprised of stainless steel with a minimum wall thickness of 0.04” (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.

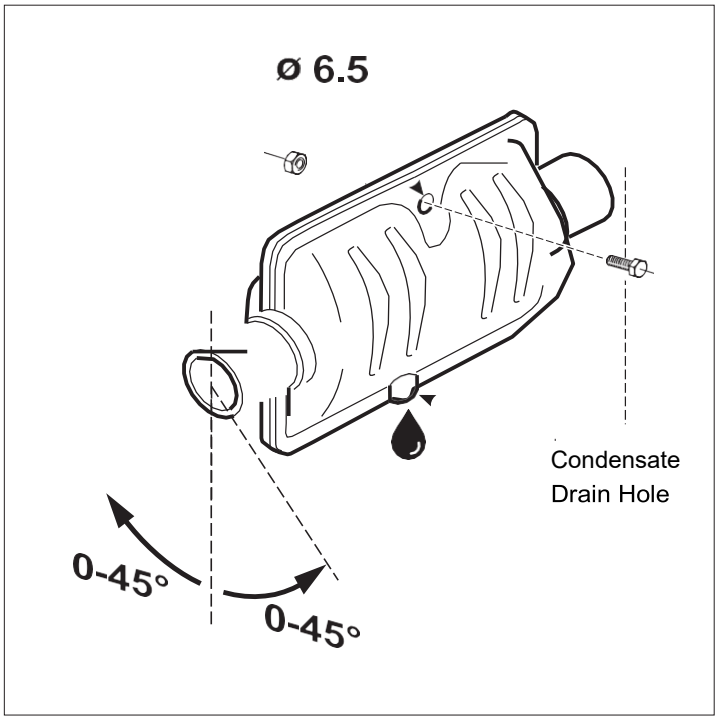



*Fig. 24: Optional Exhaust Muffler*

The exhaust gas outlet must be oriented in line with the following specifications:

- The exhaust gas must flow unobstructed.
- The exhaust gas outlet must not be blocked by debris.

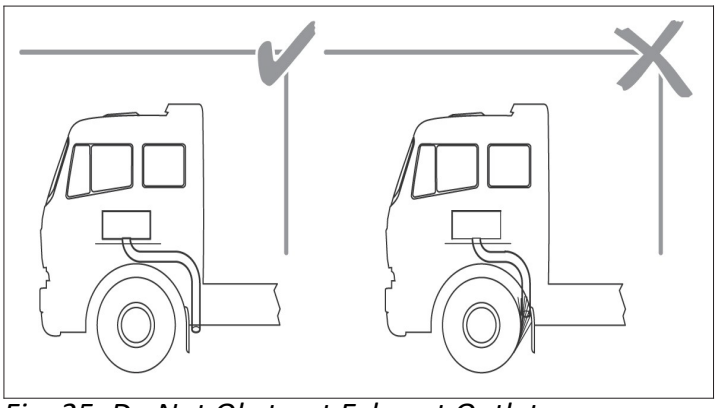


*Fig. 25: Do Not Obstruct Exhaust Outlet*

- Exhaust gas outlet must not face in the direction of travel.

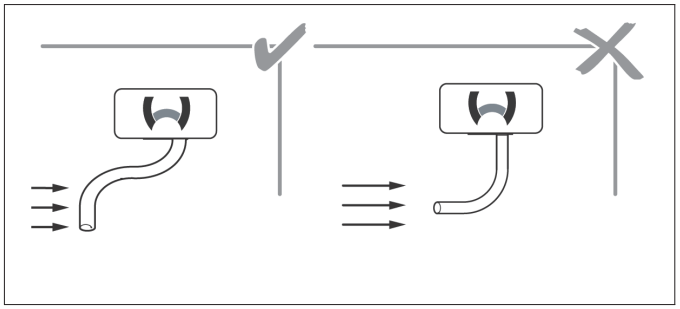


*Fig. 26: Exhaust Pipe Orientation*

- Exhaust gas must not enter the vehicle interior (e.g. through openings, ventilation equipment).
- The exhaust gas must not be drawn in as combustion air.
- The exhaust gas outlet is not too close to the ground.
- The exhaust line must continue for at least 3/8 in (10 mm) after passing through the underbody cover or skirt.
- Secure the exhaust line maximum 6 in. (150 mm) from the exhaust gas outlet so that the exhaust gas emerges at an angle of 90° ± 10° to the ground.

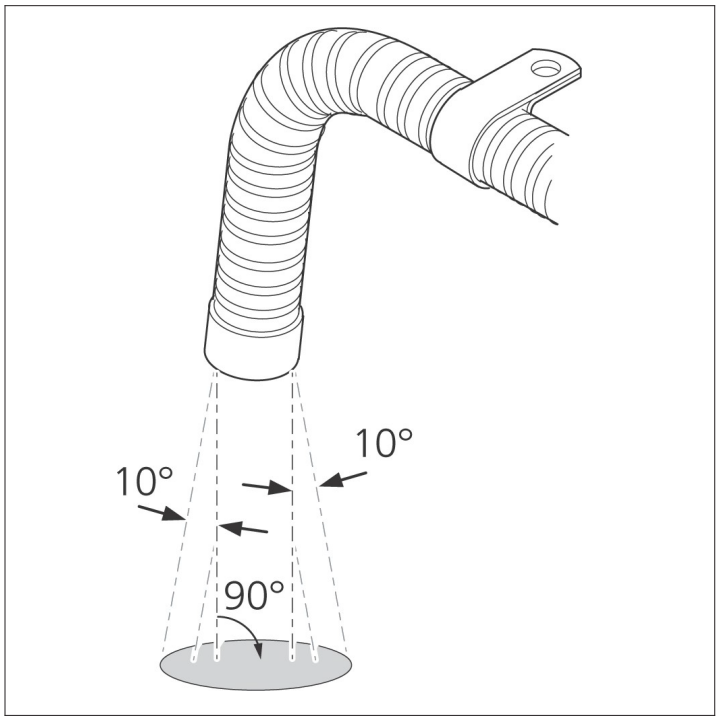



*Fig. 27: Exhaust Outlet Angle*

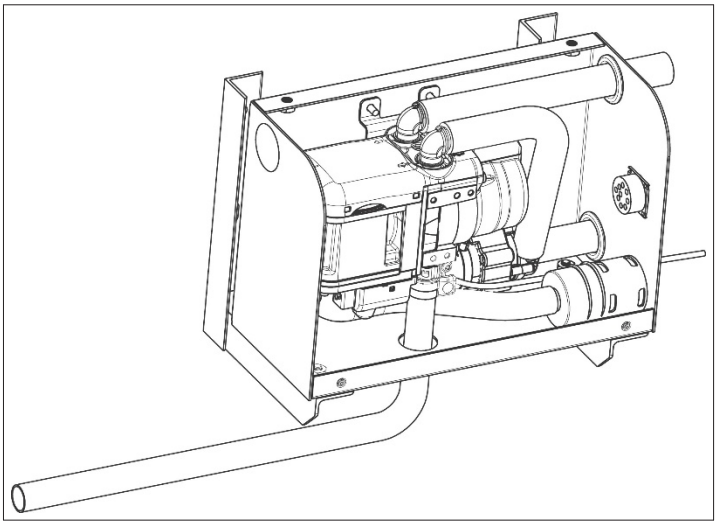


*Fig. 28: Exhaust Installation - Enclosure Box*

# 11 Electrical Connections

**WARNING**

The size (gauge) of the wire must be sufficient for the expected current flow. The supplied wiring harness is sized for maximum length and must not be lengthened. Failure to follow this direction can result in fire.

**WARNING**

All wiring must be insulated against cuts and abrasions. Failure to follow this instruction may result in fire, or inoperative components.

**WARNING**

All electrical circuits must be protected with fuses or automatic circuit breakers.

**WARNING**

Electrical cables and harnesses must be routed and firmly secured in such a way as to prevent against mechanical and thermal stresses. Failure to follow this instruction can result in a fire and / or the heater or its components becoming inoperative.

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

- Check the data on nameplate to verify 12- or 24-volt rating.
- Disconnect the vehicle's battery(ies) before installing the heater.
- Make sure the electrical system is correctly grounded.
- Always comply with legal requirements.

**CAUTION**

All the cables and wires that are not required to be connected must be insulated against accidental shorting or grounding.

## 11.1 Battery Connections

**WARNING**

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

The heater's power supply must 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 the wire harness from the Webasto heater to battery box.
2. Strip and crimp the wires using the supplied ring terminals to the positive (red) and negative (brown) wire leads.
3. Clean any corrosion from the battery terminals.
4. Connect the leads to the battery terminals.
5. Protect connections with an anti-corrosion compound designed for use with electrical connections and battery terminals.

## 11.2 Switch and Timer Connections

Install and connect the control element (SmarTemp or rocker switch) per the instructions included with the control element and the Wiring Diagrams.

The heater can be switched ON and OFF using the following Webasto controls:

### 11.2.1 Rocker Switch Installation

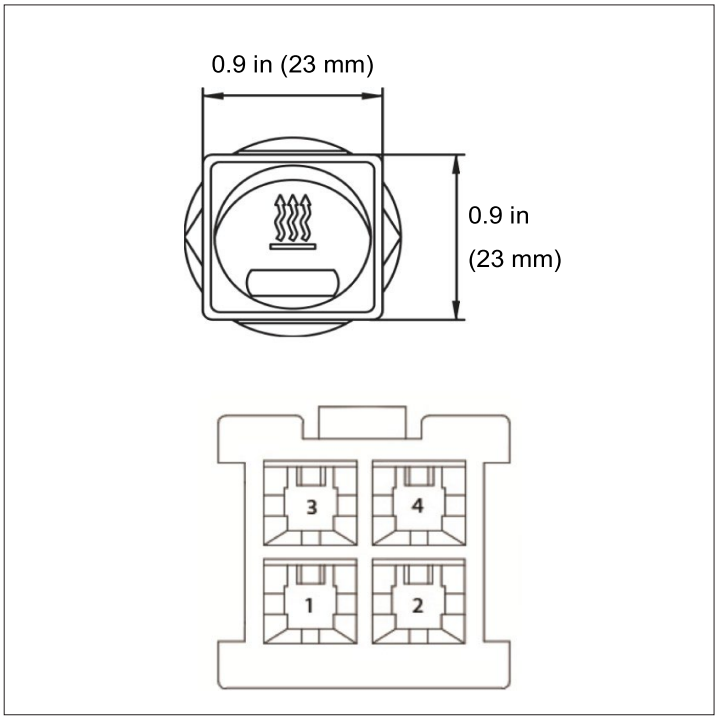



*Fig. 29: Rocker Switch Installation*

1 Red (power)
2 Brown (ground)
3 Black or Grey (ON/ OFF signal)
4 Green (diagnostic blink code)

1. Select a suitable location in the vehicle for the ON/OFF rocker switch to mount.
2. Drill a ¾ in (19 mm) hole for the switch.
3. Route the harness between the heater and the switch, secure the harness along its length with wire ties. If possible, use an existing hole in the bulkhead or drill a hole in a suitable location. Protect the harness with a grommet at the bulkhead.
4. Connect the electrical connector to the switch.

### 11.2.2 SmarTemp 2.0 fx Installation


*Fig. 30: SmarTemp 2.0 fx Connections*

1 Red (power)
2 Brown (ground)
3 Black or Grey (ON/ OFF signal)
4 Green (diagnostic blink code)

**NOTE**

Always make sure there are no obstacles behind the mounting location prior to drilling.

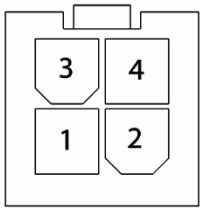
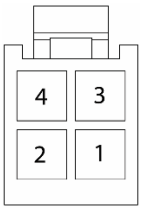
**NOTE**

Ensure good readability when selecting installation location.

**NOTE**

Observe information on adhesive labels and colored markings when connecting the control element to vehicles wiring harness.

### 11.2.3 SmarTemp Control 3.0 and 3.0 Bluetooth Installation

| 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<br>http://www.molex.com | | | |

* Only used in original-equipment installations

**NOTE**

Always make sure there are no obstacles behind the mounting location prior to drilling.

**NOTE**

Ensure good readability when selecting installation location.

**NOTE**

Observe information on adhesive labels and colored markings when connecting the control element to vehicles wiring harness.

The control element should be installed in a suitable location on a flat surface if possible, in a visible area.

- Connect control element to existing connectors on heater-unit wiring harness.
- Use the drilling dimensions 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 unit 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.

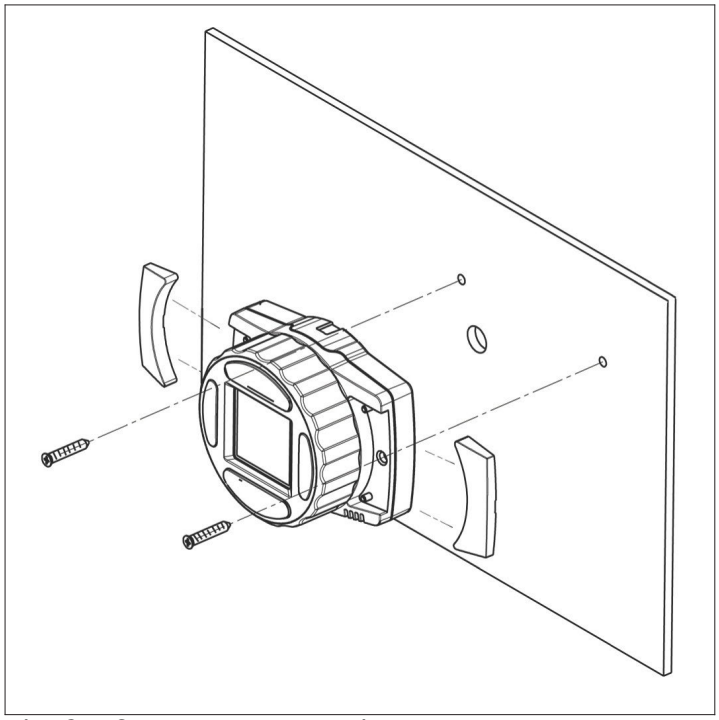


*Fig. 31: SmarTemp Mounting*

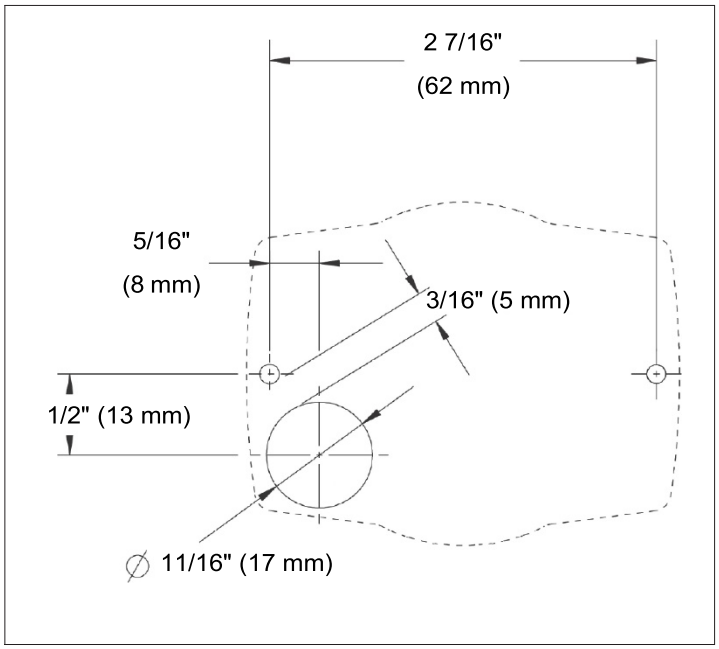



*Fig. 32: SmarTemp Drilling Dimensions (Not to scale)*

# 12 Wiring Diagrams

## 12.1 Thermo Top Evo with On/Off switch

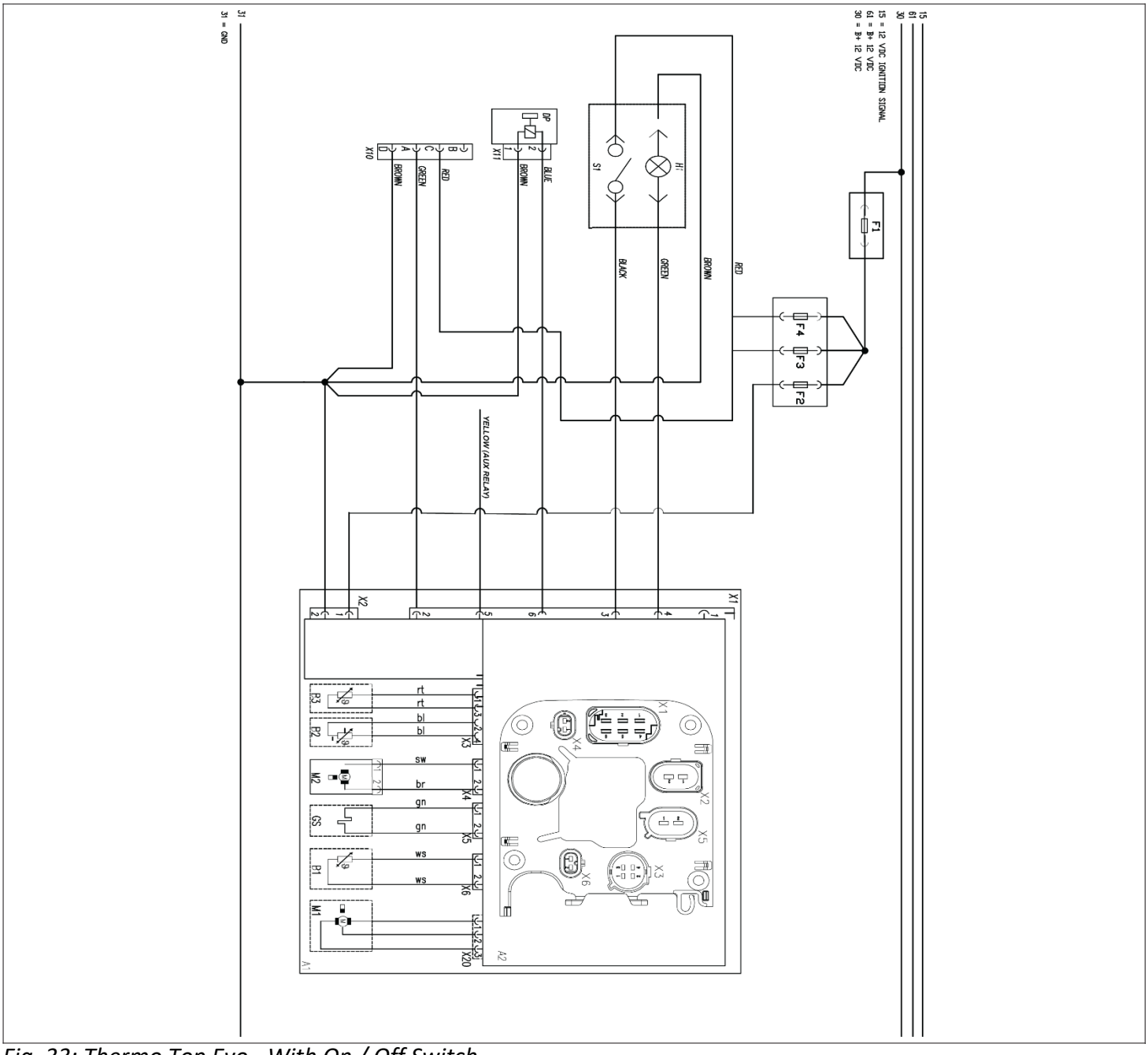



*Fig. 33: Thermo Top Evo - With On / Off Switch*

## 12.2 Thermo Top EVO with SmarTemp 2.0

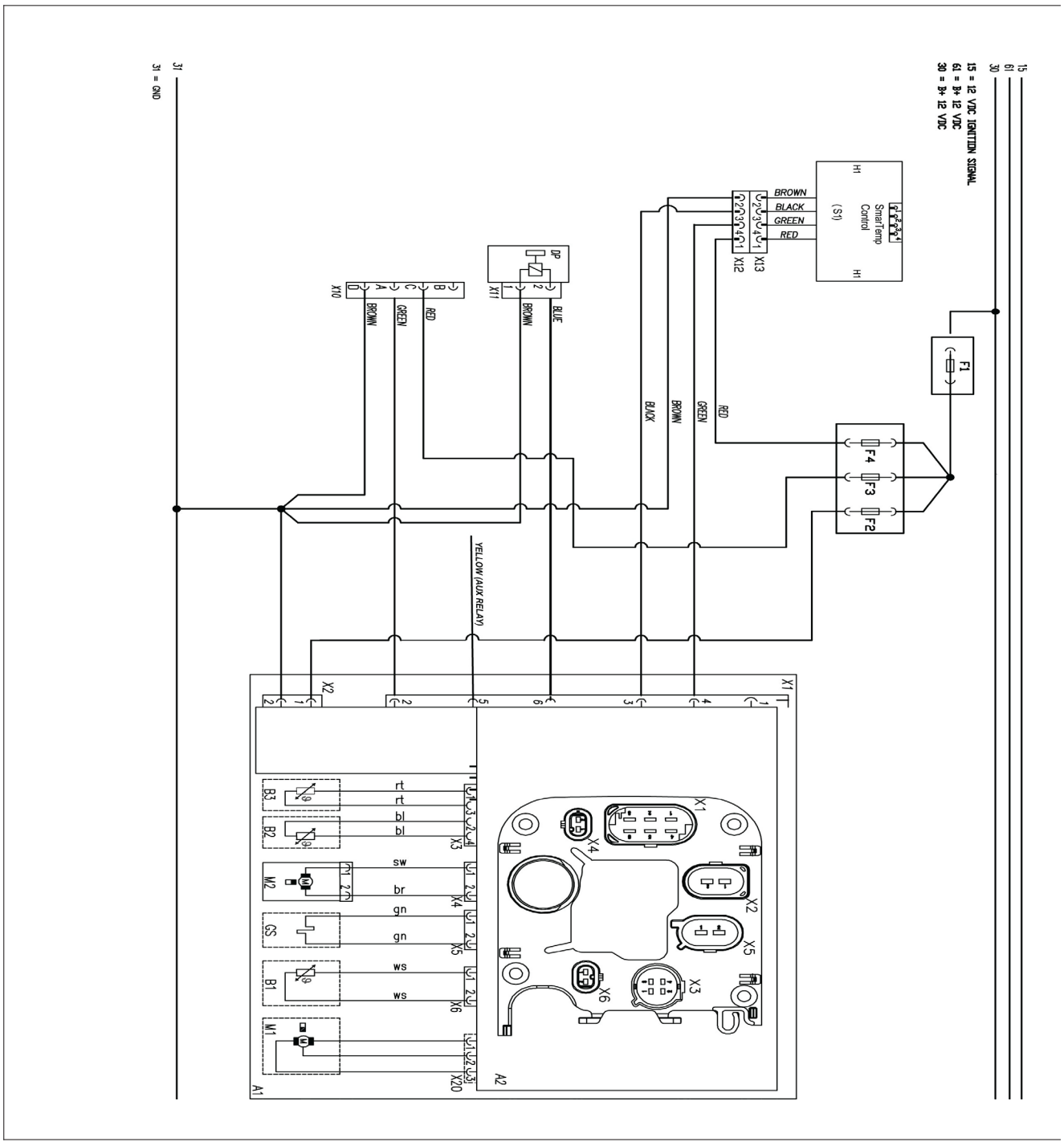



*Fig. 34: ThermoTop EVO with SmarTemp 2.0*

## 12.3 Thermo Top Evo with SmarTemp 3.0

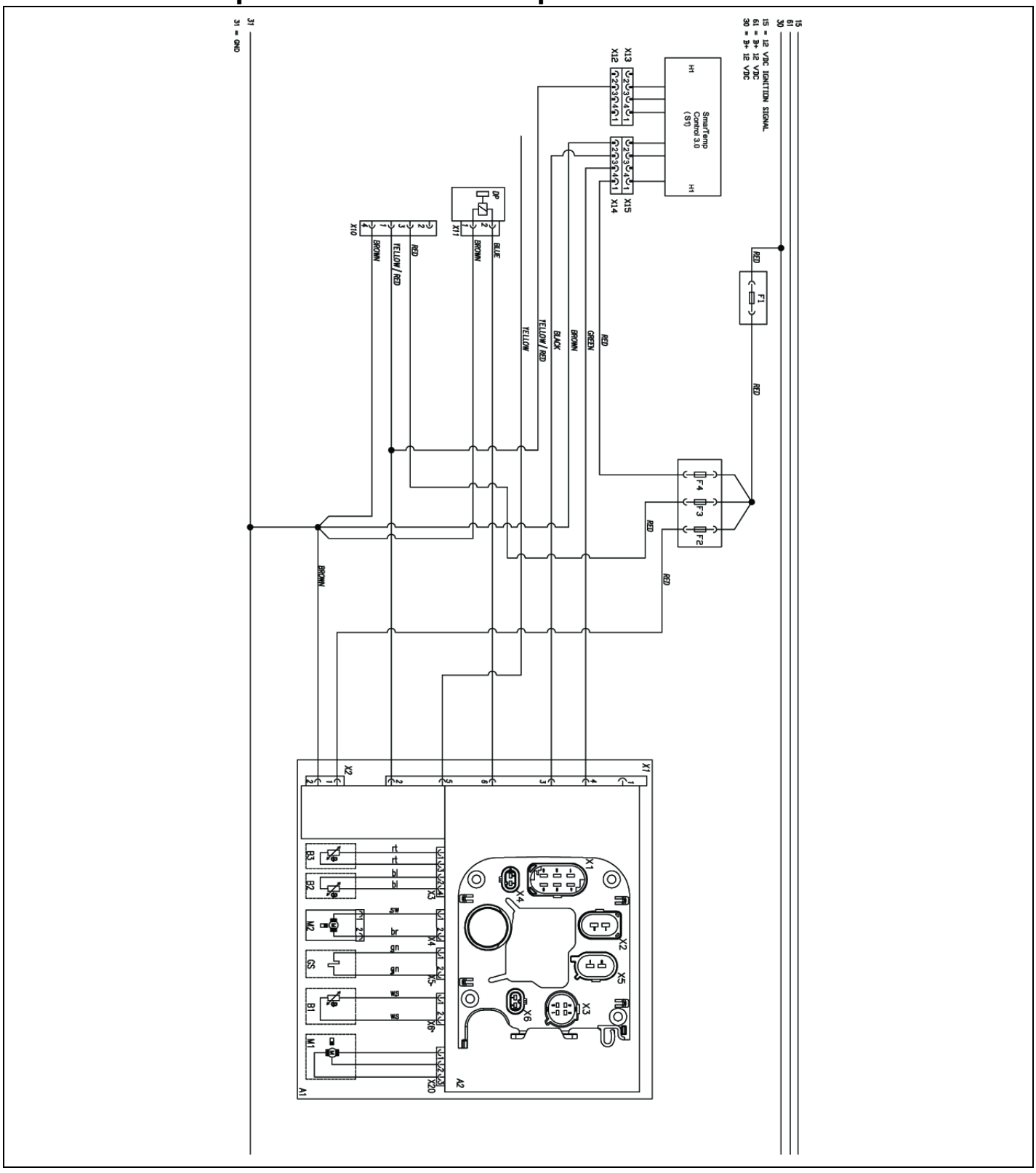



*Fig. 35: ThermoTop EVO with SmarTemp Control 3.0 and 3.0 Bluetooth*

## 12.4 Thermo Top EVO with Enclosure Box

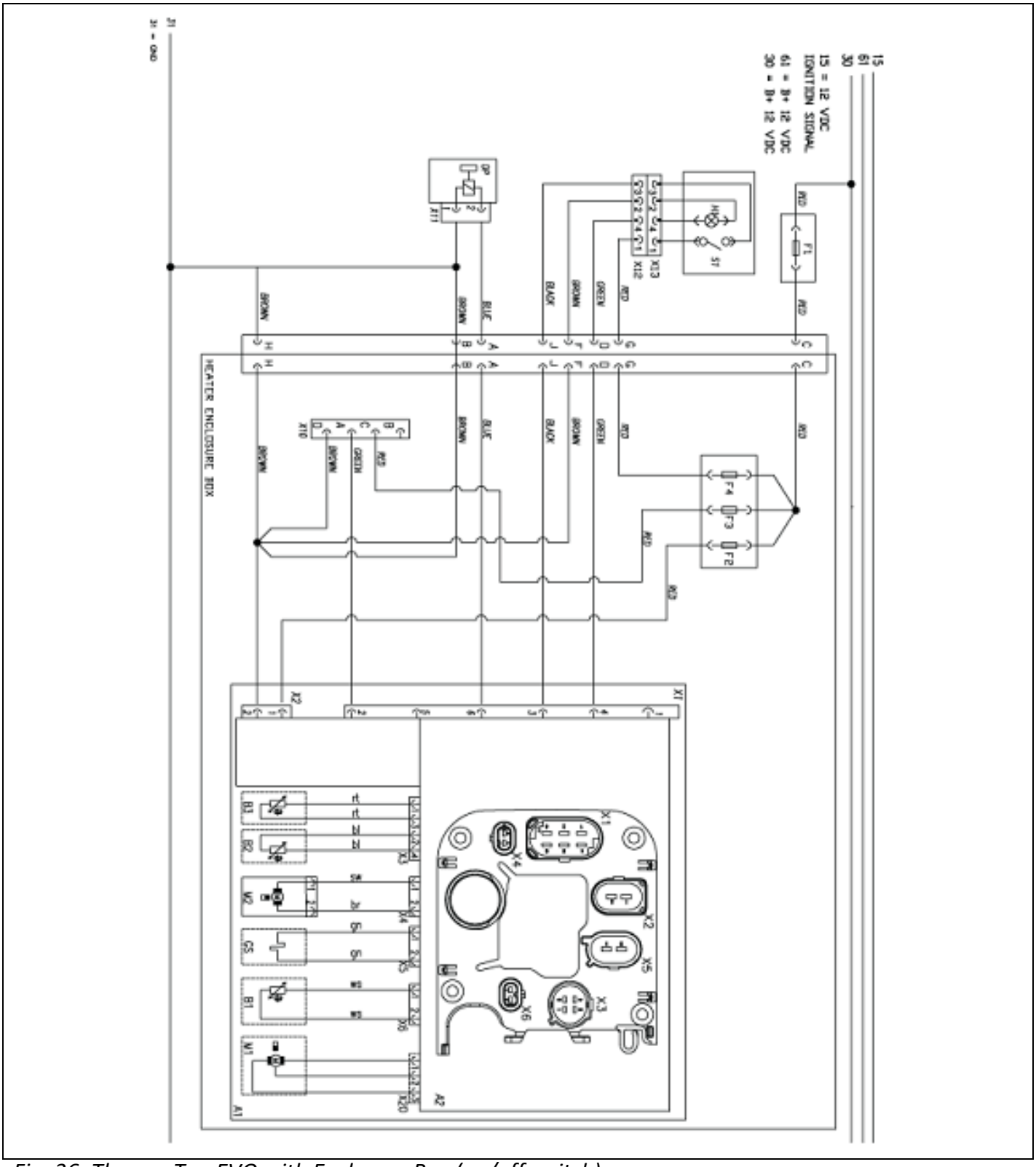



*Fig. 36: Thermo Top EVO with Enclosure Box (on/off switch)*

## 12.5 Thermo Top EVO with Enclosure Box

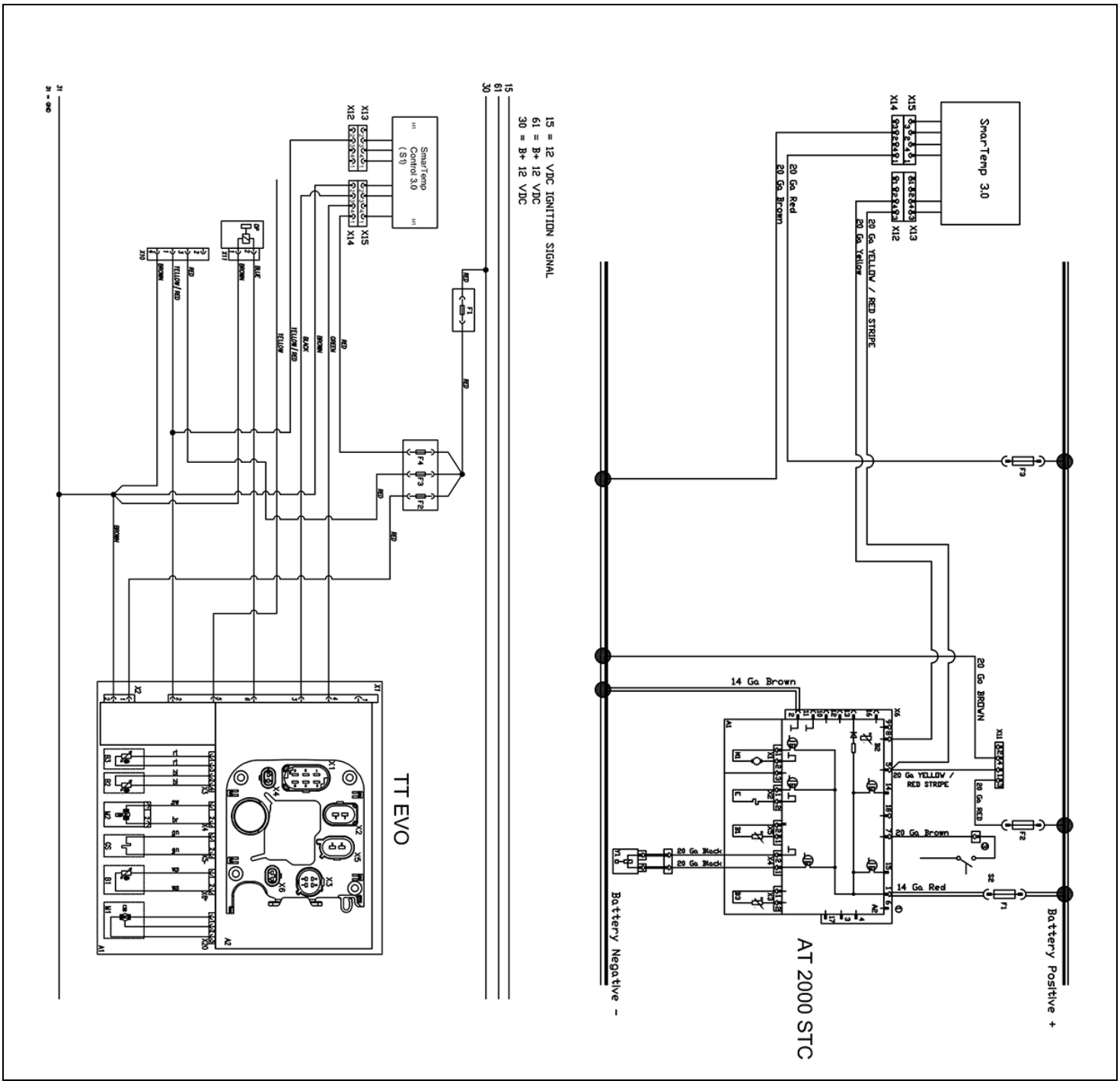



*Fig. 37: Tandem 717 wiring diagram - SmarTemp 3.0 (Thermo Top Evo left, Air Top 2000STC right)*

## 12.6 Wiring Diagram Legend

The wiring diagrams show the possible circuits for the Thermo Top Evo:

System wiring diagram – ON/OFF switch - 31

System wiring diagram for Thermo Top EVO with SmarTemp 2.0 - page 32

System wiring diagram for Thermo Top EVO with SmarTemp 3.0 - page 33

System wiring diagram for TT Evo with an enclosure box- page 34

| | Length < 7.5 -7.5m | Length 15m |
|---|---|---|
|  | 75mm2 | 1.0mm2 |
|  | 1.0mm2 | 1.5mm2 |
|  | 1.5mm2 | 2.5mm2 |
|  | 2.5mm2 | 4.0mm2 |
|  | 4.0mm2 | 6.0mm2 |

*Table 1: Cable Cross-Sections*

| Item | Description | Comment |
|---|---|---|
| **2** | Timer | – with positive on timer connection 10: Continuous operation with immediate heating<br>– Timer connection 10 open: Heating duration is programmable (10 to 120 min.), basic setting 120 min. |
| **A1** | Heater | Thermo Top Evo |
| **A2** | Control module | Thermo Top Evo |
| **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 (20A) | Mini fuse at battery |
| **F2** | Fuse (20A) | Main fuse |
| **F3** | Fuse (2A) | Mini fuse - diagnostics |
| **F4** | Fuse (5A) | Control device |
| **GS** | Glow Plug | |
| **H1** | Operation Indicator Light | On switch or timer |
| **M1** | Combustion Air Fan | |
| **M2** | Circulation Pump | |
| **S1** | Toggle switch or SmarTemp | 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 |

*Table 2: Thermo Top Evo Wiring Diagram Legend*

# 13 Initial Operation

## 13.1 Initial Operation Information

**WARNING**

Never operate the heater in closed rooms such as garages or workshops that do not have an exhaust extraction unit.

In workshops with exhaust extraction units, make sure that the exhaust extractor is fully operational.

Carefully read the heater operating manual, follow the procedures and safety information found therein.

## 13.2 Initial Start-Up Checklist

| Heater Mounting | | Complete (Yes/No/Comments) |
|---|---|---|
| 1 | Is the heater assembly safely secured and rigid? (Ensure all bracket fasteners are right) | |
| 2 | Is there a safe clearance from heat-generating components? (Exhaust, etc.) | |
| 3 | Is there sufficient clearance between the heater and any vehicle moving components under all operating conditions? (Steering at full lock, torqued driveline, loaded or unloaded suspension, etc.) | |
| 4 | Is the heater mounted in an acceptable position according to the limitations noted in this installation manual? | |
| 5 | Is the heater installed in a location that is protected from road-debris and splash water, or items stored in the same compartment? | |
| 6 | Is there sufficient clearance between the heater and the ground? | |

| Coolant System | | Complete (Yes/No/Comments) |
|---|---|---|
| 1 | Is there adequate clearance (min. 4 in.) from heat-generating components? (Exhaust, heater body, ducts, etc.) | |
| 2 | Is there adequate clearance from sharp edges/objects? (Ensure adequate cut protection has been installed) | |
| 3 | Are there any kinks, sharp bends, or the possibility of pinched hoses or harnesses, cuts and/or rub-through? | |
| 4 | Have all the hose clamps been properly positioned and tightened? | |
| 5 | Has the coolant system been topped off and bled per the vehicle manufacturer’s 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 filler cap? | |
| 8 | Has the coolant flow 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. | |
| 3 | Has the blower motor functionality been tested (if applicable)? | |
| 4 | Check for proper fuse tap connection (if applicable). | |
| 5 | Verify that 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-supplied fuse block installed in a location that is protected from water and/or moisture? | |
| 7 | Ensure the blower motor resistor is securely mounted and has sufficient clearance from any plastic components and the battery. | |
| 8 | Ensure the battery is mounted securely and connections are properly tightened. | |
| 9 | Ensure the battery has a full charge. | |

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

| Exhaust Systems | | Complete (Yes/No/Comments) |
|---|---|---|
| 1 | Are 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 the air intake system is securely fastened. | |

| Heater Function | | Complete (Yes/No/Comments) |
|---|---|---|
| 1 | Ensure the heater starts and runs for a minimum of 20 minutes. | |
| 2 | Ensure vehicle blower operates as intended. | |
| 3 | Ensure warm air is blown out of interior vents after blower is activated. | |
| 4 | Ensure timer (control element) is functioning. | |
| 5 | Check and Modify $CO_2$ setting as needed based on allowable altitude limits.<br>(See service manual for instructions to make adjustment) | |

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

## 13.3 Checking Initial Operation with Thermo Test Diagnostics

Correct operation of the heater can be checked with the Webasto Thermo Test PC Diagnosis.

Check the heater while in stable operation for approximately 20 minutes with the diagnostics monitoring the various functions.

## 13.4 Operating the Heater

**NOTE**

When filling the fuel line and purging air only activate the fuel pump using the ThermoTest software. Using a different type of switching device can damage the fuel pump.

**After the heater is completely installed:**

Install the combustion air intake guard to prevent damage to the combustion air fan.

Connect the heater to Webasto Thermo Test PC Diagnostics.

Bleed the coolant circuit using Webasto Thermo Test PC Diagnostics.

Check the coolant system for leaks at the system pressure and / or temperature that is specified by the vehicle manufacturer.

**Filling the fuel lines:**

Generally, the fuel lines are primed automatically on initial start-up of the heater.

For the heater model with a return-style fuel system, there is also an option to fill manually. Select the fuel prime function in the Webasto Thermo Test PC Diagnostics.

Prime the fuel line(s) until all of the air has been purged from the fuel lines.

Ensure that the fuel filter has been bled. See Fuel Filter.

**NOTE**

The standard duration stored in the Webasto Thermo Test software for fuel prime is sufficient for most vehicle models and heater applications.

If the lines cannot be successfully primed using Webasto Thermo Test software, it may be necessary to perform repeated start-up attempts to prime the fuel line.

Once initial start-up is complete, fuel line should be free of air bubbles.

- Make sure that the coolant is less than 122 ºF (50ºC).
- Switch the heater ON via the control element (refer to the control element operating instructions).
- Check all connections for leaks.
- CO2 settings are preset at the factory.
- If the heater switches to fault lock-out condition during operation, perform the troubleshooting procedure. Refer to the service manual for more information.

**WARNING**

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.

**NOTE**

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.

# 14 Basic Troubleshooting

## 14.1 General Information

This section describes basic troubleshooting procedures. Troubleshooting is normally limited to the isolation of defective components.

**CAUTION**

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 connections

**IMPORTANT!**

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

**NOTE**

Before each repair on the heater, the fault memory must be read out with the Webasto Thermo Test PC Diagnosis. Exist- ing faults must be printed before deleting and made available to the Webasto Hotline or the Warranty Department.

At low temperatures and with no wind, a minor amount of smoke and/or a slight odor may be noticeable during starting and/or burn-out.

The occurrence of fog with an exhaust system not warmed through or in case of unfavorable weather conditions is normal and cannot be avoided.

Smoke: exits directly from the exhaust end section. Fog: becomes visible just a few centimeters after the exhaust tailpipe.

## 14.2 General Failure Symptoms

The following table lists possible failure symptoms.

| Failure Symptom | Possible Cause | Remedy |
|---|---|---|
| Heater switches off automatically (fault lockout) | No combustion after start or automatic repeat start | Switch off heater momentarily and switch on again |
| | Flame extinguishes during operation | ■ Check coolant lines for obstructions, closed valves, and kinks.<br>■ Check coolant level, bleed coolant circuit if necessary. Allow heater to cool down. Check for failure codes and repeat as necessary. |
| | Heater overheats | ■ Charge/replace batteries<br>■ Switch off heater momentarily and switch on again |
| Heater expels black smoke from the exhaust | Combustion air and/or exhaust tube blocked | Check combustion air intake and/or exhaust tube |

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

## 14.3 PC Diagnostic Kit

**CAUTION**

Diagnostic 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 Top Evo's memory. This is achieved through the use of a diagnostic interface kit connected to the heater's diagnostic connector and a windows-based 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 Top Evo.

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. Print- ing out of fault codes is also available (User supplied printer required).

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

## 14.4 Diagnostic Fault Codes

Diagnostic fault codes can be communicated to the end-user without the use of the Webasto PC Diagnostic kit and software.

If the system is operated with a switch, the fault is indicated by a flashing code on an indicator light (rocker switch) during heater operation. There will be a series of rapid flashes, followed by 1 or more slow flashes. The rapid flashes are an alert indicator, the slow flashes should be counted as that is the fault code. If the system is equipped with a digital timer, a fault message appears on the display of the timer after a fault occurs:

F00 (Continuous flashing) – Heater interlock (lock-out)
After five short signals, count the long flashes:
F01 (1 flash) - No start (after 2 attempts to start)
F02 (2 flashes) - Flame failure
F03 (3 flashes) - Under-voltage or over-voltage
F04 (4 flashes) - Premature flame recognition
F05 (5 flashes) – Not used
F06 (6 flashes) – Coolant temperature sensor interrupt or temperature sensor short-circuit
F07 (7 flashes) - Metering pump interrupt or metering pump short-circuit
F08 (8 flashes) – Combustion air fan motor interrupt or blower motor short-circuit or incorrect speed
F09 (9 flashes) - Glow plug interrupt or glow plug short-circuit
F10 (10 flashes) - Overheating
F11 (11 flashes) - Circulating pump interrupt or circulating pump short-circuit
F12 (12 flashes) – Battery main switch short-circuit
F13 (13 flashes) – Output vehicle fan short circuit
F14 (14 flashes) – Overheating sensor defective
F15 (15 flashes) – Pre-heating/ignition circuit defective
F16 (16 flashes) – Exhaust gas temperature too high
F17 (17 flashes) – Exhaust gas temperature sensor defective

## 14.5 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 and without the ability to restart.

**Procedure in the event of a heater lock-out (inter-lock) condition** (all controls except multi-control)

Heater Lock out Reset Procedure:

1. Switch the heater ON
2. Within 10 seconds disconnect power from the heater (unplug the wiring harness, disconnect the battery, remove the fuse)
3. Wait 10 seconds
4. Switch the heater OFF
5. Reconnect power
6. Switch the heater ON
7. Rectify the cause of the fault.

**Procedure in the event of a heater lock-out (inter-lock) condition** (multi-control)

NOTE: When using the digital multi-control and the H87 error is shown, press the control knob to acknowledge the error.

Heater Lock out Reset Procedure:

1. Turn the heater OFF by the controller or switch
2. Remove the 20A fuse
3. Wait 30 seconds
4. Reinstall the 20A fuse
5. Wait 30 seconds
6. Turn the heater ON using the controller/switch, then remove the 20A fuse within 10 seconds
7. Wait 30 seconds then reinstall the 20A fuse
8. Wait 30 seconds
9. Turn the heater on and remedy the cause of the fault

NOTE: In most cases, a heater lockout can be removed using the procedure as stated above. In faults where safety is a concern, Webasto Thermo Test software must be used. Contact an authorized Webasto dealer for assistance.

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

NOTES

Webasto Thermo & Comfort N.A., Inc.
15083 North Road
Fenton, MI. 48430

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

**www.webasto.com**
**www.techwebasto.com**

5013388D Org. 03/2019 Rev. 8/2025