Scholastic Series Heater™

Coolant Heating System for Diesel Powered School Buses

Installation / Operation Guide

- Improper installation or repair of Webasto heating and cooling systems can cause fire or the leakage of deadly carbon monoxide leading to serious injury or death.
- Installation and repair of Webasto heating and cooling systems requires special Webasto training, technical information, special tools and special equipment.
- NEVER attempt to install or repair a Webasto heating or cooling system unless you have successfully completed the factory training course and have the technical skills, technical information, tools and equipment required to properly complete the necessary procedures.
- ALWAYS carefully follow Webasto installation and repair instructions and heed all WARNINGS.
- Webasto rejects any liability for problems and damage caused by the system being installed by untrained personnel.
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1. Safety and General Information

1.1 Scope and Purpose

This installation guide is intended to support authorized Webasto trained distributors, dealers and personnel in the installation of the Scholastic Heater™ coolant heating system. Webasto Product North America, Inc. does not recommend the installation and servicing of Webasto products by untrained, unauthorized personnel or end-users.

Installations and servicing of Webasto products by untrained, unauthorized personnel and end-users will release Webasto Product North America, Inc. and Webasto authorized distributors, dealers and personnel from responsibility for damage to Webasto product or collateral property and personal injury.

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

Failure to comply with all installation instructions is a misuse of Webasto product. The same applies for repairs without using genuine Webasto service parts.

This will void the coolant heaters “Official Marks of Conformity.”

1.2 Safety Signals

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This guide 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.

⚠️ DANGER: Indicates that non-compliance with instructions or procedures WILL result in serious injury or death.

⚠️ WARNING: Indicates that non-compliance with instructions or procedures MAY result in serious injury or death.

⚠️ CAUTION: Indicates that non-compliance with instructions or procedures COULD result in damage to the vehicle or equipment.

1.3 Additional Documentation to be Used

This guide contains all of the information and procedures necessary for the installation of the Scholastic Heater™. The use of additional documentation is normally not necessary. Vehicle specific installation guides (when available) may be used as complementary information if necessary.

1.4 General Safety Regulations and Information

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

1.4.1 General Safety Notes

The heater may only be installed in vehicles, with a minimum coolant capacity of 2.6 US Gal. (10 litres). The heater must not be installed in the passenger compartments of the vehicle. Should the heater be installed in such a compartment, the installation box must be sealed tight against the vehicle interior. There must be sufficient ventilation of the installation box from the exterior in order not to exceed a maximum temperature of 140 °F (60 °C) in the installation box. Excessive temperatures may cause malfunctions.

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

⚠️ DANGER: At filling stations and fuel depots the heater must be switched off as there is a potential danger of explosions. Where flammable fumes or dust may build up (e.g. in the vicinity of fuel, coal, wood, cereal grain deposits or similar situations) the heater must be switched off to prevent explosions.
Safety and General Information

1.5 Regulation for Installation in the Vehicle

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

1.5.1 Position of the Heater

- 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.
- 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.
- For passenger carrying vehicles such as shuttle buses, transit buses, and coaches, the heater must not be installed in the passenger cabin.
- 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.
- When positioning the heater, all reasonable precautions must be taken to minimize the risk of personal injury or damage to items in the vehicle.
- A clearly visible indicator within the user’s field of vision must show when the heater is switched on or off.

1.5.2 Fuel Supply

The coolant heater may only be operated with the specified fuel (Diesel 1, Diesel 2, Arctic grade, Kerosene and certain military spec. fuels).

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

- Fuel lines are to be installed in such a way that they remain unaffected by torsional stresses created by vehicle and engine movement. They must be protected against mechanical damage.
- Fuel lines must be securely fastened to the vehicle every 12 inches (30 cm.) or more often along the total length from heater to fuel tank.
- Fuel-carrying parts are to be protected against excessive heat and are to be installed so that any dripping or evaporating fuel can neither accumulate nor be ignited by hot components or electrical equipment.

- In buses, fuel lines are not to be located in the passenger area or in the driver’s compartment. Fuel supply must not be by means of gravity or pressurization of the fuel tank.
- The fuel tank must either be equipped with a vent cap or be ventilated in another way (ventilation line).
- The fuel filler neck must not be located in the passenger compartment and must have a tightly fitting cap to prevent any fuel leaks.
- 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.
- 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.

1.5.3 Exhaust System

- 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.

1.5.4 Combustion Air Inlet

- The air for the combustion chamber of the heater must not be extracted from the passenger cabin of the vehicle.
- The air inlet must be positioned in such a way that it cannot be obstructed by other objects.

1.5.5 Water Inlet

- 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.
- The inlet line must be protected from damage.

1.5.6 Hot Water Outlet

- 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.
- The water outlet line must be protected so that it cannot be obstructed by other objects or the flow of water through the lines be blocked.
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.

1.6 Contact Information

Webasto Product North America, Inc. is pleased to provide this installation manual for use with this new heater. When installed in accordance with 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 or product.

Please write to us at:

Webasto Product 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 guide, the installation procedures within or the product itself, please call us at:

(800) 860-7866 or send a fax to: (810) 593-6001
2. Purpose / Version

2.1 Purpose of the Coolant Heater

Coolant heaters are used in connection with the vehicle's own heating system
– to heat the vehicle interior,
– to defrost vehicle windows and
– to preheat water-cooled engines

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.

2.2 Versions

2.2.1 Scholastic Heater Version

Water heater for "diesel" fuel.

The Scholastic Heater™ water heater is designed for use on 12 Volt electrical systems.
3. Installation - Overview

NOTE: The water heater must be installed outside the passenger cabin.

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

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

3.2 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.

3.3 CE mark

The Scholastic Heater™ (DBW 2010 variant) 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:

NOTE: This is a class A device. This device may induce radio interference in residential areas; in this case, the owner may be required to undertake appropriate measures.

As a rule, installation inside of an auxiliary compartment of the school bus represents sufficient screening. Please contact the Webasto hotline in the event that radio interference occurs nevertheless.
4. Installation

Webasto will take you step by step through the installation process to ensure successful operation for years to come. The installation must be performed in accordance with the installation instructions provided in this manual.

4.1 General Information

**DANGER:** Due to the risk of carbon monoxide poisoning and asphyxiation, the heater must never be installed inside the passenger compartment.

The heater is to be installed in an existing enclosure (spare battery compartment) on the driver’s (road) side of vehicle. The installation template provided with the heater kit must be used.

Do not mount to the slide-out tray. The heater and tray must be mounted solidly. The heater inertia safety switch will only function properly if the heater and tray are mounted solidly.

The heater should be installed as low as possible in the cooling system to assure static bleeding of the heater and the circulating pump.

**CAUTION:** The coolant circulating pump is not self-priming. Always prime coolant circulating pump, heater and cooling circuit before initial starting of heater. See Section 6. “Initial Start-up and Operation”.

4.2 Installation Locations

**NOTE:** This manual does not cover all possible installations. This manual is a general guideline only. For special applications or installations differing from what is described in this manual, contact Webasto Product N.A., Inc. directly at 1-800-432-8371 for further information.

Figure 2: Installation locations
4.3 Mounting the Scholastic Heater™

Tray Kit mounting in existing enclosure on vehicle, e.g. spare battery box.

1. Ensure that the enclosure is large enough to accommodate the heater. Use the installation template provided with the heater kit.

2. The installation enclosure must provide adequate ventilation for combustion air requirements [4 in² (20 cm²)].

3. Lay the supplied installation template in the enclosure. Center punch the exhaust, fuel, electrical and 4 mounting hole locations.

4. Drill all required holes to the dimensions as shown on the template.

5. Solidly bolt the tray with heater mounted inside the enclosure.

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

Figure 3: Tray mount template (Included with heater kit).
4.4 Exhaust Pipe Connection

**WARNING:** Due to the risk of carbon monoxide poisoning and asphyxiation, exhaust system components must be routed in a manner that prevents exhaust fumes from entering the passenger compartment.

1. Insert the supplied flexible exhaust pipe onto the heater exhaust outlet and fasten with the exhaust clamp. Secure the outlet end to the chassis with a P-clip.

2. The exhaust system must discharge on the street (driver) side of vehicle. The discharge opening of the exhaust pipe must not point in the direction of travel, and so located that any clogging caused by snow or mud is not to be expected. See Figure 5.

**CAUTION:** Route the exhaust components in a way that prevents them from touching vehicle parts that may be damaged by heat (brake lines, electrical wiring, hoses, etc.). Do not direct exhaust outlet towards heat sensitive vehicle components.

The exhaust pipe I.D. 1 1/2” (38 mm) can have a length up to 16’ (5 m) and may have several bends totaling no more than 270° overall.

Rigid exhaust pipe may be used; bends must be formed with the smallest bending radius allowable being 3 3/8” (85 mm). Do not weld pipe to make 90° corners.

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

A ventilation opening for combustion air requirements measuring at least 20 cm² (4 inch²) is required if the heater is installed in an enclosed box. The size of the ventilation opening must be increased accordingly if the temperature in the box exceeds the permitted ambient temperature of the heater. See Technical data.
4.6 Connection to the Heating System

4.6.1 General Information

An efficient heating system must have an adequate supply of hot water to all heater cores. The amount of hot water available to a typical three or four heater-core system depends on the water pumps capability and the amount of restriction within the coolant system.

The Webasto heater is equipped with a high-performance circulating pump designed specifically for bus heating applications, and when plumbed in accordance with the following instructions, will maximize the heating systems efficiency.

The coolant-circulating pump, bottom of enclosure or tray, must be mounted at least 6” (15 cm) below the lowest permissible coolant level of the vehicles cooling system. A minimum of 10% of a good quality antifreeze should be maintained in the cooling system at all times.

Heater and water pump fit 1” (25.4 mm) ID. heater hose meeting SAE 20 R3 specifications. Silicone hose requires special hose clamps.

NOTE: Heater hose must meet SAE 20 R3 specifications. Silicone heater hose requires special hose clamps. Hose clamps must be tightened to 4 Nm (35 lb-in.) torque.

The heater is connected to the vehicle heating system as shown in Figures 8 or 9, depending on the type of heating system the vehicle is equipped with. The system must contain at least 10 litres (2.6 US Gal.) of coolant. The system must be filled with an antifreeze and water mixture as recommended by the vehicle manufacturer. Coolant flow throughout the system must be maintained in all operating conditions.

If desired, shut-off valves can be installed at the engine inlet and outlet connections of the coolant heater circuit, although, shut-off valves are not mandatory. All valves should remain open throughout the year.

Figure 6: Typical school bus heating circuit

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.

- Use good quality, heavy duty 1” ID. coolant hose for the coolant heater circuit.
- Hoses must be installed without kinks and bends which may restrict coolant flow.
- To ensure proper bleeding of air, keep hoses rising if possible. Avoid “goose necks” to prevent trapping air.
- Hoses must be supported where required to prevent chaffing and damage from vehicle components.
- Hose connections must be secured by hose clamps to prevent them from slipping off.
Installation

- Coolant heater flow direction should match the flow direction of the engine’s coolant circulation system.

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

If possible, for good performance and engine preheating, separate the heater supply and return connections at the engine as far apart as is practical. See Figure 7.

An open overheat fuse (white wires) must be replaced with a new fuse P/N 406287.

4.6.2 Various Plumbing Configurations

Select the appropriate plumbing configuration according to the customers requirements and the vehicle system type.

Figure 8 illustrates a series heating system. This system works in this fashion:

Heated water (coolant) from the engine travels through the first heater core in the circuit, then on to the next heater core in circuit, and on to the next, etc. Each core adds some restriction, resulting in decreased water flow. Not only is water flow reduced, but also water temperature is reduced by each successive heater core resulting in the last core receiving water that is usually too cool to be effective.

Figure 9 illustrates a parallel heating system. This system works in this fashion:

Heated water (coolant) from the engine travels through a common supply and return circuit, but unlike a series system, the heater cores are connected across the circuit at intervals along its length. Each core shares the available coolant and heat equally, resulting in increased heating efficiency and decreased coolant restriction.

Unfortunately, water flow and volume may not be sufficient to satisfy heating requirements efficiently in a parallel system.

A fuel fired Webasto heater with a high capacity coolant pump can significantly increase the available heat supplied to both series and parallel systems and has the added ability to ensure sufficient coolant volume and flow through the system, increasing interior heating efficiency.

CAUTION: 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 almost silently. Poor bleeding may cause the self-resetting temperature limiter to trip or the overheat fuse to open whilst the heater is operating.
Figure 8: Heating circuit with exchangers arranged in series.

1. Coolant supply connection
2. Original coolant hose path
3. Scholastic Heater™
4. Coolant circulating pump
5. Forward / step heat exchangers
6. Mid heat exchanger(s)
7. Rear heat exchanger(s)
8. Coolant return hose
9. Coolant return connection
10. Engine coolant pump

Figure 9: Heating circuit with exchangers arranged in parallel.

1. Coolant supply connection
2. Original coolant hose path
3. Scholastic Heater™
4. Coolant circulating pump
5. Forward / step heat exchangers
6. Mid heat exchanger(s)
7. Rear heat exchanger(s)
8. Coolant return hose
9. Coolant return connection
10. Engine coolant pump
4.6.3 Plumbing Instructions (Typical Installations)

CAREFULLY READ AND UNDERSTAND THE FOLLOWING INSTRUCTIONS BEFORE PROCEEDING WITH INSTALLATION!

1. Remove the radiator cap and release system pressure.
2. Close the shut off valves for heating system, if so equipped, or pinch off the supply and return line with hose clamping pliers.
3. Plumb into the system as shown in figure A, B or C. Two long brass 90° elbows with mounting flanges have been provided for making connections into existing coolant lines. To install:
   - remove heater hose access cover(s) running down left side of floor inside bus at a location over top of heater installation.
   - find and identify heating circuit supply hose. This is the hose you will use to plumb the Webasto heater into the system.
   - locate and mark suitable location on floor, above heater, where brass elbows will be installed.

   NOTE: When properly installed, the elbows should protrude down into the heater enclosure area where they can be easily connected to the coolant pump inlet and heater outlet.

   - once you are satisfied with the location, making certain there are no obstructions, you can now bore 2 holes (1-1/4”) through the floor.
   - from inside the bus, drop elbows down through the floor and align with the heating circuit supply hose, inlet elbow pointing forward and outlet elbow rearward.
   - secure elbow flanges to floor with sheet metal screws.
4. From inside the heater enclosure, connect the inlet elbow (supply) to the coolant pump and the outlet elbow to the Webasto heater outlet with rubber elbows and fittings provided.
5. From inside the bus, cut the previously identified heating supply hose at a point where it can be connected to the inlet and outlet elbows.
6. Connect the heater supply line running from the engine to the inlet elbow. Connect the other cut end of the supply line to the outlet elbow.
7. Secure all hose connections with hose clamps.
8. Remove hose clamping pliers and/ or open shut off valves.
9. Purge air from the Webasto heater by opening the bleeder valve. Refer to figure 1, item 12, on page 6, for identification.

   CAUTION: 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 almost silently. Poor bleeding may cause the self-resetting temperature limiter to respond or the overheat fuse to open whilst the heater is operating. An open overheat fuse (white wires) must be replaced with a new fuse P/N 406287.

10. Top off engine coolant as per engine manufacturer's recommendations and re-install the radiator cap. Do not install the previously removed heater hose access covers at this time. Hose connections will require inspection and re-tightening of clamps once installation is completed and tested. Refer to section 6 “Initial Operation”.

   NOTE: Heater hose must meet SAE 20 R3 specifications. Silicone heater hose requires special hose clamps. Hose clamps must be tightened to 4 Nm (35 lb-in.) torque.
4.7 Fuel Supply

4.7.1 General Information

The fuel is drawn from the vehicle's fuel tank through a fuel standpipe. This standpipe can be utilized on vehicles with a threaded port in the fuel tank, or if no threaded port is available, a 1” (25 mm) hole can be drilled into the tank and the universal tank-boss installed as shown in figure 10.

NOTE: Check local and state code and regulations for exceptions before drilling into the fuel tank!

4.7.2 Fuel Standpipe Installation

CAUTION: Keep the fuel standpipe 2” from bottom of the fuel tank.

This separate fuel pickup precludes any effect of pressure.

Figure 10: Webasto fuel standpipe

A. Fuel standpipe tube
B. Compression fitting - 1/4” NPT
C. Bushing - 1/4” to 3/8” NPT
D. Check valve - 1/4” NPT
E. Hose barb - 1/4” NPT x 1/4” barb
F. Fuel tank with threaded port
G. Nut
H. Metal washer
I. Neoprene gasket
J. Tank boss
K. Fuel tank with 25 mm (1.0 in.) hole
L. Distance from tank floor - 50 mm (2.0 in.)
M. Fuel tank floor
N. Close up view
Installing the standpipe using tank boss assembly:

1. Bore a 25mm (1") hole through top of fuel tank. See item K, Figure 10.

2. Remove sharp burrs and smooth edges with emery cloth.

3. Determine length of standpipe when installed. End should sit at least 50 mm (1.0 in) above tank bottom. Cut off excess standpipe at a 45 degree angle. Remove burrs.

4. Loosely assemble item G, item H, item I, and item J as shown in Figure 11. Refer to Figure 10 for item identification.

5. Place sealing compound on threads of item B and thread into item J. Tighten item B completely.

6. Slide standpipe into hole at angle. Slip one shoulder of item J, inside the hole as shown in Figure 11.

7. Bring standpipe up to horizontal and insert opposite shoulder under the tank hole. See Figure 12.
8. Center standpipe in tank hole. See Figure 13.

Figure 13: Standpipe installation - illustration 3

9. Pull up on standpipe and tighten in place with the clamping nut. See item G in Figure 14. Do not over-tighten causing rubber washer to squeeze out!

Figure 14: Standpipe installation - illustration 4

4.7.3 Fuel Filter Installation

The Scholastic Heater™ is equipped with a spin-on fuel filter. Fuel filters require changing at least annually and in cases of dirty fuel more often.

The fuel filter assembly should be mounted securely between the vehicle frame rails close to the fuel tank. After installation, before the heater is fired for the first time, the fuel filter MUST be filled with CLEAN diesel fuel. When replacing the fuel filter, this procedure must be repeated to ensure proper firing and operation.

**NOTE:** Check local and State codes and regulations for fuel filter mounting locations.

**NOTE:** To prevent fuel nozzle failure, always use CLEAN fuel from a known CLEAN source for priming fuel systems and filters.

**NOTE:** The Webasto Scholastic Heater™ is equipped with an internal self-priming fuel pump.

Figure 15: Fuel filter assembly
Installation

4.7.4 Fuel Line

Route and secure fuel line from fuel tank, to fuel filter, and to heater. Do not route fuel line over frame rails! Always route through or under the frame rail. Use grommets to protect fuel line whenever routed through holes.

Connect fuel line to fuel standpipe using 1/4” (6 mm) fuel hose meeting SAE 30RI specifications.

CAUTION: On School Bus applications, fuel lines must not cross over top of the vehicle frame rails. Check local and State codes and regulations for exceptions.

NOTE: Use supplied hose clamps to secure fuel line connections.

Fuel lines must be secured every 12 inches or less and kept clear of hot exhaust components and moving parts (driveshaft, wheels, etc.).

Figure 16: Fuel line parameters

A = Maximum suction length 10 m (33 ft)
B = Maximum suction height 2.0 m (6.5 ft)
4.8 Electrical Connections

Ideally, the heater power supply should be directly from the vehicle’s batteries or main buss-bar. 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.

4.8.1 Power / Control Harness Connections

A. Route item 1 into the vehicle cab in the area where the switch or timer is to be installed.

B. Route item 4 to vehicle battery box and connect to batteries as shown in Figure 17. Brown wire to ground, red wire with fuse holder to positive. Ensure battery connections are clean and protected with an anti-corrosive compound.

C. Item 3 (main connector) should be left unconnected until all electrical components are installed and heater is ready for the initial start-up.

A weather sealed fuse holder, item 5, is fitted to the main power input to protect the heater and wiring harness.

Figure 17: Power and control harness assembly
4.8.2 Connecting the Controls

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

- Toggle Switch, see Figure 18, on page 20 and Figure 21, on page 22.
- Timer Model 1529, see Figures 19, on page 21 and Figure 22, on page 23.
- Timer Model 1531, see circuit diagrams in Figures 20, on page 21 and Figure 23, on page 24.
- NOI (White) Timer, see circuit diagram on pages 37-38.

**Heater Control Harness Connection Using a 12 or 24 Volt Switch**

1. White (Ground)
2. Red (Power)
3. Black (On signal)
4. Green (Operation indication)

**CAUTION:** All the cables and wires that are not required must be insulated against accidental shorting or grounding.

**Heater Control Harness Connection Using 1529 Comfort Timer**

1. Red (Power)
2. Red (Power)
3. Green (Operation indication)
4. Optional (Dash lights)
5. White (Ground)
6. Black (On signal)

**Connector X5 (Violet)**

For School Bus operation, connect to ignition source.
Figure 19: 7-Day, 3 Program Timer model 1529

Connector X5 (Violet)
For School Bus operation, connect to ignition source.

Heater Control Harness Connection Using 1531 Comfort Timer
1. Red (Power)
2. Not Used
3. Green (Operation indication)
4. Optional (Dash lights)
5. White (Ground)
6. Black (On signal)

Figure 20: 7-Day, 3 Program Comfort Timer model 1531
5. Circuit Diagrams

Figure 21: Scholastic Heater™ with On/Off switch - connection diagram
Figure 22:  Scholastic Heater™ with 7-day digital timer model 1529 - connection diagram
Figure 23: Scholastic Heater™ with 7-day digital timer model 1531 - connection diagram
6. Initial Start-up and Operation

6.1 Initial Start-up

NOTE: 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.

If the heater suffers a fault during operation, the fault must be located and remedied.

1. Check your installation for:
   - loose nuts and bolts.
   - exhaust pipe routing and clamp tightness.
   - loose hose clamps.
   - routing and securing of wiring and heater hoses.
   - kinked or pinched hoses.
   - battery connection and polarity.
   - disconnect control thermostat on Webasto heat exchanger (red and green wire, see Figure 1, item 16, on page 6 for reference).

2. Top off or refill cooling system with coolant as per engine manufacturer's recommendations.

3. Connect power/switch extension harness to waterproof plug.

4. Open shut-off valves and driver's heater valve.

5. Set heater controls to maximum heat position and turn off Air Conditioning if applicable.

6. Switch “On” Webasto heater and check:
   - green indicator light on.
   - circulating pump in operation.

7. Start the vehicle engine and run it at a fast idle for 10 minutes to purge air from the Webasto coolant heater and all of the heat exchangers. While the engine is running check:
   - hose connections for leaks.
   - coolant level in the expansion tank and add coolant as needed.
   - use bleeder valve on top of Webasto heat exchanger to purge out trapped air. See Figure 1, item 12, on page 6 for reference.

8. Shut off the engine.

9. Plug in control thermostat, the blower motor starts and the fuel pump primes the fuel lines. After 10 to 25 sec. the fuel solenoid opens and the electronic ignition coil ignites the air fuel mixture.

NOTE: Installations with long fuel lines may require a second start attempt to prime the fuel system. Cycle switch or timer off and on to reset control unit. Coolant temperature must be below 155 °F (68 °C) at heater before heater will begin heating operation.

10. Allow heater to run until coolant is hot and heater cycles off. During this period, monitor system for any coolant or fuel leaks.

NOTE: The engine temperature gauge may read a lower temperature depending on the location of the temperature sensor on the engine.

11. Temperature differential between water inlet and outlet should not exceed 10 °C (18 °F) during heating operation.

12. Switch “Off” Webasto heater.

13. Re-tighten hose clamps to 4 Nm (35 lb-in.) and inspect installation for leaks.

14. Install any panels and access covers removed during installation.

15. Complete the warranty card and send to Webasto Thermosystems.

16. Install the enclosure cover if equipped. Installation is now complete.

NOTE: Necessary information to complete the warranty card can be found on the name plate on top of the heater burner head. The completion of the warranty card will ensure full warranty coverage. Please mail completed warranty card within 30 days of purchase to register your heater.
6.2 Operating the Scholastic Heater

**WARNING:** Due to the risk of carbon monoxide poisoning and asphyxiation, the heater must never be operated in closed spaces such as garages and workshops without adequate exhaust extraction.

**WARNING:** Due to the risk of explosion, the heater must be switched off while refueling and at fueling stations.

**WARNING:** Due to the risk of explosion, the heater must never be operated in areas where explosive materials, fumes or dusts may be present.

6.2.1 Switching ON

Before switching the Webasto heater on, set vehicle-heating system to the “Heat” position and open any shut off valves. Depending on the type of control installed in the instrument panel of the vehicle, the heater can be operated by the following methods.

**Using a Switch:**

When the switch is used for switching “ON” the heater, the “Operation Indicator” integrated in the switch is illuminated and the heater begins operation.

**Using a Timer:**

Upon pressing the “Instant Heat” button on the timer face, the “Operation Indicator” on the timer lights up and the heater begins operation.

**Heater Start-up Sequence:**

The heater motor and coolant circulating pump begin operation. After approximately 10 to 25 seconds the fuel solenoid valve opens and fuel is sprayed into the combustion chamber. At the same time, the electronic ignition coil produces a high voltage (8000 V) spark at the tip of the ignition electrodes and the mixture of fuel and air in the combustion chamber is ignited. As soon as combustion is detected by the photo resistor (flame detector), the electronic ignition coil is de-energized and combustion continues on its own (ignition process is only required to ignite the flame). At this point the heater is working and producing heat.

The Scholastic heater will cycle ON and OFF until:

1. The vehicle battery voltage drops below 10.5V.
2. The Webasto heater runs out of fuel.
3. A fault lock out occurs, indicated by the operating indicator light being off during the cool down cycle (as would happen during an overheat situation).
4. The Webasto heater runs out of fuel.

**NOTE:** Switching the Webasto heater on during the cool-down or “after-run” period is allowed. The heater will revert to normal operational mode.

6.2.2 Switching Off

When heating is no longer required, switch the Webasto heater off. The fuel solenoid valve halts the fuel supply, combustion stops and the indicator lights up and the heater begins operation.

**NOTE:** If the heater is switched on while the engine is at operating temperatures above 155 °F (68 °C) only the operation indicator and the coolant circulation pump will be activated. The engine coolant temperature must fall below 155 °F (68 °C) at the heater before the heater will begin heating operation.

**NOTE:** Switching the Webasto heater on during the cool-down or “after-run” period is allowed. The heater will revert to normal operational mode.

6.3 Engine Preheating

Set the timer 30 min. to 1 hr. before you want to start the engine. The heater will start up at the set time. (See timer operating instructions). Or switch the toggle switch or “Instant On” switch on your timer in the vehicle dash to “ON”. The heater will start up.

When the run time has elapsed on your timer or engine preheating is no longer required, switch the Webasto heater “OFF”. The heater will begin a brief after-run (cool down) cycle.

6.4 Boost Heating for Engine and Passenger Compartment

Switch the toggle switch (or the “Instant On” button of the timer) in the vehicle dash to “On”. The heater will start up if the coolant temperature is below 167 °F (75 °C). Above this temperature only the water pump will run.

When boost heating is no longer required, switch the Webasto heater “Off”. The heater will begin a brief after-run (cool-down) cycle.
6.5 Operation with 7-Day Digital Timer

The digital timer with 3 time settings permits the heater to be switched on and off instantly, or automatically at 3 programmable starting times.

The operating time of the heater can be pre-selected. It is possible to program 3 different heating programs according to your individual needs.

Only one preset starting time can be activated at any one time. When the ignition is switched on, the current time of the day and the day of the week are displayed.

When the heater is in operation, the display and the buttons of the timer are illuminated.

Programmed Heater Operation

Three memory locations numbered 1 to 3 are available. Each memory location can be assigned a given time together with the day of the week.

Pre-selected Starting Times

The pre-selected starting time is the time at which the heater will be switched on automatically.

We recommend that memory locations 1 and 2 be used for presetting starting times within 24 hours of setting the timer.

Memory location 3 can be used for a starting time within the next 7 days of setting the timer.

**NOTE:** Memory location 3 can be reserved for a starting time within the next 7 days of setting the timer. Location 3 is useful for occasional weekend or field trip operations outside of the normal schedule. By repeatedly pressing the program button, starting time program 1, 2 or 3 can be viewed and preset.

Operating Time

The period of time during which the heater is in operation is referred to as operating time. The heater remains in operation for as long as the operating time has been preset.

Heater operation can be pre-selected for any time from as little as 1 minute to a maximum of 120 minutes (factory preset is 60 minutes).

Remaining Operating Time

The remaining operating time refers to the period of time the heater still continues to remain in operation. It can only be changed while heater is in operation.

**NOTE:** If the ignition is switched off while the heater is in operation, the remaining operating time of 5 minutes flashes on the timer display and the heater continues to operate for this period of time. See “Remaining Operating Time” to adjust this time setting.

Setting the Digital Timer

Refer to the operating card or manual supplied with your timer. Instructions are also available for reading and downloading from our technical web site.

Go to:
http://www.techwebasto.com/thermosystems_bus.htm
7. Troubleshooting

7.1 General Information

CAUTION: Troubleshooting requires profound knowledge about structure and theory of operation of the heater. Troubleshooting may only be performed by Webasto trained and certified, skilled personnel.

This section describes troubleshooting procedures for the Scholastic Series coolant heater. Troubleshooting is normally limited to the isolation of defective components.

Before troubleshooting, check for and eliminate the following causes for problems:
- fuel supply (plugged fuel filter or pinched fuel line)
- corrosion of battery terminals
- corrosion of electrical wiring, connections and fuses
- loose contacts or wrong crimping on connectors
- shut-down initiated by temperature limiter (automatic reset)
- shut-down initiated by overheat fuse (replace fuse)
- shut-down initiated by inertia switch (manual reset)

NOTE: After the correction of a problem or defect, a functional test of the heater as installed in the vehicle must be performed.

7.2 Quick Check Troubleshooting Matrix

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CHECK, REPAIR OR REPLACE AS NECESSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch On No Function</td>
<td></td>
</tr>
<tr>
<td>Control Light OFF after 30 Seconds</td>
<td></td>
</tr>
<tr>
<td>Blower Motor in Unit Inoperative</td>
<td></td>
</tr>
<tr>
<td>Blower Motor in Unit No Prime Cycle</td>
<td></td>
</tr>
<tr>
<td>Blower Motor in Unit No After-run</td>
<td></td>
</tr>
<tr>
<td>Coolant Circulating Pump Inoperative</td>
<td></td>
</tr>
<tr>
<td>Ignition Spark Absent</td>
<td></td>
</tr>
<tr>
<td>Combustion Does Not Take Place</td>
<td></td>
</tr>
<tr>
<td>Combustion Stops After 30 Seconds</td>
<td></td>
</tr>
<tr>
<td>Combustion Cannot Be Stopped</td>
<td></td>
</tr>
<tr>
<td>During Combustion Light Color Smoke</td>
<td></td>
</tr>
<tr>
<td>During Combustion Dark Color Smoke</td>
<td></td>
</tr>
<tr>
<td>Heating Unit Overheating</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Quick Check Troubleshooting Matrix
7.3 Heater Test Unit (Webasto P/N 50440280A)

The tester unit has been designed to quickly check the proper operation of the various heater components. By using the tester in place of the heater control unit, you are able to manually control the heater to test components and actually operate the unit in heating mode.

The actual testing is completed in two steps, first you perform an individual component test and then a manual start and run test, both designed to pinpoint actual problems in the heater system.

**CAUTION:** Do not attempt to test fire or run heater with burner head open. Ensure burner head is properly closed and secured in place.

**NOTE:** Make sure the Water Pump and Motor Switches (1) & (2) are in the OFF position before connecting to the heater.

**SETUP:**
A. Remove connector blocks from heater control unit, inspect for loose wires, corrosion and proper wire connections.
B. Plug control unit connector blocks into tester.
C. Set heater switch/timer to “ON” and turn vehicle heater valve to “FULL” mode (if equipped).
D. Proceed to component test procedures.
COMPONENT TEST PROCEDURE and RESULTS

<table>
<thead>
<tr>
<th>Test Step</th>
<th>Result</th>
<th>If not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester connected</td>
<td>BATTERY LED (1) unit lights up</td>
<td>- test input voltage at control terminals B4(+) and B2(-)</td>
</tr>
<tr>
<td></td>
<td>CONTROL THERMOSTAT LED (2) lights up</td>
<td>- check battery connections</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- check battery voltage</td>
</tr>
<tr>
<td>Push FUEL SOLENOID VALVE button (7) several times</td>
<td>clicking of solenoid should be heard</td>
<td>- test switch/ timer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- test control thermostat on heater Normal operating range</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- approx. 75 °C (167 °F) or higher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- approx. 68 °C (155 °F) or lower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- closed (heat required)</td>
</tr>
<tr>
<td>Push IGNITION SPARK COIL button (6)</td>
<td>sparking should be heard</td>
<td>- check electrode gap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- test ignition spark coil</td>
</tr>
<tr>
<td>Turn MOTOR switch (5) “ON”</td>
<td>motor should run</td>
<td>- reset *inertia switch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- test motor</td>
</tr>
<tr>
<td>Turn WATER PUMP switch (4) “ON”</td>
<td>pump should run</td>
<td>- test pump</td>
</tr>
</tbody>
</table>

Table 2. Test procedures and results

* Inertia Switch:

All Scholastic heaters are equipped with a manual reset inertia switch located on the tray floor near the coolant pump. The switch has a round red diaphragm and about the size of a 25 cent piece on top.

The purpose of this switch is to stop heater operation in the event the vehicle is involved in an accident or receives a strong impact shock, e.g. hitting a curb. When the switch responds, the fan motor circuit is interrupted thus stopping air and fuel delivery.

Always check to make certain the inertia switch has not been tripped. Resetting is accomplished by depressing the red diaphragm on top of the switch. You should hear an audible click whenever the switch is reset.

MANUAL TEST RUN of HEATER:

A. Turn the WATER PUMP switch (4) ON
B. Turn the MOTOR switch (5) ON
C. Push and hold the FUEL SOLENOID VALVE button (7) ON (starts fuel flow to combustion chamber)
D. Push and hold the IGNITION SPARK COIL button (6) ON (starts electrodes sparking) until combustion has taken place.

NOTE: Hold IGNITION SPARK COIL button (5) ON until FLAME DETECTOR LED (3) lights or combustion is heard, then release; in any case do not hold button on for more than 15 seconds or damage to the coil may result.

TEST RESULTS:

1. LED (3) lights and combustion achieved
   - operation normal
2. Combustion achieved but no LED (3) light
   - check flame detector
3. Combustion not achieved and no LED (3) light
   - check fuel nozzle
   - check fuel pressure
   - check for blocked fuel lines (dirt or ice)
   - check ignition electrodes for damage and set gap
E. Heater should now be in heating mode and will continue to run until you release the fuel solenoid valve button (7) which stops fuel flow and extinguishes the flame immediately. Allow the heater to continue running for approximately 30 seconds (cool down) after which, turn the WATER PUMP switch (4) and the MOTOR switch (5) OFF.
NOTE: If flame does not stop when the FUEL SOLENOID VALVE button (7) is released, turn MOTOR switch (5) OFF to stop heater. Check and repair fuel solenoid valve accordingly.

F. Once the manual test run has been successfully completed, set the heater switch or timer to OFF, remove the tester and reconnect the control unit. Once done, set the switch or timer to ON. If the heater or a heater component does not respond, the control unit is defective. Replace the control unit and retest the heater.

NOTE: Since the heater operates in the 68 °C (155 °F) to 75 °C (167 °F) On to Off / Off to On range, and the vehicle engine may be hot [e.g. coolant above 75 °C (167 °F)], the heater will not start until the coolant temperature is below 68 °C (155 °F). THIS IS NORMAL and does not indicate a problem.
8. **Heater Maintenance**

8.1 **Annual Maintenance**

The Webasto heater requires a minimum of maintenance to operate.

To keep the Webasto Scholastic Heater™ in good working order, the following maintenance procedures should be performed annually before each heating season:

**NOTE:** For major repairs and service parts, return to your authorized Webasto Specialist.

**Enclosure Area**
- Clean the heater and enclosure area of any accumulated debris or dust with compressed air.
- Inspect all components for wear and damage.

**Electrical System**
- Check all wiring harnesses for damage and corrosion, repair or replace if required.
- Check the condition of the batteries and the connections.
- Load test the batteries and replace if necessary.

**NOTE:** The heater will not function properly or to your satisfaction with weak batteries.

**Exhaust System**
- Check the exhaust system carefully for restrictions or corroded areas. Replace worn or damaged exhaust components as necessary.

**Fuel System**
- Replace the fuel filter (prime) and inspect the fuel line for wear and damage. Repair or replace if necessary.

**Burner System**
- Swing open the burner head, clean the flame detection (photo eye), pull out the combustion chamber, inspect and clean the inside area of the heat exchanger. Replace the fuel nozzle if necessary (annually). Reinstall the combustion chamber and close up the burner head.

**Operational Check**
- Run the heating system for at least 15 minutes.
- Check all water and fuel connections for leakage. Check tightness of all hose clamps if necessary.

**NOTE:** Operate your Webasto heater at least once a month for 20 minutes.
9. Technical Data

Except where limit values are specified, the technical data refer to the usual heater tolerances of ±10% at an ambient temperature of +20 °C (68 °F) and at the nominal voltage and conditions.

9.1 Scholastic Heater Data

<table>
<thead>
<tr>
<th>HEATER DESIGN</th>
<th>SCHOLASTIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAT OUTPUT kW (Btu/h)</td>
<td>13.0 (45,000)</td>
</tr>
<tr>
<td>FUEL</td>
<td>Diesel #1, #2, Arctic and Kerosene</td>
</tr>
<tr>
<td>FUEL CONSUMPTION</td>
<td>l/h (gal/h – US) (gal/h – Imp.)</td>
</tr>
<tr>
<td></td>
<td>1.5 (0.4) (0.3)</td>
</tr>
<tr>
<td>RATED VOLTAGE</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td>OPERATING VOLTAGE</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
</tr>
<tr>
<td>POWER CONSUMPTION OF HEATER WITHOUT COOLANT CIRCULATION PUMP</td>
<td>Watt</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td>PERMISSIBLE AMBIENT TEMPERATURE DURING OPERATION: HEATER, CONTROL UNIT, COOLANT CIRCULATION PUMP - °C (°F)</td>
<td>– 40… + 60 (-40… + 140)</td>
</tr>
<tr>
<td>PERMISSIBLE STORAGE TEMPERATURE: CONTROL UNIT: HEATER, COOLANT CIRCULATION PUMP - °C (°F)</td>
<td>+ 85 max. (+ 185 max.) – 40… + 85 (-40… + 185)</td>
</tr>
<tr>
<td>MIN. CAPACITY OF COOLING SYSTEM</td>
<td>liter (gal. – US) (gal. – Imp.)</td>
</tr>
<tr>
<td></td>
<td>10 (2.65) (2.2)</td>
</tr>
<tr>
<td>PERMISSIBLE OPERATING PRESSURE OF THE COOLANT bar (psi)</td>
<td>0.4-2.0 (6-29)</td>
</tr>
<tr>
<td>CO₂ IN EXHAUST GASES % BY VOL.</td>
<td>10.5… 11.0</td>
</tr>
<tr>
<td>CO IN EXHAUST GASES % BY VOL.</td>
<td>0.2 max.</td>
</tr>
<tr>
<td>SMOKE NUMBER (BOSCH)</td>
<td>3.0 max.</td>
</tr>
<tr>
<td>DIMENSIONS OF HEATER INCL. CONTROL UNIT L W H mm (inch)</td>
<td>584 (23) 205 (8.1) 228 (9.0)</td>
</tr>
<tr>
<td>DIMENSIONS OF HEATER ENCLOSURE L W H mm (inch)</td>
<td>603 (23.75) 305 (12) 254 (10)</td>
</tr>
<tr>
<td>DIMENSIONS OF HEATER TRAY L W H mm (inch)</td>
<td>603 (23.75) 305 (12) 228 (9.0)</td>
</tr>
<tr>
<td>WEIGHT OF HEATER INCL. CONTROL UNIT kg (lb)</td>
<td>15 (33)</td>
</tr>
<tr>
<td>WEIGHT OF HEATER AND TRAY INCL. CONTROL UNIT kg (lb)</td>
<td>27 (60)</td>
</tr>
</tbody>
</table>

Table 3. Technical Data
9.1.1 Scholastic Heater™ Dimensions

Figure 25: Scholastic Heater™ - dimensions

1. Space required for removal of the overheat fuse
2. Fuel inlet connection - JIC #4
3. Space required for removal of the combustion chamber
4. Space required to swing the burner head open
9.2 Coolant Circulating Pump Data

<table>
<thead>
<tr>
<th>CIRCULATING PUMP</th>
<th>MP School Bus Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW RATE l/h (gal/m – US)</td>
<td>3400 - 4542 (15 - 20)</td>
</tr>
<tr>
<td>NOMINAL VOLTAGE</td>
<td>12</td>
</tr>
<tr>
<td>OPERATING VOLTAGE</td>
<td>10-14</td>
</tr>
<tr>
<td>POWER CONSUMPTION Watt</td>
<td>72</td>
</tr>
<tr>
<td>DIMENSIONS mm (inch)</td>
<td>L 214 (8.42) W 106 (4.16) H 106 (4.16)</td>
</tr>
<tr>
<td>WEIGHT kg (lb)</td>
<td>2.5 (5.5)</td>
</tr>
<tr>
<td>HOSE CONNECTION mm (inch)</td>
<td>28.5 (1-1/8)</td>
</tr>
</tbody>
</table>

Table 4.

9.2.1 Coolant Circulating Pump Dimensions

Figure 26: Coolant circulating pump assembly P/N 906017 - dimensions (inches)
9.3 Mounting Tray Dimensions

Figure 27: Mounting tray dimensions (inches)
10. Technical Service Bulletins / Product Information

Category: Thermosystems

Document Number: PI007RC

Date Posted: 02/02/2007

Description: NOI (NO OPERATOR INTERFACE) “WHITE” TIMER INSTALLATION / OPERATION

Overview

The “White” timer is a 7-day NOI (no operator interface) timer. This means you can set this timer to specific needs and the timer will do the rest. This timer has battery backup and will hold its memory if the vehicle battery is disconnected and will recharge when 12 volt power is restored.

Installation

The timer should be installed in an area protected from the effects of weather and contamination. The timer can be surface mounted on the vehicle instrument panel or inside the circuit panel (Bus applications) or any place convenient and accessible.

The timer can be mounted using customer/installer supplied Velcro tape by sticking one half of the Velcro to the timer and the other to a secure mounting location. The timer can be mounted with screws in place of Velcro.

Connect the Webasto heater switching harness to the timer. Refer to the wiring diagram below for directions.

After all connections are made, mount the new timer. Using customer/installer supplied Velcro tape or screws.

Optionally, an On/Off toggle switch can be installed with the timer. The timer will work without using the toggle switch however, it’s a nice option to have.

To mount the toggle switch, locate an appropriate mounting location and drill a ½” mounting hole. Refer to the wiring diagram on next page to, connect the appropriate wires to the toggle switch.

Wiring diagram - NOI Timer
Category: Thermosystems

Document Number: PI007RC

Date Posted: 02/02/2007

Description: NOI (NO OPERATOR INTERFACE) “WHITE” TIMER INSTALLATION / OPERATION

Setting the Timer

The timer is a 7-day NOI (no operator interface) timer. This means you can set this timer to specific needs and the timer will do the rest. This timer has battery backup and will hold its memory if the vehicle battery is disconnected and will recharge when 12 volt power is restored.

To set the timer clock:

Press and hold the “Clock” button and by pressing the “Hour” and “Min.” buttons set the clock appropriately. In the upper left corner you will see the “AM” or “PM” sign.

Setting the timer On/Off functions:

Press the “Timer” button one time. You will see the screen now reads “1” “On” using the day button select the appropriate day or days. Look in the upper left hand corner for the “AM” or “PM” sign. Using the day button you can select one or multiple days. After you have selected the proper day/days and set the appropriate on time, push the “Timer” button once again. You should now see “1” “Off” using the day button select the appropriate days again.

BE SURE THE DAYS SELECTED MATCH THE SAME DAYS YOU SELECTED FOR TIMER “1” “ON”.

Now set the timer to the appropriate “Off” time. After you have set the timer functions needed, push the “Clock” this will save your settings and return to the clock.

These steps can be repeated 6 more times giving you multiple on and off settings. It is very important that you set this timer to the specific needs of each vehicle to optimize the heaters efficiency.
Category: Thermosystems

Document Number: PI007RC
Date Posted: 02/02/2007
Description: NOI (NO OPERATOR INTERFACE) “WHITE” TIMER INSTALLATION / OPERATION

Operation in manual mode:
The largest button on the timer is the “Manual” button. At the bottom of the “LCD” screen you will see a small line that moves as you push this button. Underneath the small line you will see the corresponding function “On” “Auto” “Off”. The manual button can be used as a toggle switch to operate the heater or after you have programmed the timer for automatic service, push the manual button until the line is over “auto” on the timer. The timer will now turn the heater on and off at the times preset earlier.

NOTE:
The toggle switch will illuminate green when the heater has an “On” signal. If the toggle switch is in the “Off” position and the timer has turned the heater on, the toggle will illuminate green. This is an easy way to identify the heater is in operation. While the timer is “On” the toggle switch will NOT operate the heater. The toggle switch is a master switch whenever the timer is not in operation.

Safety Precautions:

- The heater must be switched off at filling stations and tank farms as a result of the risk of explosion.
- The heater may not be operated in enclosed spaces (such as garages) as a result of the risk of poisoning and asphyxiation, even if a timer is used.
- Wherever inflammable vapors or dust may form (for example in the vicinity of fuel, carbon, wood dust or cereal stores or the like), the heater must be switched off as a result of the risk of explosion.

As with other devices whose activation is automated, if a particular application presents a risk should the heater be automatically activated, and such a vehicle or application is equipped with a “power cut off” type switch which prevents devices from activating automatically, then this timer/heater should be wired into this “power cut off circuit” to ensure automated activation of the heater does not occur.
**WARRANTY COVERAGE AND LIMITATIONS**

Webasto Product North America, Inc. (herein after referred to Webasto) warrants their heaters and heater kits against defects in material and workmanship for two (2) years effective at the time of installation or vehicle registration date for Original Equipment installations (OE). This warranty period may not exceed three (3) years from the original date of sale by Webasto. This warranty period may be superseded by a contractual agreement.*

*Warranty coverage for Marine and Off-road applications containing DBW series heaters and the CSL Cargo Heaters are limited to a maximum of 3,000 hours of usage. All other models are limited to 2,000 maximum hours.

Replacement parts are covered for six (6) months or the remainder of the original warranty period, whichever is longer. Replacement heaters are considered a “Replacement Part.”

The intent of the Webasto warranty is to protect the end-user heater from such defects and provide free repair and replacement of defective parts in the manner provided herein. During the warranty period the exclusive remedy will be for Webasto, at their discretion, to repair or replace those parts which are demonstrated to be defective in material or workmanship.

While warranty is provided to the “end-user”, it is to be administered and serviced through an authorized Webasto dealer in accordance with the Webasto warranty policy or contractual agreement between Webasto and a second party.

**Limitations:** Webasto specifically excludes and limits from warranty the following:

- Normal wear of service parts: (fuel nozzles, filters and overheat fuses are not covered).
- Removal and replacement of heater (with the exception of the Thermo Top C).
- Damage to product in transit. All claims must be filed with carrier.
- Improper installation, which is not in accordance with valid, supplied installation instructions or approved OEM applications.
- Deterioration due to normal wear, corrosion, abuse, damage, accident, improper storage or operation.
- Modification of product by alteration, use of non-genuine parts or repair by unauthorized personnel.
- Economic loss for expenses related to travel, vehicle disability, personal injury or other incidental or consequential damages arising from any breach of this expressed warranty.

**Owner’s Responsibilities:**

1) Service heater at the start of each season by an authorized Webasto dealer (Service parts including; fuel nozzles, filters and overheat fuses are not covered under warranty).
2) A Warranty Registration Card is included with the sale of each heater. It is the owner’s responsibility to complete this card and return it to Webasto for registration. A proof of purchase is required for all heaters that are not registered.

This warranty gives you specific legal rights and you may also have other rights which vary by State or Province.

**THE WARRANTY DESCRIBED IN THIS POLICY SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**