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## “Hydronic 5 Coolant Heaters: Installation” Video Transcript

### VIDEO DESCRIPTION:

Length 19:31 min

This video is intended as an accompaniment to the installation documentation currently available. Please take the time to review it carefully prior to beginning the installation process.

### VIDEO TRANSCRIPT:

[Intro music]

(Speaker)

Welcome to Espar Heater Systems, a member of the Eberspaecher group of companies!

This video will outline the purpose, function and installation procedure of a Hydronic 5 Coolant Heater, so it is important to take the time to review it.

### Part Two: The Installation Procedure

Before we go through the installation procedure we will review the components required for the installation. The basic truck kit has the following components:

- The boxed Heater with fuel line
- and wiring harnesses attached

Or a bare heater

- With mounting bracket
- Fuel line
- And wiring harnesses
- A 7 Day Timer with mounting accessories
- Or a push-pull switch
- A standard fuel pickup pipe
- Combustion air intake tube with the bare heater
- Combustion exhaust pipe
- Various accessories
- And a literature package

The user must supply the following components:

- ¾ Inch coolant hose and clamps
- ¾ Inch coolant connectors and valves
- along with coolant

Now that we know why the Hydronic Coolant Heater is beneficial and how it works, we will go through the steps required for installation.

### 1. Gather required tools [Minute 01:47]

Step one will help you gather the tools required for the installation:

- Screwdrivers
- Torques drive set
- Standard and metric wrenches
- Standard and metric sockets
- Standard drill
- 1 Inch hole saw
- Along with pipe thread sealant and terminal grease
- Standard drill bits
- Utility knife
- Wire strippers
- Wire cutters
- Hose clamping tools

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- Hose cutter

There are also **special tools** required which can be ordered from Espar using the standard part ordering procedure. They are:

- Wire Crimpers
- Terminal removal tools
- Diagnostic unit and adapter

## 2. Plan Installation Location [Minute 02:56]

Step two will show you how to decide on the appropriate location for the heater.

Espar recommends that a boxed unit be used, however, if a boxed unit is not used, the heater should be mounted in an area where it is protected from severe environmental conditions such as road spray and debris.

The heater can be installed in various locations, such as the engine compartment, outside frame rail, inside frame rail with the required bracket, or on a cross tray between the frame rails. The heater can also be mounted inside a storage box, if the truck is equipped.

A few very important things to consider when picking a location for the heater are:

- The heater must be located below the minimum coolant level of the engines cooling system
- Be sure there is sufficient clearance between the heater and its components and all moving components and systems of the truck
- Avoid locations where there is extreme heat and or vibration
- Preferably the heater should be mounted in the normal position, horizontal, with the exhaust connection to the bottom. It can also be mounted up to 90° with the coolant connections pointing down. Or up to 90° on its side with the bleed screw on the top side.

In this video we are going to install a boxed heater in the normal position here on the outside of the frame rail behind the cab.

## 3. Mounting the Heater [Minute 04:37]

Step three is to mount the unit.

Be sure to check behind the surface being drilled, so other components or systems will not be damaged. A four hole pattern, matching the pattern on the mounting box has to be drilled to bolt the box down.

Now take the boxed heater and line up the brackets on the box with the drilled holes and insert the bolts.

## 4. Connect Heater to Coolant System [Minute 05:10]

In step four we will connect the heater to the trucks engine coolant system.

Some guidelines to follow when incorporating the heater into the engines cooling system are:

- Use existing holes in the engine block and water pump for pickups and returns
- Keep the pickup and return points as far apart as possible to ensure good heat distribution
- Take the coolant from a low point in the engine to reduce erosion in the system
- Ensure proper flow by drawing the coolant from a high pressure point and returning it to a low pressure point. For example: Take the coolant from the back of the engine block and return it to the suction side of the engines water pump.

In this video we are going to connect the heater so that the coolant will be taken from a high-pressure coolant line, coming from the rear of the engine.

To access the coolant from the rear of the engine use a Y-connector, clamp off the hoses if you have not drained the engine coolant. Install the Y-connector and clamp on the coolant hoses.

The coolant will be returned from the heater to low pressure intake side of the engine water pump. Before removing the fitting from the spare part, the engines cooling will have to be drained. Replace the plug with the required fitting and be sure to use a sealant on the threads.

Now connect the coolant hose and clamp it. Run both of these coolant hoses to the heater and secure them as you go. Make sure the hoses are routed in a manner that they will not be chafed, kinked or damaged.

In this installation we are going to install shut off valves in both the heater intake and outlet lines by the heater. These are recommended for ease of isolating the heater when not in use or while being serviced.

You may now refill the engines coolant system and check for leaks.

## 5. Install Fuel Pickup Pipe [Minute 07:40]

Step five is to install the fuel pickup pipe. In this installation we are going to mount the fuel pickup pipe using an existing hole in the fuel tank.

First, line up the fuel pipe to the fuel tank and measure about 2 Inches from the bottom of the fuel tank. Cut the pipe to this length at a 45° to 60° angle. Make sure the hole is free of burrs and chips.

Next, remove the plate that is screwed on the tank and cut a 1 Inch hole in the center. Assemble the fuel pickup pipe components onto the tank in the following order:

- 1) The metal washer, the plate with the 1 Inch hole
- 2) The rubber washer
- 3) The metal washer
- 4) And finally the nut

Now, hand-tighten the nut and mount the plate back onto the tank.

To finish the pipe installation, tighten the bolt on the fuel pipe with the spout pointing in the desired direction.

For the Hydronic Heaters with external fuel pumps the installation goes as follows:

If required, cut the fuel pickup pipe at a 45° to 60° angle to fit the fuel tank.

The fuel pickup pipe should be located at the top of the fuel tank near the heater.

Be sure there is sufficient space above the tank to fit a drill and hole saw.

Next, mark out the hole pattern; Drill the two 1/4 Inch holes first; then drill the center 1 Inch hole in the center.

The 1 Inch slot may be extracted from the hole by greasing the hole-saw prior to cutting.

Assemble the fuel pickup pipe parts onto the tank in the following order:

- 1) Insert the pipe
- 2) Slide the steal washer into the slot and under the pipe stop,
- 3) Add the rubber washer,
- 4) Add the metal washer,
- 5) Fuel pump bracket
- 6) And finally the nut

Align the fuel pipe to the required direction and tighten the nut until secure.

## 6. Connect Fuel Line [Minute10:17]

In step six we will connect the fuel line.

To do this, root it from the boxed heater to the fuel pickup pipe. Be sure to secure the fuel line to avoid potential damage. Now cut the fuel line to length, using a sharp knife or hose cutter. Do not cut the fuel line with a side cutter, it will crush the fuel line and the fuel might not flow properly.

Now take the rubber connector that reduces from 5 to 3.5 millimetres and slide the 5-millimeter opening over the pickup pipe and put on the 11-millimeter clamp.

Now push the fuel line in the 3.5 millimetres opening in rubber connector. And make sure to butt it against the fuel pickup pipe. Now clamp it with a 9-millimeter clamp that is supplied.

## 7. Install Exhaust and Air Intake Hose [Minute 11:20]

In step seven we will install the exhaust pipe and air intake hose.

Connect the flexible exhaust pipe to the exhaust port on the heater and clamp it.

Secure the exhaust pipe with a steel 'p' clamp provided.

Now route the exhaust to an open area to the rear or side of the truck, so that fumes cannot build up and enter the passenger compartment or the heater combustion air intake.

When routing the exhaust, give it a slope, or drill a small hole in the lowest point, to allow water run-off.

Also, make sure that it is at least 2 inches away from any heat sensitive materials and it is routed so it will not be plugged, crushed or faced into the vehicles slipstream.

Only the bare unit requires a combustion air intake hose. In this case it must draw clean air from outside and should be routed so it will not get plugged or crushed and does not face into the vehicles slipstream.

## 8. Installing an Operating Switch [Minute 12:43]

Step eight is to install an operating switch.

The most common are the 7-Day Timer and the push/pull switch.

The operating switch can be mounted in various locations in the drivers cab. To install the 7-Day Timer mount the bezel or mounting bracket in a suitable location.

Route the switch harness from the heater into the cab, where the control switch will be mounted. In this case a hole had to be drilled to route the harness into cab. Use a robber grommet to protect the harness and seal the entrance point into the cab.

Secure the harness so that it will not be damaged and make sure it has enough slack to compensate for the movement of the air ride cab.

Now cut the harness to length, remove about 1.5 inches of the sheathing, then strip and terminate the wires. Using the wiring diagrams supplied with the 7-Day Timer, push the wires into the connector:

The red wire goes into location 1; the yellow into location 2; the brown into location 3 and the blue into location 4.

The wires color should match when the connectors are joined: Red to red, yellow to yellow and so on.

The black and grey wires that are on the 7-Day Timer adapter can also be connected for the following options:

- To allow the timer display to illuminate with the vehicles dash lights, connect the grey wire to the vehicle demo switch
- To run the heater continuously when the heater is switched on manually you will need to connect the black wire to the vehicle ignition accessory on circuit.
- The black wire connection is also required in order to erase fault codes in the control unit memory and to unlock it.

If you are installing a push/pull switch refer to the instruction that come with the switch for its mounting and wiring.

## 9. Make battery connection [Minute 15:06]

Step 9 is to make the battery connections.

Route the battery wire harness to the battery compartment. Then cut the harness to the required length; cut the wire shielding back 4 to 5 Inches.

Strip the brown wire and attach the ring terminal; Push the un-stripped red wire up through the fuse holder. Strip the wire and terminate with the supplied terminal.

Then pull the terminal into the fuse holder; connect the ring terminals to the batteries; attach the red wire to positive and the brown wire to negative.

Insert the 20 Amp fuse; Replace the fuse cover and secure it with nylon tie wraps.

To stop the terminals from corroding apply terminal grease.

## 13. Test Heater Function [Minute 16:26]

In step ten we will test the heater function:

Before doing so, we need to bleed the coolant system. Start the engine and run it for 5 minutes while topping off the coolant and checking for leaks.

To start the heater initially press the heat button on the 7-Day Timer, then press the clock button for 2 seconds. Press the heat button again and the heater will activate.

You may need to use the bleed screw on the heater to release air trapped in the heaters coolant system.

It may take several start-up attempts to purge the air in the fuel lines before the heater will start.

Once the heater is running, allow to run for 30 minutes. The heat button is also used to stop the heater. For full instruction on how to program and use the timer, refer to the timer instructions.

In this step we will also cover [the 7-Day Timer Diagnostics](#).

If the heater has a fault when it is turned on, the active fault will appear, if it does not, press and hold the clock symbol button and the "P" button simultaneously to place the 7 Day Timer into fault code mode.

Then press the arrow buttons to review the most recent faults. The heater can store up to five faults. Consult the heater technical manual for the fault code chart diagnosis, trouble shooting and repair procedures.

Now that we have completed the Hydronic 5 installation we will review the major components.

- The heater

# Video Transcript



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- The coolant connections
  - The fuel delivery system
  - The exhaust and intake
  - The battery connections
  - And the operating switch

When servicing a unit be sure to refer back to the Hydronic Coolant Heater technical manual. This manual outlines the full installation process, provides detailed troubleshooting and repair procedures along with a complete parts list and fault list. Service tools such as the diagnostic unit or the KD2000 are required for proper service of the heater.

You have now completed the initial technical training for the installation of Espar's Hydronic 5 Coolant Heater. Thank you for taking the time to view this video.

Espar's technical support department is available if you require further assistance. Complete contact information is shown here and is also printed on the back of each technical manual.