

“Airtronic Heaters: Installation” Video Transcript

VIDEO DESCRIPTION:

Length 24:42 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]

(John Dennehy, Vice President of Marketing & Communications)

Hello. Thank you for taking the time to learn about Espar's Airtronic Parking Heater. This training material will outline the purpose, function and installation procedure of the heater will service as initial technical training. Please take the time to review. Each participant who wishes to become Espar certified must write the accompanying assessment and return it to Espar. Any questions regarding the content of this training video may be directed to Espar's technical support department. Complete contact information is shown in the back of each technical manual and at the end of this presentation. Thank you.

(Speaker)

1. Gather required tools [Minute 01:03]

The following standard tools are required:

- Phillips and flat head screwdrivers
- Mini Phillips screwdrivers
- Standard and metric sockets and wrenches
- Standard drill
- Angle drill
- 4 Inch hole saw
- 2.5 Inch hole saw
- 1 Inch hole saw
- ¾ Inch hole saw or drill bit
- Various standard drill bits
- Utility knife
- Wire cutters
- Wire strippers

Additionally, there are **3 special tools** required. These tools are available from Espar using the standard part ordering procedure:

- Wire Crimpers (part #CA0 05002)
- Diagnostic Unit (part #CA1 05 020)
- Terminal Removal Tool (part # 206 00 204)

A complete tool list is included in the training information package.

2. Plan Component Layout [Minute 01:59]

Before any holes are drilled, it is imperative that the Airtronic Heating System Layout is well planned. The best location and position of each component must be considered.

The most important planning takes place in the cab, in the area under the bunk. The Airtronic Heater, outlet and return air ducts must be installed such that they:

- a. Provide sufficient air movement in the sleeper
- b. Are protected from damage from stored items
- c. Do not interfere with cab structural members or truck mechanical components under the floor

To ensure proper air movement the HOT AIR outlet must be directed towards the front of the truck. The return air must be drawn in an area away from the outlet air, to ensure the hot outlet air is not immediately returned to the heater. Be cautious of items that could block the return air vent. For Example: If the vent is too close to hanging bed sheets or stored, dirty laundry the vent may become blocked. This will cause the heater to overheat and switch off.

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When possible, the heater should be installed in the center or passenger side compartment. The driver side compartment is used more frequently for storage, so space in this compartment is generally more valued. Also, a heater installed in a congested area is more likely to be damaged. If the heater must be installed in a heavily used storage area, it is a good idea to fabricate and install a protective covering to protect the heater and ducting from sharp and heavy objects. The most common under bunk layout is shown here [highlighted in green]. For this installation the recommended placement of the heater and ducts is shown:

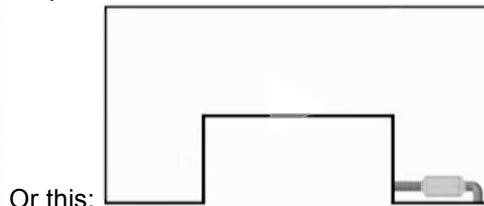


This allows for good air circulation and protects the heater and ducts from personal items placed in driver's side storage compartment.

Alternatively, the heater may be installed here:



Some trucks have a front accessible storage area under the bed. In this example a suitable location may be like this



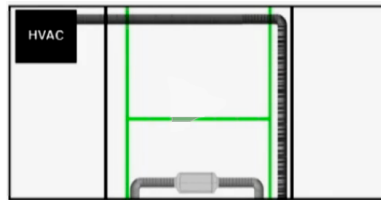
Or this:

In our truck we have decided to place the heater here:

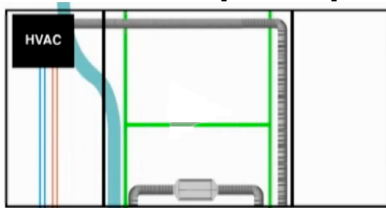


Before this location can be finalized it is important to look under the sleeper to determine the location of cab structural members and truck components.

On our truck, the structural members are highlighted in green:



The HVAC model coolant hoses are in red, the refrigerant lines are in blue [two narrow lines] and the truck exhaust pipes are in blue as well [wide line].



There will no other truck components under our sleeper that will interfere with the heaters under-cab components.

3. Drill Holes [Minute 04:51]

The location of the heater can now be marked out using a paint pen or marker on the mounting plate. The parameter of the plate and the 4 middle holes should be marked on the mat. The center hole is found by connecting the dots to make an 'x'. Now, mark a suitable location for the wire harness to go through the floor. Again, check under the sleeper for structural members and truck components. Drill both, mounting plate and wire harness center holes, with the mat in place.

[Screwdriver sound]

Now, the mat may be removed; Using a knife, cut out the rectangular hole for the mounting plate and a 1 inch round hole for the wire harness. Drill the 4-inch hole for the heater and the $\frac{3}{4}$ inch hole for the wire harness grommet in the truck floor.

[Screwdriver sound]

Now drill the two 2.5 inch holes, one for the hot air outlet vent and one for the cold air return vent.

4. Clean Up Truck Interior [Minute 06:14]

Clean up using a shop vac.

Time saving tip: If all the holes are drilled from inside the compartment all the tips will be in one place. Place a garbage can or a box under the 4-inch hole and sweep the chips down through the hole. Place the wire grommet into the cable hole. The mat may now be replaced.

5. Pre-Assemble Heater [Minute 6:50]

Before the heater is mounted into the truck, the mounting plate, fuel line, exhaust hose and combustion air hose must be attached to it. Using a 10-millimeter socket, attach the mounting plate with the 4 supplied 6 millimetre washers and nuts. Next, place the short 3.5-millimeter ID rubber hose under the fuel fitting with two 9-millimeter clamps. Push the 1.5-milliliter ID clear fuel line into the hose until it touches the fitting. Tighten the clamps [highlighted in green] using a Phillips screwdriver. Now the combustion air hose and exhaust hose may be clamped to the heater. Be sure to place the 25-millimeter ID combustion air hose on the fan side and the 24-millimeter ID exhaust hose on the heat exchanger side of the heater. All hose clamps must be located centrally to ensure the best fit into the hole in the truck floor. Finally, attach the foam gasket to the mounting plate and the end caps to the exhaust and combustion air inlet hoses.

6. Install Switch Harness [Minute 08:40]

Before mounting the heater, push the battery wire harness and the fuel metering pump wire harness through the grommet in the floor. Route the switch wire harness to the trucks sleeper control panel. The wire harness may be tie wrapped to another wire bundle using nylon ties. Or secure separately using p clamps.

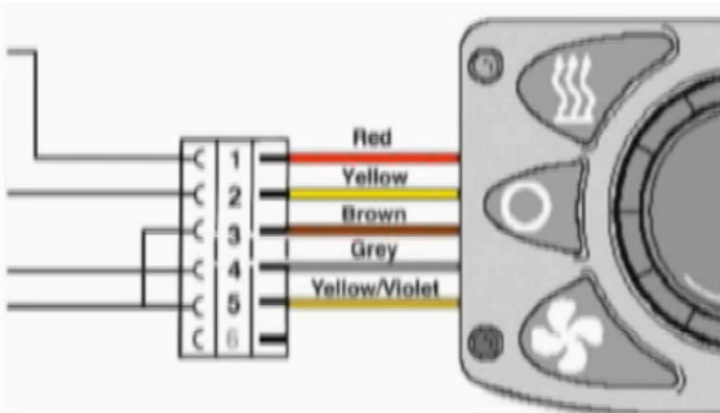
7. Install Switch [Minute 09:07]

Two operating switches are available for the Airtronic Heater: The Mini Controller [shown on the left] and the thermostat modulator [shown on the right]. Only one switch may be installed but both will be shown here for demonstration purposes.

Mini Controller Installation [Minute 09:25]

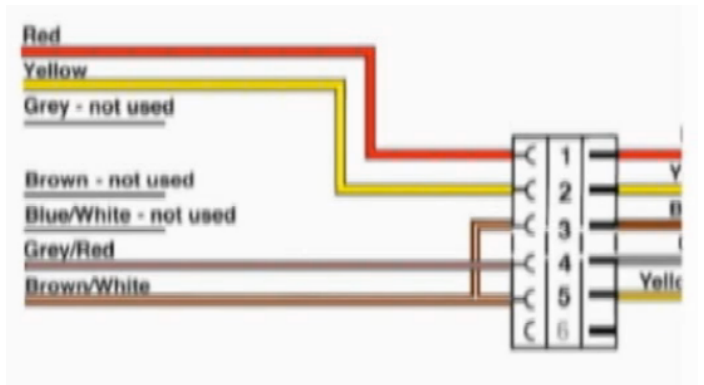


Find a suitable place to mount the Mini Controller on the sleeper control panel or near the control panel on the wall. Remove the panel and pull the switch panels up to the opening. Place the Mini Controller template sticker in the desired location. Drill the 2.5-millimeter and 7.5-millimeter holes. A 3.42 and 5.16 drill bit may be used respectively. Attach the foam backing to the Mini Controller and remove the temperature control knob. Feed the wires through the larger hole; place the supplied screw into the Mini Controller and tighten it into the smaller hole. Re-attach the temperature selection knob. Now the switch wire must be terminated and connected. Grip the supplied male mini terminals to the red wire, yellow wire and grey wire with the red tracer. Use the supplied section of brown wire with the white tracer with the additional required connection the brown white wire.



Now push each terminal in the correct connector location. On the Controller side: Red into location 1; Yellow into location 2; Brown into location 3; Grey into location 4 and yellow with the violet tracer into location 5.

Similarly on the switch harness side:
Red into location 1; Yellow in to location 2; Brown with the white tracer into location 3 and 5; grey with the red tracer into location 4.
The remaining wires are not used.

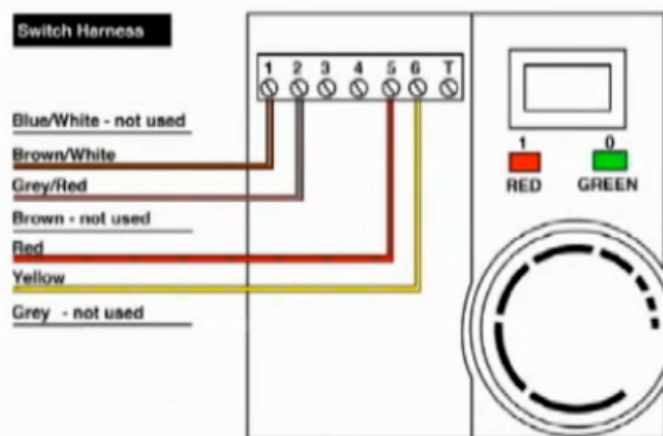


Be sure to use the correct pin locations to ensure trouble shooting ease and part interchange ability.
If a terminal is accidentally inserted into the wrong connector location use the terminal removal tool to remove it.
Make the connection, push the wires into the wall and reinstall the panel.

(Alternative) Thermostat modulator installation [Minute 12:07]

Find a suitable place to mount the thermostat on or near the rear control panel. Remove the thermostat cover and mark the 2 mounting holes and the cable hole. Drill a 5/16-inch hole for the cable and use the supplied self-drilling screws to mount the thermostat.

Push the wire harness through the hole and connect the wires as follows:



Brown with the white tracer to location 1; grey with the red tracer to location 2; red to location 5; yellow to location 6; the remaining wires are not used.
Be sure to use a mini Phillips screwdriver to tighten these screws.
Pull on each wire to ensure each contact is secure.

Re-attach the thermostat cover and re-install the truck control panel.

8. Mount Heater [Minute 13:15]

First, place the vent flanges into the 2.5-inch hole and secure them using the pre-supplied soft drilling screws for each flange.

[Drilling sound]

Snap the rotatable vent on to the outlet flange and the protective grill onto the inlet flange. The Heater may now be installed. Carefully push the fuel line, exhaust and combustion air tubing down through the 4-inch hole. Ensure the fuel line is not kinked. Mount the heater with the supplied self-drilling screws. Over tightening the mounting screws will resolve in a poor seal.

The supplied air duct may now be fitted. Cut the required duct lengths and connect them using the supplied clamps and a 5.16-inch socket. Over tightening the duct clamp on the blower side of the heater e.g. with power tools, can cause interference with the fan wheel due to its tight tolerance with the casing. The last step inside the truck is to connect the wire harness to the heater. Use a small flat screwdriver and open the positive assurance lock. Make the connection and push the assurance lock closed.

9. Install Exhaust Hose [Minute 14:40]

Round the heater exhaust hose to the rear of the sleeper, secure it to the underside of the cab floor using the supplied brackets and self-drilling screws. Do not mount it to the frame. Be sure the end of the hose extends beyond the edge of the sleeper and it is pointed downwards to avoid collecting water and dirt. If the supplied hose is too long it may be shortened.

10. Install Combustion Air Inlet Hose [Minute 15:12]

Route the combustion air inlet hose towards the front of the truck. Make sure it draws clean air by positioning it away from areas of road spray, water and snow. Turn the end of the hose towards the rear of the truck to ensure air is not forced into the heater while the truck is moving. The combustion air inlet hose may be secured using nylon tie wraps.

11. Install Fuel Pickup Pipe and Fuel Metering Pump [Minute 15:48]

If required, cut the fuel pickup pipe at a 45° to 60° angle to fit the fuel tank. The bottom of the pipe should be approximately 2 inches above the tank bottom. Ensure the hole is free of burrs and chips. The fuel pickup pipe should be located at the top of the fuel tank near the heater in an aesthetically pleasing position. Be sure there is sufficient space above the tank to fit a drill and hole saw. Mark out the hole pattern. Drill the two 1/4-inch holes first; then drill the center 1-inch hole.

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 metering pump mounting bracket
- 6) And finally the nut

Align the assembly into its final required position and tighten the nut until everything is secure. Install the fuel-metering pump into the rubber mount, with the connector on the top. Cut the 5-millimeter ID fuel hose to length and install it using two 11-millimeter clamps under the fuel pickup pipe and suction side of the fuel-metering pump. Place the small section of 3.5-millimeter ID hose with two 9-millimeter clamps onto the pressure side of the pump. Route the 1.5-millimeter ID fuel line to the fuel-metering pump. Be sure to leave sufficient line for maximum movement of the sleeper's air ride suspension.

When cutting fuel lines use a hose cutter or a sharp knife. Do not use side cutters! Push the fuel line into the connector hose until it touches the pump fitting. Tighten the 9-millimeter clamps using a Phillips screwdriver. Route the fuel-metering pump wire harness along the fuel line to the fuel-metering pump. Cut the wire to length, again taking the trucks air ride suspension into account. Remove 2 inches of sheathing and insert the wire seals onto the wires. Strip the wires and terminate with the supplied terminals. Now, push the terminals into the connector. The fuel-metering pump is non-polar so it does not matter which terminal goes into which side of the connection block. Plug the connector into the fuel-metering pump. Time Saving Tip: Route the combustion air tube towards the fuel-metering pump to create a support structure to the fuel line and fuel-metering pump wire harness. This makes for a tidy installation and ensures that nothing touches the hot heater exhaust tube.

12. Make Battery Connections [Minute 19:30]

Route the battery wire harness to the battery compartment. Again allow sufficient wire to compensate for sleepers air ride suspension. Cut the harness to the required length; cut the wire sheathing back 4 to 5 inches. Push the unstrapped red wire up through the fuse holder. Strip the wire and terminate with the supply terminal. Pull the terminal down to seat in the fuse holder. Strip the brown wire and attach the ring terminal; connect the ring terminals to the batteries; Insert the 20 Amp fuse. Replace the fuse cover and secure it with a nylon tie wrap.

13. Test Heater Function

Now we may function test the heater:

Climb into the sleeper and press the heat button on the Mini-Controller or if you have a thermostat, switch it on.

The heater will begin its start-up procedure. It may take 2 or 3 attempts for the heater to start, as it must first bleed all the air from the fuel lines. Time Saving Tip: Clean up outside the truck while waiting for the heaters first start.

If the heater does not start after second 3-minute start attempt, it will run the blower for 4 minutes to cool down and then stop. Switch it off and then back on to restart it. Once the heater has started, connect the diagnostic unit. Connect the 8 pin black connector on the diagnostic unit to the Airtronic diagnostic pigtail. If the heater did not start on its first start attempt, a fault code 52 will be in the heater memory. The diagnostic unit will be used to clear this code. Press the 'D' button to download the fault codes. Scroll through the codes using the arrow buttons. The last 5 stored faults are labeled F1 to F5. Where F1 is the most recent fault code and F5 is the oldest. The AF or actual fault, if any, is the fault that just occurred during the current operation cycle. To clear the fault codes in memory: Press and hold the two 'L' buttons 5 seconds.

Now, that the heater is installed let's take a few moments to review the steps taken:

The Airtronic installation process normally requires 2 to 3 hours.

1. Gather required tools
2. Plan component Layout
3. Drill holes
4. Clean Up Truck Interior
5. Pre-Assemble Heater
6. Install Switch Harness
7. Install Switch
8. Mount Heater
9. Install Exhaust Tube
10. Install Combustion Air Inlet Tube
11. Install Fuel Pickup Pipe and Fuel Metering Pump
12. Make Battery Connections
13. Test Heater Function

Please make full use of the Airtronic technical manual included with the kit. This manual outlines the full installation process, gives detailed troubleshooting and repair procedures and includes a complete parts list.

Service tools such as the diagnostic unit or the KD2000 diagnostic software are required for proper service of the heater. If further assistance is required, Espar's technical support department is always willing to help.

Complete contact information is listed on the back of each technical manual and will be listed at the end of this video.