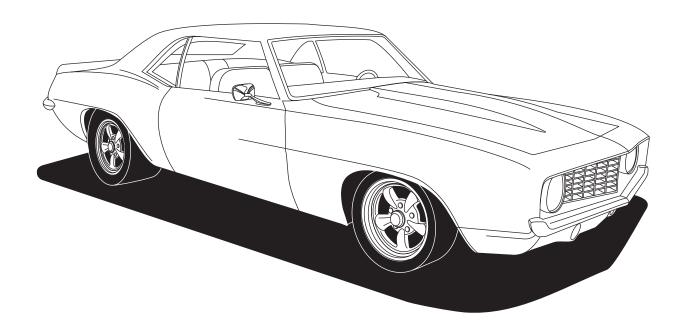


1969 Chevrolet Camaro

without Factory Air Gen 5 Evaporator Kit (561245)



18865 Goll St. San Antonio, TX 78266 Phone: 800-862-6658 Sales: sales@vintageair.com Tech Support: tech@vintageair.com www.vintageair.com



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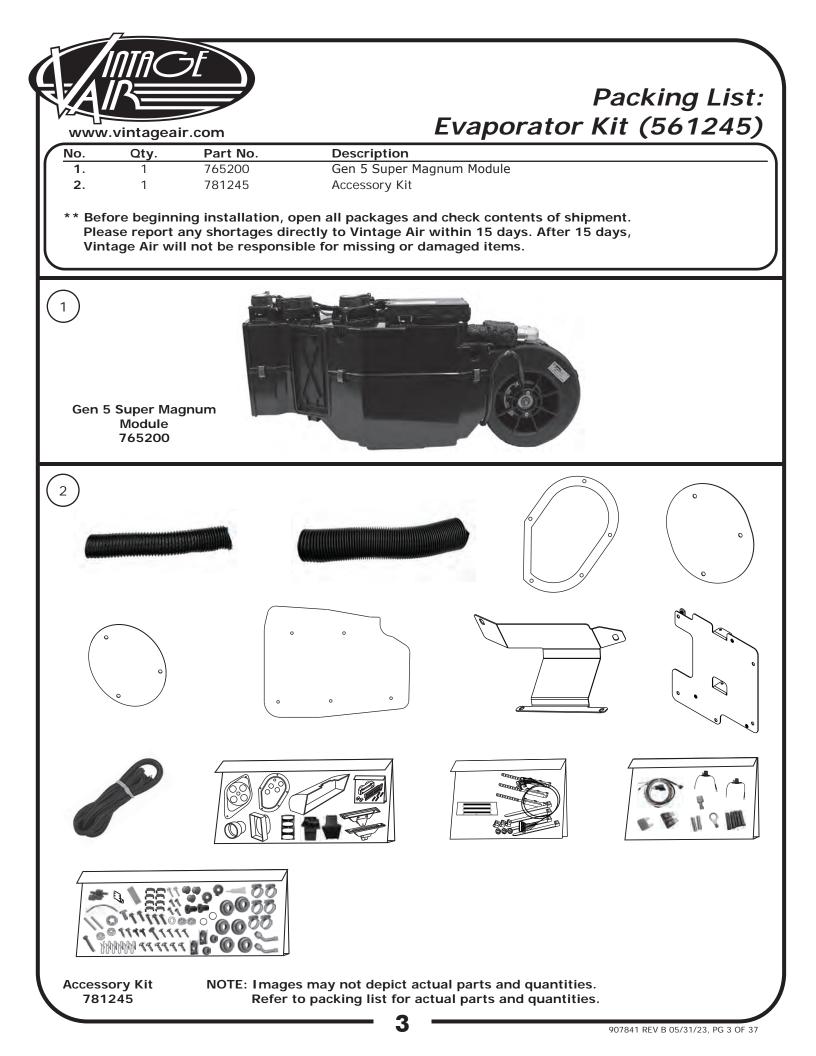
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2



A detailed tech video outlining the installation process of a Gen IV unit is available on Vintage Air's YouTube channel at <u>http://bit.ly/2GWAxWY</u>.

Installation processes of Gen IV and Gen 5 units are similar. Viewing the tech video along with the written instructions will provide the installer the most detailed installation procedure.





Important Notice—Please Read

For Maximum System Performance, Vintage Air Recommends the Following:

NOTE: Vintage Air systems are designed to operate with R134a refrigerant only. Use of any other refrigerant could damage your A/C system and/or vehicle, and possibly cause a fire, in addition to potentially voiding the warranties of the A/C system and its components.

Refrigerant Capacities:

Vintage Air System: 1.8 lbs. (28.8 oz.) or 816 grams of **R134a**, charged by weight with a quality charging station or scale. **NOTE: Use of the proper type and amount of refrigerant is critical to system operation and performance.**

Other Systems: Consult manufacturer's guidelines.

Lubricant Capacities:

New Vintage Air-Supplied Sanden Compressor: No additional oil needed (Compressor is shipped with proper oil charge).

All Other Compressors: Consult manufacturer (Some compressors are shipped dry and will need oil added).

Safety Switches

Your Vintage Air system is equipped with a binary pressure safety switch. A binary switch disengages the compressor clutch in cases of extreme low pressure conditions (refrigerant loss) or excessively high head pressure (406 PSI) to prevent compressor damage or hose rupture. A trinary switch combines Hi/Lo pressure protection with an electric fan operation signal at 254 PSI, and should be substituted for use with electric fans. Compressor safety switches are extremely important since an A/C system relies on refrigerant to circulate lubricant.

Service Info:

Protect Your Investment: Prior to assembly, it is critical that the compressor, evaporator, A/C hoses and fittings, hardlines, condenser and receiver/drier remain capped. Removing caps prior to assembly will allow moisture, insects and debris into the components, possibly leading to reduced performance and/or premature failure of your A/C system. This is especially important with the receiver/drier.

Additionally, when caps are removed for assembly, **BE CAREFUL!** Some components are shipped under pressure with dry nitrogen.

Evacuate the System for 35-45 Minutes: Ensure that system components (Drier, compressor, evaporator and condenser) are at a temperature of at least 85°F. On a cool day, the components can be heated with a heat gun *or* by running the engine with the heater on before evacuating. Leak check and charge to specifications.

Bolts Passing Through Cowl and/or Firewall:

To ensure a watertight seal between the passenger compartment and the vehicle exterior, for all bolts passing through the cowl and/or firewall, Vintage Air recommends coating the threads with silicone prior to installation.

Heater Hose (not included with this kit):

Heater hose may be purchased from Vintage Air (Part#31800-VUD) or your local parts retailer. Routing and required length will vary based on installer preference.

4



Important Wiring Notice—Please Read

Some vehicles may have had some or all of their radio interference capacitors removed. There should be a capacitor found at each of the following locations:

- 1. On the positive terminal of the ignition coil.
- 2. If there is a generator, on the armature terminal of the generator.
- 3. If there is a generator, on the battery terminal of the voltage regulator.

Most alternators have a capacitor installed internally to eliminate what is called "whining" as the engine is revved. If whining is heard in the radio, or just to be extra cautious, a radio interference capacitor can be added to the battery terminal of the alternator.

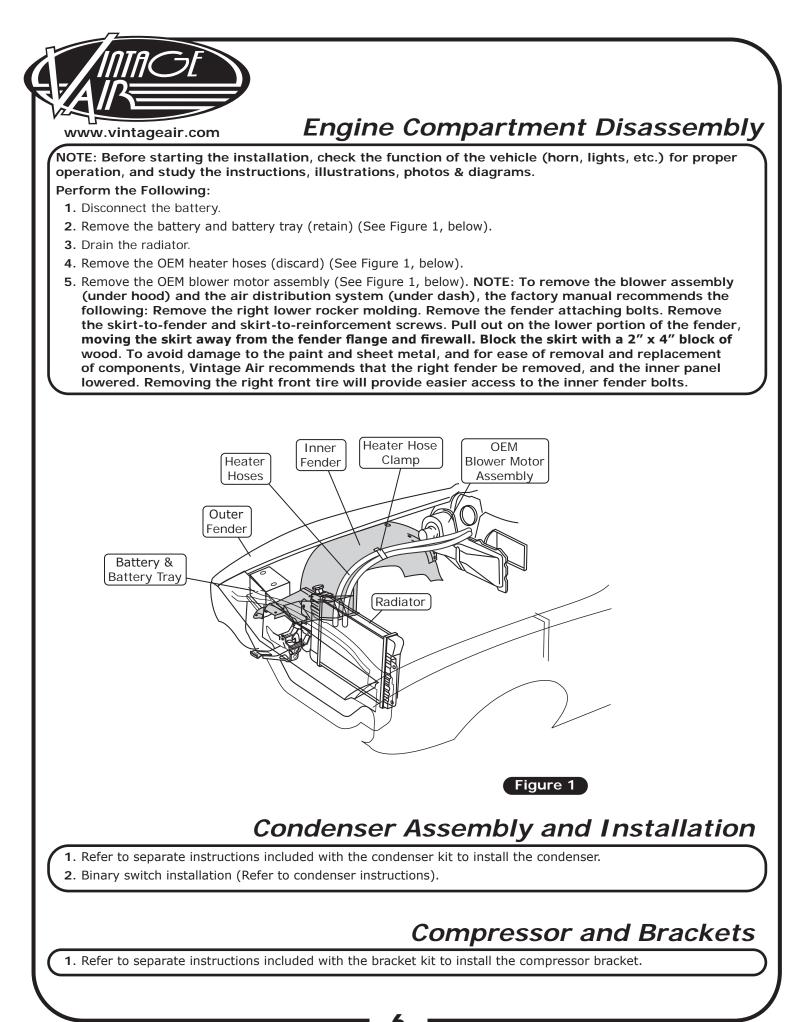
It is also important that the battery lead is in good shape and that the ground leads are not compromised. There should be a heavy ground from the battery to the engine block, and additional grounds to the body and chassis.

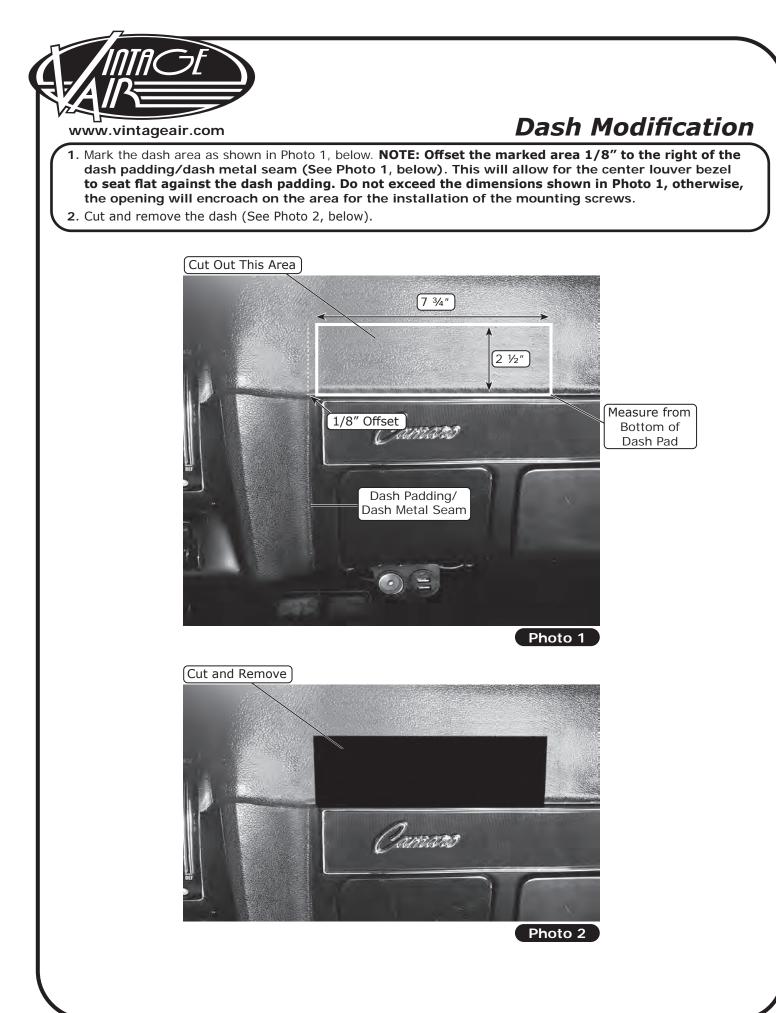
If these precautions are not observed, it is possible for voltage spikes to be present on the battery leads. These spikes come from ignition systems and charging systems, and from switching some of the vehicle's other systems on and off. Modern computer-operated equipment can be sensitive to voltage spikes on the power leads, which can cause unexpected resets, strange behavior and/or permanent damage.

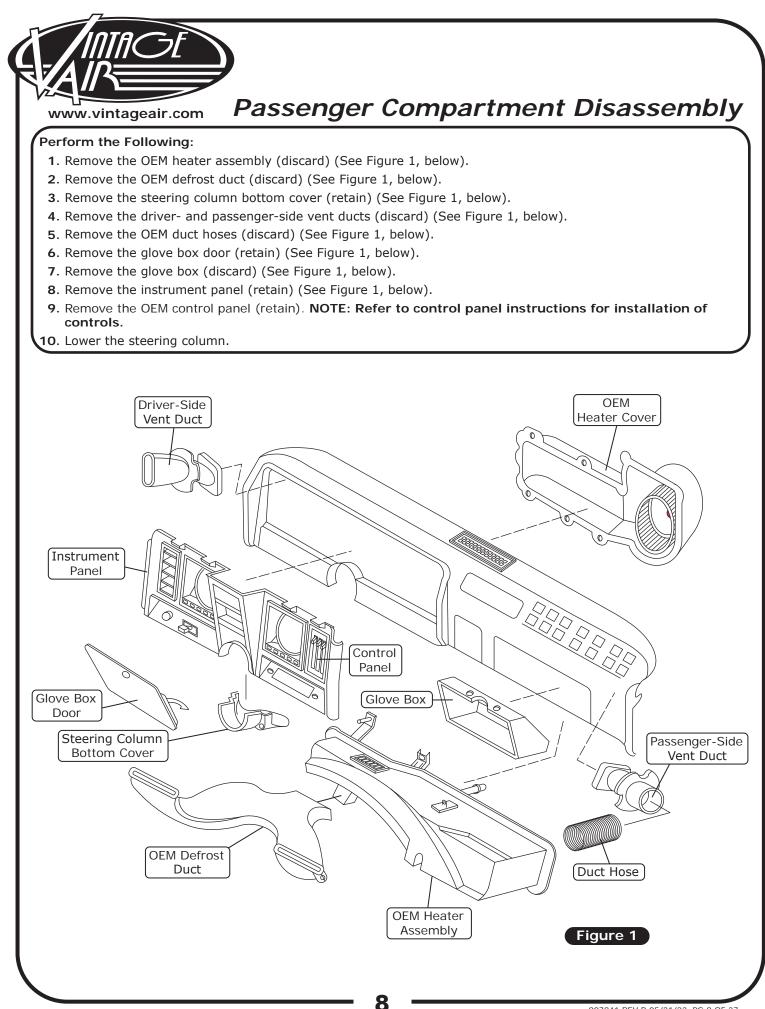
Vintage Air strives to harden our products against these types of electrical noise, but there is a point where a vehicle's electrical system can be degraded so much that nothing can help.

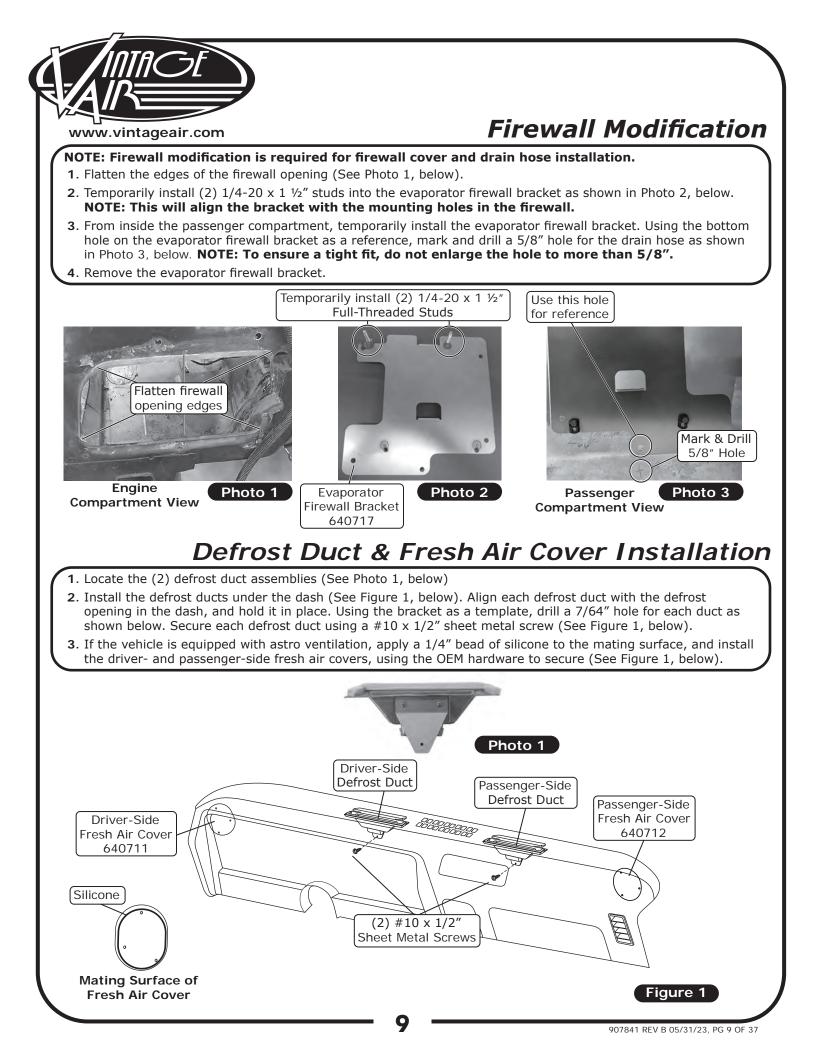
Radio interference capacitors should be available at most auto and truck parts suppliers. They typically are cylindrical in shape, a little over an inch long and a little over a half-inch in diameter, and they have a single lead coming from one end of the cylinder with a terminal on the end of the wire, as well as a mounting clip which is screwed into a good ground on the vehicle. The specific value of the capacitance is not too significant in comparison to ignition capacitors that are matched with the coil to reduce pitting of the points.

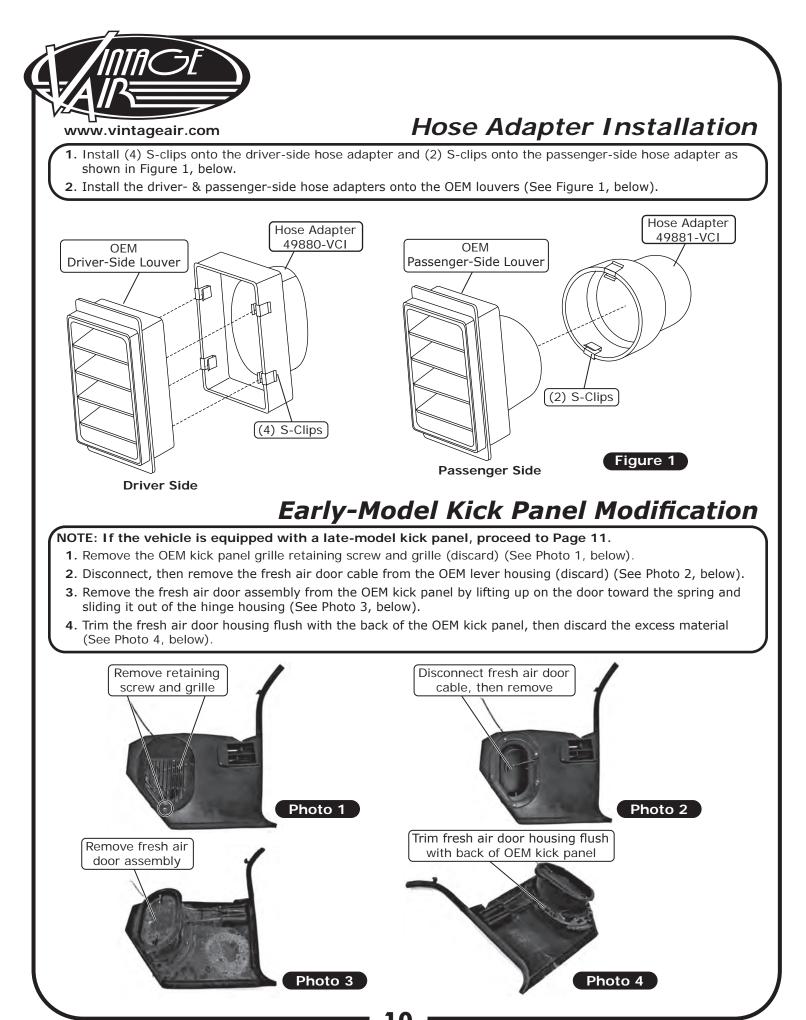
- Care must be taken, when installing the compressor lead, not to short it to ground. The compressor lead must not be connected to a condenser fan or to any other auxiliary device. Shorting to ground or connecting to a condenser fan or any other auxiliary device may damage wiring or the compressor relay, and/or cause a malfunction.
- When installing ground leads on Gen 5 systems, the blower control ground and ECU ground must be connected directly to the negative battery post.
- For proper system operation, the heater control valve must be connected to the ECU.

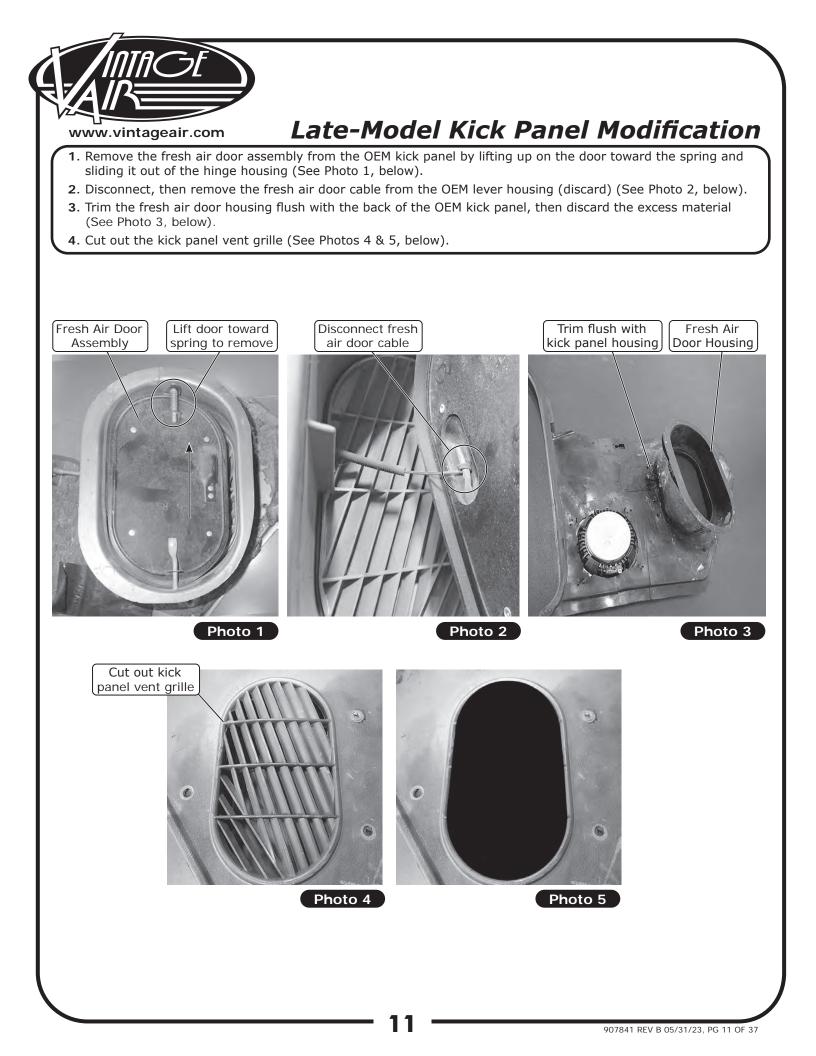


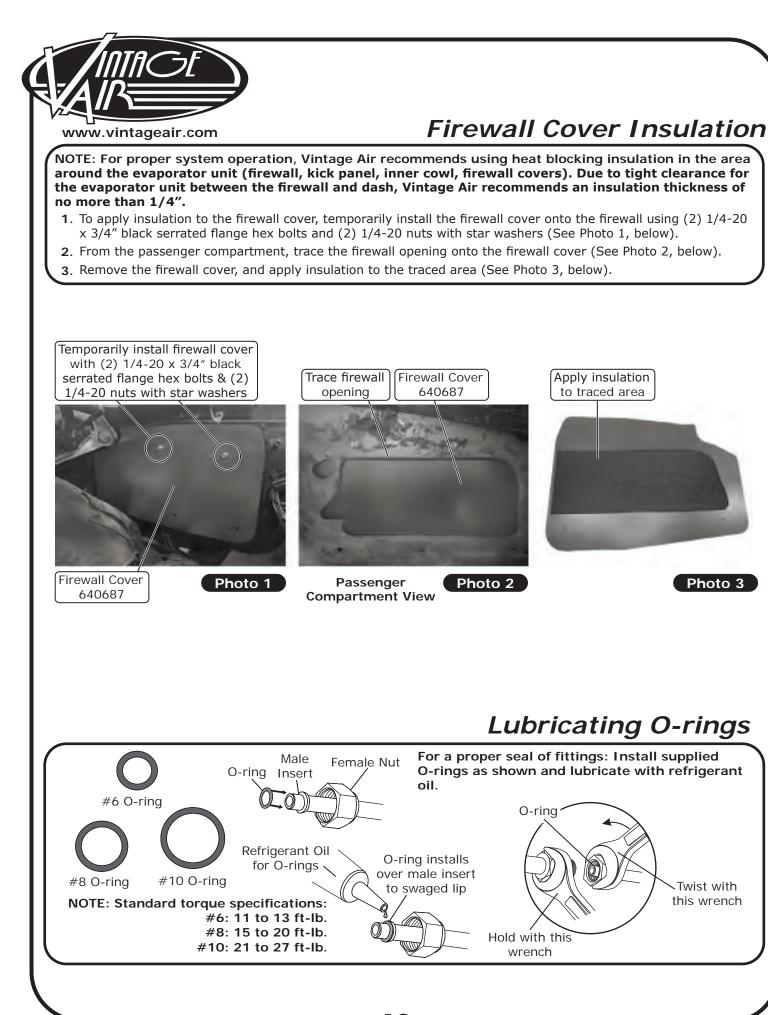












Twist with

this wrench

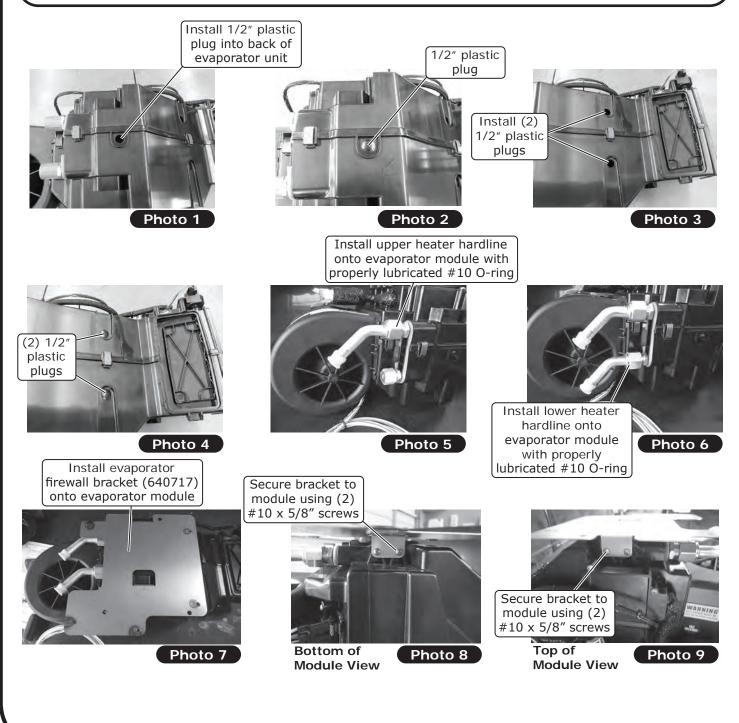
Photo 3

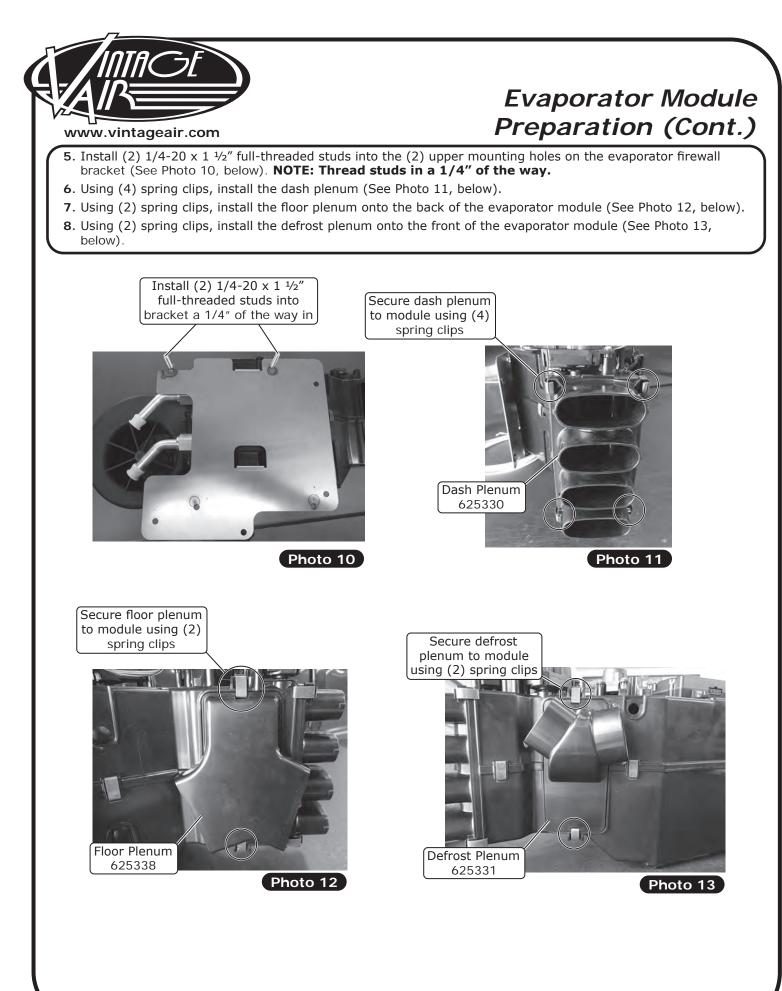


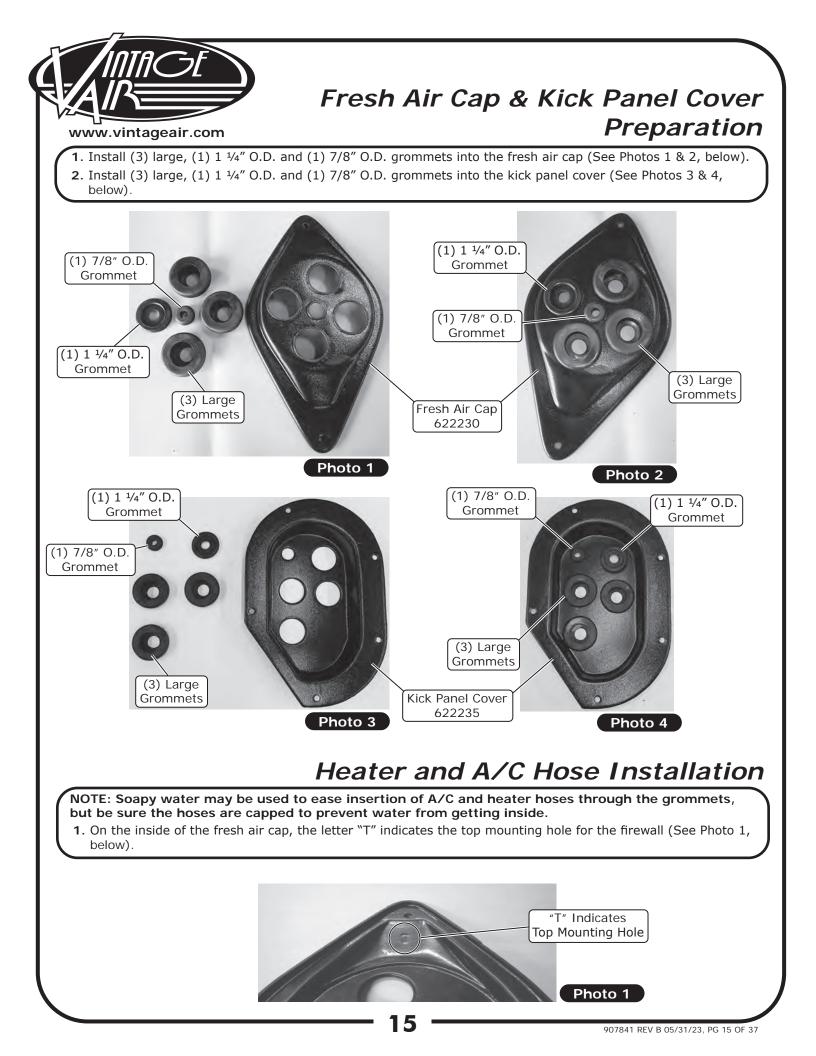
Evaporator Module Preparation

Perform the following on a workbench:

- 1. Install (3) 1/2" plastic plugs into the back of the evaporator module (See Photos 1, 2, 3 and 4, below).
- 2. Using a properly lubricated #10 O-ring (See Lubricating O-rings, Page 16), install the upper heater hardline onto the evaporator module (See Photo 5, below). **NOTE: Install the hardline facing down**.
- **3.** Using a properly lubricated #10 O-ring (See Lubricating O-rings, Page 16, install the lower heater hardline onto the evaporator module (See Photo 6, below). **NOTE: Install the hardline facing down**.
- 4. Install the evaporator firewall bracket using (4) $\#10 \times 5/8''$ screws (See Photos 7, 8 and 9, below).



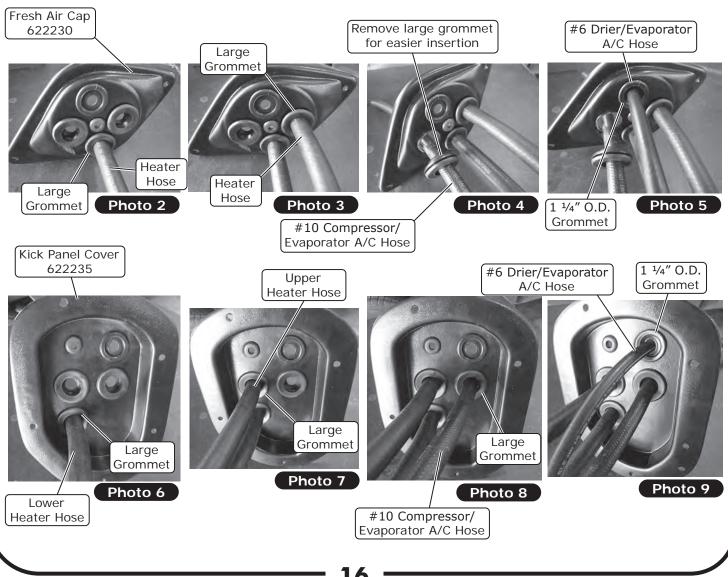




Heater and A/C Hose Installation (Cont.)

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- 2. Insert a length of heater hose through the bottom-right large grommet on the fresh air cap (See Photo 2, below).
- 3. Insert a length of heater hose through the top-right large grommet on the fresh air cap (See Photo 3, below).
- 4. Insert the 45° fitting on the #10 compressor/evaporator A/C hose through the bottom-left large grommet on the fresh air cap (See Photo 4, below). NOTE: Temporarily remove the large grommet from the fresh air cap to ease insertion of the #10 hose fitting.
- 5. Insert the 45° fitting on the #6 drier/evaporator A/C hose through the top-left 1 ¼″ O.D. grommet on the fresh air cap (See Photo 5, below).
- **6.** From the passenger compartment, insert the lower heater hose through the bottom-left large grommet on the kick panel cover (See Photo 6, below).
- **7.** Insert the upper heater hose through the top-left large grommet on the kick panel cover (See Photo 7, below).
- 8. Insert the #10 compressor/evaporator A/C hose through the bottom-right grommet on the kick panel cover (See Photo 8, below). NOTE: Temporarily remove the grommet from the kick panel cover for easier insertion.
- **9.** Insert the #6 drier/evaporator A/C hose through the top-right large grommet on the kick panel cover (See Photo 9, below).

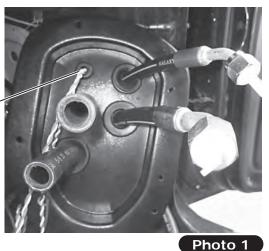




Wiring Installation

- From the passenger compartment, route the heater control valve connector and wiring (white, yellow and purple), and the red, white and blue wires from the main wiring harness through the 7/8" O.D. grommet on the kick panel cover and into the 7/8" O.D. grommet on the fresh air cap (See Photo 1, below). NOTE: Leave approximately 5" of wiring between the relay and the kick panel cover. This is to allow enough wiring to secure the relay to the mounting position.
- 2. Place the evaporator module on the passenger-side floorboard and route the orange and white wires through the 7/8" O.D. grommet on the kick panel cover, then through the 7/8" O.D. grommet on the fresh air cap.

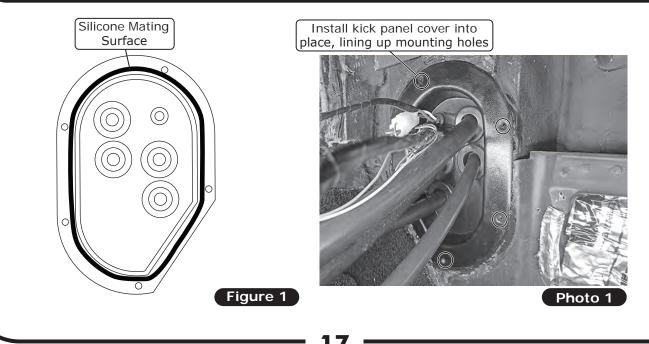
Route heater control valve connector and wiring (white, yellow and purple), and red, white and blue wires from main wiring harness through 7/8" O.D. grommet on kick panel cover and into 7/8" O.D. grommet on fresh air cap



NOTE: Leave approximately **5" of wiring between relay** and kick panel cover to allow enough wiring to secure relay to mounting position.

Kick Panel Installation

- 1. Apply a bead of silicone around the mating surface of the kick panel cover (See Figure 1, below).
- 2. Install the kick panel cover into place, lining up the mounting holes on the cover with the OEM mounting holes on the kick panel opening (See Photo 1, below).





Kick Panel Installation (Cont.)

- 3. Install the kick panel, routing the hoses and wiring through the opening (See Photo 2, below). For an early-model kick panel, secure the panel with the trim plate using (3) #8 x 3/4" countersunk washer screws (See Photo 3, below). For a late-model kick panel, do not install the trim plate. Secure the kick panel using (3) #8 x 3/4" countersunk washer screws.
- 4. Secure the main wiring harness relay to the upper kick panel mounting hole using a #8 x 1 ¼" countersunk washer screw, mounting it in the hole as shown in Photo 4, below. NOTE: If your vehicle is equipped with a kick panel vacuum vent actuator cover, it will need to be modified to fit with the installed hoses (See Photo 5, below).

(Install Kick Panel



Photo 2

Secure relay to upper mounting hole using #8 x 1 ¹/4" countersunk washer screw



Photo 4

Kick Panel Trim Plate 640709 (3) #8 x 3/4" Countersunk Washer Screws



Modified OEM Kick Panel Vacuum Vent Actuator Cover



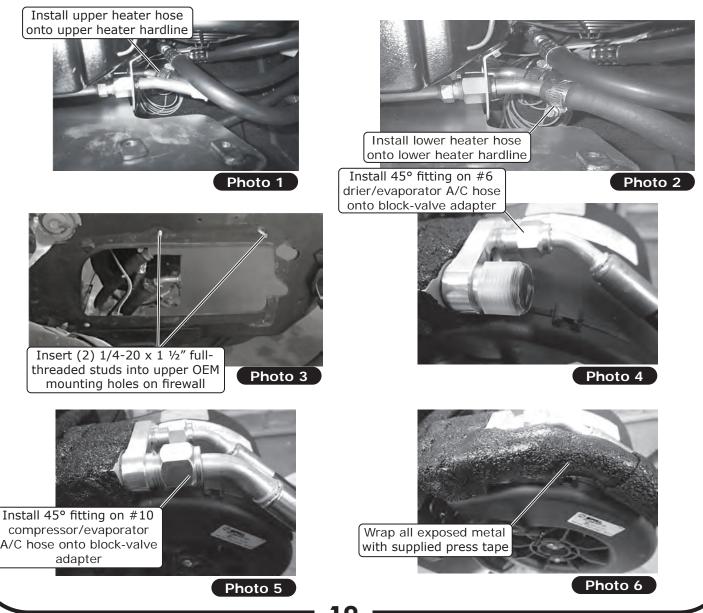
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Evaporator Installation

NOTE: A 10" block of wood may be used to support the evaporator unit while the following steps are completed. To ensure a watertight seal between the passenger compartment and the vehicle exterior, for all bolts passing through the firewall, Vintage Air recommends coating the threads with silicone prior to installation.

- 1. Install the upper heater hose and a hose clamp onto the upper heater hardline on the evaporator module (See Photo 1, below).
- 2. Install the lower heater hose and a hose clamp onto the lower heater hardline on the evaporator module (See Photo 2, below).
- **3.** Roll the evaporator into it's mounting position. Insert the (2) $1/4-20 \times 1 \frac{1}{2}''$ full-threaded studs into the upper OEM mounting holes on the firewall (See Photo 3, below).
- **4**. Using a properly lubricated #6 O-ring (See Lubricating O-rings, Page 12), install the 45° fitting on the #6 drier/evaporator A/C hose onto the block-valve adapter on the evaporator module (See Photo 4, below).
- 5. Using a properly lubricated #10 O-ring (See Lubricating O-rings, Page 12), install the 45° fitting on the #10 compressor/evaporator A/C hose onto the #10 fitting on the block-valve adapter on the evaporator module (See Photo 5, below). NOTE: After installing the #10 compressor/evaporator A/C hose, wrap all exposed metal with the supplied press tape (See Photo 6, below).

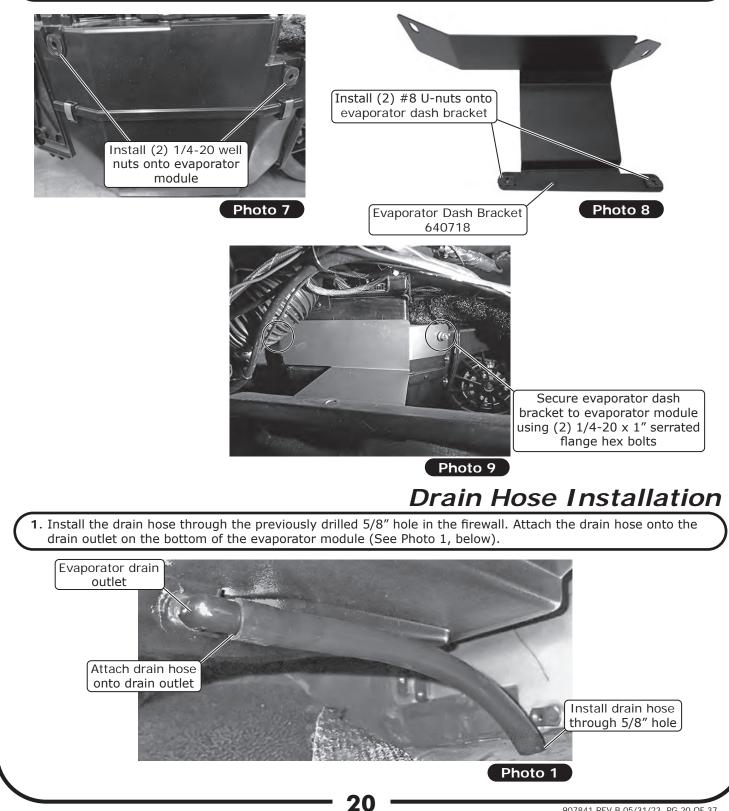


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Evaporator Installation (Cont.)

- 6. Install (2) 1/4-20 well nuts onto the evaporator module (See Photo 7, below).
- 7. Install (2) #8 U-nuts onto the evaporator dash bracket (See Photo 8, below).
- 8. Position the evaporator dash bracket under the glove box door mounting holes, then secure it onto the evaporator unit using (2) 1/4-20 x 1" serrated flange hex bolts (See Photo 9, below).

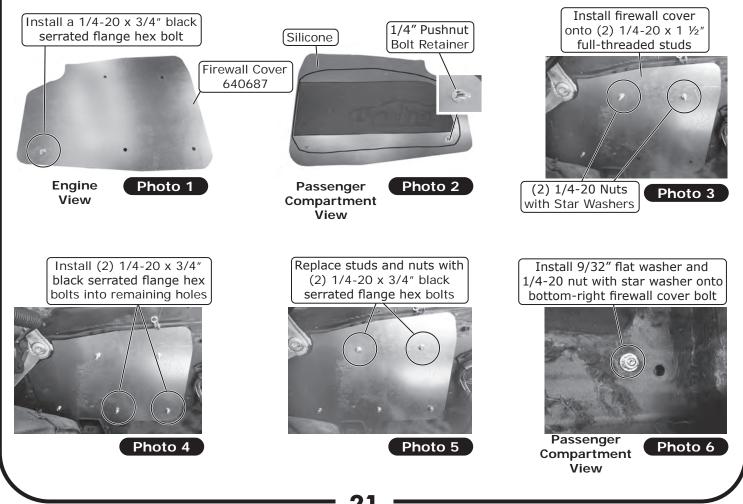




Firewall Cover Installation

NOTE: To ensure a watertight seal between the passenger compartment and the exterior, for all **bolts passing through the firewall, Vintage Air recommends coating the threads with silicone prior to** installation.

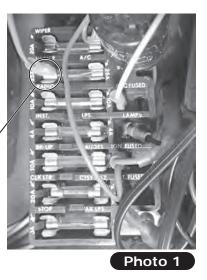
- Locate the bottom left mounting hole on the firewall cover, and install a 1/4-20 x 3/4" mounting bolt and a 1/4" pushnut bolt retainer (See Photos 1 & 2, below).
- 2. Apply a bead of silicone around the mating surface of the firewall cover (See Photo 2, below).
- **3.** Install the firewall cover over the (2) 1/4-20 x 1 ½" full-threaded studs, and secure it using (2) 1/4-20 nuts with star washers to keep the firewall cover and evaporator unit in place (See Photo 3, below).
- 4. Install (2) 1/4-20 x 3/4" black serrated flange hex bolts into the remaining open mounting holes in the firewall cover and into the evaporator firewall bracket (See Photo 4, below). NOTE: Do not fully tighten at this time.
- Remove the (2) 1/4-20 nuts with star washers and (2) 1/4-20 x 1 ¹/₂" full-threaded studs from the firewall cover, and replace them with (2) 1/4-20 x 3/4" black serrated flange hex bolts (See Photo 5, below). NOTE: Do not fully tighten at this time.
- **6.** In the passenger compartment, install a 9/32" washer and a 1/4-20 nut with star washer onto the bottomright firewall cover bolt as shown in Photo 6, below. **NOTE: Do not fully tighten at this time**.
- 7. Verify that the evaporator unit is level and square to the dash. NOTE: To ensure proper drainage, it is very important that the evaporator is level, both left-right and fore-aft. Check for level on the flat portions of the case around the drain.
- 8. Tighten all of the mounting bolts at this time. NOTE: Tighten the bolts on the firewall first. Adjust the evaporator dash bracket as needed, then tighten the bolts on the evaporator unit. Silicone or seam sealer may be applied around the outer edge of the firewall cover.



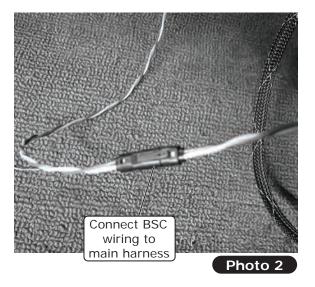


Passenger Compartment Wiring

- 1. Select a suitable ground location for the white ground wire eyelet from the heater control valve harness, and secure it using a $#10 \times 1/2^{"}$ sheet metal screw.
- 2. Route the violet power wire to a switched 12v power source on the fuse panel (See Photo 1, below). NOTE: This requires a male fuse extension (not supplied).
- 3. Connect the tan wire to the factory dash lights to enable control panel backlighting (if applicable).
- 4. Connect the BSC wiring to the main harness (See Photo 2, below).
- 5. Connect the main harness to the ECU (See Photo 3, below).



Attach Violet Wire to Switched Power Source



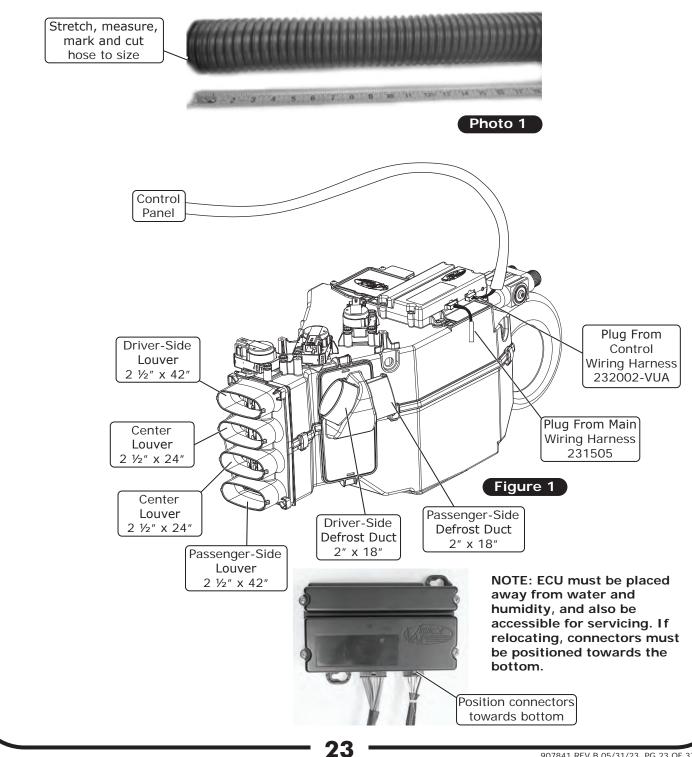


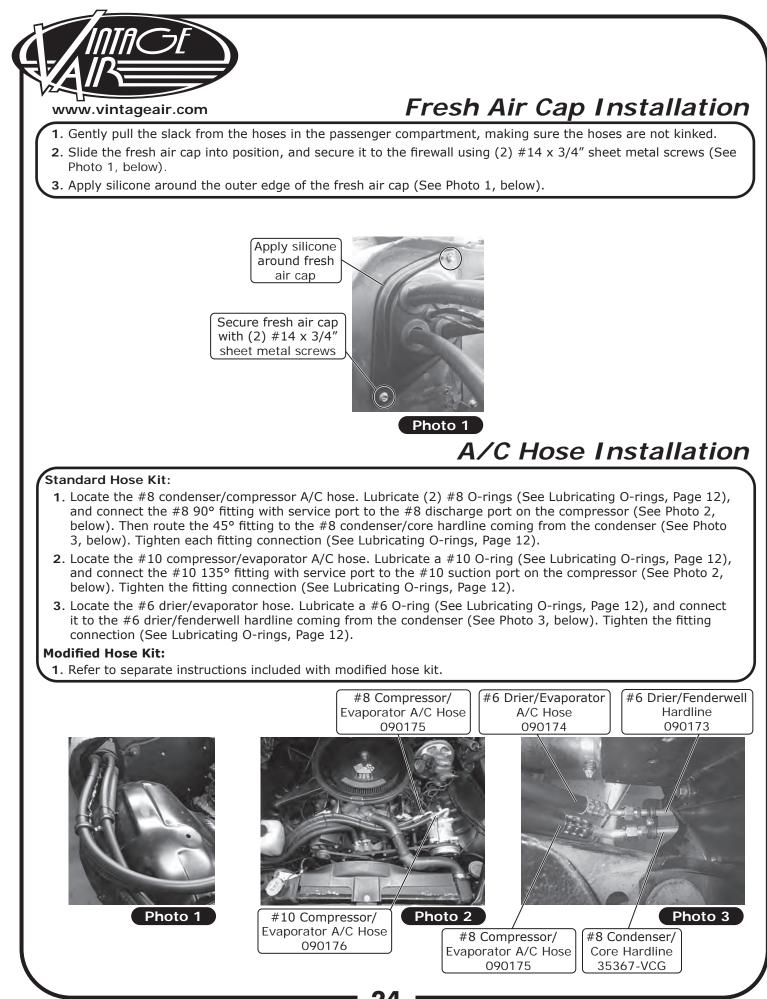


ECU, Control Panel & Duct Hose Routing

NOTE: For the system to function optimally, the duct hoses must be routed as directly as possible, taking care to avoid kinks, sharp bends and unnecessary length. Vintage Air supplies duct hoses in continuous lengths that will need to be cut to size depending on application. Before cutting, familiarize yourself with the installation instructions and verify the routing will work with your application. For custom hose routing, additional hose may be needed and can be purchased from Vintage Air.

1. Stretch the duct hose until there is no slack, measure, mark and cut hose to size (See Photo 1, below).



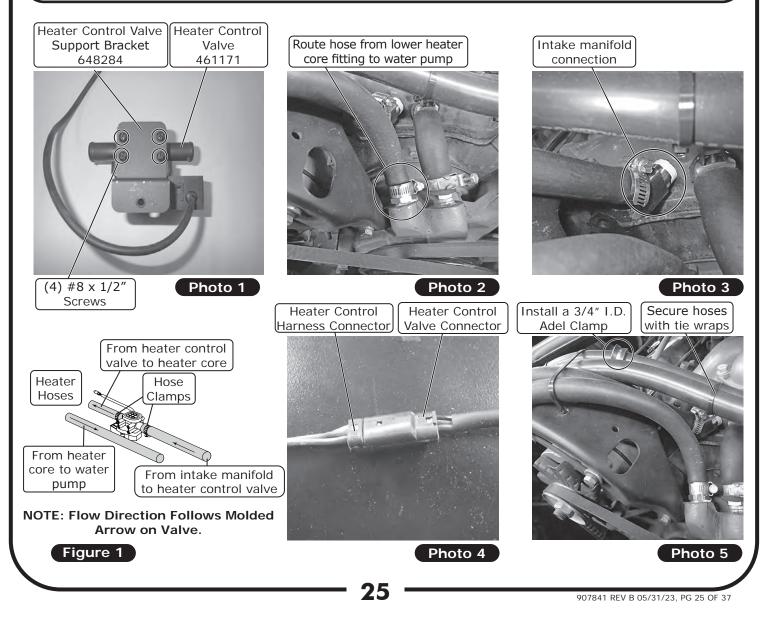


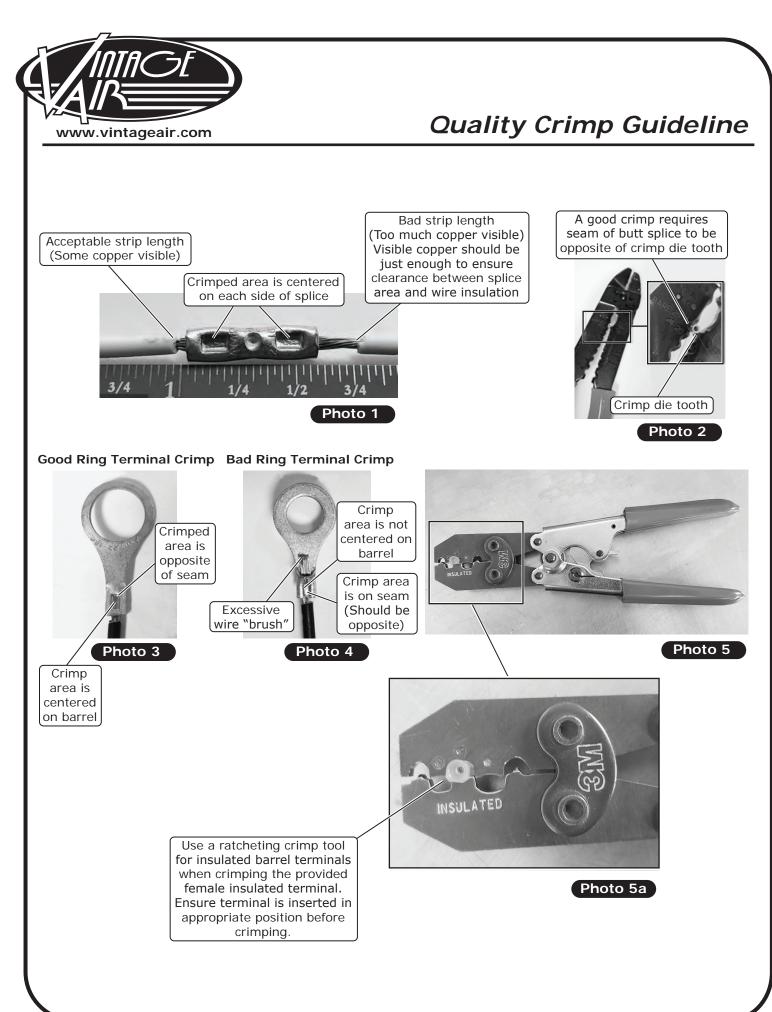


Heater Control Valve Installation

NOTE: Vintage Air Systems use 5/8" heater connections. On engines equipped with 3/4" hose nipples, these will need to be removed and replaced with 5/8" nipples (not supplied). For water pumps with a cast-in 3/4" heater outlet, a 3/4" x 5/8" reducer fitting in the heater hose (not supplied) or molded hose (Vintage Air Part #099010) will need to be installed.

- 1. Install the heater control valve support bracket onto the heater control valve using (4) #8 x 1/2" screws (See Photo 1, below). NOTE: Before mounting the heater control valve in the vehicle, ensure that the wiring from the main harness and heater control valve can be connected easily without tension or strain on the connection, or excessive pressure on the metal surfaces.
- 2. Route a piece of heater hose (not provided) from the lower heater core fitting to the water pump. Secure using hose clamps. (See Photo 2, below).
- Route a piece of heater hose (not provided) from the intake manifold to the heater control valve. Connect the heater hose from the upper heater core fitting to the heater control valve. Secure using hose clamps (See Figure 1 and Photo 3, below). NOTE: Ensure proper flow direction through the heater control valve (the flow direction follows the molded arrow on the valve).
- 4. Plug the heater control valve connector into the connector on the main wiring harness (See Photo 4, below).
- 5. Install a 3/4" I.D. Adel clamp to secure the #8 A/C hose, then secure the heater hoses using tie wraps (See Photo 5, below). NOTE: Use an OEM hole to mount the Adel clamp. If an OEM hole is not available, a new hole will need to be drilled. Be sure all hoses are routed away from the fan, belts and pulleys.

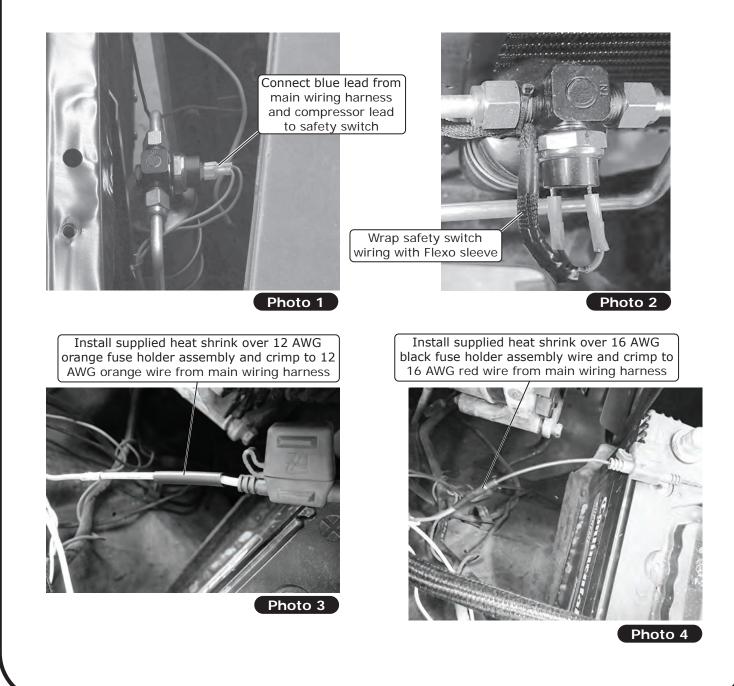






Engine Compartment Wiring

- **1**. Route the blue lead from the main wiring harness to the safety switch (See Photo 1, below).
- 2. Connect the compressor lead wire to the safety switch (See Photo 1, below).
- **3.** Wrap the safety switch wiring with flexo sleeve, and secure it with the supplied tie wraps (See Photo 2, below).
- **4**. Route power and ground wires toward the battery.
- **5.** Install the supplied heat shrink over the 12 AWG orange fuse holder assembly wire, and crimp it to the 12 AWG orange wire from the main wiring harness (See Photo 3, below and Quality Crimp Guidelines, Page 26).
- **6**. Install the supplied heat shrink over the 16 AWG black fuse holder assembly wire, and crimp it to the 16 AWG red wire from the main wiring harness (See Photo 4, below and Quality Crimp Guidelines, Page 26).

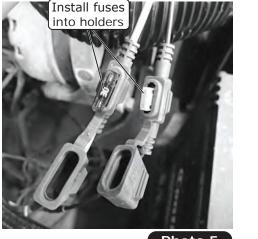




Engine Compartment Wiring (Cont.)

7. Install fuses into the holders (See Photo 5, below).

- 8. Install the supplied heat shrink over the white ground wires, then crimp on the supplied eyelets (See Photos 6 and 7, below and Quality Crimp Guidelines, Page 26)
- 9. Connect the ground wiring eyelets to the negative battery terminal connector (See Photo 8, below).
- **10.** Connect the positive wiring eyelets to the positive battery terminal connector (See Photo 9, below). NOTE: Do not connect power until installation is completed.









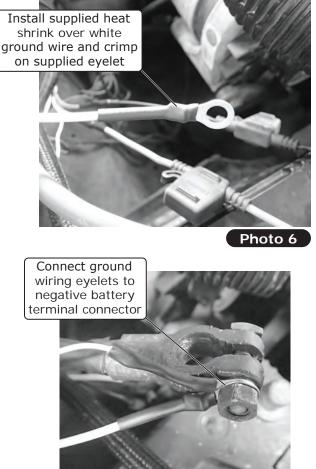
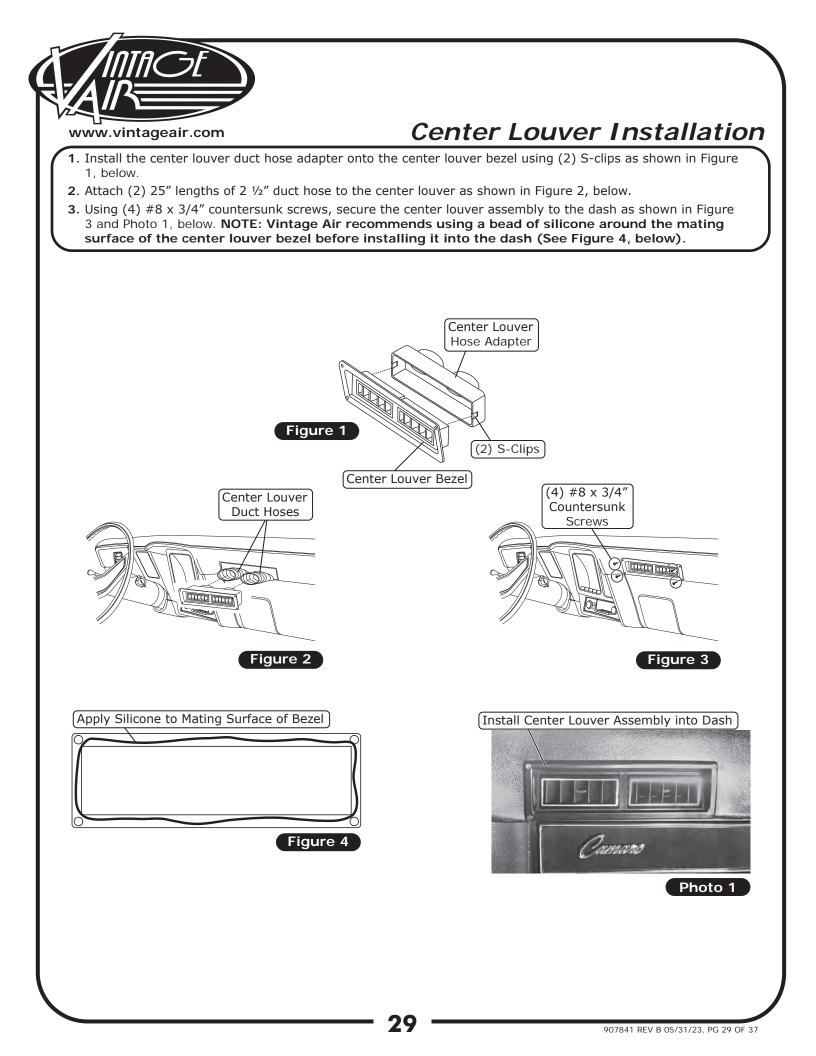


Photo 8

NOTE: Do not connect power until installation is completed.

Connect positive wiring eyelets to positive battery terminal connector

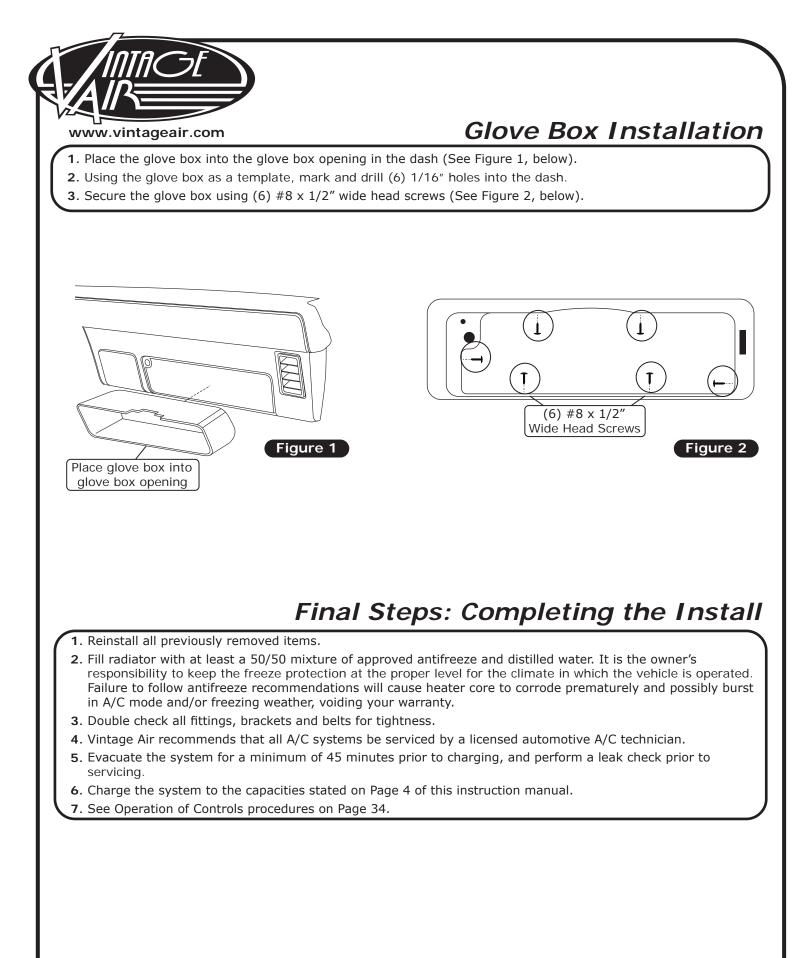
Photo





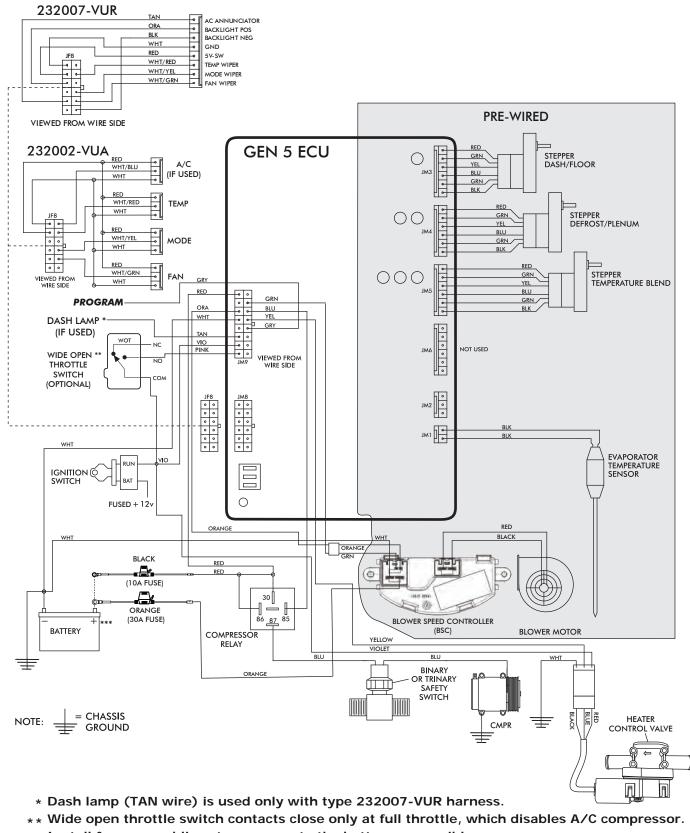
Final Steps: Installation Check

		Installation Check
ITE	ITEM TO CHECK	Procedure
	ECU	If no blinking is observed after 1 minute of turning the ignition on, go to the next check. If repetetive blinking is observed, go to the <u>Advanced Diagnostics</u> Section to diagnose.
	Blower speed control	Set the blower speed control to OFF , <i>confirm that the blower is off</i> . Blower speed control Position the blower speed control to LOW then MEDIUM and then HIGH. <i>At each setting confirm that the blower</i> <u>speed increases</u> , do this by feeling for the amount of air coming from the unit and hearing the blower speed increase.
	Mode control	Set the MODE control to the DASH position. <u>Confirm that air is being blown at the dash vents.</u> Set the MODE control to the FLOOR position. <u>Confirm that air is being blown at the floor vents.</u> Set the MODE control to the DEFROST position. <u>Confirm that all air is being blown from the defrost vents</u>
	Temperature control	If heater lines are installed: Set the MODE control to the DASH position. Set the TEMP control to the MAX HEAT position. <u>Confirm that HOT</u> air is coming from the dash vents. If system is charged: Set the TEMP control to the MAX COOL position. <u>Confirm that <u>COLD</u> air is coming from the dash vents.</u>
		Also <u>confirm that the compressor "clicks" on</u> when adjusting the TEMP control from the MAX HEAT position to the MAX COOL position.
	AC Indicator (If applicable)	While the MODE control is set to the DASH position, and the TEMP control is set to the MAX COOL/MIN HEAT position, <i>confirm that the blue AC Indicator light is on</i> .
	Backlight (If applicable)	lf your control panel has backlight capabilities and has been wired, turn the dash lamp on and <u>confirm that the AC</u> panel's legend is lit .
	Fittings	Verify AC and Heater fittings are all tight.



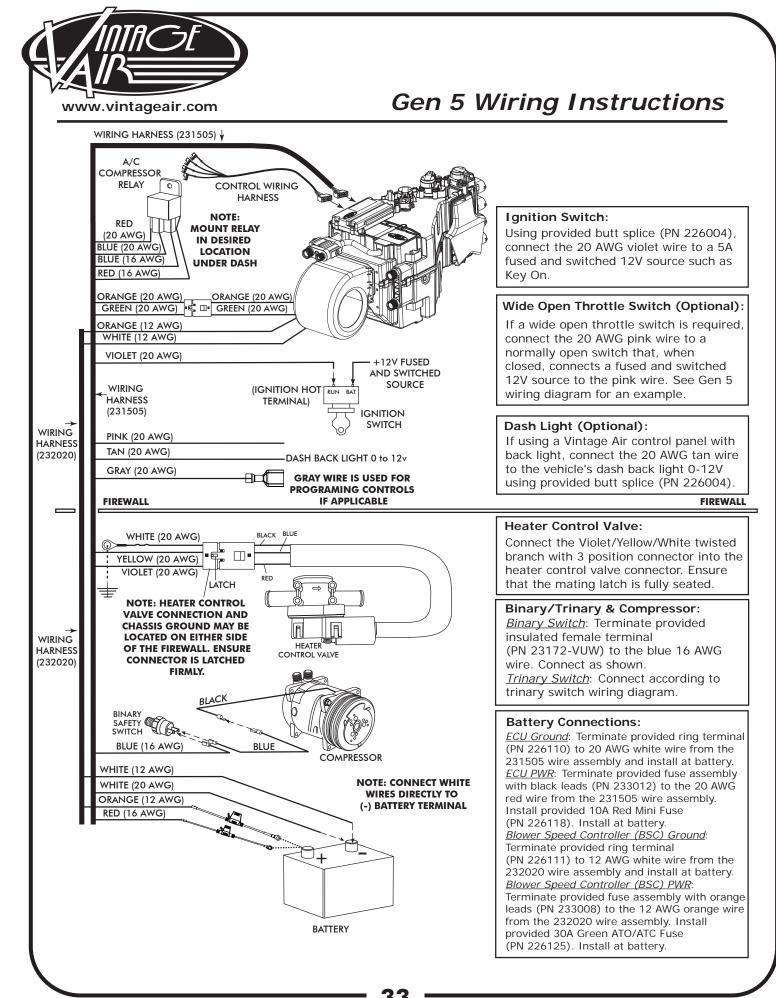


Gen 5 Wiring Diagram



*** Install fuse assemblies at or as near to the battery as possible.

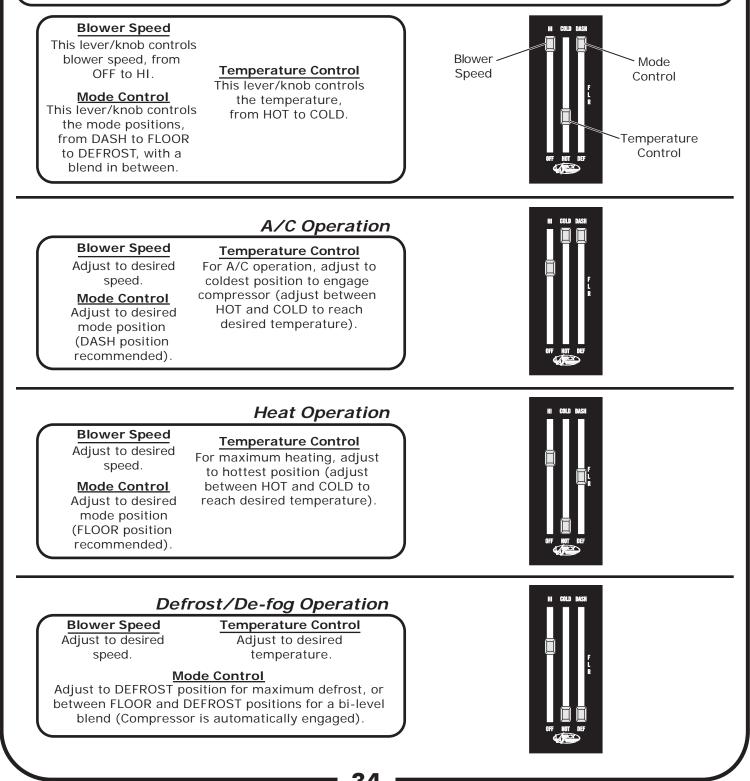
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Operation of Controls

On Gen IV or Gen 5 systems with three lever/knob controls, the temperature control toggles between heat and A/C operations. To activate A/C, move the temperature lever/knob all the way to cold and then back it off to the desired vent temperature. For heat operation, move the temperature lever/knob all the way to hot and then adjust to the desired vent temperature. The blower will momentarily change speed, each time you toggle in and out of heat and A/C operations, to indicate the change. **NOTE: For proper control panel function, refer to the control panel instructions for the calibration procedure.**



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Troubleshooting Guide

This printed troubleshooting guide is our basic guide that covers common installation problems. To see our advanced diagnostics and troubleshooting guide, please refer to the following page for instructions on how to download the complete guide.

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Symptom	Condition	Checks	Actions	Notes
	No other functions work.	Check for damaged pins or Wires in the control panel wire assembly and mating header	If found damaged, replace wire assembly or ECU.	
Blower stays on high speed with ignition on.		at ECU. Check for a bad ECU GND.		
	All other functions work.	→ Check for damaged pins or wires in the control panel wire assembly and mating header at ECU.	If found damaged, replace wire assembly or ECU.	If fuse continues to blow, there is a serious problem in
		Check if Blower power fuse is blown.	◆Replace fuse.	the wiring. Check all wiring and ensure the wire is not demaged and chorring out
		Check for a bad ECU GND.	Repair connection.	along its route.
:	System is not charged.	System must be charged for compressor to engage.	→ Charge system.	Danger: Never bypass safety switch with engine running. Serious injury can result.
compressor will not turn on (All other functions) work).	-	Check for faulty A/C potentiometer or associated wiring (not applicable to 3-pot controls).	Check continuity to ground on white control head wire. Check for 5V on red control head wire.	To check for proper pot function, check voltage at white/red wire. Voltage should be between OV and 5V, and will vary with pot
	Abystem is chargea.	Check for disconnected or faulty thermistor.	◆ Check 2-pin connector at ECU housing.	Disconnected or faulty thermistor will cause compressor to be disabled.
3. Compressor will not turn off (All other functions		 Check for faulty A/C potentiometer or associated wiring. 	▲ Repair or replace pot/control wiring.	Red wire at A/C pot should have approximately 5V with ignition on. White wire will have continuity to chassis ground. White/
work).		Check for faulty A/C relay.	★ Replace relay.	Red wire should vary between OV and 5V when lever is moved up or down.

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Symptom	Condition	Checks	Actions	Notes
4.	Works when engine is not running: shuts off when engine is started	Noise interference from either ignition or alternator.	Install capacitors on ignition coil and alternator. Ensure good ground at all points. Relocate coil and associated → wiring away from ECU and ECU wiring. Check for burned or loose plug wires.	Ignition noise (radiated or conducted) will cause the system to shut down due to high voltage spikes. If this is suspected, check with a
System will not turn on, or runs intermittently.		Verify connections on power lead, ignition lead, and both white ground wires.	Check for power at ECU, and confirm ignition is being applied to ECU properly.	quarity oscilloscope: sprikes greater than 16V will shut down the ECU. Install a radio capacitor at the positive post of the ignition
	any conditions.	Verify battery voltage is greater than 10 volts and less than 16 while engine is running.	Verify proper meter function by checking the condition of a known good battery.	installation bulletin). A faulty alternator or worn out battery can also result in this condition.
5. Loss of mode door function.	→No mode change at all.	Check for damaged mode switch or potentiometer and associated wiring.		
6 . Blower turns on and off rapidly.	Battery voltage is at least 12V. Battery voltage is less than 12V.	Check for at least 12V at circuit breaker. Check for faulty battery or alternator.	 Ensure all system grounds and power connections are clean and tight. Charge battery. 	System shuts off blower at 10V. Poor connections or weak battery can cause shutdown at up to 11V.
7. Erratic functions of blower, mode, temp, etc.	s of	Check for damaged switch or pot and associated wiring.	Repair or replace.	
	A	Advanced Diag	Diagnostics and Troubleshooting Guide	ting Guide
If after refere resolved, mo Guide that co	If after referencing the Troubleshooting Guide, the issue is not resolved, move to The Advanced Diagnostics and Troubleshoot Guide that covers the following:	If after referencing the Troubleshooting Guide, the issue is not resolved, move to The Advanced Diagnostics and Troubleshooting Guide that covers the following:	Access the latest version of the Advanced Diagnostics and Troubleshooting Guide by scanning the following QR code on your mobile device:	jnostics and ng QR code on your
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 Complet 	o. Diagnostic codes Complete Advanced Troubleshooting Guideli	oting Guidelines	You can also access the guide by typing the following address into your web browser: https://www.vintageair.com/instructions_pdf/905000.pdf	he following address into pdf/905000.pdf

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