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Thank you for purchasing this evaporator kit from Vintage Air. When installing these components as part of a complete SureFit<sup>™</sup> system, Vintage Air recommends working from front to back on the vehicle, installing the condenser kit, hose kit, and compressor first, followed by the wiring, evaporator, and finally the control panel.

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### **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. (1 lb., 12 oz.) 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 remained 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.

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## **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, 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, 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, the compressor relay, and/or cause a malfunction.
- When installing ground leads on Gen IV 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.

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1. Disconnect the battery.	
<b>2.</b> Remove the battery and the battery tray (ret <b>3.</b> Drain the radiator.	ain) (See Figure 1, below).
<ul><li>(under hood) and the air distribution system</li><li>Figure 1, below).</li><li>6. Remove OEM heater hoses (discard).</li></ul>	scard). NOTE: To remove the blower motor assembly stem (under dash), remove the inner fender panel (See
7. Remove OEM heater wiring/vacuum harness	molded grommet (See Figure 1, below).
Conden	ser Assembly and Installati
<b>1.</b> Refer to separate instructions included with t	
2. Binary switch installation (Refer to condense	
	Compressor and Bracke
1. Refer to separate instructions included with t	he bracket kit to install the compressor bracket.
	Pulle
<b>1.</b> In most instances, the belt lengths will remain	
	OEM Blower Motor
	Assembly
(Outer Fender)	Heater Hose Clamp
Inner	
Battery & Fender Panel	
Battery Tray	
	Dadiatar
	Radiator
	Figure 1
Hood Latch Hood Latch	



### Passenger Compartment Disassembly

NOTE: Dashboard removal is not required to install the evaporator. Vintage Air recommends using the factory service manual for disassembly and reassembly of dashboard components.

#### Perform the Following:

- 1. Remove the glove box door (See Figure 3, below).
- 2. Remove the glove box (discard) (See Figure 2, below). Retain the screws.
- **3.** Remove the heater assembly and all related ducting (discard, but retain screws) (See Figure 3, below).
- 4. Remove the driver/passenger side louver outlets (retain). NOTE: The instrument panel must be removed to get to the left outlet and the control panel (See Figure 3, below).
- **5.** Remove the control panel assembly (discard) (See Figure 3, below). **NOTE: Refer to the control panel** conversion kit instructions for installation of the controls.
- 6. Remove the passenger side kick panel (retain) (See Figure 3, below).
- 7. Disconnect the passenger side fresh air cable from the panel (See Figure 3, below).
- 8. Disconnect the driver/passenger cable astro ventilation ducting (discard) (See Figure 3, below).
- 9. Remove the OEM defrost duct assemblies (discard).







### Fresh Air Cap Installation

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

- 1. Install (4) grommets into the fresh air cap (See Figure 7, below).
- **2.** Apply a 1/4" bead of silicone around the mating surface of the fresh air cap as shown in Figure 7, below.
- **3.** Attach the fresh air cap to the firewall using the fresh air cap bracket, a  $1/4-20 \times 1 \frac{1}{2}$ " bolt, and a 1/4" washer (See Figure 7, below). **NOTE: The fresh air cap installs on the engine side of the firewall.**
- **4.** Install a 1 ¼" plug into the firewall (See Figure 7, below).



### Kick Panel Fresh Air Cap Installation

- **1.** Install (4) grommets into the kick panel fresh air cap (See Figure 8a, below).
- 2. Route the A/C and heater hoses through the fresh air cap and the kick panel fresh air cap as shown in Figures 8 and 8b, below.
- Apply 1/4" bead of silicone around the mating surface of the kick panel fresh air cap as shown in Figure 8a, below.
- 4. Secure the kick panel fresh air cap using the OEM screws as shown in Figure 8b, below.









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

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- Lift the evaporator sub case up under the dashboard. Using the top hole of the rear bracket, secure loosely to the firewall using a 1/4-20 x 1" bolt and washer (See Figure 12, below). NOTE: When lifting up the evaporator sub case, be careful to prevent damage to the drain outlet located at the bottom of the unit. Feed the hoses into or out of the kick panel fresh air cap as needed while lifting the evaporator sub case into position.
- 2. Using the front mounting bracket as a template, mark and drill (2) 5/32" holes on the inner cowl (See Figure 12, below). NOTE: To ensure proper drainage, it is very important that the evaporator is level, both left-right and fore-aft. Prior to drilling, check for level on the flat portions of the case around the drain.
- **3.** Loosely attach the front mounting bracket to the inner cowl using (2) #14 x 3/4" sheet metal screws (See Figure 12, below).
- 4. Verify that the evaporator unit is level and square to the dash. Then, tighten all mounting bolts. NOTE: Tighten the bolt on the firewall first. Then tighten the front mounting bracket sheet metal screws.







# A/C Hose Installation

#### Standard Hose Kit:

- Locate the #8 compressor A/C hose. Lubricate (2) #8 O-rings (See Figure 15, above), and connect the 90° female fitting with service port to the #8 discharge port on the compressor. Route the 45° female fitting to the #8 condenser hardline coming through the core support (See Figure 16, Page 16). Tighten each fitting connection as shown in Figure 15, above.
- 2. Locate the #10 compressor A/C hose. Lubricate (2) #10 O-rings (See Figure 15, above), and connect the 135° female fitting with service port to the #10 suction port on the compressor. Route the 90° female fitting to the #10 fitting on the evaporator (See Figure 12a, Page 13, and Figure 16, Page 16). Tighten each fitting connection as shown in Figure 15, above.
- 3. Locate the #6 evaporator A/C hose. Lubricate (2) #6 O-rings (See Figure 15, above), and connect the 90° female fitting to the #6 hardline coming through the core support from the drier. Route the other 90° female fitting to the #6 fitting on the evaporator (See Figure 12a, Page 13, and Figure 16, Page 16). Tighten each fitting connection as shown in Figure 15, above.

#### Modified Hose Kit:

**1.** Refer to the separate instructions included with the modified hose kit.



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# Final Steps

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- **1.** Install the duct hoses as shown in Figure 19, Page 18.
- 2. Install a 3/8" ID grommet into the firewall cover (See Figure 17, below).
- Route the A/C wires (12 volt/ground/binary switch/heater control valve) through 3/8" grommet as shown in Figure 17, below.
- 4. Install the control panel assembly. Refer to the control panel instructions.
- **5.** Plug the wiring harnesses into the ECU module on the sub case as shown in Figure 19, Page 18. Wire according to the wiring diagrams on Pages 19 and 20.
- 6. Install the glove box (See Figure 18, below).
- 7. Reinstall all previously removed items.
- 8. Fill radiator with at least a 50/50 mixture of approved antifreeze and distilled water. It is the owner's responsibility to keep the freeze protection at the proper level for the climate in which the vehicle is operated. Failure to follow antifreeze recommendations will cause heater core to corrode prematurely and possibly burst in A/C mode and/or freezing weather, voiding your warranty.
- 9. Double check all fittings, brackets and belts for tightness.
- **10.** Vintage Air recommends that all A/C systems be serviced by a licensed automotive A/C technician.
- **11.** Evacuate the system for a minimum of 45 minutes prior to charging, and perform a leak check prior to servicing.
- 12. Charge the system to the capacities stated on Page 4 of this instruction manual.
- 13. See Operation of Controls procedures on Page 21.



## **Glove Box Installation**

- Install the supplied glove box, and secure it using OEM screws through the OEM holes (See Figure 18, below).
   NOTE: If equipped with the glove box light as shown in Figure 18a, below, modify the plastic glove box using the template provided on Page 25.
- 2. Reinstall the glove box door.







### Wiring Diagram



- Dash Lamp Is Used Only With Type 232007-VUR Harness.
- Warning: Always Mount Circuit Breaker As Close to the Battery As Possible. (NOTE: Wire Between Battery and Circuit Breaker Is Unprotected and Should Be Carefully Routed to Avoid a Short Circuit).
- Wide Open Throttle Switch Contacts Close Only at Full Throttle, Which Disables A/C Compressor.

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# **Operation of Controls**

On Gen IV 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 between operations, to indicate the change.



	air.com		Troublesho	roubleshooting Guide
Symptom	Condition	Checks	Actions	Notes
la. Riower stave on	No other functions work.		<ul> <li>Verify that all pins are inserted into plug. Ensure that no</li> <li>Pins are bent or damaged in ECU.</li> <li>Verify continuity to chassis ground with white control</li> </ul>	Loss of ground on this wire
biower stays on high speed when ignition is on.	All other functions work.	wire (white) in control head harness. Check for damaged blower switch or potentiometer and associated wiring.	→ head wire at various points.	renders control head inoperable. See blower switch check procedure.
<b>1b.</b> Blower stays on high speed when		Unplug 3-wire BSC control connector from ECU. If blower shuts off, ECU is either improperly wired or damaged.	Be sure the small, 20 GA white ground wire is connected to the battery ground post. If it is, replace the ECU. Check to ensure that no BSC wiring is damaged or shorted to vehicle ground. The BSC operates the blower by ground side pulse width modulation switching. The positive wire to the blower will always be hot. If the	
ignition is on or off.		Unplug 3-wire BSC control Connector from ECU. If blower stays running, BSC is either improperly wired or damaged.		No other part replacements should be necessary.
6	System is not charged.	System must be charged for compressor to engage.	→ Charge system or bypass pressure switch.	Danger: Never bypass safety switch with engine running. Serious injury can result.
Compressor will not turn on (All other functions work).	<ul> <li>System is charged.</li> </ul>	Check for faulty A/C potentiometer or associated wiring (Not applicable to 3-pot controls).		To check for proper pot function, check voltage at white/blue wire. Voltage should be between 0V and 5V, and will vary with pot lever position.
		faulty thermistor.	→ Check 2-pin connector at ECU housing.	<ul> <li>Disconnected or faulty thermistor will cause compressor to be disabled.</li> </ul>
<ol> <li>Compressor will not turn off (All other functions work).</li> </ol>		Check for faulty A/C	► 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/ Blue wire should vary
		Check for faulty A/C relay.	▲ Replace relay.	between 0V and 5V when lever is moved up or down.

www.vintageair.com	air.com		Troubleshooting Guide (Cont.	ide (Cont.)
Symptom	Condition	Checks	Actions	Notes
4	Works when engine is not running; shuts off when engine is started (Typically early Gen IV,	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.	L
System will not turn on, or runs intermittently.	but possible on all versions).	Verify connections on power lead, ignition lead, and both white around wires.	Check for positive power at heater valve green wire and blower red wire. Check for ground on control head white wire.	quarry oscinoscope. Spikes greater than 16V will shut down the ECU. Install a radio capacitor at the positive post of the ignition
	Will not turn on under any conditions.	voltage is 10 volts and less	Verify proper meter function by checking the condition of a known good battery.	coil (See radio capacitor installation bulletin). A faulty alternator or worn out battery can also result in this condition.
5. Loss of mode door	No mode change at all.	Check for damaged mode switch or potentiometer and associated wiring.		Typically caused by evaporator housing installed in a bind in the
Turrction.	Partial function of mode doors.	Check for obstructed or binding mode doors. Check for damaged stepper motor or wiring.		vehicle. Be sure all mounting locations line up and don't have to be forced into position.
<b>6.</b> Blower turns on	east	Check for at least 12V at circuit breaker.	▲ Ensure all system grounds and power connections are clean and tight.	System shuts off blower at 10V. Poor connections or weak battery can cause
and off rapidly.	A Battery voltage is less than 12V.	<ul> <li>Check for faulty battery or alternator.</li> </ul>	★ Charge battery.	
<b>7.</b> Erratic functions of blower, mode, temp, etc.		Check for damaged switch or pot and associated wiring.	▶ Repair or replace.	
8. When ignition is turned on, blower momentarily comes on, then shuts off. This occurs with the blower switch in the OFF position.		This is an indicator that the system has been reset. Be sure the red power wire is on the battery post, and not on a switched source. Also, if the system is pulled below 7V for even a split second, the system will reset.	Run red power wire directly to battery.	





Glove Box Light Template



