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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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### Passenger Compartment Disassembly

#### NOTE: Dashboard removal is not required to install the evaporator. Vintage Air recommends using the factory service manual to disassemble and reassemble the dashboard.

#### **Perform the Following:**

- **1.** Remove the glove box door (See Figure 6, below).
- 2. Remove the glove box (discard, retain screws) (See Figure 5, below).
- 3. Remove the A/C, heater/evaporator assembly and all related ducting (discard, but retain screws) (See Figure 6, below).
- **4.** Remove the A/C and heat outlets (retain). The instrument panel must be removed to get to the left outlet and control panel (See Figure 6, below).
- 5. Remove the control panel assembly (discard) (See Figure 6, below).
- 6. Remove the passenger side kick panel fresh air cover (discard) and kick panel (retain). Remove the cable from the panel (discard) (See Figure 6, below).
- 7. Remove the OEM defrost duct assembly.











# **Evaporator Installation**

NOTE: 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.

- On a workbench, install the evaporator rear bracket using (2) 1/4-20 x 1/2" bolts (supplied on the evaporator sub case) (See Figure 13, below).
- 2. Install (2) heater fittings (See Figure 14, Page 13) with properly lubricated O-rings (See Figure 19, Page 16).
- **3.** Place the evaporator unit under the dashboard by the passenger side kick panel, and install the heater hoses and #6 A/C hose (See Figure 14a, Page 13). Use (2) hose clamps on the heater hoses.
- 4. Lift the evaporator sub case up under the dashboard. Using the bottom hole of the bracket, secure loosely to the firewall using a 1/4-20 x 1" bolt and washer (See Figure 15, Page 13). 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.
- Install the #10 A/C hose onto the evaporator (See Figure 14a, Page 13) with properly lubricated O-rings (See Figure 19, Page 16).
- 6. Install press tape all around the #10 A/C hose fitting as shown in Figure 14a, Page 13.

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- **7.** Install the front mounting bracket onto the evaporator using (2) 1/4-20 x 1/2" bolts, and tighten (See Figure 15, Page 13).
- 8. Using the front mounting bracket as a template, mark and drill (2) 5/32" holes on the inner cowl (See Figure 15, Page 13). 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.
- **9.** Loosely attach the front mounting bracket to the inner cowl using (2) #14 x 3/4" sheet metal screws (See Figure 15, Page 13).
- **10.** 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.**





# Evaporator Installation (Cont.)









# A/C Hose Installation

#### Standard Hose Kit:

- Locate the #8 compressor A/C hose. Lubricate (2) #8 O-rings (See Figure 19, above) and connect the 90° female fitting with 134a service port to the #8 discharge port on the compressor. Then route the 45° female fitting to the #8 condenser hardline coming through the core support (See Figure 20, Page 17). Tighten each fitting connection as shown in Figure 19, above.
- 2. Locate the #10 compressor A/C hose. Lubricate (2) #10 O-rings (See Figure 19, above) and connect the #10 135° female fitting with 134a service port to the #10 suction port on the compressor. Then route the 90° female fitting to the #10 fitting on the evaporator (See Figure 14a, Page 13, and Figure 20, Page 17). Tighten each fitting connection as shown in Figure 19, above.
- 3. Locate the #6 evaporator A/C hose. Lubricate (2) #6 O-rings (See Figure 19, above) and connect the 90° female fitting to the #6 hardline coming through the core support from the drier (See Figure 20, Page 17). Then route the 90° female fitting to the #6 fitting on the evaporator (See Figure 14a, Page 13, and Figure 20, Page 17). Tighten each fitting connection as shown in Figure 19, above.

#### **Modified Hose Kit:**

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





# Final Steps

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- 1. Install the duct hoses as shown in Figure 23, Page 19.
- 2. Refer to control panel instructions and install the control panel assembly.
- **3.** Plug the wiring harnesses into the ECU module on the sub case as shown in Figure 23, Page 19. Wire according to the wiring diagrams on Pages 20 and 21.
- 4. Refer to the instruction below and install the glove box.
- 5. Refer to the instruction below and install the under dash louver assembly.
- 6. Reinstall all previously removed items.
- 7. 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.
- 8. Double check all fittings, brackets and belts for tightness.
- 9. Vintage Air recommends that all A/C systems be serviced by a licensed automotive A/C technician.
- **10.** Evacuate the system for a minimum of 45 minutes prior to charging, and perform a leak check prior to servicing.
- **11.** Charge the system to the capacities stated on Page 4 of this instruction manual.
- **12.** See Operation of Controls procedures on Page 22.

# **Glove Box Installation**

- 1. Install the glove box, and secure it with OEM screws through the OEM holes (See Figure 21, below). NOTE: If equipped with the glove box light as shown in Figure 22a, below, modify the plastic glove box using the dimensions provided on Page 25.
- 2. Install the glove box door.



### **Under Dash Louver Installation**

- **1.** Reinstall the under dash louvers using the OEM screws as shown in Figure 22, below.
- **2.** Connect the duct hoses to the louvers as shown in Figure 23, Page 19.







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.



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Symptom	Condition	Checks	Actions	Notes
La. Blower stays on high speed when ignition is on.	No other functions work.	Check for damaged pins or wires in control head plug. Check for damaged ground wire (white) in control head harness. Check for damaged blower switch or potentiometer and associated wiring.	Verify that all pins are inserted into plug. Ensure that no pins are bent or damaged in ECU. Verify continuity to chassis ground with white control head wire at various points.	<ul> <li>Loss of ground on this wire renders control head inoperable.</li> <li>See blower switch check procedure.</li> </ul>
Lb. Blower stays on high speed when ignition is on or off.		Unplug 3-wire BSC control connector from ECU. If blower shuts off, ECU is either improperly wired or damaged. Unplug 3-wire BSC control	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 positive wire to the blower is shorted to chassis ground, the blower will run on HI.	
		stays running, BSC is either improperly wired or damaged.	+Replace BSC (This will require removal of evaporator from vehicle).	No other part replacements should be necessary.
	◆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).	System is charged.	Check for faulty A/C potentiometer or associated wiring (Not applicable to 3-pot controls). Check for disconnected or faulty thermistor.	Check continuity to ground on white control head wire. Check for 5V on red control head wire. Check 2-pin connector at ECU housing.	To check for proper pot function, check voltage at white/blue wire. Voltage 5% and will vary with pot lever position.
3. Compressor will not turn off (All other functions work)		Check for faulty A/C potentiometer or associated wiring.	Repair or replace pot/control wiring.	compressor to be disabled. ► 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 varv
		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 viring 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.	quality oscilloscope. 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
Tunction.	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 and off rapidly.	Battery voltage is at least 12V. Battery voltage is less	Check for at least 12V at circuit breaker.	<ul> <li>▲ Ensure all system grounds and power connections are clean and tight.</li> <li>◆ Charge battery.</li> </ul>	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.		damaged switch or sociated wiring.	<ul> <li>▶ Repair or replace.</li> </ul>	
<b>8.</b> 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.	



