

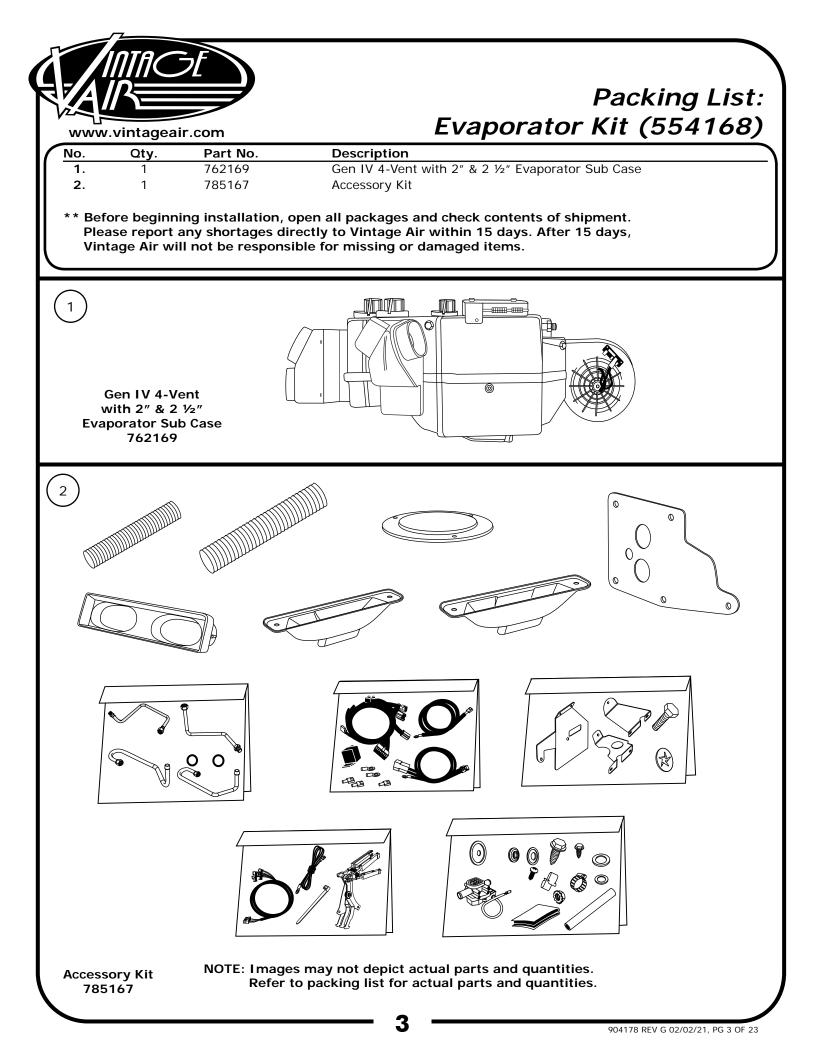
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# Table of Contents

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. (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.



# **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 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.

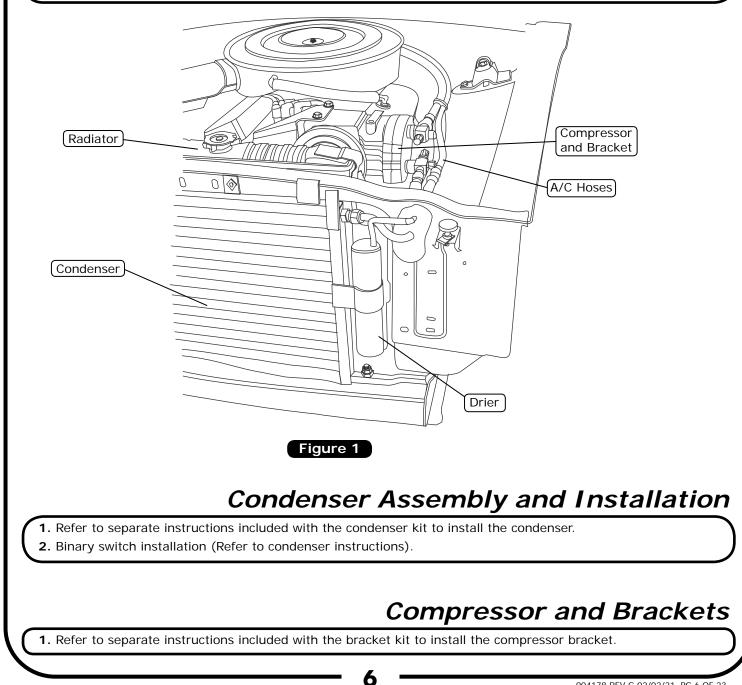


# Engine Compartment Disassembly

NOTE: Before starting the installation, check the function of the vehicle (horn, lights, etc.) for proper operation, and study the instructions, illustrations, & diagrams.

#### Perform the Following:

- 1. Disconnect battery.
- 2. Remove battery (retain).
- 3. Drain radiator.
- 4. Remove radiator (retain).
- 5. Evacuate the A/C system if necessary.
- 6. Remove the OEM condenser and drier (discard) (See Figure 1, below).
- 7. Remove the OEM compressor and bracket (discard) (See Figure 1, below).
- 8. Remove the OEM heater & A/C hoses (discard) (See Figure 1, below).



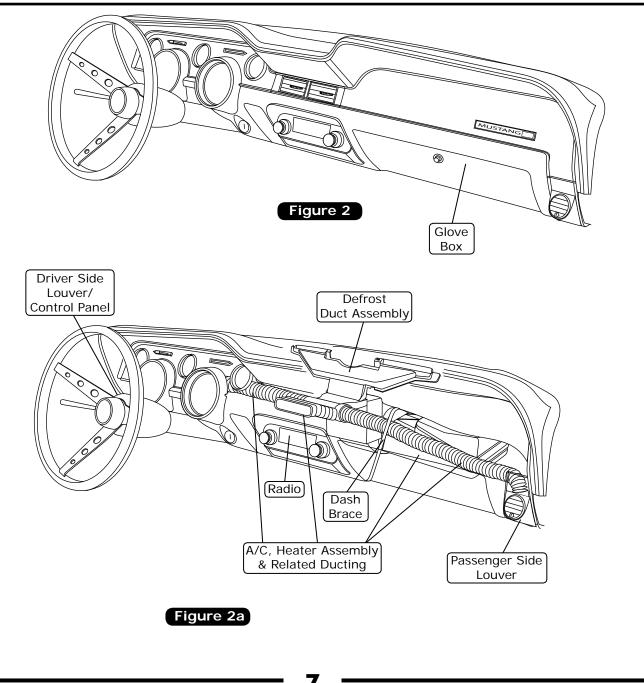


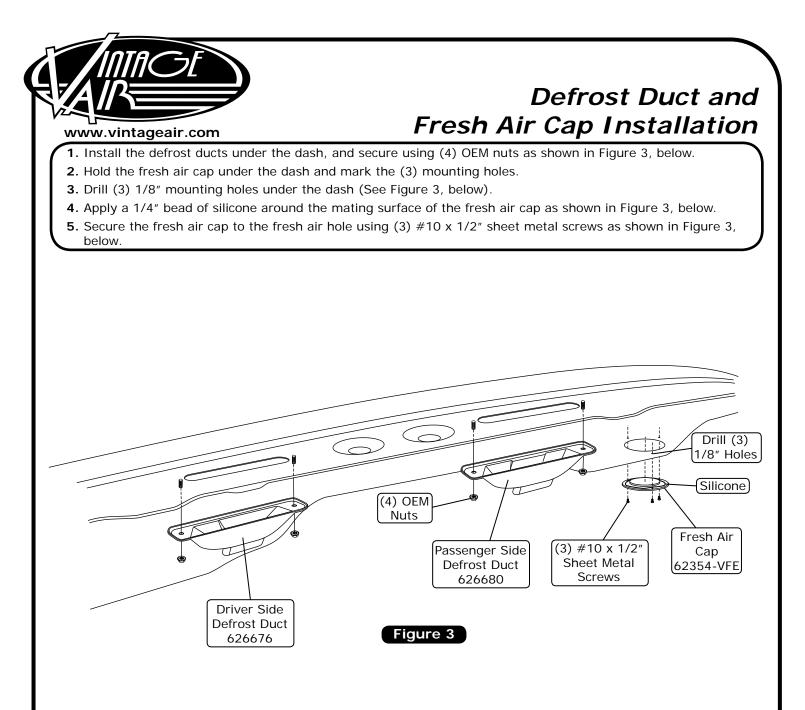
### Passenger Compartment Disassembly

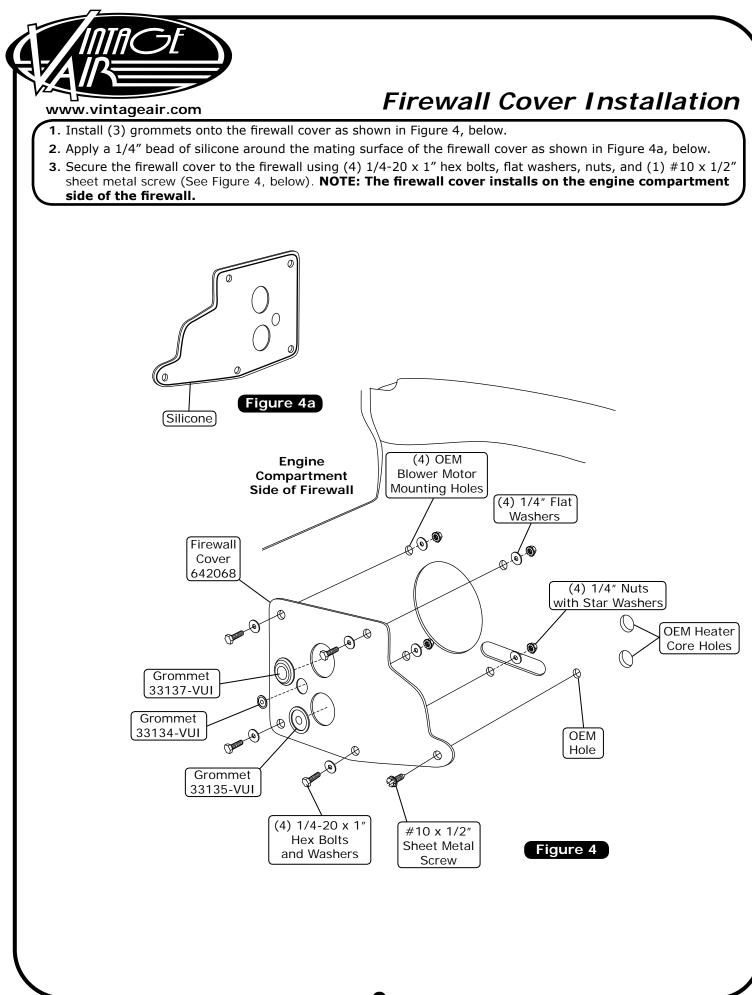
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#### Perform the Following:

- 1. Remove the glove box (retain) (See Figure 2, below).
- 2. Remove the center console (if equipped).
- Remove the A/C & heater assembly and all related ducting (discard, but retain screws) (See Figure 2a, below).
- **4.** Remove the driver side louver/control panel (retain) (See Figure 2a, below). **NOTE: Refer to control panel conversion kit instructions for installation of controls.**
- 5. Remove the passenger side louver (retain) (See Figure 2a, below).
- 6. Remove the radio (retain) (See Figure 2a, below).
- 7. Remove the OEM defrost duct assembly (See Figure 2a, below).
- 8. Remove the dash brace (discard) (See Figure 2a, below).





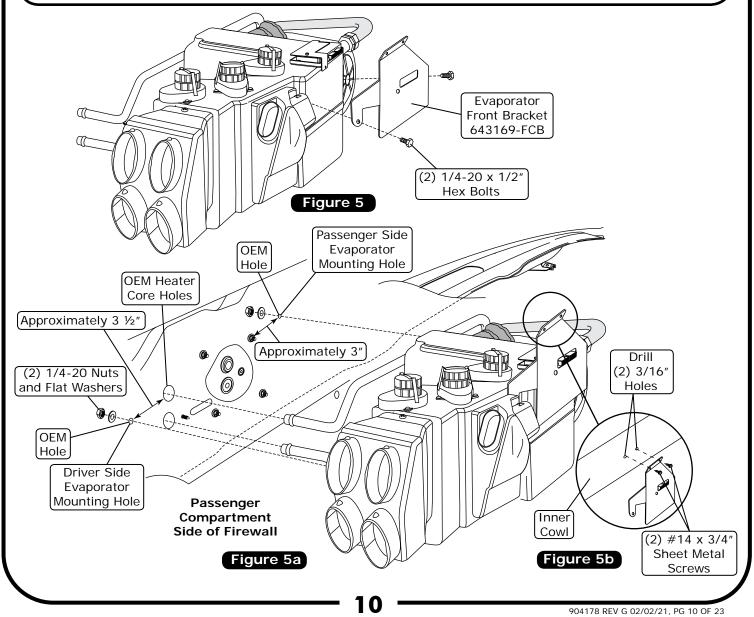


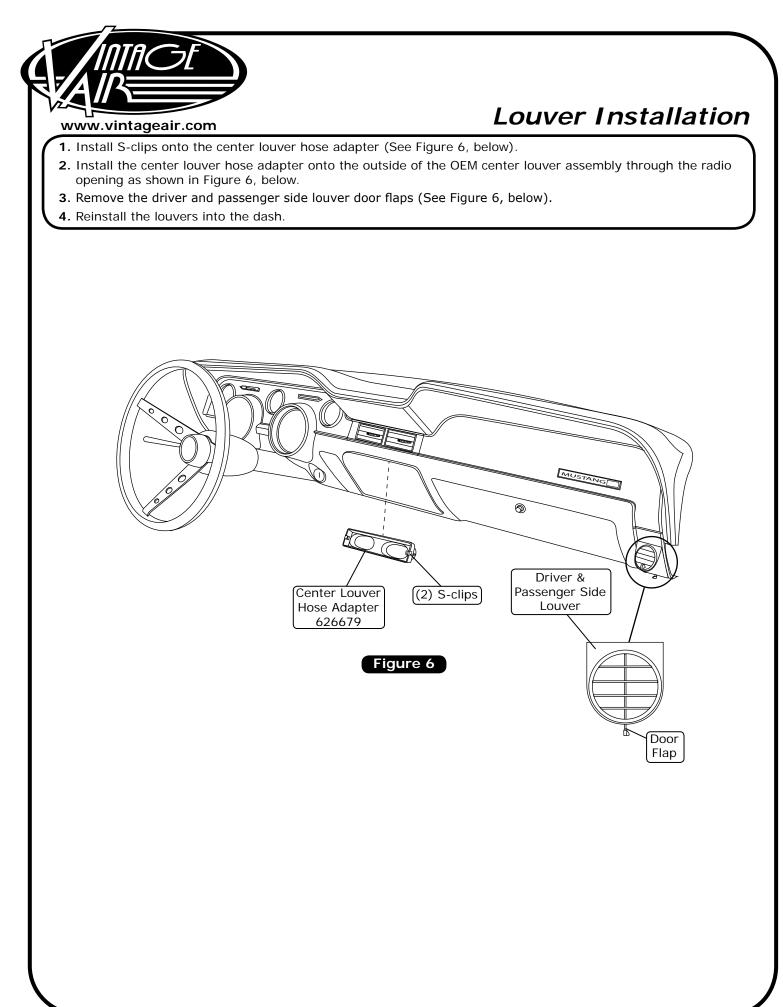
## **Evaporator Installation**

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.

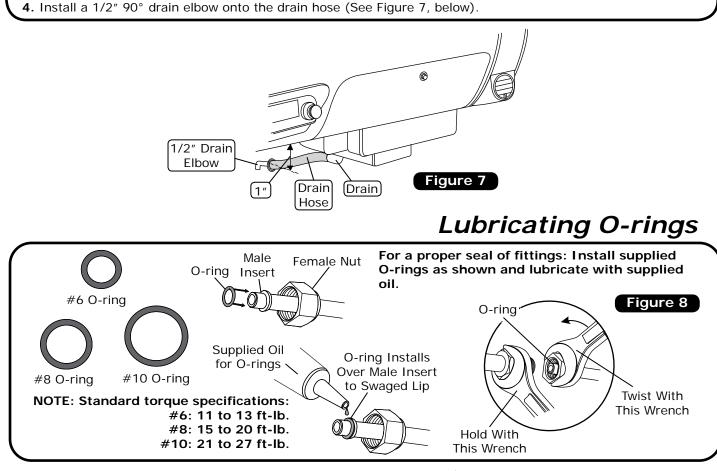
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- 1. On a workbench, install the evaporator rear brackets and hardlines with properly lubricated O-rings (See Figure 8, Page 12, and Figure 14, Page 17).
- **2.** Install the front mounting bracket onto the evaporator using (2) 1/4-20 x 1/2" hex bolts, and tighten as shown in Figure 5, below.
- **3.** Lift the evaporator unit up under the dashboard. Secure loosely to the firewall from the engine compartment side using (2) 1/4-20 nuts and washers (See Figure 5a, below). **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.**
- **4.** Using the front evaporator bracket as a guide, mark and drill (2) 3/16" holes in the cowl (See Figure 5b, below).
- Using (2) #14 x 3/4" sheet metal screws, secure the front evaporator mounting bracket to the inner cowl (See Figure 5b, below).
- 6. 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.**





### Drain Hose Installation 1. Locate the evaporator drain on the bottom of the evaporator case. 2. In line with the drain, lightly make a mark on the firewall. Then, measure 1" down and drill a 5/8" hole through the firewall (See Figure 7, below). **3.** Install the drain hose onto the evaporator drain on the bottom of the unit, and route it through the firewall.



## A/C Hose Installation

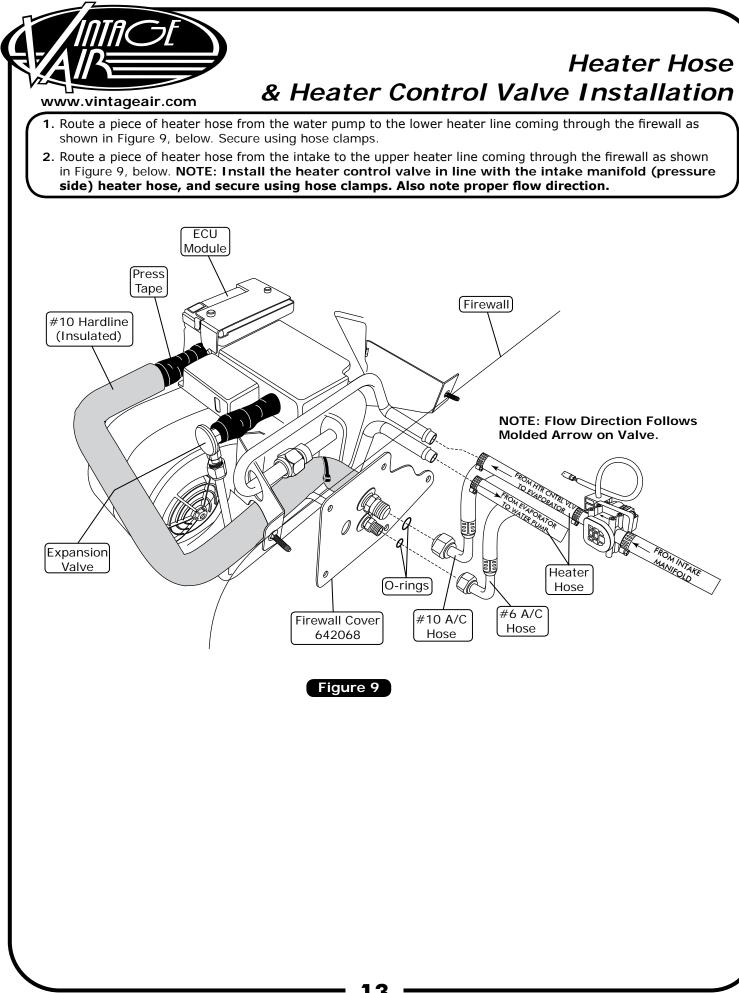
#### Standard Hose Kit:

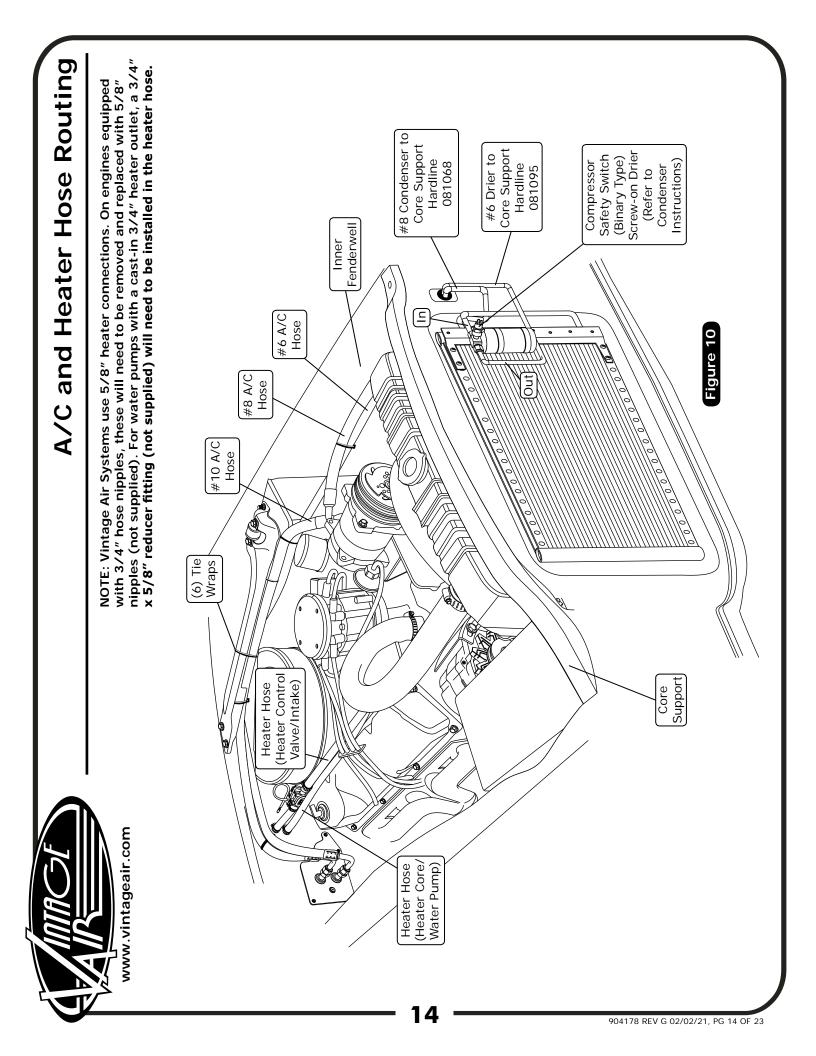
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- 1. Locate the #8 compressor A/C hose. Lubricate (2) #8 O-rings (See Figure 8, above) and connect the 45° fitting to the #8 discharge port on the compressor. Then route the straight female fitting with service port to the #8 condenser hardline coming through the radiator core support (See Figure 10, Page 14). Tighten each fitting connection as shown in Figure 8, above.
- 2. Locate the #10 compressor A/C hose. Lubricate (2) #10 O-rings (See Figure 8, above) and connect the 90° female fitting with service port to the #10 suction port on the compressor. Then route the 90° female fitting to the #10 evaporator hardline coming through the firewall (See Figure 9, Page 13, & Figure 10, Page 14). Tighten each fitting connection as shown in Figure 8, above. Wrap the #10 fitting connections with press tape (See Figure 9, Page 13).
- 3. Locate the #6 evaporator/drier hose. Lubricate (2) #6 O-rings (See Figure 8, above) and connect the straight female fitting to the #6 drier hardline coming through the radiator core support. Then route the 90° female fitting to the #6 evaporator hardline coming through the firewall (See Figure 9, Page 13). Tighten each fitting connection as shown in Figure 8, above.
- 4. Use (6) tie wraps to secure the #6 A/C hose to the brace as shown in Figure 10, Page 14.

#### Modified Hose Kit:

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

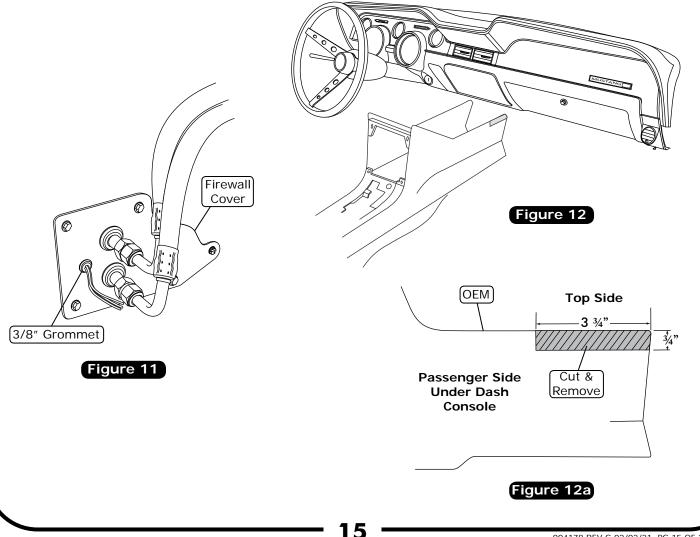


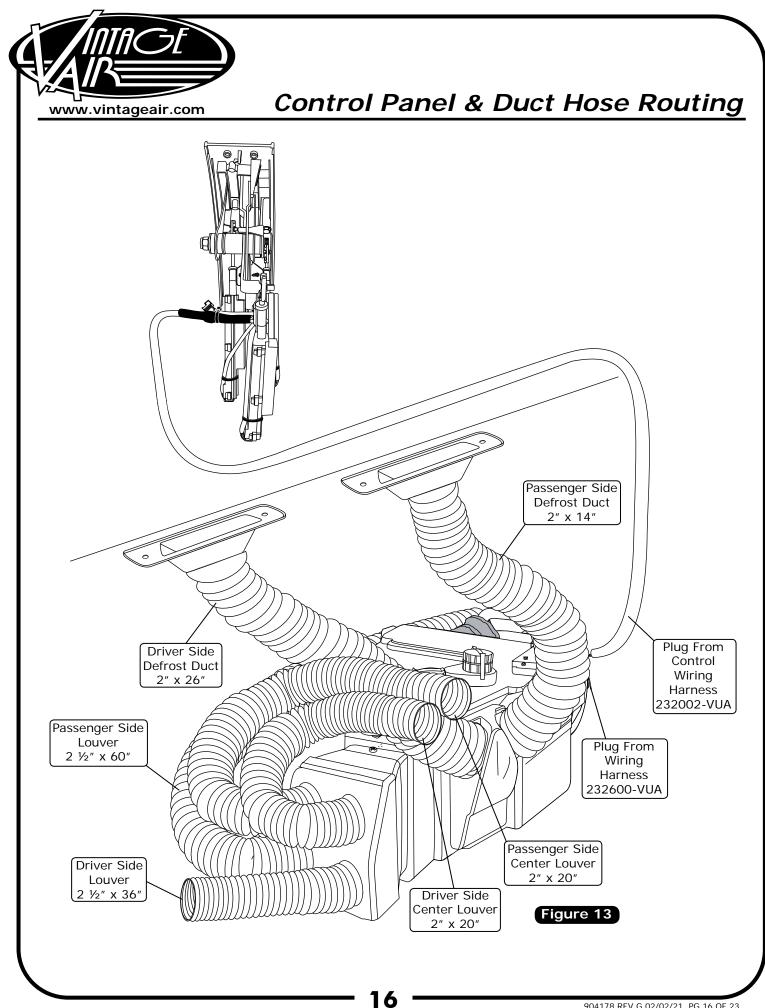


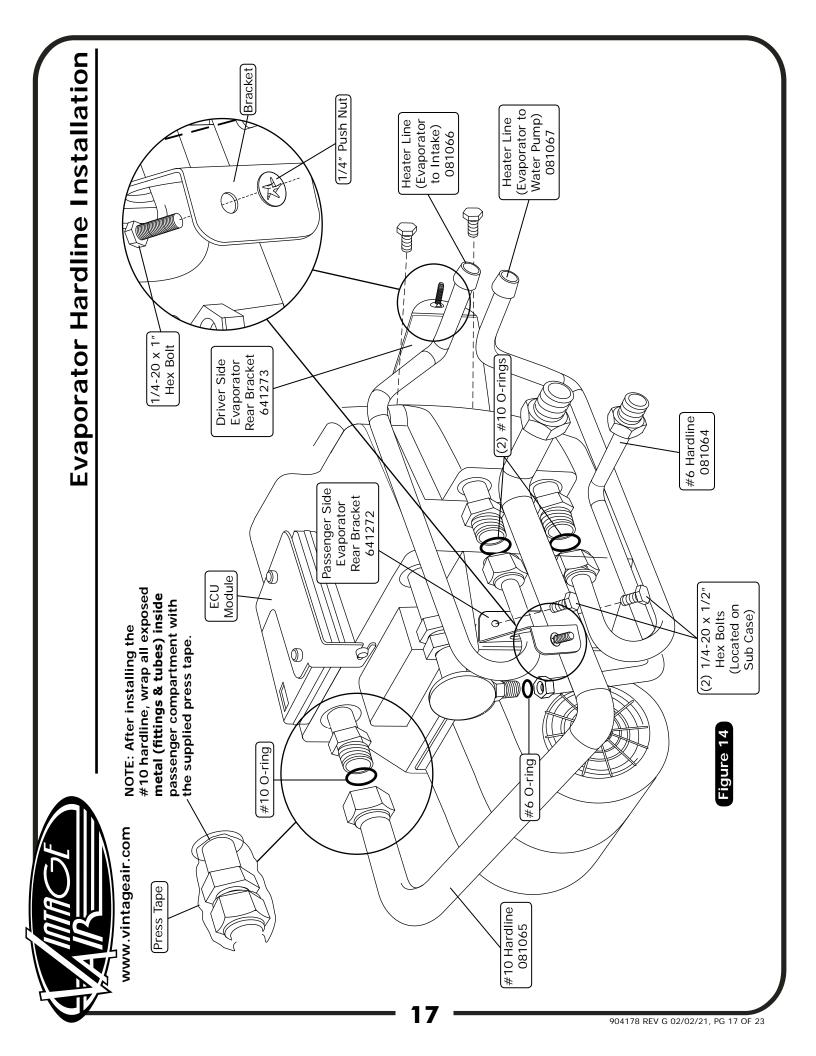
# Final Steps

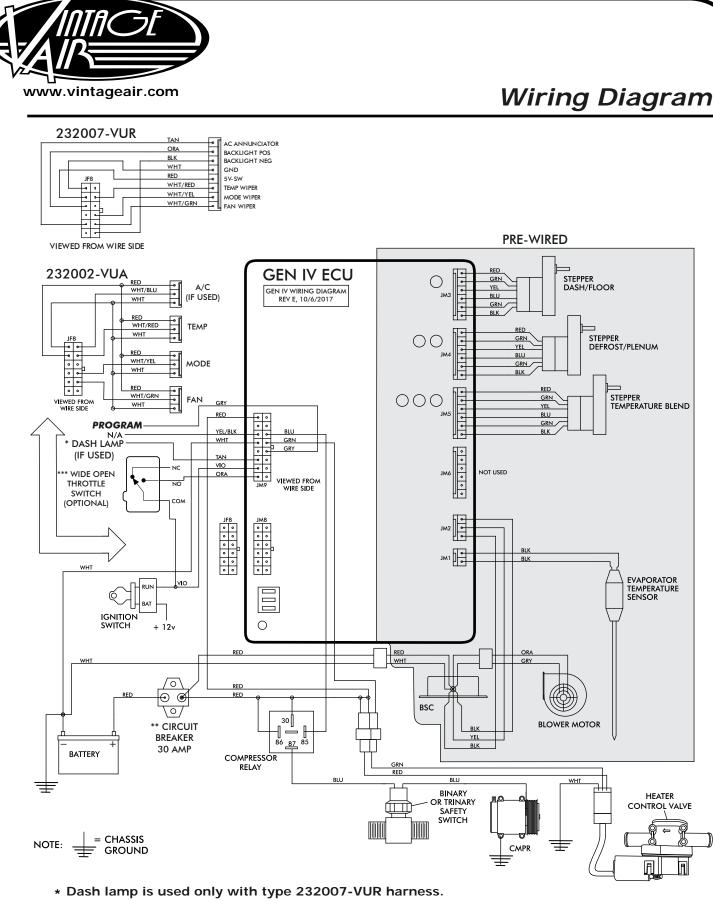
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- 1. Install duct hoses as shown in Figure 13, Page 16.
- Route A/C wires (12 volt/grounds/binary switch/heater valve) through 3/8" grommet as shown in Figure 11, below.
- 3. Install control panel assembly. Refer to control panel instructions.
- **4.** Plug the wiring harnesses into the ECU module on the sub case as shown in Figure 13, Page 16. Wire according to the wiring diagrams on Pages 18 and 19.
- 5. Reinstall the glove box.
- 6. Reinstall the center console (if equipped). Modify console as shown in Figures 12 & 12a, 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 20.



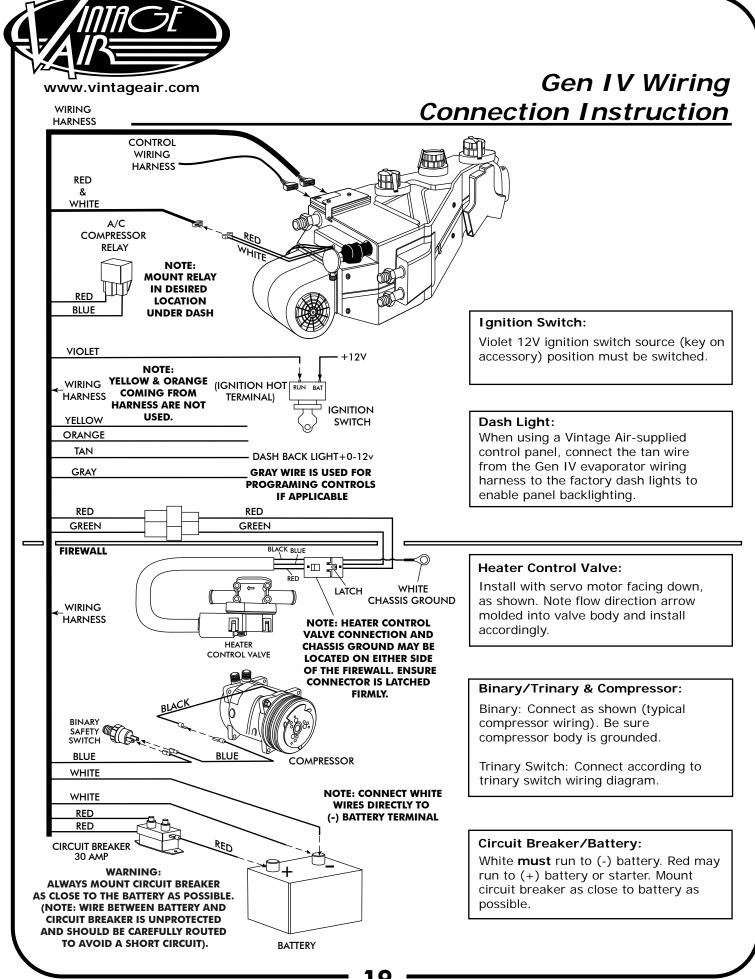






- \*\* Warning: Always mount circuit breaker as close to the battery as possible. (NOTE: Wire between battery and circuit breaker is unprotected and should be carefully routed to avoid a short circuit).
- \*\*\* Wide open throttle switch contacts close only at full throttle, which disables A/C

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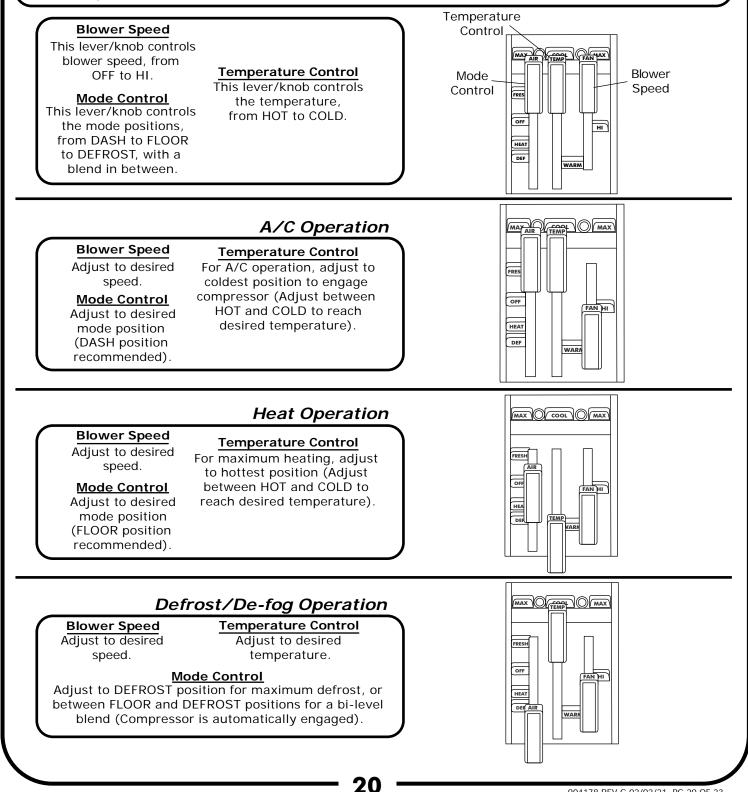


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# **Operation of Controls**

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. **NOTE: For proper control panel function, refer to control panel instructions for calibration procedure.** 



	air.com		Troublesho	Troubleshooting Guide
Symptom	Condition	Checks	Actions	Notes
1a.		Check for damaged pins or Wires in control head plug.	Verify that all pins are inserted into plug. Ensure that no pins are bent or damaged in ECU.	
Blower stays on high speed when	No other functions work.	Check for damaged ground wire (white) in control head harness.	d with white control	► Loss of ground on this wire ► renders control head inoperable.
ignition is on.	All other functions work.	Check for damaged blower switch or potentiometer and associated wiring.		See blower switch check procedure.
1b.		Unplug 3-wire BSC control connector from ECU. If blower	Be sure the small, 20 GA white ground wire is connected to the battery ground post. If it is, replace the ECU.	
Blower stays on high speed when		improperly wired or damaged.	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 alwavs be hot. If the	
ignition is on or off.		Unplug 3-wire BSC control Connector from ECU. If blower cranical BSC is oithor	*ground" side of the blower is shorted to chassis ground, the blower will run on HI.	
		improperly wired or damaged.	Replace BSC (This will require removal of evaporator from vehicle).	▲ No other part replacements should be necessary.
2	▲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).	Cvetom is characted	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/blue wire. Voltage should be between OV and box, and will vary with pot
		Check for disconnected or faulty thermistor.	→ Check 2-pin connector at ECU housing.	<ul> <li>Disconnected or faulty thermistor will cause compressor to be disabled.</li> </ul>
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.	Blue wire should vary between OV and 5V when lever is moved up or down.

Symptom     Condition       4.     4.       A.     Works when engine is not running: shuts off when engine is started (typically early Gen IV, but possible on all (typically early Gen IV, but possible on all turn on, or runs intermittently.       System will not turn on all turn on, or runs intermittently.       Will not turn on under any conditions.       5.			
ystem will not urn on, or runs ntermittently.		Actions	Notes
system will not urn on, or runs termittently.	ff when the lignition 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 quality oscilloscope. Spikes
	Verify connections on power lead, ignition lead, and both	Check for positive power at heater valve green wire and blower red wire. Check for ground on control head white wire.	greater than 16V will shut down the ECU. Install a radio capacitor at the positive post of the ignition
oss of mode door unction.		Verify proper meter function by checking the condition of a known good battery.	coil (see radio capacifor installation bulletin). A faulty alternator or worn out battery can also result in this condition.
7			Typically caused by evaporator housing installed in a bind in the
	If mode Check for obstructed of binding mode doors.		mounting locations line up and don't have to be forced into position.
6. Battery voltage is at least Blower turns on 12V. and off rapidly. Battery voltage is less than 12V.	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 shutdown at up to 11V.
<b>7</b> . Erratic functions of blower, mode, temp, etc.	Check for damaged switch or pot and associated 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.	

