an ISO 9001:2015 Registered Company

1969-70 Ford Mustang

with **Factory Air**

554170

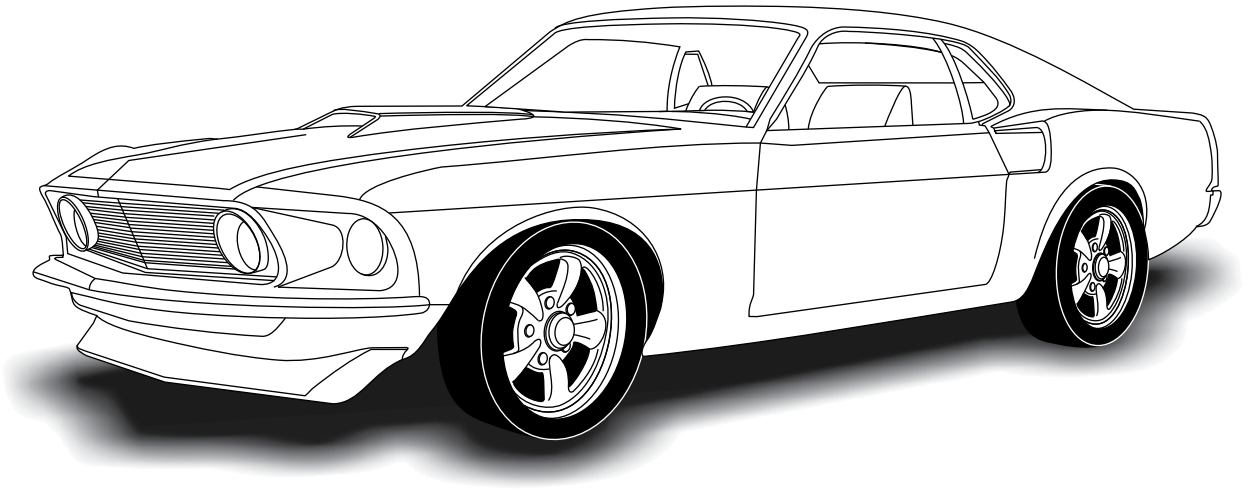

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Table of Contents

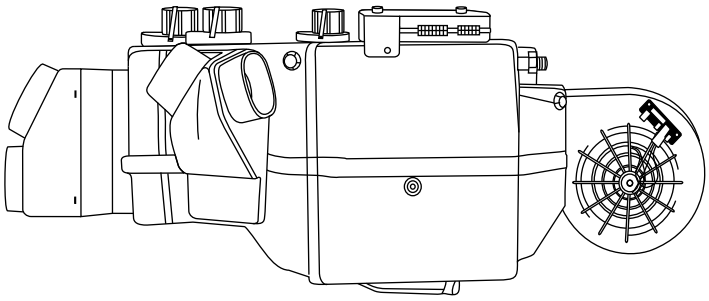
Packing List
Evaporator Kit (554170)

No.	Qty.	Part No.	Description
1.	1	744004-VUE	Gen IV 4-Vent Evaporator Sub Case with 204 ECU
2.	1	785169	1969-70 Mustang with A/C Gen IV Accessory Kit

**** Before beginning installation, open all packages and check contents of shipment. Please report any shortages directly to Vintage Air within 15 days. After 15 days, Vintage Air will not be responsible for missing or damaged items.**

1

Gen IV 4-Vent Evaporator Sub Case with 204 ECU 744004-VUE



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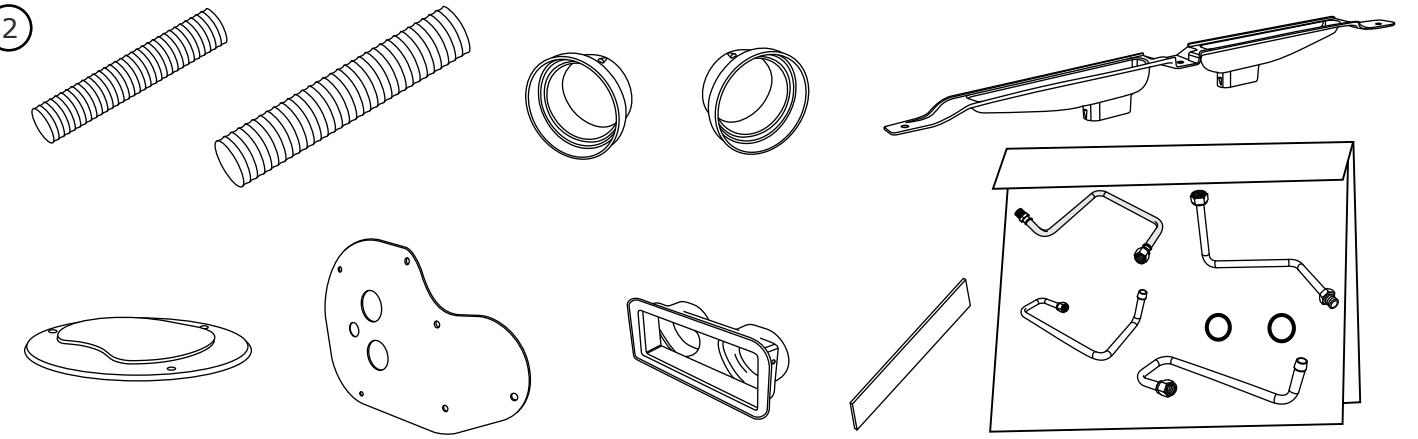
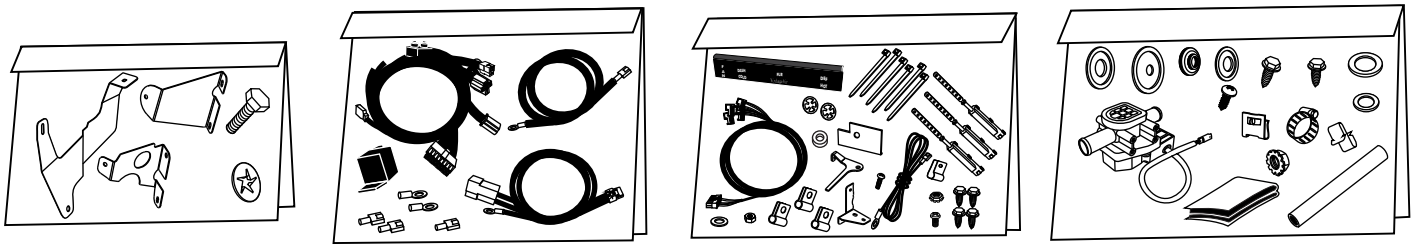




Accessory Kit 785169

NOTE: Images may not depict actual parts and quantities. Refer to packing list for actual parts and quantities.

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

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

Remove the Following:

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

Condenser Assembly and Installation

1. Refer to separate instructions included with the condenser kit to install the condenser.
2. Binary switch installation (Refer to condenser instructions).

Compressor and Brackets

1. Refer to separate instructions included with the bracket kit to install the compressor and bracket.

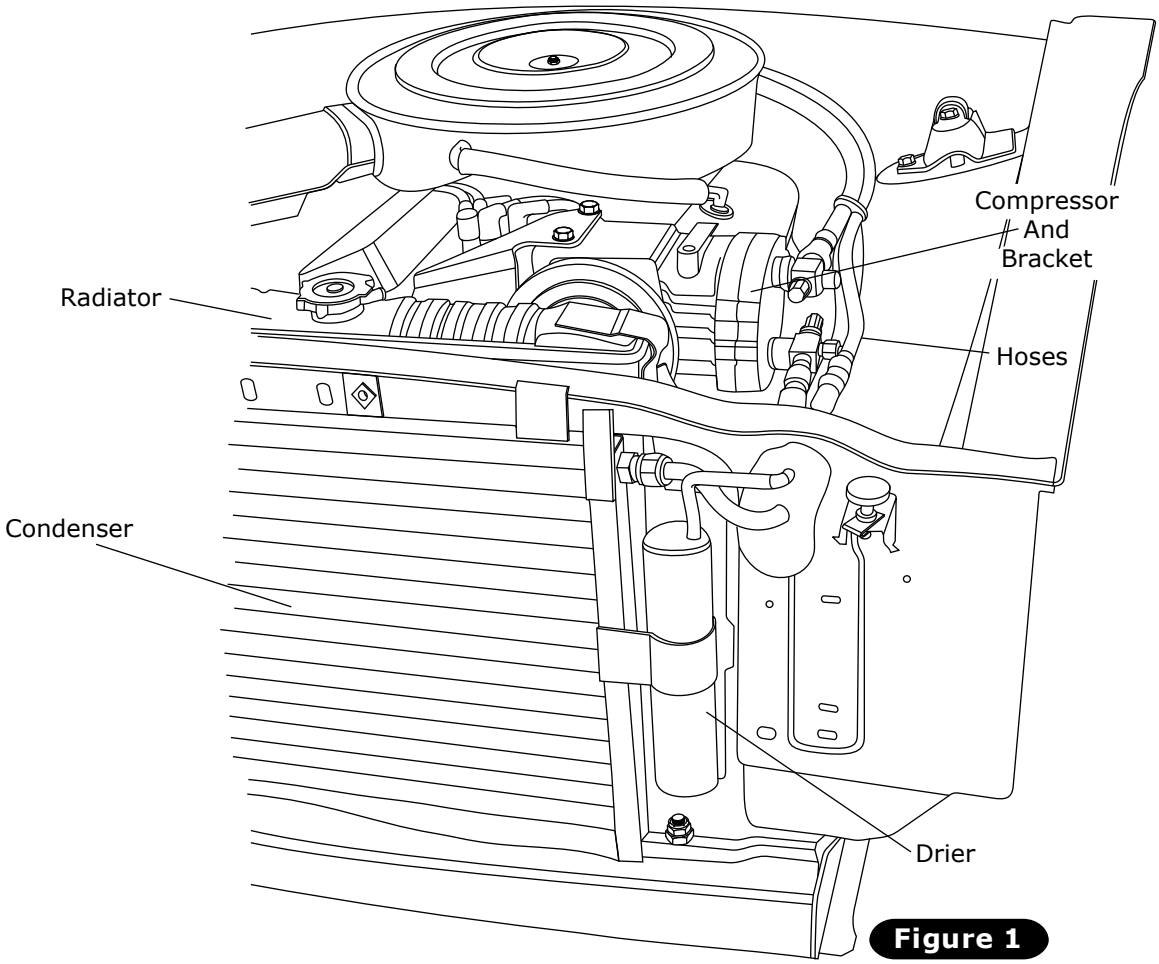


Figure 1

Passenger Compartment

NOTE: Removal of the dashboard is required to install the evaporator. Vintage Air recommends that you utilize the factory service manual when you disassemble and reassemble the dashboard.

Remove the Following:

1. Remove the dash pad, instrument panel, passenger side panel and lower passenger side dashboard (retain screws) (See Figure 2, below).
2. Glove box (retain) (See Figure 2, below).
3. A/C heater/evaporator assembly and all related ducting (discard) (retain screws) (See Figure 3, below).
4. Control panel assembly (retain control panel) (See Figure 2, below).
5. Refer to control panel conversion kit instructions for installation of controls.
6. Remove OEM defrost duct ASM (See Figure 3, below).

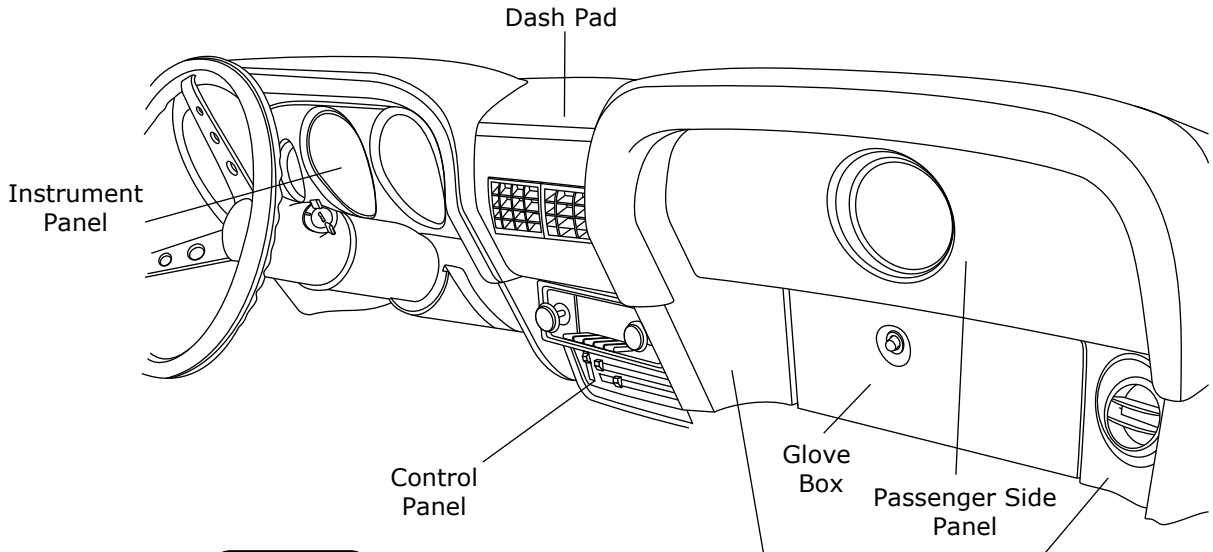


Figure 2

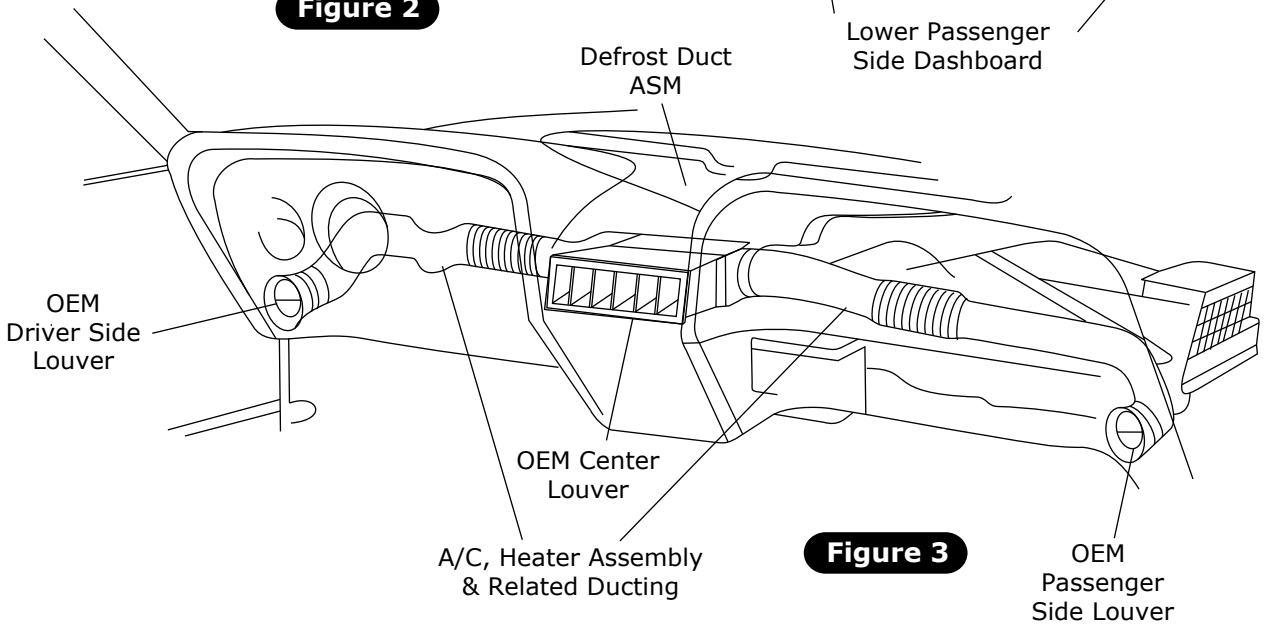


Figure 3

Defrost Duct/ Fresh Air Cap Installation

1. Install defrost duct under dash as shown in Figure 4, below. Secure using OEM nuts with (3) 3/16" SAE flat washers.
2. Hold fresh air cap under dash and mark the (3) mounting holes.
3. Drill (3) 1/8" mounting holes under dash.
4. Apply a 1/4" bead of silicone around the back side of the fresh air cap as shown in Figure 4, below.
5. Secure fresh air cap to fresh air hole using (3) #10 x 1/2" sheet metal screws as shown in Figure 4, below.

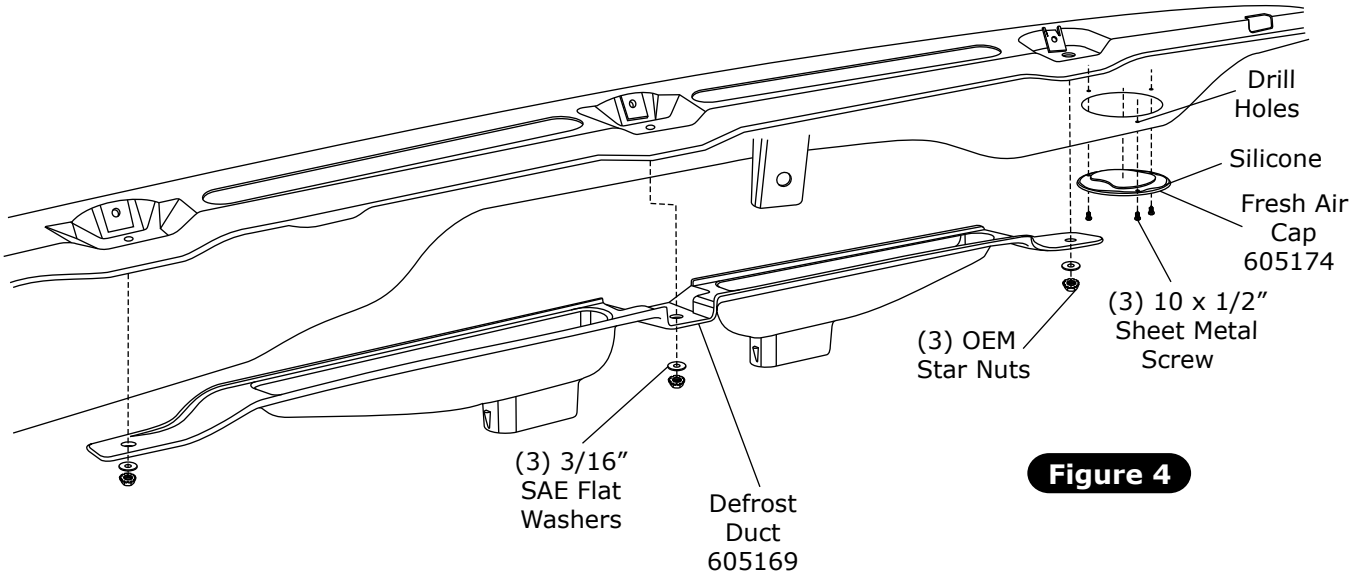


Figure 4

Hose Adapter Installation

1. Install S-clips on hose adapters as shown in Figure 5, below.
2. Install driver & passenger side hose adapters on OEM louvers. See Figure 5, below.

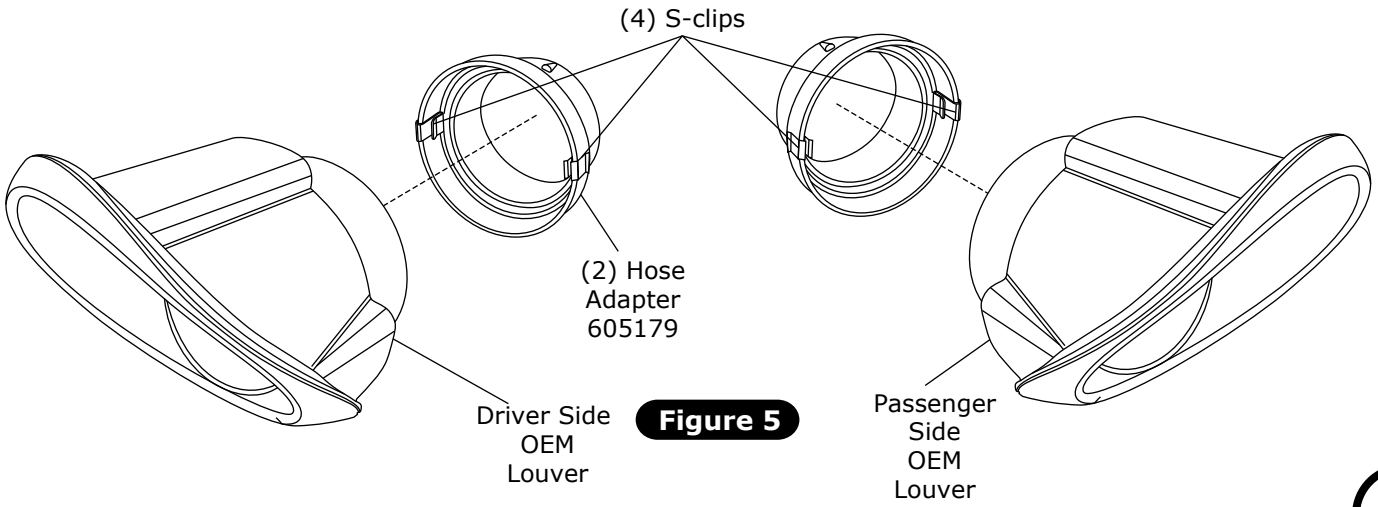


Figure 5

Evaporator Installation

1. On a workbench, install evaporator rear bracket and hardlines with properly lubricated O-rings (See Figure 11, Page 12, and Figure 16, Page 17).

2. Install front mounting bracket on evaporator using (2) 1/4-20 x 1/2" hex bolts and tighten as shown in Figure 6, below.

3. Lift evaporator unit up under the dashboard (See Figure 7, below). Secure loosely to the firewall from the engine compartment side using (2) 1/4-20 nut and washers (See Figure 7, below).

4. Using (2) #14 x 3/4" sheet metal screws with 1/4" flat washers, secure the front evaporator mounting bracket to the inner cowl (See Figure 7, below).

5. Verify that evaporator unit is level and square to the dash, and then tighten all mounting bolts. **NOTE: Tighten the bolt on the firewall first. Then tighten the front mounting bracket screws.**

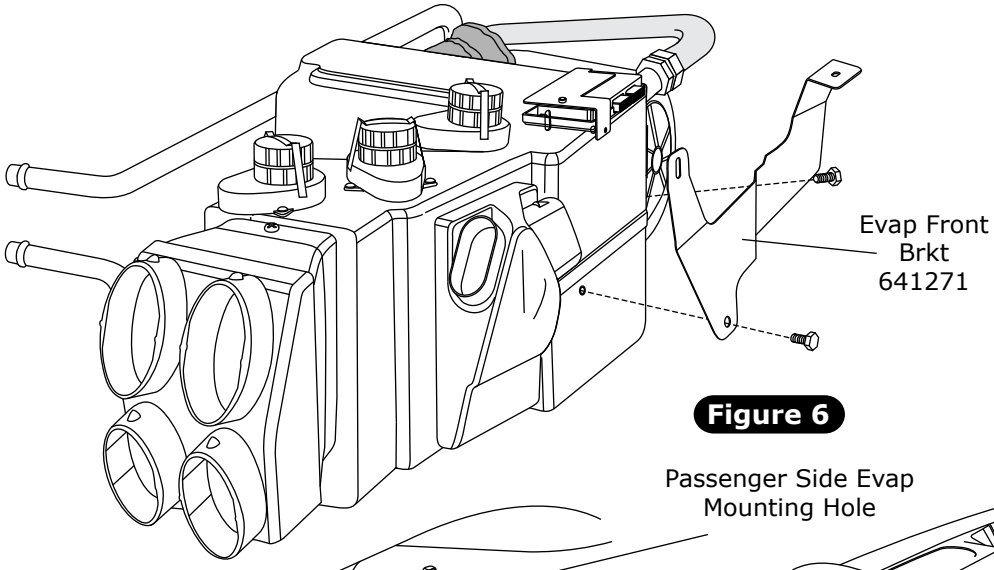


Figure 6

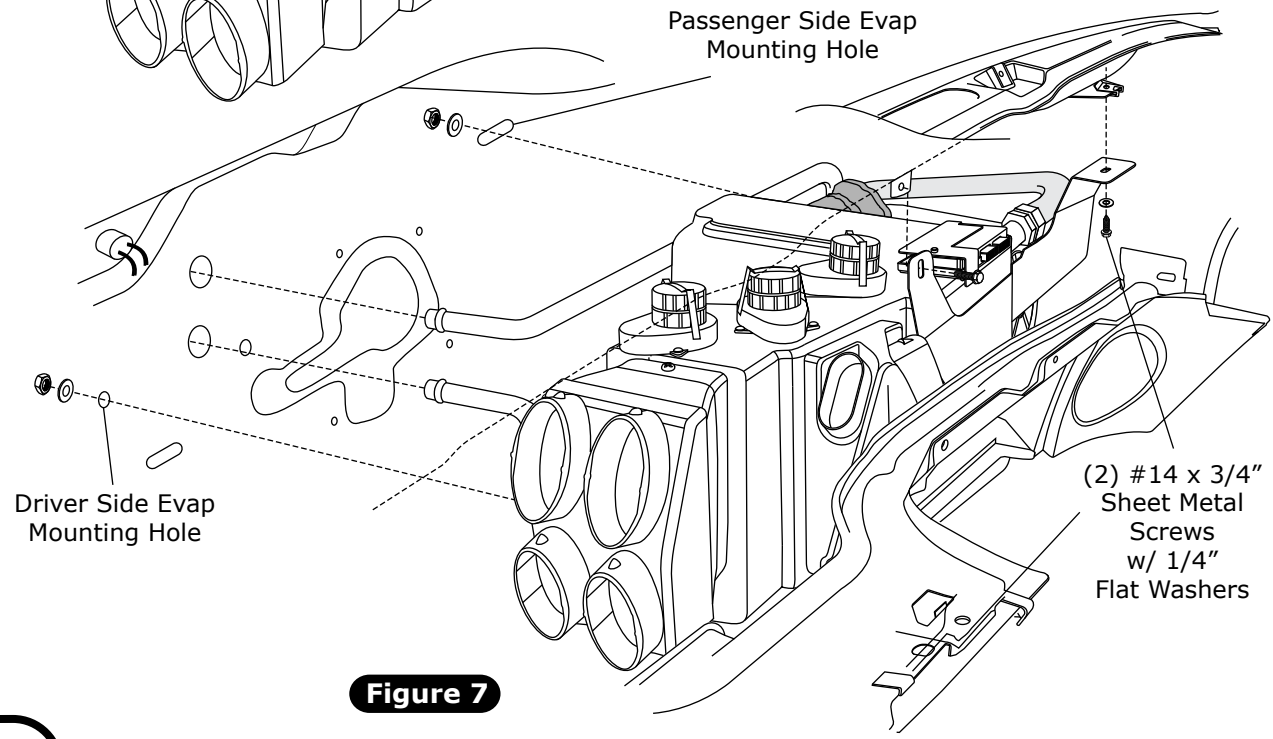


Figure 7

Firewall Cover Installation

1. Install (3) grommets on firewall cover as shown in Figure 8, below.
2. Apply a 1/4” bead of silicone around the back side of the firewall cover as shown in Figure 8a, below.
3. Secure firewall cover to firewall using (6) #14 x 3/4” sheet metal screws (See Figure 8, below). **NOTE: Firewall cover installs on engine side of firewall.**

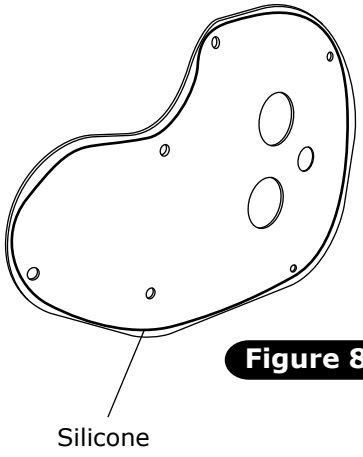


Figure 8a

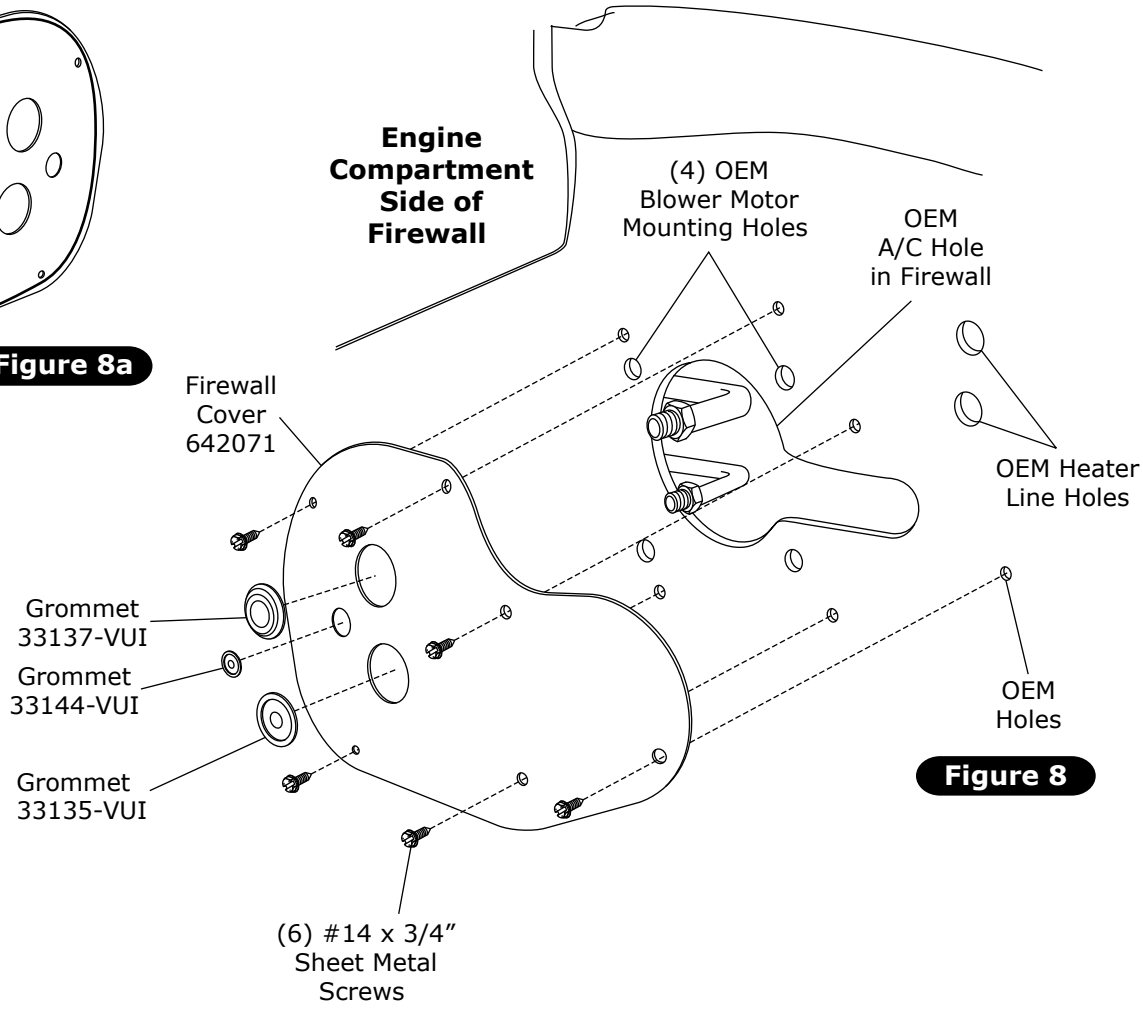


Figure 8

Center Louver Installation

1. Install (2) #8 J-nuts over mounting holes in OEM center louver assembly as shown in Figure 9a, below.
2. Install 1/2" x 20" foam around center louver hose adapter in dash as shown in Figure 9, below.
3. Secure hose adapter to center louver using (2) #8 x 1/2" pan head screws as shown in Figure 9, below.
4. Reinstall dash.

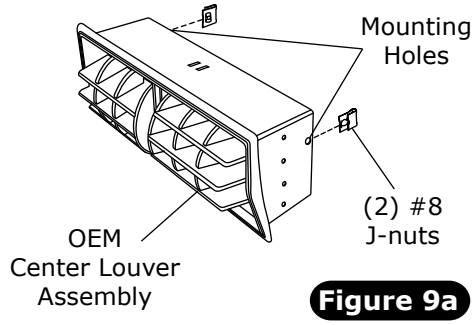


Figure 9a

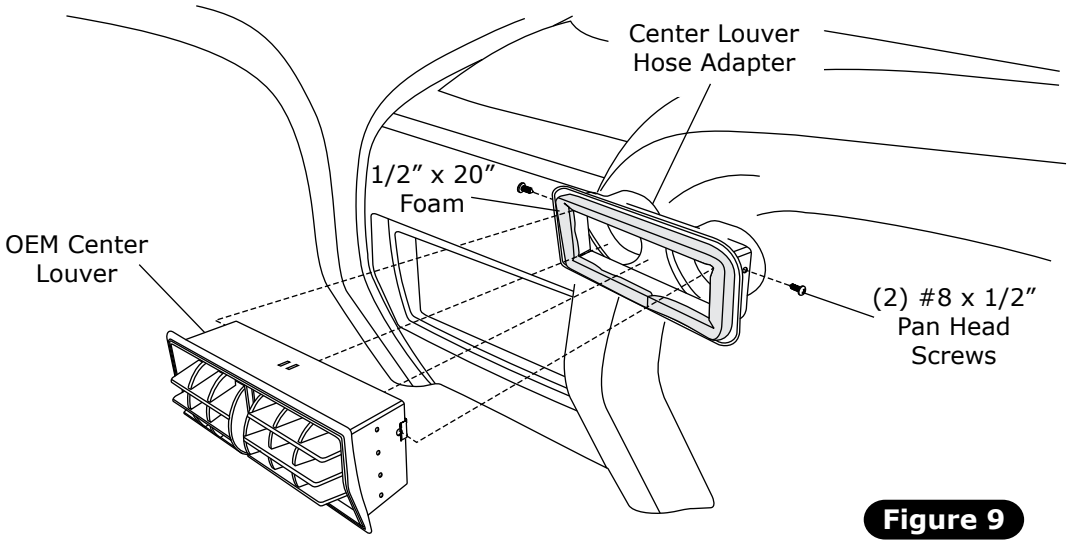
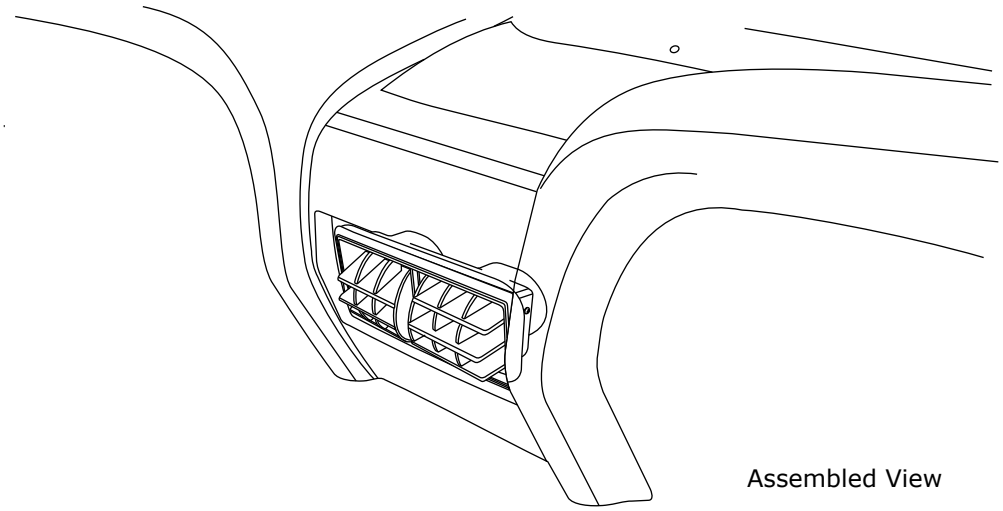


Figure 9



Assembled View

Drain Hose Installation

1. Locate evaporator drain on bottom of evaporator case.

2. Locate OEM hole in floorboard and install 1 ¼" OD X 11/16" ID grommet (See Figure 10, below).

3. Install drain hose to bottom of evaporator unit and route through firewall (See Figure 10, below).

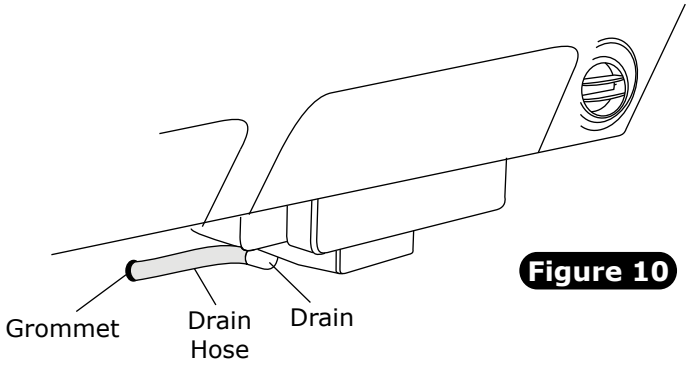


Figure 10

Lubricating O-rings

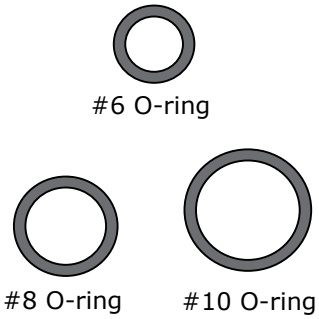
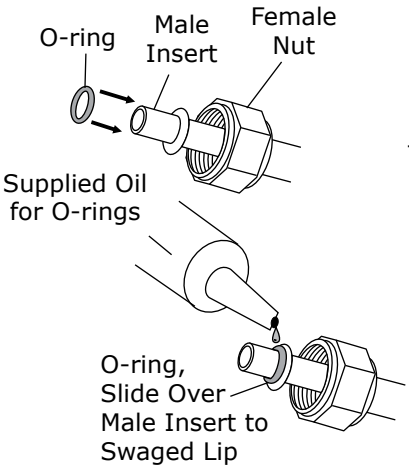
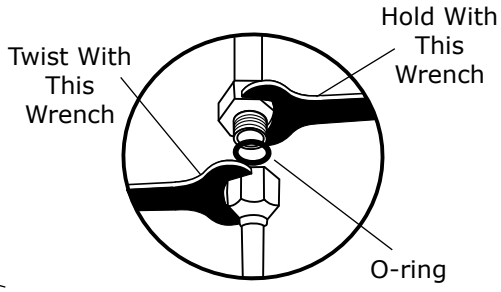


Figure 11



For A Proper Seal Of Fittings:
Install Supplied O-rings As Shown and Lubricate With Supplied Oil.



Standard Hose Kit

1. Locate the #8 compressor A/C hose. Lubricate (2) #8 O-rings (See Figure 11, above) and connect the 45° fitting to the #8 discharge port on the compressor. Route the straight female with 134a service port fitting to the #8 condenser hardline coming through the radiator core support (See Figure 13, Page 14). Tighten each fitting connection as shown in Figure 11, above.

2. Locate the #10 compressor A/C hose. Lubricate (2) #10 O-rings and connect the 90° female with 134a service port fitting to the #10 suction port on the compressor, and route the 135° female fitting to the #10 evaporator hardline coming through the firewall (See Figure 12, Page 13, & Figure 13, Page 14). Tighten each fitting connection as shown in Figure 11, above. **NOTE: Wrap the #10 fitting connections with press tape (See Figure 12, Page 13, & Figure 13, Page 14).**

3. Locate the #6 evap/drier A/C hose. Lubricate (2) #6 O-rings and connect the straight female fitting to the #6 drier hardline coming through the radiator core support. Route the 90° female fitting to the #6 evaporator hardline coming through the firewall (See Figure 12, Page 13, & Figure 13, Page 14). Tighten each fitting connection as shown in Figure 11, above.

4. Use (6) tie wraps to secure the #6 A/C hose to the export brace as shown in Figure 13, Page 14.

Modified A/C Hose Kit

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

Heater Hose & Heater Control Valve Installation

1. Route a piece of heater hose from the water pump to the heater line coming through the firewall as shown in Figure 12, below. Secure using hose clamps.
2. Route a piece of heater hose from the intake to the heater line coming through the firewall as shown in Figure 12, below. **NOTE: Install heater control valve in line with intake manifold (pressure side) heater hose, and secure using hose clamps as shown in Figure 12, below. Also note proper flow direction.**

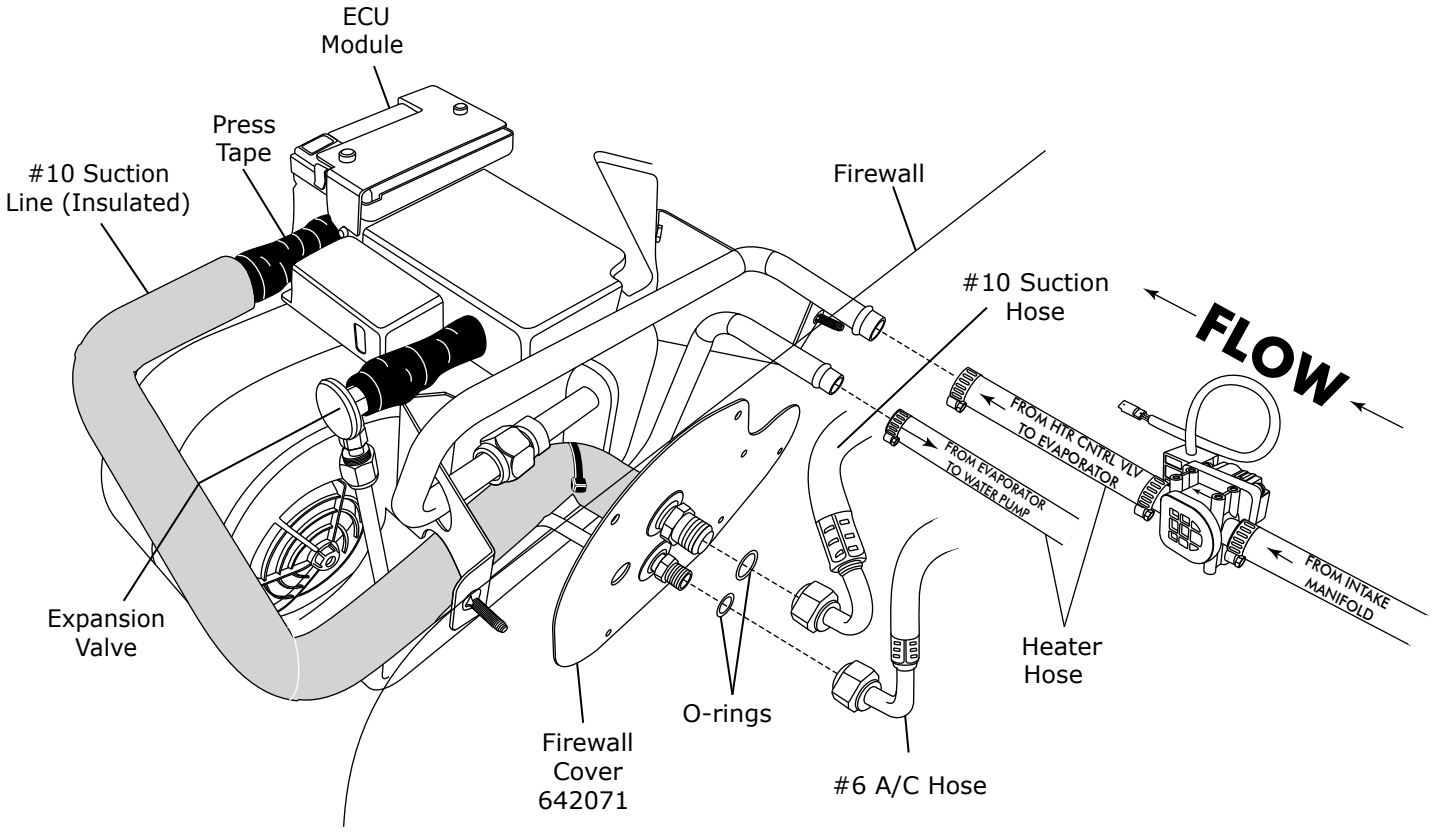


Figure 12

A/C & Heater Hose Routing

NOTE: Vintage Air Systems Require
(2) 5/8 Hose Nipples (Not Supplied)

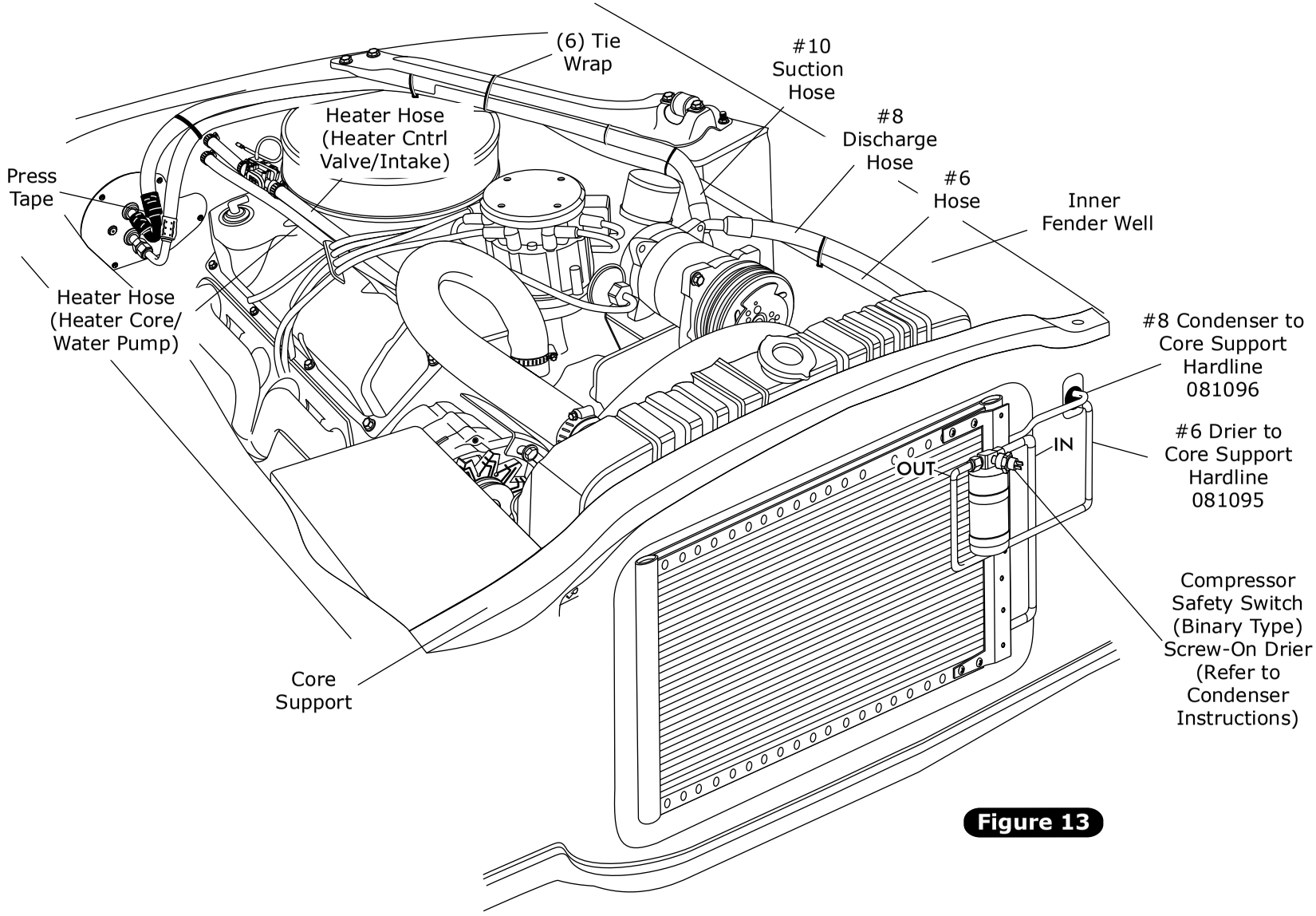


Figure 13

Final Steps

1. Install duct hoses as shown in Figure 15, Page 16.
2. Route A/C wires through 3/8” grommet as shown in Figure 14a, below (12 volt/ground/binary switch/heater valve).
3. Install control panel ASM.
4. Plug the wiring harnesses into the ECU module on the sub case as shown in Figure 15, Page 16 (Wire according to wiring diagram on Pages 18 and 19).
5. Install the glove box (See Figure 14, below).
6. Reinstall all previously removed items (battery).
7. Fill radiator with at least a 50/50 mixture of approved antifreeze and distilled water. It is the owner’s responsibilty 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 certified automotive air conditioning technician.
10. Evacuate the system for a minimum of 45 minutes prior to charging, and leak check prior to servicing.
11. Charge the system to the capacities stated on the information page (Page 4) of this instruction manual.
12. See Operation of Controls procedures on Page 20.

Glove Box Installation

1. Install glove box with OEM screws (See Figure 14, below).

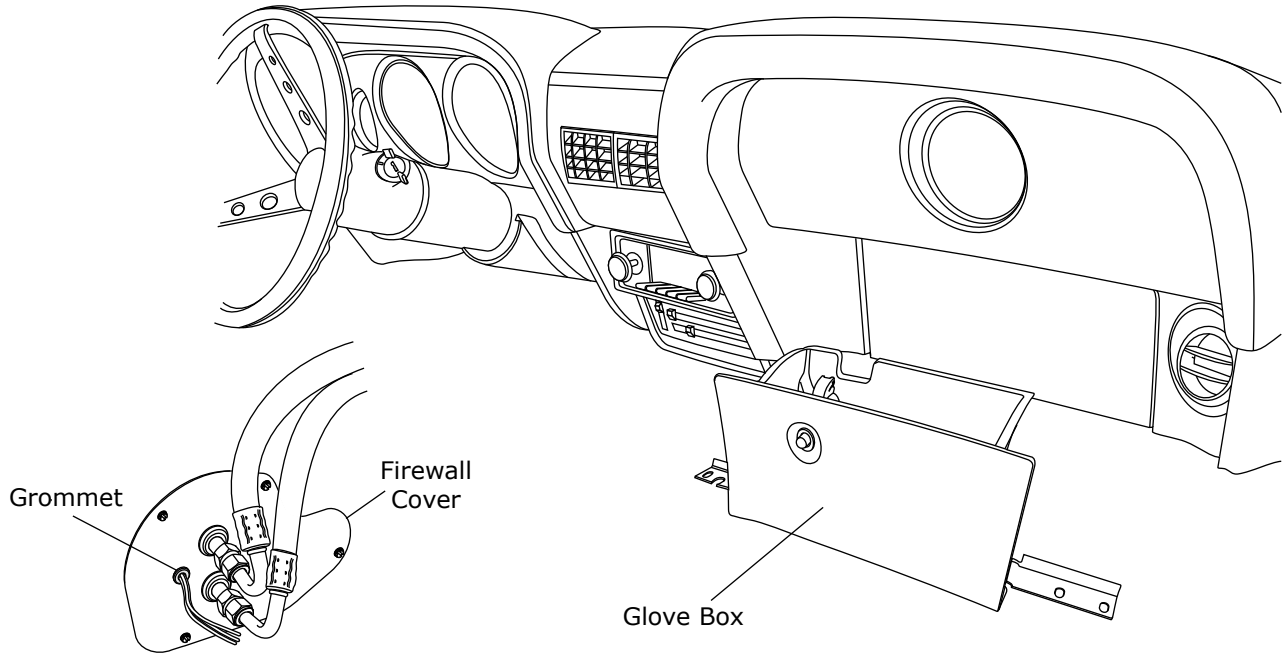


Figure 14a

Figure 14

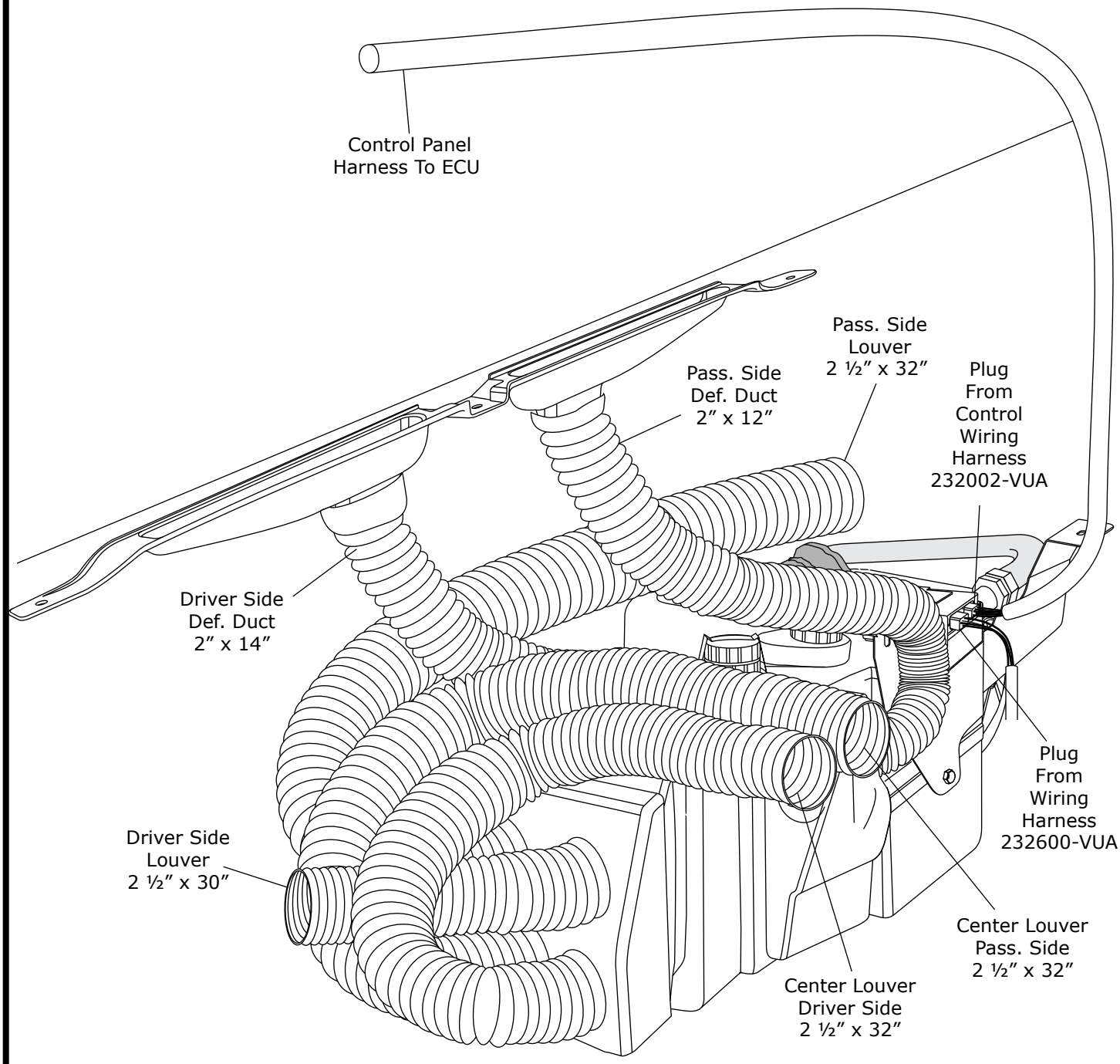

Control Panel
Harness To ECU
Pass. Side
Louver
2 ½" x 32"
Pass. Side
Def. Duct
2" x 12"
Plug
From
Control
Wiring
Harness
232002-VUA
Driver Side
Def. Duct
2" x 14"
Plug
From
Wiring
Harness
232600-VUA
Driver Side
Louver
2 ½" x 30"
Center Louver
Pass. Side
2 ½" x 32"
Center Louver
Driver Side
2 ½" x 32"

Figure 15

Evaporator Hardline Installation

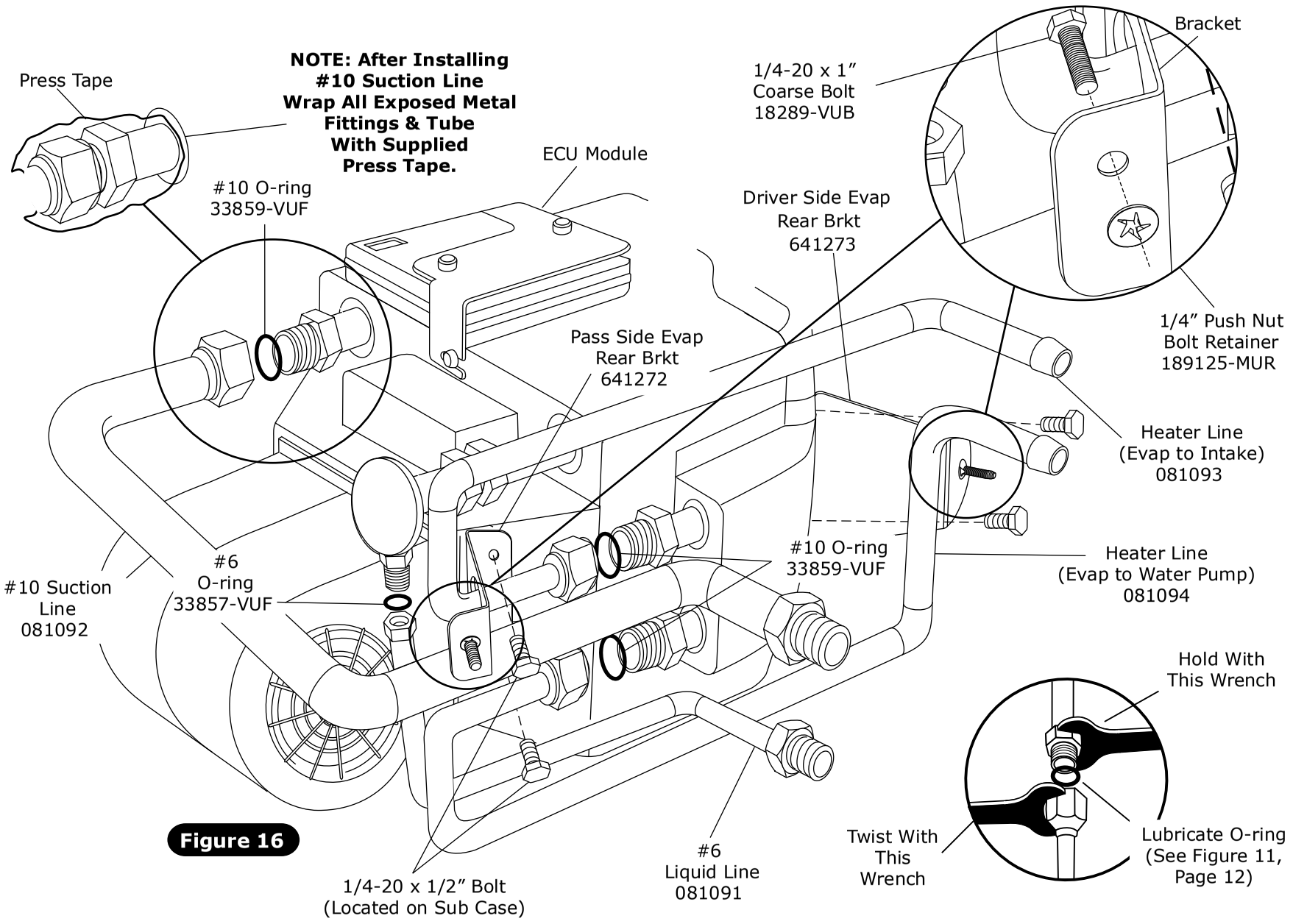
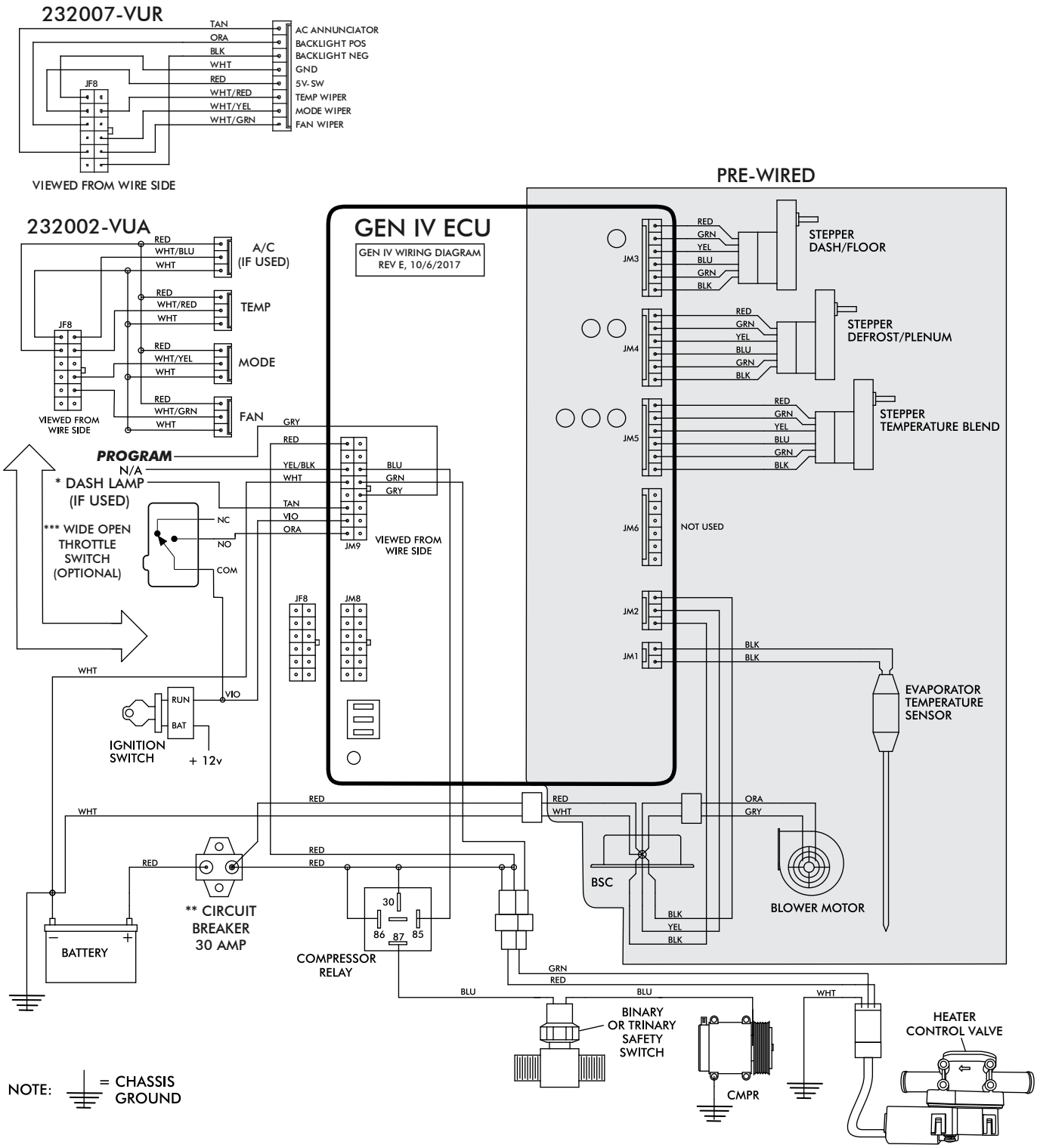


Figure 16

Wiring Diagram

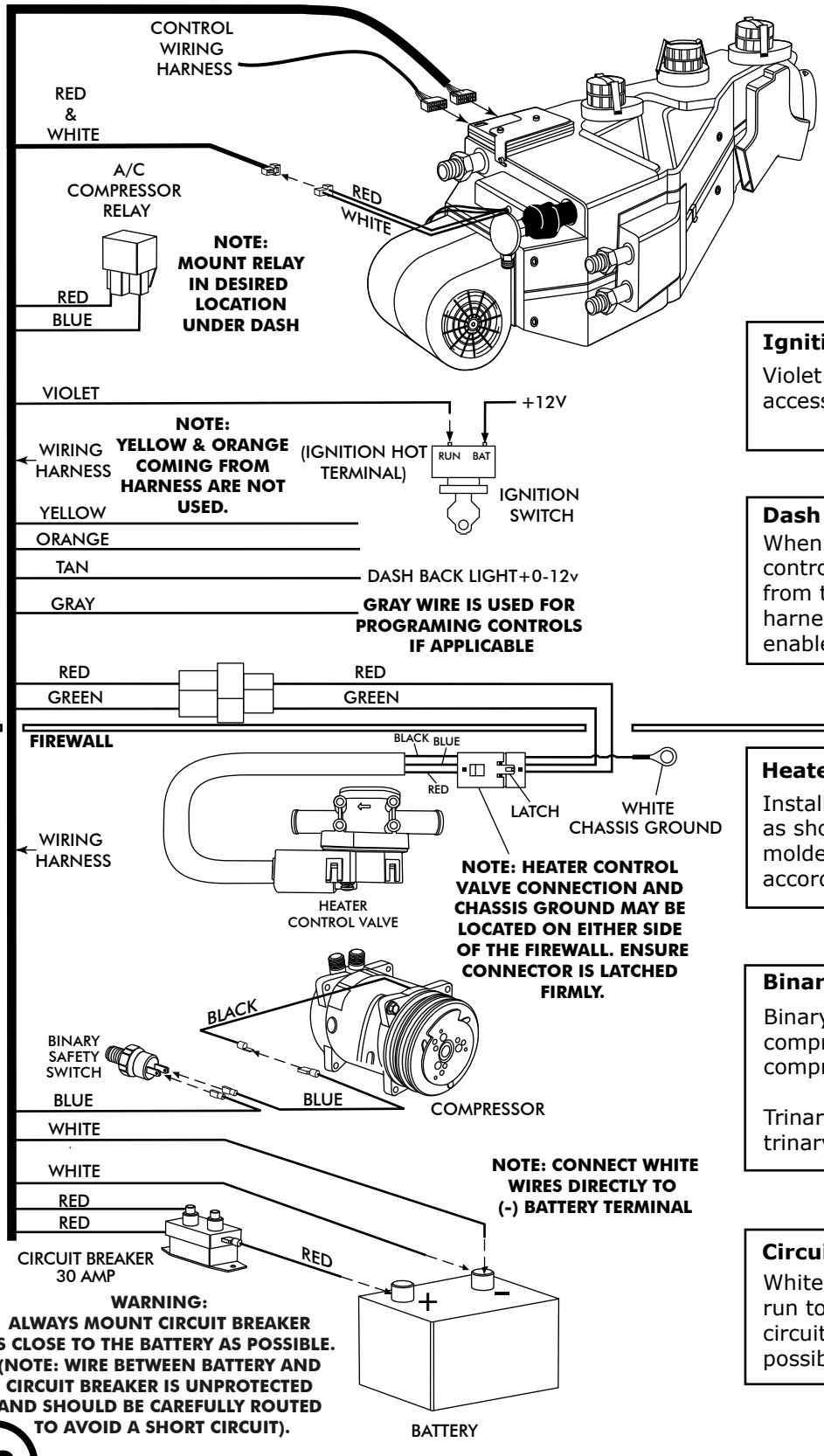


*** Dash lamp is used only with type 232007-VUR harness.**

**** 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**

Gen IV Wiring Connection Instruction



Ignition Switch:

Violet 12V ignition switch source (key on accessory) position must be switched.

Dash Light:

When using a Vintage Air-supplied control panel, connect the tan wire from the Gen IV evaporator wiring harness to the factory dash lights to enable panel backlighting.

Heater Control Valve:

Install with servo motor facing down, as shown. Note flow direction arrow molded into valve body and install accordingly.

Binary/Trinary & Compressor:

Binary: Connect as shown (typical compressor wiring). Be sure compressor body is grounded.

Trinary Switch: Connect according to trinary switch wiring diagram.

Circuit Breaker/Battery:

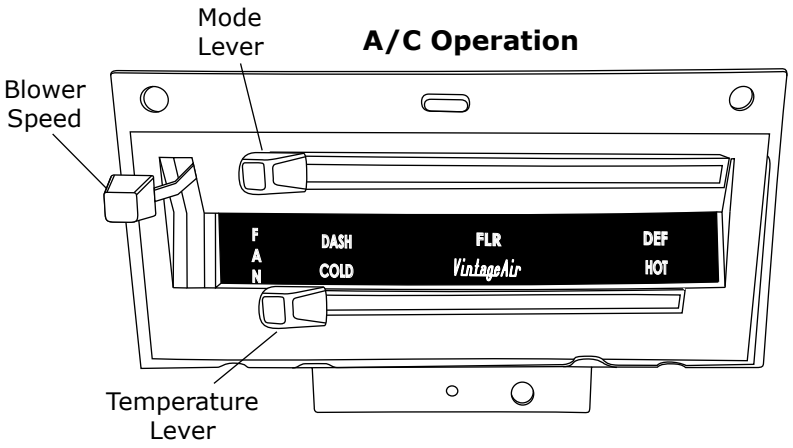
White **must** run to (-) battery. Red may run to (+) battery or starter. Mount circuit breaker as close to battery as possible.

Operation of Controls

On Gen IV systems with three lever/knob controls, the temperature control toggles between economy and A/C operations. To activate A/C, move the temperature lever all the way to cold and then back it off to the desired vent temperature. For economy/heat operation, move the temperature lever 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: Controls must be calibrated prior to first use. Refer to control panel instructions.

A/C Operation



Blower Speed
Adjust to desired speed.

Mode Lever
Slide the lever all the way left (DASH position).

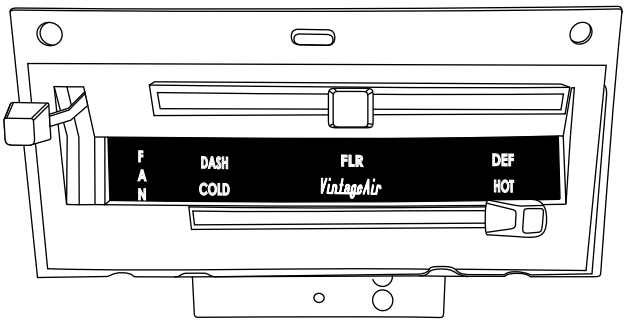
Temperature Lever
For A/C operation, slide the temperature lever all the way left to engage the compressor (Slide lever left or right to adjust to desired temperature).

Heat Operation

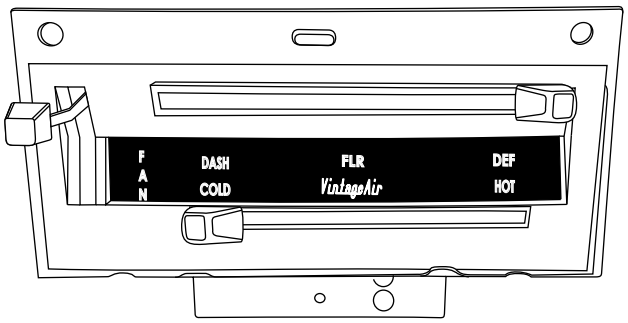
Blower Speed
Adjust to desired speed.

Mode Lever
Slide the lever to the FLR position.

Temperature Lever
For heat operation, slide the temperature lever all the way right to the HOT position (Slide lever left or right to adjust to desired temperature).



Defrost/De-fog Operation



Blower Speed
Adjust to desired speed.

Mode Lever
Slide the lever all the way right (DEF position).

Temperature Lever
Adjust lever to desired temperature (Compressor is automatically engaged).

Troubleshooting Guide

Symptom	Condition	Checks	Actions	Notes
1a. Blower stays on high speed when ignition is on.	No other functions work.	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.	
		Check for damaged ground wire (white) in control head harness.	Verify continuity to chassis ground with white control head wire at various points.	Loss of ground on this wire renders control head inoperable.
	All other functions work.	Check for damaged blower switch or potentiometer and associated wiring.		See blower switch check procedure.
1b. 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.	Be sure the small, 20 GA white ground wire is connected to the battery ground post. If it is, replace the ECU.	
		Unplug 3-wire BSC control connector from ECU. If blower stays running, BSC is either 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 always be hot. If the "ground" side of the blower is shorted to chassis ground, the blower will run on HI.	
			Replace BSC (This will require removal of evaporator from vehicle).	No other part replacements should be necessary.
2. Compressor will not turn on (All other functions work).	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.**
	System is charged.	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 0V and 5V, and will vary with pot lever position.
		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 work).		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/ Blue wire should vary between 0V and 5V when lever is moved up or down.
		Check for faulty A/C relay.	Replace relay.	

Troubleshooting Guide (Cont.)

Symptom	Condition	Checks	Actions	Notes
4. System will not turn on, or runs intermittently.	Works when engine is not running; shuts off when engine is started (typically early Gen IV, but possible on all versions).	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 quality oscilloscope. Spikes greater than 16V will shut down the ECU. Install a radio capacitor at the positive post of the ignition coil (see radio capacitor installation bulletin). A faulty alternator or worn out battery can also result in this condition.
	Will not turn on under any conditions.	Verify connections on power lead, ignition lead, and both white ground wires.	Check for positive power at heater valve green wire and blower red wire. Check for ground on control head white wire.	
		Verify battery voltage is greater than 10 volts and less than 16.	Verify proper meter function by checking the condition of a known good battery.	
5. Loss of mode door function.	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 vehicle. Be sure all mounting locations line up and don't have to be forced into position.
	Partial function of mode doors.	Check for obstructed or binding mode doors.		
		Check for damaged stepper motor or wiring.		
6. Blower turns on and off rapidly.	Battery voltage is at least 12V.	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 shutdown at up to 11V.
	Battery voltage is less than 12V.	Check for faulty battery or alternator.	Charge battery.	
7. 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.	

Packing List
Evaporator Kit (554170)

No.	Qty.	Part No.	Description
1.	1	744004-VUE	Gen IV 4-Vent Evaporator Sub Case with 207 ECU
2.	1	785169	1969-70 Mustang with A/C Gen IV Accessory Kit

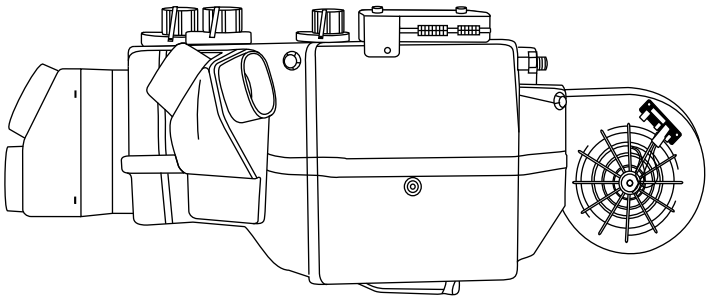
Checked By: _____

Packed By: _____

Date: _____

1

Gen IV 4-Vent Evaporator Sub Case with 204 ECU 744004-VUE



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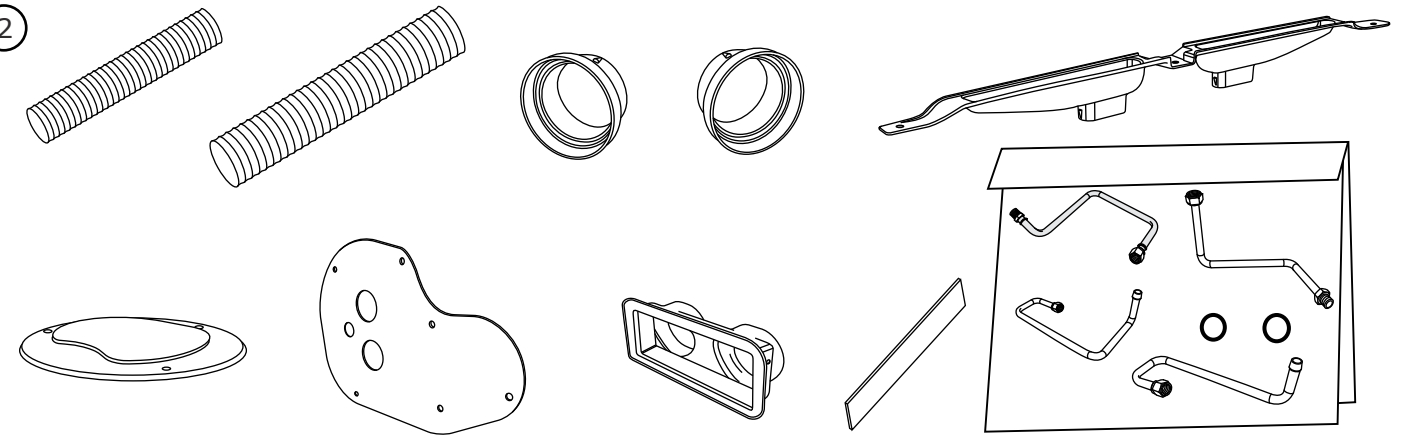

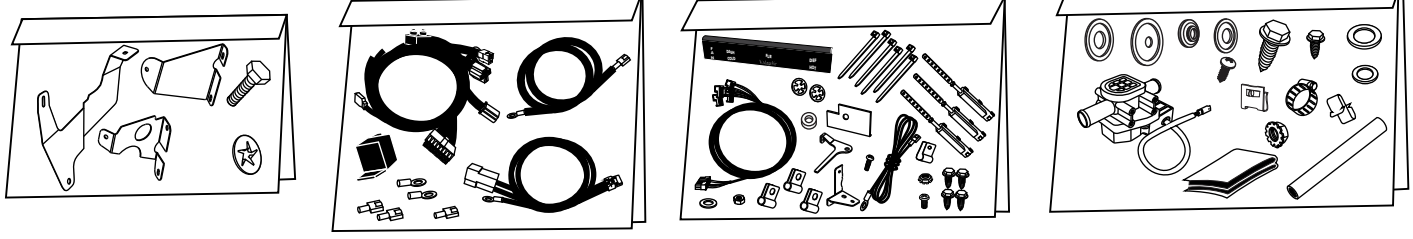

Accessory Kit 785169

NOTE: Images may not depict actual parts and quantities. Refer to packing list for actual parts and quantities.