



1969 Pontiac GTO

without **Factory Air**
Gen 5 Evaporator Kit
(561381)



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



www.vintageair.com

Table of Contents

Cover.....	1
Table of Contents.....	2
Packing List/Parts Disclaimer.....	3
Information Page.....	4
Wiring Notice.....	5
Engine Compartment Disassembly, Condenser Assembly and Installation, Compressor and Brackets.....	6
Passenger Compartment.....	7
Defrost Duct and Grille Installation.....	8
Firewall Modification, Firewall Cover Installation and Insulation.....	9
Kick Panel Modification.....	10
Fresh Air Cap & Kick Panel Cover Preparation.....	11
Fresh Air Cap & Kick Panel Cover Preparation (Cont.).....	12
A/C & Heater Hoses and Kick Panel Cover Installation.....	13
Fresh Air Cap Installation, Lubricating O-rings, Properly Seated O-ring Land.....	14
Evaporator Module Preparation.....	15
Evaporator Module Preparation (Cont.), Evaporator Installation.....	16
Evaporator Installation (Cont.), Drain Hose Installation.....	17
A/C Hose Installation.....	18
Heater Control Valve Installation.....	19
Wiring Installation.....	20
Wiring Cont.....	21
Engine Compartment Wiring.....	22-23
Center and Side Under Dash Louver Installation.....	24
Final Steps: Installation Check.....	25
Final Steps: Completing the Install.....	26
Duct Hose Routing.....	27
Quality Crimp Guideline.....	28
Gen 5 Wiring Diagram.....	29
Gen 5 Wiring Connection Instruction.....	30
Operation of Controls.....	31
Troubleshooting Guide.....	32
Troubleshooting Guide (Cont.), Advanced Diagnostics and Troubleshooting Guide.....	33
Packing List.....	34



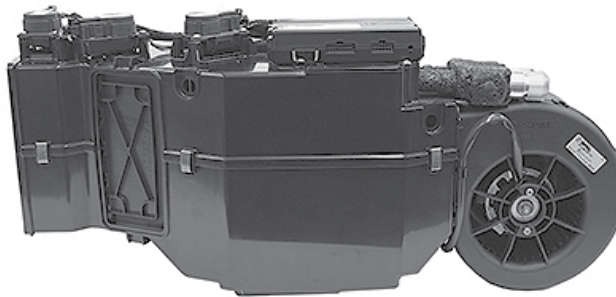
www.vintageair.com

Packing List: Evaporator Kit (561381)

No.	Qty.	Part No.	Description
1.	1	765225	Gen 5 Magnum Max Module with 444 ECU
2.	1	781381	Accessory Kit

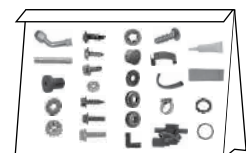
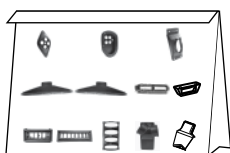
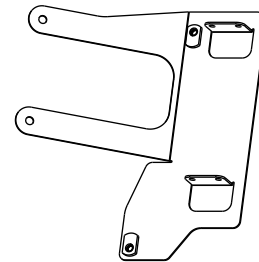
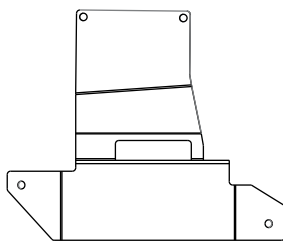
**** Before beginning installation, open all packages and check contents of shipment.
Please report any shortages directly to Vintage Air within 15 days. After 15 days,
Vintage Air will not be responsible for missing or damaged items.**

1



**Gen 5 Magnum Max
Module with 444 ECU
765225**

2



**Accessory Kit
781381**

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



www.vintageair.com

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 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.



www.vintageair.com

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 the battery.
2. Drain the radiator.
3. Remove the OEM heater hoses.
4. Jack up the front of the vehicle and support with jack stands (See Photo 1, below).
5. Remove the passenger-side wheel.
6. Remove (12) inner fender bolts and (2) under fender bolts.
7. Carefully lower the inner fender to gain access to the OEM blower assembly.
8. Disconnect the power wire from the fan and remove (5) OEM retaining nuts and (2) bolts (See Photo 2, below).
9. Remove the blower housing from the firewall (See Photo 3, below).
10. Remove the (3) fresh air duct assembly mounting screws from the engine side (See Photo 4, below).

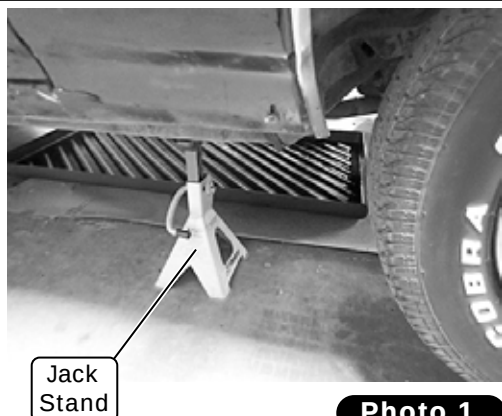


Photo 1

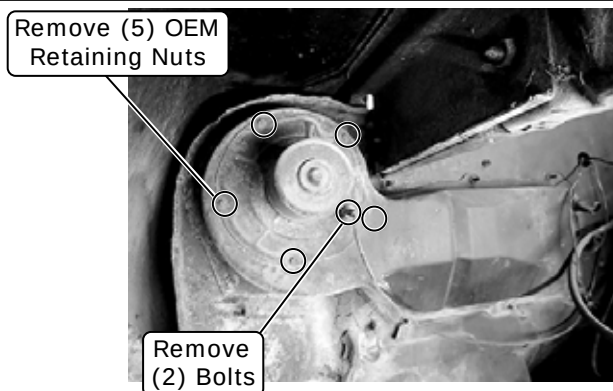


Photo 2

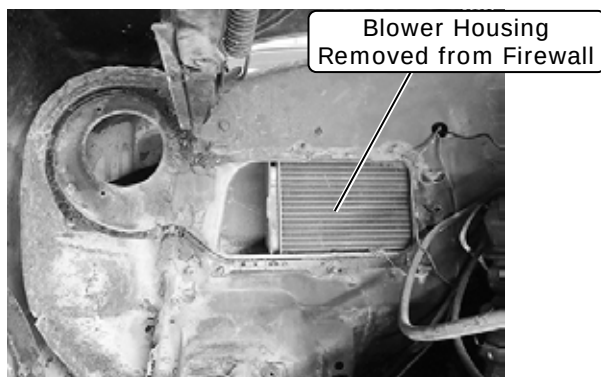


Photo 3



Photo 4

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 bracket.



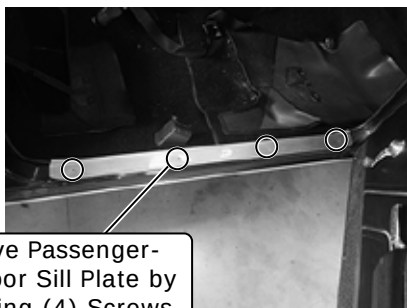
www.vintageair.com

Passenger Compartment Disassembly

NOTE: For ease of installation, Vintage Air recommends removing the front seats.

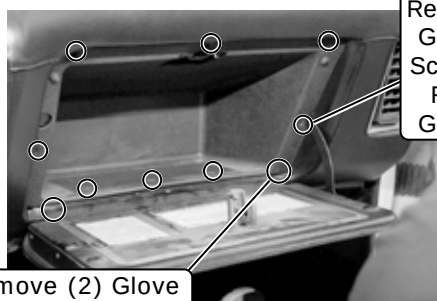
Perform the following:

1. Remove the passenger-side door sill plate by removing (4) screws (retain) (See Photo 1, below). **NOTE: In order to remove the OEM kick panel, the door sill plate must be removed.**
2. Remove (8) glove box screws and remove the glove box (See Photo 2, below).
3. Remove (2) glove box door screws and remove the door (See Photo 2, below).
4. Unplug the radio connections and remove the radio. **NOTE: The radio must be removed for clearance when installing new A/C components.**
5. Remove the kick panel grille (See Photo 3, below).
6. Remove (5) kick panel screws (See Photo 4, below), and remove the kick panel from the vehicle (See Photo 5, below).



Remove Passenger-Side Door Sill Plate by Removing (4) Screws

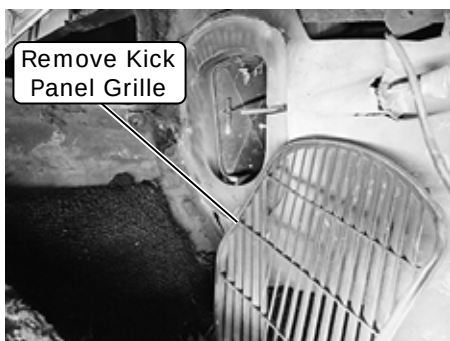
Photo 1



Remove (8) Glove Box Screws and Remove Glove Box

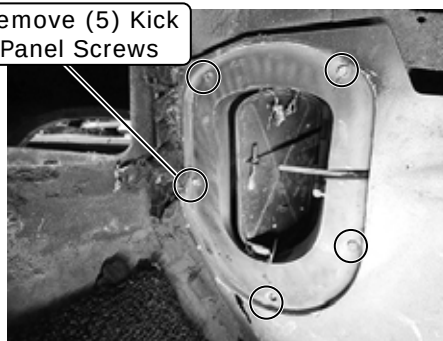
Remove (2) Glove Box Door Screws and Remove Door

Photo 2



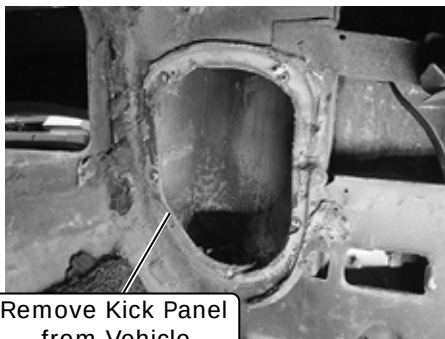
Remove Kick Panel Grille

Photo 3



Remove (5) Kick Panel Screws

Photo 4



Remove Kick Panel from Vehicle

Photo 5



www.vintageair.com

Defrost Duct and Grille Installation

NOTE: For an easier installation of the duct hose onto the defrost ducts, Vintage Air recommends connecting a piece of duct hose onto the defrost duct before securing the hose adapters under the dash. Duct hose routing is shown on Page 30.

1. Remove the grilles from the defrost ducts by removing (2) 10-32 nuts with star washers on each duct.
2. Insert the driver-side grille into the dash opening from the top of the dash as shown in Photo 1, below. Install the defrost duct from under the dash over the defrost duct grille studs as shown in Photo 2, below. Center the duct and grille, then tighten the nuts with star washers (See Photo 3, below). **NOTE: The driver-side defrost duct has more angle for gauge cluster clearance (627075 stamped in plastic as shown in Photo 4, below). When securing, do not overtighten the mounting hardware. This will cause the defrost grill to bow and not sit flush in the dash opening.**
3. Repeat steps for the other grille.
4. For preliminary preparation, install the defrost plenum along with the 2" duct hoses at their given lengths (See Figure 1, below). **NOTE: Refer to the Duct Hose Routing, Page 30, for more information in regards for measure and cut procedures.**

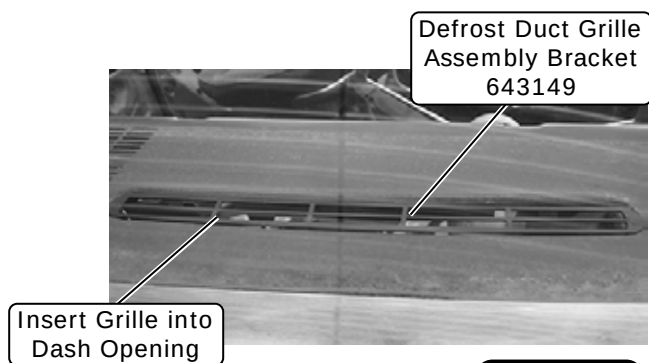


Photo 1

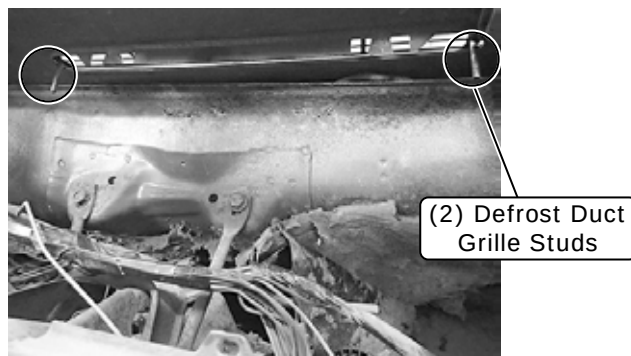


Photo 2

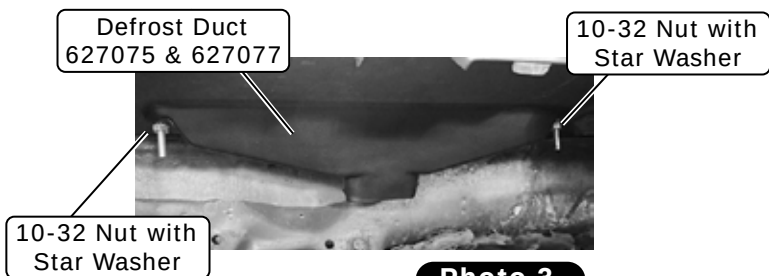


Photo 3

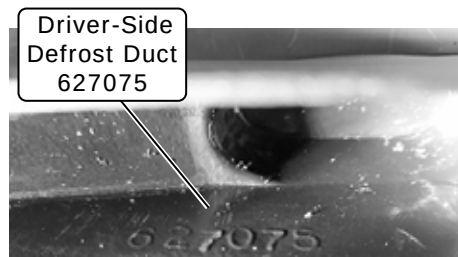


Photo 4

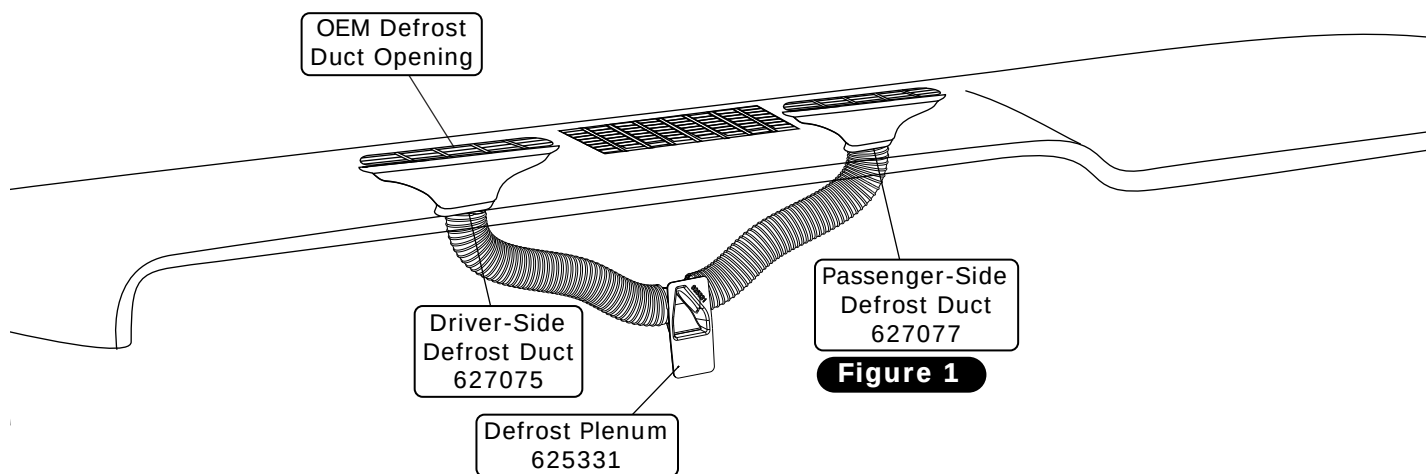


Figure 1



www.vintageair.com

Firewall Modification

NOTE: The firewall requires a modification for the firewall cover and drain hose to be installed.

1. Flatten the edges of the firewall opening (See Photo 1, below).
2. Under the firewall opening, directly below the crease and to the left of the stamping, measure 1/2" down and 1/2" to the left. Mark and drill a 5/8" hole for the drain tube. (See Photos 2 and 3, below). **NOTE: To ensure a tight fit for the drain hose, do not enlarge the hole to more than 5/8".**



Photo 1

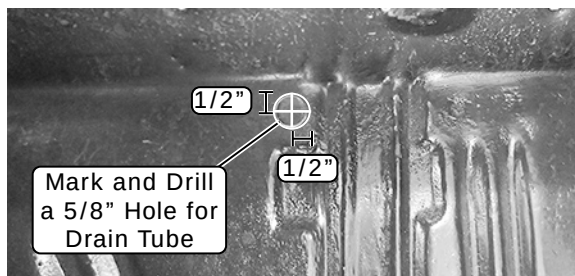


Photo 2

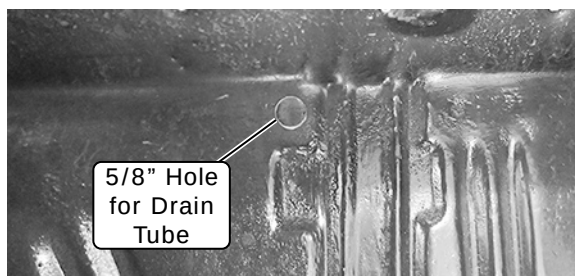


Photo 3

Firewall Cover Installation and Insulation

NOTE: For proper system operation, Vintage Air recommends using Dynaliner (461500-VIP) heat-blocking insulation in the area around the evaporator module (firewall, kick panel, inner cowl and firewall covers). Due to tight clearance for the evaporator module, between the firewall and dash, Vintage Air recommends an insulation thickness of no more than 1/8".

1. Install (3) 1/4-20 x 3/4" black serrated flange bolts with (3) 1/4" pushnut bolt retainers onto the firewall cover (See Photo 1, below).
2. Apply silicone to the mating surface of the firewall cover (See Figure 1, below).
3. Install the firewall cover onto the firewall, then secure it using (3) 1/4" USS flat washers and (3) 1/4-20 nuts with star washers (See Photo 2, below).
4. Clean the firewall and necessary areas, then apply heat-blocking insulation.

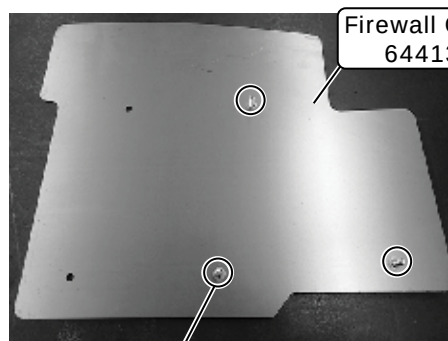


Photo 1

(3) 1/4-20 x 3/4" Black Serrated Flange Bolts with (3) 1/4" Pushnut Bolt Retainer

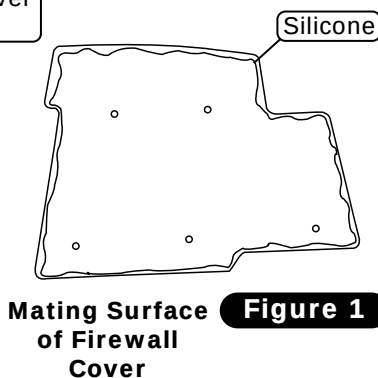


Figure 1
Mating Surface of Firewall Cover

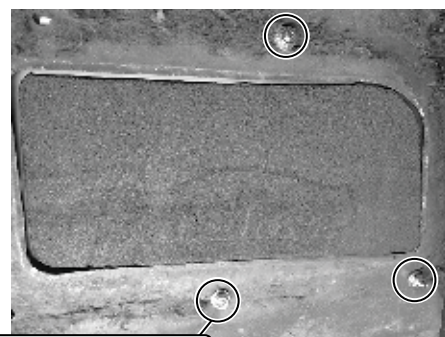


Photo 2

Install (3) 1/4" USS Flat Washers and (3) 1/4-20 Nuts with Star Washers



www.vintageair.com

Kick Panel Modification

1. Disconnect and remove the fresh air door cables from the kick panel (See Photos 1 and 2, below).
2. Enlarge the (2) cable holes to 1/2" and install the (2) 1/2" plugs (See Photos 3 and 4, below).
3. Trim the fresh air door housing to make it flush with the kick panel (See Photos 5 and 6, below).

Disconnect and Remove Fresh Air Door Cables from Kickpanel

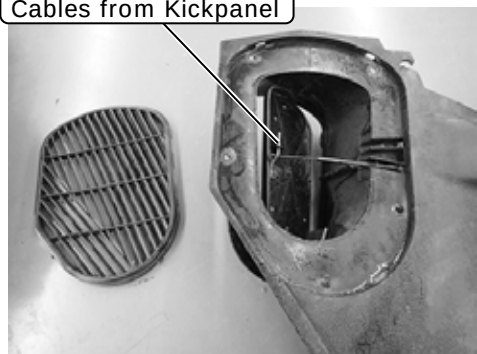


Photo 1

Fresh Air Door Cables

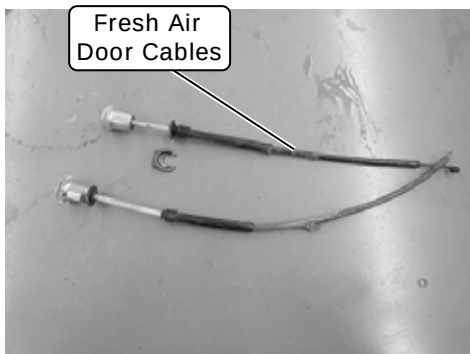


Photo 2

Enlarge (2) Cable Holes to 1/2"

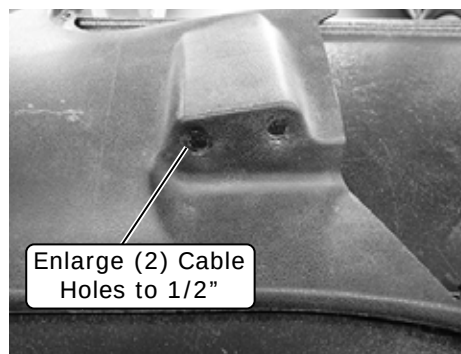


Photo 3

Install (2) 1/2" Plugs

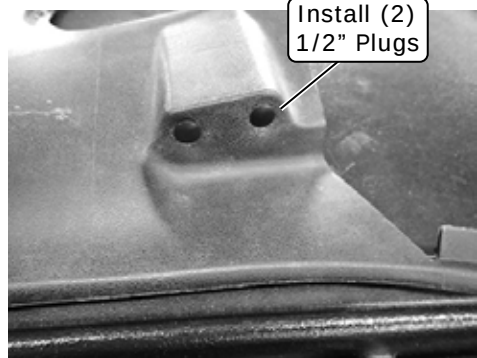


Photo 4

Trim Fresh Air Door Housing



Photo 5

Make Housing Flush with Kick Panel

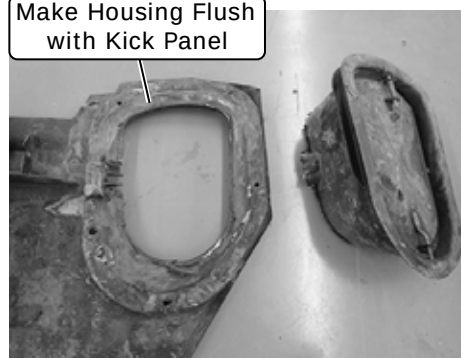


Photo 6

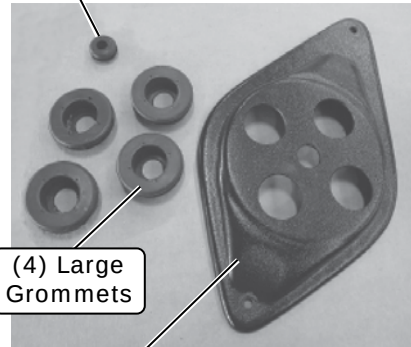


www.vintageair.com

Fresh Air Cap & Kick Panel Cover Preparation

1. Install (4) large grommets and a 7/8" grommet into the fresh air cap (See Photos 1 and 2, below).
2. On the inside of the fresh air cap, the letter "T" indicates the top mounting hole for the firewall (See Photo 3, below).
3. Install (4) large grommets and a 7/8" grommet into the kick panel cover (See Photos 4 and 5, below).

7/8" Grommet



Fresh Air Cap
622230

Photo 1

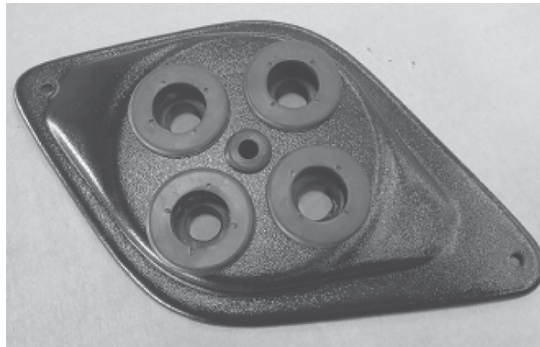


Photo 2

"T" Indicates
Top Mounting Hole



Photo 3

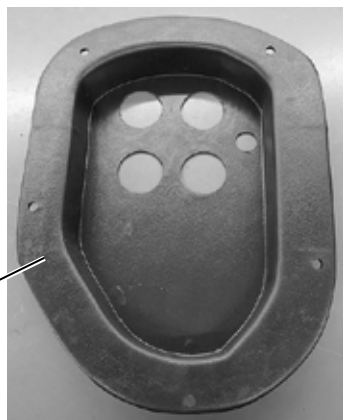
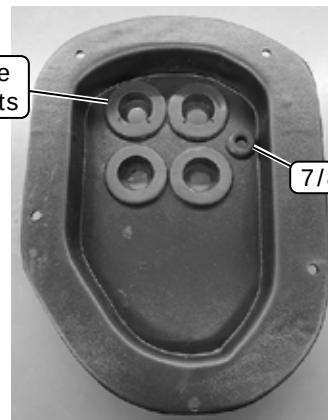


Photo 4

(4) Large
Grommets



7/8" Grommet

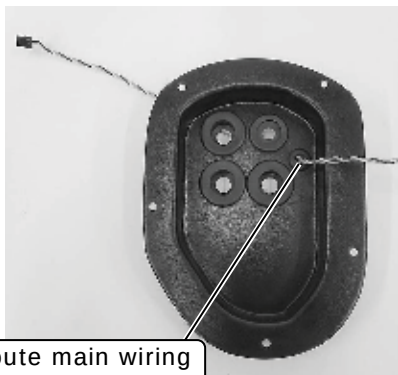
Photo 5



www.vintageair.com

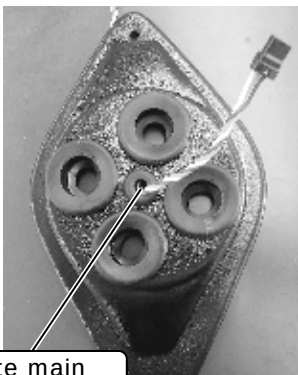
Fresh Air Cap & Kick Panel Cover Preparation (Cont.)

4. Locate the heater control valve plug on the main wiring harness (white/yellow/purple). Route it through the 7/8" wiring grommet on the kick panel cover (See Photo 6, below) and into the kick panel opening. Then, through the wiring grommet on the fresh air cap (See Photo 7, below) and into the engine compartment.
5. Route the red, white and blue wires from the main harness through the 7/8" wiring grommet on the kick panel cover (See Photo 8, below) and into the kick panel opening. Then, through the wiring grommet on the fresh air cap and into the engine compartment (See Photo 9, below).
6. Leave approximately 12" of wiring between the kick panel cover and relay.
7. Place the evaporator module on the passenger-side floorboard.
8. Route the heavy gauge orange and white wires through the wiring grommet in the kick panel cover (See Photo 10, below) and into the kick panel opening. Then, through the wiring grommet on the fresh air cap and into the engine compartment (See Photo 11, below).



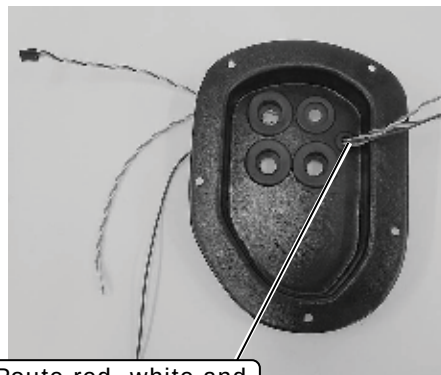
Route main wiring harness (white/yellow/purple) through 7/8" wiring grommet on kick panel cover

Photo 6



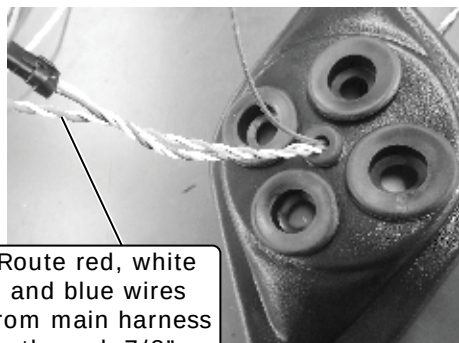
Route main wiring harness (white/yellow/purple) through wiring grommet on fresh air cap

Photo 7



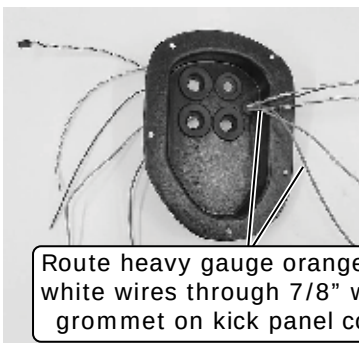
Route red, white and blue wires from main harness through 7/8" wiring grommet on kick panel cover

Photo 8



Route red, white and blue wires from main harness through 7/8" wiring grommet on fresh air cap

Photo 9



Route heavy gauge orange and white wires through 7/8" wiring grommet on kick panel cover

Photo 10



Route heavy gauge orange and white wires through 7/8" wiring grommet on fresh air cap

Photo 11



www.vintageair.com

A/C & Heater Hoses and Kick Panel Cover Installation

1. Insert a length of heater hose through the bottom-left large grommet on the kick panel cover.
2. Insert a length of heater hose through the top-left large grommet on the kick panel cover.
3. Insert the 45° fitting of the #6 drier/evaporator A/C hose through the top-right large grommet on the kick panel cover.
4. Insert the 45° fitting on the #10 compressor/evaporator A/C hose through the bottom-right large grommet on the kick panel cover (See Photo, 1 below). **NOTE: Temporarily remove the large grommet from the kick panel cover to ease the insertion of the #10 hose fitting.**
5. Apply a 1/4" bead of silicone around the mating surface of the kick panel cover (See Figure 1, below).
6. Secure the kick panel cover using (5) #8 x 1/2" wide head screws. **NOTE: Let the silicone cure, then remove the (5) #8 x 1/2" wide head screws.**
7. Install the kick panel and trim plate over the A/C lines and hoses (See Photo 2, below), then secure them using the previously removed #8 x 1/2" wide head screws (See Photo 3, below).

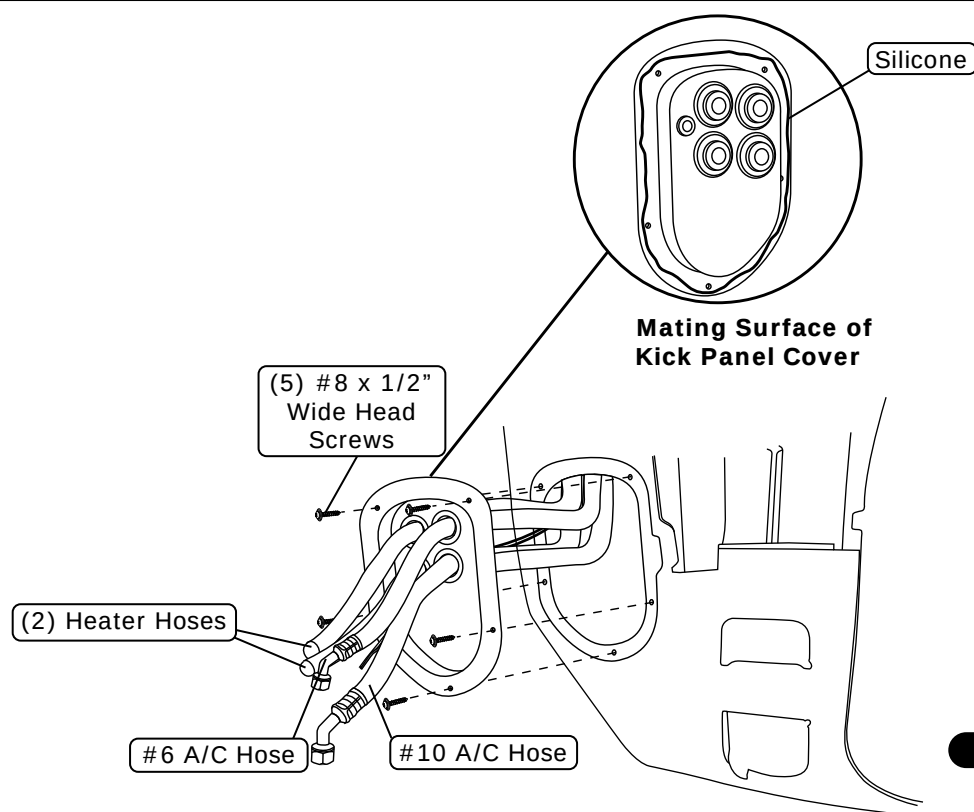


Figure 1

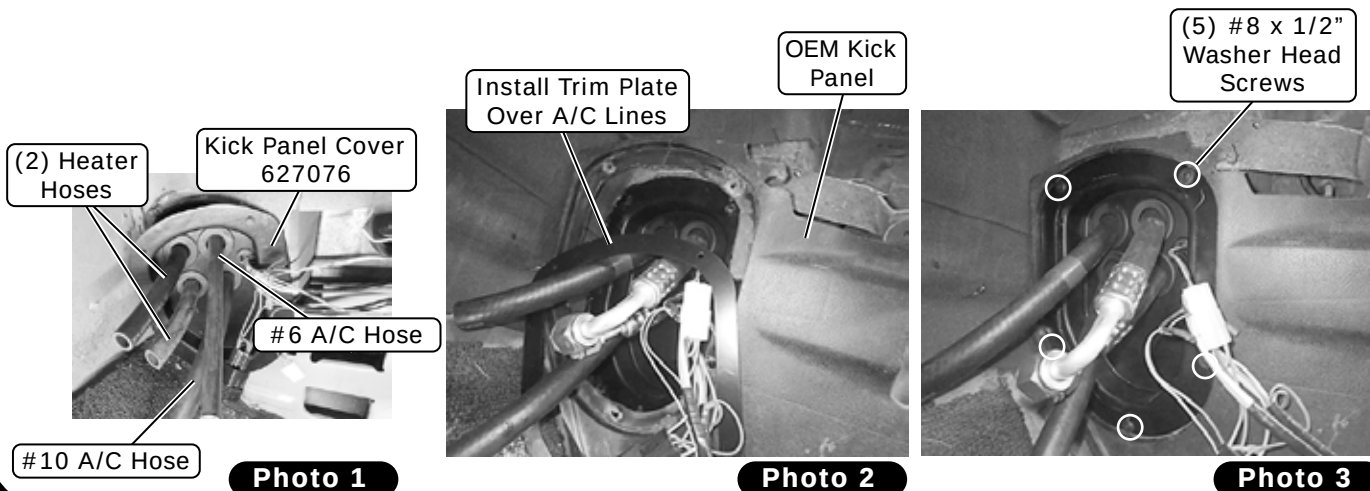


Photo 1

Photo 2

Photo 3



www.vintageair.com

Fresh Air Cap Installation

NOTE: The fresh air cap installs on the engine side of the firewall.

1. Route the A/C and heater hoses through the fresh air cap as shown in Figure 1, below.
2. Gently pull the slack from the hoses in the passenger compartment, ensuring the hoses are not kinked.
3. Slide the fresh air cap into position, and secure it to the firewall using (2) #14 x 3/4" washer head screws (See Photo 1, below).
4. Apply silicone around the outer edge of the fresh air cap (See Photo 1, below).

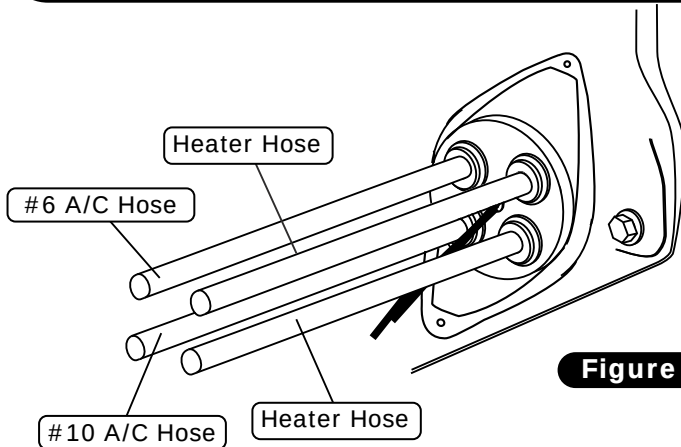


Figure 1

Apply Silicone Around Fresh Air Cap

Secure Fresh Air Cap with (2) #14 x 3/4" Washer Head Screws

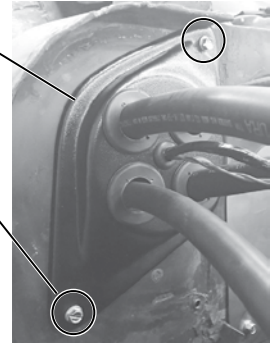
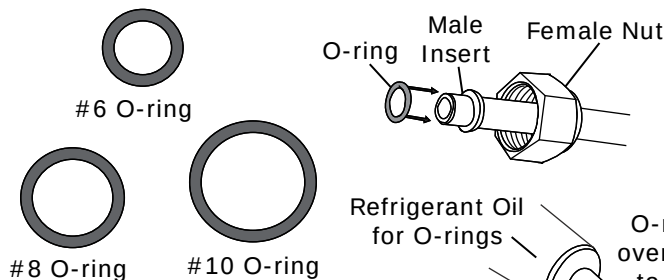


Photo 1

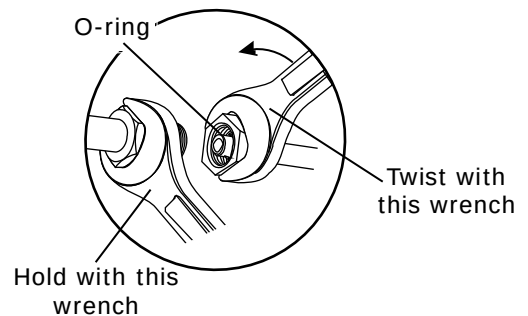
Lubricating O-rings



NOTE: Standard torque specifications:

- #6: 11 to 13 ft.-lb.
- #8: 15 to 20 ft.-lb.
- #10: 21 to 27 ft.-lb.

For a proper seal of fittings: Install supplied O-rings as shown and lubricate with refrigerant oil.



Properly Seated O-ring Land

When installing a hardline or A/C hose fitting onto the evaporator module, ensure the O-ring land is seated properly (See Photo 1, below). An improperly seated O-ring land (See Photo 2, below) can cause a leak. To properly install the fitting, slide the hardline or A/C hose nut back to expose the O-ring land and seat it onto the evaporator module fitting. Then, slide the hardline or A/C hose nut forward and thread it onto the evaporator module fitting, ensuring the O-ring land does not move or lift.

Properly Seated O-ring Land



Photo 1

Improperly Seated O-ring Land



Photo 2

NOTE: Photos shown are for reference only. Fittings may vary depending on kit received.



www.vintageair.com

Evaporator Module Preparation

Perform the following on a workbench:

1. Clip and remove the tie wraps from the back rolled ECU harness. Loosen the (2) preinstalled screws to allow ECU dismount (See Photo 1, below). **NOTE: In the event of an ECU relocation or malfunction, this will allow ECU removal and serviceability.**
2. Install a 1/2" plastic plug into the back of the evaporator module, nearest to the heater core ports (See Photo 2, below). **NOTE: These mounting positions will not be used for this application.**
3. Install the upper and lower heater hardlines onto the evaporator module using (2) properly lubricated #10 O-rings (See Lubricating O-rings, Page 17 and Photo 3, below).
4. Install (2) 1/4-20 well nuts into the back of the evaporator module (See Photo 4, below).
5. Install the evaporator firewall bracket onto the module (See Photo 5, below), and secure it using (4) #10 x 5/8" screws (See Photos 5 and 6, below).
6. Install (2) 1/4-20 x 1" serrated flange bolts into the 1/4-20 well nuts (See Photo 7, below).
7. Install (2) 1/4-20 full-threaded studs halfway into the lower and upper mounting holes on the evaporator firewall bracket (See Photo 8, below).
8. Using (2) spring clips, install the floor plenum onto the front of the evaporator module (See Photo 9, below).

Loosen (2) preinstalled screws to allow ECU dismount



Photo 1

Install 1/2" plastic plug into back of evaporator module

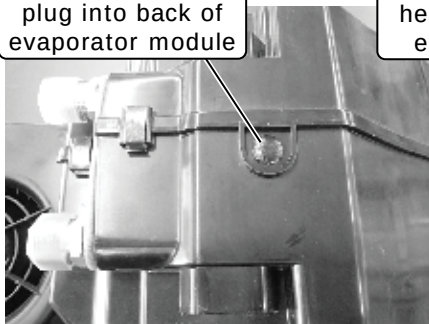


Photo 2

Install upper and lower heater hardlines onto evaporator module

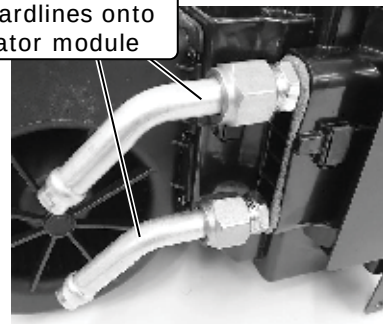


Photo 3

Install (2) 1/4-20 well nuts into back of evaporator module

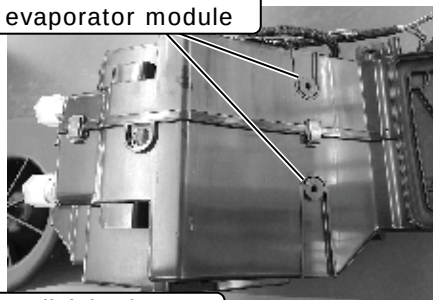


Photo 4

Install evaporator firewall bracket onto module

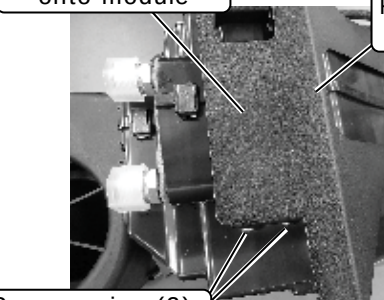


Photo 5

Evaporator Firewall Bracket 655009

Secure using (2) #10 x 5/8" screws

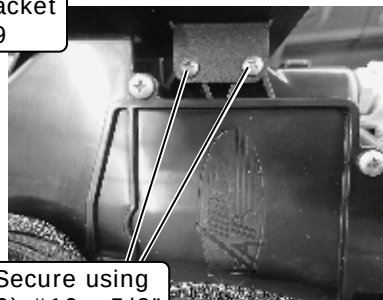


Photo 6

Install (2) 1/4-20 x 1" serrated flange bolts into well nuts

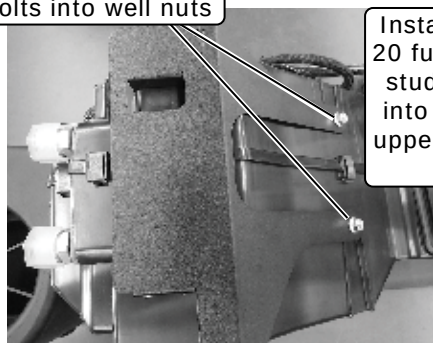


Photo 7

Install (2) 1/4-20 full-threaded studs halfway into lower and upper mounting holes

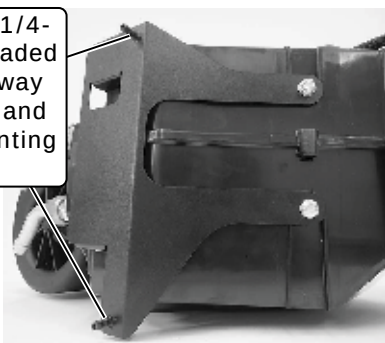


Photo 8

Floor Plenum 625338

Using (2) spring clips, install floor plenum

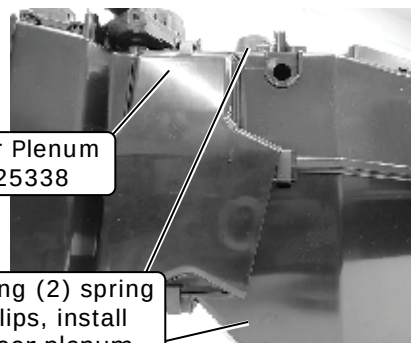


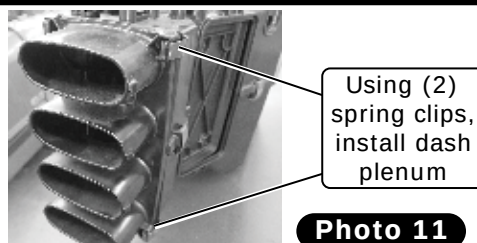
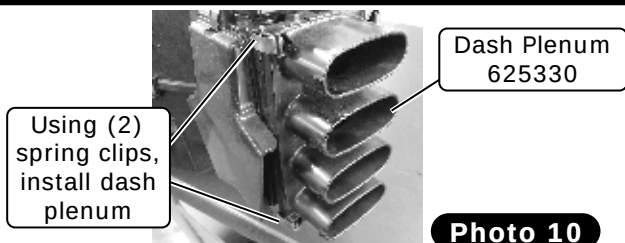
Photo 9



www.vintageair.com

Evaporator Module Preparation (Cont.)

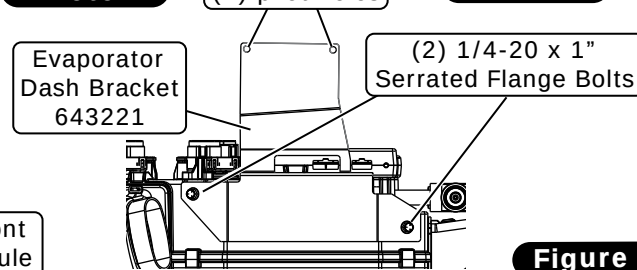
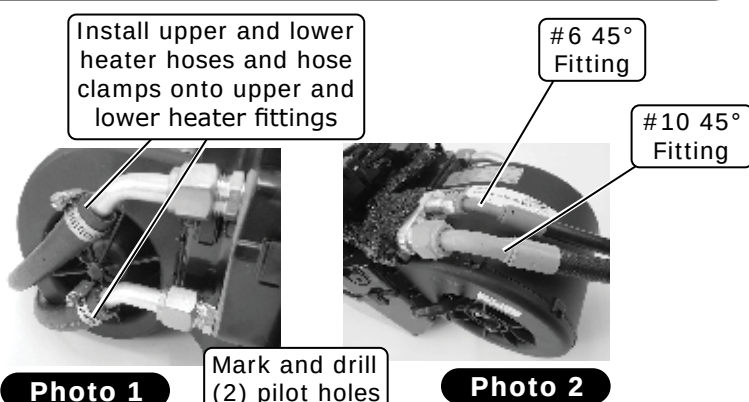
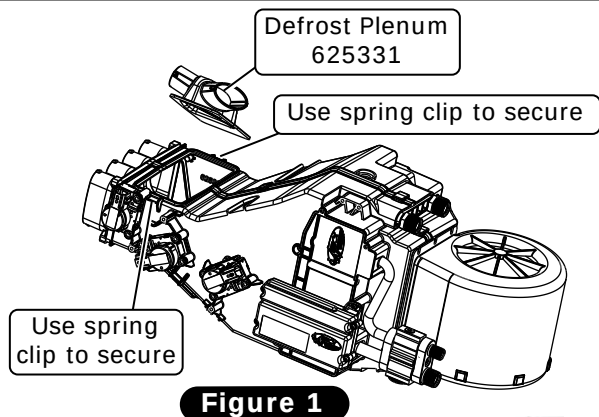
9. Using (4) spring clips, install the dash plenum onto the evaporator module (See Photos 10 and 11, below).



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.

1. With the evaporator module on the passenger-side floorboard, install the defrost plenum onto the evaporator module as shown in Figure 1, below. Use (2) spring clips to secure the defrost plenum (See Figure 1, below).
2. Install the upper and lower heater hoses and hose clamps onto the upper and lower heater fittings on the evaporator module (See Photo 1, below).
3. Using a properly lubricated #6 O-ring (See Lubricating O-rings, Page 17), install the 45° fitting on the #6 drier/evaporator A/C hose onto the block valve adapter on the evaporator module (See Photo 2, below). Firmly tighten the #6 fitting at this time. Using a properly lubricated #10 O-ring (See Lubricating O-rings, Page 17) 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 2, below). Firmly tighten the #10 fitting at this time.
NOTE: After installing the #10 compressor/evaporator A/C hose, wrap all exposed metal with the supplied press tape.
4. Install (2) 1/4-20 well nuts into the front mounting holes on the evaporator module (See Photo 3, below).
5. Using (2) 1/4-20 x 1" serrated flange bolts, install the evaporator dash bracket onto the evaporator module (See Figure 2, below). **NOTE:** To ensure proper drainage, it is very important that the evaporator module is level, both left-right and fore-aft. Check for level on the flat portions of the case around the drain.
6. Once the module is in position and level, use the bracket as a template to mark and drill (2) pilot holes (See Figure 2, below). Secure the evaporator dash bracket to the cowl using (2) #14 x 3/4" washer head screws.





www.vintageair.com

Evaporator Installation (Cont.)

7. Once the module is in position and leveled, from the engine compartment, install (2) 1/4-20 x 3/4" serrated flange black bolts (one in the upper mounting hole and one replacing the 1/4-20 full-length stud) (See Figure 3, below).

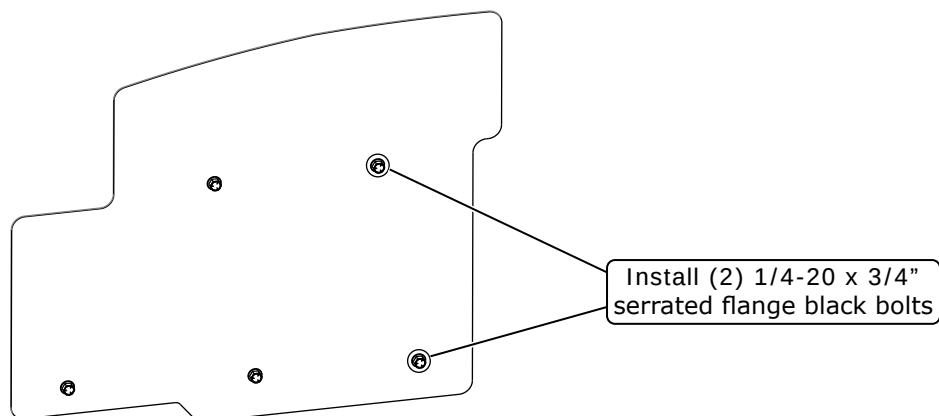


Figure 3

Drain Hose Installation

1. Cut the drain hose at 9 1/2", then insert the 1/2" drain elbow. Install the leftover drain hose onto the other outlet of the drain elbow (See Photo 1, below).
2. Insert the 9 1/2" piece through the drain hole opening from the engine compartment and install it onto the drain outlet on the evaporator unit (See Photos 2 and 3, below).

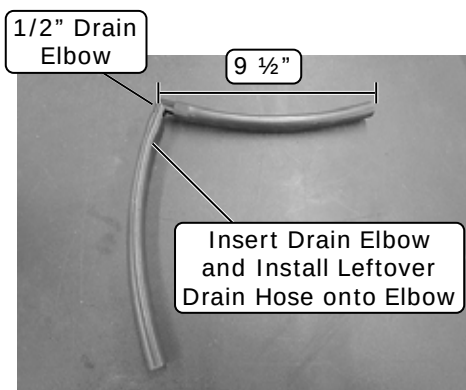


Photo 1

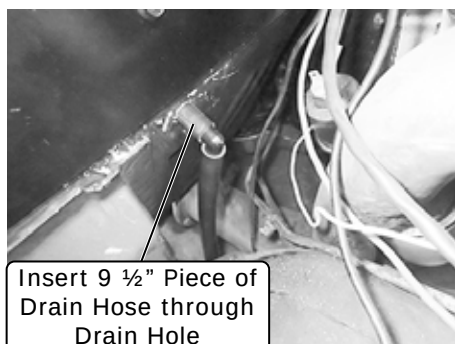


Photo 2



Photo 3



www.vintageair.com

A/C Hose Installation

1. Locate the #8 condenser/compressor A/C hose. Lubricate (2) #8 O-rings (See Lubricating O-rings, Page 17), and connect the 90° fitting to the #8 discharge port on the compressor (See Photo 1, below). Then, route the 90° fitting with service port to the #8 condenser/core hardline coming from the condenser (See Photo 2, below). Tighten each fitting connection as shown in Lubricating O-rings, Page 17.
2. Locate the #10 compressor/evaporator A/C hose. Lubricate a #10 O-ring (See Lubricating O-rings, Page 17) and connect the 90° fitting with service port to the #10 suction port on the compressor (See Photo 3, below). Tighten the fitting connection as shown in Lubricating O-rings, Page 17.
3. Locate the #6 drier/evaporator A/C hose (See Photo 4, below). Lubricate a #6 O-ring (See Lubricating O-rings, Page 17), and connect it to the drier. Tighten the fitting connection as shown in Lubricating O-rings, Page 17. **NOTE: Before fully tightening the #6 straight fitting to the drier, ensure that the fitting is not against the core support. If the fitting is against the core support, a small notch will have to be made to gain clearance and avoid damage to the hose (See Photo 5, below).**

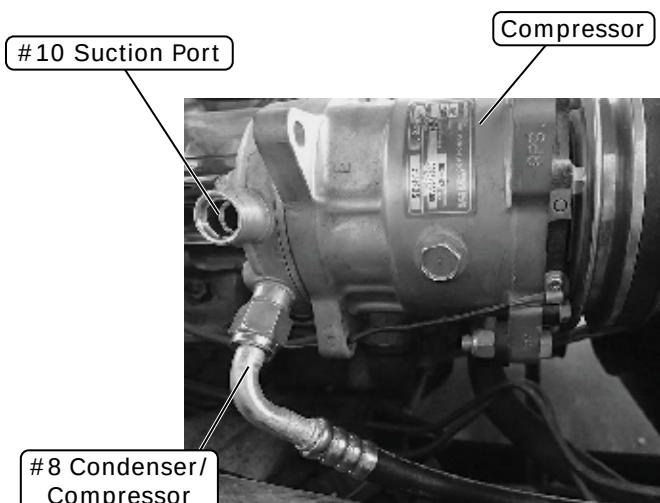


Photo 1

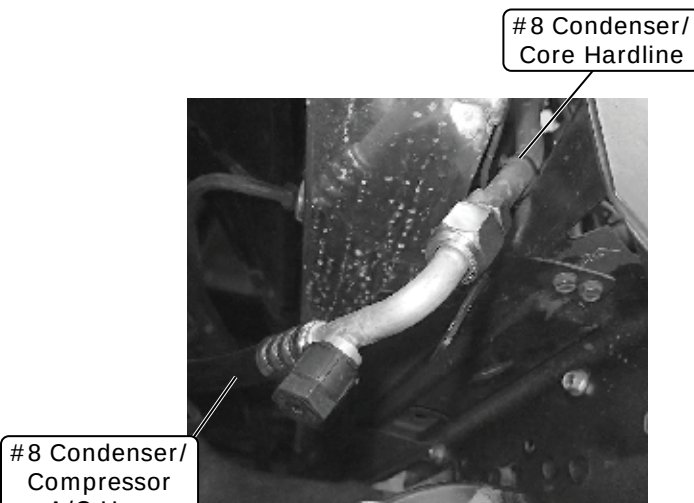


Photo 2

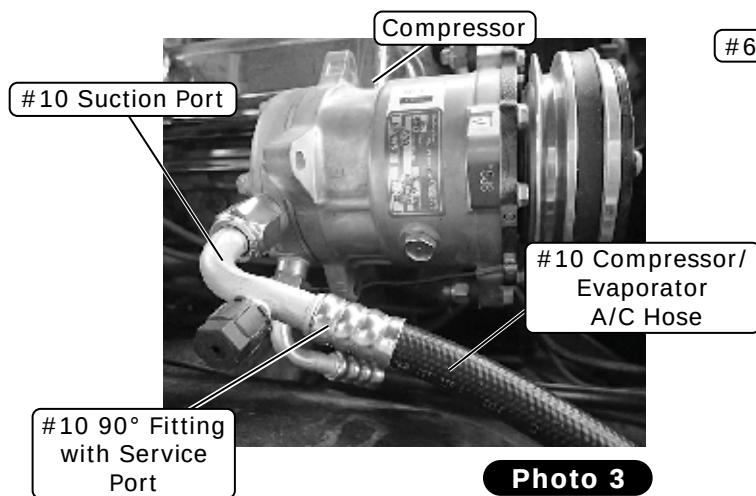


Photo 3

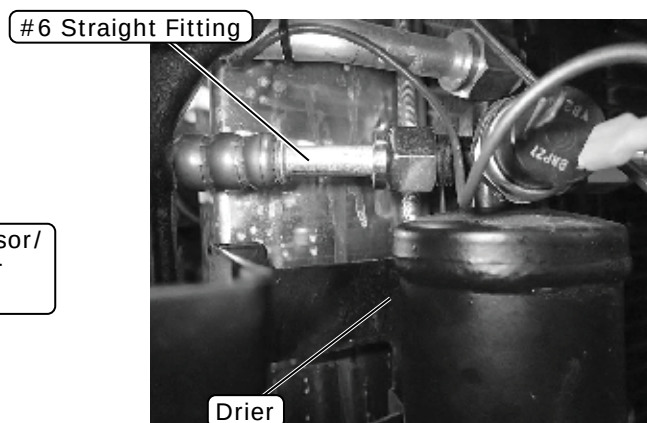


Photo 4



www.vintageair.com

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 (not supplied) or molded hose will need to be installed in the heater hose.

1. Route the previously installed lower heater hose from the lower heater core fitting to the water pump. Secure using hose clamps (See Photo 1, below).
2. 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 Photos 2 and 3, below). **NOTE: Ensure proper flow direction through the heater control valve - the flow direction follows the molded arrow on the valve (See Figure 1, below).**

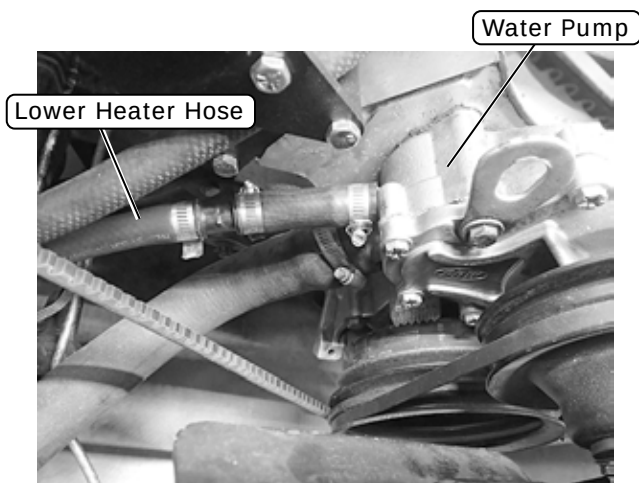


Photo 1

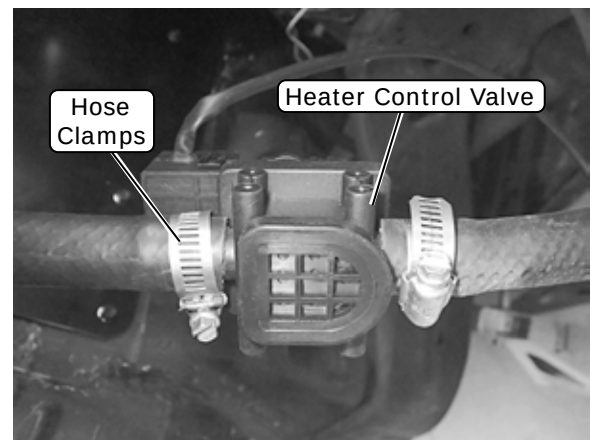


Photo 2

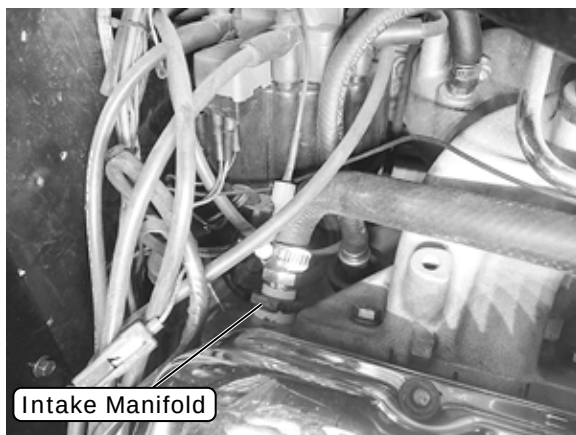


Photo 3

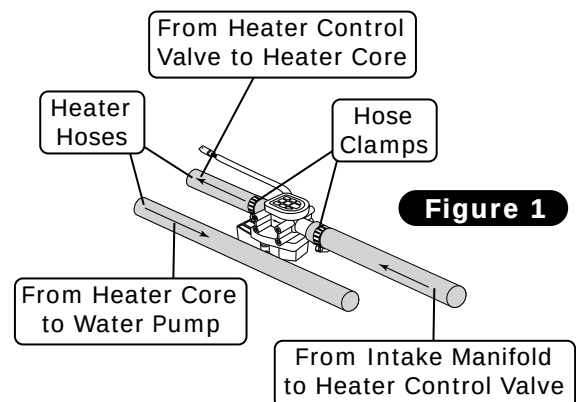


Figure 1

NOTE: Flow Direction Follows Molded Arrow on Valve



www.vintageair.com

Wiring Installation

1. Select a suitable ground location for the white ground wire eyelet from the heater control valve harness and secure it using a #12 x 1/2" self-tapping 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 main harness to the ECU (See Photo 2, below).
5. Select a suitable mounting location for the main relay.
6. Connect the violet/yellow/white twisted branch with 3-position connector into the heater control valve connector (See Figure 1, below). Ensure that the mating latch is fully seated.
7. From the underside of the evaporator module, locate the twisted bundle of green and orange strand wires joined together with a connector (See Photo 3, below). Locate the color matching twisted bundle wires from the main harness nearest to the ECU connector and connect both connectors together (See Photo 4, below).

Attach Violet Wire to Switched Power Source

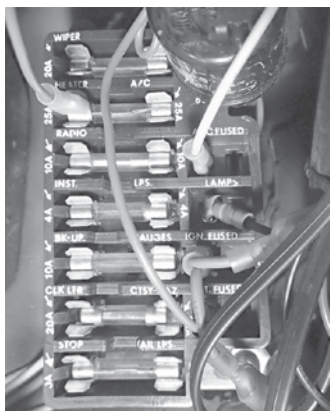
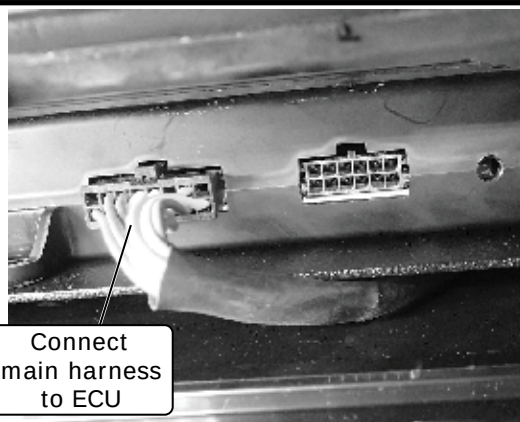


Photo 1



Connect main harness to ECU

Photo 2

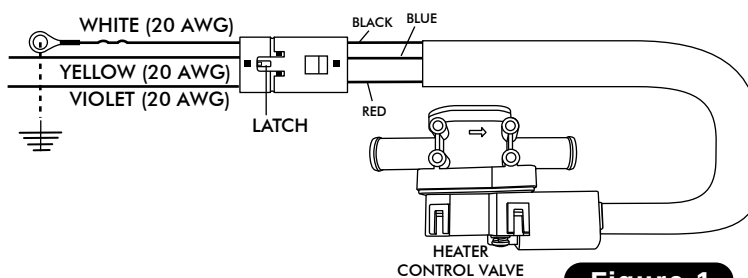


Figure 1

Locate twisted bundle of green and orange strand wires joined together with a connector

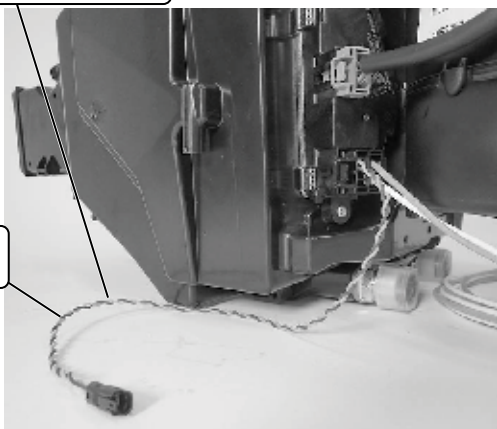
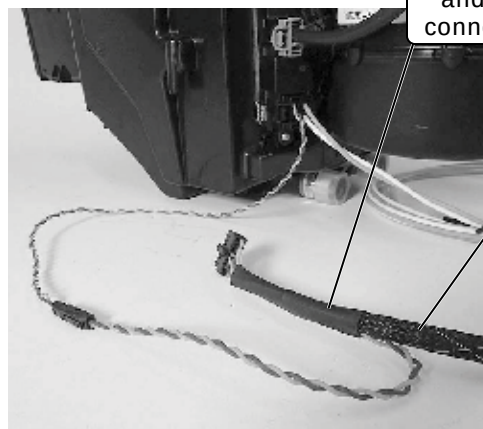


Photo 3

Locate color matching twisted bundle wires from main harness nearest to ECU connector and connect both connectors together



ECU Main Harness Connector

Photo 4



www.vintageair.com

Wiring Cont.

1. Route the blue safety switch wire along the #6 A/C hose toward the drier, securing it using the supplied 4" tie wraps (See Photo 1, below).
2. Strip the blue safety switch wire and crimp the supplied 1/4" female terminal onto it. Connect the blue safety switch wire to the safety switch on the drier (See Photo 2, below).
3. Connect the bullet terminal of the compressor lead to the compressor bullet terminal (See Photo 3, below).
4. Route the compressor lead along the #8 A/C hose and secure it using supplied 4" tie wraps.
5. Connect the 1/4" female terminal of the compressor lead to the safety switch on the drier (See Photo 4, below).

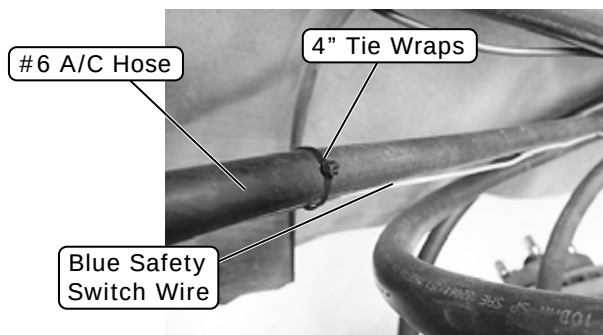


Photo 1

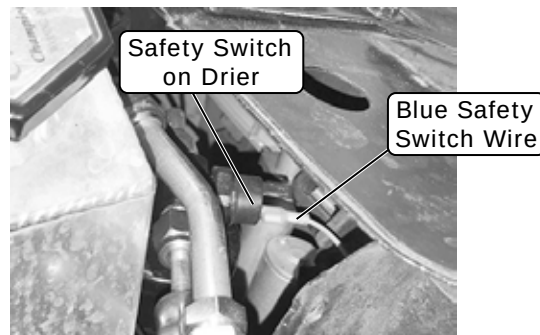


Photo 2

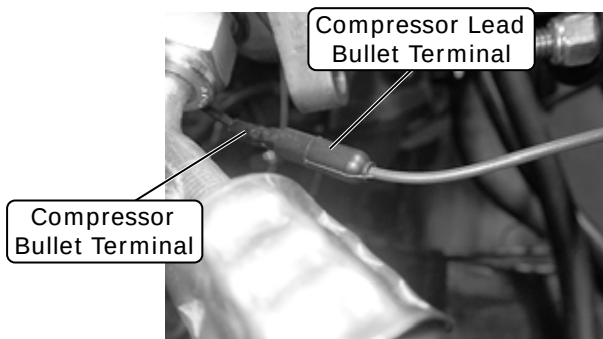


Photo 3

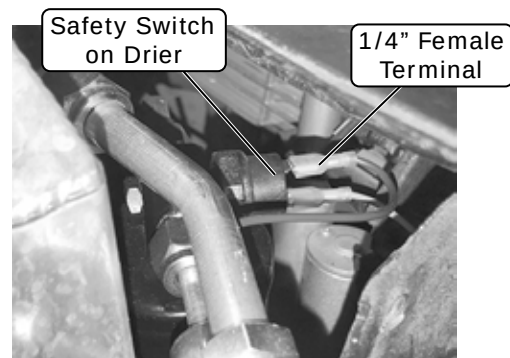


Photo 4



www.vintageair.com

Engine Compartment Wiring

NOTE: The following connections are critical to the performance of the system. Before making connections, refer to the Quality Crimp Guidelines, Page 28.

1. Route power and ground wires toward the battery (See Photo 1, below).
2. Install the supplied heat shrink over the 12 AWG orange standard fuse holder assembly wire and crimp it to the 12 AWG orange wire from the main wiring harness (See Photo 2, below). Slide the heat shrink over the crimp, then apply heat.
3. Install the supplied heat shrink over the 16 AWG black mini fuse holder assembly wire and crimp it to the 16 AWG red wire from the main wiring harness (See Photo 3, below). Slide the heat shrink over the crimp, then apply heat.
4. Install the fuses into the holders (See Photos 4 and 5, below).
5. Install the supplied heat shrink over the white ground wires, then crimp on the supplied ring terminals (See Photo 6, below). Slide the heat shrink over the crimps, then apply heat. **NOTE: Both white wires can be crimped to the larger ring terminal. Install the heat shrink, then strip the wires, twist them together and trim to length. Crimp on the ring terminal, then slide the heat shrink over and apply heat (See Photos 7 and 8, below).**

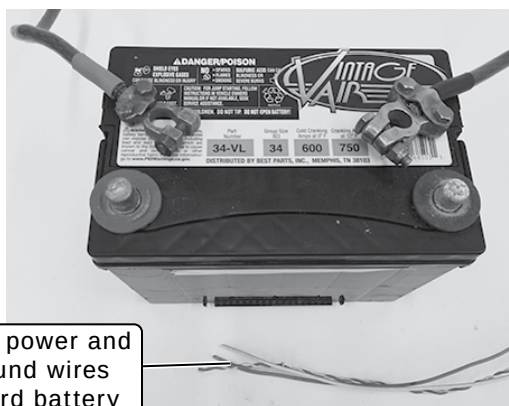


Photo 1

Crimp 12 AWG orange fuse holder wire to 12 AWG orange wire from main wiring harness



Photo 2

Crimp 16 AWG black fuse holder wire to 16 AWG red wire from main wiring harness



Photo 3

Install heat shrink over 16 AWG black standard fuse holder assembly wire

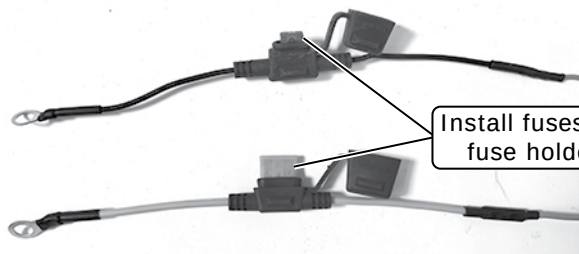


Photo 4

Install heat shrink over white ground wires, then crimp on ring terminals

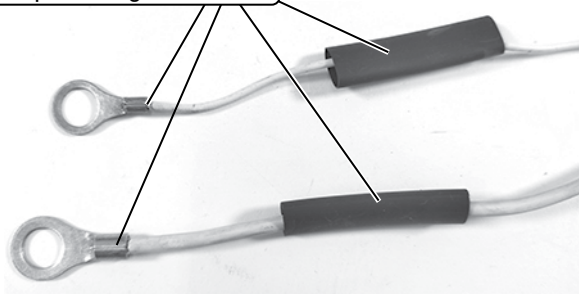


Photo 5

Both white ground wires can be crimped together. Install heat shrink, then strip wires, twist together and trim to length.

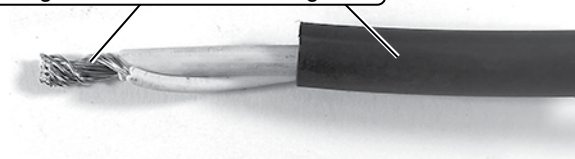


Photo 6

Crimp on ring terminal, then slide heat shrink over and apply heat

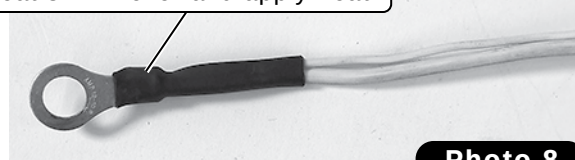


Photo 7



www.vintageair.com

Engine Compartment Wiring (Cont.)

6. Connect the ground wire ring terminals to the negative battery terminal connector (See Photos 9 and 10, below).
7. Connect the positive wire ring terminals to the positive battery terminal connector (See Photos 11 and 12, below). **NOTE: Do not connect power until the installation is completed.**
8. Wiring completed (See Photo 13, below).

Connect ground wire ring terminals to negative battery terminal
NOTE: Either connection application can be used.

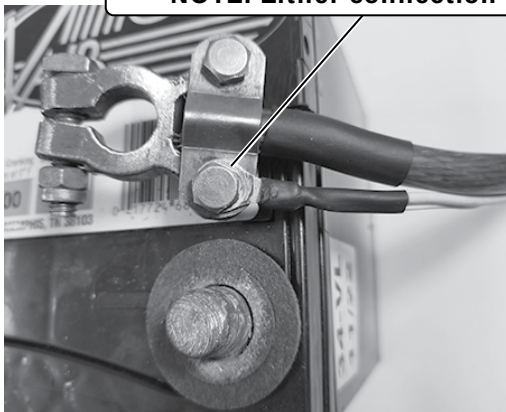


Photo 9

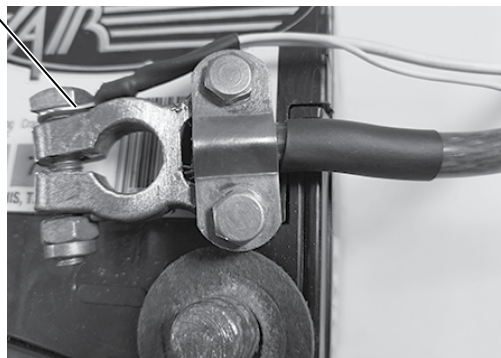


Photo 10

Connect power wire ring terminals to positive battery terminal
NOTE: Either connection application can be used.

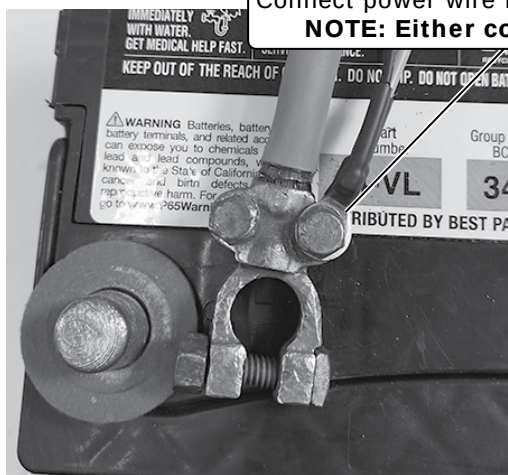
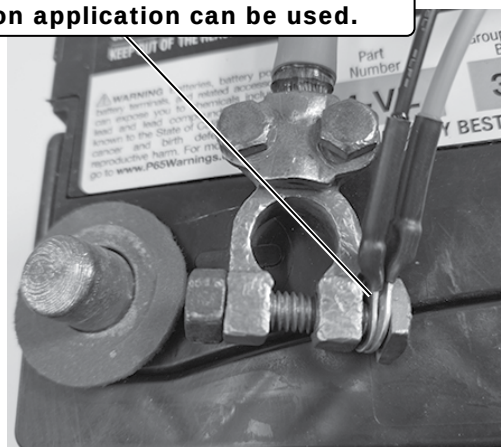


Photo 11



NOTE: Do not connect power until installation is completed.

Photo 12



Completed Installation
Shown

Photo 13



www.vintageair.com

Center and Side Under Dash Louver Installation

1. Place the under dash center louver bezel under the dash in the desired location (See Photo 1 and Figure 1, below). Using the louver bezel as a template, mark and drill (2) 1/8" mounting holes into the bottom lip of the dash (See Figure 1, below).
2. Secure the louver bezel under the dash using (2) #8 x 1/2" pan head screws (See Figure 1, below).
3. Insert (2) lengths of 2 1/2" duct hose (See Figure 1, Page 20, for duct hose lengths) through the back of the louver bezel (See Photo 2, below).
4. Attach the (2) duct hoses to the hose adapters on the (2) louvers (See Photos 3 and 4, below).
5. Insert the (2) louvers into the under dash center louver bezel and push until fully secured (See Photo 5, below).
6. For the driver- and passenger-side single louvers, repeat the same process. **NOTE: If using side louver hose adapters, skip this step.**

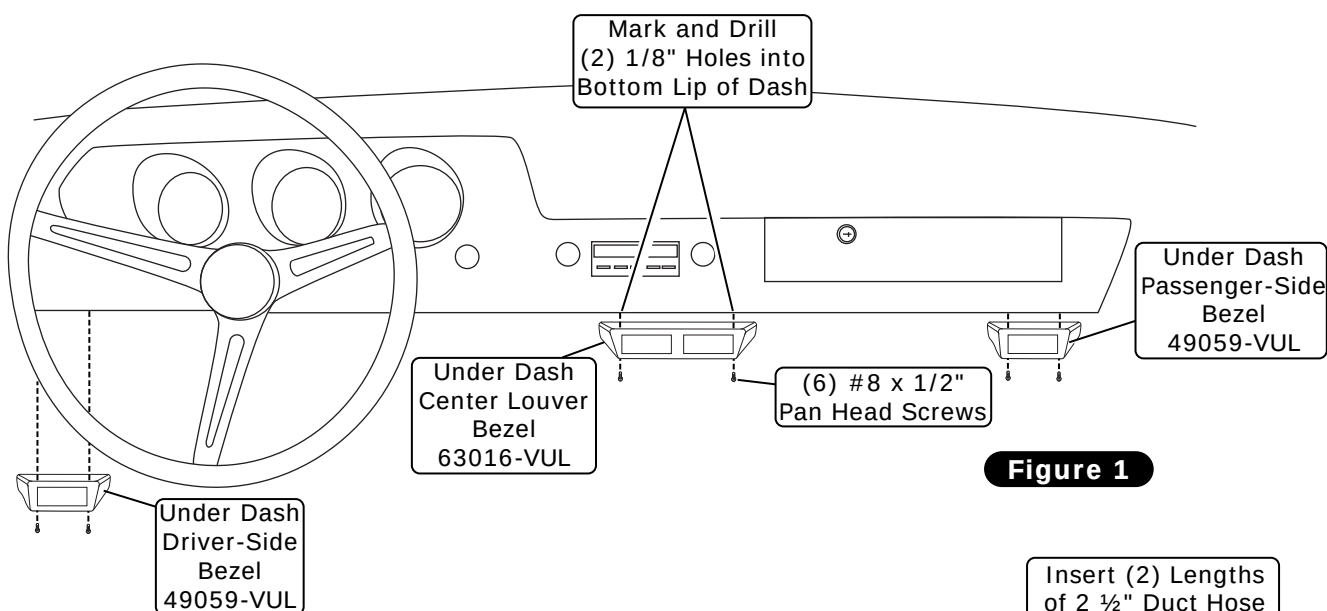
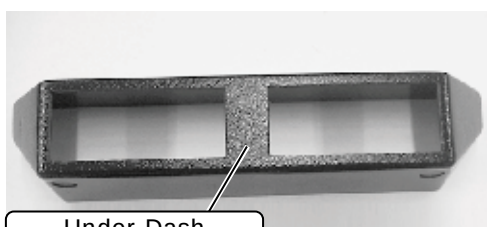


Figure 1



**Under Dash
Center Louver Bezel**

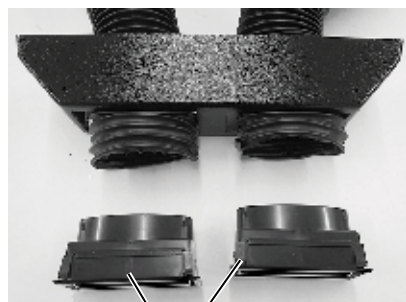
Photo 1



Top View

Photo 2

Insert (2) Lengths
of 2 1/2" Duct Hose

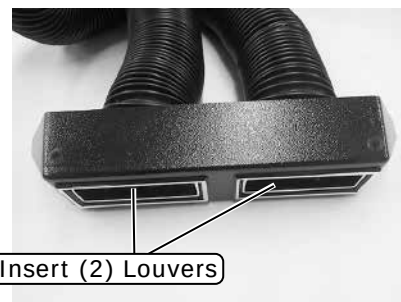


(2) Louvers

Photo 3



Photo 4



Insert (2) Louvers

Bottom View

Photo 5



www.vintageair.com

Final Steps: Installation Check

Installation Check	
ITEM TO CHECK	Procedure
☐	ECU If no blinking is observed after 1 minute of turning the ignition on, go to the next check. If repetitive blinking is observed, go to the Advanced Diagnostics Section to diagnose.
☐	Blower speed control Set the blower speed control to OFF , <u>confirm that the blower is off</u> . Position the blower speed control to LOW then MEDIUM and then HIGH . <u>At each setting confirm that the blower 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 air is coming from the dash vents</u> . If system is charged: Set the TEMP control to the MAX COOL position. <u>Confirm that COLD 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, <u>confirm that the blue AC Indicator light is on</u> .
☐	Backlight (If applicable) If your control panel has backlight capabilities and has been wired, turn the dash lamp on and <u>confirm that the AC panel's legend is lit</u> .
☐	Fittings Verify AC and Heater fittings are all tight.



www.vintageair.com

Final Steps: Completing the Install

1. Install control panel assembly. Refer to control panel instructions. **NOTE: Control panel needs to be installed before completing Final Steps: Installation Check, Page 25.**
2. Reinstall all previously removed items.
3. 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.
4. Double check all fittings, brackets and belts for tightness.
5. Vintage Air recommends that all A/C systems be serviced by a licensed automotive A/C technician.
6. Evacuate the system for a minimum of 45 minutes prior to charging, and perform a leak check prior to servicing.
7. Charge the system to the capacities stated on Page 4 of this instruction manual.
8. See Operation of Controls procedures on Page 31.



www.vintageair.com

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.

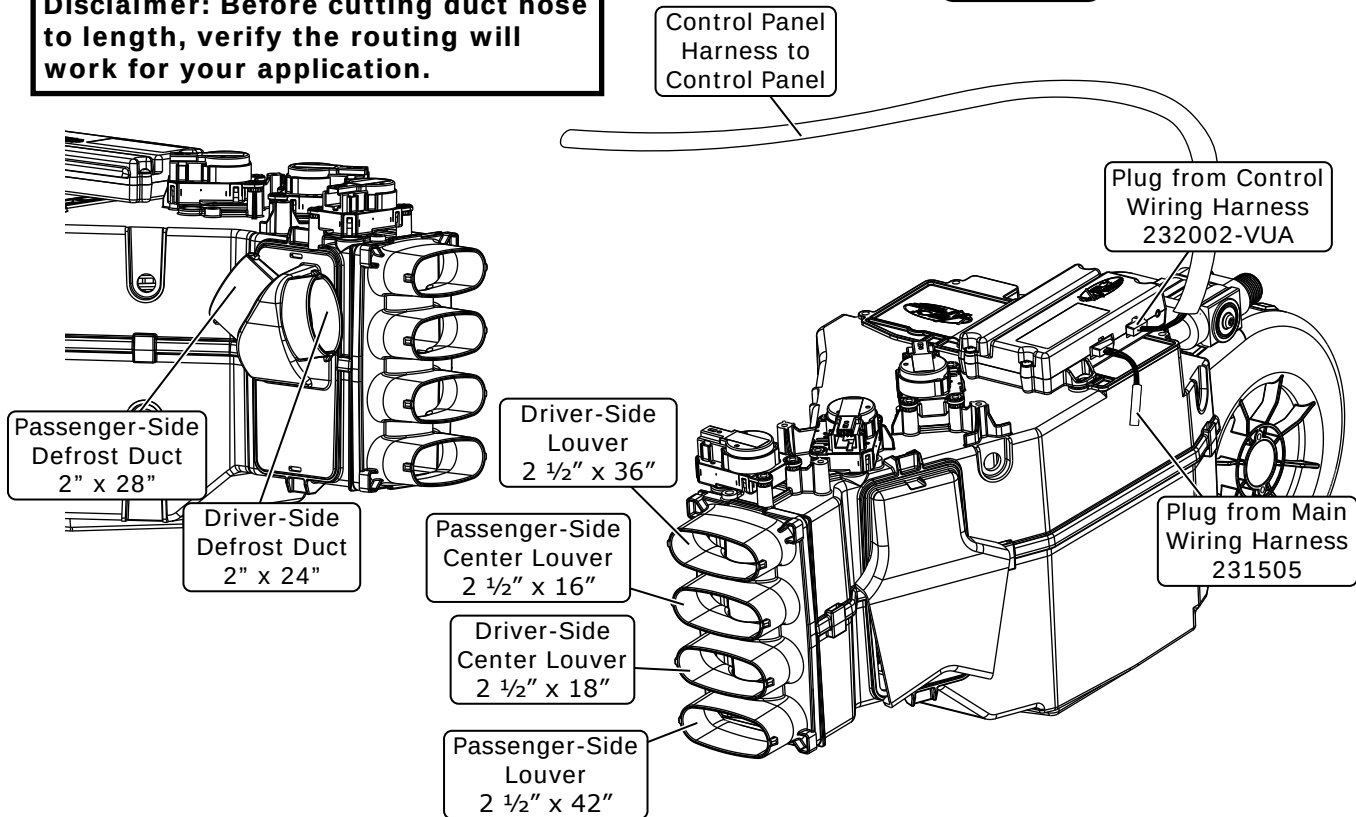
1. Stretch the duct hose until there is no slack, measure, mark and cut hose to size (See Photo 1, below).

Stretch, measure,
mark and cut
hose to size



Photo 1

Disclaimer: Before cutting duct hose to length, verify the routing will work for your application.



NOTE: ECU must be placed away from water and humidity, and also be accessible for servicing. If relocating, connectors must be positioned towards the bottom.

Position connectors
towards bottom



www.vintageair.com

Quality Crimp Guideline

Acceptable strip length
(Some copper visible)

Crimped area is centered
on each side of splice

Bad strip length
(Too much copper visible)
Visible copper should be
just enough to ensure
clearance between splice
area and wire insulation

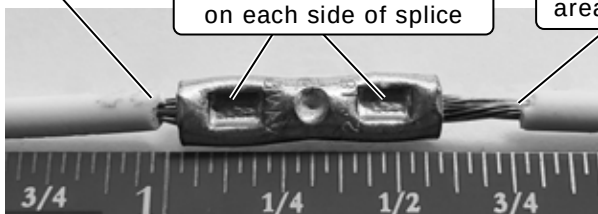


Photo 1

A good crimp requires
seam of butt splice to be
opposite of crimp die tooth

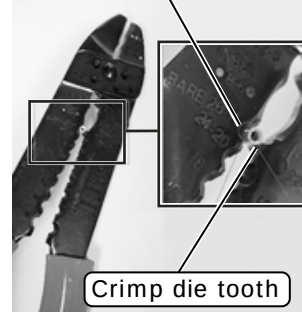


Photo 2

Good Ring Terminal Crimp Bad Ring Terminal Crimp

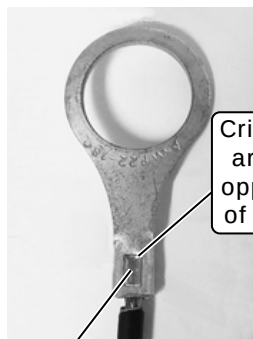


Photo 3

Crimp
area is
centered
on barrel

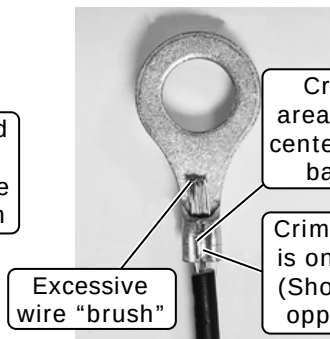


Photo 4

Excessive
wire "brush"

Crimp
area is not
centered on
barrel

Crimp area
is on seam
(Should be
opposite)

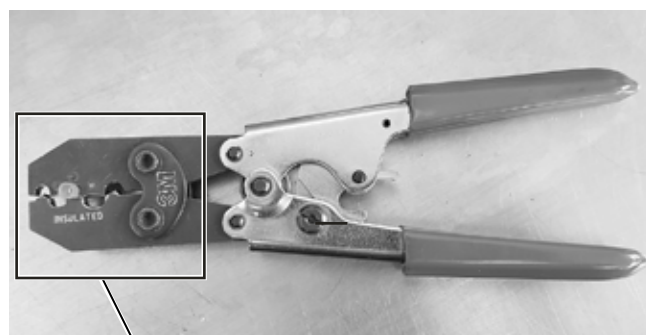


Photo 5

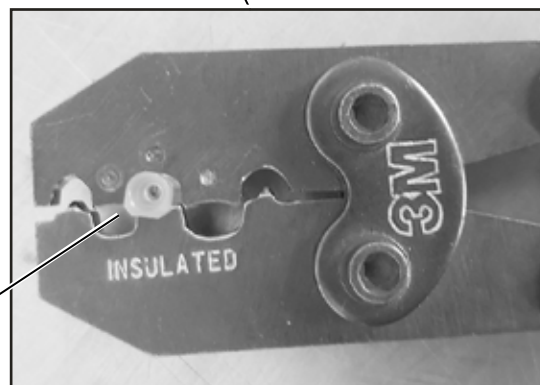


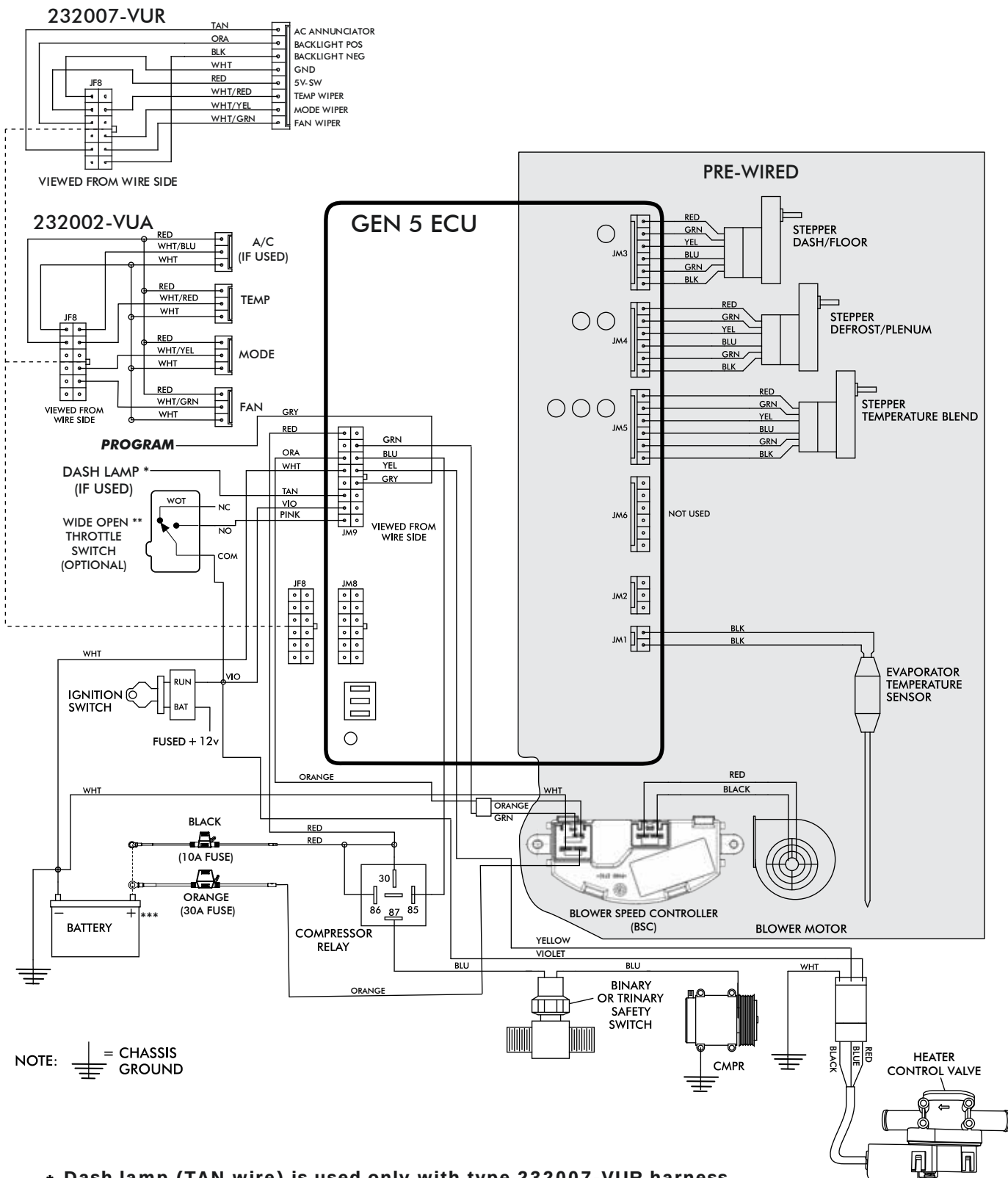
Photo 5a

Use a ratcheting crimp tool
for insulated barrel terminals
when crimping the provided
female insulated terminal.
Ensure terminal is inserted in
appropriate position before
crimping.



www.vintageair.com

Gen 5 Wiring Diagram



NOTE: = CHASSIS GROUND

* Dash lamp (TAN wire) is used only with type 232007-VUR harness.

** Wide open throttle switch contacts close only at full throttle, which disables A/C compressor.

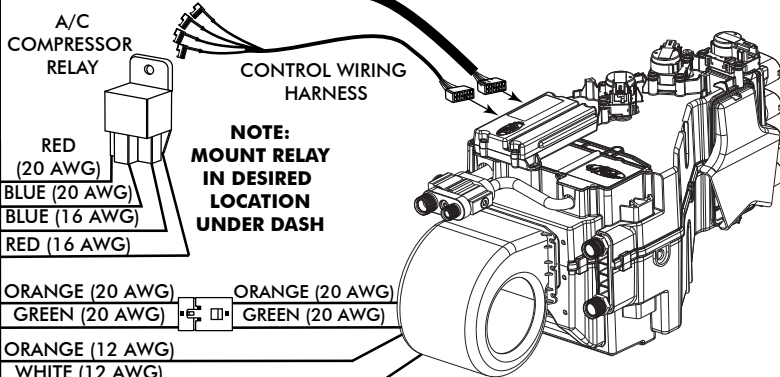
*** Install fuse assemblies at or as near to the battery as possible.



www.vintageair.com

Gen 5 Wiring Instructions

WIRING HARNESS (231505) ↓



Ignition Switch:

Using provided butt splice (PN 226004), connect the 20 AWG violet wire to a 5A fused and switched 12V source such as Key On.

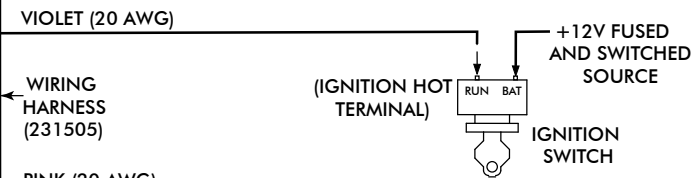
Wide Open Throttle Switch (Optional):

If a wide open throttle switch is required, connect the 20 AWG pink wire to a normally open switch that, when closed, connects a fused and switched 12V source to the pink wire. See Gen 5 wiring diagram for an example.

Dash Light (Optional):

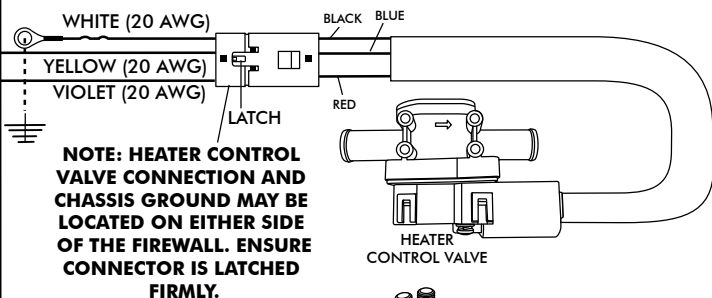
If using a Vintage Air control panel with back light, connect the 20 AWG tan wire to the vehicle's dash back light 0-12V using provided butt splice (PN 226004).

WIRING HARNESS (232020)



FIREWALL

FIREWALL



Heater Control Valve:

Connect the Violet/Yellow/White twisted branch with 3 position connector into the heater control valve connector. Ensure that the mating latch is fully seated.

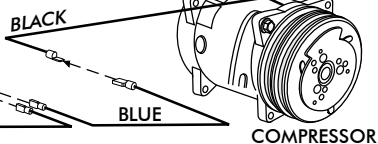
Binary / Trinary & Compressor:

Binary Switch: Terminate provided insulated female terminal (PN 23172-VUW) to the blue 16 AWG wire. Connect as shown.

Trinary Switch: Connect according to trinary switch wiring diagram.

BINARY SAFETY SWITCH

BLUE (16 AWG)



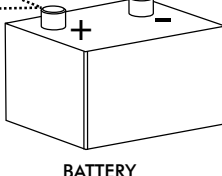
WHITE (12 AWG)

WHITE (20 AWG)

ORANGE (12 AWG)

RED (16 AWG)

NOTE: CONNECT WHITE WIRES DIRECTLY TO (-) BATTERY TERMINAL



Battery Connections:

ECU Ground: Terminate provided ring terminal (PN 226110) to 20 AWG white wire from the 231505 wire assembly and install at battery.

ECU PWR: Terminate provided fuse assembly with black leads (PN 233012) to the 16 AWG red wire from the 231505 wire assembly. Install provided 10A Red Mini Fuse (PN 226118). Install at battery.

Blower Speed Controller (BSC) Ground:

Terminate provided ring terminal (PN 226111) to 12 AWG white wire from the 232020 wire assembly and install at battery.

Blower Speed Controller (BSC) PWR:

Terminate provided fuse assembly with orange leads (PN 233008) to the 12 AWG orange wire from the 232020 wire assembly. Install provided 30A Green ATO/ATC Fuse (PN 226125). Install at battery.



www.vintageair.com

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 control panel instructions for calibration procedure.**

Blower Speed

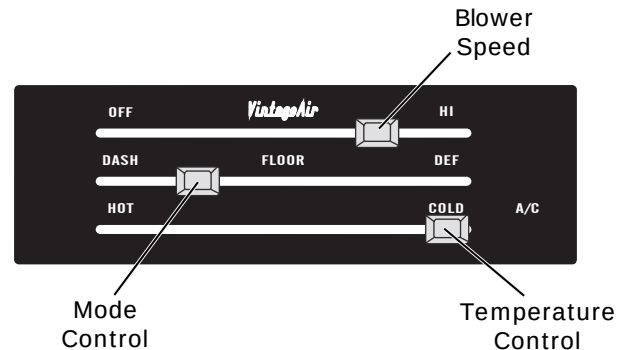
This lever/knob controls blower speed, from OFF to HI.

Mode Control

This lever/knob controls the mode positions, from DEFROST to FLOOR to DASH, with a blend in between.

Temperature Control

This lever/knob controls the temperature, from HOT to COLD.



A/C Operation

Blower Speed

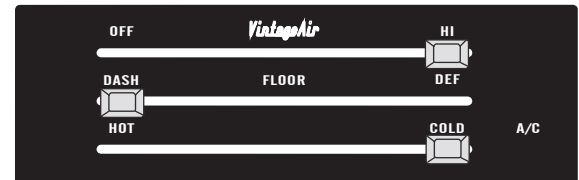
Adjust to desired speed.

Mode Control

Adjust to desired mode position (DASH position recommended).

Temperature Control

For A/C operation, adjust to coldest position to engage compressor (Adjust between HOT and COLD to reach desired temperature).



Heat Operation

Blower Speed

Adjust to desired speed.

Mode Control

Adjust to desired mode position (FLOOR position recommended).

Temperature Control

For maximum heating, adjust to hottest position (Adjust between HOT and COLD to reach desired temperature).



Defrost / De-fog Operation

Blower Speed

Adjust to desired speed.

Temperature Control

Adjust to desired temperature.

Mode Control

Adjust to DEFROST position for maximum defrost, or between FLOOR and DEFROST positions for a bi-level blend (Compressor is automatically engaged).





www.vintageair.com

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.

WARNING: While troubleshooting the system, never probe connector terminals from the front mating side, only back probe.

WARNING: While troubleshooting the system, never use automotive check lights.

Symptom	Condition	Checks	Actions	Notes
1. Blower stays on high speed with ignition on.	No other functions work. All other functions work.	Check for damaged pins or wires in the control panel wire assembly and mating header at ECU. Check for a bad ECU GND. Check for damaged pins or wires in the control panel wire assembly and mating header at ECU. Check if Blower power fuse is blown. Check for a bad ECU GND.	If found damaged, replace wire assembly or ECU. If found damaged, replace wire assembly or ECU. Replace fuse. Repair connection.	If fuse continues to blow, there is a serious problem in the wiring. Check all wiring and ensure the wire is not damaged and shorting out along its route.
2. Compressor will not turn on (All other functions work).	System is not charged. System is charged.	System must be charged for compressor to engage. Check for faulty A/C potentiometer or associated wiring (not applicable to 3-pot controls). Check for disconnected or faulty thermistor.	Charge system. Check continuity to ground on white control head wire. Check for 5V on red control head wire. Check 2-pin connector at ECU housing.	Danger: Never bypass safety switch with engine running. Serious injury can result. To check for proper pot function, check voltage at white/red wire. Voltage should be between 0V and 5V, and will vary with pot lever position. 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. Check for faulty A/C relay.	Repair or replace pot/control wiring. Replace relay.	Red wire at A/C pot should have approximately 5V with ignition on. White wire will have continuity to chassis ground. White/Red wire should vary between 0V and 5V when lever is moved up or down.



www.vintageair.com

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	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 power at ECU, and confirm ignition is being applied to ECU properly.	
		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.	
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.	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.	

Advanced Diagnostics and Troubleshooting Guide

If after referencing the Troubleshooting Guide, the issue is not resolved, move to The Advanced Diagnostics and Troubleshooting Guide that covers the following:

- **ECU Diagnostics Codes**
 1. **ECU Blink Sequence**
 2. **Firmware Version Number**
 3. **ECU Model Number**
 4. **ECU Start-Up Blink Sequence**
 5. **Diagnostic Codes**
- **Complete Advanced Troubleshooting Guidelines**

Access the latest version of the Advanced Diagnostics and Troubleshooting Guide by scanning the following QR code on your mobile device:



You can also access the guide by typing the following address into your web browser:

https://www.vintageair.com/instructions_pdf/905000.pdf



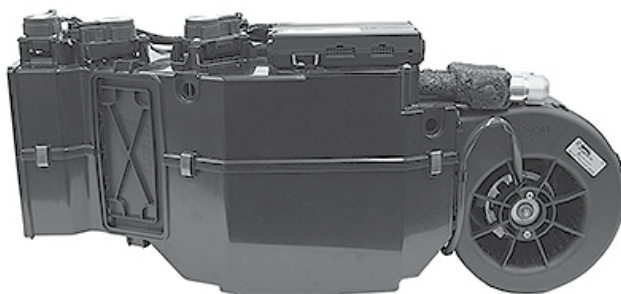
www.vintageair.com

Packing List: Evaporator Kit (561381)

No.	Qty.	Part No.	Description
1.	1	765225	Gen 5 Magnum Max Module with 444 ECU
2.	1	781381	Accessory Kit

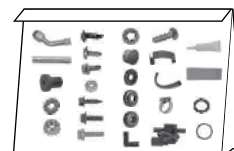
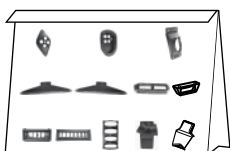
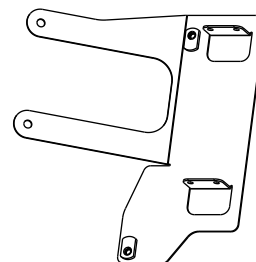
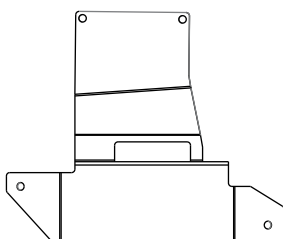
Checked By: _____
Packed By: _____
Date: _____

1



**Gen 5 Magnum Max
Module with 444 ECU
765225**

2



**Accessory Kit
781381**

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