1968-83 Toyota FJ40

with **Roll Bar**
Evaporator Kit
(751727)

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Table of Contents

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Packing List: Evaporator Kit (751727)

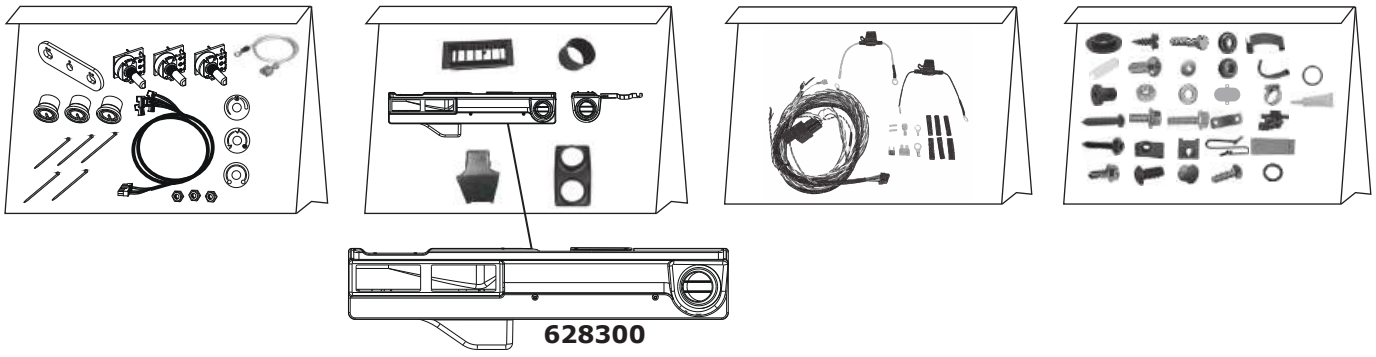
No.	Qty.	Part No.	Description
1.	1	765275	Gen 5 Magnum Max Module with 454 ECU
2.	1	791727	Accessory Kit

**** 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 454 ECU 765275

2



628300

Accessory Kit 791727

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

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Important Notice—Please Read

For Maximum System Performance, Vintage Air Recommends the Following:

NOTE: Vintage Air systems are designed to operate with R134a refrigerant only. Use of any other refrigerant could damage your A/C system and/or vehicle, and possibly cause a fire, in addition to potentially voiding the warranties of the A/C system and its components.

Refrigerant Capacities:

Vintage Air System: 1.8 lbs. (28.8 oz.) or 816 grams of **R134a**, charged by weight with a quality charging station or scale. **NOTE: Use of the proper type and amount of refrigerant is critical to system operation and performance.**

Other Systems: Consult manufacturer's guidelines.

Lubricant Capacities:

New Vintage Air-Supplied Sanden Compressor: No additional oil needed (Compressor is shipped with proper oil charge).

All Other Compressors: Consult manufacturer (Some compressors are shipped dry and will need oil added).

Safety Switches

Your Vintage Air system is equipped with a binary pressure safety switch. A binary switch disengages the compressor clutch in cases of extreme low pressure conditions (refrigerant loss) or excessively high head pressure (406 PSI) to prevent compressor damage or hose rupture. A trinary switch combines Hi/Lo pressure protection with an electric fan operation signal at 254 PSI, and should be substituted for use with electric fans. Compressor safety switches are extremely important since an A/C system relies on refrigerant to circulate lubricant.

Service Info:

Protect Your Investment: Prior to assembly, it is critical that the compressor, evaporator, A/C hoses and fittings, hardlines, condenser and receiver/drier remain capped. Removing caps prior to assembly will allow moisture, insects and debris into the components, possibly leading to reduced performance and/or premature failure of your A/C system. This is especially important with the receiver/drier.

Additionally, when caps are removed for assembly, **BE CAREFUL!** Some components are shipped under pressure with dry nitrogen.

Evacuate the System for 35-45 Minutes: Ensure that system components (Drier, compressor, evaporator and condenser) are at a temperature of at least 85°F. On a cool day, the components can be heated with a heat gun ***or*** by running the engine with the heater on before evacuating. Leak check and charge to specifications.

Bolts Passing Through Cowl and/or Firewall:

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

Heater Hose (not included with this kit):

Heater hose may be purchased from Vintage Air (Part#31800-VUD) or your local parts retailer. Routing and required length will vary based on installer preference.

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Important Wiring Notice—Please Read

Some vehicles may have had some or all of their radio interference capacitors removed. There should be a capacitor found at each of the following locations:

1. On the positive terminal of the ignition coil.

2. If there is a generator, on the armature terminal of the generator.

3. If there is a generator, on the battery terminal of the voltage regulator.

Most alternators have a capacitor installed internally to eliminate what is called "whining" as the engine is revved. If whining is heard in the radio, or just to be extra cautious, a radio interference capacitor can be added to the battery terminal of the alternator.

It is also important that the battery lead is in good shape and that the ground leads are not compromised. There should be a heavy ground from the battery to the engine block, and additional grounds to the body and chassis.

If these precautions are not observed, it is possible for voltage spikes to be present on the battery leads. These spikes come from ignition systems 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.

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Control Panel Information - Please Read

The supplied control panel kit is shown below, and includes (3) black rubber knobs with labels. For a more customized look, (2) additional options are available for purchase from Vintage Air.

A. Control Panel Knob Upgrade Kit (471201):

This kit features (3) aluminum knobs and decal bezels with labels as shown below. **NOTE: On some FJ40 models, the control panel dash holes are tightly spaced, and the outer holes on each side may need to be enlarged or slotted outward to accommodate the decal bezels supplied with this kit.**

B. Black Anodized Streamline Control Panel (491223-RUA) (shown below), Polished Streamline Control Panel (491210-RUA), and Clear Anodized Streamline Control Panel (491294) :

This control panel can be mounted in the dash for a built-in look as shown below.

Included

Option A

Option B

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Additional Installation Information - Please Read

As Vintage Air strives to remain on the cutting edge of technology and innovation, we are proud to introduce our new 1968-83 Toyota FJ40 SureFit™ kit, featuring state-of-the-art Gen 5 technology and electronic controls.

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.

Some FJ40s come with two knobs located under the dash to the right of the emergency brake—one controls the 4WD and the other operates the fresh air vent. To install the new under dash louver bezel, these knobs must be relocated.

NOTE: Our development vehicle did not include this specific knob configuration, so we were unable to account for it during product design. As such, it is the customer's responsibility to determine and perform any necessary modifications for proper fitment. We do not provide instructions or guidance for this relocation, as we do not have experience with this particular setup.

Engine Compartment Preparation

NOTE: Before starting the installation, check the function of the vehicle (horn, lights, etc.) for proper operation, and study the instructions, illustrations, photos & diagrams. Retain OEM bolts, washers and nuts (unless otherwise indicated), as some hardware will be reused.

Perform the following:

1. Disconnect the battery.

2. Remove the battery (retain).

3. Drain the radiator.

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.

Passenger Compartment Disassembly

Perform the following:

1. Remove the plastic heater duct by removing (2) bolts from the firewall (See Photo 1, below).
2. Disconnect the duct hoses from the (2) defrost ducts (See Photo 2, below). Remove the ducts along with the plastic diverters (See Photo 3, below).
3. Disconnect the heater hoses from the heater assembly by removing the clamps and covers (See Photo 3, below). **NOTE: Use a rag to collect any leftover antifreeze that may spill.**
4. Remove the heater assembly by removing (4) bolts from the firewall, (2) on the driver side and (2) on the passenger side (See Photo 4, below).
5. After removing the heater assembly, reinstall the (2) driver-side bolts into the firewall. These bolts will not be reused. **NOTE: Discard the top passenger-side bolt. Use silicone or seam sealer to cover the firewall weld nut. The bottom passenger-side bolt will be reused to install the evaporator front driver-side bracket to the firewall (See Photo 5, below).**

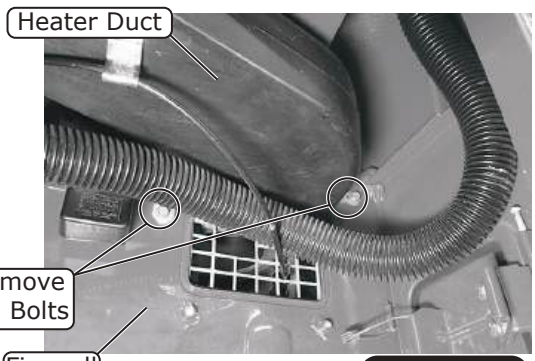
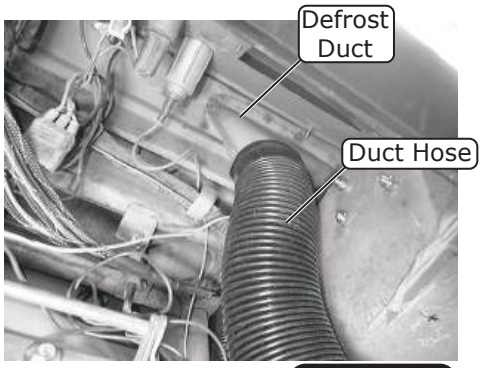


Photo 1



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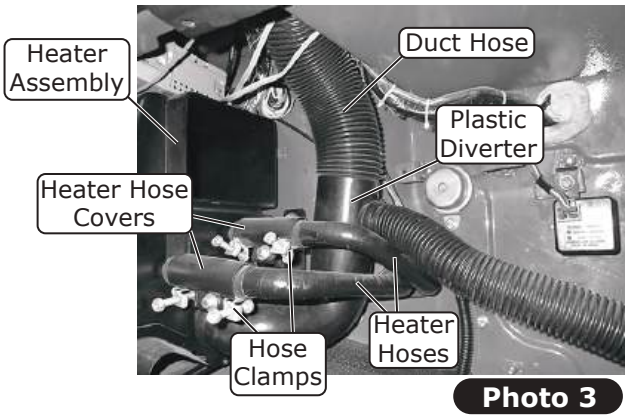

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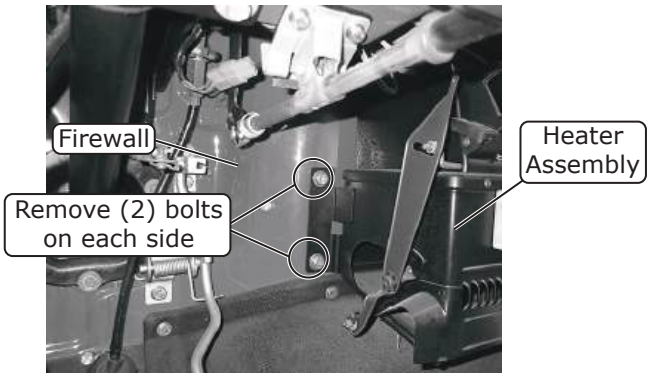


Photo 4

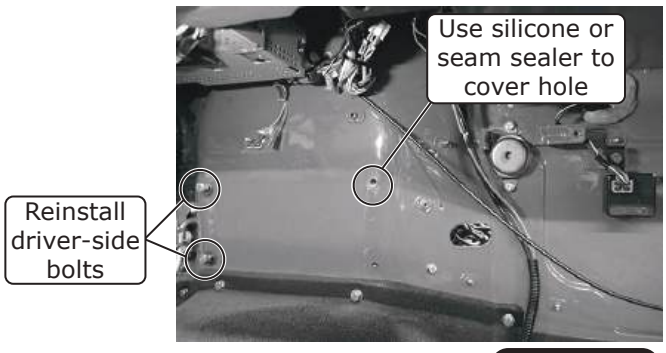


Photo 5

Engine Compartment Disassembly

1. Remove the screw retaining the heater valve cable and cable clamp. Remove the cable clamp, and slide the cable out of the clamp. Remove the (2) heater hoses and the rubber grommet from the firewall. Remove the heater valve by removing the (2) bolts securing it to the firewall (See Photo 1, below). **NOTE: After removing the heater valve, reinstall the (2) bolts into the firewall to seal the unused holes.**

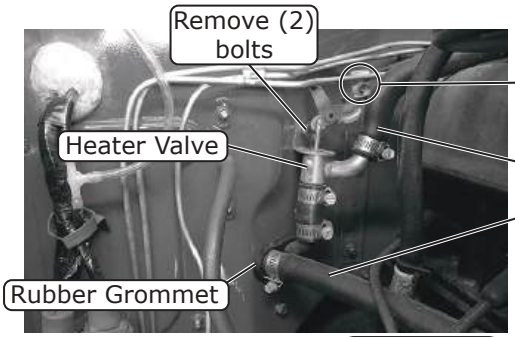
2. Perform the following to open the blower assembly and remove the fresh air cable:

A. Disconnect the (3) wires attached to the blower assembly (See Photo 2, below).

B. Remove the (3) screws holding the blower onto the assembly. Remove the (5) screws around the blower assembly and the (2) bolts securing the assembly to the firewall (See Photo 2, below). Remove the top of the blower assembly.

C. Remove the plate from the blower assembly (See Photo 3, below). Remove the fresh air door from the blower assembly housing, and disconnect the fresh air cable (See Photo 4, below).

D. Remove the bottom side of the blower assembly by removing (2) bolts securing it to the firewall (See Photo 5, below). **NOTE: Retain the (4) OEM bolts used to secure the blower assembly to the firewall. The bolts will be reused to install the firewall cover plate.**



Firewall, Engine Side View

Photo 1

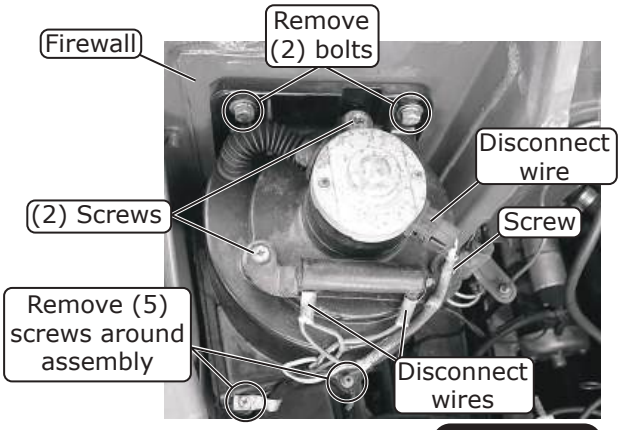


Photo 2

Photo 3

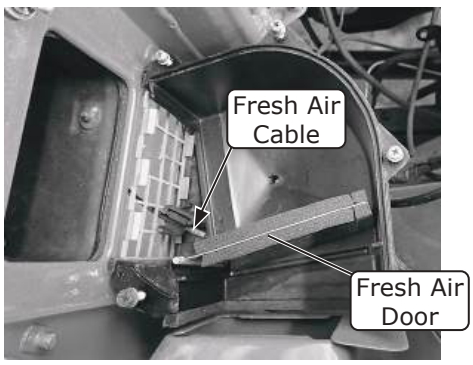


Photo 4

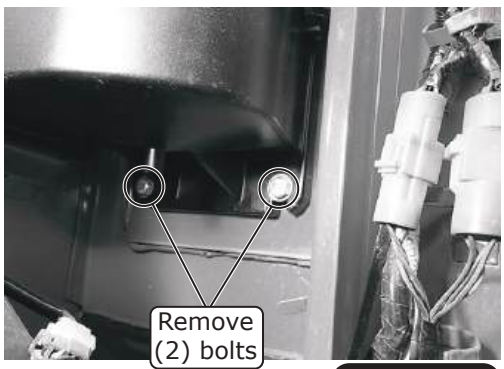
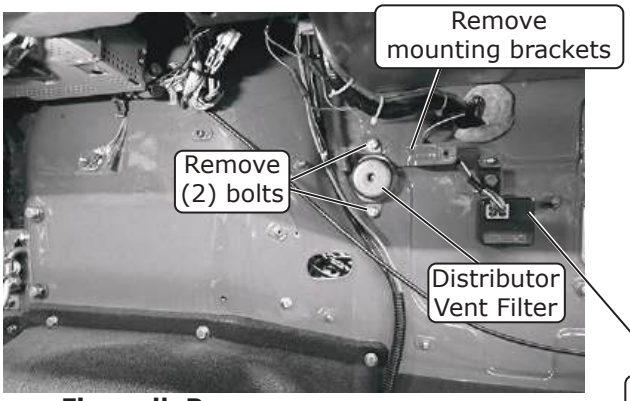


Photo 5

Firewall Modification

NOTE: The evaporator module will be installed against the firewall. Any obstruction will make the installation more difficult. Some FJ40 models have switches, relays or other devices mounted on the passenger compartment side of the firewall that will need to be relocated. The mounting brackets will need to be removed (See Photo 2, below). After evaporator installation, the space between the firewall and the front of the evaporator is approximately 1". Wires mounted on the firewall can remain in place. When installing, use caution that wiring is clear before fully installing the evaporator module.

1. Remove any relays or devices mounted on the passenger compartment side of the firewall. Remove the mounting brackets, and relocate the relays to another area (See Photo 1, below). **NOTE: Relocating the relays to the outer left side of the glove box is recommended.**
2. On FJ40 models with the 2F engine, there is a distributor vent filter mounted on the passenger compartment side of the firewall (See Photo 1, below). The distributor vent filter will need to be relocated to the engine side of the firewall, and sealed to prevent moisture from entering the filter. To relocate, perform the following:
   - **A.** In the passenger compartment, remove the distributor vent filter from the firewall by removing (2) bolts (discard bolts) (See Photo 1, below). Disconnect the hose.
   - **B.** Apply a bead of silicone onto the filter surface, leaving the center hole clear. **NOTE: Be sure the silicone will not enter the hole when reinstalling the distributor vent filter. The hole must remain open and clear (See Photo 2, below).**
   - **C.** On the engine side of the firewall, reinstall the distributor vent filter in the same location on the firewall using (2) M6 x 1 x 30mm hex bolts. Reinstall the hose onto the filter (See Photo 3, below).



Firewall, Passenger Compartment View

Photo 1

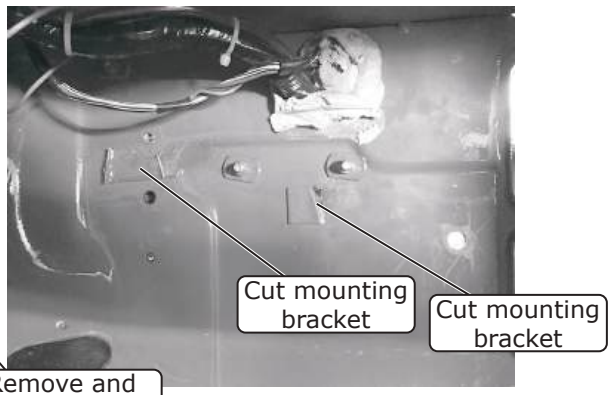
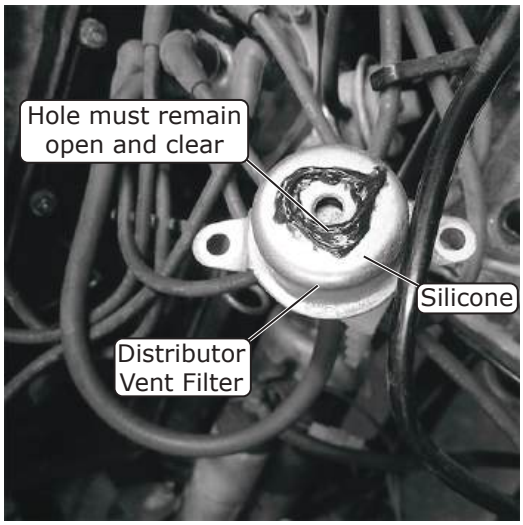


Photo 2



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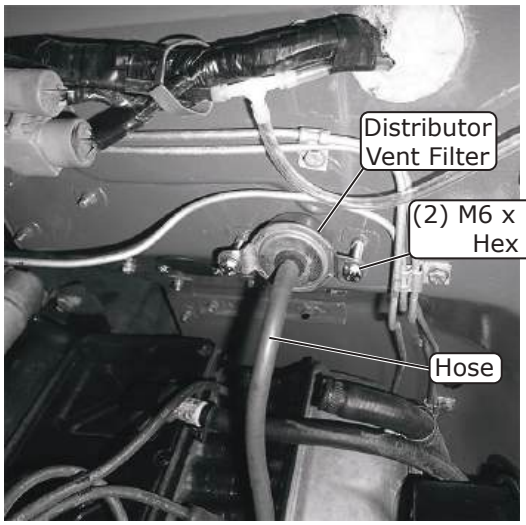


Firewall, Engine Side View

Firewall Modification (Cont.)

3. In the passenger compartment, place and center the heater hose delete plate over the heater hose opening on the firewall (See Photos 4 and 5, below). Mark the top and bottom bracket holes onto the firewall. Remove the bracket, and drill (2) 5/32" holes through the firewall (See Photo 5, below).

4. From the engine compartment, install the delete plate onto the firewall, and secure it using (2) #10 x 1/2" sheet metal screws. Seal the seam around the delete plate using silicone or seam sealer (See Photo 6, below).

5. From the engine compartment, locate the weld nut on the right side of the blower assembly opening on the firewall (See Photo 7, below). Enlarge the hole using a 3/8" drill bit (See Photo 8, below). **NOTE: The weld nut will be removed when enlarging the hole. The hole will be used to install the evaporator front passenger side bracket.**

Firewall, Passenger Compartment View

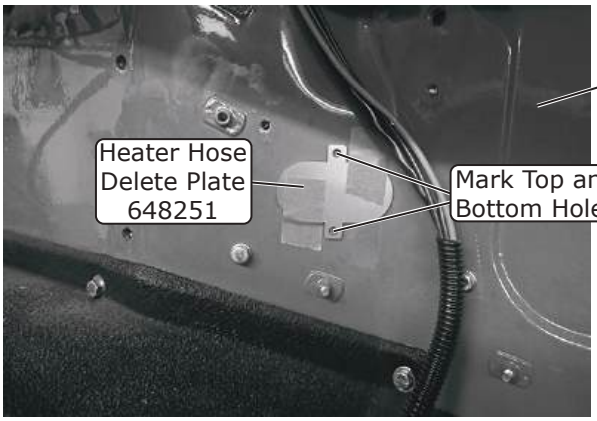
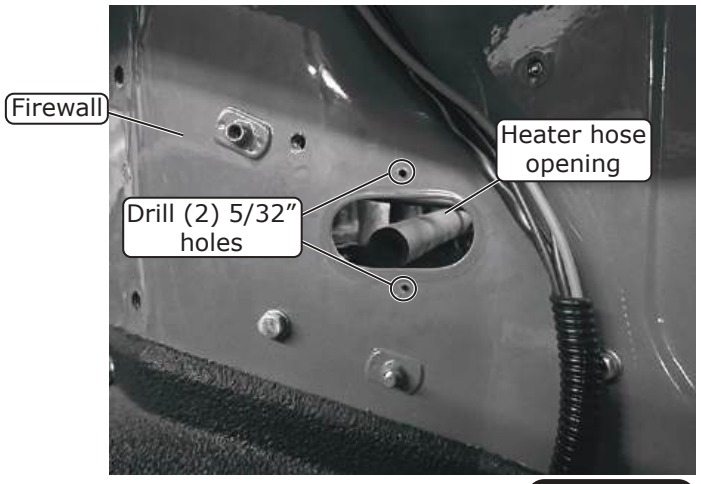


Photo 4



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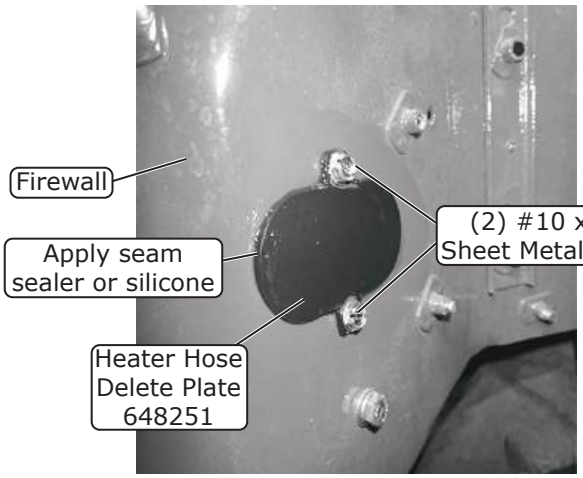


Firewall, Engine Side View

Photo 6

Firewall, Engine Side View

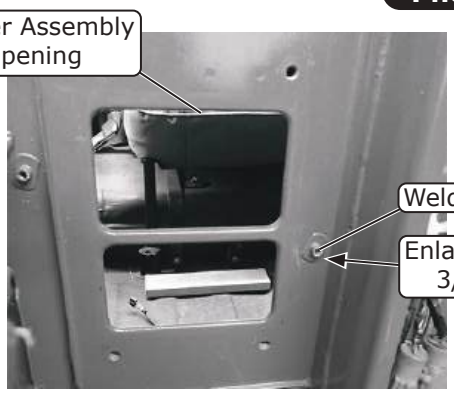


Photo 7

NOTE: The weld nut will be removed while enlarging the hole.

Photo 8

Control Panel Installation

NOTE: To remove the (3) OEM pull knobs and install the new rotary controls, Vintage Air recommends temporarily removing the radio (if equipped) for an easier installation. This kit was designed around the OEM radio. Aftermarket radios may require repositioning.

1. Remove the Fan, Fresh Air and Warm pull knobs (See Photo 1, below). **NOTE: For early FJ40 models, disconnect the cables from behind the dash. Remove the knob by removing the set screw on the side. Unscrew the knob and bezel from the front (See Photo 2, below). For later FJ40 models, disconnect the cables and remove the nuts from behind the dash (See Photos 3 & 4, below).**
2. To accommodate the rotary controls and hardware, the OEM dash holes will need to be modified. **NOTE: Vintage Air recommends using a file to modify the holes (See Photos 5 & 6, below).**

   A. Enlarge the 1st hole to 3/8". **NOTE: Do not enlarge the hole to more than 3/8".**

   B. Round the 2nd and 3rd holes without enlarging them.

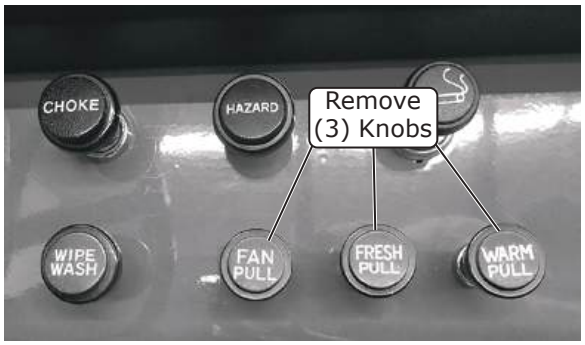
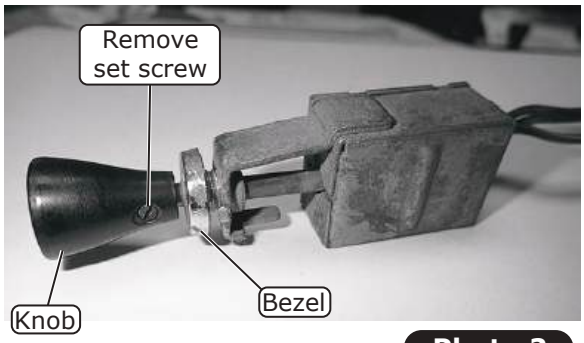


Photo 1



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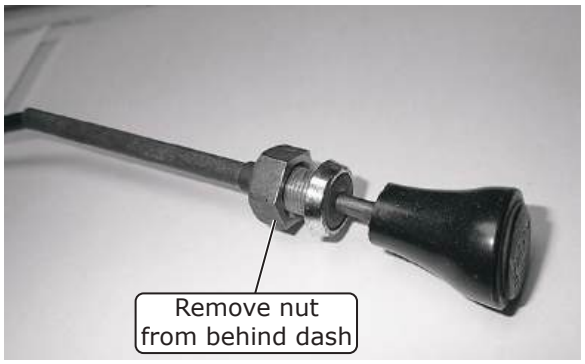


Photo 3

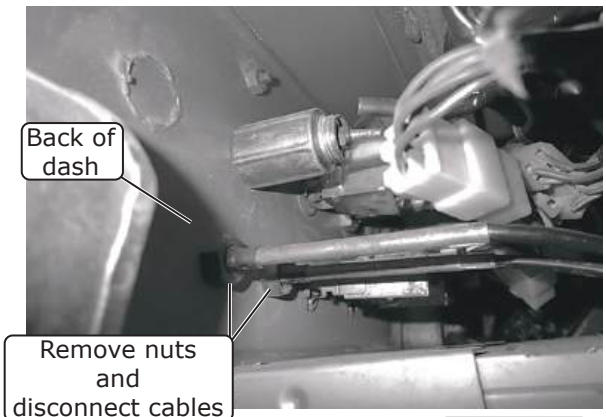
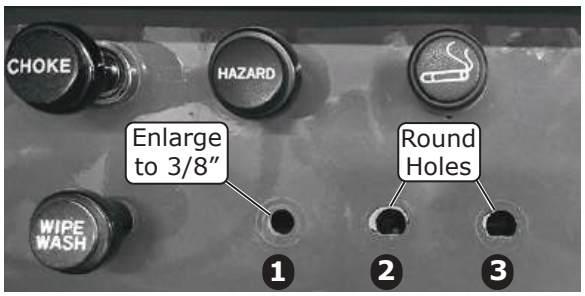
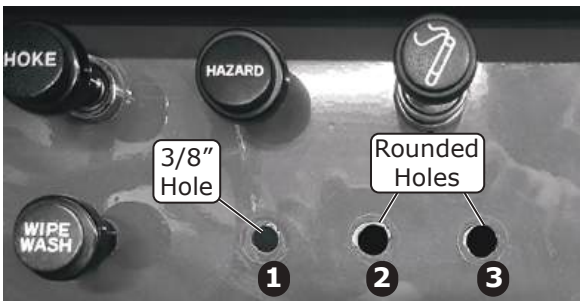


Photo 4



Before Enlargement and Rounding

Photo 5



After Enlargement and Rounding

Photo 6

Control Panel Installation (Cont.)

3. Install the control labels onto the dash as shown in Photo 7, below. **NOTE: Make sure the dash surface is clean and free of debris before installing the labels.**

4. Locate the (3) rotary pot assemblies, and remove a washer and nut from each one (discard) (See Photo 8, below).

5. Install the wiring harness onto the rotary pots as shown in Figure 1, below.

6. Secure the wiring to the rotary pots using the tie wraps provided (See Figure 1, below).

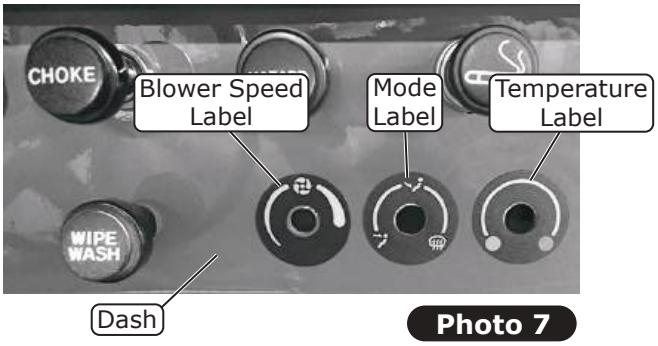


Photo 7

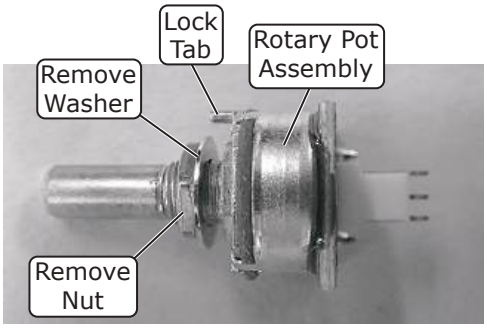


Photo 8

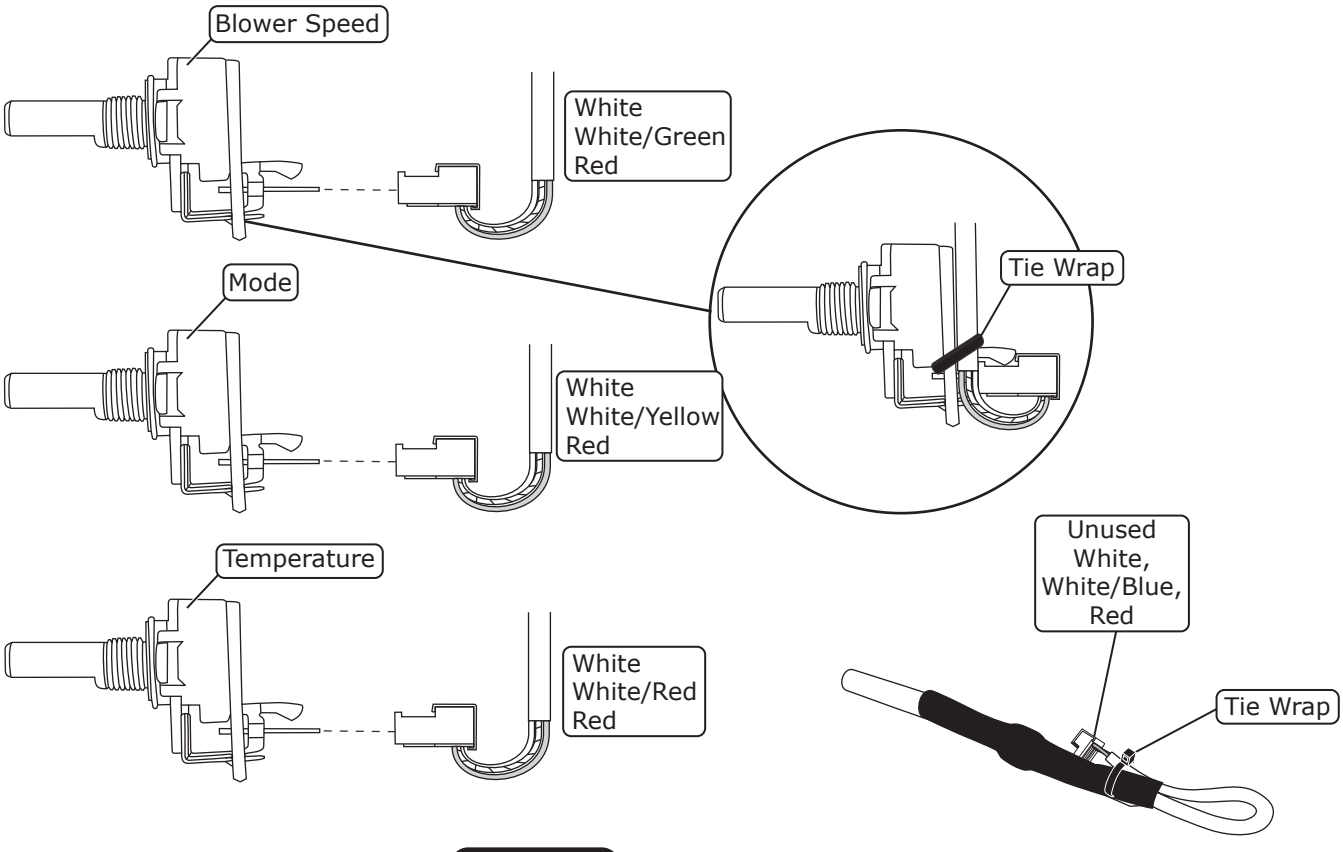


Figure 1

NOTE: Tie the unused wire to the wiring harness as shown above.

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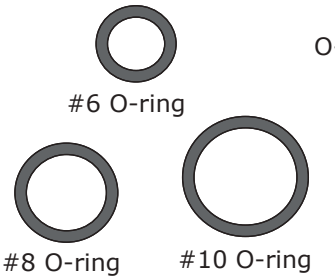
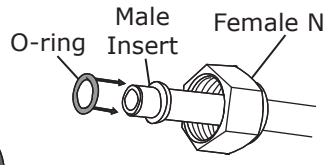
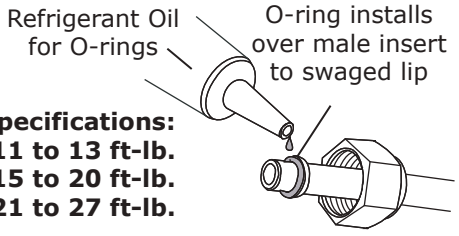
Lubricating O-rings & Fitting Torque Specs

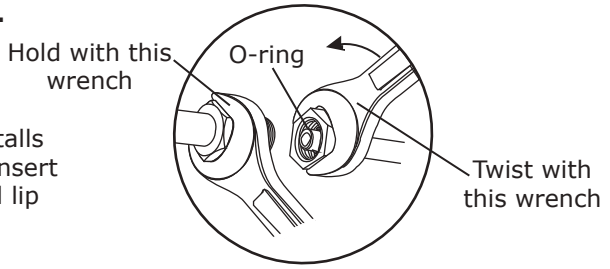






NOTE: Standard torque specifications:
#6: 11 to 13 ft-lb.
#8: 15 to 20 ft-lb.
#10: 21 to 27 ft-lb.

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



The use of a backup wrench is recommended to reduce the chance of damaging the fittings/hardline.

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.

Evaporator Preparation

On a workbench, perform the following:

1. Remove the plastic caps and rubber inserts from the evaporator module (See Photo 1, below).
2. Install the upper and lower heater hardlines onto the evaporator module using (2) properly lubricated #10 O-rings (See Lubricating O-rings & Fitting Torque Specs, above) (See Photo 2, below). **NOTE: Use back up wrenches on these connections.**
3. Confirm that the heater hardlines are at a 90° angle to the evaporator module when installed (See Photo 3, below).

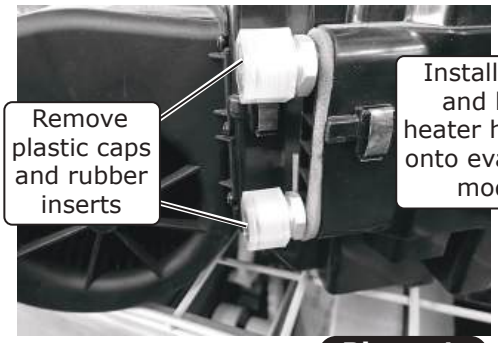


Photo 1

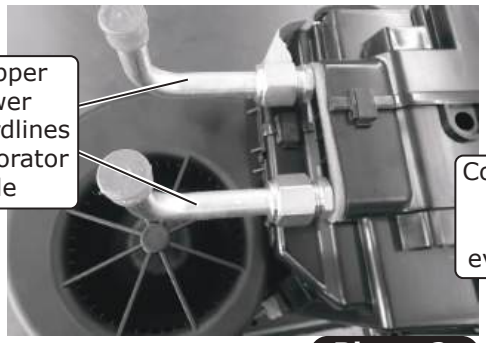


Photo 2

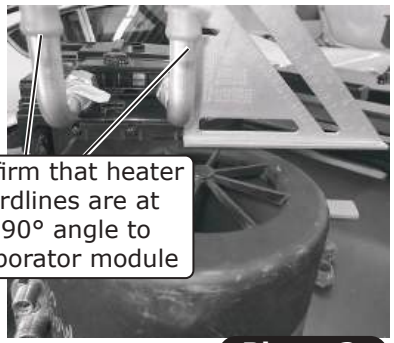


Photo 3

Evaporator Preparation (Cont.)

4. Install a 1/2” plastic plug into the back mounting provision (See Photo 4, below). This mount will not be used for this application.

5. Using (4) #10 x 5/8” screws secure the evaporator firewall bracket to the evaporator module (See Photos 5 and 6, below). Install 1/4-20 U-nut onto the bracket.

6. Install a 1/4-20 x 1” full-threaded stud into the 1/4-20 U-nut of the evaporator firewall bracket 1/4 of the way (See Photo 7, below).

7. Using (2) spring clips install the floor plenum onto the evaporator module (See Photo 8, below).

8. Install (2) 1/4-20 well nuts into the mounting provisions next to the floor plenum (See Photo 9, below).

9. Using (2) 1/4-20 x 1” serrated hex flange bolts secure the evaporator driver-side firewall bracket (See Photo 10, below).

10. Using (4) spring clips (2 per side), install the 2-vent plenum onto the evaporator module (See Photos 11 and 12, below).

Photo 4

Photo 5

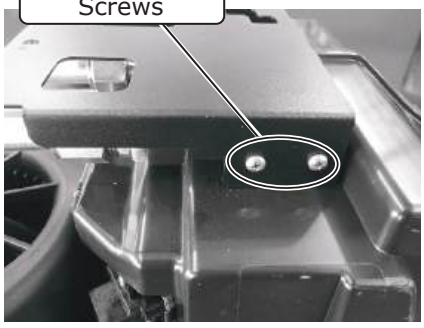


Photo 6

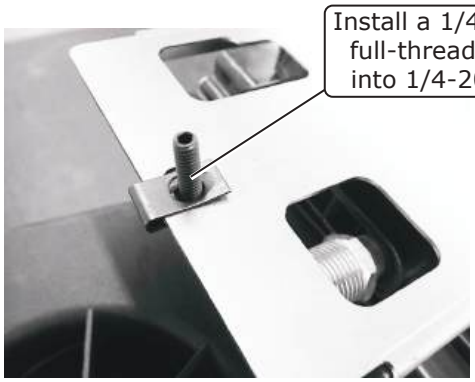


Photo 7

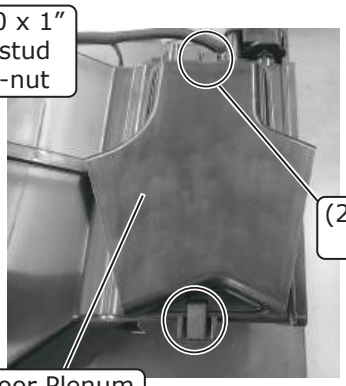


Photo 8

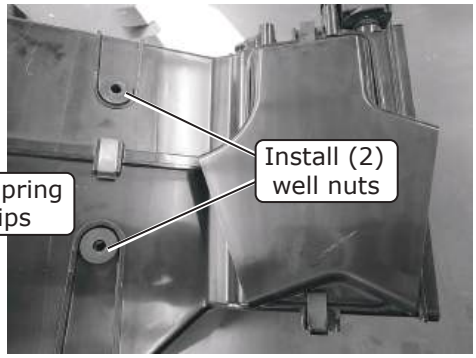


Photo 9

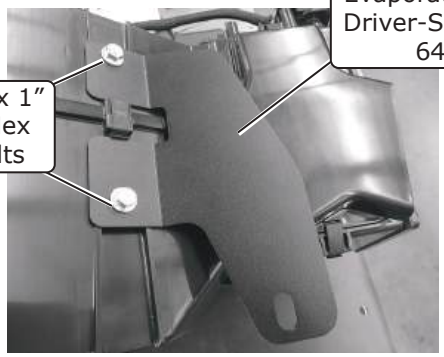


Photo 10

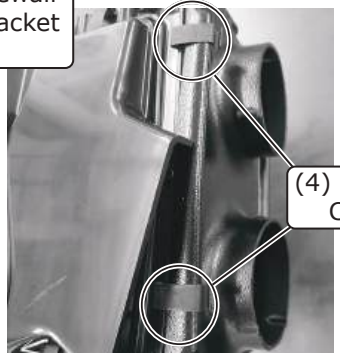


Photo 11

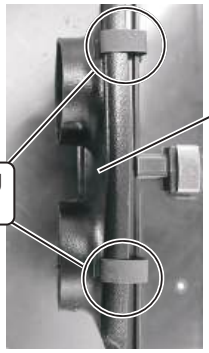


Photo 12

Evaporator Preparation (Final)

NOTE: The following steps are to prepare the ECU for relocation. ECU relocation is needed in this installation due to the limited space under the dashboard.

11. Loosen the (2) screws securing the ECU to the evaporator module (See Photo 13, below), then remove it from the top of the evaporator. Retighten the screws.

12. Carefully cut the tie wraps retaining the wire loom. This will enable the ECU to suspend on the side of the blower housing (See Photo 14, below).

13. Apply (2) strips of Velcro to the back of the ECU (See Photo 15, below).

Photo 13

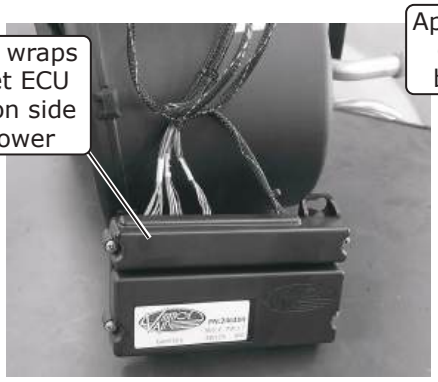


Photo 14

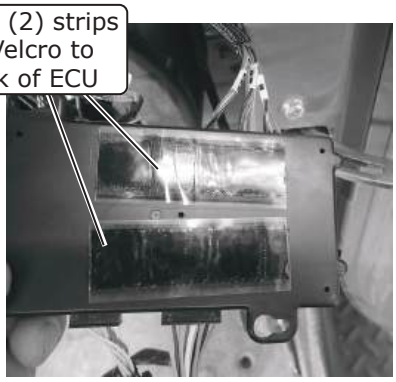


Photo 15

Firewall Insulation

NOTE: For proper system operation, Vintage Air recommends using Dynaliner (461500-VIP) heatblocking 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. Remove the OEM insulation and clean the surface where the new insulation will be installed.

2. Install the insulation using spray adhesive where needed.

Defrost Duct Hose Installation

1. Install (2) S-clips onto each duct hose adapter. Install 24" length of 2 ½" duct hose onto the passenger-side hose adapter and 14" on the driver-side hose adapter. The duct hose installs onto the barbed end of the hose adapter (See Photo 1, below).

2. Install the (2) hose adapters and hoses onto the OEM defrost ducts (See Photo 2, below).

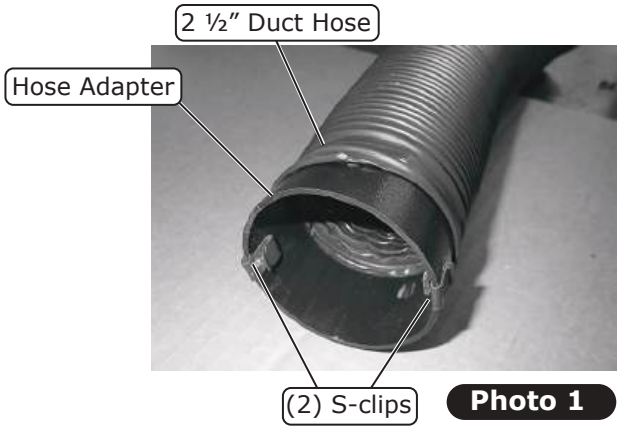


Photo 1

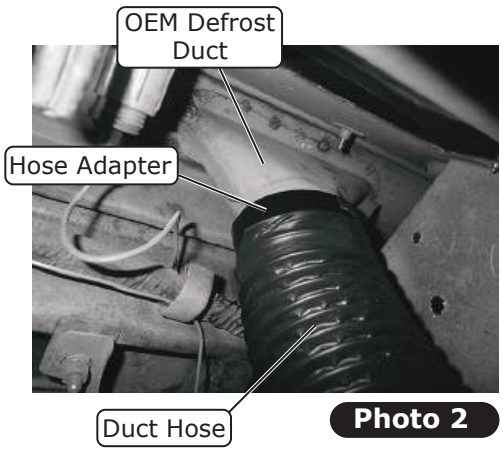


Photo 2

Wiring Installation

1. Using the OEM bolt to the right of the firewall opening, mount the wiring main relay to the firewall (See Photos 1 and 2, below). **NOTE: Main relay mounting hole may have to be enlarged to accommodate the OEM bolt.**
2. Select a location for the heater control valve ground eyelet. Use the supplied self-tapping screw if needed for installation.
3. Place the evaporator module on the passenger-side floorboard. Route the wires from the main wiring harness (red, white, blue) and the heater control valve connector (purple, white, yellow) and heavy gauge wiring (orange, white) from the back of the evaporator module through the lower firewall opening.

Photo 1

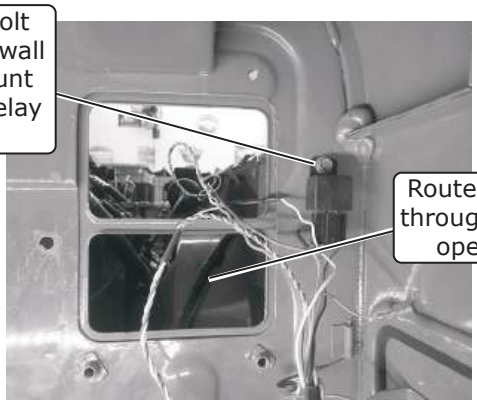


Photo 2

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. Lift the evaporator module into place using the 1/4-20 stud on the evaporator bracket to locate the mounting hole in the firewall (See Photo 1, below).
2. Using the OEM bolt secure the front driver-side bracket to the firewall (See Photo 2, below).

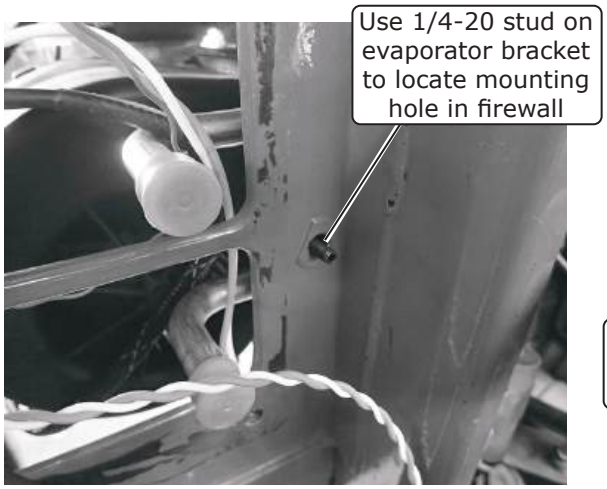


Photo 1

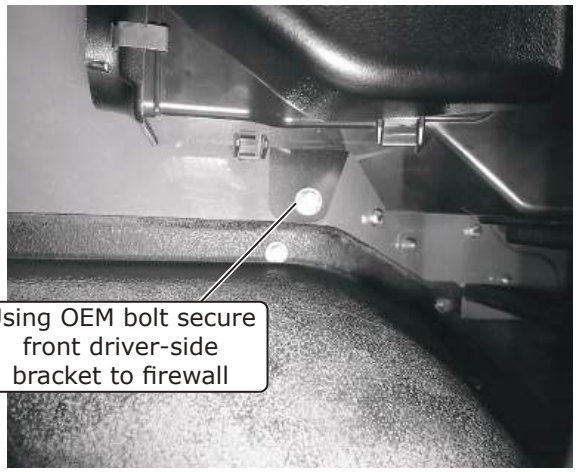


Photo 2

Evaporator Installation (Cont.)

3. Temporarily secure the evaporator to the firewall (engine side) using the supplied 9/32" flat washer and 1/4-20 hex nut with star washer (See Photo 3, below). **NOTE: A 2" x 4" block may be cut to prop up the module while the hardware is installed (See Photo 4, below).**
4. Install (2) 1/4-20 well nuts into the front of the evaporator module as shown in Photo 5, below.
5. Using (2) 1/4 x 1 ¼" pan head screws secure the dash bracket to the evaporator module (See Photo 6, below).
6. Level the evaporator left to right, fore and aft (See Photo 7, below).
7. Using the dash bracket as a template, mark the (2) mounting points onto the bottom of the glove box (See Photo 6, below).
8. Remove the dash bracket.
9. Drill the dash bracket mounting holes into the glove box using a 1/4" drill bit.
10. Install (2) 1/4-20 U-nuts onto the dash bracket (See Photo 8, below).
11. Reinstall the dash bracket to the evaporator using the (2) 1/4-20 x 1" serrated flange bolts (See Photo 9, below). Using (2) 10-24 x 1/2" pan head screws, (2) #8 washers and (2) 10-24 nuts with star washers, secure the dash bracket to the glove box (See Photos 9 and 10, below).

Photo 3

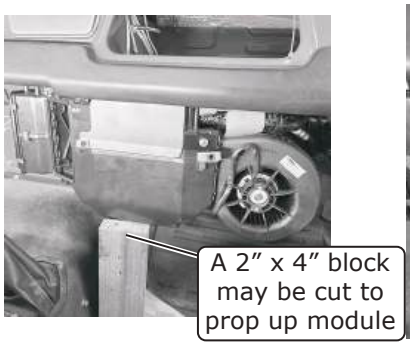


Photo 4

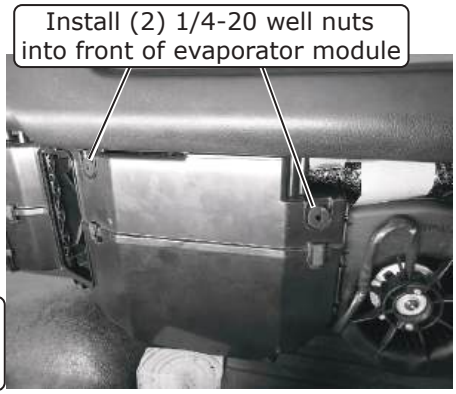


Photo 5

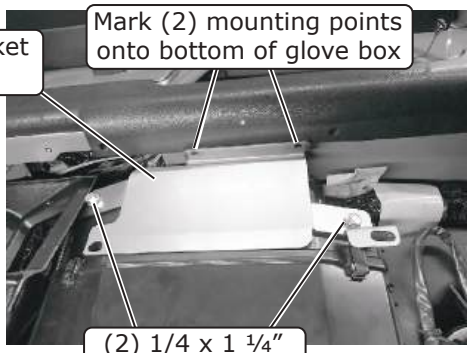


Photo 6

Photo 7

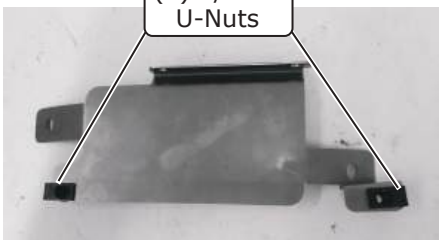


Photo 8

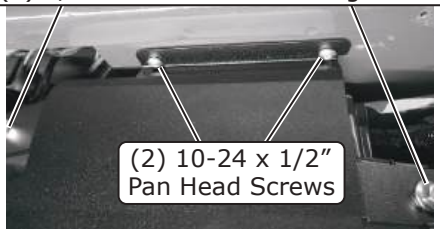


Photo 9

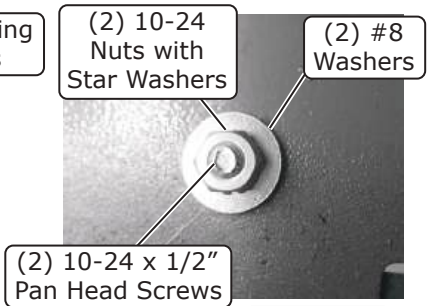


Photo 10

Evaporator Installation (Final)

12. Plug in the control panel and main harness connectors into the ECU (See Photo 11, below). Connect the BSC to the main harness (See Photo 12, below). Peel the backing from the Velcro and install the ECU on the right side of the glove box (See Photo 13, below).

13. From the engine side firewall, replace the full length stud with the 1/4-20 x 1/2" flange hex bolt (See Photo 14, below).

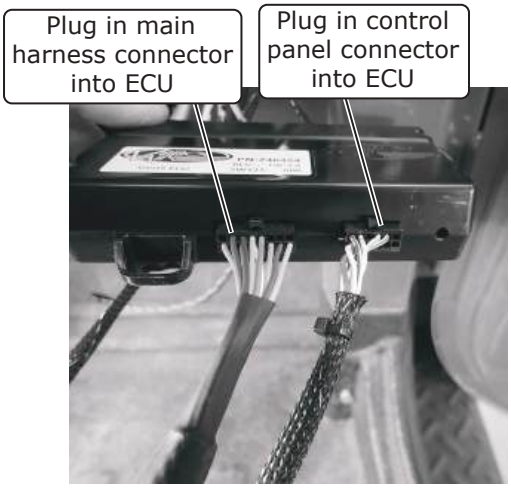


Photo 11

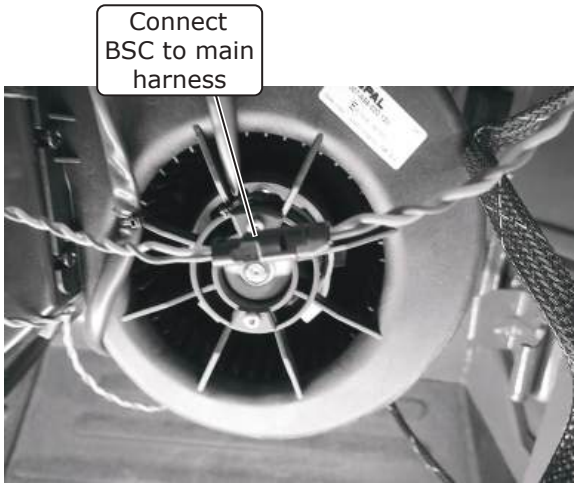


Photo 12

Photo 13

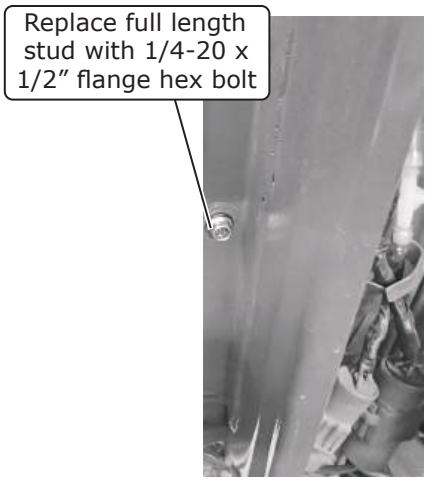


Photo 14

Drain Hose Installation

1. Locate the evaporator drain on the bottom of the evaporator case.
2. In line with the drain, lightly make a mark on the firewall. Measure 1” down. Drill a 5/8” hole through the firewall (See Figure 1, below). **NOTE: Before drilling the drain tube hole, make sure the engine side of the firewall is clear.**
3. Install the drain elbow onto one end of the drain hose and, from the engine side, insert the drain hose through the 5/8” hole in the firewall (See Photos 1 and 2, below). From the passenger compartment, cut the hose as needed, and install the drain hose onto the drain outlet on the evaporator (See Photos 3 and 4, below). Install the remnants of the drain hose onto the drain elbow in the engine compartment. Route the drain away from the exhaust and electrical components.

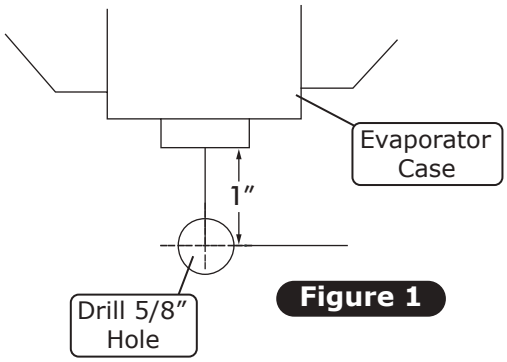


Figure 1

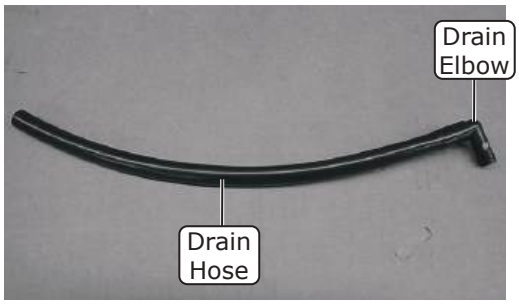


Photo 1

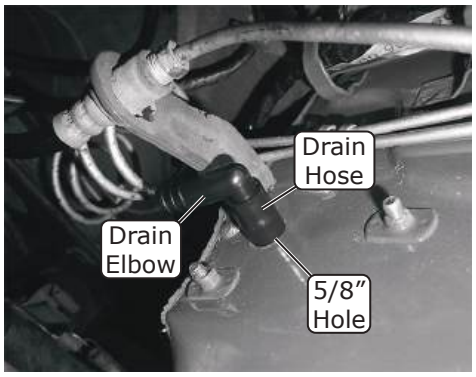


Photo 2

Firewall, Engine Side View

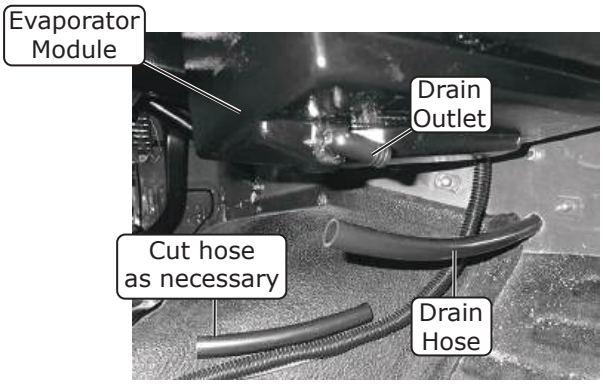


Photo 3

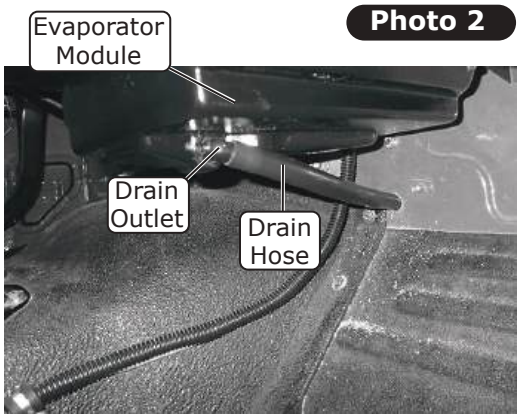


Photo 4

Firewall, Passenger Compartment View

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Firewall Cover Installation

1. Install (3) large grommets into the firewall cover as shown in Photo 1, below.
2. Route the heater control valve plug through the 5/8” wiring grommet (See Photo 2, below).
3. Route the remaining wiring through the grommet and through the grommet hole in the firewall cover (See Photo 3, below).
4. Install the wiring grommet into the firewall cover (See Photo 4, below).
5. Route the 45° fitting of the #6 A/C hose through the lower left large grommet (See Photo 5, below).
6. Install the supplied large grommet over the 90° fitting of the #10 A/C hose (See Photo 6, below).
7. Route the 90° fitting of the #10 A/C hose through the top left hole in the firewall cover, then install the grommet into the firewall cover (See Photo 7, below).
8. Apply a bead of silicone to the mating surface of the firewall (See Photo 8, below).
9. Install the firewall cover using the (4) OEM bolts (See Photo 9, below).
10. Gently pull the slack from the wiring into the engine compartment.

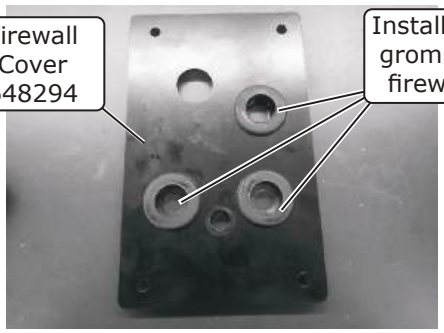

Photo 1

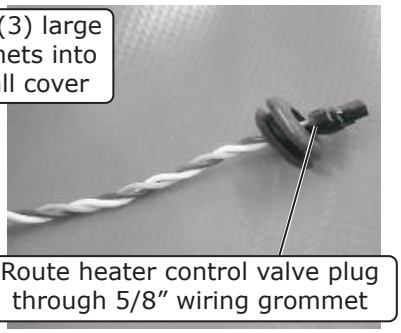

Photo 2

Photo 3

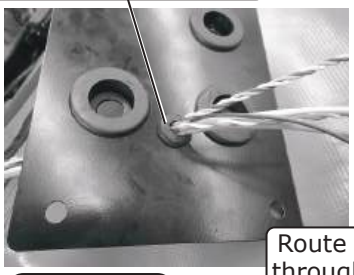

Photo 4

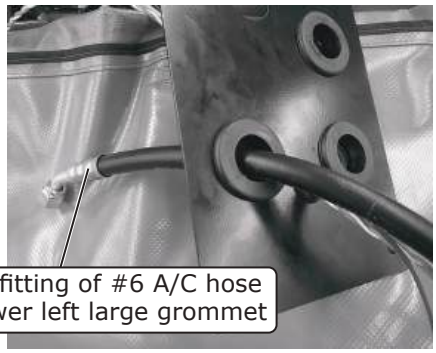

Photo 5

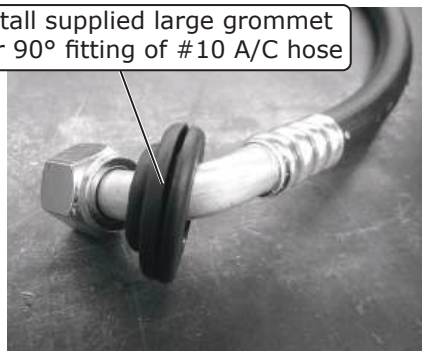

Photo 6

Photo 7

Photo 8

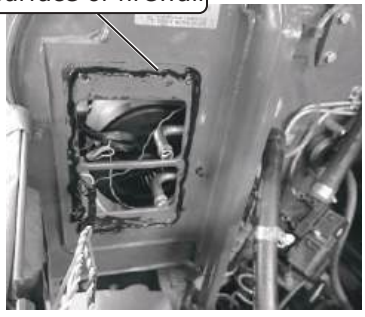

Photo 9

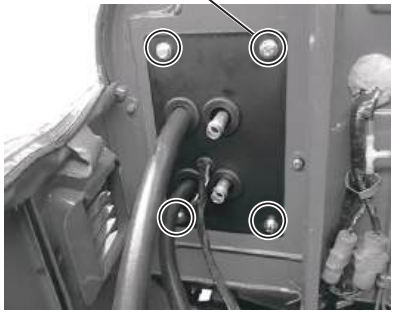

Photo 10

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A/C, Heater Hose and 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 in the heater hose (not supplied) or molded hose (Vintage Air Part # 099010) will need to be installed. It is recommended to remove the wiper and coolant reservoirs when installing the hoses.

1. With a properly lubricated #6 O-ring (See Lubricating O-rings & Fitting Torque Specs, Page 14), connect the 45° fitting to the #6 outlet of the evaporator module block fitting (See Photo 1, below).
2. With a properly lubricated #10 O-ring (See Lubricating O-rings & Fitting Torque Specs, Page 14), connect the 90° fitting to the #10 outlet of the evaporator module block fitting (See Photo 2, below). Wrap all exposed metal with supplied press tape (See Photo 3, below).
3. From the engine compartment, route a piece of 5/8" heater hose from the water pump to the lower heater hardline at the firewall and secure both ends with hose clamps (See Photos 4 and 5, below).
4. Install the molded 90° heater hose onto the heater control valve and secure using the supplied hose clamp. **NOTE: Ensure proper flow direction through the heater control valve (the flow direction follows the molded arrow on the valve) (See Figure 1, below).**

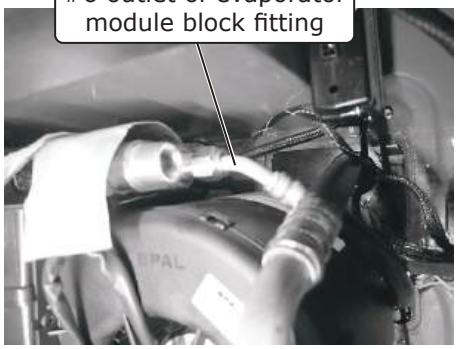


Photo 1

Photo 2

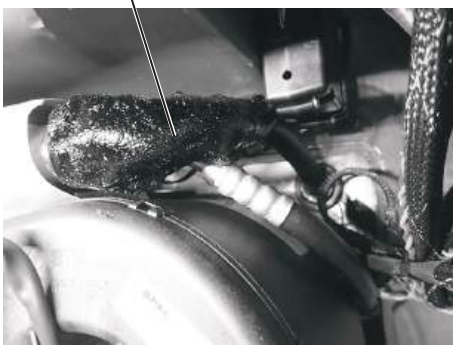


Photo 3

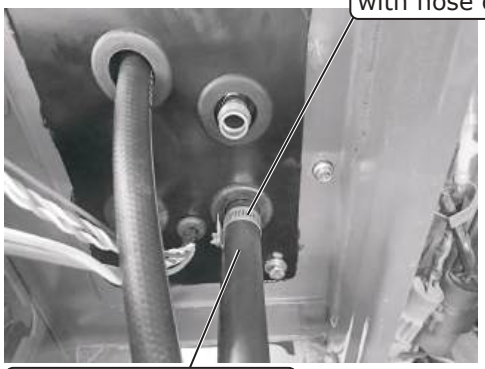
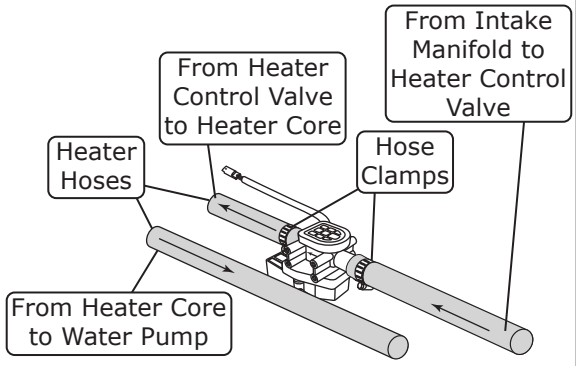


Photo 4

Photo 5



NOTE: Flow Direction Follows Molded Arrow on Valve.

Figure 1

A/C, Heater Hose and Heater Control Valve Installation (Cont.)

5. Install the other end of the molded 90° heater hose onto the upper heater hardline (See Photo 6, below).

6. Route a length of heater hose between the heater control valve and the intake manifold then secure using the supplied hose clamps (See Photo 7, below).

7. With a properly lubricated #8 O-ring (See Lubricating O-rings & Fitting Torque Specs, Page 14), connect the #8 135° fitting to the #8 condenser hardline (See Photo 8, below).

8. With a properly lubricated #8 O-ring (See Lubricating O-rings & Fitting Torque Specs, Page 14), connect the #8 45° fitting with the service port to the discharge port of the compressor (See Photo 9, below).

9. With a properly lubricated #10 O-ring (See Lubricating O-rings & Fitting Torque Specs, Page 14), connect the #10 135° fitting with the service port to the suction port of the compressor (See Photo 10, below).

10. With a properly lubricated #6 O-ring (See Lubricating O-rings & Fitting Torque Specs, Page 14), connect the #6 straight fitting to the drier connection (See Photo 11, below).

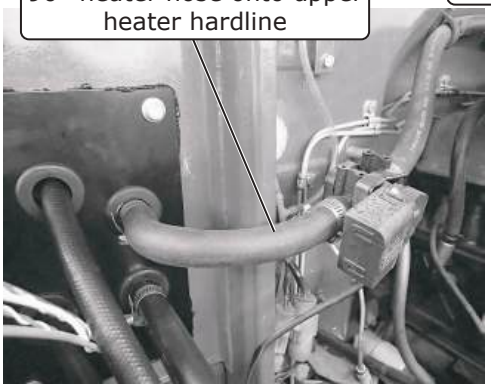


Photo 6

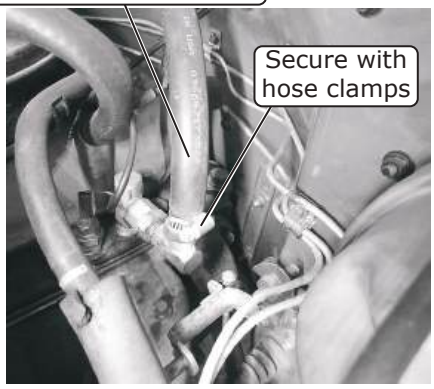


Photo 7

Photo 8

Photo 9

Connect #8 45° fitting with service port to discharge port of compressor

Photo 10

Connect #10 135° fitting with service port to suction port of compressor

Photo 11

Connect #6 straight fitting to drier connection

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 32.

1. Connect the heater control valve plug to the connection on the main harness.
2. Route the blue wire from the main harness along the #6 A/C hose toward the safety switch. Use supplied tie wraps to secure the wire to the #6 A/C hose.
3. If necessary shorten the wire, strip and crimp on the supplied spade terminal connector then install onto the drier safety switch (See Photo 1, below).
4. Connect the compressor lead bullet connector to the compressor wire.
5. Route the compressor lead along the #8 A/C hose toward the safety switch. Secure the lead to the A/C hose using the supplied tie wraps. Install the spade terminal connector onto the safety switch (See Photo 2, below).
6. Route power and ground wires toward the battery (See Photo 3, below).
7. 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 4, below). Slide the heat shrink over the crimp, then apply heat.
8. 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 5, below). Slide the heat shrink over the crimp, then apply heat.

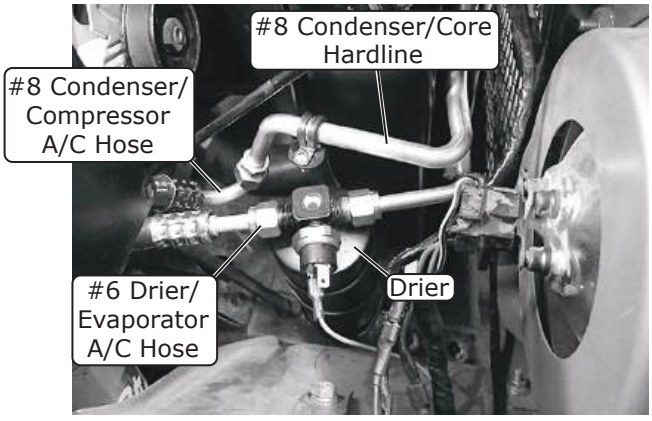


Photo 1

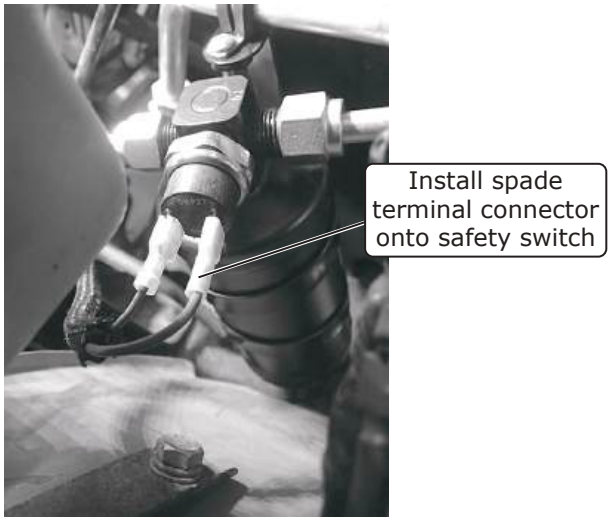


Photo 2

Photo 3

Photo 4

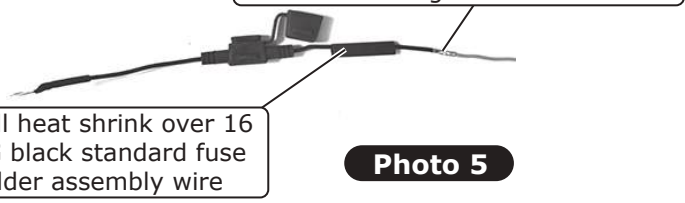


Photo 5

Engine Compartment Wiring (Cont.)

9. Install the fuses into the holders (See Photos 6 and 7, below).

10. Install the supplied heat shrink over the white ground wires, then crimp on the supplied ring terminals (See Photo 8, 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 9 and 10, below).**

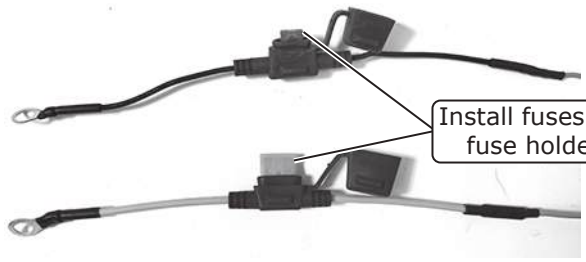


Photo 6

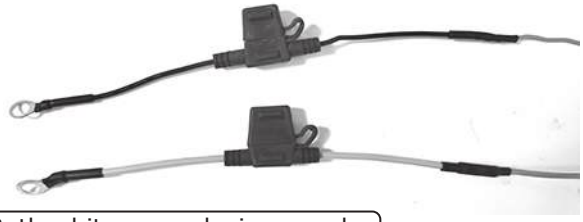


Photo 7

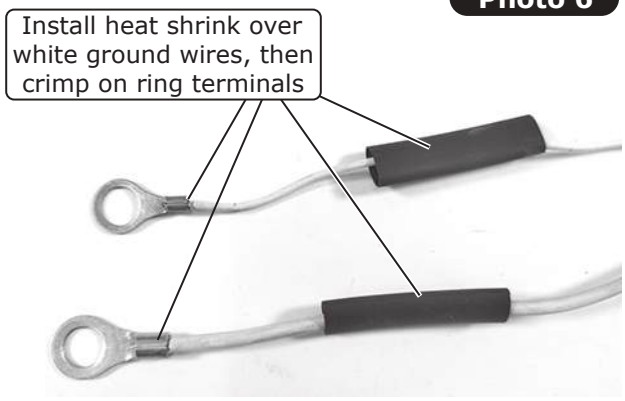


Photo 8

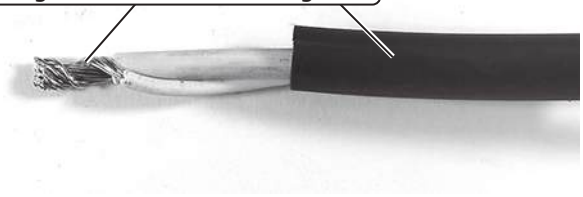


Photo 9

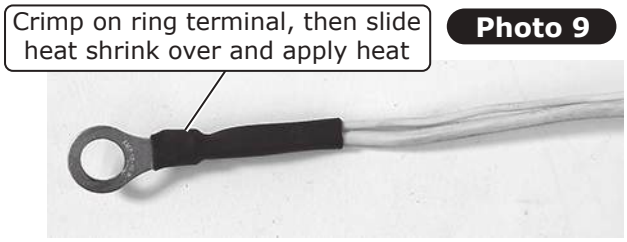


Photo 10

Engine Compartment Wiring (Final)

11. Connect the ground wire ring terminals to the negative battery terminal connector (See Photos 11 and 12, below).

12. Connect the positive wire ring terminals to the positive battery terminal connector (See Photos 13 and 14, below). **NOTE: Do not connect power until the installation is completed.**

13. Wiring completed (See Photo 15, below).

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

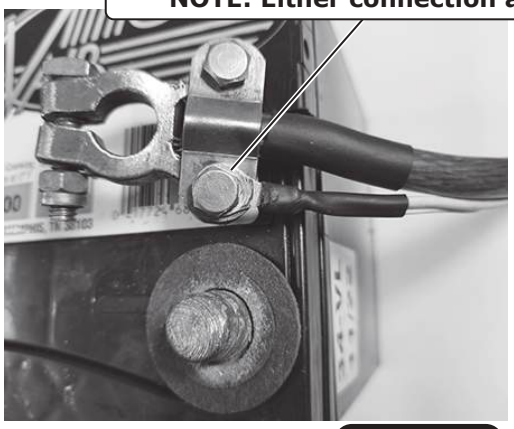


Photo 11

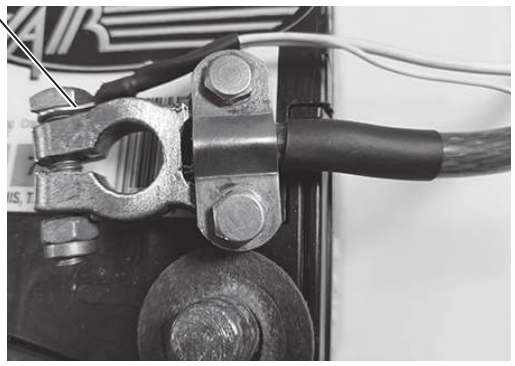
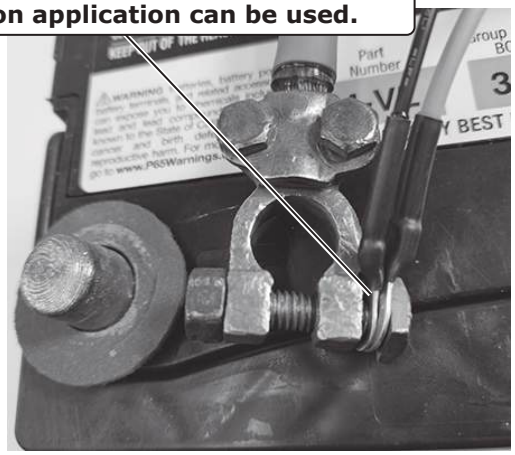


Photo 12

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

Photo 13



NOTE: Do not connect power until installation is completed.

Photo 14

Completed Installation Shown

Photo 15

Duct Hose & Driver/Passenger-Side Under Dash Louver Installation

1. Connect the defrost duct hoses to the 2-vent plenum (See Photo 1, below, and Duct Hose Routing, Page 32).
2. Install the passenger under dash plenum bracket using a #6 push nut and a #6 x 1/2" pan head screw onto the passenger-side under dash louver bezel (See Photos 2, 3 and 4, below).
3. Fit the plenum to the opening on the module and line up the plenum bracket with the lower tab on the evaporator module (See Photo 5, below). Mark the bracket's mounting hole and remove the plenum. Drill a pilot hole into the tab on the module for the #6 x 1/2" pan head screw (See Photo 6, below).
4. Using (2) 1/4-20 button head screws secure the plenum to the dash bracket (See Photo 7, and Figures 1 and 2, below).

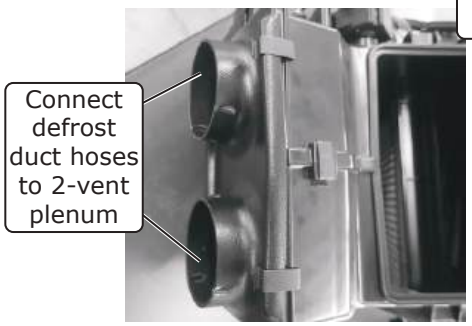


Photo 1

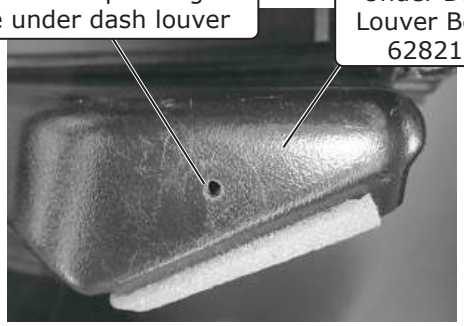


Photo 2

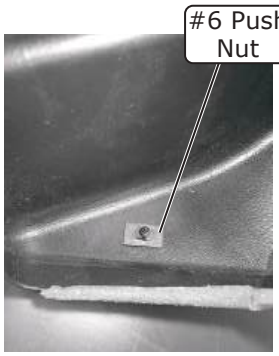


Photo 3

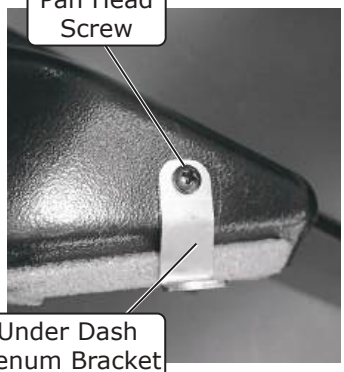


Photo 4

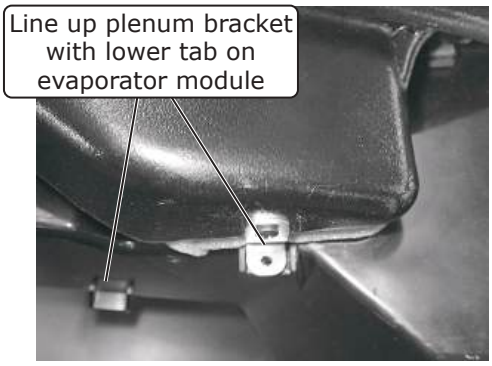


Photo 5

Photo 6

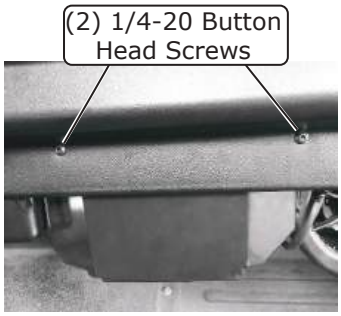
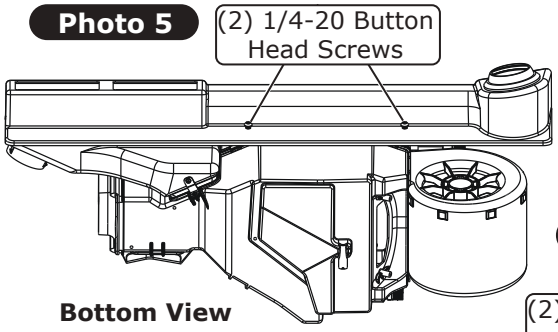
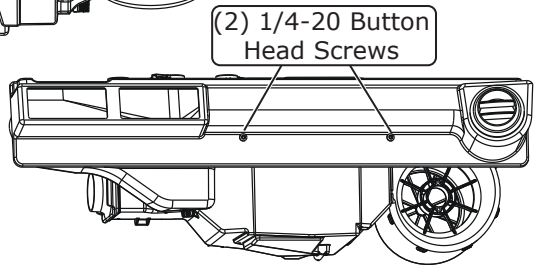


Photo 7



Bottom View

Figure 1



Front View

Figure 2

Duct Hose & Driver/Passenger-Side Under Dash Louver Installation (Cont.)

5. Secure the plenum bracket to the lower module mounting tab using (1) #6 pan head screw and (1) #6 push nut on the backside of the tab. Tighten all the mounting hardware at this time (See Photos 8 and 9, below).
6. Install (2) rectangular louvers into the front of the passenger-side under dash louver bezel (See Photo 10, below).
7. Loosen the steering column bolts and slide the driver-side under dash louver assembly bracket between the steering column bolts, then retighten the steering column bolts (See Figure 1, below).
8. Install a 24" piece of 2 ½" duct hose onto the adapters on the dash plenums (See Duct Hose Routing, Page 31).

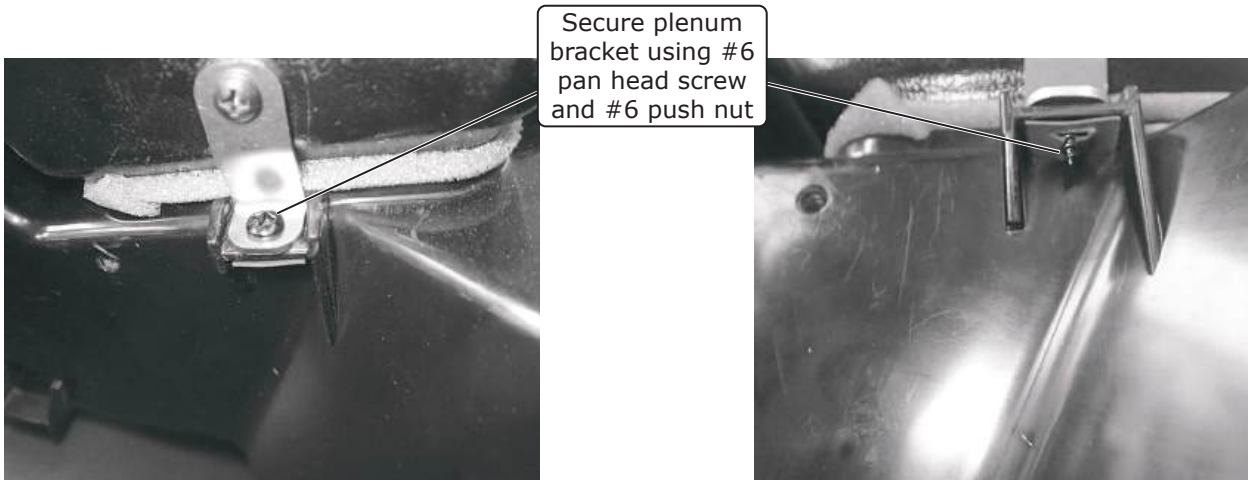


Photo 8 **Photo 9**

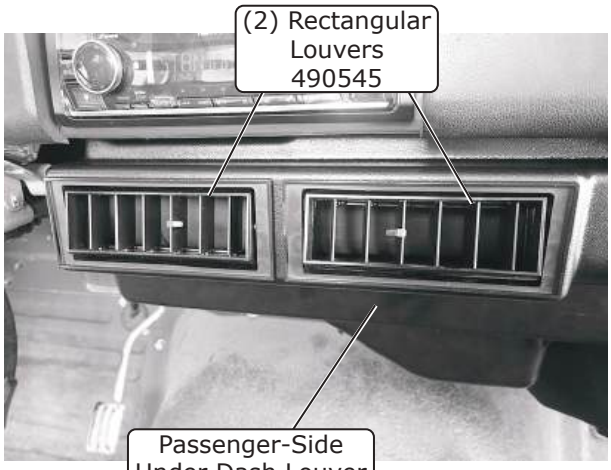


Photo 10

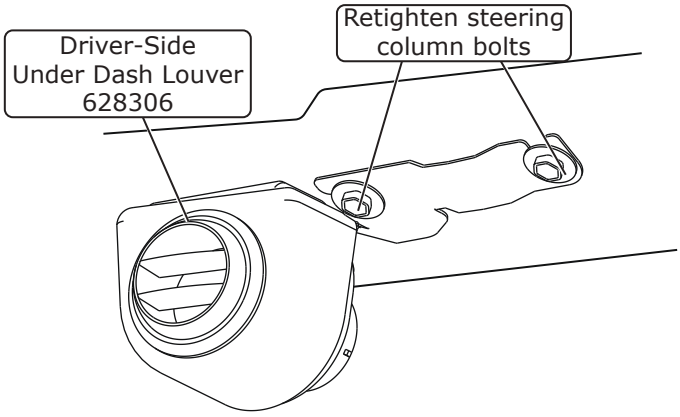


Figure 1

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 repetetive blinking is observed, go to the **Advanced Diagnostics** Section to diagnose.
☐	Blower speed control	Set the blower speed control to **OFF**, *confirm that the blower is off*. Position the blower speed control to **LOW** then **MEDIUM** and then **HIGH**. *At each setting confirm that the blower speed increases*, 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. *Confirm that air is being blown at the dash vents.* Set the **MODE** control to the **FLOOR** position. *Confirm that air is being blown at the floor vents.* Set the **MODE** control to the **DEFROST** position. *Confirm that all air is being blown from the defrost vents*
☐	Temperature control	**If heater lines are installed:** Set the **MODE** control to the **DASH** position. Set the **TEMP** control to the **MAX HEAT** position. *Confirm that HOT air is coming from the dash vents.* **If system is charged:** Set the **TEMP** control to the **MAX COOL** position. *Confirm that **COLD** air is coming from the dash vents.* Also *confirm that the compressor "clicks" on* 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, *confirm that the blue AC Indicator light is on*.
☐	Backlight (If applicable)	If your control panel has backlight capabilities and has been wired, turn the dash lamp on and *confirm that the AC panel's legend is lit*.
☐	Fittings	Verify AC and Heater fittings are all tight.

Final Steps: Completing the Install

1. Reinstall all previously removed items.
2. 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.
3. Double check all fittings, brackets and belts for tightness.
4. Vintage Air recommends that all A/C systems be serviced by a licensed automotive A/C technician.
5. Evacuate the system for a minimum of 45 minutes prior to charging, and perform a leak check prior to servicing.
6. Charge the system to the capacities stated on Page 4 of this instruction manual.
7. See Operation of Controls procedures on Page 35.

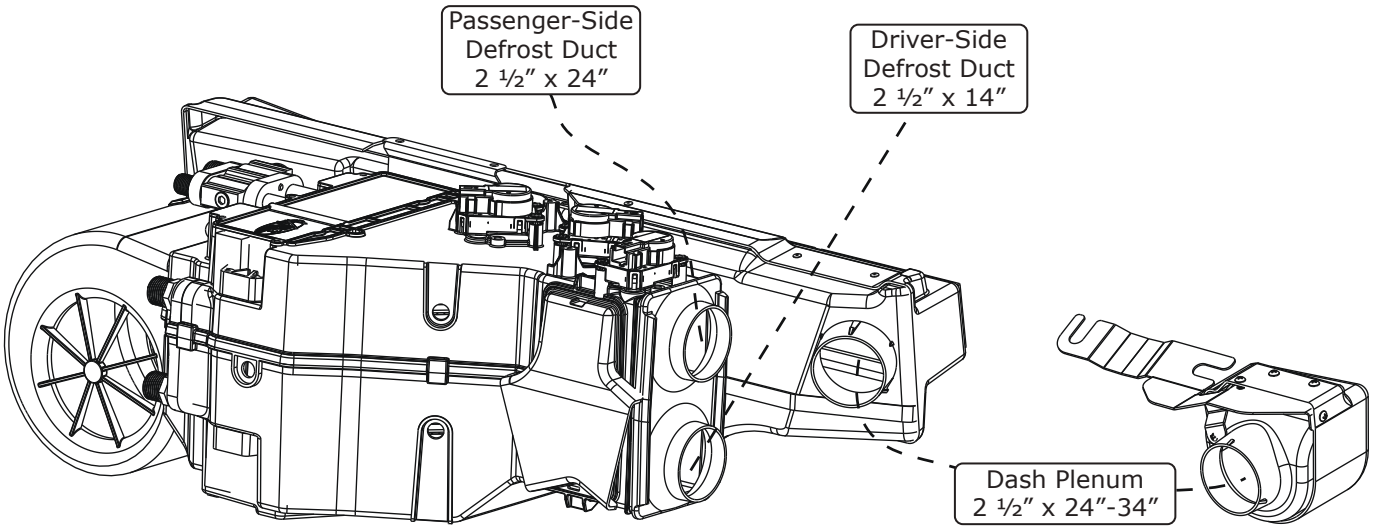
Duct Hose Routing

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).

Photo 1

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



NOTE: Dimension of this hose may vary depending on routing, connect this duct hose last, stretch hose and cut as needed.

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.

Quality Crimp Guideline

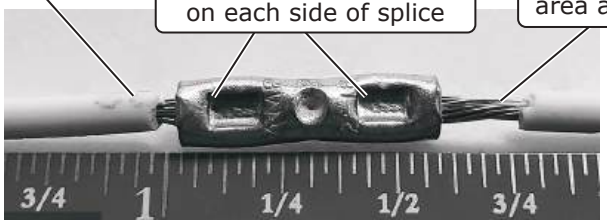


Photo 1

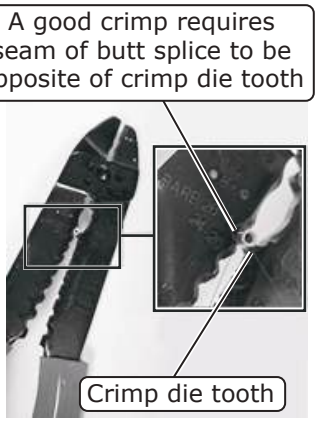


Photo 2

Good Ring Terminal Crimp

Photo 3

Bad Ring Terminal Crimp

Photo 4

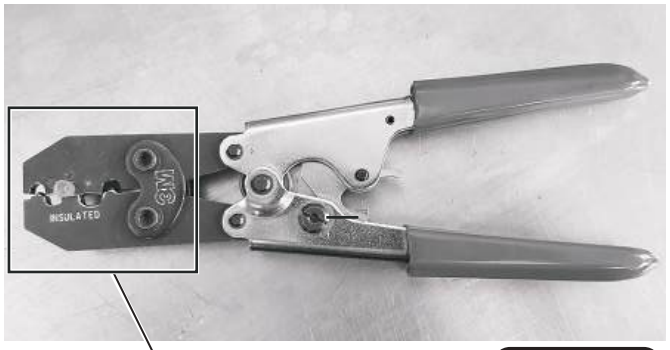
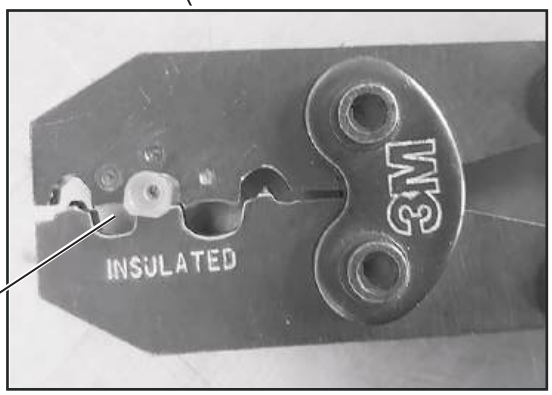


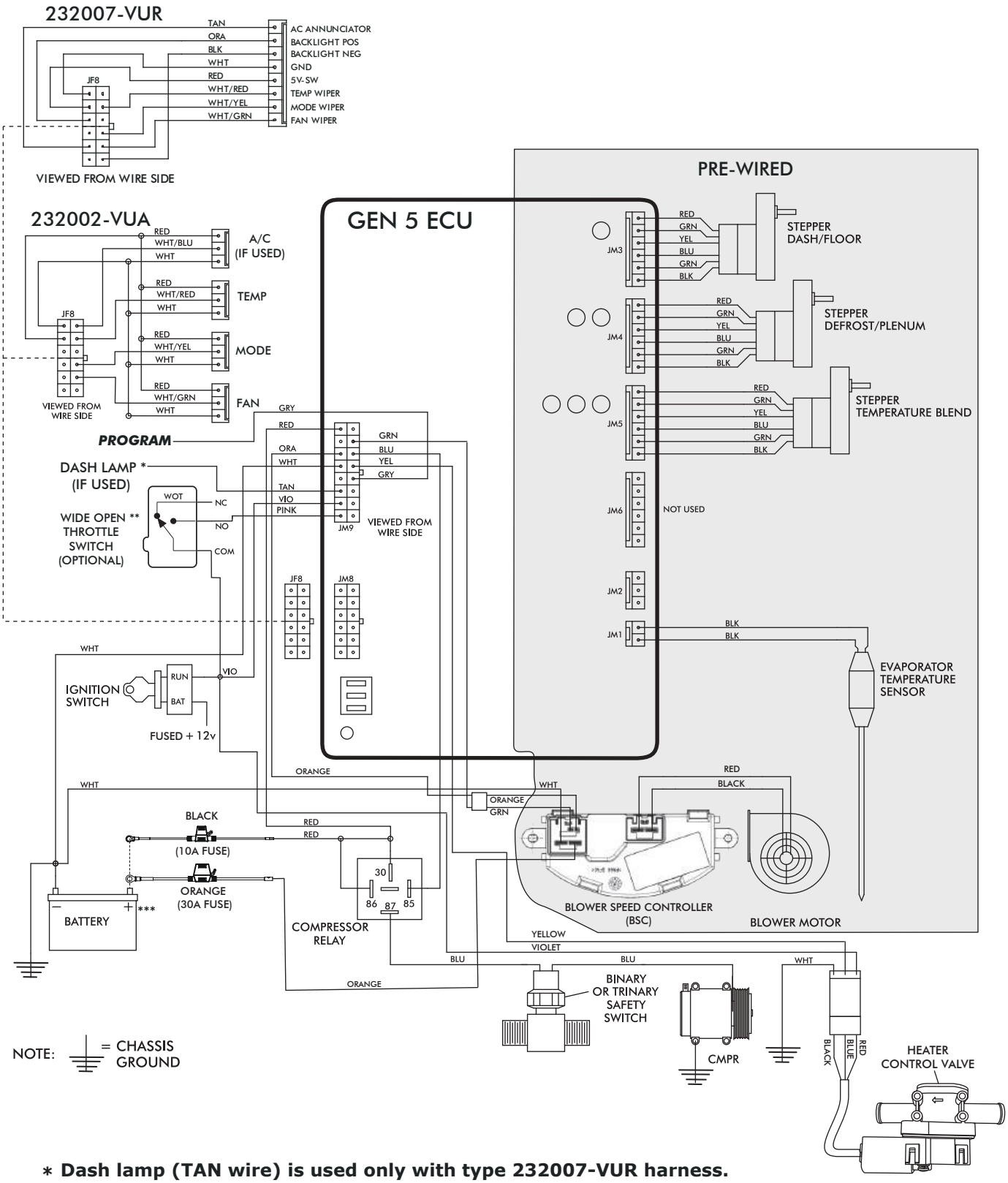
Photo 5



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.

Photo 5a

Gen 5 Wiring Diagram

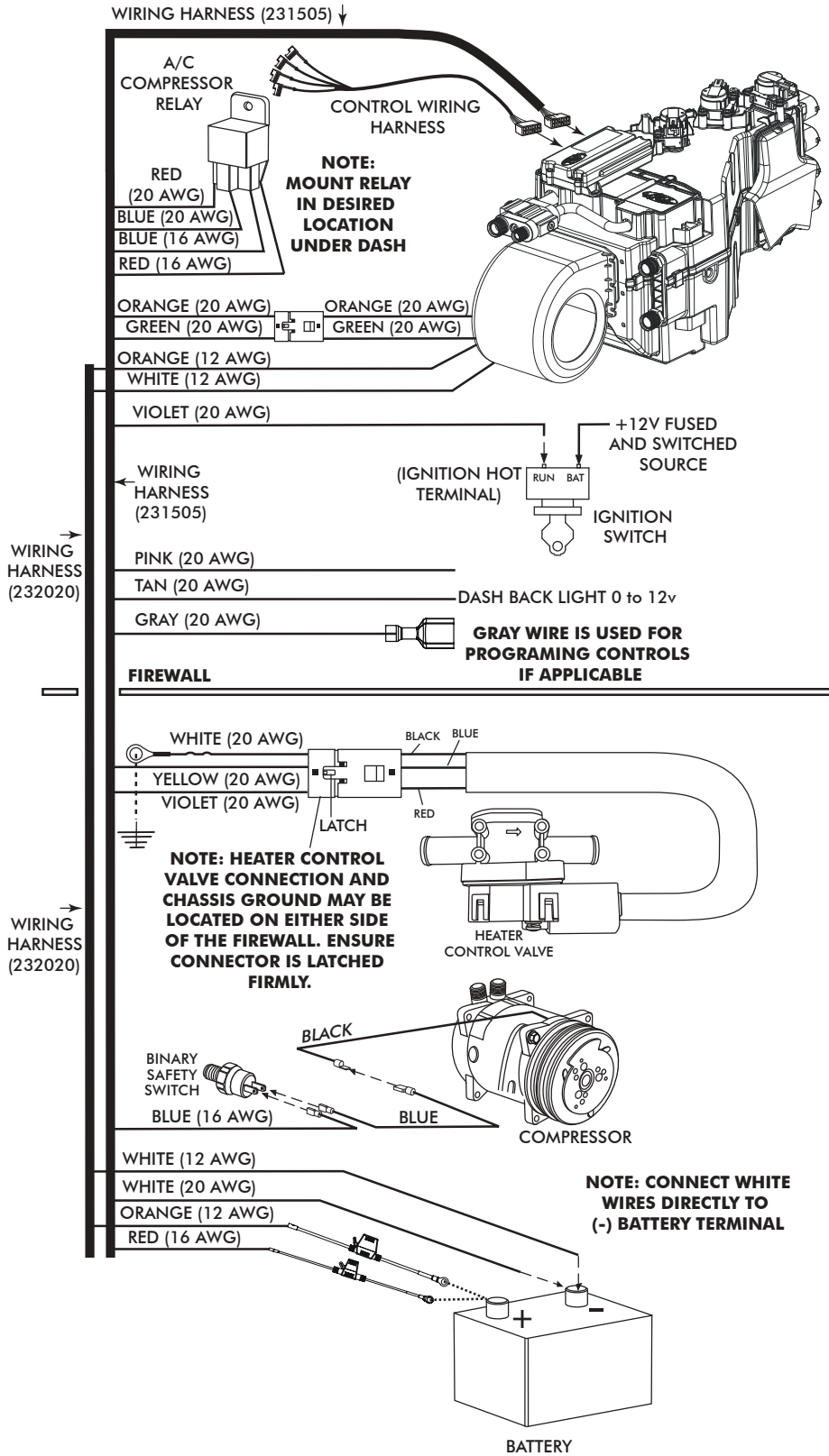


∗ Dash lamp (TAN wire) is used only with type 232007-VUR harness.

∗∗ 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.

Gen 5 Wiring Instructions



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).

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.

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.

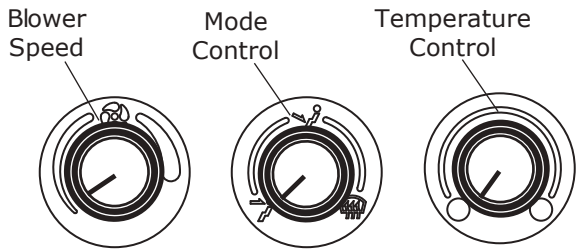
Operation of Controls

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.

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

Mode Control
This lever/knob controls the mode positions, from DASH to FLOOR to DEFROST, 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).

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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.	Check for damaged pins or wires in the control panel wire assembly and mating header at ECU.	If found damaged, replace wire assembly or ECU.	
		Check for a bad ECU GND.		
	All other functions work.	Check for damaged pins or wires in the control panel wire assembly and mating header at ECU.	If found damaged, replace wire assembly or ECU.	
		Check if Blower power fuse is blown.	Replace fuse.	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.
		Check for a bad ECU GND.	Repair connection.	
2. Compressor will not turn on (All other functions work).	System is not charged.	System must be charged for compressor to engage.	Charge system.	**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/red 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/Red 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	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 (751727)

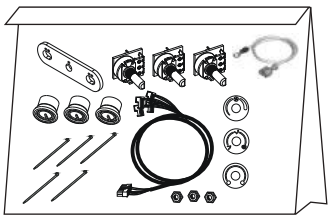
No.	Qty.		Part No.	Description
1.	1	_____	765275	Gen 5 Magnum Max Module with 454 ECU
2.	1	_____	791727	Accessory Kit

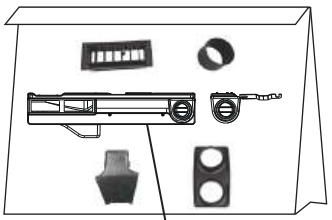
Checked By: _____
Packed By: _____
Date: _____

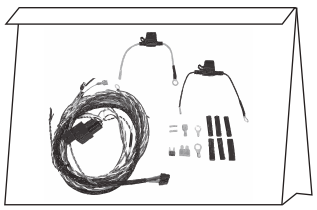
1

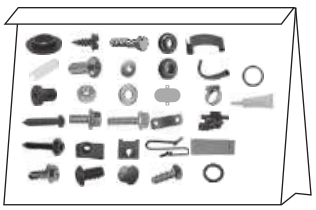
Gen 5 Magnum Max Module with 454 ECU 765275

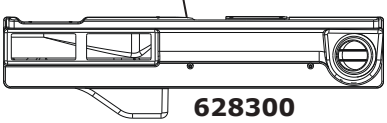
2











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Accessory Kit 791727

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