



**GEN 5 DASH A/C KIT VANAGON
INSTRUCTIONS**

DASH A/C KIT VANAGON INSTRUCTIONS

Parts NOT Supplied

The hoses necessary for the A/C system as well as the condenser are supplied separately from the base kit. You will need to ensure you have the proper compressor fittings to connect the AC system to varying year/make engines. For perspective, customers use this kit on WBX motors, Subaru Motors, Bostig kits, and more. To reiterate the compressor fitting will vary by vehicle and engine/ compressor type so these parts are available separately.

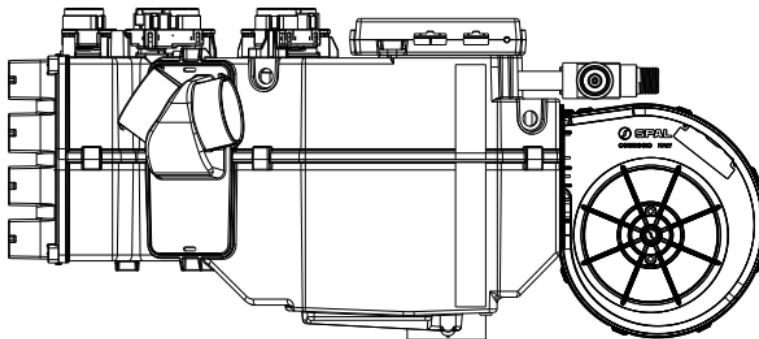
- Compressor and condenser
- Fittings for compressor
- Hoses for A/C
- Wire and connectors for extending wiring to stereo
- Wiring and connectors for in dash power outlets

1. Tools Needed

- Basic hand tools
- Drill and bits, 1" hole saw
- Small abrasive disc cutoff tool or similar for cutting dash
- Wire connector crimper, wire stripper

**** IMMEDIATELY UPON DELIVERY, OPEN ALL PACKAGES AND CHECK CONTENTS OF SHIPMENT. PLEASE REPORT ANY SHORTAGES DIRECTLY TO SMALL CAR WITHIN 15 DAYS. AFTER 15 DAYS, SMALL CAR WILL NOT BE RESPONSIBLE FOR MISSING OR DAMAGED ITEMS.**

1.) EVAPORATOR SUB CASE – QTY. 1

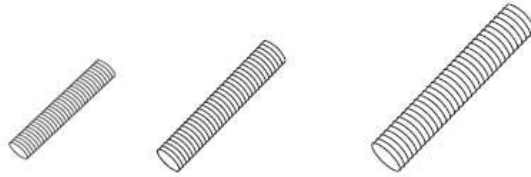


2.) HOSE A/C DUCTING 1.5" – QTY. 4FT

3.) HOSE A/C DUCTING 2" – QTY. 10FT

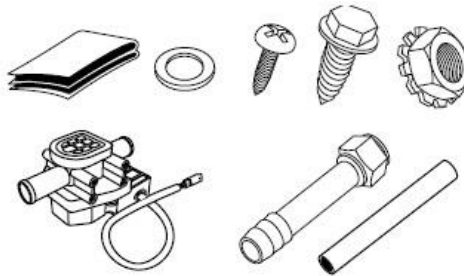
4.) HOSE A/C DUCTING 2.5" – QTY. 14FT

Small Car
P E R F O R M A N C E

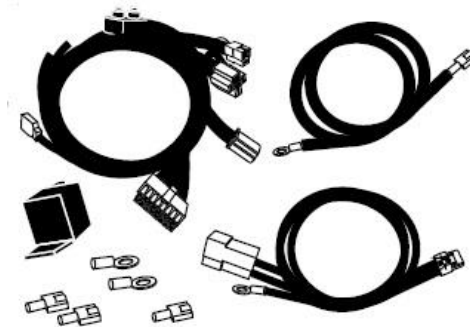


5.) HEATER HOSE INSULATION TUBE 6' – QTY. 2

6.) HEATER VALVE KIT – QTY. 1



7.) WIRING PARTS KIT – QTY. 1



8.) 40/30 AMP RELAY – QTY. 1



9.) 30AMP ILLUMINATED ROCKER SWITCH – QTY. 1

Small Car
P E R F O R M A N C E



10.) EVAPORATOR DRAIN HOSE WITH 90 ELBOW – QTY. 1

11.) DASH LOUVER 5.25"X2.5" – QTY. 2



12.) DEFROST ADAPTERS – QTY. 2

13.) CONTROL PARTS

ROTARY POT ASM – QTY. 3
 KNOB BLACK – QTY. 3
 A/C SWITCH – QTY. 1
 LOW SPEED FAN RELAY – QTY. 1
 UNIVERSAL CONTROL HARNESS – QTY. 1
 4" CABLE TIE – QTY. 5
 GROUND WIRE – QTY. 1
 CONTROLS LABEL – QTY. 1



14.) SELF TAP SCREW #2 10-16 – QTY. 18

NUT 4MM NYLOCK – QTY. 13

CAP SCREW 4MM – QTY. 13

M6 BOLT – QTY. 4

M6 WASHER – QTY. 4

Small Car
PERFORMANCE

M6 NUT – QTY.4

EXPANDING RUBBER MOUNTING NUTS QTY. 3

M6 FLANGED NUTS QTY. 3

#8 X 3/4" SELF DRILLING SCREWS – QTY. 2

GROMMET ID 23/32" OD 1-9/32" – QTY. 1 (1-1/16" DIAMETER HOLE)

GROMMET ID 1" OD 1-3/4" – QTY. 1 (1-3/8" DIAMETER HOLE)

ANTENNA CABLE EXTENSION – QTY. 1 (ONLY WITH RIGHT SIDE RADIO OPTION)

CABLE TIE HOLDER – QTY. 1

14" CABLE TIE – QTY. 30

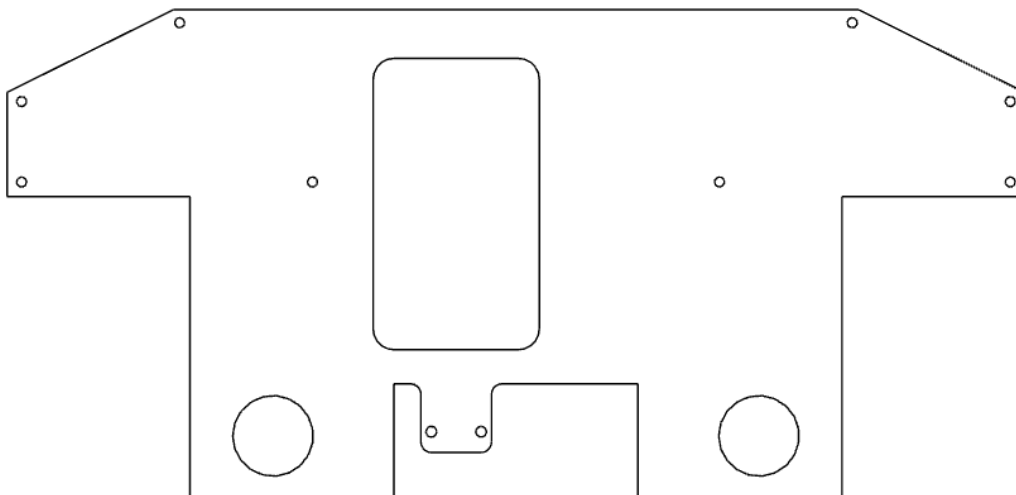
5/8" BRASS HOSE MENDER – QTY. 2

HEATER HOSE CLAMPS – QTY. 4

15.) PRE-FORMED HEATER HOSE 90S – QTY. 2.

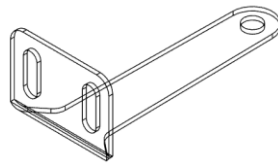


16.) FRONT AIR FLOOR HEAT ADAPTOR – QTY. 1

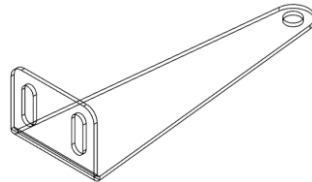


17. MOUNTING BRACKET A – QTY. 1

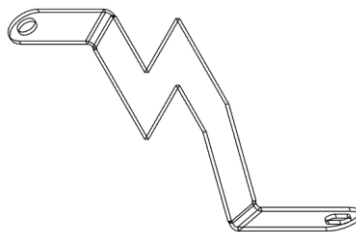
Small Car
P E R F O R M A N C E



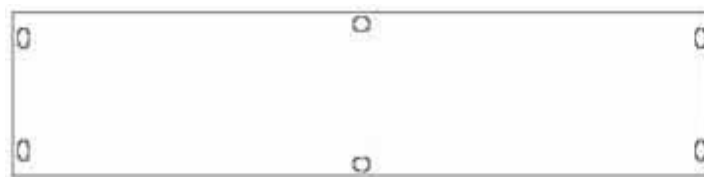
18.) MOUNTING BRACKET B – QTY. 1



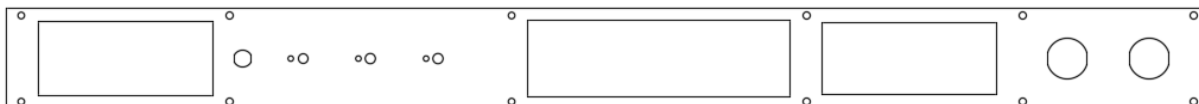
19.) MOUNTING BRACKET C – QTY. 1



20.) FRONT AIR INLET PLATE COVER – QTY. 1



21.) DASH COVER PLATE – QTY. 1



22.) 12V POWER SOCKET – Qty. 2 (1 WITH CENTER RADIO OPTION)



23.) WIPER COVER - Qty. 1



24.) #8 U-BEND HARDLINE Qty. 1

25.) #10 U-BEND HARDLINE Qty. 1

26.) TRINARY SWITCH Qty. 1

27.) BLUE SEA 4 GANG FUSE PANEL Qty. 1 (with 2 30A and 1 10A fuses)



Small Car
P E R F O R M A N C E

KIT DOES NOT INCLUDE:

- A/C COMPRESSOR
- A/C CONDENSER
- A/C RECEIVER DRIER
- ADDITIONAL 14 GAUGE WIRE FOR EXTENDING WIRING
- WIRE CONNECTORS
- FLEXIBLE WIRE COVER TUBING
- FOAM SELANT TAPE
- HEAT SHRINK TUBING
- LUBE FOR THREADING AND CONNECTING HOSES
- PAG 100 A/C OIL

*****IMPORTANT NOTICE – PLEASE READ*****

READ THE INSTALLATION INSTRUCTIONS COMPLETELY AND FAMILIARIZE YOURSELF WITH ALL THE PARTS AND ILLUSTRATIONS.

SYSTEM COMPONENTS: THE EVAPORATOR IS CAPPED. CAPS MAY BE UNDER PRESSURE WITH DRY NITROGEN. DO NOT REMOVE CAPS PRIOR TO INSTALLATION. REMOVING CAPS PRIOR TO INSTALLATION WILL CAUSE COMPONENTS TO COLLECT MOISTURE AND LEAD TO PREMATURE FAILURE AND REDUCED PERFORMANCE.

1. DASH REMOVAL

- a. Disconnect Battery.
- b. Remove cover to instrument panel.
- c. Remove instrument panel (remove 4 screws, speedometer cable, wiring harness, and plugs for switches and warning lights).
- d. Remove the glove box and ash tray.
- e. Remove the stereo.
- f. Pull the knobs off the heater control levers (4 knobs) and remove the faceplate.
- g. Unscrew the heater lever assembly from the dashboard (3 screws).
- h. Unplug rear fan switch.
- i. Disconnect the cigarette lighter.
- j. Loosen but don't remove bolts holding steering column to body. This gives the steering wheel clearance to remove the dashboard.
- k. Remove snap off torque bolts holding dashboard to the steering column. **These will have to be replaced later with new bolts.**
- l. Remove screws along top of dashboard and along the side near door jams.
- m. Disconnect all ductwork from the vents (2 defrost and 2 fresh air vents). The center defrost vents don't have any ductwork or screws.
- n. Now with the steering wheel loosened, give the dashboard a good tug towards the rear of the van and the dashboard will break free of the body. Then just rotate it out.
- o. Remove all plastic and paper hoses.

2. REMOVE CABLES AND CONTROLS FOR ORIGINAL HEATER AND FRESH AIR BOX**3. REMOVE THE ORIGINAL HEAT/FRESH AIR BOX**

- a. Remove the heater core hoses from the Heater box
- b. Remove the 4 bolts and nuts from the left and right side of the Heater box (later models have 2 mounting bolts from the outside behind the front grill)
- c. Cut the black/red stripe wire that is connected to the heater box (this is the key on RUN position power wire for the blower fan motor which will be used later)



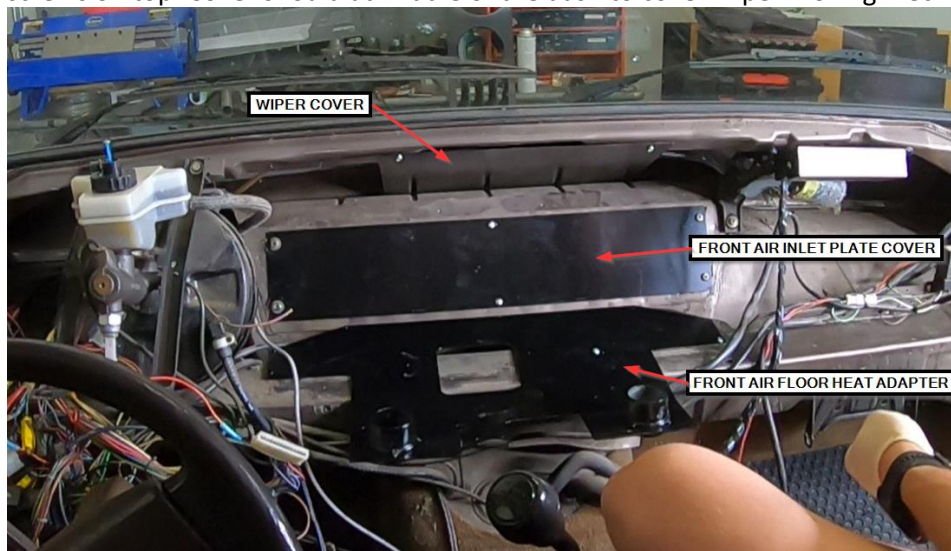
- d. Drain excess coolant in a bucket and plug the heater core pipe. With all the hoses and mounting hardware removed, give the heater box a good tug towards the rear of the van and remove

4. LENGTHEN WIRES FOR RADIO RELOCATION (RIGHT SIDE RADIO ONLY)

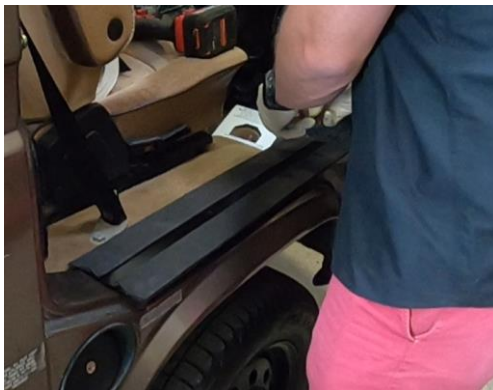
- a. With the factory heater box removed, extend the radio wiring (one wire at a time) to relocate the radio above the glove box (approx. 12-18in.) Add antenna extension if needed.

5. INSTALL WIPER COVER, FRONT AIR INLET PLATE OVER, AND FRONT AIR FLOOR HEAT ADAPTER

- a. Push wiper cover into the groove above fresh air vent then secure with 2-3 self-taping screws on top. Cover should at middle of the dash to cover wiper moving mechanism.

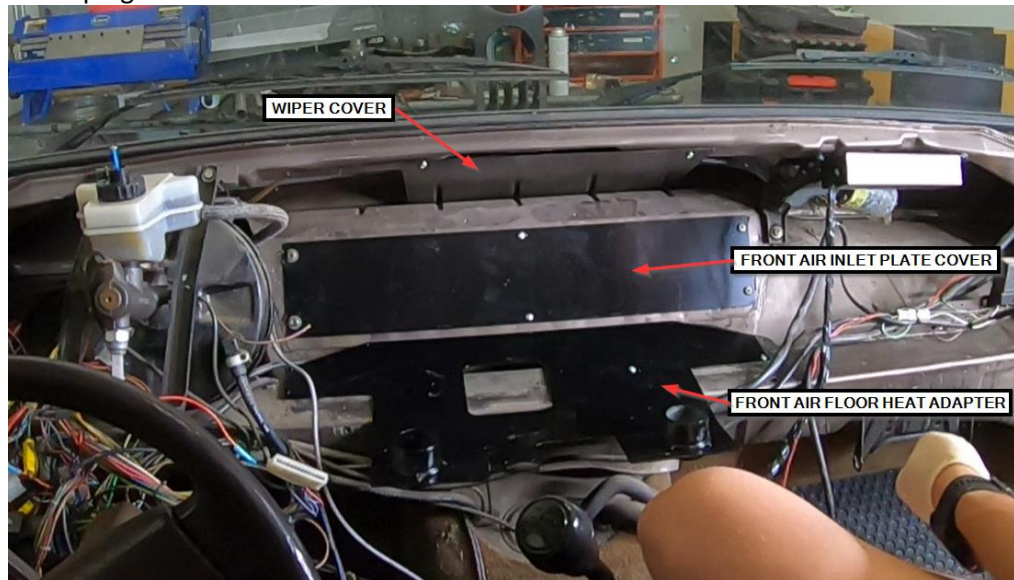


- b.
 - i. Take the supplied foam tape and apply it to the back of the front air inlet plate cover.



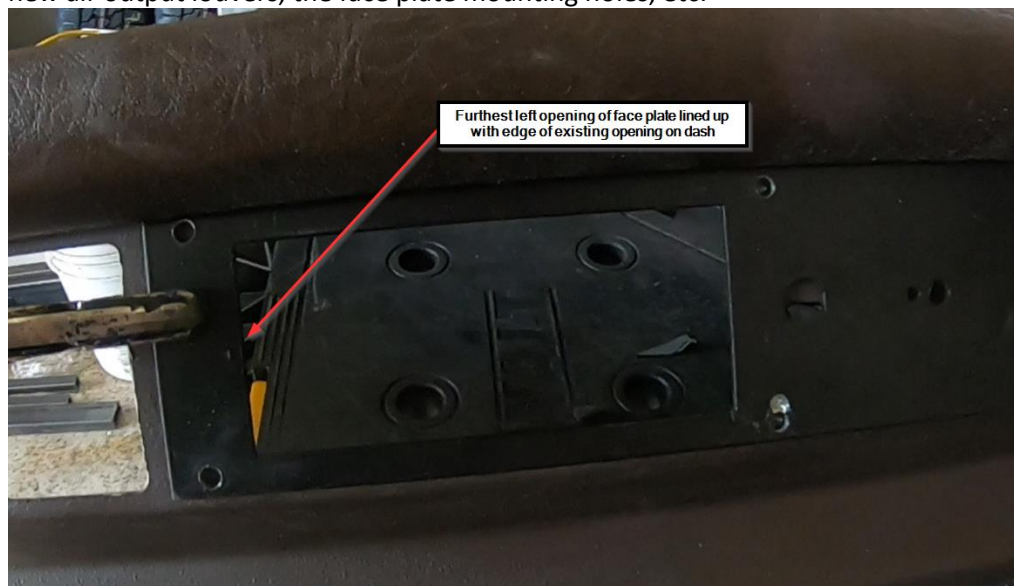
- ii. Align the front air inlet plate cover at the location shown below. It should completely cover the hole in the van sheet metal. Secure with 6 self-taping screws. You may be able to reuse the screw holes for the stock airbox.

- c. Align the edges of the front air floor heat adapter with the edges on the van in the location shown below. It will be very clear where the plate needs to sit. Secure with 9 self-taping screws.



6. MARK DASH FOR NEW FACE PLATE

- a. Position the dash face plate over the existing openings; start with lining up the left opening. Drill two holes, one on each end to hold in place until you mark areas to be cut or use a clamp to hold it in place. Mark the openings for the new radio position, the new air output louvers, the face plate mounting holes, etc.



7. DRILL DASH FOR FACE PLATE MOUNTING BOLTS & CUT OPENINGS

- a. Using an abrasive disc cutoff or similar tool, cut the dash openings so that they are 1/16-1/8" larger than the faceplate holes. Drill the mounting holes around the

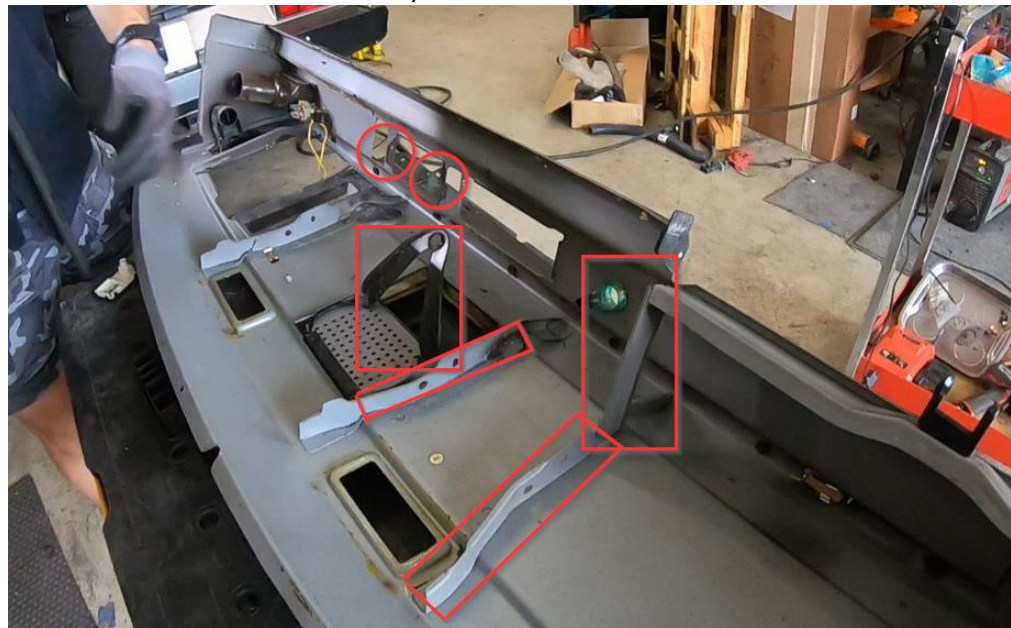
perimeter to exact size or slightly larger.



8. CLEARANCE UNDERSIDE OF DASH

Remove rear radio support and the portion of the support ribs adjacent to the defrost outlets.

- a. The sections to remove are boxed/circled below.



Small Car
PERFORMANCE

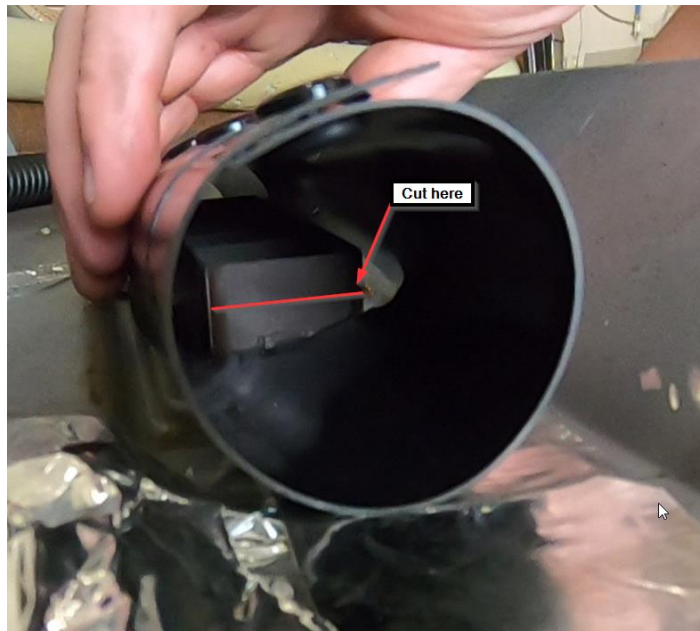
© 2021 Small Car Performance

- b. A completely trimmed dash backside can be seen below. Be sure to cover the cut edges with some kind of tape to prevent them from tearing your ducts later on.



9. DASH COMPONENT INSTALLATION

- a. Take your two inner defrost vent outlets and cut half of their depth off. This will allow for better air flow. The red line in the image below shows where to cut. Notice that without cutting the vent outlet it restricts airflow through the tube.



Small Car
PERFORMANCE

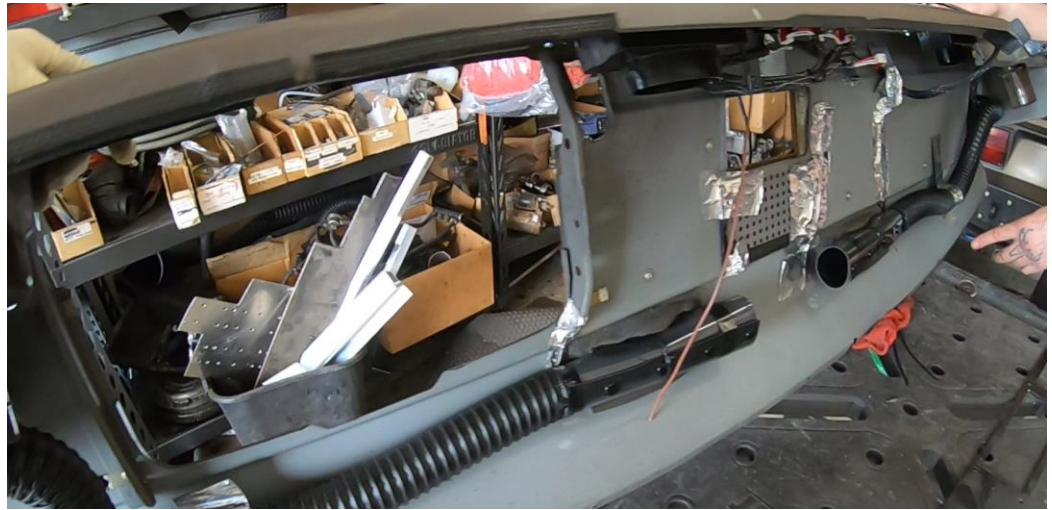
A cut vent outlet is shown below for reference.



- b. Place the defrost adaptors over the defrost louvers, mark and drill 1/8" holes through the sides of the louvers. Use wire ties to secure the new defrost adaptors to the louvers. The zip tie should go through the hole in the vent and around the adaptor. This will seal the vent to the adaptor if performed correctly to minimize air escape.



- c. Install 1.5-inch ducting using wire ties to secure them onto fittings. Use tape to keep hoses positioned as shown below. The hoses will route from the smaller outlet of the adaptors to the two outer defrost vents.

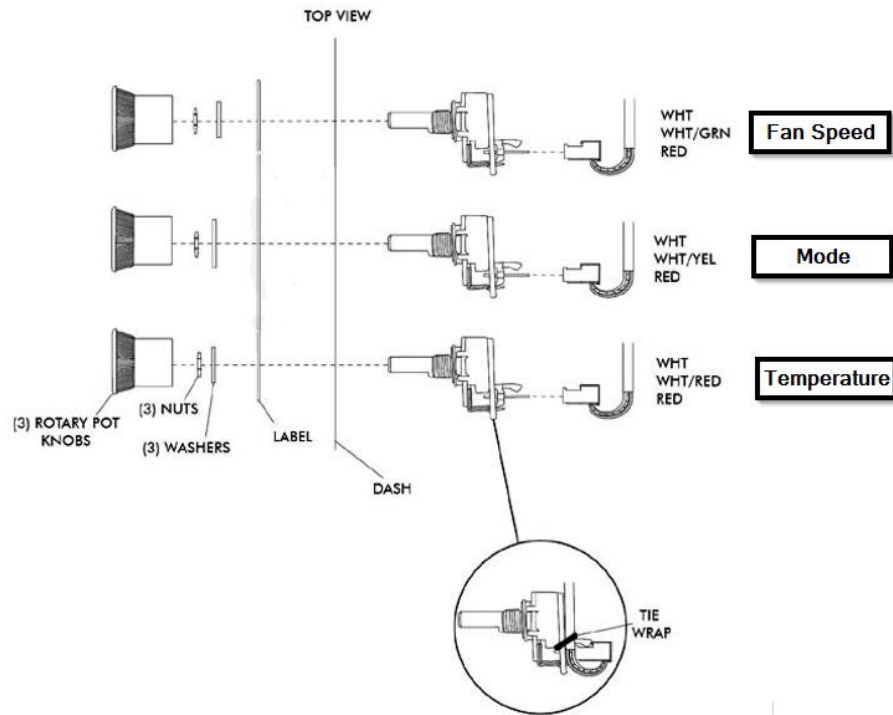


- d. Install the faceplate using the supplied socket head cap screws.



- e. Install the louvered outlets and the supplied power sockets. The louvered outlets will clip into place if the hole has been cut to the correct size and the power sockets are retained with a nut.
- f. Install the three rotary controls, the decal, and knobs. The rotary switches are retained with a nut. This nut comes installed on the switch and must be removed before the switch can be installed. Push the switch through the hole in the plate and install the nut on the exterior side of the plate. Before tightening the nut make sure that the tab on the switch is in the small anti rotation hole on the face plate. The knobs are retained with a small set screw. Loosen that screw, slide the knob onto the shaft leaving a small gap so that the knob doesn't rub on the face plate, then tighten the set screw ensuring

that the set screw lands on the flat part of the rotary switch's shaft.



- g. Now you must install the compressor switch. This switch allows you to turn the compressor off while driving. Center mount radio face plates will have a hole for this switch to the left of the control knobs. Right mount radio face plates will not have this hole and the switch will need to be mounted elsewhere. We like to mount the switch into the metal dash just below the control knobs. The electrical connections for this

switch will be made later. An installed switch is shown below.



10. U-BEND HARDLINE INSTALLATION

- a. Lubricate the O-ring on the end of each of the provided hardlines.
- b. Insert the hardlines into the evaporator outlets and hand tighten their nuts.
- c. Use one wrench to hold the evaporator nut and one to hold the nut on the hardline. Tighten the nut. Repeat on remaining line.
- d. Installed hard lines are shown below.



11. Drain Hose Installation

- a. Below your dash, in between where the heater hoses and the old AC control cables run through, drill a .5 inch hole. This is where your drain hose will run.



- b. Slide the included drain tubing assembly onto the nipple on the bottom of the AC unit.



- c. Upon installation of your AC unit you will feed this hose through the hole indicated below and then out through the hole you drilled in step 11.a.



12. DRIVER SIDE FACE VENT DUCT ROUTING

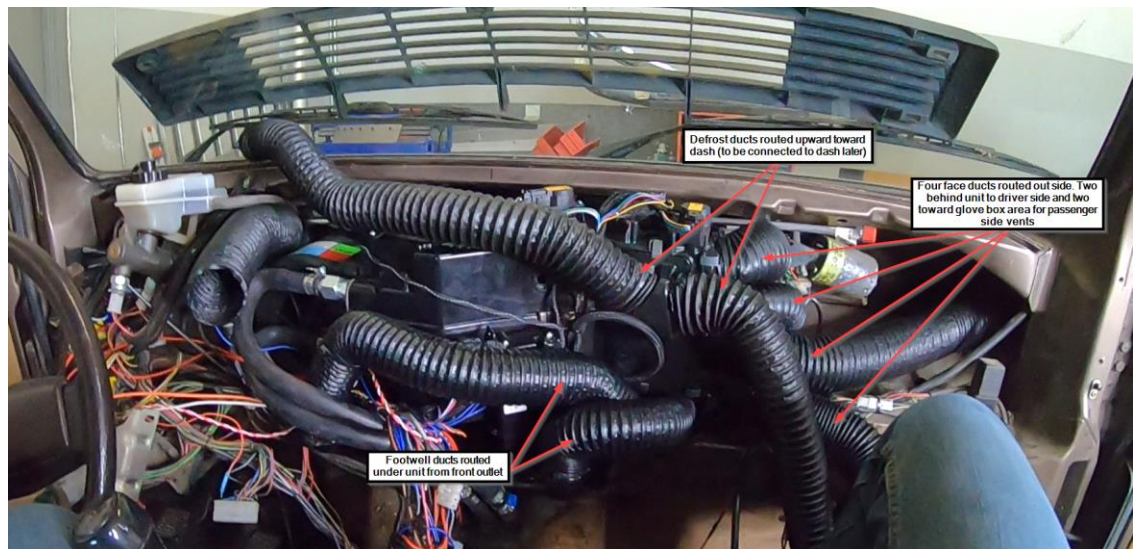
- You will now route ducts for the two driver's side face ducts. These ducts must be routed now since they will be behind the AC unit. You will use the 2.5-inch ducting for these runs.
- The far-left duct should be routed first. This duct will start right by the wiper motor and terminate to the left of the steering wheel. The duct should be routed back and around the brake booster.
- The second for the far-left duct should be routed next. This duct will also start by the wiper motor and terminate to the right of the steering wheel.

- d. The image below shows the duct routing.



13. AC UNIT OUTLET MOUNTING

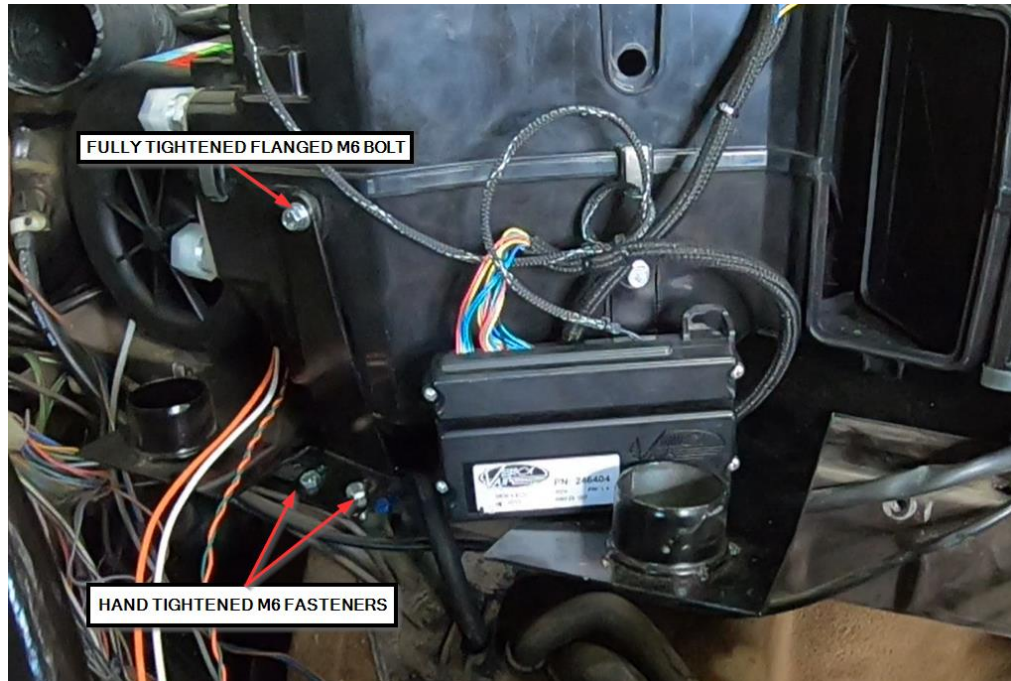
- a. You will now install the duct outlets onto the unit. The front of car outlet will be the footwell outlet, the side outlet will be the face outlets, and the rear of car outlet will be the defrost outlet. The footwell outlet should point down and the defrost outlet should point up. The face outlet is the plate with 4 round openings. The outlets are retained with metal spring clips which can be found in the fastener bag. A unit with ducts installed is shown below. This should help you understand what direction the ducts need to point. You of course have the freedom to change the orientation of the outlets but the controls for each outlet are fixed.



14. AC UNIT MOUNTING

- a. We will now mount the AC unit to the vehicle. Set the AC unit onto the floor air heat adapter plate with the blower fan on the driver's side of the vehicle.
- b. Take your three expanding rubber mounts and insert them into each of the holes on the unit.

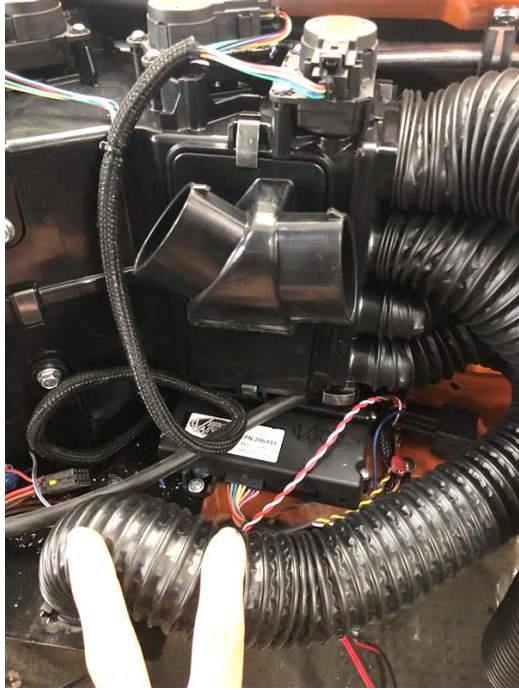
- c. Take mounting bracket A, 2 M6 nuts, 2 M6 washers, 2 M6 nuts. Attach mounting bracket A to the floor air heat adapter plate using those fasteners. Only hand tighten the fasteners.
- d. Take an M6 flanged bolt pass through the upper hole on mounting bracket A and thread it into the expanding rubber mount. Fully tighten this bolt.
- e. Your loosely installed bracket should look like the image below.



- f. Now repeat the same process in steps a-e but with mounting bracket B. This bracket gets installed just to the right of the previously installed bracket. However, with this bracket you MAY need to drill two holes once you find a good position for the unit to sit. You may have holes here already, if you do then there is no need to drill.
- g. Once both brackets have been loosely installed you must push the AC unit forward so that it is snug up against the wiper cover. Once snug, tighten all four fasteners.
- h. Once tightened, check that your wipers work and aren't interfered with. If necessary, adjust the position of the unit.
- i. Mounting bracket C will be installed later.

15. RELOCATE ECU

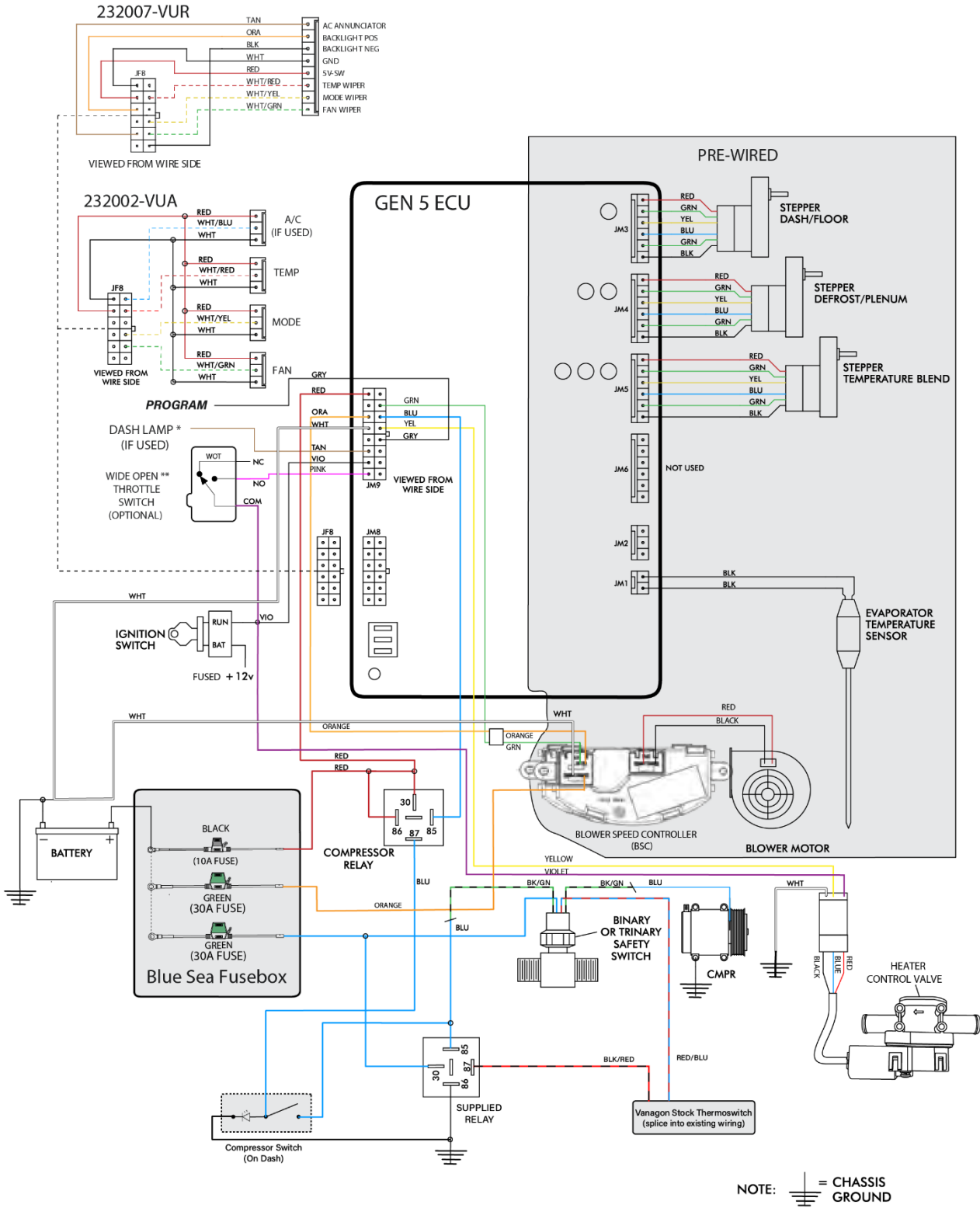
- a. The best location for the ECU is next to the glove box. This location allows for easy access when diagnosing issues and gives more room for the radio. Note that some images in these instructions do not show the ECU behind the glove box. These images will be updated later. The ECU is not waterproof. If you have a window shield leak—you need to address that immediately. The best location for the ECU is shown below.



16. WIRING

You will find most of the necessary parts to wire up your system. You may need to supply basic crimp connectors, electrical tape, zip ties, etc. The Blue Sea Fuse Panel included is used in place of the 3 inline fuse holders previously included in the kit. The diagram below shows how to wire up your system. There are many ways to do this however, the diagram below shows a wiring method that can be used in every water cooled Vanagon. Small Car Performance will offer technical support to customers that have chosen to wire up their system as shown below. If you chose to do differently, we can no longer offer support as this has led to countless hours of customer support.





17. HEATER HOSE INSTALLATION

- a. Take the two threaded barb fittings included in the heater valve kit and thread them onto the threaded ports on the AC unit as shown below.

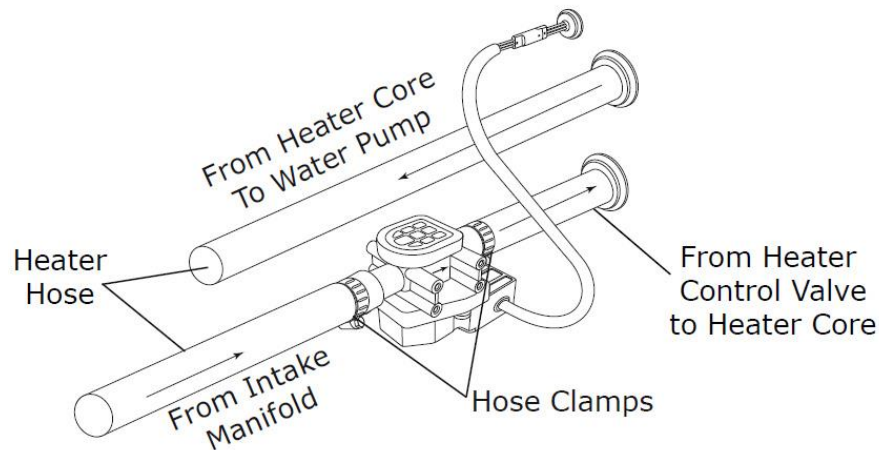


- b. Next, take the pre-formed 90s and slide them onto the end of the barb fittings. Install a hose clamp on each hose. The hoses should be routed through the center of the footwell duct adapter plate then through the holes that the original heater hose ran through.
- c. One of these hoses will be connected to the heater valve in the next section. Leave that hose long for now.
- d. The other can be sliced into the existing heater hose using the supplied menders or it can be connected to the existing mender shown below. The existing mender can be found to the left of the shift box.



18. HEATER VALVE INSTALLATION

- a. Remove the stock Vanagon heater valve and replace it with the new Vintage Air heater valve. The valve is found above the spare tire at the front of the van. It is held in place by two spring clamps. These clamps can be removed with spring clamp pliers or standard pliers. You will be reusing these clamps.
- b. After the heater valve has been installed, connect it to the dash AC harness.
- c. If you lose a lot of coolant during installation, be sure to fill your system and bleed if necessary.
- d. Reference the diagram below for hose routing and flow directions.

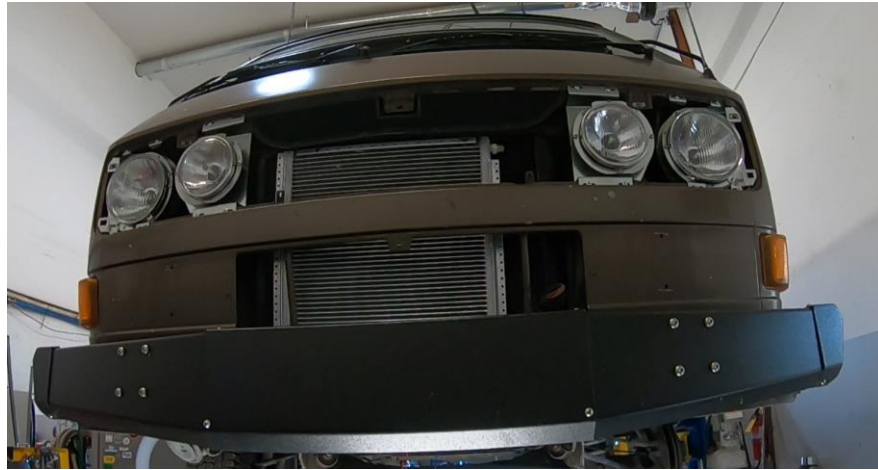


19. CONDENSER INSTALLATION

Condensers that fit the Vanagon radiator are available from us on our website. [Condenser Link](#). You can attempt to reuse an original Vanagon condenser at your own risk. We suggest thoroughly flushing the used condenser if you choose to do this.

- a. You will now install the new condenser to the front of your radiator. The radiator can be dropped and hung from the bottom of the vehicle for this installation.
- b. Align the condenser to the front of the radiator so that the inlet and outlet point toward the driver's side of the van.
- c. Using self-tapping screws, attach the condenser to the radiator. We suggest using some sort of spacer like an M6 nut between the radiator and condenser so that there is room to turn the refrigerant hose fitting nuts you'll be installing later.

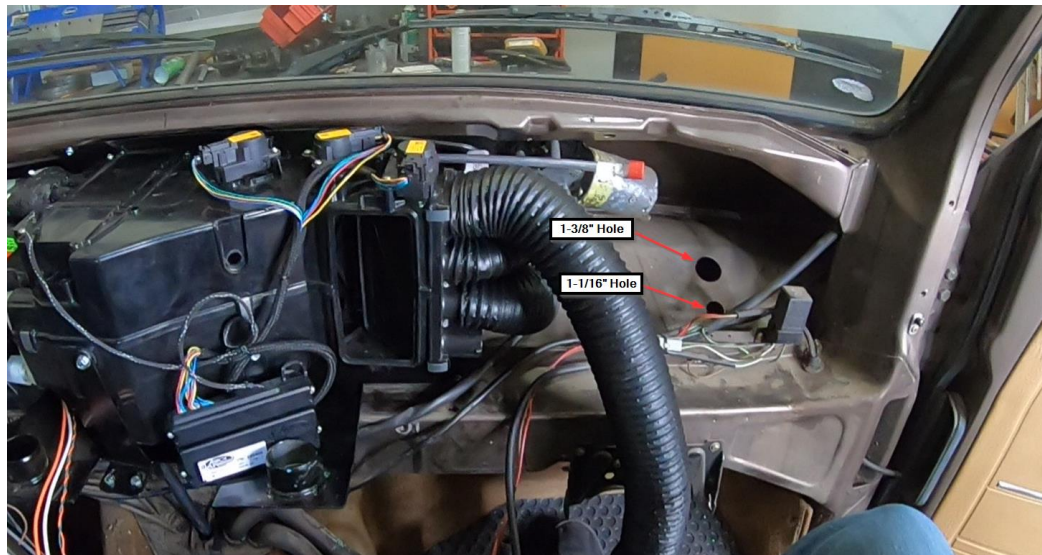
- d. An installed condenser is shown below for reference.



20. INSTALL REFRIGERANT HOSES

It is very important to install new refrigerant hoses when installing our dash AC. The original Vanagon refrigerant lines were designed for R12. A refrigerant that is no longer available. Our system uses R134a which requires a different type of refrigerant line. If you choose not to replace your refrigerant lines your refrigerant will leak out over time costing you money and harming the planet.

- First you must drill two holes in the inner dash for the #6 and #10 refrigerant lines to pass through. Prepare a drill with a step drill bit.
- Drill both holes in roughly the location shown below. One hole should be 1-1/16" in diameter and the other should be 1-3/8" in diameter. The larger hole should be on top.



- Now you must mount your filter drier. We like to mount this in the location shown below with self-tapping screws. **Be sure not to open the filter drier until you are ready**

Small Car
PERFORMANCE

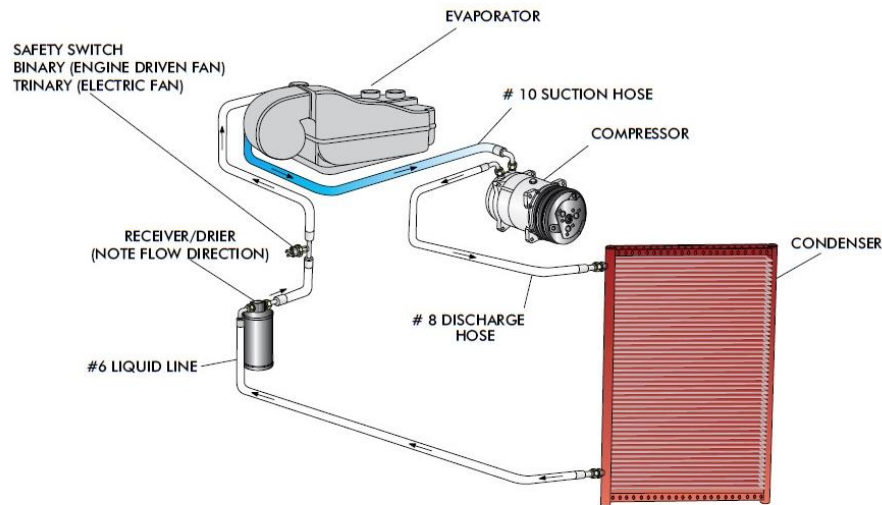
to connect it to the refrigerant lines.



- d. Next you will need to lay out the #8 and #10 hoses on the ground. Run a 10 AWG to 16 AWG (anywhere in that size range) wire along the #10 hose and tape it along the way. This wire needs to go from the compressor to the trinary switch and taping it to the #10 hose makes for easy routing.
- e. Route the #8 and #10 hoses from the compressor to the front of the vehicle. Note that the condenser and evaporator connections should be made before the compressor connections to ensure there is adequate length. We like to start routing on the driver's side of the engine bay, run up through the center of the gas tank (in a Syncro run by the front diff). The #8 hose will be connected to the larger outlet of the condenser using the supplied #8 90. The #10 hose will be routed through the larger hole into the cabin with the larger grommet installed to protect the hose. This #10 hose will then be connected to the previously installed hardline using the supplied #10 90-degree connector.
- f. Take the full length of #6 hose and install the supplied #6 90. Connect that 90 to the small outlet on the condenser.
- g. Route that hose over to the filter drier and cut it to length. Install the supplied straight #6 to the end of that hose and connect it to the inlet of the filter drier. The drier has indicators for flow direction.
- h. Now route the remainder of the #6 hose up into the cabin with the small grommet on the hose to protect it where it passes through. Install the supplied #6 90 to the end of that hose and then connect it to the previously installed #6 hardline.
- i. Route the remainder of the #6 hose to the outlet of the filter drier and install the remaining #6 90 then connect it to the filter drier.
- j. Now install the trinary switch onto the top of the filter drier and wire it in. Reference the wiring diagram in the wiring section.

- k. Now cut the #8 and #10 hoses to length in the engine bay and install the #8 and #10 90s that have the filling ports on them then connect them to the compressor.
 - i. If you need compressor fittings, please reach out to us. We may have what you need but there is lots of variation between motors and compressors, so we do not have a one size fits all solution.
- l. Go through and secure all your refrigerant lines with clamps or zip ties. Reference the diagram below to help with installation but note that the diagram is not entirely accurate when it comes to what fittings go where and the location of the trinary switch.

TYPICAL HOSE ROUTING DIAGRAM



DIRECTION OF REFRIGERANT FLOW INDICATED BY ARROWS

- m. If you are not hooking up your rear evaporator as well you can now pressure test, vacuum test, and charge the system. If you are hooking up your rear evaporator please continue to the next step.

THIS SYSTEM IS DESIGNED TO OPERATE WITH R134a REFRIGERANT ONLY! USE OF ANY OTHER REFRIGERANTS COULD DAMAGE EITHER YOUR AIR CONDITIONING SYSTEM OR YOUR VEHICLE. USE OF ANY OTHER REFRIGERANTS WILL VOID ALL WARRANTIES OF THE AIR CONDITIONING SYSTEM AND COMPONENTS. USE OF THE PROPER TYPE AND AMOUNT OF REFRIGERANT IS CRITICAL TO PROPER SYSTEM OPERATION. WE RECOMMEND OUR SYSTEMS BE CHARGED BY WEIGHT WITH A QUALITY CHARGING STATION OR SCALE.

REFRIGERANT CAPACITIES FOR SMALL CAR SYSTEM

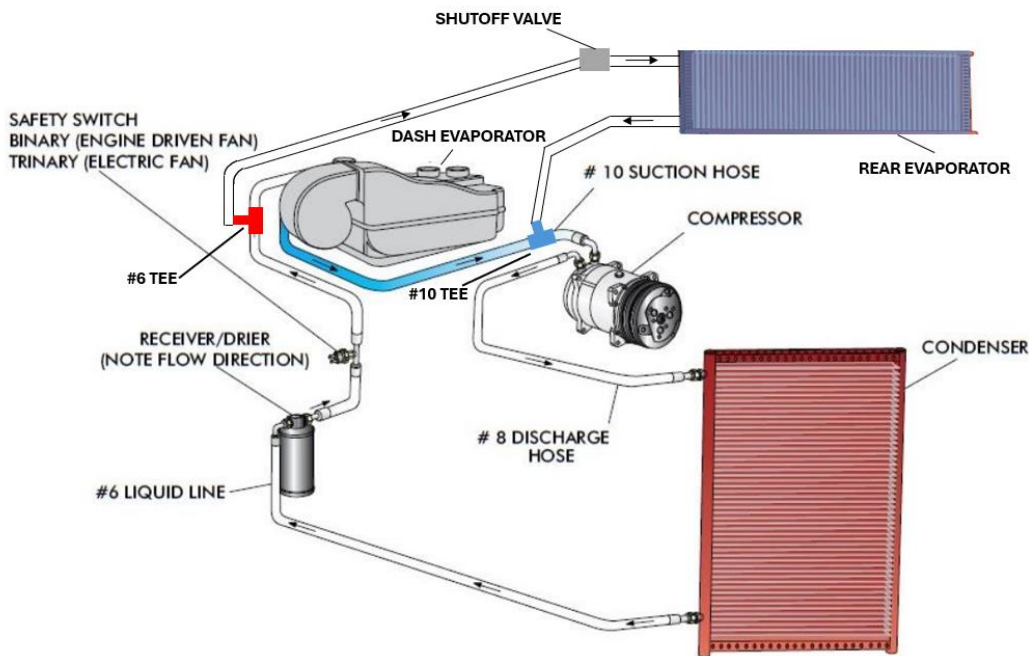
CHARGE WITH 1.8 lbs. (1 lb/ 12 oz) OF R134a REFRIGERANT

LUBRICANT CAPACITIES: 6 oz + COMPRESSOR CAPACITY.

Small Car
PERFORMANCE

SOME COMPRESSORS ARE SHIPPED PREFILLED WITH THE CORRECT AMOUNT OF OIL. SOME ARE SHIPPED DRY AND WILL NEED OIL ADDED. CONSULT COMPRESSOR MANUFACTURER FOR CAPACITY INFORMATION.

- n. To hook up your rear evaporator to your system you will need our rear AC kit. Installation of the kit is straight forward. The entire rear AC system stays intact with just one added electrical component, some hoses and fittings. Just follow the steps below.
 - i. You must first gain access to your rear evaporator. The level of difficulty in doing so depends on the year and trim of your van. See your Bentley manual for disassembly help.
 - ii. Ensure your original AC wiring is in good condition and still runs the fans as it should. Additionally, give your evaporator a visual check for leaks. If you see refrigerant oil on the outside of the unit that likely means you need a new evaporator.
 - iii. Follow the diagram below for your hose connections and the placement of the shutoff valve.



DIRECTION OF REFRIGERANT FLOW INDICATED BY ARROWS

- iv. You will tee into the #6 hose at the front of the van between the receiver drier and the front evaporator. This hose will then run all the way to the rear evaporator. You'll cut into the hose in the back of the van to install the shutoff valve. The shutoff valve should be placed as close as possible to the rear AC

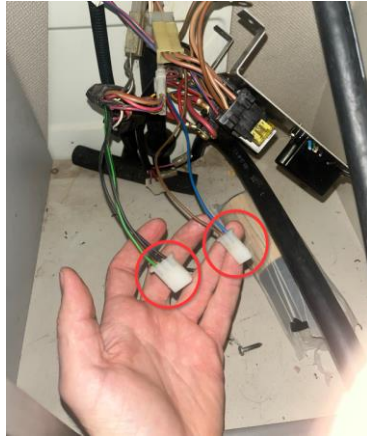
Small Car
PERFORMANCE

wiring so that the fan switch 12V signal can also be used to open the shutoff valve. The #6 hose attaches to the evaporator using the supplied #6 male threaded fitting. The #6 hose attaches to the valve with two of the supplied #6 female fittings. Make sure all fittings have O-rings installed. An installed shutoff valve is shown below.

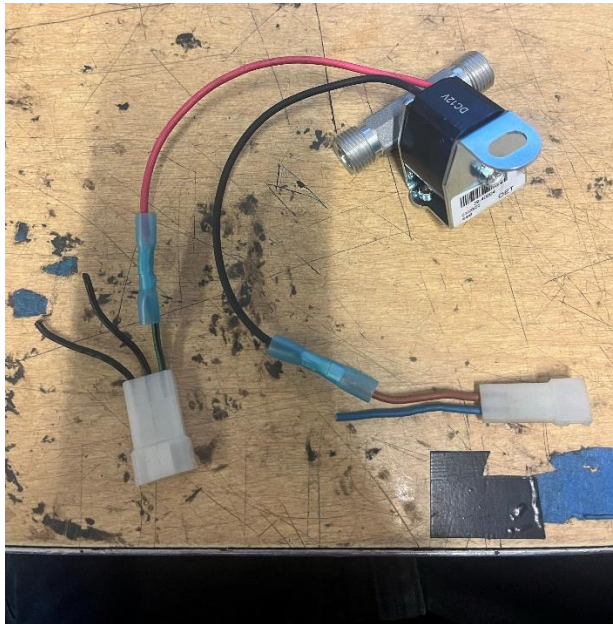


- v. You will tee into the #10 hose in the engine bay. This hose runs straight from that tee up to your rear evaporator. The #10 hose attaches to the evaporator using the supplied #10 male threaded fitting. Make sure the O-ring is present on this fitting.

- vi. You must now wire up the 12V to your shutoff valve. In you stock Vanagon air conditioning electrical system you will find the two connectors shown below. These two connectors go to the controls at the front of the van. The three pin connector supplies 12V and the 2 pin connector supplies ground. If you don't already have your switch installed in the front, install them not. Then, turn the temperature knob to the on position. Then find which pin on the 3 pin connector has voltage. This is your 12V supply to the valve. On the 2 pin connector, the brown wire will serve as your ground.



Take the female ends of the connectors shown above and cut them off of whatever they're going to. Crimp the positive wire of the valve to the 12V supply and the negative wire of the valve to the ground. Once crimped, connect the 2 and 3 pin connectors.



- vii. You can now reassemble your system.

- viii. The system must be charged with 3.2 lbs of refrigerant and 9 oz + compressor capacity of oil.
- o. If you haven't completed your engine bay wiring for the compressor, complete that now.

21. TESTING

You can now power turn the car on and test the system. Check that all controls work as intended and that the system is cooling. If you're having trouble, see the troubleshooting guide at the end of this. Additionally, there is a very long Samba thread regarding our system. If you still don't have a solution, give us a call.

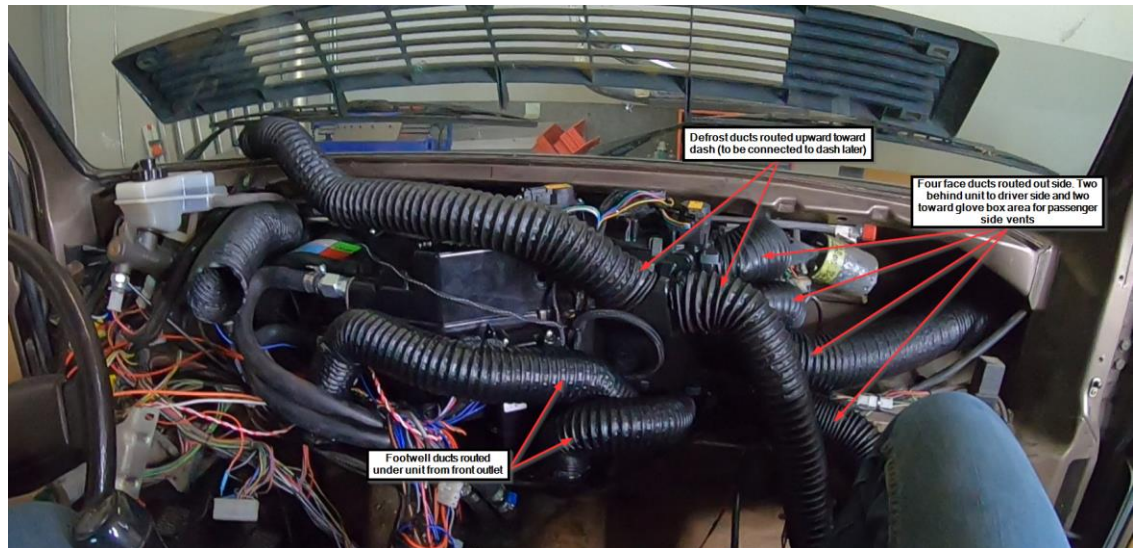
Note on dual AC systems: When running the front and rear system at the same time there will be some reduction in cooling in the front. This is due to the rear evaporator being larger. The front evaporator will work best when the rear AC is off.

22. REMAINING DUCT INSTALLATION

Once we've confirmed the system is functioning correctly, we can install the rest of the ducts.

- a. Take the 2-inch ducting and route the two footwell ducts. Be conservative here and don't leave too much slack. You don't want to end up short on ducting. The ducts should run from the front of the unit, under the unit, then over to each of the chrome outlets on the footwell duct adapter plate. You should be able to install these ducts by reaching around the back of the unit. If you can't, loosen the unit for better access. Secure the ducts to the outlets with zip ties. See image below.
- b. Take the remaining 2-inch ducting and cut it so that one section is about 1 foot longer than the other section. The longer section will go to the driver's side defrost vent and the shorter will go to the passenger side. Connect them and secure with zip ties. See image below.
- c. Connect the two 2.5" driver face ducts that you ran behind the unit. Now install the two remaining 2.5" face ducts for the passenger side face vents. These two ducts can be about equal lengths. Secure all ducts with zip ties.
- d. The completely installed unit (without dash installed) should resemble the image below. Note that the ECU has not been relocated in this image, but it is best to move it

to the glove box area shown in previous steps.



23. FINAL BRACKET INSTALLATION

You will now install bracket C. This bracket is reserved for after AC line installation so that you can manipulate the unit.

- a. Bracket C only goes onto the unit one way. Align it with the unit and attach it using the expanding rubber grommet and flanged M6 bolt. Fully tighten.
- b. Now, collect a self-tapping screw and a drill with a Phillips head bit. Push the unit as far forward into the dash as possible and drive the self-tapping screw into the open hole in bracket C. This is the final secure for the unit.
- c. Check that your windshield wipers are not being interfered with by running them. If they are being interfered with, adjust bracket C.

24. DASH REINSTALLATION

It's now time to install your dash. The dash installation procedure is just the opposite of the removal however you must now make your duct and electrical connections. Follow the steps below.

- a. Load dash into van.
- b. Connect controls harness to ECU and make all electrical connections for USB and 12V outlets.
- c. Connect compressor switch wiring. Refer to the wiring diagram in the wiring section or at the end of this document.
- d. Connect all 4 face ducts to outlets and secure with zip ties.
- e. Connect each defrost duct to the defrost duct adapters in the center of the dash. Secure with zip ties.
- f. Rotate the dash into its installed position and push ducts around behind it so that there is room for a radio after installation is complete.
- g. Reattached dash and other components.

25. CALIBRATE CONTROLS IF NECESSARY

If your controls don't function the way you think they should have installation follow the calibration procedure below.

Preliminary Information

On **Vintage Air Gen IV systems using factory controls**, the control panel will need to be calibrated to ensure proper function. The following procedure will work when calibrating **Gen IV control panels with 3 levers or knobs (Blower Speed, Mode, Temperature)**, and may be repeated as many times as necessary to get it right.

Before beginning, attach the white jumper supplied with your control panel kit to a suitable chassis ground within easy connection distance to the gray programming wire located in the main Gen IV wiring harness next to the compressor relay.

Calibration Procedure

1. Turn on the ignition switch (do not start the engine).

2. Move the (3) control panel levers or knobs to the following positions:

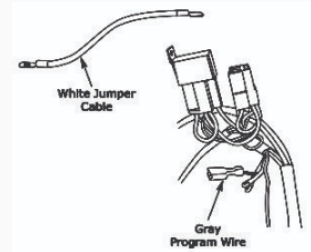
- a. **Blower Speed:** HIGH
- b. **Mode:** DEFROST
- c. **Temperature:** HOT



3. Connect the white jumper wire to the gray program wire. Wait for the blower speed to momentarily change (approximately 5 seconds).

4. Move the (3) control panel levers or knobs to the following positions:

- a. **Blower Speed:** LOW
- b. **Mode:** DASH
- c. **Temperature:** COLD



5. Disconnect the white jumper wire from the gray program wire. The blower speed will momentarily change again, indicating completion of the calibration procedure.



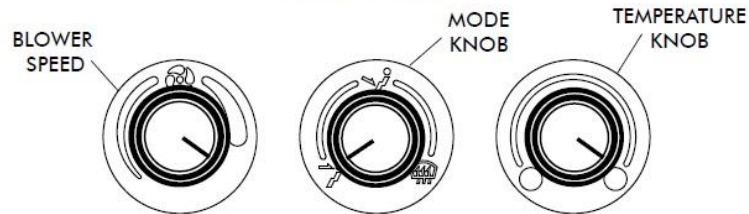
6. Confirm proper operation of the controls. Repeat the procedure if necessary. When finished, tape over the program wire connector with electrical tape to prevent accidental contact with chassis ground.

For additional **Gen IV 3-knob/lever control panel** calibration information, [click here](#) to check out our control panel calibration video.

26. OPERATION

The image below shows how to operate the AC system with the basic three knob controls.

A/C MODE



BLOWER SPEED

THIS KNOB CONTROLS THE BLOWER SPEED, FROM OFF TO HI

MODE KNOB

ROTATE THE KNOB TO THE LEFT TO DIRECT AIR FLOW TO THE DASH VENTS

TEMPERATURE KNOB

IN A/C MODE ROTATE THE TEMPERATURE KNOB ALL THE WAY RIGHT TO THE COLD POSITION TO ENGAGE COMPRESSOR. (ROTATE KNOB LEFT OR RIGHT TO ADJUST DESIRED TEMPERATURE)

HEAT MODE



BLOWER SPEED

ROTATE KNOB RIGHT TO DESIRED BLOWER SPEED FROM OFF TO HI

MODE KNOB

ROTATE THE KNOB TO THE CENTER TO DIRECT AIR FLOW TO THE FLOOR.

TEMPERATURE KNOB

IN HEAT MODE ROTATE THE TEMPERATURE KNOB ALL THE WAY LEFT TO THE HOT POSITION. (ROTATE KNOB LEFT OR RIGHT TO ADJUST DESIRED TEMPERATURE)

DEFROST/ DE-FOG MODE



BLOWER SPEED

ROTATE KNOB RIGHT TO DESIRED BLOWER SPEED FROM OFF TO HI

MODE KNOB

ROTATE THE KNOB TO THE RIGHT TO DIRECT AIR FLOW TO THE DEFROST VENTS

TEMPERATURE KNOB

ROTATE KNOB LEFT OR RIGHT TO ADJUST DESIRED TEMPERATURE (COMPRESSOR IS AUTOMATICALLY ENGAGED)

27. TROUBLESHOOTING

| TROUBLESHOOTING INFORMATION | | | | |
|--|--------------------------|---|--|---|
| SYMPTOM | CONDITION | CHECKS | ACTIONS | NOTES |
| 1. Blower stays on high speed when ignition is on. | No other function works | Check for damaged pins or wires in control head plug | Verify all pins are inserted into plug. Ensure no pins are bent or damaged in ECU | |
| | | Check for damaged ground wire (white) in control head harness | Verify continuity to chassis ground with white control head wire at various points. | Loss of ground on this wire will render control head inoperable |
| | All other functions work | Check for damaged blower switch or pot and associated wiring. | | See blower switch check procedure |
| Blower stays on high speed when ignition is on or off. | | Un-plug 3 wire BSC control connector from ECU. If blower shuts off, ECU is either improperly wired or damaged. | Be sure small, 20GA white ground wire is connected to the battery ground post. If it is replace ECU. | |
| | | Un-plug 3 wire BSC control connector from ECU. If blower stays running the BSC is either improperly wired or damaged. | Check to insure that no BSC wiring is damaged or shorted to vehicle ground. The BSC operates the blower by ground side PWM switching. The positive wire to the blower will always be hot. If the "ground" side of the blower is shorted to chassis ground the blower will run on HI. | |
| | | | Replace BSC. (This will require evaporator to be removed from vehicle.) | No other part replacements should be necessary. |

| | | | | |
|---|-----------------------|---|---|--|
| 2. Compressor will not turn on (All other functions work) | System is not charged | System must be charged for comp. to engage. | Charge system or bypass pressure switch. | DANGER. NEVER BYPASS SAFETY SWITCH WITH ENGINE RUNNING, SERIOUS INJURY CAN RESULT |
| | | Check for faulty A/C pot or assoc. wiring. (Not applicable to 3-POT controls) | Check continuity to ground on white control head wire. Check for 5V on red control head wire. | To check for proper POT function, check voltage at white/blue wire. Voltage should be between 0 and 5V and will vary with POT lever position. |
| | | Check for disconnected or faulty thermistor. | Check two 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 POT or assoc. wiring | Repair/replace POT/control wiring. | Red wire @ A/C POT should have approx. 5V with ignition on. White wire will have continuity to chassis ground.. White/blue wire should vary between 0V and 5V when lever is moved up and down. |
| | | Check for faulty A/C relay | Replace Relay | |

| | | | | |
|--|--|--|---|---|
| 4. System will to turn on or runs intermediately | Works when engine is not running; shuts off when engine is started (Typically early GenIV but possible on all versions.) | Noise interference from either ignition or alternator. | Install capacitors on ignition coil and alternator. Ensure good ground at all points. Relocate | 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 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 and conditions. | Verify connections on power lead, ignition lead and both white ground wires. | Check for positive power at heater valve green wire and blower red wire. Check for ground on control head white wire. | |
| | | Verify battery voltage is greater than 10V and less than 16. | Verify proper meter function by checking the voltage of a known good battery. | |
| 5. Loss of mode door functions. | No mode change at all. | Check for damaged mode switch or POT and associated wiring. | | |
| | Partial function of mode doors. | Check for obstructed or binding mode doors. | | Typically caused by evaporator housing installed in a bind in the vehicle. Be sure all mounting locations line up and don't have to be forced into position. |

| | | | | |
|---|----------------------------------|--|--|---|
| | | Check for damaged stepper motor or wiring. | | |
| 6. Blower turns on and off rapidly. | Battery voltage is at least 12V. | Check for at least 12V between green heater valve wire and chassis ground. | Ensure all system grounds and power connections are clean and tight. | |
| | Battery voltage is less than 12V | Check for faulty battery or alternator. | Charge battery. | System shuts off blower at 10V. Poor connections or weak battery can cause shutdown at up to 11V. |
| 7. Erratic functions of blower, mode, temp, ect. | | Check for damaged switch or POT and associated wiring. | Repair or replace. | |
| 8. When the ignition is turned on, the blower momentarily comes on, then shuts off. This is with the blower switch in the off position. | | This is an indicator that the system has been reset. Be sure the red power wire is on the battery post and not on a switched source. Also, if the system is pulled below 7V for even split second, the will reset. | Run red power wire directly to battery. | |