



Installation Manual

Street Rod Cooler II

DOCUMENT #1-1080

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Congratulations...

You have just purchased the highest quality, best performing A/C system ever designed for your Classic Vehicle.

Our #1 goal is that you'll have a successful installation and a system that performs at a very high level for many years to come. To obtain the high level of performance and dependability our systems are known for, please pay close attention to all the technical tips and installation suggestions in this manual. These are derived from a long history of research and development, combined with the accumulated knowledge of many successful installations and feedback from customers like you. Since yours will be a custom installation you'll be putting your own "stamp" on many of these steps.

Before starting, read thru the following pages and make an installation plan based on your vehicle and your desires.

On the next page you'll find a safety and general checklist that you should read before starting your installation.

Again, thank you from our entire staff.

Check List, Pre-Installation:

- Before beginning the installation check the shipping box for the correct components. YOUR BOXED UNIT INCLUDES A LIST OF MAJOR COMPONENTS AND A LIST OF BAGGED PARTS. We have a 5 stage check process to make sure you have everything you'll need.
- If your vehicle has been or is being modified, some procedures will need to be adjusted to fit your particular application.**
- A basic cleaning of the engine compartment and interior before beginning will make things go more smoothly.
- Check condition of engine mounts. Excessive engine movement can damage hoses to A/C and/or heater.
- Before starting, check vehicle interior electrical functions (interior lights, radio, horn, etc). Make a note of anything that does not work as it's supposed to. During the installation you might find the opportunity to repair or upgrade non-working or out of date components. When you're ready to start the installation, **DISCONNECT THE BATTERY FIRST.**
- Drain the radiator. Retain the coolant and reuse, or dispose of properly.
- SAFETY FIRST: Wear eye protection while drilling/cutting, deburr sharp edges, and never get in a hurry or force a part.
- Tools: Your installation only requires the basic tools everyone has in their garage, nothing exotic or specific to A/C or Heat equipment.

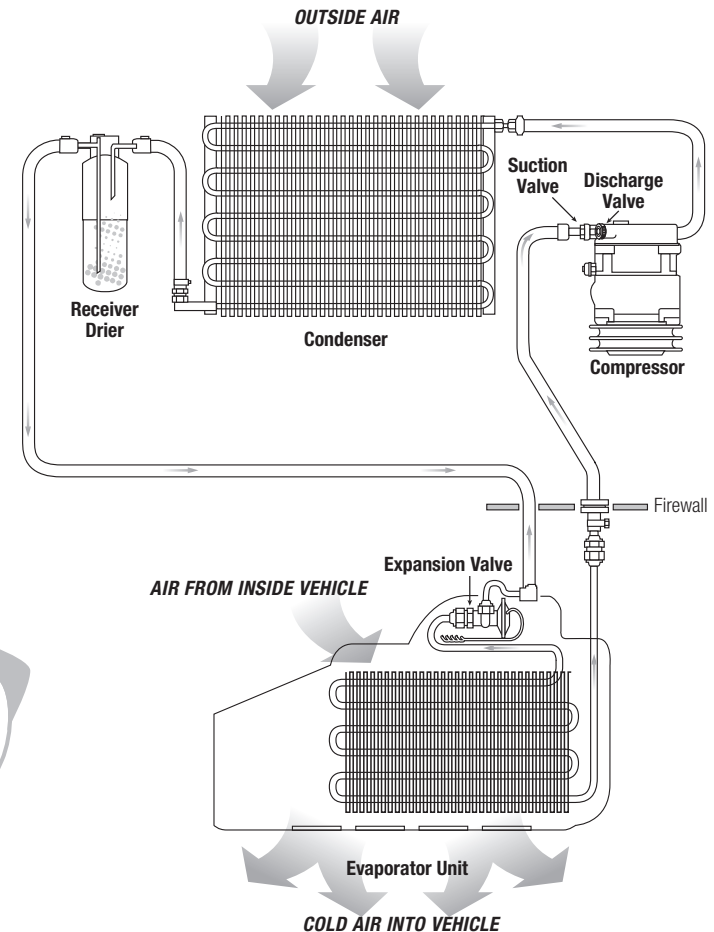
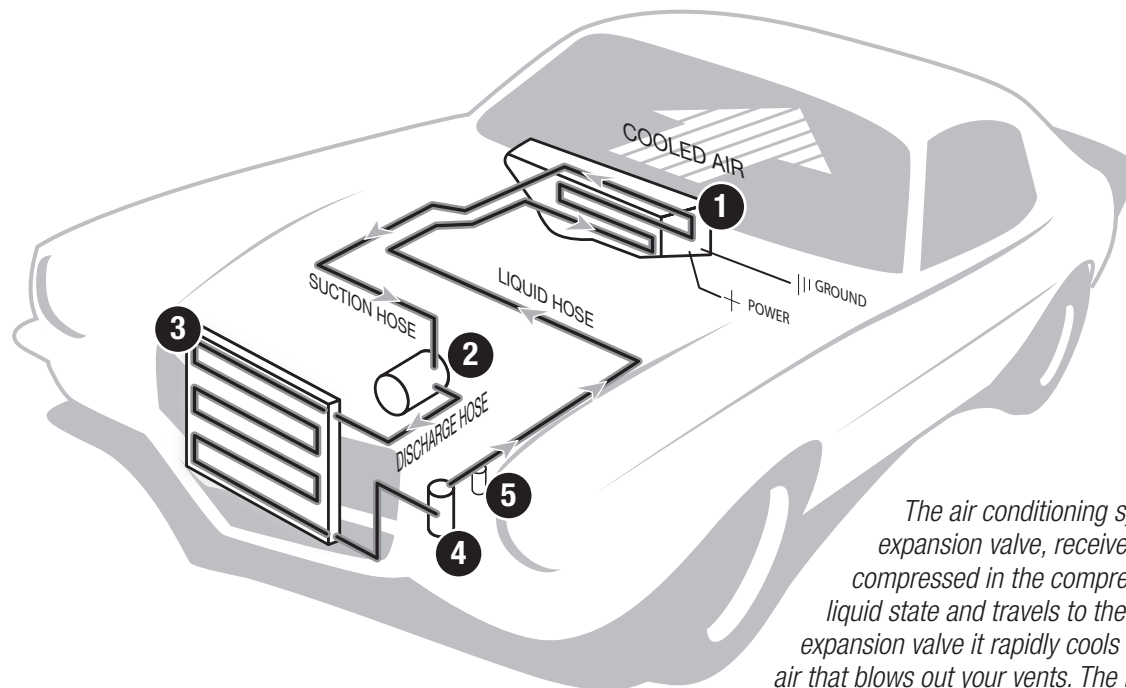
Procedures, During Installation:

- Fittings: Use one or two drops of mineral oil (supplied with your kit) on ALL rubber o-rings, threads and rear of bump for o-ring where female nut rides. Do not use thread tape or sealants.
- Measure twice (or more), cut once
- Should you have any technical questions, or feel you have defective components (or missing items), call us immediately, we will be glad to assist you. Our toll-free number is listed on every page, we're here to help!**

YOU CAN NOW BEGIN THE INSTALLATION...

A Basic A/C Overview

- 1 Evaporator with Blower Fan** In order to remove the heat from the air in the vehicle, the A/C evaporator allows the refrigerant to absorb the heat from the air passing over it. The blower fan moves cool air out into the car interior.
- 2 Compressor** The compressor pumps and circulates the refrigerant through the system.
- 3 Condenser** The condenser is a heat exchanger mounted at the front of the vehicle. Heat drawn out of the interior of the car is expelled here.
- 4 Receiver/Drier** The drier not only dries refrigerant, it also filters the refrigerant and stores it under certain operating conditions.
- 5 High Pressure Switch** A pressure switch is used to shut down the system if high or low pressure is detected, basically it acts as a safety switch.



The air conditioning system in your car is comprised of a compressor, condenser, expansion valve, receiver/drier, and evaporator. Refrigerant (also known as Freon) is compressed in the compressor and turns into a gas. In the condenser, this gas is cooled to a liquid state and travels to the expansion valve. As the liquid refrigerant goes through the expansion valve it rapidly cools in the evaporator. A fan blows over the evaporator and cools the air that blows out your vents. The receiver-drier separates gas and liquid.

General Procedures and Vehicle Preparation

Our Flex Fit Elite Series is designed to be flexible in it's final mounting location, but generally the dash area behind the glove box area is the most common and practical.

- It's a good idea to visualize the final outcome of all components before cutting into your vehicle. If you're really unsure about a component fitting, you can always make a paper or cardboard mockup first. Measure twice, cut once.
- The mounting location of the evaporator is usually determined by two factors, space and your desired way to route the heater and A/C hoses (bulkhead plate, grommets etc...).
- Consider leaving enough space under your dash to run your hoses out of the passenger compartment either via bulkhead plates or grommets, and make sure you know where you will be mounting the water valve.
- Duct hose routing and vent locations should be given careful consideration before final mounting is selected. Position the vents to give you optimal air flow. Route hoses so they will not interfere with the operation of controls or other mechanisms.
- Wrap all exposed metal on suction tube or fittings to ensure no condensation will form inside of vehicle and drip on floorboard or blower motor.
- Retain all parts you remove until after the installation is completely finished.

Vehicle Preparation:

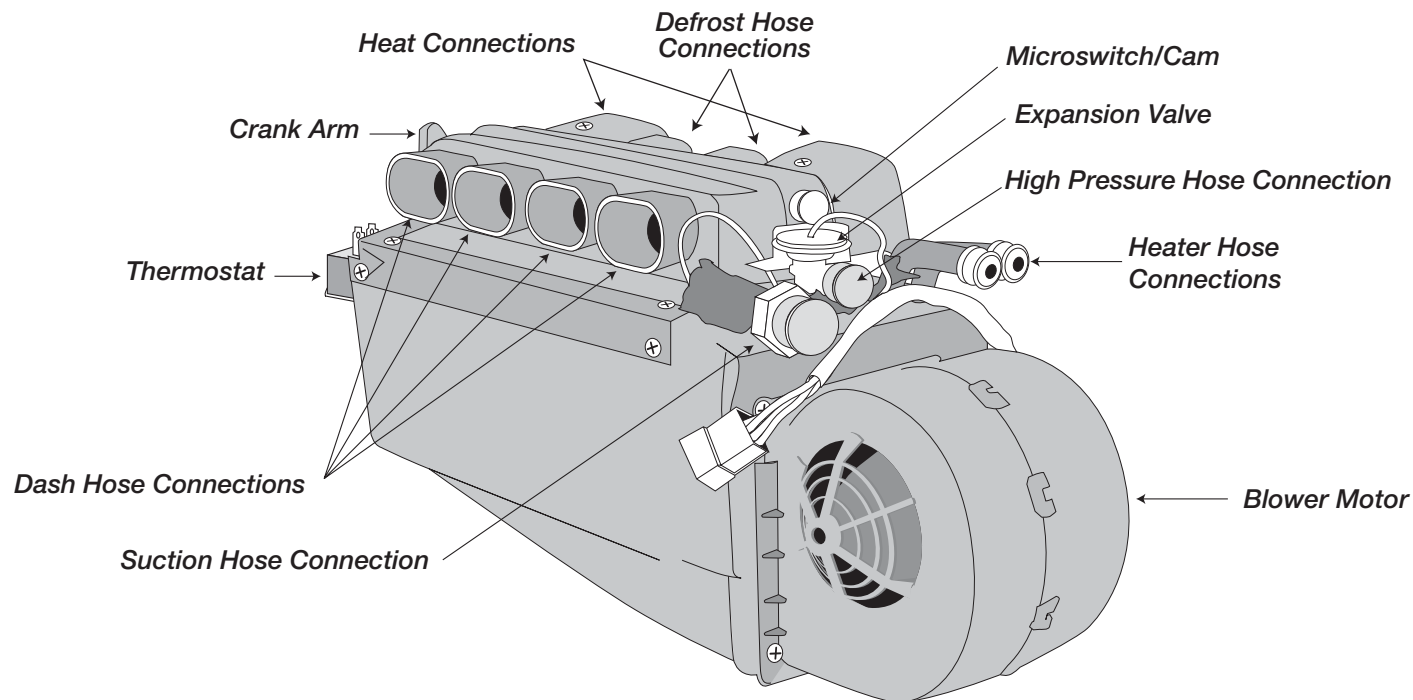
- Before beginning your installation, **DISCONNECT THE BATTERY.** Next, remove glove box (and console) for more space to work within.
- Remove all OEM heater unit and A/C components. You may be able to reuse the factory style defrost vents.
- Before installation, double check the firewall and transmission tunnel area for any holes or cracks that may allow hot engine air into the interior of the car. Be sure to seal all of these before completing installation.



When retaining parts it's a good idea to store parts in a zip lock bag, labeled with info where the parts came from and what size/type of tool is needed to reinstall. Cleaning the parts before you need to reinstall them is a good idea too.

Within the following pages we will outline the installation steps of your new Flex Fit Elite system. Since this is a custom installation and varies based on your particular vehicle, many of our procedures can be viewed as “suggestions”... and your personal preferences will play a major role in the actual installation. But please be assured, you are joining a large family of happy Flex Fit Elite owners that enjoyed the extra flexibility found with this system and completed their installations with little to no major challenges.

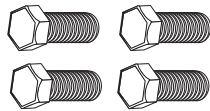
Take a moment to familiarize yourself with the heart of your new system, the evaporator case.



On the next page you will see additional tips and procedures that will greatly improve the flow your installation. Please read thru it carefully before continuing.

THESE ARE THE PARTS YOU WILL FIND IN BAG KIT A

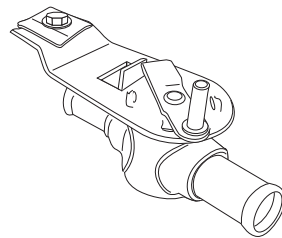
You will use all of these parts and hardware during the next series of installation steps.



Four 1/4 - #20 x 1" Bolts
and Washers



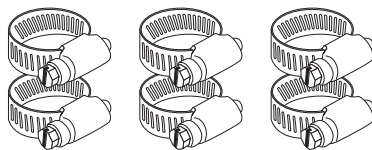
Refrigerant Tape



Water Control Valve

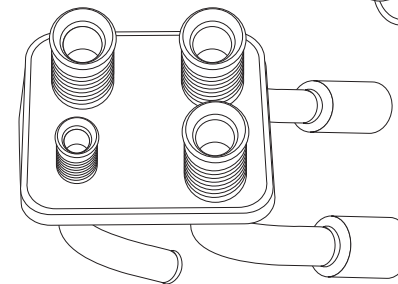
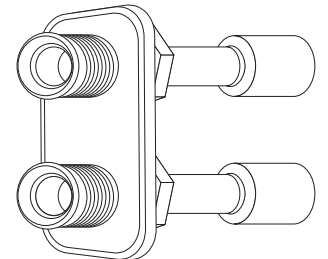


Clear Plastic Drain Tube

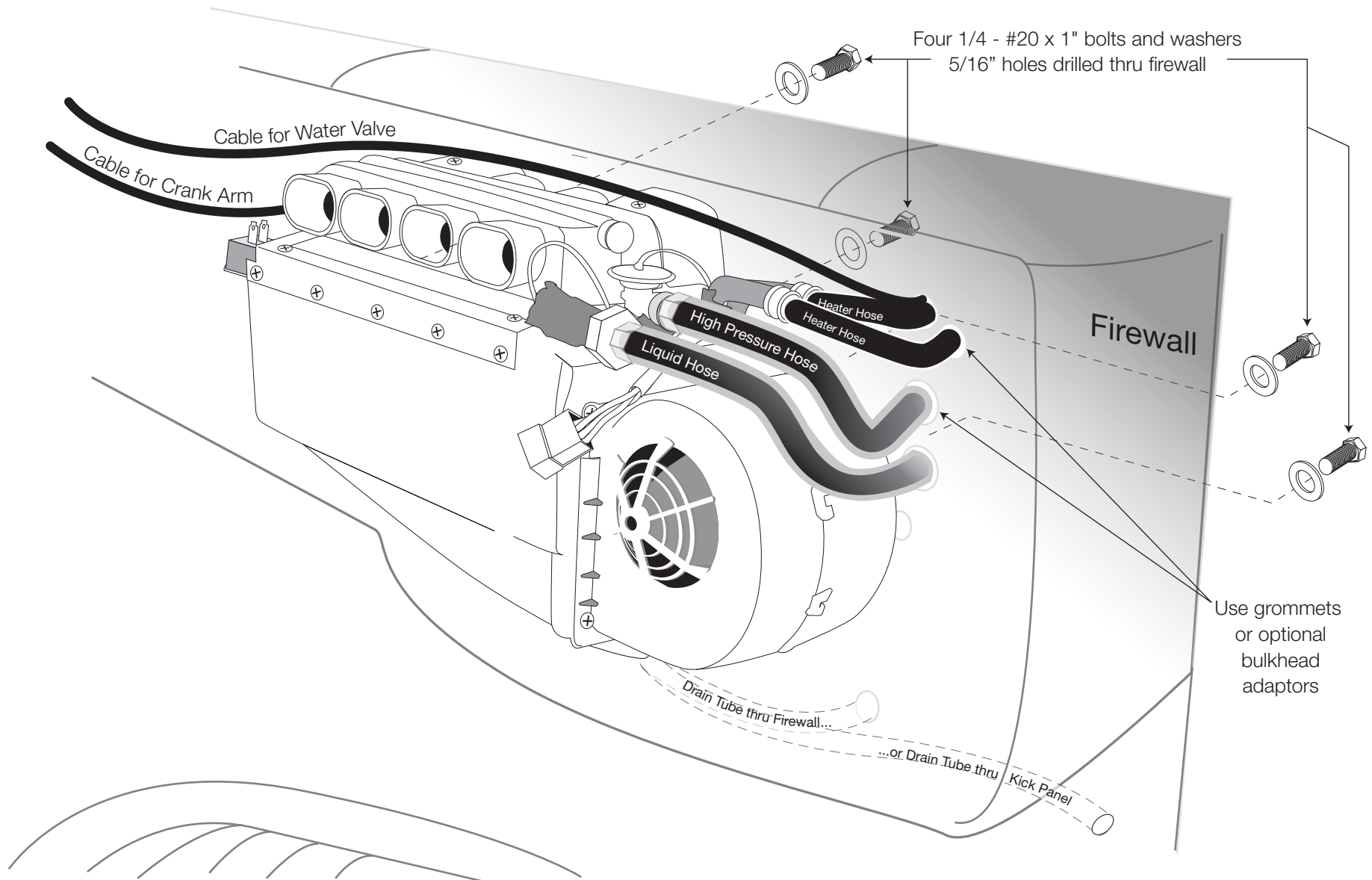


Six Worm Gear Clamps

If you purchased these
OPTIONAL bulkhead plates they
will be located within Bag A



Exploded View of Typical Installation

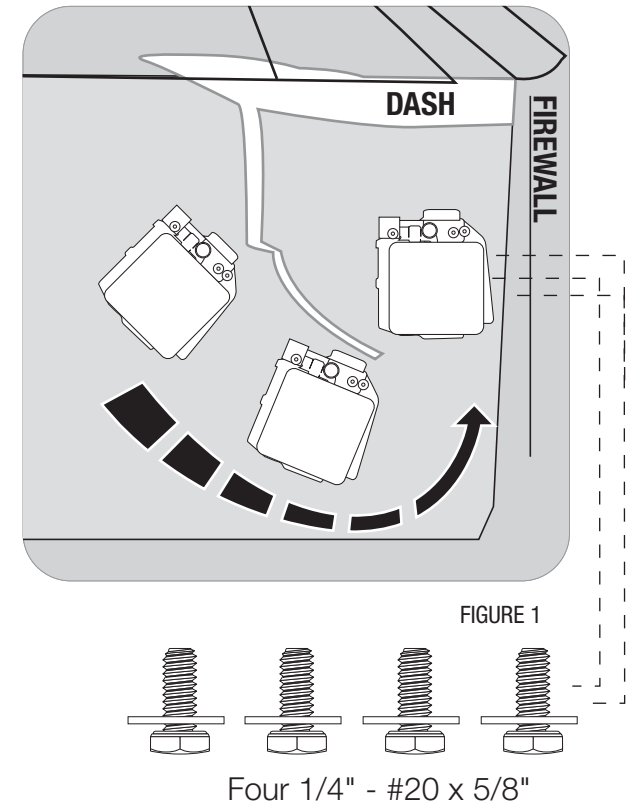


Installation of your new evaporator unit accomplished as follows. First test fit the evaporator and make sure that it can be installed in a place where it will be level and square with dash. Also, be sure that the eventual location of the evaporator unit will not interfere with the movement of any pre-existing equipment, and **check for obstructions before you drill any holes thru the firewall of floorboard.**

In order to utilize the rear mounting bolts you will need to drill four 5/16" holes thru the firewall that will allow you to accurately bolt to the mounting points on the back of the evaporator. It is important that you measure and drill carefully so that your evaporator unit will be secure and mounted properly.

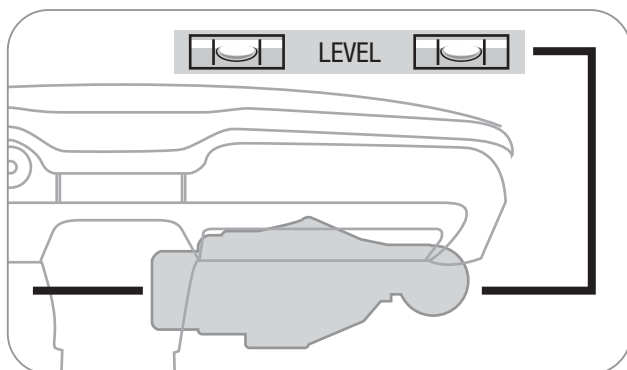
Now is also good time to specify a location for your drain tube. Drill a hole for the drain tube (5/8" hole for the 1/2" drain tube) to make sure water flows downward from unit out of firewall or kick panel (see previous page for example diagram).

Now it's time to roll your unit under the dash and secure (see figure 1). Installing the complete evaporator unit under the dash will go much easier with the help of a friend. One person can take the unit within the car and "roll" up and under the dash while the other person can be ready at the firewall area with the four 1/4" - #20 x 5/8" bolts to secure the unit in place (see previous page for diagram).



For proper drainage your unit should be level with the bottom of the dash. Attach the drain tube and route to your preferred location.

Next, route all A/C and heater hoses from evaporator unit out the firewall. Make sure you have the correct orientation on the electronic water valve (see figure 2).



Be sure to align the evaporator unit level with the bottom of instrument panel (assuming the vehicle is sitting level).

Firewall

Use grommets on holes drilled thru firewall or our Optional Bulkhead Adaptors

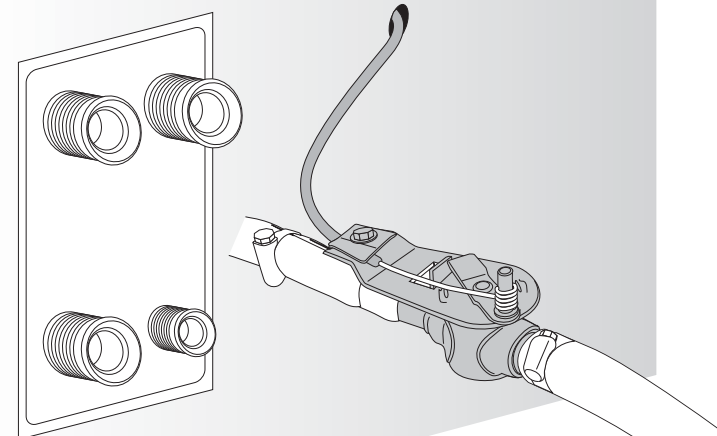


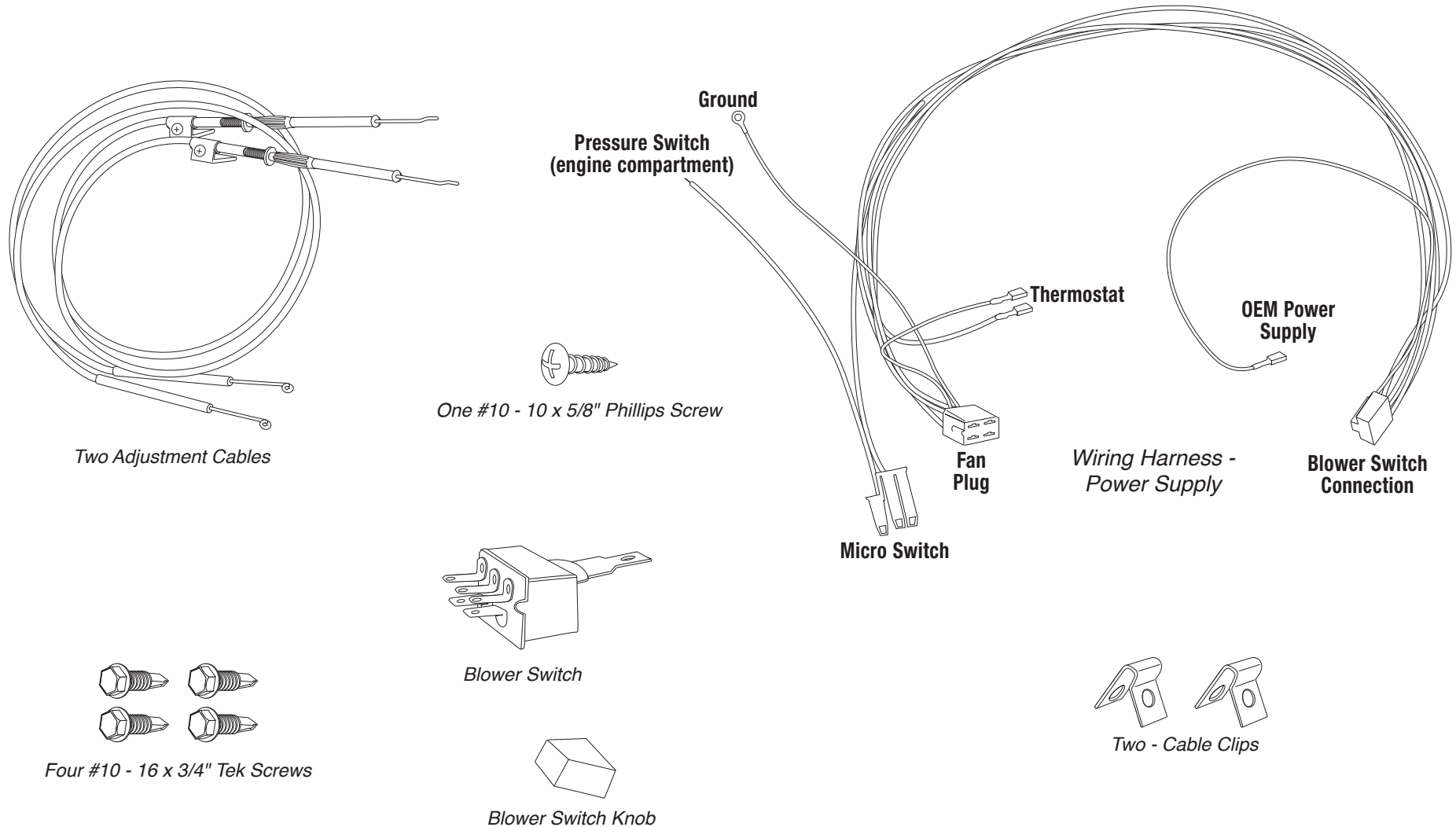
FIGURE 2

IMPORTANT NOTICE Classic Auto Air has done extensive testing on the correct method to install the water valve in order to get a repeatable and progressive temperature control. **The water valve must be installed per these instructions!...**

Connect one end to the upper connection on the upper tube coming thru the block off assembly, and the other end to the back side of the water valve (the water valve is labeled for easy installation). Locate the upper connection from the evaporator/heater unit off of the firewall and attach a 6" piece of 5/8" dia. heater hose with the supplied worm gear clamp. Attach the inlet side of the water valve using another supplied hose clamp. Attach a heater hose from the outlet side of the water valve and route to the connection on the water pump. Next run another 5/8" heater hose from the bottom heater outlet and secure using a worm gear clamp, and the other end to the intake connection on the water pump, also with a worm gear clamp.

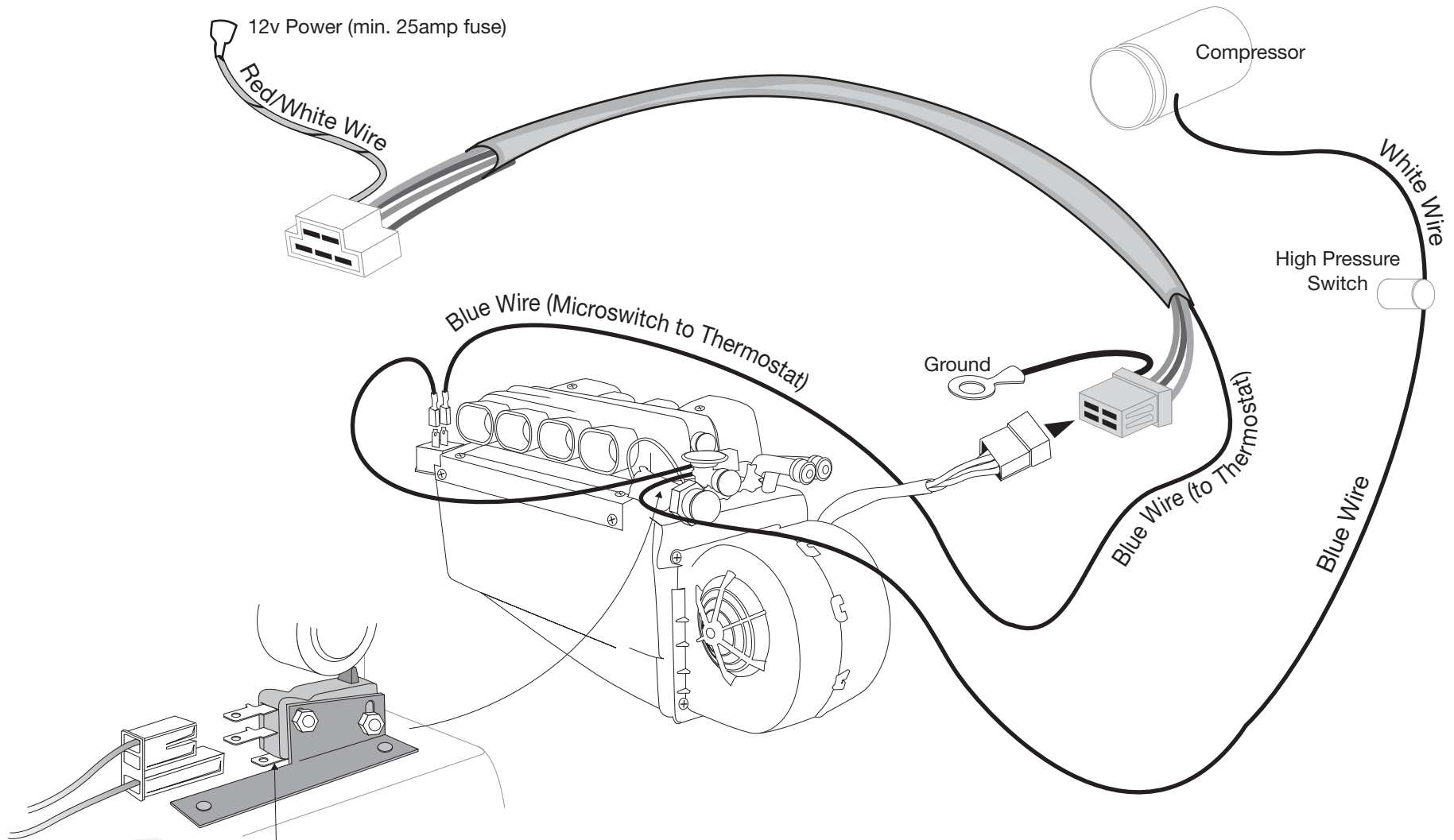
THESE ARE THE PARTS YOU WILL FIND IN BOX KIT B

You will use these parts and hardware during the next series of installation steps.



NOTE: Illustrations NOT shown actual size

The next step is to utilize the main wiring harness per this diagram.



IMPORTANT: When plugging the connection into the microswitch, make sure you make a full connection with the prong on the lower portion of the switch.

Adapting to OEM Controls:

We've included all the parts necessary for you to retain your OEM controls and adapt to your new A/C system. In order to do this, you'll need to remove your OEM temperature control head and move it to a workbench and follow thru the steps listed below. Because there is such a wide variety of controls, these steps may have to be modified to adapt your particular controls. Adhere to some simple rules and you'll be done in a short amount of time.

Step 1: Remove the OEM blower switch and discard. Attach the included blower switch to your control head in place of the OEM switch. This may require some fabrication.

Step 2: Looking at your OEM controls, identify which lever you want to use to control TEMPERATURE and which to control the MODE. Then from the back of the control head, mark the appropriate levers with masking tape and their intended function (i.e. mode and temp).

Step 3: Attach the included cable clips to each adjuster cable as shown in figure 3. You'll use these cable adaptors to secure the integrators to your OEM control head, or you may have to attach the integrators in another manner.

Step 4: Position the adjuster cables in a manner that the wire-ends can be secured to the appropriate lever ends (see figure 4). The most important aspect is that your OEM levers, which ever two you choose to use, move their entire possible distance of travel (when viewed from the front of the control head).

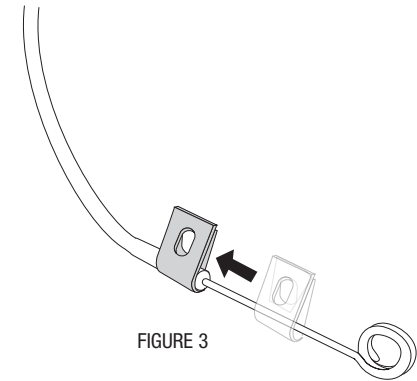


FIGURE 3

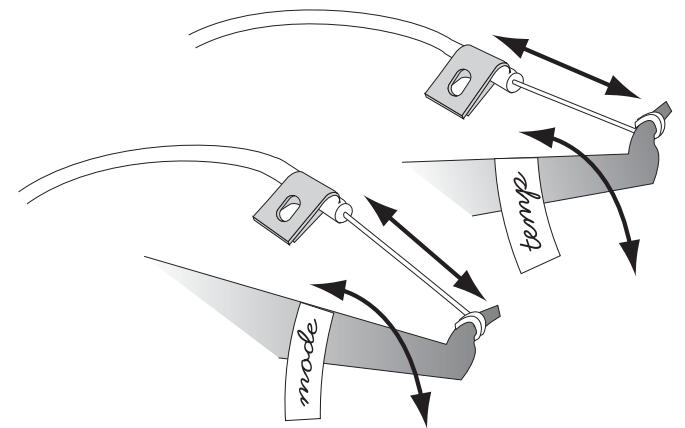


FIGURE 4

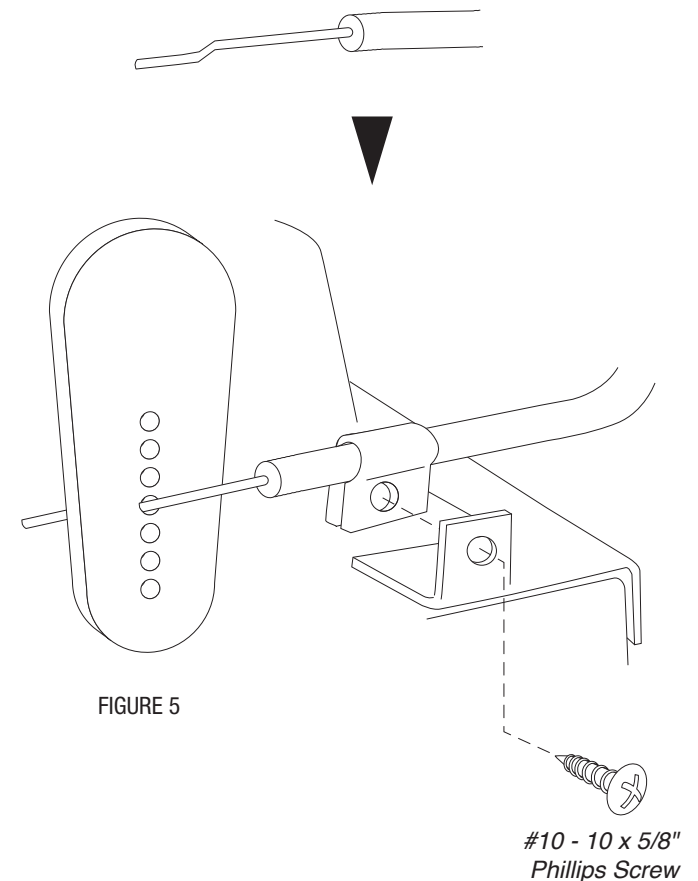
Attaching the Adjuster Cable to your Evaporator :

Once you have installed your temperature control head back in the dash, you can route the adjuster cable from the control head (from the switch you choose to adjust the mode) to the left side of the evaporator unit and attach to the crank arm (see figure 5). There are 7 holes in the crank arm, and your goal is to attach the cable to whichever hole will allow you to fully move the crank arm it's full range of travel (thus fully operating the doors within the evaporator box). Test the full-motion ability by moving the lever on your control head up and down several times.

Once you have determined the correct hole in the crank arm, utilize the bracket on the side of the evaporator case to secure the cable with the included phillips screw.

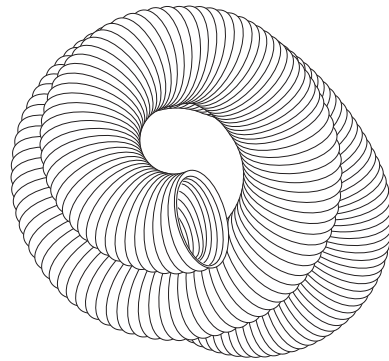
The cables also have integrated adjustment capability so you can "fine-tune" your controls.

The cable (and lever on the control head) that you have selected for the TEMPERATURE control will be routed thru the firewall and to the water valve. Simply push the curled end of the cable end over the lever tower on the water valve. Adjust the cable until moving the lever on the control head moves the water valve it's full motion.

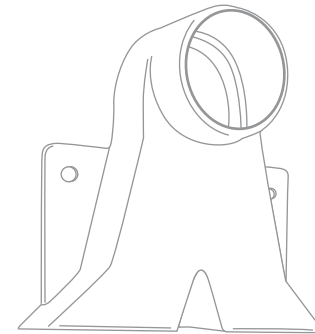


THESE ARE THE PARTS YOU WILL FIND IN BAG KIT C

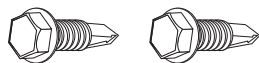
You will use these parts and hardware during the next series of installation steps.



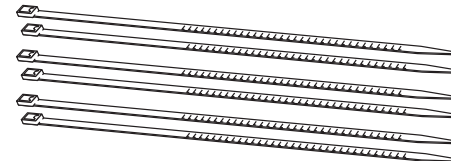
One Duct Hose, 2" I.D., 15' Long



Remote Heat Dump



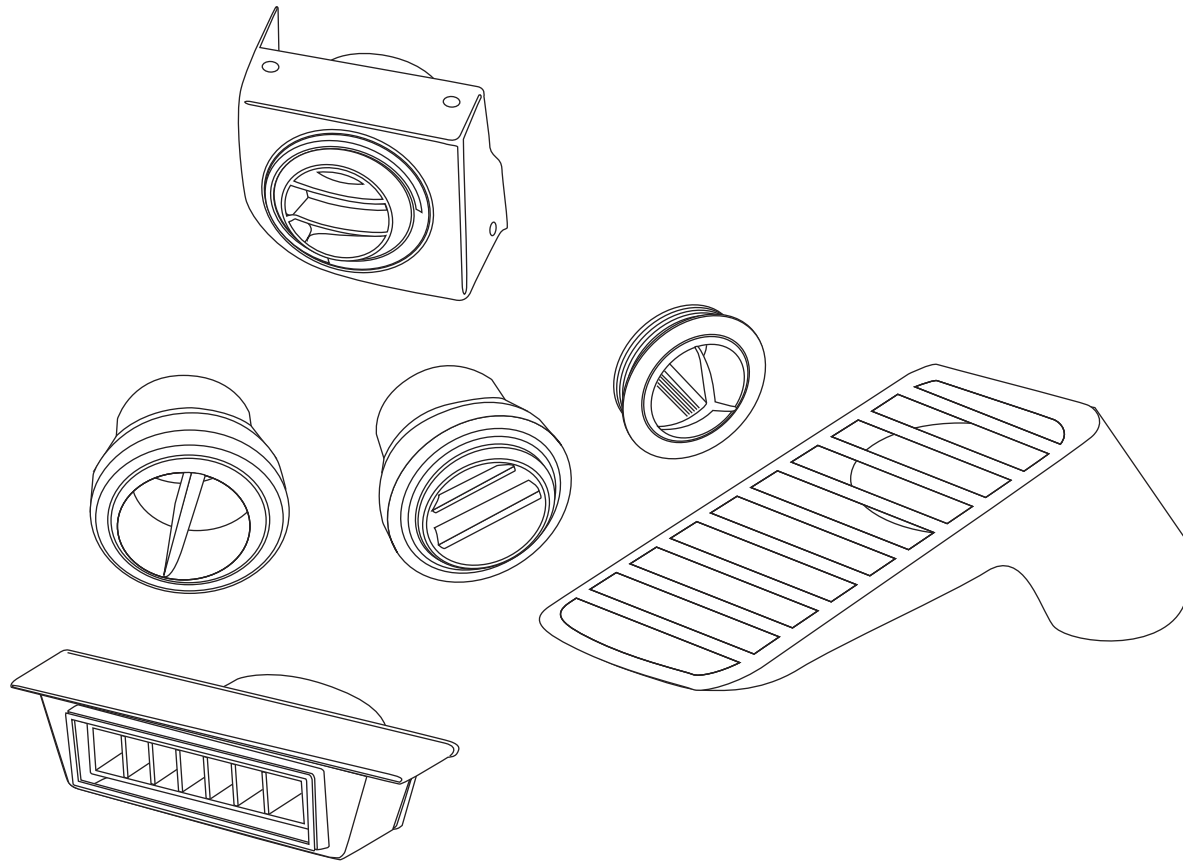
Two #10 - 16 x 3/4" Tek Screws



Six Zip-Ties

THESE ARE THE PARTS YOU WILL FIND IN BAG KIT D

You will use these parts and hardware during the next series of installation steps.



Your choice of forward vents and defrost vents will be located with Bag Kit D

Installing Vents, a Quick Primer:

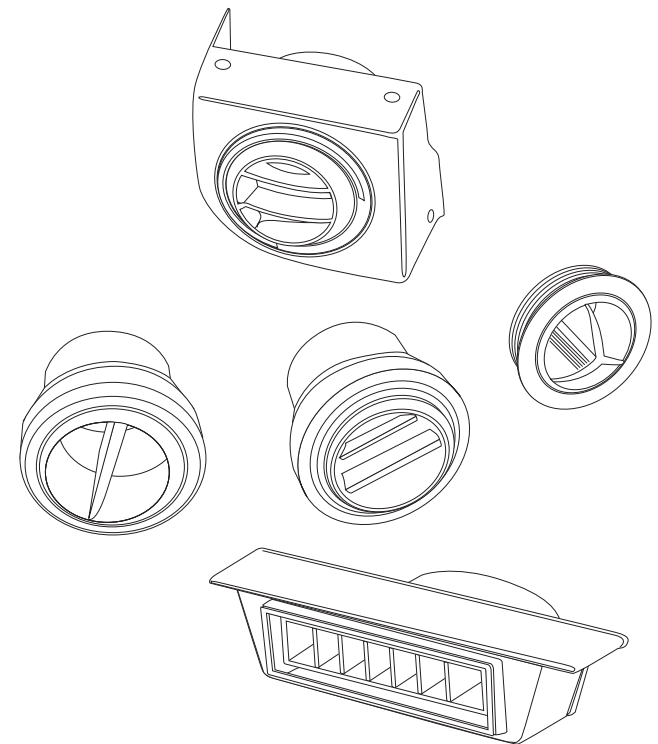
When you ordered your new system, you had a choice of vents to choose from. Installing them will go very easily if you plan ahead and take your time. In some cases you may be able to use factory installed vents, if not, follow the following steps:

A: While sitting in the vehicle, make a plan of where the vents will be located, situating them for maximum airflow and convenience. Make sure the location of the vents will not interfere with actions like shifting gears, or that the vents will not be subjected to excessive impact.

B: Many of the vents will require some drilling thru the lower dash to attach. Mark the drill hole(s) location first, and drill pilot holes (i.e. with a small bit like 9/32") before attaching the vents with the included Tek Screws. Also make sure that you don't drill thru wires or other mechanisms when drilling the pilot holes.

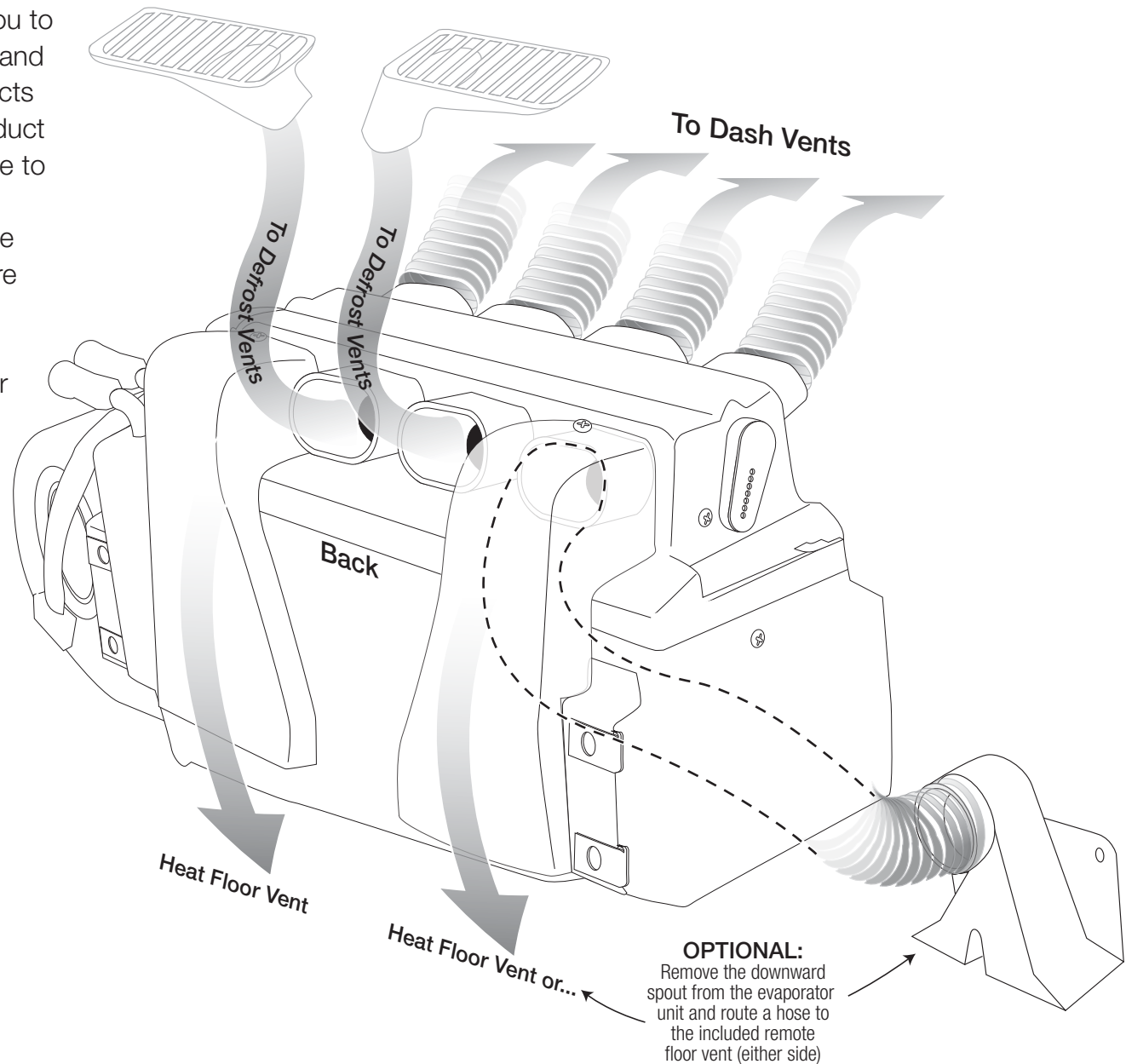
C: Some vents can be inserted into OEM vents holes, or you may need to cut-out holes within the dash... measure twice - cut once.

D: Use zip-ties to connect the flex hoses to the back of the vents.



We've included 15' of flex hose for you to route to your choice(s) of main vents and defrost vents. The evaporator unit ducts have clips that will securely hold the duct hose, just press on and route. Be sure to keep bends in the flex hoses to a minimum for optimal airflow, and route the hoses so that they will not interfere with any mechanisms.

See page 13 for tips on installing your choice of vents into your vehicle.



New A/C System Preparation

Please read thru these procedures before completing this new A/C system charging operation. A licensed A/C technician should be utilized for these procedures to insure that your new system will perform at it's peak, and that your compressor will not be damaged.

- 1) Your radiator/cooling system is an integral part of your new system. Please insure that you have a 50/50 mix of distilled water and antifreeze. The heater coil **MUST** be purged (cycle heater control valve) to make sure no water, without antifreeze, is in the heater coil before you charge the A/C system.
- 2) Evacuate the system for 45 minutes (minimum).
- 3) Your new compressor **MUST** be hand-turned 15-20 revolutions before and after charging with liquid. Failure to do this may cause the reed valves to become damaged (this damage is NOT covered by your warranty).
- 4) Your new system requires 134a refrigerant. It will require 1.5 lbs (or 24 oz).
- 5) Your new compressor comes charged with oil - NO additional oil is needed.
- 6) Insure that the new belt is tight.
- 7) **DO NOT CHARGE SYSTEM WITH LIQUID WHILE THE ENGINE IS RUNNING!**

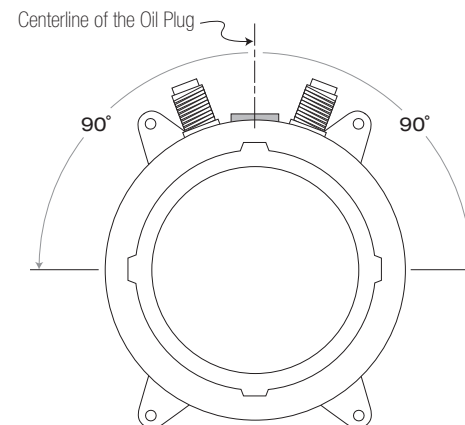
RECOMMENDED TEST CONDITIONS: (After system has been fully charged and tested for basic operation)

- Determine the temperature outside of the car
- Connect gauges or service equipment to high/low charging ports
- Place blower fan switch on medium
- Close all doors and windows on vehicle
- Place shop fan directly in front of condenser
- Run engine idle up to approx. 1500 rpm

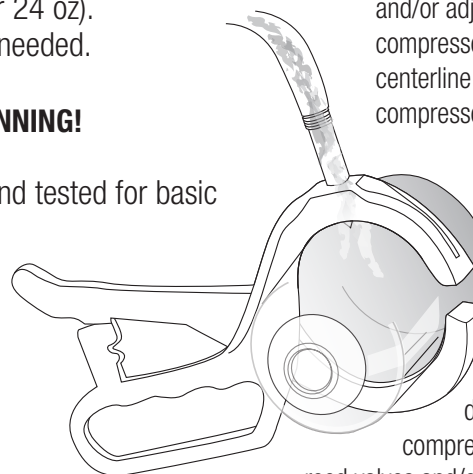
ACCEPTABLE OPERATING PRESSURE RANGES:

1. HIGH-SIDE PRESSURES (150-250 PSI)
2. LOW-SIDE PRESSURES (15-25 PSI in a steady state)

Readings above are based on an ambient temperature of 90° with an adequate airflow on condenser



CAUTION! When mounting your compressor and/or adjusting the belt, use caution not to tilt the compressor up to or more than 90° off the centerline of the oil fill plug. This can cause compressor failure.



Do not tilt, shake or turn refrigerant can upside-down OR use a charging station to install refrigerant while the engine is running. Doing so will

direct liquid refrigerant into the compressor piston chamber, causing damage to reed valves and/or pistons and/or other components, as well as potentially seizing the compressor. Allow a minimum of 30 minutes for liquid to "boil off." You must hand turn the compressor hub (not the pulley) a minimum of 15 complete revolutions prior to starting the engine with the clutch engaged.

Trouble Shooting Your Classic Auto Air A/C System

PROBLEM: system is not cooling properly

ISSUE: cold at idle, warmer when raising engine RPM's

Make sure the Water Valve is positioned correctly

The water valve is a directional valve and should be installed with the arrow pointing towards the water pump, it should be connected to the heater hose that runs from the heater core to the water pump. If the water valve is connected to the incorrect hose it allows water to circulate through the system via the heater core over powering the cooling effect of the A/C coil, (*normally the air conditioning is functioning properly*).

Step 1: Check placement of the water valve, correct if needed. (In some cases changing the location of the water valve may not fix the above problem.) Continue to next step.

Step2 If changing the location of the water valve does not rectify the issue, then possibly the water valve is permanently damaged and may need to be replaced. To check the integrity of the water valve completely remove the water hoses for the heater core and "loop" together. (This will remove the heater system completely from the possibilities) If the system now cools, replace the water valve

Verify Adequate Air Flow to Condenser

For an air conditioning system to function properly there has to be adequate airflow across the condenser. The function of the condenser is to disperse heat, without proper airflow your system will not cool correctly in the cabin of your vehicle.

Step 1: connect gauges to a/c hoses. The pressures should be: with the ambient temp is 90, low side pressures should be between 8-25 psi, high side pressures should be between 160-260psi

Step 2: IF the low side pressures are normal and the high side pressures are high then there might be an airflow issue, continue to next step.

To test air flow to Condenser do the following three tests:

1. Place a piece of paper on the condenser with the car in idle and see if paper is held in place.
2. With car in idle, attach gages, and place a large capacity fan in front of the condenser. What happens to the pressures?

3. With car still in idle and gages attached, pour water down the front of the condenser. What happens to the pressures?

If the paper is held in place you are at least getting some air flow. If the high side decreases during test 2 & 3 then your condenser is not getting enough air which is causing your system to not cool properly. To correct this issue you will need a more powerful mechanical fan.

Step 3: Confirm correct Refrigerant charge in System

All of our systems should be charged with 24oz or 1.8lbs of R134 Refrigerant only. If overcharged you will need to evacuate the system and recharge with the correct amount.*

What measurements mean:

Low Temp and High Pressure seem to be equal...

You have a malfunctioning expansion valve that is stuck open.

High Side is extremely high and Low Side is extremely low (possibly into vacuum)...

There is a blockage in the system. Remove hoses and blow compressed air through in both directions. If pressures don't change its possible that your expansion valve is stuck closed and would have to be replaced.

**Compressor Concerns:*

This is often misdiagnosed as a problem for the system not cooling properly. If you have a noisy compressor it is due to improper charging of refrigerant. An overcharged (more than 24oz or 1.8lbs R134) compressor can cause rattling. If charged with pure liquid there is a high probability you have bent reed valves that are causing tapping sound.

TROUBLESHOOTING GUIDE

TEST CONDITIONS USED TO DETERMINE SYSTEM OPERATION

(THESE TEST CONDITIONS WILL SIMULATE THE AFFECT OF DRIVING THE VEHICLE AND GIVE THE TECHNICIAN THE THREE CRITICAL READINGS THAT THEY WILL NEED TO DIAGNOSE ANY POTENTIAL PROBLEMS).

- B. CONNECT GAUGES OR SERVICE EQUIPMENT TO HIGH/LOW CHARGING PORTS.
- C. PLACE BLOWER FAN SWITCH ON MEDIUM.
- D. CLOSE ALL DOORS AND WINDOWS ON VEHICLE.
- E. PLACE SHOP FAN IN FRONT OF CONDENSER.
- F. RUN ENGINE IDLE UP TO 1500 RPM.

ACCEPTABLE OPERATING PRESSURE RANGES (R134A TYPE)

- 1. HIGH-SIDE PRESSURES (160-250 PSI) **Note- general rule of thumb is two times the ambient (daytime) temperature, plus 15-20%.*
- 2. LOW-SIDE PRESSURES (06-22 PSI in a steady state).

CHARGE AS FOLLOWS: R134A = 24 OZ.

NO ADDITIONAL OIL IS NECESSARY IN OUR NEW COMPRESSORS.

TYPICAL PROBLEMS ENCOUNTERED IN CHARGING SYSTEMS

NOISY COMPRESSOR. A noisy compressor is generally caused by charging a compressor with liquid or overcharging

- A. If the system is overcharged both gauges will read abnormally high readings. This is causing a feedback pressure on the compressor causing it to rattle or shake from the increased cylinder head pressures. System must be evacuated and re-charged to exact weight specifications.
- B. **Heater control valve installation** - Installing the heater control valve in the incorrect hose. Usually when this occurs the system will cool at idle then start to warm up when raising the RPM's of the motor. **THE HEATER CONTROL IS A DIRECTIONAL VALVE; MAKE SURE THE WATER FLOW IS WITH THE DIRECTION OF THE ARROW.** As the engine heats up that water transfers the heat to the coil, thus overpowering the a/c coil. A leaking or faulty valve will

have a more pronounced affect on the unit's cooling ability. Installing the valve improperly (such as having the flow reversed) will also allow water to flow through, thus inhibiting cooling. Check for heat transfer by disconnecting hoses from the system completely. By running down the road with the hoses looped backed through the motor, you eliminate the possibility of heat transfer to the unit.

- C. **Evaporator freezing** - Freezing can occur both externally and internally on an evaporator core. External freeze up occurs when the coil cannot effectively displace the condensation on the outside fins and the water forms ice (the evaporator core resembles a block of solid ice), it restricts the flow of air that can pass through it, which gives the illusion of the air not functioning. The common cause of external freezing is the setting of the thermostat and the presence of high humidity in the passenger compartment. All door and window seals should be checked in the event of constant freeze-up. A thermostat is provided with all units to control the cycling of the compressor.
- D. **Internal freeze up** occurs when there is too much moisture inside the system. The symptoms of internal freeze up often surface after extended highway driving. The volume of air stays constant, but the temperature of the air gradually rises. When this freezing occurs the low side pressure will drop, eventually going into a vacuum. At this point, the system should be checked by a professional who will evacuate the system and the drier will have to be changed.
- E. **Inadequate airflow to condenser** - The condenser works best in front of the radiator with a large supply of fresh air. Abnormally high pressures will result from improper airflow. Check the airflow requirements by placing a large capacity fan in front of the condenser and running cool water over the surface. If the pressures drop significantly, this will indicate the need for better airflow.
- F. **Incorrect or inadequate condenser capacity** - Incorrect condenser capacity will cause abnormally high head pressures. A quick test that can be performed is to run cool water over the condenser while the system is operating, if the pressures decrease significantly, it is likely a airflow or capacity problem.
- G. **Expansion valve failure** - An expansion valve failure is generally caused by dirt or debris entering the system during assembly. If an expansion valve fails it will be indicated by abnormal gauge readings. A valve that is blocked will be indicated by high side that is unusually high, while the low side will be