Installation Manual

1970-1978 Camaro

DOCUMENT #1-2057
Congratulations...

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

To obtain the high level of performance and dependability our systems are known for, please pay close attention to the following instructions. Our installation steps and procedures are derived from a long history of research and development and the combined experience achieved thru thousands of successful installations (and feedback from customers like you). Please remember that 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.

Before starting, read the instructions carefully, from beginning to end, and follow the proper sequence. 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 During the installation you might find the opportunity to repair or upgrade non-working or out of date components.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.
Control & Operating Instructions

Your new **Perfect Fit-Elite** system offers complete comfort capabilities in virtually every driving condition. This includes temperature control in all of the modes. This system also provides the ability to blend the air between Face, Heat, and Defrost modes simultaneously. To illustrate the various ways you can adjust the airflow direction and temperature - we’ve provided these handy illustrations and chart to show exactly how you can adjust your **Perfect Fit-Elite** for maximum comfort...

The FAN switch works like the OEM switch, the far left position is OFF (all power to the system is OFF in this position)

The COLD/HOT positions works like any traditional adjustment lever

There are 11 levels of adjustment within the range of the DASH/FLOOR lever

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Remove Glovebox, Console (optional) Radio and Bezel, and set them aside for reinstall later (see figure 1).

The removal of the Original Heater Assembly can be accomplished by disconnecting three control cables. One is attached to the Heat/Defrost door (see figure 2). One is attached to the Temperature door, and one is attached to the Vent / Heat door (see figure 3). Disconnect the electrical harness from the assembly. Also remove attachment screw located in front of the air inlet (see figure 4).

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.
Disconnect the electrical harness at the resistor block (see Figure 5).

Remove the OEM control head, which is held in with two screws. Retain the OEM screws.

Set the control head aside (you’ll need the bezel later).
Moving to the engine compartment:

In order to remove your heater assembly it is necessary to remove the heater case housing first.

Located on the engine side of the firewall, remove seven (7) bolts around the perimeter of the heater case housing (see Figure 7). Remove the housing (Discard).

**NOTE:** To remove the two bolts at locations 1A and 7B, it may be necessary to lower the inner fender. Retain these screws.

Drain coolant from radiator. Remove the heater hoses from heater coil and firewall (see Figure 8).

You will also cut a power lead to the blower motor. This will not be re-used.
You should now be able to remove the heater assembly located behind the dash area. Rotate upward being careful not to drain any coolant left in the heater coil.

The OEM defrost duct is secured with two screws remove both screws from defrost duct and set aside.
THESE ARE THE PARTS YOU WILL FIND IN CONTROL BOX
You will use all of these parts and hardware during the next series of installation steps.

D.E.R. Control
PN#16-3027

NOTE: Illustrations NOT shown actual size
THESE ARE THE PARTS YOU WILL FIND IN BAG KIT B

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

Evaporator Support Brackets
PN#0023-7

Fresh Air Inlet Block Off
PN#10-1048-2

Liquid Tube
PN#0034-9

Suction Tube
PN#0034-10

#6 and #10 O-ring

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

Six #10 - 10 x 5/8" Phillips Screws

One Flange Nut

Defrost/Heat Duct Assembly
PN#2-2025-2
PRE-INSTALLED

One Male Spade Connector

One Bulb Clamp

Illustrations NOT shown actual size
Within the engine compartment area, Install Fresh Air inlet block-off PN# 10-1048-2 (from Bag Kit B) over the OEM fan opening using the OEM screws (A1 and B7).

If necessary, reinstall inner fender.

Remove evaporator unit from box and place on a work surface.
Familiarize yourself with the Evaporator

Take a minute to familiarize yourself with the evaporator unit:

- Capillary Tube
- Blower Motor
- Defrost/Floor Servo Motor
- Thermostat
- Blower Motor Plug
- Heater Tubes
- Defrost Adapters
- Firewall Mounting Stud
- Expansion Valve
- Liquid Tube
- Suction Tube
- Condensation Drain Outlet
- Evaporator Case
- Dash Duct Assembly
- (4) Dash Air Outlets
- Front
- Rear
- Dash Servo Motor
- Floor Air Outlet
- Defrost/Heat Duct Assembly
WIRING PREP

- Locate Evaporator Unit from Main Box
- Pre-installed Face Duct Assembly
- Pre-installed Defrost/Heat Duct Assembly
- Locate electronic water valve from Bag Kit D
- Locate Blue, Yellow, Orange wiring harness from Bag Kit C
- Locate main wiring harness from Bag Kit C
- Locate the D.E.R. control in BAG KIT A
- Locate ECU and Calibration Key from Bag Kit C
- Acquire a 12V Battery (NOT a battery charger)

DO NOT USE CALIBRATION KEY WITHOUT TECH SUPPORT

12V Power Source
Push S-Clips over flange securing with two #10 x 5/8” screws, from back

Attach to front outlet securing with pre-installed S-Clips
1. Connect Blue Harness into Defrost/Heat Servo Motor
2. Connect Yellow Harness into Face/Floor Servo Motor
3. Connect Orange Harness into water valve

Click!

Click!

Click!
Connect Yellow Harness into Face/Floor Port on ECU

Connect Blue Harness into Defrost/Heat Port on ECU
Connect Orange Harness into Water Valve Port on ECU

From your D.E.R.,
Connect Green Harness into Control Port on ECU
Connect corresponding Fan Switch harness to the Bower Switch on Controls.
Connect Power lead to 12V.

Connect red tagged power harness to POWER port on ECU.
Connect ground.

Connect corresponding fan motor harness.
Connect ground.

Connect both BLUE leads into thermostat (either lead into either terminal).
Connect ground.

(White lead is to be connected to compressor)
• Function Test, Steps 1 thru 3

1. Move FAN knob to HIGH
   Move MODE knob to DASH
   Move TEMP knob to COLD

AIR OUT OF DASH VENTS

2. Move MODE knob to DEF

AIR OUT OF DEFROST VENTS

3. Move MODE knob to FLOOR

AIR OUT OF FLOOR VENTS
Return all wiring harnesses, water valve, and ECU to their originally bags/boxes (this keeps them organized for future installation steps).

Your controls are now fully calibrated to your unit. Please refer to the next steps in your installation manual for installing the system in your vehicle.

NOTE: IF DURING ANY OF THESE STEPS YOU DO NOT GET THE CORRECT OUTCOME, PLEASE CALL TECH SUPPORT BEFORE INSTALLING INTO VEHICLE. 1(866)435-7801
NOTE: Two people are needed for this step!

Place evaporator on floor panel. Roll unit up behind the glove box opening, inserting tubes through the large hole in firewall.
Installing the complete evaporator unit under the dash will go much easier with the help of a friend. Once the unit has been rolled up under the dash, one person can hold the unit in place while the other person can be ready at the firewall area with the included flange nut to secure the unit (see figure 17). Leave Flange nut loose to allow leveling of unit in next steps.
Locate in the UPPER MOUNTING BRACKETS and attach to evaporator unit using four #10 - 10 x 5/8" Phillips screws. Attach other end to the cowlng with a #10 - 16 x 3/4" Tek Screws (see figure 9). **IMPORTANT NOTE: On the side of the main unit you will see several holes for mounting holes... ONLY USE THE ONES ON THE FAR LEFT AND RIGHT FOR THESE BRACKETS!** Do not tap into the other holes for any reason (see figure 10). Also, use a screwdriver and hand-power and do not over-tighten so you don't strip the holes.
Install liquid line onto the Expansion valve (TXV) as shown. Use #6 o-ring and (2) drops of mineral oil on the o-ring and tighten securely.

Install Suction Tube to the outlet on the unit as shown. Use #10 o-ring and (2) drops of mineral oil on the o-ring and tighten securely.

Locate Sensing Coil attached to Expansion valve (TXV) and utilizing Bulb Clamp, attach to the Suction Tube.

**CAUTION: THE SYSTEM WILL NOT FUNCTION PROPERLY IF THE SENSING COIL IS NOT CLAMPED IN THE CORRECT POSITION. SEE PICTURE.**

Wrap Suction Tube and Sensing Coil with the refrigerant tape provided. Be sure that all of the exposed metal is covered.

**TECH TIPS**

Reminder...
Use two wrenches to tighten o-ring fittings

**BULB CLAMP**

YES

NO!
Mount Evaporator level to firewall.

Locate Drain nipple on Evaporator and drill a 3/4” hole below the nipple on the firewall. This will allow condensation to drain properly.

Attach 1/2” clear drain tube to Evaporator nipple and run through 3/4” hole you just drilled.

All condensation will now drain out into the engine bay.
Illustrations NOT shown actual size
THESE ARE THE PARTS YOU WILL FIND IN BAG KIT C

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

ECU and Calibration Key
DO NOT USE CALIBRATION KEY WITHOUT TECH SUPPORT

Wire Harness -
Power Supply
PN#0105-36

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

Illustrations NOT shown actual size
1. Connect Blue Harness into Defrost/Heat Servo Motor
2. Connect Yellow Harness into Face/Floor Servo Motor
3. Connect Orange Harness into water valve

Click!

www.classicautoair.com • 866.435.7801
Connect Yellow Harness into Face/Floor Port on ECU

Connect Orange Harness into Water Valve Port on ECU

From your D.E.R., Connect Green Harness into Control Port on ECU

Connect Blue Harness into Defrost/Heat Port on ECU
Connect corresponding Fan Switch harness to the Bower Switch on Controls. Connect Power lead to 12V.

Connect red tagged power harness to POWER port on ECU. Connect ground.

12V Power (20 amp fuse)

Connect corresponding fan motor harness. Connect ground.

Connect both BLUE leads into thermostat (either lead into either terminal)

(White lead is to be connected to compressor)
THESE ARE THE PARTS YOU WILL FIND IN BAG KIT D

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

Electronic Water Control Valve  
PN#16-1081-2

Clear Plastic Drain Tube

Firewall Block Off  
PN#10-1049-1

Refrigerant Tape

Six Worm Gear Clamps

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

Illustrations NOT shown actual size

www.classicautoair.com • 866.435.7801
In Bag Kit D you’ll find the firewall block off. Install this over the hose connections coming through the firewall within the engine compartment. Attach with six #10 - 16 x 3/4” Tek screws.

TIP: Route ORANGE cable through the block off plate (it will be plugged into the electronic water valve).

The loose white wire from main power harness can be fed through the same hole (as shown below).
Your water valve **MUST be installed per these instructions!... (If not, your system will not work properly.**

The **lower** heater tube connection on firewall will be routed to the water connection on intake manifold using 5/8” dia. heater hose with the supplied worm gear clamp.

The **upper** heater tube connection on the firewall will be routed to the water valve connection labeled **heater core**, using a 6” piece of 5/8” heater hose attached with supplied worm gear clamp.

Connect the remaining outlet on water valve labeled **water pump** to the water pump using 5/8” dia. heater hose with the supplied worm gear clamp.
THESE ARE THE PARTS YOU WILL FIND IN BAG KITS E, F, and G

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

**Bag E**
- Drivers-side Defrost Adapter
  PN#2-1057-3
- Passenger-side Defrost Adapter
  PN#2-1057-4
- Six S-Clips
- Two Duct Hoses, 2" I.D.
- Four Zip-Ties

**Bag F**
- Two Louver Adapters
  PN#2-1057-2
- Two Duct Hoses, 2" I.D.
- Face/Floor Assembly
  PN#2-2025-1
- Four Zip-Ties

**Bag G**
- Center Dash Vent Adapter
  PN# 2-1057-1
- Two Duct Hoses, 2" I.D.
- Four Zip-Ties

Illustrations NOT shown actual size
Before you install the evaporator, the OEM defroster duct must be removed and modified.

1) Detach the entire assembly and place on a flat work surface.

2) Detach the left and right upper ducts. Cut out and attach the included templates and trim as indicated.

3) Attach the defrost adapters (S-clips on adapters will hold firmly).

4) Place the included S-clips over the leading edge of the OEM defroster ducts, and set aside for later installation.
Push defrost vent assy onto lip of dash tab (below defrost vents, inside of dash), S-clips (already installed) will hold the adapters securely.

One end of the duct hose is installed over the defrost/heat duct assembly outlets on the main unit.

Next route the duct hoses from the defrost/heat duct assembly upward toward defrost vents. Attach the flex hose to the defrost diffuser using zip-ties on both ends.
**Bag Kit G:** Installing the center louver vent requires a small amount of cutting to the dash support. Locate template for the center dash louver installation and tape it to the dash pad. Bottom edge of template aligns with the edge of dash pad.

Cut a hole thru the dash pad.

Your new center louver came with an adapter and a brace, already assembled. Remove the brace temporarily, place louver and adapter into hole, the secure both to dash (from the backside) with the brace and screw we provided.

View from underside of dash
Attach louver adapters to the back side of OEM louvers, both sides. S-Clips will hold them in place.

Route supplied flex hoses as shown below. Take your time and route them so they don’t become kinked or torn.

During installation of the hoses be aware of the eventual movement of the wiper arm components.
These are the parts you will need for the engine compartment installation, 1970-1973 Camaro

You'll find all of these parts within the main box:

- **Right Condenser Brackets**
  - PN#0090-52

- **Left Condenser Brackets**
  - PN#0090-51

- **Drier Bracket**

- **Liquid Tube**
  - (condenser to drier)
  - (drier to rad support)

- **Discharge Tube**
  - (condenser to rad support)

- **Liquid Tube**
  - (drier to rad support)

- **Three Refrigerant Hoses**

- **Drier**

- **Splice and Bullet Connector**

- **Discharge Hose**
  - #6 5/16" Liquid Hose

- **Suction Hose**
  - #10 1/2" Suction Hose

- **Liquid Hose**
  - #10 1/2" Suction Hose

- **1" Rubber Grommet**

- **Bag of O-rings and Mineral Oil Tube**

- **Pressur Switch and harness**

- **Ten #10 - 10 x 1/4" Hex Screws**

- **Four 1/4" - #20 x 5/8" Hex Head Bolts**

- **Four 1/4" - #20 Flange Nuts**
THESE ARE THE PARTS YOU WILL NEED FOR THE ENGINE COMPARTMENT INSTALLATION, 1974-1978 CAMARO

You’ll find all of these parts within the main box

- Drier Bracket
- Right Condenser Brackets PN#0049-50
- Left Condenser Brackets PN#0049-51
- Drier Bracket
- Splice and Bullet Connector
- Nine #10 - 20 x 3/8" Screws
- Six #10 - 16 x 3/4" Tek Screws
- Pressure Switch and harness, Bag of O-rings and Mineral Oil Tube
- Discharge Tube (condenser to rad support)
- Liquid Tube (condenser to drier)
- Liquid Tube (drier to rad support)
- Three Refrigerant Hoses
- 1" Rubber Grommet
- Condenser PN#11-1089
- #6 5/16" Liquid Hose
- #10 1/2" Suction Hose
- #10 1/2" Discharge Hose
Remove the hood latch assembly. Retain original hardware.

Using the included template, attach it to the passenger side of the radiator bulkhead, and drill both needed holes as indicated. Put the included grommet into the 1” hole.

Place the condenser on a flat work surface and attach the included brackets to the condenser, as shown to the right. Use the included hex screws, but do not tighten just yet.

Place the condenser into place, and use the holes drilled on the OEM support to secure the condenser with the included 1/4” - #20 x 5/8” hex head bolts and flange nuts.

**INSTRUCTIONS FOR 1970-1973 CAMARO’S ONLY**
THE FOLLOWING INSTRUCTIONS ARE FOR 1974-1978 CAMAROS ONLY:

Remove the hood latch assembly. Retain original hardware. Using the included template, fold along dotted line and align top edge with radiator cowl opening and tape. Drill holes as indicated on template.

Attach brackets to condenser as shown using 6-10 x 1/4 tek screws.
DRIER AND CONDENSER PREPARATION. You can perform most of the following steps on a clean flat surface like a workbench. Lay the condenser down so that both hose connections are on the left side (the larger connection will be on top). The drier is conveniently mounted on the left hand side of the condenser. First insert the drier into the drier mounting bracket (it's basically a sleeve for the drier). Attach the drier liquid tube to the drier and also to the connection on the condenser (tighten connections at either end using supplied o-rings on both ends and a few drops of mineral oil to each o-ring). With these two components combined it will easy to find the correct place to attach the drier bracket to the condenser with the included #10-20 x 1/4” screws (attach drier and bracket from the front of the condenser).

PRESSURE SWITCH: Screw the high-pressure switch into the port on the top of the drier. Go ahead and plug the pressure switch harness into the switch at this time (black electrical boot with two long white wires).

BRACKETS: Install the upper condenser bracket using four #10 - 20 x 1/4” screws in the top two holes on each side. Next, attach the lower brackets using the bottom two holes, with the same size screws. These brackets have a bend that will face away from you.

Reminder… Use two wrenches to tighten o-ring fittings

You can easily find the correct position for mounting the drier to the condenser by using the drier liquid tube as a gauge.
Remove the hood latch assembly. Retain original hardware. Slide condenser assembly down in front of the radiator.

Locate condenser in the center of the radiator. Attach top condenser brackets to the bulkhead using (2) #10 Tek screws.

Located behind the air dam and at the lower radiator bulkhead, attach the lower condenser brackets using (2) #10 Tek screws.

Reinstall hood latch assembly using original hardware.

Locate the Liquid tube, Discharge tube, (1) #6 o-ring, and (1) #8 o-ring. Attach Liquid tube to the drier using the #6 o-ring and a few drops of mineral oil. Attach Discharge tube to the condenser using #8 o-ring and a few drops of mineral oil.

Locate the tube support bracket, the tube clamp, and (2) #10 x ¾” tek screws, and (1) #10 x ½” hex head screw.

Attach the support bracket to the radiator bulkhead using (2) #10 x ¾” tek screws.

Attach liquid and discharge tubes using the tube clamp, using (1) #10 x ½” screw.
Install the compressor kit. Included was a premium compressor kit with all the parts you’ll need to install the compressor. This kit includes instructions specifically written for your engine. Once you’ve installed the complete compressor kit, continue on to connecting the hoses.

CONNECTING THE HOSES:
Based on PASSENGER or DRIVERS SIDE compressor mounting see illustrations for routing.

The #10 (LARGEST) refrigerant hose. Attach end with service fitting to the compressor using (1) #10 o-ring and a few drops of mineral oil. Attach other end to #10 fitting at the firewall. Attach using one #10 o-ring and a few drops of mineral oil. Tighten securely.

The #6 (SMALLEST) refrigerant hose. Route behind fender and to the connection on firewall. Attach using two #6 o-ring and a few drops of mineral oil.

The #8 (MEDIUM) refrigerant Hose. Route behind fender and to the connection on compressor. Attach using two #6 o-ring and a few drops of mineral oil.

TWO WRENCH METHOD

Reminder... Use two wrenches to tighten o-ring fittings
New A/C System Preparation… A MUST READ!

Please read through these procedures before completing this new A/C system charging operation.

A licensed A/C technician should be utilized for these procedures to ensure that your new system will perform at its 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 a minimum of 45 minutes.

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 1.5lbs (24oz) of R134a refrigerant.

5. Your new compressor comes charged with oil - no additional oil is necessary.

6. Ensure that the new belt is tight.

7. Do not charge system with liquid refrigerant!

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 approximately 1500 rpm

Acceptable Operating Pressure Ranges:
1. High-side pressures: 150-275 PSI
2. Low-side pressures: 10-25 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. Mount by using the centerline of the oil fill plug as your guide. The compressor can only be mounted inbetween the 9 to 3 positions. Do not mount inbetween the 4 to 8 positions.

This can cause compressor failure.
Troubleshooting Guide

Test conditions used to determine system operation:
These test conditions will simulate the effect of driving the vehicle and give the technician the three critical readings that they will need to diagnose any potential problems.
A. Connect gauges or service equipment to high/low charging ports
B. Place blower fan switch on medium
C. Close all doors and windows on vehicle
D. Place shop fan in front of condenser
E. Run engine idle up to 1500 RPM

Acceptable operating pressure ranges (R134A type):
1. High-side pressures: 150-275 PSI
   *note: general rule is two times the ambient/daytime temperature plus 15-20%
2. Low-side pressures: 10-25 PSI in steady state

Charge as follows: R134a = 1.5lbs (24oz)
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. Installing the heater control valve in the incorrect hose will cause the system to cool at idle and gradually warm up when the RPM’s of the engine rise. The heater control is a directional valve; make sure the water flow is with the direction of the arrow. As the engine heats up, the 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 which inhibits the 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 can occur both externally and internally on an evaporator core. External freeze up occurs when the coil can’t effectively displace the condensation on the outside fins so 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 most common cause of external freezing is the thermostat setting and 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 the system has too much moisture inside. 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 and eventually go into a vacuum. At this point, the system should be checked by a professional who will evacuate the system and change the drier.

E. 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. Pressures dropping significantly will indicate the need for better airflow.

F. 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. 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 and the low-side unusually low (may even go into a vacuum.) A valve that is stuck open will be indicated by both the pressures rising to unusually high readings and tend to move toward equal readings on the gauges.

H. A restriction in the cooling system will cause abnormal readings on the gauges. A high-side restriction, between the compressor and the drier inlet, will be indicated by the excessively high discharge reading. These simple tests can be performed by a local shop and can help determine the extent of the system’s problem.
Troubleshooting Your Classic Auto Air A/C System

**Problem:** system is not cooling properly

**Issue:** cold at idle. warmer when raising engine RPMs

**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 incorrectly connected to the hose it allows water to circulate through the system via the heater core over-powering the cooling effect of the a/c coil.

**Step 1:** Check placement of the water valve and correct if needed.

**Step 2:** If changing the location of the water valve does not rectify the issue, the water valve may be permanently damaged and may need to be replaced. To check the integrity of the water valve you will need to completely remove the heater core’s water hoses and “loop” together. By doing so, the heater system will be completely removed from the possibilities. If the system now cools then the water valve will need to be replaced.

**Verify adequate air flow to the condenser.**
The condenser’s function is to dissipate heat. Your air conditioning system will not cool your vehicle’s cabin properly if you do not have an adequate airflow across the condenser.

**Step 1:** Connect gauges to a/c hoses. When ambient temp is 90°, pressures should be:

- Low-side pressures: 10-25 PSI
- High-side pressures: 150-275 PSI

If the low-side pressures are normal but the high-side pressures are high then there might be an airflow issue and you will need to test the airflow to the condenser.

**Test airflow to the condenser.**

**Step 1:** Place a piece of paper on the condenser with the car idling to see if the paper is held in place.

**Step 2:** With the car still idling, attach gauges and place a large capacity fan in front of the condenser. Check the pressures to see what happens.

**Step 3:** With the car still idling and the gauges still attached, pour water down the front of the condenser. Check the pressures again to see what happens.

If the paper was held in place then you are getting some air flow. If the high-side decreases during step 2 and step 3 then your condenser is not getting enough air which is stopping your system from cooling properly. To correct this issue, you will need a more powerful mechanical fan.

**Confirm the correct refrigerant charge is in the system.**
All of our systems should be charged with 1.5lbs (24oz) of R134a refrigerant only. If overcharged, you will need to evacuate the system and recharge with the correct amount.*

**Measurement meanings:**

1. Low temp and high pressure seems to be equal = malfunctioning expansion valve that is stuck open.
2. High side is extremely high and low side is extremely low (possibly into vacuum) = blockage in the system. Remove hoses and blow cold compressed air through it in both directions. Re-check your pressures. If pressures do not change then it is possible that your expansion valve is stuck closed and would have to be replaced.

*Compressor Concerns:*
If you have a noisy compressor, it is due to the improper charging with liquid or overcharging. An overcharged compressor will cause rattling. A compressor charged with pure liquid produces a high probability of bent reed valves. When the reed valves get bent they will created a tapping sound. Ensure your system is charged with 1.5lbs (24oz) of R134a refrigerant to avoid compressor related cooling issues.
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