

# **Installation Manual**

---

## **1959-68 Jaguar Mark II**

DOCUMENT #RA-1-1019

*Right Hand Drive*





# ***Congratulations...***

**You have just purchased the highest quality, best performing A/C system ever designed for your 1959-68 Jaguar Mark II.**

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 During the installation you might find the opportunity to repair or upgrade non-working or out of date components.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.**
- 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:

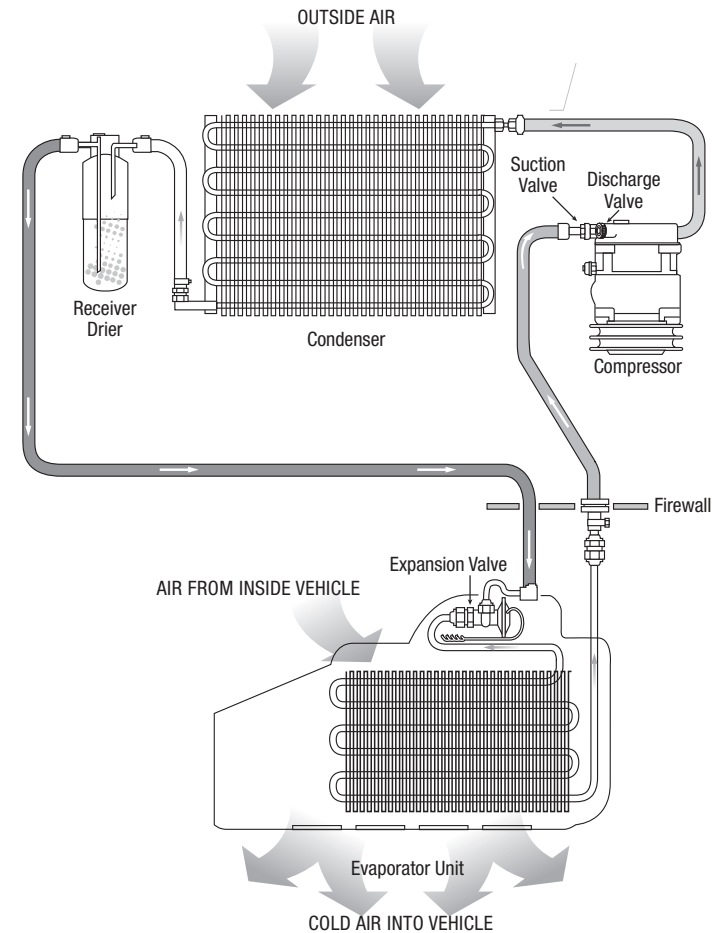
- Fittings: Use one or two drops of mineral oil (supplied with your kit) on ALL rubber o-rings, threads and rear of bump for o-ring where female nut rides. Do not use thread tape or sealants.
- Measure twice (or more), cut once
- Should you have any technical questions, or feel you have defective components (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 Overview of Automotive A/C....

- 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. In the condenser, 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.



After removal of the Heater Box Assembly and passenger carpeting, remove the LH Pedal Box cover. Using the enclosed Metal Pattern, Bolt the lower pattern hole to the corresponding hole in the body and leave loose. Aligning the pattern, trace and cut the Blower opening in the body sheet metal to give full airflow into the enclosed **RA-00004-03** 4" oval hose Adapter which will be mounted on top, inside the engine compartment. The Blower is mounted inside the car with the opening to the rear. This cut can be made with an air body saw or similar tool. Re-locate wiring and ancillary items to clear the Blower when mounted. After making sure of the blower motor placement, remove it. All of the existing Firewall Heater and defroster openings must be permanently covered with the enclosed sheet metal pieces and sealed against the weather.

Use Silicone under all metal pieces to be mounted. Mount the Blower inside and the Oval ABS Hose Adapter outside, in the Engine Compartment using the 6 #10 screws, washers and Nylock Nuts. The 4" Insulated duct inner plastic hose can be attached at this time by forming it around the ABS engine compartment outlet; secure it with the included 2 washers/screws, Tie Wraps and seal edges with silicone sealer. After the sealer is dry, seal the 4" Duct Hose outer shell with the Aluminum Tape provided. After cutting the 4" Hose to the proper length, attach to the Evaporator in the same fashion. Do not restrict the airflow! The included Insulated Hose has a "Mylar" covering and needs to be protected from high heat with the enclosed Aluminum sheet! It will need to be mounted and formed to protect the Blower and Evaporator from Exhaust Heat.

---

Install & seal firewall sheet metal before mounting evaporator!! Install the Flat metal cover over the left side of the large hole and the angled metal cover over the small bottom holes and slot.

The evaporator is shipped with the cover removed that will be installed later. To mount the evaporator, place this cover on the firewall horizontally, sharp edges out and installed Weather-strip to the bottom, where the Heater formally was. Place the left (passenger) side of the cover as close to the left hinge as possible without interfering with the Bonnet opening/closing, or the Insulation on the Evaporator. The top of the cover should be 1 ¾" from the underside of the cowl overhang. Make sure that the front cover is level and lined up, then drill two 3/32" holes on both right and left upper sides (away from the 2 and 2 ½" holes about to be drilled) to secure the cover to the firewall with screws.

Insure Evaporator & Hoses have proper clearances inside & out!

After drilling three 2" holes, and one 2 ½" hole with a hole saw through the cover and firewall, remove the 1 ½" paper defroster hoses- they will be replaced with Kit supplied hoses. When Drilling the 2" and 2 ½" holes, Space these (4) holes fairly equal to maximize airflow! The 2 ½" hole and Hose Adapter should be positioned to the left (passenger) side to take advantage of the space available since there are (2) "Y" Hose Fittings to attach- the round one with the control will be attached, with a small section of hose to the 2 ½" fitting coming through the firewall. The Air Control part of the "Y" is attached to the flat "Y" with the Defroster Hose Adapters. The round 3rd arm will attach to the 2 ½" to 2" Hose adapter, then to the vent as described below (see picture). After cutting the (4) holes (one goes through the supplied Kit Sheet Metal filler panel, and inner "Cowl vent Scuttle" housing wall), remove the Evaporator cover, and seal the small mounting holes. Use included foam weatherstrip to seal the firewall depressions under the mounted evaporator.

Clean/trim all hole edges and place the four- outlets inside the cover with a sealing or PVC adhesive, then put cover on evaporator with supplied screws after drilling and adding the round Weather Strip to the bottom of the oversized cover. Do not invert cover or holes will not line up!

Use silicone to fill any spaces in evaporator case joints. The outlets will protrude out from the cover and into the firewall holes (it may be easier to attach the duct hoses with enclosed tie wraps before mounting the Evaporator-see below). Mount the evaporator with supplied evaporator brackets and ¼ X ½” Bolts and flat washers (previously installed). After insuring that the assembly and brackets are level and outlets fully inserted, drill (3) holes (3/32”) in the firewall for each bracket and attach with supplied SM screws. The evaporator must be firmly against the firewall! This would be the time to drill a 1 ¼” hole in the inner fender for the enclosed grommet that allows the A/C hose to pass through. (This should be done prior to permanently mounting evaporator so the hose lines up with the connection).

Before moving inside the car, mount the insulated intake hose (attached to the blower motor) to the oval intake on the evaporator- cut off any excess. At this time, attach the inner, Insulated Duct hose to the evaporator with the supplied Nylon tie and seal edges with silicone. The outer, insulation w/ covering will then be secured with the enclosed Foil Tape. Once the evaporator has been securely attached, drill a hole, from inside the car, for the capillary tube and grommet through the firewall and the cover. The hole should be between the 2nd or 3rd outlet leaving enough space to attach the duct hose. See capillary tube instructions below. The space around the duct hose coming through the Cowl vent (Scuttle) housing should be sealed with Silicone. That will leave the vent fully functional for outside air coming into the car; yet seal the interior from heat.



The metal "Cubby" previously removed will now have to be cut to allow clearance for the louver duct tubing. Remove 2 ½" deep by 10" long from the right side, lengthwise, from the closed rear of the "Cubby", making it open front and rear except in back of the vent handle. Use Tape to protect the "Cubby" sharp cut edge. Reinstall the "Cubby" without the wood trim and secure the radio center console piece to it for stability. Cut the 2" duct tubing to length so 2 tubes will hang out through the "Cubby" from the 2 middle Evaporator outlets. The right Evaporator outlet duct hose will attach to the round louver installed in the finish panel under the driver side dash. The left hose will attach as below-see picture and instructions. The lower louvers are installed by unscrewing the body, making a 2 ½" hole in the finish panel with a hole saw, and assembling, or using the under-dash mounts enclosed. Secure the Hoses with Sealant.

When installing the under dash louvers, it is critical to route the hoses and louvers so they will not be obstructed. Allow extra length on all duct hose as it can be collapsed or trimmed, but not stretched! For service after installation, it will be necessary to remove the wood trim panel and louver panel and stretch the duct hose to get behind the instrument panel!

The under dash finish panel on the passenger side will have to be shortened 6 to 7" from the firewall end to mount the blower motor and allow enough air to reach it. Measure the amount to be taken and mark the unfinished side. Using a heat gun, heat up the area to be removed and pull the vinyl away from backer board past your mark. Cut the board and trim the vinyl so it can be reattached in the same manner as original with contact cement. You can make mounting holes for the switches if so desired. There is, also, a switch panel that can be used instead of concealing the switches. The "bare spot" on your upper passenger Firewall can be covered with the vinyl removed in the previous operation.

Route the capillary tube of the temperature switch through the hole (with grommet) previously drilled and push half-way into evaporator coil. This is a judgment call- the coil takes up approx. Two thirds of the case. It should go in a few inches before meeting light resistance. Once resistance is met, push it in another 2 ½" unless too much resistance is felt, pull out and try again in a slightly different location. This tube senses the temperature of the air coming in and switches the compressor on and off as needed. When routing the tube from the switch, make every effort to keep the tube from touching any metal or ducts which may affect the temperature sensing. Do not crimp the thermostat tube!

Attach the previously cut duct hose (if not already attached) to the firewall evaporator outlets using the enclosed tie wraps. Be sure these joints are secure and tight as the efficiency of the unit depends on this. This would be the time to install the round louver on the drivers side after removing the under dash finish panel.

The duct hose may now be attached to the rectangular louvers that have been fitted into their panel and will be below the instrument panel. The hose fits inside of some louver hose attachments and outside of others. They should not need any fasteners. The louver panel, with the louvers installed, may need trimming and is attached by fitting it between the wood trim piece and the "Cubby". Drill holes in the appropriate places and attach the nuts to the wood trim piece and tighten. Reattach the drivers under-dash trim panel, making sure that the duct hose is attached to the louver. Do not attach the passenger trim panel. If fitting switches to this panel, be sure of clearances and wire accessibility for the electrical hookup. Attach the 30 amp circuit breaker under dash brace as pictured. This will be wired later.

The Wiring harness has 5 electrical connectors on one end- connect as follows: Black to "B" on the Fan Switch, Red to "M", Yellow to "L", Orange to "H". The remaining Blue wire is connected to either side of the Thermostatic Switch. The short Blue wire goes from "C" on the Fan Switch to the other thermostat connector. The Long blue wire is attached to one wire on the Hi-Lo Switch. The other Hi-Lo Switch wire goes to the compressor with the enclosed 14 Ga wire and connector. Establish a connection to a switched ignition source with the free Harness Black wire, so it is "live" when the switch is on and "dead" when the switch is off. Connect this wire to the supplied circuit breaker at "AUX" terminal on the Circuit Breaker. Attach the Black large harness wire to the circuit breaker terminal "BAT". The loose Yellow wire on the Motor will be attached to the vehicle's body for "GROUND". That leaves the Red and blue wire connected. Route all the wires out of the way of obstructions that may develop when the dash and ducts are put together. Make sure all connections are good and hook up the harnesses and switches. Connect the battery and turn on the ignition to test the motor. When switched on, the motor should draw air from the passenger compartment and blow vigorously through the upper louvers. If not, something may be wired incorrectly.

With grille removed, measure 13" from bottom pan on Left (Passenger) side grille opening wall and mark. At the same height, measure 1 ½" from the radiator support/brace and check for clearance and interference on both sides of Grille wall! These intersecting marks will be the center of a 1 ¼" diameter hole in the side panel to gain access to the L/F wheel opening. Drill another 1 ¼" hole 9 ¾" (measure to be sure) below the first one. Fit the enclosed grommets into these holes after treating raw edges with rust preventive. The top hole/connection will be the large inlet, while the lower hole/connection will be the smaller outlet. Make sure the condenser connections or A/C hoses will not chafe on metal. Loosely mount the condenser so it will be next to the left (passenger) side of the grille opening where the holes were just made.

**The condenser fittings should be accessible for attachment to the A/C hoses upon completion of this section. Install the Electric Fan Last using the enclosed Relay!**

With the radiator removed and the condenser installed, remove the fan belt and fan blade. Remove the inverted 5/16" head nut and stud directly above the center generator bracket bolt (See picture) and install replacement stud first, then the "S" shaped Bracket followed by the stud nut/washer. Do not tighten nut at this time.

The front bracket is installed with the supplied 5/16" bolts/washers in the upper outermost holes in the front timing chain cover (just below the head). Remove any bolts already there. If your generator adjustment bracket is anchored to one of these, place it at another location. Leave all the bolts on the brackets somewhat loose and install the compressor with the three bolts supplied (head of bolts should be against the compressor ears and the lock washers/nuts against the steel bracket). If the compressor pulley/clutch has less than one inch of clearance to the inner fender, it may be necessary to "dimple" the inner fender to give the proper clearance prior to mounting compressor. (The engine can torque to the left, therefore it is important that all motor mounts be in excellent condition to maintain sufficient clearances between inner fender and forward between fan and radiator.) Before tightening all compressor bolts followed by the bracket bolts, make sure the compressor connection fittings are in the same position as the photographs. Prior to mounting the fan shroud, cut 1/4" to 5/16" deep section, approximately 4" to 6" long (see photos) from fan shroud edge to accommodate protruding compressor clutch and pulley. After installing the Back Idler Pulley (see attached sheet), make sure all pulleys line up prior to mounting the included fan belt. Leave the fan belt loose to be tightened after radiator and shroud is installed. After rechecking, install Radiator and shroud. Seal all open spaces around the shroud and grille opening with heat resistant foam rubber or seal. This is to direct all air entering the grille opening to pass through the condenser and radiator and all the air pulled through the radiator exits through the shroud rear opening. Tighten fan belt until the belt deflects no more than 1/2" to 3/4". This will need to be re-checked after 100 miles of operating. See accompanying instructions for Back Idler Pulley!

**Remove covers only at connection time and lubricate O-rings on each hose connection!**

There are 4 A/C hoses with your kit. RA-00009-07 (#10 suction hose) one with the Straight fitting is attached to the large compressor fitting. Hand tighten and attach other end to the upper fitting on the evaporator- again hand tighten. RA-00009-06 (#8 discharge hose) will need a 1 ¼" hole and supplied grommet in the inner fender near the Compressor. Connect the straight fitting to the end to the compressor by hand and through the hole, while the 45° end goes through the left side of the Grille shell and gets connected to the upper, large fitting of the condenser. The plain end of the RA-00004-04 goes from the Evaporator through the other inner fender hole and connects the other end to the Receiver/Drier being sure the "IN" fitting is receiving the hose from the Condenser!

RA-00009-05 has a straight end that attaches to the small fitting on the condenser. The other end will attach to the "IN" fitting on the Receiver/Drier. Be sure there are no obstructions or clearance problems for the drier bracket and screws and attach. Attach the Drier wiring harness and feed it into the engine compartment using an existing hole or make a new one.

Hose Insulation: After hose installation, cut insulation to size for hose protection against extreme heat (exhaust manifold), and cut lengthwise to slip over hose. Use enclosed Aluminum Tape to cover slit lengthwise, which should be away from heat source.

Once it is wired up correctly, connect and tighten all Refrigerant hoses as the system will need to be evacuated for one hour or more and charged with R134A refrigerant. Before charging the system, you may have to use a "jumper" wire to connect the Hi/Lo pressure switch harness terminals. Drain the compressor oil and install the same amount drained with PAG 100 or compatible oil. When charging the system, it should take approximately 12 to 18 oz of R134A refrigerant. This can be done at your local A/C garage as they should be able to recognize the proper pressures for the most efficient cooling. You should obtain temperatures of 35 to 40 degrees F at the louvers depending on the outside temperature, while maintaining good engine cooling. This is, of course, depending on the installation of the A/C Kit and condition of the cooling system.

The original Jaguar Heater Valve will be attached to the matching plate on the New A/C/Heater Unit and the other, "out" hose connected to the other 1/2" fitting.



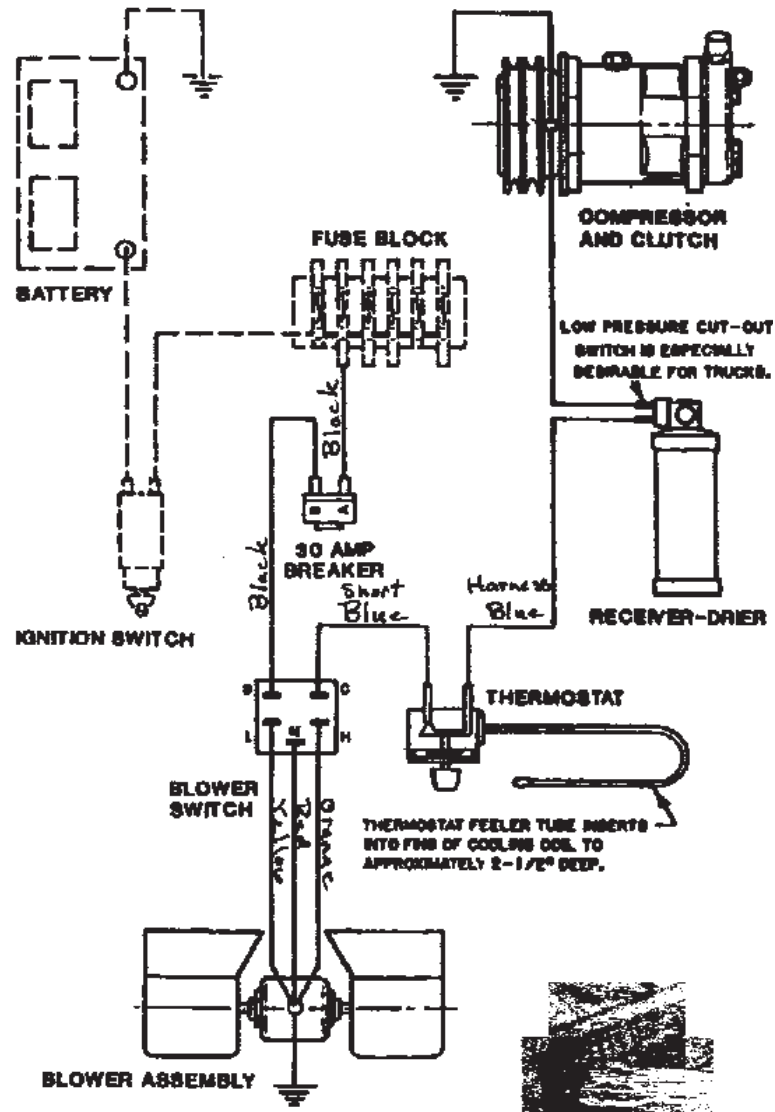
**Idler Pulley Kit**

It will be necessary to remove the Radiator and Fan Blade. Remove the Bolt (see pictures). The back of the belt rides on the idler pulley and goes down to the Crankshaft on the Right side and comes up & over the Water pump pulley on the Left side, to the Compressor, down to the Generator/Alternator to make the complete loop.



Configuring the top “Y”: The right side is attached to the outlet coming through the Firewall by 2 ½” Hose. The right side is hoses to a 2 ½” to 2” adapter, and then hoses to the 2” vent Hose Adapter installed in the under-dash Finish Panel. The center is controlled by the original cable and operates the valve that is hoses to the flat “Y” which is attached to the 1 ½” Demister hoses. Use the Tie Wraps to clamp. All items are supplied with Kit.

WIRING DIAGRAM



## New A/C System Preparation... A MUST READ!

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) Evacuate the system for 45 minutes (minimum).
- 2) **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).
- 3) Your new system requires 134a refrigerant. It will require 1.5 lbs (or 24 oz).
- 4) Your new compressor comes charged with oil - NO additional oil is needed.
- 5) Insure that the new belt is tight.
- 6) **DO NOT CHARGE SYSTEM WITH LIQUID REFRIGERANT!**



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

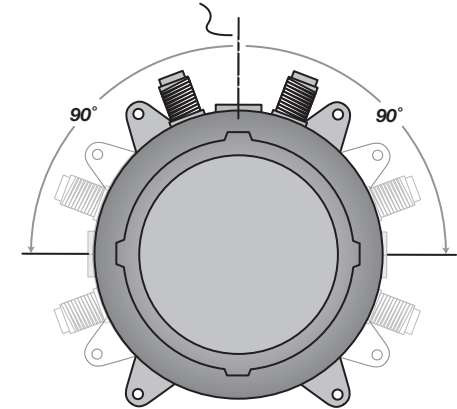
- Determine the temperature outside of the car
- Connect gauges or service equipment to high/low charging ports
- Place blower fan switch on medium
- Close all doors and windows on vehicle
- Place shop fan directly in front of condenser
- Run engine idle up to approx. 1500 Rpm

**ACCEPTABLE OPERATING PRESSURE RANGES:**

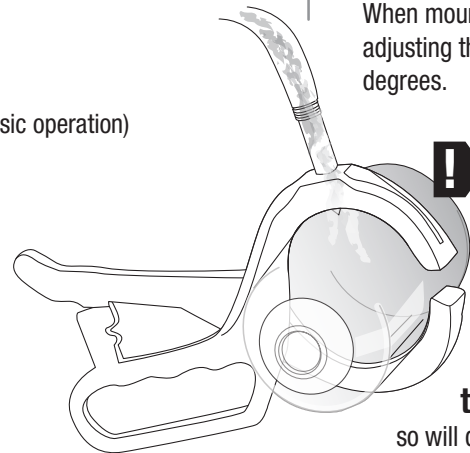
1. HIGH-SIDE PRESSURES (150-275 PSI)
2. LOW-SIDE PRESSURES (10-25 PSI in a steady state)

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

CENTERLINE OF THE OIL FILL BOLT



When mounting your compressor and/or adjusting the belt, Set compressor at 90 degrees.



**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.

## 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 ( 150-275 PSI ) *\*Note- general rule of thumb is two times the ambient (daytime) temperature, plus 15-20%.*
2. LOW-SIDE PRESSURES ( 10-25 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 unusually low or may even go into a vacuum. A valve that is stuck open will be indicated by both the high and low pressures rising to unusually high readings, seeming to move toward equal readings on the gauges.
- H. **Restrictions in system** - 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 discharge gauges reading excessively high. These simple tests can be performed by a local shop and can help determine the extent of the systems problem.



## 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.

**Step 2** 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 dissipate 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 10-25 psi, high side pressures should be between 150-275 psi

**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 24 oz or 1.5 lbs of R134A 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 24 oz or 1.5 lbs R134A) compressor can cause rattling. If charged with pure liquid there is a high probability you have bent reed valves that are causing tapping sound.

