

## **Air Conditioning a 6 Cylinder Healey**

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### Reasons to Install A/C in your Austin-Healey

- Improved Comfort (for both Driver & Passenger)
- Increased Driving Season
- Make Your Buddies Jealous

### Concerns About Air Conditioning an Austin-Healey

- Cooling System Must be Excellent (Aluminum Radiator Recommended)
- Originality Takes a Back Seat
- Expensive ( \$2,500-\$6,000 )

### Air Conditioning Equipment

- Bracket Specific to the Engine
- Compressor
- Condenser
- Drier
- Evaporator

### **How Does an Automotive Air Conditioner Cool?**

1. Freon (134A for modern systems) gas is pulled into the compressor and pumped up to a high pressure (about 225-250 psi )
2. The Freon gas condenses into liquid in the condenser that is placed in front of the radiator. This causes the temperature of the coolant to rise, like a Healey doesn't run hot enough as it is. This is why I recommend an aluminum radiator and electric fan.
3. The liquid passes through the drier, where any moisture is removed from the system. Usually a pressure switch is located in the dryer. There are two types of switches; Trinary which controls the compressor and electric fan or a Binary which controls only the compressor.
4. The liquid passes through an orifice tube, or an expansion valve, where it changes from a liquid to a low pressure gas. Although the thermodynamic phrasing is not correct, the gas gets very cold. A fan forces air across the evaporator, cooling the air as it passes into the cabin. There is a thermostatic switch located in the core of the evaporator which turns the compressor off before the core turns into a block of ice. This switch is a point of great misunderstanding, as it is referred to as the "Temperature Switch". The proper set point for this switch is as warm as will allow the interior to be comfortable.
5. The Freon is then sucked into the compressor where the cycle continues.

## Picking Equipment for a Healey A/C

**Bracket** – Easy. Get your compressor/alternator bracket from me.

**Condenser** – This is one of the most confusing items to understand. For calculation purposes, every manufacturer lists the surface size of their condenser. The actual width is usually 1 ½” more than the listed dimension. I have them custom made, and they are not cheap, but they fit well.

**Evaporator**– There are more choices of evaporators than can be covered here. Everyone has their preferences. Do you want a defroster? How many BTUs are desired? Heater included? Cable operated, electric, or vacuum? An under dash unit works fine in a roadster, but I haven’t found one that fits to my satisfaction in a BJ8. If you find one, let me know.

**Compressor** – My bracket uses a Sanden 508 compressor. This is used in most hot rod applications, and readily available for a couple hundred dollars.

**Drier** – The drier, connectors and hoses are usually included with an evaporator package.

**Pressure Switch** – Most kits a binary switch which installs in the drier. For a few bucks, you can usually upgrade to a trinary switch, which you will want if you are running an electric fan.

**Electric Fan** – A 14” electric fan mounts quite nicely in front of the x-brace. You’ll want to operate it using a relay.

## Installing your A/C

You will have some unused original equipment – The blower motor, heater core and generator will no longer be used. Some compressor brackets use the generator mount, mine replaces it. If you have not converted your car to negative ground, you will have to swap your battery cables, change fuel pump, switch coil wires, and if you have a BJ8, you’ll have to convert your tachometer. There is a pretty good market for used generators with brackets. The voltage regulator will have to be converted into a “bus bar”, or done away with in favor of a fuse block. It doesn’t look original, but is very useful.

Mount the compressor and bracket, fitting a V-Belt (not a small task as pulleys vary greatly).

Mount the drier and pressure switch, electric fan, evaporator and condenser.

Relocate the coil. If you have anything but a late BJ8, you can bolt it where the mechanical fuel pump would have been located. If you have a BJ8, the rear horn will have to be relocated.

Route your hoses and wires. Note the clocking of the fittings relative to the hose, and crimp, or have them crimped. Most auto supplies can crimp the connections onto the hose for you.

Pull a vacuum on the system. Find your leaks. Repeat. (Replace, don’t reuse O-Rings)

Charge the system according to the manufacturer’s instructions.

After a few heat cycles, retighten all the connections.

## **Beware of These Things (and More)**

**Cooling Issues** – Healeys run hot under the best of circumstances. Putting a condenser in front of the radiator only aggravates the situation. If your system is not in top shape, adding an air conditioner will cause problems.

**Clearance Issues** – Space is in short supply, and an A/C takes up a fair portion of what is left. The compressor will be close to the engine plate, and may require modification for proper orientation.

**Alignment Issues** – The Sanden compressors have dimensions held which I do not use. Sometimes the bracket must be modified to allow for proper belt alignment.

**V-Belts** – Due to variations in pulley sizes on both the compressor and water pump, it is difficult to know the proper size ahead of time. The first best guess is 48 1/2" long belt. The alternator will probably be a 24" belt.

**Hose Routing Issues**- The routing of the hoses from the engine compartment into the passenger compartment is usually done through a plate covering the hole where the air duct fed the heater box. The pockets which contain the hinges can prove to be a challenge. Sometimes making a short hose with a crimp –on bulkhead fitting is a good way to go. Other applications are best served by a long hose bent on a gentle radius. The location and orientation of the coolant fittings is the determining factor in the routing.

**Switches** – There is a fan switch which has a cable pull built in that can replace the "COLD AIR" cable. The evaporator temp control can replace the "AIR FROM HEATER" cable, and the heater valve control can be used to operate the new heater valve. This removes the need for extra holes in the dash. By the way, the blower switch can be used to control an electric fan.

**Vent Hose Routing** – If you have a separate defrost evaporator, you may find that modifications will make the routing better. Resist the urge to blow a lot of air on your face. Keep your feet cool, and you will be cool. The fewer bends in the hoses, the better the air flow.

**Air Deflectors** – The air deflectors may need to be modified to fit well.

**Charging System** – An additional wire should be run from the alternator to the voltage regulator or starter solenoid to carry the extra current.

**Insulation** – It is easier to keep a car cool if it doesn't get too hot in the first place. Hot air comes into Healeys from several locations.

1. Between the shroud and bulkhead. Put insulation in the cutouts in the bulkhead to keep hot air from coming through behind the dash.
2. Transmission Tunnel. Proper sealing of the tunnel is the best cooling per dollar you can get.
3. Footwell by the accelerator. This is the hottest panel inside the car. It should be double insulated.
4. Parking Brake Handle. Sealing off the cutout for the handle is easy, and makes a big difference.
5. Use Koolmat under the carpet. I sell it, and you'll love it.