Air Conditioning a Cadillac flathead V8

Here in Texas, air conditioning is a summer-time must unless you want to leave your classic car parked for 4-5 months out of the year.

As soon as I obtained my 1940 60S, I started in on providing this needed "accessory".

The first step in such a project, is, of course, conversion of the electrical system from 6V positive to 12V negative. That process is covered in a separate document, but I will say that the total cost of that conversion was under $300 and took me about 3 days to complete. Don't let the naysayers discourage you... a 12V conversion is a very common, simple, and reliable project to do.

I've had a bit of experience installing A/C's in other vehicles, and used that knowledge to select the components for my Caddy.

I chose the Vintage Air Mark IV all-metal under dash evaporator unit for my project. It has a great retro look, and fits near-perfectly under the dash. I've had good luck with the Vintage Air products... they offer excellent installation documentation, have some of the best prices around for hose fittings and other accessories.

To mount this unit under the '40 dash, I had to use a piece of 1"x1/16" steel which I bolted underneath the dash, after welding the supplied side mount brackets to it. This unit will fit pretty much in the center of the dash, and will just clear the defroster heater assembly.

It fits nicely:

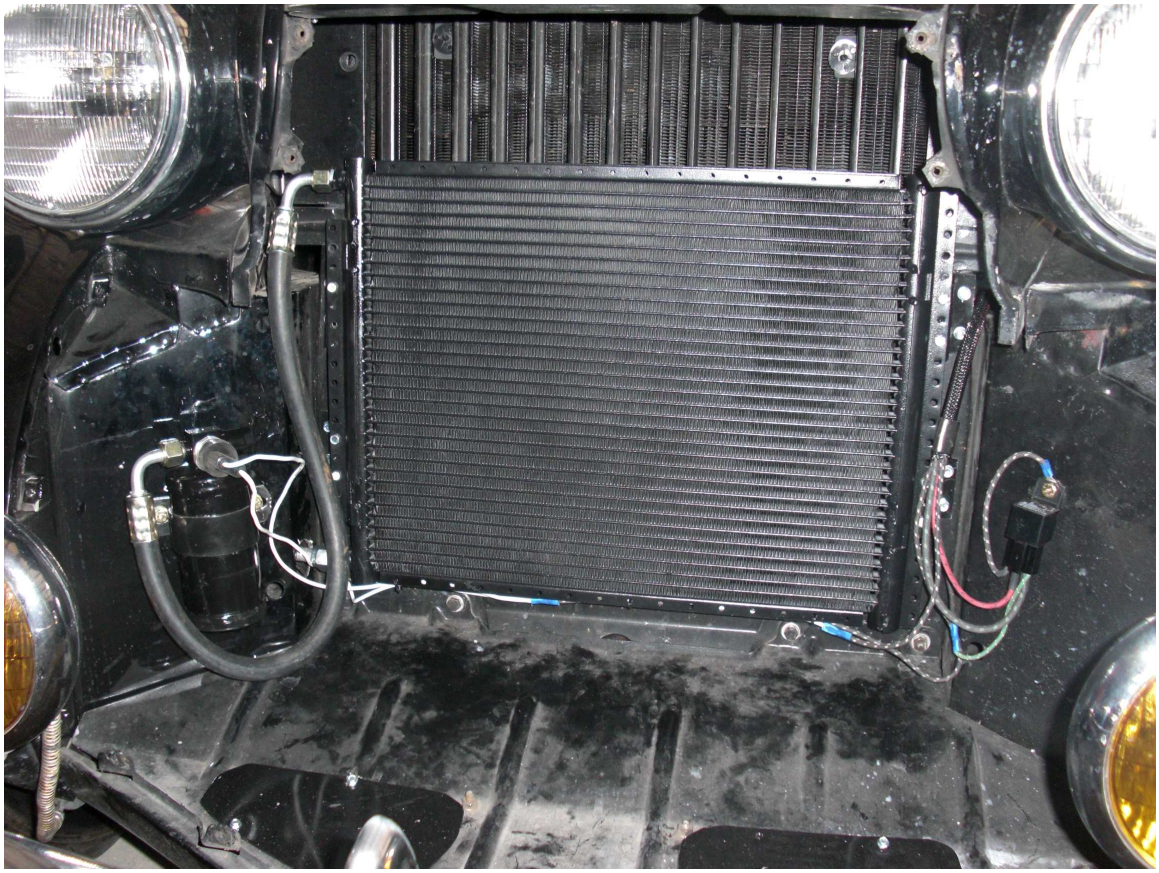
I then used a couple of flexible aluminum "hard lines" (also from Vintage Air) to transition from the evaporator to the rubber refrigerant lines. Clearance is tight to get around that heater, so I just bent these flexible tubes as needed to get the proper configuration.

Then I employed a pair of "through-bulkhead" fittings to get the refrigerant lines from cabin to the engine compartment. I prefer these over drilling a hole and using rubber grommets, as the bulkhead fittings provide an absolutely air-tight connection on the firewall. Removing the glove box facilitates installation of these bulkhead fittings.

The two refrigerant lines (#6 and #10) are routed low along the passenger-side engine compartment. The larger line will be routed over to the compressor, while the smaller #6 line will feed into the condenser outlet in front of the radiator.

For the condenser, I chose a 19" wide model, which installed nicely in front of the temperature-controlled louvers. There is a vertical, thin-metal plate installed top-to-bottom on the center line of the 60S, which interferes with fitment of a condenser. After much study, I decided that plate provides little structural support, so I just removed it entirely, and added a strengthening

member underneath the top shroud in front of the radiator (where the hood attach bracket is attached).



While behind the grill, I fabricated a pair of "block-off plates" to cover the air openings in the bottom of the pan. My guess is these are here to allow a place for air to escape when the cooling louvers are closed. In Texas summers though, I want every cc of air to be forced right through that radiator:

Again, I used flexible aluminum hard lines to get the proper transition from the condenser to the rubber refrigerant hoses.

I decided to mount the receiver-dryer inside the front grill area, so as not to clutter up the engine compartment anymore than necessary.

For cooling, I removed the complete engine-driven cooling fan and its mount, and replaced it with an electrical 16" "puller" fan, mounted on the engine side of the radiator. This frees up the fan pulley groove on the crank pulley, which can then serve as the dedicated pulley drive for the compressor.

I purchased my compressor, and a Sanden-specific mounting plate with integral adjustment arms, from Nostalgic Air in Arizona. Here's the mount:

They sell a "wide-belt V pulley" compressor model that will mate nicely with the wide belt pulley on the car.

I wasn't really pleased with the spacing of the arms on this mount, but it seems that this exact mount is sold all over the internet, including eBay, and touted as a "Sanden-style" mount. To actually make the Sanden compressor fit this mount, I had to cut a pair of spacers from 1" square aluminum bar, which turned out to be the exact dimension I needed to make it all fit.

To mount the compressor, I chose to fabricate a simple, flat plate (3/8" mild steel) mount which bolts right on the 4 forward-most cylinder head bolts (you will need to obtain longer grade 8 bolts to accommodate the additional thickness of the mount plate).

The plate extends forward of the engine to accommodate mounting the universal Sanden mount as shown:

Notice the plate required a cut-out to clear the #1 sparkplug opening, and another to clear the 3rd lower head bolt.

The original head bolts are 2 1/4" long. Ideally, with the added 3/8" steel plate, new bolts of 2 5/8" length should be used (these are Grade 8, 7/16" - 16). Unfortunately, I was only able to find 3" bolts at the local specialty bolt store, so I added a couple of thick 1/8" washers underneath each bolt head to obtain roughly the same effective length as the original bolts.

The Sanden mount with the adjustment arms was attached to the flat plate mount by marking the position, then drilling and tapping 4 holes for the 3/8" bolts used to attach it. The Sanden mount holes are elongated, so a small amount of fore-aft adjustment is available to perfect the lineup of the pulleys.

Additionally, it was necessary to relocate the remote oil filter housing 3 or 4 inches aft to give adequate clearance for the compressor.

You can see the aluminum spacers here on the aft ears of the mounted compressor (the oil filter housing is detached in this picture to facilitate the installation):

Finding a 3/4 or 7/8" wide V belt can be a challenge. The first step is to measure the length of belt you will need. I did this by cutting an old belt into a single straight piece, wrapped it over both the pulleys, and measuring the distance between the open ends. This distance is added to the straight length of the belt to get the desired belt length. For my installation, that length came to 56-57".

Goodyear makes a "Gatorback" belt in these widths. You can refer to their sizing chart online, and get the belt number, at:
www.goodyearep.com/productsdetail.aspx?id=11752

then you can purchase the belt from a variety of sources online. I found the least expensive vendor to be www.coolparts.com.