Price:$39.95

WWW.MUSTANG PROJECT.COM

INSTALLING AIR CONDITIONING IN 64.5—66 CLASSIC MUSTANGS

THIRD EDITON

With this Manual you will:

- Save hours in installation time
- Order a system properly
- Prepare your mustang for AC
- Install all components
- Test and maintain
- Enjoy the cool!

What's inside this Manual

All of the equipment provided in this manual was purchased from ***Classic Auto Air Manufacturing Company,*** *2020 W. Kennedy Blvd., Tampa, Florida 33606*
Phone: 813-251-4994,813-251-2356

Inside you will find detailed instructions on how to install air conditioning in your classic 1965 or 1966 mustang. These instructions were formulated through an actual installation in an early 1965 Mustang fastback.

We will provide step-by-step instructions diagram and over 100 photos!

Less than 10 % of all early Mustangs were originally equipped with factory air. Therefore almost all of the cars you see today with air were converted at some time in the car's life. In many cases those conversions were improperly done.

Using a system provided by Classic Auto Air of Tampa Florida we will provide instructions on how to do a correct installation that looks just like the original did in 65/66!

The approach for this installation was to make an almost show correct installation yet provide a high level of cooling performance and drivability.

We will identify and steer you around all of the pitfalls of the AC installation so that you can get your system installed and running in the shortest possible time.

This manual will literally save you hours of work and provide you with the best chance of a working installation the first time!

Ordering your AC system

"Less than 10% of all early Mustangs were originally equipped with factory air."

Though you can assembly all of the parts required for an AC system yourself for the purposes of this installation manual we will be assuming you will be ordering a complete system from Classic Auto Air (CAA).

Before you make that call to CAA you should have several pieces of information at hand.

1. Does your car have power steering?
2. If yes to 1 is it Eaton or Ford?
3. Do you want a more efficient Saden compressor or and original rebuilt compressor?
4. What size radiator do you have — 2,3 or 4 row?
5. Which refrigerant will you be using? Choices are R134A and R12.
6. Do you want an original restored under dash evaporator or a lower cost non original unit?
7. What is the build date of your car?

Now we will examine each item in detail.

Figures 1and 2. Early Mustangs came with two power steering pumps known as Eaton and Ford.

The "Ford" pumps integrated the fluid reservoir and the pump into one assembly see the figures below. While the Eaton pumps had a separate fluid reservoir which rested on top of a die cast pump unit.

Be sure and specify which

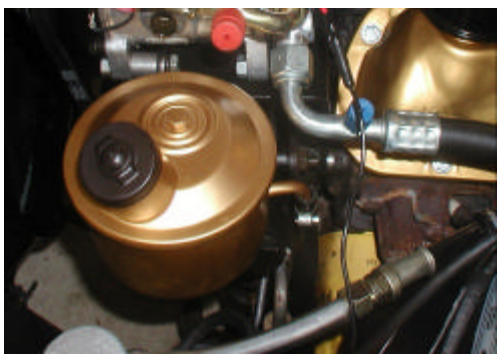


Fig. 1 Eaton Pump

Fig. 2 Ford Pump

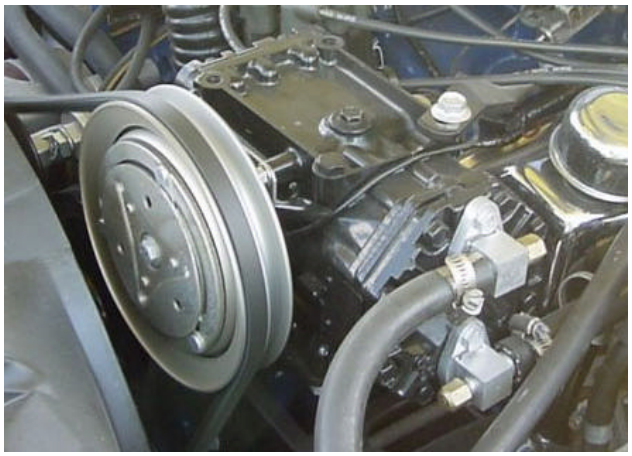


Fig. 3 Original Ford Compressor

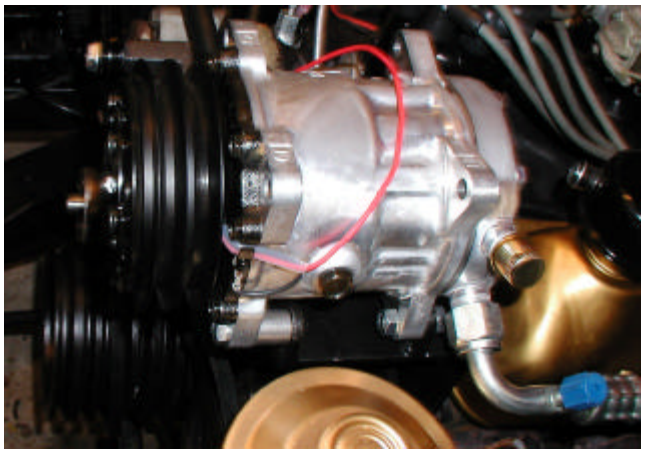


Fig. 4 High Efficiency Sanden Compressor

if any you have as this effects the type of compressor mounting bracket CAA will furnish.

The original Ford compressors were as pictured in Figure 3. They are quite large and heavy. They cause significantly more vibrations and are less efficient than modern compressors like the Sanden shown in Figure. 4.

Refrigerant choice is important. R12 is thought to provide better cooling but is extremely expensive. Virtually all new installations use the much cheaper R134A with no significant loss in cooling capability.

Figures 5, 6, and 7 show various evaporators. An original restored evaporator will make your car look authentic though the cost is higher.

Pictured here are the original 65/66 units and the CAA aftermarket replacement called "Daily Driver".

The 66 Evaporator was just a bit smaller than the 65 unit and featured a camera case finish with chrome trim. Parts from these evaporators are not interchangeable.

In addition the 66 evaporator was a satin finish aluminum and chrome. Both evaporators work in the same way with a control for fan speed and another for temperature regulation.

Below in Figure 8 you will see the 65 evaporator we will install in our example.

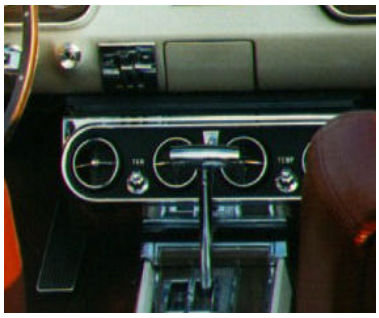


Fig. 5 1966 Evaporator

Fig. 6 CAAs "Daily Driver"

Fig. 7 1965 Evaporator

It has been expertly reconditioned by CAA including new chrome and a very nicely finished ford logo. On top of the evaporator rests the so called "coin tray".

Finally its very helpful to know the exact manufacturing date of your car. To determine this simply use a VIN calculator.

Many of these are available on the internet for example: *http://www.classicponycars.com/data.html*

"Refrigerant choice is important... Virtually all new installations use the much cheaper R134A..."

Fig. 8 1965 Mustang Chrome and brushed Aluminum Evaporator

Tools and Techniques

You should have a complete set of socket and open ended wrenches before starting the project. Few special tools are needed.

To complete your air conditioning installation standard mechanic's tools are needed. These include socket wrenches, open ended wrenches screw drivers etc.

However, your most important tool may be a full can of rust penetrating spray oil like that pictured here.

Remember you are working on a car that in most cases had its nuts tightened over 38 years ago! Any fasteners exposed to the elements are well rusted and may be seized.

Breaking bolts and rounding off nuts creates more work as part of the installation process which is in large part unnecessary.

BEFORE you loosen any rusted nuts give them a good spray with rust penetrating oil. We recommend you locate all of the rusted fasteners you will need to remove now and soak with the rust penetrator now. Allow 24 hours for the product to work and then spray again at least 30 minutes before you will actu-

Tools and Techniques

ally apply pressure.

When removing rusted nuts be sure and use a socket with 5 sides as pictured in the picture on the previous page. Sockets or open ended wrenches with multiple edges are easier to use but more easily round off nuts as the gripping surfaces are so much smaller.

Some special tools are also required.

You will need a hole saw to drill three large holes into your mustang. Two in the radiator support frame and one in the interior floor board.

Hole saws are relatively in expensive. Two general purpose types are available. The more expensive type shown in the case below are rigid and therefore longer lasting.

For our test car we actually utilized the cheaper flex blade type as shown below. Since we are drilling in metal the blades dull very quickly.

We considered the hole saw disposable so we purchased the thin flex blade type as we only had three holes to drill.

Greenlee punches can also be used if they are available. Purchasing punches just for a single project may not be economical

Be sure and use a good punch before you start drilling any hole. Also be sure and drill a pilot hole.

Mustang project suggests that you only use new bits when drilling pilot holes. New drill bits are inexpensive and provide the best possible hole.

"When removing rusted nuts be sure and use a socket with 5 sides...."

Preparing your Mustang

Preparing your mustang is key to a good installation.

Remember to check our web page: ***www.mustangproject.com*** *for updates on this installation manual and more time saving manuals!*

"It is critical that your cooling system be working at top efficiency before you add air conditioning to your Mustang."

It is critical to properly prepare you mustang before installing any air conditioning system. So while you are waiting for your AC components to arrive take a look at the following questions:

1. Does your engine run smoothly at low rpm?
2. Do you have any overheating especially in slow moving traffic?
3. It starting easy under all conditions?

Smooth Idle and Easy Starting

In our installation we found that a rough idle was cause by a poorly performing carburetor.

Previous owners had replaced the original Autolite carburetor with an rebuilt Holley. We found a good condition Autolite 2100 and rebuilt it to original factory specifications.

This smoothed the idle and resulted in better overall performance. If you don't feel comfortable rebuilding your own carburetor check out www.ponycarburetors.com . They do an excellent job and can rebuild your carb or sell you an completely new carburetor.

In addition we installed a electronic ignition from Pertronix. This is a well designed product that replaces your existing points with an electronics module right in your distributor cap.

We installed the Ignitor II . Compared to a point type system the Pertronix Ignitor II develops an average of 4 times more available energy between 3000 and 4000 RPM and 2 times more available plug voltage according to Pertronix.

In our installation the addition of the Ignitor II module made a very noticeable difference in idle smoothness by reducing missing and smoothing the idle. Visit www.pertronix.com for more detailed information.

We also installed a "Flamethrower" high voltage coil from Pertronix.

We painted the coil top yellow to match the original Ford coil. These modifications still maintain the original stock look with modern performance.

We decided to really modernize the ignition system and added a multi-spark ignition system from MSD.

This is a add-on box that creates multiple sparks each combustion cycle instead of the single spark normally available. We installed the MSD6A unit which you can see described at www.msdignition.com.

We noticed immediately better starting performance. Multiple sparks ensure that even with cold cylinders the fuel will be ignited.

We installed the MSD unit under the battery stand and painted it the same color black as the rest of the engine compartment. Our engine compartment looks completely stock but the engine runs stronger and smoother which will be critical with the additional compressor loading.

Running Cool

It is critical that your cooling system be working at top efficiency before you add air conditioning to your mustang.

Fig. 9 1965 Stock Restored Engine with AC installed

Preparing your Mustang: Continued

The addition of the condenser in front of the radiator restricts air flow. In addition the compressor generates a large amount of heat raising under-hood temperatures.

Our Mustang originally came with a stock 4 blade fan and a 2 row radiator. You can identify the number of "rows" in your radiator by removing the radiator cap. By row we mean the number of tube openings you will see across the radiator's shortest dimension.

We recommend that you install at least a 3 row radiator. CAA will provide you with a high pitch 6 blade fan and a fan shroud as part of the AC installation kit.

You will install the new fan and shroud in the final assembly stage of the project.

Since we did not want to take any chances with over heating in our project car we also upgraded the water pump to a high- flow type.

High flow water pumps move more water at low RPMs helping your car run substantially cooler.

We found an appropriate pump at www.flowkooler.com.

There were three early water pumps made for small block Fords:

1. Cast iron (most commonly used on early 289/302 engines - this pump has a steel plate enclosing the impeller cavity on the back side).
2. Original aluminum (289 Hi-Po engines and some earlier engines, this pump requires special a timing cover - and has no steel plate as it is an open impeller type). Our project car utilizes this pump.
3. Aftermarket aluminum replacement for cast iron. (This pump replaces original cast iron pumps and has a steel impeller cover on the back side - this pump will not fit on timing covers designed for original aluminum pumps).

We won't cover the details of water pump replacement in this manual but since removal of the radiator and fan is required for this project as well as for installing the air conditioning compressor you should consider replacing your pump now.

If you notice any leakage or unusual noises emanating from your water pump now is the time to replace it.

Replacing the water pump after the air conditioner compressor and bracket are in place is more difficult.

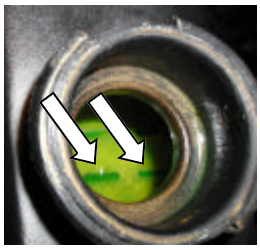
Figure 10. shows our project engine with the water pump removed. Note how we carefully plug the water inlet holes to make sure that while cleaning the gasket area we don't let any debris fall in and potentially clog some of the water channels in the engine.

Figure 11. shows the new high-flow water pump installed. It is the "original" aluminum type. Note that we have used a sealant along with the water pump gasket. The blue sealant is Permatex HYLOMAR HPF gasket dressing.

STOP! Before you do anything on your car make sure you are doing it safely!

This manual is not a safety instruction manual and some of the operations required to install air conditioning in your car can hurt you!

If you don't know how to work safely on your car don't do it!



"By row we mean the number of tube openings you see across the radiators shortest dimension."

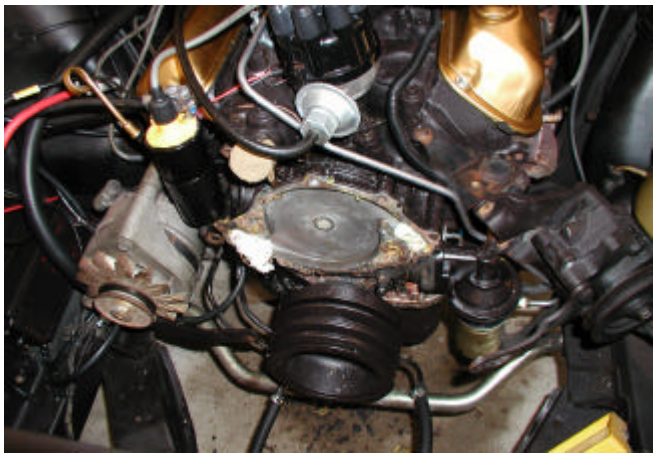


Fig. 10 Aluminum water pump removed.

Fig. 11 New pump installed.

Basic Air Conditioning Operation

You can skip this section if you don't care about the theory or come back when you have a chance.

Here we will discuss all of the key components used in an AC system and their basic functions.

Receiver/Dryer

Refrigerant is stored in the receiver/dryer labeled receiver below. This is either R12 or R134A. Remember R12 is VERY expensive so avoids its use in new installations.

The pressure in the receiver/dryer is somewhere between 80– 300 psi depending on compressor speed and temperature.

The receiver/dryer also functions as a dehydrator to remove any small amounts of moister which can ruin the system.

A special fusible plug is built into the receiver which acts as a pressure release valve in case the refrigerant gets too hot. This is a safety measure to avoid explosions!

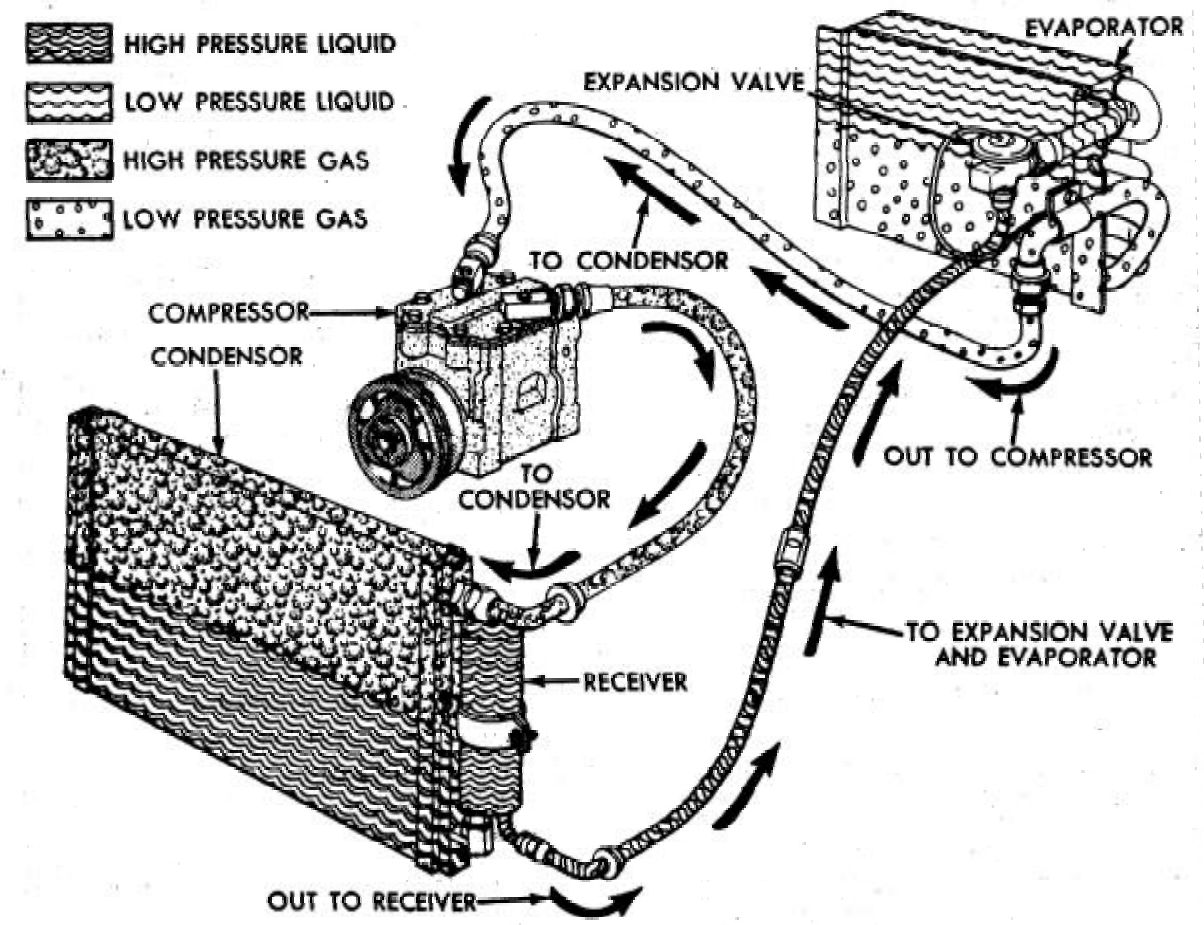
Evaporator

The evaporator is housed in the assembly mounted under the dash. Along with the evaporator this assembly houses the fan, temperature/fan speed controls and the expansion valve.

When the system is operating the liquid refrigerant flows into the evaporator from the receiver/dryer. It then evaporates at a much reduced pressure. This evaporation requires heat energy which comes from the air blown across the evaporator coils thus the air exiting the evaporator into the cockpit is cooler than the air entering it.

Expansion Valve

The rate at which the refrigerant evaporates determines how cold the air gets. This rate is controlled by the so called expansion valve. The idea here is to allow only enough refrigerant



Basic Air Conditioning Operation—Continued

to flow into the evaporator to keep the evaporator operating well enough to cool the car interior.

The expansion valve consists of the valve and a temperature sensing tube and bulb.

This bulb is clamped to the outlet pipe of the evaporator. So the valve is controlled by the evaporator outlet temperature.

In our system the expansion valve bulb sensor and associated plumbing is concealed in a layer of insulation. So during our installation all you will have access to is the connectors going to the receiver/dryer and to the compressor.

Compressor

This is the critical moving component that takes power from the engine via the compressor belt. The evaporated refrigerant leaves the evaporator as a gas at a pressure of 12-50 psi and is pumped by the compressor into the condenser located in front of the radiator.

The compressor maintains a pressure on its high pressure side from 80 to 300 psi depending again on compressor speed and ambient temperature.

The now heated and compressed refrigerant gas flows down through the condenser, it is cooled by air passing between its finned tubing. The cooler compressed gas condenses to liquid again when then goes back in to the receiver/dryer.

Below we have provide some key term definitions that will be used throughout the manual.

Relays

A relay is an electromagnetic device in which contacts are made and subsequently broken to switch current on and off. An example of this would be your car's horn which is activated when a small button on your steering wheel turns on a relay that intern provides current to the horn.

AC Blower Motor

The so called blower motor is the motor that turns the electric fan in an air conditioning or heating system.

Low Pressure Line

The low pressure line is a hose, or tube containing refrigerant that connects the evaporator to the air conditioning system's compressor. The compressor draws the low pressure refrigerant from the evaporator in through the low pressure line in order to compress it.

High Pressure Line

The high pressure line is a hose, or tube containing refrigerant that connects the air conditioning system's compressor to the condenser. The compressor forces the compressed refrigerant into the condenser through the high pressure line.

Compressor Clutch

The air conditioning compressor has an electromagnetic clutch that can engage or disengage the compressor pulley. The compressor pulley always turns when the engine is running, but the compressor only actually rotates when the pulley is engaged to the compressor driving shaft.

When this system is activated, current runs through the electromagnetic coil in the compressor clutch.

The strong magnetic pull draws the armature plate against the side of the turning pulley. This locks the pulley and the armature plate together; the armature plate drives the compressor.

The Condenser

The condenser is a long tube that goes back and forth through a multitude of cooling fins, quite similar to the evaporator in structure. The condenser is mounted in front of the radiator to take advantage of the forced air provided by the fan and the motion of the car.

As the highly pressurized refrigerant (vapor) flows into the condenser, it gives off heat and warms the condenser. This causes the condenser to be hotter than the forced air coming through the condenser. The condenser hands its heat off to the forced air and turns the refrigerant back into cool liquid in the expansion valve, where it heads back to the evaporator.

The Evaporator

The evaporator is a long tube, or coil, that goes back and forth through a multitude of cooling fins. It is quite similar to the condenser in structure. Cold liquid refrigerant circulates through this coil which is inside the car in the under-dash assembly. The blower fan forces warm inside air over this coil to cool the passenger compartment.

Discharge/Suction Service Valves

Discharge and suction service valves allow the air conditioning system to be emptied and filled. These valves also provide places where the system can be checked with pressure gauges.

Note: Some systems use a Schrader valve in place of the discharge and suction valves. This is a spring-loaded valve which looks rather like the valve in a tire.

Compressor Belt

The compressor is engine driven by a belt on the front of the crankshaft.

"The rate at which the refrigerant evaporates determines how cold the air gets."

The Components

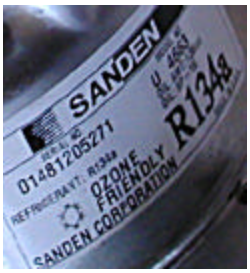
Inventory your components carefully. If something is missing or you don't understand what it is give the supplier a call to clarify BEFORE you get started!

Here we have photos of all of the parts shipped in our CAA system. Your parts listing may be different depending what type of system you ordered.

Below is the inventory of parts received with our CAA kit for a 65 Mustang with Eaton power steering utilizing a Sanden compressor and R134A refrigerant.

1. Sanden Compressor
2. Compressor Mounting Bracket
3. Crankshaft Pulley
4. Compressor drive belt
5. 2-5/8" Eccentric Idler Pulley Arm
6. 3 1/8" Idler Pulley
7. Standard Shoulder Bolt for mounting Pulley
8. 3/16" Mount Spacers (3)
9. 3/4" Mount Spacers (2)
10. 3/8" X 1 1/4" NC Bolts (5)
11. 3/8" X 2" NC Bolts (2)
12. 3/8" X 1" NC Bolts (2)
13. 5/16" X 2 3/4" NC Bolts (3)
14. 5/15" X 4 3/4" NC Bolts (1)
15. 7/16" X 1 1/2" NC Bolt (1)
16. 3/8" Lockwasher (9)
17. 5/16" Lockwashers (4)
18. 7/16" Star Washer (1)
19. 3/8" NC Nut (4)
20. Condenser
21. Evaporator 65 restored
22. Receiver dryer
23. Compressor Belt
24. Condenser Mounting Brackets (4)
25. Dryer/Condenser Grommets (2)
26. Firewall Grommet Bracket
27. Firewall Grommet
28. Dryer Mounting Clamps (2)
29. Aluminum Liquid Line
30. High Pressure Line
31. Evaporator Drain Hose
32. Wiring Harness
33. Right Angle Dryer Connector
34. 3 in 1 Oil
35. Evaporator Leveling Bolt and Nut
36. Low Pressure Line
37. Insulating Tape
38. 6 Blade Fan
39. Fan Cowl
40. Cowl Mounting Brackets and bolts (4)

"Your parts listing may be different depending on what you type of system you ordered."



1. Sanden Compressor Model # U4663, SD 7 Series compressor (www.sanden.com)

2. Compressor Mounting Bracket

A "rear" view of the compressor mounting bracket. This is the side that the engine "sees".

The Components: Continued

3. Crankshaft Pulley

4. Compressor Drive Belt

5. Eccentric Idler Pulley Arm

6. 3 1/8” Idler Pulley

Remember safety first! Make sure you take proper safety measures!

7. Standard Shoulder Bolt

8. 3/16” Mount Spacers

The Components: Continued

Keep all components in their original packaging until just before you are ready to install. This way if you find you have the wrong component you can easily return it for the correct part.

9. 3/4" Mounting Spacers (2)

Items 10 thru 19 (Compressor mounting)

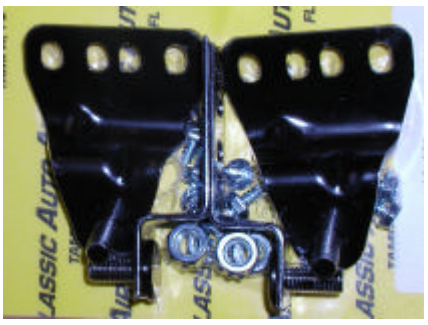
20. Condenser

22. Receiver/Dryer

21. 1965 Evaporator Restored

"Keep the receiver/dryer sealed with its dust covers in place until you are ready to install it. The same goes for all other parts"

23. Compressor Belt



24. Condenser Mounting Brackets (4)

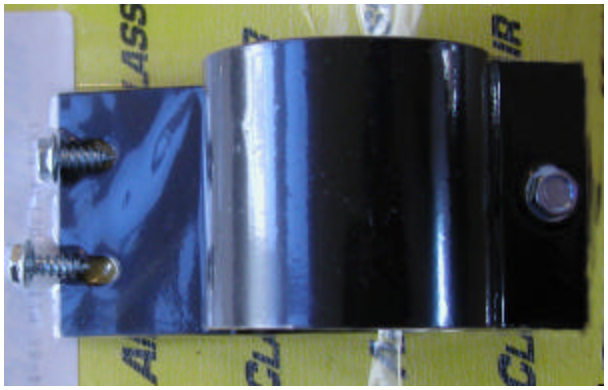
The Components: Continued

25. Dryer and Condenser Grommets

26. Firewall Grommet Bracket

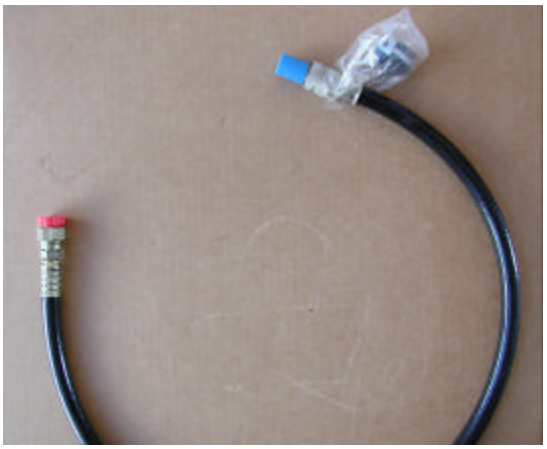
"To save assembly time place all loose parts in marked clear plastic bags."

27. Firewall Grommet



28. Dryer Mounting Clamps (2)

29. Aluminum Liquid Line



30. High Pressure Line (Evap. To Aluminum Line) and hold down bracket (plastic bag).

31. Evaporator Drain Hose

The Components: Continued

The 3 in 1 oil is used to sparingly lubricate all system connections. Use it to soak any o-rings before installation as well.

32. Wiring Harness

33. Right Angle Dryer Connector

"The insulating tape item 38 is wrapped around the evaporator connections next to the evaporator housing after installation is complete."

34. 3 in 1 Oil

35. Evaporator Leveling Bolt and Nut

36. Low Pressure Line (Evaporator to Compressor)

37. Compressor to Condensor Line

38. Insulating Tape

The Components: Continued

39 and 40. 6 Blade Fan and Cowl

Use rust penetrating oil 24hrs before removing old fasteners!

In the next section we will go through a step-by-step procedure describing how to install each component. We will also cover what NOT to do and how to test and maintain your system.

As you inventoried your parts you will have noticed that virtually all of the hoses, compressor, evaporator, dryer etc. had their connections covered with a plastic or metal seal cap.

Do not remove these caps until the last possible moment. They keep dust and dirt out of your system. The receiver/dryer can actually be ruined if left with open connections in an unsealed condition.

Keep your work area clean and if at all possible give your engine a good cleaning before you start. Its far easier to work with a clean engine where every movement does not coat your hands and arms in old black grease!

Finally observe proper safety precautions. For example disconnect the battery before you begin.

Make sure the car is in park and that the wheels are blocked so that the car won't slide down the drive way while you are working on it!

Do not work around the engine with any open flames lest a leaky fuel line cause a serious fire.

Another key tip we at Mustang Project live by is the liberal use of rust penetrating oil like WD-40, Liquid Wrench, or PB Blaster.

We suggest that you scan this manual and locate any bolt or nut you will have to loosen and give it a generous blast of penetrating oil 24 hrs. before you begin any disassembly.

Then as you reach each bolt in the disassembly process re-apply the penetrator and allow at least 30 mins. for it to work before you apply pressure to the fasteners.

This process will substantially reduce the chance of rounded nuts and broken bolt heads.

"The receiver/ dryer can actually be ruined if the connectors are unsealed.." Keep the connector caps on until you are ready to install the unit..."

Installation: Procedure

Review the entire installation procedure carefully before beginning. before

"The result is installation in substantially less time and with less chance for mistakes and rework."

The installation procedure we describe utilizes a unique approach. It is the so called "most efficient" approach. Instead of completing work in an single area and the moving on (say engine are then interior) we move from area to area sometimes not completing part of the installation in one area because that may interfere with installation in another part.

This approach is unique to Mustang Project Manuals.

Many of our writers have extensive experience with industrial engineering and production techniques. This experience is brought to you in each Mustang Project Manual.

Installation will proceed in the following order:

1. Remove radiator.
2. Remove hood latch supports and hood latch.
3. Remove fan.
4. Remove all belts.
5. Remove air cleaner and cover carburetor opening.
6. Remove power steering pump but leave lines connected.
7. Remove water-pump mounting bolts required for compressor bracket mount.
8. Remove power steering tensioning adjustment bolt.
9. Remove lower front valance.
10. Remove driver side seat.
11. Remove shifter handle and center console if equipped.
12. Cut 1 1/4" condenser and dryer hose holes in radiator support.
13. Locate and cut firewall slot with a 1 1/4" diameter by 1 3/4" spacing.
14. Make compressor bracket modifications (if needed).
15. Mount compressor bracket.
16. Remount power steering unit.
17. Route evaporator lines and mount firewall gasket and bracket.
18. Mount condenser dryer and right angle connector.
19. Assemble evaporator.
20. Place evaporator ensuring adjustment bolt is installed.
21. Make evaporator connections to high pressure line and compressor line.
22. Bolt in evaporator and adjust leveler bolt/nut.
23. Connect aluminum line to right angle connector on dryer and high pressure line from evaporator. Install lower grommet.
24. Connect low pressure evaporator line to compressor.
25. Connect condenser line to compressor.
26. Install upper condenser grommet.
27. Connect wiring harness from evaporator to compressor and to 12V point. DO NOT connect at compressor.
28. Install new 6 blade fan.
29. Install alternator belt.
30. Install power steering belt.
31. Install compressor belt.
32. Reinstall radiator.
33. Install new cowl.
34. Replace battery.
35. Remove coil wire.
36. Uncover carburetor.
37. Test crank engine and verify fan blade clearances.
38. Adjust belts check clearances.
39. Reinstall coil wire.
40. Start engine ensure compressor wire is not attached.
41. Verify clearances and overall function.
42. Test evaporator fan.
43. Install console if required.
44. Install end cap if console present.
45. Install shift handle.
46. Cut 1 " hole for evaporator drain tube.
47. Install drain tube cover.
48. Proceed to charging!

Installation: Removing the Radiator

Removing the radiator is the first step in the entire disassembly process. First make sure that your engine is cool and that you have a place where the radiator and automatic transmission fluid can drain safely.

The radiator contains the transmission cooler coil inside of it. Fluid from the transmission is pumped through it when the engine is running by a pump in the transmission.

This fluid circulates through the radiator via. two hoses which are connected at the bottom of the radiator.

Loosen the hose clamps closest to the radiator and remove both hoses. Have something handy to plug the fittings at the radiator. Use a scrap of 1/4" diameter steel fuel line or some copper tubing and connect both transmission cooler hoses together as shown in Figure 12.

This will allow you to later crank the engine without having transmission fluid spray everywhere. We will reconnect these lines when the radiator is replaced after installation of the AC system.

Now drain the radiator. This is most quickly done by removing the lower radiator hose. The lower radiator hose is usually reinforced with a steel spring. Save this spring if you ever need to replace this hose as they are sometimes hard tom obtain.

Now that the radiator is drained you can remove the top radiator hose. Re-

"Removing the radiator is the first step in the entire disassembly process."

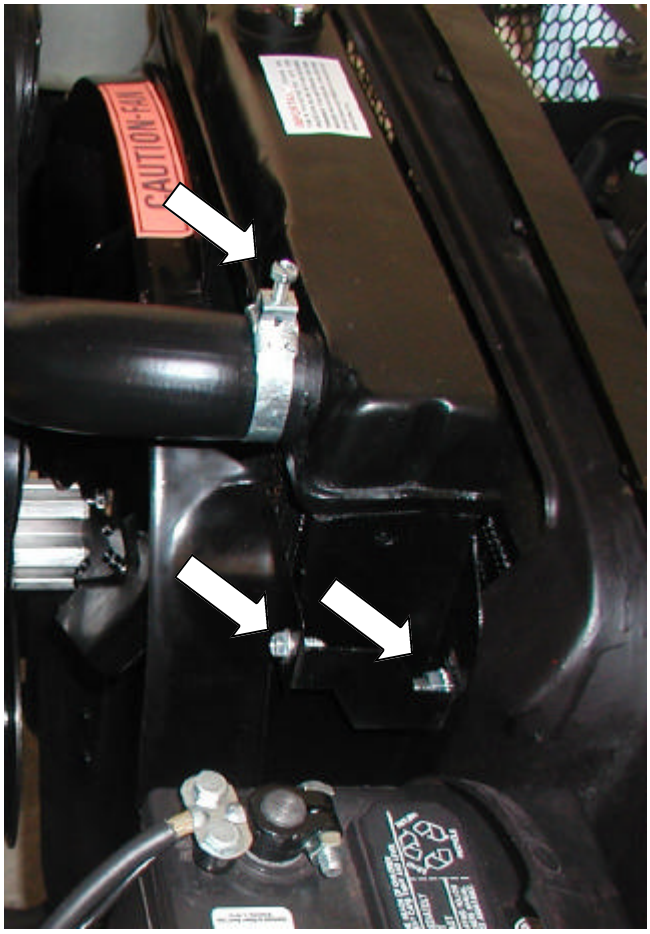


Fig. 13 Radiator hose and mounting bolts

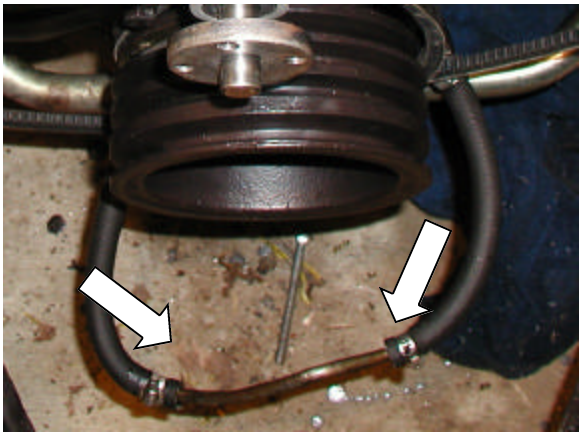


Fig. 12 Transmission cooler lines

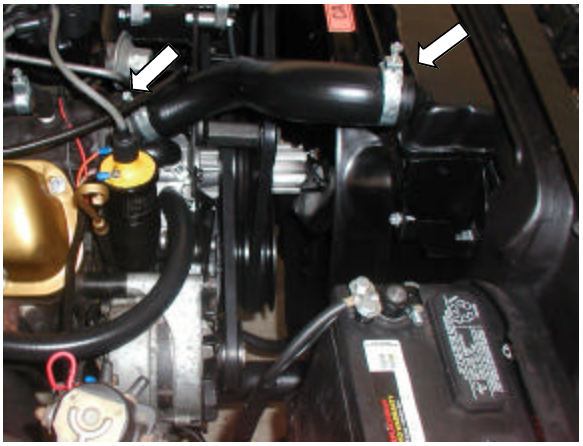


Fig. 14 Top radiator clamps

Removing the Radiator: Continued

Proper disassembly is critical to the success of this project. Take time to carefully remove each component storing in a safe location.

move the clamp at the radiator and at the thermostat housing as shown in Figures 13 and 14. You will have seen similar clamps on the bottom radiator hose. Remove both hoses completely.

Now you are ready to remove the radiator itself. If your radiator has a cowl you must remove its mounting screws and the 4 radiator mounting nuts position on each side of the radiator as shown in Figure 13.

Carefully lift the cowl if present away from the radiator and rest it on the fan blade. Now you will be able to remove the radiator itself. Lift it straight out being careful to avoid any damage by the still present fan blade.

Set the radiator aside. Once the radiator dries out a bit it will be a good time to give it a spray coat of high temperature gloss black paint. It is amazing how much better the radiator will look freshly painted when you re-install it.

Now it is time to remove the front grill. The front grill can be removed easily by removing 8 hex head screws.

Start by removing the four screws from the lower inner flange of the grille.

Next remove the four screws from the upper flange of the grille center support bracket to the hood lock support (see Figure 17 shows two of the bolts).

Now you can lift the entire grill out by tilting it slightly forward and lifting straight up. There is no need to remove any of the chrome pieces that decorate the from of the grille or surround. However, if you need to do any grille restoration do it now. You can now fully remove the chrome horse and corral if desired and repaint the grille if required.

Be sure and cover the water pump inlet and outlet with plastic tape to prevent a stray socket or nut from flying in and potentially ruining your water pump (see Figure 15).

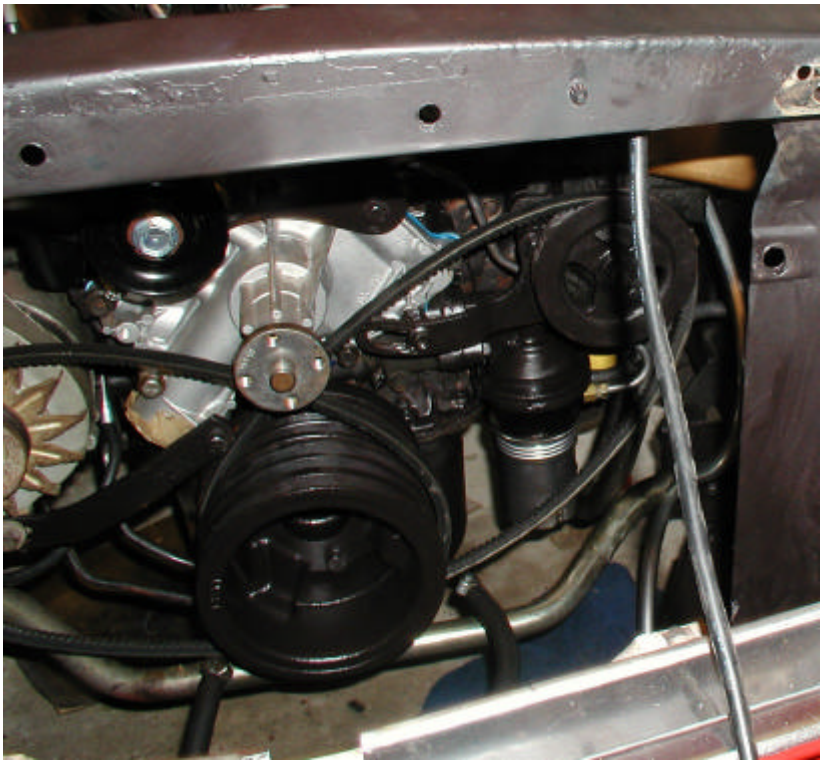


Fig. 16 Radiator, grill, hood latch, and fan removed

Fig. 15 Covered water pump openings

Installation: Removing the Hood Latch,Belts,and Fan

It is now necessary to remove the hood latch mechanism. Figure 21 shows 4 retaining screws you must remove.

Once the latch is out you will see that a support bracket is secured by 2 retaining screws. One of these screws is removed from the front of the car.

Once the hood latch support bracket is removed you can restore these pieces with flat black paint so that they will look new when they are replaced at the end of our installation. Be sure and remove any rust if possible strip to bare metal before painting.

Now you can more easily remove all of the belts.

Remove the power steering belt first. You can completely remove the adjustment retaining bolt (Figure 20) as our next step will be to un-mount the power steering pump.

Loosen the power steering pump mounting bracket bolts also in Figure 20.

Remove the alternator belt by loosening the mounting and adjustment bolts as shown in Figure 18.

Store these belts as you will reuse them when reassembling the system.

Now remove the fan, spacer, and water pump pulley. These are held together with 4 long bolts as shown in Figure 19.

You will not reuse the fan but you must retain the spacer and water pump pulley.

Figure 16 gives you a good idea of what your car should look like now. You now have clear access to the area where you will install the condenser, dryer, and compressor.

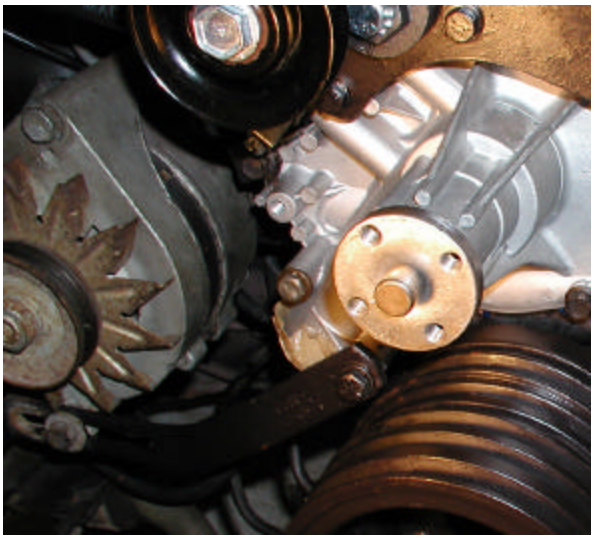


Fig. 18 Alternator

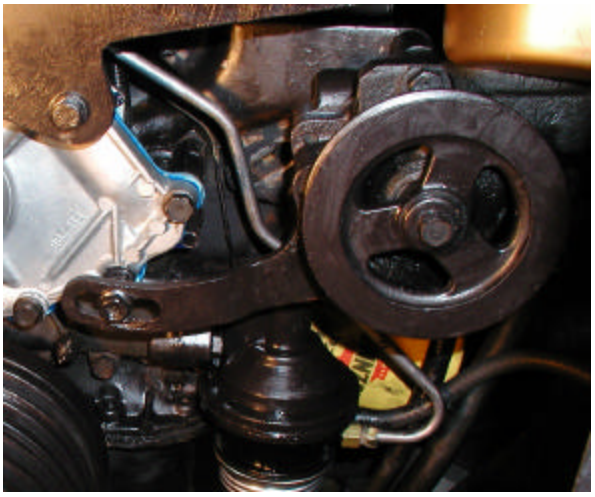


Fig. 20 Eaton power steering pump mounting bolts

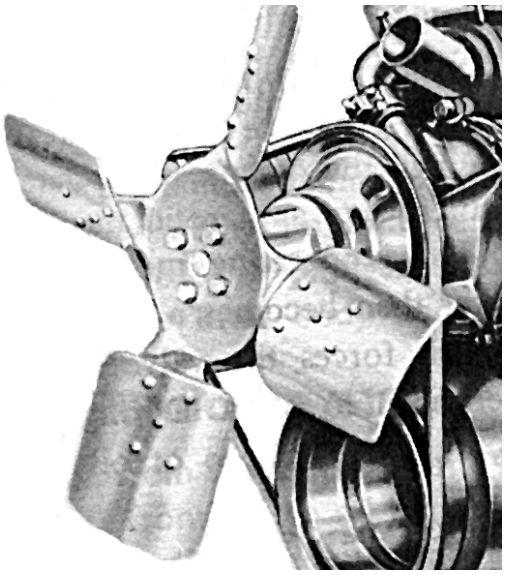


Fig. 19 Fan retaining bolts

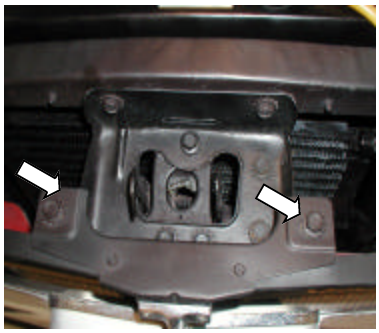


Fig. 17 Grille retaining screws

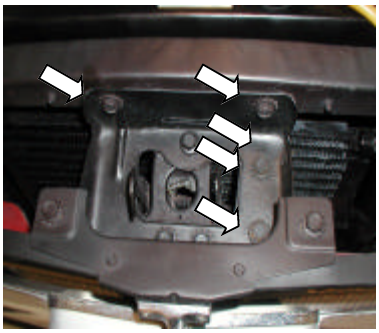


Fig. 21 Hood latch screws

Installation: Removing the Power Steering Pump

Clean and paint your engine compartment as you proceed with the installation. You will be surprised how much better the overall installation will look.

Remove the air cleaner assembly and cover the carburetor. Opening. This is an important step as you don't want any flying metal or loose nuts to fly down your carb. Remember to remove the cover before you start the engine in any case.

Now remove the power steering pump by removing two retaining bolts and lock washers locates as shown in Figure 23. The Eaton pump is quite heavy and you will want to keep the reservoir as upright as possible to avoid spilling power steering fluid.

"Now remove the power steering pump by removing three retaining bolts and lock washers..."

After we have installed the compressor mounting bracket we will reinstall the power steering pump. In order to use the Eaton pump we will add standoffs between the steering pump mounting bracket a the engine and also between the pump itself and the mounting bracket.

If you see old rust on the engine block repaint with a can of high heat Rust-0-Leam (Figure 24). This is a good method to make your engine look freshly painted.

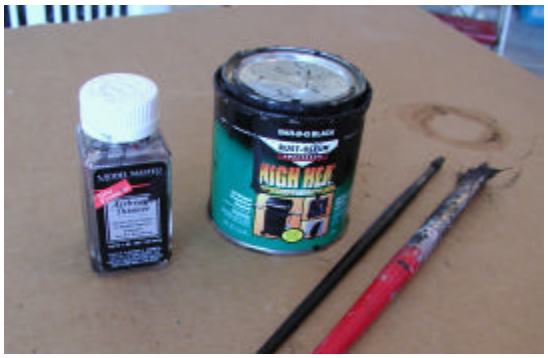


Fig. 24 Repaint

Fig. 23 Power steering pump removed with hoses intact

Fig. 22 Air cleaner removed and carb. covered

Installation: Removing the Water Pump Mounting Bolts

To prepare for mounting the compressor bracket you will need to remove 4 of the water pump mounting bolts as shown in Figure 25. and 26. below.

Since the power steering pump is now moved you can remove the power steering adjustment bolt shown in Figure 26.

Remove this bolt completely. This bolt is unusual in that it has a long threaded end after the bolt head so that the power steering adjustment bracket can be fixed with it and an additional nut. We will replace this adjustment bolt with a longer version later on since we have to relocate our Eaton power steering pump approximately 2 inches forward (towards the grill) from where it is now.

A Ford power steering pump will most likely be able to use the existing adjustment bolt.

Figure 27 shows the compressor mounting bracket installed.

We do not recommend you install the compressor mounting bracket at this point because other work needs to be done in the engine compartment and the bracket will just get in the way.

Your next step will move you into the interior of the car to prepare for the evaporator install.

"We do not recommend you install the compressor mounting bracket at this point..."

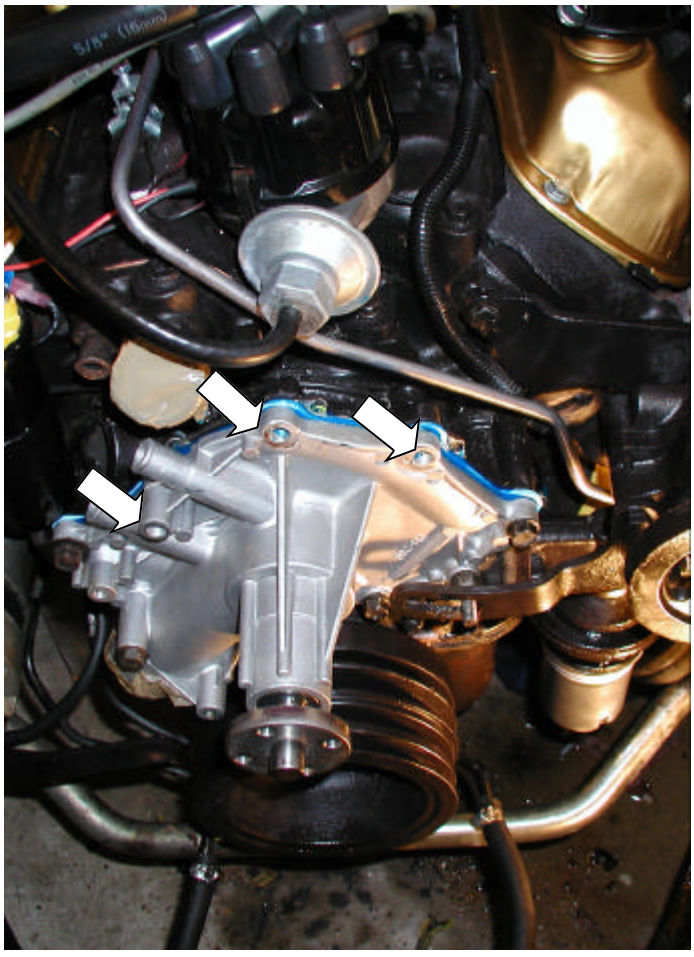


Fig. 25 Water pump mounting bolts needing removal.

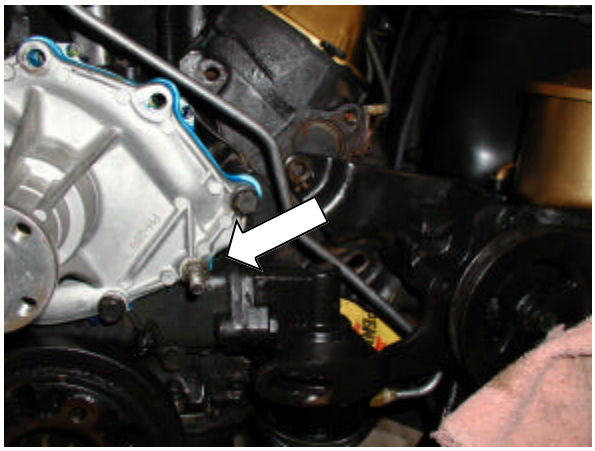


Fig. 26 Power steering adjustment bolt

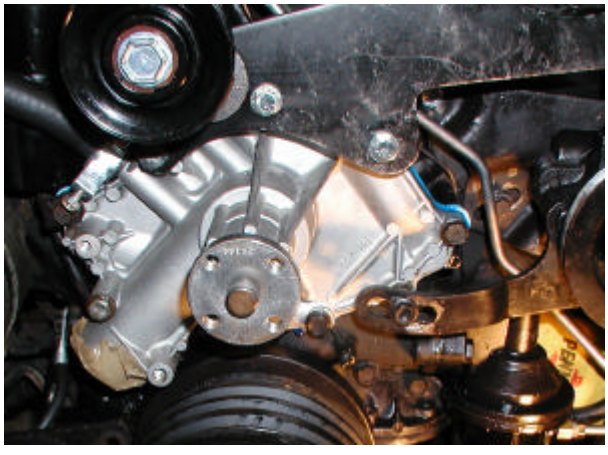


Fig. 27 Mounted compressor bracket

Installation: Removing the Front Seat

Proper disassembly is critical to the success of this project. Take time to carefully remove each component storing in a safe location.

Now we will take a break from the engine compartment and focus on preparing the interior for installation of the evaporator.

Remove the driver seat by removing 4 retaining nuts from underneath the car. Figure 25 shows the most forward left hand location. These access holes may be covered by rubber grommets. Just peel off the grommet and back out each of the four nuts.

It is important to remove the front drivers side seat as it allows for much easier installation of the evaporator, cutting of the firewall hose slot, and installation of a shortened console if needed.

In addition you will need the room to install the evaporator hoses and add the evaporator fan and control wiring.

Figure 27 shows the front seat completely removed and the evaporator in place. Do not put the evaporator in place at this time as you will need to create the firewall slot and drill the evaporator drain hole first.

You can clearly see from the photographs how much more room is available for maneuvering once the from seat is removed. It is usually not necessary to remove the passenger side seat.

Fig. 25 Seat mounting bolt holes

Fig. 26 Original console mounting

Fig. 27 Seat removed

"It is important to remove the front drivers side seat as it allows for much easier installation of the evaporator."

Installation: Removing the Front Valence

Removing the front valence is the next important installation step. Before removing any body part or engine part that has been on the care since it was originally built remember to soak with a good rust penetration fluid like WD40.

It is best to spray on the fluid the day before you start disassembly and then again approximately 30 mins. before you actually start to loosen nuts and bolts.

While it may be possible to install the condenser and dryer without removing the valence this is not a good idea for two reasons. First the dryer and condenser connections will not be easy to make and second it is important to have the valance removed during the R134A charging process so that leaks in this area can be easily identified.

First remove the two chrome bumper guards as pictured in Figure 28. Each bumper guard is secured by two mounting bolts to the bumper supports.

Now you can remove the 4 top retaining bolts from the front side of the valance as shown in Figure 29. These bolts are visible between the bumper and valence.

Get under the car on each side near the parking lights to remove the 4 (two each side) retaining bolts that hold the valence to the from lower fender lip as shown in Figure 30.

Now the valence should come completely off as shown in Figures 31 and 32. Carefully store the valence to avoid denting or scratching it. This metal is of course visible to the outside world.

"Carefully store the valence to avoid denting or scratching it."

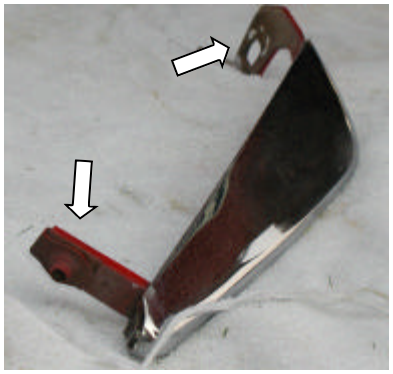


Fig. 28 Chrome bumper guard

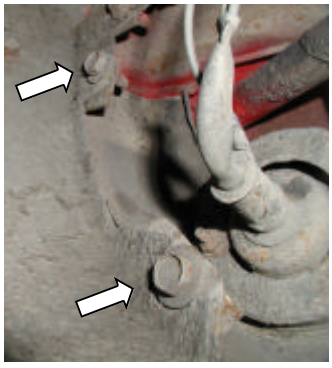


Fig. 30 inside fender bolts

Fig. 31 valance retaining bolts on inside fender

Fig. 29. Valance retaining bolts

Fig. 32 Valance removed

Installation: Remove Center Console and Shifter Handle

Review the entire installation procedure carefully before beginning. before

If your car is equipped with a center console it must be removed in order to install the evaporator and lines to the compressor and dryer.

Remove the shifter handle with an allen wrench as shown in Figure 29.

Remove the six console mounting screws (3 each side) illustrated in Figure 30.

Open the console door and remove the two mounting screws which attach the console to its support bracket.

Now you will be able to carefully remove the entire console. Since the front seat is removed this is now much easier to accomplish. As you slide the console over the shifter move the shifter in to its most rearward pointing position. You will have to carefully angle the console to remove it completely.

As you remove the console you will notice that a wiring harness is in place that provides power for lighting the rear passenger courtesy lamps. Un plug the quick-disconnects as you remove the harness. You will then be able to freely move the console.

Handle the console carefully it is usually somewhat brittle with age.

"Handle the console carefully it is usually somewhat brittle with age."

Fig. 28 Original console mounting

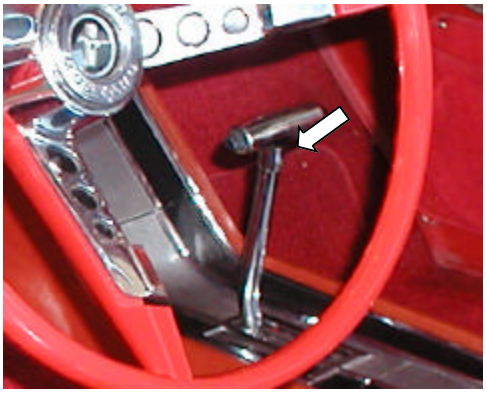


Fig. 29 Automatic shifter removal

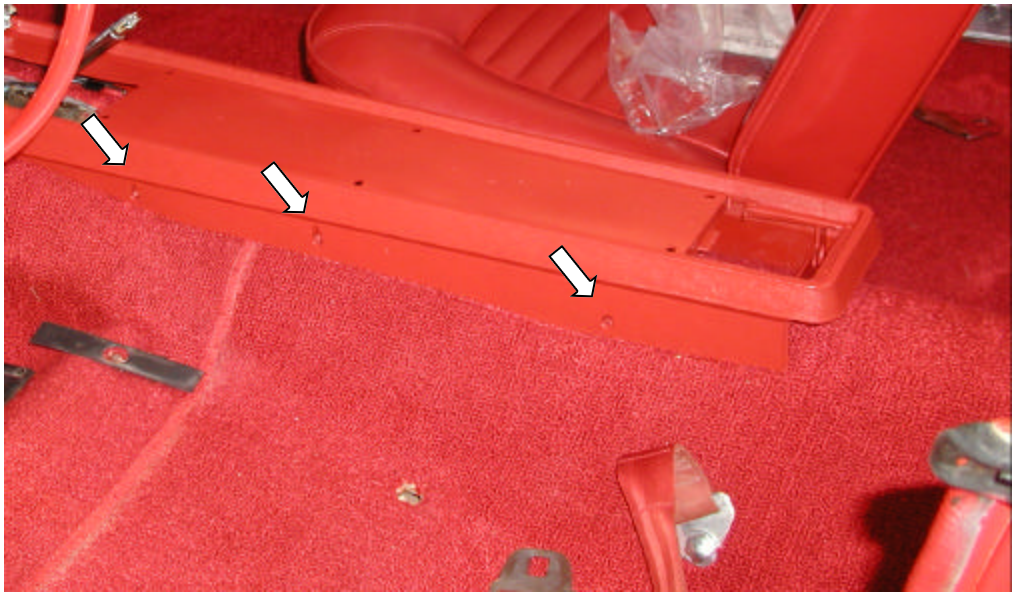


Fig. 30 Original console mounting screws

Installation: Cut Dryer and Condenser Holes in Radiator Support

Disassembly of the car in preparation for installation of the major components is now complete.

Now you will start on cutting the condenser/dryer line holes using a hole saw or a Greenlee punch.

The dryer and condenser holes we describe here are cut at 1 1/4 inches diameter.

Use a brand new hole saw and drill a 1/8 inch pilot hole before you start cutting with the hole saw. You will make the upper radiator support hole by drilling from inside the engine compartment.

The hole location is indicated by small dimples made at the Ford factory on the radiator support frame (drivers side). Figure 31 shows the approximate position of the upper hole which provides a opening to pass the compressor to the condenser line fittings.

This dimple may be hard to locate but the Figures 31 and 32 should give you a start on locating and checking their position.

After the top hole is drilled use the same procedure to drill the lower support hole. Again it is drilled at 1 1/4 inches diameter.

The location of the lower hole is critical as the right angle dryer connector must connect to the bottom of the dryer and go through this hole to meet up with the aluminum line which makes its way to the evaporator.

This is a great opportunity to clean and paint any of the radiator support assembly in order to get that factory fresh look.

Review the entire installation procedure carefully before beginning. before

Fig. 31 Upper radiator support dimple location

Fig. 32 Upper radiator support dimple location—close up

Fig. 33 Lower radiator support dimple location

"Use a brand new hole saw and drill a 1/8 inch pilot hole before you start cutting with the hole saw.

Installation: Cut Dryer and Condenser Holes in Radiator Support

A sharp hole saw is critical to good hole cuts. Use only a brand new saw for these operations. These saws dull quickly. A Greenlee punch will provide a better hole but are relatively expensive to own.

The Figure 33 shows what the upper radiator support looks like properly drilled. Here you can see how the large hose grommets will fit over the hose end.

Keep the hoses and all other components sealed with their plastic or metal end caps until the last possible moment to prevent moisture and debris from entering the system during assembly.

Debur the hole you have drilled. A Greenlee punch will make a much cleaner hole. This is an expensive tool and not absolutely necessary for a excellent installation as once the hose grommet is in place the hole edges are not visible.

Figure 34 shows the lower dryer hole in place.

Do not connect or place any hoses at this time. The pictures below show test fitting only. You will need room in the engine compartment to install the compressor bracket and to cut the firewall holes. Installing the hoses at this point will just slow your installation.

As you have your hole saw set up we will go ahead and cut the firewall slot described in the following pages.

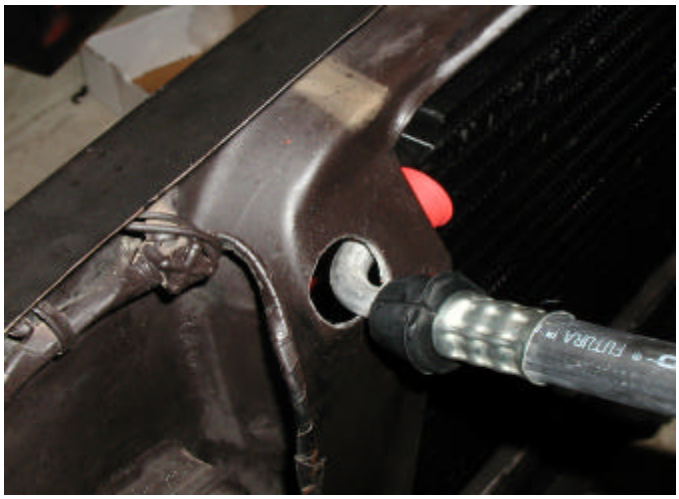


Fig. 34 Hole drilled in upper radiator support

"Keep the hoses and all other components sealed with their plastic or metal end caps...to prevent moisture and debris from entering the system."

Fig. 33 Hole drilled in lower radiator support

Installation: Cutting the Firewall Slot

In order to cut the firewall slot you must first remove the driver side brace. This is accomplished by removing the retaining bolts at the firewall and at the shock tower.

Figure 37 shows the brace moved. This figure also shows the firewall grommet and bracket installed. To illustrate what your system will eventually look like.

Do not attempt to route the evaporator lines or grommet at this time however as doing so will cause you extra work.

From inside the car just above the gas pedal you will notice an oblong cutout in the firewall insulation material.

This plug is easily pulled out and looks like Figure 36. In newer cars a knockout is present in the firewall. However, in very early cars you must manually cut the slot opening.

You will make the slot by cutting two 1 1/4 inch. Holes and using a hacksaw blade or a metal nibbler to cut the intervening metal.

The holes must be spaced approximately 1 3/4 inches apart and fit within the cutout area designated by the insulation cutout location.

Be carefully when cutting the lower hole as a brake line on many cars comes very close to the edge of this hole. In our sample installation we had to loosen the mounting bracket for this line to ensure it would not be cut during drilling of the lower hole.

Test fit the grommet to make sure that it fits snugly in the slot you have made.

Be sure and debur the slot completely. The slot should allow the stepped edge of the rubber grommet (see Figure 36) to fit closely. However you should be able to insert the grommet in the slot and it should stay in place without undue warping.

Fig. 36 Interior insulation

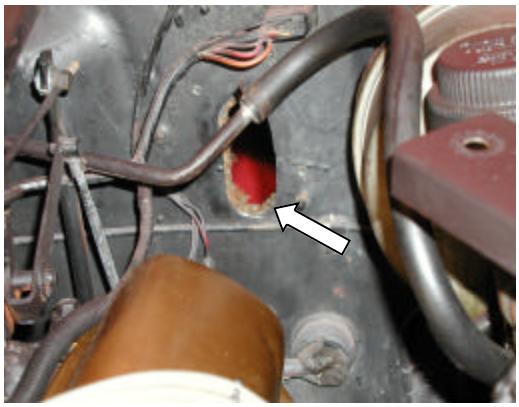


Fig. 35 Firewall slot

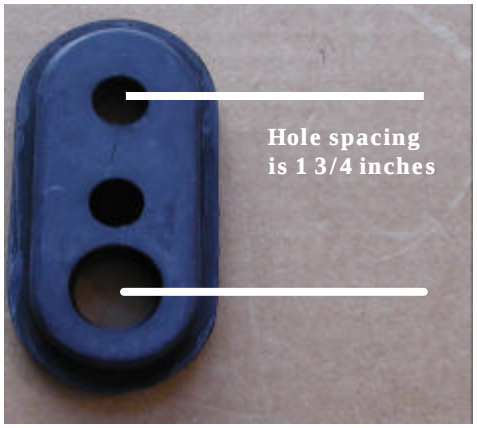


Fig. 36 Firewall grommet

Fig. 37 How the bracket will look when mounted

Installation: Crankshaft Pulley

If you have followed our advice you have already sprayed liberal amounts of rust penetrator on the crankshaft pulley bolts 24hrs. in advance of actually applying pressure to remove. Now give a second blast of the oil and after at least 30 mins. to allow the penetrator to work remove the three 3/8" crankshaft bolts.

After you remove the bolts you will most likely find that the pulley is still fastened to the crankshaft. This is usually because of a tight fitting lip that fits into a groove on the harmonic balancer. Give this area a good shot of penetrating oil as indicated in Figure 43.

Now you can knock the crankshaft pulley off of its groove/lip mounting by tapping it around the radius of the part.

Once you have the part removed clean the harmonic balancer face carefully.

Any debris between the crankshaft pulley and the harmonic balance will cause the crankshaft pulley to wobble when in motion.

Coat the back of the new crankshaft pulley shown in Figure 40 with anti-seize compound or a thin coating of lithium grease to prevent binding in case you ever have to remove the pulley for any reason.

Now tighten the 3, 1-1/4" bolts provided in a cross wise pattern to ensure even clamping.

Your crankshaft pulley should appear as shown in Figures 41 and 42 when properly installed.

Your pulley may be either a die-cast component or stamped metal one.

Always soak old fasteners 24 hrs before attempting to loosen with penetrating oil . If the fastener is rusted it will be frozen in place and weakened by the rust. In this case you may easily break a bold head or round a nut off.

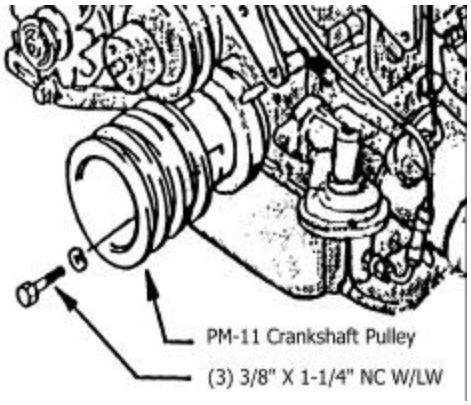


Fig. 43 Crankshaft pulley installation

Fig. 44 Old crankshaft pulley installation

Fig. 40 Old and new crankshaft pulleys

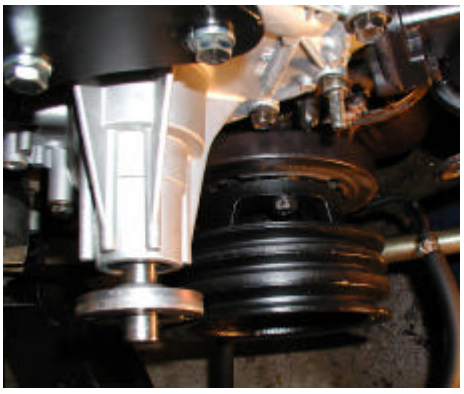


Fig. 41 New crankshaft pulley installed

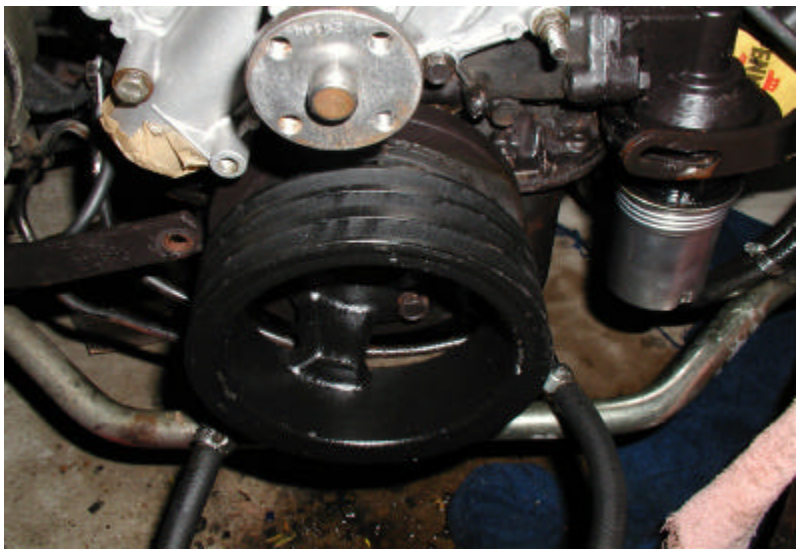


Fig. 42 New crankshaft pulley installed

Installation: Adding the Compressor Mounting Bracket

Installing the compressor bracket may require modification to the bracket itself. Carefully test fit the bracket before securing it to the engine.

You will now install the compressor mounting bracket. Start by removing the three top most mounting bolts in your water pump if you have not already.

You should now have the power steering pump loose and off of the engine block.

The bracket shape you have may vary depending on whether you have an Eaton or Ford power steering pump.

Installing the compressor bracket is the most difficult part of the entire assembly process.

There are so many combinations of engine configurations that you may have to modify the bracket you received from CAA to have it fit properly on your car.

In our sample installation case we had to enlarge the holes in the bracket where the 3/8" nuts mount.

The compressor bracket utilizes three bolts that hold the water pump together plus the two bolts that held the power steering pump in place.

Test fit the bracket carefully before first installing the three water pump bolts.

Do not install the (2) 3/8 inch bolts that mount the power steering pump bracket (not show) at this time as you will need to leave the power steering pump off until later in the assembly process.

Note that we have already assembled the idler pulley and eccentric arm visible in Figure 45.

Use the 3/16 inch spacers provided by CAA to ensure that the bracket will mount squarely against the water pump and engine block.

In the case of the Eaton power steering pump these spacers will go behind the compressor mounting bracket next to the engine block.

The power steering pump bracket will go on top of the compressor bracket with additional spacers to provide proper alignment

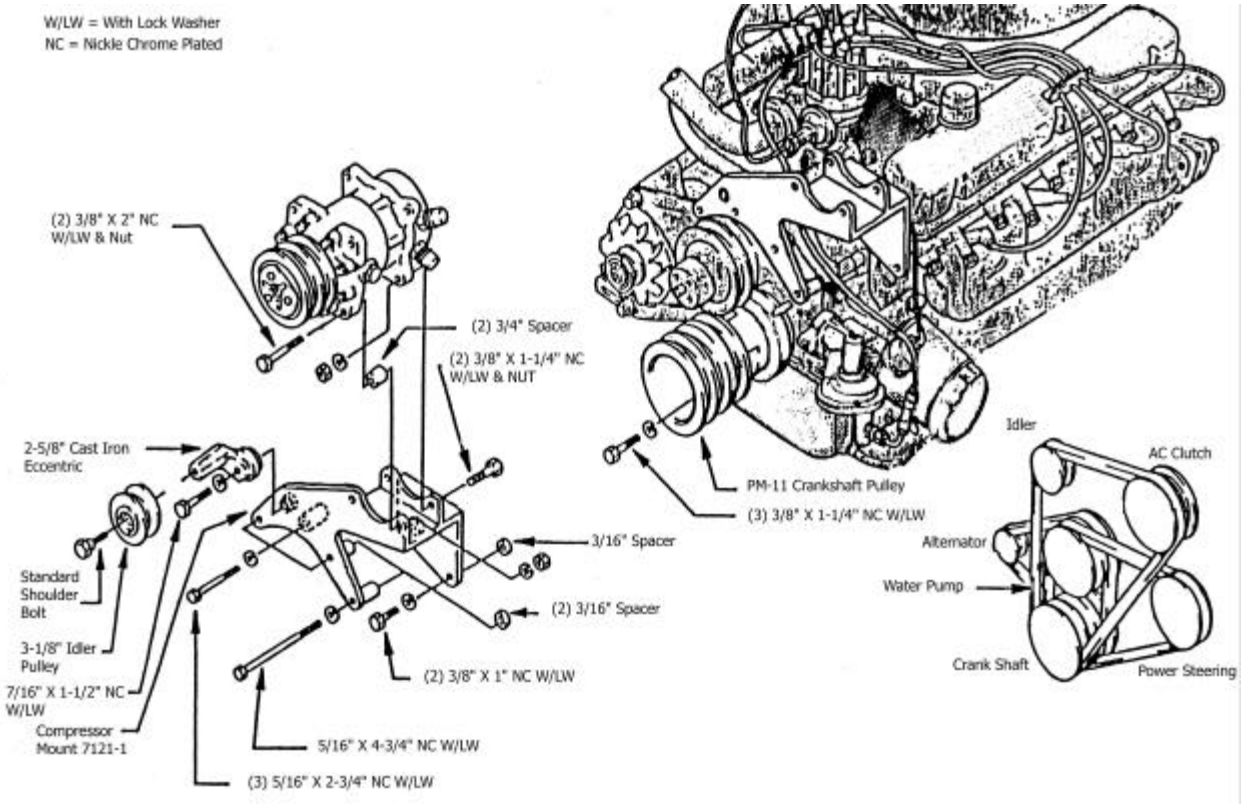


Fig. 45 Compressor Mounting Bracket Installation

Installation: Adding the Compressor Mounting Bracket

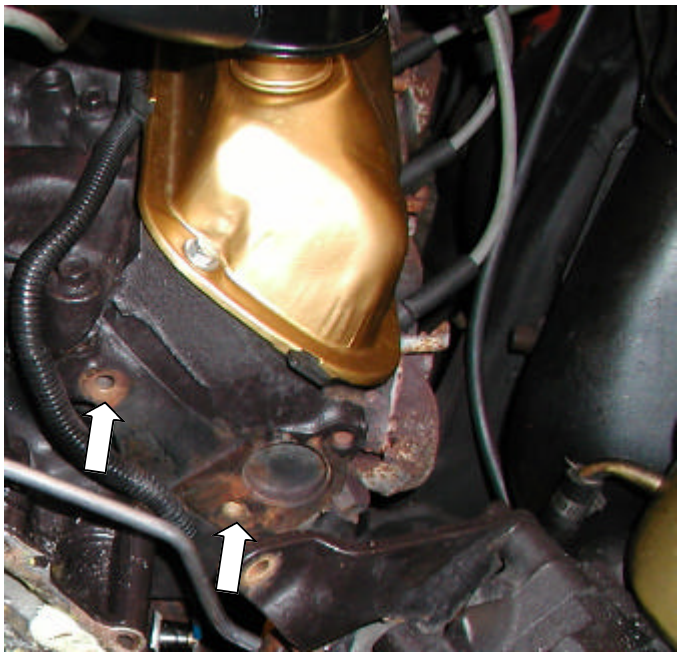


Fig. 46 Power Steering Pump Bracket Mounting Holes in Block

for the belts.

Make sure and use the provided lock nuts on all of these bolts.

Do not fully tighten the idler pulley eccentric arm. Simply finger tighten its mounting bolt to hold it in place during assembly.

Test fit the compressor and make sure that its pulley lines up with the outermost groove on the crankshaft pulley (see arrow in Figure 47).

Be careful when you lift the compressor and keep its dust caps on until just before you hook up the lines as described further on.

"Be careful when you lift the compressor and keep its dust caps on until just before you hook up the lines..."

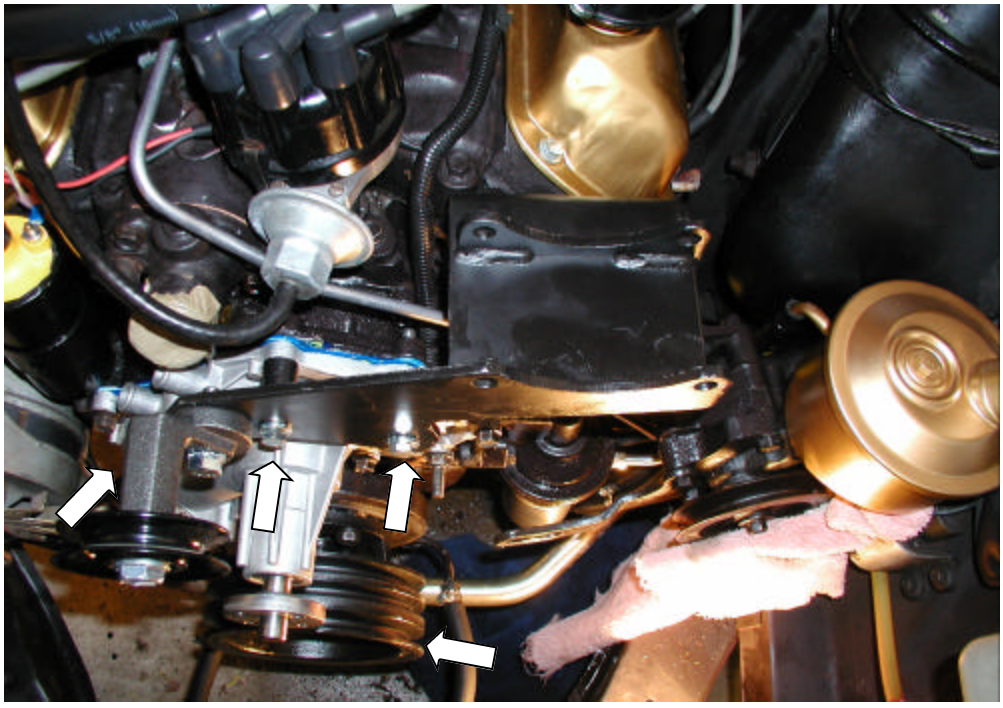


Fig. 47 Compressor Mounting Bracket Installed Top View

Mounting of eccentric arm and idler pulley

Installation: Remounting the Power Steering Pump

Carefully test fit the bracket before securing it to the engine.

The Eaton power steering pump is mounted with two bolts to the adjustment bracket. This bracket is secured to the engine block with two additional bolts.

Figure 45 shows the location of the adjustment bracket mounting bolt holes. In the figure the upper hole locates the pivot point for the pump adjustment. The lower slotted hole allows movement of the bracket and pump for belt tensioning.

Two 1 1/8 inch standoffs must be used between the pump adjustment bracket and the engine block. This is because the Eaton Power steering pump must be pushed out in order for the belt to align with the middle groove of the crankshaft pulley and the outer groove of the water pump pulley.

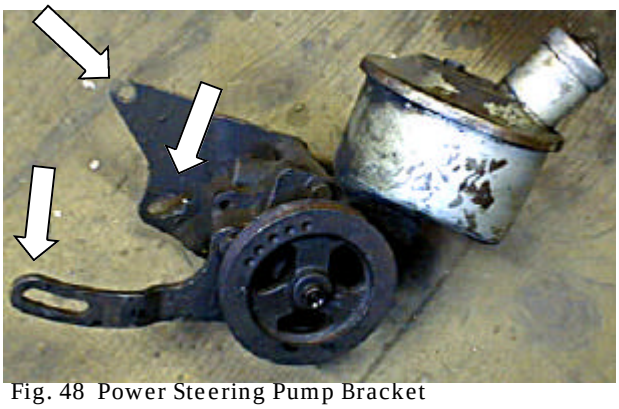


Fig. 48 Power Steering Pump Bracket

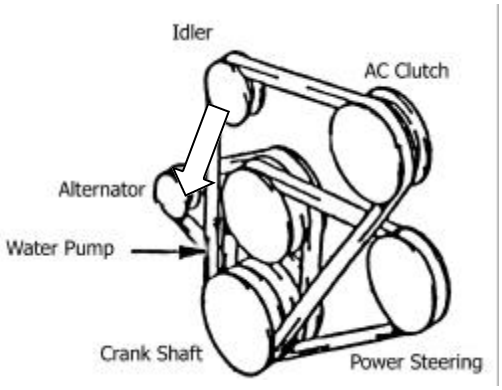


Fig. 50 Power Steering Pump Bracket

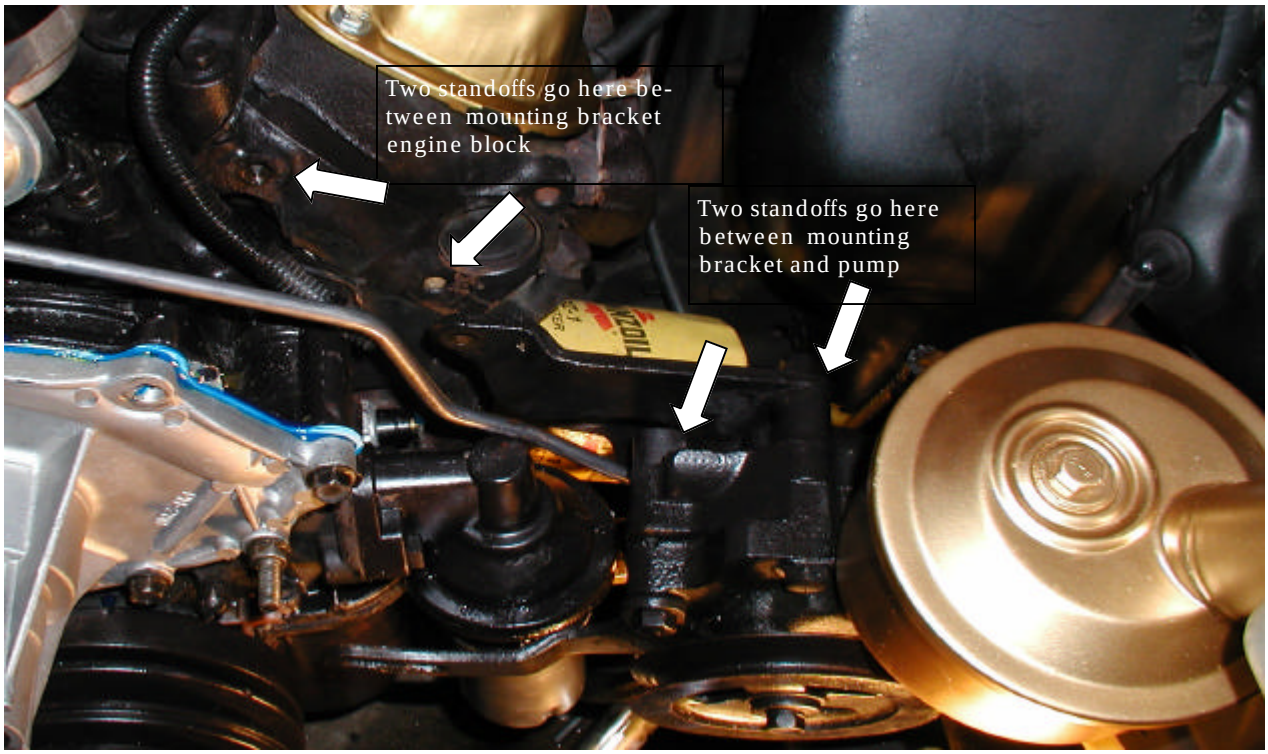


Fig. 49 Power Steering Pump Bracket

Installation: Remounting the Power Steering Pump

Additionally the pump itself must be mounted at the adjustment bracket on 1 inch standoffs. These standoffs are shown in Figures 52 and 53. The 5/16 inch bolts that go in these positions must be longer than standard to accommodate the added standoffs.

The standoffs for the bracket and steering pump mounting may not be included as part of the CAA kit. We created our standoffs by cutting steel tubing to length.

Please note that before you mount the pump you must install the power steering adjustment bolt. This bolt doubles as a fastener for the water pump.

Purchase a length of 5/16 inch threaded rod and cut to length approximately 3 inches longer than the bolt that originally mounted the water pump and acted as the power steering adjustment bolt.

As you can see in Figure 51 we mounted a threaded 5/16 inch standoff on this bolt to strengthen it a bit. We then used two nuts and a lock washer to act as the retainers for the power steering pump adjustment arm.

Once the power steering pump is properly installed its pulley should line up with the middle groove of the crankshaft pulley.

Carefully test alignment of these pulleys before clamping down the adjustment bracket arm or the pivot point for the power steering pump bracket.

You will have to adjust the power steering pump belt tension later on in any case.

Make sure that the bolts that hold the power steering pump to the mounting bracket are secured. Tightening later on in the assembly process will be more difficult.

"Please note that before you mount the pump you must install the power steering adjustment bolt."

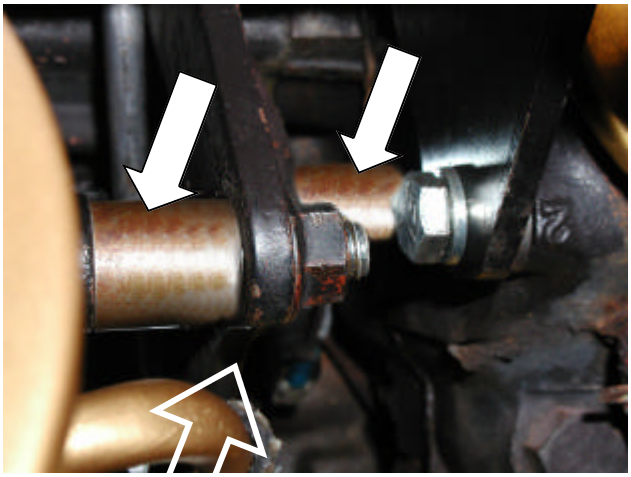


Fig. 52 Power steering pump standoffs

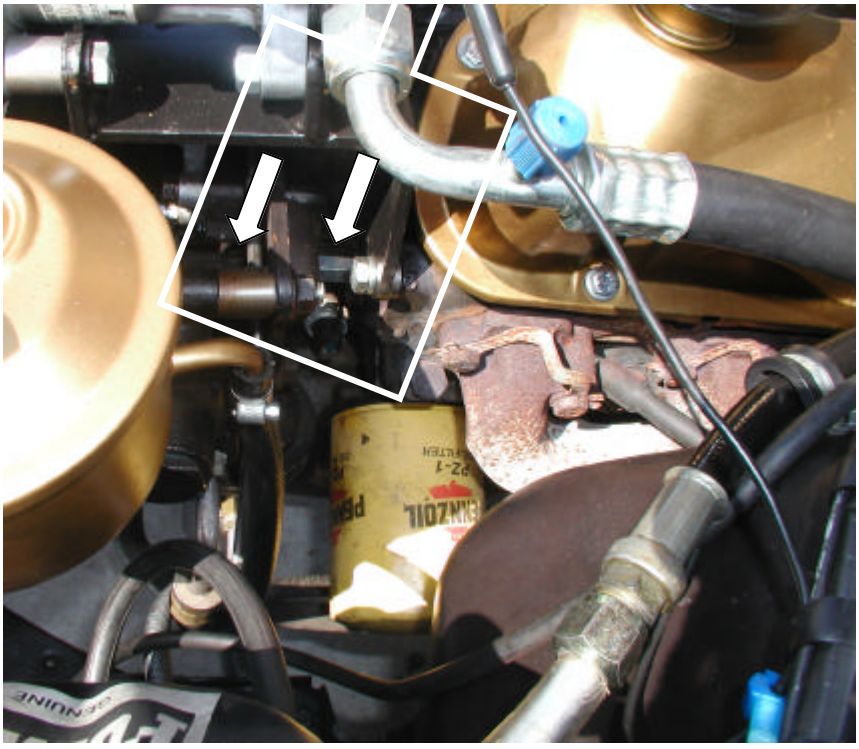


Fig. 53 Power steering bracket and pump standoffs

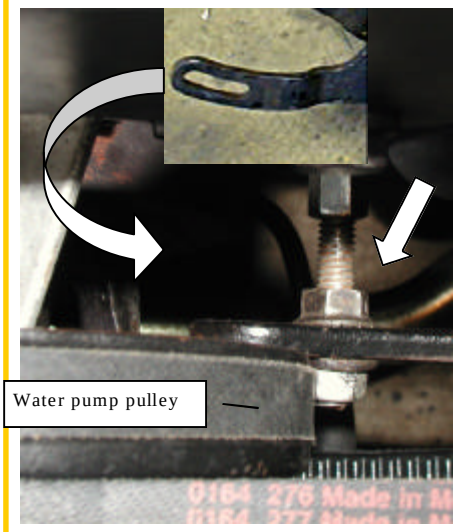


Fig. 51 Power steering water pump adjustment bolt. View down from top of engine.

Installation: Route Evaporator Lines and install Firewall Gasket and Bracket

The firewall grommet is critical to prevent engine smells and sounds from entering the passenger compartment.

"..it will help to coat the grommet with some "ArmorAll" or other similar rubber/vinyl preservation product."

Now you will install the evaporator lines and firewall grommet/bracket.

Do not secure the evaporator in place at this time. However you may wish to place it in the car in its general location to judge just how far into the car to place the evaporator lines.

In the example installation two lines go to the evaporator. The larger diameter line goes from the lower evaporator connection to the compressor.

The smaller diameter line is connected to an aluminum line which goes to the bottom of the dryer receiver as shown in Figure 51.

First position the grommet in place under the grommet bracket and mark hole locations for the mounting ears.

Drill the mounting holes but do not mount the brackets around the grommet at this time..

Next you will feed the smaller of the two hoses through the grommet. This takes some doing and it will help to coat the grommet with some "ArmorAll" or other similar rubber/vinyl preservation product. Don't use any sort of oil since oil can destroy rubber products.

Push the hose approximately 2 feet through the grommet.

Now that the smaller (evaporator to aluminum dryer line) hose is fed through the grommet mount the grommet behind the bracket. Make sure that the smaller diameter hose

Fig. 55 Evaporator lines in firewall grommet

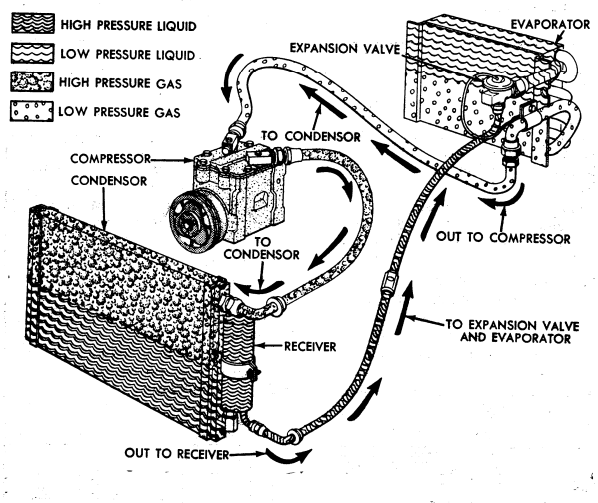


Fig. 54 System line connections

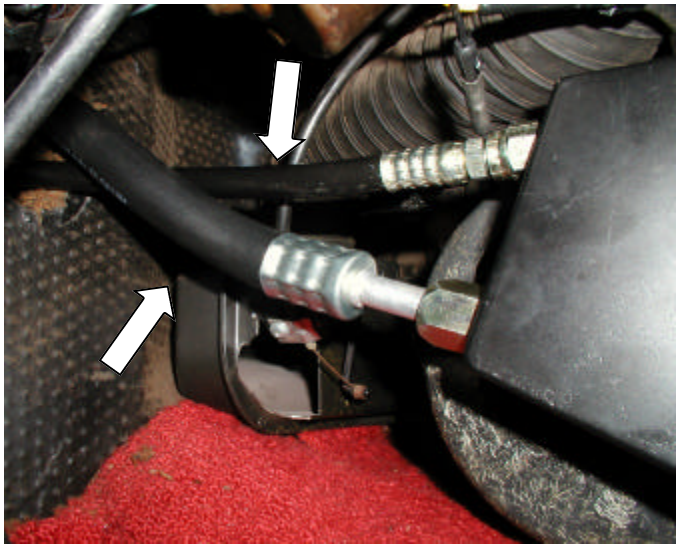


Fig. 56 Evaporator lines in place

Installation: Route Evaporator Lines and install Firewall Gasket and Bracket

is mounted on the bottom. This will keep the compressor and aluminum hose lines parallel in the engine compartment. Note that the lines "cross" inside the car as shown in Figure 56. This will result in an overall better appearance in the engine compartment of the installation.

Push the larger diameter hose through the mounted grommet after coating the hole with "ArmorAll".

Figure 57 shows the mounting screws and both lines inserted. The middle very small hole is for the evaporator control line which we will run later.

Now pull the hoses into position and loosely connect to the evaporator.

Before connecting the hoses to the evaporator or any other component be sure and apply a single drop of 3 in 1 oil to the mating surfaces. If an O ring is used on that connection soak it in the oil before installation.

In the next section we will mount the evaporator. After mounting is complete tighten the evaporator line connections. It is best to use a set of flare wrenches for this task.

Note that we have moved the driver side firewall to shock tower brace moved out of the way for installation of the grommet and lines (see Figure 58). If your car is equipped with a an export brace you will have to remove it entirely.

It may also be necessary to remove the brake vacuum hose shown in Figure 52 in order to gain access to the grommet area. This is the vacuum line from the manifold to the master cylinder. It is best to remove this line at the master cylinder end only and move the line out of the way for installation.

"Note that we have moved the driver side firewall to shock tower brace out of the way for installation of the grommet and lines..."

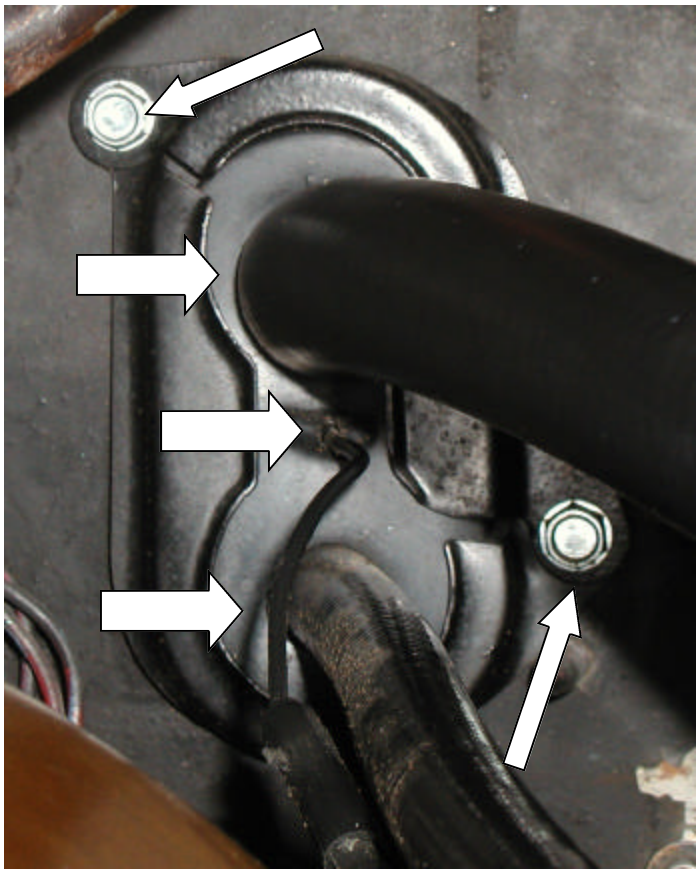


Fig. 57 Evaporator lines in firewall grommet

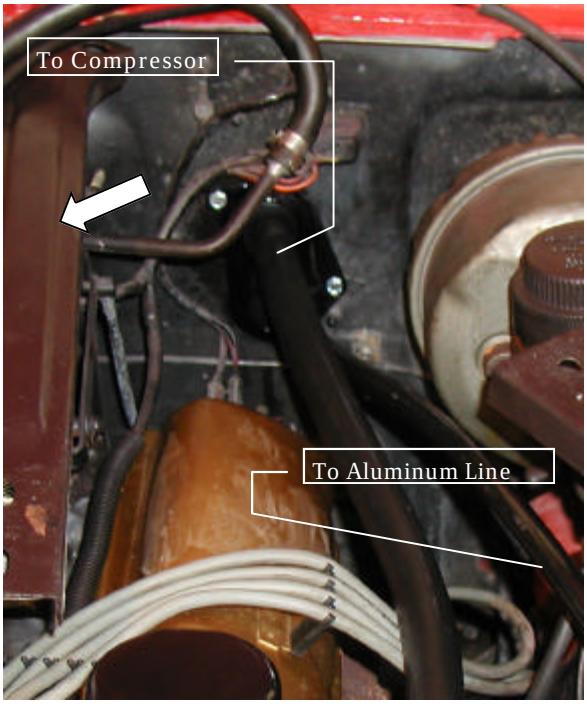


Fig. 58 Evaporator lines in firewall grommet

Installation: Mount Evaporator and Adjust Leveler Bolt

The firewall grommet is critical to prevent engine smells and sounds from entering the passenger compartment.

Mounting the evaporator is a simple task. Requiring only three bolts.

Before you mount the evaporator insert the leveling bolt as shown in Figures 59 and 61.

The leveling bolt is crucial to a good installation and proper evaporator fan life.

Thread the bolt in from the top until it extends about 1 inch below the threaded nut shown in Figure 59.

When this bolt in is place and extended approximately 1 inch loosely attaché the securing nut provided by CAA. See arrow in Figure 61.

Now you can position the evaporator and attach it to the two mounting holes that are under the dash already present in your car (see Figure 56).

First though connect the compressor and dryer lines that you pulled in from the engine compartment and tighten.

Adjust the position of the evaporator until it is straight with the face of the dash.

Now you can tighten the bolts that secure the evaporator mounting ears.

Use a 1/4 inch open ended wrench to tighten the bolt so that the evaporator is lifted off of the transmission hump with at least 1/4” inch clearance.

Now tighten the securing nut as in Figure 57.

You can now also connect the wiring harness pro-

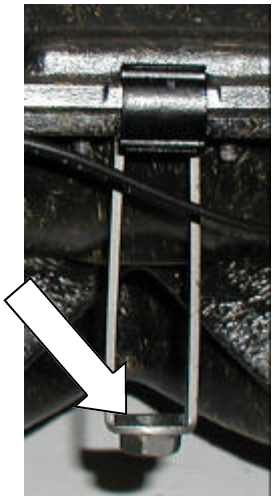


Figure 59

Fig. 60 Evaporator front view showing mounting ears

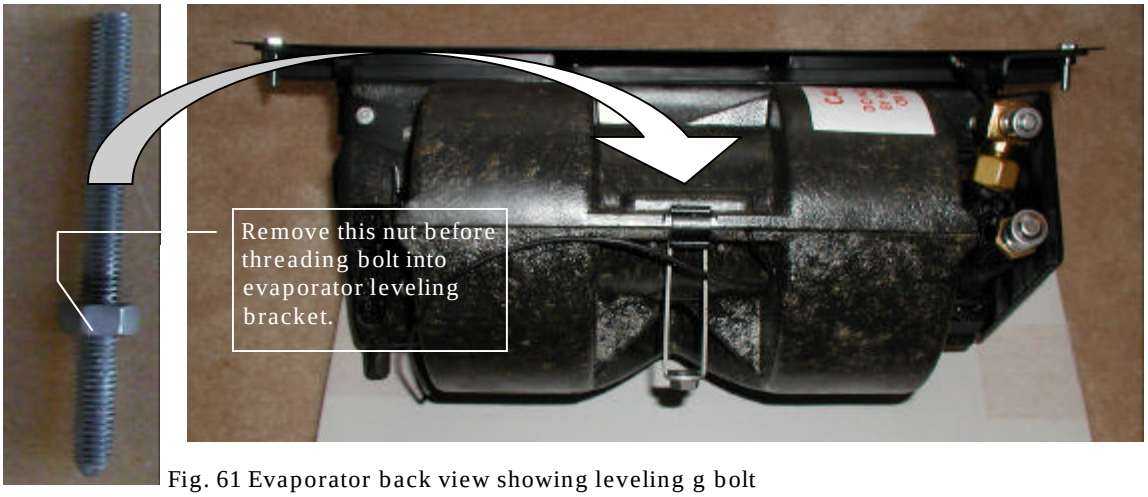
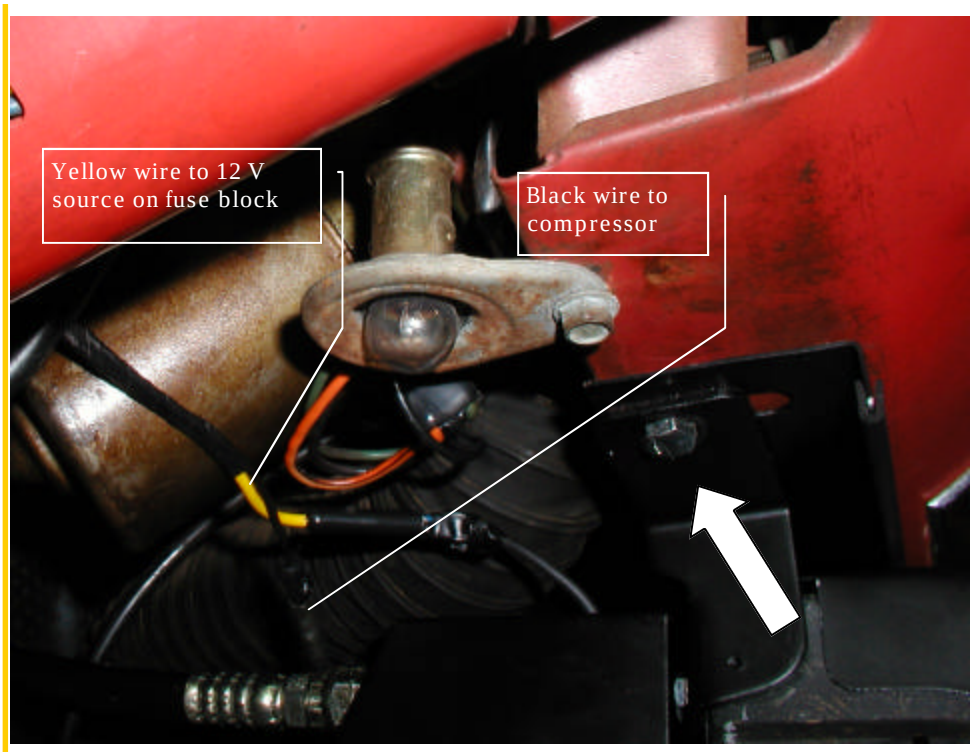


Fig. 61 Evaporator back view showing leveling g bolt

Installation: Mount Evaporator and Adjust Leveler Bolt



vided by CAA to the evaporator.

This wiring harness has two connections. One which exits through the firewall grommet and the other which provides power to the evaporator controls and fan.

Looking at the harness the yellow wire should be connected to a fused positive power point on your fuse box. The black wire will travel through the firewall plug (centered between the evaporator lines) directly to the compressor clutch power connection.

Fig. 62 Evaporator front view showing mounting

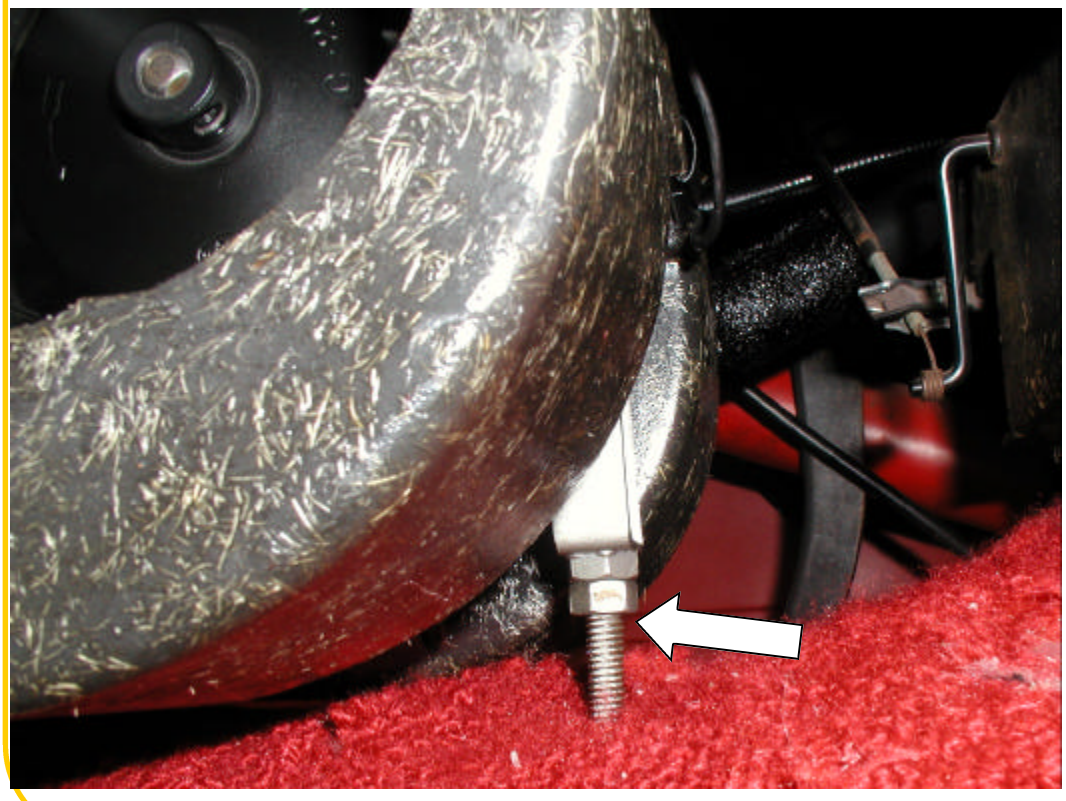


Fig. 63 Evaporator rear view with leveling bolt in place.

Installation: Mounting the Compressor

Now we an feel like real progress has been made. We are mounting the compressor!

Refer to **Appendix B** for instructions on mounting an original York type compressor. The Sanden compressor we received from CAA comes pre-charged with oil so there is not need to open the oil access plug.

Keep the compressor sealed by leaving on the dust caps during the mounting process.

The compressor mounts with (4) 3/8 inch bolts provided by CAA.

Figure 64 shows the installation. The compressor is shifted slightly forward on the bracket by the two 3/4 inch spacers that are mounted behind the front ears.

Be sure and include lock washers as shown in Figure 68.

After you have the compressor secured connect and tighten the larger of the lines coming from the evaporator.

Be sure and use a drop of 3 in 1 oil on the mating joints for these connections. Soak any O-rings in this oil before installation. Tighten this connection firmly.

Handle the compressor with care as it is quite heavy.

Tighten all mounting bolts but do not however connect the wiring harness clutch control wire to the compressor at this time.

Figure 38 gives a good idea of how the spacers lockwashers and nuts are utilized in this assembly.

Figure 64 compressor mounted

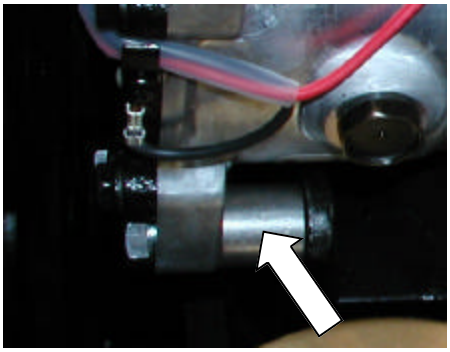


Figure 65 rear compressor mounting

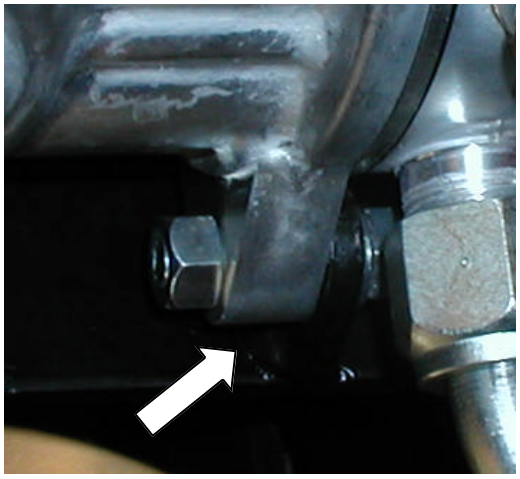


Figure 66 compressor rear mount

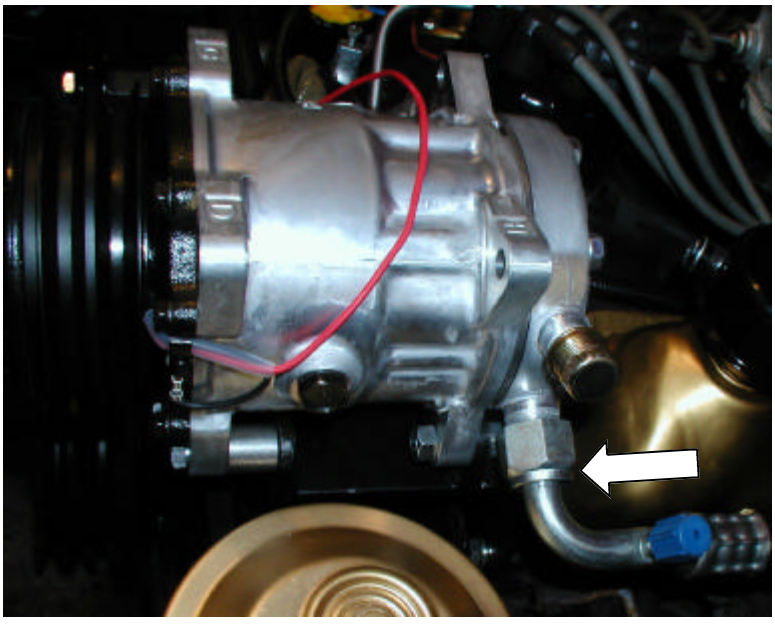
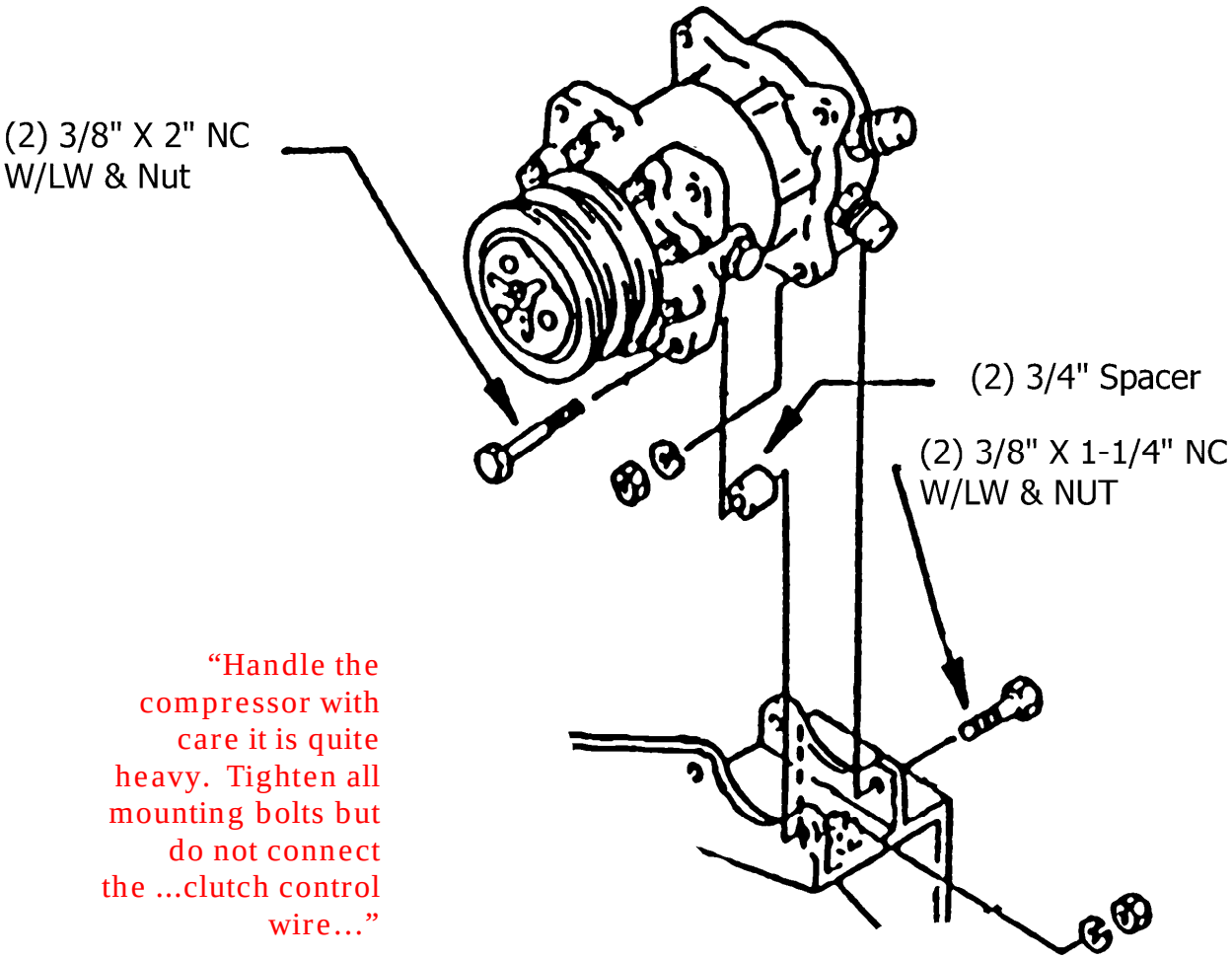


Figure 67 compressor in place

Installation: Mounting the Compressor



"Handle the compressor with care it is quite heavy. Tighten all mounting bolts but do not connect the ...clutch control wire..."

Figure 68 compressor mounting

Installation: Assembly of the Condenser and Dryer/Receiver

The dryer should be kept sealed until the last possible moment. It contains a desiccant which can absorb waterl

Assemble the 4 condenser mounting bracket as shown in Figure 69,70, and 71.

The brackets are somewhat adjustable so you should only loosely attach the brackets and test fit on the car.

Do not over tighten the bracket mounting screws. It is easy to strip out the sheet metal holding the condenser coils together.

Figure 71 shows the radiator side of the condenser. Note that the mounting bolts used to secure the radiator are now part of the condenser mounting brackets.

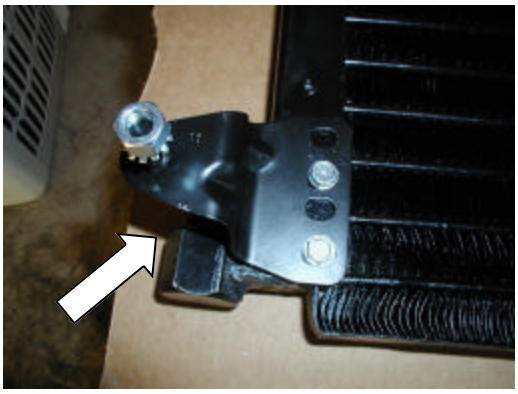
Figure 70 shows the mounting nuts with integral lock washers for reference. These will be applied from the engine side of the radiator when the radiator is installed.

Now mount the dryer as shown in Figures 72 and 73.

You will connect the dryer to the condenser first (Figure 73) and then attach the mounting strap hardware shown in Figure 72.

Once the dryer is in place test fit the condenser again to ensure that the brackets properly line up with the existing radiator mounting holes. You do not want to have to adjust the positions of these brackets once the radiator is in place.

Once the dryer is installed leave the remaining dryer dust cap and the condenser dust cap in place until just before you attach the lines.



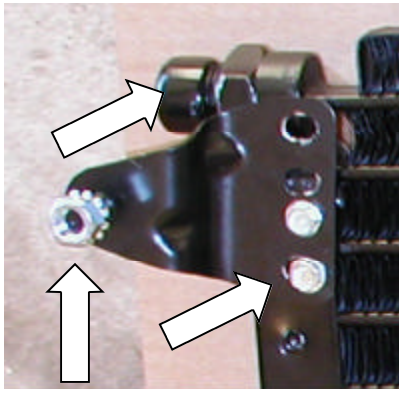


Figure69 and Figure 70. Condenser mounting brackets.

Figure 71 Condenser to dryer assem-

This will prevent debris and moisture from entering the dryer.

The dryer connection to the condenser should be tightened firmly at this point. Make sure that the dryer exit tube and connector is parallel to the condenser as shown in Figure 74.

Tighten the mounting strap with the CAA furnished screw and you are ready to mount the condenser.

Installation: Assembly of the Condenser and Dryer/Receiver

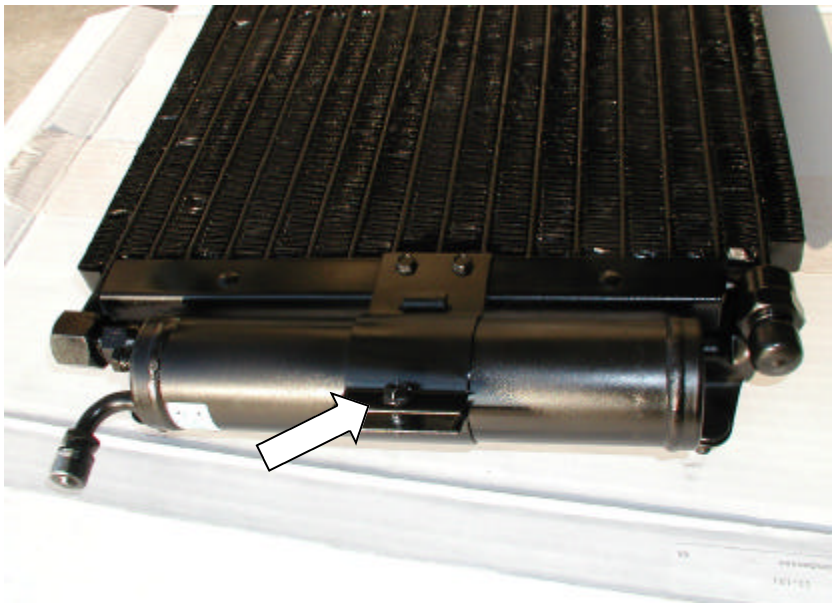


Figure 72 and 73 condenser to dryer assembly

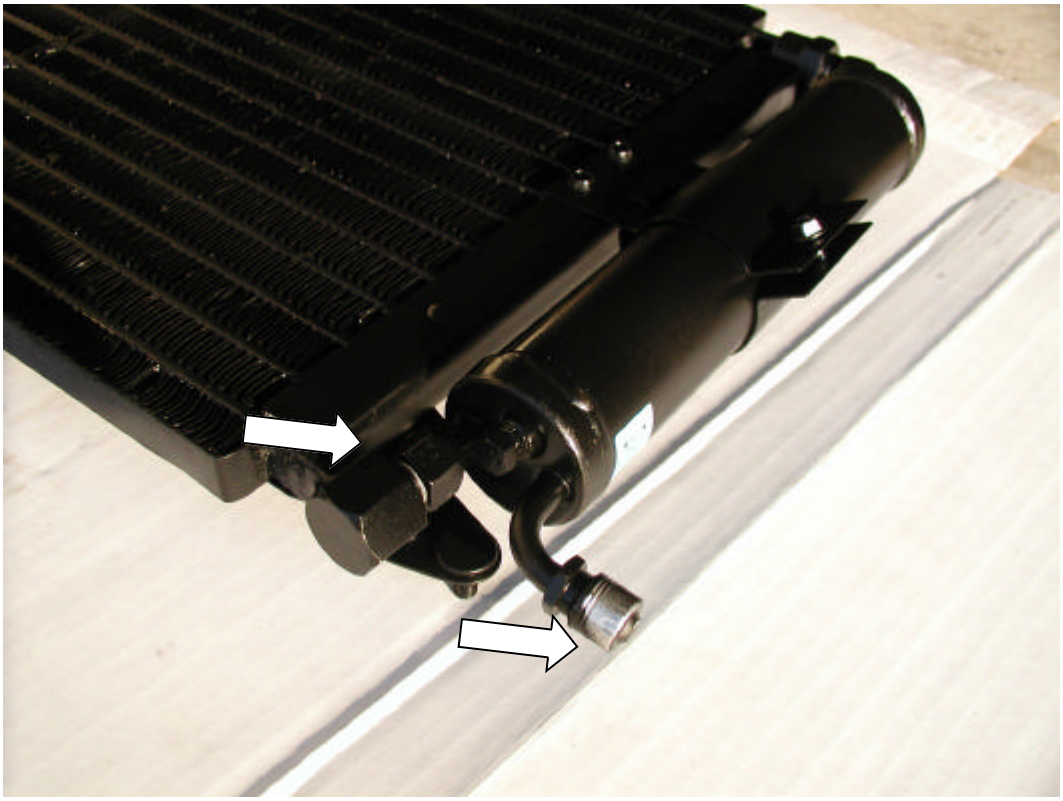


Figure 74 Condenser to dryer assembly

"The dryer connection to the condenser should be tightened firmly at this point. Make sure that the dryer exit tube and connector is parallel to the condenser...

Installation: Mounting the Condenser/ Dryer Assembly

Carefully handle the discharge hose and all other hoses as you are installing them to avoid nicks or cuts during handling.

Before mounting the condenser dryer assembly connect the compressor to condenser line also known as the "discharge hose".

Figure 75 shows the position of this hose. Figure 76 shows routing through the hole you previously made in the radiator support frame.

Tighten the line at the compressor end ensuring that you have applied 3 in 1 oil to the joint and soaked any O-rings before assembly. Do not use an excessive amount of oil.

The discharge hose connector should also be protected by a large rubber grommet provided by CAA.

Slide the condenser/dryer assembly into place, and insert the condenser bracket studs through the radiator mounting holes as shown in Figure 79. The condenser bracket studs also secure the cowl to be installed later.

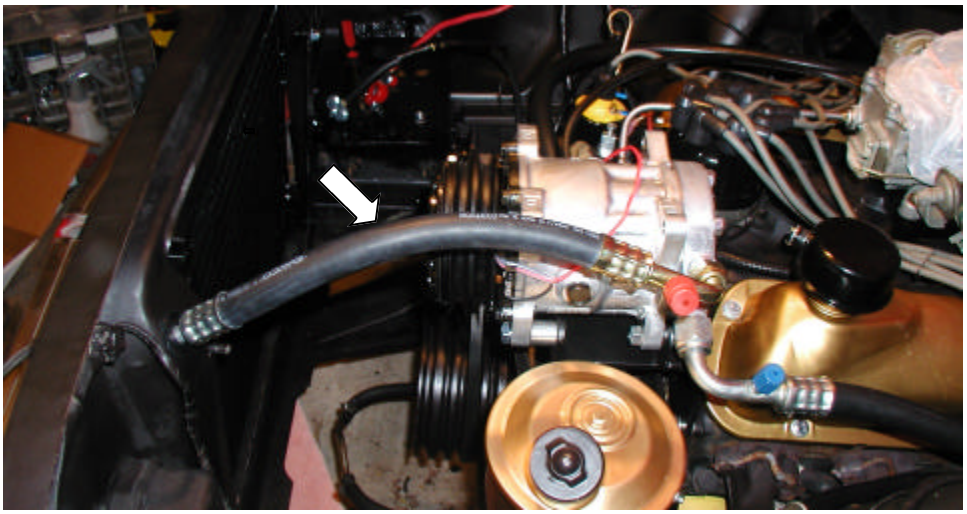


Figure 75 condenser to dryer assembly

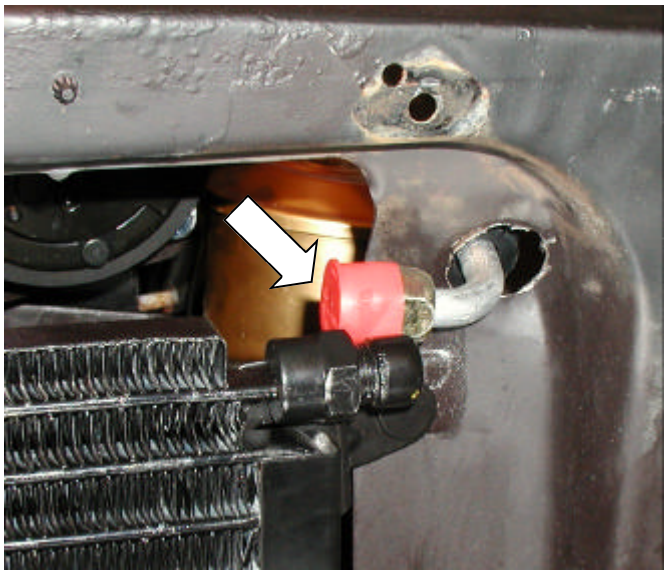


Figure 76 condenser to dryer assembly

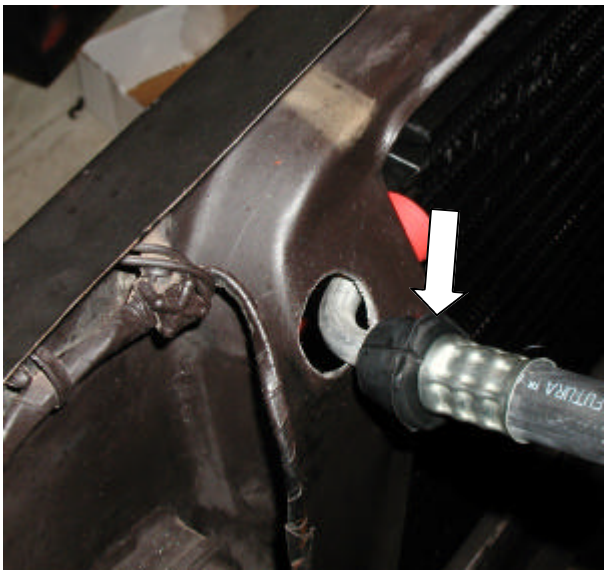


Figure 77 condenser to dryer assembly

Installation: Mounting the Condenser/ Dryer Assembly

After lowering the condenser in place be sure and attach the right angle connector to the bottom end of the receiver dryer.

You will have to access this connection from the front of the car as you have removed the valance previously.

Install the second large rubber grommet as shown in Figure 78 and 80.

Note: in the pictures below that the dust caps are in place during installation as long as possible to keep debris and water out of the system.

Make sure the right angle joint and the compressor connections are firmly tightened.

Do not reinstall the valance at this time. It is important to have the valance removed during charging of the system so leaks in the bottom of the receiver/ dryer area can be checked.

Always tighten these connections with two wrenches to ensure that the soft tubing to coupler-joints are not cracked.

Figure 78 condenser to dryer assembly

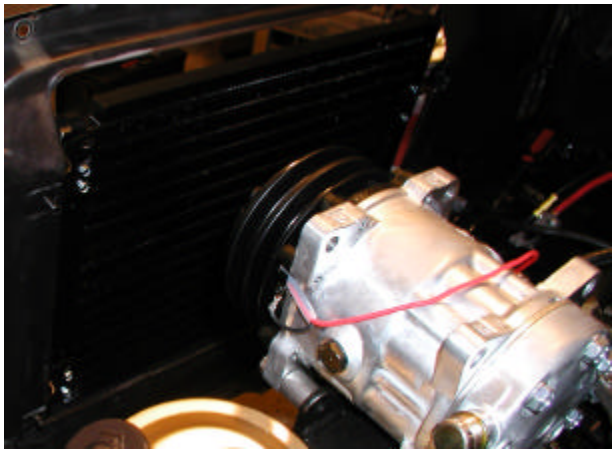


Figure 79 condenser to dryer assembly

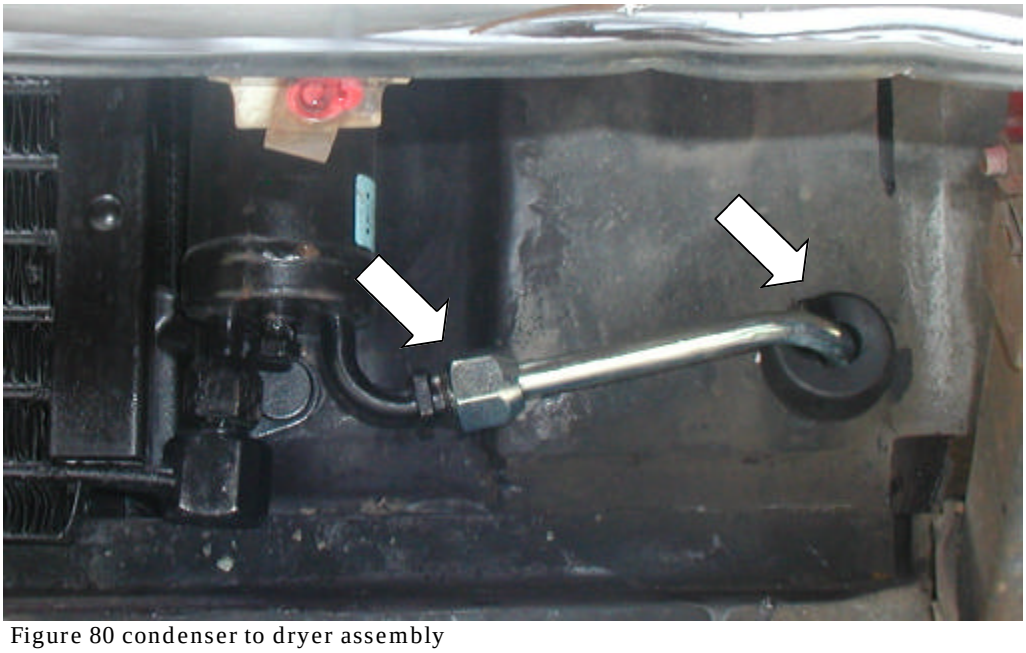


Figure 80 condenser to dryer assembly

"Do not reinstall the valance at this time. It is important to have the valance removed during charging of the system...so leaks can be checked"

Installation: Connecting the Aluminum Liquid Line

A sight glass is not a reliable method of determining charge when R134A refrigerant is used so it will not be installed.

You will have a sight glass if you have chosen a R12 system.

Connect the aluminum liquid line from smaller diameter evaporator line (high pressure liquid line) to the right angle connection at the bottom of the dryer which you attached through the radiator mounting frame.

This line is flexible so you can fit is nicely into your engine compartment with some gentle bends. Do not bend it near the ends. It should form a general S shape curving downward starting below the driver side shock tower.

Figure 82 shows how it was routed in our test car. Note the connection to the evaporator line is high enough on the shock tower to make checking for leaks easy (see Figure 84). For R134A systems no sight glass is provided. However you should have one if you are using R12.

Later we will mount a support strap shown in Figure 84.

This aluminum line is connected to the dryer/ receiver via the right angle coupler as shown in Figure 85.

Securely tighten all of these connections. Be careful when tightening the dryer to aluminum line connection. Hold the right angle coupler as you tighten the aluminum line to avoid turning the coupler.

The aluminum line should lie close to the inner fender. If you have the windshield washer optional water bag it will lay behind

Figure 81 Aluminum liquid line

Figure 82 Aluminum liquid line routing

Installation: Connecting the Aluminum Liquid Line

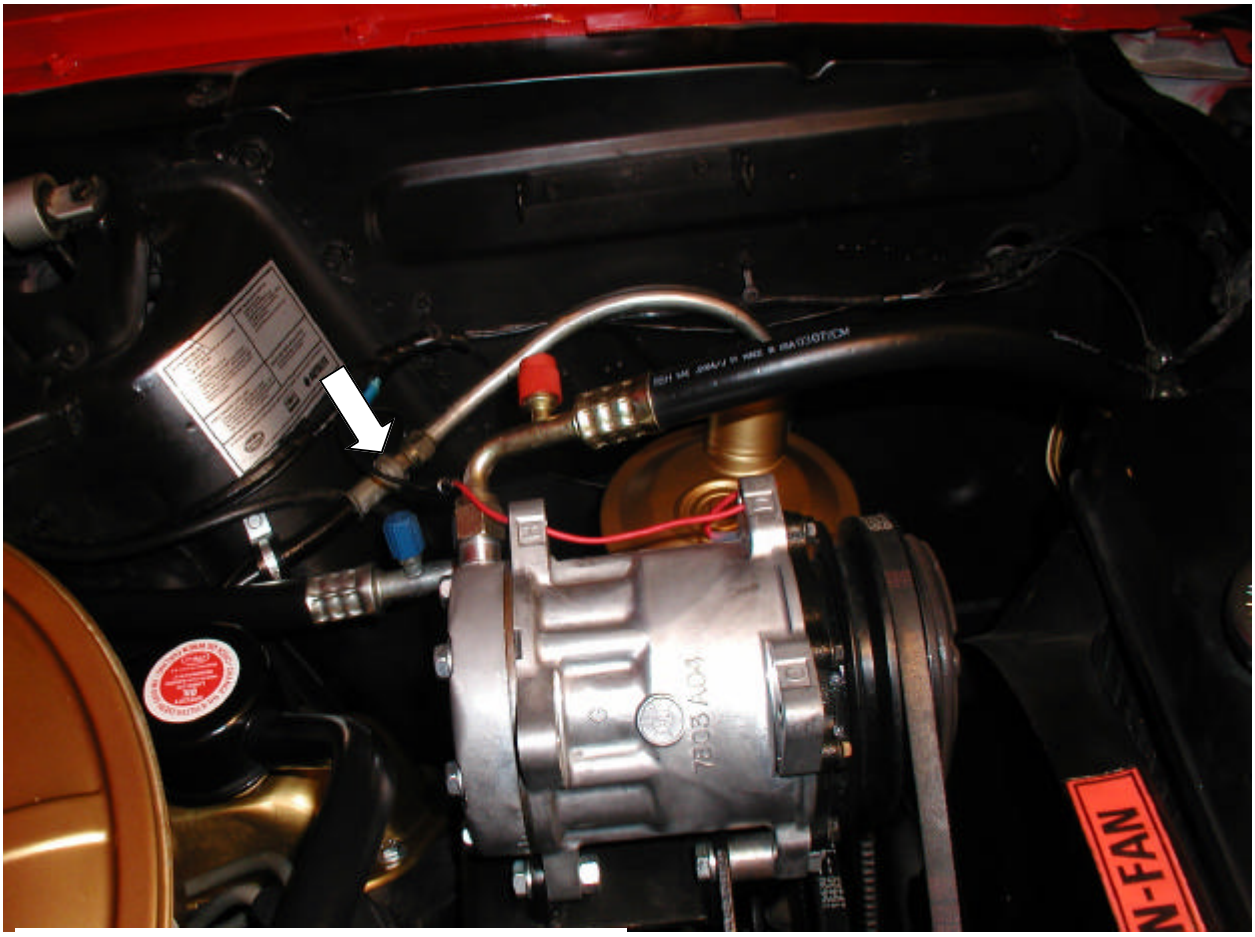


Figure 83 Aluminum liquid line placement

Figure 84 Aluminum liquid line support strap

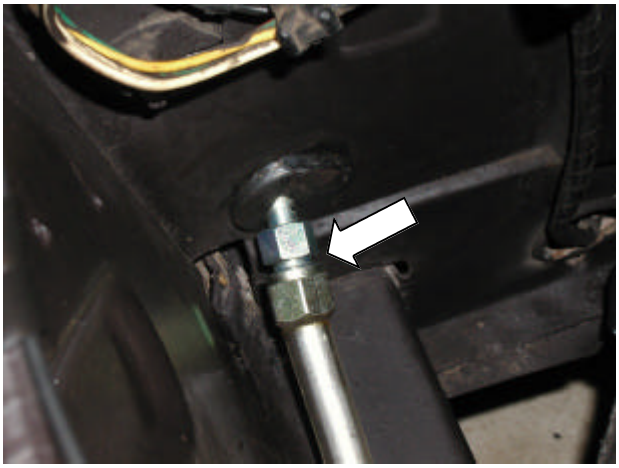


Figure 85 Aluminum liquid dryer connection.

Installation: Attach 6 Blade Fan, Spacer and Water Pump Pulley

In order to install the fan you must first fit the water pump pulley in place.

Attach the new 6 blade fan with the original spacer between the fan and water pump pulley using the original 4 retaining bolts.

The fan is clearly labeled as to which direction is should face. Double check that it is facing the correct so that cool air will be drawn from the front of the car across the condenser and radiator.

Tighten the fan bolts in a alternating diagonal pattern to ensure it is seated evenly.

Figure 87 shows the pulley and spacer installed. This picture shows the complete installation. Do not install the belts until you have the cowl installed which we will describe in the next section.

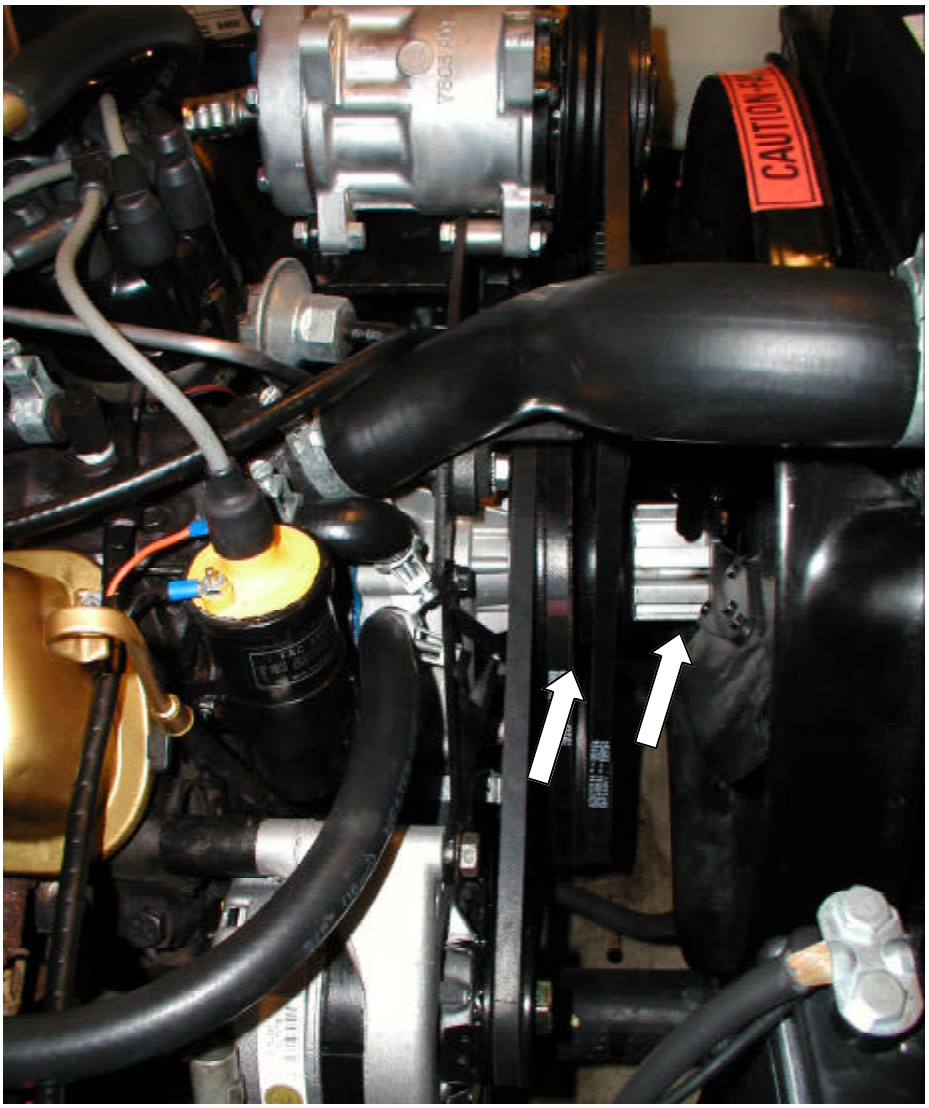


Figure 86 Water pump pulley

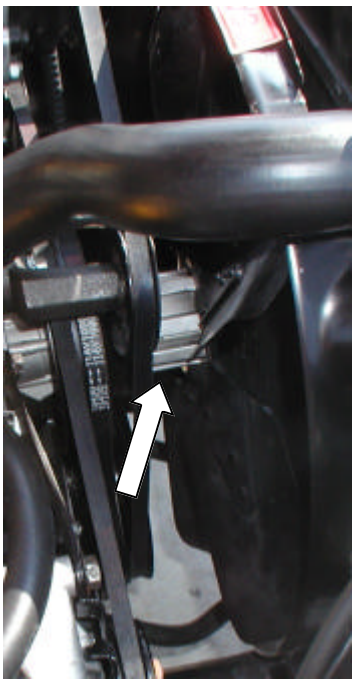


Figure 87 Spacer

Installation: Attach Alternator, Power Steering and Compressor Belts

Install the Alternator belt first by slipping it over the fan and onto the inner groove of the water pump pulley as shown in Figure 89 and 90. This belt runs on the inner most groove of the crankshaft pulley.

Tighten this belt so that the belt deflection is approximately 1/2 inch.

Next mount the power steering belt. This belt runs on the middle crankshaft groove and on the outer most groove of the water pump pulley.

Tighten this belt by moving the power steering pump on its pivot bolt. The threaded bolt you created (see Figure 88) may need some adjustment at this time.

Now mount the AC compressor belt provided by CAA. It is the last belt mounted. Its runs through the outermost crankshaft groove the idler pulley already installed and the compressor pulley itself.

Adjust the tension on this belt by moving the idler pulley. You will need two open ended wrenches.

One wrench to adjust the idler eccentric arm and one wrench to tighten the bolt holding it to the compressor mounting bracket.

If you have been following our assembly procedure it is far easier to tighten and adjust the belts at this state of assembly since the cowl is still not in place and the upper radiator hose is also still removed.

The pictures below show what the belt alignment should be like when the system is complete. Again note that this is easier to accomplish since the top radiator is not installed.

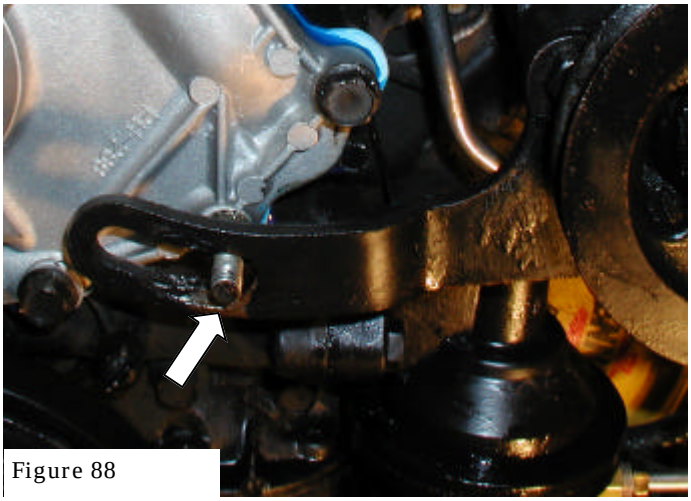


Figure 88

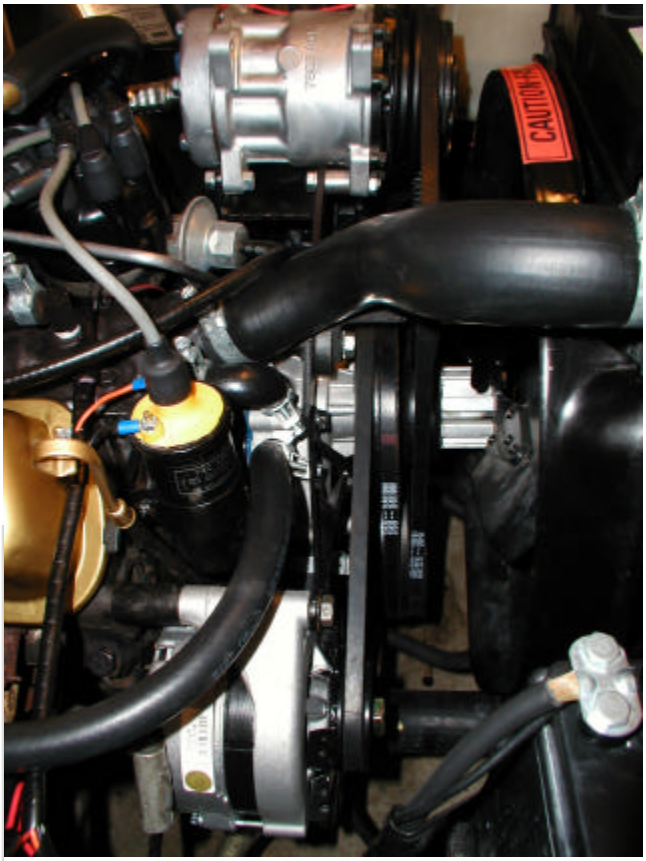


Figure 90 Belt Alignment

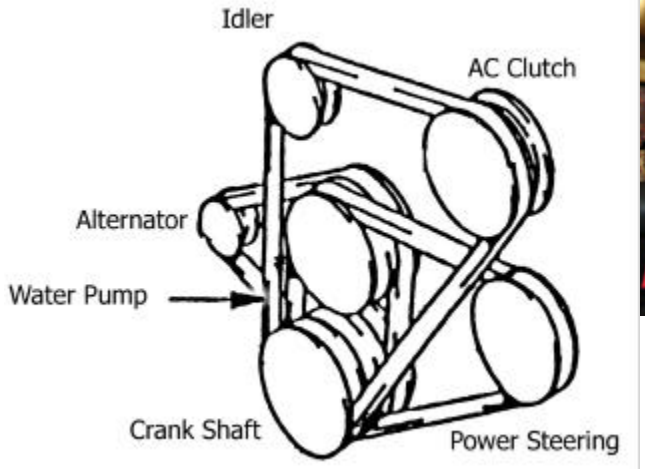


Figure 89 Belt Alignment

Installation: Mount Radiator and Cowl

We are finally ready to lower the radiator back in place. Handle it carefully and make sure that you have all of the belts aligned and properly tightened before lowering in the radiator.

"Make sure that the cowl brackets provided by CAA are in place before you apply the nuts. Only hand tighten these nuts..."

It is time to mount the radiator and the cowl.

Once you have ensured that all belts are properly installed and tightened place the cowl over the fan and temporarily position it as close to the engine as possible.

The fan will hold the cows while you insert the radiator into position.

Lower the radiator into place and secure it with the 4 studs that come through the radiator mounting frame.

Use the nuts with integral lock washers provided by CAA to secure the radiator.

Make sure that the cowl brackets provided by CAA are in place before you apply the nuts. Only hand tighten these nuts at this point so that you can adjust the position of the cowl as needed later on.

Once the radiator is secured it is time to reconnect the transmission lines as shown in Figure 91. This Figure is a

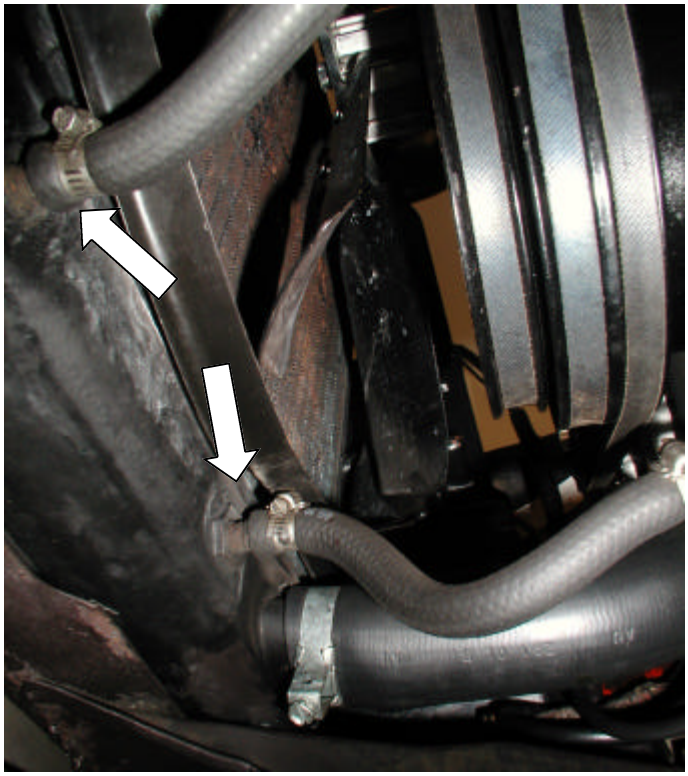


Figure 91

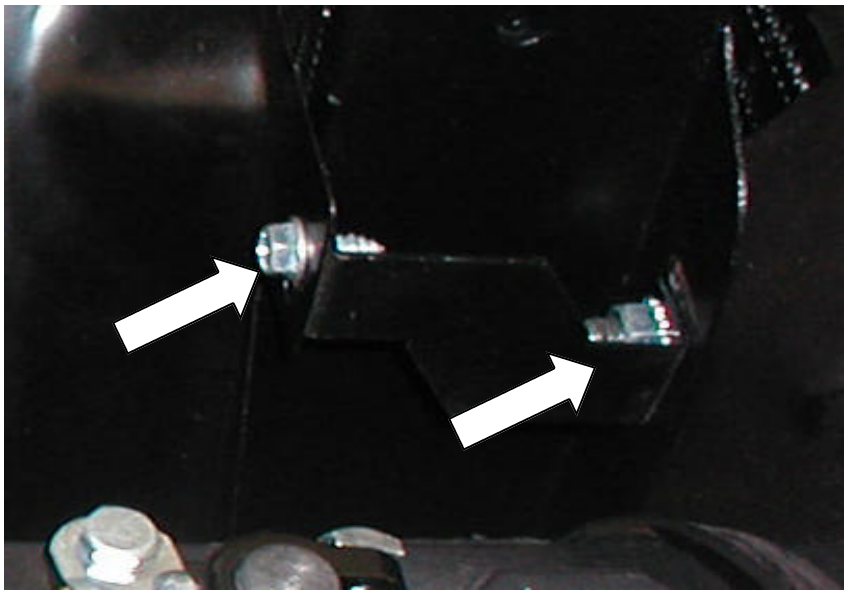


Figure 92 Cowl Brackets

Installation: Mount Radiator and Cowl

view from underneath the car.

Now replace the lower radiator hose. Make sure you use a spring in the lower hose for best performance and cooling.

Now is a good time to thoroughly coat the lower transmission and radiator hoses in ArmorAll or a similar rubber protectant. These hoses are normally harder to get at and don't get the attention they need once the car is in regular use.

Attach the cowl with the 4 retaining screws and screw clips provided by CAA.

Position the cowl so that the fan is centered in its opening. Carefully inspect the fit of the fan to ensure that if it rotates it will not strike the sides of the cowl.

Remember the engine will move during acceleration so carefully inspect clearances between the fan blades and the cowl.

After you are sure the cowl is properly positioned tighten all of the cowl mounting screws and the radiator mounting nuts.

Install the top radiator hose, water pump bypass hose and any heater hoses you may have removed to ensure you systems wont spray water all over the engine compartment when you test the installation.

Our next step will be to test the basic mechanics of your installation.

We will allow the engine to rotate in a controlled manner to determine if indeed there are proper clearances and everything fits together properly without any potential for damage.

It is critical that during the testing phase to follow that you do NOT connect the clutch wire from the compressor. You DO NOT want the compressor turned at engine speeds at this point.

The compressor needs to be properly prepped and the system charged before it is allow to rotate at engine speeds.

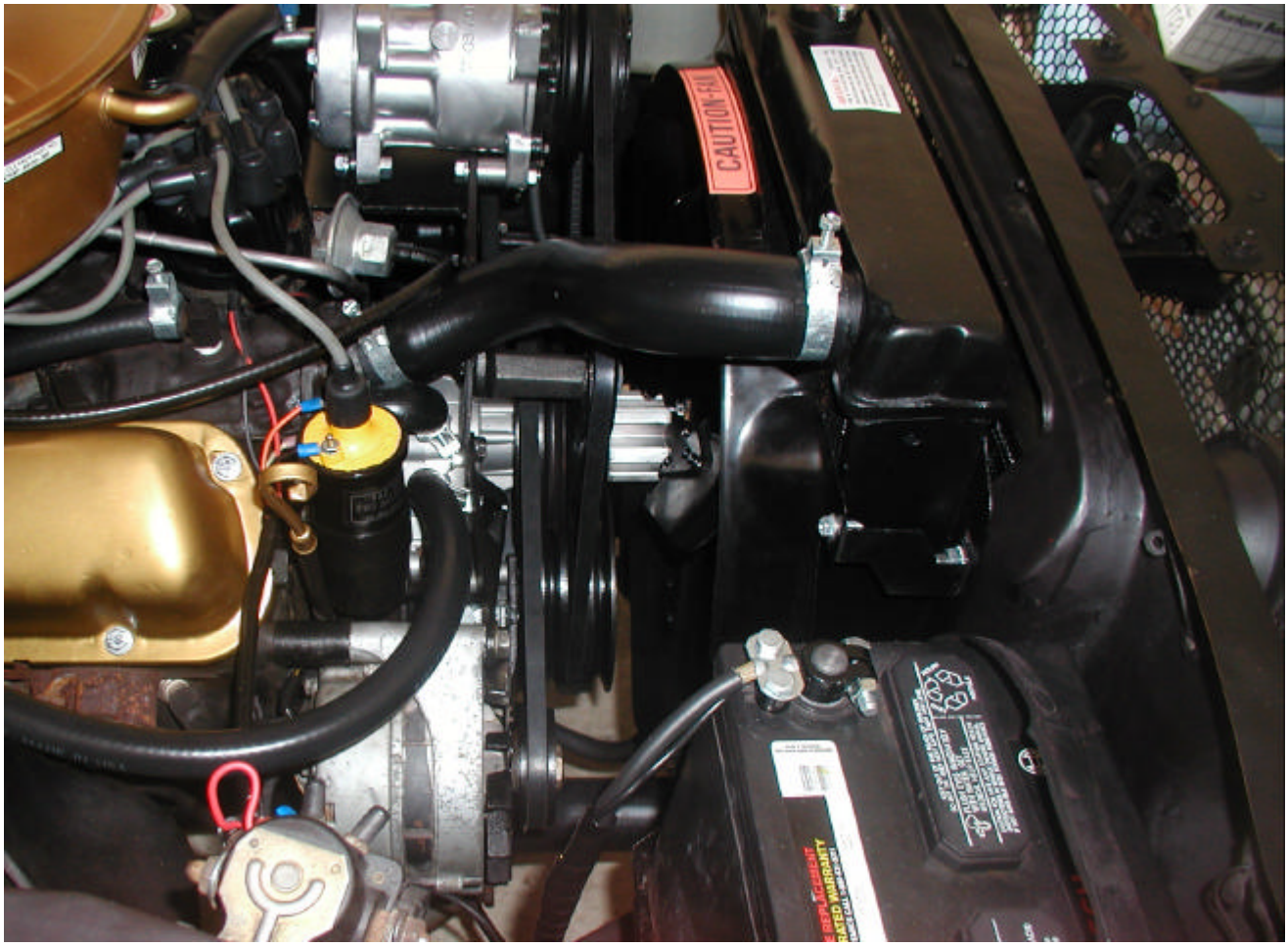


Figure 93

Testing: Verifying the Installation and Preparing for Charging

Carefully inspect you system before even attempting the test. Are all tools out of harms way? Have you checked fan and cowl clearance? Is the ignition coil wire removed to prevent starting? Does the throttle move freely?

"Carefully view the rotation of the fan and the compressor pulley and all other pulleys. DO NOT do this with the compressor clutch wire connected."

Before you attempt to charge you system we recommend that you test the installation as thoroughly as possible.

Begin by disconnecting the coil wire as shown in Figure 94 below.

Now reconnect the battery. This will enable you to crank the engine to check for fan blade clearances and belt movement without starting the car.

Make sure you have removed any tools from the engine compartment and have uncovered the carburetor. Verify that the transmission and coolant/heater hoses are properly connected.

Have someone crank the car just momentarily to ensure that the fan blade has adequate clearance from the shroud. Wear safety glasses and keep hands and arms well clear.

Carefully view the rotation of the fan and the compressor pulley and all other pulleys. DO NOT do this with the compressor clutch control wire connected. **The compressor must be rotated manually 20 times to clear and disperse the lubricating oil before it is run at engine speeds. DO NOT drive the car with the compressor turning if the system is not charged.**

Double check all system joints to ensure that you have good firm connections. Specifically check the dryer/receiver connections, compressor , and evaporator interfaces.

It is possible to have leaks of refrigerant in any of these places. When the system is charged it should be carefully checked for leaks in all of these areas.

Be sure and have the evaporator connections that are inside the car checked also. These are often ignored.

After you have verified that he fan will rotate with out striking the cowl reconnect

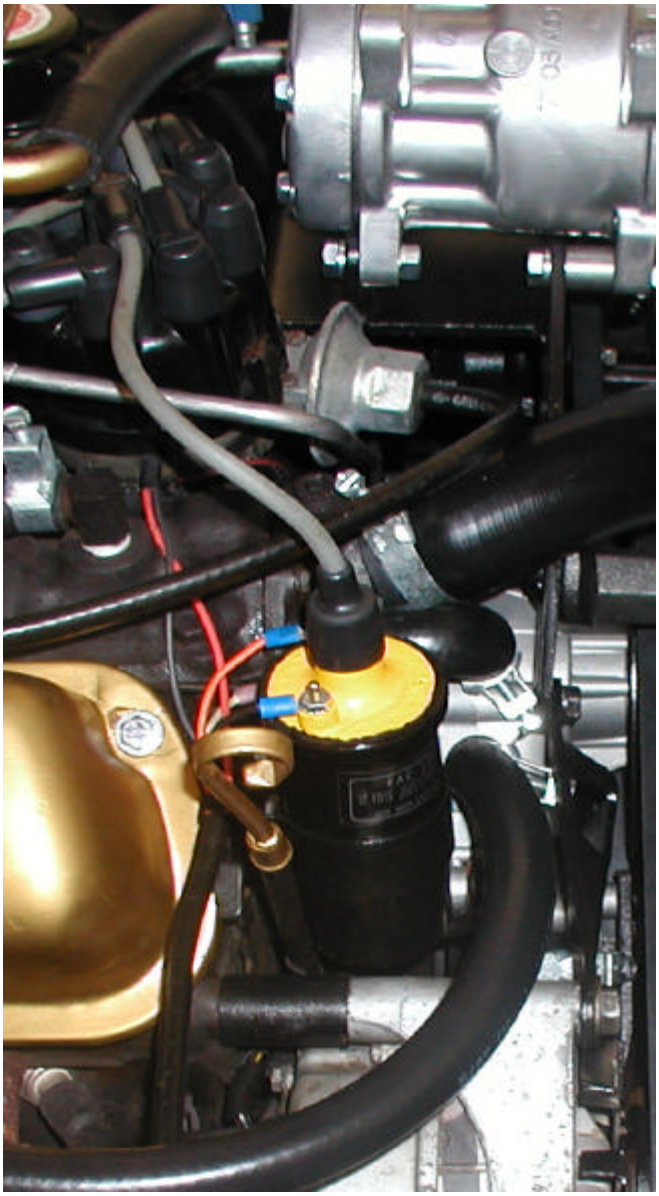


Figure 94 Coil wire

Installation: Console Replacement

Earlier you removed the console from your car (if equipped). Now you will replace it after shortening it so that it will fit properly next to the evaporator unit.

For 1965 and 1966 Mustangs the proper console length is measured from the first supporting rib at the rear (car rear) end of the console.

Remove all metal trim pieces from the console before attempting the cut.

Cut from the rib reference point 33 3/4 inches. You will cut the plastic at an approximate 30 degree angel though this is not critical since the chrome end shown on the following pages will cover the cut completely.

The plastic used in the console has usually become brittle with age. Carefully support the console during cutting to avoid cracks. Use a new hacksaw blade and cut slowly.

After the cut is complete you may want to repaint the console back to its original color. In our project car we used TrimTech color (Ragoon Red) to repaint the console. As you can see this repaint restored the original look of the console and hide any old scuff marks etc.

For our project car we installed a reproduction Ford

"For 1965 and 1955 Mustang the proper console length is measured from the first supporting rib at the rear (car rear) end of the console"

Figure 95 Original console installation

Figure 96 Measuring new console length

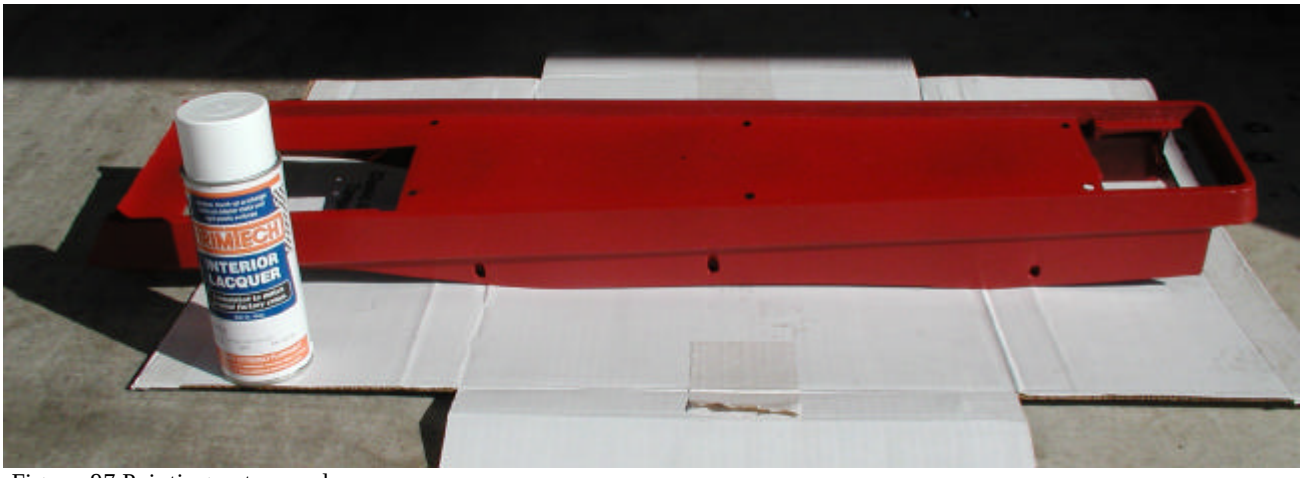


Figure 97 Painting cut console

Installation: Console Replacement

Remember the console is brittle! Handle with care.

AC end-cap as shown in Figure 98. This end-cap is installed with two screws on either side. You will have to drill holes in the transmission hump for these screws.

Test fit the console and end-cap as shown in Figure 100. Once you determine the proper position of the end-cap (there should be an approximately 1/4 inch gap between the end-cap and evaporator) you can drill the holes using the end-cap as a template.

We drilled through the end-cap openings while holding the end-cap in place.

Once you have verified you have the correct console length you are now able to mark and cut the metal trim pieces. You will have to make a cut near where the metal trim would begin to curve up.

If necessary take time to restore the metal trim. You can now polish the chrome and repaint the black inset parts.

Reassemble the trim pieces and install the console and end-cap. You installation should look like Figure 99 once you have the driver's seat replaced.

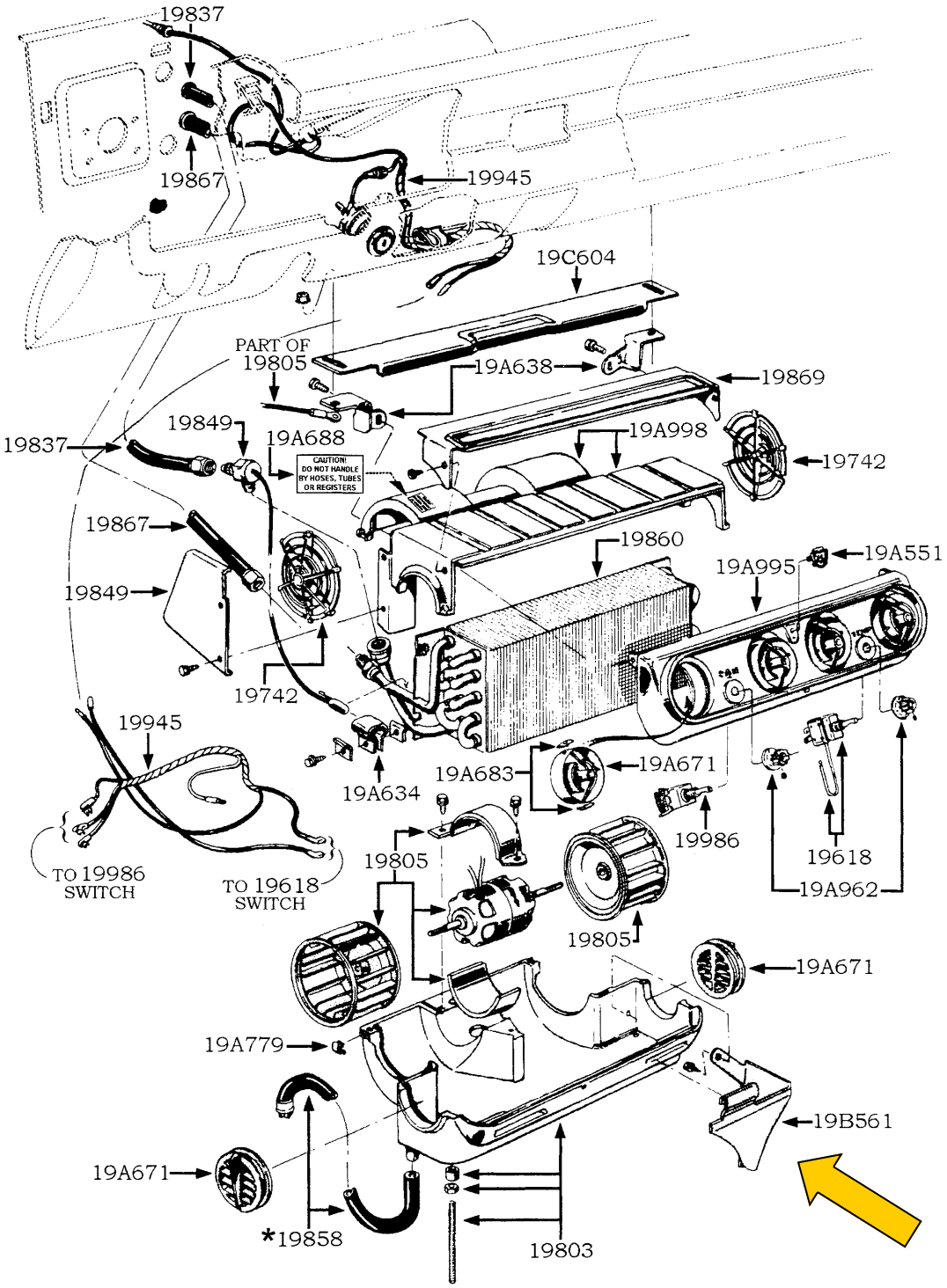
You are now ready to charge the system!

Figure 100 Painting cut console installed for test fit.

Figure 98 End-cap for cut console, Ford

Figure 99 Completed installation

Exploded View of Evaporator Assembly



*Drain is actually located on passenger side only.
Typical view of 1964½-1965 unit. Parts for 1966 unit will appear slightly different.

Installation: Cutting the Evaporator Drain Hole

Many restored Mustangs lack the so called drain hose cover. While the AC system will function properly without this item installed the drain hose is exposed and ugly.

As the evaporator cools the interior air of the card condensation will form on the evaporator coils. Without this drain tube this liquid would drain on the carpet of your car.

The exploded view of the evaporator shown on the previous page shows how the drain cover is positioned when installed. We purchased our drain cover from National Parts Depot, 1-800-235-3445 and on the web at www.npdlink.com.

Pictured here below is the drain cover as installed.

The cover is secured with an existing screw in the evaporator housing through the hole shown in the drain cover picture to the right.

At this point you can now cut the 1 inch diameter hole in the passenger side floor board for the evaporator drain hose.

The location of this hole is sometimes difficult to determine. However it must be “down hill” of the evaporator drain opening. This means that when parked on a level surface the drain hole must be lower than the entrance hole at the evaporator.

In some cars there is a dimple which locates this hole. In many cases however this dimple is covered by carpet and difficult to locate. It may be possible to locate this dimple from under the car.

Installation: Cutting the Evaporator Drain Hole

A sharp hole saw is critical to good hole cuts. Use only a brand new saw for these operations. These saws dull quickly. A Greenlee punch will provide a better hole but are relatively expensive to own.

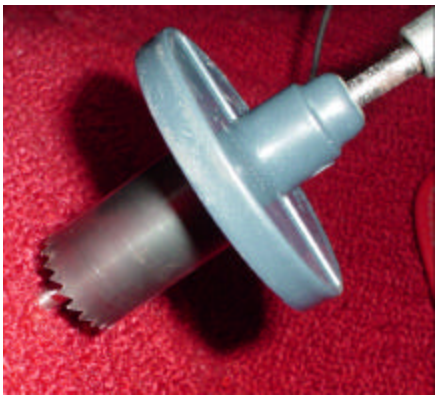
A location that appears correct and works well is described as follows.

Drill the 1 inch diameter drain hole approximately 4 1/2 inches below the bottom surface of the evaporator.

Drill this hole perpendicular to the transmission hump surface as shown below and directly below the evaporator drain opening. This will allow the drain hose to drop straight down and curve directly towards the hump.

Drilling from inside the car on the passenger side is the easiest approach.

Be very careful as you drill, transmission fluid lines run under this area. You should crawl under the car safely supported by jack stands and find where the pilot hole is passing relative to any automatic transmission fluid.



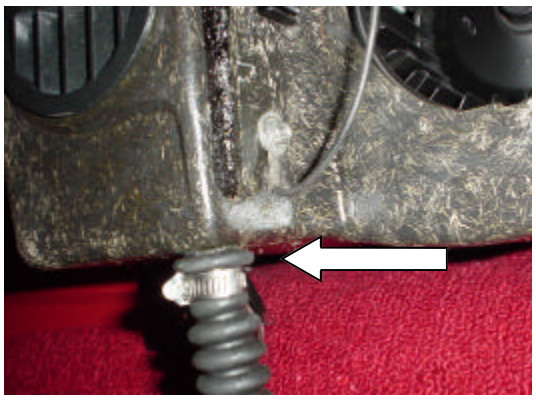


Fig. 38 Hole position for the drain hose is measured from the bottom of the evaporator.

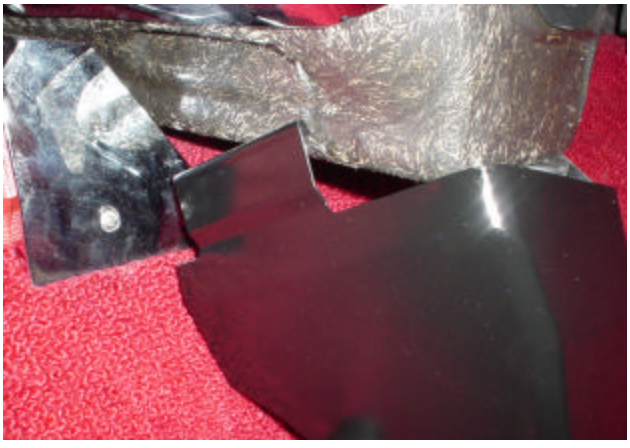


Fig. 39 Insert the hose cover behind the console end-cap.

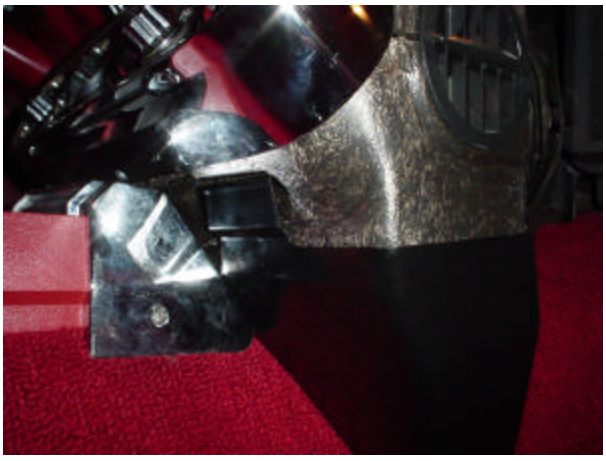


Fig. 39a Rotate into place and secure with screw.

Installation: Charging your system

A compete description of the charging process is beyond the scope of this manual. However, we will give you important steps to take in order to ensure that your system is charged properly.

Most likely you will have your system charged by a reliable AC shop. Before you take the car in make sure that the compressor clutch wire is not connected. This will avoid the possibility of the compressor becoming engaged at the wrong moment which can cause severe damage to the compressor.

Remember to leave the front valance removed when you have the system charged so that leaks in the dryer and condenser connections can be easily spotted and fixed.

Manually rotate the compressor:

The Sanden compressor we obtained from CAA came pre-charged with lubricating oil so we did not need to add any.

However, after installation is complete it is important to manually rotate the compressor. Do not just rotate the pulley since the compressor clutch will be disengaged rotating the pulley will not move the internal pistons of the compressor.

The compressor must be manually rotated before charging in order to make sure the lubricating oil is distributed in the compressor before the system is charged.

Use the center nut to slowly rotate the compressor clockwise. The nut will not twist on its shaft but the entire compressor will rotate. Make sure that you rotate the compressor at least 20 rotations before the charging process begins.

The charging process works as follows on a new R134A system:

1) *Evacuate the system:* Moisture in any quantity, is extremely harmful to the air conditioning system. Moisture reacts with R-12 and forms Hydrochloric Acid. On R-134A systems the moisture will not form harmful acids but overall performance will suffer. Evacuating the system involves using a vacuum pump to remove all traces of water from the system. A preliminary leak check is also done at this stage.

2) *Charge the system:* CAA recommends that if the system is charged with liquid refrigerant that the compressor again be manually rotated before the engine is run and the compressor spun at normal speeds.

3) *Check the system for leaks:* Your AC shop may use an electronic leak detector or they may add a die to the refrigerant which is visible under normal or ultra-violet light.

4) *Final performance test:* Run the engine at fast idle for at least 5 mins. Be sure to close all windows and doors and lower the hood. Place a thermometer in the left most evaporator register. Turn all fan and temperature controls to maximum. The thermometer in the A/C outlet should read 35-45F at approximately 75-80F ambient temperatures.

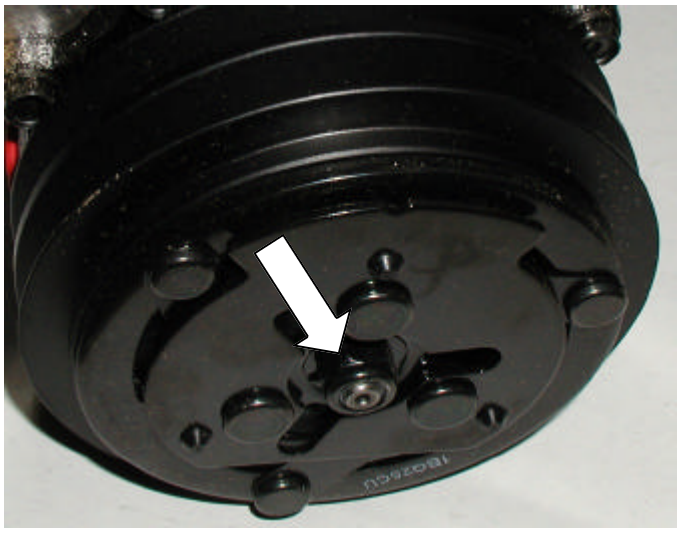


Figure 101 Compressor rotation point

Wow! You are finished!! After charging is complete put you valance back on enjoy the cool!

If you decide to charge the system yourself we highly recommend the "Automotive Air Conditioning Basic Service Training manual" from MasterCool Inc. 2 Aspen Drive, Randolph, NJ 07869-1103. www.mastercool.com

Trouble Shooting Guide

Remember to inspect every joint carefully after stressing the system for leaks.

The following guide will help you determine if a problem exists in the system that would cause a malfunction. If you are experiencing problems with the physical operation of the unit (blower does not run or compressor clutch does not engage) please check for proper power connections first.

Using a continuity or light tester you can solve many of the simple problems by tracing all connections and testing them individually.

The evaporator receives power when the ignition switch is in the on position and when the car is running. Make sure and use a fused source of power from the fuse block or insert a fuse in the yellow wire from the evaporator.

If the evaporator is functioning and the compressor clutch in engaging properly you can review the following which describes the most common problems encountered.

Fixing problems during the charging process is the best method for preventing future trouble.

Many shops will charge the system but not run it long enough or inspect it for leaks thoroughly. However, after you receive the car you can do your own visual leak test as follows.

If you detect a leak you can quickly tighten the suspect joint and recharge only if the cooling performance has dropped significantly.

The lower valence of your car will be removed during charging for easy inspection of the dryer and condenser connections. After running the air conditioner for at least 30 minutes turn off the system for at least two hours to allow the system to cool to ambient temperature. Now restart the car and run the AC system at the coolest setting for at least an hour. It is best to actually driver the car in order to set up vibrations and thermally stress all connections.

Now stop the car leaving the engine running. With a flash light and your fingers carefully inspect all joints. Look carefully for any oily substance as shown in Figure 102.

You may notice condensation on the joints at the evaporator inside the car on the driver's side. This is where you will place insulating tape only after you have verified that no leaks exist in order to prevent condensation from dripping on your carpet.

In general if you find a leak and are able to tighten it

"Fixing problems during the charging process is the best method for preventing future trouble."

Figure 103. Evaporator connections.

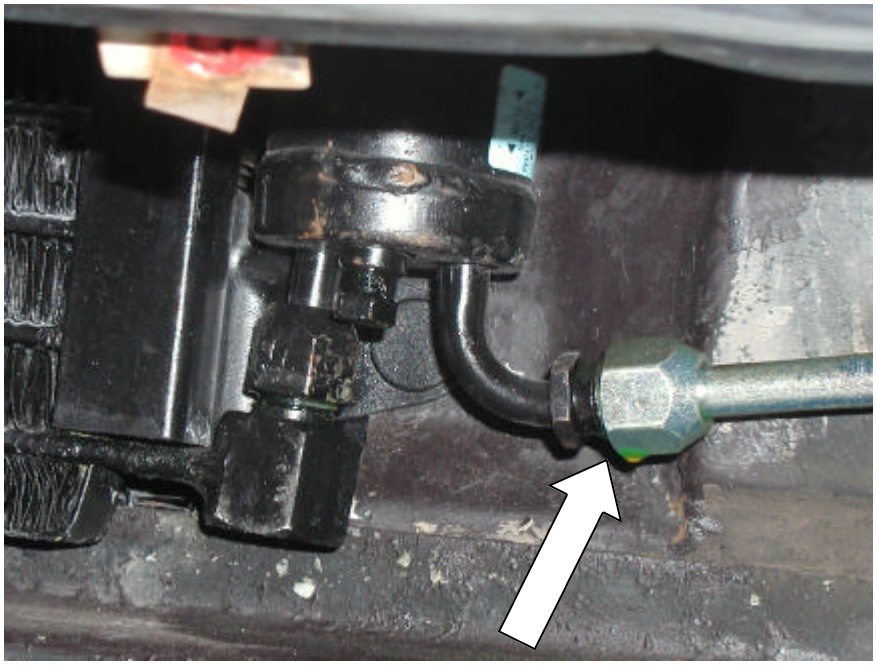


Figure 102. Leak at dryer connection under lower radiator support.

Trouble Shooting Guide

properly the system can be re-evacuated and re-charged. However, if for any reason you have had to open the system it will be necessary to replace the dryer as it will become saturated with moisture and become ineffective.

Advance trouble shooting techniques:

If the unit is functioning correctly and you cannot detect any leaks but it is not cooling properly the following guide will help you identify the most common problems encountered by installers. You will need a set of AC gauges and a thermometer for this operation.

A. Place a temperature probe (thermometer) into the center outlet of the evaporator.

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 or heavy duty squirrel-cage blower directly in front of condenser.

F. Run engine idle up to 1500 RPM.

Charge by weight as follows: R134A = 1.8 lbs. R12 = 2 lbs.

These test conditions will simulate the effect of driving the vehicle and give you the three critical readings you will need to diagnose problems.

Acceptable Operating Ranges:

R134A Type:

1. High-Side Pressure (160-250 PSI) * Generally this pressure should be two times the ambient day time temperature + 15-20%.
2. Low-Side Pressures (6-12 PSI in a steady state).
3. Center duct temperature 36-46 Degrees F.

R12 Type:

1. High-Side Pressure (140-230 PSI) * Generally this pressure should be two times the ambient day time temperature + 15%.
2. Low-Side Pressures (12-15 PSI in a steady state).

Center duct temperature 36-46 Degrees F.

Typical Problems Encountered in Charging Systems:

Noisy Compressor:

A noisy compressor is generally caused by over-charging the system or introducing outside air into the system.

If the system is over-charged both high and low side gauges will read abnormally high readings.

These high readings indicate feedback pressure on the compressor that makes it rattle or shake from the increased cylinder head pressures. The system must be evacuated and re-charged to exact weight specifications.

If air is introduced into the system during charging it will introduce moisture that will cause ice to form in the refrigerant flow and will cause the compressor to rattle or growl under acceleration.

System not Cooling:

There are numerous factors that can cause the cooling to be less than optimal. Improper charging is the number one cause of system failure.

The pressure reading should be taken before any determination can be made. High or low readings in direct proportion to the normal pressures will tell you if the charge is too high or low. Excessive system pressure can also cause vibrations and whistling noises from the expansion value and refrigerant lines.

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. This restricts the flow of air that can pass through it which gives the illusion of poor cooling.

The common cause of external freezing is the presence of high humidity in the passenger compartment or a non functional thermostat. The thermostat controls the

Changing the dryer is needed if the system has been exposed to air through a large leak or having to replace a hose or component that results in an "open" system.

"There are numerous factors that can cause the cooling to be less than optimal. Improper charging is the number one cause of system failure."

Appendix A: Installing a remote reservoir for an Eaton power steering pump

Installing a remote reservoir for an Eaton power steering pump makes adjusting the power steering pump belt tension much easier.

"Removing the existing reservoir is the first step. Remove the top bolt as shown in Figure 4..."

For a concours correct installation when using an Eaton power steering pump the power steering fluid reservoir must be mounted remotely on the drivers side fender wall. You can purchase a remote reservoir from Classic Auto Air Part Number 7-169. Eaton power steering pumps were used on all 64 1/5 Mustang and many early 65 cars as well.

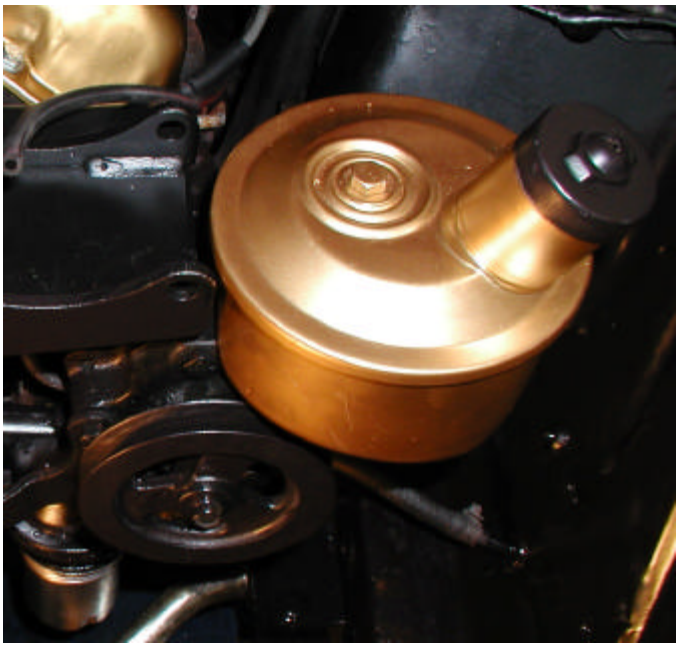


Figure 1. Top mounted Eaton reservoir

The remote reservoir is mounted on the drivers fender wall and provides fluid to the pump via a short hose and a special adapter that is mounted on the Eaton pump in place of the top mounted reservoir. A standard top mounted reservoir is shown in Figure 1. mounted onto an Eaton pump.

Figure 2. shows a remotely mounted reservoir. Note the arrows point to the hose and adapter mounting pieces and the fender mounting bolts. The bolt closest to the front of the car is only accessible with the grill removed. The bolt closest to the driver is accessible from inside the driver's side wheel well.

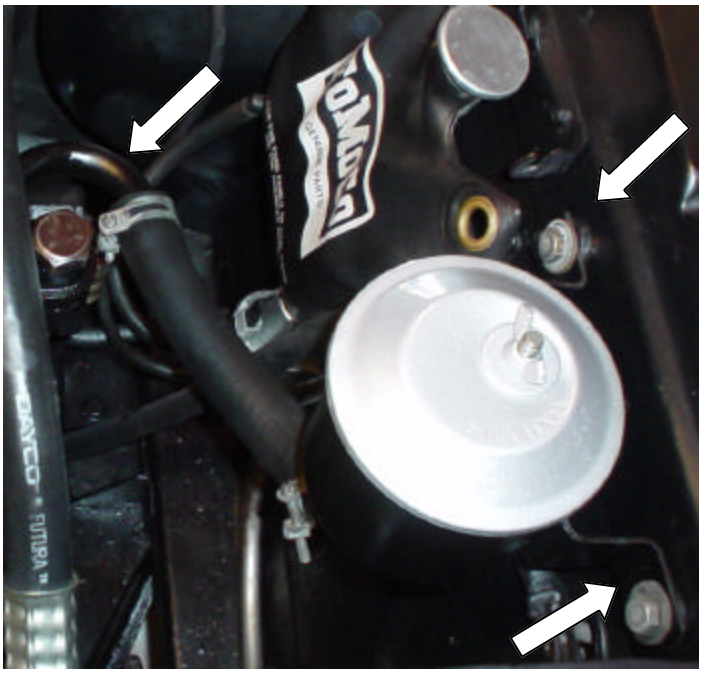
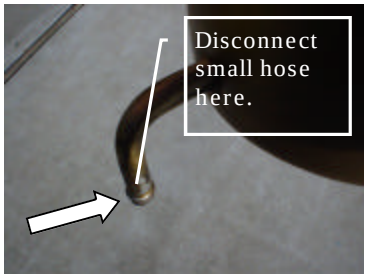


Figure 2. Remote reservoir for Eaton pump

Removing the existing reservoir is the first step. Remove the top bolt as shown in Figure 4 after first removing the small hose located at the base of the reservoir. This hose runs to the power steering control valves located under the car. The attachment tube exiting the reservoir is shown above Figure 3.

Once the fluid is drained you will see a mounting bolt shown in Figure 4. Removing this bolt will allow complete removal of the reservoir. Next we will

Appendix A: Installing a remote reservoir for an Eaton power steering pump



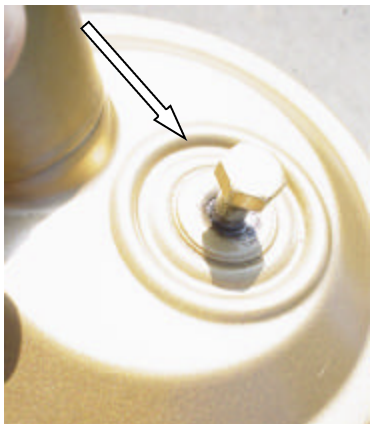


Figure 3. Top mounted bolt remove to disassemble.

Figure 4. Top mounted reservoir inside view mounting nut.

Changing the dryer is needed if the system has been exposed to air through a large leak or having to replace a hose or component that results in an "open" system.

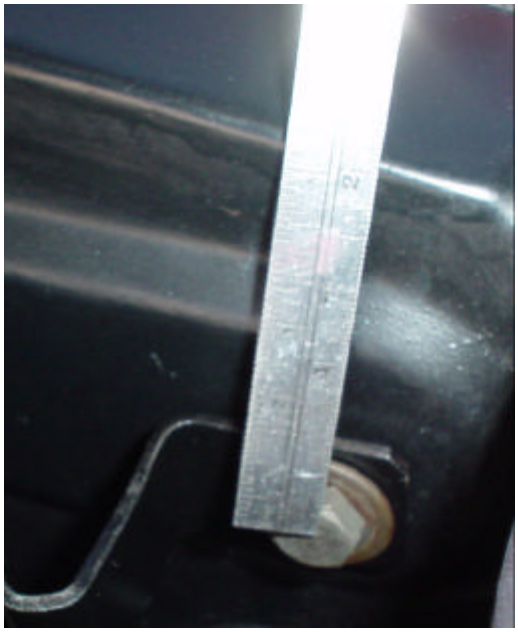


Figure 5. Mounting hole position.

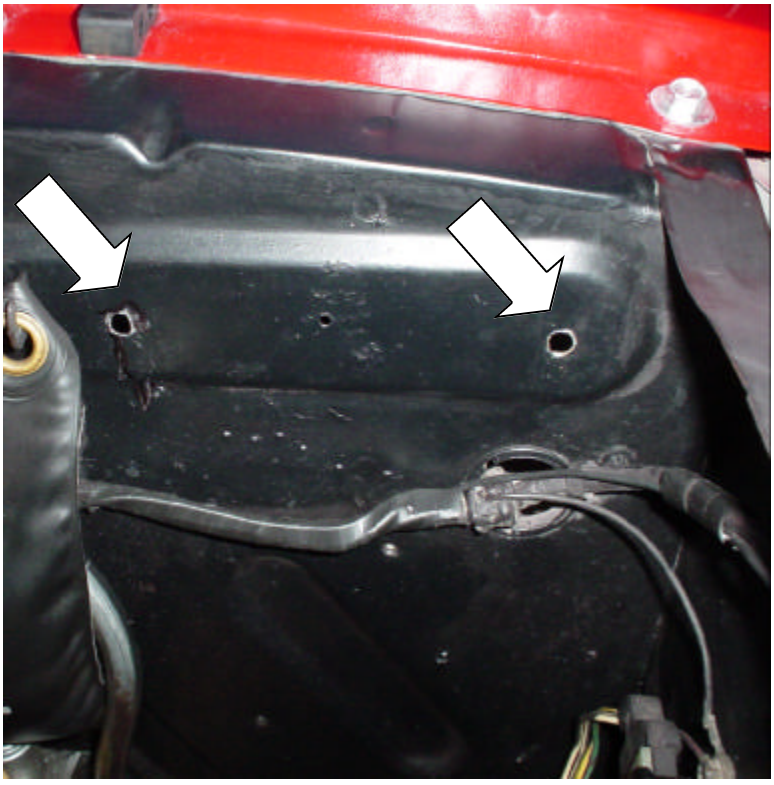


Figure 6. Remote reservoir mounting holes drilled. Look for factory dimples as hole guide.

Appendix A: Installing a remote reservoir for an Eaton power steering pump

A remote reservoir is the more correct installation for 64.5 and early Mustangs that utilized Eaton power steering pumps.

drill mounting holes for the new reservoir.

Most older mustangs will have dimples already punched in the inner fender wall. These are located approximately 2 inches from the top of the inner finder.

Figures 6 and 7 show the location of these holes. Location is not absolutely critical.

You may now drill two 5/16 diameter holes as shown. Remember to use new bits and if punch marks do not already exist make you own with a good center punch before you start drilling.

Once these holes are drilled you can mount the remote reservoir. We used a 1/16 inch rubber washer between the reservoir mounting ears and the fender. The rubber washer can provide vibration isolation and seems to have been part of original remote reservoir installations.

Lock washers should be used behind the nuts. Note the bolt heads are in the engine compartment the nuts are in the wheel well.

Once the reservoir is mounted place the hose adaptor as shown in Figure 8. on the Eaton pump. Be sure and include the two rubber washers as shown in Figure 7.

Before mounting the hose adaptor ensure that the pump mounting surfaces are clean and flat. You will have to be plug the pump openings with a lint free rag to ensure that debris does not enter the pump while you are cleaning the mounting surfaces.

Tighten the adaptor mounting nut securely and attach the shorter fluid hose to the reservoir base and the adaptor.

Now attach the steering valve hose the small tube which exits the remote res-

"Before mounting the hose adaptor be sure the mounting surfaces are clean and flat..."

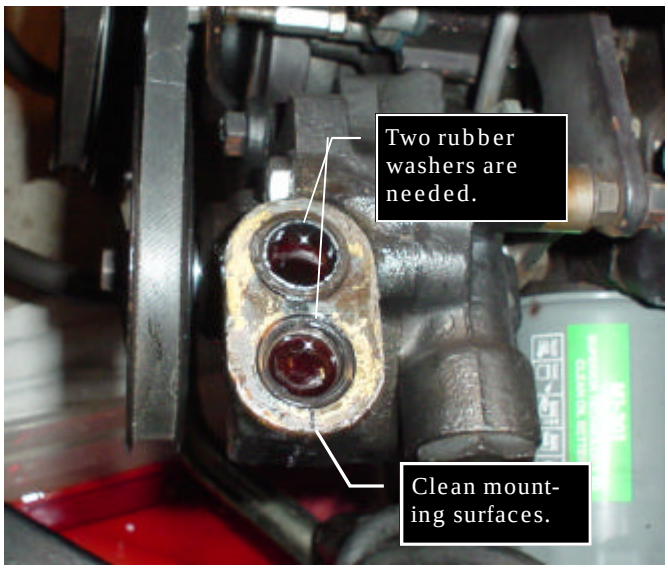


Figure 7. Old reservoir removed

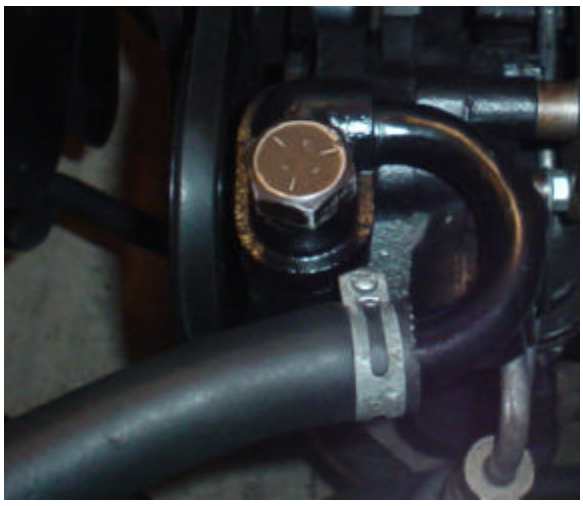


Figure 8. Eaton pump hose adapter

Appendix A: Installing a remote reservoir for an Eaton power steering pump

ervoir. Figure 9. shows these hose connections completed. If you have to purchase hose for your project be sure and specify that you are using these for a power steering application.

By removing the remote reservoir's cover you should be able to verify that a filter is installed in the reservoir. If it is not these filters are available through many Mustang parts supplies houses.

Fill the reservoir with Type F Automatic transmission fluid replace the top and check for leaks. When filling the reservoir you will find it fills much more quickly with the filter removed.

Run the engine for a few minutes to ensure that no leaks are seen even after the steering is moved through its entire range of operation.

Changing the dryer is needed if the system has been exposed to air through a large leak or having to replace a hose or component that results in an "open" system.

"Fill the reservoir with Type F Automatic transmission fluid…"

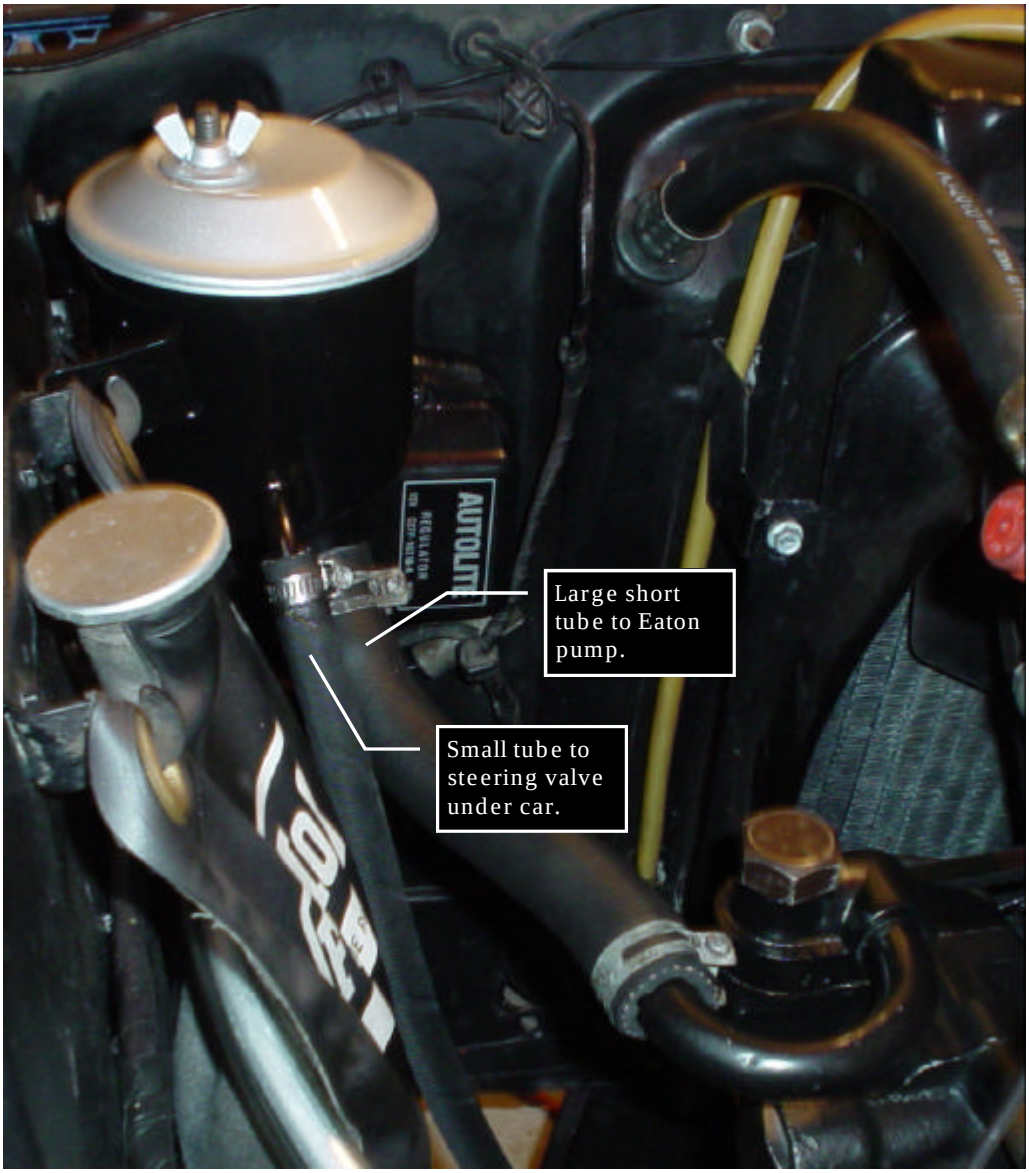


Figure 9. Eaton pump and reservoir hose attachments

Appendix B: Installing an original York type compressor: Overview

A remote reservoir is the more correct installation for 64.5 and early Mustangs that utilized Eaton power steering pumps.

To achieve a concours restoration and a comfortable car in the hot summers you will need to install an original York type compressor.

Classic Auto Air can provide a new or rebuild compressor, mounting brackets, pulleys, idler pulley, and stabilizer bar.

The key components of a concours installation are the following:

1.) York or Ford Compressor.

2.) Adjustable idler pulley.

3.) Compressor mounting bracket(s).

4.) Stabilizer bar.

5.) Non-adjustable idler pulley.

6.) Correct pulleys for water-pump and crankshaft.

7.) Compressor clutch assembly.

Our installation will be on a early 1965 Mustang with power steering and alternator.

Refer to Figures 15 and 16 for illustrations on how the various components will appear for 64.5 and 65 versions of the AC installation in the Mustang. Note that the mounting brackets and the stabilizer bar are unique between the 64.5 and 65 model years. The compressors are interchangeable despite some cosmetic differences.

A four groove crankshaft pulley and a two groove water pump pulley are also required as shown in Figure 3.

The compressor mounting

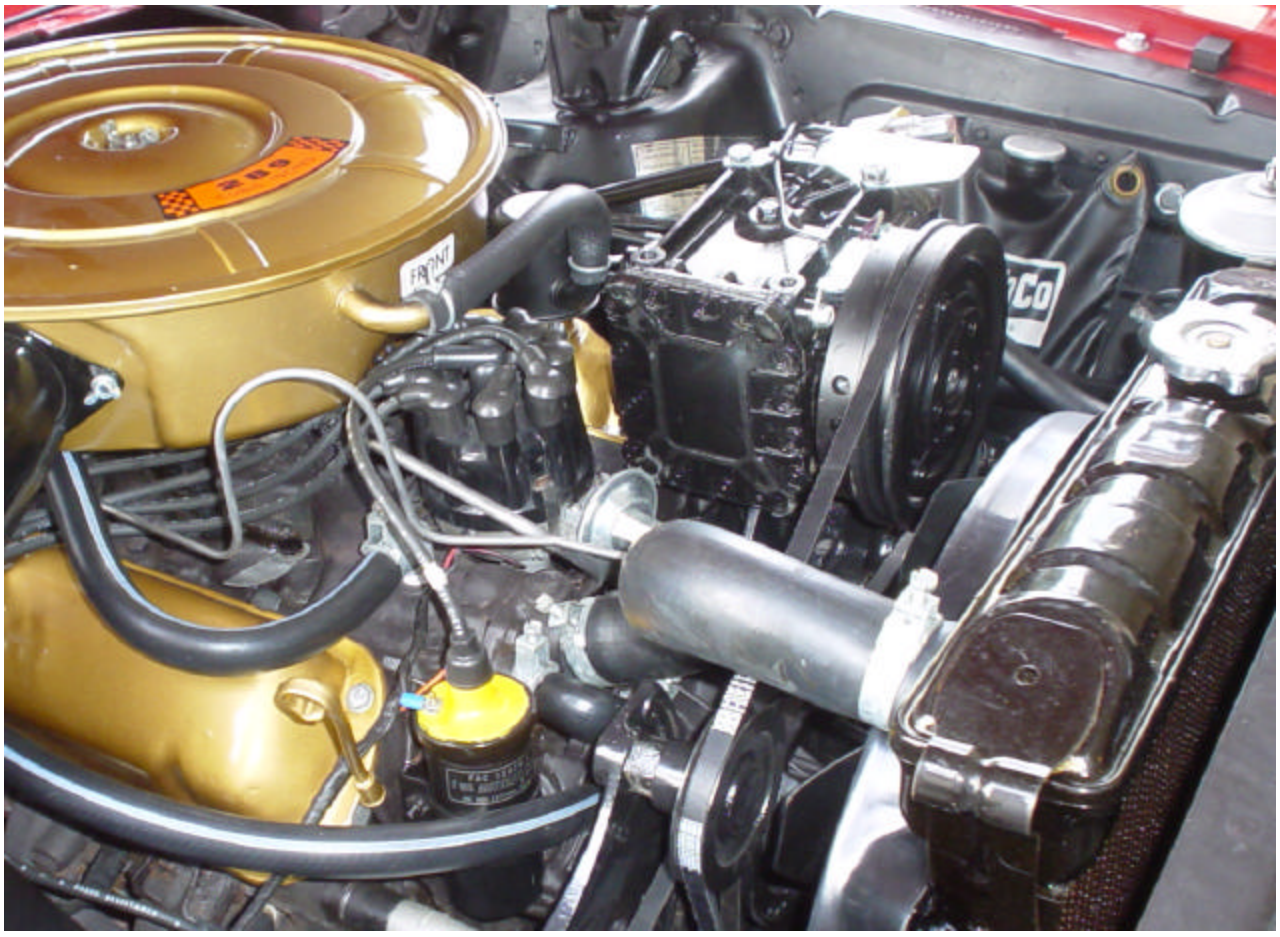


Figure 1. York compressor installed for a concours correct installation.

Appendix B: Installing an original York type compressor: Key Components

brackets are different for the 64.5 and 65 model years.

All of these components are available from Classic Auto Air and several other distributors.

The compressor itself can be purchased as a new component as it is still in production by York. Or you can have an older compressor rebuilt by Classic Auto Air. We purchased a new compressor as the cost was only slightly high and this compressor was available immediately so that we did not have to wait for the rebuild process.

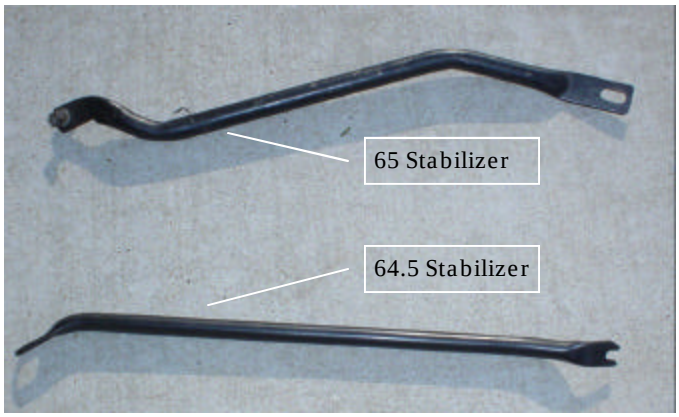


Figure 2. Stabilizer bars 65 and 64.5.

The York compressor used by Ford on early Mustang is still in production by York!

Figure 3. Water pump and crankshaft pulleys.

Figure 4. York compressor without clutch installed.

Figure 5. Compressor mounting bracket

Appendix B: Installing an original York type compressor: Crank Pulley and Adjustable Idler

The alternator will need to be spaced out 1 1/4

At this point in the assembly the radiator , power steering pump, fan, and alternator should still be removed from the car.

Mustang Project recommends that you install the crankshaft pulley first. Make sure that the mounting surfaces between the pulley and the mounting plate (harmonic balancer) are clean and smooth. A small amount of anti-seize compound or bearing grease will help for easier future removal if required.

Now is a good time to locate clean and refresh the original timing marks. Often these marks are on the harmonic balancer and are difficult to see after being covered in road grime.

When installing the alternator ensure that the spacer places the alternator

Figure 6. Alternator spacer placement

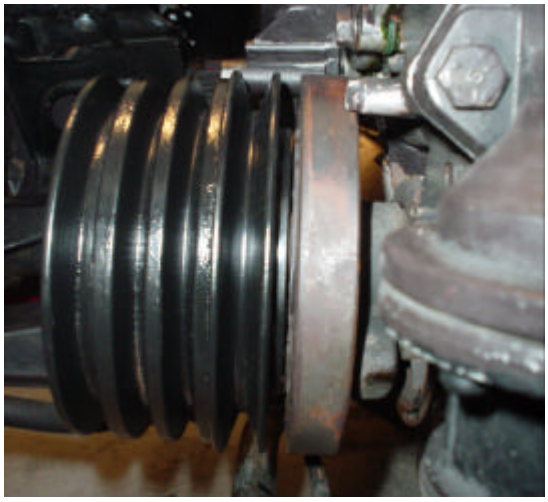


Figure 8. Crankshaft pulley mounted

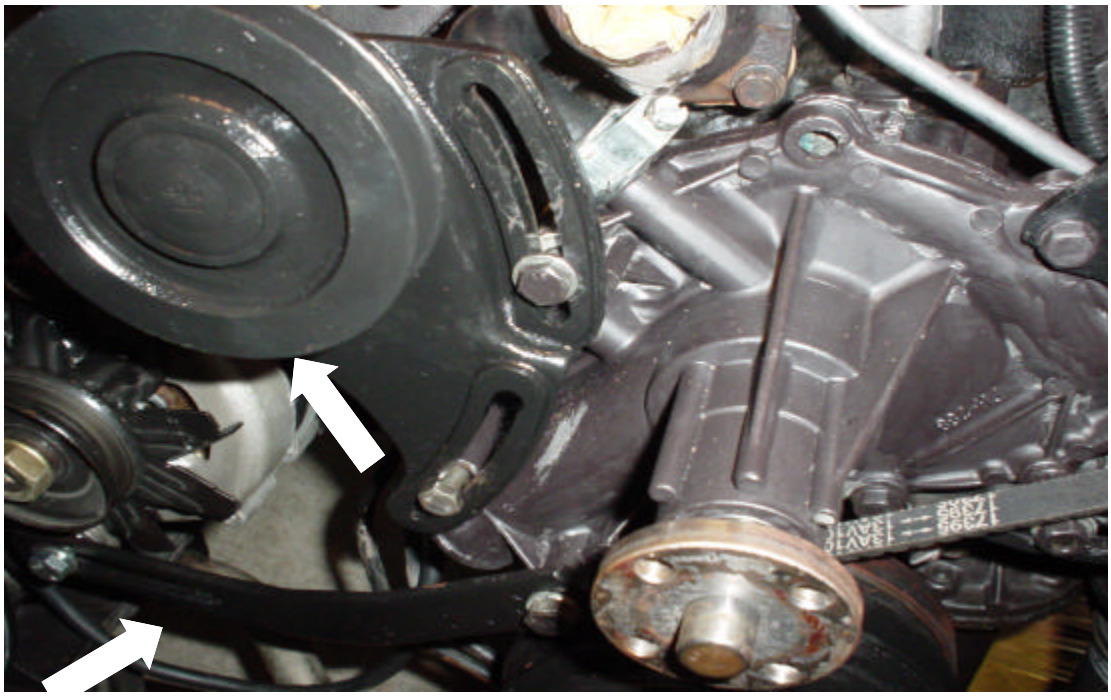


Figure 7. Adjustable idler pulley mounted.

Appendix B: Installing an original York type compressor: Compressor Mounting Bracket

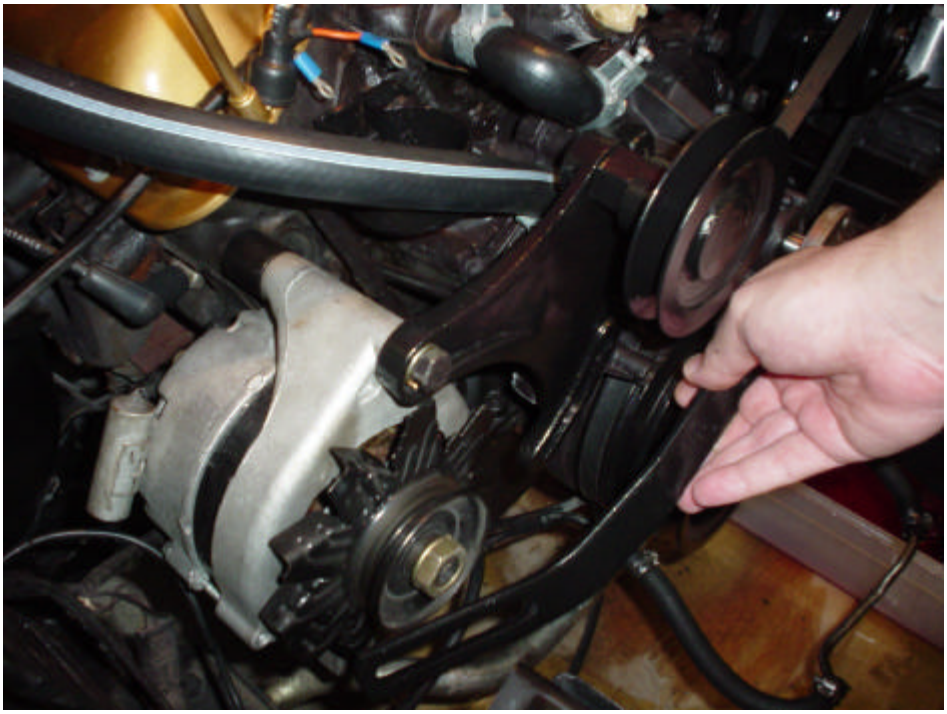


Figure 10. Alternator bracket mounting

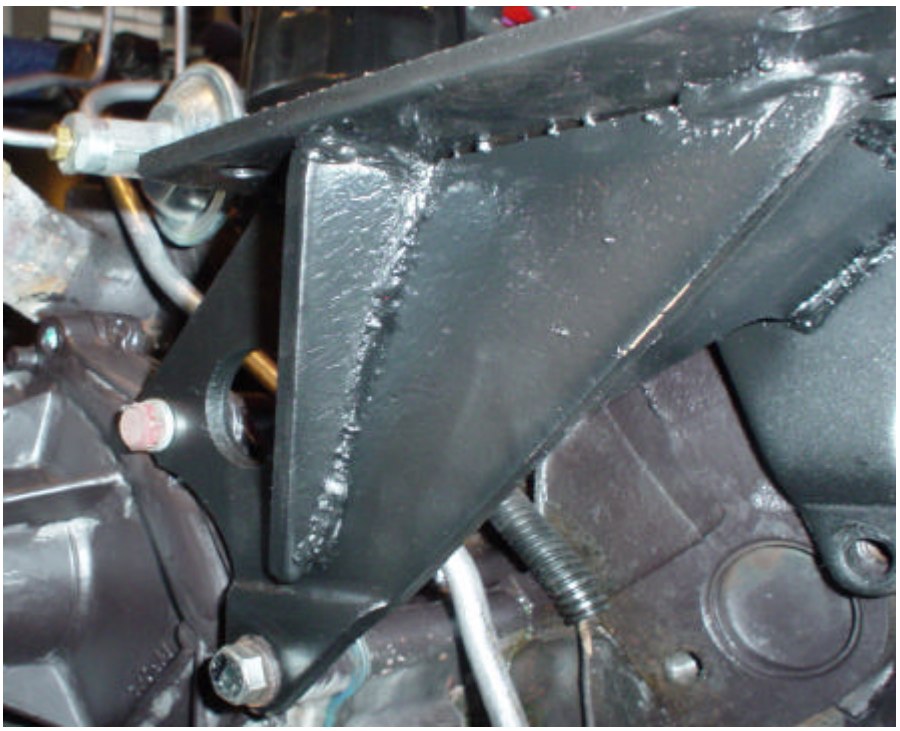


Figure 11. Compressor mounting bracket detail

A remote reservoir is the more correct installation for 64.5 and early Mustangs that utilized Eaton power steering pumps.

belt in-line with the inner most crankshaft pulley. Refer to the belt routing pictorial for exact belt routing positions for all belts.

The adjustable idler pulley is required to mount the alternator as shown in Figure 7. In addition the alternator adjustment bracket is also utilized. Make sure that the idler pulley can move after installation so that you can adjust the compressor belt later on.

Figure 11 shows the mounting position of the compressor bracket. The compressor bracket shares bolts with both the non-adjustable idler pulley and the Eaton power steering pump. Do not install the rear most mounting bolts at this time since they will be used by the Eaton power steering pump.

Though not shown for clarity the non-adjustable idler pulley should share the top most front mounting bolt as noted in Figure 11.

Now we will mount the Eaton power steering pump.

Appendix B: Installing an original York type compressor: Power Steering Bracket

The Eaton pump was mounted with a number of different brackets on Ford cars..

The Eaton power steering pump is mounted under the compressor bracket. For the addition of Air Conditioning the Eaton pump must be moved towards the car front by specially brackets or spacers.

The following pictures shows just one of the configuration Ford developed.

The critical issue is to ensure that the power steering pump pulley is aligned with the penultimate pulley groove on the crankshaft pulley as shown in the belt routing pictorial on the next page.

The power steering belt

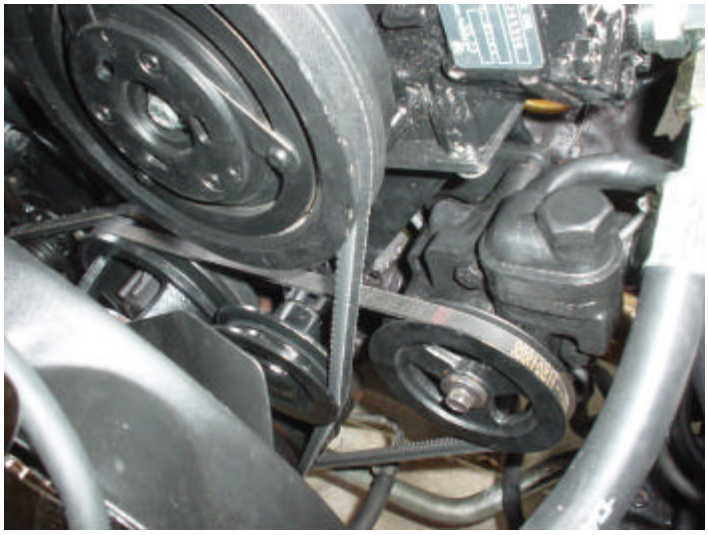


Figure 17. Eaton pump mounting bracket.

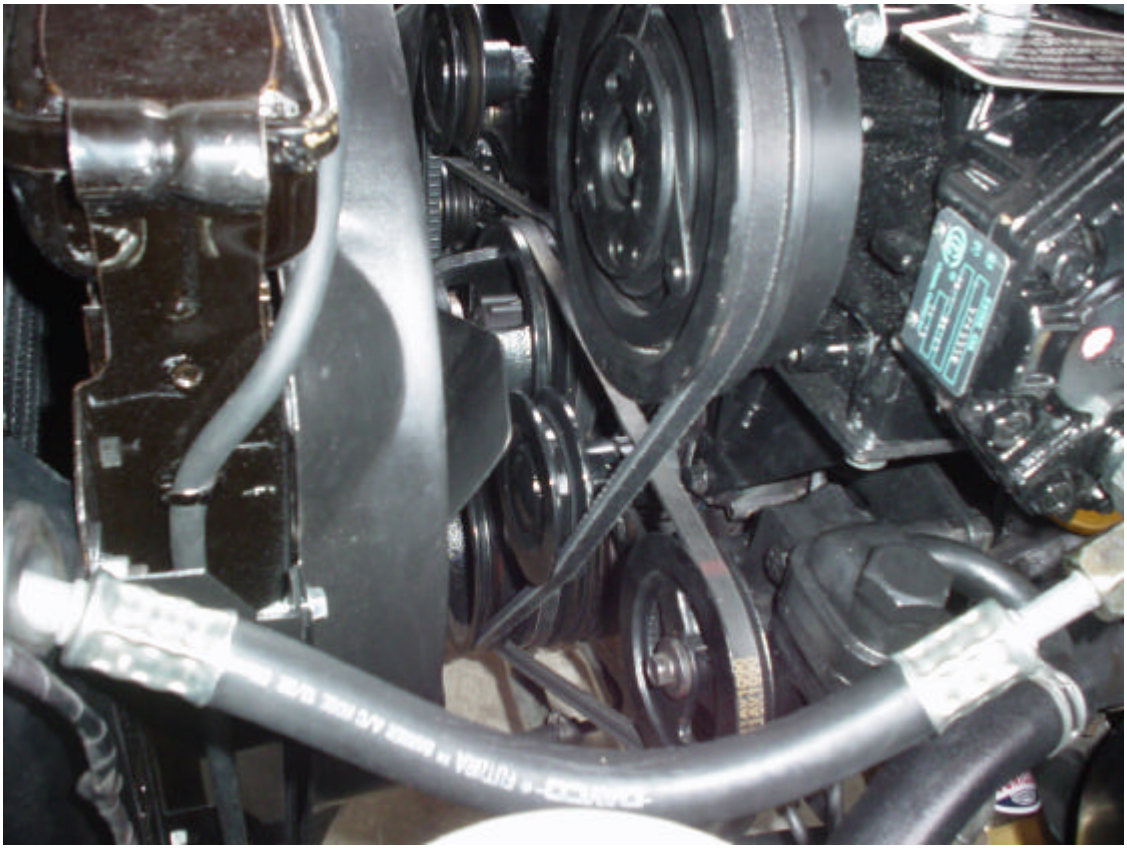
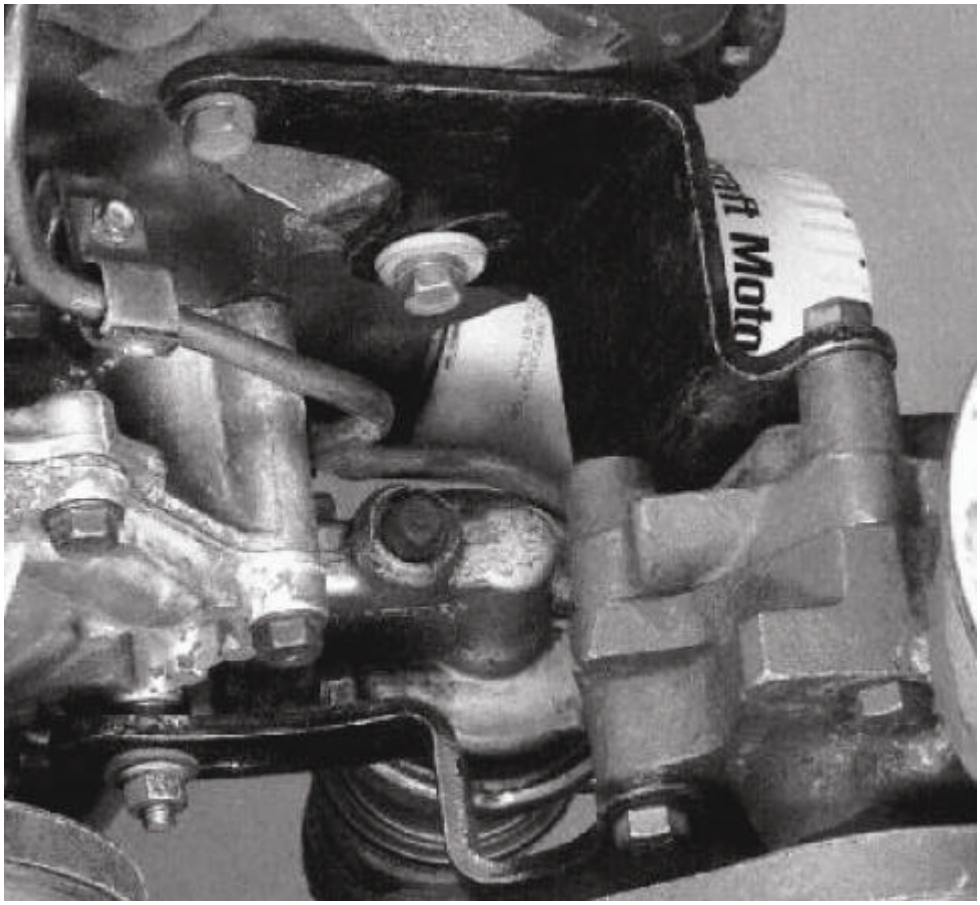


Figure 18. Properly positioned Eaton pump.

Appendix B: Installing an original York type compressor: Power Steering Brackeet



National Parts Depot provides reproduction power steering pump brackets. Contact NPD at 1-800-874-7595. The Mustang Project car utilized the National Parts Depot part number 3A732-1A.

Figure 19. Eaton pump mounting bracket

itself is routed through the last groove in the water pump pulley.

The Eaton power steering pump brackets for AC installations is extremely hard to obtain. However, National Parts Depot does carry these parts (see highlight box above for details).

Appendix B: Installing an original York type compressor: Non-adjustable Idler Pulley

A remote reservoir is the more correct installation for 64.5 and early Mustangs that utilized Eaton power steering pumps.

A non-adjustable idler pulley is essential to providing the lowest possible belt slap and vibration. Since this was an 'option" that Ford offered we did not initially in stall it on our test car. After a few hours of testing we determined that this "option" was a necessity.

Due to the very long belt length and to the character of the York compress very noticeable vibrations can be felt inside the car especially at low engine RPM if the non-adjustable pulley is not installed.

This pulley is available as an accessory fro Classic Auto Air and was offered by Ford as a dealer installed fix on early cars whose owners complained of excessive vibration.

Mustang Project highly recommends the this pulley be installed if you intend to drive the car at all.

The power steering adjustment bolt swill protrude under the non-adjustable idler pulley for the Eaton pump installation as shown in the Figure below. You may have to be creative in locating a proper bolt. We utilized a threaded rod which we cut to length for a precise fit.

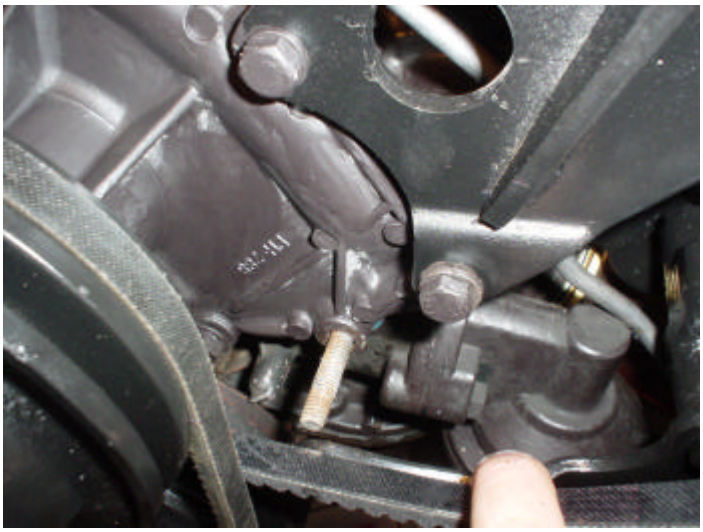


Figure 12 Power steering adjustment bolt

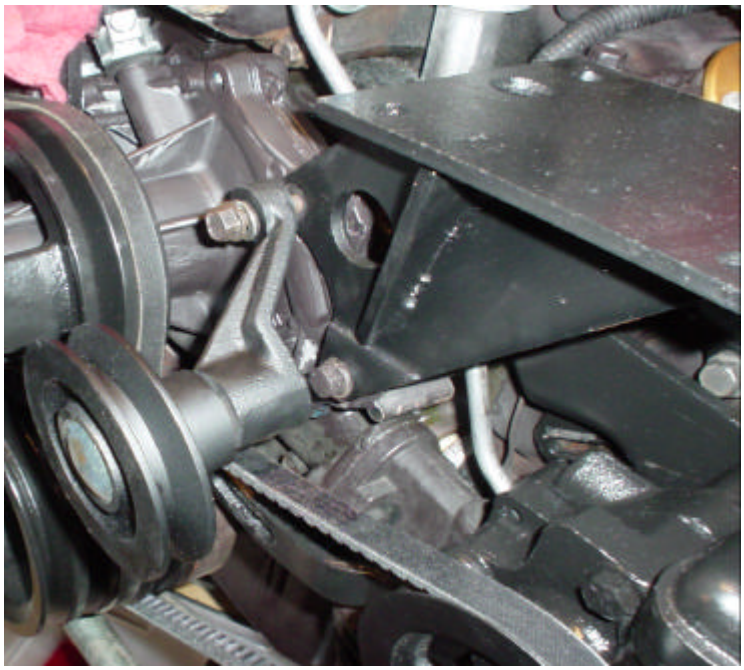


Figure 13/14 Non-adjustable idler pulley mounting

Appendix B: Installing an original York type compressor: 65-66 Assembly

These diagrams give a excellent overview of AC installation on 64.5 and 65/66 Mustangs. Pay special attention

Figure 15. 1965 Configuration with alternator and Ford type power steering pump.

Appendix B: Installing an original York type compressor: 64.5 Assembly

A remote reservoir is the more correct installation for 64.5 and early Mustangs that utilized Eaton power steering pumps.

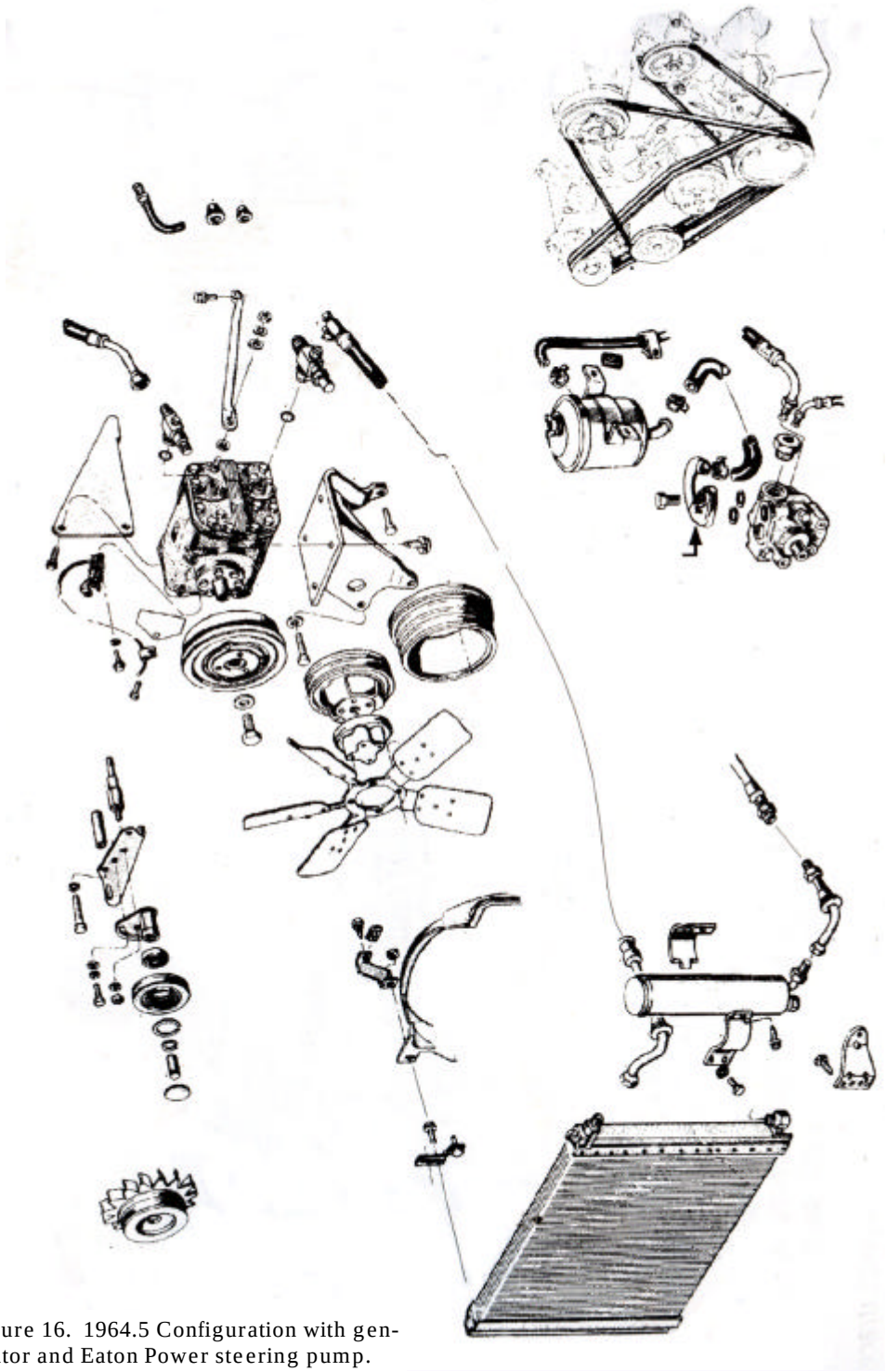


Figure 16. 1964.5 Configuration with generator and Eaton Power steering pump.

Appendix B: Installing an original York type compressor: Compressor Mounting

With the compressor bracket installed and the non-adjustable idler installed you can now mount the compressor.

The compressor is mounted with four nuts and lock washers as shown in Figure 17 below. Before you tighten the compressor bolts ensure that all of the pulleys line up correctly.

Refer to figure 19 to verify belt alignment.

With the compressor mounted test fit all of the belt alignments to ensure proper fit.

Belt adjustment range is minimal for most of the pulleys so you may have to select belts which are shorter than you might normally want to use in order to prevent belt slippage and obtain proper tension.

Check the alignment of all of the pulleys to ensure that all belts will run smoothly and without interferences.

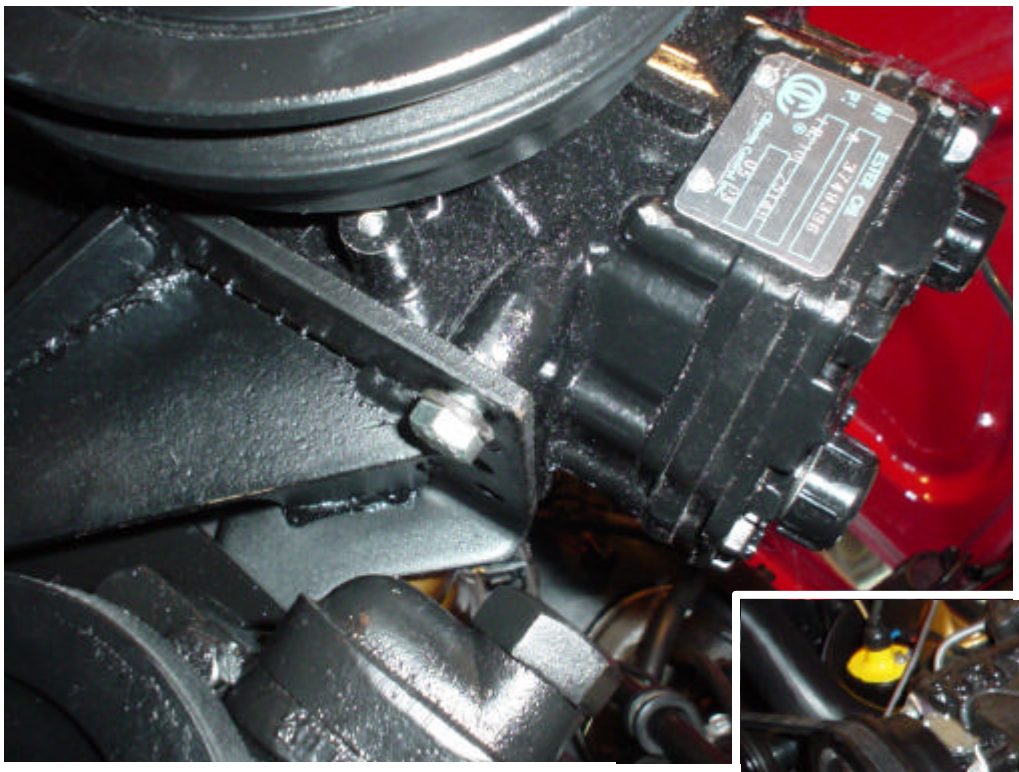


Figure 17 Compressor mounting bolts installed.

For the Mustang Project car we had to select a shorter than normal belt for the Eaton power steering pump in order to get good belt tension.

Now you will be able to route the compressor hoses as shown in Figure 15 and 16. Figure 18 shows the placement of the compressor service valves. Note how the lower service valve is tilted down to reduce the kink in the compressor to dryer hose.

It may appear that the compressor to dryer hose is too long but this is the way they came from the factory. The lower service valve is tilted down and there should be a bend in this hose as it enters the radiator support opening.

Figure 18 Completed compressor installation.

Appendix B: Installing an original York type compressor: Belt Routing

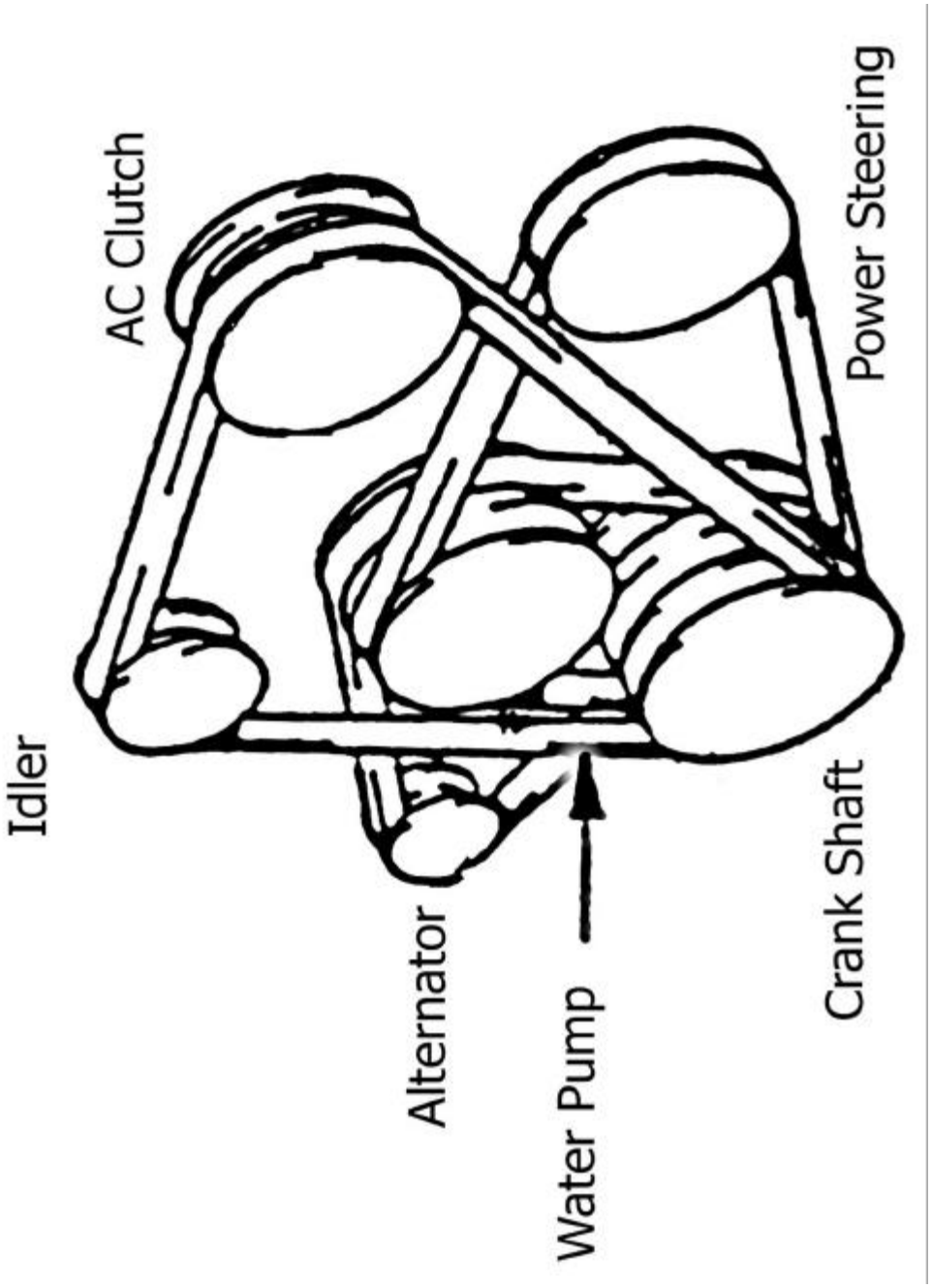


Figure 19. Belt Routing Pictorial: Belt routing with Alternator and Power Steering.

Appendix B: Installing an original York type compressor: Routing Compressor Lines

Before assembling the compressor service valves lubricate the threads with a drop or two of 3 in 1 oil as shown in Figure 20. In fact all hose connections should be lubricated before assembly. Always use two wrenches when tightening AC hoses or fittings to ensure that the mounting is not broken during tightening.

Figure 20 Apply 3 in 1 oil to the service valve threads.

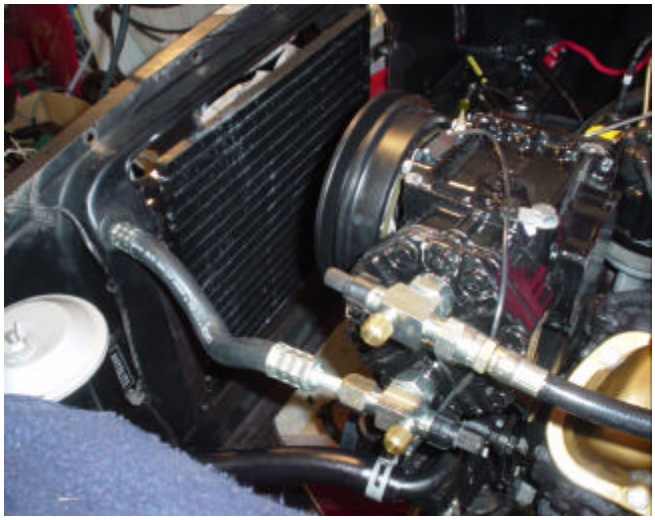


Figure 21 The completed installation should look as shown. Not the bend in the compressor to dryer hose. This is correct.

Route the compressor high and low pressure lines as shown in Figure 15 and 16 through the firewall and radiator support brackets as illustrated below.

Make sure you position the rubber grommet and hoses properly before securing the grommet bracket.

Do not over lubricate the fittings. One or two drops of 3 in 1 oil will do.

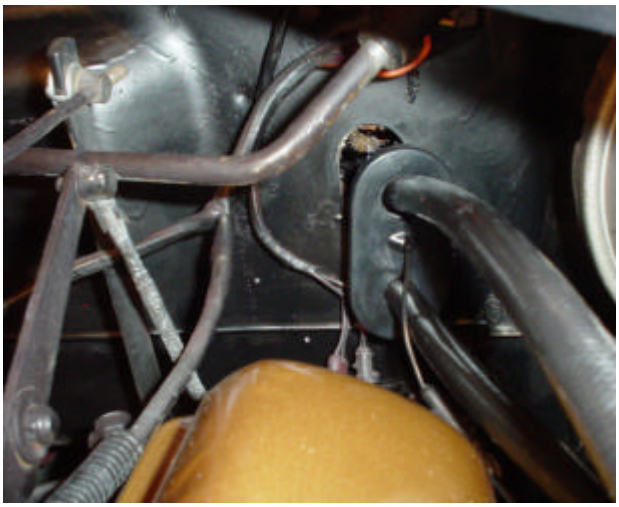


Figure 22 Route hoses through firewall.

Figure 23 Completed installation . A tilt down of the lower service valve is normal.

Appendix B: Installing an original York type compressor: Stabilizer bar

Be sure and secure the metal Ford compressor identification label under the stabilizer bar and not on top.

The stabilizer bar will reduce vibrations in the car produced by the long belts and the original type compressor. The 65/66 stabilizer bar is shown below. Note the attachment points on the compressor and on the intake manifold.

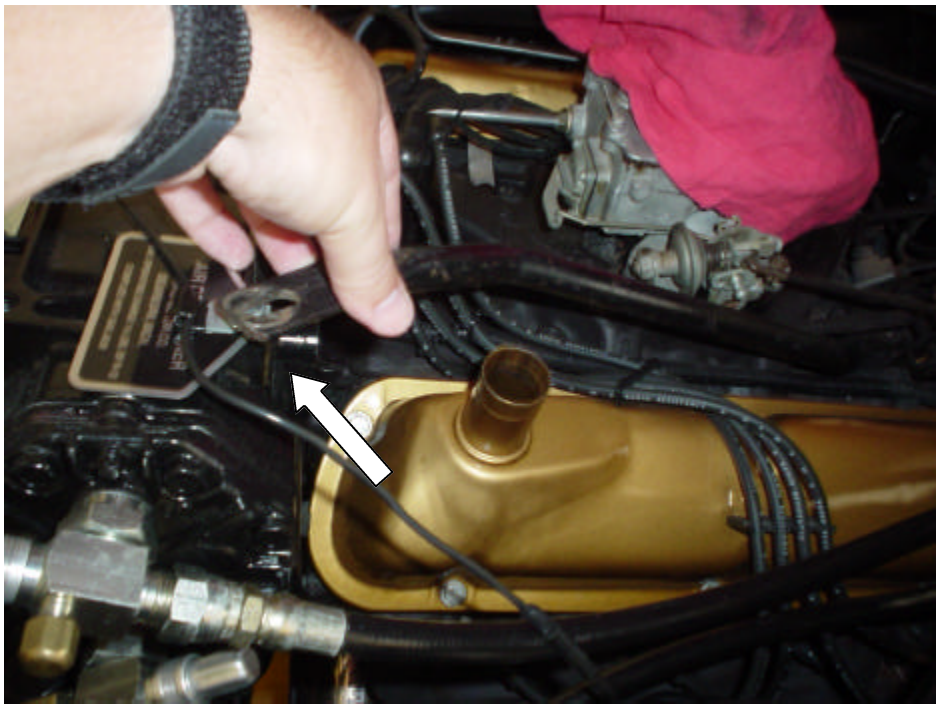


Figure 24. Stabilizer bar installation

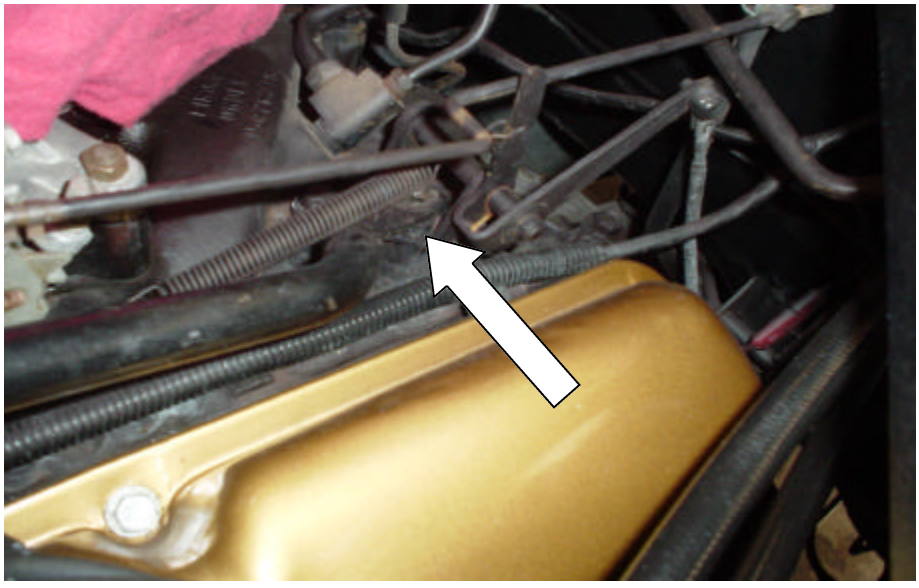


Figure 25. Stabilizer bar installation

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