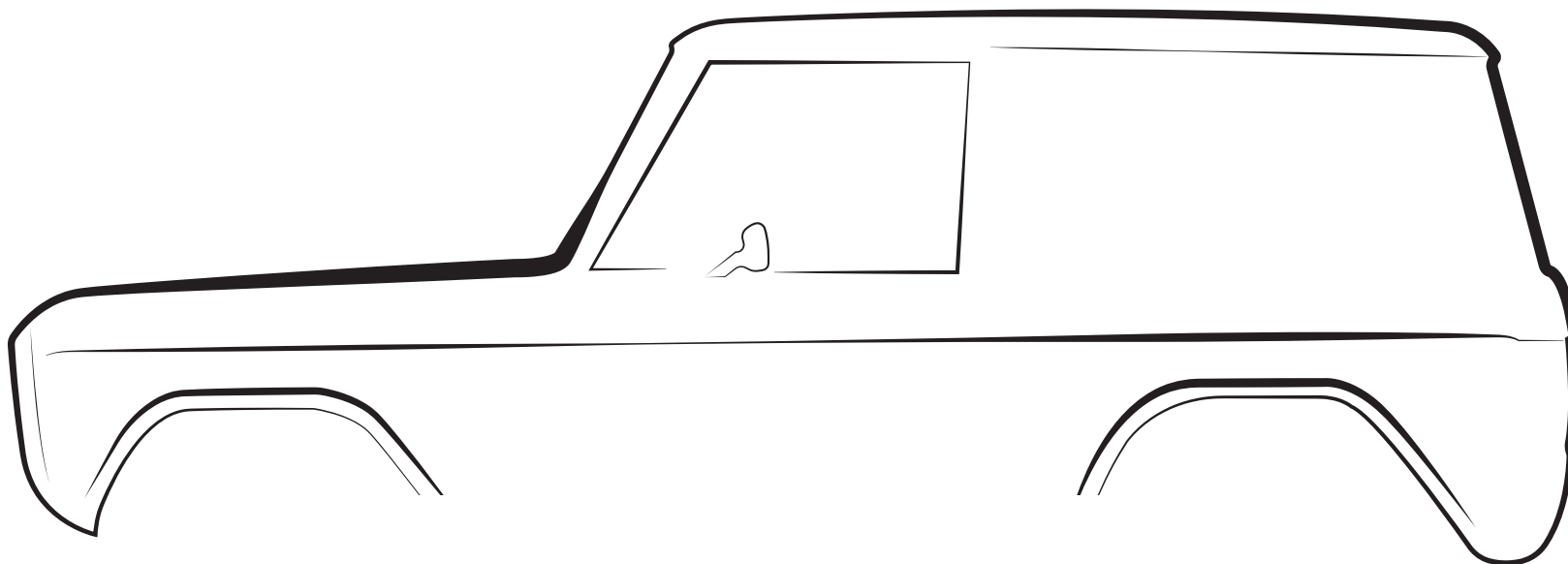




Installation Manual

1966-77 Bronco

DOCUMENT #1-3078

©2023 Classic Auto Air / 08.24





Congratulations...

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

To obtain the high level of performance and dependability our systems are known for, please pay close attention to the following instructions. Our installation steps and procedures are derived from a long history of research and development and the combined experience achieved through thousands of successful installations (and feedback from customers like you). Please remember that our #1 goal is that you'll have a successful installation and a system that performs at a very high level for many years to come.

Before starting, read the instructions carefully, from beginning to end, and follow the proper sequence. On the next page you'll find a safety and general checklist that you should read before starting your installation.

Again, thank you from our entire staff.



Check List, Pre-Installation:

- ☐ Before beginning the installation check the shipping box for the correct components. YOUR BOXED UNIT INCLUDES A LIST OF MAJOR COMPONENTS AND A LIST OF BAGGED PARTS. We have a 5 stage check process to make sure you have everything you'll need.
- ☐ **If your vehicle has been or is being modified, some procedures will need to be adjusted to fit your particular application.**
- ☐ A basic cleaning of the engine compartment and interior before beginning will make things go more smoothly.
- ☐ Check condition of engine mounts. Excessive engine movement can damage hoses to A/C and/or heater.
- ☐ Before starting, check vehicle interior electrical functions (interior lights, radio, horn, etc). Make a note of anything that does not work as it's supposed to. During the installation you might find the opportunity to repair or upgrade non-working or out of date components. When you're ready to start the installation, **DISCONNECT THE BATTERY FIRST.**
- ☐ Drain the radiator. Retain the coolant and reuse, or dispose of properly.
- ☐ SAFETY FIRST: Wear eye protection while drilling/cutting, deburr sharp edges, and never get in a hurry or force a part.
- ☐ Tools: Your installation only requires the basic tools everyone has in their garage, nothing exotic or specific to A/C or Heat equipment.

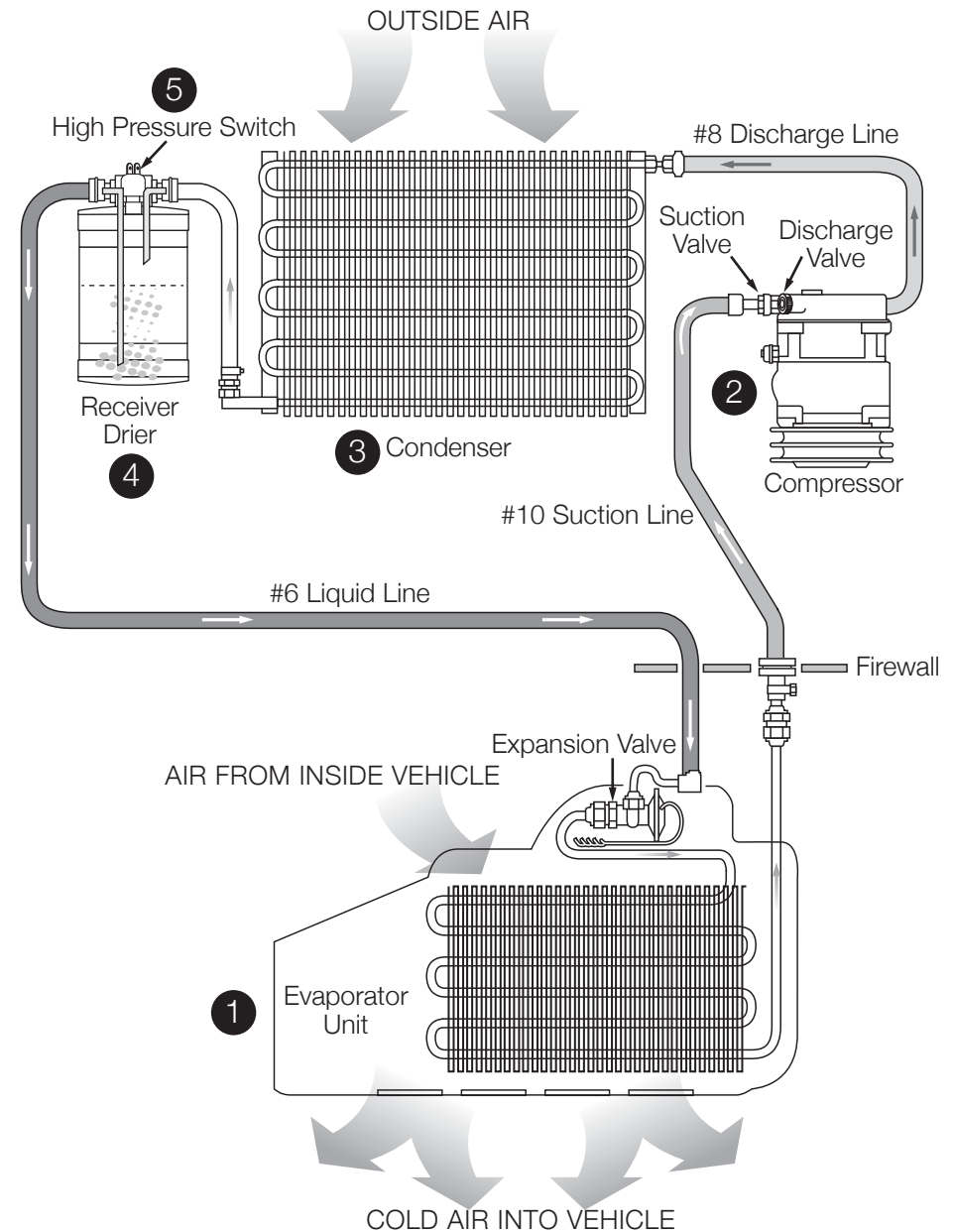
Procedures, During Installation:

- ☐ Fittings: Use one or two drops of mineral oil (supplied with your kit) on ALL rubber o-rings, threads and rear of bump for o-ring where female nut rides. Do not use thread tape or sealants.
- ☐ Measure twice (or more), cut once
- ☐ **Should you have any technical questions, or feel you have defective components (or missing items), call us immediately, we will be glad to assist you. We're here to help!**

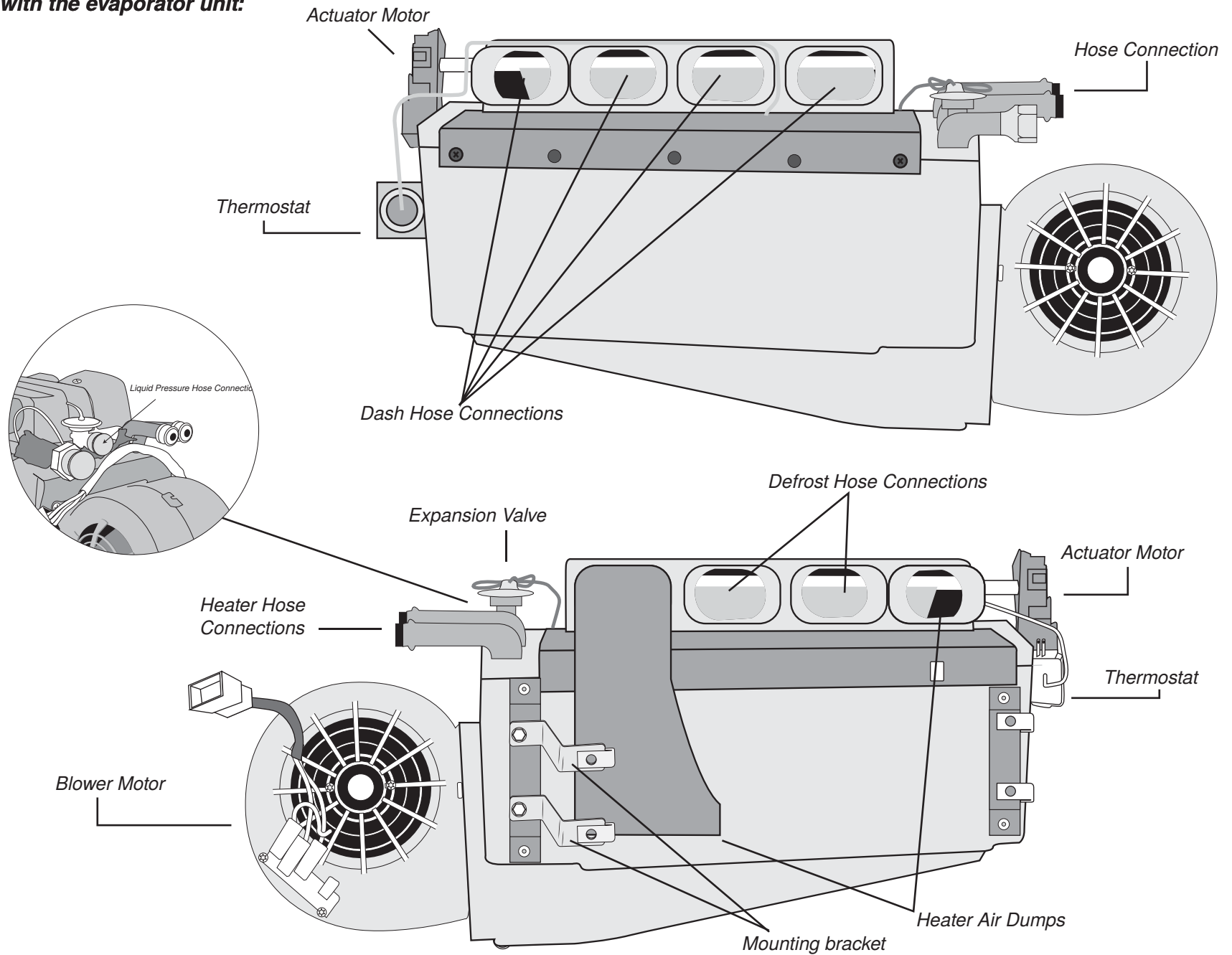
A Basic Overview of Automotive A/C....

- ➊ **Evaporator with Blower Fan:** In order to remove the heat from the air in the vehicle, the A/C evaporator allows the refrigerant to absorb the heat from the air passing over it. The blower fan moves cool air out into the car interior.
- ➋ **Compressor:** The compressor pumps and circulates the refrigerant through the system.
- ➌ **Condenser:** The condenser is a heat exchanger mounted at the front of the vehicle. Heat drawn out of the interior of the car is expelled here.
- ➍ **Receiver/Drier:** The drier not only dries refrigerant, it also filters the refrigerant and stores it under certain operating conditions.
- ➎ **High Pressure Switch:** A pressure switch is used to shut down the system if high or low pressure is detected, basically it acts as a safety switch.

The air conditioning system in your vehicle is comprised of a compressor, condenser, expansion valve, receiver/drier, and evaporator. Refrigerant (also known as Freon) is compressed in the compressor. In the condenser, gas is cooled to a liquid state and travels to the expansion valve. As the liquid refrigerant goes through the expansion valve it rapidly cools in the evaporator. A fan blows over the evaporator and cools the air that blows out your vents.

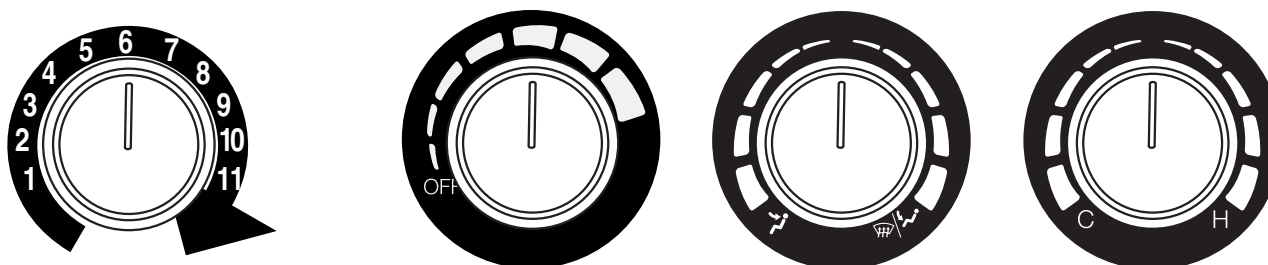


**Take a minute to familiarize yourself
with the evaporator unit:**



Control & Operating Instructions

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



FAN	POSITON	MODE			VALVE POSTION	
SPEED		DASH	DEFROST/FLOOR	COMPRESSOR	HEATER VALVE	COMPRESSOR
0%	1	100%	0%	ON	CLOSED - COLD	ON
10%	2	90%	10%	ON	VARIABLE	ON
20%	3	80%	20%	ON	VARIABLE	ON
30%	4	70%	30%	ON	VARIABLE	ON
40%	5	60%	40%	ON	VARIABLE	ON
50%	6	50%	50%	ON	VARIABLE	ON
60%	7	40%	60%	ON	VARIABLE	ON
70%	8	30%	70%	ON	VARIABLE	ON
80%	9	20%	80%	ON	VARIABLE	ON
90%	10	10%	90%	ON	VARIABLE	ON
100%	11	0%	100%	ON	OPEN - HOT	OFF

OPERATION

• Steps 1 thru 3

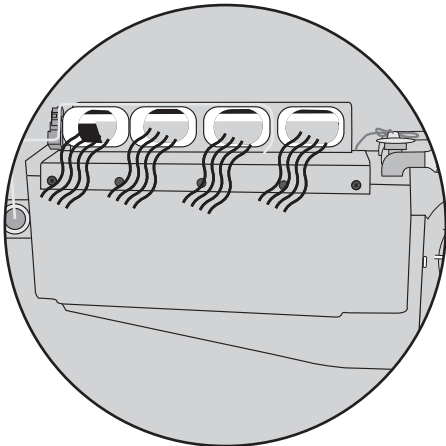
1



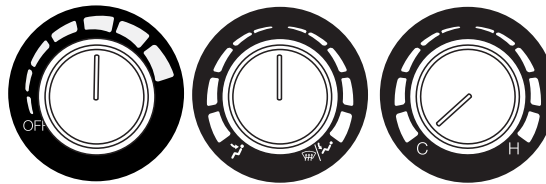
Move FAN knob to HIGH
Move MODE knob to DASH



AIR OUT OF DASH VENTS



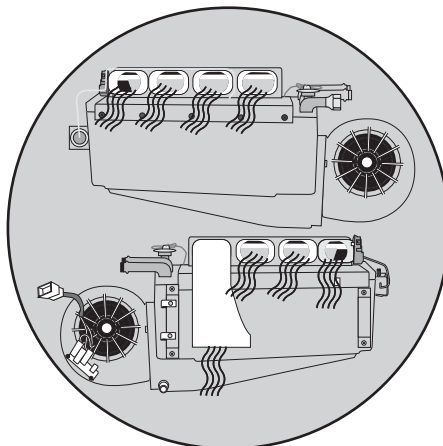
2



Move MODE knob to UP



AIR OUT OF ALL VENTS
(50/50)



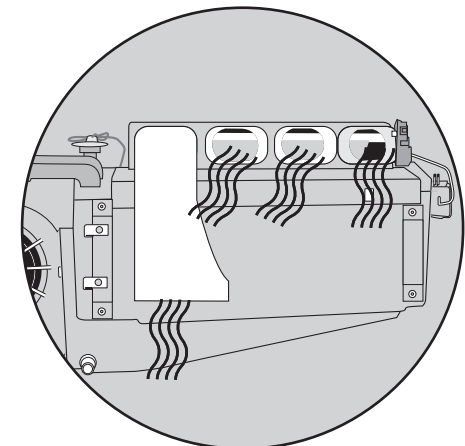
3



Move MODE knob to FLOOR/DEFROST



AIR OUT OF FLOOR/DEFROST VENTS



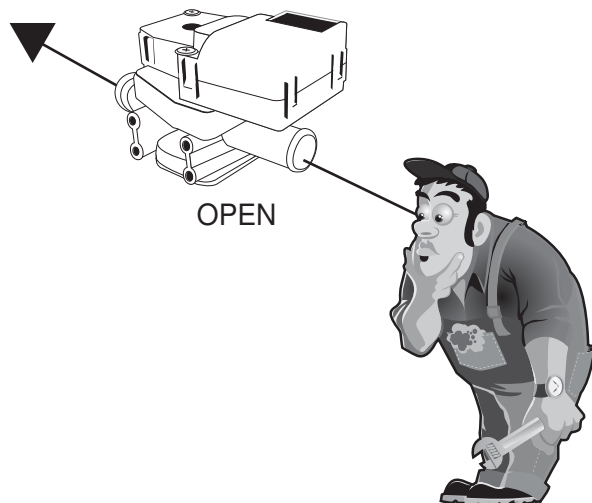
OPERATION

• Steps 4 and 5

4

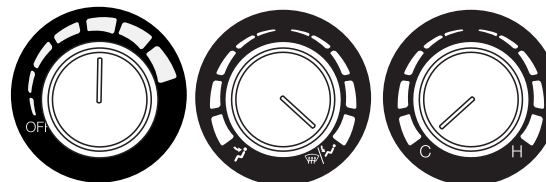


Move TEMP knob to HOT

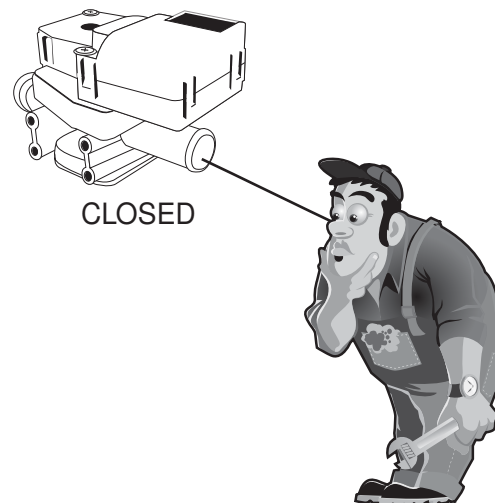


You will be able to see thru water valve passage

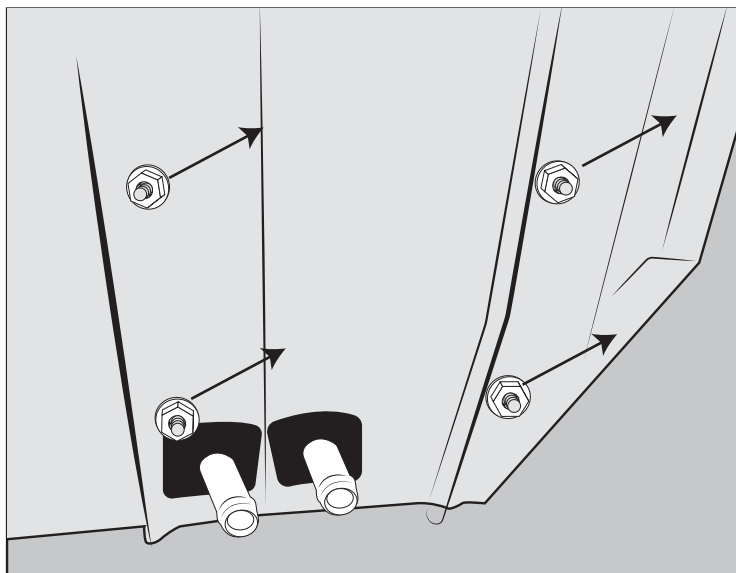
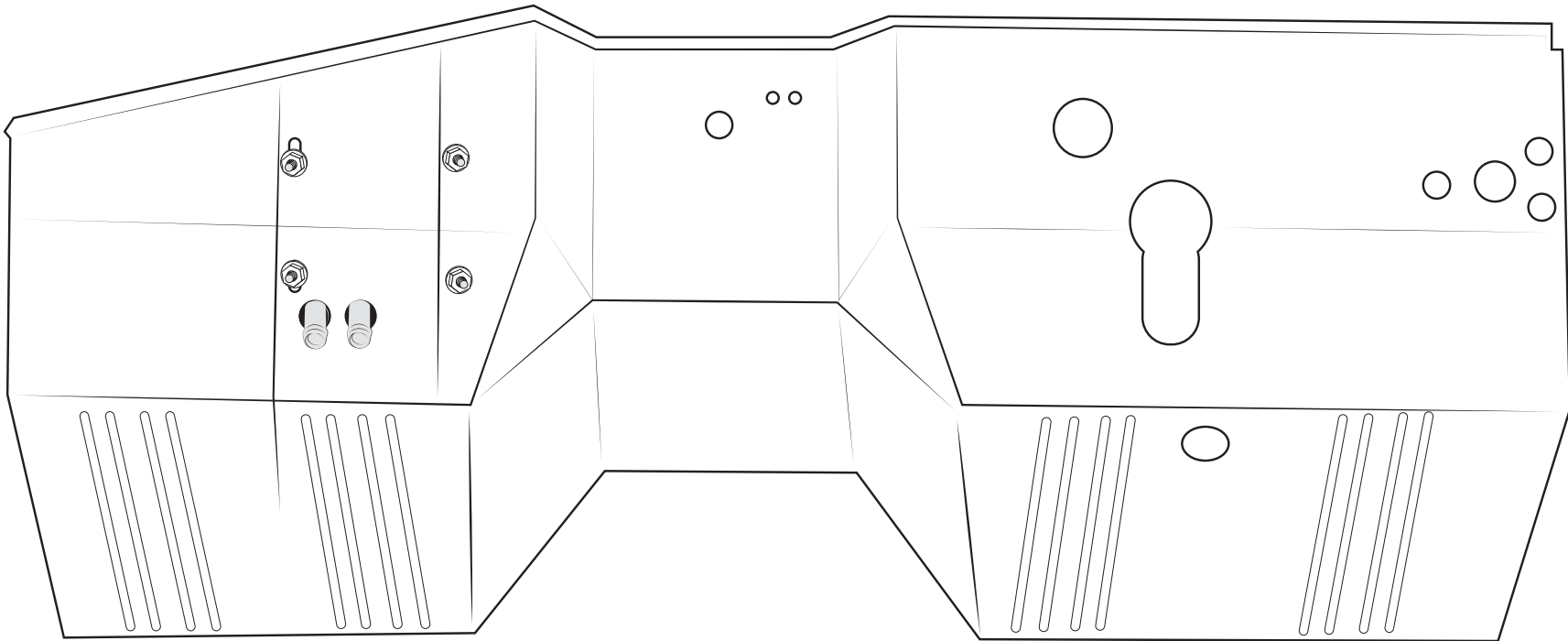
5



Move TEMP knob to COLD



You will NOT be able to see thru water valve passage



Moving to the engine compartment:

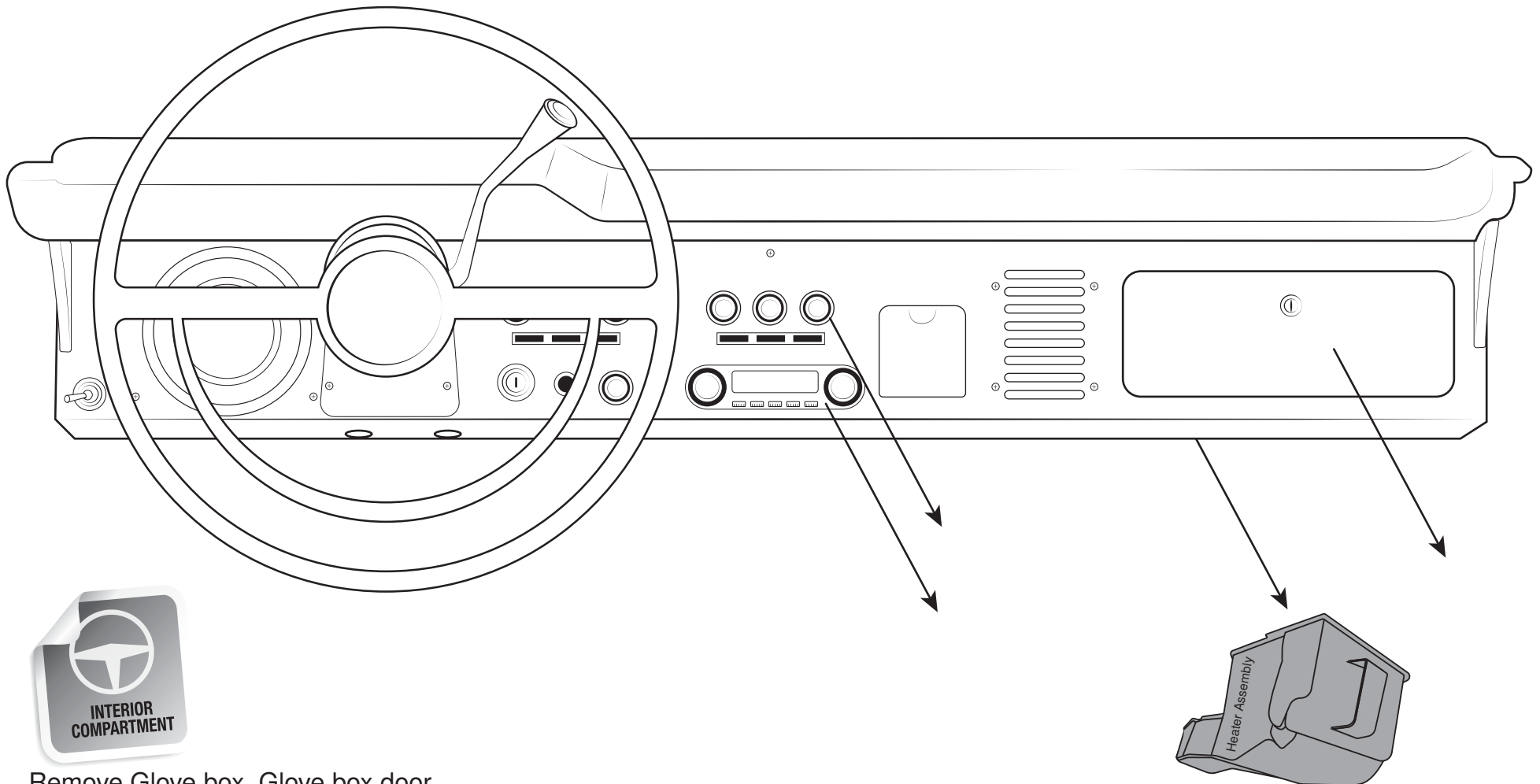
Disconnect the battery ground cable.

Drain radiator and disconnect Heater hoses from the heater connections on engine side of the firewall.

Located on the firewall in the engine compartment (4)

Hex head nut and washers.

Remove and discard.



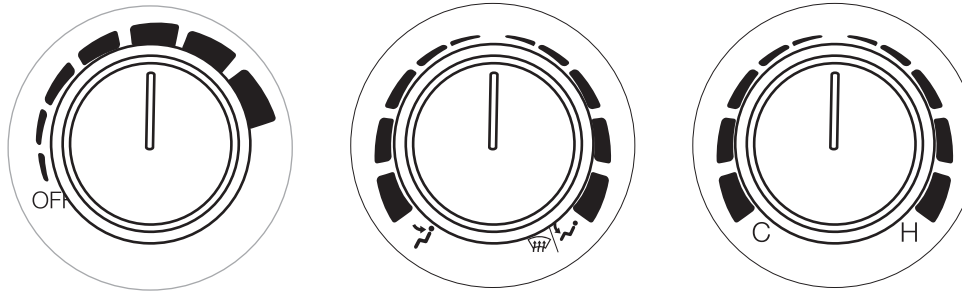
Remove Glove box, Glove box door.

Remove the control assemblies. Blower switch removal requires the knob to be removed. Discard knob.

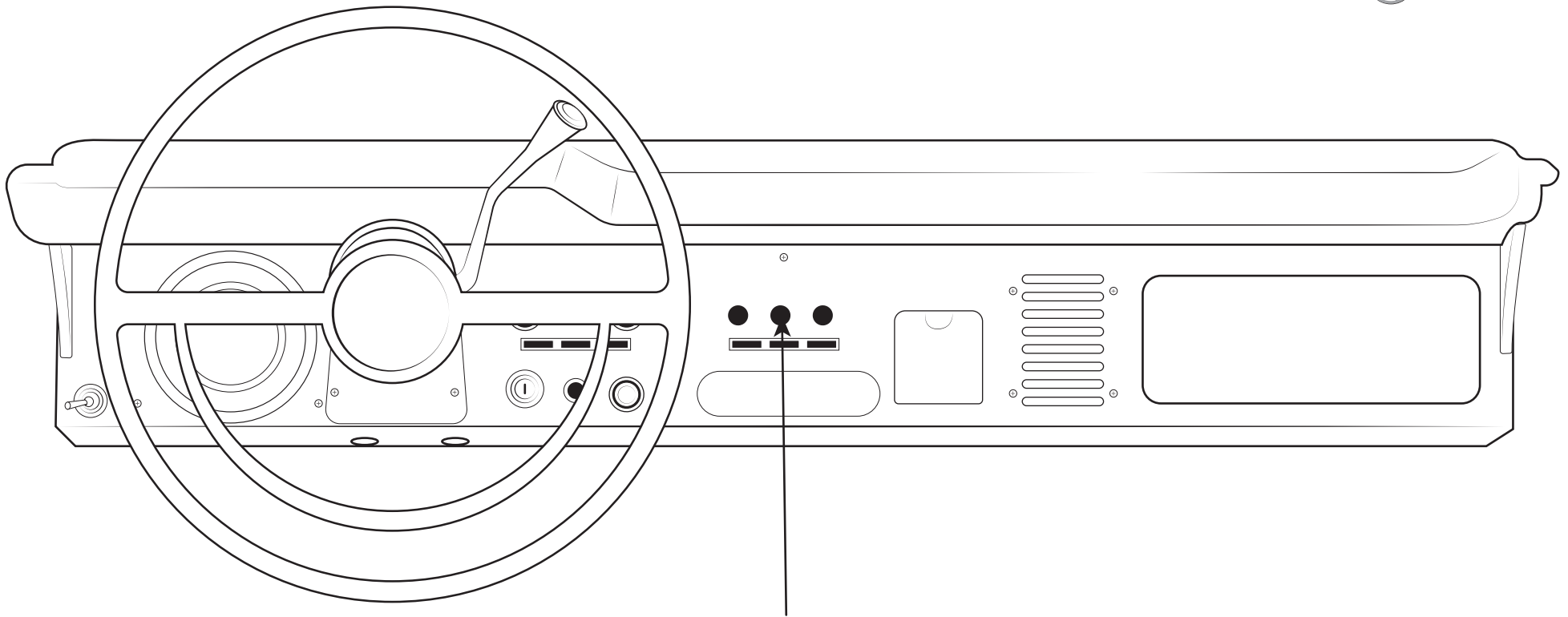
Remove nut from front of the blower switch, retain trim ring, and discard switch assembly.

THESE ARE THE PARTS YOU WILL FIND IN BAG KIT A

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

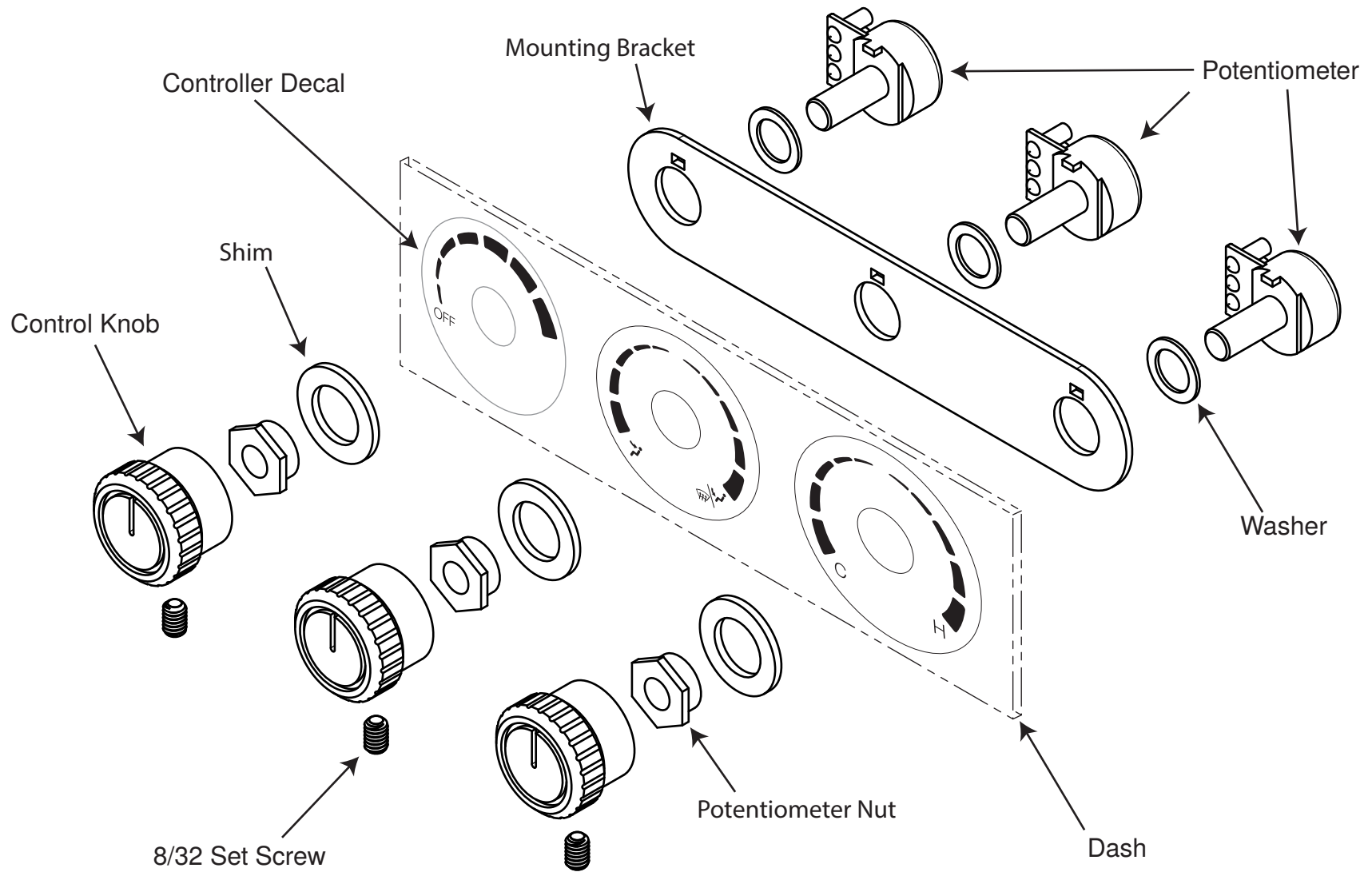


16-4078V



Install your New Classic Auto Air 66-77 Ford Bronco Decal over the pre-existing holes.

The exploded view on next page will guide you through installation of your

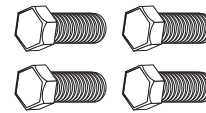


THESE ARE THE PARTS YOU WILL FIND IN BAG KIT B

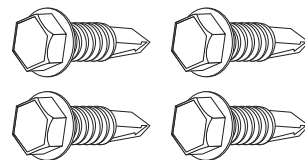
You will use all of these parts and hardware during the next series of installation steps.



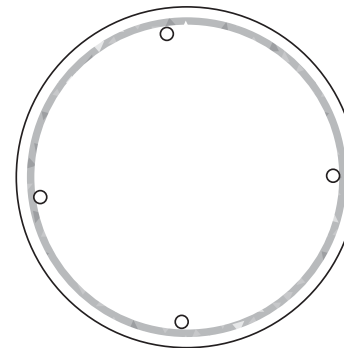
*Four 1/4 - #20 Washers
PN#25NWSAB*



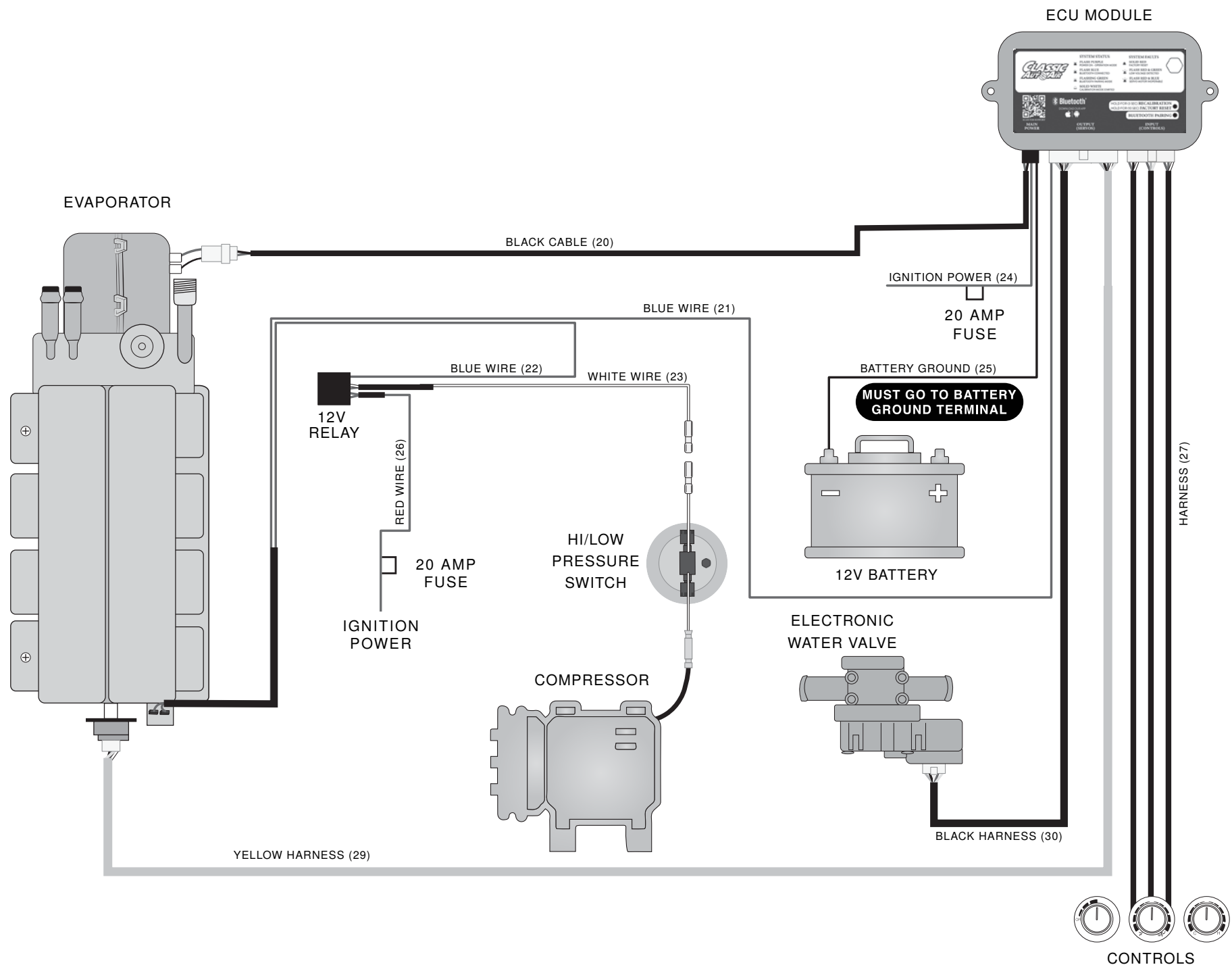
Four 1/4 - #20 x 5/8\"/>

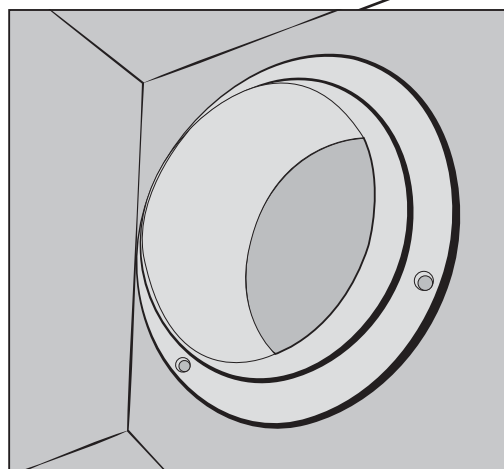
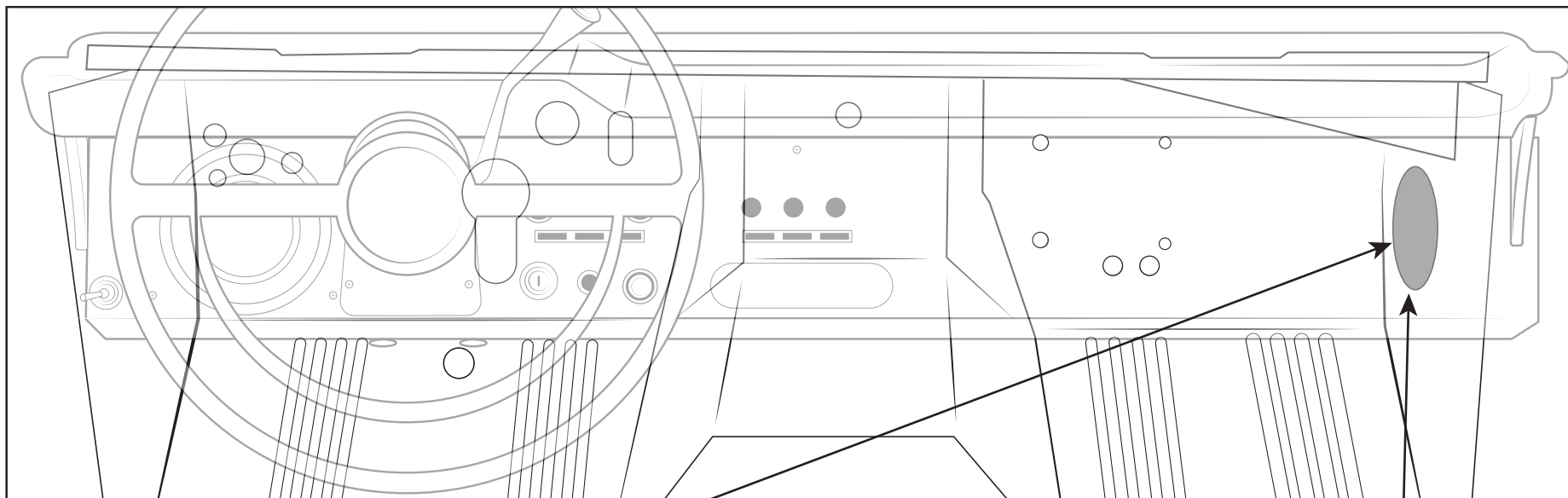


Four #10 3/4\"/>



*Fresh Air Inlet Block Off
PN#10-1025-2*

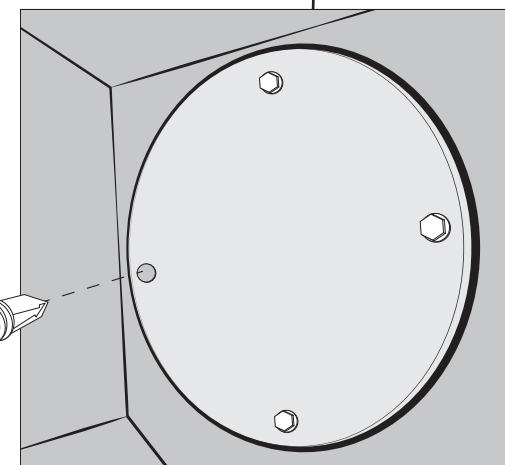


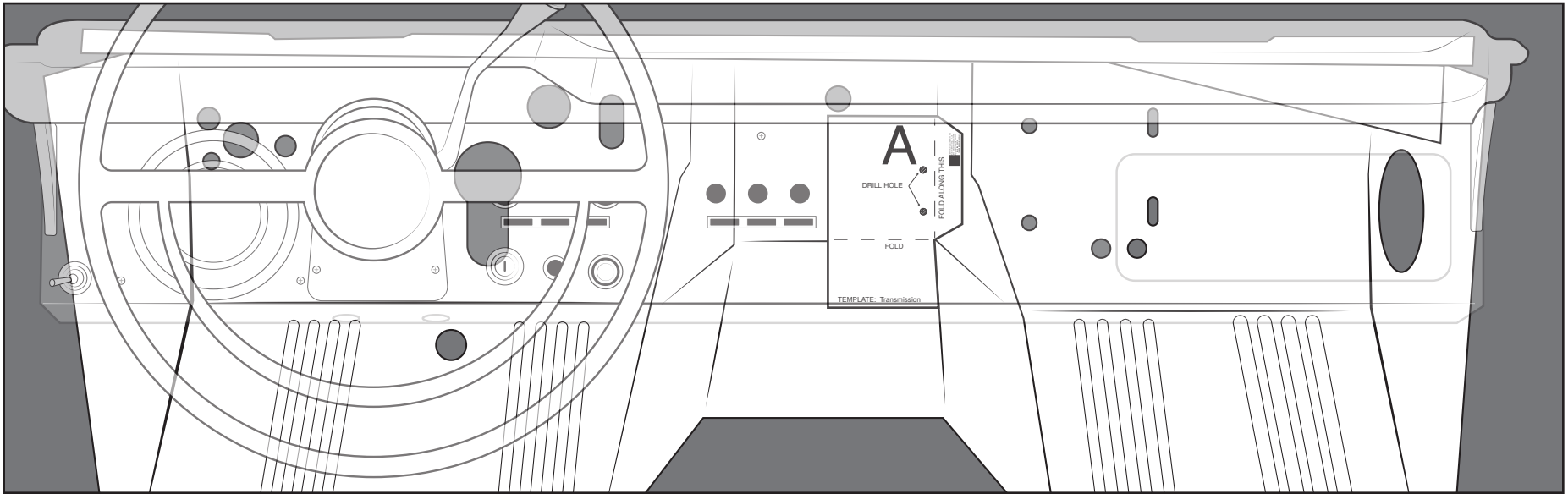


Remove the inlet air flange. Discard flange and original mounting hardware.

Locate the air inlet block off and (4) #10 x $\frac{3}{4}$ " tek screws.

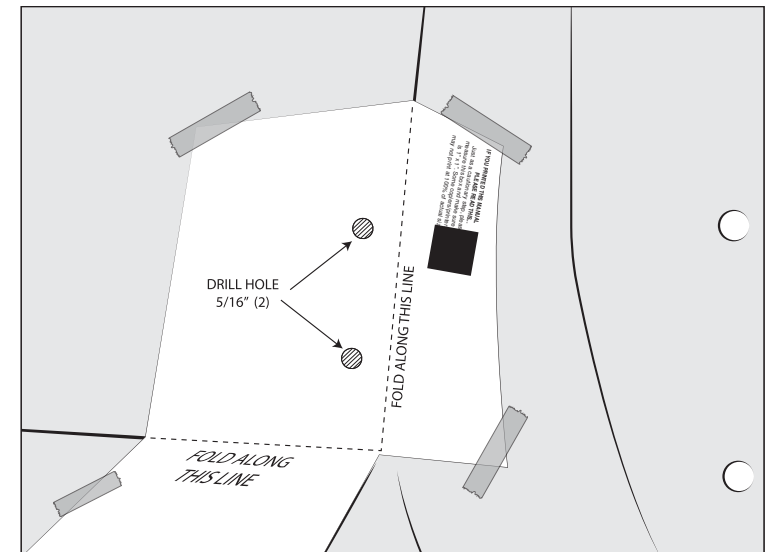
Attach the block off over the inlet hole as shown, using (4) #10 screws.

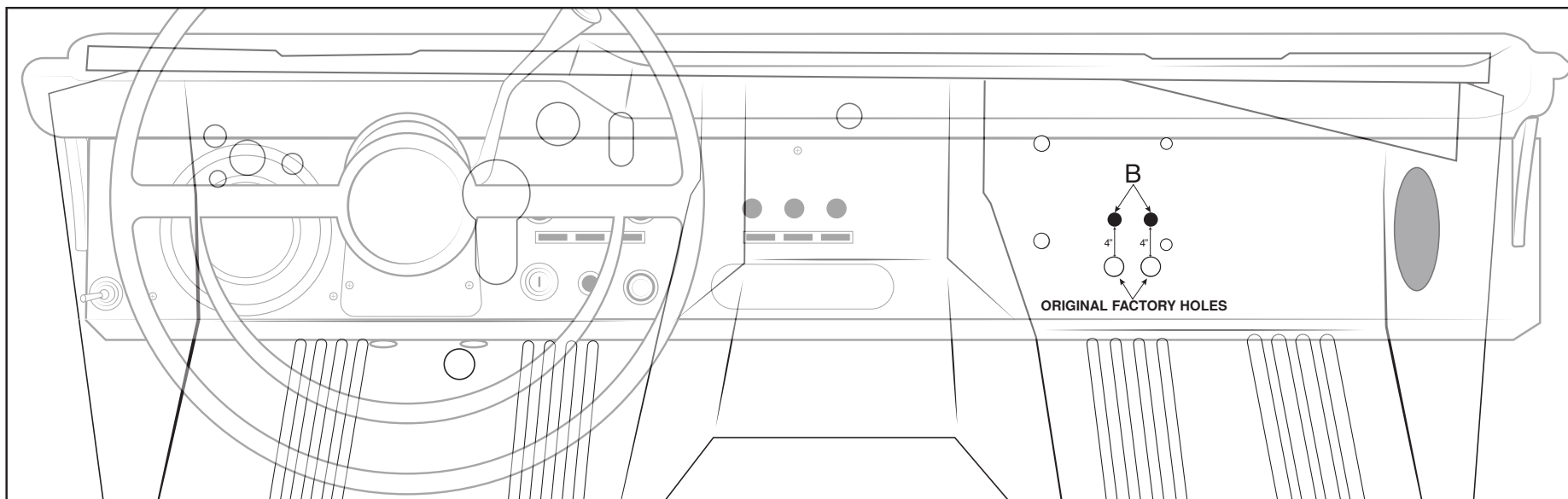




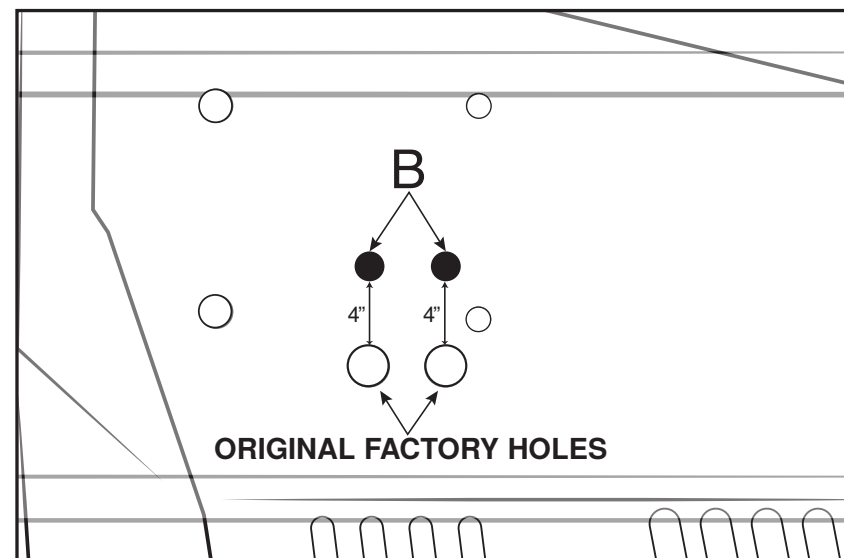
Before we install the evaporator we are going to do some drilling.

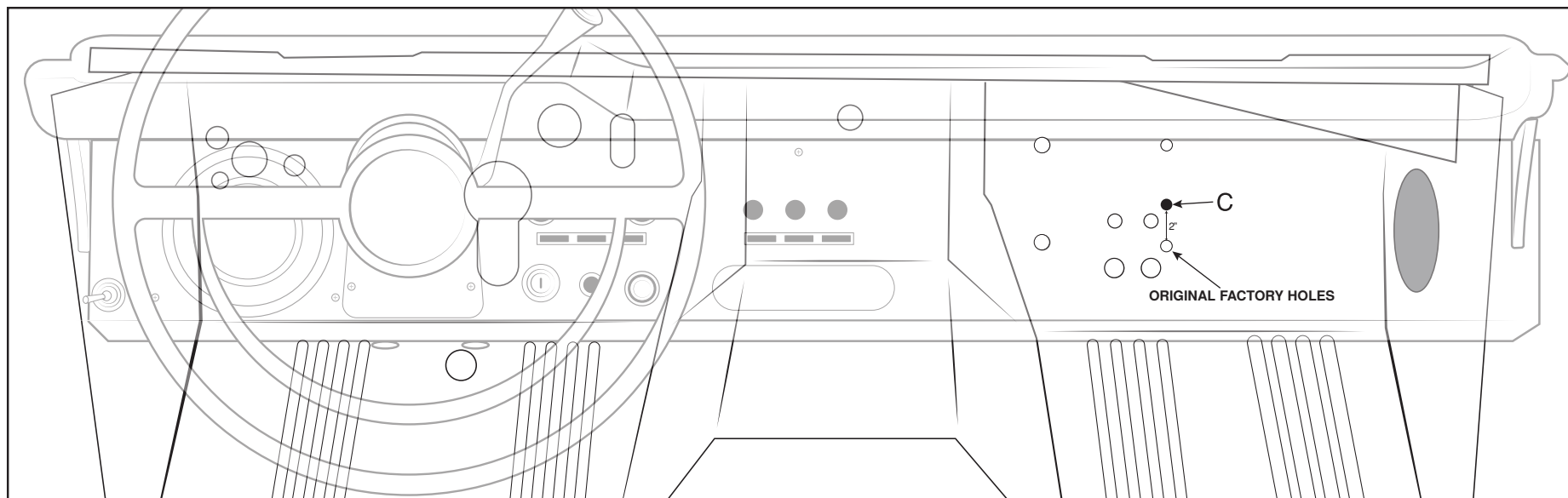
A: Locate TEMPLATE: Transmission Tunnel drill (2) 5/16" holes for the rear mounting bracket.



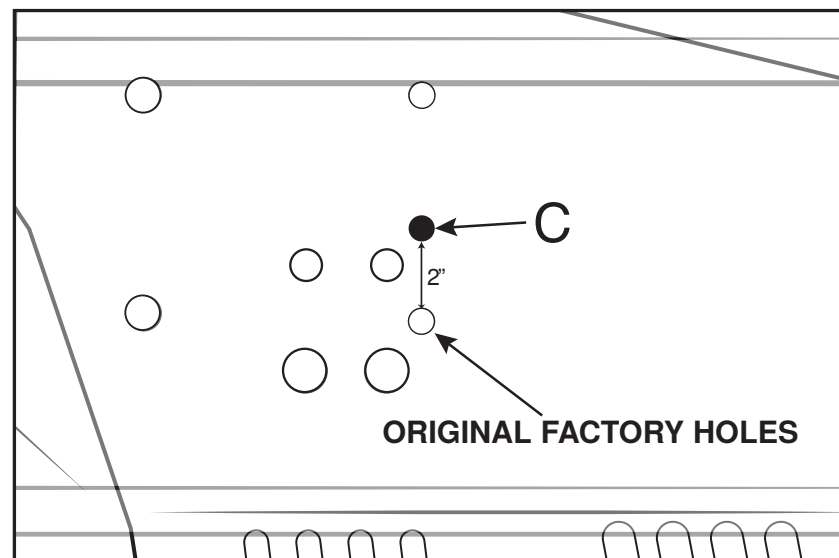


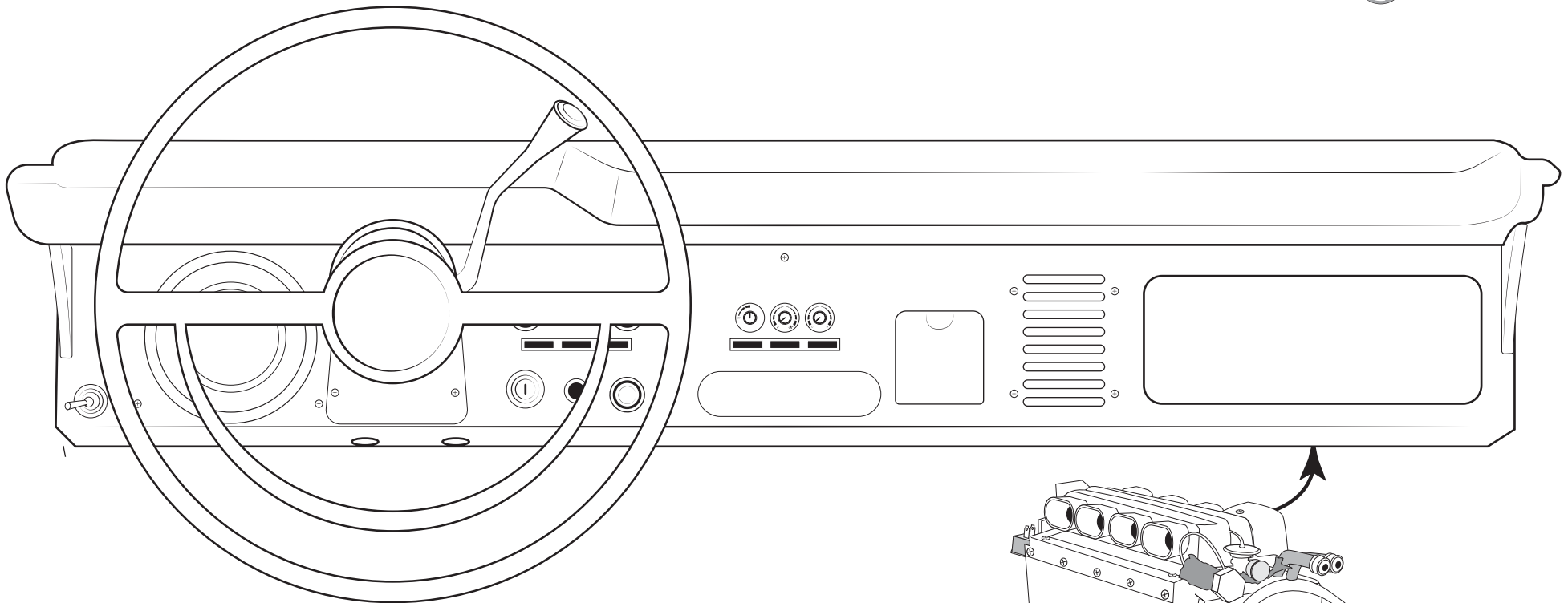
(B) Measure (Center to center) 4 inches up from the Factory heater holes. Drill (2) 7/8" holes for the Heater 90° fittings.





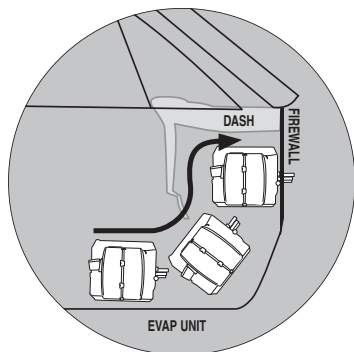
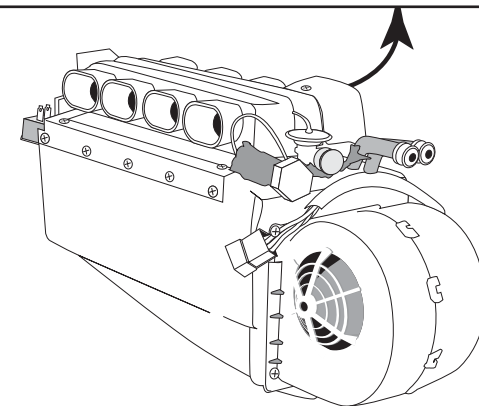
(C) Locate existing factory mounting hole. Measure 2" (Center to center) up from the factory hole and drill a 1/4" hole above from center of factory hole.



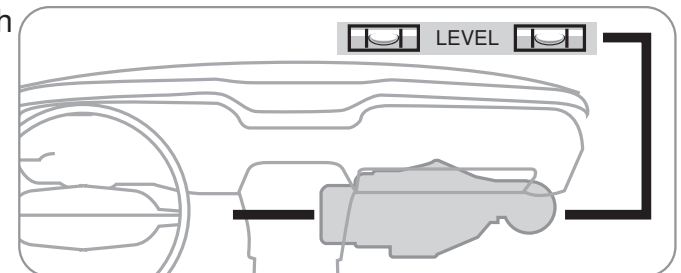


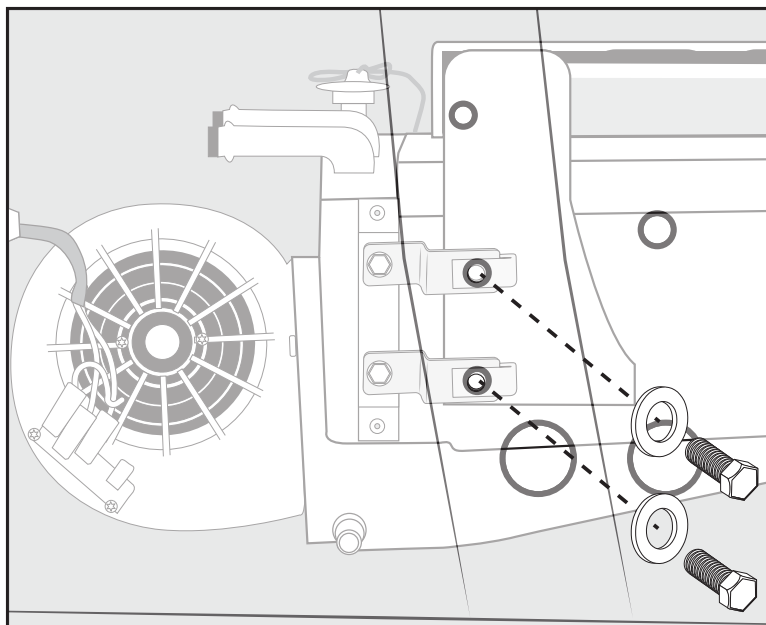
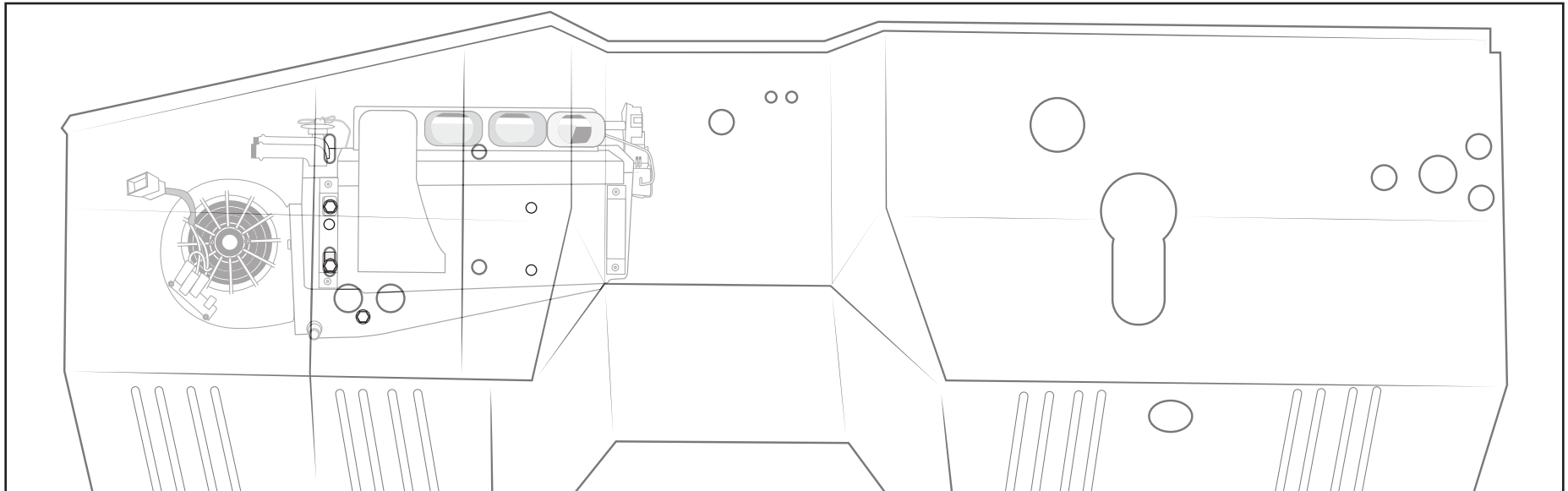
NOTE: Two people are needed for this step!

Place evaporator on floor panel. Roll unit up behind the glove box opening,



Be sure to align the evaporator unit level with the bottom of dash as shown above, with a small degree of tilt toward the back to allow proper drain of condensation.





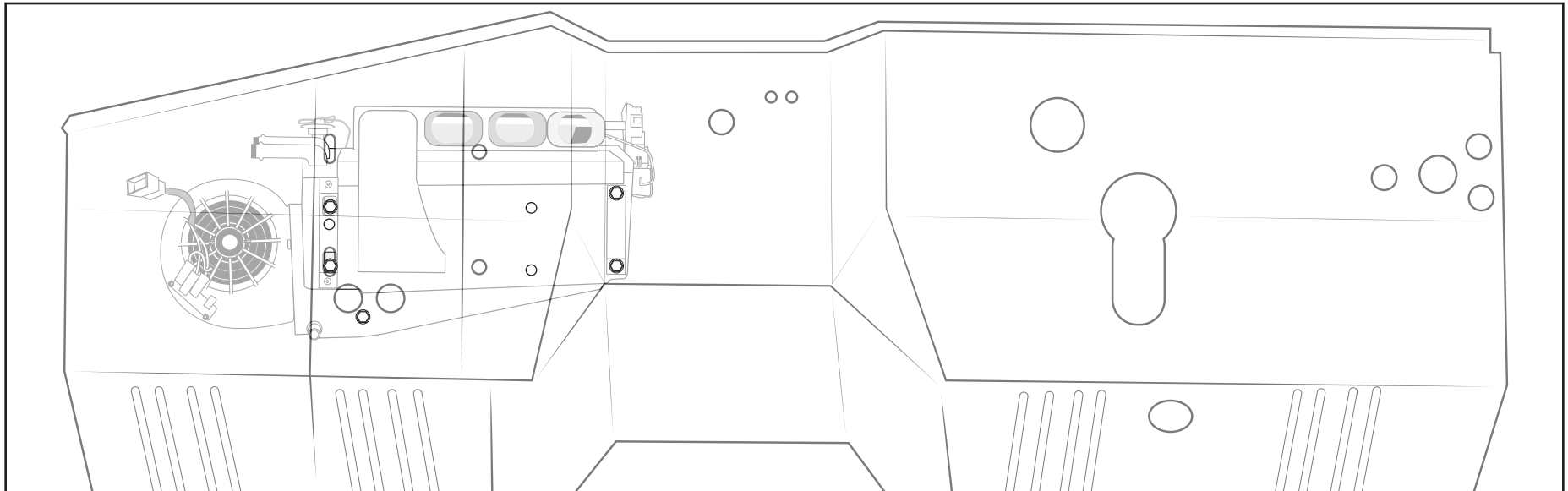
You will need two people for this portion of the install.

Locate (2) 1/4-20 x 5/8" hex head bolt and (2) 1/4" washers from the bag kit.

Insert bottom bolt and washer in factory hole from engine side of firewall and attach to the rear support bracket. Insert top bolt and washer into hole drilled earlier.

Tighten the bolts that hold each bracket to the support brace on the unit.

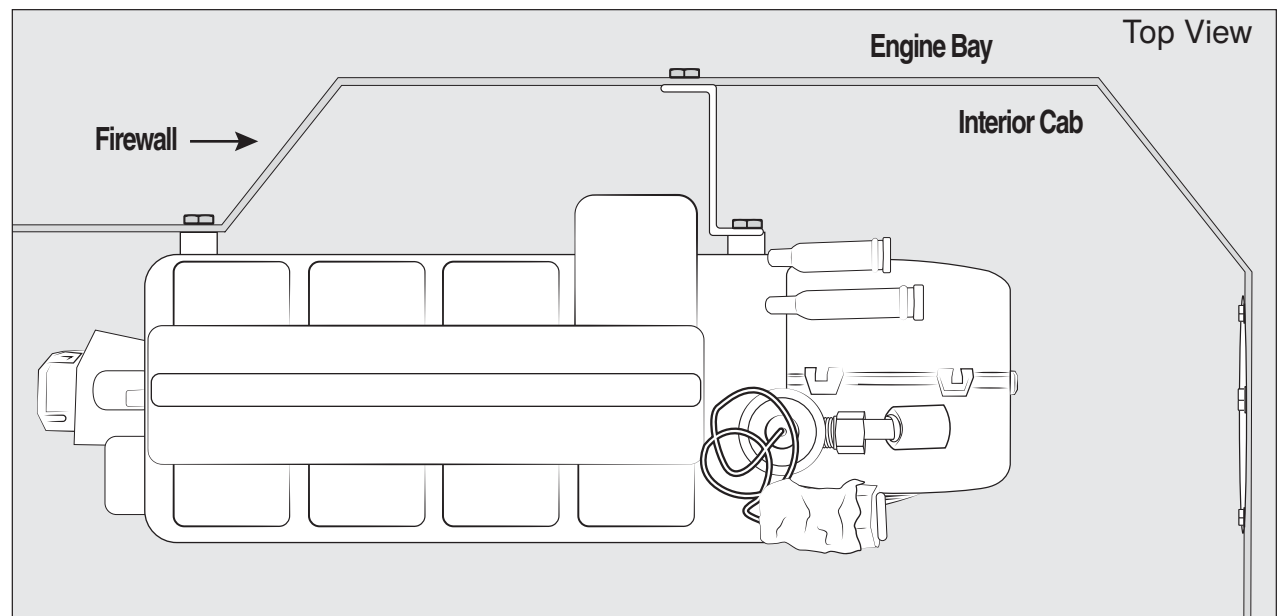




Locate (2) 1/4-20 x 5/8" hex head bolts and (2) 1/4" washers from the bag kit.

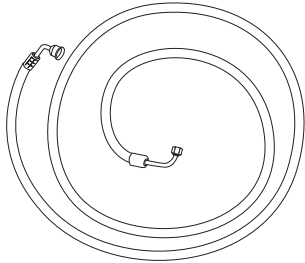
Insert bolts from engine side of firewall through hole drilled earlier and attach to the support brace.

The evaporator should now be completely mounted.

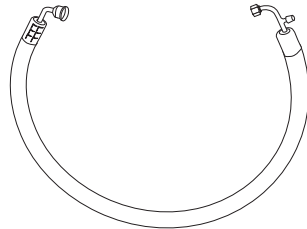


THESE ARE THE PARTS YOU WILL FIND IN BAG KIT C

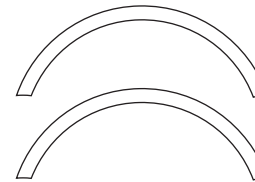
You will use all of these parts and hardware during the next series of installation steps.



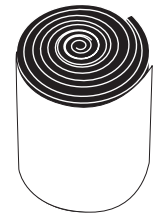
Liquid, Hose Assembly, Evap
PN#H0095-3



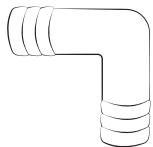
Suction, Hose Assembly, Evap
PN#H0095-5



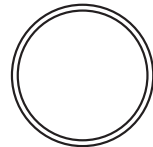
Two Hose, Heater 5/8 DIA.
PN#34-50004



Refrigerant Tape
PN#Q201



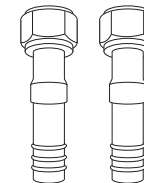
90 Degree Elbow



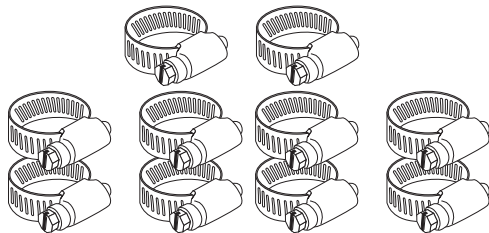
Two #10 O-Ring
PN#015G



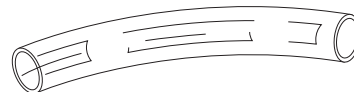
Two #6 O-Ring
PN#011G



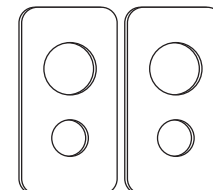
Fittings (2)
PN#14-1100



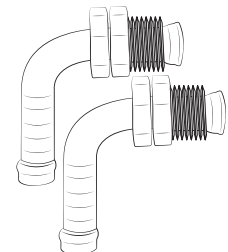
Ten Worm Gear Clamps
PN#6274 IDEAL



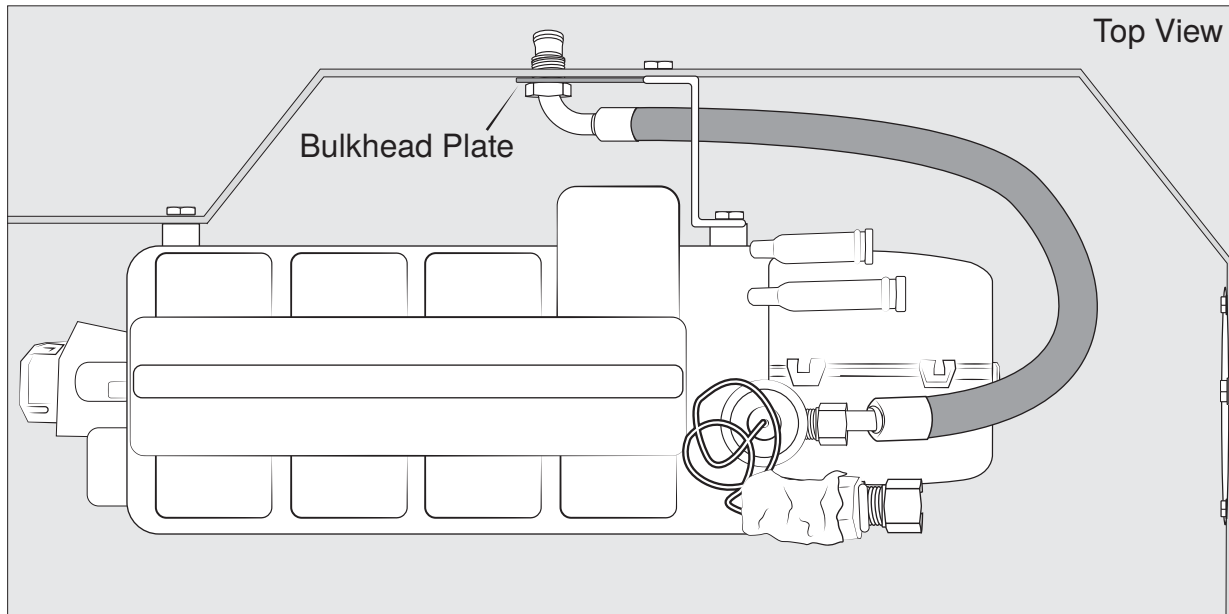
Clear Plastic Drain Tube
PN#31004845



Two Bulkhead Washer
PN#0095-2

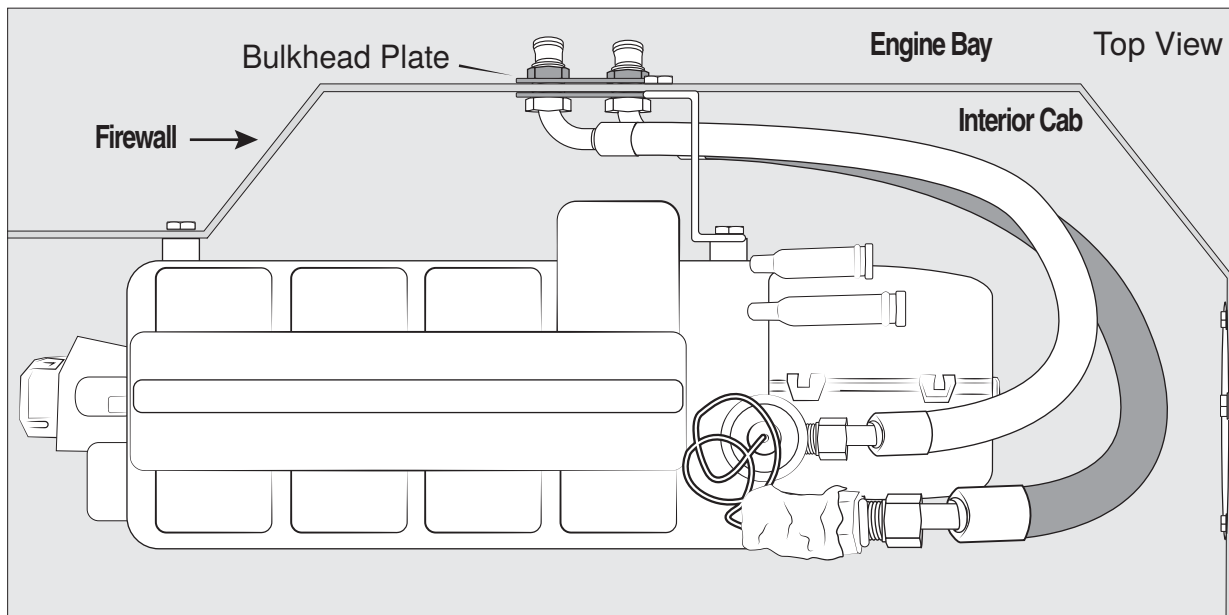


Two Fittings, Heater 90°
PN#0027-53



Locate the liquid hose (smallest), suction hose (largest), and (2) bulkhead plates from the Bag Kit. Insert bulkhead fittings through (1) the bulkhead plate and then through the firewall.

Route smallest hose up and around blower and attach to the expansion valve using (1) #6 o-ring and a few drops of mineral oil.

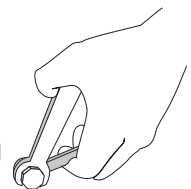


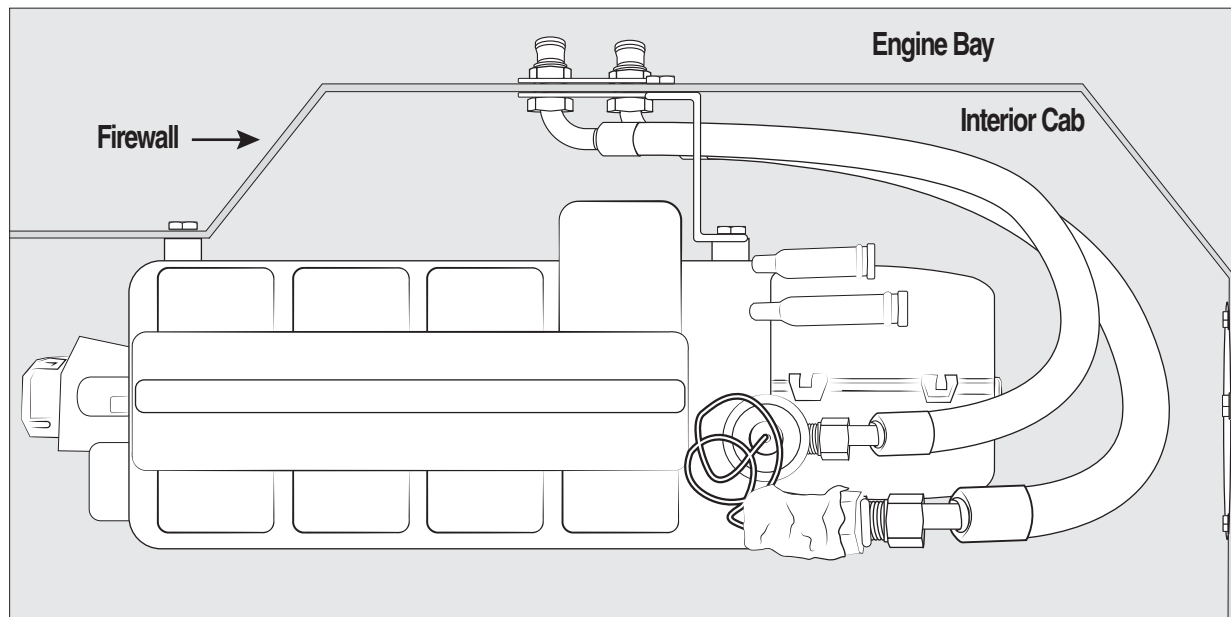
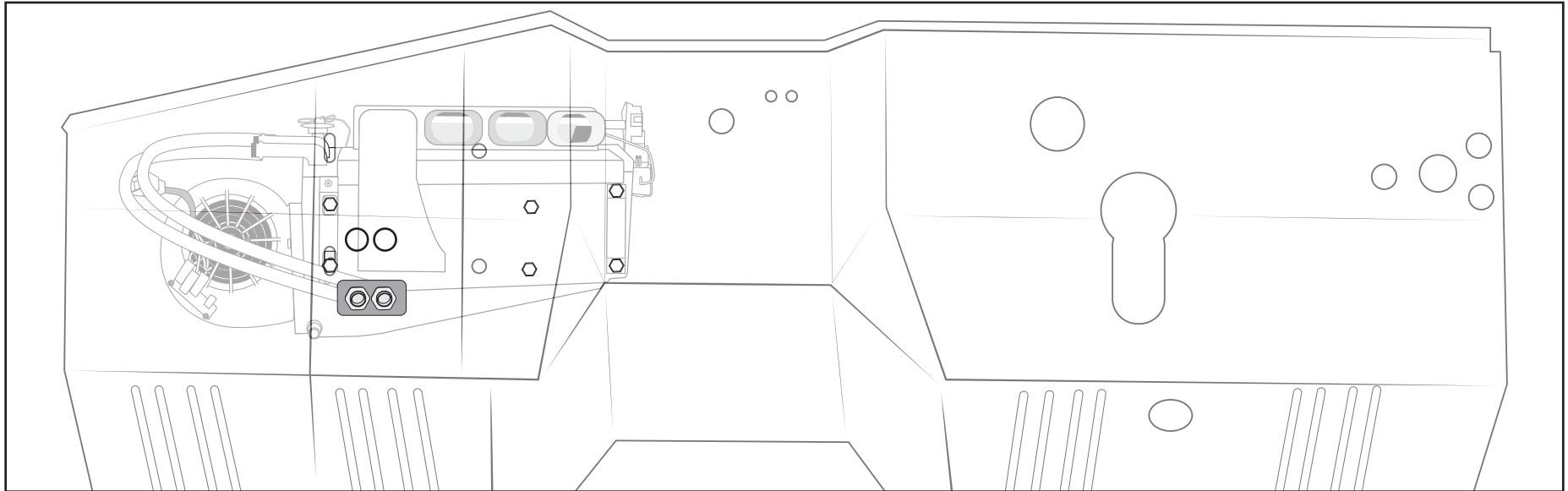
Route largest of the hoses around blower and attach to the unit using (1) #10 o-ring and a few drops of mineral oil. Use refrigerant tape to wrap any exposed metal.

On engine side of the firewall attach second bulkhead plate over the fittings and use the fitting nut and rubber seal to attach. Tighten securely.



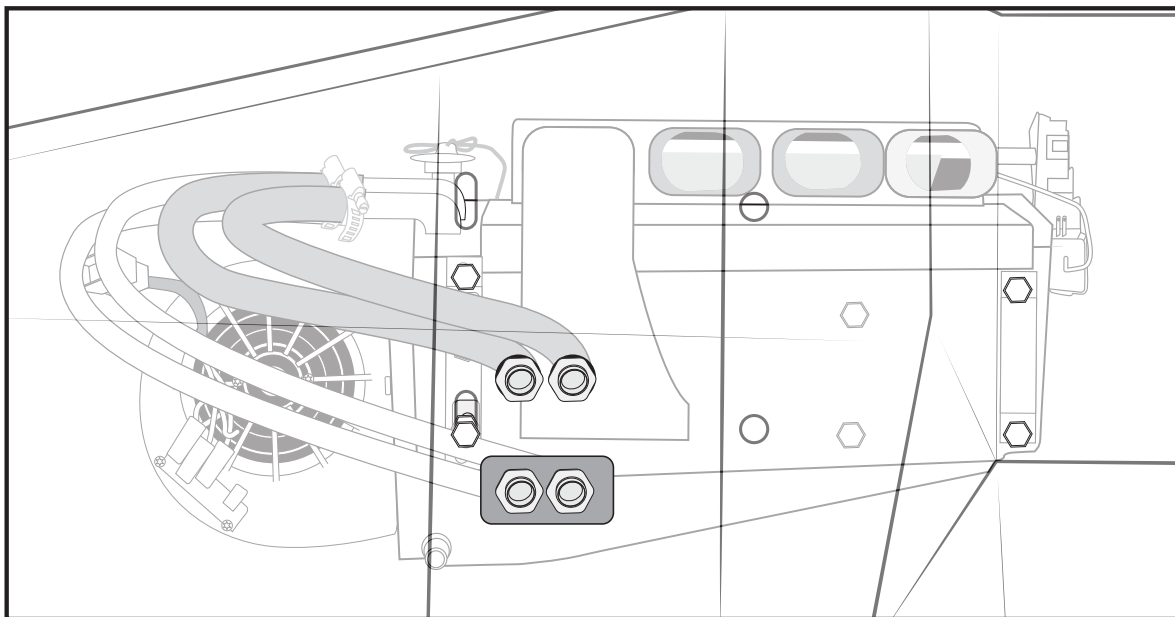
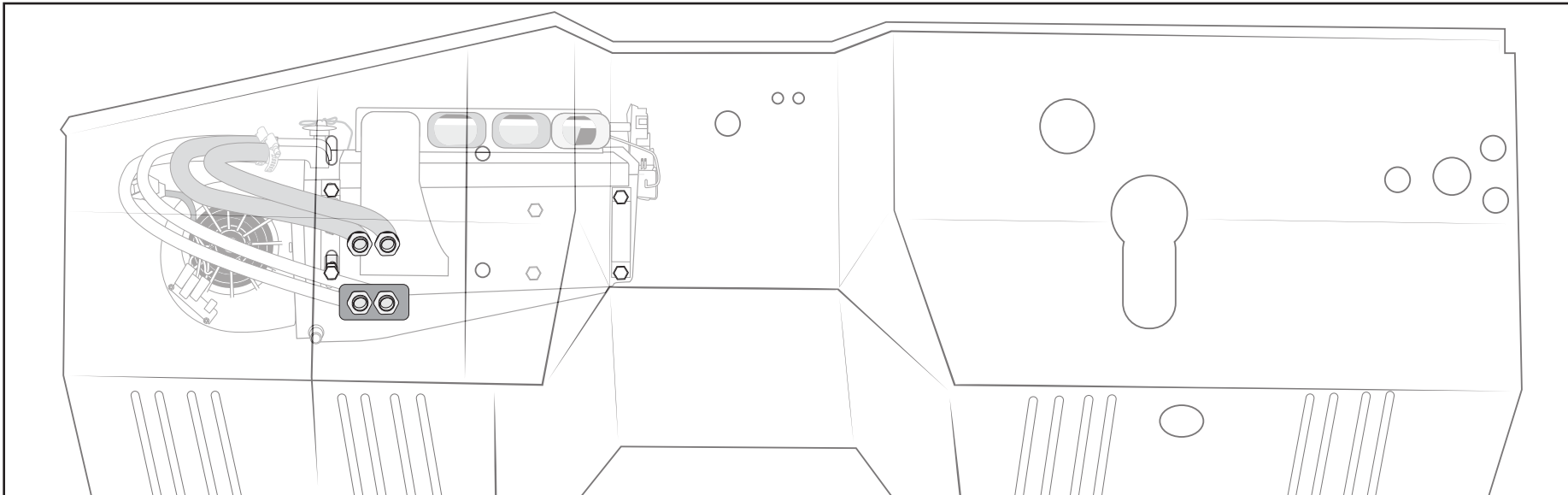
Reminder...
Use two
wrenches to
tighten o-ring
fittings





Locate in the Bag kit (2) Heater 90° Fittings. Install Heater 90° Fittings thorough 7/8" holes previously drilled.

Heater fittings should be in line with Bulkhead Plates Fittings already installed.

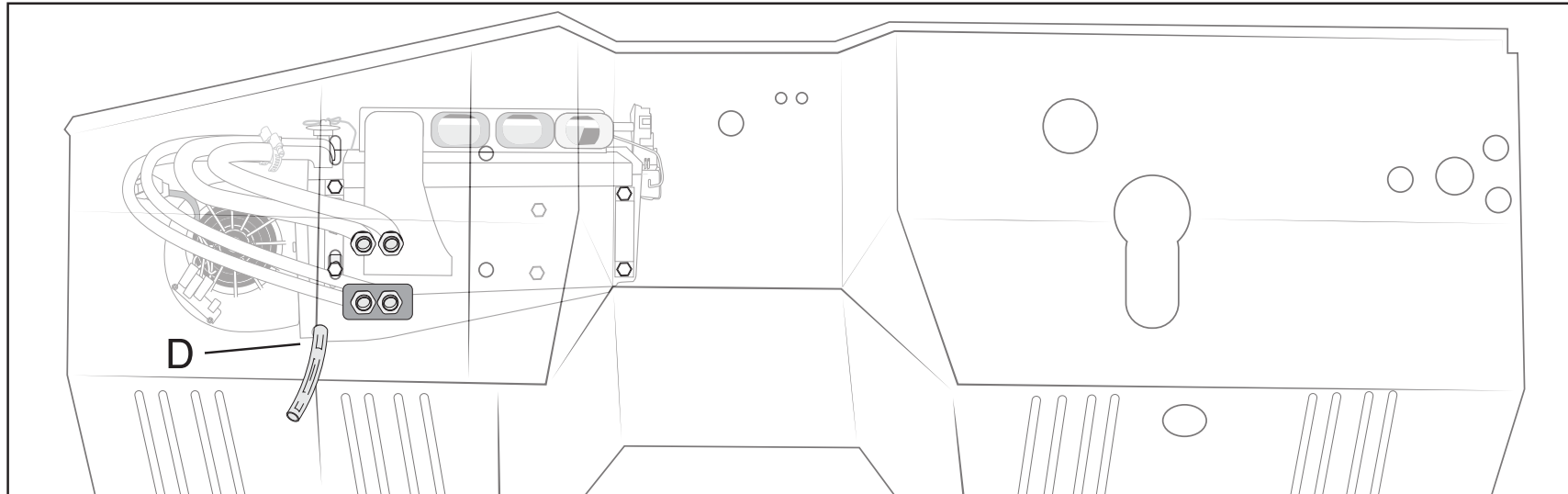


Locate the (2) pieces of heater hose from the Bag kit.

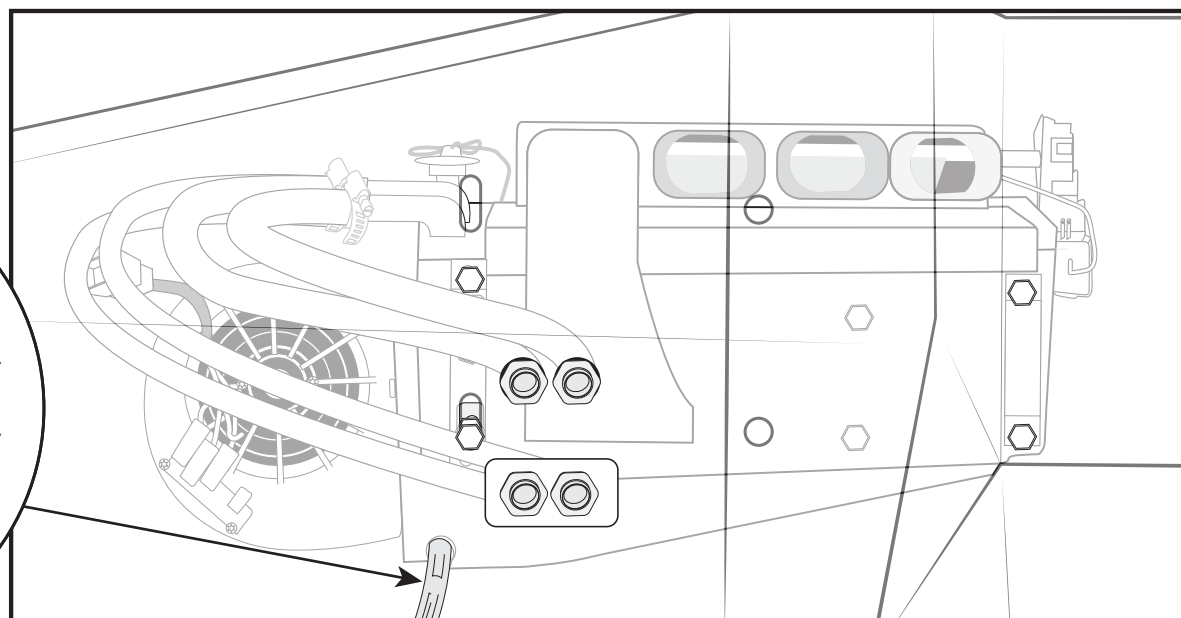
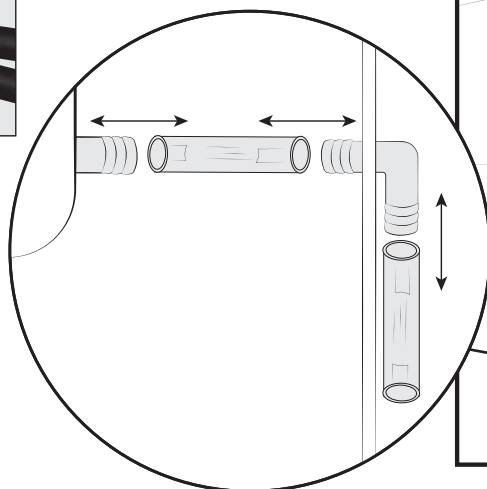
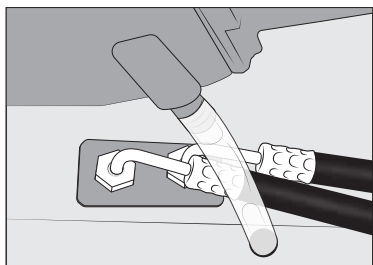
Insert Heater 90° fittings through the firewall and attach heater hoses with worm gear clamps.

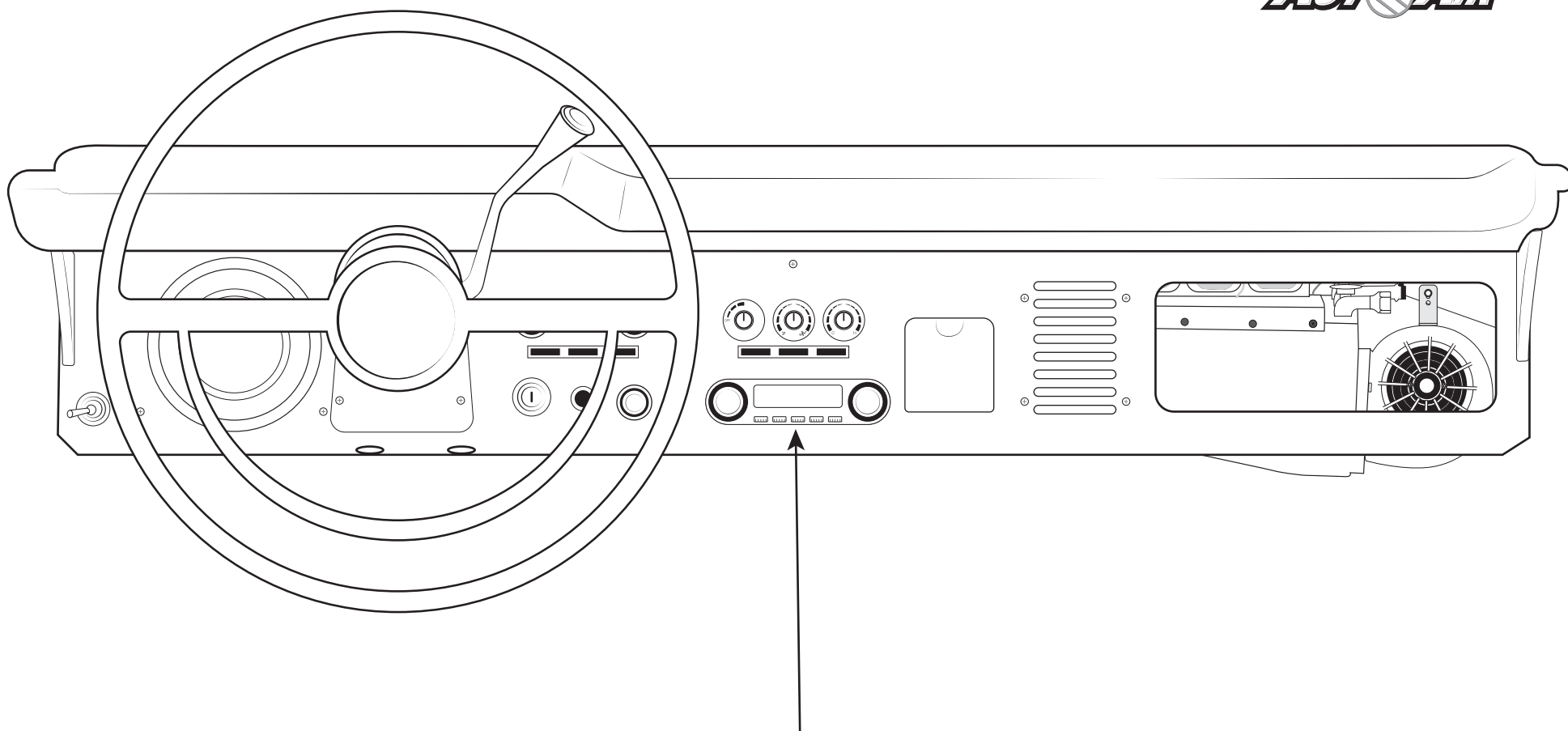
Tighten securely.

This view is from the engine bay side of the firewall.



(D) Drill 3/4" hole for the drain tube just below the evaporator to allow for draining. Do not fight gravity, have hole lower than the drain tube nipple. Locate the clear drain tube from the Bag kit. Attach over drain nipple on bottom of the unit and insert other end through the hole previously drilled.

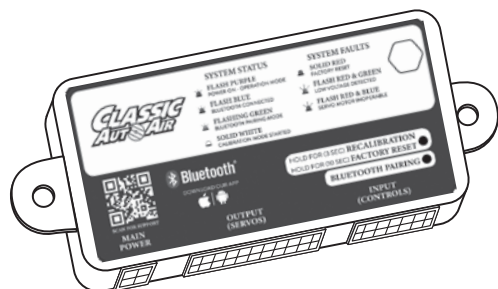




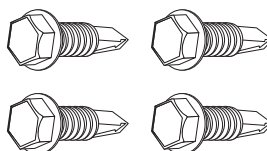
You can reinstall your radio at this

THESE ARE THE PARTS YOU WILL FIND IN BAG KIT D

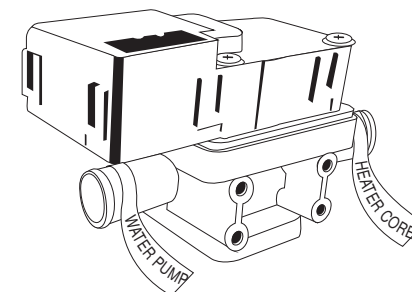
You will use all of these parts and hardware during the next series of installation steps.



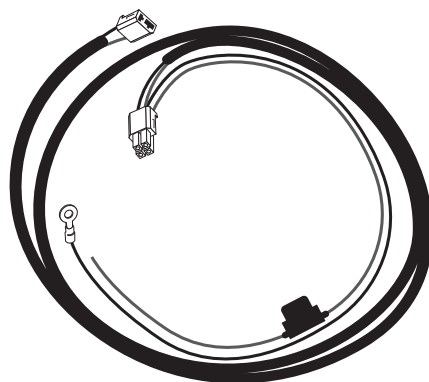
ECU
16-2500



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



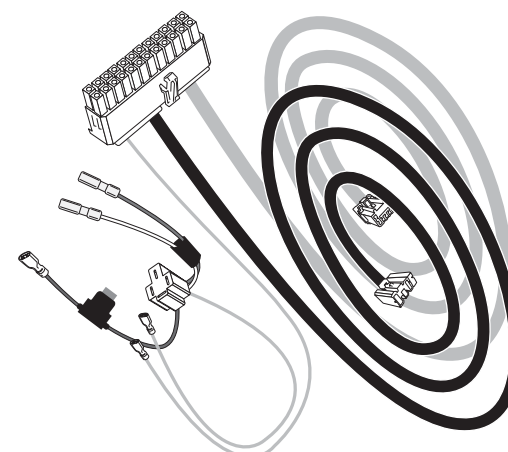
Electronic Water Control Valve
PN# 16-1023



HARNESS POWER SUPPLY
0125-5



Relay
30-13373



HARNESS
0125-20A

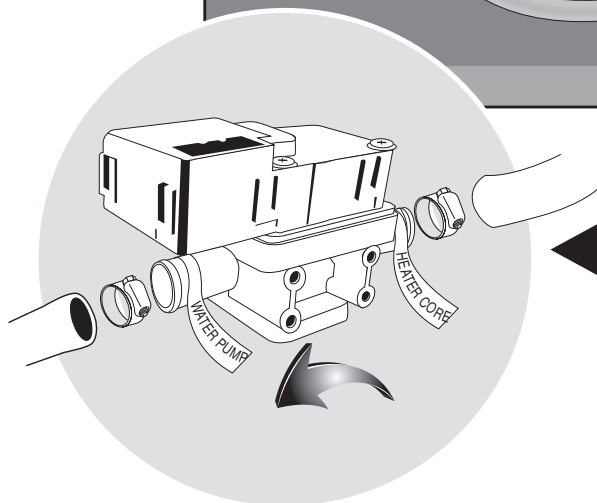
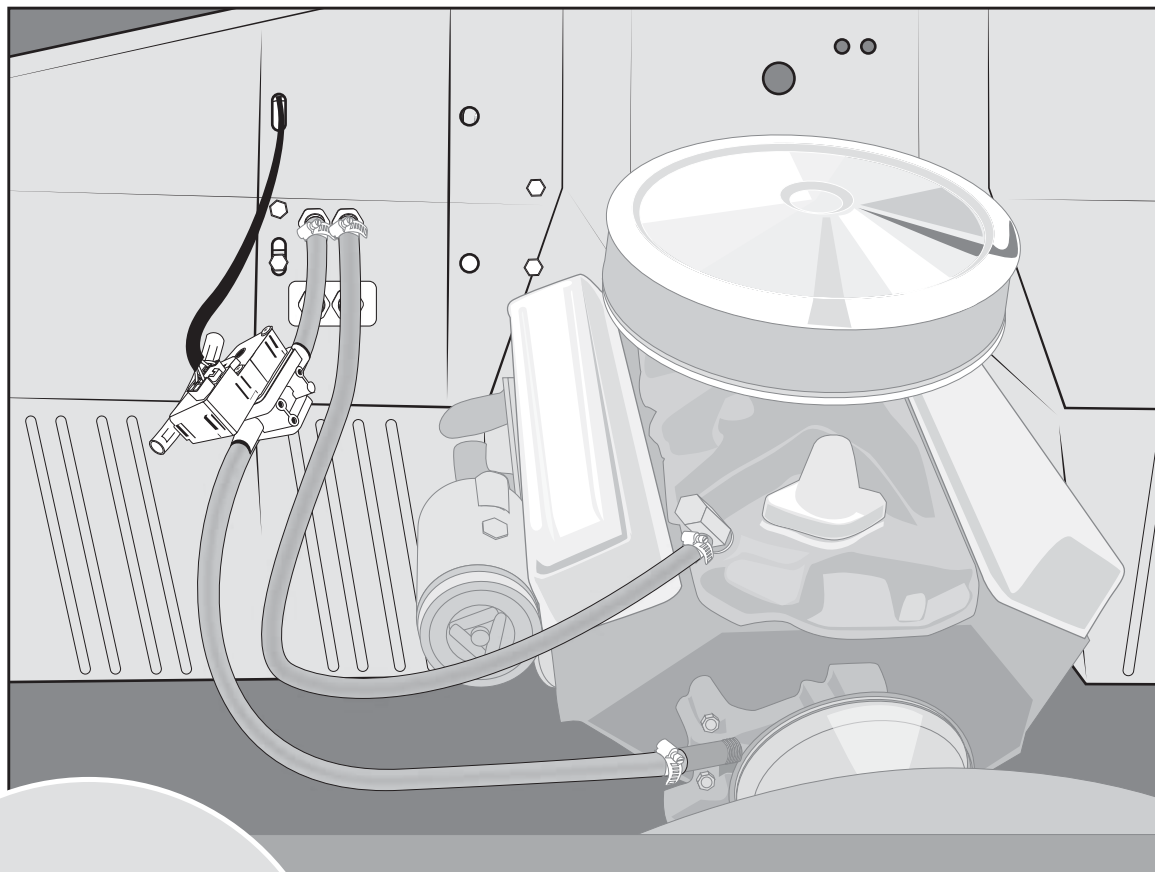
IMPORTANT NOTICE: PROPER INSTALLATION OF WATER VALVE

Your water valve **MUST** be installed per these instructions!... (If not, your system will not work properly.)

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

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

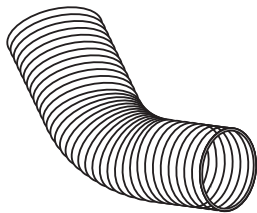
Connect the remaining outlet on water valve labeled **water pump** to the water pump using 5/8" dia. heater hose with the supplied worm gear



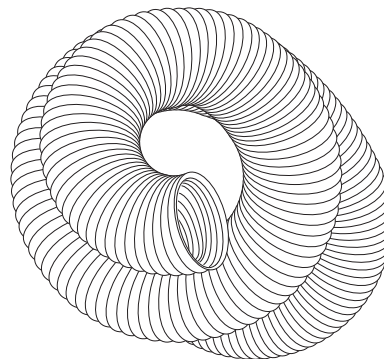
**FOLLOW THESE
TAGS... CHECK IT
TWICE BEFORE
PROCEEDING!**

THESE ARE THE PARTS YOU WILL FIND IN BAG KIT E

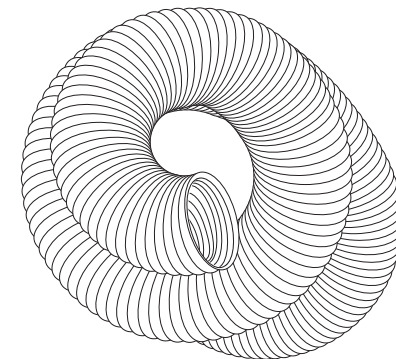
You will use all of these parts and hardware during the next series of installation steps.



One Duct Hoses, 2" I.D., 2' Long



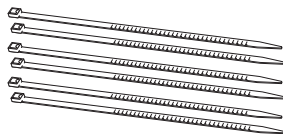
One Duct Hose, 2" I.D., 3' Long



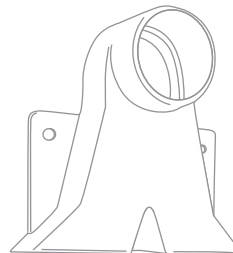
One Duct Hose, 2" I.D., 4' Long



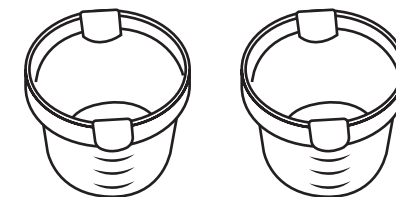
Two #10 x 3/4" Tek Screws



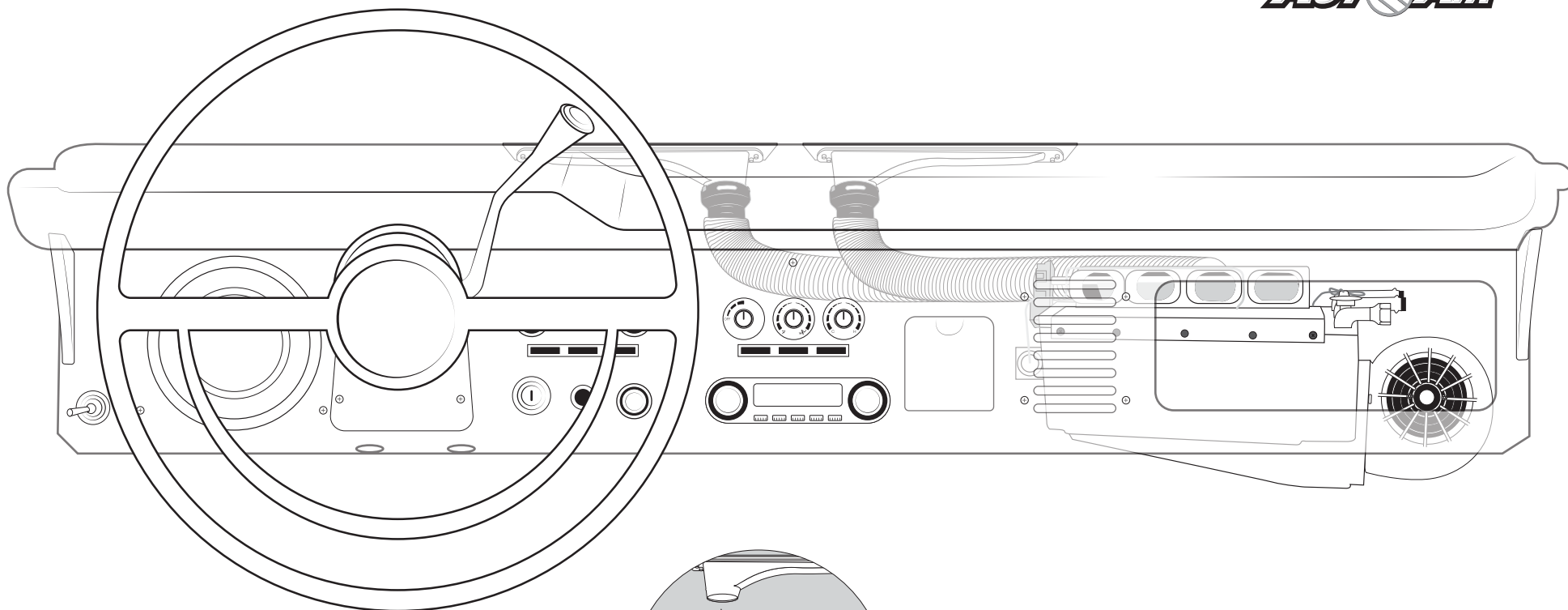
*Six Zip-Ties
PN#AL-08-40-0-M*



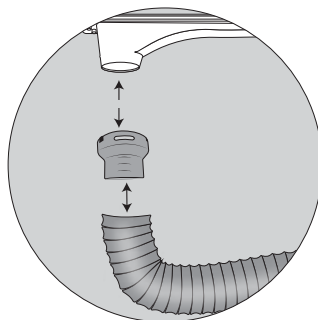
*One Remote Heat Dump
PN#0045-24*



*Two Adaptor, Step Down Hose 2" Assembly
PN#2-1025-3*

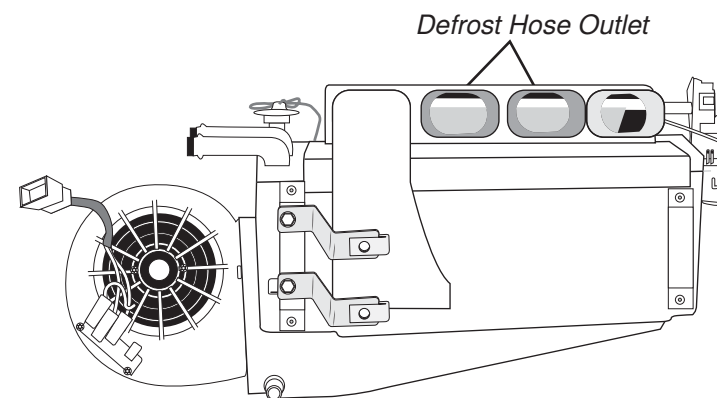


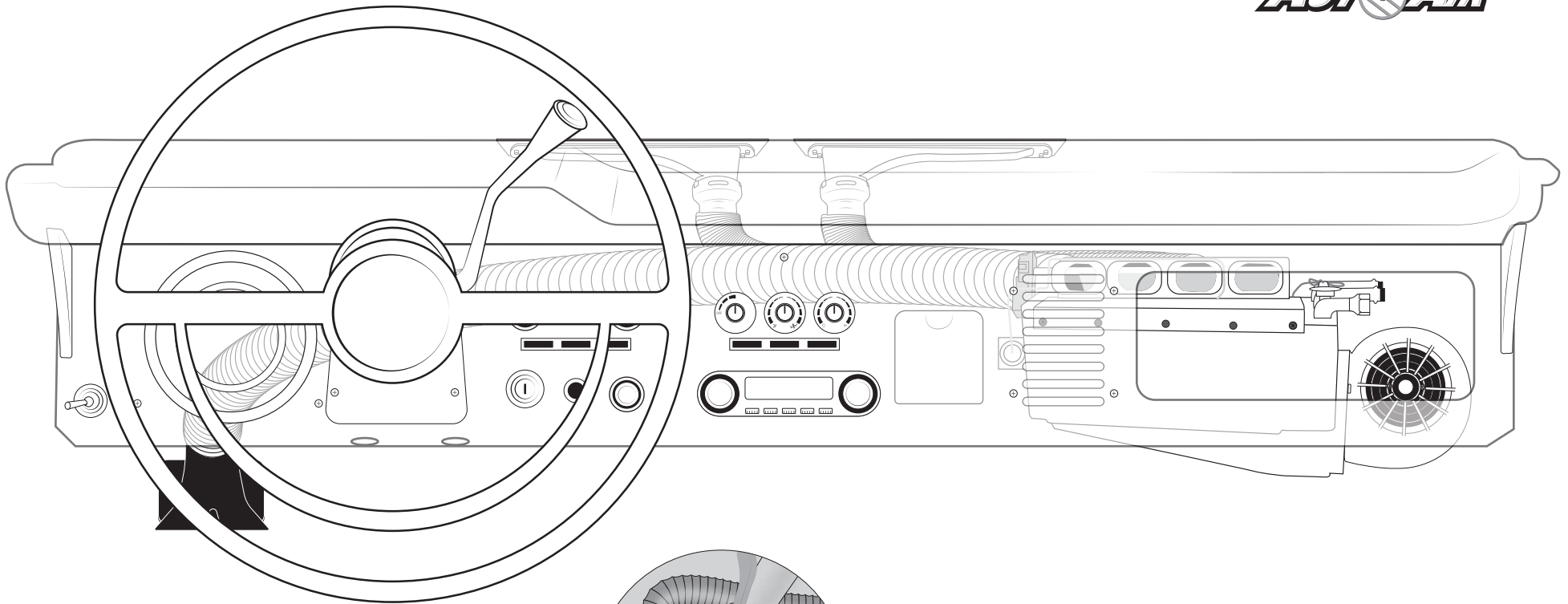
The smoother the route of the flex hoses the better the airflow.



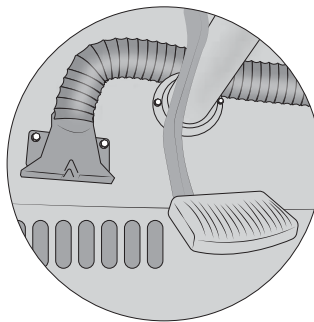
Route the duct hoses from the defrost duct assembly upward toward defrost diffusers.

Attach the flex hose to the existing defrost diffuser using supplied hose adapters and zip-ties.



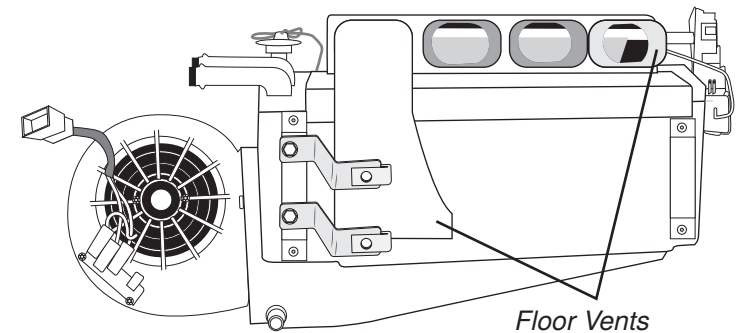


The smoother the route of the flex hoses the better the airflow.



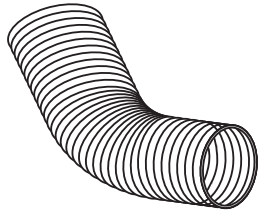
Attach heat dump to firewall just to left of the clutch pedal using (2) #10 tek screws.

Route 45" flex hose over the steering column and attach to the heat dump.

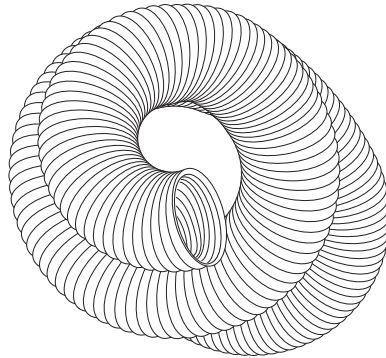


THESE ARE THE PARTS YOU WILL FIND IN BAG KIT F

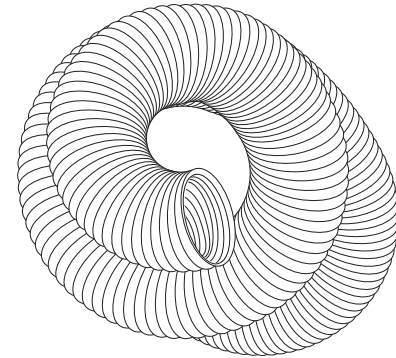
You will use all of these parts and hardware during the next series of installation steps.



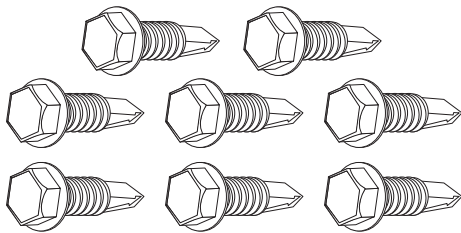
Two Duct Hoses, 2" I.D., 2' Long



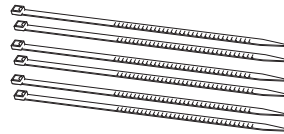
One Duct Hose, 2" I.D., 3' Long



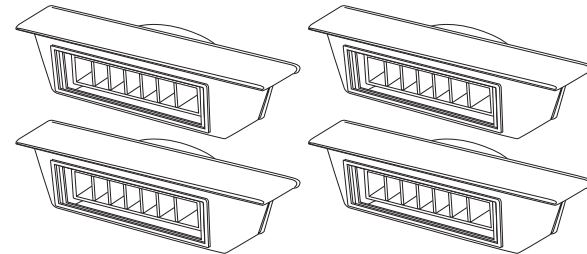
One Duct Hose, 2" I.D., 4' Long



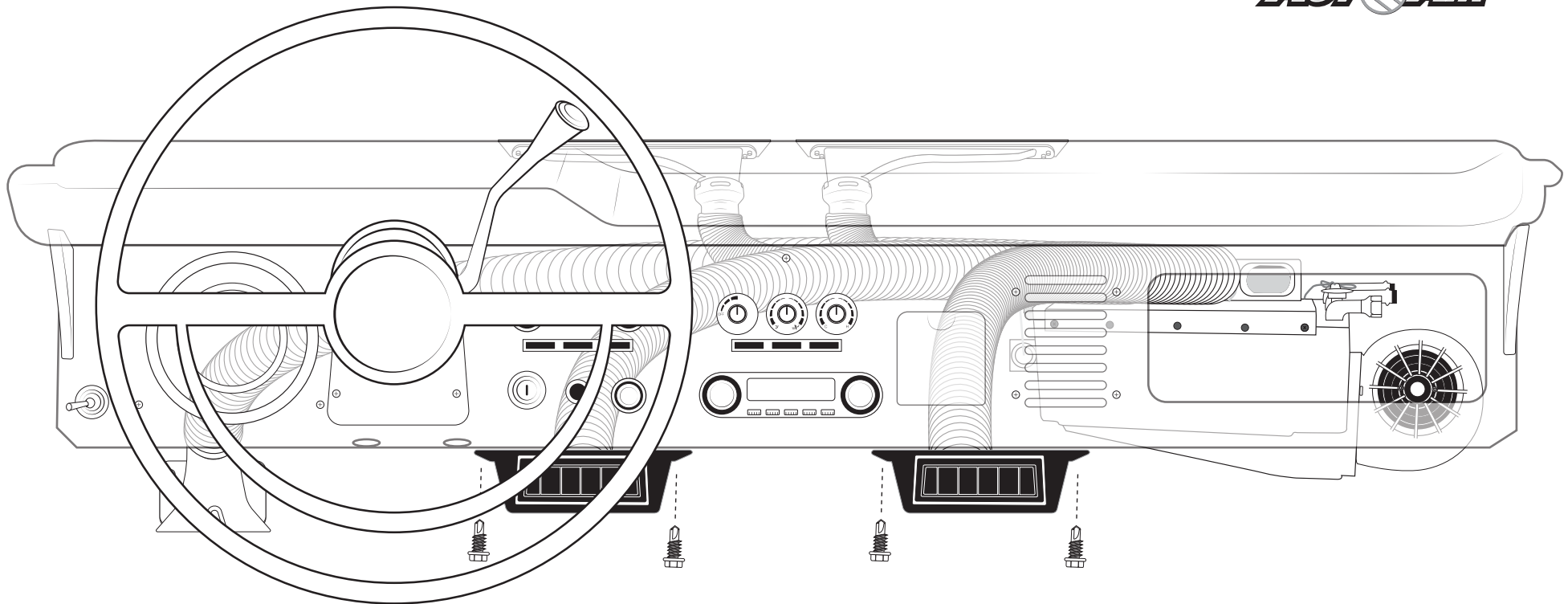
*Eight #10-14 3/4" Tek Screws
PN#10B75HW3Z*



*Eight Zip-Ties
PN#AL-08-40-0-M*



*Four Housing, Louver
PN#2-1038*

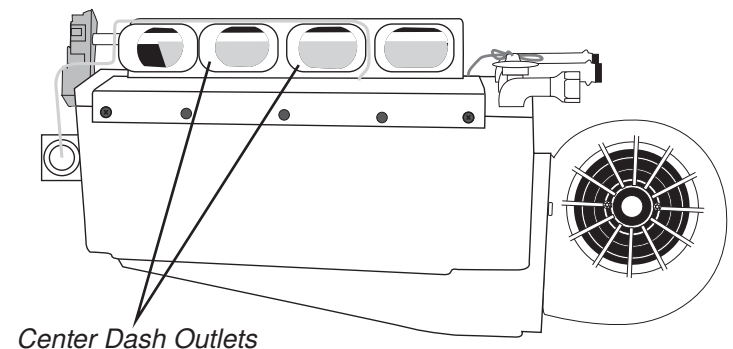


The smoother the route of the flex hoses the better the airflow.

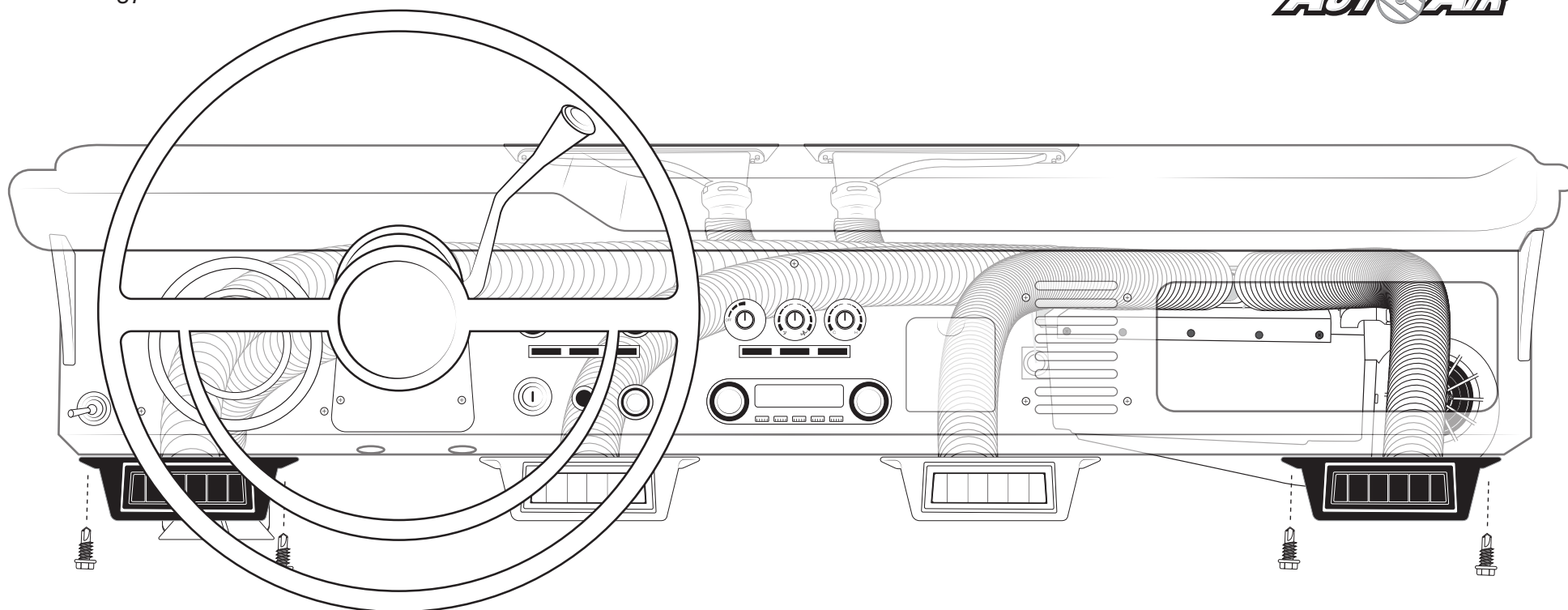
Attach lower dash louvers to the bottom of the dash using the included tek screws. Position the vents so that they won't interfere with any components.

Take your time and route the hoses so they don't become kinked or torn.

During installation of the hoses be aware of the eventual movement of the wiper arm components.



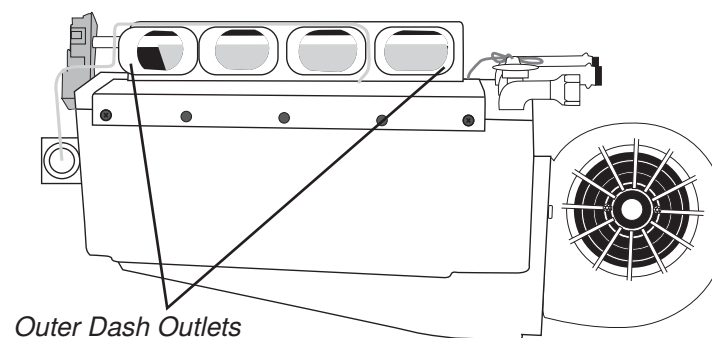
Center Dash Outlets



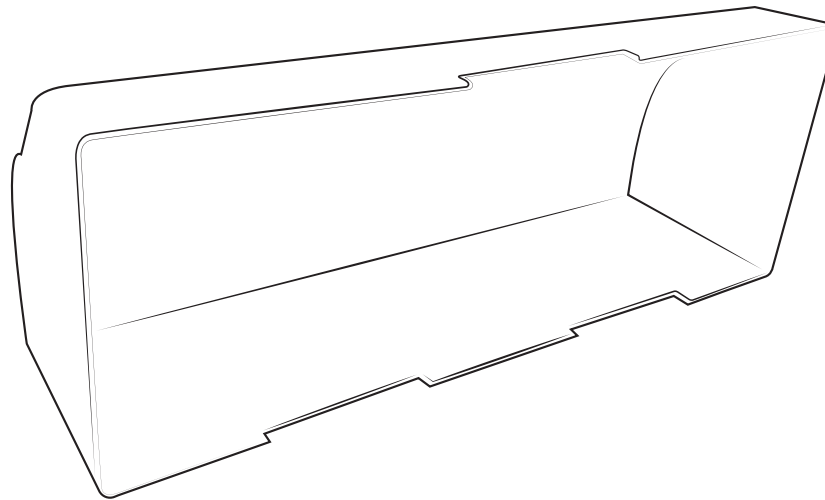
The smoother the route of the flex hoses the better the airflow.

Attach lower dash louvers to the bottom of the dash using the included tek screws. Position the vents so that they won't interfere with any components and so that the driver and passenger will get the best use of the airflow.

Route duct hose and attach with zip-ties.

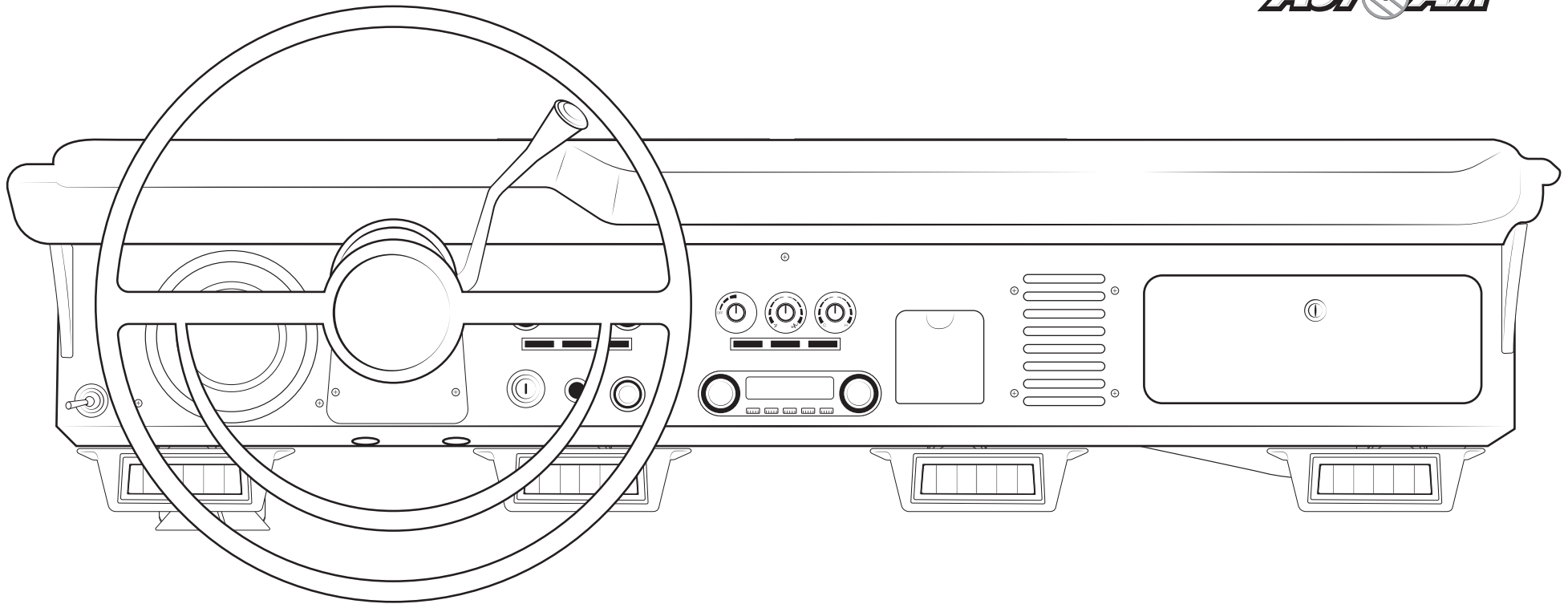


Outer Dash Outlets



We've included a replacement glovebox that you can install at this point. Attach the new glovebox to the OEM glovebox door.

This completes the interior portion of the **Smart A/C Series** installation process. This is a good time to make a final check that all the controls still move freely and that nothing is loose or hanging down.

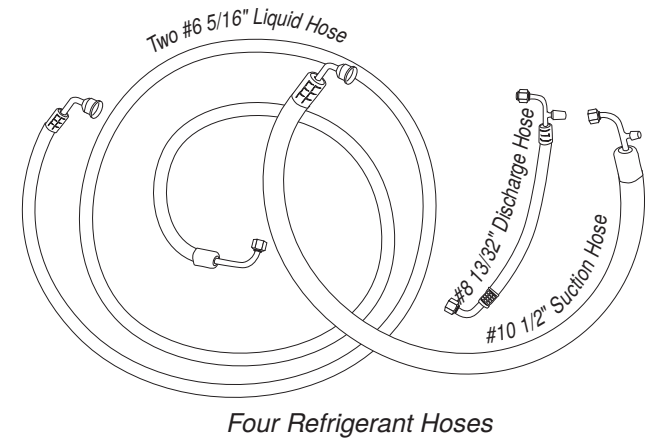
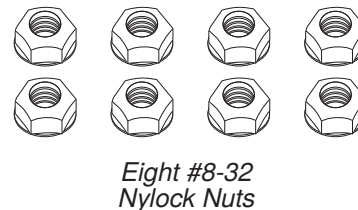
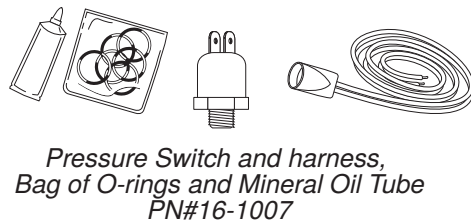
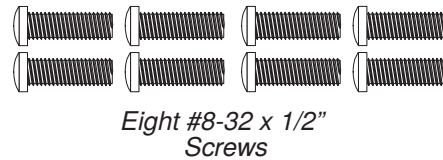
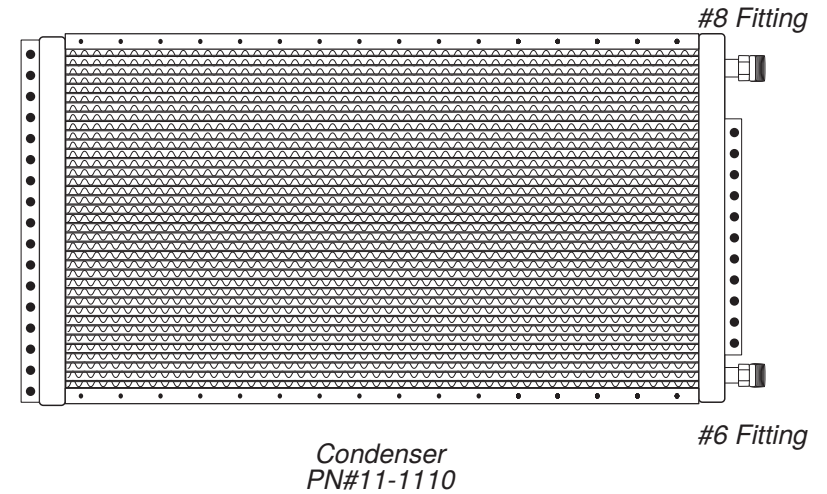
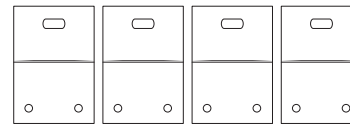
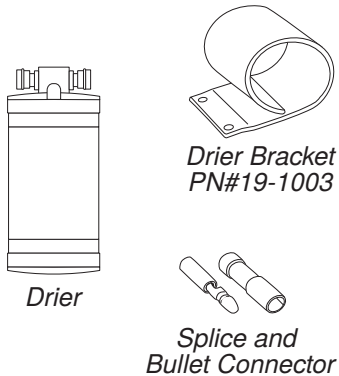


The interior of your car should look like the above picture. Plus you probably got to know the underside of your dash a lot better and might even have repaired or upgraded components that needed attention.

If you have any questions before you move on the final phase of this installation, call us.

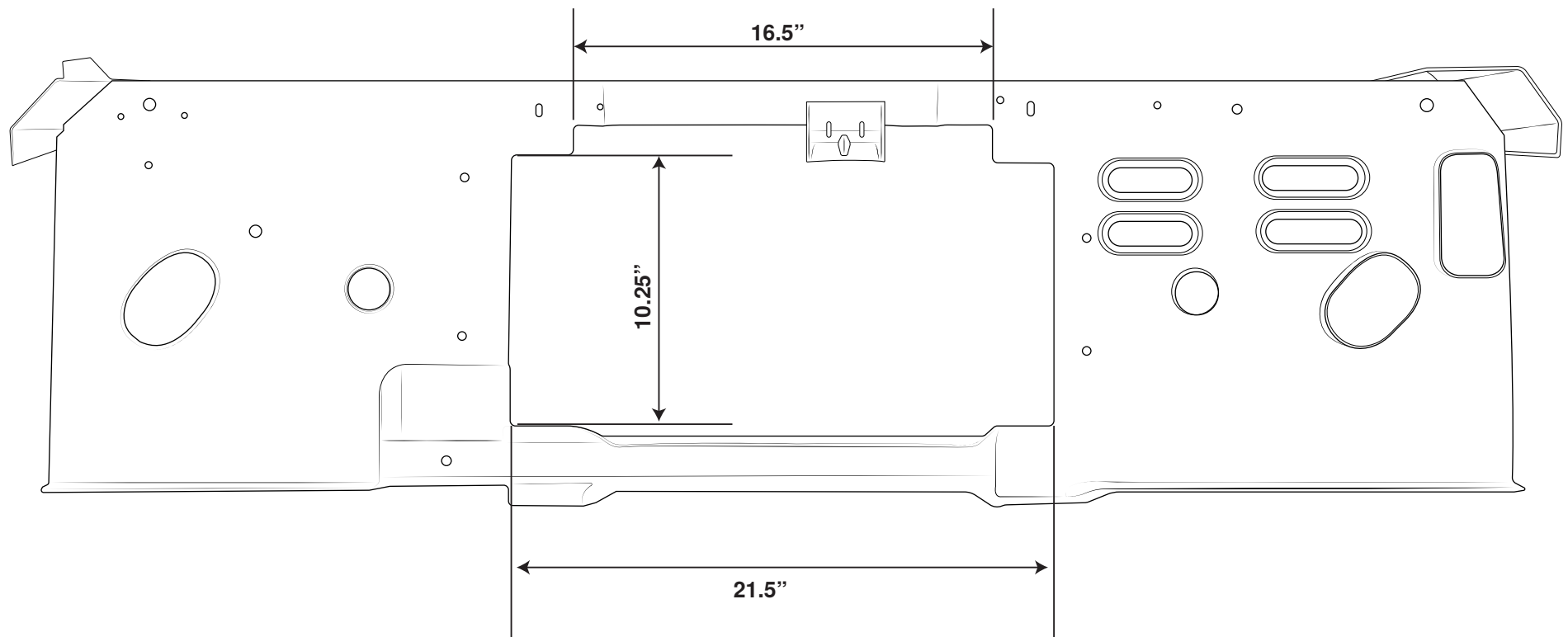
Let's move on to the major components within the engine compartment.

THESE ARE THE PARTS YOU WILL NEED FOR THE ENGINE COMPARTMENT INSTALLATION FOR YOUR FORD BRONCO 66-77



This Condenser Mounting is Designed off a V8 Core Support

Check the dimensions below. If your support varies, some modifications will need to be made per your specific vehicle.

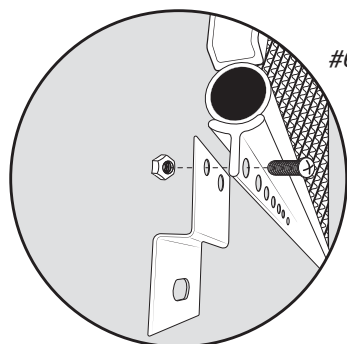
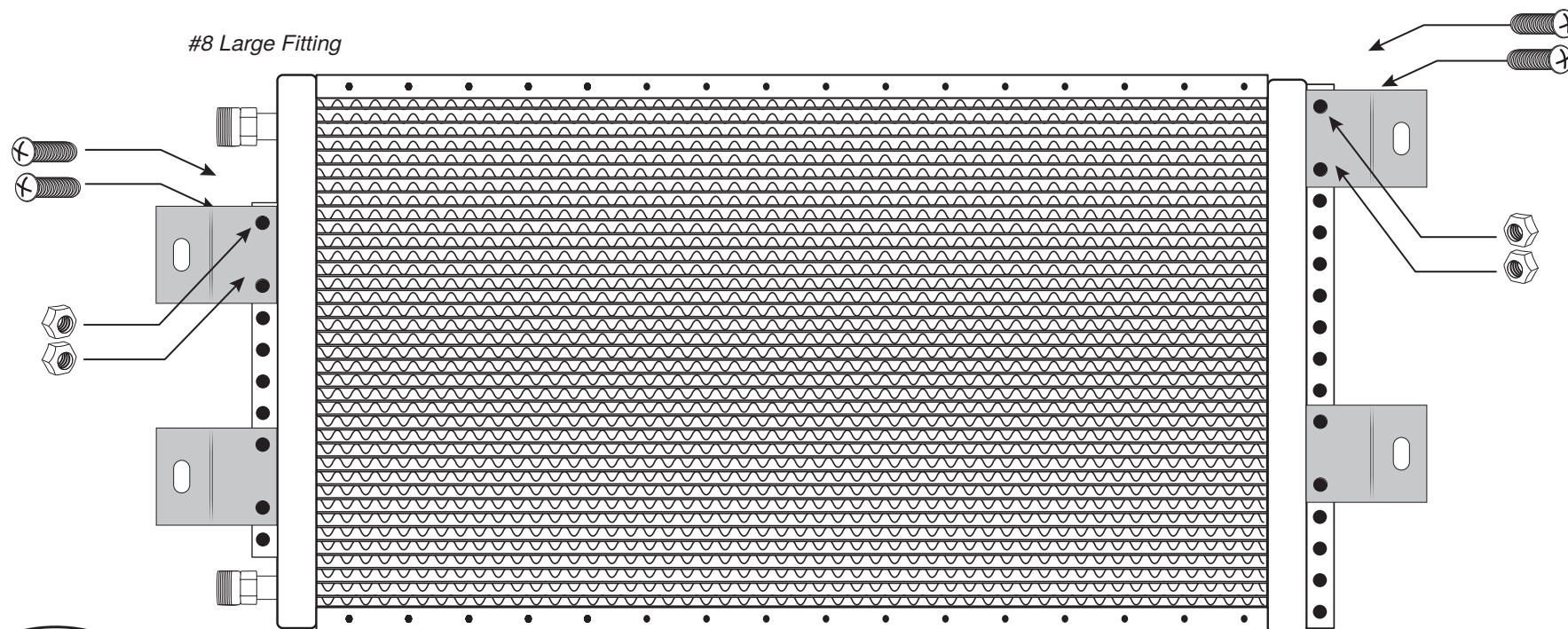


DRIER AND CONDENSER PREPARATION. You can perform most of the following steps on a clean flat surface like a workbench. Lay the condenser down so that both hose connections are on the left side (the larger connection will be on top).

UPPER BRACKETS:

Install the *TOP Left* condenser bracket at the *TOP HOLE* using two #8-32 x 1/2" screws and two #8-32 Nylock Nuts as shown.

Install the *TOP Right* condenser bracket at the *TOP HOLE* using two #8-32 x 1/2" screws and two #8-32 Nylock Nuts as shown.



#6 Small Fitting

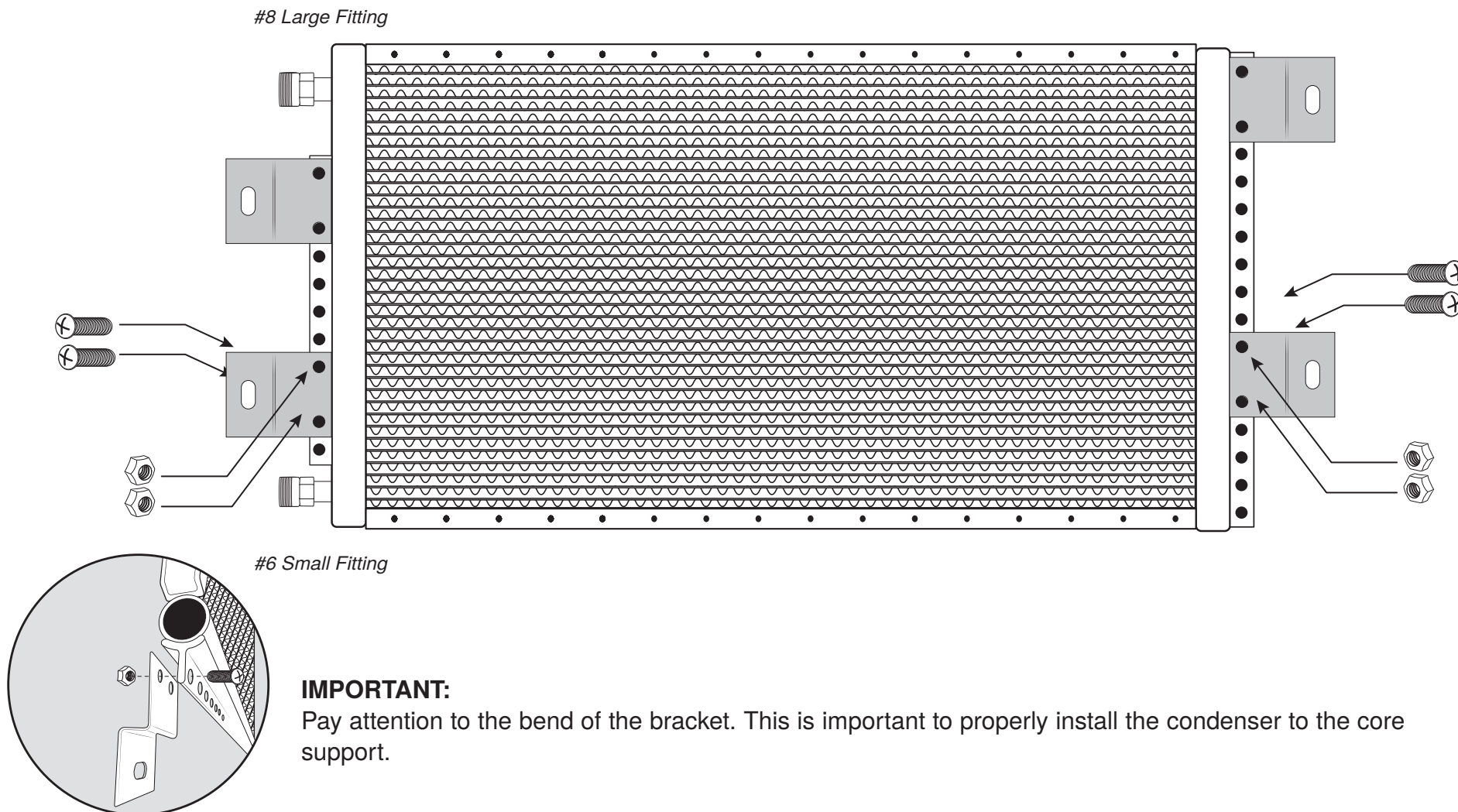
IMPORTANT:

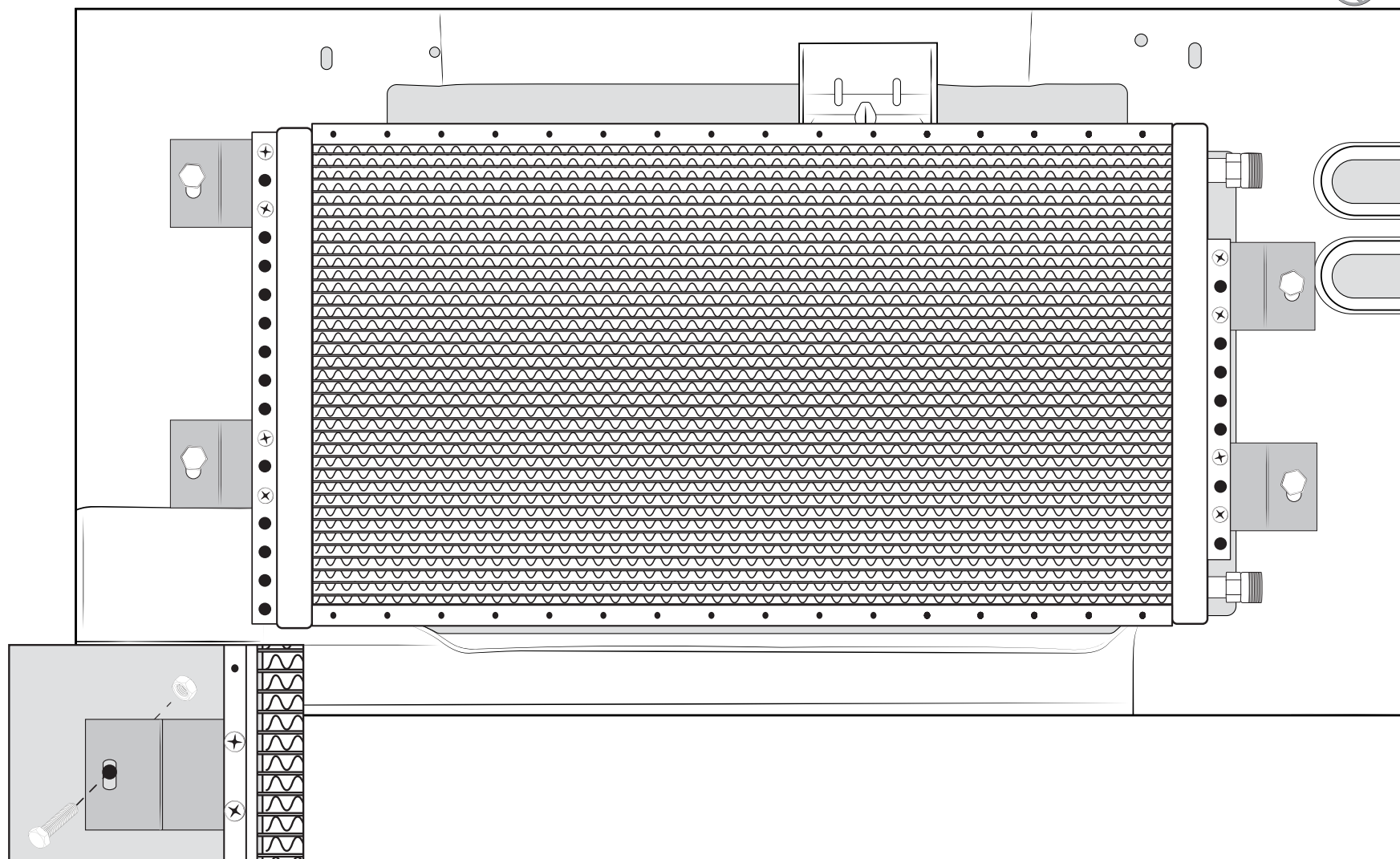
Pay attention to the bend of the bracket. This is important to properly install the condenser to the core support.

LOWER BRACKETS:

Install the *LOWER Left* condenser bracket at the *2nd hole* from the bottom using two #8-32 x 1/2" screws and two #8-32 Nylock Nuts from behind as shown.

Install the *LOWER Right* condenser bracket at the *5th hole* from the bottom using two #8-32 x 1/2" screws and two #8-32 Nylock Nuts from behind as shown.

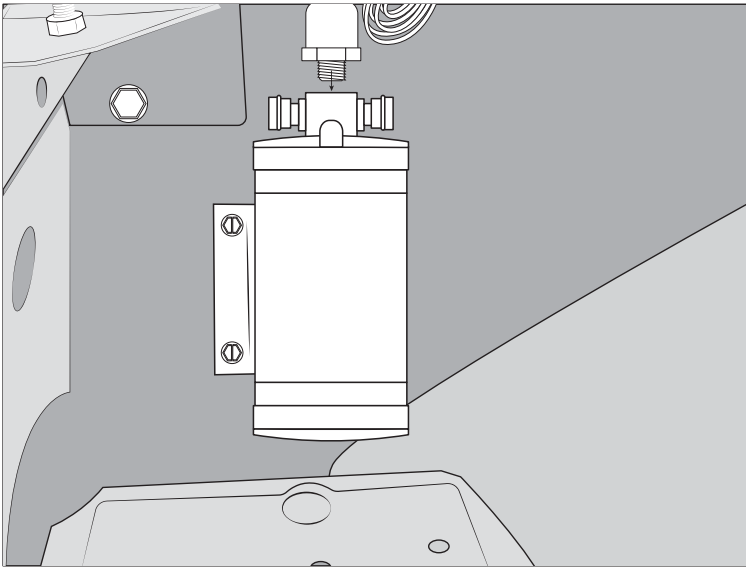




Remove Radiator Fan, Shroud and the Radiator. Retain the original mounting hardware.

Slide condenser assembly so that condenser is on engine side of the radiator support. Center the condenser and match drill mounting brackets and attach using Four #1/4 x 5/8" Bolts and Four #1/4 Flange Nuts. Note that the bolts are coming from inside the engine bay.

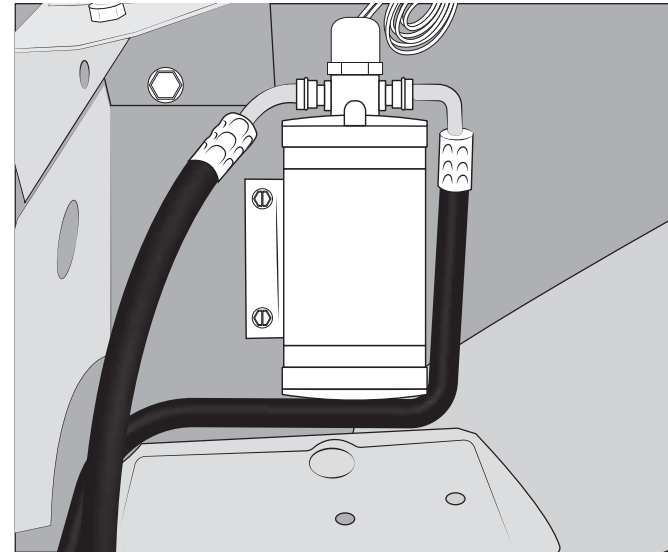
Your condenser should now be mounted.



Locate the Receiver / Drier, hi/low pressure switch, Drier Mounting bracket, and (2) #10 x $\frac{3}{4}$ " tek screws. Attach bracket to the drier and then the assembly to inner fender liner behind battery box using the (2) # 10 x $\frac{3}{4}$ " tek screws.

PRESSURE SWITCH: Screw the high-pressure switch into the port on the top of the drier (see figure 31). Go ahead and plug the pressure switch harness into the switch at this time (black electrical boot with two long white wires).

One of the wires attaches to white clutch wire from relay and the other to the compressor clutch.

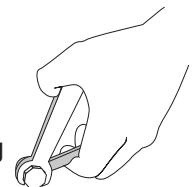


Locate the liquid hoses and four #6 o-rings. Attach liquid hose to condenser. Attach liquid hoses to the drier using one #6 o-ring and few drops of lubricating oil . Route to connection on firewall using O-rings and supplied lubricating oil.

Locate the discharge hose and one #8 o-ring. Attach discharge hose to the condenser using one #8 o-ring and few drops of lubricating oil. Route to connection on compressor using o-ring and supplied lubricating oil.



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



Connecting the Hoses



Install the compressor kit. Included was a premium compressor kit with all the parts you'll need to install the compressor. This kit includes instructions specifically written for your engine. Once you've installed the complete compressor kit, continue on to connecting the hoses.

CONNECTING THE HOSES:

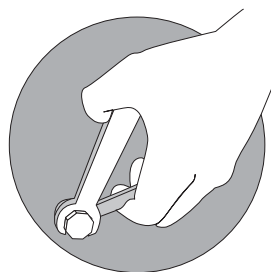
Based on PASSENGER or DRIVERS SIDE compressor mounting see illustrations for routing.

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

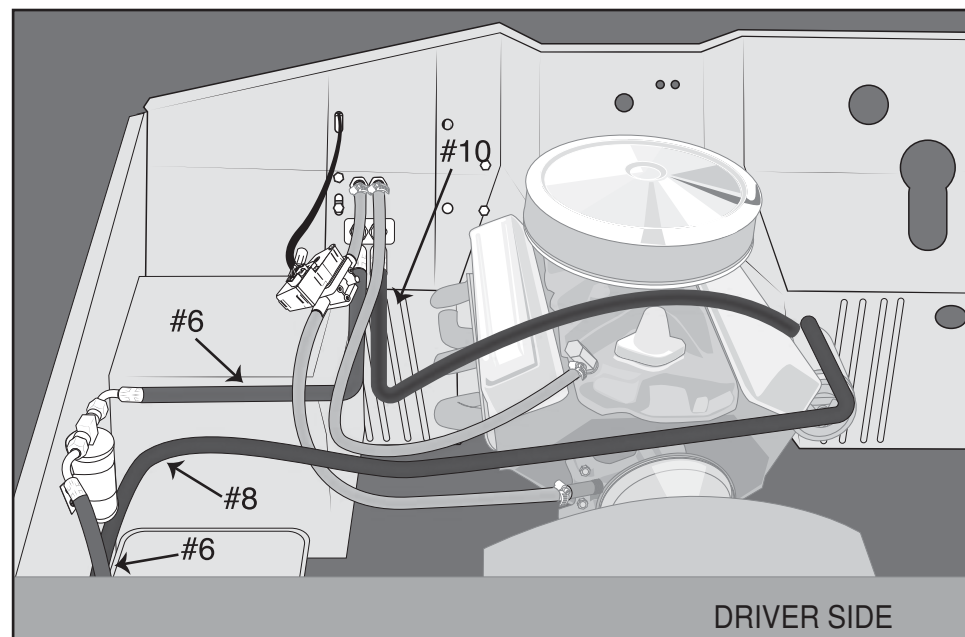
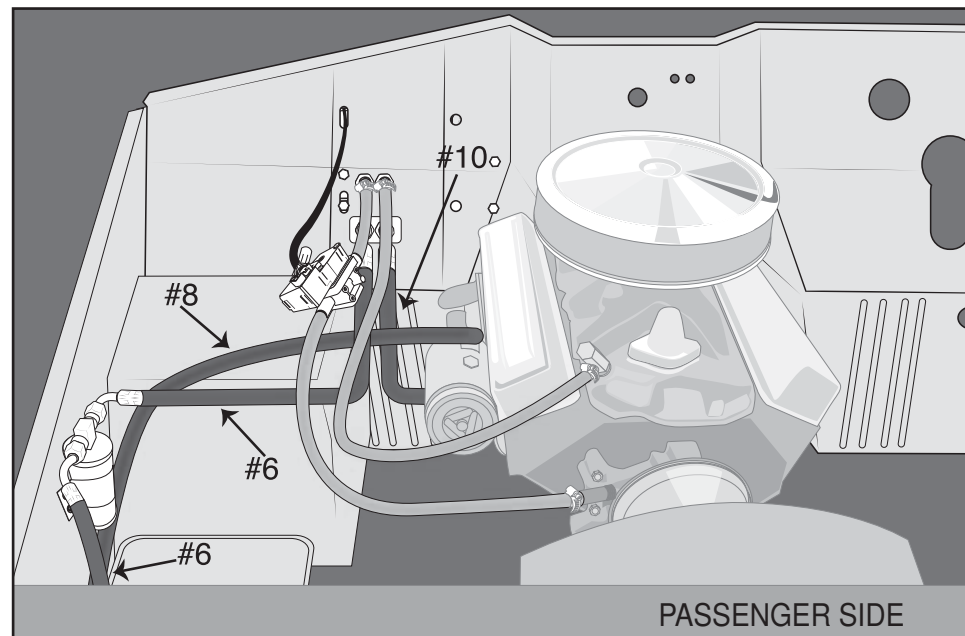
The #6 (**SMALLEST**) refrigerant hose. Route behind fender and to the connection on firewall. Attach using two #6 o-ring and a few drops of mineral oil.

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

TWO WRENCH METHOD



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



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

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

A licensed A/C technician should be utilized for these procedures to insure that your new system will perform at it's peak, and that your compressor will not be damaged.



- 1) Your radiator/cooling system is an integral part of your new system. Please insure that you have a 50/50 mix of distilled water and antifreeze. The heater coil **MUST** be purged (cycle heater control valve) to make sure no water, without antifreeze, is in the heater coil before you charge the A/C system.
- 2) Evacuate the system for 45 minutes (minimum).
- 3) **Your new compressor MUST be hand-turned 15-20 revolutions before and after charging with liquid. Failure to do this may cause the reed valves to become damaged** (this damage is NOT covered by your warranty).
- 4) Your new system requires 134a refrigerant. It will require 1.5 lbs (or 24 oz).
- 5) Your new compressor comes charged with oil - NO additional oil is needed.
- 6) Insure that the new belt is tight.
- 7) **DO NOT CHARGE SYSTEM WITH LIQUID REFRIGERANT!**

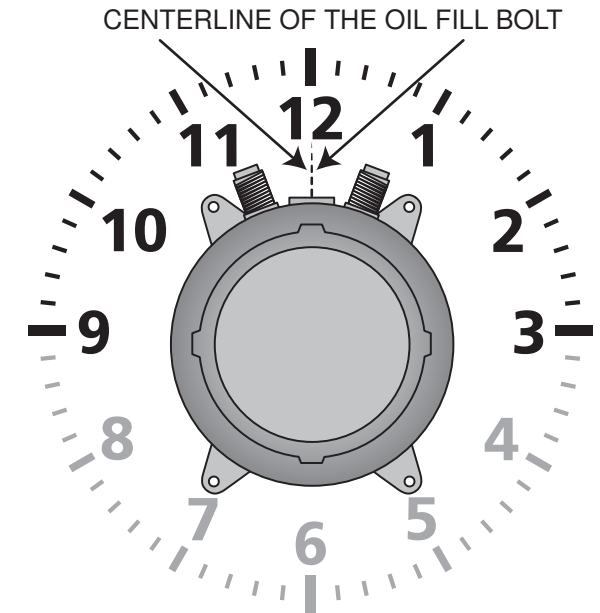
RECOMMENDED TEST CONDITIONS: (After system has been fully charged and tested for basic operation)

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

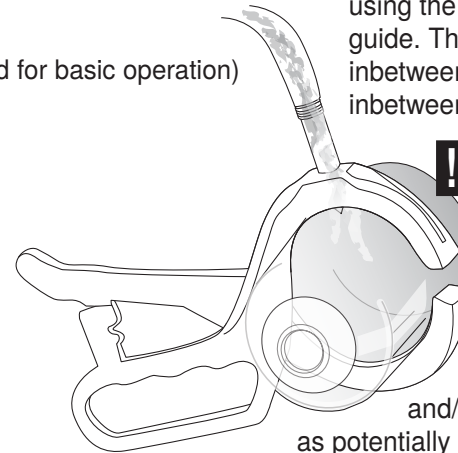
ACCEPTABLE OPERATING PRESSURE RANGES:

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

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



CAUTION! When mounting your compressor and/or adjusting the belt use caution. Mount by using the centerline of the oil fill plug as your guide. The compressor can **ONLY** be mounted inbetween the 9 to 3 positions. **DO NOT** mount inbetween the 4 to 8 positions.



Do NOT tilt, shake or turn refrigerant can upside-down OR use a charging station to install refrigerant while the engine is running. Doing so will direct liquid refrigerant into the compressor piston chamber, causing damage to reed valves and/or pistons and/or other components, as well as potentially seizing the compressor. Allow a minimum of 30 minutes for liquid to "boil off." You must hand turn the compressor hub (not the pulley) a minimum of 15 complete revolutions prior to starting the engine with the clutch engaged.

TROUBLESHOOTING GUIDE

TEST CONDITIONS USED TO DETERMINE SYSTEM OPERATION
(THESE TEST CONDITIONS WILL SIMULATE THE AFFECT OF DRIVING THE VEHICLE AND GIVE THE TECHNICIAN THE THREE CRITICAL READINGS THAT THEY WILL NEED TO DIAGNOSE ANY POTENTIAL PROBLEMS).

- B. CONNECT GAUGES OR SERVICE EQUIPMENT TO HIGH/LOW CHARGING PORTS.
- C. PLACE BLOWER FAN SWITCH ON MEDIUM.
- D. CLOSE ALL DOORS AND WINDOWS ON VEHICLE.
- E. PLACE SHOP FAN IN FRONT OF CONDENSER.
- F. RUN ENGINE IDLE UP TO 1500 RPM.

ACCEPTABLE OPERATING PRESSURE RANGES (R134A TYPE)

- 1. HIGH-SIDE PRESSURES (150-275 PSI) **Note- general rule of thumb is two times the ambient (daytime) temperature, plus 15-20%.*
- 2. LOW-SIDE PRESSURES (10-25 PSI in a steady state).

CHARGE AS FOLLOWS: R134A = 24 OZ.

NO ADDITIONAL OIL IS NECESSARY IN OUR NEW COMPRESSORS.

TYPICAL PROBLEMS ENCOUNTERED IN CHARGING SYSTEMS

NOISY COMPRESSOR. A noisy compressor is generally caused by charging a compressor with liquid or overcharging

- A. If the system is overcharged both gauges will read abnormally high readings. This is causing a feedback pressure on the compressor causing it to rattle or shake from the increased cylinder head pressures. System must be evacuated and re-charged to exact weight specifications.
- B. Heater control valve installation - Installing the heater control valve in the incorrect hose. Usually when this occurs the system will cool at idle then start to warm up when raising the RPM's of the motor. THE HEATER CONTROL IS A DIRECTIONAL VALVE; MAKE SURE THE WATER FLOW IS WITH THE DIRECTION OF THE ARROW. As the engine heats up that water transfers the heat to the coil, thus overpowering the a/c coil. A leaking

or faulty valve will have a more pronounced affect on the unit's cooling ability. Installing the valve improperly (such as having the flow reversed) will also allow water to flow through, thus inhibiting cooling. Check for heat transfer by disconnecting hoses from the system completely. By running down the road with the hoses looped backed through the motor, you eliminate the possibility of heat transfer to the unit.

- C. Evaporator freezing - Freezing can occur both externally and internally on an evaporator core. External freeze up occurs when the coil cannot effectively displace the condensation on the outside fins and the water forms ice (the evaporator core resembles a block of solid ice), it restricts the flow of air that can pass through it, which gives the illusion of the air not functioning. The common cause of external freezing is the setting of the thermostat and the presence of high humidity in the passenger compartment. All door and window seals should be checked in the event of constant freeze-up. A thermostat is provided with all units to control the cycling of the compressor.
- D. Internal freeze up occurs when there is too much moisture inside the system. The symptoms of internal freeze up often surface after extended highway driving. The volume of air stays constant, but the temperature of the air gradually rises. When this freezing occurs the low side pressure will drop, eventually going into a vacuum. At this point, the system should be checked by a professional who will evacuate the system and the drier will have to be changed.
- E. Inadequate airflow to condenser - The condenser works best in front of the radiator with a large supply of fresh air. Abnormally high pressures will result from improper airflow. Check the airflow requirements by placing a large capacity fan in front of the condenser and running cool water over the surface. If the pressures drop significantly, this will indicate the need for better airflow.
- F. Incorrect or inadequate condenser capacity - Incorrect condenser capacity will cause abnormally high head pressures. A quick test that can be performed is to run cool water over the condenser while the system is operating, if the pressures decrease significantly, it is likely a airflow or capacity problem.
- G. Expansion valve failure - An expansion valve failure is generally caused by dirt or debris entering the system during assembly. If an expansion valve fails it will be indicated by abnormal gauge readings. A valve that is blocked will be indicated by high side that is unusually high, while the low side will be unusually low or may even go into a vacuum. A valve that is stuck open will be indicated by both the high and low pressures rising to unusually high readings, seeming to move toward equal readings on the gauges.
- H. Restrictions in system - A restriction in the cooling system will cause abnormal readings on the gauges. A high-side restriction (between the compressor and the drier inlet) will be indicated by the discharge gauges reading excessively high. These simple tests can be performed by a local shop and can help determine the extent of the systems problem.

Trouble Shooting Your Classic Auto Air A/C System

PROBLEM: system is not cooling properly

ISSUE: cold at idle, warmer when raising engine RPM's

Make sure the Water Valve is positioned correctly

The water valve is a directional valve and should be installed with the arrow pointing towards the water pump, it should be connected to the heater hose that runs from the heater core to the water pump. If the water valve is connected to the incorrect hose it allows water to circulate through the system via the heater core over powering the cooling effect of the A/C coil, (normally the air conditioning is functioning properly).

Step 1: Check placement of the water valve, correct if needed. (In some cases changing the location of the water valve may not fix the above problem.) Continue to next step.

Step 2 If changing the location of the water valve does not rectify the issue, then possibly the water valve is permanently damaged and may need to be replaced. To check the integrity of the water valve completely remove the water hoses for the heater core and "loop" together. (This will remove the heater system completely from the possibilities) If the system now cools, replace the water valve

Verify Adequate Air Flow to Condenser

For an air conditioning system to function properly there has to be adequate airflow across the condenser. The function of the condenser is to dissipate heat, without proper airflow your system will not cool correctly in the cabin of your vehicle.

Step 1: connect gauges to a/c hoses. The pressures should be: with the ambient temp is 90, low side pressures should be between 10-25 psi, high side pressures should be between 150-275 psi

Step 2: IF the low side pressures are normal and the high side pressures are high then there might be an airflow issue, continue to next step.

To test air flow to Condenser do the following three tests:

1. Place a piece of paper on the condenser with the car in idle and see if paper is held in place.
2. With car in idle, attach gages, and place a large capacity fan in front of the condenser. What happens to the pressures?

3. With car still in idle and gages attached, pour water down the front of the condenser. What happens to the pressures?

If the paper is held in place you are at least getting some air flow. If the high side decreases during test 2 & 3 then your condenser is not getting enough air which is causing your system to not cool properly. To correct this issue you will need a more powerful mechanical fan.

Step 3: Confirm correct Refrigerant charge in System

All of our systems should be charged with 24 oz or 1.5 lbs of R134A Refrigerant only. If overcharged you will need to evacuate the system and recharge with the correct amount.*

What measurements mean:

Low Temp and High Pressure seem to be equal...

You have a malfunctioning expansion valve that is stuck open.

High Side is extremely high and Low Side is extremely low (possibly into vacuum)...

There is a blockage in the system. Remove hoses and blow compressed air through in both directions. If pressures don't change its possible that your expansion valve is stuck closed and would have to be replaced.

*Compressor Concerns:

This is often misdiagnosed as a problem for the system not cooling properly. If you have a noisy compressor it is due to improper charging of refrigerant. An overcharged (more than 24 oz or 1.5 lbs R134A) compressor can cause rattling. If charged with pure liquid there is a high probability you have bent reed valves that are causing tapping sound.

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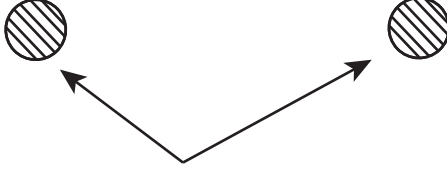


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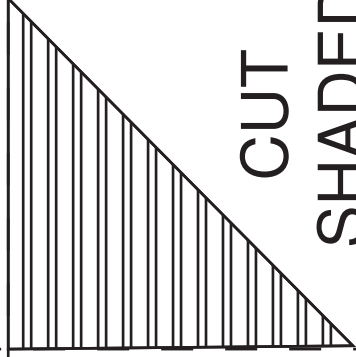


FOLD ALONG THIS



DRILL HOLE

FOLD



CUT
SHADED
AREA

TEMPLATE: Transmission

