

# **Installation Manual**

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## **1969-89 Porsche 911 (Non-Turbo)**

*Left Hand Drive Kit*

DOCUMENT #RA-1-1000

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# ***Congratulations...***

**You have just purchased the highest quality, best performing A/C system ever designed for your 1969-89 Porsche 911.**

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

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

Again, thank you from our entire staff.



## Check List, Pre-Installation:

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 During the installation you might find the opportunity to repair or upgrade non-working or out of date components.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

## Procedures, During Installation:

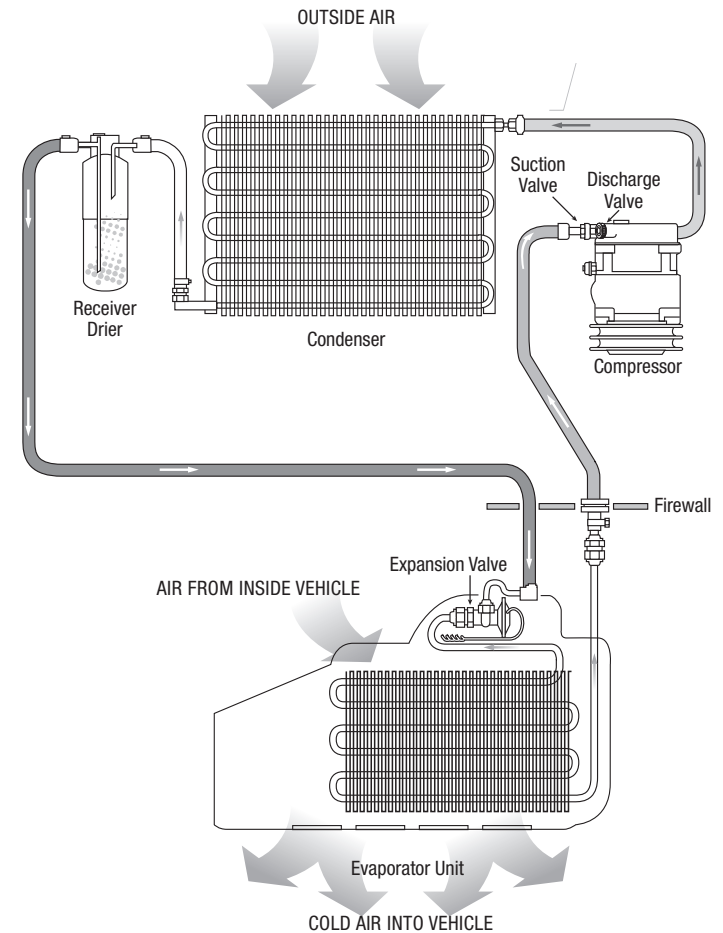
- Fittings: Use one or two drops of mineral oil (supplied with your kit) on ALL rubber o-rings, threads and rear of bump for o-ring where female nut rides. Do not use thread tape or sealants.
- Measure twice (or more), cut once
- Should you have any technical questions, or feel you have defective components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

***YOU CAN NOW BEGIN THE INSTALLATION...***

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

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

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





The box is split to facilitate installation in a non-A/C equipped car. With the bottom of the case empty and using it for a pattern, the case round hole in the lower driver's side should fit over the existing round, protruding rim built into the body. The case hole may need to be modified to fit correctly. If you're unable to get it to fit, the protruding rim may have to be cut off, even with the sheet metal. Mark the Evaporator drain hole at the bottom of the box sheet metal.

**CHECK ALL CLEARANCES ON BOTH SIDES FOR ANY INTERFERENCE!**

If all appears good, carefully trace the lower, trapezoid opening onto the firewall, making sure there is no interference with anything inside the car. That area will have to be cut out so the trapezoid intake flange can be snugly inserted into the box from inside the car. The next step will be to mark and cut a 3" diameter hole in the firewall (see pictures) for the airflow going to the louvers inside the car. The 3" hose adapter with the square mounting flange is screwed to the firewall in the Smugglers Box and sealed in the evaporator side and connected with the 3" hose clamps when ready. Inside the car, the "Y" adapter is fastened to the firewall in line with the outer Adapter making sure there are no airflow obstructions. Use silicone sealer when installing these parts. Before installing case into the box, place the Evaporator in the case, with outlets to the left, and assemble the case with the 1/8" rivets enclosed. This is a very tight fit and since there is not much of a lip, it may be necessary to tape the case assembly to install the rivets. Silicone may be an alternative method. Let it dry overnight and install in opening. Use enclosed small foam gasket around drain.



The louver plenum should be mounted with included brackets on either side of the ash tray, with the fan switch unit closest to the driver. The 2 ½” hose adapters need to be close to the “Y” outlet already mounted on the firewall. Double check all clearances and determine if you are going to leave the under-dash knee pads in place. Connect the louver assembly to the “Y” outlet with the enclosed 2 ½” duct hose. Fasten with the tie wraps to ensure an airtight fit. The temperature switch is on the right louver assembly and its capillary tube will go through the firewall, using the included grommet, and through the designated hole in the top of the case and into the evaporator core, at least, 1 ½” (38mm) not counting the space between the Box and the Evaporator Core. This can be done by performing the hole with a dull pointed rod or Phillips screw driver.



The 3 Speed Fan Switch has 5 connectors on the back – connect the wires as follows: Black to “B” (Bottom Left), Red to “M” (Top Center), Yellow to “L” (Middle Left), Orange to “H” (Middle Right). The remaining Blue wire is connected to either side of the Thermostatic Switch. The short Blue wire goes from “C” (Bottom Right) on Fan Switch to the other thermostat connector. Test with Motor Connected! Install the wire connector on the free compressor wire to the wire running along the #10 Hose from the Evaporator and Receiver/Drier Hi/low pressure switch wiring harness. Establish a connection to “switched ignition” source with the included length of Black wire, so the unit is "live" when the switch is on and "dead" when the switch is off. The lone yellow with Black lead wire on the Motor will be attached to the vehicle's body for "GROUND". The red and blue wire should already be connected. Route all the wires out of the way of obstructions that may develop when assembled.





The Receiver/ Drier can be mounted under the L/F fender, to the rear, as original (see Picture) using the 2 Drier clamps included. The Long #6 Hose from the rear Condenser is attached to the lower Drier Fitting. The Upper Drier Fitting will accept the #6 Hose from the Evaporator. The Hi-Lo Pressure switch wiring goes from the switch through the "Smugglers Box", where one wire connects to the long blue wire from the Thermostatic Switch on the Plenum inside. The other Hi-lo switch wire will run along with the Large # 10 A/C Hose back to the Compressor. Use the enclosed wire and connectors.

Before installing the Multi-Flow Condenser with the brackets provided, “dry fit” the condenser to the engine lid. Make sure the condenser is not hitting the fan shroud or the rear body when the lid is closed!! Early model cars may have to reposition their Coil to allow the Condenser to clear! Put the center bracket (P911CND1) in place on the Condenser and mark where holes will have to be drilled. Attach the “L” shaped brackets (P911CND2) between the Condenser (using the Machine screws and “Nylon” nuts) and the hinges as in OE installations. (Hose connections will be on the left side (Drivers Side). Tie down the hoses with the enclosed metal hose clamps to the hinge as shown.

The small (#6) fitting is to the rear of the engine lid!! Do not tighten until all clearances and alignment is checked! Recheck after tightening!

This is a very tight fit- if the condenser is not mounted completely forward, the lid will not close correctly or the fan housing will damage it!



The Compressor is mounted 90° to the Right (see pic), with the enclosed Brackets using the attached illustrations as a guide. The Enclosed Pulley is mounted to the Crankshaft using the included Bolt and Washer

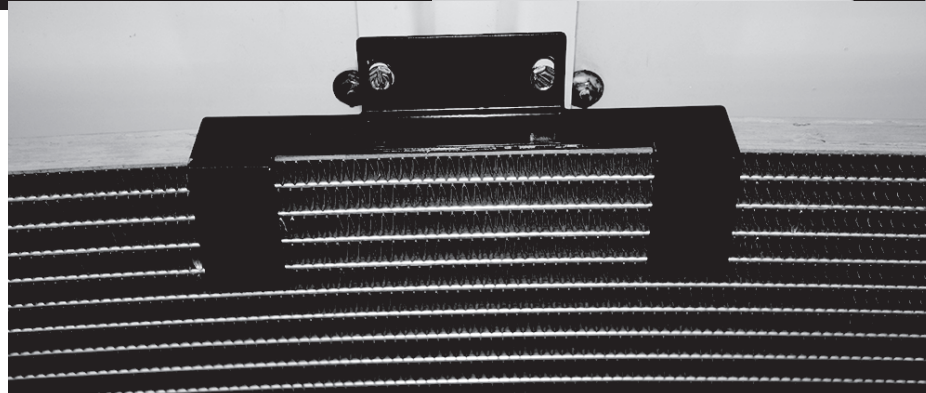
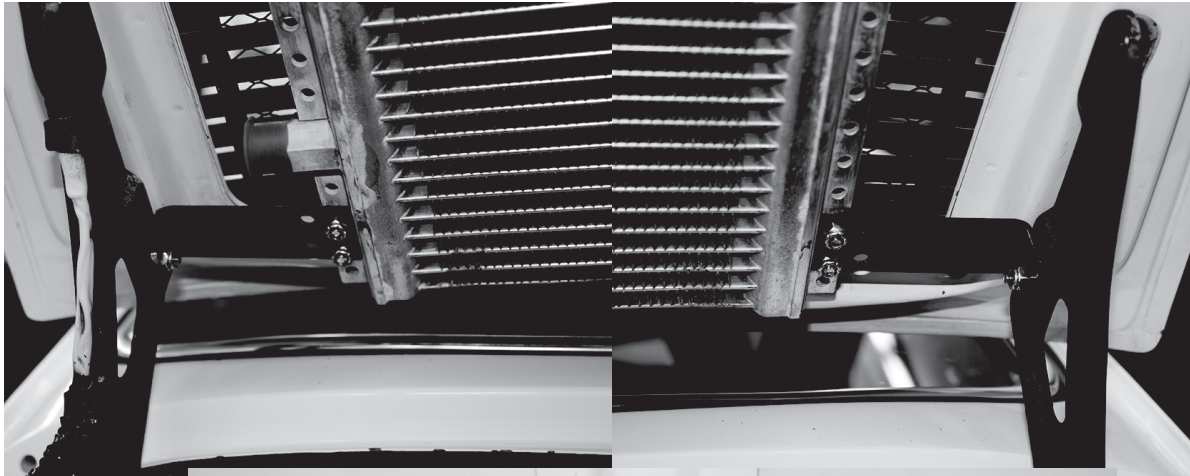


**“O” RINGS MUST BE LUBRICATED AND USED AT ALL HOSE CONNECTIONS!!**

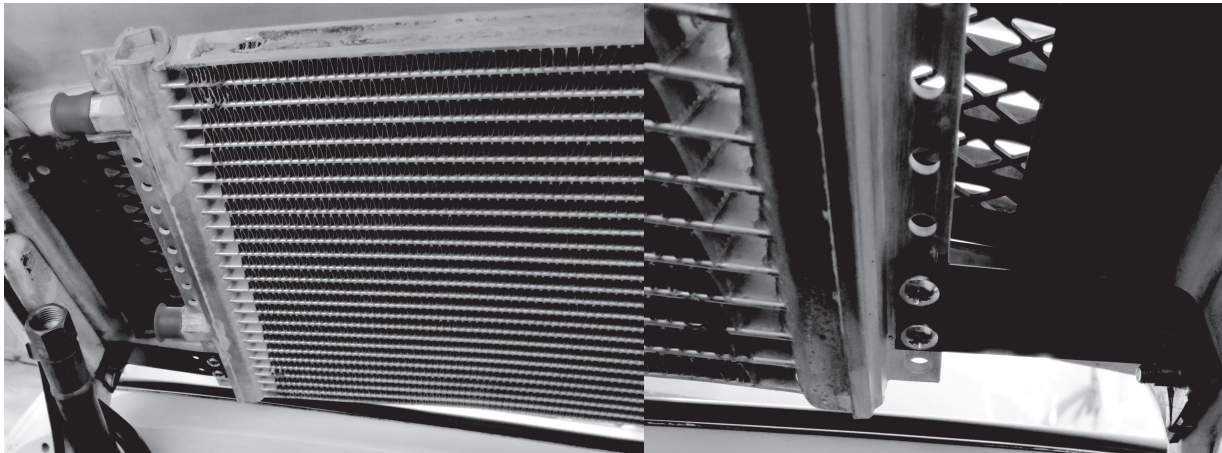
Before installing the hoses, review the Diagrams at the rear of these instructions. The smallest diameter, RA-00001-11 liquid hose will go from the lower Drier connection to the small connection on the rear Condenser, while RA-00001-10 liquid hose will go from the top Drier connection to the Expansion Valve already on the installed Evaporator/Blower Assembly Box. RA-00001-13 suction hose will go from the other Evaporator fitting and across the car (see picture) and down the right side to the compressor side (this would also be a good route for the Compressor wire, coming from the Wiring Harness in the “Smugglers Box”). RA-00001-12 discharge hose will go from the other Compressor fitting, around the back of the Engine and run up the Hinge next to the #6 hose coming from the front Drier. Some Foam around the Hoses may be needed to keep dust from entering the Engine Compartment.



After evacuating the system add approximately 16-24 oz. of R134A refrigerant, depending on Ambient Temperature. At 90-95 degrees Outside Temperature, we found the High Pressure should read approximately 200-225 PSI and the low side should read approximately 20-25 PSI. All of these pressures would be at "high Idle" (Approx. 1,000 RPM) and good airflow running through the Condenser. Do not use the sight glass to determine the amount of refrigerant- it is only for R12 refrigerant!

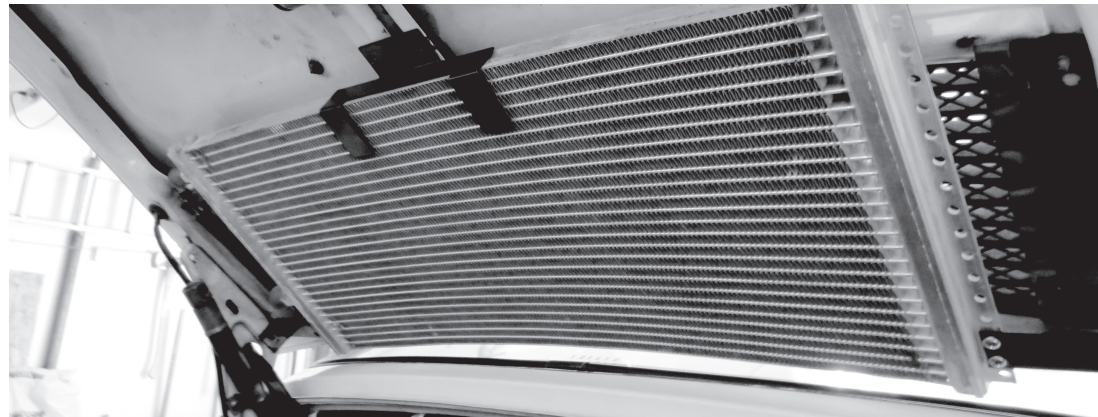


Before installing the new High Efficiency Condenser with the brackets provided, “dry fit” the condenser to the engine lid. MAKING SURE THE CONDENSER IS NOT HITTING THE FAN SHROUD, COIL OR THE REAR BODY WHEN THE LID IS CLOSED!! After installing the enclosed Hinge to Condenser Brackets, fit the new wide center bracket in place on the new Condenser and mark where holes will have to be drilled. The holes will be aligned with the old ones, except for being further to the rear of the car and the old clips and fasteners can be used. Attach the “L” shaped brackets to the Condenser using the Machine screws and “Nylon” nuts.

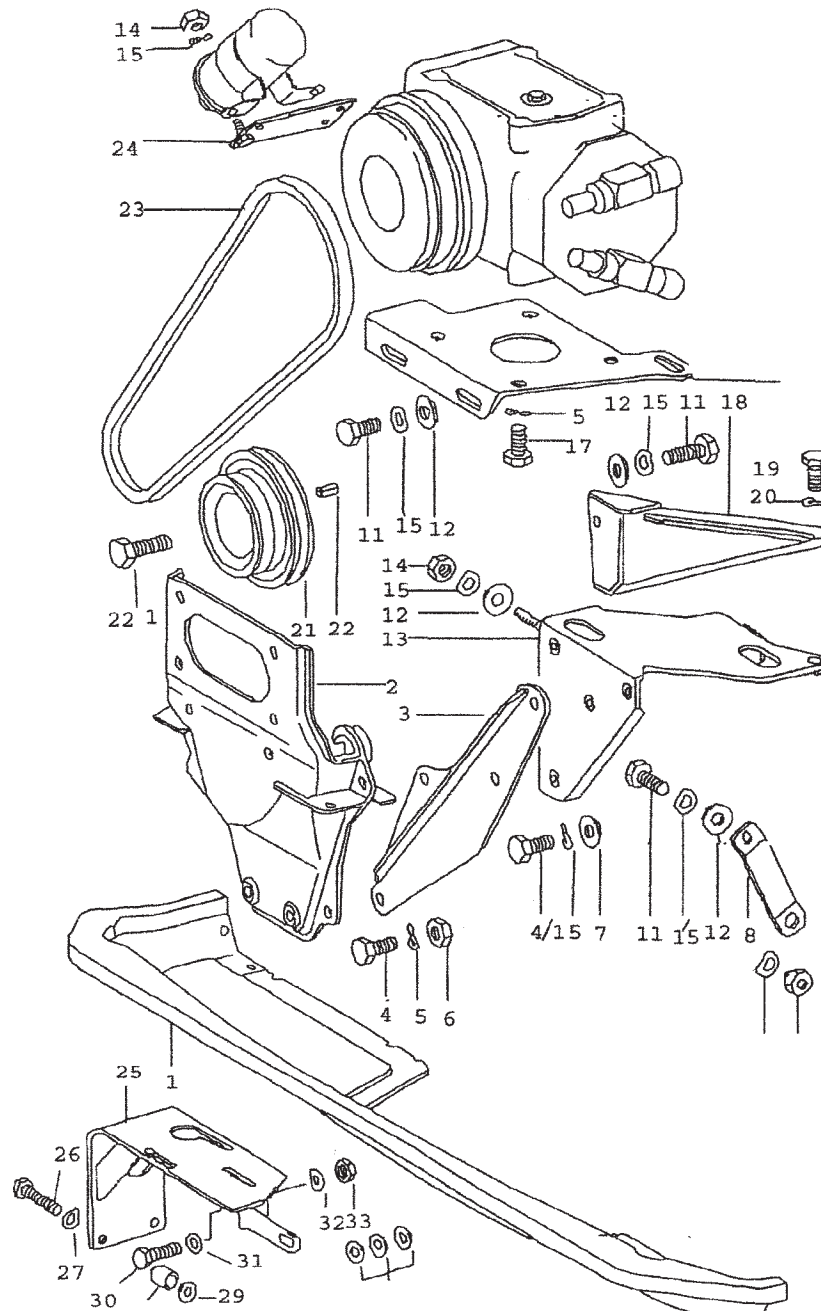


Use the old condenser connection on each side of the lid hinges for the other end of the new bracket. All new, 90° hose fittings will be on the left side (Drivers Side) and should be connected to the Lid hinge (as the original on the Right side) with the enclosed hose clamps. THE SMALL (#6) FITTING IS TO THE REAR OF THE ENGINE LID!!

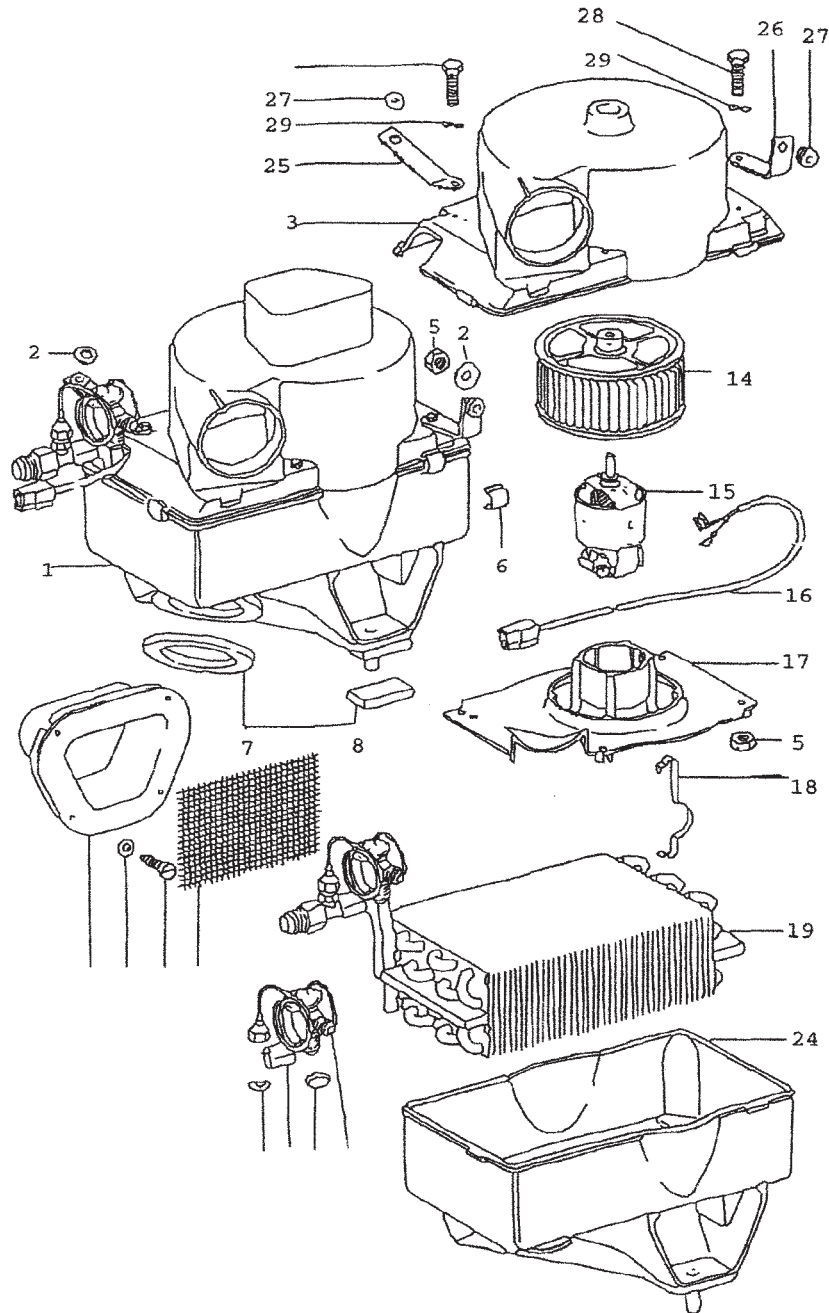
DO NOT TIGHTEN UNTIL ALL CLEARANCES AND ALIGNMENT IS CHECKED! RECHECK AFTER TIGHTENING!  
O-RINGS MUST BE USED AND LUBRICATED AT ALL HOSE CONNECTIONS!!

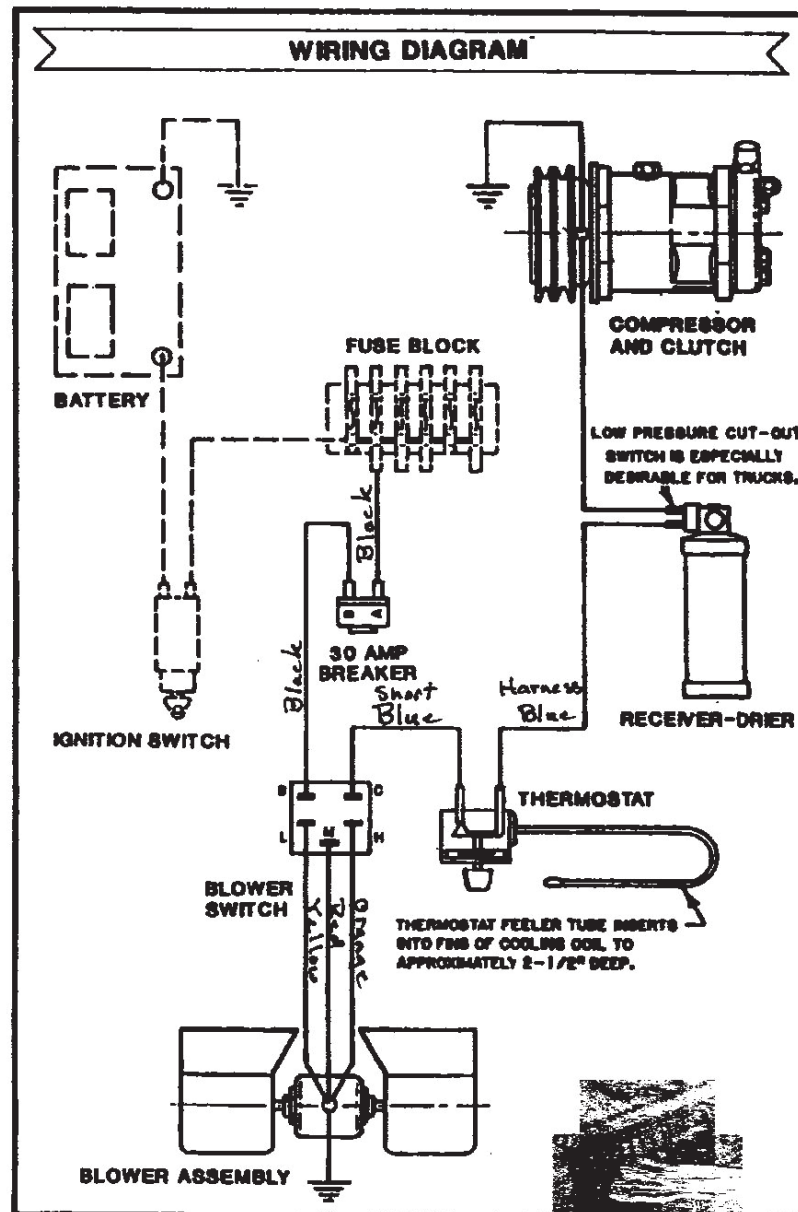














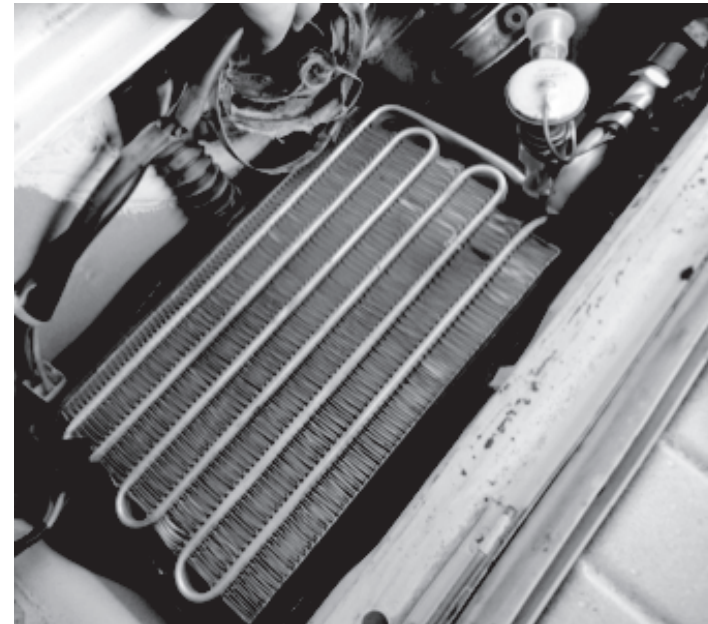
**REMOVE THE REAR CONDENSER FROM ENGINE LID, EVAPORATOR CASE ASSEMBLY, FRONT CONDENSER (IF REPLACING), RECEIVER/DRIER AND HOSE ASSEMBLIES AFTER LAWFULLY RECOVERING EXISTING REFRIGERANT.**

If using original Front Condenser and Compressor, they must be thoroughly Flushed, and Oil Changed to R134A Compatible Oil (Sanden-PAG 100) Before Completing This Upgrade!!

Before extracting the Evaporator Assembly from the "Smuggler's Box", carefully remove the capillary tube, electrical connections and hoses. You will also have to remove the Blower Motor Resistor/Air Intake Housing inside the car. Separate the top half of the box which houses the Blower Motor Assembly by removing the clamps on the side of the box. The Evaporator/Expansion Valve Assembly should be easily pulled from the bottom half.



After cleaning the box, the new, High Efficiency Evaporator can be installed after removing the rubber "bumpers" on the bottom of the lower box and one rubber bumper on the upper box, nearest the Hose connections. On later Models, Cut any Upper Cover Extension Pieces that will damage the New Evaporator before Replacing the Evaporator Case Cover. Install R134A Service Ports on Compressor - Do not use R12 Svc. Ports!!



There is an electrical connection to be made between the Hi-Lo Pressure switch and the Compressor Relay wire in the "Smuggler's Box". The wire will be cut in two with either one of the wires from the Hi-Lo switch will be attached to each end of the cut wire. All of the power to the Compressor goes through the switch. The switch will stop power from going to the Compressor if it detects a too low or too high pressure condition. The two wires from the switch should be run next to the hose from the drier and connected to the cut ends of the Harness Compressor wire with the enclosed Butt ends.



Before Installing REMOVE original blower and mounting plate, resistor on trapezoid air intake (drill out pop rivets holding it in) and blower wheel from motor (Being careful not to distort while removing).

Fit the new mounting plate in upper housing. Mark and drill the holes necessary to mount to the blower housing, and one hole to allow the capillary tube to enter the evaporator. Place the motor in the Motor Mount cradle without tightening it down. Check for clearance with the Evaporator top cover after attaching the old Blower wheel to the new motor, making sure the wheel is as close to the motor without rubbing.

Make sure the blower wheel is not hitting the top cover, and the motor "Button" on the bottom is not hitting the Evaporator Core. There should be approximately ¼" between the cradle venturi and the bottom of the blower wheel! Once that is done, correctly orient the wires to exit the case in the same direction of the original. Install and tighten the clamp around the motor after the correct depth is obtained. Clean & rough the edges of the Mounting Plate and the Motor Mount before applying epoxy to the edges and installing the enclosed screws to the Motor Mount cradle - we do not want the motor coming down onto the Evaporator Core.

Before drilling holes, make sure the motor Fan Hub is centered in top "button".

The enclosed Wire Harness can be connected directly to the OE Fan switch in the Console or spliced into the wires before the OE resistor at the Intake located behind the Passenger Floorboard. Using the enclosed wire connectors and shrink wrap, splice the original Porsche low speed wire to the new yellow wire. Then the original medium speed wire to the new red wire and the high speed to the new orange wire. The loose yellow/black wire on the motor goes to ground. Use the enclosed wire ties to eliminate loose wires.

Confirm that the motor is turning and the Fan speeds are correct! Removing the Resistor Pak is important to allow more re-circulated air to enter the system so there can be more volume expelled (higher CFM).

After testing and prior to reinstalling back in the Evaporator Box, Silicone seal the edges of the mounting plate where it meets the sides of the Box. Also seal the hole where the hose outlets exit the Evaporator Case with the enclosed Cork Sealing Tape. This will ensure air-tight performance.



The included center vent can be mounted with screws to the top of the center console, although this necessitates removal of the console components. We prefer not to disfigure the console with holes by using Black Silicone Sealant to adhere the vent to the console. It could then be removed without leaving holes in the console. Before mounting the vent, remove the lower center vent cover and rubber gasket. You should now have a tube showing with space around it. The enclosed 2" tubing should "screw" into the space and turn, at least, two times. That should secure the duct hose to the A/C Plenum. The other end gets attached to the vent and gets secured as described above using tape to hold it in place until completely dry.





**DO NOT USE THE SIGHT GLASS TO REGULATE THE R134A REFRIGERANT!**

The new Receiver/Drier should be an exact replacement for the old one except for the Hi-Lo Pressure switch, but will connect the same. The Hi-Lo Pressure switch wiring goes from the switch through the "Smugglers Box", where one wire connects to the wire from the Thermostatic Switch on the Plenum inside. The other Hi-lo switch wire will run along with the Large # 10 A/C Hose back to the Compressor. Use the enclosed wire and connectors.

Before installing the new Multi-Flow Condenser with the brackets provided, "dry fit" the condenser to the engine lid. Making sure the condenser is not hitting the fan shroud, coil or the rear body when the lid is closed! After installing the enclosed Hinge to Condenser Brackets, fit the new wide center bracket in place on the new Condenser and mark where holes will have to be drilled. The holes will be aligned with the old ones, except for being further to the rear of the car and the old clips and fasteners can be used. Attach the "L" shaped brackets to the Condenser using the Machine screws and "Nylon" nuts. Use the old condenser connection on each side of the lid hinges for the other end of the new bracket. All new, 90° hose fittings will be on the left side (Drivers Side) and should be connected to the Lid hinge (as the original on the right side) with the enclosed hose clamps.

**THE SMALL (#6) FITTING IS TO THE REAR OF THE ENGINE LID!!**

**DO NOT TIGHTEN UNTIL ALL CLEARANCES AND ALIGNMENT IS CHECKED! RECHECK AFTER TIGHTENING!**

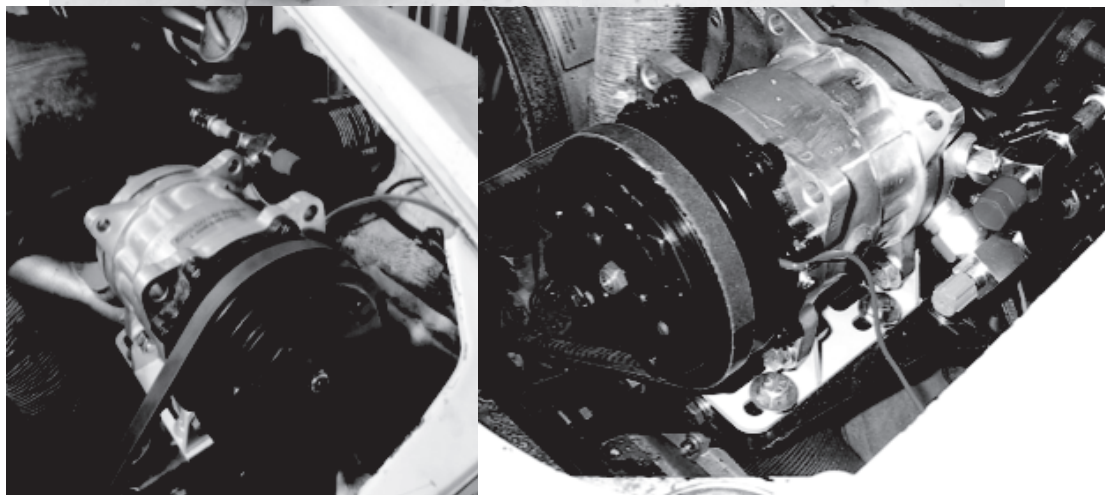
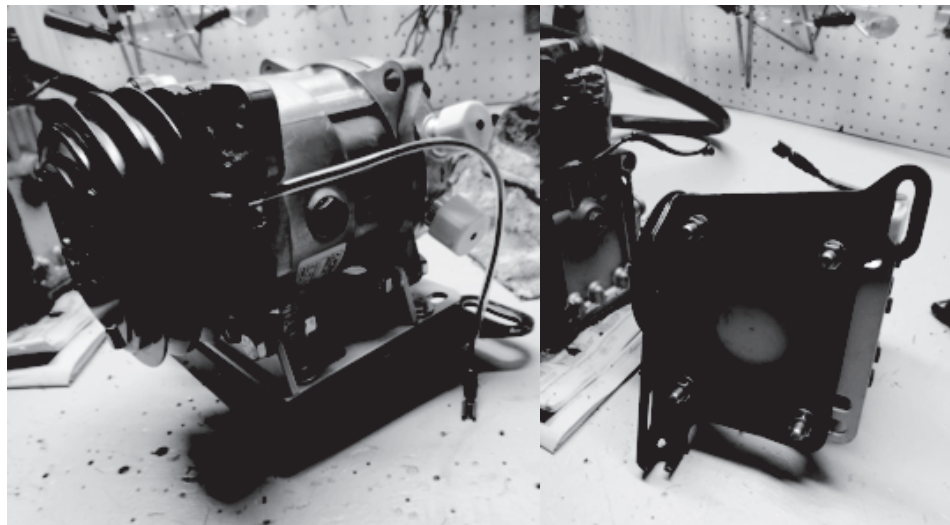




**O" RINGS MUST BE USED AT ALL HOSE CONNECTIONS AND LUBRICATED!!**

Before installing the hoses, review the Diagrams at the end of these instructions. The smallest diameter, RA-00001-11 will go from the lower Drier connection to the small connection on the rear Condenser, while RA-00001-14 hose will go from the top Drier connection to the Expansion Valve already on the installed Evaporator/ Blower Assembly Box. The largest diameter hose, RA-00001-15 will go from the other fitting on the Evaporator and down the right side to the compressor (suction) side (this would also be a good route for the Compressor wire, coming from the Wiring Harness in the "Smugglers Box". RA-00001-12 will go from the other Compressor fitting, around the back of the Engine and run up the Hinge next to the #6 hose coming from the front Drier. Some Foam around the Hoses may be needed to keep dust from entering the Engine Compartment.

The new Compressor is mounted on its side (see pic), with the enclosed Bracket (which may have to be altered slightly, depending on Engine configuration).





REMOVE THE REAR CONDENSER FROM ENGINE LID, EVAPORATOR CASE ASSEMBLY, FRONT CONDENSER (IF PURCHASED), RECEIVER/DRIER AND HOSE ASSEMBLIES AFTER LAWFULLY RECOVERING EXISTING REFRIGERANT.

DISCONNECT BATTERY. IF USING THE FRONT CONDENSER AND OE COMPRESSOR, THEY MUST BE THOROUGHLY FLUSHED, AND OIL CHANGED TO R134A COMPATIBLE OIL (DENSO-SAME AMOUNT OF PAG 46 AS THE R12 OIL REMOVED) BEFORE COMPLETING THIS UPGRADE!!

Install Included R134A Service Port Adapters on Denso Compressor!!



Before extracting the Evaporator Assembly from the "Smuggler's Box", carefully remove the capillary tube, electrical connections, Flexible Duct Hose and hoses. You will also have to remove the Blower Motor Resistor/Air Intake Housing inside the car. Remove the stock Blower Housing (top half or front half in RHD models) from the bottom half of the Evaporator Assembly. The Evaporator/Expansion Valve Assembly should be easily pulled from the bottom half.

After cleaning the box, the new Evaporator can be installed after removing the rubber "bumpers on the bottom of the lower box and one rubber bumper on the upper box, nearest the Hose connections. On late Models, it will be necessary to cut any Upper Cover Extension Pieces so it will not damage the New Evaporator before Replacing the Evaporator Case Cover. There is an electrical connection to be made between the Hi-Lo Pressure switch and the Compressor Relay wire in the "Smuggler's Box" on the passenger side. Either Switch wire Color will work.

The Yellow (controls Compressor and Condenser fan) or Brown (controls Compressor) wire will have to be split (cut) so all of the power to the Compressor goes through the switch. The switch will stop power from going to the Compressor if it detects a too low or too high pressure condition.

The two wires from the switch should be run next to the hose from the drier and connected to the cut ends of the Harness Compressor wire with the enclosed Butt ends.



Before Installing- REMOVE: Original Blower and Mounting Plate, Resistor Pak inside Car (Drill out Pop Rivets holding it in), Blower Wheel from Motor (Being careful not to distort while removing).

Fit the new mounting plate in upper housing. Mark and drill the holes necessary to mount to the blower housing, and one hole to allow the capillary tube to enter the evaporator. Place the motor in the Motor Mount cradle without tightening it down. Check for clearance with the Evaporator top cover after attaching the old Blower wheel to the new motor, making sure the wheel is as close to the motor without rubbing.

Make sure the blower wheel is not hitting the top cover, and the motor "Button" on the bottom is not hitting the Evaporator Core. THERE SHOULD BE APPROXIMATELY ¼ INCH BETWEEN THE CRADLE VENTURI AND THE BOTTOM OF THE BLOWER WHEEL! Once that is done, correctly orient the wires to exit the case in the same direction of the original. Install and tighten the clamp around the motor after the correct depth is obtained. Clean & rough the edges of the Mounting Plate and the Motor Mount before applying epoxy to the edges and installing the enclosed screws to the Motor Mount cradle - we do not want the motor coming down onto the Evaporator Core.

Before drilling holes, make sure the motor Fan Hub is centered in top "button".

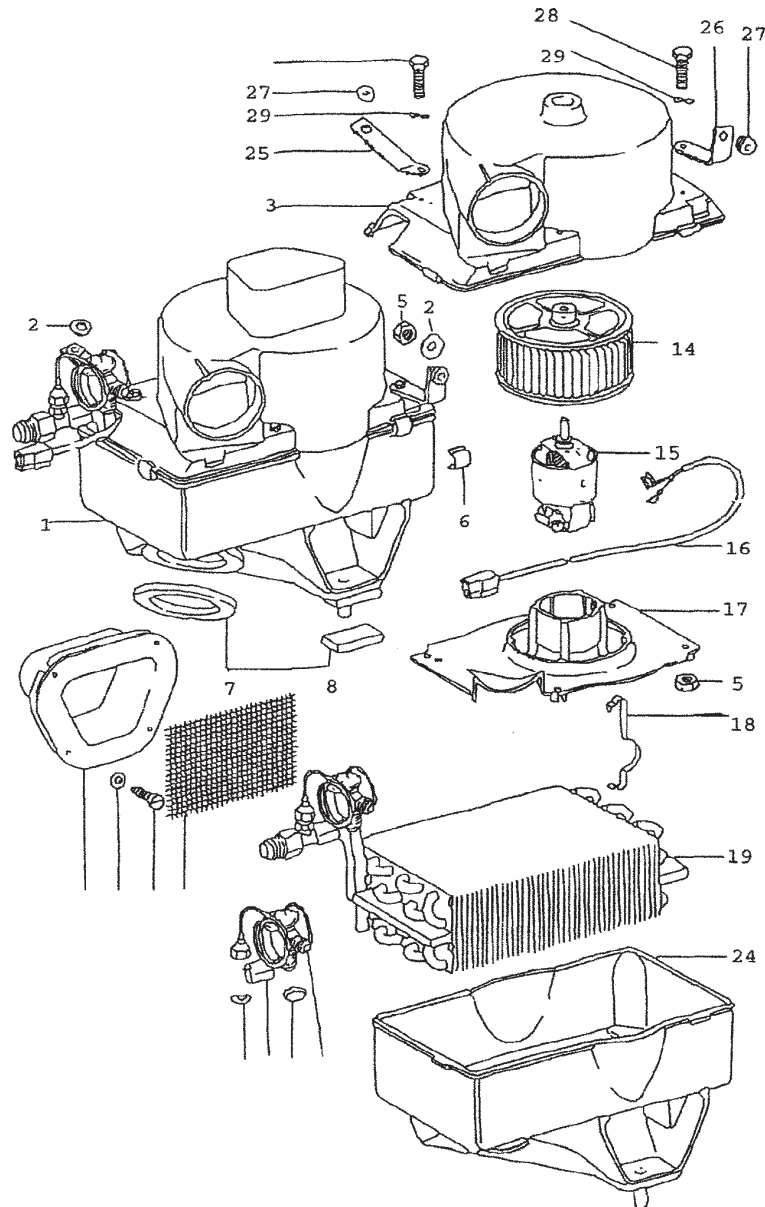
The enclosed Wire Harness can be connected directly to the OE Fan switch in the Console or spliced into the wires before the OE resistor at the Intake located behind the Passenger Floorboard. Using the enclosed wire connectors and shrink wrap, splice the original Porsche low speed wire to the new yellow wire. Then the original medium speed wire to the new red wire and the high speed to the new orange wire. The loose yellow/black wire on the motor goes to ground. Use the enclosed wire ties to eliminate loose wires.

Confirm that the motor is turning and the Fan speeds are correct! Removing the Resistor Pak is important to allow more re-circulated air to enter the system so there can be more volume expelled (higher CFM).



# 1984-85 Porsche 911 (Non Turbo) A/C Upgrade Kit

## Optional Blower Motor Upgrade





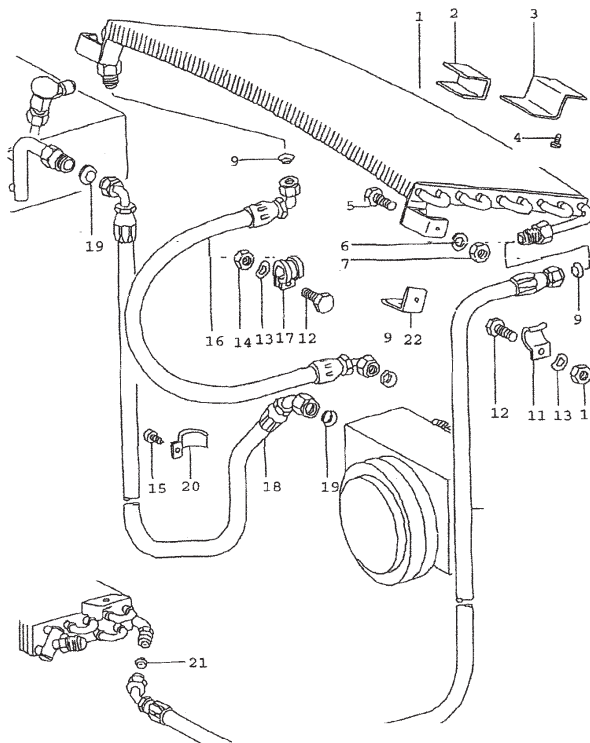
The included center vent can be mounted with screws to the top of the center console, although this necessitates removal of the console components. We prefer not to disfigure the console with holes by using Black Silicone Sealant to adhere the vent to the console. It could then be removed without leaving holes in the console. Before mounting the vent, remove the lower center vent cover and rubber gasket. You should now have a tube showing with space around it. The enclosed 2 inch tubing should "screw" into the space and turn, at least, two times. That should secure the duct hose to the A/C Plenum. The other end gets attached to the vent and gets secured as described above using tape to hold it in place until completely dry.

Before installing the new High Efficiency Condenser with the brackets provided, "dry fit" the condenser to the engine lid.

**MAKING SURE THE CONDENSER IS NOT HITTING THE FAN SHROUD, COIL OR THE REAR BODY WHEN THE LID IS CLOSED!!**

After installing the enclosed Hinge to Condenser Brackets, fit the new wide center bracket in place on the new Condenser and mark where holes will have to be drilled. The holes will be aligned with the old ones, except for being further to the rear of the car and the old clips and fasteners can be used. Attach the "L" shaped brackets to the Condenser using the Machine screws and "Nylon" nuts. Use the old condenser connection on each side of the lid hinges for the other end of the new bracket. All new, 90° hose fittings will be on the left side (Drivers Side) and should be connected to the Lid hinge (as the original on the right side) with the enclosed hose clamps.

**THE SMALL (#6) FITTING IS TO THE REAR OF THE ENGINE LID!!**  
**DO NOT TIGHTEN UNTIL ALL CLEARANCES AND ALIGNMENT IS CHECKED! RECHECK AFTER TIGHTENING!**





TO AVOID CONTAMINATED DO NOT REMOVE COVERS UNTIL CONNECTION TIME!  
O-RINGS MUST BE USED AND LUBRICATED AT ALL HOSE CONNECTIONS!!

After removing the old assemblies, replace with the new Barrier Hose assemblies, but keep in mind that some of the new hoses are not the same length. The hose (#6) from the front condenser to the rear condenser has a slightly different length. The other front condenser hose (#6) should be of the same approximate length (going to the Drier under the L/F fender). The other hose (#6) from the Drier goes to the Evaporator. The large diameter hose (#10) from the evaporator (in the "smugglers box") will be of the same approximate length going to the Compressor. The Mid-Diameter hose (#8) will have a 180° fitting to attach to the right side of the rear Condenser and the other end to the Compressor.



The new Receiver/Drier should be an exact replacement for the old one except for the Hi-Lo Pressure switch, but will connect the same.

**DO NOT USE THE SIGHT GLASS TO REGULATE THE R134A REFRIGERANT!**

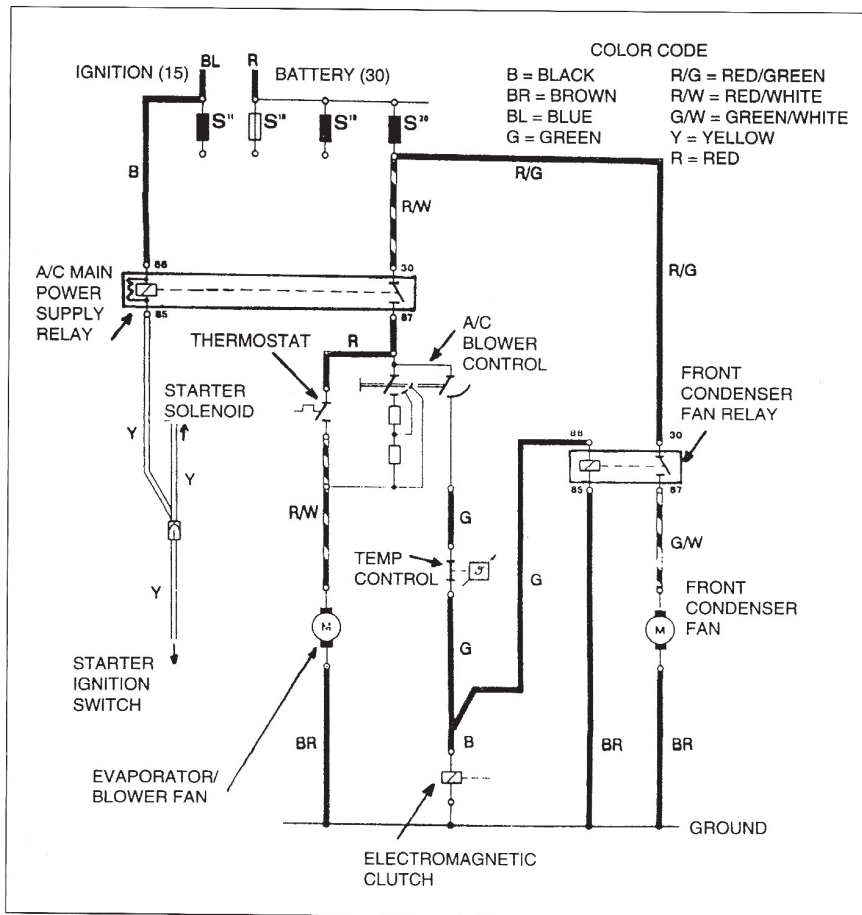
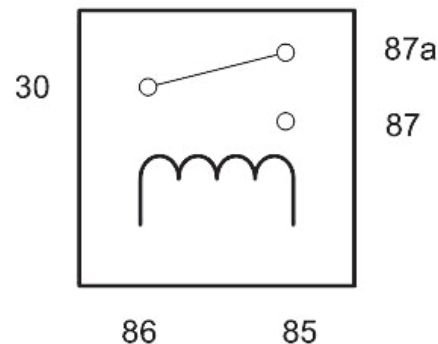


FIGURE 2. Pre 1989 911 Air Conditioner Electrical Wiring Showing the Relays for the Main blower and Front Condenser.

Relay Wiring Guide and Terminal Numbers



- 30 - High Power Feed (Must be Fused!)
- 85 - Relay Coil Ground
- 86 - Relay Coil Feed (Trigger Wire)
- 87 - High Power Output - Normally Open Contact
- 87a - High Power Output - Normally Closed Contact



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DISCONNECT BATTERY. IF USING THE FRONT CONDENSER AND OE COMPRESSOR, THEY MUST BE THOROUGHLY FLUSHED, AND OIL CHANGED TO R134A COMPATIBLE OIL (DENSO-SAME AMOUNT OF PAG 46 AS THE R12 OIL REMOVED) BEFORE COMPLETING THIS UPGRADE!!

Install Included R134A Service Port Adapters on Denso Compressor!!



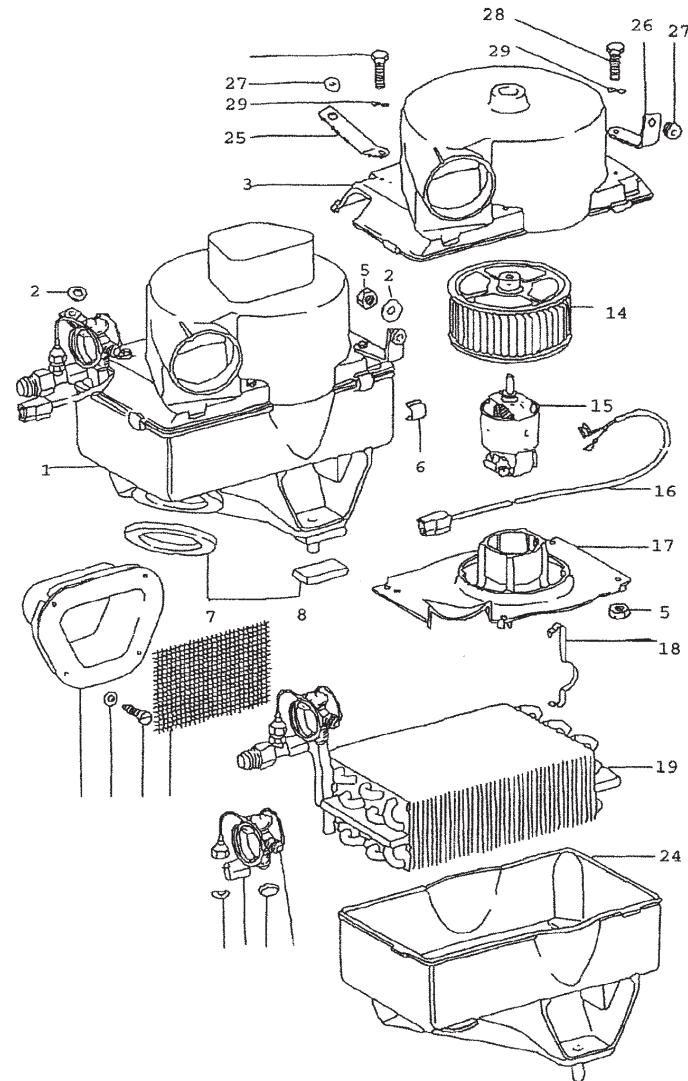
Before extracting the Evaporator Assembly from the "Smuggler's Box", carefully remove the capillary tube, electrical connections, Flexible Duct Hose and hoses. You will also have to remove the Blower Motor Resistor/Air Intake Housing inside the car. Remove the stock Blower Housing (top half or front half in RHD models) from the bottom half of the Evaporator Assembly. The Evaporator/Expansion Valve Assembly should be easily pulled from the bottom half. After cleaning the box, the new, High Efficiency Evaporator can be installed after removing the rubber "bumpers on the bottom of the lower box and one rubber bumper on the upper box, nearest the Hose connections. On late Models, it will be necessary to cut any Upper Cover Extension Pieces so it will not damage the New Evaporator before Replacing the Evaporator Case Cover. There is an electrical connection to be made between the Hi-Lo Pressure switch and the Compressor Relay wire in the "Smuggler's Box" on the passenger side. Either Switch wire Color will work.

The Yellow (controls Compressor and Condenser fan) or Brown (controls Compressor) wire will have to be split (cut) so all of the power to the Compressor goes through the switch. The switch will stop power from going to the Compressor if it detects a too low or too high pressure condition.

The two wires from the switch should be run next to the hose from the drier and connected to the cut ends of the Harness Compressor wire with the enclosed Butt ends.



When ready, place the new Blower Assembly in place. Position the included metal clips so they hook around the nylon clamp tabs on the New Blower Housing and engage the bottom Evaporator Case clamp tabs- they should snap in. Drier and connected to the cut ends of the Harness Compressor wire with the enclosed Butt ends.



The enclosed Wire Harness can be connected directly to the OE Fan switch or spliced into the wires before the OE resistor at the Intake located behind the Passenger Floorboard. Remove the OE Resistor by drilling out the Pop Rivets holding it to the Intake Frame. Using the enclosed wire connectors and shrink wrap, splice the original Porsche low speed wire to the new yellow wire. Then the original medium speed wire to the new red wire and the high speed to the new orange wire. The loose yellow/black wire on the motor goes to ground. Use the enclosed wire ties to eliminate loose wires.

After confirming the motor is turning and the Fan speeds are correct, secure the wires and seal the drilled holes with silicone. This is important to allow more re-circulated air to enter the system so there can be more volume expelled (higher CFM). After testing but prior to permanently reinstalling the new Blower Housing, Drill holes in the housing to correspond to the original Hold-down housing Bracket holes- be careful of interfering items! Use silicone to seal the edges of the Evaporator Box where the two halves meet. Also, use the supplied Cork Sealing Tape to seal the opening where the evaporator ports and electrical wires exit the Case, making it airtight. Re-fasten the brackets and install the new flexible duct hose to the assembled Evaporator Case.

If the Smuggler's Box Lid will not close due to the Front edge of the Housing hitting, it may be necessary to "Dimple" the Lid to obtain the Proper Clearance!!



The included center vent can be mounted with screws to the top of the center console, although this necessitates removal of the console components. We prefer not to disfigure the console with holes by using Black Silicone Sealant to adhere the vent to the console. It could then be removed without leaving holes in the console. Before mounting the vent, remove the lower center vent cover and rubber gasket. You should now have a tube showing with space around it. The enclosed 2 inch tubing should "screw" into the space and turn, at least, two times. That should secure the duct hose to the A/C Plenum. The other end gets attached to the vent and gets secured as described above using tape to hold it in place until completely dry



The new Receiver/ Drier should be an exact replacement for the old one except for the Hi-Lo Pressure switch, but will connect the same.

DO NOT USE THE SIGHT GLASS TO REGULATE THE R134A REFRIGERANT!

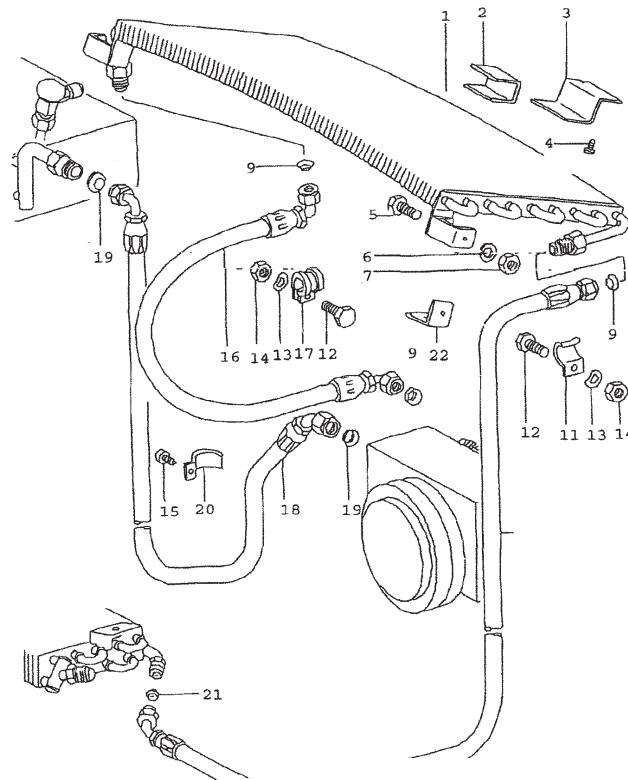
# 1986-89 Porsche 911 (Non Turbo) A/C Upgrade Kit Rear Condenser



Before installing the new High Efficiency Condenser with the brackets provided, "dry fit" the condenser to the engine lid. **MAKING SURE THE CONDENSER IS NOT HITTING THE FAN SHROUD, COIL OR THE REAR BODY WHEN THE LID IS CLOSED!!**

After installing the enclosed Hinge to Condenser Brackets, fit the new wide center bracket in place on the new Condenser and mark where holes will have to be drilled. The holes will be aligned with the old ones, except for being further to the rear of the car and the old clips and fasteners can be used. Attach the "L" shaped brackets to the Condenser using the Machine screws and "Nylon" nuts. Use the old condenser connection on each side of the lid hinges for the other end of the new bracket. All new, 90° hose fittings will be on the left side (Drivers Side) and should be connected to the Lid hinge (as the original on the right side) with the enclosed hose clamps.

**THE SMALL (#6) FITTING IS TO THE REAR OF THE ENGINE LID!!  
DO NOT TIGHTEN UNTIL ALL CLEARANCES AND ALIGNMENT IS CHECKED! RECHECK AFTER TIGHTENING!**



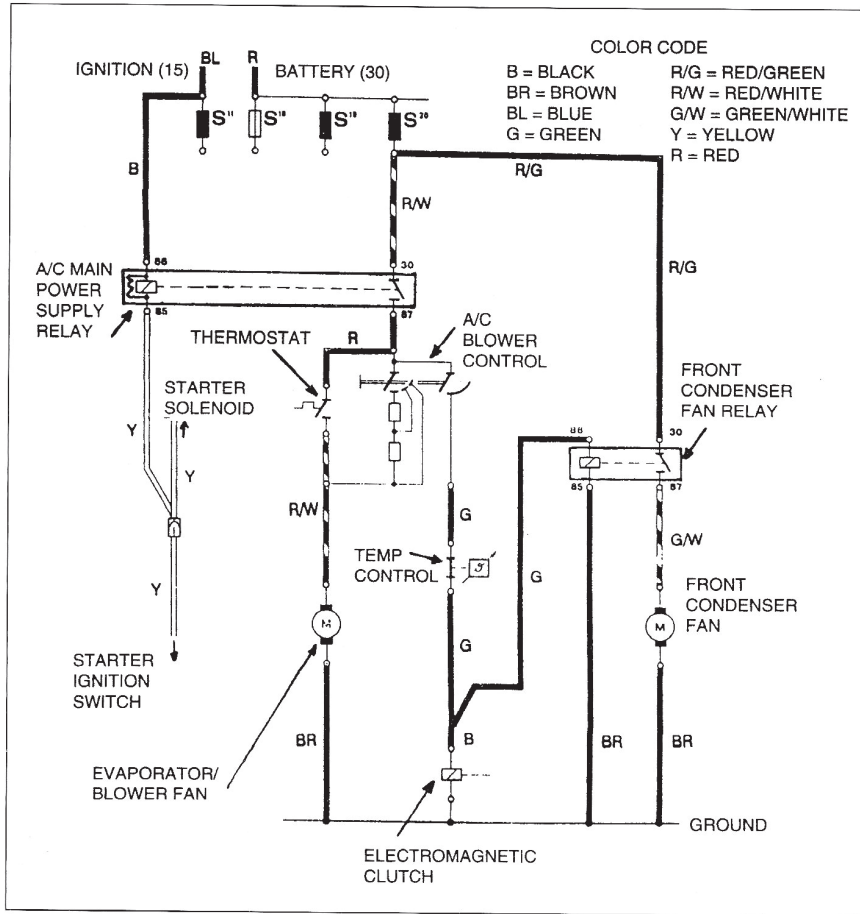


TO AVOID CONTAMINATED DO NOT REMOVE COVERS UNTIL CONNECTION TIME!

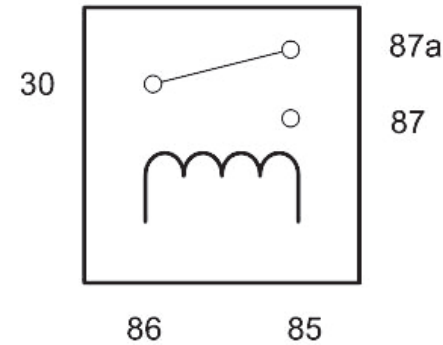
After removing the old assemblies, replace with the new Barrier Hose assemblies, but keep in mind that some of the new hoses are not the same length. The hose (#6) from the front condenser to the rear condenser has a slightly different length. The other front condenser hose (#6) should be of the same approximate length (going to the Drier under the L/F fender). The other hose (#6) from the Drier goes to the Evaporator. The large diameter hose (#10) from the evaporator (in the "smugglers box") will be of the same approximate length going to the Compressor. The Mid-Diameter hose (#8) will have a 180° fitting to attach to the right side of the rear Condenser and the other end to the Compressor.

O-RINGS MUST BE USED AND LUBRICATED AT ALL HOSE CONNECTIONS!!

# 1986-89 Porsche 911 (Non Turbo) A/C Upgrade Kit Wiring Diagram



### Relay Wiring Guide and Terminal Numbers



- 30 - High Power Feed (Must be Fused!)
- 85 - Relay Coil Ground
- 86 - Relay Coil Feed (Trigger Wire)
- 87 - High Power Output - Normally Open Contact
- 87a - High Power Output - Normally Closed Contact

FIGURE 2. Pre 1989 911 Air Conditioner Electrical Wiring Showing the Relays for the Main blower and Front Condenser.

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

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

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

- 1) Evacuate the system for 45 minutes (minimum).
- 2) **Your new compressor MUST be hand-turned 15-20 revolutions before and after charging with liquid. Failure to do this may cause the reed valves to become damaged** (this damage is NOT covered by your warranty).
- 3) Your new system requires 134a refrigerant. It will require 1.5 lbs (or 24 oz).
- 4) Your new compressor comes charged with oil - NO additional oil is needed.
- 5) Insure that the new belt is tight.
- 6) **DO NOT CHARGE SYSTEM WITH LIQUID REFRIGERANT!**



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

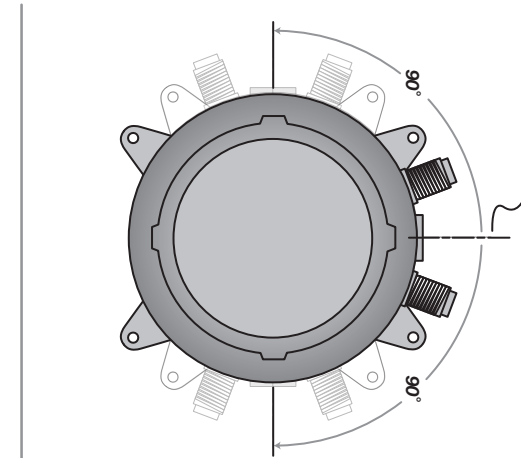
- Determine the temperature outside of the car
- Connect gauges or service equipment to high/low charging ports
- Place blower fan switch on medium
- Close all doors and windows on vehicle
- Place shop fan directly in front of condenser
- Run engine idle up to approx. 1500 rpm

**ACCEPTABLE OPERATING PRESSURE RANGES:**

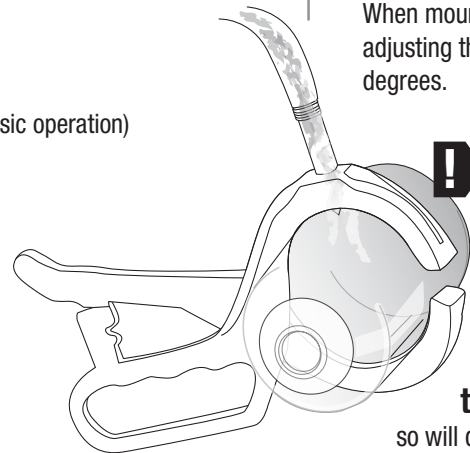
1. HIGH-SIDE PRESSURES (150-275 PSI)
2. LOW-SIDE PRESSURES (10-25 PSI in a steady state)

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

CENTERLINE OF THE OIL FILL BOLT



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



**Do NOT tilt, shake or turn refrigerant can upside-down OR use a charging station to install refrigerant while the engine is running.** Doing

so will direct liquid refrigerant into the compressor piston chamber, causing damage to reed valves and/or pistons and/or other components, as well as potentially seizing the compressor. Allow a minimum of 30 minutes for liquid to "boil off." You must hand turn the compressor hub (not the pulley) a minimum of 15 complete revolutions prior to starting the engine with the clutch engaged.





## TROUBLESHOOTING GUIDE

### TEST CONDITIONS USED TO DETERMINE SYSTEM OPERATION

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

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

### ACCEPTABLE OPERATING PRESSURE RANGES (R134A TYPE)

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

**CHARGE AS FOLLOWS: R134A = 24 OZ.**

**NO ADDITIONAL OIL IS NECESSARY IN OUR NEW COMPRESSORS.**

### TYPICAL PROBLEMS ENCOUNTERED IN CHARGING SYSTEMS

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

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

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

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

## Trouble Shooting Your Classic Auto Air A/C System

**PROBLEM: system is not cooling properly**

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

### Make sure the Water Valve is positioned correctly

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

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

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

### **Verify Adequate Air Flow to Condenser**

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

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

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

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

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

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

### **Step 3: Confirm correct Refrigerant charge in System**

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

### **What measurements mean:**

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

You have a malfunctioning expansion valve that is stuck open.

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

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

### **\*Compressor Concerns:**

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

