

# RetroAir

## LHD AIR CONDITIONING KIT INSTRUCTIONS

JAGUAR Mk. II 12/14

### OPEN AND CHECK SHIPMENT!

**You have 3 days to report any shortages!**

**CAREFULLY LAY OUT ALL PARTS IN THEIR APPROXIMATE LOCATION AND READ INSTRUCTIONS BEFORE PROCEEDING!**

**PLEASE BE SURE YOU UNDERSTAND THE INSTRUCTIONS AND WHERE EACH PIECE GOES!**

A Contents List is Included!

**KEEP COVERS AND TAPE ON ALL A/C HOSE FITTING OPENINGS UNTIL CONNECTION TIME!!**

*Prior to starting, use the proper repair manual to remove the following:*

**Battery; Hood (Bonnet); Radiator Grille; Radiator; Fan Blade; Fan Belt; Wooden Dash Top and Right Side Pieces; Mk II Center Radio Console; Mk II "Cubby" Metal Shelf with Wooden Trim; "S" Models Parcel Shelf.**

### SEE AND UNDERSTAND PICTURES BEFORE STARTING!

#### CONDENSER INSTALLATION

With grille removed, measure 13 inches from bottom pan on right (Passenger) side grille opening wall and mark. At the same height, measure 1 inch forward from the radiator support/brace. Check for clearance and interference on both sides of side Grille wall! These intersecting marks will be the center of a 1-1/4 inch diameter hole in the side panel to gain access to the R/F wheel opening. Drill another 1-1/4 inch hole 9-3/4 inches below the first one. Fit the enclosed grommets into these holes after treating raw edges with rust preventive. The top hole/connection will be the large inlet, while the lower hole/connection will be the smaller outlet. Make sure the condenser connections or A/C hoses will not chafe on metal. Loosely mount the condenser so it will be next to the right (passenger) side of the grille opening where the holes were just made. Install the Condenser Fan at this time. The condenser fittings should be accessible for attachment to the A/C hoses upon completion of this section.

**THE CONDENSER SHOULD BE AT LEAST ONE (1) INCH AWAY FROM THE RADIATOR!!**

# SEE AND UNDERSTAND PICTURES BEFORE STARTING!

## COMPRESSOR INSTALLATION

With the radiator removed and the condenser installed, remove the fan belt and fan blade. Remove the inverted 5/16" head nut and stud directly above the center generator bracket bolt. Rear Bracket is "S" shaped Bracket that is mounted to the new longer inverted stud only. Parts are Laser cut, but not Computer bent so some adjustments may be needed. Do not tighten at this time.

The front bracket is installed with the supplied 5/16-24X3" bolts/washers in the upper outermost holes in the front timing chain cover (just below the head). Remove any bolts already there. If your generator adjustment bracket is anchored to one of these, you may need a longer bolt In "Grade 8". Leave all the bolts on the brackets somewhat loose and install the compressor with the three bolts supplied (head of bolts should be against the compressor ears and the lock washers/nuts against the steel bracket). If the compressor pulley/clutch has less than one inch of clearance to the inner fender, it will be necessary to "dimple" the inner fender to give the proper clearance prior to mounting compressor. (The engine can torque to the left in reverse, therefore it is important that all motor mounts be in excellent condition to maintain sufficient clearances between inner fender and forward between fan and radiator). See Last Page for Back Idler Pulley Instructions! Before final fitting of the compressor, install the Heat Shield (after cutting and fitting) and tighten the bolts followed by the bracket bolts- make sure the compressor "T"(90 deg w/Svc Port) fittings are fitted, and transfer covers to the new fittings. Prior to mounting the Radiator and fan, cut 1/4 to 5/16th-inch deep section, approximately 4-6 inches long (see photos) from fan shroud edge to accommodate protruding compressor clutch and pulley. Now make a "dry run" radiator installation to check your clearances- BE CAREFUL NOT TO DAMAGE RADIATOR FINS! CHECK FOR TOP END CLEARANCE. Leave the fan belt loose to be tightened after radiator and shroud is installed. After rechecking, install Radiator and shroud. Seal all open spaces around the shroud and grille opening with heat resistant foam rubber or seal. This is to direct all air entering the grille opening to pass through the condenser and radiator and all the air pulled through the radiator exits through the shroud rear opening. Tighten fan belt until the belt deflects approximately 1/2 inch. This will need to be re-checked after 100 miles of operating.

# SEE AND UNDERSTAND PICTURES BEFORE STARTING!

## EVAPORATOR/BLOWER MOTOR INSTALLATION

### Blower Motor

After removal of the battery, battery tray, Right Battery Tray Brace, passenger carpeting and lower dash trim panel, remove the RH Pedal Box cover and install the Enclosed Blower Reinforcement Plate from inside the Engine Compartment. Bolt the bottom plate hole into the corresponding bottom hole in the body. Trace the opening and cut out the body to match, so the Blower, mounted inside the car (with the opening to the car rear) will have the correct size for maximum airflow. The other holes in the plate match the mounts on the Blower and will need to be drilled in the Body. The Plate must then be made to conform to the Bend on the Body (Bend it). The enclosed ABS Plastic Oval Hose Inlet can then be drilled to match the Plate holes- this part is mounted inside the engine compartment as well. Use Silicone or other sealer under the plate and Blower Mounting Plate surface for a good seal. After making sure of the blower motor placement, attach the Blower inside the car (with opening to the rear) with the Oval inlet on top,

inside the engine compartment. The interior plastic hose of the Insulated duct hose can be attached in the Engine Compartment at this time by forming it around the oval Blower Outlet; secure it with the included 3 washers/screws and Tie Wrap and seal edges with silicone sealer. The included Insulated Hose has a "Mylar" covering and needs to be protected from high heat! (Be sure that blower opening is maximized for airflow before permanent attaching)

## Evaporator

**DO NOT SUBSTITUTE EVAPORATOR HARDWARE- IT CAN CAUSE DAMAGE!!**

The evaporator is shipped with one cover loosely fitted on that will be installed later. To mount the evaporator, place this cover on the firewall horizontally, sharp edges out, where the battery formally was. Place the left (drivers) side of the cover, past the edge of the right (pass) edge of the center raised panel to which the VIN information plate is attached. The top of the cover should be 1-1/2 inches from the underside of the horizontal cowl overhang. Make sure that the front cover is level and lined up, then drill two 3/32 inch holes on both right and left upper sides (away from the 2 inch holes about to be drilled) to secure the cover to the firewall temporarily with screws.

***INSURE THE EVAPORATOR HAS PROPER CLEARANCES INSIDE & OUT!***

Before drilling four- 2-" inch holes with a hole saw through the cover and firewall, remove the 1-1/2" paper defroster hose and duct tape the end to prevent the hose from splitting. Add the supplied rubber section and adapter. **Space these four (4) holes fairly equal to maximize airflow!** It should be easier to space if smaller, pilot holes are drilled first. After cutting the four holes, remove the cover, and seal the small mounting holes with silicone. Use included foam weatherstrip to seal firewall depressions under the mounted evaporator. Clean/trim all hole edges and place the four- two (2) inch outlets inside the cover with a sealing or PVC adhesive, then put cover on evaporator with supplied screws after drilling ( the Firewall holes will have to be filed to accept the Hose adapters). *Do not invert cover or holes will not line up!*

Remove cover from Firewall and mount to the Evaporator case with included screws

Trim Insulation as necessary and use silicone to fill any spaces in evaporator case joints. The outlets will protrude out from the cover and into the firewall holes. Mount the evaporator with supplied evaporator brackets and 1/4X1/2 Bolts and flat washers. After insuring that the assembly and brackets are level and outlets fully inserted, drill 3 holes (3/32") in the firewall for each bracket and attach with supplied screws. **THE EVAPORATOR MUST BE FIRMLY AGAINST THE FIREWALL!** This would be the time to set the expansion valve (the bottom hose connection on the evaporator) at a 10 to 15 degree angle toward the inner fender and drill a 1-1/4 inch hole in the inner fender for the enclosed grommet that allows the A/C hose to pass through. **(THIS SHOULD BE DONE PRIOR TO PERMANENTLY MOUNTING EVAPORATOR SO THE HOSE LINES UP WITH THE CONNECTION).**

***It may be easier if the duct hoses were also attached before mounting the Evaporator!*** Prior to moving inside the car, manipulate the insulated intake hose (attached to the blower motor) past all engine obstructions, bending and forming it, but maintaining maximum airflow up to the oval intake on the evaporator- cut off any excess. At this time, attach the inner Duct hose to the evaporator (if not already done) with the supplied Nylon ties and seal edges with silicone. The outer, insulation w/ covering will then be secured with the enclosed Foil Tape. Once the evaporator has been securely attached, drill a hole, from inside the car, for the Thermostat Switch capillary tube and grommet through the firewall and the cover. The hole should be

between the 2<sup>nd</sup> and 3<sup>rd</sup> outlet leaving enough space to attach the duct hose *-Do not penetrate too far or you could damage the evaporator coil!*

The metal "Cubby" previously removed will now have to be cut to allow clearance for the louver duct tubing. Remove enough metal, lengthwise, from the closed rear of the "Cubby", making it open front and rear, but leave enough to provide a Background for the Vent Handle. Use black Duct Tape to protect the "Cubby" sharp cut edge. Reinstall the "Cubby" without the wood trim and secure the radio center console piece to it for stability. Cut the 2-inch duct tubing to length so 2 tubes will hang out through the "Cubby" from the 2 center Evaporator outlets. The outer outlets will be routed to the Left and Right under-dash panels. The louvers are installed by unscrewing the Louver body, making a 2-1/2 inch hole in the under dash mounting panel and assembling, or using the included under-dash holders. Secure the Hoses to each corner of the dash and kick panel.

*When installing the under dash louvers, it is critical to route the hoses and louvers so they will not be obstructed. ALLOW EXTRA LENGTH ON ALL DUCT HOSES AS THEY CAN BE COLLAPSED OR TRIMMED, BUT NOT STRETCHED!* For service after installation, It will be necessary to remove the wood trim panel and louver panel and stretch the duct hose to get behind the instrument panel!

The under dash finish panel on the passenger side will have to be shortened 6 to 7 inches from the firewall end so sufficient air will get to the blower motor. Measure the amount to be taken and mark the unfinished side. Using a heat gun, heat up the area to be removed and pull the vinyl away from backer board past your mark.

Cut the board and trim the vinyl so it can be reattached in the same manner as original with contact cement.

If installing under the dash, you can cut out the louver duct hose opening at this time (making sure of clearances upon reassembly) as well as make mounting holes for the switches if this way is desired. There is, also, a switch panel that can be used instead of concealing the switches. The "bare spot" on your upper foot well can be covered with the vinyl removed in the previous operation

Route the capillary tube of the temperature switch through the hole (with grommet) previously drilled and push halfway into evaporator coil. This is a judgment call- the coil takes up approx. one half of the case. It should go in a few inches before meeting light resistance. Once resistance is met, push it in another 2-1/2 inches unless too much resistance is felt, pull out and try again in a slightly different location. This tube senses the temperature of the air coming in and switches the compressor on and off as needed. When routing the tube from the switch, make every effort to keep the tube from touching any metal or ducts which may affect the temperature sensing. **DO NOT CRIMP THIS TUBE!**

Attach the previously cut duct hose to the 3 left side firewall evaporator outlets using the enclosed short tie wraps. Be sure these joints are secure and tight as the efficiency of the unit depends on this.

**Mark II:** The duct hose may now be attached to the rectangular louvers that have been fitted into their panel and will be below the instrument panel. The hose fits inside of some louver rear attachments and outside of others. They should not need any fasteners. The louver panel, with the louvers, may need trimming and is attached by fitting it between the wood trim piece and the "Cubby". Attach the nuts to the wood trim piece and tighten. Make sure that the duct hoses

are attached to the louvers. Do not attach the passenger trim panel. If fitting switches to this panel, make sure of clearances and wire accessibility for the electrical hookup. Attach the 30 amp circuit breaker under dash brace as pictured. This will be wired later.

## **SEE AND UNDERSTAND PICTURES BEFORE STARTING!**

### **BATTERY/ TRAY/ CABLE INSTALLATION**

Place battery and tray on right side (passenger) of trunk (boot). Position it the best way to retain access to the jack stand and mark trunk floor where battery cables should come through from under the car. Check underneath the car to insure there are no obstructions to the battery cable coming through the floor. Be mindful of the fuel lines and suspension travel. Drill two holes next to each other and fit the supplied grommets. Mark and drill the battery tray holes as well. **IT IS IMPORTANT THAT YOU MATCH THE + OR - TERMINALS TO THE BATTERY IN THE TRUNK! DOES THE CAR HAVE POSITIVE OR NEGATIVE GROUND? KEEP TRACK!** In the engine compartment, remove the old battery cables and insure that there is a good ground connection from the engine to the car frame. Crimp and/or solder an "eye" cable connector to one end of cable supplied and connect that to the old battery cable's position on the firewall mounted solenoid. Feed the cable down under the car along the right "frame rail". From under the car, space out and drill 6-holes along the frame rail, avoiding other lines already there, hanging the cable with the supplied hangers and screws.

Feed the cable through one of the drilled holes and calculate where to cut the cable to fasten to the battery and terminal. The end of the long cable will now need the appropriate + or- terminal to be crimped and/or soldered on. Do the same to an "eye" for the short cable end and insert in the remaining hole and attach to the frame with the enclosed self-tapping bolt. That cable now gets cut to length and the remaining terminal is crimped and/or soldered on. Do not connect the battery until all A/C wiring is done!

### **A/C HOSE CONNECTIONS**

**REMOVE COVERS ONLY AT CONNECTION TIME!!**

**HAVE PROPERLY LUBRICATED "O" RING ON EACH HOSE CONNECTION!**

There are 4 A/C hoses with your kit. The largest Diameter one with the Straight fitting is attached to the large compressor fitting and hand tightened. The longest Med Diameter hose, from the Compressor will need a 1-1/4 inch hole and supplied grommet in the inner fender near the small hose 1-1/4" Hole and grommet for the small hose leading from the evaporator Expansion valve. Connect the straight end of the Med Hose to the compressor by hand and the rest through the hole- the 45 degree end goes through the inner fender and gets connected to the upper, large fitting of the condenser. Use enclosed hangers to route correctly. The straight fitting of the small Diameter hose goes through the other inner fender hole by the evaporator to the Drier mounted under the fender. Connect the other straight fitting end to the front fitting of the Receiver/Drier (arrow or IN points to Condenser) with the other end attached to the bottom Condenser fitting, being sure the Hi-Lo Pressure Switch is facing out.

Be sure there are no obstructions or Tire clearance problems for the drier bracket and screws and attach. Attach the Drier wiring harness and feed it into the engine compartment using an existing hole or make a new one.

**Hose Insulation:** After hose installation, cut insulation to size for hose protection against extreme heat (exhaust manifold), and cut lengthwise to slip over hose. Use enclosed Aluminum Tape to cover slit lengthwise, which should be away from heat source.

### **Electrical Hook-up**

The Wiring harness has 5 electrical connectors on one end- connect as follows:

Black to “B” on the Fan Switch, Red to “M”, Yellow to ”L”, Orange to “H”. The remaining Blue wire is connected to either side of the Thermostatic Switch. The other end of the long blue wire goes either side of the Drier Hi-Lo Switch. The short Blue wire goes from “C” on the Fan Switch to the other thermostat connector. Test with Motor Connected! The Switch Letters are small and confusing!

Install one of the snap-apart wire connectors on the free compressor wire and the mate to a length of supplied 12 ga wire which is routed in front of the radiator to the other wire on the Drier Hi/low pressure switch wiring harness. Establish a connection to the ignition switch with the included length of Black wire, so it is "live" when the switch is on and "dead" when the switch is off. Connect this wire to the supplied circuit breaker at "AUX" terminal on the Circuit Breaker. **FOR EITHER GROUND-** attach the Black large harness wire to the circuit breaker terminal "BAT". To use the Relay for the Condenser fan, route the correct fan wire to the Relay # “87”. #30 gets connected to a battery source, # 86 gets connected to the “C” post on the Fan switch sharing that position with the short blue wire. It can also be connected to switch under the dash to aid in cooling when the a/c is not on.

#85 goes to ground. Route all the wires out of the way of obstructions that may develop when the dash and ducts are put together. Make sure all connections are good and hook up the harnesses and switches. Connect the battery and turn on the ignition to test the motor. When switched on, the motor should draw air from the passenger compartment and blow vigorously through the upper louvers. If not, something may be wired incorrectly.

### **Refrigerant Installation**

Once it is wired up correctly, connect Refrigerant hoses using lubricated “O” rings, as the system will need to be evacuated for approximately one to three hours and charged with R134a refrigerant. Before charging the system, you may have to use a "jumper" wire to connect the Hi/Lo pressure switch harness terminals. The system should take approximately 12 to 14 oz of R134a refrigerant. This can be done at your local A/C garage as they will recognize the proper pressures for the most efficient cooling. Look for 200 to 225 psi hi press @ 90 to 95 deg Ambient Temp, and 25-35 low pressure. You should obtain temperatures of 37 to 42 degrees F at the louvers depending on the outside temperature, while maintaining good engine cooling. This is, of course, dependant on the installation of the A/C Kit and condition of the cooling system.

**CALL, CALL, CALL.**

**DO NOT HESITATE TO CALL OR E-MAIL FOR TECHNICAL ASSISTANCE.**

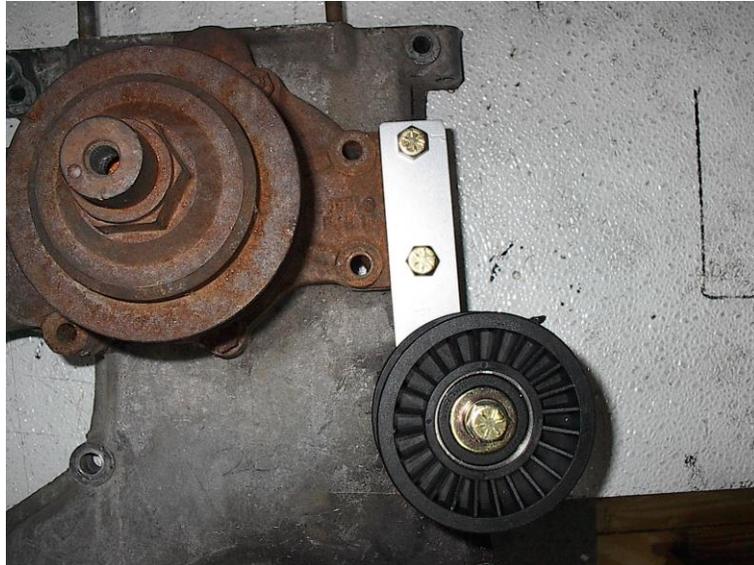
**Technical Support- 972-996-6687- [sales@retroair.com](mailto:sales@retroair.com)**

Thank you for purchasing the most efficient and complete kit available for this car- anywhere!

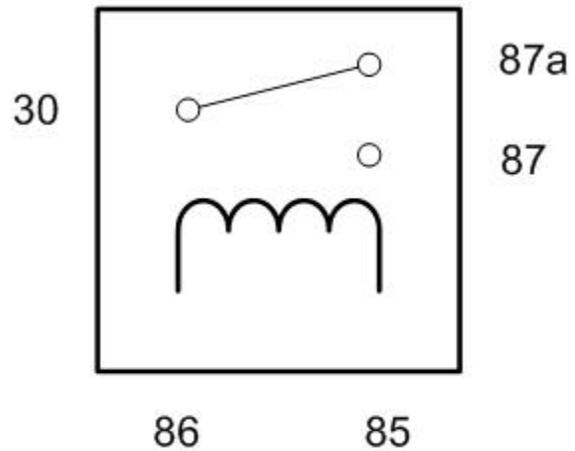
# **MARK II, IX, XKE S1-3.8, 4.2 IDLER PULLEY KIT For 3.8 Engine With Our A/C**

## **3.8 Engine Instructions:**

**It will be necessary to remove the Radiator and Fan Blade. Remove the Bolt (see pictures). The back of the belt rides on the idler pulley, and goes down to the Crankshaft on the Right side and comes up & over the Waterpump pulley on the Left side, to the Compressor, down to the Generator/Alternator to make the complete loop.**



## Relay Wiring Guide and Terminal Numbers



30 - High Power Feed (Must be Fused!)

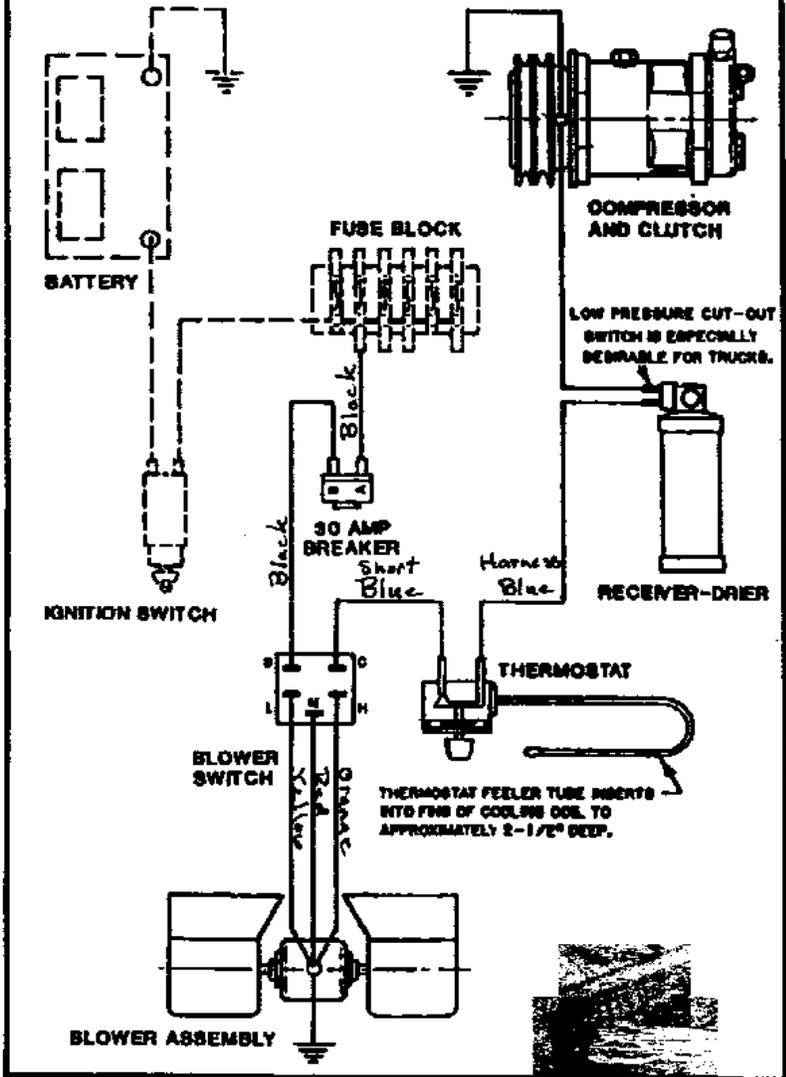
85 - Relay Coil Ground

86 - Relay Coil Feed (Trigger Wire)

87 - High Power Output - Normally Open Contact

87a - High Power Output - Normally Closed Contact

WIRING DIAGRAM



**JAGUAR Mk. II- Left Hand Drive**

**CONTENTS LIST**

**RETROAIR MULTI-FLOW CONDENSER**

**CONDENSER PACK**

2- Custom Long Brackets; 4- Sheet Metal Screws;  
4- 10 X ½” Bolts & Nyloc Nuts; 2- 1-¼” Grommets

**SANDEN/BEHR 5H14-V COMPRESSOR**

**COMPRESSOR PACK**

6 ft-14 GA Wire w/ Female Terminal Installed;  
3- 3/8 X 1-¼” Bolts, Nuts & Lock Washers  
2- 90 degree M/F Service Port Adapters (#8,#10);

**EVAPORATOR ASSEMBLY**

2- Installed Brackets & Faceplate

**EVAPORATOR PACK**

4- 2” Hose Outlets; 1- Capillary Grommet;  
2-8”-½” Drain Hoses; 6- 10 X ½” Black Screws;  
12- 10 X ½” SM Screws; 6- Washers; 1 ft- Weather Strip;  
6”- 1 ½ Duct Hose; 1 – 1 ½ Hose Adapter (custom)

**MISCELLANEOUS PAK 1**

10- "O" Rings & Lube; 2- 1-¼” Hose Grommets;  
1- 3 Speed Fan Switch; 1-Temp Switch (long capillary tube);  
2- Switch Knobs/Nut Covers; 1- Fan/Temp Switch Wire Harness  
2- Round Chrome Louvers; 2-Under-dash mounts;

**LOOSE ITEMS:**

**4- A/C BARRIER HOSES**

**2- RECTANGULAR LOUVERS/PANEL**

**1-17555 FAN BELT**

**1- EXHAUST ALUMINUM HEAT SHIELD**

**15 ft- 2” DIA. DUCT HOSE**

**2 ft- 4” DIA. INSULATED DUCT HOSE**

**1- 4” OVAL HOSE OUTLET**

**1- SWITCH POD**

**OPTIONS:**

**1-ALLOY CRANKSHAFT “V” PULLEY**

**1-ALLOY WATER PUMP “V” PULLEY**

**1- POWER STEERING ALTERNATOR KIT-**

*See Separate Contents List in Box*

**ALUMINUM RADIATOR**

**11” ELECTRIC FAN ASSEMBLY**

4- Plastic Fan Mounting Ties & Pads

**BLOWER MOTOR ASSEMBLY**

1- Blower; Steel Blocking Plate;  
6-10 X ¾” Bolts, Washers, & Square Nuts;

**2 CUSTOM COMPRESSOR BRACKETS**

2- 5/16” X 2” Bolts & Lock Washers;  
1- Replacement 5/16” Head Stud

**BACK IDLER PULLEY PACK**

1- Back Idler Pulley Assembly  
2- 5/16” X 3” Gr. 8 Bolts & Lock Washers

**RECEIVER/DRIER PAK**

1- Receiver/Drier; 1- Hi/Lo Pressure Switch and Harness;  
1-Drier Bracket Clamp; 1- 10 X ½” Sheet Metal Screw;  
2- 14ga Wire Connectors & Heat Shrink

**BATTERY TRAY PAK**

15ft- 2ga Battery Cable; 1- Battery Box w/ Hardware;  
2- Copper Lug Ends; 2- Solder Slugs 2- Copper Terminal Ends; 6-  
5/8” Cable Hangers; 6- 10 X ½” SM Screws;  
2- 5/8” Cable Grommets; 1- Self-Tapping Bolt

**MISCELLANEOUS PAK2**

1-30amp Circuit Breaker; 1-30amp Relay;  
3- 1” Hose Hangers; 3- ¾” Hose Hangers;  
6- 8 X ½” SM screws; 10-Medium Nylon Hose Ties;  
7-Large Nylon Hose Ties; 4 ft- Hose Insulation;  
8 ft- Aluminum Tape; 2- 14ga Wire Connectors & Heat Shrink

**COMPLETE INSTRUCTIONS  
WITH PICTURE ALBUM**