JEEP AIR

SPECIALIZING IN JEEP A/C COMPONENTS AND A/C KITS

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# 2003-2004 Jeep Wrangler TJ 2.4 LITER

# Installation instructions

# Important information aboutyour system, and warranty

➔ **DO NOT ADD ANY OIL TO ANY PART OF THE SYSTEM.**
➔ **DO NOT OVERCHARGE THE SYSTEM**

This is a brand new a/c kit that is capable of a vent temperature of 39-47 degrees and to be used with R134 refrigerant. The kit is not designed for sealer, dye, or Freon substitutes. If these substances are used we are not responsible for the performance of the a/c system.

This kit was created with the customer in mind. It is the simplest kit on the market to install, and it can be done without any special tools. The kit will fit into the Jeep just as the factory designed it too. Follow the directions and you will have cold air conditioning in less then a day. Before beginning the installation please read the directions provided to get familiar with the kit and installation process. Before beginning the installation go through the checklist on page 4. If any parts are not included contact us immediately. We have a google link available for color photos and additional photos of the installation available here: https://photos.app.goo.gl/QYdwSigXzBH85KaJ7
You can also request the above link via email: sales@jeepair.com

A soldering iron and a 5/64" drill bit will be needed for this installation.

The Jeep Air team would like to thank you for your recent purchase of a complete a/c kit for your car or truck. There are a few steps that must be followed in order for your a/c system to operate properly.

→ The **HIGH SIDE** gauge reading should not exceed 220 PSI. We **MUST** have the **HIGH SIDE** gauge reading if you need any assistance in correcting a potential problem.

→ If you purchased the a/c compressor from **Jeep Air, DO NOT ADD ANY OIL, DYE, LEAK SEALANTS, OR OTHER ADDITIVES TO ANY PART OF THE SYSTEM**. If oil is required, Jeep Air will provide an additional sheet with directions on filling the system with oil.

→ There should be adequate airflow from the radiator fan, and a sufficient amount of room between the condenser and radiator. Make sure the **CONDENSER HAS A TUNNEL EFFECT OF AIRFLOW THAT FLOWS THROUGH THE CONDENSER AND RADIATOR**. Foam can be put in between condenser and the radiator edges to achieve a proper airflow effect. There should be ¼" to 1" gap in between the radiator and condenser. **EFFECTS OF INADEQUATE AIRFLOW**: the compressor may act like it is "locking up"; warm air only from the vents, overheating of the engine, high head pressure, air blows cold at idle and blows warm while driving, and more.

→ The system should be charged with R- 134a ONLY. If you do not follow this instruction your warranty may be void and you may not be eligible for technical assistance. **EFFECTS OF OVERCHARGING:** Compressor is "noisy", engine overheating, warm air only from the vents, and more.

→ If a problem exists after checking all these conditions you may call or email for technical assistance. **IF YOU DO NOT HAVE THE HIGH SIDE GAUGE READING WE WILL NOT BE ABLE TO ASSIST YOU IN FIXING THE PROBLEM.**

**If you have a problem with the system we ask to call before diagnosing or changing any parts. We can fix problems easier if the system is not tampered with.**

**If you have a warranty claim you need to call prior to shipping any parts back. OUR POLICY IS TO GET THE OLD PART BACK PRIOR TO SHIPPING ANY NEW PARTS OUT.**

**We are not responsible for the following:**
**Cracked compressors from improper installation**
**Compressor with broken valves from overcharging of oil or refrigerant**
**Burned up clutches from to high of head pressure**
**Evaporator tubes cracked during installation**

**We will be here to serve you five days a week by phone and / or email**
**Please contact us if you need assistance.**
**800-223-7167**
**sales@jeepair.com**

# Parts Checklist

2003-2004 TJ Wrangler 2.4 Liter

| | |
|---|---|
| ☐ COMPRESSOR | PN: 15-5002 |
| ☐ EVAPORATOR | PN: 96-7349F |
| ☐ CONDENSER | PN: 93-7879 |
| ☐ ACCUMULATOR DRIER W/ SUCTION Lines Connected | PN: 62-8270H |
| ☐ LIQUID LINE | PN: 79-5538 |
| ☐ DISCHARGE LINE | PN: 79-5540 |
| ☐ TRANSDUCER SWITCH (attached to 79-5540) | PN: 611-9902 |
| ☐ CYCLING SWITCH (attached to 62-8270H) | PN: 915-2293 |
| ☐ A/C CONTROL HEAD | PN: 915-2281 |
| ☐ ACCUMULATOR STRAP | PN: 915-2302 |
| ☐ ACCUMULATOR SUPPORT BRACKET | PN: 915-2303 |
| ☐ ACCUMULATOR MOUNT BRACKET | PN: 999-1008 |
| ☐ MOUNT KIT with BELT | PN: 8030 |
| ☐ HARDWARE BAG KIT | PN: 920-1006 |

Kit includes:
915-2313 oil tube
915-2304 hose hold down
77-2002 relay
20 amp fuse
6 X wire ties
Wire connector w/ splice
4 X 1/4" x 1" bolts with washers flat and lock
2 X 1/4" speed nuts and 2 X 1/4" nuts
2 X M8 Condenser bolts with washers
WH 65 wire harness
WH 66 wire harness
WH 67 wire harness

**Checked by:**_____

*This checklist serves as a reference of all the parts included with this a/c kit.

# STEP ONE

# Removing the Radiator

1. **REMOVE THE POSITIVE AND NEGATIVE BATTERY CABLES and REMOVE THE BATTERY FROM THE VEHICLE**
2. **Remove the six bolts from the radiator core support.**
3. **Slide the radiator towards the engine. Be careful not to damage any hoses, or the radiator.**

# STEP TWO

## Install the Compressor

1. **Remove the Air Box and the Air filter tube going to the throttle body.**
2. **Remove the front bolt from the passenger side support bar in the engine bay. See fig. 2.1**
3. **The compressor mount kit will have a new belt as well as directions for mounting the compressor. Please refer to mount kit directions for compressor installation.**
4. **After the compressor is mounted, the fittings will point out towards the passenger side fender well. Do not uncap the compressor until the lines are attached. The wire on the compressor will be plugged in later.**

Figure 2.1

# STEP THREE

## Condenser Installation

1. **Install J-nuts into lower core support**
2. **Set the condenser on the core support, hang it to the top by the tabs**
3. **Install the top two bolts, be sure to put washers on the bolts and lock washers on the bottom DON'T TIGHTEN THE BOLTS**
4. **Install the bottom two bolts and washers Tighten lower bolts**
5. **Tighten all four bolts**
6. **Reinstall the Radiator.**

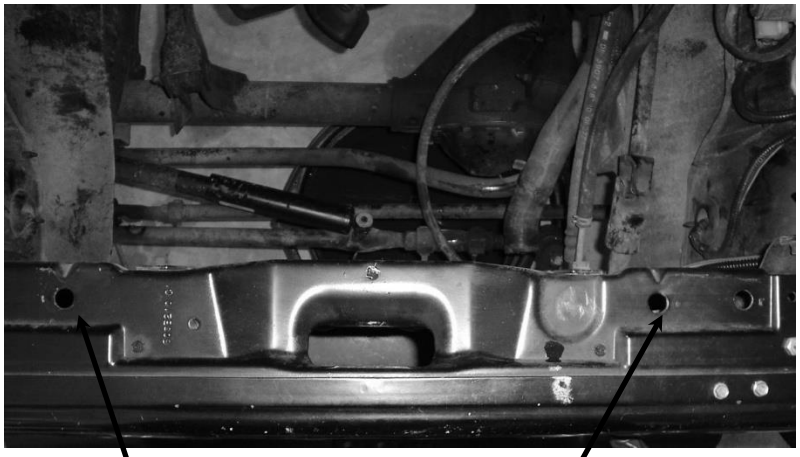


Figure 3.1

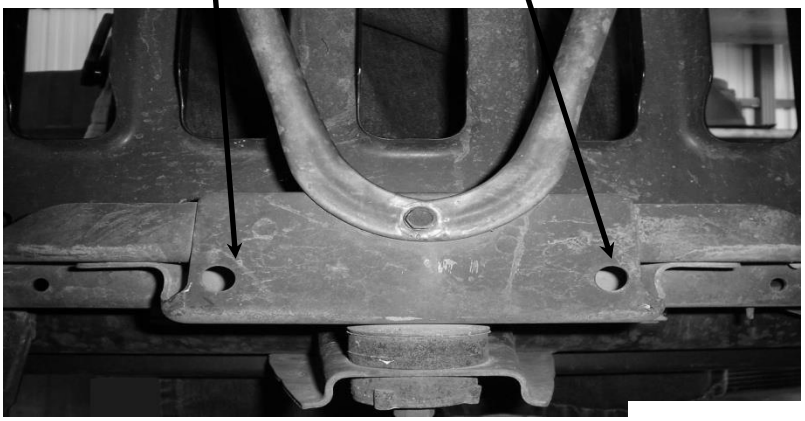



Figure 3.2

# STEP FOUR

## REMOVING CONTROL HEAD

1. **Remove the ashtray, and the Philips head screws located behind the opening**
2. **Remove the defrost grill (no screws) pull straight up**
3. **Remove the two Philips head screws holding the top center vent panel**
4. **Remove the center vent panel**
5. **Remove the four screws holding the control head**
6. **Remove the electrical plugs and the cable; unplug the vacuum lines at the connection on the control head. You will not use the Vacuum line on the OE Control Head if it is too short. See fig. 4-2**

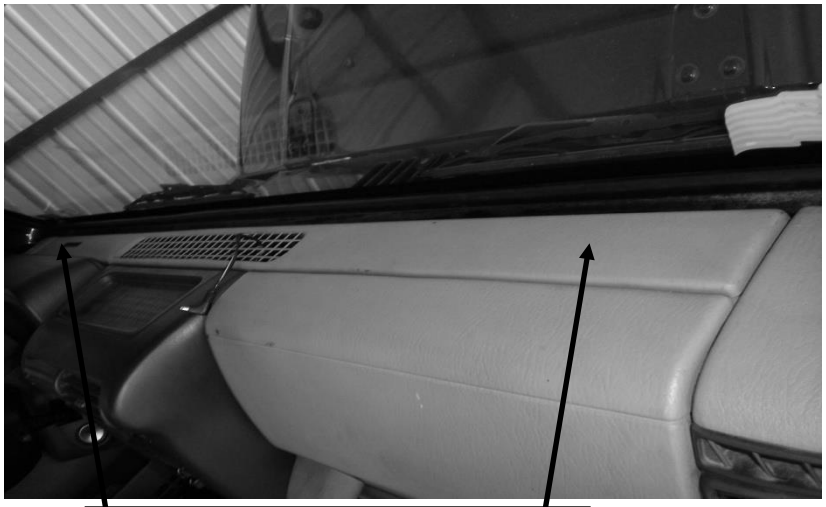



Figure 4.1

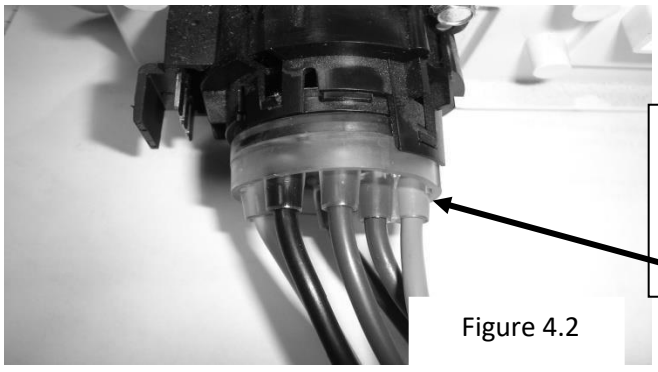



Figure 4.2

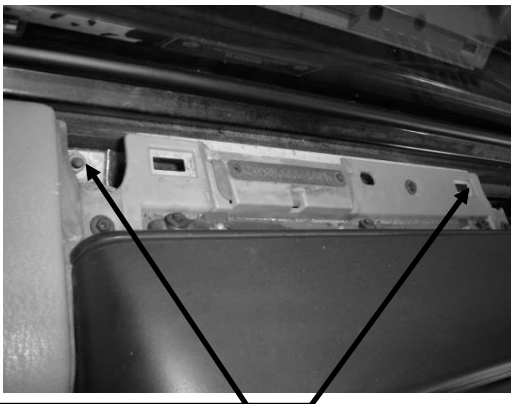
# STEP FIVE

## Dashboard removal

1. **Remove three torx bits from each side of the dash, six total (T-30) Fig. 5-1**
2. **Remove four 9 mm nuts from top of dash Fig.5-2 (Pictured on cd)**
3. **Remove the cover on the bottom of the plenum (over transmission tunnel, in front of console) Fig.5-3**

Remove Six torx bolts

Figure 5.1



Remove all four 6mm nuts

(Only one pictured)

Figure 5.2

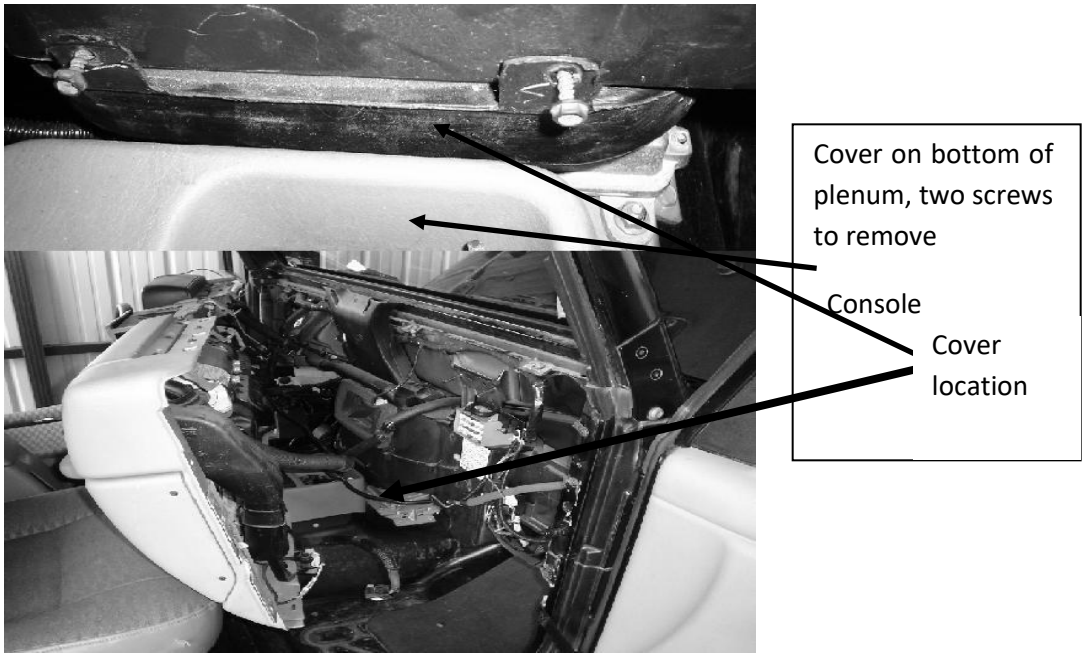



Figure 5.3

4. **Remove the glove box by pulling the tab on passenger side of glove box toward center of vehicle. Let glove box drop, and lift off hinges.**
5. **Remove two nuts through glove box opening**
6. **Remove lower panel under steering column by removing two screws and pulling back on top of panel. Lift off hinges Fig. 5.4**
7. **Remove reinforcement plate behind lower panel by removing four screws Fig. 5.5**
8. **Remove two nuts securing steering column. Let steering column hang loose.**

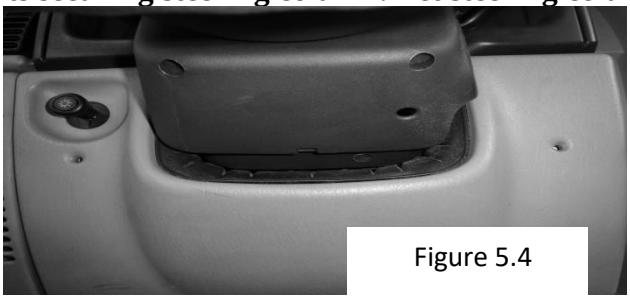


Figure 5.4

Figure 5.5

9. **Disconnect wire harness from dash to heater**
10. **Remove fuse panel by removing to screws at top of panel. Fig. 5.6**

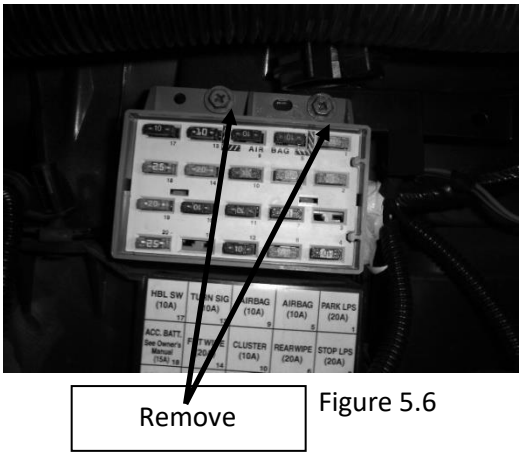



Figure 5.6

**11. Remove bolt securing heater case to fuse panel bracket**

# STEP SIX

## Dashboard Removal Under Hood

1. **Disconnect Heater hose and vacuum line**
2. **Remove five nuts from heater case mounting studs on firewall. One is located under the blower motor. There are two nuts on one stud above the drain.**
3. **On the inside of vehicle, lift up the dash to clear the studs across the top of the dash. Pull back on passenger side of dash and let it rest on the front seat.**
4. **Remove heater case from vehicle through passenger door.**

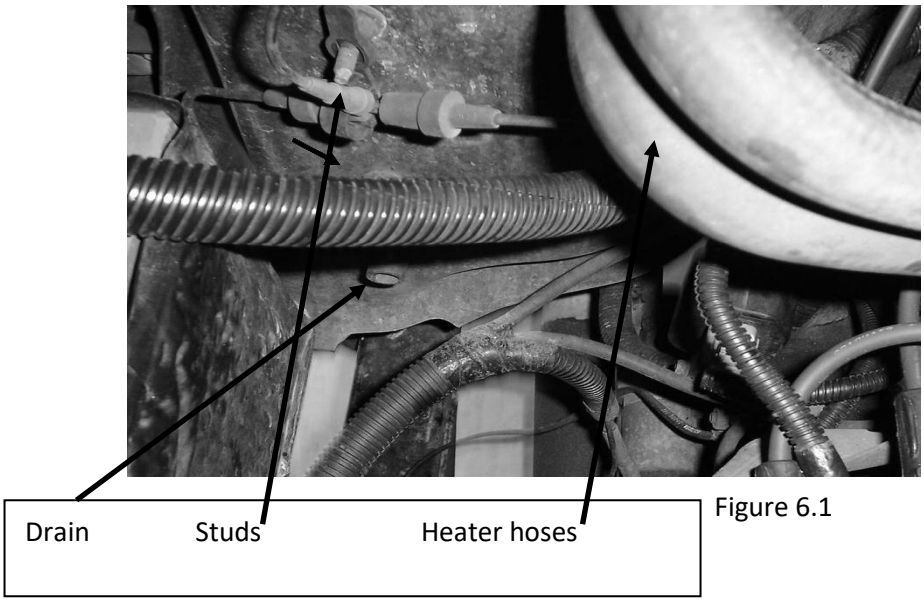



Figure 6.1

Figure 6.2

# STEP SEVEN

## Separating the Evaporator case

1. **Put the case on a table or bench for easier working conditions. Remove the 20 screws holding the case halves together; remove the two clips holding the case together, and the three screws securing blower motor to the case.**
2. **Top right side of the box is a duct housing (opposite side of blower motor), remove duct-housing Fig. 7.1**
3. **Remove the two screws under the duct-housing and two beside it.**
4. **Remove the screw on the bottom of the case behind the vacuum actuator. Fig. 7.2**

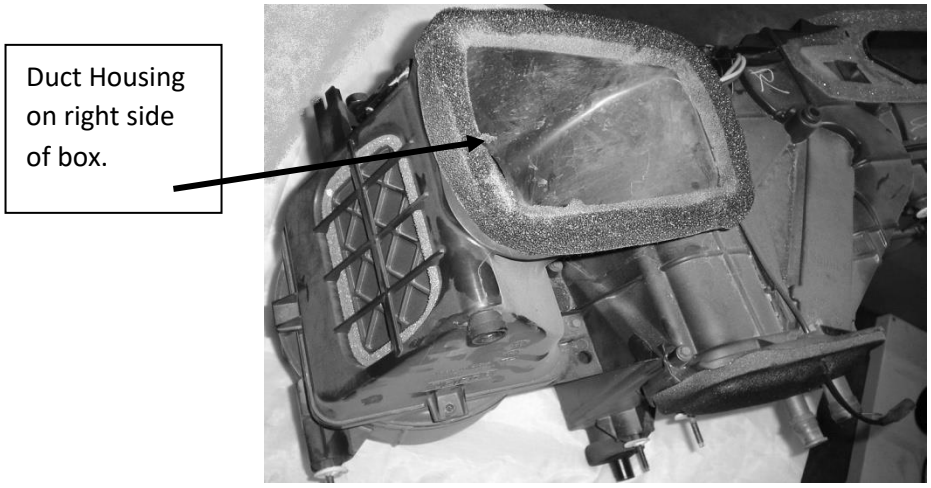



Figure 7.1

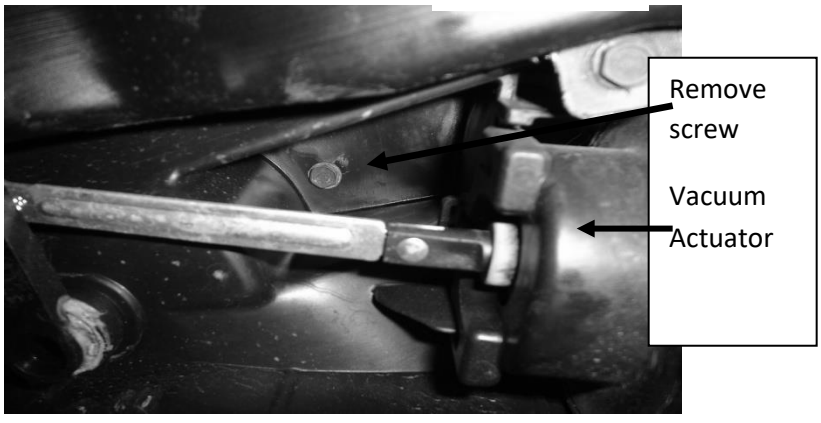



Figure 7.2

5. **Remove screw holding vacuum line cluster. Fig. 7.3**
6. **Remove blend door dowel Fig. 7.4**

Figure 7.3

Figure 7-4

# STEP EIGHT

## Installing Evaporator

1. **Place the evaporator into the case. Make sure the foam is attached.**
2. **Set the top half of the plenum back on**
3. **Insert and tighten the 20 screws, and two clips**
4. **Be sure the doors are back on, and the dowel is in place. If it is not lined up the system will not work properly.**
5. **Reattach the Vacuum actuator on bottom of case. It will come off when the case is separated.**
6. **Install the duct housing cover**
7. **MAKE SURE THE HEATER DOOR AND BLEND DOOR MOVE FREELY.**

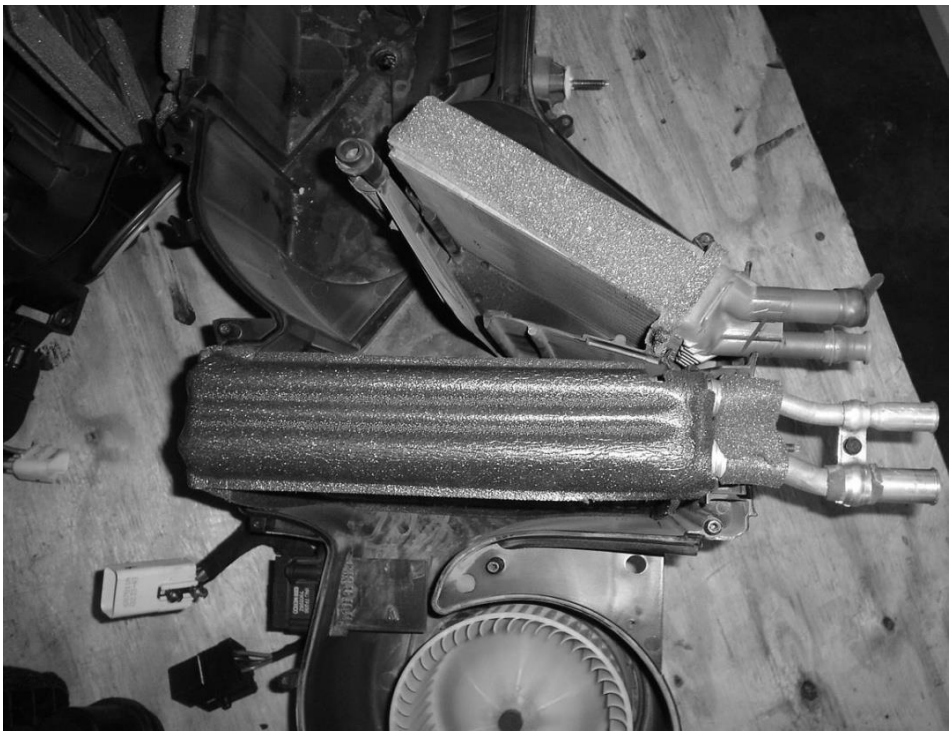


Figure 8.1

# STEP NINE

## Attaching Rubber Grommet

1. **There is a rubber grommet that sits on the evaporator and heater hose lines. You will need to cut two holes in the grommet and place over the lines.**
2. **Remove caps over evaporator outlets**
3. **Push the rubber up against the evaporator tubes, remove and mark with a pen or marker where the lines sit.**
4. **Take a razor or a round pipe and cut out the two holes. If you use a pipe, place the grommet over a piece of wood and hit the pipe with a hammer. The holes do not need to be larger then ¼".**
5. **Remove the support brace over the evaporator tubes, with the brace removed you can slide the grommet over the four tubes, place the caps back on the evaporator**
6. **Pull the vacuum tube and the power wire (normally red w/white) through the grommet**
7. **Now you can reinstall the evaporator case into the vehicle. Follow the directions if needed.**

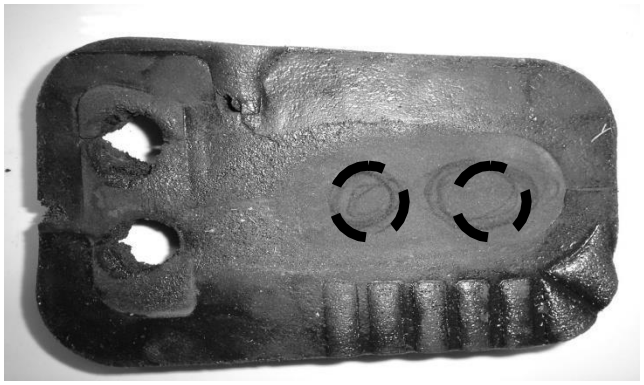


Figure 9.1

Figure 9.2

Figure 9.3

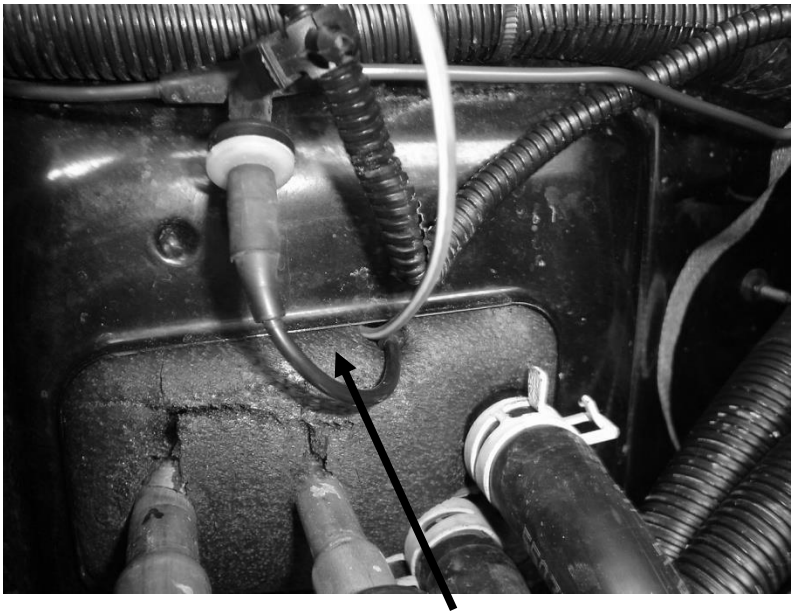


Figure 9.4

# STEP TEN

# Under Hood Hook up

1. **Now that the Inside is back together we can hook up the rest of the parts under the hood. Starts by making sure all the nuts are attached on the outside of the firewall, Hook up the Vacuum line, and heater hoses**
2. **Be sure the vacuum line does not get stuck between the bracket and firewall**
3. **Mount the accumulator bracket with strap to the passenger side fender well. Use the ¼ x ¾ bolts with washers and nuts. See fig. 10.3**

Figure 10.3

4. **Insert the accumulator into the strap. Tighten Accumulator after the hoses are attached.**

# STEP ELEVEN

## Attaching the Hoses

1. **Attach the liquid line to the bottom fitting on the condenser, then to the evaporator. PUSH HARD, LISTEN FOR THE CLICK.**
2. **Clip the liquid line to the inner fender well. See figure 11.1 and 11.2**

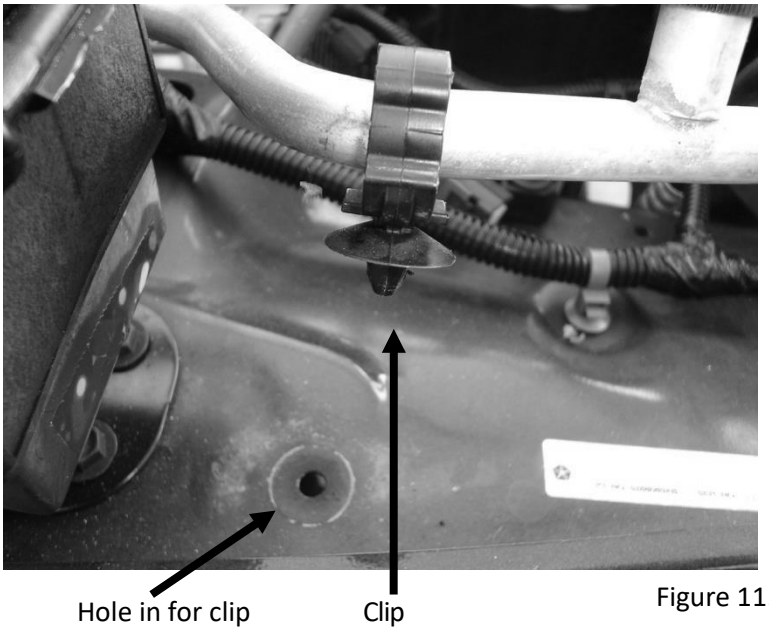



Figure 11.1

Figure 11.2

3. **Attach the discharge line to the small fitting on the compressor, to the top fitting on the condenser. The hoses may need to be slightly modified in order to fit properly.**

4. **Attach the large fitting to the compressor. This line runs from the compressor to the accumulator, from the accumulator to the evaporator. PUSH HARD but be careful not to put too much force on the evaporator, LISTEN FOR THE CLICK. You can use the oil tube provided to lubricate the fittings.**
5. **Tighten the accumulator strap after all the hoses are connected.**

Figure 11.3

Figure 11.4

Figure 11.5

# STEP TWELVE

## Wiring

**Connecting the wiring will require modifying the connectors that plug into the Power train Control Module (PCM) and making connections to existing wires on these connectors. A 5/64 inch drill bit is required to make the modifications and a soldering iron is required to make the connections.**

**The PCM is located on the firewall behind the battery and will have 3 connectors plugged into it. The connectors are referred to as C1, C2, and C3and are identified by color.**

- **Connector 1 (C1) is black.**
- **Connector 2 (C2) is white.**
- **Connector 3 (C3) is gray.**

**Carefully unplug connectors C1, C2, and C3. There is a catch on the top and bottom of each connector that must be depressed to release the connector. Remove the wire covers on the back of the connectors by depressing the 4 catches on each cover.**

**Installing a wire into the connector where no wire currently exists requires that a 5/64 inch hole be drilled in the connector. Drill the hole and insert the pin that is crimped on the end of the wire in the pin position as per the instructions. The pin positions are labeled on the front and back of the connectors.**

**Some connections will need to be made to pin positions that already have a wire installed. Do this by locating the pin position on the connector, trace that wire back a few inches and "tap" onto the existing wire. (Carefully remove about ¼ inch of the insulation and solder the new wire onto the existing wire. Cover the bare area with electrical tape.)**

**Relay Harness Wiring:**

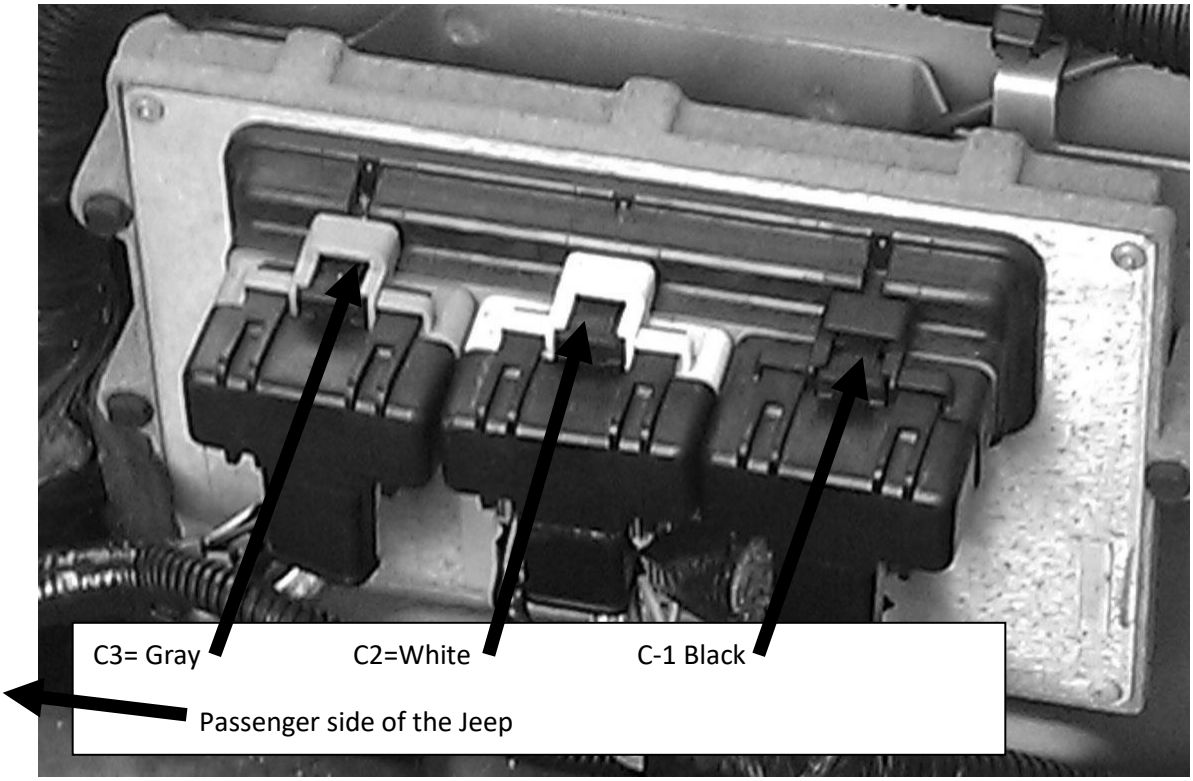
- **Purple wire – Drill connector C3, position 1 and insert pin into connector. This is the AC Clutch Relay Control output from the PCM**
- **Wire with inline fuse – Remove the Power Distribution Center (fuse panel) cover located on the passenger side, inner finder well. Locate the two studs with nuts at the end of the panel. Remove one of the nuts and install the ring connector. See figure 12-3. This is the 12 volt power source for the AC Clutch Relay and AC Clutch.**
- **Black wire with female connector – Plug the compressor clutch wire into this connector.**

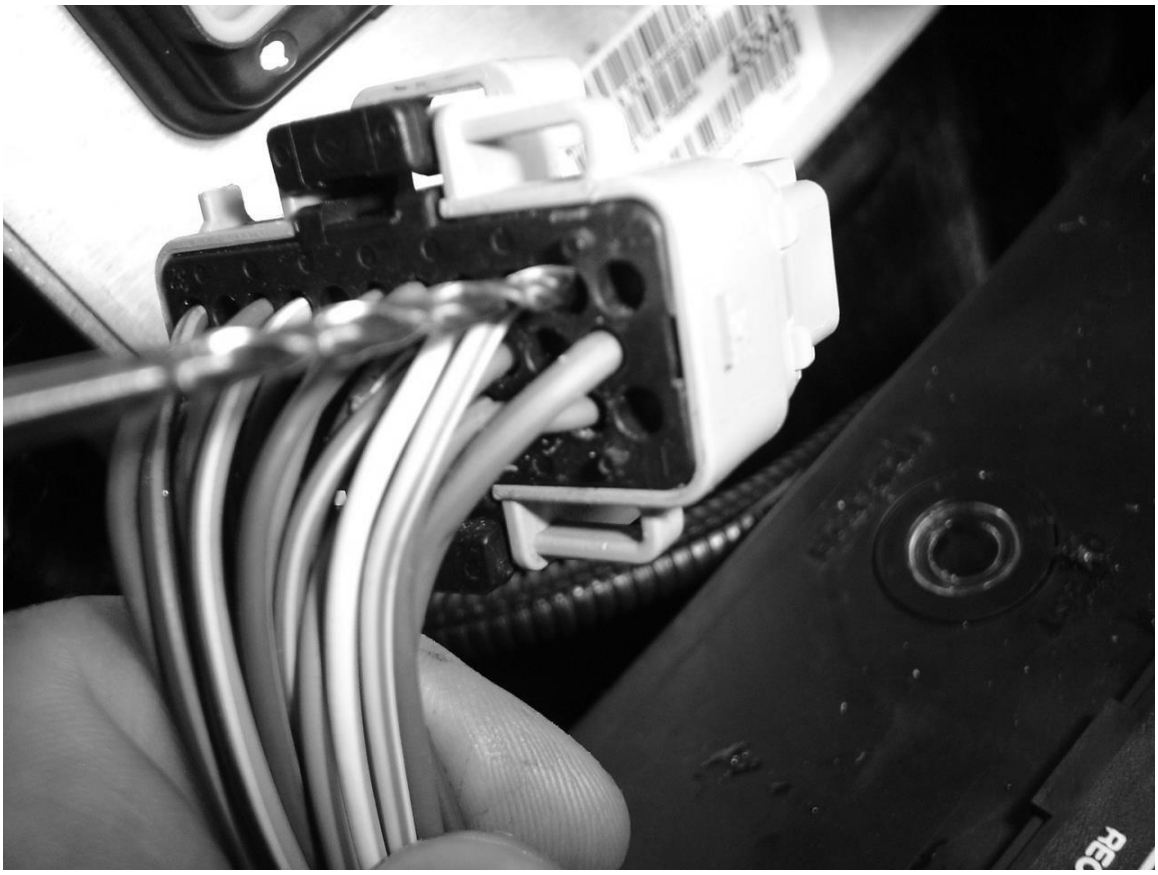
**Transducer Wiring:**

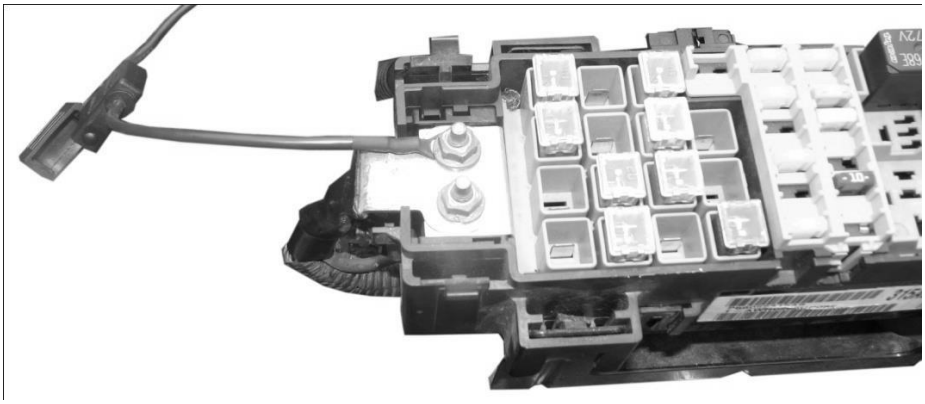
- **Yellow wire - Tap the Yellow wire from the transducer harness onto the existing violet with white tracer wire at connector C2 position 31. This is the 5 volt supply for the transducer.**
- **Green Wire – Drill connector C2 position 19 and insert the green wire. This is the A/C pressure signal to the PCM. NOTE: Your vehicle may have a dark blue wire installed at connector C2 position 19, if so cut the pin off of the green wire and tap it onto the existing dark blue wire.**
- **Blue Wire – Tap the blue wire from the transducer harness onto the existing black with a light blue tracer wire at connector C1 position 4. This is the Sensor Ground source.**

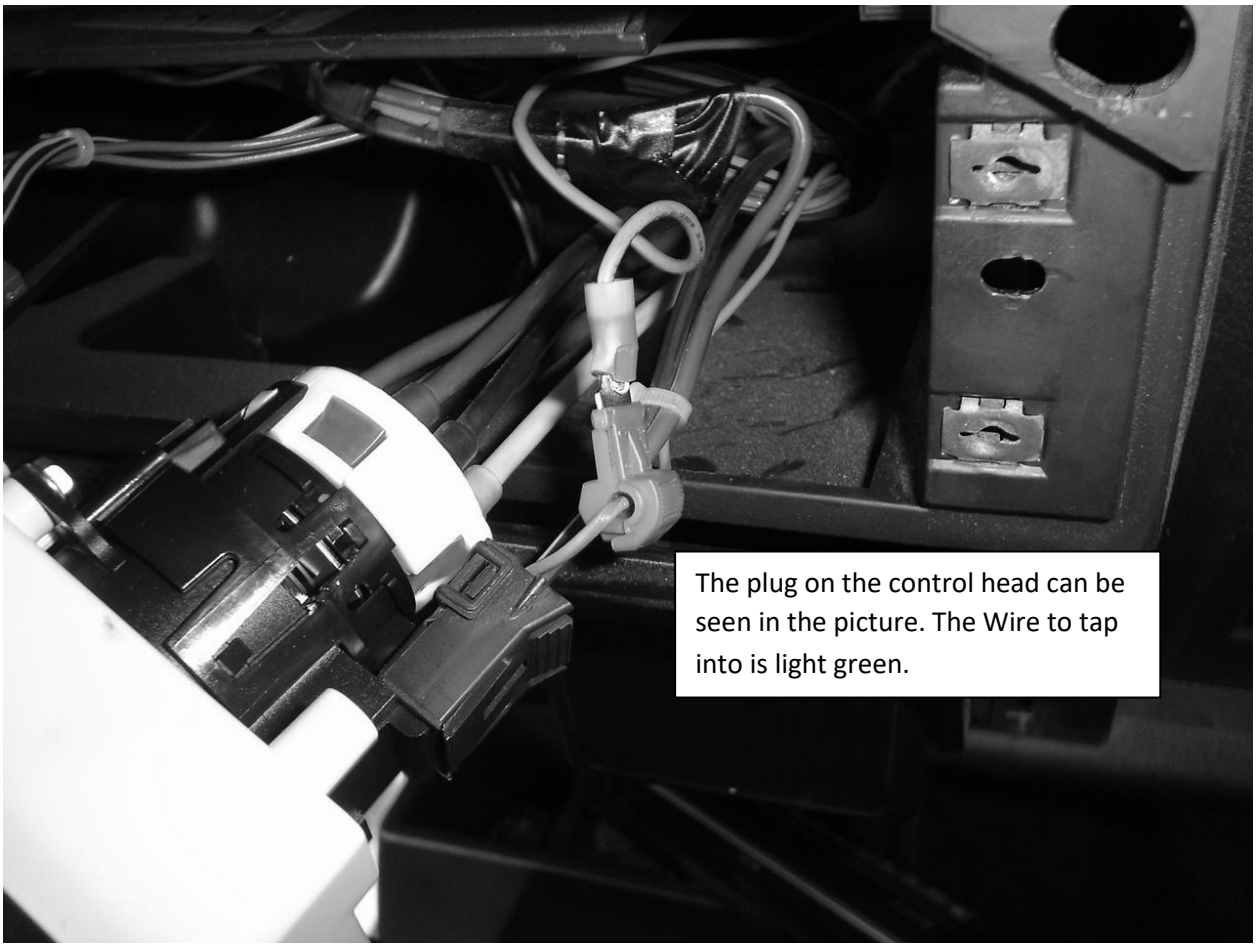
**Cycling switch:**

- **White Wire – Drill connector C3 position 23 and insert pin. This is the AC Select input signal to the PCM.**
- **Solid blue wire – Drill connector C3 pin 22 and insert pin. This is A/C Switch Sense signal to the PCM.**
- **Blue with white tracer – This wire goes through the firewall and connects onto the control head. Cut a small hole in the foam and route the wire above the AC connections on the evaporator case with the vacuum tube. The glove box will need to be removed. Locate the light green wire on the passenger side of the control head and install the "T" tap with pliers. Crimp a male connector onto the blue with white tracer wire and plug the connector into the "T" tap.**

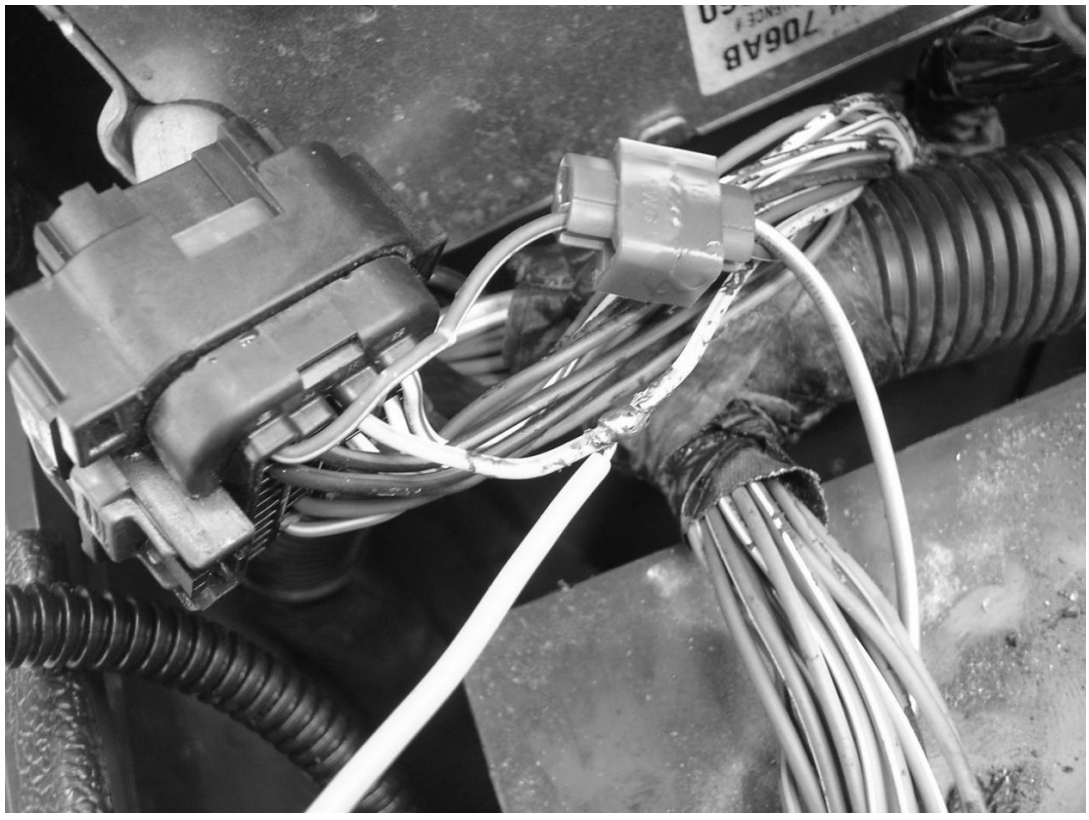








The plug on the control head can be seen in the picture. The Wire to tap into is light green.



**Mounting the relay and fuse. The relay should be attached to the fuse box mount with a screw, or a rivet. The fuse should mount next to it with the wire tie strap.**

**Tie up the remaining wires; they are best routed around the battery, on the passenger side. Follow the hoses for the cleanest look.**

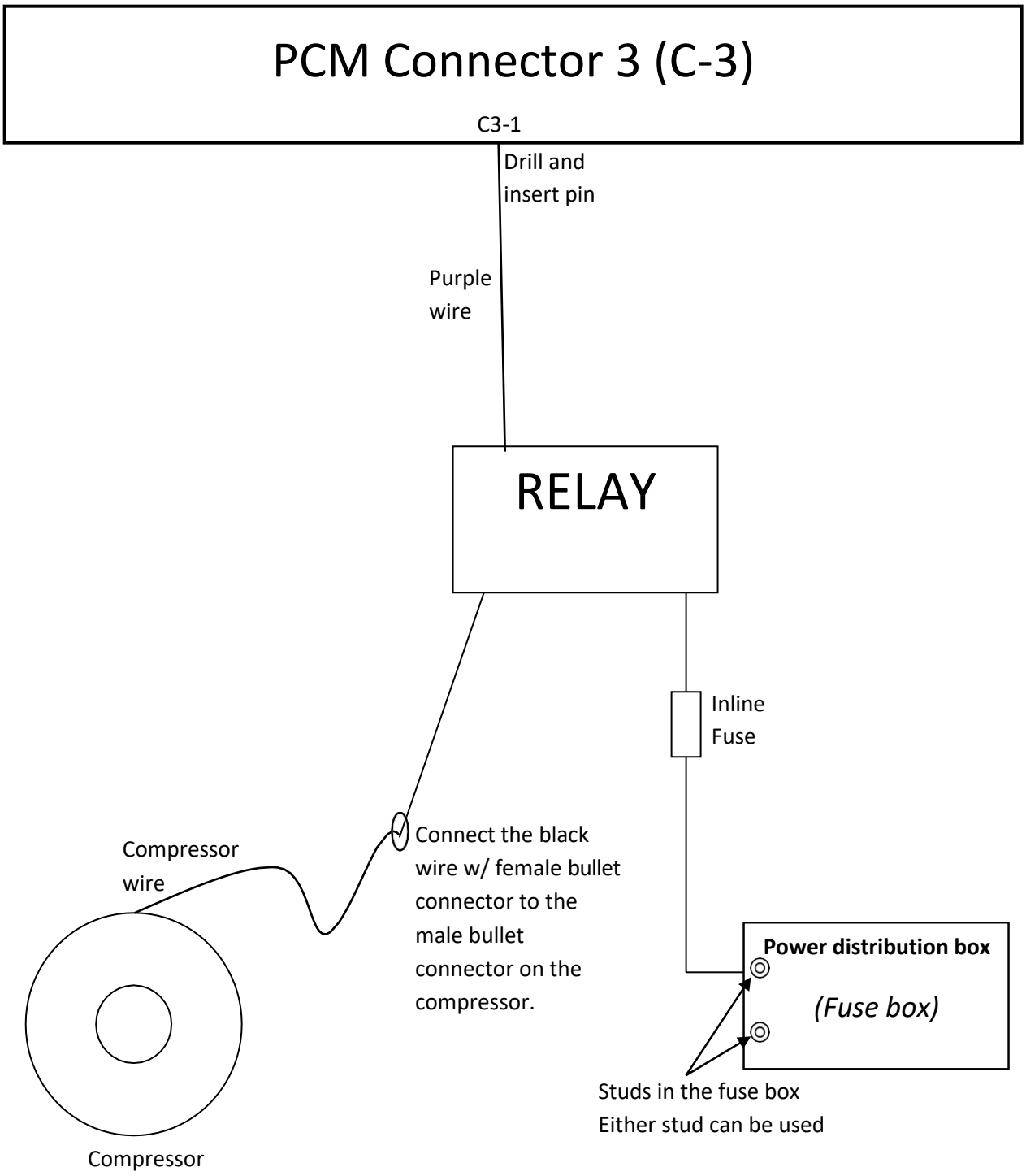
# STEP THIRTEEN

## Finishing UP

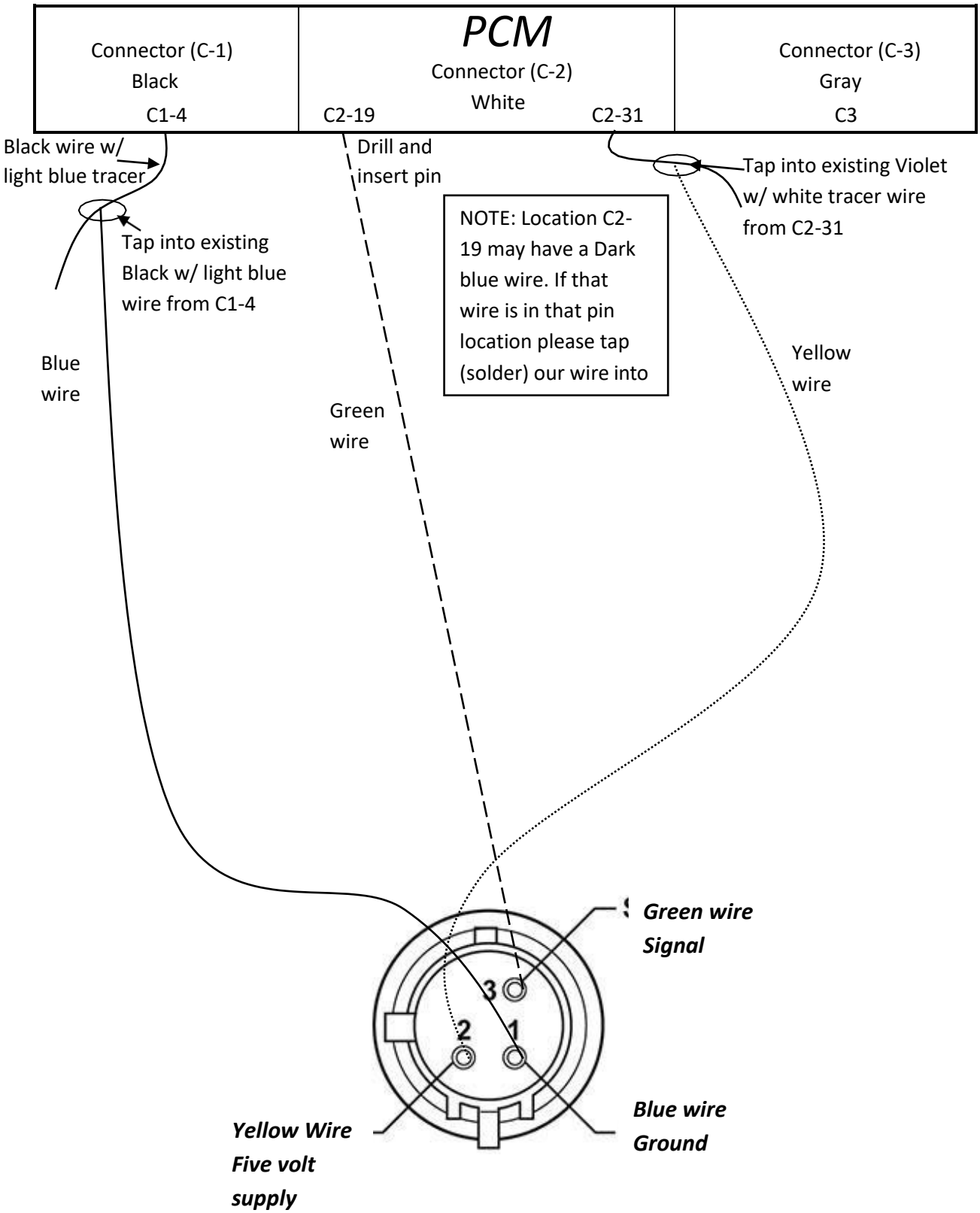
1. **Install the battery and hook up the cables**
2. **Evacuate the a/c system for at least 45 minutes**
3. **Charge the system with 24 ounces or two Cans of R134a Refrigerant. DO NOT ADD OIL, DYE, SEALERS, OR ANY ALTERNATIVE REFRIGERANTS.**
4. **Apply the sticker under the hood, and then write in the exact amount of freon used.**

**The system is designed for R134a; you will get the best performance by using it.**

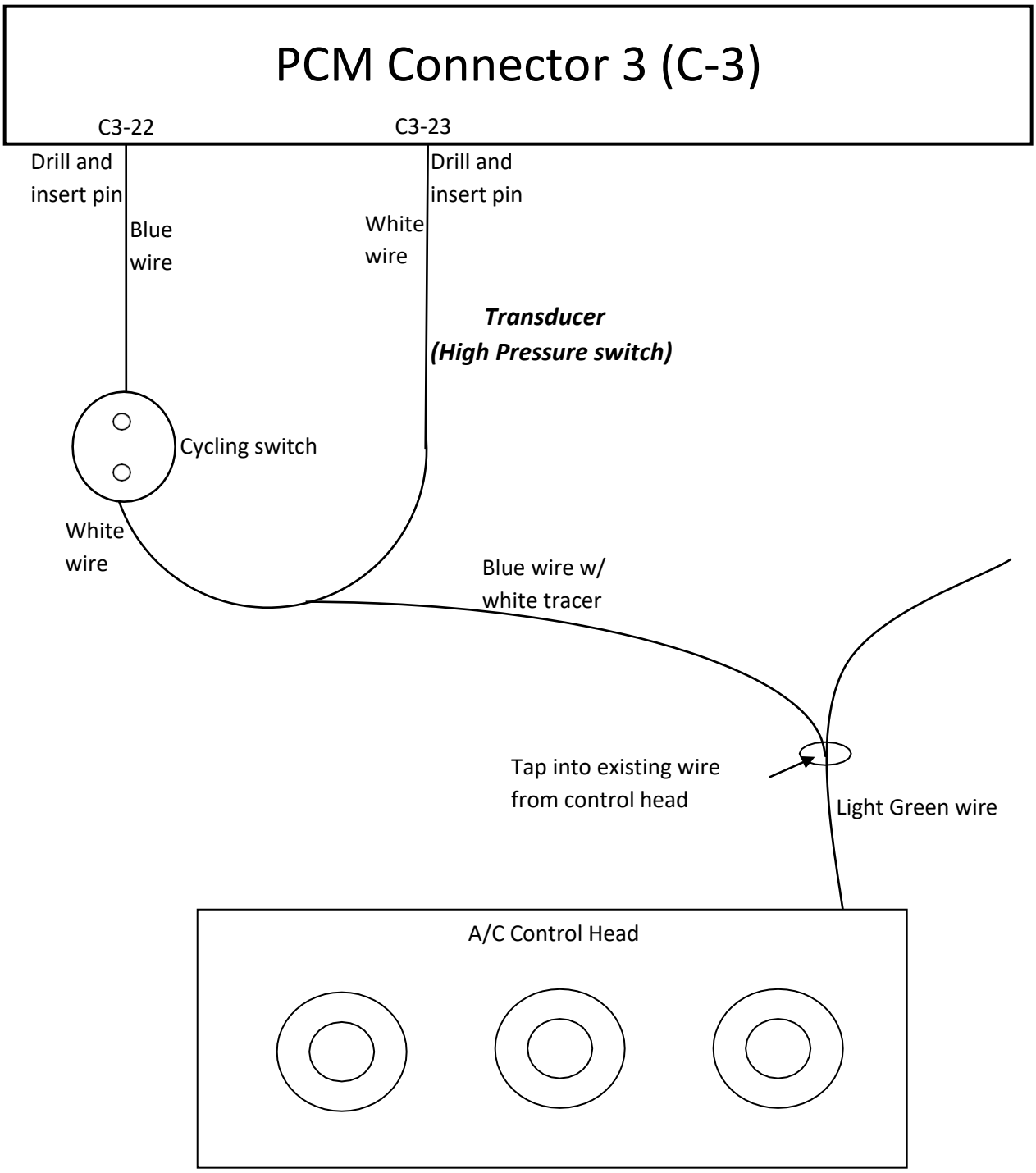
2003-2004 2.4 liter compressor clutch relay schematic



2003-2004 2.4 liter transducer (high pressure) switch schematic



2003-2004 2.4 liter cycling switch schematic



# Supplement

**Tips for troubleshooting wiring issues on the 2003-2004 Jeep Wrangler 2.4 liter kit**

1. Testing the relay and compressor clutch solenoid wiring. With the engine NOT running and the key in the off position use a short length wire to ground the purple wire where it connects to the relay plug. This will cause the relay to operate and you should hear the compressor clutch engage. DO NOT do this with the engine running. This bypasses the high pressure safety cutoff and the PCM control of the electric fan. Forcing the compressor to run in this configuration will cause the system pressure to go extremely high and WILL cause damage.
2. Testing the cycling switch and control head wiring. The control head applies ground to the blue with white tracer wire when the controls are set to any position that requires the compressor to run. This ground goes directly to C3 pin 24 and through the cycling switch to C1 pin 10. The PCM must see the ground on both of these pins.

   How to test for continuity:
   Unplug the wiring harness at the cycling switch, set the controls to off, and turn the ignition switch on (don't start the engine just turn the switch on so the PCM is powered up). Set your volt meter to read DC volts and connect the common (black) lead of your volt meter to the negative battery post or a good ground.

   Touch the red probe to the female plug in the connector that goes to the blue wire. You should read approximately 10 volts coming from the PCM.

   Touch the red probe to the female plug in the connector that goes to the white wire. You should read approximately 10 volts coming from the PCM.

   Set the volt meter to read ohms and turn the AC controls on. Touch the red probe to the female plug in the connector that goes to the white wire. You should read approximately 30 ohms or less.

3. Testing the transducer wiring.
   Unplug the transducer connector and turn the ignition on. Set your volt meter to read DC volts and connect the black lead to the negative battery post or a good ground. Look closely at the connector where the wires go into the plug and you will see the positions are labeled 1, 2, and 3.

   Touch the red probe to the connection at position 2. You should see approximately 5 volts.

   Set your volt meter to read ohms and touch the red probe to the connection at position 1. You should read approximately 10 ohms.

   The next test requires that small bit of insulation be removed from the green wire in order to take a voltage reading. The reading must be taken with the connector plugged into the transducer. Correct any problems that you may have found up to this point and test the system before proceeding.

   Remove a small amount of insulation from the green wire. Set your volt meter to read DC volts and connect the black lead to the negative battery post or a good ground. Turn the ignition switch on and touch the red probe to the conductor inside the green wire. You should read approximately .95 to 1.25 volts.

Conditions that must be present in order for the PCM to send a ground out on C3 pin 11 to start the compressor.

- The voltage on the green wire at C3 pin 31 must be above 0.45 volts and below 4.5 volts. (A reading below 0.45 volts indicates the system is low on refrigerant and the PCM is programmed not to run the compressor. A reading above 4.5 volts indicates the system pressure is too high and the PCM is programmed to shut off the compress to protect the system)
- The PCM must be receiving the ground from the control head at C1 pin 10 and C3 pin 24.
- The engine must be running.
- The request for WOT cut out must set to “false” on a vehicle equipped with an automatic transmission. (you need a scan tool to check this)
- The engine must not be overheating. (A faulty temperature sending unit could make the PCM turn off the compressor. It’s pretty unlikely that this would happen and I think you would see other issues with a faulty sending unit.)