

## **John Deere 304H Loader**

## **Installation Instructions**

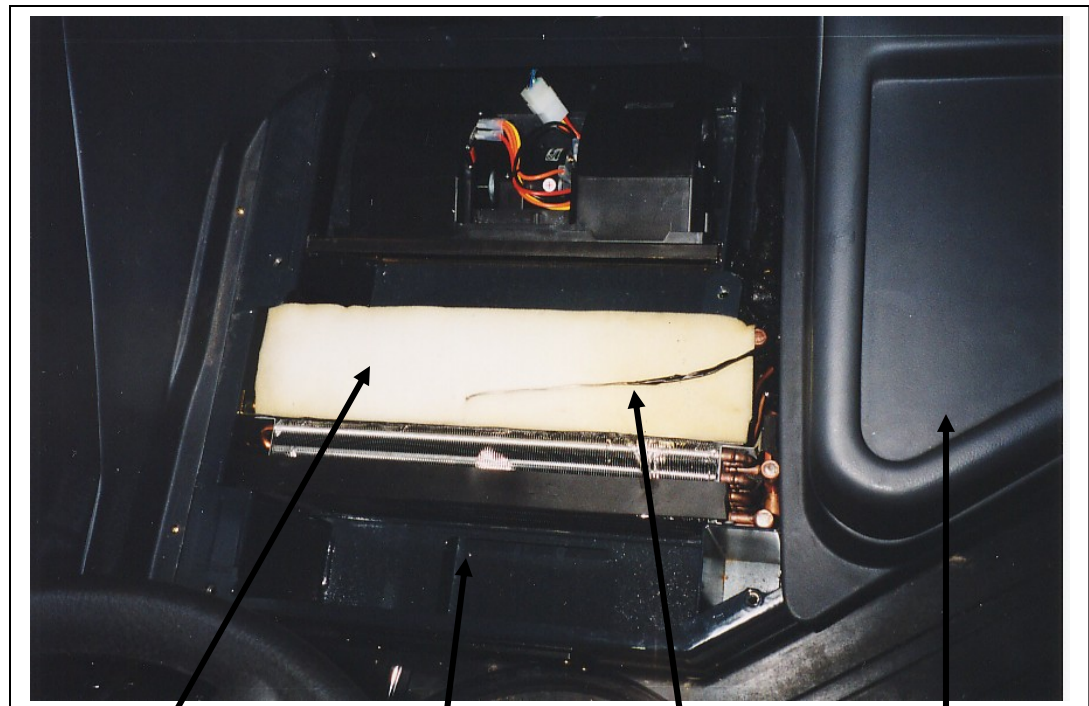


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**Evaporator:** The evaporator setup for the 304H loader is a “drop in” design that goes in under the operators seat. It uses the original heater blowers, air ducts, louvers, blower controls and air filters with some minor modifications to reduce the outside air intake.

Steps:

1. Unbolt the seat plate from the seat platform. Leave the seat attached to the plate. Slide the seat plate forward towards the steering wheel and then remove it from the cab.



Evaporator coil

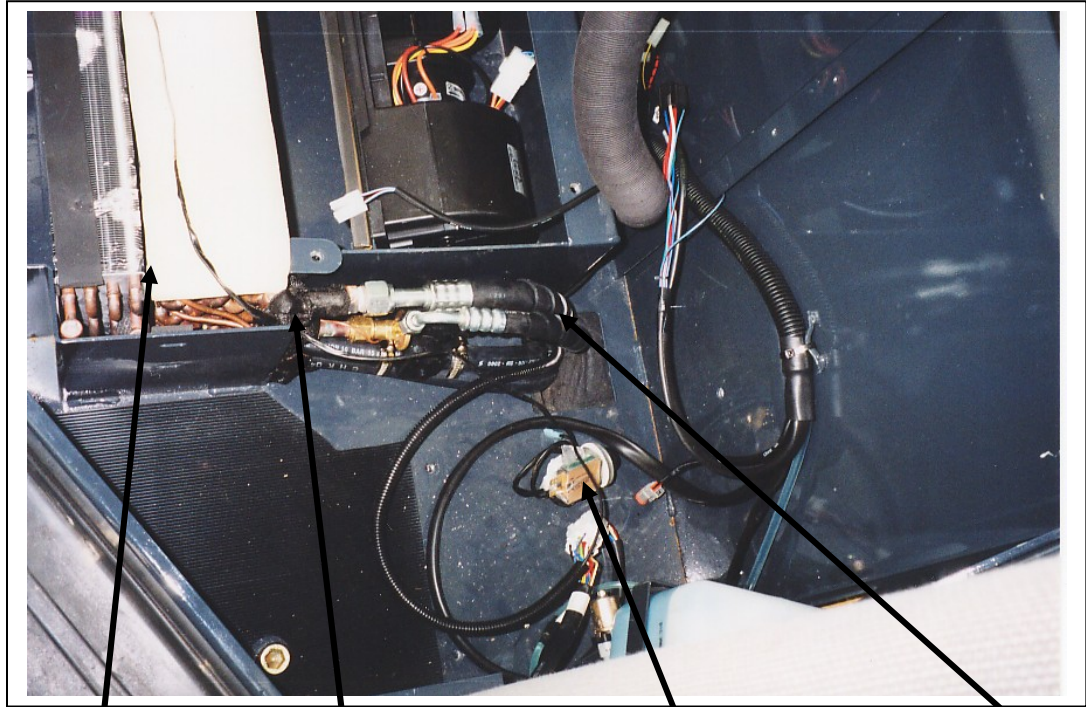
Seat plate and  
seat removed

Thermostat probe

Remove this panel

2. Open the storage compartment to the right of the operators seat. Remove the contents of the compartment. Remove the rubber mat on the bottom of the compartment.
3. Remove the plastic pieces from behind the seat and to the left of the seat. This section contains the heater/blower controls. They must be disconnected to remove this section. This will expose the side of the heater A/C box that houses the heater and A/C hoses.
4. Remove the heater coil retaining bracket from the right hand side of the heater box. It sits between the heater coil and blowers and is held in place with two M6 bolts and nuts. Discard the bracket and hardware, it will not be reused.

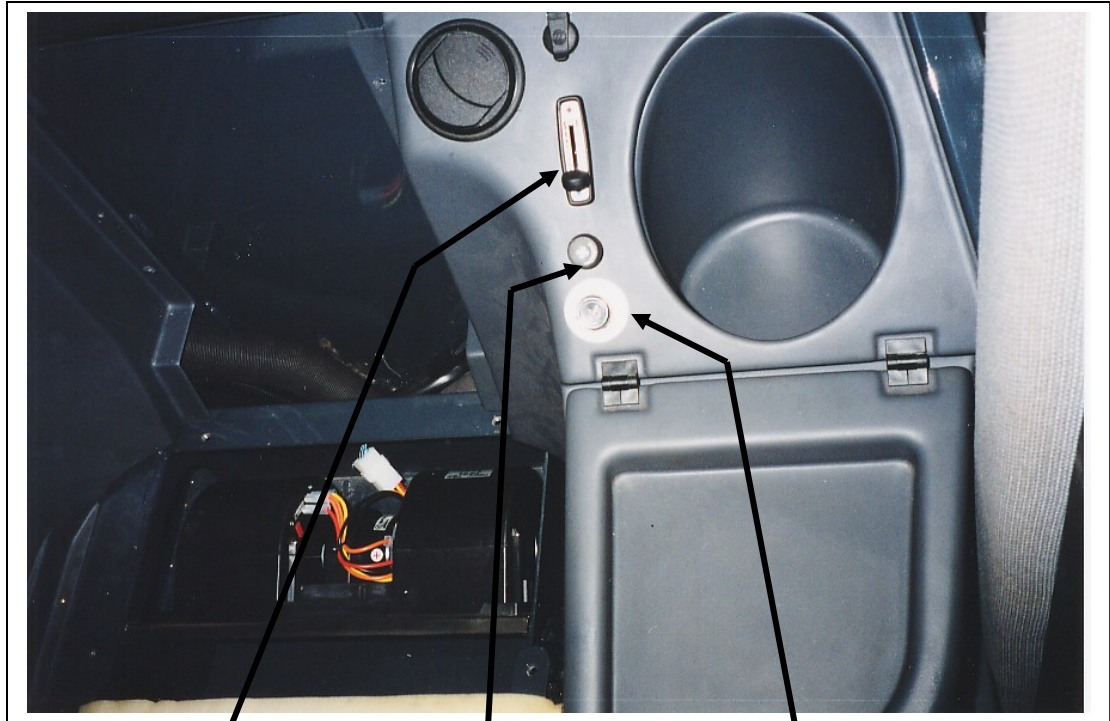
5. Slide the evaporator coil into place with the fittings on the left side pointing towards the back of the cab. On the right end of the evaporator coil, the front flange on the evaporator coil should be in between the heater coil flange and the coil retaining bracket.



Evaporator coil in place    Seal this area with tar tape    Thermostat    A/C hoses and clutch wire

6. The evaporator coil should sit flush with the heater coil at the top

7. The thermostat probe is run from the thermostats location on the left hand control console towards the back of the console and through the existing slot for the heater and A/C hoses. Run the thermostat probe along the top of the evaporator and insert it five inches deep into the coil between the second and third row of tubes from the front, about half way along the length of the coil



Heater control

Blower control

Thermostat in place once panel replaced

8. Using tar tape, seal the area all around the heater and A/C lines as they exit the heater box area. Also plug the two small holes left from the removal of the M6 bolts holding the right heater coil retaining bracket.
9. In extreme environments, it may be necessary to increase the airflow to the top of the cab. This can be done by installing a louver in the left hand column just behind the door. A ball louver with flex hose installed on it is supplied in the kit. Cut out a 2 1/2" round hole in the column cover at or near head level. Install the ball louver and flex hose in the hole. Run the flex hose down the column and into the storage box area. This may require drilling a 3" hole in the side of the storage box. Run the flex hose across the bottom front of the storage box to the side wall of the heater box ahead of the coils. Drill a 2 1/2" hole in the side of the box and install the supplied hose adaptor. Connect the flex duct to the hose adaptor. The cover plate for the heater A/C hoses can be notched out to fit around the flex duct.





This cover is hollow and could accommodate a flex hose and louver mounted at head level.



Add hose adaptor in here

Notch this plate to fit around the flex duct.

- 10) This machine draws too much outside air to cool well in very hot conditions. A self adhesive foam panel is supplied to restrict the opening on the outside air intake plate. Install the foam on the inside of the plate so that it blocks all but one or two vents.



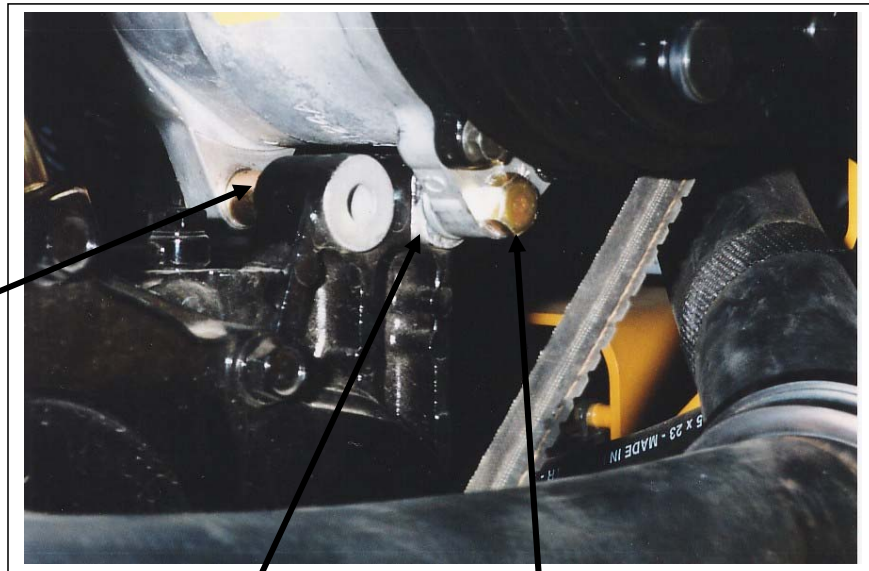
Outside air intake louvered door off.



Outside air intake with louvers on door restricted by self adhesive foam panel

**Compressor Mount:** The compressor is mounted in the factory alternator location and the alternator is remounted overtop of the compressor.

- 6) Remove the belt cover shield from in front of the engine. Keep all parts for reinstallation.
- 7) Remove the alternator from its original location. Keep the tightener bracket and all hardware for mounting the compressor.
- 8) Install the compressor onto the alternator mount using the same hardware and tightener bracket. One or more washers may have to be used as spacers between the front compressor ear and the engine mount point. Check the belt alignment with a straight edge. The main drive belt goes on the back groove of the compressor clutch.



Original alternator mounting hardware used for compressor mount.

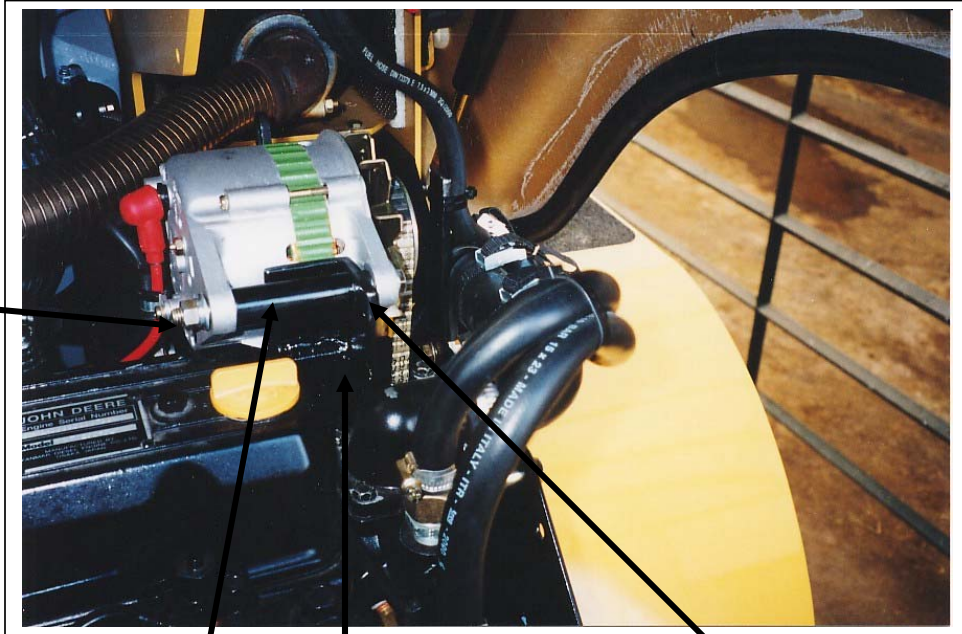
Washer used for compressor belt alignment

Original alternator mounting hardware used for compressor mount.

- 9) Bolt the new alternator mount to the engine head just above the compressor. Attach the alternator to the mount bracket using the spacers and long 3/8" bolt provided. Double check the alignment with the front groove on the compressor. Use a straight edge.



Long 3/8" bolt

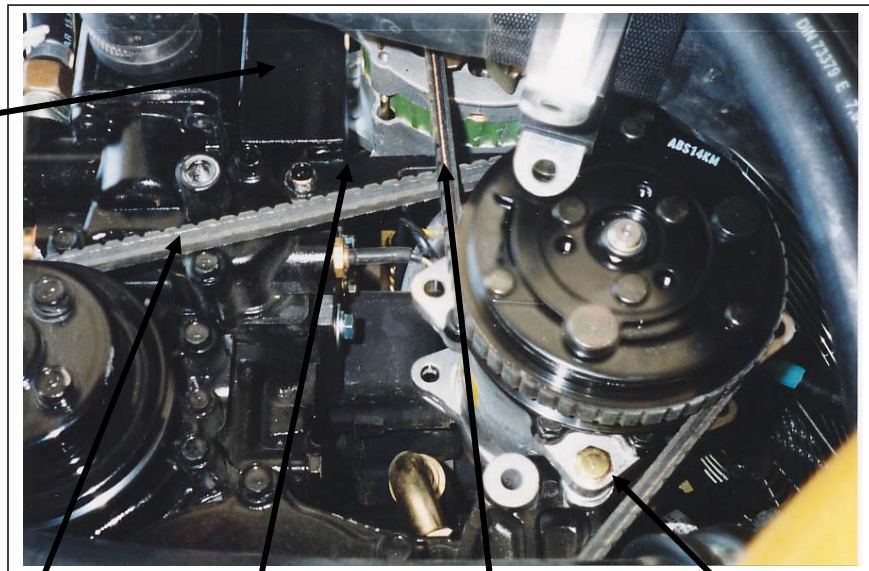


2 5/8" spacer

Alternator bracket

1/4" spacer

Alternator mount bracket



Compressor drive belt

Compressor tightener bracket

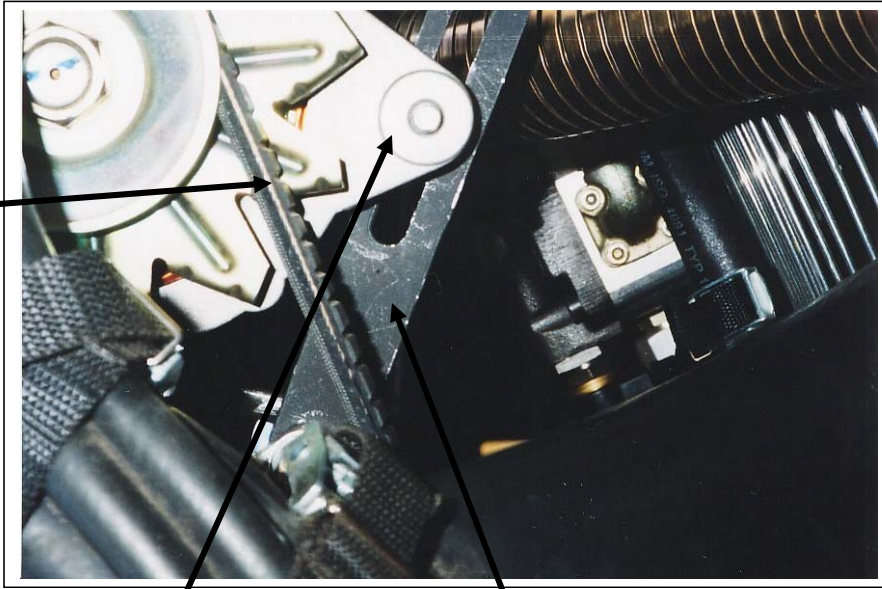
Alternator drive belt

Main compressor mount bolt

10) Install the alternator tightener onto the compressor between the top front compressor ear and the compressor tightener bracket. It sticks up from the compressor and the slotted end bolts to the backside of the alternator ear.



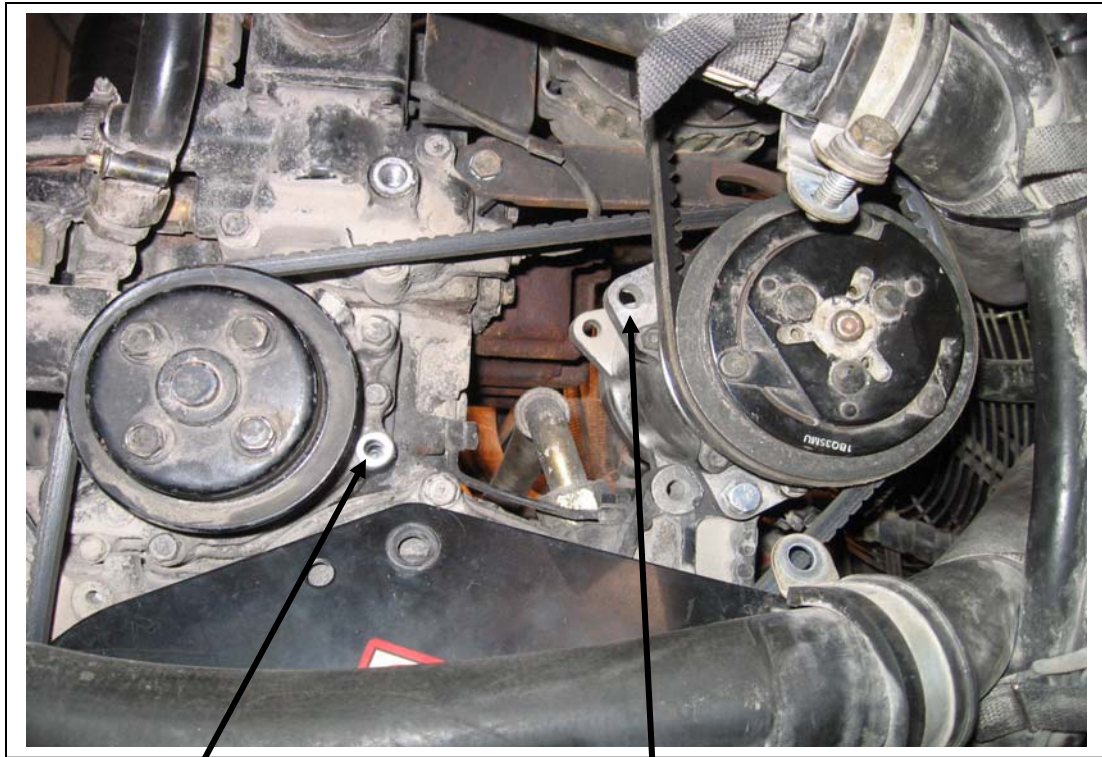
Alternator belt



Original alternator

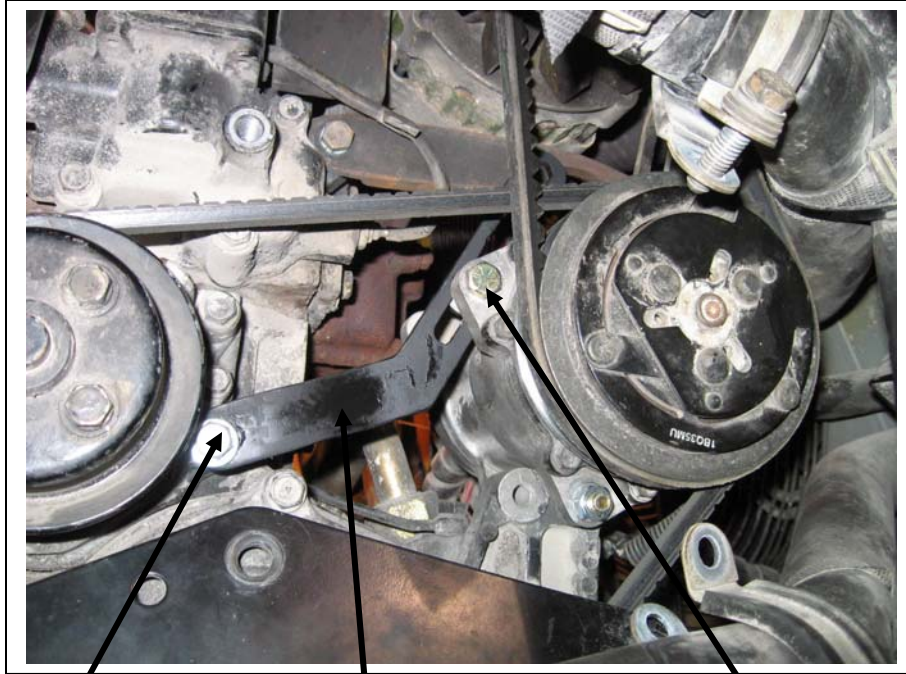
Alternator tightener bracket supplied in kit. Mount between top compressor ear and compressor tightener bracket.

11) Tension the compressor belt first, then tighten the alternator.



Remove this M8 bolt to install compressor mount stiffener bracket.

Stiffener bracket to bolt to the back of this compressor ear.

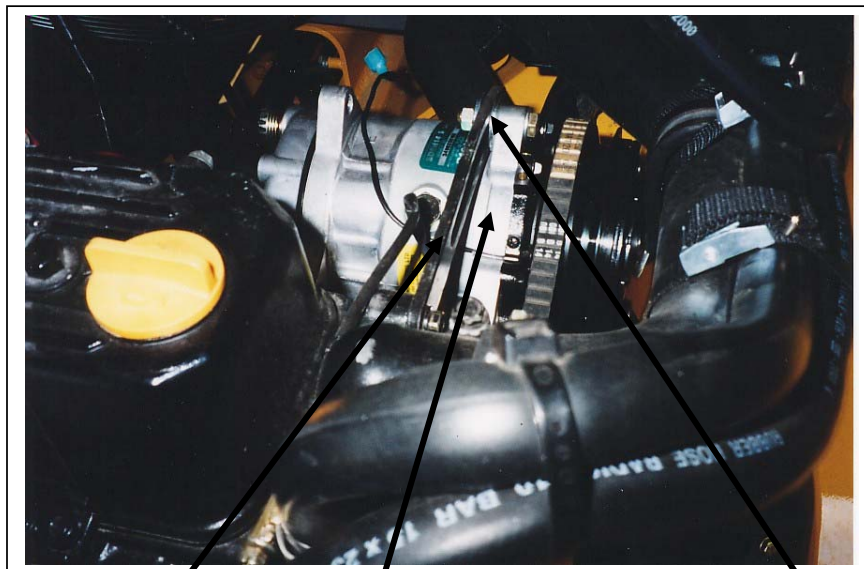


M8 x 70mm bolt

Compressor mount stiffener bracket.

3/8" x 1 1/2" bolt holding stiffener bracket to compressor.

12) Bolt the compressor mount stiffener bracket on between the water pump housing and the front inside ear of the compressor.



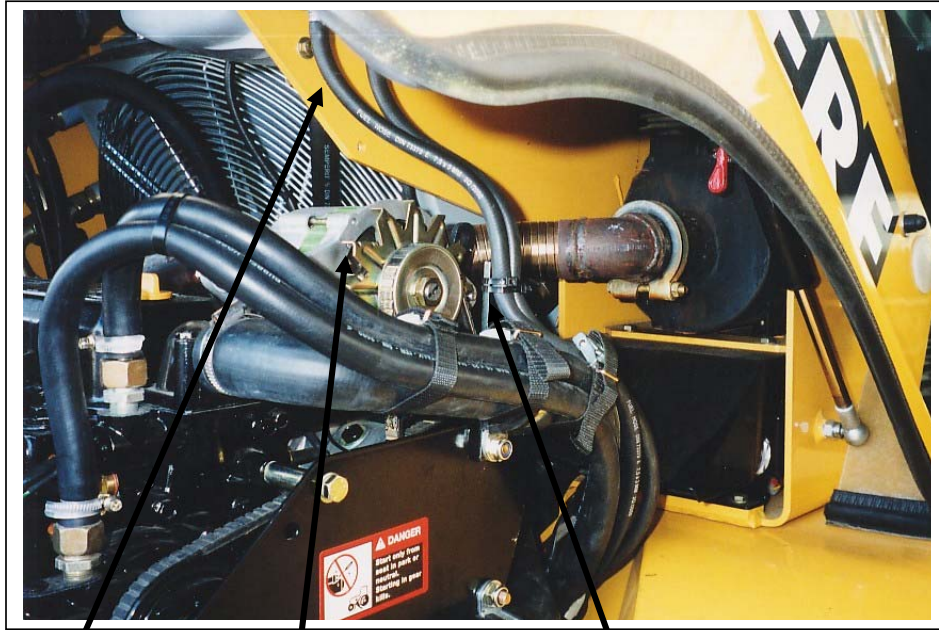
Original alternator tightener bracket

Compressor

Spacer to be replaced with new tightener bracket for re-mounted alternator



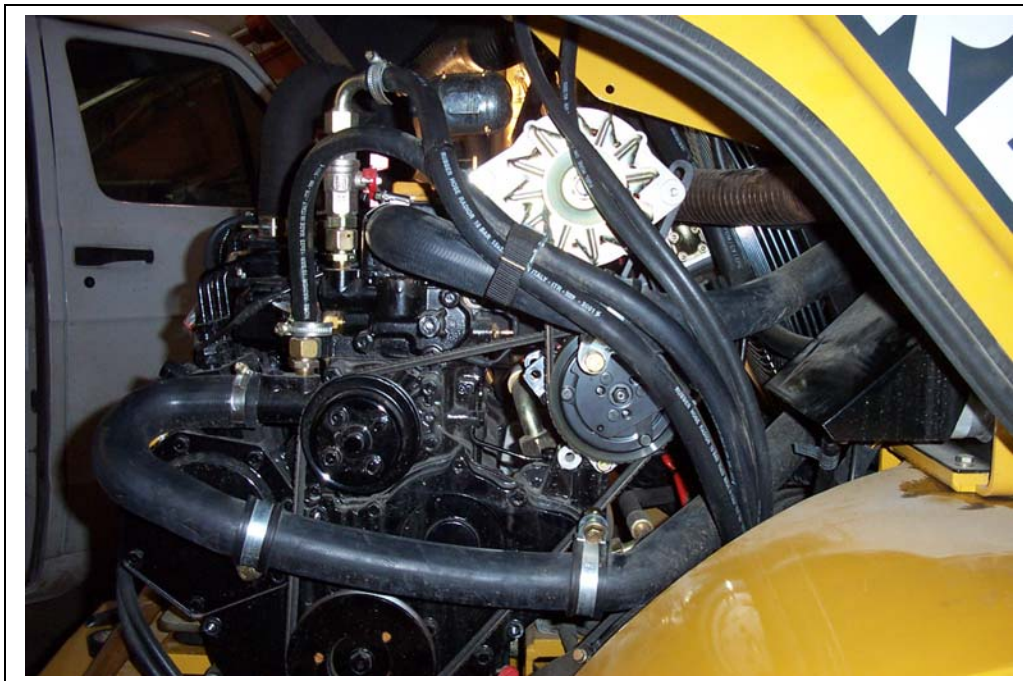
13) Reinstall the belt cover shield. Add the straight brake line support bracket to the top front bolt. Tie wrap the brake line to this bracket so that they can't come in contact with the front of the alternator.



Brake fluid lines

Alternator

Brake line support bracket



Compressor / alternator mount set-up

**Receiver Drier:** The drier mounts off a bracket added to the top of the radiator fan shroud. The drier has a normally closed trinary pressure switch on it to turn on the hydraulic fan when the A/C system requires it.

Steps:

- 1) Locate the top left fan screen bolt and remove it. Reinstall it with the straight drier bracket pointing straight up.
- 2) Clamp the drier to the bracket using the two #48 gear clamps provided. Have the pressure switch pointing away from the radiator



Receiver drier with trinary switch mounted on fan shroud



**Condenser Installation:** The condenser setup is a radiator mount design.

Steps:

- 1) Remove the radiator intake grill from the top of the engine compartment just behind the cab.



View of condenser mounting area on the intake side of the radiator

Remove the M10 nuts and washers

- 2) Remove the nuts and washers from the bottom two studs holding the radiator to its mount brackets. Place the lower condenser mount brackets onto the studs and reinstall the nuts.



Lower condenser mount bracket installed

Mount bolts for condenser frame

- 3) Repeat this for the top condenser mount bracket.



Condenser mount brackets installed across the radiator face.

- 4) Slide the condenser down onto the two 1/4" bolts on the lower condenser frame. Line up the two 1/4" bolts holes on the top condenser frame and install all four bolts.



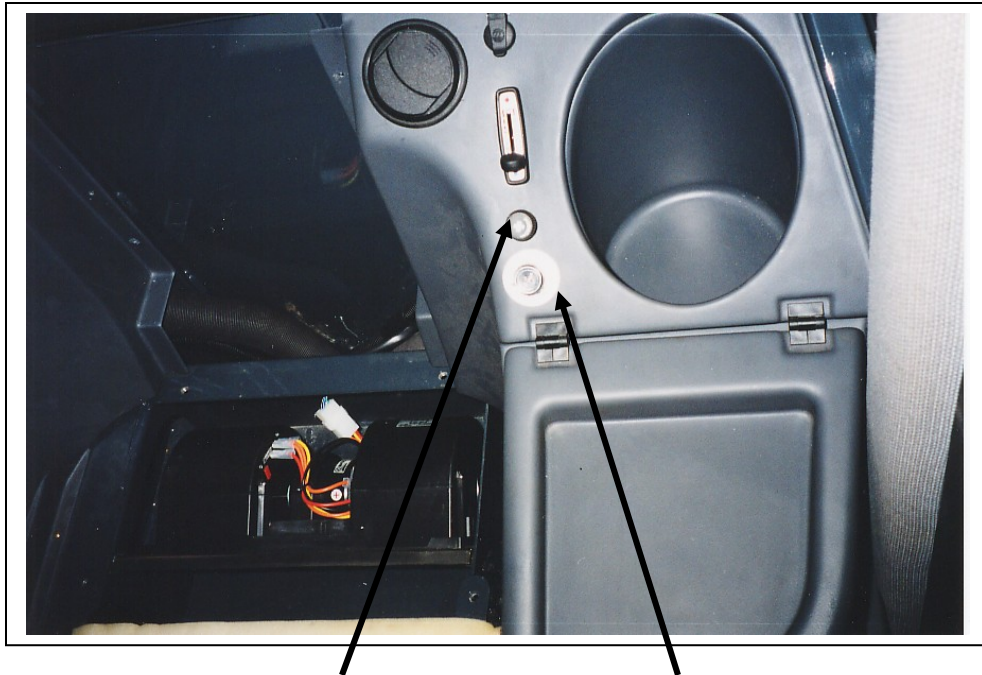
Condenser in place on intake side of radiator

- 5) NOTE: It may be easier to connect the 5/16" fitting on the bottom of the condenser before sliding it all the way into place.

**Electrical:** The electrical system ties into the factory blower switch and supplies power to the compressor. It also contains a trinary switch that engages the hydraulic radiator fan when the A/C system needs it.

Steps:

- 1) Mount the thermostat switch below the blower switch.

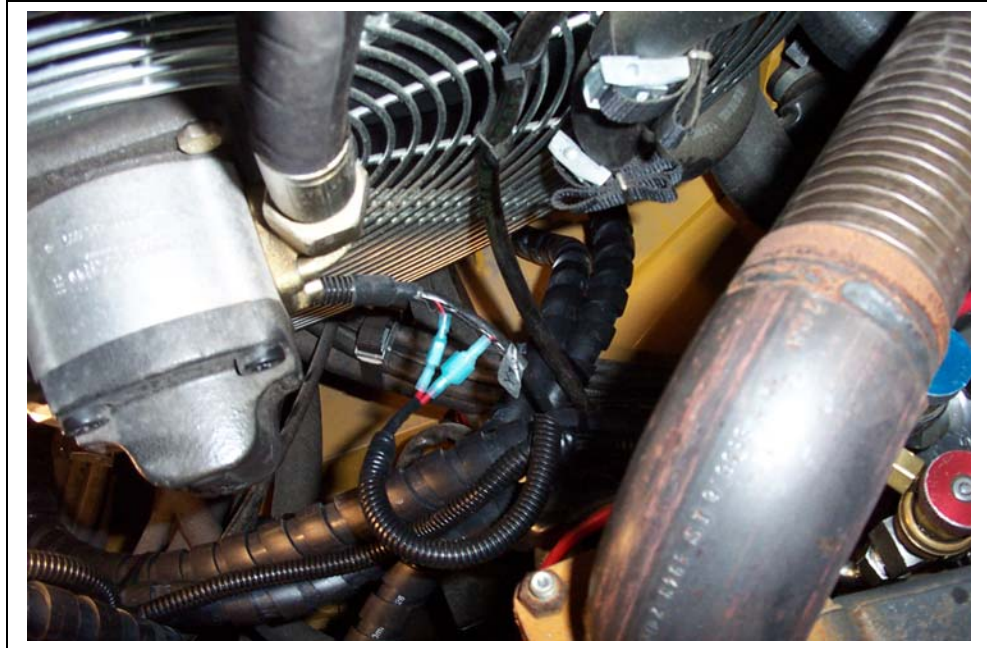


Blower control

Thermostat in place once the panel is replaced.

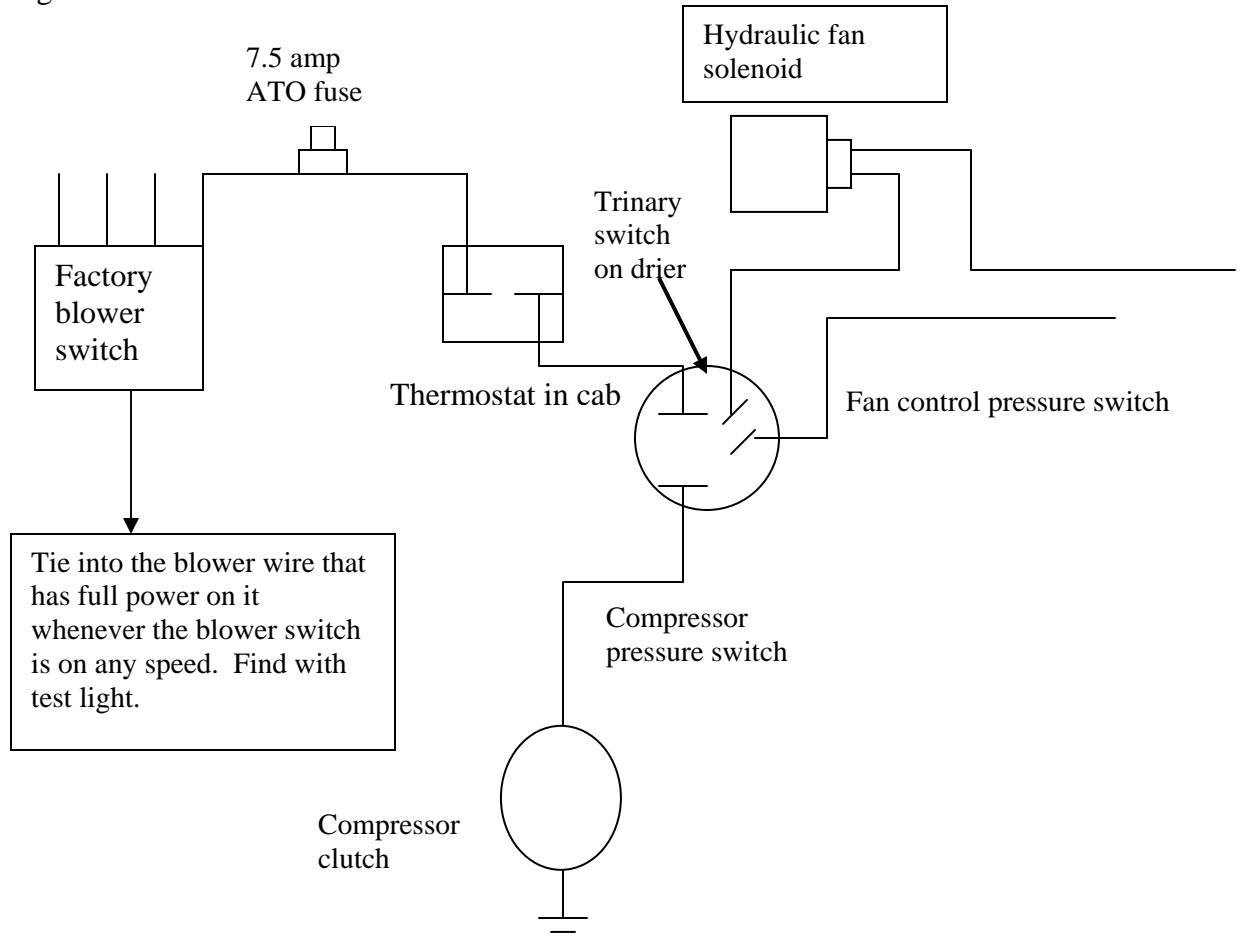
- 2) Find the wire on the blower switch that has full power to it when the switch is turned to any speed. Splice into this wire with one end of the ATO fuse holder. Connect the other end to one terminal on the thermostat.
- 3) Connect the other terminal on the thermostat to the black 14g clutch wire, and run the wire out of the cab with the A/C hoses.
- 4) Run the clutch wire up to the pressure switch on the drier. Cut to length and connect each wire to the terminals marked for the compressor circuit. Run the remaining wire down to the compressor and connect it to the clutch wire on the compressor.
- 5) Find the wires going to the radiator fan hydraulic solenoid. Cut back some of the bundle cover and expose one of the wires. Cut this wire. Extend each end of the cut wire and run them to the trinary switch on the drier. Connect the wires to the fan control terminals. They are marked “DC Power” and “Override”





Wiring tie-in for hydraulic fan assembly to turn on the trinary switch

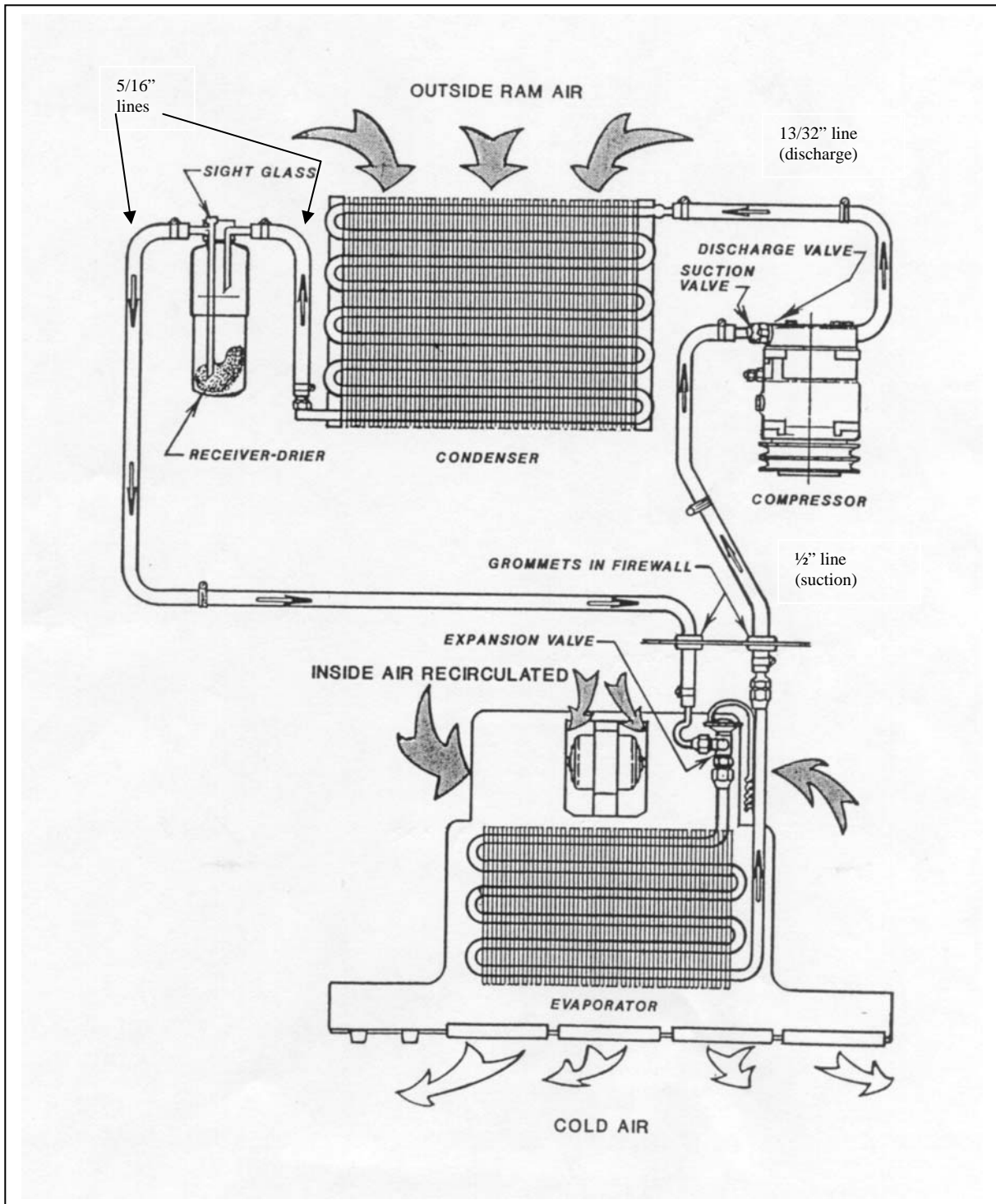
304H JD Wiring



Tie into the blower wire that has full power on it whenever the blower switch is on any speed. Find with test light.

The hydraulic fan runs when the power supply to the hydraulic solenoid is interrupted. This is a failsafe system. The fan control pressure switch on the trinary switch is normally closed. This means that the power supply to the hydraulic solenoid is interrupted when the pressure switch activates. The tie into the fan control pressure switch can be made on either the power or ground side of the solenoid wires.

# Refrigerant Flow Pattern in a Standard Air Conditioning System



## Thermostat Setting Procedures

- 1) Thermostat types
  - a) preset
  - b) adjustable
    - a) A preset thermostat is adjusted to its specific cut in and cut out temperatures when manufactured and does not have a rotary adjustment for the operator.
    - b) An adjustable or rotary thermostat has been manufactured to a predetermined cut in and cut out temperatures, but it is also operator adjustable to achieve the desired comfort level.

Both types of thermostats can have their factory settings adjusted by turning the setting screws on the body of the thermostat. One body type has the setting screws mounted externally and labeled for direction of rotation. The other body type requires the removal of the plastic end plate to expose the set screw.

- 2) Thermostat probe location: The location of the thermostat probe in an evaporator coil can be very important to achieve the maximum cooling potential of the coil while also preventing coil freeze-up. There is no set location for the thermostat probe to be put that will be optimum for all systems, but several rules of thumb may be followed:
  - a) Insert the probe in the coldest area of the evaporator coil.
  - b) Insert the probe from the top of the coil down, if possible.
  - c) Make sure that at least the last 3" of the thermostat probe are in the coil.

To find the most likely area where the coil is the coldest, consider these factors:

- 1) Direction of air flow through the coil.
  - 2) The coil area likely to have the lowest air flow.
  - 3) The inlet locations of the refrigerant into the coil.
  - 4) The inlet of the hotter outside air into the coil area.
- 
- 1) Usually the coldest side of the evaporator coil will be the air outlet side. Often the thermostat probe can be inserted between the last and second last row of tubes.
  - 2) The lower air flow area of the evaporator coil in most systems tends to be near either end of the coil. These areas will be colder
  - 3) The area of the coil that the refrigerant inlet tube(s) occupy should be the coldest part of the coil.
  - 4) If the system is equipped with an outside air intake, where and how that air is brought into the evaporator area can have a large effect on the coil temperature. If all the outside air is piped into the evaporator in one area, that area will be considerably warmer in hot weather.

By looking at all these different factors, the area of an evaporator coil most likely to be the coldest can be determined.



Once the probe is inserted, the A/C system needs to be tested. Run the system to ensure that the thermostat is cycling the compressor off at the appropriate temperature. A core temperature ranging between 25° and 30° F should cause the thermostat to cycle off. The air temperature at the vent outlet closest to the evaporator coil should be between 38° F and 45° F when the compressor cycles off.

If the thermostat doesn't cycle off after a reasonable cool down period, and the air outlet temperature has dropped below 40° F, the cut in and cut out settings should be adjusted until the compressor is cycling on and off regularly. Let the system run for a decent time period (at least 15 min) and then check the evaporator coil for any signs of freezing.