

INSTALLATION INSTRUCTIONS

FUCHS MHL 331 SCRAPHANDLER



1-800-267-2665

1-888-267-3745 (FAX)

EVAPORATOR COIL: The evaporator assembly mounts into the existing heater/filter/pressurizer setup that is located under the operators seat. It is accessed from under the cab by removing the metal cover panel.

1. Raise the cab up about 2' to allow easier access to the bottom of the cab.
2. Remove the cab entrance step and two metal cover panels from the bottom of the cab.
3. If the heater has been plumbed in, clamp off the heater lines just behind the cab. Remove the heater/lines from the heater coil. The electronic heater control valve can remain in place on the heater coil. Move the heater lines out of the heater box area temporarily.
4. Cut away tie wraps and temporarily move away hydraulic lines that block access to the metal panel, directly behind the heater coil, in the floor of the cab.

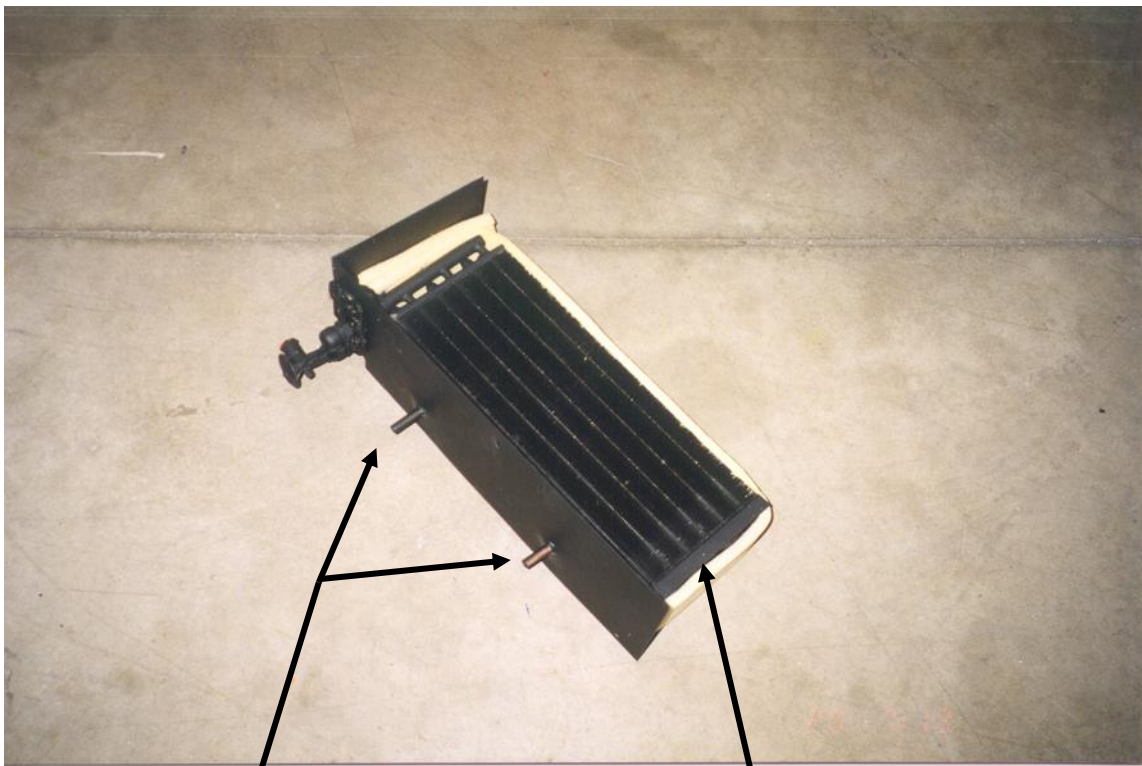


Flex
ducts

Heater hoses
removed

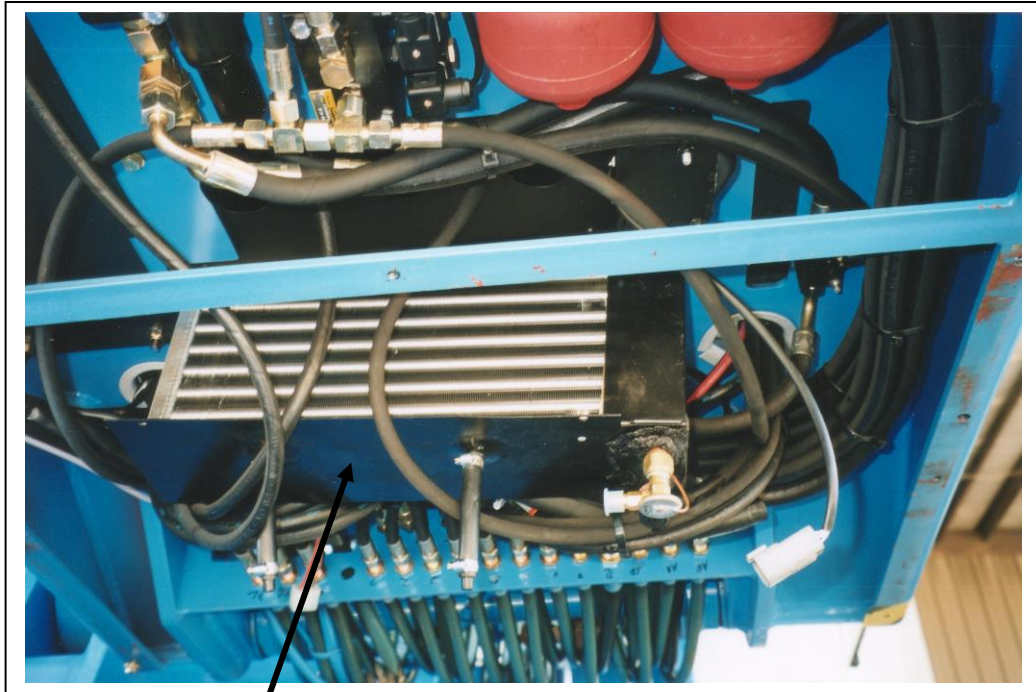
Metal panel
removed

5. Disconnect and move temporarily the electrical wiring harness going to the heater control valve if it is present (newer machines)
6. Remove the four philps screws holding the metal panel, (behind the heater coil) in place and remove it from the machine.
7. Replace the metal panel with the evaporator coil assembly supplied in the kit. Slide the assembly up into place so that the fittings are located on the left side of the cab. (same side as the heater coil outlets)



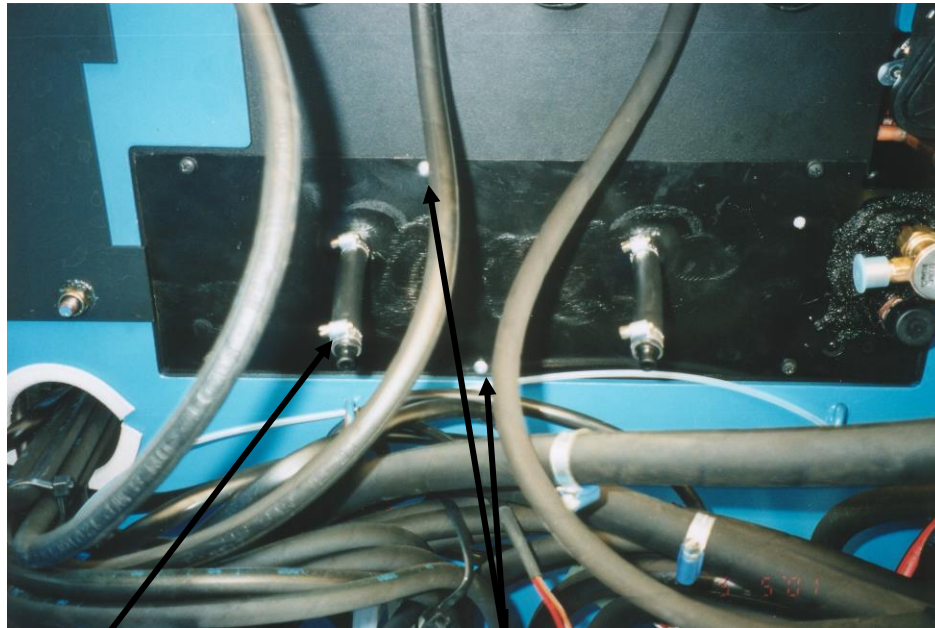
Drain tubes

Evaporator coil
assembled to
access panel



Evaporator coil
assembly sliding
into place

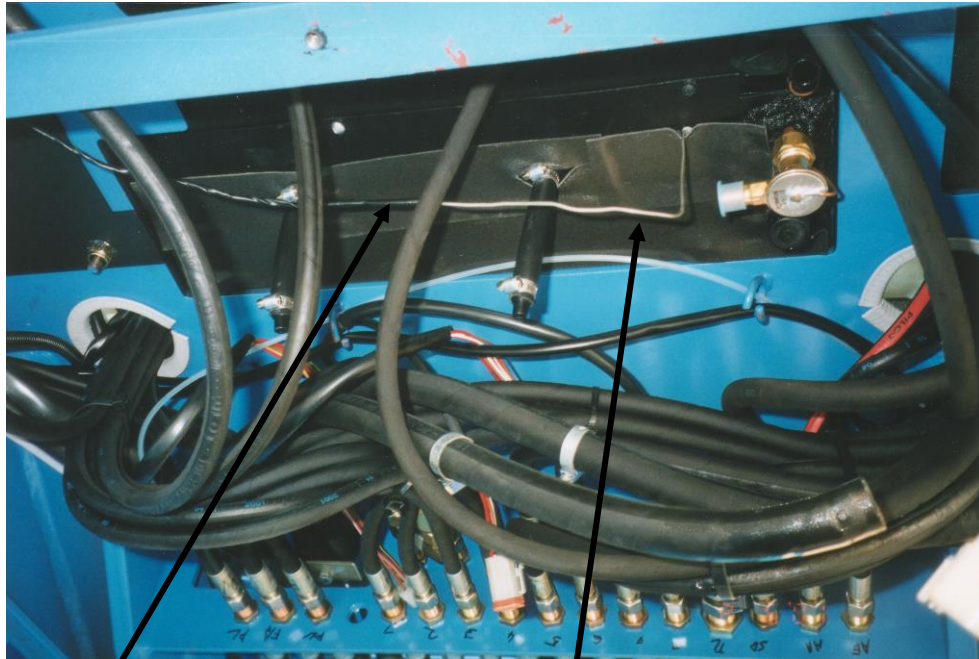
8. Secure the evaporator assembly into place by re-using the four philps screws previously removed. Add two more screws to secure the middle section of the evaporator about half way along the front length of the evaporator coil and the second one on the back side of the evaporator coil. Use the self drilling screws supplied in the kit. This will limit any bowing and air gaps along the bottom of the evaporator coil assembly. If not already done, install short sections of drain tube and a drain tube restrictor to each drain pipe.



Drain tube and
restrictor

Extra screws

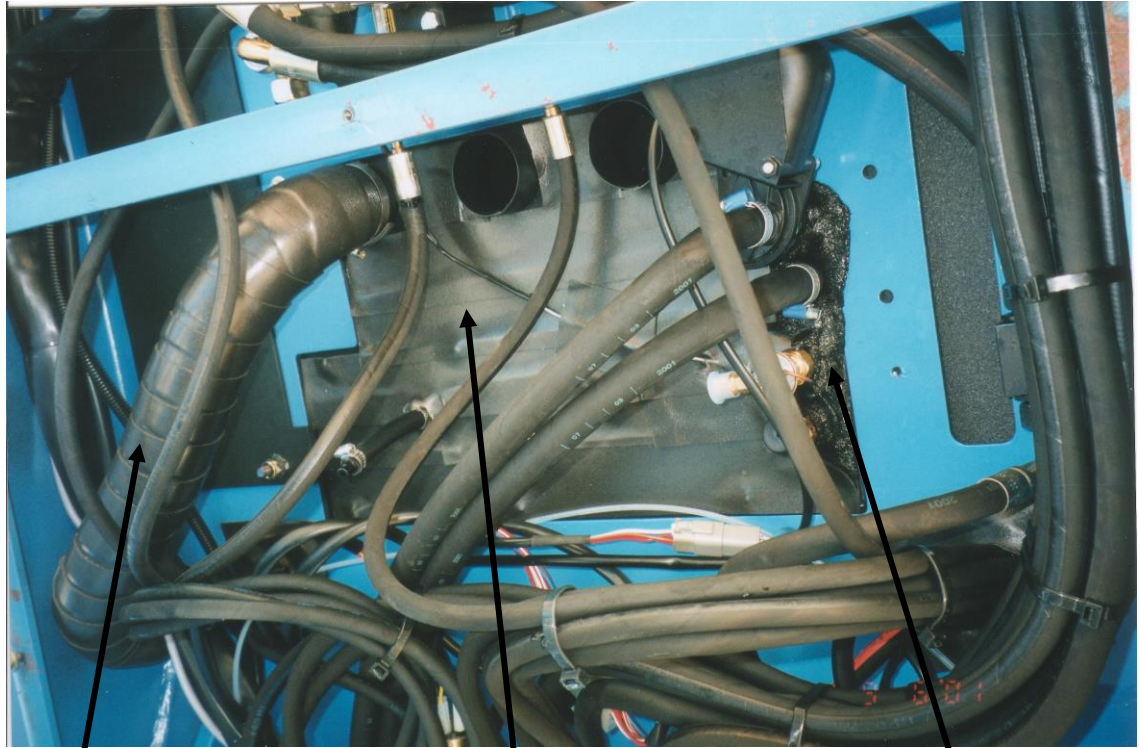
9. Once the thermostat probe has been inserted up into the evaporator coil through the pre-drilled hole in the bottom of the evaporator panel, all holes and gaps around the evaporator and heater coils and outlet pipes can be sealed with tar tape and foam tape to eliminate air loss.



Foam insulation
tape

Thermostat probe
being inserted 5"
to 6" into the coil

10. Put a layer of foam tape insulation on the metal bottom of the heater/A/C box to limit heat transfer from hot air under the floor.

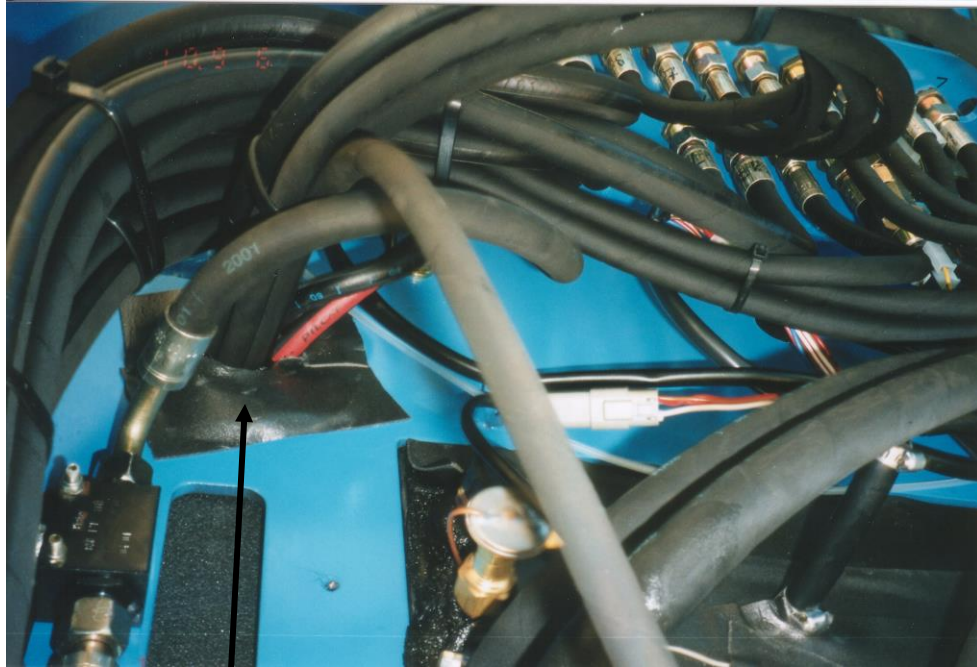


Insulated flex duct

Insulated bottom of box with foam tape

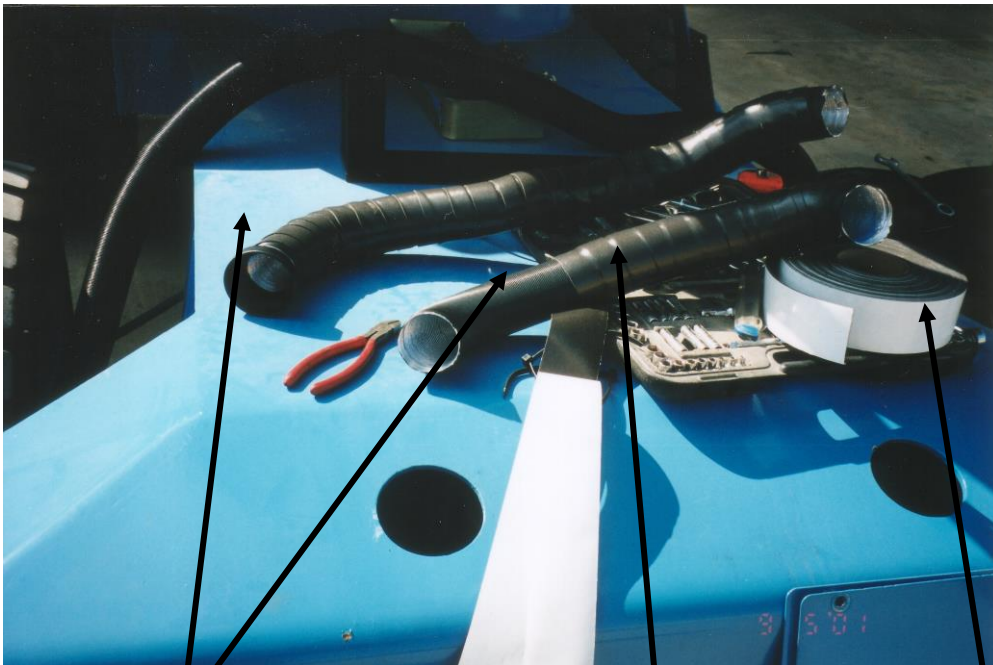
Gaps around heater and A/C lines sealed with tar tape

11. Seal all holes in the floor of the cab as well as possible using foam tape and tar tape to limit the hot air incursion into the cab from the hot hydraulic components mounted below the cab floor. Big areas that can be sealed are: 1) the hydraulic control line holes on either side of the operators seat. 2) The large rectangular hole beneath the front right electrical console in the cab. 3) All other small openings for wires or hoses



Foam tape around hyd. Lines entering the cab floor

12. Remove the three flex ducts that carry air from the heat/A/C box to various louvers around the cab.

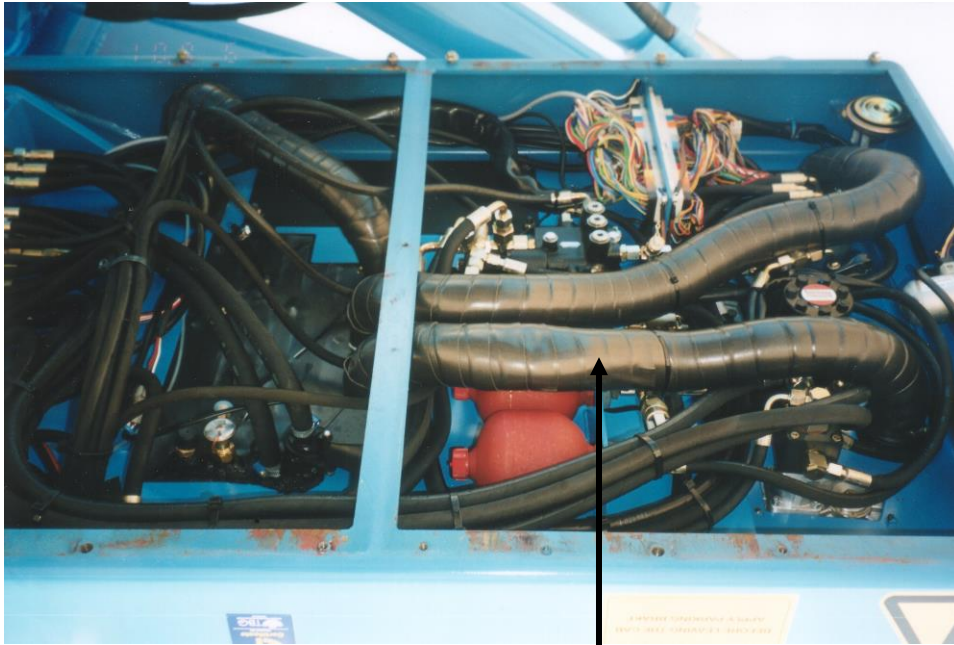


Flex ducts

Spiral wrap pattern

Insulation tape

13. Using the insulation tape supplied in the kit put a double layer of foam insulation on the flex ducts. A spiral overlaying tape pattern works well. Leave two to three inches at each end bare to allow for reclamping of the flex ducts to their outlets. On the first 24” of duct on the largest length that passes up through the front right corner of the cab, only put a single non-overlapping layer of foam to make re-installation easier.
14. Re-attach the three insulated flex ducts back to their original positions.



Insulated flex
duct re-installed

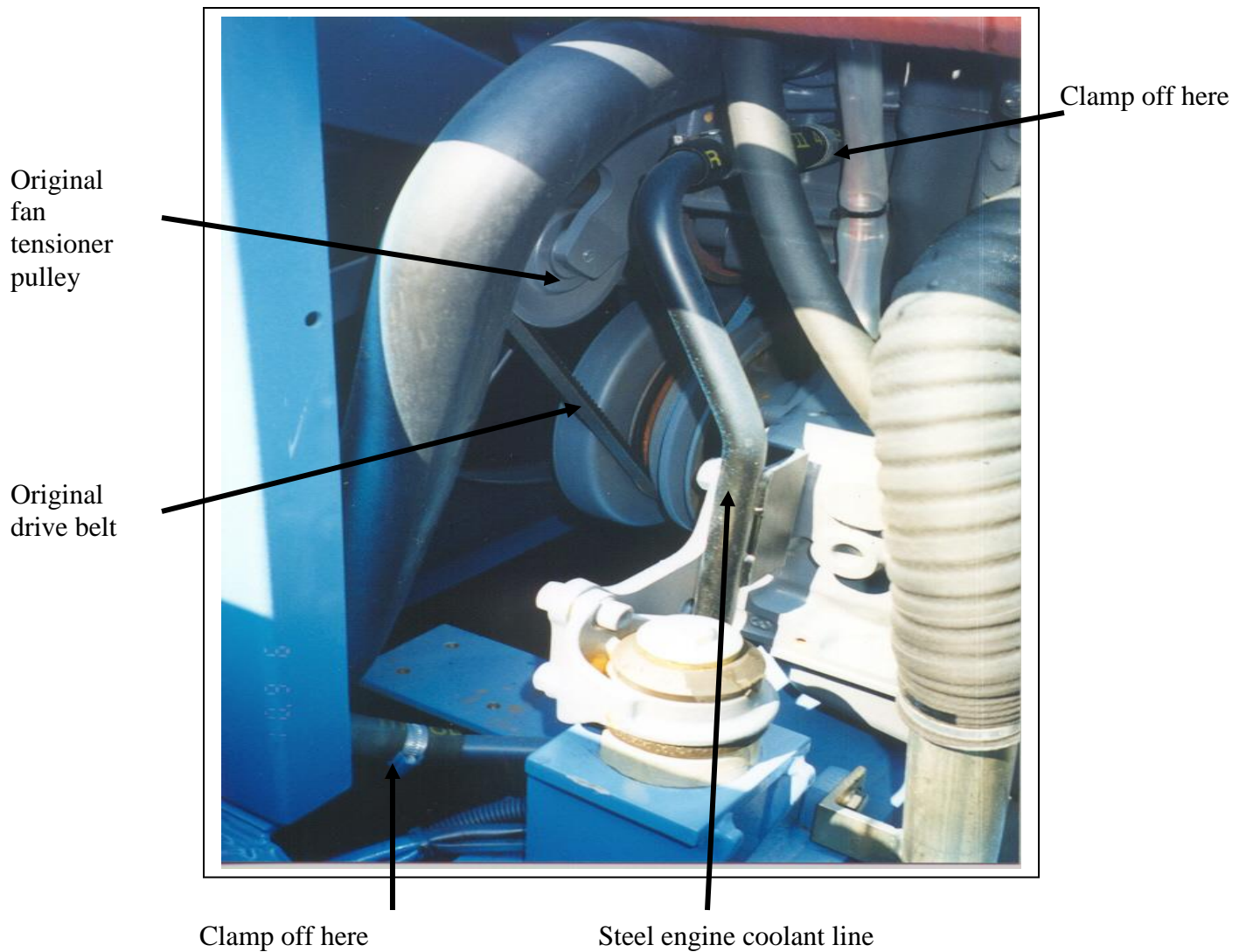
15. On older machines that have a diesel fired cab heater there are a number of splices and “Y” connectors on the flex ducts. If this diesel heater is no longer being used. (ie. Replaced with hot water heater) remove the extra duct and “Y” connectors to maximize the cab air flow by reducing the restrictions.
16. From inside the cab, through an access panel behind the seat, the evaporator coil assembly needs to be sealed to the heater/A/C box walls all the way around. This will ensure that all the air flow from the blower assembly passes through the A/C coil.
17. Pull the seat all the way forward to gain access to the panel directly behind the seat and ahead of the inside air intake vents. Remove the seven philps screws from the panel and lift the panel off the heater/A/C box. This same panel also accesses the heater/A/C filter assembly for cleaning and service. Remove the air filter and frame by pulling it straight up.

18. Unbolt the blower assembly frame by removing the four philps screws that secure it. There are two on each vertical surfaces on either side of the heater A/C box. Slide the blower assembly towards the rear of the cab to access the evaporator coil.
19. Using foam, foam tape and or tar tape, seal any air gaps around the sides and top of the evaporator coil and frame.
20. Re-install the blower assembly and filter. ****Note**** If the filter is dirty, remove it from its frame and wash it. Shake it dry and re-install it into the frame and replace the frame behind the blower assembly. Replace the access panel and seven screws.
21. Once all the A/C hoses are connected, all moved components are replaced, the thermostat tested, and the bottom of the heater/A/C box is checked for a air leaks, the two metal panels and the step can be replaced.

Compressor: The compressor is located on the left side of the engine just under the lower rad hose and replaces the factory tensioner pulley for the radiator fan.

STEPS:

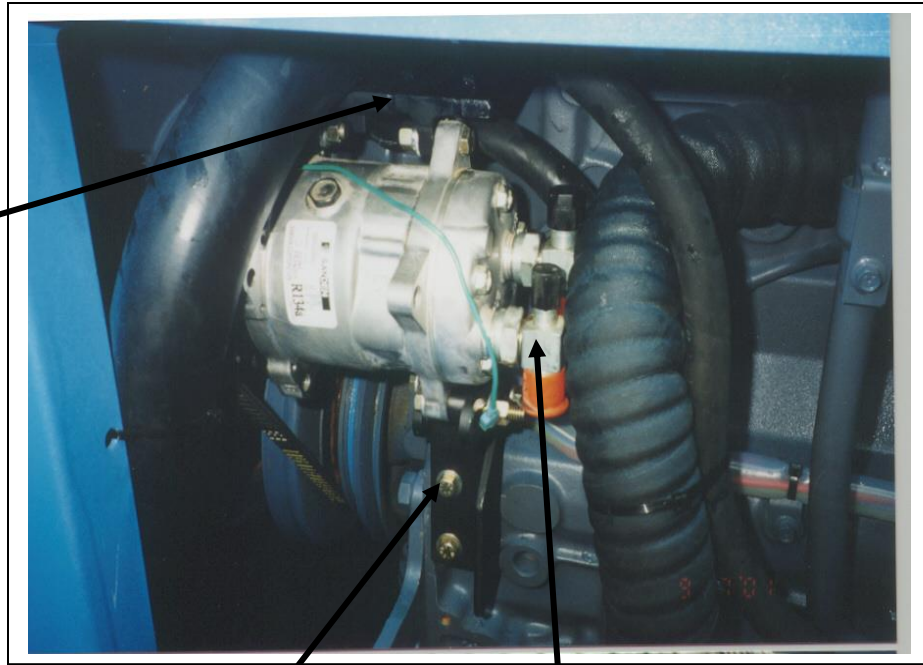
- 1) Remove the side panels from the left side of the engine compartment and the cover off the generator.
- 2) Remove the radiator fan tensioner pulley assembly and drive belt



- 3) Clamp off the engine coolant line just under the engine end if the lower rad hose using needle nose vise grips (or similar). Clamp off the same line on the radiator side of the motor mount. Unbolt and remove the steel line section to make room for the compressor and mount. Keep the steel line for modification and re-use.

- 4) Attach the upper compressor mount bracket to the engine in the same location that the factory tensioner was mounted. Use the original mount hardware.

Upper
compressor
mount bracket

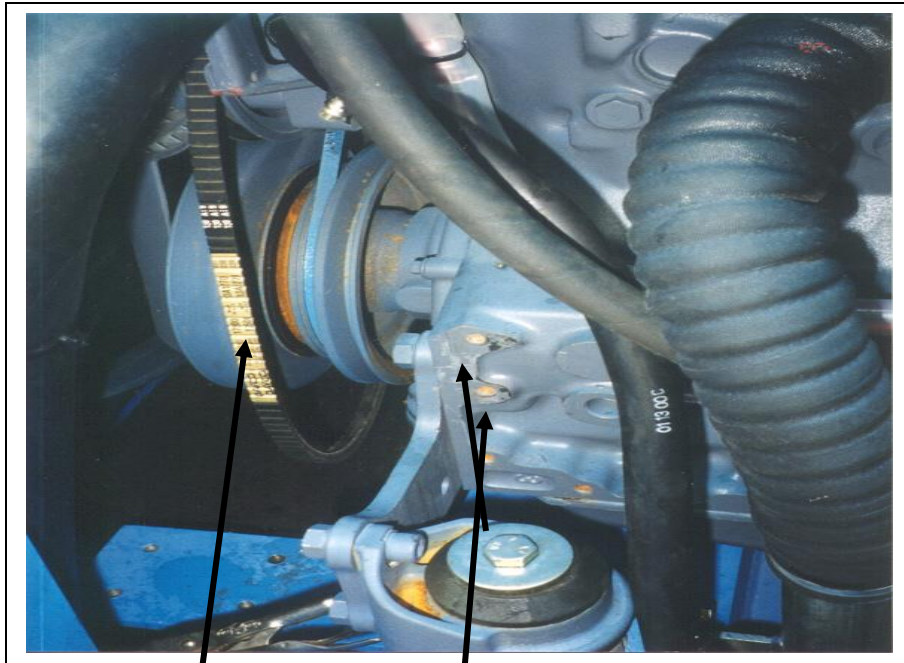


Lower compressor mount bracket

Rotolocks installed

- 5) Bolt the lower compressor mount bracket to the engine block just behind and above the left front engine mount. These are the same two holes that the steel engine coolant line was located on. Use the original hardware on this bracket as well.

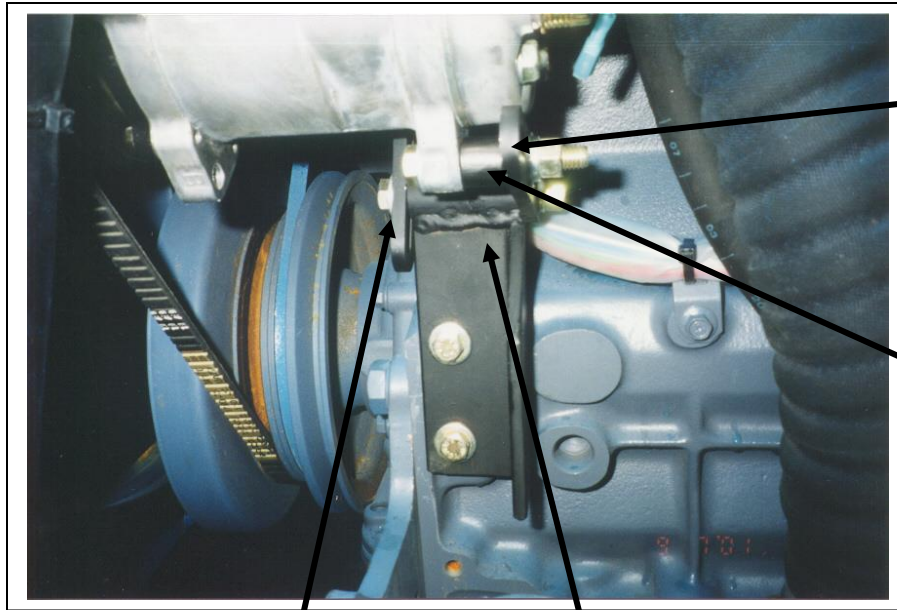
- 6) Install the 17500 “V” belt, supplied in the kit, around the crank and fan pulleys.



17500 “V” belt

Mount location for lower
compressor mount

- 7) Bolt the A/C compressor onto the upper compressor mount bracket utilizing compressor ears ‘D’ and ‘H’. Use the 3/8” X 1 ½” hardware provided. Don’t tighten down the bolts until the two compressor tightener brackets are installed from the lower compressor mount to the bottom ears on the compressor.
- 8) Install the lower inside tightener bracket onto the compressor utilizing compressor ears ‘C’ and ‘G’. Bolt in place using the 3/8” X 5” bolt and hardware supplied. The slotted end of the bracket will bolt to the top of the lower compressor mount bracket using the 3/8” X 3” bolt supplied. Before installing the nut on the other end of the lower compressor mount bracket, install the lower outside tightener bracket over the bolt. Have the round hole over the bolt and the slotted hole up towards ear ‘F’ on the compressor.



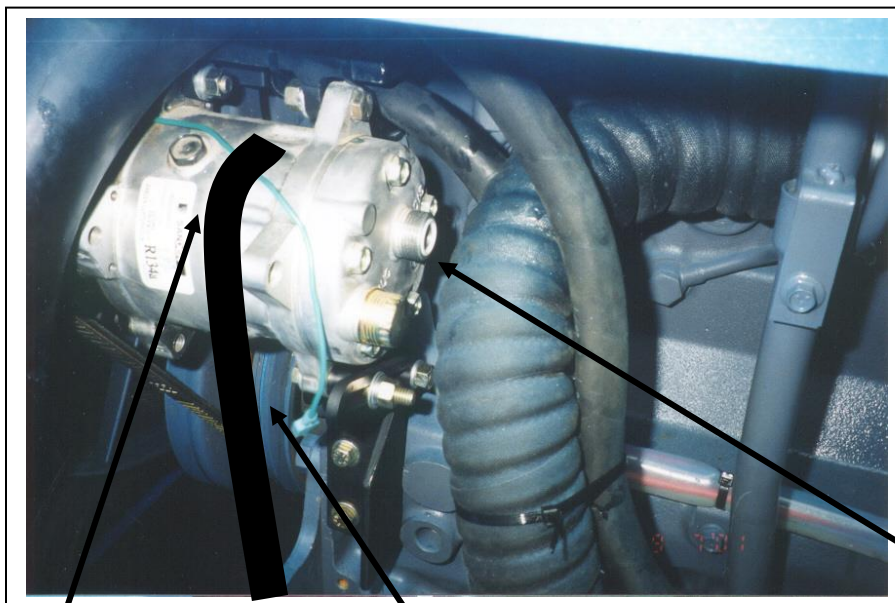
Lower outside tightener bracket

3/4" spacer

Lower inside tightener bracket

Lower compressor mount bracket

- 9) Bolt the slotted tightener to the compressor using the 3/8" X 2 1/2" bolt and 3/4" spacers provided.
- 10) Install the drive belt onto the rear pulley groove on the compressor and tighten it. Tighten down all compressor mount bolts to secure the compressor in place. Double check the compressor belt alignment and tension. Make any adjustments necessary.
- 11) Once the compressor is installed the steel engine coolant line needs to be cut and re-installed with a section of heater hose in the middle of it. Cut the 90° bend off the top of the steel line 3" above the angle iron mounting bracket. Insert the cut end into the rubber hose still on the engine above the compressor body. Use the existing gear clamp to secure in place so the steel 90° pipe will come out over the compressor body and 90° down the side of the engine.

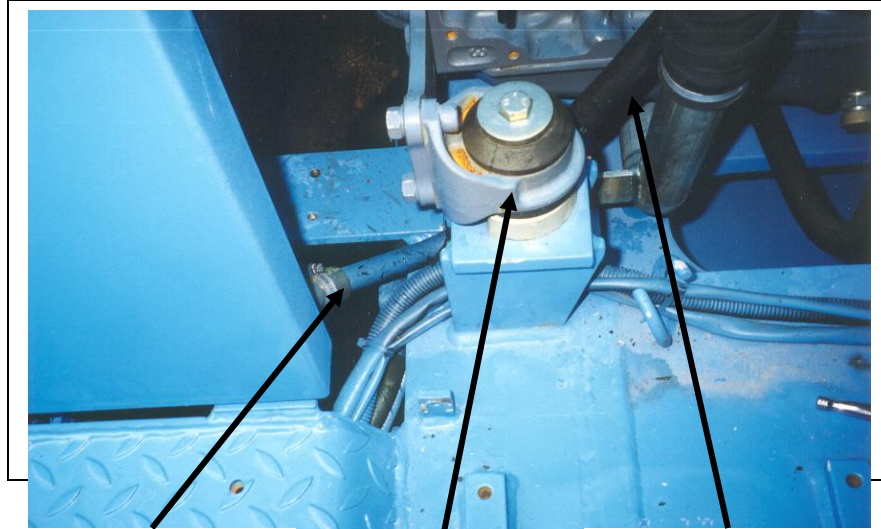


90° steel line cut off original longer steel line

1" heater line supplied in kit

Nylon gasket for rotolock installed

- 12) Cut the bottom off the steel line 1" below the angle iron mounting bracket. Re-install this piece in its original orientation to the rubber hose on the radiator side of the engine mount. Use the existing gear clamp to secure it in place.



Lower section cut off original steel line Engine mount 1" heater line supplied in kit

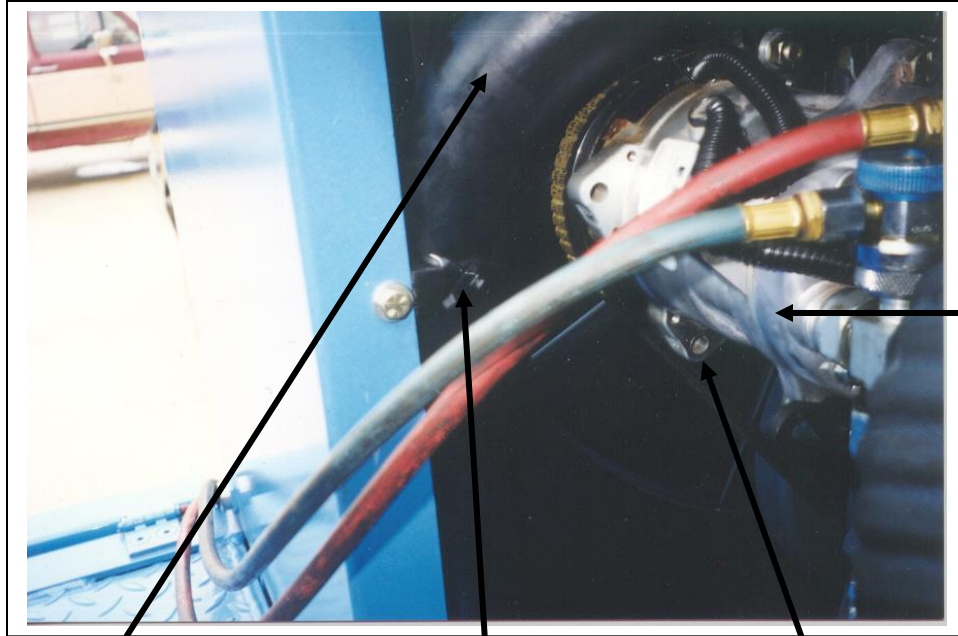
- 13) Cut the 1" ID rubber hose supplied in the kit to length and join the two ends of the steel line together with it. Use the two #16 gear clamps supplied to secure the hose. ****NOTE**** The 1" ID hose is slightly larger than the steel pipe OD so the clamps will have to be tightened down well.



3/8" x 1" bolt Lower rad hosed support bracket

Ear "A" to be removed in future

- 14) Install the lower rad hose support bracket onto the existing mount hole in the engine compartment frame approximately level with the compressor. The bracket goes on the inside of the frame and is secured in place using the supplied 3/8" X 1" bolt supplied in the compressor mount hardware bag.



Lower rad hose

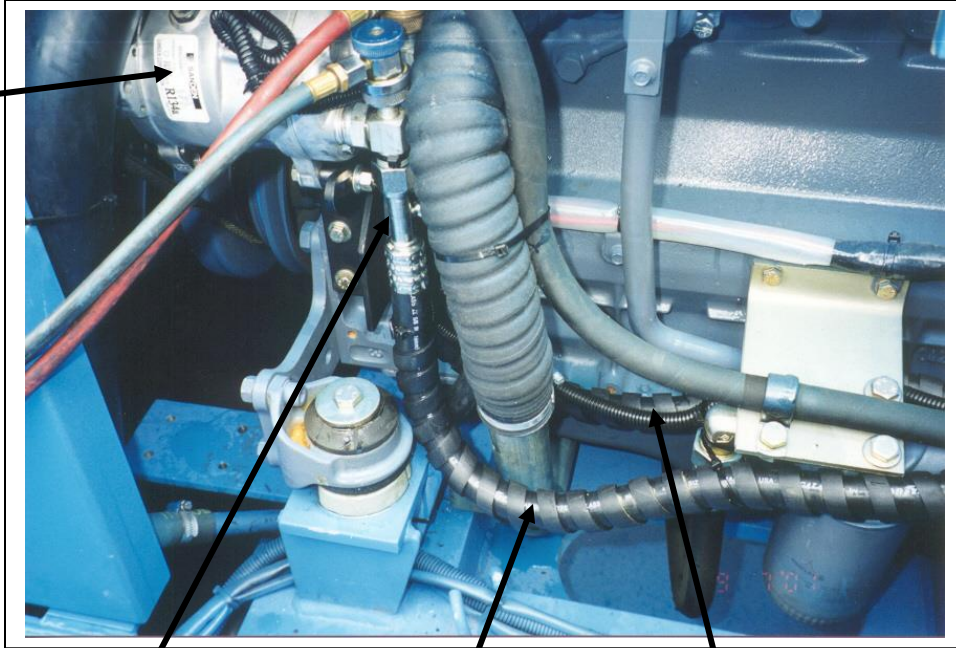
Lower rad hose support bracket

Ear "B" to be removed in future

Compressor

- 15) Install the rotolock fittings provided onto the back of the compressor. Use the white nylon gaskets to seal the rotolocks to the compressor. The gasket is inserted into the groove cut into the end of the fittings on the compressor. Put a few drops of PAG oil onto the nut and flange mating surface of the rotolocks so they don't bind when tightening. Install the 13/32" rotolock onto the discharge fitting on the compressor with the 134A access port pointing up. Install the 1/2" rotolock into the suction fitting on the compressor with the 134A access port pointing up.

Compressor



5/8" straight fitting

5/8" A/C line

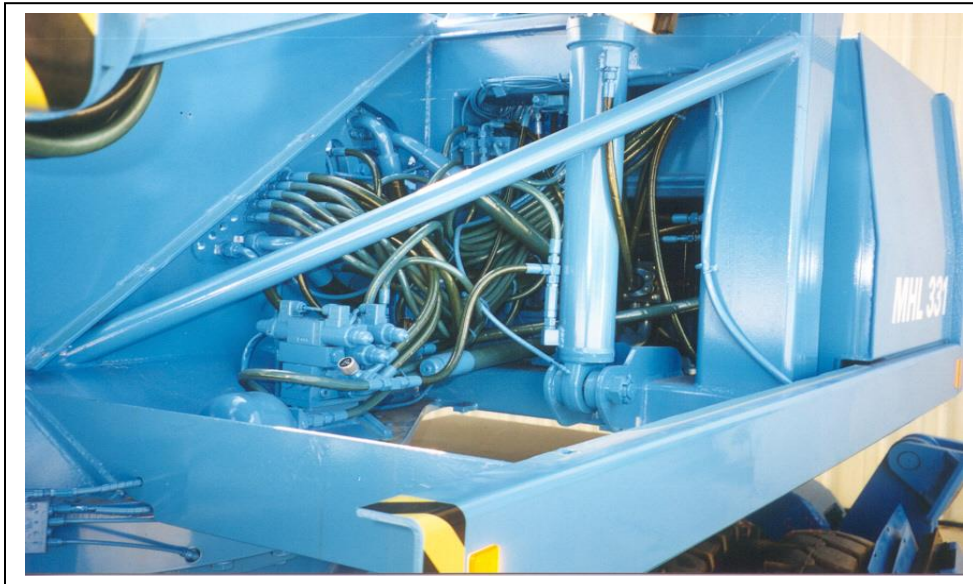
13/32" A/C line

- 16) Check all lines, belts, hoses and wiring bundles around the compressor area. Ensure they are properly secured and out of the way of any moving parts.

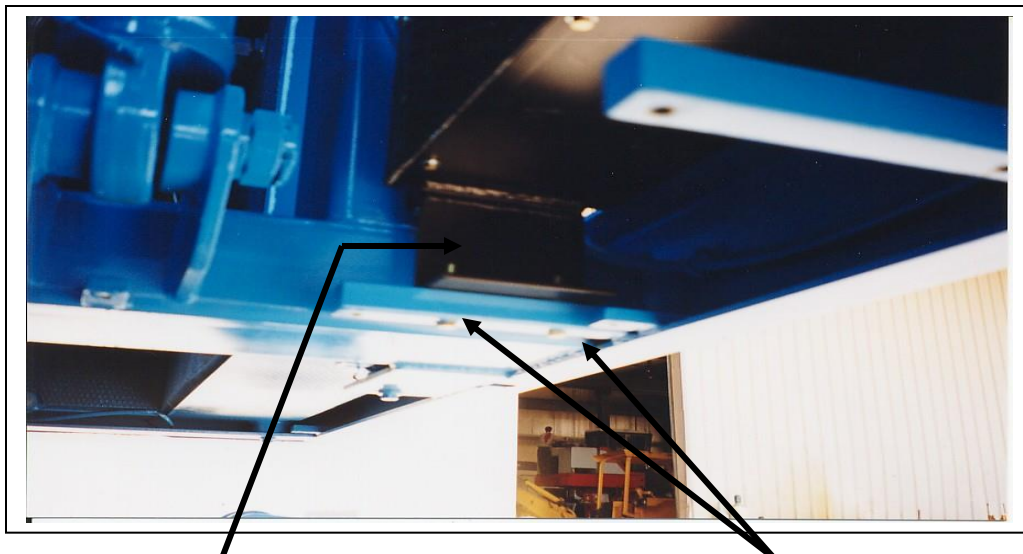
Condenser: The condenser is mounted below the cab hydraulic arm on the left side of the machine, just behind the removable side panel that is ahead of the hydraulic tank.

STEPS:

- 1) Remove the two cover plates and the side panel from under the cab hydraulic arm. Raise the cab a few feet to better access this area.
- 2) Remove the plywood bottom panels from the underside of the main frame.



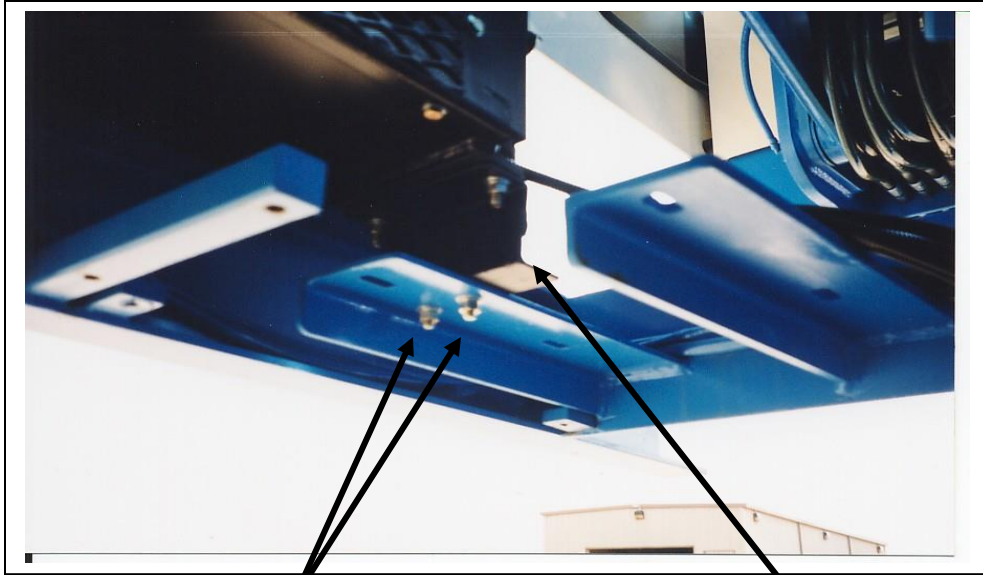
- 3) Bolt the right hand condenser mount spacer bracket to the existing mounting bar just ahead of the vertical frame member for the cab arm. Place the right hand condenser mount spacer bracket onto the mounting bar and use the two existing M12 threaded holes to secure the bracket in place. The required M12 bolts are supplied in the condenser mounting hardware bag.



Right hand condenser mount spacer bracket

Mount bolts have been upgraded to two M12 bolts threaded in from the top

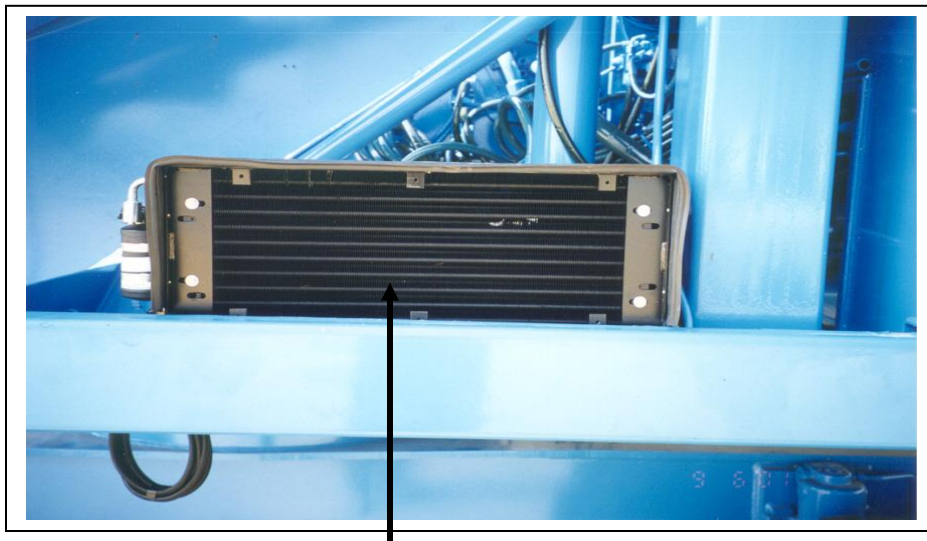
- 4) Bolt the left-hand condenser mount spacer bracket to the left mount foot on the condenser. Use the two outside holes only. Position the mount so the bottom of the bracket juts out from the condenser. Bolt in place using the 3/8" X 1 1/2" hardware provided.
- 5) Position the condenser on the mounting bars so that the right mount foot on the condenser is aligned with the upper holes on the right hand condenser mount spacer bracket. Mark the location of the lower two holes on the left hand condenser mount spacer bracket. Remove the condenser and drill the holes for 3/8" bolts.



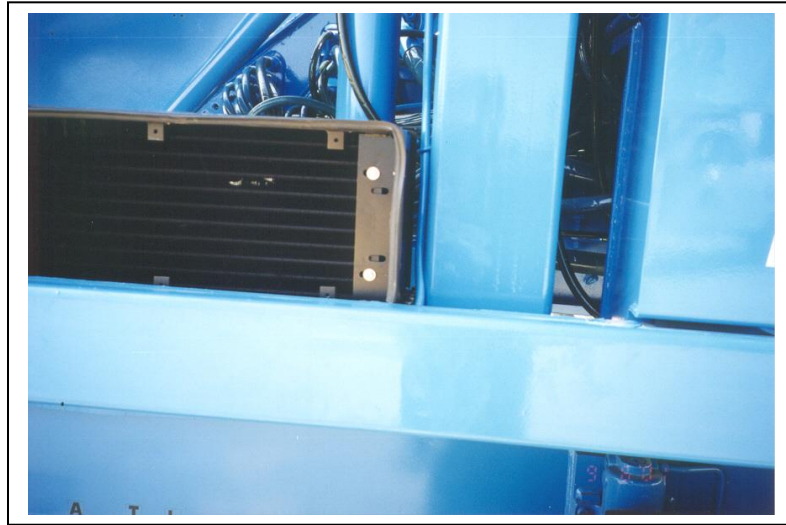
Lower mount holes marked drilled and bolted

Left hand condenser mount spacer bracket

- 6) Install the condenser and mount brackets and bolt solidly in place on both ends. Use the 3/8" X 1 1/2" hardware provided.

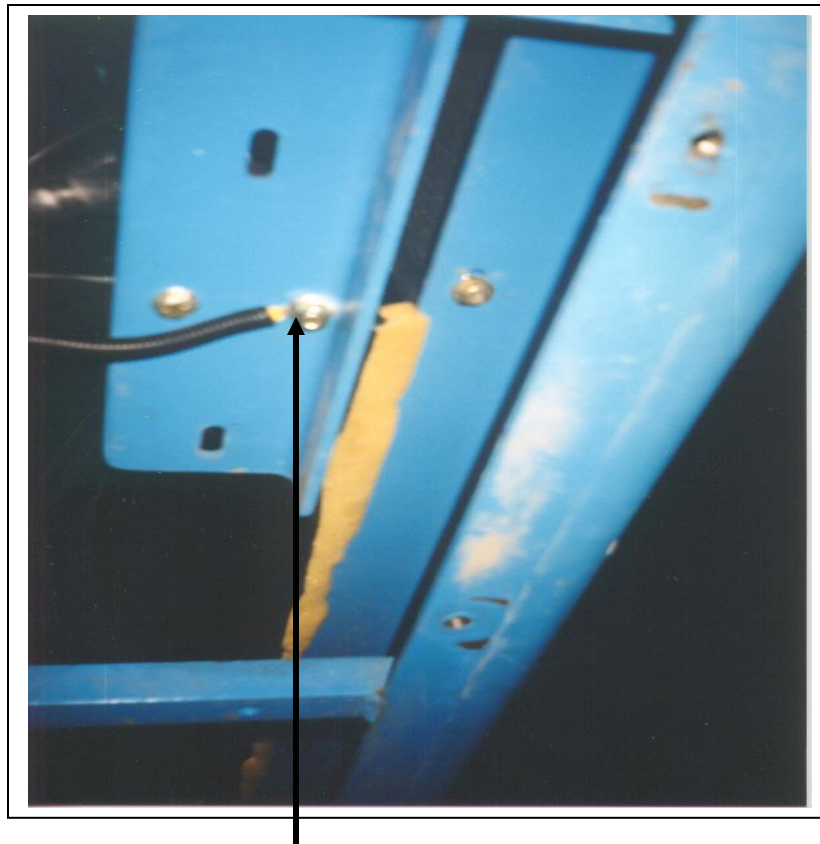


Condenser in place on its brackets



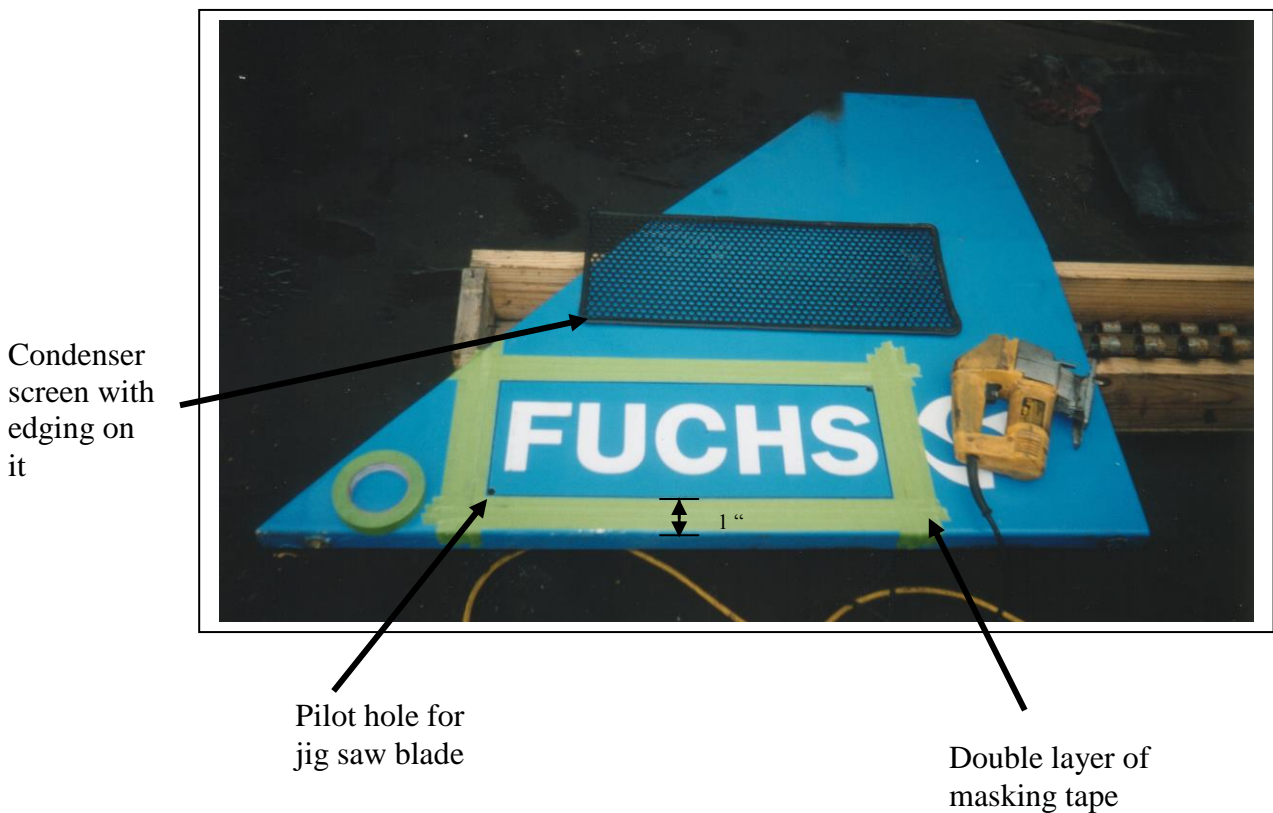
Right end of condenser positioned tight to the vertical frame member for the cab arm

- 7) Ground the condenser to the machine by crimping a 3/8" yellow ring connector to the black wire coming out of the condenser and bolting the connector to one of the bolts securing the support brackets to the frame, or attach it to a convenient ground lug.



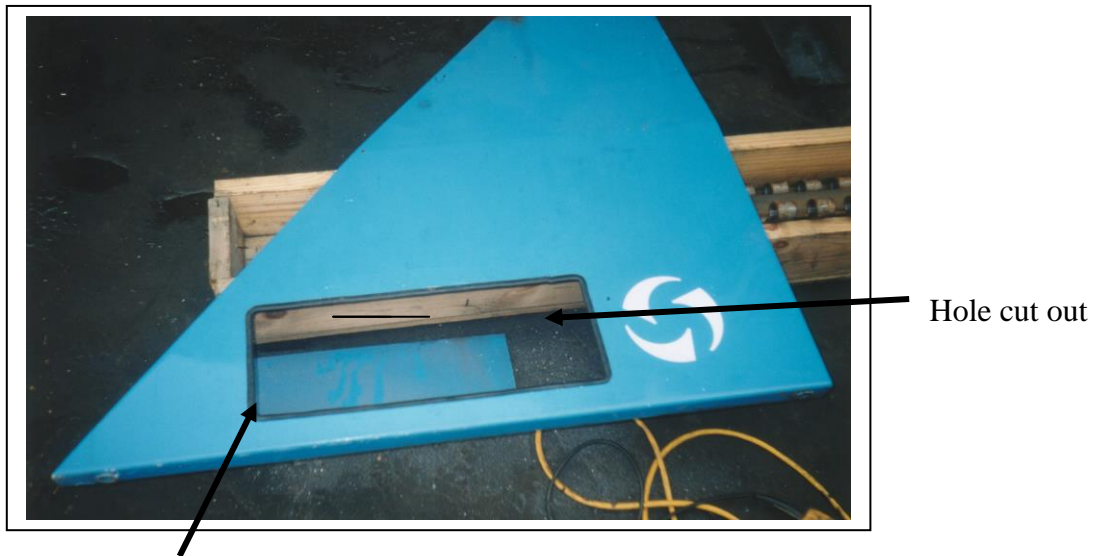
Condenser ground wire on one of the left mount bolts

- 8) In all environments it is necessary to cut a hole in the side panel in front of the condenser intake area to allow for improved air flow into the condenser. A 8" high x 22" long hole would be adequate. A piece of 10" x 24" perforated steel has been included in the kit along with 144" of edging and 1/4" mounting hardware.
- 9) Center the hole for the air intake screen overtop of the Fuchs decal on the side panel. Mark a rectangular cutout 8" high x 22" long. The bottom of the hole should be approx. 1" up from the bottom of the side panel. Put a double layer of masking tape around the hole to protect the paint.



(picture shows 360, similar for 331)

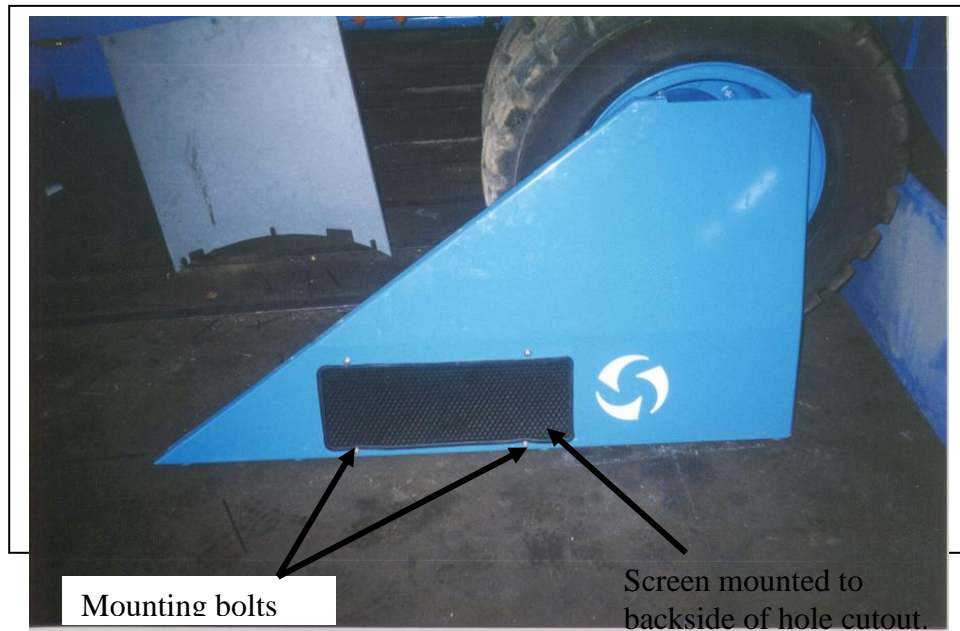
- 10) Drill a pilot hole in opposite corners of the cut out big enough for a jig saw blade. Use a jig saw to cut out the marked rectangle of steel. Deburr the sharp edges with a hand file.



Edging installed on hole

(picture shows 360, similar for 331)

- 11) Install the black edging all around the cut out. Place the screen overtop the hole and mark six holes to bolt the screen on. Drill the holes for the 1/4" bolts supplied in the kit. Bolt the screen to the inside of the cut out to achieve the cleanest look for the panel. Once the panel is re-installed on the machine, the adjustable shroud on the condenser must be pushed ahead to seal with the inside of the panel. Tighten the securing bolts on the condenser to hold the shroud in place



(picture shows 340, similar for 331)

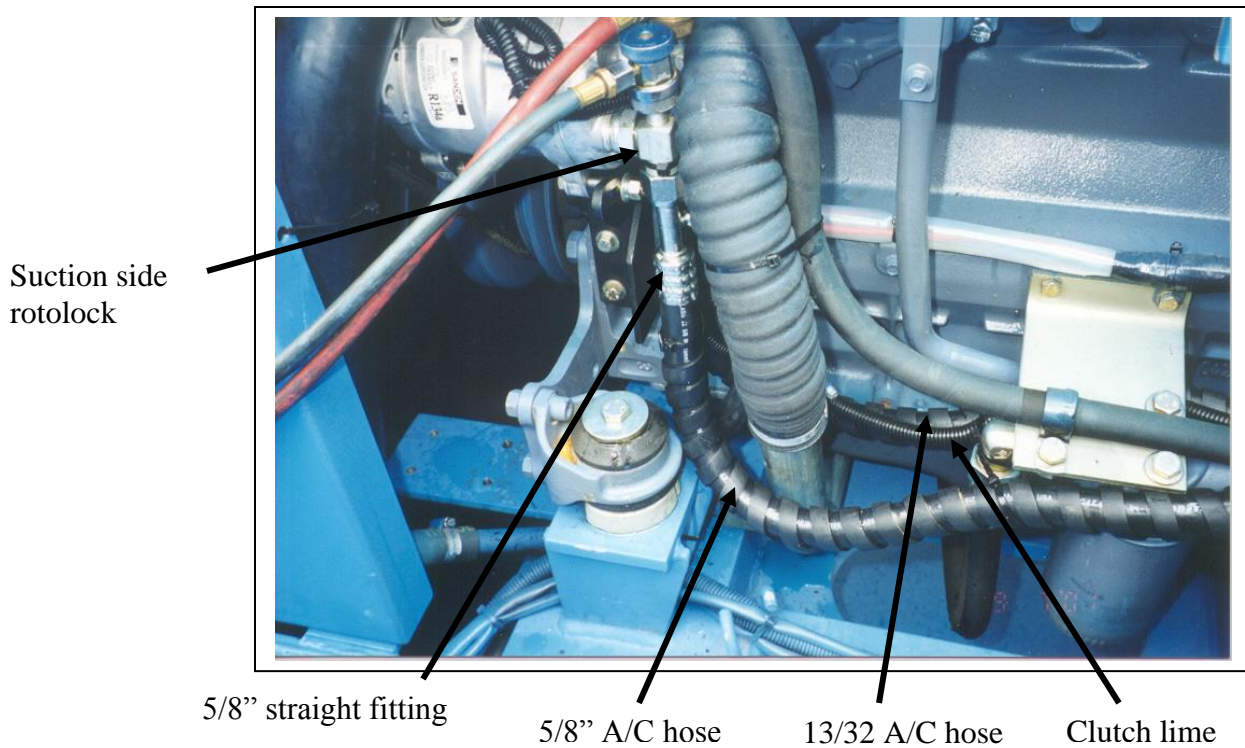


(picture shows 340, similar for 331)

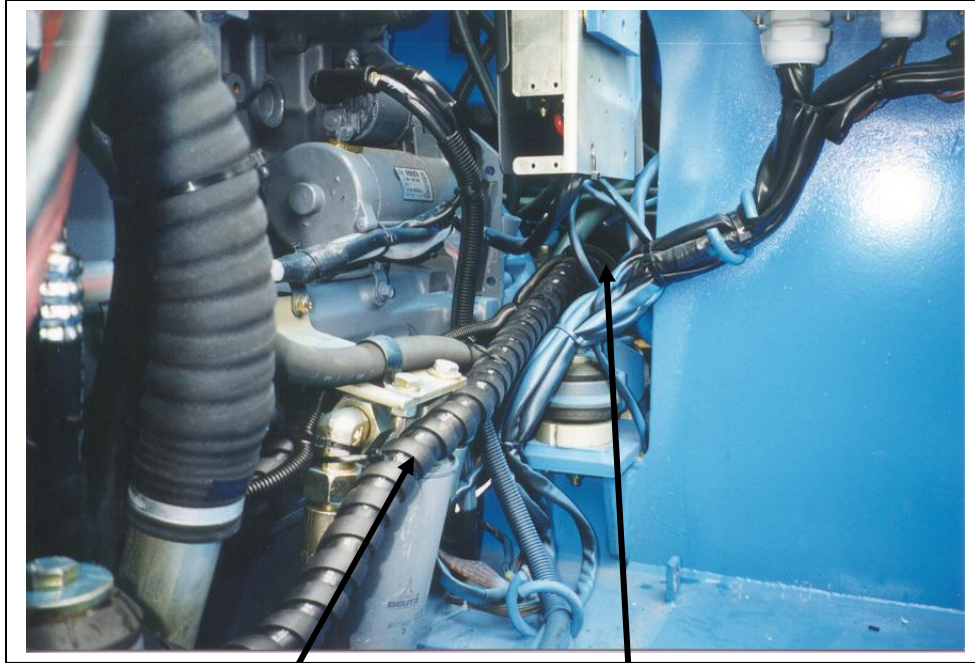
Hose runs: The hose runs on the MHL 331 are quite long and have to be run carefully to accommodate the telescoping cab design.

STEPS:

- 1) Connect the straight 13/32" discharge line fitting with the high side access port to the discharge rotolock on the compressor. This is the rotolock closest to the engine. Connect the straight 5/8" suction line fitting with the low side access port to the suction rotolock on the compressor. This is the rotolock farthest from the engine. Use the correct "O" rings and oil all contact surfaces with PAG refrigerant oil.



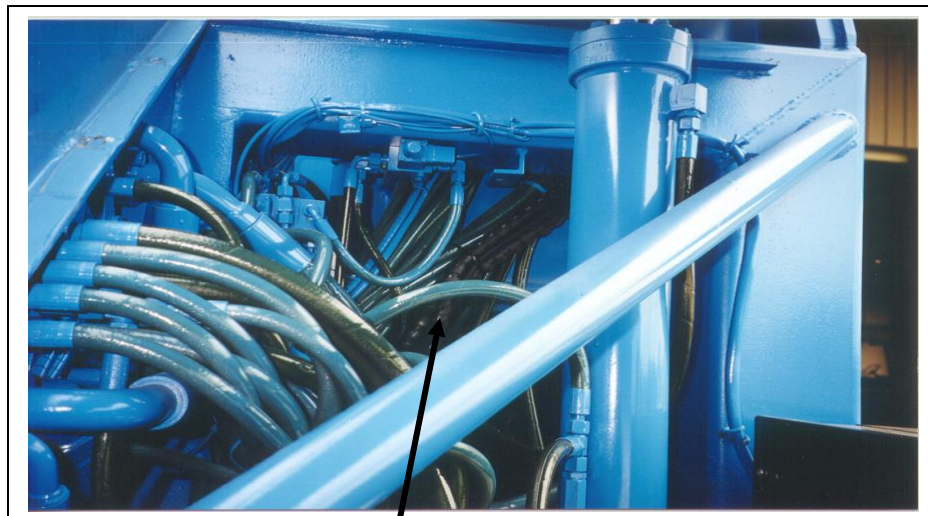
- 2) Run both hoses straight down from the engine and then 90°, then back along the engine overtop of the oil filters. Continue along the side of the engine and exit the engine compartment over top of the rear engine mount.



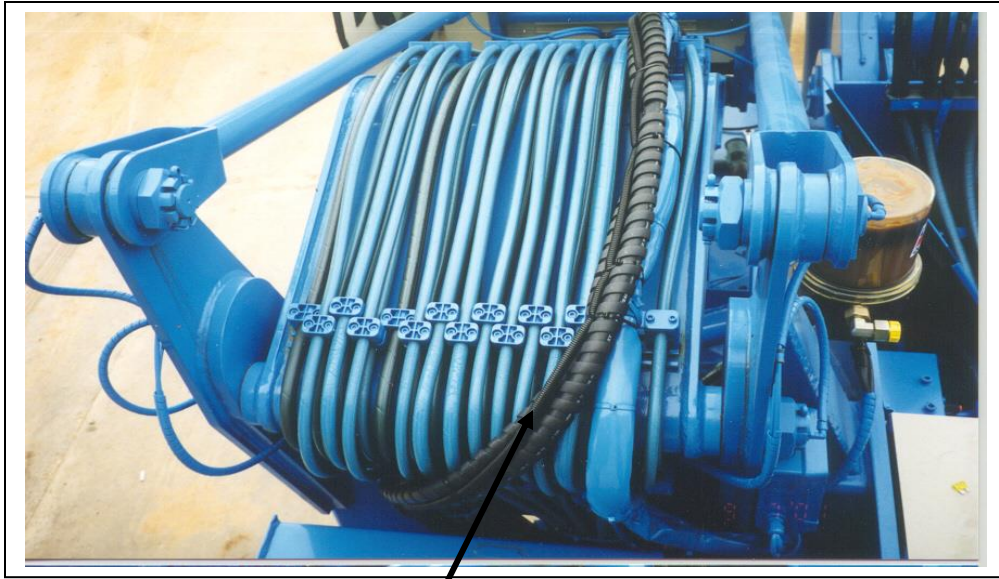
Keep hoses overtop of filter

A/C hoses and clutch wire leaving the engine compartment

- 3) Run both hoses forward towards the cab along with the hydraulic lines. At the base of the cam arm frame, split up the 13/32" and the 5/8" hoses. The 5/8" hose runs up the cab arm frame along with the hydraulic lines and then crosses back over to the electrical bundle at the top of the cab arm frame. The 5/8" hose follows the electrical bundle all the way up the arm to the back wall of the cab. At the cab, the 5/8" hose runs under the cab along with the hydraulic lines and loops around to the suction fitting on the evaporator coil. Connect the 90° 5/8" fitting to the suction fitting on the evaporator. Use the correct "O" rings and oil all contact surfaces with PAG refrigerant oil.

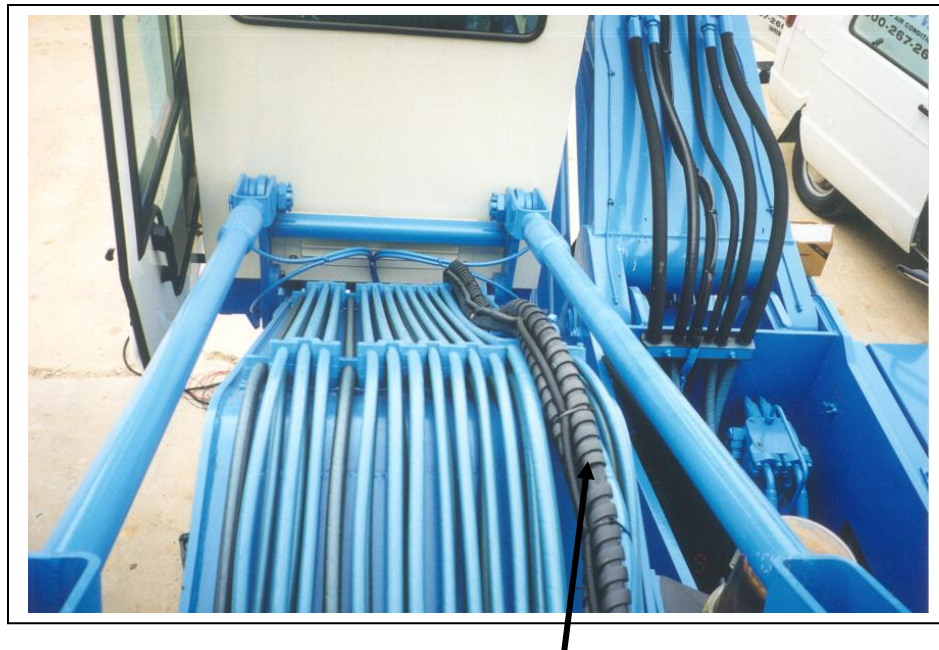


5/8" and 5/16" hoses and wire bundle routed up the cab

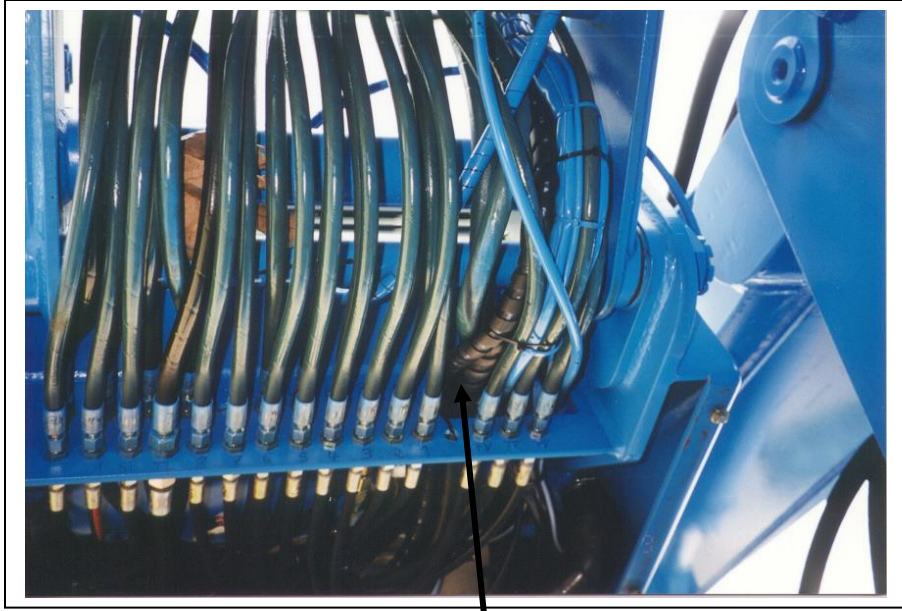


5/8" and 5/16" A/C hoses and wire bundle coming up cab arm frame and following existing wire harness.

- 4) Continue the 13/32" hose forward from the cab arm frame towards the condenser at the fitting end. Connect the 13/32" hose to the top fitting on the condenser coil. Use the correct "O" rings and oil all contact surfaces with PAG refrigerant oil.

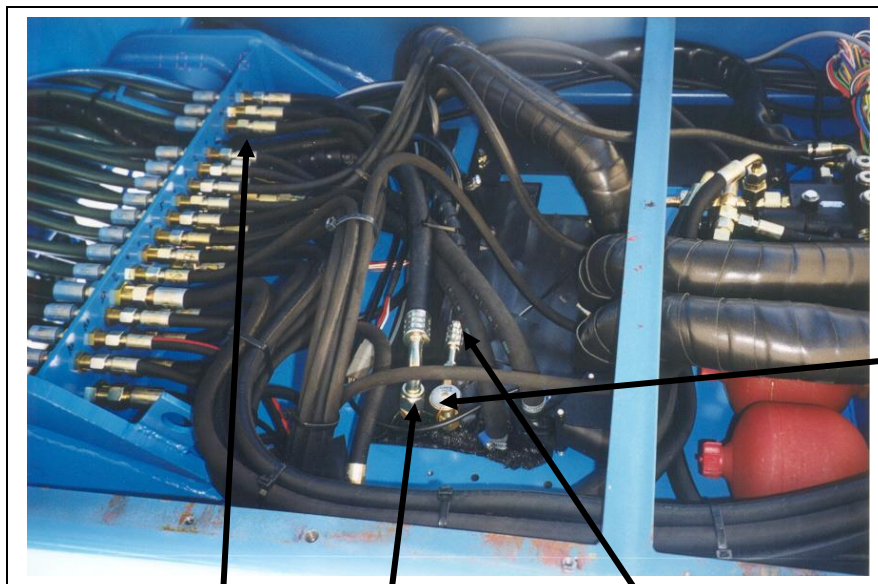


5/8" and 5/16" hose and wire bundle running up to the cab



5/8" and 5/16" hose routed under the back of the cab

- 5) At the drier outlet (mounted on the condenser box) connect the 90o 5/16" fitting using the correct "O" ring and PAG oil. Run the 5/16" hose back along with the 13/32" hose until it reaches the 5/8" hose. Follow the 5/8" hose up to the cab and under it to the evaporator coil. Connect the straight fitting on the 5/16" hose to the expansion valve. Use the correct "O" rings and oil all contact surfaces with PAG refrigerant oil.



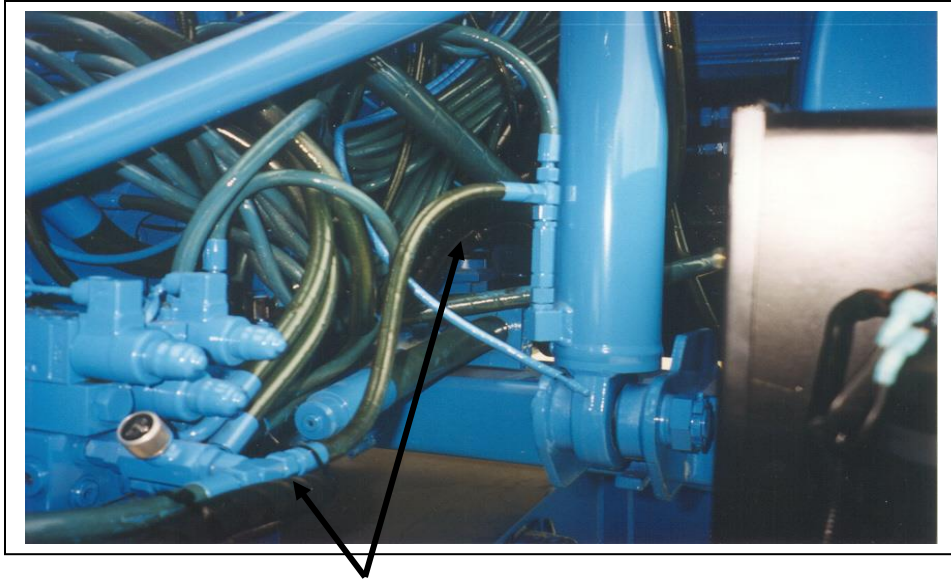
5/8" and 5/16" A/C lines

5/8" 90° fitting

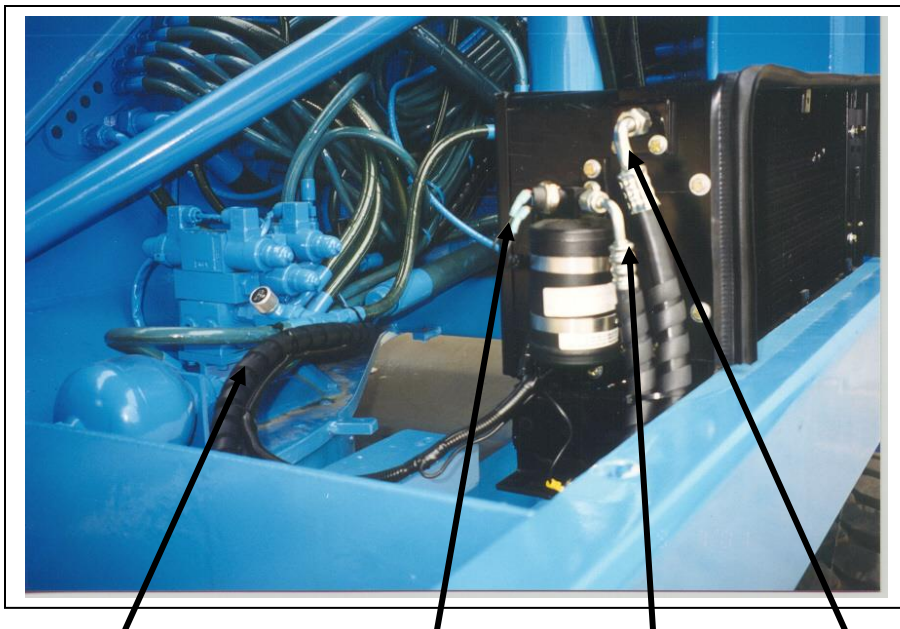
5/16" straight fitting

Expansion valve

- 6) When all the hoses are connected, the system can be pressure tested and checked for leaks. Use tie wraps to secure the hoses all along their runs. Be sure they are well secured and protected from damage. It is best to wait until all the electrical wires are run as well and secure them all together at once.



5/16" and 13/32" hoses running forward to condenser



13/32" and 5/16" A/C hoses, condenser power wire and clutch wire

14 gauge black wire connected at binary switch

5/16" 90° fitting on outlet of drier

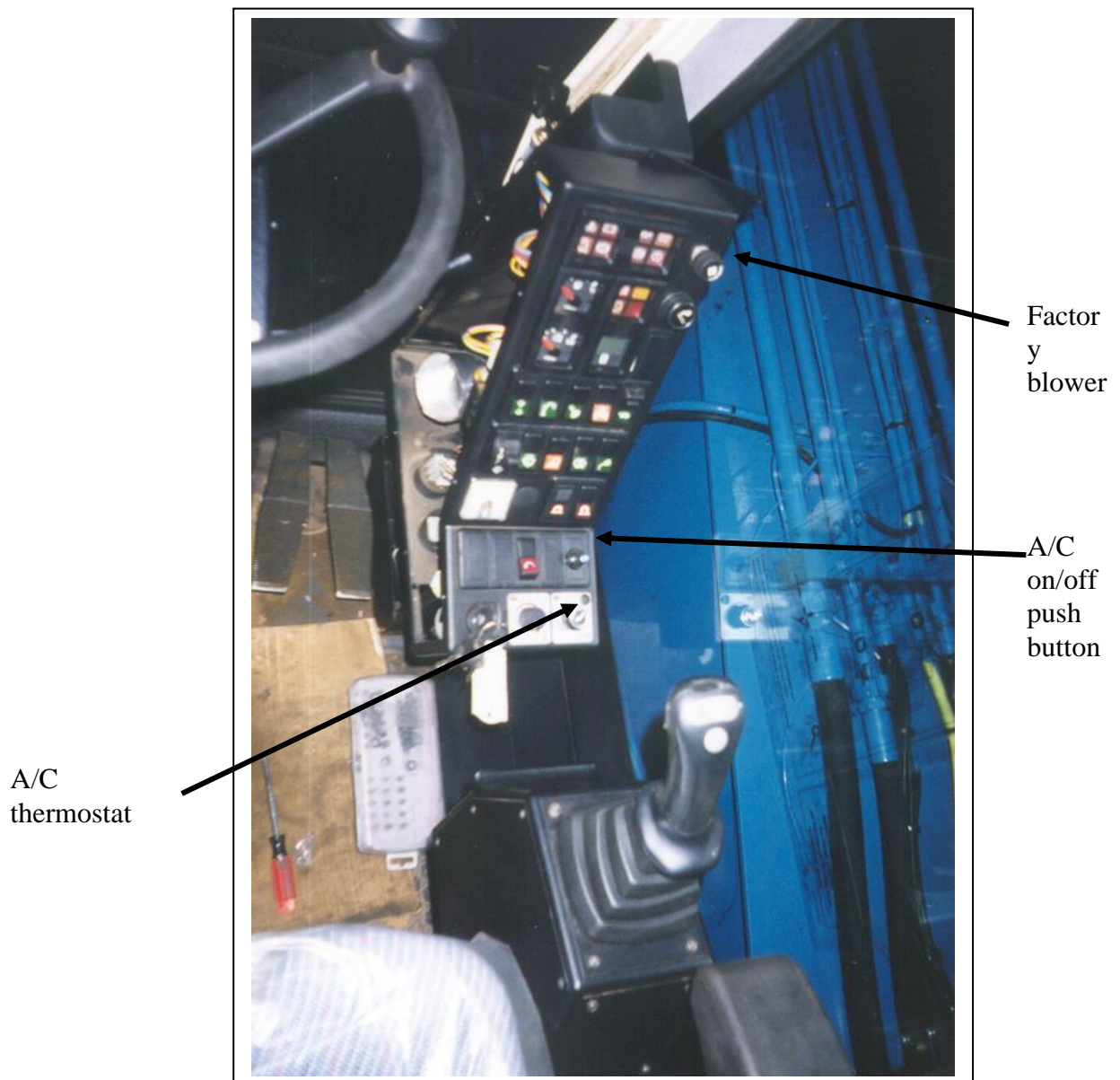
13/32 90° fitting on condenser inlet

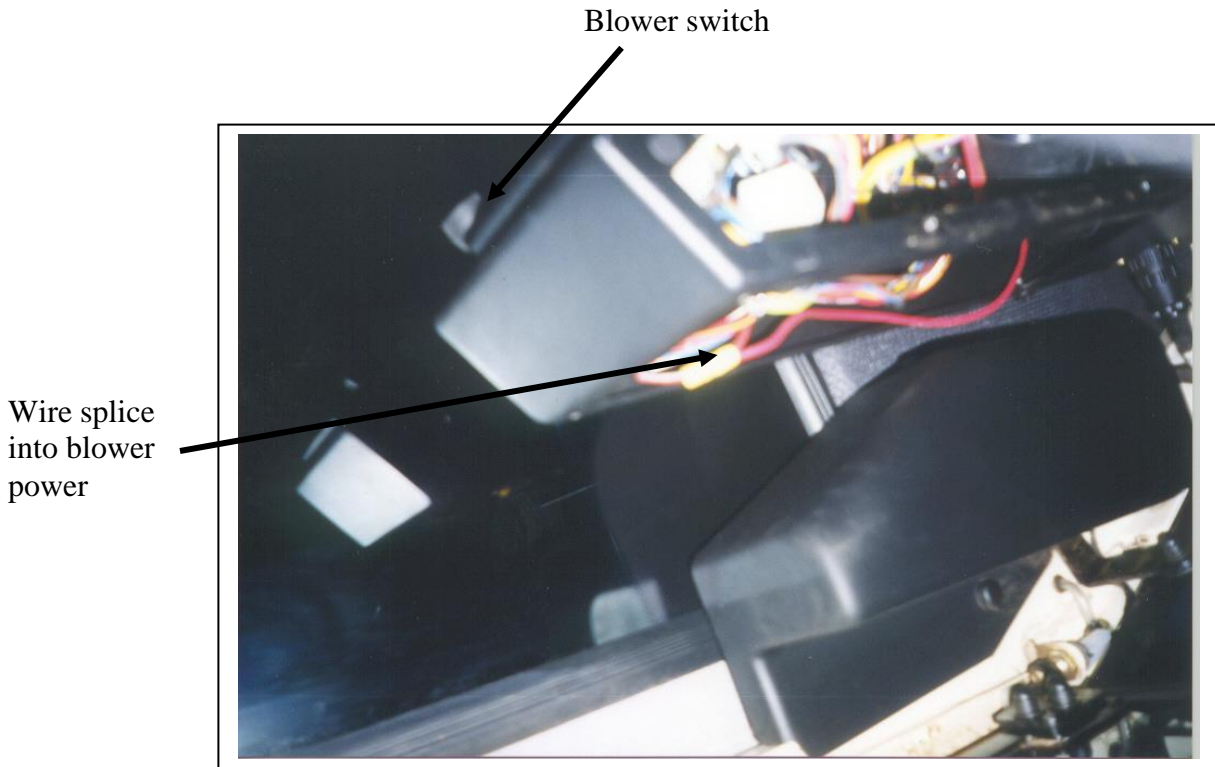
ELECTRICAL

The electrical system for A/C is activated by the blower switch which is located on the upper front right control panel in the cab.

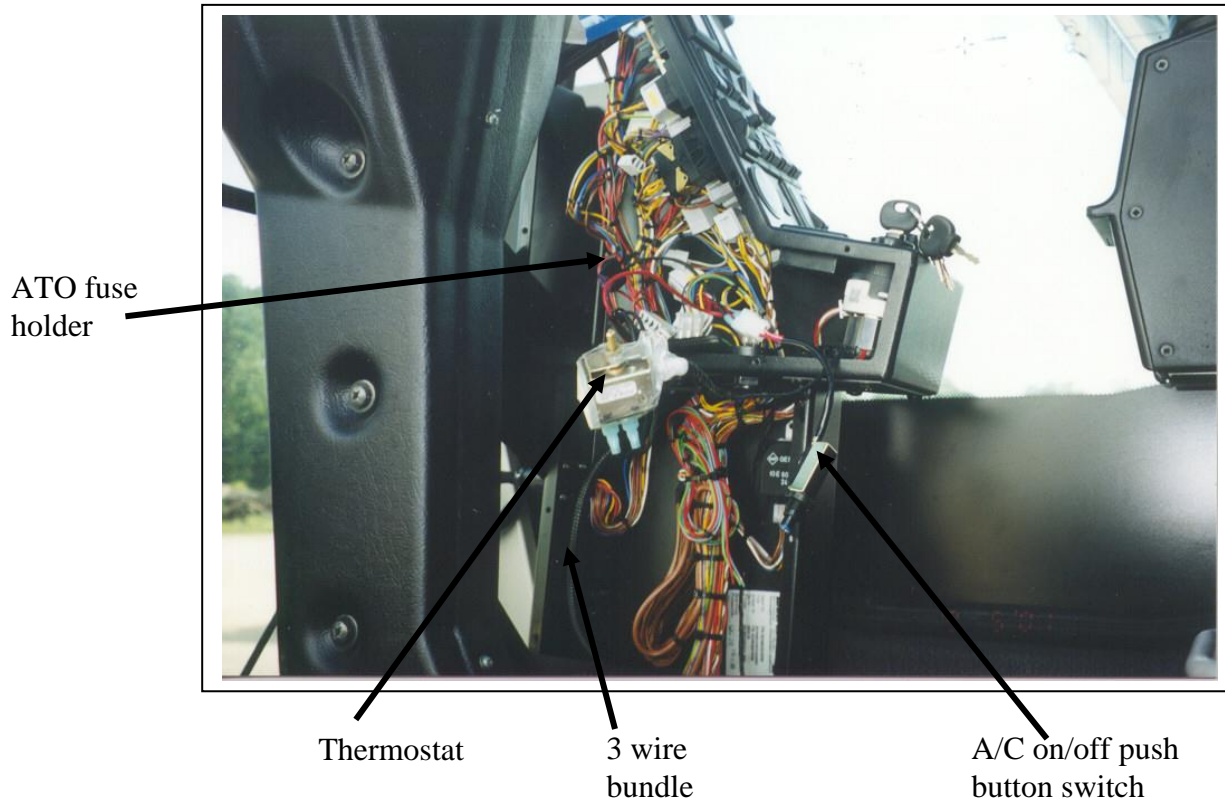
Steps:

1. Remove the side panel on the front right control panel to access the blower wiring. Determine which wire coming from the blower switch has 24 volt power whenever the blower switch is turned on any speed. Splice into this wire and run it to the a/c on/off push button switch through a 3 amp inline ATO fuse. The push button switch should be mounted to the right of the ignition key on the same control panel as the blower switch. Drill a 9/16" hole to mount the push button switch into one of the blank rocker switch covers above the heater control knob.



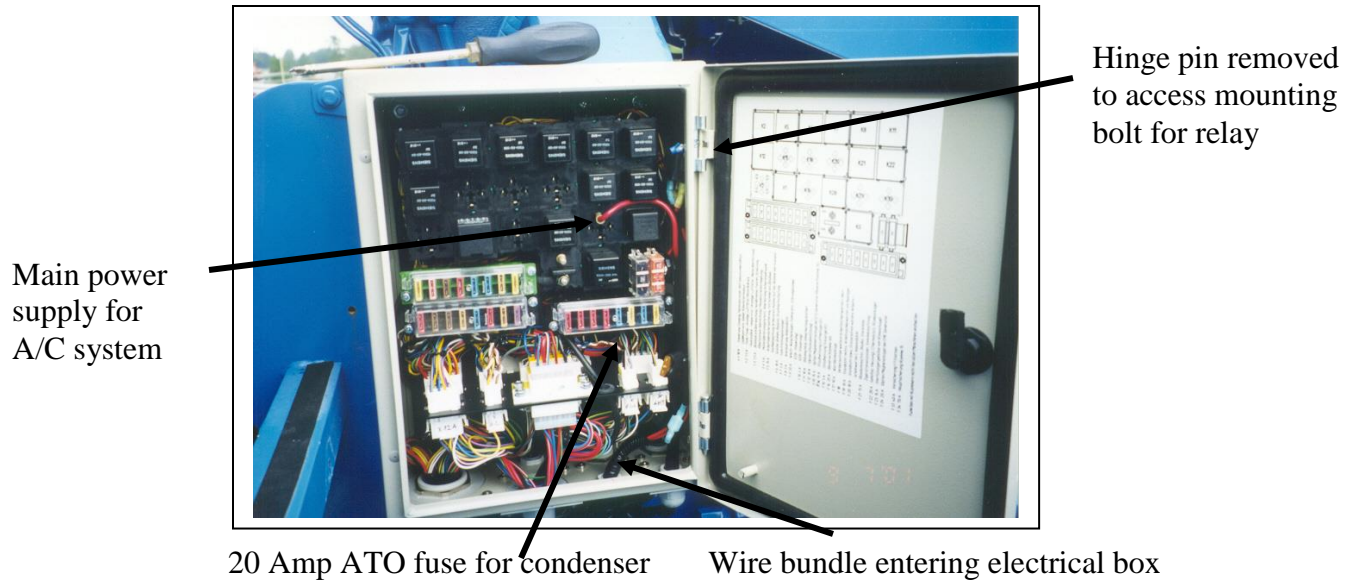


2. The thermostat setup is dash mounted beside the heater control knob. Remove the plug from the thermostat hole. Use a round file to slightly enlarge the thermostat mounting hole until the threaded stem of the thermostat will fit through it. On older machines the hole may not be there at all and a 7/16" hole will have to be drilled. Do not mount the thermostat until the A/C system has been installed and tested. Adjustments may have to be made to the thermostat setting to avoid coil freeze ups.
3. At the second terminal on the A/C on off push button switch, connect the 14 gauge red wire from the three wire electrical bundle. Connect the two black wires to the thermostat terminals. It doesn't matter which black wire goes on which terminal of the thermostat.

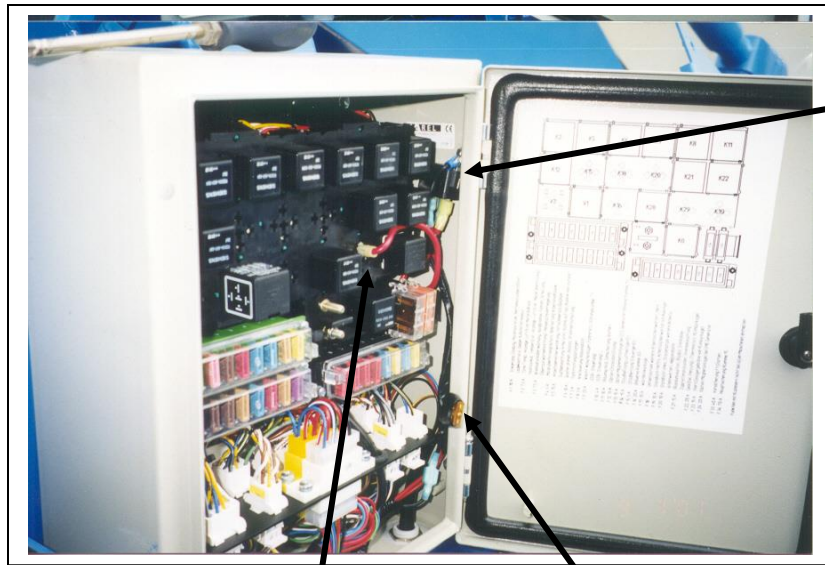


4. Run the 3 wire bundle and the thermostat probe down inside the console and out through the hole in the floor of the cab underneath the console.
5. Route the probe and wire bundle back towards the evaporator coil. Insert the thermostat probe into the evaporator coil as shown in the evaporator installation instructions.
6. Run the three 14 gauge wire in loom along with the A/C hoses out to the engine compartment by following the A/C hoses.
7. Once the wiring gets to the condenser area, have the 12 gauge red wire from the condenser join the wire bundle as it heads towards the engine compartment. If it was not done during installation, ground the 12 gauge black wire from the condenser to a convenient bolt on the frame. Take one black 14 gauge wire from the bundle and run a loop with it with the 12 gauge red condenser wire, over to the binary pressure switch mounted on the drier. Connect the 14 gauge black wire through the pressure switch. Run the wire back to the original bundle.
8. Just as the wire bundle enters the engine compartment, split one 14 gauge black wire out of the bundle. This one wire will continue along with the A/C hoses to the compressor. Connect the 14 gauge black wire to the clutch wire coming from the compressor.

9. Run the rest of the wire in the bundle over to the power distribution box located on the upper left wall of the engine compartment.
10. Drill out the empty plug in the bottom of the power distribution box and run all the wires up through it. There should be a 14 gauge red, a 14 gauge black and a 12 gauge red wire.
11. Remove the upper hinge pin on the door of the power distribution to gain access to the screw behind it. Once all the wires are attached to it, the supplied 24 volt relay for the A/C system will mount to the inside edge of the power distribution box using this screw.



12. Main ignition live power is drawn from the live terminal on the empty relay spot K29. This power supply is fused in the fuse panel directly below it with a 15 amp fuse. It should be the fourth fuse from the right end. Upgrade it to a 20 amp fuse (supplied). Use 12 gauge red wire. Connect the ignition live power service to terminal #30 on the A/C relay.
13. From the outlet terminal of the relay (#87) there must be two wires, a 12 gauge red (from the condenser) and an inline ATO fuse holder. Both wires can be crimped into one yellow female quick disconnect terminal. Connect the second black wire from the wire bundle to the other end of the ATO fuse holder. The control power for the relay comes from the red 14 gauge wire running from the A/C on /off switch in the cab. Connect this wire to either relay control terminals on the relay #(85) (86) and connect the other terminal to ground. Install a 5 amp ATO fuse in the fuse holder to protect the compressor clutch circuit.



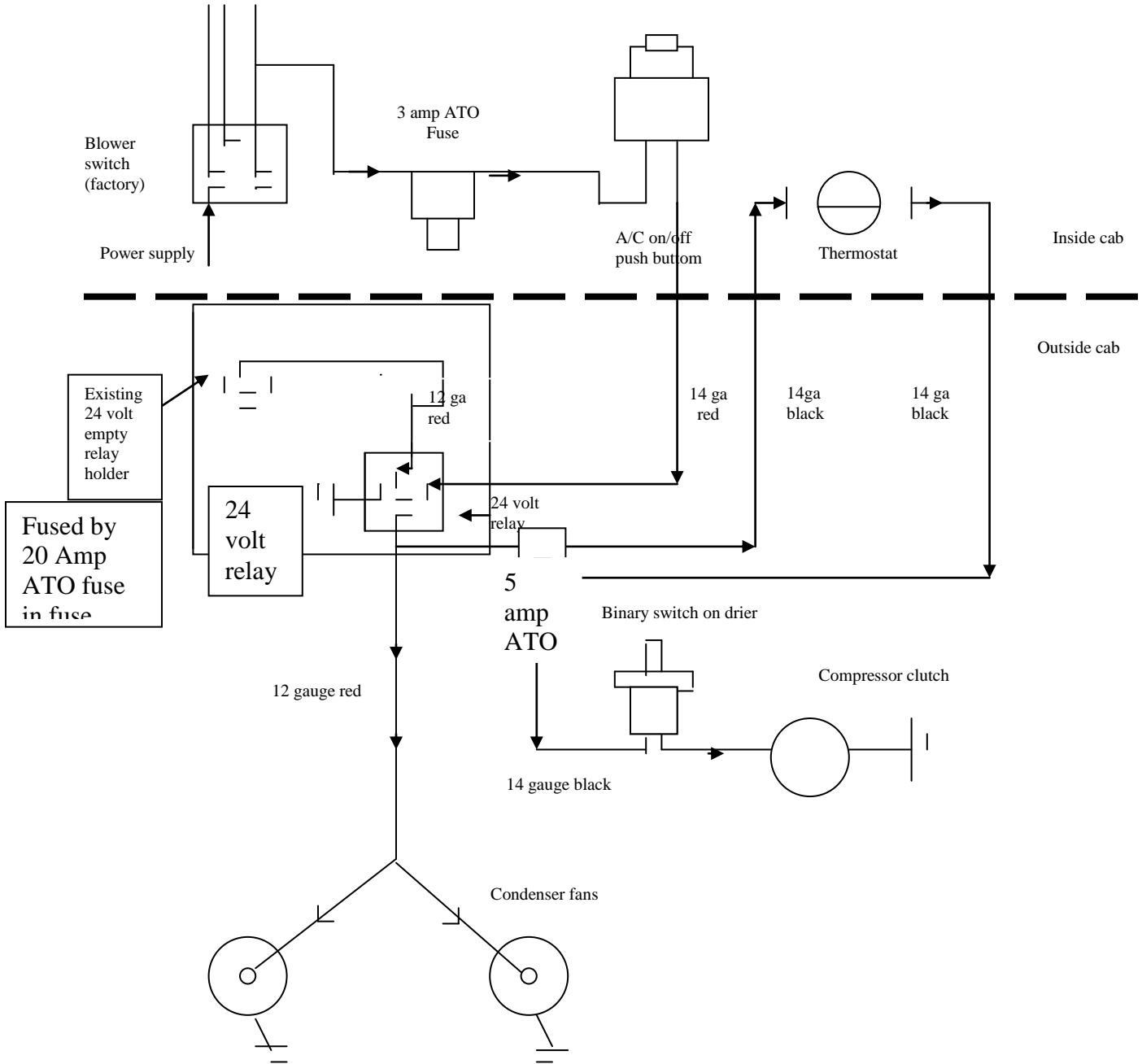
24 Volt
relay

Main power supply for A/C system

5 Amp ATO fuse for compressor
clutch circuit

14. Test the electrical system before closing up any boxes or panels. Check the rotation of the condenser fans to ensure they are pulling air through the box. Check that there is power to the binary switch at the compressor. ****NOTE**** The compressor clutch will not engage until there is sufficient pressure in the system******
15. When all the wires have been plugged into the relay, mount it as described in step 11. Use that screw as the ground for the relay as well. Re-install the hinge pin when done.

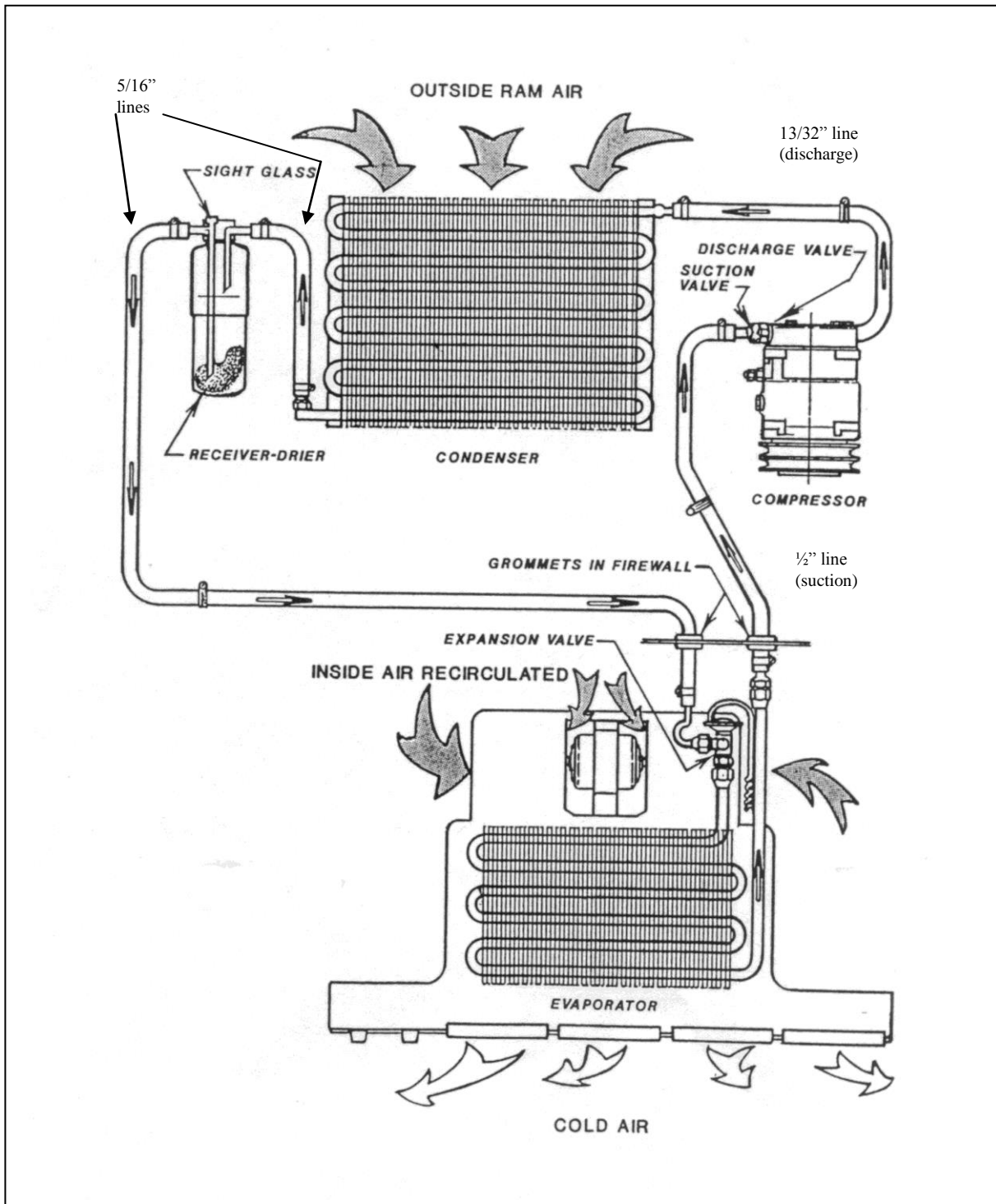
ELECTRICAL:



Final checks and charging:

1. Pressure test the system with nitrogen to at least 250 PSI and check all fitting and connections for leaks. The complete electrical system can be tested while there is pressure in the system as well.
2. Vacuum the system out with a good vacuum pump for ½ hour to 45 minutes. Ensure the system holds a vacuum to double check it for leaks. Add 4 oz of PAG oil to the system. Charge the system with 3 lbs of new 134A refrigerant. Run the system to test it. Check the temperature at the louvers. Add 134A refrigerant in 2 oz increments and check the air temp. A charge of 3 lbs 8 oz should be about right.
3. Check that the thermostat is cycling the compressor off before coil freeze up problems can occur. The thermostat can be adjusted with the adjustment screw under the plastic cap on the body of the thermostat. See the thermostat setting procedures at the end of this instruction manual.

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.

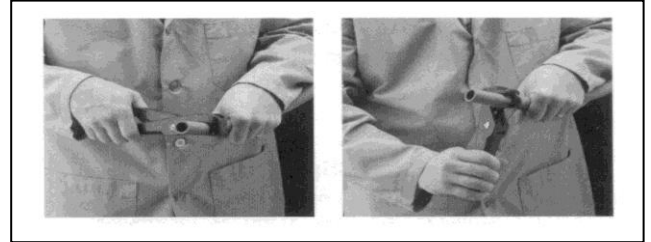
By looking at all these different factors, the area of an evaporator coil most likely to be the coldest can be determined.

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.

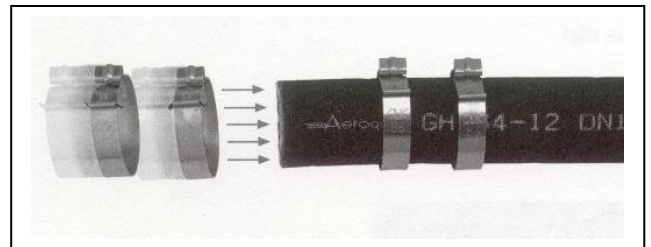
If the thermostat doesn't cycle off after a reasonable cool down period, and the air outlet temperature has dropped below 40° F, the cut in and cut out settings should be adjusted until the compressor is cycling on and off regularly. Let the system run for a decent time period (at least 15 min) and then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

Aeroquip E-Z Clip Assembly Instructions

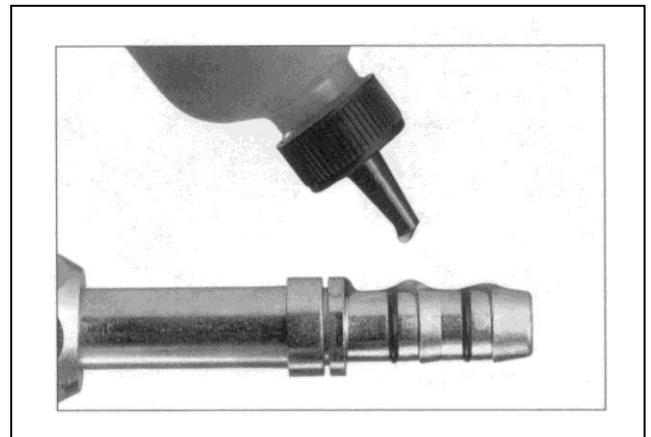
Step 1. Cut the hose to proper length with an appropriate cutting tool. Aeroquip's hand held hose cutter has been specially designed for cutting all non-wire reinforced hose, such as GH-134 Multi-Refrigerant hose. Be sure the cut is made square to the hose length.



Step 2. Install two proper-sized clips onto the cut end of the hose. Orientation of the clips does not affect the performance of the connection. However, for ease of assembly, both clips should have the same orientation. NOTE: Failure to slide the clips over the hose at this time will require the clips to be stretched over the hose or fitting later. This may permanently damage the clip.



Step 3. Lubricate the nipple with a generous amount of the refrigeration or A/C system's compressor lubricating oil. This MUST be done to lower the force of nipple insertion.

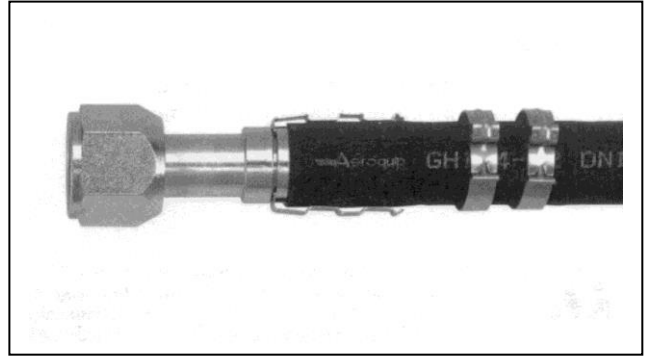


Step 4. Insert the nipple into the hose. To ensure that the nipple is fully inserted, check the gap between the cut end of the hose and the shoulder on the nipple. Care should be taken to avoid kinking or other damage to the hose during nipple insertion. NOTE: Be sure to wipe excess oil from the nipple and hose.



Step 5. Snap the cage into the groove on the nipple. The arms should extend over the hose length. When the cage has been correctly installed in the cage groove, the cage will be able to rotate in the groove. This step **MUST** be performed to ensure:

1. The clips will be located over the O-rings on the nipple.
2. The connection will be compatible with the connection's pressure rating.



Step 6. Slide the clips over the cage arms and into the channels on each arm.



Step 7. Use the pliers to close the clips. The pliers should be positioned squarely on the clip connection points and should remain square during the closing of the clip.

NOTICE: E-Z Clip components should not be reused.

