HR20 Terex Excavator

Installation Instructions

TEREX
1-877-907-8300

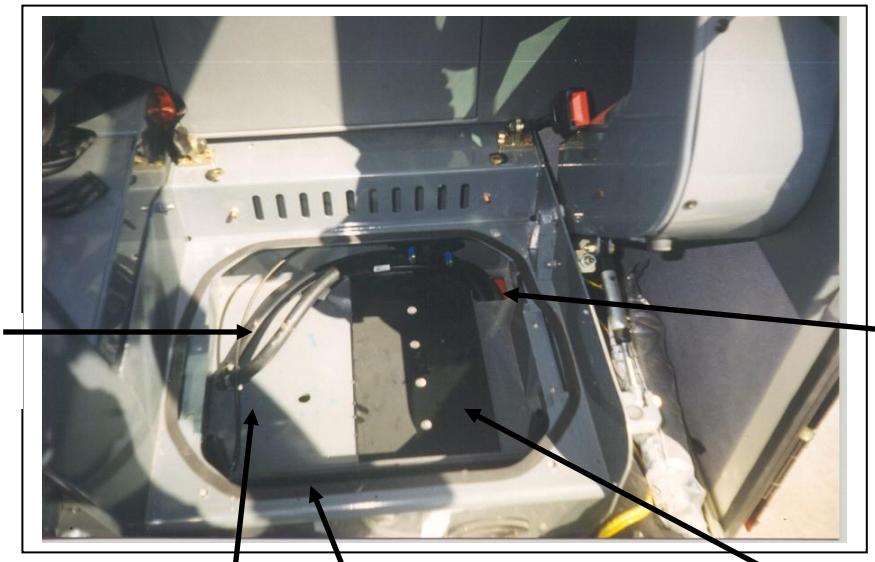
Evaporator/Heater Box

The evaporator / heater box is located under the operators seat in the same location as the original heater box. Air flow passes through the original louvers and defrost vents as well as two extra louvers mounted on either side of the operators seat.

Step: 1. Remove the operators seat from the cab by unbolting the metal plate that the seat sits on. Remove the four M8 bolts, two in front of the seat and two behind the seat. Lift the seat and plate out through the cab door. Remove the cover plate over the heater box by removing the rear two M8 bolts.

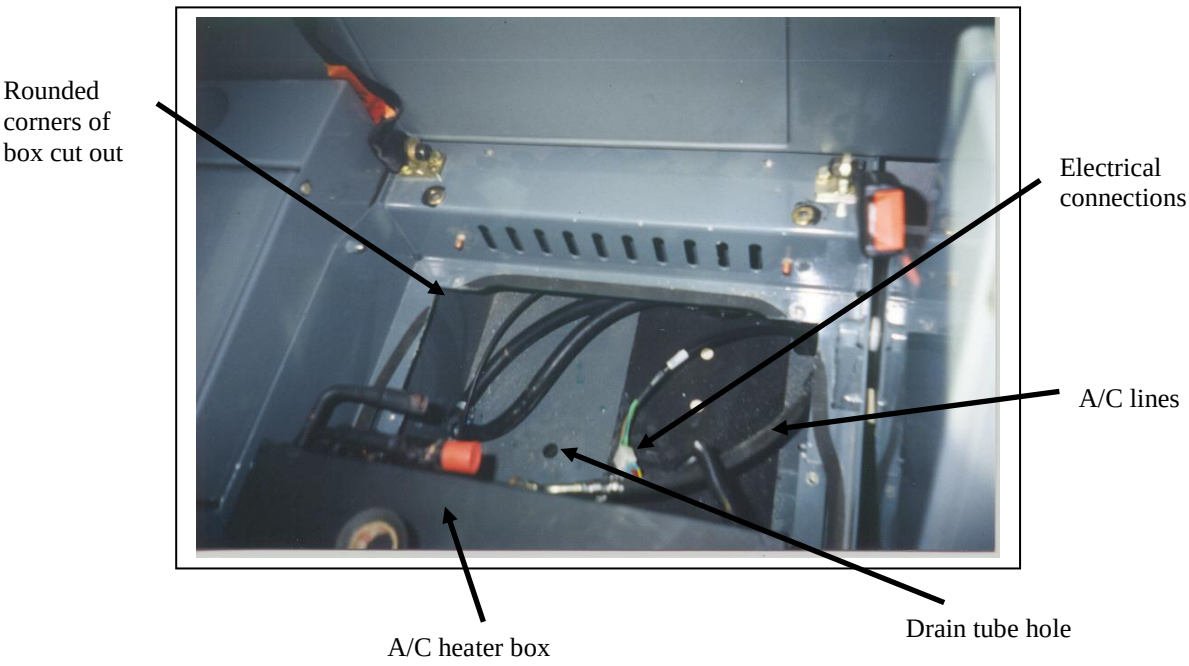
Remove seat and seat frame

2. Unbolt the original heater box from its frame. Keep the four M6 bolts for re-use. Clamp off the heater lines from under the cab and unplug the blower motor. Disconnect the heater lines at the heater coil and remove complete heater assembly from the cab.



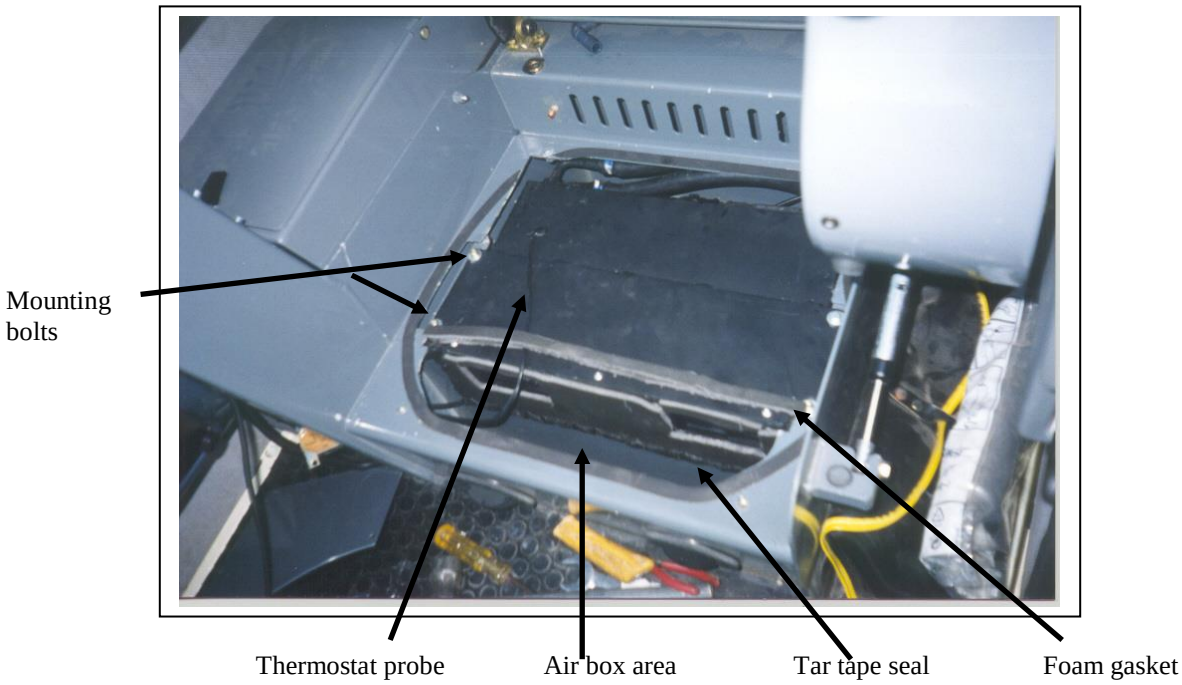
3. The outside air intake filter on this machine is much too large for the air conditioner to work effectively and must be restricted in size. Install the restrictor cover over the filter from inside the cab. Place the foam gasket down and secure in place using double sided tape or silicone.
4. Square up the rounded rear corners of the heater box opening using a jigsaw or sawsall. This makes enough room for the larger A/C heater box to slide in.

5. Connect the drain tube to the drain outlet on the fitting and of the box and then set the box half in place. Reconnect the heater lines to the heater outlets on the box. Route the drain tube through the hole in the floor that the heater hoses come up through.



6. Once the A/C lines are run into the heater box area, the A/C lines can be connected to the fittings on the A/C heat box.

7. Plug the wiring coming out of the A/C heat box into the terminals from the original blower plug. Test the blower to ensure that the speeds are in the right order. When all the connections are done and tested on the back of the box, slide it back into place. Take care to pull any excess heater or A/C hoses down through the floor as the box is being slid into place. Place the box on the mounting bracket and bolt down in place re-using the M6 bolts.



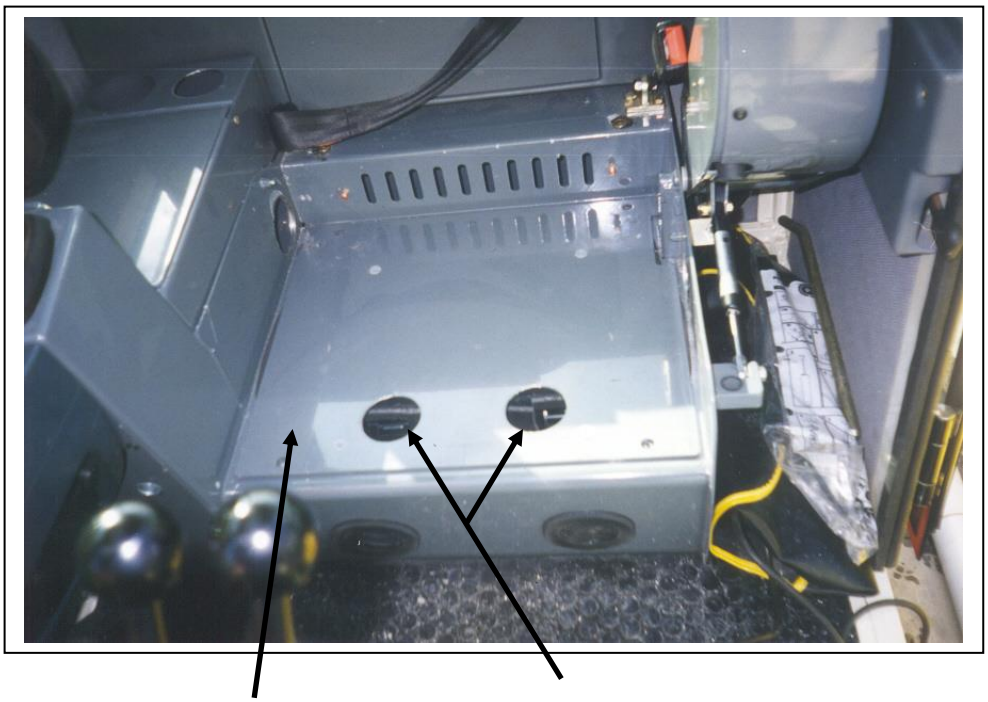
8. Use tar tape to seal the bottom and sides of the A/C heater box to its compartment so no air can escape around the bottom or sides of the box. This is done on the blower outlet of the A/C heater box.

9. Install the thermostat probe by sticking it into the predrilled hole in the top of the box about 5”. Secure with a piece of tar tape.

10. Place a strip of foam across the top front edge of the A/C heater box so that when the cover plate is installed there is a sealed air box formed in front of the heater box.

11. Remove and discard the inside air re-circulation control plate. This is removed so an operator cannot accidentally block off the inside air supply.

12. Drill two 2 ½" holes in the cover plate so that the holes will be overtop of the air box area in front of the A/C heater box. Install the two 2 ½" hose adapters up from the bottom of the cover plate so that the 2 ½" flex hose can be installed on the topside of them. These hoses will supply the extra two louvers in the back corner of the cab.



Cover plate

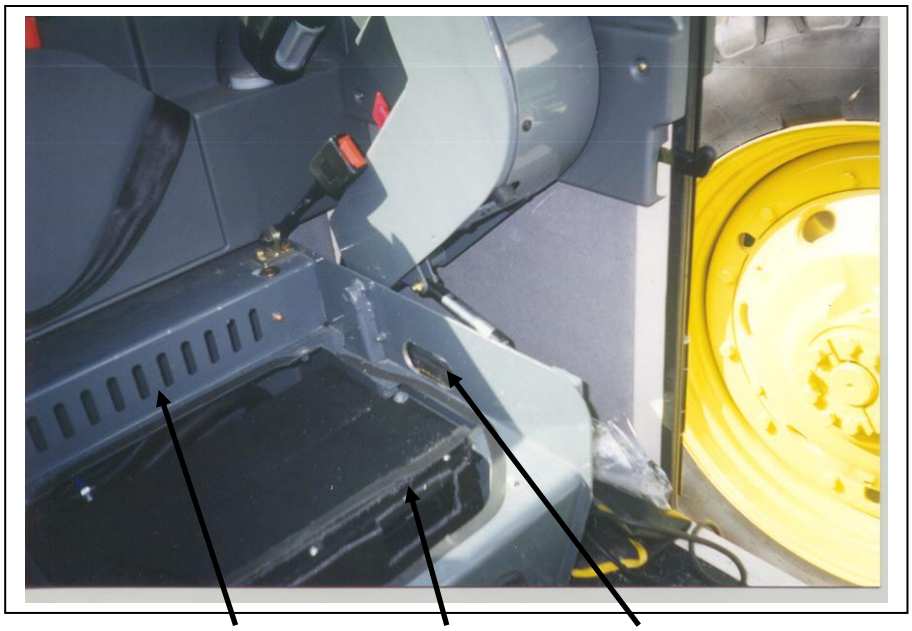
2 ½" holes for hose adapters

13. On the right side of the cab, drill a 2.5" hole through both layers of metal in the right side storage compartment. The hole should be positioned on the side panel just above the cover plate and just ahead of the inside air intake area.

14. Drill another 2.5" hole just to the left of the drink holder at the back right corner of the cab. Run a 2 ½" flex hose from the right hose adapter through the 2.5" side hole and out the 2.5" top hole. Cut it to length and connect it to the hose adapter on the round snap-in louvers supplied in the kit. Secure the hose with a tie wrap then snap the louver down into the hole.

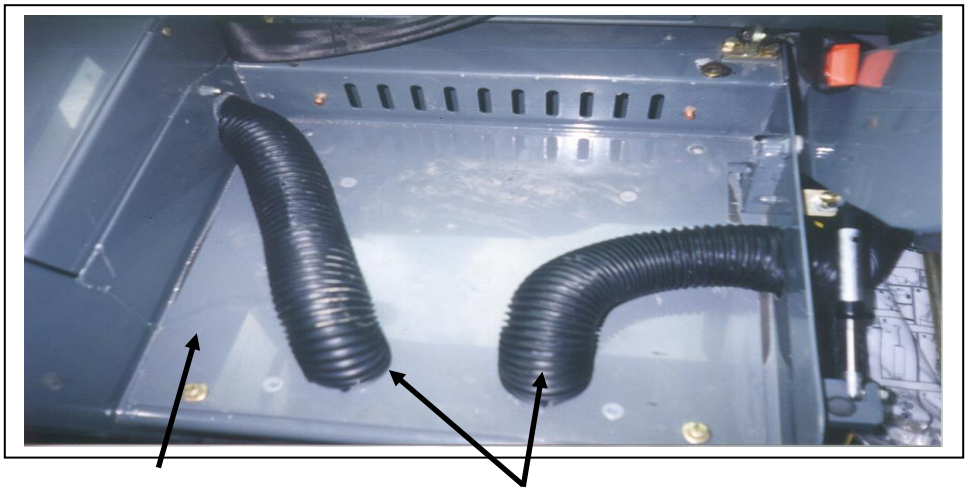
2 ½ ” hole for snap-in louver 2 ½ ” hole for flex

15. On the left side of the cab, about 1” ahead of the left control arm pivot frame make a 2 ½” hole just above the cover plate to pass the 2 ½” flex hose throught.



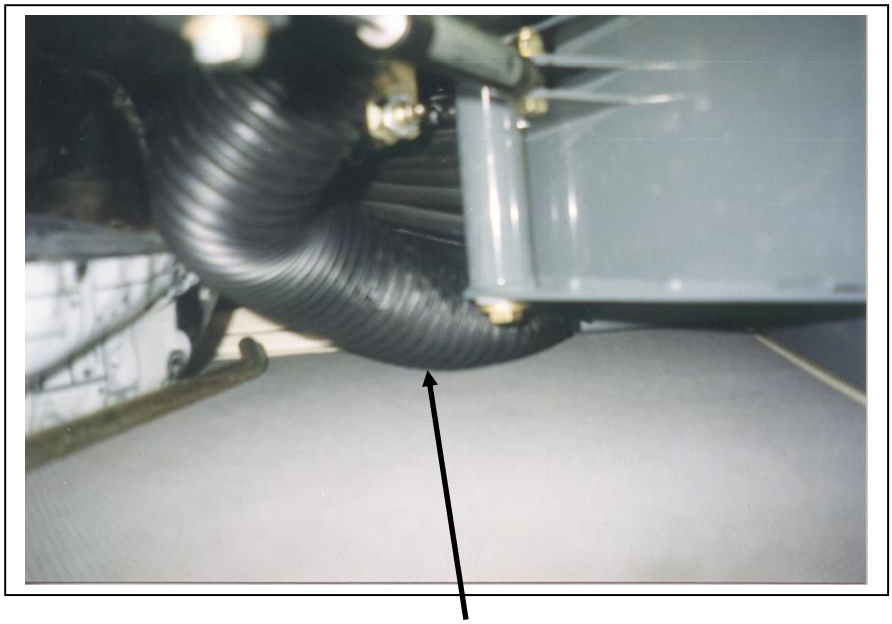
Inside air panel removed Foam gasket Hole for flex hose

16. Route the flex hose under and to the outside of the control arm and up behind it. Cut the flex hose to length and attach it to the hose adapter of the black ball louver. Mount the ball louver to the left cab wall using self drilling screws. Mount the louver bezzel just ahead of the windshield washer tank with the top of the bezzel about level with the top of the washer tank cover.

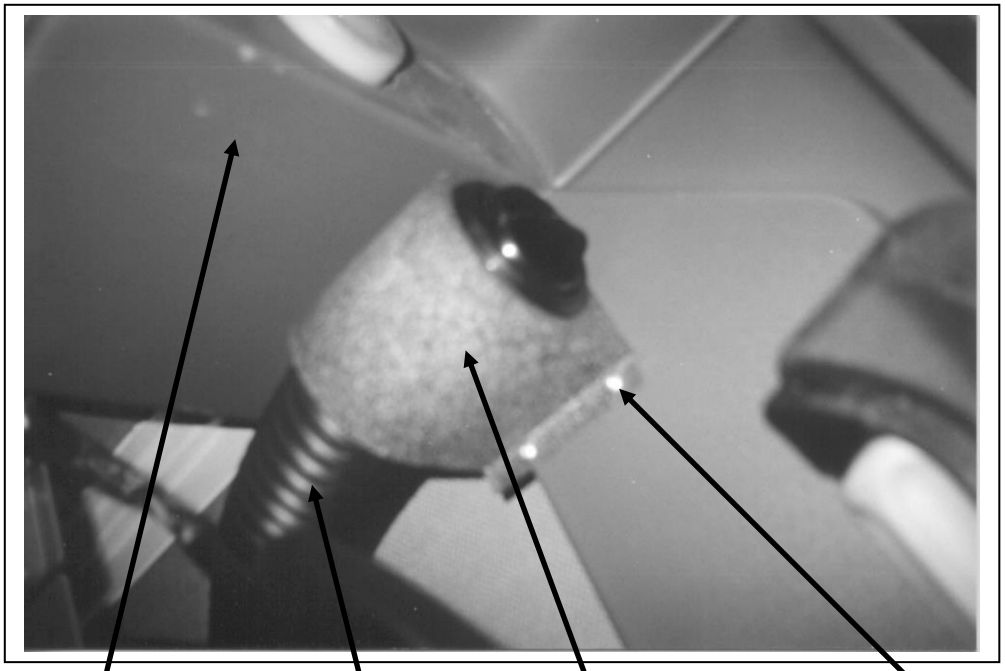


Cover plate

Flex hose attached and run



Flex hose under left control arm

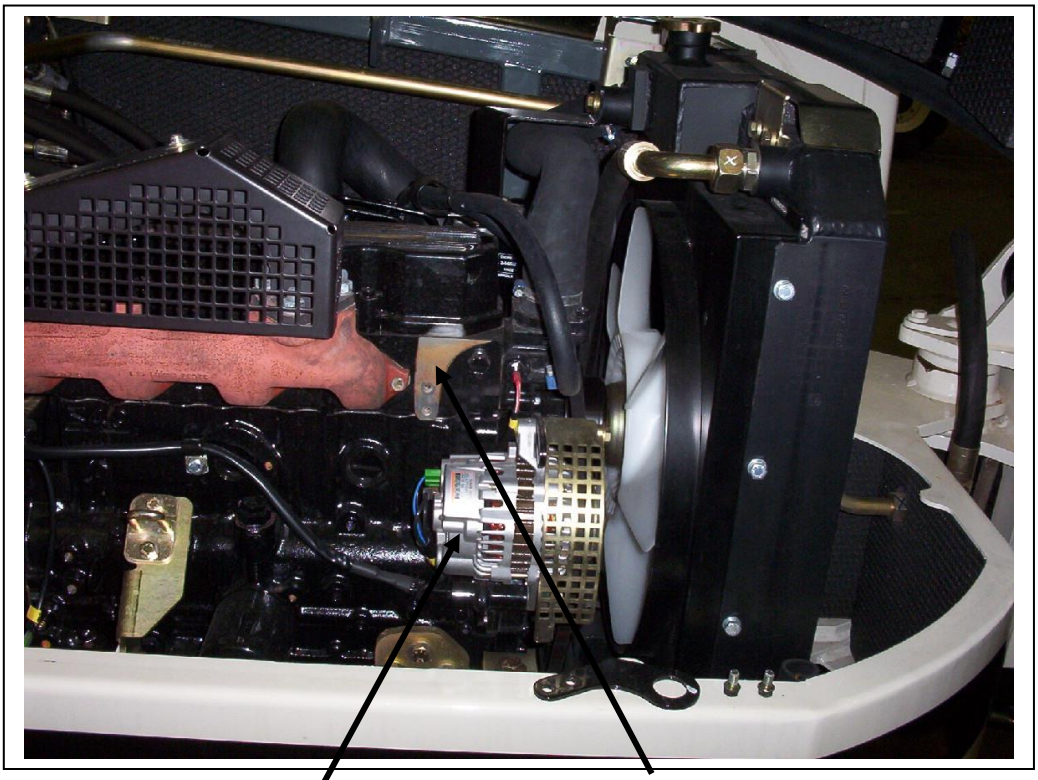


17. When the system is all installed and tested, the seat and mounting plate can be re-installed and all electrical access panels can be re-installed.

18. Use tar tape to seal the hole around the cab access for the heater and A/C lines. Also seal any extra space around the drain hole and install the drain tube restrictor in it.

Compressor mount: The compressor is located on the right side of the engine in the original alternator location.

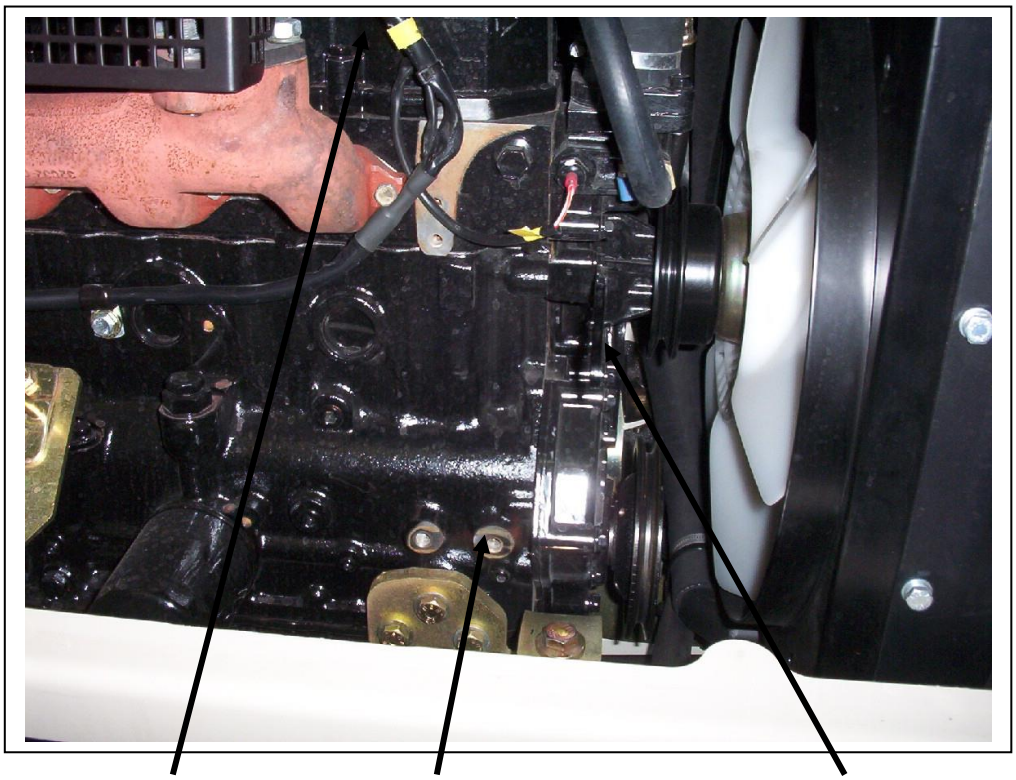
Steps: 1. Remove the alternator and alternator mount from the machine. Leave the alternator tightener bracket in place to act as the compressor tightener bracket. Retain the two M10 bolt for later use on the compressor mount. Place the alternator on top of the engine out of the way until it is time to remount it in its new location. Remove the original drive belt from the engine. It will not be reused.



Original alternator location

Engine lifting bracket removed.

2. Put protective hose wrap on the heater lines coming out of the engine block just above the original alternator location. This will protect them from rubbing on either the compressor or alternator.

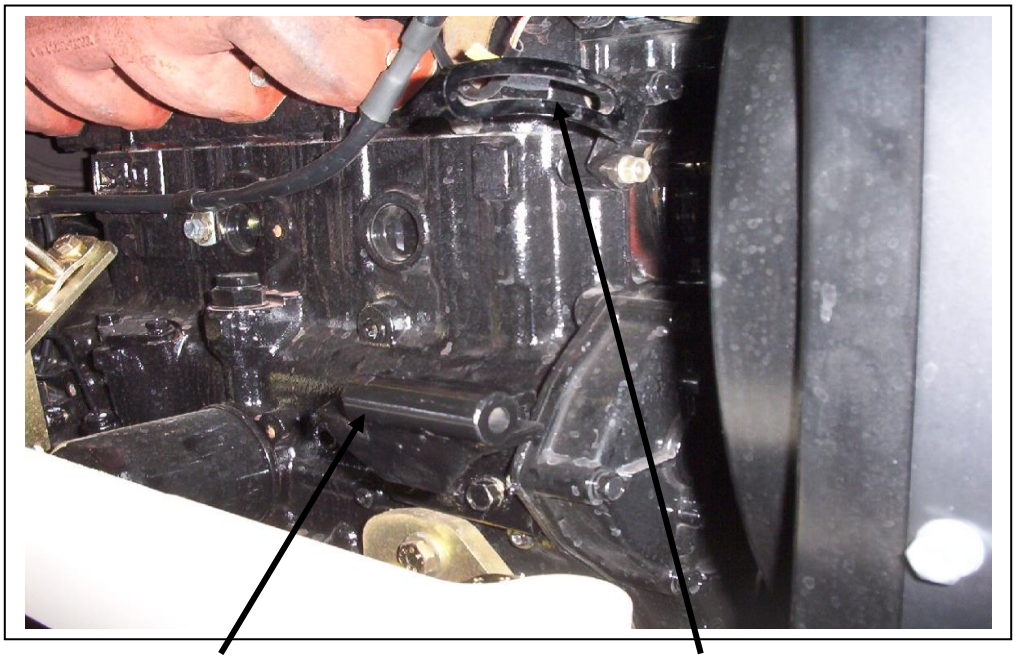


Alternator on top of engine

Alternator and bracket removed

Alternator tightener stays in place

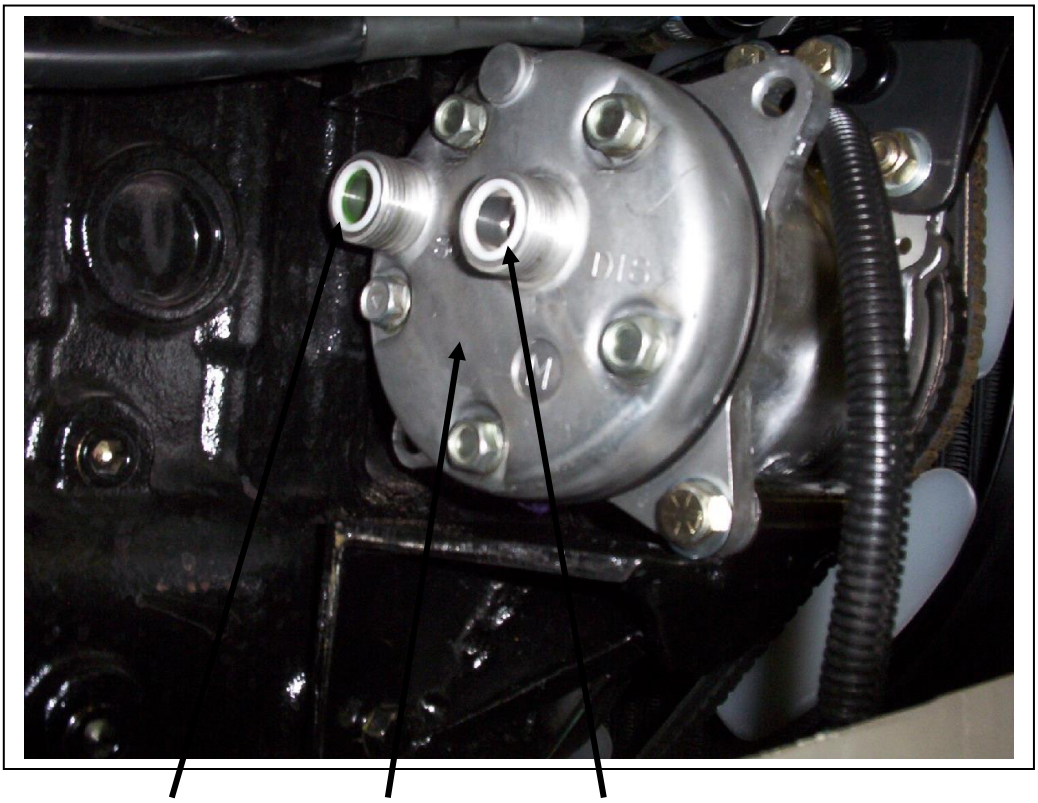
3. Install the compressor mount onto the original alternator mount location and bolt loosely in place using the two M10 bolts saved in step 3. Leave the mount slightly loose so it can be adjusted to achieve the correct alignment of the compressor to the crank pulley. The rear groove of the compressor pulley will be lined up with the crank pulley.



Compressor mount bracket

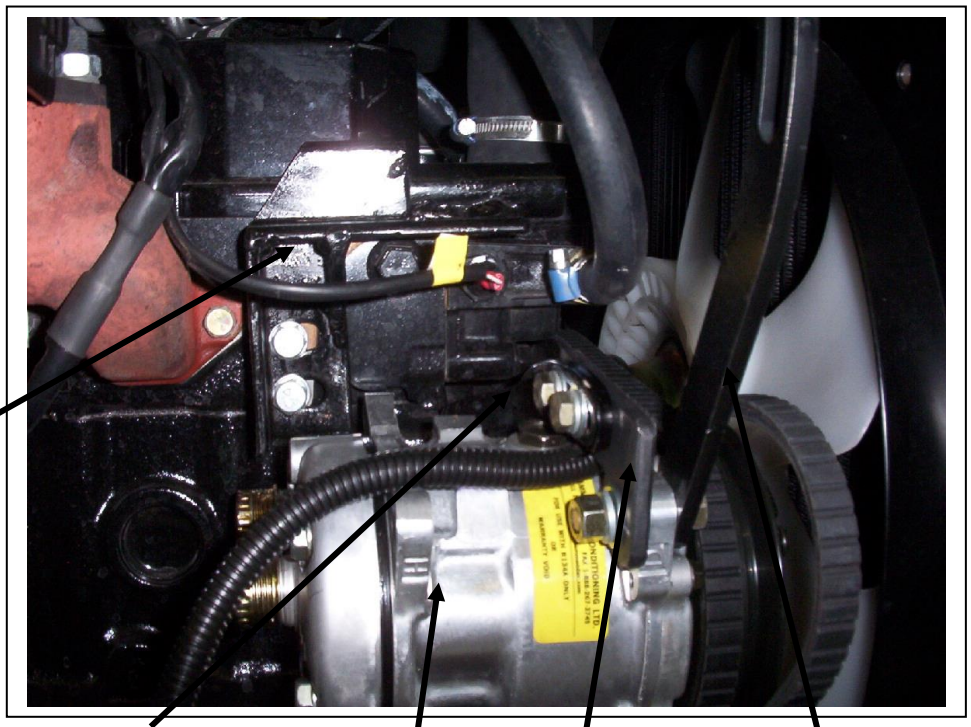
Original alternator tightener to be used for compressor tightener.

4. Get the compressor, the white nylon gaskets and the rotolock fittings from the a/c kit and assemble the rotolocks to the compressor before installing the compressor onto the compressor mount. Remove the shipping caps from the compressor fittings and insert the white nylon gaskets into the recessed rings on the end of the compressor fittings. Oil the surfaces on the rotolock fittings before installing them onto the compressor fittings. The 13/32" rotolock (smaller one) goes onto the discharge fitting on the compressor with the access port pointing up. The 1/2" rotolock (large one) goes onto the suction fitting on the compressor with the access port pointing up. Tighten the fittings in place using a 1 1/8" and 7/8" wrench.



Shipping caps removed Compressor Nylon gasket installed

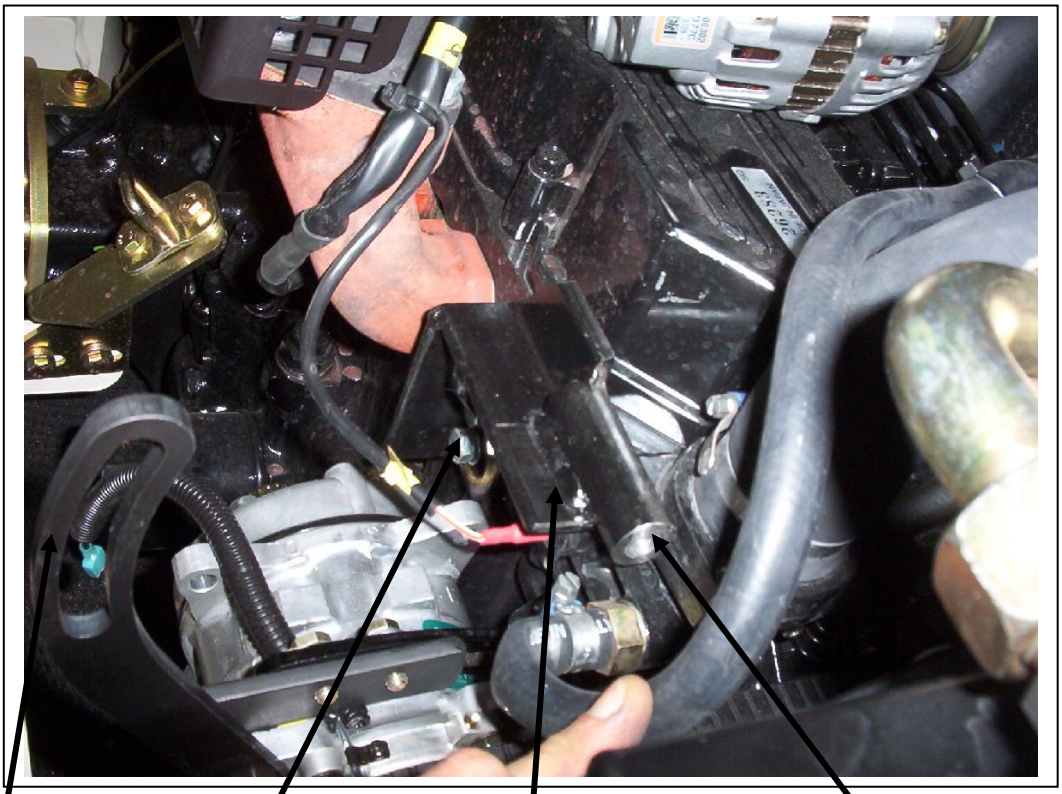
5. Place the compressor down onto the compressor mount with the two, lower, outside ears over the mount bracket. Using the long 3/8" bolt, secure the compressor loosely to the mount.
6. On the top front outside ear of the compressor, bolt the alternator tightener bracket and the compressor tightener "L" bracket onto the ear using the 3/8" x 1 ½" bolt provided. The "L" bracket goes on the inside of the ear. The alternator tightener goes on the pulley side of the ear. The 3/8" x 1 ½" bolt should pass through all three items and secure them together.



7. Loosely bolt the original alternator tightener bracket, (now the compressor tightener arm) onto the "L" bracket using the two 1/4" bolts locks and flats provided in the kit.
8. Install the longer drive belt, supplied in the kit, around the crank pulley, the fan pulley and the rear groove of the compressor pulley. Loosely tighten. Check the compressor alignment by placing a straight edge across the face of the crank pulley. Adjust the compressor and mount to make the belt run parallel to the straight edge. Once the belt is straight, tighten the compressor mount bracket in place. Double check the alignment them fully tighten all other mounting bolts and bracket.

Alternator mount: The alternator is remounted above the compressor with a heater line running between the alternator and the compressor. The mount is bolted to the engine lifting eye location. The alternator tightener bracket comes up off the front outside ear of the compressor. The alternator is driven off the front pulley of the compressor. The rpm of the alternator will remain the same as it was before the relocation.

Steps: 1. Remove the engine lifting eye from the back side of the engine
2. Bolt the alternator mount bracket to the same M8 holes as the engine lifting eye was. Use the M8 hardware supplied in the kit. The mount holes in the bracket are slotted to make aligning the belt easier.



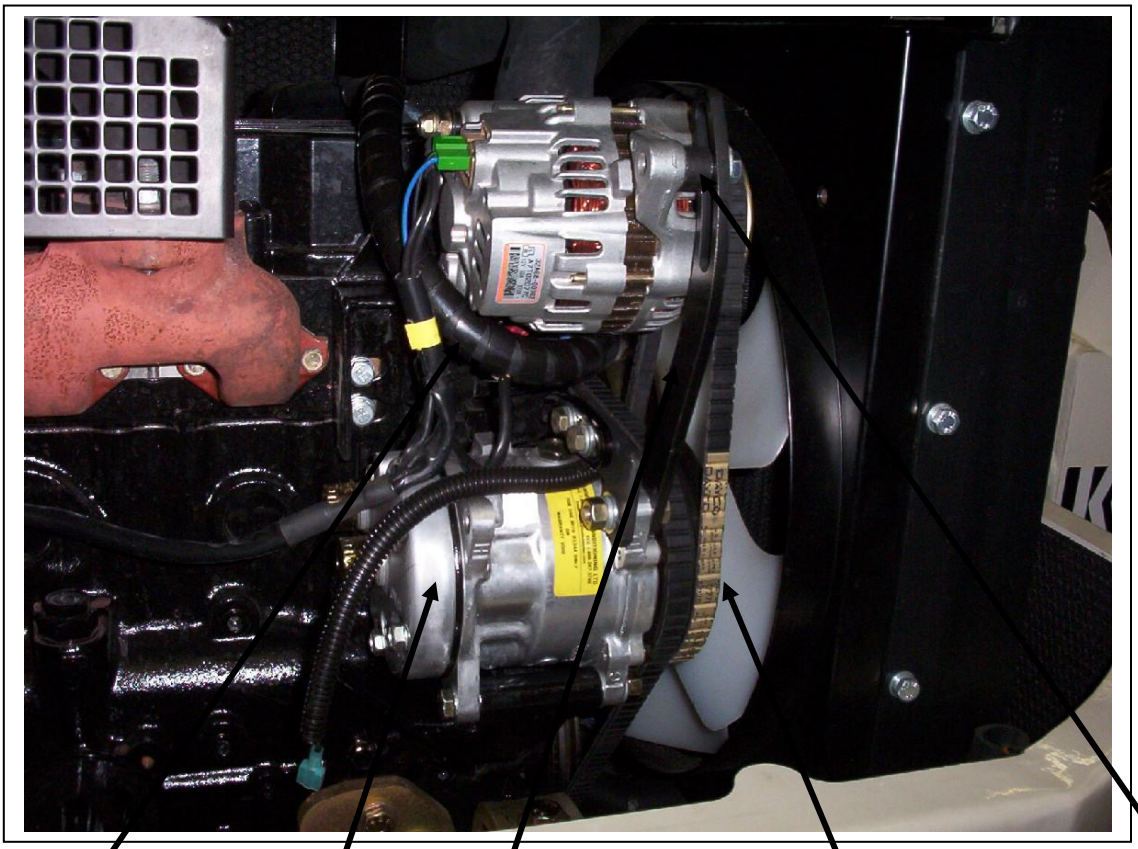
New tightener bracket

M8 bolt to mount alternator bracket.

Alternator bracket

Hole threaded for a M10 bolt to mount alternator to the bracket

3. Bolt the alternator to the mount bracket using the M10 bolt and hardware provided in the kit. Make sure to bolt the non-threaded alternator ear to the mount.
4. Bolt the curved alternator tightener arm to the alternator threaded ear using a ½" spacer in between the two. Use the M8 x 35mm bolt and the original large O.D. flatwasher as hardware. Leave the bolt loose until the drive belt is installed.



Heater line with hose wrap installed. | Alternator | Alternator tightener | Alternator drive belt | ½" spacer

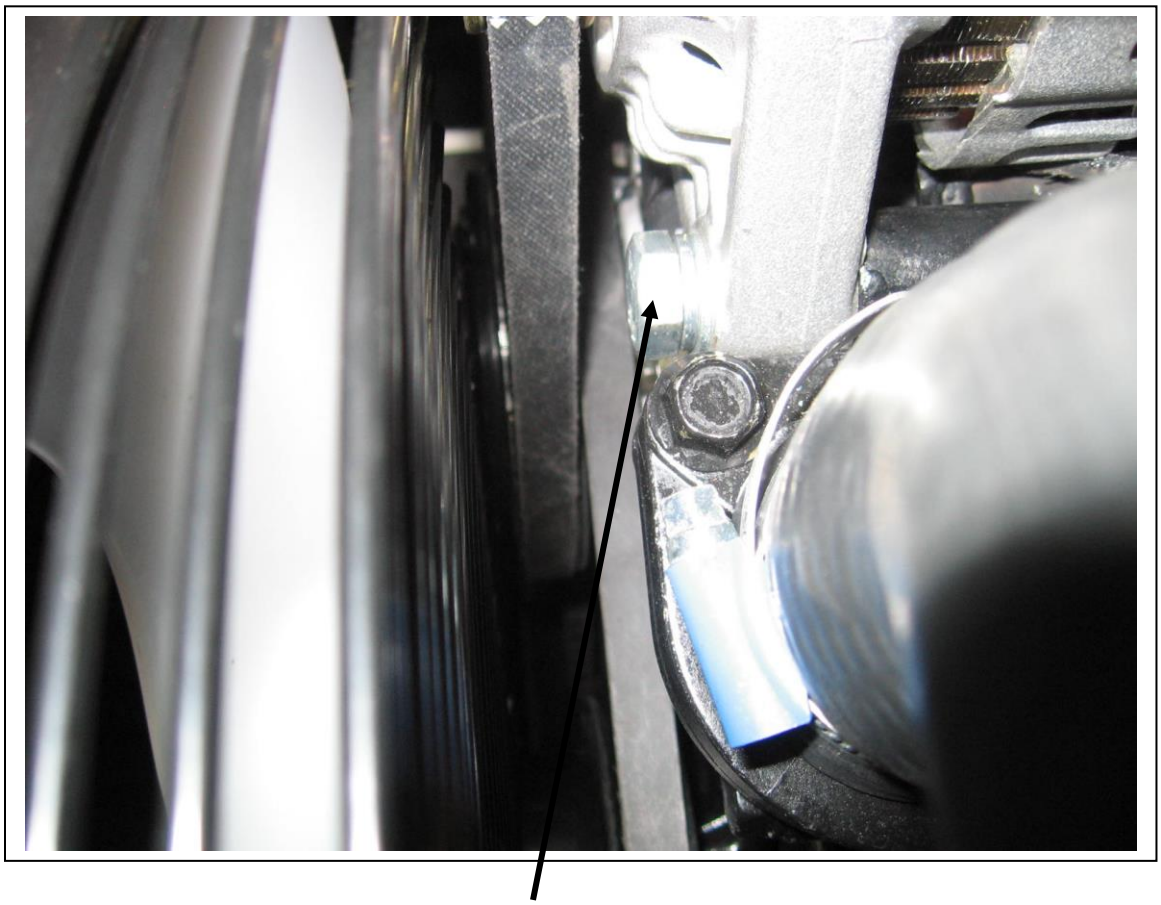
5. With the tightener still loose, install the alternator drive belt over the front groove of the compressor and the alternator pulley. Tighten the belt by pivoting the alternator and secure both the tightener arm bolt and the main bracket bolt. Check the belt alignment using a straight edge across the face of the pulley. If the alignment needs to be adjusted, loosen the two M8 bolts holding the alternator mount to the engine block and relocate the mount with the slotted holes to correct the position. If the alternator needs to move ahead farther than the slots will allow, washers can be used between the bracket and the alternator ear to space the alternator ahead.

HR20 ALTERNATOR STIFFENER BRACKET UPGRADE

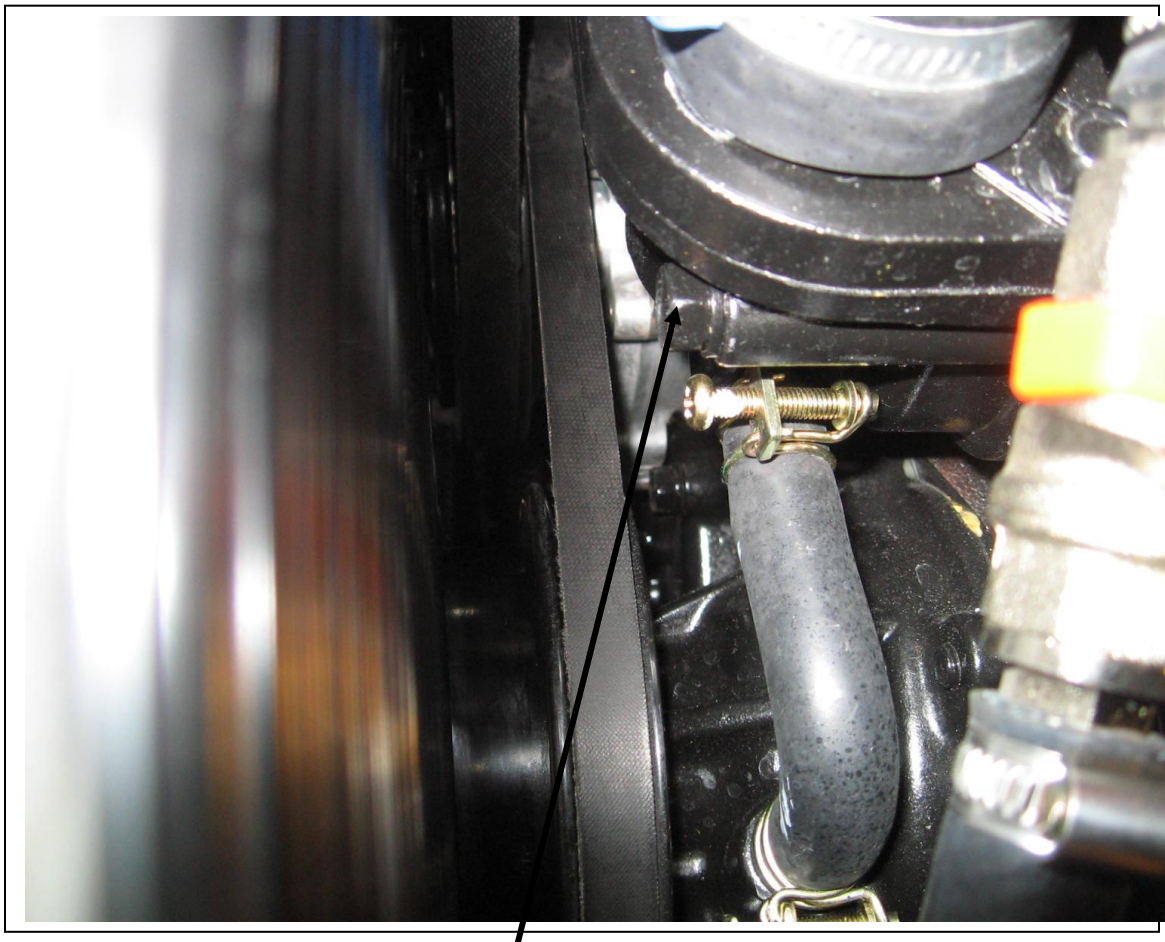
M10 bolts and 5/8” spacer goes here.

Rough location of stiffener bracket.

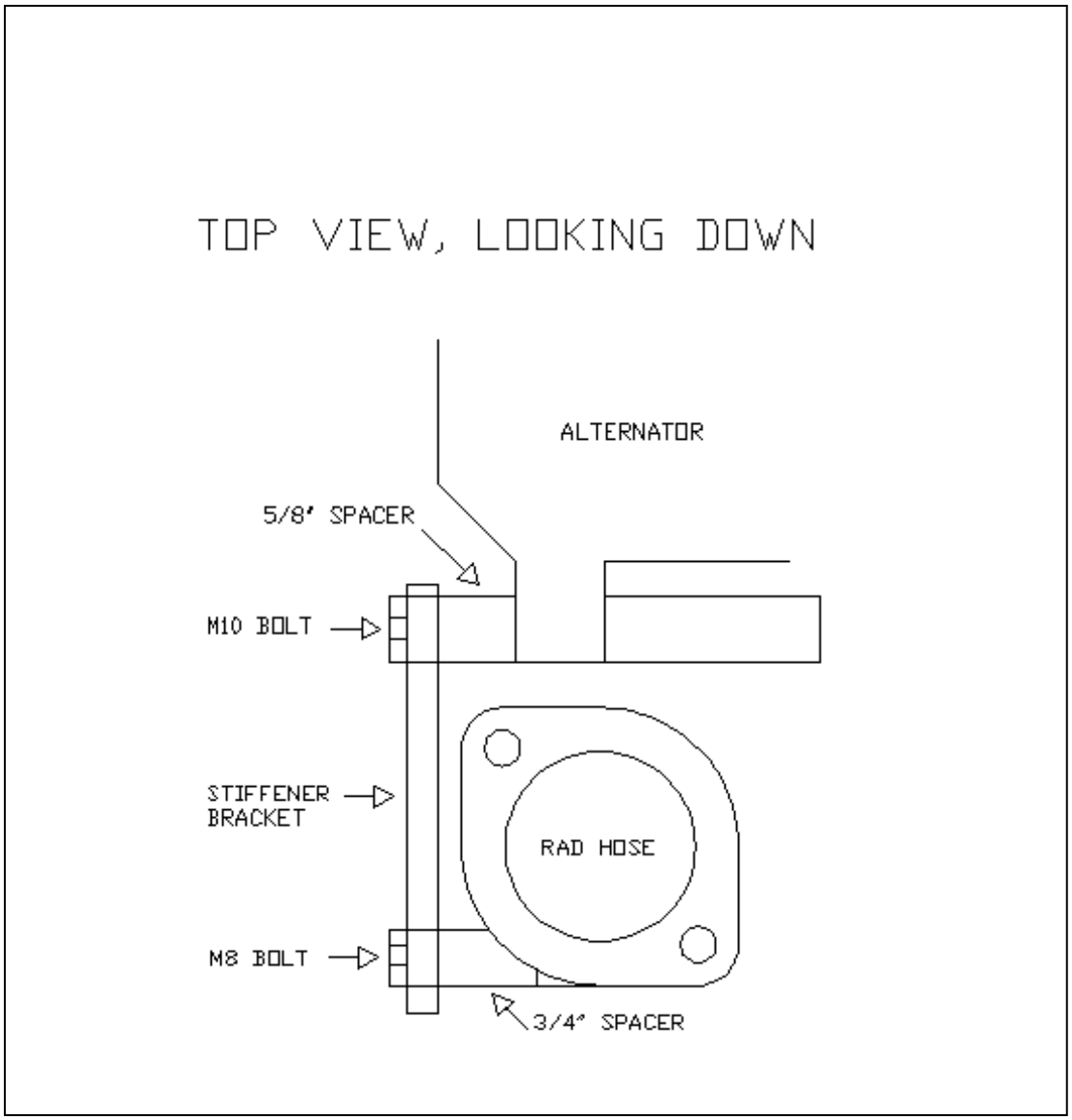
M8 bolt and ¾” spacer here.



Replace with 5/8” spacer and longer bolt on the stiffener mount. The stiffener end with the round hole goes on this end.



The end of the stiffener bracket with the slot bolts on this point using the ¾” spacer and the long M8 bolt.

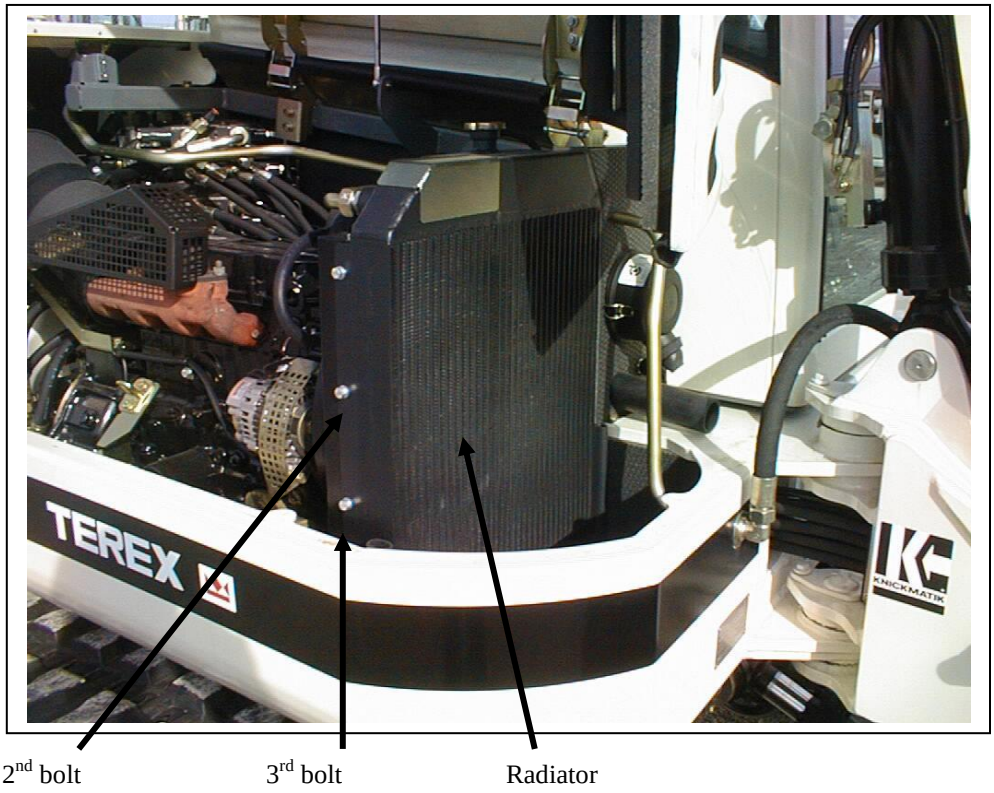

TOP VIEW, LOOKING DOWN
ALTERNATOR
5/8" SPACER
M10 BOLT
STIFFENER
BRACKET
RAD HOSE
M8 BOLT
3/4" SPACER

Condenser: The condenser is located on the air inlet side of the radiator between the radiator and the rear engine compartment panel brace.

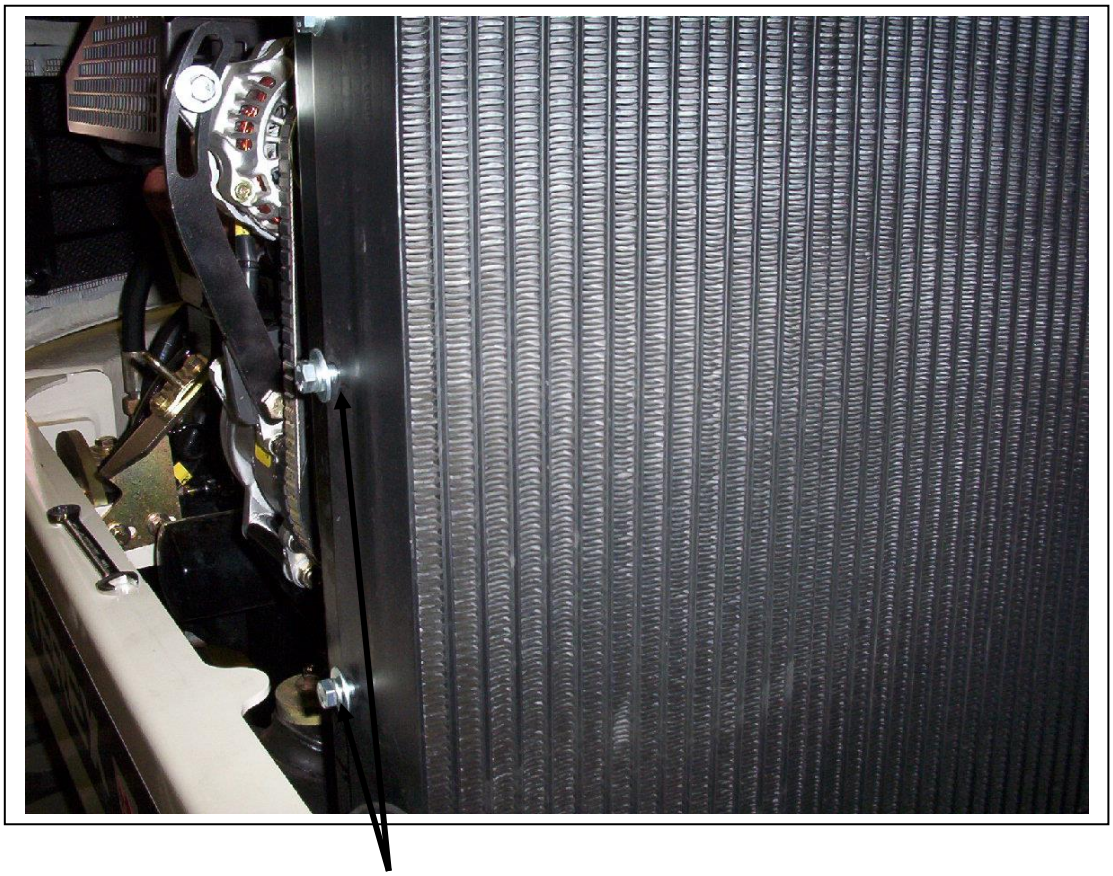
**** NOTE**** The condenser must be installed while the rear engine compartment panel is removed.

Steps:

1. Loosen the 2nd and 3rd bolts from the top of each side of the radiator frame.

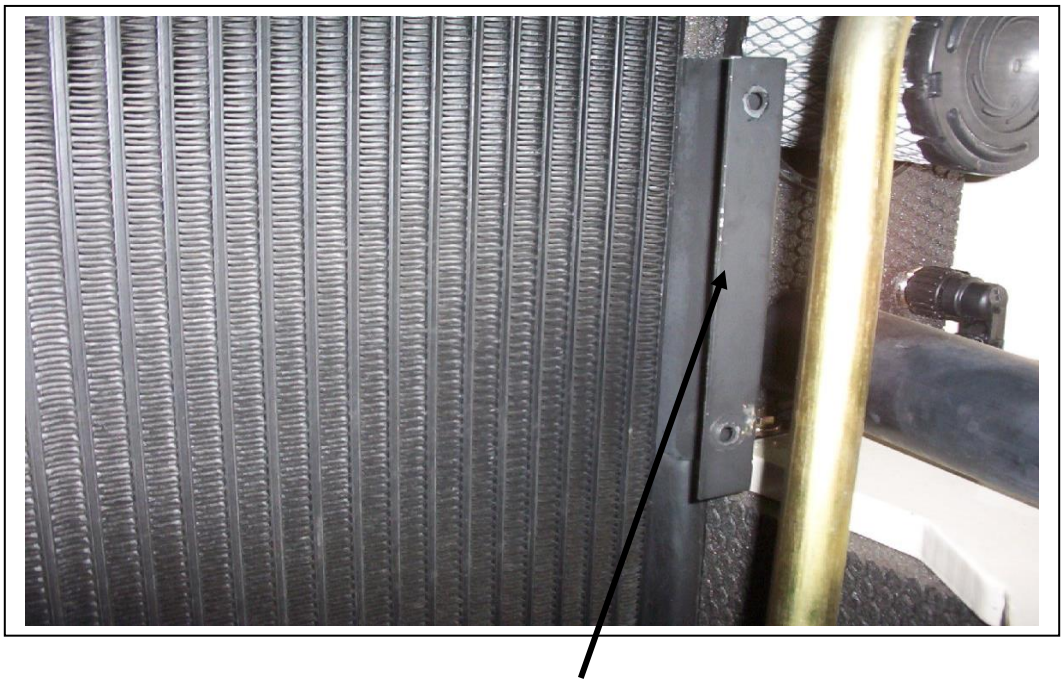


2. On the cab side of the radiator there is a thick foam gasket glued to the rad frame. To accommodate the condenser mounting bracket the foam must be separated from the rad using a sharp knife from 1" above the 2nd bolt to 1" below the 3rd bolt. This will allow the condenser mount bracket to slide onto the bolts flush with the rad frame.



Bolts loosened and large OD flat washers installed on them.

3. Remove the non fitting side bracket from the condenser and install it onto the rad frame loosely



Non fitting side bracket slid between the foam and rad frame and bolted in place.

4. Slide the condenser in between the non fitting end bracket and the rad until the fitting end condenser bracket lines up with the two bolts on the rad frame. Tighten the original bolts to secure the condenser frame. Reinstall the ¼" bolts previously removed from the non fitting end condenser frame and tighten the two loose M8 bolts to secure the non fitting end of the condenser.

Fitting end bracket

Non fitting end bracket

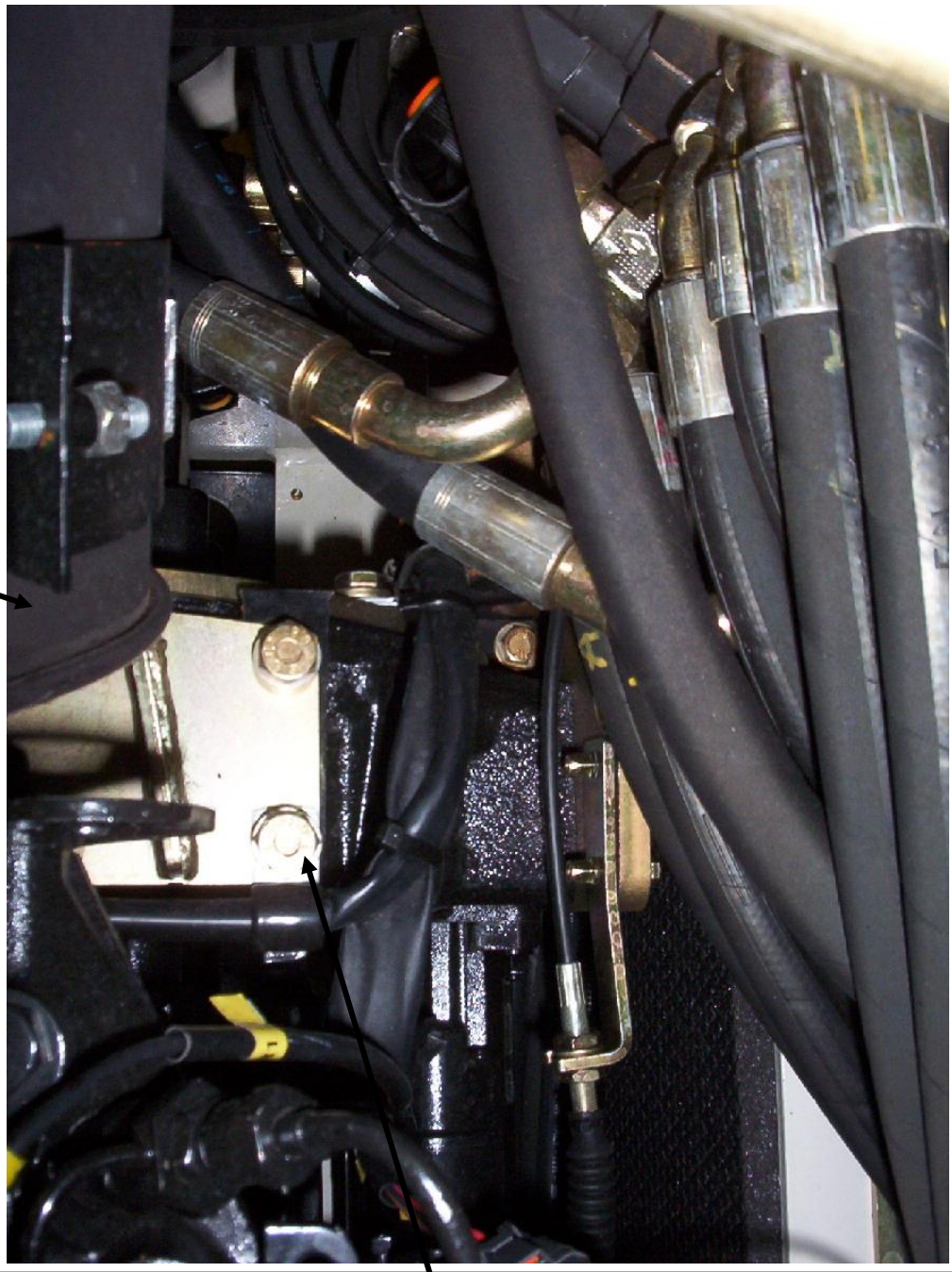
5. Check clearance around the condenser and between the condenser and radiator to ensure nothing can rub and cause damage.

Receiver Drier: The receiver drier is located on a support bracket at the rear left corner of the engine to the cab side of the muffler.

Steps:

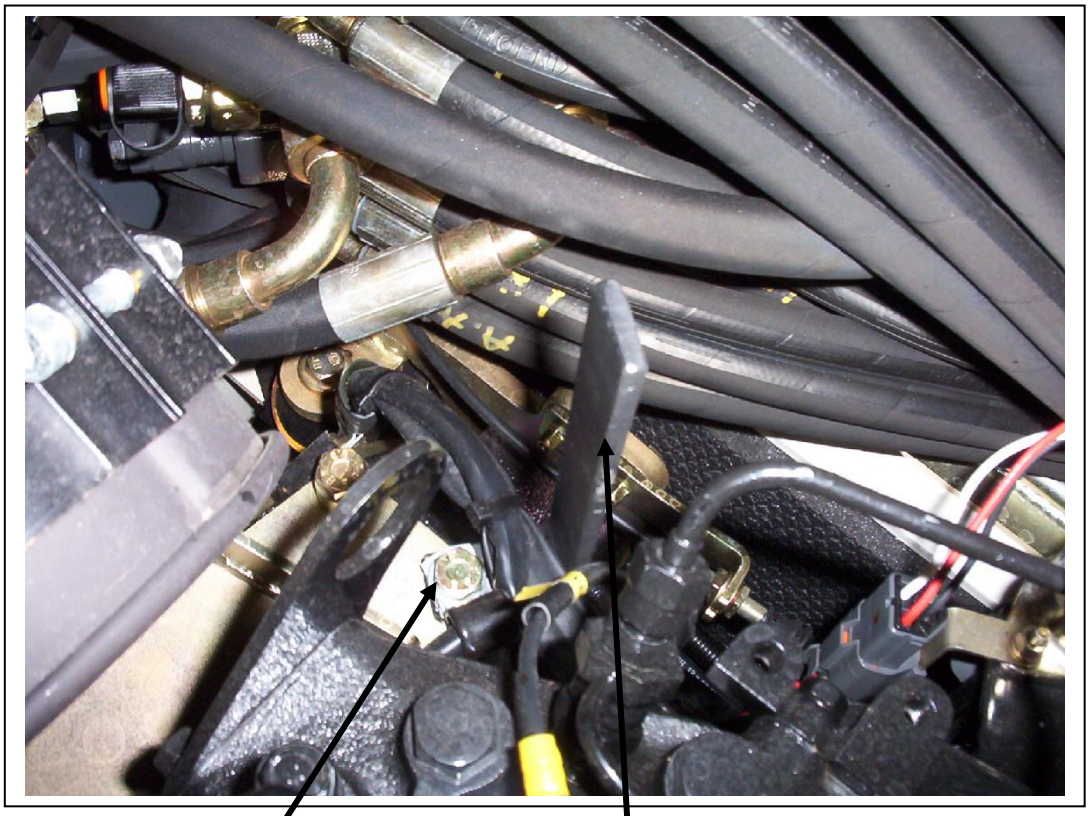
2. The 90^{o} drier bracket bolts to an existing bolt on a support bracket at the left rear of the engine. Remove the bolt and slip the 90^{0} bracket below the wire clamp with the long end of the bracket towards the cab and angled to the right. Bolt the bracket in place using the original bolt.

Muffler



Cab side.

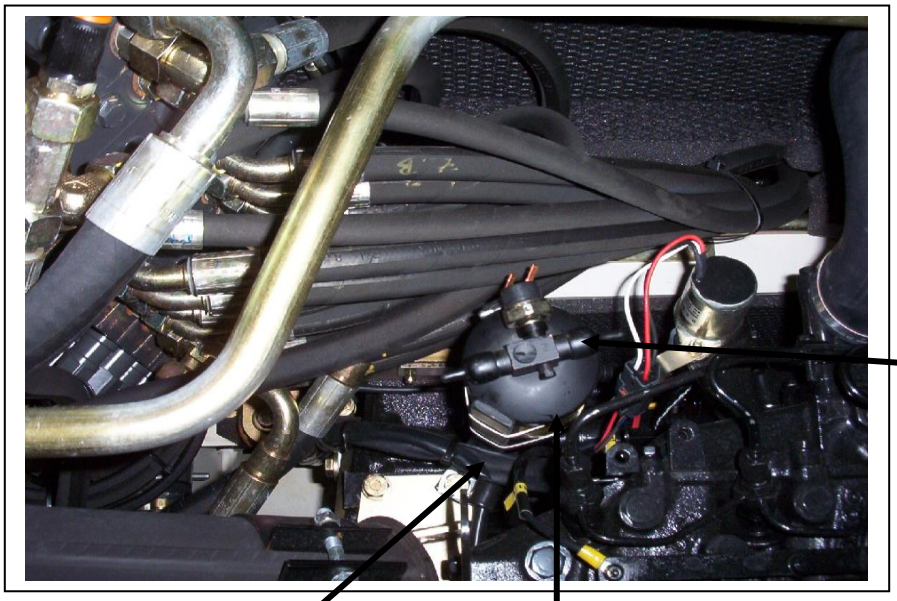
Remove this bolt to mount the drier bracket.



Bolt reinstalled

Drier mount bracket in place

3. Secure the receiver drier to the bracket using the two #48 gear clamps provided. The inlet fitting for the drier (marked "in") should be pointing towards the front of the engine. The binary pressure switch points towards the cab and the outlet from the drier points towards the left of the machine.



Drier inlet

Bracket towards the cab and angled to the right.

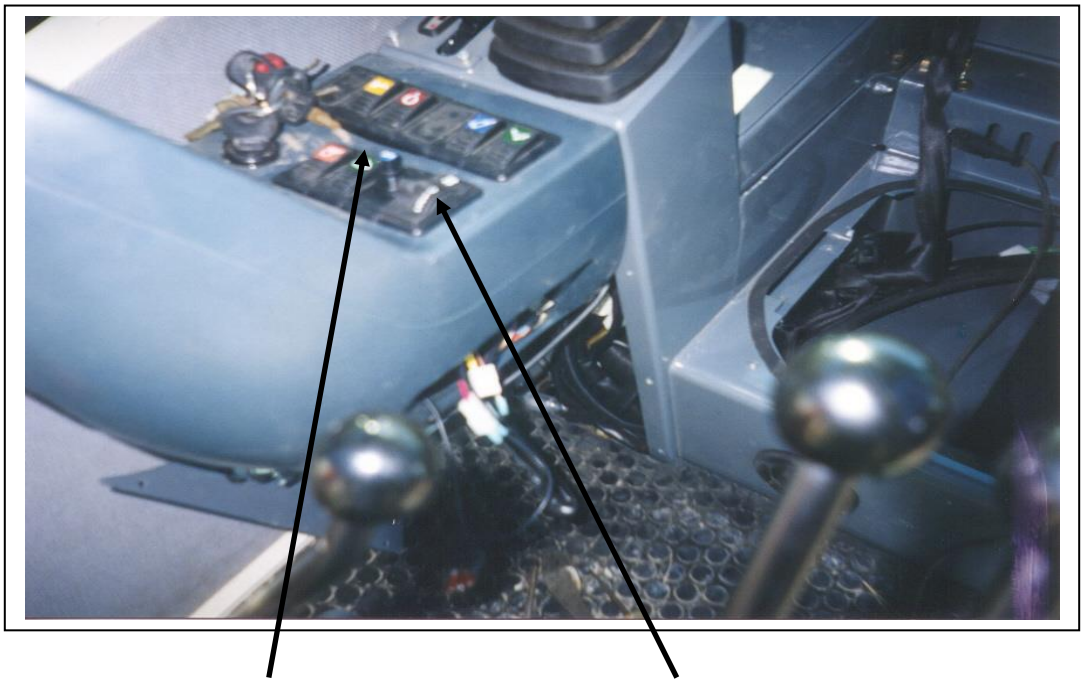
Drier installed on bracket

Electrical:

The electrical system for this machine uses a preset thermostat and a push button A/C on-off switch.

Steps:

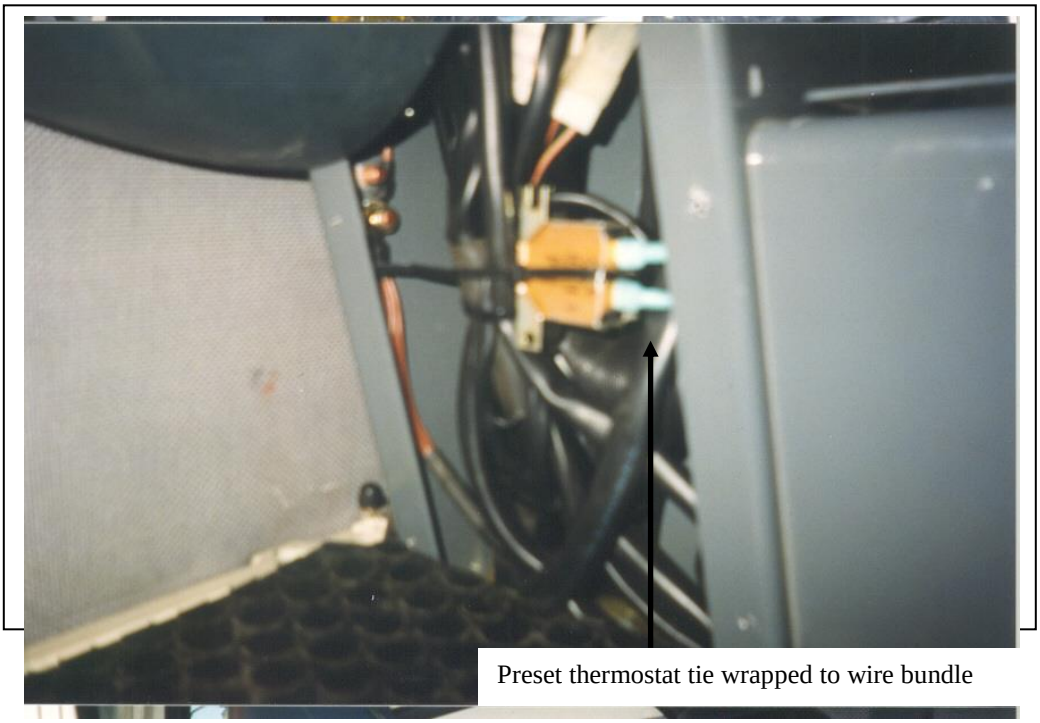
1. Mount the A/C on/off push button in an empty switch plug beside the factory blower control. Carefully drill a 9/16” hole on the center of the switch plug to mount the push button switch. The ground wire coming off the switch must be grounded for the light to work.



AC on/off push button switch

Factory blower switch

2. Locate the preset thermostat inside the lower right front electrical access panel. Use a tie wrap or two to secure it to the wire bundles. Pass the thermostat probe through into the heater box area through the same hole as the heater control cable

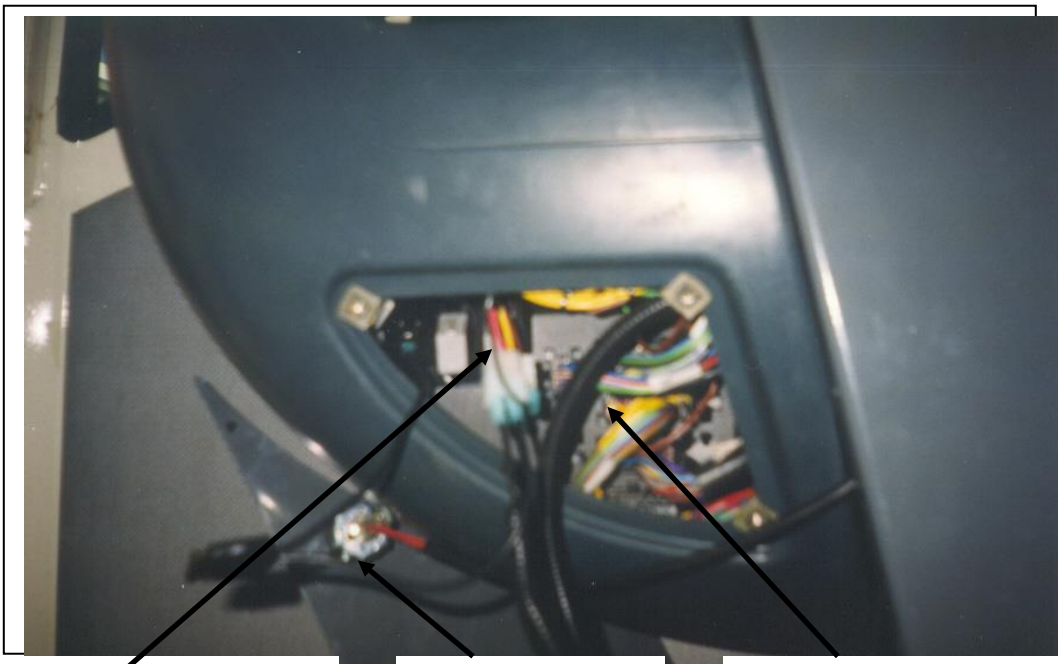


Preset thermostat tie wrapped to wire bundle

Probe through same hole as heater control cable

Thermostat probe

3. Draw ignition live power for the A/C system from the live female plug on the empty relay spot behind the plastic triangular cover on the side of the right control console. Crimp a bare male quick disconnect terminal to one end of the in-line ATO fuse holder. Insert that into the live female plug. Install a 7.5 Amp ATO fuse into the holder.



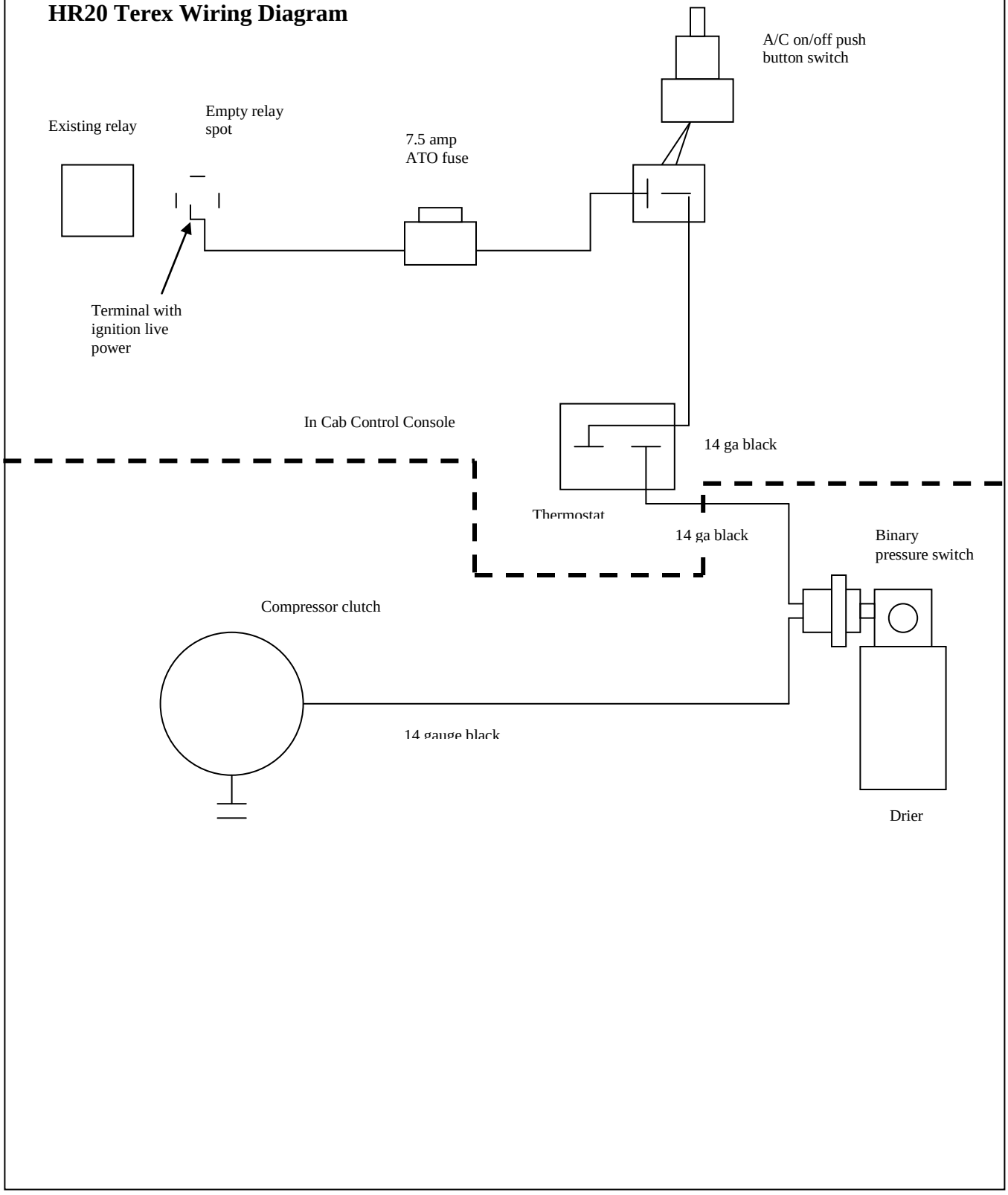
Ignition live 12 volt power

Inline ATO fuse holder

Plug from A/C on-off push button switch

4. Crimp a female quick disconnect terminal to the other end of the inline ATO fuse holder. Plug that wire into one terminal on the push button switch.
5. From the other terminal on the push button switch, run a 14 gauge black wire down to the thermostat and connect it to one terminal there.
6. From the second terminal on the thermostat run the long 14 gauge black wire in loom down through the floor and along under the cab with the A/C hoses. Route it over the receiver drier following the 5/16" hose.
7. Cut the wire to length and crimp female quick disconnect terminals to the ends of both wires. Plug them into the two terminals on the binary switch. It doesn't matter which wire goes on which terminal.
8. Run the rest of the wire from the pressure switch to the compressor, routing it along with the A/C hoses. Cut to length and connect it to the clutch wire on the compressor.
9. Replace the factory blower fuse with a 25 amp ATO fuse supplied.
10. The new A/C heat blowers draw more current than the original heater. This can cause the factory blower switch to overheat when the blowers are on high speed. To eliminate this problem a relay is cut into the high speed blower wire coming from the blower switch. See the supplied drawing for the exact directions. Tuck the wired relay in with all the other wiring and reinstall the switch plate in the dash.

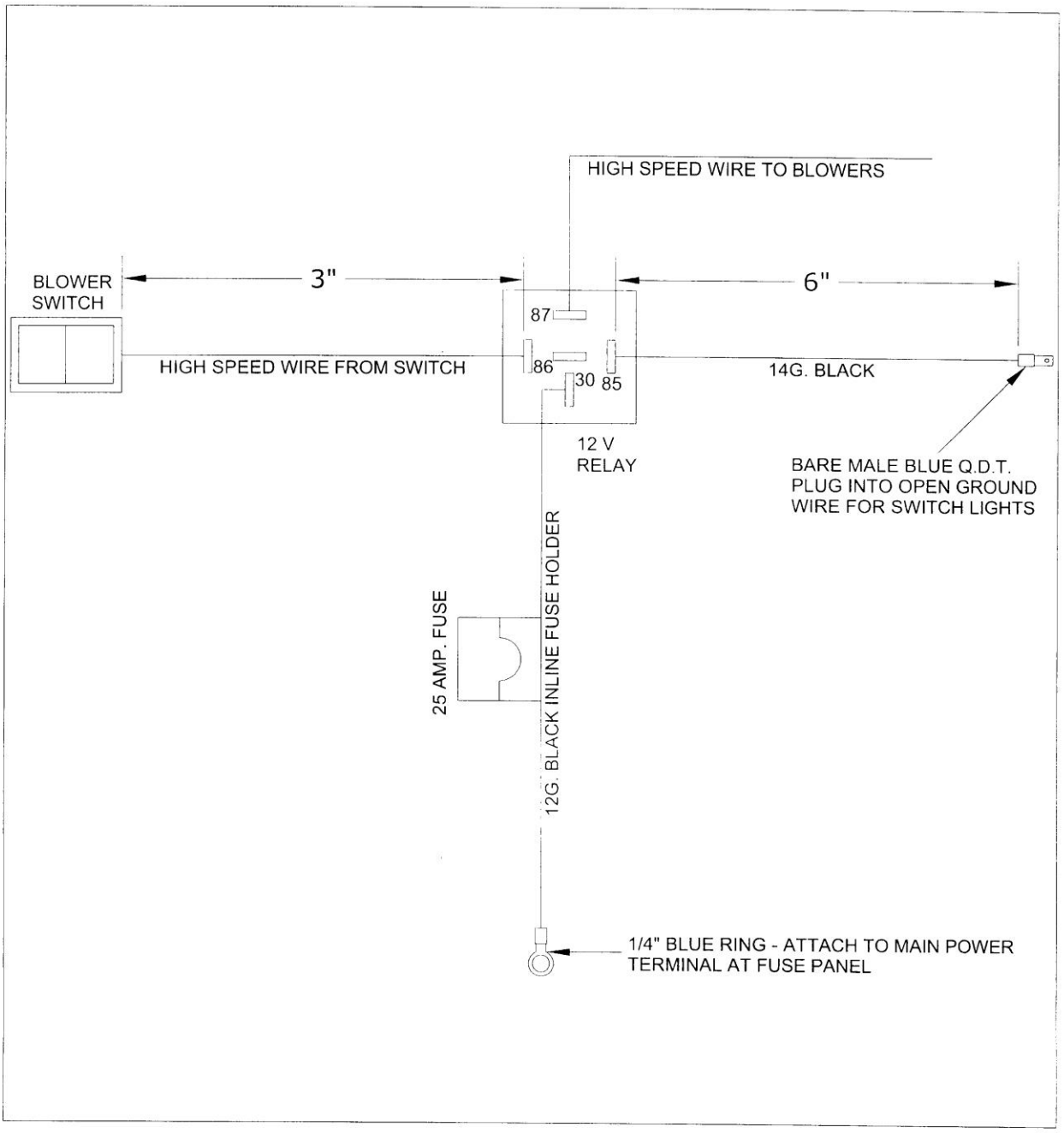
HR20 Terex Wiring Diagram



HR 20-32-42 HIGH SPEED FAN RELAY SETUP

CUT HIGH SPEED BLOWER WIRE 3" FROM SWITCH AND CRIMP
A BLUE FEMALE Q.D.T. ON BOTH SIDES OF THE CUT.
PUT 3" WIRE FROM SWITCH TO RELAY TERMINAL 86
PUT HIGH SPEED WIRE TO BLOWERS ON RELAY TERMINAL 87

FEB. 16, 2004

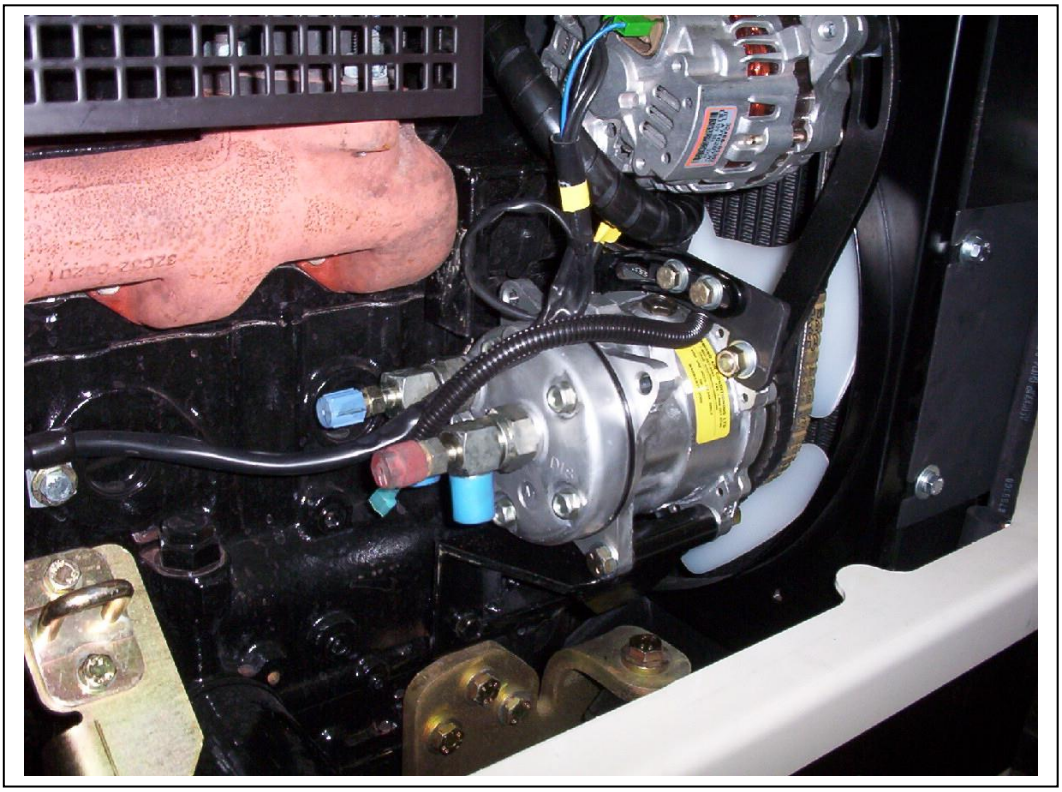


Hose Runs:

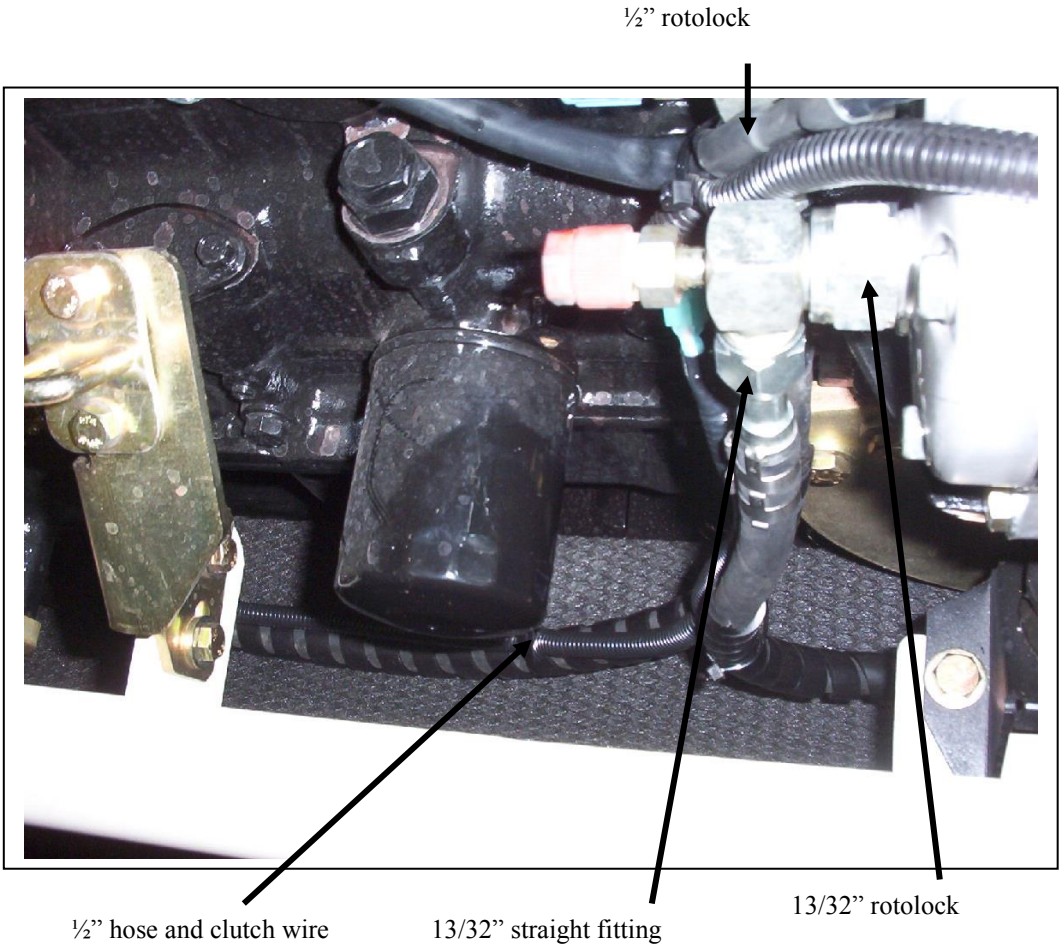
The A/C hoses connect all the major components of the system together. This system uses special A/C hose made by Aeroquip that has a reduced outside diameter and is very flexible. The hose fittings do not require a mechanical crimp but are attached to the hoses with special locking clamps. To install these clamps a special in-expensive pliers-like tool is needed.

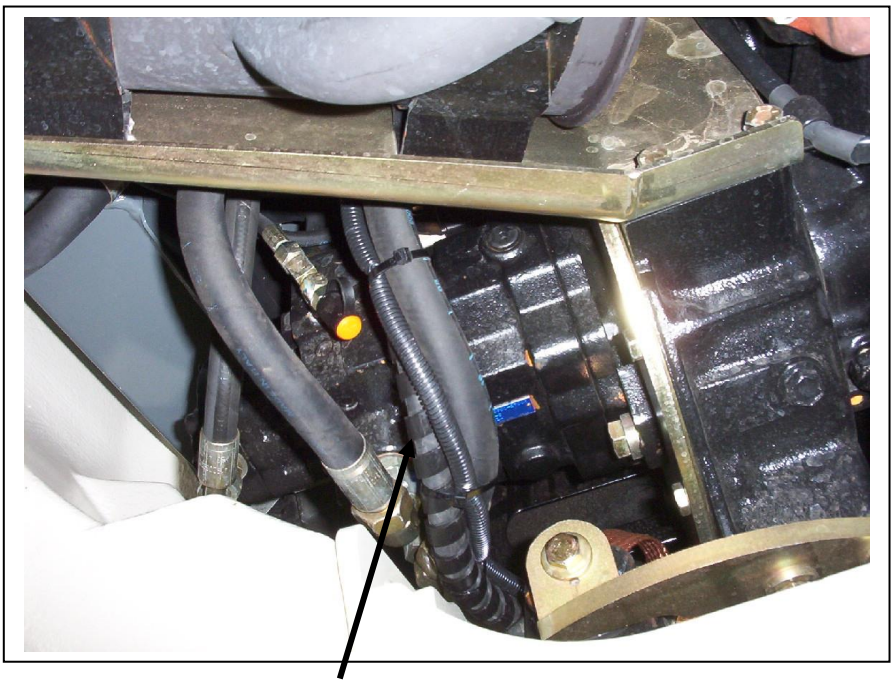
STEPS

1. Starting at the compressor, the rotolock fittings need to be attached to the back of the compressor with the fittings pointing down and the 134A access's back. Remove the caps from the ports on the back of the compressor and install the white nylon gaskets into the grooves on the back of the ports. Use PAG oil to oil the contact surfaces and nuts of the rotolock fittings. Install the larger rotolock fitting (½ ") to the suction port on the compressor. This is the port closest to the engine. Tighten the rotolock down with the access port back and fitting pointing straight down. Repeat the process for the 13/32 rotolock except attach it to the outer port marked "D" for discharge.



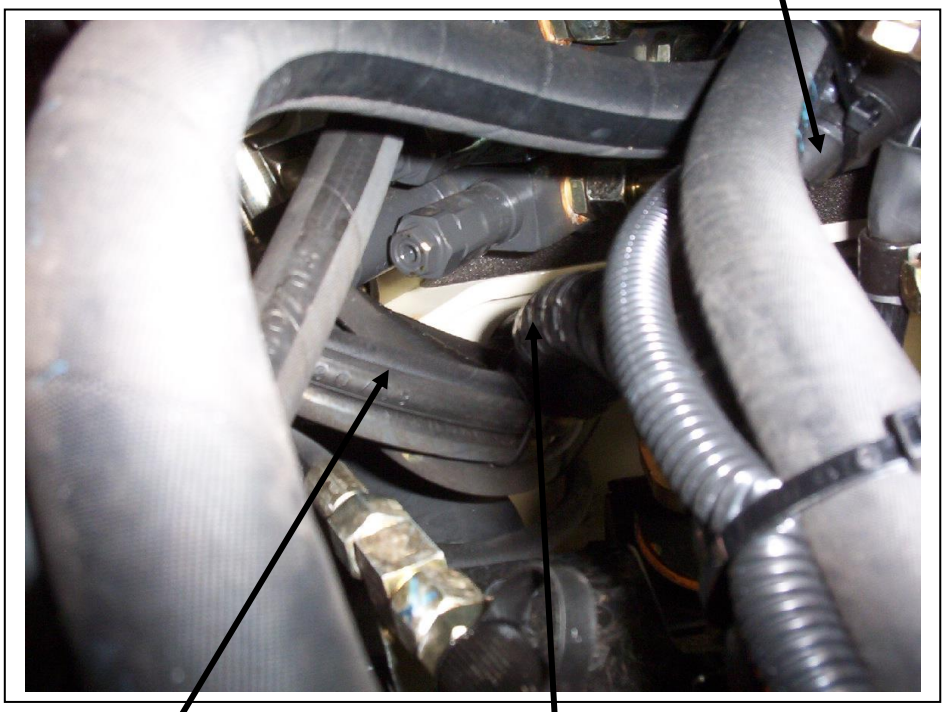
2. From the ½" (inner) rotolock, attach the straight fitting on the ½" hose to it using the correct "O" ring. Oil all contact surfaces with PAG oil. Route this hose straight down then to the left under the engine mount and up over the hydraulic pump. Feed the hose through to the space underneath the cab along with the hydraulic lines. Use a long straight rod as a snake to get the hose through both bulkheads. Run the ½" line over to the square hole in the floor just beside the back corner of the outside air filter. The heater lines also pass through this hole. Run the ½" hose up through the floor and over to the outlet fitting on the A/C coil. Connect the straight fitting to the A/C coil outlet using the correct "O" ring. Use PAG oil on all "O" rings and contact surfaces before assembly.





½” hose and clutch wire running over the hydraulic pump

5/16” hose running over to the hole in the bulkhead that the hydraulic hoses run through to the underside of the cab.



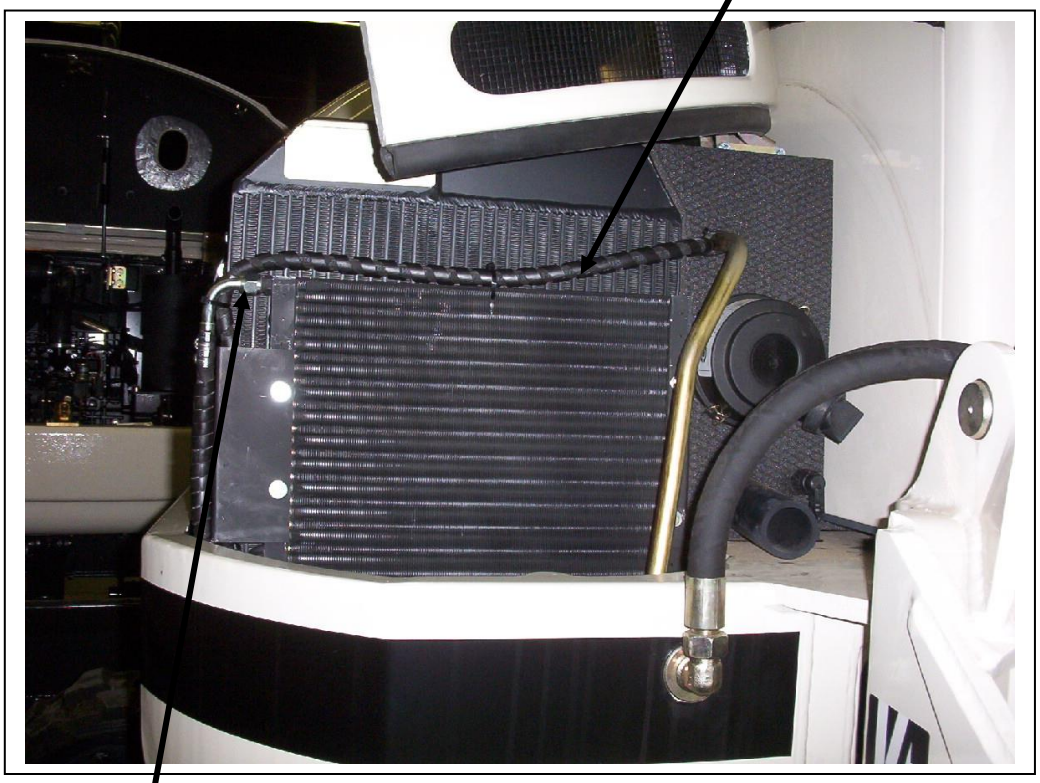
Hydraulic lines running to the underside of the cab

½”hose running through the bulkhead to the under side of the cab.

3. From the 13/32” (outer) rotolock, attach the straight fitting on the 13/32” hose to it using the correct “O” ring. Run the hose stright down and then left towards the radiator. Run the hose between the radiator and the counterweight into the radiator compartment, then straight up the outside of the condenser mount bracket. . Connect the 13/32” fitting to the top fitting on the condenser. Use the correct “O” ring and oil all contact surfaces with PAG oil.

Foam gasket between radiator and counterweight may need 2” cut off the bottom to allow the 13/32” hose through to the radiator compartment

5/16” hose



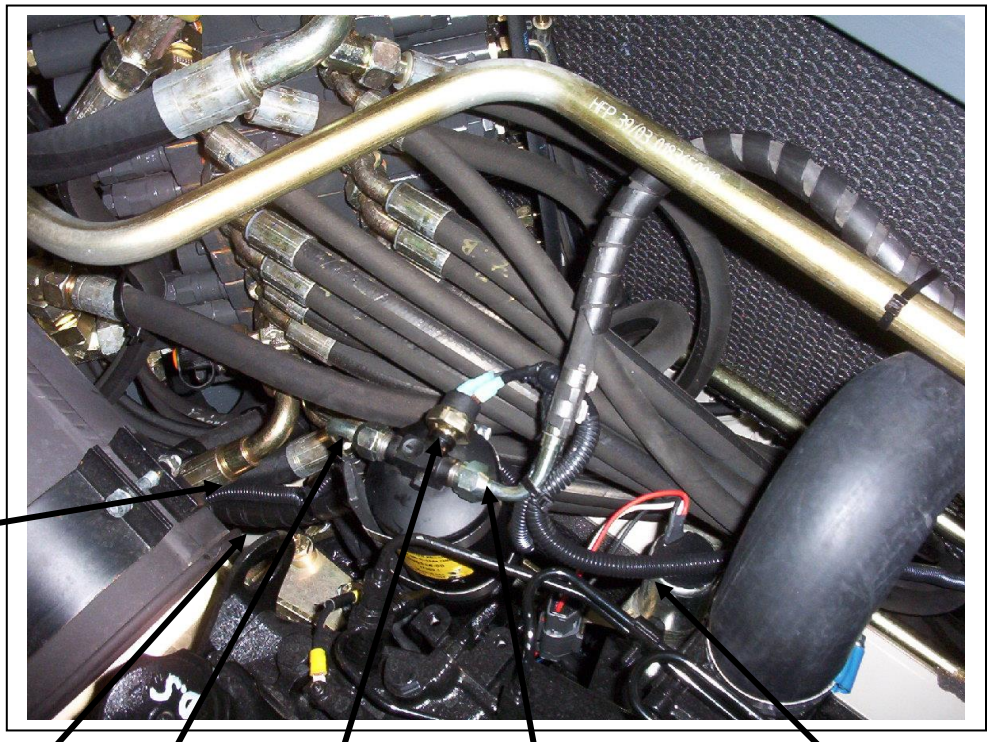
13/32 90 ^{0} fitting at condenser

4. At the lower fitting on the condenser, connect the 5/16” straight fitting on the shorter 5/16” hose to it. Run the 5/16” hose up beside the condenser on the inside of the mount bracket and across the top of the condenser towards the air cleaner. Run the 5/16” line through the wall beside the steel hydraulic line into the engine compartment and back towards the drier. Connect the 90o on the 5/16” hose to the drier inlet. Use the correct “O” ring and oil all contact surfaces with PAG oil.

5/16” hose

Air cleaner

Radiator



Clutch wire from compressor

5/16” hose running down to follow the ½” hose through to the underside of the cab.

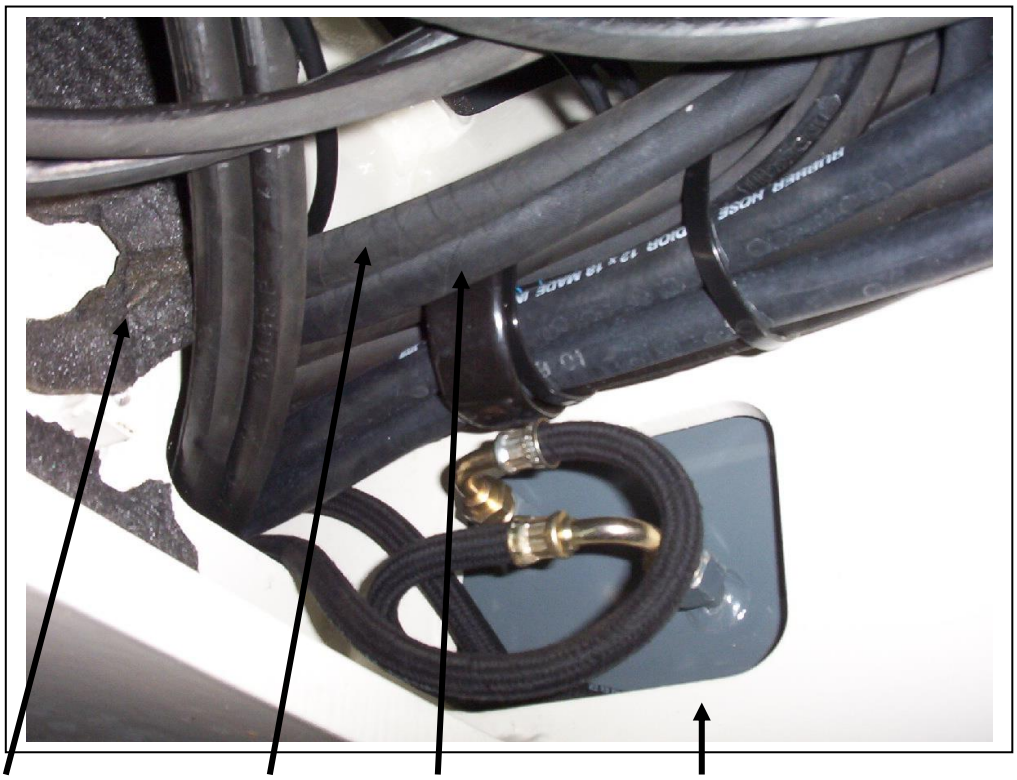
5/16 90^0 fitting on drier outlet

Binary switch

5/16 90^0 fitting at drier inlet

Clutch wire running forward under the edge of the cab and up through a slot with other wiring into the dash area.

5. From the outlet on the drier connect the 90o fitting on the longer 5/16 to it. Use the correct "O" ring and oil all contact surfaces with PAG oil. Route the hose down along with the ½" hose. Run it along with the ½" hose and hydraulic lines into the space under the cab. Route the 5/16" hose up through the same hole as the ½' hose and heater lines. Connect the 5/16" hose to the expansion valve on the evaporator with the 5/16" 90o fitting. Use the correct "O" ring and oil all contact surfaces with PAG oil.

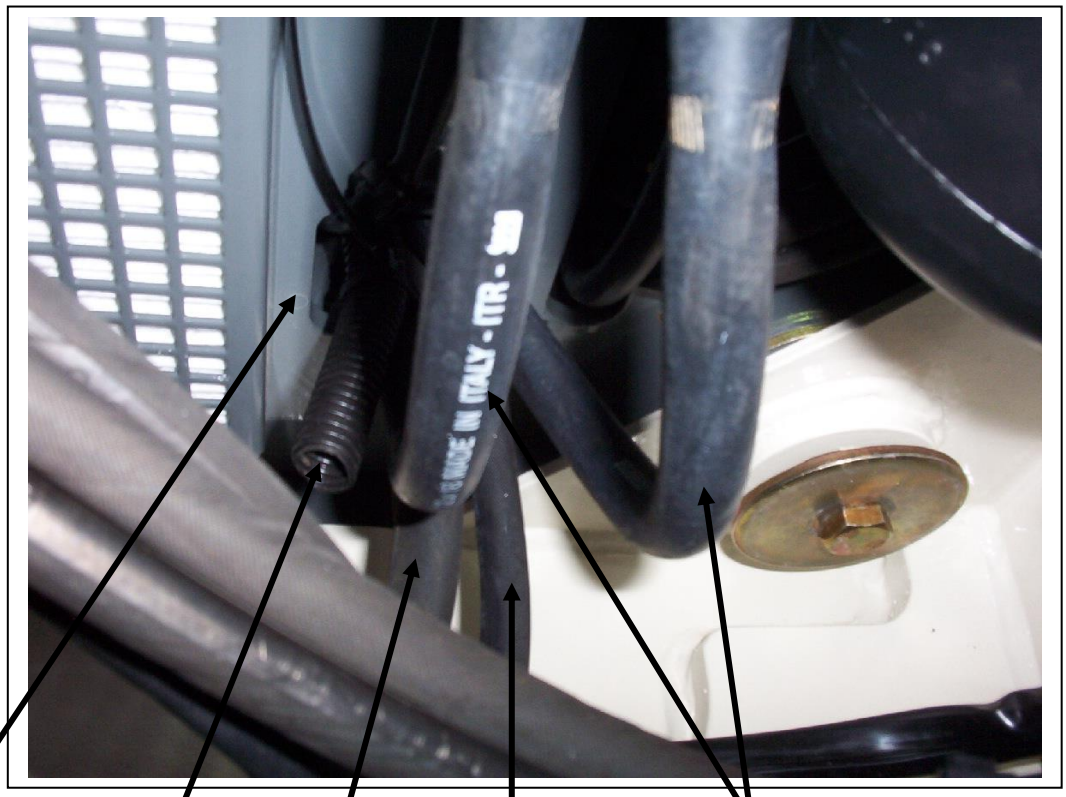


Unbolt and slide this plate to the side to give more room to fish the A/C hoses through the cab side bulkhead.

½" hose

5/16" hose

Under cab at rear of cab. Remove the large access panel



Hole up into cab

Drain hose

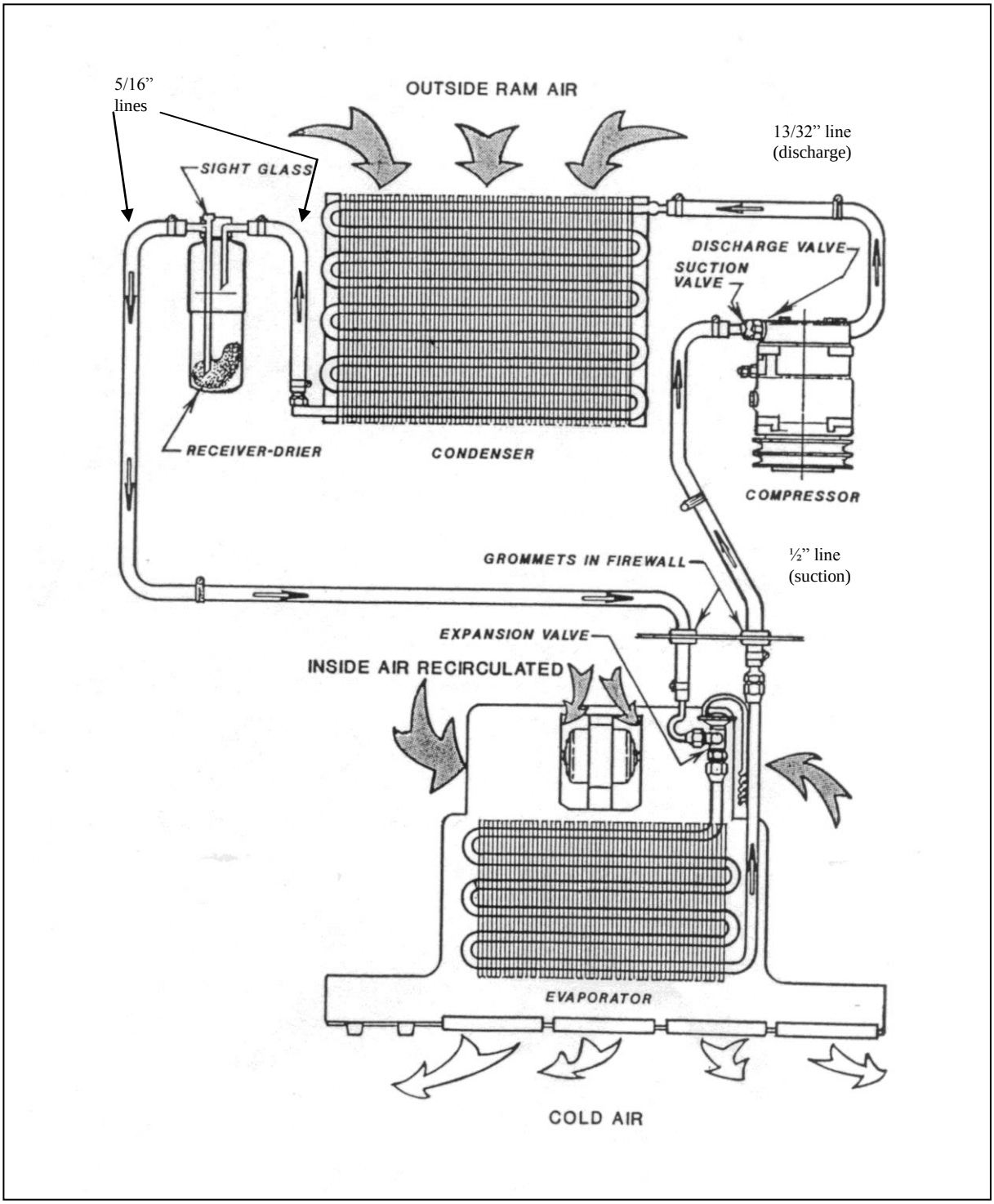
½” hose

5/16” hose

Heater lines

Drain tube with restrictor installed on it

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.

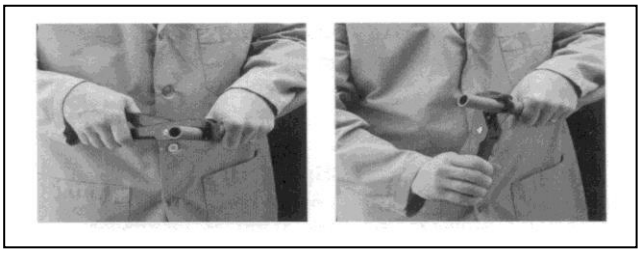
By looking at all these different factors, the area of an evaporator coil most likely to be the coldest can be determined.

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.

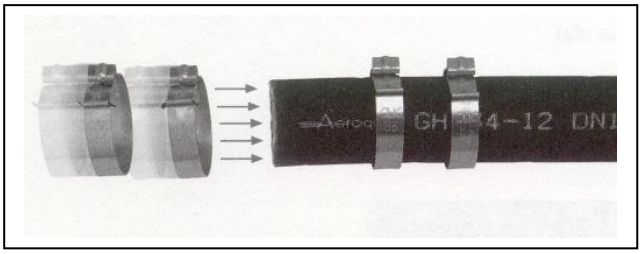
If the thermostat doesn't cycle off after a reasonable cool down period, and the air outlet temperature has dropped below 40° F, the cut in and cut out settings should be adjusted until the compressor is cycling on and off regularly. Let the system run for a decent time period (at least 15 min) and then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

Aeroquip E-Z Clip
Assembly Instructions

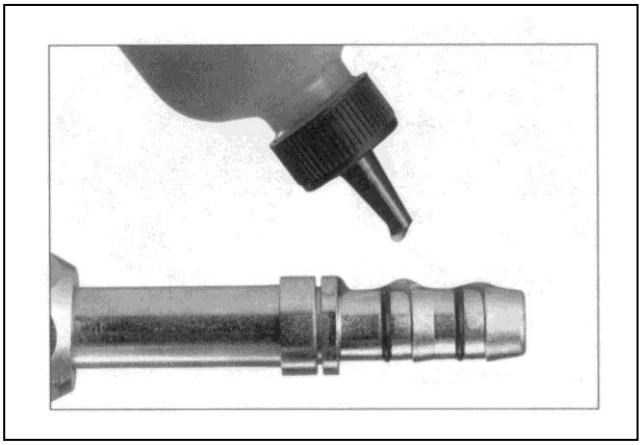
Step 1. Cut the hose to proper length with an appropriate cutting tool. Aeroquip's hand held hose cutter has been specially designed for cutting all non-wire reinforced hose, such as GH-134 Multi-Refrigerant hose. Be sure the cut is made square to the hose length.



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.



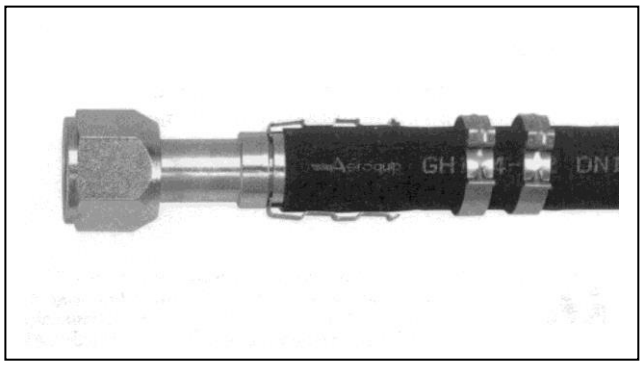
Step 3. Lubricate the nipple with a generous amount of the refrigeration or A/C system's compressor lubricating oil. This MUST be done to lower the force of nipple insertion.



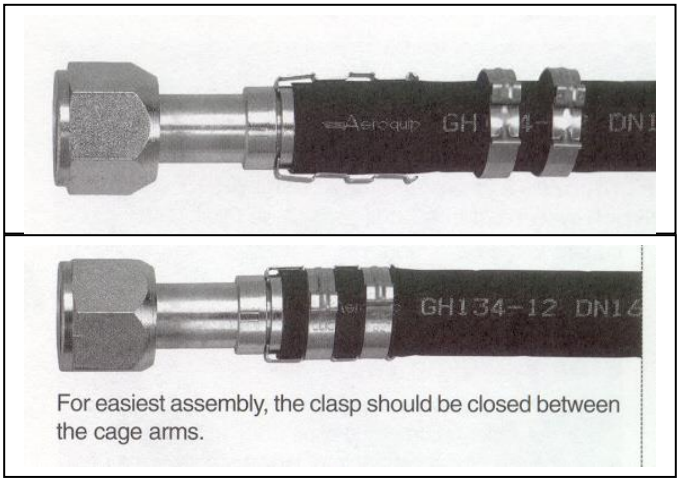
Step 4. Insert the nipple into the hose. To ensure that the nipple is fully inserted, check the gap between the cut end of the hose and the shoulder on the nipple. Care should be taken to avoid kinking or other damage to the hose during nipple insertion.
NOTE: Be sure to wipe excess oil from the nipple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



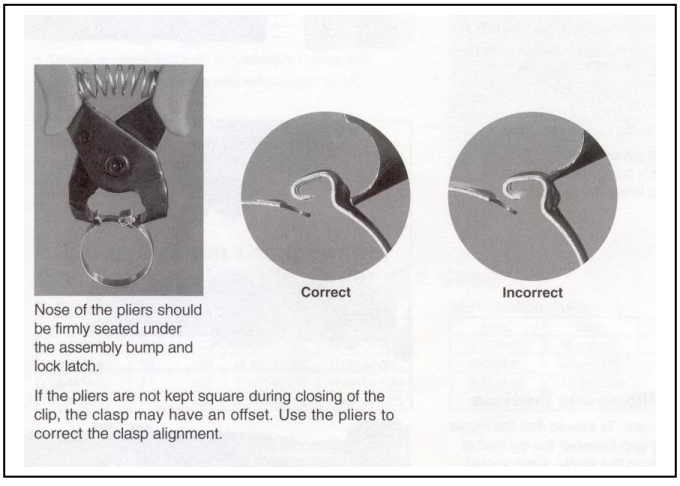
Step 6. Slide the clips over the cage arms and into the channels on each arm.



For easiest assembly, the clasp should be closed between the cage arms.

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.



Nose of the pliers should be firmly seated under the assembly bump and lock latch.

If the pliers are not kept square during closing of the clip, the clasp may have an offset. Use the pliers to correct the clasp alignment.