

INSTALLATION INSTRUCTIONS

CAT 140H MOTOR GRADER



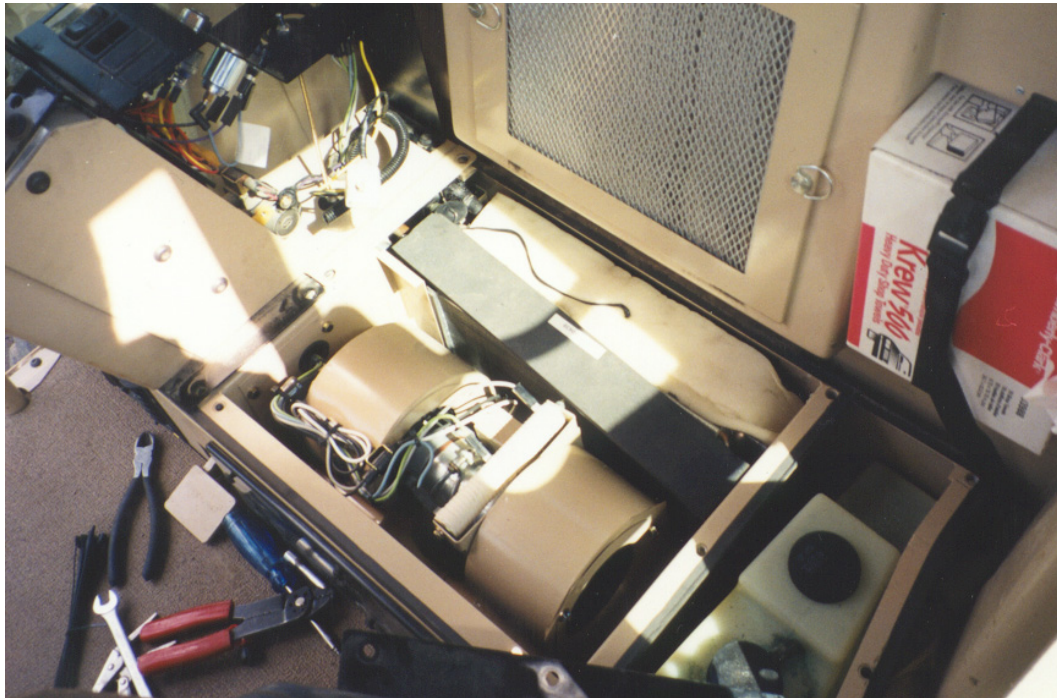
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CAT 140H INSTRUCTIONS

EVAPORATOR COIL:

The evaporator coil goes alongside the heater core in the heater blower assembly under the operator's seat.

1. Remove the operator's seat from the cab to allow more room. Remove the top from the heater blower area.
2. Loosen the bolts securing the heater flanges in place. The slotted holes on the evaporator coil flanges are designed to use the same securing locations to mount the coil.
3. There is one thermostat provided in the kit and it can be set up as either a controllable or pre-set depending upon the operator's preference. For the controllable arrangement drill a 7/16" hole on the control panel (see picture). Route the thermostat down and into the evaporator coil 2" to 3" away from the expansion valve and at least 6" into the coil.
4. For the pre-set arrangement the thermostat is mounted down near the evaporator box and the probe is inserted the same into the coil. The thermostat is then pre-set to a position approximately 1/8th turn back from maximum.



Evaporator coil in place with thermostat probe inserted.



Thermostat in position on control panel.

COMPRESSOR:

The compressor mounts on the lower right hand side of the engine above the engine mount and drives off of an open pulley on the cab end of the engine.

- 1) Install the compressor mount to the mount location above the motor mount flange. Two of the holes will be pre-threaded and the other will be a through hole. Use the hardware provided in the kit for mounting.
- 2) Install the compressor onto the mount with the hardware provided. Ensure the oil fill port is oriented up.
- 3) Install AM-41 belt provided and tighten. It will be necessary to disconnect drive shaft output coupler in order to install the V-belt on the crank pulley.



Compressor mounted in location on engine.



Compressor showing drive assembly.



Drive assembly showing drive shaft coupler which must be disconnected to install V-belt.



Shields back in place over compressor mount and drive assembly.

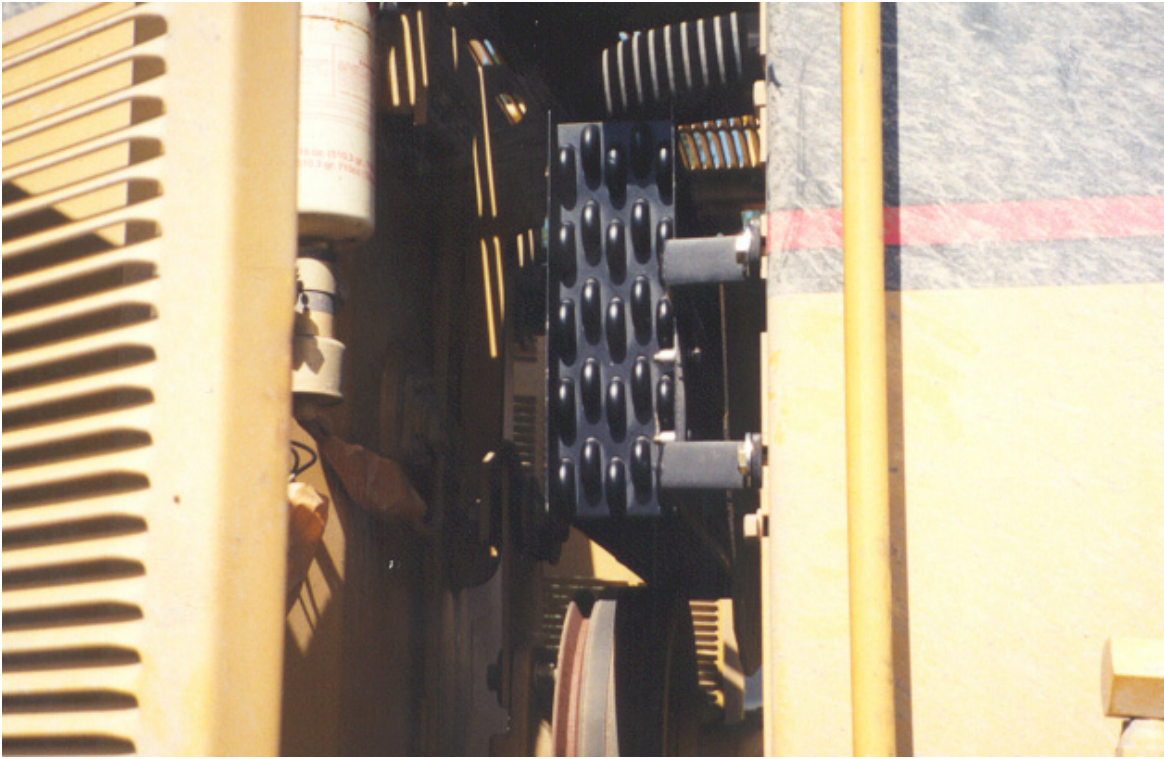
CONDENSER:

The condenser mounts across inlet surface of the engine fan on the stand off brackets as shown in the picture.

1. Slide the condenser and frame in across the fan assembly above the fan drive hub. Ensure the fittings are on the correct side of the fan assembly as determined from the pictures.
2. The condenser bracket is set up to use existing threaded holes on either side of the radiator frame.
3. Mount the condenser assembly using the existing hardware.



Condenser as viewed from fitting side.



Condenser as viewed from non-fitting side.

RECEIVER-DRIER:

The receiver drier assembly is mounted on the forward wall of the engine compartment.

1. The straight drier bracket is bolted to an existing threaded bolt point using the hardware supplied.
2. Attach the drier to the bracket with the two #48 gear clamps provided. Make sure the 'INLET' fitting is pointed to the outside of the engine compartment.



Receiver drier in place on forward engine wall.

HOSES:

The hoses for the air conditioning are all pre-crimped on one end and will require being cut to length and crimped by the installer.

1. The 13/32" (#8) hose runs from the compressor discharge rotolock fitting (the one with the pressure switch with black leads – high pressure) toward the back of the machine, across and up to the inlet fitting of the condenser. The pre-crimped end fitting will connect to the compressor discharge rotolock. Route up to the top fitting of the condenser as shown in the pictures. Cut the hose to length and crimp on the 90o fitting supplied loose in the kit.
2. The first 5/16" (#6) hose runs from the condenser to the drier. From the lower fitting on the condenser the hose runs back with the 13/32" hose and the forward on along the engine toward the cab. The drier is mounted on the front wall of the engine compartment on the straight bracket. The hose must be cut to length and the 90o fitting at the drier crimped on.
3. The longer 5/16" (#6) hose runs from the drier down under the cab to the opening in the floor below the evaporator. The hose passes through the floor and connects to the inlet side of the expansion valve. The hose must be cut to length and the correct fitting crimped on.
4. The 1/2" (#10) hose runs from the compressor suction rotolock fitting (the one with the pressure switch with blue leads – low pressure) up toward the cab with the 13/32" hose and then the 5/16" hose. The suction hose will pass through the floor of the cab and then hook up to the outlet side of the evaporator. Cut the hose to length and crimp on the 90o fitting supplied loose in the kit.

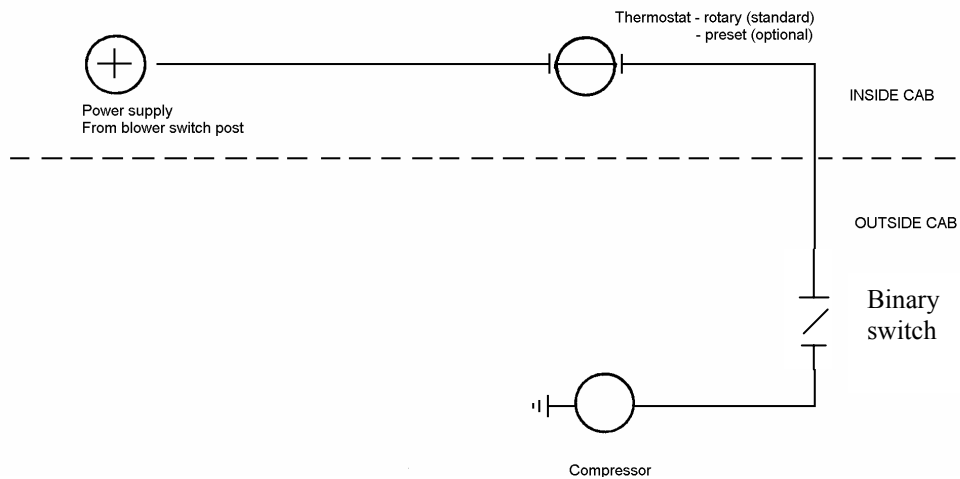


Hoses under cab.

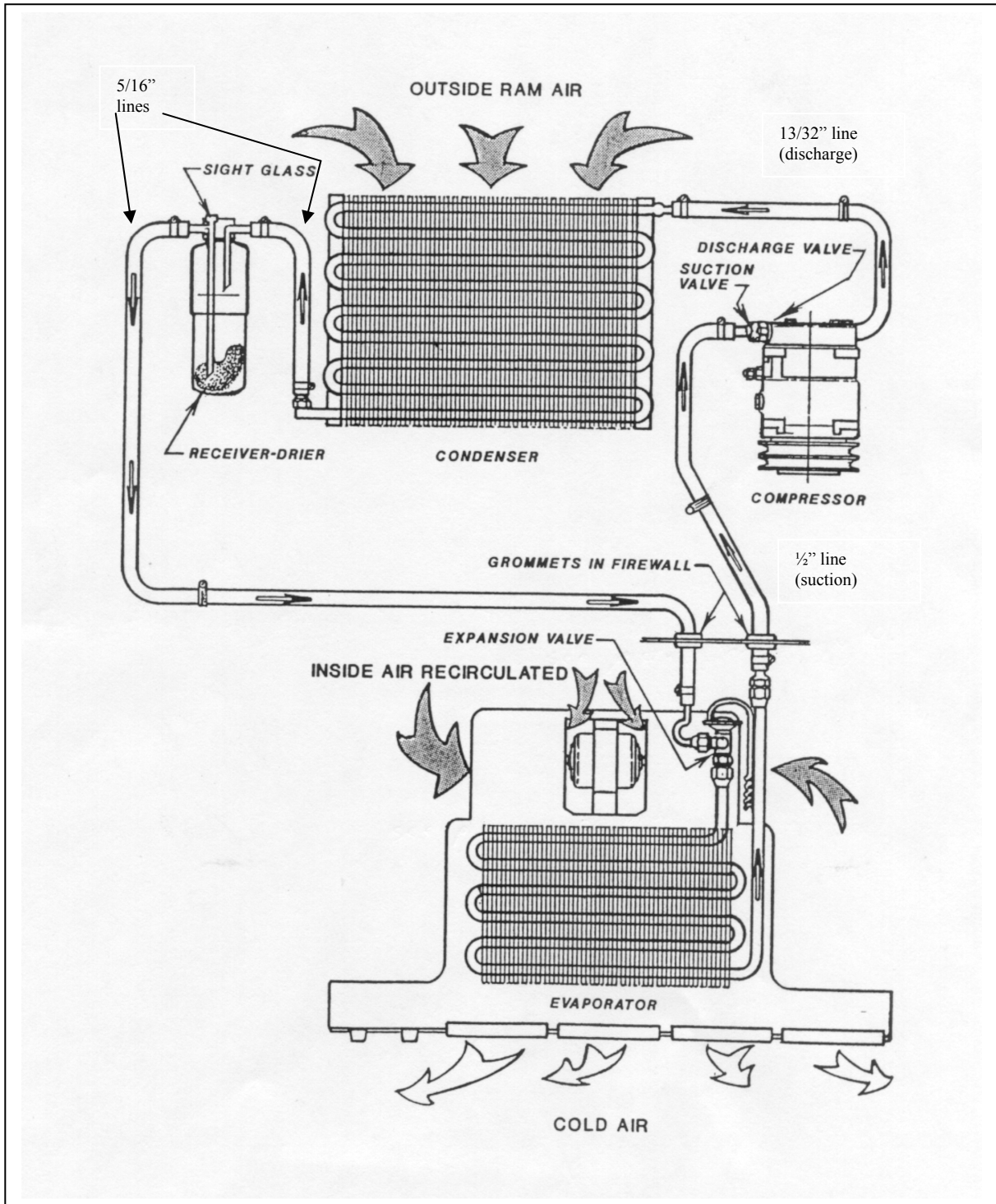
ELECTRICAL:

The electrical system is designed to be simple and straightforward to install and to service. All connections are in series and require no special tools.

1. From the blower switch there will be one post that is live in all the A/C blower side functions. This is the 'clutch' post.
2. Connect the thermostat to the clutch post of the blower switch. It is the same process for either of the thermostat set-ups. If there is a wiring harness in place on the blower switch cut the wire from the clutch post and extend it to connect to the thermostat.
3. Connect the 14ga black wire with the wire loom to the other terminal on the thermostat and run back to the compressor with the suction hose.
4. Connect to the pressure switches in series and then to the compressor clutch wire.



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.
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- 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.