

# INSTALLATION INSTRUCTIONS

KOMATSU WA300-3

DENZO A/C SYSTEM



Hammond Air Conditioning Ltd.

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## **COMPRESSOR:**

The compressor mounts on the lower right hand corner of the engine and drives off of the open pulley on the crank closest to the engine.

### Steps:

- 1) Locate the three M12 threaded holes on the lower right corner of the engine.
- 2) Place the compressor mount over the three holes and bolt in place with the M12 hardware provided.
- 3) Install the compressor onto the mount with the rear compressor ears ahead of the rear tightener ears. Note: Have the oil fill cap up.
- 4) Loosely bolt the compressor in place using the 3/8" hardware provided.
- 5) Install the 17390 drive belt around the open pulley on the crank (closest to engine) and the front groove on the compressor.
- 6) Tension the belt and tighten the compressor in place.
- 7) Install the rotolock fitting onto the compressor. Use the white nylon gaskets supplied. Insert the nylon gaskets into the grooves on the end of the fitting on the back of the compressor. The gaskets have to be pushed into place. If they wont stay in one way, try flipping them over. Oil the contacts surfaces of the rotolock fittings using PAG oil. Install the 13/32" rotolock fitting onto the discharge fitting of the compressor (closest to engine), with the binary switch pointed down. Install the 1/2" rotolock fitting onto the suction fitting of the compressor with the access port pointed down.
- 8) Use a straight edge to double check the belt alignment. Adjust if necessary

## **DRIER**

The drier is located on the right hand side of the machine on the dividing wall just ahead of the engine.

### **Steps:**

- 1) Bolt the straight drier bracket to the open M10 threaded hole below and forward of the air cleaner. Have the bracket pointing up from the bolt.
- 2) Install the two #48 gear clamps around the drier mount bracket and secure the drier in place with the drier inlet (marked IN) pointing towards the side door.

## CONDENSER

The condenser mounts between the radiator and the fan utilizing existing bolts for the fan shroud.

Steps:

- 1) Remove the fan screen and fan blades.
- 2) Unbolt the fan shroud from the radiator frame.
- 3) Drill a 2" to 2 1/2" hole in the right side of the fan shroud in the lower back corner of the shroud. Install the supplied edging around the hole to cover the sharp edges.
- 4) Slide the condenser and frame inside the shroud so that the upper mounts on the condenser pick up the top set of bolt holes for the shroud. Loosely bolt the condenser into place on the left side of the radiator, putting the bolts through both the shroud and the condenser frame. Line up the holes on the right side of the radiator and bolt the shroud and condenser frame to it.
- 5) Reinstall the rest of the bolts in the fan shroud and tighten them all down. Run the 13/32" A/C hose into the shroud through the hole in the side, and up to the top fitting on the condenser. Connect the 90° 13/32" fitting on the hose to the condenser. Use the correct "O" ring and oil all contact surfaces with PAG oil. Do the same for the 5/16" hose.
- 6) Drill a hole in the shroud side just below the start of the curved part and use a double hose clamp to secure the hoses back towards the radiator surface so that they stay out of the fan blades area.
- 7) Leave the fan and fan screen off until the system has been all installed and tested for leaks. Once it has been tested the fan and screen can be reinstalled.

## **EVAPORATOR:**

The evaporator coil is located in the cab behind the operators seat. It goes inside the existing plastic heater box to the right of the heater coil.

### Steps

- 1) Remove the plastic air ducts and covers from around the back windows. Remove the lunch box and cover panels from behind the seat. Do not remove the storage compartment to the left of the seat. It may be easier to remove the drivers seat to do the work in the cab.
- 2) Remove the plastic cover from the evaporator section of the heater/ A/C box. This is between the filter box and the heater coil. Unscrew and discard the metal baffle plate by removing the three screws in the plastic cover. Make sure the two drain holes are unplugged. The drain tubes may need the copper drain extensions supplied inserted into the holes and glued down in place from the inside of the box.
- 3) Remove the rubber grommet on the seat side of the box to allow the hoses into the box. Install the evaporator coil into the box with the fittings on the filter end of the box pointing towards the front of the cab. The thick foam seal is on top of the coil.
- 4) Run the 5/16" and 1/2" hoses up through the hole in the floor of the cab directly in front of the A/C box. Connect the hoses to the evaporator coil. Use PAG oil on all contact surfaces and use the correct "O" rings.
- 5) Run the thermostat probe into the box through the same opening in the box and insert into the coil until it just comes out the back of the coil 1/2". Bend the end down slightly to help secure the probe in place. The probe should be inserted into the coil about 2" from the back side of the coil , about half way down the coil from the top.
- 6) Test fit the lid. Wait until the system is pressure tested before reinstalling the lid and all other parts behind the seat.

## **ELECTRICAL:**

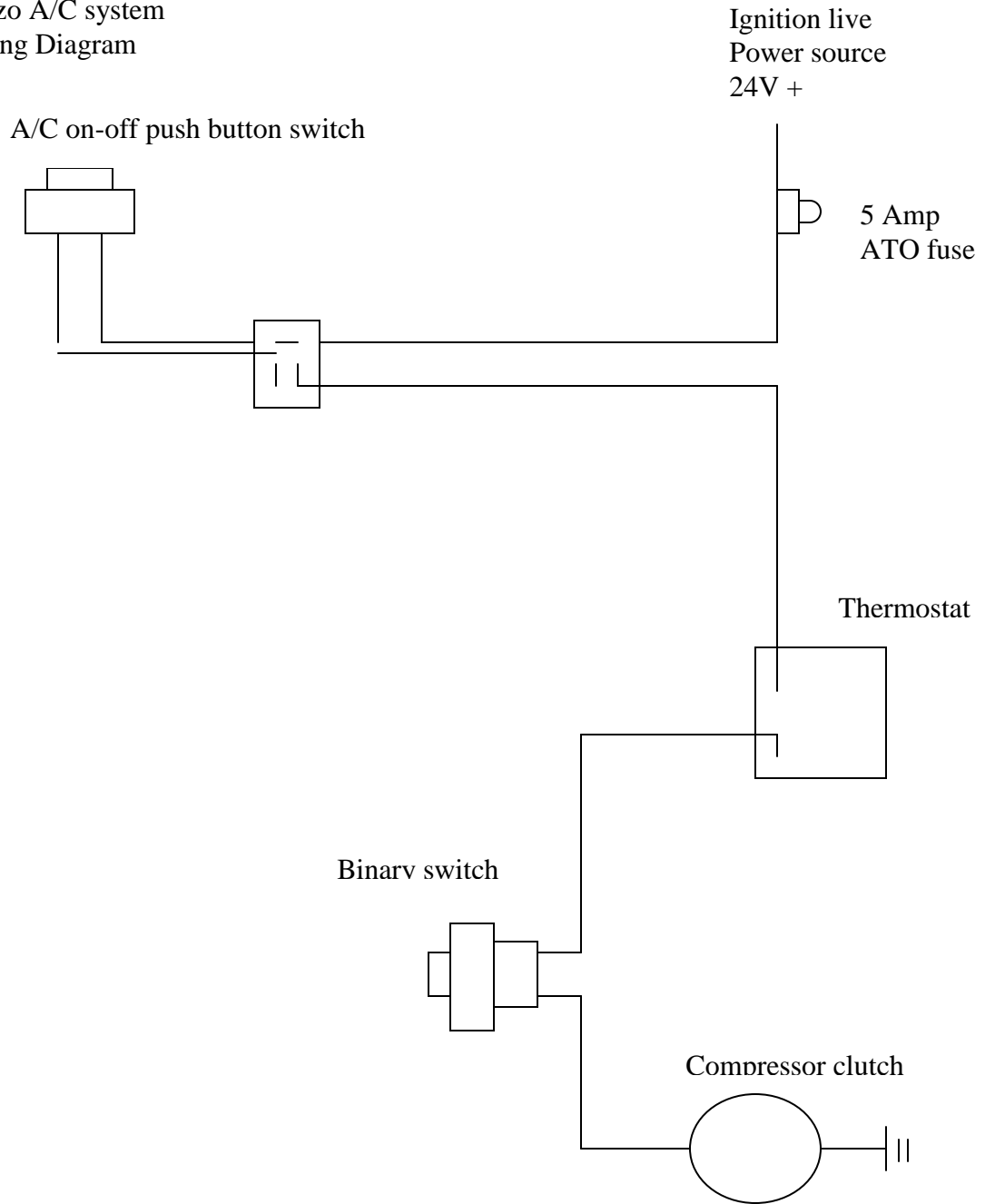
The air conditioning is controlled by a push button switch mounted beside the heater control console to the left of the steering wheel.

### **STEPS**

- 1) Find an ignition live power source off of the fuse panel to the right of the evaporator box. Tie into it using an inline ATO fuse holder and 5 amp ATO fuse.
- 2) Connect the 14g black wire to the other end of the fuse holder and run it down and out of the cab through the same hole as the A/C lines. Double this wire up in the loom because a return wire from the A/C push button switch will be needed.
- 3) Drill a 9/16" hole beside the heater control panel on either the right or left side. Mount the A/C on-off push button switch. The switch has three wires, Red, Red/White and Black. Do NOT use the black wire. Connect the two wires coming from behind the seat to the red and the red/white wire on the switch.
- 4) Back behind the seat, secure the thermostat to a convenient wire bundle support using tie wraps. Set the thermostat back 1/8" of a turn from wide open. Further adjustment may be necessary to prevent coil freeze up. Adjust if required while testing the system.
- 5) Connect the second wire coming from the push button switch to the thermostat. Connect a 14g black wire to the other side of the thermostat and run it out of the cab along with the 1/2" hose to the compressor.
- 6) Connect the 14g black wire to the pressure switch mounted on the rotolock fitting. Connect the compressor clutch wire to the other side of the binary pressure switch.

**NOTE:** The compressor will not engage until the system pressure reaches at least 30PSI.

WA300-3  
Denzo A/C system  
Wiring Diagram



**CHARGING:**

The system must be vacuumed for a minimum of 30 minutes.

Two extra ounces of PAG oil should be added to the system.

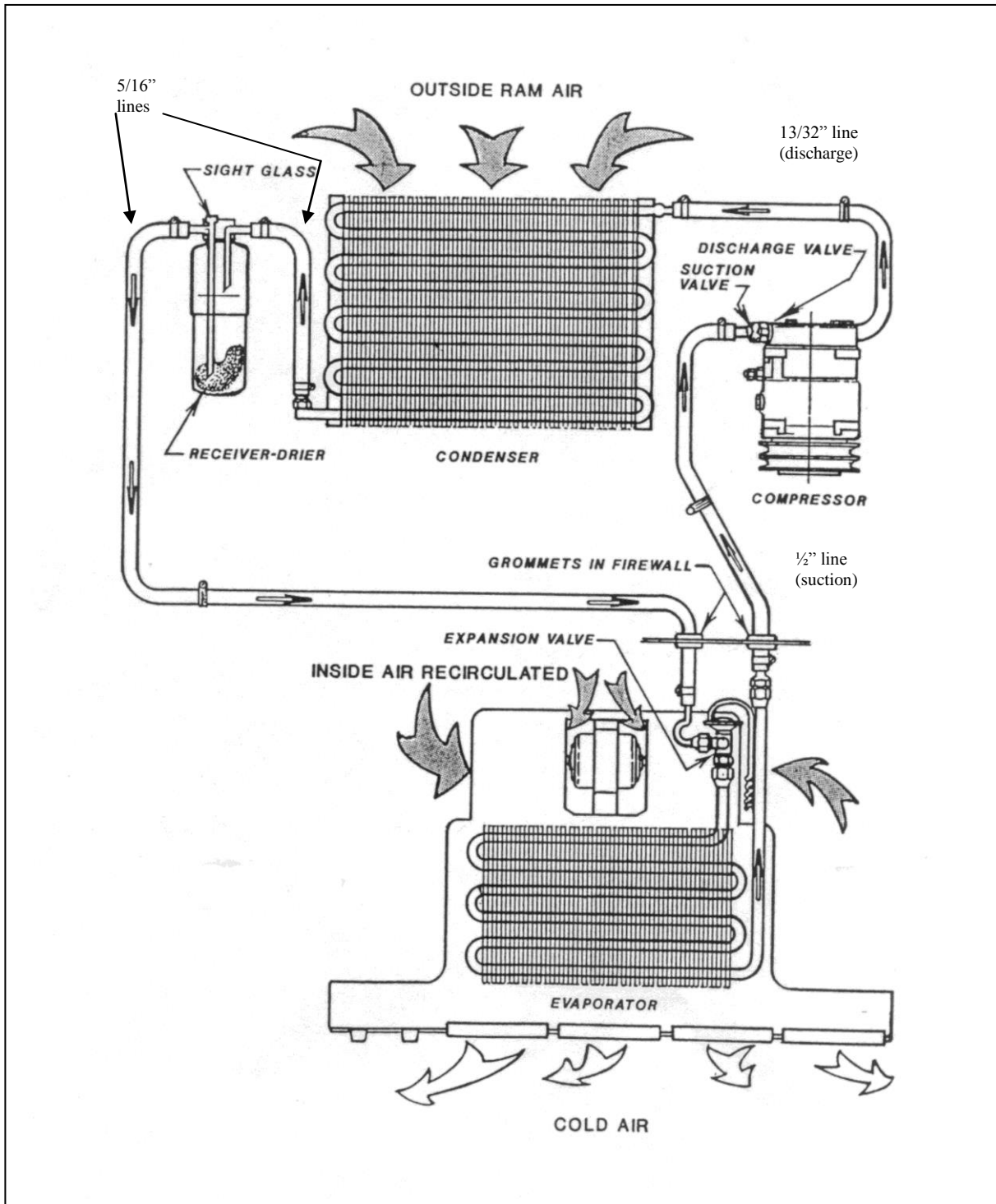
The system should be pressure tested to between 250 and 300 PSI with nitrogen to check for leaks.

The system must only be charged with new R134a refrigerant. Any other refrigerant will void the warranty.

The system will require between 2.75 and 3 lbs of R134a refrigerant.



## 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.

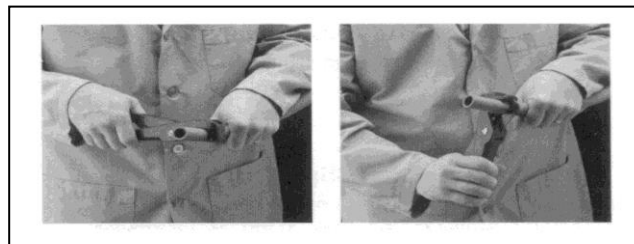
By looking at all these different factors, the area of an evaporator coil most likely to be the coldest can be determined.

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.

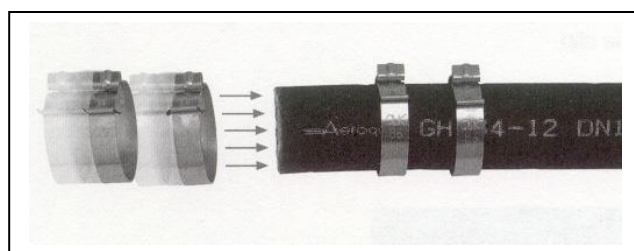
If the thermostat doesn't cycle off after a reasonable cool down period, and the air outlet temperature has dropped below 40° F, the cut in and cut out settings should be adjusted until the compressor is cycling on and off regularly. Let the system run for a decent time period (at least 15 min) and then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

## Aeroquip E-Z Clip Assembly Instructions

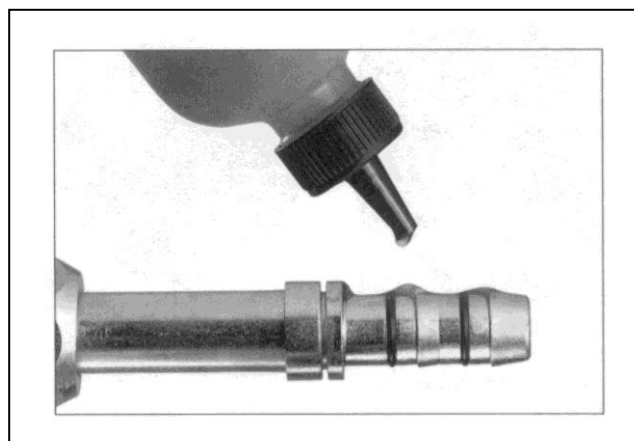
Step 1. Cut the hose to proper length with an appropriate cutting tool. Aeroquip's hand held hose cutter has been specially designed for cutting all non-wire reinforced hose, such as GH-134 Multi-Refrigerant hose. Be sure the cut is made square to the hose length.



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.



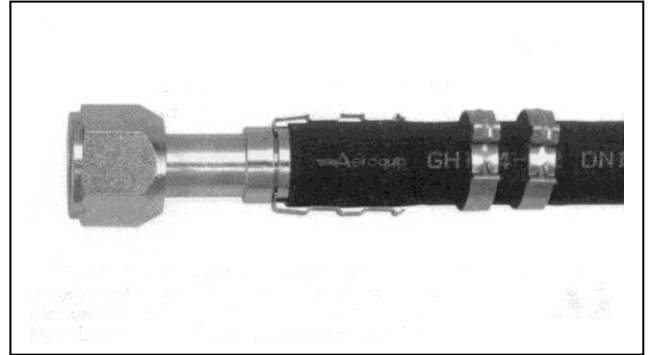
Step 4. Insert the nipple into the hose. To ensure that the nipple is fully inserted, check the gap between the cut end of the hose and the shoulder on the nipple. Care should be taken to avoid kinking or other damage to the hose during nipple insertion. NOTE: Be sure to wipe excess oil from the nipple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



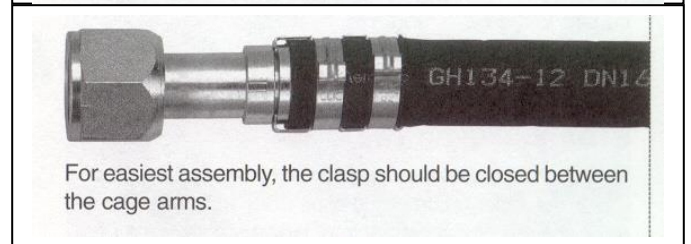
Step 5. Snap the cage into the groove on the nipple. The arms should extend over the hose length. When the cage has been correctly installed in the cage groove, the cage will be able to rotate in the groove.

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.

