

# INSTALLATION INSTRUCTIONS CAT 902



PHONE: (519) 485-5961 or 1-800-267-2665  
FAX (519) 485-3745 or 1-888-267-3745

## *Cat 902 loader A/C install*

### **Evaporator installation**

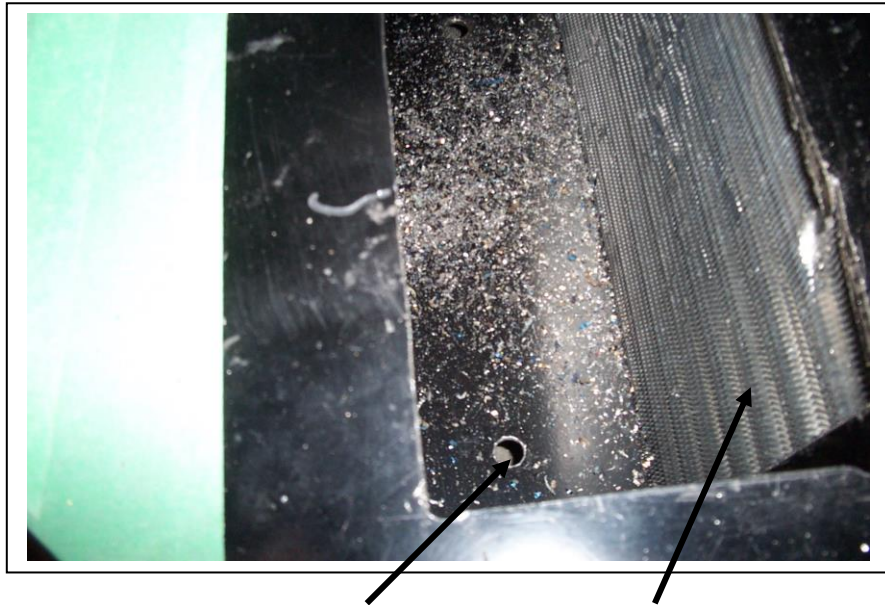
The evaporator coil for the Cat 902 loader is a “drop in” style design that goes along side the heater coil in a box mounted beneath the seat. Remove the seat to access this box. It uses the original heater coil, blower and blower controls.



Seat removed

1. Set the supplied template into place to scribe and cut out the opening for the evaporator coil.

2. Drill a couple of 3/8" holes in the floor of the heater box to allow the water to drain.



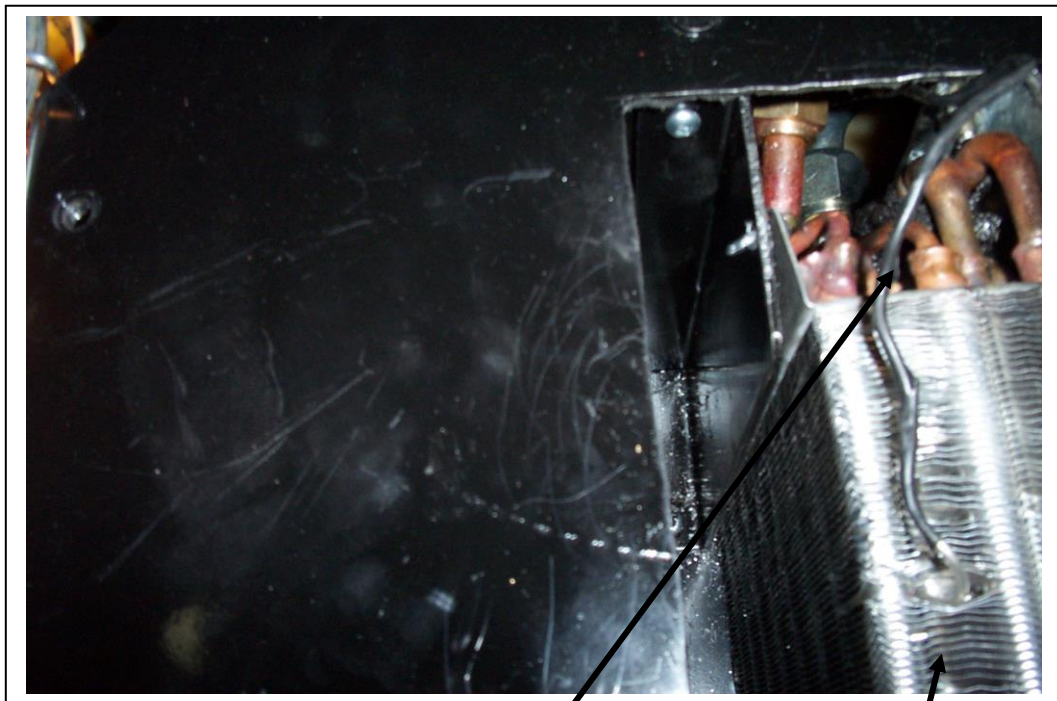
3. Cut a couple of slots in the heater box floor for the expansion valve and return tube to extend out of the box.



Hole cut out for expansion valve and hoses

4. Fit the new evaporator coil into position once to ensure fit and to identify the ideal spot to drill a hole in the pan of the heater box for the thermostat tube.

5. The ideal spot is approximately one row in and 2" in from the side the small tubes go into evaporator coil. Generally the coldest spot of the coil is the best spot for the thermostat probe to prevent coil freeze-up.
6. Install the coil and fasten with clips supplied. Seal with tar tape the area where the coil extends out of the heater box.
7. Install the supplied cover for the access hole that was made to install the coil.
8. Connect hoses to evaporator coil. Direct the hoses straight back towards the radiator.
9. Install the thermostat into the console panel and route the probe through the console and down to the bottom of the heater box. Insert the probe approximately 5" into the coil through the hole drilled in the pan directly below the coil. Tape the remainder of the probe to the pan with tar tape provided.



Thermostat probe

Evaporator coil



**Condenser installation.** (Cat 902 and 906)

The Condenser is a radiator mount style, which slides out for easy cleaning of the coil or the radiator.

1. Open the side panel which gives access to the radiator. Locate the radiator mounting bolts.
2. Replacement hardware is provided to mount the upper and lower brackets which straddle the radiator and leaves approximately 1" separation between the condenser coil and the radiator.



Lower condenser bracket

3. Once the two brackets are mounted the condenser should slide directly into the brackets. A small amount of light grease on the railing will help it slide in and out smoothly. The brackets should be adjusted so they firmly grip the condenser coil.
4. Remove the 8mm nut from the side of the radiator so the small flange on the condenser coil can fit over the stud.. A wing nut is provided to replace the nut. This allows for no-tools required to slide out the condenser for cleaning of the condenser or radiator.
5. When the hoses connect to the condenser they should be looped in a fashion that allows the condenser to slide completely out of the frame.

## Dryer installation (Cat 902 and 906)

The dryer is to be mounted in the engine compartment from a bracket provided. When standing at the rear of the equipment and the hood open, the dryer will be located on the right side of the compartment.



Receiver drier

Drier bracket

1. Mount the bracket as shown in the picture with the hardware provided.
2. Two #48 gear claps are to be used to fasten the dryer to the bracket.
3. The dryer has one of the outlets marked "IN". Be sure that the dryer is turned such that the hose which will come from the condenser can connect to the "IN" side of the dryer.

### Compressor and pulley mount. (Cat 902)

The compressor mount is to be located on the inside top of the engine when standing behind the equipment. Two ears have been removed from the compressor to ensure enough tightening allowance below the engine muffler. It may be easiest to install the two rotolock fittings onto the compressor prior to installing the compressor. The rotolock with the binary shall be connected to the discharge outlet of the compressor. Be sure to install and lubricate the nylon seals prior to installing rotolock fittings.

1. Remove the plastic belt guard by removing two bolts at the top of the guard and loosening the two bolts on the bottom.
2. Remove the two bolts on the front / top of engine which fasten the guard bracket.
3. Remove the bolt on the inside / front of the engine which gets replaced with a longer one to fasten the lower part of the new compressor mount.
4. Install the compressor mount and refasten guard bracket in same location using new hardware provided.



Compressor mount

Tightener bracket will bolt here

5. Hang compressor from new mount. Small spacer provided should go clutch side between compressor ears to make a very snug fit to prevent the ears from breaking off when the 12mm bolt is tightened. However, do not tighten bolt until the all other mount components have been installed and the belt is on so you can determine good belt alignment. It's possible the spacer may be replaced by a couple of washers or even be moved to the back in order to achieve good belt alignment.

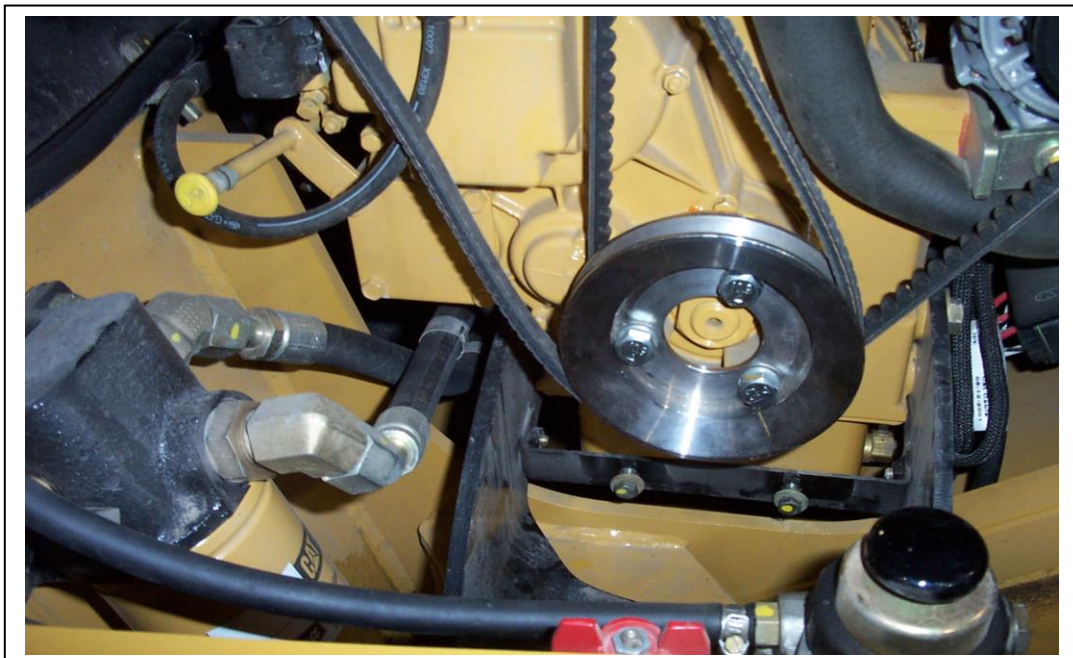


6. The compressor tightening bracket fastens on the lower inside ear of the compressor and then to the engine block directly inside that ear. A spacer and longer bolt is provided to achieve the appropriate standoff.



Compressor mounted in place with tightener bracket and belt.

7. Install the add-on pulley to the face of the existing belt pulley.



Add on pulley



8. Install the belt and determine alignment. If required shim compressor back or forth,
9. Tighten compressor.
10. Cut away a small section of the belt guard to allow the new compressor belt to pass through. Reinstall the guard.



Belt guard with cut outs for new compressor belt.

## Hose Installation

The hoses provided are Aeroquip with easy clip fittings. This type of hose is very flexible yet durable. For added protection hose wrap has been provided and should be installed onto hose where there is risk of rubbing or contact with other hose or objects. Be sure to insert "O" ring seals at all connections and lubricate those seals with PAG oil prior to final connections.

1. The 13/32" (#8) hose with the 134a fitting connects to the discharge side rotolock at the compressor. This is the rotolock with the binary switch. Do not final tighten until all hoses are in place so you can arrange them to prevent problems. The other end of this hose connects to the condenser coil. A loop should be made in the hose in front of the condenser coil to allow the coil to slide out.
2. The 1/2" (#10) hose should already be connected to the evaporator, should now be connected to the other rotolock fitting (suction side)
3. The 5/16" (#6) hose already connected to the expansion valve at the evaporator coil, can now be connected to the dryer.
- 4 The other 5/16" (#6) hose should run from the condenser to the inlet side of the dryer. This hose should also have a loop made in front of the condenser coil to allow the condenser coil to slide out.
5. Arrange all hoses to minimize contact, tighten fittings and strap hoses.

## Electrical

The electrical is a very simple circuit. Since the blower already exist, connect to the open terminal of the blower switch, through an ATO fuse to the thermostat. From the thermostat a 14 gauge wire is run to the binary switch and then to the compressor clutch.



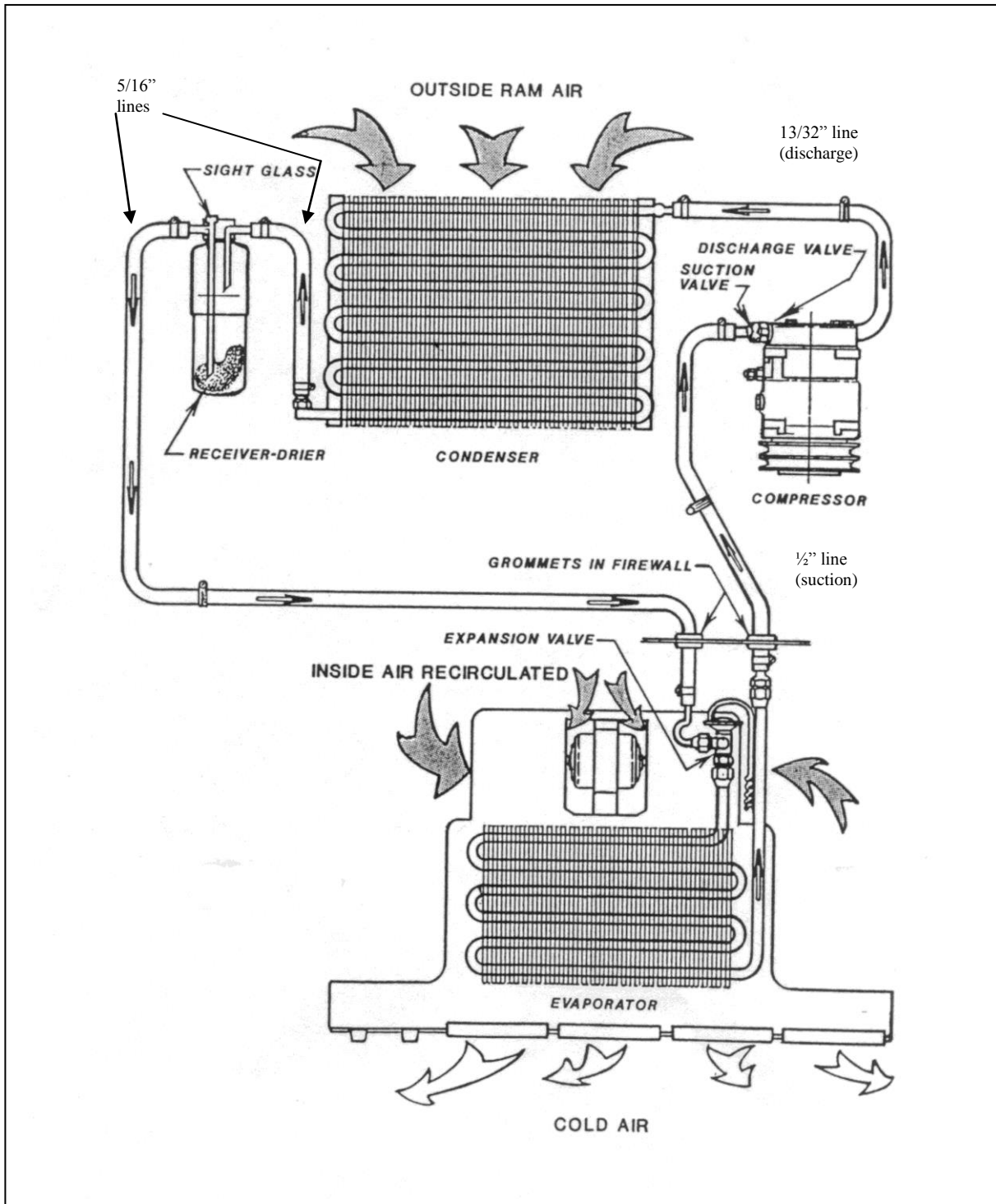
Thermostat control

## **CHARGING AND TESTING**

- 1) Pressure test the system using nitrogen to a pressure of 250 psi. Check for leaks.
- 2) Add 2oz of SP20 Sanden PAG oil to the system.
- 3) Vacuum the system for at least ½ hour.
- 4) Check that the vacuum holds.
- 5) Fill the system with 2.5lbs of R134a refrigerant. **DO NOT USE ANY OTHER TYPE OF REFRIGERANT OR IT WILL VOID THE WARRANTY.**
- 6) Test the system. Check the cycling temperature of the thermostat. Adjust the thermostat settings if required to avoid coil freeze up problems. See the thermostat setting procedures at the end of these instructions.



## 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.

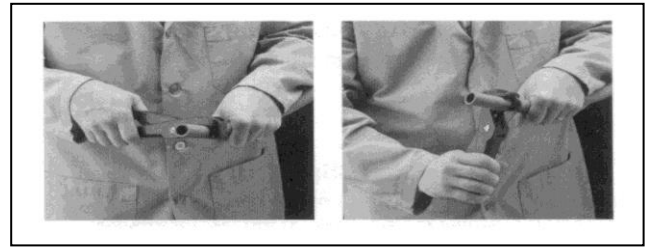
Once the probe is inserted, the A/C system needs to be tested. Run the system to ensure that the thermostat is cycling the compressor off at the appropriate temperature. A core temperature ranging between 25° and 30° F should cause the thermostat to cycle off. The air temperature at the vent outlet closest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

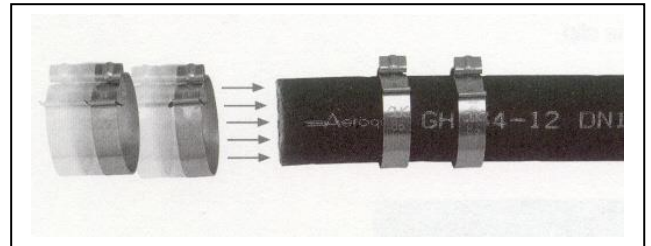


## Aeroquip E-Z Clip Assembly Instructions

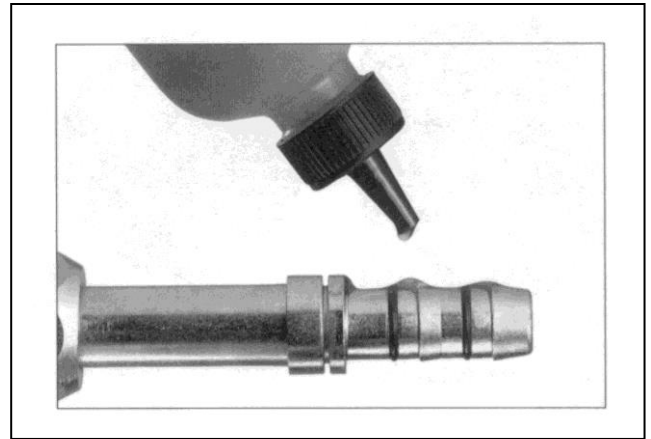
Step 1. Cut the hose to proper length with an appropriate cutting tool. Aeroquip's hand held hose cutter has been specially designed for cutting all non-wire reinforced hose, such as GH-134 Multi-Refrigerant hose. Be sure the cut is made square to the hose length.



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 ensure the nipple is fully inserted into the hose during nipple insertion.

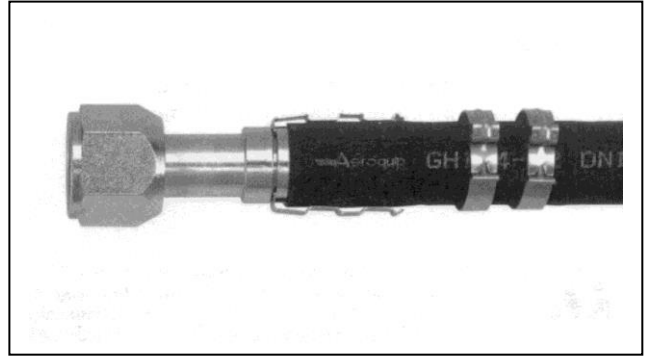
NOTE: Be sure to wipe excess oil from the nipple and hose.



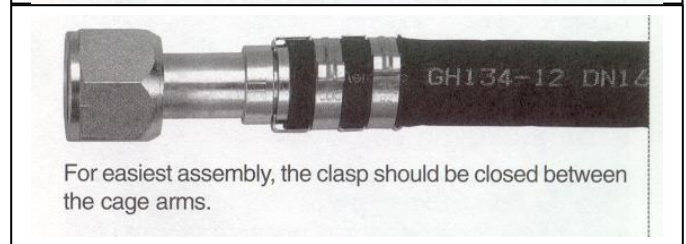
Step 5. Snap the cage into the groove on the nipple. The arms should extend over the hose length. When the cage has been correctly installed in the cage groove, the cage will be able to rotate in the groove.

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.

