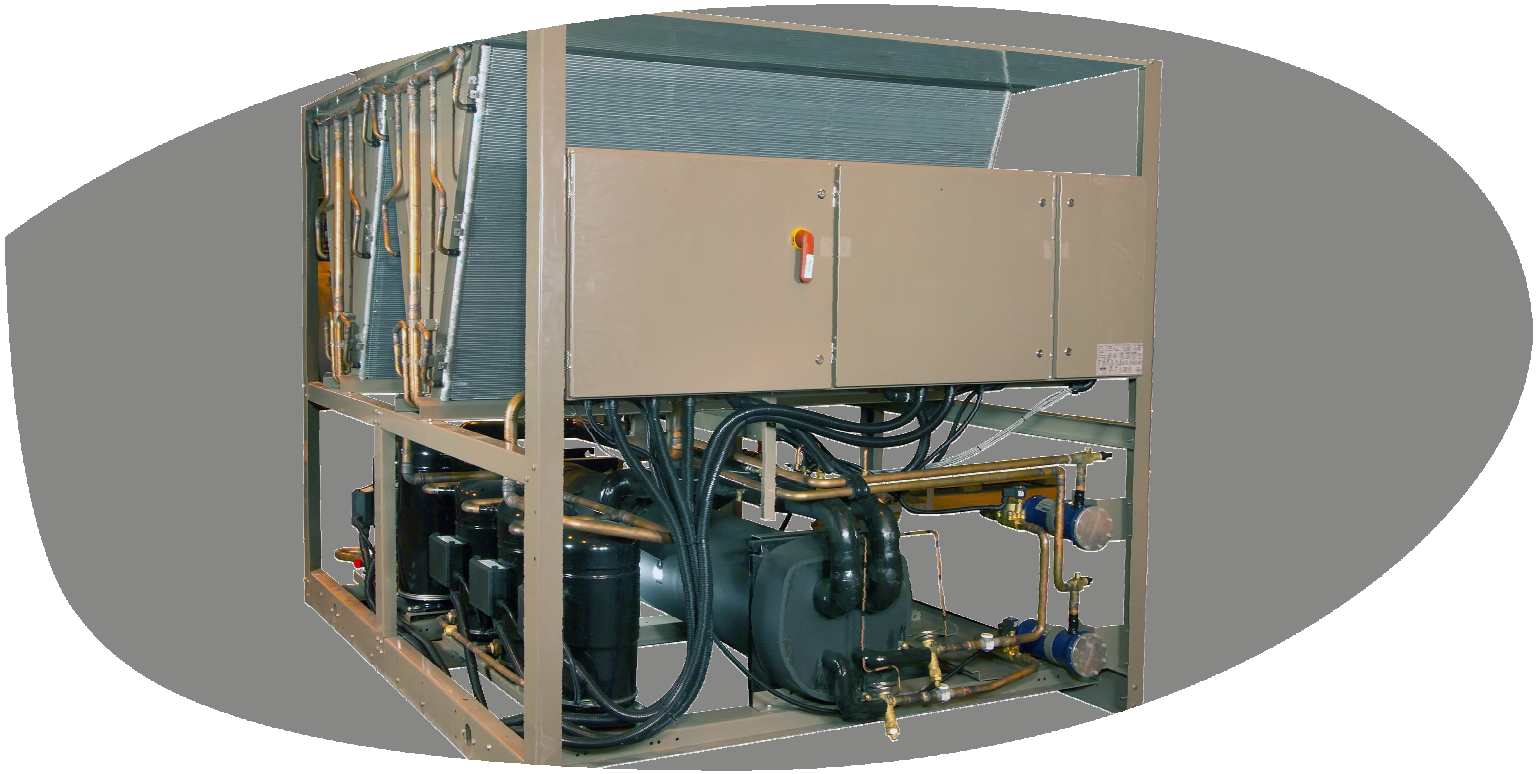
YLAA



Johnson Controls

1 . Which models were made in GZF?

2 .The system of the units

3. Microchannel Introduction

4. TEMPO (YLAA) Microchannel Repair Overview

5 . Can we wash the Coil and How ?

Johnson Controls

1 .Which models were made in GZF?

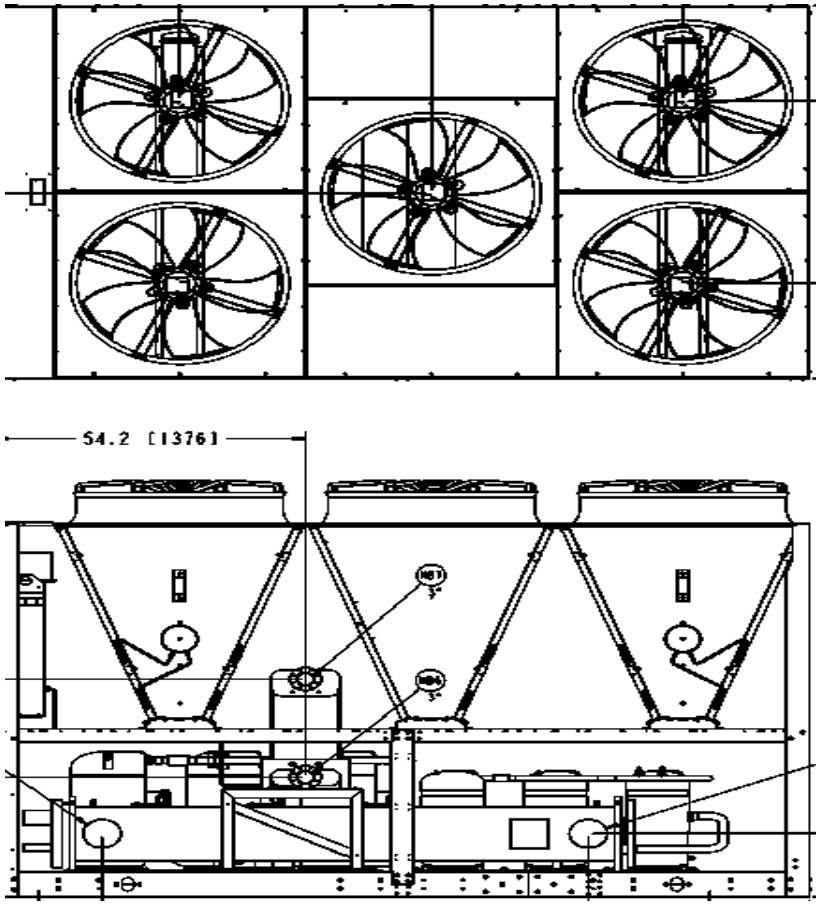
Operating Limitations - HE Models

High Efficiency (HE) Models			YLAA0300		YLAA0350	
			Min.	Max.	Min.	Max.
Chilled Liquid	Liquid Outlet Temperature (Water)	°C	5 to 15			
	Liquid Outlet Temperature Range	°C	3 to 8			
	Evaporator Flow Rate	L/s	6.3	24.3	7.6	39.4
	Evaporator Pressure Drop	kPa	8	91	6	118
	Maximum Water Side Pressure	bar	10			
Ambient Air	Air Temperature - Standard Unit	°C	-4 to 46			
	Air Temperature - LS Unit	°C	-10 to 46			
	Air Temperature - Dual Speed Fans	°C	-10 to 46			
Maximum Refrigerant Side Pressure		bar	38.6			
Power Supply Voltage 400V, 3 ~, 50 Hz (nominal)		V	360 to 440			
Recommended Minimum System Water Volume		L				

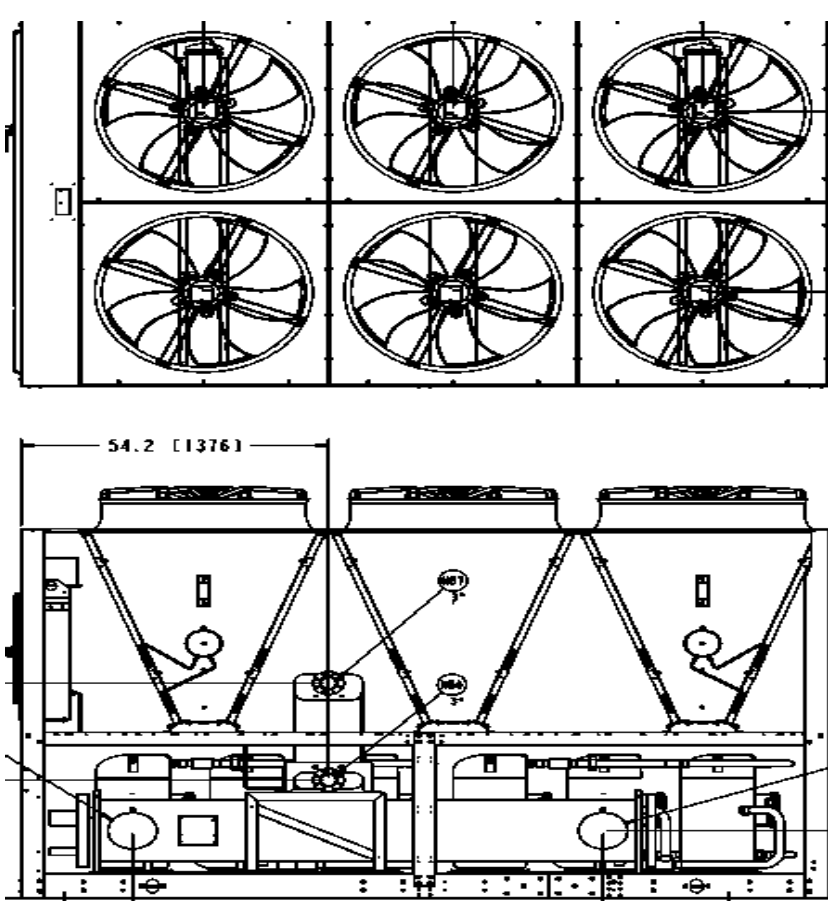
Johnson Controls

High Efficiency (HE) Models			YLAA0390		YLAA0440		YLAA0455		YLAA0515	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Chilled Liquid	Liquid Outlet Temperature (Water)	°C	5 to 15							
	Liquid Outlet Temperature Range	°C	3 to 8							
	Evaporator Flow Rate	L/s	12.6	41.0	9.5	39.4	7.6	39.4	12.6	41.0
	Evaporator Pressure Drop	kPa	13	105	11	154	6	118	13	105
	Maximum Water Side Pressure	bar	10							
Ambient Air	Air Temperature - Standard Unit	°C	-4 to 46							
	Air Temperature - LS Unit	°C	-10 to 46							
	Air Temperature - Dual Speed Fans	°C	-10 to 46							
Maximum Refrigerant Side Pressure		bar	38.6							
Power Supply Voltage 400V, 3 ~, 50 Hz (nominal)		V	360 to 440							
Recommended Minimum System Water Volume		L								

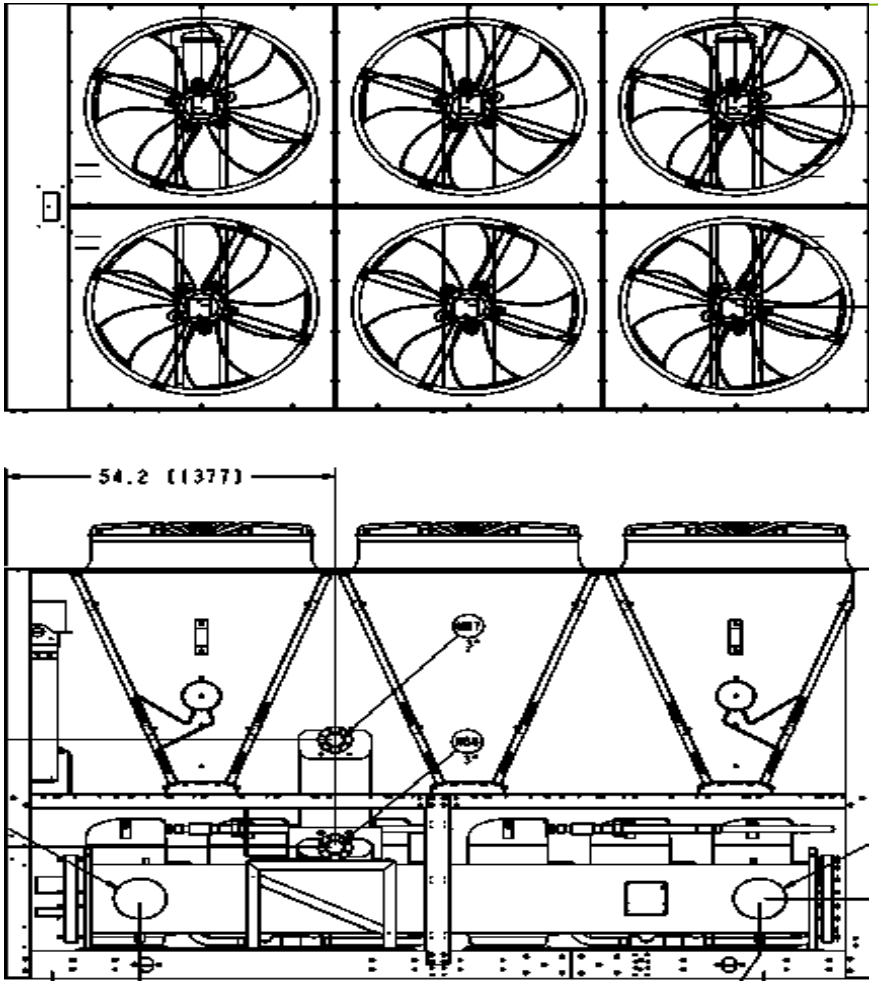
Johnson Controls



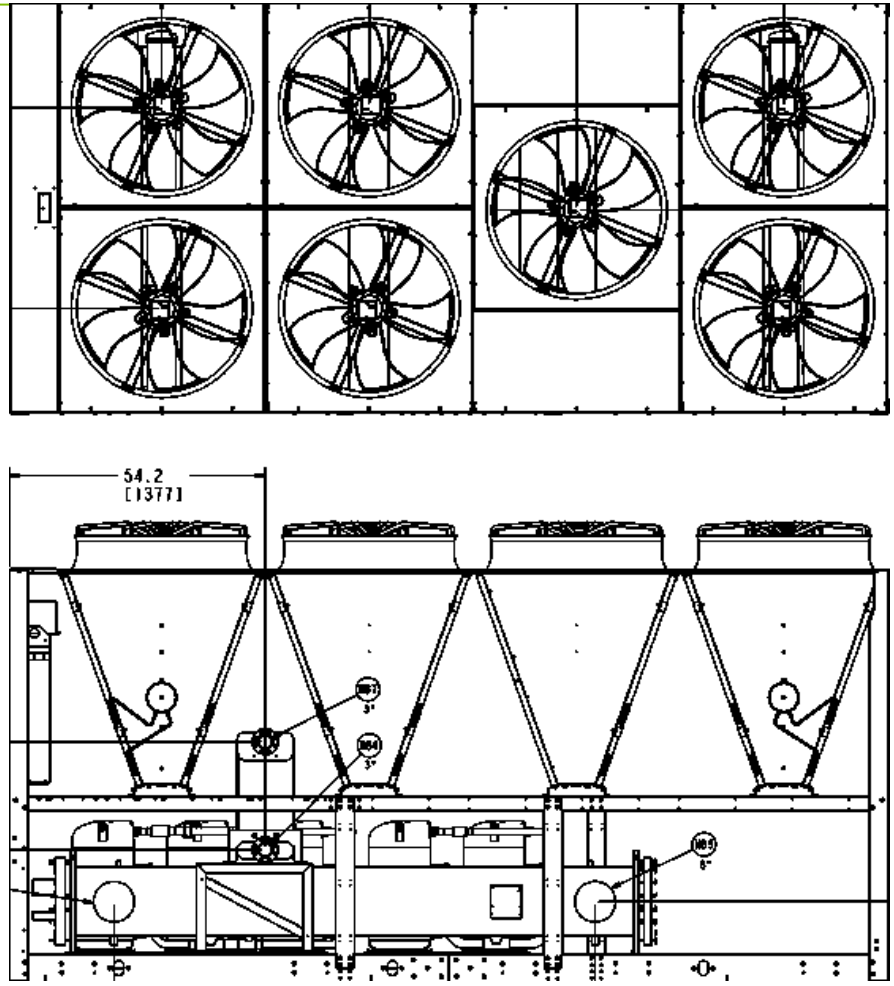
YLAA300



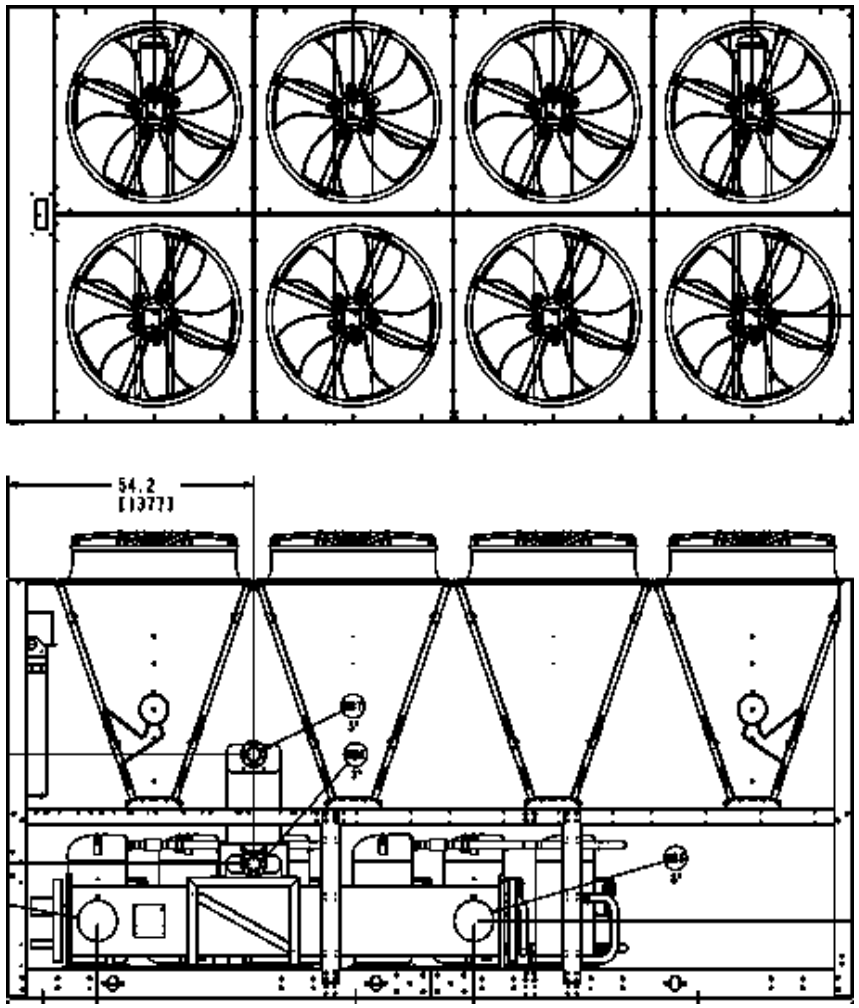
YLAA350



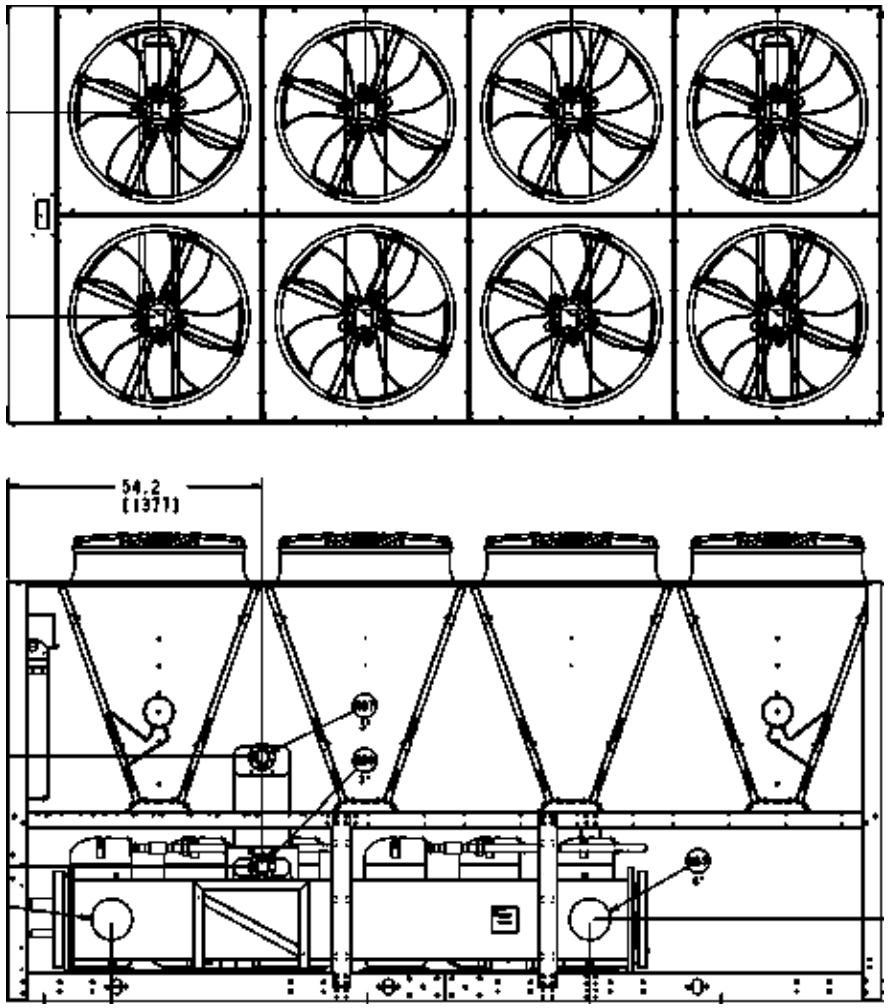
YLAA390



YLAA440



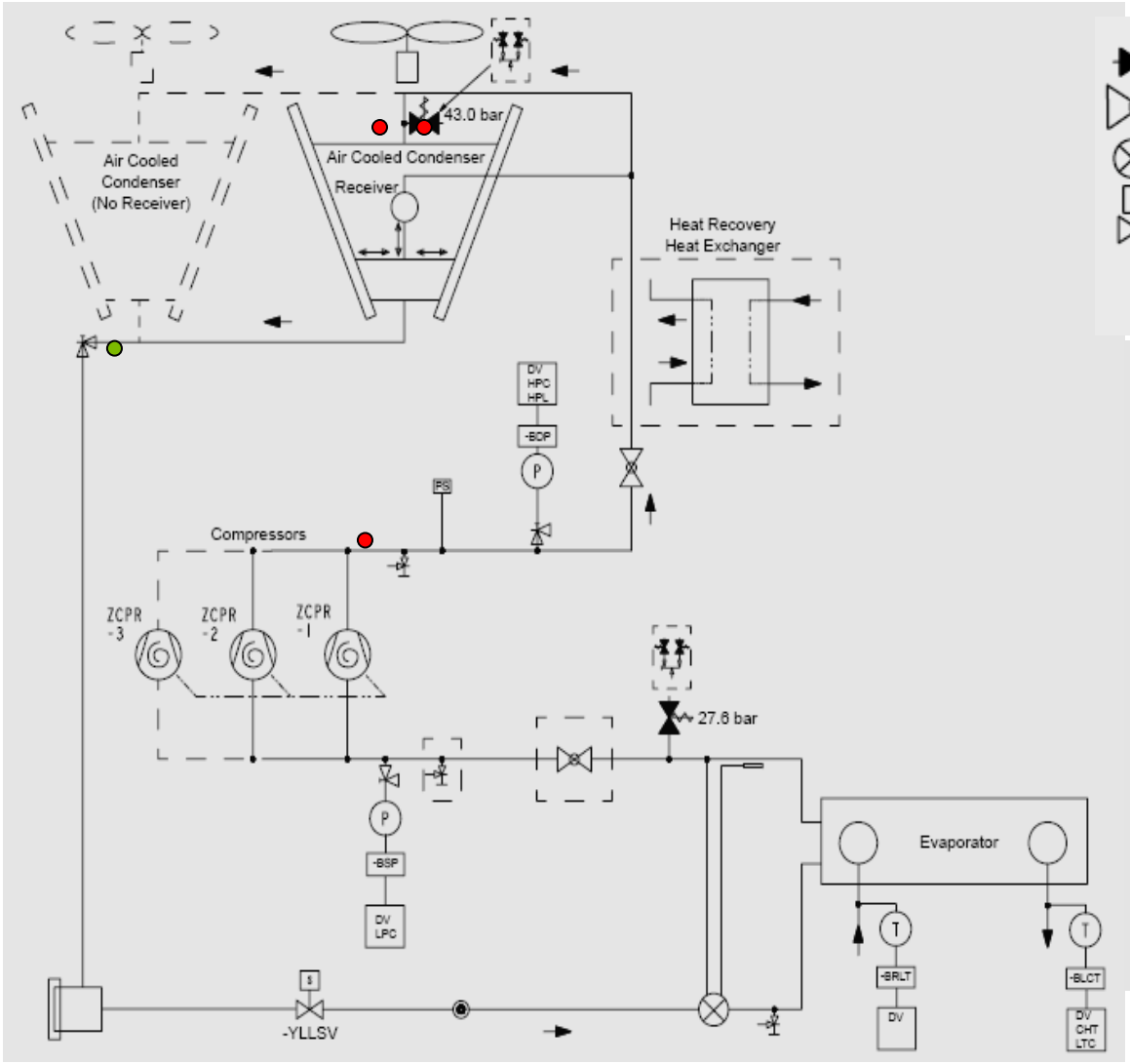
YLAA455

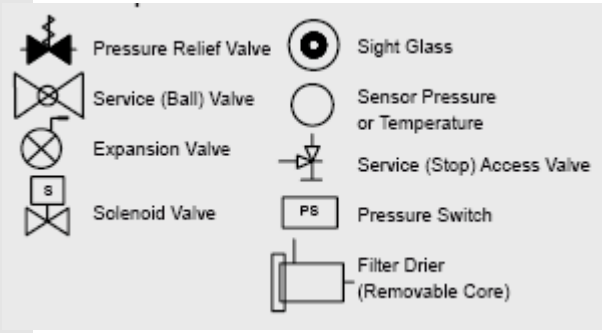


YLAA515

Johnson Controls

2 .The system of the units





Control Functions:
CHT - Chilled Liquid Temperature
HPC - High Pressure Cutout
LPC - Low Pressure Cutout
HPL - High Pressure Load Limiting
HTC - High Temperature Cutout
LTC - Low Temperature Cutout
DV - Display Value

Pressure Transducers:
-BDP Discharge Pressure
-BSP Suction Pressure

Temperature Sensors:
-BLCT Leaving Chilled Temperature
-BRLT Return Liquid Temperature

Solenoid Valves:
-YLLSV Liquid Line Solenoid Valve

Johnson Controls

Microchannel heat exchanger

Compare with the traditional heat exchanger ,the microchannel has lots advantages :

1 small size ,weight less but with high heat exchange efficient

2 cost down due to using less refrigerant

3.Reduce the possibility of the liquid back

However ,it still have advantages :

1 hard to dry out the condensing water due to the fin design

2 it is hard to recycle the oil when it was in heating model

3 repairing the defect or leak coil still a big challenge

Johnson Controls

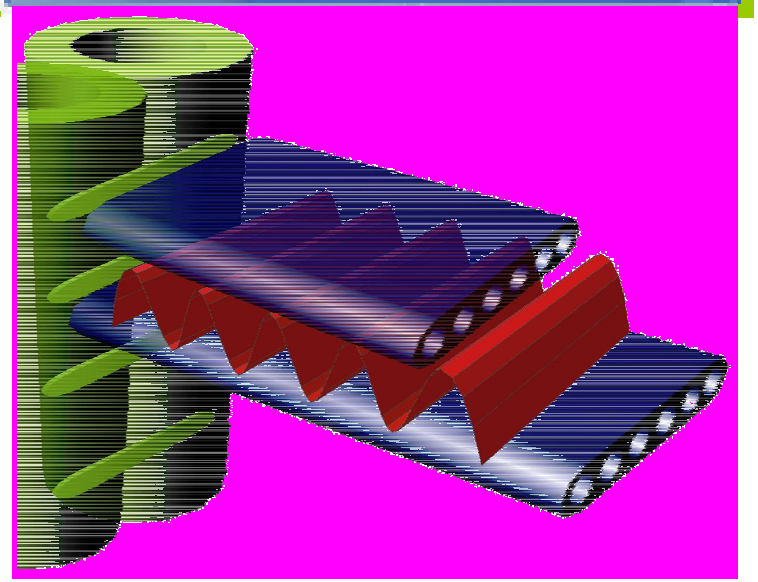
3. Microchannel Introduction

All aluminum coil (tubes, fins & headers)

Used in Automotive Industry for roughly 15 years and is in service in millions of vehicles

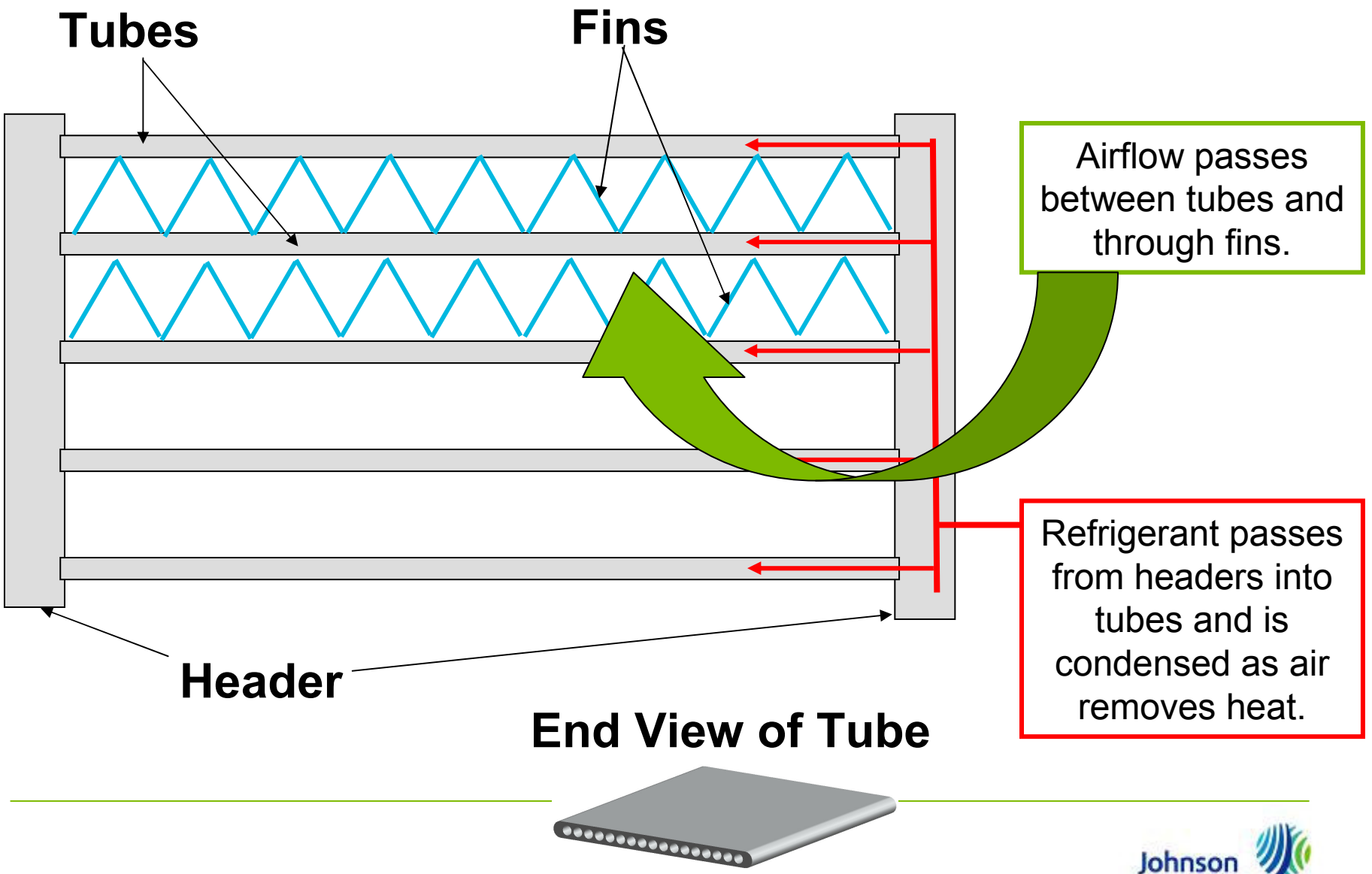
- Facilitated switch from R12 to R134a (in compact space)
- Capable of more heat transfer per volume of coil

Oven brazed construction



Johnson Controls

What is Microchannel?

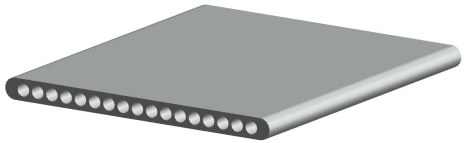


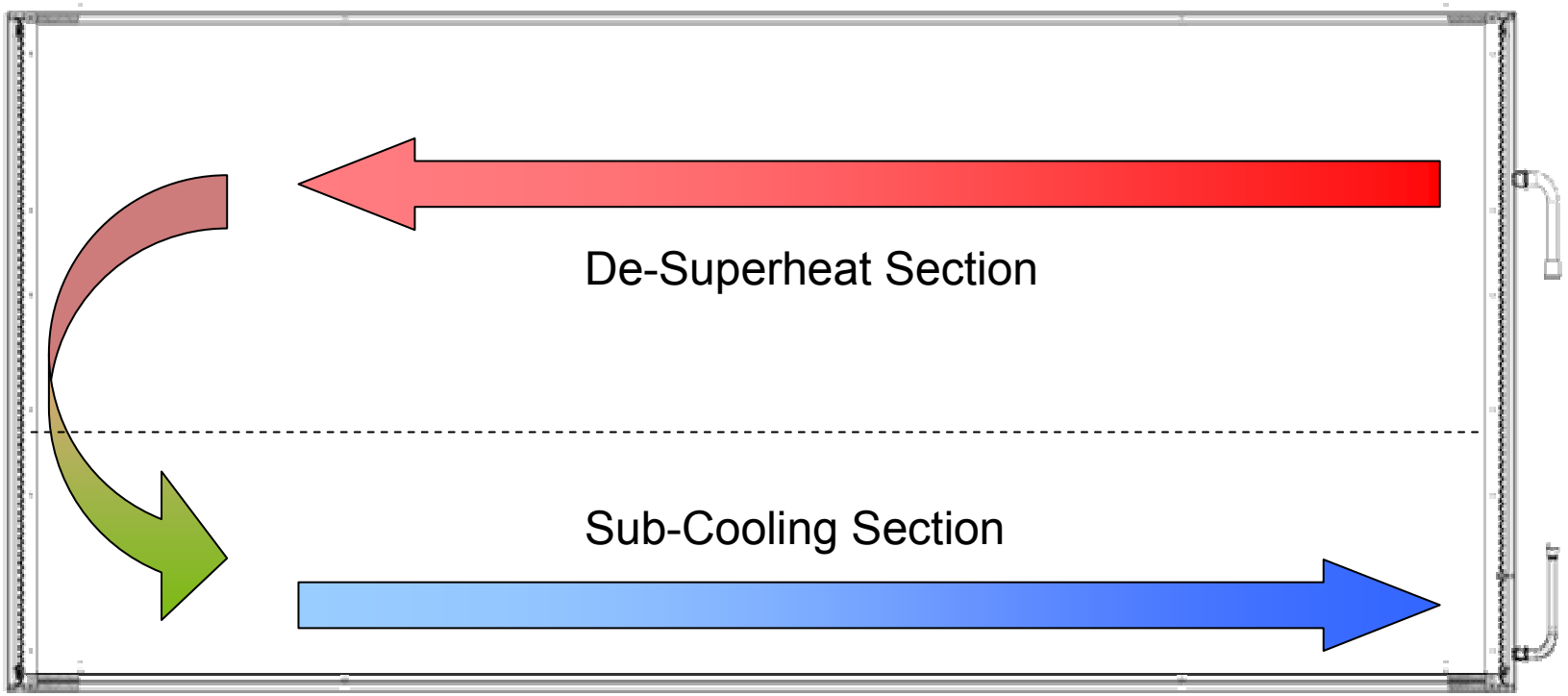
Johnson Controls

What is Microchannel?

Refrigerant flows through tubes from header to header and can be arranged in multiple passes

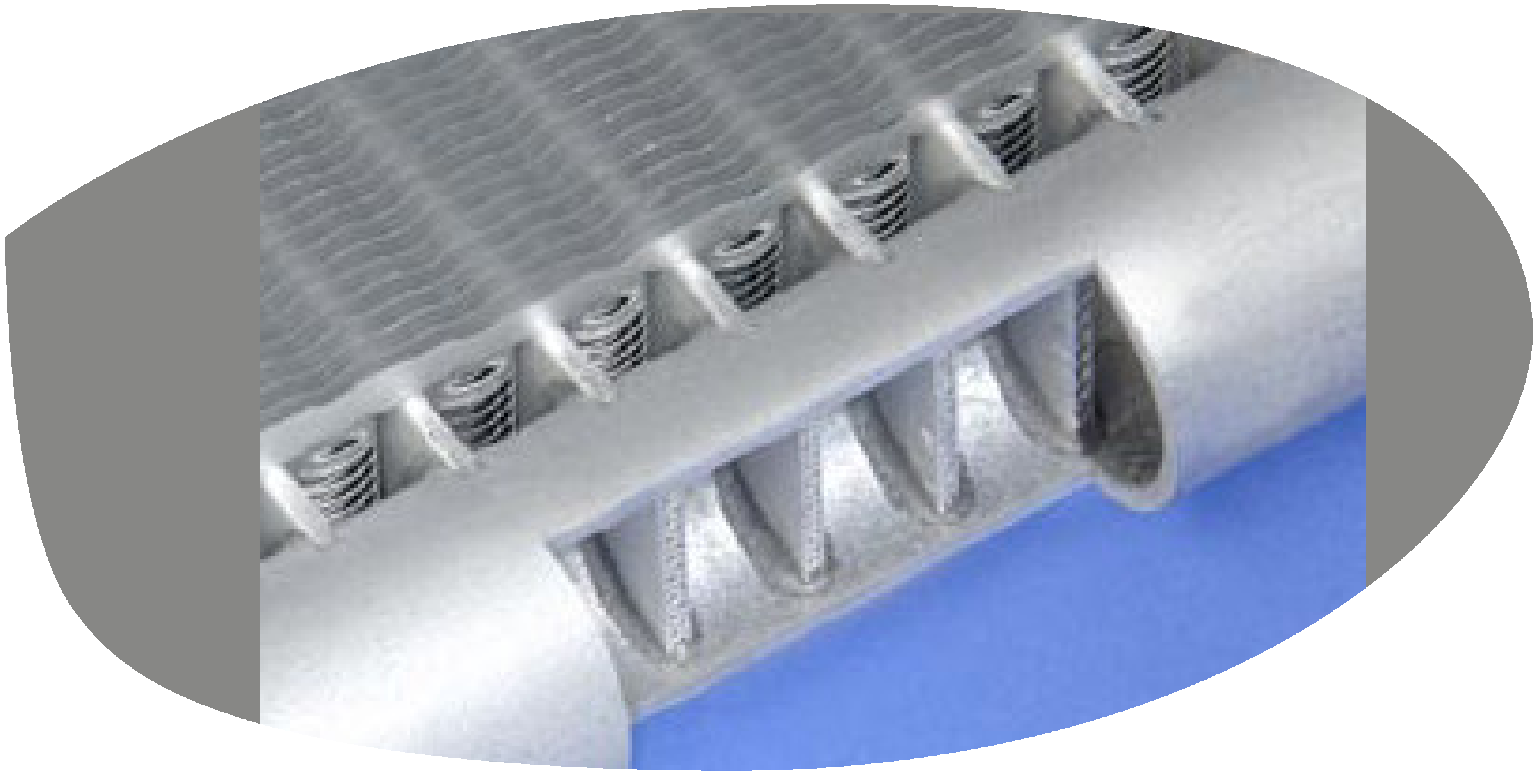
End View of Tube





Johnson Controls

4.TEMPO (YLAA) Microchannel Repair Overview



Johnson Controls

Tube Damage and Fin Replacement

Condenser Repair Materials

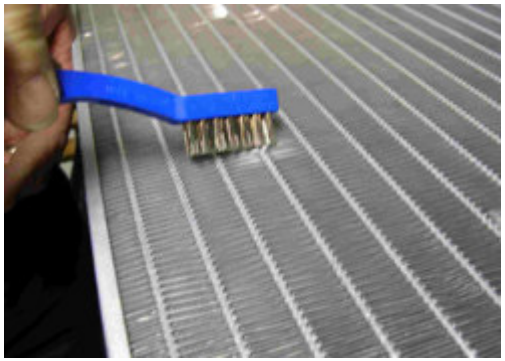
Material:

- OMNI PROBRAZE non-corrosive flux (CX-60)
- SUN KWANG pre-fluxed Zinc-Aluminum Repair Wire 80-20 (SKA TC-110C)
- Replacement Air Center (Optional)
- Loctite 430 Instant Adhesive
- Krylon Industrial Rust Preventive Paint (R00159)
- Stainless Steel Heat Shields

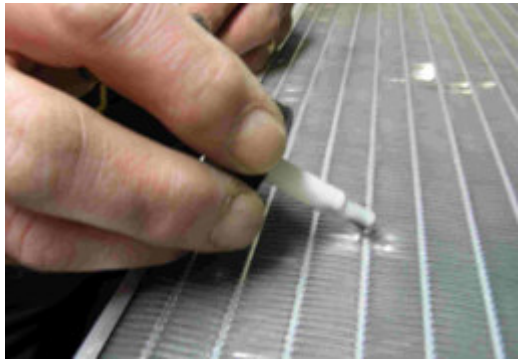
Tools:

- Needle nose pliers (long nose)
- Stainless Bristle Brush
- MAPP or Oxy-Acetylene torch, ex. - Turbo Torch Extreme (TX-503)

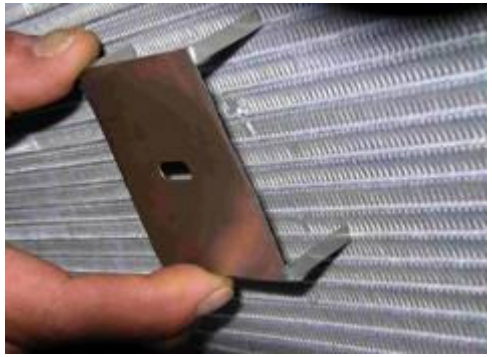
Repair Overview



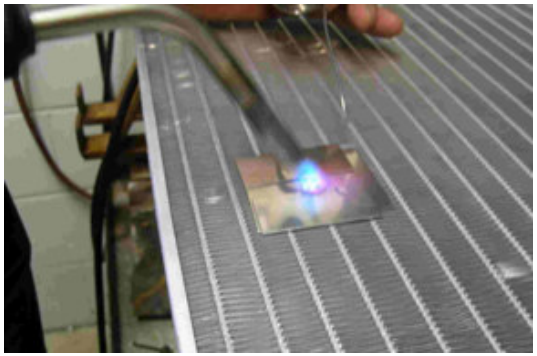
Prepare Area – clean, remove fin



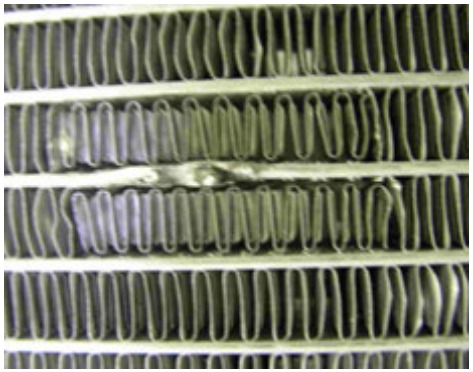
Apply flux



Mask area around leak



Braze



Replace fins - optional

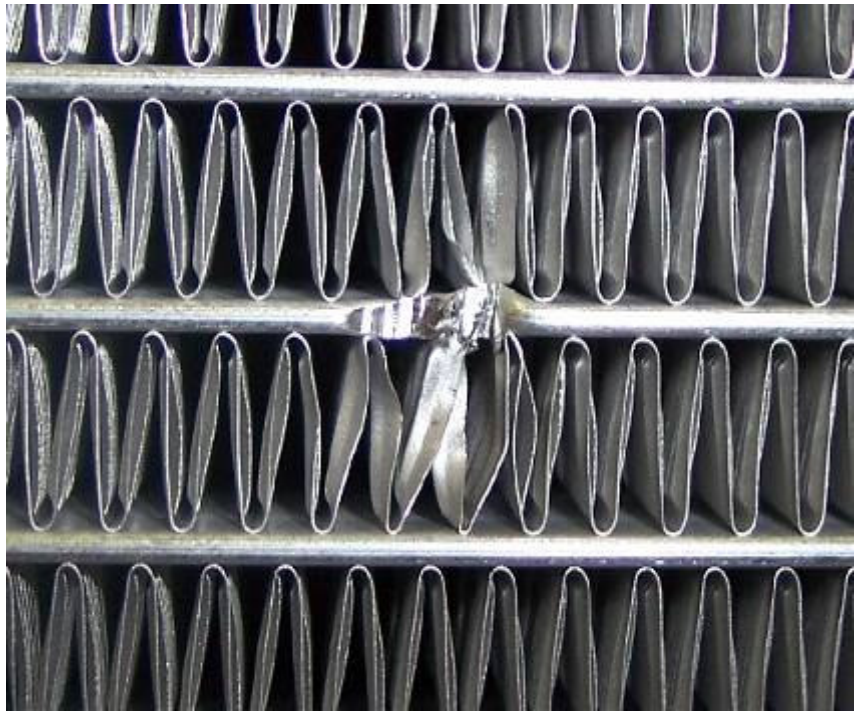
Protect against corrosion

Johnson Controls

Condenser Repair Procedure

Step 1:

- Locate the damaged area and verify that there is actually a leak using industry standard practices.
- Note: The tube construction is capable of withstanding a hard impact as long as the impact is not sharp and does not cut the tube.



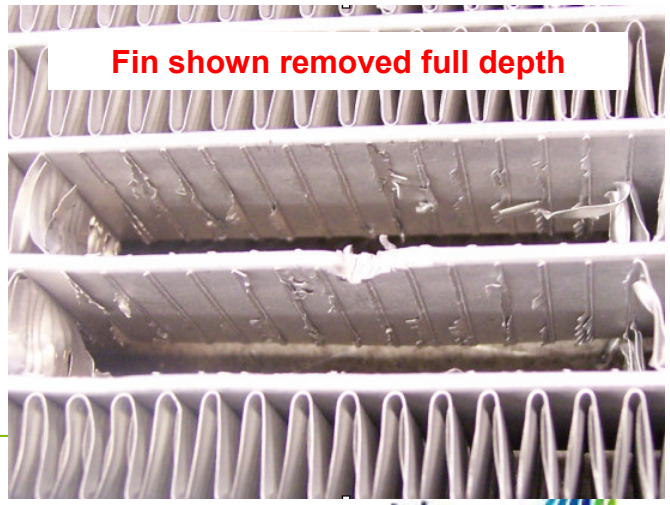
Johnson Controls

Condenser Repair Procedure

Step 2:

- It may be necessary to remove some of the air center to gain access to the damaged area.
- Using needle nose pliers, remove the fins above and below the tube needing repair. The fins to be removed should be approximately 25mm either side of the repair location.
- Note: The fin can be removed by grabbing the fin with the long nose pliers and slowly tearing the fin away from the tube.
- Advice: Remove the fin only to a depth sufficient to make the repair while retaining the best cosmetic appearance when viewing the repair from the opposite side.

Note: Use caution when working with sharp objects around the refrigerant tubes

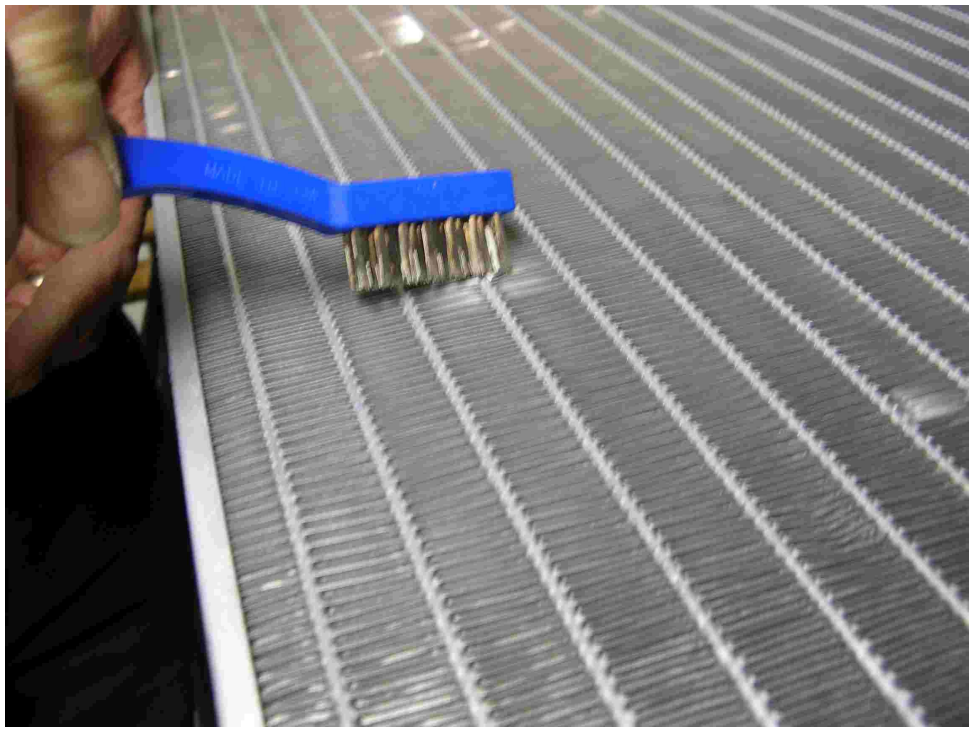


Johnson Controls

Condenser Repair Procedure

Step 3:

- Remove all foreign debris around the damaged area with a small stainless bristle brush. Avoid contaminating the damaged area.



Johnson Controls

Condenser Repair Procedure

Step 4 (Optional):

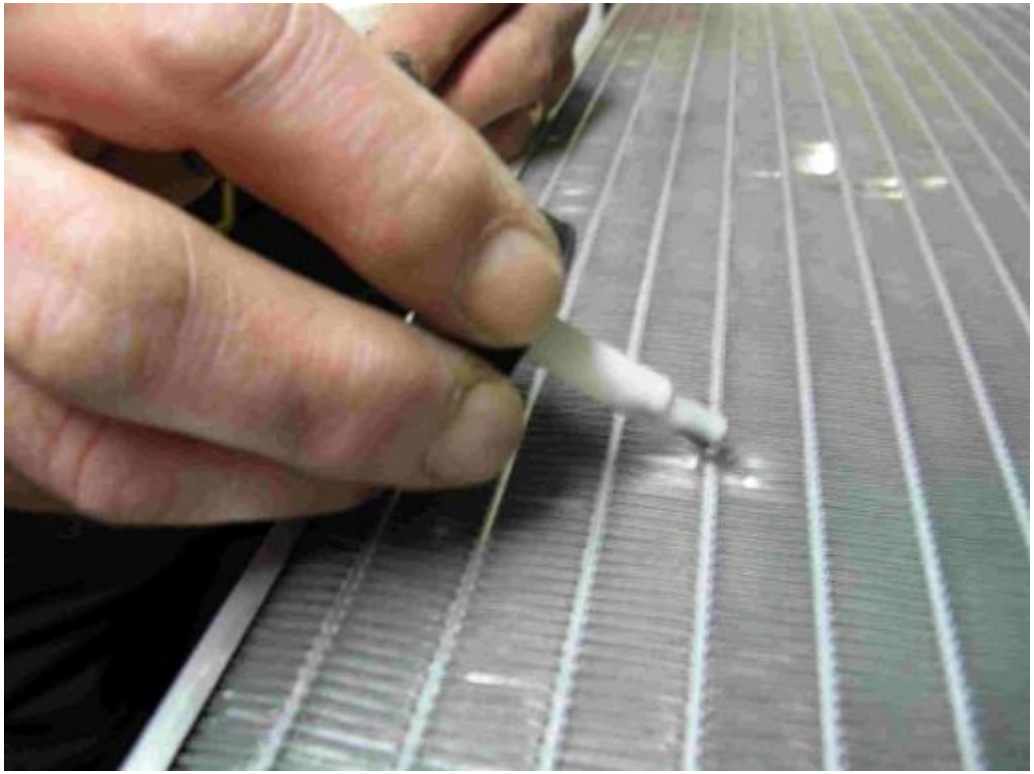
- Thoroughly clean the area with mild soap and water such as a dish soap mixture. Thoroughly rinse the area with clean water. Using a MAPP or Oxy-Acetylene gas torch, very carefully evaporate the water; repeat washing procedure attempting to flood the refrigerant ports with soapy water. Rinse with clean water and again evaporate dry with the torch. The torch should eliminate all moisture (and contaminates), but a steady state vacuum can be pulled on the system after the repair to insure no moisture remains in the system.

Johnson Controls

Condenser Repair Procedure

Step 5:

- Apply flux to the damaged area.

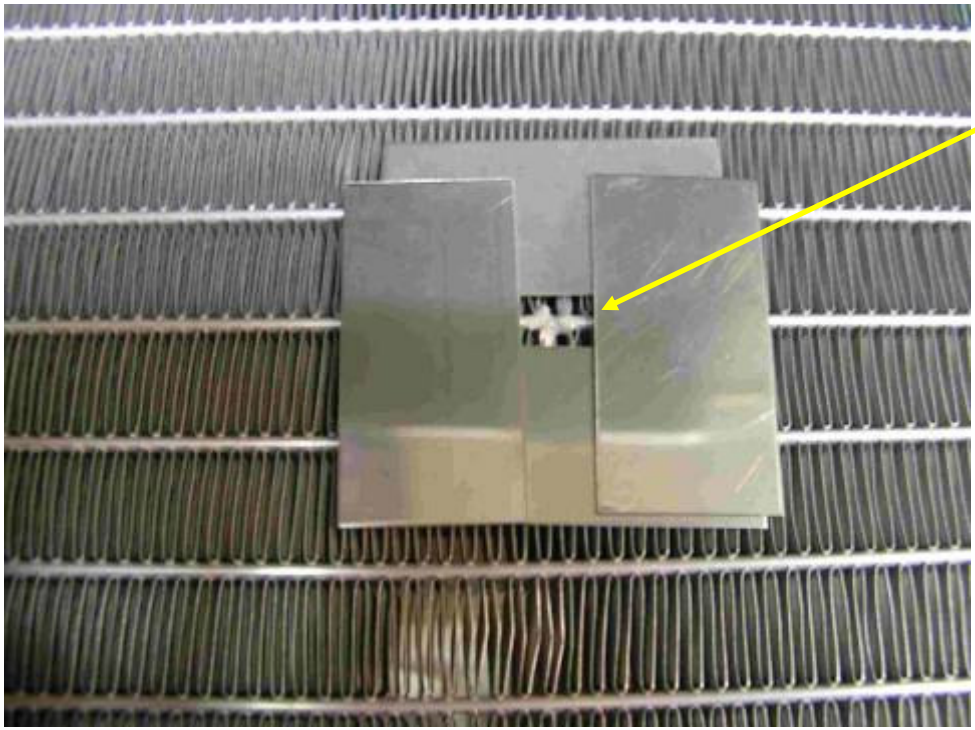


Johnson Controls

Condenser Repair Procedure

Step 6a (Tube Nose Repair):

- Place metal mask material (heat shield) around the damaged area to protect adjacent tubes and air centers.

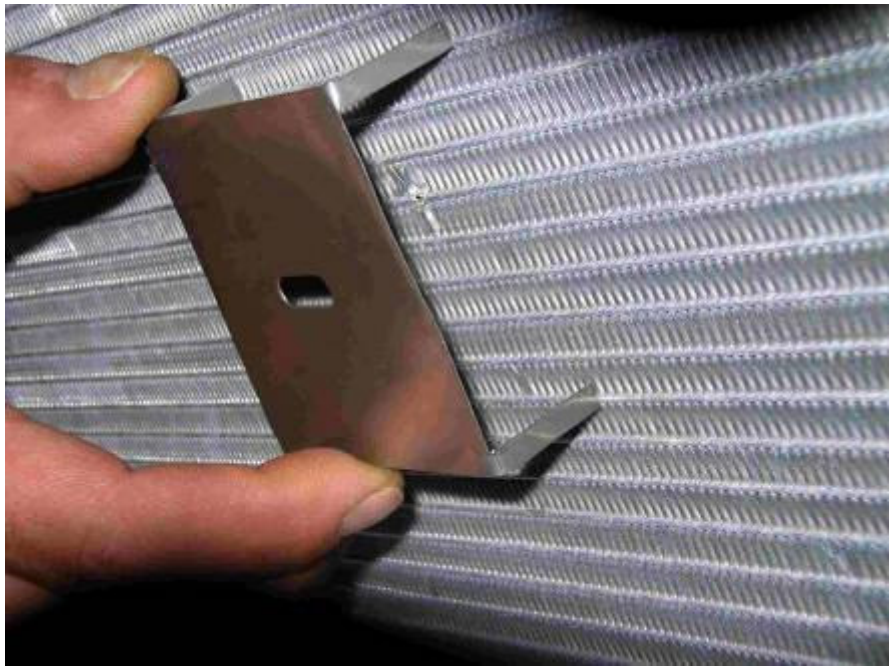


Johnson Controls

Condenser Repair Procedure

Step 6b (Repairing the core at an angle):

- Cut tabs into the mask material long enough to extend completely through the core (greater than 1”).
- Mount the mask on to the core using the tabs to hold in place

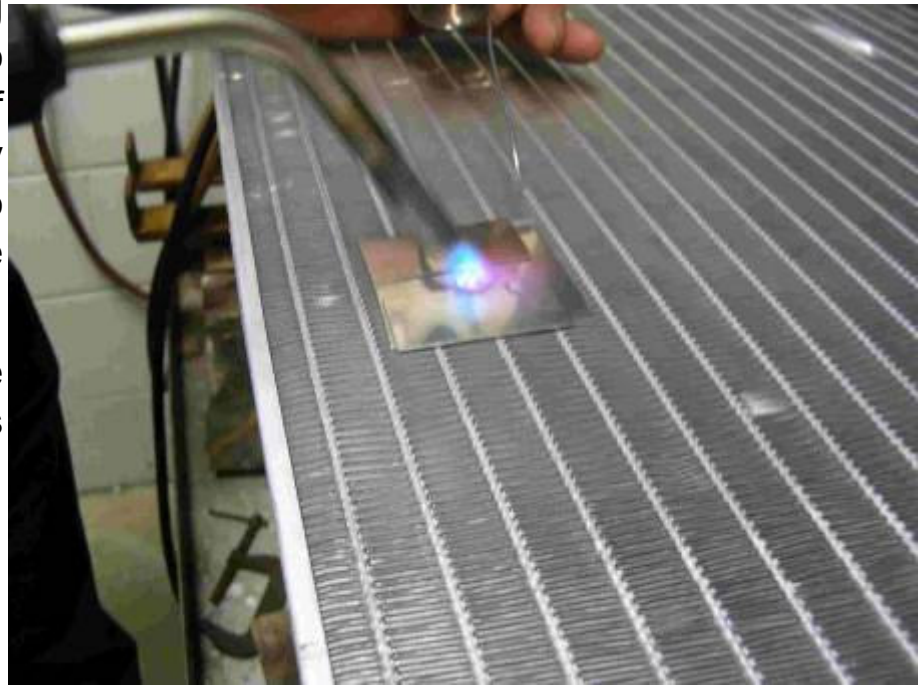


Johnson Controls

Condenser Repair Procedure

Step 7:

- Adjust the torch tip to a neutral or rich carburizing (low oxygen) flame (450°-500°C), and apply heat to the edge of the damaged area. Place the end of the solder wire against the damage and gradually heat the edge of the tube and mask area parallel to the damage until the solder wicks into to the core tube ports. Allow to cool and remove the masks.
- The core tube walls are very thin, and it is possible to burn through the tube wall if excessive heat is applied.

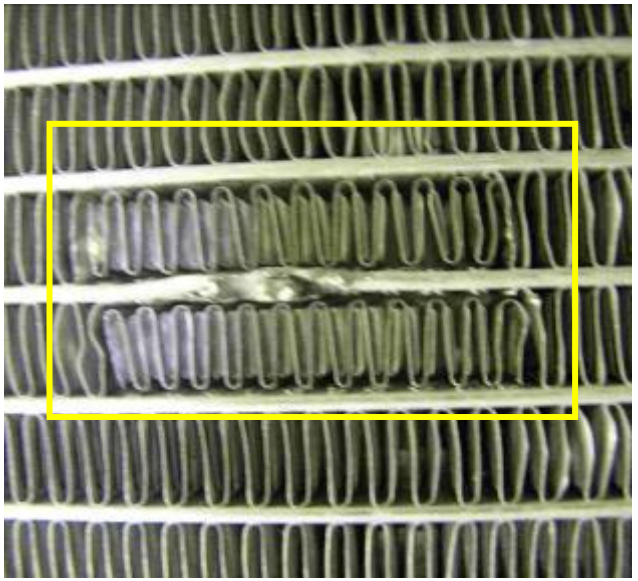


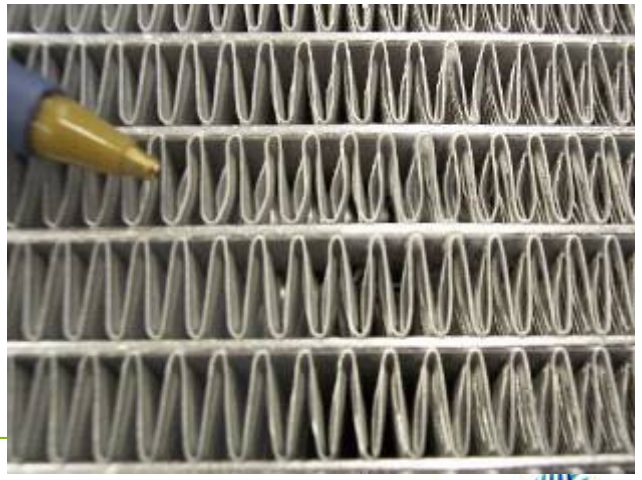
Johnson Controls

Condenser Repair Procedure

Step 8 (Optional):

- Replace air center if removed.
- Using tin snip or shears, cut a portion of replacement air center equal to the length and width previously removed. Apply instant adhesive (LOCTITE 430) to hold the replaced air center in place.
- Picture 2 shows the core after repair from the reverse side taking advantage of the advice referred to in step #2 above.





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Condenser Repair Procedure

Step 9:

- Paint the repaired area to protect against corrosion.

Johnson Controls

Full Microchannel Coil Replacement

Johnson Controls

Condenser Replacement

Step 1:

- Locate the damaged area and verify that there is actually a leak using industry standard practices.
- Note: The tube construction is capable of withstanding a hard impact as long as the impact is not sharp and does not cut the tube.

Condenser Replacement

Step 2:

- Once leak is detected, evacuate circuit with leak.
- Ubrazed all copper connections related to the leaking coil.

Johnson Controls

Condenser Replacement

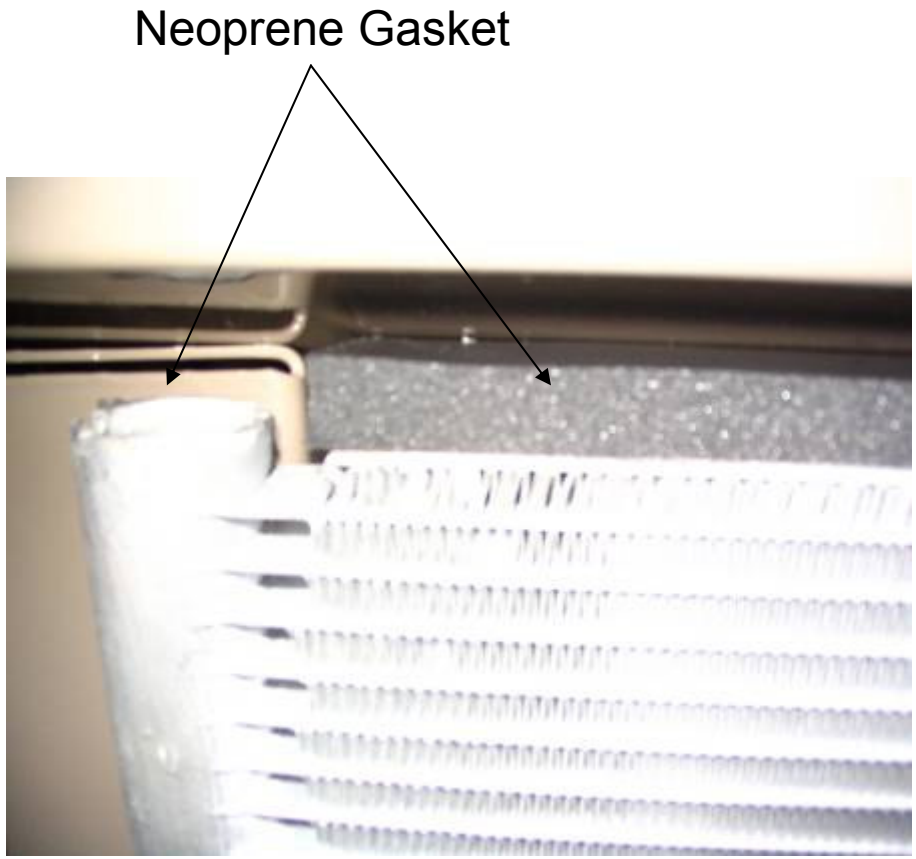
Step 3:

- Remove “P-Clip” support.
- Slide coil out of the V-panel
  - Coils are roughly 65lbs a piece

Condenser Replacement

Step 4:

- Replace coil.
- Coil should not be in contact with any of the V-coil frame, therefore check to see if gaskets on the V-coil needs replacing.
  - If needed, replace with a neoprene gasket.



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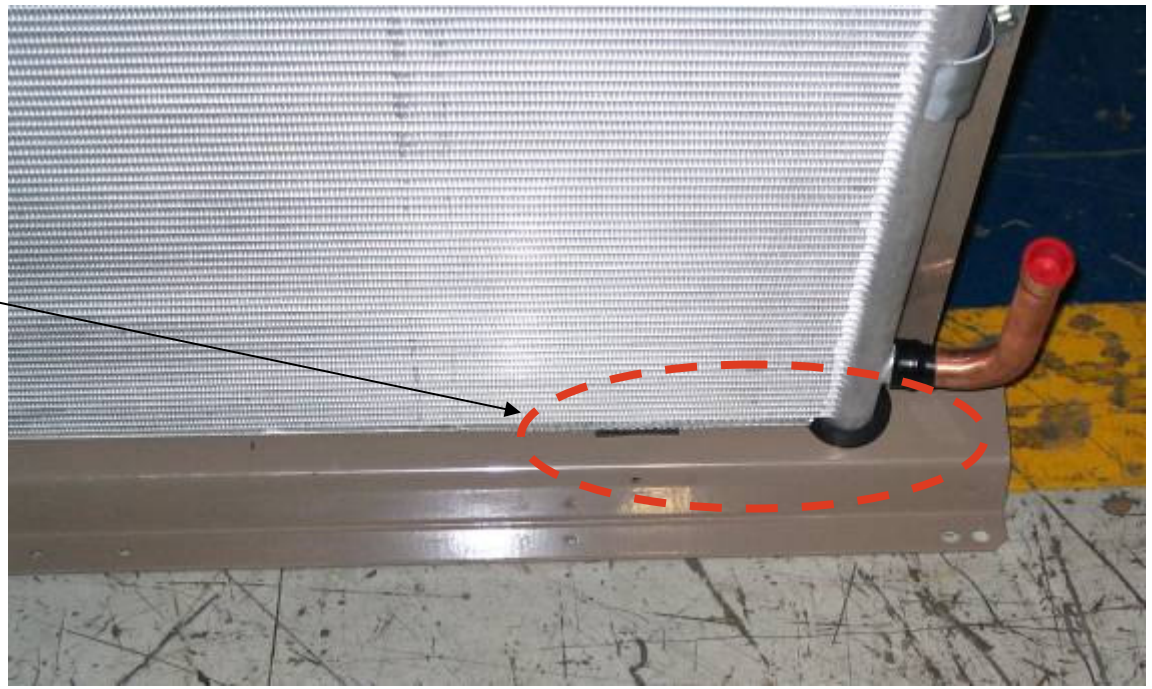
Condenser Replacement

Step 5:

- Make sure that the bottom of the coils are set in properly to the “rubber shoe” support on the bottom of the unit

“Rubber Shoes”



Condenser Replacement

Step 6:

- Tighten “P-clip”
- Re-braze connection
- Charge unit
- Perform final leak test.

Johnson Controls

5 .Can we wash the Coil and How ?

- Coils can be easily pressure washed (1500 PSI (103Bar) max), saving time and sustaining efficiency

Johnson Controls