

# Natural Refrigerant Training Summit

Building a Sustainable Workforce

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## Troubleshooting Booster Oil Systems

Rusty Walker

Hillphoenix

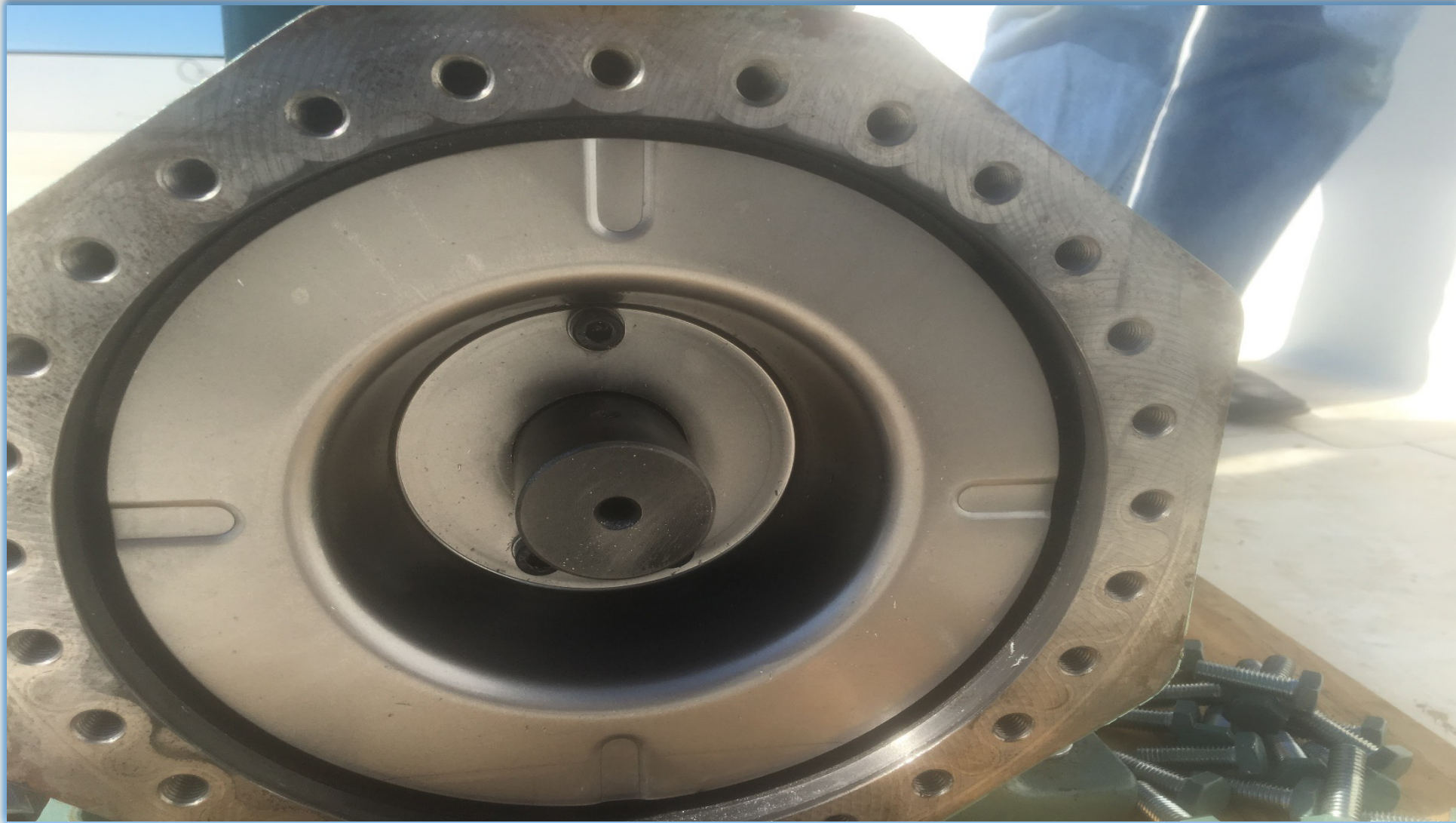


NORTH AMERICAN  
Sustainable  
Refrigeration  
Council

# Troubleshooting the Booster Oil System

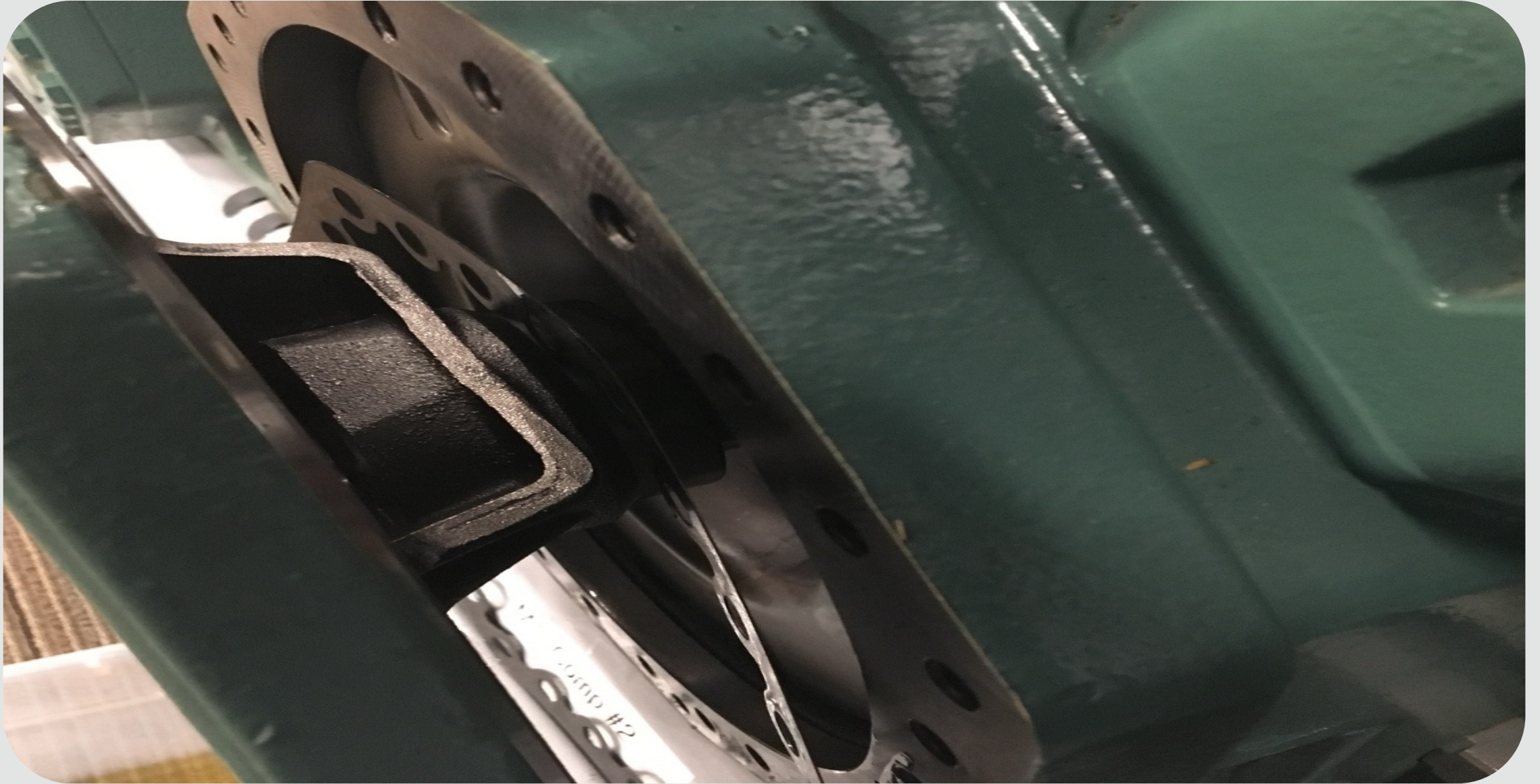
Rusty Walker

# Compressor Oil Sling





# Centrifugal Oil System



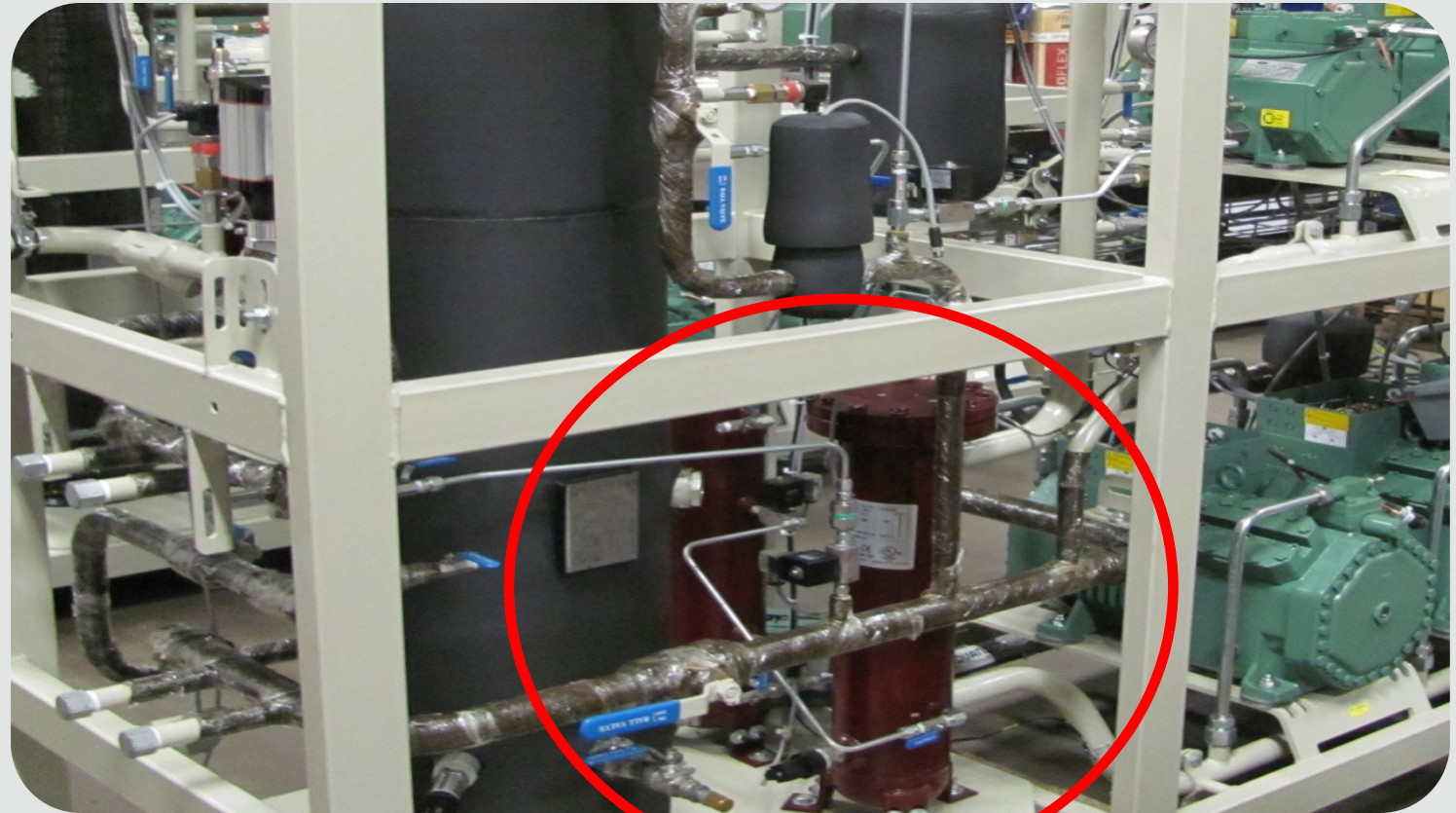


# Centrifugal Oil System





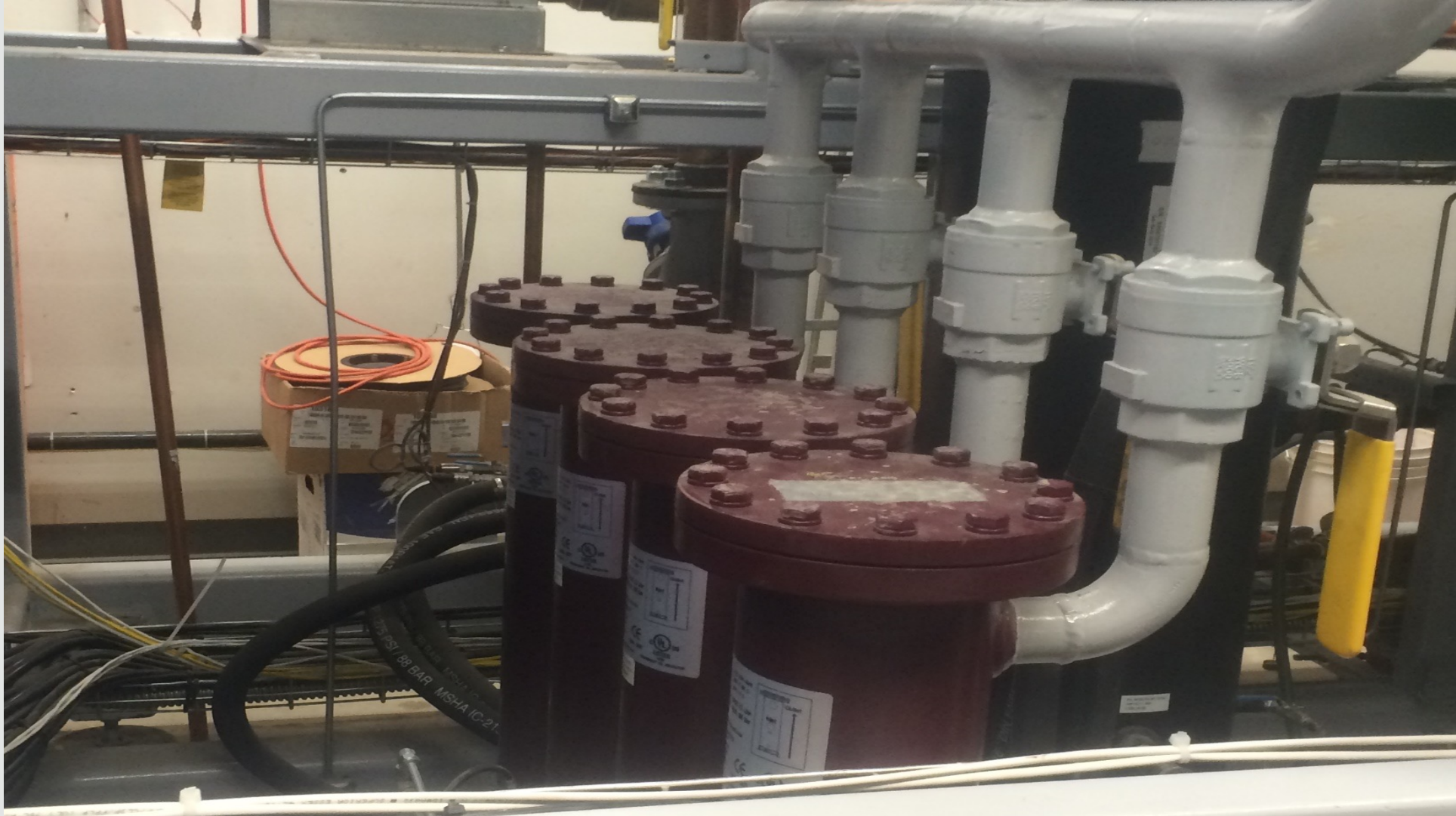
# Discharge Oil Separator



- ❑ Coalescent oil separator with filter
- ❑ 99.98 % oil separation
- ❑ POE Bitzer BSE-85K



# Discharge Oil Separators



# Westermeyer Oil Separator





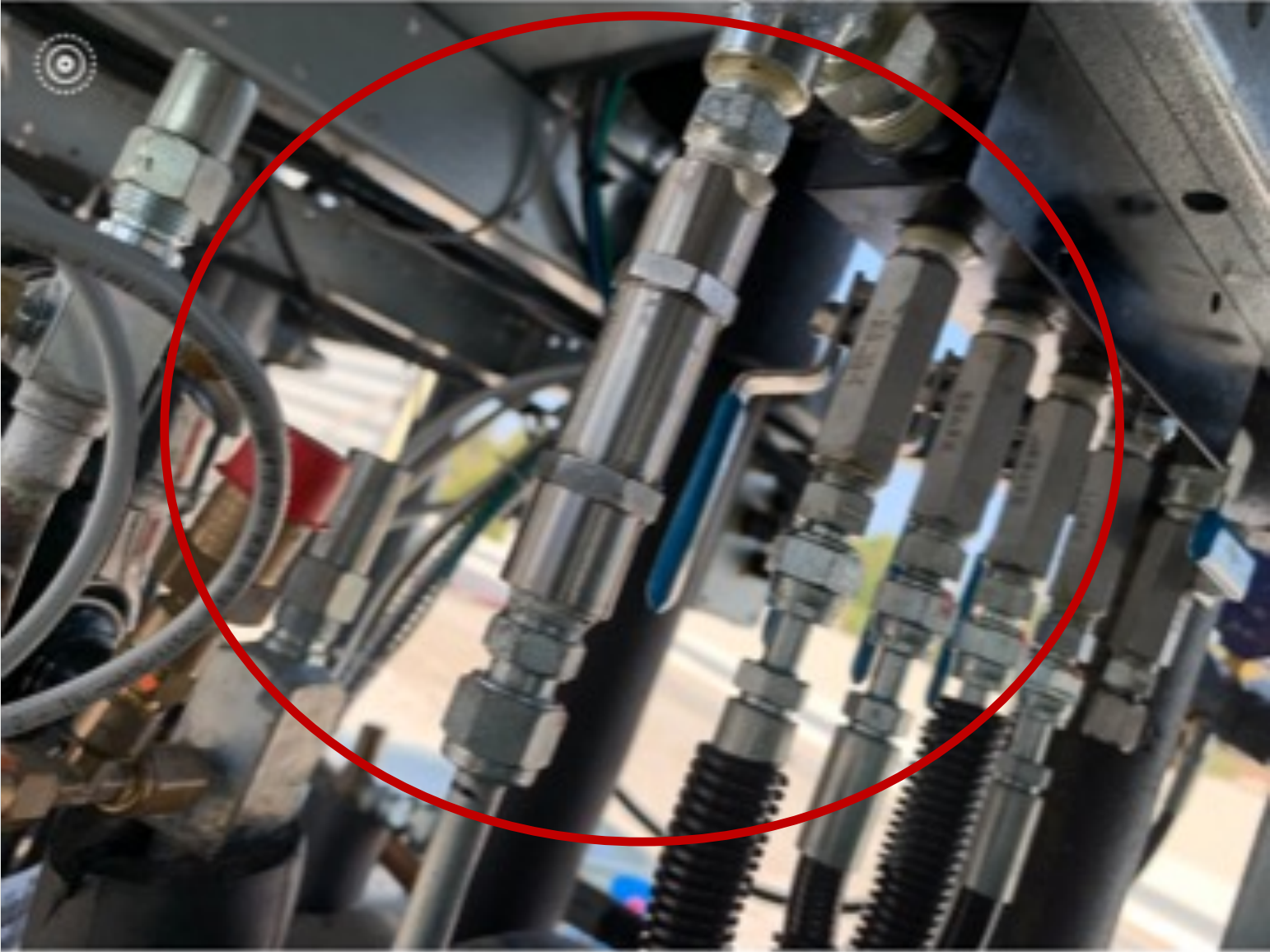


# Oil line Filter on Discharge Oil Separator

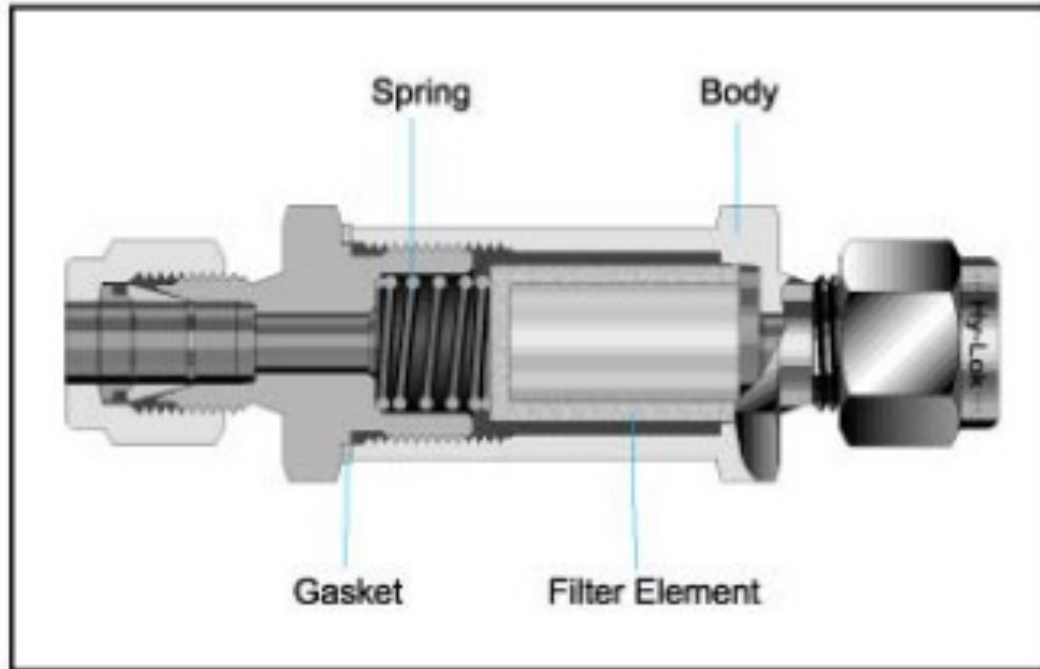




# In-Line Oil Filter



# Oil Filter Element



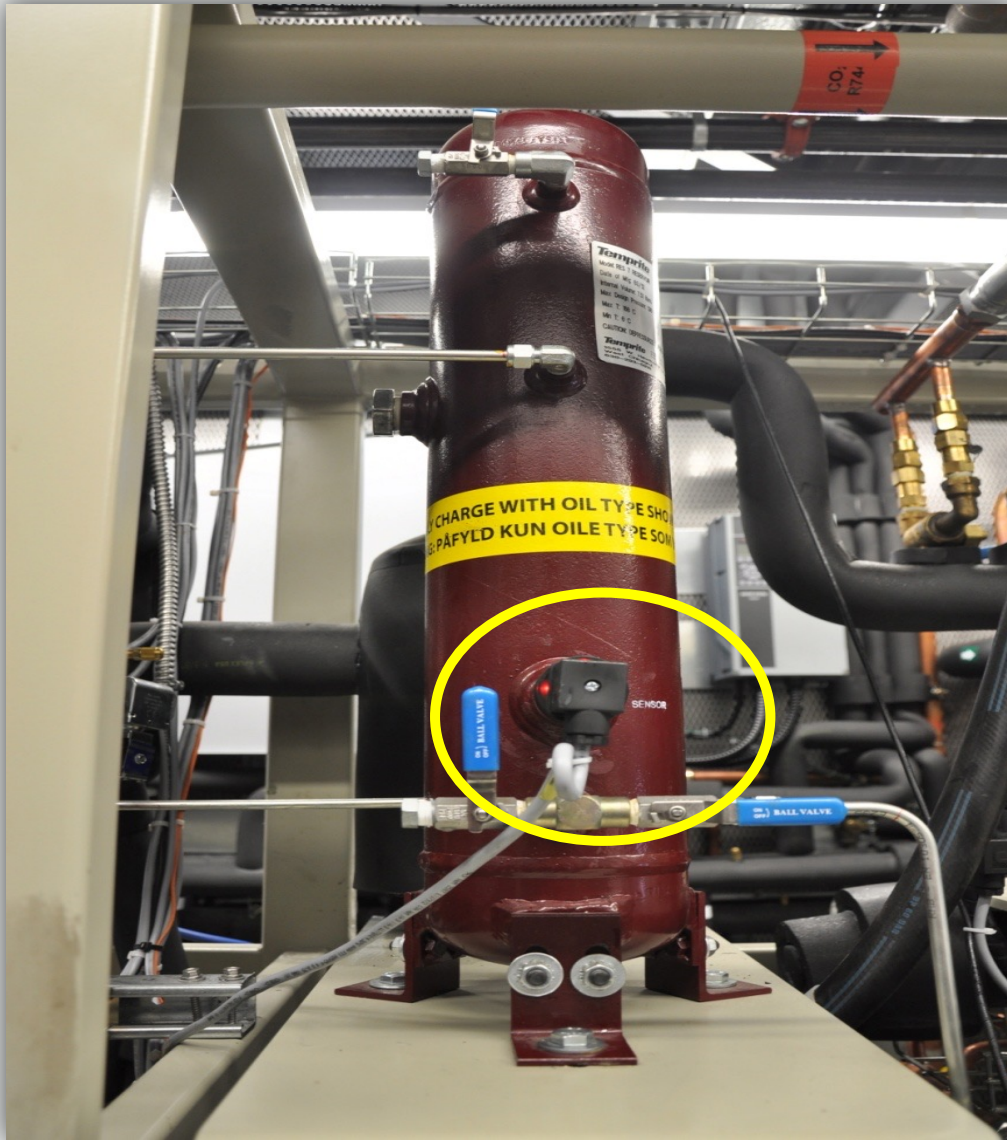
## Features

- In-line filters are for use where space is limited
- Replaceable Filter element
- Particle trapping for clean fluid





# Temp Rite Oil Reservoir with HB Oil Sensor

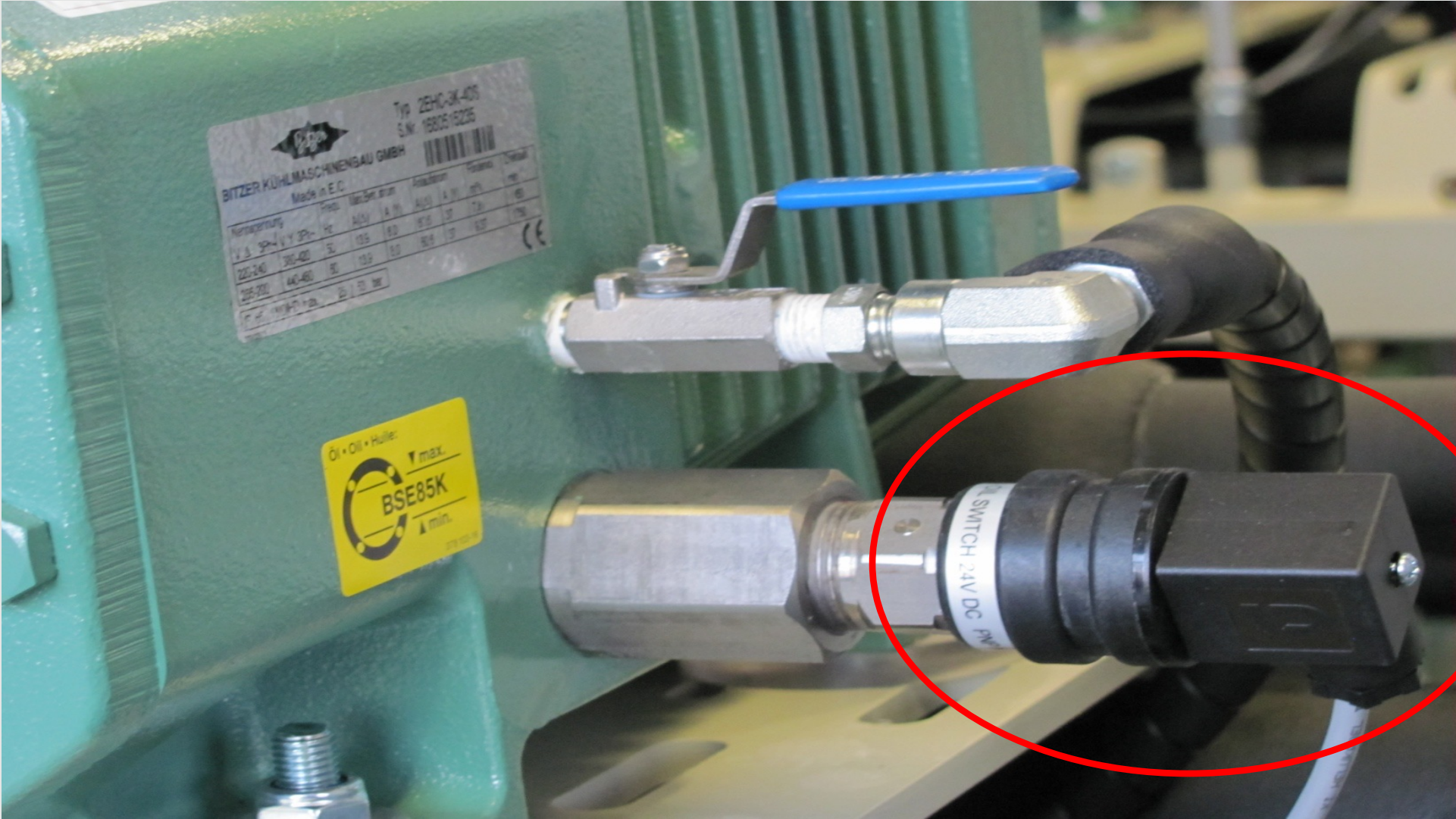


# Westermeyer Oil Reservoir





# HB Capacitive Oil Level Sensor



# HBSO1 Oil Sensor

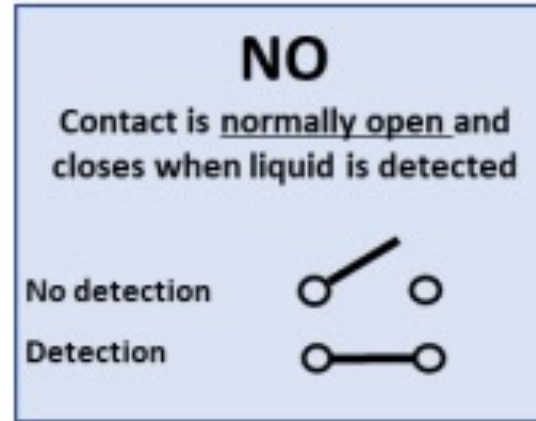
## Functionality

The switches are used for detecting liquid in gas or air (HBOR detect oil in liquid ammonia). The mechanical elements have different design because they are optimized to different liquids. The switches use the capacitive measuring principle and react to the difference in dielectric constant between liquid and gas.

## Switching

All switches except HBOR switch on when liquid is detected. This means a NO switch close the contact when liquid is detected, and a NC open the contact when in liquid

HBOR is different: it switches off when oil is detected



## LED indication

4 x red LED's indicate liquid/oil detection.

4 x green LED's flashing indicate no detection, but sensor is active.

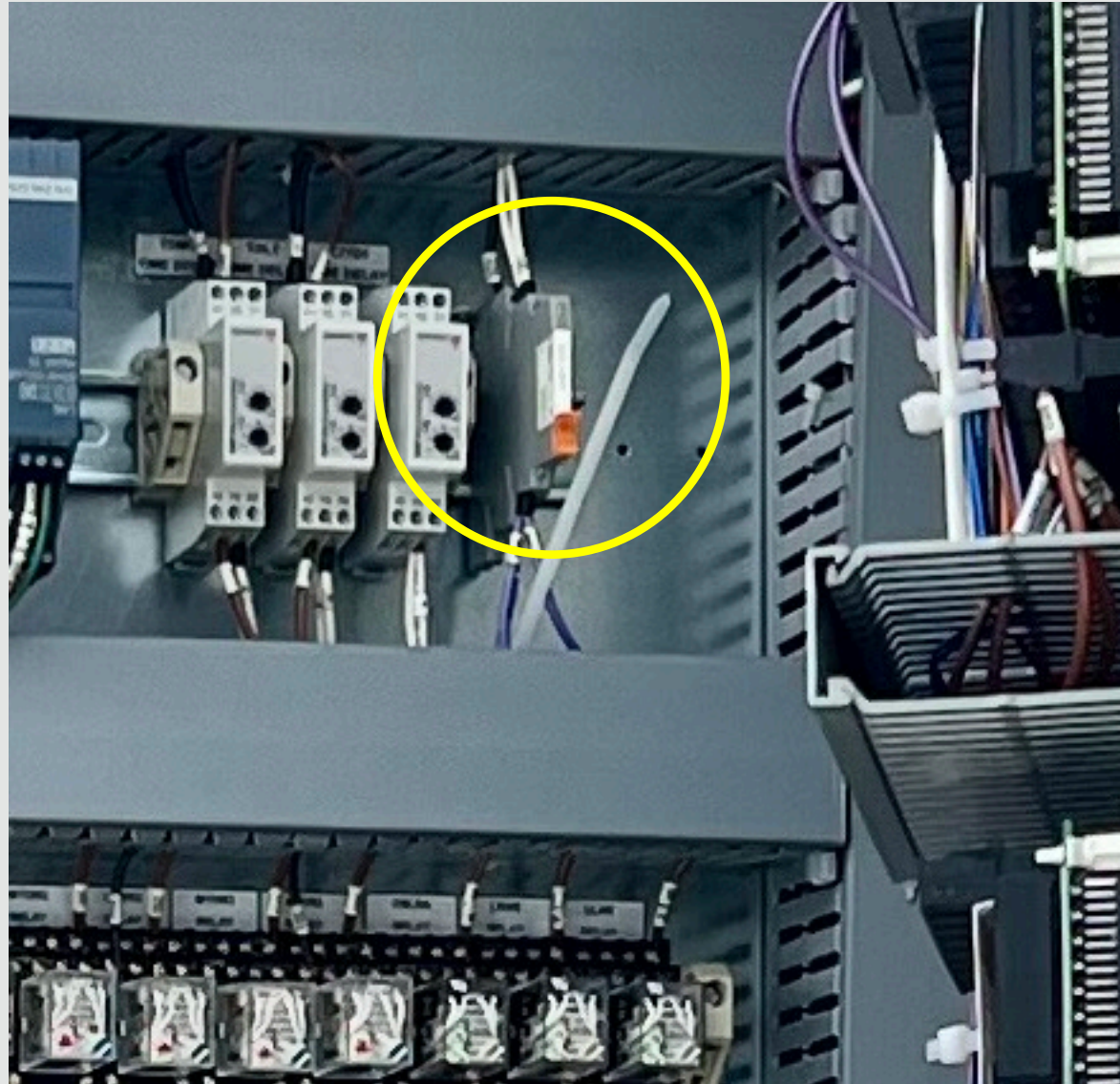
4 x red flashing LED's indicate no connection to mechanical unit.

Irrespective of the output function (NO/NC) LED's are activated when liquid is detected.



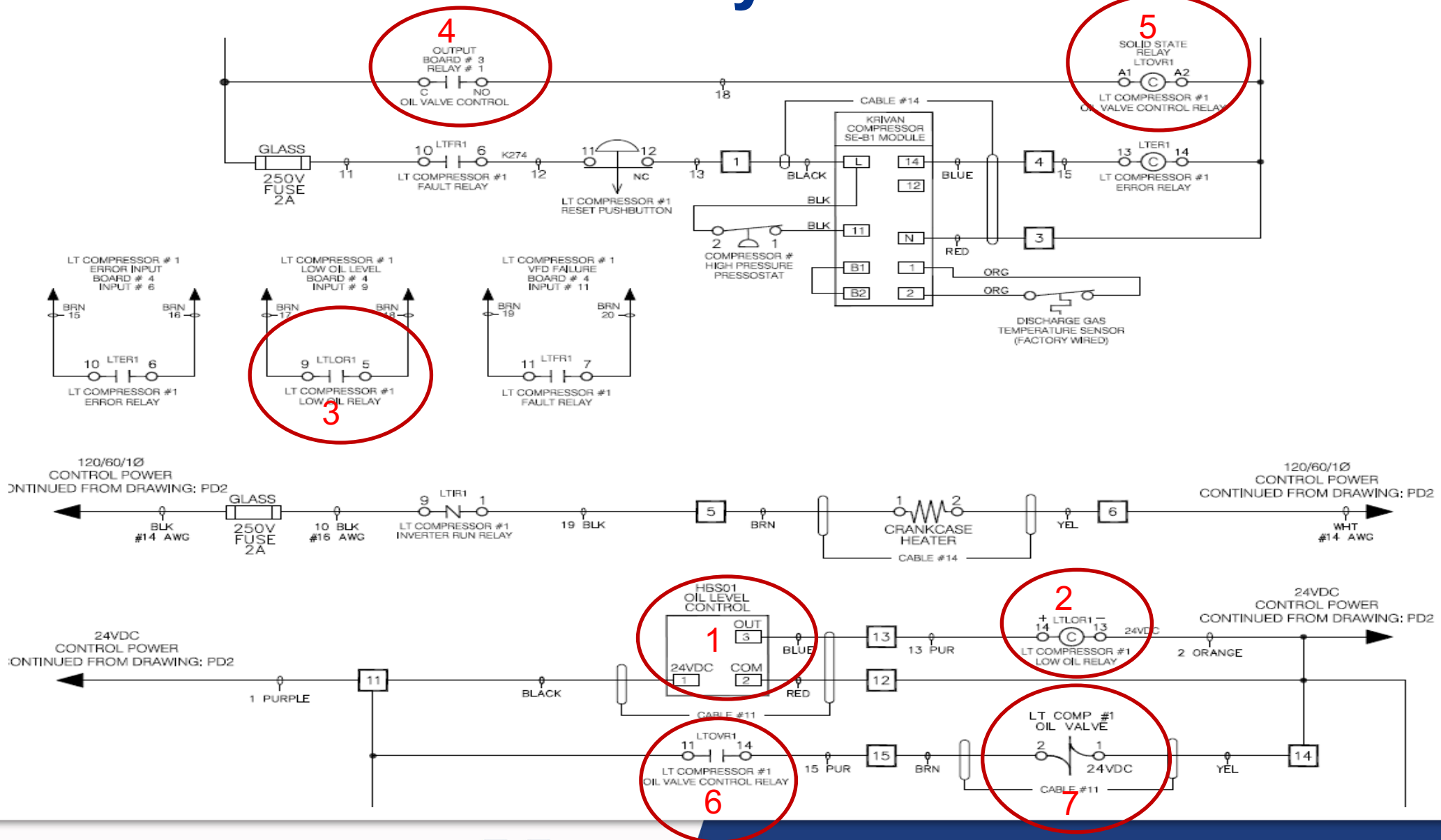


# Discharge Oil Separator Relay

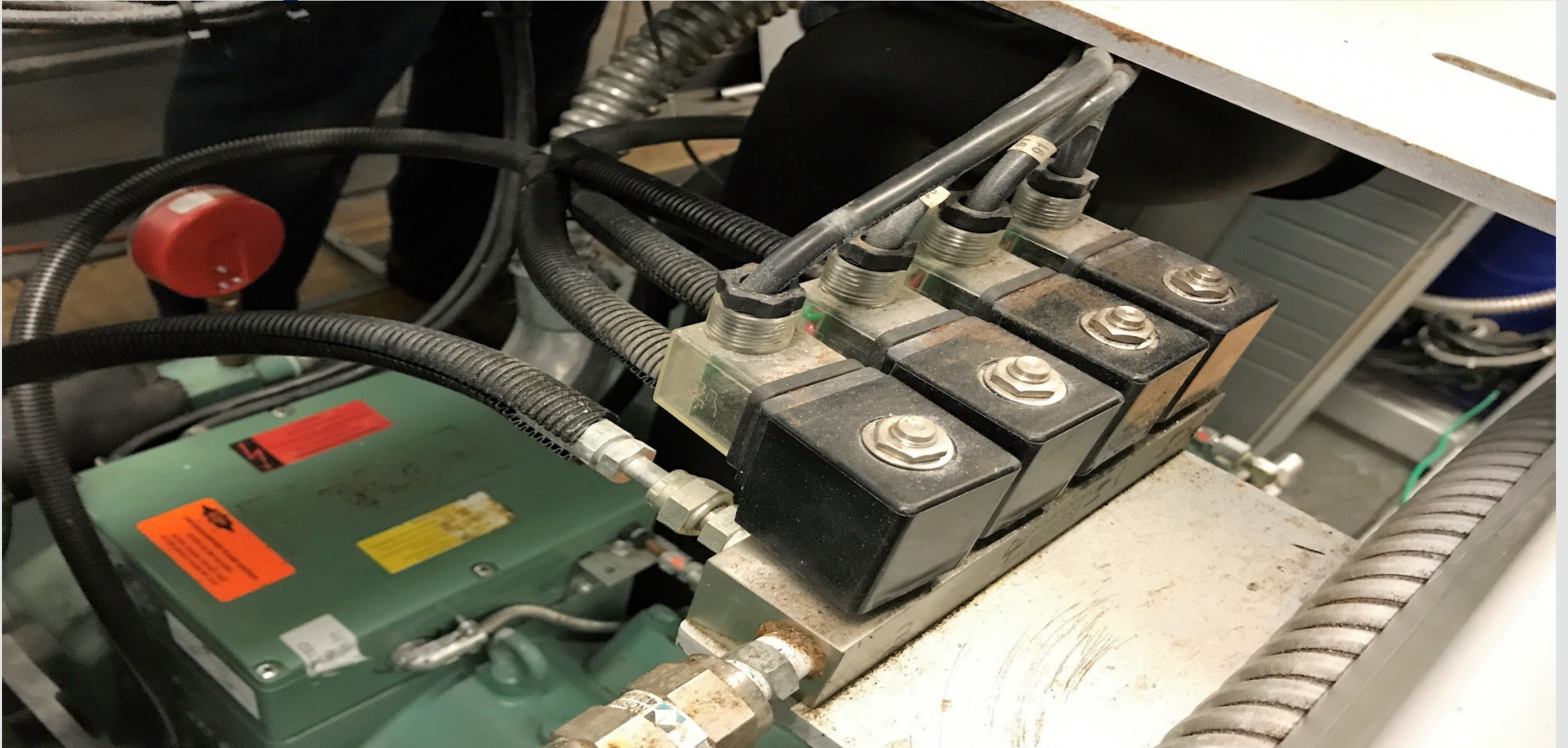




# HB Sensor Oil System Electrical



# Oil System Solenoids used with HB Sensor





# BSE85K Bitzer Booster Oil



# Quick Ship Program Locations



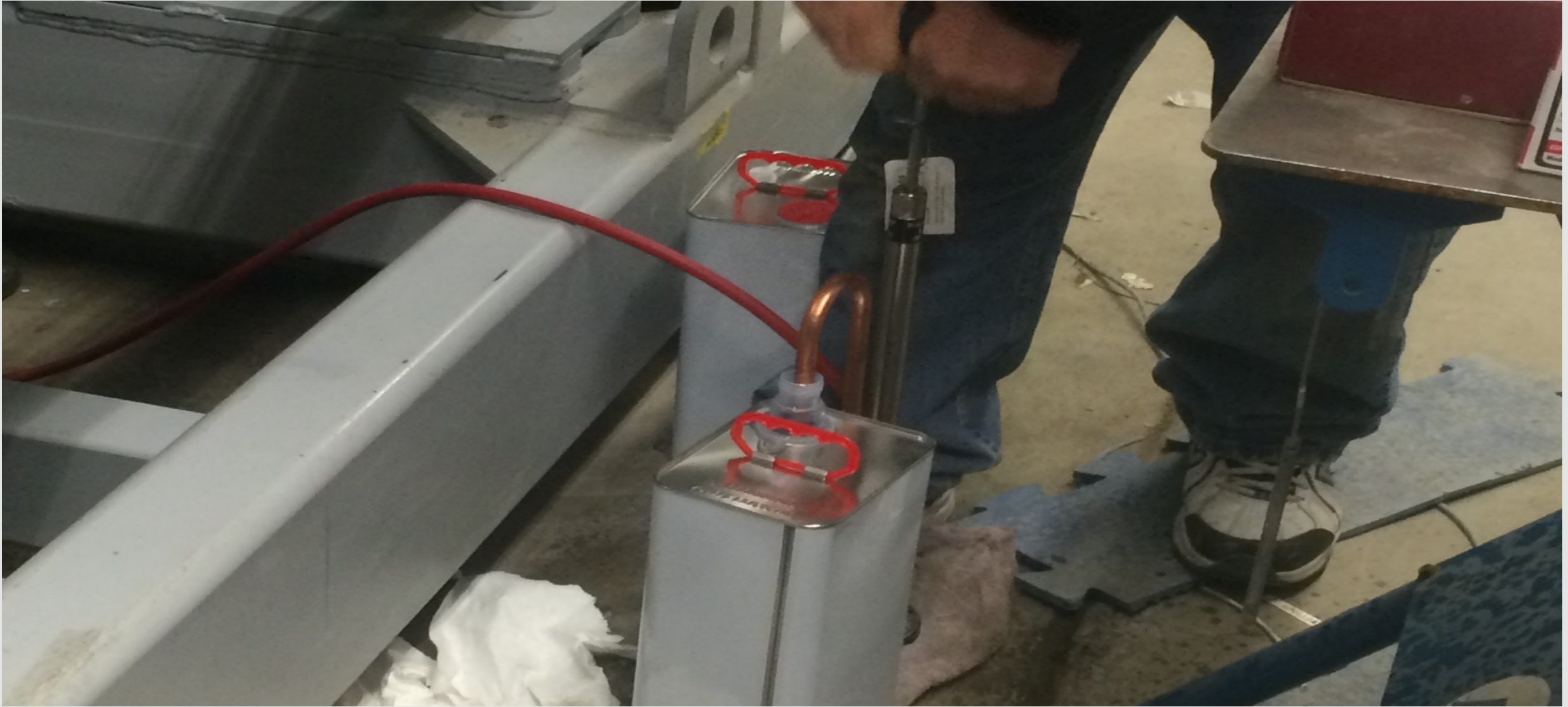
QUICKSHIP PROGRAM LOCATIONS

1 888 Go Bitzer (462.4893)





# Adding Bitzer BSE85K POE Oil



# Emerson High Pressure Oil Systems OMB/C

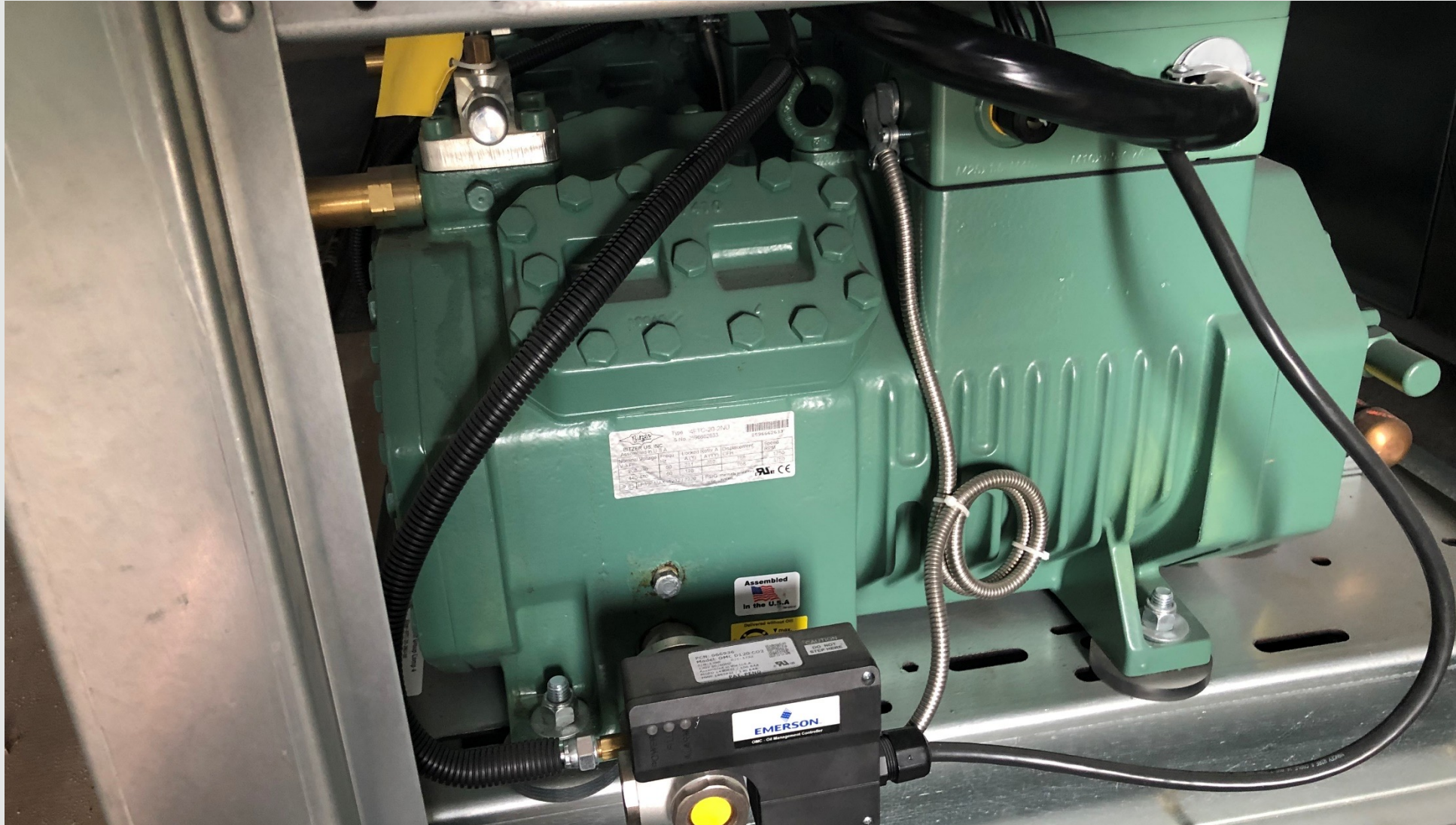


# Low Temperature Compressor's Oil Sensor



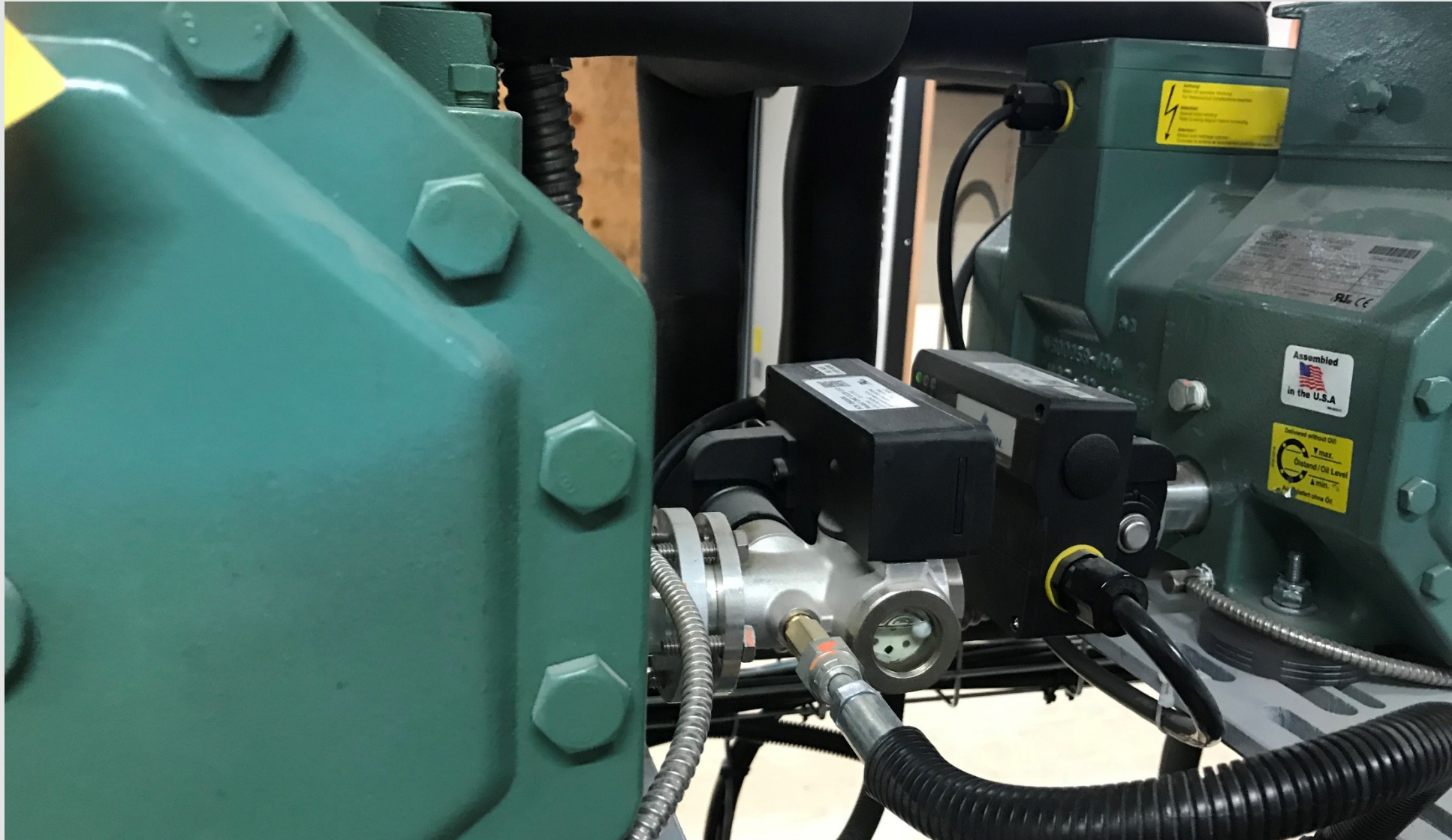


# High Pressure Oil Sensor OMC

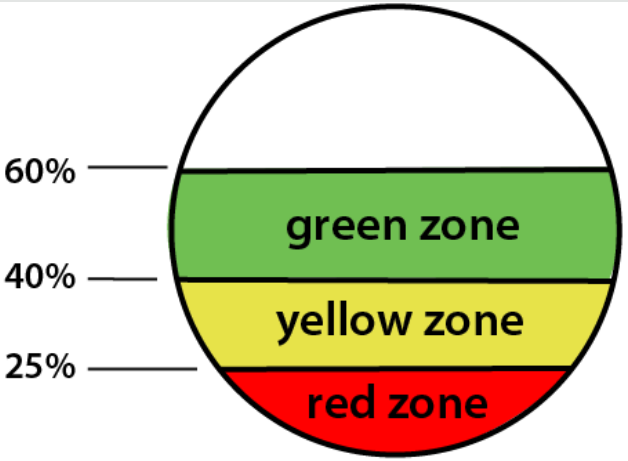




# High Pressure Oil Sensor OMC



# LEDs on Oil Level Control



LED COLOR	STATUS/FUNCTION
● Green	Oil Level in Green Zone (60% - 40%)
● Green    ● Yellow	Oil Level in Green Zone (60% - 40%) & Injection
● Yellow	Oil Level in Yellow Zone (40% - 25%) & Injection
● Red    ● Yellow	Oil Level in Red Zone (25% - 0%) & Injection



# Compressor w/Emerson OMB/C Oil Controls

## LED Codes When Lit:

**Green** – 24 VAC power is supplied to OMB.

120 or 208 VAC power is supplied to OMC

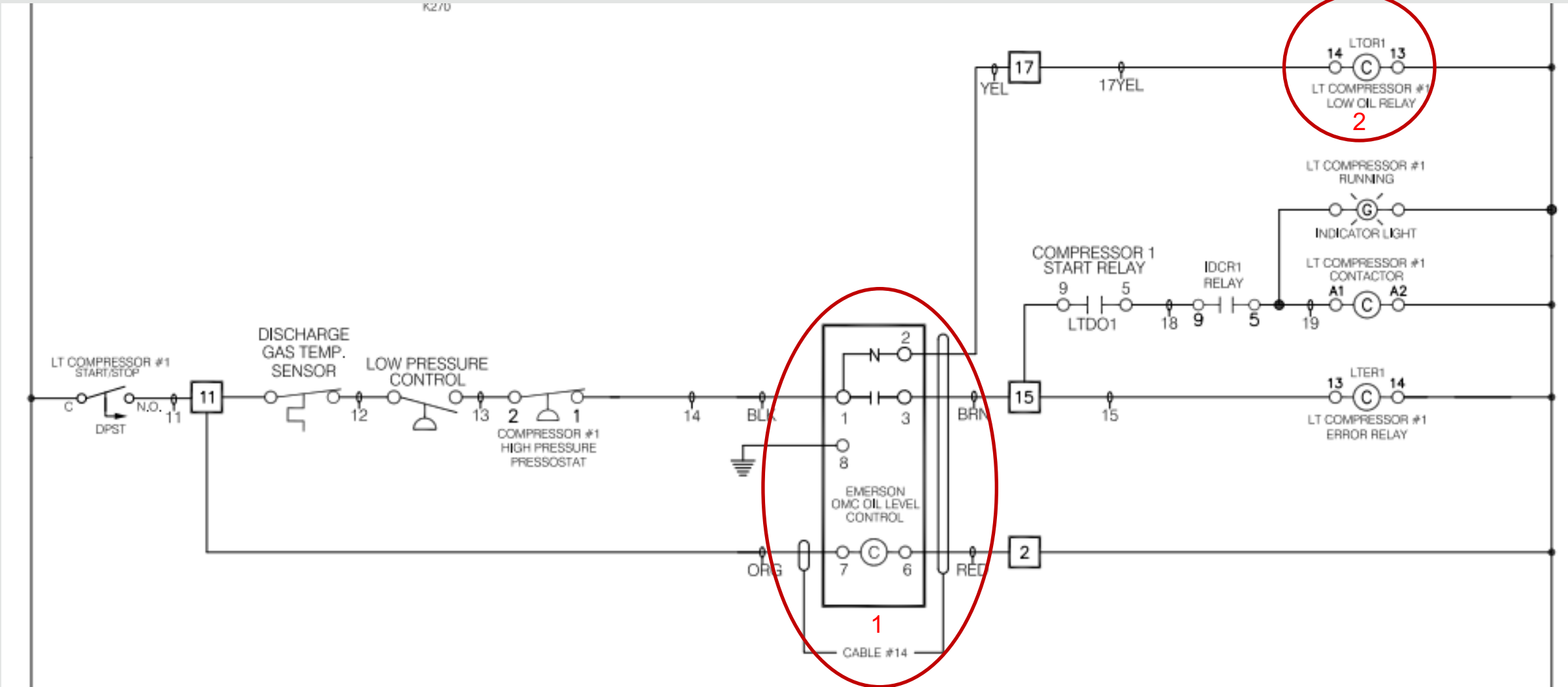
**Yellow** – Float sensor determined that the oil level has been below ½ sight glass for over 10 seconds. Fill solenoid has been activated.

**Red (continually lit)** – Oil level has remained below ½ sight glass for over two minutes after fill solenoid has been activated. Alarm has been activated and compressor is prevented from operating until oil level reaches ½ sight glass when alarm automatically resets.

**Red (flashing)** – There have been **five auto reset** alarms registered within a 30 minute period. **Alarm circuit is now locked on and compressor locked off.** Fill solenoid is de-energized. Alarm remains locked in until 24 VAC power lead is manually unplugged and again plugged back into device

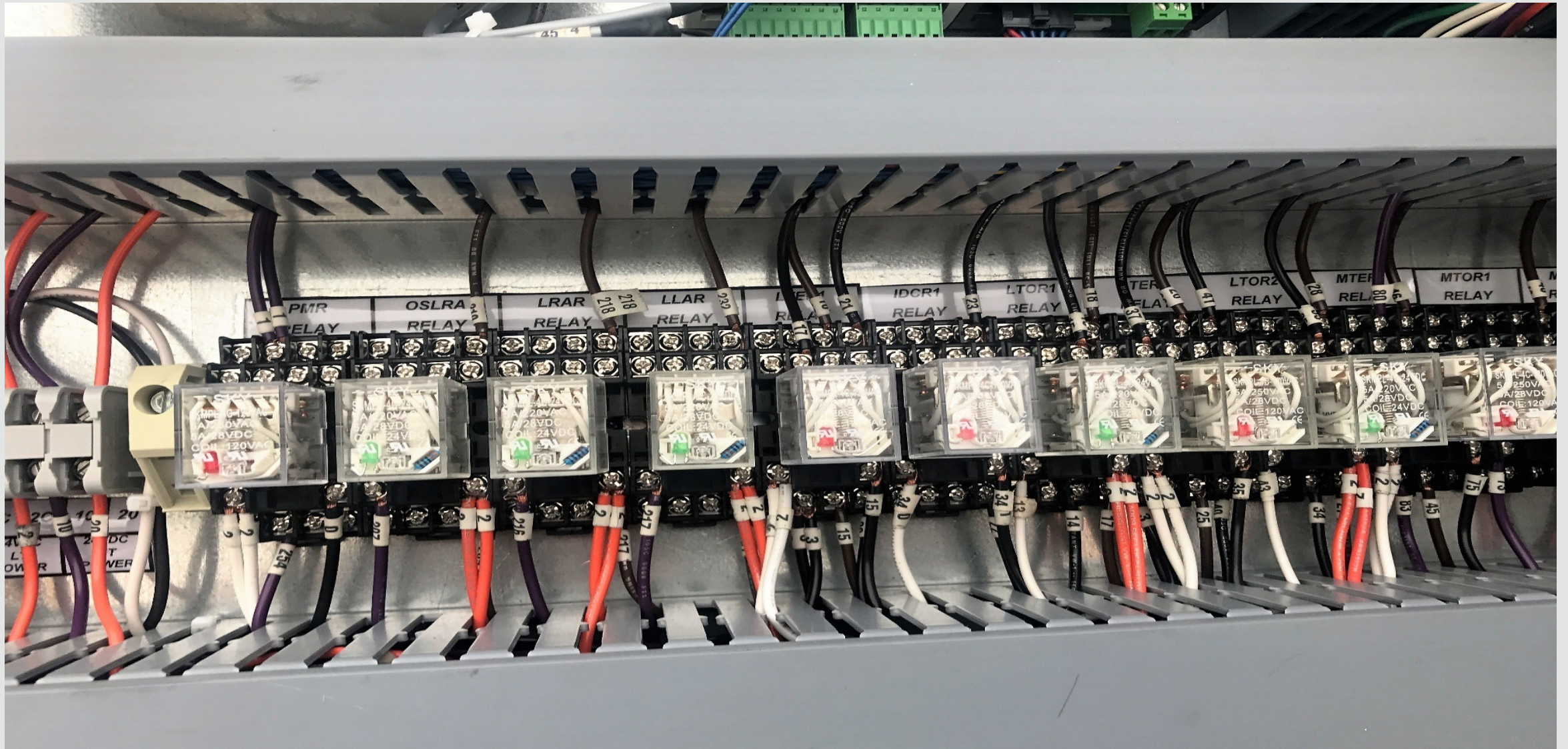
# Low Temp Oil System

K2/D





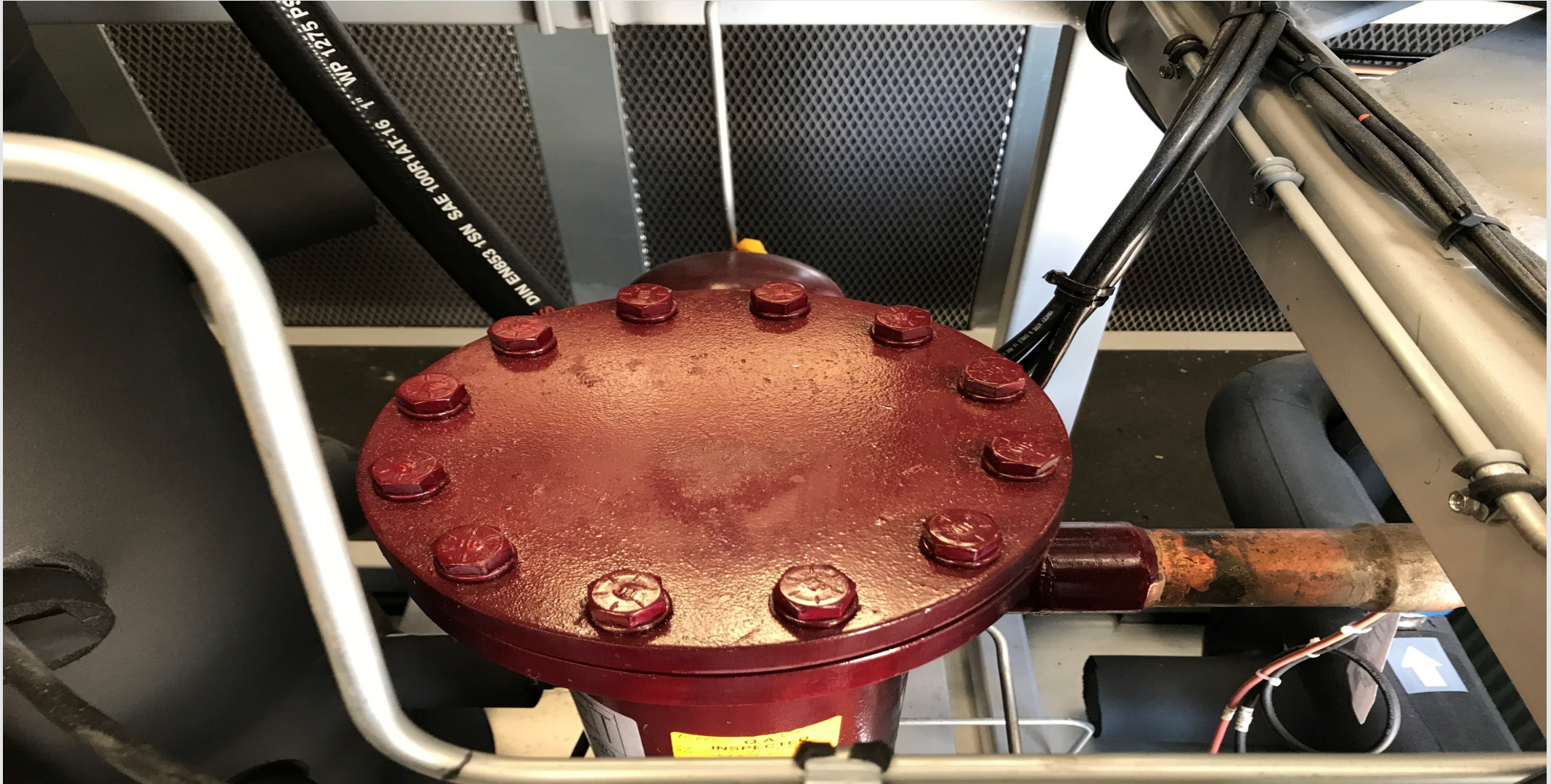
# Oil Relays



# Changing out a Temprite Cartridge



# Discharge Oil Separators





# Spider with Cartridge





# Gasket on the Temprite Cartridge





# Oil Separator Cartridge with Lid Gasket



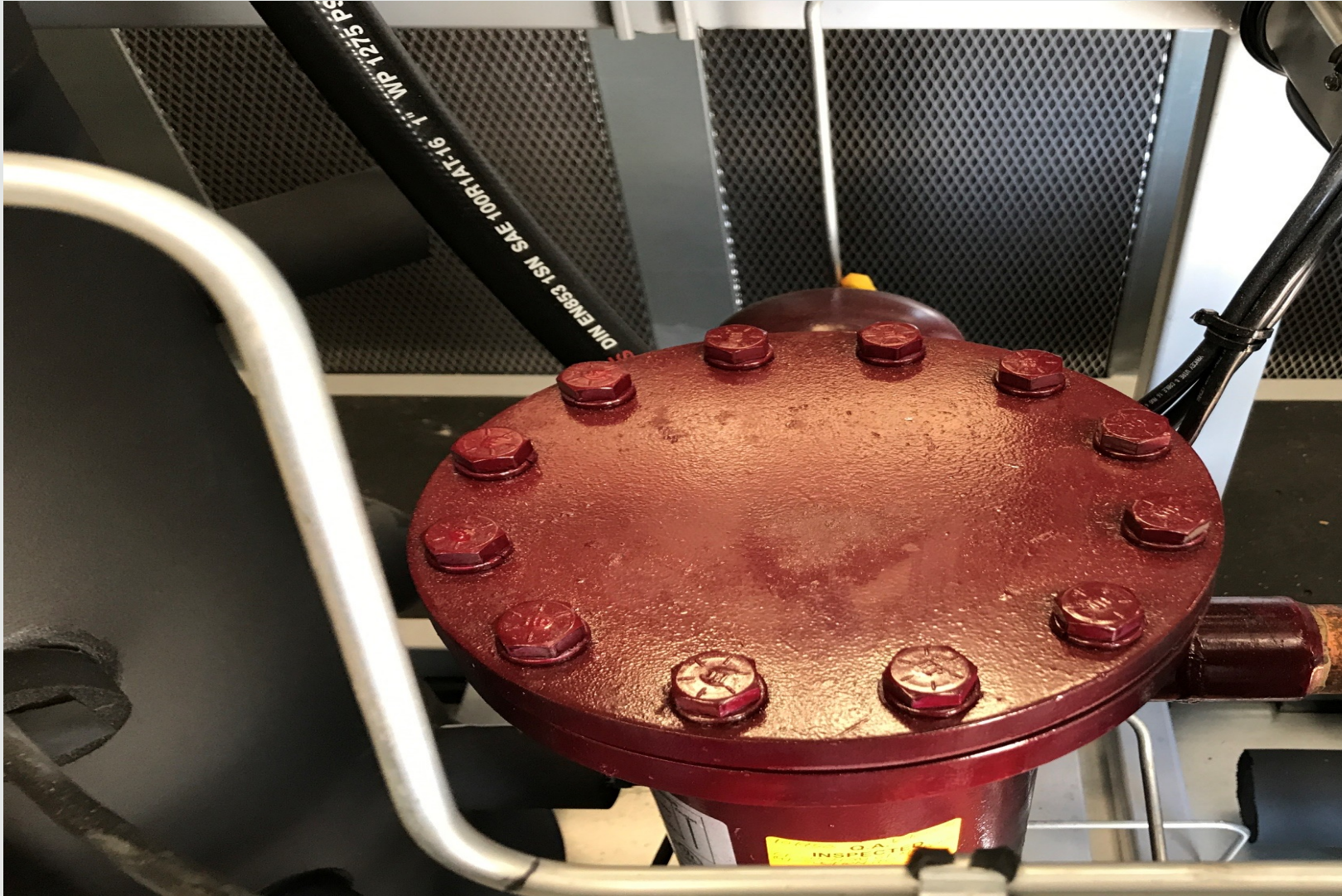


# New Oil Filters





# Discharge Oil Separators



- Remember to tighten lid in a star pattern to 50 ft/lb



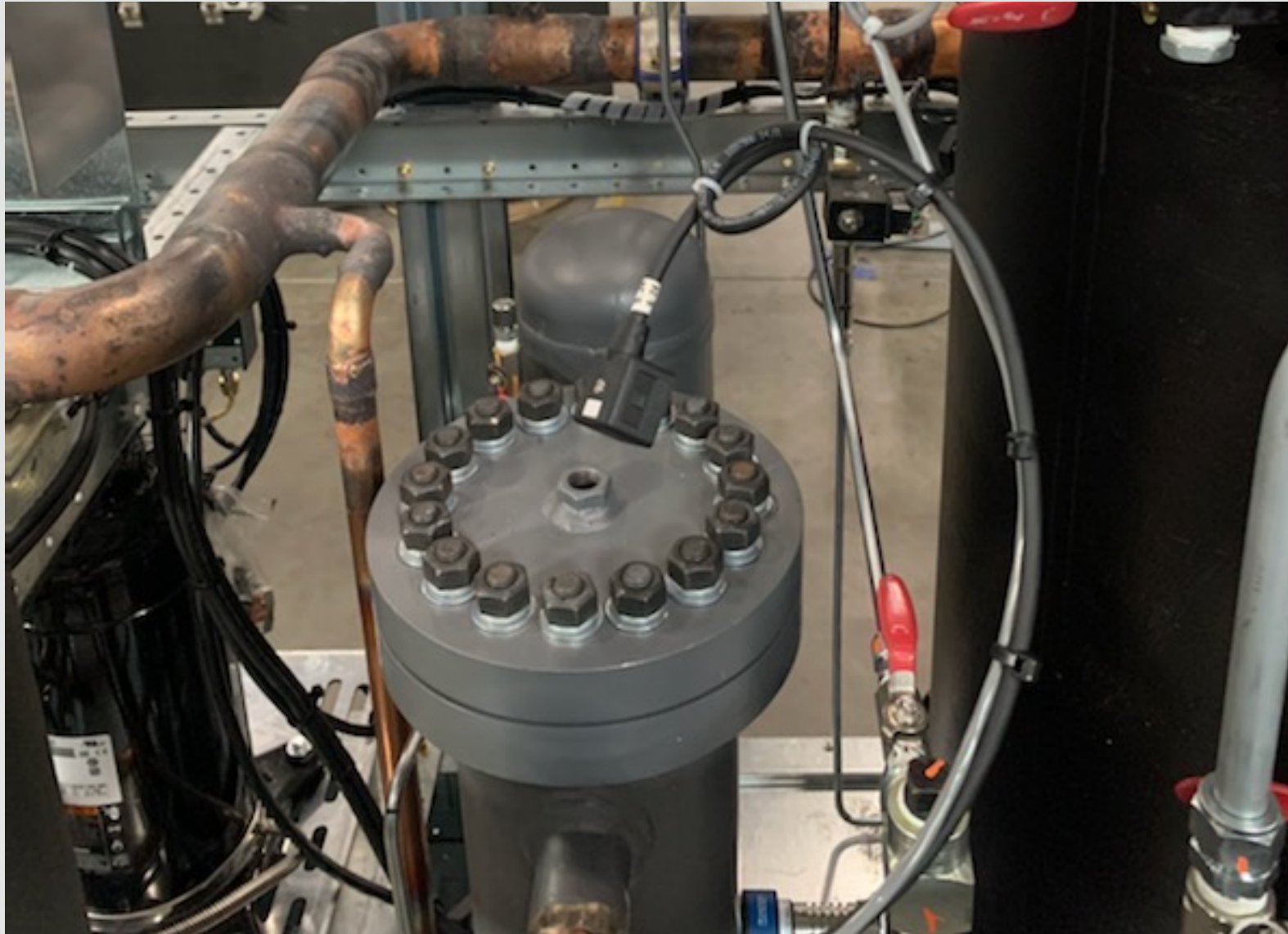
# Changing Out an Westermeyer Coalescing Oil Filter

# Westermeyer Oil Reservoir and Coalescing Oil Separator





# Westermeyer Coalescing Oil Separator



Remember to  
tighten lid in a star  
pattern to 55 ft/lb

# Westermeyer Coalescing Oil Separator





# Westermeyer Coalescing Oil Filters



# Westermeyer Failed Gasket





# Westermeyer Coalescing Steel Gasket



# Westermeyer Coalescing Oil Filter





# Westermeyer Coalescing Oil Filter



# Questions?



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2. Provide your name and email at the end of the survey

***Please Note:*** You will not receive a certificate unless you share your name on the survey form.

## Troubleshooting Booster Oil

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