



805 13th Street North
Humboldt, IA 50548
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TECH TIPS

Troubleshooting: Compressor or Compressor Clutch Failure

Most common reasons for compressor failure

1. Lack of lubrication
2. Excessive pressure
3. Overheating
4. Contamination/other system component failure
5. Excessive Oil
6. Electrical problems
7. Mechanical or Installation problems

Causes defined:

(1) Lack of lubrication

A) Leaks in System

1. As refrigerant leaks out, it takes oil with it
2. Topping off system without adding oil
3. Lower pressure allows oil to fall out of suspension
4. A6 & York/Tecumseh compressors have an oil reservoir for primary lubrication, other compressors depend on oil circulating with refrigerant

B) Internal Restriction

1. Reduces low side pressure
2. Oil drops out of suspension with refrigerant vapor
3. Oil left in evaporator and or filter/drier
4. Restriction itself can knock oil out of suspension

(2) Excessive High Side Pressure

A) Causes overheating and rapid wear of internal parts

B) Causes clutch slippage

C) Reasons for excessive pressure

1. Lack of air flow through the condenser
2. System is overcharged with refrigerant
3. Internal restriction in the system
4. Contaminated refrigerant
5. Air in the system



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(3) Overheating

- A) **Causes oil to thin allowing contact between moving parts**
- B) **Can cause rapid expansion of parts leading to seizure or excess clearance promoting noise and uneven wear**
- C) **Leak in system - refrigerant is coolant for compressor**

(4) Contamination/other system component failure

- A) **Types of contaminants**
 1. Metal particles and Teflon seal particles
 2. Desiccant- from filter/drier or accumulator
 3. Moisture - which leads to acid formation
 4. Unapproved refrigerant or flushing solvents
- B) **Failures Caused by contaminants**
 1. Internal restriction - causing lack of lubrication, excessive high side pressure, resulting in compressor overheating
 2. Corrosion & acids - when moisture is combined with refrigerants containing chlorine, hydrochloric acids can form. These greatly increase the corrosion of metals, causing expansion valves to stick
 3. Unapproved solvents such as alcohol, brake clean, industrial cleaners, etc. leave trace chemicals and can leave pockets of liquid solvent that won't necessarily boil off under a vacuum. These solvents as well as some unapproved refrigerants (i.e. HC12) are combustible/flammable and can literally explode in a compressor.

(5) Excess oil in system

- A) **Large quantity of oil (instead of mist-like droplets) reaching an operating compressor can bend or break reed valves**

(6) Electrical problems

- A) **Major Cause of clutch failure**
 1. Low voltage, poor ground, poor connections will lead to clutch slippage and burning even at low to normal head pressures
 2. Malfunctioning pressure switches can rapidly cycle the clutch causing premature failure
 3. Electric condenser cooling fans can cause excessive head pressure



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(7) Mechanical or Installation Problems

A) **Types of Mechanical Compressor problems (out of the box defects)**

1. Compressor won't turn (even with spanner wrench or cheater bar)
2. Compressor has tight spot or flat spot when turned by hand
3. Excess shaft end play
4. Tight or flat spot, rough clutch bearing
5. Oil leaking around compressor assembly bolts
6. Snap ring groove worn or broken
7. Mounting bolt hole - threads bad

8. Oil leaking past shaft seal
9. Bent pulley (usually a shipping problem)
10. Uneven or excessive air gap
11. Clicking noise when hand turning
12. Compressor not pumping
13. Compressor locks up within the first 5 minutes of operation

B) **Types of Compressor installation problems**

1. Compressor failure due to improper installation
2. Compressor failure due to miss-diagnosis
3. Not flushing the system or using unapproved solvents
4. Using an in-line filter in the wrong location
5. Using unapproved refrigerants (HC-12)
6. Not changing the required components
7. Not hand turning compressor to remove oil from the top of the pistons
8. Not allowing enough run time for front shaft seal to seat