March 29. 2024

Tech Tip: FLEXX / FLEXX Eco Refrigerant Line Vibration

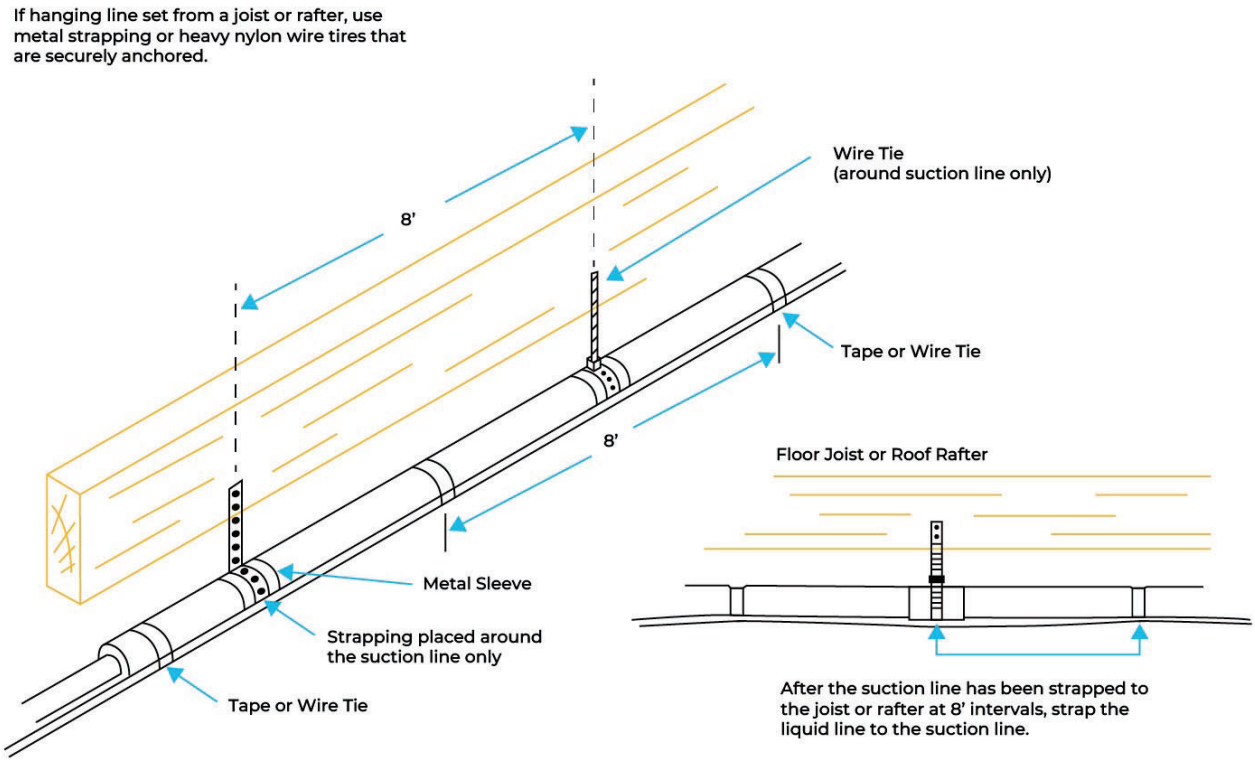
All unitary split systems can have issues with vibration. Inverter-driven compressors that run at high frequencies, mostly during heating mode, can especially be sensitive to vibrations in the refrigerant lines. There are different causes for this occurrence:

- **Structural resonance** - oscillating force from the compressor or refrigerant pulsations match the natural resonant frequency of the line set.
- **Forced vibration** - the mechanical vibration of the compressor translates directly into the piping.
- **Acoustic resonance** – the piping's geometry causes turbulence in the refrigerant which creates vibrations in the line.

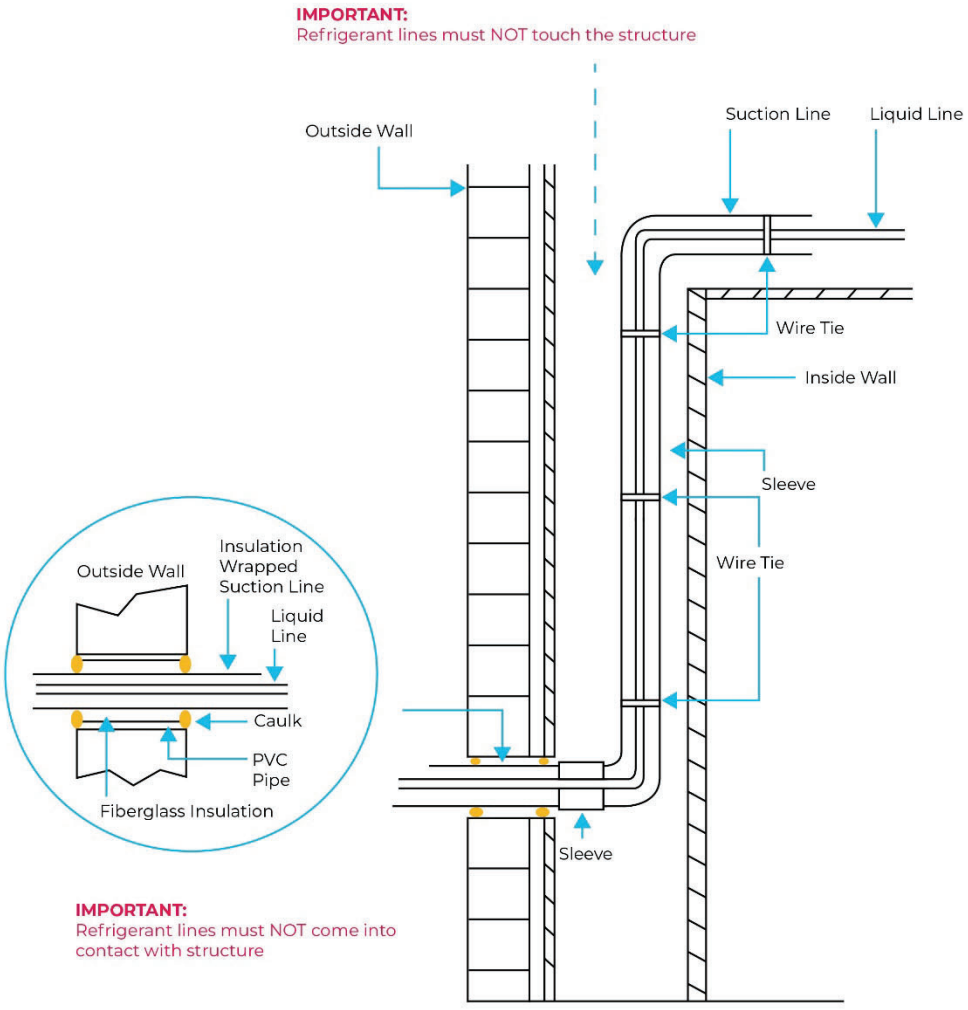
Tips to help mitigate excess refrigerant line vibration:

- Ensure the **system has been properly charged** with the correct amount of refrigerant.
- During cold weather, **make sure the compressor crankcase heater is operational and has been powered on for the manufacturer's recommended time**. Starting a cold system can slug the compressor with liquid and prevent proper lubrication of mechanical parts inside the compressor, causing excess vibration and wear.
- If using a **ducted air handler, ensure the system has proper air flow** for your application. Improper air flow can lead to liquid refrigerant slugging the compressor in cooling mode and elevated pressures in heating mode.
- **Keep refrigeration lines as stiff, light, and straight as possible**. If necessary, only use long, sweeping formed bends or long-radius fittings. Formed bends with a bend radius greater than 10 pipe diameters have a very low pressure drop and acoustically behave like a straight section of piping. Never use sharp bends or short-radius fittings.

- **Secure horizontal sections of pipe as shown** in the picture below. Do not secure piping directly against building materials. Always use an approved hanger strap to isolate vibration.



- When running a line set in a wall, make sure the **piping only runs in the void space** of the wall as shown below. If the line touches any building materials, vibrations can transfer from the line into the structure.



- For FLEXX and FLEXX Eco systems, **GREE specifies a 3/8'' liquid line and a 3/4'' suction** line. Using sizes other than what is specified may cause line set vibration issues.

- **Accessories such as refrigerant line weights, discharge line mufflers, or vibration absorbers can be used** to reduce vibration. Line weights should be added to the section of pipe where vibration is occurring. Discharge line mufflers or vibration absorbers should be installed as close to the compressor as possible. GREE does not manufacture these accessories, but they can be purchased from 3rd party manufacturers. Please reach out to your local distributor to source these items.

Note: Vibration can also be caused by the outdoor unit's mounting system. When mounting the outdoor unit, utilize vibration isolators. If the unit is pad mounted, ensure the pad is not directly touching the structure. (Ex. If the pad is touching the structure's foundation, vibration will flow though the unit pad into the structure.)