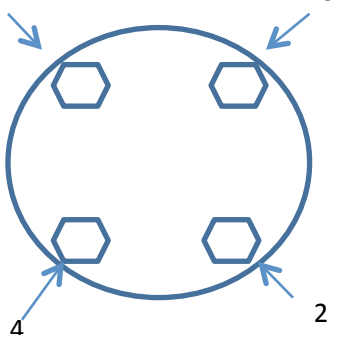
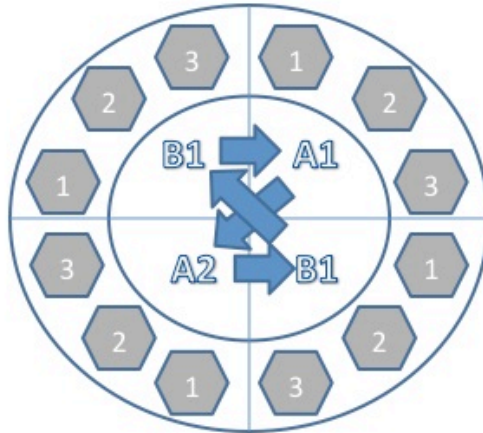


Flange One-Point Lesson

Failure: Flange Leaks	Root Cause/ Solution	
Bolts Improperly Tightened	Loosen the bolts and retighten them using the 180/90 degree tightening pattern. Like on a car tire tight a nut and go to the fastener 180 degree from the first fastener and tighten. Go to the fastener that is 90 degree from second and tighten. Go to the fourth 180 degree from the third and continue pattern until flange is drawn up Tight to meet torque specifications.	
Flange is cracked or broken	Can be caused by misuse and abuse something dropped or hit flange. High vibration due to pipe hammering or connected to equipment that has hard start-ups and shutdowns, improper supporting (number, tightness) or piping alignment. Cut and replace flange and flange face. Correct installation to remove vibration source, pipe tension and pipe fit misalignments.	The flange will need to be replaced. Follow proper LOTO and safety procedures and remove the flange(s). Install the new flanges with proper alignment and correct any installation issues to remove vibration, pipe tension and misuse.
Wrong Gasket Material	Material is designed for the operating temperature, ingredients and pressure.	Determine the correct gasket material based on plant piping standards to meet the operating condition and replace the gasket. Check pipe alignment and flange face as you replace the gasket.

Flange One-Point Lesson

One Point Lesson – Tightening a Flange



- Start in any quadrant (A1, A2, B1 or B2) and snug bolt 1.
- Follow the arrows until all bolt 1's in all quadrants are snug.
- Repeat process for bolts 2 and 3.
- Using a torque wrench to properly tighten all the bolts per specification on the last sequence.