



Motion Terminology

Hose Live Length

The live length of the hose assembly must be sufficient in order for the hose to properly meet the movement requirements. A hose assembly with a live length shorter than suggested could cause premature failure.

Lateral Offset Motion

This motion occurs when the hose centerline is moved in a plane perpendicular to the longitudinal axis with the end remaining parallel. Dynamic offset motion should never be more than 25% of the minimum centerline bend radius. See page 25 for design information on lateral offset.

Angular Offset Motion

Angular movement is defined as the bending of the hose so that the ends are no longer parallel. Amount of movement is measured in degrees from centerline of the hose if were installed straight. See **Angular Offset Motion** for design information on angular offset.

Axial Movement

Axial movement is compression or elongation along the longitudinal axis. Metal hose assemblies installed in line with the longitudinal axis of the piping should not be subjected to axial movement.

Two design options are available to compensate for axial movement. The first option is installation of the metal hose assembly perpendicular to the longitudinal axis of the pipeline. As axial movement occurs, the metal hose assembly will be subjected to lateral offset. See **Lateral Offset Motion** for additional design information.

The second option is the use of a Class "B" traveling loop. See **Radial Movement** for design requirements of traveling loops.

Torsion Movement

Torsion movement occurs when the hose is twisted or torqued such as when the hose bends out of plane or during improper installation.

Twisting forces are extremely destructive and are one of the most common causes for premature failure.

Motion Frequency

The rate of flexure that the hose is subjected to in a given time period. Three basic types of motion frequency include vibration, dynamic motion and continuous motion.

Vibration

This is low amplitude motion occurring at high frequency. Vibration is normally found in engine exhaust, pump and compressor applications. Hose resonance must be avoided to prevent premature failure. Consult SSB Hose engineering if hose resonance is anticipated or for additional vibration data.

Dynamic/Intermittent Motion

Non-continuous or intermittent motion such as the result of thermal expansion. Dynamic bend radius is used in calculations determining the hose live length for lateral offset, angular offset and radial motion during dynamic or intermittent flexing.

Static Bend

A non-moving or fixed radius bend in a hose assembly used to compensate for misalignment.

Continuous Motion

Regular cyclic motion at a slow cyclic rate and constant travel. The dynamic minimum centerline bend radius must be doubled on continuous motion applications.

Random Motion

The uncontrolled motion of a metal hose such as motion that occurs during manual handling.

Bend Radius

The minimum radius the hose can be bent and still maintain the integrity of the hose. Usually expressed as dynamic or static centerline bend radius. The bend radius is used in calculations associated with angular and lateral offset motion.

Cycle Life

The number of cycles a hose is flexed before failure. Some factors that affect cycle life include working pressure, temperature, bend radius, hose and braid materials. SSB Hose uses the ISO10380 fatigue test standard for cycle life testing. See ISO 10380 Summary for a more complete description of the ISO 10380 standard.