9 Most Common Reasons for Hydraulic Hose Failure

1. Routing. More than 57% of premature hose failures result from abrasion caused by improper routing. To secure long hydraulic hose life, select and carefully place clamps, route through pivot points, and use protective sleeves.

2. Operating pressure. Check that the rated maximum operating pressure of the hydraulic hose is greater than the system's operating pressure. Hose lines are rated for continuous operation at their specified maximum operating pressure.

3. Pressure surges. Almost all hydraulic systems develop pressure surges that may exceed relief valve settings. Exposing the hose to surge pressures above the maximum operating pressure shortens hose life. In systems where pressure peaks are severe, select a hose with a higher maximum operating pressure, or choose a spiral reinforced hose specifically designed for severe pulsing applications. In general, hoses are designed to accommodate pressure surges and have operating pressures equal to 25% of the hose minimum burst pressure.

4. Operating temperatures. Temperature ratings refer to the maximum temperature of the fluid being conveyed. High heat conditions may have an adverse effect on hoses by degrading the rubber, which limits a hose's usefulness. In some cases, fluid being conveyed may slow down degradation, while other fluids may accelerate it. Low temperatures, although a less common concern, should also be taken into consideration, particularly in cold environments. Continuous use of hoses at maximum temperatures together with maximum pressures should be avoided. Such continuous use causes a deterioration of the physical properties of the inner tube and outer cover of most hoses, reducing the service life.

5. Ambient temperatures. Very high or low ambient temperatures affect cover and reinforcement materials, reducing the life of the hose. Ambient temperatures, in conjunction with internal temperatures, should be considered. This situation can occur in hot process piping operations. For specific recommendations consult the manufacturer.

6. Bend radius. Recommended minimum bend radius is based on maximum operating pressure with no flexing of the hose. Safe operating pressures decrease when the bend radius is reduced below the recommended minimum. Flexing the hose to less than the specified minimum bend radius reduces hose life. The precise bend radius is measured at the inside curvature of the hose and is often difficult to determine. In general, avoid flattening or kinking any hose.

7. Chemical resistance. Consider the chemical resistance of the fittings, O-rings, hose cover, and inner tube. Covers are designed to resist most common mildew, cleaning solvents, oils, and fuels. Charts detailing the chemical resistance of hose inner tubes, O-rings, and fitting materials are found in manufacturer's handbooks.

8. Vacuum service. Vacuum service is not recommended for double-wire braid or spiral-wire reinforced hose. If vacuum data is not given in a catalog, then the hose is usually not recommended for this type of service. In addition to specific applications, the pump inlet line of hydraulic systems is frequently subjected to vacuum or negative pressure. Hoses specifically designed for vacuum service have an integral steel coil in the reinforcement lining that does not disrupt fluid flow.

9. Fittings. For any hydraulic hose to be useful, it must have a fitting at each end. In selecting fittings, a decision must be made between crimped and reusable styles. A fittings configuration, as well as a strategic selection of elbows and jump-size components, should be considered for long-life use. Follow manufacturer's recommendations for fitting assembly procedures.