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Five easy tips to optimize coupling performance

THERE ARE TWO TYPES OF COUPLINGS AVAILABLE on the market: sliding and deforming. Sliding couplings eventually wear due to parts that slide across each other during misalignment, such as gear, grid and jaw types, with several requiring lubrication to perform properly.

Deforming couplings, such as disc, diaphragm and elastomer couplings, are marketed as "low maintenance" as they don't require lubrication and are only limited by material or shelf life, with many offering infinite life if maintained properly.

Despite recent advancements in coupling design and manufacturing, nearly all couplings eventually show wear if not properly installed and maintained. To help couplings perform better and last longer, there are some easy tips to follow.

Keep track of installation and maintenance instructions: Regardless of coupling type, proper installation and maintenance is imperative for safety and maximum life. A good start is reading and understanding coupling installation and maintenance instructions. Far too often, this documentation is misplaced by the time the coupling reaches the installation site.

Know alignment limits: Coupling alignment, consisting of a combination of shaft offset, angle and axial movement, is important to know prior to installation. Equipment alignment is typically tighter than coupling alignment. Minimal axial movement does not affect lubricated couplings.

This is not the case with deforming couplings. Axial growth or movement from a neutral position creates constant stress in the flex elements that decrease the ability to transmit torque and handle angular misalignment. Prior to installation, familiarize yourself with misalignment limits and recommended running angles for all couplings by checking the installation instructions, not product catalogs or marketing literature.

Don't over- or under-tighten bolts: Unlike other power transmission components, couplings often include bolted connections that transmit torque. A torque-transmitting coupling bolt is designed to optimize its clamping of the mating parts while still carrying shear stresses induced by torque. When a bolt is over-torqued, it is less able to carry shear stresses, leading to failure. In an under-torqued bolt, lack of clamping can loosen the connection. A loose bolt will slide relative to its mating parts and fret. Over time, the loose connection will cause fatigue failure.

Bolted coupling connections are designed so a certain number of bolts always carry the torque load. This is why most torque-carrying bolted connections consist of body-fitted or coupling bolts. Never substitute a regular bolt for a coupling bolt.

Use the right lubricant: Lubricant is the lifeblood of lubricated couplings. Seventy-five percent of premature coupling failure is attributed to lubrication issues: old lubricant, leaking lubricant, insufficient lubricant or incorrect lubricant. In addition, maintenance personnel don't always realize that couplings require a different lubricant than bearings.

Bearings use grease classified by the National Lubricating Grease Institute (NLGI) as Grade 2. Couplings require a grease equivalent to NLGI Grade 1 to withstand centrifugal forces created by rotation. An NLGI Grade 1 grease incorporates thickeners with a density closer to oil, manufactured to resist centrifugal separation. Using bearing grease in a coupling will lead to premature failure.

Practice preventive maintenance: Regardless of coupling type, perform periodic checks according to installation and maintenance instructions. It's important to note that couplings can be checked without shutting down an application or dismantling the components.

With lubricated couplings, thermography can be incorporated as a predictive maintenance tool. By knowing the typical operating temperature of a coupling, it is possible to identify variances and lubricate the coupling prior to failure. If the temperature subsides, lubricate the coupling. If the temperature remains elevated after lubrication, thoroughly inspect the coupling during the next scheduled down day for damage.

Inspect general disc couplings dynamically using a strobe light. By adjusting the flash, disc pack links can be visually inspected to look for buckling, corrosion or cracks that are usually only seen when the coupling is still.

Optimize coupling performance

Carefully following installation and maintenance guidelines that address misalignment issues, bolt tightening torques and coupling lubrication is critical to ensure coupling performance. In addition, regular inspection and maintenance can prevent extensive and costly downtime.

MAINTENANCE MATTERS