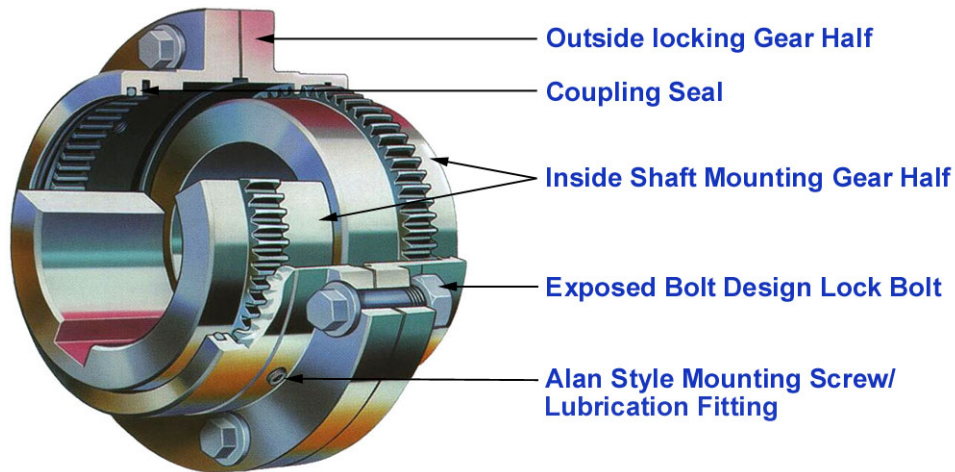


CONDITION MONITORING STANDARD Version 1.2 COUPLING GEAR

Basic Principle

The function of the gear coupling is to connect two shafts. The gear coupling consists of two inside metal gear halves each connecting to one shaft and to the external gear, and a metal external gear connecting the inside gears. This coupling is designed to handle heavy loads. Remember to consider driving and driven components loading and stress before accepting misalignment in any type of coupling.

Gear Couplings are best suited for heavy load, slow speed applications.

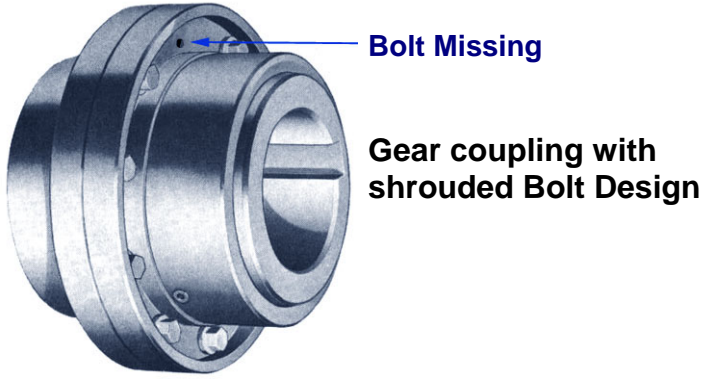


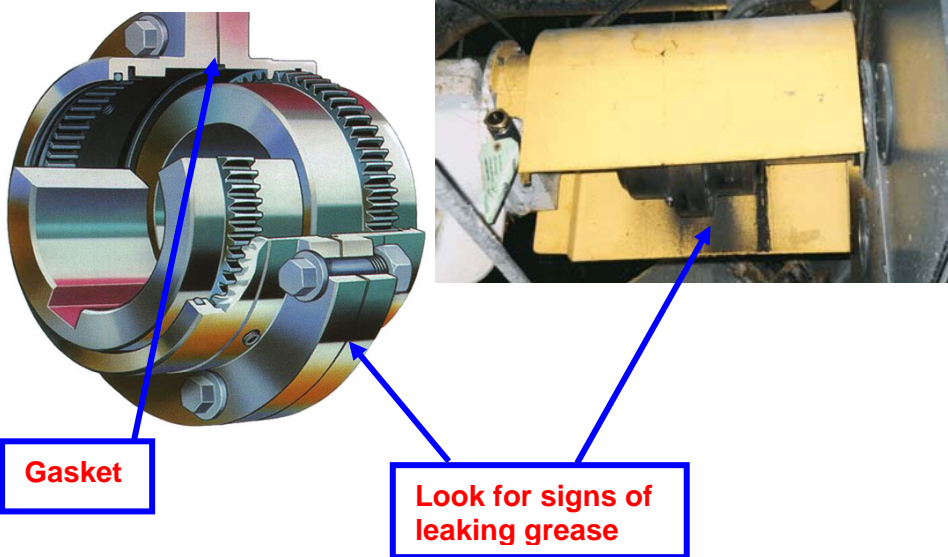

Picture Courtesy: Falk Corporation

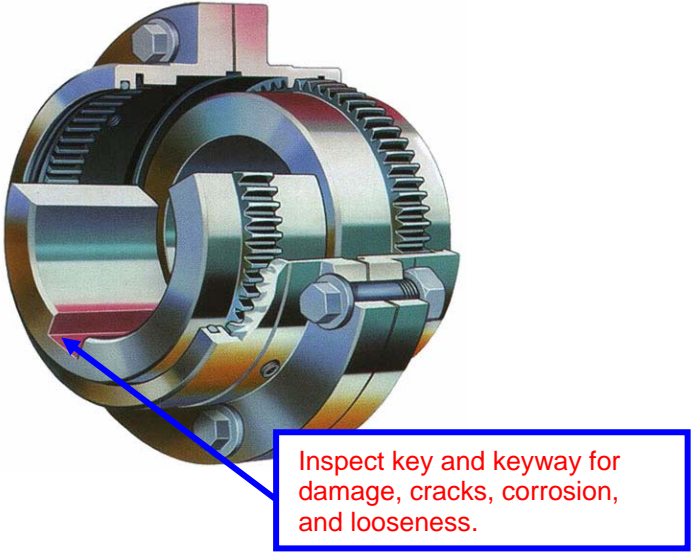
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NOTE: Visual and thermal inspection requires direct access to coupling, thus coupling guard must allow safe access to coupling. If coupling cannot be seen, modify guard at earliest convenience.

KEY	WHAT	WHY
Noise	Listen for abnormal noise. Wearing/broken coupling may have a high pitched squeak or rattle.	Noise may be due to: <ul style="list-style-type: none"> • Misalignment. • Imbalance • Loose Bolts • Lack of Lubricant • Chipped Teeth

KEY	WHAT	WHAT
Visual	<p>Use a stroboscope to visually “stop” the coupling. Look for excessive dirt and buildup on coupling. Look for grease emitting from coupling. Look for loose/missing bolts or cracks on flanges. Look for looseness in coupling outside flanges. Check for moisture on coupling</p> <div style="text-align: center;">  <p>Bolt Missing</p> <p>Gear coupling with shrouded Bolt Design</p> </div>	<p>Dirt and buildup on coupling may cause imbalance. Metal particles indicate wear inside coupling. When grease is coming out of the coupling the seal is broken and needs to be replaced.</p> <p>Missing bolts will loosen the coupling, and may also cause imbalance and this in turn will damage driven and driving components. Excessive moisture will tend to shorten the lubrication life span of the coupling.</p>
Temperature	<p>Check coupling for increased temperature. Scan across the coupling for the highest temperature reading. Maximum allowed coupling temperature should not exceed 40°F above ambient temperature (depending on grease used). When temperature is too high, check vibration and balancing of entire system (Ex. Motor – Coupling – Pump) and modify to correct. Further ensure that coupling is greased properly on following shutdown. (Falk suggests 3 year lubrication interval on their Long Term Grease used for Gear Couplings)</p>	<p>Temperatures in excess of 250°F will permanently damage the seal (Unless special seal). Coupling temp. in excess of 40°F above ambient temperature may be due to misalignment, imbalance or lack of lubrication. Misalignment will wear coupling shaft and gear.</p>

KEY	WHAT	WHY
Leaking grease	<p>Look for leaking grease from flanges. There is a gasket between the flanges that seals the coupling from leaking. The gasket may deteriorate due to heat, or mechanical movement from imbalance or misalignment. Look inside the coupling guard for grease (that leaked from coupling).</p> <p>The manufacturer recommends changing grease in the gear couplings every 6 months. Most process plant will change grease on an annual or bi-annual frequency.</p> 	<p>The reliability of the gear coupling is highly dependent on the quality of grease inside the coupling.</p>
Guards	<p>The guard has to have an inspection opening to enable an on-the-run inspection of the coupling. Some guards must be modified. Inspection ports with wire mesh metal or inspection lids with a hinge are examples of guard modifications that will enable coupling inspection. Paint mesh matte black to increase visibility.</p>  <p>When modifying guards, refer to OSHA standard 1910.212 (for USA). The allowed size of the wire mesh depends on the distance from the coupling to the mesh. For example a 1-inch (25.4 mm) wire mesh must be at least 1.5 inches (38.1 mm) away from the coupling. If your plant applies higher standards than OSHA, make a wire mesh according to OSHA standard, then apply a hinged lid over the wire mesh.</p>	<p>Guard modification is a prerequisite for performing safe and effective condition monitoring on-the-run.</p>

KEY	WHAT	WHAT
Keyway	<p>Use a stroboscope and make sure the coupling <i>appears</i> to be stopped. Inspect shaft key for damage, cracks, corrosion and looseness</p> 	<p>The radius of keyways could be sharp. Sharp edges create <i>stress concentration</i>, therefore carefully check around keys and keyways when inspecting shaft keyways.</p> 