FALK COUPLING RESOURCE GUIDE

HOW TO EXTEND THEIR LIFESPAN AND PROTECT AGAINST EQUIPMENT MALFUNCTIONS

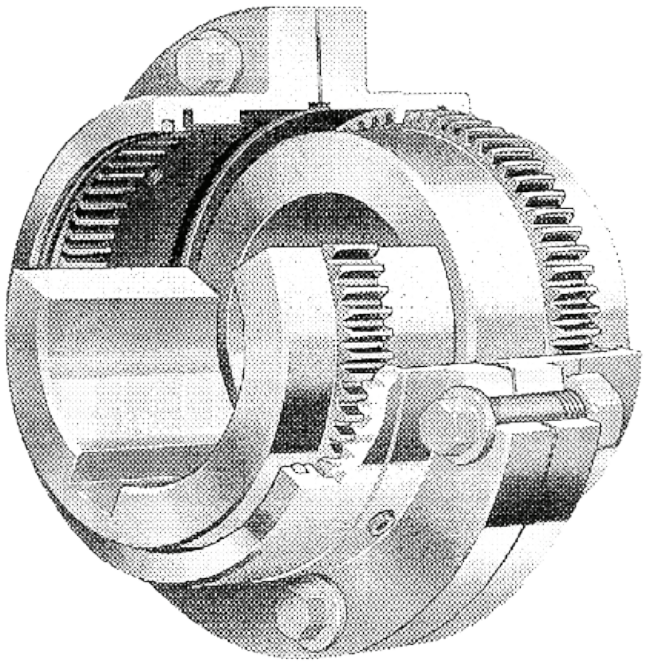
WHAT ARE COUPLINGS?

Couplings connect rotating shafts within mechanical systems. Their most important role is to transfer power across shafts, connecting the driven part to the driving motor. Couplings can also reduce shock loads, accommodate some degree of misalignment, and protect against system overload. No matter what configuration exists within a mechanical system, there's a type of coupling to transfer power between shafts. However, the wrong coupling selection can spell a costly break down. For cost efficiency and productivity, plant engineers must understand a) coupling types, b) how to best maintain couplings for maximum longevity, and c) how to protect against common malfunctions. Read on for our resource guide on how to best care for couplings.

TYPES OF COUPLINGS

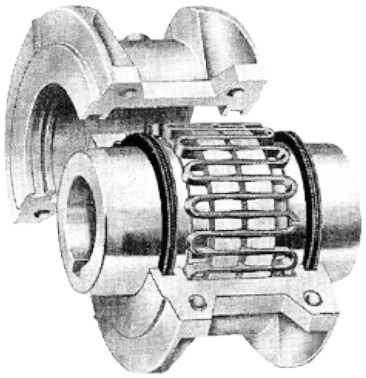
There are two overarching categories of couplings: Rigid and flexible. Rigid couplings create a secure connection, for precise alignment. Flexible couplings allow for slight misalignment between shafts. Beyond these types, multiple coupling designs exist to suit various operation requirements. Here are four common flexible coupling designs.

1. GEAR COUPLINGS, also known as G Couplings, transmit power between shafts using gear teeth. Gear couplings may pass torque between non-collinear shafts. Within a G Coupling, two joints connect the shaft. A third shaft, called the spindle, connects the joints. Falk gear couplings are easy to switch out for repair and replacement.



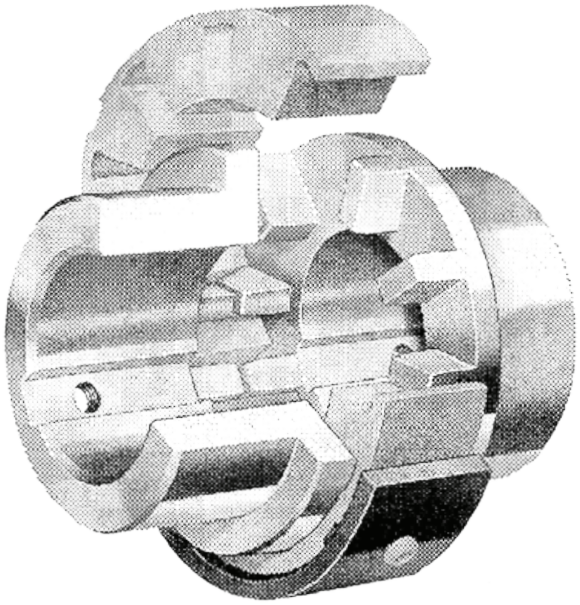
2. GRID COUPLINGS or T/F Couplings use a steel grid to transfer power. The flexible steel grid increases strength while distributing shock. Oftentimes, the design of grid couplings includes two flanged, grooved hubs. The grid holds together the two hubs while absorbing force. As the load increases, contact increases between the grid and the grooves, providing outstanding performance.

Previously, Falk sold F couplings; now they have replaced the entire line with T couplings. Gearbox specialists, including Mar-Dustrial, continue to sell F couplings, which are still in use in many facilities, although considered obsolete by the manufacturer. Compact and efficient, grid couplings suit reverse line operations and high torque loads.



3. ELASTOMER COUPLINGS / JAW COUPLINGS

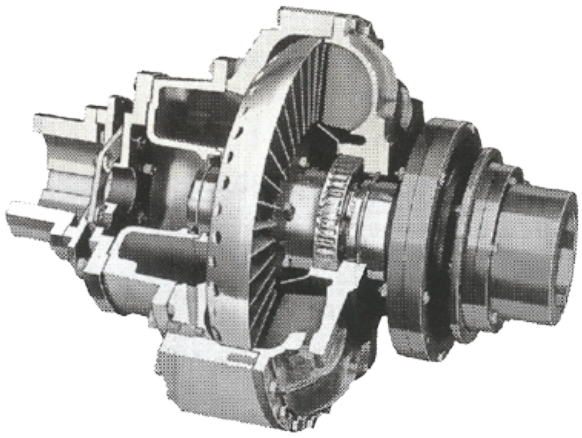
The elastomer spider within a jaw coupling fits perfectly between two crenellated hubs. Flexible and non-conductive, the spider protects against electricity and minimizes heat. A few degrees of misalignment are possible with this type of coupling. Elastomer couplings are ideal for preventing backlash in high temperature operations with slight shaft alignment.



4. FLUID COUPLINGS sometimes called Hydraulic Couplings.

The engineer who invented the fluid coupling, Dr. Hermann Fottinger, was initially inspired by the lurching action of London buses. In addition to facilitating smooth starts, fluid couplings are excellent for preventing shock loading in systems with variable speeds.

Within this type of coupling, hydraulic fluid transmits force from a driving turbine to an output turbine. A pump rotates the driving turbine. Because there is no direct contact, there is very little wear except for the sealing and bearing elements. The liquid also minimizes torque fluctuations.



Additional designs exist within each of these groups. There are dozens of types of couplings to accommodate a world of potential shaft arrangements, torque loads, and operation requirements. However, all couplings will last longer with the proper installation and maintenance, as described below.

HOW TO EXTEND THE LIFESPAN OF FALK COUPLINGS

Choose Couplings Carefully. There are dozens of important inputs for coupling selection, including service factor. This key variable specifies the maximum torque a coupling can endure. If torque is constant, the service factor may be as low as 1.0. In contrast, heavy shock loads with some negative torques require the highest service factor of 3.0.

System compatibility, operating environment, and service requirements also figure into coupling selection. Additional considerations include:

- **BUDGET**
- **SPACE PARAMETERS**
- **TORQUE, INCLUDING START/STOP NEEDS AND PEAK LOAD LIMITS**
- **STIFFNESS OF THE COUPLING**
- **SHAFT MOUNTING LIMITATIONS**
- **RPM**
- **INERTIA**

Careful coupling selection can help prevent costly repairs later. Manufacturers publish detailed instructions on how to properly select couplings.

MINIMIZE MISALIGNMENT.

Misalignment leads to friction, excessive heat, and disrepair. Laser alignment tools and alignment computers can help you effectively test for alignment. At the very least you'll need to use a straight edge, spacer bar, and feelers to check for gaps and angular alignment. This should be done consistently, as misalignment drags down overall efficiency and can lead to gearbox failure over time. Additionally, certain applications, such as motion control, require zero-backlash couplings.

FOLLOW INSTALLATION RECOMMENDATIONS.

Different couplings have different fit requirements. For instance, Falk T couplings come in either clearance fit (generally smaller couplings) or interference fit (typically larger couplings). When installing interference fit T couplings, it's required that they be heated to 275 degrees Fahrenheit. The same is not true for clearance fit couplings. To extend the life of any coupling, carefully follow Falk's installation guidelines.

KEEP COUPLINGS PROPERLY LUBRICATED.

Lubrication is the lifeblood of gearboxes—without it, failure is inevitable. Each coupling will have its own preferred type of lubrication. Many are compatible with grease, a combination of thickener and base oil. Over time, the oil seeps out of the thickener and infiltrates the coupling's parts to guard against friction.

Some couplings, however, require Long Term Grease (LTG). For instance, T couplings often see centrifugal force, which can cause regular grease to separate and cause build-up of thickener between grid grooves. LTG resolves this problem by changing consistency according to operating conditions, thereby resisting separation.

HOW TO PROTECT COUPLINGS AGAINST MALFUNCTIONS

To understand how to prevent malfunctions, it's useful to recognize the most common coupling problems.

CAN'T FIND REPLACEMENT.

Older couplings may be obsolete. As an example, remember that Falk no longer manufactures F couplings, as their new T couplings are superior. (Unlike F couplings, T couplings may be replaced in-place, with minimal disassembly required.) For managers and engineers that hope to replace an obsolete coupling, there's one option left: contact a couplings sales specialist, who may have the obsolete part in inventory. At Mar-Dustrial, we maintain a wide inventory of surplus Falk parts, including F couplings.

SOFT FOOT.

Soft foot occurs when one corner of a gearbox sits higher or lower than the others. You can expect soft foot whenever there's a lackluster connection between the casing and the baseplate. There are several root causes of soft foot:

- DAMAGED BASEPLATE, FEET, OR UNDERLYING FOUNDATION
- OIL OR OTHER ITEMS BETWEEN THE FEET AND THE BASE
- INCORRECTLY INSTALLED SHIMS BENEATH THE FEET'
- A PIPE OR SOME OTHER OBJECT PREVENTS THE GEARBOX FROM SITTING ON ITS FEET PROPERLY
- TOO MUCH TENSION ON THE FEET, DUE TO JACKBOLTS

You know you have soft foot if tightening a bolt causes a decrease in vibration amplitude. You can tighten each foot bolt, one at a time, to see if this occurs. Soft foot is a considerable problem as it causes looseness, clearance issues, and misalignment. For more details on minimizing soft foot, check out our blog on the topic.

F COUPLING GRID FAILURE.

Overload and misalignment can cause excessive cyclic load changes within F couplings. If the force is greater than the grid's ability to absorb it, the grid can snap.

HUB FAILURE.

High peak loads can break a coupling's teeth. Alternatively, the hub shank may be cracked due to improper installation. A failed coupling should be carefully documented and studied, so as to avoid future failures. Any available stats about the surrounding environment should also be noted, as they may suggest a cause for the failure.

PREVENT COUPLING MALFUNCTIONS WITH REGULAR MAINTENANCE

Consistent maintenance extends the life of couplings and ensures smooth operation. The maintenance setting for your schema will depend on a number of factors, including environment, operation requirements, job cycles, and end application. A properly researched maintenance schedule will keep the whole system working smoothly, so that no one piece is overloaded.

MAINTENANCE TASKS MAY INCLUDE:

NOISE MONITORING.

Sound vibrations are educational when tracked over time. They may change when a part is being jammed, for instance.

TEMPERATURE TRACKING.

By watching temperature at various points in the system, engineers can note unusual spikes and track down problems.

CHECKING FLUID LEVELS,

including lubrication.

Regardless of which coupling you need, Mar-Dustrial has you covered. Our expansive inventory includes thousands of surplus Falk parts. Whether you need a coupling that will always stay connected, or you prefer a system that disconnects at high torque loads, Mar-Dustrial has the Falk coupling you require. We also offer fast turn-around repair services, to minimize your downtime. Finally, we can typically answer any maintenance concerns you may have. Call us for more information on coupling selection, maintenance, and repair.