

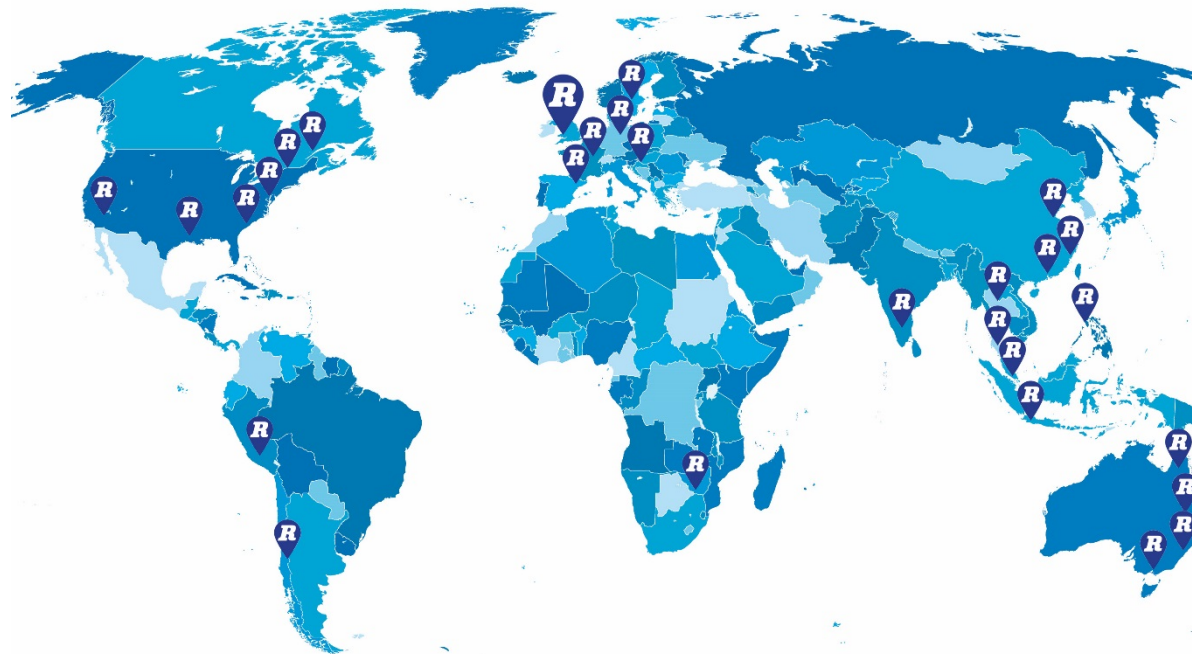
VS.



Advantages of  
Rubber in  
Compression  
Couplings

# Overview

Renold Inc. is a global market leading manufacturer and developer of coupling solutions, from Fluid Couplings to Rubber-In-Compression and Gear Couplings.



# Westfield, NY

- Established Reputation & Experience
- Vast Array of Design Features
- Multiple Coupling Configurations
- Parametric Design Capability
- Continued Design Development
- In-House Type-Testing
- Significant Manufacturing Capacity
- Best-in-Class Quality - ISO 9001
- World-Wide Sales & Service
- CEO Excellence Award Winner 2018



# Gear Couplings



## Standard Gear Coupling

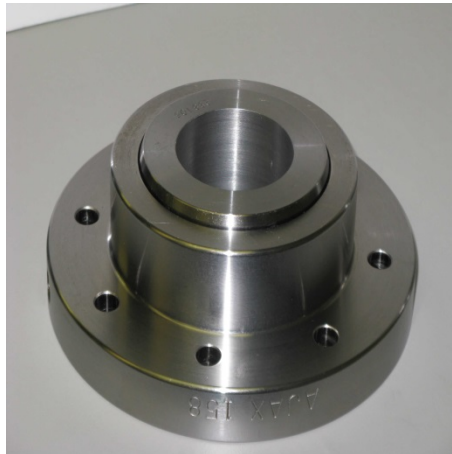
Renold Ajax carries a full line of standard gear couplings that conforms to the AGMA gear coupling specification number.

They are offered in o-ring or metal seal designs, and include quality features such as fitted bolts, crowned and barreled teeth with tooth tip piloting, and forged steel components.

The Renold Ajax metal seal design coupling uses a unique method of seal retention that will not allow the seal to separate from the ring gear during operation. This seal design also allows a metal seal ring gear to easily be converted to an o-ring seal configuration and back to metal seal if needed.

Renold Ajax standard couplings also include a line of D- and DS-Series high misalignment couplings that are capable of operation at up to 6 degrees misalignment. The D-Series couplings use a piloted flange for connection while the DS-Series couplings have a detachable sleeve for connection in applications with a diameter restriction such as levelers.

# Applications



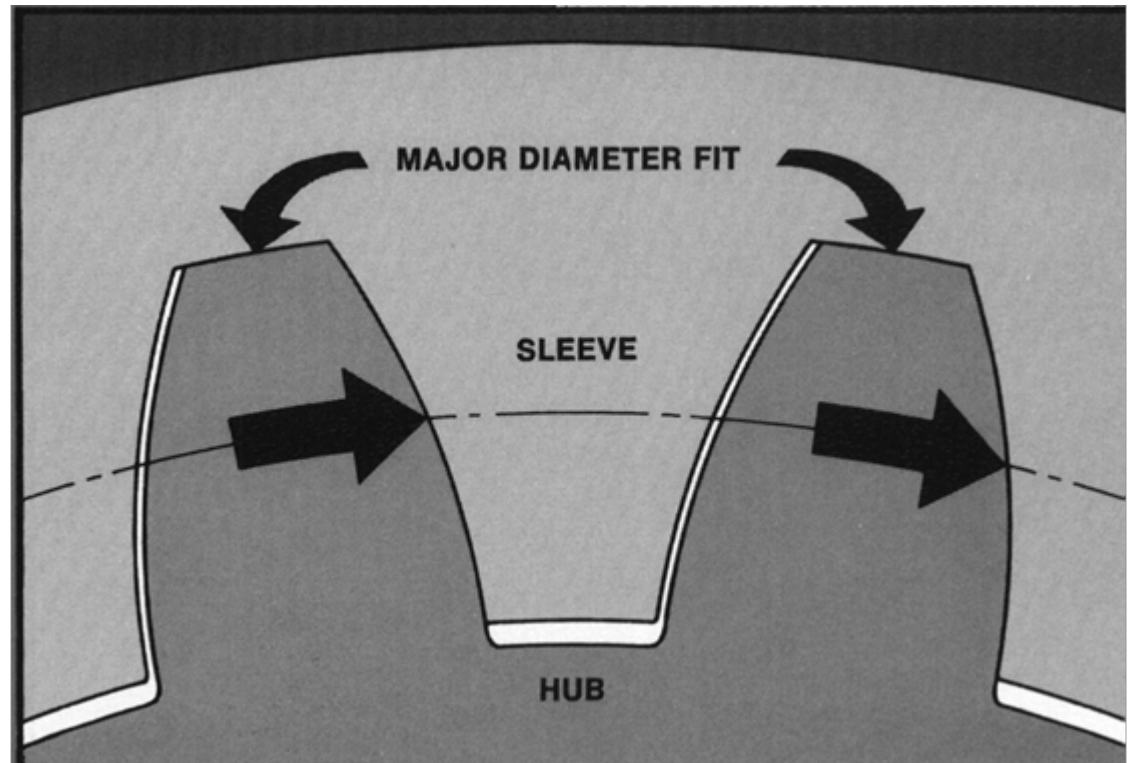
Motor to Gearboxes  
Main Motor Drives  
Pump Drives  
Crane Drives  
Runout Tables

# Torque & Misalignment

Major Diameter Sleeve Piloting

Backlash

Crown Gearing

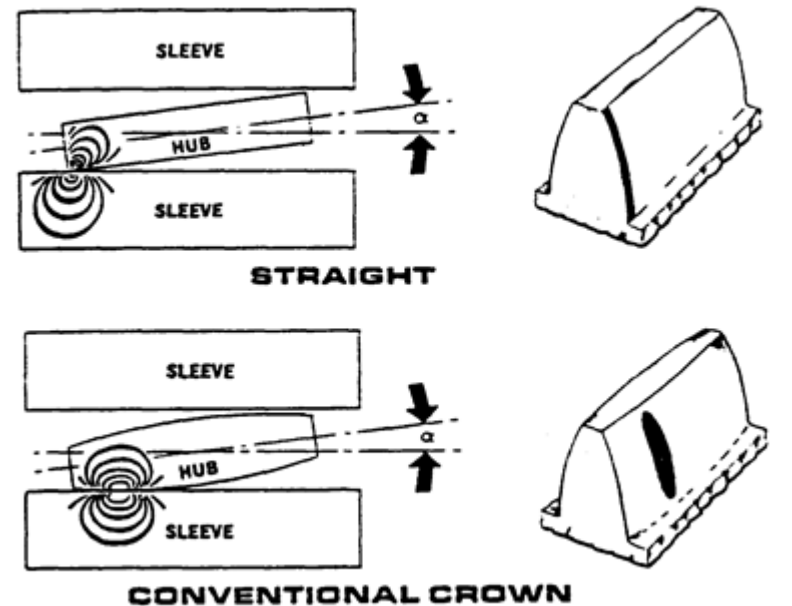


# Why Crowned Gear Teeth

Reduce Backlash

Eliminate End Loading

Lower Contact Stresses



# O-Ring Seal

Half for Half Interchangeability  
Forged 1045 Steel Construction

Sizes 1-7 Half for Half

- Ameridrives
- Falk
- Kopflex
- Lovejoy/Sierbath

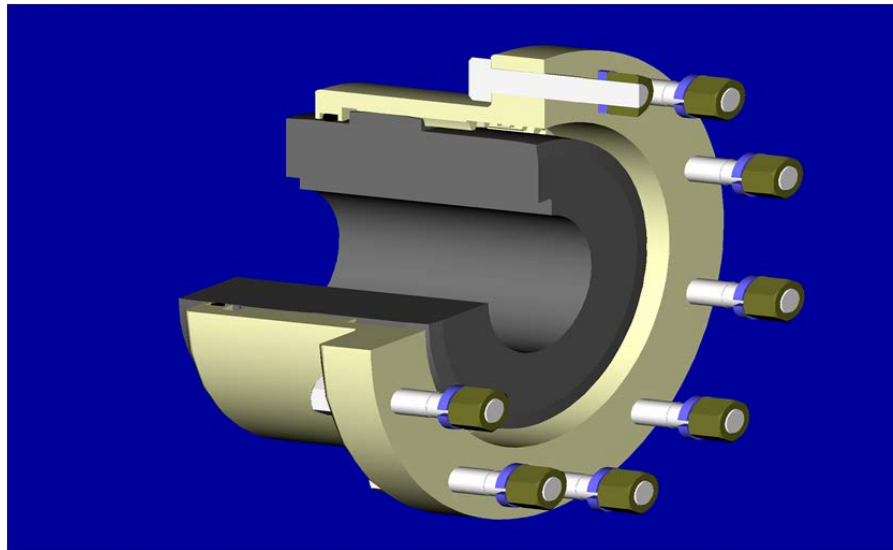




# O-Ring Seal

20° Pressure Angle Tooth Form  
Tooth Tip Piloting  
Assembly Lead-In Chamfer

Induction Hardened Case Available  
Long Internal Tooth  
CNC Drilled Hole Pattern



# Maintenance

## Installation, Maintenance, Lubrication

### Lubrication is essential

If you are getting short life from your couplings, the first thing to check is your lubricant. Proper lubrication is essential to minimize heat generation and assist in heat dissipation when operating in a misalignment condition. Application experience shows that couplings almost always fail from overheating. Most commercial lubricants are developed for high-volume applications such as bearings and do not possess sufficient performance characteristics for coupling applications. Gear type couplings require specially compounded lubricants formulated with highly refined base oils that have naturally high viscosity indexes, excellent extreme pressure qualities, water resistance and adhesiveness. To select an appropriate lubricant, check the technical data specifications for the following:

- The grease should be compounded with a minimum soap base made of select high-quality thickeners, such as aluminum complex for best performance.
- The grease should, at a minimum, include additives for extreme pressure, rust prevention, adhesiveness, high load carrying capability, boundary lubrication and water resistance.
- Base oils should possess natural viscosity indexes above 90. The viscosity of the base oils should be no less than 80 SUS at 100°C. The minimum flash point of the base oil should be 475°F. Products containing synthetic base oils should be of the Polyalphaolefin (PAO) synthetic base oil family.
- The grease should have good low temperature pumping characteristics and should require no more than 1,500 psi applied pressure @ 0°F on the Lincoln ventometer test. The grease should not require heating.
- Molybdenum disulfide, graphite, PTFE and antimony are excellent additives for extreme pressure and boundary lubrication but will separate out at high rpm. For shaft speeds over 1,500 rpm, a lubricant void of solids should be used, with the exception of Molybdenum Dibutylthiocarbamate. This is a synthetic form of Molybdenum that is solubilized and will not separate or centrifuge out of lubricants.

If the lubricant you are using does not appear on the spindle manufacturer's recommended list, refer to the previous information for minimum grease performance specifications or call Renold Ajax. RENOLD AJAX recommends use of the following types of lubricants:

#### High Speed - above 1,500 RPM

AMOCO	.....	Coupling Grease
ANDEROL	.....	Anderol 786
MOBIL	.....	Mobilgrease XTC
SCHAEFFER	.....	248R Moly Syngard 2000 EP2
SHELL	.....	Alvania Grease CG
TEXACO	.....	Coupling Grease 1912

#### Medium Speed - between 800 and 1,500 RPM

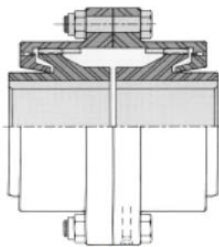
AMOCO	.....	Coupling Grease
MOBIL	.....	Mobilgrease XTC
MOBIL	.....	Mobilux EP111
SCHAEFFER	.....	279R Spindle Compound
SHELL	.....	Alvania Grease CG
TEXACO	.....	Coupling Grease 1912

#### Low Speed - Below 800 RPM

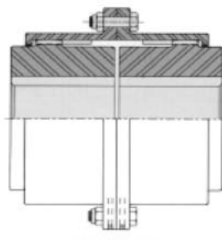
AMOCO	.....	Coupling Grease
MOBIL	.....	Mobilux EP111
SCHAEFFER	.....	279R Spindle Compound
SCHAEFFER	.....	200SR Silver Streak
SHELL	.....	Alvania Grease CG
TEXACO	.....	Coupling Grease

#### Frequency

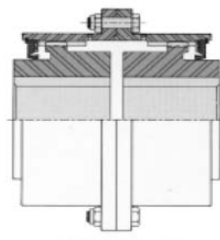
Gear couplings should be lubricated a minimum of every six months or sooner if the application requires. When installing a coupling, be sure to also hand-pack the teeth with grease prior to greasing by normal methods to ensure the teeth will not run dry for the first few minutes of operation until the lubricant works its way to the gear mesh. If operating temperatures of coupling sleeves exceed 130°F/55°C, check the lube level, misalignment and operating torque. When possible, add lubricant until fresh lubricant appears at the discharge. This purge method keeps lubricant properties at their best and contaminants to a minimum.



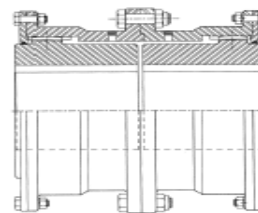
Metal Seal



O-Ring Seal



High Misalignment



Heavy Duty

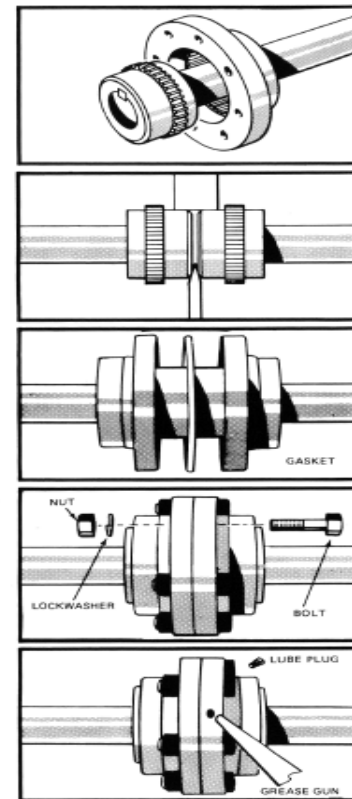
## Installation, Maintenance, Lubrication

1. Inspect and clean all parts.
2. Apply a light coat of selected lubricant to gear teeth (if O-Ring style, coat O-Ring and seal hub diameter).
3. Place sleeve ring gear over shaft.
4. Coat shaft with anti-galling compound. Insert key in keyway and check to assure a snug side-to-side fit.
5. Heat hubs in oil or oven to approximately 300°F (148°C); do not exceed 350°F (176°C). Slip hubs onto shaft to correct position and allow to cool. (Clearance fits are only used for light duty applications and have set screws. Tighten firmly.)
6. Align equipment, using straight-edge and feeler gauge or dial indicator. Alignment and shaft gap must be within design limits of coupling and should be best economically possible.
7. Coat coupling gear teeth with selected lubricant.
8. Pull sleeve ring gear over hub, engaging gear teeth.
9. Inspect flange gasket for damage. Clean flanges and insert gasket between flanges. (If gasket is damaged, use Permatex or equal.)
10. Draw flanges together, aligning bolt holes. Insert bolts and tighten with lockwasher and nut.
11. Position coupling so two (2) lube holes, 180° apart, are horizontal. Remove these lube plugs. Pump lubricant into one hole until discharged from hole at 180°. Replace and tighten plugs.  
*Note: In case of floating shaft, spacer or similar type design, each end must be lubricated.*
12. Recheck all mechanical connections to make certain they are tight.

### INSTALL COUPLING GUARD.

#### WARNING

Rotating equipment must be provided with a suitable guard before operating or injury may result. Check applicable code.



# Hi Tec



Zero maintenance

Intrinsically fail safe

Misalignment capability of  $\pm 1/2^\circ$

Torsional tuning and vibration damping

High temperature capability

High technical support

Exceedingly long life

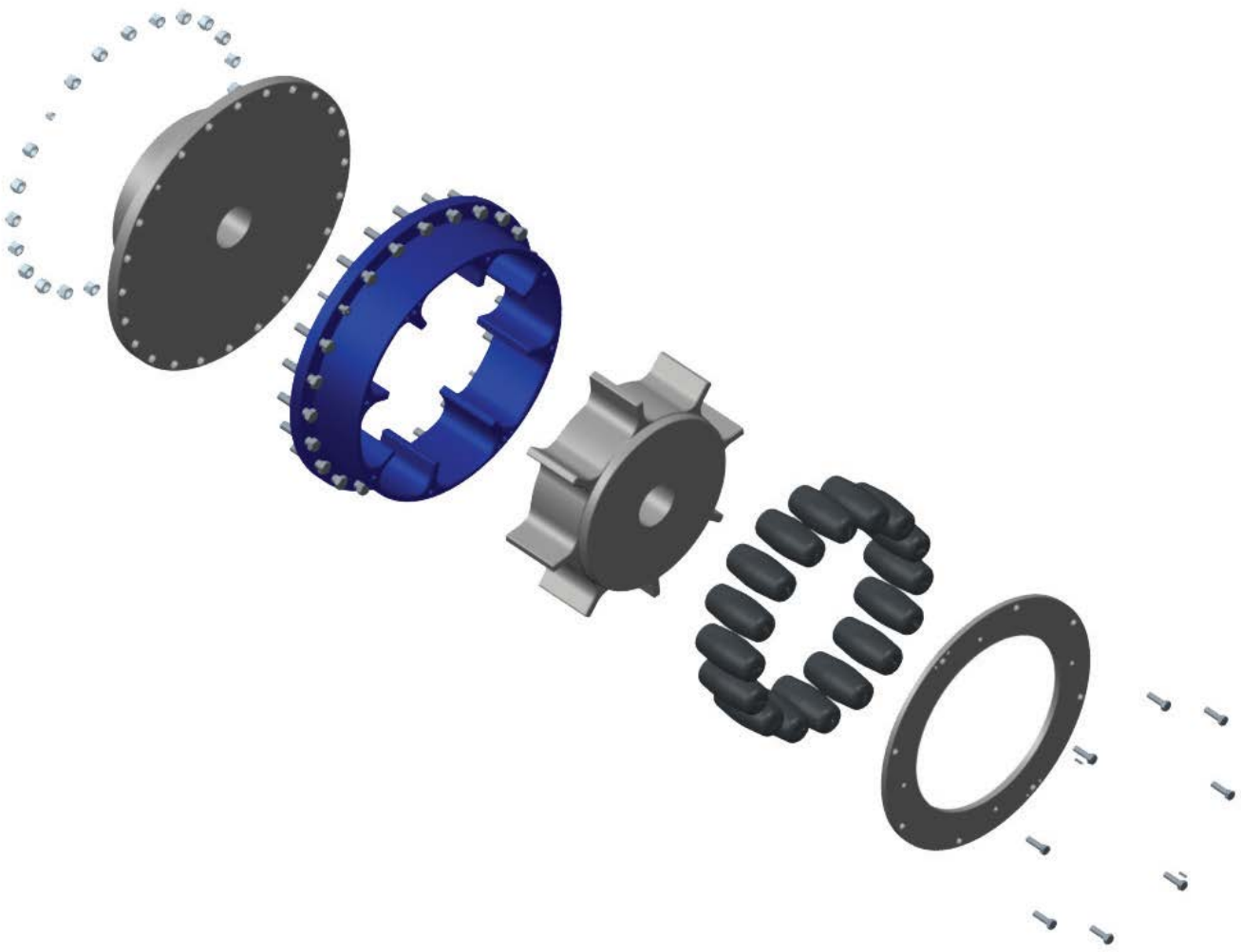
Non Lubricated

# Typical Applications

Steel Manufacturing  
Rubber Processing and Plastics Industry  
Pulp and Paper Industry  
Material Handling  
Cranes & Hoists  
Mining  
Power Generation  
Marine Propulsion



# Construction



# Features

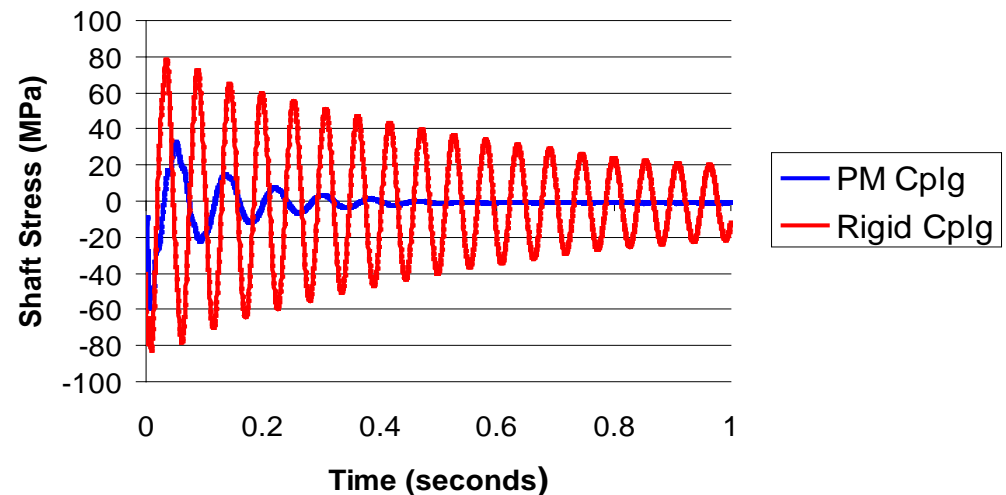
Extends Equipment Life By

- Absorbs Torque Spikes from High Impact Loads
- Dampens Vibrations
- Reducing Peak Stresses in Shafts, Bearings & Gearing
- Reduces number of fatigue cycles

Shock Events Include

- Startup
- Shutdown
- Short Circuit

**Motor Shaft Stress During Short Circuit Event**



# Features

Extends Equipment Life by:

- Protects shafting from torsional vibration stress during operation
- Reduced vibration in the drivetrain

Low Torsional Stiffness

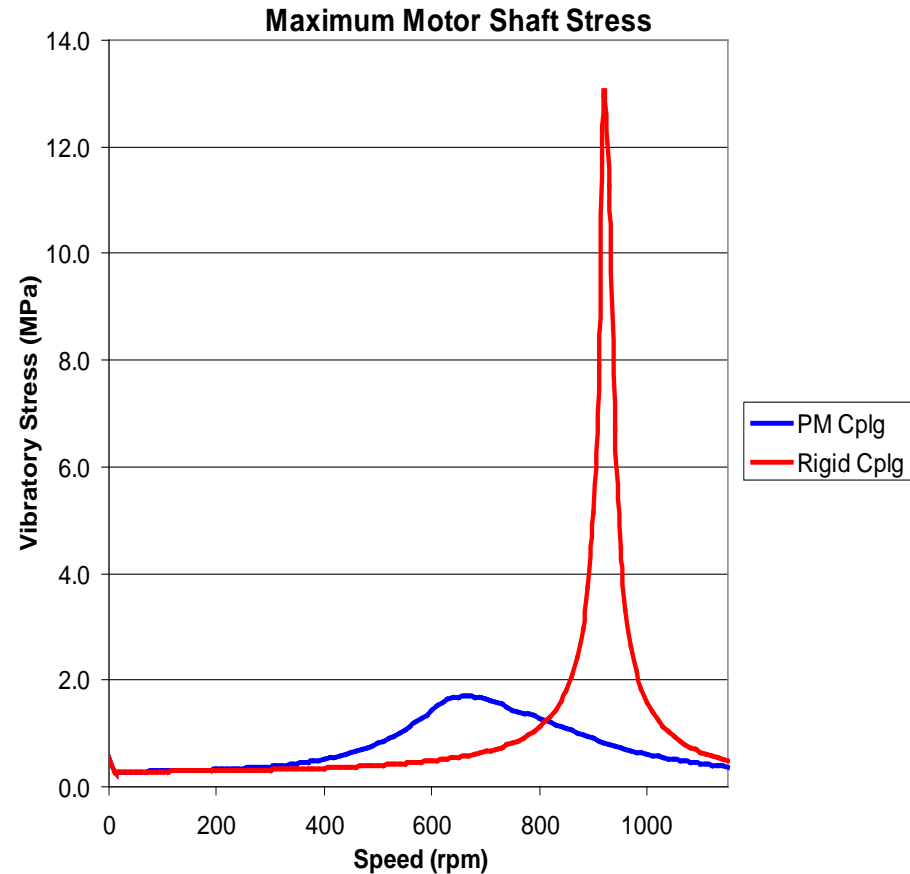
- Torsionally “soft”
- Transmits less motor vibration
- Isolates motor from fan

Rubber Dampening

- Reduces vibration energy

“Tune” The Drive

- Select rubber grade to minimize vibration
- Minimizes damage to drivetrain components



# Features

Intrinsically Fail Safe  
Ensures continuous operation of  
the driveline  
Reduced Downtime





# Features

## Shock Load Protection

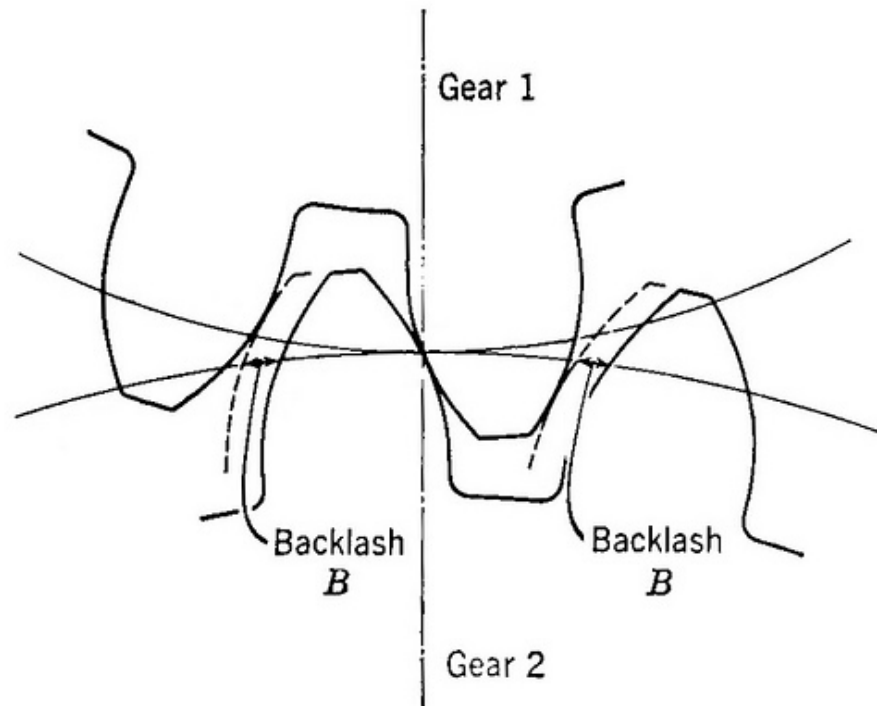
Absorbs high torque impulse loads  
Minimises damage to the drivetrain



# Features

## Zero Backlash

Reduces torque amplification factors  
Avoids damage to the drivetrain



# Features

## Misalignment Capability

Allows axial and radial misalignment between the driving and driven machines

Reduced loads on driving and driven components

Allows for thermal expansion

Low radial and axial stiffness, reducing bearing loads



# Features Summary

High torque density  
Intrinsically fail safe  
Vibration damping  
Maintenance free  
Shock load protection  
Misalignment capability  
Zero backlash



## COST SAVINGS

Resulting in the lowest  
lifetime costs

# Coupling Comparison

Coupling Type	High Torque Density	Cost Effective	Fail Safe	Maintenance Free	Shock Load Protection	Misalignment Capability	Backlash Free
Rubber-in-Compression	✓	✓	✓	✓	✓	✓	✓
Rubber-in-Shear				✓		✓	✓
Gear	✓	✓				✓	
Grid	✓	✓				✓	
Membrane/Disc	✓	✓		✓			✓
Pin & Bush	✓	✓		✓			✓

# TVA Service

Our resident torsional analysts are able to provide a full Torsional Vibration Analysis service to investigate a customer's driveline and report on the system performance. This service, together with the facility for transient analysis, is available to anyone and is not subject to purchase of Renold Hi-Tec product.

# Maintenance

## Maintenance Free

No lubrication or adjustment required

No downtime for maintenance

Reduced operator requirements

No failures of drivetrain due to lack of  
coupling maintenance



# Safety

Issued: February 2015  
Ref: REH/1028

## **Couplings for safety-critical applications**

Rubber-in-compression couplings, from Renold Hi-Tec, provide fail-safe operation on applications such as mine winders, hoists, draw-works on drilling rigs and industrial overhead cranes. The intrinsically fail-safe construction of the couplings protects both people and plant on safety critical applications from the potentially catastrophic consequences of coupling failure that could result in the sudden loss of drive and the load being dropped.

Rubber-in-compression couplings are comprised of two round metal sections fitting one inside the other with what looks like the paddles of a paddle steamer projecting inwards from the outer section and outwards from the inner. Rubber blocks are placed in the spaces in-between the paddles, and, as the outer section is turned by the motor, it drives the inner section through the rubber blocks.

There are no wearing components in a rubber in compression coupling as there are in gear or other types of metallic coupling. As the rubber blocks are totally encased in metal they can only change shape during operation and will not wear or fail, thus ensuring that the drive is always maintained. This is particularly important on safety-critical applications such as mine winders carrying people and ladle cranes in the steel industry where molten metal is being lifted and moved.

Rubber-in-compression couplings are also maintenance free and offer the lowest lifetime operating costs over other coupling types. They are backlash free and protect plant and equipment from otherwise damaging vibration, shock loading and torque amplification, lengthening its life and reducing maintenance.



# Types



HTB



DCB - GS



PM



RB



RBI



MSC



VF



Questions?