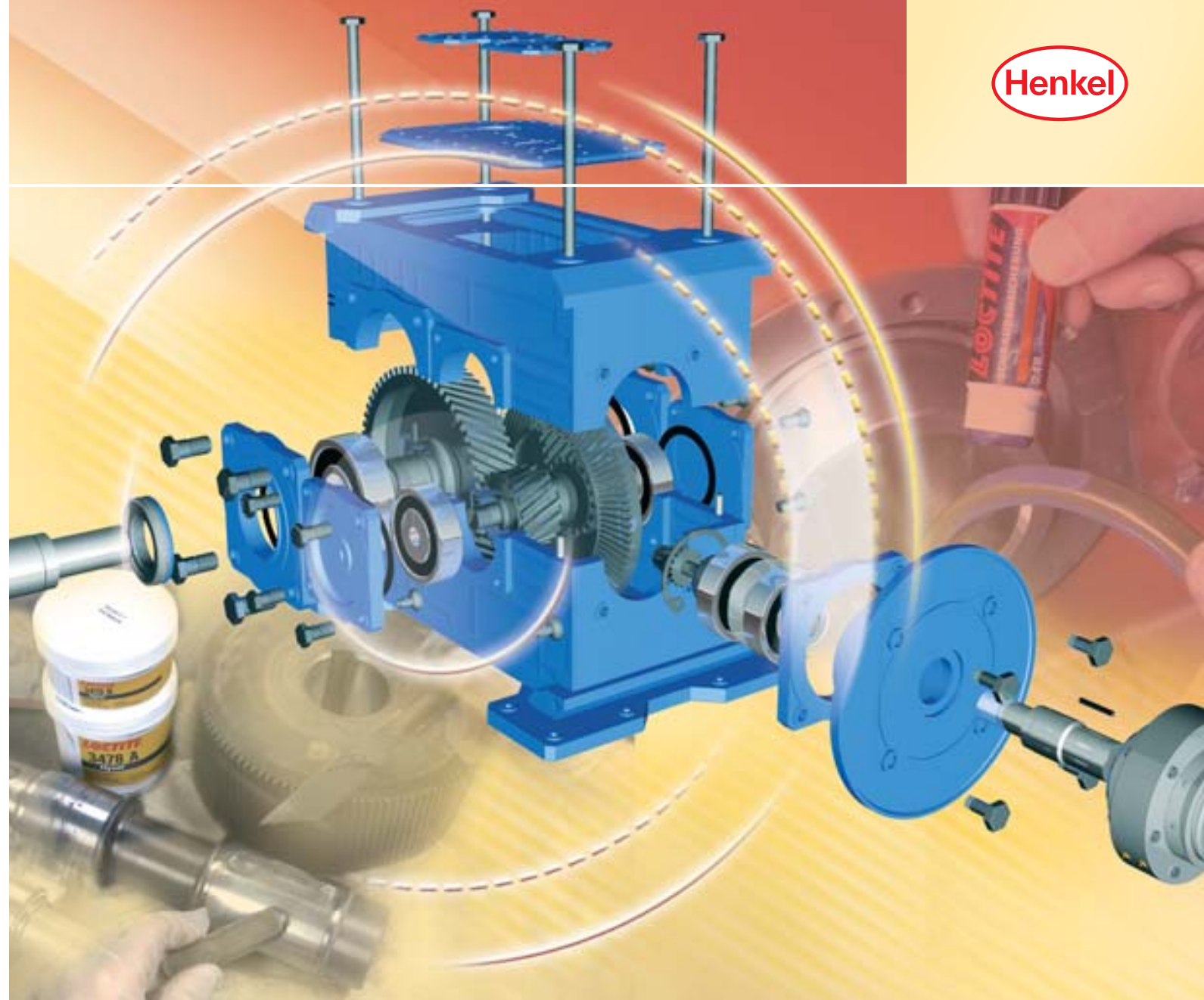


LOCTITE®

Industrial Gearboxes
Service Manual



Henkel





This guide has been designed to provide quick and easy assistance to the professionals who service industrial gearboxes and look for reliability, longevity and cost reduction. With the help of this guide, you can:

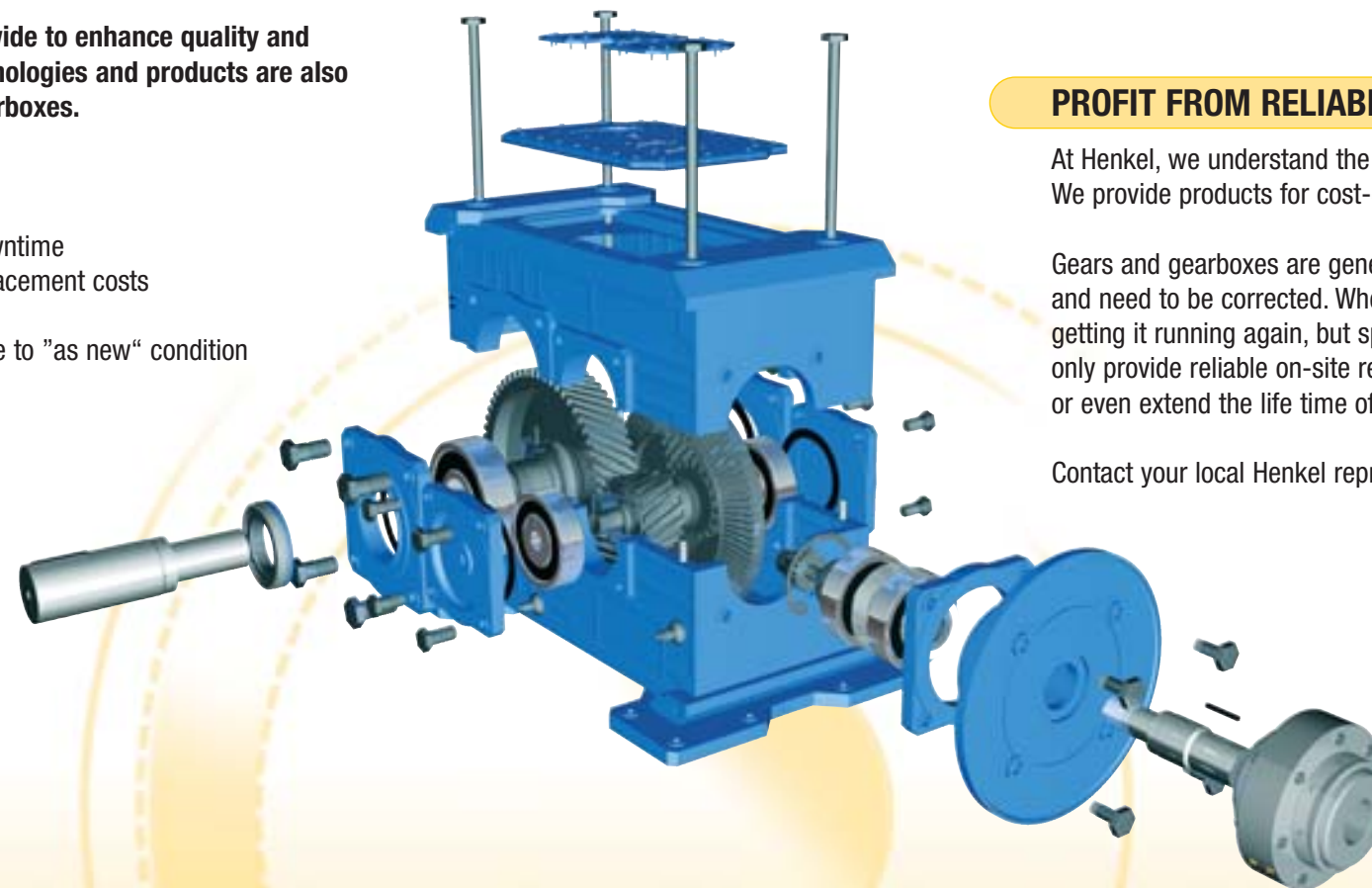
- Easily select the right Loctite® products to help you service the wide variety of gearbox assemblies
- Prevent wear proactively
- Pinpoint the most suitable solution for servicing worn parts, or
- Determine the best product for your particular service or repair problem

Industrial gearboxes play an important role in processing and manufacturing facilities. Performance must be tailored to an endless diversity of demands, and reliable operation over a long service life with minimum maintenance is a key requirement. For plant professionals, the ultimate goal is to maximise machinery output, reliability and efficiency. That's why a gearbox failure can be a costly setback to overall plant operations. Proactive maintenance will minimise expensive downtime, enhance reliability and dramatically cut costs.

Loctite® products are used in gearbox manufacturing worldwide to enhance quality and extend end-product life. The same high quality Loctite® technologies and products are also available to the people who maintain, repair and service gearboxes.

There is a comprehensive range of Loctite® products to

- Repair and prevent gearbox failures – on site, to minimise downtime
- Reclaim worn or damaged assemblies to avoid scrap and replacement costs
- Assist in assembly, installation and disassembly
- Ensure reliability and smooth running by restoring performance to "as new" condition



GEARBOX SERVICE MANUAL SOLVES REAL PROBLEMS

The applications described in the Gearbox Service Manual are based on a bevel helical gearbox configuration. They apply equally for helical gearboxes, worm gear units and geared motors. Applications on planetary gearboxes, due to their different construction, are shown in a separate illustration.

The Gearbox Service Manual is designed as a practical guide to provide essential information in a logical and systematic manner. It is structured in major sections covering key gearbox assembly groups, coupling and mounting, as well as general maintenance aids. The manual is based on the real world, and on solving real problems: you're bound to find service and repair solutions you can use every day – quickly and conveniently.

FEASIBILITY CONFIRMED

The recommendations given in this Gearbox Service Manual are based on collaboration with customers, institutes and universities to establish their validity and confirm that these methods are operable, practicable and indeed the best solutions for servicing and repairing gearbox assemblies.

PROFIT FROM RELIABILITY

At Henkel, we understand the problems you face in ensuring reliability, safety and durability. We provide products for cost-efficient, easy and effective gearbox maintenance and repair.

Gears and gearboxes are generally robust and reliable devices. However, problems do occur, and need to be corrected. When gearboxes and ancillary equipment fails, the greatest concern is getting it running again, but spare parts may not always be readily available. Loctite® products not only provide reliable on-site repair capability, but emergency repair and service solutions that last or even extend the life time of equipment.

Contact your local Henkel representative for help to meet your specific product application needs.



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Make any size or shape gasket: For flexible covers and covers with large bolt spacing use Loctite® 5910 Flange Sealant; For rigid assemblies use Loctite® 518 Flange Sealant
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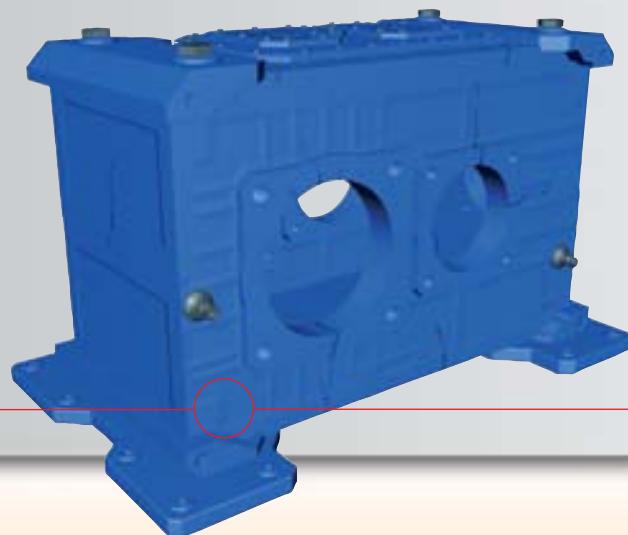
CHALLENGE

► Repair housing and cover defects

► Seal oil leaks due to damaged housing

Cause

- Gearbox housings may be porous
- Service or repair work may cause damage to gearbox housings and covers



SOLUTION #1

Sealing porosity (up to 0.05 mm) using wicking grade adhesive Loctite® 290

Steps

1. Thoroughly clean and dry the components with Loctite® 7063 Cleaner & Degreaser, insuring the porosity is oil free
2. Brush Loctite® 290 into the porosities
3. Allow to cure, typically for 3 hours
4. Clean of excess product

SOLUTION #2

Filling damaged areas with Loctite® Hysol 3471 Metal filled Epoxy

Steps

1. Thoroughly clean and dry the components with Loctite® 7063 Cleaner & Degreaser, insuring the repair area is oil free
2. Mix and apply Loctite® Hysol 3471 onto the area to be repaired
3. Allow to cure, typically for 12 hours to achieve functional strength
4. Machine to original size if required

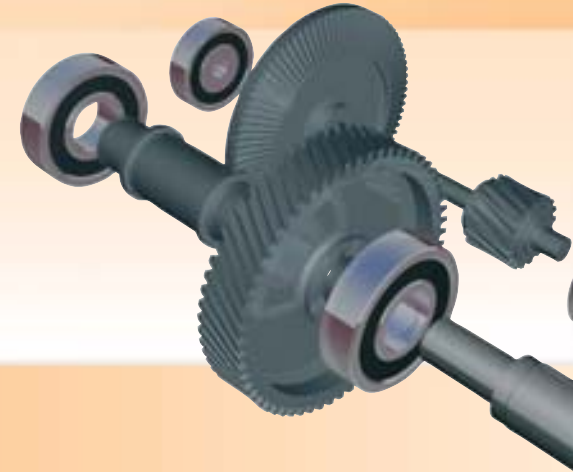
For further technical details refer to selection chart on page 69.

YOUR ADVANTAGE

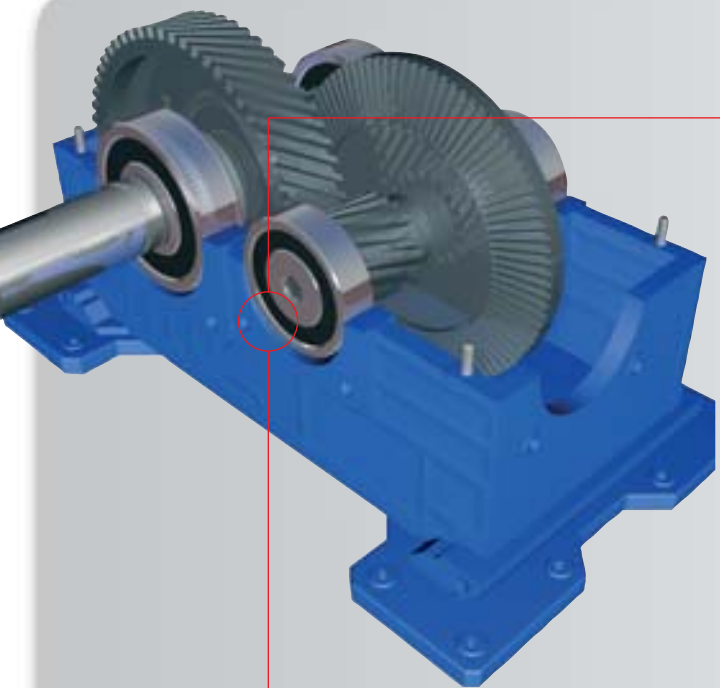
- Quick return to service
- Reduce scrap by salvaging and extending the life of gearbox housing and cover



Housings



CHALLENGE



► Prevent bearing spin, corrosion and housing damage

Cause

- Bearing outer races are prone to spinning within their housings, resulting in damage to the housing (regardless of whether or not they have been pressed or shrink fitted in place)
- The air space between a bearing and housing is an area susceptible to rust and fretting corrosion, thus causing damage to the parts

SOLUTION

- Apply a film of Loctite® 641 Retaining Compound to the outside diameter of the bearing
- Loctite® 641 Retaining Compound is a medium strength, allowing for easy disassembly during future overhauls
- Alternatively use Loctite® 603 for a high strength joint or Loctite® 640 for longer assembly time

Steps

1. Clean the mating surfaces with Loctite® 7063 Cleaner & Degreaser
Note: Loctite® 603 is oil tolerant and cleaning is less critical
2. Apply a film of Loctite® Retaining Compound to the outside diameter of the bearing
3. Assemble using normal techniques
4. Functional cure in 6 hours at room temperature

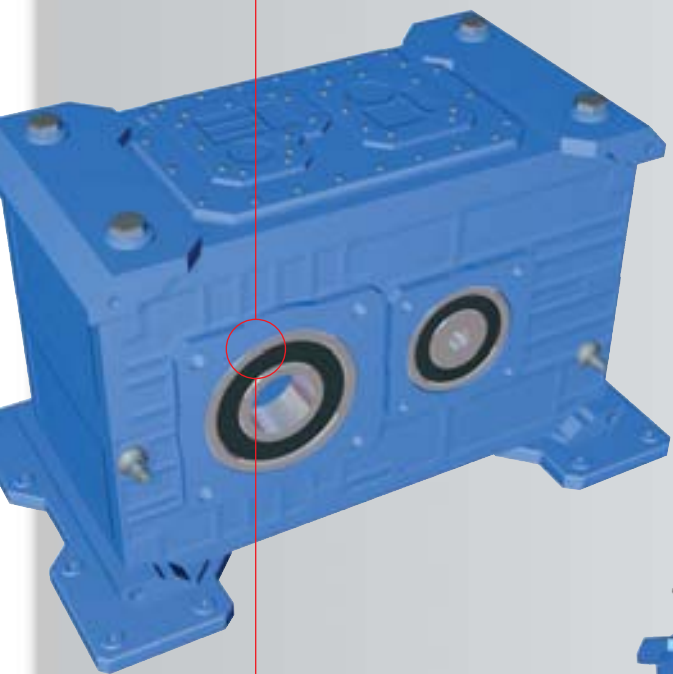
For further technical details refer to selection chart on page 68.

► YOUR ADVANTAGE

- Bearing movement is eliminated
- Bearing can be easily removed with standard tools
- Corrosion is eliminated because the air space between the bearing and the housing is sealed



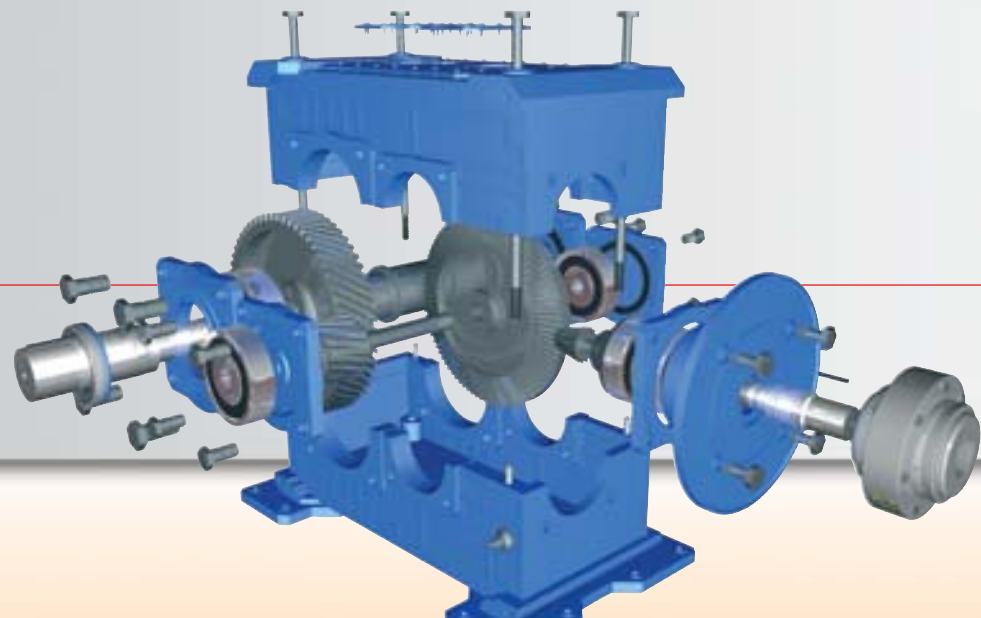
CHALLENGE



► Repair and rebuild worn bearing housing

Cause

- Worn components lead to micro movement and additional wear
- Load produces axial forces that are higher than original calculations
- Spun bearing caused by seizure or inappropriate loads



SOLUTION

- Rebuilding of the worn surface of the housing with Loctite® Hysol 3478 Superior Metal

Steps

1. Using a machining centre, undercut the housing bore by 1.5 mm in the worn area, leaving the surface rough
2. Clean parts with Loctite® 7063 Cleaner and Degreaser
3. Mix and apply a layer of Loctite® Hysol 3478 Superior Metal and force it into the rough surface finish. Build the surface above the final desired level
4. Allow the adhesive to cure for 12 hours at room temperature
5. Machine the repair to the required dimensions (in general press fit) using diamond cutting inserts
6. Clean the rebuilt surface and the outer bearing ring with Loctite® 7063
7. Retain the joint between the housing and the outer bearing race with Loctite® 2701



For further technical details refer to selection chart on page 68 and 69.

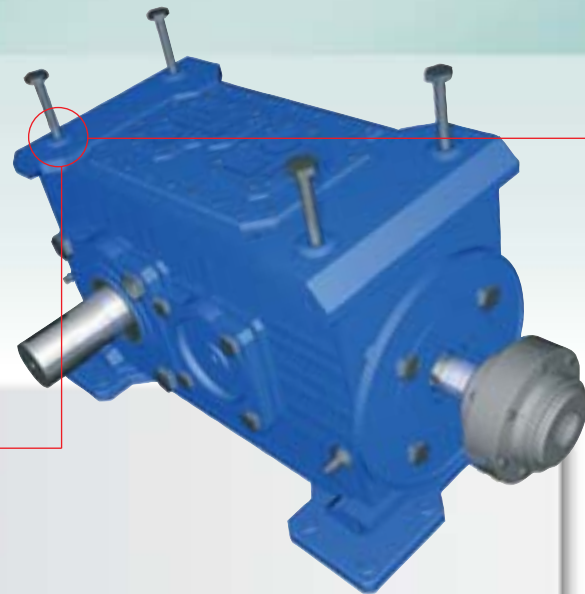
YOUR ADVANTAGE

- Assembly is restored, unitised, and ready for service without a major overhaul
- Easy and fast repair method, compared to alternative repair methods
- Joint between housing and bearing outer race is strengthened by using Loctite® Anaerobic Adhesive



Housing and Cover Assembly

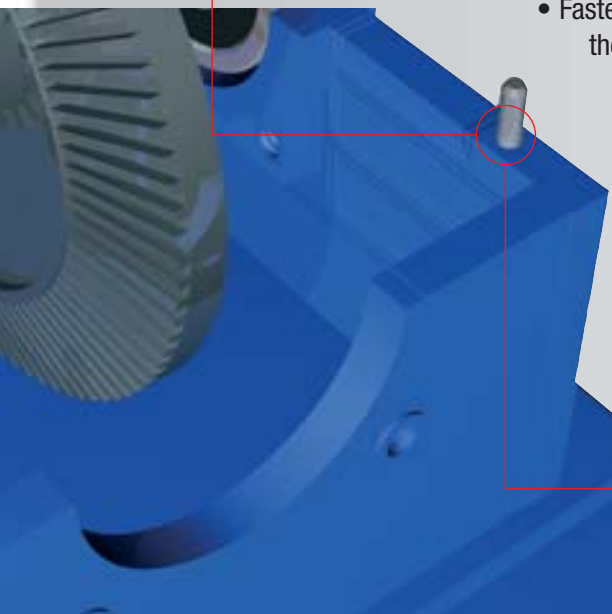
CHALLENGE



- ▶ Prevent loosening and corrosion of split gearbox housing fasteners to ensure reliability of the gasket between the upper housing and the base
- ▶ Prevent corrosion and seizure of split gearbox alignment pins

Cause

- Fasteners can work loose when subjected to torque, vibration, thermal expansion and shock loads
- Once the fasteners become loose, the preload for the gasket will be lost and the gasket will fail
- Dowel pins can rust and seize into component, making disassembly very difficult



SOLUTION

- Apply Loctite® 243 or 248 Medium Strength Threadlocker to the housing fastener
- Use Loctite® 2701 for high strength or on stainless steel and plated fasteners
- Before assembly, apply a thin film of Loctite® 8009 Heavy Duty Anti Seize to the dowel pins

Steps

1. Clean the threads and pins with Loctite® 7063 Cleaner and Degreaser
2. Apply Loctite® 8009 Heavy Duty Anti Seize onto the dowel pin
Note: If a liquid gasket is in use, ensure only a very thin layer of Anti Seize is applied
3. Apply Loctite® 243 Medium Strength Threadlocker into lower third of the blind hole
Apply Loctite® 2701 High Strength Threadlocker if stainless steel fasteners are in use
4. Assemble and tighten

For further technical details refer to selection chart on page 67.



YOUR ADVANTAGE

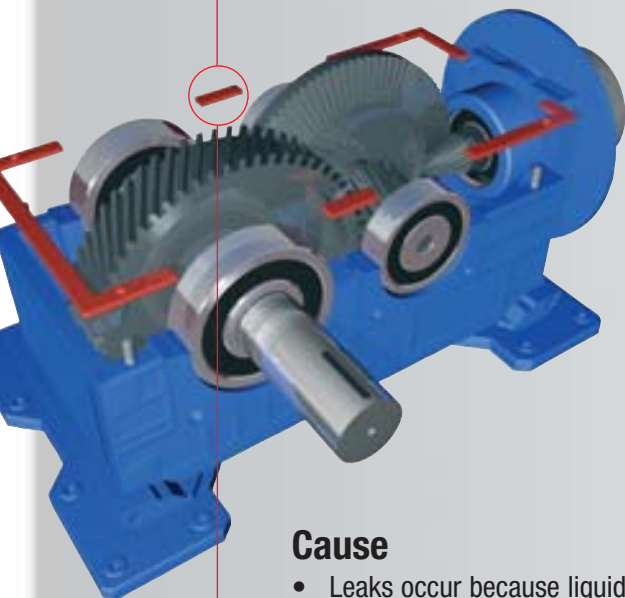
- Prevention of rust and seizure of these close fitting parts
- Easy and consistent disassembly
- Prevents fasteners from loosening



Housing and Cover Assembly



CHALLENGE



- ▶ Prevent gasket failure between the upper and lower housing of a split gearbox
- ▶ Ensure close tolerance control of the assembly
- ▶ Sealing of damaged surfaces

Cause

- Leaks occur because liquids migrate out of the joint
- Damaged flanges can result in a leak path
- Incomplete sealing of T-joints, where three parts come together (upper and lower housing and cover)

SOLUTION



- Use Loctite® 518 Flange Sealant for standard gearbox size or Loctite® 128068 Flange Sealant for large gearboxes
- Optimum stiffness between mating parts means movement is minimized

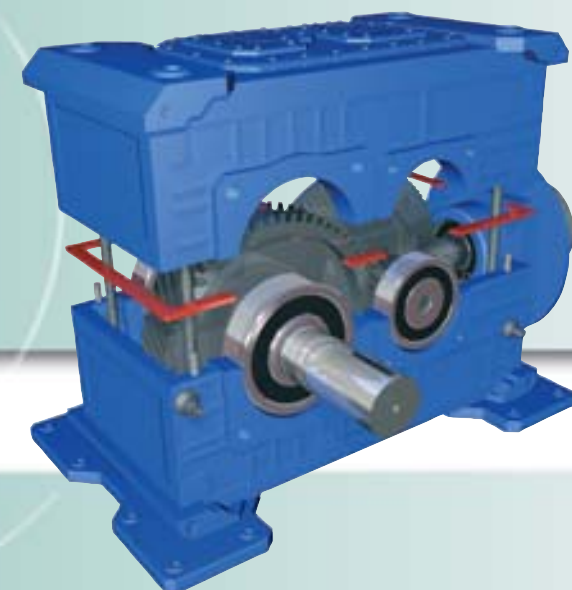
Steps

1. Remove old gasketing material and other heavy contaminants with Loctite® 7200 Gasket Remover
2. Clean both flange surfaces with Loctite® 7063 Cleaner and Degreaser
3. Apply a continuous bead of Loctite® 518 Flange Sealant. Circle bolt holes with sealant if appropriate
Note: Use Loctite® 128068 Flange Sealant for large gearbox flanges. Loctite® 128068 is designed to cure slowly to allow extra time for assembly
4. Assemble parts and tighten as required
5. Allow to cure

For further technical details refer to selection chart on page 68.

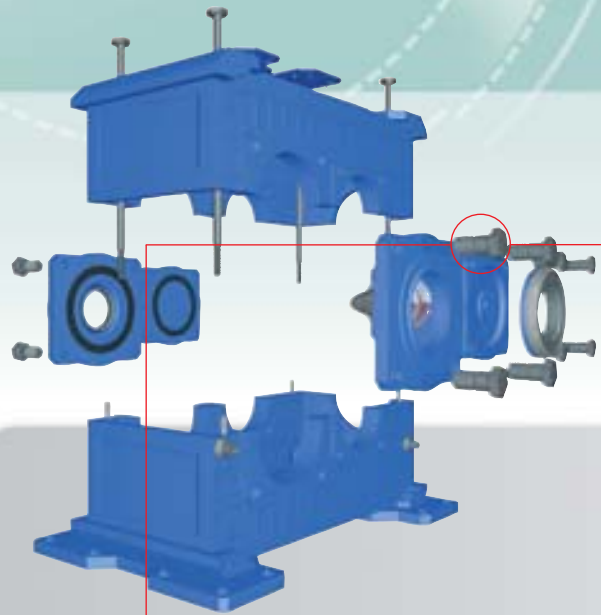
YOUR ADVANTAGE

- High shear strength transmits forces from one part to the other
- Reliable seal





Housing and Cover Assembly



CHALLENGE

- ▶ Prevent loosening and corrosion of the cover fasteners to ensure the reliability of the gasket between the housing and covers
- ▶ Typical applications are fasteners for inspection cover, bearing cover and input/output flanges

Cause

- Cover fasteners that are rusted and seized make gearbox maintenance difficult and create additional labour associated with drilling and tapping the fastener hole
- Fasteners can work loose when subjected to torque, vibration, thermal expansion and shock loads



SOLUTION

- Apply Loctite® 243 or 248 Medium Strength Threadlocker to the housing fasteners
- Use Loctite® 2701 for high strength or on stainless steel and plated fasteners
- If locking of the fasteners is not required use Loctite® 8009 Anti-Seize

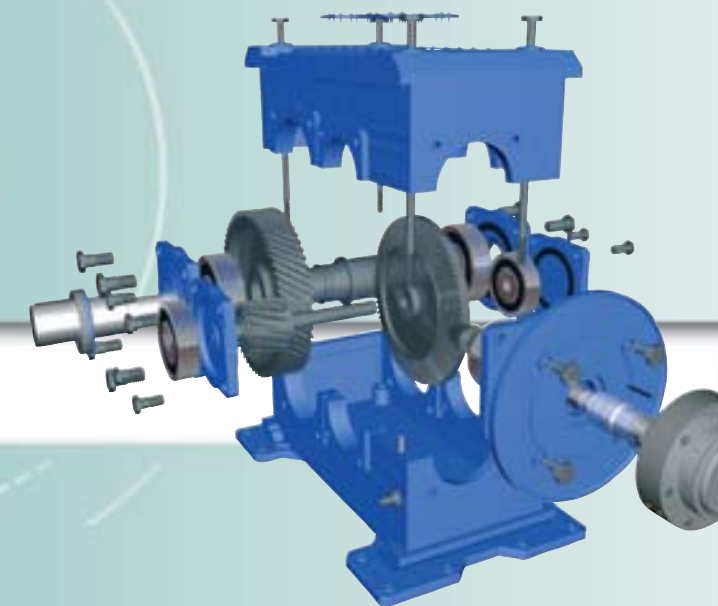
Steps

1. Clean the threads and pins with Loctite® 7063 Cleaner and Degreaser
2. Apply Loctite® 243 or 248 Medium Strength Threadlocker to the housing fasteners
Apply Loctite® 2701 High Strength Threadlocker if stainless steel or plated fasteners are in use
3. Assemble and tighten

For further technical details refer to selection chart on page 67.

YOUR ADVANTAGE

- Correct clamp load is maintained
- Elimination of rust and seizure
- Easy disassembly with normal hand tools





Housing and Cover Assembly



CHALLENGE

- ▶ Prevent leaks between the inspection cover / bearing cover / input – output flange and housing
- ▶ Eliminate cut gaskets
- ▶ Optimize sealing performance of cut gaskets

Cause

- The use of cut gaskets is associated with several inherent problems, such as gasket relaxation, shrinkage, extrusion, and breakage which can lead to leaks



SOLUTION #1

Replacing cut gaskets

- Sealing of rigid flanges
Replace the cut gasket and apply Loctite® 518 Flange Sealant to the flange surface of the housing
- Sealing of flexible flanges
Replace the cut gasket and apply Loctite® 5910 Flange Sealant to the flange surface of the housing

Rigid flanges are designed:

- To achieve optimum stiffness between
- To minimize movement between two parts
- To transmit forces from one part or another

Flexible flanges are normally used:

- To cover an opening in a housing two mating parts
- To cover moving parts
- To encapsulate components to reduce noise

Steps

1. Remove old gasket material with Loctite® 7200 Gasket Remover
2. Clean both flanges with Loctite® 7063 Cleaner & Degreaser
3. Apply a continuous bead of Loctite® Flange Sealant onto the housing, circle holes if appropriate
4. Assemble and tighten as required
Note: If you are using Loctite® 5910, assemble parts within the skin over time (10 min)
5. Allow to cure



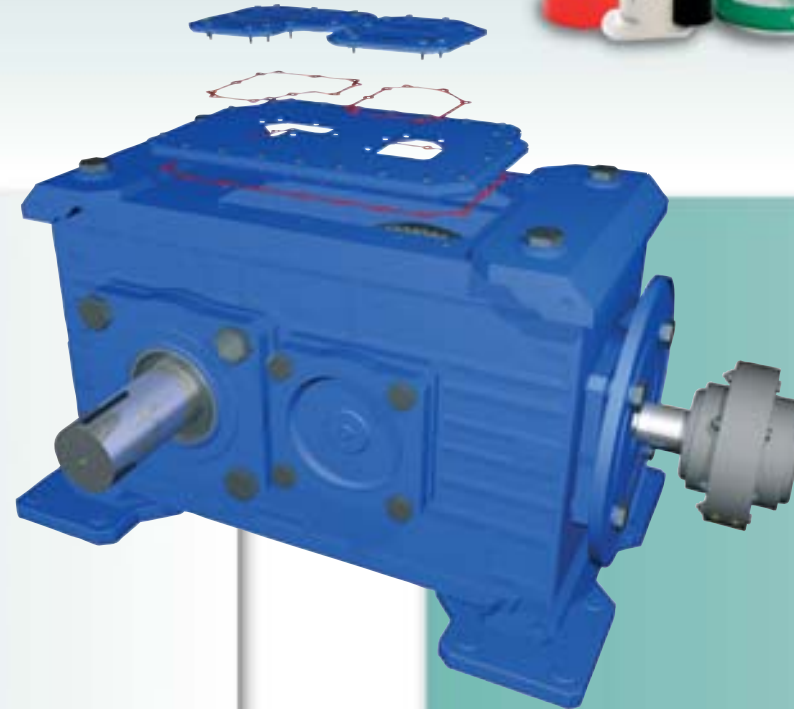
For further technical details refer to selection chart on page 68.



Housing and Cover Assembly



SOLUTION #2



When the existing gasket needs to be used as a shim:

For increasing the sealing reliability and accurate positioning of the pre-cut gasket, use one of following products:

- Loctite® 5922 Flange Sealant, non hardening pre-cut gasket dressing
- Loctite® 534, hardening pre-cut Gasket Positioner

Steps

1. Remove old gasket material with Loctite® 7200 Gasket Remover
2. Clean both flanges with Loctite® 7063 Cleaner & Degreaser
3. Coat flange face on both sides (cover and housing) with Loctite® 5922 non hardening Flange Sealant or Loctite® 534 hardening Flange Sealant. Note: Although Loctite® 534 is a hardening Flange Sealant, the product allows a pre-cut gasket to be positioned on a gasket surface. It holds aggressively yet still allows for repositioning of the pre-cut gasket
4. Position the pre-cut gasket
5. Assemble and tighten as required
Note: Accurate re-positioning, component assembly and tightening should be handled in a continuous workflow without interruptions
6. Assembly is operational after 6 hours

For further technical details refer to selection chart on page 68.

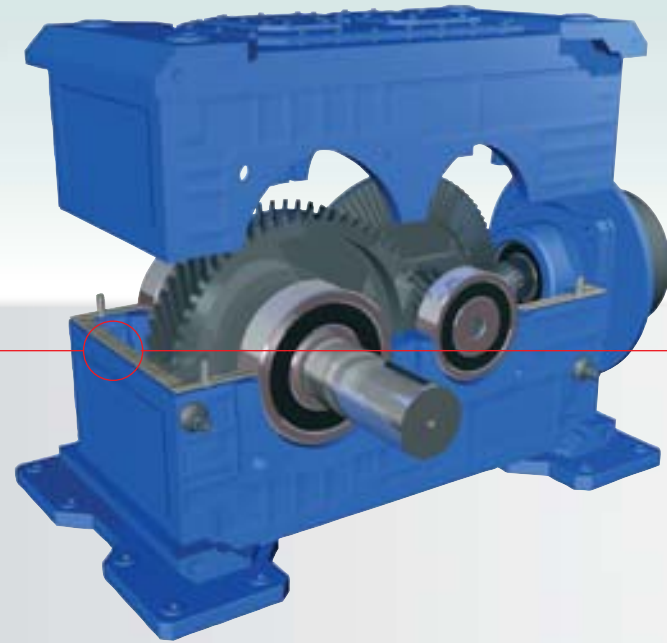
YOUR ADVANTAGE

- Eliminate gasket leaks
- Eliminate corrosion and damage on the flange surface



Housing and Cover Assembly

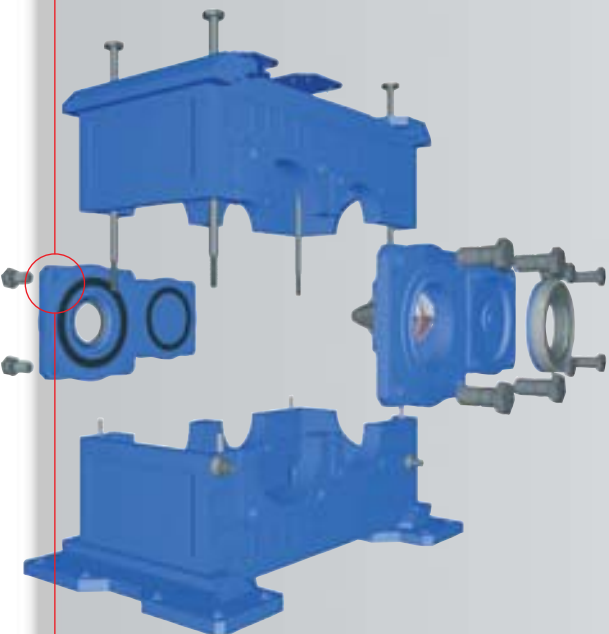
CHALLENGE



► Removal of cured chemical gaskets from dismantled flange surfaces

Cause

- After dismantling the gearbox components the flanges must be cleaned before reassembly



SOLUTION



Use Loctite® 7200 Gasket Remover to soften the gasket material on the flanges, reducing need for scraping and avoiding possible damage to the machine surfaces

Steps

1. Protect painted surfaces thoroughly from over-spray, as Loctite® 7200 will attack the paint
2. For best results, spray a heavy coat onto the flange or surface
Note: Remove any surface oil using Loctite® 7063 prior applying Loctite® 7200
3. Allow 10 to 15 minutes to soften the gasket
4. Remove gasket with soft scraper and wipe flange or surface clean
5. Repeat procedure if necessary
6. Before application of new gasketing material, it is essential to clean the flange or surface with Loctite® 7063 Cleaner & Degreaser

► YOUR ADVANTAGE

- Components are well prepared for assembly and flange sealing
- Ideal surface preparation for chemical gaskets is ensured



Lubrication and Cooling System

CHALLENGE



► Prevent leaks from threaded fittings of lubrication and cooling systems

Lubrication System

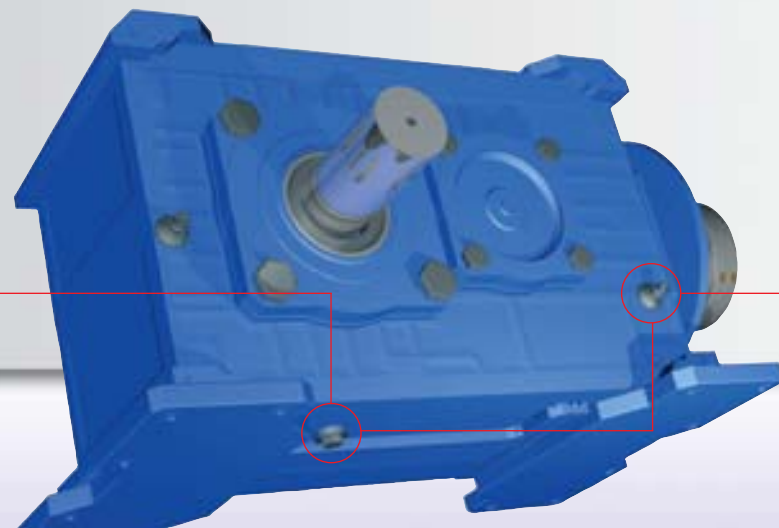
- Prevent oil leaks on oil drain plug, oil inlet, housing ventilation, oil pump, oil filter and gauge glass

Cooling System

- Prevent leakage on the coolant pump, pressure and temperature control unit and all pipe work

Cause

- Traditional thread sealants are susceptible to weeping
- Constant pressure and temperature changes within a gearbox system can aggravate any leakage
- Vibration between the gearbox and lubrication/cooling system leads to stress on the pipe work



SOLUTION

- Seal threaded assemblies with Loctite® 577, 572 or 561 Thread Sealants
- When cured, Loctite® Thread Sealants are resistant to oil and water/glycol and ensure zero leakage
- Thread sealants prevent fittings from loosening, yet allow easy disassembly with normal hand tools

Steps

1. Clean parts with Loctite® 7063 Cleaner & Degreaser
2. Apply a bead of Loctite® Thread Sealant to the leading threads of the male fitting
3. Assemble parts and allow to cure

For further technical details refer to selection chart on page 67.



► YOUR ADVANTAGE

- Elimination of all leaks
- No hazards and clean up associated with oil leaks
- No loss of coolant



CHALLENGE

- ▶ Prevent leaks between the gearbox housing and oil seal
- ▶ Prevent movement of oil seal in housing

Cause

- As with any press fit, there are small air spaces between the housing and the oil seal. This air space can create a leak path
- In the case of a split gearbox housing, T-joints are potential leakage points



SOLUTION #1

- For oil seals with elastomer press fit
 - Fill the air spaces by applying Loctite® 435 Instant Adhesive to the outside diameter of the oil seal
 - For longer positioning time and oil seal diameter larger than 60 mm use Loctite® 480
 - In the case of a cassette seal, also bond the inside diameter to the shaft using Loctite® 435 Instant Adhesive

Steps

1. Clean the bonding surfaces of the oil seal and the gearbox with Loctite® 7063 Cleaner & Degreaser
2. Apply the adhesive recommended for the different kinds of oil seals to the outside diameter of the oil seal
Note: In the case of a cassette seal apply adhesive onto the cleaned shaft as well
3. Press the oil seal into position using normal techniques and wipe off any excess

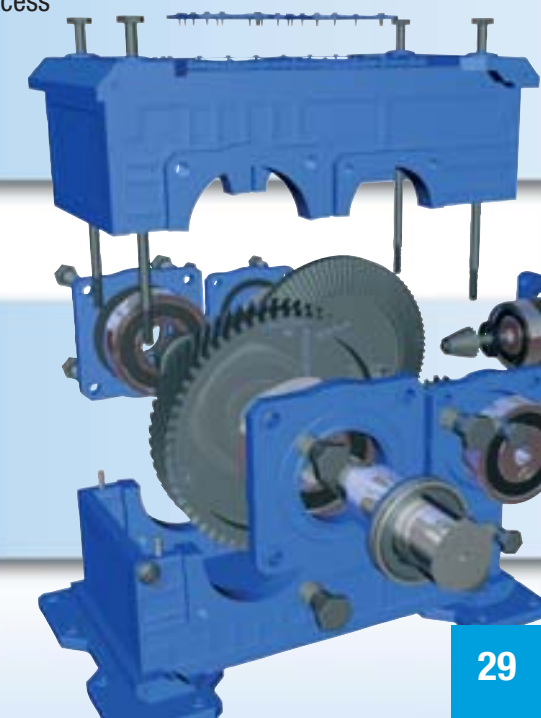
For further technical details refer to selection chart on page 69.

SOLUTION #2

- For oil seal with metallic clamping part
 - Fill the air spaces by applying Loctite® 243 or 248 Medium Strength Threadlocker to the outside diameter of the oil seal

YOUR ADVANTAGE

- A sealed assembly eliminates leaks, contamination and corrosion
- Movement of oil seal during running is eliminated
- The oil seal can still be easily removed with a screwdriver during the next overhaul





Shaft Mounted Components: Bearings

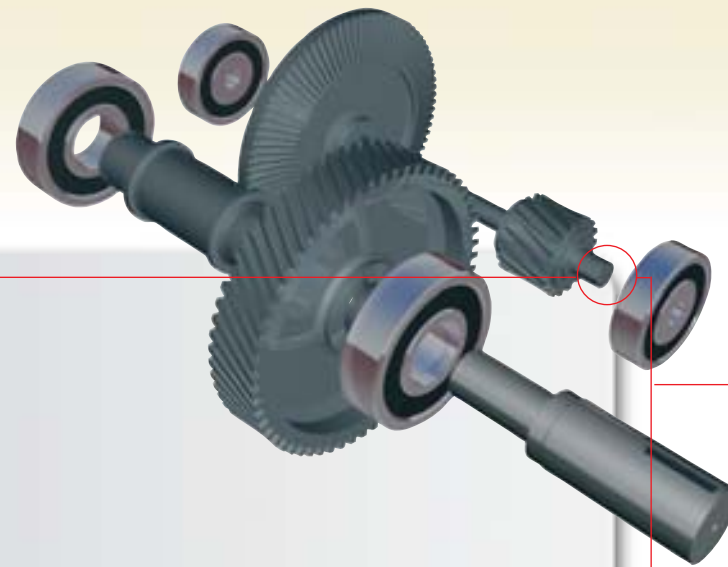
CHALLENGE

- ▶ Prevent bearing spin
- ▶ Repair worn cylindrical shafts
- ▶ Prevent downtime and scrap costs

Cause

- Bearings are prone to spinning on their shaft, this results in damage
- Load produces axial forces that are higher than original calculations
- Spun bearing caused by insufficient interference or inappropriate loads

Depending on the extent of wear, the following adhesives are recommended:



SOLUTION #1

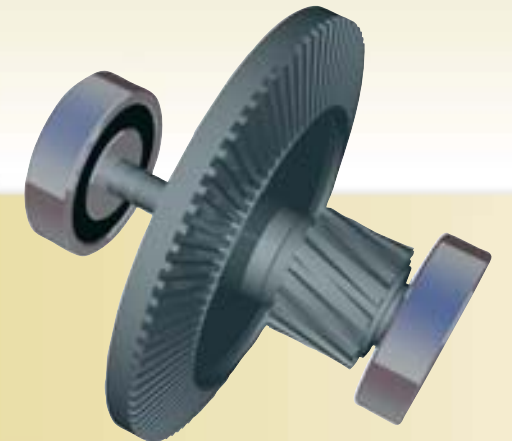


For gaps up to 0.05 mm:

- Retain joint using Loctite® 603 (oil tolerant, high strength) or Loctite® 641 (medium strength, easy to dismantle) Retaining Compound

Steps

1. Clean parts with Loctite® 7063 Cleaner and Degreaser
2. Apply a bead of Loctite® 603 or Loctite® 641 to the circumference of the shaft
3. Mount the bearing onto the shaft using normal techniques
4. Wipe off excess material
5. Allow adhesive to cure for 6 hours



For further technical details refer to selection chart on page 68.



Shaft Mounted Components: Bearings



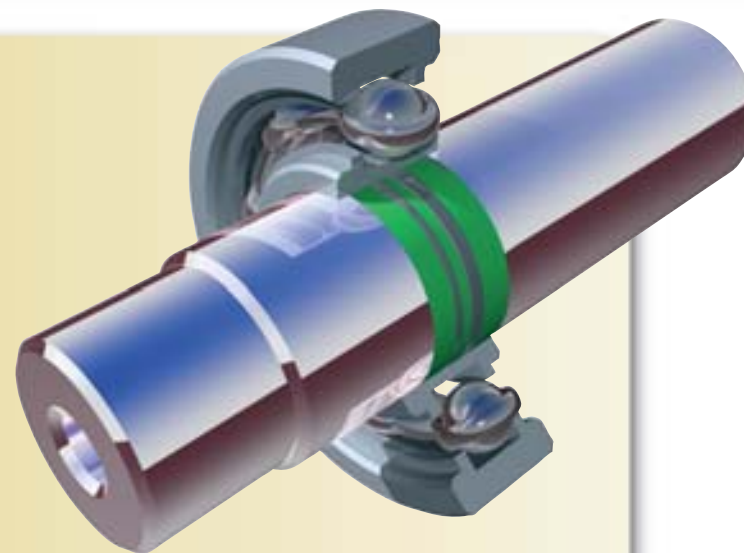
SOLUTION #2

For gaps up to 0.25 mm:

- Bond using Loctite® 660 + Loctite® 7649 Activator

Steps

1. Clean parts with Loctite® 7063 Cleaner and Degreaser
2. Apply Loctite® 7649 Activator to the inner bearing race
3. Apply a bead of Loctite® 660 to the circumference of the shaft
4. Assemble the components
5. Wipe off excess
6. Allow adhesive to cure for 12 hours before putting the equipment back into service



For further technical details refer to selection chart on page 68.

SOLUTION #3

For gaps which exceed 0.25 mm:

- Rebuild with Metal filled Epoxy Loctite® Hysol 3478 Superior Metal to the original diameter + bond the bearing onto the rebuilt shaft with Loctite® 2701

Steps

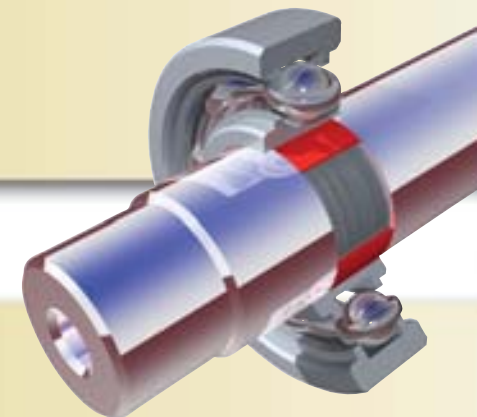
1. Using a lathe, undercut the shaft in the worn area 1.5 mm deep
2. Dovetail the ends of the worn area to lock the application into place and leave a rough surface
3. Clean parts with Loctite® 7063 Cleaner and Degreaser
4. Apply a layer of Loctite® Hysol 3478 Superior Metal, build the surface above the final desired level
5. Allow the adhesive to cure for 12 hours at room temperature
6. Machine the repair with a diamond tipped tool to the required dimensions
7. Apply Loctite® 7649 Activator to the rebuilt area of the shaft
8. Apply Loctite® 2701 to the inner bearing race

Note: In the case of a shrink fit between the shaft and the bearing, apply Loctite® 638 Retaining Compound

For further technical details refer to selection chart on page 68 and 69.

YOUR ADVANTAGE

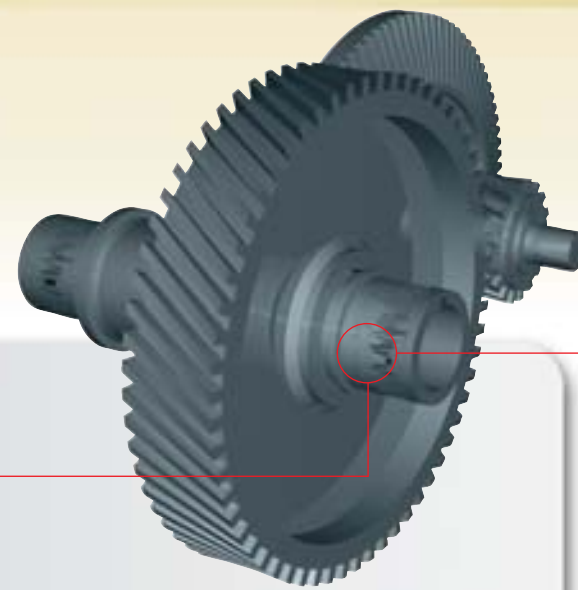
- Cylindrical joint is strengthened by using a Loctite® Retaining Compound
- Shaft is repaired to provide full surface contact





Shaft Mounted Components: Bearings

CHALLENGE



- ▶ Repair of axial score marks on cylindrical shafts
- ▶ Strengthen the retaining joint on worn shafts



Cause

- Disassembly of bearings and gear wheels frequently causes damage to shafts by scoring
- Bearings and gear wheels are mounted with a shrink fit. If they are dismantled without application of heat, friction results in axial score marks



SOLUTION #1

Moderate scoring

- Strengthen the joint between the damaged shaft and the bearing with Retaining Compound Loctite® 603

Steps

1. Remove any raised burs
2. Clean the parts with Loctite® 7063 Cleaner and Degreaser
3. Apply a bead of Loctite® 603 Retaining Compound to the circumference of the shaft
4. Press the bearing onto the shaft using normal techniques
5. Wipe off excess material

For further technical details refer to selection chart on page 68 and 69.

SOLUTION #2

Heavy scoring

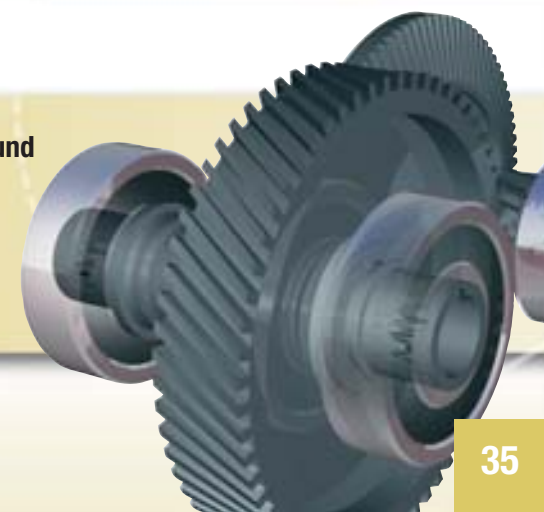
- Fill the grooves with Loctite® Hysol 3478 Superior Metal to rebuild a uniform surface and ensure that the bearing will be mounted on a smooth shaft surface

Steps

1. Remove any raised burs
2. Clean parts with Loctite® 7063 Cleaner and Degreaser
3. Apply Loctite® Hysol 3478 Superior Metal into the groove. Build the surface slightly above the desired diameter
4. Allow the adhesive to cure for 12 hours at room temperature.
5. Grind the excess material with abrasive paper
6. Apply Loctite® 7649 Activator to the rebuild area of the shaft
7. Apply Loctite® 603 to the inner bearing race and assemble

YOUR ADVANTAGE

- Cylindrical joint is strengthened by using a Loctite® Retaining Compound
- Shaft is repaired to provide full surface contact

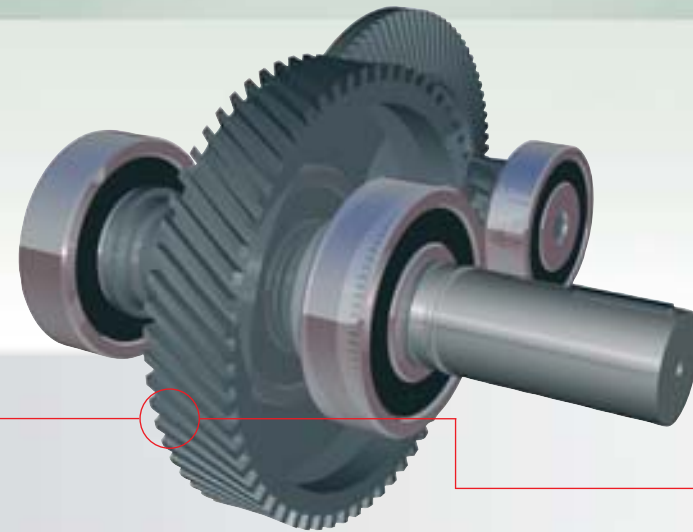




Shaft Mounted Components: Gear Sets



CHALLENGE



- ▶ Increase reliability and strength of a gear mounted on a shaft
- ▶ Repair worn taper joints

Cause

- Incorrect reassembly during maintenance leading to micro movements
- Overload conditions and elevated operating temperatures

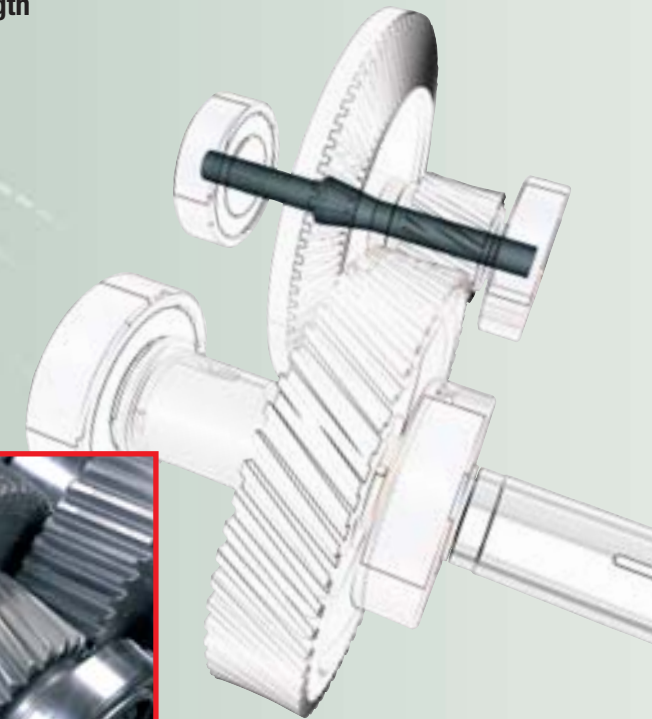


SOLUTION #1

Bonding of gear wheels directly onto the shaft with high strength Retaining Compound Loctite® 648

Steps

1. Clean parts with Loctite® 7063 Cleaner and Degreaser
2. Apply a bead of Loctite® 648 to the circumference of the shaft
3. Press the gear onto the shaft using normal techniques
4. Wipe off excess material
5. Allow adhesive to cure for 6 hours



For further technical details refer to selection chart on page 68.



Shaft Mounted Components: Gear Sets



SOLUTION #2

Bonding a sleeve on the worn shaft with Loctite® 648

Steps

- Determine an appropriate size of sleeve and machine the shaft to match
- Clean parts with Loctite® 7063 Cleaner & Degreaser
- Apply a bead of Loctite® 648 to the circumference of the shaft
- Assemble sleeve on to the shaft
- Wipe off excess
- Allow adhesive to cure for 6 hours
- Apply the same product between the sleeve and the gear wheel



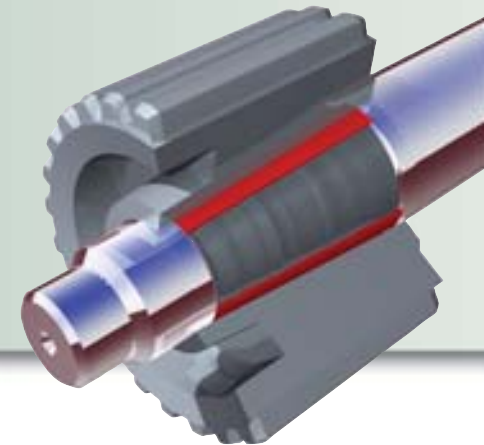
SOLUTION #3

Rebuilding the worn shaft with ceramic filled epoxy Loctite® Hysol 3478 Superior Metal and bonding the gear wheel onto the shaft with Loctite® 638 Retaining Compound

Steps

1. Using a lathe, undercut the shaft in the worn area 1.5 mm deep and leave a rough surface over the entire machined surface
2. Dovetail the ends of the worn area to lock the application into place
3. Clean parts with Loctite® 7063 Cleaner and Degreaser
4. Apply a layer of Loctite® Hysol 3478 Superior Metal, building the surface above the final desired level
5. Allow the adhesive to cure for 12 hours at room temperature
6. Machine the repair with a diamond tipped tool to the original dimensions
7. Apply Loctite® 638 Retaining Compound to the components
8. Assemble using normal procedures

For further technical details refer to selection chart on page 68 and 69.



▶ YOUR ADVANTAGE

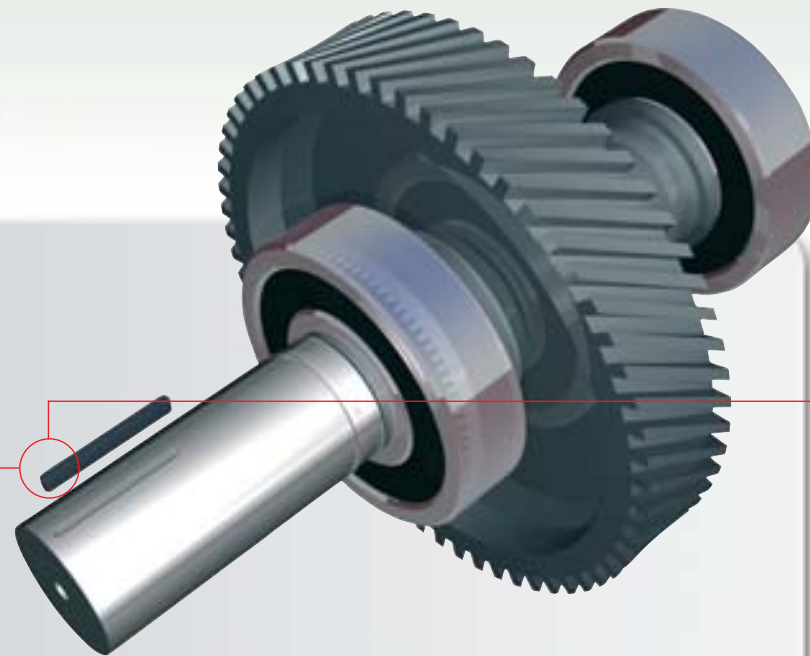
- Taper joint is strengthened by using a Retaining Compound
- Assembly is restored and ready for service without a major overhaul



Shaft Mounted Components: Gear Sets



CHALLENGE



- ▶ **Secure the key in the keyway on new equipment**
- ▶ **Prevent micro movements that lead to wear**
- ▶ **Repair worn keyways**

Cause

- Alternating loads and combined loading result in micro movement wear and loose parts
- Over time, wear can cause keys to loosen – leading to damage of the keyway

SOLUTION #1

New components

- Apply a Loctite® Medium Strength Threadlocker to eliminate any future wear of the key or keyway

Steps

1. Clean the keyway and key with Loctite® 7063 Cleaner and Degreaser
2. Apply several drops of Loctite® 243 Threadlocker into the keyway, or Loctite® 248 Threadlocker onto the key
3. Insert the key into the keyway
4. Wipe off any excess adhesive
5. Allow the adhesive 6 hours to cure before assembling the gear wheel



For further technical details refer to selection chart on page 67.



Shaft Mounted Components: Gear Sets



SOLUTION #2

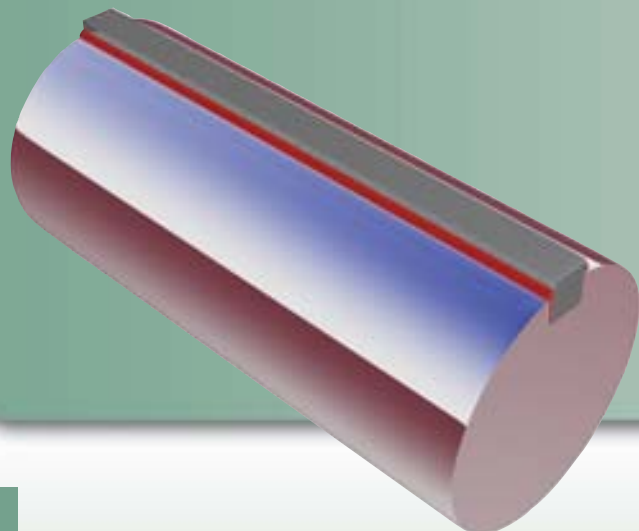


Rebuilding

- Rebuilding and bonding of a parallel key into a worn shaft using Loctite® Hysol 3478 Superior Metal

Steps

- Clean parts with Loctite® 7063 Cleaner & Degreaser
- Apply a thin layer of Loctite® 8192 Dry Film Lubricant to the collar and to any other area where adhesion is not required, and allow to dry for 30 min
Note: Loctite® 8192 Dry Film Lubricant is acting like a Release Agent
- Mix and apply Loctite® Hysol 3478 Superior Metal. Use a thin coat on the bottom and a thicker layer on the side walls
Note: For minor wear in the keyway, up to a gap of 0.25 mm, use Loctite® 660
- Assemble parallel key into keyway
- Scrape away excess adhesive
- Assemble the gear onto the shaft within 10 minutes
- Allow the adhesive to fully cure before putting back into service



SOLUTION #3

New keyway in existing shaft and gear

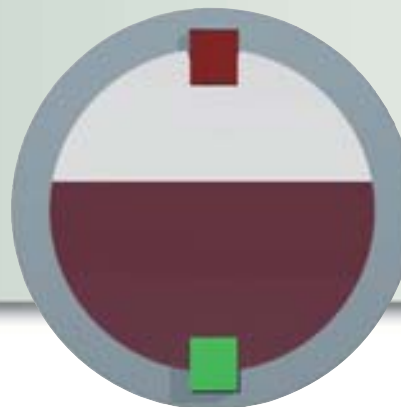
- If parts are badly worn it may be necessary to cut new keyways. In this case the old keyway should be filled with metal filled epoxy

Steps

- Clean parts with Loctite® 7063 Cleaner & Degreaser
- Mix and apply Loctite® Hysol 3478 Superior Metal into the keyway of both the shaft and gear
- Allow 12 hours curing time
- Machine the cured adhesive to the original dimensions of the shaft and bore of the gear
- Cut a new keyway in the shaft and gear
- Use solution No.1 above to refit the key

- **Note: For gear sets mounted on a shafts use the same technique as mentioned in the bearing section of Shaft Mounted Component (see page 30-33)**

For further technical details refer to selection chart on page 69.



YOUR ADVANTAGE

New components:

- Eliminate micro movement which leads to fretting
- Prevent keyway wear

Worn components:

- The assembly is restored and ready for service without a major overhaul
- The key is secured into the keyway



Couplings



CHALLENGE

- ▶ Secure the key in the keyway on new equipment
- ▶ Prevent micro movements that lead to wear
- ▶ Repair worn keyways

SOLUTION

- Please also refer to section "Prevent and repair keyway wear" on page 42-43.



YOUR ADVANTAGE

- Reduce the cost of replacement parts by salvaging and extending the life of the original components



CHALLENGE

- ▶ Protecting the spline assembly to prevent unnecessary fretting

Cause

- Wear will occur where there is friction and movement in the spline



SOLUTION

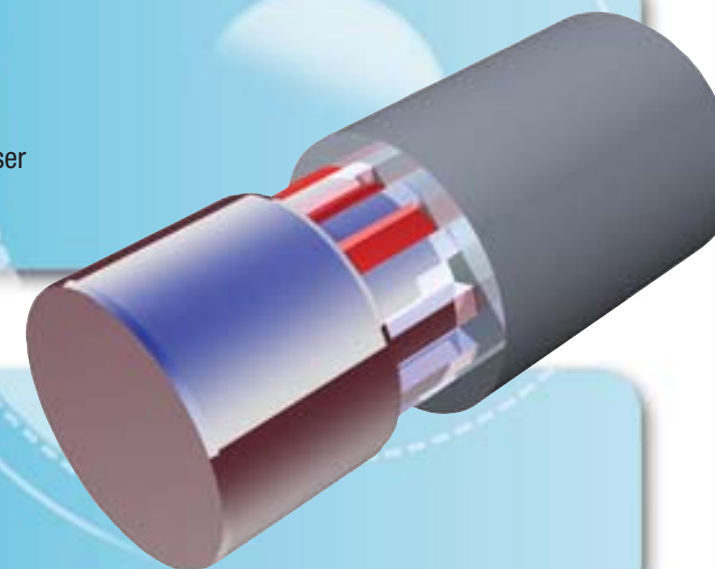
- Use Loctite® 8012 Moly Paste proactively
- Moly Paste reduces friction and wear

Steps

1. Clean mating surface with Loctite® 7063 Cleaner & Degreaser
2. Coat mating surface with Loctite® 8012 Moly Paste
3. Assemble parts

YOUR ADVANTAGE

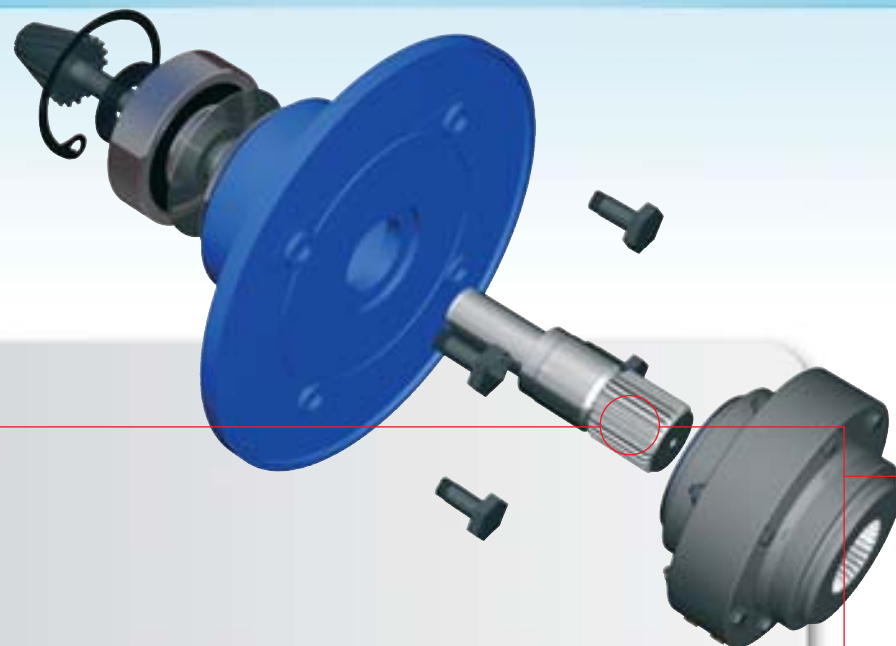
- Prevention of wear caused by friction
- Prevention of corrosion





Couplings

CHALLENGE



► Fixed spline repair

- Repair spline backlash
- Stop spline wear and failure
- Reuse previously worn components

Cause

- Alternating loads and worst case combined loading can cause micro movement
- Incorrectly specified spline drive – producing overload during operation

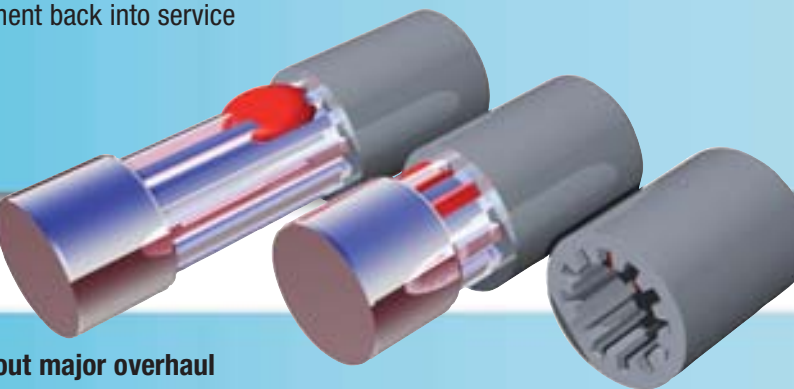


SOLUTION #1

- Bonding of a non sliding spline with backlash of up to 0.25 mm
- Bonding with Retaining Compound Loctite® 660 and Loctite® 7649 Activator

Steps

1. If possible abrasive blast the surface of the spline shaft and socket
2. Clean parts with Loctite® 7063 Cleaner & Degreaser
3. Check the spline area for uniformity
4. Apply Loctite® Hysol 3478 Superior Metal to the spline shaft and disperse the product uniformly over the spline circumference
Note: For wear between socket and shaft below 0.25 mm use Loctite® 660 Retaining Compound in combination with Loctite® 7649 Activator
5. Immediately push the spline shaft into the socket and remove excess adhesive
6. Allow the adhesive to cure before putting the equipment back into service

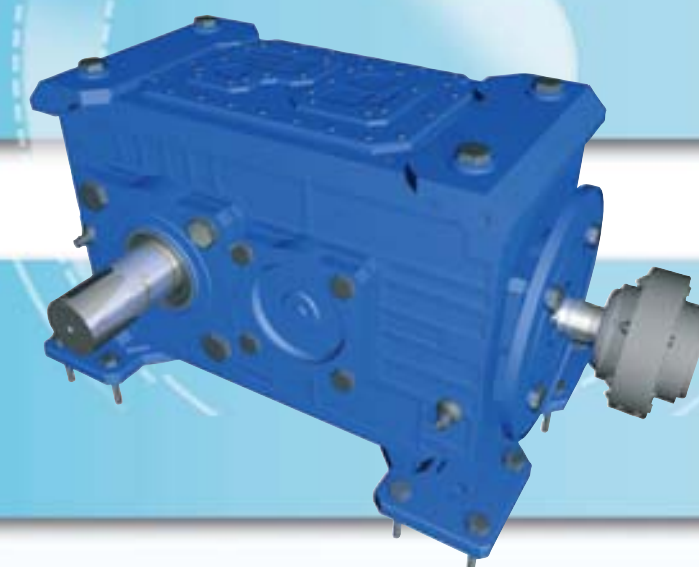


SOLUTION #2

- Rebuilding of a non sliding spline with backlash greater than 0.25 mm
- Rebuilding with metal filled Epoxy Loctite® Hysol 3478 Superior Metal

► YOUR ADVANTAGE

- Assembly is restored and ready for service without major overhaul



CHALLENGE

- ▶ Prevent couplings from moving due to loose set screws
- ▶ Secure coupling assembly screws against working loose
- ▶ Ensure optimum assembly life in “on site” conditions

Cause

- Couplings are commonly held in place by a key and a set screw
- Coupling assemblies are subjected to vibration and high loads which can cause threaded fasteners to loosen
- Typically, couplings are assembled on site; for this reason it is difficult to ensure that tightening specifications are followed

SOLUTION

Secure all threaded fasteners on couplings using Loctite® 243 or 248 Medium Strength Threadlocker

Steps

1. Clean the components with Loctite® 7063 Cleaner & Degreaser
2. Apply Loctite® 243 or 248 Medium Strength Threadlocker to all threaded fasteners
3. Align the coupling and assemble
4. Tighten each fastener within 5 minutes of assembly

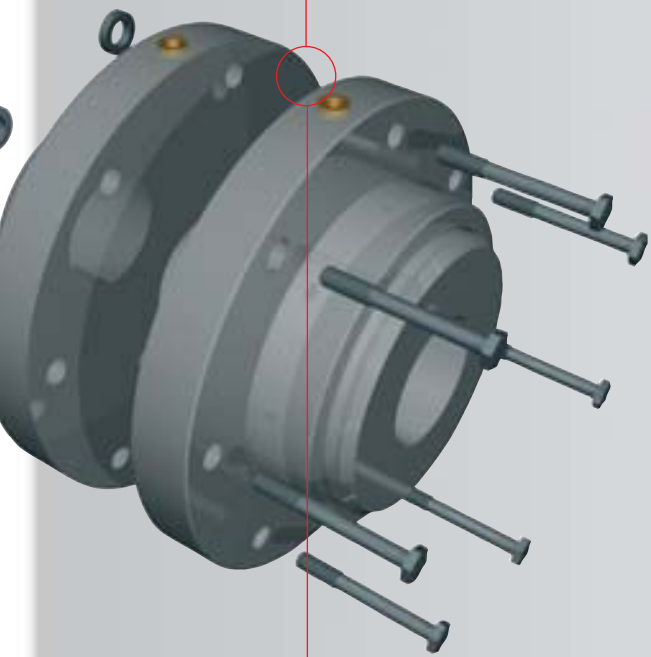
For further technical details refer to selection chart on page 67.

YOUR ADVANTAGE

- All fasteners are secured in place
- Prevention of misalignment and coupling failure



CHALLENGE



- ▶ Upgrade the load capacity of existing flange drive couplings
- ▶ Reuse worn flange couplings

Cause

- The transmittable torque of a flange drive coupling is limited by the friction of the surfaces
- Overloading causes slippage and wear of the coupling surface

SOLUTION



- Use Loctite® 638 High Strength Retaining Compound on the flange face to increase the torque capacity
- Increase torque capacity without any mechanical changes

Steps

1. Clean the surfaces with Loctite® 7063 Cleaner & Degreaser
2. Apply a thin film of Loctite® 638 on the entire surface of the coupling flange
3. Once you start to assemble, torque bolts within 10 minutes
4. Allow to cure for 6 hours before applying full load

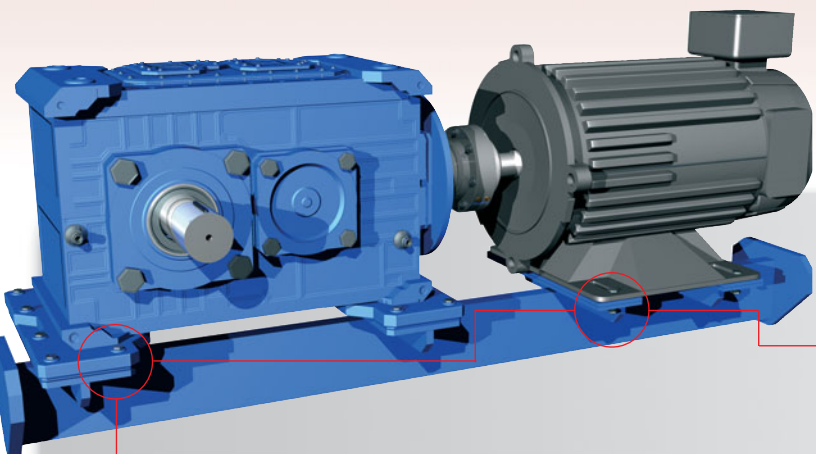
▶ YOUR ADVANTAGE

- Improved torque capacity without mechanical changes
- Eliminates micro movement and loss of joint tension
- Eliminates corrosion





Mounting Gearbox to Motor



CHALLENGE

- ▶ Secure all the components of the motor – gearbox – bedplate system
- ▶ Prevent loosening under high loads and vibration
- ▶ Select the correct threadlocking grade given the different load requirements and the need for dismantling

Cause

- Vibration and shock load can loosen fasteners and mounting bolts
- Loose bolts result in movement, which in turn allows the gearbox system to lose its alignment



SOLUTION #1

- Apply Loctite® 243 or 248 Medium Strength Threadlocker for applications such as engine flange and bell housing
- Use Loctite® 2701 for high strength needs such as gearbox and drive motor to bedplate fasteners

Steps

1. Clean parts with Loctite® 7063 Cleaner & Degreaser
2. Apply sufficient Loctite® Threadlocker to all fasteners
3. Assemble and tighten as usual

For further technical details refer to selection chart on page 67.

SOLUTION #2

Where parts need to be aligned, tightened and adjusted, use Loctite® 290 Wicking Grade Threadlocker after final adjustment and tightening

Steps

1. Clean parts with Loctite® 7063 Cleaner & Degreaser
2. Align the assembly and tighten as usual
3. Apply Loctite® 290 Wicking Grade Threadlocker to surface of assembled fastener, it will penetrate into the gap between the assembled threads

YOUR ADVANTAGE

- Mounting bolts and fasteners are secured in place
- Eliminate vibration loosening
- Eliminate bolt corrosion
- Prevent misalignment



Maintenance – Lubrication



CHALLENGE

- ▶ Light lubrication of metals during assembly and dismantling
- ▶ Assembly aid – aerosol – for all parts of the gearbox
- ▶ Protect machined components against corrosion



SOLUTION

Apply Loctite® 8201 Five Way Spray during dismantling and assembling

- Loctite® 8201 is a universal penetrating liquid which frees, lubricates, cleans, displaces moisture and prevents corrosion on all parts of the gearbox
- Loctite® 8201 does not contain silicone
- Loctite® 8201 provides light lubrication of mechanisms
- Loctite® 8201 displaces moisture and leaves a protective anti-corrosive film



CHALLENGE

- ▶ To free rusted, corroded and seized fasteners during dismantling



SOLUTION

Apply Loctite® 8040 Freeze & Release to seized parts

- The shock-freezing effect will cool parts down to – 43 °C and cause microscopic cracks in the layer of rust
- The freezing effect allows the lubricating ingredients to wick directly into the rust by capillary action
- Released fasteners remain lubricated and protected from corrosion

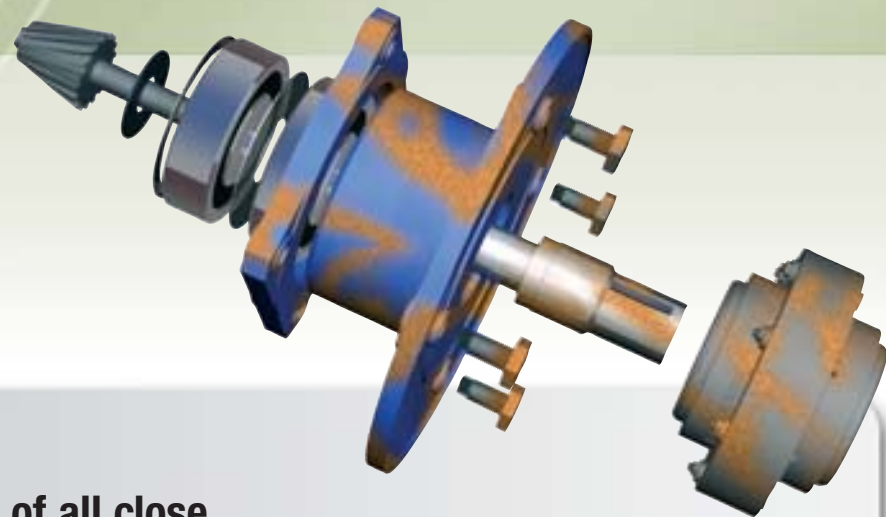
Steps

1. Remove dirt and loose rust from parts
2. Shake can thoroughly. Spray onto the fastener at a distance of about 10 to 15 cm for 5 to 10 seconds
3. Allow the product to react for 1 to 2 minutes before attempting to release the seized parts
4. Repeat application if necessary





Maintenance – Lubrication



CHALLENGE

- ▶ Ensure easy assembly of all close fitting parts by using assembly paste



SOLUTION

Apply Loctite® 8106 Multi Purpose Grease or Loctite® 8102 High Performance Grease onto any parts that need lubricating during assembly
 Loctite® 8012 Moly Paste ensures maximum lubricity, gives good resistance to extremely high loads and is ideal for protection of parts during running in or cold start



CHALLENGE

- ▶ Ensure easy future maintenance
- ▶ Protect fasteners and alignment pins against seizing and galling



SOLUTION

Apply Loctite® 8065 Copper Anti-Seize to non stainless external fasteners and dowel pins
 Use Loctite® 8009 Heavy Duty Anti-Seize on all metal fittings or in aggressive chemical environments

- Prevent wear and cold welding during assembly and operation
- Anti-Seize products are used to lubricate and to permit easy disassembly
- Inhibit corrosion and oxidation in chemically and thermally hostile environments





Maintenance Cleaners

CHALLENGE



▶ General cleaning of gearbox housing, covers and external surfaces

▶ General cleaning and degreasing of small surfaces like gear wheels and gearbox components



▶ Cleaning and degreasing of surfaces prior to bonding with Loctite® adhesives



SOLUTION #1-3



SOLUTION #1

Use Loctite® 7840 Cleaner and Degreaser for general cleaning of large surfaces

- Loctite® 7840 is a water based, concentrated, biodegradable cleaner & degreaser; it can be diluted to meet a wide range of industrial cleaning applications
- Loctite® 7840 is used for removing general surface dirt and contamination

SOLUTION #2

Use Loctite® 7070 Cleaner & Degreaser for machined components

- Loctite® 7070 Cleaner & Degreaser is a solvent based general parts cleaner which leaves no residue
- Loctite® 7070 Cleaner & Degreaser has slow evaporation and can be used in dip tanks
- The product is used as a final pre-assembly cleaning treatment to remove most greases, oils, lubrication fluids, metal swarf from all surfaces to be bonded

SOLUTION #3

Use Loctite® 7063 Cleaner & Degreaser for small components and small surfaces

- Loctite® 7063 Cleaner & Degreaser is ideal for use prior to bonding as it leaves no residue
- Loctite® 7063 Cleaner and Degreaser is compatible with metal, glass, rubber, most plastics and painted surfaces
- The product is a non - CFC solvent based formulation





Surface Protection

CHALLENGE



- ▶ Converting existing rust on external components into a stable surface
- ▶ Protect surfaces from future corrosion

SOLUTION

Use Loctite® 7500 Rust Treatment for external components that are corroded

- Loctite® 7500 Rust Treatment is a non-toxic, aqueous liquid which dries at room temperature
- Converts existing rust and forms a primed surface ready for painting
- Protects surfaces from rusting

Steps

1. Shake container thoroughly before use
2. Ensure that all surfaces are free of any dirt, oil and loose corrosion
3. Sanding is not required
4. Apply liberally by brush, roller or sponge or airless spray gun
5. Application of 2 coats is recommended for maximum durability
6. Recoat time is 60 – 120 minutes. Allow 24 hours minimum to dry before painting



CHALLENGE



- ▶ Long term protection of ferrous metals against corrosion
- ▶ Surface treatment for external surfaces

SOLUTION

- Loctite® 7800 Zinc Spray provides cathodic protection
- Can be used for long term protection or as a primer
- Gives an aesthetically pleasing appearance





Gearbox Application Product Table

GEARBOX ASSEMBLY GROUP – PRODUCT INDEX

APPLICATIONS	LOCTITE® SOLUTIONS	BENEFITS	PACK SIZE	IDH NO.	PAGE
HOUSING					
Defects and porosities	Loctite® Hysol 3471 A&B	Steel-filled repair epoxy	500 g	229176	8
	Loctite® 290 Threadlocker	Wicking for post-assembly	50 ml	233733	8
Prevent bearing spin	Loctite® 603 Retaining Compound	High strength, oil tolerant	50 ml	135280	10
	Loctite® 640 Retaining Compound	High strength, high temperature, slow cure	50 ml	564050	10
	Loctite® 641 Retaining Compound	Medium strength	50 ml	195780	10
Repair and rebuild worn bearing housing	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	12
	Loctite® 2701 Threadlocker	High strength	50 ml	234853	12
HOUSING AND COVER ASSEMBLY					
Split gearbox housing fastener	Loctite® 243 Threadlocker	Medium strength, oil tolerant	50 ml	135278	14
	Loctite® 248 Medium Strength Threadlocker	Semi-solid stick, medium strength	19 g stick	540491	14
	Loctite® 2701 Threadlocker	High strength	50 ml	234853	14
	Loctite® 8009 Heavy Duty Anti Seize	Metal-free, high lubricity	453 g	504219	14
Prevent gasket failure between upper and lower housing (split gearbox)	Loctite® 518 Flange Sealant	General purpose, up to 0.25 mm gap fill	65 ml	135480	16
	Loctite® 128068 Flange Sealant	Slow cure where long assembly time is needed	300 ml	135245	16
Cover fastener	Loctite® 243 Threadlocker	Medium strength, oil tolerant	50 ml	135278	18
	Loctite® 248 Medium Strength Threadlocker	Semi-solid stick, medium strength	19 g stick	540491	18
	Loctite® 2701 Threadlocker	High strength	50 ml	234853	18
	Loctite® 8009 Heavy Duty Anti-Seize	Metal-free, high lubricity	453 g	504219	18
Prevent leaks between covers and housing	Loctite® 5910 Flange Sealant	High adhesion, greater than 0.25 mm gap fill	300 ml	142491	20
	Loctite® 518 Flange Sealant	General purpose, up to 0.25 mm gap fill	65 ml	135480	20
	Loctite® 5922 Flange Sealant	Increase the reliability of cut gasket seals	600 ml	142274	22
	Loctite® 534 Gasket Positioner	Increase the reliability of cut gasket seals	19 g stick	705075	22
Removal of cured chemical gasket	Loctite® 7200 Gasket Remover	Aggressive gasket remover	400 ml	458654	24

GEARBOX ASSEMBLY GROUP – PRODUCT INDEX

APPLICATIONS	LOCTITE® SOLUTIONS	BENEFITS	PACK SIZE	IDH NO.	PAGE
LUBRICATION AND COOLING SYSTEM					
Threaded fittings for lubrication and cooling system	Loctite® 577 Thread Sealant	General purpose	50 ml	229342	26
	Loctite® 572 Thread Sealant	Slow cure	50 ml	229360	26
	Loctite® 561 Thread Sealant	Semi-solid stick, controlled strength	19 g stick	540920	26
SHAFT SEALS					
Prevent leaks between oil seal and housing	Loctite® 248 Medium Strength Threadlocker	Semi-solid stick, medium strength	19 g stick	540491	28
	Loctite® 435 Instant Adhesive	Transparent, toughened, fast cure	20 g	871787	28
	Loctite® 480 Instant Adhesive	Black, toughened	20 g	135250	28
SHAFT MOUNTED COMPONENT: BEARINGS					
Prevent bearing spin or repair worn cylindrical shaft	Loctite® 641 Retaining Compound	Medium strength	50 ml	135523	30
	Loctite® 603 Retaining Compound	High strength, oil tolerant	50 ml	135280	30
	Loctite® 660 Qucik Metal Retaining Compound	High strength, gap filling up to 0.25 mm	50 ml	229232	32
	Loctite® 638 Retaining Compound	High strength	50 ml	234795	32
	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	32
	Loctite® 2701 Threadlocker	High strength	50 ml	234853	32
Repair score marks on cylindrical shaft	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	34
	Loctite® 603 Retaining Compound	High strength, oil tolerant	50 ml	135280	34



Gearbox Application Product Table

GEARBOX ASSEMBLY GROUP – PRODUCT INDEX

APPLICATIONS	LOCTITE® SOLUTIONS	BENEFITS	PACK SIZE	IDH NO.	PAGE
SHAFT MOUNTED COMPONENT: GEAR SETS					
Gear mounted on a taper shaft	Loctite® 648 Retaining Compound	High temperature, high strength	50 ml	234880	36
	Loctite® 638 Retaining Compound	High strength	50 ml	234795	38
	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	38
Prevent and repair keyway wear	Loctite® 243 Threadlocker	Medium strength, oil tolerant	50 ml	135278	40
	Loctite® 248 Medium Strength Threadlocker	Semi-solid stick, medium strength	19 g stick	540491	40
	Loctite® 660 Quick Metal Retaining Compound	High strength, gap filling up to 0.25 mm	50 ml	229232	42
	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	42
Gear mounted on a cylindrical shaft	Loctite® 660 Quick Metal Retaining Compound	High strength, gap filling up to 0.25 mm	50 ml	229232	42
	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	42

GEARBOX COUPLING AND MOUNTING

APPLICATIONS	LOCTITE® SOLUTIONS	BENEFITS	PACK SIZE	IDH NO.	PAGE
COUPLINGS					
Prevent and repair keyway wear	Loctite® 660 Quick Metal Retaining Compound	High strength, gap filling up to 0.25 mm	50 ml	229232	44
	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	44
	Loctite® 243 Threadlocker	Medium strength, oil tolerant	50 ml	135278	44
	Loctite® 248 Medium Strength Threadlocker	Semi-solid stick, medium strength	19 g stick	540491	44
Protecting the spline assembly	Loctite® 8012 Moly Paste	Moly paste, brush top	453 g	504236	45
Repair spline backlash	Loctite® 660 Quick Metal Retaining Compound	High strength, gap filling up to 0.25 mm	50 ml	229232	46
	Loctite® Hysol 3478 Superior Metal	Ferro-silicon carbide based epoxy, with outstanding compressive strength	452 g	886366	46
Prevent coupling moving: Set screws	Loctite® 243 Threadlocker	Medium strength, oil tolerant	50 ml	135278	48
	Loctite® 248 Medium Strength Threadlocker	Semi-solid stick, medium strength	19 g stick	540491	48
Increase torque capacity: Flange couplings	Loctite® 638 Retaining Compound	High strength	50 ml	234795	50
MOUNTING GEARBOX TO MOTOR					
Mounting fastener	Loctite® 243 Threadlocker	Medium strength, oil tolerant	50 ml	135278	52
	Loctite® 248 Medium Strength Threadlocker	Semi-solid stick, medium strength	19 g stick	540491	52
	Loctite® 290 Threadlocker	Wicking for post-assembly	50 ml	233733	52
	Loctite® 2701 Threadlocker	High strength	50 ml	234853	52



Selection Chart

GENERAL MAINTENANCE AIDS

APPLICATIONS	LOCTITE® SOLUTIONS	BENEFITS	PACK SIZE	IDH NO.	PAGE
MAINTENANCE – LUBRICATION					
To free, lubricate and clean all parts of the gearbox during assembling and dismantling	Loctite® 8201 Five Way Spray	Moisture displacer & rust preventer	400 ml	142730	54
To free rusted, corroded and seized parts during dismantling	Loctite® 8040 Freeze & Release	Frees rusted parts	400 ml	760225	54
Assembly aid for all assembly works	Loctite® 8102 High Performance Grease	High performance grease	400 ml	142540	56
	Loctite® 8106 Multi Purpose Grease	General purpose lubrication grease	400 g	142543	56
	Loctite® 8012 Moly Paste	Moly paste, brush top	454 g	504236	56
Long term protection for fasteners and alignment pins	Loctite® 8065 C5-A® Copper Anti Seize	Semi-solid stick, general purpose	20 g stick	525380	57
	Loctite® 8060 Aluminium Anti Seize	Semi-solid stick, general purpose	20 g stick	525113	57
	Loctite® 8009 Metal free Anti Seize	Metal free Anti seize, for stainless steel	453 g	504219	57
MAINTENANCE CLEANERS					
General cleaning of external surfaces	Loctite® 7840 Cleaner & Degreaser	Large parts cleaner, water based	750 ml	235330	58
Cleaning and degreasing of machined parts	Loctite® 7070 Cleaner & Degreaser	Solvent cleaner	400 ml pump spray	88432 88365	58
Cleaning and degreasing of surfaces prior to bonding	Loctite® 7063 Cleaner & Degreaser	General parts cleaner, prior to bonding, solvent based	400 ml	88344	58
			pump spray	195814	58
			10 l	149293	58
SURFACE PROTECTION					
Rust treatment	Loctite® 7500 Rust Treatment	Rust treatment coating	1 l	303403	60
Corrosion protection	Loctite® 7800 Zinc spray	Zinc spray, shiny	400 ml	142716	61

Threadlocking

Are parts assembled?

YES		NO			
Wicking grade	Low strength	Medium strength	High strength		
290	222	243	248	2701	268
Thread size					
Up to M6 ¹	Up to M36 ¹	Up to M36 ¹	Up to M50 ¹	Up to M20 ¹	Up to M50 ¹
Temperature resistance					
+ 150 °C	+ 150 °C	+ 150 °C	+ 150 °C	+ 150 °C	+ 150 °C
Functional strength after					
3 hrs ²	6 hrs ²	2 hrs ²	6 hrs ²	6 hrs ²	24 hrs ²
Viscosity					
Low	Medium	Medium	Semi-solid	Low	Semi-solid
Pack size / IDH no.					
50 ml 233733	50 ml 231501	50 ml 135278	19 g stick 540491	50 ml 234853	19 g stick 540907

¹ General recommendation not limiting testing other sizes.

² Time to functional strength. Cleaning of substrates with Loctite® 7063 recommended. At temperatures below 5° C use of Loctite® 7649 Activator required.

Thread Sealing

Type of thread?

FINE PITCH	COARSE PITCH			PLASTIC/PLASTIC OR PLASTIC/METAL
Hydraulic & Pneumatic	Universal	Slow cure	Stick form	Universal
542	577	572	561	55
Thread size				
Up to 3/4" ¹	Up to 3" ¹	Up to 3" ¹	Up to 3" ¹	Up to 4" ¹
Temperature resistance				
+ 150 °C	+ 150 °C	+ 150 °C	+ 150 °C	+ 130 °C
Disassembly strength				
Medium ²	Medium ²	Medium ²	Low ²	Low
Viscosity				
Low	High	High	Semi-solid	Thread
Pack size / IDH no.				
50 ml 267431	50 ml 229342	50 ml 229360	19 g stick 540920	150 ml 270153

¹ General recommendation not limiting testing other sizes.

² All grades. Cleaning of substrates with Loctite® 7063 recommended. At temperatures below 5°C use of Loctite® 7649 Activator required.

Flange Sealing

Does the existing gasket need to be used as a shim?

NO				YES			
Gap: Up to 0,25 mm				Gap: Bigger than 0,25mm			
Rigid metal flanges & Flange couplings				Flexible flanges – Plastic or combined plastic/metal parts		Positioning / dressing of pre-cut gaskets	
518	548	574	128068	5699	5910	5922	534
Take free time/cure speed							
Fast curing	Fast curing	Fast curing	Slow curing	10 min Tack-free time	20 min Tack-free time	Non hardening	Fast curing
Temperature resistance							
+ 150 °C	+ 150 °C	+ 150 °C	+ 150 °C	+ 150 °C	+ 200 °C	+ 200 °C	+ 150 °C
Cure mechanism							
Anaerobic	Anaerobic	Anaerobic	Anaerobic	Moisture	Moisture	n.a.	Anaerobic
Viscosity							
Paste	Semi solid	Gel	Paste	Paste	Paste	Paste	Semi solid
Pack size / IDH no.							
300 ml 435566	18 g stick 704920	250 ml 135500	300 ml 135245	300 ml 135270	300 ml 142491	60 ml 142274	19 g stick 705075

¹ With temperatures below 5°C please use Loctite® 7649 Activator

Retaining

Need to be able to disassemble?

YES	NO					
Medium strength	High strength					
641	668	603	640	648	638	660
Diametrical clearance						
< 0.1 mm	< 0.15 mm	< 0.1 mm	< 0.15 mm	< 0.15 mm	< 0.25 mm	< 0.5 mm ¹
Temperature resistance						
+ 150 °C	+ 150 °C	+ 150 °C	+ 175 °C	+ 175 °C	+ 150 °C	+ 150 °C
Handling strength						
30 min ²	30 min ²	8 min ²	90 min ²	5 min ²	8 min ²	20 min ²
Viscosity mPa.s						
15	Semi-solid	125	450	450	2,500	Paste
Pack size / IDH no.						
50 ml 135523	19 g stick 705053	50 ml 135280	50 ml 142620	50 ml 234880	50 ml 234795	50 ml 229232

¹ Use with Loctite® 7649 Activator

² Time to handling strength. Cleaning of substrates with Loctite® 7063 recommended. At temperatures below 5°C use of Loctite® 7649 Activator required

Selection Chart

Metal filled Epoxy

Which material will be repaired?

STEEL					ALUMINIUM		
Standard application					High perform.	Stand. appl.	High perform.
Steel filled kneadable stick	Steel putty	Steel pourable	Steel fast cure	Steel under friction	Outstanding comp. strength	Multi purpose	High temperature
3463	3471	3472	3473	3474	3478	3475	3479
Working life							
3 min	45 min	45 min	6 min	45 min	20 min	45 min	45 min
Fixture time							
10 min	180 min	180 min	15 min	180 min	90 min	180 min	150 min
Compressive strength							
82,7	70 N/mm ²	70 N/mm ²	60 N/mm ²	70 N/mm ²	124 N/mm ²	70 N/mm ²	90 N/mm ²
Operating temperature							
Up to + 120 °C	Up to + 120 °C	Up to + 120 °C	Up to + 120 °C	Up to + 120 °C	Up to + 120 °C	Up to + 120 °C	Up to + 120 °C
Pack size / IDH no.							
114 g 265628	500 g 229176	500 g 229175	500 g 229174	500 g 195891	452 g 886366	500 g 229173	500 g 195826

Instant Bonding

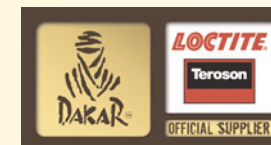
Dissimilar materials needs to be bonded?

UNIVERSAL / GENERAL APPLICATION		TOUGHENED / HIGH TEMPERATURE	
401	454	435	480
Especially for:			
Plastic/Rubber/ Porous Substrates	Plastic/Rubber/ Porous Substrates	Plastic/Rubber/ Porous Substrates	Metal/Plastics
Operating temperature:			
Up to + 80 °C	Up to + 80 °C	Up to + 100 °C	Up to + 100 °C
Fixture time (on steel):			
5-20 sec	5-20 sec	5-20 sec	60-120 sec
Viscosity mPa.s			
110	Gel	200	300
Colour:			
Clear	Clear	Clear	Black
Pack size / IDH no.			
20 g 135428	20 g 195678	20 g 871787	20 g 135250

Surface Preparation

Do you need an activator?

Increase cure speed on passive surfaces such as stainless steel, aluminium, plated or passivated metals	
Recommended for bonding on rebuilt surfaces with Loctite® Hysol 3478 Superior Metal	
Solvent based	Solvent free
7649	7240
Appearance:	
Transparent, green liquid	Blue-green liquid
Evaporation time:	
Min. 60 sec	Not applicable
On part life	
> 24 h	6 h
Pack size / IDH no.	
150 ml aerosol 142479	90 ml pump 333369



The data contained herein are intended as reference only. Please contact your local Henkel Technical Support Group for assistance and recommendation on specifications for these products.

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