

LOCTITE[®]

SURROUND YOUR PUMP WITH EXPERTISE

Provides 360° reliability for big value parts:
The LOCTITE Pump Maintenance Guide.



Henkel



This guide has been developed to assist maintenance personnel who service industrial centrifugal pumps in achieving their goals of pump reliability, longevity and cost reduction.

Most industrial centrifugal pumps carry a significant capital equipment value and it is therefore important to extend their useful lives and ensure that they run efficiently and reliably. Proactive maintenance can reduce the risk of breakdowns and increase pump reliability and longevity. Without proactive maintenance, some pump failures may go unnoticed until there is the inevitable breakdown.

Pump breakdowns can have significant negative impact, such as a stop in production and the cost of a broken piece of capital equipment. Many of these breakdowns are the result of simple, needless failures, such as the loss of clamp load between two assemblies caused by a loose fastener. This loss of clamp load could lead to misalignment and ultimately cause bearing failure. Taking some proactive steps can reduce the risk of this occurrence and can help extend the mean time between failure (MTBF).

LOCTITE brand products have been helping OEMs around the world prevent common failures and extend end-product life. These same technologies are used by the people who maintain equipment.

Various LOCTITE brand products can be used in all stages of pump maintenance:

- › Assembly
- › Installation
- › Repair
- › On-going maintenance
- › Disassembly

The use of LOCTITE brand products in a proactive maintenance program can:

- › Prevent common failures, both major and minor
- › Allow for the recycling of parts to avoid scrap and replacement costs
- › Assist in disassembly
- › Help ensure reliability and a consistent running condition

To highlight the common failures, challenges and LOCTITE product solutions, a common Goulds 3196 pump was used. This type of pump is very common, has been an industry standard, and is manufactured by one of the leaders in the pump industry. The environments in which these pumps operate, not necessarily pump construction, can affect pump operation and efficiency and present challenges to end users. We chose the Goulds 3196 to demonstrate the solutions to these common challenges. Similar solutions will apply to other types and brands of centrifugal pumps. **Contact your local Henkel representative if help is needed for your specific applications.**



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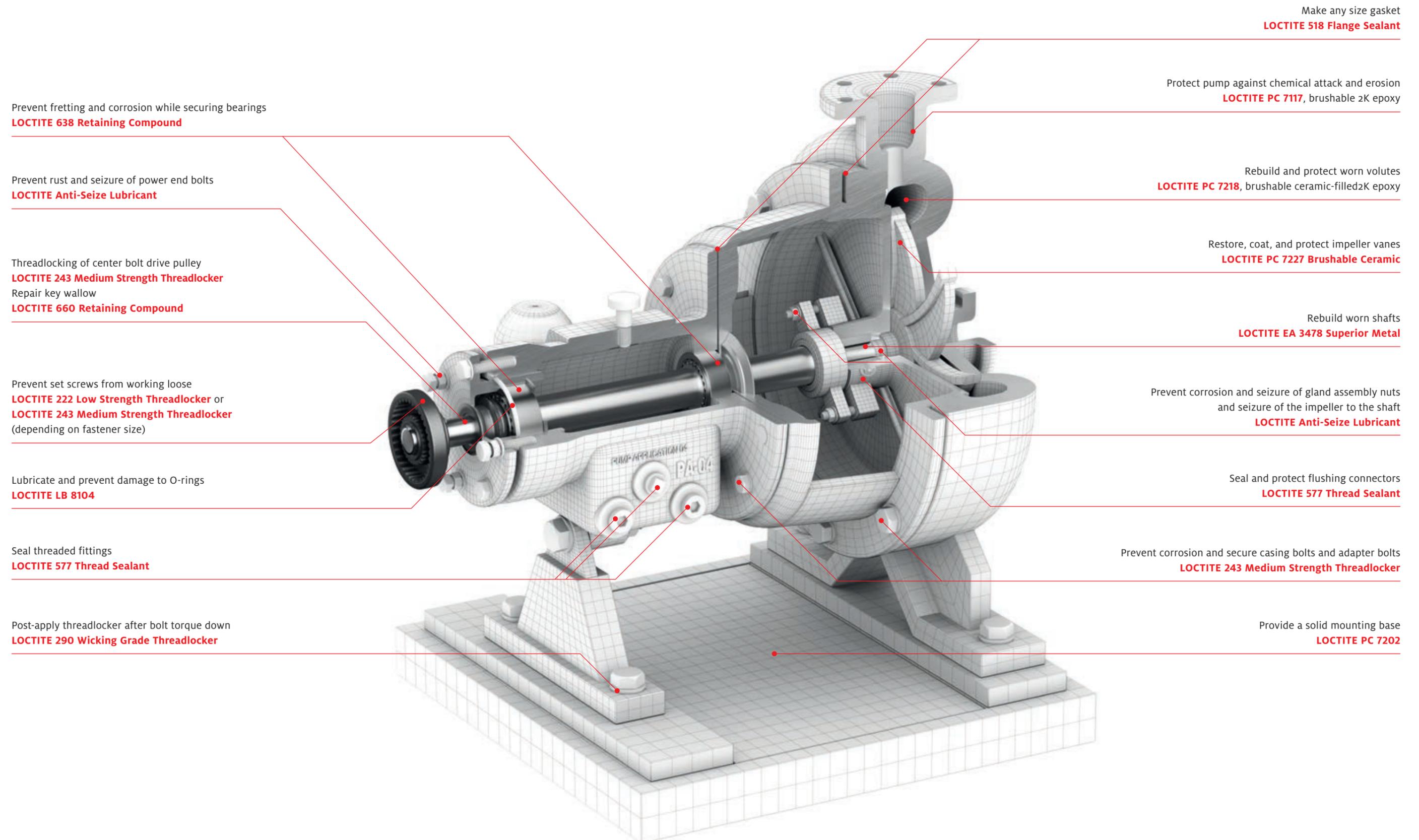
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INDUSTRIAL PUMP APPLICATIONS



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LOCTITE 638 Retaining Compound

Prevent rust and seizure of power end bolts
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Threadlocking of center bolt drive pulley
LOCTITE 243 Medium Strength Threadlocker
Repair key wallow
LOCTITE 660 Retaining Compound

Prevent set screws from working loose
LOCTITE 222 Low Strength Threadlocker or
LOCTITE 243 Medium Strength Threadlocker
(depending on fastener size)

Lubricate and prevent damage to O-rings
LOCTITE LB 8104

Seal threaded fittings
LOCTITE 577 Thread Sealant

Post-apply threadlocker after bolt torque down
LOCTITE 290 Wicking Grade Threadlocker

Make any size gasket
LOCTITE 518 Flange Sealant

Protect pump against chemical attack and erosion
LOCTITE PC 7117, brushable 2K epoxy

Rebuild and protect worn volutes
LOCTITE PC 7218, brushable ceramic-filled 2K epoxy

Restore, coat, and protect impeller vanes
LOCTITE PC 7227 Brushable Ceramic

Rebuild worn shafts
LOCTITE EA 3478 Superior Metal

Prevent corrosion and seizure of gland assembly nuts
and seizure of the impeller to the shaft
LOCTITE Anti-Seize Lubricant

Seal and protect flushing connectors
LOCTITE 577 Thread Sealant

Prevent corrosion and secure casing bolts and adapter bolts
LOCTITE 243 Medium Strength Threadlocker

Provide a solid mounting base
LOCTITE PC 7202

BEARING FRAME AND HOUSING

CHALLENGE

Prevent oil leaks from threaded assemblies

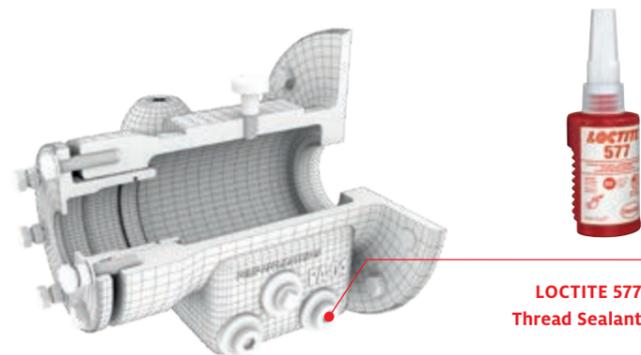
Drain plugs, oiler nipples, fittings, etc., all have air space between the threads and can weep oil out from the bearing housing. Constant pressure changes within the bearing housing can force these threaded assemblies to leak.

SOLUTION

- › Seal threaded assemblies with LOCTITE 577 Thread Sealant.
- › LOCTITE 577 Thread Sealant is designed to cure only when enclosed in metal, such as in a threaded assembly.
- › Once cured, moisture and oil cannot penetrate this barrier as the pressure changes within the bearing housing.
- › The thread sealant prevents fittings from loosening, yet allows for easy disassembly with normal hand tools.

Steps

1. Clean parts of contamination. If necessary, spray LOCTITE SF 7649.
2. Apply a band of LOCTITE 577 Thread Sealant to male threads, starting one to two threads from end of fitting.
3. Assemble parts per OEM specifications.



LOCTITE 577
Thread Sealant

RESULTS

- › Less oil consumption, thereby reducing the risk of the pump running low on lubricant.
- › Elimination of the potential hazards and cleanup associated with oil leaks.
- › Elimination of seized fittings because moisture and air have been sealed out.
- › Elimination of rust and corrosion within the thread space.
- › Contaminants prevented from getting into the oil through the gaps in the threads.

CHALLENGE

Prevent leaks and seizures between the bearing housing and oil seal

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 where corrosion can form.

SOLUTION

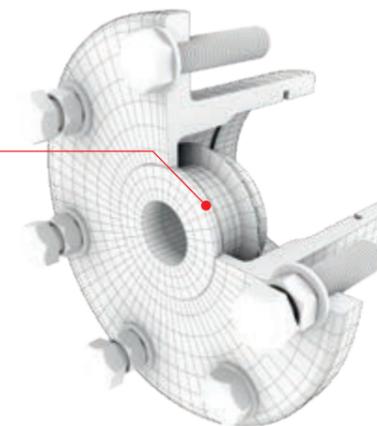
- › Fill the air spaces by applying a LOCTITE Medium Strength Threadlocker to the outside diameter of the oil seal.

Steps

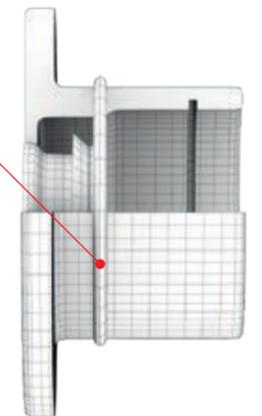
1. Clean the outside diameter of the oil seal and the side diameter of the bearing housing with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
2. Apply LOCTITE 248 Medium Strength Threadlocker Stick to the outside diameter of the oil seal.
3. Wipe off any excess and press into housing using normal techniques.



LOCTITE 248
Medium Strength
Threadlocker



LOCTITE LB 8104
High Performance
Synthetic Grease



RESULTS

- › A sealed assembly eliminates leaks, contamination and corrosion.
- › Elimination of cleanup and hazards associated with oil seal leaks.
- › Less oil consumption.
- › Reduced risk of running low on lubricant.
- › Service of the pump is easier.
- › The oil seal can be easily removed with a screwdriver during the next overhaul.

RESULTS

- › Lubricated O-rings remain pliable and capable of sealing oil in and contaminants out.
- › O-rings are prevented from adhering to the bearing frame.

PUMP ASSEMBLY

During the assembly of a pump there are many simple steps that can be taken to help reduce or eliminate common failures and that will also make future disassembly much easier. The following sections will discuss proven reliability applications and techniques starting with the bearing housing of the common 3196 end-section centrifugal pump all the way through to the final assembly of the pump casing, attaching the coupling and grouting the base.

BEARING FRAME AND HOUSING

CHALLENGE

Prevent bearing spinout, corrosion and component damage

Bearings are prone to spinning either on their shafts or within their housings, resulting in damage to these parts regardless of whether or not they have been pressed, shrink or slip fitted in place. The air space that exists between a bearing and shaft is an area where rust can form and cause damage to the parts.

SOLUTION #1

- › Outboard Bearing – Apply a coating of LOCTITE 638 Retaining Compound to the outside diameter of the outboard bearing.
- › LOCTITE 638 Retaining Compound is low strength, which allows for easy disassembly during future overhauls.

Steps

1. Clean parts with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
2. Apply a coating of LOCTITE 638 Retaining Compound to the outside diameter of the outboard bearing.
3. Assemble using normal techniques.

SOLUTION #2

- › Inboard Bearing – Apply a coating of LOCTITE 638 Retaining Compound to the inside diameter of the inboard bearing.

Steps

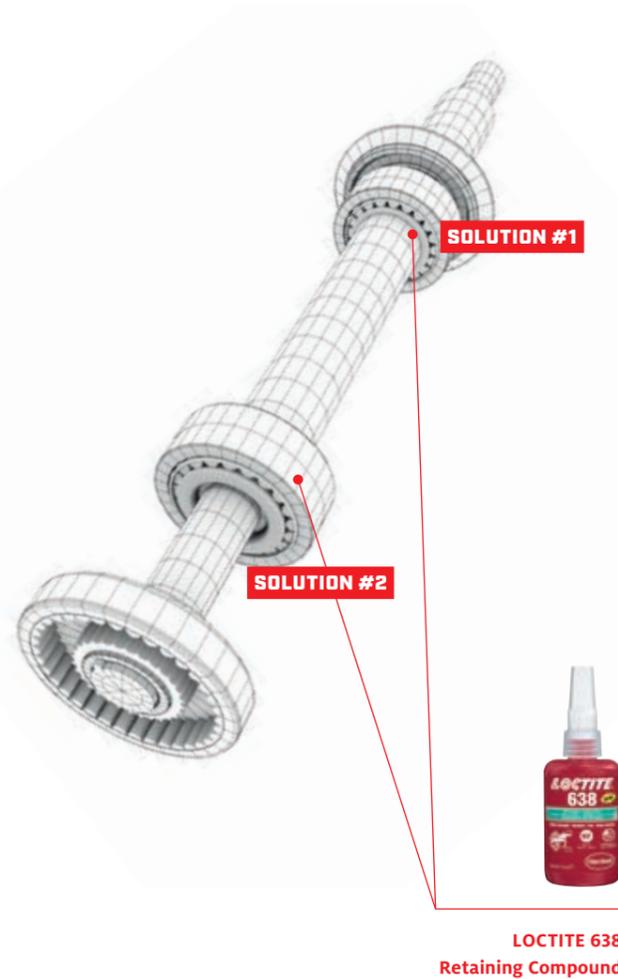
1. Clean parts with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
2. Apply a bead of LOCTITE 638 Retaining Compound to the circumference of the shaft at the leading area of engagement.
3. Press the bearing onto the shaft using normal techniques.
4. Wipe off any excess material.



Solution #1, Step 2.



Solution #2, Step 2.



LOCTITE 638 Retaining Compound

RESULTS

- › Shaft and/or bearing housing damage is eliminated.
- › Bearings are easily removed with standard tools.
- › Corrosion (the rust left on a shaft after a bearing has been removed) is eliminated because the air space between the bearing and the shaft or housing is sealed.

CHALLENGE

Prevent corrosion and seizure of power end jack bolts, jam nuts and clamp bolts

Any exposed metal parts on a pump that are not stainless or coated, such as power end nuts and bolts, are subject to rust. When rust forms within the air space between the threads, the bolts will seize in place.

SOLUTION

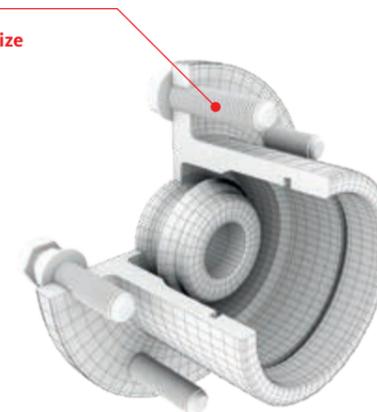
- › Apply LOCTITE LB 8023 Marine Grade Anti-Seize to the power end bolts.
- › LOCTITE LB 8023 Marine Grade Anti-Seize is met al-free and has superior water washout resistance.

Steps

1. Apply LOCTITE LB 8023 Marine Grade Anti-Seize liberally to the bolt threads.
2. Assemble jam nuts onto the bolts.
3. Thread the bolts into the bearing housing and adjust as required.



LOCTITE Anti-Seize Lubricant



RESULTS

- › Easy adjustment of bolts when needed to ensure that the pump runs closest to its best efficiency point (BEP).
- › Easy disassembly/removal of bolts.



FRAME ADAPTER

CHALLENGE

Prevent dowel pins from seizing to the bearing frame and frame adapter

The dowel pins are exposed to the exterior pump environment and if not protected can rust and seize themselves to the bearing frame. When these pins seize in the bearing frame, the disassembly becomes very difficult.

SOLUTION

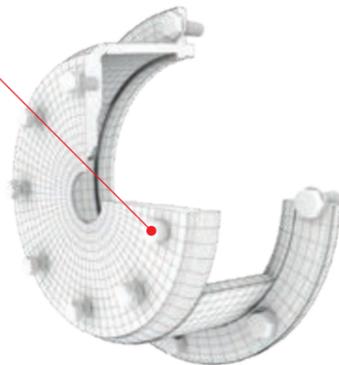
- Before assembly, apply LOCTITE Marine Grade Anti-Seize to the dowel pins.
- LOCTITE Marine Grade Anti-Seize Compound provides a protective coating to parts that are exposed to severe heat and moisture.

Steps

1. Clean the parts.
2. Apply LOCTITE Marine Grade Anti-Seize to the pins.
3. Assemble adapter to the bearing frame.



LOCTITE Anti-Seize Lubricant



CHALLENGE

Prevent fastener loosening and corrosion to frame adapter mounting bolts

Bolts can work themselves loose because they are always under strain caused by torque. Also, vibration, thermal expansion and contraction, and shock all contribute to loosening and reduction of clamp load.

SOLUTION

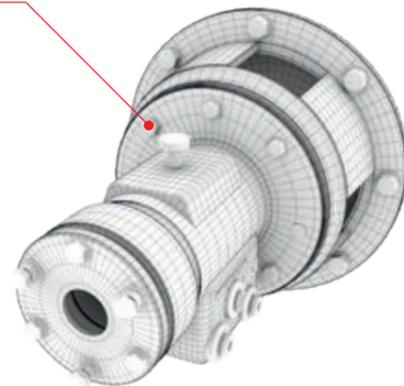
- Apply a LOCTITE Medium Strength Threadlocker to the frame adapter bolts.

Steps

1. Clean threads with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
2. Apply several drops of LOCTITE 243 Medium Strength Threadlocker to the adapter bolts.
3. Assemble and tighten as usual.



LOCTITE Medium Strength Threadlocker



RESULTS

- Prevention of rust and seizure of these closefitting parts.
- The bearing frame and frame adapter will be easier to separate during the next disassembly.

RESULTS

- Prevention of the bolts from rusting and seizing in place because a LOCTITE brand threadlocker will seal all of the air space within the threads.
- Easy and consistent disassembly.
- Prevention of bolts from loosening.
- Torque and clamp load is maintained.
- Proper clamp load is ensured between flange surfaces, and leaks are eliminated, when LOCTITE 518 Flange Sealant is used instead of a cut gasket.

CHALLENGE

Prevent gasket failure between the bearing frame and frame adapter

Leaks occur because a cut gasket can relax over time, resulting in loss of clamp load between the two flanges. Cut gaskets can also leak because they are prone to extrusion, misalignment, shrinkage and breaks. Flange imperfections can be leak paths that a cut gasket may not be able to seal over time.

SOLUTION

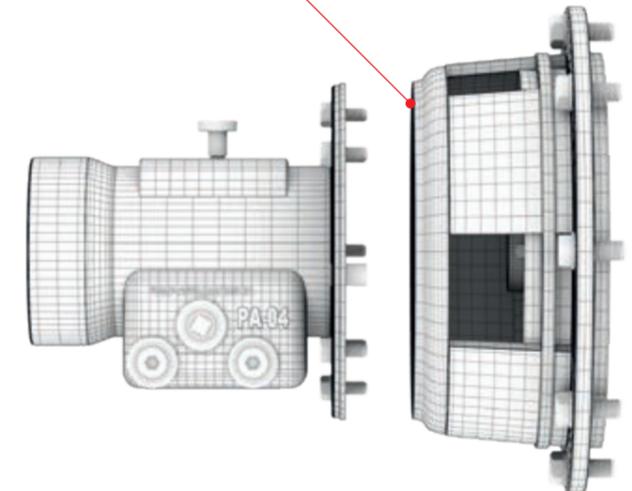
- Apply LOCTITE 518 Flange Sealant to the flange face of the frame adapter.
- The LOCTITE 518 Flange Sealant not only eliminates the gasket but also eliminates all the failure modes of cut gaskets and, most important, it seals all of the air space between the two parts.
 - Note:** In some cases the cut gasket is required for spacing. In this case, apply LOCTITE 518 Flange Sealant to both sides of the gasket as a shellac.
- LOCTITE 518 Flange Sealant can cure through fairly large gaps and surface imperfections.

Steps

1. Remove old gasketing material and other heavy contaminants with LOCTITE SF 7200.
2. Clean both flange surfaces with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
3. Spray LOCTITE SF 7649 on only one flange surface and allow to dry.
4. Apply a layer of LOCTITE 518 Flange Sealant to the other surface.
 - Note:** Circle bolt holes with sealant if appropriate.
5. Assemble parts and tighten as required.
6. Allow to cure:
 - No pressure – immediate service
 - Low pressure (up to 3,4 bar) – 30 to 45 minutes
 - High pressure (3,4 to 17,2 bar) – 4 hours
 - Extreme high pressure (17,2 to 34,4 bar) – 24 hours



LOCTITE 518 pen



RESULTS

- Elimination of common cut gasket failures such as compression set, shrinkage, relaxation and breaks.
- Constant clamp load is ensured.
- Reliable seal.
- Elimination of oil leaks between the bearing frame and frame adapter, along with associated cleanup costs and hazards.
- Reduced oil consumption.
- Reduced risk of running low on oil.

GLAND ASSEMBLY

CHALLENGE

Prevent corrosion and seizure of packing gland nuts

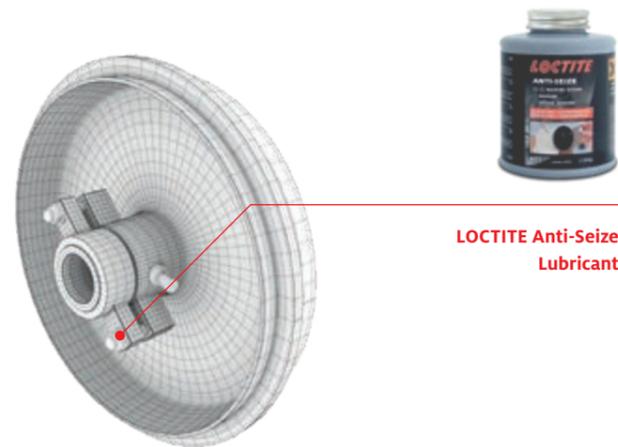
The gland assembly is subject to severe corrosion and seizure because of the continuous flow of water that lubricates and cools the packing. This continuous flow of water also causes the gland studs and nuts to rust and seize. If the nuts seize to the studs, it becomes impossible to properly adjust the gland follower and, ultimately, proper lubrication and cooling cannot be maintained. This can lead to the packing running dry, overheating and subsequent wearing and gouging of the shaft. What starts out as a simple failure mode of a corroded threaded assembly can lead to a major failure of one of the main pump components.

SOLUTION

- › Apply LOCTITE LB 8023 Marine Grade Anti-Seize to the studs.
- › LOCTITE LB 8023 Marine Grade Anti-Seize is metal-free and is designed to have superior water washout resistance, a key feature in a gland application.

Steps

1. Clean the parts.
2. Apply LOCTITE LB 8023 Marine Grade Anti-Seize to the studs.
3. Assemble gland nuts and adjust gland follower as necessary.



LOCTITE Anti-Seize Lubricant

RESULTS

- › Elimination of gland nuts freezing to the studs.
- › Proper adjustments can be made to the gland follower.
- › Water can properly flow through the packing for lubrication and cooling.
- › Excessive shaft wear can be prevented.

CHALLENGE

Prevent corrosion within the gland flushing connector

Whether using a mechanical seal or packing, these components are typically cooled and lubricated by either a product flush or an external flush. In either case, the flushing connector is prone to corrosion and seizure. This is especially true for pumps configured with packing. Since packing typically requires 40–60 drops per minute for proper cooling and lubrication, there is plenty of available moisture for rust to attack the gland assembly components.

SOLUTION

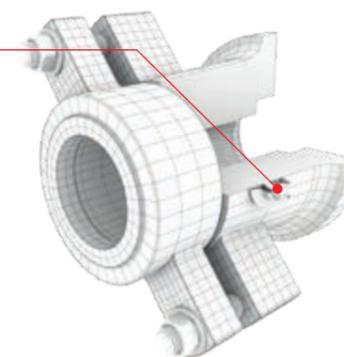
- › Apply LOCTITE 577 Thread Sealant.
- › LOCTITE 577 Thread Sealant fills the air space within the threads.
- › Allows the flushing connector to be removed with normal hand tools when necessary.

Steps

1. Clean the parts with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
2. Apply a band of LOCTITE 577 Thread Sealant to male threads, starting one to two threads from the end of the fitting.
3. Assemble parts snugly. Do not overtighten.



LOCTITE 577 Thread Sealant



RESULTS

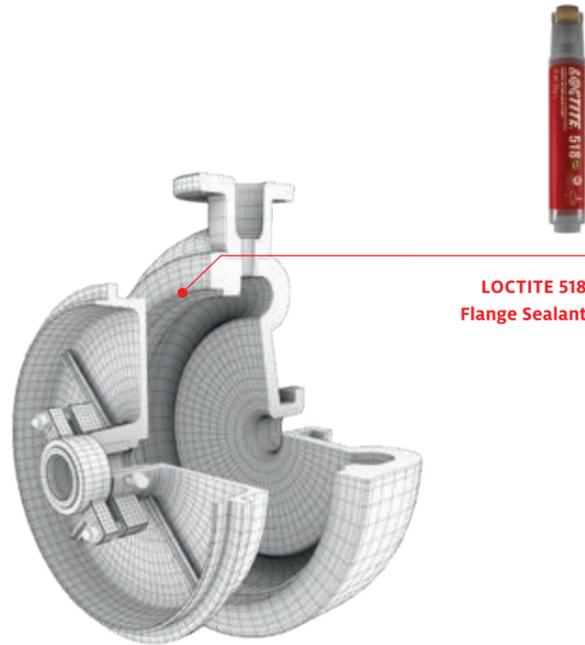
- › Prevention of leaks and corrosion.
- › Eliminated seizure.
- › Ensured easy maintenance of flushing connectors.



CHALLENGE

Prevent leaks between the stuffing box and casing

The use of cut gaskets suffers from inherent problems, such as gasket relaxation, shrinkage, extrusion and breakage, which can lead to leaks.



LOCTITE 518
Flange Sealant

SOLUTION #1

- › Replace the cut gasket and apply LOCTITE 518 Flange Sealant to the flange surface.
- › Direct metal-to-metal contact along with the use of LOCTITE 518 Flange Sealant allows for a positive seal.
- › Since there is metal-to-metal contact, proper clamp load can be maintained and the two parts become unitized – they act as one.

Steps

1. Remove old gasketing material with LOCTITE SF 7200.
2. Clean both flanges with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
3. Spray LOCTITE SF 7649 on only one surface and allow 1–2 minutes to dry.
4. Apply a continuous bead of LOCTITE 518 Flange Sealant to the other surface.

Note: Circle all bolt holes, if appropriate.

5. Assemble and tighten as required.
6. Allow to cure.

SOLUTION #2

- › Coat the gasket material with LOCTITE 518 Flange Sealant.
- › If there is not enough clearance between the impeller and the casing to eliminate the gasket, the cut gasket must be used.
- › LOCTITE 518 Flange Sealant will fill all the air space that cut gaskets simply cannot fill.
- › LOCTITE 518 Flange Sealant will withstand expansion and contraction caused by pressure and temperature changes.

Steps

1. Remove old gasketing material with LOCTITE SF 7200.
2. Clean both flanges with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
3. Spray LOCTITE SF 7649 to both flange faces and both sides of the gasket. Allow 1–2 minutes to dry.
4. Smear LOCTITE 518 Flange Sealant to both sides of the precut gasket.
5. Assemble and tighten as required.
6. Allow to cure.



RESULTS

- › Eliminated casing gasket leaks.
- › Eliminated corrosion and damage on the flange surface.

CHALLENGE

Prevent the frame adapter, stuffing box and casing from seizing together

When assembling these components, there are areas where the clearance is very tight. These small clearances are areas where rust and corrosion can work in to seize the components together, making disassembly very difficult.

SOLUTION

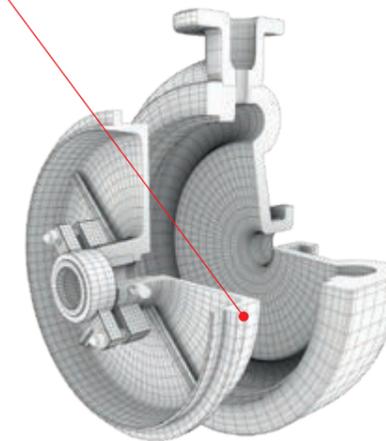
- › Apply a LOCTITE Anti-Seize compound during assembly. Because LOCTITE Anti-Seize compounds have superior water washout resistance, they will stay where they are applied.

Steps

1. Clean the parts.
2. Apply LOCTITE LB 8023 Marine Grade Anti-Seize to the outside diameter of the stuffing box at the mating point.
3. Assemble components as usual.



LOCTITE Anti-Seize
Lubricant



RESULTS

- › Sufficient lubrication provided during assembly.
- › Prevention of rust while in service.
- › Efficient disassembly.

CHALLENGE

Prevent corrosion and seizure of the pump casing bolts

The severe pump environments of constant temperature, pressure and humidity changes result in corrosion. Casing bolts that are rusted and seized make pump maintenance difficult and create additional labor associated with drilling and tapping the bolt hole.

SOLUTION

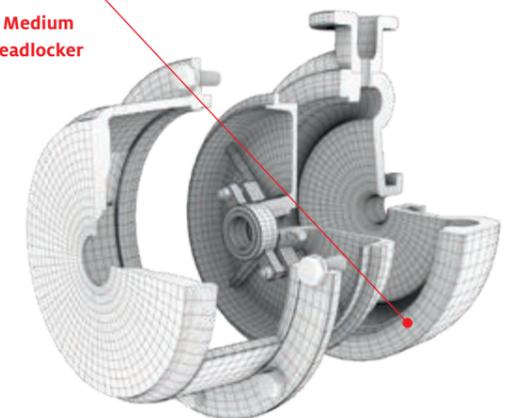
- › Apply LOCTITE 243 Medium Strength Threadlocker in the bolt holes prior to assembling the casing.
- › LOCTITE 243 Medium Strength Threadlocker fills all the air space within the threads.

Steps

1. Place several drops of LOCTITE 243 Medium Strength Threadlocker down the side of the female threads.
2. Apply several drops of LOCTITE 243 Medium Strength Threadlocker onto the bolt threads.
3. Install bolts.



LOCTITE 243 Medium
Strength Threadlocker



RESULTS

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

KEYWAYS / KEY STOCK

CHALLENGE

Prevent keyway wallow by securing the key stock in the keyway

In a new assembly, the fit between the key stock and the keyway are usually fairly tight. Over time the fit between the key stock and the keyway can loosen and lead to damage to the keyway.

SOLUTION

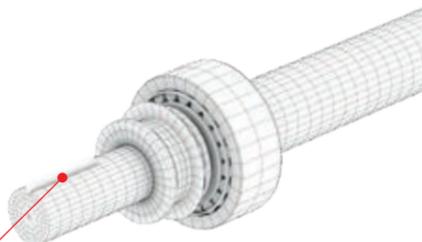
- Proactively apply a LOCTITE Medium Strength Threadlocker to the keyway and then insert the key stock.
- The viscosity of a LOCTITE Medium Strength Threadlocker is appropriate for the gap fill and provides the proper amount of strength, while allowing for easy removal.
- If the key needs to be removed, simply use a hammer to tap a metal chisel or drift against the key stock to pop it out of the keyway.

Steps

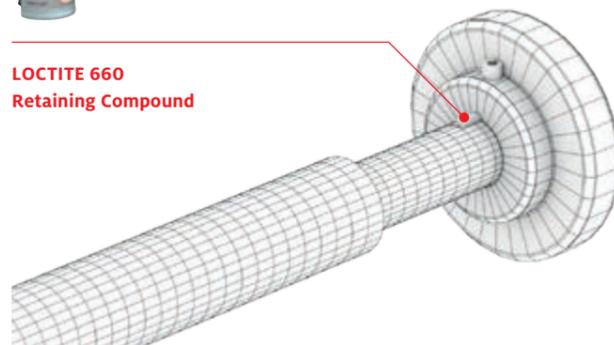
- Clean the keyway and key stock with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
 - Apply several drops of LOCTITE 243 Medium Strength Threadlocker directly into the keyway.
 - Insert the key stock into the keyway.
- Note:** Cover the shaft with a rag to prevent splatter when inserting the key stock.
- Wipe off any excess threadlocker.



LOCTITE 243 Medium Strength Threadlocker



LOCTITE 660 Retaining Compound



RESULTS

- Prevention of corrosion.
- Prevention of keyway wallow.
- A unitized assembly.

RESULTS

- Assembly is restored, unitized and ready for service without a major overhaul.

CHALLENGE

Stop keyway wallow

Over time, keyways can wear out if the key stock is not secured in place, which results in keyway wallow. This is a common failure for power transmission components such as couplings, sprockets, sheaves, etc. If keyway wallow is allowed to perpetuate, further damage can result, such as a sheared key stock or damage to the coupling. If the key stock shears, the result is a loss of power transmission (i.e., the pump will stop running) and further damage to the shaft will occur.

SOLUTION

- If the keyway has already been wallowed out, use LOCTITE 660 Retaining Compound to stop the wallow and allow the components to return to service.
- LOCTITE 660 Retaining Compound is a very thick product, which allows it to fill large gaps.

Steps

- Clean the keyway and key stock with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
- Apply LOCTITE 660 Retaining Compound into the keyway.
- Assemble parts and wipe off excess.

Note: If keyway wallow is severe, shims can be used on both sides of the keyways in conjunction with the LOCTITE 660 Retaining Compound.

COUPLING

CHALLENGE

Prevent coupling from loosening or moving

Couplings are held in place by a key and a set screw. If the set screw was to loosen, the coupling can begin to slide along the shaft and disengage, or it can begin to wallow out the keyway.

SOLUTION

- LOCTITE Medium and Low Strength Threadlockers.

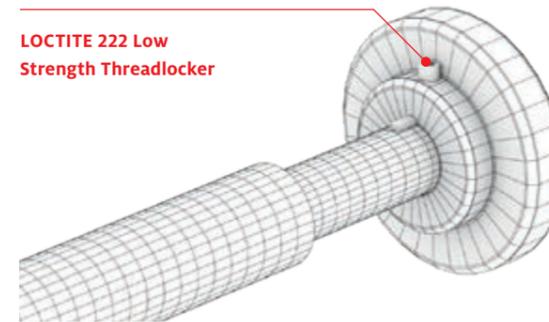
Steps

- Clean set screw with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
- If necessary, spray all threads with LOCTITE SF 7649 and allow to dry.
- Apply a couple of drops of a LOCTITE 222 Low Strength Threadlocker to the set screw (use a LOCTITE Medium Strength Threadlocker if the set screw is over 1/4" in diameter).
- Assemble in the coupling as usual.

Note: Consider applying a LOCTITE brand retaining compound or threadlocker to the shaft prior to assembling the coupling to completely unitize the coupling to the shaft and prevent any possible corrosion.



LOCTITE 222 Low Strength Threadlocker



RESULTS

- Assembly is restored, unitized and ready for service without a major overhaul.

IMPELLER

CHALLENGE

Prevent seizure of the impeller to the shaft

The combination of small air spaces within the threads and high humidity and temperatures allows for rust to develop and seize the impeller to the shaft.

SOLUTION

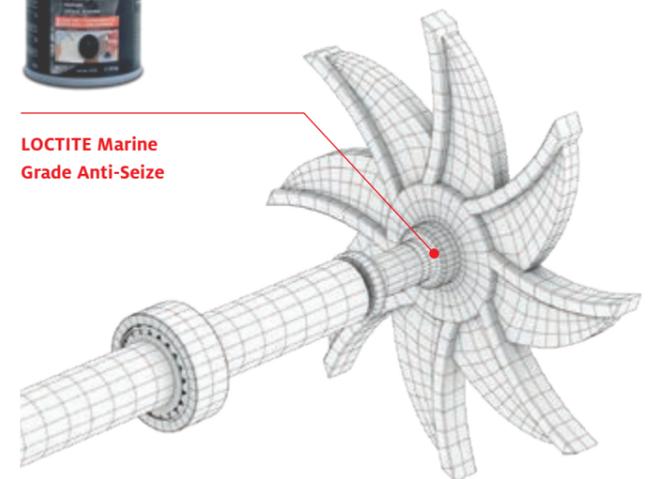
- Apply LOCTITE LB 8023 Marine Grade Anti-Seize compound to the shaft threads prior to impeller assembly.

Steps

- Clean the shaft and impeller threads.
- Apply LOCTITE LB 8023 Marine Grade Anti-Seize to the shaft threads.
- Assemble the impeller using normal techniques.



LOCTITE Marine Grade Anti-Seize



RESULTS

- Prevention of seizure.
- Easier disassembly.

PUMP BASE MOUNTING

CHALLENGE

Prevent pump mounting bolts from losing clamp load, leading to misalignment

Vibration and possible impact shock can work to loosen the mounting bolts. Loose bolts result in a loss of clamp load, which in turn allows the pump to lose its level and aligned configuration.

SOLUTION #1

- Apply LOCTITE 263 High Strength Threadlocker to the mounting bolts.

Steps

- Clean threads with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
- Apply several drops of LOCTITE 263 High Strength Threadlocker to the mounting bolts.
- Assemble and tighten as usual.

SOLUTION #2

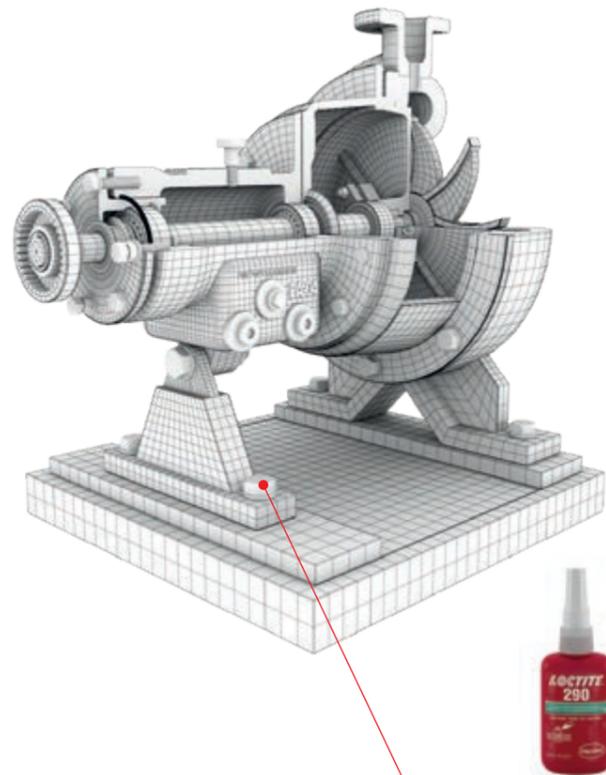
- Apply LOCTITE 290 Wicking Grade Threadlocker to the mounting bolts after the pump has been aligned and torqued in place.

Steps

- Clean the parts with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
- Align the pump.
- Tighten the nuts on the mounting studs.
- Apply several drops of LOCTITE 290 Wicking Grade Threadlocker to the mounting bolts.



Solution #1, Step 2 and Solution #2, Step 4.



LOCTITE 290
Wicking Grade Threadlocker

RESULTS

- Mounting bolts are secured in place.
- Proper clamp load is maintained.
- Elimination of bolt corrosion.
- Prevention of misalignment.

PUMP BASE GROUTING

CHALLENGE

Prevent twisting, vibration and corrosion of pump base

The pump base is made to not only provide a level mounting surface but is also designed to withstand torque loads and vibration/reverberations. The base by itself is not strong enough to withstand these forces along with the chemical attack and corrosion it is subject to.

SOLUTION

- Fill the pump base with LOCTITE PC 7202

- The base needs to be filled with a grout to fill the entire air space thereby preventing corrosion and providing a much more solid unit that can withstand torque loads and vibration. LOCTITE PC 7202 is:

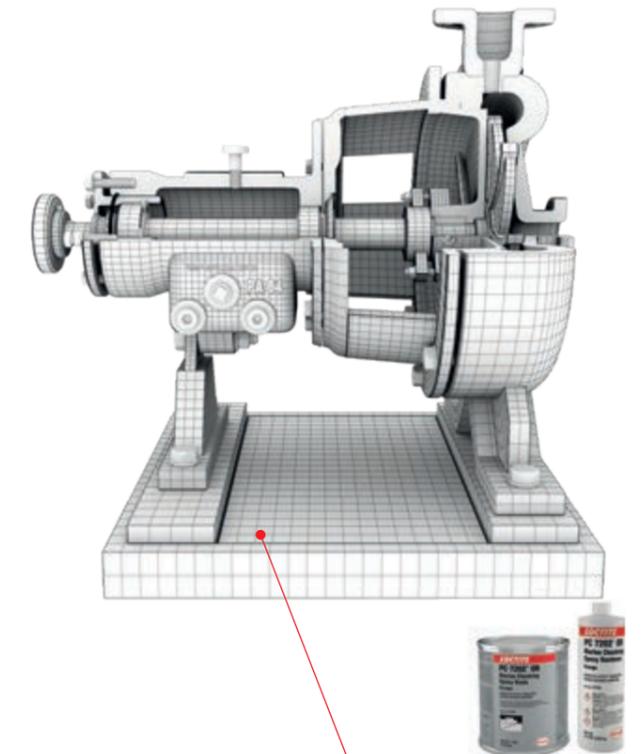
- Self-leveling
- Low shrinking
- Able to withstand chemical attack
- Vibration resistant

Steps

- After the base has been leveled with shims or wedges, build a form around each pump support to contain LOCTITE PC 7202.
- Line the forms with either a thick mil plastic sheeting or a high-pressure laminate. Ensure the containment is upper than the pump support.
- Coat the plastic or laminate with a release agent to prevent the epoxy to from bonding to the form.
- A good release agent choice is LOCTITE LB 8034 High Performance Synthetic Grease in aerosol packaging.
- After the form has been lined and built, seal any gaps in the form with a LOCTITE Silicone to prevent LOCTITE PC 7202 from leaking.
- Then simply mix LOCTITE PC 7202 according reduction chart and pour into place up to the to border of the pump support.
- Allow to cure.



Step 6.



LOCTITE
PC 7202

RESULTS

- Solid pump base that is resistant to compression, corrosion and chemical attack.

PUMP REPAIR

Repairs are a critical element to pump maintenance. Because of the harsh environments and operating parameters, pump parts are subject to wear, erosion, corrosion, leaks, etc. In addition to preventative measures, LOCTITE brand products can be used to restore pump parts. Alternative solutions such as scrap and replacement or the use of other repair technologies may be too costly. Using LOCTITE brand products to restore parts is a very cost-effective solution because users can be assured of the consistent quality, performance, availability and support that is provided and expected from Henkel Corporation.

CORROSION

CHALLENGE

Prevent corrosion damage to external parts

The external components can suffer from rust and chemical attack due to exposure to the elements, extreme temperatures, temperature changes, humidity and chemicals.

SOLUTION

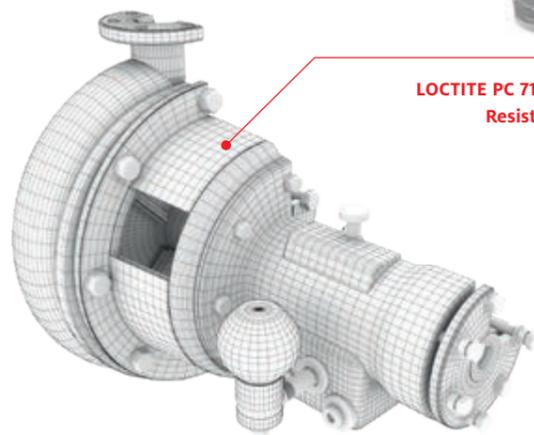
- › LOCTITE PC 7117 Chemical Resistant Coating.
- › Originally developed to protect mining equipment from sulfuric acid.
- › Provides an excellent coating to protect pump parts from a variety of severe chemical environments.

Steps

1. Clean and abrade the surface to a near white metal finish.
2. Apply LOCTITE SF 7515 Surface Treatment to prevent flash rusting.
3. Mix and apply LOCTITE PC 7117 Chemical Resistant Coating per the package instructions.



LOCTITE PC 7117 Chemical Resistant Coating



RESULTS

- › Extended equipment life.
- › Reduced component consumption.
- › Increased pump reliability.

OIL SEEPAGE

CHALLENGE

Prevent oil loss from seepage

This cast part can have porosities created during the casting. These porosities can lead to the housing weeping oil.

SOLUTION #1

- › Coat interior of bearing frame to seal porosities with LOCTITE PC 7117 Chemical Resistant Coating.

Steps

1. Blast the interior of the bearing frame to remove contaminants.
2. Apply LOCTITE PC 7117 Chemical Resistant Coating to the interior of the bearing housing to protect and coat the bearing frame.

SOLUTION #2

- › For a part where the specific leak points are known, brush on LOCTITE 290 Wicking Grade Threadlocker.

Steps

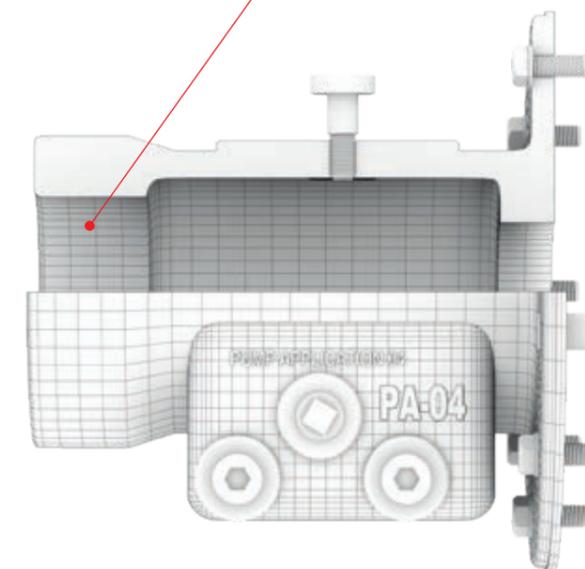
1. Clean the surface.
2. Bake it dry.
3. Brush on LOCTITE 290 Threadlocker.
4. Allow to cure.



Leak paths in housing.



LOCTITE PC 7117 Chemical Resistant Coating



RESULTS

- › Elimination of oil loss through seepage.
- › Reduced oil consumption.
- › Reduced cleanup.

CASING / IMPELLER WEAR

CHALLENGE

Rebuild worn areas to restore pump casing and impellers

Pump casings and impellers are subject to wear from abrasive slurries and solids, cavitation and chemical attack. Each of these can wear down internal sections of pump casing. Some of the common wear areas include the cutwater, wear ring seats, impeller vane tips and inside the volute. Casing and impeller wear typically falls within the following category types:

- › Minor abrasive wear from pumping light slurries
- › Heavy casing wear and erosion from pumping solids and/or cavitation
- › Chemical attack
- › Wear to specific areas of the casing or impeller
- › Wear to rubber liners

SOLUTION #1

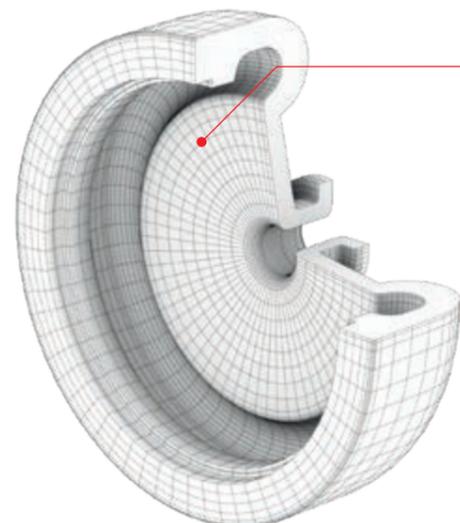
- › Repair minor surface wear. Rebuild and coat the surface with LOCTITE Brushable Ceramic.
- › Provides a high gloss, low friction finish to help ensure the pump runs as close to its BEP as possible.

Steps

1. Clean and abrade the surface to a near white metal finish.
2. Mix and apply LOCTITE Brushable Ceramic per the package instructions.
3. Apply a coat of white LOCTITE PC 7228 Nordbak® Brushable Ceramic first, and then a second coat of grey LOCTITE PC 7227, to allow for easy visual inspection of the coating and wear.
4. Use as many coats as necessary to restore the casing to original dimensions.



LOCTITE
Brushable Ceramic



SOLUTION #2

- › Repair heavy surface wear to the casing. Rebuild the casing with LOCTITE PC 7218 Nordbak® Wearing Compound.
- › Ceramic beads provide superior wear resistance.

Steps

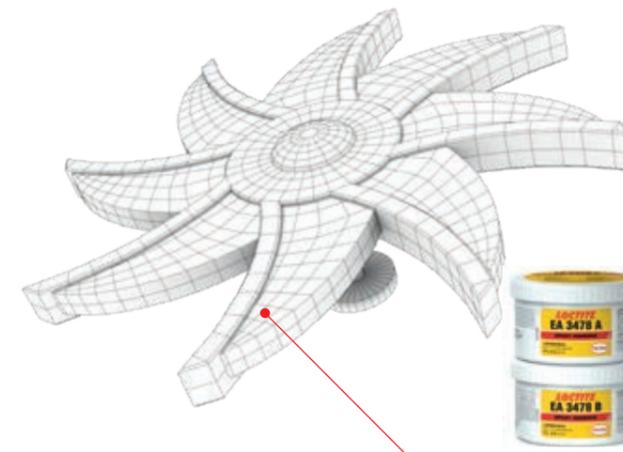
1. Clean and abrade the surface to a near white metal finish.
2. Mix and apply LOCTITE PC 7218 per the package instructions.
3. Apply a topcoat of LOCTITE Brushable Ceramic to provide a low-friction finish, or for larger surfaces LOCTITE PC 7255 Sprayable Ceramic.

SOLUTION #3

- › Repair damage from chemical attack and provide a protective coating. Coat the casing and the impeller with LOCTITE PC 7319 Nordbak® Chemical Resistant Coating.
- › Protects parts in severe chemical environments.

Steps

1. Clean and abrade the surface to a near white metal finish.
2. Mix and apply LOCTITE PC 7319 Nordbak® Chemical Resistant Coating per the package instructions.



LOCTITE EA 3478
Superior Metal

SOLUTION #4

- › Rebuild worn areas of the casing and impeller. Apply LOCTITE EA 3478 Superior Metal or LOCTITE PC 7222 Wear Resistant Putty to rebuild worn cutwaters, wear ring seats, impeller vane tips or other specific areas of the casing.
- › Use LOCTITE EA 3478 Superior Metal to rebuild heavily worn areas.
- › Use LOCTITE PC 7222 in areas where there is constant abrasion, such as wear ring seats.

Steps

1. Clean and abrade the surface to a near white metal finish.
2. Mix and apply the products per the package instructions.

SOLUTION #5

- › Repair wear to rubber liners using LOCTITE PC 7350 Rubber Repair Compound.
- › Provides excellent abrasion resistance.

Steps

1. Clean and prepare the surface using LOCTITE cleaner and etching agent.
2. Mix and apply the products as per package instructions.



Worn impeller prior to repair.



Solution #4, Step 2.

RESULTS

- › Reduced component consumption by salvaging and extending the life of pump casings.
- › Casings protected from wear and chemical attack.
- › Pumps helped to run close to their BEP.

SHAFT WEAR

CHALLENGE

Restore worn shaft to the original condition

Wear caused by packing and oil seals is typically the result of constant pressure and abrasion against the shaft surface. Over time, oil seals can cut a groove in a shaft. Neglect and improper water lubrication can cause the packing to heat up and in turn to cause severe wear to the shaft.

SOLUTION

- Rebuild shafts with LOCTITE EA 3478 Superior Metal.
- LOCTITE EA 3478 Superior Metal is an epoxy with high compressive strength that will not rust.

Steps

1. To make the repairs, turn the shaft on a lathe and even out the worn areas to at least 0.030", leaving a rough surface finish.
2. Clean the shaft of any cutting fluids or oils with LOCTITE SF 7070 ODC-Free Cleaner & Degreaser.
3. Mix the product per the package instructions.
4. While the shaft is turning on the lathe, apply LOCTITE EA 3478 Superior Metal by pressing it into the shaft. Firm pressure is required to squeeze out any potential air pockets.
5. The cured product can be turned on the lathe and brought down to the original shaft diameter.



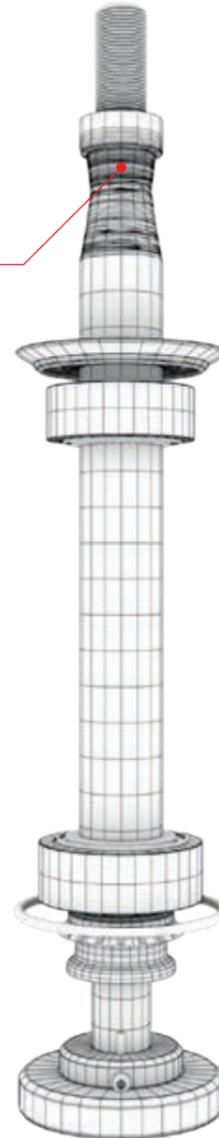
Worn shaft.



Step 4.



LOCTITE EA 3478
Superior Metal



RESULTS

- Quick return to service.
- Reduced component consumption.
- Extended shaft life.

KEYWAY WALLOW

CHALLENGE

Repair wallowed out keyways

Shaft vibration and external forces affect key stability. Over time, this instability leads to keyway wallow.

SOLUTION

- Apply a bead of LOCTITE 660 Retaining Compound directly in the worn keyway.
- LOCTITE 660 Retaining Compound is a heavy-bodied product designed to fill large voids, up to 0.030".

Steps

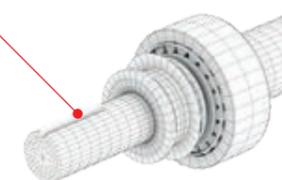
1. If the keyway wallow is severe, you may need to add shims to both sides.
2. Apply LOCTITE 660 Retaining Compound directly into the keyway.
3. Press the new key stock into the keyway and the assembly is restored without having to take apart the pump.



Step 2.



LOCTITE 660
Retaining Compound



RESULTS

- A secured fit to the keyway.
- Elimination of repeat wallowing.



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