

# Revolubes

*friction is fiction*

## **Preparation, application and maintenance manual for bike's hardware using Revolubes™ active lubricants.**

This manual has been developed in accordance with the industrial lubrication techniques applied to gear and chain transmissions, bearings and auxiliary frictional nodes and their application practicalities in bike's maintenance, using means available in every household.

Revolubes™ guarantees the described effects, provided that the products are being used on brand new parts, prepared in accordance with the attached procedure.

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## Introduction

The criteria for lubricants applied to bearings or chain and gear transmissions are highly elevated due to the boundary friction model that occurs in those systems – small lubricant's amounts separating the cooperating surfaces or lack of sufficient separation in addition to high pressures per unit surface and thus high loads being transferred. This obliges the application of lubricants with the EP additives (extreme pressure). At the same time, lubricants must create a durable oil film that is resistant to being washed away or pressed out from between the surfaces, due to accessibility limitations at exploitation stage.

Revolubes™ products meet the criteria by containing the mentioned EP additives and by binding chemically to the metal surface (metallic bonding), forming a durable, monomolecular coating. The established layer is non-washable, impossible to be squeezed-out and resistant to high temperatures. It has extremely high resistance to forces perpendicular to the surface (normal forces), while ultra-low resistance to parallel forces (tangential forces), thereby reducing friction between contacting surfaces from 5 to 7 times.

It should be emphasized that the most appropriate moment for application of Revolubes™ products, in order to obtain the best possible results, is the assembly stage due to the accessibility and possibility of supplying the lubricants exactly where friction occurs. Alternatively, if this is not possible, Revolubes™ should be used on brand new components. While application of Revolubes™ on used parts will certainly improve their operation, the effects may be worse than when applied from scratch.

Revolubes™, due to its properties, alter the cooperation of the surfaces from shear (material machining) to plastic (material displacement). This means that during the mutual wearing-in process of the cooperating parts, the shape irregularities are no longer being cut and extracted, but plastically deformed, pressed and strain hardened. This process reduces surface irregularities and shape deviations by moving the material from crests to cavities, strengthening the surface of frictional contact, tightening fit tolerances, thereby increasing the contact area, and thus reducing the load per unit area factor.

## Revolubes' effects guarantee

**Revolubes™ guarantees the described effects, provided that the products are being used on brand new parts, prepared, applied and maintained in accordance with the attached procedure.**

1. Exchange of the shear "wear-in" process for "laying-down" of cooperating surfaces, through plastic deformation without material loss.
2. Tightening fit tolerances between the cooperating parts, while simultaneously decreasing friction between them. This will eliminate excessive surface loads by increasing the contact area and will prolong the time of uninterrupted operation.
3. Obtaining greater chain's stiffness in unfavorable planes – bending, twisting.
4. Significant reduction of drive-train's internal drag. Smooth gear shifting, better cooperation and reduced wear of chain, cassette, cogs, bearings, cables and so on.
5. Operational noise reduction - usually intensive wearing is associated with noisy operation.
6. Greater protection against external contamination, due to tighter clearances and dry coating effect.
7. Longer intervals between maintenances with small amounts of lubricant applied.

## Preparation

Each bike's component, regardless if it is used or brand new, requires proper preparation for the chemical reaction with Revolubes™ active ingredients. In order to prepare the surfaces correctly, they must be thoroughly washed and degreased to remove the preservative/old grease, production contamination, steel fillings after mechanical treatment (metal, abrasive), wear products (oxides, deposits, etc.) and other impurities, which may affect the components operation. Therefore, the preparation step should be carried out with special care.

### What you will need

1. 1L of solvent capable of dissolving hydrocarbons – e.g. unleaded petrol.  
Petrol is the last liquid product of crude oil distillation and is capable of dissolving denser oil fractions such as greases and oils.  
Alternatively, you can use extraction petrol or turpentine.



**Attention! Solvent, petrol and turpentine vapours are flammable and can explode. You must not use open fire in their presence! Inhalation of fumes is harmful to your health. Always work with solvents and fuels in prepared, well-ventilated place or in the open air. Always use protective means/clothing.**

2. Detergent containing SLS soaps (Sodium Laureth Sulphate), e.g. shower gel - see the ingredients on the label.  
SLS soaps are being used in the industry for machinery cleaning from greases and oils. These act as degreasers and coagulants. You will also find them in cleaning agents used by car washes.
3. Glass container with a lid, big enough to contain the cleaned component.

### Cleaning

1. Clean the surfaces with a wire brush from larger deposits before washing.
2. Put the component in the container and fill it with fresh petrol, so the component is fully submerged.
3. Wait for 10 minutes to allow the solvent to penetrate every nook and cranny.
4. Shake the container vigorously for about 1 minute.
5. If the petrol is dirty or has changed its colour, replace it with a fresh fill and return to step 2.
6. If the petrol remains clean and does not change colour, proceed with degreasing.

### Degreasing

After cleaning, the solvent needs to be washed off and the surfaces to be degreased to obtain optimal conditions for the chemical reaction to occur. This operation is also required as a supplementary to cleaning as it removes any attached particles, leaving the surfaces chemically inert.

1. Put the component in the container and fill it with a solution of hot water and detergent.
2. Wait for 10 minutes for the solution to penetrate every nook and cranny.
3. Shake the container vigorously for about 1 minute.
4. Remove the cleaned element and rinse thoroughly with fresh water.
5. Allow to dry for about 1 hour.

## Application

After the component has dried, you can proceed to the application step.

Revolube™ should be applied to each friction node by dosing small amounts of the lubricant.



### Attention!

**Revolubes' products are chemically active lubricants. If the label has been lost, mark the container to avoid confusion. Categorically avoid contact with:**

**1. Eyes – may cause vision loss or serious damage. In case of contact, wash continuously under running water for several minutes. Remove contact lenses if possible. Continue rinsing.**

**2. Skin and clothing – may cause skin irritation. In case of contact, wash continuously under running water for several minutes. Remove contaminated clothes.**

**3. Do not ingest – poisonous agent. If swallowed, call a POISON CENTRE, or consult your doctor.**

**Always use protective measures/clothing. Keep out of reach of children.**



## Chains

Dried chain can be mounted on bike's drive train. Revolube should be applied to each, individual link with the dropper provided, preferably at the chain's midpoint between rear and drive cog, while moving the drive crank gradually. Apply Revolube ensuring it penetrates between the contact surfaces of the outer and inner plates, the roller and the inner plate, and further onto the pin. After covering all the links, wait a few minutes for Revolube to penetrate and then start spinning the crank while smearing any Revolube's excess over the chain with a cloth.

Such lubricated chain should operate at a low load for approximately 2 hours/20 miles for better penetration and coating settlement. This is a lapping period for the cooperating chain's parts and surfaces as they are being matched with one another, as well as the connection between rollers and cassette/cogs. During this time, you need to control the chain's operation and if necessary (squeaking), apply more Revolube where needed. All chains will have their elements made with shape deviations within some tolerance, thus some sections may work worse than others.

In addition, some Revolube's excess might get pushed out from inside the links during operation, thus keep wiping it with a cloth. After the layer has settled, the chain may appear dry. However, this is not a sign of lack of lubrication.

## Bearings

Fill the bearing track with up to 1/3 of its volume, using Revolube™ Bearing Grease. Exceeding 1/3 of fill is not recommended as this may cause excessive hydrodynamic resistance during operation.

## Ratchet mechanism

Cover with a thin layer of Revolubes™ Bearing Grease (up to 0.3 mm thick), ensuring accurate coverage of all surfaces – ratchet ring, pawls and hinges. Turn the assembled mechanism a couple of times to ensure the grease penetrates it thoroughly.

## Wires

After inserting the wire into its protector, keep dropping Revolubes™ Chain Lube into the gap in between, until the lubricant starts to flow from protectors opposite side.

## Maintenance and subsequent applications

### Chains

Apply small amounts of Revolubes™ Chain Lube after each washing, but not less often than once every two weeks in the summer and once a week in the winter.

A solution of hot water and detergent (SLS soaps) and pressure washer can be used for washing.

### Bearings

Inspect every six months. If necessary, add Revolube Bearing Grease.

If the grease is contaminated, clean and degrease the bearing and lubricate with Revolube™ Bearing Grease.

### Ratchet mechanism

Inspect once a year. If necessary, add Revolube™ Bearing Grease.

If the grease is contaminated, clean and degrease the ratchet and lubricate with Revolube™ Bearing Grease.

### Wires

Re-lubricate once a month.

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