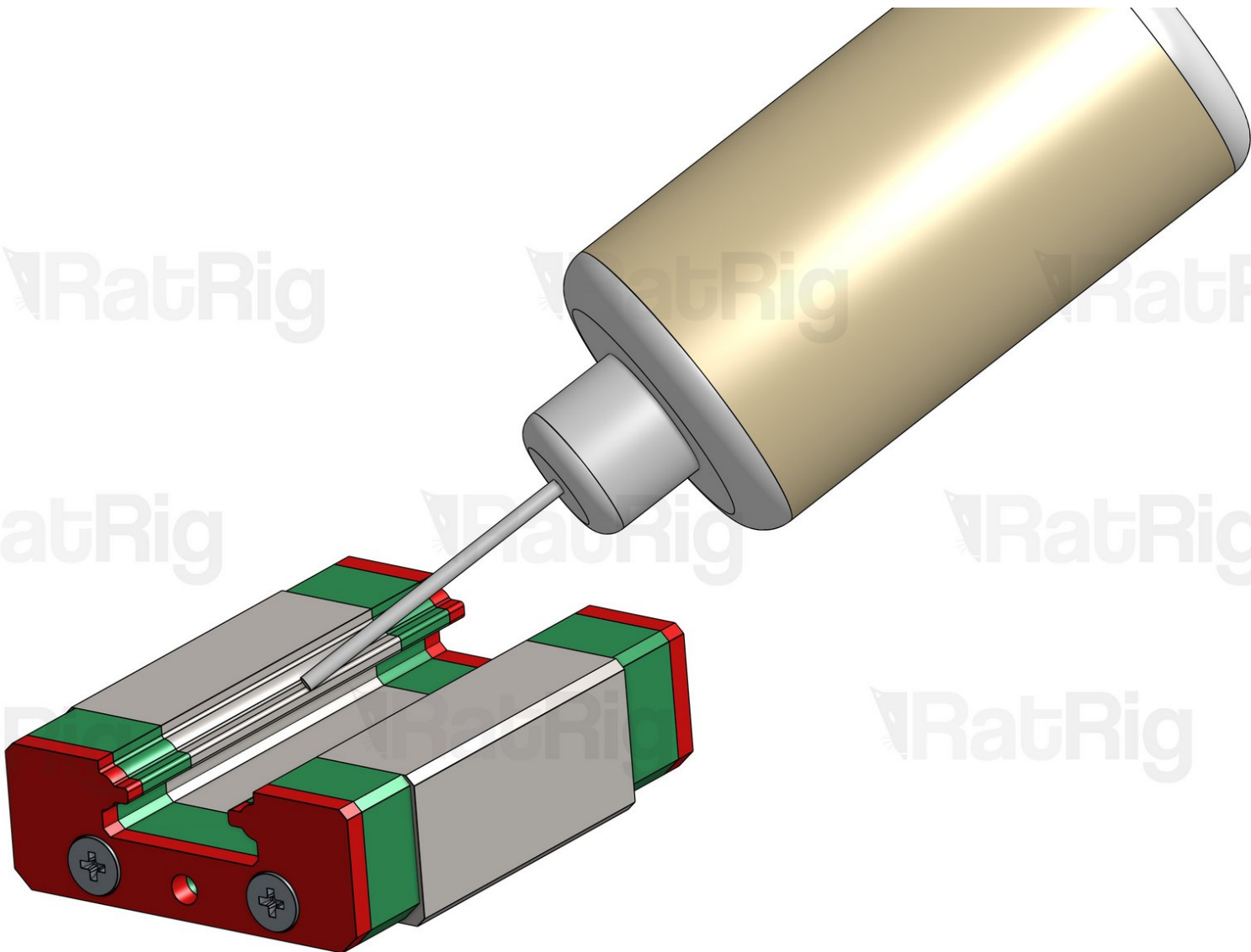


Rat Rig

03. [Intermediate] Linear rail maintenance guide with disassembly

Clean and lubricate the linear rail and carriage by removing the carriage from the rail, cleaning both and then reassembling with correct lubrication.

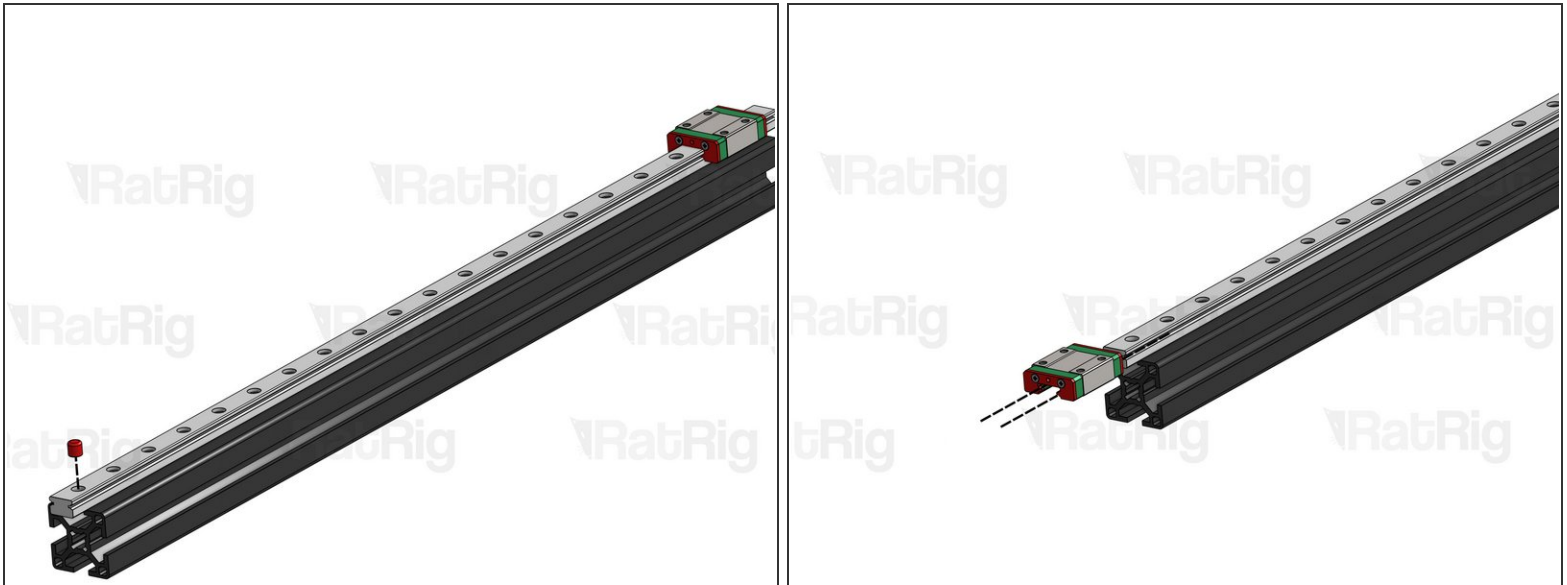
Written By: Rat Rig



INTRODUCTION

Over time, linear rails and carriages will collect particles of dust and debris, requiring cleaning and maintenance. This guide is designed to show you how to clean and lubricate the linear rail and carriage by removing the carriage from the rail, cleaning both and then reassembling with correct lubrication. The linear rail does not need to be removed from the machine for this process.

Step 1 — Removal of the carriage from the linear rail



- Disassemble and remove anything attached to the carriage
- Your linear rail may have a small plastic “stop” at each end. These are usually red. This is to prevent the carriage coming off of the rail under normal use.
- Carefully grip the plastic stop as close to the rail as possible. You may find it beneficial to use a small pair of flush cutters to do this, but don’t cut the insert!
- Pull the stop out of the hole in the linear rail
- Slowly slide the carriage off the end of the rail, gripping both sides as you do so. Set the carriage to the side, making sure to note the orientation it came off of the rail.

Step 2 — Cleaning the linear rail



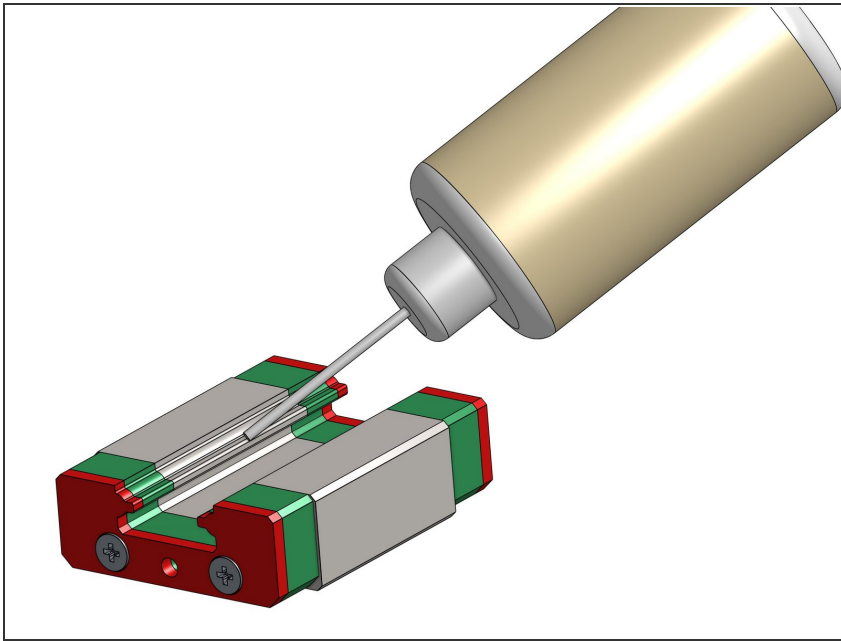
- Apply a small amount of 99% isopropyl alcohol to a lint-free paper towel.
- Wipe down the length of the rail with the paper towel, ensuring that you grip the sides of the rail tightly. This will allow the paper towel to clean the groove down the side of the rail, as well as the other surfaces.
- Depending on the amount of dirt and debris present, repeat this as necessary.

Step 3 — Cleaning the carriage



- Carefully place the carriage top side down, so that you can see the groove which normally runs along the rail. You will notice that each side has small ball bearings behind a thin spring clip.
- Using a lint-free paper towel, carefully wipe away any dust or debris from the groove, do not touch the ball bearings as you can cause them to become dislodged from their holder and you would need to reinsert them.

Step 4 — Lubricating the carriage (Part 1)



- Lubrication of the carriage is simple with access to the bearing race, and furthermore allows a wider choice of lubricants to use.
- The easiest (and least messy) lubricant is a simple light oil such as “3-in-1 oil” or sewing machine oil. A more advanced lubrication uses a dedicated bearing grease. The two options are detailed further below.
- The most important requirement is that the lubricant must not have an additive. These should not be used for linear rails as the additives can interfere with the precise tolerances which linear rails have. The most common additives are as follows:
 - Polytetrafluorethylene (also known as PTFE or teflon)
 - Graphite
 - Molybdenum disulfide
 - Boron nitride

Step 5 — Lubricating the carriage (Part 2)



- If using light oil, simply apply several drops of directly onto the ball bearing raceways on each side. The light oil will spread once the carriage is reapplied to the linear rail.
- When using a specialised bearing lubricant, it is important to use the correct grade. The recommended grade of grease is EP00 or EP000 as these lubricate well, without being too viscous.
- It is recommended to use a disposable syringe filled with the grease to apply a thin layer directly to the ball bearings. This will then be spread once the carriage is reapplied to the linear rail.

Step 6 — Reassembly



- Gripping both sides of the carriage, carefully line up the carriage with the linear rail. You will note that the carriage has two “wings” which align with the channel on the rail.
- Slowly slide the carriage on to the linear rail. It is normal for it to resist sliding back on, but it must not be forced as you can cause the ball bearings to be ejected from the raceway. Reinstallation is easiest if you have a clear view of the underside of the carriage.
- If the carriage feels that it is binding or resisting sliding back onto the rail, slide it off completely and try again. Do not be tempted to force it, or touch the ball bearing raceways.
- Once the carriage has been fully placed upon the rail, slide it the full length of its travel. This will distribute the lubricant and ensure there are no binding points.
- Reinsert the plastic “stop” into the hole on the rail.
- Reattach any components to the carriage which were removed in step 1.