

Linear Rail and Guide Maintenance

Recommended Oil

We only recommend using Mobile Vactra No 2 oil on linear rails, ball bearing carriages (AKA linear guides or guides), and ball screws. It should NOT be used on any other parts of the machine including the Z-Axis lead screw of the Z-Plus and Shapeoko Pro.

Currently we don't sell oil in the Carbide 3D store but it can be bought cheaply from Amazon, eBay, and in most cases, local machinists stores. Follow the safety guidelines provided with the oil. Wear gloves and safety glasses.



Figure 1

Linear Rail and Ball Bearing Carriage Maintenance

Our linear rails and guides are rated for tens of thousands of hours of use. To keep them in optimal condition, we recommend the following:

General Maintenance

- Keep them dust-free; after every use wipe down the linear rails and guides with a clean, dry, lint-free cloth.
- Never use water-based products.
- Rub a small amount of the recommended oil on the linear rails using a lint-free cloth. Be sure to clean off any excess.

Lubricating the Z-Axis Linear Rails and Guides

Depending on use, we recommend injecting oil into the ball bearing carriages. While not required, it will prolong the life of the carriages.

It is usually easier to remove the X/Z-assembly from the machine to lubricate it. While it can be done on the machine, accessing the lower ball bearing carriages can be difficult and messy.

WARNING: Do NOT remove linear guides from the rails. This will cause the internal ball bearings, which are under load, to fall out.

NOTE for HDZ Users: Removing the screws securing the Z-Axis carriage plate to the ball screw nut could result in the Z-Axis carriage plate and linear guides accidentally sliding off the rails.

To lubricate the X/Z-assembly when removed from the machine:

1. Place the X/Z-assembly flat on its back.
2. Remove the small M4 grub screw in the center of each linear guide. *See Fig. 2.*

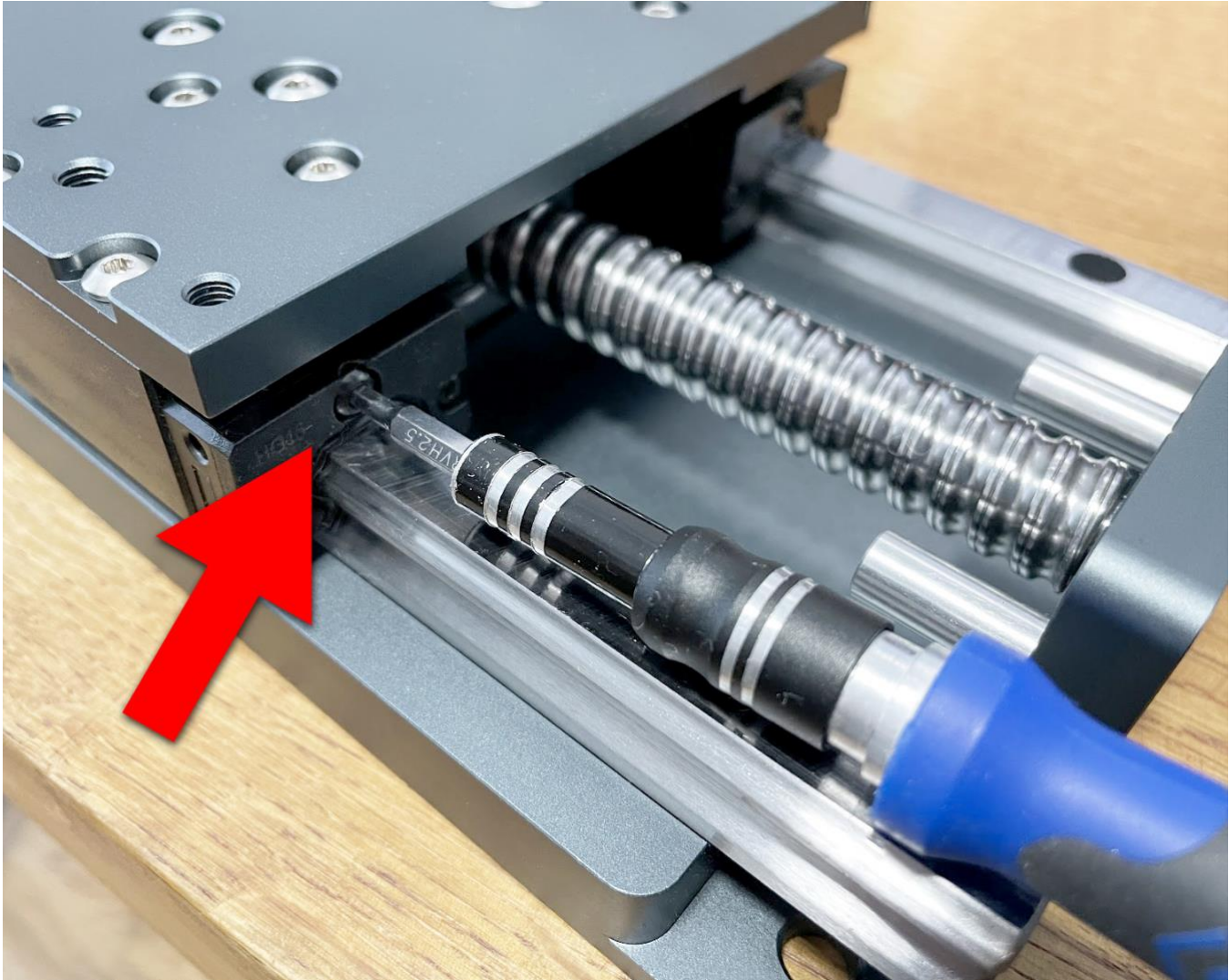


Figure 2

3. Fill a large-bore plastic syringe with Mobile Vactra No. 2 oil.
4. Press the tip firmly into the screw hole and gently squeeze about 1ml of oil into the ball bearing carriage. *See Fig. 3.*

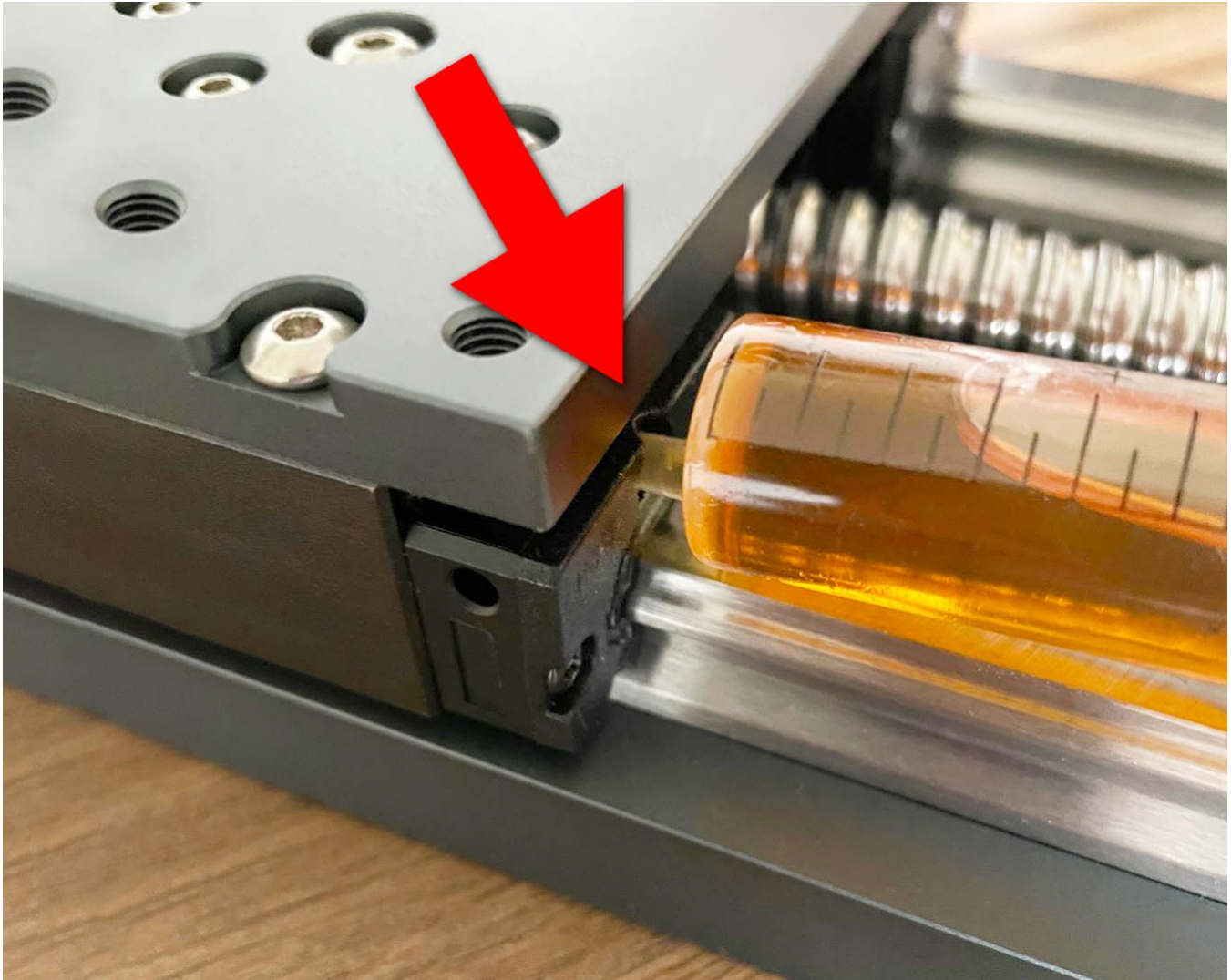


Figure 3

5. Replace the M4 screw.
6. Repeat the process for all ball bearing carriages.

To lubricate the X/Z-assembly while it is on the machine:

1. Raise the Z-Axis to the top of travel.
2. Place a disposable cloth under the X/Z-Axis.
3. Complete steps 2–6 above.

Lubricating Shapeoko Pro X- and Y-Axis Linear Rails and Guides

The X- and Y-axis of the Shapeoko Pro use a different rail and guide system than the Z-Axis. Not all of the ball bearing carriages have access ports for oiling inside the guides themselves.

We recommend lubricating the linear rails to keep each axis moving smoothly:

1. Wipe the linear rails with a clean rag with a small amount of Mobil Vactra No 2 oil.
2. Move the axes back and forth a few times to spread the oil evenly.
3. Wipe off any excess oil.

HDZ Ball Screw Maintenance

WARNING: The Z-Plus and Shapeoko Pro use a lead screw, NOT a ball screw. Do NOT apply oil to the lead screw.

General Maintenance

- Keep it dust-free; after every use wipe down the ball screw with a clean, dry, lint-free cloth.

Lubricating the Ball Screw

This process is easiest when the HDZ is fitted to the machine and when the power is on and the machine is homed and jogged to the front.

1. Jog the Z-Axis to the bottom of travel.
2. Using the same syringe method as above, gently squeeze a small amount of oil onto the ball screw.
3. Jog the Z-Axis up and down a number of times to spread the oil onto the ball screw.

Z-Plus and Shapeoko Pro Lead Screw Maintenance

Lead screw maintenance is very straight forward:

- Do NOT oil the lead screw.
- Keep it clean and dry.
- Keep it dust-free; after every use wipe down the lead screw with a clean, dry, lint-free cloth.

How Often Should Maintenance Be Done?

Maintenance intervals will vary according to use. However, performing maintenance every 6 months or so will keep the linear rails and guides in optimal condition. Everything is rubber-sealed and as long as it's kept dust-free and clean, it could keep going for years without needing oiling.

NOTE: It is normal for the linear guides to occasionally leak a small amount of oil, especially guides that are mounted vertically. Internally, they are filled with a series of ball bearings that rotate in the rail channels. All guides are double rubber-sealed to keep them lubricated and to keep dust out. The seals are effective, but not foolproof. Too much leakage, more than a drop or two, could be the result of overfilling.

If you run into any questions or issues, contact the Carbide 3D support team at: support@carbide3d.com.