

Section 10: Engraving Machine Cleaning

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Cleaning - Important!



Fire Warning!



Through normal use your laser system can collect debris and soot that are potentially flammable. Keeping your laser system clean and the area around it clean are important parts of laser maintenance. Some materials are extremely flammable and can easily ignite and burst into open flame setting the machine afire. This open flame is very dangerous and has the potential to destroy not only the machine, but the building in which it is housed.

Please read the following warnings and recommendations and follow them closely at all times!

- **NEVER** let the laser system operate if it will be unattended.
- **KEEP** the area around the machine clean and free of clutter, combustible materials, explosives, or volatile solvents such as acetone, alcohol, or gasoline.
- **ALWAYS** keep a properly maintained and inspected fire extinguisher on hand. Epilog recommends a Halotron fire extinguisher or a multi-purpose dry chemical fire extinguisher. The Halotron extinguishers are more expensive than a dry chemical, but offer certain advantages should you ever need to use an extinguisher. The Halotron extinguisher discharges a clean, easily removable substance that is not harmful to the mechanics or wiring of the laser system. The dry chemical extinguisher discharges a sticky, corrosive powder that is very difficult to clean up.
- **ALWAYS** use air assist when vector cutting.

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- **BE CAREFUL!** when vector cutting. Many materials have the potential to burst suddenly into flames – even materials that may be very familiar to the user. Always monitor the machine when it is operating.
- **KEEP YOUR LASER SYSTEM CLEAN** – A build up of cutting and engraving residue and debris is dangerous and can create a fire hazard in its own right. Keep your laser system clean and free of debris. Regularly remove the vector grid to clean any small pieces that have fallen through the grid.

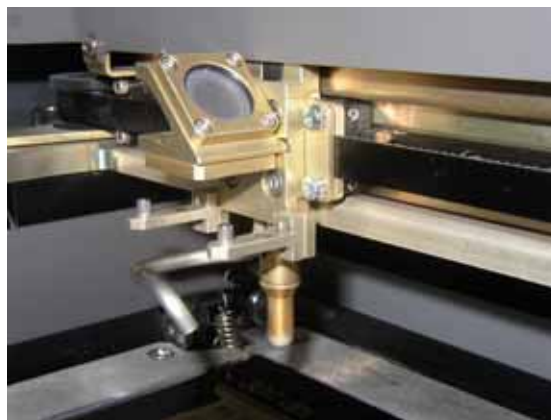
The single most important thing that you can do to keep your laser working as if it were new is to keep it clean! Five minutes once a day will keep the residue and debris from building up and causing problems. There is almost no maintenance required for your laser if you **KEEP IT CLEAN!**

To keep your system clean use a soft cloth and a mild solvent like Isopropyl alcohol to remove the smoke and vapor from the table, X-beam and anywhere else that collects dirt and debris.

Cleaning the optics requires special care. Please see the instructions on the following pages.

Cleaning the Auto Focus Plunger

The Auto Focus plunger, as shown at the right, is mounted at the back of the carriage that holds the focus lens. It is about a quarter inch in diameter, and about two inches long. The bottom shaft needs to be periodically cleaned for accurate focusing. Use a cotton rag and some mild household cleaner (Windex, 409 or isopropyl alcohol). Gently wipe the plunger until it is clean.

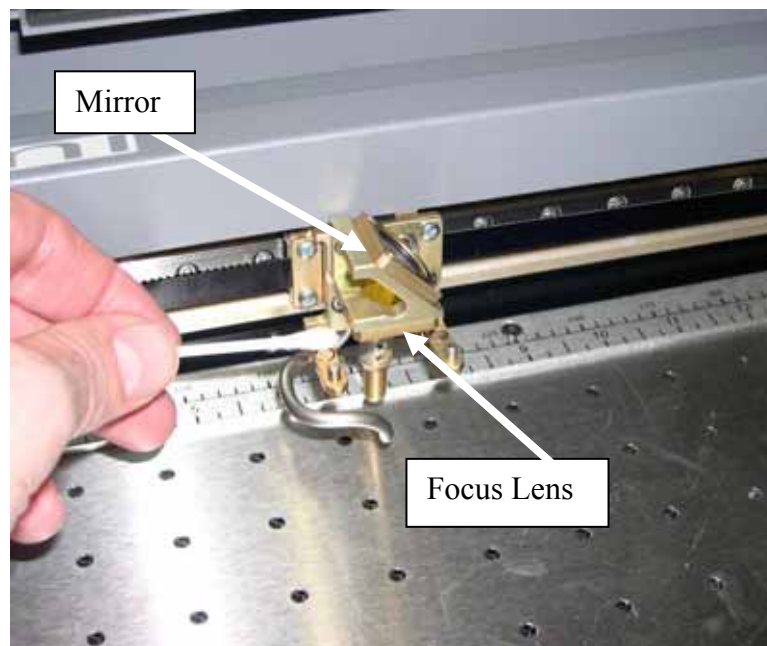


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Cleaning the Optics

About once a week, or if you notice the optics are dirty, you will need to clean the optics (mirrors and lenses) of your laser. If smoke, resin, or other contaminants are allowed to accumulate too heavily, they will reduce the available laser power and may cause damage.

The two optical components most likely to require cleaning are the focus lens and the mirror directly above it. The lens and mirror are a single assembly, and can be removed from the machine for cleaning, but it is generally not recommended. If you need to remove the assembly, remove the two 3/32" hex screws that hold the lens to the carriage.



To clean the optics use a high-quality cotton swab moistened with the optics cleaner supplied in the accessory kit. Please read the label on the bottle carefully. Rubbing alcohol should be used only to remove fingerprints. If you run out of the cleaner supplied by Epilog, acetone can be used as a temporary measure, but should not be used for regular cleaning as it contains impurities, which can contaminate the optics. If you run out of optics cleaner, pure ethyl (grain) alcohol such as "Golden Grain" and "Everclear" are highly recommended because of their pure nature and because they are readily available.

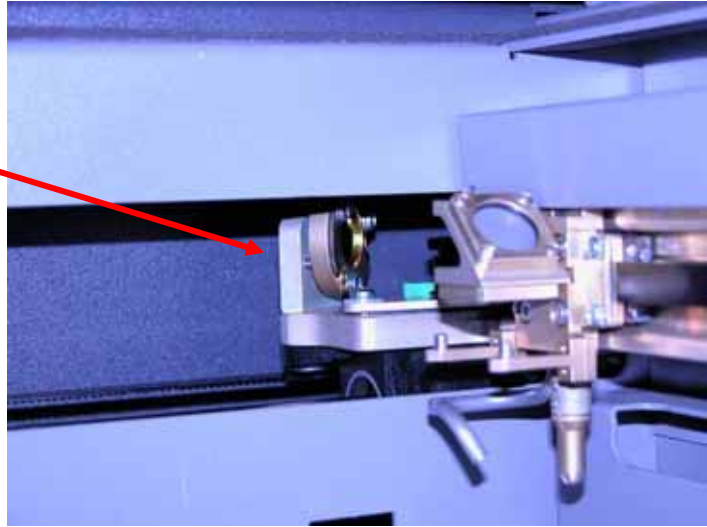
Wet the swab thoroughly with the solvent, and then blot it against a piece of cotton so that it is no longer soaking-wet. Then daub the optic gently, rotating the swab after

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each daub to expose clean cotton to the surface, until the optic is free of visible contamination. At that point, prepare a fresh swab and clean the surface with a gentle zigzag motion across it. Avoid any hard "scrubbing" of the surface, especially while there are visible particles on it, and try not to use repetitive circular motions. When you are done, be careful to remove any cotton threads that may have snagged on the mountings. Allow the optics to dry before you operate your engraver.

In addition to the focus lens and the mirror directly above it, there is a mirror located on the left side of the Mini and is mounted to the X-beam.

This mirror is very well protected and should not need regular cleaning. It can be accessed with a cotton swab if it does need cleaning. The photo at right shows where this mirror is located in relation to the X-beam and carriage.



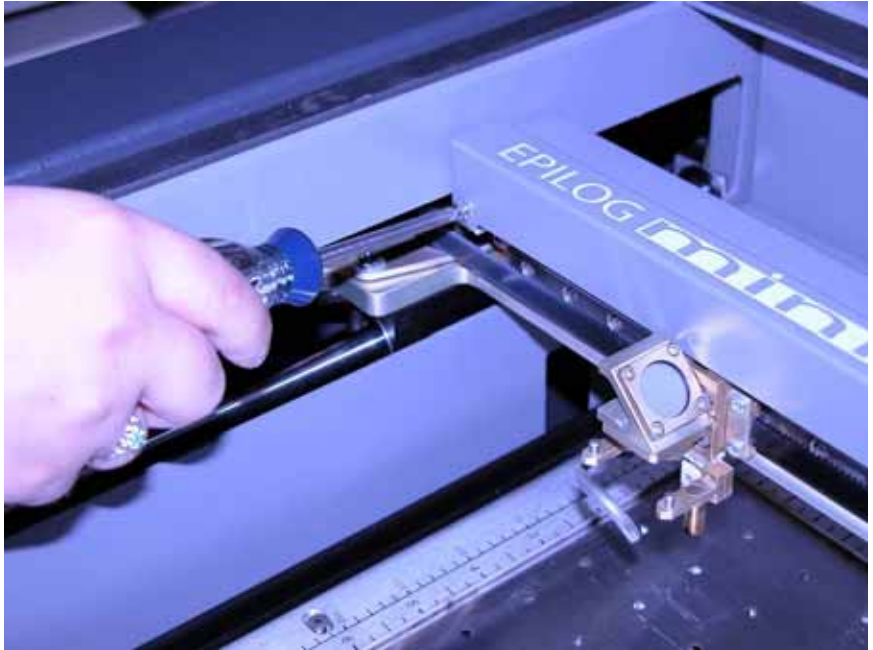
Cleaning the Optical Strip and Encoder

Occasionally you may need to clean the optical strip and encoder. The optical strip and encoder are located under the protective cover of the X-beam assembly. The optical encoder provides precise positioning for the x-axis carriage. If the encoder or encoder strip gets dirty, the X-axis can lose its position. Under normal circumstances this is not a problem, but if you engrave a lot of material that generates a lot of dust or debris, the dust and debris can build up over time on the encoder strip and prevent the optical encoder from working properly. If the x-axis carriage loses position, it is just a matter of removing the X-beams protective cover and wiping off the optical strip using a soft cotton cloth or cotton swab soaked in water or a mild liquid dishwashing soap.

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To remove the X-beam cover, turn off the Mini and then loosen the two screws in the front of the cover and another five in the rear (you do not need to remove the screws – they just need to be loosened to remove the cover).

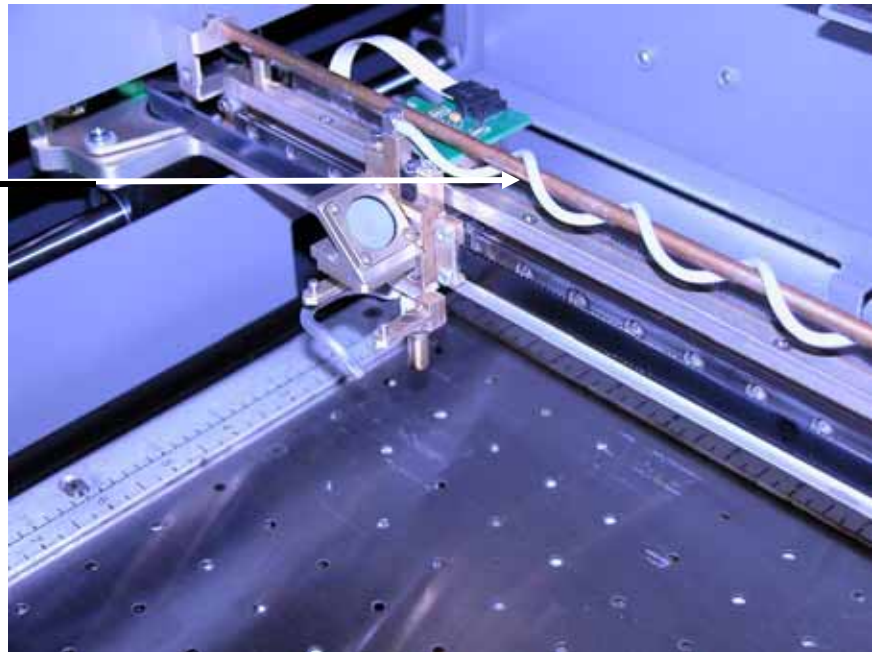
Lift the cover from the beam. This exposes the optical encoder and the optical strip.



The X-beam with the cover removed. This photo shows the air assist tube and support.

In order to properly photograph how to clean the optical encoder and strip, the following photo shows an X-beam assembly that is not in the machine and has the air assist removed.

You will not need to remove the air assist or X-beam to clean the optical encoder and strip!

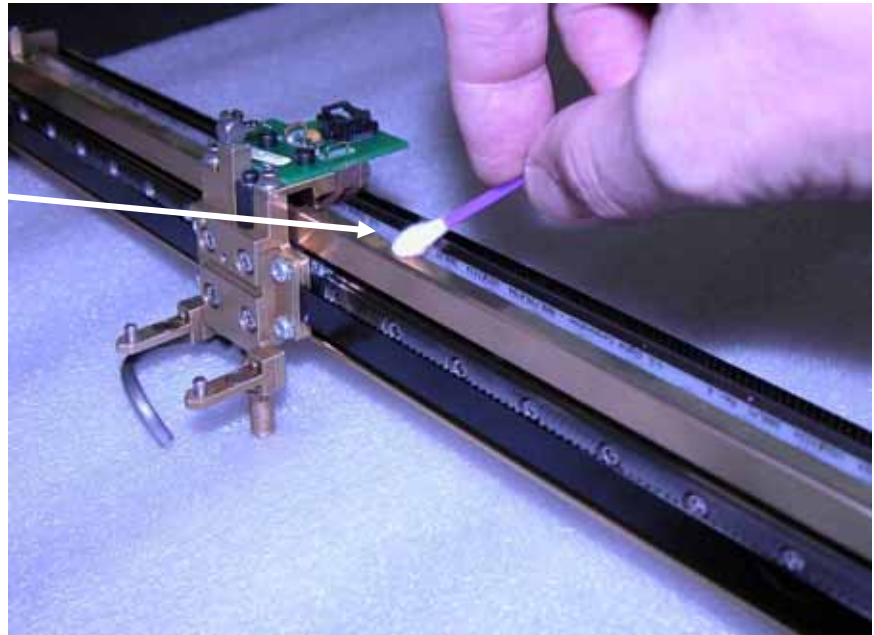


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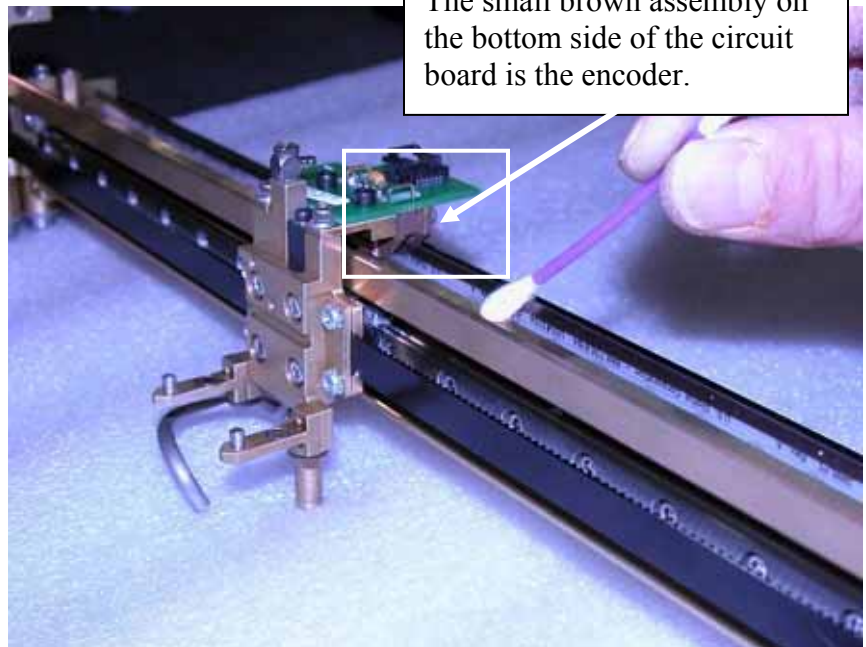
The optical strip is a thin, clear piece of plastic that has very thin, small vertical lines on it. The strip runs the length of the x-beam from left to right. The cotton swab is shown on the front side of the strip.

To clean, soak a cotton swab or cloth in water and move the swab across the front and back of the optical strip for the entire length of the strip. Mild dish washing soap can also be used to remove debris that just water does not remove.

If you wish, you can use a clean swab or cloth and wipe the strip again to be sure you remove all of the dust or debris.



This photo shows the encoder. The encoder is a horseshoe shaped device that straddles the encoder strip. There is a slim possibility that dirt and debris can get up inside the encoder. Blow some compressed air under the encoder to remove any dust and debris.



The small brown assembly on the bottom side of the circuit board is the encoder.



One word of Caution! Use gentle pressure when cleaning the optical encoder and strip. They are not easily damaged, but the use of excessive force or sharp tools could

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damage either device. Do not disassemble anything other than removing the cover from the X-beam. Please replace the cover once the encoder strip and encoder have been cleaned.

Cleaning and Lubricating the Bearing Rails

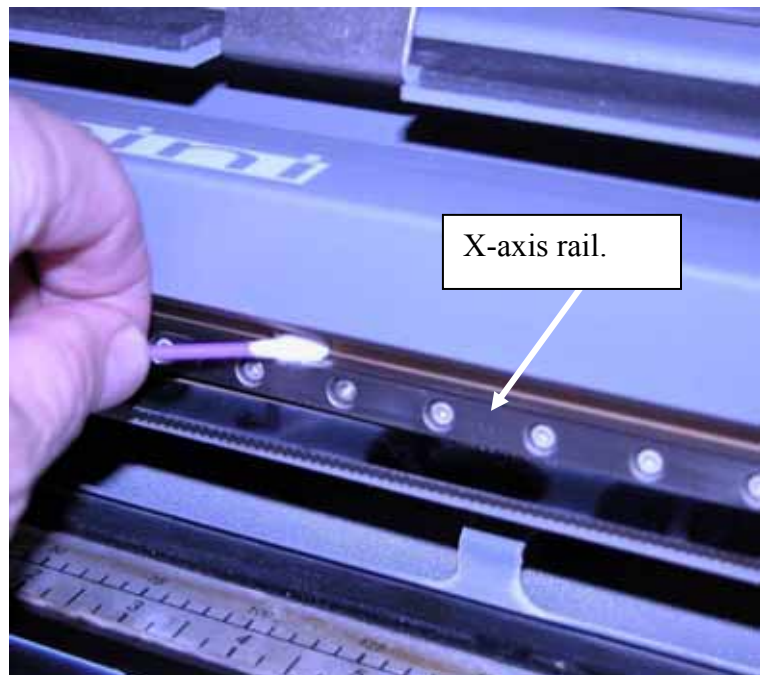
The bearing system in the laser should be cleaned about once a week depending on use. Use a soft cloth or cotton swab with some alcohol or similar mild solvent to clean each of the bearing tracks which the optics (mirror and lens) run along. A cotton swab is perfect for cleaning out the inside of the grooved tracks of the x-axis rail. About once every three months, you should lubricate the bearings. Using the lubricant Syringe from your accessory kit, apply a thin bead of grease into the bearing grooves. Each rail has two grooves – one on the top and one on the bottom of the rail. The grease should go down inside the grooves on each side of the bearing.

The following photos show cleaning and lubing of the X-axis rail.

Use a soft cotton cloth or cotton swab to clean the entire length of the X-axis rail.

This photo shows a cotton swab cleaning out the top groove of the X-axis rail. There is another groove on the bottom side of the rail.

You will need to move the X-axis belt out of the way to access the rail. There is enough flex in the belt to move it out of the way, but do not pull on it so hard that it becomes stretched or stressed.



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After cleaning the rail, place about an inch long bead of Epilog supplied grease into the top and bottom grooves of the X-axis rail. The following photo shows where to grease the bottom groove of the rail.

After applying the grease to both grooves, run the X-carriage over the grease to work it into the bearing block and rail.

Turn the machine off to easily move the X-carriage back and forth over the grease.

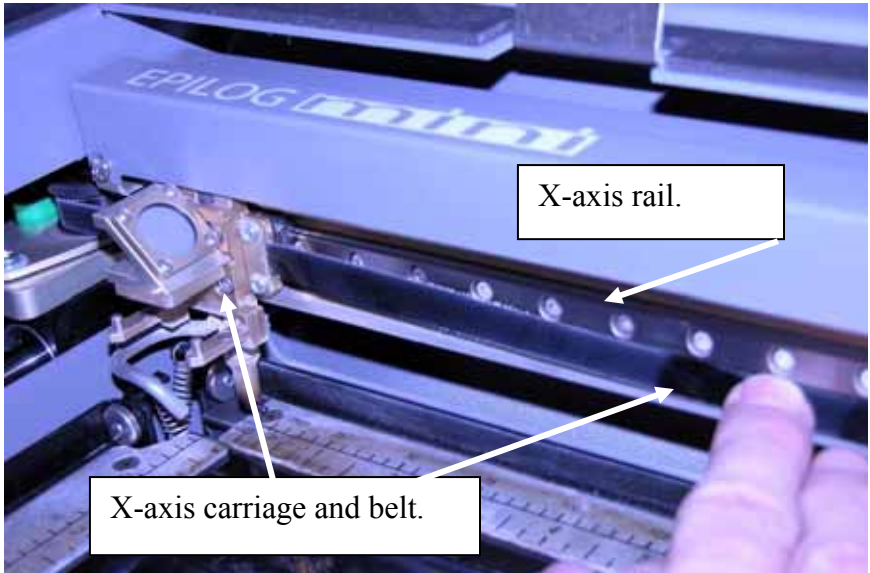


Place a bead of grease along the bottom groove of the X-axis rail.



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This photo shows the location of the X-axis carriage and the X-axis bearing (which is behind the X-axis belt).

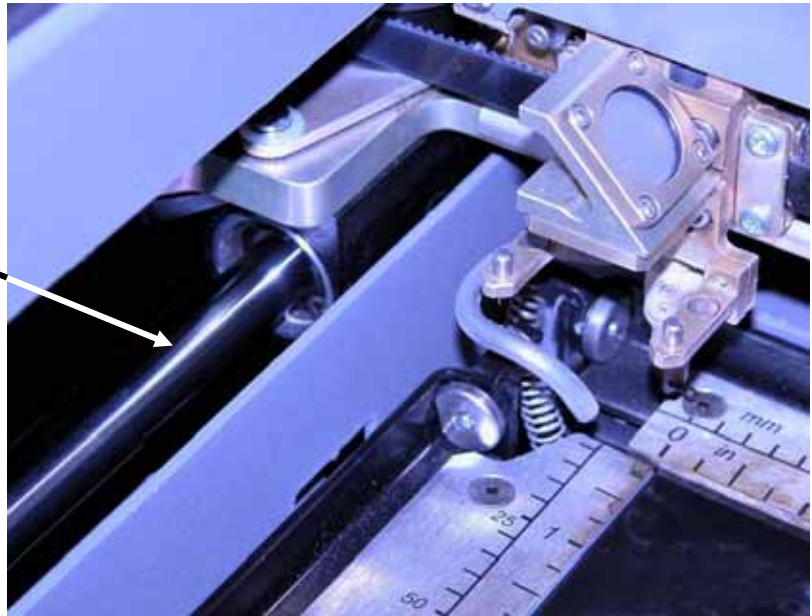


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Clean the length of the right side Y-axis rail using a soft cotton cloth. Lubrication is not required.



Clean the length of the left side Y-axis rail using a soft cotton cloth. Lubrication is not required.



After cleaning the rails and bearings, clean off the table and the rest of the inside of the machine. Spending just a few minutes a week will pay off in the long run with better quality and performance.

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Cleaning out the Crumb Tray



The Crumb Tray collects small debris that falls through the vector grid when vector cutting. Open the front access door and slide the crumb tray out of the front of the machine to keep it clean.



This photo shows the crumb tray partially removed. It is full of debris that should be disposed.

To remove the crumb tray, open the front access door and disengage the two pop out connectors at the front of the tray and then slide the tray out of the machine.

Dispose of the debris in the crumb tray.

Always keep the table tray clean!

Remove all debris that has fallen through the vector grid.

Debris and soot build up in the table tray create a dangerous fire hazard!

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Cleaning the Exhaust

Make sure the exhaust blower you are using receives proper maintenance. Periodically clean the exhaust blower and duct system to remove built-up debris. If you detect odor while engraving, or if the smoke in the cabinet is visible in the area of the lens carriage, inspect the exhaust system. Check for loose or broken pipe/hose connections, or obstructions. The photos below show where to clean the duct work of your machine. You should also occasionally check your exhaust blower and the duct work that is connected to it.



Clean the vents from the inside of the machine. It is best to use a flexible plastic or wire brush that can access the inside of the vent.



Clean the down draft ports too.

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Periodically remove the duct from the back of the machine and clean both exhaust ports.

Inspect and clean your exhaust fan and the duct work connected to it.

Laser Tube

The laser tube used in your system does have a maximum service life, and there is very little maintenance that is required. At some point in the life of the laser you will need to replace it for gas recharge, electrical repair or mechanical repair. Replacing laser tubes is common practice and Epilog has made the process of changing tubes extremely easy for users to perform with a minimum amount of effort. The laser tubes can be refurbished and are available on an exchange basis by contacting Epilog technical support.

Insure that all of the laser cooling fans are properly working at all times. The fans keep the laser tube cool and prevent it from overheating. An overheated laser tube will produce erratic output and may fail completely.

If the laser system is in a dirty or dusty environment, make sure that the cooling fins on the laser tube are kept free of dust buildup. Use compressed air to blow the dust and debris off of the laser tube fins. **Be sure that the system is unplugged before performing any maintenance on the machine!**