

Finger Lakes Instrumentation, LLC  
Shutter Service Instructions  
*All Camera Models*

*Introduction*

The FLI Leaf Shutter has been designed for reliable operation over many thousands of cycles. It's difficult to predict the performance of an individual sample, but 200,000+ cycles were easily achieved during life tests. Field conditions are usually harsher than the lab, with extremes of temperature, dew, and abrasive particles, thus the shutter has been designed for easy service and blade replacement, should it ever be required. This is an abbreviated procedure for both the IMG and MaxCam models- see your manual for more detailed information on troubleshooting.

*Before Starting...*

Early MaxCams with integral fins (4 fins, 4 grooves) do not have internal screws to hold the unit together during shutter service. There is a high risk of losing the purge when servicing the shutter. You can reduce this risk by applying a piece of tape to the body joint opposite the serial number plate. This prevents separation of the body halves. Use clear shipping tape or masking tape, not a stretchable tape like electrical or strapping tape. MaxCams with no fins are secured by internal screws and no special precautions are necessary.

You will need a 1/16" hex key wrench. Be sure the ends are not rounded- obtain a new high quality wrench if there is any doubt.

You may also need a shutter blade service kit from FLI, and possibly a replacement drive ring (IMG series only).

*Disassembly*

1. Using a 1/16" hex key wrench, remove the flathead screws around the nosepiece. IMG users should also remove the two additional flathead screws that secure the small slotted solenoid cover.
2. Lift off the nosepiece (and solenoid cover if present).
3. Using the end of the hex key wrench or tweezers, lift out the circular plastic drive ring.
4. Using tweezers, lift out each stainless steel shutter blade. Avoid touching the camera window.

*Inspection*

1. Inspect each blade for the presence of a pivot ball on each side.
2. Inspect the weld area opposite each ball for cracks. Use a magnifier.
3. Inspect the IMG drive ring for distortion, discoloration, or cracks in the neck area.
4. Inspect the MaxCam drive ring for the presence of the velvet pad.
5. If any shutter blade is defective, replace all the shutter blades.
6. If a pivot ball becomes stuck in the camera, do not use tools to free it. Use only gravity and "canned air". If the ball will not come out, there is no harm in leaving it. The use of tools will damage the pivot hole, making removal of the ball impossible.
7. Replace all defective parts.

*Reassembly*

1. Remove any oils and fingerprints from the shutter blades by wiping them with alcohol.
2. All shutter blades are installed pointing CW. The top side of the blades has the pivot ball near the edge. The camera side of the blades has the pivot ball near the center. With the solenoid closest to you, install the first blade in the leftmost pivot hole. MaxCam blades are installed in the closed position, IMG blades in the open position.
3. Working CW, install the rest of the blades. Do not insert the last blade under the first.

4. MaxCam users- install the drive disk with the large slot engaging the solenoid pin, and the pivot balls in the three slots. The textured side faces up.
5. IMG users- install the tang of the drive ring on the solenoid, then hold the solenoid in the open position. The textured side faces up. Drop the drive ring onto the shutter blades, engaging the pivot balls in the four slots. Don't let go! Replace the nosepiece and wiggle it slightly to center the drive ring. Holding the nosepiece, release the solenoid. The shutter should close. Operate the solenoid lever to check the shutter action.
6. Reinstall the screws around the nosepiece. IMG users also install the solenoid cover and its two screws.
7. Test the shutter operation under power and in various orientations before heading out to your dark sky site!