

Chapter Six

Mechanical Cleaning & Lubrication

“What should I use to lubricate my camera?” is the question I most often hear from do-it-yourselfers. Interestingly, they don’t ask, “How should I lubricate my camera?” when, in fact, that’s the difficult part.

Many people think that most malfunctioning cameras can be put right by applying a few drops of oil here and there. Well, some can but the majority of them can’t. If a camera doesn’t work at all, chances are slim that all it needs is a drop of oil. Sluggishness in the mechanism is usually caused by old, coagulated lubricant which must be cleaned out. Adding more oil will aggravate the problem.

Often cameras have been flooded with WD-40®, a sprayable oil solution. It works well for lubricating larger metal assemblies such as locks, door hinges, casters and the like, but not cameras. Electronic stores also carry sprayable oil solutions for cleaning and lubricating rotary switches and other moving parts in electronic appliances. Do not use any of these sprayable lubricants in cameras.

In any camera, the range of lubricating agents runs from heavy, high viscosity grease to light oil or dry molybdenum or graphite. Which one of these you select for lubrication depends on which part of the camera you’re lubricating. Often you must experiment. A mechanism may be too tight or too loose, and can be very sensitive to the type of lubricant used. This is often due to factory tolerances,

the clearance allowed between moving parts. German made cameras are notorious for close tolerances.

If you run into some mysterious intermittent jamming or binding that will persist even after the most thorough cleaning and lubrication, then you must think of tolerances. Sometimes the only way to remedy one of these mysterious malfunctions is to pull a shaft and grind off a thousandth of an inch or two from its circumference. I have often tried three or four different kinds of lubricant before a mechanism worked reliably.

In similar difficult situations you may want to try graphite. Graphite powder comes in different grades of coarseness and in different liquid carriers. You can mix your own if needed, but usually graphite is used dry. Graphite powder is available in automotive accessory stores. One brand is called Mr. ZIP from American Grease Stick Co. Get very fine powder—that’s what is most often needed. It must be as fine as baby powder. If you can see the grains in the powder then it is not fine enough. Coarse graphite, mixed with a grease carrier into a thick paste, is for filling in gaps between loose-fitting parts.

If you want to use it dry, or if you must flood the mechanism because you can’t get to the parts otherwise, then mix the powder with lighter fluid. Otherwise you may want to mix it with a different viscosity of oil or grease.

The **Lubrication Recommendations** chart in the Appendix (Table 1) helps you choose the appropriate lubricant for different parts of the camera. To simplify the lubrication chart, four types of lubricants for four types of functions are distinguished: fast moving, slow moving, high friction and helical threads. By studying the mechanism you can determine which of these functions is involved, and, consequently, what kind of lubricant to use.

Generally, the *fast moving* parts are connected to the shutter. These are the shutter curtains or blades, curtain shafts, timing gears and other gears that may also spin together with the shutter when the shutter is operating. Other fast moving parts are ratchet claws, catch levers and others that snap into place. Use light oil for fast moving small surfaces such as shafts in bushings. Use dry graphite for fast moving large surfaces (shutter blades and the blade activating rings). Escapements are also fast moving, and either very thin oil or dry graphite should be used after washing them in lighter fluid.

Any other parts, such as film advance gears, are *slow moving*. Use light grease if called for. These parts require no relubrication unless there is something specifically wrong, such as squeaking or binding due to corrosion or badly gummed old lubricant. Normally you will leave them alone.

The *high friction* parts in critical points are mirror and shutter tensioning mechanisms, charging levers and their claw counterparts. These parts are spring-loaded and, despite the high load and friction, must move fast and reliably when the shutter is tripped. Use molybdenum paste for high friction functions.

Helical threads are used in a lens' focusing mechanism. The focusing ring should rotate smoothly with a certain amount of drag. Use bearing grease for helical threads.

Since organic-based lubricants may react with some plastics, use synthetic oil or grease for plastic parts if lubrication is required.

Table 1 in the Appendix lists recommended lubricants for different parts of a camera. Use this as a guideline only. The actual lubricant to use will depend on accessibility and the end result (does it work?). Don't stray too far, though. Table 1 lists lubricant alternatives that are readily available in any hardware store or auto accessory store.

You will also find lithium, silicone and other lubricants on the shelves. Molybdenum seems to work better than lithium, although lithium could be substituted for molybdenum. Silicone is not usually used either (except for plastic parts), but you can try silicone grease under #2 (slow moving), and light silicone oil under #1 (fast moving, small surface).

If you use graphite powder dry (not in a solvent carrier) you must work the mechanism and then blow it out thoroughly with compressed air, otherwise the graphite powder may contaminate the optics. You must always protect the optics from contamination when using the flooding method, or any time you blow into the camera for whatever purpose. Tilt the camera so the solvent flows away from the viewfinder, and direct the air jet away from the optics. The last thing to do before putting the covers back on is to check the viewfinder for dust and stains, and clean them if required.

Don't be oil-happy. Before you start oiling, determine why the camera doesn't work. Fix the actual problem and leave the oil-can alone if not required.

This may come as a surprise, but, theoretically, a camera is lubricated for "life." A camera does not need annual maintenance as cars do. The lubricant will dry out and gum up eventually, but depending on temperature, humidity and other conditions, this will usually take from ten to fifteen years.

Mechanical Cleaning

Usually, it is possible to dissolve the old gummed-up grease without taking the parts out or pulling the shafts or rivets. But sometimes (fortunately not often) the grease will not dissolve by flooding it with lighter fluid. In particular, there was a greenish grease used occasionally in the sixties that will completely solidify given enough time. Petri used this grease in some of their models. Some German makes, as well, have this green grease in them. This hardened grease will not dissolve at all. You must pull the shaft or take the assembly apart, and scrape the green mess off with a sharp knife or file it off with a needle file.

So how do you clean the mechanism? Unless the mechanism is badly contaminated or corroded you don't have to pull the parts. What you do is just squirt a few drops of lighter fluid onto the parts (shafts, bushing, gears, escapement, etc.) and work the mechanism. Cock and release it a few times, set the camera to one second and do it again, then blow the solvent out. Use the minimum amount of solvent and make sure that it doesn't get into the viewfinder. If it does, you will have to disassemble and clean the optics. Do this treatment fast and only once. That way the grease stays in the gears, but the dry oil will be washed out. Warm up the camera gently with a hair dryer to help evaporate the solvent.

Oiling

Once the cleaning is done, you'll need to relubricate the camera. Using an oil syringe or other applicator, oil the curtain shafts, timing gears and other gears that may be spinning together with the curtain shafts. Touch the tip of the syringe needle to the gap between shaft and bushing (or the gear and its shaft) and tap the plunger gently. If you're using a screwdriver or a length of wire instead of a syringe, take a tiny drop of oil onto the

end of one of these applicators, touch the drop to the interface between shaft and bushing, and capillary action will pull the oil into the gap between the two parts.

After cleaning and lubrication are completed, check the shutter speeds (see Chapter 11). If okay, leave them alone. If capping occurs at high speeds (one side of the frame is darker), give a little more tension to the first curtain (see Pentax SP).

Flooding with Graphite Powder

If you can't reach the points where the camera should be oiled, or the camera has dried out completely from old age, heat or humidity, you may want to flood the mechanism with graphite solution. To do so, squirt a little lighter fluid in a small container and mix a small amount of fine graphite powder into the fluid. The powder will sink to the bottom immediately; it doesn't stay mixed. With a wad of tissue, stir the solution, dab it onto the mechanism, and squirt a little extra lighter fluid after it. Do this a few times until the graphite gets to all the mechanical parts. Work the mechanism a number of times, then blow it out thoroughly. Again, use a minimum of powder and liquid, and do it fast.

This treatment will not harm any part of the camera, but it will stain everything if you're not careful. The graphite can be cleaned off with detergent, but it's not easy. Don't get the graphite onto your hands, either, because your blackened fingers will stain everything you touch, particularly the outside of the camera.

Essentially, the above procedure is equally applicable to SLR bodies, lens-shutter assemblies and diaphragm mechanisms (see Chapter 10 for cleaning diaphragms.)