

# **Kiron 28-85 f2.8-3.8**

## **Cleaning Oily Diaphragm Blades and Re-lubrication.**

By Prentice Fish, November 2010  
version 1.1

*Disclaimers: Here I am merely describing what I did on seven manual focus Kiron 28-85 lenses, two in Canon FD mount and one in Minolta MD mount, and three in Olympus OM mount, and a Nikon mount parts lens. I do this as a personal hobby and I lack lens repair skills/experience. What follows reflects that perspective – this is not written for, or by, an experienced lens technician. Don't hold me responsible if you try this procedure and something goes very wrong. That may happen. Don't call me and I don't want any lens repair work. You assume all risks for whatever you do, and carefully consider consulting others who are qualified and experienced. Also keep in mind that Kino Precision (Kiron was their brand name) made changes over time when producing this lens, so my lenses may be different from yours. Some of the differences in the seven lenses I disassembled are noted in this document.*

*There is a very helpful a 48 page “Vivitar Service Manual, Publication No. 3746153” for this lens. This Vivitar lens is the same as the Kiron 28-85 lens. This Manual has parts diagrams, parts lists, disassembly procedures, and re-assembly procedures. Very helpful. Study it. As of December 2010, you can download this complete manual, from the helpful Kiron Klub, at this website address:*

<http://groups.yahoo.com/group/Kiron-Klub/files/Vivitar%20Repair%20Manuals/>

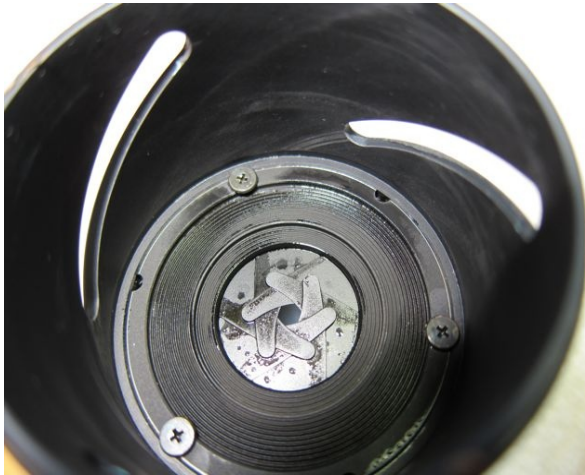
*An improperly disassembled lens, especially a focusing helix separated without a mark at the point of separation, may be very difficult and time consuming to repair. If you doubt your ability, or get into trouble, or don't want to bother with trying to fix the lens yourself, consider sending the lens to an experienced lens repair person such as Ralph Innes, a member of the Kiron Klub, whose website address is:*

<http://members.shaw.ca/f35mru20458/index.html>

*I don't know Mr. Innes, have not met him nor communicated with him, and of course have no financial connection to him. But several Kiron Klub members have mentioned his skills, and I'd talk to and consider him if I were looking for someone to work on a lens of mine. As always, evaluate your options and pick what you think is the best option for you at the time.*

**The Problem – Is the lens aperture stuck wide open?** Oily lens diaphragm blades are not unusual for old lenses, since the grease used on these lenses breaks down over the years, and gets on the aperture blades, resulting in an aperture stuck wide open. Viscous or hardened oil will at least make the aperture sluggish and give improper exposure or may stop all aperture action. Apertures were stuck wide open on the seven Kiron 28-85 f2.8-3.8 lenses that I obtained in 2010. Here is one way to test (there are other test methods you may prefer) whether or not your lens has this problem: With the lens in a camera, open the camera back, put

the shutter on B shutter setting, and set the f-stop wide open. Cock the shutter, look through the open camera back and the lens, press and hold down the shutter, and observe the size of lens opening in the “wide open” lens. Now release the shutter, and change the f-stop to (say) f16. Cock the shutter again, press and hold the shutter down, and look through the camera back and lens again, just like before. If everything is okay, you should see a much smaller opening in the lens. But if the diaphragm remains wide open – the same size as at the f3.5 setting you tried first – the aperture is not “stopping down” as it should, and oily shutter blades may be the problem. You may also see the opening slowly get smaller as you hold the shutter down. If this happens, the aperture is not “stopping down” quickly as it should, and oily shutter blades may be the problem.



The photo here shows an example of oily aperture blades on a Kiron 28-85. The oily diaphragm blades are the six overlapping parts in the center of this photo.

I took apart both the front and rear parts of the lenses, cleaned the oily aperture blades, cleaned any oily films on the exposed glass lens groups, and inspected them for haze/fungus/other problems, removed the broken-down old grease from the helicoids and other parts, and re-lubricated with a good synthetic grease having a wide temperature range. I'm satisfied with the end results.

List of Tools/materials used:

- \* Lens spanner wrench and tweezers
- \* flat screwdriver 1.0x40 (for the really small screws), 1.5x40, 2.0x40, 2.5x40
- \* clamps (hose clamps and plastic clamps)
- \* plenty of containers (like paper drinking cups and cheap plastic bowls) to hold lens parts, and to keep the lens parts in the same order as disassembled, which makes reassembly easier.
- \* JIS/Crosspoint screwdriver 1.7x40mm, 2.0x50mm, 2.5x50mm, and 3.0x50mm
- \* phillips screwdriver 0x50
- \* a cleaning fluid of your choice. I used denatured alcohol (from most any hardware store). Opinions differ, and some with greater experience prefer Coleman brand camp stove fuel and/or naphtha (lighter fluid). You pick the fluid you decide you want to use; I'm not recommending anything. Be aware of all safety hazards and read all the product safety labels and take all recommended precautions.
- \* dish soap and water, and q-tips (lots of these)
- \* can of compressed air – readily available product
- \* good synthetic grease with a wide temperature range
- \* an Ottlite “Jupiter Magnifier Lamp”, or similar lamp with a magnifier built in, which relieves eyestrain. This is not an absolutely essential item, but it sure helps.
- \* a fluid of your choice for penetrating and loosening stuck threads on camera parts.
- \* “ring wrenches” (friction spanner) – different sizes of round rubber-like furniture leg cups (from most any hardware store) and/or cane or crutch tips (from medical supply stores). See the picture in Step 3 below for an example of a “ring wrench”.

**The Vivitar 28-85 Service Manual.** *Get this Manual* on the Internet (website listed on page 1) and review it. This Vivitar manual applies to the Kiron 28-85. The Manual is a great resource with parts diagrams, parts lists, disassembly procedures, and reassembly procedures. The parts names that now follow here are usually consistent with the parts names in the Vivitar 28-85 Service Manual (later referred to here as the “Service Manual” or “Manual”).

**Take Lots of Photos and Notes during Disassembly.** Go overboard here – you cannot have too many photos at different angles. Look carefully (before taking lots of pictures) for things such as slots or notches and anything different, so you can get the parts reassembled in the original position. Close-up photos from many different angles are a real help later.

**JIS/Crosspoint head screws, phillips head screws, thread-locker, appropriate solvents for stuck threads, appropriate glass lens cleaning solvents, proper screw removal techniques, etc.** If these subjects are unfamiliar, consider even more carefully sending the lens to an experienced lens repair person. Knowledge of these subjects is both helpful and beyond the scope of what is presented here. Search the Internet for helpful information on these subjects. You'll probably have to sift through the material to sort it out and find the “good stuff”. If not familiar with lens disassembly, consider also finding several free or really cheap “beater lenses” to practice taking apart and reassembling before disassembling your Kiron/Vivitar lens.

**Thread-locker:** There are several kinds. MEK or acetone will at least soften most of them but are slow to penetrate deep threads. If all is metal, a red hot soldering tip on the screw head for 30 seconds often softens the thread-locker enough for a steady torque to move the screw. When cool, it becomes stiff as ever.

**Set screws:** Set screws have a sharp point and often are slot headed. The screwdriver should fit exactly to reduce the chances of breaking off one side. Remove as much paint as you can so the screwdriver blade can fit. When reassembling, it does not take much force to replace them adequately. Consider using thread-locker or something else to keep them there. If several are spaced around a ring tighten them evenly or else the ring could warp and bind.

## **Disassembling the Kiron 28-85**

*(see Service Manual, §1.0 and following,  
starting on Manual page 1)*

**Step #1. – Removing the Name Ring.** Among my lenses there were three different types of “name rings”, also called the “filter ring”. So I'll describe each separately here, and you decide whether your lens name ring is like one of mine, or a different type.

**Kiron Brand Variation #1 -- three set-screws in Name Ring.** Look at the “filter ring” – also called the “name ring”. That's the lens front cover that has the Kiron lens name on it. Look for three very small set-screws (slot heads, with the slots often hidden with some black paint, glue, or silicone on the slot head) evenly spaced around the name ring which hold it on to the “cowling ring”.



Photo left shows the name ring off the lens. Red arrow points to name ring, and red triangle points to cowling ring. Loosen the three small set-screws on the name ring enough to slide it off to the front, and leave the three small set-screws in the name ring. If one does fall out, use a piece of thin closed-cell foam with a hole in it to hold the screw for replacement. Slide the name ring forward and off the lens.

--- Suppose you cannot find three small set-screws on your Kiron brand name ring, but instead find only one small set-screw. Look at the paragraph below -- *Kiron Brand Variation #2*.

--- Suppose you have a Vivitar brand (and Kiron made) 28-85, with only one set-screw on the name ring. Look at the paragraph below -- *Vivitar Brand Variation*.

--- Suppose you find a filter ring on your lens that differs from the three filter ring variations described here. Apply common sense, guided by experience.

*Kiron Brand Variation #2 – one set-screw in Name Ring.* Some Kiron 28-85 lenses had only one set-screw on the name ring. In these lenses the name ring is threaded onto a threaded cowling ring, unlike the model in the previous photo, which has three set-screws and no threads on the name ring or cowling ring. On the “one set-screw” models, that one set-screw holds the name ring from turning on the cowling ring threads. So loosen the one set-screw, and unthread the name ring from the cowling ring, and the name ring slides off the lens to the front.

*Vivitar Brand Variation.* On my two Vivitar branded (and Kiron made) 28-85's, another filter ring variation existed. Loosen the one set screw on the filter ring, unscrew the filter ring from the threaded cowling ring, then slide the filter ring as far forward as you can to expose the threaded joint of the 1<sup>st</sup> lens group. Apply loosening fluid to the threaded joint and give it time to work. Photo right shows the filter ring unscrewed and as far forward as it will go. Curved red arrow points to the Vivitar filter ring. Red triangle points to the exposed part of the 1<sup>st</sup> lens group. Red straight arrow points to the threads on the cowling ring. And the right-angled red arrow points to the exposed threaded joint of the 1<sup>st</sup> lens group, for loosening fluid



application. Unlike the two Kiron branded variations, the Vivitar filter ring will not slide off the front at this point – it will move forward only as far as shown in the previous photo.

For this Vivitar variation, next unscrew the 1<sup>st</sup> lens group with (1) a lens spanner wrench from the lens front, which is what I did, or (2) a properly sized clamp on the exposed part of the 1<sup>st</sup> lens group, to which the red triangle points in the previous photo. But first give the loosening fluid plenty of time to loosen the exposed threaded joint of the 1<sup>st</sup> lens group.

Photo right shows the front of a Vivitar branded (and Kiron made) 28-85, with the insertion points for the lens spanner wrench tips in the 3 o'clock and 9 o'clock positions.



**Step #2.** Next off after the Kiron name ring is the “1<sup>st</sup> lens group assembly”. It's the front lens, and unscrews. It comes off as a unit, and often only by hand turning. But it may refuse to unscrew (even with proper clamps), until applying a little loosening fluid to the threaded joint and letting it soak in for a few hours and loosen the threaded joint. Don't rush; let the loosening fluid do its work before you try to unscrew the lens. Choose a loosening fluid that won't harm the lens parts or you. Once the lens is off, look for any round spacing shim(s), and reinstall these

when you reassemble. Photo left shows both the name ring and the 1<sup>st</sup> lens group assembly out along with a circular spacing shim to be reinstalled when the 1<sup>st</sup> lens group assembly is re-installed.



Now remove the “cowling ring” by loosening the three small set-screws on the cowling ring enough to get it off. Leave the three small set-screws in the cowling ring. If one does fall out, use a piece of thin closed-cell foam with a hole in it to hold the screw for replacement. Photo left shows the cowling ring off the lens, and the red triangle points to the cowling ring.



**Step #3.** Zoom the lens out to the 85 mm position and observe the “light baffle ring” in the left photo – red triangle points to it. Using the proper diameter rubber type tool often called a “ring wrench”, unscrew the light baffle ring. What can you use as a ring wrench tool? Furniture leg cups and crutch/cane tips come in many different diameters, and can readily be used. They are usually available at your local hardware store or medical supply store. Get various diameters.



This photo shows such a rubber “ring wrench” tool (far left of photo) and the light baffle ring unscrewed and out, and laying flat on the table (center of photo).

**Step #4.** The Service Manual refers to the part with the lens focal length scale on it as the “scale ring”. It's in the photo right, and is the part with the numbers and infinity symbol on it. Zoom the lens out to the 85mm focal length position. Find and remove the three small screws evenly spaced around the scale ring. The red arrow in the photo right points to one of those screws.

Now slide the scale ring forward – it will move forward a short distance, as shown in the following photo.





**Step #5.** Using your correctly sized JIS screwdriver, carefully remove the four flathead screws evenly spaced around the shiny aluminum part (the “rear mount assembly”) shown in the photos above. Red curved arrow points to one such flathead screw. Expect thread-locker on these four screws. They are in adjustment slots. Shim(s) set their position. The flat head often digs into the sides of the slot and these screws are tight. Replacements unavailable.

There is also a pin in the “helicoid frame” that is in a slot (or a rectangular hole in some models) in the rear mount assembly. When reassembling, make sure the pin lines up so it fits in the slot/hole. The red curved arrow points to that pin in photo right. The straight arrow points to the slot in the rear mount assembly where the pin goes. On some models, instead of a slot for this pin, there is a rectangular hole.

Once all four flathead screws and the pin are unscrewed, remove the rear mount assembly. You may need to rotate (or rock slightly) the rear mount assembly back and forth just a little as you evenly remove it. Keep any shims so that you can reassemble with the shims in place. Once the rear mount assembly is off, also slide the scale ring off the lens rear.



Photo left shows the rear mount assembly and the shims off the lens. The scale ring is still on the lens. Red arrows point to those parts. Avoid bending or altering the aperture control arms in any way. They are a precise link between the aperture and the aperture set ring.



Now the scale ring has slid off the lens rear, as shown in photo left. Red arrow points to the scale ring.

**Step #6.** Take off the “grip”. It is the rubber-like cover on the “control ring”. A bamboo skewer works well to get under the grip edge and start rolling it off. The grip slides or rolls off with your fingers. There may be a little glue under the grip, which you’ll first need to separate from the control ring before taking the grip off. Again use the bamboo skewer, or something wood slipped under the grip, rather than a metal flat screwdriver, although that works also. Once the grip is off, you can see the black control ring and the two round holes (one on each side, 180° apart) in which there is a “roller shaft” and “rollers” that are flat sided (meaning not completely round). Photo shows the grip partly rolled off. Red curved arrow points to the grip.



Red arrow in photo right points to the small white colored “roller” around the “roller shaft” in the hole. The red triangle points to the control ring. Unscrew the two roller shafts in the two round holes – each roller shaft has flat sided (meaning not completely round) white plastic rollers around the roller shaft. Take great care in removing these roller shafts and rollers, as the parts are small and replacement parts unavailable, unless you find a “parts lens” to cannibalize. Expect thread-locker (such as loctite) on the threads of these roller shafts, so take great care in removing them properly. After unscrewing the roller shaft about 5 turns or so, it may still stay in the slot due to friction between the white rollers and the slot. Use tweezers or something



else to take the roller shafts and rollers out of the slots. Or rotate the control ring back and forth a bit, which makes it easier to grasp the loose roller shaft and rollers.



Photo left shows the small roller shaft, flat sided white roller, and washer out of the lens. These can be tricky to reassemble. If not screwing in smoothly they may be “cross threading” and damaging the threads.

Now slide the control ring off the lens rear. Photo right shows the control ring off. The red triangle points to the control ring. The red arrow points to the two roller shafts, with the rollers and washers on those shafts.



**Step #7.** The Manual calls the two brass colored, and tee shaped, parts shown in the photo right the “helicoid guides”. Photo right shows one such helicoid guide out; red straight arrow points to it. The other helicoid guide is still partly in and partly out of the lens. Remove both helicoid guides by removing the two screws that hold each helicoid guide in place. Curved red arrow points to where the screw is located; in this photo the screw is already out. Note that two of the screws are pan head, and two are flat head. The black letter “T” shown in the photo reminds me to put the flat head screws here, and the pan head screws on the other helicoid guide, when I reassemble. Note that the screw seats in the helicoid frame for these two types of helicoid guide screws are machined differently, so you can figure out which screw type goes into which side.



**Step #8.** Place the lens on the table as shown in the photo right, with the outer helicoid assembly turned to the infinity stop. That means turn the outer black helicoid assembly, which has the brass colored “infinity stop ring” with the “stop tab” to which the arrow in photo right points, all the way against the shiny aluminum part (the “helicoid frame”), at the tip of the red arrow in photo right. This photo shows the lens in the infinity position.



Keeping the outer helicoid in the infinity position, note the two slots to which the arrows point in photo right. When you reassemble the helicoids, this is the only correct position, assuming the infinity stop ring is in the infinity position. See also Figure 3 on page 13 of the Manual.



You are about to disassemble the helicoids. Before doing that, note here how things should look when you reassemble.

**Step #9.** Disassemble the outer and inner helicoids by turning them until they come apart. Red arrow points to outer helicoid assembly in photo right. Red triangle points to inner helicoid.

The helicoid frame and the infinity stop ring can be taken off the outer helicoid. These parts can then be cleaned and re-greased. Having disassembled these parts on one lens, my current preference is to leave them together as found, and to clean off any old grease, and re-grease. You decide what you want to do. If you elect to take the helicoid frame and infinity stop ring off, make scribes, measure distances, count revolutions, and take notes on disassembly, so that they can be put back in an “as found” condition. See Section 3.4.3 of the Manual for reassembly. [Not currently having collimation equipment, I cannot test focus as set forth in Section 3.5.2 of the Manual. Thus the effort to always reassemble “as found”, on the assumption that the lens is correctly focused before disassembly, and that reassembly to an “as found” condition results in a return to correct focus.]



**Step #10.** The “2<sup>nd</sup> lens group slide ring” is held in the inner helicoid by three roller shafts and rollers. [On some Kiron 28-85 models there are only two roller shafts and rollers, and only two corresponding slots in the inner helicoid. See discussion about these different models in the reassembly section.] The red arrow in photo right points to one of those roller shafts and white rollers. Remove all three. Take great care in removing these roller shafts and rollers, as the parts are small and replacement parts unavailable, unless you find a “parts lens” to cannibalize. Expect thread-locker (such as loctite) on the threads of these roller shafts, so take great care in removing them properly. After unscrewing the roller shaft about 5 turns or so, it may still stay in the slot due to friction between the white rollers and the slot. Use tweezers or something else to take the roller shafts and rollers and washers out of the slots. Note that the three rollers are completely round – that is, no flat sides.



Try to remove the shaft and the surrounding white rollers and washer as a unit. The rollers may slide off the roller shaft; put them back on correctly, and put the washer on as well. Photo left shows the small roller shaft, and one roller off the shaft and one roller still on, and the small washer.

The straight red arrow in photo right points to the three roller shafts and rollers and washers. The curved red arrow points to the 2<sup>nd</sup> lens group slide ring. Once the three roller shafts are removed, the 2<sup>nd</sup> lens group slide ring will (hopefully) fall out gently into your waiting hand.





Just falling out rarely happens, though. As it comes forward, it often gets a little turned or twisted inside the inner helicoid, and needs a little (gently, please) encouragement from a wooden skewer, used from behind through the slots in the inner helicoid. See photo left. Work your way around the inner helicoid, through all the slots, in little “bites”; don't try to pry the 2<sup>nd</sup> lens group slide ring out of the inner helicoid all at once.

Then when the 2<sup>nd</sup> lens group slide ring is almost out, you may need to move your wooden skewer to the front, as shown in this photo right. Again, work your way around the 2<sup>nd</sup> lens group slide ring and the cam tube. Be gentle.



Note: when reassembling, the 2<sup>nd</sup> lens group must be reinstalled before reassembling the helicoids.



Now remove the four screws holding the cam tube to the inner helicoid. Red triangle in photo left points to the cam tube. Red arrow points to the inner helicoid. Curved red arrow points to the four screws. [Note that two of these screws are pan head, and two are flat head. When reassembling, restore these screws as found. Meaning don't put a pan head screw where a flat head screw belongs, or vice versa. The seats in the cam tube are machined differently.]

**Step #11.** Remove the 4<sup>th</sup> lens group slide. Photo right shows the 4<sup>th</sup> lens group slide out of the inner helicoid. Red arrow points to the 4<sup>th</sup> lens group slide. Red triangle points to the inner helicoid.

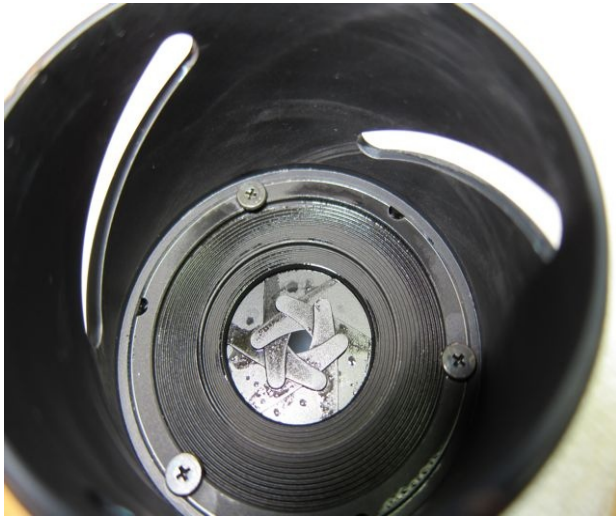


Stand the inner helicoid on your table as shown in photo left.

Red triangle points to the “aperture cam” and the red arrow points to the “blade operating ring”, which has a spring attached to it. Gently work the aperture blades closed with the “blade operating ring”, so you can see the blades and if they are oily. If the blades don't move, maybe the aperture cam ring is holding the blades open. So move the aperture cam ring in one direction. Try moving the blade operating ring again with gentle pressure, and see if the blades now move. If not, move the aperture cam ring in the opposite direction, and once again try moving the blade operating ring with gentle pressure, and see if the blades now move.

If the blades will not move, or if the blades do close down and you can see oil on the blades, then scribe a line as shown in photo right, so that the diaphragm assembly can be reinstalled later into the inner helicoid in the position found. Red arrow points to a scribe line on inner helicoid wall, and on diaphragm assembly.





Turn the inner helicoid upside down on your table, and remove the 3 screws shown in the photo left. The diaphragm assembly now falls out of the inner helicoid.

At this point I prefer to remove the 3<sup>rd</sup> lens from the diaphragm assembly with a spanner wrench, but if it seems too hard to remove at this point, leave it in and let its threads soak overnight in your cleaning fluid.

Once out in your hand, examine the diaphragm assembly, and again try gently moving the levers that move the aperture blades. When the blades move from the “stuck wide open” position, you should be able to see clearly the sticky oil on the aperture blades, if oily blades are the problem, but sometimes only the pivots are stiff with dry oil. The photo shows the diaphragm assembly in hand, and oily aperture blades now “stopped down” gently from the “stuck wide open” position.



Try removing the sticky oil on the aperture blades without disassembling the diaphragm assembly. Put the diaphragm assembly in the cleaning fluid of your choice. Gently work the aperture blades open and closed, with the blade operating ring that has a spring attached to it, so the cleaning fluid can get at the sticky oil on the blades. If the blades don't move, maybe the cam on the aperture cam ring is holding the blades open. So move the aperture cam ring in one direction. Try moving the blade operating ring again with gentle pressure, and see if the blades now move. If not, move the aperture cam ring in the opposite direction, and once again try moving the blade operation ring with gentle pressure, and see if the blades now move. If nothing moves, let the diaphragm assembly soak overnight in the cleaning fluid, and try again.

Often this will remove the oil and free up the aperture blades so they are “snappy” once again, and “snap down” when you let go of the blade operating ring. Move the other lever as well, to see if the blades now open and close properly. Count your blessings if this happens! With the benefit today of hindsight, on the aperture assemblies that did not clean up, as an assembly, with denatured alcohol, I'd consider using (and observing all safety precautions) other “more powerful” cleaning fluids commonly used on camera parts. But that's just an opinion – you decide. As a general rule, avoid using acetone or MEK because some lens aperture blades are plastic and will be warped by such solvents.

[An Alternative to Consider: As an alternative to removing the diaphragm assembly from the inner helicoid, and then removing the 3rd lens from the diaphragm assembly as described in the previous few paragraphs – consider instead putting the inner helicoid, with the diaphragm assembly still in it, into an appropriate safe container holding a sufficient and safe amount of your chosen cleaning fluid. And cleaning everything as a unit. When cleaning the 3rd lens (the one in the diaphragm assembly), you'll need to hold the blades fully open to clean the side of the lens facing the blades, and clean that lens after all the cleaning fluid has evaporated from the diaphragm assembly. This alternative can save time and disassembly steps.]

A general thought before returning to the oily diaphragm problem. While you have a chance to examine each lens group individually during disassembly, do so carefully. Besides examining the outer glass surfaces of each lens group for problems, look for fungus or oily haze on the interior (that is, the non-exposed) glass surfaces of each lens group. Hopefully there is no problem on the non-exposed glass surfaces; if there is, consider dealing with it. What is the point of a mechanically good lens with hazy or oily glass? The goal here is clean and bright glass when everything is re-assembled, for those great pictures you'll be taking. Now back to the oily diaphragm.



Suppose the blades cannot be cleaned by cleaning the entire diaphragm assembly as a unit. In other words, suppose the blades need to be taken out of the diaphragm assembly. Review §3.2.7 of the Manual. To get the blades out of the diaphragm assembly, remove the three small screws in the diaphragm assembly, and remove the black cover. Take a picture of how the blades in your diaphragm lie, as the diaphragm blade overlap pattern differs for different lens mounts. See also Section 4 of the Manual for your blade overlap pattern. The photo left shows an Olympus OM diaphragm pattern.



Separate and clean the blades and other diaphragm parts, shown in the photo left. Red arrow points to one of the individual diaphragm blades needing cleaning. These blades shown in this photo were rusted a bit, as well as oily, and this diaphragm would not clean up as a unit. So I had to take it apart. The blades in my other lenses were only oily, without rust stains, and usually cleaned as a unit.

**Step #12.** Once the diaphragm assembly parts have been cleaned, reassemble it, using the Manual and your photos to determine how the blades in your diaphragm overlap. Photo right shows an Olympus OM pattern, with some but not all of the blades in place. Be sure to get the last blade in place correctly. This may take some time, and a few tries. Things easily move about.



## **Re-Assembly.**

At this point, the old grease and oil have been cleaned off the parts. The oily diaphragm assembly has been cleaned and (if taken apart, re-assembled) is ready for re-installation. The individual lens groups have been examined and found to be clear, bright, and without significant problems, with any oily films on the glass surfaces removed. No irreplaceable parts were ruined during disassembly. So the lens will be re-assembled, and you've got great modern synthetic wide temperature range grease on hand, which you've decided will give your lens just the right feel (for you) when zooming and focusing.

In general, reassembly is the reverse of disassembling. The Manual covers re-assembly in §3.4.1 and following, starting on page 11. Here are some additional thoughts.

1. When installing the 4<sup>th</sup> lens group slide (shown in photo right) into the two slots in the cam tube “legs”, note that there are two possible positions for the 4<sup>th</sup> lens group slide that are 180 degrees apart. In one position (but not the other) the controlling levers on the rear mount assembly will be blocked by the frame of the 4<sup>th</sup> lens group slide. Observe the diaphragm assembly in place in the inner helicoid, and install the 4<sup>th</sup> lens group slide into the cam tube so that blade operating ring and the aperture cam lever on the diaphragm assembly can be reached by the the controlling levers on the rear mount assembly.



On all of my lenses, whether two slot or three slot models, this also meant that the notch in the cam tube “leg” was on the same side as the part of the 4<sup>th</sup> lens group to which the red arrow points in this photo.



2. The 2<sup>nd</sup> lens group slide (shown in photo left) fits inside the inner helicoid near the diaphragm assembly, and rotates as the lens is zoomed in and out. The circular metal parts of the 2<sup>nd</sup> lens group slide, to which the red arrows point in the photo left, may rub too tightly against the inner surface of the inner helicoid. Check for smooth operation right after installing the 2<sup>nd</sup> lens group slide. Consider lightly smoothing these shiny metal surfaces of the 2<sup>nd</sup> lens group slide before installation. If there is binding, or sticky operation, remove the 2<sup>nd</sup> lens group slide, and smooth the shiny metal surfaces on the 2<sup>nd</sup> lens group slide that contact the inner surface of the

inner helicoid. Avoid grease in this area, so near to the just-cleaned diaphragm blades. The Manual states (page 10, bottom) that these surfaces are self lubricating and warns against applying any grease to the bearing surfaces of the 2<sup>nd</sup> lens group slide or the inner helicoid, to avoid fresh diaphragm blade contamination. After cleaning, my “two slot” models of the Kiron 28-85 had much greater friction, one unacceptably so, as compared to the “three slot” models. On one “two slot” model with oily blades, much grease had been used on the 2<sup>nd</sup> lens group slide in order to make its zoom operation possible. You may have to consider the possibility of using a good wide temperature range grease as a last resort, if the only alternative is excessive binding when zooming. Possibly Kiron “upgraded” the Kiron 28-85 “two slot” model to “three slots” at some point in lens production. My “three slot” models zoom without binding.

3. When re-installing the rear mount assembly, to match the coupling levers more easily, I found it best to first move the aperture cam ring lever (which stays in place where you put it) towards the other lever on the diaphragm assembly – the “blade operating ring” lever (which is moved to a limit position by a spring, and stays there until something pushes it). Then I pushed the diaphragm actuator lever on the rear mount assembly away from its spring, and held the forked lever (aperture control lever) over the aperture cam ring lever, and put the rear mount assembly on, and then released the actuator lever. Try whatever works best for you, and your mount type. Don't force anything of course.

Once the rear mount assembly is re-installed, use the f-stop ring to make sure the aperture assembly is working correctly. When checking this on Canon FD mount versions, keep in mind that, when the breech lock ring of the Canon FD lens is turned to the "off camera" position, the aperture controls on the back of the lens do not function the same as when the ring is turned to the "on camera" position. So on Canon FD lenses make sure the breech lock ring is in the “on camera” position before checking the aperture assembly.

4. Once the lens is reassembled, and mounted on your camera body, an infinity focus adjustment can easily be made if needed. Using a distant object on the horizon – such as a tall telephone pole – check to see if the lens correctly focuses at the infinity position (lens control ring fully counterclockwise, viewed from the lens rear). If not, zoom the lens to the 85mm position (that is, fully forward) and remove the 3 small screws in the scale ring, and slide it forward as much as you can. Then turn the control ring to the close focus position (fully

clockwise, viewed from the lens rear). Now the brass colored infinity stop ring is visible. Loosen the two set-screws holding the infinity stop ring in position, and turn that infinity stop ring on the threads in the direction needed to achieve correct infinity focus on your lens. Retighten the two set screws in the infinity stop ring. Also adjust the index ring (the part with the red dot) so that the red dot correctly lines up directly above the infinity symbol on the scale ring, with the control ring in the infinity position. The usual three small set-screws hold the index ring in place. Note: on several of these 28-85 lenses, I could not get a correct infinity focus for both the close focus 28 mm position and the 85mm telephoto position. If one position was correctly focused at infinity, the other was slightly out of focus at infinity. So I compromised, and set the infinity focus ring “midway”. The Manual discusses the procedure to follow to correctly set the infinity focus at both close focus (28mm) and telephoto (85mm). But this involves test equipment I do not have, thus my decision.

Finally, I'd like to gratefully acknowledge the excellent help and comments of Mel Smith, who kindly reviewed earlier drafts. That said, any mistakes here are the responsibility of the author alone. Should you detect something(s) that needs correction, please send your constructive comments to: [\\*prenticefish\\*@\\*msn.com\\*](mailto:*prenticefish*@*msn.com*). All such comments welcomed and appreciated. [The e-mail address is not correct in the hope that spammers can't grab it and use it to peddle stuff. Please cut and paste the address into your e-mail, then remove the \*.]

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