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New Life for Old Omega Enlargers

A few simple fixes can add years of service to this darkroom workhorse

by **Larry Hamel-Lambert** *and* **William Schneider**

One of the most common darkroom enlargers is the venerable Omega D2 series, and with digital photography displacing many home darkrooms, these enlargers can be found at rock-bottom prices. This is a potential windfall for darkroom printers, especially those working in medium and large format, where comparable digital quality comes at a prohibitive price. These older enlargers are still doing yeoman duty for many photographers who want to stand out from the digital crowd, but they often need repairs as they age.

Lining replacement

Older Omega D2 enlargers may need attention in several areas, especially if they've been used heavily or stored improperly. Many are difficult to raise or lower smoothly due to wear or maladjustment of the plastic bushings (liners) that ride against the enlarger rail. Because the D2 is a push/pull enlarger without an elevation crank, this lack of smoothness can be troublesome. On one enlarger, maladjustment had caused a flat spot to be worn on the bushing surface that prevented it from rolling smoothly. Worse, such wear can cause alignment perturbations as the enlarger is raised or lowered.

This article will show you how to replace the original plastic bushings with flanged roller bearings and bronze bushings. After replacing them, incremental print size changes should be easy with the push/pull D2, and alignment should remain constant throughout the range of travel.

The modifications cost about $25 and involve a few hours of work using common household tools. We've purchased parts online from McMaster-Carr (www.mcmaster.com), but a well-stocked bearing retailer also may have the parts. Enlarger alignment will need adjusting after the modification, but that's a maintenance chore that should be performed routinely anyway. A similar fix using larger diameter bearings may improve the performance of a D2 with an elevation crank (see figure 1), but I couldn't find off-the-shelf replacement bearings for the current D5 enlarger.

Replacing the bearings

The instructions and illustrations that follow show how to fix an older Omega D2 enlarger. This particular enlarger benefits most from replacement bushings because it lacks a lift crank and must be pushed or pulled to the desired height. The parts listed here are for a $\frac{3}{8}$-inch diameter bushing shaft, so measure to be sure this procedure is compatible with your enlarger.

Find a well lit area on which to place the enlarger. You will be working mostly on the rear of the enlarger, so make sure you have easy access to it. Remove the enlarging lens and lens board from the enlarger head for safekeeping—bumping the enlarging lens could be costly.

Next, support the enlarger head by lowering it onto a sturdy cardboard box and tightening the head-lock knob. Once it is supported, detach the lift springs from the hooks at the top of the enlarger. These springs have considerable tension, so use a hook or other tool to gently retract the steel tape into the housing. I've done it by hand, but it's hard to grip the end tightly enough to prevent sudden retraction.

Without the support springs, the enlarger head could drop under its own weight if not held in place by the box. Note that some Omega D enlargers may have a different spring-mounting arrangements than shown in figure 2, but the comments still apply. Once the lift springs are retracted, you can detach the spring housings to ease subsequent work, although it's not necessary.

Finally, detach the heavy lamp house by removing the four thumb screws that attach

Figure 1. *The heart of the enlarger improvements are provided by four flanged roller bearings and four flanged bronze bushings. These replace the original plastic bushings on the enlarger to provide much smoother head motion and more stable alignment. See parts list on page 23 for details.*

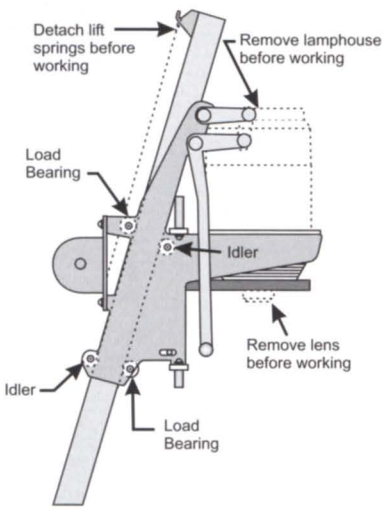


Figure 2. *Replace the plastic bushings located in positions marked "Load Bearing" and "Idler" using smooth-acting roller bearings and bronze bushings.*

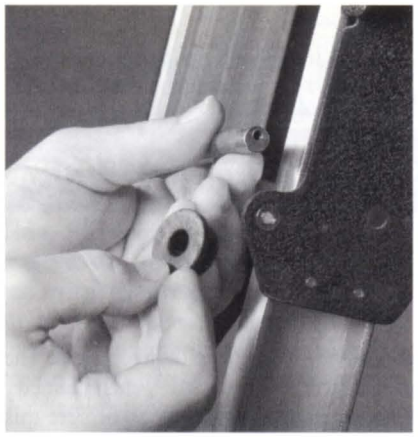


Figure 3. *A plastic bushing is removed from one end of the shaft. Note that the mounting hole for the shaft is drilled off-center, providing adjustment for enlarger fore/aft alignment.*

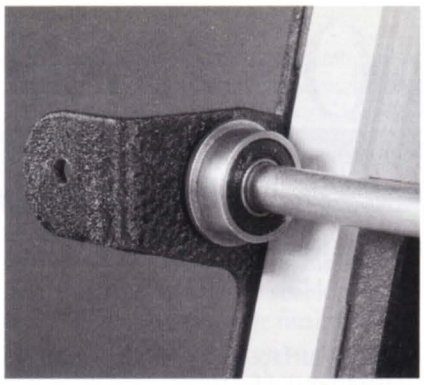


Figure 4. *A roller bearing is shown installed on one of the shafts that support the weight of the enlarger head. The flange should fit between the rail and the frame. This bearing is key to the improvements realized in enlarger motion and alignment stability.*

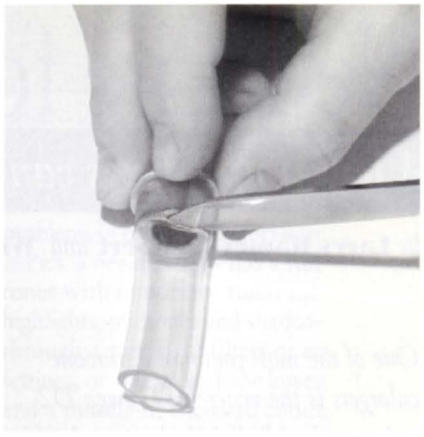


Figure 5. *Stretch flexible plastic tubing over the contact surface of the bronze bushings to silence them and to increase their diameter to the desired size.*

the lift arm linkage to the lamp house casting. Once the lamp house is removed, it's easy to work on the remaining parts. Because you will never have better access to the remaining parts, you may want to clean up accumulated dust and grime.

The bushings are attached to shafts on the enlarger head and ride against the enlarger rail to guide up/down motion. A total of eight bushings will be replaced. Half of these bear the weight of the enlarger head; the others are idlers that prevent derailing if the enlarger is jostled. Figure 2 shows the location of the bushings and identifies which of them are load-bearing. The ball bearings will be mounted on the load-bearing shafts, while the bronze bushings will replace the plastic ones on the idler shafts.

Begin by using a Phillips #2 screwdriver to remove the screws that secure a load-bearing shaft to the head. Once the shaft is removed, the enlarger head can fall if it's not supported. When the shaft is removed, slide off the plastic bushings. This shaft may be dirty, so take the opportunity to clean it. You'll notice that the shafts holding the bushings are eccentric—the mounting holes on each end of the shaft are drilled off-center (see figure 3). This provides the fore/aft alignment of the enlarger when the shaft is rotated during adjustment. It's not an indication of a quality problem.

Very old D2 enlargers use steel shafts; if they're rusty, a little sanding makes them smooth again. Test to see if the roller bearing slips onto the shaft. Steel shafts often provide a perfect fit without much work.

Late model D2s use aluminum shafts, and the shaft diameter can be a little larger than the hole in the roller bearing. If this is the case, sand the shaft at each end where the bearings fit. If you have access to a $\frac{3}{8}$-inch electric drill, you can speed this process by chucking the shaft into the drill and spinning it while holding the sandpaper against it. Don't overdo it. Remember that a ball bearing's inner race is supposed to be stationary against the shaft, and a loose fit may invite problems.

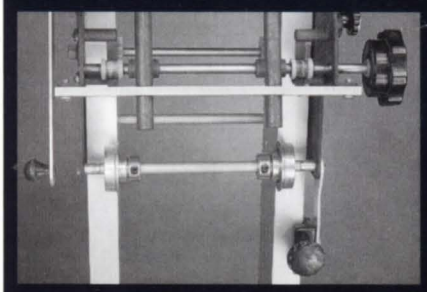
With both roller bearings slipped onto the shaft, position the shaft onto the enlarger head support frame and attach the screws into each end. Don't tighten them just yet—just snug them down. See figure 4 for proper orientation of the bearing flange. If your original screws are rusted or have damaged screwdriver slots, now is the time to replace them. I ended up replacing the original eight screws with eight $32\times\frac{3}{8}$-inch button-head socket cap screws, which use a $\frac{3}{32}$-inch hex key for tightening. Another attractive option is stainless-steel Phillips head screws. Repeat these steps to attach roller bearings to the other load-bearing shaft.

Replace the remaining plastic bushings (idlers) with bronze ones that have had a piece of flexible tubing stretched over the contact surface (see figure 5). The flexible tubing serves two purposes: it dampens noise when raising or lowering the enlarger head, and it increases the diameter of the bushings. Without the tubing, the diameter of the bronze bushings is insufficient to contact the enlarger rails.

The flexible tubing is a very tight fit over the bushing. I inserted needle nose pliers into the tubing and pulled the handles to stretch it first. The stretched tubing starts to return to its original size as soon as the pressure is removed, so work quickly to get it into position. Warm air from a hair dryer also may be used to soften the tubing. After the tubing has been attached, cut it flush with the edge of the bushing (see figure 5).

Remove the shafts, which contain the plastic bushing serving as idlers, one at a time, and replace the old bushings with the

Ball-bearing replacement for D2 crank-lifts



Omega D2 crank-lift models have larger-diameter flanged bushings. We've been unable to find an exact ball-bearing replacement for them, but here's a workaround if you're missing parts or want to improve the motion.

In this photo, we've replaced the plastic bushings on the lower shaft with two flanged ball-bearings (McMaster-Carr #6383K245). Because these particular flanged ball-bearings have an extended hub, we couldn't place them in the original bushing position between the column supports and the side plates of the enlarger head. Instead we used a pair of clamping collars (#6157K13) to hold the bearings in position on the inside of the column supports. Also the bore of the flanged ball-bearings was larger than the enlarger shaft so we inserted a pair of flanged bronze bushings (#6338K416) to serve as a sleeve.

Two drawbacks remain. Because of the gear teeth machined on the rear of the enlarger column, we were unable to inside-mount the flanged ball-bearings. They remain plastic bushings on our enlarger. Secondly, the inside mounting of the bearings consumes $1\frac{1}{2}$-inches of the enlarger's motion range because the bearings contact the enlarger's mounting pedestal. This isn't a significant disadvantage for most users. Both of these problems disappear if a suitable flanged ball-bearing can be found from another supplier.

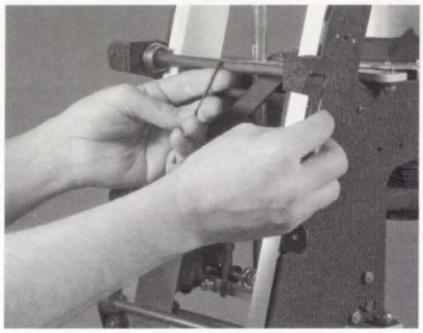


Figure 6. *To realign the enlarger, rotate the eccentric load-bearing shafts to tilt the enlarger head parallel with the baseboard. A good bubble level will suffice for judging parallelism. Depending on the type of screws installed, you may use a screwdriver instead of a hex key to tighten the shaft. The lift springs have been removed in this picture for clarity.*

new bronze ones. Again, some light sanding of the shaft may be necessary to make them fit. Unlike the roller bearings, these bushings must rotate against the shaft so be sure they turn freely. A little household oil will help. A light application of household oil also inhibits further rusting in steel shafts. Reattach the shafts to the enlarger, making sure the flanges are properly positioned in the space between the rail and the enlarger frame.

After replacing all the plastic bushings, loosen the lock knob on the enlarger head and carefully raise and lower the head by hand to ensure the head is not "derailed" by out-of-position bearings. Address any problems you find.

Now that the old bushings have been replaced and head movement seems reasonable, it's time to replace the lamp house, lift springs, and lens, then adjust the fore/aft alignment.

Parts List

- Four unmounted steel radial ball bearings, flanged, double sealed for $\frac{3}{8}$" shaft diameter, $\frac{7}{8}$" outside diameter. (See photo in Figure 1) McMaster-Carr stock number 6384K354—$4.71 ea.
- Four SAE 841 Bronze Flanged bearings for $\frac{3}{8}$" shaft diameter, $\frac{5}{8}$" outside diameter, $\frac{1}{2}$" length. (See photo in Figure 1) McMaster-Carr stock number 6338K461; $0.58 ea.
- 1 foot of flexible plastic tubing $\frac{1}{2}$-inch inside diameter × $\frac{5}{8}$-inch outside diameter × $\frac{1}{16}$-inch thick. McMaster Carr number 5231K371; $0.34/foot
- 150 and 400 grit sandpaper if the bushing shafts are rusted/dirty or are slightly oversized
- Household oil

Aligning your enlarger is the next step. Many already know how, so, due to space constraints, we have put the instructions online at www.phototechmag.com/extra/02_05.

Conclusion

Replacing the worn bushings in my enlarger has greatly enhanced its action. I can easily nudge the head up or down in fractions of an inch if I want to. These stout roller bearings will hold alignment longer than the original plastic bushings, and I can produce the quality darkroom prints that I expect. It's a satisfying experience knowing that the enlarger is now built better than when it left the factory. ■

Larry Hamel-Lambert and William Schneider teach photography in the School of Visual Communication at Ohio University. Hamel-Lambert holds degrees in journalism and photography. He has worked as a photojournalist and picture editor at several U.S. newspapers. Schneider holds degrees in photography and mechanical engineering.