FABRICATING HEADLIGHT ADJUSTERS for 2001 BMW E39 Xenon AE's

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If you suffer from bobbling headlights, chances are the fragile plastic adjusters inside have shattered. I have no clue why Hella chose to use such weak plastic, but they did, and consequently, tearing apart your headlight assemblies to make repairs is a common DIY project for BMW owners. Prior to 2001, this was a straightforward task – buy the $11 adjusters, pop the clear cover from the headlights, remove the broken adjuster pieces, install the new adjusters. It's easily less than an hour's work. That all changed with the 2001 xenons.

Anyone who has managed to remove the clear cover from the 2001-on OE (Hella) xenon headlights knows that it's not an easy task. If that weren't bad enough, once the cover is removed, you find that your BMW dealer doesn't sell the adjusters for this year headlight. The adjusters from earlier years are not the same size/shape, so they cannot be used to make the repairs. It turns out, if you have access to some shop tools, you can make your own, and they will outlast the headlights.

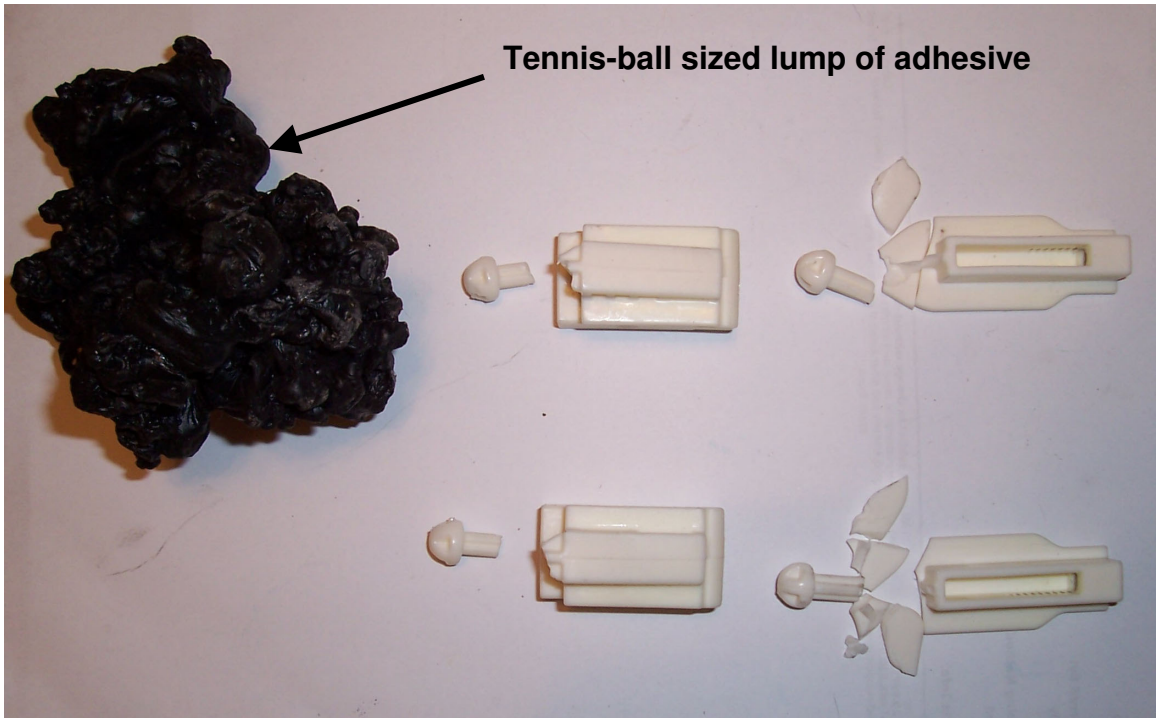
Removing the Clear Cover

I understand there are two different adhesives that were used to attach the covers – mine was the soft, extremely sticky, black, tar-like adhesive. After hours of careful application of a wide screwdriver and putty knife, I finally managed to remove the cover. One huge pain. I then found some RoadFly posting by others who had gone before me, and they recommended a heat gun or a short bake in the oven to soften the adhesive. I took the low-impact approach and used a simple hair dryer. It worked just fine. I played the heat over a small section of the joint, and used the same screwdriver and putty knife to separate the cover. The heat was the key – it probably took about ½ hour to work around the perimeter twice and pop the cover. I definitely recommend this technique. The hair dryer provides enough heat and there's no chance of doing any damage to the plastic. Once the cover was removed, and the xenon bulb assembly extracted, I continued to use the hair dryer to soften and remove the adhesive in the channel. *(see picture below)*

Once the inner bulb assembly is exposed, and presuming that both of the adjusters are broken (mine were), the only thing left holding the bulb assembly in place is the ball/socket of the self-leveling servo. *(I don't know if all headlight assemblies of from 2001 have this, but if not, it will be something similar.)* This part is well-constructed, and should not be broken. There's no need to muscle this joint apart. The plastic socket flexes sideways – I just pushed it to the side and slid the ball out the end.

The Broken Adjusters

Once inside, I realized that the broken adjusters didn't look like the ones from my halogens. Actually, one looked pretty close (maybe identical, I'm not certain), but the other one was very different from the either of the adjusters used in the halogens. *(And this was when I discovered I couldn't buy replacements.)* The failure pattern was the same for all of the adjusters:



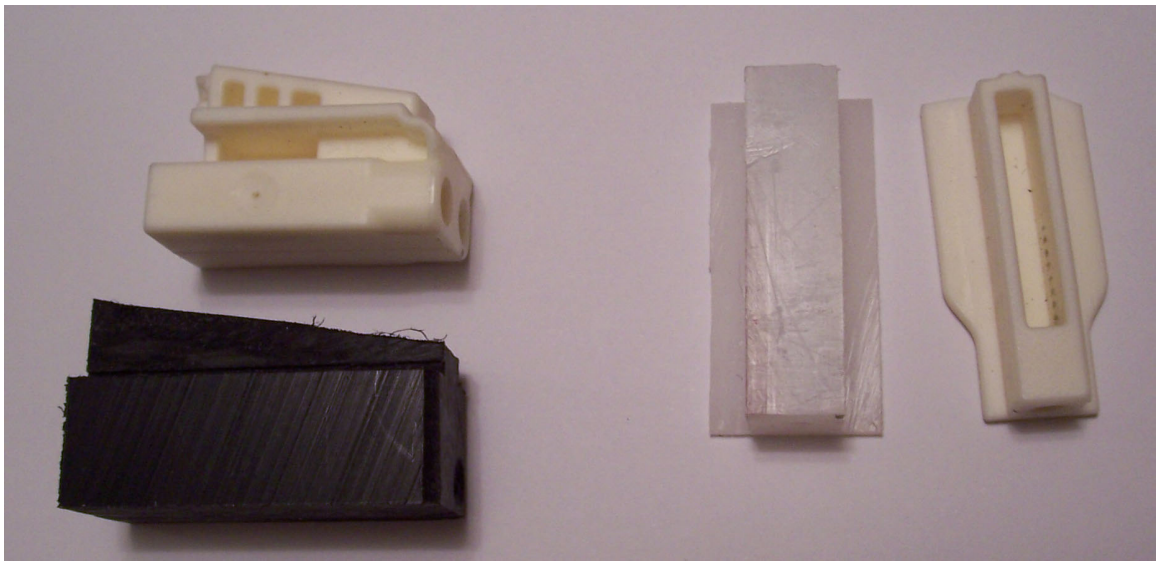
Materials for New Adjusters

I bought a bag of assorted UHMW plastic pieces (ultra-high molecular weight) from my local Woodcraft store for around $12. This is the same type of plastic used for kitchen cutting boards. A cutting board would even work for this purpose for the shallow adjusters (on the right), but the bulkier adjusters are around ¾" thick, and I didn't want to try to piece them together. The assorted bag had some pieces that were just the right thickness. Also, buy a few 2-1/2" #10 machine screws with matching acorn nuts – these will be used for the pin and knob of the new adjusters. I bought mine at Home Depot in the small bags ($1 per bag). If I had a marine store nearby, I would have opted for stainless steel, but zinc coated should be fine.

Construction

After selecting pieces that were roughly the same thickness as the adjusters, I cut pieces to the same width using a tablesaw. You do not want to try to cut this stuff by hand. I started to cut a small piece with a Japanese pullsaw (very sharp), and I could tell I would dull the saw before I got too far. A cheap saw blade in the tablesaw was the best way to go. Now, cutting the notch (rabbet) on each piece can be done two ways – either on the tablesaw (which I did) or on a router table (which I didn't try). Essentally, you want to end up with a couple of longer pieces (at least enough for 2 adjusters each) with the following profiles. Take your dimensions from the broken adjusters.

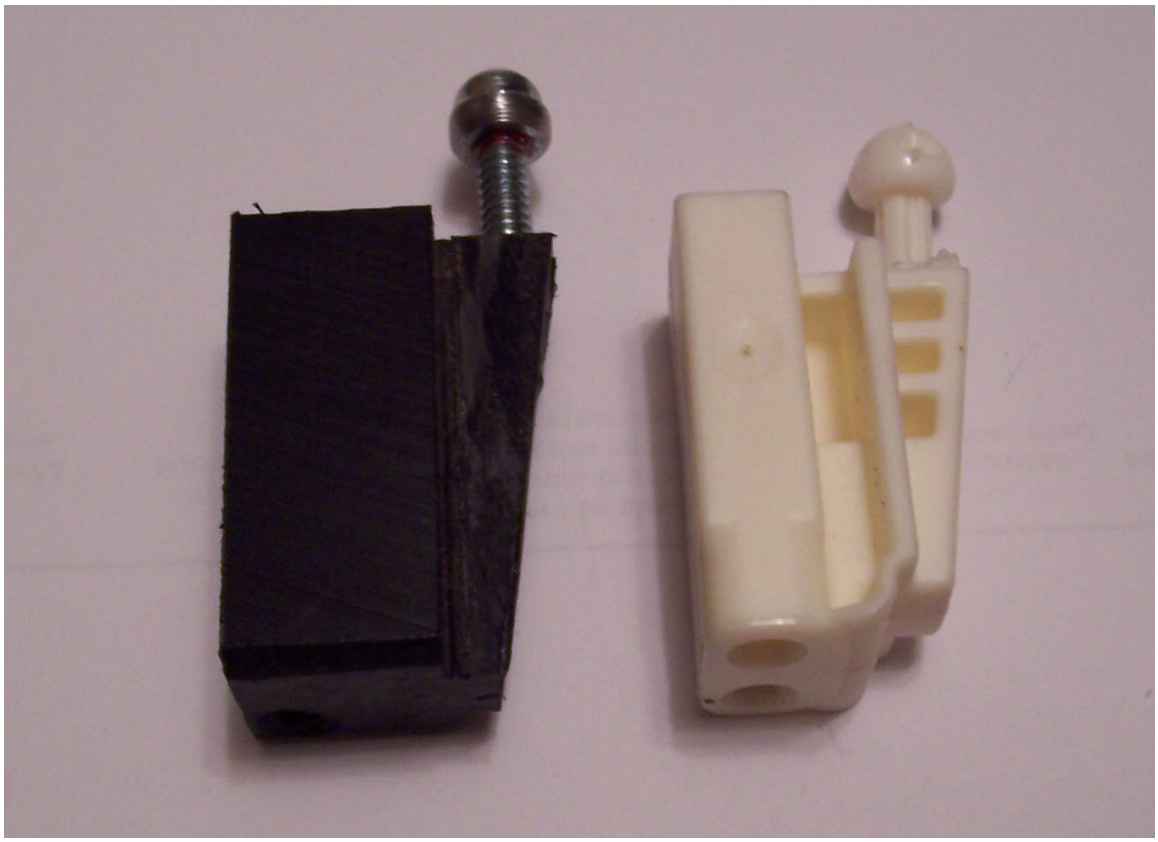
Once you've duplicated the cross section as closely as possible, cut the pieces to length. The length should match the length of the main body of the original adjuster (not including the pin and knob). I cut the slope on the left adjuster on the tablesaw. Watch your fingers – I used a wood clamp to hold the small piece and just eye-balled the cut on the tablesaw.



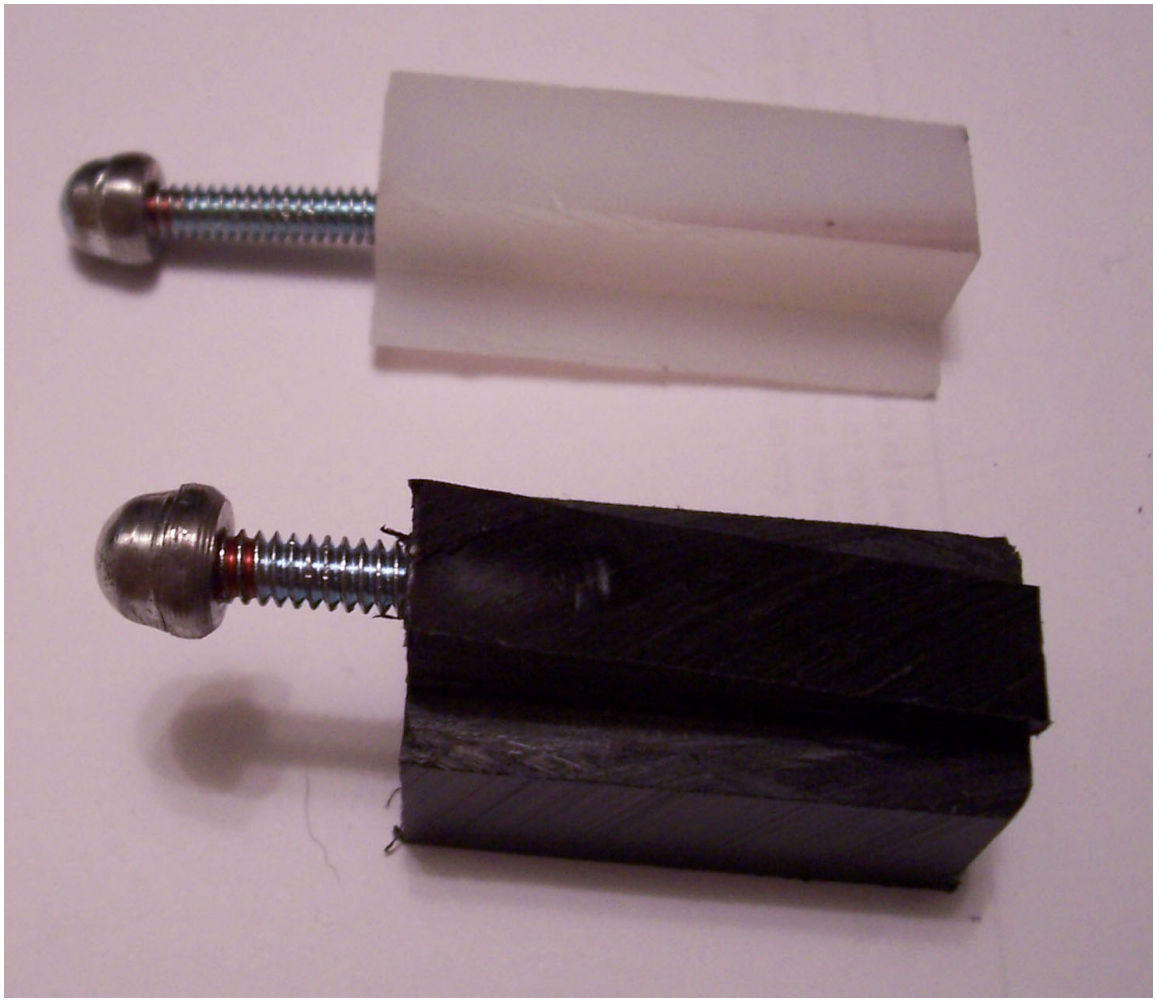
Transfer the locations of the holes in the broken adjusters to the new ones, and drill them out. A drill press would be great, but I did it with a hand drill. Clamp the new adjuster to the edge of the workbench and carefully drill, checking alignment to keep the bit going straight. I used an 11/64" bit (I think – it was hard to read), but start small and move up slowly if you are unsure of the size. If the bit slips easily into the hole in the old adjuster, you know it won't be too big. If you use #10 machine screws, the same diameter bit will work for that, too.

The acorn nut should match the size/shape of the knob on the old adjusters. I knocked-off the corners of the nut to make it a closer match. This can be done easily by threading an acorn nut onto a screw, chucking it into a hand drill, and running it at low speed while applying a file to the spinning nut.

Once shaped, cut a length of the machine screw so that once threaded into the new adjuster, it will be the same length as the original.



I used a drop of loc-tite on the threads to hold the acorn nut in place. I did not bother using any of it where the screw threaded into the plastic – that was tight enough that there was no chance of the screw loosening.



It's difficult to see here, but the screw in the top adjuster (the white one) is slightly angled down (you can see the edge of the adjuster lifting-up off the table). This was done to duplicate the geometry of the original adjuster (as best I could determine by assembling the fractured pieces). I don't know if this is absolutely necessary, but I didn't want to have to fabricate another, so I tried the best I could to make the shapes similar.

Assembly

Once you have the new adjusters fabricated, it's time to install them. I did a dry run first: install them and the xenon bulb assembly, but not the outer shield and clear cover. I then installed the headlight in the car and did a rough aiming. Once I was convinced that the adjusters would allow the inner assembly to move sufficiently to aim the lights, I pulled it back off in order to install the remaining pieces.

Rather than using adhesive to attach the clear cover, I used closed-cell weatherstripping instead. I had to cut some ½" wide weatherstripping down the middle to get strips that would fit down into the channel on the headlight shell. I

did this so that if I wanted to replace the clear cover sometime in the future, I wouldn't have to struggle again to remove the cover. The black inner bulb shield (the part with the angel eye's attached) goes on first, then the weather stripping is pressed down into the channel (use the flat of a small screwdriver), then the clear cover is pressed in and locked with its tabs. There was some residual black adhesive that helped hold things in place.

And that's it. You now have adjusters that are tough enough to outlast the headlights themselves.