



Check Your Bearings - Part 1

by Jim Lunson

I had a recent surprise with my MG that turned out to be a good learning experience. Took my MG in for its annual safety inspection as required by Virginia and failed. Seems the inspector jacked up the right front tire, grabbed it at the 3 and 9 o'clock positions, pulled on it and noticed some wobble. Needs new tie rods he exclaimed and slapped the reject sticker on the windshield.

Back home I inspected his findings and sure enough, by jacking up the right front wheel and pulling on the tire at the 3-9 positions, there was some wobble. But I noticed there was also the same wobble when I grabbed the tire at the 6-12 o'clock positions. Wobble in the horizontal direction could mean the tie rods, but in the vertical direction it would have nothing to do with the tie rods and instead indicates wear in the front wheel bearing. I got to remembering that I had completely rebuilt the front suspension when I first got the car, but that was now almost 20 years and 35,000 miles ago, so it was time to look at the bearings again.

The bearings in the MGB are very strong, but are of a unique design. Most cars use a method of seating the front wheel bearings by simply tightening the large slotted nut on the end of the shaft until the bearing tapers are squeezed together on the shaft to the point they restrict spinning, then back off the nut until free spin is achieved and then back the nut off a little more to line up the slots in the nut with the hole in the shaft and reinsert the cotter pin. This setup works but only if the perfect adjustment occurs exactly at the spot on the nut where the cotter pin can be inserted does this adjustment method give a perfect fit. Otherwise a little play is always present in the adjustment. Not an exact way to get the best fit with wheel bearings and why bearing wear out.

Instead of this system, the MG bearings are adjusted using a steel tube spacer and then inserting shims (washers of varying thickness) over the shaft to adjust the spacing between the inner and outer bearings to provide an exact tight firm fit. The adjustment with these shims is made down to the .001 inch. The hub nut can then be tightened very tight (40-70 ft-lbs) and locked in with a cotter pin wherever it lines up. The system is firm and is adjusted precisely to the space needed between the bearings allowing them to spin very precisely with no play or wobble. This setup yields minimal wear to the bearing over the miles. It is one of the best designs on the entire MG. So remember, every so often check your front bearings, and wobble in the vertical direction probably indicates there are too many shims spacing the

bearing sets too far apart allowing for the wheel to move on the shaft in addition to spin. In my case, the adjustment was good when done 20 years ago, but due to wear over the miles, a new adjustment was necessary. I'll go into the steps to make the bearing adjustment in the next issue. Suffice to say that after making corrections to these shims, I then checked the left tire, and performed the same exercise. Then back to the inspection station and passed. No wobble whatsoever. And no work was needed on the tie rods or steering system either.

I usually fear the annual Virginia safety inspection and have thought about switching to the antique plate which eliminates this hassle, but I haven't done it as the inspection does serve a purpose as demonstrated by this little episode. An added benefit to this incident over and above a safety issue is that I noticed as I drove back to the inspection station the car seemed to roll easier, truer and the steering felt like I had rebuilt the entire front end again. Amazing how the gradual wearing goes so unnoticed. So don't wait for an inspection, check your bearings sometime, and make sure you don't have any wobble in the vertical direction. And don't panic if you get rejected some time at your friendly inspection station for front wheel wobble. If its in the vertical direction, it can usually be easily adjusted.



MG Car Club
Washington, D.C. Centre

Check Your Bearings - Part 2

or

Front Wheel Bearing Adjustment

by Jim Lunson

I mentioned last month the experience I recently had with the front wheel bearings and that they needed adjustment. Here is how I went about making the adjustments on my MG. First, remove the tire and wheel and the cap over the hub end. Wire wheels do not have the cap but the same nut inside the hub. Pull out the cotter pin and unscrew the large slotted nut (1-1/8" dia). Behind the nut is a thick flat washer with a tab on it and behind that is the outer bearing case. All these need to be slid off the end of the shaft. Behind the bearing are shims, looking like simple washers, but of varying thicknesses. They also need to come off. They usually can be reached with your fingers and pulled right off the shaft, but if they stick, a magnet part retriever works great to lift them out of the shaft end. These washers come in .003, .005, and .010 inch thicknesses. The bearing adjustment is made by inserting as many washer shims as necessary to allow the wheel to spin freely when the outer bearing and washer are replaced and the nut tightened, but not so many shims as to cause wobble in the least, even when the big end nut is very tight. The thickness of shims is fairly easy to discern: the .010 shim is almost the thickness of a regular bolt washer, the .050 half as thick as the .010, and the .003 shim is flexible and about the thickness of paper. You will probably need a couple of each .005 and .003 shims to do the job on one wheel.

My adjustment to the front wheel bearing on my car went like this:

I removed the tire, cap, cotter pin, large nut, big thick washer and the outer bearing set and behind the bearing, the shims. On the innermost end of the shaft is a .010 shim, almost always needed as the bearing tube spacer is cut short on purpose so shims are always required. Outboard of this one was an .005 and 2 each .003 shims. This made a total of .021 inch of shim on the shaft (.010 + .005 + .006). I started by removing all but the .010 shim; replaced the bearing, flat washer and tightened the end nut to the recommended 40 ft-lb torque setting. The wheel would not turn at all - too tight.

Removed the nut, washer and bearing assembly again, and added a .050 shim on top of the .010 for a new total of .015 inch. Replaced everything, tightened up the nut and still no turning the wheel - still too tight. Removed everything again, and

added one .003 shim for a new total of .018 shims on the shaft. Tightened up everything and now had a free spinning wheel with just a slight wobble in the vertical direction, better than before I started but not perfect.

Removed everything again, took out the .005 and the .003, then inserted two .003 shims for a total of .016 inch. Tightened up the big nut on the end once more and this was it. The wheel spun freely, but with no wobble.

To complete the job, I put the torque wrench on the big nut and increase the reading somewhat more until the slot in the nut aligned with the hole in the shaft. Insert the cotter pin, cap and put the tire back on. Check once again for wobble using the 6-12 o'clock method again and for free spin. The wheel and tire assembly now had no wobble and still turned freely. Job done. It is just a combination of shims using the trial and error method to get a smooth spin yet no wobble or play between the bearings.

Please note that this sequence is only for adjusting the front bearings on an MG. Keep in mind that this operation is not a complete bearing replacement job or overhaul, but only an adjustment. The complete job is a bit more complicated as it involves removing the brake caliper so the entire disk hub can be removed to get at the inner bearing race. And during any renewal of these bearings, inspection for wear is important and also to be sure to add lots of clean bearing grease in the reassembly steps to insure they last and roll properly. Nevertheless, it is amazing how much difference a thin shim can make in the steering feel of the car and this method on the MG, if done properly will yield many miles of trouble free rolling. So check the bearings, do the exercise outlined above, and insure the wheel bearing fit properly so they can do their job.