

BMW Oilhead Cam Chain Tensioner Replacement

by Moshe K. Levy

BMW's "OILHEAD" ENGINE, the 850, 1100, and 1150cc Type R259 flat twins utilized on R-Series motorcycles from model years 1994–2004, has an excellent reputation for reliability and ease of maintenance. However, veteran BMW "Oilhead" riders are familiar with an irritating 3–5 second long "death rattle" sound emanating from the left side of the motor upon start up—a fly in the ointment of an otherwise very refined powerplant. This potentially costly cacophony can now be cured by a readily available upgrade which is relatively inexpensive and easy to perform.

What's That Rattle?

In the BMW "Oilhead" motor, the standard cam chain tensioners (one on the left side, and one on the right side, see the diagram) each contain a piston which requires oil pressure to build up before the tensioners can take up proper slack in the cam chain. The problem is inherently one of location. The left-side cam chain tensioner resides above the cam chain in the left cylinder casting, such that oil drains out of the tensioner's piston when the engine is stopped. The aforementioned "death rattle" racket at startup is the result of the left-side chain tensioner itself being violently smashed around by the cam chain until proper oil pressure finally builds, at which point slack is taken up. The smashing action can eventually lead to premature failure of the timing chain tensioner shoe and other related components, which in turn may require splitting the engine cases to fix! You don't want to go there.

Meanwhile, the right cam chain tensioner assembly is located in the right cylinder casting, below the right cam chain, and facing upward. As such, it naturally remains filled with oil even when the engine is stopped, and is therefore immune from the condition which affects the left-side tensioner.

The Hexhead Cam Chain Tensioner Solution

In model year 2005, with the introduction of its updated "Hexhead" boxer engine, BMW finally addressed this issue by redesigning the cam chain tensioner to include a check valve, which prevents oil pressure leak down when the engine is shut off. As a result, start ups on Hexheads are a much quieter affair, with none of the danger to the cam chain tensioner shoe and related components found in the Oilheads. Luckily, the Hexhead's improved left side cam chain tensioner is a direct bolt-on replacement for the Oilhead's unit, allowing riders of these older models to enjoy the benefits of the redesigned component via this simple parts swap.

Parts Required

There have been numerous articles on this issue posted online, resulting in plenty

of confusion over which parts to use and what assembly method is best. It can be noted that BMW has further muddied the waters by duplicating and superseding part numbers for the required components on occasion. As such, many of the existing articles on the subject using a "mix and match" approach of individual components are no longer accurate. After performing this operation firsthand, we believe the parts and methodology described herein are the simplest way to tackle this project.

All of the parts employed in this upgrade are now available in a single kit from Tom Cutter's Rubber Chicken Racing Garage, a renowned source in the BMW community for special parts and maintenance requirements. Kit #OHTensKit consists of the latest revision OEM

tensioner, piston and copper crush washer, as shown in Figure 1. This kit is preferred mainly because it eliminates the confusion of mixing and matching individual components. The kit contains everything required for this job, and retails for \$80 plus \$4.80 for two-day USPS shipping to the lower 48 states. As an added bonus, as of press time, this is slightly less

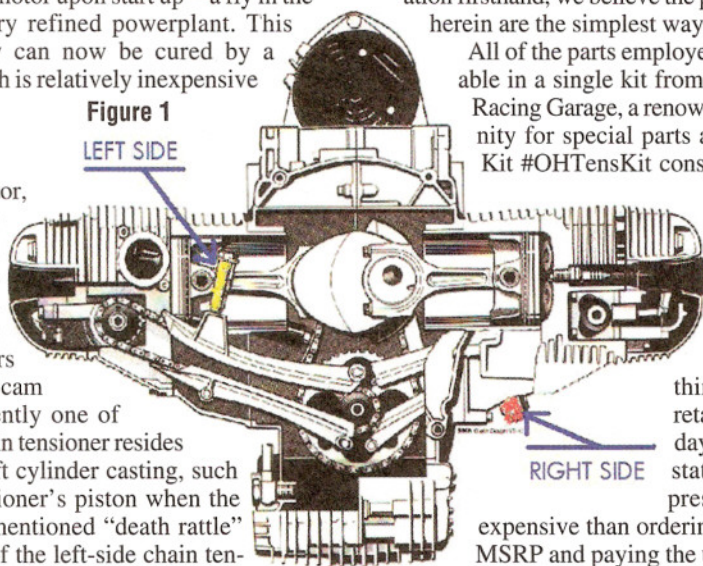
expensive than ordering the components separately at MSRP and paying the usual shipping charges from the major BMW parts vendors.

Figure 2 shows the original Oilhead cam chain tensioner components on top for reference, with the new Hexhead kit below. Notice that the original Oilhead tensioner uses a separate steel spring along with its piston, while the new Hexhead's tensioner's piston is completely self contained. Also, observe that the Oilhead's tensioner body uses a 17mm hex, while the Hexhead's uses a 15mm hex. This 2mm difference in hex size will be the only external clue that a swap has been made once installation is complete.

Note that in both Figures 1 and 2, the "narrow side" of the new Hexhead tensioner's piston is marked. This will be a very important detail to remember upon installation of the kit.

Figure 1

LEFT SIDE



RIGHT SIDE

Figure 2



Original Oilhead Tensioner Assembly on top vs. new kit below.

Installation

The "Cutter Method" procedure described herein involves an absolute minimum of disassembly to get this job done, unlike several online articles which are much more involved and time consuming. Please refer to your Oilhead's service manual for reference, and see Figure 3 with numbers for each step required. The bike should be on the centerstand or a lift if possible. The first step in the process is to disconnect the fuel injector's electrical connector (1). Next, we disconnect the fuel line retainer spring clip, fuel line, and fuel line bracket (2). Note: If the fuel injector's O-ring stays in the fuel line's end cup when taking the fuel line off, gently remove it with a blunt object and put it back on the fuel injector body for later reassembly.

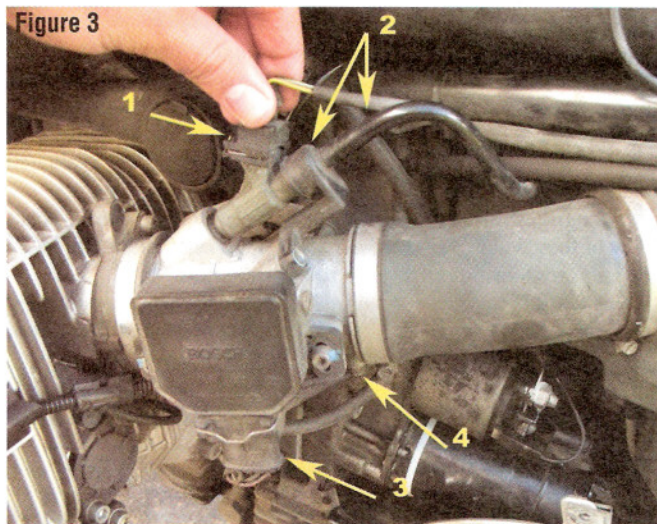


Figure 3
Top: Disconnect these fittings from the throttle body assembly to provide access to the chain tensioner.

Now, we disconnect the TPS cable (3) and throttle body ground lead (4). At this point, we loosen the circular clamps between the throttle body and the rubber intake manifold, and between the plastic intake tube and the air box. Unlike other methodologies, here there is no need to disturb the connection between the throttle body and the plastic intake tube, eliminating the chances of destroying the delicate O-ring between these two assemblies. Now that the clamps are loose, simply slide the complete assembly back into the air box as shown in Figure 4. The throttle body/intake tube assembly may be stuck tight after all these years of stationary service—loosen it by squirting some silicone lube or WD-40 underneath the rubber gaskets at each end, patiently twist on the assembly until it breaks free, and then slide it back as shown.

Once this is done, we can finally access the old cam chain tensioner. Clearance is quite tight, so an invaluable tool for this application is a flexible-head ratcheting wrench, such as Gearwrench's "Flex Combination" model wrenches (specifically in 17mm and 15mm sizes). Without such a tool on hand, progress will grind to a crawl as you loosen and tighten the tensioner bodies 1/16 of a turn at a time.

Loosen the old cam chain tensioner body until it pops up under the force of its spring—this is a gentle pop, so your fingers are not in any danger. There is a detent on the underside of the Telelever suspension's front control arm to allow for enough clearance to form a gap between the bottom of the old loose cam chain tensioner body and the steel spring underneath. Methods for removing the assembly at this point vary greatly, but we found grabbing the spring with a hook tool and pulling the tensioner body up and out worked just as well as anything else. One can also pull the tensioner out by force, bending the spring, and then pulling it out as well. This works fine so long as care is taken not to scratch the soft aluminum bore in the cylinder casting with the hardened steel spring as it exits. You'll have to jiggle things around and see which method works for you. Either

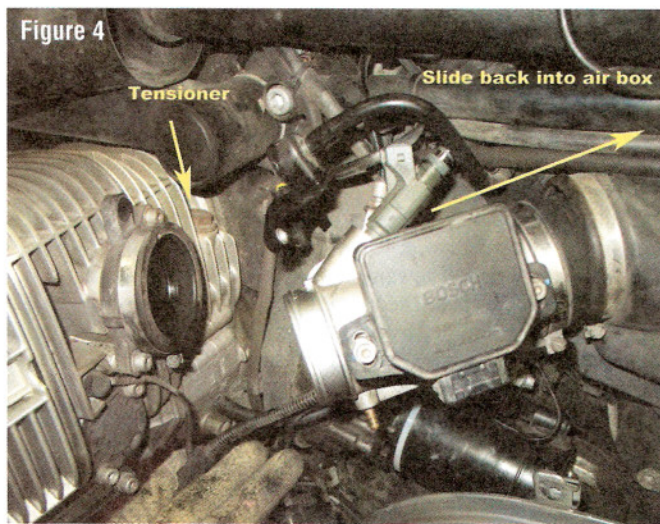


Figure 4
Slide the throttle body and intake tube back into the airbox for easy access without unnecessary disconnections.

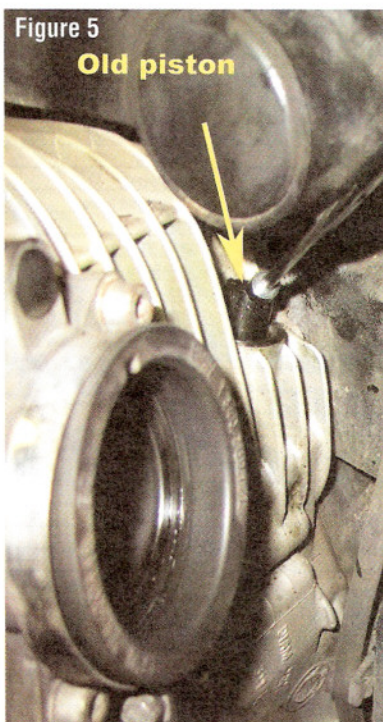


Figure 5
Old piston
Pull the old tensioner piston out of its bore using a telescopic magnet tool. Install the new parts, make the reconnections and you're done. No more worries about "death rattles."

way, once the tensioner body and spring are out, the old piston is still left in the bore. We found the easiest method of removing the piston from the bore is to use a small telescoping magnet tool, as shown holding the old piston in Figure 5. Don't worry, the piston cannot fall through the bore into the engine, so there's no need for trepidation. The disassembly portion of the job is now completed.

Reassembly and replacement with the new Hexhead tensioner is essentially the reverse of the disassembly process. Start by dropping the new Hexhead tensioner's large piston into the bore narrow side up, in exactly the same orientation as shown in Figure 2. The only "risky" part of the job is dropping the piston into the bore narrow side down as shown in Figure 1, which would be incorrectly oriented and may prove very difficult to get back out. Next, feed the tensioner body (with copper crush washer installed) up and behind the Telelever front suspension's control arm so it can be threaded into the bore, and tightened down. Slide the throttle body and intake tube assembly back into the original location. Reinstall the fuel injector components, the TPS cable, and the throttle body ground lead. Tighten up those circular clamps between the throttle body and the rubber intake manifold, and between the plastic intake tube and the air box. Reassembly is now complete!

Once everything is buttoned up again and double-checked for tightness, hit the starter button. *Voilà*—no more death rattle! Besides the audible improvement, you can now rest assured that your Oilhead's timing chain tensioner shoe and other related components will last longer as a result of the swap.

Tom Cutter's Rubber Chicken Racing Garage—1360 Colony Way, Yardley, PA 19067; 215-321-7944; 215-321-7954 fax; www.rubberchickenracinggarage.com

GearWrench—www.gearwrench.com