



Updating the Berg 5-Speed Transaxle

After decades of freeway usage, the Bergs have found ways to make their unique VW gearbox that much better

BY DEAN KIRSTEN

It's hard to believe that the Gene Berg 5-speed VW transaxle conversion has been around since 1975. And even though the majority of the parts used remain Volkswagen, including the basic case, certain parts do wear quicker than others over the long run. With the process of adding a 5th gear set, and creating an extended housing, it has been found that, with age, the mainshaft bearing has shown more wear than what was originally expected. In high mileage cars (some now with over 40,000 miles!), this bearing can show signs of limited lubrication, while the rest of the gearbox looks great. With this in mind, along with what has been done to address high internal case pressure in recent times, we have decided to outline these straight-forward modifications.

To get an inside look, we stopped by Gary Berg's shop in Orange, as he was freshening-up Glenn Ring's IRS 5-Speed that has been driven well over 40,000 miles since being built many years ago. Once disassembled, Glenn's ZF limited slip required rebuilding, along with replacing all the brass synchro rings and bearings. During the rebuilding process, Gary performed the following modifications to this transaxle.



TOP, Gary Berg installs the gear cluster into a Rhino cased, Berg 5-Speed. ABOVE, this 5-speed assembly shows some of the new improvements Gary makes during current builds. Most of these upgrades are designed to allow more lubrication to access the mainshaft bearing.



ABOVE, the fifth gear slider receives three new oiling holes, evenly placed between the dog slots. Hole size is .200-inch, then chamfered to allow more oil to pass through to the bearing.



ABOVE, fifth gear stop washer is also modified on the right. Gary machines three large (.500-inch) holes into the face of this washer. BELOW, Berg drills three additional holes into the side of the billet mainshaft bearing retainer. These holes are placed between the four mounting holes already machined to the face.

once again, Gary drilled three holes into the side, spaced evenly across. Hole size was .250-inch, then chamfered on the outside edge. These holes are positioned between the four mounting holes drilled into the side of this retainer.

3) STOP WASHER

Located at the very end of the gear stack, the stop washer is a large, solid steel washer that has a step machined along the outside edge so it can register to the slider hub. On the face of this washer, Gary drills three 1/2-inch holes, then chamfers them to allow a free flow of oil to gain access to the bearing.

4) INTERMEDIATE HOUSING

Within the Berg intermediate housing, there are three holes located around the pinion bearing that allow oil to pass from one side to the other. Gary feels that the two lower holes should be enlarged from 21/64-inch to 7/16-inch. This should increase the overall flow of oil to the bearings as well.

5. BREATHER VENT

When the Berg 5-speed first came out, a vent tube was mounted in the intermediate housing to relieve internal pressure. You then clamp a short section of rubber hose with a breather filter attached to the other end, and mount it above the transaxle. While this worked for most, in some applications this system allowed too much oil to run out and create a mess underneath. The fix is now to add this vent with a new one mounted right above the ring and pinion chamber, on the top of the right side of the case. You have to drill directly into the case (with ring and pinion assembly removed), using a 1/4 NPT thread and barbed brass fitting. The exact location is between the ribs on the non-ring gear side of the transaxle. You then attach that same length of rubber hose and vent as before, and you should see zero blow-by and oil consumption. By the way, you can still use the original vent, so there is no need to plug it.

In current production Berg 5-Speeds, procedures #1, #3, and #5 are now included, while items #2 and #4 are things Gary does at his own shop. Finally, when asked about which oil to use in this transaxle, Gary feels strongly about using Valvoline 80W-90 Gear Oil (PN VV 831), that displays the GL-5/MT-1 logos, which is safe when using a limited slip as well. Berg says this oil gives the brass synchro rings the best performance over the long run.

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ABOVE LEFT, to improve the breathing capabilities of the Berg 5-Speed, new installations require the main transaxle case to be drilled and tapped for a breather fitting. Placed over the non-ring gear side of the case, and in-between the ribs, Gary drills into the case for a 1/4-NPT fitting. ABOVE RIGHT, new 45° barbed fitting installed. BELOW LEFT, intermediate housing's two lower bolt holes around the pinion bearing are enlarged to 7/16-inch. BELOW RIGHT, nose cone housing is Dykem'd to show any possible interference with shift forks and housing.



1) 5th GEAR SLIDER HUB

To allow more oil to pass to the mainshaft bearing and 5th gear race and bearing, Gary modifies the hub by drilling a series of three holes into the face, positioned between the three dog slots. These holes are approximately .200-inch in diameter, then chamfered on both sides of the hub. The idea is to

allow as much oil as possible to flow into the mainshaft bearing and 5th gear race/bearing.

2) MAINSHAFT BEARING RETAINER

This U-shaped solid steel brace holds the mainshaft bearing against the housing. But in doing so, it also tends to shield it from getting enough oil for long term survival. So,