

Project CABRIO

By JEFF HOLIFIELD

Driveway Front Wheel Bearing Replacement

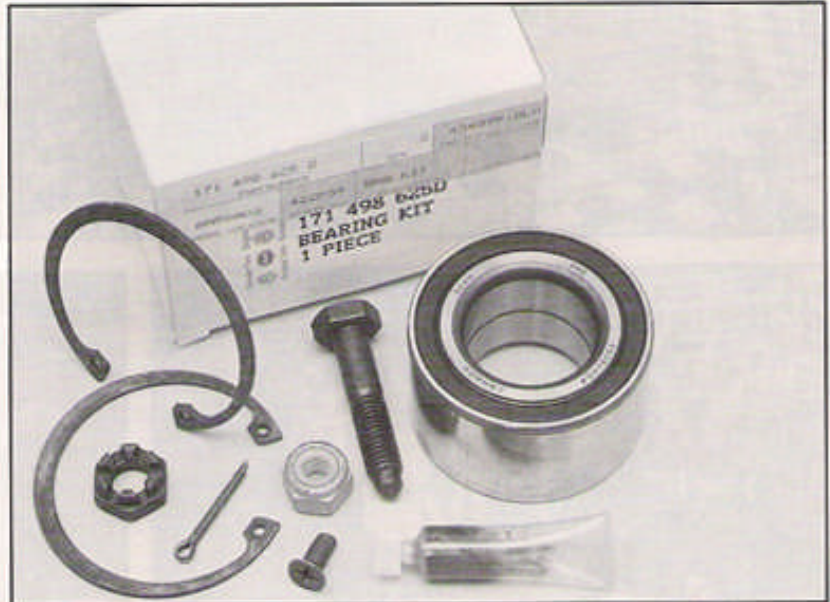
The front wheel bearings in Volkswagen water-cooled cars take a real beating. With the bulk of the weight on the front suspension, and the fact that all the engine torque is delivered through the front wheels, the front wheel bearings are designed to withstand tremendous loads and work at elevated temperatures.

Overall service life of VW's front wheel bearings is surprisingly good, despite the demands placed upon them. Even so, they are subjected to premature wear, or outright failure, when mistreated and abused. Simple things such as large, sticky tires and spirited driving increases the load components must withstand, and thus increase wear.

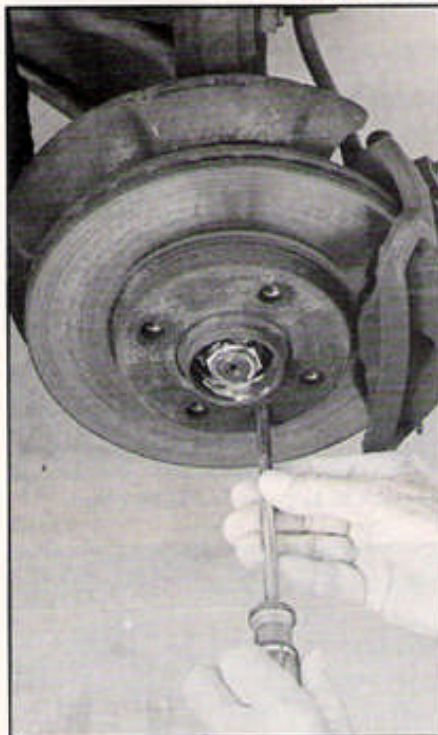
The same goes for vehicles that are out of alignment, have out of balanced wheels, or ail from other problems, such as a worn outer CV-joint, or dragging brakes. One of the most judicial killers of front wheel bearings are drivers who believe the tire is to be used as a curb feeler when parking. Let's face it, slamming into solid objects, even at low speeds, just doesn't do good things for a car.

When a wheel bearing does decide to go south, it normally gives the car owner plenty of warning before catastrophic failure. The most common is the

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The Genuine VW Parts front wheel bearing kit is very complete and comes with everything needed for the job, including a small tube of molybdenum disulfide grease and new flat head retaining screw for the rotor!



First order of business is to break loose the axle nut — while the car is on all four wheels! Then raise the car and secure it on jack stands before removing the wheel, caliper, and rotor. Don't let the caliper hang by its hose. Instead, use wire to keep it up, out of the way. Remove the axle nut completely.



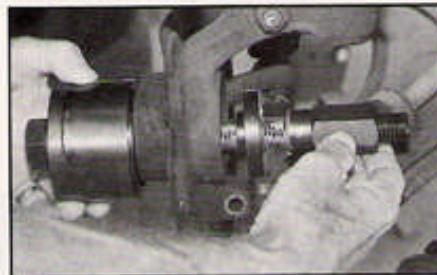
Install the two jacking bolts (supplied in the SPTools bearing puller kit) into opposite lug nut holes in the hub. Screw the bolts in until they just meet the backing plate. Verify there are solid portions of the wheel bearing housing under each jacking screw. Alternate from one bolt to the other, only 1/2 turn at a time (no more, just 1/2 turn) to remove the hub. Remember, once the hub starts to separate, the bearing is destroyed and must be replaced. There is no turning back!

The wheel bearing's outboard inner race comes off with the hub, and must be removed using a two-claw puller. A word of warning here — very few pullers have claws that will work in the narrow undercut that VW put in the hub (see text).





Remove lower ball joint clamping bolt from the wheel bearing housing and push the control arm down. The ball joint is not a tapered fit, and does not require a pickle fork, or similar tool, but the bolt must be removed.



Select the required pusher washer from the Schley kit that fits the bearing the best, and assemble the puller as shown. Note the liberal amount of anti-seize spread on the threads of the puller, and that we had to use the inner reducer sleeve in the cup.



The new wheel bearing is now ready to be installed. Note the small starter lip (see arrow) ground into the new bearing. This lip aligns the bearing in the wheel bearing housing bore when it is first inserted. Also note that the protruding lip of the pusher washer goes inside the new bearing to keep it centered.



Install the second circlip behind the new wheel bearing to capture it inside the housing. Now reassemble in reverse order. Insert the CV joint spindle into the hub, attach the housing to the lower control arm ball joint, and secure with the new bolt and lock nut provided in the kit. Torque to 37 ft.-lb.



Pull the strut assembly away from the car and pull the CV joint splines from the bearing.



Before things get farther than hand tight, apply plenty of lubricating oil on thrust bearing between the bolt and the puller's cup. Hold the large inside nut of the puller with a wrench and turn the nut to draw the wheel bearing into the cup. It's a real work-out at first, but gets easier the farther the bearing moves.



The new bearing is installed from the rear of the housing. Insert the starter lip into the housing (it should stay in place with no problem), install the well lubricated puller tool, slide the puller washer on, thread on the large nut hand tight. Double-check that the new bearing is correctly aligned, and pull it into the wheel bearing housing by turning the bolt. The new bearing slides in like butter, and you will feel it stop against the new circlip.



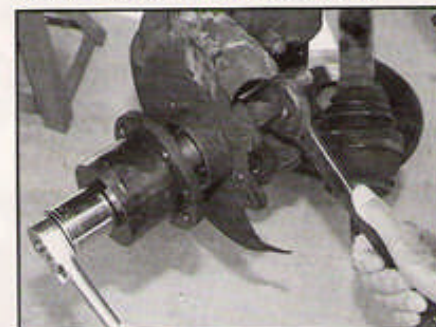
Install the axle nut (just snug at this time), and reinstall the rotor using the new replacement screw supplied in the kit. Bolt the caliper on, making sure not to twist or kink the brake hose. Torque to 29 ft.-lb.



Remove the inner and outer circlips (a.k.a., snap rings). Note special "snap ring" pliers are needed.



Remove the puller with the old wheel bearing. Clean out the wheel bearing housing bore, install a new circlip in the outermost groove and lubricate the bore with the molybdenum disulfide grease supplied in the Genuine VW Parts bearing kit.



Once the new bearing is seated against the outermost circlip, remove the puller tool (and remove the inner reducer sleeve from the cup). Clean, and lube the hub with a very small amount of grease. Insert the hub into the new bearing, install the puller tool through the hub, orient and install the pusher washer so that the lip is not protruding into the bearing (as it may block the hub from pressing in all the way). Thread on the large nut, and again, hold it while turning the puller tool's bolt to draw the hub into the bearing.



Install the wheel and lower the car onto the ground. Torque the main axle nut to 177 ft.-lb., and the four wheel lug bolts to 81 ft.-lb. Test drive at a reasonable speed, and that's all folks!

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audible warning. First it's a low hum, or whine, emitting from the front corner. Then it moves to a steady growl, which signals it's time to park it ... before the bearing blows out.

Other signals of a front wheel bearing problem come by feel, such as a mild vibration, or shutter. A definite sign that something isn't right, vibrations can be contributed to a host of different problems, and require a detailed inspection as soon as possible. So when Project Cabrio picked up an intermittent vibration, we knew something was up.

At first, we figured a wheel weight had fallen off. But, upon closer investigation, we found a fair quantity of grease slung on the backside of the hub, and on the splash shield. Places where little, or no grease should be found. Apparently, the right front wheel bearing had been damaged, lost much of its grease, and was on its last leg. The wheel bearing needed replacement.

For a front-wheel-drive car, the procedure for wheel bearing replacement is much different than what we were accustomed to. The Robert Bentley factory manual instructs the mechanic to remove the wheel bearing housing from the car, and use a hydraulic press (with plenty of special VW tools) to remove and install the bearing. We then checked other manuals, which suggested the bearing housing be removed and taken to a Genuine Volkswagen Service center that has the special tools required to do the job. That's fine, but what about those who want to do the work themselves?

Not one book we read showed how a home mechanic could get the job done in his driveway. If you remember when we began Project Cabrio, we wanted to be able to demonstrate alternative methods of repair that an enthusiast could utilize at home. (Or at least pass on some tips and shortcuts from the pros.) Our search for a workable solution took us to a very familiar place, Schley Products, Inc., in Anaheim Hills, California, (714) 693-7666.

Tucked neatly on the pages of their latest catalog is, of all things, a Wheel Bearing Puller System. Perfect for our application. If the Schley name sounds a bit familiar, then you may have already had the pleasure of using one of their fine specialty tools, manufactured under the SP Tools name. (Or, perhaps you've been around VWs a long time and remember that the Schley brothers campaigned a drag sedan called the "Lightning Bug" in the early days of the sport).

The SP Tools wheel bearing puller is available in many configurations, for different makes of cars. Part number 95500 is the kit of choice for VWs, and consists of two sets of jacking bolts (12mm and 14mm) to remove the hub, the special puller assembly with reducing sleeve for the cup, five specially-sized pusher washers, and a horseshoe collar (for use on later model Golfs and Jettas).

The SP Tools bearing puller works on all water-cooled VWs, except those that have ABS and the EuroVan (requires additional components for EuroVan). The puller kit will also work on a variety of domestic and foreign front-wheel-drive cars, though new pusher washers may be required. We found the puller incredibly easy to use, and by not having to remove the bearing housing, gained the additional benefit of not visiting an alignment shop when we were through.

The only down-side we found is the price of the puller. The complete VW kit has a suggested retail of \$259! An inexpensive price for an auto repair shop, but a bit steep for a home mechanic with one water-cooled VW. Two possible solutions would be to go in halves with a friend, or two, to split the cost. Or, for those enthusiasts who belong to a larger VW club that has its own "tool box," is to have the club purchase the tool, and then "rent" it out at a low rate to its members until its paid for.

With the puller in hand, all we needed was the parts — Genuine VW Parts, that is. Volkswagen's front wheel bearing kit (p/n 171.498.625D) is available from dealers across the county for around \$55. The kit comes fully equipped with a high-quality wheel bearing, two new circlips, small tube of molybdenum disulfide grease, new ball joint clamping bolt with self-locking nut, and new flat head retaining screw for the rotor.

Also included with the kit is a new castle nut and cotter pin for the tie rod end. These items were not used in this installation, as the wheel bearing housing (with attached steering arm) was never removed from the car. In all, it took us about three hours to swap out the old bearing for the new. If we were a little bit better prepared, and hadn't ran into our little problem (see below), it would have been a lot quicker.

If you plan on doing the job yourself, remember one thing: the second the hub is removed, the old wheel bearing is destroyed, and there's no going back!

What we haven't touched on yet is how to get the old wheel bearing's inner race off the hub. We were warned this part of the job could prove tricky without the correct puller, but we had no idea how tricky it would be. The hub has two very narrow flats machined into it, where the claws of a puller can get under the race to pull it off. The problem being, the claws on most pullers (including ours) simply didn't fit into the small grooves.

We ended up taking the hub to a trustworthy shop in the area (O&M Complete Auto & Truck Service, Downey, California) to get the race removed. Since then, we have found a couple rental yards that, indeed, do rent a two-claw puller that will work (but the rental would cost us just about the same as having our local shop do it!). Again, keep in mind, once the hub is removed from the wheel bearing housing, the wheel bearing is destroyed and cannot be used. The new bearing must be installed.

We hope you enjoy this latest installment of *Hot VWs Project Cabrio*, brought to you by Genuine Volkswagen Parts. ●