

Bob's Service Tip

V8 Counter Balance Shaft

Replacement Work-Around

The trusty V8 with 251K began clucking like lose bolts in a can. At first, I thought the noise emanated from a serpentine idler pulley with a dry bearing, but no, it was the counterbalance shaft. The shaft sits between the two cylinder heads and deep inside the motor. The shaft has front and rear sealed bearing that are not lubricated by motor oil.

This noise went on about a week before I identified the problem. Unrepaired, the engine would self destruct due to the loss of timing. In this event, many owners are advised to junk the car as the cost to replace the counterbalance shaft is \$6000 plus parts. The flat rate time for this job is 46 hours.

Counterbalance shaft (CBS) failure is a known problem *allegedly* caused by the accumulation of water in the CBS cavity. Volvo "resolved" the problem by drilling a weep hole in the CBS cavity adjacent to the rear bearing cap. This problem is a design failure by Yamaha. Placing sealed bearings in a hot motor rotating at 2500-6000 rpm is poor judgment.

In reality, the bear seal fails due to time and heat; the dry bearing begins to chirp. To keep the vehicle, I have to change the bearings or find a way to lubricate them. Typically, the rear bearing, between cylinders 7 and 8, is the first to fail.

Not anxious to remove the intake manifold, the Bank 1 exhaust manifold and cylinder head, I decided a work around was required. (Creativity is a wonderful thing.) Removing the intake manifold, fuel injector rail and other plumbing exposed the CBS cover. On the cover are two spark knock sensors. Upon removing both, I was able to peer through the opening into the chamber, which appeared dry and not crusty.

Conjecturing my 2006 V8 was one of the pre weep hole motors, I could fill the cavity with 90 weight gear lubricant to lubricate the ball bearings. Shortly after pumping a pint of 90W into the chamber, I observed a puddle on the floor. Yup, it had a weep hole. This wasn't going to work. Then, I reasoned, why not pump graphite lube with a consistency greater than honey into the chamber. Heat from the engine would cause it to flow, but ever so slowly. One tube of graphite grease later, I replaced the knock sensors and intake manifold.

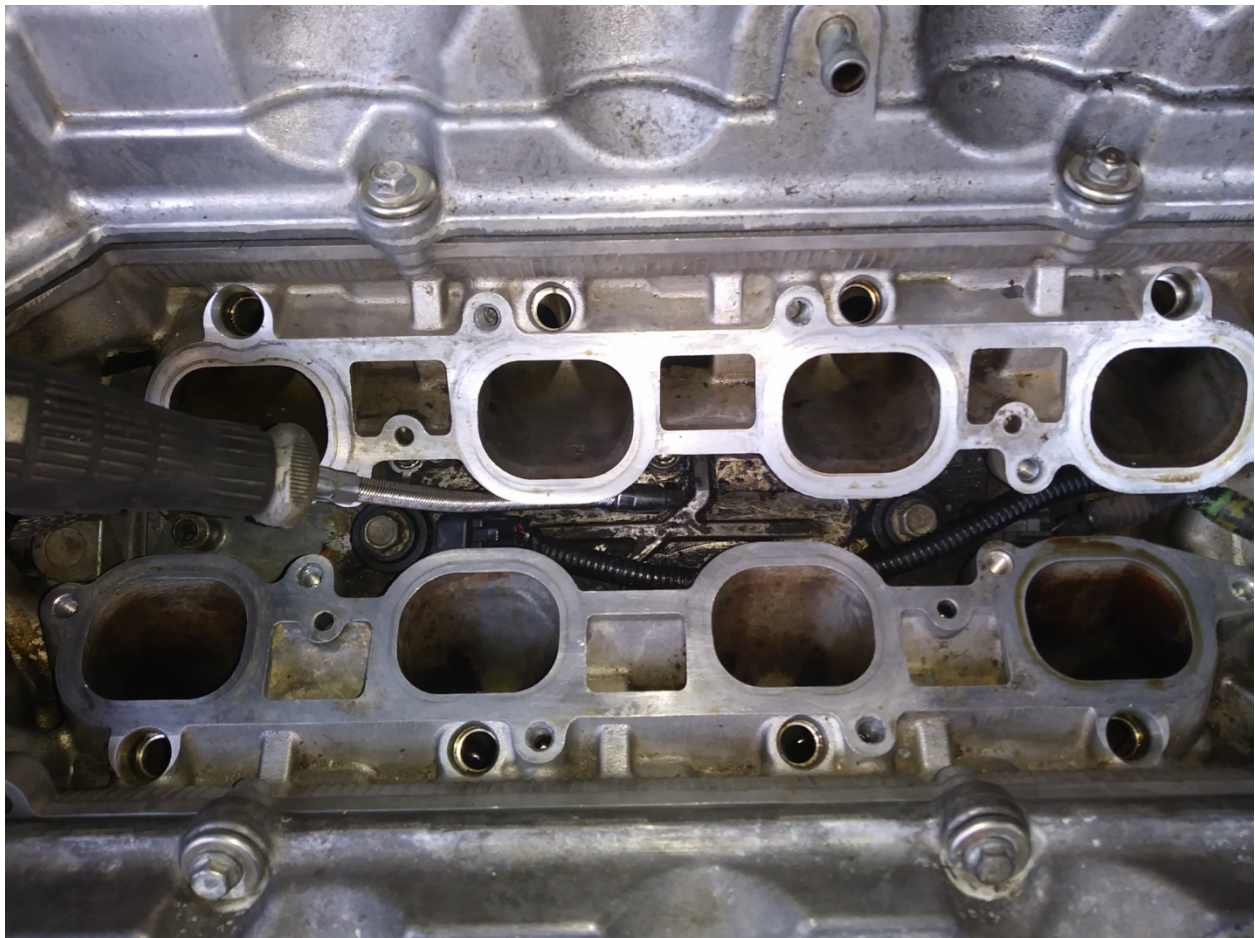
The moment of truth, I hit the starter and the V8 roared, settled down to its 750 rpm idle and nary a chirp from the counter balance shaft. I had to use a stethoscope to detect a slight bearing noise from the CSB. Time spent, 4 hours.

Yes, a temporary fix good for 10K-15K miles; long enough to develop ambition to tear into the V8 on a cool Fall day as working in the 93° - 103°F summer heat is no fun. At that time, I might refresh the piston rings and bearings.

It is only possible to use this technique when the ball bearings have not been destroyed, but are just dry. If the bearings have been ground into dust, they must be replaced. And I am developing a short cut method for that as well.

For the moment, my daughter requested my presence in the Northwest to repair an S70 and XC70, both driven by my granddaughters. While there, I'll fire up the 1986 760 (280K miles) and COVID tour the Olympic Peninsula; perhaps the LeBra on the 760 will suffice as a mask. The 760 sits longingly in the barn awaiting my return. It was my late wife's favorite Volvo.

Examine the picture closely; the screwdriver tip rests on the CBS cover; the knock sensor (left and right) fasteners were removed to access the CBS cavity and fill with lubricant. The large openings lead to 2 intake valves/cylinder and companion dime size holes are for the fuel injectors. The cabling is for the knock sensors.



BTW, my motors and transmissions are clean as I deplore becoming dirty while wrenching.

I know the same service is required on the 2010 V8 to avoid high mileage CBS bearing failure.

Questions about your Volvo; contact me at rfsepe@gmail.com or if urgent, 919-417-5019.