

## **How to Stop (Almost All) Oil Leaks in Your T-Car The Cheap and Easy Way**

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After thirty years of fiddling with XPAG engines, I've long held the notion that the majority of oil leaks are caused by improper installation of the cork seal on the rear bearing cap. The result has been more articles about how to fix oil leaks in T-Series cars than on any other subject. Nearly all have recommended installing "other car" seals, not to mention the well-known Moss crank seal. In many cases, this means yanking the engine out of the car, extensive machine work and money. Lots of it.

I've seen some real leakers in my time, including my own car (TB). Some owners have gone so far as to install little reservoirs under the sump in an effort to stop oil from dribbling onto the garage floor. I know one guy who even tried to figure out a way to get this oil back into the engine...automatically. He failed, of course.

We know that with the initial production run of the TC, Abingdon was picking bits and pieces out of the dustbin as the cars came down the line. Money was tight, as were top grade materials. Nevertheless, one still reads bulletin board messages from owners trying in vain to obtain "original" parts—like nuts and bolts for the frame—and "original" paint colors, when few realize that for a couple of extra pounds, Abingdon would paint polka dots on your car. Still, I got to thinking—would Abingdon knowingly produce a car that dropped oil by the quart? Hark, is that a tumultuous, resounding "YES!" I hear in the background. I don't think so.

What we have is an older car fitted with anachronistic seals. The rope seal on the crank pulley is a prime example. Today, there is a replacement...the lip seal. The cork seal at the rear is another anachronism, but with care, it will work pretty well. Honest! The secret lies in prepping the seals correctly before installation and then putting everything back together precisely in the proper sequence, plus purchasing a few inexpensive items from your local auto store. Will it still leak? Maybe, maybe not. It depends on how careful you are and if you have the patience to do it right the first time. Doing it right requires thoughtfulness—and precise timing. If you do this, at least your car won't be dropping large quantities of oil on your pristine garage floor.

Start by ordering up some inexpensive parts. Using the Moss Catalog as a reference, order two oil pan gaskets (part no. 291-000). Why two? You're probably going to botch the first one; the standby will be your backup. At the same time, order the one-piece lip seal (part no. 120-750) that's going to replace the rope seal. You'll also need to order a timing chain cover seal (part no. 291-600), because you're going to be pulling the cover in order to properly install the lip seal. TB owners will need to buy some gasket material to handmake a gasket, because no one makes TB timing chain cover gaskets any more. Next, go down to your local auto supply house and purchase one tube of silicone sealant (Permatex Blue RTV with the code 6B on the bottom) and a small can of Permatex High Tack Spray-a-Gasket Sealant (comes in a blue can and may have the name Loctite on it). Why High Tack Spray? Because using silicone sealer with abandon in the wrong places can ruin your day. If you apply it to the sump gasket and use too much, it may squeeze out and drop into the oil pan where it can find its way into the oil galleries. Ouch!

Moreover, the next time you try to remove the sump, you may need a jackhammer to get it off. A final word, you're going to be removing a lot of bolts. Inspect each carefully for stretching or corrosion before reinstalling and replace as needed.

As the saying goes, "tidy ship, tidy mind." Clear a bench or table where you can temporarily store bits and pieces removed from the engine. Timing is going to play a role and you don't want to lose time rummaging through a pile of stuff looking for a part you took off two days ago.

Start by clearing the decks. Remove the radiator shell and radiator. Check the hoses and while you're at it and consider replacing them. Pull the fan, the timing chain cover and drop the sump. Loosen the bolt holding the crank pulley and remove it. This might be a good time to clean up and put a dab of paint on the TDC mark—maybe even adding the 5 and 10 degree advance marks mentioned in Part I of "How to do a Complete Engine Tune-up" (see most recent issues of the Octagon Topics, or contact me). Remove the old cork seal attached to the bearing cap. Clean (scrape) all sealing surfaces—sump, bearing cap, block, and timing chain cover—scrupulously.

Next, place the sump on a bench and lay the raw gaskets in place. It helps to drop some bolts in to keep them from sliding around. Formerly, the front end of the gasket extended between the ends of the rope seal and was crushed by it, making a tight seal. Okay, maybe not *that* tight! With the new lip seal in place, you can easily see that the end of the gasket is going to interfere. Using a ballpeen hammer and holding the gasket firmly in place with the holes lined up, carefully tap, tap, and tap the gasket where the lip seal slot is. This will indent the underside and show you where to remove a tiny portion of the gasket. If you really want to get a good seal, take care when cutting the gasket. You'll want those two little tab ends of the gasket to remain so they will cover both sides of the lip seal. I used a sharp pair of scissors and was lucky enough to remove just the right amount of gasket material. So can you, provided your patient and work slowly.

Take the timing chain cover and clean out the slot where the lip seal is going to be inserted. When you certain it's clean, apply a small amount of silicone sealer—not too much because you don't want any spilling out the sides of the slot. Insert the seal and press fit it into the slot. Make sure the flat side of the seal is facing forward and the slotted side with the spring in it is facing toward the engine. It should be a firm fit. Wipe off any excess silicone and quit for the day. Allow 24 hours for the silicone to cure and glue the seal to the cover.

Next day is Hallelujah Day. Inspect the lip seal and make sure it's firmly adhered to the slot. Don't pull on it or try to rotate it, you may dislodge it causing you to start over. Apply a dollop of grease to the inner surface of the seal. This will prevent it being burnished when the engine is first started and before oil pressure is attained. Assuming you're satisfied, lay out several layers of newspaper on a flat surface and spray the timing chain gasket with the high tack sealer...both sides. Soak it. Insert the bolts into the cover and place the gasket on the cover so that the bolts hold it in place while you maneuver the cover into position. Using care, place the timing chain cover up close to the bearing plate. Then maneuver the cover so as to slip the lip seal over the end of the crank. Install and tighten the bolts that attach the cover to the front bearing plate.

The order and timing for installing the sump with its gasket and the cork gasket are critical. Look at the sump gasket and note that the zig-zagged ends adjacent to the cork

gasket hang over the edge of the sump. This is important. As already stated, it's long been my belief that the majority of big oil leaks occur at this point because these two gaskets are installed out of order, crushing the ends of the sump gasket, thereby allowing oil to escape around the ends. If the gasket ends don't butt up against the cork gasket, a major leak is forecast. This means the sump gasket must be installed before the cork gasket.

The cork gasket itself can be installed improperly. The partial cuts at the ends of the gasket are supposed to slip into the slotted openings in the bearing cap, but not all the way. When the sump is installed and the bolts tightened, it squeezes the gasket and pushes the ends all the way up into the bearing cap, but not before. I have botched the job at earlier times by inserting the cork gasket all the way up into the slot on one side, leaving the other side too short to be squeezed up into its receptacle. In this instance, that the cork gasket appears to be okay is an illusion because the sides of the slot hold it in place. To preclude this from happening to you, mark the absolute center of the bottom of the cork gasket with a pen. Later, when inserting this gasket, check to make sure the gasket is centered by checking the mark at bottom dead center of the slot.

With the cork gasket marked but not installed, it's time to install the sump gaskets. Again, lay out some newspapers and apply a liberal dose of high-tack sealer to only one side—the side that butts up against the block. Leave the other side clean. Apply the gaskets to the block. The high-tack sealer should hold them there. If it doesn't, pull them off and give them another dose of sealant. Eventually, they'll stick. With the sump gasket sticking to the block, insert the cork gasket into the slot on the bearing cap. Check your mark to make sure it's centered. The sides of the slot should hold it there provided you've pressed the cork well into the slot. The jagged ends of the sump gasket should now just be nudging the cork seal. By the way, I wore surgical gloves while messing with the high-tack gasket sealer.

With both gaskets in place, grab the can of high-tack and spray the underside of the sump gasket...liberally. Some haste is required as you don't want to let the upper side of the sump gasket to dry out. Now, you're ready to reinstall the sump itself. When that's done, you're almost through. Don't forget to apply a dab of silicone sealer in the slot at the front of the sump where the lip seal will sit. With the sump in place, the crank pulley should slide right through the lip seal ready to be tightened down. Remember the washer that goes between the nut and the pulley. Reinstall the radiator, shell and connect the hoses and you're done. Don't forget the bolts that attach the sump to the tranny housing.

One additional note on oil leaks. Never, never remove the banjo bolts that connect the oil lines to the filter and block without replacing the copper washers that go on both sides of the banjos. In tightening these bolts, old copper washers can shred bits of copper off and cause leaks.

I highly recommend warming up the engine two or three times and checking for leaks before hitting the road. Run it up and let it cool down, all the time checking for the odd leak. It's almost certain that you'll find several timing chain and/or sump bolts needing an extra turn.

I made all the foregoing mods to Abbie. No oil leaks up front. Maybe a tiny drop at the rear after a very long, hard run—if that much. As my granddaughters like to say, "That's cool, Bop Bop." Hallelujah!