## **Sealing Brit Bike Primary Cases**

Oil leaks from Triumph and BSA unit single and twin primary cases have always been a common complaint. Luckily, their repair is very easy and similar for both makes. By themselves, the leaks are rarely worth fixing, however, owners should keep this information for the time when they'll have to enter the primary for a required clutch repair. Applying this information to a primary case that's already open only adds 30 minutes to the repair, and solves all those nuisance oil leaks for good.

The major primary case oil leaks from usually come from these sources:

1) The sprocket window. It's not usually the seal's fault, but you can replace the seal just to make sure. Be careful to let the oil seal's spring face the clutch basket. The most likely source on earlier models is due to wear on the bronze bush the oil seal rides on. If there is a groove in the bronze bush, remove the high gear and press in a new bush. The bush should be completely cylindrical with NO dips, grooves, or fractures. On later models the oil seal ran on the steel and was nearly leak proof.

2) Gearbox oil passing the sprocket splines. Oil leaks here usually show up when 4-speed bikes are parked on their side stand. Definitely fix this while you have the sprocket window out: Remove the nut and lock tab. (No need to remove the sprocket or chain.) Clean the sprocket, high gear splines, tab and nut in lacquer thinner and blow off with compressed air. Run a 1/8" bead of silicone around where the splined shaft meets the sprocket. Push the clean tab into place. Run another 1/8" bead around the splines, this time on top of the tab. Install the nut with Loctite on the threads and don't bother bending the tab. Torque the nut per the manual.

Five-speed Triumphs are equipped with an o-ring to stop leaks in this area. The only thing different is that the o-ring should be renewed before the sealer is added. Always restore the large oil seal behind the sprocket when you get in this far.

3) The aluminum sprocket window. Seal the sprocket window to the inner primary case using a good quality sealer. Be sure to apply sealer to the underside of the 6 screw heads too.

4) The alternator wire. Oil will wick out through the port where the alternator leads exit the primary case because the rubber boot cannot stop all the oil. Pull the rubber boot toward the stator, clean the interior of the wire guide and boot with spray cleaner and blow out with compressed air. Fill the boot full of silicone sealer and reinstall the rubber boot. Re-installing the boot pushes the sealer up into the port and completely seals 360 degrees around the alternator wire. There is no need to glop on sealer on the outside of the case.

5) The primary cover. Use one of the many thick, high quality primary gaskets now available. Use a long, flat, sharp, hand file to remove any rough surface features from the engine and cover. Then hold the gasket in place with grease while installing the screws. Remember that over tightening on the cover screws does NOT stop oil leaks. Good flat clean gasket surfaces and evenly torqued screws do.

6) The drain plug is a particular concern. If too much torque is used the owner runs the risk of stripping out the threads in the engine case. If too little is used, then the drain plug may vibrate out. If sealer is used, it may gum up the primary chain adjuster. The best solution I have found is to use a fat o-ring at this location. Some people trim down the OD on o-ring washers (as used on petcocks after 1971) and use those with great effect. The general idea is to use something thin and soft.

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7) Stripped out level plugs. A screw is sometimes provided on the lower rear of the primary cover to help owners find the correct oil level. Most owners now find that the aluminum threads were stripped out long ago causing the bolt to weep. I fix this by simply installing a 1/4" longer bolt with a steel nut on the inside. The nut may need to be shaped to precisely fit the contours of the cover. Install the bolt and nut with lots of LocTite to hold the nut in place and permanently seal the leak. From then on, the owner must measure the amount of oil being added to the primary case, which is much quicker.

8) Automatic chain oilers. On most pre-1970 English bikes an orifice was usually provided to tap off primary case oil and drip it onto the rear drive chain. The rear chain then slings primary oil all over the rear of the bike making a huge mess. This device is totally redundant if you're using one of the modern chain oils. I find the best fix for this is to thoroughly clean the orifice with a solvent /thinner, and then totally block off the oil passageway with a dab of filler epoxy, like J-B Weld.

## Additionally...

a) For additional help, you can put o-rings on both the 1-inch diameter "inspection covers". Later models came with o-rings, but before  $\sim$ 1968 the inspection covers used paper washers that always wept oil and allowed the inspection covers to vibrate loose. O-rings not only stop the weeping, but also stop the loss of these covers. O-rings to do this job are available at most hardware stores.

b) On some pre-1970 Triumphs, the hole in the case for the gearbox selector shaft came all the way through, which allowed gearbox oil to leak out, just forward of the sprocket. Applying sealer to the end of the shaft from either end will stop this leak.

c) On all pre-1970 Triumphs, the engine breather pipe also exits just in front of the sprocket. Due to grit being thrown from the rear wheel and chain, a breather hose in this location usually never lasts more than 2 years before a leak develops. The only way to stop these leaks is to replace the hose with 1/4 inch ID fuel line. Since the breather pipe is slightly larger than 1/4 inch, making the hose troublesome to install, the perfect time to replace the hose is when the sprocket window is removed.

Hope these suggestions help you stop those pesky primary case leaks.

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