Removing Triumph Sludge Tube

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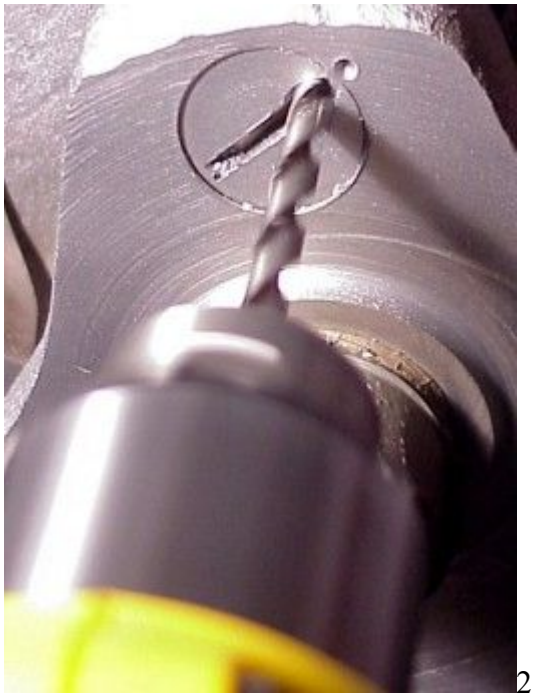
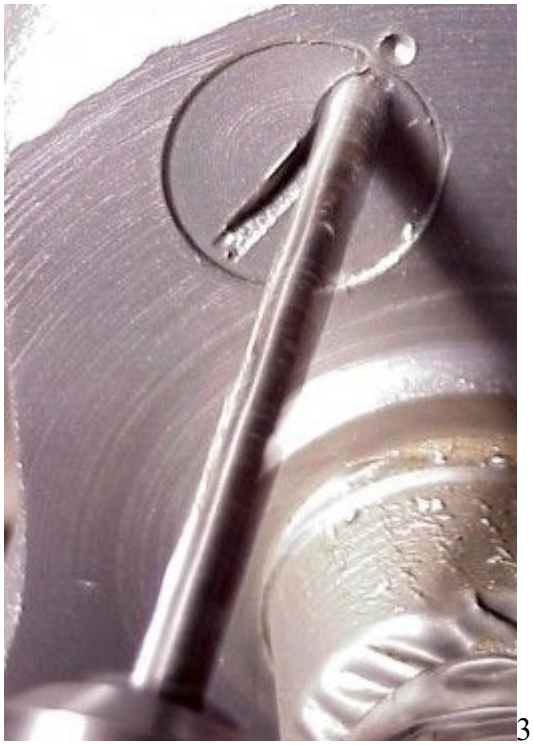
The first challenge is removing the slotted plug from the flywheel. Removing this plug gives you access to the sludge tube. The plug should not have been Loctited and should only be prevented from unscrewing by the center punch on the face of the flywheel.

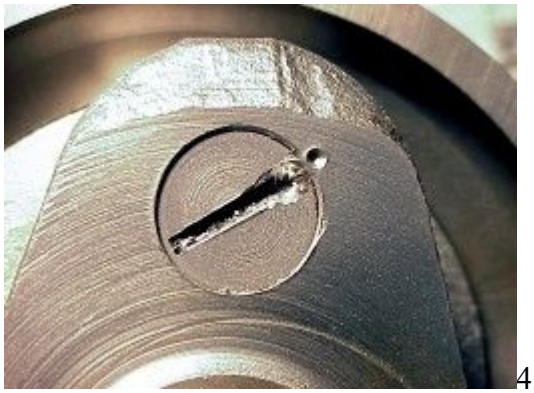
If it was Loctited by a previous mechanic then this procedure and a little bit of heat (200-250F) applied to the face of the plug should release the Loctite enough to allow the plug to be removed.

 2

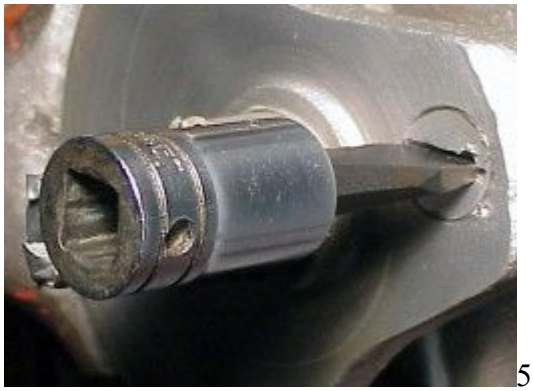
We don’t want to put any more stress risers on the face of the flywheel, so we start by drilling straight into the face of the plug. What we want to do is only remove the flywheel metal that is pushed against the plug.

 3

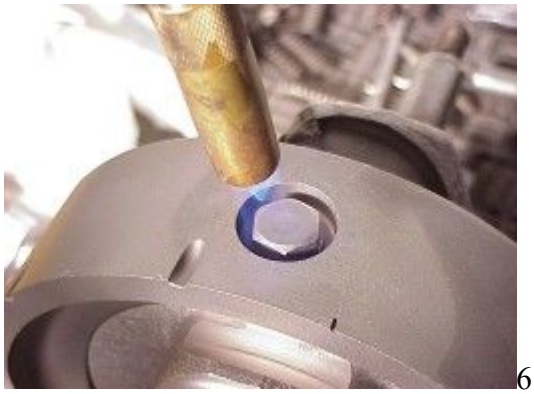
We started the drill a little bit back from the edge of the face of the plug and now we need to work the drill bit toward the edge and the center punch divot. Slowly tip the drill aiming it toward the edge and let it start cutting away the folded metal. To free the plug you will have to remove a little bit of the flywheel in the area of the divot, but be careful. Remove as little as possible.

 4

The drill was first started straight, then tipped. Then the drill bit was allowed to walk toward the edge. When the edge of the drill bit starts to cut the flywheel metal distorted by the center punch it is time to stop. If the plug was not Loctited you can use a modified drag link socket (looks like a large screw driver blade on the end of a socket.) I like the Snap-On 1/2″ drive screw driver blade shown below. Modify the tip of the blade so it fits firmly in the plug's slot. With a ratchet, impact wrench or a hand impact driver to remove the plug.

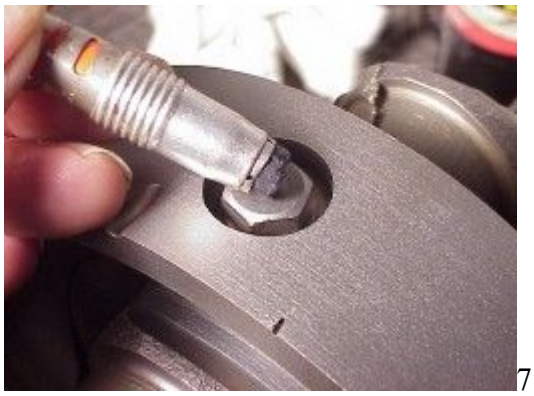
 5
So it appears that the plug was installed with Loctite. Time for plan B. There are a lot of ways to approach this. If you have welding equipment you can weld a nut to the face of the plug. Weld the center to the plug and use a socket and ratchet to remove the plug. The heat from the welding will loosen the Loctite. If you don't have welding equipment you can use a drill to drill three contiguous holes in the slot and drive in the blade of the screw driver. Use a Mapp gas bottle to heat the face of the plug. Starting with the first drilling I continue and drill three holes along the plug's screw driver slot. I then drive my Snap-On 1/2″ drive screw driver bit into the three holes. I try to keep the holes as close together as I can. To connect the three holes, and allow the screw driver bit to get a solid purchase in the plug, I use a small chisel or carbide bit in my air grinder.

Often you can use a ratchet with the while I use a 1/2″ drive impact wrench you can use a 1/2″ drive ratchet to finish removing the plug.

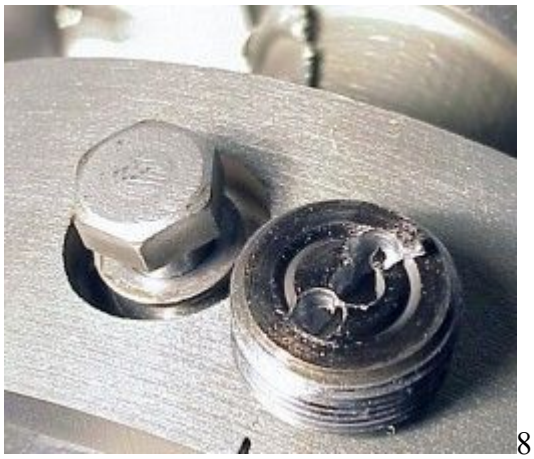
 6
To remove the sludge tube you will have to remove the flywheel bolt adjacent to the tube. This bolt is Loctited in place. Because it is a hard (brittle) bolt you want to be sure to release the Loctite before you apply any pressure to remove it. With your Mapp bottle apply heat to the head of the bolt and the side of the of crankshaft where the bolt's threads are located. Failing to release the Loctite greatly increases the chances you will break the bolt off in the crankshaft. If you do it will be one of those moments you will remember for a while. While with age, the Loctite that is used to retain the bolt will degenerate and the bolt can be easily removed, If it does not come right out I find it safer to follow the heat the head of the flywheel bolt to about 200-250 degrees F. I also heat both sides of the flywheel where the bolt's threads are located.

Because some mechanics insist on using Red or green Loctite on this bolt, heating the bolt and the area the flywheel that houses the threaded portion of the bolt, is very important!

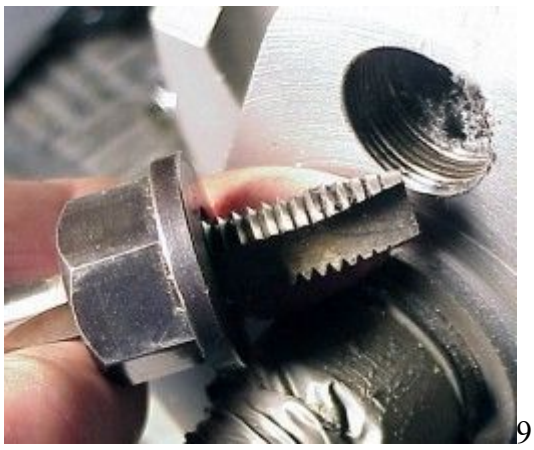
If one doesn’t take some precautions removing this bolt, it is easy to break it. If this happens removing the piece that remains in the flywheel can be a confounded nuisance and a job best suited for an expert.

 7

I use a Tempastick to determine when I reach the temperature I am looking for. I try to constrain the heating to the head of the bolt. If I am having trouble getting the Loctite to release I apply localized heat to the bolt retaining area at the crankshaft. Lacking a Tempastick one can use a drop of water which will sizzle when the temperature reaches 200 – 212 F.

 8

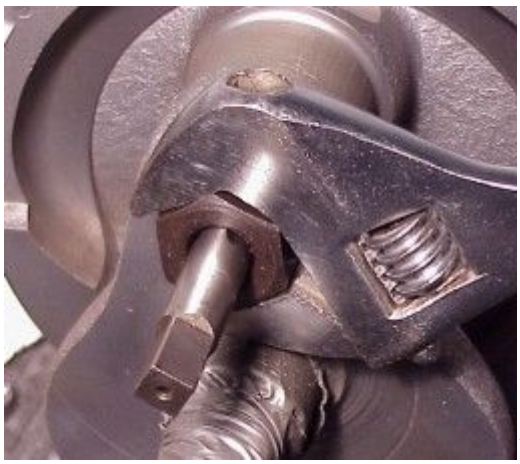
You can see where the three 1/4″ holes were drilled in the plug to remove it. Even though the flywheel bolt has been loosened do not remove it as you will need it in place to keep the sludge tube from turning as you offer the removal tap.

 9

In the old days people hooked the head of a spoke in the sludge tube and struggled to pull out

the tube with a set of vise grip pliers. If all you have is a spoke you can get the tube out, but it will take a while and some heat to loosen the gunk that is holding it in place. I find It is easier to use a tap, large easy out or other threaded device to do the job. On a 650-750 twin I like using a 5/8″x 11 tap. You start threading the tap into the end of the sludge tube until it has just firmly caught the tube. It usually takes less than a one full thread to have enough purchase to remove the the tube. You are not setting out to cut a thread in the tube. You just want to get the tap caught in the tube.

When the tap is secure in the tube I thread a 5/8″x 11 nut onto the tap. You just made a puller that will pull the tube out of the flywheel. Just tighten the nut against the side of the flywheel. As youTtghten the nut it is time to remove the flywheel bolt the end of which resided in the tube and locates it. Once the flywheel bolt is removed place a 5/8″ x 11 nut onto the tap and tighten it against the side of the flywheel. This will pull the tube out of the flywheel.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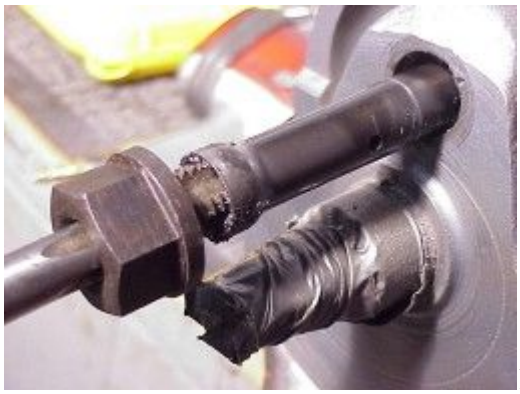
Tighten the nut against the face of the flywheel to withdraw the tube.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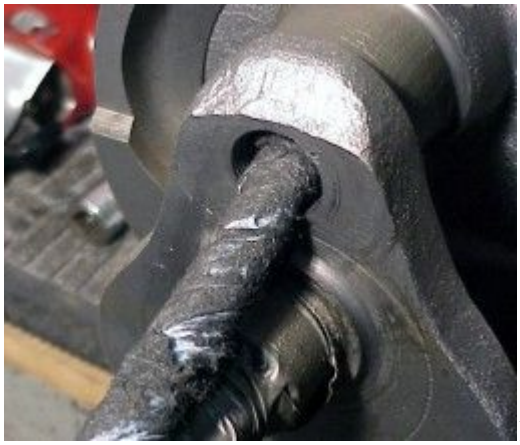
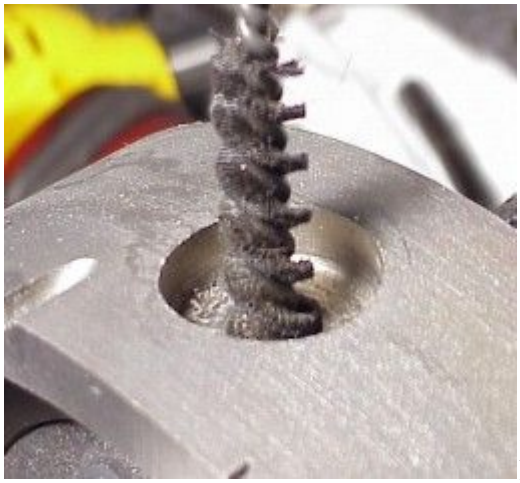
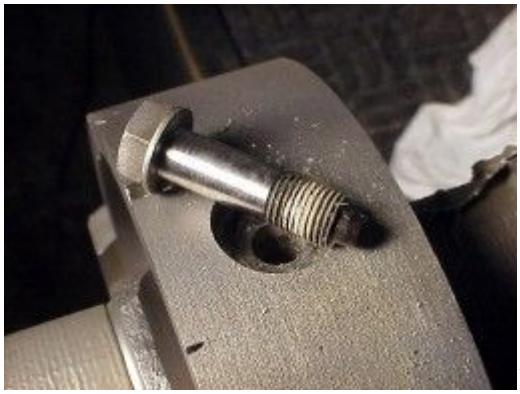
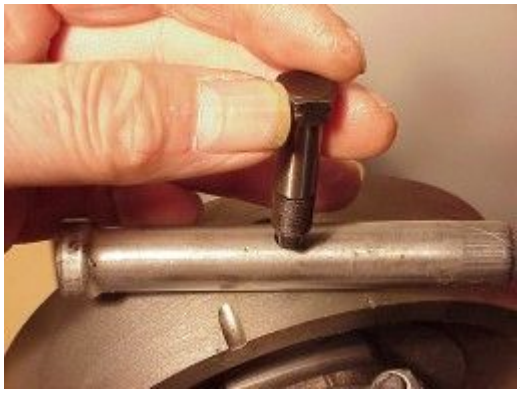
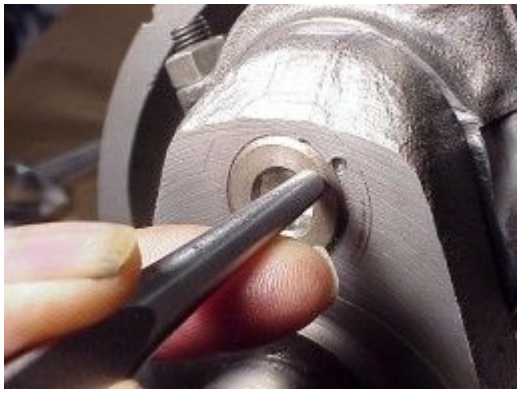
Actually this sludge tube appears pretty clean…

 12
Use a screw driver, gun brushes and some spray brake cleaner (CRC Brakleen) and scrape and brush until the tube starts to get clean. Then wrap a paper shop rag around a medium sized screw driver and twist it into the hole. More spray cleaner and a half dozen, or more rags, clean the hole until you think it is spotless, and as my mentor always said, “Then clean for another ten minutes.”

 13
Don’t forget to clean the threads in the flywheel! Gun brushes are handy for these kind of jobs. Don’t forget the oil feed holes that feed the connecting rods and the oil supply drillings in the timing side main shaft. A spray can of brake clean, with the small plastic tube,is handy for getting the oil ways clean.

 14
The remains of the Loctite can be seen on the threads. You can also see the “tit” that locates the sludge tube. Clean the bolt until it sparkles.

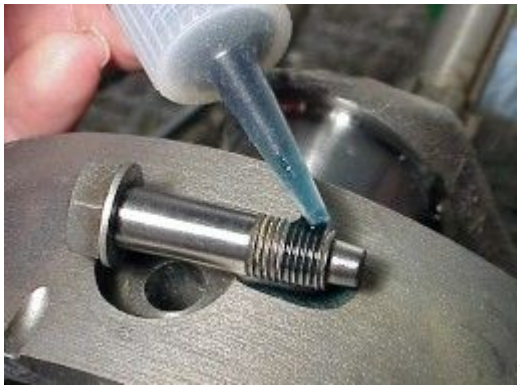
 15
When you offer the new or cleaned tube to the flywheel, be sure to locate it so as the “tit” on the flywheel bolt can enter the larger of the three holes. Look down the flywheel hole to be sure the hole is properly aligned before offering the flywheel bolt.

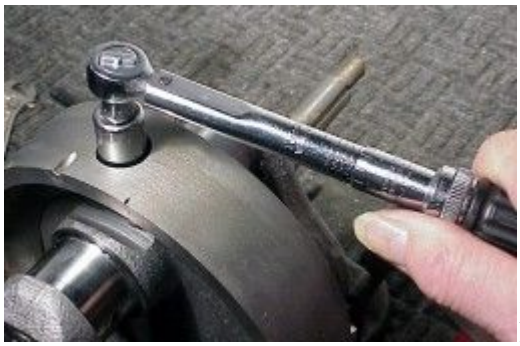
 16
Hex driver flywheel plugs are the way to go (Use a relaible dealer as there are some oversize ones being sold). To have as few stress risers as possible I like to re-punch the face of the plug, instead of the flywheel, into the area that was originally punched. his leaves the crankshaft with only the original stress riser from the original center punching.

This displaces metal into the depression left from by the original punching. Place the tip of the center punch near the edge of the plug and drive a small bit of the plug into the original divot on the face of the flywheel.

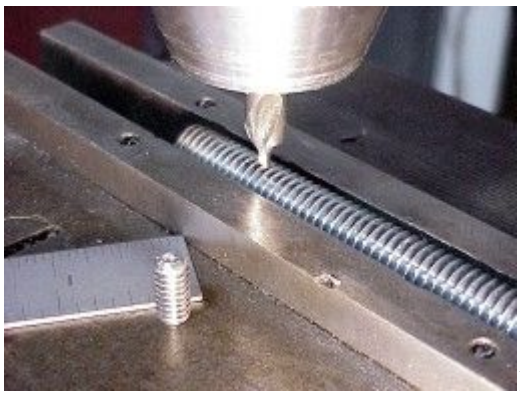
The plug is not a place where you want to use Loctite! If you are driven to use something, a very little bit of Hermatite Blue sealant, ThreeBond #4, or Loctite 515 or 518 anaerobic gasket sealant on the threads wouldn’t hurt.

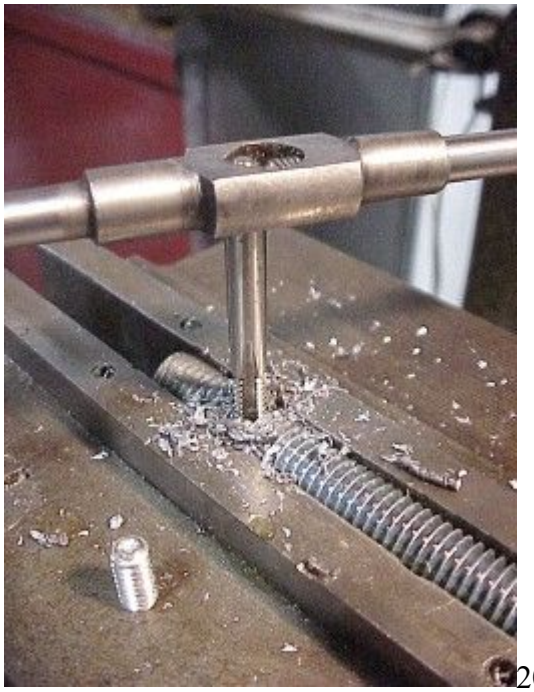
On occasions the threads of an aftermarket plug are cut too small and the plug screws in so the face of the plug is below the face of the flywheel. This can lead to a rare problem where the plug has the potential to block the flow of oil the rod bearings. There are numerous people making these plugs and it is worth the effort to obtain a plug that tightens so the face of the plug is flush with the side of the flywheel. If you get a plug that is loose in the crankshaft return it and get one that fits better.

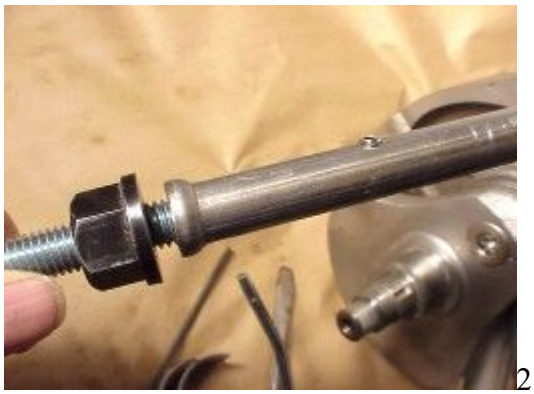
 17
A few drops of blue Locite and the flywheel bolt is ready to be installed (If you are racing use Loctite 270, but be sure you use enough heat to release it when doing future service.

 18
The flywheel bolt must be tightened to 33 foot pounds. Resist the temptation to believe that the Triumph engineers didn't know what they were doing and over tighten this bolt. It would be a real pain if the bolt broke as you tighten it. Worse, if it broke later at speed.

There are other ways of removing the sludge tube. Some people use a large Easy Out while others, like Paul Ackerman a dealer in Maine, make a puller:

 19
Using a short length of 1/2″ threaded rod available in most big box stores for a few dollars and a 1/4″ x 1/2″ x 20tpi allen head grub screw you first drill and tap the rod 1/4″ x 20.

 20
The 1/4″ allen grub screw is in fore ground while the threaded rod is being tapped 1/4″ x 20.

 21
You remove the sludge tube plug and flywheel bolt. You slide the 1/2″ rod into the sludge tube while looking down the flywheel bolt hole. When the threaded hole in the 1/2″ rod aligns with the flywheel bolt hole place the allen screw on a long allen wrench and lower it into the hole until you are able to thread it into the 1/2″ bar. Be sure the top of the screw is clear of the flywheel bolt hole, but is sticking through the hole in the tube as illustrated above. Place a 1/2″ nut, and a washer if necessary, on the rod and tighten the nut. This will pull the tube out of the flywheel.

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