

How to repair a broken gear shift shaft on a Triumph 885 triple.

Part numbers:

T1190255 – Gearchange Quadrant (the broken shaft!)

T2081778 – Gearstick pin (goes through the rubber)

T2080766 – Gear lever rubber

T2080284 – Gear lever

T1230056 – Sump gasket

T1260801 - Sprocket cover gasket

3600008T0301 – Oil seal for the sprocket cover

3500008T0301 – Circlip, 2x (for end of the shaft inside the engine, and on the sprocket cover side)

3550016T0301 – The washer that goes under the circlip, sprocket cover side (mine was missing)

Only order what you need obviously!

Also needed:

Oil

Oil filter with O-Ring set

Silicone gasket sealant

Full tool set, circlip pliers (outside), Torx bits, good socket set.

Two 6 inch high pieces of 4x4 or equivalent sturdy pieces of wood

Remove the seat, fuel tank, side panels, battery, coolant reservoir, mirrors, exhaust pipes, and drain the carbs. Drain the oil.

Remove the horn assembly, the left hand footrest, and then the clutch slave cylinder. Strap a big socket or something round onto the cylinder with cable ties to hold the piston in.

Remove the sprocket cover and clean up the gasket surfaces.

Remove the circlip from the gear shaft and put the underlying washer somewhere safe. Undo and remove the black bolt in there, that is the gear spring post.

Place the block of wood just to the side of the sidestand bracket, raise the sidestand, and slowly lower the bike onto it's left side so the block sits nicely under the sidestand bracket, like so:



The bike is not really that heavy once all the excess guff has been removed, hold the bike firmly by the handlebars and make sure you have a good firm foot hold!

It also pays to support the rear of the bike under the rear wheel axle bolt with another piece of wood or anything that's lying handy nearby. Also you might want to put something under the bar end to prevent scratches.

Loosen the rear suspension linkage front bolt so you can get access to the middle-rear sump bolt.

Put some rags or old towels under the engine and remove the oil filter and then the sump bolts.

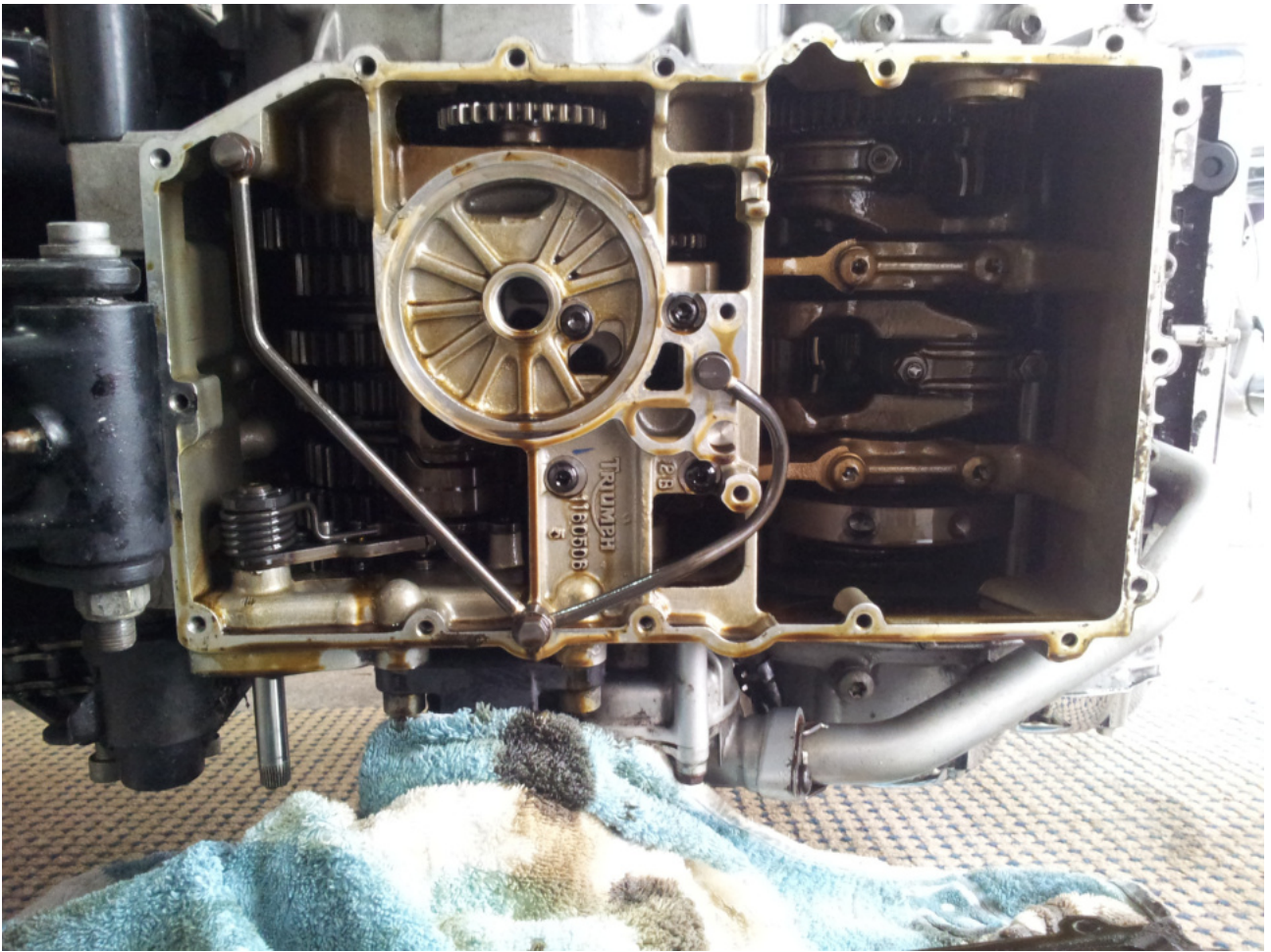
After the oil had stopped dripping, I put the sump and filter back on and tipped the bike onto it's right side and left it for a few minutes so as to remove the old oil still trapped in the valve cover. You don't need to do that, but I was putting fresh oil in so I thought it was worth it.

The sump:





And the underside of the engine:

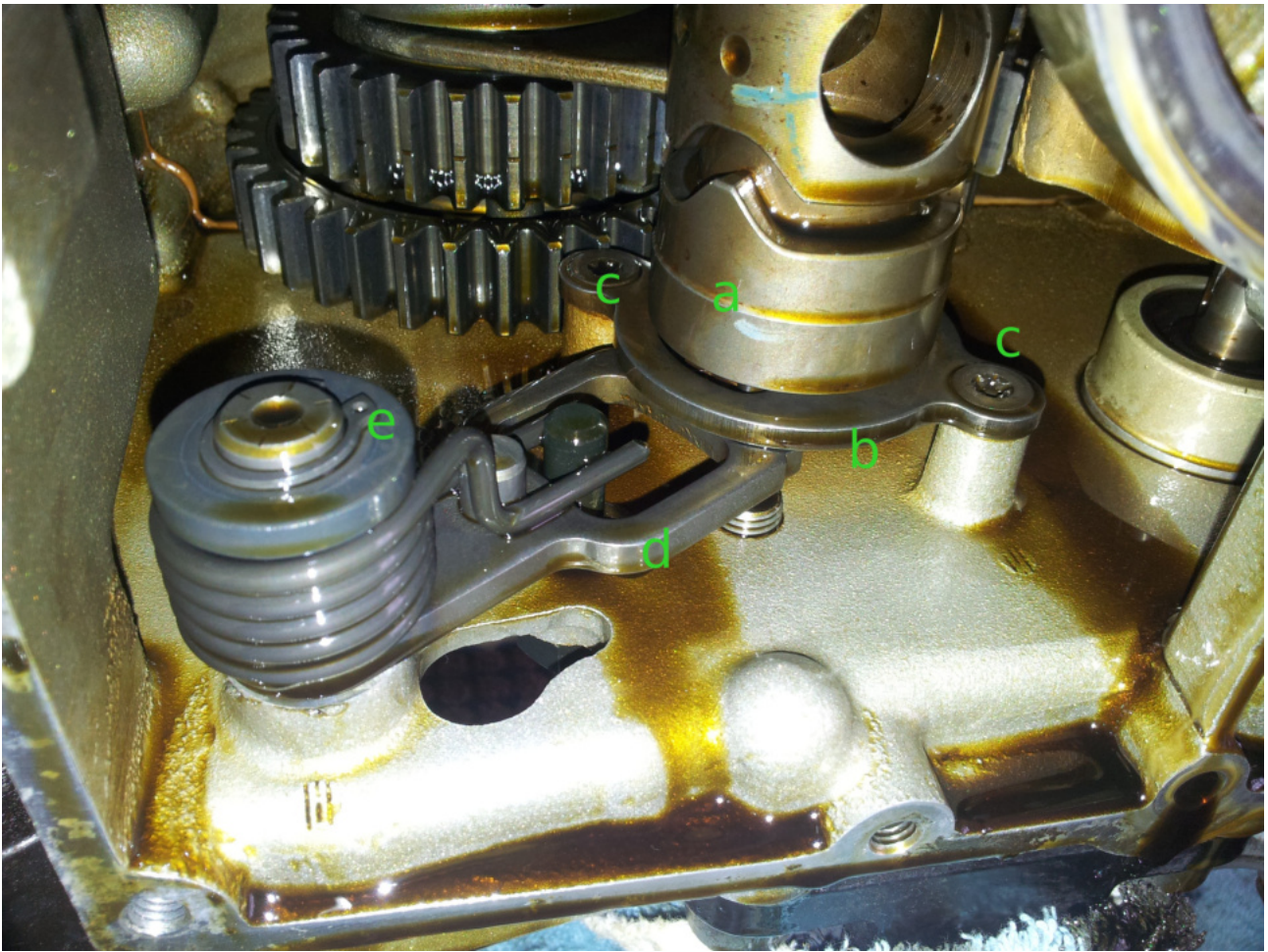


Next you need to remove that oil pipe, being careful not to lose the two copper washers under the banjo bolts. I used cable ties to keep them all together, like so:





This is the area we're going to be working in:



a = selector drum

b = retaining plate

c = screws

d = selector quadrant (selector shaft)

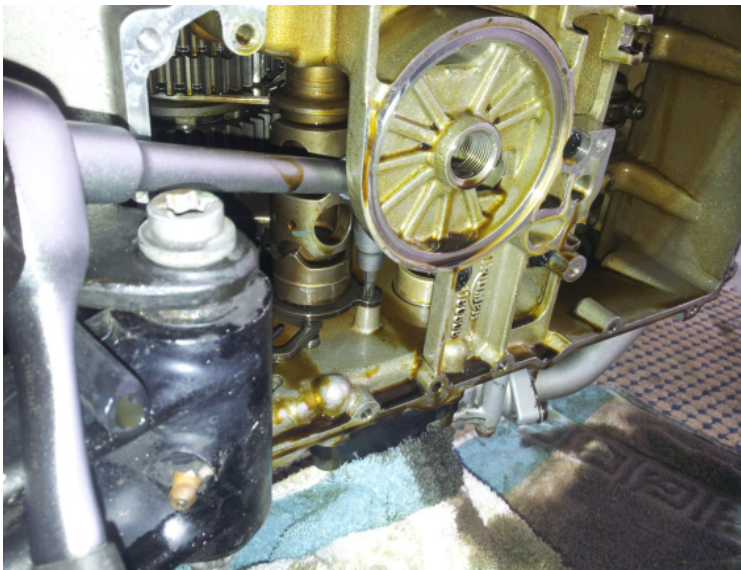
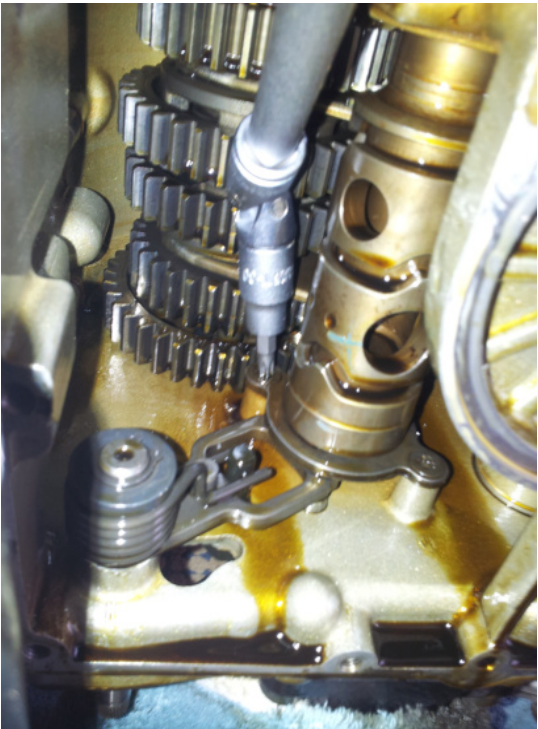
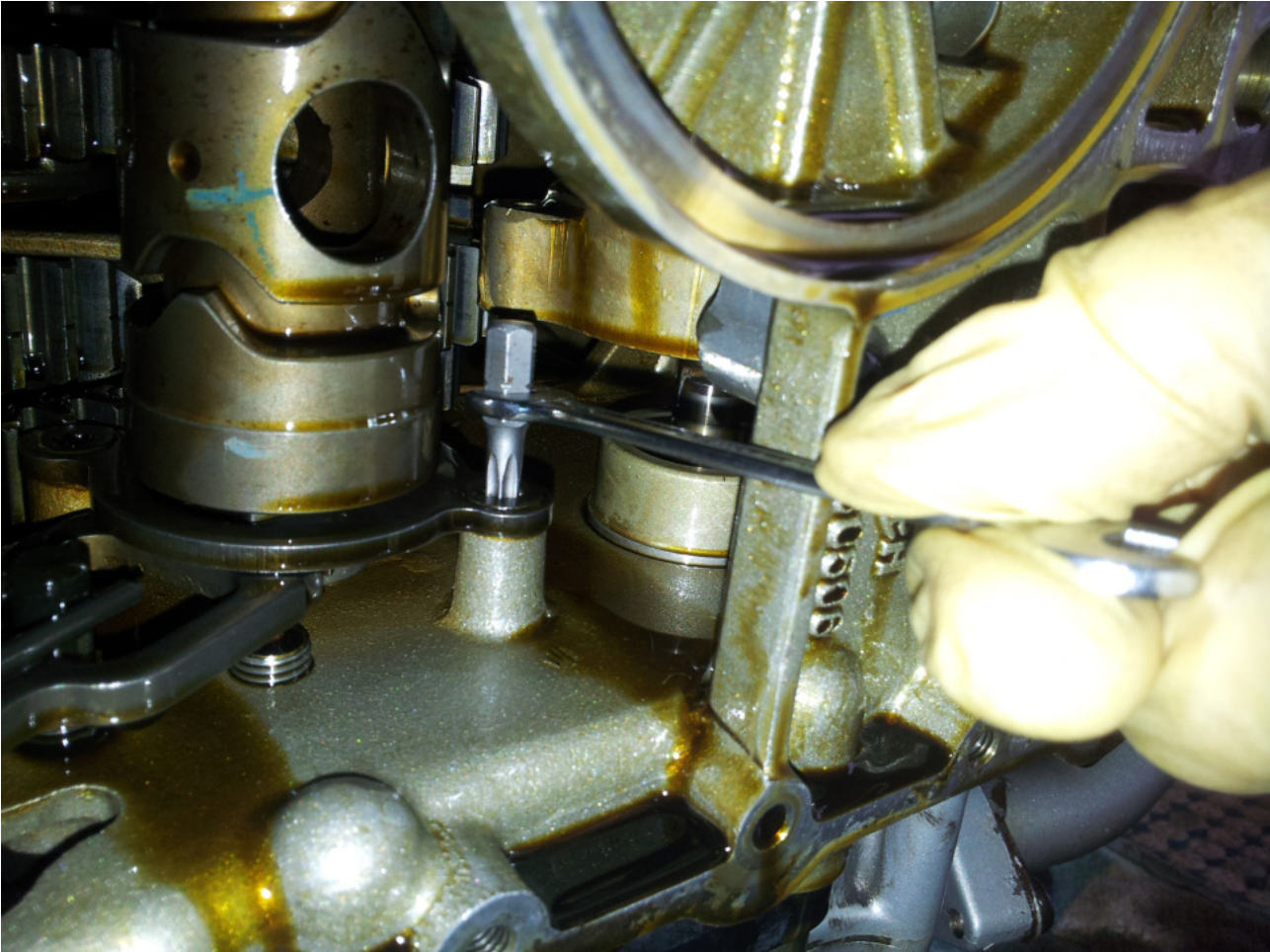
e = circlip, spring locating bush, and the gear lever centering/return spring

Remove the circlip at “e”, remove the bush and spring.

Now you need to loosen the two screws holding the retaining plate on. I used a Torx bit hammered into a 6mm claw spanner to do the job. It's a very tight location, but you might be able to get in with a socket wrench and flexi adapter.

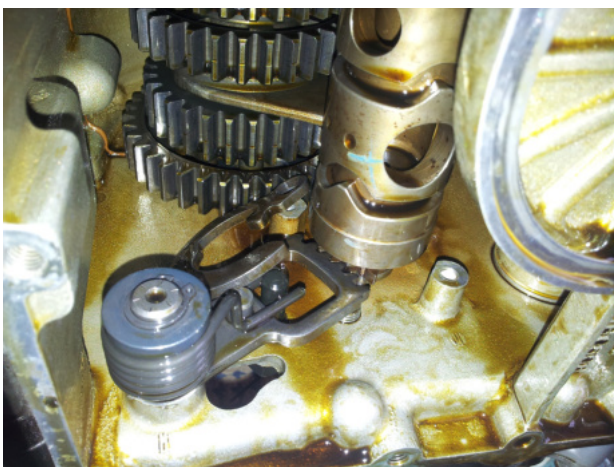


Here's how I did it:





Next remove the retaining plate (b) by holding the right side of the plate and rotating it clockwise while pulling it back and toward you, like so:



And we're now left with this:





I then used a short socket extension bar in that hole in the selector drum to rotate the entire drum clockwise so I could disengage the selector quadrant:



It might help to jiggle the rear wheel forward and backward a little in order for the gears to engage/disengage allowing the drum to rotate easily. I'm really not sure if I needed to do that (I've forgotten!), but just see how it goes.

Once it's clear of the selector drum teeth, you can simply lift it out:





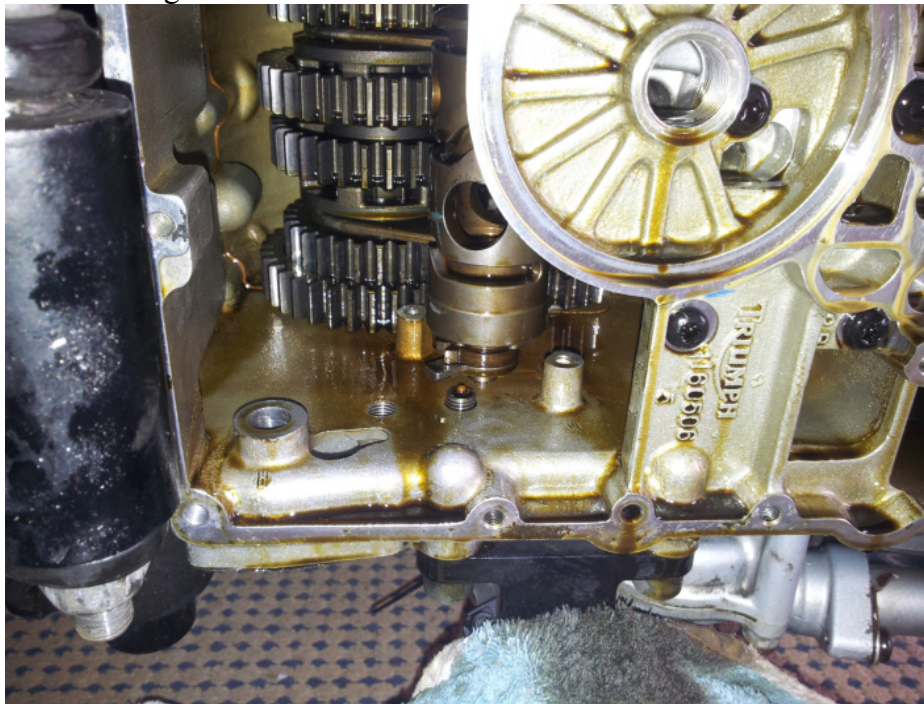
....and Bob's your uncle – the offending article finally removed -



Now the party is complete -



And should look something like this -



Clean up any oil and the gasket faces.



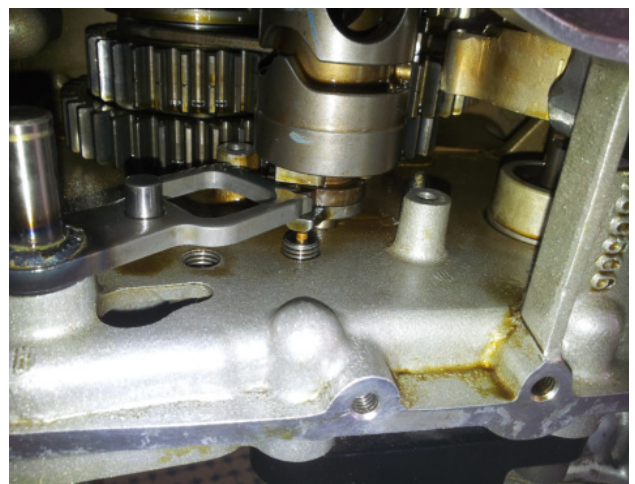
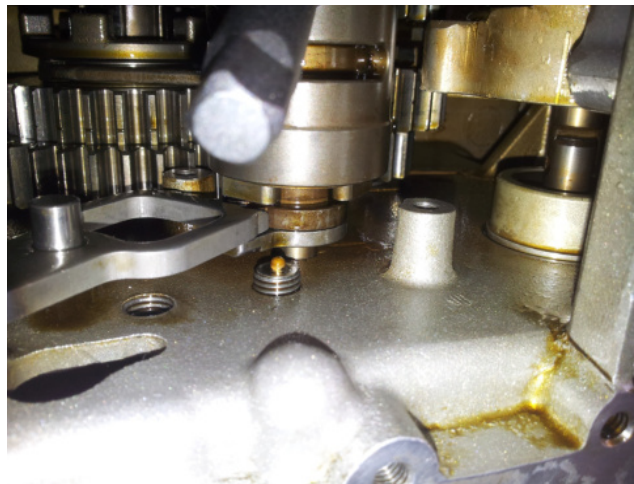
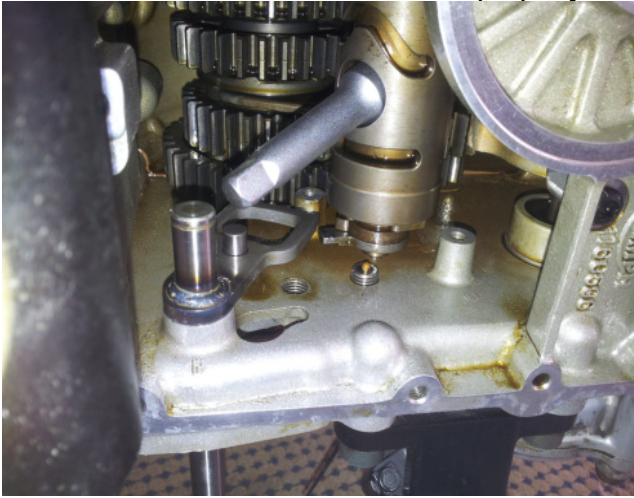
Remove the oil strainer pan from the sump and give it a good clean out. You'll be amazed at what you find in there, I found a brand new copper washer along with bits of old gasket, silicone sealant, and bits of bearing shell! I just hope they were from a previous repair :S.



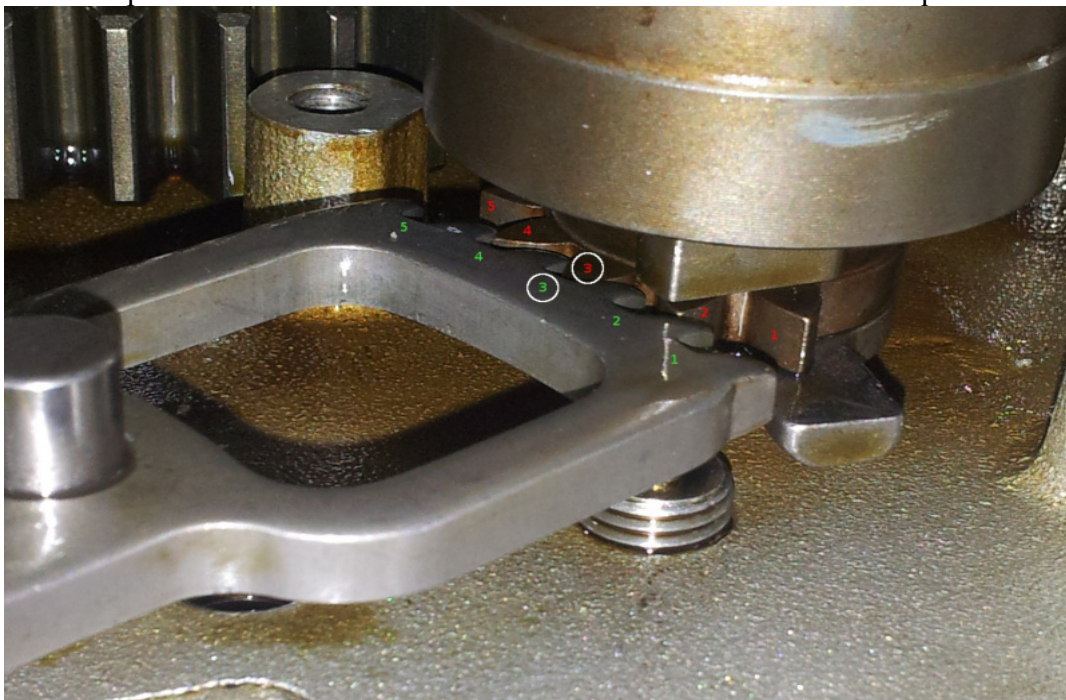


## Reassembly

Oil the new quadrant piece and slide it into it's hole. Use your short socket extension again to rotate the selector drum and mesh the teeth properly.



You need to end up with the middle tooth of the drum in the middle hole of the quadrant -





Don't panic, if you don't get it right first time, simply go back and try again. Don't worry about messing up the gears, or them going “out of sync”, it won't happen because the retaining plate is not there :).

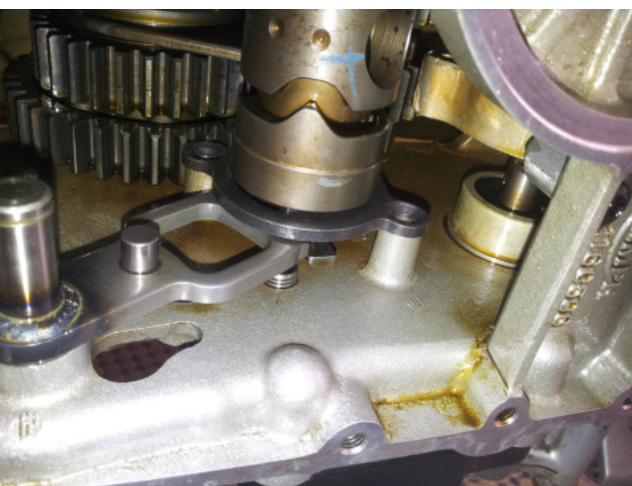
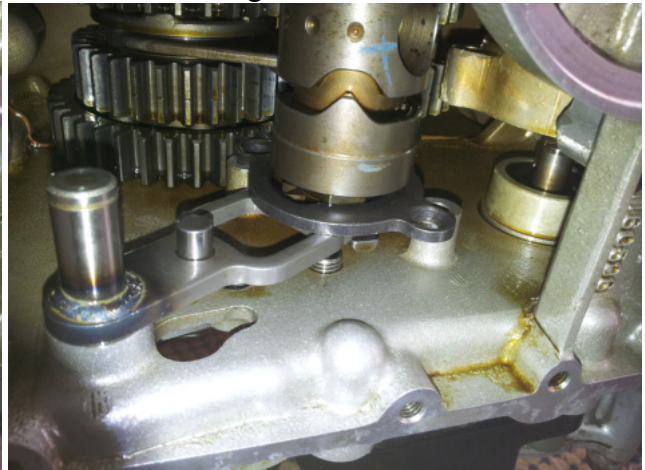
This was my biggest worry of the whole job, as nobody had explained it in any detail. Thankfully it turned out good and I didn't need to worry so much, so now you don't either.

Again I think jiggling the wheel backwards and forward helps the gears engage/disengage, and the drum to turn freely.

Next comes the second part that had me worried – installing the dreaded retaining plate. This went in far too easily on my first attempt, so I assumed it couldn't be right and proceeded to remove it to try again. Big mistake, as it somehow got jammed under and behind the selector drum and it took half an hour of swearing, crying, and praying to the gods of motorcycling to get it out again!

I had to rotate the drum nearly all the way to 6<sup>th</sup> gear to get it out, but thankfully it worked.

Anyway, to insert the retaining plate, hold it by the front screw hole and insert it's tail (rear screw hole) to the back of the drum and rotate it towards the front of the engine -





And get those screws in pronto -

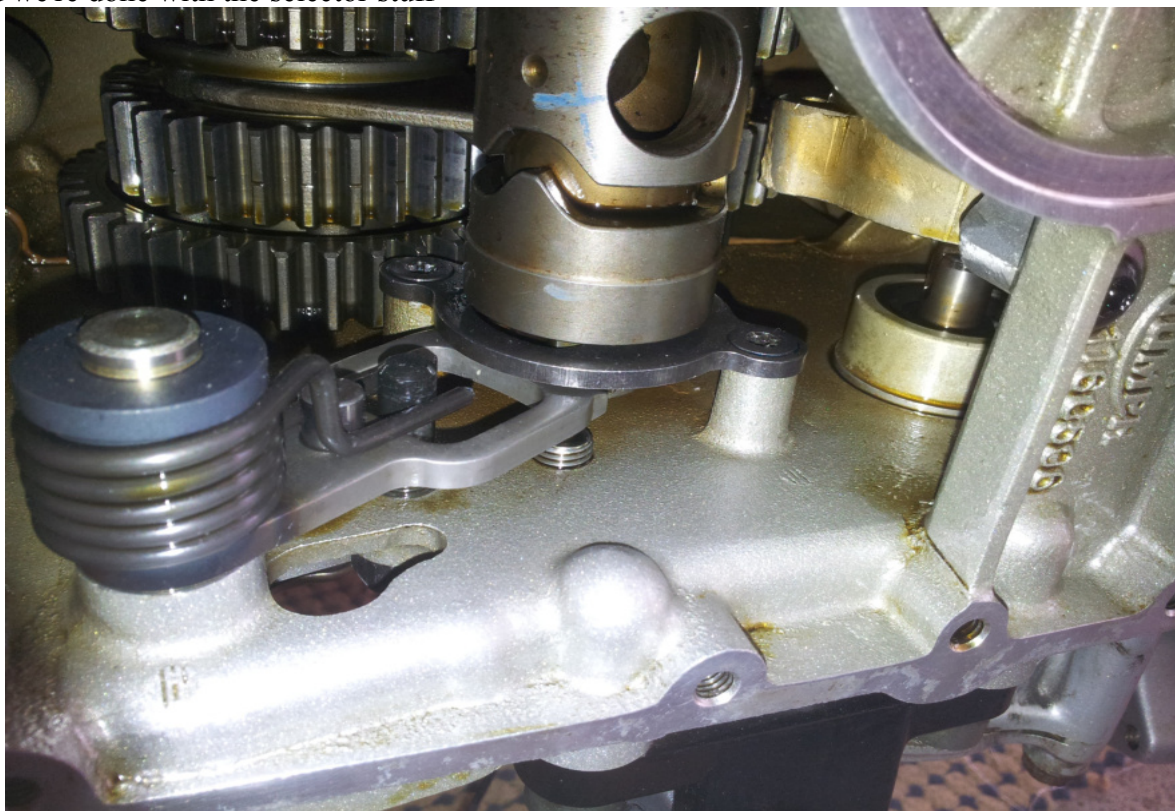


Locate the screws in their threads but apply a bit of Loctite before you screw them home, you really do not want them to come loose while riding!

Again use either your bodged spanner with Torx bit or Torx socket with extension and flexible adapter to tighten them home.

Next Screw the spring centering bolt in from the sprocket cover side (and tighten it if you want to/can), then replace the spring and attach a BRAND NEW circlip. I shouted that because it's really not worth scrimping on a 50 cent part only to have it fall off later due to vibration!

And we're done with the selector stuff -



It would be wise to attach your gear lever at this point and try out all the gears to make sure all is well. Again jiggle the rear wheel to allow easier shifting. If something is not right, go through everything again till it's working. If still not right – cry!



If you don't believe me about the circlips, then here's what they look like after removal, even when using a circlip plier -



See what I mean? It's really not worth the risk.

Re-attach the oil pipe, making sure the banjo bolts are tight, but don't overdo it as they will snap off! I think the torque setting is only about 12nm, but not sure. If unsure consult the manual.

Clean the sump nicely, and don't forget to re-attach the (cleaned out) strainer and tighten it.

Here's a nice picture of a clean sump! No real reason, I just thought it looked nice -





TIP: Remove the oil level window and give it a good clean while you've got the opportunity :).

I used silicone gasket sealer to cover the engine side of the sump face with a light film, that holds the gasket in place. Also place a few blobs on the big oil filter O-Ring to hold that in place. Apply silicone sparingly to the sump's gasket face, and slap the sump pan back onto the block, making sure that big O-Ring stays put. Insert the 2 centre bolts and work your way around the sump till all the bolts are in place.

Tighten in a gradual cross sequence, don't do each bolt up tight right away, do them gradually tighter as you work around the sump.

Insert your oil filter and make sure the drain plug is in and everything looks right.

Re-attach the suspension linkage, using Loctite on the nut and tighten it to 100nm – that's VERY TIGHT on the “ArferBrick scale of tightness”.

Now you can stand the bike back on it's wheels.

In the sprocket cover opening, place the spacer washer and circlip over the gear shaft, and make sure that 14mm black bolt is tight before gluing a new gasket onto the gasket face and re-attaching the sprocket cover and tightening it. It helps to remove the clutch pushrod before fitting the gasket and cover. Make sure you use silicone sealer on the bottom part of the gasket as that's the only part that contains oil, and could leak.

I bought a new gear shaft seal, but didn't use it. A lot of people have had real problems with these leaking so I just left it alone, it seems OK so far. But if you have a new oil seal on hand, at least you can change it if you need to.

Next re-attach the clutch slave cylinder. A trick here is to apply engine oil to the walls of the hole it sits in. I do this because I've known one poor soul had a hell of a time removing his clutch cylinder due to corrosion. If brake fluid leaks, it can wreak havok. Smearing the walls with oil is a little bit of insurance.

Either use a gasket or use silicone on the joint face to prevent water getting in to the joint. Again this is insurance against corrosion.





Fill the engine with oil, don't forget this! I filled to halfway up the sightglass. After first start you will need to top this up as some oil is taken up in the rocker cover. Don't forget!

Re-attach the horn, battery, side panels, left hand side footrest and exhaust pipes.

Next comes the coolant reservoir (fill it with coolant), that black plastic shield thing under the tank (I forgot and had to take the tank off again :( ), and finally the tank.

Attach the seat, screw the mirrors back in, stick the key in and start 'er up :D.

Let it run for a minute or so, then turn it off and re-check the oil level and look for oil leaks.

All good? Great, ride fast and live long.

ArferBrick :).