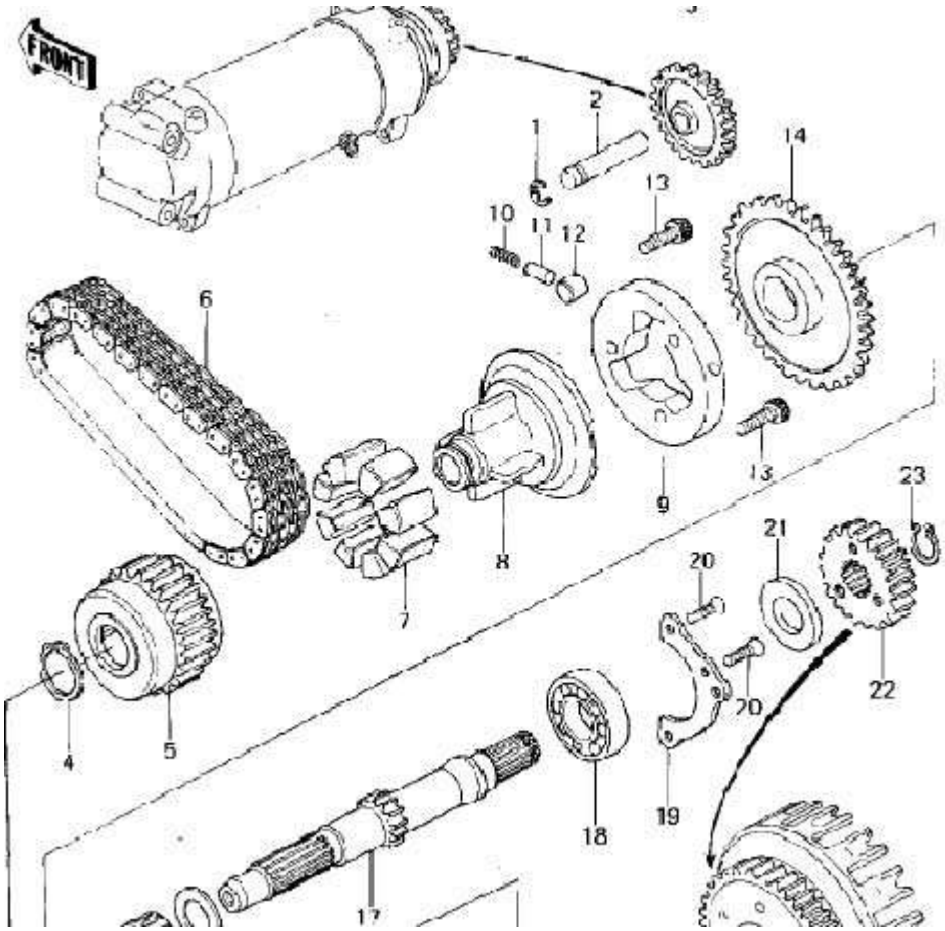
8KZ 650/750 four starter clutch repair.

Disclaimer:

The procedures for the repair are all in the manual (I have a Clymer) but in different chapters (clutch removal, oil pump removal etc.) – I just tried to compile the info and add my hands-on experience, how you apply the information is up to you, I´m not a pro and you won´t get your money back if you mess up.
(I haven´t got any anyway).



Most starter clutch problems are caused by clutch rollers binding or starter clutch springs being bent or broken thus either preventing the rollers to properly grab the secondary shaft or to properly be released by centrifugal forces once the engine is started. In both cases you are likely to hear a grinding noise (much like the sound of a Ford A horn) when trying to start the bike, the latter could also do serious damage to your starter motor. Time to put in a starter clutch repair kit: new rollers, new plungers and new springs, this is what it looks like, A1 is for the 650/750, B1 is for the 900/1000:

Note: problems with slipping may also be due to wear of the grabbing surface of the starter clutch sprocket (#14 in the pic above), if so there´s not much you can do except replace the sprocket.

Here´s what you do – since I don´t know your level of mechanical skill I´ll go through it step by step so pardon me if I´m explaining something you already know. As usual left and right refers to your view sitting on the bike and all bolts and nuts are threaded normally (lefty/loosey, righty/tighty). I´ve been told that this repair can be done with the engine still in the frame – someone compared it to doing dental work through the rectum, which seems to be a fairly accurate description. Whatever gets your rocks off, I did mine with the engine out.

If you decide to pull the engine do this first:

Drain the oil.

Remove the kickstarter if you have one.

Remove the right side foot peg.

Remove the oil filter and then the oil pan – you may have to remove the exhaust to do this depending on exhaust type. There are two oil passage o-rings sitting between the oil pan and lower crankcase - one next to the oil filter and one right behind the oil pump - don´t drop these when you remove the pan.

Remove the clutch cover, if you still have the original philips screws best use an impact driver to avoid stripping the screws – if you choose to replace the phlips screws with stainless allen bolts note that standard size 6 mm bolt lengths jump in 5mm increments and may be ever so slightly longer than the stock screws, put a washer under each bolt to prevent them from bottoming out before the cover seats properly).

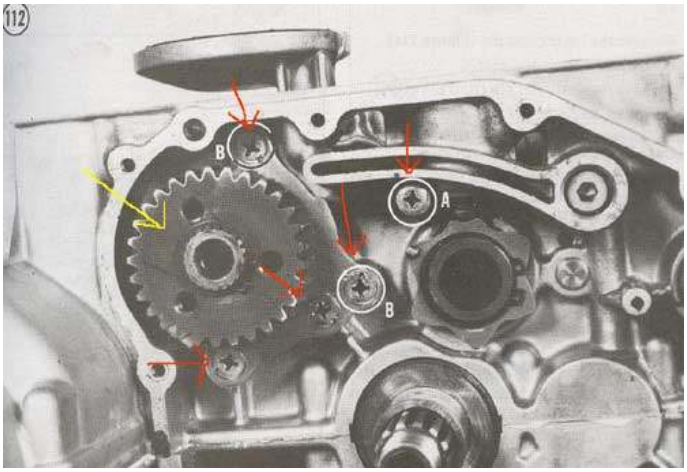
Remove the 5 clutch bolts, spacers and springs, then remove the stopper plate and clutch plates/friction discs. Take note of which way the plates/discs face, when reinstalling they should go in facing the same way they came out, starting with a friction disc.

Pull out the lifter plate sitting in the center of the clutch basket. There´s a small steel ball between the lifter plate and clutch pushrod, take care not to lose it when you pull out the lifter plate.

Next to remove is the clutch basket, this is best done with the engine still in the frame. The clutch hub nut can be a real bitch to remove, it´s torqued to 108-160 Nm (80-118 ft.lbs) and is also tightening itself as the engine spins. The clutch spins counterclockwise (opposite direction of the wheels), so attempting to loosen the nut will make the bike move forward. Best way is to use air tools or an electric impact driver. If you don´t have access to any of those set the front wheel against a wall, engine in first gear and use a breaker bar to gain leverage. (Alternatively you´ll need a clutch holder tool, Grabbit or similar). When the hub nut comes off you can pull off the lockwasher and the clutch basket – don´t drop the needle bearing. There´s a spacer behind the clutch basket, when reinstalling this the flat side of the spacer should face out. The lockwasher behind the hub nut is marked "outside", obviously this should face out too.

At this point you can either pull the engine, which will in turn require the removal of carbs, exhaust, chain and misc. electrical connections or you can decide to suddenly become an amateur proctologist and go ahead with the job, your call.

Remove the secondary shaft gear (marked yellow in pic 1), it´s held in place with a circlip, and the spacer behind it. (Note: this is not absolutely neccessary, I removed mine because the body of my impact driver would hit it when trying to remove the bolts). Then remove the 4 bolts holding the secondary shaft bearing bracket plus the bolt A (all marked red in pic 1), you´ll need an impact driver for these as they are staked - remember to restake them when reinstalling, also a good idea to apply some blue Loctite to the bolt threads.



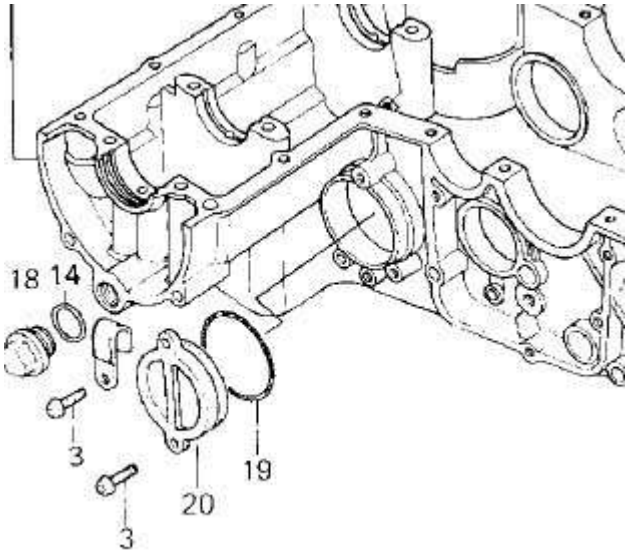
pic 1 (engine is upside down)

When the bolts are out you can remove the bracket and the oil pump. Be careful not to drop the two dowels holding the oil pump when you remove it.

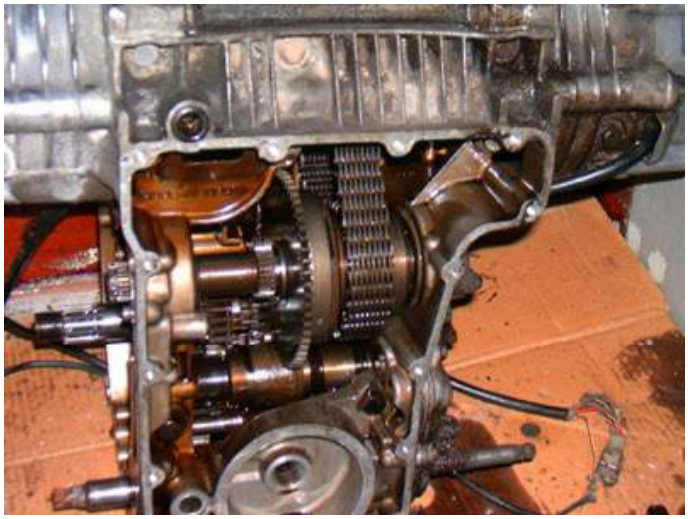
On the left side of the engine remove the sprocket cover and the starter motor, the latter to gain easier access to the bearing cap.

Still on the left side of engine right behind the alternator remove the bearing cap (item 20 in pic 2), and use a wooden drift to tap out the secondary shaft to the right. The right side bearing behind the secondary shaft gear will come out when you do this - once you release the shaft from the left side bearing it should slide right out.

Hold on to the starter clutch assy as you slide out the shaft, once the shaft is out you can disengage the starter clutch from the primary chain and pull it out. Remember to take note of the order of parts, washers etc. so you can put it back in correctly.



pic 2 – bearing cap is #20



pic 3 – oil pump removed

To access the starter clutch pistons and springs separate the starter sprocket from the starter clutch and remove the 3 allen bolts (pic 4) and flip the top over (pic 5) - swapping or cleaning the springs, caps and rollers is fairly obvious, do one at a time so you have the others for reference. Make sure the rollers move freely with no binds, you might want to touch up the sliding surfaces of the starter clutch with some fine grade sanding paper to ensure no binds. When reassembling the assy apply a bit of blue Loctite to the bolt threads and tighten them good, you do not want them to come loose inside your engine.

pic 4 – starter clutch w/starter sprocket removed

pic 5 – starter clutch dissassembled, top flipped over

When reinstalling fit the starter clutch assy including the starter sprocket into the primary chain (getting it in can be a bit tricky, just be patient and don´t loose your cool) and remember to fit the bearing cap (item 20 in pic 2) to avoid driving out the bearing when you tap the shaft back in. Also make sure that the starter

sprocket is in mesh with the idler gear connecting it to the starter motor before you tap the shaft all the way in.

Reinstall the bearing behind the secondary shaft gear and reinstall the oil pump and bearing bracket - apply a bit of blue Loctite to the bolt threads and stake the bolt heads once they´re tightened down.

Install the spacer, secondary shaft gear and circlip.

Refit the oil pan with a new gasket and torque to spec (6–9 Nm = 5–7 ft.lbs). Refit the oil filter and torque the filter cover bolt to 18-22 Nm = 13-16 ft.lbs.

If you pulled the engine, this is where you put it back in the frame and remount the chain to refit the clutch basket and hub nut.

Reinstall the clutch basket (the spacer behind it should have the flat side facing out, the washer under the hub nut is marked ”outside” on one side) and torque the hub nut to spec (108-160 Nm = 80-118 ft.lbs). When you tighten the nut with the engine in 1st gear the bike will attempt to move backwards, set the rear wheel up against a wall and sit on it to prevent the rear wheel from spinning. I´m fairly light (175 lbs.) so I had to stick a broom handle in the wheel. Again air tools or an electric impact driver will make the jo easier.

Reinstall the steel ball and lifter plate, refit the clutch and mount the clutch cover with a new gasket.

Reinstall the starter motor (apply a little oil to the o-ring) and the sprocket cover and check your clutch adjustment.

Reassemble whatever you disassembled, fill up with app. 3.7 quarts (3.5 liters) of fresh oil, press the start button and do a little happy dance as she fires right up – at least I hope she will.