

Quick access to clutch and gearbox on Guzzi big-twins with a Tonti frame ("crab the frame" – Pete Roper)

The following is a tip for Guzzi big-twins with a Tonti frame (before the spine frame generation of V11 etc.) to get access to the rear part of the engine, the clutch and flywheel assembly and the gearbox itself, without dismantling and lifting off the frame. The technique is to tilt the frame up in a quick and easy manner. It is easy to believe that you need to completely take apart frame and engine in order to get access to the gearbox and clutch. Not so!

Advantages

The advantages of "crabbing" compared to lifting off the frame, are the following:

- you take apart fewer connections between the frame and engine/gearbox
- easier to carry out, can be done easily by one person with very little use of muscle power
- takes less space in the garage compared to wheeling frames about
- quicker and easier to get everything back into its place again

Procedure

The first time you do this there will perhaps be a bit of hesitation on the way ('*am I doing this right?*'). You will experience that the second time around you'll get into the clutch and back out again and having the bike on the road again in two ticks! Leaving you full of respect for the incredibly simple, functional and in my opinion quite genius design of the Tonti frame!

- 1 Support and block the engine and gearbox properly on level ground. (When the bolts holding the centrestand are loosened at a later stage the stand will collapse!). Poor support was the number one frustration the first time I tried this method and doing this properly is well rewarded at a later stage in the process!
- 2 Off with the tank, the battery out, and off with the plate connecting frame and gearbox under the battery. *Tip:* Keep bolts&nuts coming from the same 'area' on the bike together so you need less guesswork when time comes for assembly.
- 3 Off with the front wheel, perhaps not necessary if the bike rests on a very high platform so that the frame can be tilted forwards without the front wheel touching the ground (perhaps only with professional jack systems?).
- 4 Off with silencers and rear wheel. This means unbolting and lifting off the brake calliper, and hooking it up in a string, just like you would do when changing a tyre. (Don't open nipples or pipe/ hose connections to the brake system).
- 5 Off with the swingarm, which means disconnecting the lower attachment for the shocks. Use a string for suspension of the swingarm while disconnecting the front end of it at the bearings. *Tip:* If you remove the rear drive (only four nuts), the swingarm will be much easier to handle, and you get access for lubricating splines.
- 6 Disconnect the lower end of all wires (clutch, throttle, speedo, revcounter(?) and whatever else on your bike that can get pinched or stretched when the frame is tilted up from the engine/gearbox. Loosen connections to the brake pedal and gearshift and the electric connections to the starter and the gear neutral switch. *Tip:* As for the speedo, disconnect the wire&hose only, **NOT** the part that on the gearbox that is holding the wire. If you dismantle the speedo assembly - with its axle and all - while the gearbox sits in the bike, it is very likely that the little hardened washer from underneath the speedo gear is getting lost into the gearbox. From there onwards your only next move is to get the gearbox up on the bench and dismantle it before even thinking about driving the bike again.

7 Disconnect the rubber hoses for the ventilation of the gearbox and crankcase (only the one end of each of the hoses going to the engine/gearbox).

8 Off with the footrests and the frame bolts, but **NOT** the long bolt going through the timing chest, that on some bikes is also attaching the side stand at the front of the engine. (*Fig.1*). The frame is later in the process being tilted up using this bolt as a 'hinge', i.e. the bolt/nut should be loosened, not pulled out! Don't forget to remove the frame bolts at the front, attaching the lower frame rail to the rest of the frame.



*Fig.1 – The long bolt through the timing chest is loosened, but **NOT** pulled out!*

9 Dismantle the long bolt attaching the centre stand to the gear box. *NB* the stand will now collapse, requiring proper support of the engine&gearbox



10 Tilt the frame (*Fig.2*), i.e. tilt the entire frame up using the bolt through the timing chest as a 'hinge', while constantly checking that there are no connections you have overlooked, that get pinched or stretched. Depending on you bike model there may be one or two more connections to undo.

Fig.2 – Tilt up the frame (a bit of 'cheating' that the gearbox/clutch is already out in this picture!)

11 When the frame is tilted up sufficiently high, block it with a piece of plank between the frame and the cylinders. You have now got full access to the gearbox, clutch and rear part of the engine. (*Fig.3*).



Fig.3 – Block off by using a piece of plank.

- 12 After the end of the job, and the gearbox is bolted back on the engine again, the frame can be lowered back into position while watching carefully that no wires etc. get pinched or stretched. A bit of judicious wiggling, and everything can be put back in the opposite order. Remember one round of checking the tightness of all bolts including the long one going through the timing chest!

Assembly tip (1): Put all the bolts for frame, footrests, battery plate and gearbox, centrestand and og gearbox back into their holes **BEFORE starting to tighten any of them**. Thereby you avoid the frustration halfway when it appears some of them "do not fit"!

Assembly tip (2): Make sure the swingarm gets properly centred by checking that the stub axles stick out the same length from the frame on both sides, using the back of a measuring calliper as described in the workshop manual. You thereby prevent unnecessary forces on the U-Joint and the carrier bearing for the UJ.

Assembly tip (3): Put back the rear wheel **BEFORE tightening** the four nuts attaching the rear drive to the swingarm. You thereby avoid a possible frustration of not being able to put the rear axle easily through the rear drive in case it became slightly twisted in relation to the swingarm.

Assembly tip (4): Use the opportunity to clean and lubricate (grease) all splines from gearbox to rear drive seeing you're in there anyway.

Assembly tip (5): Use the opportunity to clean and repack the swingarm bearings with grease seeing you're in there anyway.

Assembly tip (6): Clean and lubricate the (very fine) threads for the stub axles as they otherwise tend to corrode. Don't be too heavy-handed when starting to screw they stub axles into the frame. Damaged threads is bad news for the frame.

Assembly tip (7): Some Guzzisti claim the carrier bearing for the U-Joint should be changed whenever the swingarm is off as this bearing is doing a tough job, it is cheap from your local store (SKF 6206-2RS1 for newer bikes Ø30mm diameter, respectively SKF 62/28-2RS1 for older bikes such as V7 with Ø28mm diameter). A failed bearing can cause an expensive havoc from what I hear! For the same reason don't even think about changing an expensive UJ without also including a new bearing! I changed my "ok" bearing on my LM3 in connection with a change of a "not too bad" UJ and found to my surprise that the old bearing felt quite 'notchy' when I got it out and turned it with the fingers. Happy to bin it!