

## Good news for Guzzi mechanics – special tools!

*Rolf Halvorsen (member of the Norwegian Moto Guzzi Club) has made available a set of tools to tackle the tricky parts of the big-engine Guzzis at a price of nearly at-cost. For workshops and fellow Guzzisti having interest in doing own work on the engine and gearbox, this is a great opportunity to purchase a set of special tools of a very high quality that is virtually impossible to find at dealers.*

### Contents of the toolkit

The toolkit contains three pipe sockets of highest professional quality - some of which are very difficult to source - and enables you to tackle nuts that often give problems on large-engine Guzzis. Two sockets fit peg-nuts (*Fig.1*) where alternative Guzzi special tools are not known for their high quality, and besides that will not fit ordinary square half-inch wrenches like those of the kit. A third socket is a modified hex power-tool pipe (*Fig.2*). Each socket is surface treated and engraved with the respective MG part number for the nut to which they fit. The kit also contains a tool for pulling the alternator off the front of the crankshaft (*Fig.3*) and a tool for centre-positioning and pre-stressing the clutch on assembly (*Fig.4*).



*Fig.1 - Peg-nuts of two sizes, for the **crankshaft (front)**, and clutch boss on the **gearbox** respectively.*



*Fig.2 – Modified hex-pipe socket for the nut on the output shaft at the back of the **gearbox***



*Fig.3 - Tool for pulling the **alternator** off the front of the **crankshaft***



*Fig.4 - Tool for centre-positioning and pre-stressing of the **clutch** on assembly*

## Use of the toolkit

### Tool for pulling off the alternator

The tool for pulling the alternator off the front of the crankshaft (*Fig.3*) puts an end to chopping up Torx- or Umbraco keys and wondering if you measured correctly and will get it out of there again!

### Hex-nut on the output shaft at the back of the gearbox

On this nut at the back of the gearbox (*Fig.5*) you get such a small contact surface with tools that ordinary 27 mm sockets (has to be a deep/long type) do not get a proper grip on the nut, which may damage the nut and you got a big problem. This nut requires among the highest torques for tightening on the entire bike so this is a critical position! The socket in the toolkit is a 27 mm power tool socket (*Fig.2*) where the end has been modified so that it makes a grip right to the bottom of the nut, even with the seal in place! The socket is of a type with rounded off inner corners so that the corners of the nut do not get so easily damaged under high torques.



*Fig.5 - Nut on the gearbox output shaft*

### Peg-nut at the front of the crankshaft

A desperate and destructive method for dealing with this special nut (*Fig.6*) is hammer and chisel. Alternatively there exists an original special tool, but the quality is not known to be very good and torquing the nut properly is not easy. Fortunately a producer of sockets has been sourced that is prepared to specially modify a high quality peg-nut socket (half-inch square for the wrench, see *Fig.1*) to make a perfect fit with the nut so that damage does not occur. In case your peg-nut is already damaged, the MG number is 93601026 (alternatively SKF KM5 at your local hardware store). A new lock washer is required every time it is opened, MG-number 95028025 (alternatively SKF MB5 at your local hardware store).



*Fig.6 – Peg-nut at the front end of the crankshaft. (this is a Guzzi V7, i.e. without a timing chain, but with sprockets made of steel!)*

### **Peg-nut at the front of the gearbox (in the clutch-boss)**

This peg-nut (*Fig.7 og Fig.8*) is slightly smaller than the one on the crankshaft, but also this nut requires hard tightening, although the torque is not specified as far as we know. A **new lock washer is required** every time it is opened, MG-number 95028022. The position of this peg-nut makes it virtually impossible to attack by violent methods such as chisels, but I've experience with a desperate attempt to grind an ordinary 30mm hex socket into something that 'fits' the nut. Believe me, it's not worth the effort and mine now goes to the bin! In case your peg-nut is already damaged, the MG number is 93601022. *Tip:* If you have an old U-joint lying around DON'T throw it away! Together with a piece of pipe, 22mm outer diameter, half of the U-joint can be made into a perfect tool for holding on the output shaft of the gearbox when opening/closing the peg-nut (*Fig.9*). In case you cannot put force through the gearbox for some reason the alternative is to hold the clutch boss with a pipe wrench, well protected with a couple of layers of rubber tube.



*Fig.7- Peg-nut at the front of the gearbox towards the clutch (seen in the clutch-boss)*



*Fig.8 - Socket in use*



*Fig.9 – Make for yourself an elegant tool for holding the output shaft while wrenching on the peg-nut at the front of the gearbox. Use half of an old U-joint and a piece of pipe 22 mm outer diameter (in addition this tool is an absolute 'must' if you at some later time need to work on the bevel box!)*

### **Tool for assembling the clutch**

This tool (*Fig.4*) is necessary for centre-positioning and pre-stressing of the clutch on assembly after changing plates or dismantling of the clutch/flywheel for other reasons. Assembling the clutch without pre-stressing is - besides being a big hassle - pure gambling with an expensive intermediate plate that normally gets damaged during attempts without such a tool.

The tool is used together with a clutch boss (*Fig.10*) of the same type as on your bike (there are two types), it may well be an old worn out boss, *Fig.11* shows how it is being used. The tool consists of a 90mm M12-1,5 bolt, i.e. having threads fitting the end of the crankshaft, which happens to be surprisingly hard to find off the shelf. A sleeve made of nylon is made in the lathe to fit exactly inside the clutch boss, and together with a large washer this simple tool solves all problems pre-stressing and centre-positioning the clutch on assembly.



*Fig.10 – Tool for pre-stressing and centre-positioning of the clutch, seen here with a clutch boss.*



*Fig.11 – Tool being used together with the clutch boss.*

### **What can this toolkit do for me?**

With this toolkit in your toolbox you are well equipped to undertake the following operations that otherwise could have caused frustrations, less fun and perhaps full stop in the work:

- **Change the timing chain and –tensioner.** The chain does not last forever and if you still have the original type of 'tensioner' you should exchange it with an Ago-Stucchi type that actually works the sooner the better. Perhaps a new seal in the timing chest while you're in there, MG part 90402840 (alternatively an Angus 28x38x7 in your local hardware store).
- **Access to the camshaft** for changing it or for further dismantling of the engine.
- **Opening the gearbox** for shimming of the shift drum, giving improved operation. (*Tip:* Look up illustrated instructions for this job on [www.guzzitech.com](http://www.guzzitech.com))
- **Change the clutch** or dismantling/assembly of the clutch for other reasons.
- **Change clutch-boss**, normally required when clutch plates are being changed, at least on bikes produced before the mid 1980-ies (before LM4) when the splines of the boss&plates were the shallow (2 mm) type prone to wear. Wear at this point is often the culprit when the clutch makes an idling bike crawl forward with the clutch engaged. Remember the o-rings are changed every time the clutch boss comes off (MG part 90706203 and 90706235).
- You can now **take the clutch-boss off the gearbox** for assembling the clutch together with tool (*Fig.11*). Handy if you don't have the garage full of old clutch bosses of the right type!
- You get easy access to **change gear return spring** (*Fig.12*) which is located inside the back lid of the gearbox. This spring is hardly known to last for as long as the rest of the gearbox and some Guzzisti claim it should be changed whenever the gearbox is out of the bike for any reason. (*Tip:* Don't attempt opening the gearbox while it is fitted in the bike, the lid cannot be put back unless it stands upright, besides there are problems to be self inflicted in the speedo department unless things are done in certain ways, see instructions on [www.guzzitech.com](http://www.guzzitech.com))



*Fig.12 – Gear return spring (inexpensive part, known to have limited life)*



*Fig.13 – The bearing on the output shaft (extreme left on the picture) seen from within the back lid of the gearbox.*

- **Rebuild of the 5-speed gearbox** is hardly an everyday requirement, the box is known to be tough as nails! One should however consider changing the bearing on the output shaft depending on the age of the bike. Some time in the middle of the 1980-ies the factory exchanged the old, and good, 14-ball/race bearing having steel cages (*Fig.13 extreme left on the picture*) with a 9 ball/race bearing having nylon cages. The new type of bearing can cause problems if/when the nylon cages fail, and many Guzzisti recommend changing to the old type if you want your bike to last ‘forever’. In the opposite (front) end of this shaft a similar bearing is located, working under less strain and apparently not giving any problems. The old type of bearing requires some investigation to source. SKF does not produce them anymore, but from alternative suppliers the following reference number can be useful in the search: NTN 3205AC3 or NSK 3205JC3. Failing this at your local hardware store, Pete Roper in Australia can supply them at a very reasonable cost: Pete Roper, Moto Moda, 65 Osborne St., Bungendore, NSW 2621, Australia. (e-mail: [motomoda@austarmetro.com.au](mailto:motomoda@austarmetro.com.au))

### ***Production and price of the toolkit***

The entire toolkit (5 pieces) can be purchased for a nearly at-cost price of EUR240,- plus freight.

The pilot production of ten kits disappeared rather quickly to local enthusiasts and we’ll need to see what the feedback from other fellow Guzzisti is like before starting the production of a new series. The interest will determine the size of the new series of production and to some degree the unit price for which the kits can be offered.

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