SERRATED NUT TOOLS

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Fig 1

The three images of the serrated nut tools show different construction methods of obtaining the necessary reach, access or strength of the 'fingers' to enter the serrations of a nut. Just for the record these tools were constructed for Fig 1 left, Phantom III axle pinion bearing nut, Fig 1 right, Six cylinder post war engine crankshaft damper retaining nut, Fig 2 & Fig 3, Axle bearing retaining nut on Bentley R type.

The usually way that one sees these tools constructed is by hand filing or grinding castellations onto the end of a known diameter size of tube. This type of construction leads to a weak tool, which is also inaccurate. The type of tool shown is strong, robust and importantly very accurate, meaning it will not damage the fixtures that it is meant to undo. Furthermore the tool can be constructed using the actual in situ serrated nut, as a pattern for the tool. It should be noted that the key steel described is very cheap, and available in all the popular sizes that R-R used for serrations. It is therefore worthwhile obtaining some lengths say, 12 inches long of 0.187, 0.250, 0.312 and 0.375 inch square although rectangular sections like 0.250 x 0.375 inch are available. If examples of key steel sizes are at hand it enables trial fitting into the nut serrations without the need to measure.

Fig 2

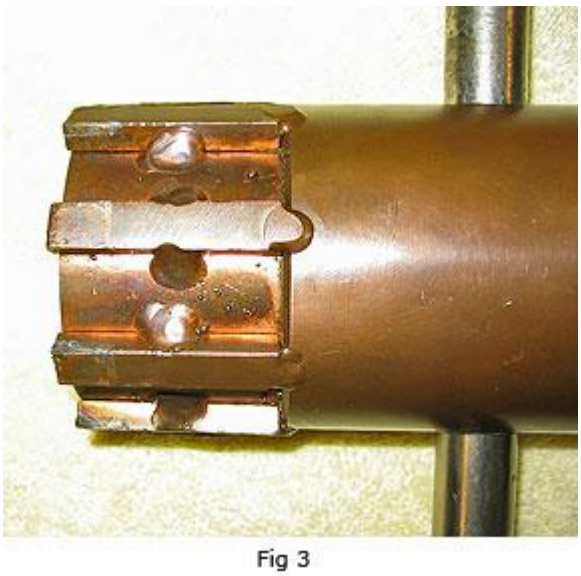

Fig 3

By way of example the Phantom III tool Fig 1 left, was made in the following way. The serrations of the nut, in situ, were measured at 0.312 inch wide. A 12inch length of suitable square key steel was obtained and nine one inch long sections were cut off. It was established that the base diameter of the serrations was 1.90 inch and a section of bar some 6.0 inch long was turned to this diameter. As the serrated nut that we wish to undo is positioned part way down the axle pinion shank, the tool must pass over the pinion shaft. In order to allow this positioning our 6.0 inch long bar was counter bored at one end to a diameter of 1.60 inch for 2.5 inches deep and at the other end a hole needs drilling through the bar at 90 deg to allow a tommy bar to be used as a lever. In the illustrations the large hexagons at the

opposite end of these tools should be ignored as they are for production purposes. At this point the bar, which in effect forms a tube at one end, is placed over the pinion end and up to the face of the serrated nut. Whilst holding the bar in this position the nine pieces of key steel are positioned in the serrations of the nut and secured to the tube with a hose clip. The assembly is then withdrawn and the nine individual pieces of key steel are tack welded to the tube. In this instance the tool was later mounted in a lathe and the ends of the key steel sections were trimmed so that they could enter the serrated nut without fouling a special bearing cage.

Serrated nut tools made in this way can be varied to suit the operational need, in some cases for clearance or strength purposes the key steel may be position inside of the tube section instead of on the outside. In other cases the key steel can run along the shank sides of the tube as in Fig 2 & 3 . Whichever method is chosen for fixing the key steel it is a far superior method, and easier to produce, than filing castellations into a piece of tube to very roughly fit the nut serrations.