The 53KN load from 150ft-lb on the nut will impart a stress in the order of 800-1,000MPa on the thin land in contact with the bearing. Assuming the TC/TCS axle is made of the same steel as the S2 shaft and has a strength of 880Mpa it will yield badly if an additional force is imparted due to the cornering leverage effect discussed in the S2 section of this report. This will quickly create the situation of a nut that has not moved, but an assembly that has worked loose, as described by 4 owners.

How to correct the situation? Perhaps to simply revert to an S1/S2 standard of drive shaft with the modifications described at the start of this report? Or bite the bullet and buy one of the after market options available?

One way of utilising the original shafts would be to increase the bearing abutment area by adding a sleeve shrunk onto the seal running diameter. This sleeve would need to be hardened, it would also need to have an abutment diameter below that of the inner bearing seal, and also necessitates a different seal, though there are many and various standard options for these.

8.0) Final summary

S1/S2 faults are caused by inadequate hardness of the spacers/axle/hub and insufficient stretch in the fastening system, the axle. However, experience suggests that if the car is driven carefully and not cornered too hard, too often, it will survive, the S2 owned and driven for 100k+ miles by my father did just that. If more enthusiastic driving is accompanied by a more enthusiastic maintenance regime, specifically periodic torque check of the hub nut, then hardware may also remain functional.

The recommendations at the beginning of the report are formulated to lower surface stresses within the S1/S2 axle system rendering it much more fault tolerant and therefore reliable. It requires no special tools to complete the changes and should ensure no deformation and loss of clamp load.

The TC and TCS failures are also caused by material deformation. Unfortunately not as simple to rectify.