TClinic

TC DIFFERENTIAL
by Robert Gibson

The TC differential is of particularly antiquated design, derived from Nuffield mass production vehicles of the mid 1930's. The thrust loading on the pinion is taken entirely by the angular contact double row ball race located in the front end of the pinion bearing housing. This bearing has very poor side loading characteristics and eventually owing to the great strain imposed upon them the brass ball cages collapse, leading to rapid destruction of the bearing. This in turn allows the pinion to "float" into the crown wheel as it has nothing to restrain it. The roller race in the inner end of the pinion can absorb no thrust. Complete failure of the differential soon occurs as either the crown wheel or the pinion lose some or all of their teeth.

In every TC differential that I have stripped which has covered any appreciable mileage, the double row ball race has fallen from its housing in a handful of pieces. Now that TC crown wheel and pinion sets are totally unavailable, this double row ball race should be inspected every 5000 miles.

This inspection may be done as follows:

1. Remove the differential cover board
2. Drop the tail shaft
3. Remove the pinion flange
4. Undo front nuts and remove the pinion assembly
5. Remove two securing screws holding the front cover plate to bearing housing.

The double row bearing is now freely removable. If it appears faulty, retract it and fit a new one. One further point, if the bearing has failed the total bearing action on the front of the pinion may have been taken by the pinion flange rotating in the bearing cover. If this has occurred the bearing cover may require building up and turning out to the original size.

If TA, TB and TC owners do not carry out the above checks regularly, more and more cars will be immobilized with permanent differential failure.

Contributed by Robert Gibson,
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One should be careful in their choice of lubricants as too much sulphur can destroy yellow metal like the brass ball cages as well as the bronze bushings and may be part of the problem described above. Sulphur additives are used to help higher pressures of tooth and shock loads. Since 1972 synthetic lubricants have become more popular and Redline does make a synthetic 80W/140 gear oil good for the TC differential and it will not harm the yellow metals.