

## FATIGUE (not STRESS) CRACKS

Elans which have been raced a lot have a bad habit of shedding rear wheels. This occurs because of fatigue cracking of the stub shaft. The axle shaft usually fails  $1/16$  of an inch outboard of the hub (see fig. 1.). A crack starts on the side of the shaft where the groove for the dowel pin is, and then progresses across the full diameter of the shaft, little by little, as the shaft is exposed to more cycles of bending under heavy cornering.

It is thought that this failure occurs here because of the combined effects of (1) the taper in the shaft ( which begins just inboard of the failure point), (2) the notch left in the bottom of the dowel groove by the sharp end of the dowel, and (3) the sharp edge (arrow in fig.2) left when the dowel groove is cut into the shaft.

The proposed solution is to (1) round the end of the dowel ( as shown in fig. 3), (2) round the sharp edge of the dowel groove for the first  $1/2$  to  $5/8$  of an inch (brackets in fig. 1.), (3) remove the notch from the bottom of the dowel groove, and (4) shot peen. Of course, these modifications will not save a part which has already begun to crack.

It is also recommended that racers periodically pull their rear hubs, polish the critical area with 500 or 600 sandpaper, and visually inspect for cracking. The cracking takes many hours of high speed cornering to pass across the diameter of the shaft, and so can usually be caught by a regular inspection program.

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