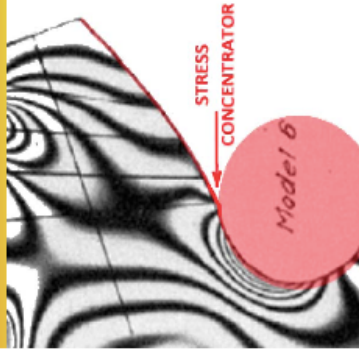


## 1016 and the Le Mans Classic - Part 2



In the last issue, Claude had just discovered that P1016's catastrophic gearbox failure in the 2012 Le Mans Classic had been caused by stress concentrations, where the gear teeth had been improperly ground.

The more I analyzed the gears, the more I became convinced the line I saw came from an error in grinding the teeth, where the root grinding and the profile grinding did not match perfectly, leaving a step between the 2 machined surfaces.

If that was the case, we needed to check immediately whether the new gears that came with both gearboxes carried the same marks. The box we had used at Goodwood had not been stressed, as it had rained most of the time, making it difficult to put full torque on the gears.

We decided that Trevor would inspect the gears in the 2 assembled gearboxes. If these had the same problem too, I knew we would have the same problem again this year.

I decided to ask Hyten, an engineering group specializing in high performance gearboxes and engines, whether they could think of a way to smooth out this stress raiser, at least to diminish its impact. I had worked with them before on various engineering projects and Bruno Meignan, one of the owners, spoke to me during that week. He first of all confirmed there was a definite stress raiser, and then that it would definitely cause gears to fail at much lower loads than designed for.

The only solution he could suggest was to send all the gears to a company they knew in Le Mans (of all places), to have them shot-peened on their contact surfaces. We hoped we had time for them to go, be masked, shot-peened and come back in time for

Trevor to assemble both boxes the second one had arrived in the meantime).  
From there on all I had gone to plan and we had taken the cars to Magny Cours to be tested on the evening of 2<sup>nd</sup> July.

Just before leaving for Le Mans Trevor sent the following to Lee Holman:

We have received the transaxle KKL729R1 and the parts to rebuild KKL738.  
I have opened the side cover (gear selector) of the rebuilt KKL729R1 with Mr Nahum and Mr Meignan.

We have noticed that the final grinding/finishing of the gears has left a mark across the teeth. This mark is in the root of all the teeth on all the gears, (some marginally less than others).

In looking at some of the failed parts from KKL738, we have deduced that the teeth have failed at exactly that point.

We are concerned that, if we run the transaxles in this state, we will end up with a similar failure this year.

Hence, we have disassembled KKL729R1 and Mr. Meignan has sent all its gears, as well as the gear set for KKL738, for specialist shot-peening in order to remove these marks.

Whilst disassembling KKL729R1, I came across a few eye openers:

- I noticed that the cluster gear does not have the aluminium plugs fitted, as on all the other cluster gears that I have seen. Was this done for any particular reason?
- The lip seal at the front top of the gear unit FoMoCo XW-7003 appears to have been damaged at some stage, (as if it has had swarf pass through) and has not been replaced.
- The hole where the cluster gear shaft locates in the front of the casing is oval and has had to be sent for bushing.

Testing at Magny Cours revealed no problems, other than that the car jumped out of 3<sup>rd</sup> gear when not fully loaded. That meant that every time I lifted off or needed to coast in gear, for even a very short interval during braking or otherwise, the car was out of gear. It gave me a few hairy moments that evening, but I had decided I could do nothing but drive in such a way as to keep my hand on the gear-lever when I was in 3<sup>rd</sup>, which meant I had to steer with my left hand!

During the 2 practice sessions at Le Mans, I had forgotten a few times and got the car all out of shape in the corners that followed. A couple of friends had suggested I cut a piece of tyre inner tube and hook it over the lever to pull it into the upper gate, but I didn't think I could get it to create enough pull without

## by Claude Nahum >>



pulling the lever out of 2<sup>nd</sup> or 4<sup>th</sup>, which I definitely didn't want.

So, I had started the first race with things as they were. ONE lap into the race I was AGAIN parked at the side behind a safety barrier in the middle of the miserable, drizzly, night completely dejected, watching cars going by while the adrenalin of the race start was leaving my system.

I had plenty of time to simmer down, as the race ended just about midnight. I had to wait another quarter of an hour for a truck and to get hoisted onto the back, followed by a long drive through the forest waiting for various gates to be unlocked and locked again as the truck went through them, to end at the paddock roundabout at a quarter to one at night. I was getting quite good at sitting in P1016 on top of a truck, driving around the forest at night at Le Mans.

On the truck I had thought about this situation and came to the conclusion that if Trevor could fix the problem, I would try my best to go to the end of the next race.

Bernard had been back in the paddock for some time and was ready to go to the caravan we had rented in the Parking des Houx to sleep for a few hours.

I explained to Trevor exactly what had happened, hoping it would give him some clues. He told me not to worry, to go to sleep and that the car would be ready in the morning.

The second race pre-grid time was at 0639, which meant we would have to leave the paddock about 30 minutes before, around 0600. The way we liked to manage the race meant being ready at the paddock at 5 in the morning, so we didn't waste any time and left for the caravan to take a shower and get a few hours' sleep. It rained in the night and I could hear the drops on the thin roof amid the car noises, but we still slept for around 3 hours.

Back in the paddock area before dawn, I discussed what had happened with Trevor and the other mechanics. In fact, they had worked all night - first finding an alternator combined with a regulator, to replace the unit that had given up. The difference in the alternators had required some new wiring, then they all had worked to change the engine on the T70. We had had a bit of rest; they, on the other hand, looked bushed.

I went to the Pilot's Club for a bite of breakfast before waiting to be called out. Dawn had just broken on a cloudy sky, but I was in no hurry since I would have to leave the paddock last, not having finished race one.

Once on the pre-grid, I was effectively the last car behind David Ferrer and Mr John of B in their yellow Ligier JS 3 DFV, since they had also left the first race at some point.



On lap 8, going down the Hunaudières after the first chicane, it started raining in earnest. At times it became difficult to see through the windscreen. A bit

