

## Leaking Rear Axle Seals

After a number of years running on the track, I decided to have a good look at why my rear axle seals leak. The problem was that on the road there was no leak evident but after a hard day on the track, there was a real leak problem on the loaded wheel. The loaded wheel being the one on the outside of the circuit. The left seal leaked at Wakefield (clockwise) and the right seal at Oran Park (anti-clockwise).

I had changed the seals a number of times but new seals made no difference. The last time out at Wakefield Park, the leakage finally became too bad to ignore any more. Also I had entered my car in the Tasman Revival meet and did not think I needed to lubricate my rear brakes on one side for the fast Eastern Creek circuit. This meant further investigation of the problem.

When I built the car ten years ago, I had the diff set up by a diff shop but set up the end float of the axles myself. If you look in the manual, you will note the specs are 0.004" - .006". When I checked mine this time, I found it to be 0.008". I had not checked it during past seal replacements as I was not changing the axles or bearings. To understand why this was an issue you need to understand how the axial load on the wheels is handled.

Unlike the Lockheed diff which uses ball races for wheel bearings, the Girling utilises tapered roller bearings. Side loading on the Lockheed wheels is taken up by the wheel bearing (ball race) on the wheel being loaded. You go around a right handed corner and the load on the left wheel is taken up on the left wheel bearing. With the Girling set up it is the opposite. The load would be taken by the bearing on the opposite side of the axle.

The diagram shows the Girling set up. If we follow the thrust from the right wheel it goes as follows. Thrust from the wheel to the axle, through the axle to the spacer in the diff. From the spacer to the left axle, through the axle to the left wheel bearing. It can be seen therefore that no thrust is being taken on the right wheel bearing. The right bearing is only taking the radial load of that wheel.

Remember this is a tapered bearing, like the front wheel bearing. As such the inner race (and axle) of the right wheel bearing would not be running in the centre of the outer race. Providing the end float is within specs, the seals are designed to handle this out of centre condition.

Now, if like mine, the end float was excessive at 0.008", the side play would be much more, because it is a tapered bearing. You know how much side play you can get with a loose front wheel bearing. The rear seals on my car could not handle this extra side play and as such leaked. This time I adjusted the end float to 0.004" and fitted new seals. After three days of competition.....not a signe of a leak.

The lesson here is that if your Girling rear axle seals are leaking, check the axle end float.