

High Speeds on *The Red Devil*



Red Devil in full flight with the Orange Express, Kimberley-De Aar, 1991 [photo: Richard Niven]

On page 287 of his book “The Red Devil and Other Tales from the Age of Steam”, Wardale described his attempt to have 3450 tested at high speeds. He wrote as follows:

Something that was requested but not authorized was a high-speed test. I had already discussed this with the train dynamics section during 1982 and floated the idea of seeing just how fast 3450 could go, perhaps on the electrified Sishen-Saldanha iron ore line where track conditions were ideal for high speed running. When arranging the indicating test, I made a written request for authority to make such a test for the purpose of obtaining engineering data at high speed and for publicity reasons. I stated that 160 km/h should have been attainable on level tangent track with eight standard passenger coaches, a conservative estimate with the then-available data but which would still have been a world speed record for a narrow gauge steam locomotive. A short while later, I learned that a high-speed passenger service was being planned between Pretoria and Rustenberg and that haulage with re-gearred 37 Class diesels was envisaged. I sent another memorandum pointing out that haulage of such a service with the 26 Class would be much cheaper and showing by means of loading curves that it was much more suited to high-speed work than the 37 Class, the latter having a balancing speed on level tangent track with a 500 ton load of 94 km/h versus at least 150 km/h with the 26 Class. No stops would have been required en-route for taking water or fire cleaning with the load planned for the new service. I repeated the request for authorization for a high-speed test on the grounds that the data from it should have been available before any decision on the type of traction for the proposed high-speed train was made. Unlike most of my other submissions, these memoranda did provoke a response. It was ‘no’. However the data which was gathered at speeds up to about 100 km/h pointed to 3450 being at its best in high-speed service. Its 1524mm (nominal) diameter coupled wheels were no barrier to high speed because of the good internal streamlining, a consequence of which was high ‘breathing capacity’ of the front end at high rotational speed. High speed was traditionally associated with large couple wheels but this was not true: what mattered was drawbar power at elevated speed. It was indeed a pity that this was never verified by suitable tests, but for the record 3450 was timed at 125 km/h downhill between Belmont and Witput on the Trans Orient Express loaded to 21 coaches, 845

tons tare (about 870 tons gross) in 1991, the fastest ever authenticated speed by an SAR steam locomotive in regular service.

In fact, The Red Devil may have done better than this. David Niven describes an occasion in the early 1990s as follows:

That day we hit 90mph with her was really unbelievable on her footplate. John as usual drove her to Orange River where we took on water and gave the fire a shake then headed onwards to De Aar. He gave me the regulator and told me to get her flying. Through Kraankuil we must have been hitting a good 80mph or so and then it's a long steep climb up Rooidam bank when the speed falls to about 60. Her load was 19 coaches and just over 900 tons.

As we get to the top of the bank John says to me "keep her open" and so I keep her wide open and we start racing down the bank towards Poupán. Both of us have our eyes peeled looking at the signals and then John shouts out, "Two off", and on that note I opened her regulator full and the beat from her exhaust was more like the beats of a diesel engine. In the video the rods are just a blur. Photographers were trying like mad to keep up with us on the dirt road alongside the line but we left them behind.

Finally we arrive into De Aar about 16 minutes early and its all cheers from the passengers and photographers but as from management we were in the pits!!

What we hadn't realized was that the top bosses were trying to keep up with us in a car, taking photos and recording us at 92mph. On our arrival into De Aar, "management" was waiting on the platform and we knew we were in trouble!!

The occasion described in Richard's brief account was captured on film and is available in DVD format under the title "Steam Fever".

Post-script: Dave Wardale discounts the likelihood that such a high speed could have been attained by the Red Devil in the partially de-modified form that it had reverted to at the time. Indeed, he prepared six pages of calculations to prove that the actual speed achieved could not have been higher than 82 mph with a 19 coach train. A copy of his calculations (and additional commentary) can be downloaded from the 5AT website.