

Locomotive Resistance - Reply to John Knowles letter 22 May 2021

It is commendably short, but it contains misrepresentations, and some plain mistakes calling for comment I will deal with his six points in the order presented.

The preamble and final paragraph suggests that the RPS is no place for a discussion of this nature and it should continue elsewhere. It's rather late to make this suggestion at such a late stage, and the suitability or otherwise of the RPS is something of a moot point. It does after all contain material of a technical nature from time to time.

The second paragraph bewails the fact that $WRTE \propto ITE$ at a given speed resolves into a simple equation of the form $WRTE = ITE \times C$. on the grounds of the "limited usefulness" of "single variable equations for complex relationships." Complex indeed, but this simple single variable relationship is what consistently falls out of the test data time after time. It was only necessary to weed a single data set to eliminate an erroneous negative constant, An aberration entirely explicable, given the sensitivity to the potential hazards of random scatter. There's no guarantee multiple variables would indicate a reliable causal relationship, quite the reverse for such complex iterations is more likely, rendering them unfit for purpose.. A "bumblebees can't fly" outcome probable.

1. "His claim that MR at the coupled wheels and the pull on the dynamometer (DP) are precisely the same cannot be right, certainly on the road."

I said nothing of the kind, I said the plant Amsler DBTE and WRTE were the same. Otherwise constant speed would not obtain.

- 2 The 228lb is the minimum value or a constant in a CWBR

It is more complex than that. CWBR, is not constant as a function of speed/RPM as previously explained. The WRTE outcome is a very complex mechanical iteration of manifold shifting forces that resolve into a linear relationship of single variable, negative constant form. .

- 3 ."He claims that the MR of a Crosti 9Fis reduced because the ITE is reduced."

Really? Reduced! Surely this cannot be what was intended. The Crosti MR recorded on the test plant was substantially increased compared to a standard 9F, a characteristic confirmed by inferior DBHP on road tests. Obviously the reduced cylinder efficiency attributable to increased back pressure contributed to this, but said back pressure had no influence whatever on the increased MF. This was clearly demonstrated by the 92250 tests when fitted with Double Chimney and Giesel Ejector, where the differences in back pressure were significantly higher than was the case for Crosti v 92050. No difference in MF was discernable for 92250 in both Guises. See Figure 46 , my submission November 2019.

- 4 "The assertion that Damping Resistance (DR) did not and could not exist"
"Bellville Washers required work to operate."

DR is an irrelevance. If I stretch an elastic band the applied force and restraining force will be exactly the same. As Carling pointed out, the abandoned dashpot would have worked had it been installed in series rather

than in parallel.

5. “He has never before published his criticisms of the Perform programme.”

It is a matter of fact that published Perform estimates do not tally with the Rugby test data in regard to steam rate and IHP for given working conditions. It follows that they cannot both be right, perhaps both are wrong. Perform may have some utility, but has insufficient authority to substitute for MR evaluation. My reservations are therefore primarily empirical. It is interesting that Perform contradicts the Rugby data in which JK has previously expressed much confidence.

6. “Carling’s remarks on the low value of ITE recorded on the LTS.....”

I’m not sure what point is being made here. Carling did express the wish that the comparative tests with mechanical indicators in 1953 had been carried out at higher speeds than 50 mph. As things turned out the two mechanical types had to be returned to Swindon for recalibration. It is interesting that the corrected results for the Maihak indicator remained 2% higher than Rugby’s Farnboro indicator results. The recalibrated Dobbie & McInnes indicator was up to 7% high on Rugby at low steam rates. Report L116 identified steam rate anomalies as the prime source of the IHP disparities between that arose between plant and road tests.

It is disappointing that John Knowles appears unable to change his mind when the experimental evidence unequivocally contradicts his views, as exemplified by his supposed effects of back-pressure on machinery friction; ref point 3 above. The chances he will concede his several conceptual errors seems remote. I have no wish to continue these discussions elsewhere

Doug Landau

25 May 2021