

Accuracy of ROMDAS Tester

When using the ROMDAS tester the speeds and bumps are not constant. This arises because of the tolerance of the pulse generator which is approximately $\pm 5\%$ (according to the manufacturer).

To verify this, the following was done.

1. The calibration factor was set to 2000 pulses/km. This corresponds to 200 roughness pulses/100 km.
2. The unit was run in test mode with the speed of 68 km/h (close to 70).
3. The roughnesses over 100 m were noted. These were in the range of 197 - 206, although there was one outlier at 193. This range $9/200$ is 4.5% -- rounded up to 5% to allow for the occasional outlier.
4. At 68 km/h it takes 5.29 s to travel 100 m.
5. With a 5% tolerance in the number of ODO pulses this corresponds to a 5% tolerance in the timing. Thus, the confidence interval for the timing is 5.02 s - 5.29 s - 5.55 s.
6. These intervals result in speeds of 72 km/h - 68 km/h - 64 km/h.
7. The speeds displayed on the screen were all within the range of 64-72 km/h, thus verifying that the differences were due to the variation in the pulse generator.