

Effect of movable aerodynamic body parts in WLTP type 1

Bern, IWG WLTP 18

Effect of movable aerodynamic body parts in WLTP type 1

Annex 4

Movable aerodynamic body parts on the test vehicles shall operate during road load determination as intended under WLTP type 1 test conditions

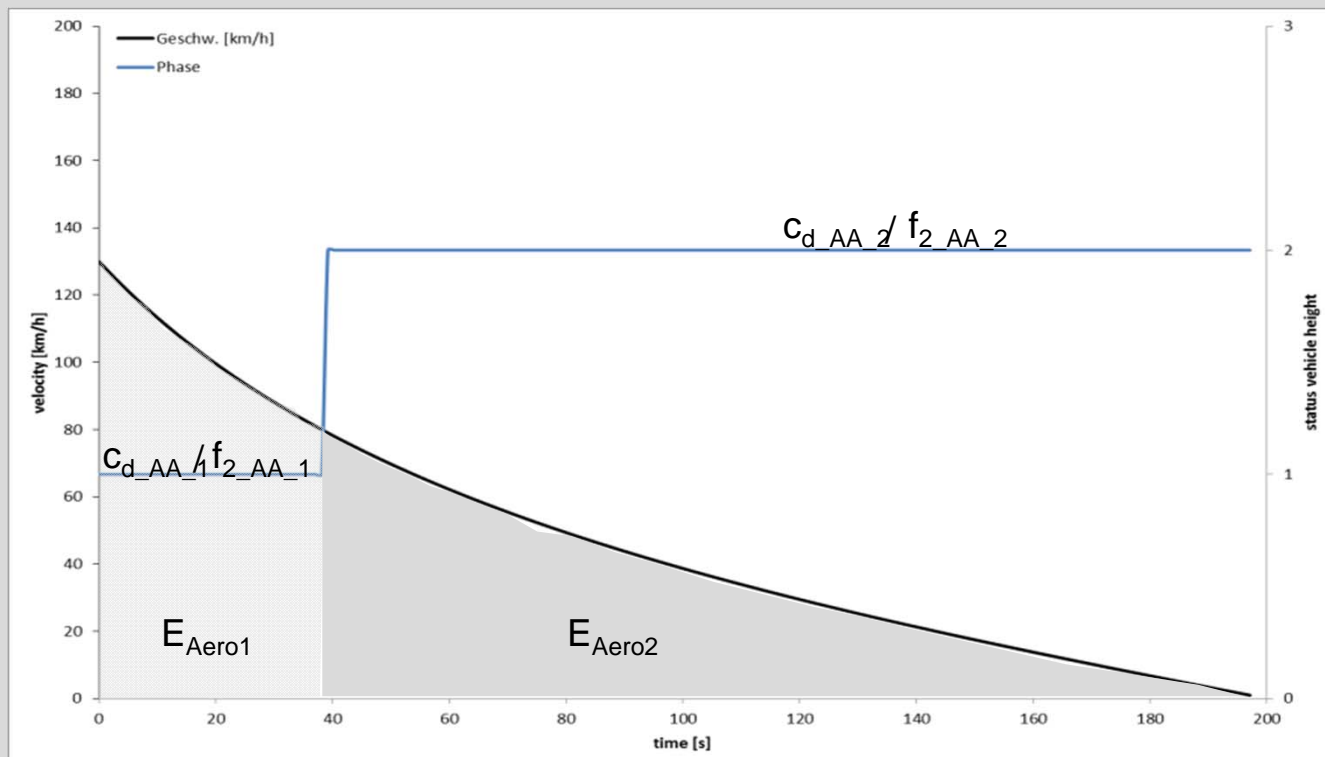
Question

Is there a way to effectively reflect the influence of movable aerodynamic body parts (mabp) during the WLTP cycle in the lab?

- » The operation/position of mabp could differ between different road load determination (RLD) procedures and therefore the position simulated in a WLTP type 1 test

Road load determination

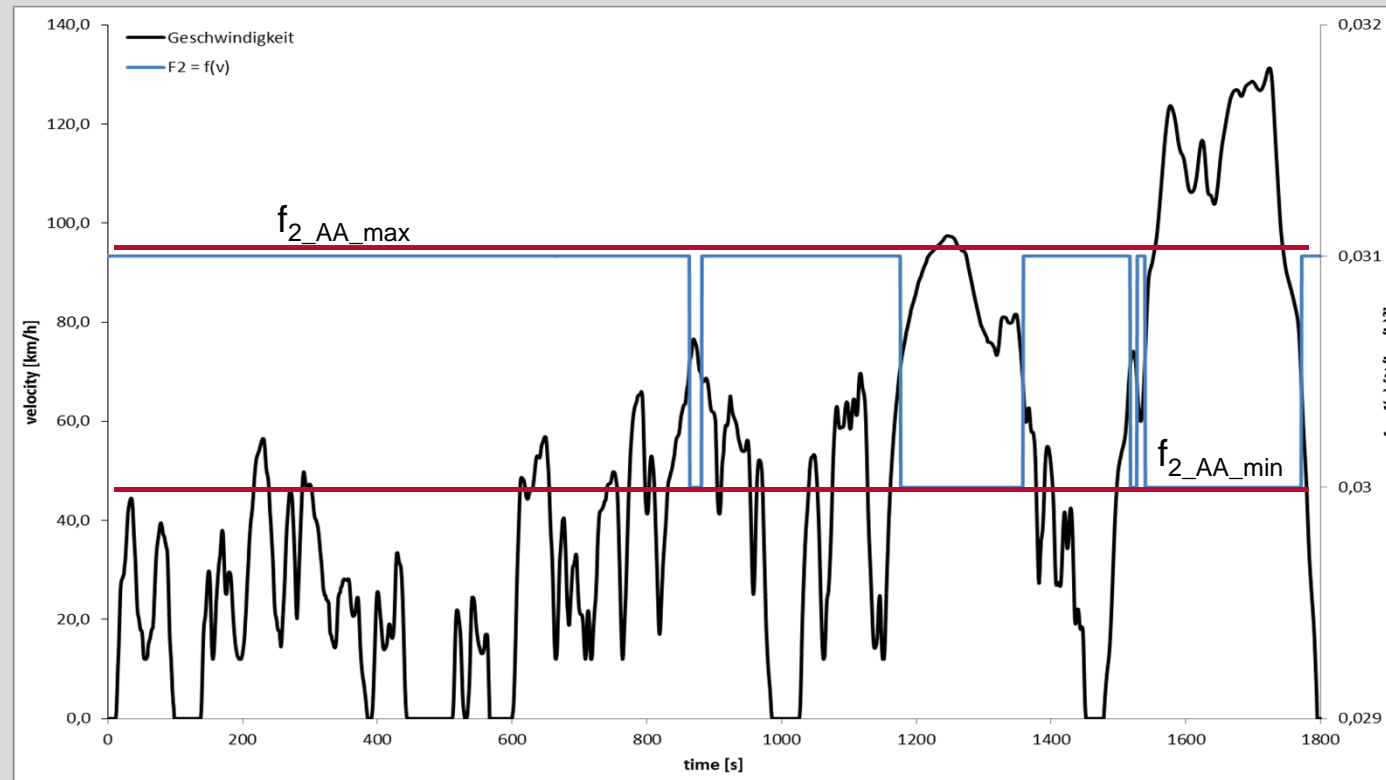
- A change in mabp position changes the $c_d \times A / f_2$ -value
 - Calculate a weighted c_d -value using the energy demands
 - Calculate f_{2_AA} -values using weighted c_d -value



WLTP

- During WLTP the c_d -value might change often
 → Calculation of **max/min** and **real** energy demands with simple equation:

$$E = \int f_0 + f_1 * v(t) + f_2 * v(t)^2 dt$$



Result

Interpolation of effective f_2 -value

- Max/min/real energy demand
- f_2 -max/min value

→ simple interpolation for an effective f_2 -value during WLTP

Result

- The interpolation of f_2 gives a physically correct calculation to reflect the real world conditions in WLTP
- This calculation can be used for any number of mabps

