Transmitted by the expert from OICA

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PROPOSED CORRIGENDUM TO ECE/TRANS/WP.29/GRRF/2008/2
(Brake assist systems)

A. PROPOSAL

Annex 10, Appendix 2, amend to read:

2.3. Filter phase shifts and time delays for anti-aliasing filtering

Excessive analogue filtering shall be avoided, and all filters shall have sufficiently similar phase characteristics to ensure that time delay differences are within the required accuracy for the time measurement. Phase shifts are especially significant when measured variables are multiplied together to form new variables, because while amplitudes multiply, phase shifts and associated time delays add. Phase shifts and time delays are reduced by increasing f_o. Whenever equations describing the pre-sampling filters are known, it is practical to remove their phase shifts and time delays by simple algorithms performed in the frequency domain.

NOTE: In the frequency range in which the filter amplitude characteristics remain flat, the phase shift ~~@~~ **Φ** of a Butterworth filter can be approximated by
$\Phi = 81 \times (f/f_0)$ degrees for second order
$\Phi = 150 \times (f/f_0)$ degrees for ~~**second**~~ **fourth** order
$\Phi = 294 \times (f/f_0)$ degrees for ~~**second**~~ **eighth** order
The time delay for all filter orders is: $t = (\Phi/360) \times (1/f_0)$

B. JUSTIFICATION

See ISO 15037-1:2006 Annex D as reference.