

## 1 Transformation of the French/German proposal of an ASEP concept for cars to motorcycles

### 1.1 Aim

Check the noise emission behaviour of a motorcycle for driving conditions that occur in real world traffic but are not covered by the ISO 362-2 test(s) (not to exceed concept). The checks should make sure that the noise emission behaviour of the motorcycle under these conditions does not deviate significantly from what one would expect from the ISO 362-2 results.

### 1.2 ASEP test area limitations

- Vehicle speeds between 20 km/h ( $v_{AA'}$ ) and 90 km/h ( $v_{BB'}$ )
- Engine speeds at BB' up to  $0.85 \cdot (s - n_{idle}) + n_{idle}$  for  $pmr \leq 66$ ,

up to  $3,4105 \cdot pmr^{-0,3315} \cdot (s - n_{idle}) + n_{idle}$ , for  $pmr > 66$

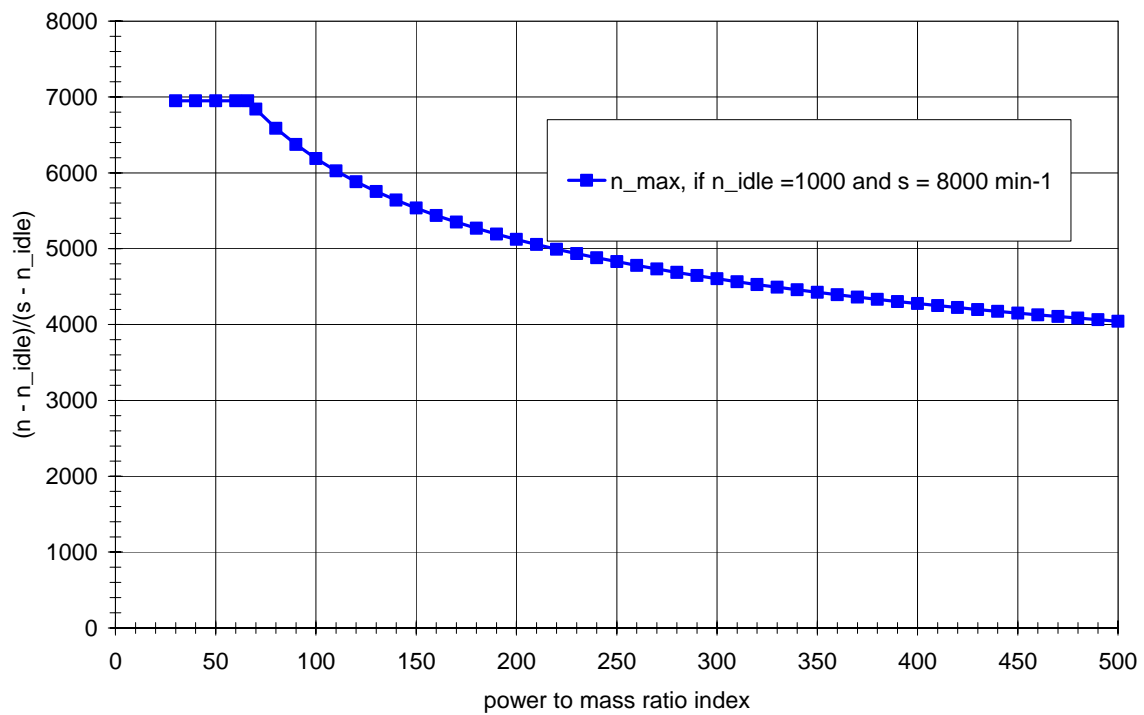
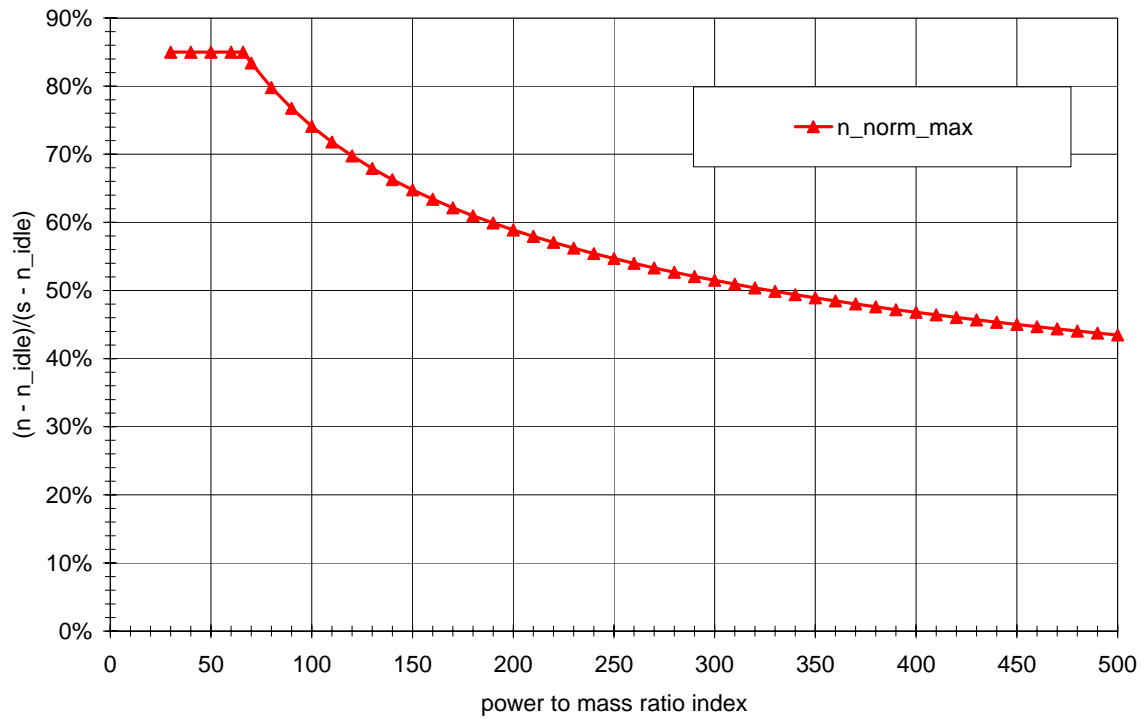
with  $s$  – rated engine speed in  $\text{min}^{-1}$ ,

$n_{idle}$  – idling speed in  $\text{min}^{-1}$

$pmr = P_n \text{ in kW} / (m_0 \text{ in kg} + 75) \cdot 1000$

$pmr$  is the power to mass ratio index. This is the rated power of the vehicle ( $P_n$ ) in kW divided by the kerb mass of the vehicle ( $m_0$ ) in kg + 75 (to account for the mass of the driver) and multiplied by 1000.

The following graphs shows the normalised engine speed as well as the engine speed as functions of the power to mass ratio index.



### 1.3 Reference level and noise emission threshold curve

The noise emission is a function of engine speed. The reference point is defined by  $L_{wot,i}$  and  $n_i$  of the ISO 362-2 test procedure.  $L_{wot,i}$  is the test result of the ISO 362-2 wide open throttle acceleration tests in gear  $i$ ,  $n_i$  is the corresponding engine speed belonging to  $L_{wot,i}$ .

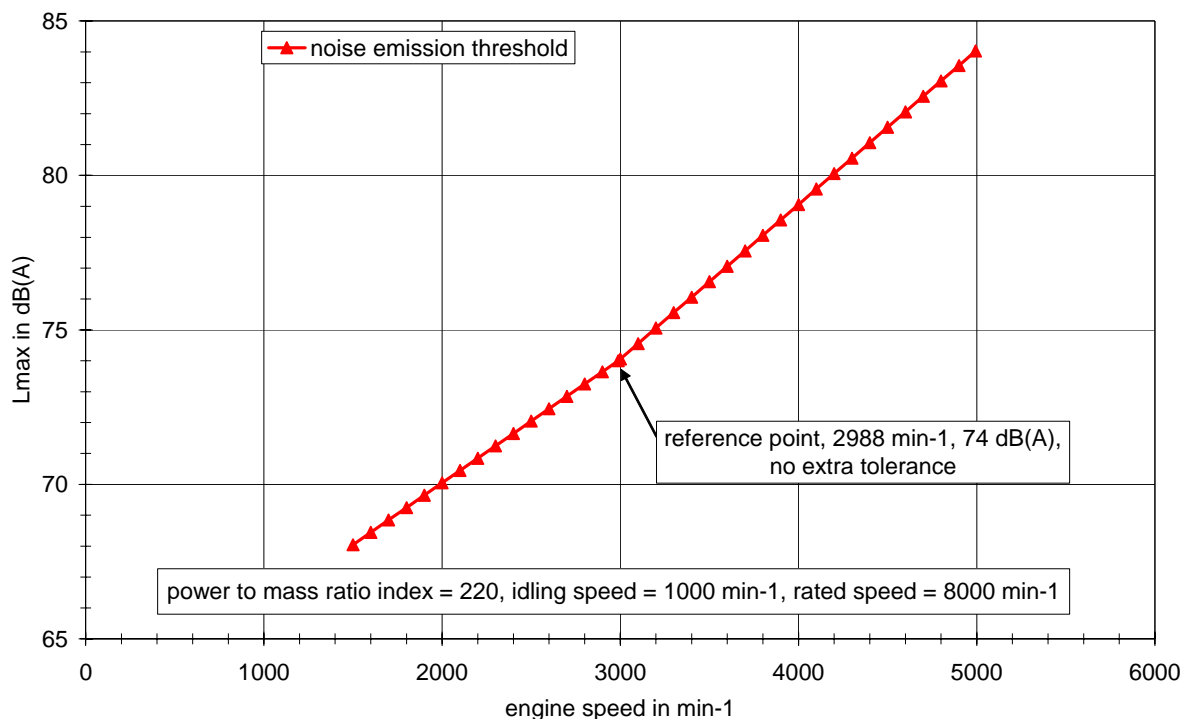
The noise emission threshold curve is defined as follows:

$$L_{max}(n) = L_{wot,i} + 5 \cdot (n - n_i) / 1000 + x \text{ dB, if } n > n_i,$$

$$L_{max}(n) = L_{wot,i} + 4 \cdot (n - n_i) / 1000 + x \text{ dB if } n < n_i.$$

With  $n$ ,  $n_i$  engine speeds in  $\text{min}^{-1}$ ,  $x$  dB is a tolerance value that may be necessary to be added. The slopes of 5 and 4 dB need to be verified by measurement results.

An example is shown in the following graph, assuming that  $L_{wot,i}$  is 74 dB(A) at  $2988 \text{ min}^{-1}$  and  $n_{\text{max}}$  is  $4994 \text{ min}^{-1}$ .



The motorcycle may be tested within the ASEP area at wide open throttle acceleration in any gear ratio, except 1. gear. The max. noise level must not exceed the threshold curve.