

# Interpretation document with regards to the number of test points when performing test runs for type approval according to regulation UNECE R41-05, Annex 7 “RD-ASEP”

## Purpose of this document:

This Document supports the interpretation of the requirements within regulation R41-05, Annex 7 with regards to the maximum number of tests runs, as specified in point 3.1., and the interpretation being in line with the “RD-ASEP” purpose and general principles.

- **“RD-ASEP” purpose and relevant general principles**
  - assessment of noise emissions in all real driving conditions within the RD-ASEP control range, as defined in point 2.5.
  - assessment of noise emissions in vehicle operations as defined in point 3.3. and different from the operating conditions which are applied for the determination of  $L_{urb}$  according to Annex 3
  - assessment and prove of compliance of the motorcycle noise emissions in all operating conditions within the RD-ASEP control range, including available user selectable software programs or modes
  - avoid undue workload by limiting the number of RD-ASEP test runs, while granting the effectiveness of the test procedure, by applying the “mystery point concept” – meaning that the actual operation conditions are understood as a spot check, for which the applied operating conditions are not known to the applicant for approval (vehicle manufacturer) prior to the type approval test

**Background:** The assessment of noise emissions in all possible vehicle operating conditions within the RD-ASEP control range cannot be performed, as this would require an infinite number of test runs. Instead, a random selection of vehicle operation conditions is defined by the technical service or the type approval authority. The random selection of operating conditions is not known to the applicant for type approval prior to the actual type approval testing. Since the applicant for type approval does not know which operating conditions will actually be applied during the RD-ASEP tests, the vehicle has to be designed for being compliant with all possible operating conditions within the RD-ASE control range.

- **maximum number of RD-ASEP test runs**

Point 3.1. reads, “... testing is restricted to the reference points defined in paragraph 3.2. below and three additional operating conditions as defined in paragraph 3.3. of this Annex per gear. The total number of operating conditions to be tested according to paragraph 3.3. of this Annex shall be reduced by the operating conditions which were applied for tests according to paragraph 3.2. of this Annex and for the determination of  $L_{urb}$  according to Annex 3.

*For vehicles with variable gear ratios or automatic transmission with non-lockable gear ratios testing shall be limited to 6 operating conditions as defined in paragraph 3.3. of this Annex, and different from the operating conditions which were applied for the determination of  $L_{urb}$  according to Annex 3."*

Interpretation: The total number of RD-ASEP test runs and with this, the total number of different operating conditions is defined by the number of gears of motorcycles with manual gear boxes ("three additional operating conditions per gear"), and for motorcycles with automatic transmission with non-lockable gear ratios, for which the number is fixed with 6 operating conditions.

The maximum number of RD-ASEP test runs shall be reduced by the number of operating conditions which were applied for the determination of  $L_{urb}$  according to Annex 3 (i.e. two operating conditions for a single gear test or four operation conditions for a two-gear test; one or two "constant speed" operation, plus one or two "wot-acceleration" operation). Furthermore, the maximum number of RD-ASEP test runs shall be reduced by the number of operating conditions applied as RD-ASEP reference test conditions, according to point 3.2. (one for  $v_{pp}=50\text{km/h}$  (a), and at least one for  $n_{BB}=0.8 \times S$ ).

Since the operating conditions for the RD-ASEP reference test (a) is identical to the "wot acceleration" test of Annex 3, these two tests shall account as one operating condition for the determination of the number of RD-ASEP test runs.

The number of operating conditions of the test runs of Annex 3 and the RD-ASEP reference test conditions shall not be understood as being strictly related to the number of RD-ASEP tests runs in the respective gears in which these operating conditions were applied but may be accounted to the number of tests in any of the available gears.

- **user selectable software programs or modes**

Point 3.3.2. reads, "*The vehicle may be tested in any of the available user selectable software programs or modes which affect the sound emissions of the vehicle.*"

Interpretation: The technical service or the approval authority may select any of the available user selectable software programs or modes for the additional RD-ASEP operating conditions. Since for motorcycles with manual transmission, the number of additional operating conditions is limited to three per gear, and to six additional operating conditions for vehicles with non-lockable automatic transmissions, situations may occur, where not all available user selectable software programs or modes can be tested in all gears. This circumstance shall be acceptable because the general purpose and principles of RD-ASEP are still met.

If the applicant for approval (vehicle manufacturer) can explain to the satisfaction of the technical service or the approval authority, that one or more of the available user selectable software programs or modes does not affect the sound emissions of the motorcycle, the respective user selectable software programs or modes do not need to be considered for the tests. However, this shall not be understood as justification for a reduction of the maximum number of RD-ASEP test points.