Technical support for the impact assessment on Euro 5 step of L-category sound emissions level limits

TFSL-04, 13-14/09/2021

By Applus IDIADA & ACASA, on behalf of the European Commission
Project Tasks

• Task 1: Estimate of L-category fleet representativeness in sound emissions (IDIADA)
• Task 2: Verification of sound level limits (IDIADA)
• Task 3: Noise source ranking tests (IDIADA)
• Task 4: Cost-benefit analysis (ACASA)
• Task 5: Proposal of sound emission limit values and reporting (IDIADA)
• Task 6: Project Management (IDIADA)
Task dependencies

- **TASK 1**: Data from consultation stakeholders, Data from regulation and type approval
- **TASK 2**: Tests verification limit sound emissions
- **TASK 3**: Estimation sound emissions
- **TASK 4**: Noise Source ranking, Cost Benefit Analysis
- **TASK 5**: Proposal for sound emission limit values
Task 1: Estimate of L-categories fleet representativeness in sound emissions

Conclusions

• Questionnaire addressed to 336 stakeholders with a very large spectrum of profiles. 33 received answers with a balanced representation of the different profiles

• Fitting of NORESS and single noise events among others are seen as having a significant impact on the motorcycle noise perception

• L3e are seen as the vehicle category more prone to be tampered

• L3e-A3 are perceived as the sub-category for which is more difficult to comply with the current sound level limits

• Opinions from stakeholders regarding a possible reduction of sound emissions level limits are divided

• In-use controls are understood as an efficient way to lowering effectively the real-world noise emission caused by motorcycles
Task 2: Verification of sound level limits

Conclusions

• The obtained sound level test results for all the 19 tested vehicles are below the existing limits.

• The margin between the actual test results and the existing limits varies depending on the vehicle’s subcategory.

• Most of the motorcycles tested according to RD-ASEP provisions give already positive results.
Task 3: Noise source ranking tests

Objective

• To quantify the contribution of the different vehicle noise sources to the overall vehicle noise emissions, by determining tests requirements and by analysing the results of such tests.

• Finished (6 vehicles tested)
Task 3: Conclusions

• The various technologies used for L-vehicles noise control (exhaust, shields, intakes, engine design, gearing) are very much influenced by the type of vehicle under consideration. Available space for component or system modification is a key point for the definition of the most cost-effective strategies for noise control.

• Current results and observations suggest that certain technology refinements applied to silencers, shields, packaging, engine block vibration, gearing or valve design can provide noise reductions.

• However, very different CBA results can be expected depending on the actions taken. This will be a decision driver.

• The feasibility of an eventual noise values reduction and its corresponding CBA is under study.

• The expected noise reduction based on reasonable design modification of L-vehicle components seems to be quite low.
Task 4: Cost Benefit Analysis

Objectives

• To assess the feasibility of the sound emission levels proposed by means of a Cost Benefit Analysis (CBA).

• It will identify the main benefits associated to a certain noise reduction and the cost of implementing measures, related to vehicles sound emissions improvement, to achieve such reduction.

• Preliminary results suggest a strong positive impact of increased enforcement of current limits on noise reduction and associated social benefits.
## Gantt chart

<table>
<thead>
<tr>
<th>Task n°</th>
<th>Title</th>
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<tr>
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<td>3</td>
<td>Noise Source Ranking tests</td>
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<td>6</td>
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<td>4</td>
<td>Cost-benefit analysis</td>
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**Progress:**
- 100% completed
- 100% completed
- 100% completed
- 60% progress
Keep in touch

- ec.europa.eu/
- europa.eu/
- @EU_Commission
- @EuropeanCommission
- European Commission
- europeancommission
- @EuropeanCommission
- EUTube
- EU Spotify
Thank you
Background information
Task 1: Estimate of L-categories fleet representativeness in sound emissions

Objectives

• Determine a quantitative picture of the noise level emission of the current fleet.

• The potential new technologies that can enable a noise emission improvement in current vehicles and in the mid and long term.

• A high-level proposal of potential of new noise emission thresholds including a timeframe for implementation.

Sub-tasks

• Task 1.1: Feedback gathering

• Task 1.2: Literature review
Task 1: Estimate of L-categories fleet representativeness in sound emissions

Task 1-1: Feed-back gathering: questionnaire topics (30 questions)

• Effect of noise
• Effectiveness of regulation
• Tampering
• Driver’s behavior
• Evaluation of fleet
• Noise sources
• Technological limitations

• Sound limits
• Cost benefit
• Time to market
• In-use control
Task 1: Estimate of L-categories fleet representativeness in sound emissions

Task 1-1. Feed-back gathering: Contacts

- Industrial stakeholders
- Technical services and type approval authorities
- Department of transport, market surveillance and enforcement authorities
- Countries, cities and citizens
- Motorcycle and noise concerned associations
- Environmental organisations and institutes

Contacts: 336
Replies: 33
Task 1: Estimate of L-categories fleet representativeness in sound emissions

Task 1.2. Literature review: Topics

- Vehicle life expectancy
- Available technologies to reduce sound levels in L-category vehicles
- Vehicle average mileage
- EU sales of replacement exhausts
- Registration per country and per vehicle category
- EU countries with technical inspection of L-category vehicles
- Urban noise levels
- Extra urban noise levels
- Average speed in EU cities
- Number of EU cities with low-speed areas
- Health issues related to noise
- Environmental impact of road traffic noise
- Average approval sound level values found in ETAES
Task 2: Verification of sound level limit

Objectives

• Verification of the sound levels of vehicles of different technologies available in the market, by means of real tests performed according to the procedures defined in the current regulatory framework.

• Comparison of the obtained results with the sound level limits estimated by means of the survey and literature analysis of task 1.

Sub tasks

• Task 2.1: Vehicle selection
• Task 2.2: Vehicle testing
### Task 2 & 3: Vehicles tested

**Task 2: Verification of Sound level limits**  
(18 vehicles)

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**Task 3: Noise source ranking**  
(6 vehicles tested)
Task 3: Noise source ranking tests: Example

Example: Noise source contribution

<table>
<thead>
<tr>
<th>Source</th>
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<td>Transmission</td>
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<td>Driveline</td>
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<td>Intake</td>
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<td>Tyre noise*</td>
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<td>Residual noises</td>
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<td>TOTAL</td>
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