



L Category vehicles: Powertrain tampering prevention & Durability

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Overview

Task 1

Impact assessment report on L-category vehicle powertrain tampering prevention with recommendations for cost effective measures

Task 2

Cost effective durability measures for L-category vehicles

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Background (1)

Task 1 – Tampering prevention

- The scope of this study is limited to assessing tampering prevention measures associated with modifications of powertrain systems and components that have detrimental effects on:
 - Functional safety of a vehicle; and/or
 - Environmental emissions; and/or
 - Environmental noise.
- The European Commission acknowledge that total prevention of these undesirable modifications to a vehicle can only partly be achieved by type approval legislation requirements, and that it is just a matter of time when revised countermeasures will again be circumnavigated
- ‘Harmless’ modifications – e.g. those with no adverse effects on safety or the environment will not fall under the scope of possible anti-tampering measures.

Background (2)

Task 2 – Cost effective durability measures

- The performance criteria for L-category vehicles with respect to their exhaust gas and evaporative emissions as they and their components age, is intended to be included as a chapter on durability requirements in a delegated act.
- The scope of this study includes:
 - Analysis and selection of cost effective durability measures for L-category vehicles in terms of their environmental performance over vehicle life.
 - Article 21 (1) of the proposal of a Regulation to type approve L-category vehicles contains two alternative methods from which a manufacturer can choose to demonstrate to a technical service that the emissions of the candidate vehicle for type approval comply with the applicable emission limits

(1) http://ec.europa.eu/enterprise/sectors/automotive/files/projects/report_anti_tampering_devices_en.pdf

Background (3)

Project team

- TRL will work in partnership with JRC (EC's Joint Research Centre).
- TRL will lead the programmes and be responsible for the technical direction and scope of the work undertaken.
- JRC will be responsible for the majority of the testing work.
- Wherever practicable, we will seek efficiencies by harmonisation of Tasks 1 and 2, but without compromising the technical quality of the individual work programmes.

Objectives: Task 1 – Tampering prevention

The primary objectives ...

- The overall objective of the study is to identify undesirable vehicle modifications that have adverse effects on the functional safety and/or the environmental performance of the wide range of L-category vehicles.
 - Identify types of tampering
 - Analyse these using “risk tree” analysis to identify their consequences on safety and the environment
 - Quantify the environmental impacts in test programme
 - Prioritise tampering types in terms of their expected impacts
 - Identify measures required to mitigate tampering
- Define what is the ‘maximum continuous rated power’ for the different propulsions listed in Article 4 (1).

Objectives: Task 1 – Tampering prevention

Continued ...

- If practicable, identify how an enforcement authority could undertake measurements in the field to determine different L-category vehicles' 'maximum continuous rated power'.
- Seek to recommend a pragmatic way to assess the authenticity of components, based on road-side inspections.
- Where practicable, cost effective countermeasures will be sought and recommendations presented aimed at preventing undesirable vehicle tampering.
- Include recommended measures, summarised and reported in a comprehensive report, with proposed text that can be used one-to-one in a draft delegated act on vehicle construction.
- Provide an impact assessment containing the economical, environmental, safety and societal impacts from the recommended, preferred options. Attention shall be paid to the impact on SMEs and on the freedom of customising culture from the vehicle owners.

Objectives: Task 2 – Cost effective durability

- The purpose of the work programme is described succinctly in the Service Request as:
 - *“Cost effective durability measures for L-category vehicles. The output of the study with recommended measures will be used as chapter on durability requirements in a delegated act, which is a Regulation on Environmental and Propulsion Performance Requirements.”*
- The study will identify the tests and/or measures that would be most effective for ensuring L-category vehicles are sufficiently durable so as to maintain acceptable exhaust and evaporative gas emissions as they age and through use (increasing cumulative mileage).
- Consideration will be given to the repeatability, reproducibility and accuracy of any proposed measures and most importantly their costs.

Detailed description of tasks: Task 1 – Tampering prevention

- The main project will update the TÜV Nord (2003) study and is divided into four sub-projects
 - Stakeholder Consultation
 - Theoretical approach
 - Literature study
 - Experimental programme
- The final report
 - The final report will contain an impact assessment detailing the economical, environmental, safety and societal impacts for the recommended options. Special attention shall be paid to the impact on SMEs and on the freedom of customising culture from the vehicle owners.

Summary of proposed emissions testing regime – tampering prevention

Vehicle (sub-) category	Vehicle (sub-) category name	Amount of vehicles	Test Cycle	Comments
L1Ae	Powered cycle	3	R47	<ul style="list-style-type: none"> 1 electrical pedal assisted cycle (EPAC) falling outside scope of proposed Regulation. 2 L1Ae vehicles of which one vehicle with full electric propulsion and, if feasible, one vehicle equipped with a combustion engine.
L1Be	Two-wheel mopeds	8	R47	<ul style="list-style-type: none"> 4 low speed mopeds / scooters (\leq 25 kph), all with combustion engine propulsion; 4 high speed mopeds / scooters (\leq 45 kph) of which 2 with combustion engine and 2 with full electric propulsion.
L2e	Three-wheel moped	0	-	Not part of the experimental program.
L3e – A1	Low performance motorcycle	3	WMTC	1 scooter, 2 street motorcycles. If feasible 1 out these 3 vehicles equipped with full electric or hybrid propulsion.
L3e – A2	Medium performance motorcycle	3	WMTC	1 scooter, 1 street motorcycle, 1 enduro motorcycle. If feasible 1 out these 3 vehicles equipped with full electric or hybrid propulsion.
L3e – A3	High performance motorcycle	3	WMTC	1 scooter, 2 street motorcycles. If feasible 1 out these 3 vehicles equipped with full electric or hybrid propulsion.
L4e	Motorcycle with side car	0	-	Not part of the experimental program.
L5Ae	Tricycle	2	R40	
L5Be	Commercial tricycle	2	R40	
L6Ae	Light on-road quad	2	R47	
L6Be	Light mini-car	2	R47	If feasible one equipped with PI and one equipped with CI engine
L7Ae	Heavy on-road quad	2	R40	One on-road quad, one All Terrain Vehicle (ATV)
L7Be	Heavy mini-cars	2	R40	If feasible one equipped with PI and one equipped with CI engine

Detailed description of tasks: Task 2 – Cost effective durability

- The main project will identify the elements of the durability requirements for L-category vehicles and is divided into:
 - Stakeholder Consultation
 - Literature study
 - Theoretical approach and analysis
 - Experimental programme
- The final report
 - The final report shall contain an impact assessment containing the economical, environmental, safety and societal impacts for the recommended, preferred durability test options.
 - Special attention shall be paid to the impact on SMEs and on the estimated timeframe in which a durability test can be completed. The report shall contain a proposal for the chapter on durability requirements, to be included in a Regulation for Environmental and Propulsion performance requirements.

Summary of proposed testing regime – durability

Vehicle (sub-) category	Vehicle (sub-) category name	Amount of vehicles	Test Cycle 1	Test Cycle 2	Comments
L1Ae	Powered cycle	1	R47	Revised WMTC	Vehicle equipped with a combustion engine.
L1Be	Two-wheel mopeds	2	R47	Revised WMTC	<ul style="list-style-type: none"> • 1 low speed mopeds / scooter (≤ 25 kph), with combustion engine propulsion; • 1 high speed mopeds / scooter (≤ 45 kph) with combustion engine propulsion
L2e	Three-wheel moped	0	-	-	Not part of the experimental program.
L3e – A1	Low performance motorcycle	1	WMTC stage 1	WMTC stage 2	1 scooter with combustion engine propulsion.
L3e – A2	Medium performance motorcycle	0	-	-	Not part of the experimental program.
L3e – A3	High performance motorcycle	1	WMTC stage 1	WMTC stage 2	1 scooter, 2 street motorcycles. If feasible 1 out these 3 vehicles equipped with full electric or hybrid propulsion.
L4e	Motorcycle with side car	0	-	-	Not part of the experimental program.
L5Ae	Tricycle	1	R40	WMTC stage 2	
L5Be	Commercial tricycle	1	R40	Revised WMTC	
L6Ae	Light on-road quad	1	R47	Revised WMTC	
L6Be	Light mini-car	1	R47	Revised WMTC	If feasible one equipped with PI and one equipped with CI engine
L7Ae	Heavy on-road quad	1	R40	WMTC stage 2	One on-road quad, one All Terrain Vehicle (ATV)
L7Be	Heavy mini-cars	1	R40	Revised WMTC	If feasible one equipped with PI and one equipped with CI engine

Detailed description of tasks: Tasks 1 & 2 – Stakeholder consultation

- Within the EU, we will be actively seeking the help of key stakeholders, including:
 - *traffic police;*
 - *type approval authorities;*
 - *technical services;*
 - *periodical technical and road side inspection authorities;*
 - *vehicle taxation authorities;*
 - *driving licence authorities;*
 - *riders associations;*
 - *automobile clubs;*
 - *insurance companies;*
 - *L-category vehicle manufacturers and Tier I suppliers;*
 - *aftermarket component suppliers and independent repair industry; and*
 - *specialised L-category racing vehicle manufacturers and engine tuners*

- **Can you help?**



Timescale and discussion

Task 1: Powertrain tampering prevention

- The duration of the tasks is estimated to be 11 months commencing in December 2010.

Task 2: Durability

- The duration of the tasks is estimated to be 6 months commencing in December 2010.



Thank you

Any questions?

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