Additional Technical Remarks and Proposals for Clarification on ECE R51.03

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transmitted
by the experts of
OICA

These Amendments have beeen collected by OICA from various sources,
contracting parties during expert group meetings and meetings in junction with the informal working group on ASEP.
It is the idea to stipulate the discussion on necessary progress in the development for R 51.03.

Page	Main Body or Annex	Paragraph or other	LDV or HCV Subject	Original UN R51.03 Text	Remark	Proposal for Change	Supplement Information
0	All	All	All		Clean-up is needed	Review all indices and find a general rule for writing, many times in the ducuments same variables are written differently.	
0	All	All	All		Clean-up is needed, hamonize phrases	51.03 accelerator, accelerator control, 540/2014 accelerator, acceleration control unit	
0	All	MB: 2.13 // 2.24 A3: 3.1.2.1.4. // 3.2.5.3.2.2. // 4.1 A4 1.3.6.	All	"wot"; wide open throttle"; "full throttle"; "partial throttle"; etc...	Consider new definition for acceleration with maximum performance to overcome “wide open throttle”. The meaning and technical interpretation of this phrase is unclear. Long ago, with a wired connection between acceleration pedal and throttle, the meaning was clear. With the introduction of “e-gas” the meaning has become ambiguous. May technologies have no throttle any more, the phrase is used as a synonym for performance. A more correct phrase would be “partial acceleration performance” or “maximum acceleration performance”.	partial throttle condition => accelerator depressed partly (adp) wide open throttle => accelerator depressed fully (adf) full throttle condition => accelerator depressed fully (adf) throttle control => accelerator	
4	Main	2.11.1	LDV	In the case of vehicles of categories M1, N1 and M2 < 3,500 kg technically permissible maximum laden mass: (a) For front engine vehicles: the front end of the vehicle; (b) For mid-engine vehicles: the centre of the vehicle; (c) For rear engine vehicles: the rear end of the vehicle.	When a vehicle has several engines at different loations, which engine should be used to determine the reference point? This definitions sets for all design a default for the front of the vehicle. There is no need to differentiate the reference point for electric engines, but for ICE	In the case of vehicles of categories M1, N1 and M2 < 3,500 kg technically permissible maximum laden mass, the reference point is the front of the vehicle, unless: (a) For mid-combustion engine vehicles: the centre of the vehicle; (b) For rear-combustion engine vehicles: the rear end of the vehicle.	
7	Main Body	6.2.3.	LDV	The sound emission of the vehicle under typical on-road driving conditions, which are different from those under which the type-approval test set out in Annex 3 and Annex 7 was carried out, shall not deviate from the test result in a significant manner.	There is no common understanding, what is normal or typical for on road driving and what is a significant deviation. And what is the test result. Annex 7 is a limitation curve or a performance dependent ratio between acceleration and aurban.	Find precise definitions for ambiguous phrases	Subject to ASEP Revision 2. Stage
13	Main	2.xx	All		Add definition for ‘defeat device’ Part of the ASEP Revision; either such statements or an extended ASEP control range is needed to control all gears relevant for the control range. Manufacturer may either follow this prohibition or follow the ASEP provisions.	2. 25 ‘defeat device’ means any element of design which senses temperature, vehicle speed, engine speed (RPM), transmission gear, manifold vacuum or any other parameter for the purpose of activating, modulating, delaying or deactivating the operation of any part of the silencer system, that reduces the effectiveness of the silencer system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use.	Subject to ASEP Revision 2. Stage
13	Main	2.26.1	LDV	2.26.1. "Stable acceleration" applicable when acceleration needs to be calculated is given when the acceleration ratio between awot_testPP-BB and awot test is less than or equal to 1,2.	Common definition in Annex3 and Annex7	To add: if the acceleration ratio cannot be achieved, the acceleration awot_testPP-BB shall be used.	
13	Main	2.26.1	LDV	↑	For all of cases, use awot_testPP-BB. The key question: what is the acceleration correlating to Lmax, we need more data, wouldn't it be better to use the acceleration between PP and BB in general, if this acceleration can be determined more stable.	Delete 2.26.1 and remove acceleration calculation AA-BB in Annex 3 and Annex 7	
14	Main	6.1.3	All		Add prohibition "defeat device" see above, definition	6.1.3 The use of defeat devices that reduce the effectiveness of silencer systems shall be prohibited for all [on-road] driving conditions of the vehicle. [The prohibition shall not apply where even if state of the art technologies are included, no other technology is available to protect the engine against damage or accident and for safe operation of the vehicle.]	Subject to ASEP Revision 2. Stage
18	Main Body	6.2.3.1	LDV	The vehicle manufacturer shall not intentionally alter, adjust, or introduce any mechanical, electrical, thermal, or other device or procedure solely for the purpose of fulfilling the sound emission requirements as specified under this Regulation which is not operational during typical on-road operation.	Same common as for 6.2.3.	Find precise definitions for ambiguous phrases	Subject to ASEP Revision 2. Stage

29	Annex3	1.1	All	1.1. Acoustic measurements The apparatus used for measuring the sound level shall be a precision sound-level meter or equivalent measurement system meeting the requirements of class 1 instruments (inclusive of the recommended windscreen, if used). These requirements are described in "IEC 61672-1:2002: Precision sound level meters", second edition, of the International Electrotechnical Commission (IEC). Measurements shall be carried out using the "fast" response of the acoustic measurement instrument and the "A" weighting curve also described in "IEC 61672-1:2002". When using a system that includes a periodic monitoring of the A-weighted sound pressure level, a reading should be made at a time interval not greater than 30 ms. The instruments shall be maintained and calibrated in accordance to the instructions of the instrument manufacturer.	Harmonizing with R138 to apply modern measurement system	1.1. Instruments for acoustic measurement 1.1.1. General The apparatus used for measuring the sound pressure level shall be a sound level meter or equivalent measurement system meeting the requirements of Class 1 instruments (inclusive of the recommended windscreen, if used). These requirements are described in IEC 61672-1-2013. The entire measurement system shall be checked by means of a sound calibrator that fulfils the requirements of Class 1 sound calibrators in accordance with IEC 60942-2003. Measurements shall be carried out using the time weighting "F" of the acoustic measurement instrument and the "A" frequency weighting also described in IEC 61672-1-2013. When using a system that includes a periodic monitoring of the A-weighted sound pressure level, a reading should be made at a time interval not greater than 30 ms.	
29	Annex3	1.3	All	1.3. Compliance with requirements Compliance of the acoustic measurement instrumentation shall be verified by the existence of a valid certificate of compliance. These certificates shall be deemed to be valid if certification of compliance with the standards was conducted within the previous 12 month period for the sound calibration device and within the previous 24 month period for the instrumentation system. All compliance testing shall be conducted by a laboratory, which is authorized to perform calibrations traceable to the appropriate standards.	Harmonizing with R138 to apply modern measurement system	1.1.3. Compliance with requirements Compliance of the sound calibrator with the requirements of IEC 60942-2003 shall be verified once a year. Compliance of the instrumentation system with the requirements of IEC 61672-3-2013 shall be verified at least every 2 years. All compliance testing shall be conducted by a laboratory which is authorized to perform calibrations traceable to the appropriate standards.	
34	Annex3	3.1.1.	All	The reference axis for free field conditions (see IEC 61672-1:2002) shall be horizontal and directed perpendicularly towards the path of the vehicle line CC'.	Need definition of "reference axis"	Delete "for free field conditions" Should use "reference direction" defnied in IEC61672	
34	Annex 3	2.2.6	All	If the vehicle is equipped with an exhaust system containing fibrous materials, the exhaust system is to be conditioned before the test according to Annex 4.	The text is ambiguous as it could be understood to mandate a silencer conditioning, while Annex 4 specifies critia under which a silencer conditing is not needed. For clarity, it is suggested to modify the provision of 2.2.6. to reflect that a silencer conditioning is not always necessary.	If the vehicle is equipped with an exhaust system containing fibrous materials, it might be necessary to carry out a conditioning test prior testing. The provisions of Annex 4 paragraph 1 in junction with the flowchart (figure 2) of the appendix to Annex 4 shall be followed.	
37	Annex 3	3.1.2.1.2.	LDV	At the choice of the vehicle manufacturer, front engine vehicles may use l = 5 m, and mid-engine vehicles may use l = 2.5 m.	sentence should be moved to 3.1.2.1.5.	At the choice of the vehicle manufacturer, front engine vehicles may use l = 5 m, and mid-engine vehicles may use l = 2.5 m. In that case, the accelerator shall be kept in	
37	Annex3	3.1.2.1.4.	LDV	If the vehicle allows different transmission setups like automatic or manual gear selection and/or has different software programs or modes (e.g. sporty, winter, adaptive) leading to valid accelerations, the vehicle manufacturer shall prove to the satisfaction of the Technical Service, that the vehicle is tested in the mode which achieves an acceleration being closest to awot ref.	It is not clear that a device can be used to lock a gear ratio in case of automatic transmission without manual gear selection. The closest to awot_ref should be considered transmission setup, different software programs, or mode as well as "mode".	If the vehicle allows different transmission setups like automatic or manual gear selection with electrical or mechanical device if applicable and/or has different software programs or modes (e.g. sporty, winter, adaptive) leading to valid accelerations, the vehicle manufacturer shall prove to the satisfaction of the Technical Service, that the vehicle is tested in the ~~mode~~ above condition which achieves an acceleration being closest to awot ref.	
37	Annex 3	3.1.2.1	LDV	... If the vehicle is fitted with more than two-wheel drive, test it in the drive selection which is intended for normal road use. ...	Already addressed under 2.2.4.	... ~~If the vehicle is fitted with more than two-wheel~~ ~~drive, test it in the drive selection which is intended for normal road use.~~ ...	
38	Annex3	3.1.2.1.4. 2	LDV	A gear shifting to a gear ratio which is not used in urban traffic shall be avoided. Therefore, it is permitted to establish and use electronic or mechanical devices, including alternate gear selector positions, to prevent a downshift to a gear ratio which is typically not used for the specified test condition in urban traffic. The achieved acceleration awot test shall be greater or equal to aurban. If possible, the manufacturer shall take measures to avoid an acceleration value awot test greater than 2.0 m/s2.	・What is definition of "not used in urban traffic"? a_wot ref? ・What kind of device is allowed for establishing and using electronic or mechanical devices?	It is suggested to make reference to a table in the appendix to annex 3, which provides examples for acceptable measures. This table could be reviewed and amended from time to time.	

39	Annex 3	3.1.2.1.4.1.	LDV	If one specific gear ratio gives an acceleration in a tolerance band of ±5 per cent of the reference acceleration awot ref, not exceeding 2.0 m/s2, test with that gear ratio.	Issue of practical workload. -> Not yet ready, need data. Can do as part of the general review	Acceleration tolerance of +/-10% ?	To be Provided by ISO individual experts in ISO first ==> see as well R41 gear selection, page 24 point (b) Alternative: add footnote to wait between runs one minute for better repeatable results
40	Annex 3	3.2.1.1.4.2 3.2.1.1.4.3	LDV	If possible, the manufacturer shall take measures to avoid an acceleration value awot test greater than 2.0 m/s2.	For more transparency, it is recommended to elaborate a table of measures as examples. This would give guidance to manufacturer, technical services and Type Approval Authorities.	If possible, the manufacturer shall take measures to avoid an acceleration value awot test greater than 2.0 m/s2. Table 1 in the Appendix of Annex 3 provides examples on measures to restrict the acceleration.	Alternative: GRB discusses this table on each session with red or green and notes
40	e.g. 3.1.2.1.4.2.	Annex 3 Annex 7	All	non-locked	Add a definition and remove everywhere "automatic transmission, adaptive transmission and CVT"; the enummeration gives examples, but is not limited to this		Subject to ASEP Revision 2. Stage
44	Annex 3	3.1.2.2.1.3.	LDV	…	Proposal of France during GRB 65	(d) If no rotational engine speed is available and the target vehicle speed vtarget BB', vBB'1 and vBB'2 defined as 25 km/h ≤ vBB'1 ≤ 35 km/h 35 km/h ≤ vBB'2 ≤ 45 km/h cannot be fulfilled, it is necessary to conduct, only one test with vBB'3 where vBB'3 is defined as the maximum speed of the vehicle. The test condition for vBB'3 is taken for further calculation of Lurban.	
45	Annex 3	3.1.3. 3rd Chapter	LDV	… The results of each side shall be averaged separately. …	Proposal of France during GRB 65	See Amendment 1 to UN R51.03	
46	Annex 3	3.1.3.1.	LDV	…	Proposal of France during GRB 65	… In the case of vehicles with a PMR not exceeding 25, the final result is calculated only with Lwot rep : Lurban = Lwot rep	
46	Annex3	3.2.3.	All	Test site - local conditions (see appendix of Annex 3, Figure 2)	This figure is mismatch to this paragraph.	Test site - local conditions (see appendix of Annex 3, Figure 3a)	
46	Annex 3	3.2 and subparagraphs '4. and subparagraphs	All	Move section for stationary sound emission test and passby test as substitute for stationary test to an own Annex	Annex 3 is already a very complex annex with many provisions for the passby. It is suggested to move the stationary provisions to an own annex for better clarity	Create Annex 8 and insert paragraphs for stationary sound	
47	Annex3	3.2.5.3.	All	Measuring of noise in proximity to the exhaust (see appendix of Annex 3, Figure 2)	This figure is mismatch to this paragraph.	Measuring of noise in proximity to the exhaust (see appendix of Annex 3, Figure 3b~d)	
47	Annex3	3.2.5.3.	All	Measuring of noise in proximity to the exhaust (see appendix of Annex 3, Figure 2)	This figure is mismatch to this paragraph.	Measuring of noise in proximity to the exhaust (see appendix of Annex 3, Figure 3b~d)	
49	Annex 3	3.2.6 last sentence	All	The maximum sound level, for all measurement positions, and of the three measurement results, constitutes the final result.	UN R51.03 is the only regulation where the maximum sound level out of three measurements is taken as the final result. ISO5130:2007 request to calculate the average. The finally reported value shall be rounded to the nearest interger. All official documents to which in-use checks can refer state the value as a full integer.	For all measurement positions the average sound level of the three measurement results shall be calculated and rounded to the nearest integer. The maximum sound level~~, for~~ of all measurement positions~~, and of the three measurement results,~~ constitutes the final result.	ISO 5130:2007
65	Annex 4	Appendix	All	None	Add flowchart figure 2 for silencer conditioning test	===> see flowchart	
70	Annex 7	3.2.2	LDV	None	What happens when P1 is close to P4? (No, or low, seperation in speed) Need to consider in next steps. Again something for the general review.	Need clarifying remark to treat a) only with L_urban; 2) assume defined slope limit [6], or c) exclude gear.	ASEP Revision 2. Stage

Examples for Measures to Enable a Vehicle Tested within the Acceleration Boundaries

Nr	Impact	Sub Nr	Measure	Documentation in Test Report	Additional Requirements	Comment
1	**Lock of a discrete gear ratio**	1	A discrete gear ratio can be locked by the driver	Report Gear Ratio	none	This is a standard situation
		2	A discrete gear ratio is onboard available but is not available to the driver. The locking can be activated by the manufacturer with an onboard (hidden) function or with an external device	Document way of activation	none	
2	**Controlled gear shift management** Applicable to automatic transmission with cannot be locked, or where no locked gear provides a valid test result	1	Kickdown is deactivated	Report deactivation	none	This is a standard situation
		2	Gear shift change(s) will happen during test test, gear shift is controlled by activation of an internal function or external device	Report gear shift strategy	Acceleration shall be between aurban and awot,ref	
3	**Partial load driving**	1	Acceleration is limited by a mechanical device	Detailed description of the mechanical device,	For ASEP Lwot,i is calculated by: Lwot,i = (Ltest,i - kp*Lcrs) / (1-kp) where kp = 1-atest/awot,ref	
		2	External Programming for partial throttle acceleration	Document way of activation and the difference in software		
4	**Mix Solution (Mode)** This measure will be a mix of the above solutions combined in a specific mode	1	Mode is onboard available and can be selected by the driver	Report Mode	none	This is a standard situation
		2	Mode is onboard available and can only be activated by the manufacturer with a hidden function or an external device	Document way of activation	none	
		3	Mode is not onboard available, an external software overrides the internal software	Document difference between internal and external software	Acceleration shall be between aurban and awot,ref	


Check on Necessity for a **Silencer Conditioning**
Silencer contains fibrous material ?
NO
YES
Is the fibrous material in contact with exhaust gas?
NO
YES
Is the silencer member of a design family for which it has been proven that the fibrous material will not deteriorate?
NO
YES
Provide documentation, that the silencer is belonging to a family of silencers for which it was proven that the fibrous material will not deteriorate.
Provide information about the family representative silencer and the way of proof for the non-deterioration
Conditioning test **IS** necessary
Conditioning **IS NOT** necessary
Perform either a conditioning test or – on request of the manufacturer – remove the fibrous material
Proceed to the sound emission Tests