<table>
<thead>
<tr>
<th>Page</th>
<th>Main Body or Annex</th>
<th>Paragraph or other</th>
<th>LDV or HCV Subject</th>
<th>Original UN R51.03 Text</th>
<th>Remark</th>
<th>Proposal for Change</th>
<th>Supplement Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>Clean-up is needed</td>
<td>Review all indices and find a general rule for writing, many times in the documents same variables are written differently.</td>
<td>5.03 accelerator, accelerator control, 540/2014 accelerator, acceleration control unit.</td>
<td></td>
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<tr>
<td>0</td>
<td>Main</td>
<td>2.11.1</td>
<td>LDV</td>
<td>In the case of vehicles of categories M1, N1 and N2 ≤ 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.</td>
<td>When a vehicle has several engines at different locations, which engine should be used to determine the reference point?</td>
<td>In the case of vehicles of categories M1, N1 and N2 ≤ 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.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Main Body</td>
<td>6.2.3.</td>
<td>LDV</td>
<td>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.</td>
<td>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 speed.</td>
<td>Find precise definitions for ambiguous phrases</td>
<td>Subject to ASEP Revision 2. Stage</td>
</tr>
<tr>
<td>13</td>
<td>Main</td>
<td>2.26.1</td>
<td>LDV</td>
<td>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.</td>
<td>Common definition in Annex3 and Annex7.</td>
<td>To add: If the acceleration ratio cannot be achieved, the acceleration awot_testPP-BB shall be used.</td>
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<tr>
<td>14</td>
<td>Main</td>
<td>6.1.3</td>
<td>All</td>
<td>Add definition for “defeat device” see above, definition.</td>
<td>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.)</td>
<td>Subject to ASEP Revision 2. Stage</td>
<td></td>
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<tr>
<td>18</td>
<td>Main Body</td>
<td>6.2.3.1</td>
<td>LDV</td>
<td>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.</td>
<td>Same common as for 6.2.3.</td>
<td>Find precise definitions for ambiguous phrases</td>
<td>Subject to ASEP Revision 2. Stage</td>
</tr>
</tbody>
</table>
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.

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 "T" 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.

1.1.3. Compliance with requirements

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".

2.2.6. All

The test is ambiguous as it could be understood to mandate a silencer conditioning, while Annex 4 specifies criteria under which a silencer conditioning 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.

3.1.2.1.4. All

The reference axes 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 axes".

3.1.2.1.5. 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. Conditionning is not needed. For clarity, it is suggested to modify the Annex 4 paragraph 1 in junction with the flowchart (figure 2) of the appendix to Annex 4 shall be followed.

3.1.2.1.1

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. 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.

3.1.2.1.2.

Harmonising with R138 to apply modern measurement system

3.1.2.1.3.

Harmonising with R138 to apply modern measurement system

3.1.2.1.4.

Harmonising with R138 to apply modern measurement system

3.1.2.1.5.

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 "T" 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.

3.1.2.2.1.

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 drive selection which is intended for normal road use.

3.1.2.4.

Already addressed under 2.2.4. 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.
3.1.2.1.4.1. LDV
If one specific gear ratio gives an acceleration in a tolerance band of ±5 percent of the reference acceleration $a_{wot\, ref}$, 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.

Accelration 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.

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 $a_{wot\, test}$ 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 manufacturers, technical services and Type Approval Authorities.

If possible, the manufacturer shall take measures to avoid an acceleration value $a_{wot\, test}$ 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.

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

3.3.2. 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)

4. and subparagraphs

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.

5.2.5. 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 5, Figure 3b-d)

5.2.3. 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 integer. 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, sum of all measurement positions, and of the three measurement results constitutes the final result.

ISO 5130:2007

5.2.2. Annex 7
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 0% or c) exclude gear.

ASEP Revision 2. Stage
<table>
<thead>
<tr>
<th>Nr</th>
<th>Impact</th>
<th>Sub Nr</th>
<th>Measure</th>
<th>Documentation in Test Report</th>
<th>Additional Requirements</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lock of a discrete gear ratio</td>
<td>1</td>
<td>A discrete gear ratio can be locked by the driver</td>
<td>Report Gear Ratio</td>
<td>none</td>
<td>This is a standard situation</td>
</tr>
<tr>
<td></td>
<td>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</td>
<td>2</td>
<td>Document way of activation</td>
<td>none</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Controlled gear shift management</td>
<td>1</td>
<td>Kickdown is deactivated</td>
<td>Report deactivation</td>
<td>none</td>
<td>This is a standard situation</td>
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<tr>
<td></td>
<td>Gear shift change(s) will happen during test test, gear shift is controlled by activation of an internal function or external device</td>
<td>2</td>
<td>Report gear shift strategy</td>
<td>Acceleration shall be between urban and awot,ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Partial load driving</td>
<td>1</td>
<td>Acceleration is limited by a mechanical device</td>
<td>Detailed description of the mechanical device,</td>
<td>For ASEP Lwot,i is calculated by: Lwot,i = [(test,i - kp*Lcrs) / (1-kp)] where kp = 1-atest/awot,ref</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External Programming for partial throttle acceleration</td>
<td>2</td>
<td>Document way of activation and the difference in software</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Mix Solution (Mode)</td>
<td>1</td>
<td>Mode is onboard available and can be selected by the driver</td>
<td>Report Mode</td>
<td>none</td>
<td>This is a standard situation</td>
</tr>
<tr>
<td></td>
<td>Mode is onboard available and can only be activated by the manufacturer with a hidden function or an external device</td>
<td>2</td>
<td>Document way of activation</td>
<td>none</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mode is not onboard available, an external software overrides the internal software</td>
<td>3</td>
<td>Document difference between internal and external software</td>
<td>Acceleration shall be between urban and awot,ref</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

Perform either a conditioning test or — on request of the manufacturer — remove the fibrous material

Conditioning IS NOT necessary

Proceed to the sound emission Tests