

**Consolidated Proposal to replace
Working Document GRBP/2026/4
(Proposal for Supplement 11 to the 03 series of
amendments to UN Regulation No. 51 (Noise of M and N
Categories of Vehicles))**

I. Introduction and References

The changes introduced by the Subgroup on UN-R51 & 138 by GRBP/2026/4 amended by Informal Document GRBP-83-09-Rev1 are marked in **blue** (bold and strikethrough).

Consolidation with adopted and frozen documents of 82nd GRBP:

- The changes introduced by the Working Document GRBP/2025/20 amended by the Informal Document GRBP-82-07 are marked in **violet** (bold and strikethrough).
- The changes introduced by the Informal Document GRBP-82-22 are marked in **green** (bold and strikethrough).

Consolidation with documents adopted in 83rd GRBP:

- The changes introduced by ISO by the Working Document GRBP/2026/5 amended by the Informal Document GRBP-83-28 are marked in **orange** (bold and strikethrough).
- The changes introduced by the Working Document GRBP/2026/13 are marked in **light blue** (bold and strikethrough).

Consolidation of adopted and frozen documents regarding the package of TF AVRS:

- The changes introduced by the Working Document GRBP/2025/25 amended by the Informal Document GRBP-82-15-Rev1 are marked in **red** (bold and strikethrough).

II. Proposal

Table of content, Annexes, amend to read:

"10 Special provisions for the testing of vehicles equipped with an ADS "

Paragraph 1., footnote 1, amend to read:

¹ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.) (ECE/TRANS/WP.29/78/Rev.8)."

Paragraph 2.4.(a), amend to read:

"2.4. "Mass of a vehicle in running order (m_{ro})" means

(a) In the case of a motor vehicle:

The mass of the vehicle, with its fuel tank(s) filled to at least 90 per cent of its or their capacity/ies, ~~including the mass of the driver,~~ of the fuel and liquids, fitted with the standard equipment in accordance with the manufacturer's specifications and, when they are fitted, the mass of the bodywork, the cabin, the coupling and the spare wheel(s) as well as the tools **and the mass of the driver (75 kg) except in the case of vehicles of category X or category Y.**

..."

Paragraph 2.8., amend to read:

"2.8. "Maximum net power, P_n " means the declared engine power available for propulsion expressed in kW and measured dependent on the drive train concepts pursuant to UN Regulation No. 85 or UN ~~GTR No. 21~~ **Regulation No. 177.**

..."

Paragraph 2.8.3., amend to read:

"2.8.3. ...

The maximum engine power is the "vehicle system power rating" according to the arithmetic sum of parallel propulsive engines on the vehicle or ~~the GTR 21, paragraph 6.9.1.(b)~~ "sustained vehicle system power" **according to UN Regulation No. 177, paragraph 8.9.1.(b).**"

Insert a new paragraph 2.11.3., to read:

"2.11.3. For bidirectional vehicles, the reference point shall be determined separately for each forward direction. "

Paragraph 2.24., amend to read:

"2.24. Table of Symbols

...

...				
n_{anchor} n_{anchor}	1/min	Annex 7	3.1.	reported vehicle engine speed for gear ratio i from Annex 3
v_{anchor} v_{anchor}	km/h	Annex 7	3.1.	reported vehicle test speed for gear ratio i at BB' from Annex 3; value to be reported and used for calculations to the first decimal place
a_{anchor} a_{anchor}	m/s ²	Annex 7	3.1.	reported vehicle acceleration for gear ratio i from Annex 3; value to be reported and used for calculations to the first decimal place
$L_{ASEP \kappa, j}$	dB(A)	Annex 7	3.3.	sound pressure level calculated for a gear κ at test point j to reflect the estimated linear sound level increase as a function of the engine speed (ICEs) or the vehicle speed (EVs)
$\Delta L_{ASEP, j}$	dB	Annex 7	3.4.	added sound pressure level for ASEP at test point j to reflect the relation of the measured performance versus performance at the anchor point; value to be used for calculations to the first decimal place
$L_{\kappa j}$	dB(A)	Annex 7	3.4. 3.5.	...
...				

..."

Add new paragraphs 2.29. to 2.34.3., to read:

"2.29. "Automated Driving System (ADS)" means the vehicle hardware and software that are collectively capable of performing the entire Dynamic Driving Task (DDT) on a sustained basis.¹

- 2.30. ***“Dynamic Driving Task (DDT)”*** means the real-time operational and tactical functions required to operate the vehicle.¹
- 2.31. ***“Bidirectional vehicle”*** means a vehicle that can operate in two opposite forward directions.¹
- 2.32. ***“Forward direction” (of a vehicle)*** means a direction that is intended to be used as main travelling direction of the vehicle.¹
- 2.33. ***“Accelerator”*** means
- (a) **for manually driven vehicles:**
the device used by the driver to control the engine speed and the vehicle speed;
 - (b) **for vehicles equipped with an ADS:**
the function in the ADS used to control the engine speed and the vehicle speed.
- 2.34. **Categories of vehicles equipped with an ADS¹**
- 2.34.1. ***“Category X vehicles”*** are vehicles of categories M, N, L and T meeting all of the following conditions:
- (a) They are equipped with an ADS
 - (b) They are not capable of being driven manually at speed exceeding 6 km/h; and
 - (c) They are designed to carry occupants
- 2.34.2. ***“Category Y vehicles”*** are vehicles of categories N, L and T meeting all of the following conditions:
- (a) They are equipped with an ADS
 - (b) They are not capable of being driven manually at speed exceeding 6 km/h; and
 - (c) They are not designed to carry occupants at any time"

Add a new paragraph 2.35., to read

- "2.35. ***“Enhanced Exterior Sound (EES)”*** means any sound
- (a) generated by one or more active systems² installed on a vehicle for the purpose of enhancing the vehicle’s exterior sound emission, and
 - (b) which is not subject to another UN Regulation."

Add a new paragraph 2.36., to read

- "2.36. ***“Vehicle Master Control Switch”*** means the device by which the vehicle’s on-board electronics system is brought, from being switched off, as in the case where a vehicle is parked without the driver being present, to normal operation mode (i.e. the vehicle status is "ready to drive")."

Paragraph 6.2., amend to read:

- "6.2. Specifications regarding sound levels"

Paragraph 6.2.3., amend to read:

- "6.2.3. Additional sSound eEmission pProvisions (ASEP)²

² See guidance document for interpretation of paragraph 6.2.3. ASEP of UN-R 51, which is included in the list of documents for reference of GRBP."

The **Requirements of Annex 7** ~~Additional Sound Emission Provisions (ASEP)~~ apply ~~only~~ to vehicles of categories M₁ and N₁ ~~equipped with an internal combustion engine.~~

Vehicles are deemed to fulfil the requirements of Annex 7, if the vehicle manufacturer provides technical documents to the type approval authority showing, that the difference between maximum and minimum engine speed of ~~the~~ vehicles at BB' for any test condition inside the ASEP control range (as defined in paragraph 2.3. of Annex 7 ~~to~~ of this Regulation (including Annex 3 conditions) does not exceed 0.15 x S. This article is intended especially for non-lockable transmissions with variable gear ratios (CVT).

...

The sound ... in a significant manner.²

~~Any electric sound enhancement system for the purpose of the exterior sound emission~~ **emission of EES** shall be ~~operational~~ **activated** during the type-approval test."

Add a new paragraph 6.2.3.3. and subparagraphs, to read:

6.2.3.3. Specifications for EVs and HEVs in the operating conditions in accordance with Annex 7 paragraph 1.1.

6.2.3.3.1. Operation of EES

When the vehicle is switched on by the vehicle master control switch, any EES shall be deactivated.

Any activation of EES shall require an intentional action of the driver.³

The EES shall be capable of being deactivated.

6.2.3.3.2. Vehicle Sound Limits

In the speed range equal to or lower than 20 km/h including standstill the sound emitted by the vehicle shall comply with the requirements of UN-Regulation No. 138 paragraph 6.

In the speed range from 20 km/h to 80 km/h the sound emitted by the vehicle shall comply with the requirements of this Regulation."

Paragraph 6.2.3.3. (former), renumber as paragraph 6.2.3.4.

Insert new paragraphs 11.17., 11.18., 11.19. and 11.20., to read:

11.17. Supplement 10 does not apply to existing type approvals and their extensions, granted prior to the date of entry into force of Supplement 10.

11.18. Supplement 11 does not apply to existing type approvals and their extensions, granted prior to the date of entry into force of Supplement 11.

11.19. Until 24 months after the date of entry into force of the Supplement 11 to the 03 series of amendments to this UN Regulation, Contracting Parties applying this UN Regulation can continue to grant extensions to existing UN type approvals to the 03 series of amendments to this UN Regulation, granted prior to the date of entry into force of Supplement 11, without taking into account the provisions of Paragraph 6.2.3.3.1."

11.20. From the entry into force of Supplement 11, ISO 362-3:2022 shall be accepted for all approvals granted under this Regulation. Until five years from the entry into force of Supplement 11, ISO 362-3:2016 shall be accepted for all approvals granted under this Regulation."

³ Example: changing a mode or operating a switch.

Annex 1,

Insert a new item 0.4.1., to read:

"0.4.1. Vehicle equipped with an ADS: yes/no"

Appendix 1, add a new item 1.1.10., to read:

"1.1.10 System(s) generating EES installed: yes/no"

1.1.10.1. System(s) generating EES, Make and Type: "

Appendix 2, add a new item 7.2., to read:

"7.2. Details of any system(s) generating EES (e.g., number and position of actuators and active sound sources) including a description of a possibility to activate and deactivate the EES"

Annex 3,

Paragraph 1.2., amend to read:

"1.2. Calibration Verification and Adjustment of the eEntire Acoustic Measurement System for a Every Measurement Session

The Technical Service shall determine the duration of a measurement session, which shall be no more than one day.

At the beginning ~~and at the end~~ of every measurement session the entire acoustic measurement system shall be checked by means of a sound calibrator of at least precision Class 1 according to IEC 60942:2003, **and – if the equipment allows it – adjusted to the reference values given by the calibrator.**

At the end of every measurement session, the entire acoustic measurement system shall be re-checked by means of the same sound calibrator which was used for the check at the beginning. Without any further adjustment the difference between the readings of ~~two consecutive checks~~ **at the beginning and at the end** shall be less than or equal to 0.5 dB(A).

~~If this value~~ **the difference is exceeded greater than 0.5 dB**, the results of the ~~measurements obtained after the previous satisfactory check~~ **whole measurement session** shall be discarded.

For indoor testing, the entire measurement system shall be checked at the beginning and at the end of a series of sessions.

Section 6 of ISO 362-3:2022 describes a A-qualified calibration method (i.e. electrical calibration). Such a method is recommended to be provided by the hardware supplier and, in that case, shall be implemented in the measurement software used. Simulation algorithms using sound source localization detection should deactivate that feature for these tests."

Paragraph 2.1.2., amend to read:

"2.1.2. Test Site Indoor

Test Site Indoor requirements shall be as specified below.

- (a) The test room dimensions are described in paragraph 7.2. of ISO 362-3:~~2016~~ **2022**. All room dimensions may be adjusted to meet the specific application for the products being tested according to Annex 8, paragraph 4.
- (b) The test facility shall meet the requirements of ISO 26101:2012 with the qualification criteria and measurement requirements appropriate to this test method as described in ISO 362-3:~~2016~~ **2022**, paragraph 7.3.
- (c) Condition of the floor is described in ISO 362-3:~~2016~~ **2022**, paragraph 7.4.

- (d) Cooling, ventilation, and exhaust gas management are described in ISO 362-3:2016-2022, paragraph 7.5.
- (e) Dynamometer requirements are described in ISO 362-3:2016-2022, paragraph 8.
- (f) Vehicle fixing system is described in ISO 362-3:2016, 2022 paragraph 9.3."

Paragraph 2.2.2.2., amend to read:

"2.2.2.2. Target mass, m_{target} , is used to denote the mass that N_2 and N_3 vehicles should be tested at. The actual test mass of the vehicle can be less due to limitations on vehicle and axle loading.

For vehicles in category N_2 , N_3 equipped with an ADS, $m_d = 0$ if there is no driver. In this case, if a person is inside the vehicle to perform the test, the mass of this person shall be considered part of the extra load m_{xload} . "

Table 2, amend to read:

"Table 2: Specification of test mass for the various vehicle categories

Vehicle category	Vehicle test mass
M_1	<p>The test mass m_t of the vehicle shall be between $0.9 m_{ro} \leq m_t \leq 1.2 m_{ro}$</p> <p>For vehicles in category X and Y, $0.9 m_{ro} \leq m_t - 75 \text{ kg} \leq 1.2 m_{ro}$ in case a person is inside the vehicle to perform the test</p> <p>For vehicles equipped with an ADS, other than those of category X and Y, $0.9 m_{ro} \leq m_t + 75 \text{ kg} \leq 1.2 m_{ro}$ in case there are no occupants in the vehicle</p>
N_1	<p>The test mass m_t of the vehicle shall be between $0.9 m_{ro} \leq m_t \leq 1.2 m_{ro}$</p> <p>For vehicle in category X and Y, $0.9 m_{ro} \leq m_t - 75 \text{ kg} \leq 1.2 m_{ro}$ in case a person is inside the vehicle to perform the test.</p> <p>For vehicles equipped with an ADS, other than those of category X and Y, $0.9 m_{ro} \leq m_t + 75 \text{ kg} \leq 1.2 m_{ro}$ in case there are no occupants in the vehicle</p>
N_2, N_3	<p>$m_{\text{target}} = 50 \text{ [kg/kW]} \times P_n \text{ [kW]}$</p> <p>Extra loading, m_{xload}, to reach the target mass, m_{target}, of the vehicle shall be placed above the rear axle(s).</p> <p>If the test mass m_t is equal to the target mass m_{target}, the test mass m_t shall be $0.95 m_{\text{target}} \leq m_t \leq 1.05 m_{\text{target}}$</p> <p>The sum of the extra loading and the rear axle load in an unladen condition, $m_{\text{ra load unladen}}$, is limited to 75 per cent of the technically permissible maximum laden mass allowed for the rear axle, $m_{\text{ac ra max}}$.</p> <p>If the test mass m_t is lower than the target mass m_{target}, the test mass m_t shall be achieved with a tolerance of ± 5 per cent.</p> <p>If the centre of gravity of the extra loading cannot be aligned with the centre of the rear axle, the test mass, m_t, of the vehicle shall not exceed the sum of the front axle in an unladen condition, $m_{\text{fa load unladen}}$, and the rear axle load in an unladen condition, $m_{\text{ra load unladen}}$ plus the extra loading, m_{xload}, and the mass of the driver m_d, except in the case of vehicles of category X or category Y where $m_d = 0$.</p>

<i>Vehicle category</i>	<i>Vehicle test mass</i>
	<p>The test mass for vehicles with more than two axles shall be the same as for a two-axle vehicle.</p> <p>If the vehicle mass of a vehicle with more than two axles in an unladen condition, $m_{unladen}$, is greater than the test mass for the two-axle vehicle, then this vehicle shall be tested without extra loading.</p> <p>If the vehicle mass of a vehicle with two axles, $m_{unladen}$, is greater than the target mass, then this vehicle shall be tested without extra loading.</p>
$M_2 (M \leq 3,500 \text{ kg})$	The test mass m_t of the vehicle shall be between $0.9m_{ro} \leq m_t \leq 1.2m_{ro}$
Complete $M_2 (M > 3,500 \text{ kg}),$ M_3	<p>If the tests are carried out with a complete vehicle having a bodywork,</p> <p>$m_{target} = 50 \text{ [kg/kW]} \times P_n \text{ [kW]}$ is calculated either in compliance with conditions above (see N_2, N_3 category)</p> <p>or</p> <p>the test mass m_t of the vehicle shall be $0.9 m_{ro} \leq m_t \leq 1.1 m_{ro}$.</p>
Incomplete $M_2 (M > 3,500 \text{ kg}),$ M_3	<p>If the tests are carried with an incomplete vehicle not having a bodywork,</p> <p>$m_{target} = 50 \text{ [kg/kW]} \times P_n \text{ [kW]}$ is calculated either in compliance with conditions above (see N_2, N_3 category),</p> <p>or</p> <p>the test mass m_t of the vehicle shall be $0.9 m_{ro} \leq m_t \leq 1.1 m_{ro}$.</p> <p>where</p> <p>$m_{ro} = m_{chassisM2M3} + m_{xloadM2M3}$</p>

"

Paragraph 2.2.2.3.4., amend to read:

"2.2.2.3.4. Calculation of the test mass of a virtual vehicle with two axles:

...

If the vehicle (vrf) has more than one front axle, take the one with the highest unladen front axle load.

$$\rightarrow m_{unladen (2 \text{ axles virtual})} = m_{fa (vrf) \text{ load unladen}} + m_{ra (vrf) \text{ load unladen}}$$

$$\rightarrow m_{xload (2 \text{ axles virtual})} = m_{target} - (m_d + m_{unladen (2 \text{ axles virtual})})$$

$$m_{unladen (2 \text{ axles virtual})} = m_{fa (vrf) \text{ load unladen}} + m_{ra (vrf) \text{ load unladen}}$$

$$m_{xload (2 \text{ axles virtual})} = m_{target} - (m_d + m_{unladen (2 \text{ axles virtual})})$$

...

$$\rightarrow m_{ac ra \text{ max} (4x2 \text{ virtual})} = m_{ac ra \text{ max} (chosen)}$$

$$m_{ac ra \text{ max} (4x2 \text{ virtual})} = m_{ac ra \text{ max} (chosen)}$$

..."

Paragraph 2.2.3.3., amend to read:

"2.2.3.3. ~~Active Sound Systems~~ **generating EES**

Any ~~active sound devices~~ **system generating EES, subject to paragraph 6.2.3. and Annex 7 of this Regulation, either for noise control, or sound enhancement**, shall operate ... measurements."

Paragraph 3., amend to read:

"3. **Methods of testing**

Outdoor tests shall be performed according to paragraph 3.1.

Indoor tests shall be performed according to paragraph 3.1. using the specifications of ISO 362-3:2016 **2022**, variant A. For indoor application, the manufacturer shall provide to the technical service, documentation according to Annex 8, paragraph 1. Variant A is a combination of indoor testing (power train sound) and outdoor testing (tyre/road sound)."

Paragraph 3.1.2.1.4.3., amend to read:

"3.1.2.1.4.3. Vehicles with only one gear ratio, like but not limited to Battery Electric Vehicles (BEV) and Fuel Cell Vehicles (FCV)

...

The achieved acceleration a_{wot_test} , **but no more than 2.0 m/s²**, is then used for the calculation of the partial power factor k_p (see paragraph 3.1.2.1.3.) **instead of a_{wot_ref} .**"

Paragraph 3.1.2.1.5., amend to read:

"3.1.2.1.5. **Acceleration test**

... when line BB' is crossed.

Specific provisions for the testing of vehicles equipped with an ADS are provided in Annex 10. "

Paragraph 3.1.2.1.6., amend to read:

"3.1.2.1.6. **Constant speed test**

... During the constant speed test the **accelerator** ~~acceleration control~~ shall be positioned to maintain a constant speed between AA' and BB' as specified. If the gear is locked for the acceleration test, the same gear shall be locked for the constant speed test.

Specific provisions for the testing of vehicles equipped with an ADS are provided in Annex 10."

Paragraph 3.1.2.2.2., amend to read:

"3.1.2.2.2. **Acceleration test**

When the reference point of the vehicle reaches the line AA' the **accelerator** ~~acceleration control~~ shall be fully depressed ...

..., the semi-trailer shall be disregarded in determining when line BB' is crossed.

Specific provisions for the testing of vehicles equipped with an ADS are provided in Annex 10."

Paragraph 3.2.5.3.2.2., amend to read:

"3.2.5.3.2.2. **Test procedure**

... mathematically rounded to the first decimal place, is taken as the test value.

Specific provisions for the testing of vehicles equipped with an ADS are provided in Annex 10. "

Appendix 2, paragraph 3.3.4., amend to read:

"3.3.4. ...
 The redefined $L_{TR,wotj,9wot}$ shall then be subjected to temperature correction in ~~3.2.3.~~ **paragraph 3.3.3.** to obtain the corresponding $L_{TR,wotj,9ref}$.
 ..."

Appendix 3, paragraph 3.1., amend to read:

"3.1. General conditions
 ...
 When the front end of the test vehicle has reached the line AA' the vehicle shall be brought to coast-down by full release of the ~~accelerator acceleration pedal~~. If applicable, the influence of the power train noise shall be minimized, e.g. the driver shall have put the gear selector to neutral position and switched off the engine. ...
 As an alternative test method, the ~~accelerator acceleration pedal~~ may be positioned such to maintain a constant speed between line AA' with an accuracy of +/- 1 km/h. The procedure is recommended especially for electric vehicles when a release of the acceleration pedal would result in a forced deceleration (recuperation) with higher negative torque on the tyre.
Specific provisions for the testing of vehicles equipped with an ADS are provided in Annex 10. "

Annex 6,

Paragraph 2., amend to read:

"2. Testing procedure
 The test site and measuring instruments shall be those as described in Annex 3 **and Annex 10 for vehicles equipped with an ADS. "**

Annex 7,

Add a new paragraph 1.1., to read:

"1.1. **Vehicles, when electrically propelled without internal combustion engines operating shall comply with Analysis method 1⁴ (Slope assessment method) only. "**

Paragraph 2.3., amend to read:

"2.3. Control ~~±~~Range
 The ASEP ... below.
The control range is specified as:

⁴ The Analysis method 2 (L_{urban} assessment) and the Reference Sound Assessment are not applicable for these vehicles.

	<i>For vehicles in operating conditions in accordance with Annex 7, paragraph 1.1.</i>	<i>For vehicles in all other operating-conditions</i>
Vehicle speed V_{AA_ASEP}	$V_{AA} \geq 20 \text{ km/h}$	$V_{AA} \geq 20 \text{ km/h}$
Vehicle acceleration a_{WOT_ASEP}	$a_{WOT} \leq 5.0 \text{ m/s}^2$	
Engine speed n_{BB_ASEP}	not applicable	$n_{BB} \leq 2.0 * PMR^{0.222} * S$ or $n_{BB} \leq 0.9 * S$, whichever is the lowest
Vehicle speed V_{BB_ASEP} for vehicles tested in Annex 3 with		
<ul style="list-style-type: none"> locked gear 	$V_{BB} \leq 80 \text{ km/h}$	<p>If the vehicle, in the lowest valid gear does not achieve the maximum engine speed n_{BB_ASEP} below 70 km/h, increase the vehicle speed in that gear to reach the maximum engine speed n_{BB_ASEP}, but no more than 80 km/h.</p> <p>For any other gear, the maximum vehicle speed is 70 km/h.</p>
<ul style="list-style-type: none"> non-locked gears 	$V_{BB} \leq 80 \text{ km/h}$	
Gear selection	only if applicable, e.g. for hybrid electric vehicles: gears $\kappa \leq \text{gear } i$ as determined in Annex 3	gears $\kappa \leq \text{gear } i$ as determined in Annex 3
Transmission condition for vehicles tested in Annex 3 with		
<ul style="list-style-type: none"> locked gear 	Gear _i , gear _{i-1} ,...	Gear _i , gear _{i-1} ,...
<ul style="list-style-type: none"> non-locked gears 	Non-locked gears	Non-locked gears

Vehicle speed V_{AA_ASEP} : $V_{AA} \geq 20 \text{ km/h}$

Vehicle acceleration a_{WOT_ASEP} : $a_{WOT} \leq 5.0 \text{ m/s}^2$

Engine speed n_{BB_ASEP} : $n_{BB} \leq 2.0 * PMR^{0.222} * S$ or $n_{BB} \leq 0.9 * S$, whichever is the lowest

For vehicles subject to paragraph 1.1. of this Annex, the manufacturer shall take measures to achieve an acceleration within the control range in such a way that each test point P1 to P4 as specified in paragraph 2.4. of this Annex reaches the given target speed within the specified tolerance.

Table 1 in Appendix 1 to Annex 3 provides examples for valid measures to enable a test condition within the above specified acceleration boundaries. Any measure used by manufacturers for the above-mentioned purposes shall be documented in the test report.

Vehicle speed V_{BB_ASEP} :

If the vehicle, in the lowest valid gear does not achieve the maximum engine speed n_{BB_ASEP} below 70 km/h, increase the vehicle speed in that gear to reach the maximum engine speed n_{BB_ASEP} , but not beyond 80 km/h.

For any other gear, the maximum vehicle speed is 70 km/h.

For vehicles tested in non-locked transmission conditions, the maximum vehicle speed is 80 km/h.

Gears $\kappa \leq$ gear i as determined in Annex 3

Transmission conditions:

<i>Annex 3 gear selection</i>	<i>Annex 7 gear selection</i>
Locked	Gear _i , gear _{i-1} ,...
Non-locked	Non-locked

"

Paragraph 3.1., amend to read:

"3.1. Determination of the anchor point

...

For vehicles subject to paragraph 1.1. of this Annex:

L_{anchor} is the higher sound pressure level of L_{wot} of left and right sides of gear ratio selected for the test;

v_{anchor} is the average of $v_{\text{BB,wot}}$ of the 4 runs of gear ratio selected for the test reported from Annex 3, but limited to 60 km/h for further calculation.

a_{anchor} is the measured acceleration and is not limited to 2.0 m/s² as required in paragraph 3.1.2.1.4.3. of Annex 3 for the determination of the k_p factor, and is the average of $a_{\text{wot,test}}$ reported from Annex 3, as defined in paragraph 3.1.2.1.2. of Annex 3."

Paragraph 3.2., amend to read:

"3.2. Slope of the regression line for each gear ratio κ

...

For vehicles subject to paragraph 1.1. of this annex, the sound measurements shall be evaluated as function of vehicle speed and Slope_{κ} shall be set to a constant value of 0.25 dB/(km/h) for further calculation."

Paragraph 3.3., amend to read:

"3.3. Calculation of the linear sound level increase expected for each measurement

...

For vehicles subject to paragraph 1.1. of this Annex:

The sound level $L_{\text{ASEP},\kappa,j}$ for measurement point j and gear ratio κ shall be calculated using the vehicle speed measured for each measurement point, using the constant slope specified in paragraph 3.2.2. above to the specific anchor point for each gear ratio.

For $v_{\text{BB},\kappa,j} \leq v_{\text{anchor}}$:

$$L_{\text{ASEP},\kappa,j} = L_{\text{anchor}} + (\text{Slope}_{\kappa} - Y) \times (v_{\text{BB},\kappa,j} - v_{\text{anchor}})$$

For $v_{\text{BB},\kappa,j} > v_{\text{anchor}}$:

$$L_{\text{ASEP},\kappa,j} = L_{\text{anchor}} + (\text{Slope}_{\kappa}) \times (v_{\text{BB},\kappa,j} - v_{\text{anchor}})$$

Where $Y = 0.05 \text{ dB}/(\text{km/h})^n$

Add a new paragraph 3.4., to read:

"3.4. Calculation of the sound level increase regarding performance

For tests of purely electrically propelled vehicles, the sound level $\Delta L_{\text{ASEP},j}$ shall be calculated:

For $v_{\text{BB,test},j} \times a_{\text{wot,test},j} \leq v_{\text{anchor}} \times a_{\text{anchor}}$:

$\Delta L_{\text{ASEP},j} = 0 \text{ dB}$

For $v_{\text{BB,test},j} \times a_{\text{wot,test},j} > v_{\text{anchor}} \times a_{\text{anchor}}$:

$\Delta L_{\text{ASEP},j} = 6 \text{ dB} \times \log_{10} \left(\frac{v_{\text{BB,test},j} \times a_{\text{wot,test},j}}{v_{\text{anchor}} \times a_{\text{anchor}}} \right)$

For all other tests the sound level $\Delta L_{\text{ASEP},j}$ is set to 0 dB."

Paragraph 3.4. (former), renumber as paragraph 3.5. and amend to read:

"3.45. Additional Samples

....

For vehicles subject to paragraph 1.1. of this annex, the additional runs can be selected under any operating condition within the control range, inclusive partial load acceleration or constant speed."

Paragraph 3.5. (former), renumber and amend to read:

"3.56. Specifications

Every individual ... below:

$L_{\kappa,j} - \Delta L_{\text{ASEP},j} \leq L_{\text{ASEP},\kappa,j} + X$

With:

$x = 3 \text{ dB(A)} + \text{limit value}^5 - L_{\text{urban}}$ ~~for vehicle tested with non locked transmission conditions~~

$x = 2 \text{ dB(A)} + (\text{limit value}^6 - L_{\text{urban}})$, of Annex 3 for all other vehicles

and only for vehicles

- **tested with non-locked transmission conditions given by multiple gear ratios, or**
- **having multiple electric propulsion sources or**
- **EV and HEV when electrically propelled without internal combustion engines operating having an $L_{\text{crs_rep}}$ greater than $L_{\text{wot_rep}}$ of Annex 3:**

$x = 3 \text{ dB} + (\text{limit value}^6 - L_{\text{urban}})$ of Annex 3.

If **at any point** the measured sound level ~~at a point~~ exceeds the limit, ... specification."

Paragraph 5.2., amend to read:

"5.2. The determination of gear α is as follows:

For vehicles tested in locked condition

- $\alpha = 3$ for manual transmission and for automatic transmission ~~tested in locked position~~ with up to 5 gears;

⁵ As applicable for the approved type of vehicle

⁶ As applicable for the approved type of vehicle

- $\alpha = 4$ for manual transmission and for automatic transmission ~~tested in locked position~~ with 6 or more gears. If the acceleration calculated from AA to BB + vehicle length in gear 4 exceeds 1.9 m/s², the first higher gear $\alpha > 4$ with an acceleration lower than or equal to 1.9 m/s² shall be chosen. If there is no gear with an acceleration less than or equal to 1.9 m/s² available, the highest available gear shall be chosen.

~~For vehicles tested under locked condition, the gear ratio for further calculation shall be determined from the acceleration test result in Annex 3.~~

..."

Annex 8,

Paragraph 2.2., amend to read:

"2.2. Power train sound

It shall be ensured that there is no remaining tyre/road sound affecting the measurements. In any case it shall be ensured that the remaining tyre/road sound shall be at least 10 dB below the maximum A-weighted sound pressure level produced by the vehicle under test. If this condition cannot be fulfilled, a correction shall be carried out. This correction procedure is described in ISO 362-3:2016-2022 Annex B, paragraph B.6.7

The vehicle shall be measured according to the operating condition specified in paragraphs 3.1.2.1. or 3.1.2.2. of Annex 3 of this Regulation."

Paragraph 2.3., amend to read:

"2.3. Tyre/road sound

The measurements of the tyre/road sound shall be performed on a test track as described paragraph 2.1.1. of Annex 3 of this Regulation. The evaluation of tyre/road sound consists of two procedures, namely:

- (a) Evaluation of free rolling sound ~~as described in Appendix 3 of Annex 3;~~
- (b) Evaluation of tyre/road sound including torque influence which can be derived from a) by a simplified method.

All conditions for evaluation of tyre/road sound shall be done according to paragraph 3. of this Annex. "

Paragraph 2.4., amend to read:

"2.4. Calculation of the total vehicle sound

The total vehicle sound is the energetical sum of tyre/road sound and power train sound. This calculation shall be carried out for each single run as describe in ISO 362-3:2016-2022, paragraph 10.2.4."

Paragraph 3., amend to read:

"3. Procedure for measurement, evaluation, and calculation of tyre/road sound when using variant A

All conditions for evaluation of tyre/road sound, free rolling sound, and torque influence are described in ISO 362-3:2016-2022, Annex B."

Paragraph 4., amend to read:

"4. Adjustment of room dimensions

To cater for the smaller size test rooms, the maximum levels shall be evaluated with caution though to avoid missing them according to ISO 362-3:2016-2022, Annex EF."

Insert a new Annex 10, to read:

"Annex 10

Specific provisions for the testing of vehicles equipped with an ADS

1. General

This Annex adapts Annexes 3 and 7 to vehicles equipped with an ADS. It does not add nor remove any requirement.

2. Specifications

2.1. Preparations

When performing the tests of this Regulation, the conditions prescribed in chapter 6 “Specifications” shall be fulfilled. Additional preparation of the test track, the vehicle or other equipment may be needed for vehicles equipped with an ADS. This additional preparation shall be approved by the Type Approval Authority and its designated Technical Service and described in the test report.

2.2. For vehicles equipped with an ADS, other than those of category X or Y, it is sufficient to test either in manual operation or ADS operation, when the two following conditions are fulfilled:

- the manufacturer declares that the vehicle is designed in such a way that there should be no difference between the manual and the automated modes with regards to this Regulation and**
- the Type Approval Authority and its designated Technical Service agree to this single mode testing.**

2.2.1. If tested in manual operation, the sound shall be measured according to Annex 3 and, if applicable, Annex 7

2.2.2. If tested in ADS operation, the sound shall be measured according to Annex 3 and, if applicable, Annex 7, and this Annex.

3. Adaptation of the accelerator commands

Several paragraphs in Annexes 3 and 7 prescribe actions on the accelerator. For vehicles equipped with an ADS and tested in ADS operation, these should be interpreted as commands from the ADS to achieve specific vehicle behaviours. Table 1 below translates the actions on the accelerator into the required actions from the ADS.

Table 1: Translation of actions on the accelerator into required actions from the ADS.

Chapter	Action for vehicles tested in manual operation	Equivalent action for vehicles tested in ADS operation
Annex 3, paragraph 3.1.2.1. Annex 3, paragraph 3.1.2.2. Annex 7, paragraph 2.3.	Fully depressing the accelerator	Command from the ADS to apply the maximum acceleration
Annex 3, paragraph 3.1.2.1.5.	Keeping the accelerator in the depressed position	Command from the ADS to continue the maximum acceleration
Annex 3, Appendix, paragraph 3. and paragraph 3.1.	Releasing the accelerator	Command from the ADS to achieve coast down condition (no torque requested from the engine)
Annex 3, Appendix 3, paragraph 3.1.	Positioning the accelerator as such to maintain a constant speed	Command from the ADS to achieve a constant speed
Annex 3, paragraph 3.2.5.3.2.2.	Rapidly release the throttle control	Command from the ADS to the ICE to release the throttle to go to idling. (Only applies to Category X and Y vehicles with an ICE.)

"