

**Engine speed shall be considered in UN Regulation No. 51
 new test method for all vehicles**

I. about the old editions of ISO 362:1998, GB1495-2002 and UN Regulation No. 51- 02 series of amendments.

Table 1 test method differences between ISO, ECE and GB

		ISO 362:1998	GB1495-2002	ECE R51-02
Depart ure speed	M1、 N1	The Departure engine speed can not exceed the rated engine speed, otherwise reduce the approach speed	Same to ISO	Same to ISO
	Other vehicles	If the Departure engine speed exceeds the rated engine speed, raise the test gears until the gear with Departure engine speed can not exceed the rated engine speed, but use the maximum noise gear.	If the Departure engine speed exceeds the rated engine speed, raise the test gears until the gear with Departure engine speed can not exceed the rated engine speed, only use the first gear with Departure engine speed can not exceed the rated engine speed.	Same to ISO

This table means ten years ago (actually 15 years ago), the ISO 362:1998, and ECE R51 02 series only considered the engine speed of M1 N1 categories, the engine speed of other vehicles is not been considered, but China has considered the engine speed of all vehicle categories.

The test results show that the ISO 362:1998, and ECE R51 02 series will always get the highest sound in the gear which the departure engine speed exceeds the rated engine speed. But these gears are not typical used in urban conditions, so it makes big problems for the manufacturers and engineers, cause they must spend lot of time and money to control the noise which is always not used in the urban conditions. Maybe it is also one of the reasons why the noise test result is controlled, but the urban condition is still loudly. But in this field China has done a more clever decision 15 years ago, even at that time, the Chinese automotive technology is not developed. And the proof tests results show that the ECE R51 03 series test result is very close to the test results of GB 1495-2002 in the commercial vehicle test field.

II. about the new test method of ISO 362, GB1495-20XX and draft UN Regulation No. 51- 03 series of amendments

1. The condition of the vehicle is as follows:

Engine power	Rated engine speed	Vehicle length	Test mass	PMR	a_{urban}	$a_{wot\ ref}$	Gear No.
60.5 kW	5300	4 meters	1225 kg	49.4	0.98	1.28	5

2. The acceleration of Gears

2 nd gear	3 rd gear	4 th gear
1.92	1.20	0.86

3. Gears selected according to acceleration:

2 nd gear	3 rd gear
1.92	1.20

4. The departure vehicle speed and departure engine speed

	2 nd gear	3 rd gear
Vehicle speed ($V_{BB'}$)	55.7	53.8
Engine speed ($n_{BB'}$)	5500	3460
Verdict	Discarded	Use this gear

I find the relative items in Regulation No. 51 Revision 1 - Amendment 3 Annex 10 - Methods and instruments for measuring the noise made by motor vehicles (Measurement Method B)" Annex 10

3.1.2.1.4.1. Vehicles with manual transmission, automatic transmissions, adaptive transmissions or CVT's tested with locked gear ratios The following conditions for selection of gear ratios are possible:

(e) If rated engine speed is exceeded in a gear ratio before the vehicle passes BB' the next higher gear shall be used.

In the new test method of ECE R51 03 series and ISO 362-1:2007, the departure engine speed is still only considered in the passenger car (M1 N1 and some M2 vehicles) tests, but in the commercial vehicles tests field, only the $n_{BB'}$ is considered, the departure engine speed is still not considered. But China will consider all of them.

So, we suggest that the engine speed should be considered in all vehicles categories to make sure that the engine speed is in the recommended engine speed range and in the typical urban driving conditions. ECE and ISO should avoid the same mistake which has happened 15 years ago.

And we also suggest the ECE and ISO building up some organizations or doing more tests yourselves but not just collect data from technical service organizations from different countries for the purpose of finding the questions of test method. China thinks that more typical tests you do, the more questions you will find, and the regulation will be more perfectly.