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PROPOSAL FOR A DRAFT AMENDMENT TO THE 05 SERIES OF AMENDMENTS TO REGULATION No. 83
(Emissions of M1 and N1 categories of vehicles)

Transmitted by the experts from International Organization of Motor Vehicle Manufacturers (OICA)

Note: The text reproduced below has been prepared by the expert from OICA to allow manufacturer to introduce specific gear shift points for vehicles with manual gearboxes as an alternative to the gear shift points as specified in Tables 1.2 and 1.3 of annex 4.

Note: This document is distributed to the Experts on Pollution and Energy only.

A. PROPOSAL

Annex 4, paragraph 2.3.2., amend to read:

"2.3.2. Vehicles equipped with semi-automatic-shift gearboxes **and manual gearboxes (for manual gearboxes under the condition of the availability of a gear shift indicator)** shall be tested by using the gears normally employed for driving, and the gear shift is used in accordance with the manufacturer's instructions. **As an alternative, the gear shift points according to Table 1.2 and 1.3 can be used. The tolerances as mentioned in article 2.4 shall be applied**."

B. JUSTIFICATION

INTRODUCTION

The gear shift points as laid down in the Regulation No. 83 were originally designed for vehicles with 4 speed gearboxes. The modifications having occurred with reference to 5 speed and 6 speed gearboxes nevertheless do not satisfy the abilities of present vehicle technology. The engine torque characteristics and the manual gearboxes of today's vehicles allow an earlier up-shifting than the Regulation does allow. Furthermore, the gear shifting procedure for hybrid vehicles with manual gearbox will be allowed according to the manufacturer's specification – the relevant amendment of this Regulation is on the way.

BACKGROUND AND JUSTIFICATION

Regulation No. 83 requires for vehicles with manual gearbox to use the shifting strategy as laid down in Tables 1.2 and 1.3 of annex 4. See Table 1.3 as an example.

No. of operation	operation	Phase	acceleration (m/s^2)	speed (km/h)	Duration of each operation (s)	Duration of each Phase (s)	Cumulative time (s)	Gear to be used in the case of manual gearbox
1	idling	1			20	20	20	K_1(*)
2	acceleration	2	0,83	0-15	5	41	25	1
3	Gear change				2		27	-
4	acceleration		0,62	15-35	9		36	2
5	Gear change				2		38	-
6	acceleration		0,52	35-50	8		46	3
7	Gear change				2		48	-
8	acceleration		0,43	50-70	13		61	4
9	Steady speed	3		70	50	50	111	5
10	deceleration	4	-0,69	70-50	8	8	119	4s.5+4s.4
11	Steady speed	5		50	69	69	188	4
12	acceleration	6	0,43	50-70	13	13	201	4
13	Steady speed	7		70	50	50	251	5
14	acceleration	8	0,24	70-100	35	35	286	5
15	Steady speed	9		100	30	30	316	5(**)
16	acceleration	10	0,28	100-120	20	20	336	5(**)
17	Steady speed	11		120	10	20	346	5(**)
18	deceleration	12	-0,69	120-80	16	34	362	5(**)
19	deceleration		-1,04	80-50	8		370	5(**)
20	deceleration, clutch disengaged		-1,39	50-0	10		380	K_5(*)
21	idling	13			20	20	400	PM(*)

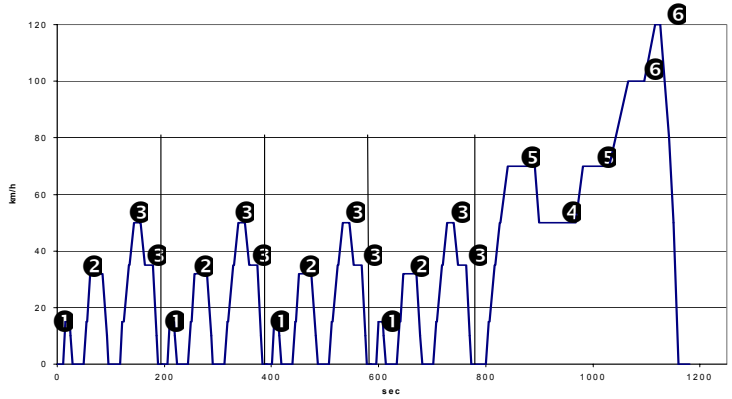
(*) PM = gearbox on neutral, clutch engaged..
K_1, K_5 = first or second gear engaged, clutch disengaged.
(**)Additional gears can be used according to manufacturer recommendations if the vehicle is equipped with a transmission with more than five gears.

Since only the sixth gear could be used in replacing the fifth gear, the gear spreading of modern 6 speed gearboxes is not considered, which influences the gear shifting strategy also in the lower gears. The same problem occurs in principle with 5 speed gearboxes. The market penetration of

5 and 6 speed gearboxes today is nearly 100 percent. So the state of the art technology cannot be used in the way as it was designed for.

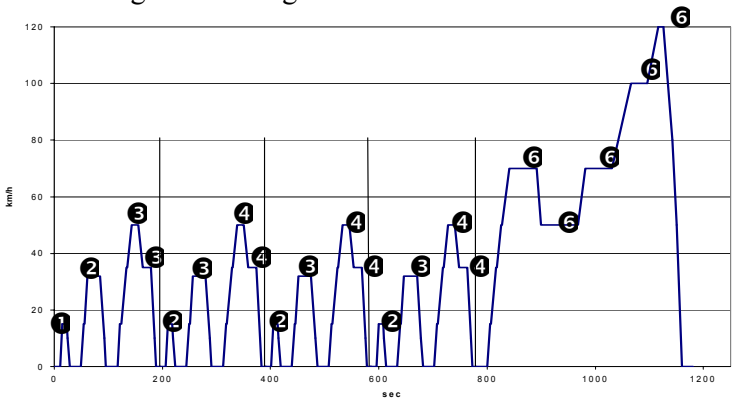
Comparison between the gears used according to ECE Regulation No. 83 and a possible manufacturer specific gear shift strategy

Example for a manufacturer specific gear shifting strategy



Steady speed in NEDC: 441 sec, i.e. 37%
share 1. Gear during steady speed: 8,2%
share 2. Gear during steady speed: 21,8%
share 3. Gear during steady speed: 22,7%
share 4. Gear during steady speed: 15,6%
share 5. Gear during steady speed: 22,7%
share 6. Gear during steady speed: 9%

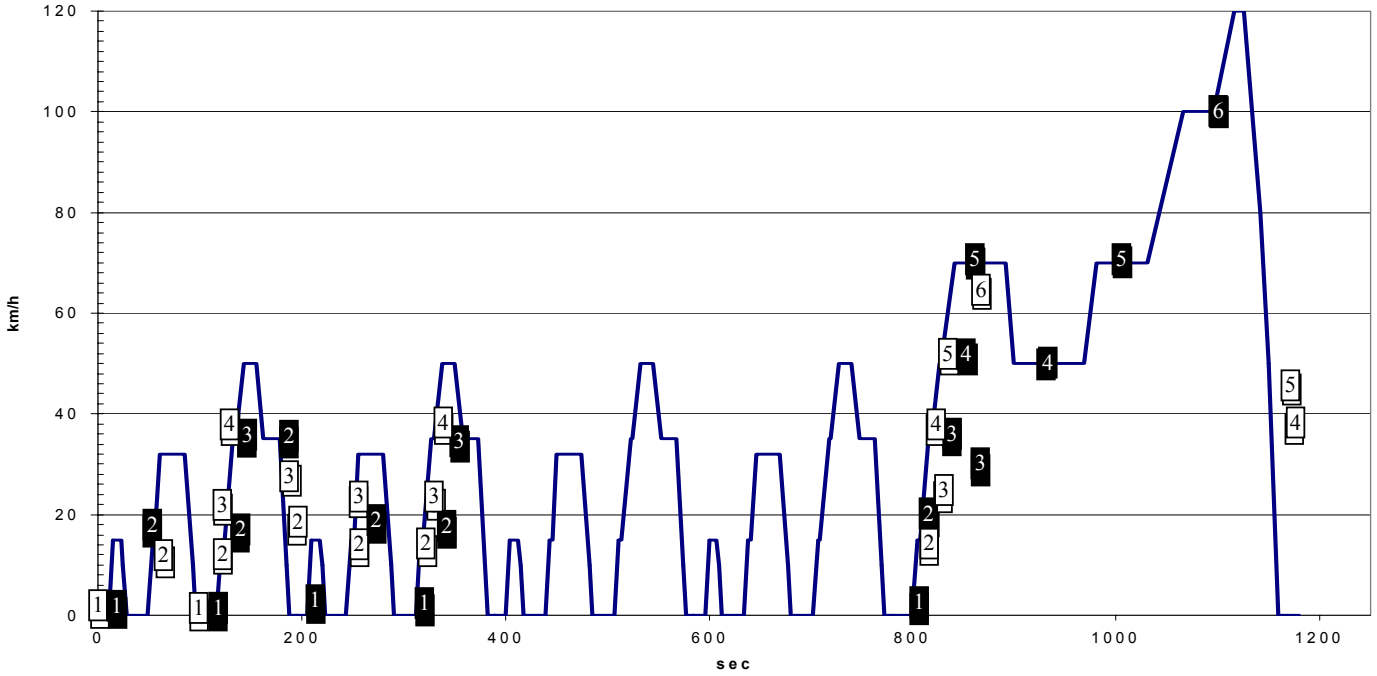
According to ECE Regulation No. 83



Steady speed in NEDC: 441 sec, 37%
share 1. Gear during steady speed: 2%
share 2. Gear during steady speed: 12%
share 3. Gear during steady speed: 22%
share 4. Gear during steady speed: 17%
share 5. Gear during steady speed: 0%
share 6. Gear during steady speed: 47%

The manufacturer specific gear shift strategy as shown above is in line with the requirement of this Regulation, where in paragraph 2.3.2 of Annex 4 vehicles equipped with semi-automatic-shift gearboxes shall be tested by using the gears normally employed for driving.

Comparison of the up-shifting



According to table 1 6
1.2/1.3
1.gear: 0-15 km/h
2. gear: 15-35 km/h
3. gear: 35-50 km/h
4. gear: 50-70 km/h
5. gear: 70-100 km/h
6. gear: 100-120 km/h

example
manuf. specific gear shift strategy 1 6
1. gear: 0-13 km/h
2. gear: 13-23 km/h
3. gear: 23-36 km/h
4. gear: 36-52 km/h
5. gear: 52-65 km/h
6.gear: 65-120 km/h

An earlier up-shifting is possible with today's 6 speed gearboxes.

In addition to the requirement in paragraph 2.2.3. of annex 4, the shown gear shift strategy fulfils in addition the required tolerances as mentioned in paragraph 2.4. of annex 4. Both criteria should be the only limitation for a gear shift strategy.