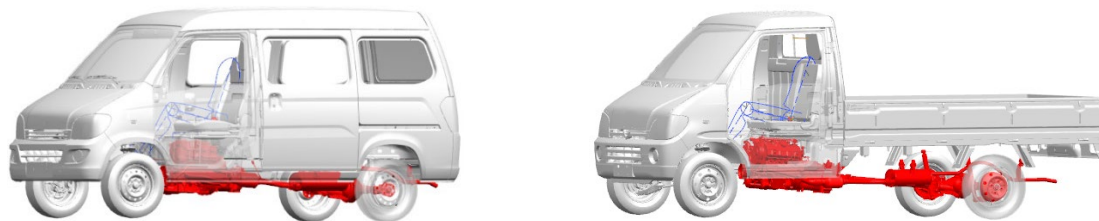


China Proposal for Micro-Van and Micro-Truck



8th February, 2022

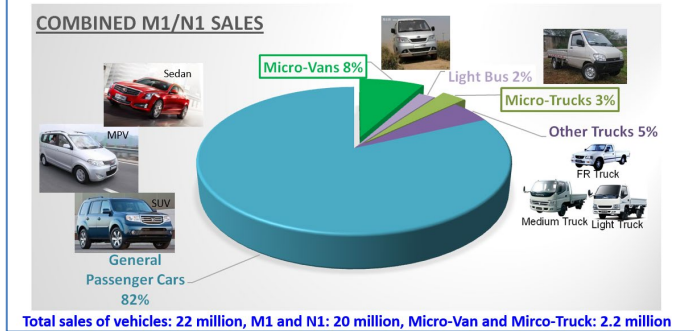
Current items in UN R51.03

11.8. Until **30 June 2022** for vehicle types of category N_1 or for vehicle types of category M_1 derived from N_1 the limits according to paragraph 6.2.2. of the vehicle types of category N_1 having a technically permissible maximum laden mass above 2.5 tons apply, if all the following specifications are met:

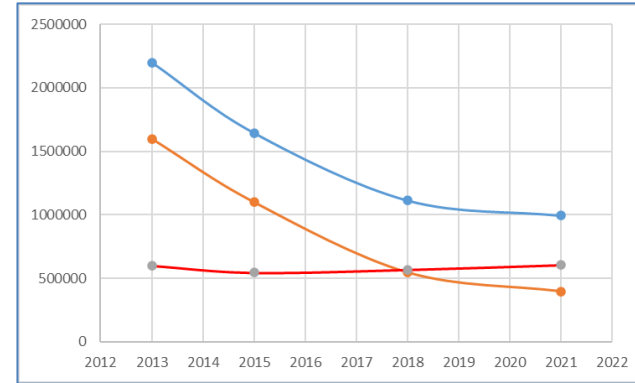
- (a) Having a technically permissible maximum laden mass of less than or equal to 2.5 tons;
- (b) An R-point height greater or equal to 800 mm from the ground;
- (c) An engine capacity exceeding 660cc but less than 1495cc;
- (d) An engine where the centre point of gravity of the engine is between 300 mm and 1,500 mm behind the front axle;
- (e) And having a rear axle drive.

Marketing changes

Market share of Micro-Van and Mirco-Truck in China(2013)



* Figure from GRB-60-10, 2014, GRB 60th session.

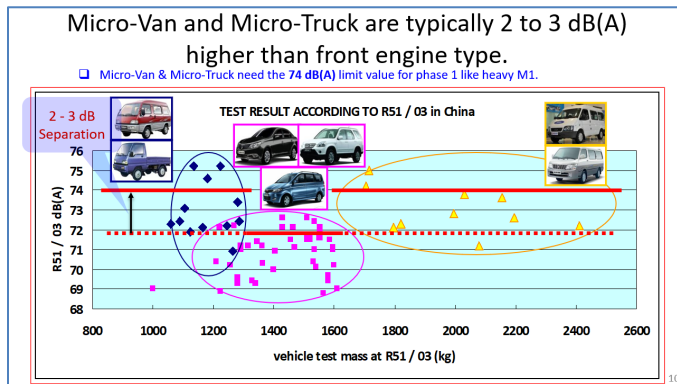


* Data from CATARC <Automotive Information>2014, 2016, 2019 and 2022.

- Year 2013 (total 2,200,000): Micro-Van≈1,600,000, Micro-Truck≈600,000.
- Year 2015 (total 1,645,000): Micro-Van≈1,100,000, Micro-Truck≈545,000.
- Year 2018 (total 1,115,000): Micro-Van≈547,000, Micro-Truck≈568,000.
- Year 2021 (total 996,000): Micro-Van≈398,000, Micro-Truck≈605,000.

✓ The market of **Micro-Van** goes down year by year, but the **Micro-Truck** is still in a stable marketing share.

The noise levels are nearly the same as 2013



* Figure from GRB-60-10, 2014, GRB 60th session.

Test mass kg	Test year	Engine position	Emission	Pn kW	Test gear(s)	L _{wot rep} dB(A)	L _{crs rep} dB(A)	L _{urban} dB(A)
1125	2013	middle	China 4	63	3, 4 of 5	73.3	70.1	72.4
1125	2013	middle	China 4	60.5	3, 4 of 5	72.6	69.8	71.9
1235	2018	middle	China 5	75	3, 4 of 5	73.4 (74.9&71.4)	69.1 (69.9&68.3)	72.2
1470	2018	Front	China 5	78	3 of 6	70.6	68.7	70.0
1345	2021	middle	China 6	73	3 of 5	71.6	68.8	70.9
1175	2021	middle	China 6	73	3 of 5	72.4	69.0	71.6
1617	2022	middle	China 6	85	3 of 5	73.1	69.3	72.1
1556	2022	middle	China 6	78.5	3 of 5	71.9	69.0	71.3

* Data tested in 2014, 2018, 2021 and 2022, all tests in 2018, 2021 and 2022 are on ISO 10844-2014 test tracks.

- The weak power lead to a low k_p factor.
- The middle engine and powertrain system arrangement lead to a high **cruise noise** between 68.5 -70.0dB(A).



- Tyre Rolling Sound Model, L_{TR}**
 $L_{TR} = \text{Slope}_{TR} * \log(V_{test} / 50) + L_{REFTR}$
 $L_{REFTR} = X \% \text{ of } L_{CRS,REP}$
- Power Train Base Mechanic Sound Model (No Load), L_{PTNL}**
 $L_{PTNL} = \text{Slope}_{PTNL} * \log((n_{test} + n_{min}) / (n_{CRS,REP} + n_{min})) + L_{REFPTNL}$
 $L_{REFPTNL} = (100 - X \%) \text{ of } L_{CRS,REP}$
- Dynamic Model, L_{DYN}**
 $L_{DYN} = \text{Slope}_{DYNL} * \log((n_{test} + n_{min}) / (n_{WOT,REP} + n_{min})) + L_{REFDYNL} + \Delta L_{DYN}$
 $L_{REFDYNL} = L_{REFPTNL} - 15$
 $\Delta L_{DYN} = [L_{WOT,REP} - L_{TR}(V_{WOT,REP})] - L_{REFDYNL}$

The base mechanic sound is still a big challenge for Micro-Van and Micro-Truck, which take 20-50% of cruise noise. **The base mechanic sound is not only from engine but also from powertrain system.**

* ASEP-09-06 (OICA) Brief Introduction to Model

✓ There is still more than 2-3 dB(A) separation between Micro-Van, Micro-Truck and front engine vehicles.

Problems and suggestions

Vehicle category	Vehicles used for the carriage of passengers	Limit Values (dB(A))		
		Phase 1	Phase 2	Phase 3
M ₁	PMR ≤ 120	72	70	68
	120 < PMR ≤ 160	73	71	69
	PMR > 160	75	73	71
	PMR > 200, no. of seats ≤ 4, R-point height < 450mm from the ground	75	74	72
M ₂	M ≤ 2.5 t	72	70	69
	2.5 t < M ≤ 3.5 t	74	72	71
	M > 3.5 t; P _n ≤ 135 kW	75	73	72
	M > 3.5 t; P _n > 135 kW	75	74	72
M ₃	P _n ≤ 150 kW	76	74	73
	150 kW < P _n ≤ 250 kW	78	77	76
	P _n > 250 kW	80	78	77
Vehicle category	Vehicles used for the carriage of goods	Phase 1	Phase 2	Phase 3
N ₁	M ≤ 2.5 t	72	71	69
	M > 2.5 t	74	73	71
N ₂	P _n ≤ 135kW	77	75	74
	P _n > 135 kW	78	76	75
N ₃	P _n ≤ 150 kW	79	77	76
	150 kW < P _n ≤ 250 kW	81	79	77
	P _n > 250 kW	82	81	79

For Micro-Van and Micro-truck, it is **difficult** to fulfil the phase 2 limits (2020) and **impossible** to fulfil the phase 3 limits (2024).

The N₁ having a technically permissible maximum laden mass above 2.5 tons should still apply to **Micro-Van** and **Micro-truck**.
Another **three years'** transitional provision is needed to see the changes of Micro-Vans and Micro-trucks.

✓ Suggestions:

11.8. Until **30 June 2022** for vehicle types of category N₁ or for vehicle types of category M₁ derived from N₁ the limits according to paragraph 6.2.2. of the vehicle types of category N1 having a technically permissible maximum laden mass above 2.5 tons apply, if all the following specifications are met:

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Thanks for your attention!



| China Automotive Technology and Research Center Co., Ltd.