

China Proposal for Micro-van and Micro-truck



Micro-van and Micro-truck :

GVM \leq 2.5 ton

R-point height \geq 800mm from the ground
Mid-engine and with Rear axle drive

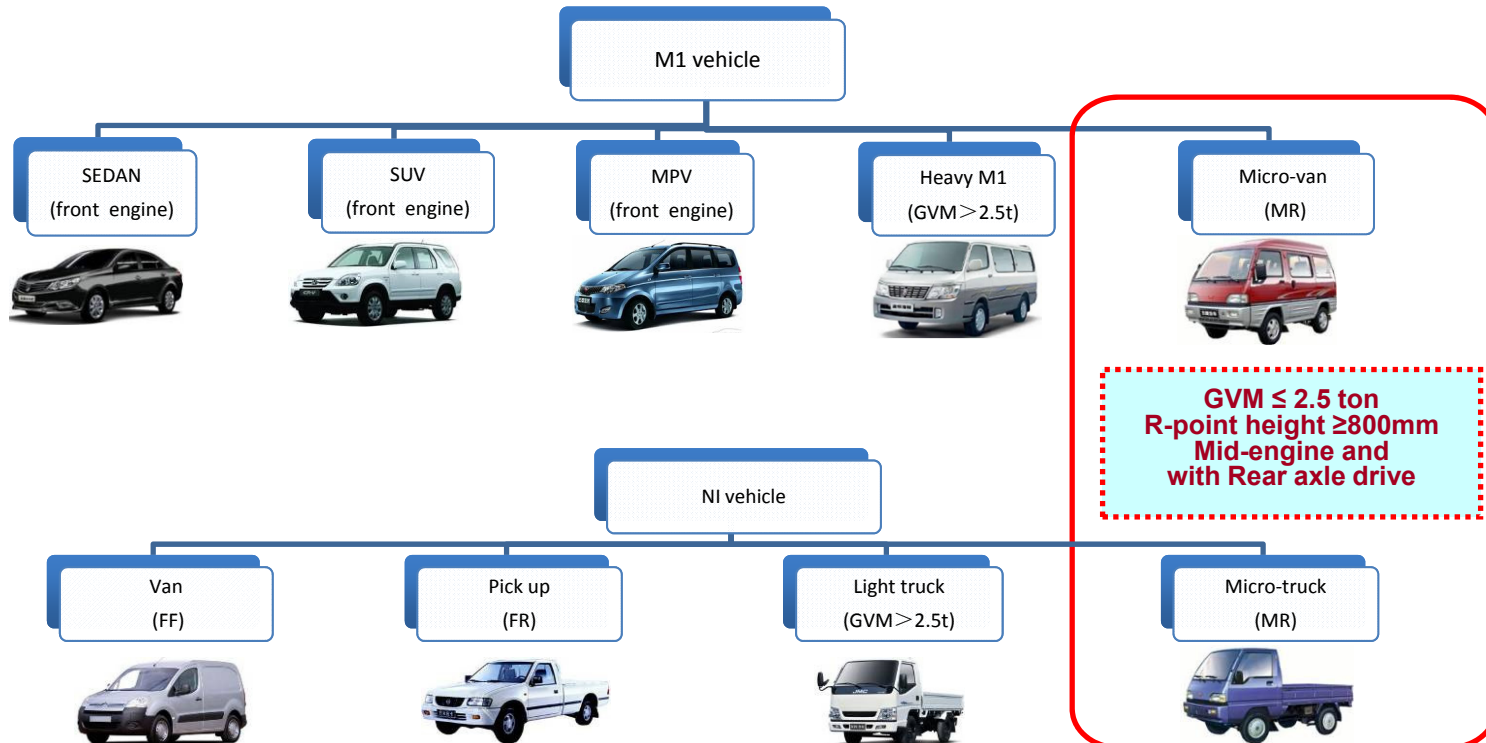
China's proposal is already included in the document "ECE-TRANS-WP29-GRB-59-inf4r1e - IWG Changes 2014-02-20a" Paragraph 6.2.2.1.6. highlighted in red.



CHINA AUTOMOTIVE TECHNOLOGY & RESEARCH CENTER

What are Micro-Vans and Micro-Trucks?

GVM ≤ 2.5 ton
R-point height ≥800mm from the ground
Mid-engine and with Rear axle drive

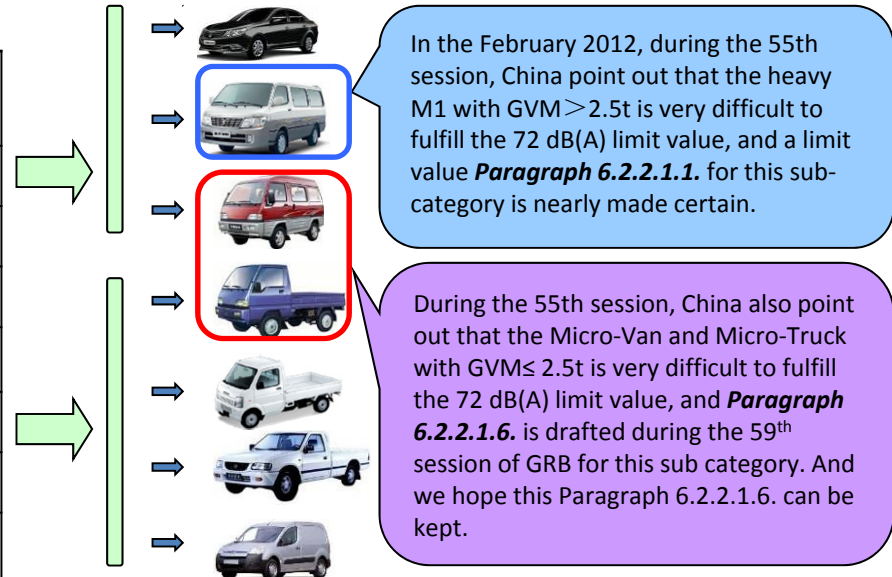


Contents

- **Background for limit value table on Micro-Van and Micro-Truck**
- **Market share of Micro-Van and Micro-Truck in China**
- **Usage of Micro-Van and Micro-Truck**
- **Micro-Van and Micro-Truck vs. front engine type**
- **Difficulty of noise reduction for Micro-Van and Micro-Truck**
- **Overseas strategy of Micro-Van and Micro-Truck**
- **Conclusion**
- **Reference**

Background information

| Veh. Cat | Sub-categories | Phase1 | Phase2 | Phase3*/ |
|----------|----------------|--------|--------|----------|
| M1 | PMR ≤ 120kW/t | 72 | 70 | 68 |
| | ... | ... | ... | ... |
| ... | ... | ... | ... | ... |
| Veh. Cat | Sub-categories | Phase1 | Phase2 | Phase3*/ |
| N1 | GVW ≤ 2.5t | 72 | 71 | 69 |
| | GVW > 2.5t | 74 | 73 | 71 |
| ... | ... | ... | ... | ... |

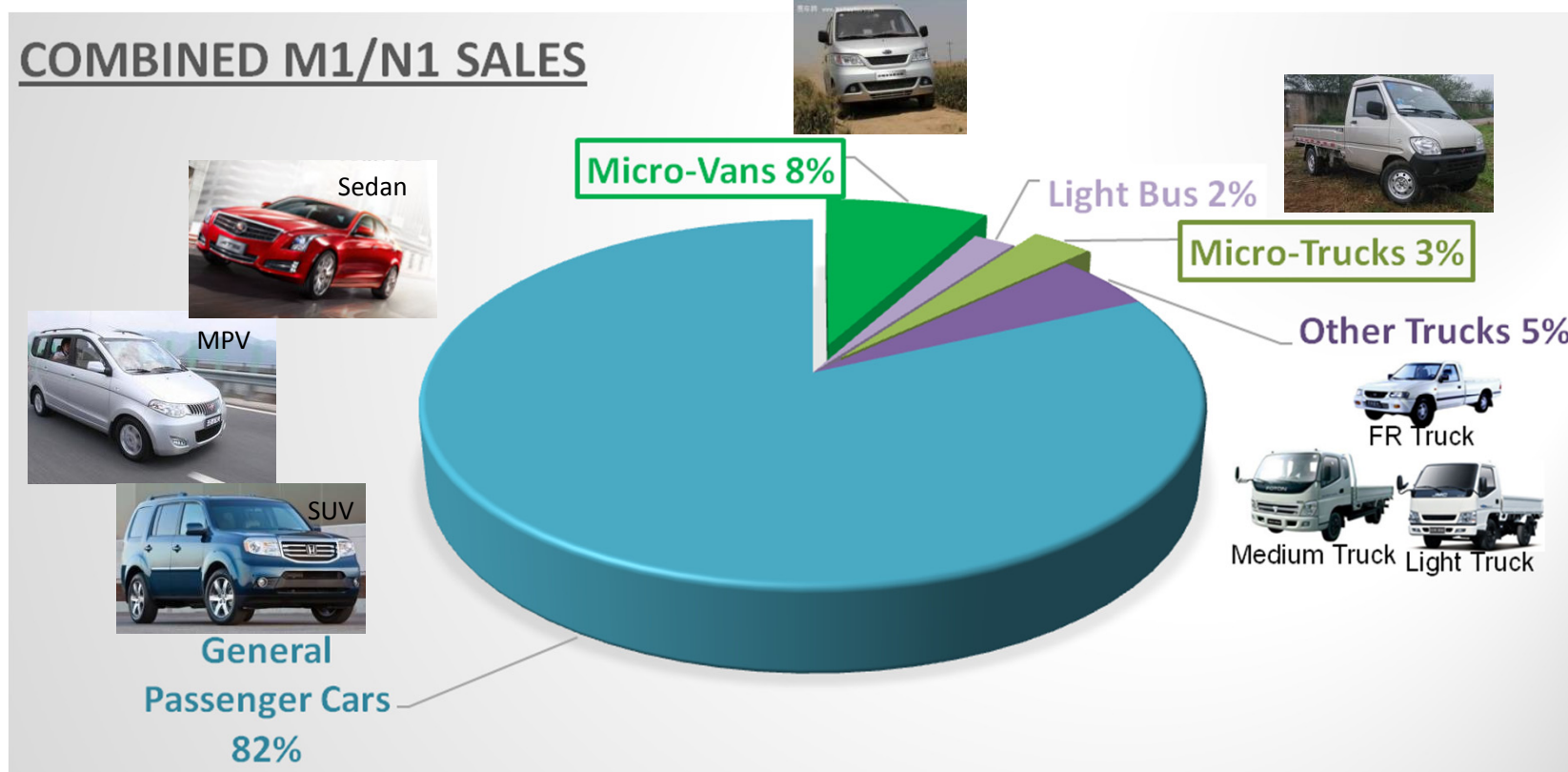


“ECE-TRANS-WP29-GRB-59-inf4r1e - IWG Changes 2014-02-20a”

6.2.2.1.6. For vehicle types of category M1 and N1 having a maximum technically permissible laden mass of less than or equal to 2.5 tons and a R-point height greater than 800mm from the ground and a mid engine and with rear axle drive, the limits of the vehicle types of category N1 having a maximum technically permissible laden mass above 2.5 tons apply.

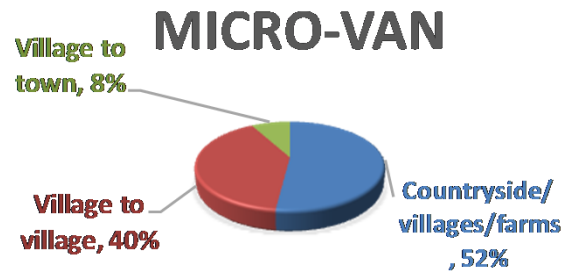
Market share of Micro-Van and Micro-Truck in China

Total sales of micro-vehicles 2,152,234 units in 2013, 11% M1 and N1, of which Micro-Van 8% and Micro-Trucks 3%

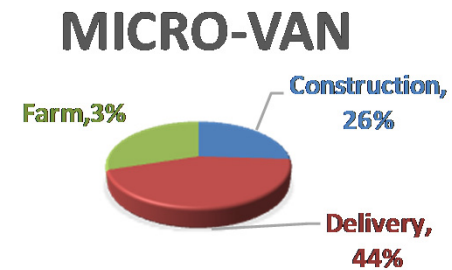


Micro-Van and Micro-Truck usage in China

By locations



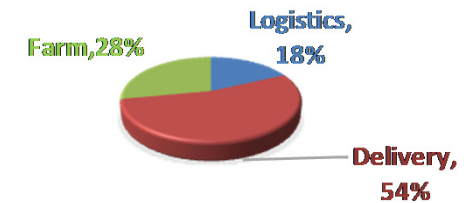
By usage



MICRO-TRUCK

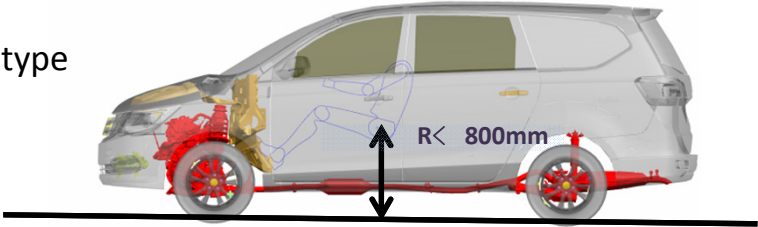


MICRO-TRUCK

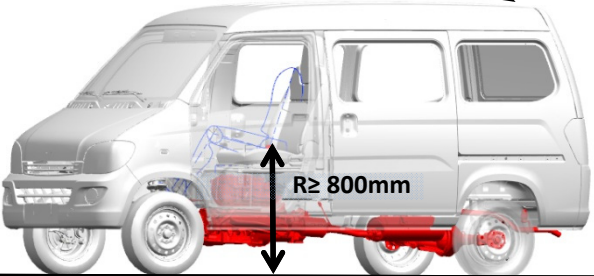


Structure differences between micro-vehicles and front engine type

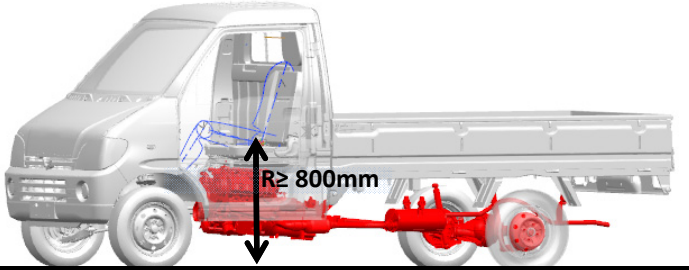
Front Engine type
GVM ≤ 2.5t



Different type

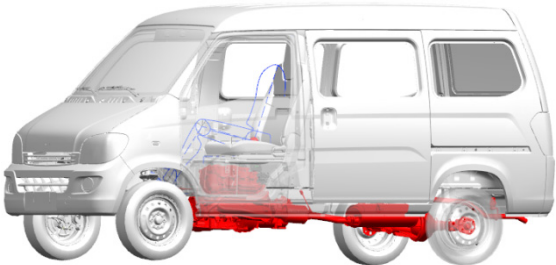


Same type

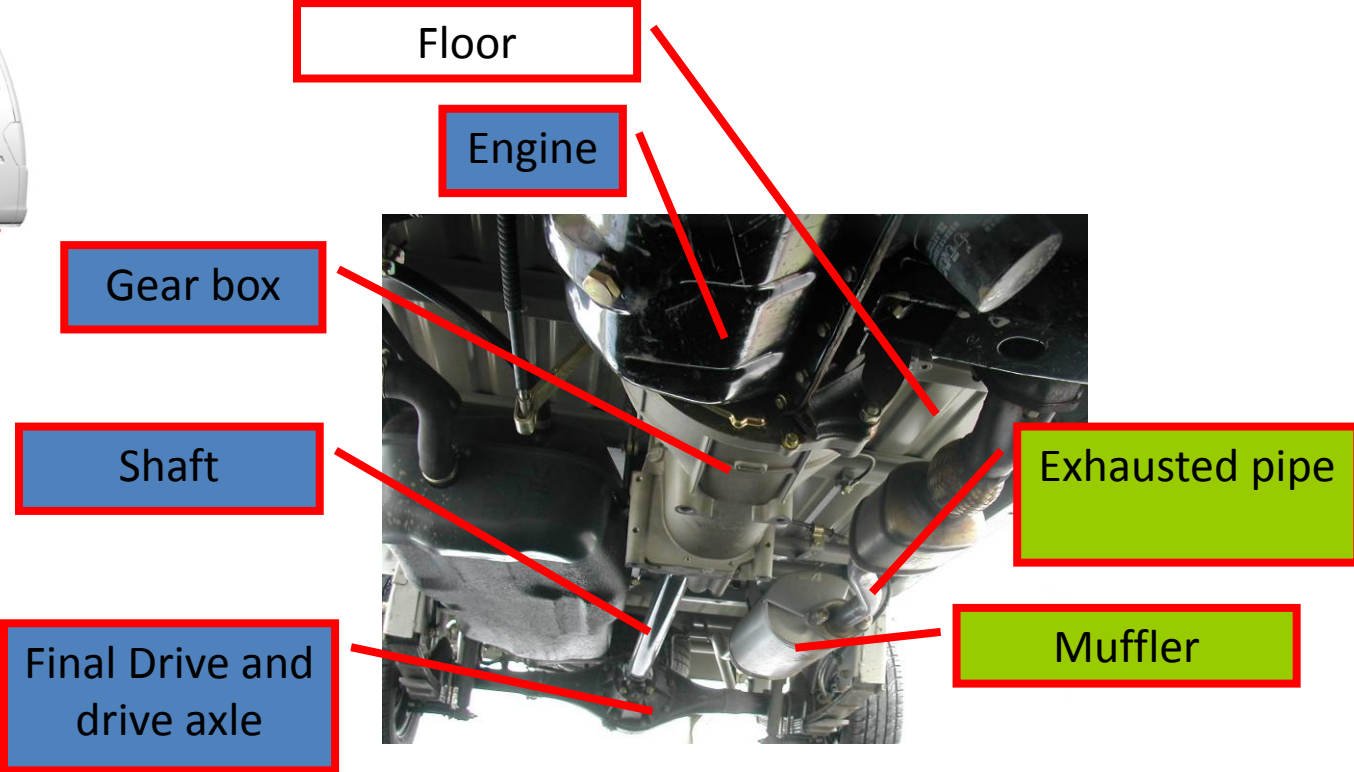


GVM ≤ 2.5 ton
R-point ≥ 800mm from the ground
Mid-engine and with rear axle drive

Micro-Van and Micro-Truck noise sources are much more exposed than front engine type

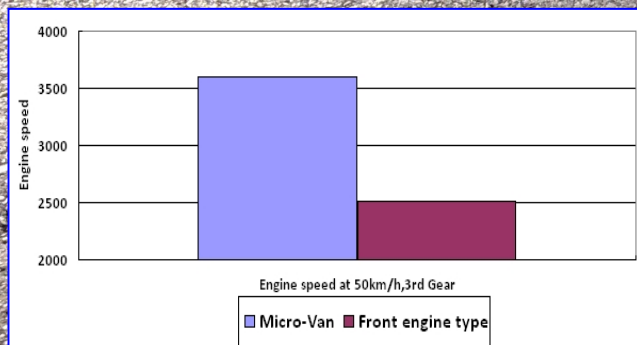
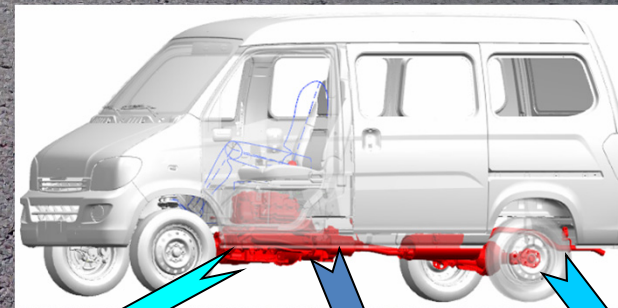


The majority of noise sources in Micro-Van and Micro-Truck are directly exposed, resulting in inherently louder noise.



Powertrain system differences between micro-vehicles and front engine type

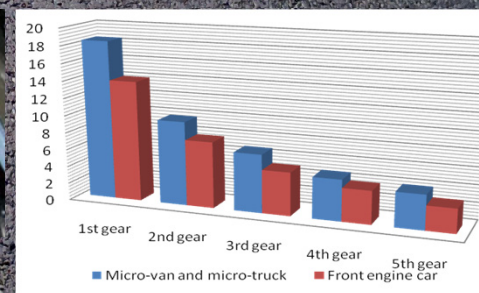
| Vehicle | Engine displacement | Test Gear | Engine speed at 50km/h | 3 rd gear ratio | Tyre radius (mm) | L _{urban} |
|-------------------|---------------------|----------------------|------------------------|----------------------------|------------------|--------------------|
| Front engine type | 1000 cc | 3 rd gear | 2509 | 5.37 | 295 | 68.3 |
| Micro - Van | | | 3604 | 6.94 | 270 | 72.3 |



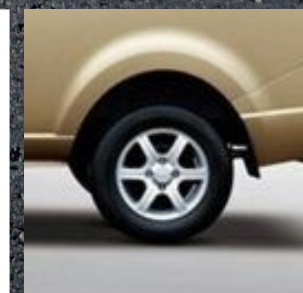
***A higher transmission ratio and lower tyre radius make the test engine speed of Micro-Van and Micro -Truck higher than front engine type, resulting in louder noise.**



Always weaker power engine with PMR(GVM) 20 – 41kW/t.



Always higher transmission ratio.

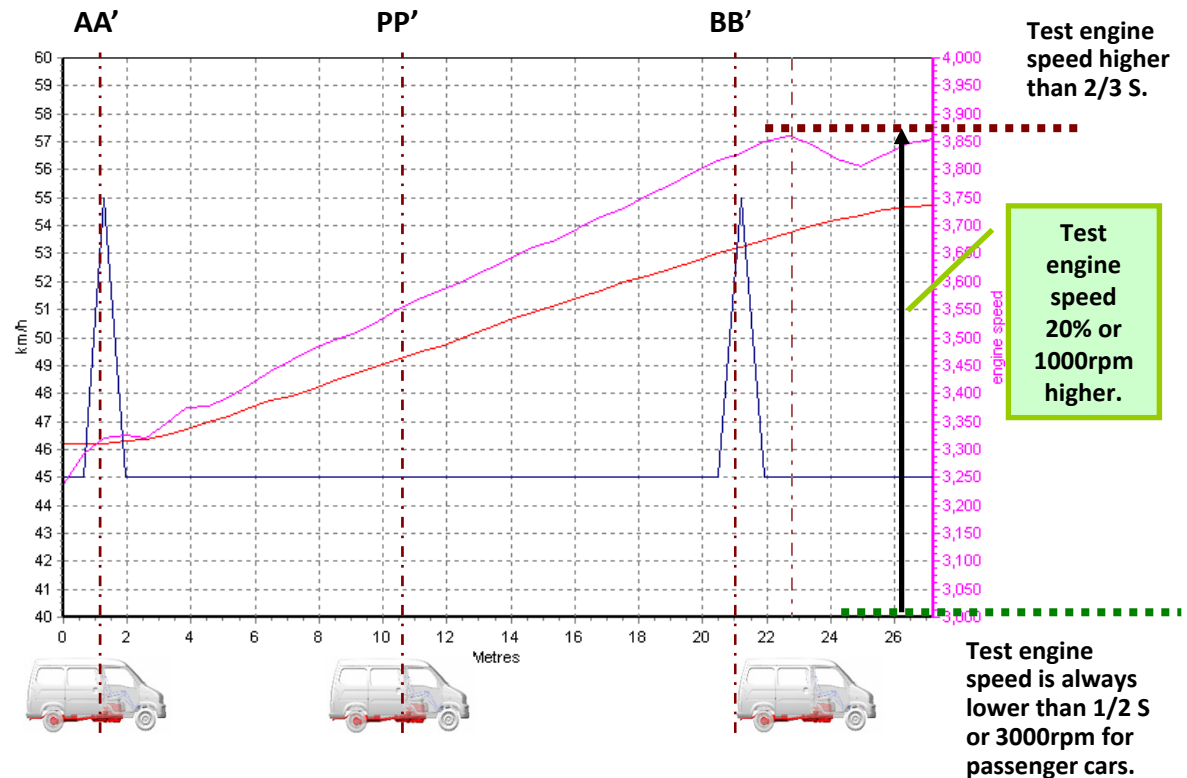


12-13 inches tyre, and the tyre radius is between 250-280mm.

Micro-Van and Micro-Truck perform differently than front engine type

| Seats No. | Test mass | Pn | S | Test engine speed | Lurban |
|-----------|-----------|------|------|-------------------|--------|
| 7 | 1030 | 47.5 | 5600 | 70% | 72.3 |
| 7 | 1060 | 50 | 5600 | 97% | 72.3 |
| 8 | 1225 | 60.5 | 5300 | 65% | 72.2 |
| 7 | 1135 | 68 | 6000 | 74% | 75.2 |
| 7 | 1285 | 60 | 6000 | 76% | 72.4 |

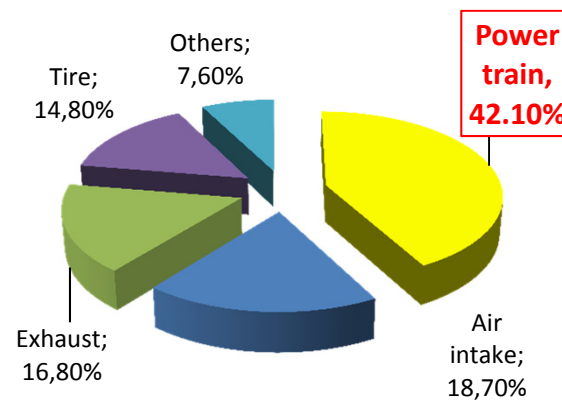
- Average value of micro-vehicles: 73.1 dB(A), which is nearly 2 -3dB(A) higher than ordinary passenger cars.
- The micro-vehicles engine speed during the test are always higher than 65% of rated engine speed, but the ordinary passenger cars engine speed during the test are always lower than 50% of rated engine speed.



Structure and Powertrain differences lead to different noise contributions

Vehicle External Noise Contribution from Each Sound Source in R51-03 Sound Emission Test

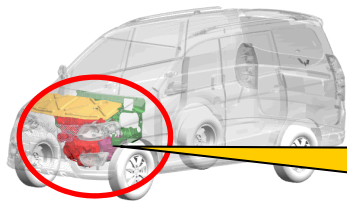
Overall level 72 – 74 dB(A)



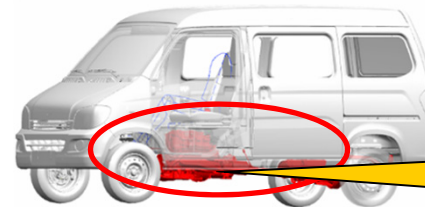
Micro-Van and Micro-Truck

Difficulty of noise reduction for Micro-Van and Micro-Truck

* There is no engine-compartment, and it's impossible to cover the whole powertrain system for the purpose of reducing noise.

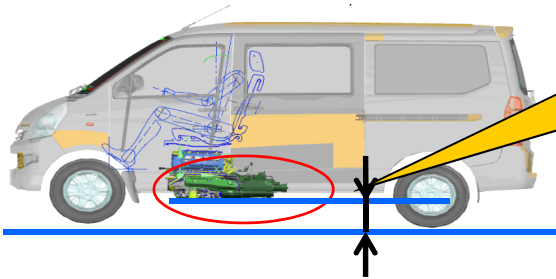


Front engine type



Micro-Van and Micro -Truck

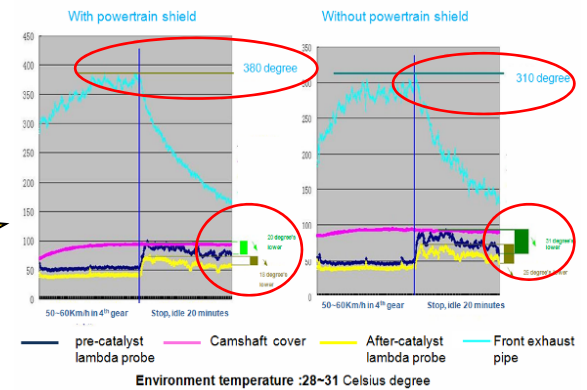
* Addition of Noise shields will greatly reduce ground clearance & thermal performance, key characteristics for Micro-Van and Micro-Truck used in mountain and rural areas.



The ground clearance is only 140-155mm, adding noise shields will reduce ground clearance by 10mm, resulting in poor passing capacity.

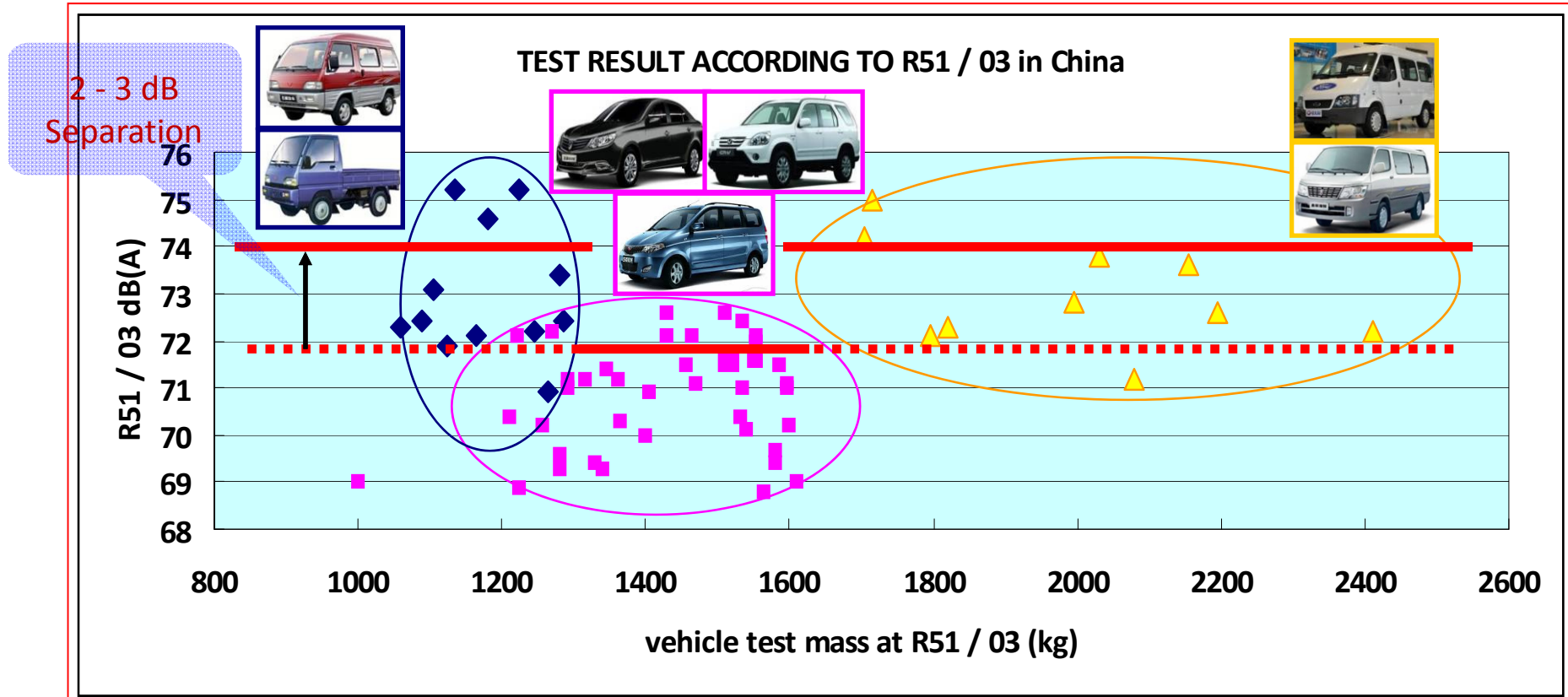
The thermal performance of Micro-Van and Micro-truck is not as good as front type, with the noise shield the thermal performance will be worse.

Temperature changing trend around engine









Micro-Van and Micro-Truck are typically 2 to 3 dBs higher than front engine type.

- Micro-vans & micro-trucks need the **74 dB(A)** limit value similar to heavy M1 vehicles for R51 / 03 series.



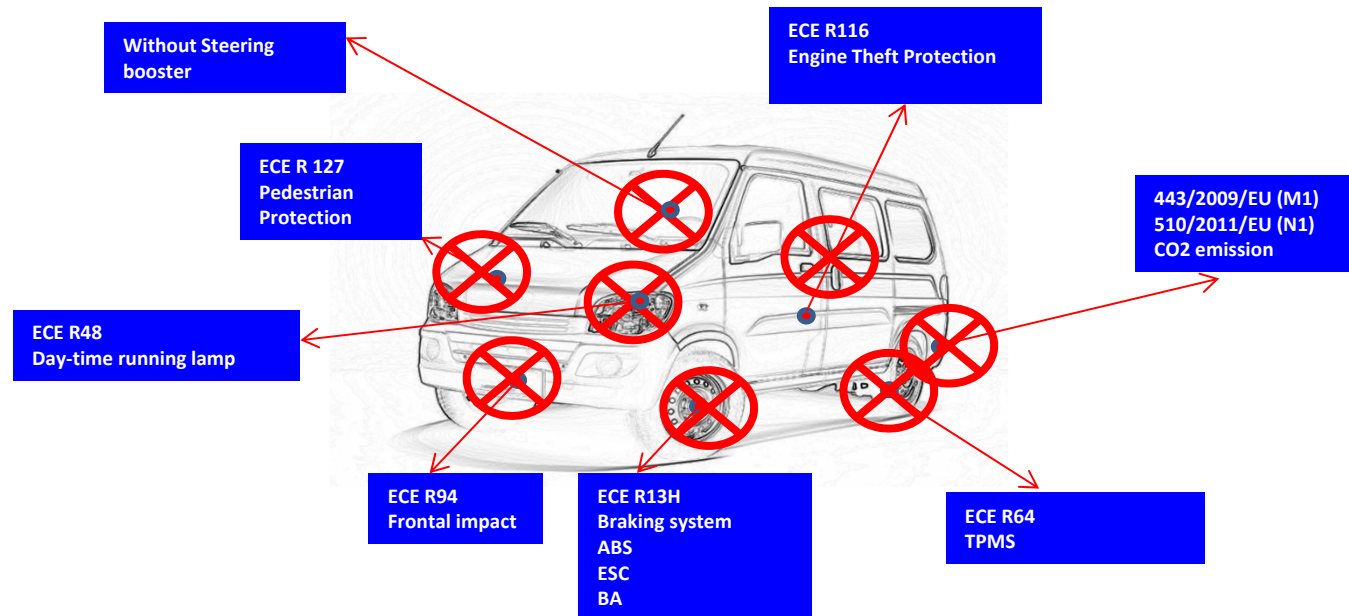
Micro-Van Micro-Truck and other vehicles Parameters Comparison

| Model | SGMW Micro-Van | SGMW Micro-Truck | Renault Kangoo | PSA Partner | VW Saveiro | Nissan NP200 |
|---------------------------------|---|---|---|---|---|---|
| Picture |  |  |  |  |  |  |
| Dimension and Weight | | | | | | |
| Exterior dimension OL/OW/OH(mm) | 3810/1510/1820 | 4250/1510/1760 | 4010/1672/1860 | 4137/1960/1800 | 4493/1708/1497 | 4499/1735/1554 |
| Cabin dimension OL/OW/OH(mm) | N/A | 2500/1430/340 | N/A | N/A | 1655/1006/519 | 1807/1024/535 |
| Wheelbase(mm) | 2500 | 3050 | 2600 | 2693 | 2750 | 2904 |
| Treads(F/R)(mm) | 1290/1290 | 1280/1290 | 1400/1415 | 1420/1440 | N/A | 1466/1458 |
| Kerb mass(kg) | 955 | 920 | 1230 | ---- | 1023 | 1055 |
| Gross vehicle mass (kg) | 1575 | 1720 | 1875 | 2054 | 1735 | 1890 |
| R Point(mm) | 895 | 845 | 691 | 711-724 | 694-705 (VW caddy) | 830 |
| Powertrain | | | | | | |
| Displacement(ml) | 995 | 1051 | 1598 | 1560 | 1598 | 1598 |
| Max Power(kw/rpm) | 47.5/5600 | 38.5/5200 | 70/5000 | 66/4000 | 74/5250 | 87/5500 |
| Max Torque(N.m/rpm) | 90/4000 | 83/3000~3500 | 130/3750 | 225/1750 | 142/2500 | 128/3000 |
| Transmission | 5MT | 5MT | 5MT | 5MT | 5MT | 5MT |
| Drive type | MR | MR | FF | FF | FF | FF |
| Tyre size | 165 / 70 R13 | 165 / 70 R13 | 175 / 65 R14 | 185 / 65 R15 | 185 / 65 R15 | 185 / 65 R15 |
| Performance | | | | | | |
| Max Speed(km/h) | 120 | 105 | 164 | 154 | 174 | ---- |
| Payload(kg) | ---- | 800 | ---- | ---- | 712 | 840 |
| Price | | | | | | |
| € | 3634 - 5800 | 4020 - 4800 | 13499-21150 | 16150 | 16500 | 14436 |

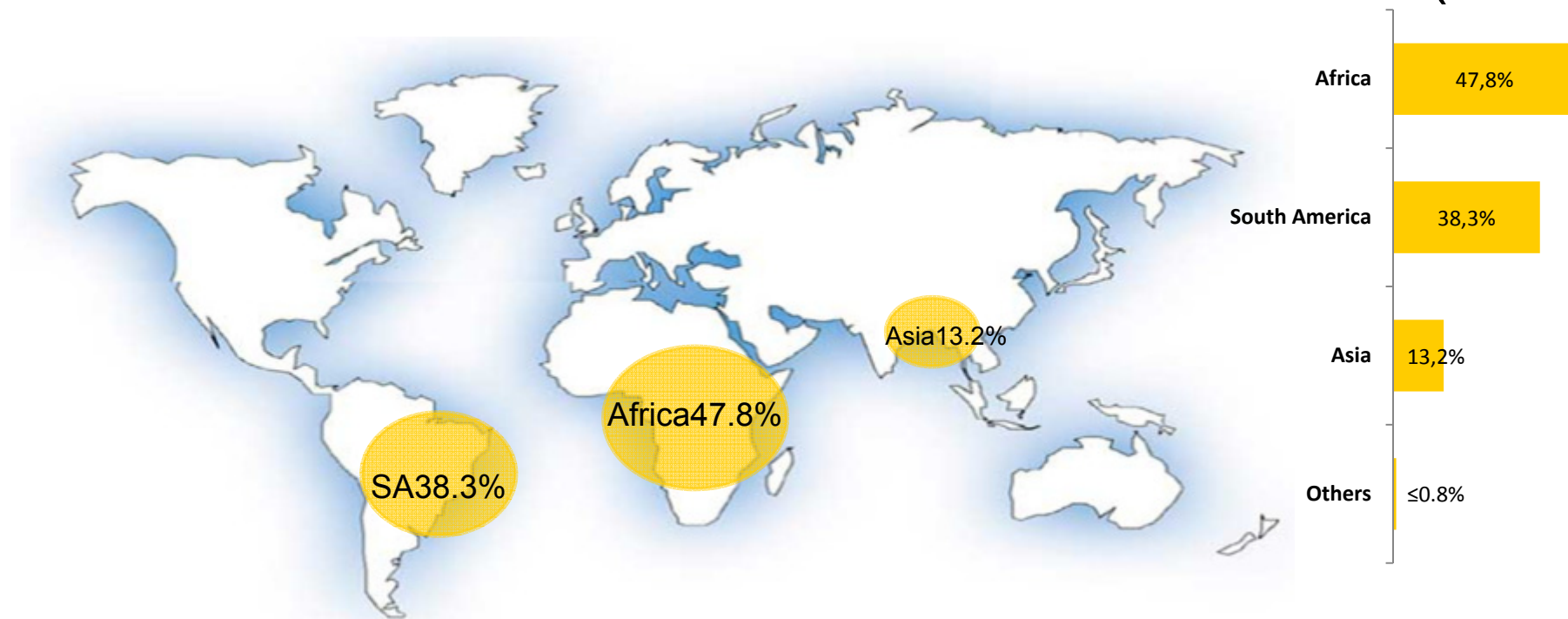
Chinese micro-vehicles are not designed or planned for sales in Europe, Japan or US.



➤ The requirements of ECE, FMVSS and EPA regulations (R13H, R127, R94, FMVSS 208, EPA Tier II, etc.) are too difficult for Micro-Van and Micro-Truck.



Overseas market of Micro-Van and Micro-Truck (2013)



* 120,000 Micro-Vans and Micro-trucks were sold overseas, nearly all of them were sold to Africa, South America and the developing area of Asia (not including Japan or South Korea).

* Although this kind of vehicle is very cheap and poor performance, and will not be accepted by the customers in Europe, Japan, or US. But it's really an important vehicle type for developing areas and developing countries.

Conclusion

- ❑ The structure and powertrain system of Micro-Vans and Micro-Trucks are quite different from the front-engine type vehicles, which will lead to a 2-3dB(A) higher test results according to ECE R51 / 03.
- ❑ Micro-Vans and Micro-Trucks need a 74dB(A) limit value for phase 1st with a cut-off nearly 15%.
- ❑ China suggests keeping “***GRB 59-04 6.2.2.1.6. For vehicle types of category M1 and N1 having a maximum technically permissible laden mass of less than or equal to 2.5 tons and a R-point height greater than 800mm from the ground and a mid engine and with rear axle drive, the limits of the vehicle types of category N1 having a maximum technically permissible laden mass above 2.5 tons apply.***”

Reference

- **GRB-55-05-Rev.1** - (China) Discussion for limit values to Regulation No. 51
- **GRB-56-07** - (China) Proposal of new sound limit values to the draft 03 series of amendments to UN Regulation No. 51
- **GRB-56-22** - (China) Summary of the opinions of the expert from China for the noise test method of UN Regulation No. 51
- **GRB-57-05** - (China) Common solutions for Sub-categories of M1 and N1 Categories
- **GRB-57-07** - (China) Sub-categories suggestion from China
- **GRB-58-10** - (China) Set of sub-categories of M1 \ N1

Experience of driving this new vehicle type

* Experience of driving Micro-Van and Micro-Truck .



* Check the mid-engine under driver seat and the different chassis.



Thank you for your attention