

UN Regulation No.51

Noise of M and N categories of vehicles

(Test procedures)

NTSEL

National Traffic Safety and Environment Laboratory

Takuya WATANABE

6th February 2020

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Outline

1. Noise of acceleration section
2. Noise of stationary section
3. Test facility & equipment
4. Introduce difference 02 series vs 03 series

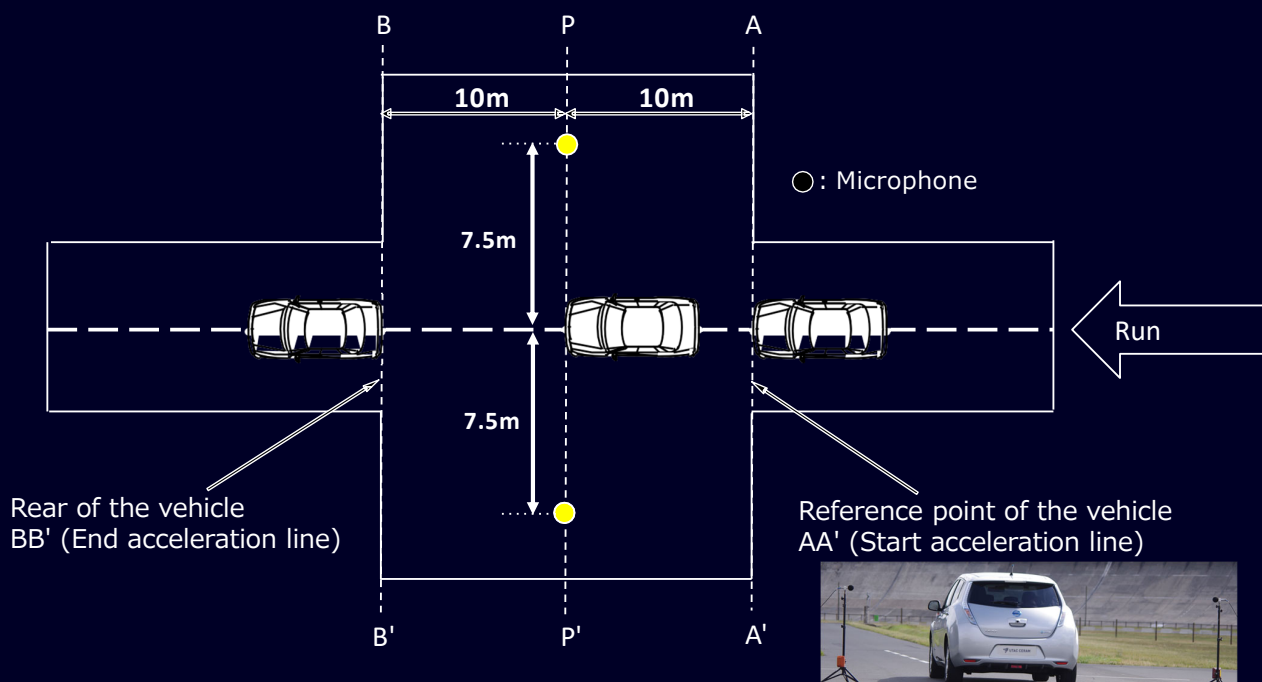
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Noise of acceleration section



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Noise of acceleration section

Target	Check point
Speed	$V_{AA'} = 50 \pm 1 \text{ km/h}$
Vehicle mass	Curve mass + 75 kg (running order)
Gear position	2nd gear (gear ≤ 4) 2nd and 3rd gear (gear ≥ 5)
Running condition	Full throttle
Environmental conditions	0 - 40 degrees C (ambient temperature) $\leq 5 \text{ m/s}$ (wind speed)
Ambient noise	Ambient noise + 10 (dB) \leq Vehicle noise (dB)

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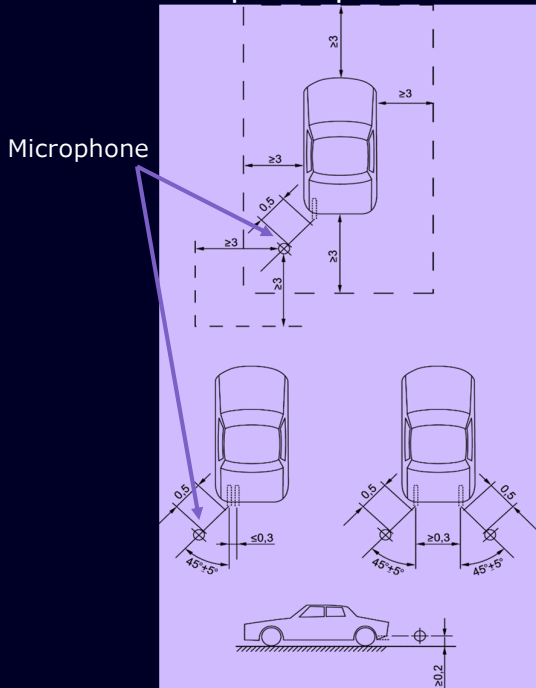
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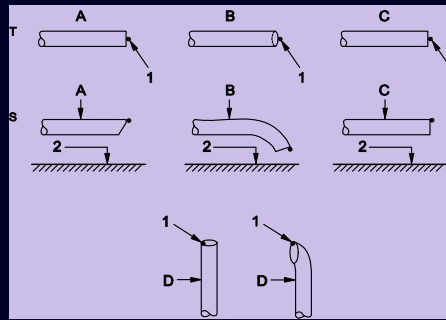
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Noise of stationary section

Microphone point



reference point of the exhaust pipe



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Noise of stationary section

Check point

Reference point of
the exhaust pipe

Located at a distance 0.5 m +/- 0.01 m
from the reference point of the exhaust pipe

Located at an angle 45 deg. (+/-5 deg.)
to the vertical plane containing the flow axis of the pipe termination

Target engine speed 75 % of the engine speed S (rated engine speed $\leq 5,000 \text{ min}^{-1}$)
3,750 min^{-1} (5,000 < rated engine speed $\leq 7,500 \text{ min}^{-1}$)
50 % of the engine speed S (7,500 < rated engine speed)

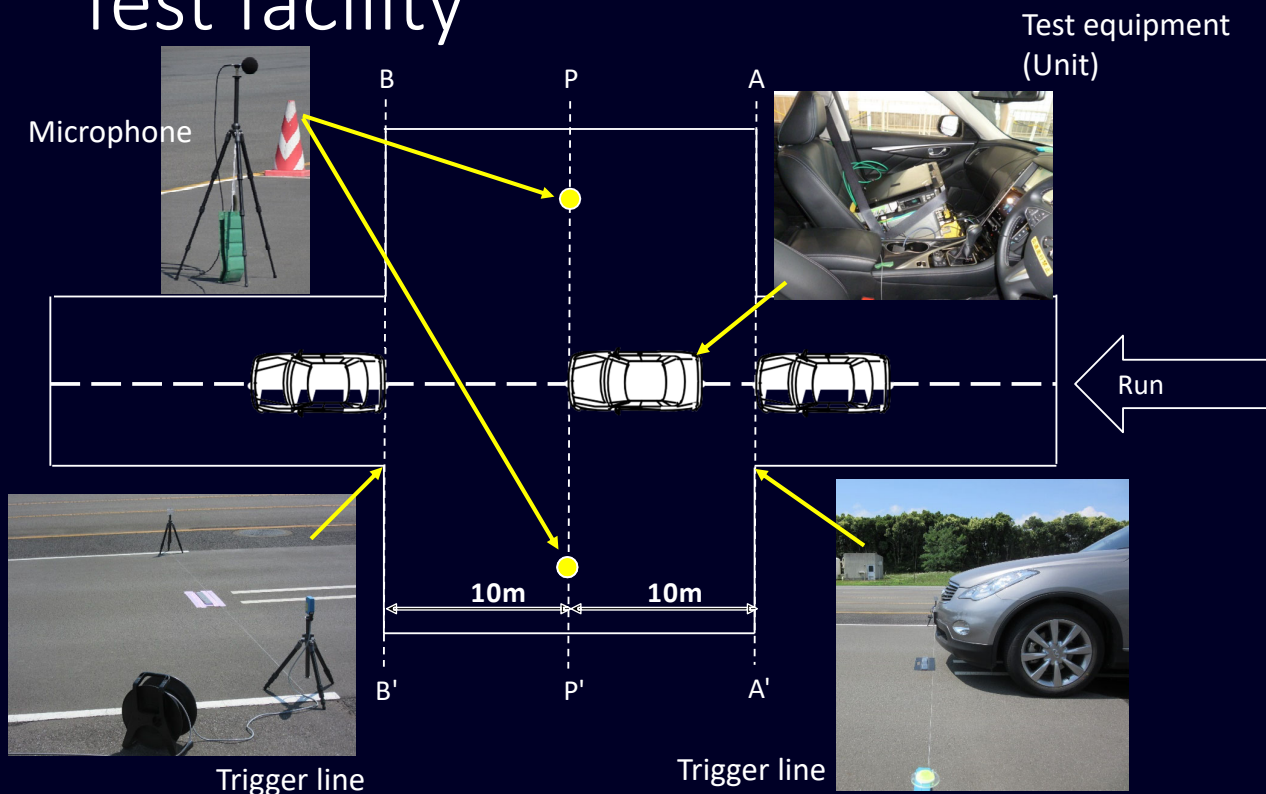
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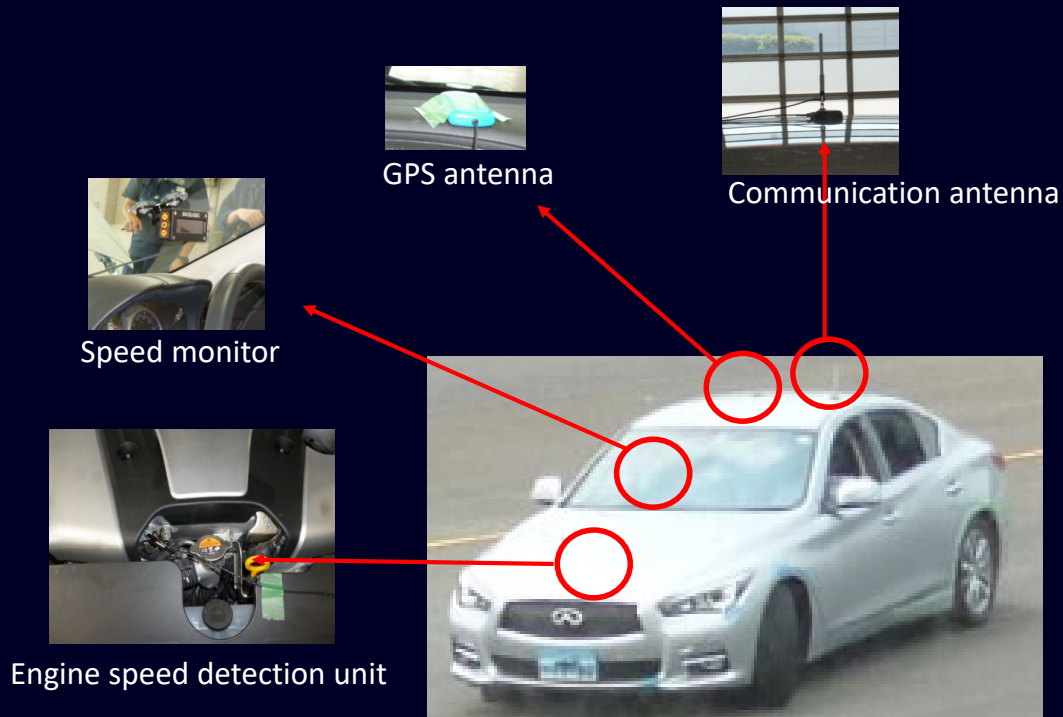
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Test facility



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Test equipment



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Difference of 02 series and 03 series

e.g.) M1

Acceleration

Target	02 series	03 series
Speed	$V_{AA'} = 50 \pm 1 \text{ km/h}$	$V_{PP'} = 50 \pm 1 \text{ km/h}$
Vehicle mass	Curve mass + 75 kg	Curve mass + 75 kg
Gear position	2nd gear ($\text{gear} \leq 4$) 2nd and 3rd gear ($\text{gear} \geq 5$)	most nearly acceleration to $\alpha_{\text{wot_ref}}$ ($\leq 2.0 \text{ m/s}^2$) (lockable) Gear D (Unlockable)
Running condition	Full throttle	Full throttle
Environmental conditions	0 - 40 degrees C (ambient temperature) $\leq 5 \text{ m/s}$ (wind speed)	5 - 40 degrees C (ambient temperature) $\leq 5 \text{ m/s}$ (wind speed)
Ambient noise	Ambient noise + 10 dB \leq Vehicle noise (dB)	Ambient noise + 10 dB \leq Vehicle noise (dB)

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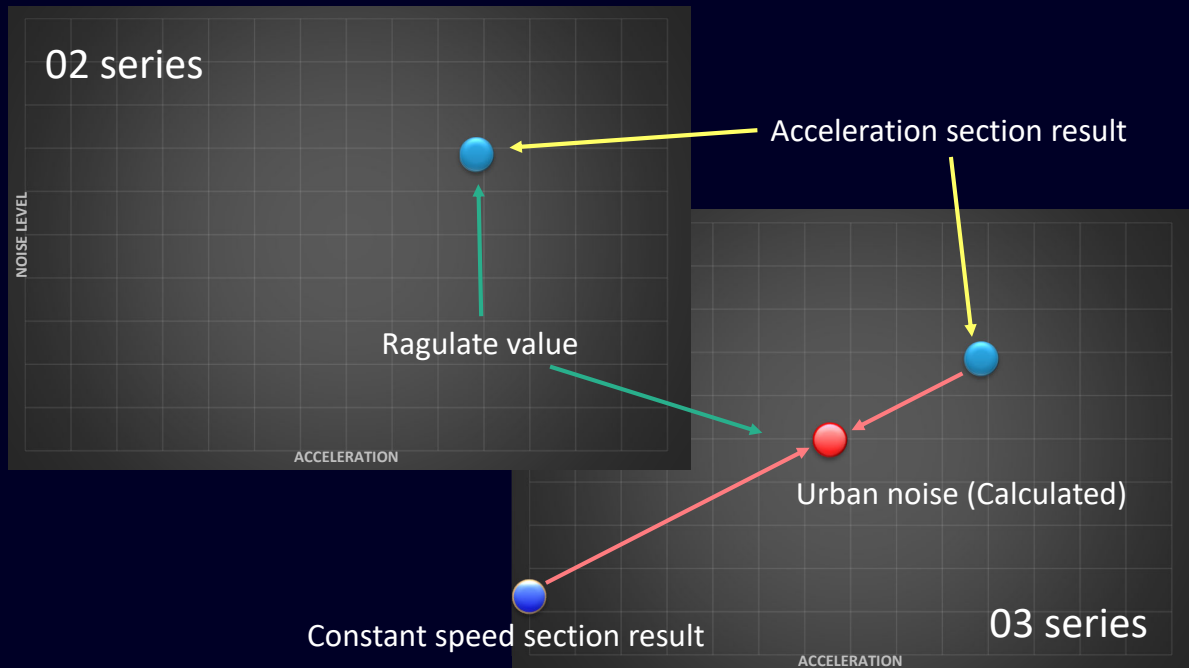
Difference of 02 series and 03 series

Constant speed section

Target	02 series	03 series
Speed	None	$V_{AA'} = V_{PP'} = V_{BB'} = 50 \pm 1 \text{ km/h}$
Vehicle mass	None	Same as Acceleration section
Gear position	None	Same as Acceleration section
Running condition	None	Constant speed (Acceleration $\doteq 0.0 \text{ m/s}^2$)
Environmental conditions	None	Same as Acceleration section
Ambient noise	None	Same as Acceleration section

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Difference of 02 series and 03 series



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Difference of 02 series and 03 series

Stationary section

Stationary section of 03 series is same as 02 series.

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Thank you for your attention !