

GRB – ASEP – 08

Criteria to compare proposals

Proposals

We can check 6 proposals or improvement of proposal :

- F/D proposal → **GRBIG-ASEP-05-010**
- F/D proposal with D improvement → **GRB-IG-ASEP-07-006**
- F/D proposal with F improvement → **GRB-IG-ASEP-07-007**
- F/D proposal with option for a limit derived anchor point → **GRB-IG-ASEP-07-009**
- Chairman proposal → **GRB-IG-ASEP-07-002**
- OICA proposal → **GRBIG-ASEP-05-003**

Models concepts

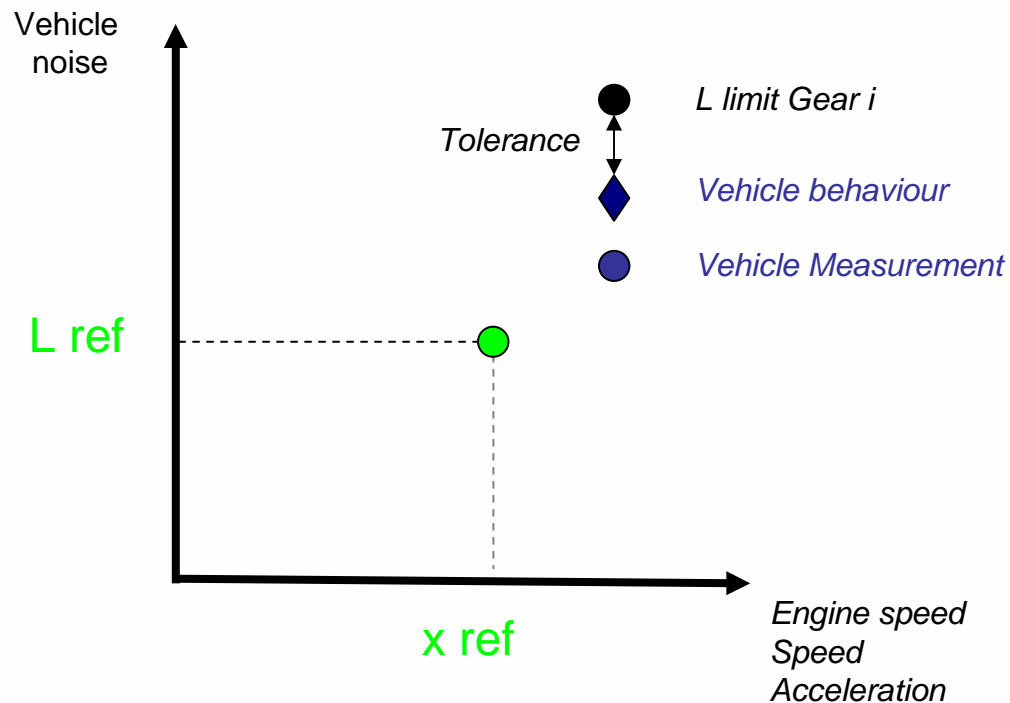
Each concept is based on the same construction :

One Reference point :

- L ref (x ref) is derived from annex 3 result and/or limit (and additional elements as L tyre and PMR)
- x ref = **N ref** and/or **V ref** and/or **a ref** are derived from Annex 3 result and/or additional elements

One noise vehicle behaviour :

L limit (N, V, a) is derived from L ref (x ref) by applying a **model** and a **tolerance**



Reference point

The reference point is based on Annex 3 result and/or limit and additional statistical results :

	REFERENCE POINT			
	L ref	N ref	V ref	a ref
F/D proposal	<i>L wot i</i>	<i>N wot i</i>	<i>V wot i</i>	-
F/D proposal with D improvement	<i>L wot i limit derived from L urban limit & L tyre & PMR</i>	<i>N urban</i>	<i>50 kph</i>	-
F/D proposal with F improvement	<i>L wot i</i>	<i>N wot i</i>	<i>V wot i</i>	-
F/D proposal with option for a limit derived anchor point	<i>L wot i limit derived from L urban limit L urban & L wot i</i>	<i>As F/D</i>	<i>As F/D</i>	-
Chairman proposal	<i>L urban limit</i>	-	<i>50 kph</i>	<i>a urban</i>
OICA proposal	<i>L wot i</i>	<i>N wot i</i>	-	-

Vehicle noise behaviour

The vehicle noise behaviour is based on different approaches from individual to statistics :

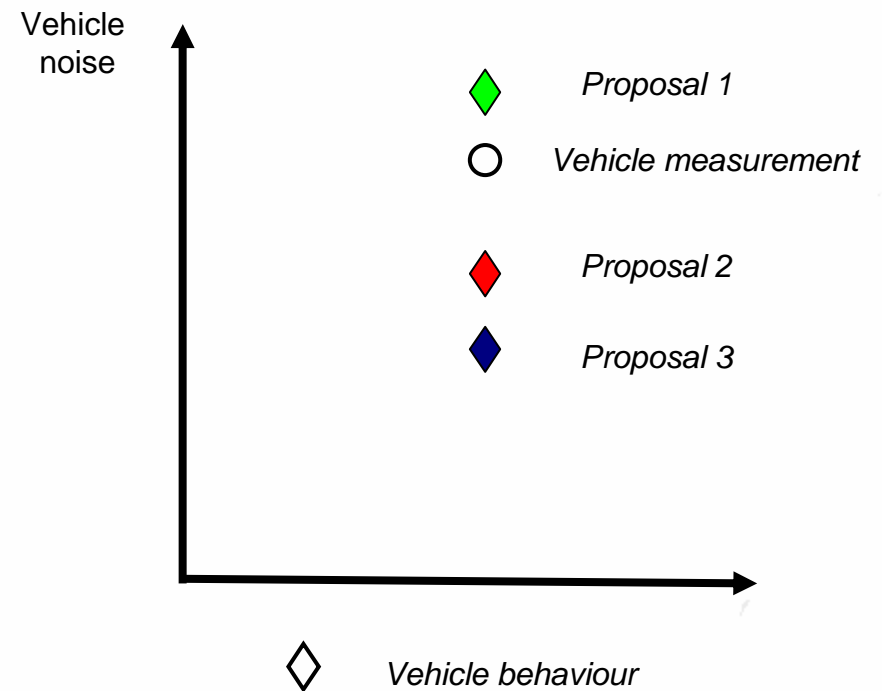
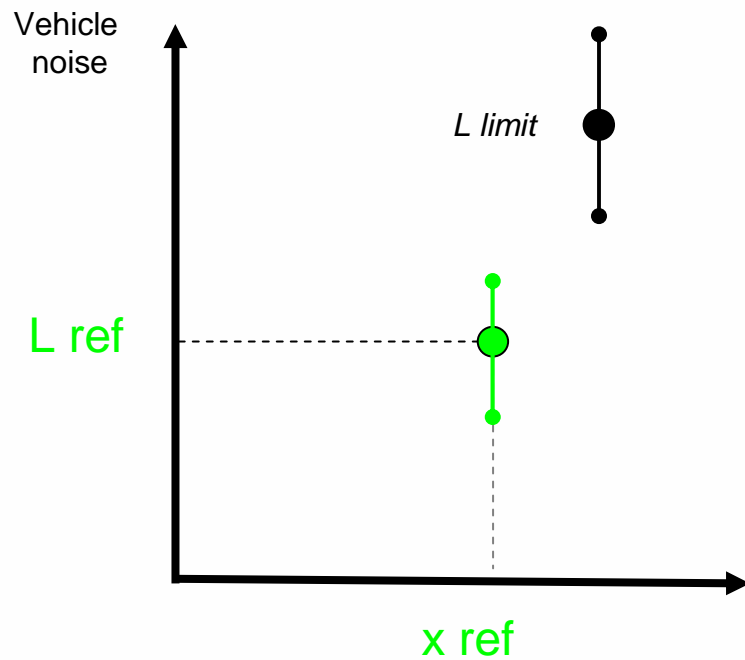
	LIMIT CONCEPT				
	Model	Slope behaviour	Reference point	Limit plotting	Gear ratio
F/D proposal	<i>vehicle physics</i>	<i>Typical engine physics</i>	<i>Vehicle (annexe 3 derived)</i>	<i>Point by point</i>	<i>From Tyre noise</i>
F/D proposal with D improvement	<i>vehicle physics</i>	<i>Typical engine physics</i>	<i>statistical with tyre noise correction</i>	<i>Point by point</i>	<i>From Tyre noise</i>
F/D proposal with F improvement	<i>vehicle physics</i>	<i>Typical engine physics</i>	<i>Vehicle</i>	<i>Line for each gear ratio</i>	<i>From Tyre noise</i>
F/D proposal with option for a limit derived anchor point	<i>vehicle physics</i>	<i>Typical engine physics</i>	<i>Vehicle with additionnal tolerance for silent vehicle</i>	<i>As F/D</i>	<i>From Tyre noise</i>
Chairman proposal	<i>statistical</i>	<i>Statistical</i>	<i>statistical</i>	<i>Point by point</i>	<i>From acceleration</i>
OICA proposal	<i>Linear vehicle fit</i>	<i>Individual vehicle physics</i>	<i>vehicle</i>	<i>Line</i>	<i>?</i>

Uncertainties and dispersions

To choose the method, we need to study 2 points

The uncertainties to determine the reference point and vehicle noise behaviour

Spread of "normal" vehicles compared to the model



Uncertainties, dispersions and tolerances

Influent factors must be check and study one by one :

		F/D proposal	F/D proposal with F improvement	F/D proposal with option for a limit derived anchor point	F/D proposal with D improvement	Chairman proposal	OICA proposal
Uncertainties : influent Factors	Reference point	L wot i N wot i V wot i	As F/D	As F/D	L tyre	-	L wot i N wot i
	Limit line or point	L tyre N wot V wot	L tyre 50 kph N wot V wot	As F/D	As F/D	a wot V wot	L wot N wot
Dispersion : Influent factors	Reference point and slope	Engine noise slope vs engine speed	Engine and vehicle noise slope	As F/D	Engine noise slope N urban	Vehicle noise slope vs speed and acceleration a urban	Regression
	Tolerance between vehicle noise behaviour and limit	[2] dB	[1] dB	As F/D	[1] dB	[] dB	[2] dB + 1.5 dB / 1000 rpm
Additional tolerance on Reference point		-	-	L wot limit from L urban limit and L wot	L wot limit from L urban limit	L urban limit	-

The tolerance will be adjust to discriminate “normal” vehicles to “abnormal” vehicles

Conclusions

- for all proposals using an ASEP limit linked with L urban limit
 - L ASEP is a function of L urban limit and additional data(s)

- All proposals can be link with L urban limit not to discriminate silent vehicles

- All method present uncertainties on ASEP limit

- Three following points need to be checked to compare proposals :
 - Uncertainties on the limit
 - Spread of normal vehicle compare to each model
 - Tolerance necessary to discriminate “normal” to “abnormal” vehicles