

# **ASEP**

## **-- Proposal for CVT --**

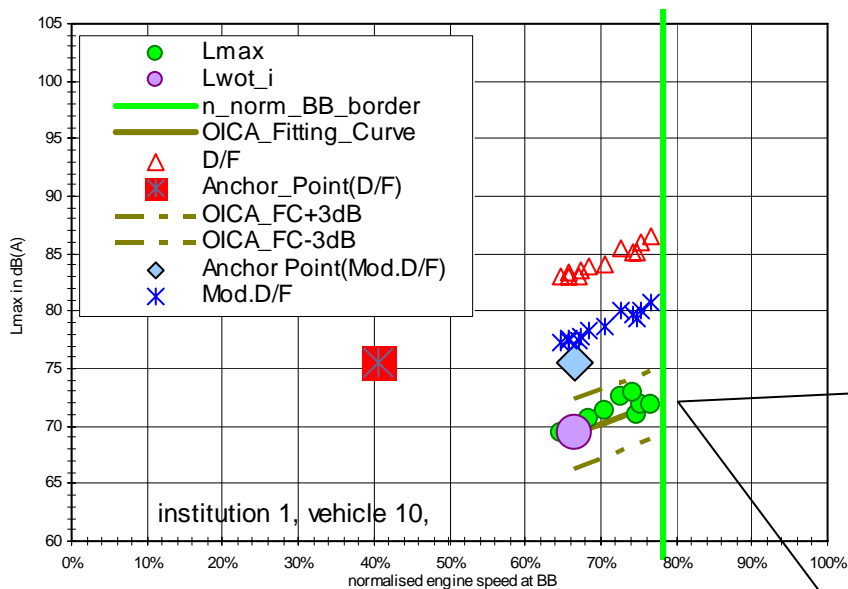
**GRB informal meeting #14**  
**28-29 January 2009**  
**JASIC**

**1** Revision of the OICA method for CVT

**2** Definition of classical CVT

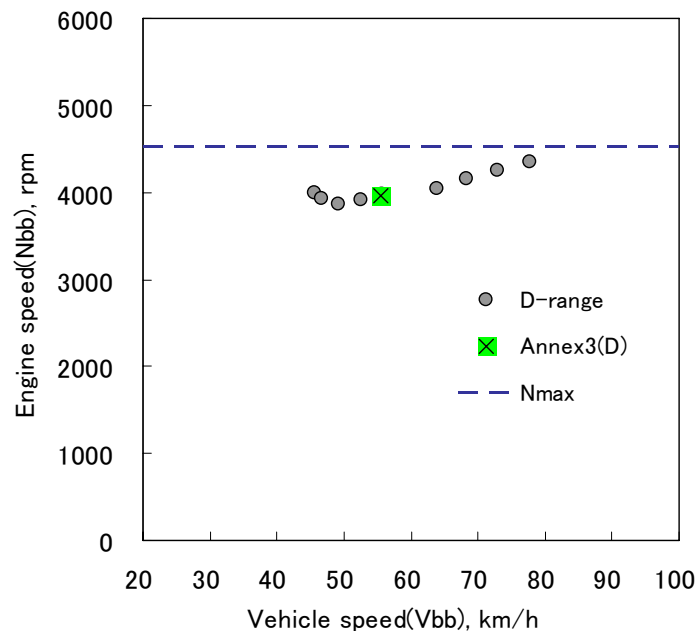
# Consideration for revising the OICA proposal on D-range test for CVT

Vehicle 1-10

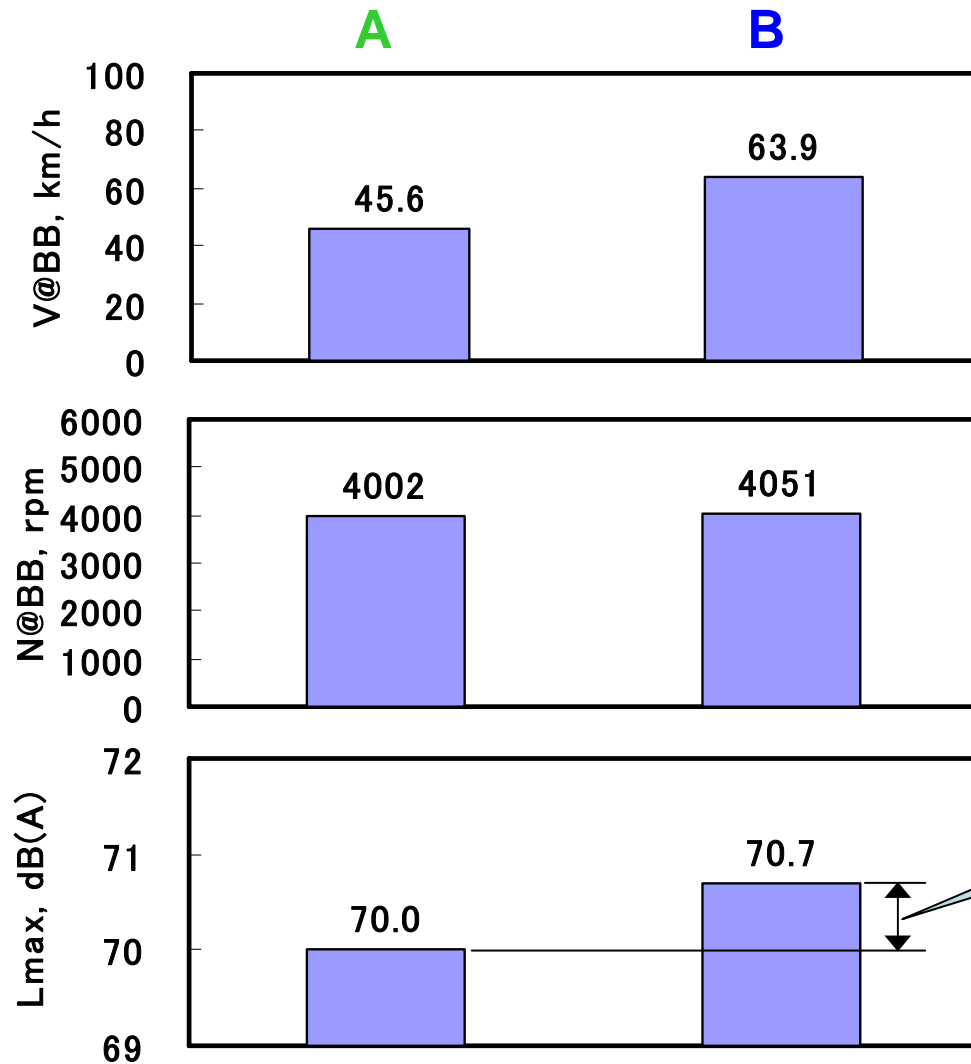


**Gear : D-range , Annex3,i : D-range**

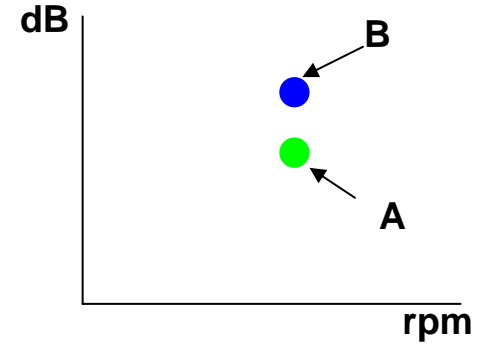
**OICA proposal compensate tyre noise only at the anchor point.  
There is the influence of tyre noise at every point as well as at the anchor point, because the relationship between vehicle speed and engine speed is not liner in case of CVT.**



# Revised OICA proposal for D-range test



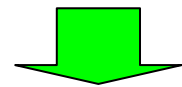
Vehicle 1-10



Same engine speed but different vehicle speed

0.7 dB

Influence of tyre noise



Should use maximum vehicle speed within ASEP test for the calculation of the anchor point

# Calculation procedure for limit line

	MT, AT & locked CVT	CVT D-range
Annex 3 test (gear i, D)	From Annex3 test results $L_{\text{woti,annex3}}$ $n_{\text{BB,woti,annex3}}$ $V_{\text{BB,woti,annex3}}$	From Annex3 test results $L_{\text{wotD,annex 3}}$ $n_{\text{BB,wot D,annex3}}$ $V_{\text{BB,wotD,annex 3}}$
【Step-1】 Anchor point gear i	$L_{\text{anchor,i}} = L_{\text{woti,annex3}}$ $n_{\text{anchor,i}} = n_{\text{BB,woti,annex3}}$ $V_{\text{anchor,i}} = V_{\text{BB,woti,annex3}}$	
【Step-2】 Anchor point gear k	$L_{\text{anchor,k}} = 10 * \log(10^{(L_{\text{wotk}}/10)} - 10^{(L_{\text{cruise}}/10)} + 10^{(32 * \log \Delta V + L_{\text{cruise}})/10})$ $\Delta V = i_k / i_i \quad (= V_{\text{BB,wot k}} / V_{\text{BB,woti,annex 3}})$ <p>where <math>i_k</math> = gear ratio of the tested gear k  <math>i_i</math> = gear ratio of gear i</p>	$L_{\text{anchor,D}} = 10 * \log(10^{(L_{\text{wotk}}/10)} - 10^{(L_{\text{cruise}}/10)} + 10^{(32 * \log \Delta V + L_{\text{cruise}})/10})$ $\Delta V = V_{\text{BBmax}} / V_{\text{BB,wot D, annex 3}}$ <p>where <math>V_{\text{BBmax}}</math> = maximum vehicle speed during ASEP test</p>
【Step-3】 Sound Slope	Regression analysis based on measured data.	Regression analysis based on measured data.
【Step-4】 Limit Line	$L_{\text{ref}} = L_{\text{anchor,k}} + \text{Slope} * (n_{\text{BB}} - n_{\text{BB,wot i,annex3}}) / 1000 + X$	$L_{\text{ref}} = L_{\text{anchor,k}} + \text{Slope} * (n_{\text{BB}} - n_{\text{BB,wot D,annex3}}) / 1000 + X$

# Amendment for text

Based on the Chairman's draft proposal,

## 4.1. Determination of the anchor point for each gear ratio

.....  
The sound level of the anchor point in gear k is calculated by:

$$L_{\text{anchor},k} = 10 \cdot \log(10^{(L_{\text{wotk}}/10)} - 10^{(L_{\text{cruise}}/10)} + 10^{(32 \cdot \log \Delta v + L_{\text{cruise}})/10})$$

$$\Delta v = i_k / i_i \quad (= v_{\text{BB,wotk}} / v_{\text{BB,woti,annex 3}})$$

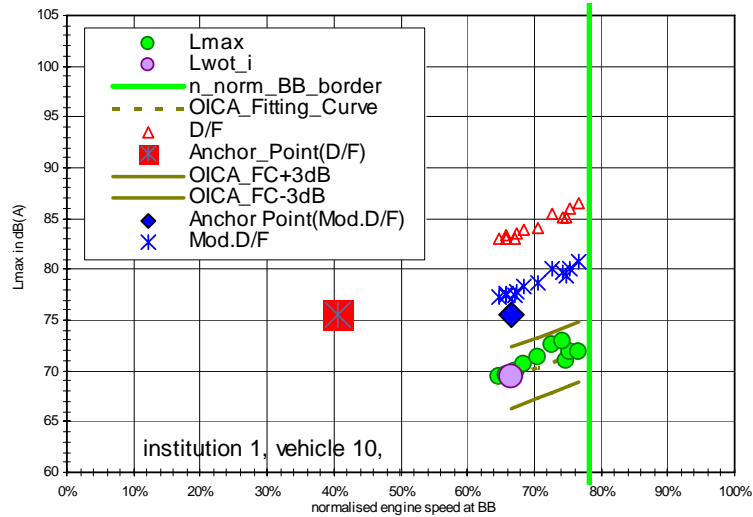
**In case of vehicles with CVT's non-locked gear ratios,  $\Delta v$  shall be used as follows;**

$$\Delta v = v_{\text{BBmax}} / v_{\text{BB,wotD,annex 3}}$$

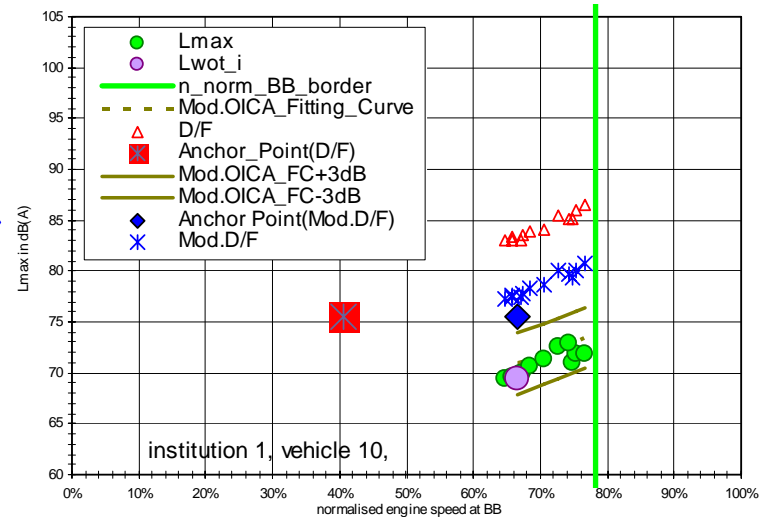
**where  $v_{\text{BBmax}}$  = maximum vehicle speed during ASEP test**

# Revised OICA proposal for D-range test

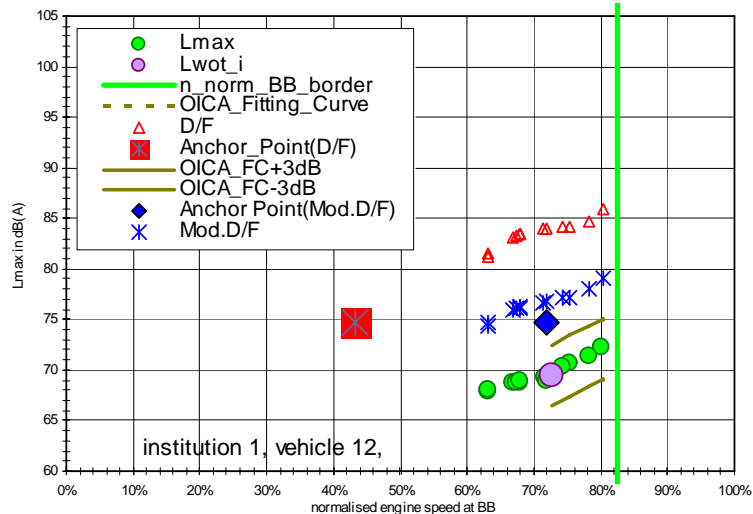
## Vehicle: ASEP 1-10 (original)



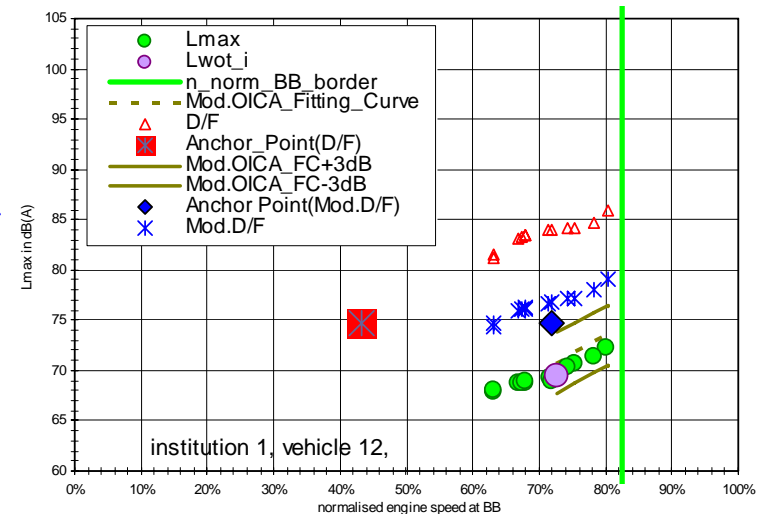
## Vehicle: ASEP 1-10 (rev.)



## Vehicle: ASEP 1-12 (original)

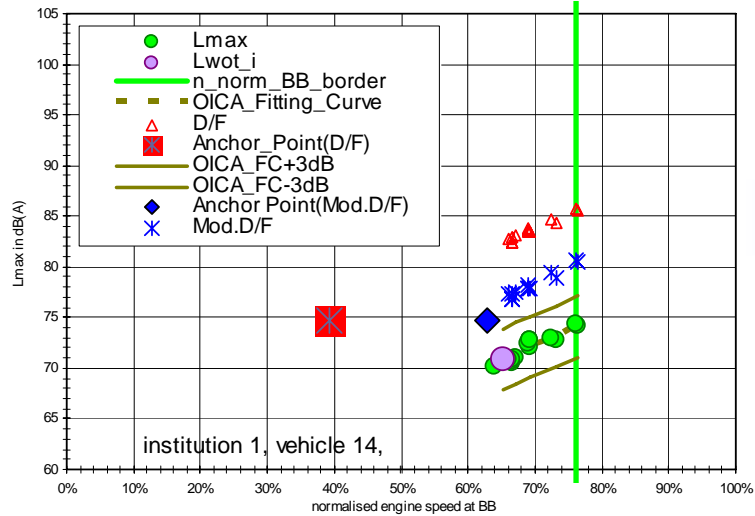


## Vehicle: ASEP 1-12 (rev.)

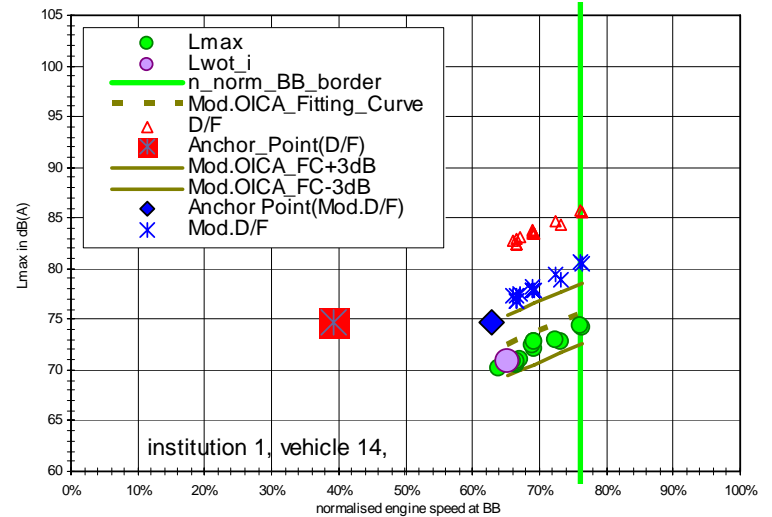


# Revised OICA proposal for D-range test

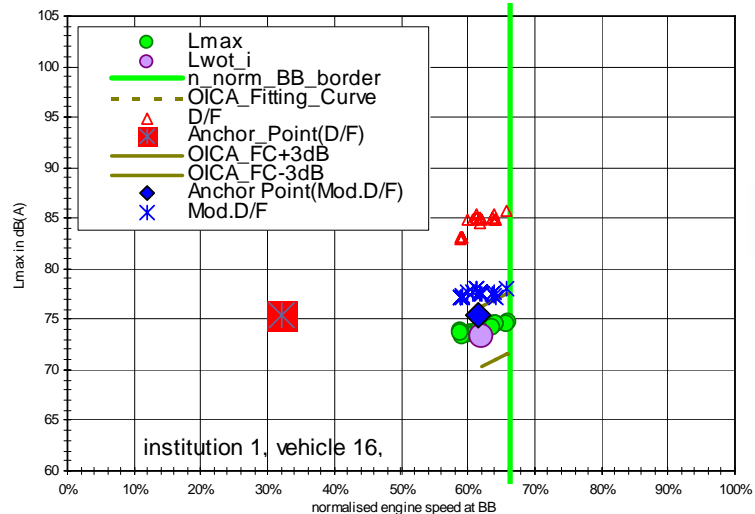
Vehicle: ASEP 1-14 (original)



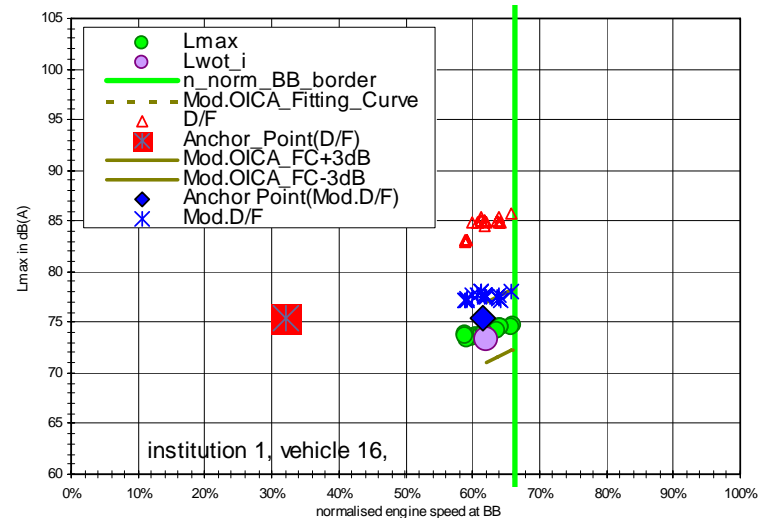
Vehicle: ASEP 1-14 (rev.)



Vehicle: ASEP 1-16 (original)



Vehicle: ASEP 1-16 (rev.)



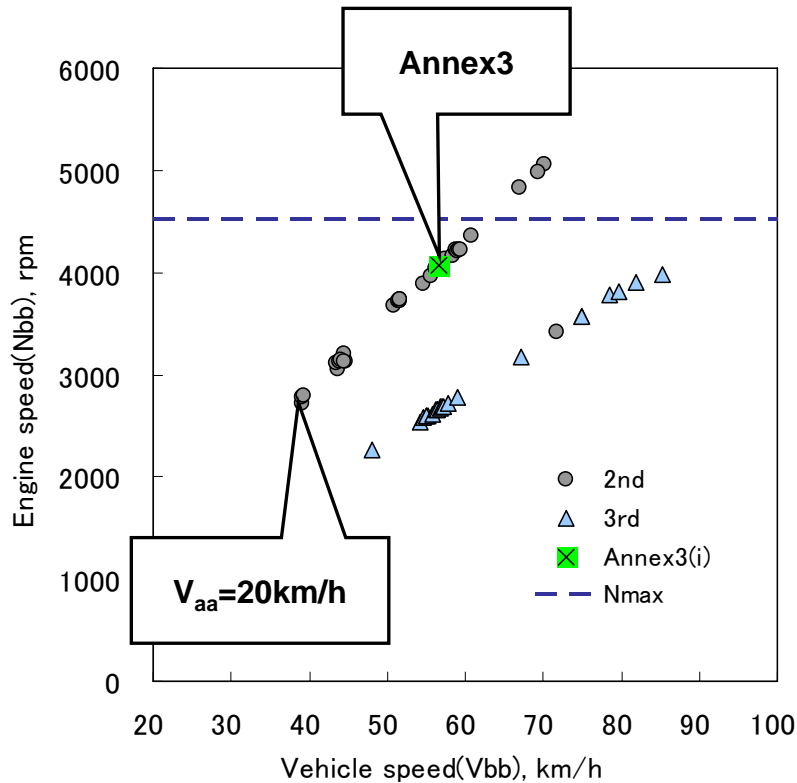


# Proposal for definition of classical CVT

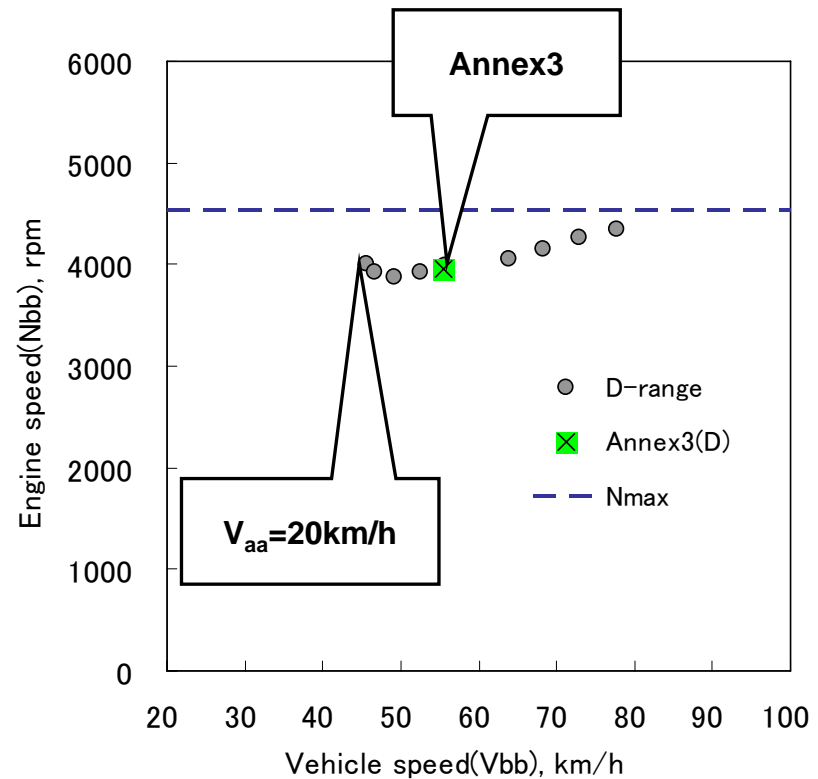
Both  $n_{BB}$  on Annex3 test and on wot test from  $v_{aa}=20\text{km/h}$  are larger than **0.85  $n_{BB \max}$**

# Typical characteristics for CVT

MT(Vehicle:107-6)

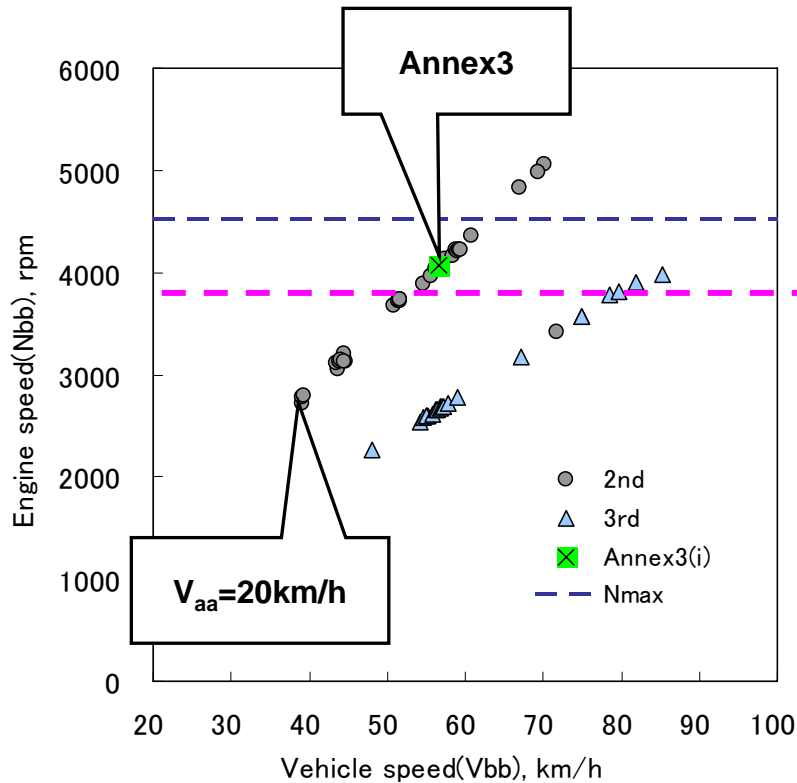


CVT(Vehicle:1-10)

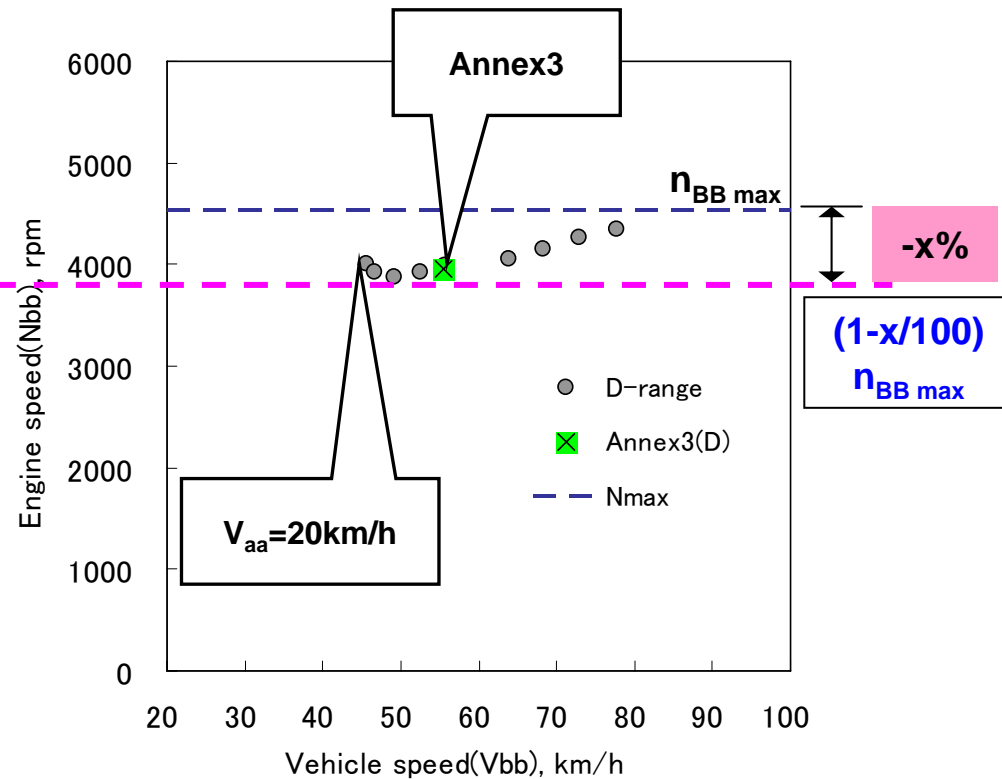


# Typical characteristics for CVT

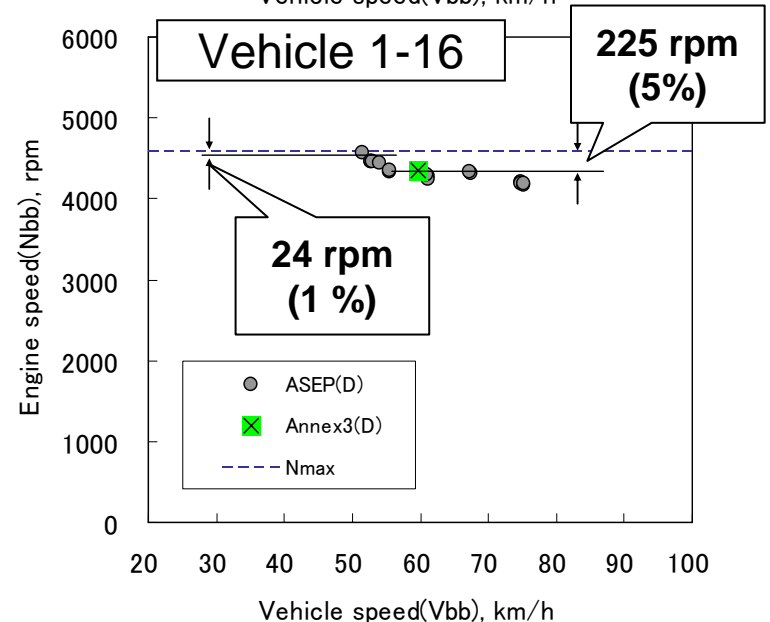
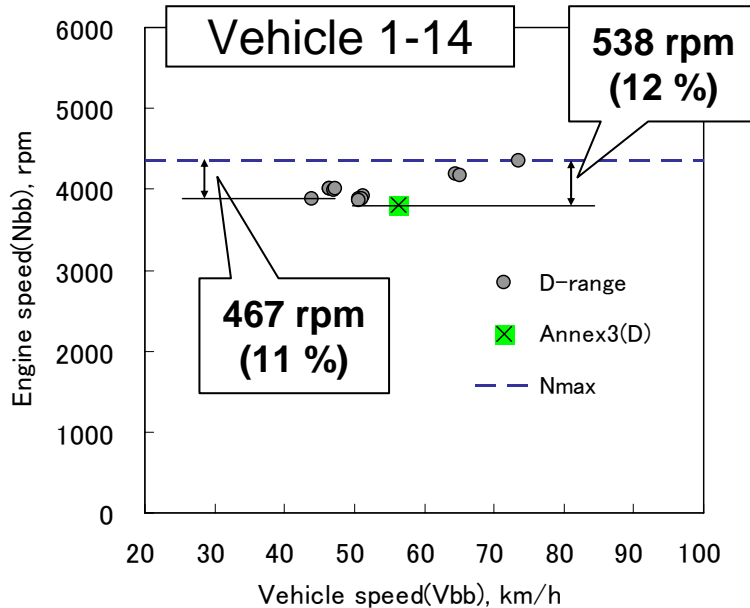
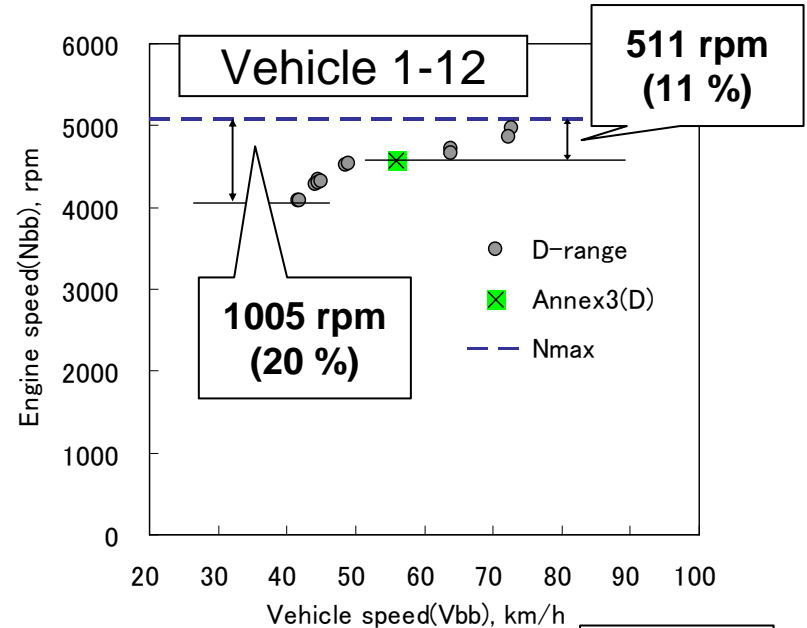
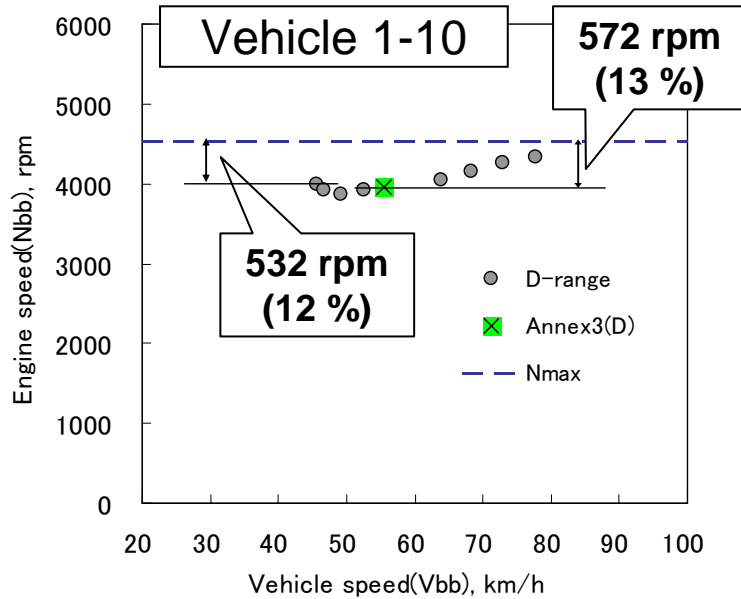
MT(Vehicle:107-6)



CVT(Vehicle:1-10)

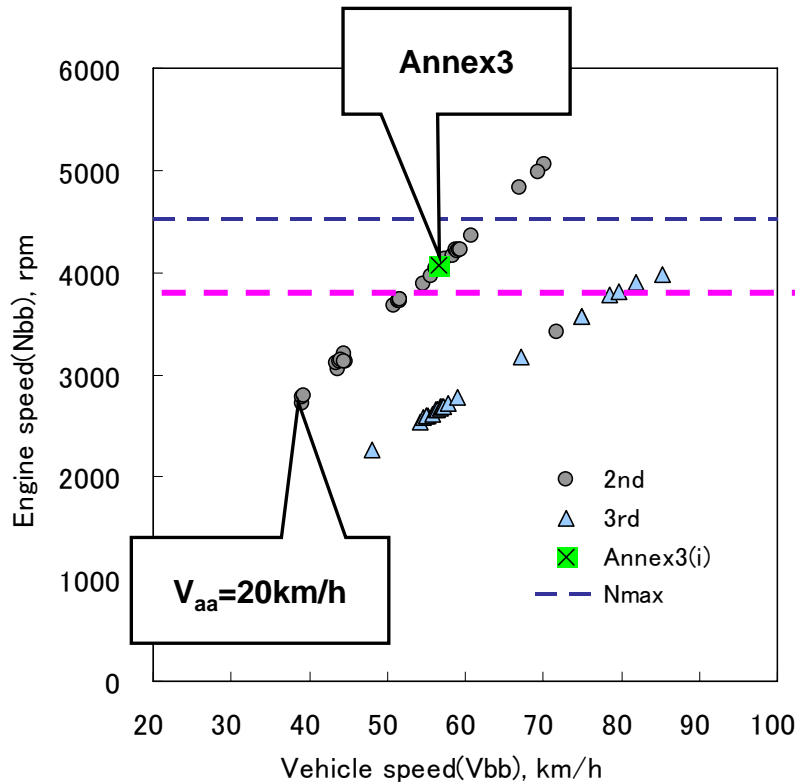


# Range of engine speed for CVT

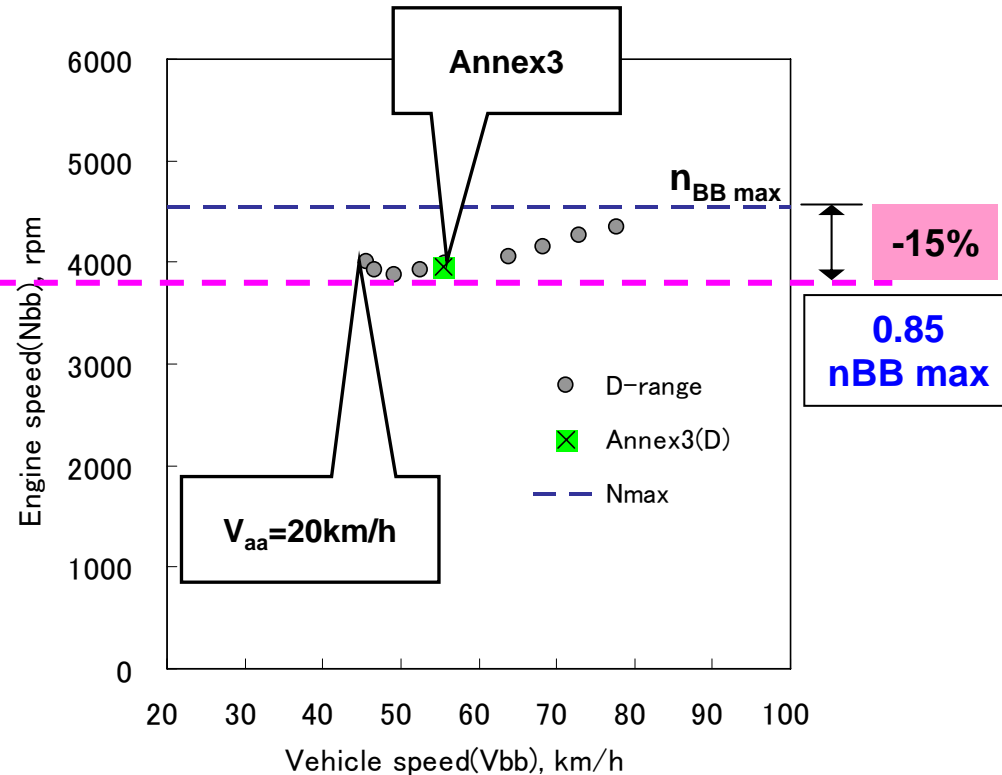


# Typical characteristics for CVT

MT(Vehicle:107-6)



CVT(Vehicle:1-10)



Both  $n_{BB}$  on Annex3 test and on wot test from  $v_{aa}=20\text{km/h}$  are larger than **0.85  $n_{BB\ max}$**