

# Geneva informal QRTV meeting

AVAS requirements

# Vehicles concerned

EV and HEV (operating in their electric mode)	Mandated	forbidden	Optional	Remarks
Light Vehicles	France, Japan, Spain		UK, Germany	Additional sub-categories to be defined
Heavy Vehicles	France, Spain		UK, Germany	Additional sub-categories to be defined
2-3 Wheelers (L1, L2, L3, L4, L5)		Germany	UK, France	
L6, L7		Germany	UK, France	
Vehicles with noise level above xx dB(A) – EV & HEV (are not required to be equipped with an AVAS)	Needed	Not Needed UK, Germany, France, Spain		Additional sub-categories to be defined

# Operating conditions

	<b>Mandated</b>	<b>forbidden</b>	<b>Optopnal</b>	<b>Remarks</b>
Stationary	[China]	France, Switzerland, Norway	Japan, Germany, UK	operating after vehicle ON or after gear engaged
Commencing	Spain	Switzerland	Japan, France, UK, Norway, Germany	
Reverse	Japan, Spain		Germany	UK has legislation on reversing devices
From start up to 20 km/h	France, Japan, Spain		Germany	
From 20 to 30 km/h			France, Japan, Spain	
> 30 km/h		Germany, France, Spain	Japan	

# Pause / Attenuation

	<b>Mandated</b>	<b>forbidden</b>	<b>Optional</b>	<b>Remarks</b>
Pause switch On/Off	UK, Germany	[Spain]	France, Japan	
Re-operation (after deactivation of the vehicle) in previous driver choice	[UK], Germany	France		
Re-operation (after deactivation of the vehicle) in ON	France, Japan			
Attenuation	<b>NEEDED</b> Germany, Spain	<b>NOT NEEDED</b> UK, Japan		
Software On/Off Switch (for regional legislative purposes)	UK, Germany, Spain		[France], Japan	

# Signal characteristics and minimum noise

	<b>Mandated</b>	<b>forbidden</b>	<b>Optional</b>	<b>Remarks</b>
Description of sound avoided	UK, France, Japan, Spain, Germany			R.E.3
Minimum sound level on 1/3 oct band level (8 bands)				NPRM : 315, 400, 500, 2000, 2500, 3150, 4000, 5000 Hz
Minimum sound level has to be met on one band less than 800Hz and on one band over 1.25kHz (1/3 oct band level)	France, Japan, Spain			Japan One band less than 800Hz and one band over 1.25kHz. The manufacture may add more bands without minimum requirements
Minimum sound level in overall	France, Japan, Spain			
Minimum sound level per band	France, Japan, Spain			

# Pitch shifting

	<b>Mandated</b>	<b>forbidden</b>	<b>Optional</b>	<b>Remarks</b>
Pitch Shifting	In favour UK, Germany, France, Japan, Spain	Not in favour		
At least 1% / 1km/h	Japan			NPRM
At least 8% / 10km/h	France		[Japan]	Japan is also considering this option
X tones between xx and yy Hz	Needed France	Not Needed Japan		NPRM : 1 tone between 160 and 400 Hz

# Maximum sound level

	Required	Not Required	Remarks
Maximum Sound Level for Evs and HEVs with the AVAS activated	UK, Germany, France, Spain		Japan has not carried-out a discussion yet
Max SPL of EV or HEV with AVAS activated not higher than the SPL of non-QRTV of the same category operated at conditions specified in SAE 2889-1 or ISO 16254	France		Japan has not carried-out a discussion yet Spain requires more information to become available
No vehicle shall be more noisy (with AVAS activated) than M1a vehicles	Germany, [France]		Japan has not carried-out a discussion yet Spain requires more information to become available

# Test Procedure for verification of acoustic performance of QRTV

	Allowed	Not Allowed	Remarks
Indoor Vehicle Testing			
Outdoor Vehicle Testing			



# Test Procedure of Vehicles equipped with AVAS system

Test Procedure	YES	NO	Remarks
Component Testing Indoors			AVAS system standalone test on a testing bench
Simulated Vehicle Testing Indoors			AVAS system testing with the vehicle as the test bench and the AVAS system receiving speed increase signals
Vehicle Testing Indoors			
Vehicles Testing Outdoors (when test facility meets some minimum requirements, i.e. each 1/3 octave bands has to be at least 6db below the targeted measurement)			