

WLTP – DHC

Results of Validation Phase 1.b

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	Vehicle 1	Vehicle 2	Vehicle 3
Vehicles category	LCV	PC	PC
Manufacturer	Ford	Renault	Fiat
Model name	Transit	Clio	500
Fuel type	Diesel	Diesel	Petrol
Engine displacement [cm ³]	2198	1461	875
Max. rated power [kW/min ⁻¹]	63/2625	55/3000	62.5/4125
Vehicle mass [kg]	1715	1175	930
Aftertreatment	DOC	DOC + DPF	TWC
Emission standard	Euro 4	Euro 5A	Euro 5A
Transmission	5MT	5MT	5MT

Vehicles	Gear Shift Strategy	Vehicle Condition	Test Series
Ford Transit Renault Clio Fiat 500	JP	Cold	1,1;
		Hot	2, 3; 2, 3;
	EU	Cold	1,1;
		Hot	2, 3; 2, 3;

Each vehicle has been tested 6 times with the Japanese GS strategy and 6 times with Steven 2 GS, for a total of $(6+6)*3=36$ tests

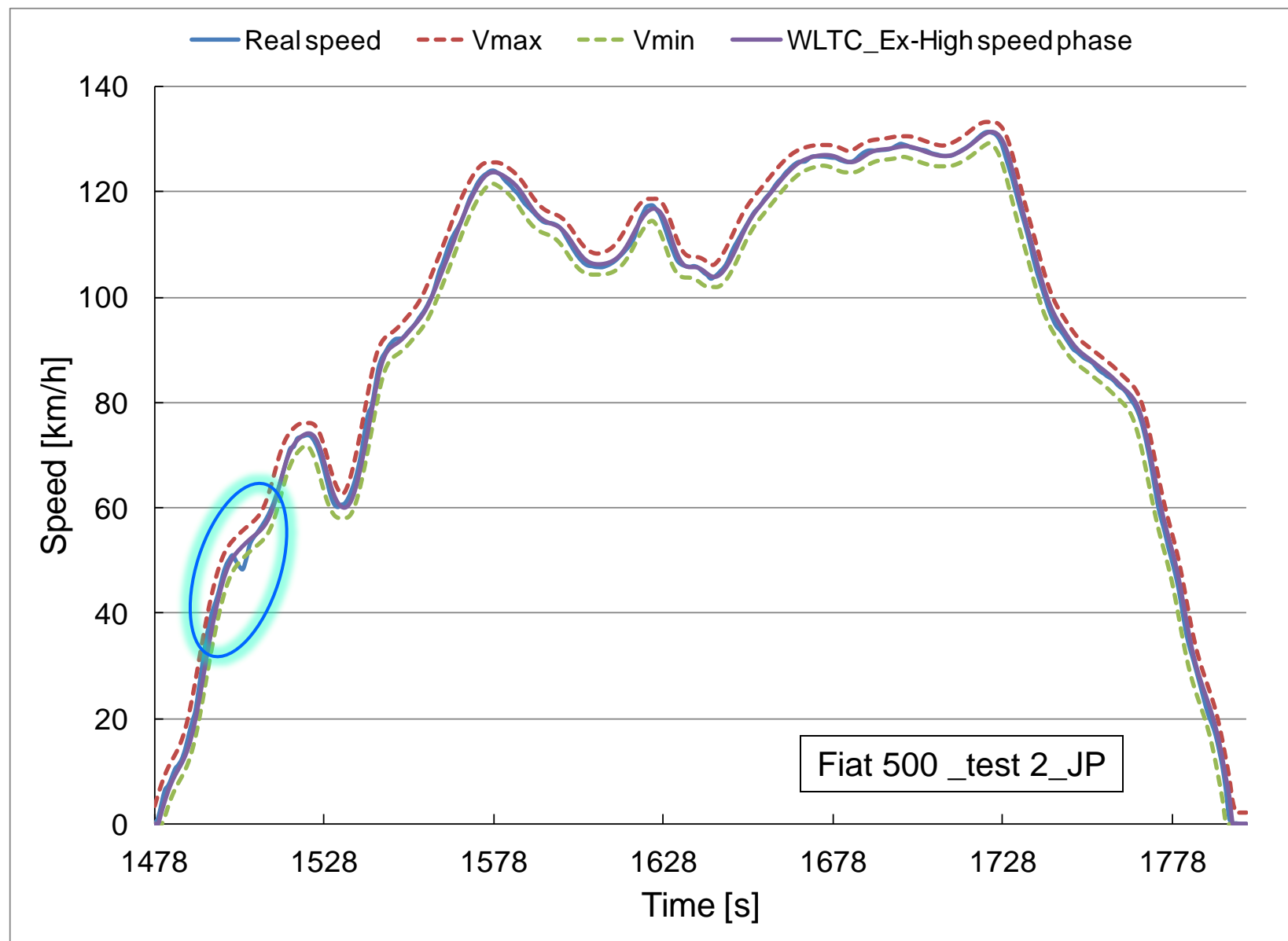
	Laboratory	Vehicle	Gear Shift	Vehicle Conditions	Test series #	Mode Trace Ability										Remarks	
						Violation *	Driving Index *										
							Low ST1	Low ST2	Low ST3	Low ST4	Low ST5	Low Total	Middle	High	Ex-High		
23022012_001	JRC	Ford-LCV	Japan	Cold	1		-3.72%	-2.00%	-8.36%	-6.48%	-7.64%	-3.29%	-2.40%	-1.41%	-0.59%	Violations: # 0; Time:0 [s] ; % 0	
23022012_002	JRC	Ford-LCV	Japan	Hot	2		-3.09%	-2.94%	-8.01%	-6.24%	-8.22%	-3.75%	-2.13%	-1.56%	-0.51%	Violations: # 0; Time:0 [s] ; % 0	
23022012_003	JRC	Ford-LCV	Japan	Hot	3		-2.99%	-1.89%	-4.68%	0.17%	-7.17%	-2.53%	-2.69%	-1.35%	-0.78%	Violations: # 0; Time:0 [s] ; % 0	
24022012_002	JRC	Ford-LCV	Japan	Cold	1		-3.05%	-2.19%	-6.29%	-1.60%	-10.01%	-3.05%	-1.93%	-1.52%	-0.31%	Violations: # 0; Time:0 [s] ; % 0	
24022012_003	JRC	Ford-LCV	Japan	Hot	2		-1.80%	-2.27%	-5.87%	-0.02%	-6.19%	-2.61%	-1.68%	-1.70%	-0.53%	Violations: # 0; Time:0 [s] ; % 0	
24022012_005	JRC	Ford-LCV	Japan	Hot	3		-1.35%	-2.77%	-4.29%	-4.75%	-6.54%	-2.82%	-1.83%	-1.83%	-0.27%	Violations: # 0; Time:0 [s] ; % 0	
27022012_002	JRC	Ford-LCV	Steven	Cold	1	Low: 57s	-0.99%	-2.60%	-4.22%	-0.29%	-6.16%	-2.51%	-3.11%	-1.03%	-0.49%	Violations: # 1; Time:2 [s] ; % 0.11	
27022012_003	JRC	Ford-LCV	Steven	Hot	2		-0.73%	-1.52%	-1.88%	-2.04%	-2.26%	-1.44%	-2.05%	-1.09%	-0.34%	Violations: # 0; Time:0 [s] ; % 0	
27022012_005	JRC	Ford-LCV	Steven	Hot	3	High: 1382s	-1.23%	-2.30%	1.09%	2.54%	-1.92%	-1.62%	-2.47%	-0.43%	-0.60%	Violations: # 1; Time:2 [s] ; % 0.11	
28022012_001	JRC	Ford-LCV	Steven	Cold	1		-1.57%	-2.73%	-4.25%	-0.40%	-2.33%	-2.56%	-1.80%	-0.98%	-0.73%	Violations: # 0; Time:0 [s] ; % 0	
28022012_002	JRC	Ford-LCV	Steven	Hot	2		-3.95%	-1.98%	-3.13%	-3.97%	-2.90%	-2.58%	-2.22%	-1.36%	-0.42%	Violations: # 0; Time:0 [s] ; % 0	
28022012_004	JRC	Ford-LCV	Steven	Hot	3		-1.94%	-2.57%	-2.80%	-0.37%	-5.68%	-2.53%	-1.14%	-1.02%	-0.48%	Violations: # 0; Time:0 [s] ; % 0	

	Laboratory	Vehicle	Gear Shift	Vehicle Conditions	Test series #	Mode Trace Ability										Remarks	
						Violation *	Driving Index *										
							Low ST1	Low ST2	Low ST3	Low ST4	Low ST5	Low Total	Middle	High	Ex-High		
14032012_001	JRC	Renault Clio	Japan	Hot	2		1.69%	0.50%	-0.88%	1.35%	-0.84%	0.58%	0.82%	-0.58%	0.20%	Violations: # 0; Time:0 [s] ; % 0	
14032012_002	JRC	Renault Clio	Japan	Hot	3		0.60%	0.61%	1.76%	-2.99%	1.85%	0.67%	-0.49%	-0.52%	0.06%	Violations: # 0; Time:0 [s] ; % 0	
15032012_001	JRC	Renault Clio	Japan	Cold	1		1.90%	0.94%	-2.95%	-2.69%	2.28%	0.73%	-0.15%	-0.80%	-0.13%	Violations: # 0; Time:0 [s] ; % 0	
15032012_002	JRC	Renault Clio	Japan	Hot	2		0.85%	0.57%	-2.97%	-6.02%	0.47%	0.12%	-0.22%	-0.22%	-0.21%	Violations: # 0; Time:0 [s] ; % 0	
15032012_003	JRC	Renault Clio	Japan	Hot	3		2.48%	-0.03%	-1.67%	-1.04%	-5.17%	0.10%	-0.80%	-0.13%	-0.11%	Violations: # 0; Time:0 [s] ; % 0	
19032012_001	JRC	Renault Clio	Japan	Cold	1		2.48%	0.76%	0.27%	-1.85%	-4.36%	0.79%	-0.75%	0.17%	0.05%	Violations: # 0; Time:0 [s] ; % 0	
19032012_003	JRC	Renault Clio	Steven	Hot	2		0.67%	1.65%	-0.99%	2.39%	2.98%	1.28%	-0.02%	-0.38%	0.11%	Violations: # 0; Time:0 [s] ; % 0	
20032012_001	JRC	Renault Clio	Steven	Cold	1		0.91%	1.31%	-3.04%	4.91%	2.02%	0.95%	-0.15%	-0.38%	0.12%	Violations: # 0; Time:0 [s] ; % 0	
20032012_002	JRC	Renault Clio	Steven	Hot	3		0.57%	-0.07%	-2.34%	0.70%	2.17%	-0.04%	0.16%	-0.14%	0.09%	Violations: # 0; Time:0 [s] ; % 0	
20032012_003	JRC	Renault Clio	Steven	Hot	2	Medium: 833s	2.50%	-0.12%	-1.12%	5.78%	5.24%	0.68%	-1.00%	-0.48%	-0.10%	Violations: # 1; Time:1 [s] ; % 0.06	
21032012_001	JRC	Renault Clio	Steven	Cold	1		0.78%	1.79%	-3.29%	8.54%	2.30%	1.31%	-0.63%	-0.21%	-0.23%	Violations: # 0; Time:0 [s] ; % 0	
21032012_002	JRC	Renault Clio	Steven	Hot	3		1.94%	-0.53%	-2.78%	-0.78%	3.18%	-0.10%	-0.24%	-0.19%	-0.03%	Violations: # 0; Time:0 [s] ; % 0	

	Laboratory	Vehicle	Gear Shift	Vehicle Conditions	Test series #	Mode Trace Ability										Remarks
						Violation *	Driving Index *									
							Low ST1	Low ST2	Low ST3	Low ST4	Low ST5	Low Total	Middle	High	Ex-High	
01022012_001	JRC	Fiat	Japan	Cold	1		-0.88%	-1.34%	0.73%	3.90%	5.20%	-0.68%	-1.31%	-0.98%	-0.20%	Violations: # 0; Time:0 [s] ; % 0
01022012_002	JRC	Fiat	Japan	Hot	2	Ex-High: 1503	-0.34%	-0.36%	-1.21%	-2.61%	-4.96%	-0.67%	-1.64%	-0.12%	-0.27%	Violations: # 1; Time:3 [s] ; % 0.17
01022012_006	JRC	Fiat	Japan	Hot	3		-1.81%	-0.35%	0.19%	3.48%	3.65%	-0.35%	0.15%	-0.13%	-0.04%	Violations: # 0; Time:0 [s] ; % 0
02022012_001	JRC	Fiat	Japan	Cold	1		1.59%	-0.82%	-3.96%	-0.87%	3.14%	-0.46%	-1.45%	-0.63%	-0.05%	Violations: # 0; Time:0 [s] ; % 0
02022012_002	JRC	Fiat	Japan	Hot	2		1.24%	-1.50%	-1.49%	-3.56%	-0.32%	-0.94%	-1.07%	-0.99%	-0.04%	Violations: # 0; Time:0 [s] ; % 0
02022012_004	JRC	Fiat	Japan	Hot	3		-0.46%	-1.26%	-1.99%	-2.05%	6.02%	-0.89%	-1.42%	-0.52%	-0.42%	Violations: # 0; Time:0 [s] ; % 0
03022012_004	JRC	Fiat	Steven	Cold	1		-1.08%	0.14%	-4.96%	-2.28%	-3.89%	-0.79%	0.08%	-0.58%	-0.41%	Violations: # 0; Time:0 [s] ; % 0
03022012_005	JRC	Fiat	Steven	Hot	2		0.04%	-0.53%	4.24%	-1.73%	-1.60%	-0.06%	-0.03%	-0.25%	-0.12%	Violations: # 0; Time:0 [s] ; % 0
03022012_006	JRC	Fiat	Steven	Hot	3	L:372; Ex-High: 1482	0.60%	0.38%	0.38%	-0.38%	-0.07%	0.39%	-0.40%	-0.86%	-0.02%	Violations: # 2; Time:4 [s] ; % 0.22
06022012_001	JRC	Fiat	Steven	Cold	1		0.78%	-1.97%	-1.43%	-2.55%	-0.44%	-1.31%	-0.98%	-1.07%	-0.27%	Violations: # 0; Time:0 [s] ; % 0
06022012_004	JRC	Fiat	Steven	Hot	2		1.58%	0.51%	-2.11%	2.60%	0.65%	0.55%	-0.55%	-0.45%	-0.21%	Violations: # 0; Time:0 [s] ; % 0
06022012_005	JRC	Fiat	Steven	Hot	3		-1.08%	-0.34%	-2.56%	2.88%	-1.65%	-0.67%	-0.71%	0.01%	0.25%	Violations: # 0; Time:0 [s] ; % 0

No systematic violation has been detected on the three vehicles.
Some episodes seem of accidental nature.

Extra-High Speed Phase



	Laboratory	Vehicle	Gear Shift	Vehicle Conditions	Test series #	Pollutants (g/km)								
						HC	CO	NOx	CO2	CH4	NO2	N2O	NH3	HCHO
23022012_001	JRC	Ford-LCV	Japan	Cold	1	0.021	0.244	0.373	193.28					
23022012_002	JRC	Ford-LCV	Japan	Hot	2	0.011	0.108	0.364	182.13					
23022012_003	JRC	Ford-LCV	Japan	Hot	3	0.016	0.159	0.364	184.9					
24022012_002	JRC	Ford-LCV	Japan	Cold	1	0.024	0.281	0.37	189.7					
24022012_003	JRC	Ford-LCV	Japan	Hot	2	0.012	0.108	0.37	182.83					
24022012_005	JRC	Ford-LCV	Japan	Hot	3	0.013	0.11	0.358	181.8					
27022012_002	JRC	Ford-LCV	Steven	Cold	1	0.028	0.321	0.366	190.26					
27022012_003	JRC	Ford-LCV	Steven	Hot	2	0.012	0.1	0.369	181.54					
27022012_005	JRC	Ford-LCV	Steven	Hot	3	0.013	0.094	0.386	181.4					
28022012_001	JRC	Ford-LCV	Steven	Cold	1	0.035	0.345	0.367	188.8					
28022012_002	JRC	Ford-LCV	Steven	Hot	2	0.02	0.192	0.368	184.79					
28022012_004	JRC	Ford-LCV	Steven	Hot	3	0.012	0.101	0.371	180.98					

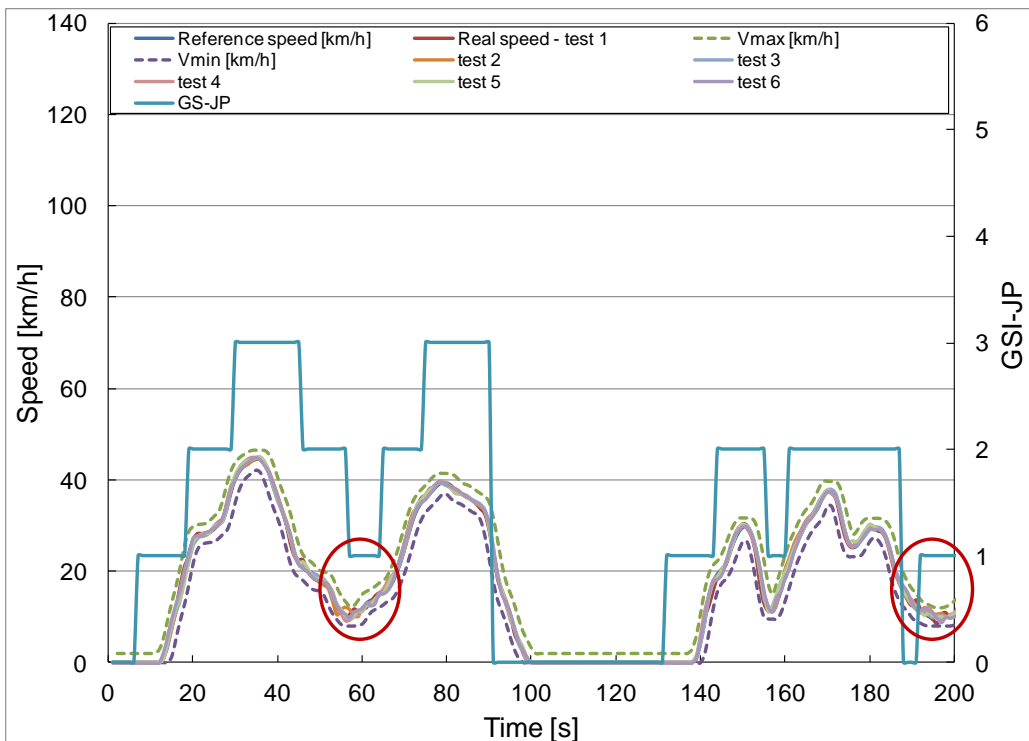
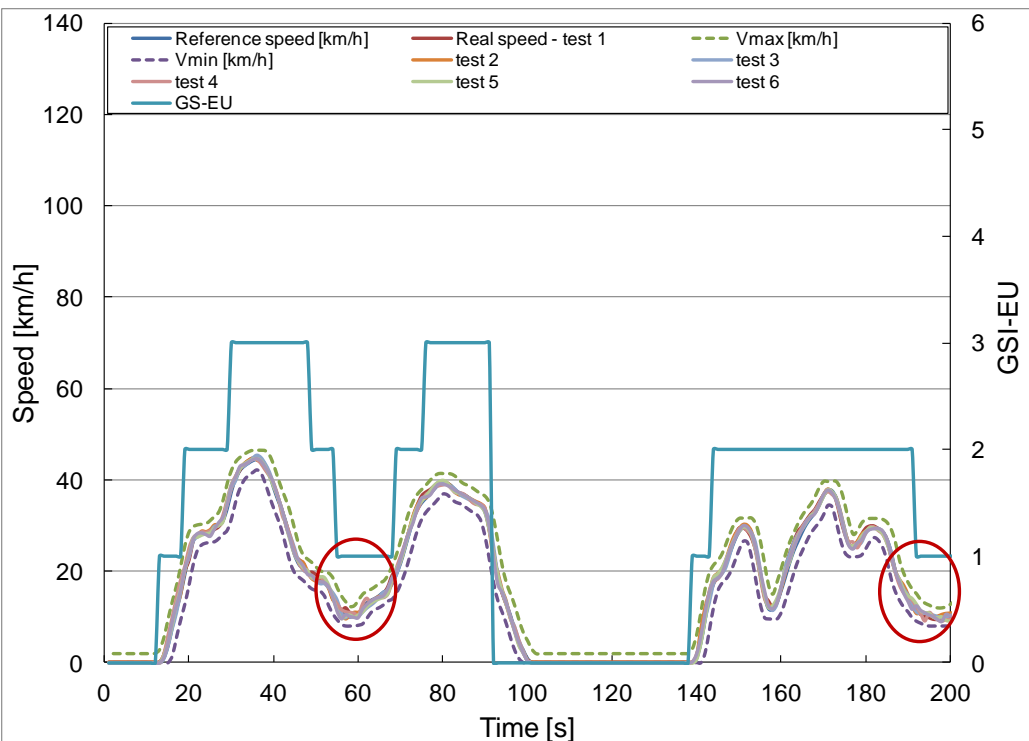
	Laboratory	Vehicle	Gear Shift	Vehicle Conditions	Test series #	Pollutants (g/km)								
						HC	CO	NOx	CO2	CH4	NO2	N2O	NH3	HCHO
14032012_001	JRC	Renault Clio	Japan	Hot	2	0.003	0.055	0.455	121.73					
14032012_002	JRC	Renault Clio	Japan	Hot	3	0.003	0.061	0.461	120.33					
15032012_001	JRC	Renault Clio	Japan	Cold	1	0.008	0.106	0.442	124.94					
15032012_002	JRC	Renault Clio	Japan	Hot	2	0.003	0.055	0.461	120.67					
15032012_003	JRC	Renault Clio	Japan	Hot	3	0.003	0.064	0.466	121.12					
19032012_001	JRC	Renault Clio	Japan	Cold	1	0.009	0.14	0.442	124.35					
19032012_003	JRC	Renault Clio	Steven	Hot	2	0.003	0.055	0.495	120.82					
20032012_001	JRC	Renault Clio	Steven	Cold	1	0.009	0.114	0.473	124.47					
20032012_002	JRC	Renault Clio	Steven	Hot	3	0.003	0.056	0.497	120.13					
20032012_003	JRC	Renault Clio	Steven	Hot	2	0.003	0.065	0.494	120.63					
21032012_001	JRC	Renault Clio	Steven	Cold	1	NA	NA	NA	NA					
21032012_002	JRC	Renault Clio	Steven	Hot	3	0.003	0.053	0.495	120.87					

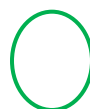
	Laboratory	Vehicle	Gear Shift	Vehicle Conditions	Test series #	Pollutants (g/km)								
						HC	CO	NOx	CO2	CH4	NO2	N2O	NH3	HCHO
01022012_001	JRC	Fiat	Japan	Cold	1	0.062	1.182	0.031	120.16	–	–	–	–	–
01022012_002	JRC	Fiat	Japan	Hot	2	0.034	1.203	0.021	114.33					
01022012_006	JRC	Fiat	Japan	Hot	3	0.035	1.212	0.024	114.23					
02022012_001	JRC	Fiat	Japan	Cold	1	0.052	1.246	0.029	122.11					
02022012_002	JRC	Fiat	Japan	Hot	2	0.03	1.168	0.022	117.07					
02022012_004	JRC	Fiat	Japan	Hot	3	0.032	1.237	0.024	117.53					
03022012_004	JRC	Fiat	Steven	Cold	1	0.065	1.38	0.036	118.07					
03022012_005	JRC	Fiat	Steven	Hot	2	0.038	1.376	0.025	112.68					
03022012_006	JRC	Fiat	Steven	Hot	3	0.033	1.195	0.023	113.36					
06022012_001	JRC	Fiat	Steven	Cold	1	0.068	1.421	0.042	120.44					
06022012_004	JRC	Fiat	Steven	Hot	2	0.034	1.343	0.025	116.26					
06022012_005	JRC	Fiat	Steven	Hot	3	0.03	1.229	0.018	113.71					

During the DHC phone-conference on 22nd March we presented the preliminary results of the Gasoline PC and LDCV.


The tests on the Diesel PC confirm the results anticipated at the phone conference.

Gasoline passenger car (875 cm³ – pmr~55 kW/t)



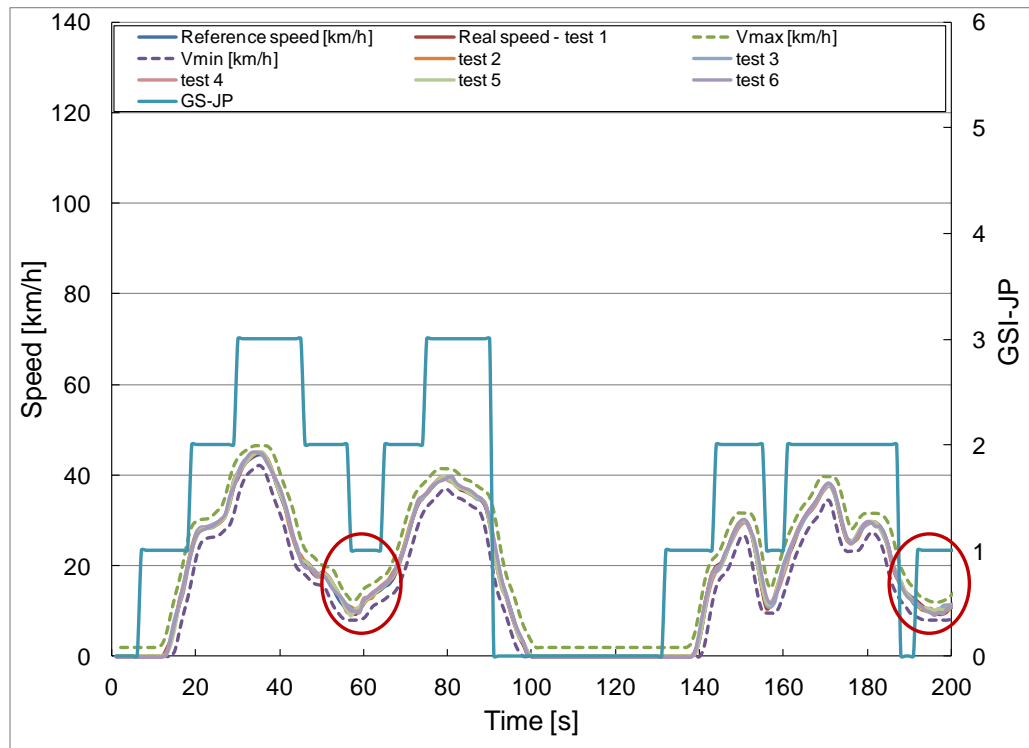
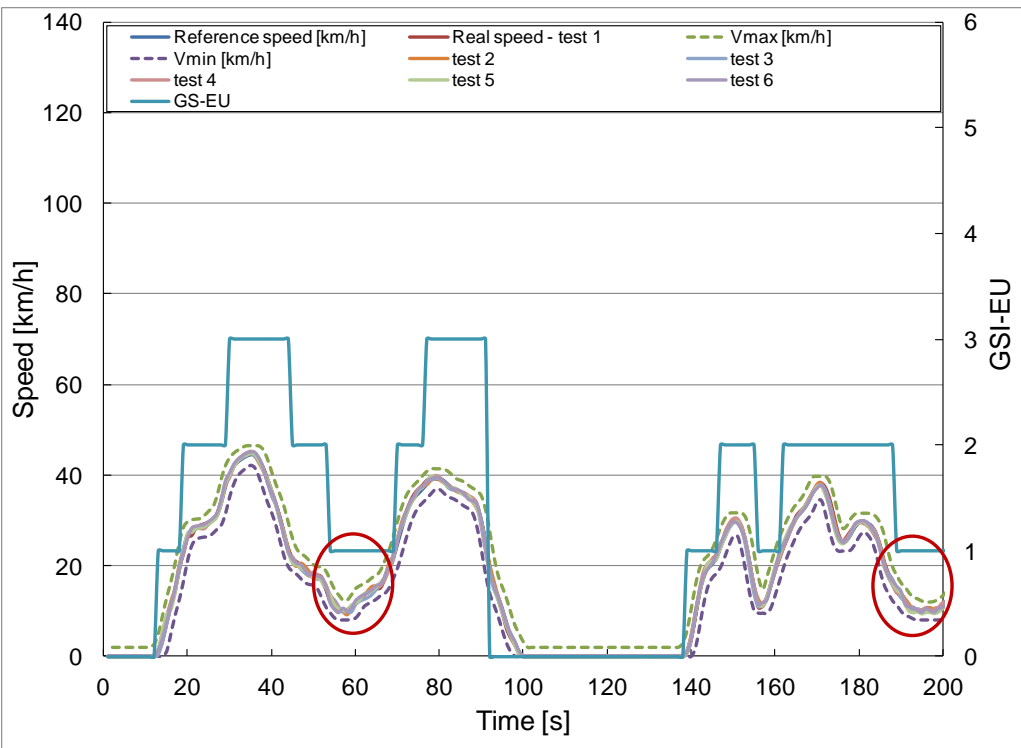
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 = problem

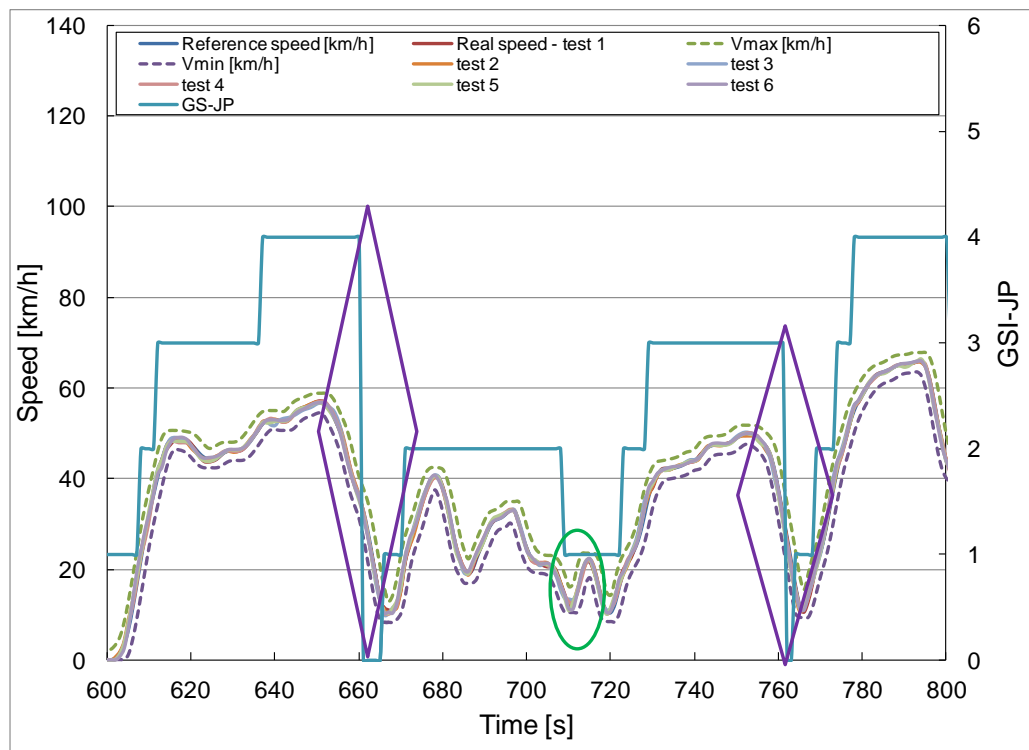
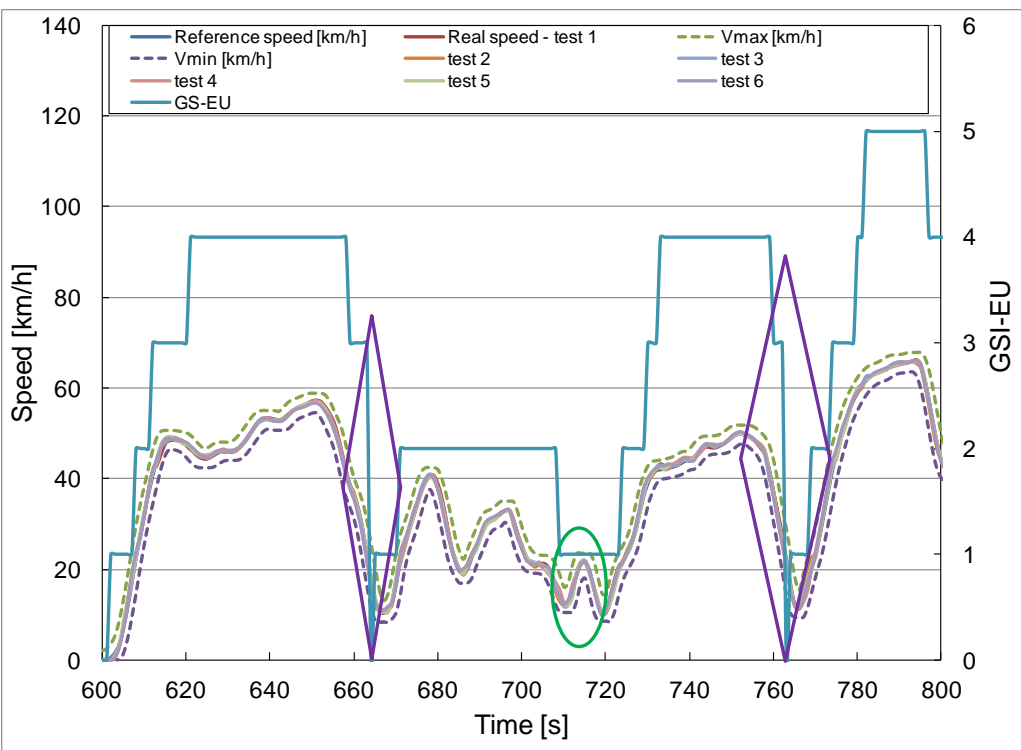
 = OK

 = warning

Diesel passenger car (1461 cm³ – pmr~44 kW/t)



Diesel passenger car (1461 cm³ – pmr~44 kW/t)



Vehicle category	N1	M1	M1
Engine type	Diesel (Ford Transit)	Diesel (Renault Clio)	Petrol (Fiat 500)
rated power [kW]	63.0	55	62.5
kerb mass [kg]	1715	1175	930
idling speed [min ⁻¹]	800	800	800
n/v, gear 1 [min ⁻¹ /(km/h)]	135.5	110	151.0
n/v, gear 2 [min ⁻¹ /(km/h)]	76.7	62.3	78.3
n/v, gear 3 [min ⁻¹ /(km/h)]	48.2	39.8	49.6
n/v, gear 4 [min ⁻¹ /(km/h)]	33.1	28.2	35.2
n/v, gear 5 [min ⁻¹ /(km/h)]	24.3	20.7	27.7

- Three vehicles tested (1 LDCV-Diesel; 1 PC-Diesel; 1 PC- Petrol)
- Six drivability tests for each vehicle (2 Cold start, 4 Hot start) and each Gear Shift strategy
- All three vehicles have shown some difficulty to drive the low speed parts (~10 km/h) with the 1st gear.
- There are several downshifts from 4th gear (even from 5th gear) to 0, soon followed by an upshifts to 2nd gear. These should be avoided (it is possible to go from 4th to 2nd gear and continue with 2nd gear).
- Like the previous 2 vehicles, the Diesel PC has confirmed no problem with accelerations and top speed of WLTC ver.4.